WE LAUNCH 'HD RADIO NEWS.' Page 8

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Emerging Radio
In visits to three countries, John Merli finds a medium seeking its voice.
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In Your Pocket
IBiz adds FM to your pocket PC.
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Radio World

$2.50 The Newspaper for Radio Managers and Engineers March 26, 2003

N.Y. Booster Meets Resistance

by Randy J. Stine

NEW YORK A station's plans to add a booster to improve its signal in New York City has two neighbors on the dial worried about potential interference.

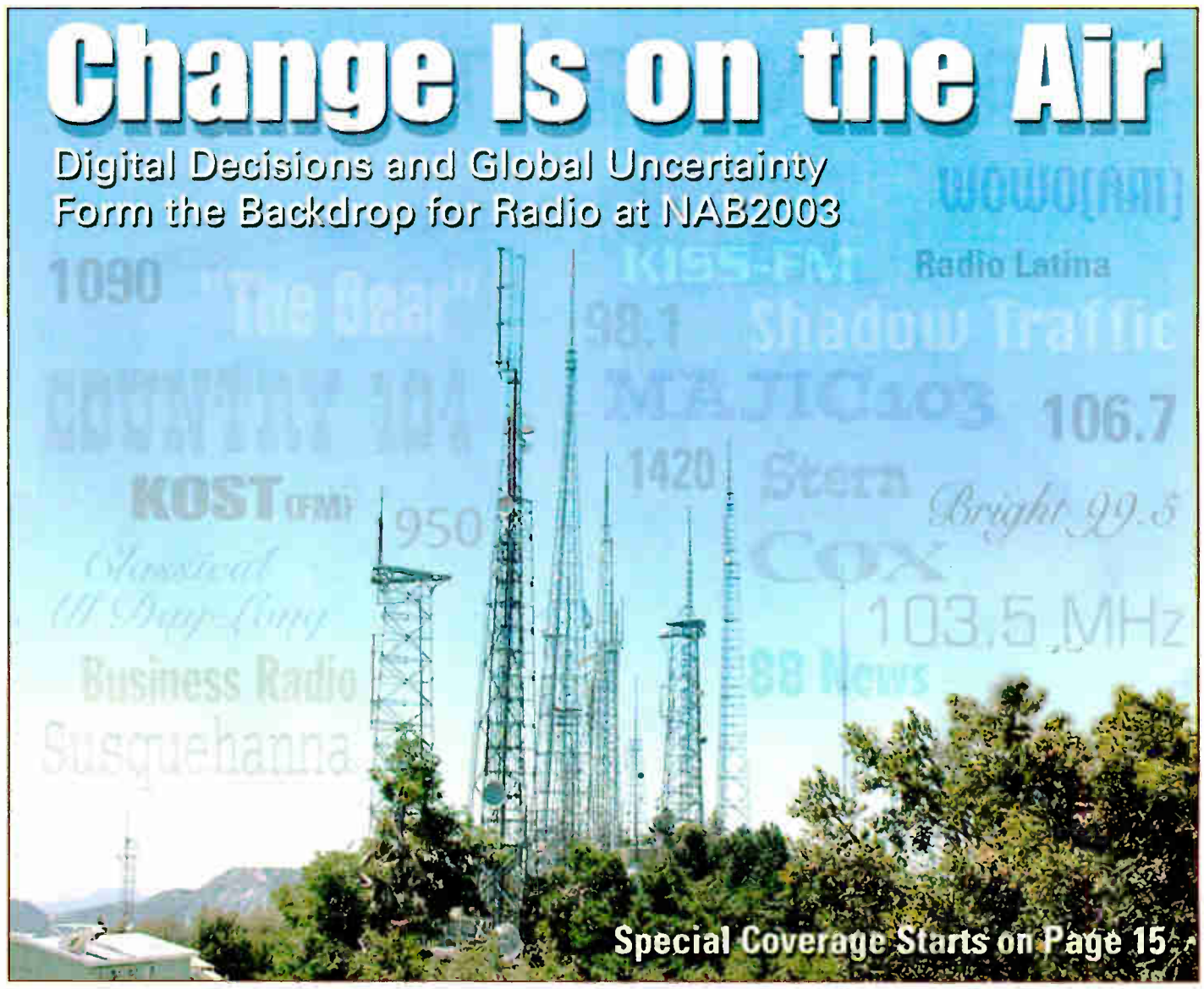
The FCC has issued a construction permit to Fordham University's noncommercial WFUV(FM) to construct a 600-watt booster, call sign WFUV-FM2, atop the 392-foot bell tower of a church in Manhattan. Station officials say the relay would extend the station's signal into Manhattan and in parts of nearby Queens and Brooklyn. Contruction was nearing completion in mid-March.

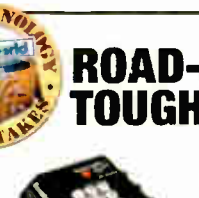
WFUV broadcasts at 90.7 MHz, between WHCR at 90.3 MHz and WFMU at 91.1 MHz, the two stations opposing the planned booster. Those stations say they have engineering reports showing the booster signal will drown out their transmissions.

At issue are FCC rules on constructing booster antennas. Boosters relay the signal of the originating station's antenna on the same frequency to reach areas the main signal cannot. FCC rules stipulate that booster antennas cannot cause interference with adjacent stations once operational.

Those opposed to WFUV's plan say boosters were intended for use in sparsely populated areas as low-power operations, typically 10 to 100 watts. WFUV officials claim there is nothing in the FCC's Part 74 rules governing FM boosters to prevent them from going

See BOOSTER, page 6 ▶





ROAD-TESTED TOUGH

▼ A JK Audio RemoteMix Sport goes to a lucky reader.

Page 4

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An AM/IBOC transmitter worth shouting about.

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People get pretty excited when they hear about Harris' new DAX AM/IBOC transmitters. And who can blame them? Only the people who pioneered every currently used AM modulation standard could bring you the cleanest analog sound and the most accurate In-Band/On-Channel (IBOC) signal available in 1-6kW transmitters.

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World Radio History

Orban/CRL Relocates Arizona Plant

TEMPE, Ariz. Processor manufacturer Circuit Research Labs Inc. has sold its manufacturing facility here and moved its operations to a larger plant it is currently leasing.

CRL President and CEO Jay Brentlinger said the company's old facility measured only 10,500 sq. ft. and had a very small area available for expansion. The building's sale was completed in December 2002.

According to filings with the Security and Exchange Commission, CRL reached agreement to sell the facility to an unidentified buyer for $668,378.

"We used the money to pay off the mortgage and to buy parts to build more units," Brentlinger said.

The company resumed production of CRL products in mid-January at a 30,000-square-foot plant in Tempe's new high-tech manufacturing area. The company's phone number in Arizona remains the same.

The new plant is near Intel's operations and many Motorola plants, Brentlinger said. "That makes for a large electronics skilled workforce nearby."

CRL, which purchased Orban in 2000, also has operations in San Leandro, Calif. Operations there were unaffected.

Brentlinger said plans call for further expansion of the Tempe operation in 2003 by adding the production of the Orban Opticodec line of professional audio codecs and other new product lines from both CRL and Orban.

"We have a very large backlog due to strong sales by our dealers of Orban and CRL products in December and January," he said.

CRL continues efforts to pay off debt accumulated from its acquisition of Orban. It has restructured debt owed to Harman International Industries Inc. several times. The latest restructuring last summer calls for Orban/CRL to repay both long-term and short-term notes totaling $8.5 million by Dec. 31, 2003.

At Orban's new Tempe, Ariz., facility

"We have been working with Harman to reduce our debt,' Brentlinger said.

The company reported a net loss of nearly $1.5 million, or 40 cents per share through the first nine months of 2002, according to the company's most recent quarterly filing with the Security and Exchange Commission.

Brentlinger said Orban/CRL will debut several products at NAB2003 in April.

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

— by Randy J. Stine

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World Radio History

FIRST PERSON

Radio, When Anything Is Possible

In Visits to Three 'Emerging' Nations, the Author Finds Radio Seeking Its Voice

by John Merli

In a growing number of third-world nations, the concept of independent radio is so new that broadcasters, listeners and the government are just barely beginning to learn how to make it a reality.

I recently conferred with broadcasters and government officials in Uganda, Romania and the Republic of Georgia. Each emerging country has its own success stories following years of problems, where state-controlled radio, television and newspapers were the only sanctioned media until only a few years ago.

Old attitudes die hard

A tiny piece of the former Soviet Union, the Republic of Georgia sits uneasily along the southern border of Russia, a still-considerable political power that many Georgians have disdained for two centuries.

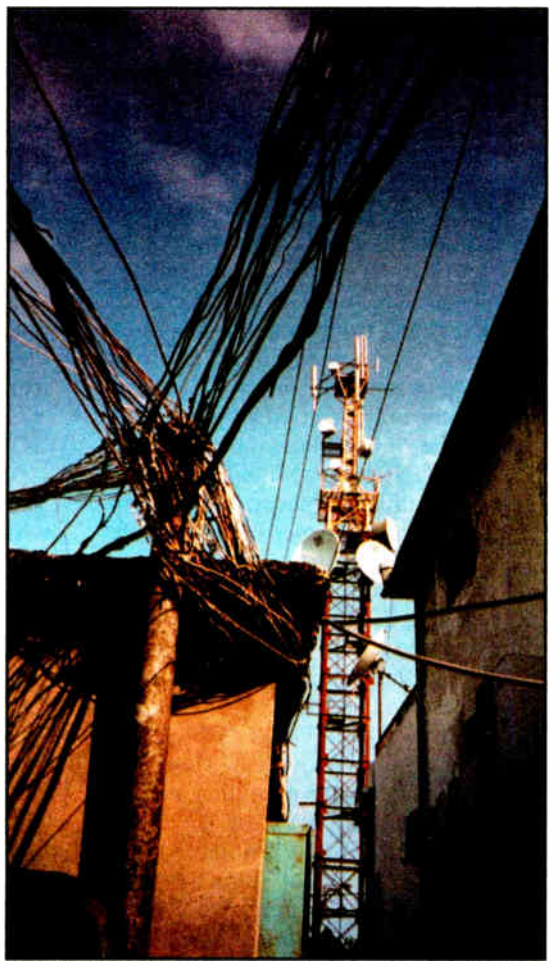
In its capital, Tbilisi, there are nearly a dozen NGO (non-government organization) radio stations struggling to gain loyal listenerships in a nation with exceptionally low radio penetration (homes with at least one radio set) — an estimated 56 percent of adults and below 50 percent on weekends — according to recent surveys. This is no great surprise when one considers there are only 20 NGO radio outlets in the entire country.

(In sharp contrast, Georgians boast a *television* penetration rate of about 92 percent, where independent programming far outshines the lingering Soviet-era grayness of state TV.)

I spent five weeks conferring with six new radio operations in the capital of Tbilisi, near the Black Sea in the west, in the southeast near the Azerbaijan border, and in the southwest near Turkey. The stations are members of the nation's first NGO radio network, GRN, which is headquartered at Green Wave radio in Tbilisi.

Working with a bare minimum of broadcast equipment amid primitive conditions in crumbling or war-damaged buildings that would be condemned in many countries, mostly young radio broadcasters (some still teenagers) are pioneering commercial radio for more than 4 million Georgians who do not yet fully understand the basic concept of non-government FM radio, much less radio advertising and formats.

Several stations have the typical window partitions seen in most radio studios — but with no glass, which is considered a luxury. Electrical wiring is strung across walls and along the floors. And GRN still is more of a "network" in spirit than in reality: Stations are not linked together by landlines or satellite, only via the unreliable phone company for a weekly "radio bridge" (simulcast).



A nest of wires is visible outside the broadcast communications center in Poti, Georgian Republic.

Ironically, as in many emerging nations, broadcasters must rely on modern digital cell-phone networks for most of their telephonic communications. Also, amid these meager surroundings, stations do use sophisticated computer software for programming music, paid commercials and public service announcements, equal to typical radio facilities in other parts of the world. The FM stations are licensed to operate at various power levels, averaging about 48,000 watts.

A casual observer might assume achieving the goals of these inexperienced, yet enthusiastic, broadcasters would be relatively easy: For the most part, each rural station represents the *only* FM signal in its listening area.

Yet because of this radio monopoly-by-default in the rural regions, some broadcasters feel obligated to air several different formats daily, in order to please as many potential listeners as possible. Even in selling advertising time, Georgian broadcasters have political hurdles to clear. Ties between many private businesses and politicians are extremely strong. It is not unusual for negative news coverage to prompt the politicians' businesses to pull their ads in protest.

Due primarily to its strategic location, Georgia is the beneficiary — politically and financially — of growing American support. These Western influences also are cropping up in radio: In August 2002, the GRN stations were equipped with satellite receivers by Radio Free Europe to pull in RFE programming from Prague in the Czech Republic.

New Telecom Act

The Romanian Association of Broadcasters (ARCA) also has been fighting to establish more open broadcast media in a non-communist environment for the past decade.

Romania had gotten a taste of democratic rule nearly a century ago, and then underwent the tyranny of fascism and communism for most of the 20th century. Following a bloody revolution that led to the overthrow of dictator Nicolae Ceausescu in 1989 (he was executed on Christmas Day), its new crop of NGO broadcasters has slowly been nudging Romania towards a true republic.

I addressed an annual meeting of ARCA in the People's Palace, a Ceausescu-inspired boondoggle that rivals the Pentagon in size — today nearly empty and always cold in winter since the cash-strapped government is unable to pay its upkeep. I also conferred with members of Parliament who were in the midst of considering a national communications law that would govern the way broadcasters conduct themselves for years to come.

The Romanian Parliament recently did approve a wide-sweeping telecommunications act, with its final results largely applauded by ARCA. Broadcasters now have a blueprint in place for how to proceed in their emerging republic as their country struggles to pull itself into the 21st century. One noteworthy part of Romanian regulations is that broadcasters are not permitted to sell advertising time within news or public affairs programming – in order to avoid potential conflicts of interest with advertisers (something that rarely poses a problem in the West).

Romania's independent FM stations continue to struggle for profits, given the extremely poor economy. (The unemployment rate is more than 50 percent.) For the most part, the AM band continues to serve state-controlled radio, whose signals blanket the entire country. However, these days government radio is believed to hold a rapidly aging, declining audience.

Financial freedom

Radio broadcasters in the tiny Republic of Uganda are in the midst of fighting government intentions to

See EMERGING, page 5 ▶

Correction

Orban's Optimod-PC 1100 is designed to run on Windows 2000 and Windows XP, not Windows XT as stated in the March 12 Buyer's Guide. Incorrect information was provided by the company.

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World Radio History

Radio's Year of Digital Decision

From the Editor

Paul J. McLane

In this issue, Radio World launches a new section of our newspaper, *HD Radio News*, dedicated to reporting on the industry's digital transition. It will appear in alternating issues.

As the headline on page 8 states, radio has reached its digital Rubicon.

When Julius Caesar crossed that Italian river in 49 B.C., he was committing himself to a course of action. Radio faces a similar choice.

HD Radio technology involves compromises as well as great promise. Many respected industry people question it. But I have little doubt that if radio is to transition to digital at all in the coming decade, this is the time and this is the technology.

Will radio build a digital bridge and cross its river? Or put its toe in and withdraw?

Radio World will cover the topic closely in the coming months, and report to you what we find.

★ ★ ★

This is our big NAB show preview issue; you'll find full show coverage beginning on page 15, including radio booth listings. At the bottom of page 26, we summarize the notable HD Radio/IBOC sessions and papers.

In some years, radio seems lost at the spring NAB show. "Good ol' radio" rarely has made headlines in the past decade, taking a back seat to buzz about digital television, multimedia or the Internet.

This convention presents one of the best radio technical programs in years.

But radio promises to be at center stage at NAB this year, thanks to digital and HD Radio in particular. The agenda is chock-a-block with digital sessions, papers and demonstrations in the Radio Management Conference, the Broadcast Engineering Conference and the SBE Ennes Workshop and at numerous vendor booths on the exhibit floor, as well as the Public Radio Engineering Conference just prior to NAB.

Beyond digital, this convention presents one of the best radio technical programs in years. Several important news stories appear on the agenda.

Tuesday morning, the Radio Transmission Forum includes a presentation by Mario Hieb about the challenges of frequency coordination at the 2002 Winter Olympics. Then James Dalke tells about KKOL in Seattle, an AM station operating from temporary facilities aboard a cargo ship in Elliott Bay, as we reported in an earlier *Buyer's Guide* story. It is the only licensed broadcast station in the United States on a ship.

Also on Tuesday, Mike Dorrough talks about his Advanced Modulation System. Another paper focuses on the promise of the Kinstar low-profile AM antenna.

I'm intrigued too by the new technology of audio search and retrieval, now starting to show up in radio products. The Tuesday afternoon Audio Forum has a presentation from Fast Talk Communications about that. Multiple papers look at trends in routing and networked console architecture.

One of the industry's notable visionaries, Steve Church of Telos Systems, will fly in from his somewhat mysterious laboratory in eastern Europe to talk about extending the use of Ethernet to include live audio.

On Wednesday, the series on facilities management includes a discussion of the EIA-222-G tower standard; Richard Strickland speaking on RF hazard control equipment; and a presentation on how to plan the construction or renovation of a high-technology digital studio facility.

I'm pleased that readers are familiar with many of these topics through our coverage in recent months, and that several of our contributors and sources are among the speakers.

But quite apart from that, this convention promises to be one of the best for radio technical sessions in some time. I hope the uncertain economy and the situation in Iraq will not prevent you from coming.

★ ★ ★

Congratulations to John Reiser, winner of the NAB's Radio Engineering Achievement Award. The retired FCC senior broadcast engineer will be honored during the show. Reiser was the subject of a feature story here in 2001. Look for more about his career next issue.

And my thanks to Terry Hanley for her dedicated work on this year's exhibitor listings. Those pages of tightly packed words represent an incredible amount of research by the listings coordinator and our editorial staff. After the show, we'll tell you more about these new products and others not yet announced.

See you on the show floor.

NEW TECHNOLOGY SWEEPSTAKES — Radio World

Drew Smith, general manager and engineer of Roche-A-Cri Broadcasting in Friendship, Wis., will cover his next game or live remote easily with this tough, road-tested mixer from JK Audio.

The RemoteMix Sport provides connections for three mics and three headphones so everyone can join in the broadcast. It connects to POTS lines, PBX phone systems or through the headset jack on a cell phone. Mix out and cue connections enable RemoteMix Sport to be used as a front-end mixer for any codec. Retail value: $995.

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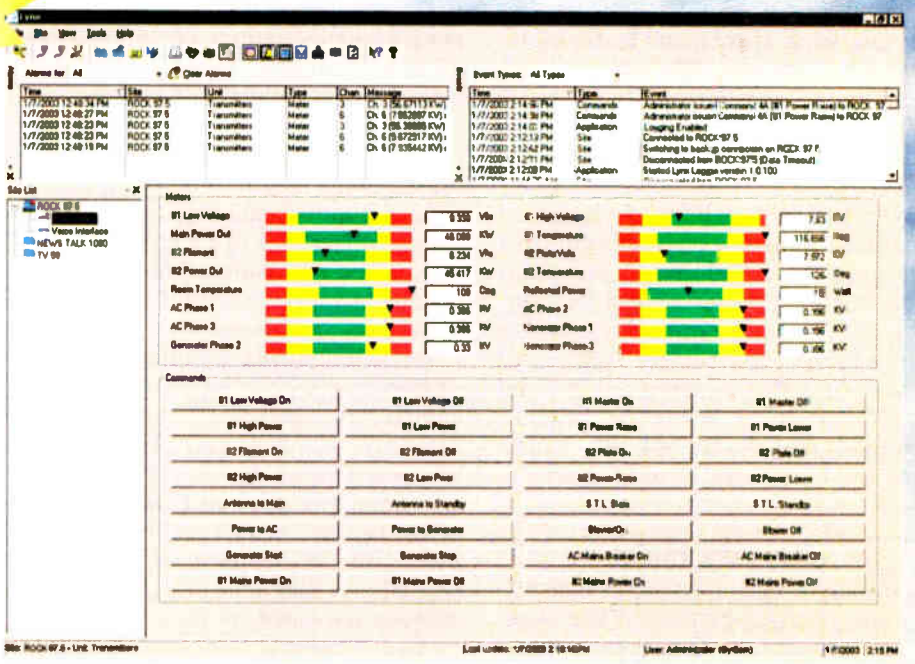

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World Radio History

Emerging

▶ Continued from page 3

impose high licensing fees and taxes that could cripple local radio outlets throughout the country.

The station manager's office at Radio 107.9 in Kutaisi, Georgia, is on the sixth floor of building with no working elevators, restrooms or plumbing.

In a nation still recovering from the violent reign of former dictator Idi Amin, who fled the capital of Kampala nearly 25 years ago (and now reportedly lives comfortably in Saudi Arabia), the fledgling Ugandan broadcasting group is trying to head off the potentially burdensome costs of doing business.

Apart from overcoming government uncertainty and economic hardship, it is clear what radio broadcasters in emerging nations most urgently need are skills training and long-term mentoring.

With more than a hundred independent FM stations already on the air throughout Uganda, including about 30 in Kampala, radio broadcasters already have entered a very competitive environment and several stations in the capital are doing relatively well. Yet at a recent Ugandan NAB meeting in Kampala, which I addressed, radio broadcasters expressed their deep concerns with pending government fees being contemplated on their industry as the nation considers its own telecom laws.

These concerns appear to be well founded: I met with the Ugandan Minister of State for Information, who is also member of Parliament. He spoke of the government's tentative plans to impose several special fees on independent broadcasters that would, I suggested, impose major (if not crippling) financial hardships on NGO radio businesses. There is a general misconception among Ugandan officials that radio broadcasters inherently enjoy large profits. In Uganda, clearly this is not the case.

I emphasized to the minister that to inflict burdensome fees on broadcasters in the West would be widely viewed by lawmakers as ultimately hurting the general public — which still relies on *free* broadcast services. We also discussed the public service obligations tied to all FCC broadcast licenses in the United States, and I said this provision could ensure that independent broadcasters serve the community needs of their respective audiences.

I also stressed that although the American Federal Communications Commission restricts obscene content based on local community standards, there are no U.S. regulations restricting the use of musical lyrics, news, political talk-show or other programming before it is aired.

A tour of independent Radio One/Radio Two in the heart of Kampala's small but bustling business district revealed an impressive digital state-of-the-art facility. Primarily featuring pop music, this station combo also provides a steady diet of news and public service programming, and has had success with commercial advertisers — especially in creative tie-ins for the stations' promotions with such international concerns as Coca-Cola.

I also conferred with the equally young staff of Monitor Radio, which is the most vocal critic of government policies, routinely airing candid interviews with government and military officials, some of them currently in exile. (Rebel activity and civil unrest are still common is northern Uganda, where the weapon of choice seems to be the machete.)

In early October 2002, the government unexpectedly shut down Monitor's companion newspaper, citing "national security violations of false information" regarding the alleged downing of a government helicopter by rebels in the north. The newspaper remained closed for several days. Monitor Radio also was raided by government officials, but did not go off the air.

It may be noteworthy that when the U.S. embassy in Kampala strongly urged the government to allow the newspaper to re-open, it was carried on the front page of the government-controlled newspaper, New Vision — although not on its Web site, which often is used by outside news agencies to monitor Ugandan activities.

Apart from overcoming government uncertainty and economic hardship, it is clear what radio broadcasters in emerging nations most urgently need are skills training and long-term mentoring.

Such programs already are underway in much of Africa, Eastern Europe and Asia, hosted by the nations' broadcasters and journalists themselves, with the aid of outside media groups. The melting-pot approach of the three countries I visited to devising radio infrastructures seems the most logical for broadcasters starting their industries from the ground up: Sample independent radio from a wide variety of nations — notably North America and Western Europe — blend the best ingredients of each system, and work with government to smooth the transition toward more reform-minded societies.

John Merli has held various media positions for 33 years, including radio broadcaster, editor/director at NAB, digital seminar presenter at PBS and international broadcast consultant for the U.S. State Department. He is communications director for Funds For Learning, LLC, based in Arlington, VA. Reach him at jmerli@fundsforlearning.com.

◆ NEWSWATCH ◆

Sirius Shareholders, Debt-Holders Approve Re-Cap

NEW YORK Sirius received approval on its $1.2 billion recapitalization and expected the deal to close by mid-March. Part of this also provides the company with $200 million in additional funding. Sirius executives said the deal provides it with a debt-free balance sheet, allowing the company to focus on building subscribers.

"This is a major milestone for Sirius that now enables us to move forward with a strong balance sheet," said President/CEO Joe Clayton.

More than 90 percent of Sirius debtholders and stockholders agreed to exchange their debt for common stock. The recapitalization also exchanges the company's preferred stock for common stock and will inject $200 million in new capital from major financial partners through the sale of newly-issued common stock.

Affiliates of OppenheimerFunds, Blackstone and Apollo have agreed to provide $200 million in additional funds. When combined with cash on hand, Sirius said it would have more than $300 million in cash, sufficient to fund it into the second quarter of next year.

World Radio History

◆ NEWSWATCH ◆

Nielsen Ups PPM Involvement

NEW YORK Arbitron and Nielsen expect to report initial results of expanded Portable People Meter tests by the fall. Nielsen agreed to increase its financial commitment and resources to the project, a move reached several months after Arbitron had first hoped it would happen.

The companies are exploring the feasibility of using the PPM as a data collection tool for TV audience measurement. They started working together in 2000 to test it in Philadelphia.

Nielsen has its own version of the PPM, for TV measurement only. The Arbitron version measures the audience for radio, TV and cable.

"This latest agreement expands this relationship to include a number of research initiatives that will be supported, in part, by increasing the financial involvement and commitment of resources from Nielsen Media Research," the companies said. Arbitron President/CEO Steve Morris said Nielsen now will take a more active role.

Tauzin, Leaders Request Study of CPB Funding

WASHINGTON House Energy and Commerce Committee Chairman Rep. Billy Tauzin, R-La., with key congressional leaders, called on the U.S. General Accounting Office to review funding programs of the Corporation for Public Broadcasting to ensure fairness in how the funds are distributed.

"The last study GAO prepared was nearly 20 years ago," Tauzin stated in a letter to the comptroller general of the GAO. "With significant advancements in public broadcasting, many in Congress believe a current study is needed before reauthorizing CPB in the 108th Congress."

Tauzin added, "As the largest single source of funding, CPB dollars have been crucial both in terms of providing direct support, and in leveraging support from other sources, for public broadcasting system and station operations, and the production of quality programming."

Consolidation Helps Program Development, Katz Finds

NEW YORK Radio is keeping up with changing demographics and lifestyles. So says Lisa Chiljean of The Katz Media Group, commenting on the company's fall National Format Averages report.

"The study strongly suggests that a greater number of ethnic formats are now the top formats in popular markets," she said. The company wrote that shifts in demographics have affected radio programming and formats, as has ownership consolidation.

"Contrary to the beliefs of some, the evidence suggests that common ownership has actually helped accelerate the pace of program development. ... Prior to duopoly, when owners could control only one station on each band in a specific market, stations had to be programmed to appeal to the widest possible audience. As a result, many competitors sounded alike as they battled for the biggest share," Katz wrote.

"Common ownership and cluster selling has made it possible to target different audience with each station, or to point each station toward different segments of a broader audience or format. ... New, more targeted formats have appeared since duopoly took effect."

State Broadcasters Debate Ownership, Royalties

WASHINGTON Rep. Edward Markey, D-Mass, urged more hearings about media ownership as the FCC reviews those rules. He told attendees at NAB's State Leadership Conference in late February that mergers may be good for a large corporation, but not a local community. "I would hope as an industry you would be reasonable."

He said it's important to have a long-term national debate on consolidation issues.

Rep. Fred Upton, R-Mich, chair of the House Telecom Subcommittee Congress should find a way to allow radio stations to stream content online without paying prohibitive fees. The issue was prompted by a comment from a Kansas broadcaster that streams local radio content over the Web so military personnel can hear it overseas. The broadcaster said the situation reminded him of his service in Vietnam, when his father sent him reel-to-reel tapes of local news.

NRB Sets Luncheon

LAS VEGAS Religious broadcasters will meet at the NRB Media Luncheon, coinciding with the NAB2003 convention here.

The National Religious Broadcasters association said faith-based and family formats are two of the fastest-growing programming segments.

The luncheon will be held Monday, April 7 at 12:30 p.m. in the Las Vegas Hilton. Speaking will be filmmaker Bill Ewing and writer-director Jim Hanon.

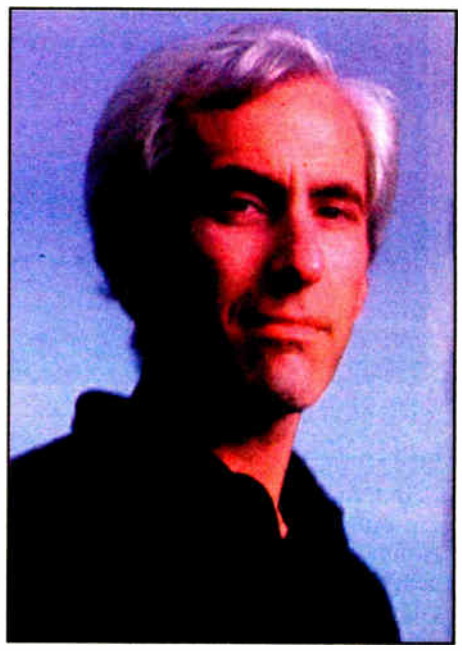
Information is at *www.nrb.org/conv.htm.*

Booster

▶ Continued from page 1

ahead with the project. They cite as evidence their CP for the booster the FCC issued last fall.

"Boosters were designed for mountainous regions to push a signal over a mountain range, not for use in a major city," said Ken Freedman, station manager for non-commercial 1,250-watt WFMU in Jersey City. "This is an extremely densely populated area with many radio signals."



WFMU's Ken Freedman

In its petition to the FCC to deny the booster, WFMU's counsel wrote, "Engineering studies demonstrate that the proposed booster station would unquestionably cause interference within the 60 dBu protected service contour of WFMU."

Freedman said Fordham University is advancing the project without considering potential interference with second-adjacent channels.

"If this had been an application for a low-power FM or a translator, the FCC would have never allowed it. Boosters were never intended to be used in an urban area," Freedman said. "What broadcaster in any major city wouldn't want to improve their signal?"

Freedman said his station has spent $30,000 on engineering studies that show there will be "massive interference" if WFUV goes forward with the project.

"We want to be able to broadcast to our service area according to the license.

See BOOSTER, page 7 ▶

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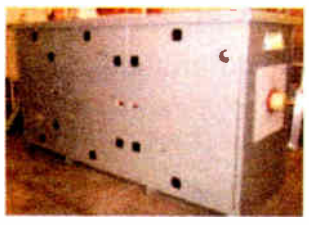

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We are just looking for a better way to service our listening audience.

— Ralph Jennings
WFUV

World Radio History

Booster

▶ Continued from page 6

We won't be able to do that with the projected interference" from the booster, Freedman said.

Freedman fears that once WFUV's booster is operational, the onus will be on his station to prove interference exists. "That will cost even more money for further engineering reports," Freedman said.

John King, counsel for the City College of New York's WHCR, said the 8-watt Class D noncommercial station's signal would be overwhelmed by WFUV's booster antenna.

"Our theoretical studies show that the chances for interference are great. (WHCR's) transmitter site is about a mile from the proposed location for the booster," King said.

"This type of application was never on the FCC's radar screen when they created the rules." Boosters, he said, were intended for use in places such as Casper, Wyo., and Bozeman, Mont., not New York City.

Big Apple concerns

King said that in New York City's congested RF environment, any loss of signal is devastating.

"We think this will be contrary to public interest. WHCR is a community radio station with educational and information programming for diverse populations in the city," King said.

According to WHCR's engineering report filed with the FCC, "The 100 dBu contour of the proposed FM booster is entirely encompassed by the 60 dBu contour of WHCR(FM). As a result, a doughnut-hole of interference will be caused to WHCR in the very heart of its service area in Manhattan."

WFUV General Manager Ralph Jennings said the station does not expect interference with second-adjacent stations to occur once the $100,000 project is completed, sometime in the spring.

"We don't expect problems. Our engineering studies indicate there will not be interference. The FCC agreed with that. With the new technology available in boosters, with the synchronization they can get ... it's a very doable thing," Jennings said. "If there is interference, we'll correct the problem."

FCC rules require the licensee of an FM booster to correct any condition of interference on any frequency outside the assigned channel.

Jennings said the station has received numerous comments over the years from listeners in Manhattan complaining of poor reception. "We are just looking for a better way to service our listening audience," he said.

Tower update

Jennings said the booster project is unrelated to Fordham's efforts to build a new tower on its Rose Hill campus next to the New York Botanical Garden in the Bronx (Radio World, Sept. 11, 2002).

Currently, WFUV broadcasts from an FM antenna mounted on a partly constructed tower 150 feet from the property line of the National Historic Landmark. Botanical Garden officials claim the tower looming over the skyline lessens the beauty of the 250-acre historical area.

Fordham began construction of the proposed 480-foot tower in 1994. Construction was halted with a bit more than half of the tower completed after the Botanical Garden notified the FCC of alleged inaccuracies in the construction-permit application submitted by the school.

Boosters were designed ... to push a signal over a mountain range, not for use in a major city.

— Ken Freedman
WFMU

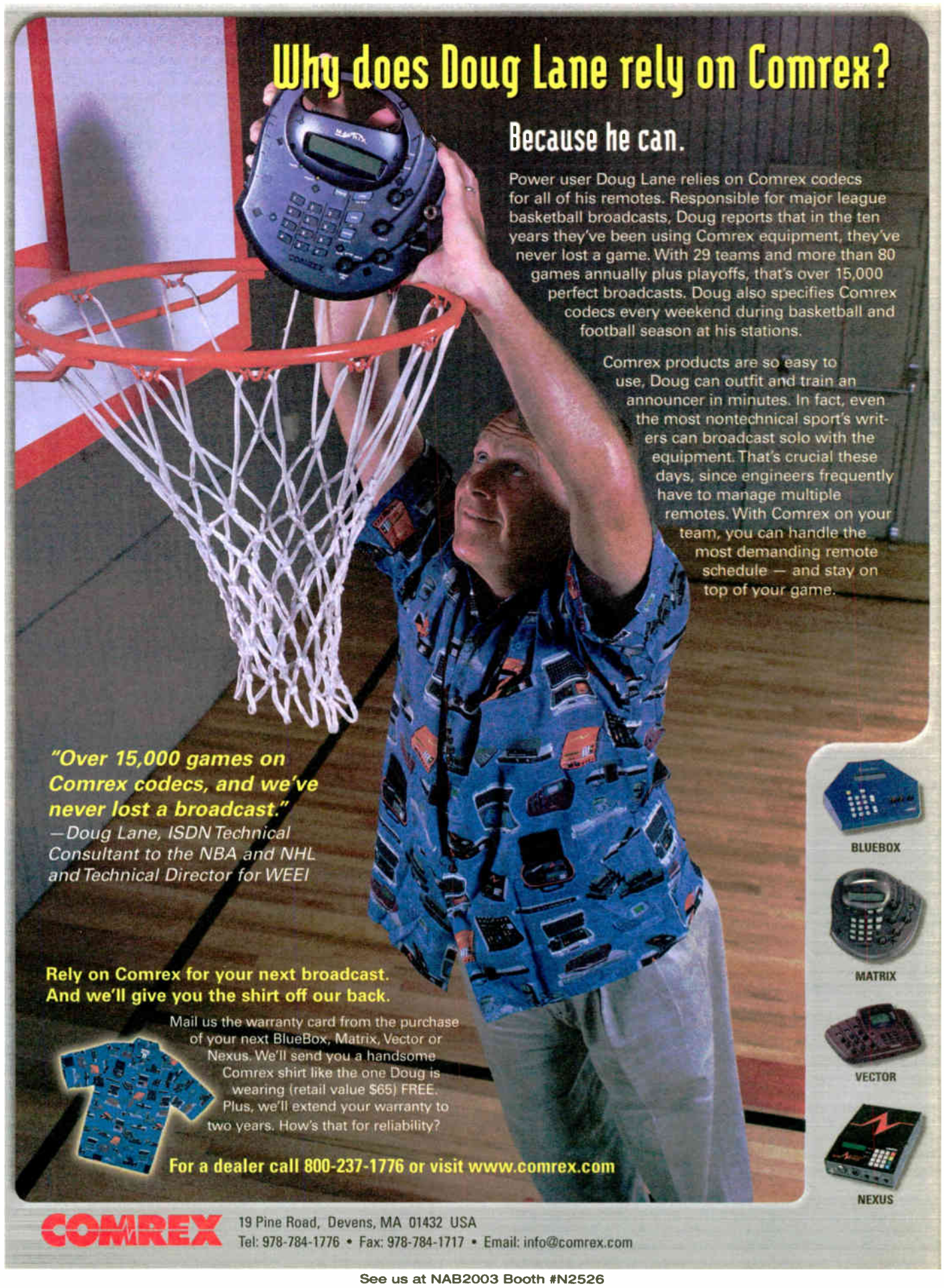
The school moved the WFUV antenna to the partly completed structure in 2000 and continues to transmit from the site on special temporary authority from the FCC, operating at half of its permitted 50 kW capacity.

Fordham officials claimed the antenna had to be moved from its old location on campus atop three-story Keating Hall to comply with tighter guidelines governing radiofrequency radiation exposure adopted by the FCC in 1997.

Negotiations between the school and the Garden continue, with Garden officials hoping to find an alternative site for the tower.

The FCC is still considering Fordham's concession to lower the height of the existing tower from the originally planned 480 feet to 380 feet to better suit the aesthetic nature of the area.

Jennings said WFUV would need the booster antenna even with a new location for its main antenna.



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World Radio History

HD Radio News

Radio World | Covering the Industry's Digital Transition | March 26, 2003

Rackley and AM IBOC Page 10

HD Radio is a trademark of Ibiquity Digital Corp.

Radio Reaches Its Digital Rubicon

by Leslie Stimson

After a decade of promise, U.S. terrestrial digital radio is finally here.

Virtually no one can hear it yet.

A small number of stations have begun broadcasting in HD Radio, Ibiquity Digital's trademarked name for the technology. The upcoming NAB2003 convention agenda is salted heavily with sessions that explore HD-R for the benefit of managers and engineers.

Soon consumers will be able to buy radios in order to hear their local terrestrial station broadcasting digitally.

Unknown, though, is how fast stations will adopt the technology, and whether possible changes in radio ownership rules and conflict in Iraq might affect the digital conversion rollout.

Some observers say these issues might make radio advertisers sufficiently nervous to hold back spending, which, in turn, could affect whether stations feel comfortable spending money themselves to convert their plants. Supporters feel ownership and war issues won't affect the HD Radio rollout.

Signing up, signing on

Initial rollout statistics appear positive; most of the major radio groups, having invested money and resources over 10 years to the terrestrial digital radio technology, commit to converting some of stations in key receiver markets this year.

At least 135 stations in more than 40 markets have committed to begin transmitting both analog and digital signals in 2003; Ibiquity predicts about 300 will be on by the end of the year. (See HD Scorecard, page 12.)

According to the FCC, 42 stations were licensed to transmit in analog and digital as of early March. These stations have special temporary authorizations to go HD Radio. Other stations have experimental authorizations to go digital to test certain concepts.

In the weeks prior to the NAB convention, the commission was hoping to simplify its HD Radio notification process. It intends to require that stations notify it within 10 days after turning on a digital signal. Assistant Chief of the Audio Services Division Edward De La Hunt said the FCC expected to issue a notice with further instructions and possibly include a form on its Web site for broadcasters to use.

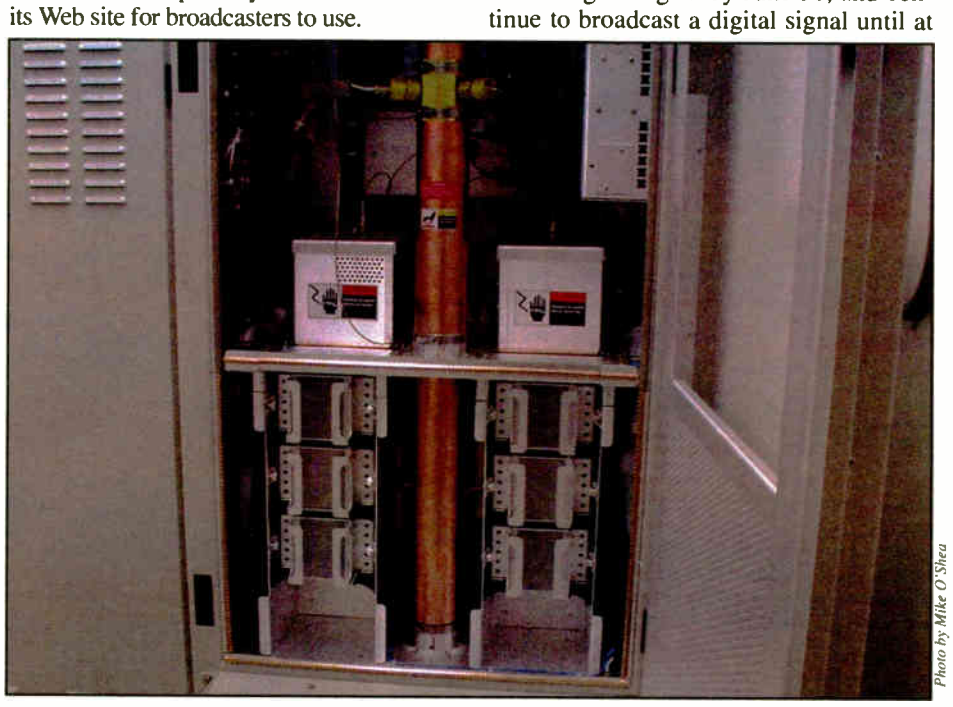

Photo by Mike O'Shea

Rear View of Harris Z12HD transmitter at WUSF(FM) in Tampa, Fla.

The initial 135 stations that have committed to go digital have signed licensing agreements with Ibiquity Digital Corp. Under the initial incentive offered by Ibiquity, licensing fees for these stations were waived. Stations had to prove they were serious about the intent to convert their stations this year in order to receive the waiver, such as showing an equipment order form to the technology developer.

Ibiquity has another incentive in place. The first 125 commercial stations to enter into a licensing agreement after Feb. 1, 2003, would have their Ibiquity licensing fee capped at $5,000. Further, noncommercial stations that sign on the dotted line with Ibiquity by June 30 would have the fee waived completely.

Incentives are contingent upon the station making its best effort to be on the air with a digital signal by June 30, and continue to broadcast a digital signal until at least Dec. 31 of 2004.

"I think incentives are necessary in order to get broadcasters to provide initial implementation before receivers are on the market," said Charles Morgan of Susquehanna Radio Corp. and chairman of the standards-setting National Radio Systems Committee.

Another source said of the new incentive, "Anything that affects that chicken-and-egg equation is good. Anything that gets it on the air can only be a good thing.

"I liked our deal better," he added, referring to the waiver that was offered to early adopters at the end of last year.

'HD Radio News' Section Debuts

With this issue, we launch a section devoted to HD Radio, the most significant technical change in U.S. radio in decades. It will appear in alternating issues.

No publication in the world has focused on digital radio as Radio World has. Now, with our industry poised to implement the system, we further expand our coverage.

We'll update you on the rollout to date; we'll present HD-R case studies; we'll interview managers who have invested in HD Radio and those who oppose it; we'll keep track of the list of stations on the air; we will talk with equipment makers and consultants, engineers and regulators, listeners and retailers, Ibiquity and, we hope, with you.

If your station has converted to HD Radio, tell us about it and send us your photos. We'll share your news with the industry. We also welcome your questions, suggestions and comments to *radioworld@imaspub.com.*

Paul McLane
Editor

Leslie Stimson
News Editor/Washington Bureau Chief

Gear here

While some RF manufacturers have had compatible or completely new transmission equipment ready for at least a year, receiver makers need to make equipment before the public can hear HD Radio.

Ibiquity is working with at least seven receiver partners and three chipmakers: Texas Instruments, Philips and S.T. Microelectronics. Its manufacturing partners displayed home and in-dash radios

See HD RADIO, page 10 ▶

World Radio History

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World Radio History

NEWS MAKER

Rackley Delves Into AM IBOC

Few members of the engineering community are as familiar as Ron Rackley of du Treil, Lundin & Rackley Inc. For this first issue of HD Radio News, we decided to check in with him on this thoughts about AM IBOC.

Rackley worked as a consulting engineer with Palmer Greer & Associates and Jules Cohen & Associates, and as a senior RF systems design engineer with Kintronic Laboratories, before starting a consulting practice with Bob du Treil. In 1988, du Treil-Rackley Consulting Engineers and A. D. Ring & Associates combined to form his present firm.

He is involved with a number of industry technical groups, has authored numerous articles, has adjusted directional antenna patterns as complex as 12 towers and as powerful as 2 megawatts, and has designed diplexed AM antenna systems. He is a registered Professional Engineer.

Radio World contributor Mario Hieb interviewed Rackley.

***RW:** How will AM transmitters perform with AM-IBOC?*

Rackley: A lot will be required of AM transmitters that carry the IBOC hybrid signal.

They must have very good linearity, low intermodulation distortion (IMD), low incidental phase modulation (IPM), and wide amplitude and phase response. A modulator bandwidth of 50 kHz or more is needed to provide acceptable IBOC performance and minimize out-of-band emissions.

'It is entirely possible that some broadcasters will find transmitting IBOC not to make sense economically.'

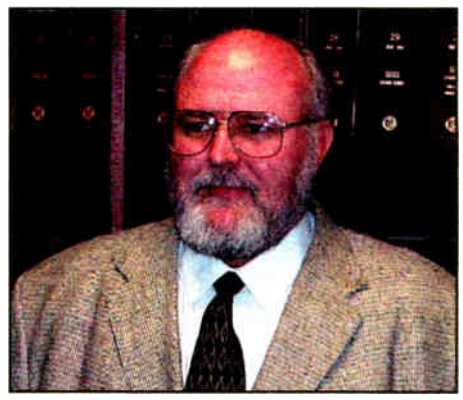
The older transmitters employing vacuum tubes, such as high-level plate modulated models, are not expected to be able to pass the IBOC signal.

Transmitters that employ single-phase pulse-width modulation (PWM, also known as pulse duration modulation or PDM) such as models employing vacuum tube final amplifiers and modulators, and some early-generation solid-state designs, are not expected to pass the IBOC signal without significant modification of their modulator circuits and high-level pulse filters. Such modifications may not be economically justifiable.

Solid-state transmitters that employ poly-phase PDM — which includes several models that have been designed by major manufacturers in recent years — are expected to be compatible with IBOC, although some may require relatively minor modification.

The most modern digitally modulated solid-state transmitters are expected to be IBOC-compatible without modification.

***RW:** How will AM antenna systems perform with AM IBOC?*



Ron Rackley

Rackley: AM antenna system performance is important in two ways.

First of all, the input impedance must be sufficiently flat and symmetrical above and below carrier frequency to allow the final amplifier of the transmitter to "see" a load to which it can deliver the digital sidebands in their proper relationships without interference from the analog signal. With good input impedance bandwidth, a high-quality hybrid IBOC signal can be put into an antenna system.

Where it goes after that is related to the other way in antenna system performance is important, radiation pattern bandwidth. Because the IBOC system uses both amplitude and phase modulation, both the magnitude response and the delay characteristics of the transmitter-output-to-far-field process are important.

I expect that many, if not most, of the nondirectional antennas in use today will be able to perform well with hybrid IBOC without any modification, and that most of those that do not will only require the installation of a new phase-rotation network between the transmitter and the antenna tuning unit to improve the symmetry of the sideboard load impedance's at the transmitter's final amplifier in order to perform well.

The exceptions would mainly be shunt-fed towers that happen to have been built with high-Q wire skirts — such as can occur when the skirt of a high-impedance tower is shorted to the tower at a point which forces the input resistance to be 50 ohms without regard to the slope of the resulting reactance-vs.-frequency curve — and towers that are fed through filters that have a non-symmetrical effect on the input impedance, such as are found at some diplexed sites.

Modifications beyond the installation of a simple RF network, such as changing the skirt feed arrangement or installing new filters, may be required in such cases.

Multi-tower directional antennas are another matter. The complexity of their feed systems and the large variety of pattern shapes that are in use make it impossible to say much about them in general.

I can say that the impedance bandwidth issue will be a major factor for a larger proportion of AM directional antenna systems than will be the case for non-directional antennas and that, when the installation of a phase rotation network is not enough, good solutions will be more evasive for them also.

On the pattern bandwidth issue, directional antennas present a whole new level of complexity, since a pattern shape depends on characteristics like transmission line length, tower spacing and tower height, which change in terms of the critical parameter — wavelength — with frequency, as well as the reactances of the

See RACKLEY, page 12 ▶

HD Radio

▶ Continued from page 8

and components to consumer electronics retailers in January at the Consumer Electronics Show.

Soon, some of those manufacturers will be ready to take orders from retailers for HD Radios. Kenwood USA is taking the lead in aftermarket radios; it intends to begin taking orders in April and ship HD Radios to stores in June.

"I would like to see stations and local retailers work together on promoting the fact that stations are starting to broadcast in digital," said Bob Law, Kenwood USA senior vice president. Such promotions could include contests with a free radio as a prize, he said.

Kenwood, Ibiquity and some stations are discussing such promotions.

In the store, for example, consumers will be able to hear the audio of local stations broadcasting in digital so potential buyers can hear the difference.

Salespeople can pitch the fact that, unlike satellite radio, HD Radio involves no monthly subscription charge, proponents said.

Part of the flexibility Ibiquity has designed into its system allows broadcasters a choice of how much spectrum they want to devote to programming and what portion they choose to devote to data services, which may be the return on investment some stations seek to justify the initial funding outlay.

Initial data services might include on-demand traffic or weather reports, and eventually interactive features such as a "buy" button on the radio.

For now, Ibiquity has built data specifications into its system so initial receivers can show simple text displays, such as the name of an artist or song. The company has been working with several content partners and the NRSC to develop an open standard so that all possible services would work with Ibiquity's system, stations and receivers.

"We provide the interface ... and the receiver decides how to display the information," said Scott Stull, director of broadcast business development.

Some noncommercial broadcasters plan to test a variation of a data concept for HD Radio technology. Specifically, National Pubic Radio wants to test whether it is feasible for noncommercial stations using the technology to broadcast two programming streams on each station.

NPR, using Harris RF equipment, and Kenwood hope to conduct tests late this summer on KKJZ(FM) in Long Beach, Calif. NPR's Mike Starling, vice president of engineering, hopes the tests could be done in August, a little earlier than previously planned.

Of the initial stations committing to go HD Radio, only one was noncommercial, WUSF(FM), Tampa, Fla.

The IAAIS, representing radio reading services, also hoped to have a computer demo in Ibiquity's booth of a concept in progress, including encrypted reading services in a station's data stream. The IAAIS prefers this solution to eliminate the need for SCA receivers.

Non-coms go HD, too

Last fall, Congress set aside about $4 million for noncommercial radio stations to go digital. The Corporation for Public Broadcasting was working on a mechanism in early March to distribute that money to stations that meet certain criteria in the initial markets Ibiquity considers crucial.

While the FCC has outlined how stations may go digital initially, it authorized AMs to do so only in the daytime, on the advice of the NRSC, which has said that not enough is known about the potential for interference with neighboring stations, especially those transmitting on skywaves at night.

Ibiquity had completed additional AM nighttime tests requested by the NRSC in December using WLW in Cincinnati and WOR in New York. The tests were designed to test the impact of AM HD Radio on analog skywave and groundwave signals. Ibiquity hoped to have its report to an ad-hoc committee of the NAB by the time the convention takes place.

"We put the facts on the table, and the industry makes its decision," said Glynn Walden, Ibiquity vice president of broadcast engineering.

In reply to detractors who worry about interference, Ibiquity has said tradeoffs will be required, a point both Ibiquity and the NRSC have emphasized for at least two years.

Part of the problem facing the engineers studying the skywave issue, sources said, is that analog signals sound so bad on skywave, it's hard to tell the difference once a digital signal is added.

Another question to be decided is whether protecting listeners outside a station's contours even matters. Ibiquity and the FCC seem to be focused on protecting a station's signal within its contours, sources said.

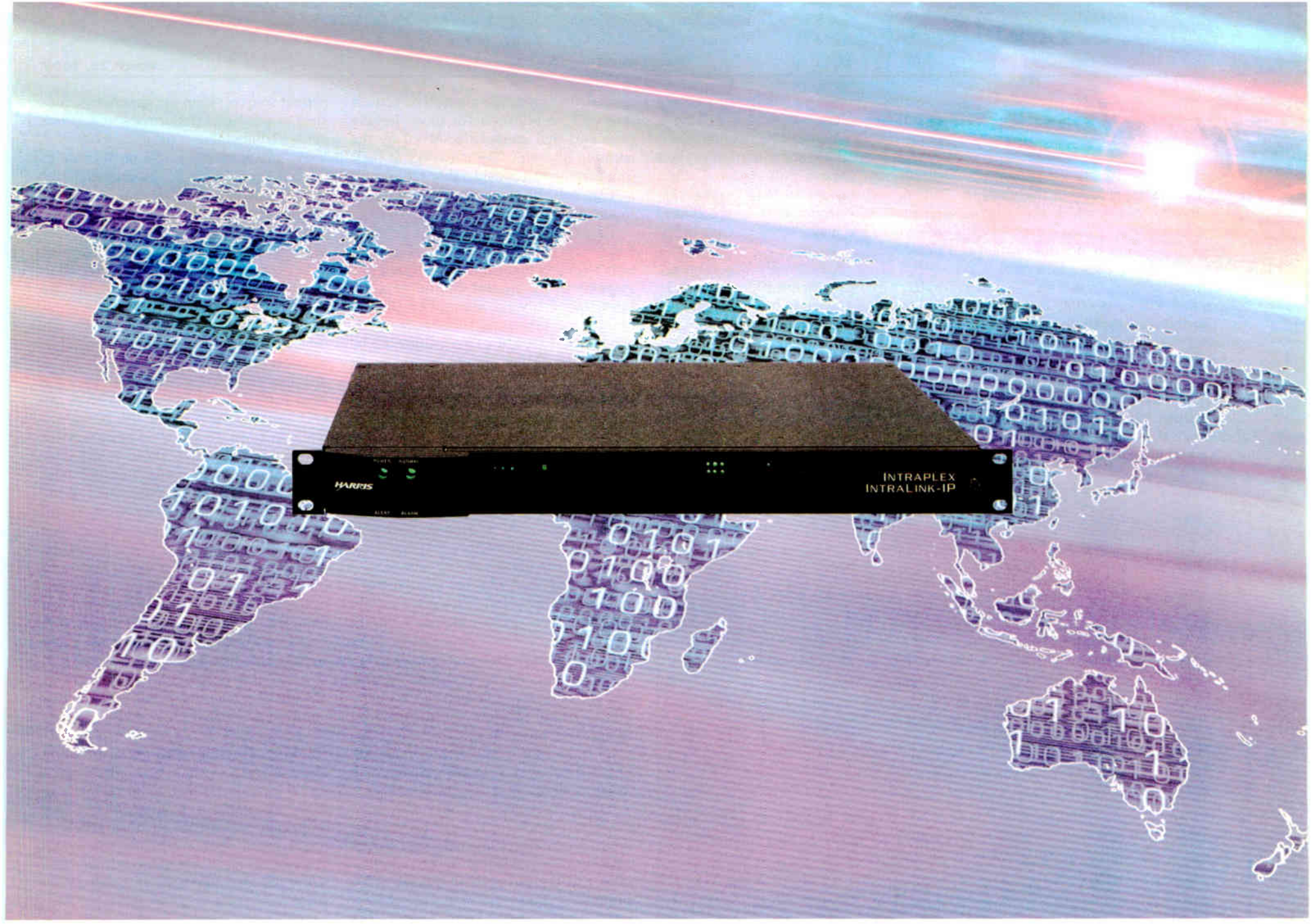
Presumably the determining factor in whether interference beyond the contour matters is whether a station attracts sufficient listeners to interest advertisers.

Engineers commenting to the FCC about DAB authorization differ on these points. Glen Clark, for example, has said about 80 percent of AMs could go digital now; while long-time AM stereo advocate Leonard Kahn has taken the position that the technology needs to be studied further. Kahn has urged the commission to stay the initial authorization that allows stations to go digital.

Members of the NRSC, meanwhile, have shifted their focus from system testing to standards-setting to help make recommendations to the FCC for final DAB authorizing rules, expected later this year.

While the commission initially authorized all stations using the HD Radio technology to use their existing antennas, NAB has formed a committee to study other antenna configurations that may help stations save money when implementing the digital technology. The so-called "dual antenna" testing is progressing and will be discussed as part of the Broadcast Engineering Conference.

World Radio History



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World Radio History

Rackley

▶ Continued from page 10

inductors and capacitors in the phasing and coupling system, which also change with frequency.

Assuming that it is possible to get a high-quality IBOC signal into most AM directional antenna systems — and I believe that will be possible if the necessary phasing and coupling system modifications for good impedance bandwidth are made — the percentage of coverage area where IBOC reception is possible will still be highly variable among stations because they use such a large variety of directional radiation patterns with differing pattern bandwidth characteristics.

Some stations that happen to have excellent pattern bandwidth will have good IBOC reception throughout their coverage areas, including in most of their directional pattern null regions, while others will put out an IBOC signal that receivers can decode only in the central regions of the major lobes of their radiation patterns.

I'm afraid that the only way to attack pattern bandwidth problems involves redesigning the complete phasing and coupling system, meaning that the networks within a phasor cabinet and at the tower bases will have to be extensively modified to an engineering-intensive custom design to make any improvement.

Although I believe the prospects for providing acceptable hybrid IBOC service through directional antenna systems to be good, the corrective actions that will be required for those having problems that cannot be solved by the addition of simple RF networks at their inputs might be considerably more costly than will be the case for non-directional antennas.

I also believe that there will be some cases where it will be necessary to construct replacement directional antenna systems using a combination of more land, more towers and taller towers before acceptable performance can be achieved. I would expect these to be mostly arrays that employ short towers with short spacings (in terms of wavelength) between them, which are more commonly found near the lower end of the AM band.

It is entirely possible that some broadcasters will find transmitting IBOC not to make sense economically.

RW: How will AM phasor systems perform with AM IBOC?

Rackley: Having discussed phasor systems already, I'd like to say that there may be another solution for good pattern bandwidth that doesn't require a phasor system at all.

I have always been interested in an idea that has come up from time to time over the years that I've been in this business — to put separate transmitters with appropriate power levels at the various tower bases of a directional antenna system and do away with the conventional phasing and coupling system altogether.

I remember that this was discussed extensively among my peers back in the 1970s, when Westinghouse had a modular solid-state transmitter under development and the possibility of having the modules spread out among the towers was thought to be an attractive one. The idea was that the RF phasing would be done at very low power with networks using small components in a rack-mounted unit connected through small diameter transmission lines to the RF power modules at the tower bases, with the tower ratios adjusted by adjusting the powers of the various RF modules.

It was an interesting idea that never went beyond the discussion stage — the fact that the FCC would have to be convinced that the correct total power could be maintained was daunting enough; and then there was the problem of having the RF modules at the tower bases operate into loads that change impedance due to mutual coupling every time the parameters are adjusted.

I did see one design overseas some years ago that had two high-power transmitters feeding two towers to produce a two-tower pattern without a phasor; but that was a rather special case because the pattern had two towers with identical power, which greatly simplified things, and no FCC Rules to deal with. No one, to my knowledge, ever came forward to fund work on the various hurdles that would be required to use such a system domestically.

This idea has been resurrected recently with the new twist of using digital control for the system. This has me thinking on the subject again.

I believe that it should be possible to construct modulated RF units that may be installed at the tower bases of a directional antenna system and have them serve as either current sources or voltage sources, as necessary depending on tower height, to establish the desired radiation parameters and, to the extent that they act like perfect sources, keep the parameters constant at sideboard frequencies to improve pattern bandwidth.

For that matter, it might be possible to control the parameters at sideband frequencies as necessary to compensate for the changing array geometry with frequency to maintain the pattern nulls at precisely their correct azimuths to provide even better pattern bandwidth than can be achieved by merely holding the parameters constant with frequency.

It might be necessary to dissipate a significant amount of power and use complicated RF networks at some tower bases to simulate perfect-source behavior over the operating impedance ranges that are encountered, but it might still be worthwhile to do so if there is no other way for a station to transmit an IBOC signal short of developing a new transmitter site.

If the power can be determined to the FCC's satisfaction, and computer control may make that easier than it would have been years ago, the main hurdles will be persuading a transmitter manufacturer to provide a transmitter in pieces and developing the necessary hardware to turn them into sources to drive the towers.

Who knows? The economics just might work out for such a scheme this time.

RW: It's been said that AM systems that can pass AM stereo are AM IBOC-ready. Your thoughts?

Rackley: I assume that we are talking about antenna systems here. There are a lot of transmitters that could be made to work acceptably well in AM stereo that will never pass the IBOC signal, because of the much wider modulator bandwidth required to carry the amplitude components that are necessary to produce the IBOC waveform.

Although the same antenna system performance characteristics that degrade AM stereo will also degrade the IBOC signal, I believe that the IBOC system will be more sensitive to them for the simple reason that, when it "crashes," an IBOC radio will default to the noisy, narrowband analog signal while a stereo radio simply loses the spatial separation of that noisy, narrowband analog signal.

RW: Is there anything else you may want to add?

Rackley: I should disclose that I was a consultant to Ibiquity's predecessor, USA Digital Radio, for many years and helped them with the conceptual issues of getting the IBOC signal with which they were experimenting at that time through AM transmitters and antenna systems. I was also responsible for the engineering aspects of licensing various experimental facilities in different cities during the 1990s.

I can tell you that the hybrid IBOC signal that they now propose is much more sophisticated than those that were tested in the early years. Significant changes have been made to improve the signal's "survivability" in the real world of noise and interference that exists in the AM band.

Although I am not a specialist in signal theory — especially digital signal theory — I believe that it probably represents the best that can be done under the present circumstances.

Rackley also spoke about issues including concerns over noise, consequences of reducing the frequency response of the transmitted analog signal to 5 kHz and digital delay. The full version of this interview appears at www.rwonline.com.

HD Radio Scorecard

In this space, we'll tell you which stations plan to go digital with HD Radio.

Stations with one asterisk (*) have special temporary authority from the FCC to broadcast HD Radio along with their analog. Two asterisks (**) are confirmed on the air. Not all stations on the air hold STAs; some may have experimental authorizations. The other stations listed have ordered equipment from vendors or have otherwise indicated a commitment to HD Radio.

Eventually, the FCC hopes to transition all stations to a simpler notification process; stations simply will notify the FCC within 10 days of turning on HD Radio.

This is a partial list. If your station is on the air with HD Radio, we want to know; send us an e-mail to *radioworld@imaspub.com.*

Station	Freq.	Owner	Market
AM			
KCBS*	740	Infinity	San Francisco
KMRY	1450	Sellers B'csting	Cedar Rapids, Iowa
KNX*	1070	Infinity B'casting	Los Angeles
KTNQ	1020	Hispanic B'csting	Los Angeles
KXNT*	840	Infinity B'casting	N. Las Vegas, Nev.
WADO	1280	Hispanic B'csting	New York
WBZ*	1030	Infinity B'casting	Boston
WCTC*	1450	Sentinel Publishing	New Brunswick, N.J.
WHSR	980	Beasley	W. Palm Beach, Fla.
WIND	560	Hispanic B'csting	Chicago
WJLD**	1400	Richardson B'casting	Birmingham, Ala.
WJNA*	640	S. Florida Radio	Royal Palm Beach, Fla.
WKAT*	1360	Spanish Media B'csting	N. Miami, Fla.
WMTR*	1250	Sentinel Publishing	Morristown, N.J.
WOLF*	1490	Wolf Radio	Syracuse, N.Y.
WOR**	710	Buckley	New York
WOWO	1190	Federated Media	Ft. Wayne, Ind.
WPEN*	950	Greater Philadelphia Radio	Philadelphia
WQBA	1140	Hispanic B'csting	Miami
WRHB*	1020	New World B'csting	Kendall, Fla.
WRHC	1550	WRHC Management	Miami
WRMR	1420	Cleveland Classical	Cleveland
WSAI	1530	Clear Channel	Cincinnati
WTMJ*	620	Journal Broadcast	Milwaukee
WTWZ*	1120	Wood B'casting	Clinton, Miss.
WWDB	860	Beasley	Philadelphia
WWFE	670	Fenix	Miami
WWJ*	950	Infinity B'casting	Detroit
WWTR*	1170	Sentinel Publishing	Bridgewater, N.J.
WXGI	950	Gee Communications	Richmond, Va.
FM			
KBKS*	106.1	Infinity B'casting	Tacoma, Wash.
KBSG	97.3	Entercom	Seattle
KDFC*	102.1	Bonneville	San Francisco
KEMR	105.7	Hispanic B'csting	San Francisco
KFOG	104.5	Susquehanna	San Francisco
KIIS	102.7	Clear Channel	Los Angeles
KISW	99.9	Entercom	Seattle
KKBT*	100.3	Radio One	Los Angeles
KKDV*	95.7	Bonneville	San Francisco
KKSF	103.7	Clear Channel	San Francisco
KLVE	107.5	Hispanic B'csting	Los Angeles
KMTT	103.7	Entercom	Seattle
KNDD	107.7	Entercom	Seattle
KOIT*	96.5	Bonneville	San Francisco
KOST	103.5	Clear Channel	Los Angeles
KQBZ	100.7	Entercom	Seattle
KROQ**	106.7	Infinity B'casting	Pasadena, Calif.
KSAN	107.7	Susquehanna	San Francisco
KYLD	94.9	Clear Channel	San Francisco
KZIA*	102.9	KZIA Inc.	Cedar Rapids, Iowa
WAAF*	107.3	Entercom	Worcester/Boston
WASE	103.5	W&B B'csting	Elizabethtown, Ky.
WBOS*	92.9	Greater Boston Radio	Brookline, Mass.
WCAA	105.9	Hispanic B'csting	New York
WCLV	104.9	Cleveland Classical	Cleveland
WCSX	94.7	Greater Boston Radio	Birmingham, Miss.
WDMK	102.7	Radio One	Detroit
WDRV	97.1	Bonneville	Chicago
WDTW	106.7	Clear Channel	Detroit
WEDR	99.1	Cox	Miami
WKLB*	99.5	Greater Boston Radio	Lowell, Mass.
WKWS*	96.1	W.Va. Radio Corp.	Charleston, W.Va.
WMGC*	105.1	Greater Boston Radio	Detroit
WMGK*	102.9	Greater Philadephia Radio	Philadelphia
WMGQ*	98.3	Sentinel Publishing	New Brunswick, N.J.
WMWX*	95.7	Greater Philadephia Radio	Philadelphia
WNEW*	102.7	Infinity B'casting	New York
WNUA	95.5	Clear Channel	Chicago
WNWV*	107.3	Elyria-Lorian B'casting	Elyria/Cleveland
WOJO	105.1	Hispanic B'csting	Chicago
WPWX	92.3	Crawford B'csting	Chicago
WQSX*	93.7	Entercom	Lawrence/Boston
WRAL	01.5	Capitol	Raleigh, N.C.
WRMA	106.7	Spanish B'csting	Miami
WROR*	105.7	Greater Washington Radio	Framingham, Mass.
WRTO	98.3	Hispanic B'csting	Miami
WTKK*	96.9	Greater Boston Radio	Boston
WTMX*	101.9	Bonneville	Skokie, Ill.
WUSF**	89.7	Univ. of So Fla.	Tampa, Fla.
WUSN*	99.5	Infinity B'casting	Chicago
WVAF	99.9	W.Va. Radio Corp.	Charleston, W.Va.
WVAQ*	101.9	W.Va. Radio Corp.	Morgantown, W.Va.
WVAZ	102.7	Clear Channel	Chicago
WYGY**	96.5	Susquehanna	Cincinnati

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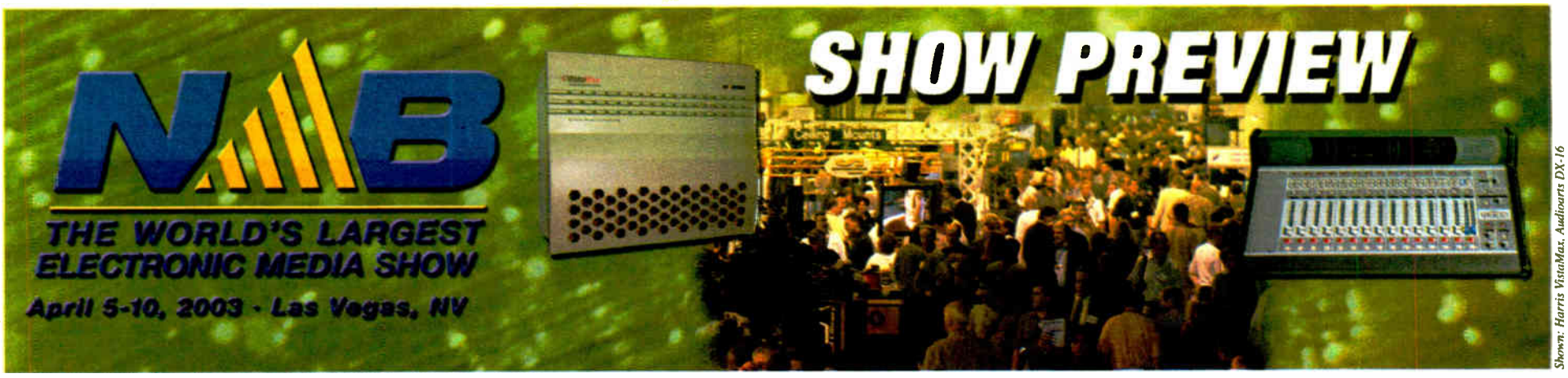

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Engineers Get Practical With IBOC

by Craig Johnston

NAB's Broadcast Engineering Conference takes a practical turn this year, as the emphasis on Sunday's day-long IBOC sessions turns from technology to implementation.

"In other years we've talked about system development," said Milford Smith, vice president of engineering for Greater Media Inc. "We've talked about testing, we've talked about possible methods of implementation, those kind of issues. This year we're really doing it."

Smith will chair the morning IBOC sessions.

Jeff Littlejohn, vice president of engineering operations for Clear Channel Communications, who will chair the afternoon IBOC sessions, agrees.

Get it rolling

"In the past we talked about the technology, and this particular time we're doing more talking about implementation and getting it rolling," he said. "I would call it largely a nuts-and-bolts presentation."

As an example, Littlejohn points to the presentation "Practical Considerations for the Implementation of AM IBOC" by Thomas Ray III, corporate director of engineering for Buckley Broadcasting/ WOR Radio in New York.

"(He's) doing a paper based on the testing that they did, and will talk about the troubles they had with implementation," said Littlejohn.

Smith senses a lot of excitement about

See ENGINEERING, page 18 ▶

Radio Returns to the Desert

Unsettled by War Threat, Excited by Digital, Broadcasters Convene in Las Vegas

by Randy J. Stine

LAS VEGAS Will the newborn HD Radio technology take hold? Will radio revenues continue to rebound? Will events in Iraq repress the advertising economy — and, for that matter, repress attendance at the show?

©NAB

Sam Donaldson, Lowry Mays, Michael Powell and Eddie Fritts at last year's convention.

These are among the questions facing radio broadcasters and exhibitors heading into NAB2003.

Although discussed for more than a decade, Ibiquity Digital Corp.'s HD Radio technology is expected to dominate the radio landscape at the convention. Stations are buying and installing transmitters, making their digital transitions, and the company hopes to persuade more to do so this year.

Equipment manufacturers hoping to ride the wave plan to display lines of digital transmitters and other related transmission and studio gear.

"This show will be a key step in the development of digital radio. Ibiquity has made good progress in lining up licensing agreements," said Dennis Wharton, NAB senior vice president of corporate communications. "Radio broadcasters should be interested in coming if for no other reason than to check on the progress of what will be terrestrial radio's future."

The agendas of technical and management conferences are dominated by HD Radio concerns, including questions of implementation and possible new revenue streams. Broadcast engineers can expect a steady dose of sessions on the transition to digital audio broadcasting.

"I think IBOC will be the major item for everyone this year," said Jeff Littlejohn, Clear Channel senior vice president for engineering services, referring to the in-band, on-channel HD Radio technology.

The economic backdrop against which the show takes place is unsettled.

Radio ad sales just missed the $20 billion mark last year, having jumped 6 percent from the year before, and the Radio Advertising Bureau thinks radio sales will grow another 6 to 8 percent this year. Some managers point to the continued strength of national spot sales as evidence that radio has made a full recovery; others note that the economy has not returned to its previous strength.

The unknown nature and impact of war could muddy matters.

Fewer bus rides

Last year's convention was smaller than in years past, drawing approximately 92,000 people, down about 17 percent from reported statistics the year before.

Visitors will find a major change in venue, no doubt welcome to many. NAB will no longer have exhibit space at the Sands Expo and Convention Center. In the past, attendees had to take a shuttle bus or taxi or make a very long walk to reach the Sands from the Las Vegas Convention Center.

Beginning this year, sessions and exhibits have merged into the LVCC. The mammoth new South Hall, completed in 2002, is home to television, video and film exhibits. Most radio and audio exhibitors

See NAB, page 16 ▶

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World Radio History

NAB

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remain based in the North Hall.

The Mobile Media exhibit, featuring news gathering equipment, vehicle-mounted systems and outdoor tools, moves from the North Hall to LVCC's Orange lot between the Central and South Halls.

Comedian Bill Cosby kicks off the show with a live appearance on Sunday night April 6 at the Bellagio Hotel and Casino.

The All-Industry Opening Ceremony on Monday at the Las Vegas Hilton, adjacent to the LVCC, will feature keynote speaker Barry Diller, chairman and chief executive officer of USA Interactive and Vivendi Universal Entertainment.

The FCC Chairman's Breakfast, slated for 7:30 a.m. on Tuesday at the Las Vegas Hilton, features Chairman Michael Powell interviewed by Sam Donaldson about radio and TV issues.

More regulatory news will be available later that day when FCC commissioners gather for a regulatory face-off at 3:30 p.m. John Cochran of ABC News will moderate discussion of ownership and digital radio issues.

Hearings on radio ownership on Capitol Hill have the industry wondering whether Powell's deregulatory agenda will overcome resistance from lawmakers. The FCC hopes to act on new media ownership rules regulations by late spring.

"Ownership rules are a key issue right now. We are opposing the proposed rule that would allow the FCC to redefine the definition of a local radio market," Wharton said. "We think that would be akin to re-regulating the industry. There has been consolidation. We dispute the claim that it has hurt listeners."

The NAB is also supporting a modification of the rules to permit broadcast and newspaper cross-ownership. "We think that would allow owners to become more competitive with pay services," Wharton said.

Scott, John and Bob

Legendary air personality Scott Shannon will be inducted into the NAB Broadcasting Hall of Fame at the Radio Luncheon at the Las Vegas Hilton, also on Tuesday, April 8.

The NAB Engineering Achievement Awards will be handed out at the Technology Luncheon on Wednesday, April 9. This year's radio winner is John Reiser, who retired in 2000 as a senior broadcast engineer with the FCC's International Bureau.

The Broadcast Engineering Conference Opening on Sunday features keynote speaker Leonardo Chiariglione, vice president for Telecom Italia Lab.

"(Chiariglione) will discuss the ongoing transition to digital here in the United States and how it can all come together. He will focus on a spirit of cooperation among the people who supply the content and the need for businesses to be profitable during that process," said Lynn Claudy, NAB vice president for science and technology.

The Radio-Television News Directors Association will host RTNDA@NAB April 6-9 at the Las Vegas Hilton. Electronic media news directors will be particularly interested in the conference's offerings. Events at RTNDA@NAB include Bob Schieffer, anchor and moderator of CBS News' "Face the Nation," receiving the Paul White Award on April 7.

The convention agenda includes numerous sessions and papers of interest to radio broadcasters. (This section of Radio World newspaper looks more closely at several of them, including the Broadcast Engineering Conference and conferences on management, business and law.)

Complying with the FCC's revised equal employment opportunity rules will be the topic at the session "The New EEO Rules: Making Lemonade" on Monday morning as part of the Business Law and Regulation Conference.

The NAB Super Session "Internet Broadcasting and Webcasting — New Opportunities in the New Digital Broadcast Marketplace" on Wednesday afternoon encompasses long-term models for using the Internet for delivering content profitably.

Conference agendas for both engineers and managers are dominated by HD Radio concerns.

Other notable events include the Radio and Television Career Fair on Sunday afternoon in the LVCC's North Hall; "The Digital Landscape," also on Sunday, with opening remarks by Jeff Jury, Ibiquity Digital Corp. senior vice president; and the Super Session "Technologies & Media on Wall Street — A Look at the Near-Term Future" on Wednesday morning, with the keynote address from Greg Estes, vice president of corporate marketing for SGI.

New will be an awards program honoring exhibitors for outstanding technological innovations and products. The NAB Award for Innovation in Media will fall into three categories including content creation, content management and content delivery. NAB2003 attendees will vote for the winners by casting ballots on site.

"The NAB convention has always been regarded as a launching pad for innovative technology," stated NAB President and CEO Eddie Fritts. "The AIM program is designed to recognize cutting-edge products."

Fewer people?

The RAB manages the radio sales and marketing presentations at NAB, and it plans six sessions to help broadcasters through the "current unsettled economic climate."

"After two years of struggling with difficult economic conditions, many radio broadcasters face higher expectations for sales and profitability this year," said Executive Vice President of Training George Hyde in an RAB statement.

Despite tight travel budgets, a few of the major radio groups said they would take more or about the same number of engineers as last year to NAB2003.

"I expect that 40 to 50 engineers from Clear Channel will attend NAB," Littlejohn said. Last year Clear Channel took approximately 30 engineers.

Gary Kline, corporate director of engineering at Cumulus Broadcasting Inc., said he's taking six regional engineering directors and "four market engineers who have shown exceptional dedication" throughout the previous year.

"I'm always looking for new technology on the floor that will give Cumulus a better product, ways to improve our quality of signal, quality of production and reliability of equipment," Kline said.

The NAB predicts attendance to top 90,000 in its prospectus material for vendors. Last year's attendance was approximately 92,000 — 38 percent television employees and 14 percent who said radio was their primary business.

An area of growth has been international attendance. More than 20,000 attendees representing about 137 countries were at NAB2002 and estimates are for more than that this year.

Marketplace

Some 1,200 exhibitors will cover 850,000 square feet.

"Even though the number of exhibitors will be the same as last year, exhibit space might be down just a bit," said Stacy Perrus, NAB media relations manager. "That's because of tighter budgets for some companies who want to be at the show but are electing to take a smaller amount of space."

Nigel Spratling, chair of the NAB Exhibitor Board and president of Sigma Electronics Inc., said many exhibitors have told him they will travel with smaller staffs to the convention.

"Like everyone else, they have cut down in some areas, including travel expenses and booth space. However, everyone is optimistic that many broadcasters will be willing to commit to purchases during NAB and post-NAB," Spratling said.

Vendors hope radio's digital transition will result in a willingness among broadcasters to spend for new gear after several years of smaller equipment budgets.

"With regard to technology, we think this will be one of the most interesting shows ever. There are a lot of new things in the area of audio and networking," said Denny Sanders, managing director for Telos Systems.

Scott Studios Corp. President Dave Scott said, "I'm much more optimistic than last year. Station people with budgets for significant purchases tend to go to NAB. They can do more shopping in less time."

One company not exhibiting is Digigram. Neil Glassman, who has exhibited for 20 years with four vendors, said his company sells most of its radio products through software developers, not directly to customers; and he found that potential buyers in his key markets weren't showing up at NAB.

"In 2002 we decided to test whether it was us or the show, and really pulled out all the stops. We concluded at the end that it was the show. ... NAB was touted as the ultimate, ultimate multimedia convergence show," he said. "I think perhaps it continues to be very strong for those people in television and post-production ... but in terms of the single event for everything to do with audio and video and multimedia, it's not there."

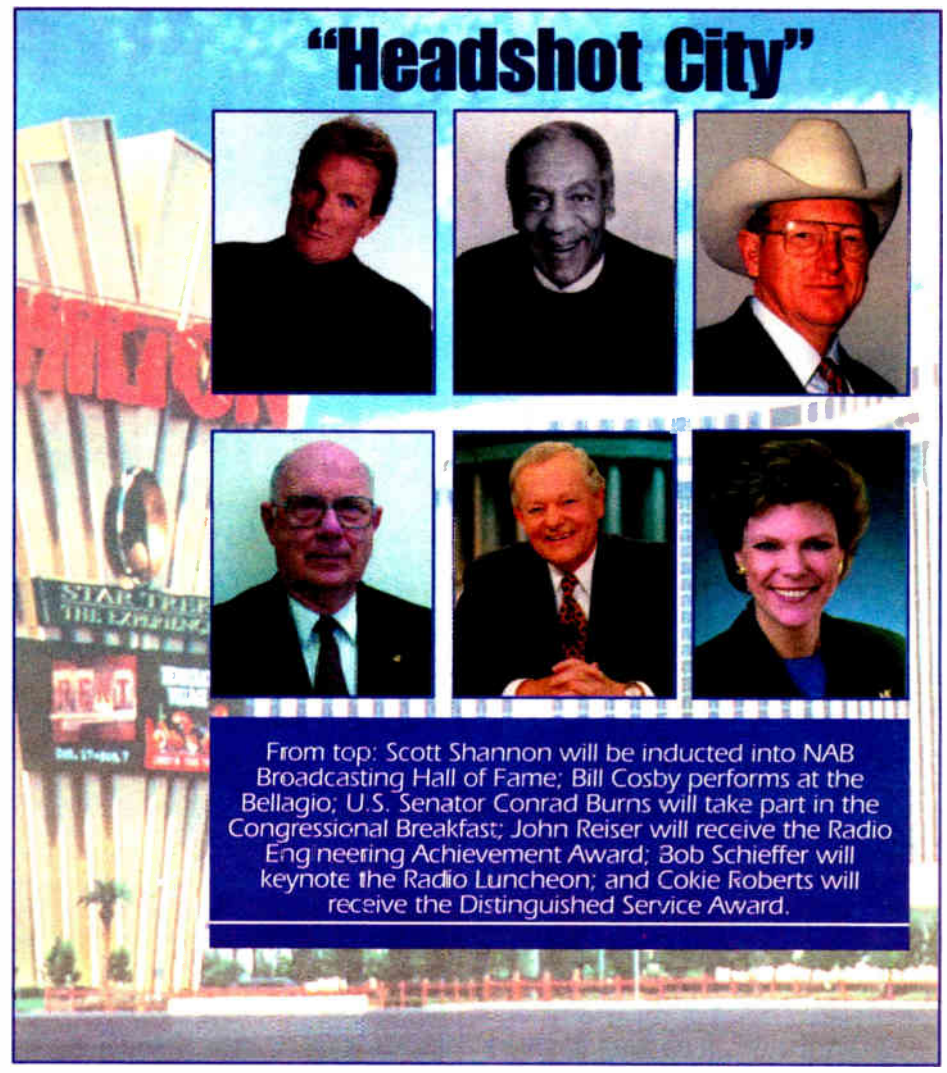
Also absent from the show floor this year are several dealers including BSW, Bradley and Crouse-Kimzey. But numerous radio suppliers remain.

"Many of our product improvements have come directly from feedback we've received at the NAB shows," said Peter Burk, president of Burk Technology. "This is our chance to meet with a lot of broadcasters one on one."

Cost for a conference registration package for NAB members is $495 prior to April 2. On-site registration will cost $595. Non-members pay more; exhibit-only passes cost $150. This year, the NAB offers discounts to groups that bring six or more employees from the same company and address.

Many hotels offer rates for NAB attendees. Free shuttle bus service to the LVCC is available from official NAB2003 hotels.

Craig Johnston contributed to this story.



From top: Scott Shannon will be inducted into NAB Broadcasting Hall of Fame; Bill Cosby performs at the Bellagio; U.S. Senator Conrad Burns will take part in the Congressional Breakfast; John Reiser will receive the Radio Engineering Achievement Award; Bob Schieffer will keynote the Radio Luncheon; and Cokie Roberts will receive the Distinguished Service Award.

World Radio History

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World Radio History

Engineering

▶ Continued from page 15

where IBOC is at this juncture.

"This really is a new radio service, that's really what it is. The last time we had one of those was when FM showed up, and that was a long time ago. I think as we go about the practical implementation of this stuff, it's a good idea to occasionally say, 'Hey, this is a little bit of groundbreaking stuff here. This is something that will be with us for awhile.'"

The Broadcast Engineering Conference will kick off with a keynote from technologist Leonardo Chiariglione, vice president of Telecom Italia Lab, Torino, Italy. Chiariglione is founder and head of the MPEG committee since it was started in 1988.

Digital rights

"We're especially excited about that keynote," said Lynn Claudy, NAB senior vice president of science and technology. "This is the first time Leonardo Chiariglione has come to an NAB convention." Claudy will chair the conference opening session.

Among the areas Chiariglione is expected to address is the timely issue of digital rights management.

"When the MP3 explosion occurred, and the record industry got worried because of the non-secure nature of MP3 and the ubiquity of the Internet, he was in charge of the standards effort to send compressed audio files across the Internet in a very secure way," said Claudy.

The Secure Digital Music Initiative of which Chiariglione was in charge no longer exists. However, it began to bring together the music industry, distributors of music and users of music on the topic of copyright protection in the age of digital transmission.

"(Chiariglione) has a great perspective not only on how audio compression, and video compression for that matter, can be performed as a technical matter, but all the political and intellectual property questions that right now are really the crux of the discussions on compression and distribution of content," Claudy said.

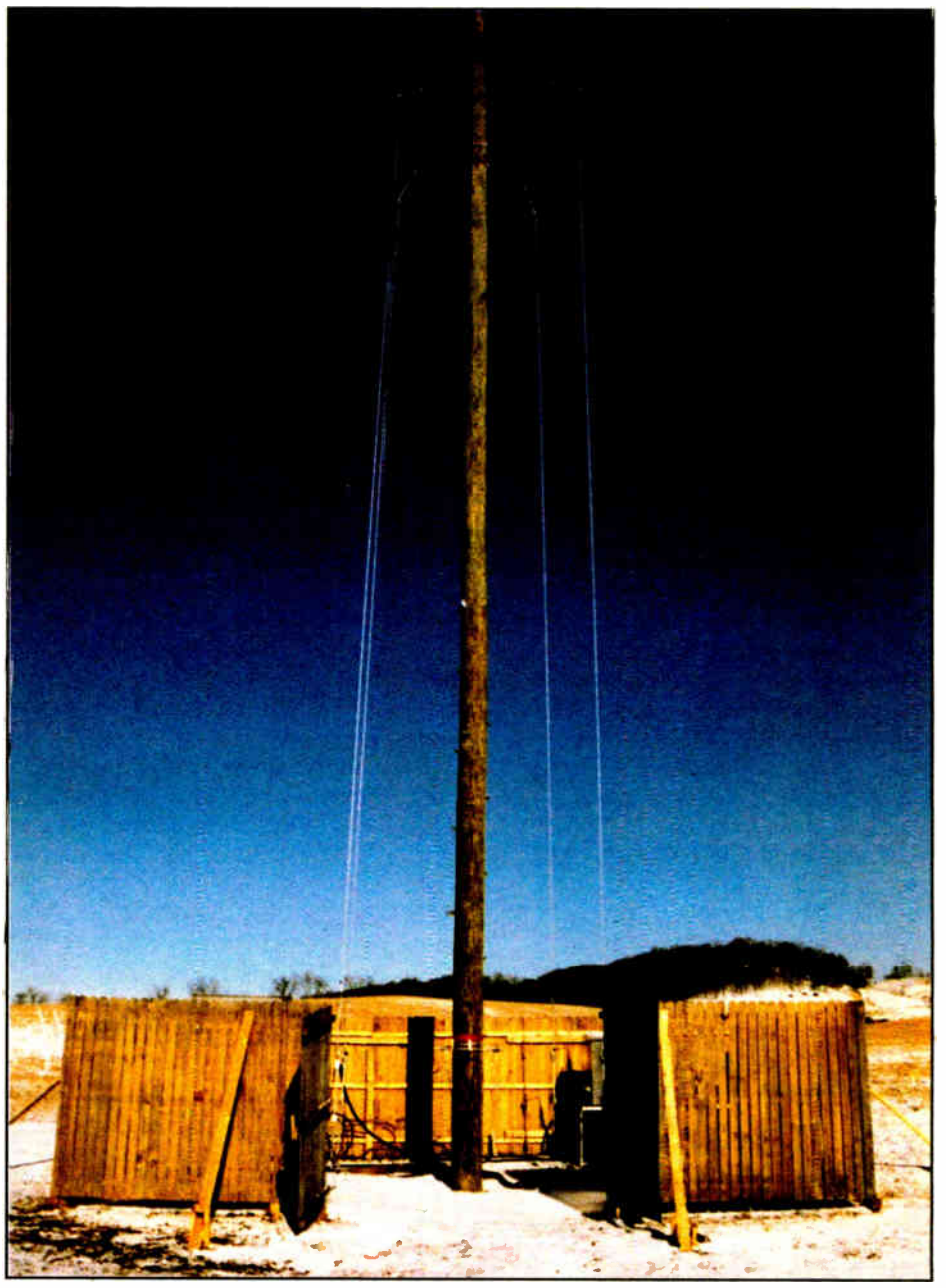
Kinstar

A Monday morning session on international developments includes some intriguing topics.

"Broadcast Engineering Behind the Lifted Iron Curtain" is presented by Martin Junek, presiden of the ABEX Society in Prague, Czech Republic. Another presentation delves into the Digital Radio Mondiale System, a third into networked systems in public broadcasting. Don Messer, chief of the Spectrum Management Division of the IBB, moderates.

Radio engineers likely will be drawn to two technical sessions on Tuesday, the Radio Transmission Forum in the morning and the Radio Audio Forum Tuesday afternoon.

Chairman for both sessions, Andy Laird, vice president of radio engineering for Journal Broadcast Group Inc., said the sessions are a combination of cutting-edge and practical papers. "Not only stuff that is new developments in RF and audio, but experience, case studies."



Will the Kinstar antenna change the face of AM?

Laird points to one paper that will be difficult for any AM engineer to pass up: "Testing and Results of a New, Efficient Low-Profile AM Medium Frequency Antenna System," called the Kinstar, presented by Michael Jacobs, manager of research and development for Star-H Corp. Radio World reported on this project in the Jan. 1 issue.

"There have been many attempts to build a short-profile antenna for AM that is as efficient as a quarter-wave tower and has good bandwidth," said Laird. "Nobody's been able to achieve it, even thought there have been a number of attempts through the years. It looks like it has now happened."

If the effort is successful, 350-foot towers could be replaced with 80-foot towers. "So the impact of this is huge," he said. "It also appears that it will function in directional arrays where you'd have several towers, so this is a big one. They've been doing field tests ... this will be kind of a progress report."

Overseas presence

The Tuesday sessions also have an international flavor, with presentations by engineers from HCJB World Radio, Quito, Ecuador; Audio Processing Technology, Belfast, Northern Ireland; and Coding Technologies, Nürnberg, Germany.

"We tried to integrate (overseas presenters) through the sessions," said Laird. "This is an international convention by all measures of who attends."

Wednesday's Technology Luncheon features futurist and author George Gilder, chairman of Gilder Group Inc. His latest book, "Telecosm: How Infinite Bandwidth Will Revolutionize Our World," explores the exponential growth in communications technology, supplanting computers as the engine of world economic growth. The NAB Engineering Achievement Awards will be presented at the lunch.

Wednesday also features an afternoon series on facility management, moderated by Troy Pennington. Among topics of interest to radio attendees are the new EIA-222-G standards for towers and structures; a novel method for detecting leaks on pressurized transmission systems by Hal Smith of AM/FM Services Co.; RF hazard control equipment by Richard Strickland of RF Safety Solutions; and designing for the unexpected, by George Crowe, about designing or adapting a building for broadcast use. He uses the BBC's new Broadcasting House and White City developments as examples.

Wednesday night is the popular annual Amateur Radio Operators Reception.

Thursday morning will feature "*Workbench* Tips From Radio World's John Bisset." Bisset, an RF district sales manager for Harris Corp., will provide the practical discussion of maintenance, transmitters and transmitter sites that he brings to his column in this newspaper.

Claudy put a wrapper around the Broadcast Engineering Conference: "Technology is there to do it if they can find a proper way to fit it into their business plans. We're going to hear a lot about that."

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World Radio History

HD-R Just One Question of Many

Management, Business Sessions Consider Impact Of Digital Radio, EEO Changes, Ownership Talks

by Susan Ashworth

Management and business sessions at NAB2003 will touch on traditional topics like boosting revenues and increasing listenership. For one thing, radio station licenses are up for renewal for the first time in eight years.

But beyond the conventional, this year attendees will be tasked with making some important decisions — some of which have the capacity to change the way radio operators do business.

The biggest of those undoubtedly is HD Radio. The topic isn't just for engineers anymore; indeed the first session listed on the Radio Management Conference agenda this year is "The Digital Landscape" on Sunday April 6.

Stations plan to go on in at least 40 markets with the technology, supported by Clear Channel, Infinity Broadcasting and numerous other groups. HD Radio receivers are to be shipped to retailers in the second quarter of the year.

The NAB convention may prove to be an instrumental step in promoting the technology to those stations that have yet to adopt the service.

"Our target at this show is to start a dialog with general managers and engineers as to why they should want to do digital radio in the first place," said Scott Stull, director of broadcast business development for Ibiquity Digital Corp., who will be participating in several panels as part of two radio conferences, Radio Management and Business, Law and Regulation.

"We've been at this for more than 10 years," Stull said. "But this is our first year at NAB with commercial stations on the air. Rather than convincing people to be first, we now need to convince them they need to be *next*. Rather than watching the evolution, we want to convince them they need to start implementing it."

The right direction

Some who have begun implementing the technology say it was the right step.

WOR(AM) in New York has been on the air with HD Radio since October 2002, and supporters there have called the technology the biggest improvement in radio since FM stereo was introduced in the 1960s.

"The benefits are enormous; you can hear it just plain sounds better, cleaner and clearer," said Tom Ray, corporate director of engineering of Buckley Broadcasting/WOR, who will participate with Stull and others in the session "Digital AM & FM Radio: The Future Begins Now."

The technology involves capital expenditures. Exactly how much depends on the station and its existing RF plant.

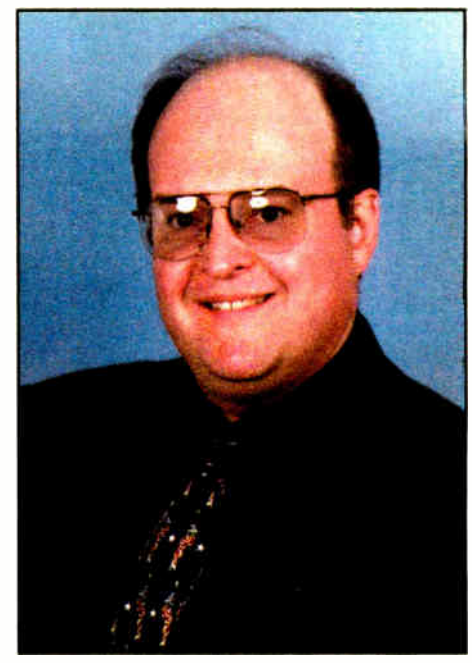
There is also some question over how HD Radio will affect coverage. Although HD Radio produces a useable digital signal out to the 0.5 mV/M FM service contour, analog AM radio may likely see a perceived reduction in coverage past that contour because of the bandwidth requirements of the IBOC sidebands, experts say.

Experts differ over whether the audience beyond a station's service contour matters.

That issue is coupled with the question of narrowing the AM bandwidth to 5 kHz in order for a station to transmit both analog and digital signals. While AMs have been able to transmit signals including audio frequencies out to 10 kHz, most receivers can only handle up to 5 kHz for AM; the impact of the change on listeners is debated.

Ray of WOR believes that there is no impact on his average listener, as 95 percent of the audience listens on narrow-bandwidth radios.

Critics say that while HD Radio doesn't involve a monthly fee like the satellite subscription-based radio services, it also doesn't make radio programming different enough to compel consumers to give up downloaded music and stick with terrestrial radio.



Tom Ray

Supporters say HD Radio is a technology, a tool that provides better audio quality and the added promise of data services. Digital radios, they say, will have the same jazzy interactive features as the satellite radio services eventually hope to have.

Supporters, therefore, see this convention as pivotal. Improved technology may lead to increased listenership, they argue, which may in turn lead to increasing revenues.

"We tell them you have a digital answering machine, digital phone,

See MANAGEMENT, page 21 ▶

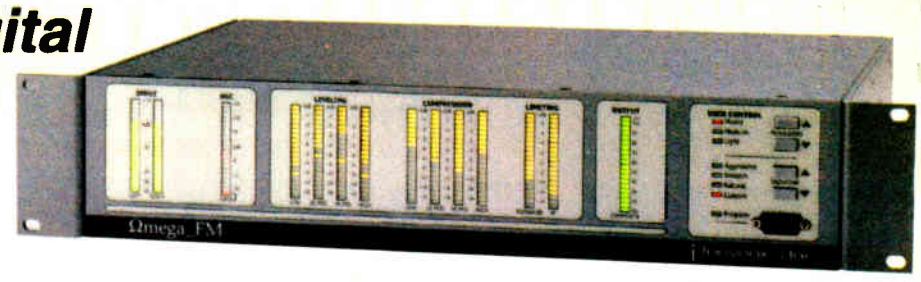
NAB 2003
See us there.

Model 531 — for FM

- Off-air FM Mod-Monitor
- Synthesized tuning - presets
- Subcarrier measurement
- AM-noise monitoring

Omega_FM — all digital

- High-power FM airchain
- Simultaneous DAB output
- Rev. 3 software preview
- take the 'test drive'



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1305 Fair Ave. • Santa Cruz, CA 95060
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www.inovon.com • e-mail: info@inovon.com

The entire line of Inovonics processors, monitors and RDS/RBDS products will be cheerfully demonstrated by our friendly, professional team. We'll have candy, too! **Booth N2326**

See us at NAB2003 Booth #N2326

World Radio History

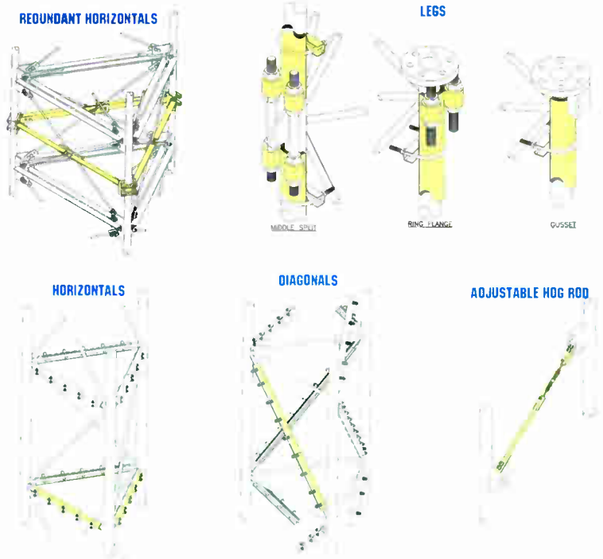
EL Series antennas can be side mounted or top mounted by using ERI's innovative LAMBDA antenna mounting section.

ERI will also highlight a line of VHF antenna solutions, including batwing antennas with models for both low band and high band VHF applications, from 2 to 12 bays and designs capable of accommodating input power levels up to 75-kilowatts, peak TV power. ERI's batwing antennas are ideal for either single channel or multi-frequency applications. In addition, we will have information on a unique side mounted high band VHF antenna. Dubbed the 540 Series Antenna, it is ideal for service as a standby antenna or for use as a main antenna for high band VHF DTV applications.

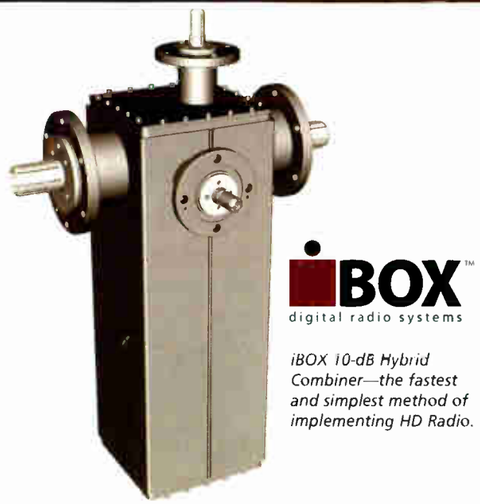
New EL Series UHF Transmitting Antenna for either DTV or NTSC applications.

Innovative Tower Products

We will also introduce our new line of pre-engineered bolt-on and weld-on leg reinforcement parts, inner member reinforcement parts, and adjustable length hog rod members. And ERI structural engineers will be on hand to discuss structural analysis services for existing towers and reinforcement plans for both tower members and foundations, as well as our series of superior gin poles. Our newest gin poles are engineered to the proposed TIA/EIA-PN-4860 Gin Pole standard, which goes far beyond previous designs.



ERI will also be featuring a full line of tower products, from small self-supporting structures to our custom designed tall towers, including candelabras for supporting multiple antennas at the tower top.



iBOX 10-dB Hybrid Combiner—the fastest and simplest method of implementing HD Radio.

Introducing iBOX™ Digital Radio Systems

ERI will also be displaying its new IBOX™ series Hybrid Combiners. Available in Low, Medium, and High power versions, the iBox™ combiners are based on ERI's reliable quarter wavelength hybrid design and require no tuning. They offer a simple and straightforward high-level combining solution for those FM stations that choose to combine a new IBOC FM transmitter into their existing antenna and transmission line system.

SHPX FM antenna

The Antenna Division of ERI will display a broad range of HD Radio-compatible FM antennas for both single station and multi-user applications. These proven FM antenna designs have been adapted for IBOC operation. The new dual input SHPX and LPX series FM antennas offer a simple approach to getting HD Radio on the air by incorporating separate analog and digital inputs. These antennas are offered in a variety of models to fit virtually any requirement.

Please make time in your NAB schedule to come by the ERI exhibit in the North (Radio) Hall in **Booth Number N2738.**

Employee Spotlight

Bill Harland Joins ERI

Bill Harland has joined Electronics Research, Inc. as Product Line Manager for the company's Antenna Division. Harland has held product line and sales management positions in the broadcast equipment industry for more than 25 years. His most recent positions have included account manager and product line manager for Andrew Corporation's Broadcast Systems business and prior to that he was Director of Domestic Sales for Broadcast Electronics.

In this newly created position, Harland will be charged with providing guidance for ERI's new product development efforts and will also be responsible for developing new systems and tools to allow the company to be more responsive to antenna and filter system customer requirements. He will also be charged with launching the company's new television antenna product line.

Kinsley Jones, Engineering and Marketing Manager for ERI's Antenna Division says, "We are lucky to have someone with Bill's experience, in both the radio and television sides of the broadcast equipment industry, join ERI. He is uniquely suited to provide the company with the direction needed to enter the television antenna business as well as maintain ERI's dominance in the FM antenna market."

Harland says of joining the ERI team, "I am very excited to become a part of the finest engineering and manufacturing organization in the industry. The depth of experience, knowledge, and skill sets within the company is not matched by any other in the broadcast industry. There is no other company in the business positioned with better prospects and more opportunity than ERI."

Harland will be based at the company's headquarters and manufacturing facility in Chandler, Indiana.

Martin Sacks Joins ERI

Electronics Research, Inc. has announced that Martin Sacks has joined the firm as Director of Worldwide Sales.

Marty, a thirty year veteran of the broadcast industry, joins ERI after a decade in broadcast equipment sales. He was most recently National Sales Director of Telos Systems/Omnia Audio. Prior to that he spent a total of eight years as a Regional Sales Manager for Pacific Research and Engineering and Northeast Broadcast Labs. Before his career in sales, Marty served in a variety of technical radio station positions, which included several years as Engineering Manager for Greater Media's then-owned Washington, DC stations.

He will be responsible for leading ERI's sales efforts in the US and internationally. An important part of his efforts will involve developing and strengthening relationships with key customers as well as resellers of ERI towers, antennas and services. Marty has extensive experience in this area having negotiated business agreements with Clear Channel Communications and Harris' Broadcast Communications Division among others.

ERI Chief Operating Officer Jim Meleski comments, "Our customers have told us that they want the closest possible relationship with our firm. They tell us that our towers, antennas and professional services are key components in their success as broadcasters. In hiring Marty, we hope to send the message that close partnership with our customers is our highest priority."

Sacks responds, "ERI is one of the most respected companies in our industry. It has a great reputation for producing superior products. I am very excited to have the opportunity to join this team and look forward to working closely with broadcasters worldwide in my new role."

Contact us:

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fax: (812) 925-4030
sales@eriinc.com
www.ERIinc.com

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fax: (410) 579-2124
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World Radio History

Please send any address corrections or other newsletter - related comments to tkellen@eriinc.com or mail comments to the attention of "The Source" at the address shown below.

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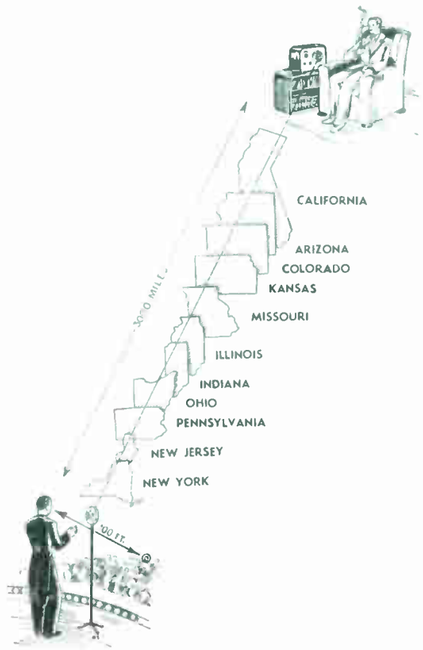
www.ERIinc.com

Broadcast Trivia Challenge



Take a look at the illustration and answer this question:

Who hears the program sooner? The man 100 ft. away in the New York City studio audience, or the man listening to his radio in Los Angeles over 3000 miles away?

Be one of the first to respond with the correct answer and win a custom "Trivia Winner" t-shirt and other prizes! To submit your answer to this Trivia Challenge, go to www.eriinc.com and click on Trivia Challenge.

Electronics Research, Inc. *See us at the NAB Show — Booth #N2738*
7777 Gardner Road
Chandler, Indiana 47610
USA

World Radio History

ERI®
The Source
A Newsletter from Electronics Research, Inc.

Spring 2003
Vol 3 - Issue 1

New Generation of Television and Digital Radio Antennas Highlight ERI's Exhibit at NAB 2003

Every television attendee needs to see the new VHF and UHF antenna products available from ERI at booth N2738 in the Radio Hall!!

We are very excited about this year's NAB Convention as we're introducing many new things at this Las Vegas show. Electronics Research, Inc. will have a new display highlighting our broad range of structural and antenna products. In particular, ERI is showing for the first time several new antenna designs for analog and digital television. These products offer significant benefits to both full service television stations as well as for Part 74 television operators.

TV Broadcast Antenna Systems

A new partnership between ERI and IRTE now offers broadcasters a unique manufacturing and service combination that provides experience, product performance, and installation support services. IRTE is the only European television antenna manufacturer with significant experience in supplying UHF panel antennas to US television stations needing broadband antenna systems. Manufactured from copper and brass with a stainless steel reflector and galvanized steel mounting components, the IRTE panel antenna is reliable and rugged. All elements are enclosed in UV resistant fiberglass radomes (standard radome color is gray and other colors are available on request), and the antenna system is designed with a computerized calculation and plotting program authored and verified by IRTE.

New Broadband UHF Panel Antenna for Single or Multi-Station Operations.

Visit us at Booth N2738

NAB
THE WORLD'S LARGEST ELECTRONIC MEDIA SHOW
April 5-10, 2003 · Las Vegas, NV

This partnership with IRTE provides broadcasters with panel antenna components with a record of performance and durability proven at sites all over the US. The combination of the ERI's strong engineering, manufacturing, and field service organization, backed by IRTE's design and manufacturing expertise, offers US television broadcasters technically superior antenna systems from a local supplier having demonstrated excellence in providing first rate quality, performance and service.

In addition to the new UHF panel antenna product, ERI will also have on display its new line of EL Series low and medium power UHF transmitting antennas. The EL Series antennas are available in a wide variety of azimuth patterns and in arrays from 4 to 32 bays, with models capable of handling up to 20-kilowatts peak power (15-kilowatts average power, 8VSB digital).

ERI's VHF Batwing Antenna models available for high band and low band applications.

continues...

60 Years 1943-2003 ERI® **www.ERIinc.com**

SBE Boasts Full Schedule at NAB

by John L. Poray

John L. Poray, CAE, is executive director of the SBE. Contributing to the article is Frederick M. Baumgartner, CPBE, director of engineering for Comcast Media Center. Radio World provides this space to the SBE as a service to the industry.

The annual migration of broadcasters to Las Vegas for the NAB spring convention will soon be upon us.

For the many broadcast engineers who will make the trek, the Society of Broadcast Engineers has a full slate of activities, meetings and educational offerings on tap, including the annual Ennes Workshop.

SBE will exhibit Monday through Thursday of convention week in Booth 21, in the lobby area across from Central Exhibit Hall 4 and next to the entrance to the Broadcast Engineering Conference rooms, N109 and N111. SBE staff and board members will welcome questions on membership, certification and frequency coordination.

SBE once again is NAB's partner in presenting the five-day Broadcast Engineering Conference.

The SBE Board of Directors and a number of committees will meet during the convention. There also will be meetings of special interest regarding frequency coordination, EAS and broadcast tower regulation. An extensive schedule of papers is listed on the NAB Web site.

For the ninth consecutive year, the Ennes Educational Foundation Trust, in cooperation with SBE, will present an Ennes Workshop during the convention. This year, the workshop will be held Saturday April 5 from 9 a.m. to 6 p.m. in Room N111 of the Las Vegas Convention Center. Attending the Ennes Workshop requires registration for the full NAB convention; SBE members can register at a discounted "Partner" rate.

The workshop will cover today's broadcast technology and operational issues. Sessions are focused on digital audio broadcasting, centralization and broadcast operational efficiency. The day rounds out with an open-ended panel discussion that involves the afternoon's presenters in a session of information exchange with the audience.

Organizing this year's Ennes Workshop is Frederick M. Baumgartner, CPBE and director of engineering for the Littleton, Colo.-based Comcast Media Center. Baumgartner is a trustee of the Ennes Trust, an SBE Fellow and a past member of the SBE national Board of Directors. Morning presentations will be of particular interest to radio engineers. The complete workshop presentation lineup follows.

Digital transmission

"Audio Processing for Digital Transmission" — Leading off the workshop will be Robert W. Reams, Neural Audio's CTO, co-founder and chief scientist, who will cover methods and means of processing for digital transmission. Reams has a background in research, development, management and application of both analog and digital technology.

"Understanding the XM Radio Transmission System" — XM Satellite Radio's revolutionary satellite radio architecture incorporates state-of-the-art technologies with its own proprietary innovations. Presenting this session will be Tony Masiello, XM vice president of operations. He oversees the design, construction and operation of XM's Washington-based Programming Center, the largest digital radio facility in the country.

"Understanding the Sirius Radio Transmission System" — Sirius Satellite Radio provides more than 100 channels of digitally transmitted audio and data services via a system of three moving satellites in highly inclined elliptical orbits plus ground based gap filler transmitters. Mark Kalman, vice president of Sirius' National Broadcast Studio in New York, will provide an overview of the technology and details of the transmission infrastructure, studio/production networks and audio coding solutions.

"Understanding the Ibiquity IBOC Transmission Systems" — Deepen Sinha, Ibiquity Digital Corp. director of audio development, will discuss the IBOC transmission aystem and will

See SBE, page 22 ▶

Digital transmission, infrastructure concerns and centralization are on the agenda for the Ennes Workshop on April 5.

Management

▶ Continued from page 20

digital cable and digital camera in your life," said Gregg Thomas, merchandise manager for mobile electronics and wireless, Ultimate Electronics, who is speaking on a "Related Industries Roundtable" about HD Radio.

"This is one of the last devices to make the move to digital, and it offers such crystal-clear sound that you just need to listen in order to take the leap."

Enforcing the rules

Broadcasters also are keeping a close eye on enforcement issues, be they RF radiation concerns, tower lighting restrictions or public filing issues.

Scott Stull

ig question confronti ners es the FCC proce ver ownership rules, said Joh gett, a partner with Wiley Rein Fielding. Any changes to the definition of a local radio market undoubtedly would affect the number of stations that might be owned by a single owner, "and the problem with redefining the market is that (those changes will lead to other) anomalies to deal with, whatever happens with ownership issues," Burgett said.

Broadcasters also are faced with learning about the newest regulations for EEO compliance. In November, the FCC established new Equal Employment Opportunity rules and policies for broadcasters. In addition to prohibiting discrimination by broadcasters, the new FCC rules, which were to take effect in March, also require broadcasters to provide notice of job vacancies and undertake additional outreach measures.

That's what the nation's largest radio owner has done. In August 2001, Clear Channel established a new diversity initiative and mentoring program to provide minorities and women greater access to the company's hiring process, said James Dockery, Clear Channel's new director of operations, who will speak during the session "The New EEO Rules: Making Lemonade."

"Our mission is to provide greater access to all levels of our business," he said.

NAB will also touch on another hot-button enforcement issue: indecency rules. FCC Commissioner Michael Copps has made several statements on the importance of sex and violence indecency controls, saying that "enforcing indecency laws is an important priority for me (during) my service at the commission."

While there are more than enough concerns for broadcasters to keep track of, there is one issue that will soon make life easier for radio stations: The FCC now is allowing radio stations to make license renewals online. But despite the ease of use this new process promises, snags often occur.

"We'll be talking about ways to make the process work, and offering tips on what to do to avoid having the FCC look into an application because a mistake was made," according to Gregg Skall, an attorney with Womble Carlyle Sandridge & Rice, who will speak on the panel "Radio Licenses: Renew Them or Lose Them."

Radio stations start filing for license renewal in mid-2003. Each broadcast license has an eight-year term. The process runs for three years, with the FCC accepting applications for state-by-state groupings of broadcasters. The first radio renewal applications come in from stations in the District of Columbia, Maryland and Virginia. They are due June 2.

Also on tap in the Radio Management Conference are sessions on the customers of the 21st century, idea swaps and how cross-ownership affects advertisers. The Business, Law and Regulation Conference also has sessions on copyright, music performance licenses and other topics.

For a list of sessions, look under Conferences at *www.nab.org/conventions/nab2003.*

Susan Ashworth is former editor of TV Technology and is a San Francisco-based technology reporter.

World Radio History

SBE

▶ Continued from page 21

focus on PAC, the audio compression technology employed the company's in-band on-channel standard. In particular, he will cover the features of the audio codec, which were designed for the IBOC system, and audio processing optimization. also Sinha will cover studio issues (including tandem coding) related to the digital broadcast system.

Infrastructure

"Employing ASI in Broadcast Station Design" — Scott Barella, vice president of engineering with Burst Communications, will discuss the requirements of dealing with the ASI signal on 75-ohm copper baseband topology.

"IP-Based Content Distribution" — This presentation will illustrate implementation of a standards-based digital distribution and content management methodology.

Key points that will be addressed include advantages of IP-Multicast distribution, improved interoperability opportunities by use of widely adopted standards and the importance of establishing a method of metadata exchange from time of creation through distribution to the intended user. Presenting will be Joe Fabiano, chief technical officer of Pathfire.

"Connectivity for Centralization" — Danny R. Romeo, co-owner of Nexustar LLC, will present.

The presentations in this section focus primarily on television facilities.

"Using the Advanced Digital Distribution Entity to Improve Station Operational Efficiency" — ADDE was conceived as a facility to distribute programming to PBS member stations in the region economically and reduce the cost of master-control operations by consolidating tasks and hardware. What can be achieved by centralcasting while retaining local identity? Tom Handy, telecommunications project manager with public TV stations KWSU/KTNW at Washington State University, is the presenter.

"Making the Centralization Decision" — Presenting is Wendell Bailey, CEO at Strategic Technology International, NBC.

"The New York Times: Remote Control Station and Transmitter Monitoring" — Frank A. Chebalo, senior vice president of engineering and operations with The New York Times Co. Digital Operating Center and GM of WTKR(TV), will put on this session. The center was the first facility of its kind, constructed to operate analog and digital television stations remotely anywhere in the country. It opened in 1998.

"McGraw-Hill's Centralcasting Initiative" — Presenting will be Ron Jennings, director of engineering for the McGraw-Hill Broadcast Group.

"The Evolution of LIN Broadcasting's Centralization" — Larence K. Oaks, director of engineering (special projects) for LIN(TV) will speak.

"Emmis Broadcasting and Centralcasting" — Mike McKinnon of Emmis Broadcasting will discuss the company's centralcasting experience.

"The Proposed, New and Improved Clear Channel Centralcasting Platform" — Michael D. DeClue, vice president and director of engineering with Clear Channel, will share lessons learned in Clear Channel's centralization efforts.

More SBE Events

Saturday, April 5

Certification Committee Meeting, 6:30-11 p.m., Royal Salon, Las Vegas Hilton Hotel

Sunday, April 6

Board of Directors Meeting, 8:30 a.m.-12 p.m., Continental Salon, Las Vegas Hilton Hotel

National Tower Consortium Meeting, 6-8 p.m., Ballroom G, Las Vegas Hilton Hotel

Monday, April 7

Frequency Coordinators Meeting, 10-12 p.m., Conference Rooms 1-3, Las Vegas Hilton Hotel

Emergency Alert System (EAS) Meeting, 2-4 p.m., N242, Las Vegas, Convention Center

Tuesday, April 8

SBE Certification Exams, 9-12 p.m., Club Salon, Las Vegas Hilton Hotel

SBE/NFL Game Day Coordinato. Meeting, 9-11:30 a.m., Grand Salon, Las Vegas Hilton Hotel

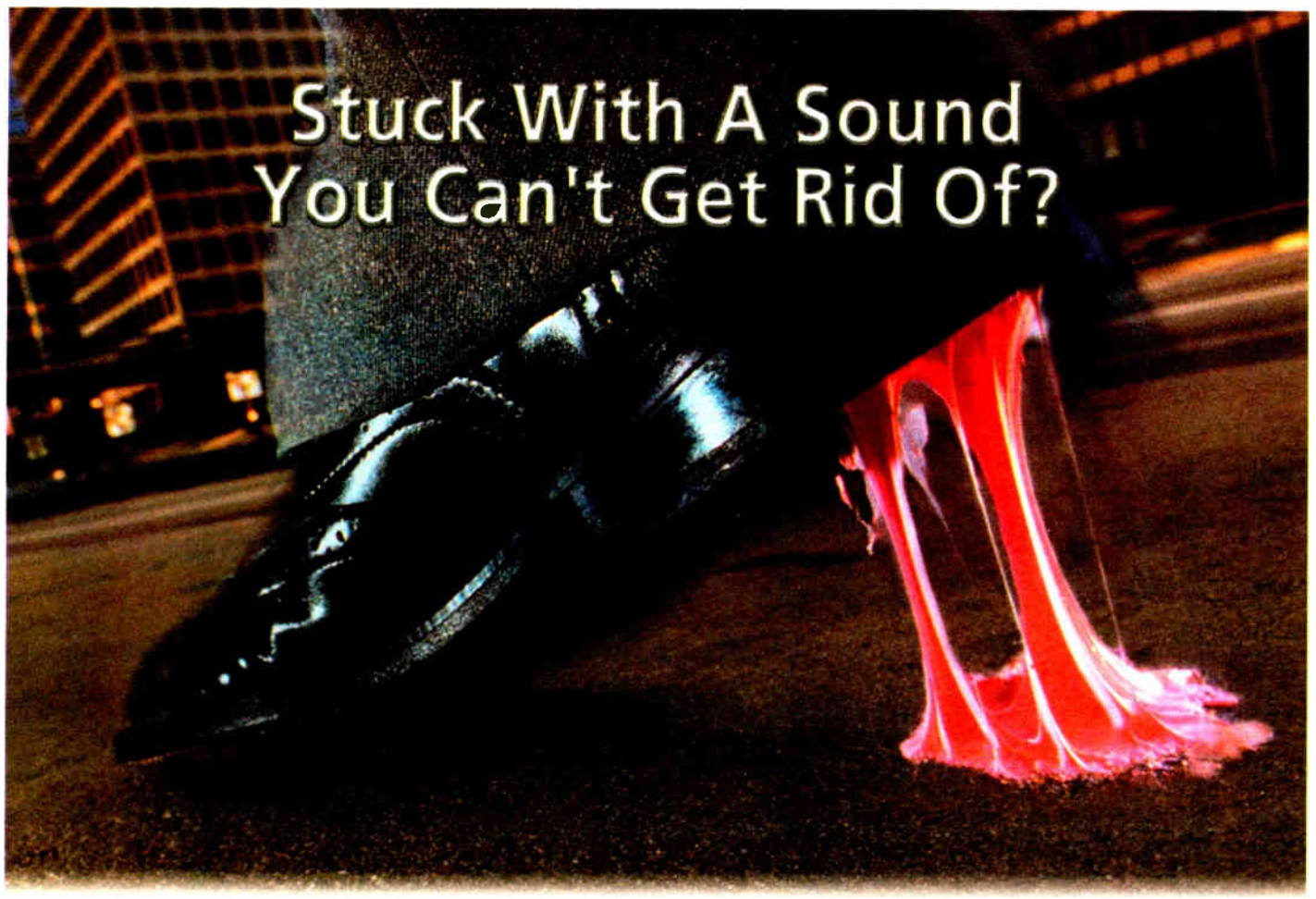
Ennes Educational Foundation Trust Meeting, 2-3 p.m., Board Room, Las Vegas Hilton Hotel

2GHz Transition Group Meeting, 2-4 p.m., Grand Salon, Las Vegas Hilton Hotel

SBE Membership Meeting, 5-6 p.m., N109, Las Vegas Convention Center

Thursday, April 9

Engineering Friendly Documentation (EFD) Meeting, 1:30-3:30 p.m., N242, Las Vegas Convention Center



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Settling for flabby, undefined bass? Buried, clouded, mids? Shrill, annoying high end that you just can't tune out of your current processor? Is your only comfort that some of your neighbors on the dial sound as bad or worse than you do? Then it's time to step up to the new Aphex 2020MkIII.

Radically new processing algorithms and circuitry bring even greater loudness while maintaining clarity and musicality. The bass is tight, deep and resonant, the mids are detailed and forward, and the highs are open and natural. The 2020MkIII is so powerful, yet so clean, it is the only "broadcast" processor used in world class post production and mastering facilities.

With an extensive range of useful controls you can readily achieve your own unique sonic signature ....a sound that you'll never want to get rid of.

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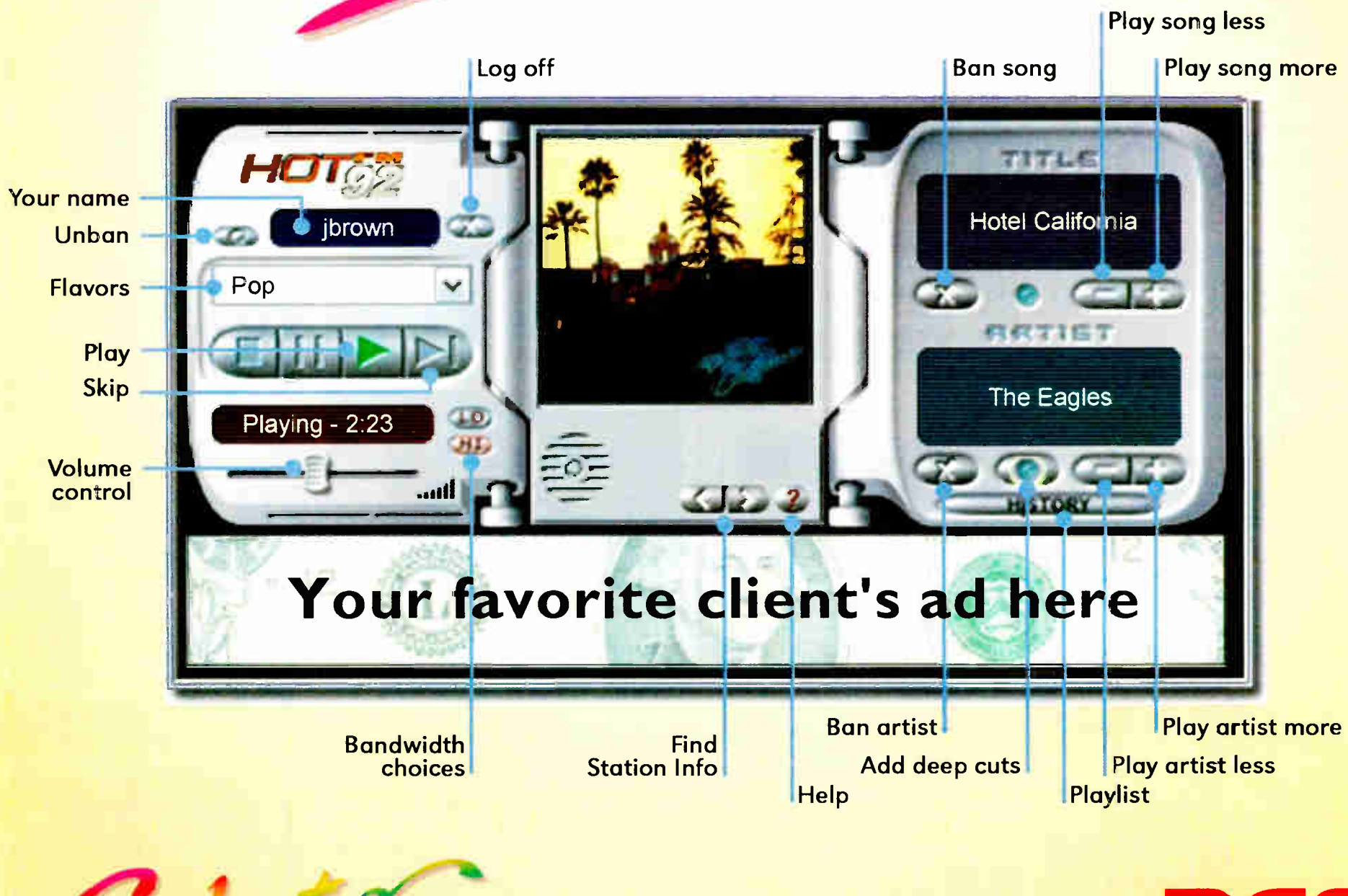
World Radio History

i·Se·lect·or (ī sə-lek'tər), n. 1. a fully branded Internet player for radio stations in the United States. 2. listeners can customize the station's format. 3. a way for stations to get back on the web legally and economically. Synonym: VALUE ADDED

iSelector™



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World Radio History

Let's All Go to the Audio Forum

Session Taps Ethernet, Ground Loops, Audio Search Tools and Stacking Algorithms

by Jeff Johnson

Amid controversies concerning the RF aspects of digital radio, questions have arisen about the audio advantages. How will HD Radio sound? Is it worth doing?

These are some of the issues to be addressed during a "Radio Audio Forum" at NAB2003 on April 8 from 1 to 5:30 p.m.

The forum is chaired by Andy Laird, vice president of radio engineering for Journal Broadcast Group, Inc.

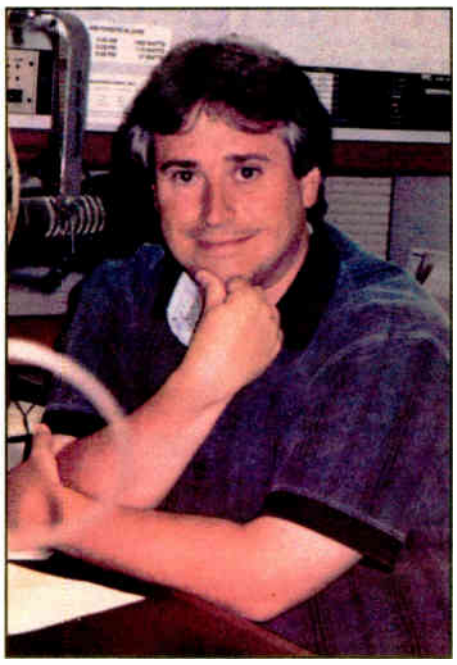
HD Radio promises

Simon Factor, U.S. sales manager for Audio Processing Technology Ltd., will make a presentation titled "Will IBOC/DAB/HD Radio Deliver All That's Promised?"

Factor cautions, "care must be taken in signal distribution combined with careful management of audio compression in the signal chain to maximize the digital advantage.

"In this session we will discuss different coding technologies and where they are found in the traditional broadcast chain, looking at remote links, STS and STL as well as forms of storage and, of course, final emission," Factor said.

Jon McClintock, commercial director of APT said, "We at APT are becoming increasingly concerned about the audio quality of digitally delivered content." He considers the "here and now" issue of concatenation or multiple passes of compressed MPEG audio files to result in a marginal, at best, advantage to DAB.



Alan R. Peterson

The next presentation of the afternoon is by Armistead Whitney, president and CEO of Fast Talk Communications in Atlanta. His paper is "Maximizing Untapped Information Assets: the Case for Audio Search and Retrieval."

"Revolutionary audio search technologies are now enabling broadcast entities to maximize the value of their assets. New revenue streams, cost savings and quick access to content are a few of the reasons audio search tools are taking radio into the 'Google Age,'" said Whitney.

Fast-Talk software does not require speech-to-text conversion, but extracts any word, name or phrase from voice data 100,000 times faster than real time.

The process of shoehorning a listenable data stream into the often-restricted bandwidth of available digital distribution media is becoming more sophisticated.

Thomas Zeigler, an expert in audio coding technologies, formerly with Fraunhofer Gesellschaft and now at Coding Technologies GmbH, will present "aacPlus — High Efficiency Audio Coding for Broadcast Applications." aacPlus allows high-quality stereo audio at bit rates of 40 kbps or even lower.

Steve Church

A new approach is to be found in Ethernet technology developed for computer interconnectivity.

"Our industry is clearly ready for a new way to interconnect studio components," said Steve Church, president of Telos Systems. In his presentation, "Ethernet for Studio Audio Systems," Church will propose a way to use Ethernet for studio audio connections and Ethernet switches as audio routers.

See AUDIO FORUM, page 25 ▶

Digital
The Perfect Hybrid
JK Audio's Got A Digital Hybrid With Features Just Right For Your Job – Whatever Your Job Is!

Over the years, we've heard many ideas of what the "perfect hybrid" might be. We've learned that the "perfect hybrid" is actually different things to different people, depending on its use. The good news is that it really comes down to a handful of features, combined in ways that make a lot of sense. We're happy to introduce a series of digitol hybrids that hit the nails on the heads, making them perfect for their respective jobs. Stop by NAB booth N2237 to check them out. Let us know what you think.

INNKEEPER 4 squeezes four independent digital hybrids in a 1U rack space. The front panel keypad, display, and handset jacks provide easy speed dialing and call setup. Maintain excellent separation between your voice and the caller. XLR output jacks contain only the caller's voice. Available July 2003

BROADCAST HOST turns your desktop into a professional broadcast center. Everything you need to get talk show quality phone recordings into your mixer or sound card. Send mic and line level signals into the phone line while maintaining excellent separation between your voice and the caller. Available June 2003.

INNKEEPER PBX easily converts your multi-line PBX type telephone system into a professional, affordable talk show console. Simply connect between your telephone handset and the phone base. So simple, anyone can do it. Available June 2003.

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www.jkaudio.com • info@jkaudio.com

Crystal Radio Award Finalists

Here are the 40 finalists for this year's NAB Crystal Radio Awards, which recognize outstanding community service. The winners will be announced during the Radio Luncheon on Tuesday, April 8.

KDFC, San Francisco
KFME, Kansas City
KFOR, Lincoln, Neb.
KGO, San Francisco
KJDX, Susanville, Calif.
KKLI, Colorado Springs, Colo.
KNOM, Nome, Alaska
KOIT, San Francisco
KOZT, Fort Bragg, Calif.
KPRS, Kansas City
KSL, Salt Lake City
KSTP-FM, Minneapolis
KUZZ, Bakersfield, Calif.
KVAK-AM, Valdez, Alaska
WAVJ, Princeton, Ky.
WAXX, Eau Claire, Wis.
WBIG-FM, Washington
WCMT-AM, Martin, Tenn.
WDEL, Wilmington, Del.
WDRV, Chicago
WEBB, Augusta, Maine
WEZF, Burlington, Vt.
WEZN, Milford, Conn.
WFUN-FM, St. Louis
WGMS, Washington
WIBC, Indianapolis
WTVK, Knoxville, Tenn.
WJBC, Bloomington, Ill.
WJJY, Brainerd, Minn.
WLUP, Chicago
WMIL, Greenfield, Wis.
WOAI, San Antonio
WPHR, Syracuse, N.Y.
WQCS, Fort Pierce, Fla.
WTAM, Cleveland
WUGO, Grayson, Ky.
WUPE, Pittsfield, Mass.
WUSL, Philadelphia
WVRV, St. Louis
WWZZ, Washington

World Radio History

Audio Forum

▶ Continued from page 24

"I will demonstrate and discuss PCs being used for real-time studio processing and mixing," Church said.

Production tools

Using new tools and software developed for pro audio and music production in a radio environment will require innovative techniques.

Alan Peterson, Radio World columnist and a professor of visual communications technologies at Montgomery College in Maryland, will explore those means in "Radio Production: Beyond the Digital Editor."

Enhancing a production director's creative ability with "a concentration on the astounding abundance of software available to music producers and musicians, but which is almost untouched by radio production people," said Peterson, "is one of the last truly creative avenues in radio.

"The tools now available to the creative production director, running on something as commonplace as today's PC, are truly wondrous. All of it makes production sound like a million bucks."

Did you know
that you can do simple tests, using no instruments, to reveal the exact location of the audio interface producing hum or buzz?
— Bill Whitlock

New studio topologies are made possible by technical advances originating outside of radio. "Don't Re-invent the Wheel, Find a Different Spoke," will be the message of Rick Kemp, chief engineer with Journal Broadcast Group.

Central architecture

As reliance on a central architecture such as Ethernet in our broadcast plants becomes ever more pervasive, reliability will become crucial. Carl Christensen Sr., design engineer for Thompson Grass Valley, will address this issue by presenting "Reliability and Redundancy in Linearly Expandable Routers."

Such considerations as placement of redundancy decision points, complexit and forward error correction will be discussed.

Michael Dosch, director of product development for Telos Systems, will focus on Ethernet technology as applied to consoles.

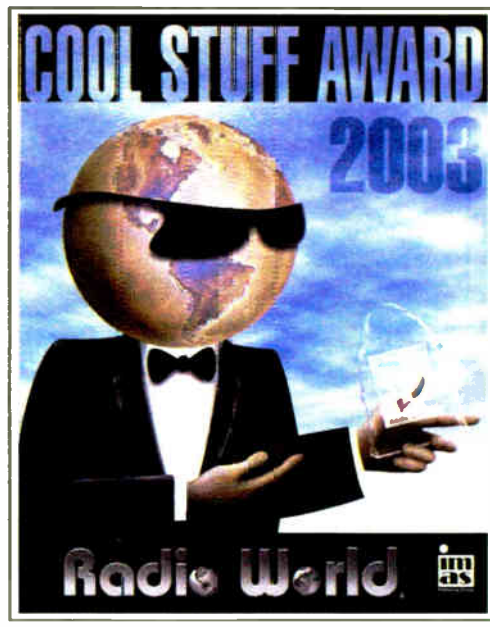
"Mixing and processing can be performed by inexpensive network-based processing engines and control surfaces utilizing software GUIs," Dosch said.

His "Network-enabled Radio Console Architecture" talk will emphasize how "a fully configured network-based system can be assembled for about the cost of a traditional analog console."

Regardless of advances in slick new technologies, noise continues to cause trouble. In his presentation "Understanding and Avoiding Ground Loop Problems," Bill Whitlock, president of Jensen Transformers Inc., explains simple tests that can be done to uncover problems.

"Did you know that you can do simple tests, using no instruments, to reveal the exact location of the audio interface producing hum or buzz? The same tests indicate whether the cable itself or badly designed equipment is at fault. It works for balanced or unbalanced interfaces," Whitlock said.

Jeff Johnson is network engineer for the X-Star Radio Network, Xavier University, Cincinnati.



Radio's most prestigious technical honor, the Radio World "Cool Stuff" Award, will be given at NAB2003. Watch for the winners in a future issue, and if you can't wait, check out www.rwonline.com at the end of the NAB convention.

Up to...

HD Radio

Broadcast Electronics was there at the beginning, the birth of HD Radio. And now we're leading the pack in implementation and design of real HD Radio systems for the real world of broadcasting.

Stepping

Many have realized the benefits of going HD Radio with BE, as orders for new equipment and system designs have poured in since last year. Entercom, Clear Channel, Greater Media, Crawford Broadcasting, Beasley Broadcast Group, WJLD-AM (first non-experimental AM station to broadcast HD Radio), and many more have chosen BE to help them prepare for the future–the HD Radio future.

"This is the future of AM radio, so this is definitely money well spent."
— Gary Richardson, Owner and Chief Engineer
WJLD-AM - First non-experimental AM station to broadcast HD Radio

"We're excited about the impact of HD on the future of Radio. BE's solutions have the flexibility to make our implementations easy and cost-effective."
— Bob Demuth, Vice President and Chief Technology Officer
Beasley Broadcast Group, Inc.

Take your first step towards tomorrow's new radio format by calling BE at **888-232-3268** or visit us on line at **www.bdcast.com**.

BE

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HD Radio is the Format of the Future. And the Future has Arrived.

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World Radio History

Workbench

Tips From Radio World's John Bisset

Perhaps the most popular columnist in radio, certainly the most popular technical columnist, is John Bisset.

Radio World's *Workbench* expert will lead a three-hour session on Thursday morning, April 10, from 9 a.m. to noon, sharing tips from the hundreds of columns he has written and the thousands of ideas that have been sent in by readers from the field over the years.

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

NEWS WATCH

'The Goat' Is the Hero

Canadian station Border Rock 106.1, "The Goat," which went on the air just two years ago, will be honored at the NAB2003 show with the association's International Broadcasting Excellence Award.

The station is in Lloydminster, Canada. It was recognized "for extensive efforts to improve the lives of its listening audience, through local public affairs programming and numerous off-air community-service projects," NAB stated.

"Among the many individual campaigns the station undertook in the past year were its 'Goat's Christmas Convoy,' a mobile food-bank drive utilizing a number of 40-foot, 18-wheelers covering 500 kilometers (about 310 miles) over four days in December."

The station also undertook fund drives for Big Brothers & Big Sisters, the Heart and Stroke Foundation and other organizations.

Canal 9 Televida in Mendoza, Argentina, received the honor in the television category.

The NAB International Broadcasting Excellence Award was established in 1995.

Separately, the NAB and the Broadcast Education Association said they will present the 2003 Hugh Malcolm Beville Jr. Award to John Dimling of Nielsen Media Research.

Dimling was vice president of NAB's Research Department in the 1970s and directed the Corp. for Public Broadcasting Corporate Planning & Analysis group for four years. He is former executive director of the Electronic Media Rating Council. He joined Nielsen in 1985 and was appointed president and COO in 1993. He now is chairman of that company and chairman of the board of NetRatings Inc.

The Beville Award honors achievement in contemporary audience research.

Who Goes, Who Stays Home

by Paul McLane and Craig Johnston

Are you going to NAB? Why or why not? We picked names from our lists of readers and suppliers and called to ask. Here's an unscientific sampling.

"Ah, no," said Scott Stevens, operations manager for Cumulus Broadcasting in Van Buren, Ark., when asked if he'll attend, although he said he'd like to.

"If anyone goes from the Fort Smith area, it's probably our general manager Del Williams." Stevens learns about equipment through catalogs sent to the station.

Also not attending is Integrity Media Chief Engineer Dave Wooten in Albany, Ore.

"We're a small-market station, and NAB is not in the budget." He learns about equipment from friends who attend and by reading Radio World.

Pete Schartel, president of KCXL(AM) in Liberty, Mo., is the station's technical expert as well. He has attended for 10 years but is considering not going this year.

"I honestly didn't see a whole lot from the seminars that intrigued me, things I couldn't live without."

Supplier Joe Klinger is the "JK" in J.K. Audio. He'll be exhibiting.

"I'm not really sure what to expect from this year's show," he said. "We're excited about the three new products that we're putting out, so we're really kind of biased towards showing up, despite whatever the expectations of attendance are."

Regional staff

Radio's biggest group is Clear Channel. As reported elsewhere in this issue, senior vice president for engineering services Jeff Littlejohn will be there with a group.

"We've probably got 20 or 30 people we're sending this year," he said. "It's going to be lighter than past years. ... We've got our engineering organized as a corporate staff that's regionally based, and those regionally-based engineers will all be at that meeting. But the chief engineers and that sort of thing won't be at that meeting."

Paul Cameron is executive director and general manager for several Christian radio stations in Appleton, Wis. He normally attends the National Religious Broadcasters convention rather than NAB and won't be in Las Vegas.

Steve Denemark is planning to launch an LPFM station in Quincy, Ill., and will attend.

"There are a few manufacturers who are there I need to talk to," he said. "I need to get the whole package together for low-power FM, transmitter manufacturers, tower, the basic stuff."

Aaron Read, staff engineer with Broadcast Signal Lab, can't afford to go on his own dime and anyway he's "too busy at work and (there's) not enough value since my focus is on non-commercial."

Joe Klinger

However, his boss David Maxson expects to be there "due to his deep involvement with the data services side of IBOC/digital radio."

Busy schedule

Conrad Trautmann, senior vice president of engineering for Westwood One, says NAB is an "excellent opportunity" to meet with vendors and customers. He'll be in Las Vegas.

"I am on the SBE Board and Executive Committee, plus chairman of the Finance Committee and on a few other committees; so it's important for me to attend. SBE holds its board meeting at the NAB." Trautmann says his appointment calendar gets pretty booked up before he even gets to the show.

"I plan to learn what I can about the latest technology and how it may apply to our operations at Westwood One and Metro Traffic."

All the cluster chief engineers for Greater Media will be there, according to Milford Smith, vice president of engineering.

"The opportunities available to become more conversant with new technologies — especially in this the 'year of HD Radio rollout' — get hands-on orientation to new products and renew and improve our relationships with both equipment vendors and fellow broadcast engineers are simply too valuable to pass up."

Steve Denemark

Smith is a big fan of the convention.

"I don't believe there another forum in the world, let alone the U.S., where broadcast professionals, especially technical broadcast professionals, can profit more from attendance than at the annual NAB convention. I have never left a show without bringing home knowledge and ideas that were immediately valuable to our company's ongoing technical operation."

And Mark Humphrey, chief engineer for Radio One stations WPLY(FM)/WPHI(FM) in Philadelphia, said, "Yes, I will be there, along with the CEs from most of Radio One's other markets."

He plans to spend a day in meetings and workshops with company management and engineers; participate in the SBE Board Meeting; walk the show floor; attend a few engineering papers; and talk with key vendors over dinner.

"I'll be taking pictures and notes, too, for an 'NAB Review' presentation at our local SBE chapter meeting in late April."

Everything You Ever Wanted to Know About HD Radio

Here is a summary of sessions about HD Radio at NAB2003. Other sessions deal with digital satellite radio, processing for digital transmission, international developments including Digital Radio Mondiale and related topics. The Public Radio Engineering Conference, held prior to NAB in Las Vegas, also has HD Radio on its agenda.

Saturday, April 5

SBE Ennes Workshop, 11-11:30 a.m.

"Understanding the Ibiquity IBOC Transmission Systems," Deepen Sinha, Director, Audio Development, Ibiquity

Sunday, April 6

Radio Management Conference

•"The Digital Landscape," 2-4 p.m.: Ibiquity Digital executives discuss the chicken-and-egg aspect of the HD Radio rollout and wireless data business opportunities.

•"Related Industries Roundtable," 3-4 p.m., with representatives from Kenwood, Ibiquity, WOR(AM) and Ultimate Electronics

Broadcast Engineering Conference

IBOC DAB: Ready for Prime Time, Part I, 9:30-11:30a.m.

•"Chipping Away at HD Radio," John Gardner, Texas Instruments

•"Swept Frequency Methods to Evaluate AM Antenna System Bandwidth," Ron Rackley

•"FM IBOC Transmission Using Dual Input Antennas," ERI's Eric Wandel

•"AM High-Definition Radio: Technical Issues Affecting Adoption at Night," Glen Clark

•"IBOC Technical Activities Report," NAB's David Layer

IBOC DAB: Ready for Prime Time, Part II, 1-5 p.m.

•"Practical Considerations for the Implementation of AM IBOC," WOR's Tom Ray

•"A Planning Guide: Determining the Best IBOC Migration Path for Your AM or FM Radio Station," Harris' Keith Mullin

•"The Effects of Implementation of IBOC Transmissions on Nighttime Analog Reception," Ibiquity's Glynn Walden

•"IBOC Space Diversity Test," Bonneville's Talmage Ball

•"Solutions for the Implementation of FM IBOC Technology," Dielectric's Henry Downs

•"Reducing FM IBOC Transmission Costs With the Proper Configuration and Linearization Techniques," Harris' George Cabrera

•"Applying the Principles of Data Communications to the Development of an Open and Universal IBOC Data Protocol," Broadcast Signal Lab's David Maxson

•"Digital Radio Concepts for Satellite and Terrestrial Reception," about interoperable digital radio, Philips' Jack Morgan

Tuesday, April 8

Radio Audio Forum 1-1:30 p.m.

•"Will IBOC/DAB/HD Radio Deliver All That's Promised?" Simon Factor, Audio Processing Technology

World Radio History

Susquehanna People

Experience. Stability. Vision. *And Chris Lawton.*

Chris Lawton
Sr. Systems Engineer
Susquehanna Radio Corp.

Chris Lawton is wired for success. He first hooked up with us in a part-time role while studying electrical engineering in Atlanta. That was back in the late 80's when new technologies were emerging. Later, as an assistant engineer, Chris asked to install the company's first LAN system. Now, as a member of the corporate IT team, Chris travels to every market we serve, helping our radio stations with their LANs, WANs, digital audio systems, and network upgrades.

What's different about Susquehanna Radio Corp.? "Doing things right has always stood out," says Chris. "If someone says, 'this is what I believe should be done,' if they're passionate about it, they will often be given that chance, because the company does listen."

Make a Sound Career Choice!

With operations in major markets across the USA, Susquehanna Radio Corp. offers a number of radio career opportunities. For more information call our Human Resources Department at (717) 852-2132.

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World Radio History

Shown: Harris VistaMax Audioarts DX-16

NAB 2003 Exhibit Hours

Monday, April 7:	9 a.m.- 6 p.m.
Tuesday, April 8:	9 a.m.- 6 p.m.
Wednesday, April 9:	9 a.m.- 6 p.m.
Thursday, April 10:	9 a.m.- 4 p.m.

Note, *RTNDA@NAB* exhibits run Sunday, April 6, 2-6 p.m., and Monday through Wednesday 9 a.m. to 6 p.m., with no Thursday hours.

The following is a selection of exhibitors of interest to radio attendees at NAB2003. Highlights are paid for by exhibitors, information is from the companies. Check the on-site program for changes, late-registering suppliers and the full list of convention booths.

Booths preceded by the letter N are in the North Hall of the Las Vegas Convention Center. C indicates Central Hall, SL is South Lower Hall, SU is South Upper Hall, MM is Mobile Media, MR is Meeting Room. Booths preceded by RT are RTNDA booths at the Las Vegas Hilton.

360 Systems C2024
On Display: Instant Replay, Short/cut.

615 Music Library RT518, C664

A

A.F. Associates Inc. C950

AARP RT616

ABE Elettronica S.p.A. C144

AccuWeather C3534

Acoustic Systems N2256

Acoustical Solutions Inc. C543
Intro: ARISC-1 Alpha Resilient Isolation Clips in combination with AB10NR AudioSeal Sound Barrier acoustical caulking improves STC rating; Alpha Corner Traps for low-frequency absorption available in polyurethane foam in multiple colors, in convoluted or flat-face melamine foam or fabric-wrapped; ADF-24 Alpha Diffusers molded thermoplastic panels to diffuse or disperse acoustic energy to help eliminate hot or dead spots while maintaining a live sound; SoundSuede fabric-wrapped wall panels in a variety of sizes, shapes and colors offer an elegant synthetic suede appearance while providing noise reduction and reverberation control; Milgard Quiet Line windows with dual sash glazing achieve some of the highest STC ratings available in the residential window industry.

Also: AlphaSorb wall panels; AudioSeal sound barrier; Sonex acoustical foams and ceiling tiles; Alpha Pyramid and Wedges acoustical foam; Barrier wall panels; door seals; bass traps and diffusors.

Acrodyne Industries Inc. C958

ADC C4026

Advanced Microwave Components N1264

Advertising Edge Inc. N3036

AEQ S.A. N3146
Intro: The BC-2000 Digital System is a routing, mixing, audio processing and communications system for radio and TV. It also handles centralized audio management and distribution, and intercommunication and linking of broadcast audio facilities; also the Systel 6000 system, new ISDN/telephone multichannel software, uses the Impact digital router, which provides as many interconnections as necessary, up to 120 crosspoints distributed in 20 circuits; also new features of the Swing ISDN portable codec, digital hybrid and mixer include an internal Digital Dynamic Level Processor that provides customized and constant clear audio levels without overloads. Controlled and configured by software, the working environment for the user is simple; new features for Eagle ISDN dual audiocodec include MPEG Layer III and auto dial-up when a point-to-point link failure is detected.

Also: Portable ISDN codecs MPAC-02 and TLE-02D, Digital Telephone Hybrid TH-02 EXMkII, Automation System MAR4Win, Self-Powered Audio Monitor AM-03, Analog Mixing Consoles BC-300 BC-500 and BC-2500, E@sy Family.

AEV S.P.A. N2460

Rollercoaster at New York, New York

Las Vegas News Bureau

Ampex Data Systems SU5860

Amphenol Audio USA C4543

AMS Neve N3038
Intro: XSP DSP processing for Libra Live digital broadcast console as well as channel module option with a 30 mm fader pitch allowing room for 64 faders, new console frame, new software with Audio Follow Talley and the MIOS I/O suite; Logic MMC console with 96 kHz operation, XSP DSP and MIOS 96 I/O and the same technology as the DFC console.

Also: AudioFile SC professional editing system; 1081R remote mic preamp.

Andrew Corp. C2630
Intro: 3-1/8-inch hybrid for use as a power divider/power combiner; 3-1/8-inch patch panel; 1-5/8-inch coaxial directional coupler; earth station monitor and control system.

Anheuser-Busch Inc. RT620

Anton/Bauer Inc. C3650

Anvil/Calzone Cases C4074

Aphex Systems N2224
Intro: Model 1401 single-channel true Aural Exciter and Optical Big Bottom with a top-quality D.I. with ground lift. Battery operation or external power accepted. Voiced for acoustic instruments. Model 1402 single-channel true Aural Exciter and Optical Big Bottom with a top-quality D.I. with ground lift. Battery operation or external power accepted. Voiced for electric guitar. Model 1403 single-channel true Aural Exciter and Optical Big Bottom with a top-quality D.I. with ground lift. Battery operation or external power accepted. Voiced for electric guitar.

Also: 120A, 124A, 204, 207, 250, 320A, 323A, 622, 661, 720, 722, 1100, 1401, 1402, 1403, 1788, 1788RC, 2020MKIII.

Apogee Electronics SL830
Intro: Rosetta A/D-D/A supports sampling rates up to 96 kHz, upgradeable to 192 kHz, eight analog and eight digital I/O, optical and word clock I/O, optional FireWire connection; Big Ben 192 kHz master word clock with AES, S/PDIF and optical I/O, word clock/video in and six word clock outs, optional FireWire connection, real-time format conversion, Direct Digital Synthesis using Apogee C777 clock technology up to 192 kHz and Adaptive Loop Filtering to optimize clock performance and minimize

See us at NAB2003 Booth #2455

AirCraft Production Music Library SU5612
Intro: The Latin Compilation; American Travelog; Punk Rock; Pedal Steel Guitar; and Dance Club Grooves.

Also: The AirCraft Music Library; The American Music Series; Rock Sweepers; and Cinemusic.

AirNow – U.S. EPA RT614

AKG Acoustics N2241

Alcorn McBride Inc. SL1625
Intro: The MP3 Machine professional audio player, in a portable rugged enclosure, stores hundreds of MP3 audio clips on removable CompactFlash cards and plays them back using playlists, schedules or serial/contact closure control through balanced audio outputs and an Ethernet interface.

Also: MP3; 8 TraXX; LightCue.

Allen Avionics Inc. SU5318

Allen Osborne Associates Inc. SU5131
Intro: Pneumatic drive-up mast for quick deployment; turnkey pneumatic mast system with Nycoil and camera mount included as well as free mounting brackets and a foot pump.

Allergy Alert RT520
Intro: An exclusive four-day pollen forecast to help build ratings and revenue.

Allied Tower Co. N2445

Altronic Research Inc. N2428

American Inflatables Inc. N1851

American Radio Relay League Lobby Booth 23

American Tower N2166

Americas Generators MM217

World Radio History

jitter; Mini-DAC 192 kHz A/D converter with AES/EBU single and double wide, optical, S/PDIF Coax and USB I/O, analog output level control, low-current low-voltage for location/ENG use and digital thru mode for USB functionality.

Apple Computer **SL601, SL825**

APT — Audio Processing Technology **N3204**

Intro: Wireless apt-X 2.4 GHz Bluetooth module, available as an OEM product, digital 22.5 kHz (48 kHz Fs) with reverse control channel, forward error correction and adaptive frequency hopping; WorldNet Milano low-delay audio codec for permanent STLs and STSs, integrated ISDN terminal adapters, fully duplex, analog and AES/EBU I/O, alarm relays contact closure for remote control and RS-232; WorldNet Tokyo multi-algorithm ISDN audio codec supports apt-X, MPEG Layer II, MPEG Layer III, G.722 and AAC; WorldNet Chicago fully duplex stereo codec with TCP/IP or UDP/IP capability, 15 kHz or greater via LAN or WAN for studio networking.

Also: WorldNet Rio; WorldNet Milano with SMPTE; PCAU Cool Edit Pro plug-in; licensing of apt-X; and multichannel E1/T1.

Arena-MaxTronic **C4067**

Intro: Ultra160-to-SATA, Ultra160-to-Ultra160, Ultra160-to-ATA and Ultra160-to-EIDE subsystems boost performance through I/O load sharing of dual-PCI interface plug-and-play RAID solutions, transparent to host computers and operation systems with versatile RAID management software for remote configuration and monitoring.

Armstrong Transmitter **N2846**

Intro: Compact 2 kW solid-state FM amplifier. Housed in two 3-RU high chassis, requiring 10-1/2 inches of rack space, can be used as an emergency backup transmitter or 2 kW main transmitter. The top cabinet houses eight 300-watt power modules and the bottom contains redundant switching power supplies and the transmitters command center. Telemetry is available for remote-control hook up. Metering is available via DB9 remote control interface connector. The XFM series of digital broadcast amplifiers was designed for stations that are planning on using high-level combining or second antenna solutions to IBOC FM implementation. These amplifiers use the same technology the company used in its first digital amplifier on the air to prove the viability of IBOC FM. Digital XFM amplifiers are available from 100 watts to 2.5 kW.

Also: AM and FM transmitters, STL systems, exciters, FM antennas and passive RF products

Arrakis Systems **N2638**

Associated Press Broadcast Technology **SU6271, RT304**

Intro: ENPS Web Publishing feature allows broadcasters to drag and drop stories into ENPS running orders to publish to the Web or portable devices automatically or with mouse click approval; OPENS — Organization, Place, Event Notification System — automates the collection of data about school and business closings during bad weather and automates the transmission of that information to automatically cycled CG over live programming, Web pages, WAP, e-mail and e-mail pagers and phones.

Also: ENPS.

Associated Production Music **SU6357**

Intro: Mars Lasar's Big Box Modular Library maximizes output and creativity in production by providing modular WAV files that can be assembled in a digital editor to create a customized music track; Big Shorts Promo Music six-CD microlibrary with maximum attitude, providing big music for short spots; APM On the Cutting Edge music for keeping projects ahead of the curve, including the KPM Bad Ass music collection of emo, punk, rap-rock and eclectic alternative and the Carlin alternative punk and nu metal CD; Broadway Music from Hal David and John Cacavas offers Broadway melodies in vocal and instrumental versions; NFL Films Music Library of hard-driving tracks.

AT&T **SL2816, MR3360**

ATCI/Antenna Technology Communications Inc. **N1336**

Intro: SimulSat C/KU improves C- and Ku-band performance to increase revenue streams, lower costs, improve aesthetics; outperforms parabolic retrofits.

Also: Multibeams, parabolics, fiber-optic equipment, test equipment and systems integration.

ATI-Audio Technologies Inc. **C135**

Intro: MMA800-XLR eight-channel mic preamp consisting of eight mic/line preamps in 1 RU enclosure with XLR in and out. Each low-noise preamp includes front-panel selection of level, hi or lo gain, phase reverse and low-cut filter I/O with LED readouts of signal presence and signal clipping. A switchable output level meter, headphone amp and global phantom power switch are included. Internal jumper plugs allow summing of inputs into multiple outputs. Active balanced or transformer balanced outputs available; also, AMM200 Nanoamp Series features stereo loop-though XLR analog inputs, a two-color bargraph meter and a stereo headphone output with switched rear RCA jacks for powered speakers; DMM200 Nanoamp Series Digital monitor accepts loop-through AES/EBU format digital audio via 110-ohm XLR, 75-ohm BNC and RCA connectors. A 24 bit, 96 kHz D/A converter feeds headphone drivers, balanced audio line outputs and a stereo LED meter.

Also: Broadcast consoles; AES/EBU and analog distribution amplifiers; AES and analog matching amplifiers; headphone amplifiers; studio bargraph audio metering; digital and analog audio metering monitoring and ENG mixers.

ATTO Technology Inc. **SL3033**

Intro: FibreBridge 2300E/r/d 2 GB high-performance Fibre Channel-to-SCSI bridge configures with one Fibre Channel port and two independent SCSI buses; FibreBridge 1290E 2 GB embedded Fibre Channel-to-SCSI bridge for high-performance applications such as serverless backup; FibreCenter 3400R/D 2 GB hub with advanced management, product modularity and high availability with eight 2 GB Fibre Channel ports and four programmable zones.

Also: ExpressPCI FC 3320; FC 3300; FC 3305; FC 2600; FCSW; ExpressPCI UL4D; UL4S; UL3D; UL3S PSC; and PSCd.

Audemat-Aztec **N2049**

Audio Accessories Inc. **C149**

On Display: Patchbays.

Audio Ltd./MacArthur Group **N3132**

Audio Precision **N2220**

Intro: ACC-1221 Switching Amplifier Measurement Filter enables accurate and meaningful measurements of Class D, Class I,

Prophet Systems Innovations

DIGITAL AUDIO SOLUTIONS
AS INDIVIDUAL AS YOUR STATION

There is no station like yours. And no digital audio solution like NexGen Digital Broadcast from Prophet Systems. It doesn't matter if you're after seamless music scheduling, effortless voice tracking or trouble-free WANcasting. You'll find the features you need from Prophet Systems. NexGen Digital is customizable and scaled to fit your format and budget – whether you're responsible for a dozen stations or one. And it's developed and supported by real world broadcasters. So call to find out all the ways Prophet Systems can help you deliver great radio, with a system that's as unique as you are.

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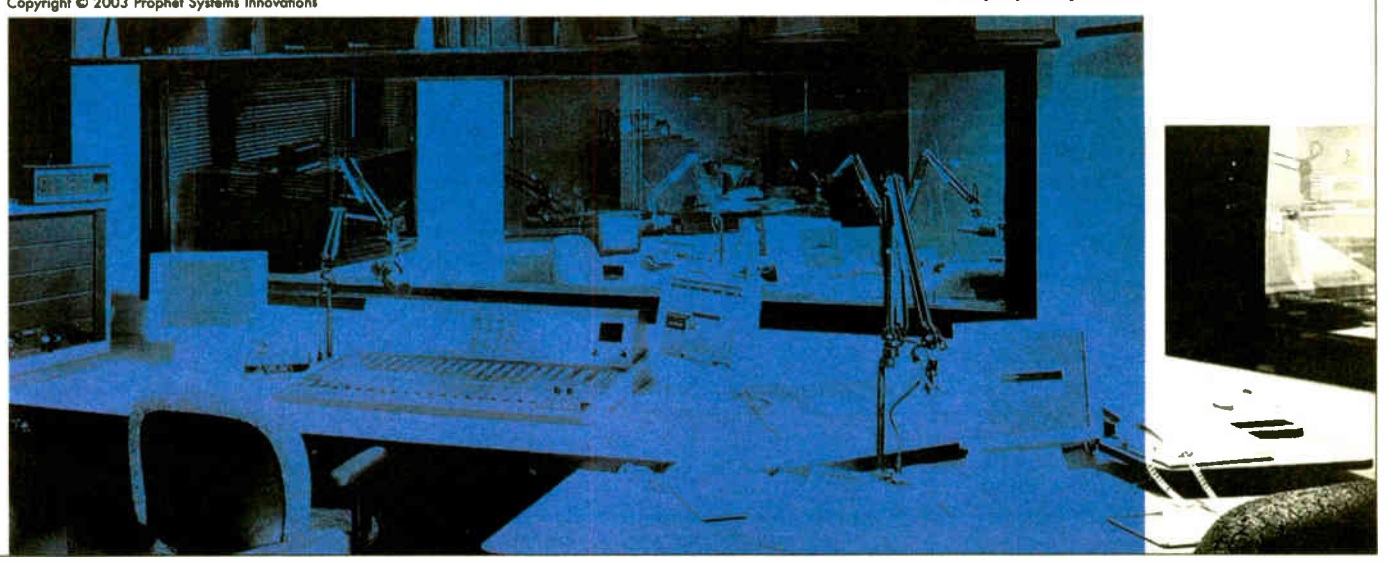


See us at NAB2003 Booth #N1924, SU5369

World Radio History

Class T, digital amps and other switching amplifiers; APP-8010 PC Audio Test software, developed in conjunction with Microsoft, makes it easy to characterize accurately the performance of soundcards and embedded sound devices for local or remote PCs.

Also: Cascade Plus, ATS-2, Portable One Plus Access, Portable One Dual Domain, ATS-1 Access and ATS-1 Dual Domain test sets and audio analyzers.

Audio-Technica U.S. Inc. **N2112**

Intro: AT899 subminiature omnidirectional condenser lavalier microphone provides maximum intelligibility in a 5 mm diameter housing, available in wired or wireless, black or beige versions and accessory collection includes interchangeable clothing clip, single and double mic holders, viper clip and windscreens; AT3060 cardioid tube microphone operates on 48V phantom power and features a new large-diaphragm condenser element for smooth sound reproduction with low noise levels and large transformer-coupling for low-frequency linearity.

Audioarts Engineering **N2804A**

Intro: DX-16 digital on-air board with 16 input channels, two caller phone module, digital domain metering and router; R-55 countertop mount, modular, cost-effective analog on-air radio console in 12- or 20-input channel mainframes with two caller phone module, logic and electronic switching; R-90 mixing console for multi-studio installations, modular design houses up to 23 input channels with dual caller support, two studios, two headphones, VU meter pairs, two stereo and two mono outputs and countertop installation; ACS-1 digital radio air console with rackmount engine and separate compact, modular control surface, analog or digital I/O modules and machine logic I/O ports, four to 20 input faders and capability to interface with Audioarts and Wheatstone audio routers and Wheatstone network router/mixing system; ADR-32 rackmount digital audio router with front-panel X-Y control and monitor speaker, configuration via Wheatstone X-Point software and optional event scheduler software is available.

Also: R-60 analog radio on-air console.

AudioScience Inc. **N3003**

Intro: ASI2214 (SoundSlice) USB-based multistream audio adapter. Includes MPEG Layer 2/Layer 3 record and play, with MRX Multi-rate mixing technology; ASI is announcing a hardware-based compression/expansion algorithm that functions on multiple streams at multiple sample rates simultaneously, with or without pitch shift.

Also: ASI4215, ASI5111, ASI6114, ASI6012, ASI4342, ASI4344

Avid Technology Inc. — Also see Digidesign **RT606, SL300**

Axel Technology Srl **N3224**

Intro: Falcon 15 FM three-band digital audio processor incorporating MPX and RDS coders and PC remote control; Oxygen 4 audio mixing console for on-air purposes available in 10 and 20 module frame versions, stainless steel and aluminum frame with wood inserts and a modular structure with mono, stereo, telco plus telephone modules; DJ Pro modular system for automated radio broadcasting with new utilities for SMS, e-mail and phone message management; Digi-Ware playlist creation software for TV and radio programming.

Also: Oxygen range; Falcon range; Boxtel; Macrotel; Shark; Genius; Matrix; Sat Time; Mr Light; Parrot; and Forget.

AZCAR **SU5166**

Azden Corp. **N2038**

Intro: FMX-2 Professional Field Mixer with two balanced XLR inputs with level controls, two peak level input LEDs, two balanced XLR outputs, selectable output configurations, stereo minijack output for DV cameras, monitor output with level control, and low-battery LED. Runs on single 9V battery. MSRP $350.

Also: 51BT UHF Bodypack Transmitter with 63 user-selectable frequencies. Features include case, improved antenna design, metal belt clip, input level control, locking 4-pin microphone input. Designed to work with Azden 500UDR, 411DRH and 411UDR receivers; 51XT XLR Plug-in Transmitter with 63 selectable frequencies. Features include new phantom power for condenser microphones, turns any microphone that has XLR output into a wireless microphone. Input level control, peak input LED indicator. Designed to work with Azden 500UDR, 411DRH and 411UDR receivers.

B

B&H Photo-Video-Pro Audio **N3052, SU5000, SU5000A**

BBC Technology **SU5047**

The expansion of the LVCC means no one has to trek to the Sands. But bring your MREs if you plan to go from the radio booths to the far end of the South Hall.

Las Vegas News Bureau

BeachTek **SU5620**

Intro: DXA-6 Dual Phantom Adapter; DXA-2 Compact Adapter; DXA-8 Ultimate Adapter; SVU-1 Compact VU Meter is a compact stereo VU meter that mounts to shoe on a camcorder; SVU-2 Multi Purpose Stereo VU Meter.

Belar Electronics Lab Inc. **N2504**

On display: AM, FM and TV modulation monitors and related equipment for the broadcast industry. Belar markets its products through direct sales, OEMs and distributors, domestically and internationally. Wizard for Windows monitors your station on your network as well as the Internet.

Belden Electronics Division **C674**

Intro: 1502R and 1502P multimedia control cables for use with multimedia control equipment, such as AMX and Crestron, available in Riser and Plenum versions.

Also: AES/EBU digital audio cables, line level analog, mic cables, multipair snake cables.

Bext Inc. **N2532**

Intro: XL 1000 1 kW FM LCD display radio exciter/transmitter with new software, remotely accessible via modem; Lex 30 slimline 30 W FM radio exciter/transmitter fits a programmable LCD display FM exciter with stereo generator card in 1 RU; HS 5000 MOSFET-type solid-state 5 kW FM analog/IBOC-compatible radio transmitter fits in single cabinet with five hot-swappable RF modules and dual exciter; Coverage Doctor FM broadcast signal analyzer and recorder shows and records signal strength, modulation, deviation, multipath component, 19 kHz pilot injection, SCA injection and RDS/RBDS injection levels, can log and send alerts when parameters on selected signal(s) change beyond user-specified thresholds.

Also: Broadcast transmitters; radio FM; RF amplifiers; antennas; STLs; boosters; translators; and RF accessories.

Beyerdynamic Inc. **C700**

Bird Technologies Group **N3251**

Intro: BPM7; SA-1700 and SA-1700P 25 MHz to 1.7 GHz; TPS coupler; combiner load; and digital air load.

Bittree Inc. **C461**

Intro: Mini-Weco looping plug for use with non-normalling Mini-Weco patchbays; 488 Series internally programmable long-frame patchbay, which allows users to change the normalling and grounding configuration by the replacement of shunts inside the patchbay.

Also: Audio patchbays and patchcords.

Blue Order **SU5671**

Intro: Media Archive enterprise media asset management platform manages all types of rich media within broadcast and nonbroadcast environments; Media Workbench workgroup media asset management system handles all formats of digital assets as a Web-based "out of the box" solution.

Boom Audio & Video **C3939**

Intro: The Kit Cool boom holder helps a lot of sound recordists and boom operators boom long shots without shakes or hand noises.

Briargate Media **RT524**

Intro: "Focus on Your Family's Health" five-times-a-week, 60-second healthcare feature provides relevant, breaking health information with a personal touch; "Focus on the Family Commentary" five-times-a-week, 90-second feature hosted by Dr. James Dobson; Peabody Award-winning "Radio Theatre" weekly 30-minute features packs the sound and entertainment quality of contemporary films into distinctive radio programming; "Weekend Magazine" weekly 60-minute program offering practical advice and encouragement for families from Bill Maier, Ph.D., and his guests.

Broadcast Electronics Inc. **N2604**

Intro: AM and FM HD Radio transmitters.

Also: AudioVault; SoniXtream; Marti RPUs and STLs; AM and FM transmitters and accessories.

Broadcast International **N1749**

Broadcast Microwave Services **MM512, C138**

Broadcast Richardson, Div. of Richardson Elec. **C454**

Intro: BCC's DTS Dolby 5.1 24-bit audio editor and automation system. BMS system was chosen to be involved in the world's first satellite DTS-Dolby surround 5.1 radio broadcast. Incorporates 24-bit system to provide optimal sound. Asset Tracker, BCC's BMS system, lets user share various song libraries. Radio Illustrator sends audio, text, and images to a Web site in a synchronized manner; also, Syntax Media's Multimedia/Video to CD-ROM Output Wizard; Q-Stream's "Worldwide Overhead Projector"; Swe-Dish IPT Satellite Suitcase, using IP technology at 2 Mbit/sec broadband transmission; Swe-Dish van-mountable Drive-Away system on a H2 Hummer; Digital One turnkey broadcast solutions for the Internet.

Broadcast Software International **N2654**

Intro: Simian 1.4.1 digital automation features an improved event categories function, BSI FlexTime feature and an easy voicetracking system for live-assist, music-on-hard-drive and satellite automation applications; Speedy 4.0 CD-to-PC ripper with the ability to name and tag audio files automatically, support for compilation album file naming, trim and normalize, and automation of CD ripping to linear or compressed files.

Also: WaveCart; Stinger; and Series 110-210 Systems.

Broadcast Technology Ltd. **C2912**

Broadcast Tools Inc. **N2350**

Intro: TeleSwitch 6 is a six-line telephone call director to work with standard phone lines, a standard phone set and almost any phone hybrid, it is sold with a controller and work surface and a second work surface may be added; also the STI II, for interfacing a POTS line to user equipment while the hybrid provides full-duplex audio quality, it is equipped with a programmable serial port that allows control and monitoring via user-provided computer and software, it simplifies remote call-in recordings while eliminating DTMF tones; the SM III monitors any stereo or two independent monaural sources, generates alarms and switches to backup source equipment when silence is detected; the SS 4.2 provides matrix audio switching of four stereo inputs to two stereo plus two mono outputs; the SS 16.16 is a high-performance 16 x 16 stereo audio crosspoint switcher for balanced audio stereo signals on deplug-gable screw terminals.

Also: SS 2.1/BNC III, SS 2.1/Term III, SS 8.1 II, SS 8.2, SS 16.4, Intercom System.

Broadcasters General Store **N2519**

Brookings Institution **RT619**

BT Broadcast Services **N1038, MM312**

BTX Technologies Inc. (formerly Bi-Tronics) **SU7221**

Intro: The CD-DB9FST is a female DB9 connector for control applications that features a rear-mounted terminal block in place of the usual solder or crimp connection. This design allows termination to be completed in less than 2.5 minutes, saving time and labor costs.

Also: Audio cable assemblies, Neutrik connectors, Switchcraft connectors, Mogami cable, Belden cable, West Penn cable, patchbays.

Bureau of Economic Analysis **RT314**

Burk Technology **N2338**

Intro: Lynx 4 site management software for use with GSC300 and VRC2500 transmitter remote control systems offers simple site set-up and control, customized logging and a flexible feature set; AutoPilot 2.2 provides advanced control and automation for ARC-16 transmitter remote control systems handling multiple connections.

Also: GSC3000, VRC2500 and ARC-16 transmitter remote control systems.

Burle Industries Inc. **C2513**

On Display: Power tubes and cavities.

Burli Software Inc. **N2067**

Intro: An audio editor for journalists integrated into its newsroom system. Features include edit-while-record, native MP3 editing, sample-level zoom of compressed audio, envelope control including presets, variable normalize, unlimited undo/redo with jump-to history, multi-format audio in one project, auto zero-cross and CD ripper. Updated news editing interface, script and run-down editors add enhanced formatting, multi-language spell checking and thesaurus, improved script navigation and asset management.

Also: Burli Newsroom System.

World Radio History

VLZ Pro Industry Standard Compact Mixers

sealed rotary pots

studio-grade XDR™ mic preamps

low noise / high headroom

ultra-high RFI rejection

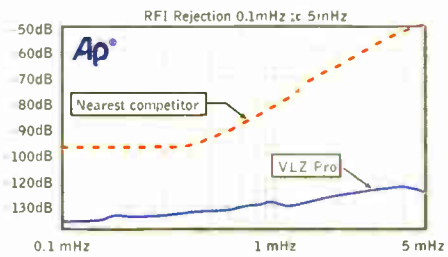
solid steel chassis

Mackie 1202-VLZ Pro, 1402-VLZ Pro, 1604-VLZ Pro & 1642-VLZ Pro:

Industry standard for good reasons.

Family specs

- Studio-grade XDR mic preamps
- Advanced DC pulse transformer RFI rejection
- VLZ (Very Low Impedance) Circuitry
- Solid steel chassis
- Sealed rotary pots
- Wear-resistant faders
- Metal 1/4" jacks
- Neutrik® XLRs

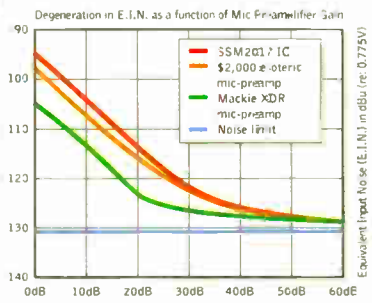


Unrivaled RFI Rejection

As you can see, our VLZ Pro Compact Mixers have the best RFI Rejection of any compact mixer on the market today.

Studio-grade XDR mic preamps

Our mic preamps have specs that exceed mic preamps costing hundreds, if not thousands, of dollars more. As you can see, our XDR design maintains lower noise levels in the critical 0 to +30dB gain range, and is typically half that of the most expensive units.



Why are Mackie VLZ Pro Compact Mixers used to produce more ENG and remote broadcasts, live in-studio performances, and promotional spots than any other compact mixer? Crystal-clear sound. Unshakable performance. All-around versatility. And an unmatched ROI.

For more reasons, visit www.mackie.com or call your broadcast equipment supplier.

Legendary Reliability

Our mixers have survived drops from moving vehicles and the impact of earthquake-strewn studio monitors. How? We construct them out of solid steel to fend off the assaults of live remotes and the occasional ding and drop. And unlike competitors that mount their pots to vertical circuit boards that snap under pressure, our pots "ride" just above the mixer's chassis and transfer downward force from the knob to steel — instead of knob to control.

"You rely on your mixers to always deliver – day in and day out. That's why we designed the VLZ Pros to stand up to years of use and abuse, and still sound great."

Greg Mackie

Call 888.337.7404 or visit
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World Radio History

C

Calrec Audio Ltd. **N2646**

Intro: The Zeta 100 digital production console with dynamics on every channel, eight auxiliaries, 16 multitrack/IFB sends, 99 Flash ROM setup memories, internal routing and 5.1 Surround mixing and monitoring in three frame sizes — 24, 32 or 48 faders — with hot-pluggable cards and panels and automatic redundancy on power supplies, DSP and control processors.

Also: Alpha 100 digital production console provides 48 multitrack/matrix outputs, 20 auxiliary buses, eight audio groups and four main outputs each of which can simultaneously be mono, stereo or surround; Sigma 100 digital production consoles with four-band EQ, separate filters compressor/limiter/expander gate, surround and stereo panning and mix-minus outputs on each channel.

Canare **C2878**

CGS InfoGraphics Automation **C2682**

Intro: The CloseNow school closing display system automates the collecting, organizing and displaying of school, business and church closings to radio using voice synthesis, video, the Internet or e-mail.

Channel Master **N1162**

Chromatec Inc. **C165**

Intro: AM-32/8S color in-picture surround audio metering with configurable vectored audio bar graphs, for representation of surround sound plots with up to eight audio channels, up to six phase-correlation bars may be displayed concurrently and assigned to any channel pairs.

Also: AM-32VGA.

Clark Wire & Cable **C4121**

New: Plenum-rated serial digital cabling products; flat RGB cables offer easy identification and timing; two lines of digital audio snakes; fiber optic cabling products; networking cable products.

Also: Cable, connectors, patchbays, reel assemblies, cable assemblies, tooling, custom and stock panels, stage boxes, testers and rack units.

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Clear Channel Wireless **C157**

Clear-Com Intercom Systems **C3526**

CNN Newsource Sales **SL100**

Coastal Satellite Inc. **N1363**

Coaxial Dynamics **N2337**

Cobalt Digital Inc. **SU5732**

Intro: 6541 Modular SDI 10-bit D/A with de-embedded audio.

Comlab Telecommunications Inc. **N2360**

Intro: Mac-IPsec and MiniMAC-IPsec site monitoring, alarm and remote control systems with IP secure communication, 128-bit encryption and extended vocabulary features.

Also: MAC System and MiniMAC System.

Communications Specialties Inc. **SL3539**

Intro: Pure Digital Fiberlink Flex System custom-configurable fiber-optic link to support video, audio, data and contact closure signals to support a range of signal combinations that may be transmitted in one or both directions; Pure Digital Fiberlink 7070 Series for component video and audio; Pure Digital Fiberlink 7130 Series fiber-optic transmission system for transmission of 15 MHz wideband composite video and four independent audio channels over a single fiber; Pure Digital Fiberlink 7140 Series transmits four channels of composite video with eight independent audio channels over a single fiber.

Also: Pure Digital Fiberlink 3440 Series.

The show floor. Last year's show drew about 92,000 people, down 17 percent from the year before.

Computer Concepts Corp. **N2519**

Comrex **N2526**

Intro: GSM Wireless Module inserts into the Matrix to send higher-quality audio via a built-in GSM phone with 2-watt power booster and external antenna and new algorithms to improve audio and frequency response up to 7 kHz with reduced artifacts; BlueBox codec for simple remotes across POTS lines or GSM; DH20, DH22 and DH30 digital hybrids acquired from Gentner.

Also: Matrix, BlueBox, Vector, Nexus and Envoy.

Comtech EF Data Corp. **N1442**

Intro: CDM-600 open network satellite modem 2.4 kbps to 20 Mbps with 16 QAM and Turbo Product Coding; CDM-550 cigital satellite modem closed network SCPC 2.4 kbps to 2.048 Gbps in 1-bit steps with optional Turbo Product Coding available; CST-5060 C-band transceiver available in 5, 10, 25, 50 or 100 W.

Consumer Reports TV News **RT513**

Continental Electronics Corp. **N2403**

Cooper Sound Systems Inc. **N2652**

Intro: CS 208 six- to eight-channel audio mixer available with internal A/D converters and AES/EBU outputs, provides 24-bit, 96 kHz digital outputs for the four main outs; CS104 ENG audio mixer available with four balanced direct outs at +4 dBU, either pre or post faders.

Countryman Associates Inc. **N2020**

CPI — Eimac Division **C720, N1329**

On Display: Broadcast power grid tubes.

CreamWare GmbH **SL2424**

Creative Support Services/ CSS Music **SU5631**

Crown Broadcast **N2112**

Intro: Omnia three-band digital processor module available as an option for Crown FM transmitters, also available as an upgrade; Signalclear IM attenuation transmitter design solves intermodulation interference problems without cavities or circulators; Sentinel System auto-backup transmitter systems uses Crown redundant transmitter control module to sense power-down and bring backup transmitter on line; RMS remote monitoring and control system allows phone access to transmitter operating information and remote control of transmitter operation.

Also: FM 30, FM100, FM250, FM500, FM1000, FM2000, and FMX digital control system.

CTE International SRL **N2130**

Cummins Power Generation **C2783, MM210**

D

D&C Electronics **N3152**

Intro: Transmitters, studio equipments, antennas, STLs, RPU.

D.A.V.I.D. **C2670A**

Dalet Digital Media Systems **SU7137**

Intro: DaletPlus ActiveLog media management solution for recording, cataloging and distributing digital media across the lifecycle of audio and video material for organizations such as courts, parliaments, government, universities, corporations, entertainment companies and other institutions that need to record and document media; DaletPlus Radio Suite asset management system to help radio broadcasters produce and deliver news and music programming with production tools and a workflow management system.

Dan Dugan Sound Design **N2652**

DAWNco **N1548**

DB Elettronica Telecomunicazioni SpA **N2058**

Intro: PM 1000 1 kW compact solid-state FM transmitter with Cold-Fet technology, optional stereo generator, 1.1 kW high-efficiency amplifier and four 300W modules, fold-back protection and low power consumption and weight; PFS 10000/LD 10 kW compact solid-state FM transmitter with Cold-Fet technology and LCD exciter, 10.5 kW high efficiency amplifier and ten 1.1 kW modules coupled in a high redundant architecture.

Decisionmark **SU7107A**

Delco Wire & Cable **SU6622**

Delta Meccanica s.r.l **N2141**

Delta RF Technology **N2553**

Denon Electronics **N2918**

Intro: DN-T645 CD/MP3 player and cassette recorder; DN-T625 CD player and cassette recorder; DN-C615 CD/MP3 player; DN-780R dual-well auto-reverse cassette deck; and DN-C635 CD/MP3 player.

Also: IC recorders, MiniDisc, CD, dual DJ CD and multizone amplifiers.

Designcraft **N3146**

Intro: Premium Series furniture system

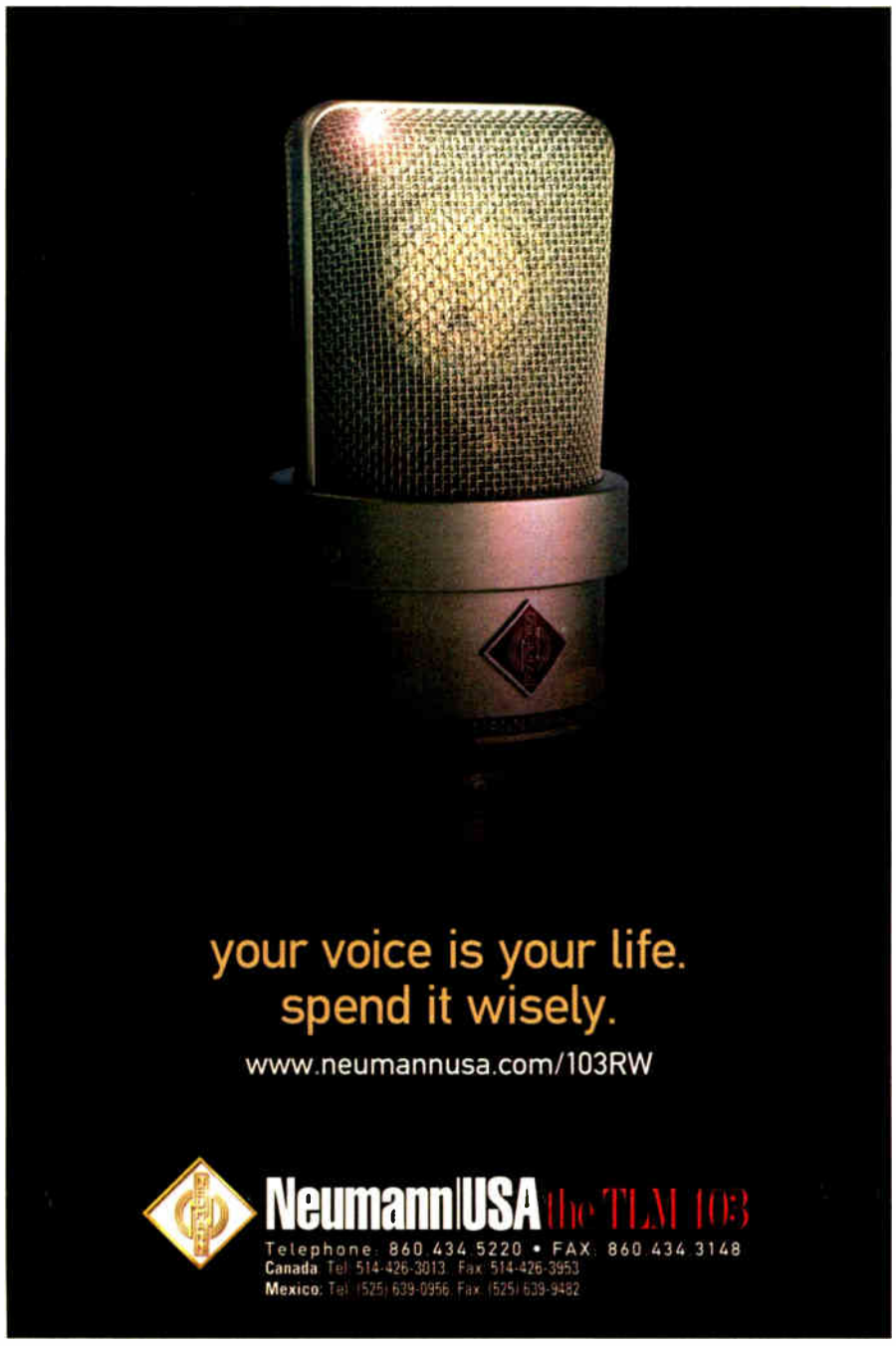
Also: Custom-designed and -built studio furniture systems for radio, TV, multimedia, distance learning, computer labs and conference rooms. Formerly the manufacture of furniture systems for The Audio Broadcast Group Inc. (ABG).

Dialight Corp. **N2453**

Dielectric Communications **C424**

Digidesign, a division of Avid Technology Inc. **SL300**

Intro: Pro Tools 6.x software with support for Mac OS X and increased performance with support for dual-processor Apple PowerMac G4s and new DigiBase file management utility for viewing, searching, auditioning and importing files, enhanced MIDI functionality, enhanced Beat Detective functionality and import session data flexibilities; Pro Tools 5.3.3 software for interoperability with Pro Tools|HD running under Windows XP, multiDSP 48-bit mixer, increased sync I/O options and 192 kHz digital I/O; Digi 002 integrated control surface with FireWire connection and 24-bit, 96 kHz sound quality on 18 channels of simultaneous analog and digital I/O; DigiDrive MediaDock with 36 GB and



World Radio History

73 GB Shuttle hard drives; DigiDrive MediaDock II two-bay unit to supporting DigiDrive MediaDock Shuttles and Avid MediaDock iS LVD and MediaDock iS 160/LVD shuttles; DigiDrive MediaDock II+ adds StorCase receiver model S20A101 for support of StorCase carrier models DE100i-SW and D100i-SW160, with both LVD and Single-ended drives.

Also: Digidesign audio products for radio and audio production, featuring high-definition Pro Tools|HD.

Disc Makers **SU6626**

Diversified Marketing **SU5230**

On Display: Bidirectional microwave systems, Premier Wireless systems, Nucomm Microwave Systems, Avcom, Global Microwave Systems, Gabriel antennas and accessories, Nicom systems and Technalogix products.

Diversified Technology Inc. **SL3148**

Intro: Industrial computing solutions, including the LBC9216 Pentium 4 single-board computer, cPB-4321 2.16 compliant CompactPCI Pentium III single-board computer; and cPS-4081 2.16 Compliant 4 RU CompactPCI rack-mount chassis.

Also: LBC9216, ePX-Sx10, cPB-4321, cPB-4325 and cPS-4081.

DK-Audio **C766**

Intro: MSD600M++ surround meter, an enhanced version of the MDS600M with more memory and faster processing speed; SDI Module for de-embedding up to four channels of audio; PT5202 compact half-rack VariTime generator with front-panel LCD control, moving text, eight fields for PAL and four fields for NTSWC master applications with internal high stability reference.

Dolby Laboratories **SU4555**

Intro: Dolby Pro Logic II is an enhanced version of Dolby Surround Pro Logic, provides viewers an amazing five-channel matrix surround sound experience over any stereo medium; intelligent dialog measurement added to LM100 Loudness Meter for more accurate loudness control, as well as a software remote contro; Model 585 Time Scaling Processor is a real-time audio time scaler for multichannel audio (up to eight channels of input) that enables the highest quality pitch correction; Dolby E Encoder DP571 and Decoder DP572 software upgrade simplifies and improves frame rate conversion for Dolby E bitstreams; Dolby Bitstream Analyzer DM100 software upgrade has new test capabilities.

Also: Pro Logic II encoding for broadcast, LM100 upgrade, 585 Time Scaling Processor, Dolby E encoder/decoder upgrade, DM100 upgrade

Dorrough Electronics **C3840**

Intro: Model SD-10 serial digital interface decoder with four group selections; Model 12-AES digital reading meter with readout in the traditional arc style; and the addition of phase indicators to loudness meters.

Also: Loudness meters and audio test sets.

DPA Microphones **N3023**

Drake Electronics Ltd. **C386**

Intro: FreeSpeak first digital, cellular wireless intercom that includes the capabilities of a traditional wired intercom with 7 kHz audio and full-duplex operation across a cellular network of active antennas located around the production environment and connected to the Drake matrix; 4000 Digital Series upgraded for features and enhancements, as well as a new-look frame and power supplies for outside broadcast and studio use; Refresh range of LCD keypanels for the 4000 Series II digital intercom.

DSI RF Systems Inc. **C3468**

Intro: Wireless MPEG-2 video transmission system is available in point-to-point or point-to-multipoint configurations; licensed and unlicensed options; audio and data systems available.

E

EASi (Efficient Antenna Systems Inc.) **N1654**

On Display: EASi 4.5 meter satellite antenna.

Econco **N2920**

Intro: Medium- to high-power new and rebuilt power transmitting tubes for radio and TV transmitters.

Ecreso - Broadcast RFTS **N1852**

Electro-Voice **C2812A**

Elenos **N2634**

Elettronika S.R.L. **N2756**

Emmis Communications **RT324**

ENCO Systems **N2546**

Intro: EnterActive Radio is a technology that merges the Internet with the mobile phone to provide retention and growth of audience and revenue generation opportunities for broadcasters; also Phonetica speech search and recognition to locate words spoken in recorded audio files quickly. Phonetica interfaces with the ENCO DAD Digital Audio Delivery and Automation System.

Also: DADpro32, Qed, NewsBoss, Bont Building Studio Furniture.

Encoda Systems **C3211**

Energy-Onix Broadcast Equipment Co. Inc. **N3019**

Intro: Tele-Link Intra Link Wireless spread spectrum has a 20 to 40 mile range and is compatible with Ibiquity Digital specs. Uncompressed AES and analog minimum latency, the Tele-Link is a solution for IBOC STL; Roadcaster VHF and UHF remote pick-up; Pulsar 250/500 MK II portable, solid-state. Minimum rack space, attractive cost, high-performance specs; NFR demo AM transmitter with FM carrier provides noise-free AM radio.

E-N-G Mobile Systems Inc. **C2778**

Envivio Inc. **SL2256**

Intro: Live Broadcaster captures one video stream and associated audio, encodes into MPEG-4 and streams the data in RTP packets over an IP network in multicast or unicast mode; Encoding Station provides MPEG-4 encoding for creation of Advanced Simple Profile MPEG-4 ISO-compliant files; Streaming Server can stream any MPEG-4 file that conforms to the ISO or ISMA standards to the network using the IETF-defined suite of protocols based on IP for real-time streaming with support for http tunneling to cope with firewall configurations; Broadcast Studio MPEG-4 authoring system lets designers manage the authoring process as they import, create, edit, preview and encode scenes; EnvivioTV MPEG-4 player

Powerful Automation from BSI

Improve your station's performance with a digital automation system from BSI, and we'll save you money. We provide reliable equipment and eliminate the unnecessary. When you purchase a BSI system, you're buying years of research into what makes an automation system both versatile and reliable. Dell servers, AudioScience sound cards and BSI software make a great combination. Each system is customized to best meet your needs. Our team of professionals installs and configures your software and hardware and each system comes with telephone training and a full year of Standard support and upgrades.

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Para el español, llamada Felipe Chavez, Distribuidor de los E.E.U.U.
(916) 368-6332 fchavez@ommedianet.com

BSI

World Radio History

allows users to interact directly with broadcast media.

ERI — Electronics Research Inc. N2738

Intro: IBOX combiner family of high-level combiners for low-, medium- and high-power HD Radio applications; range of side- and top-mounted HD Radio FM antennas for analog, HD Radio and single or multistation systems; a line of pre-engineered bolt-on leg reinforcement parts, inner-member reinforcement parts and adjustable-length hog rod members; ERI Tower comprehensive software program that helps ERI meet growing demand by designing superior tower structures faster and more efficiently.

Also: FM antennas; towers; filters combiners; lightning protection and grounding systems; bolt-on structural reinforcement parts; structural analysis services.

ESE SU5623

***Intro:* Time Control System programmable relay outputs for remote control and automation applications.**

***Also*: Master clock systems NTP time servers, clocks and timers; distribution amplifiers.**

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Euphonix N3014

Intro: Options for the Max Air 96-channel digital broadcast console and System 5-B digital broadcast console for larger installations.

Also: Max Air console; System 5 console; and R-1 recorder

European Commission SL2306

Intro: The CIMWOS project aims to facilitate common procedures of archiving and retrieval of audiovisual material by developing and integrating a robust, unrestricted keyword-spotting algorithm and efficient image-spotting algorithms for digital audiovisual content; Contessa is developing content and application-tailoring engines that enable e-business operators to extend their brand to emerging digital business environments; and Wedelmusic defines and implements a unified model for distributing music in several forms — audio, symbolic and image — and reliable watermarking mechanisms for protecting intellectual property rights.

Eutelsat N1046

E-Z UP International Inc. N2357

F

Fairlight SL1635

Family Health Radio RT610

FirstCom Music Inc. SU7346

Intro: MusiQuick Online Web-based search, audition and downloading program updated with features including a project manager, allowing users to save tracks into manageable projects and share them via e-mail; Connect Library produced in London by Barry Blue with a focus on fresh, upfront, street-level music, reacting and responding to the latest club and chart trends.

Also: MusiQuick Online; surround sound on DVD-AVR; QuickTrax; LiquidTrax Fast; and 14 production libraries.

Flash Technology N2438

Forecast Consoles Inc. C102

Intro: MASTERail Dynamic Device Management System technical furniture with a universal mounting system for easy install, reconfiguration and expansion; MASTERail Edit Consoles technical furniture in a standalone edit console format easily reconfigured for longer jobs; accessories for both MASTERail systems, including flat-screen monitor holders, tool bars, multiple keyboard holders, script stands, lighting, etc.

Frontline Communications C4012

Intro: ENG-350-HT High Top raised-roof vehicle with an aluminum raised roof; NT-8ex SNG vehicle with the AVL 2.4 meter SNG antenna system; DSNG-Sprinter vehicle utilizing the Freightliner/Mercedes Sprinter chassis and a Vertex 1.8 meter DSNG antenna system.

G

Garner C2678

Genelec Oy N1837

Gepco Wire and Cable C244

Intro: X-Band cable flexible single-pair and multipair cable for extended-distance analog audio applications; flooded audio and video cables for outdoor and direct-burial applications.

Also: Single-pair, dual-pair, multipair, speaker, guitar/instrument, microphone and digital audio cable.

Globalstor Data Corp. SU6015

Intro: GSL line of DVD-RAM libraries includes 20- and 40-slot desktop solutions as well as 400-slot solutions expandable to over 1,600 slots (with up to 64 drives). Libraries include a flipper mechanism to take advantage of the capacity provided by double-sided DVD media. Offering 24 GB to over 18 TB capacities, RAID solutions are approved for levels 0, 1, 0+1, 3, 4 and 5 storage and include redundant, hot-swappable power supplies and fans. Available in both desk-side and rackmount enclosures with LVD, SCA or dual channel fibre interface.

Also: GSL DVD Libraries, Globalstor RAID.

Groove Addicts/ Who Did That Music? SU6434

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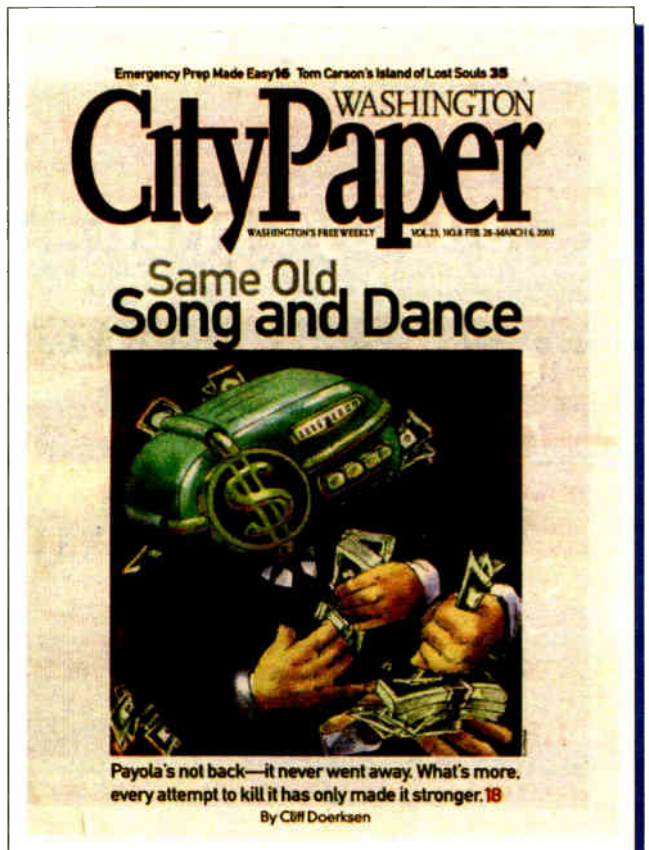
H

Hamilton Metalcraft N2055

On Display: Cases, chassis, panels.

Hannay Reels C2313



Radio has come in for withering criticism during the past year, thanks to debate over pay-for-play and ownership concentration. Shown: Washington City Paper.

Hardigg Cases, a division of Hardigg Ind. SL2038

Harris Corp., Broadcast Communications Div. C404

Intro: ReCon remote control and facility management system for radio and TV, harnesses the power of accessible IP networks by communicating with a diverse list of network and facility control equipment. The system can handle an unlimited number of status, analysis and control channels. ReCon is Web-enabled, monitors SNMP, is capable of remote operation and handles EAS logging; also new, eDCi links Harris and FM radio transmitters to Web browsers, wireless PDAs, Web-enabled cell phones and SNMP network managers, converts Harris-protocol RS-232 serial connections into Ethernet XML interface and SNMP Management Information Base, allowing Ethernet monitoring and control with Web browser allowing the Harris transmitter to be connected to a central management system like Harris Broadcast Manager; also Expresso, 10- to 14-channel digital console, analog meters, ergonomic implementation, phone set-up. Broadcasters can start with analog and upgrade to digital when they are ready; also DAX 1-6kW AM transmitter line, provides analog and HD Radio performance, with Digital Adaptive Modulation, a technique that uses digitally generated AM waveform with DSP-based adaptive correction.

Also: Z HD FM HD Radio transmitters; Z CD Series FM transmitters; DAX 1-6kW AM Analog/HD Radio transmitters; DX Series solid-state medium-wave transmitters, HD Radio-ready; Dexstar AM/FM HD Radio exciter; Digit CD Digital FM exciter; Harris BMXdigit.

Harrison By GLW N2666, SU4802

Henry Engineering N3101

Intro: Rack-mountable MatchBox bidirectional audio interface is 1/3 rack width (1RU), built-in AC power supply, gain trims on all 4 outputs, gold-plated XLR and RCA connectors; rack-mountable Superelay is 1/3 rack width (1RU), "On The Air" warning light flasher and AC power supply, with new plug-in Euroblock connectors and multi-unit slave output; Digistor-MP stores 20 minutes of audio with 15 kHz bandwidth for near-CD audio quality, 99 messages, RS-232 for PC control and download of messages, GPI control, its EOM relays can be programmed to trigger during or after message playback; rack-mountable TwinMatch is a dual-stereo (4-channel) -10dBV to +4dBm interface, 1/3 rack width (1RU), gold-plated XLR and RCA connectors, built-in AC power supply; rack-mountable MicroMixer is 1/3 rack width (1RU), 4-input stereo line audio mixer, assign switching, plug-in Euroblock connectors and built-in AC power supply.

Also: MixMinus Plus, MoniSwitch, StereoMixer, StereoSwitch, LogiConverter, USDA, Audio OnLine.

Herman Electronics C4040

Hewlett Packard SL2917

HHB Communications USA Inc. N2146

Hollywood Edge C572

Honeywell Obstruction Lighting N2726

Hosa Technology Inc. SL645

I

Ibiquity Digital Corp. N2066

IBM SU7237

Intro: Digital radio system that enhances workflow efficiency and is used by BBC radio stations to improve day-to-day radio production processes. Users share information easily across local networks and create high-quality programming packages.

IDB Systems N1563

Intro: Satellite earth station system engineering, design and integration; flyaway earth stations; mobile satellite communications; domestic and international communications networks; international private-line systems.

IEEE Broadcast Technology Society Lobby Booth 22

ILC (Industrial Logic Corp.) N1115

Intro: MaxView Scenario booking and scheduling system enhances the MaxView network management system. The Scenario scheduler is a booking and reservation system for automating the operation of the network, working in conjunction with MaxView Maestro event manager to put scheduled activities into operation. Broadcasters can react to changes in programming and eliminate errors in content distribution. Enables maintenance of a system database, submission and review of booking requests, review of the allocation schedule and an interface to the monitor and control system for execution. The human interface is through a Web browser. System allows for the detection of conflicts, generation of multiple reports and addition and modification of equipment.

Also: MaxView Scenario.

illbruck/Sonex N2802

Intro: Acoustical ceiling tiles to compliment office, studio or conference room. Whiteline ceiling tiles offer a smooth contemporary finish and NRCs ranging from 0.65 to 0.75, available in dimensions from 2'x2' to 4'x8'; also Contour Ceiling Tiles for applications that need a real acoustical ceiling tile, with standard and custom designs and 10 color options, NRC ranges from 0.95 to 1.20, suitable for challenging acoustical requirements; Harmoni Ceiling Tile is for applications needing effective and economical acoustical control, available in two patterns and three color options. With an NRC of 0.90, it will tone down reverberation in an office or conference room.

Also: Sonex acoustical wall panels, Fabritec fabric-wrapped wall panels, Prospec barrier.

IMAS Publishing N2057, SU6163

Also see Radio World

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more than 100 countries, with true local content as well as news from around the globe. Our flagship publications are often referred to as "must-reads" for anyone involved in the broadcast and/or production fields.

Independent Audio Inc. **N3201**

Intro: Coles 4040 ribbon microphone with internal shockmount, higher output then the 4038 ribbon mic and a better frequency response; also Isotrack Isopatch Pro Series Bantam patchbay panel, rear D-sub, Model PST96D25P; also Pearl Lab CO 22 microphone using the classic Pearl rectangular capsule configured in an omni-directional pattern. Its phantom powered preamplifier has low noise levels. The CO 22 in matched pair configuration can be used for A-B stereo recording; Sonifex products.

Also: Coles 4038 ribbon mic and 4104b commentators noise canceling ribbon mic; Isotrack Smartpatch, CPSeries, CP Series Bantam, CP Series XLR.

Industrial Acoustics Co. **N3017**

Industrial Logic Corp. **N1115**

Inmarsat Ltd. **C4226**

Inovonics Inc. **N2326**

***Intro:* Omega_FM Digital On-Air Processor/Stereocoder with Version 2 software and a preview of coming Version 3 features; Model 531 Off-Air FM Mod-Monitor with synthesized tuning, AM noise measurement and subcarrier injection readout.**

***Also*: "David-II" and other AM and FM on-air audio processing systems; AM, FM, RDS and subcarrier monitors; RDS encoders and decoders.**

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Intel Corp. **SL2305**

Intelsat **N1546**

Interactive Inflatables **N2446**

International Datacasting Corp. **N1320**

Intro: Datacast XD Content Distribution Software lets you multicast broadband multimedia content, including digital audio files; SRA2100 series DVB satellite receiver appliance; SFX2100 series DVB satellite multimedia server appliance.

International Webcasting Association **SL2446**

IRTE S.p.A. **SU5505**

Intro: The PR-XX/D Radio Link system for long-haul microwave, suitable for temporary and fixed application, multi-hop and/or multi-channel transmission, capable of supporting analog and digital modems, consists of equipment necessary to set up a microwave link for the transmission of a digital channel with selectable rate up to 45 Mbps, using different modulation techniques (QPSK, 16QAM).

Itelco Inc. **SU4676**

J

Jampro Antennas/RF Systems Inc. **C315**

***Intro:* JSWB Broadband FM Side Mount Antenna, including broadband characteristics not typically provided by FM side-mounted antenna systems with low VSWR. Ideal for multi-frequency installations of various powers and standby installations where one of several frequencies might operate individually. The JSWB is pressurized and internally fed. Its natural broadband characteristics and physical size make it useful for installations where ice accumulation is a concern. The JSWB also is useful for stations transitioning to IBOC. The antenna is tested in full scale (not modeled in miniature) to assure quick, trouble-free installation. No field tuning is required to achieve predictable results. Performance to specifications is equal to or better than some antennas costing significantly more. The JSWB has been provided to combine frequencies with as much separation as 16 MHz and tests indicate greater bandwidth is possible with low VSWR. The antenna may be optionally adapted for use with one, two or three multiplexed channels, and/or pole mounting. Full-size pattern measurement services on our testing range are available to aid in coverage study and/or mounting arrangements. RCHA-333-DAB IBOC Hybrid is a new high-performance, low-cost DAB–IBOC hybrid with high efficiency, low VSWR and high port-to-port isolation. The RCHA is rack-mountable and ideal for adding your IBOC signal to an FM system. No field tuning is required to achieve predictable results. Performance to specifications is equal to or better than other hybrids costing significantly more.**

***Also*: JBCP and JHPC sidemount antennas, JCPD and JAHD panel antennas, RCCC and RCCS combiners.**

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Japan Electronics Show Association **SU6747**

JK Audio Inc. **N2237**

Intro: Innkeeper 4 Multi-Line Digital Hybrid provides four auto-answer phone line connections in 1RU, menu-driven speed dial from the front-panel keypad and LCD display. Digital Hybrids provide 50+ dB separation between balanced XLR transmit and receive paths, four reliable IFB feeds in a concentrated package; also, Broadcast Host Digital Hybrid low-cost desktop telephone interface for home/office remote broadcasts or telephone interviews, XLR mic/line input, headphone and sound card connections, 50 dB separation between send and receive connections; and Innkeeper PBX Digital Hybrid low-cost desktop interface to a PBX type telephone system, simply connect the handset cord of a desk telephone to provide balanced XLR connections to audio equipment. DSP algorithm provides 50 dB separation between send and receive on most telephone systems, allows user to create a talk-show system out of an existing PBX.

Also: RemoteMix Sport, RemoteMix C+ ComPack, Innkeeper 1, Inline Patch, THAT-2, QuickTap, Pureformer.

JLCooper Electronics **SU5864**

Intro: CS-32 MiniDesk controller, 32 dedicated faders/channel strips for real-time control of volume levels, mute, solo, track arming, with

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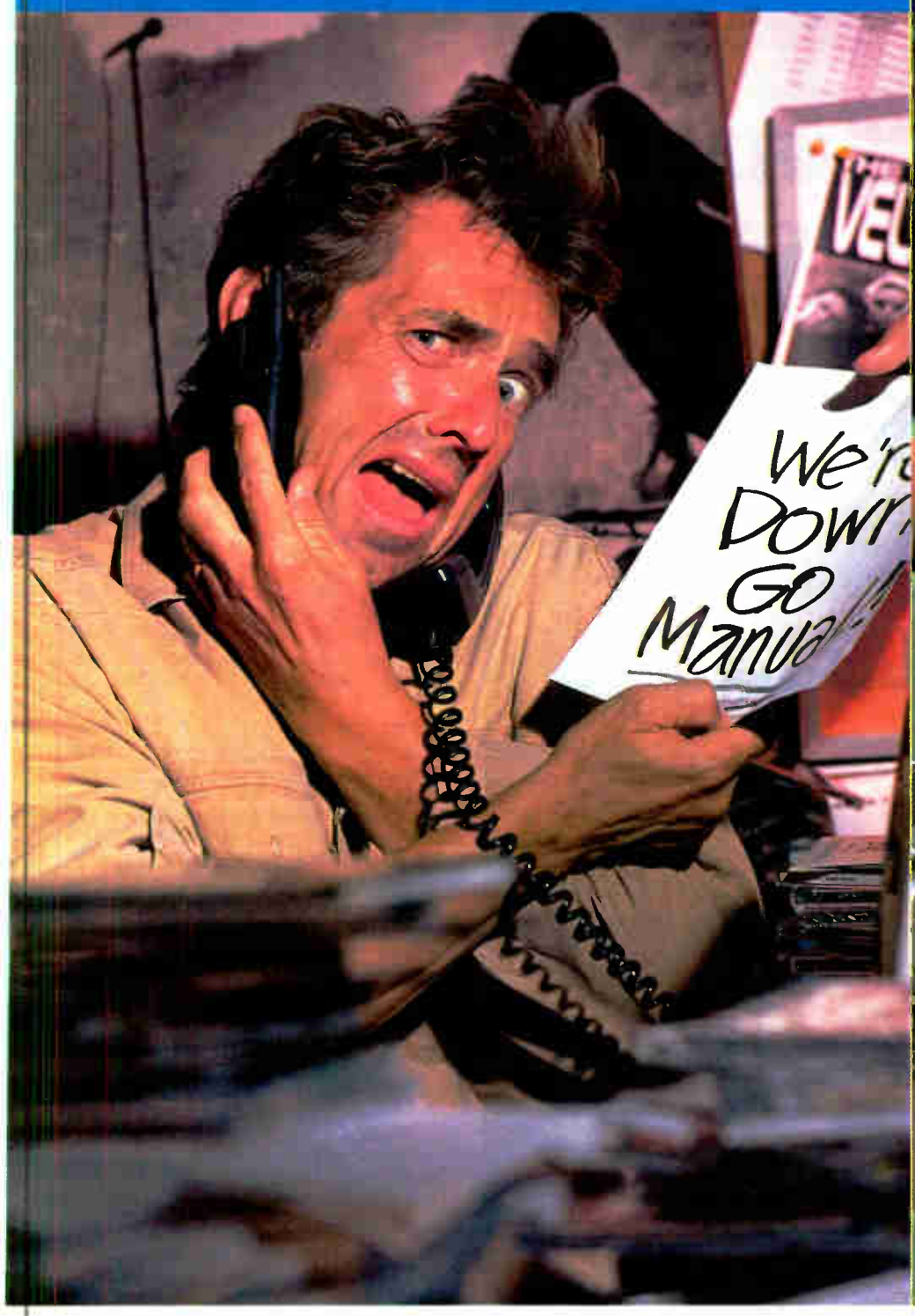

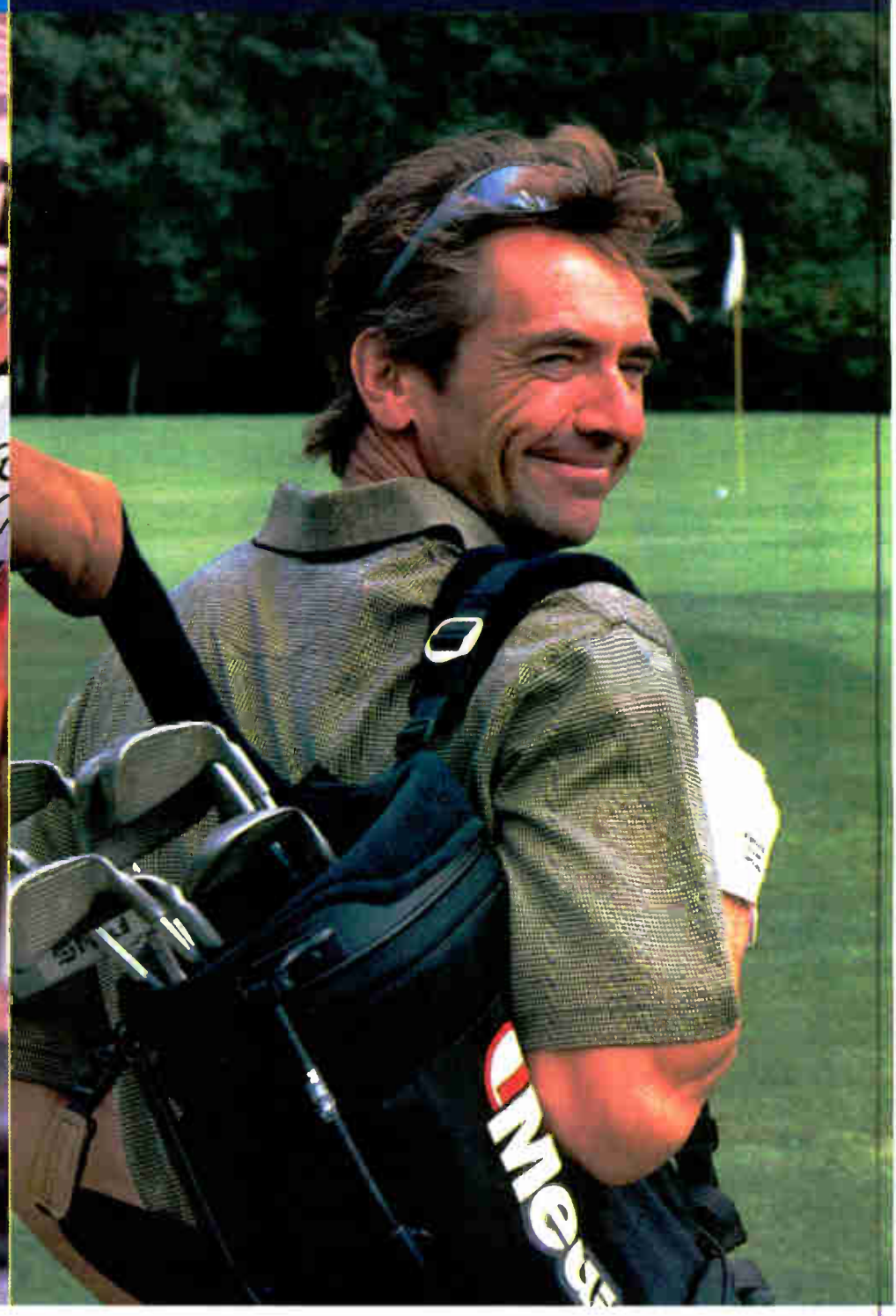

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tactile transport buttons, cursor keys and weighted jog/scrub wheel, six rotary knobs for hands-on, automation control of panning and plug-ins, a bank of function keys for frequently used editing features, unit is suitable for portable recording applications with a laptop.

Also: MCS-3000 series Media Command Stations, Edit Suite series, Media Control Stations, Fadermaster automation controllers, audio/video interfaces, MIDI line amplifiers.

John Lennon Educational Tour Bus C3046

Jünger Audio Studiotechnik GmbH N3015

Intro: D07 digital transmission processor for optimized level control of audio signals in radio and TV, combines unique amplifying algorithms with a digital limiter and adaptive pre-emphasis employing new Adaptive Spectral Processing, providing more loudness than fixed filter sets without the danger of exceeding the modulation deviation of FM transmitters; C8000 modular processing system has new DSP and I/O modules; f.i. transmission signal processor C8007.

Also: Accent1/2, C8000 system.

K

KAE Corp. C4127

Intro: DEF-3 is a 3RU exhaust fan with disposable "furnace-type" filters, suitable for removing dust bunnies from the bottom of racks, filters removable from front of rack, with on/off switch on front; also NB-1, a 1 RU Pull Out Notebook Drawer with hinged front panel for access to notebook typing and mouse controls, includes retainer for notebook for trucks, rear access cutouts for cabling, power block storage area; also ARM-2 and ARM-TM Articulated rack mount (2U) or table-mount arm for PC LCD monitors with rear support brackets, cabling access through rack-mount panel or table-mount post; also ICRB-1,4,8 Internal Cable Relief Bar for use with APW racks.

Kagan World Media Ltd. SL3535

Kart-a-Bag C353

Kathrein Inc., Scala Division C3438

Intro: YA7-FM series yagis are five-element, 7 dBd gain heavy-duty antennas for FM broadcast booster/translator and monitor applications, with two broadband models that cover 88-98 MHz and 98-108 MHz. Black anodized finish maximizes the antenna's ice shedding capability during cold weather. May be used individually or in stacked arrays.

Also: FMV dipole/reflector; GP-FM groundplane.

Kathrein-Werke KG C3438

Intro: DAB and DVB-T broadcast antennas.

Also: FM and DAB broadcast antennas.

Kay Industries Inc. N2801

Intro: Phasemaster Type T-R rotary phase converter allows a station to site a transmitter in the absence of utility three-phase power without incurring utility line extension charges that can exceed $50,000 per mile, allows operation of a three-phase transmitter from a one-phase supply. A converter for a 20 kW FM transmitter sells for less than $6,500. A load range controller enables the converter to maintain a balanced voltage within 3 percent to broadcast transmitters including DTV regardless of power requirements. Disconnect switch, fuses, terminal blocks and surge protection enable the installer to hook up the converter in minutes. Simple "two wires in, three wires out" installation.

KD Kanopy Inc. N3102

On Display: Radio remote canopies, tents and signage.

Kenwood Communications N2232

Intro: KMB-21 multiple position charger for ProTalk, ProTalkXLS, FreeTalk and FreeTalk XLS portable two-way radios; also ProTalk XLS portable two-way on-site radio, with drop-in charger and belt clip, and accessories, including hands-free headsets, available; FleetSync AVL/fleet management solutions to simplify fleet routing using two-way radios and data terminals, operating on a PC platform.

Also: ProTalk, ProTalk XLS two-way professional mobile and portable radios.

Killer Tracks C873

Kings Electronics Co. Inc. C2514

Intro: Miniature Audio-Video Interconnect System with miniature 7-ohm audio/serial digital video jack, positive locking equipment connections, crimp or solder contacts, plug that terminates to dominant broadcast cable. It meets or exceeds the requirements of SMPTE 276M.

Kintronic Labs Inc. N2012

Intro: KinStar AM/medium-wave low-profile antenna, providing 67 percent height reduction compared to a quarter-wave mast, 98 percent efficient compared to a quarter-wave mast, wide bandwidth, compatible with IBOC DAB transmitters, ideal for sites where zoning does not authorize towers or near airports. It can be used in directional arrays. Available for U.S. market. Does require FCC proof and current distribution measurements for approval.

Also: AM directional antenna phasing systems, AM/MW diplexing systems, transmitter combiners, AM/MW dummy loads, folded unipole kits, mobile broadcast systems, RF components, Web-accessible antenna system controllers, pre-engineered aluminum buildings.

Kline Towers C2922

On Display: Designers, fabricators and erectors of broadcast towers and antenna supporting structures.

Klotz Digital America N1825

On Display: VADIS 880, VADIS DCII Digital Broadcast Consoles, VariZone Public Address System.

Knox Video Technologies SL1863

Intro: HD16 16x16 Modular Matrix Routing Switcher switches NTSC, Y/C, component video and balanced or unbalanced stereo audio with volume and tone contro; NetControl is an Internet Protocol control device designed to enable control of Knox routing switchers via the Internet or via Ethernet (LAN); Chameleon MB Series Modular, affordable 30 MHz bandwidth audio/video routing switchers expandable to a full 256 x 256 matrix.

Korea Radio Promotion Association SL2864

L

Lamar Systems C866

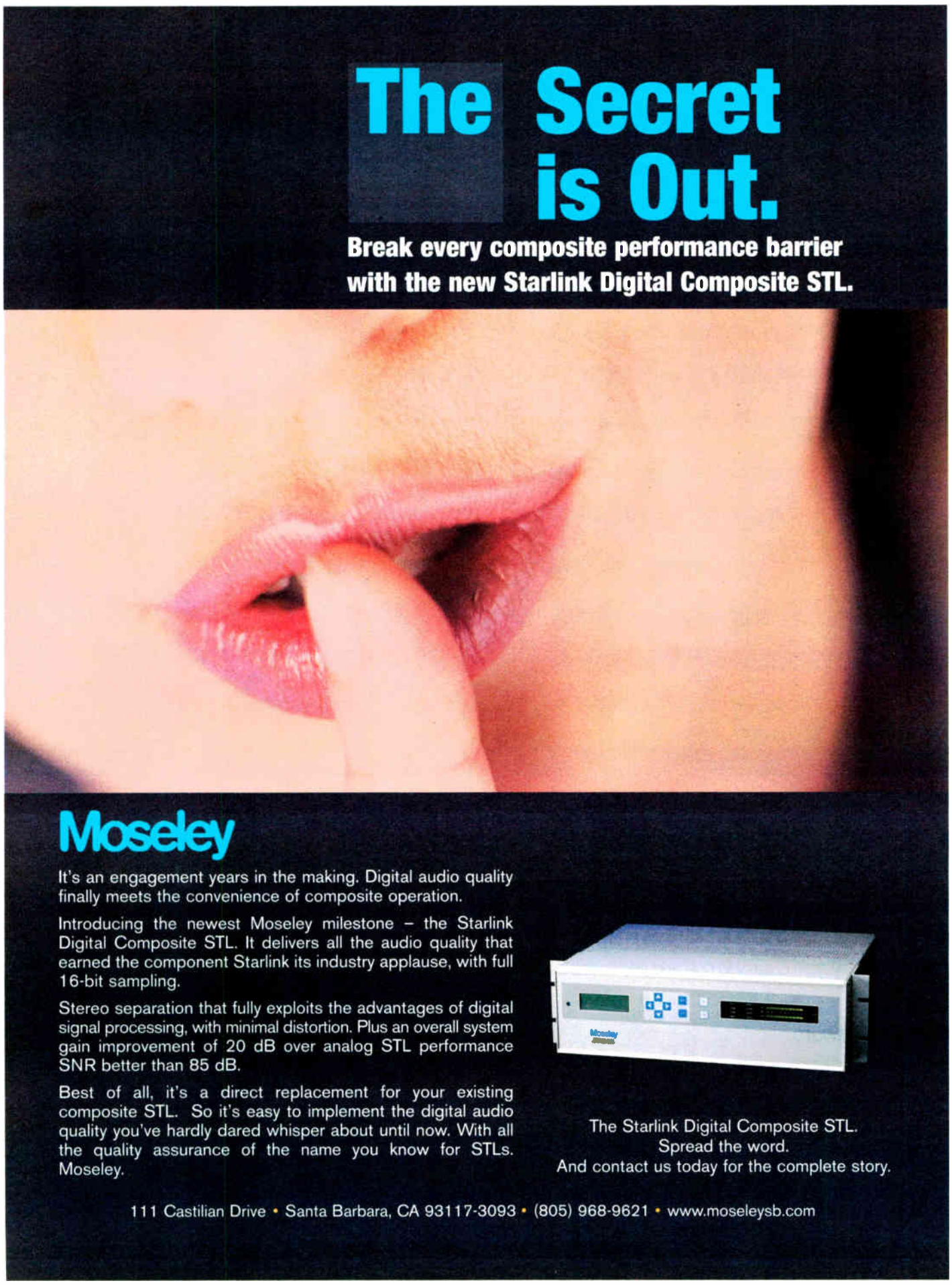
Intro: Turnkey streaming video/audio Webcasting solution for your Internet site.

Also: InternetVU.

Larcan C3450

On Display: FM translators/transmitters.

LeaksTech div. AM/FM Services Co. C262



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World Radio History

Lectrosonics Inc. **N2120**

Intro: Six-pack portable multicoupler with RF and power distribution for six Diversity Compact Receivers, operates from a rechargeable gel-cell battery, designed for location recording and motion picture production; also MM400A with DSP-based design for selectable emulations of several analog and digital operating modes, the transmitter can be used with Lectrosonics receivers and other brands of wireless microphones, lightweight corrosion-resistant housing, watertight seals.

Leitch Inc. **SU4525**

Lightning Eliminators & Consultants Inc. **C3426**

Linear srl **N2138**

Logitek Electronic Systems **N2931**

Intro: Audio Engine upgrades include Version 3 firmware, implements direct routing capabilities of new audio cards, provides more stand-alone router functions, expands mix-minus busses to 24, now provides 8 stereo mix busses; Supervisor upgrades include a UDP network connection (in addition to TCP/IP), also able to address color modes of control surface graphic screens (users can select own colors on various text), also allows a hardware temperature sensor to be decoded and sent to control surfaces for real-time temperature indication; Numix Console upgrades include updated LCD display on Selector wedge, optimized for better viewing angles.

Also: Remora digital console; Route3 and Button12 router controllers, audio level meters.

LPB Communications Inc. **N2916**

Intro: Mechanical overhaul and electrical update to the Omni line of AM transmitter amplifiers.

Also: MX audio consoles, Silent Boom mic arms, Fidelipac studio warning lights, Blue5c audio console, Omni AM/shortwave transmitters, LPB P Series low-power AM transmitters, AM/FM Part 15 broadcast applications, low-power FM transmitters.

M

Mackay Communications **N1650**

***Intro:* Mackay is a leading provider of secure, wireless, portable satellite communications equipment and airtime. For turnkey audio and video broadcast solutions utilizing Nera WorldCommunicator GAN units, contact Mackay Communications today.**

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Mackie Designs Inc. **SL2531**

Intro: Mackie Control Automated touch-sensitive control surface is a nine-fader (eight channels and master) MIDI controller that provides mixing, editing, automation and navigational control for any supported digital audio workstation; Mackie Control C4 DSP Plug-In editing control surface extension for the Mackie Control allows for easier editing of DSP plug-ins such as EQs, compressors and other effects used in the mixing section of music production software; Soundscape I/O 896 Eight-Channel Audio Interface for the Soundscape 32 digital audio workstation offers an assortment of I/O flavors, with optional goodies, in a compact 2RU unit; Soundscape 32 with Version 3.7 software Embedded Hard Disk Recorder; Baby HUI compact touch-sensitive fader control surface.

Mager Systems Inc. **N1934**

Intro: Sound Choice in-stock modular furniture with plywood construction and solid-surface tops; also, Computer Pullout allows your hard drive to sit in a carriage, completely pull out, rotates 180 degrees to give total access to computer wiring.

Also: Custom studio furniture.

Magnum Towers Inc. **N2238**

Manhattan Production Music **C115**

Intro: Digital Music Downloading to search and sample any song from MPM and Apple Trax music libraries, then download it in less than real time; Apple Trax Updates featuring styles such as techno drama and acid jazz plus contemporary corporate and cutting-edge sports music.

Also: Apple Trax, MPM.

Marketron International **C4322**

Intro: Marketron Radio Solution suite of sales, traffic and business intelligence systems; Marketron ASP hosted solution provides the functionality of Marketron's client-server applications via the Internet; Marketron Accounts Receivable, customizable accounts receivable software for broadcasters.

Marshall Electronics **SL745**

Martinsound Inc. **N2048**

Intro: MultiMAX EXR is a competitively priced version of the popular multiformat surround monitor controller; Flying Faders II is the next-generation moving fader console automation system that has been developed in a Windows XP environment to provide support for new features and future growth.

Also: Martech MSS-10 Natural Sound Microphone Preamplifier, MonitorMAX Stereo Monitor Controller, PanMAX Automated Surround Panner, MultiMAX EX Multiformat Monitor Controller, ForMAX Surround Monitoring Formatter, RecordistMAX Machine Room Monitor Controller.

Maxell Corp. **C3163**

On Display: Professional audio including MS Studio cassettes, DTRS, ADAT and MD-Pro MiniDisc.

MediaTouch — see OMT/iMediaTouch **N2937**

Medical Coaches Inc. **MM206**

Intro: Manufacturers of custom specialty vehicles for broadcast and entertainment. Trailers are lighter in weight than any other; truck and trailer engineering including virtual model and absolute weight analysis prior to manufacture; slide-out modular-style power input panel for trucks and trailers for ease of preventive maintenance on electrical system; low-voltage (12V) expanding side mechanism; each interior is custom-finished to achieve the interior look required.

Megatrax Production Music Inc. **SU6441**

Men's Health Network **C3382, RT307**

Micro Communications Inc. **C3639**

On Display: Channel and power combiners, switches, notch filters, harmonic filters, splitters, N+1 switching matrix.

Microboards Technology **SL1652**

Intro: PrintFactory is a CD and DVD inkjet that prints directly on the disc at 4800 x 1200 dpi resolution; also DSR DVD, a duplicator that records 1 to 8 DVDs at a time, records DVDs at 4X speed and CDs at 16X, with optional FireWire connection for recording a master disc from a computer; also Playwrite DVD external, portable PC-connect DVD writer, connects via FireWire and USB 2.0, with Mac and PC support.

Microspace Communications Corp. **N1648**

Intro: Live video and data demonstrations of the Velocity digital broadband satellite-based delivery service, including video-to-the-TV and video-to-the-PC solutions. also video to a personal digital assistant (PDA), as 128 kbps streaming video translates to a wireless handheld; also streaming video to the desktop, over 512 kbps video channels; MPEG digital video at 1.5 Mbps and 3 Mbps.

Microwave Radio Communications **C704**

Middle Atlantic Products Inc. **SL1869**

Intro: Thermostatic Proportional Fan Controller controls up to four fans, extends equipment life and reduces service calls by varying the fan speed based upon temperature. The fan controller has three temperature settings. UL Listed in the U.S. and Canada; also Wall Racks, including the DWR, SR, HDR and WRP Series, now similarly UL Listed; welded floor-standing enclosures now UL Listed with a 2,500 lb. weight capacity; slim, high-density power strips contain a number of outlets spaced to accommodate "wall-wart" style plug-in power supplies; 15-amp strips, available with eight or 24 outlets, with and without surge protection.

Also: WRK, MRK, ERK, DWR Edit Center, MultiDesk Video.

Modulation Sciences Inc. **C125**

On Display: FM modulation monitors, Spatial Image Enlarger, audio subcarrier generators.

Moseley Associates Inc. **N2204**

New: MaxLink 5.8 GHz U-NII band full-duplex data radios with low-profile antenna, providing two full-duplex T1 circuits for distances up to 10 miles. $8,250 list per link; also Starlink STL Series with 44.kHz sampling for HD Radio; for those who like their processor at the studio, the Starlink Composite.

Motorola, Broadband Communications Sectr **MR6766, SU4737**

MPEG-4 Industry Forum **SL2455**

Multidyne Video & Fiber Optic Systems **C276**

Intro: DVM-8000 bidirectional, multichannel, video, audio, data and telephone fiber-optic multiplexer for sports, ENG and field production; DVM-2700 2-channel, video, audio and data fiber-optic multiplexer; DVM-2500 bidirectional video, audio and data fiber-optic multiplexer; DVM-1, 2, 4, 8, 16, 32, 64 and 80 series of multi-channel, 8-bit, digital video, audio and data fiber-optic multiplexers for surveillance, transportation, CATV; FMX-230 add/drop RS232/RS422 data transceivers.

Music Box **SU6362**

Musicam USA **N3022**

Intro: While maintaining compatibility with existing codecs, the NetStar codec offers new connection capabilities. It can send and receive full-fidelity, real-time stereo audio via ISDN and dedicated data lines, but also via IP. Contains standard coding algorithms like G.711, G.722, MPEG 1 and 2 Layer II and MPEG 1 and 2 Layer III, but also MPEG 2 Advanced Audio Coding (AAC) and MPEG 4 AAC-Low Delay. It can connect bi-directionally via IP with uncompressed linear audio and near-zero delay.

Also: CDQPrima Series, RoadRunner, TEAM, SuperLink.

Myat Inc. **C112**

On Display: Filters, Combiners, Transmission Line.

N

Nagra Audio Kudelski Group **C3146A**

National Weather Service **N3134**

Nautel Maine Inc. **N2312**

Intro: HD Radio-compatible AM transmitters: 1kW, 2.5kW, 5kW, 10kW, 25kW and 50kW are available and shipping; also, 40kW Solid-State FM Transmitter is a dual-configuration 20kW solid-state system with redundant broadband RF amplifier modules and power supply modules. Duplication features include digital FM exciters, IPA/IPA P.S. and low-voltage P.S; also, HD Radio Digital Exciter is for Nautel AM radio transmitters, current and many past models. Many Nautel AM transmitters produced in the last 10-12 years are upgradeable to HD Radio technology; also, analog FM exciter, 30 watts, a value-priced alternative analog FM exciter that can be used in conjunction with Nautel FM transmitters. Rugged two-stage broadband MOSFET amplifier.

Also: FM3.5, FM5, FM8, FM10 - FM3.5 to 10kW solid-state FM Transmitters, NE50, 50W digital FM exciter with AES/EBU direct digital input (or optional composite input), NA100-300, 100kW to 300kW medium-wave AM transmitters, DRM compatible.

NBC Enterprises **RT504**

Nemal Electronics International Inc. **C3318**

Intro: SND2424 Digital Audio Snake Cable, AES/EBU-compliant 110-ohm pairs; color-coded and numbered pairs, UL-CM approval, flexible outer jacket; also SNX24PL plenum-rated audio snake cable, UL-CL2P plenum approval. individually shielded and jacketed pairs. available in analog and digital versions; also Fiber Optic Connector-6 Contact, NEFO-600 series for broadcast and communications.

Also: Riser-rated flexible audio snake cables.

World Radio History

Netia N2434

Network Electronics SU7045

Intro: VikinX.128 Modular Routing Switcher - SD/HD-SDI 128x128 modular compact router with hot-swappable architecture, dual redundant power supply and redundant controller functions.

Also: VikinX router range for all signal formats; Conquer signal processing products.

Network Innovations N1446

Network Music, a unit of BMG SU4565

Intro: Slam! Network's new music library; BMG FX sound effects library in conjunction with BMG; Essential Series - 40-CD package featuring Network's Ultimate Sound.

Also: SLAM!, Network Music, Short Trax, Essential Series, Classical Music Library, Spank, AfterShock, Shockwave, Spike & Glide, Brainstorm.

Neutrik USA C2560

Intro: MiniLink USB interface is a link that enables PC-based communications between Minilyzer (ML1) and Digilyzer (DL1), and allows easier documentation and data acquisition of device functions. The Minilyzer and Digilyzer are part of the Minstruments family of test gear, which can be used to maintain audio equipment, debug audio installations and tune live sound systems, as well as analyze acoustical and industrial vibration. The connected instruments are powered through the MiniLink connection, eliminating the need for batteries because the Minstrument will be powered via the USB interface with the PC. In conjunction with upgraded firmware for the Minilyzer (release 3.xx) and the Digilyzer (release2.xx), the instruments will be able to handle screen shots and provide data storage for post processing. .

Also: NTI MiniLink.

New England Satellite Systems Inc. N1225

Nicom USA Inc. N2339

Nielsen Media Research RT415

NKK Switches SL3642

Intro: Overhauled SmartSwitch Web site, *nkksmartswitch.com*, enables engineers to prototype the enhanced IS Series SmartSwitch online. In this virtual environment, engineers can visualize ideas, experiment with layout designs, validate and test programs, and save projects. Low-profile LCD module suits tight-fitting applications requiring a graphic display; also added options for the UB2 series low-profile, power and logic-level rated pushbutton switches.

Also: SmartSwitch, UB2 Illuminated Pushbutton Switch, JB Tactile Switch, Legend Packets.

Non-Stop Music Library SU5636

On Display: Production Music Library, custom music, syndicated news music packages.

Norsat MM315, N1220

Northern Technologies Inc. C549

Intro: The DMK series of Transient Voltage Surge Suppressers provide protection for AC circuits with a small footprint; MMK Series is designed to divert power anomalies and prevent damage to sensitive equipment; TCS-HWR Series is hardwired two-stage TVSS designed for a 15 or 20 amp AC circuit. The TCS-HWR provides protection and filtering for sensitive equipment.

Also: Transient voltage surge suppression.

NPR Satellite Services N1312

Intro: Satellite content distribution solutions including space segment, equipment, system engineering and design, and 24x7 customer support.

See us at NAB2003 Booth #N2350

O

Olympus Flag & Banner N2424

OMB Sistemas Electronicos N3114

On Display: FM transmitters 15 watts to 20 kW, STL systems, translators, RPU units, FM antenna systems, antenna accessories.

Omnia, A Telos Co. N2618

Intro: Omnia-6dab; Omnia processors are used on high-profile Eureka-equipped stations and network broadcasters (such as Virgin Radio), and Omnia processors are key components of DAB tests conducted with broadcasters throughout the U.S. With 96 kHz sampling rate, 24-bit resolution. six-band limiter, five AGC bands, wideband AGC, twin color displays, adjustable AGC crossovers, digital and analog I/O, dual composite outputs, stereo EFX enhancement, Dorrough loudness meter, Ethernet and serial ports, dual PC card slots for memory and optional modem. The final limiter for digital and analog outs is designed to condition the audio for maximum results from the bit-reduced encoders employed in IBOC/IBAC systems. Omnia A/X may be combined with a streaming encoder on a single machine.

Also: Omnia on air processors, Omnia stereo generator, ToolVox, Omnia-6cd.

Omnimusic SU5629

On Display: Omni library, CDM French library, Omni Blue Dot broadcast library.

OMT/iMediaTouch N2937

New: iMediaAccess suitable for station clusters. iMediaAccess Server, a LAN/WAN add-on module for iMediaTouch, allows control of audio assets across all stations. Using a drag-and-drop interface, operators can copy audio (voice tracks, songs, commercials, IDs) to and from on-air or production studio locations; also OMT's flagship iMediaTouch digital audio and broadcast system delivers added benefits with the introduction of iMediaTouch V.2.

On-Air Systems Ltd SL3568

Optimal Satcom Inc. N1016

On Display: COMPLAN CoMSAT STAR.

Orban/CRL N1845

Intro: Optimod 8400HD FM provides two independent peak limiting chains, one for an analog FM transmission and one for any non-preemphasized digital transmission, for HD Radio, Webcasts and Eureka-147 broadcasts simulcast with an analog FM signal; also, Optimod-FM 8300, a new, mid-priced processor with many of the processing features previously available only to 8400 owners; Optimod-PC fits in an IBM-compatible PC and processes one stereo audio stream. With supplied WAV drivers, it looks like a standard sound card to native applications, like Real or Microsoft streaming encoders, but has hundreds of MIPS of DSP processing power, allowing it to apply broadcast-quality audio processing to a Webcast or digital broadcast without loading down the computer's CPU with DSP tasks; also, Audicy2 is next-generation digital audio workstation for broadcast.

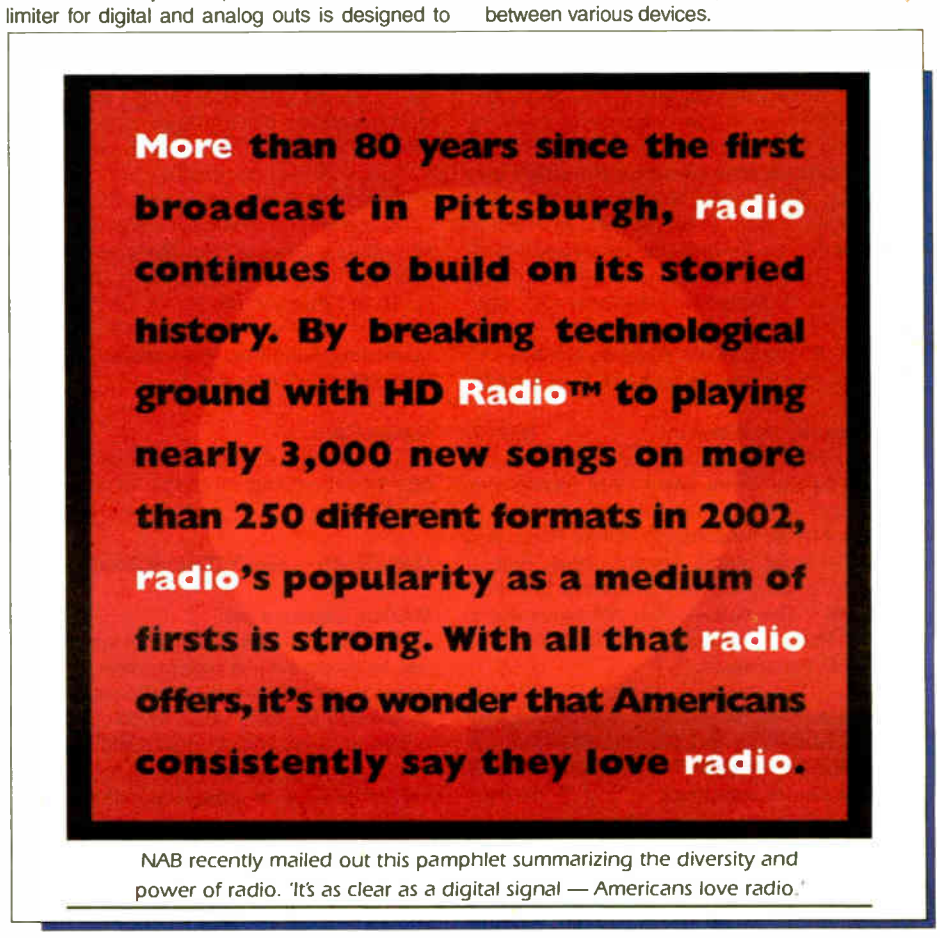
P

Pacific Radio SU6407

PanAmSat C724

ParkerVision Inc. SU5246, RT420

Intro: ParkerVision will unveil a stand-alone XSwitch model that allows one-button switching of audio, video and control sources from one set of equipment to a backup or secondary array of devices. Add-on modules allow for 1 to 2, 2 to 2 and other matrix arrangements for switching between various devices.



NAB recently mailed out this pamphlet summarizing the diversity and power of radio. 'It's as clear as a digital signal — Americans love radio.'

Patriot Antenna Systems N1130

Intro: 1.0, 1.2, 1.8 m SNG Tx/Rx Antenna System; .90, 1.0, 1.2, 1.8, 2.4 m tx/rx antenna system packages with 1.5-watt or 2-watt Ku BUC.

Peace Corps C274

Peak Communications N1753

On Display: L C X and Ku band up and down converters, earth station monitoring systems, redundancy controllers, redundant amplifiers systems, signal conditioners.

Penny & Giles Controls Inc. N2520

Penta Laboratories N2142

Pesa Switching Systems Inc. SU6625

Intro: TDM3000 multiplexing technology performs synchronous AES audio switching, allowing left-right breakaway of the AES audio stream. It also offers analog audio inputs and outputs, and can route signals between the analog and digital formats. Recent technology purchased from Lighthouse Digital makes this product a complement to the Pesa SD/HD Cheetah routing switcher.

Phasetek Inc. N1938

On Display: Custom AM phasing and branching systems, antenna tuning units, diplexers, dummy loads and associated AM RF components.

Pioneer Electronics (USA) Inc. C3830

On Display: Professional audio/DJ.

plus24/Sanken Microphones N2125

PMI Audio Group N3001

World Radio History

Intro: LSD-2 large stereo diaphragm condenser microphone, 270 degrees of rotation on the top capsule with three polar patterns, high-pass filter and -10dB pad for each capsule. Shockmount, road case and windscreen included; C4 matched pair small diaphragm conderser microphones, interchangeable heads for cardioid and omni operation, high-pass filter and -10dB pad, shockmounts, road case and windscreens included; JM828 single-rack-space, eight-channel mic preamp with an 8x2 mixer, includes 48V phantom power, phase reverse, mic/line switch, peak and signal present indicators, gain control level and pan, solo, impedance control 50/200 ohm.

Also: LSD-2, C4, JM828.

Porta Brace, K & H Products Ltd. **C3160**

Potomac Instruments Inc. **N2619**

On Display: 1900 Series Antenna Monitor, FIM-41 MW Field Strength Meter, AA-51A Audio Analyzer, AG-51 Audio Generator, 1750-TLM Tower Light Monitor.

Poynter Institute **RT613**

PR Newswire **RT319, RT323**

Prime Image Inc. **C3980**

PrimeLED Inc. **N2050**

Prism Media Products **N2346**

Pristine Systems Inc. **N3133**

Intro: CDS32 is a Content Delivery System for Windows 2000 or XP platforms for live assist, satellite automation, music-on-hard-drive, remote control access and unlimited walk-away time. It supports all traffic and music scheduling software, but also includes Spot Set Editor and two music schedulers (QuickScheduler and MusicPlus). CDS32 Live Assist systems are an alternative for stations not interested in automation or satellite features. The Live Assist system is a replacement for aging cart machines. Operates manually or use simple Script Automation for additional Live Assist features. It has the capability to automate multiple satellite networks easily. CDS32 Pro Music-on-Hard-Drive systems are designed to operate live or automated. It features in-context voice tracking for a live sound. Professional 4-play digital audio card (capable of simultaneous four plays and one record) supports uncompressed WAV, MPEG Layer II or Layer III and many other formats.

Also: CDS32 Pro, CDS32 Live Assist, CDS32 Satellite Automation.

Production Garden Music **SL101**

Professional Sound Corp. **N3032**

Intro: PSC AlphaMix portable audio mixer designed for ENG, documentary and film sound; PSC PowerMax power distribution platform; PSC M3 Portable Audio Mixer brings modern features and quality audio to the portable three-channel mixer market.

Also: Millimic lavalier microphone, universal microphone power supply, headphone distribution amp, equipment carts, RF multi antenna splitter, standard and custom cables, adapter barrels, VDB boom poles, M6 mixer.

Promusic Inc. **C450**

Intro: Abaco Music Libraries with jazz, pop culture, pop beds; Cavendish Music Library CD 153 "Live & Unsigned," a range of undiscovered No. 1 hits, and "Stupid," a selection of ludicrous music and effects.

Propagation Systems Inc. **C354**

On Display: Slant "V," "Rototiller style."

Prophet Systems Innovations **N1924, SU5369**

Intro: MusicGen: Own or lease the next generation in music scheduling. Integrate your digital automation system and create personalized music rotations. Kiosk!: "Do It Yourself" presentation software. The software package allows you to create your own marketing solutions. Run sales or tradeshow demonstrations, interactive maps or sell advertising space.

Also: NexGen Digital.

Q

QEI Corp. **N2914**

Quartz Electronics Inc. **SU6435**

Intro: Multi-format Q256-DA/AA audio router, supporting both digital and analog audio I/Os, features soft switching, wild shuffling and sample rate conversion. Soft switching predicts and smoothes out the audio transition to guarantee a "click free" switch, wild shuffling allows any input audio track to be selected with any other and routed to the same output and the sample rate converters, which are located on the input fins. Convert the input audio of 32, 44.1, 48 and 96 kHz to the chosen standard of 48 or 96 kHz.

Also: Q32-PR Port Router, SC-1000 System Controller, CP-1000+CP2000 series of Intelligent Control Panels.

R

Radian Communication Services Corp. **C2562**

Intro: Broadcast towers to 2,000+ feet; engineering analysis and strengthening of existing towers; supply, installation, testing and repair of new and existing broadcast antenna systems including combiners.

Also: Towers, antennas, structural engineering, tower modifications, field installation services, antenna system performance and benchmarking tests.

Radio Express Inc. **N2026**

Intro: TripQ Production Library from Brandon D'Amore, creator of D-Frag and Supercharger, market-exclusive, unpublished, royalty-free and delivered monthly on CD or online; Soul Lounge is Urban Vibe/Neo-Soul; features include The Happs entertainment report, Tongue & Groove, a poem/spoken-word segment, artist of the week, artist interview and The Vibe Session — an hour mix.

Also: Radioplay Music Services and Music Libraries, World Chart Show, Jammin' World Chart Show, Superadio Mix Shows, Snoop Dogg Radio Show, Hollywood Hamilton Weekend Top Thirty, Soul Lounge, Fatboy Slim, Paul Oakenfold Presents.

Radio Frequency Systems **C3012**

On Display: UHF system, made up of a broadband panel antenna, combiner, filter, rigid line, and patch panel, FM antennas and a combiner.

Radio Systems **N2320**

On Display: Consoles, distribution amplifiers, clocks/timers, StudioHub+ wiring system.

Radio Waves Inc. **C4414**

World Radio History

Radio World **N2057, SU6163**

The industry's first and leading source of information about digital radio for the past decade now launches *HD Radio News*, a special section devoted to the digital radio transition; also *Technology for Managers*, a new column aimed at today's non-technical manager who must make technical decisions; also featuring popular columnists like John Bisset, Skip Pizzi, Guy Wire, Al Peterson, Mark Lapidus and Paul McLane; and Radio World's annual "Cool Stuff" Awards at NAB2003, the industry's most prestigious product honor.

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Radyne ComStream **SU5736**

RCS **N2831, C2509**

On Display: Broadcast software, with 23 offices in 19 countries. RCS serves more than 5,000 radio stations, TV music channels, cable companies, satellite music networks and Internet stations worldwide. RCS also develops real-time audio recognition technology.

RDL (Radio Design Labs) **N2637**

***New:* Stick-On "Universal" Mixer combines performance and features of six current modules. Each input is individually switch-selectable mic or line. The output is switch-selectable mic or line. Unit is capable of mixing any combo of three mic or line-level sources, balanced or unbalanced, to a mic or line-level balanced or unbalanced output. Input gain for each channel may be adjusted by single-turn audio taper pots. Dual-LED VU meter included for output level monitoring; also new, Stick-On Dual-Channel Line Amplifier, STA-2A, uses SupplyFlex power input configuration to allow operation with a floating or ground-referenced powering configuration. Each channel is identical. Audio inputs are bridged at 20 kohm and accept an unbalanced or a balanced audio signal. Gain is adjustable from unity gain to +24 dB using a 25-turn audio taper trimming pot. The output driver circuits drive long balanced audio lines into 600-ohm loads. Wideband circuitry for excellent phase response, low noise, low distortion and audio clarity; also new, SupplyFlex Power Input Configuration. Now the ST-DA3 Audio Distribution Amplifier utilizes a configuration that allows the power input to be wired in either a floating or ground-referenced powering configuration; also new, TX-8I, 8-ohm galvanic isolation transformer for the isolation of headphones from source equipment; also, SR-4 universal module chassis can mount to a backboard, wall or nearly any other support. It provides mounting for four Stick-On power amplifiers or seven standard Stick-On modules.**

***Also:* Stick-Ons, Rack-Ups, TX Series, Flat-Paks, System-84**

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RealNetworks **SL2909**

Register Data Systems **N2246**

Intro: MPEG III Automation.
Also: Phantom III.

RF Parts Co. **N2242**

On Display: Transmitting Tubes, Sockets, Transistors, Modules, Much More.

Richland Towers **C580**

Intro: Tall multi-tenant broadcast towers typically featuring full K-Brace construction and 60-foot candelabra. Most towers capable of supporting up to 20 TV and FM broadcast operations plus top-mounted ENG. Full-service provider with tower services including tenant equipment build-out, RF studies, and facility maintenance.

On Display: Broadcast towers.

Riedel Communications Gmbh **C4136**

Intro: Artist S, multimedia platform; 2000 panel series.
Also: Artist M, RPL, Intercom.

Riz Transmitters **N3218**

Rohde & Schwarz **C335**

On Display: Communications, test and monitoring instruments and systems with emphasis on mobile radio, radio monitoring, radio location, and radio communications.

Rohn Industries Inc. **C3346**

On Display: towers, tall towers, monopoles, antenna mounts, security fencing.

RTS **C2812B**

RTW Radio-Technische Werkstätten Gmbh **N3013**

Intro: Instrument for advanced level metering: SurroundMonitor 10800X including the SurroundAnalyzer and DialNorm measurement mode, available as desktop and panel mount versions fitting into many consoles. New desktop peak- and loudness- meters 1204A (analog) and 1205D (digital AES/EBU) in desktop housings, suited for applications with workstations. A phase correlation meter is integrated. The instruments feature three-color bargraphs with 106 segments per channel. Available in blue and light gray finish.

Also: Audio Vectorscopes: PortaMonitor, BroadcastMonitor, Phase Correlation Meters, Peak Program Meters.

Rules Service Co. **C2510**

On Display: FCC rules and regulations.

Rycote Microphone Windshields **N2145**

Rymsa **C3639A**

S

S.W.R. Inc. **C653**

Sabre Communications Corp. **C4554**

On Display: Towers, tower services, tower parts and accessories.

SADIE Inc. **N2746**

ScheduALL Software **SU4615**

Intro: ScheduLINK transmission management software for satellite and terrestrial bandwidth and pathways. Fast scheduling with multiparameter conflict checking. Comprehensive financial reporting with seamless cost allocation and billing features.

Schoeps Microphones **N2046**

Intro: U.S. Edition Microphone Sets comprise the company's most popular amplifier and capsule combinations with accessories in a custom wooden case. The CMC641C with CUT 1 filter is a suitable for booming overhead dialog in production sound applications. The CMC 6 M/S Mid-Side stereo set offers two sequential serial-numbered CMC6 amplifiers, an MK4 cardioid capsule, an MK8 bidirectional capsule, an AMS 22 elastic suspension and a WMS foam windscreen.

Scientific-Atlanta Inc **SU4543**

Scott Studios Corp. **SU5471, N2701**

***Intro:* SS 32 live-assist digital audio system with several touchscreen layout choices. Can enhance (speed up) tempo with or without pitch change, play all spots as perfect 30s and 60s, integrates with NewsRoom and multitrack production, distant city voice tracks; SS Flex is affordable hard disk digital automation for medium and small markets; Maestro 3.3 is robust digital automation with CD ripper, WAVE file support, distant city voice tracking, newsroom integration.**

***Also*: Digital Universe.**

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Web site: www.scottstudios.com

Screen Service Italia **N2828**

Sennheiser Electronic Corp. **N2103**

Intro: MKH 418S compact M-S stereo shotgun microphone is based on the MKH 416 short shotgun microphone; MKE Platinum Lavalier is an nobtrusive, rugged subminiature microphone; the SK 5012 professional bodypack transmitter delivers 30mW of wireless audio while housed in a 61 x 53 x 17mm shell.

Also: Sennheiser evolution wireless microphones systems, MD 46 handheld condenser microphone, Quad Pack.

Seratel Technology **N3109**

Intro: FM transmitter 3 kW, FM transmitter 1 kW portable; digital stereo encoder.

A Wednesday panel of the Broadcast Engineering Conference discusses EIA-222-G, the next revision of an important tower standard. Mike McCarthy took this photo of a tower climber.

Shively Labs **N2626**

Intro: IBOC high-level combiner provides cost effective digital conversion; IAD interleaved analog/digital antenna system.

Also: FM antennas, IBOC filter combiners and related RF equipment.

Sierra Automated Systems **N1813**

Intro: 32KD Digital Audio Network with RIO link remote input/output chassis connected via fiber optic cable or CAT-5 cable. More than a router, the 32KD switches, mixes, has level control and DSP, and communicates as an intercom or IFB system with mix-minus capability. Unlimited capacity. Flexibility.

Also: 64000, 32000, 16000.

SKB Corp. **SU6257**

Intro: 3SKB-4250 Plasma Case: Roto-molded impact-resistant body with heavy-duty locking casters and twist latches, tilt-back wheels for loading, spring loaded 90-degree lifting handles and pull-out caster storage. Interiors can be customized to fit 42-inch or 50-inch plasma screens.

Smart Technologies Inc. **SL2839**

Intro: Bridgit data-conferencing software Version 1.0 for multi-user, reservation-less data conferences.

Society of Broadcast Engineers **Lobby Booth 21**

Solid State Logic **N2512**

Intro: C100 is a new-generation digital broadcast console for on-air/production environments, with a small-footprint,it is an assignable broadcast console for applications such as news and sports, as well as live-to-tape talk and game shows, where fast and efficient handling of sources and destinations are important. The transition to digital broadcast is addressed; also, Avant Plus Digital Post console, with advanced HS Control Processing.

Sonic Foundry **SL1569**

Sonic Solutions **SL542**

Sonifex Ltd. **C133**

Intro: HY-03 analog phone hybrid/balance unit has a lower price and more features than the HY-02, and is for applications where a clean telephone signal is required and the line is not subject to delay, features include automatic operation adapting to varying line conditions with auto signal limiting, local and remote line hold switching, integrated auto-answer after a pre-determined number of rings, balanced mic/line input, low-impedance balanced output with output gain adjustment, line limiter, bandpass filter and output noise gate with preset threshold; also RB-PMX4, a 10-mono input to 4-mono output preset mixer; RB-DAC1 Digital-to-analog converter; RB-DMA2 Dual Digital Microphone Amplifier; RB-DHD6 Digital 6 Way Headphone Distribution Amplifier.

Also: Net-Log audio logger Courier portable recorder, Redbox range of audio interfaces.

Sonomic **SL103**

Intro: Total Library Server for finding, auditioning and spotting sound effects, samples and music. A CD collection is digitized, categorized and indexed onto a server that you access from any Mac, Windows, or Linux workstation. Find, audition and import any sound, in any format, into Pro Tools, Avid and other audio/video software. If it doesn't have what you need, it will query and download from the 200,000+ sound Sonomic Online Library, featuring Sound Ideas, the BBC, Serafine, Zero G, Q Up Arts, Valentino and other libraries. Waveform overviews, pitch/time control, taglists, quickeys.

Also: Online Library, Soundation

Sony Electronics Inc. **MM80**

Intro: UWP series wireless microphones; DMX-P01 digital portable mixer; SIU-100/100t system interface unit; ECM-88 Electret condenser lavalier microphone.

Also: DMX-R100

Sound Devices LLC **N2045**

Intro: 302 Compact Production Mixer for audio-for-picture applications.

Also: USBPre Computer Audio Interface, MP-1 Preamplifier.

Sound Effects Library **SL1628**

Sound Ideas **C174, SU6330**

Intro: Series 6000 Extension IV, a general sound effects library with 1,000 new digitally recorded effects on 10 CDs featuring a military helicopter and a "Hummer"; Ear Candy 7, 400 new imaging elements including music, logos, accents and enhancers, fly-bys, takeoffs and landings, engines and machines, electronics, beeps, bonks and boinks, sci-fi, lasers and weapons, zaps, hits, blasts, whooshes, flutters and special fx; SuperSearch Electronic Catalog, a new release of popular SuperSearch electronic catalog software featuring an updated look, new search interface, easier-to-use features, 20,000 additional keywords and a "Custom Add" feature that will allow you to update SuperSearch by adding products as they are released.

Also: Sound Ideas Sound Effects Libraries, Mix Music Libraries, Ear Candy.

Spacecom Ltd. **N1121**

SpectraSite Broadcast Group **C304**

Intro: Owns and manages 120 broadcast towers. Contact us to inquire about DTV needs or other antenna space leasing.

SRS Wowcast Technologies **SU4857**

Staco Energy Products Co. **C103**

Intro: FirstLine Voltage Regulators offer a three-year warranty, customer service and competitive pricing, a power quality product for your studio or other broadcast power quality application; UniStar Sx is a 1 to 3 kVA, single-phase, online UPS system with remote monitoring, user-friendly panel controls, state-of-the-art technology, two-year warranty. Available in rack, tower and floor models.

Also: Staco voltage regulators, Staco power conditioners, TreStar 3-Phase Online UPS systems.

Storeel Corp. **C432**

Studer **N3005**

World Radio History

BSW
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Dear Radio World Reader,

Because we hope that a visit to the BSW booth is a familiar part of your NAB show itinerary, we want you to be aware of a major change for 2003.

This year at NAB, BSW will NOT have a booth.

Before rumors start flying, we wanted you to know our real reasons for not displaying.

1. We're now carrying so many great products that trying to pack them into a booth 'somewhat smaller' than Sony's is incredibly difficult and very expensive. We think that the money is better spent on things that more directly benefit our customers. For example, lowering prices.

2. Frankly, our usual great service has tended to suffer when our entire sales staff packed up and left for sunny Las Vegas. This year we're leaving a contingency of Sales Representatives at home to "man the fort".

3. Like you, we consider the NAB to be an educating experience. We believe we can better serve you by receiving factory training on the newest equipment that the industry has to offer. So we're sending a strategic detachment of select staff to scout out new products and to spend more hands-on time with the products we sell.

So be sure to say "Hi" when you see a BSW person on the show floor. Of course if you'd like to meet with us or a BSW salesperson, please call and we'll make the arrangements.

We hope you enjoy the show. As always, we are grateful for your business.

Sincerely,

Tim Schwieger
President

Tom Roalkvam
Sales Manager

The World's Best Source for Professional Audio Equipment

This has been a test of the BSW Print Broadcast Network.
We now return you to your regular BSW center-spread ad.

World Radio History

Shannon has sold our warel
Call her and you'll understand why.

Order from Shannon Nichols by calling 800.426.8434 or e-mailing her at ShannonN@bswusa.com

Shannon Nichols, BSW Senior Sales Representative has 13 years experience in broadcast equipment sales.

Shannon knows mixers. And signal processors. And codecs. And microphones. And monitor speakers. And virtually everything else we sell.

Because there aren't that many women in our industry, Shannon has had to battle against stereotypes to prove her expertise. Anybody who's ever ordered from her will agree: She won the battle. When you call her, you don't get an order taker, you get a seasoned expert whose decade of experience is immediately obvious.

Along with Tom, John, our other John, Laz, Ryan, Paul, Ric, Gary and Steve, Shannon is another reason why Broadcast Supply Worldwide really *is* your best source for professional audio — our friendly folks really DO know their stuff. Whether you need pop filter or a whole new studio full of gear, call our experts today and we know you'll agree.

We'd love to take you for a ride in the new BSW corporate jet. Leather seats...satellite internet access...jacuzzi. Pending a large increase in revenue, we should take delivery sometime in 2112.

BSW
BROADCAST SUPPLY WORLDWIDE

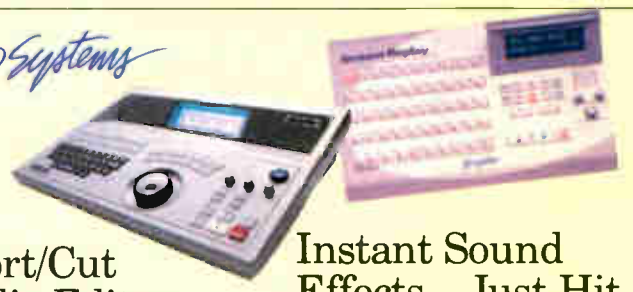
NEW

Full-Range Sound in a Weird Looking Package

Combining full-range sound with a space-saving surface-mount design, the Electro-Voice EVID 4.2 speaker system is an above-and-beyond performer. Dual 4-inch woofers bust out the bass response of a much larger units, and 1-inch waveguide-coupled titanium tweeters deliver controlled, clean mids and highs, making the EVID 4.2 a solid choice. **Features:** full-bandwidth overload protection; Strong-Arm Mount with large swing/rotation ranges for mounting flexibility; shielded for video applications.

EVID4.2 List 340.00/pair

270.00/pair



Short/Cut Audio Editor

The digital 360 Systems Short/Cut Editor acts like reel-to-reel for fast editing of single or dual channel audio. It offers all the features you'll need to capture and edit audio for talk radio, news, and more. **Features:** split-second editing; tape-like interface; waveform display; real-time cut, copy, insert, erase; crossfades; fade-in/out; gain changes and ramping; one-touch instant record in any mode; title and cut select with built-in keyboard; assign cuts or edited clips to 10 Hot Keys per directory; 12 hour hard disc capacity; D-NET File Transfer Network capability; balanced XLR analog I/O; AES/EBU digital I/O.

SC182 List 3,495.00

Call For Price

Instant Sound Effects – Just Hit the Hot Key

360 Systems' Instant Replay redefines 'Hot Key' with a control panel offering rapid-fire playback of 50 cuts in 10 different banks, and up to 24 hours of stereo audio can be stored on its hard drive. **Features:** stores up to 1,000 audio cuts of various lengths; "Top and Tail" detailed trim editing; start-on-audio record feature for tight starts; built-in keyboard locates cuts by name/number; ten banks of 50 Hot Keys; hard disk stores 24 hours of random access audio; external parallel port for outboard storage drives; built-in D-NET File Transfer Network capability; balanced XLR analog I/O; AES/EBU digital I/O.

DR554-E List 3,250.00

Call For Price

NEW

Bring Vocals Warmly Into Digital

The Behringer digital VX2496 voice processor cleanly and warmly brings vocals into the digital domain. It's loaded with goodies like a voice-optimized EQ, authentic tube emulation circuitry for fat sounds, and a true RMS expander for smooth noise reduction. **Features:** ultra low-noise vintage-design mic/line input stage with phantom power; 24-bit AES/EBU digital output with selectable rates up to 24 bit/96 kHz; opto compressor/de-esser; XLR connectors; high-precision ALPS potentiometers; shielded transformer for lowest noise interference.

VX2496 List 199.00

159.99

BEHRINGER

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house out twenty times over.

Win A Free Pair Of Patriot POTS Audio Codecs!

Achieve 15 kHz Audio over Standard Phone Lines at a Great Price

The Tieline Patriot is a low-cost 15 kHz POTS codec featuring high-stability modem technology and remote control facilities, allowing you to achieve high-quality 15 kHz audio over standard telephone lines. **Features:** low 100 ms delay; mobile telephone connectivity with a cellphone mini jack; mic/line switchable XLR input; stereo RCA input summed to mono; balanced XLR output; headphone jack; bi-directional data transfer; line quality visual display; remote controllable from the studio; intelligent gain control.

BSW is giving away a pair of Patriots valued at $5,300.00! Sign up to win at www.bswusa.com. Contest ends 05/31/03. No purchase necessary. One entry per person. See website for all rules.

TLF100 List 2,595^{00} **Call For Price**

Record To Flash With This Rugged Performer

The PMD690 from Marantz records in stereo to flash memory cards that are highly reliable and have no moving parts (cards sold separately). **Features:** compatible with compact flash with adaptor; .mp2, .bwf, or .wav file formats; time/date generator; manual or auto record level; built-in mic and speaker; 2-second pre-record buffer; balanced XLR and 1/4" inputs; RCA I/O; coax digital out; telephone jack.

PMD690 List 1,499^{00}

995^{00} marantz

Dual-Transport MP3/CD Monster

Gemini's new MP-3000X is not only a high-performance dual CD player – this bad boy also plays MP3s. Now you can carry 150 songs on a single CD, or download the latest hot track and spin it immediately! **Features:** frame-accuracy; anti-shock buffer; selectable 4/8/16% pitch control range; jog wheel for quick searching and ultra-accurate cueing.

MP3000X List 899^{95}

599^{95} gemini

4-In /16-Out Distribution Amp

Symetrix' high-end 581E is a quality 4-input, 16-output DA. Each 1-in, 4-out module operates independently. Easy rewiring creates 2x8 and 1x16 configurations. **Features:** removable Phoenix-type connectors for easy install; THD + noise levels less than .009%; LED input metering.

581E List 549^{00}

399^{00} Symetrix

audio-technica.

Smooth, Natural Condenser

Audio-Techinca's affordable AT4040 is designed for professional recording and broadcast/live sound. **Features:** polarized true condenser/large diaphragm design; cardioid polar pattern; low noise/wide dynamic range; high-SPL capability; switchable hi-pass filter; 20 Hz - 20 kHz, includes shock mount.

AT4040 List 495^{00}

299^{00}

EDIROL

Digital/Analog Ins

With onboard 24 bit/96 kHz converters, the Edirol MA10D powered monitors use analog or digital sources for the ultimate in flexibility, as well as impressive dynamics in a small package. **Features:** dual 10 watt amps; RCA/mini jack ins; optical/coax S/PDIF digital ins; 45 Hz – 35 kHz response; 2-way bass reflex enclosures.

MA10D List 165$^{00/pair}$

149^{00}/pair

Long-Life LED Rack Light

CBT Systems' Railight is the perfect addition to any rack full of important gear. This long-life LED light source (that's right, no bulb!) is mounted in a rugged steel housing with a black powder finish. Only occupying a single rack space, this sliding rack unit can be extended out 9 inches and will light areas in a rack that conventional pull-style lamps can't. It has a Plexiglass lens and an external UL approved power supply.

RAILIGHT

219^{00}

Self-Contained Portable 250 Watt PA

Fender's Passport P-250 is a totally self-contained portable sound system complete with a self-powered 4-channel mixer, 2 full-range speakers, 2 dynamic cardioid mics and all necessary cables – grab this and you're good to go, at only 53 lbs! **Features:** 250 watts/8 ohms of pure stereo power; 4-channel/8-input mixer; 2 additional stereo channels; one-touch EQ; digital reverb with remote bypass; eight 6.5" high-efficiency drivers in two cabinets; selectable main/monitor operation; audio-out jacks for performance recording; storage for mics and cables; aux send/return; amplifer send/return.

P250 List 950^{00}

599^{00}

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Studio Cutz Music Library **SU5625**

Intro: A library with tracks available for download in WAV, AIFF or MP3 formats. No more converting files after download. We also have 30+ CDs of production music featuring live instruments available for licensing; also Drums & Bass, a three-CD boxed set, 250+ individual tracks of bass and drums for broadcast application, spots or video production, styles ranging from pop and funk, to novelty and sports. Full compositions, riffs and grooves.

Superior Broadcast Products **C4020**

Intro: FM and television transmitters and antennas. Studio-transmitter links including antennas. Broadband antennas and combiners for multistation operation. A new line of digital transmitters for all power levels.

Also: Superior broadcast products.

Superior Electric **N2455**

Intro: Stabiline SEG Series of true online, uninterruptible power supplies. Available in rack and cabinet configurations. VA ratings of 1000 to 6000 VA.

Also: Stabiline WHR Series automatic voltage regulators, power conditioners, uninterruptible power supplies and transient voltage surge suppressors.

Swe-Dish Satellite Systems AB **MM314**

Switchcraft Inc. **C750**

Intro: MBPK Series combination bantam audio/midsize video patchbay. Offers bantam audio and midsize video in one patchbay. RS422 Series data patchbay features low-cap internal wiring in either 8, 16, 24 or 32 ports. EZ Norm Series patchbays get expanded options including front-access slide-out tray option. New Patchcord Series offers high-quality cable, base 10 colors and premium flex reliefs. Available in audio and video.

Symetrix **N2621**

Intro: AirTools Studio Matrix multifunction, DSP-based audio routing system. Modular and scalable, it consists of several hardware modules, which connect to give you a flexible routing and signal processing system tailored to your needs.

Also: 528E Voice Processor, 628 Digital Voice Processor, AirTools 6000 and 6100 Profanity Delay, Lucid converters and clocks.

Systems Wireless **C2535**

Intro: HME PRO850 UHF Two-channel Synthesized Wireless Intercom System with automated frequency selection of TX and RX bands, paging/IFB/stage announce output, beltpack talk-around, and configurable Alert relay; also, Drake Series 4000 II Digital Matrix Intercom System featuring 4222RBL 24-key LCD user panels with individual level adjust pots. HiQue Networking card eliminates external trunking boxes, interfaces to Fiber T1 or E1 lines. Multiple-user panel options available; also, Lectrosonics 400 Series Digital Hybrid ENG/EFP wireless microphones featuring the UCR411 Compact Diversity Receiver with spectrum scanning and the MM400 Ultra Compact Bodypack Transmitter powered by a 9V battery.

Also: Sennheiser, Clear-Com, Telos, Shure, Sound Devices, beyer, Sony, Tram, Sanken, DPA.

Los Angeles' Mt. Wilson

T

Tai Audio **C4372**

Intro: PSC alphamix ENG four-channel stereo mixer operates on AA or NP1 batteries and features four direct outs with PFL, dual camera sends and returns and four power outputs; Fostex PD-6 DVD location recorder with timecode; Lectrosonics UCR211 UHF wireless mic receiver features 256 frequency options, backlit LCD display with spectrum analyzer, smart squelch and smart diversity circuitry; Lectro UCR411/UM400 UHF digital hybrid wireless mic system; and MM400A miniature lightweight UHF bodypack transmitter weighs less than four ounces, features waterproof construction, and works with Lectrosonics 200, 400 series and Sennheiser receivers.

Also: Shure, Sennheiser, RTS, Clearcom, Rycote, PSC.

Tally Display Corp. (TDC) **C3263**

Tannoy/TGI North America Inc. **N2052**

TASCAM **N2134**

On Display: SX-1 Digital Production Environment, DM-24 Digital Mixing Console, MX-2424 Hard Disk Recording.

TBC Consoles Inc. **SU5221**

Intro: Ergonomic solutions for video and audio applications.

Also: Studio furniture.

TC Electronic Inc. **N2926**

Intro: P2 level pilot and limiter for the post-production and broadcast industries features single-stroke level control with total lock ability, factory-loaded with international standard presets ensuring compliance to audio standards, maximum loudness, spectral balance and total level control; PC ICON software provides detailed access to parameters for editing and creating tailor-made presets that can be cloned to other P2s for anyone to use; Dynaudio Acoustics AIR 20 offers performance and precision in three-way powered monitors and superior control of directivity, minimizing reflection effects from a console, floor or similar planes with central remote control, preset storage and recall, and extensive alignment flexibility that can be configured in stereo and 5.1 monitoring setups.

Also: VoicePrismPlus.

Tektronix Inc. **C2450**

Telefunken Sender Systeme Berlin AG **N2347**

Intro: VHF FM low-power Tx family 10 W to 1.25 kW T32xx; high-power solid-state VHF FM Tx 20 kW and 30 kW; Tram line MF and LF Tx 1 kW to 600 kW.

Telesat **N1158**

Telex Communications Inc. **C2812**

Intro: 7-52NH is a seven-drive 52x CD copier with a 40 GB hard drive for storage of up to 26 full-length audio or data CDs; 1-52NH is a cost-effective, one-to-one 52x CD copier; 7-416D New 4X DVD seven-drive copier tower copies seven DVDs at 4x real time and CDs at 16x speed, with a 40 GB hard drive that allows for storage of up to seven full-length 4.7 GB DVDs; 1-416D one-to-one 4x DVD copier.

Also: SpinWise CD/DVD towers, SpinWise CD/DVD rackmounts, SpinWise CD/DVD automated copiers and printers

Telos Systems **N2618**

Intro: The lightweight and portable Zephyr Xport enables broadcasters to transmit audio from remote locations where ISDN circuits are not available using up-to-date MPEG coding and Telos DSP modem technology and a mixer that provides mic and line inputs with selectable Omnia dynamics processing; also, call-screening software Assistant Producer v3.5 provides instant communication between producers and hosts with detailed on-screen line and caller status, allows remote screening/supervision of talk shows via LAN or WAN, and comes available with multi-language support and improved user interface; TWOx12 talkshow system with a split mode feature allows 12 lines to be split between two studios for two separate shows; Profiler, automated archiving software v2.0, features logging, air-check skimming and remote listening with multi-stream support and enhanced user interface.

Also: Zephyr, Hybrids; ONE, One+One, Telos TWO, Talkshow Systems; 2101, One x Six, Delta 100, Assistant Producer, Audioactive Production Studio.

Teracom Components **C574**

Intro: Mast/Tower lighting features high-reliability and high-intensity long-lasting bulbs that have been proven in extreme conditions; corrugated foam cable and connectors come in sizes from 3/8 to 1-5/8-inch and are flexible guaranteed waterproof connectors that are easy to install.

Also: Filter combiners, antenna connectors, rigid line and engineering software for AM, FM, and DAB

TerraSonde **N2149**

Intro: Precision Microphone System is a battery-powered preamplifier system and external low-noise mic with frequency response from 10 Hz to 20 kHz, +/- 0.7 dB, influence of humidity of <+/-0.1dB (non-condensing), nominal diameter of 1/2-inch, temperature coefficient, preamplifier gain is switch selectable, 20, 30 and 40 dB; also, TerraLink is a software application that provides real-time display of Audio Toolbox functions including the 30-band Real Time Analyzer, FFT analyzer and Energy-Time Graph; the Digital Audio Toolbox is a powerful portable digital audio tester that has two sets of digital audio inputs, with AES, S/PDIF and Toslink connectors, ADAT in/out, word clock and video sync (black burst) inputs, one digital output with stereo analog outputs for headphones or line-level outputs.

Texas Instruments **SL2215, MR3264, MR3164**

TFT Inc. **N2820**

Thales Broadcast & Multimedia Inc. **C2000**

Intro: Digital Starter Kit for AM broadcasters is based on the latest generation 10 kW medium-wave transmitter of the M2W family, ready for digital as well as analog operation.

Thales Components **C2725, N1219**

Thomson Broadcast and Media Solutions **MR7050, SU7059**

Tieline Technology **N2063**

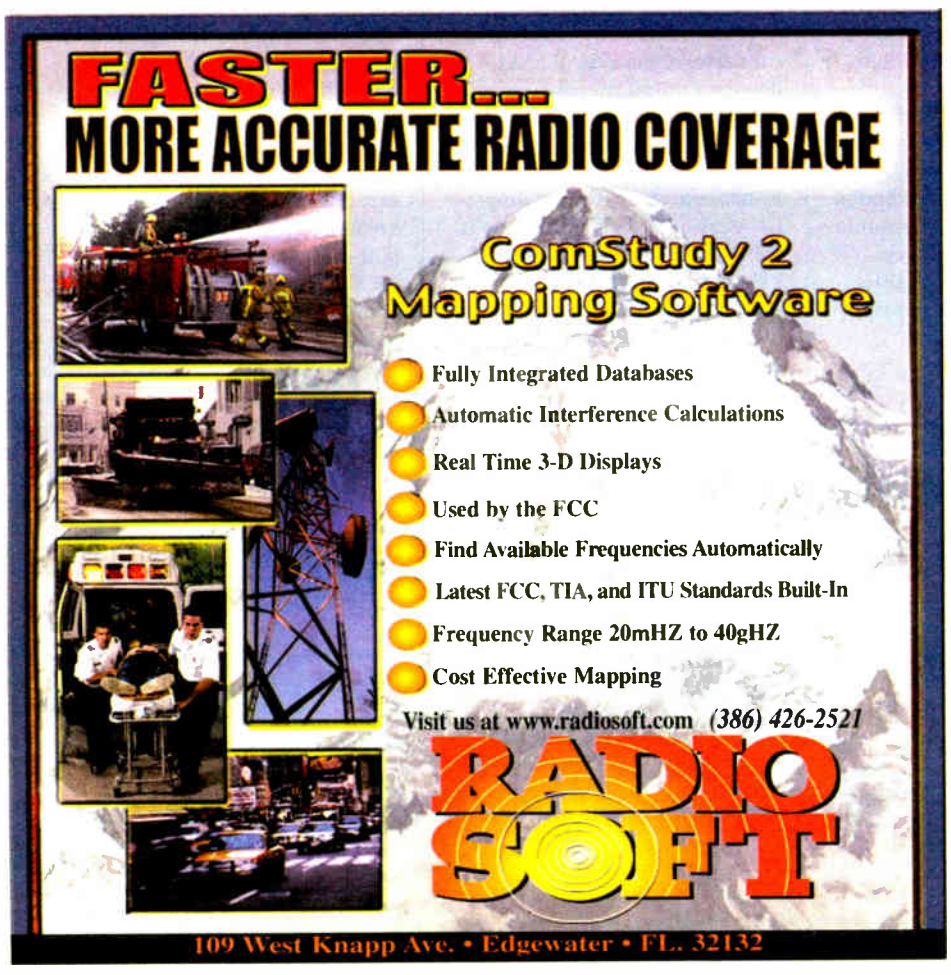
***Intro:* 5-input Tieline i-Mix delivers super-stable studio quality (15 kHz) audio in both directions on plain phone line with a 15 kHz ISDN option which includes G.722, intelligent gain control, cell interface, intercom, automation control, four individually-controlled headphone jacks, local PA, mix-minus and control ports.**

***Also:* Tieline Patriot Commander, i-Mix and Tieline ProSolutions A/V Products**

Kevin Webb, Gen. Mgr.
5555 N. Tacoma Ave., Ste. 101
Indianapolis, IN 46220
Phone: 317-259-8000/888-211-6989
FAX: 317-259-8040
E-mail: sales@tieline.com
Web site: www.tieline.com

Trenton Technology Inc. **SL2631**

Intro: The XPT is a single-board computer or SBC that features dual Intel Xeon processors, dual 10/100/1000Base-T Ethernet



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ports, an ATI integrated graphics and video controller, dual Ultra320 SCSI ports and PCI-X support and is ideal for advanced audio and video data processing, storage and network communications; T4G is a single-board computer featuring the Intel Pentium 4 processor and 845GV chipset with advanced integrated graphics and video support built into the 845GV chipset.

Also: XPI, T4I CompactPCI Computer Backplanes.

Trew Audio Inc. **N1948**

Intro: The Hot Box provides the ability to distribute a single DC power source to an entire sound or video cart; Remote Audio Antenna Bar is designed to accommodate two diversity antenna sets (four antennas), separated by as much as 48 inches (using Lectrosonics folding dipoles) when extended and it breaks down to only 12 inches; Remote Audio Ground Adapter Boom Pole Stand provides a safe, convenient way to stow the boom pole between shots; the Pole-Cat provides wind protection on short shotguns, like the MKH60, MKH416, ME66, MKE300, or AT4073.

Also: Nagra, Neumann, Otari, Otto Engineering, Pearl Mics, Pelican, Porta-Brace, PSC, Quantegy, Remote Audio, Rip-Tie, Rolls, Rycote, Sanken, Schoeps, Sennheiser, Shure, Sonifex, Sonosax, Sonotrim, Sony, Sound Devices, Studer, Tannoy.

TRF Production Music Libraries **C662**

Intro: Releases to the Kool Kat library include X-treme Drama, Fashion, Hip-Hop, Latin/Salsa, Jazz, World Beat, Acoustic Guitar and 1960s British Rock Soundalikes; 50 production music CDs added to the Bravo Cobra, Dennis, PowerSound, Pyramid and Stock Production Music libraries; 60 classical and authentic ethnic music CDs added to the Supraphon Classical library and the PAN International Ethnic library; Power Distortion, with 492 broadcast-quality production elements produced by Weirdoactivity.

Also: TRF libraries include Bravo Cobra, Dennis, Kool Kat, MP 2000, Musictrack, PowerSound, Pyramid, Spain Is Music, Stock, Supraphon Classical library and the authentic International Ethnic library.

Trilogy Broadcast Ltd. **SU6457**

Intro: Mentor HD features a new design which offers multiple sync and test outputs in 525/625 analog and digital, plus facilities to operate in multistandard HD where required; Black Box 2 is a multifunction interface with enhanced performance and facilities that allows four-wire audios, intercom panels and virtual PC-based panels to interconnect on a WAN or LAN in any combination; Callstation is a compact control panel with eight push-buttons capable of direct connection to a Black Box 2 or via a USB interface unit to a laptop PC; Cosmos software control system include network connectivity, improved alarm masking and a host of other improvements and options that include VTR/Server data, subtitles and AFDs.

Also: Sentinel, Mercury Commander, Orator.

Triple Crown Products Inc. **N1946**

TWR Lighting Inc. **N2137**

Intro: LED obstruction light, low-power consumption, long bulb life, fits in standard fixtures.

U

U.S. Geological Survey **RT515**

UtilityTower Co. **N2538**

On Display: Towers, lighting, grounding, engineering.

V

Valcom Limited **N3131**

Intro: Freestanding 75-foot fiberglass AM antenna with top radials.

Also: Antennas.

Valentino Production Music and Sound Effects **SU5619**

Intro: Millennium Production Music Library (16 CDs); "Pocket Studio" Hard Drive with 5,000 sound effects and 600 production music clips, royalty-free; Action/Impact Sound Effects Library (5 CDs) ; Evergreen Production Music Library (113 CDs).

Also: Production Music and Sound Effects Libraries

Vanex Inc. **SL2864**

Intro: MCMS integrated media administration solution; NIBILL billing solution.

Videoquip Research Ltd. **SU5613**

Intro: DMX-1 SDI Audio Separator is a compact device that allows the AES/EBU digital audio signal to be de-embedded from an SDI video stream. Features a headphone output for monitoring the audio signal; ADM-4 AES/EBU Digital Mixer is a half-rack digital mixer that provides front-panel level controls to mix four channels of digital audio; AM-4 Audio Monitor Panel is a two rack-space monitoring system, including amplifier and speakers, for monitoring a variety of audio sources. Inputs include two balanced analog, two digita and an SDI video input that permits monitoring of the embedded digital audio stream; ADC-2 and DAC-2 analog to digital and digital to analog audio converters are half-rack converters with 24-bit, 96-kHz operation, exceptionally low noise with zero jitter.

Videotek Inc. **C974**

Intro: ASM-100 multiformat audio monitor for sound studios, production audio rooms, surround sound applications, an audio instrument designed to monitor many audio formats in one unit, 1RU, high-resolution XGA output for use with a standard PC monitor. It will display eight channels of analog or AES/EBU audio in the base unit.

V-Soft Communications **N2007**

On Display: AM-Pro mapping and allocations tool plots FCC coverage and interference contours and performs full groundwave and skywave AM allocation studies.

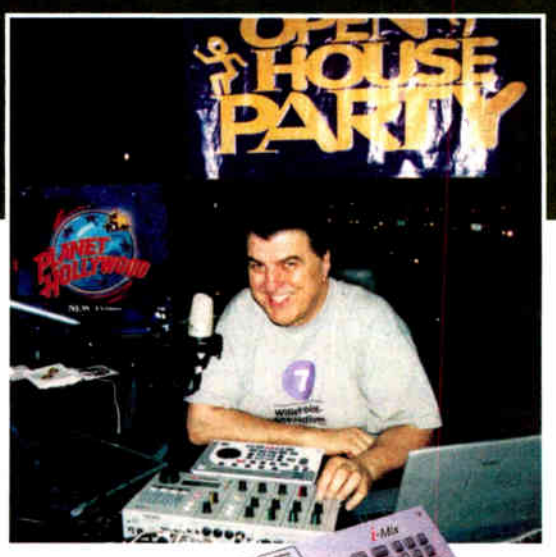
W

Ward-Beck Systems Ltd. **C722**

***Intro:* POD22 Stereo Loudness Meter, 1/2 rack width, 1 rack high, 41-segment stereo LED bargraph and seven-segment phase correlation meter, designed to display VU and PPM meter ballistics simultaneously. Inputs may be analog stereo or AES/EBU 110 or 75 ohms. This is an addition to the family of POD products; also, the DA305 AES Processing Distribution Amplifier, allows level adjustment of AES digital audio signals through manual or automatic control, and can provide up to 31 frames of delay and be used as a sample rate**

Test drive the Tieline Codecs @ NAB Booth #N2063

Tieline POTS Codec upstages ISDN at Grammys!



John Garabedian uses i-Mix at the Grammys

The Open House Party entrusted Tieline POTS Codec Technology to deliver the Grammys LIVE to 160 stations across the USA.

Reed Lewis, VP of Technology for "The Open House Party" had this to say about Tieline:

"The Tieline connected over an analog line for seven hours straight over notoriously bad New York phone lines with a rock-solid connection. Audio was definitely broadcast quality, and 'blew us all away'. We didn't have to use an ISDN line! Tieline delivered studio-quality audio over a plain telephone line".

Use Tieline 15kHz POTS audio codecs for:

- Unrivalled Stability
- Superior Sound
- Unique Remote Controllability

A small selection of satisfied Network and Radio Group Tieline Owners

- Clear Channel
- Entercom
- Disney/ABC
- CBS/Infinity
- Sandusky
- Jefferson-Pilot Broadcasting
- Westwood One
- Tribune Broadcasting
- University of N. Alabama Sports Network
- Simmons Media
- Tennessee Titans Radio Network

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converter or an AES test tone generator. This is an addition to the WBS Serialboxx line-up; also, the SLM Free-Standing Loudness Meter Series. The SLM1D is a stereo meter, SLM2D is a 4-channel meter, SLM4D is an 8-channel meter. Ideal for stereo, 5.1 and 7.1 audio metering.

***Also:* R2K production and on-air consoles, Bit Buddy, Bit Spitter, PODS, XTM4 Extended Range Meter.**

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E-mail: michael@ward-beck.com
Web site: www.ward-beck.com

Weather Central **RT519, C3136**

Weather Metrics **C4448**

Intro: City Weather.Net is a "Live-Local Neighborhood Weather Network" combined with a graphics system to create an on-air weather presentation and marketing tool. Real-time weather information from locations that do not have weather reporting, coupled with user-created, broadcast-quality graphics, which allows you to meet the needs of a market and create the "look you want" to air for your weather presentations. It can ingest multiple streams of live weather data and video simultaneously and output to air and the Internet.

Also: Turfwatch.

Wegener Communications **SU5280**

West Penn/CDT **C3781**

Westar Music **SU6332**

Intro: Production music for broadcast, audio, video and multimedia use, with 45 new music CDs.

Wheatstone Corp. **N2804**

Intro: D-4000 4-bus digital radio console with hot-swap modular design, 28 or 32 mainframe inputs, analog and digital I/Os, VU metering, dual source inputs, optional line selectors, phone modules, open-bus architecture, logic, opto-isolated machine control, TB, cue, headphone, clock and timer, electronic switching and solid-state illumination, switchable daughter cards to allow varying sources and signal rates; also, A-7000 analog modular air console with any combo of dual source mic or line inputs, four stereo outputs, mono sum and out, programmable logic, machine control, mutes, sends and mix-minus outs, phone call-in support, monitor and talkback functions, VU, clock, timer, stereo cue/solo, EQ, aux send and individual channel IFB feed options; also, Gen-9 Digital On-Air Radio Control Surface, integrates with Wheatstone Bridge network routing system. Bridge engine components allow up to 256 mix busses in one rackmount cage, and cages can be stacked for larger systems. Multiple Generation-9 surfaces can be linked to form a network, suitable for large integration projects, and providing integration of routing, machine logic and communications, configurable via Wheatstone's X-Point and VDIP software packages.

Also: D-8000 digital radio console, Wheatstone Bridge router, studio furniture and prewire systems, SP-8 modular analog production/live TV/radio console.

Not Barney, but close.

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Experience Armstrong Transmitter!

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

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

Features Include:

1/4 Wave Grounded Grid Tetrode PA

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Advanced Control System with remote computer interface

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Whirlwind **C3434**

Intro: MultiSnake combines a four-channel audio snake with four Whirlwind Director DIs; also DCS88 CobraNet digital audio transceiver, with eight mic or line analog inputs and eight line outputs and a remote power feature that eliminates the need for AC power at each unit.

Also: Presspower 2, Qbox, Tester.

WhisperRoom Inc. **SL2657**

On Display: Sound Isolation Room.

Will-Burt Co. **C3181**

On Display: Hurry-Up telescoping manual mast, pneumatic telescoping ENG masts.

Winemiller Communications **C2569**

Winsted Corp. **SU5421**

WireComm Corp. **SU6233**

Intro: WireCap Professional captures and organizes stories from wire services like Reuters, AP wire, PR Newswire, NOAA Weather Wire Service and City News Service and puts them into a database for retrieval and display; also, the Network Directory program enables a user on a LAN or WAN to access the WireCap database, sort, display and search for a word or phrase, display the results in single or multi-line format, store common searches on function keys or assign them to buttons. Functions of the Internal Instant Messaging program are available optionally to create an integrated directory and messaging program; also Internal Instant Messaging, with a supervisor profile that enables you to set up user profiles for the message system, users or groups of users so John Smith may be an individual profile but also be part of a "Sales" group; also, Pictures and Tunes, a program that facilitates the creation of multimedia presentations so you can create a professional sales presentation with pictures, graphs, voice and music in minutes. Assemble a package presentation to show at an employee event or on the corporate TV channel. An advertiser could put together an ad for a cable channel. Pictures, sound, video and text can be scheduled. A caption field can provide additional information about the presentation. *Also:* WireCap2000

Wireworks Corp. **C2309**

Wohler Technologies Inc. **C2543**

Intro: VAMP2-SDA compact 2U rackmounted unit offers combined digital video and audio monitoring, four-inch LCD video for SDI and composite video plus self-powered speaker system for monitoring audio from SDI, AES/EBU and analog inputs with conversion and front-panel group select; E MON-1/SDI Dolby E audio monitor is now available in HD-SDI and SDI variants for the direct monitoring of Dolby E signals embedded in SDI streams; AMP-S8 self-powered speaker systems come with eight high-resolution tricolor LED bargraphs and available for 1.5 Gbps HD-SDI, SD, AES/EBU digital and analog audio, and with new front-panel selection of any combination of eight channels to the left and right speakers. Versions are available in 1 or 2U.

Wolf Coach Inc. **C2462**

World Tower Co. Inc. **C821**

X

Xytech Systems Corp. **C4208**

Y

Yamaha Corp. of America **N2420**

Intro: DM1000 Digital Production Console is a multiplatform 48-channel mixer featuring 24-bit/96 kHz audio, effects and processing on every channel, surround production features, integration with digital audio workstations and automated recording in a compact, rackmountable package; PM1D 1.5 System Software contains operational enhancements and new expansion capabilities, plus feature sets for theatrical and broadcast applications. Operational enhancements include Global Paste, Auto Mix Minus, improved Patch Screen and DCA Mute Indication, Dual Console Mode, System Cascade and Remote MIDI Control Change operation.

Z

Z Technology Inc. **C3567**

Intro: Signal coverage measurement/mapping systems in rack-mount and portable configurations.

Also: DSS5100 Measurement/Mapping System, R-506 Programmable Field Strength Meter, BC-BCB Calibrated Low-Frequency Block Converter.

Zaxcom Inc. **C3024**

Intro: Digital Wireless Microphones offering a range of 1,500 feet, hard-wire quality, noise-free transmission, 128/256-bit key encryption, true digital.

Zero Manufacturing Inc. **C143**

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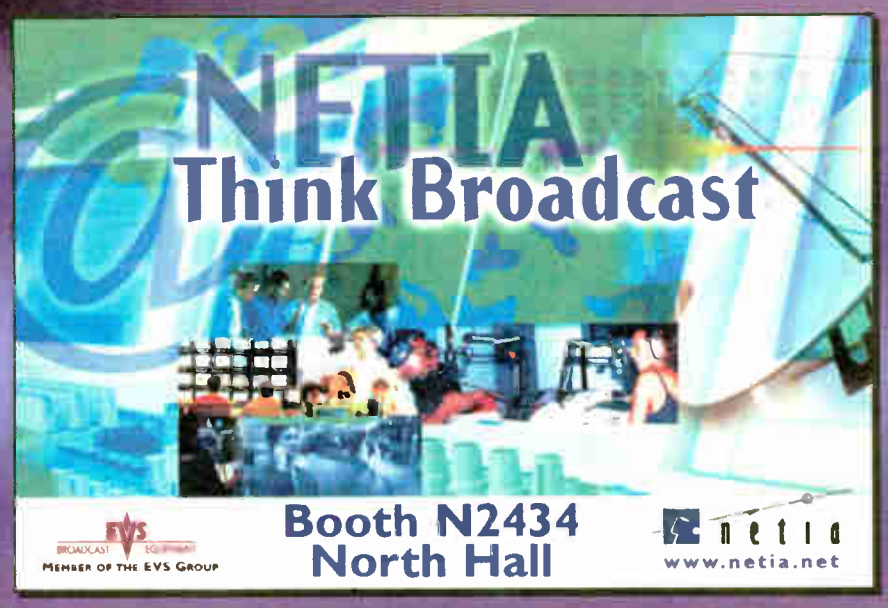

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World Radio History

What's Ahead for Menu-Driven Radio

Broadcasters Should Be Cooking Up Services To Appeal to the Tastes of Future Users

by Skip Pizzi

Part of my duties involves work with a standards body called the TV-Anytime Forum, which is developing specifications for interoperable Personal Video Recorders (PVRs, such as TiVo, Replay, UltimateTV, DishPlayer, etc.). The group meets around the world. One of the more fascinating meetings was hosted recently by Novell at its headquarters in Provo, Utah.

At the meeting's end, a large group of delegates headed off to dinner at a nice restaurant. As the meal progressed and the venue became less busy, the restaurant's pleasant hostess came over to our table and asked, "So what exactly is 'TV-Anytime'?" The group nominated me to describe its work, and not knowing anything about her, but assuming no special knowledge of digital media technology, I started slow and waited for cues of recognition.

From her reactions, I gathered that she was starting to get it, but I soon saw signs of TMI (too much information) setting in. (I get that a lot, especially from my kids, where it happens within nanoseconds after I start talking.)

Just then, some new customers arrived and the hostess had to attend to her work, leaving me with a sense that she felt sorry she had asked.

An enjoyable dinner continued, but our table was surprised a few minutes later to get a visit from the executive chef of the restaurant. After inquiring briefly about our satisfaction with the meal, he turned his line of questioning to the PVR. It turns out that the hostess had, in fact, captured the essence of the Forum's work and faithfully represented it to the chef back in the kitchen. Although she had no experience with a PVR herself, the chef was a multiple-TiVo owner and rabid enthusiast of the technology, so he hustled out to our table, armed with lots of questions.

After several minutes of deep PVR discussion, the chef advised the group, "Now you have to do the same thing for radio."

Tomorrow's special

At this point, I was the only person at the table who was interested in continuing the conversation; most of the others were exclusively TV-oriented. So I probed the chef's thinking independently.

He acknowledged that he was also a multi-vehicle XM Satellite Radio user, and strongly desired some sort of electronic program guide or EPG and integrated digital storage in a radio receiver, including local terrestrial services.

Unfortunately, I had no good news for him regarding progress in this direction, but it speaks to an important open issue: What *is* the future for personalization or interactivity in the next generation of radio?

This is a fundamental new requirement to any media system in the post-Internet age. Users will no longer be satisfied (at least for some parts of their listening time) with random browsing of the available services in real time. If a medium does not offer some method of seeking desired content and capturing or time-shifting it, terrestrial broadcast radio could become marginalized.

The model of today's purely passive listening will never fully go away, but it will become increasingly less valuable as other more personalized services emerge.

Some will argue that radio isn't used this way, and that as long as you know the format of a particular service or channel, you have all the information you need. Today's terrestrial radio doesn't even have that — although RBDS was supposed to provide a text display of this data for FM stations, and various database ROM systems have come and gone — so a channel surfer still has to scan and listen to find a particular format. If a commercial is running as the listener tunes by, the format's existence on the dial is not recognized.

IBOC radios w likely ill provide a format display, but this too remains a promise yet to be fulfilled. Satellite radio is today's only consistent provider of visual format identifiers, and they are essential in navigating these multichannel services.

Yet there are plenty of occasions where format identification, or even title/artist data, isn't enough.

Consider the case where you're at home watching a sporting or news event on TV, and then have to leave the house, but you'd like to keep listening to the event on the radio. How do you find out if it's being broadcast and what station it's on?

At least TV viewers without EPGs can consult TV Guide or the newspaper for comprehensive and consistent program listings. Radio listeners typically are on their own in such cases.

The Big Picture

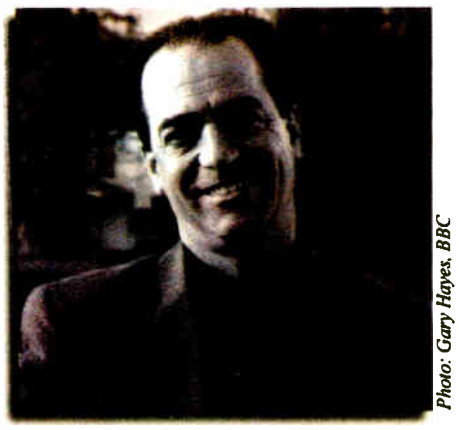

Photo: Gary Hayes, BBC

by Skip Pizzi

Or what if you're a fan of a national weekly show like "American Top 40," "The Grand Old Opry," "The Metropolitan Opera" or "Prairie Home Companion," and you're traveling, but would still like to hear it in the city you're visiting? How to find the time and station?

And what about commercial opportunities for these new data services (subscriptions, banner ads, etc.), such as digital TV broadcasters are now contemplating and starting to deploy?

These are the services that broadcasters should be developing for their future broadcasts. Higher audio fidelity is fine, but added convenience and responsiveness to personal needs provided by EPGs, integrated storage/timeshifting and synchronous enhancement data do more to build listener loyalty and good will.

The digital transition that seems ready to begin is the best — and perhaps the only — opportunity that radio broadcasters have to enable such features. Given the surfeit of competitive services likely to emerge, broadcasters should be doing everything they can along these lines to retain current audiences and appeal to the listeners of tomorrow. Anything less is a recipe for failure.

Skip Pizzi is contributing editor of Radio World.

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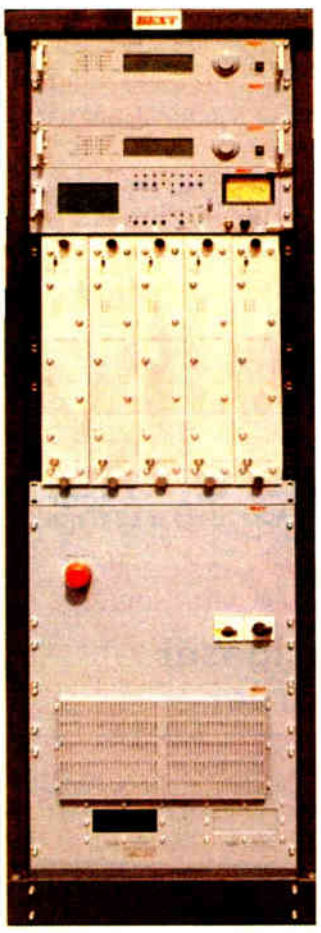

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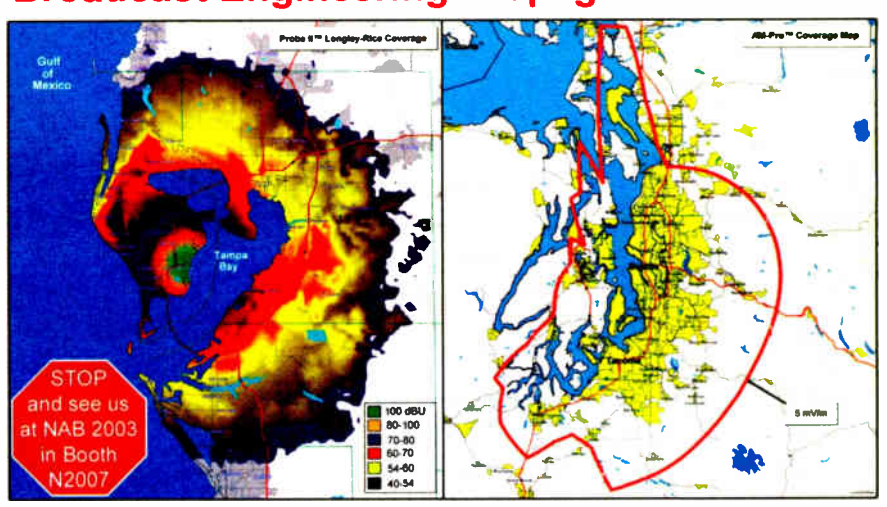

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World Radio History

Control Gets More Sophisticated

by Tom Vernon

Radio broadcasters' needs for remote control and monitoring gear have grown from yesterday's simple equipment based on stepping relay technology to keep watch on one or two transmitter sites, to today's microprocessor-based units that supervise multiple locations, allowing access via dial-up telephone, cell phones or the Internet. What does the future hold?

The landscape for monitoring and control applications in radio continues to expand at a fast pace, and now there are a growing number of unattended sites with uninterruptible power supplies, emergency generators, air conditioners and AC switchgear along with their associated mission-critical computers, routers and servers that run the station's traffic and automation, and stream media over the Internet.

Design approach

In some states, energy deregulation legislation permits utility customers with large AC generators to switch them online during periods of peak demand for a reduction in their electric bills. This, too, requires some sophisticated monitoring and control circuitry.

While these and other power management devices need to be monitored, many of the standards and protocols being developed in the IT world seem to be at odds with the ways that broadcasters traditionally have handled remote control.

Managers and engineers in radio plants may soon need to decide how they will integrate monitoring and control of IT equipment from remote sites with legacy equipment at the transmitter site. The ultimate goal of these efforts should be to present an integrated view of the entire plant.

Alan Katz, senior product manager for MGE UPS Systems, sees changes and developments in monitoring technology for UPS and power management systems.

"We're moving towards the use of XML tags, rather than having custom-designed shutdown software. These tags give key status information such as: the UPS has low battery voltage, is about to shut down or is online."

A benefit to the use of XML tags is that it will make it easier to create industry-wide standards, so that different manufacturers' equipment will be able to communicate.

"Web-enabled monitoring is becoming a universally demanded feature," he said. "In the past there were dry contacts and serial port or USB monitoring. Now the UPS needs to have its own embedded Web server that will be addressable over the Internet as a unique device."

Another trend in monitoring, he said, is for operating systems such as Microsoft Windows or Mac OS to have power management features built in.

SNMP

One of the most popular methods that administrators have adopted to manage large networks is SNMP or Simple Network Management Protocol, an Internet standard that manages nodes such as UPSs, servers, routers, hubs and switches. One reason for the widespread adoption is its flexibility.

"SNMP is one of the most universally integratable methods because it allows the system administrator to write their own script to look for the trap from the UPS, and then create another script to manage the shutdown," Katz said.

Whenever UPSs and servers are located at unattended sites, there are usually a host of other parameters that need to be monitored, such as room temperature, emergency generator status, air conditioning, intrusion alarms and leak detection. At this point, the next logical step is to migrate to a building management system or BMS, a combination hardware and software solution that gathers info from all equipment and presents it via a common point to the Internet or other connections.

Traditionally these systems have been quite expensive, but a new generation of equipment is available for under $1,500 that allows them to be used by a wider market. Don Raymond Sr., president of RLE Technologies, said most systems offer a variety of ways to notify someone when trouble occurs.

"If the system doesn't receive an acknowledgement from the first person on the list, it continues contacting people until the alarm is acknowledged."

Many systems, he said, can be set up to call different groups of people for different types of alerts. For example, an air conditioning alarm can page a list of HVAC servicemen, security alarms can call police.

As users of energy management systems attempt to connect different vendors' equipment together, and tie in to a building management system, they may be confronted with the lack of accepted standards.

Alan Katz

Sriram Sivaram

Harold Hallikainen

Peter Burk

Sriram Sivaram, president of Catalyst Power, said, "If you were to purchase a UPS today, you would find that each vendor has their own software protocols to monitor and manage facilities remotely, but you would not find a standard between vendors. The same thing applies to the world of backup or parallel generators. This is one area where the industry really hasn't come together."

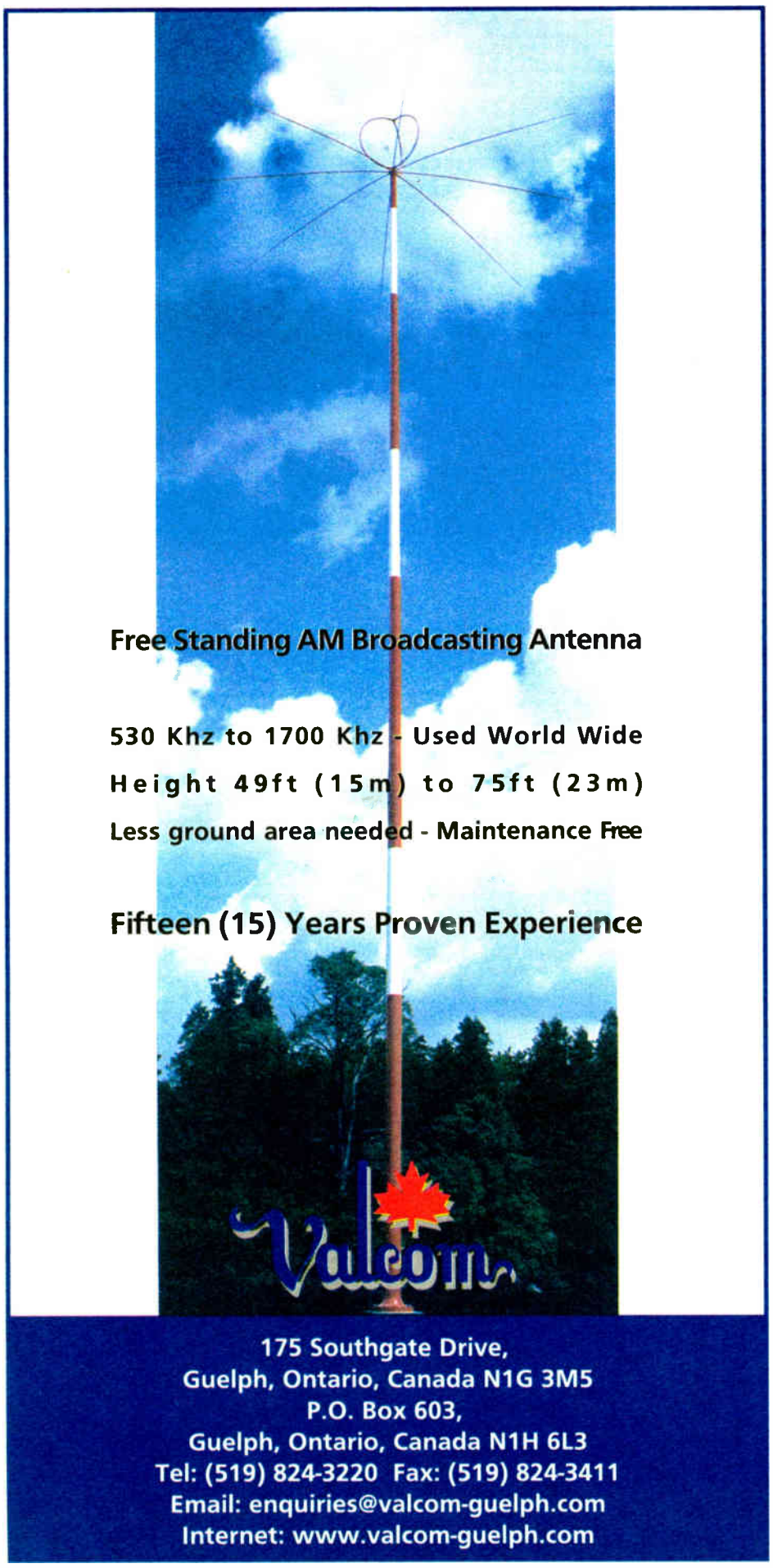
While there is a W3C consortium charged with setting standards for UPS monitoring, Sivaram feels that the implementation of its guidelines is still some way off.

The situation grows more complicated when attempting to interface with a building management system. "Many of the larger BMS are still software-based," he said. "I haven't seen too many XML-based solutions, that's just starting now."

Predicting the future of technology is never easy. Not surprisingly, industry leaders differ in their opinions on some points.

Peter Burk. president of Burk Technology, noted differences between the coming IT standard for monitoring,

See CONTROL, page 55 ▶



World Radio History

Control

▶ Continued from page 54

SNMP, and broadcasters' needs.

"SNMP technology is critical for running a large IT network, because there is too much data to collect using old-fashioned methods," he said. "It is also applicable to radio and TV, but there are a few hurdles. Broadcasters need to continuously gather data on transmitters and other equipment, but SNMP is based on exception reporting, only alerting staff when parameters go out of tolerance.

"Right now, SNMP is a little ways off, largely because of all the legacy equipment in the field. In the long run, though, there is a trend to integrate more and more data streams into the control process so that we don't have to do everything with individual wires to each device. The main task that we have is integrating the signals from all these devices and boiling it down to a user-friendly view of the plant."

With the growing trend toward autonomous pieces of equipment talking among themselves over the Internet, one could speculate that the remote control box might go the way of the cart machine. Burk remains confident, though, that the hardware-based system used by broadcasters has a bright future.

"The vargarities of the Internet as a communications medium are still an issue. You need to be positive you can keep control of your system. The MTBF (Mean Time Between Failure) of modern remote control equipment is much better than the best PCs, and the actual box doing the control is critical. Also, we tailor our solutions specifically to the broadcaster's needs."

Burk said his company is doing a great deal of research and development in the realm of hardware design, and sees this as a growth area.

Harold Hallikainen, president of Hallikainen and Friends and a contributor to Radio World, also thinks that the remote control as a separate box has a future. He believes the Internet will be an important part of it.

"As we build larger systems, we need simple interfaces, and analog voltages and contact closures are a simple way to go. I don't see that going away any time soon."

Regarding the reliability and security of the Internet, Hallikainen said, "If you're nervous about the Internet, you can run stuff over your own network, i.e. STL, TRL and use point-to-point protocol, but I'm not convinced that your own network is necessarily more reliable than using any other provider. If you're really concerned, you can always set up redundant paths.

"The bigger worry should be security, for example, someone from the other side of the globe shutting down your transmitter."

New breed

The new breed of monitoring and control gear is Web-based, user-friendly and easy to interface with various pieces of computer and AC power equipment. Some interesting devices are offered to fill various needs.

For instance, Dawning Technologies, a company new to the broadcast market, offers the Secure Network Interface unit for $595. The SNI can convert a serial port connection to TCP/IP protocol without the hassle of a host computer. The box is assigned its own IP address, allowing users to display and monitor whatever is connected to it. Customers need to do some BASIC programming to interface the attached equipment to the SNI. For deep remote applications, the Secure Network Interface can work through a cell phone connection.

Typical of mid-range equipment is RLE Technologies Falcon Monitoring products, which incorporate monitoring, logging, alarming and a multi-protocol notifying solution in one package. The standard unit includes eight universal inputs and two relay outputs. Option cards are available to provide additional inputs and relay outputs. Two-stage high- and low-level alarms can be configured individually for each channel. Users can access the Falcon products remotely to view real-time status of any parameters via the Internet, dial-up telephone line, LAN or WAN network, or via EIA 232 serial connection. Falcon products are priced from $1,295.

On the small-scale end of the spectrum, Videoquip Research Limited's UVM-6 Universal Voltage Monitor can measure true RMS voltage from six 120 or 220 VAC sources. The one-rack unit device then sends the results via an EIA-232/422 port, or optionally, via a 10Base-T Ethernet connection. The Universal Voltage Monitor can monitor line voltage on six circuits, or measure the line-to-neutral voltages of a three-phase line, or track the voltage from a standby generator. The UVM-6 sells for $495.

For information on the Falcon monitoring products, visit the RLE Technologies Web site at *www.rletech.com* or call (800) 518-1519. Data on the Videoquip UVM-6 is at *www.videoquip.com*, or call (888) 293-1071. For Dawning Technologies SNI, go to *www.dawning.com* or call (800) 332-0499. For Burk Technology, visit *www.burk.com* or call (978) 486-0086.

Tom Vernon is a multimedia consultant based in Philadelphia. E-mail him at TLVernon@blazenet.net.

MARKET PLACE

Mini-Strobe Runs on D Battery

This personal safety device can be seen up to five miles away, depending on conditions and line-of-sight, and runs on a D battery. Stick one in a toolkit in your car, another one in the locker at your transmitter site.

LEDtronics makes the Mini-Strobe, which can make a person easier to see in low-light environments. Its Xenon lamp emits a bright flash 50 to 70 times per minute for 72 hours on one battery. The lamp itself lasts for 200 hours before needing replacement.

Clear, amber, green and blue lenses are included, as is a stainless steel safety pin to attach to a tool belt, hiking gear or safety vest.

Cost: $21.50 per flashlight.

For information contact the company in California at (800) 579-4875 or visit www.ledtronics.com.

Eimac Updates Power Tube Reference

A popular reference book about power tubes is available online, with updates, and will be reissued in print soon.

The Eimac division of CPI has posted "Care and Feeding of Power Grid Tubes" at *www.eimac.com*. It covers device fundamentals and theory, equipment design and applications information.

"This is considered by many to be the essential reference work in the tube industry," the company stated.

The book is out of print. The online posting is in PDF format and has updates, including a new section on inductive output tubes, or IOTs.

For information contact the company in California at (650) 592-1221 or visit www.eimac.com.

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World Radio History

Workbench

Radio World, March 26, 2003

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

You Won't Find This at IKEA

by John Bisset

College students scrounge for furniture. Usually they end up with hand-me-downs from home or the Salvation Army.

Joe Brannan is program director and engineer of WEGL at Auburn University in Alabama, and an electrical engineering student at the university. When it was time to retire the station's Scientific-Atlanta SEDAT receivers, Joe sprung into action.

The receiver was first used to hold up a speaker in his surround-sound system. It makes for a great $16,000 conversation piece — especially since it still lights up.

But furniture evolves in the college dorm. Its latest use, as seen in Fig. 1, is as a TV stand.

★ ★ ★

Chris Waldrup, former engineer for Curtis Media in Raleigh, N.C., now with Integrian at the Research Triangle Park, uses these old satellite receivers in a different way.

An avid ham and bread-boarder of circuits, Chris cannibalizes them for the ceramic trimmer caps, Mini-Circuits mixers, silver mica capacitors, socketed chips and MBD101 hot carrier diodes, which are now obsolete in leaded packages. The SEDAT boxes also contain high-quality Jensen audio transformers, useful for building projects.

As for removing the components, Chris suggests using an ordinary heat gun (Weller, Master Mite, Easypower). These do an excellent job of desoldering components, including Ics when coupled with some solder wick. Guns that operate in the 750 to 800 degree range are best; hotter guns tend to burn the board.

Fig. 1: WEGL's old Sedat receivers make a nice TV stand.

★ ★ ★

One morning, not long ago, Jon Hosford, director of engineering for Montpelier Broadcasting, got that dreaded call from a DJ. The building smelled like something was burning, and the ISDN line, used as an STL, was down.

Jon uses a Telos Zephyr Classic to get audio to transmitter, 30 miles from the studio. As always seems to be the case, there's no backup.

Jon quickly diagnosed the problem to be related to the power supply, but the Zephyr supply provides +5, +12 and -12 VDC. At 5 in the morning, and with no -12 VDC supply handy, it occurred to Jon that a normal computer power supply would have those outputs.

Within 15 minutes, the Zephyr was back on the air. It didn't look pretty, but worked until Telos overnighted a replacement.

Why it never occurred to Jon to use an old computer supply for a DC supply, he's not sure. But a typical 200-watt computer supply can provide 20A @5VDC, and 8A @12VDC. Even though the -5 and -12 volt supplies are only 0.5A, in a bind that could be just enough power to get you by. The larger 350W supplies can handle even more of a load.

Everyone has at least one junked computer laying around. And even if there isn't one, sacrificing the computer the jocks use to surf the Net will work to get the station back on the air.

★ ★ ★

Speaking of power supplies, Jim Arcaro of Cleveland writes about a

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See us at NAB2003 Booth #N3101

World Radio History

Workbench

▶ Continued from page 56

problem you might want to check into, if you have programmable uninterruptible power supplies.

Jim got called to a site where the computer network was down. There was a direct lightning hit to the power line, and the fuses in both the UPSs and the DSUs blew.

Jim thought it strange that the customer DSUs should blow, as they were after the UPS, and all equipment was grounded by a dedicated #6 ground wire.

Jim plugged the equipment directly into the wall and got some of it working. He then replaced the fuse in the UPS, and let its batteries start to charge.

Everyone has at least one junked computer around.

While replacing the fuses in the DSUs, however, Jim noticed they were only slightly brown, not black as one would expect with a direct hit. He called the manufacturer of the DSU and was informed by the technician that the maximum rated input voltage was 130V.

Checking the UPS, which was programmable, Jim found that it was set for its maximum of 138V. Jim reset all the UPSs to 128VAC. By the way, he also checked the brownout voltage. It was OK at 105V. The tech rep said the DSU would work fine down to 90V.

Thanks to the UPS, the routers and hubs were unfazed by this, but the dial-up modem took a hit through the phone line, even though the telco was protected with gas tubes. A monitor, printer and print server were saved by a high-quality surge strip, which took the hit and was sacrificed.

The lesson learned? Jim is plugging the UPS into a wall-mount surge protector. He admits that it's redundant, but if it blows, he can just plug the UPS into the wall outlet and keep running while replacing a $50 item instead of the $900 item, at his leisure.

★ ★ ★

We all have to fish RG-6 or smaller coax and low-voltage plenum wiring through tight spaces. Due to a lack of rigidity, threading the cable through floor joists, attic crawl spaces, or above dropped ceilings makes the job nearly impossible. Even a fish tape will bend and curl, leaving the "fish-ee" ready to go fishing.

I've pestered my friend Bob Hughes, who has worked on the air in Washington, programmed stations and engineered them, to draw on his experience and contribute something to *Workbench*. Bob is now the manager of the Visual Recording Facility at the Pentagon. Drawing from his own frustration in "fishing" cables, he came up with an inexpensive solution.

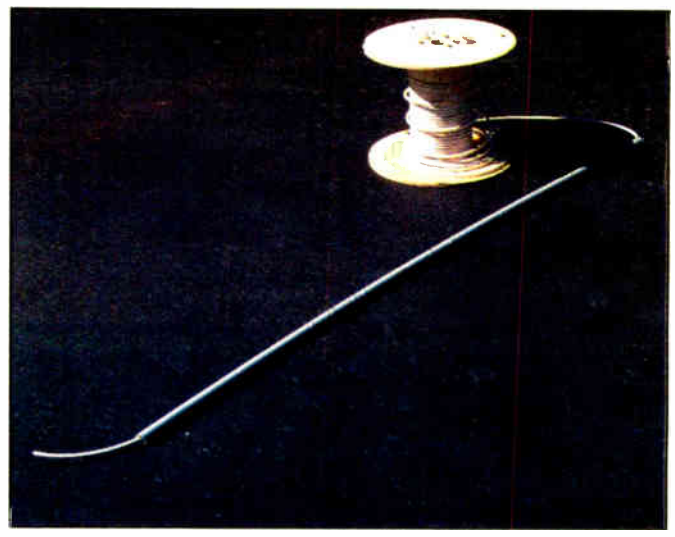
Bob calls it his Ronco/Popeil Cable Pusher, perhaps lobbying for wider distribution with that famous widgets company. You can see it in Fig. 2, thanks to his daughter Ashley's skill with a camera.

Construction is simple. Take a length of 1/2-inch PVC pipe (length to be determined by individual needs, and the length of your arm), cut it to size and thread the cable through it to its destination. By using the PVC to "push" the cable along, you'll be afforded the necessary rigidity to accomplish the task, with a minimum of frustration and aggravation.

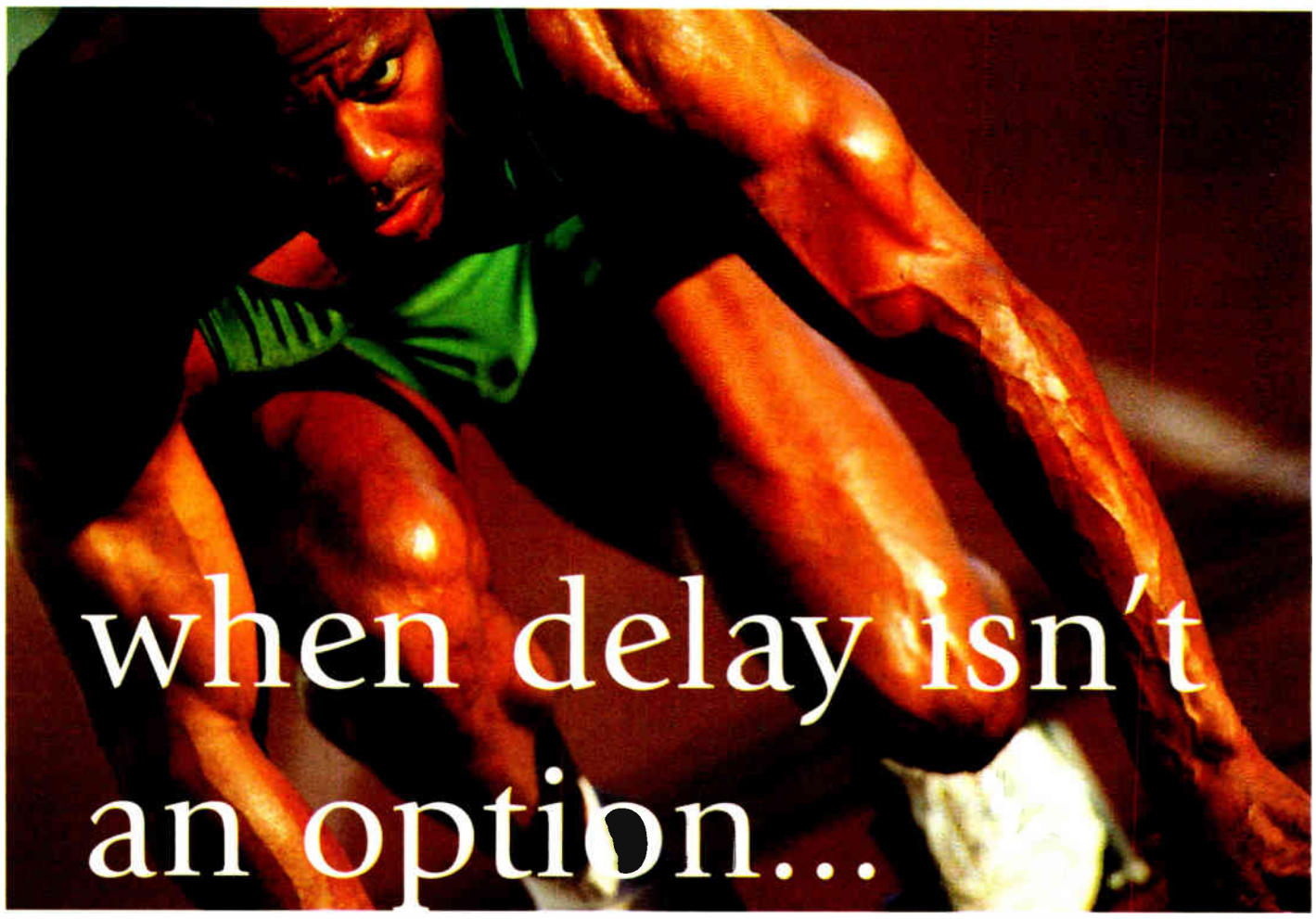
Once the cable gets to its destination, remove the PVC pipe and make your connection.

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

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



Bob Hughes calls this his Ronco/Popeil Cable Pusher.



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World Radio History

IBiz Adds FM to Your Pocket PC

by Don Tolson

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The IBiz Pocket Radio is a Compact Flash Type I card and accompanying software that adds a fully functioning FM radio to your Pocket PC bucket of tricks. Its small size keeps the overall product still very "pocket-able" and, if you get some better headphones, it has quite reasonable sound quality.

You can order the Pocket Radio directly from IBiz (*www.ibizcorp.com/pocketradio.html*) for $49.99. It is available in CompUSA stores as well as *www.mobileplanet.com* and *www.ibizpda.com*.

Installation

I should announce up front that I am a big fan of this product.

Ever since I found out I could create and play MP3s on my Jornada 568, I've been hoping for a radio attachment. I was getting tired of listening to the same songs, even though I had almost three hours of stuff on my 128 MB CF card.

The box contains a Pocket Radio CF card, an installation floppy, a set of bud-type stereo earphones and a four-page installation/usage summary.

The latter is just that, a summary of the technical specifications, a three-line description of how to run the installation *setup.exe* file and a picture of the screen interface, describing each of the controls.

Installing the Pocket Radio is straightforward. I would strongly suggest, as does the supplier, that you install the software from the floppy first, before inserting the radio/CF card into your unit.

I did, however, try it the other way to determine that nothing disastrous happens. It's just that the floppy software installs the drivers necessary for your PDA to recognize the card, and without those drivers you get weird messages like "unrecognized card."

If you run the install from the *setup.exe* on the floppy, it will expect that you have Microsoft's Activesync running and will use this to do the usual software install. I did notice that the floppy contains a *.cab* file, but I didn't try just copying the file over to the PDA, then running the *.cab* file. That might work too, but the manual didn't talk about that, and I'm just as happy using Activesync's installation routines.

Install took about a minute and didn't require any intervention on my part, except to confirm that I wanted to install in the default locations. Again, I didn't try installing to my CF card, and the manual doesn't talk about whether this is possible.

One nice feature of the install was that I didn"t have to do a soft-reset after installation was complete. Everything was immediately ready to go. The Pocket Radio icon is available from the Programs menu.

Interface

The screen shot on page 59 shows what it looks like on your PPC. Unfortunately, the colors in this shot are quite a bit brighter than in reality.

The user interface is simple and fairly intuitive (there's no manual or help text provided, other than the one-page description of the buttons and their functions in the installation/usage guide).

- PWR button is located at the top left, to shut down the application
- There is a slider on the frequency indicator to go directly to a portion of the band, and the frequency display updates as you move along
- The Scan button changes from Manual to Auto, depending upon which mode of scanning is selected, and scanning up or down the FM band is selected via the buttons beside the Scan button
- The Volume control on the left side is a slider (I noticed that the jogger up/down control on the side of my HP Jornada 568 worked to increase and decrease the volume)
- The Mute button shuts off the sound if someone comes up to your desk
- There are six presets available for each of three "bands," which you can preset by tuning to the desired frequency, then tapping and holding the preset button for more than one second
- The Z button turns off the screen to conserve battery power (unfortunately, with the colors selected, it always looks like this button has been depressed)
- The only Options are "About" and "Exit," and they do pretty well what you"d expect

There is no option to input a given frequency manually or go directly to a known frequency, except by using the scan or a preset.

The Auto Scan moves up or down the FM band, depending upon the direction selected, to find the next station. It seems only to stop on the strongest signals; it missed a number of serviceable signals, which I found later using Manual Scan.

Manual Scan goes up in 0.1 MHz increments — not exactly standard for North America, where stations are spaced at 0.2 MHz increments on "odd" numbers; but European stations do not have this restriction, so this is a good compromise.

The look and feel is not bad, fairly clean and intuitive; but it does seem a bit "fuzzy." Maybe there was a bit too much "shading" on the buttons? It just doesn"t look as clean and precise as I'd like.

Some of the labels on the buttons (Manual/Auto Scan, PWR button, Vol control) are hard to read, either because of color choices or the text is too small. The red "frequency" scale on the gray background is impossible to read at any distance.

For me, the Scan buttons are larger than they need to be. They may have been sized to allow for activation using fingers; but I almost never touch the screen with my skin. The use of the "segmented" numerical display for the frequency display probably tries to evoke a car radio; but again, from my perspective, it looks fuzzy and unpolished.

There are many colors on the interface (powder blue, turquoise, pink, orange, salmon, gray, green). This would look more polished if they focused on a single color theme.

It's neat that the application remembers which station you were on when you last closed it, even if you power off the Pocket PC.

Overall, I would say the sensitivity of the

See POCKET RADIO, page 59 ▶

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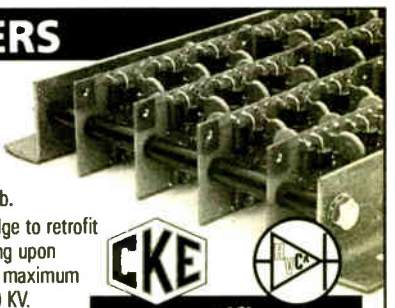

The Model 51014 package shown is a single-phase, full wave bridge to retrofit all AM and FM transmitters to greater than 15 kilowatts, depending upon modulation method. Rectifier cards are rated at 24 KV per leg at a maximum forward current of 6 amps, suitable for plate supply voltages to 10 KV. Additionally, each diode is protected by both an MOV *and* a resistor.
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World Radio History

Pocket Radio

▶ Continued from page 58

unit is quite good. IBiz appears to be using the headphone's cord as part of the antenna, which I guess was a good way to reduce the overall size of the unit.

I live in Victoria, British Columbia. It's not a large metropolis, but it's close to Vancouver and Seattle, each about 40 miles away. When I first tried the unit at work, I was able to receive only the strongest local signals, nothing from Vancouver or Seattle. I realized it was probably because I was on the first floor of a building that used to be a raised-floor computer room — lots of wires and cabling around.

When I took the unit home, I was able to receive all the major stations from both Vancouver and Seattle clearly, even some of the smaller stations out of the universities and colleges.

Pocket Radio Screenshot

On an FM radio, "quieting" is the ability to eliminate all noise, fuzz, etc. from the music signal so that you get a clear background. This has a lot to do with the strength of the signal being received. At a certain signal strength, you should hear nothing in the background at all. Pocket Radio did well in this regard, providing full quieting when given a good, strong signal, like an average FM radio.

There's plenty of volume in this unit. As mentioned, there is a volume control provided on the interface via a slider, and you can use the jogger control on the side of the Pocket PC to increase or decrease the volume in steps. This is a nice touch; it means that I can control the volume without opening up the organizer.

The quality of the sound is not quite as good as a 48/64 kbps MP3, but still reasonable for an FM radio. A lot will depend on what type of headphones you use. It was good to see that I could plug in almost any type of headphones and have it work adequately.

I'm not really sure why they couldn't route the sound to the ear jack on the Pocket PC; maybe they were building for some units with no ear jack. The unit could have been made physically smaller if this had been done, as I suspect a good portion of the right side is taken up with providing space for the audio jack.

I would have preferred an option to allow the user to route the sound through the audio facilities in the Pocket PC, rather than just the earphone jack on the Pocket Radio.

Crosstalk is a radio's ability to separate and distinguish between strong signals that are close together. It's also related to the tuner"s selectivity. A radio with a larger amount of crosstalk allows "spillage" of signal off the primary frequency onto nearby frequencies.

On the Pocket Radio, there was noticeable crosstalk from stronger stations up to 0.3 MHz on either side of the primary frequency. It was a bit of a problem at my home, where the Vancouver and Seattle stations tend to get bunched up at the high end of the FM band. This could be problem in high-density areas where there are a number of strong signals close together.

Sorry, there are no keyboard equivalents for any of the functions. However, you can adjust the volume using the side up/down jogger control, as I've mentioned.

Be careful if, like me, you have mapped the jogger controls to handle volume in the Windows Media Player. If you run WMP, the jogger controls will no longer work in Pocket Radio until after the next soft reset.

The unit is light and as compact as it can be, I would guess, given the need for the mini-stereo jack for the headphones. However, it's not quite like a memory-type Compact Flash card. It needs more careful handling; otherwise it can get broken.

I have to be careful to make sure it sits properly in the CF slot. If it isn't properly connected, my Pocket PC freezes up and refuses to respond to taps until the card is taken out of the slot.

Things I'd like to see in the next release:

- Integration with the audio provided in the Pocket PC
- Cleaner user interface — fewer colors, sharper graphics
- Better crosstalk performance
- More sensitivity on the Auto Scan function
- Ability to input directly a frequency to go to

Overall, I've been waiting for something like this device ever since I discovered MP3s and the Windows Media Player on my Pocket PC. In fact, I'm listening to it while writing this article.

I'm pleased with its performance. It's a little pricey when it arrives in Canada, after currency exchange, duties and brokerage fees; but I'm happy to have the ability to listen to my favorite radio programs without another addition to my already crowded work desk.

Don Tolson is an associate director of systems development for Fujitsu Consulting, where he provides management and strategic planning to senior executives. He enjoys playing with whatever new gadgets he can afford. Reach him via e-mail to don.tolson@consulting.fujitsu.com.

World Radio History

U.S. Radio Is an Anomaly

by Skip Pizzi

The turbulent international political situation and a lot of recent travel abroad have moved me to reexamine what we consider the status quo in U.S. radio broadcasting.

This seemingly unshakable and most stable environment may not always remain so, and it is helpful to see how the other half lives to evaluate our strengths and weaknesses. In addition to allowing us to count our blessings (or rue our shortcomings), it can help us predict where trends might turn.

The actual content of radio around the globe is remarkably uniform, at least in general terms. Broadcasts include various mixes of musical offerings and spoken-word fare, the latter ranging from news to sports to talk.

Formats vary, of course, and some services outside the United States change their format radically across dayparts. (Stateside, the only services typically using such a block-programmed approach are public radio stations, with the exception of some commercial music or news stations that also carry local sports teams' game broadcasts and pre/post game talk shows.)

Where real differences appear between U.S. and foreign radio broadcasts are in the areas of control and influence of these services.

The United States is one of the few countries where all radio stations are federally licensed but privately owned. Even the public broadcasting sector works this way in America, where there is no government-operated broadcasting. In most other countries, public broadcasting implies state-controlled services, owned and operated by national or regional government agencies.

Although there is some federal funding applied to U.S. public broadcasting, it is granted to the qualifying, private non-profit entities that are licensed to operate such non-commercial stations, and there is no governmental control of these stations' operations exercised as a result of this funding.

In this respect, the process functions like many other federal subsidies of private industry. Public broadcasters are simply regulated by the relevant FCC rules, which differ from commercial radio rules in some respects, but which are administered by the same agency that regulates commercial broadcasters.

The process of disbursement for these funds to public broadcasters is further distanced from federal control by their passage through the Corporation for Public Broadcasting, a private, non-profit entity. Additional insulation is provided by an unusual forward funding mechanism, by which CPB's funds are appropriated by Congress two years in advance, to avoid any capricious cutbacks in reaction to current programming.

Nevertheless, the amount of federal funding applied to public broadcasting in the United States is very small per capita relative to most other developed nations, requiring most stations to seek additional funds through voluntary contributions and underwriting. The familiar on-air exhortations for listener support that result are another uniquely American broadcast phenomenon.

Art of the state

Even in the kindred environments of Canada and the United Kingdom, public broadcasting is a federally operated function. In these countries, as in many others, highly developed and well-funded state broadcast agencies own and operate end-to-end systems that include national and local production studios, distribution networks and myriad local transmitters, along with R&D facilities and more recently developed online services. Most of these state broadcasters handle both domestic and internationally directed external services.

The only true state broadcasting operations in the United States are the purely external services operated by an independent agency of the federal government's executive branch called the Broadcasting Board of Governors, or BBG. This autonomous organ manages all non-military governmental broadcast services operated by the United States, the best known of which are run by an agency called the International Broadcast Bureau, or IBB. These include the Voice of America, providing worldwide shortwave, satellite and Internet radio services; Radio Sawa, with Arabic services on FM in the Middle East; Radio Free Europe/Radio Liberty or RFE/RL, presenting shortwave and Internet services to much of Europe and parts of Asia; Radio Free Asia, with shortwave services to SE Asia and the Far East; Radio/TV Martí (Office of Cuba Broadcasting), providing AM and TV services beamed to Cuba; Radio Farda, a joint RFE/VOA service in Persian on AM, shortwave in the Middle East, and on the Internet; and Worldnet, providing TV content via satellite to broadcast affiliates worldwide.

Most of the radio services also maintain affiliations with other broadcasters around the world, to which they provide content.

Formerly operated by the State Department's U.S. Information Agency, which traditionally tried to maintain a policy of journalistic independence, these external services were moved to the newly created BBG in October 1999, and the USIA disbanded, to further shield them from the appearance (and the reality) of governmental control over their broadcast content and operations.

This is another uniquely American structure, as is a tenet of a 1948 law called the Smith-Mundt Act, which established the original Office of International Information at the State Department, stating that these services shall not be directed toward the U.S. domestic listener.

Comfort zone

In many other countries, radio also has a different overall position than in the United States.

Particularly among developing nations, where television is not yet widely deployed due to prohibitively high receiver cost and/or minimal services extant, and where low literacy rates obviate the use of print media, radio is the dominant method of mass communication, bar none. This elevates its importance to governments and other entities that would use the medium for public influence.

Given this lofty viewpoint, some may decry the seemingly frivolous usage of radio here for the likes of shock jocks and incessant advertising. Yet, in an indirect way, this shows the comfort, progress and media diversification that America has achieved, where such a fundamental medium can be successfully populated by ostensibly inconsequential or superficial material.

Consider also that although these are the most popular services, not all of American radio is occupied by such banal fare. Serious journalism, artistic expression and discussion of weighty subjects are still in good supply among U.S. radio services, and there are encouraging indications that audiences for such material is growing.

Like many other parts of our environment in these United States, it's easy to forget how different American broadcasting is from the rest of the world. It's one of the things that makes life so uniquely interesting here.

Skip Pizzi is contributing editor of Radio World.

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11 Software Helps Stations Run Shopping Shows

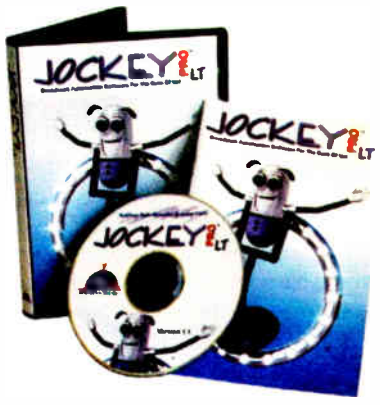
11 Software announced the release of three software packages for radio stations.

The company called Shopping Show Pro the first software aimed at radio stations airing shopping shows. It manages item tracking, costs, sales, commissions, Web site updating and certificate printing, so announcers can focus on the show and not on writing things down. Shopping Show Pro lists for $2,499.99 and works with Windows 98se, 2000 and XP.

Also news is Arrows, a Windows-based traffic management package for billing. It comes with an accounting module and spot delivery system and is available to various market levels at a buy-out price. Arrows works under Windows 98se, 2000 and XP.

Spotman Suite is for multiple stations with multiple locations that need to move spots, news, weather and logs to others on a network. The software automatically updates stations with whatever the traffic or production manager needs to get out and places the information in directories on the remote systems. After sending and receiving the data, it sends a confirmation e-mail to the sender.

Spotman Suite lists for $999.99 and works with BSI automation software; it is standard on the upcoming release of Jockey Pro.



11 Software also released updates to Jockey Pro LT and Vtracker LT. Jockey Pro LT is station automation for $99.99; it is aimed at college, low-power and small-market stations and Internet radio. V-Tracker LT is for use with Jockey Pro LT for Voice Tracking; it lists for $49.99.

Software is available on the Web site for trial download and use for seven days.

For information contact the company in Michigan at (906) 341-7588 or visit www.11software.com.

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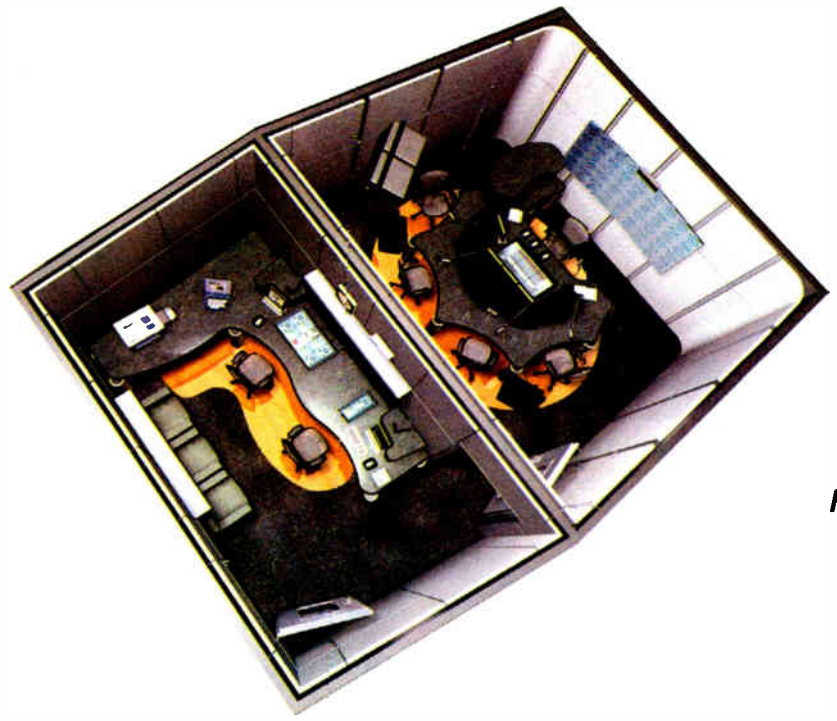

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Freed's Legacy Lives in Radio Studio

by Alan R. Peterson

March came in like neither lion nor lamb in Cleveland. It came in rockin'.

The newly redesigned Alan Freed Memorial Radio Studio was dedicated March 1 at the Rock and Roll Hall of Fame and Museum. It coincides with a new exhibit on the life and career of the legendary rock and roll broadcaster.

The event included a catered reception, ribbon-cutting ceremony with Freed's daughter-in-law and looped playback of classic Freed broadcasts.

Rather than a nostalgic recreation of a 1950s vintage station, the Freed studio is a state-of-the-art broadcast performance room with digital storage technology, an Internet Webcam, ISDN connectivity and a digital console, mounted in custom cabinetry. It is available at no charge to visiting stations for remotes.

Broadcasters General Store played the leading role in outfitting the studio, in particular the company's Gary Tibbets and Cecile Gibson. Representatives from Logitek Electronic Systems, Comrex Corp., Studio Technology, ENCO Systems, Telos Systems, Gepco, Auralex, McVay Media and other suppliers made the journey to the museum for the dedication. Friends, family and fans were present for the unveiling, presided over by officials of the Hall of Fame.

Radio World is a corporate sponsor. Rock Hall Donor Relations Manager John Grayson said Radio World Associate Publisher John Casey "has been a champion of this project since its inception." He credited Casey with the idea of naming the studio for Freed.

Also saluted was the late Scott Beeler, an industry sales executive who supported the project from the start. "While we dedicate this radio studio to Alan Freed's life and legacy, those of us who knew Scott and loved him and constructed the radio studio, dedicate our efforts to his memory," Grayson said. Beeler's mother, stepfather and pregnant widow attended as special guests.

Taking the stage to share their thoughts were Janis Purdy, vice president of planning and development; Grayson, one of the main coordinators of the project; and Associate Curator Craig Enciardi, who related a nostalgic experience on his way to Cleveland.

Photos by Alan R. Peterson

A view of the studio; some of the studio vendors pose after the ceremony; the Rock Hall logo appears in acoustical foam behind an equipment module; and John Grayson and Judith Fisher Freed celebrate the dedication.

"I passed the site of the old Paramount Brooklyn theater on the way here, where Alan did a lot of his live shows," Enciardi said of his trip from New York.

He introduced Judith Fisher Freed as "the keeper of Alan's flame. Without her, we wouldn't be here tonight."

After a swift ribbon-cutting ceremony, Freed strode into the studio and pushed a button on the console, launching a montage of broadcasts made by the self-proclaimed "King of the Moondoggers" and played over the sound system throughout the museum.

She also shared a thought with the builders of the studio. "It's beautiful, but two things are missing: a phonebook and a cowbell." Freed kept both within reach during his broadcasts. Sources say both will be added.

Judith Freed also noted the absence of a Diet Coke bottle, which her father-in-law kept close by. "Always empty," she said. "He'd finish it right away."

In a nod to Freed's legacy, the studio includes two concealed turntables for playing back the old stacks of wax. "Oh yes, turntables," she said. "I want to cry."

The studio dedication coincides with an exhibit on Freed's life and career that opened on the ground floor of the Rock Hall. Photographs, posters, Freed memorabilia and documents pertaining to the later payola scandals are displayed on the walls and in glass cases.

However, the ultimate tribute can be found on the second floor of the Hall: Alan Freed's cremated remains are in a silver box behind glass, presiding over the Rock and Radio interactive exhibit.

The studio is open and can be reserved in advance for remote live broadcasts originating from the Hall of Fame. There is no charge for use of the studio; stations typically are asked to read promotional announcements as part of their broadcasts.

To schedule a broadcast, contact Doris McVay at McVay Media. Fax a request for a broadcast date to (440) 892-8817 or send e-mail to *radio@rockhall.org*.

A live Webcam view is at *www.rockhall.com*.

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World Radio History

SUNY Brockport Preps Students

by Eric Shoars

This is one in a series of occasional articles about broadcasting education.

People seeking to enter the broadcasting field typically have their sights set on becoming on-air personalities. Most budding broadcasters do not realize the transferability of skills learned to other parts of radio and broadcasting-related activities.

The communication program at State University of New York at Brockport has recognized the importance of these transferable skills. It developed a curriculum that stresses this transferability and gives students the opportunity to develop those skills.

SUNY at Brockport is a four-year, public institution about 15 miles west of Rochester, along the Erie Canal. It was founded in 1867 and joined the SUNY system in 1948.

The communication program offers four majors: broadcasting (radio and TV), journalism, communication studies and communication application.

Today's students are more interested in PR and production than in being DJs.

As of 2002, the college had an enrollment of 9,200. Half of the 360 students enrolled in the communication program were listed as broadcasting majors.

The average class size is 18 to 22 in a studio class, with up to 40 in a theory class. The broadcasting major offers coursework that is a mix of theoretical, hands-on and technical components.

Among the course offerings in the major are such topics as principles of communication and theory of mass communication, radio/TV writing, broadcast announcing, radio production and TV production.

Electives include ENG field production, broadcast journalism, broadcast sales and marketing, argument and debate, propaganda and persuasion.

'Koz'

Warren Kozireski is an instructor in the communication department at Brockport. He says the mission of the broadcasting program is to provide students with the opportunity to gain hands-on and theoretical experience with all facets of radio and television, from camera operator/board operator to station management, via classroom and extracurricular activities in the student radio and television stations and newspaper.

Kozireski said his program compares favorably to other broadcasting programs.

"Combining student media with extracurricular (activities), the student working at the radio station gains a 'real radio station' feel to see if they will like the business," he said.

Students, he said, program the station using Selector playlists, work with digital live assist audio on a BE AudioVault, sell underwriting, make public appearances, do sports play-by-play, deliver newscasts, run a Web site with live broadcast and do ticket giveaways with recorded phone calls.

"Our alums can attest to the experience."

Alumni of SUNY station WBSU are working in cities such as Tampa Bay, Phoenix, Pittsburgh, New York, Philadelphia and Jacksonville. Jason Wentworth, a graduate of the SUNY/Brockport program, works as part of the morning team at KCOW(AM) in Alliance, Neb.

"Let me say this: If you are attending SUNY/Brockport because you want to work in radio, time at WBSU is a must. WBSU boasts a rich tradition of helping good, driven students get great jobs in radio mere weeks after graduation."

'On The Point'

WBSU(FM) operates at 89.1 MHz with 7,338 watts and goes by the slogan "The Point." It covers all or part of seven counties in western New York and the southern portion of Ontario, Canada.

WBSU's format is a mix of contemporary, rock and alternative, with specialty shows covering a variety of musical genres targeting males and female listeners 17-34. Seventy students run the station, with Kozireski overseeing as general manager and a student as operations manager.

Within the technical plant is an on-campus cable television studio for training new on-air personalities, two production studios and a news/sports studio. There are three studios adjacent to the classroom for hands-on studio work. This facility is being upgraded to digital.

Kozireski says today's broadcasting majors are trending away from disk jockey positions toward public relations and production. He believes that could be a result of voice tracking and the industry's pay scale.

"Stations used to breed their new DJs on the overnight shift, but those opportunities no longer exist. It seems every time we

See SUNY, page 64 ▶

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SUNY

▶ Continued from page 63

bring someone in from the field, they are telling the students to get into sales, and that's the last thing students want to hear."

Koizireski says Brockport's broadcasting program is improving the employment outlook for his graduates interested in radio.

'It seems every time we bring someone in from the field, they are telling the students to get into sales, and that's the last thing students want to hear.'

"The students gaining extra experience here at the student radio station are having no trouble at all finding jobs, in fact, stations are calling us looking for our students all the time. It's the students not getting the out-of-classroom experience that have fewer skills coming out of college who are having (or) will have trouble."

Kozireski said employers can improve the possibilities for future broadcasters in a couple of ways.

"Become more involved via guest speaking in classroom or station meetings and setting up a better intern experience than just using them as warm bodies at stations appearances handing out bumper stickers," he suggested.

"This gets old real quick with the students, and they leave the business thinking that's all there is to it. Challenge them and move them around to different areas until the light goes on.

"(It's) more work for the stations, but you need to treat them a more than warm bodies. If you don't have the time, don't take on any interns."

Dave Cohen, another graduate of SUNY/Brockport, who is working as an account executive for WNNX(FM) in Atlanta, credits WBSU as the reason he got his first job in radio. Asked about how he would rate the program's effectiveness in properly preparing students for a career in radio he said, "Ten out of 10 — excellent."

Wentworth and Cohen speak in high regard of Kozireski.

"Koz runs WBSU exactly as professional stations are run, so I learned how things were really done," said Cohen. "Koz is honest without being heartless; he's friendly and informal at no expense as his role as advisor. He spins anecdotes from his own commercial radio successes and failures.

"Koz is not some professor who hasn't seen a commercial radio station in 35 years. Koz is the real deal."

Kozireski's advice to students thinking about entering his program and getting into radio?

"Get involved in the student radio station from day one. No matter your level of experience, we'll take you up to your level of interest and ability.

"If you choose to attend class and get a degree without the extra experience, you'll probably end up working in retail. With automation, your entry-level job is the college radio station. If you take a passive 'I'll learn after I get hired' (approach), you're committing career suicide."

The SUNY Brockport web site is *www.brockport.edu*. E-mail Warren Kozireski at *wkozires@brockport.edu*.

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World Radio History

OPINION

We Play All the Hits — Not!

by Ken R.

Oldies stations always proclaim (usually in a six-second jingle after every eight—minute spot cluster) that they play "all the hits," or perhaps, "your favorite oldies."

Think again, request-breath!

Most oldies stations only play the top few hit records from each year. Those are the records (and they were actually "records" back then) to which research cannot find one single objection. These songs have been "committee'ed" to death. The programmers throw out any song that is the slightest bit unfamiliar, anything slightly dated, and certainly anything that hasn't appeared as the soundtrack for a Burger King commercial.

Even though a song may have sold millions of copies and supplied background atmosphere for countless submarine races across the country, it may not be good enough to put on the air. Actually the songs that evoke the greatest response are songs uniquely "of that era," which are by definition, pretty dated.

Here are 10 songs from 10 summers of great radio listening.

How many times lately have you heard "Good Vibrations" by the Beach Boys, "Help" by the Beatles, and "Rock Around the Clock" by Bill Haley and the Comets? Give me a break!

The typical oldies station playlist consists of only 400 songs. Even if one were to consider just the 40 largest sellers of each year 1955-1975, one would have to play at least 840 different songs ... and that's just (for you vinyl fans) scratching the surface of what those of us on the sweet side of 50 remember from those years.

Those oldies-but-goodies

Ken Williamson, a friend of mine who works for a popular TV network based in Burbank, Calif., which shall remain nameless, helped me research this little project. He unearthed the weekly music surveys from WABC(AM) in New York for the summers of each year 1960 through 1969, the last year of civilization as we know it.

In these days of consolidation, debt service, focus groups and political correctness, the deck certainly is stacked against my ever hearing the truly unique songs from those years.

I'm not suggesting that programmers air these lesser-known, highly memorable songs five times an hour. I'm just begging for a shot once in a while to add a little spice to their otherwise boring but "acceptable to the 25-49 demographic" stew.

With this in mind, I list below just one song from each summer of the 1960s that I would enjoy hearing again.

1960: "Pineapple Princess" by Annette Funicello (reached #11)

1961: "Rama Lama Ding Dong" by The Edsels (reached #21)

1962: "Vacation" by Connie Francis (reached #9)

1963: "Sukiyaki" by Kyu Sakamoto (reached #1)

1964: "Can't You See She's Mine" by the Dave Clark Five (reached #4)

1965: "Sunshine, Lollipops and Rainbows" by Leslie Gore (reached #13)

1966: "They're Coming to Take Me Away, Ha-Haaa!" by Napoleon XIV (reached #3)

1967: "Mercy Mercy Mercy" by the Buckinghams (reached #5)

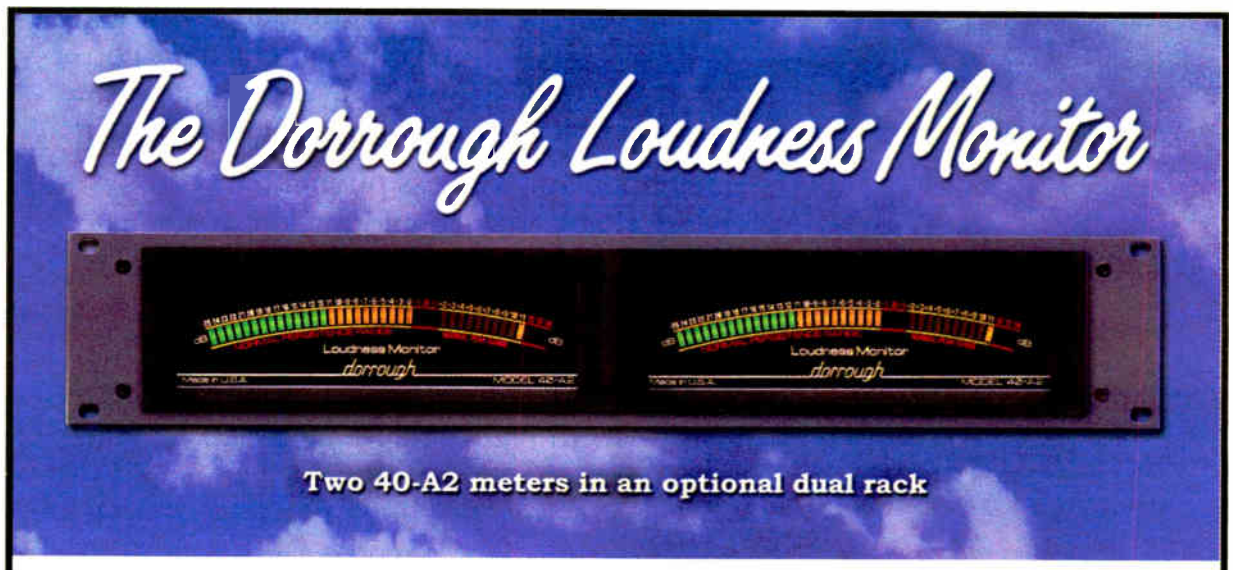
1968: "Indian Lake" by the Cowsills (reached #10)

1969: "Mother Popcorn (You Got to Have a Mother for Me) Part I" by James Brown (reached #11)

All chart positions are based on "Joel Whitburn's Top Pop Records 1955-1972."

The above rant is written by Ken R., who does not claim it is unbiased. He consulted no one. His wife doesn't even agree.

Ken R. was a disk jockey in the late 1960s and early 1970s when few people not riding elevators ever heard FM. He blasted "1,000 watts of audio radiance for his radio audience" from WPAG(AM-FM) Ann Arbor, Mich., WOHO(AM) Toledo, Ohio, and several other even more obscure stations.



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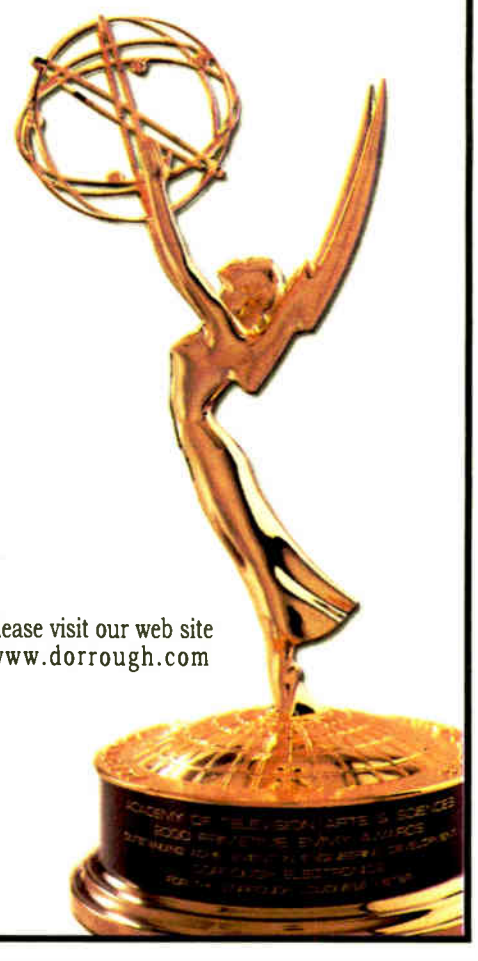

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SINE SYSTEMS

RFC-1/B: Full-Featured Remote Control

Sine Systems RFC-1/B Remote Facilities Controller is an affordable, full-featured transmitter remote control system that can be accessed through a standard telephone or wireless phone.

Readings and alert information are reported with a human-sounding voice. The basic system consists of an RFC-1/B and at least one RP-8 Relay Panel that provides eight channels of telemetry and raise/lower control. Up to eight relay panels can be connected for a maximum of 64 channels.

All telemetry inputs can be used to indicate on/off status to deliver analog readings complete with decimal point and unit word. Any eight channels can be programmed with alarms to alert station personnel of an out-of-tolerance condition or to take corrective action. Up to six telephone numbers can be called when an alarm situation occurs.

The RFC-1/B can be programmed to perform power/pattern changes and take readings automatically. Depending on the system configuration, up to 80 timed events can be stored in memory so a full year of pattern changes can be programmed in advance. Programming adjustments can be made on-site or from a remote location by calling into the system.

The RFC-1/B installs completely at the transmitter site and requires a single telephone line that may be shared with other devices. For rack installation, the RFC-1/B requires a single rack space (1RU) and each RP-8 requires two rack spaces (2RU).

Telemetry inputs require a minimum of 1 VDC to achieve a full-scale reading. Maximum input voltage is 10 VDC. Nominal telemetry input voltage is 5 VDC. Telemetry inputs are floating and will accept inputs that are offset from ground.

Optional accessories

- SP-8 Surge Protector suppresses electrical surges on the telephone line and eight telemetry inputs.
- ACM-2 AC Current Monitor allows the RFC-1/B to monitor AC current sources such as tower lights.
- AFS-3 Audio Failsafe is an audio silence sensor that interfaces easily to the RP-8.
- DCA-1 DC Amplifier boosts telemetry signals that are too small to measure reliably.
- MA-2 Modem Adapter provides a modem interfaces for logging readings by computer.
- PA-1 Parallel Printer Adapter provides a parallel printer interface for logging readings to a printer.
- RAK-1 Intelligent Rack Adapter combines modem, parallel printer interface and battery backup in a single rack space chassis.
- TS-1 Temperature Sensor measures air temperature.

Sine Systems' Demo Transmitter Site provides an interactive demonstration of an actual RFC-1/B connected to a simulated transmitter site. Prospective customers can call to evaluate the operation of the RFC-1/B. Instructions for the demo site are available from the Web site at *www.sinesystems.com.*

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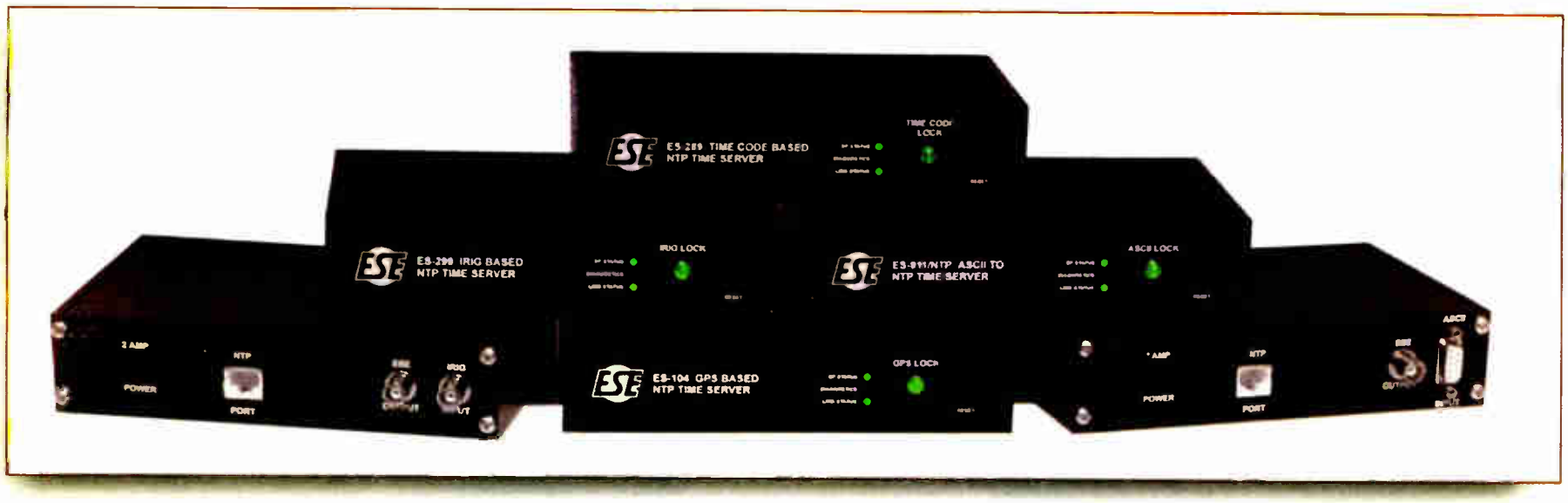
ESE Introduces New Series of NTP Time Servers



Timing is everything in many situations, and exact timing through a network is in many cases essential for the operation of many businesses. To address the wide variety of applications that are reliant on precise, split-second timing accuracy, ESE has introduced a new line of NTP (Network Time Protocol) Time Servers.

These NTP Time Servers are perfect for use in broadcast facilities, security exchanges, financial organizations, manufacturing process controls, military installations, telephone and dispatch time stamps, digital signatures and all applications where exact, reliable time keeping is a must. The ESE line of NTP Time Servers comes in four models, each capable of providing accurate timing through any network.

The **ES-104** is the ideal product for networks not already using a precise source of timing. It employs an internal GPS receiver as its time reference and functions as the NTP Primary Time Server for the network. The ES-104 provides the user with a source of UTC (Universal Coordinated Time) from an NTP Primary (stratum1) Time Server. It includes an active GPS antenna, an 18-foot cable, an Ethernet 10/100Base-T output (RJ-45), status LEDs, lock status output and ESE (TC-90) Time Code Output™.

For applications already utilizing a time reference, the remaining three models operate as time-code translators, taking already existing time code and converting them to NTP.

The **ES-289** accepts SMPTE/EBU time code or ESE time code and outputs it through a network using Ethernet 10/100Base-T output (RJ-45). It includes status LEDs, lock status output and ESE (TC-90) time-code output. It is perfect for broadcast or editing applications.

The **ES-299** references either IRIG (A, B or E), NASA-36, XR3 or 2137 time code (AM or TTL). It also outputs to an Ethernet 10/100Base-T output (RJ-45), provides ESE (TC-90) time-code output and has status LEDs and lock status output.

The **ES-911/NTP** is an ASCII (RS-232) to NTP Time Server that accepts NENA (format "0" or "1"), ESE format A or NEMA 0183. As all of the other units, it outputs to an Ethernet 10/100Base-T output (RJ-45), provides ESE (TC-90) time-code output and has status LEDs and lock status output.

All of ESE's Time Servers are capable of driving up to 100 ESE Slave Clocks from a distance of up to 4,000 feet, making it ideal for multiple studio situations. They all come in rugged, desktop black anodized aluminum cases and use a maximum of 5 W of power.

The ESE line of NTP Time Server products are extremely cost-effective and are available from ESE dealers nationwide. They will truly make time count each and every time, in all situations where time really is everything.

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NEUTRIK

EtherCon® Series: Rugged RJ-45

Neutrik's EtherCon® series of rugged RJ-45 style connectors are well-suited to such applications as the design and construction of radio facilities, to install and connect new equipment, especially in new or redesigned studios that will be wired for Ethernet. The connectors are also intended for use with audio and video stage technology, DMX systems and harsh environments.

The EtherCon cable carrier has been created with a die-cast shell and Neutrik's unique chuck-type strain relief in order to reinforce the cable and protect the plug. The NE8MC series is easy to assemble and accepts all standard RJ-45 plugs. The NE8FA series of chassis-type connectors is based upon the proven construction of the XLR A/B and D Series. The key feature is the secure latching system, which is not found on other standard RJ-45 receptacles.

The EtherCon series was developed in response to the needs of technicians and engineers, as their product applications increasingly demand a more rugged style of connector that offers higher levels of durability, but still provides convenience and ease of use.

Neutrik's EtherCon Receptacle is unshielded. The receptacle has eight contacts, has a rated current of 1.5 A and has dielectric strength of 1000 V ac rms with a contact resistance of < 10 mW and an insulation resistance of >500 MW. The lifetime of the EtherCon has been estimated at > 1,000 mating cycles.

The EtherCon series is used in a variety of installations and applications around the world. One recent example is the fact that the EtherCon was chosen as the interconnect device for Crest Audio's NexSys™ 4 amplifier control system and Cki line of power processing amplifiers. The NexSys 4 is the latest generation of Crest Audio's amplifier control system. It operates across a standard Ethernet network and allows both control and audio signals to be transferred to compatible amplifiers on the network in conjunction with Ethernet and CobraNet.

Due to their goal of offering the contracting market audio and control on one cable, Crest needed an extremely reliable and robust connector system. A key factor in their decision to use the EtherCon was due to the product's positive lock and rugged design. ●

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Henry Engineering Debuts Product Line

Matchbox

It's been a busy year at Henry Engineering. In addition to producing a few thousand Match-boxes, Superelays and other "blue boxes," company founder Hank Landsberg has been hard at work designing all-new versions of Henry's most popular products. These new units will offer even more features and functionality, plus have the added benefit of being rack-mountable.

Two important features of Henry Engineering products have always been their compact size and built-in AC power supply. In researching the best way to improve the product line, Hank insisted upon keeping these important attributes. Making the products easily rack-mountable was a major goal, but not at the expense of size or performance.

The final design resulted in an industry first: products that were only 1/3 rack width, with a built-in AC power supply and superb performance. This new series of "problem solvers" from Henry Engineering can be rack-mounted (three across) on a rack shelf, or easily mounted to a cabinet, tabletop or under a counter.

All products are the same size, and because each product has its own internal AC power supply, none of those pesky "wall warts" are ever needed. The chassis are made of steel for excellent shielding against both electrostatic and electromagnetic fields.

The first product in the new series is Superelay. In addition to the new rack-mountable chassis, Superelay also features plug-in "Euroblock" connectors instead of the screw-type barrier strips that were used on the original version.

Besides being more compact than barrier strips, plug-in Euroblocks make installation quick and easy. Just attach the plug to your wiring and plug it in. Henry Engineering will be using Euroblock connectors on several products in this new rack-mountable series.

The popular Matchbox has also gotten a makeover. In addition to the new rack-mountable enclosure, The Matchbox offers even better audio performance specs with increased dynamic range. It features a special "HI GAIN" mode that provides the extra gain that's often needed when computer sound cards are used. The gain adjustments are on the front panel, with audio inputs and outputs on the rear.

TwinMatch has also been updated. It's now very similar to The Matchbox, featuring gold-plated RCA jacks for the unbalanced inputs

Superelay, Rear View

and XLR connectors for the balanced outputs. (These replace the barrier strips used on the old version.) Other improvements to TwinMatch include better dynamic range with increased headroom and a lower noise floor.

A sturdy 1RU rack shelf is available from Henry Engineering. It mounts up to three units across, and includes "filler panels" that can be used when fewer than three units are installed. The rack shelf features an integral cable tray to facilitate a neat installation. Cabinet/wall mounting brackets are available for use with these new products.

Henry Engineering's new product line includes all-new versions of The Matchbox, TwinMatch, Superelay, USDA, MicroMixer, StereoMixer, StereoSwitch, MoniSwitch and LogiConverter.

Some new products are also on the drawing board, in addition to a new "CD Quality" version of DigiStor, so stay tuned!

For detailed specs and information, please visit *www.henryeng.com*.

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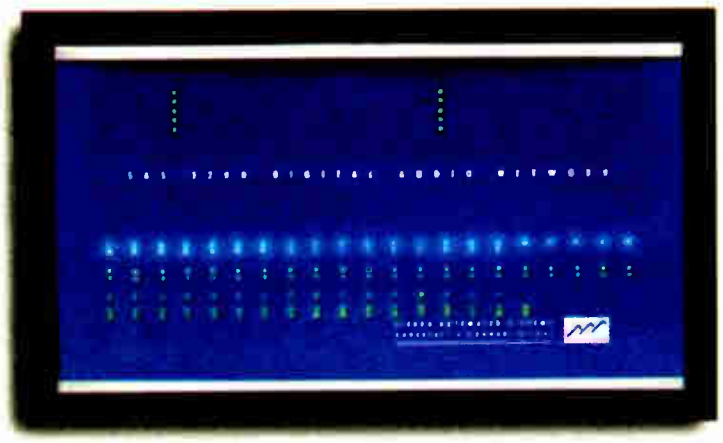

Connectivity, via the fewest number of cables possible, is the road of future-thinking radio studio design.

SAS designed the Connected Digital Network™ as the hub and spoke of the digitally connected radio facility. Everything SAS has been doing for the last 15 years is rolled into this one versatile system: routing and distribution, mixing, level control, signal processing, intercom/IFB and mix-minus.

But the router alone is just the hub. At the spokes of the digitally connected facility are digital and analog consoles, digital storage and delivery systems, production editors, terminal room inputs and outputs, facility intercom, remote inputs and outputs for STLs and RPUs on the roof, and more.

The Studio Control Room

The digitally connected studio control room has local sources such as microphones and CD players, and local destinations such monitors, headphones and local recorders. Remote sources and destinations include network feeds, telephone, ISDN, and feed to air.

At the center is the new SAS Rubicon™ Digital Control Surface, designed for complete flexibility for major and medium market stations. Rubicon can accommodate any number of input, monitor, control, and intercom modules, and provides up to eight program and auxiliary bus outputs plus mix-minus feeds.

Rubicon provides the ideal solution to the local/remote dilemma: Rubicon connects with a single control cable to the new SAS RIOLink that provides the local audio and control I/O, and interconnects to the main SAS 32KD™ Digital Audio System in the terminal room via CAT5 or fiber.

For the broadcaster that prefers an analog console, also new at NAB is the SAS Indigo™ Modular Broadcast Console, a collaborative effort with Ward-Beck Systems of Canada. Unique among analog consoles is the availability of complete router selection of sources on each input module.

The Terminal Room

The hub of the SAS Digital Audio Network is 32KD, expandable to up to 4096 channels. Modular design with built-in redundancy enhances fault tolerance and eliminates single point failure issues. Multiple processors in each frame distribute command functions and increase reliability. Power supplies and modules are hot-swappable by design, providing quick and easy service.

Various modules provide analog or digital I/O in groups of 16 stereo or 16 digital. Redundant clock and polling are provided by a back-up module.

Studios and remote locations

The SAS RIOLink provides an efficient method of distributing signals throughout a facility, whether used with the SAS Rubicon control surface, Indigo Analog Console, or your existing equipment. RIOLink houses 32 channels of audio in, 32 channels of audio out, 16 serial control ports, and 16 GP inputs and outputs. It connects to the 32KD or to one or more other RIOLinks via CAT5 or fiber.

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World Radio History

PRODUCT EVALUATION

Kamesan Mixer a Capable Performer

by Alan R. Peterson

In a world populated by compact mixers from Mackie, Shure and Behringer, the name Kamesan would not be among the first to trip off the tongue.

Not to worry. Many domestic broadcasters have never heard of this small Japanese manufacturer. But once you consider that Sigma Systems Engineering, the parent company of Kamesan, claims to hold 95 percent of the Japanese small-mixer market, then the name demands a little attention.

Among the products you might want to know about is the model KS-T2000. This is a compact three-input, stereo out audio mixer intended for field mixing duties in video production, but right at home as a basic three-mic mixer for many radio purposes.

Tiny mixer

The KS-T2000 will be the tiniest mixer you may ever bring to a remote broadcast. Set up and plugged into the codec box, it leaves you with more room on the table for giveaway T-shirts and CDs.

Combined with a pair of microphones and a portable DAT or MD recorder, a KS-T2000 turns the station's executive meeting room into an impromptu interview/recording space when J-Lo or the president comes for a visit.

With its balanced stereo outputs, it can connect directly to a larger console, or to a basic consumer recording deck with a pair of unbalanced RCA inputs.

The KS-T2000 lacks certain extras like panpots and peak limiting, but it does include a 1 kHz calibration oscillator and three 160 Hz, -12/dB low-cut filters.

Should your studio location be the same as the transmitter and tower, you will be pleased to know RF immunity is good. Nothing will be leaking into your recording through the KS-T2000.

The KS-T2000 mixer has a durable softcover case that protects the unit against hard knocks on the way to a remote site or an interview. The case is festooned with hook-and-loop tabs and strips that fasten down stray XLR cables and bundle everything up to travel.

Discrete components fill the circuit board rather than the surface-mount pieces typical of today's manufactured products. It may still be a bear to repair, but at least unsoldering bad resistors is easier than wrestling with a magnifying glass and tweezers.

Some elaborate components appear as epoxied "mystery modules." Do not

expect to field-service a blown quad op-amp chip in this mixer.

The mixer takes external DC power from 10 to 15 V, or from four AA batteries mounted in a slide-out clip. Running the KS-T2000 with a cheapie AC wall-wart power supply could cause hum in your cans and on the recording. Lesser-quality units lack decent filtering and allow AC ripple to get through. If you are going to run the KS-T2000 off a battery eliminator, begin with a well-made one, or at least clap a good-sized electrolytic cap across an iffy one.

The input knobs are not going to fall off or get yanked. These are held in place by screw-tightened collets rather than set screws. Other pots and rotary switches are recessed to avoid accidental hits.

Instead of panpots, Kamesan opted for toggle switches to assign inputs to the L or R outputs or to both. Not the worst — remote mics rarely are mixed in a panoramic fashion. And with the switches, audio can be hard-panned left and right to the two audio channels on a recording device.

Once dumped into a DAW at the station, both audio tracks can be separately EQ'd, ducked or otherwise processed, then mixed down to mono for air.

See KAMESAN, page 75 ▶

PRODUCT EVALUATION

KRK Great For Small Studios

by Bruce Bartlett

Here is a tiny, powered monitor that is ideal for smaller environments such as voice tracking booths, DAW-based production spaces and on-air studios with limited dimensions.

A two-way active loudspeaker, the V4 is a new, smaller version of the KRK V Series that includes the KRK V8 and KRK V6.

A pair of these monitors also would be appropriate for mobile use, should your station be looking to create or refit a remote studio-on-wheels.

The V4 ($400 each) looks classy and

See KRK MONITORS, page 79 ▶

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World Radio History

So You Thought That Was Funny?

by Alan R. Peterson

Thank you on-air talent, one and all, for resisting the urge.

We are coming out of a particularly unhappy time in recent memory, between the shuttle Columbia disaster, nightclub horrors in Chicago and Rhode Island and some of the most brutal weather on record for the region in which I live.

As I write, it seems that most of the in-your-face jocks on radio with whom I am familiar have pulled way back and deliberately avoided shock humor attempts on these topics.

Whether this will change, even by the time you read this, is impossible to predict. And whether this was due to a new diligence on the part of programming or just the realization by air talent that they would still like having a job tomorrow is for minds greater than my own to work out.

Just for now, may I commend those amongst us who could have gone for the cheap gag and did not.

Soapbox mode 'on'

For the record, I love good comedy. And I love well-produced and well-prepared radio.

When I hear a good show come together, I cheer. When I hear clever social commentary with a humorous twist to pull it all together, I am impressed. Guys like Harry Shearer are brilliant at this.

It is only when some dude on his second or third job goes mining for laughs by splicing together "Burning Down the House," "Fire," "Help!" and "We Gotta Get Out of This Place" that even *I* call for the guy's firing.

I never thought I would hear Challenger shuttle jokes again, yet came the report from Africa that an air personality there rewrote one to fit the Columbia disaster. Totally off base.

"Dark humor," they will call it in defense. Gallows humor. Cutting-edge, observational comedy. A mirror held up to the realities of the world today. Black humor. Free speech. Social satire. Reflections of what people are saying around the coffeemaker this morning.

It is cruel and unfunny crap from a lazy jock who saw how much of a rise he got in 4th grade by saying 'hell' in front of the principal.

My own opinion as a performer and writer is that it is just cruel and unfunny crap from lazy jocks who saw how much of a rise they got in 4th grade by saying "hell" in front of the principal and rode the wave into adulthood.

Psychologists and sociologists, while not pleased or amused by it, understand the purpose served by dark attempts at humor. It provides a release, a nervous laugh if you will, that defuses some of the stark horror we experience.

As harsh as we may think of such attempts and as much as we try to resist, they somehow burn a primal path into our synapses and stay with us.

We all recoiled from those Challenger jokes of 1986, yet oddly enough many folks remember at least two of them today.

The mass suicides of the Heaven's Gate cult, as well as the flock led by Jim Jones more than 20 years ago, left us speechless. Yet today, references are still made to "drinking the poisoned Kool-Aid," and putting on the sneakers and waiting for the mothership.

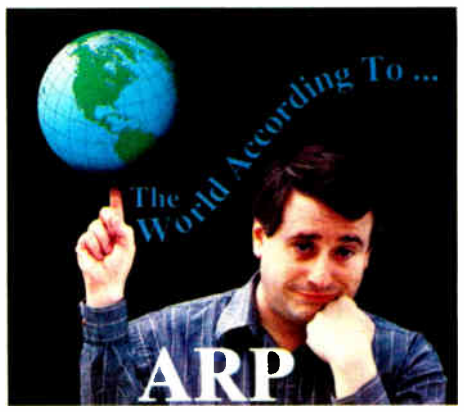
Clearly the degree of humor hinges on how easy it is to extract a punchline, which is why Pee Wee Herman and Michael Jackson remain such easy targets. It also depends on a perceived level of how tragic the headline is. The Nixon resignation in 1974 was a day the nation hung its head in shame, yet Nixon jokes flew like confetti.

The events that unfolded at the Branch Davidian compound in the 1990s led some to joke about those "Waco Wackos." Nobody laughed when the Murrah Building in Oklahoma City was destroyed, an event shown to be related to the handling of affairs at Waco.

It truly is strange and almost contradictory what can and cannot pass as fair game, and a seasoned head and a trained ear often must feel out what will fly and what will get a jock fired.

For better or worse, Elvis Presley and Rock Hudson both continue to be fodder for cheap shots long after their passings. But watch the hotline ring as soon as something askew is said about Christopher Reeve or former President Ronald Reagan.

An explosion at a sewage plant in New York some 25 years ago killed one youth playing nearby, yet the way he died (buried under gallons of human waste) instantly made his tragically short life a punchline. And what was it about a skiing accident that made the death of Congressman Sonny Bono the 6:45 Joke of the Day?



Johnny Carson, after one bit about the 16th president fell flat and was met with boos, said, "Guess it's still too early for Lincoln jokes." Yet now the MTV show "Clone High" mercilessly parodies both Honest Abe and John F. Kennedy, among others.

A more rewarding approach is to identify the villains and take it out on them.

The most deranged of minds can find nothing remotely humorous about Sept. 11, but song parodies and humiliating jokes aimed squarely at Osama bin Laden have been fertile territory since that date and proven enormously popular. Who remembers Shah of Iran gags like the Beach Boys parody, "Bomb Bomb Iran?"

A micro-fine line

Do I find any of this funny myself? A better question should be, do you? Does your audience? Does that out-of-control jock across town find it funny? That is where your concern should be.

Clearly there exists a micro-fine line separating cleverness and abject horror, and it is in constant oscillation. Good radio entertainers can predict how that line will fall and fine-tune the act to fit. Not-so-good radio entertainers will beat the line into the dirt and keep saying "hell" in front of the principal until it costs them their jobs and respect.

So again, a big thanks to those of you who knew when to pull back. You may have had a gag or two turning around in your heads, but you knew enough not to share them. We needed the break.

Having preached and pontificated about inappropriate comedy, I must now turn the tables on myself and share an instance where I got in the only *real*

See ARP, page 80 ▶

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PRODUCT GUIDE

Nemal Introduces Plenum-Rated Cable Snake Series

A new series of plenum-rated audio snake cables for broadcast and other high-end audio applications is available from Nemal Electronics International.

The Miami-based company makes the cables in two- to 24-pair constructions. Part number SN1624PL consists of 16 individually shielded and jacketed pairs with an overall jacket. The digital versions, the 24XPL Series, are also available in two- to 24-pair versions.

Cable snakes are UL-CL2P rated and available with color-coded conductors and no inner jackets. Standard outer jackets are available in natural color, with other colors by special order. The cables come on 1,000-foot rolls or terminated to customer specifications.

For more information contact Nemal Electronics International in Florida at (305) 899-0900 or visit www.nemal.com.

World Radio History

TIPS AND TRICKS

Setting Up Remotes With Mix-Minus

by Bruce Bartlett

Radio programming often features remote sources, such as a DJ at a local business, an announcer at a concert, traffic helicopters, sports, listener call-ins and so forth. An important technique for handling remotes is mix-minus. This can be a confusing topic.

How remotes are set up

Remote signals come into the central studio by microwave link, wireless RPU links or phone lines, including POTS (plain ol' phone service), frequency-extended POTS and ISDN. The central studio can communicate with the remote site in several ways:

- A radio at the remote site (to hear the station's signal), plus a telephone or cell phone for communications.
- A full-bandwidth phone line — typically ISDN or extended POTS for the program and a separate limited-bandwidth POTS phone line for communications.
- A full-bandwidth telephone line used to communicate during setup, and to feed program to and from the remote site during the remote broadcast.

Because renting full-bandwidth ISDN phone lines is more expensive, this method is used only when high-quality and stereo sound is needed on both ends. An example would be a remote DJ whose PA system is playing the station's signal.

In the central studio, the remote signal is coming in either on a microwave link or a telephone hybrid circuit. To set it up, patch or switch the remote signal to a channel input strip on your console, and set the channel to CUE or PFL (pre-fader listen) so that its signal does not go on the air.

Call the remote site on the phone. Ask the remote announcer to identify the line by voice and to send a test tone. While monitoring the CUE bus, check that the level and quality of the line are okay.

The remote announcer listens to the studio program over headphones. When the central studio announcer introduces the remote over the air ("Here's Barb Smith coming to you live from Wesley Stadium ..."), the remote announcer starts talking. Another way to cue the remote announcer is via the telephone.

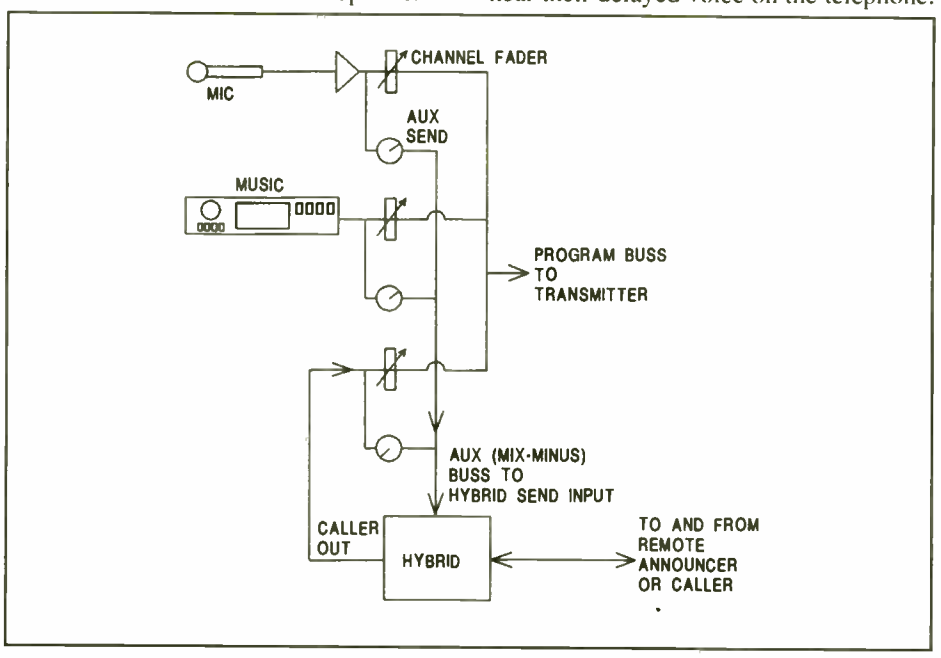

Fig. 1: Typical Mix-Minus Signal Flow

If the remote DJ does not need to interact with the station DJ during the broadcast, he or she can switch the monitor from the station signal to the local signal when speaking.

Mix-minus

Often, however, the remote DJ needs to hear the central studio program while sending the remote show. This might occur during a live news broadcast in which the studio announcer asks questions to be answered by the remote announcer.

Callers on call-in talk shows also need to hear the station signal on their telephones.

If the remote DJ or caller hears the station signal, and there is a signal delay from the remote location to the studio and back, the remote person will hear his or her voice delayed a few milliseconds. This can cause confusion or stuttering.

What's more, call-in talk shows typically use a profanity delay of several seconds, which can confuse the caller if they hear their delayed voice on the telephone. The way to prevent this problem is by setting up a *mix-minus*.

A mix-minus signal (sent to the remote location) is a studio program mix, minus the voice of the remote announcer or caller. While the broadcast audience hears the remote voice mixed with the studio program, the remote announcer or caller hears only the studio program.

Fig. 1 shows how to set up a mix-minus feed to send to the remote site. Do not send the station program over the phone line to the remote. Instead, send a feed from the aux-send output of the studio console (the "mix-minus bus"). This can also be an Audition or Utility bus in the console selectable in or out on each channel module. This aux-send signal is a mix of the studio's DJ microphone and other program sources, but not the remote line.

At the studio console, turn up the auxiliary sends of any channels the remote person needs to hear. Turn down the auxiliary send of the remote channel. You might want to send the caller a mix-minus signal derived from just the host's microphone and other selected mics.

Feed the auxiliary mix to the telephone hybrid "send" input. From the hybrid, the signal goes to the remote person, who listens to it over headphones or a telephone.

While the audience hears the remote voice mixed with the studio program, the caller hears only the studio program.

Because the remote announcer or caller hears the studio program, they can answer questions, talk back and forth, and so on. But because they do not hear their own delayed voice over the headphones or telephone, stuttering and confusion is eliminated.

Make sure that the auxiliary sends are prefader so that the levels sent to the remote will stay constant. Also, avoid sending a compressed signal because it can counteract the automatic gain control done by the telephone hybrid.

Another reason for using mix-minus: The hybrid is designed to isolate the studio audio (fed to the caller) from the caller audio. Ideally, the hybrid output should be only caller audio, and no studio audio. If you send caller audio to the hybrid's "send" input, the hybrid has trouble removing the studio audio. There might be feedback within the hybrid as well.

If desired, the remote announcer can

See MIX-MINUS, page 75 ▶

World Radio History

Products & Services SHOWCASE

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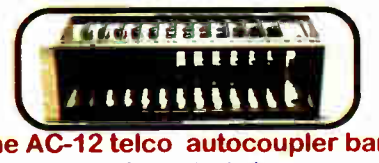

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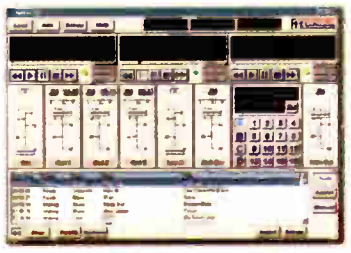

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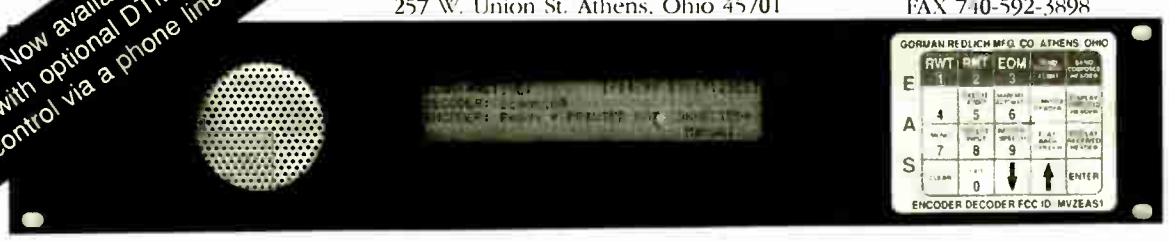

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World Radio History

Kamesan

▶ Continued from page 71

Recessed trimmer pots allow the adjustment of input gain before the main level control on each channel. Input selector switches let you dial in mic or line-level response and activate 12 or 48 V phantom power.

The Kamesan KS-T2000 mixer is a capable performer for field and interior portable use.

A voltage converter inside kicks the 6 VDC battery supply up to a useable voltage, which means that you may plow through batteries fairly quickly, especially if powering more than one microphone. The manufacturer states that better than eight hours of performance can be expected when using alkaline AA batteries. A three-segment LED display on the front will follow your battery status.

As mentioned, you can feed recorders with the balanced XLR and unbalanced RCA output jacks on the right side of the mixer. Originally, these jacks were intended to feed pro or semipro video cameras, which is why the XLRs include +4 line/-60 mic level switches. Presumably, it is possible to simultaneously drive a codec with the XLRs and run a cassette recording off the RCA jacks for an instant souvenir at remote broadcasts.

Radio people are going to wish the KS-T2000 had a 1/8-inch headphone jack to accommodate Walkman-type headsets. There is instead a 1/4-inch stereo jack for that purpose. I prefer the larger plug for use with more serious headphones and you are welcome to use an adapter for smaller plugs if desired.

As I mentioned, the KS-T2000 is good at ignoring RF.

I ran the mixer on battery power in close proximity to two AM radio stations and a stretch of high-tension power lines in the greater Washington area. The metal shielding of the mixer did a complete job rejecting RF energy and the stray AC noise fields generated nearby, although it did reveal just how bad my microphone cables were. Time to switch to star quad.

Printed specifications show a frequency response of 50 Hz to 15 kHz, which is perfectly fine for FM radio and exemplary for AM.

It is hard to say if your jocks will ever use the low-cut filters. Many like to hear the throaty rumble of their voices in their headsets and may perceive a loss of lows when the filter is cut in. Of course, this is all in their heads.

Feel free to switch the filters in if the remote broadcast places you close to a generator, outdoor air conditioning exchanger or truck traffic, or just if the wind is a little stiff that day. Your talent will never notice.

I do bemoan the absence of a good peak limiter. Small mixers such as the ATI NanoAmp MXS100 and the classic Shure M367 include such a limiter for those moments when a jock gets carried away with excitement or a fan screams the call letters at full volume.

Because the Kamesan KS-T2000 is a mixer intended for video use, a limiter would be redundant (most field cameras have built-in compressors). Still, having one could make this unit a more popular choice as a remote audio mixer for radio.

The Kamesan KS-T2000 mixer is a capable performer for field and interior portable use. Solid metal construction means good RF rejection and XLR jacks that will not pull apart a case if the cable gets snagged. Quality sealed components assure long life, although how long is a good question (the manual lacks warranty information).

You won't see as many of these mixers as you will a Mackie 1202 VLZ going out the door to a remote, but you may wish to look into the Kamesan KS-T2000. Remember, the company says they have 95 percent of the Japanese market; that kind of saturation begs a close look.

Product Capsule:
Kamesan KS-T2000
Compact Audio Mixer

Thumbs Up
- ✓ Simple, straightforward field mixer
- ✓ Switchable output levels
- ✓ Two voltage level phantom power
- ✓ Solid RF immunity

Thumbs Down
- ✓ Lacks limiter
- ✓ No panpots
- ✓ Relatively unknown in US

Price: $1,700

For information contact the U.S. distributor of Kamesan, HHB Communications USA Inc. in California at (805) 579-6490 or visit www.hhbusa.com *or* www.kamesan.info.

Alan Peterson can be reached at alanpeterson@earthlink.net.

Mix-Minus

▶ Continued from page 71

feed their headphones a combination of the central studio's mix-minus signal, and the output of their local mixer, so they can hear themselves over headphones without any delay.

What if you have four remote announcers contributing to the same program? In the studio, set up four independent auxiliary sends. The auxiliary 1 mix contains everything except remote announcer 1; the auxiliary 2 mix has everything except remote announcer 2, and so on. Each auxiliary mix goes to a different hybrid, one per announcer (or one per caller).

If your console has only one mix-minus bus, you can purchase some small splitter/mixers with which to set up additional auxiliary mixes, each sent to its own hybrid.

Hardware

Some call-in talk shows put several callers on the air at once. These callers need to hear each other. To make this happen, set up each hybrid's auxiliary mix to include the outputs of all the other hybrids. Some hybrids do this automatically.

For example, the Telos ONE plus ONE is a dual hybrid, which cross-couples the outputs of its two hybrids. Because of this cross-coupling you need to send it only a single mix-minus signal. The Telos unit derives another mix-minus signal for its other hybrid circuit.

Some hybrids accept a regular studio program and create their own mix-minus signal. A device like the Alice Mix-Minus-Pak, Fig. 2, takes your mixer output and a tap from the telephone hybrid output, then removes the telephone signal by adding it in opposite polarity to the mixer program signal.

This produces a "clean feed" or mix-minus signal that is equivalent to the mixer output minus the telephone signal. The clean-feed signal is sent to the caller. With this system, you do not have to set up a special auxiliary mix for the caller.

Whatever method you use, mix-minus is an essential tool which prevents audio confusion on the remote end.

Fig. 2: Alice Mix-Minus-Pak

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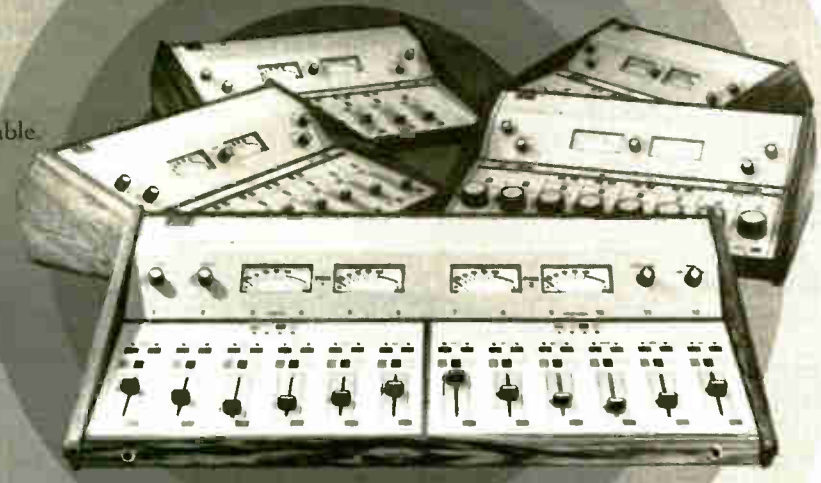

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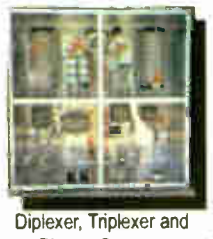

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World Radio History

Time-Shift Airchecking Uses Inexpensive VCR

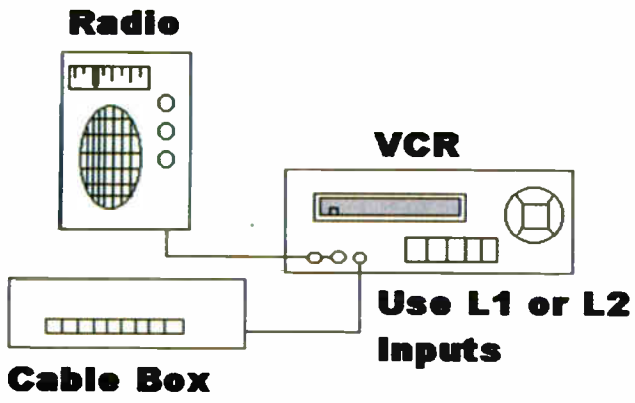
Radio World occasionally is asked, "How can I record a radio talk show and play it back later, the way a VCR catches TV shows?"

Some product solutions in the past have included combined slow-speed audio cassette recorders and radios with timers. Software such as Cybercorder and AirCheck allow computers to record audio at particular times of day. Skip Pizzi has thoughts on this topic, as well, on page 52.

Simplicity

But if what you want is VCR simplicity, what is wrong with using a VCR? It's cheaper than an audio recording computer and you most likely already own one.

Nearly all VCRs today have external input jacks, often labeled L1 and L2 for incoming audio and video. Generally, this is where cameras or video games are patched into the line. Instead, connect the Line Out or Headphone output of a portable radio or tuner to the L1 or L2 audio inputs. (See Fig 1.) Now you may program the deck to record desired programming from start to finish.



If you use the VCR already connected to your home entertainment system, check the back of the cable box. Often in addition to the threaded coaxial "To TV Set" connection, there may be RCA output jacks for video and stereo audio.

If so, patch the yellow Video Out jack to the L1 or L2 Video In jack on the VCR and set the cable box to the TV Guide channel or any other channel rolling a real time clock. Now as you record audio from your radio, you will be capturing an accurate on-screen clock to help you find the start of the show or locate the good stuff.

Besides its entertainment value, this simple setup can be used to aircheck up to eight hours of your own station on one T160 tape. This same arrangement was recently used back East to monitor a daytime AM station suspected of illegally operating before and after licensed hours. The on-screen clock gave a time reference of operation, confirmed by the jock's timechecks.

If you are hoping to catch your favorite AM talker, just remember not to turn on the TV receiver while recording. If it is close to your radio receiver, you will record nothing but buzz.

— Gowan Grey

RDL Adds 'Universal' Mixer Stick-On

RDL has added to its lineup of Stick-Ons with a new "universal" mixer module.

The company says the ST-UMX3 combines the functions and features of six of its existing mixing modules.

Each input is individually switch-selectable, mic or line, as in the output. The ST-UMX3 is capable of mixing any combination of three mic- or line-level sources, balanced or unbalanced, to a microphone- or line-level balanced or unbalanced output.

Input gain for each channel may be adjusted by top-mounted single-turn audio taper pots. A dual-LED VU meter is included for monitoring output level.

The ST-UMX3 replaces the ST-AMC3, ST-LMX3, ST-MLX3, ST-MMX3 and ST-MXL3, and may be used in place of the ST-MX3.

Info: rdlnet.com.

For more information, call the company in California at (800) 281-2683 or visit rdlnet.com.

Degrading Media

As I was restoring audio for some clients recently, a thought occurred to me: With respect to preserving and archiving precious recordings, things are getting worse.

Old vinyl albums can still be played. The material may need some cleaning up (I use Cedar De-Noise and Cedar De-Click software), but I have worked on records pressed in the 1940s and they sound just fine.

Tapes made as recently as the 1970s and 1980s have to be baked in many cases to prevent them from shedding and squealing. Once they are baked, you have a day or two to transfer them to another medium before they fall apart. Engineers who are given the task of remastering multitrack tapes that are only 20 years old face unbelievable challenges. Oddly, tapes recorded in the 1960s almost always play very well.

In the late 1980s and early '90s, the DAT was the way to go. Now I try to play some DAT recordings and they are ruined by occasional bursts of nasty digital grunge. Occasionally a DAT recorded on one machine won't play properly on another machine. Some of these recordings are lost forever, unless future technology can save them.

Now we have CDs. They've been around exactly 20 years. I wonder how they will sound in another 20 years. They sound terrific today and are the best we have, but the jury is still out.

But in the 1950s and '60s, people prided themselves on having the best "high-fidelity" systems possible. The concept was to get a faithful reproduction of the original recording. Remember Nipper the RCA dog looking into the speaker and hearing his master's voice? Even CDs lose analog content during digital conversion when sampling "rounds off" the signal.

Now folks settle for compressed, lossy systems like MiniDisc, which leaves out "unimportant" or "redundant" information. Unimportant to whom?

Radio stations compress digitally compressed music from hard drives prior to the transmitter in an effort to be the loudest station on the dial. Hard drives can fail, causing catastrophic loss if not backed up. Often broadcast or satellite signals are compressed again later in the audio chain.

It is amazing that songs sound anything like the original recordings by the time they get through one-inch Walkman speakers. I have never heard a listener say "I like WXXX because they are the loudest."

I am not one of these retro-vinyl freaks. I prefer digital editing over razor blades, but I end up using the highest resolution the software allows and making multiple CD copies of everything just in case.

It seems that utility and convenience have replaced longevity and faithful reproduction. Many opt for lower fidelity because of the accompanying increased storage capacity. Whether the brilliance of Britney Spears, Puddle of Mudd and Snoop Dog will be something people want to listen to in 40 years is up for debate. But will it be there in case they do?

— Ken R.

World Radio History

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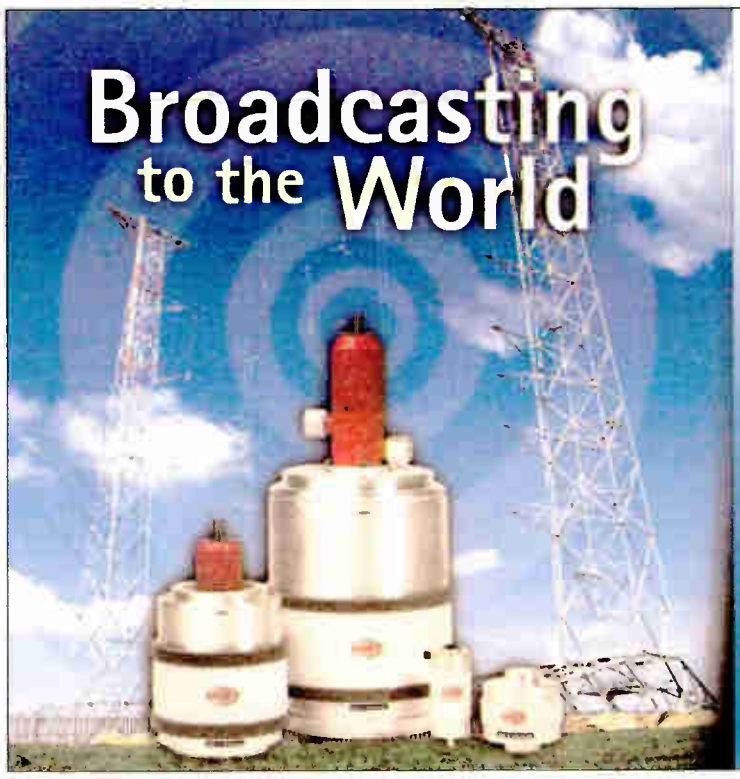

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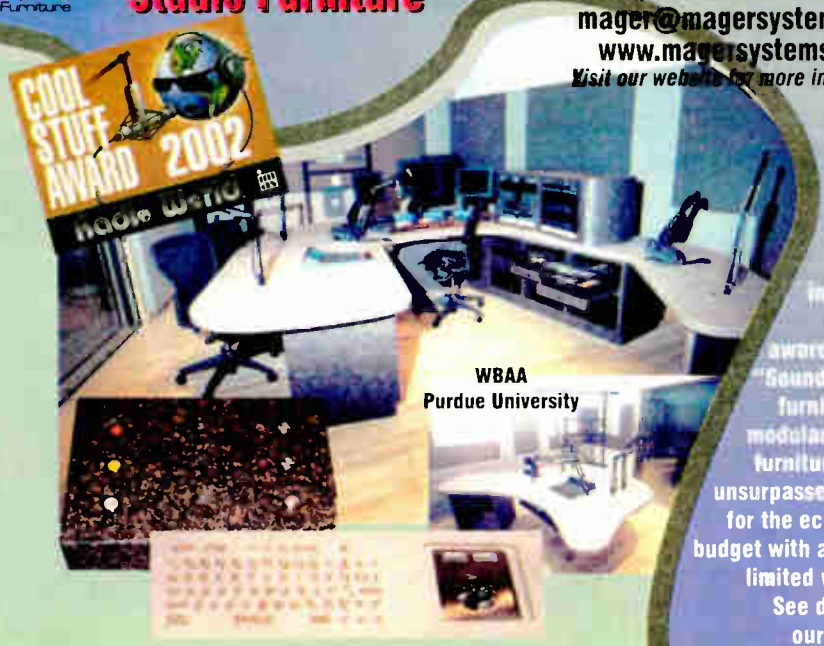

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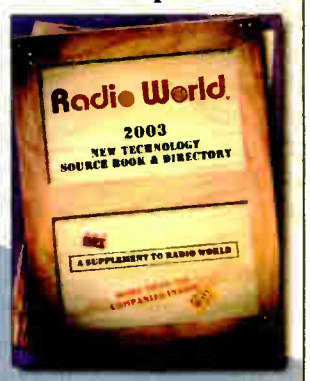

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World Radio History

KRK Monitors

▶ Continued from page 71

has first-rate workmanship. The dense, solid MDF cabinet includes a 1-inch thick front baffle with a port for the woofer.

Cabinet dimensions are small: only 9.25 x 6 x 7.75 inches (H/W/D). Internally braced to reduce resonance, the cabinet is finished in dark gray Zolatone, and is smoothly rounded on the edges to reduce diffraction and port flutter.

Magnetically shielded

As for drivers, the V4 uses a custom 4-inch woofer made of woven Kevlar, which is lightweight and rigid. The woofer crosses over at 1.7 kHz to a 1-inch fabric dome tweeter. The tweeter is recessed in a waveguide. Both drivers are magnetically shielded for use near computer monitors. A 12 dB/octave subsonic filter prevents extreme lows below 32 Hz from reaching the drivers.

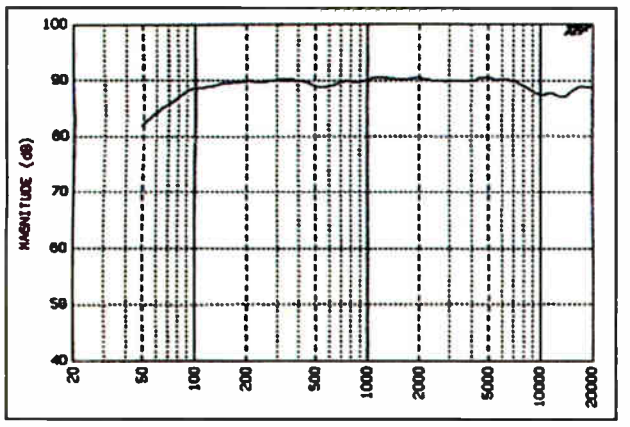

Fig. 1: Anechoic Frequency Response, 1/3-Octave Smoothed

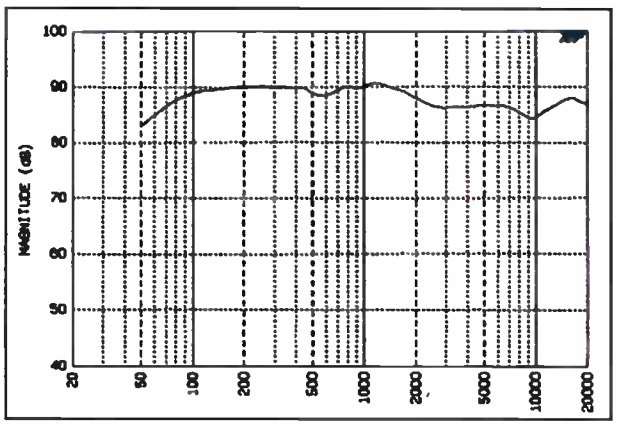

Fig. 2: Anechoic Frequency Response of the Other Monitor of the Pair

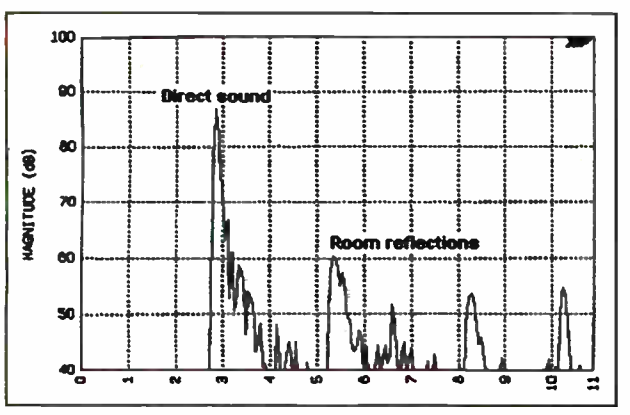

Fig. 3: Energy Time Curve

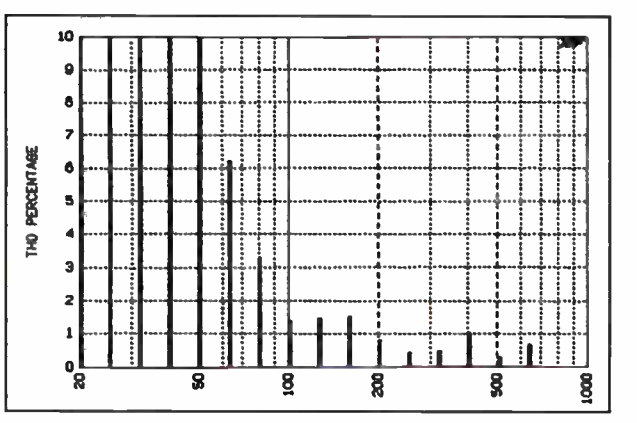

Fig. 4: Total Harmonic Distortion vs. Frequency at 90 dB SPL, 1 Meter

On the back is a power switch, an AC connector, a fuse block/voltage selector, and a Neutrik combo connector that accepts an XLR, 1/4-inch TRS, and 1/4-inch TS phone connector. Also on the back is a gain control (+6 dB to -30 dB), which can be screwdriver-adjusted to match levels in a surround setup. There are no tone controls. A yellow LED on the front lights when the power is on.

KRK specs the frequency response as 65 Hz to 20 kHz ±2 dB. Claimed maximum SPL at 1 meter is 101 dB music, 104 dB peak. The woofer's power amp provides 30 watts average while the tweeter amp puts out 15 watts. Amplifier S/N is claimed to be greater than 90 dB, and the amp uses no compression. Each V4 weighs less than 11 pounds.

When used with the KRK S8 subwoofer, the V4 provides a low-cost surround monitoring system.

The V4 owner's manual is clear and to the point. It covers connections, installation, placement for stereo and surround, features, specs and troubleshooting.

I placed the V-4s on stands behind my console, 1 foot from the rear of the speaker to an absorbent wall behind them. Here are my impressions of the V4 reproducing some musical instruments:

Drums: Powerful dynamics and natural sound.

Kick drum: Tight. Surprisingly deep for such a small speaker.

Cymbals and percussion: Delicate and smooth with extended highs. Not peaky or exaggerated.

Piano: Mostly uncolored. Slightly warm, not metallic or harsh.

Electric guitar: Slightly puffy in the lower mids. Good "bite" or edge.

Electric bass: Fairly deep and tight. Slightly tubby in the upper bass but well-defined. Full. Well balanced with the rest of the audio range. Deep notes are weak but are handled gracefully. A sub could help with the deep bass.

Acoustic bass: Full but not overwhelming. Tight and well-controlled.

Acoustic guitar: Gentle. Detailed but not "etched" in the highs.

Sax: Pleasantly warm and mellow.

Strings, brass and woodwinds: Natural timbres.

Flute: Natural, with a realistic amount of breathiness.

Voice: "Human" sounding. Not too much sibilance. Slightly chesty with some singers.

My own mixes: Originally done using NHT Pro A-20s, my mixes sound slightly tubbier and softer in the highs on the KRK V4s. The difference is subtle.

Mixes

I did some mixes on the KRK V4s. The mixes translated well to other speakers. I got used to the sound of the KRK V4s quickly and enjoyed working with them.

Overall, the V4 monitors sound musical and pleasant and are easy to listen to. They have low distortion and low listening fatigue. Imaging is sharp and the sense of depth is impressive. Instruments stay separated in loud, complex mixes.

Fig. 1 shows the anechoic frequency response of the KRK V4 in a free field. It is quite flat, ±2 dB from 65 Hz to 20 kHz. If the speaker were placed near a wall or large console, the low end would come up about 4 to 6 dB.

Product Capsule:
KRK V4
Powered Monitors

Thumbs Up

- ✓ Smooth and uncolored
- ✓ Tight, full bass
- ✓ Sharp imaging
- ✓ Solid construction
- ✓ Low distortion and listening fatigue

Thumbs Down

- ✓ Lacks deep bass (normal for small speakers)
- ✓ Slightly tubby near surfaces (but this is easy to get used to)

Price: $400.00 each

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That could account for the slightly tubby sound heard from the KRK V4 when placed just behind my console and a foot from the wall behind it. A monitor placement farther from surfaces would give a flatter response and a more natural low end.

Fig. 2 is the same but for the other monitor of the pair. In this case, the response is ±3 dB from 58 Hz to 20 kHz. There is some loss in the upper mids and highs with this unit.

Not shown is the response at 30 degrees off-axis. It is uniform, within 2.5 dB of the front response up to 10 kHz. A producer and engineer seated side by side will hear almost the same tonal balance from the KRK V4s (except for the usual phase cancellations of dual sound sources heard off-axis).

Fig. 3 shows the Energy Time Curve, which correlates with the transient response. The direct-sound spike is sharp, and delayed vibrations are down 22 dB or more. Apparently the stiff, rounded cabinet is doing its job. This sharp transient response contributes to the V4's fine sense of detail in time and space.

Finally, in Fig. 4 we see the Total Harmonic Distortion vs. frequency at 90 dB SPL, 1 meter. As is normal for small speakers, THD exceeds 10 percent at and below 50 Hz, but is less than 3.2 percent above 80 Hz. This is excellent performance for a monitor of this size.

Summary

The KRK V4 is a serious contender where space is at a premium. In spite of its small size, it puts out a loud, clean sound with impressively full bass. A subtle emphasis in the upper bass is the speaker's only coloration, and this occurs only when the speaker is near large surfaces. Although the deep bass notes lack weight — normal for small speakers — they can be enhanced with a sub such as the KRK S8.

Because the V4 is self-contained, easy to set up and compact, wiring a set to your Monitor Out jacks for in-studio use is a breeze.

Should your production room include surround sound capability, or might in the future, a group of V4s and a sub could make a great surround monitoring system.

Bruce Bartlett is the author of "Practical Recording Techniques 3rd Edition," published by Focal Press.

Review Setup

NHT Pro A20 monitors; Sony PCM-R300 DAT recorder; Philips CD 910 compact disc player; Mackie 1604VLZ mixing console; TASCAM DA88 recorder; Goldline TEF-20 sound analyzer; Crown CM-150 measurement microphone.

World Radio History

ARP

▶ Continued from page 72

zinger I dared allow myself back during the Bronze Age on my college station. It turned a head or two, but never crossed the line.

Hard and heavy came the snows in the Northeast back in the winter of 1978. Numerous roof collapses were reported, many of them in New England, including the roof of the Hartford Civic Center in Connecticut.

New York certainly was not spared the brunt of the storm, and a wind-blown accumulation of snow and ice brought down the roof of the domed auditorium at C.W. Post University on Long Island.

The dome collapsed overnight when the hall was empty, which fortunately meant no injuries or loss of life. But the tangle of snow, steel and ice wasn't pretty.

It should be noted here that the Post Cereal Co. had recently introduced "C.W. Post" cereal, so christened for the company's namesake and benefactor. Students at that campus were understandably proud that their alma mater's name was emblazoned across boxes of sugary processed oats in every supermarket on Long Island.

Clearly there exists a micro-fine line separating cleverness and abject horror, and it is in constant oscillation.

One student who worked at our FM station at Nassau Community College on Long Island had transferred to Post during the semester break and had gone on the air at his new school's station. I don't remember who started it, but a mild on-air feud began on both stations, at first targeting the jock that defected, then each other's stations and finally targeting each other's schools.

Nassau took it in the teeth. We were chided on-air for the fact the college was actually a former air base — Mitchell Field — where classes were still held in drafty old barracks, the gymnasium was an abandoned hangar and the campus radio station was in the basement of the former base hospital (all true).

There was not a lot we could have said about Post. Admittedly it was a lovely campus, well equipped and attractively laid out. Trying to find something to slam was quite difficult. At least until the snowfall.

After a particularly brutal shellacking we took from one broadcast, it was my turn:

"Did you hear about the new and improved C.W. Post cereal? When you pour milk on the box, the top caves in!"

We never heard from them again on the air, but a few jocks confided in us that they, too, thought it was a good one.

Al Peterson dedicates this column to Rhode Island air talent "The Doctor," lost in the fire at The Station nightclub in West Warwick in February.

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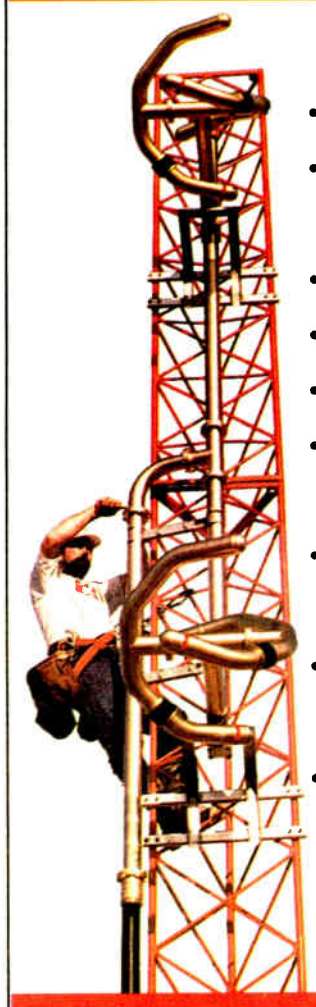

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World Radio History

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◆READER'S FORUM◆

A Song for the Armed Forces

On March 5 at 9:00 MST (11:00 EST), radio and television stations around the country took time out of their regular programming to play the national anthem to honor our armed forces. The feedback we have been receiving has been nothing short of phenomenal. The success of this project surpassed even our expectations.

However, we know that there are many more stories we have yet to hear. Readers, would you be so kind as to take a minute to express what this project meant to you, or the people you love?

How did your city or office participate? What comments have you overheard as a result of this project? Also, if you know of a station or stations that played the national anthem, please forward their call letters to me so that we can record their participation.

Our goal is to compile these heartwarming stories to forward to our armed forces. It is important that they know our nation rallied in support of our troops for one minute, united in voice and song. Please e-mail your comments and thoughts to *NationalAnthemProject@cox.net*.

The following is an e-mail we received from a sailor aboard the USS Tarawa, floating somewhere in the Persian Gulf. It is because of his story that we feel it's essential we compile as many stories as possible:

"Yesterday the CO gave us permission to play the national anthem at 7 p.m. local. That was 8 a.m. your time. I was put in charge of the arrangements and ensuring everything was in place. It is nowhere as big as the tasking you lovingly put forth over the past months, but there was stress.

"I am a technician; I fix things when they are broke. I am not good at setting stuff like this up, so I was extremely nervous about the whole thing. What if they start asking questions? What if someone gets offended? What if the CO backed out all of a sudden? In fact I could not sleep before my mid watch, I just wanted to go home as see my wife and kids, I wanted to be anywhere but here and in charge of this project. I was scared out of my mind.

"Instead of the CD player and microphone on the bridge (which always sounds like crap), three of the crew volunteered to sing *a capella*. Let me tell you, when they started to sing in the dark, so close to the hottest place on earth, I started to cry. I didn't want to be anywhere but on the bridge of the Tarawa in the Persian Gulf. At that moment I was truly proud to be a Service Member.

"Thank you for making it real for me. Your dream came to pass on the Tarawa last night and I was proud to be a small part."

Kathy Wiskur
California Coordinator
National Anthem Project
San Diego

'Three of the crew volunteered to sing a capella. Let me tell you, when they started to sing in the dark, so close to the hottest place on earth, I started to cry.'

Just another remote?

I just finished reading "Radio Presses On Under Shuttle Path" (March 1).

The opening paragraph stated, "It was supposed to be just another Saturday remote." Apparently that's exactly what it was, despite the disintegration of the shuttle Columbia overhead and debris falling on the car dealership.

The decision to "go ahead in an upbeat, yet low-key fashion," complete with regular cut-ins, amazed me. It is this kind of compelling local coverage that makes satellite radio so appealing

I cannot help but wonder if the station sold a remote for the following weekend to celebrate the big "Scratch 'n Dent Sale."

Joseph L. Brosk
Program Director
WTOJ(FM)
Watertown, N.Y.

Congrats to Jim Roselle

WJTN radio will be celebrating Jim Roselle's 50th year on the air in Jamestown, N.Y., this year. Jim has been serving the Southern Tier since 1953. He is a well-respected member of the community, not only for his on air work, but also for his charitable work with many local organizations.

Jim is involved with the Boys & Girls Clubs of Jamestown among others. Jim has been the voice of Chautauqua Institution for over 25 years, which has afforded him the opportunity to interview not only celebrities, but also many people of historical importance over the years.

I am honored that I have been given the opportunity to work alongside a living legend, and I am sending this letter to publicly commend his achievement. Jim means more to this community through his life on the radio than you can imagine. Congratulations, Jim.

Nicholas Keefe
Program Director
WJTN(AM)
Jamestown, N.Y

World Radio History

◆ READER'S FORUM ◆

Creating 'The Nation's Station'

All of us at WVXU and the X-Star Radio Network in Cincinnati enjoyed reading Paul McLane's comprehensive column, which discussed our recently released documentary "Cincinnati Radio: The Nation's Station."

Photo by Melvin Grier, courtesy of the Cincinnati Post

Mark Magistrelli, Mike Martini, Dr. James C. King and George Zahn, From Left.

RW's obvious enthusiasm for this project helped all of us justify the prodigious amounts of work, frustration, costs, dead-ends, restorative efforts and anxiety which were at the core of this massive undertaking. I don't think any of us envisioned that this project, born in concept back in 1990, would have taken nearly 13 years to complete.

I have long been an admirer and supporter of Radio World and the kinds of articles and reportage found in every issue. It's far and away my favorite and most useful radio periodical. It was terrific to see this project revealed to the broadcasting community for the first time in this newspaper.

As the article stated so eloquently, those of us who are involved in documentary production at WVXU remain concerned and even a little bit depressed about the general lack of interest, even among radio professionals, in preserving broadcast history. Our station is truly blessed with a team of four individuals who care passionately about the heritage of our industry.

With the exception of myself, the other three people working on this project are all in their 40s and clearly didn't live through these embryonic, formative days of early broadcasting. I stand in utter amazement at their unwavering dedication to the preservation of radio history. All that they do is ancillary to their "regular" jobs in the industry, yet their passion for radio history tends to rule their lives. As a manager, it is a privilege to work on these efforts with Mike Martini, Mark Magistrelli and George Zahn.

I would guess that each of us, in our own individual way, yearns to leave a legacy to succeeding generations. I especially enjoy the "motto" above the door to Mike Martini's office: "Out with the New...In with the Old."

The people with whom I've had the good fortune to work have most assuredly left an incredible legacy of documentaries, from our Peabody award-winning "D-Day + 50 Years" to the story of "Red Barber: From the Catbird's Seat," "Let Me Entertain You" (Ruth Lyons), "Cincinnati Radio: The War Years (1941-1945)" etc.

All of us take a great deal of pride in noting that not one penny of government money or private grants was used in any of these productions. Every expense was self-funded or came from the regular WVXU operating budget.

Those of us who are involved in documentary production at WVXU remain concerned and even a little bit depressed about the general lack of interest ... in preserving broadcast history.

— Dr. Jim King

Thanks for recognizing this effort for what it was. While we have high hopes for an enthusiastic response from the listening public, we care deeply about what our fellow broadcasters think of the work. In the near future, high-quality streaming audio excerpts will be available on our Web site at *www.wvxu.com*.

Dr. Jim King
Dir. of Broadcasting
Xavier University
Cincinnati

CFA gripes disputed

A few weeks ago, Radio World printed a letter from a U.K. "engineer" in which he spells out all of the reasons why the Crossed Field Antenna cannot work (Jan. 2) — in spite of the fact that at last count, there were 10 of them with various configurations operating with great success in Egypt.

I passed the letter onto the CFA's inventor, Professor Maurice Hately. You might like to see his response, below.

Robert E. Richer
President
Crossed Field Antennas, Ltd.
Farmington, Conn.

Do not believe Martin Spencer for the following reasons:

Item 1: Isn't this very muddled thinking? NEC programs indeed cannot explain the CFA because they do not incorporate the basic theorem behind the CFA, i.e. Poynting Vector Synthesis. E x M = S. NEC assumes all the energy is launched by magnetomotive forces from currents alone.

Item 2: Separate E and M fields have to fulfill six essential criteria before synthesis occurs within a working Interaction Zone:

A) Fields must each contain half the power; B) Both fields must be accurately in-phase and remain so for all time; C) Both fields must cross each other geometrically at right angles; D) Both fields must have the correct spin so as to create outwardly directed flow of the Poynting vector; E) Fields must be proportioned so they match the Zo of space i.e. E/H = 366 ohms; F) Both fields must have the same curvature, so they comprise a spherical wavefront.

If any of the criteria are in error, the efficiency collapses and synthesis is unfulfilled. If two or three are incorrect, no radiation will be found, and the near field swamps everything. No random experimenter will have found the effect because it is so evasive. Experimentation must be precise.

Item 3: On March 6, 1991, I was invited to visit Mr. Spencer at his residence/business in Evesham, Worcestershire, England, where he had set up a crude GP CFA, whose wire mesh cylinder was about 40 cm diameter and 1 meter high over a small wire mesh disc and ground plane about 1 meter square. This was fed with a 100-watt amateur transceiver at 7 MHz (i.e., lambda 41 meters).

The adjustment of the 90 degrees phase difference required between the high voltages on the Plate and the disc necessary to produce E and M in phase was to be performed by making two resonant circuits sit slightly out of tune with + and - 45 degrees. Accuracy to less than 2 or 3 degrees of maximum error was absolutely impossible with the wire mesh flopping about and us within the E field environment.

Furthermore the rig was set within a narrow yard only 2 meters wide between the house, and a neighbor's wire fence 2 meters high, no doubt taking away the E field lines from the small interaction zone. Also the houses rose above us to 5 meters or more and absorbed any radiation that might have been created.

The resonant circuits pulled each other, so only one resonance was possible, and what action there was, came from a Near Field effect of the cylinder going into resonance; a small field-strength indicator was available to detect any action.

By walking away with a receiver, the signal was clearly a Near Field effect and was far smaller in extent than the same transmitter loaded into half wave dipole hanging over the house at about 9 meters height.

The experimental gear was a hopeless lash-up and would never have worked in that situation, surrounded by the house and the wire fence. Within three hours I had to go, so there was no time to clean up the rig and the owner's mind was so utterly convinced that it couldn't work there was no possibility of getting it to work, or of changing his opinion in his small yard.

Many experimenters have fallen into similar traps and have never seen a CFA begin to work, let alone get one going with high efficiency. We have been able to develop versions of the CFA, which employ only two "Out-of Phase" currents. The Dual Conductor Loop version of the CFA is only 1 percent of a wavelength in size, yet radiates efficiently and receives excellent signals, which are ideal for two-way communication in clandestine situations, or for mobiles. Refer to U.S. Patent 6,025,813, issued Feb. 15, 2003, or refer to RSGB magazine RAD COM in May 2002 for independent review article.

Maurice C. Hately
Inverness, Scotland

How to Submit Letters

Radio World welcomes your point of view on any topic related to the U.S. radio broadcast industry.

Letters should be 100 to 300 words long; the shorter the letter, the better chance it will be published in full. We reserve the right to edit material for space. Longer commentaries are welcome but may not reach print as quickly.

Include your name, address and contact information, as well as your job title and company if appropriate.

Send letters via e-mail to *radioworld@imaspub.com*, with "Letter to the Editor" in the subject field; fax to (703) 820-3245; or mail to Reader's Forum, Radio World, P.O. Box 1214, Falls Church, VA 22041.

World Radio History

◆READER'S FORUM◆

C. Crane vs. GE

In response to "C. Crane Loves AM Radio" (RW, Feb. 12): I have both the CC Radio plus and the GE Superadio III. The central coast here in California is a perfect place to test weak signals. Our best daytime DX window is to Fresno and Los Angeles.

I listen to several stations in both markets. The CC Radio tuner performance is, for all practical purposes, identical to the GE Superadio.

Photo from C. Crane

Chris Justice and Bob Crane

What is interesting to note is that the C. Crane radio lacks a tweeter in its speaker array. That makes a small difference, but when both radios were plugged into an external speaker source, the GE really stood out with sparkling audio quality, even on the narrow AM band setting.

The C. Crane radio didn't come close to the quality and sounded muddy and very lacking in high-frequency response compared to the GE.

The FM tuners performed just about identically as well. Yes, you get more features on the C. Crane radio, including the TV audio and NWS weather band as well as the clock and timer/alarm clock and weather alerts. If you want those features, the C. Crane is the radio of choice.

If, however, all you want is a good, solid, superior-sounding AM tuner/audio amp section, the GE is worth the money. It isn't digital tuning but is easy to use and a bargain for the cash.

If only they made the GE with a digital tuner and the features of the C. Crane radio, it would be the radio of choice with out a doubt.

But until they do, the GE is the best thing going period, not only for the money but quality in tuning sensitivity and audio.

John Curtis
Los Osos, Calif.

AM bandwidth

I am an Alaskan engineer and have worked most kinds of radio stations and some TV ones. My first station in Anchorage was KHAR/KKLV, which ran the new stereo AM system.

I also have a computer science degree, and have been a ham operator since 1970. I think I understand the term bandwidth as well as the next person, and perhaps bandpass better than most.

My bottom line in the debate about IBOC causing AMs to go to 50 percent bandwidth (Jan. 15, "Is Narrow AM IBOC Bandwith Bad?") is that you get what you pay for.

If you cut the bandwidth in half, the sound quality *must* suffer. We are doing all we can to make it sound good now. Besides, any good AM engineer will tell you that the last thing he wants is to be the weak link in the chain.

If there is a sound quality problem, we all prefer to blame it on lousy receivers. That does not relieve us of the responsibility to try to make it sound as well as we can, of course.

We are already very much limited at 10 kHz bandwidth, and those of us who have had to squeeze every last drop of quality out of it know that it will be the death of AM sound quality to cut the bandpass in half at the transmitter.

We all know what a phone call sounds like with 3 kHz of bandwidth. I shudder to think what AM will sound like at 5 kHz. We've come to accept the compromises of 10 kHz after multiple decades. We should not throw away that experience lightly.

I would urge everyone in the AM community to make it known how they see this issue, lest the wrong decision be made and only after dozens of station failures will we realize what we have done.

Scott Dennis
Owner and Consulting Engineer
InfoTech Alaska
Anchorage, Alaska

Ratings revisited

I'd like to respond to Chris McKay's letter (Feb. 12, "Processing") regarding the ratings of KIIS Los Angeles and Orban's claim that "all four of the top four stations in Los Angeles were using Orban processing."

At the time that we made the claim, the winter 2002 book, the Los Angeles Arbitron ratings were as follows for listeners 12+, 6 a.m. to midnight:

KROQ 5.1
KPWR 5.0
KOST 4.4
KSCA 4.0
KFI (AM) 4.0
KIIS 3.8

Only when KIIS' rating were added to the 0.2 share of its simulcasted sister station KVVS did KIIS tie for the number-four FM spot with KSCA.

Either way you count it, our claim was correct at the time it was made.

Bob Orban
President
Orban/CRL
San Leandro, Calif.

Lives Depend on You

Separate tragedies at nightclubs in Chicago and Rhode Island this past winter serve as stark reminders that facility management decisions can save lives or hasten deaths.

This issue matters in radio. We as owners, managers and engineers of facilities are among those responsible for lives of employees, visitors and contractors in our studios and lobbies, on our towers and at our events.

After Sept. 11, 2001, Radio World called on radio groups and station managers to conduct vigorous reviews of their station emergency policies and their training, in case of future terrorism, natural disaster or criminal activity. Some listened; but to this day, we believe many broadcasters have not prepared adequately for the unexpected.

Radio World contributor Buc Fitch, prompted by the nightclub deaths, reminds us now that the same caution should be extended to a review of your station's preparedness for fire and evacuation.

Are your exit light signs illuminated? Are the backup battery lights good? Test them — how bright are they, and for how long can you count on them?

Can people actually get out of your exits? This sounds obvious; but after 9/11, security concerns may have resulted in exits being chained shut.

In fact, Fitch said, "How many times have I come into a station or studio and found the mandatory second exit *locked*, sometimes with a chain and a huge Masterlock? No one is going out that way except through heaven."

Where is flammable material present in your building? Is it kept to a minimum?

Are you saving quadruple copies of 20-year-old sales contracts, boxed up in the basement, for "good will value"? Are they more of a risk than an asset?

Does the station have a no-smoking policy, and enforce it? Are your fire extinguishers charged and ready to go? Remarkably, Fitch says he visited one station where every single extinguisher was *wire-tied* to the holders. Perhaps someone did it as a prank. It wouldn't be funny if a fire were to spring up in the station kitchen.

When it comes to safety, assume nothing. Create a facility safety and emergency practices manual now, and update it regularly. Make managers responsible for identifying safety hazards and solutions in their departments. Reward those who contribute ideas. Establish safety checklists and schedule regular safety inspections.

Lives may depend on you.

— RW

More Opinions On Pages 84-85

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