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Atop 4 Times Square
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Radio World



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The Newspaper for Radio Managers and Engineers

June 4, 2003

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Photo-illustration: Joaquin Araya

NEWS ANALYSIS

Algorithm Concerns Slow HD Radio

IBOC Standard-Setting 'Temporarily Suspended' By NRSC After Demo

by Leslie Stimson

Has radio's digital rollout hit a slight pause, or a big glitch? That depends on who's being asked.

Standards-setting activity for IBOC was suspended temporarily in May by the steering committee of the National Radio Systems Committee's DAB subgroup.

After a private demonstration at National Public Radio, several NRSC sources said they found the artifacts in the system using the PAC audio coding algorithm "unacceptable."

In a memo to fellow members of the DAB Subcommittee, the steering committee stated: "DAB Subcommittee members who attended the NPR demonstration do not consider the audio quality demonstrated by the Ibiquity 36 kbps PAC technology to be suitable for broadcast."

A written complaint from the industry standards body at this stage of the digital radio rollout is unwelcome news for

See IBOC, page 3 ►

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Pa. EAS Goes Cutting-Edge

HUMMELSTOWN, Pa. Pennsylvania officials believe they have the next-generation public warning system in a new satellite communications network that links emergency management officials with broadcasters.

Successfully tested in March, the system includes approximately 44 broadcasters that are considered key entry points for emergency information, said Dale Gehman, vice president of technology for the Pennsylvania Association of Broadcasters.

"This replaces a broken EAS daisy-chain network that was left over from the early EBS days," Gehman said.

The Pennsylvania Emergency

Management Agency selected Communications Laboratories Inc.'s EMnet Satellite EAS System because of its "secure,

This system will eliminate the need for broadcasters to rely on other stations to relay emergency information.

— Dale Gehman

encrypted TCP/IP platform and MP3 broadcast audio quality," Gehman said.

The EMnet Satellite EAS System allows PEMA's Emergency Operation

Center in Harrisburg, the state capital, to originate an emergency message via satellite to online stations and receive confir-

mation that the command was received within 15 seconds, Gehman said.

"The delivery can include MP3 audio messages, photos, detailed text messages

and other attachments," Gehman said. "This system will eliminate the need for broadcasters to rely on other stations to relay emergency information."

PEMA has installed 50 downlink and four uplink sites encompassing all LP-1 and LP-2 facilities in the state. Another 160 broadcasters are scheduled to go online later this year, Gehman said. When completed within two years, PEMA's satellite EAS system will include some 320 broadcast sites.

Gehman said PEMA so far has invested an average of \$3,500 per site for installation and will pay a \$38 access fee per month to Comlabs. Each station receives a satellite dish, receiver and a Dell computer system.

Comlabs designs satellite warning and messaging systems for emergency management applications. Sales Manager Dan Rau said Delaware launched EMnet EAS in December and that five states, in addition to Pennsylvania, are on the verge of deploying the technology.

"The technology takes EAS into what it can be. It's a very reliable delivery mechanism that is very robust and secure," Rau said. "It's all digital, which allows for text files to be attached, even photos. And it's instantaneous for everyone eliminating the daisy chain notification system of EAS."

Rau said EMnet EAS communicates with broadcasters' existing EAS encoder/decoder units.

Delaware and Pennsylvania emergency management authorities obtained federal funding to launch the system, Rau said.

"There is money available from the Department of Justice and the Department of Transportation for states to do this. It all goes toward emergency messaging improvements and interoperable communications," Rau said.

— by Randy J. Stine

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IBOC

► continued from page 1

proponents. It comes at a time when many groups have placed initial equipment orders, receiver makers have set plans and a few stations are on the air.

This development, sources said, puts the onus on Ibiqity Digital Corp. to solve problems related to its codec of choice. Ibiqity can continue to tweak PAC or choose another audio algorithm. The company continues to work on improvements of PAC so the standards process for HD Radio can resume. It said it would continue to work on software upgrades for PAC. Ibiqity Co-COO and Senior Vice President Jeff Jury said, "This will be resolved. It will be in the short term."

Growing concern about the performance of PAC on AM at low bit rates led the steering committee to make this decision, although members expressed concern about FM as well; and they have questions about how PAC's performance could affect secondary audio channels and data services.

Some orders affected

Also as a result of the suspension, some major radio groups are slowing adoption of AM IBOC until the codec issue is resolved, according to broadcast sources.

Some vendors said some customers had asked that their equipment not be shipped while the issue plays out.

Harris Vice President of Transmission Systems Dale Mowry said that while no one had cancelled orders, a handful of "industry leaders" have asked for a hold on AM and FM shipments.

"These represent a small portion of the IBOC backlog," he said. Harris also said its NeuStar, a codec pre-conditioner meant to enhance digital signal processing at low bit rates for AM and FM, could work with a variety of codecs, not just PAC.

Broadcast Electronics Vice President of RF Systems Tim Bealor said that while some of the major groups were slowing the rollout on the AM side, BE was still shipping HD Radio systems.

"Everyone who has orders has taken at least partial delivery. ... Certainly, I won't say the codec issue has no impact. Everybody wants to make sure it sounds good. We'll keep an eye on it," he said.

Nautel President/CEO Scott Campbell said, "We'll see how this news affects the rollout."

Clear Channel Radio had been planning to transition one AM and seven FMs this year. The AM station, WSAI in Cincinnati, is on the air, and a Clear Channel source said the company is proceeding with the FM conversions.

The company transitioned one AM primarily to get a feel for how the system would work. "We have concerns on the AM side," said Bill Suffa, senior vice president of capital management.

The steering committee stated: "The NRSC has long considered flexibility to be an important feature of IBOC digital radio systems, and is concerned that PAC operating at bit rates between 36 kbps and 96 kbps (the maximum coding rate used in the hybrid FM IBOC system) could also have quality issues that may need to be investigated by Ibiqity."

The steering committee is made up of NRSC Chairman Charlie Morgan, DAB Subcommittee Chairman Milford Smith, Evaluation Working Group Chairman and co-Chairman of the IBOC Standards Development Working Group Dr. Don

Messer and Co-Chairman of the Working Group Paul Feinberg. The steering committee is authorized to render decisions between DAB Subcommittee meetings.

Smith said the NRSC still supports IBOC. "The overall system is really great and works well." Yet, "Our goal from the start has been to have both an AM and FM solution. We don't think we've got an AM solution."

The NRSC is not aware of any testing or public demonstration of the Ibiqity system utilizing PAC at these low bit rates.'

Smith said his employer, group owner Greater Media, is proceeding with antenna modifications for IBOC. However, a source close to the company said, "We're hesitant to flip on the switch until the issue is resolved."

Smith and others said the standards process would resume when Ibiqity has demonstrated the problem is resolved.

Ibiqity can continue to tweak PAC or choose another algorithm such as AAC or MPEG. It had used AAC previously; several NRSC sources thought the system audio with AAC was better than with PAC.

Ibiqity declined to give details about the demonstration in May at NPR.

NRSC sources said non-commercial and commercial NRSC station members who attended that demo agree the artifacts are unacceptable. Several said the audio quality on a talk-format example with the system fed through a digital exciter sounded "unnatural."

Members of the NRSC Steering Committee believe the average listener would notice the artifacts and be annoyed.

Yet the DAB Subcommittee believes the problem can be fixed. When asked what the FCC might think of the development, one steering committee member said, "We want the FCC to know it's a problem we found, but there's no need for the FCC to raise an eyebrow" over this.

Ibiqity has been working on codec improvements for some time, several sources said. The difference between this discussion now and those that took place a year ago, one vendor said, is that "Now people are asking, 'Is it really getting better?'"

PAC upgrades

In a statement, Ibiqity responded to the NRSC's suspension.

"At this time, we concur with their decision to temporarily delay these efforts until the issue is resolved. ... This issue is in the audio coder and has to do specifically with AM audio quality. The resolution will be a software upgrade, and no other changes to the system will be necessary. We have an on-going improvement plan and anticipate resolution of the AM audio quality issue as soon as possible."

After the news came out, various participants disagreed on what it meant. Some in the proponent camp said the NRSC was basing its action on the hypersensitive ears of a handful of "golden ears," and some broadcast sources argued that many consumers listening in the car environment wouldn't care. Others felt the NRSC action was long overdue.

Ibiqity used AAC as the codec for all the previous data submitted to the NRSC, and the technology developer and NRSC

members agreed some tests would be re-run with PAC. NRSC sources didn't believe the data would indicate a problem, yet Ibiqity chose not to submit an AM report with PAC earlier in the year, saying it wanted to re-run the tests with a later version of the codec.

The steering committee addressed the codec difference issue in its memo: "Earlier Ibiqity demonstrations of its AM IBOC system incorporating the previous low bit-

without changing codecs. It's important, he said, to set realistic expectations based on what consumers want.

A source with a group owner and Ibiqity investor agreed. "In the end, it's the perception of the listener" that counts, he said.

Uncertain was how the pause might affect the rollout for chipset makers and other receiver manufacturers. Ibiqity was expected to release software code to chip and receiver manufacturers soon to keep the HD Radio rollout on track. It was unclear how substantially manufacturers could compress production to allow for a delay.

Broadcast sources pointed to potential consumer perception issues that could arise if the chipset software must be changed after the first generation of HD Radios is on the market and the change cannot be handled without a customer trip back to the retailer.

Also unclear was whether the decision would affect the work of a separate NRSC subcommittee developing data standards for IBOC, although in its memo, the steering committee stated, "the poor performance of the PAC codec at low bit rates raises concerns of performance at intermediate rates, such as 64 kbps."

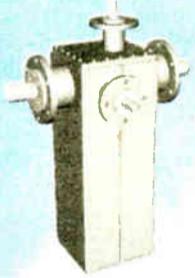
It said many ancillary data providers and secondary audio providers propose reducing the main audio channel of the digital transmission to 64 kbps to provide these services.

"The NRSC is not aware of any testing or public demonstration of the Ibiqity system utilizing PAC at these low bit rates. This is an important matter for the NRSC," given the formation of the subcommittee, it stated. ●

HD-Ready Radio Antennas



IBOC Hybrid Combiners



Television Antennas



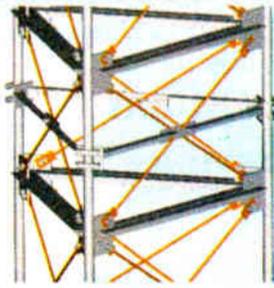
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Dirty Discourse at the Beach

by Paul McLane

In this issue you'll find 500+ column inches devoted to the new products of summer 2003.

But what about your *literary* needs? As you sizzle in the sun listening to the sounds of the surging surf, you'll probably reach for a tall cool drink. But how will you quench your ongoing thirst for knowledge?

Down with trashy paperbacks. Fie on beach novels. Here are three summer reading suggestions just for fans of Radio World. No sex, just lots of information.

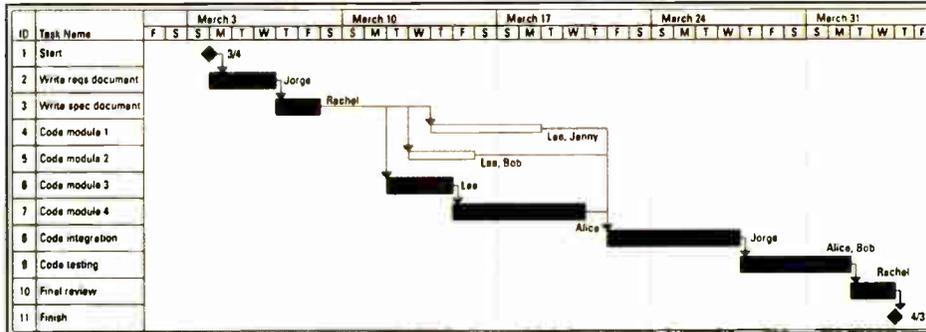
OK, maybe a little sex.

★ ★ ★

Engineers who want to be managers can turn to a text by B. Michael Aucoin. "From Engineer to Manager: Mastering the Transition" is a hardcover that is not specifically for radio or broadcast engineers, and yet it is.

How many times have we written in these pages that engineers should learn to be more effective managers to advance their careers, attain their goals and find a seat at the corporate table?

Aucoin helps. He understands that certain principles can help any technical person become more effective in the big, bad world of non-technical management.



This is a sample Gantt chart in "From Engineer to Manager."

What does it mean to facilitate ownership? Why can't other people follow explicit rules? Are office politics *ever* healthy? How can I manage risk, manage assets, prompt changes, make recommendations, organize a group?

It's pricey at \$75 retail, but it's a fine investment for any engineer with managerial ambitions. 360 pages, published by Artech House, www.artechhouse.com.

★ ★ ★

In his recent *Workbench* columns, John Bisset has shared funny examples of silly or downright stupid behavior by DJs and radio station operators. Hey, don't these folks know how to run a radio station?

Maybe not. The FCC no longer requires operator licensing. But now there's a book for operators to help them handle their responsibilities, the "SBE Certification Handbook for Radio Operators" by Ron Bartlebaugh, published by the Society of Broadcast Engineers.

It educates in a straightforward way that is never condescending, using simple photos and diagrams to explain such items as a digital audio workstation, a four-bay FM antenna, a balanced patch-bay cable. It discusses important topics like EAS, FCC inspections, the station log and even smoking in the studio.

This is a super overview for non-technical readers about the responsibilities of an operator and the various terms and types of equipment used in radio. The book also will prepare the reader for the operator certification exam available from the SBE; sample questions are included.

You can hand this 74-page booklet to any novice who crosses your path in a radio station. Congratulations also to the SBE National Certification Committee, chaired by Chriss Scherer, for this much-needed publication.

Cost: \$42 plus shipping including the exam fee. Call (317) 846-9000 or e-mail lbaun@sbe.org.

★ ★ ★

And if those two selections don't float your beach ball, try "Dirty Discourse: Sex and Indecency in American Radio."

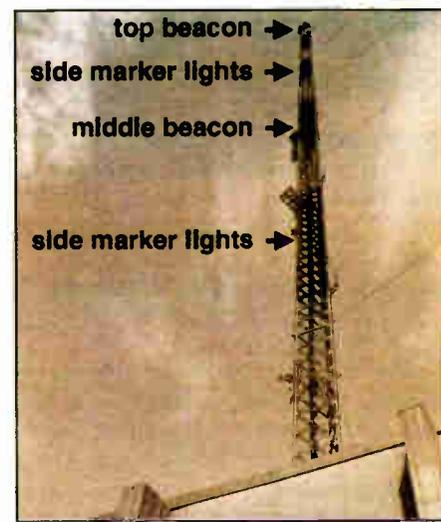
Burning ears. Topless radio. Rap lyrics. Sextop radio. Wolves in she's clothing. Eargasm. The King of All Raunch. Call letters that spell out anatomical phrases. "Is it smut or satire?" And *how* many dirty words are there again?

Robert L. Hilliard and Michael C. Keith take on a touchy subject in an academic way, giving us a hardcover look at softcore radio.

They explore the question of how broadcasting evolved to the point where... well, to *this* point. (I was going to quote some examples of shock-jock words and behavior, lifted from actual radio broadcasts, but I think I'd better not.)

They include examples of songs and bits that were considered indecent, commentary from various participants and observers, and a deep appendix of relevant FCC and legal material.

It's quite fascinating. If you are inter-



Tower light locations and designations are given in an SBE handbook for radio operators.

ested in questions of freedom of speech, indecency and the cultural questions raised by these issues, read this book. If you are easily offended, skip it; the authors don't shy away from the language. (Sorry, there are no photos. This is radio, after all.)

Published by Iowa State Press, 300 pages, retail \$49.99. Visit www.iowastatepress.com.

Boy, do we have great prizes this year in our New Technology Sweepstakes. You can sign up by clicking on the logo at our Web site, www.rwonline.com.

This week's winner is Val Reugger, owner of Sportsline Radio Network in Riverview, Fla. He wins the Broadcast Tools ACS 8.2.

It provides matrix audio switching of eight stereo inputs to two stereo plus two mono outputs. Any input assigned to output one has fading capabilities. Features include headphone jack and level control, front-panel switches, contact closures and multi-drop RS-232 serial port, audio activity and silence sensors for both output channels, 16-input GPI port, eight open collectors and eight SPST relays. Retail value: \$759.



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- Site List** - A list of sites, currently showing 'ROCK 97.5'.
- Meters** - A grid of meters for various parameters:
 - B1 Low Voltage: 9.330 Vts
 - Main Power Out: 48.000 kW
 - B2 Filament: 8.224 Vts
 - B2 Power Out: 45.417 kW
 - Room Temperature: 108 Deg
 - AC Phase 1: 0.396 kV
 - AC Phase 2: 0.396 kV
 - Generator Phase 2: 0.33 kV
 - B1 High Voltage: 7.63 kV
 - B1 Temperature: 116.666 Deg
 - B2 Plate Vols: 7.977 kV
 - B2 Temperature: 1.26 Deg
 - Reflected Power: 7.5 Watt
 - AC Phase 2: 0.396 kV
 - Generator Phase 1: 0.396 kV
 - Generator Phase 3: 0.396 kV
- Commands** - A grid of control buttons for various system functions like 'B1 Low Voltage On/Off', 'B1 Master On/Off', 'B1 Power Raise/Lower', etc.

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FIRST PERSON

Embedded With Connie in the Gulf

A Radio Reporter Finds That a Ship at War Can Be a Thrilling and Frustrating Place

by Jim Ryan

This is the conclusion of a two-part article by Jim Ryan, who reported on the war in Iraq from the Persian Gulf aboard an aircraft carrier. Ryan is a regional correspondent for ABC News Radio and senior reporter for WBAP(AM) in Dallas-Ft. Worth.

Earlier he described the training given by the military to reporters. He had begun to settle in on the USS Constellation and file stories among periods of sleep deprivation and communications blackouts. He said the process was going relatively smoothly until April Fool's Day.

On March 31, I accepted the Navy's offer to visit one of the other warships in the Constellation battle group.

On deployment, aircraft carriers usually are accompanied by companion vessels — destroyers, cruisers, supply ships, frigates and submarines. I would travel by helicopter to the USS Higgins, an Arleigh Burke-class destroyer positioned just off Iraq's tiny coastline, in hopes of seeing her do what she does best: launch Tomahawk cruise missiles.

The captain could offer no guarantees, though; just before I arrived, a TV crew had left empty-handed. The commanders at Central Command had simply not ordered any cruise launches during the previous few days. So traveling away from Connie was a gamble.

Instead of leaving the potential danger zone, boats large and small were creeping around us like cats circling a trashcan.

But the Higgins is a pleasant enough place, as warships go. She's about one-tenth the physical size of the Constellation and her crew is less than a tenth in number.

Because the Higgins was built just four years ago (Connie first went to sea during the Kennedy administration), she was designed to accommodate a co-ed Navy. About 90 of the USS Higgins' 320 crewmembers (including the executive officer) are women, compared with about 40 women among Constellation's population of 5,500.

I was told shortly after setting foot on the aircraft carrier that every ship has her own personality. I wasn't sure what that meant until I visited the Higgins.

Bad timing

Partly because of her mission (F-18 Hornets never land on her roof) and partly because of the gender mix and smaller crew, I sensed a more intimate, genteel environment aboard the Higgins.

Meals on the destroyer, for example, are a formal affair at which one must politely ask permission to join the senior officer already seated at the table. Mealtime on the Connie is boisterous and businesslike —

wolf it down and back to work.

On April 1, I awoke early on the Higgins and flipped on the TV set in the admiral's lounge, the e-mail equipped office I had been offered as a workspace. I watched the latest war headlines and



Jim Ryan on the deck of the USS Constellation shortly before a series of Tomahawk missile launches.

absent-mindedly read the scroll running across the bottom of the screen: "...PLANE SLIDES OFF DECK OF USS CONSTELLATION IN THE PERSIAN GULF..."

I couldn't believe it. I had been on the carrier for three relatively uneventful

weeks and within hours of my departure; a plane slides off the deck! To make matters worse, the Higgins might not even launch cruise missiles.

The crew of the ill-fated plane had managed to eject and both men were going to be okay, but I immediately began asking when I might catch another helicopter back to the Constellation. No luck; my departure would have to wait until the following day.

Suddenly, my embed experience was going very badly. I did manage to gather enough information from the PAO on Constellation that I could file stories on the incident involving the S3-B Viking, the submarine-hunting radar-jammer that had ended up in the water. After all, I was still within the Constellation battle group.

Launch

The disappointment of having left the carrier just before a major event like the loss of an airplane was soon softened: The captain of the Higgins told me that the crew would, indeed, be firing cruise missiles in just a few hours.

The Higgins, I was told, was farther north than any of the more than 100 American warships in the Gulf, explaining

why every crewmember was required to keep a gas mask in a pouch worn on a belt around the waist. It was a sobering reminder that we were closer to Saddam's Iraq and its presumed chemical-weapons threat than any other U.S. Navy vessel.

As the appointed launch hour approached, other ships in the area were quietly warned. But instead of leaving the

seeing missiles fired is, in purely military terms, very cool.

The seconds ticked down to zero, a siren screamed on board Higgins, and in a blinding blaze of fire and a gray mountain of smoke, the first missile roared out of its tube and turned northwest toward Iraq. The Higgins launched five missiles, about five minutes apart.

About 20 seconds after launch, the booster rocket bursts away and a turbofan takes over, carrying the weapon on its precision-guided way. At least that's what's supposed to happen. On the April Fool's Day I spent with the USS Higgins, one of the missiles failed. The turbofan simply didn't start and the Tomahawk fell harmlessly into the Persian Gulf, much to the apparent surprise of the Australian minesweeping ship that had ambled within a couple of miles of us and was in the line of fire when the dud fell into the sea off her starboard side.

News as it happens

Evidence that embedding was still in its infancy: About two hours before the cruise launches, the Higgins captain imposed River City restrictions, meaning that no one on board, sailor or reporter, could call or e-mail off the ship.

That's hardly surprising, because the Pentagon did not want to tip off the Iraqi leadership that weapons were on the way. About 15 minutes after the launches, River City was lifted.

I asked the ship's executive officer (XO) when the Tomahawks would land. "About 90 minutes," she said.

See EMBEDDED, page 6 ▶

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Embedded

► continued from page 5

Now, if I report the fact that missiles will land on Iraq in an hour-and-a-half, I would be well within the embedding guidelines, since River City had been lifted. I decided to re-approach the XO: "So, the Tomahawks will strike in 90 minutes, but you've lifted River City and I can report that fact now, right?"

desk in New York: "I really can't tell you why, but I think you should put me on at the top of the hour."

They trusted me, patched me through to the engineer and anchor Doug Limerick improvised a lead: "Activity today in the Persian Gulf. Let's go live to ABC's Jim Ryan aboard the USS Higgins."

Rare is the moment when a reporter can open with the words "At this moment..." We had the exclusive story of Tomahawk missiles landing *right then* in Iraq and operational security was preserved. But it

One CNN photographer bloodied his forehead when, jolted from sleep, he sat straight up in his lower bunk. Others awoke screaming incoherently.

I think she suddenly realized that, as a network radio correspondent carrying a mobile satellite phone, my broadcast would be immediate and national. "You can report it," she said, "but I hope you don't."

In the end, I waited. The first of the missiles would drop at precisely 2 p.m., Gulf time (6 a.m. Eastern).

At 1:55 p.m., I called the ABC radio

was obvious that the River City process needed some refinement.

On April 2, I returned to the USS Constellation carrying a video and audio record of the missile launches. It felt good to be back on Connie's relatively solid ground.

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Photo by Jim Ryan

An S3-B Viking like this one slid off the flight deck, taking out part of the satellite dome and severely restricting e-mail capability and Ryan's ability to feed radio stories.

Constellation was much more reliable than her smaller companion.

Or at least it was under normal circumstances. But because the S3-B Viking had taken out part of the satellite dome when it slid off the flight deck, the ship's e-mail capability was severely curtailed.

Suddenly, media and crewmembers alike were limited to 500 KB per e-mail. That translated to one 30-second MP3 audio piece and long-form pieces had to be broken down into half-minute segments. Still, my system still worked, only much less efficiently.

Life during wartime

Given the bare floor, exposed pipes, industrial paint on every surface and the never-ending noise, living on an aircraft carrier is very much like living in a factory. We, the embedded media, slept in the enlisted men's berthing below the engineering deck ... somewhere between the bomb elevator and the aircraft elevator, both of which growled and screamed like bears caught in a trap.

Like Constellation's sailors, the reporters on board worked long hours and were generally deprived of sleep. Our jobs were not nearly as physical or dangerous as sailor work, but nightmares were a

common theme among the journalists, especially early on in the assignment.

One CNN photographer bloodied his forehead when, jolted from sleep, he sat straight up in his lower bunk (called a "rack" in Navy parlance). Others awoke screaming incoherently. My first night was interrupted by dreams of being crushed in a giant trash compactor — a product, I'm sure, of the howling elevators.

Eventually, I eased into a routine of short naps interspersed with the day's reporting duties. Because the Constellation was on an overnight schedule (reveille was piped in on the ship's public address system at 6 p.m. and taps came on the following morning at 10 a.m.)

I might be interviewing a pilot returning from a sortie at 2:30 a.m. or talking with the ship's doctors about a feature at 2 in the afternoon. U.S. morning drive fell between noon and 5 p.m. Persian Gulf time, so I would e-mail several pieces for use during those hours, then make myself available for live shots via satellite telephone.

Once the problems of disorientation during the day and sleep deprivation at night were mastered, it was possible to sit back and take stock of life on the carrier. True,

See EMBEDDED, page 7 ►

◆ NEWSWATCH ◆

FCC Tries to Simplify Tower Siting

WASHINGTON Recognizing that tower siting can be painful and tedious, the government is trying to streamline the process for those who want to place towers on private or federal land. A task force made up of several agencies hopes to issue recommendations within a month or so, according to a spokesman for the National Telecommunications and Information Administration.

The FCC is coordinating with the task force, and in May, Chairman Michael Powell wrote the director of the U.S. Fish and Wildlife Service to suggest the agencies coordinate efforts.

Under current procedures to satisfy the Endangered Species Act and historic preservation efforts, Powell wrote, "the number of communications tower reviews is not only creating a heavy case-load, but is causing administrative delays and consuming resources at both agencies that may be more effectively directed towards other types of reviews."

Powell suggested the agencies agree to

streamed procedures by the end of the year, and determine which tower categories can be excluded from this type of review because the structures pose no threats to endangered wildlife.

Key, said Powell, is determining whether migratory bird kills are related to towers. "There's a lot of speculation, but we need to know more," Powell told Radio World.

DMarc Expands RDS Offerings

PASADENA, Calif. DMarc Networks headed to Clear Channel's Wango Tango Concert in Pasadena in May to show off its technology that provides text message to RDS-enabled automobiles.

DMarc deployed last year in Los Angeles. At Wango Tango the company said it was demonstrating service expansions to allow consumers to send personalized text messages, assist listeners in finding song information and purchasing music over the phone, and help artists and concert organizers promote music through RDS.

Embedded

► continued from page 6

the food in the cafeteria-style wardrooms was not gourmet. But it was plentiful and always available, regardless of my schedule.

The coffee was hot and the soups were tasty. The point of mealtime eventually was not just to eat, but also to socialize with other reporters and with our "shipmates," the sailors and flight pilots who happened to be eating at the same time. Many stories that would later find airtime or print space were generated at the breakfast table at 9 p.m. on Constellation.

Coming home, sort of

The constant backdrop for life at sea was The Question. It came up among the journalists during lulls in the bombing runs; sailors I met in the pressroom raised it. The admiral even posed it during his morning media briefings. The Question replaced the weather as the casual conversation-starter.

Although it rarely had a definite answer, The Question increasingly became an obsession, asked of one another and asked of ourselves: "When are you going home?"

For Constellation crewmembers, it was purely rhetorical: They couldn't leave until their commanders decided the job was done.

When we civilian reporters asked it of each other, we half-expected a date, but rarely heard one. After all, the mantra of the Pentagon's great experiment was "Embedded for Life." We, too, were supposed to remain "on station" until the work was finished.

It dawned on me that The Question, put to a shipmate as a cruel little joke or agonized over during a lonely, sleepless night, had been asked countless times by genera-

tions of sailors longing for home. It became a cornerstone of my "embed" experience and a first-hand lesson in the hardships of military life.

land-embed gear I had left at the Diplomat about six weeks earlier and head to the airport for the short, evening flight to Qatar. There, I joined New York-based ABC News

Halfway through media "boot camp," Gen. Chris Kelly, commander of Ft. Dix, N. J., had explained his understanding of the logic behind the embedding process. His view was that the program's roots could be traced back to the Vietnam War and the frigid media/military relationship that grew out of it.

The hope now, he suggested, is that cooperation between the two sides would benefit reporter and soldier, ultimately to the good of the American public. The Pentagon, he said, would have first-hand coverage of the important story of the U.S. military.

Journalists would be free to report events as they saw them, not as a PAO described them. It's clear the two sides are still feeling their way; but in the final analysis and based on my own experience, both sides got what they needed. I think the American audience did, too.

In the final analysis and based on my own experience, both sides got what they needed.

Finally, my answer to The Question came from New York. On April 10, I was up at 5:30 a.m. to catch the turbo-prop Carrier On-board Delivery plane for Bahrain. We were catapulted off the forward end of Constellation at about 7 a.m. for the hour-long flight back to land.

I had just enough time to pick up the

Radio reporter Tim Scheld, and Linda Albin, our correspondent in London.

Trading my middle "rack" for a king-sized bed and fried chicken patties for garlic-roasted shrimp, my final week overseas was spent anchoring early-morning status reports and covering activities of the Doha-based U.S. Central Command. And resting.

NEWSWATCH

Harris Tightens; Lays Off Workers

CINCINNATI By the end of June, Harris expects to have closed its Intraplex plant in Littleton, Mass., and outsourced that product line to Cirtronics in Manchester, N.H. Most that line was being manufactured by Cirtronics.

The changes were part of a larger effort at Harris to cut costs, necessitated by the stalled economy and lengthening DTV transition. The company eliminated approximately 230 positions, 125 in its corporate division and the balance, roughly 105, in Broadcast Communications. Some manufacturing jobs for TV and radio equipment were eliminated in Mason as well as Quincy, Ill., and Sunnyvale, Calif.

Many of the positions were unfilled and part-time, a spokeswoman said.

Some Intraplex engineering managers and product line managers have been offered positions at the Harris Broadcast headquarters in Mason, Ohio, she said. Intraplex product salespeople would maintain their home offices and continue to sell the line.

Before the move, 55 people worked on Intraplex products. Harris could not give a current count until the end of this month.

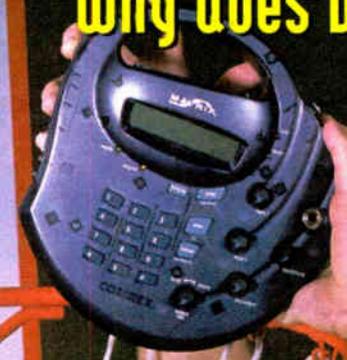
The company said overall cost-cutting moves would include reductions in facility expenses, discontinuation of several low-margin telecom products and disposal of assets remaining from the telecom switch business that it exited earlier.

Why does Doug Lane rely on Comrex?

Because he can.

Power user Doug Lane relies on Comrex codecs for all of his remotes. Responsible for major league basketball broadcasts, Doug reports that in the ten years they've been using Comrex equipment, they've never lost a game. With 29 teams and more than 80 games annually plus playoffs, that's over 15,000 perfect broadcasts. Doug also specifies Comrex codecs every weekend during basketball and football season at his stations.

Comrex products are so easy to use, Doug can outfit and train an announcer in minutes. In fact, even the most nontechnical sport's writers can broadcast solo with the equipment. That's crucial these days, since engineers frequently have to manage multiple remotes. With Comrex on your team, you can handle the most demanding remote schedule — and stay on top of your game.







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— Doug Lane, ISDN Technical Consultant to the NBA and NHL and Technical Director for WEEI

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Rooftop Work Begins at 4 Times Square in N.Y.

Project Would Be First New Broadcast Structure Built in City Since 9/11 Terrorist Attacks

by Randy J. Stine

NEW YORK The Durst Organization, owner of the Conde Nast Building at 4 Times Square, will build the first new broadcast structure in the city since the Sept. 11, 2001, terrorist attacks.

The designers hope the new 384-foot rooftop structure will attract clients who will use it as an auxiliary site. They are building the facility with sufficient room for every FM broadcaster in the city to do so. The project will include transmission sites for New York City television stations.

Work on the 4 Times Square project began in late April with the dismantling of a 132-foot tower built in 1999. A Shively Labs 6017 is being used for a temporary FM master antenna on the roof during construction. The \$25 million project is expected to be complete in October. The top of the tower will be 1,142 feet above street level.

The 4 Times Square transmission facility already serves as an auxiliary site for Clear Channel's five-station group, Spanish Broadcasting's WXXQ(FM) and WPAT(FM) and public radio WNYC(FM).

John Lyons, manager of communica-

tions and broadcast operations for the Durst Organization, said Electronics Research Inc. is constructing the new tower while Shively Labs is building the FM combiner.

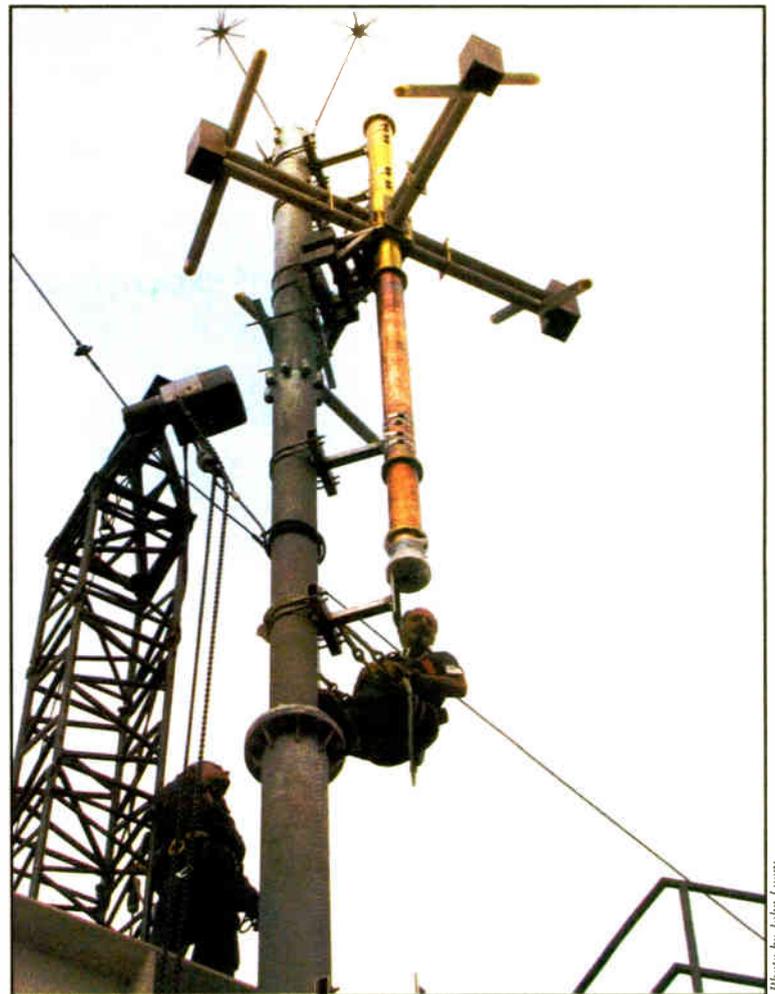
"The new FM antenna is a Shively 6016-3/4 modified master antenna with Dielectric Communications handling the TV antenna," Lyons said. "The new FM master will be HD Radio-ready without the need for any additional antennas or equipment."

Lyons said 4 Times Square eventually could serve as a primary site for several radio and TV broadcasters. "We are in negotiations with a couple groups about that."

Sources say Univision Communications, the largest Spanish-language television network in the United States, was close to signing a deal with the Durst Organization to transmit from 4 Times Square.

The Durst Organization has received all necessary approvals for the new tower from the Federal Aviation Administration as well as the FCC, Lyons said.

The Empire State Building currently serves as the main transmission site for nearly every commercial FM in the city. The ERI master combiner system has 16 FM tenants with an antenna height of



Two employees of Hatzel & Buehler electrical contractors work on the transmission line of the temporary FM master antenna atop 4 Times Square.

1,454 feet from the street. Other stations broadcast from Empire but are not part of the master antenna group.

Durst is building the facility in the hopes of capturing a share of the broadcast space-leasing market in the city, and to a certain extent is building part of it "on spec," hoping for more tenants.



Artist Rendering of the Project

Plans to expand the FM master combiner at Empire State remain stalled, said one source familiar with the current availability of rooftop tower space in the city. Plans also call for a maintenance combiner to be added.

Herb Squire, vice president of engineering and operations for DSI RF Systems Inc., which is assisting the master FM antenna group, said limited physical space is a problem with transmission facil-

ities at the Empire State Building.

"We need more floor space for equipment on the 85th floor. A few structural issues with the tower itself remain, too," Squire said.

Spanish Broadcasting System's WPAT(FM) joined the master combiner at the Empire State Building in late April, bringing the number of stations on the master combiner to 16. "That is the original design capacity," Squire said.

If a structural engineering study indicates the tower and rooftop structure can handle it, "we would like to expand the existing combiner," Squire said.

A handful of stations are still considering a "mini-master concept" at the Empire State Building. The group would lease space for a new independent antenna system. Sources say that five stations, WPLJ(FM), WQHT(FM), WCBS(FM), WQCD(FM) and WKCR(FM), likely would be included in the mini-master antenna project.

Across town

Five radio broadcasters lost main transmission facilities in the World Trade Center collapse on Sept. 11, beginning a scramble for additional primary and aux sites around the city.

Meanwhile, the search for a site of a new 2,000-foot broadcast tower continues. A spokesman for the Metropolitan Television Alliance, a consortium of New York City television stations, says officials in Bayonne, N.J., have agreed to host the \$200 million permanent tower. However, the MTVA is still entertaining offers to build a temporary tower on Governor's Island just off the tip of Manhattan, to use until a new skyscraper is built at the WTC site.

A MTVA representative told Radio World nothing would rule out radio broadcasters leasing space on the new structure, but that it is being designed with television in mind.

The Bayonne plan calls for the construction of a structure similar to the CN Tower in Toronto, one that would also serve as a tourist destination. 

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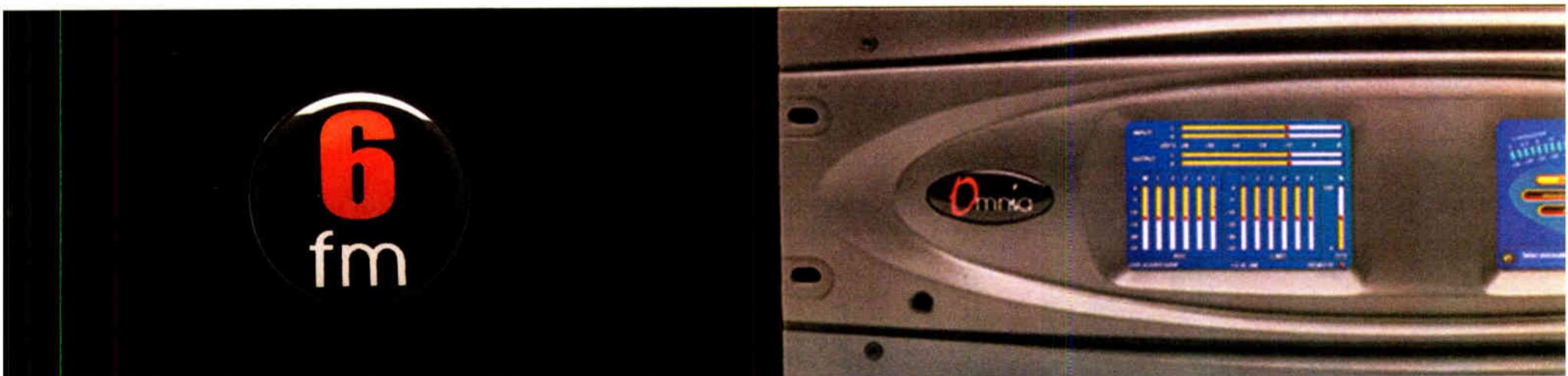
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World Radio History



Summer is upon us and that means new products introduced at NAB2003 are flooding the radio industry. In this section, Radio World provides a sampling. Suppliers, if your company showed a product that we missed, send an e-mail to radioworld@imaspub.com so we can tell our readers in a future issue.

Contributors to this section include Paul McLane, Sharon Rae Pettigrew, Leslie Stimson, Michele Kramer-Peterson, Elizabeth Prevatt, Marguerite Clark, Brett Moss, Ty Ford, Scott Fybush, Jeff Johnson, Paul Kaminski, Michael LeClair, Tom Osenkowsky, Al Peterson and Ken R.

Burk Features Lynx 4 Software

Burk Technology was at NAB2003 with Lynx 4, site management software for use with its GSC3000 and VRC2500 transmitter remote control systems. The software is included with new units. Features include customized report writing, real-time event logging and expanded connectivity. It allows the user to access all sites on one screen, with dockable windows that present information logically. Views can be switched among sites, while alarms and events for the system are kept in sight.



The company also recently announced a contract to supply 200 GSC3000 transmitter remote control units to the U.S. Coast Guard to monitor and control LORAN transmitter facilities.

Contact the company in Massachusetts at (978) 486-0086 or visit www.burk.com.

Audio Precision Tests With ATS-2

Audio Precision exhibited its ATS-2 Audio Test and Measurement System.

It allows users to discover and isolate circuit problems quickly with a Harmonic Distortion Analyzer. A Multitone Analyzer allows five performance tests in one acquisition, collating the data needed to graph test results. Multitone performance tests include two-channel frequency response,

noise vs. frequency, total distortion vs. frequency, interchannel separation vs. frequency and interchannel phase response.

The unit comes with control software and interface hardware to connect to your PC. AP also offers a performance option that increases the analyzer bandwidth to 120 kHz and includes digital interface signal measurement and analysis.

Contact the company in Oregon at (800) 231-7350 or visit <http://audioprecision.com>.

Audioarts, Wheatstone Roll Out Several Models

New from Audioarts Engineering is a range of digital and analog mixing consoles designed to suit all markets.



The compact digital DX-16 handles 16 input channels and two telco channels; it is fitted with digital bar-graph metering, alpha source displays and four mix-minus outputs. Also new at NAB this year was the analog R-55 countertop console with 12 input channels, pointer-style VU meters, timer and electronic switching.

For larger stations, Audioarts introduced the R-90 analog mixer with a modular design that houses up to 23 input channels with dual caller support. Another addition to the line was the ACS-1 digital on-air console, shown,

with a rack-mounted engine and a separate modular control surface.

Also new was the ADR-32 compact digital audio router with front-panel X-Y control and monitor speaker.

The Wheatstone D-4000 is a four-bus digital radio console with hotswap modular design and 28 or 32 mainframe inputs. The A-7000 is a "top-of-the-line" modular analog radio console.

Also featured was Gen-9, a digital on-air radio control surface that integrates with the Wheatstone Bridge digital router. The Bridge engine components allow 256 mix busses in a rackmount cage; and cages can be stacked for larger systems. Surfaces can be linked to form a network, suitable for large integration projects.

Contact the company in North Carolina at (252) 638-7000 or visit www.wheatstone.com.

BE Focuses on HD, Transmitters

With new transmitters, exciters and expansions to its automation systems, Broadcast Electronics introduced a range of products for HD Radio.

The FMi transmitter series of transmitters can handle digital-only and combined digital-analog broadcasting with power from 17 watts digital to 28 kilowatts combined digital-analog.

The FXi 60/250-watt digital exciter and HD Radio signal generator can be added to an FMi transmitter for high-level combining of analog and digital signals to a common antenna or for low-level combining in a shared amplifier configuration.

The AudioVault and VaultXpress automation systems feature new support tools for HD Radio data and MP3 audio, as well as new automation capabilities for controlling digital consoles. The addition of Main Program Service data specification allows the systems

to synchronize the transmission and reception of HD Radio data displayed on digital receivers.

Also new is the FM-25T 25-kilowatt single-tube FM transmitter, completing the BE line of single-tube FM transmitters. Two FM-25Ts can be combined for output powers up to 50 kilowatts.

Contact the company in Illinois at (217) 224-9600 or visit www.bdcast.com.

Omnia Demos HD Radio, FM Processor

The Omnia-6hdfm, an audio processor for FM air chains, was on display.

The company said it can reproduce the entire range of frequencies that HD Radio is capable of, up to 20 kHz. FM broadcasters using the new Omnia chain obtain synchronized audio processing of both HD Radio and FM analog signals.



A split processing structure routes audio from the mixer section to separate, concurrent output stages. Other features include a six-band limiter, five AGC bands with adjustable AGC crossovers and wideband AGC, twin displays with Dorrrough Loudness Meters and remote control via Ethers, serial or modem connection.

For more information, contact Omnia Audio in Ohio at (216) 241-7225 or visit www.omniaaudio.com.

Marti STL/RPU Receivers Added

The new SR-20C composite STL receiver was designed by Marti Electronics to complement the STL-20C long-range studio-to-transmitter links introduced last year.

Versions of the receiver are available for all the STL and RPU frequency bands Marti covers, 935 to 965 MHz.

Used in combination an STL-20C and SR-20C pair will yield an average left/right separation better than 60 dB, according to the company.

Also new were the SR-20M signal-channel receiver for 950 MHz STLs and the SR-40A and SR-30 RPU receivers.

Contact the company in Texas at (817) 735-8134 or visit www.martielelectronics.com.



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"In summary, the TASCAM SX-1 is a magnificent piece of engineering, with a mixing surface that feels comfortable and serious, and with audio quality you would expect from the folks who have made everything from portable cassette multitracks on up to full-bore studio gear."

- Alan R. Peterson, Radio World, March 2003



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Henry Revamps Product Line

Henry Engineering has repackaged its line of audio interfaces and digital storage systems as rackmount units, departing from its legacy of mount-anywhere blue boxes.



Classics such as the Matchbox unbalanced-balanced converter and the SupeRelay control interface have made the transition. New to the lineup for NAB include the DigiMatch two-in, six-out digital audio interface and DA that converts between AES-EBU and S/PDIF signals; and the newest version of the Digistor MP, which stores up to 20 minutes of 15 kHz mono audio. This unit is appropriate for network news delay, ID/spot insert for remote translators and message-on-hold.

Contact the company in California at (626) 355-3656 or visit www.henryeng.com.

Musicam USA Introduces Codec

Corporate Computer Systems, d/b/a Musicam USA, rolled out the NetStar audio codec, which sends full-fidelity stereo audio via ISDN lines, dedicated data circuits and over IP.

The silver-faced unit maintains compatibility with earlier codec products, while incorporating recent algorithms MPEG 2 Advanced Audio Coding (AAC) and MPEG 4 AAC-Low Delay. It also maintains the ability to send and



receive standard algorithms such as G.711, G.722 and MPEG 1 and 2 Layers II and III.

The NetStar includes rear connections for ISDN lines and a multifunction LAN connector that allows bidirectional audio via the Internet. With its internal Web Server, the NetStar can be remotely controlled from a Web browser.

Contact the company in New Jersey at (732) 739-5600 or visit www.musicamusa.com.

Armstrong And HD Radio

Armstrong Transmitter Corp. demonstrated a line of compact HD Radio-ready AM transmitters and a compact rack-mount 2 kW FM transmitter.

The X-500B is a solid-state 500 W digital-ready transmitter with +90 percent PA efficiency and +80 percent overall efficiency. Designed for the new HD Radio digital standard, the X-500B will be shipped in early summer.

New and available now are the X-1000B 1 kW transmitter, also digital-ready, with redundant RF, modulator and power supplies; the FM-2000B compact 2 kW FM transmitter, which occupies less than 11 inches of rack space and features eight 300 W modules for reliability; and the FM-30B frequency agile FM exciter.

Contact the company in New York at (315) 673-1269 or visit www.armstrongtx.com.

Econco Expanding

In 2002, RF tube rebuilder Econco announced it would begin building new transmitter tubes, concentrating at first on high-power triodes.

This year, Econco is expanding its line to include a wider choice of power tubes, including 3CX10000A7, 4CX5000A and 4CX15000A units.

The company continues to rebuild power tubes for shortwave and commercial radio stations and provide radar tubes to the military.

Contact the company in California at (800) 532-6626.

New Release From Pristine Systems/CartWorks

Following the 2002 merger of CartWorks and Pristine Systems, the company has introduced CDS³², a digital storage and playback system optimized for live assist, automation and satellite programming.

CDS³² runs under Windows XP Pro and uses audio cards from AudioScience. Audio files can be encoded and played back as MPEG-2, MPEG-3, linear or Dolby AC2.

The product conforms to the Cart Chunk standard and, under live and satellite mode, displays the familiar cart-style interface used previously by CartWorks.

Contact the company in California at (800) 795-RADIO or visit www.pristinesys.com.



Energy-Onix Puts Out Pulsar

The Pulsar line of AM transmitters from Energy-Onix use high-efficiency pulse duration modulation (PDM) and come in power levels of 250, 500 and 1,000 W.

The model 250B and 500B Pulsar transmitters primarily are for standby and low-power nighttime operation. With a weight of 70 pounds, the Pulsar is portable and rack-mountable. A redundant modular design keeps the unit on the air in the event of failure of one module. Optional external components include a rack-mountable antenna tuning unit, line surge protection and AM processing system.

Contact the company in New York at (518) 758-1690 or visit www.energy-onix.com.

OMB Has One Mix 100

Spanish broadcast manufacturer OMB introduced a compact radio mixing console, the OMB One Mix 100, that offers analog and digital capabilities in a small-size frame.



The One Mix 100 offers analog mic- and line-level inputs, along with AES3 Professional digital I/O. There are two telephone hybrid connections and a 15-pin logic connector for control logic and muting. The unit is 19 inches wide, allowing rack mounting if space is a consideration.

Contact the company's U.S. office at (305) 447-0973 or visit www.omb.com.

SoundSlice Is AudioScience USB Audio Interface

AudioScience used NAB2003 to roll out the SoundSlice ASI2214 audio peripheral, a professional audio unit that interfaces with a computer via USB 2.0.

A contained device rather than a PCI soundcard, the SoundSlice provides four balanced analog stereo outputs, one AES/EBU digital output, a single balanced analog stereo input and one AES/EBU input, two record streams and four play streams.

It is capable of MP3 playback as well as linear PCM and MPEG Layer II. While backwards compatible with the USB 1.1 standard



(12 Mbps), it runs in high-speed mode (480 Mbps) with the more recent USB 2.0 standard. Pitchless time scaling of ± 20 percent is possible, as are sample rates of up to 96 kHz. Driver support for Windows 2000 and XP is included.

Contact the company at (302) 324-5333 or visit www.audioscience.com.

AKG Headphone Features Closed Backs

AKG showed its replacement for the K270 headphones. The newly designed K271 and K271 stereo headphones feature closed backs that provide 40 dB of acoustic isolation or ambient noise isolation.

The 55-ohm design provides 10 dB to 12 dB of increased sensitivity, the company said. The K271 has a micro switch in the band that cuts audio to the headphones when taken off. When the announcer chair runs over the cord too many times, a new detachable cord with a TA-3 connector makes for an easy replacement.

Also on display was the new WMS 4000 series wireless microphone system. This high-end system offers 120 dB of dynamic range. Expandable to 64 separate mic channels, with up to 1,200 frequencies per band over four bands, the system comprises 50 mW transmitters that run for 12 hours on a single charge, a central hub that monitors and remotely controls transmitter and receiver functions via a user's PC computer and a multicoupler for antennas.

A typical single handheld transmitter and receiver operates for 12 hours on rechargeable batteries and 15 hours two AA alkaline batteries.

For more information, contact AKG in Nashville at (615) 620-3800, or visit www.akgusa.com.

Audio-Technica Expands Mic Line

Audio-Technica was showing several mics for studio use. The new AT3060 tube cardioid condenser microphone with shock mount sets a low price for a professional tube microphone; it retails for \$599.

It design uses phantom power to power the internal vacuum tube of the microphone, allowing it to plug directly into existing boom arm wiring.

Two new mics from Audio-Technica's Artist Elite series can be incorporated into a radio studio. The AE5400 handheld cardioid condenser mic uses a cardioid-only version of the AT4050 capsule. The AE5100 takes up less space and uses a medium-diameter capsule.

For more information, contact Audio-Technica in Ohio at (330) 686-2600 or visit www.audio-technica.com.



CPI/Eimac Tube in Continental Tx

CPI/Eimac showed its 4CX20000E high-performance tetrode transmitting tube.

This forced air-cooled 20 kW VHF power amplifier tube is designed for use in FM transmitters, and is now the standard power amplifier tube in Continental Electronics' 816 series of FM transmitters, the supplier said.

Eimac also showed its 3CX3000A7, a forced air-cooled 3 kW power triode which it says offers excellent linearity characteristics that make it suitable for IBOC use.

For more information, contact Eimac in California at (800) 414-8823 or visit www.eimac.com.

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More reliable Xport doesn't rely on the off-the-shelf modems found in other POTS codecs. **Instead,** we developed a custom DSP modem optimized for live audio.

Easier and lower cost Xport's ISDN option lets you use it as a universal field codec.

Better sounding Xport's aacPlus is the finest low-bitrate codec on Earth – and Xport is the only POTS codec to have it. You'll be stunned at how good an analog line **can sound.**

Now, your POTS and ISDN remotes are more reliable, better sounding, easier, and cost less.

Zephyr Xstream owners, hear the clarity of aacPlus for yourself!
To get an instant demonstration of Zephyr Xport, visit telos-systems.com/xport/

More reliable Zephyr Xstream's pure-digital ISDN connection on the studio side eliminates a lot of the analog line problems that can make a modem unstable. An Xport call is converted to digital by the nearest Telco central office, and continues through the network to your studio in digital form. Working as a tightly integrated system, Xport and Xstream extract maximum performance and reliability from real-world Telco lines.

Easier and lower cost Your studio Zephyr Xstream is now universal, linking with both POTS and ISDN codecs in the field. You need only one box and one line for everything, so you save money, your operators have only one interface to learn, and you conserve console inputs and outputs.

Today, Zephyr Xport and Xstream are *The Best Way to Hear from Anywhere.*

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World Radio History

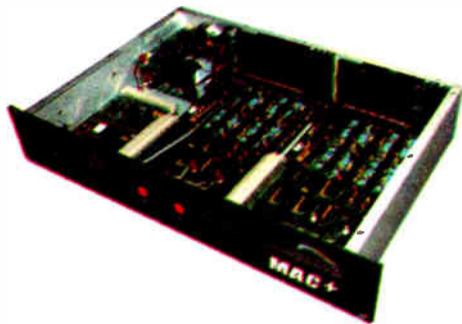
Davicom Introduces Secure IP-Based Monitoring

Davicom, a division of Canada's Comlab Inc., introduced secure, IP-based remote site monitoring capability for its MAC+ line of monitoring, alarm and remote control products.

MacNet and MacNet Lite use 128-bit AES encryption to provide secure communication between engineers and an unlimited number of remotely operated sites.

MacComm software, which runs on Windows-based PCs, provides a graphic interface to allow engineers to assess the status of remote sites. In addition to being able to take local actions (such as switching to a backup transmitter or activating heating or cooling systems) without waiting for external instructions, the MAC system can initiate telephone calls, faxes, SMS, SMNP traps, e-mail or pager messages to alert engineers to potential problems.

For more information, contact Davicom in Quebec at (418) 682-3380 or visit www.davicom.com.

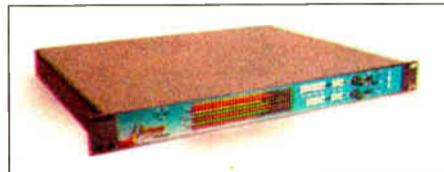


program comes with 30-second terrain data and 2000 Census information. Optional 3-second terrain data is available. The Professional edition can update its station database directly from the FCC Web site.

For more information, contact rfSoftware in Florida at (352) 336-7223, or visit sales@rfsoftware.com.

TransLanTech Targets Natural Sound

The Ariane Stereo Audio Leveler eliminates the use of the front-end full-bandwidth AGC built into most radio processors, according to TransLanTech.



The true RMS control allows transients to pass through without being processed at all. Four bands of L+R processing and three bands of L-R processing with phase linear filters produce a more natural sound, the company says.

Adjustable crossover frequency points are designed so that equal RMS energy exists in all bands. The RMS detection circuitry and TransLanTech's long-term vs. short-term dynamics algorithm help produce the signature sound.

For more information, contact TransLanTech Sound in New York at (212) 222-0330, or visit www.translantech.com.

Altronic Loads Configured for Analog and IBOC

Altronic Research Inc. showed Models 6606 and 6612 convection-cooled resistor loads. Designed to handle loads of up to 6 or 12 kW respectively, these new terminators can accommodate frequencies from DC to 110 MHz, and are configured to handle analog and IBOC digital FM needs.

Requiring no AC power, the 6606 and 6612 present 50-ohm dummy loads to transmitters through either a 3 1/8-inch EIA flanged or unflanged connection, with other connectors available by special order.

Both units are 35 inches high and 28 inches wide; the 6606 is 35 inches long, the 6612 is 54 inches.

For more information, contact Altronic in Arizona at (800) 482-5623 or visit www.altronic.com.



Belar Wizard Monitors Remotely

Belar introduced its Wizard for Windows, an extension of its popular Wizard line of monitoring equipment; it allows for remote operation and monitoring through RS-232, modem, LAN/WAN or Internet connections.

The software consists of two modules: a data acquisition/control module and a Java applet. The data acquisition and control module allows multiple users to connect to the remote unit; access is password-protected.

This module also handles data logging, at user-defined intervals or continuously. A single CD-R/RW stores a month of continuous log files. The Java applet provides a virtual front-panel interface that retains the look and feel of Belar monitoring products. Individual users can customize screens.

Belar also showed its AMMA-2 Wizard digital AM modulation monitor/analyzer. In addition to monitoring standard AM modulation, the AMMA-2 can monitor modula-

tion-dependent carrier level (MDCL) AM transmissions. The AMMA-2 adjusts for injection of IBOC digital sidebands, and includes 5- and 8-kHz filtering to provide accurate measurements of analog modulation in the presence of IBOC signals.

For more information, contact Belar in Pennsylvania at (610) 687-5550 or visit www.belar.com.

BGS Shows Danagger, Audion, Others

Broadcasters General Store showed numerous new products, including the Plan B silence eliminator from Danagger Audio Works.

This rack-mountable unit can be located at the studio or transmitter, where it detects silence on incoming digital or analog programming lines and instantly substitutes audio from its internal multiformat disc player, which can play standard CDs, CD-R, CD-RW or MP3 discs.



The Plan B includes a remote-control system that can dial up to three phone numbers automatically to alert station personnel of audio failures.

BGS also showed the VoxPro PC audio editor from Audion Laboratories. VoxPro PC now integrates with a station's network to make audio accessible in multiple studios instantaneously.

For more information, contact Broadcasters General Store in Florida at (352) 622-7700 or visit www.bgs.cc.

Superior Electric Protects Against Strikes

Superior Electric showed its Stabiline transient voltage surge suppressors, which provide additional lightning protection for studio and transmitter sites. Stabiline products are available in a range of product levels from 60 to 300 kiloamps.

Superior also showed its uninterruptible power supply (UPS) systems, available in 400, 800 and 1200 amp models.

For more information, contact Superior Electric in Connecticut at (860) 585-4500 or visit www.superiorelectric.com.

CircuitWerkes Debuts Audio, Phone Solutions

CircuitWerkes showed the Telco 6, a six-line phone ringer interface box with relay output ports that can be used to activate six different light or chime devices.



The company's DR-10 system allows operators to call from the field and interact with station programming automation to get on the air or to override it. A loop-back feature allows the operator to hear the on-air audio, so calls can be made from outside the station listening area and the remote operator can be on the air with the push of a button. The Silencer option removes DTMF from the audio outputs of the DR-10.

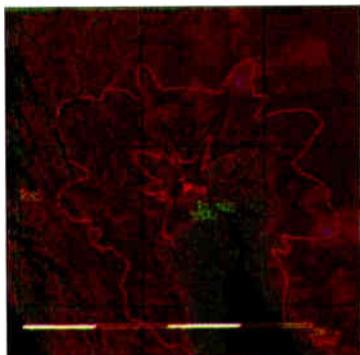
The CircuitWerkes RR20 relay multiplier uses a simple D9 input and Centronics 50 connectors, affording eight control inputs and 20 relay outputs. According to the company, they are handling increasing amounts of custom work based on broadcasters' specific requests.

For more information from CircuitWerkes, contact the company in Florida at (352) 335-6555, or visit www.circuitwerkes.com.

RfSoftware Tracks Competition

For group owners, consulting engineers, station owners and chief engineers, rfSoftware's rfInvestigator is useful for keeping track of the competition, upgrading existing stations or planning radio facilities.

rfInvestigator (\$4,250 Standard, \$5,995 Pro) combines FCC and 2000 Census databases to display station location, class, power, antenna height, owner information and audience distribution. The program generates FCC exhibits required for filing. "What if" tools allow technical projections for multiple stations.



Displays are based on Part 73.207 spacing rules and Part 73.215/509 contour rules. The

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 digital hybrids that hit the nails on the heads, making them perfect for their respective jobs. Check them out and 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. Winner of Radio World's 2003 Cool Stuff Award. Available June 2003.

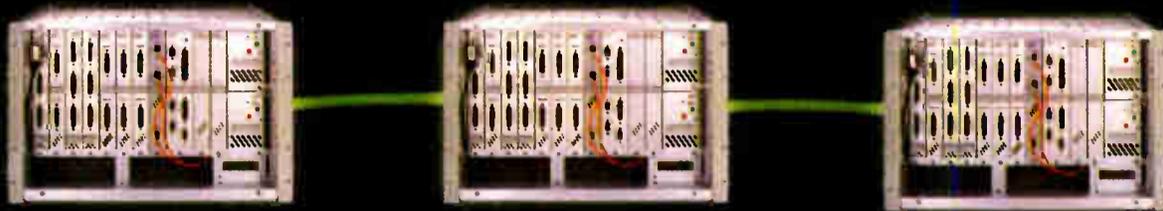


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D i g i t a l w i t h a B e t t e r D i f f e r e n c e

Ward-Beck Systems' Indigo Consoles Result Of Collaboration

Ward-Beck Systems Ltd. showed its new Indigo consoles, the fruit of a joint effort between WBS and Sierra Automated Systems.

Manufactured by Ward-Beck and marketed in the United States by SAS, the Indigo consoles incorporate LED bar-graph meters for peak and VU metering, as well as integrated SAS routers, expanding on a partnership in which previous WBS consoles have offered



SAS routing modules.

Each Indigo console offers up to four storage and recall settings for customized configuration.

For more information, contact Ward-Beck in Toronto at (800) 771-2556 or visit www.ward-beck.com.

Crown Broadcast Gets 'Omnia Inside'

Crown Broadcast showed upgrades to its FM transmitter line. The company said the Crown FM and FMX transmitters will be the first to offer an optional Omnia three-band digital processing card, the FM-DP3, installed internally. Also available as a retrofit upgrade, the Omnia card replaces the current processor and stereo generator. It earned a Radio World "Cool Stuff" award.

The Crown FMX — Digital Management System/Remote Management System allows



control of presets and parameters of the Omnia FM-DP3 processor, transmitter frequency adjustment, as well as audio monitoring of input, processed and RF output (on-air) signals with the built-in receiver.

The FMX retrofittable upgrade for the Crown FM30, FM100 and FM250 models also incorporates a remote control system accessible via dial-up or Ethernet port. "Real Voice" reporting allows monitoring of other remote site functions such as HVAC and tower lighting.

Crown's FM250GT "Signal Clear" transmitter provides broadband intermodulation attenuation in RF-rich environments frequently encoun-

tered in translator installations. Signal Clear is available as an upgrade to FM250 transmitters.

Contact the company in Indiana at (574) 262-8900 or visit www.crownbroadcast.com.

Dawnco Stresses Satellite Interference Filters

Dawnco Director of Sales and Marketing John A. Joslin pointed to the post-9/11 importance of C band satellite terrestrial interference filters. The filters are placed between the feedhorn and LNB of a C band downlink. TI filters clean up reception of desired satellite signals from possible jamming by radar signals originating with AWACS planes, now more prevalent.

"The filters are available to pass even just one transponder and solve almost all conditions of TI," said Joslin. The company featured a high-stability C band LNB — important for digital downlinks.

Satellite dish locations are becoming more of a premium. By necessity, they may be placed at a greater distance from receive equipment than optimum. For this situation, the supplier promoted its fiber optic links. "Fiber links can cover long distances, eliminate ground loops and prevent lightning damage," said Joslin.

Contact the company in Michigan at (248) 391-9200 or visit www.dawnco.com.

Eventide Turns Back the Clock

Old was new again at the Eventide booth. Five "Eventide Clockworks Legacy" plug-ins for Digidesign ProTools TDM were introduced. Reaching back up to 30 years, Eventide brought back Harmonizer-brand effects processors in software form. Such units as the H910, H949, Omnipressor, Instant Phaser and Instant Flanger are available for your computer.

Old but new again in hardware form was the Reverb 2016, a dedicated reverb unit. Recreating the original three algorithms of the SP2016, the Reverb 2016 adds three more, which take advantage of the increased horsepower of the new platform.

Ray Maxwell, VP of Sales and Marketing, pointed out the "menu free" controls of the unit known to old-timers as knobs, but with a twist: they have LED indicators which indicate the settings visually. The Reverb 2016 earned a Radio World "Cool Stuff" award.

Also new were OS Version 3.0 for the Orville, DSP7000 and DSP7500 series of Harmonizer-brand effects processors and an eight-channel ADAT board for Orville.

Contact the company in New Jersey at (201) 641-1200 or visit www.eventide.com.

Broadcast Richardson Shows RF Transmitter Line

The Broadcast Richardson division of Richardson Electronics unveiled a new logo and showed a line of RF Cast AM transmitters that were field upgradeable for HD Radio transmission. It showed the BCC DTS 5.1 audio editor and automation system, which uses a 24-bit encoding rate.

It also displayed the Solidyne VA-16, which uses a digital receiver to remotely interface with a station computer and monitor the operating parameters to include phase measurement, harmonic distortion and spectrum analysis.

Contact the company in Illinois at (800) 882-3872 or visit www.rell.com.



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IBC Shows Digital Stereo Encoder

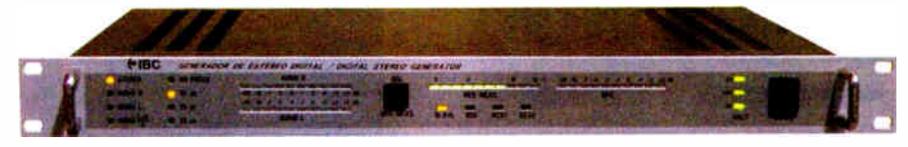
The IBC Ibertécnica S.A. digital stereo encoder Model 30.920 promises to improve the quality of FM signals with the use of DSP-FPGA technology.

The analog input signals are digitally converted with 24-bit resolution. This allows for the required filtering, pre-emphasis and generation of stereo multiplex signal (MPX).

Model 30.920 audio inputs are balanced and unbalanced; right and left channel; XLR connectors; input impedance of 600 ohms; RDS and SCA inputs are provided on BNC. Outputs are MPX principal (BNC); MPX auxiliary (BNC); and 50 ohms unbalanced output impedance. An auxiliary 19 kHz tone is available (BNC).

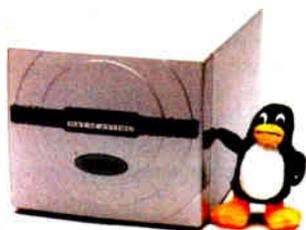
Features include a noise level of <-80 dBc; signal/noise ratio of <-87 dB (90 dB typical); power input 220 Vac +/- 10 percent, 50 Hz, 16 VA.

Contact the company in Spain at 011-34-91-876-88-90 or visit www.ibercom.net.



International Datacasting Implements Satellite IP Multicasting

"Convergence is real," stated Diana Cantú of International Datacasting. Distribution of audio, data and video via IP point-to-multi-point satellite technology was the story here. Stressing its datacasting experience and use of the MPEG-2-based open standard, packet switched DVB-S, IDC provides radio networks with digital audio and data distribution.



"Think of us as an IP access enabler for your remote network locations as well as for distributing your network programming," she said.

Referring to its latest generation of SRA2100 and SFX2100 satellite receivers as "appliances," IDC stressed network content distribution conceived as IP-based file delivery available with multimedia streaming options. Running Linux and configurable for BPSK, QPSK, 8PSK & 16QAM and other modulation techniques, these receivers can sustain output speeds as low as 256 kbps up to speeds of more than 70Mbps. They employ IP router protocols. A PCI expansion slot can accommodate, for example, a multi-channel audio decoder.

The SFX2100 comes with a selection of modular software components such as an Apache Web server and a multimedia player. It also comes with "Datacast XD" transforming the receiver into a streaming server, file server, or a variety of other multicast-enabled content distribution servers.

Contact the company in Ottawa, Ontario, at (613) 596-4120 or visit www.intldata.ca.

Mackay Demos Notebook Satellite Terminals

Showing NERA WorldCommunicator portable communication system, Mackay Communications demoed equipment journalists used to transmit voice, video and data from the recent



conflict in the Middle East. Relying on Inmarsat's Global Area Network service, the WorldCommunicator provides high-speed data and low cost voice worldwide; it can be used as a modem and provides Mobile Data Packet Service. MPDS allows the unit to be "always on" while billing only per the amount of data sent and received, not for total connect time.

Live Works LiveLink is a water- and dust-proof video conferencing system. Paired with NERA WorldCommunicator, it provides a broadcaster with "on air" audio and video from anywhere in the world. The units together weigh less than 30 pounds with batteries and will fit into 16x13x10 inches.

Mackay Communications also promoted the next-generation Inmarsat satellite terminal, Regional Broadband Global Area Network. Described as a satellite IP modem and sized similarly to a notebook computer, the BGAN modem sets up automatically and is treated as any other standard network connection by the PC. Regional BGAN includes the MPDS connectivity feature.

Contact the company in North Carolina at (919) 850-3164 or visit www.mackaycomm.com.

Prime Image Cash Adds Ads

Prime Image returned to NAB with its Cash machine and A/V Twister audio distribution system. Cash helps broadcasters add advertising inventory to their schedule by squeezing in 60 or more seconds of commercial availability within a period of 10 minutes to two hours. The process doesn't affect the pitch of the audio and works in real time.

The A/V Twister is Prime Image's version of a Cat-5 twisted pair audio interface, and can transmit stereo audio up to 5,000 feet using RJ-45 twisted pair wire and up to 10,000 feet using Belden Media Twist Cable.

Contact the company in California at (408) 926-5177 or visit www.primeimageinc.com.

Forecast Aims at Studio Flexibility

Forecast Consoles has a twist on studio furniture. Vice President of Sales and Marketing Rudy Salegna said, "Anyone can build a console for a user's current needs, but what happens when those needs change? Our patented new system called MasteRail answers that question, allowing future flexibility and expandability," he said.



MasteRail is a system for random placement of monitors (VGA, NTSC, flat screen, 16x9), EIA rack boxes, speakers, script stands and special-purpose devices anywhere along the length of the console. Salegna said equipment can be installed, relocated or removed easily.

"The system is modular and the upper

bridge is totally independent of the lower console structure," he said. Senior designer/projects coordinator Ernesto S. D'Angelo said recent clients include the CBS, ABC and NBC TV networks as well as Court TV. "What our clients can imagine," he said, "we try to make real."

Contact the company in New York at (631) 253-9000 or visit www.forecast-consoles.com.

Staco Touts FirstLine

The FirstLine Conditioning Power System is not uninterruptible, but according to Dave McElvein, national sales manager, power quality, it doesn't have to be.

"About 98 percent of the power problems a station faces are not blackouts," said McElvein. "They are fluctuations, so we can save a station money by not including an expensive battery system in our product while still delivering clean power through a double-conversion system."



The Firstline System is designed to save wear on equipment caused by inconsistent power. The price range is \$16,900 to \$24,000 for the 30 to 75 kVA for this product line.

The company also introduced the TreStar SX Series, a three-phase UPS product with a double conversion design that isolates and conditions the power coming into the unit before it is distributed to station equipment.

The TreStar front panel gives access to 15 measurements and 33 alarms.

Contact Staco Energy Products in Ohio at (937) 253-119, toll-free (866) 261-1191 or www.stacoenergy.com.

360 Systems Shows DigiCart/E

"DigiCart/E is a greatly improved DigiCart II which now has networking capabilities," said Ralph Goldheim, vice president, sales. "It's an Ethernet audio recorder which is 100 percent file-compatible with earlier DigiCart recorders, can play files produced on them and uses similar front panel commands."



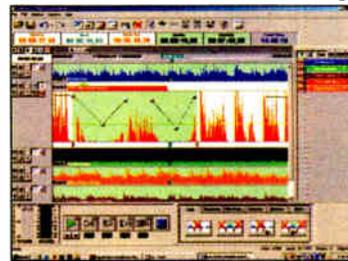
The California company's DigiCart/E can link to Mac and PC-based workstations. It's a stand-alone unit that uses a dedicated server in a network environment.

The DigiCart/E can store audio on a 250 MB Zip drive or the older 100 MB discs. It can also store audio on its own 40 GB hard drive. Editing features include head trims, tail trims, fade-ins, fade-outs, pre-roll times and gain change. Edits can be undone, and both WAV and Broadcast Wave (BWF) are supported.

Contact 360 Systems in California at (818) 991-0360 or visit www.360systems.com.

D.A.V.I.D.'s DigaSystem

D.A.V.I.D. Systems Inc. is a Va.-based extension of D.A.V.I.D. GmbH, a German company. In 1991, several radio and software engineers



created a computer-based radio platform for sharing, editing and delivery of news audio. Now this product, DigaSystem, has been expanded.

Paul Weiland, director of projects and customer services, North America, said D.A.V.I.D. covers most applications a radio station needs from automated ingest to play-out including multi-format distribution. The DigaSystem interfaces to most available traffic and billing packages.

"One of our real strengths is interconnectivity between stations," he said. "You can connect over 1,000 workstations in different locations and at different bandwidths, and they can all share the same content. The content can be transferred or distributed via IP, ISDN or satellite."

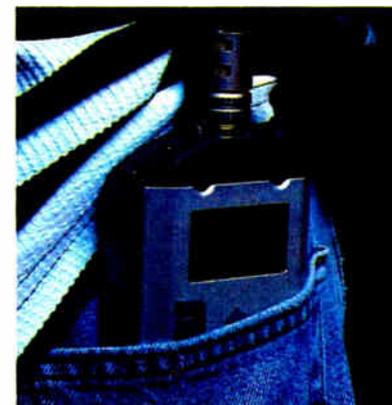
Weiland said the storage of music involves more than just audio.

"The rich base of metadata allows items to be re-purposed for use in content portals, Web archives and research databases," he said. "For example, pictures, text, videos and Web addresses can be stored with the audio files."

Contact D.A.V.I.D. in Virginia at (703) 396-4900 or visit www.digasystem.com.

Nagra Ares-P Is More Compatible

The Ares-P/RCX220 is a handheld recorder that uses a removable flashcard for digital audio storage. John Owens, Nagra area sales manager, said the latest twist is simplified connectivity.



"The audio can be downloaded at high speed directly to a laptop or PC through the USB port with PCX card emulation," he said. "FAT 16 formatting gives instant compatibility with workstations. It can record in mono or stereo and the user can select the sound quality needed for each application."

Other features: one button can begin the recording without overwriting any audio files and instant replay of the last recorded file is available when "Play" is pressed.

Owens said operation of this device has been simplified for ease of use in news gathering, interviews and live concerts.

The Ares-P/RCX220 will operate for four hours on five AA batteries. It will shortly record linear, uncompressed PCM audio with reduced recording time.

Contact the company in Tennessee at (615) 726-5191 or visit www.nagrausa.com.

Kintronic Low-Profile Antennas Skirt Height Restrictions

Kintronic Labs AM/medium-wave low-profile Kinstar antennas are offered in two feed configurations, Model KSA-QWM-1/5/10 and Model KSA-VCTB-1/5/10/25/50.

Kinstar antennas are less than one-third the electrical height of quarter wave masts on the same frequency. Requirements are five vertical supports (wooden utility poles or guyed lattice masts depending on operating frequency) and 120-radial quarter wave ground system. The Kinstar radiating efficiency is 98 percent compared to quarter wave mast and the vertical pattern is predictable.

The Kinstar antenna also can be considered for directional array or multiplexed station applications.

Contact the company in Tennessee at (423) 878-3141 or visit www.kintronic.com.

Whirlwind Addresses Backhaul Problem

Whirlwind demonstrated a two-way laser link and digital audio control system in Las Vegas.

Though at first look the DLS1 Gigabit Laser Transceiver link might be more appropriate for TV, the link solves the backhaul problem from a remote site to the remote RPU transmitter and cue receiver, without stringing wires. It can work in fixed installations by transmitting Ethernet or CobraNet digital data.

Whirlwind's DCS products transmit digital data through Ethernet RJ-45 wiring. The DCS 88 transceiver will convert eight channels of analog mic or line-level audio to digital, and back to analog. The system uses a low-power system that eliminates the need for AC drops at each location, and can be controlled by a Windows-based computer program.

Contact the company in New York at (800) 733-9473 or visit www.whirlwindusa.com.



NPR Satellite Touts Experience

NPR Satellite Services stressed "always on" reliability as the result of decades of relying on it themselves to distribute NPR and other public radio programming.

In addition to radio services covering the 50 states and much of the Caribbean, NPR Satellite Services provides video distribution services via C band satellite.

The company emphasized NPR Satellite Service's "available everywhere" satellite distribution technology, point-to-multipoint business media content such as training information and point-of-purchase video. Taking advantage of this technology are smaller television and radio networks distributing to their O&O stations as well as to cable head-ends.

Contact the company in Washington at (202) 513-2626 or visit www.nprss.org.

TWR Lighting Shows 6-LED Marker Light

Incorporating six LED lamps, a marker lamp as bright as a standard 116 watt incandescent marker was previewed by TWR Lighting Inc.

"This new product minimizes both production costs and energy usage," said Scott Meador, business development manager. The lamp will carry a five-year warranty. As with the existing OLI LED marker, the lamp housing is molded of Valox fiberglass reinforced thermoplastic.

"Valox is lightweight, non-corrosive and near-

ly indestructible," said Meador. The LED marker lamps require a special ice shield, as they do not generate enough heat to melt an ice coating.

TWR also told about its new 40,000-square-foot facility in Houston. "It will allow fast turnaround of product orders," Meador said.

Contact the company in Texas at (713) 973-6905 or visit www.twrlighting.com.

Harris Offers PocketRec, Expands Audio and RF

Harris' display at the NAB showed the next generation of IBOC-capable AM solid-state transmitters. The DAX 1-6kW uses what Harris calls Digital Adaptive Modulation. This generates a digital AM waveform, and uses DSP technology to correct load-induced distortion, which translates to cleaner sounding analog audio and extended digital coverage.

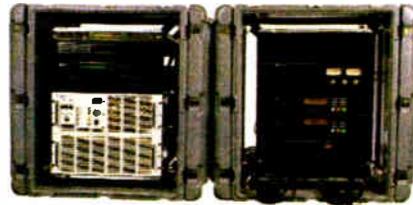
It also showed the 5.1 surround NeuStar audio conditioning tool for IBOC transmitters, which permits a 5.1 "surround sound" signal to be transmitted on a IBOC channel, without compromising the standard stereo signal. It's available for FM IBOC transmitters.

Harris digital console line was augmented by the Espresso 10- to 14-channel console, which allows engineers to mix and match analog and digital sources as operations convert to all-digital plants.

Its VistaMax system is the company's new network audio management system. It uses Cat-5 or fiber connections between destinations, which lets all users on such a network

share console resources (i.e., satellite or remote signal) and audio assets (i.e., workstations and audio storage).

Preparedness is the aim of Harris' AM/FM Radio Flyaway portable broadcast system (shown). With shippable rack cubes for program origination and transmitting, and knock-down antenna systems, broadcasters can be on air within hours of receiving the equipment.



The company also announced exclusive agreements to market the PocketRec radio newsgathering digital recorder system and the second generation of Orban's Audicy audio workstation.

Contact the company in Ohio at (513) 459-3400 or visit www.harris.com.

Dorough Monitoring Line Grows

Dorough showed its line of audio monitoring meters and equipment. Its RW-100 Remote Analog/Digital Remote Control is compatible with all of its analog and digital products. The RW-100 allows operators to monitor program level, phase correlation, peak hold, overs display and hold, phase error, bitstream corruption and whether the unit is reading full scale.

The 12-AES combines the functions of the remote control and a stereo AES/EBU digital loudness meter in a package that connects to 96 kbs, 11/075 ohm inputs. The standard 40 A now has a phase correlation indicator alarm light.

Contact the company in California at (818) 998-2824 or visit www.dorough.com.

Acoustical Solutions Demos Noise Control Gear

Acoustical Solutions Inc. demonstrated its line of sound and noise control solutions. Products included the traditional Sonex line of wall and ceiling tiles, bass traps, ceiling and wall blankets and sound barriers.

Its SoundSuede line of wall panels is an alternative approach to soundproofing. These synthetic suede panels come in 45 colors, providing solutions for any architectural design and Class 1 fire rating for the risk managers.

Contact the company in Virginia at (800) 782-5742 or visit www.acousticalsolutions.com.

Dielectric Goes Interleaved

Dielectric displayed its line of FM antennas, combiners and accessories. Its HDR Series Interleaved FM antenna system gave plant managers considering a digital upgrade food for thought.

The HDR system allows for the interleaving of digital antenna elements within the existing analog antenna footprint. The analog circular polarization (right hand) and digital circular polarization (left hand) reduces the coupling effect when a small circulator is installed at the output of the HD transmitter. The digital system is separate from the analog system, and in an emergency, can be used to transmit the analog signal.

The company touted its Alarm Response Center, which monitors transmission infrastructure systems. The ARC monitors the physical site, tower, transmission system and aviation obstruction lighting with equipment, testing, maintenance, remote monitoring, emergency service and Web-enabled access.

The company introduced Flexline air dielectric coaxial cable, available in 7/8-inch through 6-1/8-inch line sizes. And it announced that the BBC had awarded the company a \$9 million contract that includes more than 24 high-power shortwave transmit-



ting antenna systems for one of the World Service's major transmitting stations.

Contact the company in Maine at (800) 341-9678 or visit www.dielectric.com.

Clark Adds Digital Products

Two of the new digital products on display at Clark Wire and Cable were the Series 900 and 800 110-ohm AES/EBU-rated wire. The wire comes in 26 and 24 gauge, has an individual shield over each pair of wires and an individual shield for the connectors. The quick strip feature cuts down preparation time.

The company also showed its online "Custom Panel Designer" program, which allows designers to design custom patch panels.

Contact the company in Illinois at (800) 222-5348 or visit www.clarkwc.com.

PocketREC: Field Audio in Your Pocket

PocketREC Inc. displayed a field audio system for radio journalists based on a standard PocketPC. Located in the booth of Harris, its distributor, the company showed how the PocketREC software enables a standard PDA device to record and edit broadcast quality audio, manage the content and transmit it over a wired or wireless Internet connection.



Recording capacity depends on the size of the storage medium used; the capability to transmit the audio files over a cell phone connection was in the works. The PocketREC won a Radio World "Cool Stuff" award.

Contact the company in Virginia at (571) 218-7766 or visit www.pocketrec.com.

Propagation Systems Welds FHR Series

Propagation Systems promoted shunt- and series-fed antennas. The high-power series-fed FHR series is based on the ERI-style "rototiller" element. Propagation Systems doesn't weld the elements into the familiar "rototiller" shape, but forms them from a single piece of metal, which makes the element smooth and reduces the inherent weakness of welded copper. The FMR is a smaller, series-fed "rototiller" style antenna for lower-power transmitters. The FH series is a circular polarized series fed model, consisting of two dipole elements.

Contact the company in Pennsylvania at (814) 472-5540 or visit www.psbroadcast.com.

Studio Solutions

Model CAS-1 Con/Air Switcher

- eliminates delay from studio headphone monitor
- immediate warning on air signal failure
- adjustable EQ and compression of monitor audio
- air signal is not altered in any way
- balanced audio inputs and output
- optional rack mount panel available



Model TAS-1 Telephone Announcement System

- digital message storage--no moving parts
- variable outgoing message format
- inactive or defective telephone line indicator
- resettable incoming call counter
- temperature delivery in Fahrenheit or Celsius
- battery backed AC synchronized clock



Sine Systems, Inc.

615.228.3500

more information: www.sinesystems.com

Networked Audio from Harris? You Betcha!



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VistaMax is a digital audio management system that lets you network your audio studios together. With universal access to all of your resources simultaneously you increase productivity and quality while decreasing maintenance. You can smoothly migrate from a dedicated analog studio to a digital networked infrastructure with this distributed approach – on your timeframe. Benefits include:

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Lightning Eliminators Shows Sandwich

Lightning Eliminators & Consultants was at the NAB show with a concept in surge protection called the "sandwich block," a registered trade name for a protection device that can withstand higher surges in power.

"It doesn't contain a wire, which is the weakest link in ordinary systems," said Joseph Lanzoni, vice president of operations. "It can withstand up to 1.3 million amps, and no station is ever going to have a lightning strike of anywhere near that magnitude."

The term "sandwich" refers to the way Metal Oxide Varistors are sandwiched between two highly conductive plates. Because the entire face of the MOV is used, it provides longer life and highly reduced heat buildup, which are the chief causes of failure in other products, according to Lanzoni.

Contact Lightning Eliminators in Colorado at (303) 447-2828 or visit www.lightningeliminators.com.



Flexible X-Band Cables From Gepco

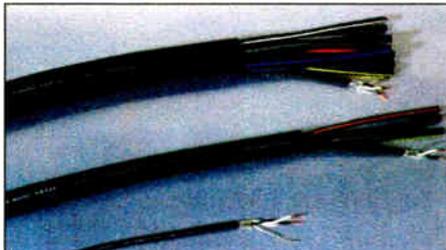
Cable with increased flexibility is available from Gepco Wire and Cable.

Vice President of Sales and marketing Greg Hansen said X-Band analog audio cable is a departure for the company in that it is not UL-rated for permanent installation.

"In not having to put the compounds in to pass the tests, we made the cable ultra-flexible," he said. "The cables are available in both single and multi-pair versions and will not retain kinks and bends when flexed, while still maintaining ease of termination and superior electrical characteristics."

The company also manufactures 61806PU cable for direct burial.

"We apply a water-blocking tape under the outer jacket of this cable," Hansen said. "In case of an animal bite or some other puncture, the tape spreads to cover the pairs on the inside. It's



perfect for running audio between buildings."

Contact the company in Illinois at (847) 795-9555 or visit www.gepco.com.

Neutrik Says Ethercon Is the Future

Neutrik USA showed two additions to its Ethercon line of ruggedized RJ45 connectors. The most recent innovations are the feedthrough panel-mount receptacle in their standard D series hole cutout and a cable-to-cable adapter.

The Ethercon series is capable of carrying at minimum CAT-5 signal, and the system consists of a receptacle with printed circuit board terminations or punch-downs. The punch-downs are Krone or 110.

"There is a need to push more data through connectors," said Jim Cowan, president, "and this line was designed for that purpose."

According to Kathi Evans, product marketing and communications supervisor, the company also offers a cable carrier, NE8MC, which consists of a die-cast metal shell, internal strain relief and an outside boot into which the customer provides an assembled RJ45 cable. This shell helps to protect the fragile contacts of the RJ45 connector.

Contact Neutrik in New Jersey at (732) 901-9488 or visit www.neutrikusa.com.



Monitor that we introduced in 1989."

According to Stack, the software offers several new features.

"With the ModAnalysis tools, modulation readings can be stored over time so direct comparisons can be made," he said. "The logged modulation data can be used to evaluate and set up processing or for audio troubleshooting, as needed."

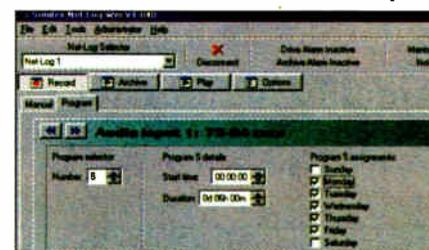
The FMMM-2 is priced at \$3,183; the software upgrade is free to owners requesting it and providing the FMMM-2 serial number.

Contact Modulation Sciences Inc. in New Jersey at (732) 302-3090 or visit www.modsci.com.

Sonifex Features New Breed of Hybrids, Logger

Sonifex promoted the HY-03, an analog phone hybrid. According to Marcus Brooke, managing director, it is a replacement for the HY-02.

"It's automatic and adapts to varying line conditions with automatic signal limiting," he stated. "The unit has a built-in power supply with switchable 115V or 230V mains input."



The company also showed Net-Log, an audio logger that can record four mono or two stereo audio streams for playback over TCP/IP. Audio is encoded in MPEG Layer II format and written to a large internal IDE hard disk.

"The list price is about \$4,695," said Brooke. "With it a program director can monitor his own or other stations, or a salesman can e-mail files to a client illustrating how a spot sounded on the air."

These products are distributed in the United States by Independent Audio.

Contact Independent Audio in Maine at (207) 773-2424 or visit the Sonifex site at www.sonifex.co.uk.

Superior Broadcast Supplies FM Gear

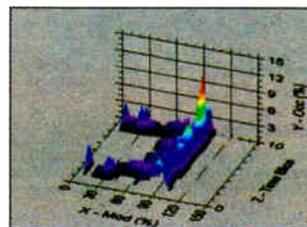
Superior Broadcast Products focused on its FM antenna, which has broadband performance across the FM band. This unit saves operators money because with the combiners, only one set of antenna elements need to be installed for the signals (main, digital and backup).

Superior plans to add an AM line of transmitters to its product mix. Its FM transmitters (solid-state) are available in power levels as low as 30 watts.

Contact the company in Texas at (800) 279-3326 or visit www.superiorbroadcast.com.

Modulation Sciences Releases Software Upgrade

Modulation Sciences brought a software upgrade to the show. Joe Stack, vice president engineering, said, "We've moved from DOS to Windows on our remote control software for the FMMM-2, our ModMinder Modulation



RFS Emphasizes Antennas

828LP FM sidemount antennas from Radio Frequency Systems are designed for circular polarization applications and low windloads, according to Asad Zoberi, product manager. The company offers products that cover the FM spectrum.

The 828LP is a series of antennas offering stainless steel construction, various power ratings, broadband operation to facilitate antenna sharing and optimal array tuning. Radomes are an option for all models in the 828LP line.

The antennas in this category have varying numbers of bays and are each given separate catalog numbers.

Contact the company in Connecticut at (203) 630-3311 or visit www.rfsworld.com.

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ATA Audio Scoop E-Z for Remotes

The ATA Audio Scoop E-Z portable audio/codec mixer can be used for such applications as live broadcasts, two-way interviews, talk shows, sports broadcasting, news reports and remote contributions into studio discussions. The unit is 9 by 6 by 3 inches.

The Scoop E-Z is a two-channel audio mixer with automatic answering and recognition of the incoming call type; the unit can be used through POTS, ISDN, wireless or INMARSAT. It has a selectable compressor/limiter.

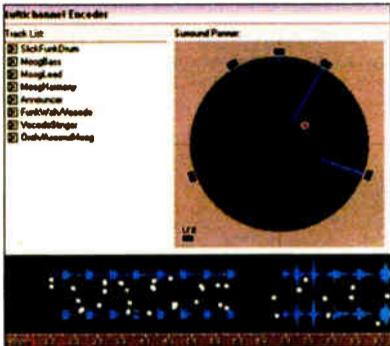
Contact the company in New Jersey at (973) 659-0555 or visit www.ataaudio.com.



Syntrillium Launches Cool Edit Pro 2.1

Syntrillium Software debuted Cool Edit Pro 2.1 with features for 5.1 surround sound at NAB 2003.

The big news for broadcasters is the inclusion of Cart Chunk header editing. The wave properties dialog box now includes fields for creating and editing Cart Chunk data.



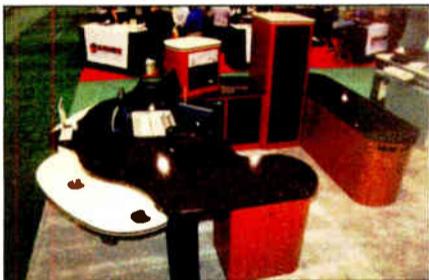
In addition to the Syntrillium Red Rover USB remote control for Cool Edit Pro, version 2.1 now supports the Mackie control, Tascam US-224 and Event Ezbus.

Also announced at the show was the Loopology loop library expansion with the release of "Funk & Rock." This is a two-CD library of 4,000 production loops performed live by musicians and available royalty-free for Cool Edit Pro users.

Contact the company in Arizona at (480) 941-4327 or visit www.syntrillium.com.

Mager Systems Boasts WAXY(AM) Custom Build

The Mager System booth was dominated by the custom build it will install in the Miami studios of WAXY(AM). The studio makes use of the company's "Cool Stuff"-winning touch-switch technology from NAB2002.



In addition, Mager had its stock line of Sound Choice Furniture on display.

Mager also is marketing a computer pull-out that permits a hard drive to sit in a carriage that completely pulls out of the cabinet and rotates out up to 360 degrees.

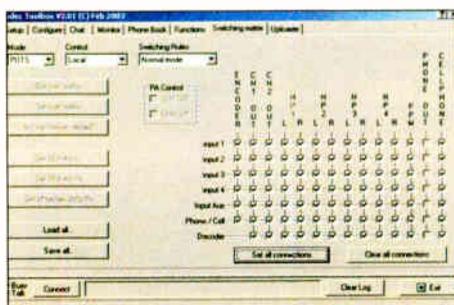
The pullout adjusts to hold any size computer, holds up to 100 pounds and includes installation hardware.

Contact the company in Arizona at (623) 780-0045 or visit www.magersystems.com.

Tieline Digital Matrix Router Expands i-Mix Capabilities

The Tieline i-Mix Matrix Router changes the company's i-Mix from a simple mixer to a studio broadcast mixer with built-in codecs. The new digital matrix router permits a user to switch any i-Mix input to any onboard output.

The user can, for example, switch input 1 to headphone 1 left and input 2 to headphone 1 right for program and cue management; one



can send inputs 2, 3 and 4 to the encoder only and leave inputs 1 and 5 as communications inputs that do not go to air. Any input can be allocated to any output.

The software makes live talkback possible via cell phone while simultaneously broadcasting live program over a POTS link back to the studio. It enables mix-minus to be created to separate the caller return audio from the main program mix.

The matrix software is optional at an additional fee.

Contact the company in Indiana at (800) 211-6989 or visit www.tieline.com.

Burli Virtual Newsroom Enhancements Demo'd

Burli Software showcased enhancements to its newsroom software. Updated tools



include spell checker, instant messenger, CD ripper, and integrated audio editors and prompters for studios. An improved multi-track audio editor includes native MP2 and MP3 editing, complex fades and normalize.

Other newsroom tools in the Burli Virtual Newsroom include planning, contacts, archiving, fax and e-mail capture. Virtual Newsroom tools allow users in bureaus or the field to drag-and-drop stories to the newsroom over an Internet connection.

Contact the company in Vancouver at (604) 684-3140 or visit www.burli.com.

Nicom Exhibits Portable Mod Monitor

Nicom showed the portable MM2002 FM Modulation Monitor for testing and evaluating FM broadcast parameters. Its measurements include peak deviation, medium-value deviation, right- and left-channel levels, pilot tone presence and RF signal level. Pilot tone and RDS level can be measured "live" with the program on. The MM2002 has a tuner with a direct frequency input via keypad in 10 kHz steps.

The NAE 20 AM transmitter, for the 530-1700 kHz range, has adjustable power outputs from 5 to 25 W with automatic power control maintaining the output at preset levels. The NT 20/Challenger is a phase locked loop FM exciter/transmitter that has low-pass/harmonic filter, programmability in 10 kHz increments, adjustable power output from 2 to 20 W and optional FSK ID keyer.

Contact the company in California at (619) 477-6298 or visit www.nicomusa.com.

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Comrex Matrix Goes Wireless at NAB

Comrex introduced its Matrix Wireless Module at its NAB booth. The product is the company's latest addition to its Remote Broadcast System line.

With the Matrix module, broadcasters can transmit high-quality remote audio over a wireless network, eliminating the need to pay for a telephone line or a separate wireless phone.

The Matrix incorporates a GSM wireless phone and firmware into a compact housing that is compatible with all portable Matrix units. The module adds an external antenna. Installation is quick and simple and with an optional battery kit the unit can broadcast from the field for up to seven hours. Updated firmware provides up to 7 kHz frequency response.

Contact the company in Massachusetts at (978) 784-1776 or visit www.comrex.com.



Moseley Debuts Digital RF Links

The Maxlink from Moseley (shown) is a new entry in the field of digital STLs, providing dual, full-duplex T1 capacity data links in a small configuration. Operating in the unlicensed U-NII or ISM bands (5 GHz), it uses a small (approximately 15" square) antenna with integrated transceiver that connects to a separate T1 multiplexer via common Cat-5 cable. Combined with external audio and data equipment, it will handle two or more stereo audio channels and can provide connection of the studio computer network to the transmitter site.



The Maxlink is designed for line-of-sight links and operates over approximately 8 miles. List price: \$8,250 for a complete link.

Also new is LANLINK 900, a wireless IP/Ethernet Local Area Network extender that can be operated over an existing 950 MHz band STL infrastructure. RF connections are made to the provided duplexer that accommodates both the existing STL equipment and the LANLINK 900. It uses FHSS technology for license-free operation in the 902-928 MHz

band at a distance of up to 30 miles.

The LANLINK 900 is a simple and inexpensive way for stations that currently use a 950 MHz STL to connect their main studio computer networks out to the transmitter site for improved data-sharing, IP-based remote control of transmitters, and bit-reduced audio/video duplex connections (for example, a video security camera with audio sensor).

Contact the company in California at (805) 968-9621 or visit www.moseleysb.com.

Scott Studios Demos New Features

SS 32 from Scott Studios fixes spot lengths; every spot can be made the correct length for network stop sets without script changes and without rerecording.

The new Stretch and Squeeze option permits production to be done on a commercial in the usual way, and then it can be adjusted it (plus or minus 20 percent) to 30- and 60-second lengths. Pitch is not affected.

Segue editor in SS 32 allows a stations to tweak a particular music segue in the air studio on a one-time basis without changing the

Artist	Track	Time	Genre	Copyright
Los Angeles	State Checks	0:30	Pop	© 1992 Scott Studios Corp.
Los Angeles	When You Dance	0:30	Pop	© 1992 Scott Studios Corp.
Los Angeles	Traffic Report	0:30	News	© 1992 Scott Studios Corp.
Los Angeles	RICKS 90 Jingle	0:30	Pop	© 1992 Scott Studios Corp.
Los Angeles	Unsung	0:30	Pop	© 1992 Scott Studios Corp.
Los Angeles	George King	0:30	Pop	© 1992 Scott Studios Corp.

standard end-of-message trigger used the rest of the time with other songs.

Another enhancement permits restricting on-air personnel from performing undesired functions, such as adding, deleting and moving songs of specified categories and commercials. Restrictions can be relaxed or tightened on a shift-by-shift basis.

Contact the company in Texas at (888) 438-7268 or visit www.scottstudios.com.

ESE Displays New Line

New products in the ESE booth included its GPS-based frequency standard, the ES-110. The ES-110 provides two 10 MHz outputs (one sine wave and one square wave) and a single phrase coherent 1 pps output, referenced to GPS.

The ES-171U universal time code reader is a small time-code display designed for a console mount application.

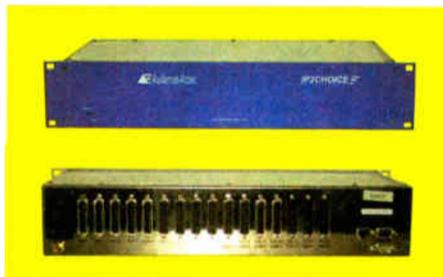
The LX-192U/194 and ES-192U/194 master clocks are master clocks suitable for applications that do not require GPS or temperature-controlled stability. These clocks use the AC line-frequency as a time reference or a quartz crystal time base is available as an option.

Contact the company in California at (310) 322-2136 or visit www.e-se-web.com.

Audemat-Aztec Provides Global Monitoring Solution

The Audemat-Aztec IP2 Choice is a modular remote control in TCP/IP with scripteasy software.

The IP2 enables control of conditions on the transmitter site. In addition, equipment installed on site can be interfaced via serial communication port to the IP2 Choice.



The IP2 Choice acts as a gateway between the Ethernet or telephone network and the remote equipment. It can be made up of a mix of digital input boards, relay boards, analog metering channel boards and RS232/485 communication boards.

Used as a 2RU, 19-inch rack-mounted unit, the IP2 can be integrated with 16 boards.

Several units can be linked to provide thousands of I/Os.

IP2 technology is accessible in the IP2 Choice through its embedded Web site, which offers such IP2 services as HTTP, SMTP, SNMP and FTP for remote IP connection, alarm dispatch via e-mail and other controls. Alarms reception and communication with the unit can also be made through regular phone and cell phone.

Using the IP2 Choice with the Goldeneagle and Manager Web server software provides network management and a global monitoring solution. Alarms received from remote Goldeneagle and IP2 Choice units at the transmitter can be centralized in one software program along with site configuration.

Contact the company in Florida at (305) 692-7555 or visit www.audemat-aztec.com.

Phasetek Product Line on Display

Phasetek Inc. exhibited its line of AM RF components, antenna tuning units and custom Phasor cabinets (designed for digital broadcast).

Also on display were the company's Drop Wire System for feeding grounded towers or for detuning structures near an AM station.

Contact the company in Pennsylvania at (800) 742-7383 or visit www.phasetekinc.com.

Aphex 2020 MkIII Has Enhanced Algorithms

Aphex demonstrated the Model 2020 MkIII broadcast audio processor at NAB2003.



The Model 2020 MkIII has a split-band optical pre-emphasis limiter, an overshoot-compensated, low-distortion low-pass filter and new processing algorithms that the company says make the Model 2020 MkIII sound louder and cleaner than earlier models.

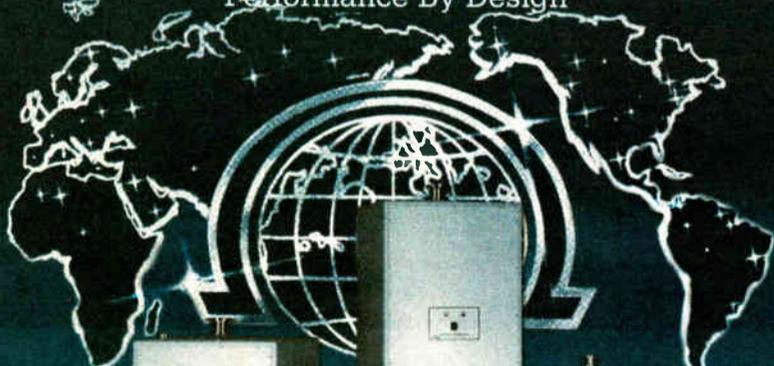
New features include enhanced circuit designs, improved remote-control interface, RDS and dual composite outputs.

The Model 2020 processes within the analog domain, which Aphex says avoids the aliasing problems some digital processors have. The unit can be run in dual mono mode, making it suitable for installations requiring multiple single-channel processing. The 2020 can be used for CD and DVD mastering.

An upgrade path from the MkII is available. Contact the company in California at (818) 767-2929 or visit www.aphex.com.

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JK Audio Unveils Digital Hybrids

Designed to work with digital phone systems, the Innkeeper PBX is a digital phone hybrid that connects to the phone system between the handset and the telephone base. It has balanced XLR inputs and outputs for the Send and Caller audio, with LEDs for audio level monitoring. Internal DSP monitors send and receive audio signals to provide separation without using a transmitted white noise burst. It lists for \$495.



"Combine the Innkeeper PBX with a multi-line telephone set and you can have a studio quality talk show system for under \$500," said Joe Klinger, president.

Also new is the Broadcast Host. This digital telephone hybrid is for desktop operation on standard telephone lines and features microphone input, line-level input, interface to computer sound card and connections for standard telephone set. The Broadcast Host also can be operated as an auto-answer/auto disconnect coupler for remote monitoring and IFB applications. Retail: \$495.

And the company introduced the Innkeeper 4, a multi-line digital telephone hybrid. Four independent digital hybrids are combined in 1RU. The Innkeeper 4 offers a 50-phone number speed dial list and auto-answer/auto-disconnect functions for use in IFB or remote monitoring applications.

Contact the company in Illinois at (815) 786-2929 or visit www.jkaudio.com.

Radio Systems Makes More StudioHub Connections

Radio Systems displayed its line of StudioHub wiring products, including new adapters for automation systems and digital consoles. The StudioHub line uses RJ-45 connectors and Cat-5 cabling to interconnect a range of audio and digital signals in a broadcast facility.

The StudioHub line now offers adapters for equipment from Klotz, Broadcast Electronics, Wheatstone and Prophet Systems. According to Gerrett Conover, executive vice president of Radio Systems, "We can offer a breakout box for virtually any computer sound card that is now available."

Contact the company in New Jersey at (856) 467-8000 or visit www.radiosystems.com.

Broadcast Tools Debuts Call Director, More

The Teleswitch 6 routes up to six telephone lines and will work with any phone hybrid. Lines are connected to the 1RU controller, which connects to the desktop switch console via standard Cat-5 cable. Up to three more switch consoles can be connected. The system comes with Windows-based call screening software.



Broadcast Tools introduced a 16x16 stereo audio routing switcher, the SS16.16. It features a 40x4 LCD display to assist operation and programming of custom commands. The switcher includes serial control ports and a 16-input GPI port for remote switching with contact closures. "NetSwitch" Windows-compatible control software is supplied.

Also new is Program Schedule Controller II, a sequencer for up to 512 events. The PSC II can interface with two serially controlled devices (using RS-232 or RS-422 connec-

tions) and has 16 relays for GPI interface. It is supplied with a Garmin 12 Channel GPS receiver with embedded antenna that can be located up to 4,000 feet away. The PSC II can control events by time and date, time and day of the week, serial port commands, or remote contact closures.

And the company showed Silence Monitor III, a new version of the Smart Silence Monitor, now with audible alert, adjustable silence thresholds, front-panel control and automatic backup audio switching.

Contact the company in Washington state at (360) 854-9559 or visit www.broadcast-tools.com.

Klotz Introduces Varizone Digital PA

Based on the VADIS Mainframe, the Varizone System is a digital public address system that can provide paging,

background music or specialized audio feeds to multiple zones with remote control of channel selection and levels. A facility buildout for RadiOhio Inc. of Columbus, Ohio, was the first U.S. implementation.



It uses a digital speaker bus (DSS) to transport power, control data and eight channels of digital audio using 4-conductor

twisted-pair cable, with up to 32 channels of audio available on each DSS bus card. Digital transport eliminates power losses of traditional 70V speaker distribution cables and transformers.

A powered amplifier module (PAM) connects to the DSS bus and can power four loudspeakers. The PAM includes DSP to control local audio levels and has up to four bands of parametric EQ. An optional delay module can be fitted for time alignment applications as well as speaker delays. The amplifier modules are addressable so paging or routing custom feeds to individual speakers is possible. Any amplifier channel can be assigned to any zone in the system and zones can be reconfigured dynamically should system requirements change. For large systems, power supplies can be distributed to minimize line losses.

Contact Klotz in California at (805) 581-1004 or visit www.klotzdigital.com.

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Wohler Releases New Audio Alarms

The ALM series audio alarms combine high-resolution audio monitoring with configurable alarms. Contact closures for silence, overmodulation and phase error are provided, as well as LED indicators and an audible alarm.

Custom alarm thresholds may be set with supplied windows software communicating through an RS-232 serial connection.



The Wohler ALM series level meters, available with the alarms, provide 26- or 53-segment bargraphs for high-resolution monitoring, and a usable dynamic range greater than 70 dB. Models are available for monitoring from 8 to 24 channels of audio, with either analog or AES digital inputs. Alarm panels without metering are available.

Contact the company in California at (888) 596-4537 or visit www.wohler.com.

Prophet Systems Introduces Turnkey Packages

Prophet Systems showcased its NexGen 2 Studio Suite, featuring all of its software programs in an integrated package, starting at \$4,500.

The NexGen 2 Studio Suite includes NexGen Digital, WANcasting, VoiceTRAC, MusicGen, CDX/AFC, Digital Reel-to Reel and PhoneTRAC software. This suite can support radio station automation, WAN file transfers,



voice-tracking, music scheduling, CD ripping, program time-shifting and phone call recording.

Prophet Systems includes the system hardware in its turnkey packages. A range of systems are available depending on station size and requirements.

Contact the company in Nebraska at (877) 774-1010 or visit www.prophetsys.com.

Mackie Shows Control Family, Mixers

Mackie displayed the Control C4, a member of its Control family. It is a plug-in and virtual instrument controller with four banks of eight V-Pots each. Four displays can access up to 32 software parameters without the need for scrolling or bank switching. The C4 will be available in the second quarter of 2003 for around \$1,099.

Mackie also introduced the Tapco 6306 6-Channel Mixer, the first product in new line using that classic name. It includes two mic preamps, two instrument inputs, a stereo aux return to monitor, two aux sends, eight-segment LED metering and separate phones and

AEQ Explores ISDN

AEQ debuted the Systel 6000 System, an ISDN/telephone multi-channel software program (shown) that uses the AEQ Impact digital router to provide interconnections of up to 120 crosspoints distributed in 20 circuits. Each circuit is an interconnection with N-1 or Mix-minus capability so each caller can talk to as many as 20 other callers at once without feedback.

The ISDN functionality of the Eagle dual codec is sporting new features that include MPEG Layer III and automatic dial-up when a point-to-point link failure is detected. Including a terminal adapter compatible with National 1 and Euro ISDN protocols and additional X21 and V35 connections, the Eagle has digital and analog inputs and outputs.

The Swing ISDN portable codec received a revamping and now includes the internal Digital Dynamic Level Processor, which provides customized audio levels without overloads.

AEQ also exhibited the BC-2000 Digital System, a routing, mixing and audio processing system for radio and TV program production. Along with its digital console mixing ability, it provides centralized audio management and distribution, a link-up of broadcast audio facilities with digital routing capacity of up to 2,048 x 2,048 channels.

Contact the company in Florida at (954) 581-7999 or visit www.aeqbroadcast.com.



to-mono converter.

The RB-DMA2 dual digital microphone amplifier is 24-bit/96 kHz compliant and consists of two independent low-noise microphone pre-amplifiers for converting microphone-level signals to digital AES/EBU or S/PDIF and analog line-level outputs. It can be used as a front end for digital mixing desks or routers that do not have microphone inputs.

Contact the company in Maine at (207) 773-2424 or visit www.independentaudio.com.

APT Offers Look at New Codec

NAB2003 gave many their first look at APT's multipurpose, multiformat codec, WorldNet Tokyo.

WorldNet Tokyo is compatible with other major codecs including those by Telos, AETA, AEQ and CCS/Musicam USA. The ISDN box also uses APT's apt-X codec (16-, 20-, 24-bit).

Tokyo performs at full bandwidth, 20 Hz to 22.5 kHz, and offers automatic operation for various functions. There are USB and Ethernet ports on the back panel for PC interfacing.

Higher up the production food chain is the WorldNet SkyLink, a codec that had been seen in prototype previously. The SkyLink is a TCP/IP codec capable of handling 7.1 surround sound and SMPTE timecode. It offers real-time bi-directional operation or off-line up and downloading. APT is aiming the unit towards film and video markets but its bandwidth could raise the interest of digital radio broadcasters.

Contact the company in California at (323) 463-2963 or visit www.aptx.com.

Elenos Adds Amplifier

Elenos debuted the E5000 high-power solid-state modular FM amplifier.

Constructed of 10 removable 500-watt modules, the E5000 requires 150 watts of input drive to produce full power. The E5000 has microprocessor controlled protections and parameter display. A GSM modem may be used for remote control and telemetry.

The E5000 is supplied in a 20 RU cabinet, with space for an exciter. RF stage efficiency at 98 MHz is greater than 70 percent. The E5000 will maintain output in the event of partial failure or extreme conditions.

Contact the company in Ferrara, Italy at 011-39-0532-829965 or visit www.elenos.com

control-room level controls.

The company showed its Mackie Control touch-sensitive control surface running with Digidesign's Pro Tools.

Contact the company in Washington at (425) 487-4333 or visit www.mackie.com.

Omega_FM V2.0 Software Debuts at Inovonics

Inovonics demonstrated a new software revision for its signature digital audio processor, the Omega_FM. Included in Version 2.0 is remote control via modem capability, enhanced bass processing and the ability to switch processing presets by day part.

The Omega_FM is a software-based audio processor that uses a short signal path for minimal audio latency. It features multiband leveling, multiband compression and parametric equalization to create a unique station sound and a dual-band final limiter.

Contact Inovonics in California at (831) 458-0552 or visit www.inovon.com.

Independent Audio Markets Redbox Range

Independent Audio showed off gear from several manufacturers it represents.

For audio interfaces, Independent displayed new Redboxes from Sonifex. The RB-PMX4 rack-mount mixer is a preset



mixer with 10 mono inputs to four mono outputs for small mixer installations where it will be configured and rarely altered. Uses include a four-bus mini-mixer, a four-zone mixer for bars and clubs and a quad stereo-

BROADCAST TOOLS® *new* "Rack-Ables"

SS 2.1 III

SS 4.1 III

SILENCE MONITOR III

SS 8.1 II

RA-1 with FP-II Filler Panel

The upgraded SS 2.1/TERM III & BNC III switcher/routers are improved with new front panel switches. They may be used as a desktop device, and are equipped with mounting holes for wall mount installation or may be installed on the new RA-1 "Rack-Able" 1RU mounting shelf.

The new "Rack-Able" SS 4.1 III switcher replaces the popular SS 3.1 while adding a fourth stereo input channel and front panel control. We've kept the best of the SS 3.1 features and added a few more.

The new Silence Monitor III improves on the features of the original SSM, with front-panel control, removable screw terminals, "Plug & Play" installation, built-in program switcher, restore timing delay, aural alarm and relays for most remote functions. Now rackable!

The new SS 8.1 II switcher replaces the popular 6x1 with the addition of two more stereo input channels and GPI, while keeping the price the same! The SS 8.1 II may be desktop, wall mounted or installed on the new "Rack-Able" mounting shelf.

The new RA-1 (1-RU rack shelf) provides mounting for three tri-rack or two half-rack "Rack-Able" configured products. The RA-1 is pre-drilled for flush and recessed product mounting. The RA-1 is furnished with filler panels and mounting hardware.

Look for additional
"Rack-Able" products soon.

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New Team at ATI Intro'd

NAB2003 gave many attendees their first chance to meet the new team at Audio Technologies Inc. Familiar faces Sam Wenzel and Ed Mullin are giving way to new owner and President David Day — the Day of high-end tuner manufacturer Day Sequerra — and his team of Ken Davis, CFO, and Linda Reed, marketing manager.

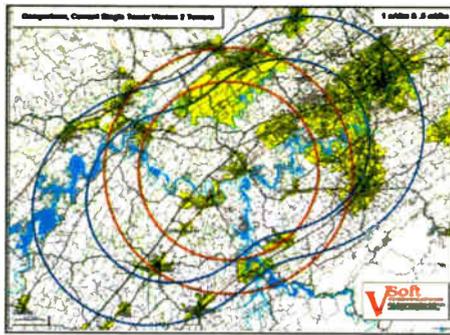
Wenzel said, "David brings two decades of proven experience in growing world-class electronic design and manufacturing companies."

As for new products, ATI showed a new eight-channel mic preamp and an eight-channel line amplifier. Both use XLR connectors and offer active balancing or transformer balancing. The more feature-filled preamp, MMA800-XLR, has level controls, 48V phantom power, phase reverse and low-cut filters.

Contact the company in Pennsylvania at (215) 443-0330 or visit www.atiaudio.com.



David Day



This street-level map compares coverage of a one-tower omnidirectional pattern and a two-tower directional. The two-tower pattern was designed using AM-Pro.

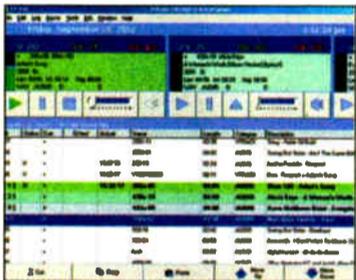
oriented at various azimuths and polarity, and contains a multifunctional pattern editor that allows features including point-and-click editing and mouse-controlled rotation.

Contact the company at (319) 266-8402 or visit www.v-soft.com.

BSI Shows Off Simian V1.5

Broadcast Software International's latest offering is Simian version 1.5. BSI is touting new features with the upgrade, including Dynamic Time Compression and an expanded Production Mode capability. Simian also will save several "Sessions" that can be launched with their own saved settings from numbered shortcuts.

A new multilingual version of Simian was released at the show. Spanish is the first lan-



guage available. Simian is priced at \$1,499. Contact the company in Oregon at (541) 338-8588 or visit www.bsiusa.com.

V-Soft Features AM-Pro

V-Soft Communications touted its AM-Pro program at the spring NAB show. The program plots FCC coverage and interference contours and performs full groundwave and skywave AM allocation studies.

"We believe strongly enough in the ultimate vitality of the AM band to have spent the last two years in the development of a sophisticated, yet easy-to-use, high-quality AM coverage/interference mapping and allocations tool," said President Doug Vernier.

Also new is the Pattern Workshop. This program creates professional-looking directional antenna azimuth graphs and tables for FCC submissions. It contains an antenna combiner that allows combining the patterns of antennae

Iso Booths on Display From WhisperRoom

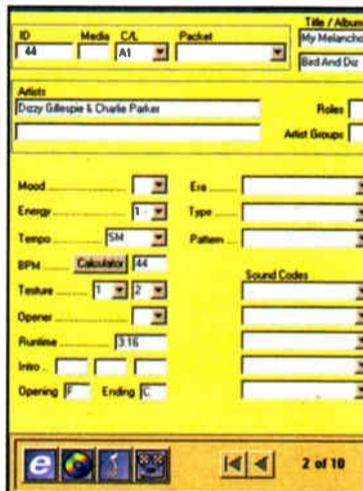
For NAB2003, WhisperRoom demonstrated its bread-and-butter product, modular isolation booths.

Visitors to the WhisperRoom booth were treated to demonstrations of the isolating qualities of the SE 2000 series along with numerous options, including windows, fans, lights and casters. WhisperRoom also offers booths in numerous sizes, shapes and interior decors.

Contact the company in Tennessee at (800) 200-8168 or visit www.whisperroom.com.

RCS Unveils Several Products

AirCheck LLC, a division of RCS, unveiled new audio recognition technology, Aircheck, a broadcast monitoring and automated audio identification service providing data from top-rated radio stations in New York City. AirCheck provides verification of commercials and songs aired. The product picked up a 2003 Radio World "Cool Stuff" Award.



Selector XV contains Smart Ripper.

RCS also joined forces with Ibiqity Digital Corp. to offer U.S. stations enhanced audio services for stations converting to HD Radio. RCS will be incorporating the advanced features of Ibiqity's audio compression technology into its RCS Master Control XV studio automation system.

RCS and Arbitron are working together as well. RCS ProRate yield management pricing software is used by the ratings company's Tapscan Software Suite's Reachmaster proposal generator.

Selector XV music scheduling from RCS is adding features including data exchange, sound enabling, flight scheduling, Smart Ripper/data analyzer, audio marker/editor, Enterprise Spin Analysis and classroom training.

RCS also is adding mobile phone text messaging for radio. The RCS Direct Audience Connection features two products for real-time studio poll results and current title/artist-on-demand from listener cell phones.

Contact the company in New York at (914) 548-4948 or visit www.rcsworks.com.

ENCO Develops DAD, New Products

ENCO Systems hit the floor in Las Vegas with developments to its DAD digital audio automation system. Changes include new core functionality, an enhanced AirPLAY live-assist on-air user interface, new database features allowing more fields and a virtually unlimited number of audio cuts and a tightly integrated interface between DAD and the CoolEdit family of digital audio editors.



Live Demonstration Site for EnterActive Radio

ENCO also showed an extension of its XML messaging service. This allows real-time messaging of now-playing information to a variety of external systems including HD Radio and radio station Web pages.

EnterActive Radio is a suite of modules designed to bring interactivity to the listener through a mobile phone and on a station's Web page while generating revenue to the broadcaster.

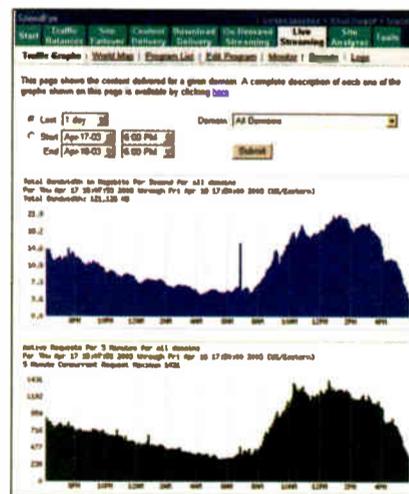
ENCO also featured Phonetica, a phonetic search engine that allows users to search libraries of recorded audio for specific words and phrases. Results of a Phonetica search can be immediately loaded into the DAD editor.

Contact the company at (248) 827-4440 or visit www.enco.com.

Speedera Provides Streaming Solution

Speedera Networks, a global content delivery service, was at the show to showcase its outsourced solution for streaming audio over the Internet. Speedera hosts stations' streaming audio content on servers within a distributed network of servers, deployed worldwide.

Speedera's delivery network allows stations to deliver high-quality audio content without having to incur the costs of building, maintaining and managing streaming server infrastructure. According to the company, the solutions scale easily so that stations can accommodate sudden surges in demand.



Speedera enables radio stations to monitor live streaming audio traffic through its SpeedEye user interface.

Speedera's Content Delivery Network is able to stream live and archived programs in Real, Windows Media and Quicktime formats.

Contact the company in California at (408) 970-1500 or visit www.speedera.com.

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studio or any other location to the 32KD in the terminal room.

The most critical facility user interface is the final link in the chain: the SAS **Rubicon™** console control surface.

Rubicon sets new standards for innovation and versatility.

In fact, it was the hands-down new product winner at this year's NAB.

Supervising development of Rubicon is **Jack Williams**, widely known as the dean of console engineering.

According to Jack, "The feel of a great console is like the feel of a great car. Rubicon has it. It looks great, too."

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KD Kanopy Offers New Fabric

Promotion directors take note: KD Kanopy is out with a new fabric canopy top for the company's radio remote booths.

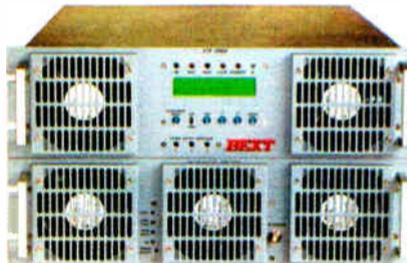


The four-color process fabric allows for full coverage digital printing. Fabric is UV protected, fire retardant and water resistant.

Contact the company at (800) 432-4435 or visit www.kdkanopy.com.

Bext Expands RF Range

Bext introduced the LEX 30 frequency agile FM transmitter/exciter. The LEX 30 features a front-panel RS-232 jack, selectable stereo generator, 30-watt adjustable output power and single-space chassis.



The LEX 30 is microprocessor controlled and has an LCD display and menu-based functions. A two-year warranty is standard.

Also debuted at NAB 2003 was the FD 2000 compact solid-state FM amplifier. It has LED status lamps and an LCD display. For those requiring a 10-watt composite STL transmitter/receiver, Bext unveiled the LD series, which employs LED status indicators and a front-panel LCD display.

Contact the company in California at (619) 239-8462 or visit www.bext.com

Shively Refines IAD Concept for HD Radio

Shively Labs said it continues to refine the IAD Antenna System concept it introduced last year. It is touted as a cost-effective solution for side-mount antennas transitioning to HD Radio.

The design duplicates existing azimuth patterns, while it requires no additional tower space or analog power and minimizes the size of the digital transmitter required.

Initially the IAD models were end fed only and designed for up to 10 kW transmitters. In the past year, Shively has expanded the technology to include any size transmitter, and it can be made to include beam tilt and null fill.

The digital arrays use a power divider for a corporate feed system as well as a fine matching transformer to compensate for any real-world tower effects that will detune the digital array.

Contact the company in Maine at (207) 647-3327 or visit www.shively.com.



HHB Features PortaDrive

High-end radio users and pro audio engineers are among the potential users of HHB's PortaDrive hard-disk recorder, which offers three hours of uncompressed eight-channel, 24-bit, 96 kHz digital audio recording capability. It's more than 12 hours at four-channel, 24-bit and 48 kHz.

The recording medium is a removable 30GB hard disk. Other features include



phantom power, limiters, high-pass filters, mic pads, onboard delay, mic preamps, onboard mixing capabilities and AES31/SDII/BWF compatibility. Main inputs and outputs are standardized RCA, XLR, 1/4-inch connectors along with other standards.

HHB's other NAB news was the addition of upgraded DVD-R media. Now available in bulk packs, HHB's DVD-R discs are also 4X-compatible.

Contact the company in California at (805) 579-6490 or visit www.hhbusa.com.

Delta Has PAB Series

Delta RF Technology was at the show with its PAB FM Series Class C solid-state power amplifiers.

Featuring a new control system and hot swappable modules, the PAB FM series will operate into a 3:1 VSWR load, default to full power in the event of a control failure and remain on the air should ventilation fans or air filter fail.

The PAB FM series mounts in a standard rack 16 inches deep. Control functions are via front panel or RS-232. Quick status indications are provided by LEDs; there is a free module loaner program in place. The PAB FM series has power ranges from 50 to 5,000 watts.

Contact the company in Nevada at (775) 335-8273 or visit www.drft.com.

Sadie Shows PCM4 and PCM8

Sadie unveiled two new products at NAB2003.

The PCM4 is a four-I/O, DSP-based system with 32 virtual tracks, modular faders, EQ, dynamics processing, reverb, routing to external processors or media storage devices, real-time Direct-X plug-in support and standard Windows 2000/XP networking.



The PCM4 supports up to 96 kHz/24-bit audio, one-button PQ editing, AIFF, WAV and BWF file support, three- and four-point editing with 50 undo/redo levels, 36 definable keys, breakpoint and dynamic editing which can stay within a clip and 32-bit floating point recording resolution as well as 16- and 24-bit. It supports four channels of analog electronically balanced inputs/outputs and two AES stereo digital inputs/outputs.

Also unveiled was the PCM8, an eight-channel version of the PCM4. It may be used for recording of live musicians, DDP images of in-house recording and music post-production.

Contact the company in Tennessee at (615) 327-1140 or visit www.sadieus.com.

Computer Concepts Plans Maestro 4

Computer Concepts previewed the Maestro 4 digital audio management system, which it said offers new looks, phone

editing features, distant city heads and tails, voicetracking and CD ripping capabilities. Also provided is support for non-proprietary audio cards, switchers and computers, as well as backwards compatibility for previous DCS and Maestro users with Computer Concepts audio cards and switchers.

Maestro 4 is in the beta testing stage and will be a no-cost upgrade to Technical Support clients.

Contact the company in Texas at (888) 438-7268 or visit www.computerconceptscorp.com.

Sennheiser Updates Shotgun, Lav Lines

Sennheiser's MKE2 lavalier mic has been updated to the MKE Platinum, based on the original MKE2 red dot, but 2/3 the size and using a thinner, more flexible cable with less cable noise. Like the red dot, the MKE Platinum has a flatter HF frequency response.

Sennheiser's new MKH 418-S mono-com-

patible, mid-side stereo/shotgun mic adds a pair of side capsules and new porting to its traditional MKH 416.

The MKH 418S can be used to record M/S stereo or the center capsule can be used by itself as a quality shotgun microphone. Although any good preamp can be used, Sennheiser suggests the True Systems P2 Analog because it offers M/S decoding.

Sennheiser also showed the long-handle loose cardioid MD46 (\$199) for ENG work. This is a dark blue satin finished interview mic with a slightly tighter pattern than standard interview mics, and low handling noise.

Contact Sennheiser in Connecticut at (860) 434-9190 or visit www.sennheiserusa.com.

VoxPro Goes V3.2

Audion Labs introduced version 3.2 of VoxPro PC phone and voice track editor.

Most prominent new features are MP3 import and editing capability, auto install of ancillary software and a new Control Panel. Standard features include the ability to access on-air work from any VoxPro PC in the station while continuing to record and edit off the air, recording of host and caller on two separate channels, network on Novell, NT or peer-to-peer networks without the need for a dedicated file server.



Editing may be performed by a scrub wheel or buttons. Copying, deleting or moving multiple files is possible. With a networked environment, air talent, news, producers and others can have instant availability to files for playback or editing.

Contact the company in Washington at (206) 842-5202 or visit www.audionlabs.com

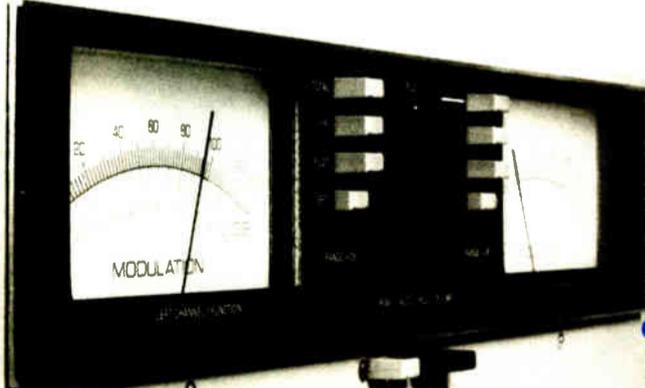
Beyer's Compact Mic Power Solution

New from beyerdynamic, the MCE 494 is a small and handy problem solver, a cardioid electret condenser mic with an integrated mini TRS plug. It retails for \$89.

The MCE 494 uses the voltage available from most computer, DAT and MiniDisc jacks to power its electret element, turning the recording device into a one-handed ENG device. It won a "Cool Stuff" Award from Radio World this year.

For more information contact beyerdynamic in New York at (631) 293-3200 or visit www.beyerdynamic.com





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New Consoles From Soundcraft

Soundcraft, distributed in the United States by Harman Pro North America, upgraded its RM1d digital radio console and introduced a low-cost Spirit E Series of mixers to NAB convention-goers.



The RM1ds adds features to the RM1d console, originally intended as a combined air/production console. The new on-air-only version includes separate Stop and Start functions for each channel, internal dynamics processing and Lexicon effects and integration with the RCS Master Control on-air digital storage system. The RM1d and RM1ds are available in 6- and 12-channel versions. New Version 3.0 software for the RM1d is available, adding password lockout, new menus and enhanced dynamics.

The Spirit E Series offers up an interesting model, the ES, which caters primarily to studios with multiple stereo sources. It has four mono mic inputs and 10 stereo inputs, a reversal from the typical small-mixer topology of multiple mic inputs and only a few stereo connections.

Contact the company in Tennessee at (615) 360-0471, or visit www.soundcraft.com.

Driving With Delta Meccanica

Delta Meccanica now offers a two-way switch 7/16 motor drive.

In the 87.5-108 MHz frequency range, the unit offers isolation of ≥ 84 dB and return loss of ≤ -40 dB.

It operates at temperatures of -5°C to $+45^{\circ}\text{C}$. The operating voltage is 220-240 V AC at 50 Hz, with a control voltage of 5, 12 or 24 V DC. Typical switchover time is three seconds. There is an impedance of 50 ohms and insertion loss of ≤ 0.05 dB.

For more information, contact the company in Italy at 011-39-0763-316222 or visit www.deltameccanica.com.

RDL Intros Message Repeater, Chimes

Radio Design Labs introduced the FP-MR1 Message Repeater. It can store up to one minute of single voice message with background music electronically. The message may auto repeat using an internal timer and be started manually using the Start button or remotely by a contact closure. The background music can fade under the voice message or be turned completely off. An internal AGC maintains recording level.



Also new at RDL is the FP-CH8 Chime Generator, with eight electronic chimes, selectable in single or repeated modes, input for background music or paging audio and automatic ducking. The chime patterns are manual/single/double/triple strike, tone ring, descending triple strike, eurosiren and multi-tone alert.

RDL makes a variety of StickOn devices covering an extensive list of applications. Also new are the RMS-4 Wallplate, RCX-J2 Line Input Assembly, RCX-A2 Line Output Assembly, US-A1 Mounting Adapter and RUC-4 Universal

Remote Control for RDL Modules.

Contact the company in California at (805) 684-5415 or visit www.rdlnet.com.

Go Digital With Starter Kit From Thales

Thales has digital gear for shortwave, AM and longwave radio, called the Thales Broadcast & Multimedia Skywave 2000. It comprises a digital exciter and a digital reference receiver allowing the broadcaster to transmit, receive and analyze digital signals.

The Skywave 2000 DRM M²W Starter Kit is designed to enable signal testing while keeping costs low. The kit consists of a Thales 10-kW M2W series transmitter adapted for digital operation, a TXW 5123D integrated digital encoder/modulator and a special bandwidth output filter.

The M2W digital system is rated for 10-kW carrier output power analog or 4-kW RMS out-

put power digital operation.

The TXW 5123D encoder/modulator is designed for digital operation according to the Digital Radio Mondiale standard and is compliant with the IEC standard.

Contact the company in France at 011-33-1-34-90-30-11 or visit www.thales-bm.com.

New Amp, Exciter From DB Elettronica

The DB Elettronica PFS 10000 system features the PM500 exciter and 10-kW KFS



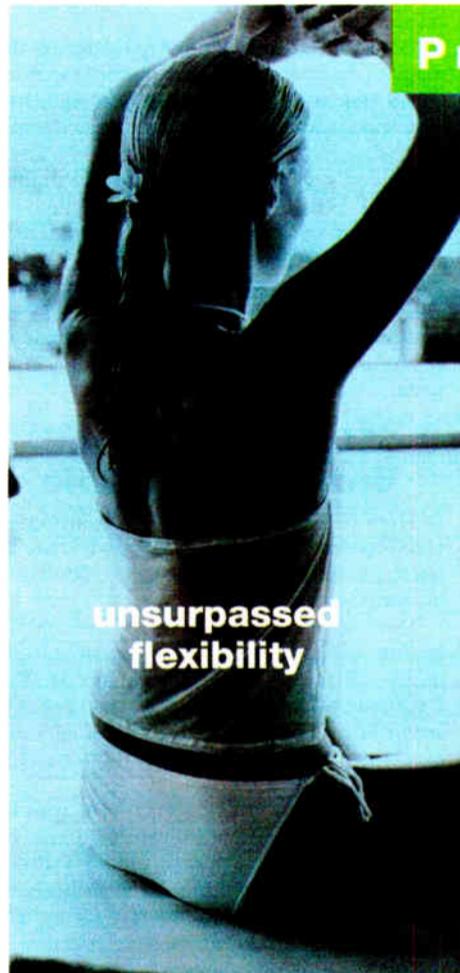
10000 FM amplifier. New coupling architecture enables the transmitter to be smaller and weigh less, which also leads to reduced cooling costs, easier transportation and maintenance, according to the company.

A proportional foldback protection circuit reduces the output power without on-air interruption, keeping RF devices within safety limits in the event of load mismatching, environmental over-temperature, cooling failure, failure in one or more amplification modules and failure in power supply modules.

Features include metering of currents and voltages of each MOS-FET stage, forward power and reflected power.

DB Elettronica offers an optional remote control interface to manage the voltages and currents of each RF stage, forward power, reflected power, alarm status, on/off and stand-by functions.

Contact the company in Italy at 011-39-049-8700-588 or visit www.dbbroadcast.com.



unsurpassed flexibility

Prophet Systems Innovations

NexGen II Studio Suite, the revolutionary "all in one" radio system designed with you in mind.

Prophet Systems has integrated all our software packages into one ultra powerful software suite, NexGen II Studio Suite. NexGen II is the product of our many years of experience, and our well deserved reputation for thinking outside of the box. NexGen II utilizes the same classic Prophet feature-rich software, but it's packaged into hardware that maximizes your investment of money and time like never before!



"In today's economy, we all have to stretch our dollars and our time. Large, complex solutions are too costly and too time consuming for the realities of modern radio. But everyone still needs all the features and redundancy possible, because off-air is simply not an option. NexGen II Studio Suite is all about convenience, and getting the most for your money."

Kevin Lockhart
President of Prophet Systems

Introducing NexGen II Studio Suite, the perfect solution in a box!

Choose from four affordable Studio solutions, each designed to handle your specific needs.

Studio 11 - \$4,500

Cost-effective solutions for the standalone AM, FM or LPFM. Ideal for remote or home-based voice tracking and music scheduling.

Studio 22 - \$7,000

Designed for mostly automated, satellite or voice tracked stations.

Studio 41 - \$7,500

Perfect for active control rooms and production studios.

Studio 44 - \$9,700

The best of both worlds! This powerful workstation can handle live or automated operations.

With any Studio solution, we include all the software you need to run your station.

NexGen Digital

WANcasting™

VoiceTRAC

MusicGen

CDX/AFC

Digital Reel-to-Reel

PhoneTRAC

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1-877-774-1010
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sales@prophetsys.com

Active Power Emphasizes CleanSource

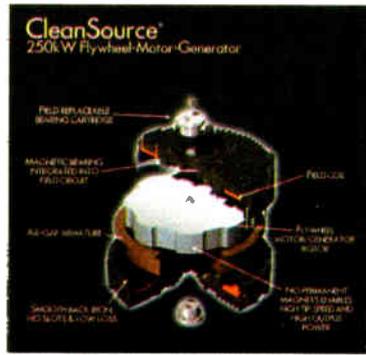
Digital broadcast environments place greater demand on utility power purity and reliability. Active Power touted its flywheel-based CleanSource UPS system as a solution.

"No matter what the event on the power line, you will see no change on the output voltage waveform from the CleanSource UPS," said Chuck Barry, product marketing manager. Active Power emphasized protection of microprocessor-equipped transmitting equipment from damaging power line surges.

In the event of incoming power failure, CleanSource provides a 15- to 30-second ride-through, and "walks" the load onto the backup generator over a period of 1-10 seconds.

Incorporating a 600-pound steel disc rotating at 7,700 rpm, CleanSource technology replaces or augments UPS battery banks. A CleanSource DC system in parallel with batteries extends battery life. CleanSource uses typically 25 percent of floor space required by batteries. The system does not require a temperature-controlled environment.

Contact the company in Texas at (512) 836-6464 or visit www.activepower.com.



Uni.Com Introduces Trim FM Transmitter

Weightwatchers has nothing on this transmitter. Keep it tiny and keep those costs down. The latest addition to the Unicast range is a compact 10-kW FM unit.

The BT02-103CU is based on the BT02-103 but comes as a single standard 19-inch rack unit.

RF modules are hot-pluggable from the front. Redundancy and protection technology ensure signal integrity under severe conditions, according to Uni.Com. A cooling system helps prolong transistor life.

Each power amplifier has its own power supply, and an optional redundant AC distribution system is available. A digital exciter is also available as an option.

Contact the company in Italy at 011-39-06-2279-6607 or visit www.unicomspa.com.

Shotgun Mic Uses Single Capsule

The Sanken CS-1 short shotgun for studio or field recording (shown) uses a single-capsule design to provide off-axis rejection, as much as 23 dB of cancellation down to 200 Hz.

The Sanken HAD-48 is an addition to an audio road warrior's toolkit. It is an inline module that uses phantom power to boost dynamic mic output levels by either 20 dB or 40 dB and is useful for boosting signal over long cable runs.

For live, in-studio, music broadcasts, Sanken has the new CUW-180. This small microphone has two small-diaphragm cardioid capsules that can be physically adjusted to capture a variety of X/Y stereo sound.

The CO-100k is an omnidirectional studio microphone with a reported response to 100 kHz. This mic will be of special interest to those working in high-sample-rate PCM or DSD recordings.

For more information contact Sanken Microphones in California at (323) 845-1171 or visit www.plus24.net.

Switchcraft Designs New XLR Connector

Switchcraft was showing a new design for XLR connectors at the show.

The AAA series connectors for cables provide strain relief and a tight connection without



the traditional setscrew. The back housings are available in ABS plastic or metal.

For more information contact Switchcraft in Illinois at (773) 792-2700 or visit www.switchcraft.com.

Middle Atlantic Rail System: Access to Gear

Several products from Middle Atlantic will be helpful to engineers involved in construction or revamping projects.

The Rotating Sliding Rail System (SRSR) is for mounted in-wall construction. Available between 12 and 24 RU and useable depths of 19 inches and 23 inches, this rack pulls out on its integral rails and spins on its base allowing access to the rear of the mounted equipment. The SRSR can hold up to 300 pounds of gear, depending on model.

Studies have shown that for every 10 degrees of Fahrenheit above 85 degrees, digital equipment life is reduced by approximately 40 percent. The FC-4 (\$150) thermostatic fan control provides four AC outlets and operates fans at speeds proportional to enclosure temperature to maintain a cool, healthy environment for rack-mounted gear. This system won Radio World's "Cool Stuff" Award.

Isolation racks provide up to 22 dB of sound isolation, an air filtered inlet and brush grommets for cable entry. Isolation racks are available in 12 RU and 24 RU heights. Rack systems of every height, and raised floor systems capable of accommodating any number of racks are also available.

For more information, contact Middle Atlantic in New Jersey at (800) 266-7225 or visit www.middleatlantic.com.

DPA Broadcast Mic Has Wide Polar Response

The small-diameter 4015 transformerless sub cardioid microphone from DPA offers a wider polar response than standard cardioid mics, the company said.



This mic has a built-in 20dB pad. Applications include high-end recording or broadcast uses where specific isolation of cardioid patterns is too small to capture the intended soundfield.

For more information, contact DPA Microphones in Ontario, Canada at (519) 745-1158 or visit www.dpamicrophones.com.

Illbruck Acoustic Materials Stress Safety

Illbruck was at the NAB promoting its Sonex Wall Panels and Baffles, Fabritec Wall Panels, Squareline metal ceiling tiles, Contour

ceiling tiles, Whiteline ceiling tiles and Harmoni ceiling tiles.

The company highlighted the Class 1 fire retardant feature of Sonex offerings.

For more information, contact Illbruck in Minnesota at (800) 438-0685, or visit www.illbruck-archprod.com.

Belden Cables Tailored For Touch Panels

Belden showed 1502R and 1502P multimedia control cables designed for connection of touch panel systems, increasingly found in broadcast studios.

Both include a data pair of two 22 AWG seven-strand tinned copper conductors insulated with foamed polyethylene and shielded with Beldfoil tape and a drain wire, as well as a power pair of two 18 AWG copper conductors.

The 1502R is insulated with PVC for the power pair; the 1502P is insulated with plenum-rated PVC and encased in a plenum-rated PVC jacket.

Belden also introduced packaging for many of its products, a clear plastic dispenser called Belcoil. The packaging is designed to save space and require less set up than the traditional spools, as well as creating less waste.

Belden's 1800F cable, a flexible digital audio cable used for digital microphone connections, now carries a CL2R rating from Underwriters Laboratory that allows it to be used in risers while meeting National Electrical Code requirements.

For more information contact Belden in Indiana at (765) 983-5200 or visit www.belden.com.

SSL Debuts Digital Broadcast Console

High-end users and those with affiliated video operations are among those who may be interested in Solid State Logic's C100 digital broadcast console.

Designed for on-air, it incorporates certain features of the SSL C200 production console in a small-footprint, assignable format. The C100 uses Centuri processing technology, with self-healing DSP and remote diagnostic capability. It can accommodate 128 channels of mixing.

The C100 uses a central TFT touchscreen to display signal level and status of mix busses. It incorporates audio-follow-video functionality, allowing it to be controlled from an external source during TV broadcasts.

Control Linking enables a range of configuration functions (such as starting external sources) to be linked to a specific input or



output. An offline configuration tool permits engineers to set up complex configurations in an Excel spreadsheet while the console is in use, then download the configuration to the console over the Internet.

Contact Solid State Logic in England at 011-44-1-865-842-300 or visit www.solid-state-logic.com.

ATCi Promotes Simulsat Multibeam Satellite Antenna

"Simulsat sees them all" is the promotional headline for ATCi's Simulsat C/Ku advanced multibeam satellite earth station antenna. Capable of receiving 35+ satellites simultaneously, Simulsat C/Ku is 2₊ compliant and captures satellite signals from C and Ku Band satellites within a 70₊ view arc.



ATCi also offers antenna to headend connectivity with a fiber optic link using Agere/Ortel products distributed by ATCi. The technology provides EMI/RFI immunity, high isolation and low attenuation, the company said.

ATCi's Model TE900A Digital and Analog Signal Level and Spectrum Analyzer is enclosed in a case for use outdoors. Field use is enhanced by a rotary-push knob for one-hand operation. An audible tone indicating signal strength adds to field convenience. The TE900A features digital synthesis tuning and covers 5-862MHz, and 920-2150MHz.

Contact the company in Arizona at (480) 844-8501 or visit www.atci.com.

Bird Emphasizes Test, Load Equipment for Digital

Bird Electronics Corp. promoted its line of directional couplers and passive loads designed for the wideband demands of digital broadcasting.

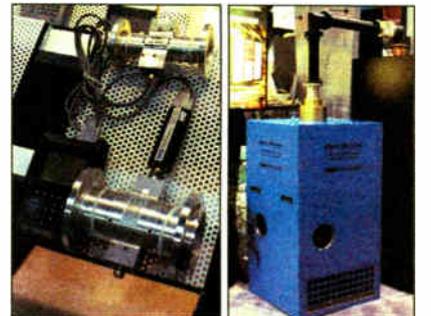
Asked, "What is digital about a dummy load?" Don Huston, broadcast support engineer, said Bird's Digital Air Load is designed to handle the large peak-to-average power ratios for HDTV and IBOC with low VSWR and reliability. The Digital Air Load Series incorporates greater resistor surface area, higher temp resistive materials, connector interfaces and internal transmission line spacing designed to handle high-voltage gradients. The units are forced air cooled, making them cool to the touch.

Bird has developed an oil-free passive load series featuring reduced volume and the ability to be mounted in any position. The units feature low broadband VSWR and the ability to sustain high peak digital power ratios.

A new WBC Wideband Coupler for high-power applications uses the Bird Model 5000 handheld meter for readings in the VHF and UHF ranges. Bird emphasized its cost effectiveness and wide-band characteristics.

The Model SA-1700 Site Analyzer featuring a frequency range of 25 MHz-1700 MHz also was promoted. Setting this unit apart is an ability to pinpoint transmission line problems across a range of frequencies even in high ambient RF levels. It earned a Radio World "Cool Stuff" award.

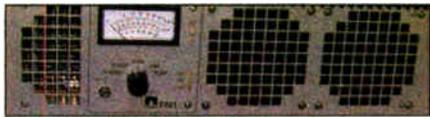
Contact the company in Ohio at (440) 684-3378 or visit www.bird-technologies.com.



New FM Products From Nautel

The Nautel FM1 is an addition to the company's line of solid-state FM transmitters. The 1 kW broadband FM amplifier is compact, taking only 3RU.

Four amplifier pallets, rated in excess of 250 W, are operated in parallel so that if one fails the remaining amps keep the signal on-air at reduced power.



The FM1 has selectable linear mode operation, to accommodate hybrid FM/IHD Radio transmission using common amplification or digital HD Radio transmission for separate amplification.

Nautel also expanded its Q Series FM transmitter line with the Q10. Features include 68 percent AC to RF efficiency, redundant parallel rectifiers, dual exciters, dual IPA and dual low-voltage power supply facilities.

For more information, contact Nautel in Nova Scotia, Canada, at (902) 823-2233 or visit www.nautel.com.

Orban Offers New Audicy, Optimod

Orban showed the new, broadcast-oriented Audicy2 digital audio workstation, which runs under Windows XP Professional, and the Optimod-FM 8300 audio processor.

The Audicy2 is built around an ergonomic control surface designed to be intuitive to use thanks to faders, buttons and a scrub wheel. It also uses Windows XP networking capabilities to integrate with modern broadcast operations; it can be part of a peer-to-peer or client-server network, or it can run as a stand-alone editing deck.

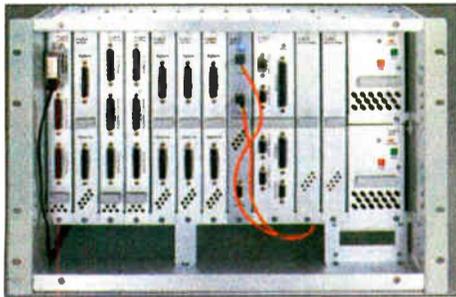
The mid-priced Optimod-FM 8300 gives users access to the versatility of the Optimod-FM 8400 at a lower cost. Orban labels the five-band processor as "HD Ready" for digital broadcasting.

Contact the company in California at (510) 351-3500 or visit www.orban.com.

Logitek Upgrades Audio Engine

Logitek announced several upgrades to its Audio Engine digital audio router.

The Audio Engine is a modular unit based on card cage architecture; users plug in cards for the desired number of analog and digital I/Os, networking with other Audio Engines and DSP audio processing capabilities.



Upgrades include Version 3 firmware that enables a number of standalone audio routing functions. The firmware also expands the number of available mix-minus busses to 24 and increases the stereo mix bus count to 8.

The flexibility of the Logitek Audio Engine and digital console architecture was stressed. The company's display featured multiple Numix, Remora and vMix consoles connected to networked Audio Engines. Demos included one-button scene changes, in which a console's layout can be remapped for a new user or daypart, output router control capabilities, talkback capa-

bilities across networked routers, switching monitor feeds automatically between air and program when a mic is activated and telephone hybrid sharing between two studios.

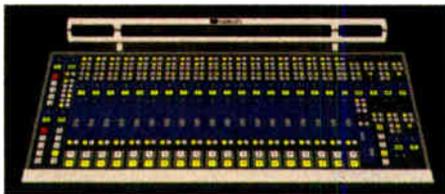
For more information, contact Logitek in Texas at (713) 664-4470 or visit www.logitekaudio.com.

SAS Adds Rubicon, Williams, Mullinack

SAS introduced the Rubicon Broadcast Console Control Surface. It uses the SAS 32KD Digital Audio Network for its mixing, switching, level control and effects. Rubicon is a modular, customizable radio on-air and production console control surface.

"With the 32KD as the hub, and RIOLink and Rubicon at the spokes, the SAS Connected Digital Network provides the major-market and multi-station broadcaster with a complete solution for integrated control and distribution of audio and data," the company stated.

SAS also introduced Indigo, a modular analog console, the first product of a joint venture with Ward-Beck Systems. It was derived from the Ward-Beck R2K Series, introduced in 1998 and successful in the Canadian market.



The company announced that Jack Williams had joined the firm as director of console and systems development. SAS earlier added Howard Mullinack, making him responsible for marketing and strategic development. And SAS announced a strategic partnership with Sierra Video Systems.

Contact the company in California at (818) 840-6749 or visit sasaudio.com.

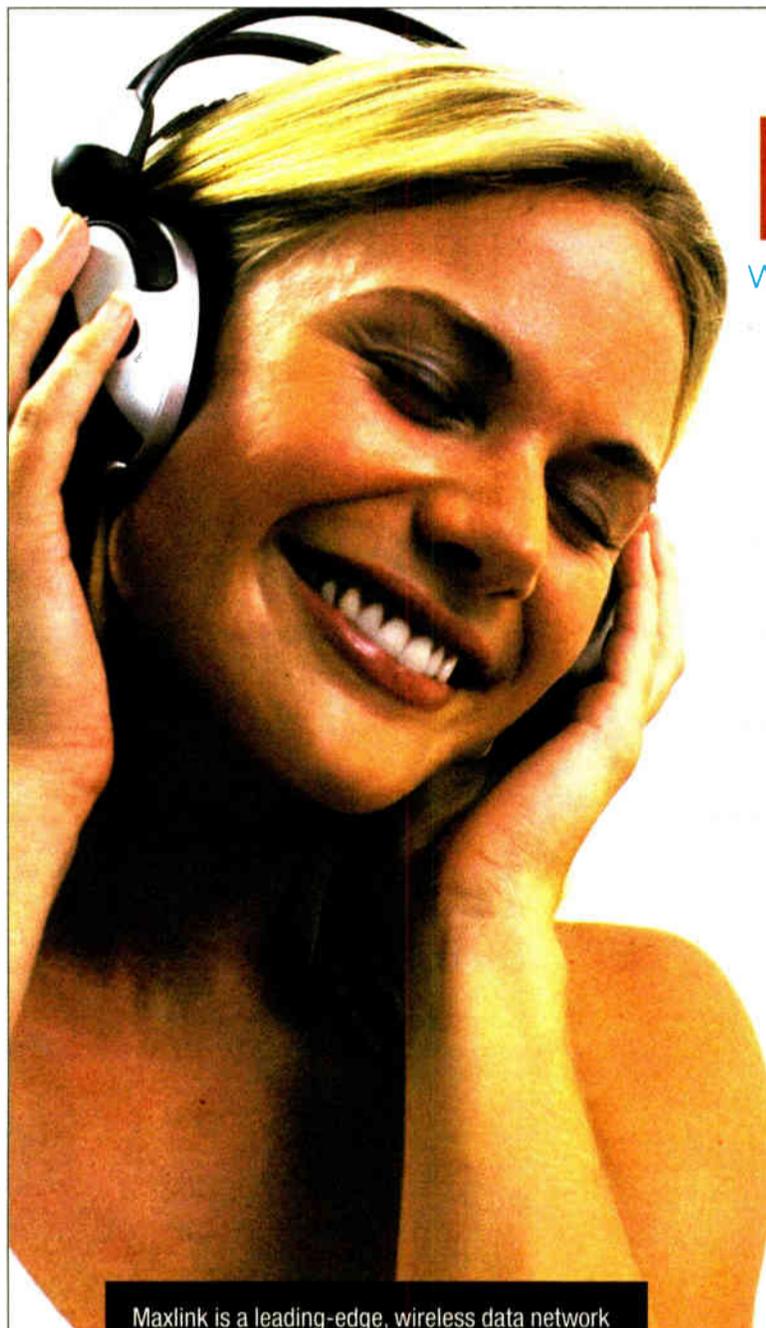
TFT RPU Meets New Channel Assignments

TFT reintroduced its 8888 and 8889 Remote Pick Up equipment to comply with new FCC channel assignments.

The 8888 Transmitter and the 8889 Receiver were two of the first frequency-synthesized units that featured DTMF control of frequency and bandwidth. A touch-tone telephone plugged into the transmitter can switch the receiver remotely between two preprogrammed frequencies and select three bandwidths. TFT has upgraded the units to meet Part 74 requirements for carriers on 3.125 kHz spacings.

The transmitter has three audio inputs, three RF output power levels, external processor patching and test-tone oscillator. The receiver, also frequency-agile, has selectable IF bandwidth, DTMF and a repeater enable circuit.

Contact TFT Inc. in California at (408) 943-9323 or visit www.tftinc.com.



Maxlink

Wireless 5 GHz UNII • ISM Band Data Link

Maxlink is a leading-edge, wireless data network product designed to provide a cost-effective alternative to T1/E1, DSL and cable modems.

For broadcasters faced with costly phone bills, the Maxlink provides twin full-duplex, high-speed T1/E1 data performance. Best of all, the Maxlink doesn't tether you to a T1 line or constrain you with FCC licensing applications.

With a low profile radio/antenna combination, it's cost-effective, fast and easy to deploy whenever and wherever you need it.



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Stock Up On Quality Rack Accessories

The Middle Atlantic U2 heavy-duty metal 2-space rack shelf (shown, middle) will hold your recording and audio processing equipment. Fits equipment up to 17-3/8" wide. Save a bundle by purchasing the special BSW 4-pack!

The EB2 (shown, top) is a 2-space metal blank rack panel, available in a money-saving 10-pack. Other sizes available.

The HW500 is a cup of 500 3/4"-long screws with 10-32 threads. A pre-installed nylon cup washer speeds installation and provides a clean, professional appearance for your rack equipment.

U2PACK 4-pack, 2-space rack shelves	89⁰⁰	EB3 single, 3-space blank panel	11⁰⁰
EB2PACK 10-pack, 2-space blank panels	69⁰⁰	EB4 single, 4-space blank panel	14⁰⁰
EB1PACK 10-pack 1-space blank panels	49⁰⁰	HW500 500 screws/washers	89⁰⁰



MA
Middle Atlantic Products, Inc.

Flat-Response, Dynamic Studio Vocal Microphone

An all-time favorite, the Shure SM7B dynamic cardioid microphone is known for its warm sound and unpronounced proximity effect. **Features:** classic cardioid polar pattern, uniform with frequency and symmetrical about axis, to provide maximum rejection and minimum coloration of off-axis sound; flat, wide-range frequency response for exceptionally clean and natural reproduction; bass rolloff and presence boost controls with graphic display of response setting; improved rejection of electromagnetic hum, optimized for shielding against broadband interference emitted by computer monitors; internal "air suspension" shock isolation which virtually eliminates mechanical noise transmission. The SM7B ships with large and small windscreens.

SM7B List 619⁰¹ **359⁰⁰**



SHURE

Rugged, Portable MiniDisc Recorder

The PMD650 has been designed from the ground up as a professional portable MiniDisc recorder for the ultimate in high-quality digital recording in the field, on sturdy, dependable MiniDisc media. The PMD650 offers a full complement of analog and digital I/O to suit a wide variety of applications. The coaxial digital input with sample rate converter can be used to record from digital sources with sample frequencies of 32, 44.1 and 48 kHz. An XLR digital output (S/PDIF) offers the flexibility to transfer the recorded digital data to other professional equipment. The PMD650 also includes the latest-generation mechanism and a generous 20-second stereo recording buffer. **Features:** balanced XLR stereo microphone inputs equipped with professional-level mic preamps; switchable 48-volt phantom power; mic inputs, switchable to line level; built-in microphone and loudspeaker; edit and playback functions.

PMD650 List 1,249⁰⁰ **995⁰⁰**



marantz



Schwieger Hall, BSW's state-of-the-art sales training facility looks nothing like this picture. However, we do have frequent product lectures from knowledgeable factory reps on exciting new products. Arrive early and you get one of those gooey, luscious maple bars. mmmmm... maple bars. Arrive late and you get one of those dry, plain cake ones...

Powerful Audio Editing for the PC

WaveLab 4.0 from Steinberg is the gold standard in audio editing for Windows PCs. Combining easy-to-use stereo editors with a wealth of mastering features, WaveLab 4.0 offers powerful editing tools and an array of new, high-quality virtual effect processors, letting you powerfully edit, cut, process and manipulate audio. **Features:** real-time I/O monitoring; unique "Audio Montage" non-destructive editing window; 32-bit floating point processing up to 192 kHz; real-time plug-ins; integrated batch processing; pro sampler support and CD writing. ****No returns on software**

****WAVELAB4.0 List 599⁰⁰ 449⁹⁹**



steinberg

Professional Studio Condenser

The popular AKG C4500B-BC is a front-address, large-diaphragm condenser microphone designed for use in professional broadcast environments. It's immune to electrostatic and magnetic fields and provides an extremely wide dynamic range with low self-noise. **Features:** 20 dB pad and bass roll-off (6 dB/octave below 120 Hz); internal shock mount; self-noise 8 dB; max SPL 155 dB; dynamic range 137 dB. The microphone includes an H100 spider suspension and W4000 windscreen. Order today!

C4500B-BC List 665⁰⁰ **399⁰⁰**



AKG

Great Value Boom Mic Stand Only \$89.00!

The ProBoom is the best value in studio microphone booms. This 41" arm comes complete with a 12" riser for table top mounting and two sets of upper springs to accommodate microphones of all weights and sizes. Black color. Additional mounts for wall mounting are available as options. The ProBoom requires no maintenance and has a lifetime manufacturer warranty.

PROBOOM-B **89⁰⁰**



O.C. White

BSW
BROADCAST SUPPLY WORLDWIDE

friendly folks in Tacoma



NEW

New Audioarts 12-Channel Console Packed with Performance

A truly no-nonsense unit with plenty of usability, the Audioarts R55 modular console has 12 channels and 4 busses and offers a monitor module with control room, studio, headphone and talkback functions and an output module with program, audition, pre- and post-mono fader outputs, plus independent meter selection. Flip up the hinged meter bridge and everything you need to access is right there: DB-25 I/O connections, calibration trimpots and console logic dipswitches. Its counter top design fits almost anywhere, with dimensions of 26" W x 25-1/2" D x 8" H (2-1/2" in front), and it has rugged steel frame construction. **Features:** built-in cue speaker/amp and headphone jack/amp to save on onboard gear; built-in event timer; external meter input; mic logic included on line modules for use with line-level mic inputs; stereo program and audition busses plus two mono output busses.

With the purchase of your new R55, we're even throwing in a FREE phone module valued at \$614.00! This is an exclusive BSW offer! Call today.

R55 List 5,695⁰⁰ CALL FOR PRICE

AUDIOARTS' ENGINEERING



NEW

Complete Sony Lavalier and Handheld Wireless Systems

The Sony UWPS1 and UWPS2 are complete UHF diversity-reception wireless microphone systems, perfect for PAs and many other applications. The UWPS1 comes with a unidirectional electret-condenser lavalier and bodypack transmitter; and the UWPS2 comes with a unidirectional, dynamic handheld microphone with an internal antenna - both with level controls and switchable 30 mW or 5 mW RF output. The half-rack-size tuner is equipped with both balanced XLR and unbalanced 1/4" output, the XLR switchable between mic and line levels. Two frequency ranges available (specify when ordering).

UWPS1 Lavalier System List 640⁰⁰ **569⁰⁰**
 UWPS2 Handheld System List 640⁰⁰ **569⁰⁰**

SONY.



Vocal Effects Processor with Double-Tracking and Harmonies

The VoiceWorks vocal processor from TC Helicon has multi-voice harmonies, transparent pitch correction and fat automatic double-tracking, all so realistic you can solo them with confidence. **Features:** S/PDIF I/O; phantom power; compression; EQ; tap-tempo delay; reverb; four independent harmony voices; humanization of harmonies with vibrato, inflection and pitch randomization; fully-adjustable gender and voicing; 100 factory/user presets.

VOICEWORKS List 799⁰⁰ **699⁰⁰** TC-HELICON



Robust 100 Watt Amp Only \$199⁰⁰!

The SLA-1 Studio Linear Amplifier from ART is a robust yet compact power amplifier, designed to provide clean, quiet power with ultra-low noise and distortion, in a compact 1U rackspace unit. The SLA-1 is rated at 100 watts RMS/channel at 8 ohms. It features a Toroidal Transformer, XLR and 1/4" inputs, a ground lift switch, Power, Clip, Signal and Protect LEDs; frequency response of 10 Hz-40 kHz; silent fan cooling/heat-radiating fins; rugged, steel chassis.

SLA1 List 279⁰⁰ **199⁰⁰** A R T
APPLIED RESEARCH AND TECHNOLOGY



Quality Closed Headphone with Swivel Earcups

The HD280 Pro is Sennheiser's most significant closed, circumaural headphone to be introduced in years. The collapsible design and swiveling ear cups offer maximum flexibility in any application. **Features:** closed, dynamic stereo headphone; accurate, linear sound reproduction; 64 ohms impedance; wide 8 Hz-25 kHz frequency response; up to 32 dB of ambient noise attenuation; single-sided, coiled cable with miniplug and locking 1/4" adaptor. This is one of our best values. Order today.

HD280 List 199⁹⁵ **99⁹⁵**

SENNHEISER



Access Both Sides of Telephone Audio

The Inline Patch connects between the base of an analog or cordless telephone and the wall jack, allowing access to audio on both sides of the call. Input jacks let you mix sound bites or music into your conversation. One stereo output jack provides your voice on one channel and the caller's voice on the other channel. A second jack contains a mix of both voices.

INLINESPATCH List 270⁰⁰ **239⁰⁰**
JK Audio

Best Buy Passive Reference Monitor

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

M5 List 124⁵⁰ **99⁰⁰/ea**
Hafler



LED Rack Light

CBT Systems Railight is the perfect addition to any rack. This long-life LED light source (that's right, no bulb!) is mounted in a rugged steel housing. Only occupying a single rack space, this sliding 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 externally-mounted, UL approved power supply.

RAILIGHT List 225⁰⁰ **219⁰⁰**

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ERI Intros Structural Reinforcements, Adds Sacks, Harland

Electronics Research Inc. introduced a line of pre-engineered bolt-on and weld-on leg reinforcement parts, inner-member reinforcement parts and adjustable-length hog rod members.

The company's engineers were at the show to discuss structural analysis services for existing towers and reinforcement plans for tower members and foundations, as well as the company's gin poles, engineered to the proposed TIA/EIA-222-G standard.

ERI displayed its iBox Series Hybrid Combiner, available in low/medium- and high-power versions. They are based on ERI's quarter-wavelength hybrid design and are broadband, requiring no tuning. Antennas compatible with FM HD Radio were shown.

The company recently appointed Marty

Sacks as director of worldwide sales and Bill Harland as product line manager for the antenna division.

Contact the company in Indiana at (812) 925-6000 or visit www.eriinc.com.

Arizona Engineered Debuts SureShot

Arizona Engineered Products introduced a device at the Frontline display called the SureShot, which makes positioning vehicle-mounted RPU antennas less difficult and quicker. Using global positioning technology software, the operator can park the RPU truck, raise the antenna and punch in a three-digit code. The antenna will adjust direction, pan and tilt without operator intervention.

Accuracy is within one degree, horizontally and vertically. Once a station has pre-programmed the location of its receive sites, the time to get on air from the field decreases dra-



matically. The unit will also allow manual operation and aiming.

Contact the company in Arizona at (520) 891-5858 or visit www.azep.us.

Comsearch Eyes Regulatory Changes

Comsearch promoted its Interactive Solutions, designed to streamline and expedite the planning, design and management of RF spectrum. Access to databases for microwave, earth station and company contacts help stations research current spectrum use, identify potential interference sources, determine line-of-sight conditions and create FCC required documentation.

Chris Hardy, V.P. of Comsearch's Spectrum Management Solutions, presented a paper on technical and regulatory changes to Broadcast Auxiliary Services. Of interest to radio broadcasters are the changes affecting Aural BAS such as use of digital modulation and a change to maximum EIRP limitations in lieu of transmit power levels. Hardy's presentation and white paper are available for download on the company Web site.

Contact the company in Virginia at (703) 726-5744 or visit www.comsearch.com.

RYMSA Showcases Antennas

RYMSA showed its line of radio antenna systems and passive components. Antenna systems from the Spanish manufacturer included horizontal and vertical units, along with circularly polarized units. RYMSA had examples on the floor of high-powered (300 kW) multi-channel combiners for FM applications.

The company also provides lower-power multichannel FM combiners and coax fine matchers, gas barriers, elbows and connectors, transmission lines and coaxial patch panels.

Contact the company in Spain at 011-34 91-876-0681 or e-mail broadcast.commercial@rymsa.com.

mSoft Service Provides Production Solution

Monthly packages from mSoft provide access to music and production libraries for a fraction of the cost of ownership, the company said. The package includes the server, the database, the interface and the libraries.

A comprehensive digital asset management system lets the user search, demo, download and log anything from the music libraries. The systems work with Avid, Pro Tools, Nuendo and other popular DAWs.

Subscription prices range from \$175 a month for up to 200 CDs to \$1,500 a month for up to 5,000 CDs (based on 36 months).

Contact the company in California at (800) 489-9314 or visit www.msoftinc.com.

Will-Burt Looks for Power Lines

Accidents can happen when remote vehicle towers extend up into power lines. But that problem is solved with Will-Burt's D-TEC, which detects obstructions or power lines and stops the tower from raising further.



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Workbench

Radio World, June 4, 2003

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

Cellphones in Them Thar Trees

by John Bisset

From the "why didn't I think of that" department: Have you spotted the new cellular "trees" sprouting up across our country? I guess these are in response to environmentalists who feel that regular cellular towers are ugly.

Mark Bohnett of WOLC(FM) in Princess Anne, Md., sent in the example in Fig.1. He calls them "Ugly Trees," and I have to agree.

I wonder if the next step will be to require RFR studies for the birds and squirrels that will start nesting in the artificial branches.

Remote season has arrived. Fig. 2 shows a good way to protect your Telos Zephyr power supply so it won't get lost or banded around.

Some wire ties looped around the supply and fastened to the body of the Zephyr keep the supply snug. Thanks to Roger duFault at WPGC for this tip.

From the response to the last few columns, it seems like we all enjoy a good story. Here are a couple more.

Dave Sanford once was chief of a station in Prescott, Ariz. One Sunday morning the transmitter went off. About 4 hours later, the disc jockey's replacement came in and asked how long the station had been off the air.

The disc jockey who was "on the air" didn't know the station was down. His relief called Dave at church, and Dave walked him through turning on the filaments, waiting a couple minutes, then turning on the plates.



Fig. 1: I think that I shall never see a cell site lovely as a tree.

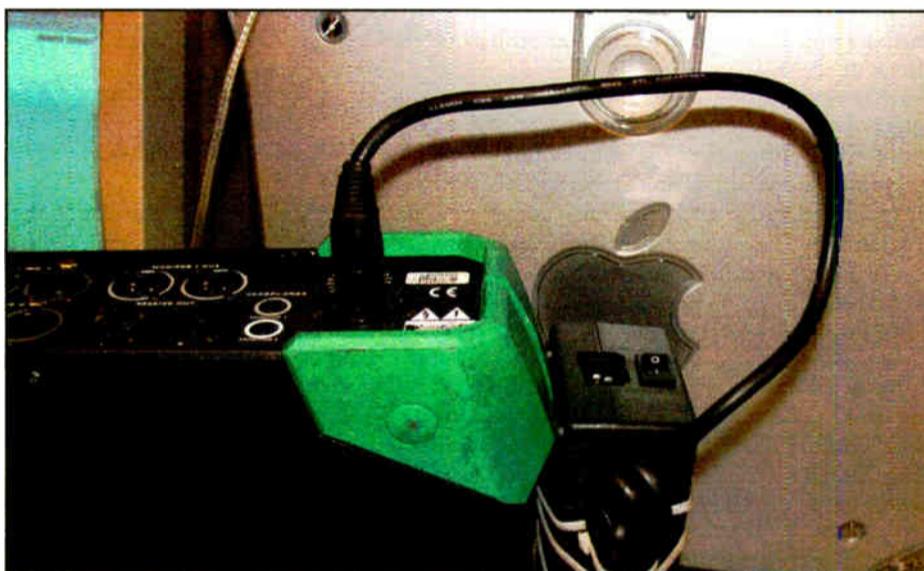


Fig. 2: Protect your Telos Zephyr power supply with wire ties looped around the supply and fastened to the body of the unit.

When Dave asked about the speakers in the control room, the previous operator said that right after he came in, they all of a sudden changed to static. So he switched over to program so he could hear what he was doing.

When Dave asked about the remote-control readings, the talent replied that they all said zero or had minus signs in front of them, so he just copied down what the overnight operator had for readings.

The jock added that listeners had called in complaining all morning that they couldn't hear the station, but the jock said that since he could hear the station just fine (in program), he ignored their calls.

In a similar vein: Vic Jester now works for Radio One in Atlanta. He was a contract engineer for a 1 kW daytimer some years ago. One Saturday he called in just to check on the station. The jock said everything was fine now, but the station had been off the air earlier that afternoon.

When asked what the problem was, the jock replied, "I'm not really sure. When we went off, I pressed the button labeled 'PGM' on the monitor module and we just came back on."

And then there are the tales about promotions and climbing the corporate ladder.

Friend Weller writes that early one morning his sleep was interrupted by the telephone. The voice of the new overnight announcer informed him that the station was off the air and demanded to know what Friend, as the chief, was going to do about it.

Sadly, this air talent had been hired more for her "eye-candy" appeal at remote broadcasts than her experience in radio. In the prior week, there had already been more than one run-in over why the control room speakers had to mute when the mike was opened.

See WORKBENCH, page 36 ▶

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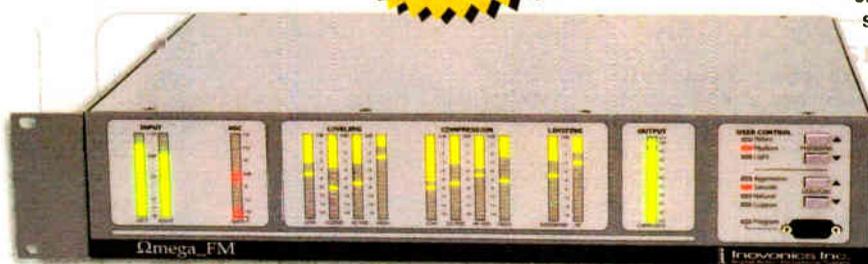
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TECH TIPS

Mark's Two-Hour AM Micro-Proof

by Mark Persons

AM radio is still very much alive and profitable in Minnesota, especially in small towns.

I love these places because they offer news, information and flavor for the local communities being served. It is in those towns that the owner/manager of the station will often corner me to say, "The AM is not reaching out as far as it used to ... and would you please check it out."

Put GPS to work

In most cases, the station is nondirectional, and no full or even partial RF proof-of-performance measurements were ever taken. None is required under FCC rules for nondirectional operation. If there were previous measurements, I could go out and check field intensity at a few previously measured points to confirm or deny the manager's claim.

Assuming no previous field intensity measurements were ever taken, there are several approaches.

I could order 15-minute topographical

maps and spend most of a week plotting radials, driving to points on those radials, measuring the points and analyzing the signal levels. This may be a bit much for a low-budget local station.

I could use a road map and plot some radials within two miles of the tower and

is important because the licensed location may not be the actual location. Then drive around making measurements wherever it is convenient and include a set of GPS coordinates with every reading. In this case, I mean 20 or more measurements within two miles of the tower. This

This is not data that you or I can submit to the FCC, but rather a quick check to see if things are working.

measure wherever possible. However, this can lead to errors when the map is not easily scaled. The measurements could be far enough off to give misleading results.

A third approach seems to take care of most of the above problems.

Use a Global Positioning System unit to get the coordinates of the tower. This

can be done in less than two hours.

I did this recently at a station and was amazed at how quickly measurements could be made and logged. I was able to pick locations with a minimum of potential power line interference and I did not need to find specific locations to measure.

As long as I took at least four measurements in each of four directions, I could be reasonably assured that the antenna efficiency could be estimated. Again, I was not driving in straight lines. I took measurements wherever it felt good to do so.

Back in the office I ran calculations on distance and bearing from the tower.

ing with a big company is the resources available to you. I know the engineers among the big groups appreciate this, and it's no different with a broadcast equipment manufacturing company.

John Stevens is Harris' digital applications engineer, based in Mason, Ohio. Perhaps you had a chance to chat with him at the NAB.

He passed along a Web site that is chock-full of information for beginner and veteran engineers. The subject matter runs the gamut from electrical to electronic topics and includes some great links. The subjects are presented in a tutorial manner, and are easy to understand, and quick to read. Bookmark this site for reference: www.williamson-labs.com.

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) 627-0233.

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

Workbench

► Continued from page 35

As is his style, Friend responded calmly by beginning to ask the usual questions, starting with, "Have you tried to turn the transmitter back on?" The announcer scoffed at having to do such a thing, to which Friend replied that if the transmitter were on, she would be back on the air and he could go back to sleep.

"Transmitter!" she retorted, "What transmitter? I thought they only used those things in the olden days."

A week later, she was promoted to evenings.

At least that was the end of the overnight calls.

The stories are funny, but they point to an important troubleshooting tip: don't assume anything. It's like when you call the Computer Help Desk and the first thing they ask you is if the computer is plugged in.

★★★

One of the great things about work-

BUSINESS DIGEST

Cumulus/Telos Exclusive Keeps Dealer Involved

Is this a model of things to come in the supply industry?

Last fall, Clear Channel expanded the use of direct buying from selected equipment vendors.

Now Cumulus Broadcasting, the second-largest owner at 260 stations, has chosen Telos/Omnia Audio as its exclusive supplier of audio processing equipment.

It will standardize on Omnia processors, and treat Telos as a preferred supplier of ISDN codecs and broadcast phone gear, according to the supplier in a May announcement.

But the deal has a twist.

Instead of buying direct, as in many such deals, Cumulus will buy those products exclusively from Broadcasters General Store, a dealer.

Gary Kline is corporate director of engineering for Cumulus.

In December, Radio World reported that Clear Channel had approached selected broadcast equipment makers to expand the use of direct purchase agreements. Companies involved included Harris Corp., Telos/Omnia and Andrew Corp.

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Wacky DJ Stunts: Where's the Line?

by Ken R.

It's no secret that radio personalities and their willing "stunt boys" are daring to go where no broadcasters have gone before.

Traffic disruptions, phone calls aired without permission, public nudity, even slaughtering a boar live on the air, all seem to be fair game in the ratings war.

that the kid would be charged with a felony."

Morris said the case was pled to a misdemeanor and Downs did not face trial.

"Todd is doing some community service and we had to run some public service spots," said Morris.

Would the station do anything different next time?

Cumulus, declined comment for this story.

KYLD(FM), Clear Channel's self-proclaimed "party station" in San Francisco, ran afoul of the law in August 2000 when two of its disk jockeys dressed up as county prisoners and wandered from house to house asking unsuspecting homeowners to help them

remove their handcuffs.

The Associated Press reported the story at the time, but a station spokesperson was unable to verify the consequences of the prank.

In Florida, "Bubba the Love Sponge," the air talent who arranged to slaughter a boar live on the air, initially faced five years in jail for his animal mutilation stunt at Clear Channel's WXTB(FM) in Tampa. He subsequently was found not guilty.

See DJ STUNTS, page 40 ▶

I guess it mushroomed and got a little out of hand. We didn't think the FBI would get involved.

— Rob Morris,
KDWB(FM)

Are these stunts successful as measured by audience growth? What are the consequences for the stations and individuals involved?

Chain reaction

In Minneapolis on Aug. 14, 2002, KDWB(FM)'s Todd Downs carried a Weed Whacker onto the Hazeltine National Golf Club course and tried to talk his way into the PGA Championships. When this didn't work, morning host Dave Ryan told him to try it again with a chain saw.

Downs, known as "T-Bone," was arrested when he claimed to need to "cut down a tree."

Program Director Rob Morris, an eight-year station veteran, told Radio World that while "any press is good press," the jury is still out on whether this stunt was good for the ratings.

"I guess it mushroomed and got a little out of hand," said Morris. "We didn't think the FBI would get involved or

"Maybe people's sense of humor changed after 9-11," said Morris. "In light of what happened at the PGA, we might want to have a few more checks and balances."

A tattooing incident left several radio station listeners changed forever, according to a report by KCCI(TV) in Des Moines, Iowa.

KORB(FM), licensed to the Bettendorf/Davenport market, apparently promised two listeners that if they would get the station call letters tattooed on their foreheads, KORB would pay them \$30,000 a year for five years. The two men met with officials of the station before going ahead to make sure the offer was legitimate.

The deed was done. One of the recipients of this unique "branding" was fired from his job. Both men are suing the Cumulus Broadcasting station for \$150,000.

Jennifer McKillop, director of marketing and special projects for

Their Radio Careers Are Just Ahead

by Sharon Rae Pettigrew

Penn State student Julie Ziegler hit the floor at NAB2003 with realistic expectations.

"I didn't come here thinking I was going to get an offer," she said frankly. "I came here to meet contacts."

Ziegler was one of hundreds to file into a meeting room at the Las Vegas

Convention Center for the NAB/BEA/RTNDA Career Fair. Billed as "the largest career fair in broadcasting and related industries," the shindig brings students jonesing for jobs and the folks who want to hire them together in one room.

"We're looking for new talent — hungry, enthusiastic, creative young

See CAREERS, page 40 ▶



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Careers

► Continued from page 39

people who want to expand their broadcast horizons," said Andy Kaye, news and public affairs director for the Lotus Broadcasting group in Las Vegas.

Kaye was at the show looking for new blood for Lotus' fifth Vegas radio station, slated to be on the air by spring 2004.

Tom Gauthier, attending NAB2003 from Emerson College in Boston, stood patiently in line to speak with Kaye. The senior is looking for a sports radio gig with an eye toward the warmer climates for his first job.

"I definitely want to do radio," said Gauthier. "It's more relaxed and more personal than TV. You can especially be yourself in sports radio ... you can talk to callers, argue with them, do interviews ... I love that."

Other radio recruiters at the fair included Bill Kappelman, KUSC(FM) vice president and counsel to the station general manager. Kappelman was at the show collecting résumés.

While the classical-music Los Angeles-based station doesn't have any chairs to fill at present, "We regularly have openings in the sales area and every so often we need classical

announcers," said Kappelman, who indicated periodic openings in the production department as well.

Minnesota Public Radio was represented at the event by human resources rep Allison Gredesky.

"We're looking for producers and editors, plus we have a few positions open in the development area — raising money for the company," she said. "We also always take résumés for internships. MPR is definitely growing. We're not only local; we do great national programs as well."

Gredesky said while many people don't jump at the chance to come to Minnesota, "Once they hear what we have available and how large we actually are, many times they reconsider."

Denise Sanseverino is a recruiter for Hispanic Broadcasting Group. She said she was pleased with the career fair turnout, and was trying to entice new workers with HBG's promise of great bennies at a strong company that's family-oriented.

"We have a lot to offer," she said.

Ziegler, the Penn State student, has one up on many of her contemporaries. She's ahead of the game with last summer's internship at WTOP(AM/FM) in Washington on her résumé. While fellow classmates were savoring their final summer before their foray into the real world, Ziegler was honing her reporting and production skills in a top-10 radio market.

"I couldn't have asked for a better experience over the summer," she said of her time wrapping weekend packages for air.

Ziegler says she's looking for a job in TV or radio.

"I have no preference," she said, but her fondness for radio already shows.

Telling her story

"I do like radio because it makes you a great writer," she said. "You have to be able to tell a story without using pictures. Because of that you really have to be articulate and succinct. Radio makes you be the best reporter you can be."

not, it probably won't fly on the air."

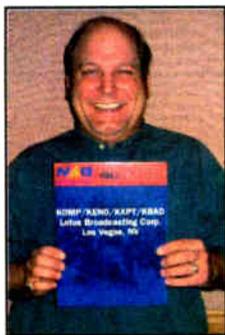
O'Day placed responsibility for setting boundaries firmly with management.

"Both on the local and national level, all too often they are derelict in their duty to provide guidelines," he said. "Instead, at many stations morning shows have been given carte blanche to do whatever it takes to get attention in the marketplace. Much of American radio has reached the point where the ends (i.e., ratings and therefore revenue) justify the means."

Palagi said stations should use common sense.

"If you can't figure out how to entertain your audience without jumping off the deep end, you have no business being on the air."

Ken R. is a former broadcaster who once told his listeners that giant snails were coming up out of the Maumee River to attack Toledo, Ohio. Many people called the station to find out how big they actually were. 🌐



Lotus Broadcasting's Andy Kaye



Student Tom Gauthier is looking for a sports radio gig.

Photos by Sharon Rae Pettigrew



Stephen Foltin and Bob Mills of the Ohio/Illinois Center for Broadcasting show off some of the school's cool SWAG they gave away at the career fair.

While many of these students admit to being enticed by the thought of being the voice inside the radio or the face in front of the camera, Emerson College graduate student Ayobami Bell has a more philosophical reason for pursuing a job as a reporter.

"As a minority, I've always wanted to get stories out there for the voices that aren't heard," she said. "I feel many people are being misrepresented or underrepresented."

Courtney Penn is a San Francisco State junior. He said he's wanted to do sports broadcasting since he was 9, and he's definitely looking for a radio gig.

"Radio is more raw talent," he said. "All you have is your voice. You have to expand your talent to allow for your listeners to see what it is that you see since you don't have all the graphics and such that enhance what a viewer might see."

Dwight Ellis, NAB vice president of human resource development, called the career fair a "remarkable success."

"This is an absolutely incredible turnout," he said, scanning the room and beaming at the long lines of students, résumés in hand, waiting to talk to recruiters. "Not only are there students here, but professionals and graduates as well — non traditional broadcast-interested people."

Ellis commented on the convergence of the industry.

"We're looking at an emerging generation," he said. "Men and women who understand the convergence of this industry, that it's not simply traditional broadcasting. This is not the broadcasting of your grandfather or even your father. This is the broadcasting of the future."

According to one recruiter at the career fair, the broadcasting of the future involves returning to the art of storytelling.

Michael Patrick is a professor of communication and the arts at Regent University in Virginia Beach, Va., an all-graduate school.

"At one time, because of technology, everything in the field was specialized," he said. "They were newspaper people or television or radio."

Patrick said technology now has

made it easier and more accessible for the producers of mass media to be like the audience.

"The average person in the audience out there is watching all kinds of media," he said. "Yet the average media person can only usually tell one kind of story. We're teaching people to be a storyteller in all the media across the board."

Regent recently wrapped up construction on a \$25 million facility in communication and the arts.

"One of the things I find fascinating about this convention is the discussion of convergence as a leading trend, particularly in journalism," he said. "Regent has overhauled its curriculum to be a converged media curriculum, and the new facility was built with that in mind."

And what does convergence mean to him?

"Enabling people to return to the art of storytelling and reach the consumer the way the consumer wants to be reached," said Patrick.

Another school represented at the career fair was the Ohio/Illinois Center for Broadcasting. Stephen Foltin is the center's vice president and executive director.

"Our training centers teach students of all ages hands-on courses with internships, taught by professionals in the business," he said. "We are nationally accredited. Every year we come out the job fair here at NAB to help students find jobs and opportunities."

Foltin said he assists in making contacts for jobs in radio, television, digital audio and digital video. He said there are lots of different opportunities, not just in radio and TV anymore.

"We're placing more and more people into hospitals, law firms, race tracks, the cruise lines ... students really need to be aware and not just be boxed into disk jockey or camera work or news anchor."

Foltin said he enjoys the yearly career fair.

"It's great to see ambitious students. I love to see young people getting into the business. If they are ambitious; if they show up on time and have a good attitude, they are going to go to work." 🌐

DJ Stunts

► Continued from page 39

Do stunts help ratings?

"Sometimes, but the smaller the talent, the larger the stunt needs to be," said Los Angeles-based morning show guru Dan O'Day.

Zapoleon Media Strategies consultant Lorrin Palagi said any gain in audience is short-lived.

"And probably a long-term loss," he said. "True professionals are talented enough to win ratings without resorting to stupid or inappropriate stunts."

And how is the air talent supposed to know when that danger line is about to be crossed?

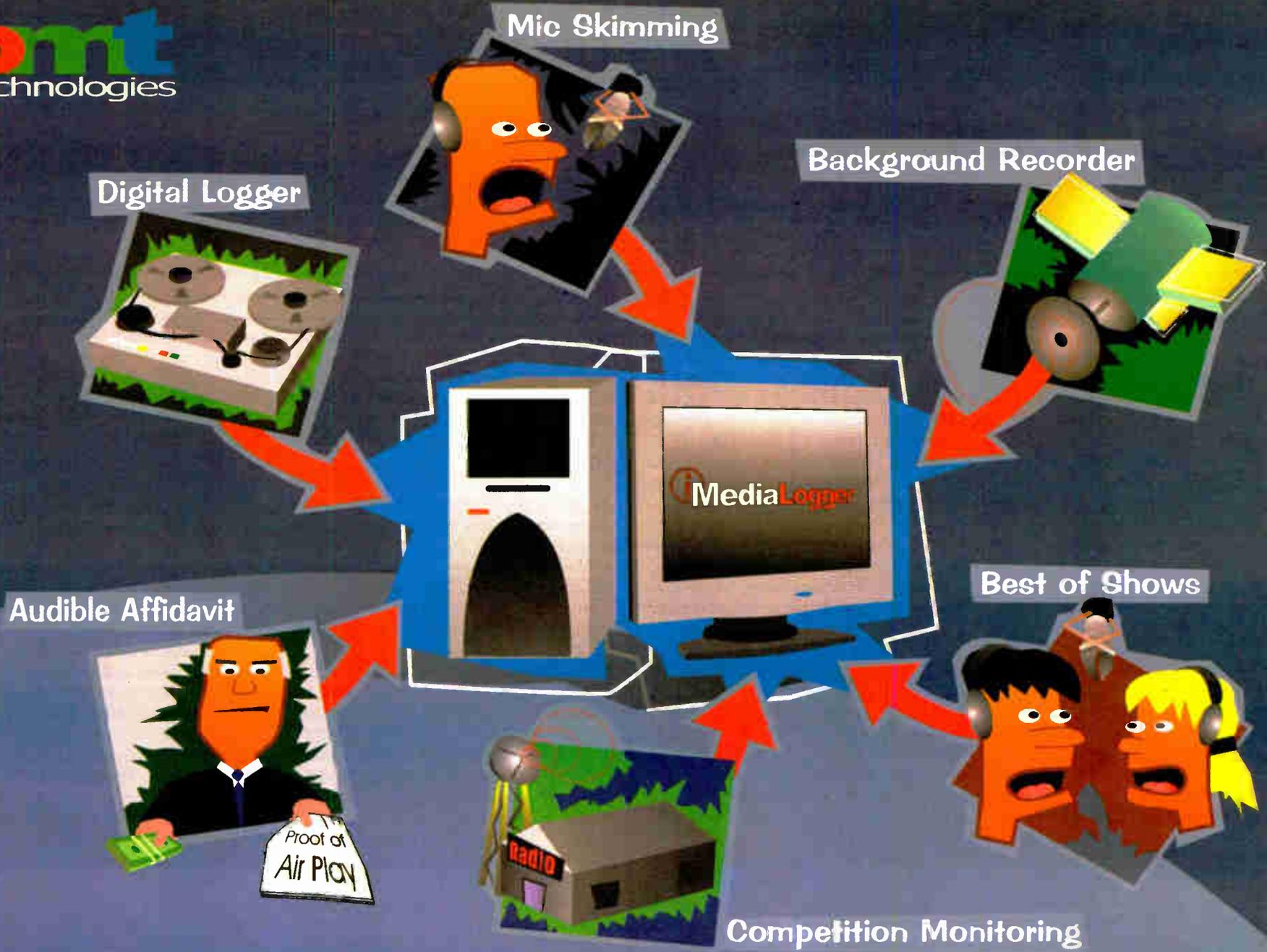
"Keep your target audience in mind," Palagi said. "For example, if you had your neighbors and kids over for dinner, would the stunt be appropriate in that context? If



Bubba the Love Sponge



Dan O'Day



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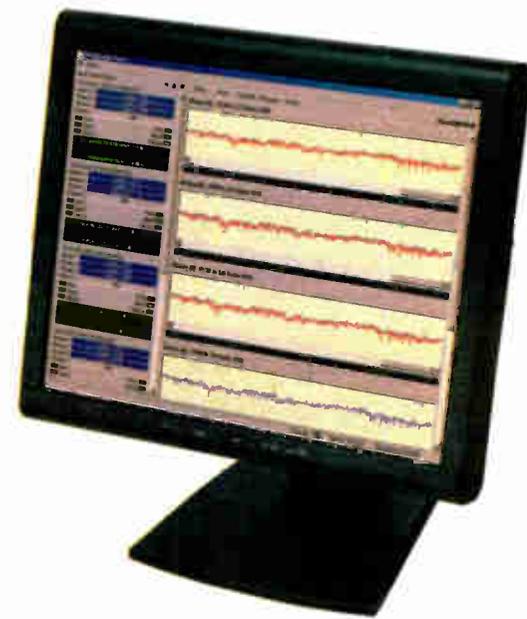
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COLE'S LAW

Is a Sin Still a Sin at the FCC?

by Harry Cole

The FCC has reminded us that it's still a sin to tell a lie to the commission. But the gravity of the sin apparently depends on who is doing the sinning and in what context the sinning happens to occur — the regulatory equivalent of situational ethics.

In a decision released in March, the FCC announced that it was "broaden(ing)" Section 1.17 of its rules. Previously, that section required that "no applicant, permittee or licensee" could make any misrepresentation in, or material omission from, any "response to commission correspondence or inquiry or in any application, pleading, report or any other written statement submitted to the commission." That previous language already seemed pretty broad.

But the commission apparently was concerned that the earlier version of the section applied only to applicants, licensees and permittees, not to others who might find themselves submitting statements to the commission for one reason or another — perhaps petitioners, or unlicensed pirate radio operators, or complainants.

Authorization

Accordingly, the scope of the universe subject to the rule has been expanded to include, among others, "any person performing without commission authorization an activity that requires commission authorization" — for instance, presumably, pirate broadcasters or other folks who may have broken the rules somehow and are the subject of a commission inquiry or investigation.

That makes sense. But the commission then seriously limited the scope of the revised rule by making it applicable only "in any investigatory or adjudicatory" proceeding and "in any proceeding to amend the FM or Television Table of Allotments (with respect to expressions of interest)."

It thus appears that the rule does not apply, for example, to statements made in applications, or in rulemaking comments as long as those comments don't constitute "expressions of interest" in allotment proceedings.

The new version of the rule also makes clear that when a person covered by the rule makes a written statement to the commission in one of the contexts covered by the rule, the party making the written statement must have a "reasonable basis for believing" that the statement is correct and not misleading.

That is, a party making a *written* statement to the commission must exercise reasonable diligence in the preparation of that statement. But no equivalent limitation is placed on *oral* statements made by such people in such contexts — because, according to the commission, "of the difficulty in determining the degree of due diligence applicable to any oral statement."

Surprisingly, the commission's revised rule seems to invite inaccurate statements in some contexts. With respect to declaratory ruling requests and rulemaking proceedings not involving channel allotments, for example, the commission states such matters "involve wide-ranging discussions of general policy," and the commission does not "wish to hinder full and robust public participation ... by encouraging collateral wrangling over the truthfulness of parties' statements."

This seems to say that, in order to avoid the unpleasantness of having one party claim that another party is lying, the commission is announcing that there is no bar against lying in declaratory ruling and non-allotment rulemaking proceedings.

That seems an unusual position for the commission to be adopting, but it does seem to be the consequence of the change in the rule.

It's something of a mystery how the commission ended up where it did with this rule revision. To be sure, the old ver-

sion of the rule was limited in certain respects and could have used some "broadening," which was the commission's original stated goal here.

But that "broadening" could have been accomplished simply by stating that the prescription against filing misrepresentations applied to any and all submissions made to the commission, regardless of who happened to making them or the manner in which they happened to be made or the context in which they happened to be made.

Rather than take such a simple approach, however, the commission has managed to do too much and too little at the same time, leaving us with an anti-misrepresentation rule that sends the wrong message.

Unintended?

Historically, lying to the commission was the one form of misconduct that everyone agreed was the kiss of death, the ultimate mortal sin, the guaranteed hanging offense. You could survive lots of indecency violations, tower lighting problems, overmodulation incidents, etc., etc., without any real risk to your license. But lie to the commission? That's when you could expect them to offer you a last meal, a cigarette and a blindfold.

So it's more than a little surprising that, as the newly revised rule now reads, it may not be a violation to engage in blatant lying to the staff if you do it orally, or if you do it in rulemaking comments other than "expressions of interest" in allotment cas-

es, or if you do it in an application.

We strongly suspect that (a) the commission did not really intend to give the green light to lying to the agency in any form, and (b) it is entirely possible that some further revisions may be adopted to correct the (possible) misimpression which we at Team Cole's Law have fallen prey to.

As a practical matter, the commission cannot afford to invite *any* degree of untruth from those appearing before it. As the commission and the courts have long recognized, in order to work effectively, the regulatory process requires truthfulness by regulatees. The routine functioning of the FCC's processes would grind to a quick halt if the FCC were required, with its own resources, to double- and triple-check each and every claim advanced to it in each and every submission.

But as matters stand, the revised rule does appear to tolerate potential dishonesty far more than was previously the case.

Notwithstanding the seeming softening of the commission to misconduct that would have seemed unthinkable in the past, and even if the new version of the rule does not get modified further, our hunch is that the commission will still frown on any intentional misrepresentations which may be made to it, and for that reason we caution one and all to maintain a high degree of honesty and completeness in all communications of any sort with the FCC.

You should contact your communications counsel if you have any questions about the new rule and how to assure that you comply with it.

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

WRR Calms Road Rage

Classical music station WRR(FM) launched a weekday feature recently, designed to help calm commuters and reduce incidents of aggressive driving in North Texas.

"Road Rage Remedy" airs weekdays at 7:20 a.m. and 5:20 p.m., providing 10 minutes of uninterrupted, tranquil music.

"Within a matter of months, 'Road Rage Remedy' became one of WRR's most popular features," said General Manager Greg Davis.

To promote the program and to draw attention to the problem of aggressive driving, the station launched a "Road Rage Remedy" CD.

Humorous images of irate drivers fill the CD booklet, a ploy Davis said was designed to get people's attention and to encourage them to be curious about the music on the disc.

"Even if (potential buyers) do not perceive themselves as agitated drivers, they probably know someone they think is ... maybe their spouse, sibling, boss or best friend," Davis said.

The CD is being sold at Dallas-Fort Worth area stores, and online at the WRR Web site.

Selections include compositions by Brahms, Dvorak, Schubert, Tchaikovsky, Debussy, Beethoven, Handel, Massenet and Bach.

WRR is the oldest commercially licensed radio station in Texas and has an extensive history collection on its Web site.

For more information visit www.wrr101.com.

— T. Carter Ross

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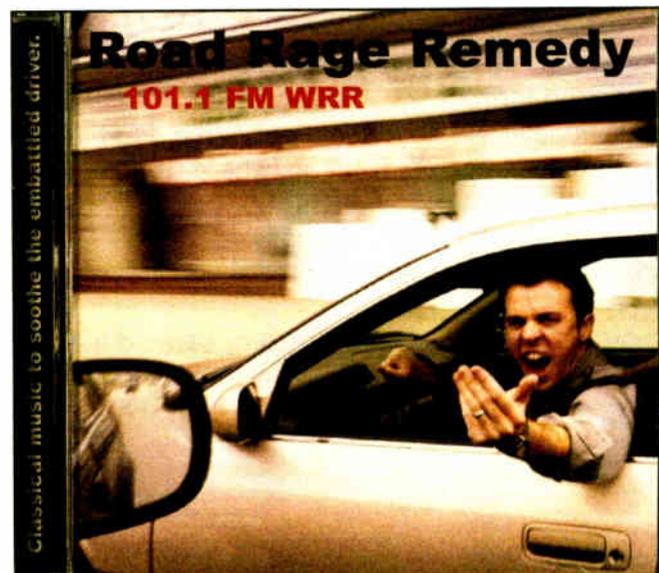
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STATION SERVICES

CNBC Business News Radio Launched

It's a joint effort between Westwood One and CNBC: CNBC Business News Radio debuted in March on radio stations across the country. CNBC staffers, including Maria Bartiromo, Ron Insana, Bill Griffeth, Sue Herera and Michelle Caruso-Cabrera, anchor and report on the new network.

One-minute business reports are fed hourly each weekday from 5 a.m. to 10 p.m. Eastern, including 10 feature reports for weekend use. CNBC Business News Radio affiliates also have CNBC's stock market reports for use on air.

For more information visit www.westwoodone.com.

ABC, 'Country Stampede' Partner

A national promotion is in the works between ABC Radio Networks and "The Country Stampede Presented by Belterra Casino Resort."

The festival, a three-day event, is to feature country artists including Travis Tritt, Jeff Foxworthy, Diamond Rio, Lonestar, Trace Adkins, Brad Paisley, Honky Tonk Tailgate Party Tour, Phil Vassar, Gary Allan, Sawyer Brown and Ricky Skaggs.

The first-time festival is set for June 6 to 8 at the Kentucky speedway. ABC Radio is bringing the show live to affiliates.

"We will be talking with the artists live from the festival, giving our stations an exclusive opportunity for their listeners to hear the excitement a festival of this stature brings to the airwaves," stated ABC Radio Networks' Director of Operations Dave Nicholson.

ABC and the festival together are offering a promotion providing a listener and guest VIP prizes at the festival, including a meet-and-greet session and up-front, center seats at the show. Airfare, meals and hotel will be covered as well.

RAB Announces Conference Dates

The Radio Advertising Bureau is out with plans for its annual conference. RAB2004 is scheduled for Feb. 5-8 at the Adams Mark Hotel in Dallas.

RAB leaders decided to maintain registration costs of \$425 for members and \$825 for nonmembers.

"Our mission remains 'you come, you learn, you make money'," stated RAB Executive Vice President, Training, George Hyde. "RAB2004 is not about bells and whistles; it's about learning how to attain a higher share of advertising dollars."

RAEL Offers Case Studies on Web Site

The Radio Ad Effectiveness Lab is making research on advertiser case studies available on its Web site

One study shows how radio increased sales by nearly 4 percentage points more than TV in test markets for an over-the-counter healthcare product, and radio did it at a lower cost. The study, available at www.radioadlab.com/raelcs1.pdf, is the first in a series of studies available on the site.

The lab is funded by radio industry companies. It seeks to further understanding of how radio advertising works, to measure radio's effectiveness and to increase advertiser and agency confidence in radio.



From left: Bob Meyers, GM of CNBC Enterprises; Joel Hollander, President and CEO of Westwood One; CNBC's Maria Bartiromo and Ron Insana

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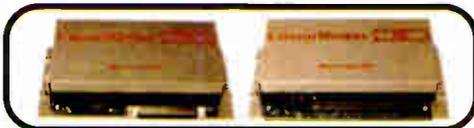
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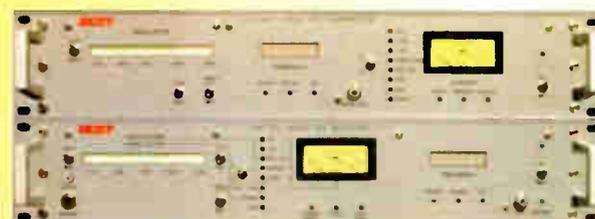
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Emmis Buys Historic Austin Cluster

by Steve Sullivan

When Emmis Communications spent \$105 million to buy six Austin, Texas, radio stations on March 3, Wall Street didn't exactly stand up and applaud the deal. Emmis stock took a pretty hard hit, dropping \$2.50 to \$17.29 the day the deal was announced.

But Emmis was undaunted by the rough reception.

"I really feel like we got beachfront property," said Rick Cummings, president of Emmis' radio group. "Wall Street kind of punished us for it. They wanted to see us get our debt down a little further before we bought anything. But, I'll tell you, I can't imagine buying a better cluster."

As clusters go, this one is particularly notable. Not just because it was the top-billing group in Austin in 2002 (revenues of approximately \$23.5 million and cash flow of around \$9.7 million). Not just because the stations account for half of Austin's highest-rated dozen (Arbitron, April 3).

These stations are particularly notable because they belonged to the family of Claudia Alta Taylor Johnson, a woman known to one and all. If her name doesn't immediately ring a bell, perhaps it's because Mrs. Johnson is more commonly known by her nickname Lady Bird.

First family of Austin radio

The former First Lady got into the radio business in Austin in 1942 when she took \$17,500 in inheritance money and bought KTBC(AM), a low-power, daytime-only station. The story goes that her then-congressman husband, Lyndon Baines Johnson, used his legendary powers of persuasion to gain FCC approval for a full-power license for the station.

Doing everything from mopping the floors to bringing in more advertising, Lady Bird nurtured LBJ Broadcasting Co. into a local media force. In 1952, the company founded Austin's first television station, KTBC(TV), which was sold 21 years later to Times-Mirror. In 1960, KTBC(AM) was joined by an FM counterpart, and in 1973, the radio stations incorporated the family's famous monogram, changing their call letters to KLBJ.

In 1997, LBJ Broadcasting became LBS Broadcasting when the family entered into a partnership with Sinclair Telecable, a Virginia-based company. Sinclair, run by brothers Bob and David Sinclair, owns stations in Norfolk, Va., and Santa Rosa, Calif.

At the time of the Emmis deal, LBS Broadcasting included both KLBJ stations, plus KGSR(FM), KROX(FM), KEYI(FM) and KXMG(FM).

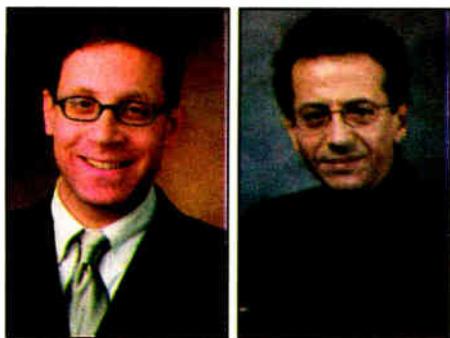
Offers had been made for the stations in the past. Ian Turpin, who is married to Luci Baines Johnson and serves as president of LBJ Holding Co., which oversaw operations of the stations, said, "With radio consolidation hot and heavy, we've had several suitors over the years, but we chose not to sell."

However, this time, the situation seemed to match the stations with a company the Johnson family felt understood the unique Austin market and would value the people who work for LBS Broadcasting.

Nonetheless, Luci Baines Johnson describes her family's decision to sell the

group as agonizing.

"Bittersweet seems to be the operative word. We recognize that this was an opportunity that made sense for our family for a multitude of reasons. But it was a very difficult decision.



Evan Smith

Rick Cummings

"I do not remember life before radio. KLBJ and successive stations have been an important part of my life. I've gone to weddings, baptisms, bar mitzvahs, first communions and funerals of many, many, many of our radio family. We played together, prayed together, worked together and worried together. It's been very much a family operation."

Mixed feeling

Scott Gillmore, vice president and market manager for LBS Broadcasting, said word of the sale was received with mixed emotions.

"These stations have been in the Johnson family for 60 years and there are many employees who have a long association with the family. But at the same time, the staff and stations are thrilled because the Sinclair family is still going to be a partner in this.

"We feel that the Johnsons and Sinclairs picked a great partner. Emmis is a big enough company to give us some great resources, but small enough that we're not going to get lost in the shuffle."

In the deal, Emmis is buying LBJ's stake in the partnership. Emmis also gets the assets of KEYI from Sinclair, which will give Emmis a 50.1-percent interest. Sinclair retains board representation, but Emmis will manage day-to-day station operations and has an option to buy Sinclair's stake in five years.

Desirable

Cummings said that Emmis is delighted to gain such a strong presence in the Texas capital.

"We had always coveted Austin. Our game plan is to be in the top 30 markets. Austin isn't technically a top-30 market, but it sure acts like one. It's market No. 42 in population, but it performs like No. 32 in terms of revenue. It's a very desirable market."

LBS's Gillmore said picking up the top-billing cluster in such a financially strong market gives Emmis "not just a foothold here, but a real footprint."

Although Austin is new territory for Emmis Broadcasting, the company has had a presence here since 1998, when it purchased Texas Monthly, one of the nation's top regional magazines. The combination in Austin gives them opportunities similar to those the company currently enjoys in Los Angeles and Indianapolis, other markets in which Emmis owns radio stations and city magazines.

However, Cummings says the chance

for synergies was more of an afterthought than a strategic driver of the deal.

"After it was done, we said, 'Hey, own the magazine, too! We can do all kinds of cool things.' We don't normally go into these situations saying, 'Let's try to buy radio there because we have a television station or a magazine.' But if it turns out like it did in Austin, we'll certainly look for some ways to cross-promote or share content."

They won't have to start from scratch. Texas Monthly and some of the LBS stations have been working together for years on an informal basis. Some of the magazine's editors and writers are regular guests on the radio stations, and some of the radio station personnel have in the past contributed to the magazine.

Evan Smith, Texas Monthly's editor, says that more interaction between the magazine and the stations is a likely outcome of the deal, and adds, "We're all only happy about it."

Jody Denberg, program director and DJ at LBS's AAA station, KGSR, said, "Certainly we're going to be looking for more ways to work with Texas Monthly. It's a fantastic magazine and we've always viewed ourselves as kindred spirits anyway."

Song remains the same

While there has been enthusiasm about the possibility of the magazine and stations working together more closely as a result of the deal, there has also been some concern at the stations and among listeners about whether Emmis intends to come into the market and tinker with programming.

Texas Monthly's Smith said, "The day the sale was announced, I called Kevin Connor, who's the morning on-air personality at KGSR, and Jeff Ward, a talk show host on KLBJ(AM), and said, 'These (Emmis) are good guys. They're not these media aggregators who come in and cut half the staff and change the formats and ignore what the market wants. They're very reasonable people who know enough to trust the smart people running the entities who do the very best job they can.'"

Old Sarge Uses Radio to Reach Vets

For years, "The Old Sarge," as he's known on the air, had sought a way to inform veterans, armed services retirees and their families of developments in veteran's affairs and personal issues.

He wound up with a new kind of radio program: "The Veteran's Café," a nearly four-year-old brainchild of Ronald V. Regan.

"I was very surprised at the number of veterans and retirees, and their wives and widows, who know nothing about the benefits they are entitled to under the laws and directives of the Veterans Administration, the Department of Defense and our nation's legislature," Regan said.

The program is broadcast each Wednesday from 11:30 a.m. to noon on Leesburg, Fla.-based WLBE(AM) and tries to bring veteran's problems onto the airways. It also gives listeners interviews from federal, state and local politicians and officials from the Department of Veteran's Affairs and entertains call-ins.

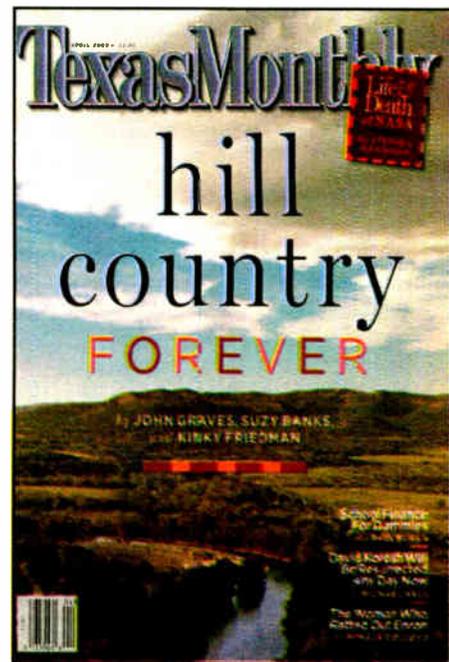
Some of the more heated topics on the show relate to what Regan sees as the government's refusal to make amends to America's surviving veterans and retirees, including free health care.

"We fought tenaciously during World War II, Korea and Vietnam ... Some of us vets have been waiting nearly 60 years and the politicians still can't get it right!" said Regan.

Regan has also teamed up with two local TV stations to broadcast "Combat Veterans," where he interviews combat-line personnel, and "Veteran's Forum," which mirrors his radio program.

"The Veteran's Café" reaches more than 500,000 veterans that pick up WLBE's signal, which spreads out from Florida's Atlantic to the Gulf coasts and from Kissimmee to Gainesville.

— Elizabeth Prevatt



Emmis owns Texas Monthly magazine

Cummings also plays down concerns about major changes on the airwaves. He was impressed by the outpouring of concern about any changes being made to KGSR, a station with a reputation for showcasing talent drawn from the Lone Star State's deep pool of musicians and launching many new artists to national attention.

"After this deal was announced, I got e-mail from listeners saying they hoped we weren't messing with KGSR. That's pretty rare to see that kind of passion for a radio station. We've seen the ratings. We've seen the passion Austin has for this radio station. We're going to learn from you before we say anything. It truly is an original."

KGSR's Denberg said, "They bought our stations because they wanted to own it and they supported what we're doing, not tear it down. I feel it's a real blessing that if the Johnson family was going to sell us, that they sold the stations to a company like Emmis. We feel like there was an angel on our shoulders looking out for us when we landed with a company like this."

Steve Sullivan is executive news editor for multimedia at The Baltimore Sun and a co-founder of the Advanced Interactive Media Group LLC. Reach him at (410) 332-6503 or via e-mail to steve.sullivan@baltsun.com.

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WEB WATCH

Stations Reach Deal With Labels

by Craig Johnston

Web Watcher had just been thinking that was pretty quiet on the copyright royalty front, but it turns out he was wrong.

In May, radio broadcasters who simulcast their terrestrial programming over the Internet came to a private agreement with the recording industry on copyright royalties for sound recordings streamed over the Web.

Last December, small Webcasters arrived at their own agreement with the recording industry. In April, larger commercial Webcasters who were not simulcasting their AM or FM programming also came to an agreement with the recording industry, though as of mid-May the Copyright Office had not endorsed this deal.

From the beginning, radio broadcasters simulcasting their terrestrial programming on the Net have insisted the Digital Millennium Copyright Act did not specifically subject them to copyright royalty fees. Congress had exempted them from such fees decades earlier.

So, asks Web Watcher, if you don't think you owe the fees in the first place, why come to an agreement with the recording industry to pay them?

Two answers come to mind, both of which center on the Copyright Arbitration Royalty Panel.

First, as broadcasters have appealed their case to the Copyright Office and a series of courts, they've lost at every turn. At press time an appeal has been before the Third Circuit Court of Appeals in Philadelphia for six months, with no decision in site.

Barring success in court, they can either come to a voluntary agreement or allow a CARP to arbitrate the rates and other terms. The actions of the first Internet radio CARP was unpredictable, and broadcasters may have opted for the certainty of a voluntary agreement.

A second reason to avoid the CARP proceeding may be purely economic: the participants in a CARP proceeding have to foot the bill for the process. Because the Internet-only Webcasters have come to their own agreement, there are fewer CARP participants to spread the considerable costs across.

In any case, NAB Vice President for Corporate Communications Dennis Wharton told Web Watcher that broadcasters haven't forgotten their initial premise that they don't owe copyright royalties in the first place.

"From the NAB's perspective, this agreement in no way effects our position in court that broadcasters are exempt from being subject to the recording industry copyright fees," he said. "We are still awaiting a decision from the Third Circuit Court of Appeals."

★★★

When an industry goes through tough financial times, consolidation usually accompanies it.

Web Watcher expects no argument that Internet radio is experiencing those tough financial times now, so it's no surprise that one of the owners of the largest subscription/download music Internet services gobbled up another.

Late in April, RealNetworks Inc., part-owner of the MusicNet subscription/download music service, announced it was buying Listen.com. Listen was the first service

to offer music from all five major labels, and pioneered 50-cent-a-song downloads for CD burning.

In addition to offering subscription music and downloads through its Rhapsody music service directly over the Web, Listen also has distribution agreements with Time Warner Cable's Road Runner high-speed ISP, Charter Communications, Verizon Online, Sprint, Cablevision Systems Corporation's Optimum Online, Gateway, Lycos, RCN Corporation, and Sony's Musiclub.

The acquisition agreement, for a combination of cash and RealNetworks stock, is worth approximately \$36 million. "Listen.com's Rhapsody has pioneered a number of important capabilities such as integrating artist guides and customized radio stations within a music subscription service," stated Rob Glaser, RealNetworks CEO. "Bringing Rhapsody and RealOne together will, we believe, accelerate the adoption of legitimate digital music services."

Listen will continue to operate from San Francisco, and its executives will be joining RealNetworks.

★★★

Some shuffling in who is measured and who is not caused some changes at the top of the Arbitron Inc. Webcast ratings. Yahoo!'s music destination Launch joined the list of Arbitron's subscribers, and immediately debuted as the number one Internet broadcast network for the week of April 14. Launch replaced Live365.com, which had occupied the top network spot a week earlier.

On the flip-side, Web Watcher noticed that radioio's radioioEclectic music channel, which had occupied the top or number-two Internet station spots since the first of the year, had gone missing from Arbitron's charts in April. The company had decided to forego being rated once Arbitron changed its financial model to a paid-subscription model.

★★★

Web Watcher keeps his eye on the various surveys that predict future growth of Internet stream listening and viewing, and they've always pointed to more growth.

A recent survey by AccuStream iMedia Research forecasts exactly that: Internet radio aggregate tuning hours will grow to 141 million a month in 2003 from 94 million a month in 2002, a 50-percent jump.

But another item in AccuStream's research may portend good things for late-comers to the Internet radio space. The report states: "The size of the streaming media audience has grown so rapidly over the past three years that 'hit' programs can and do jump quickly into the top ranks of streaming sites on a monthly basis."

AccuStream Research Director Paul Palumbo told Web Watcher that though

the survey looked specifically at Web video streaming, it holds for audio streams as well.



RealNetworks bought Listen.com in a deal worth approximately \$36 million.

"Internet radio can indeed jump in usage by channel or aggregation platform, as witnessed by the recent tuning hour growth at Wolf FM, radioio and StreamAudio, among others," he said.

"A major broadcaster that has yet to make the signals transition to Internet broadcasting could indeed grow aggregate tuning hours quickly ... the issue has always been how to monetize those hours in a very tough ad market."

So perhaps would-be Webcasters who have sat on the sidelines to this point will have missed out on nothing but red ink while waiting for a business plan that makes sense. It may be less a case of the early bird getting the worm than the second mouse getting the cheese.

★★★

And finally, in our technology corner, Web Watcher would like to follow up on an item reported several months ago about German Airline Lufthansa's test marketing passenger broadband access during international flights.

That test has concluded, after 140 flights. Typically, from 50 to 80 passengers per flight plugged their laptops into the broadband service.

While Lufthansa is still evaluating whether and when to begin the service commercially, Web Watcher wondered if passengers testing the service listened to Internet radio.

"They used the service for the same types of things they do on the ground: e-mail, streaming applications, corporate intranet access, sending and receiving files, staying in touch with the family," said Terrance Scott, spokesman for Connexion by Boeing.

Scott called it an improvement to the passenger experience. "You're no longer confined to the things that are offered onboard the airplane. You now have a way to, if you will, get off of the aircraft and go back and use some of the content that you use in your home or your office."

British Airways is just concluding its own test marketing of the Connexion in-flight broadband access. ●

Broadcaster Sound Recording Copyright Terms

Terms of the agreement between commercial terrestrial broadcasters simulcasting their AM and FM signals over the Internet and the music industry over copyright royalties are virtually identical to those agreed to by the music industry and large Internet-only broadcasters a month earlier.

The agreement, which covers performance royalties for sound recordings Webcast on the Internet, runs from 2003 through 2004. To become effective, it must be approved by the U.S. Copyright Office, which is soliciting comments on the agreement.

Broadcasters will have the option of paying per performance, defined as one sound recording streamed to one computer, or by aggregate tuning hours.

The rate to be paid per performance is 7.62 one-hundredth of a cent per performance, with 4 percent of the performances bearing no royalty. (Four percent are exempted to allow for those accidentally listening to a stream as they are tuning from channel to channel.)

Rates for those choosing the Aggregate Tuning Hour option will vary depending on the format of the station. Those stations classified as music broadcasters will pay .88 cents per ATH. News, talk, sports or business program stations will pay .0762 cents per ATH.

An Internet-only station will pay 1.17 cents per ATH.

The agreement allows for minimum fees: \$2,500, or \$500 per channel or station (excluding archived programs, but in no event less than \$500 per licensee), whichever is less, for each calendar year.

Should a broadcaster simulcast the terrestrial signal on a pay-to-listen subscription model, the same per-performance or ATH rates will apply. However, a subscription service may opt for a Percentage of Subscription Revenues plan, paying 10.9 percent of "subscription service revenues," but in no event less than 27 cents per month for each person who subscribes to the subscription service or to whom service is delivered without a fee, such as during a trial period.

Those subscription services choosing the percentage of subscription revenue option will also face a minimum fee of \$5,000 per year.

The broadcaster agreement differs from the Internet-only Webcaster agreement in its provisions for news, talk, sports and business programming rates for those choosing the ATH option. Music stations also pay .88 cents per ATH vs. 1.17 cents per ATH for Internet-only stations, a 25 percent discount, on the theory that the broadcasters play fewer songs per hour because of news and commercial messages.

— Craig Johnston

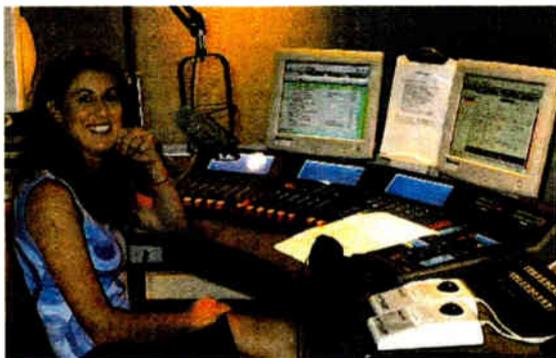
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* Source: www.coxradio.com



Here's Cox's WMMO FM air studio, using Computer Concepts' Maestro and EpiCenter for all digital audio at Cox's five station cluster in Orlando, Florida.

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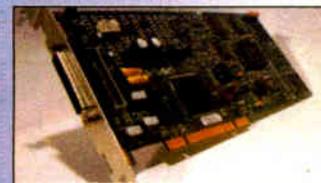
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Buyer's Guide

Orban
On a Card



Page 50

Radio World

Audio Processing

June 4, 2003

USER REPORTS

Omnia-6 at Work for Cumulus

by Gary Kline
Corporate Director
of Engineering
Cumulus Broadcasting

ATLANTA Two hundred sixty eight radio stations. Fifty-seven radio markets. That's one set of call letters every business day. What this means is that I'm in two or three markets every week ... if I could redeem my frequent flyer miles for time off for a vacation, this would be a perfect world.

To get a station sounding its best, I analyze the entire air chain, from music dubbing technique to the transmitting antenna. Items like digital audio storage methods, console setup and condition, STL medium and FM exciter and transmitter are scrutinized. D/A and A/D conversions are kept to a bare minimum; there are no analog distribution amps in the Program feed.

I try to keep a digital, linear air chain from start to finish; a weak link anywhere between the source material and the lis-

teners' radios can put a real crimp on the station's audio. When it comes to creating a competitive advantage for programming and management, probably the most important tool in my audio toolbox is the Omnia-6 FM processor.

market comes to mind. All the other major radio groups had a presence in this market; their stations had clean audio chains, competent engineers and audio processing purchased within the past couple of years.

After first getting the air chain up to our standards, we installed two Omnia-

6 FM processors, one on the main system and the other on the backup air chain. Due to the quality of the competitors' audio, getting this station dialed in was a little more challenging than usual; we had to reach higher and spend extra time and effort in the listen/adjust cycle. The effort was worth it, however, and with help and comments from the PD and market engineers, we achieved the clean, powerful,

See OMNIA, page 50 ▶



Having charge of so many stations, formats and markets may seem overwhelming, but a number of factors help make possible the effective technical management of these diverse facilities, among the most important of which are talented market engineers and useful, efficient technology.

In the radio business, winning means creating compelling content and delivering it clearly. As director of engineering, the delivery of that content is my job and that of our market engineers. Getting it right is important enough that I'm usually addressing some aspect of audio quality and effective delivery as part of each market visit.

I've found that getting a station's audio to sound "right" involves a number of factors and considerations; you really can't pin down any one aspect of a station's audio chain as being the most important. However, the target audience influences audio and processing decisions, as does the station's signal reach.

Adjusting audio

The Omnia-6 is flexible in what it can do for a station's sound and dial impact. A few situations call for one of our stations literally to dominate the dial with a loud, in-your-face attitude. Other stations need to have an airy transparency — an "open" sound — without getting lost on the dial. The audio presentation, and as a result, the processing setup, needs to be appropriate for both the format and the other factors and considerations mentioned.

When I think about using the Omnia-6 FM to help win a market, one particular station in a fiercely competitive top 10

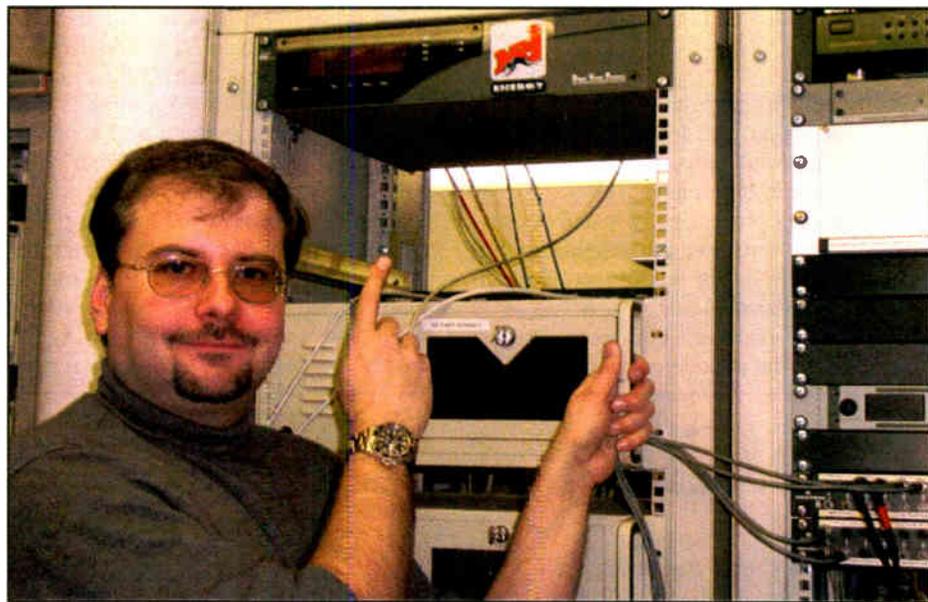
IDT Gets Energized With DVP in Munich

by Andreas Amoros-Koehler
Technical Manager
Energy Munich

MUNICH, Germany Until 2001 we used a Sound Design processor, an old IDT product that was the company's first.

To replace it, we had to choose between several processors available on the market, each with its own distinctive properties and peculiarities — the right choice was hard to make.

Sound processing is subjective: See IDT, page 51 ▶



Andreas Amoros-Koehler points to his IDT sound processor.



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"The Heil GOLDLINE PRO delivers the richness of the RE 20 bottom end, complimented by a brilliant and shiny top end. A combination I have never heard before in any dynamic mic."

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USER REPORT

'Urban Sound' Abounds at WOR

by Kerry Richards
Chief Engineer, WOR(AM)

NEW YORK I operate The WOR Radio Networks as well as the WOR local air feed and the WORi stream out of its studio complex in Times Square.

When WOR was getting ready to turn on the new HD Radio from Ibiquity, we were presented with an Orban 6200. I immediately wanted to get my hands on it and I fell in love with it. We put it into use in the HD airchain along with our Orban 9200 handling the analog duties.

I was amazed at the capabilities of the 6200 and immediately called our dealer, Broadcasters General Store, for a 6200s (a slightly smaller package of the 6200) for a demo. Again we were impressed with the sound, the capabilities and the numerous presets. Both of these units are traditionally packaged broadcast processors. The output is amazing.

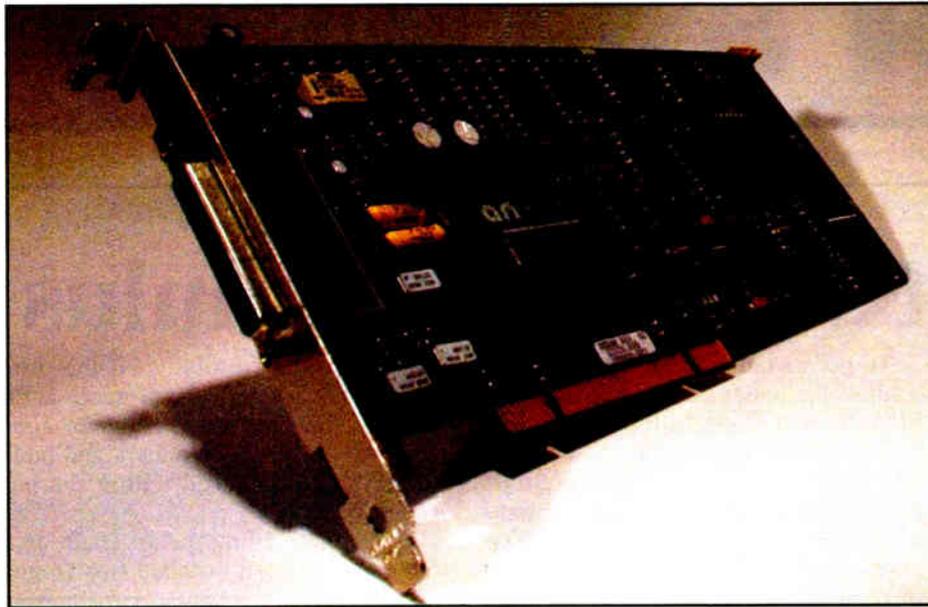
With this new PC1100 you basically get that Orban control, sound and quality, which is so predictable and well behaved that the unit becomes transparent in the audio chain handling the audio processing duties. It is a 6200 or 6200s for a computer slot, and does everything the 6200 can do, with the exception of the CBS loudness controller program.

Keep in mind, all you are doing is manipulating the Motorola chips on this card with Orban's software. The possibilities are endless and exciting.

The setup

The unit fits into an available PCI slot and you can have as many PC1100 cards as there are available slots in the machine. Think about it. If you have a cluster of signals that need processing, you can put several of these cards in a machine and it will handle all the duties that numerous traditional processors would.

There is a DB-25 connector on the back where the outside world interfaces.



Orban's PC1100 Card

Buy the cable. I made my own. It was a task, but then I am an impatient engineer. I want the audio as soon as I install the card.

There are two digital inputs, plus an analog input and a Wave input. Output wise, you get digital and analog, plus the Wave out for direct streaming. Once installed, the unit can behave like any sound card in a PC, which is good for streaming purposes. The software is an easy install, and you must use WIN2k or above for it to work.

No problem. I took an old IBM 166 clunker, put WIN2k in it and I had an instant 6200, at less than 1/3 the price.

The accompanying manual is complete, easy to understand and written in the typical and accurate "Orban" style, just like any other Orban product.

Most of the power required to process the audio is done on the card; therefore, you only need the CPU on the motherboard to do the communication, display and adjust duties. Even if the host CPU crashes, the card keeps going. I have tried

to crash the card and the operating system, but the PC1100 just keeps processing. You actually have to shut off the CPU to crash the card.

Now comes the good stuff. How many nights have you spent twiddling that big knob and those little buttons adjusting the processing chain? Now you can do it all from the mouse. Even though there are PC interfaces to the other Orban processors, this seems so much easier.

Starting with Basic control after a preset is loaded, you get the usual "less-more" Optimod setting, a great place to start. There are numerous presets, as in any Orban unit. These are "real-world" starting places and by themselves will work fine for most applications. You get that predictable, clean, well-controlled Orban sound.

For those who are adventuresome, there are the advanced control screens, which take you into the minds of Robert and Greg at Orban. With the mouse you can adjust almost every parameter of the processing you'd like. This is a self-teaching process: you adjust, it changes and you hear and see the results.

If you are comfortable with any of the current Orban processors, you will love the PC1100 because it is even easier to use with the mouse. For the first time you can see multiple parameters and settings at once, and therefore learn how to

get the actual sound you want for your application. It's a lot of fun and, once installed, controllable from anywhere in the world by your LAN connection. Each card can be given a specific name so they are easy to manage remotely. And I'm talking about all settings, not just some of them, and the full display too. What a dream come true.

There is a great input mixer. It will work well in any analog or digital environment. The input can default automatically to analog in case of a loss of the digital input, perfect for the processing chain.

We have tested it for streaming, processing of the HD chain, and foremost, CD mastering. This unit is fantastic for the latter application, ensuring CD mastered audio is processed perfectly and cleanly. The output adjustments are accurate and predictable, unlike other audio processors.

One of our favorite presets is "News Talk," which makes a lot of sense for us. It's clean and does not pump. You can start anywhere you want and fine tune to get the sound you want.

Ever want to put out hot CD-Rs that can hit digital 0 dB cleanly? The Orban PC1100 can do it, the AES in and outs are perfect. Even using the analog input, making the PC 100 the converter to AES it is as clean as you'd ever want.

How about cleaning up your audio before streaming? Although the streaming process in itself is still extremely crude, this card solves a lot of the problems and will work at any sample rate commonly in use. It gives your stream that wonderful Orban sound, and makes a hell of a difference. Your audio will jump out of the computer speakers.

As far as IBOC and HD Radio, this unit behaves exactly as an Orban 6200, and is in my opinion easier to set up.

I could write about the technical specs and measurements of the card, but being the streetwise engineer that I am, we do not use these measurements in the end. It's always about the sound and the setup. In this case, it's great.

If you want a handy-dandy Orban processor with all the goodies, easy setup, multiple uses and a low price, the Orban PC1100 is the right choice.

We are on software version No. 1; I have asked Orban if they can put a stereo enhancer into the software, and I'm sure this is just the beginning of the fun to come.

For more information, including pricing, contact the company in California at (510) 351-3500 or visit www.orban.com.

Omnia

► Continued from page 49
competitive sound we were after.

Driving around the market, our corporate PD said, "Gary, you opened it up. It's wide and full. You're the man." Music to my ears, for sure.

Driving around the market, our corporate PD said, 'Gary, you opened it up. It's wide and full. You're the man.'

Omnia-6 doesn't require an infinite amount of tweaking. If you listen a lot, adjust a little, listen a lot more and adjust a little more, you'll quickly get to the point where you're proud of how your station sounds.

If you need some help or ideas for getting the particular sound you want, Omnia's support team and Web site can be useful. Several good presets are available for download on the Web. Another major benefit of the Omnia-6 is the ease with which you can control the unit remotely. I use dial-up quite often, but more of our sites are getting IP connections, and I find myself using the

Internet to check on or adjust my Omnias.

The remote control software is free and lets me store connection setups for dozens of stations. I can also easily grab a great preset from one facility and load it onto an Omnia-6 at another station. This ability alone has saved my staff and I a lot of time; it lets us get happy fast with a station's on-air sound, then share that effort with our stations in similar competitive situations.

Over the past two years I've become quite familiar with the Omnia-6 FM. The support and R&D staffs at Telos/Omnia have responded positively to our suggestions and needs, and the Omnia-6 processor is now one of my most important tools for delivering the competitive on-air sound that my program directors and market managers need to excel. We've gotten to the point where there's competition within Cumulus as to which stations are next in line for an Omnia-6 upgrade.

For more information, including pricing, contact the company in Ohio at (216) 241-7225 or visit www.omniaaudio.com.

TECH UPDATE

Air Corp's Model 500 Controls Voice Levels

Air Corp's Model 500 ph Pro-Announcer microphone processor controls voice levels. The company says three equalizer sections with variable boost and cut are designed for adjustment without increasing room rumble or system hiss. A de-esser suppresses excessive sibilance without being noticeable and protects FM pre-emphasis curves from sibilance overshoots. The 500 ph includes phase rotators to correct voice symmetry.

Selections of input levels come in four ranges, from +4 dB to -50 dB, and allow for integration into any system. Dual inputs are mic- and line-level and servo-balanced to eliminate ground loops. The inputs can feed consoles, create external mix-minus sources or return to console patch points.

The compressor-expander is close coupled for punch with no noise "rush up." The compressor protects for overshoots and holds average levels to within 3 dB of nominal output. Air Corp says the expander can reduce studio noise and room "ringing" with no apparent effect on the microphone sound.

The Pro-Announcer microphone processor comes with 48 VDC phantom power for condenser mics and a headphone jack.

For more information, including pricing, contact the company in Texas at (972) 304-0455 or e-mail jim.loupas@verizon.net.

IDT

► Continued from page 49

everybody has different tastes; some people prefer great bass and do not care about what happens on the high end of the signal, others prefer to emphasize other frequencies depending on the kind of program they are radiating. Another factor that should be considered is the "character" that a station is supposed to have. Energy Munich needed a versatile and powerful sound processor to keep its position as one of the leading local FM broadcasters here.

We tested Omnia 6, Optimod FM 8400, IDT Digital Virtual Processor and Apex devices to be sure to make the right choice for the station. After several weeks of tests, we chose the IDT Digital Virtual Processor (DVP) processor because it works more efficiently than its competitors regardless of any output level restrictions there might be. It goes to the limit and stays there without messing with the sound; it does not sacrifice sound definition to archive loudness.

A new concept

The IDT DVP brings a new approach to FM sound processing. It applies Fast Fourier Transformation to processing instead of using the band concept, which has been used by virtually all similar devices until now.

The IDT DVP brings a new approach to FM sound processing.

Working on FFT, it does not have to deal with the limitations of analog sound processing or devices that are based around the analog way of sound processing ("analog" analog devices). That's why the IDT DVP is probably the most flexible processor for FM broadcast; for me, it is the first processor that takes full advantage of digital technology.

This new concept of sound design also needs a new way to control it, and the remote software developed by IDT does a nice job. I found it a little bit strange at first, but it did not take me much time to master it. Once you get used to it and the way it works, it is really fun to work with. The first approach to the device is similar to what you would expect: start from a pre-set and alter it to fit the specific needs of the station.

Working with the device may be different from what is expected because the handling resembles a Pro-Tools plug-in more than a broadcast sound processing device. It is easier to tune than its predecessor. This issue used to be one of the main drawbacks in working with earlier IDT machines and there were not so many people around (at least in Germany) who felt comfortable operating one of them.

One of the "problems" that can arise while working with the IDT is that, because of its flexibility, it has no "standard" sound. Other processors sound like

themselves — the sound can be altered, tuned and tweaked, but the output will always have something distinctive from the device.

This means that, with the IDT DVP, the possibilities are wider, as there is the chance to create the sound that fits the individual characteristics of your station's program. I appreciate the possibility to have distinctive sound, apart from the established clichés that have been dominating FM broadcasting for the past decades. A look at the reference list from IDT is enough to notice that its versatility is unique, with all kinds of stations listed, even jazz-oriented and classical music ones.

On a commercial FM station setting, we archived an extremely balanced sound with enough bottom as to compete with the other stations but, thanks to the FFT,

without compromising the high end of the signal. We also got a clear high end and with a well-shaped and balanced middle section of the spectrum, making the signal much more transparent than other stations.

Due to the integrated advanced peak control, it is possible to optimize the clipping point, increasing loudness without risking overshoots. The ideal setup would be to have the unit at the transmitter, as it is remote controllable by external modem or an optional TCP/IP board; but sadly in Munich this is not possible due to restrictions by the Deutsche Telekom.

Value for money

I also notice the contrast between its design and that of similar machines. It seems like the engineers from IDT put their craft toward the inside of the device

instead of the outside, which makes sense; an audio processor is supposed to work placed in the basement or at the transmitter, not in public display. Though this may be subjective, its sober design looks a little bit better than some of its more flashy competitors.

This may be one reason this device is far less expensive than comparable equipment; the value rating from the IDT DVP is one of the best in FM sound processing.

In my opinion, this fact combined with its flexibility contributes to make the DVP a great choice for every open-minded station that is looking for the ultimate sound.

For more information, including pricing, contact the company in France at 011-33-472-18-1920 or visit www.idt-fr.com.

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USER REPORT

Nicom Has Jupiter, Poseidon

by **Michael Martindale**
Chief Engineer
KVON(AM)/KVYN(FM)

NAPA, Calif. Everyone has an opinion on audio processing; it opens a Pandora's box for interpretation. I don't claim to be an expert, but I have good ears and know what to listen for.

Not too long ago I had the opportunity to construct an LPFM in Woodland, Calif., as well as change the audio processor on a station owned by a good friend.

I had several criteria and knew how I wanted the stations to sound, so I began to sort through many of the available processors on the market. I decided to demo and eventually purchase two audio processors marketed by **Nicom USA Inc.**

Michelle De Fazio at Nicom was kind in arranging demos for a Jupiter and a Poseidon.

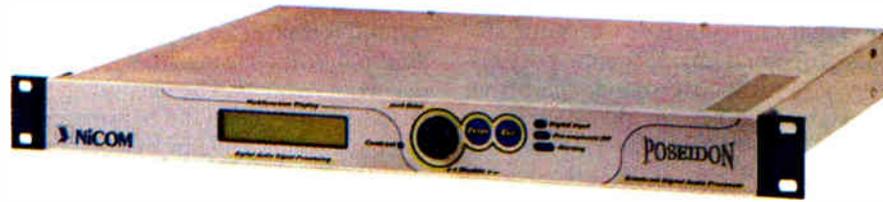
I installed the Jupiter on KYLO, the 100-watt LPFM that I recently constructed, and the Poseidon on my friend's commercial 100 kW FM. Both the Jupiter and Poseidon are 1RU, DSP-based units that are user friendly.

In both situations, it did not take long to realize the excellent potential of these audio processors. Immediately I noticed depth and clarity with few artifacts and excellent stereo separation. The processors offer an inviting sound signature unlike any I am used to.

The differences between the Jupiter and Poseidon are substantial from a user interface standpoint, but not much different in design philosophy.

Jupiter has 30 pre-programmed processing settings that are not user modifiable, and it is a three-band unit, whereas the Poseidon is five-band with 30 presets and 10 editable presets allowing the user to store available, menu-selectable parameters.

Both have digital stereo generators.



Nicom Poseidon Audio Processor

Both accept balanced or AES/EBU input and offer composite or discrete L/R output. AES/EBU output will be available on a new version of the Poseidon this summer, according to Nicom. An RS-232

modified; Poseidon allows modifications here. In addition, Poseidon has a stereo spatial enhancer and a Super Bass option allowing for a wide range of customization to the low end.

The three-band Jupiter has 30 preprogrammed settings; the five-band Poseidon has 30 plus 10 that can be edited.

port and software allows for direct computer connection for remote adjustment of processing parameters. Input/Output synchronization ports with a 19 kHz pilot at 5 vpp are provided for synchronizing RDS coders. An RDS encoder is available as an option.

Presets

Inside the menu tree you find the user-selectable options and set-up parameters. The menu is broken intelligently into separate sections of the processor structure, i.e. In/Out, MPX, RDS, AGC settings, etc. Selectable Pre emphasis, Pilot phase and Pilot Level are easily accessed and adjusted.

On the Jupiter, the AGC offers several presets that are selectable but cannot be

there. Comparing presets and stored "custom" processing programs is easy by rotating the knob to the desired program and selecting it.

Both processors have a green LCD display with adjustable contrast and provide enough information without being confusing. In either case, it was not difficult to find a program to suit our needs.

Neither unit will allow adjustments that can make them sound bad. They are, in this sense, idiot-proof, particularly Jupiter. The Poseidon will allow adjustments but not to the point of bad audio being delivered over the air, which can often be the case when a good processor is put into the hands of an inexperienced user. While the Poseidon's adjustments are flexible, about the only thing they will not do is "shred" the audio. Neither unit was designed to sound bad and does not allow the user to get to that point.

These processors are designed intelligently and sound very good. Both the Jupiter and Poseidon are for people who want a unique sound signature while being competitively loud and preserving their audio integrity.

It's not often I find something special worth writing about. Both the Jupiter and Poseidon processors exceeded my expectations, and we have received many compliments. It's one thing for a broadcaster to take notice; but when listeners take notice it's apparent Nicom is a strong competitor in the processing arena.

For more information, including pricing, contact the company in California at (619) 477-6298 or visit www.nicomusa.com.

SRS Gives Surround Sound Over Stereo

SRS Labs' Circle Surround (CS) is a matrix encode/decode system that delivers 5.1 or 6.1 surround-sound content over two channels. CS encoding is achieved with a CSE-07 professional hardware encoder. CS encoded content can be decoded using selected car stereo head units or conventional, home A/V receiver; the product targets audio engineers, Internet content streaming, broadcasters and post-production studios.

The 1 RU hardware box features balanced XLR analog I/O with seven-in, two-out interface. Additional encoding tools are available via software. SRS and Minnetonka Audio Software offer software plug-ins and stand-alone encoding applications for CS, including encoding plug-ins for VST, TDM/Pro Tools and Windows Media.

CD decoding is achieved with a CSD-07 Circle Surround Decoder. This 1 RU hardware features balanced XLR analog I/O with a two-in, seven-out interface and level controls. The CSD-07 targets monitoring any matrix surround encoded, stereo or mono content.

Additional decoding systems are available from M-Audio, SRS, Kenwood, Marantz, Accuphase, Theta, Jatou, Orion Studios, InterVideo and Smart Devices. Circle Surround encoded content is stereo and mono compatible, and is in use by ESPN, ABC Sports, CBS, NBC and others.

For more information, including pricing, contact the company in California at (949) 442-1070 or visit www.srslabs.com.



TECH UPDATES

Inovonics 235 Targets AM Processing

Touted as the only box required between console and transmitter, the Model 235 from **Inovonics** offers an answer to mono AM modulation control.

An initial slow, "gain-riding" automatic gain control stage erases long-term input level variations that occur because of program source variations and operator inconsistencies. A three-band dynamics compressor follows the AGC, working independently on the bass, midrange and top end. The program signal is split, compressed and recombined. The user has control over the drive to the three-band section as well as the band remix, which is said to give a degree of low- and high-frequency program equalization.

Absolute peak control is provided by a "feedback" limiter/clipper. A panel adjustment labeled Density controls clipping depth by monitoring the clipped-off program products and programming the limiter to keep these at a preset ratio. The user can decide what degree of



"edge" (particularly on voices) can be tolerated for the station's format. Both the limiter and the clipper support asymmetrical modulation to the +125 percent maximum allowed.

A seven-pole, 10 kHz low-pass filter in the Model 235 output assures NRSC mask compliance. This filter incorporates proprietary overshoot control to preclude any modulation sacrifice. The 235 is available with optional cutoff frequencies between 4.5 kHz and 15 kHz for shortwave, overseas medium-wave and other broadcast or non-broadcast applications.

The Model 235 comes with a Windows interface for remote control. Priced at \$1,800, it presents a budget approach to on-air processing for AM, the company says.

For more information, including pricing, contact the company in California at (800) 377-0552 or visit www.inovon.com.

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.

TECH UPDATES

Broadcast Technology Gets Loud

Broadcast Technology's CompRoc2 is a composite baseband processor that the company says will add presence and loudness to FM stations. The CompRoc2 combines a feed-forward compressor, which targets faster attack speeds, and program-dependent release behavior.

The CompRoc2 can be inserted after the stereo audio processor at the studio or the transmitter. Its automatic pilot re-insertion loop monitors the composite signal and simultaneously adjusts the phase of the pilot to be in phase with the original. It also nulls the incoming pilot, so stereo separation is maintained above 60 dB.

The CompRoc2 has two composite outputs that are independently adjustable as well as an SCA/RDS input and a pilot output. A momentary closure through the remote control can switch the unit into operate or bypass mode.

For more information, including pricing, contact the company in Kansas at (719) 688-1439 or visit www.broadcasttech.com.



Henry Engineering Combats Delay

Henry Engineering's MoniSwitch is a monitor switcher that seeks to eliminate the effects of time delay in the station's headphone-monitor system.

MoniSwitch has inputs for two stereo audio sources. One input receives the off-the-air monitor signal from the station's demodulator. The second input is fed with real-time audio: the console's Program bus output, the output of an analog processor or the "low delay" monitor output of a digital processor. The output of MoniSwitch is fed to the console's air monitor input.

MoniSwitch also has control input, which is interfaced with the console mic tally circuit so it can sense when the DJ mic is in use. When the mic is off, the off-air signal is heard through the monitor system as usual. However, when the DJ mic is on, MoniSwitch automatically switches the monitor system (DJ headphones) to the real-time audio source. Henry Engineering says DJs can then hear themselves without echo, flanging or other distractions.

MoniSwitch uses electronic audio switching to create a transition between the off-air and real-time audio signals. There are gain adjustments for both inputs, so that levels can be closely matched.

For more information, including pricing, contact the company in California at (626) 355-3656 or visit www.henryeng.com.



Eventide Reverb 2016 Celebrates Knobs

Eventide has recreated the reverb algorithms of its SP2016 with the Eventide Reverb 2016 by Princeton Digital.

The Reverb 2016, which includes the same user parameters and original reverb algorithms from the SP2016, features the original three reverbs, Stereo Room, Room Reverb and High Density Plate. It also has updated versions of each algorithm to take advantage of additional processing power. The Reverb 2016 features a menu-free, "one knob, one job" user interface, which provides dedicated controls for each parameter with ergonomic LED rings and a numeric display that provide visual feedback on parameter settings even in low light.

The Reverb 2016 algorithms, which are said by the company to sound natural and distinctive, are meant to simulate aspects of the sound of a real enclosure, capturing the early reflections and the way in which the echo density increases with time as well as the Gaussian decay of the reverb tail.

Of interest to radio production are setting up a reverb without sorting through menus and parameters. Reverb can be tailored for any application, handy for radio production, from adding "room" to a live voice talent or enhancing a station ID. Results are achieved and stored.

The hardware implementation features a 120 MIP, 24-bit DSP, 24-bit balanced XLR, analog I/O and 24-bit S/PDIF digital I/O. The Reverb 2016 includes MIDI in and out and software programmable footswitch, as well as a direct input for guitars and other high-impedance sources.

For more information, including pricing, e-mail audio@eventide.com or visit www.eventide.com.

HHB Adds Model to Ivory 2 Series

The TL Audio 5052 Stereo Valve Processor is an addition to the Ivory 2 Series. The 5052 is a system front-end and stereo mixdown and mastering device that provides two channels with preamp, dynamics and EQ stages, each with independent stereo linking of the compressor, EQ and limiter sections.

For mono or stereo applications, a source can feed either channel of the 5052 with discrete dynamics control per channel or linked stereo EQ and dynamics.



The 5052's valve preamp stage will accept mic, line or instrument connections. The valve compressor section includes hard- and soft-knee modes and has variable control of all parameters. The EQ section is a valve, four-band equalizer with swept low-frequency and high-frequency bands and parametric mids.

The output limiter is an optical type. Metering shows input, output and gain reduction. Sidechain inserts are unbalanced. Balanced-analog input, output and insert connections are standard, while the DO-2, a 24-bit stereo, S/PDIF output digital interface card, is available as an option.

The 5052 uses six triode valve stages shared between the two channels, run from an internal 150 V stabilized DC supply. The 5052 retails for \$1,699.

For more information, contact the company in California at (805) 579-6490 or visit www.hhbusa.com.

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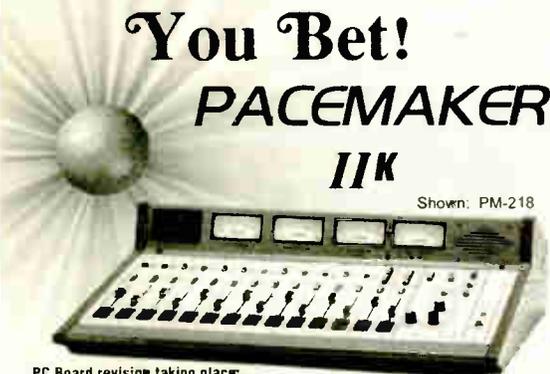
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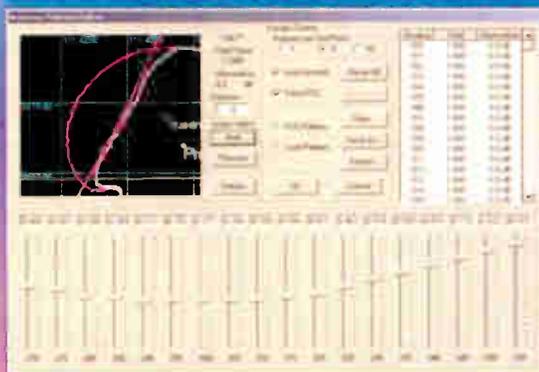
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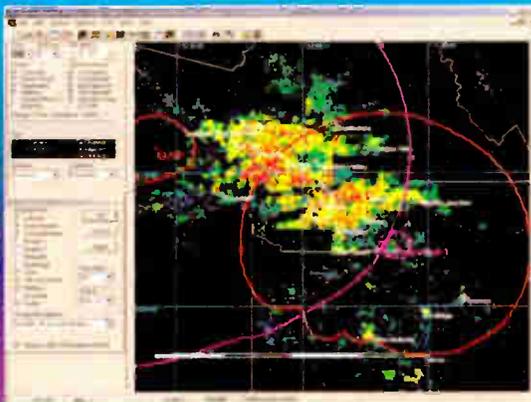
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TECH UPDATES

Omnia Processes Audio for HD, FM

For HD Radio and FM analog signals, the Omnia-6HDFM features a 96 kHz, 24-bit I/O sampling rate and a maximum of 768 kHz internal sampling, which the company claims is the highest sampling rate of any broadcast processor. The sampling rate lets the Omnia-6HDFM reproduce IBOC's frequency range up to 20 kHz.

Omnia-6HDFM is a dual-output processor that provides simultaneous dedicated signals and features two separate user-configurable AES outputs in addition to an existing MPX output. The processing section contains multiband architecture that creates a commonality for conventional FM and IBOC because Omnia split the system at the output of the final mixer.

One path proceeds to the conventional FM section, where pre-emphasis, distortion-controlled final limiting and 15 kHz filtering are used. The second path is routed to the IBOC processing section, which contains a look-ahead final limiter, tuned to condition audio for the bit-reduced codecs employed in IBOC systems.

This configuration targets smooth cross-fades between the analog and digital channels and processes both transmission signals. Upgrade packages will be available to give split-processing capability to existing Omnia-6HDFM processors as well. The upgrade will contain a back panel with added AES connections, and software that will enable the IBOC limiter. Pricing for the upgrade will be \$980.

Also included in Omnia-6HDFM are wideband AGC, or five AGC bands with adjustable AGC crossovers and a six-band limiter and twin color active-matrix displays with integrated Dorrrough Loudness Meter. Remote control is accomplished via Ethernet, serial or modem connection; plug-in software is included for software updates.

For more information, including pricing, contact the company in Ohio at (216) 241-7225 or visit www.omniaaudio.com.



SPL's Transient Designer Shapes Sound

The Transient Designer envelope modeler from Germany-based SPL is a processor with circuitry that offers level-independent shaping of the dynamic response of a sound. With it, users can modify the attack and sustain portions of a signal.

SPL says that unlike other dynamics processors, the unit reacts to a signal's dynamic characteristics rather than its level, which gives consistent processing over the entire dynamic range.

The Transient Designer can emphasize or smooth the attack and extend or shorten the sustain, affecting sounds in ways similar to changing mic position, ambience and reverbs, drum muffling, head type, tuning and, in some cases, EQ with only two controls after recording. The device works on most instrumental signals, including acoustic and electric guitars and basses, piano, strings, brass and woodwinds, synthesizers and drums and percussion.

For more information, including pricing, contact the company in California (805) 241 5140 or visit www.soundperformancelab.com.



BSS Audio Adds to Compressor/Limiter

BSS Audio's DPR 402 is a two-channel (stereo) compressor/limiter, high-frequency de-esser and wideband de-esser with peak limiting, adjustable speed, dynamics program manipulation and LED metering for input and output. Integrated side-chain and gain reduction metering allow for continuous dynamic activity monitoring, while Auto mode provides program-dependent attack and release control.

The DPR 402 uses of an extra side-chain in the circuit design; only the subtractor circuit and the gain control lie in the signal path. The control circuitry, which includes a voltage control amplifier, lies parallel to the signal path, controlling the subtractor. BSS says its components have no adverse effect on the signal.

The BSS DPR 402 loudness control targets AM/FM broadcast processing, while the unit's frequency-selective loudness control may be used to enhance a frequency spectrum without additional equalization. Selective de-essing sibilance control can be combined with either compression or expansion.

Housed in a 1 RU chassis, the DPR 402 offers XLR inputs and outputs on its rear panel as well as a pair of barrier strip connections to facilitate patching of external devices and provide frequency-conscious expansion and compression. The DPR 402 retails for \$1,599.

For more information, contact the company in Tennessee at (888) 251-8351 or visit www.bss.co.uk.

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TECH UPDATES

IDT Sounds Off With VVP

IDT's voice dedicated processor, the Virtual Voice Processor is an FFT voice processor at 96 kHz-40 bit floating point for broadcast live application and post-production. With its five bands, it can modulate the voice to handle its timber; according to IDT, creating a warm and strong sound isn't a problem for a tiny voice.

The user, according to IDT, will be able to set up the processor easily because tool tips are integrated in several languages and the user interface is simple.

The VVP integrates a mic pre-amp, a Fast Fourier Transform (FFT) noise gate, a one- to five-bands process, an FFT sibilance canceller, a parametric equalizer and a transparent final limiter.

It accepts a total of 116 user-defined voice parameter settings per card and comes with 24 factory presets. When settings are finished, the DJ can select his or her personal settings by switching the button on the processor front panel. A Flash card allows for storage and transfer parameters to another VVP.

For more information, including pricing, contact the company in France at 011-33-472-18-1920 or visit www.idt-fr.com.



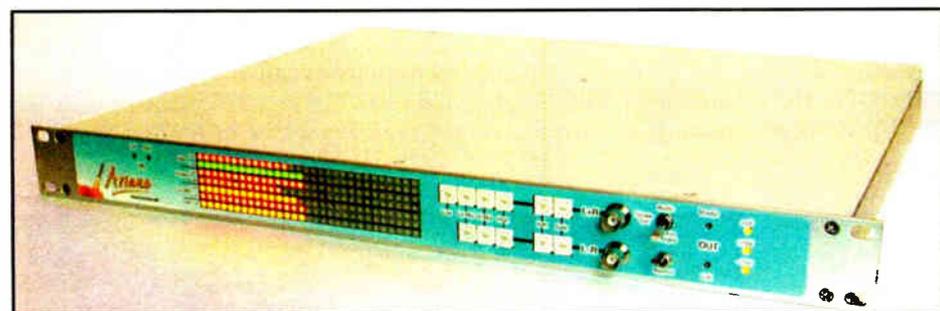
TransLanTech Gives Consistent Audio

TransLanTech's Ariane Stereo Audio Leveler targets radio stations that want a loud, but not busy, sound. The box is used in conjunction with existing processors. Its multiband RMS leveling takes over the initial wide-range leveling function usually done by a wideband processor.

By passing on audio that the Ariane determines has "enough" processing, and then only processing that material which requires it, the company says the system has a more consistent signal to work with, which allows the user to set a controlled peak level without the artifacts of using a wideband leveler.

The 1 RU Ariane Stereo Audio Leveler operates on any line voltage and has balanced XLR ins and outs as well as insert points for additional external side chain effects processors. The Ariane is available for \$3,600 and is in use in AM and FM stations in major market. The company says it is used in front of Omnias and with analog and digital Optimods.

For more information, contact the company in New York at (212) 222-0330 or visit www.translantech.com.



BW Offers Digital Audio Processor

Broadcast Warehouse says the DSP X, a multiband audio processor in one rack space, provides cost-effective loudness for broadcasters, especially low-power FM stations in the United States.

The DSP X is controlled by an 8-bit RISC micro-controller which operates analog and digital circuitry. These include 24-bit A-D and D-A converters, two dozen DSP chips and a pair of sample rate converters to facilitate the AES/EBU digital input/output option.

BW uses its own Ethernet Module and code to provide a Web-based front-end. A metering system with 180 LEDs and LCD display completes the visual interface. Features include a pair of RS232 serial ports, a remote trigger port and a headphone socket.

The DSP X can be upgraded via Flash, allowing broadcasters to update units in the future without having to return them to the manufacturer. This feature includes a hard-coded "boot loader," which prevents a failed upgrade from locking up the system.

The initial release of the DSP X is meant for existing FM stations and includes processing blocks like wideband AGC with gating, multiband AGC with gating, dynamic multiband limiting with defeatable look-ahead limiting, distortion-controlled over-sampled clipper and DSP-generated stereo multiplex signal

Free future updates will include equalization and composite processing. Internet, Digital radio and AM software versions will be provided for free to "Flash" into the hardware platform of the DSP X.

For more information, including pricing, contact the company in England at 011-44-208-5409992 or visit www.broadcastwarehouse.com.



Orban Debuts Optimod-FM 8300

Orban says its Optimod-FM 8300 is a processor, with many of the sound processing features available on Optimod-FM 8400 that work regardless of format or source material.

Its five-band processing targets pop music formats, while phase-linear two-band processing yields sound for classical, classical jazz and fine arts broadcasters. The 8300 includes stereo encoder, AES/EBU digital inputs and outputs and analog I/O for interfacing to any broadcast plant, and the 8300 can be at the studio or transmitter.

Orban says the band limiting to 15 kHz means customers can use any uncompressed digital STL to pass 8300-processed audio from studio to transmitter without affecting loudness; thus, users don't need to use STLs having 44.1 or 48 kHz sample rates.

To locate the 8300 away from the studio, there are three remote control ports: GPI contact closures, RS-232 serial and Ethernet for TCP/IP networks. Clock-based automation lets users automatically daypart the processing and users can control other 8300 operating parameters. The 8300 feature set uses the processor's DSP and computer-based control architecture.

For more information, including pricing, contact the company in California at (510) 351-3500 or visit www.orban.com.



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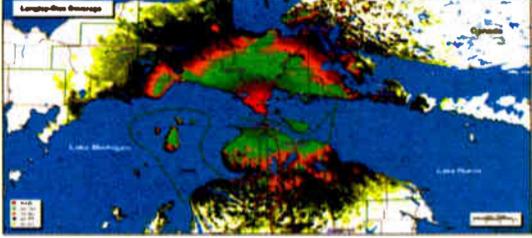
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GUEST COMMENTARY

Processing in the LDR Environment

The Chief Scientist of Neural Audio Delves Into Audio Pre-Conditioning for Encoded Digital Radio Systems

by Robert Reams

The author is CTO, chief scientist and co-founder of Neural Audio. This is the first of two parts. For the complete version of this paper, visit www.broadcast.harris.com/support/white_papers.asp?cat=78.

This is a brief overview of contemporary processing considerations anticipating the challenges as broadcasters transition from analog to digital audio in a low data rate environment.

Noise and hum reduction

All noise and hum consume precious bits in lossy encoding/decoding processes while contributing nothing to the value of the received audio content. Noise and hum have additional impact on an important and relevant *non-audio* feature of lossy codecs used in broadcast: the transmission of *ancillary data*.

If the codec is busy dealing with audio non-content, the result is slower updates on text, visual ads, control signaling or other revenue generating features of the digital broadcast.

In fact, powerful, agile noise reduction may be one of the most important processes to take place before *any* codec, whether its application is archiving, STL, exciter/receiver, newswire, etc. Noise and hum reduction systems vary in characteristic from transparent to aggressive. Transparent types of noise reduction are most useful in archiving and STL application where the data reduction ratios are relatively low and perceptual transparency is high.

Aggressive noise reduction, on the other hand, is useful where data reduction ratios are high and reduction of audible coding artifacts are of higher importance than perceptual transparency.

Hum reduction is equally important. Even when hum is not perceivable, a function of the consumption environment, it drives down entropic opportunities of the codec making an already bit starved situation worse.

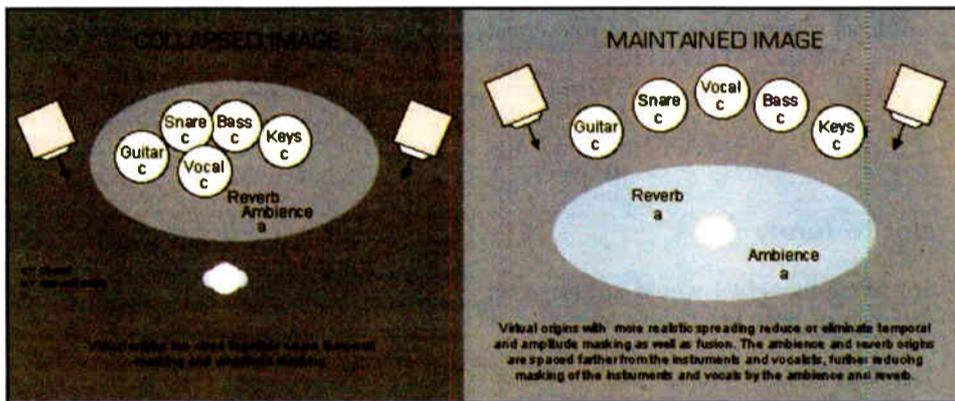
Volume management

One of the most valuable services that broadcasters provide to the listener is volume normalization.

While this is especially important in automotive audio because of a relatively high environmental noise floor (road noise, aero noise, etc.) it is also of great benefit to the average listener who wants to get the most out of his/her "economy" audio system.

To accomplish this, broadcasters use effective and expertly designed volume management processing to maintain a solid and tightly defined volume window.

Perceptual codecs do not respond linearly to overly aggressive volume management. It is generally understood that perceptual codecs respond poorly to heavily clipped signals. What is generally not understood is that heavy dynamic range compression may deleteriously affect the codec's ability to operate efficiently. In fact, overly zealous, "in-your-face" processing may aggravate the codec's performance in two areas: temporal masking function and entropic opportunity.



Collapsed vs. Maintained Image

The temporal masking function (TMF) is a term that describes the effects that exist before and after a loud transient. Sound masked following the transient is said to be post-masked. Sound masked leading the transient is referred to as being pre-masked. The height of the transient influences the masking envelope duration. Suppression of the transient degrades masking duration, impairing the perceptual codec's ability to mask artifacts.

Entropic opportunities can be described as rapid transitions in the content energy envelope. This occurs in periods of relative "quiet" or transients interspersed within the content. Entropic opportunities are periods within the content where perceptual entropy, a measure of the fundamental limit of transparent compression for audio, is the highest.

Perceptual entropy estimation is accomplished as follows. The signal is first windowed and transformed to the frequency domain. A masking threshold is then obtained using perceptual rules. Finally, a determination is made of the number of bits required to quantize the spectrum without injecting perceptible noise (artifacts). The PE measurement is obtained by constructing a histogram over many frames and then choosing a worst-case value as the actual measurement.

Any interference in the periods of "quiet" or transient height result in the degradation of perceptual entropy, impairing the codec's ability to transparently code the content. This doesn't mean that volume leveling and peak management are not allowed for percep-

tual codecs. It does mean, however, that certain fundamental processing rules be followed. "Codec-friendly" volume management employs smart leveling that bases gain on the perceptual "usefulness" of the content.

In addition to this it is necessary to use variable ballistics that shape the changes in gain to be cooperative (maximum PE) with the codec. The volume management must define a window transparent to the temporal masking function (TMF) that would maintain maximum allowable volume with adequate peak control. Within the constraints of TMF transparency in conjunction with allowable (and ade-

ing events from the content image prior to encoding. Image anomalies that are perceptually irrelevant (long-term L/R intensity offsets, short-term M/S displacements and long-term M/S imbalance) are reduced or removed by predicative (through forward-prop nets) and agile manipulation of the side channel.

With *predicative* transcoding the designer understands and can predict the behavior of the source encoding and destination decoding. Stereo music content may be subtly altered to remove decoder instability causing elements in the music using methods that have no perceptual impact on the content.

Parametric image reparsing

For low data rate codecs, there is often a need for additional processing. Without assistance, undesirable side-channel artifacts may become "unmasked" in less-than-optimal spatial environments. Parametric image reparsing allows for spatial "reassignment" of spectra to alternate portions of the image. This reduces overcoding of the side channel and improves the performance of the codec without having to "throw away" content.

Spectral management

To assure the quality and consistency of the content flow, certain perceptual aspect targets must be determined and maintained. Different genres of music draw listeners with different perceptual expectations. Maintaining an overall loudness target and (dynamic) range is assumed to be an accepted and generally understood perceptual aspect.

Two other important perceptual aspects are the spectral and image balance of the broadcast. Terms historically used to describe spectral balance would be "bright," "punchy," "warm," "subterranean," etc. Language used to describe image balance has been "in your face," "focused," "fluffy," "big," "huge," "wall of sound," etc.

Some of these terms have been used to describe the complex interaction of both spectra and image (more "fluffy" means less "punch"). There lies the rub. Perceptually, these two aspects are not parametric; that is, they interact with each other.

Rather than trying to parameterize these two aspects separately it is possible to create a "map" that adequately describes both simultaneously. The "spectral image map" (SIM) describes the complex relationship of spectra and image over a fixable time interval. The spectral image map serves as the programmable "target" for an adaptive spectral and image management process.

Prototypical templates for desirable spectral image maps may be derived from samples of critically acclaimed music of appropriate genre, samples of a successful competitor's broadcast or purchased from an appropriately equipped service. The prototype template is then easily modified by the PD or engineer to individual tastes.

This concludes an overview of "b-chain" processing considerations for the delivery of broadcast-typical content over a two-channel, constrained bit-rate broadcast backbone.

READER'S FORUM

HD Radio isn't HD

Hundreds of stations around the world have been broadcasting in high-definition analog AM stereo for over two decades. Especially on the AM band, "HD Radio" is not truly "high definition." It is a highly compromised system, the audio quality of which can only approach that of a typical "Webcast" over a 56K modem.



Analog AM stereo offers audio frequency response up to 10 kHz — two-thirds of the human range of hearing — and accurate, full-dimensional stereo separation throughout this range. Subjectively, many listeners claim it sounds equal to or even better than FM stereo, due to the type of audio processing that AM stereo stations use. AM stereo-capable receivers continue to be manufactured today by companies such as Visteon Corp., which now has prototype receivers that support both analog AM stereo and Ibiquity's HD Radio system.

audio samples of HD Radio that are available for public listening have demonstrated.

Ibiquity claims that HD Radio on the AM band will offer "near-FM quality." For that to be an accurate claim, major improvements will be needed; for now, HD Radio doesn't even match up to the quality of analog.

AM radio is radio that countless listeners have been enjoying for decades. IBOC DAB, a.k.a. HD Radio, is indeed a noble idea, but Ibiquity and its predecessors have spent well over a decade trying to get it to work and live up to its claims.

Now, "HD Radio" finally does work, sort of. But at this point, it's equivalent to putting a Ferrari engine into a Hyundai. If Ibiquity wants to have a creditable final product, they should have started with a much better platform — one that won't be a step backwards from the current level of performance that traditional analog AM and FM radio offers.

Kevin Tekel
Founder & Webmaster
The AM Stereo Web Site
Warren, N.J.

Not so funny

I never thought I would accuse Alan Peterson of bias, but I can't help it after reading his column "So You Thought That Was Funny" (March 26).

Alan made a case against inappropriate humor on the radio. He listed some examples: jokes about the Space Shuttle crashes, 9/11, the nightclub fires, the Branch

HD Radio is equivalent to putting a Ferrari engine into a Hyundai.

— Kevin Tekel

Ibiquity's HD Radio on the AM band simply cannot match this level of quality and efficiency. It only offers accurate stereo audio reproduction up to 4 kHz — scarcely better than that of a telephone. All audio content above 4 kHz is only carried through in monaural and is digitally synthesized based on harmonics of lower frequencies, providing a very harsh and artificial type of sound, as all of the

Davidian situation, etc. — but he didn't include one of the worst offenses of all: the one made by a man Alan has idolized in his column, a man Alan volunteered his services to out of devotion and admiration, Doug "The Greaseman" Tracht.

In 1999, the Greaseman attempted to find humor in the James Byrd murder. (In the racially charged Texas case, Byrd was chained to a pickup truck by two

IBOC's 'Pause' Is Bitter Pill

"This is not a show stopper, this is how to best proceed with the show." The IBOC show, that is.

That's how one RF manufacturer characterized news that Ibiquity's PAC codec is not ready for prime time — at least in the minds of the DAB Subcommittee of the National Radio Systems Committee (see page 1).

The wise reader will pay close attention to this debate. It isn't just a discussion of "iffy" audio, something only engineers might notice. We're talking about the future of our industry.

Sources told us that, in a private Ibiquity codec demonstration, conducted at NPR in May, PAC sounded annoying and artificial on AM talk content.

And when people like Charles Morgan, Milford Smith, Donald Messer and Paul Feinberg cite "growing concerns over the audio quality of Ibiquity's low bit-rate codec" — as they did in the NRSC group's memo — they're saying AM digital radio with PAC doesn't sound good.

Doesn't sound good is not the formula for future success in radio. Doesn't sound good is a long way from "measurably better performance than analog" — one of the main benefits touted by IBOC fans for years. Remember? "FM will sound like near-CD quality, and AM will sound like FM, at least."

One might reply, "Well, who's going to notice in the car, anyway?" But we don't want to have to launch the radio industry's digital transition with an apologetic manner.

To be fair, Ibiquity has been working on improvements to PAC for quite a while. But the news that the steering committee of the DAB Subcommittee of the NRSC doesn't see the point in continuing standards-setting activities until Ibiquity resolves PAC's performance on AM at low bit rates was a sad development for digital radio fans, in particular for the roughly 4,000 commercial AMs in the United States. They've been waiting a long time to compete on a more even playing field with FM.

While this latest step may not be a "show stopper," it represents an unexpected and unwelcome pause in the IBOC rollout, one with implications for Ibiquity, for every equipment manufacturer on the transmission and receive ends of the technology, and for radio stations and groups that have begun to commit.

While the industry (including Radio World) has been saying "get it done" to Ibiquity for a long time, many industry voices, some quiet, some not, have expressed concerns over digital radio's audio quality on AM. But only one body other than the FCC is really in a position to do anything about it.

Our industry's audio product is in the hands of the NRSC. We applaud it for doing what it's supposed to do — determine whether this new technology, or any other, delivers our product properly.

The key for Ibiquity now is to get a handle on what "better" means and get it done, as quickly as possible.

Perhaps the receiver rollout is blown for 2004. Maybe not. But better to fix this now than wait to dump a problem in the laps of receiver makers and consumers.

We urge Ibiquity to be as forthright and as open as possible with the industry as it seeks solutions to this problem.

—RW

white men and dragged to his death.) After joking about the incident, Greaseman was fired.

For the sake of candor, I should point out that I produce a comedy service for a syndicator that occasionally contains humor of questionable taste. Alan should have done the same by including a mention of the James Byrd murder with his examples. His relationship with the Greaseman, not to mention journalistic integrity, called for it.

Dave Stewart
President
CBA Inc.
New York

Jedi scientist

I almost choked on my sandwich when I read Paul McLane's allegory (April 23, page 4) suggesting that Leonard Kahn had been in seclusion on Tatooine.

I had never looked at it quite that way.
Glen Clark
Consulting Engineer
Pittsburgh

More Opinion
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