NewBay Media

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'To Better Serve Their Local Communities'

FCC Gives Some AM Stations the OK to Use FM Translators, But the Impact Is Unclear

BY RANDY J. STINE

WASHINGTON — The Federal Communications Commission hopes its new rule to allow the rebroadcast of AM radio programming on FM translators will not only boost coverage areas for some broadcasters but also help efforts to increase localism of broadcast content.

However, the limited universe of FM translators inevitably will curb opportunities for broadcasters hoping to exploit the rule, observers say — though in fact, at least 220 stations already have benefited.

The rules amendment, released in June, allows retransmission of AM programming on existing FM translators as long as the AM station does not extend its coverage area or drop AM service in doing so.

AM daytimers, which long have argued that their limited hours hinder

(continued on page 5)

They're Hoping for A Net Gain

Makers of Internet Receivers Aim For Bigger Things

BY JAMES CARELESS

Internet radio receivers — standalone radio-like devices that connect to the Internet to access thousands of online broadcasters, either by Ethernet cable or Wi-Fi — are making the move from niche novelty to mainstream product.

"Best Buy currently sells our Grace Digital Internet radios in their stores on a nationwide basis," said Greg Fadul, Grace Digital co-founder and chief marketing officer. "Additionally many regional electronics stores such as Fry's and J&R have proven successful for us."

Grace Digital isn't alone: The Sonoro Internet Radio "is being sold by Saks Fifth Avenue online and many of their stores," said Deanna Dal Pos, Sonoro's international marketing director. Specialty retailers are also selling the Sanyo Wi-Fi Internet Radio, Tangent Quattro and Tivoli Audio NetWorks among others.

THE MARKET

How big is the U.S. market for Internet radio receivers? That's a hard question to answer.

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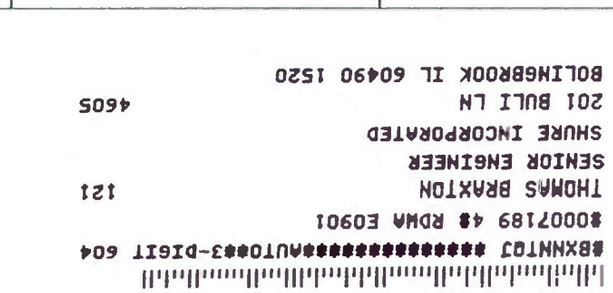

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Drivers Want New Car Devices

Entertainment, Connectivity Prized While HD Radio And Satellite Are Relatively Static on Wish List

BY LESLIE STIMSON

WESTLAKE VILLAGE, CALIF. — Consumers looking for a new car in the next six months are interested in entertainment and connectivity features. Satellite radio and HD Radio are holding their own as features that survey participants say they'd want in a new car once the price is revealed, neither dropping but not improving much either.

The conclusions are part of the 2009 J.D. Power & Associates U.S. Automotive Emerging Technologies Study released in June.

Automakers and suppliers use information from the survey to determine which technologies are of most interest to consumers and at what price point, the company told Radio World. In the version of the study sold to companies, three price points are tested. The prices that are publicly released are the mid-range amounts.

The study is designed to measure consumer familiarity, interest and purchase intent for emerging automotive technologies, both before and after an estimated market price is revealed.

> **Satellite radio** is holding its own.
>
> – Mike Marshall, J.D. Power

Mike Marshall, director of automotive emerging technologies for J.D. Power, said that "satellite radio is holding its own" even though research shows a little apprehension about the subscription fee. Satellite radio ranked eighth out of 18 in consumer interest before the participants were shown the average market price of $12.95 a month, assuming the in-dash radio of a new car would be satellite-capable. After the market price was mentioned, satellite radio moved up to the fifth position.

HD Radio remains "relatively static," he said. HD Radio was ranked ninth before price and moved up to seventh after an average price of $200 per unit was shown.

Both kinds of radio have been in the survey at least three years.

Entertainment and connectivity pat-

(continued on page 8)

NEWSWATCH

BEST BUY SELLS FIRST HD RADIO PORTABLE

MINNEAPOLIS — The armband portable HD Radio made by KRI and containing a Samsung HD Radio IC is being sold under Best Buy's Insignia brand name. The unit became available July 12 at Best Buy and retails for just under $50.

Headquartered in Minneapolis, Best Buy has locations throughout the U.S., as well as Canada, Mexico, Europe and China. Listeners can hear main and multicast FM HD Radio signals as well as analog signals.

The unit features a built-in, rechargeable Lithium-ion battery that lasts up to 10 hours. A USB cable for recharging is included as well as an armband. Users can program up to 10 presets and use the 3.5 mm jack output to listen in the car or on the go.

MINORITY BROADCASTERS SEEK FINANCIAL AID

WASHINGTON — A group of broadcasters says if the auto industry can have a federal bailout, so too should minority stations.

Fourteen minority broadcast owners appealed directly to U.S. Treasury Secretary Tim Geithner for financial aid. The request comes as the Federal Communications Commission is collecting data on broadcast owners, both minority and other station owners.

Entravision, Spanish Broadcasting System, Inner City, the National Association of Black Owned Broadcasters and others said the recession and credit crisis are threatening to make minority-owned stations "extinct."

"It is particularly concerning that the percentage of minority ownership in the broadcast industry is currently in the low single digits … Financial foreclosure will roll back decades of work by the federal government to encourage more minority voices in the broadcasting industry," they state in the letter, which follows one sent by House leaders led by Majority Whip Jim Clyburn D-S.C., father of FCC commissioner nominee Mignon Clyburn, as well as Charlie Rangel, D-N.Y., and Maxine Waters, D-Calif.

The broadcasters and lawmakers seek federal financial aid to help restore credit flows to minority broadcasters, similar to what was done for the auto industry until the economy improves.

For RW, Readers Have Their Own Designs

Most Like Our New Look; a Few Are Vocal in Dissent

This is the third issue of Radio World with our "new look." Overall reader reaction to the design change has been positive, though with vocal dissent.

"Congratulations on the new look," says Thomas Mintner, president of manufacturer NTI Americas. "I know it takes a lot of work for something like this."

Mintner has doubts about our new logo, which he thinks feels a little cheap: "Perhaps something in the nature of the font and the outline line thickness? Looks like a cross between the font used on the interstate highway system for informational signs and something from an Asian consumer magazine ad. I don't see why a more professional-looking update of the existing logo wouldn't have worked as well. But I'm sure that's the least of your worries these days."

He loves the paper stock, a comment we've heard from others as well.

"And the content — after all, the most important thing — in both RW and RWEE are setting new highs. Skip Pizzi's well-written 'come over or back to reality' piece on royalties will probably stir up the troops but is right on. And we constantly appreciate you also keeping the RWEE version on a high technical and practical broadcast craft level."

At WRNJ(AM) in New Jersey, Larry Tighe spares no feelings:

"*Gasp*, it's awful! Looked like a cheap throwaway advertising circular. And what's with no letters to the editor in the back? Good heavens, don't you know all your readers go there first and then filter through the articles? I want it the way it was."

Don't worry about the letters, Larry. I consider the strong *Reader's Forum* content to be one of my most important contributions as editor over the years and it's not going anywhere. Letters give way occasionally if space is tight and a commentary article occupies that space; but the current issue is more typical, with a mix of both.

> **'The slightly smaller** size and easier-to-read layout scores a hit.'

Another reader who was entertained if not impressed is Joe Brosk at WTOJ(FM) in Watertown, N.Y.

"Paul, I just got my 'new and improved' copy of Radio World and immediately turned to your column for an explanation. The laughter began when I read, 'The pages are more open.' *¿Qué*? Then I read, 'Our text is easier to follow.' The laughter continued as my eyes jumped all over the page, trying to find where the text continued, only to be misdirected by another old RW cover. 'This is funny!' I thought to myself. 'That same sense of humor RW usually reserves for April Fool's Day is alive and well in July.'"

After continuing to read the issue, Joe wrote, "I found it was still filled with the same high-quality, thought-provoking industry articles I've come to anticipate. Excellent. Then, on a whim, I grabbed the June 17 issue and compared your columns side-by-side. It was as I suspected. Radio World followed the cell-phone model by making the important stuff smaller and harder to see. I refer, of course, to your picture.

"Best of luck with the new format … but now I have to get new reading glasses!"

But most comments I received were positive, if briefer.

Don Kennedy of "Big Band Jump" in Atlanta likes the quality of our new paper and the fresh masthead, which he feels make the format immediately attractive.

"But the best part is the size. It's so much more convenient to read, somehow more solid. The only suggestion would be to put color in the front-page word 'radio,' for the word tends to disappear as it is now."

Don adds: "In whatever form, Radio World is a valued asset to any business connected with electronic communication. We look forward to every issue, particularly zooming in on commentaries, which tend to give us a broader view."

Brian Preston at Spectrum Communications in Moses Lake, Wash., said he "loves" the layout, though he also asks, "Why do companies always insist on changing or redesigning their logo? Look at Pepsi, Burger King, Best Western. All have redesigned their logos over and over. On the other hand … what is the most recognized logo in the world? Coca-Cola. The same logo for all these years.

"I get tired of this new and improved. Just pick one logo and stick with it. You'd be amazed at the results."

"Kudos on Radio World's brand-new look," writes Bill Diehl, entertainment correspondent for ABC News Radio in New York. His reaction was succinct: "The slightly smaller size and easier-to-read layout scores a hit."

And supportive words come from Thom Price, director of programming for EWTN Global Catholic Radio Network in Irondale, Ala., who said the new look is "great." He adds: "As a long-time reader, I had to smile looking at the issues of 1977 (an ad for a CBS Audimax) and 1986 (Fidelipac carts). Compared with this week's cover story on the Zune …who would have dreamed?"

> **'Gasp,** it's awful!'

Thanks, Thom. I too enjoy flipping through old issues; I have a full bound set a few feet from me in my office and sometimes I do just that.

By the way, we inadvertently swapped two captions for those covers in my July 1 column. Did you notice? The captions for the years 1996 and 2003 were reversed.

Personally, I'm particularly pleased with the change in paper stock. I like how it improves our graphics and also makes the advertisements "pop." That's an important consideration because those ads allow us to bring our content to you in the first place.

And I find it notable that our publishers have invested labor and money in making RW's print product better. At a time when many publications are cutting and gutting, this seems to me to be an important statement about NewBay's commitment to the radio broadcast industry.

As always, my e-mail is open for your comments. Write to *pmclane@nbmedia.com*.

FROM THE EDITOR

Paul McLane

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TRANSLATORS

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local service, also will be permitted to originate programming on FM translators during hours that they are not otherwise authorized to operate.

The new rules were still pending approval by the Office of Management and Budget and publication in the Federal Register in mid-July.

ers are using FM translators now.

Industry observers say they expect there will be widespread interest from AM operators, particularly daytimers that offer no nighttime service. But some also sound a note of caution.

"As many AM stations that I feel will be interested, relatively few will actually be able to take advantage of the option," said Bob du Treil Jr., president of engineering consulting firm du Treil, Lundin & Rackley Inc.

WRHI(AM) told the FCC that thanks to its FM translator, 'at night we are now able to give our community a good clean signal to broadcast high school football games.'

The regulations allow AMs to use only licensed FM translators already on the air. Only existing construction permits for FM translators that have not expired can be used.

The commission placed no limit on the number of fill-in FM translators allowed for an AM station.

The FCC previously had rejected arguments in favor of this rules modification; but in the latest ruling it switched direction, citing increased interference levels for AM broadcasters and the need to fill service voids in their coverage areas to remain competitive in the world of mass media.

The commission recently had issued Special Temporary Authority for some AMs to rebroadcast their signals on translators. It cited the generally favorable comments of those broadcasters in its Report and Order making the change official.

'RE-DISCOVERED LOCAL RADIO'

The licensee of WDXY(AM) in Sumter, S.C., told the commission in public comments that "the station's FM translator has been a God-send for the radio station and the Sumter community." The station had been suffering from a "poor signal and low ratings," officials wrote.

Similarly, Alan Miller, managing partner of WRHI(AM) in Rock Hill, S.C., described the benefits of that station's FM translator.

"In many cases listeners within our own community have rediscovered what local radio is all about. In particular, at night we are now able to give our community a good clean signal to broadcast high school football games," Miller wrote to the commission.

The FCC granted approximately 220 STAs to AM licensees to rebroadcast on FM translators since the agency began granting such authority in the summer of 2008, according to the commission. An FCC spokesman could not determine exactly how many AM broadcast-

The number one challenge for AM broadcasters is finding FM translators that are eligible, du Treil said, citing the need for the 60 dBu contour of the FM translator to be entirely enclosed within either a 25 mile circle centered on the AM transmitter site or the 2 mV/m daytime contour of the AM station, whichever is smaller.

As of Dec. 31, 2008, there were 6,120 licensed FM translators and boosters in the United States. Observers contacted for this story said there was no way of predicting how many existing licensed FM translators could be used by AMs under the rule change, nor how many translators are licensed but currently off the air.

"Even if a FM translator is found to be eligible, the next big hurdle will be negotiating a deal for the FM translator itself," du Treil said.

In fact, he thinks it was a disservice to AM licensees for the FCC to approve FM translators for use without providing a reasonable opportunity to obtain service.

"For the moment there is no opportunity for AM stations to apply for a new FM translator," du Treil said, "and who knows when that window might open."

'ONE-SIZE-FITS-ALL RULES'

The FCC has already noted that LPFMs, not translators, will have the next opportunity to apply for new spectrum.

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NEWSWATCH

NEWS ROUNDUP

SPECTRUM INVENTORY: The Senate Commerce Committee wants Congress to get an inventory of how the nation's spectrum is being used and managed. The committee passed a measure backed by Communications Subcommittee Chairman John Kerry, D-Mass., that would have the Federal Communications Commission and the National Telecommunications & Information Administration create a database so the public could keep track of auctions or changes in frequency allocations or assignments. The administration supports the measure as officials consider the lack of available wireless airwaves a barrier to widespread mobile Internet access, a top priority for President Barack Obama. A companion bill has been introduced in the House.

AT&T CRUISECAST: AT&T CruiseCast is now available in Avis Rent A Car vehicles in several Florida cities. The system uses satellite TV technology from RaySat Broadcasting that delivers 22 video satellite channels and 20 satellite radio channels to a mobile unit in automobiles. Advance rental reservations are required, see *www.avis.com/cruisecast*.

JOHN ORLANDO: According to Roll Call, John Orlando is in the running to head NAB. If it came to pass, this would be his second time at the broadcast lobbying group; Orlando, a Democrat, was NAB's lead lobbyist before moving to CBS more than three years ago. Radio World looked at other potential candidates in the July 1 issue.

SAFER: The National Federation of Community Broadcasters, National Public Radio and the Corporation for Public Broadcasting announced the SAFER project — Station Action for Emergency Readiness. Organizers said SAFER will develop customizable plans to help stations stay on the air, online and in touch with their audiences through mobile devices during crises.

CAR INTERNET RADIO: QNX Software Systems, which provides operating systems to help automakers deliver software updates and new features to new cars, will support Pandora Internet radio. Pandora becomes the newest company to contribute to the QNX Car program, which QNX says speeds up prototyping and reduces engineering costs. QNX demoed an infotainment system with integrated Pandora support at Telematics Detroit 2009 in June.

TRANSLATORS

(continued from page 5)

After that filing window is past, the FCC said it would revisit the issue of expanding opportunities for AM stations to use FM translators.

Jack Sellmeyer, principal engineer of Sellmeyer Engineering, said AM broadcasters will face numerous technical challenges in seeking to take advantage of the change.

"The R&O is full of technical hurdles," Sellmeyer said.

As an example, he cited "a local daytime operator who has a tight null, which pulls in the 2 mV/m contour in its local market. Maybe the station has a good signal but is hurt in the area of the null. Well, his maximum FM power will be artificially limited by that null. I think there are some significant problems with the one-size-fits-all mentality in the new rules."

The FCC said in its Report and Order that AM audience share has dropped to 17 percent and the median age of AM listeners is 57 years old. Many observers said those are ominous numbers for AM broadcasters already facing severe economic challenges.

"It's certainly an indication of the reality that small AM broadcasters are facing in a digital age," said Barry Thomas, CPBE, CBNT, vice president of engineering for Lincoln Financial Media and president of the Society of Broadcast Engineers.

"I suspect in some ways the decision [by the FCC] was based on the economic situation. This might give troubled businesses another way to compete."

However, there will be new expenses incurred by AM broadcasters using the FM translator option, Thomas said, either by purchasing an FM translator license or pursuing brokerage agreements. Additional equipment may also be needed for the delivery of programming.

> **The R&O** is full of technical hurdles.
>
> – Jack Sellmeyer

"It's always a challenge solved case by case, but IP codecs could be a great way to deliver programming," Thomas said. "Off-air delivery is certainly the cheapest but risky. It's susceptible to interference from someone running a nearby hair dryer."

David Obergoenner, director of engineering for Zimmer Radio Group, said he expects the rules will help some AM stations a great deal. He also predicts the value of translators will increase.

"In my case, it will likely price a translator I've had my eye on out of our reach," Obergoenner said.

He also speculates that interference will increase on the FM band from translators that have been dark and now will come back on the air.

"I think it will prevent some LPFM stations from getting on the air," he said.

Few commenters opposed the rules modification, the FCC said.

The agency noted the concerns of Prometheus Radio Project, a group devoted to promoting low-power FM. Prometheus filed comments expressing concern that expanding AM service to include FM translators would take away possibilities from new low-power FM entrants.

CBS Radio argued against the change, saying the FCC's prior reasons for rejecting cross-service translating — namely, that most AMs had no need for fill-in facilities on the FM band — remain sound.

The National Association of Broadcasters was in favor the rules modification, which will help AM stations overcome some of the technical challenges they face, said NAB Executive Vice President of Media Relations Dennis Wharton.

"AM stations broadcast some of the most localized programming in America, providing listeners with all-news, all-sports and all-talk formats focusing on community issues. We salute the FCC for recognizing the role played by AM stations across the country," Wharton said.

AM TRANSLATOR FAQ

A handy checklist courtesy of Bob du Treil Jr. of du Treil, Lundin & Rackley (www.dlr.com).

Which classes of AM stations are eligible?

All classes of AM stations are eligible for a fill-in FM translator.

Are commercial and non-commercial stations treated differently?

Yes. Commercial stations are only eligible for commercial FM translators outside of the FM reserved band (below 92.1 MHz).

How do I determine if there is an eligible translator in my area?

One must first determine the AM station eligible area. This is defined as the lesser of the daytime 2 mV/m contour or 25 miles (40 km). An eligible FM translator must have its predicted 60 dBu (1 mV/m) contour entirely contained with the eligible area. Also, the FM translator must have be authorized a license or construction permit as of May 1, 2009.

What about pending FM translator applications?

Any pending FM translator applications are not eligible for the AM fill-in service.

What about LPFM stations?

LPFM stations are "non-commercial" and are, therefore, ineligible for commercial AM station fill-in. However, agreements with LPFMs are possible provided the deals comply with the "non-commercial requirements" of LPFM stations.

Can AM stations file applications for FM translators?

Not for some time. The FCC anticipates opening a filing opportunity for new FM translators, but it will not be until after a new LPFM filing window.

Can an AM station feed an FM translator by any method?

Yes. FM translators for AM stations are, by definition, "fill-in" translators. Therefore, any terrestrial facility may be used to receive the signal that is being rebroadcast.

What height/power restrictions are there?

The rules for normal FM fill-in translators apply. The maximum ERP is limited to 250 watts with no height limitation, provided that the predicted 60 dBu contour of the translator does not extend by any amount — no exceptions — outside of the AM station eligible area. However, as with all FM translators, the normal allocation requirements must also be met.

Can modifications to FM translators be filed?

Yes. FCC-defined "minor change" modifications that would allow an otherwise ineligible FM translator to meet eligibility requirements are permitted. However, such modifications must also meet the normal FCC allocation requirements.

LIVE & LOCAL

Your Story Is Out There

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In Fargo, ND there was more than enough news this past winter as floods ravaged the area. Armed with nothing more than an ACCESS and a mic, talk show host Scott Hennen was on the scene and on the air immediately.

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INTERNET

(continued from page 1)

In terms of listenership, "Sixty-nine million Americans per month listen to online radio, according to Arbitron and Edison Research in their Infinite Dial report in 2009," said Jake Sigal, principal of Myine Electronics, maker of the IRA Internet radio.

Fadul of Grace Digital said, "According to a J.P. Morgan study published in 2008, Internet radio listenership was estimated at 62 million by the end of 2007."

Most of this listenership is through Web-connected computers. So what is the market for Internet radio receivers?

"I have seen it estimated at around 100,000 units for 2009," says Bob Crane, president of C. Crane Co. and maker of the CC Wi-Fi Radio. "It is a growing market."

WHO LISTENS

The audience for Internet radio receivers is based on "the iPod generation," said Deanna Dal Pos, "the young who have grown up with the Internet (both male and female) and the older generation (typically men) who are curious and willing to experiment with technology."

Maybe so. But at C. Crane, "Our number one purchaser wants to improve their reception of their favorite station," said Crane. "This may surprise some station owners who do not stream."

Fadul says that there are many reasons consumers are buying Internet radio receivers. Besides the obvious — being able to hear a favorite Webcaster while away from their computers — consumers of these products want more than what is on local AM and FM stations, without having to pay for premium services, he says.

Other reasons include poor over-the-air signal strength, a desire to have an Internet radio as their bedroom clock radio and access to personalized music services such as Pandora.com or to international stations or local stations "back home."

Also, "They enjoy music that is seldom played from standard AM/FM stations — different language, less prolific genres; bluegrass, barbershop quartet, dixieland, fusion, reggae, western," Fadul said, or "they want a higher-quality audio source. Many Internet radio stations are 64 –128 kbps which is higher quality than analog and even most HD Radio stations."

GROWTH FACTORS

Even with their availability at Best Buy and Saks Fifth Avenue, Internet radio receivers are far from selling at the same rate as iPods and HDTV sets. Besides increased visibility with consumers, what would help boost the penetration on Internet radio receivers?

A price drop wouldn't hurt. Typically, Internet radio receivers sell for $150 and up, although prices have been dropping in recent years.

"Price reductions will always drive demand and a 10-figure advertisement budget wouldn't hurt either," said Fadul. "In the meantime, word of mouth, customer referrals and integration with premium Internet radio content providers — Pandora, CBS Radio, Sirius — are starting to create an awareness of the advantages of standalone Internet radio devices."

"Hands-on experience will help the technology get out to the masses," said Sigal. "Our products cater to the average busy nontech-savvy user who wants fast set-up without all the bells and whistles."

One area where dedicated Internet radio receivers will not likely grow is in the mobile market. The reason: Lacking any portable technology that can deliver Internet radio to the 2009 equivalent of a transistor radio, today's consumers are accessing Internet broadcasters through 3G wireless devices.

The Sonoro Elements Wi-Fi Internet Radio

"Mobile Internet requires a mobile Internet receiver like an iPhone," said Sigal. "Unless there is a free Internet receiving device [available], using your mobile phone — which you already pay a monthly fee for — seems like the logical way to go."

An Internet radio receiver in every home?

The idea seems outlandish. Yet there was a time when people might have scoffed at the notion that every home would have a PC, a television or an analog AM radio.

Fadul is bullish about the future of Internet radio receivers. "Currently, when a consumer leaves their computer, the only source for real-time audio is a FM/AM clock radio/tuner," he says. "It is only a matter of time until consumers will not accept that. We are seeing today that consumers are demanding the same music choices they have on their computer in every room of their house. Those needs can be satisfied most effectively by a dedicated Internet radio audio device; in other words, an Internet radio receiver."

A Promotional Image for Grace Digital's GDI-IR1000

DEVICES

(continued from page 3)

terns became apparent in the survey results. Among consumers who listen to their portable digital music players in their vehicles, more than one-half use an auxiliary input jack, while approximately 20 percent use a wireless FM transmitter.

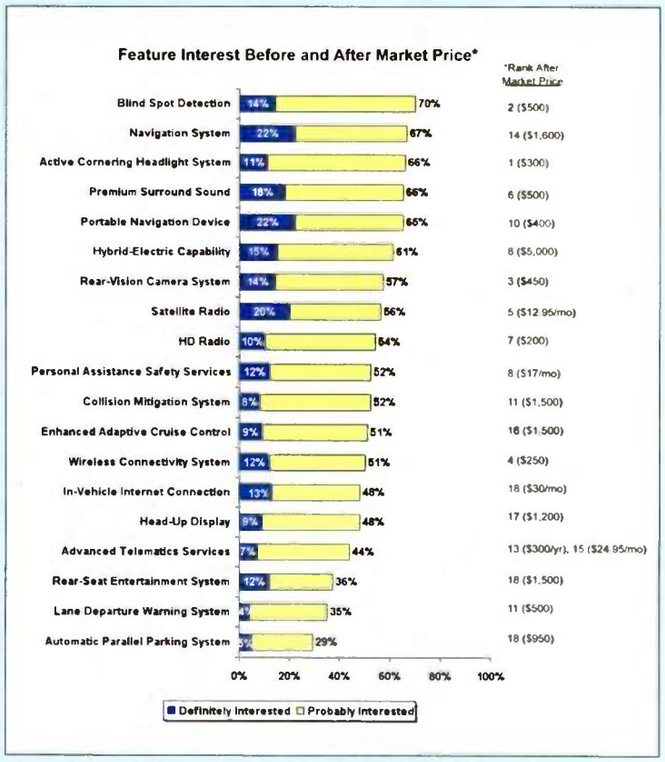
Nearly two-thirds of consumers indicate that they would like the ability to listen to a portable digital music player through their vehicle's speakers, while 27 percent express a desire to use a smartphone's music capabilities in conjunction with their vehicle's audio system.

What was the top feature participants said they'd want in a new car, even after hearing the price? "Active Cornering Headlight System" ranked number one. These lights are tied to the steering system and mimic the turn your car is making, such as a 90- or 45-degree turn.

A Collision Mitigation System ranked in the middle of the survey at number 11. This system looks at what's around the car and uses visual, physical and audible cues to warn drivers of a potential collision. If it senses a crash, it tightens your seatbelt, hits the brakes and "moves your seat into a position that's ready for a crash. It reacts before you can," Marshall said. Those who didn't want this feature said they didn't want to give up control of the car or were waiting for the technology to improve before purchase.

The features surveyed all exist, but they are not all on cars right now. Some are only on luxury models. Automakers use the information to decide what features they should expand to other models.

J.D. Power surveyed 19,249 participants in April and grouped people by car size, since you're more likely to stay with the size car you have now when you get a new one, according to Marshall.



A graphic from the J.D. Power & Associates 2009 U.S. Automotive Emerging Technologies Study. The bar graph indicates consumer interest absent of any mention of price. The column labeled 'Rank After Market Price' indicates the rank of consumer interest in features after the estimated market price of each. Price quote is listed in parentheses.

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NPR Cranks on Elevated Power Testing

It Hopes to Recommend Channel Protection Ratios in September

BY LESLIE STIMSON

As the first portable HD Radio model hit store shelves in July, the discussion over elevated FM digital power became more urgent, and those lobbying for and against a power increase let the Federal Communications Commission know their thoughts.

IBiquity and NPR, meanwhile, offered up different, interim steps the agency could take before rendering a decision on a full, voluntary 10 dB increase.

IBiquity and Greater Media proposed an immediate, interim 6 dB increase and submitted indoor reception tests results for various digital power levels on a Greater Media Boston station to back up the request (see page 12).

NPR prefers that the commission wait until NPR can deliver its latest testing results; it opposes an "arbitrary" across-the-board increase that it believes would fail to prevent new analog interference. However, should the FCC feel compelled to make a decision sooner, NPR proposed its own interim increased power approach based on distance separations and station class (see sidebar at right).

At the same time, NPR Labs personnel were racing to meet a self-imposed accelerated test schedule. The lab plans to have mobile field tests completed in various markets and data tabulated this month. It hopes to deliver results and recommend channel protection ratios — the foundation of an allocation policy — to the commission next month. NPR also hopes to present its test findings at the NAB Radio Show.

Minnesota Public Radio's Terry Cockerill and Mike Hendrickson with Harris HPX transmitter

As Radio World's "The Leslie Report" first reported in July, NPR Labs had completed two-thirds of its mobile field testing and was close to beginning the final leg of that testing in a Baltimore suburb.

RHODE ISLAND TESTS

"Everybody wants an answer about how to manage power in light of adjacent neighbors," John Kean of NPR Labs said, "because we expect analog to be around for many years to come."

The broadcaster first conducted mobile field tests in Rhode Island. Over numerous several-day periods, WKLB and WRNI conducted elevated power tests, looking at modeling field- and lab-generated mobile audio samples. Those two stations were chosen because they're first-adjacent to each other and WKLB had received temporary high-power authorization earlier this year.

Class A WRNI is part of Rhode Island Public Radio and operates on 102.7 MHz in Providence. Class B WKLB is owned by Greater Media and

(continued on page 12)

A Ford Focus was fitted with NPR Labs' custom Calibrated Ground Plane Antenna, which was used to receive the over-the-air audio as well as collect field strength data. NPR collected field strengths continuously on 88.3 MHz (KBPN), 88.5 MHz (KCRB) and 88.1 MHz (lower first-adjacent to KBPN). They also recorded fast (Rayleigh) fading to determine multipath levels and audio WAV files on the analog FM receiver, a Chevy Suburban unit.

NPR'S INTERIM POWER BOOST PROPOSAL

An across-the-board HD Radio power increase would be arbitrary and fail to avoid new analog interference, NPR told the FCC in July. However: "If the commission deems it vitally necessary to authorize an interim power increase, then it should only authorize an increase that avoids additional adjacent analog interference, and adopt mileage-based power increases."

The commission should consider distance separations and facility size in ways appropriate to the commercial and non-commercial band, the network believes. Its proposal for stations in the non-reserved band is based on minimum separation requirements according to station class.

The NPR proposal for the reserved FM band is adapted to contour protections:

- Compute the F(50,50) 60 dBu service contour of the protected station
- For the first-adjacent IBOC proponent's FM carrier, determine F(50,10) field strengths (FS_I) at intersections with the service contour of the protected station
- The allowable IBOC power, in dBc, is the maximum of: –(20 dBc – 60 dBu + (IBOC station maximum analog) FS_I dBu + 6 dB)

This formula determines the IBOC transmission power above the standard –20 dBc level. For example, if 47 dBu is the highest field strength of the first-adjacent IBOC proponent station at any intersection with the protected station contour, then the allowable IBOC power is: –(20 – 60 + (47 + 6)) = –13 dBc (5.0%)

The only sure way to resolve interference concerns is to avoid interference in the first place as assurances that interference can be resolved on a case-by-case basis are likely to prove elusive and expensive to implement, NPR concludes.

— Leslie Stimson

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Selected content from Radio World's "The Leslie Report" by News Editor/Washington Bureau Chief Leslie Stimson. To receive the free, bimonthly e-mail newsletter, subscribe at www.radioworld.com/subscribe.

PROPONENTS SAY DRIVE TESTS SHOW 'SERIOUS DIGITAL COVERAGE DEFICIENCIES'

Broadcast organizations have had to get very specific in their effort to convince the FCC to approve a power increase.

Greater Media says elevated power tests conducted by its engineers along with iBiquity Digital at WKLB(FM), Waltham, Mass., show that a power increase to less than –14 dB — which is 6 dB above the currently authorized digital power level — would provide little "if any" improvement to FM IBOC's reception issues.

The company's Milford Smith tells me the tests took place over a month's time and looked at results for various digital power levels, when the digital power was at –20 dB up to and including the proposed –10 dB. They did drive tests using a JVC KDHDR50 car HD Radio, and also indoor tests using a Sony table HD Radio, the Sony XDR-S10HDiP and a prototype KRI-made portable armband radio.

In comments filed with the commission, Greater Media said mobile tests show at the current digital power level of –20 dB, there are "significant and serious digital coverage deficiencies within the WKLB(FM) 54 dBu protected analog contour" on all the measures routes.

The "cliff effect" of digital radio propagation characteristics make any loss of the digital signal, even momentary, irritating to the listener, who is likely experiencing the fallback to analog accompanied by a significant decrease in fidelity. Greater Media and iBiquity point to numerous points along all the tested routes where the digital signal was lost. And when digital dropouts occur with a multicast channel, the signal is simply gone.

Digital power at –14 dBc (reflecting a 6 dB increase over the current digital power level) showed significant improvement but also evidence of occasional losses of the digital signal within the underlying analog 54 dBu protected contour. IBiquity has proposed an interim power increase of 6 dB — which provides significant improvement, but fails in terms of replicating the analog signal coverage, say the technology developer and Greater Media.

With the digital power level raised 10 dB, at –10 dBc, there was marked improvement in digital coverage. "Other than terrain shadowed area in the Providence/Pawtucket and Plymouth areas, digital reception is virtually flawless over the various routes," wrote Greater Media and iBiquity. Virtually no digital signal dropouts were observed. "This is the level of service a listener anticipates and expects," they wrote.

It's an interesting experience to read comments from HD Radio advocates iBiquity and Greater Media that point out *deficiencies* in digital coverage.

They've been saying this for more than a year, when the 18 "Joint Parties" proposed the voluntary digital power increase. The new tests build on the previous Los Angeles indoor reception tests and involve structures representing more types of construction materials.

INDOOR RECEPTION 'IMPOSSIBLE' TO 'NON-EXISTENT,' SAY IBIQUITY, GREATER MEDIA

Greater Media and iBiquity conducted indoor elevated power reception tests as well, again using WKLB(FM).

They took measurements at six locations with buildings chosen to represent various types of construction. This test is noteworthy because it used several buildings and multiple radios within the buildings, and because it involved a station whose signal covers an entire metro.

The first three locations in downtown Boston are within 8 to 10 miles of the WKLB transmission facility in Needham, Mass. They are the Greater Media studio building, a low-rise, two-story structure built with masonry, steel and glass; The Caning Shop, a single-story building of wood and masonry construction; and the Prudential Tower, a high-rise skyscraper of steel, aluminum and glass construction.

The other points where measurements were taken were farther out in the Boston Metro. They are a two-story, split-level home in Andover, of wood frame construction; the Comrex Corp. headquarters, a two-story, steel-framed, wood building in Devens; and a three-story apartment building of poured concrete (with rebar) construction in North Attleboro. These locations are at approximately the edge of digital coverage assuming the currently authorized –20 dB power level.

Up to four receivers, operated with manufacturer supplied antennas, were used simultaneously in each location to characterize reception at various points within each building.

Generally, the closer testers went to the core of each building, the worse the digital reception was. Digital power was increased in 2 dB steps from –20 dB to –10 dB until the radio solidly locked onto the digital signal.

Testers concluded that in many types of buildings, digital reception is "simply impossible" on IBOC table radios and "nonexistent" on the new class of portable receivers about to be introduced into the market. An interim power level increase may partially mitigate the problem in some fixed locations, they concluded, however only the full 10 dB increase will permit reliable service to portable IBOC receivers and come close to replicating analog coverage.

As I noted, it's striking for advocates of HD Radio to state publicly that "digital reception is simply impossible in many types of buildings"; this says a lot about the HD Radio rollout.

In pushing for an increase, the proponents are reiterating that they intentionally asked for a certain power level to be low enough so as not to cause analog interference to those stations nearby as well as those not yet digital. Engineers have said to me recently concerning the power issue that the NRSC, a largely volunteer effort, did what testing it could given the time and resources it had.

NPR

(continued from page 10)

operates on 102.5 MHz in Boston.

The Rhode Island tests, a story "The Leslie Report" also broke (*www.radioworld.com/article/82316*), differed from past NPR Labs tests because they involved taking mobile audio measurements to back up measurements made in the lab. WRNI and NPR Labs engineers took measurements at certain points from one van while Greater Media and iBiquity engineers followed in another and also took measurements for corroboration and redundancy on collecting the NPR audio samples.

A core working group — consisting of several commercial radio directors of engineering as well as iBiquity staff, engineers from CEA, NAB and Harris — advises the lab on its methodology for the elevated power tests. A larger peer review group of several dozen stations — both commercial and non-commercial — and industry stakeholders are reviewing and commenting on the study.

MINNESOTA TESTS

In Mid-June, NPR Labs conducted mobile field tests on two Minnesota Public Radio stations.

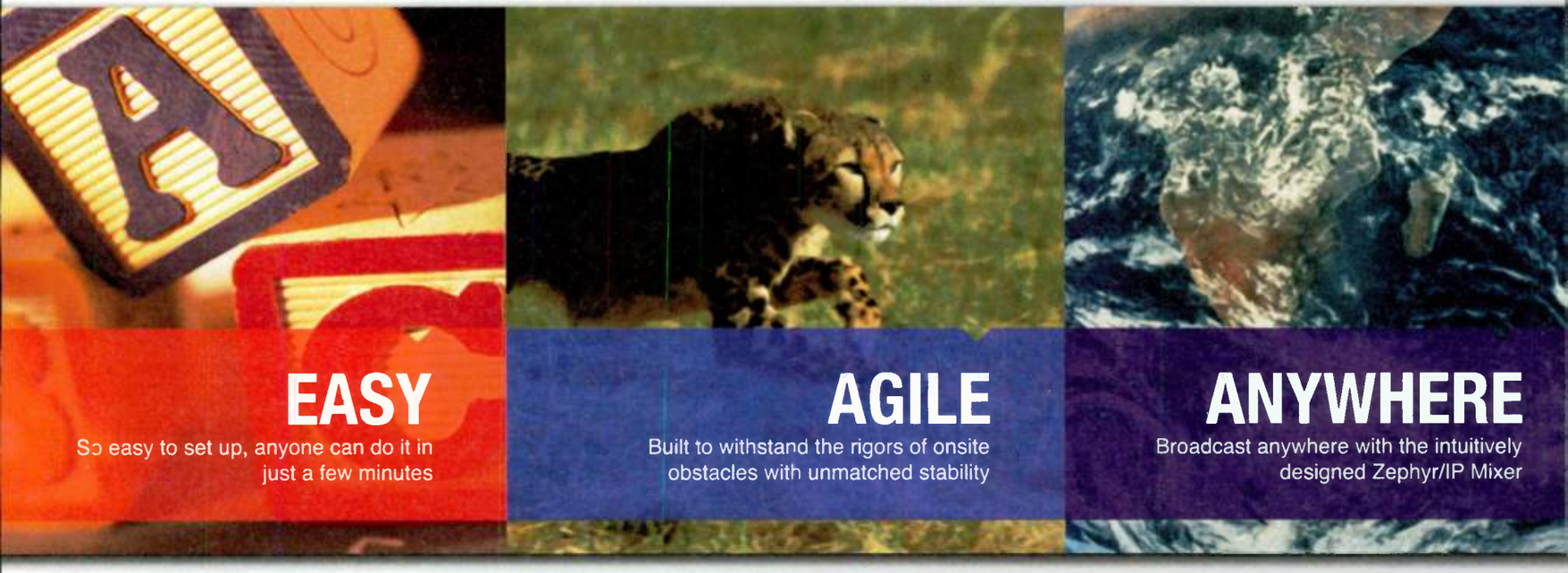
Harris shipped an HPX40 high-power, common-amplification transmitter to KCRB(FM), Bemidji, Minn., for the elevated power tests, which took place on three days and two nights. Engineers raised the digital power for the Minnesota Public Radio station at its transmitter site in Black Duck to –20 dB, –14 dB and –10 dB while NPR Labs took mobile field measurements from both KCRB and on so-called "victim station" KBPN (FM), Brainerd, Minn. with test gear in its measurement vehicle.

KBPN is a first-adjacent to KCRB and 75 miles to the southeast. The idea of this "pilot" test was to see how raising the IBOC transmission power on KCRB affected mobile reception of KBPN as samples of loud and soft music and male and female talk were aired.

Engineers took audio recordings and field strength measurements for each test. Kean and Jan Andrews of NPR Labs conducted the testing along with MPR engineers Mike Hendrickson and Doug Thompson. CBS Radio DOE Glynn Walden, a member of the working group that's advising NPR on the tests, rode in the car and coordinated transmission powers and cued audio samples from KCRB and KBPN. Harris' Tim Anderson, Brett Blankenship and Terry Cockerill helped with the installation and transmitter testing.

The results were being tabulated in July, Kean said, and the next step was to have the audio samples evaluated by listeners in a controlled subjective test. Kean said the material gathered in Minnesota and in Rhode Island will determine if the field audio and lab-generated samples are "statistically indistinguishable." It's an important validation, he added, to use lab-generated samples for the in-car testing slated for a Baltimore suburb which will determine the IBOC interference ratios for the project.

NPR Labs is also performing SCA host compatibility tests.



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End Your Bulb Replacement Routine

LEDs Last Almost Forever and Can Provide Some Side Benefits

Some things can drive an engineer mad. One of the most frustrating is panel lights that burn out.

Our RW colleague Buc Fitch has a fix: LEDs. They have an almost infinite life, ending your bulb replacement routine.

WORKBENCH
by John Bisset

Read more Workbench articles online at radioworld.com

Here are steps to replace incandescent bulbs in Marti discrete STL-10 transmitters.

Buc writes that the notable annoyance in these units is the relatively fast burn rate of the incandescent bulbs behind the meters. Frustration is compounded because replacing these bulbs is a disruptive exercise at most stations. The units must be powered down and taken out of the rack, the bad bulbs desoldered and the new soldered back in. You can only do this when you don't need your STL; and if this is your only link, think 3 a.m.

The STL-10 transmitters lack a pilot lamp to indicate power to the units; Buc's modification permits the replacement LEDs to also serve as pilot lights, though they do provide good meter illumination, too, as seen in Fig. 1.

Fig. 1: Replace incandescent bulbs with LEDs to illuminate the meters. Bonus: The glow serves as a power 'on' indicator.

To this end, Buc uses a highly focused white light LED from Electronic Goldmine; but any typical T 1-3/4, 5 mm, 20 mA LED will do.

Your first step is to measure the optimal LED current, as seen in Fig. 2. This ensures the mod will work *before* you tear into the equipment. Here, the trusty old Simpson shows 20 mA, optimal current for the LED.

There is a benefit to using this T 1-3/4 size LED. It slides smoothly through the hole allotted for the original bulb and solders easily onto the connection posts in the rear. If you want a more vivid color or a more diffused backlight, purchase what you desire in a 20 mA T 1-3/4 5 mm format.

After gaining access inside, you'll be replacing the old lamp, shown in Fig. 3. Note how the heat has toasted the back of the meter case.

The incandescent bulbs used a pair of two 1/4 watt resistors in series (a 10 ohm and a 3.3 ohm) not only to reduce the supply voltage and lengthen bulb life, but

(continued on page 18)

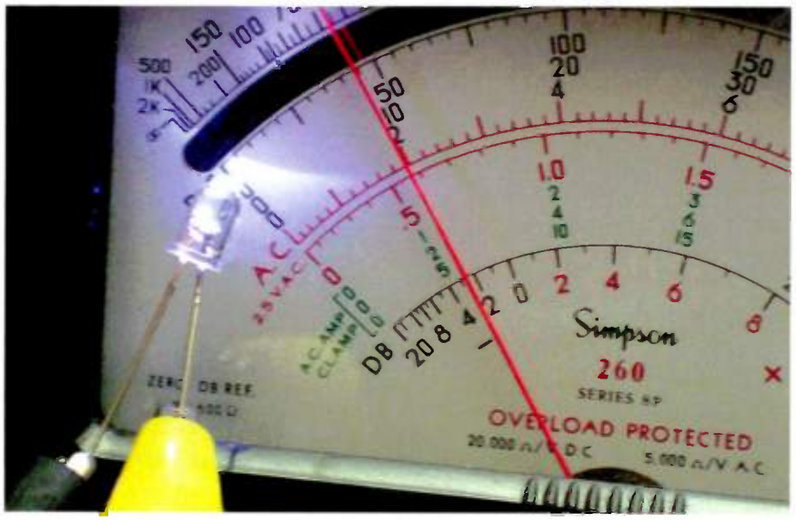


Fig. 2: The trusty old Simpson meter is used to check operating parameters of the LED before installation.

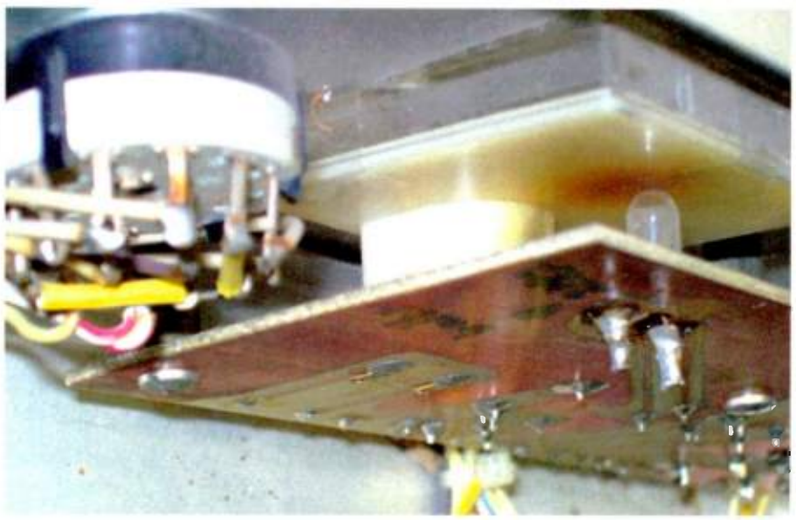
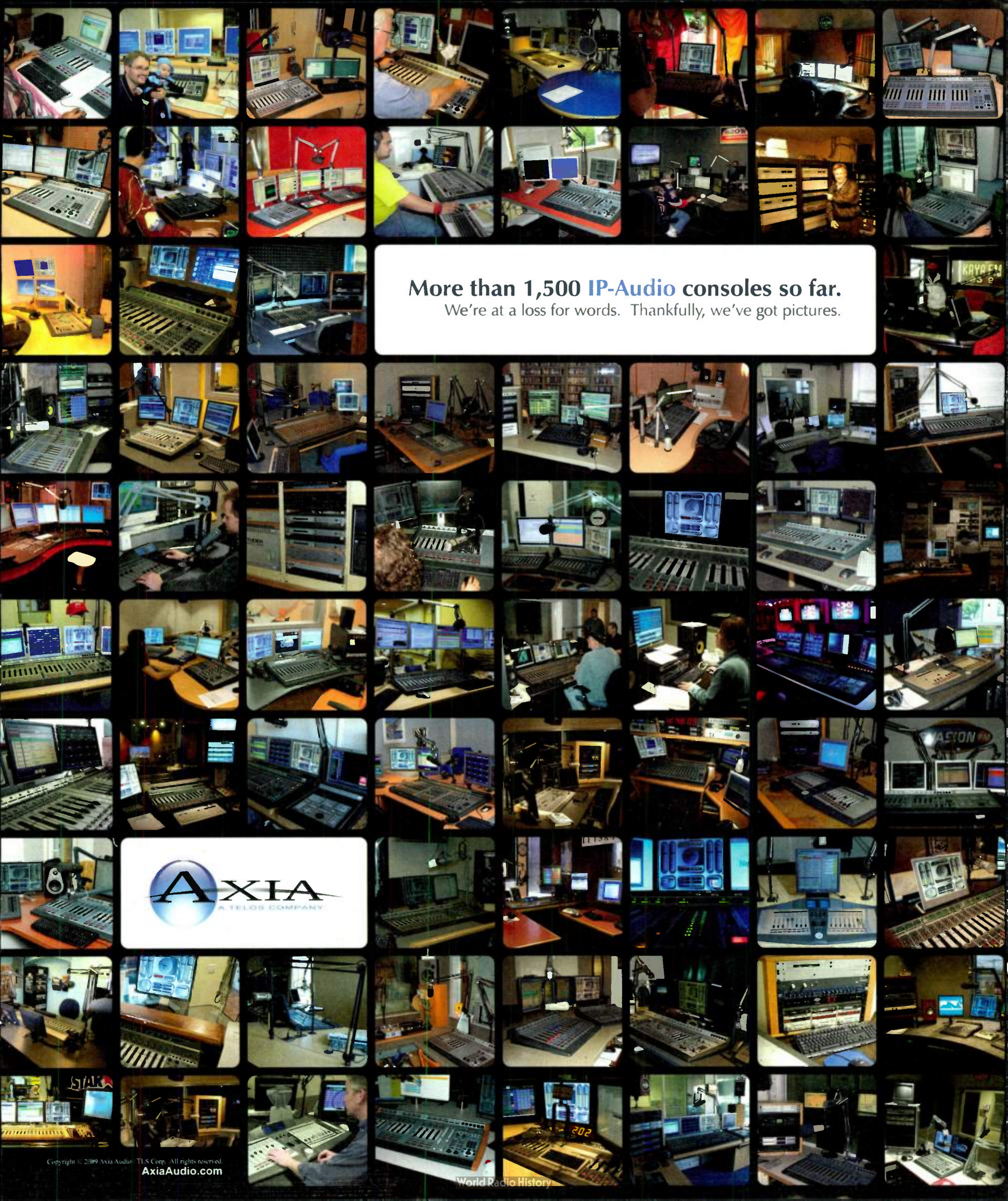


Fig. 3: This is the culprit, a burned out incandescent bulb, visible at right. It effectively has roasted the back of the meter.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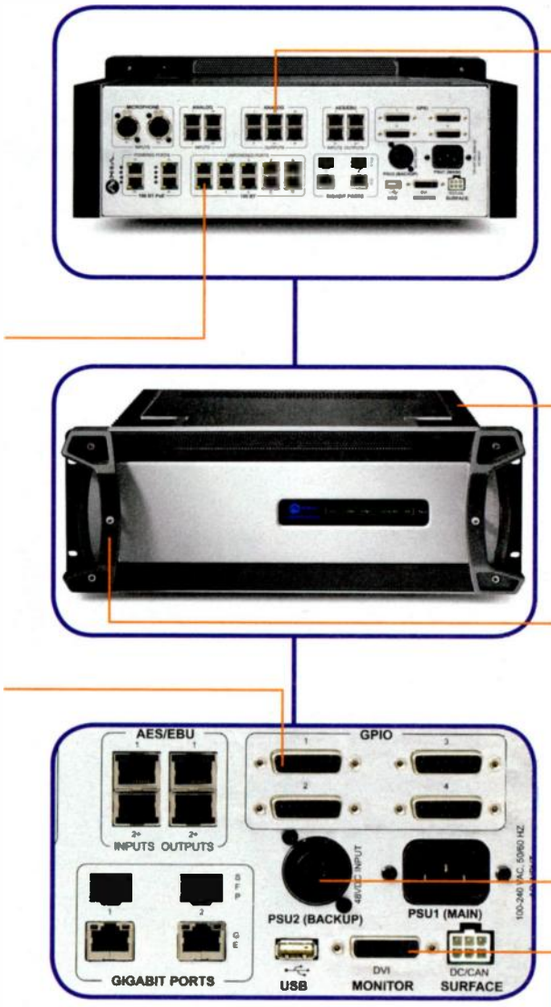
Easy as π • PowerStation combines a console DSP engine with audio and logic and a network switch, **all in one box.** As its name implies, there's a whole lot o' muscle inside that burly frame, but that doesn't mean it's complicated. In fact, setting up PowerStation **couldn't be easier:** connect your studio gear with standard CAT-5 cables, connect your console with just one cable, name your sources and set preferences with a browser, and you're ready to rock. PowerStation makes building studios about 3.14 times easier than ever.

GPI Oh! • **GPIO ports are built in** to PowerStation — no breakout boxes or add-on converters needed. One day, you might not even *need* logic ports: more and more products from companies like 25-Seven Systems, Audio Science, ENCO, Google Radio Automation, International Datacasting, Omnia Audio, Radio Systems and Telos (to name just a few) use the Livewire™ standard to send their audio and logic control directly to Axia networks over a **single CAT-5 connection.**

Everything's included • Yeah, we said *everything*: PowerStation combines half-a-dozen essential tools into one compact unit. No hidden extras to buy, no "gotchas" after purchase. Inside that muscular chassis you'll find a **bulletproof mixing engine** capable of handling consoles up to 40 faders, a beefy power supply (with optional **redundant power**), machine control ports, and **audio I/O**, all in one box. And of course, since it's from Axia, the IP-Audio experts, a studio built with PowerStation can stand alone — or it can become a part of a large network quite easily. Thanks to **PowerStation Simple Networking,** you can daisy-chain up to 4 PowerStations directly for easy multi-studio installation without the need for a separate core switch. Just another way Axia makes IP-Audio easy.



You're covered • Axia has the most comprehensive warranty in the industry — **5 years parts and service**. And (not that you'll need it), **free 24/7 technical support**, 365-days-a-year. We've got your back, my friend.

E-I-E I/O • Finding space in the equipment racks is like living in a barnyard: too many chickens, never enough coops. So our team of obsessive designers fit **an entire studio's worth of inputs, outputs, logic and network connections** – plus an advanced DSP mixing engine and a massive console power supply – into just 4 RU. There's inputs for 2 mics, 4 analog inputs and 2 AES/EBU inputs, with 6 analog and 2 AES outputs. 4 GPI/O logic ports round things out. Want even more? Just connect the PowerStation Aux to instantly *double* the I/O — or plug some Axia Audio Nodes into its **built-in Ethernet switch.**

Fan free • PowerStation is **silent and fanless.** Because studios today are already full of PCs, laptops and playout servers clicking, whirring and generating heat — who needs more of that? Not only is there no in-studio noise with PowerStation, those **big extruded heat sinks** are just plain cool. No pun intended (or maybe it was. We're like that, you know).

Built like a tank • Remember when consoles were built to last? We do. At Axia, we're all about the long haul. **There are no compromises:** PowerStation uses only best-of-the-best components. Like studio-grade Mic preamps and A/D converters. A rigid, steel-framed, EM-tight chassis that shrugs off RF like Walter Payton brushing off tackles. An industrial CPU designed for high reliability in harsh environments. Beefy extruded heat sinks. Big, brawny handles to make rack-mounting easy. (And it looks cool, too.)

Redundant power redundancy • The power supply is the heart of any broadcast equipment, right? That's why PowerStation is **hardened against failure** with a **super-duty power supply** that sports enough amps to power an arc welder. And for those of you who like to wear a belt *and* suspenders, there's even a connection for **redundant auxiliary backup power** – with automatic switchover, naturally – that kicks in if it's ever needed.

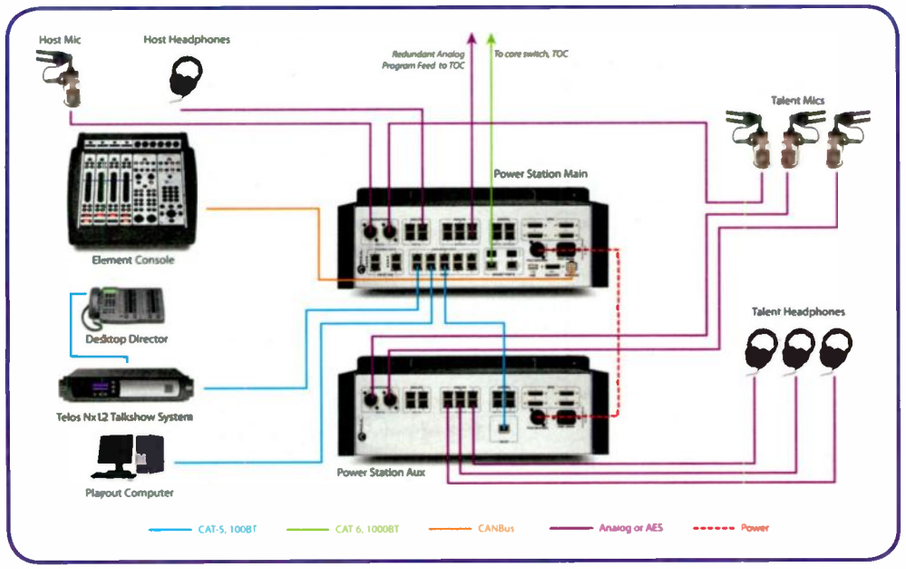
Screen play • Yep, that's a DVI connector. **Your favorite monitor** – standard or widescreen – plugs in to present the console operator with Axia's "so easy an overnight jock could do it" **info-center display.** Meters, timers, fader assignments, mix-minus settings and more, all on-screen, on-demand.

Element shown in Silver/Charcoal color scheme. Also available: Bronze/Charcoal and Warm Grey.

Element 2.0 • With more than 1,000 consoles already on the air, Element is a huge hit. And now, thanks to suggestions from our clients, it's better than ever. Element 2.0 has cool features like Omnia™ **headphone processing** presets to give talent that "air sound", **super-accurate metering** with both peak and average displays, **one-touch phone recording** with automatic split-channel feed, **automatic mix-minus** for every fader, an eight-channel **Virtual Mixer** that lets you combine multiple audio streams and control them with a single fader, and metallic bronze or silver module overlays. And we haven't even begun to tell you about Element's **Show Profiles** that instantly recall talent's favorite settings, its **built-in Telco controls**, fully-integrated **talkback/IFB** and **Mic processing** by Omnia. And durable? Element is nearly indestructible, ready to take whatever pounding ham-fisted jocks dish out and keep going. You want examples? Element's **avionics-grade switches** are rated for more than two million operations. What look like ordinary rotary controls are, in reality, **bullet-proof optical encoders** — no wipers to wear out or get noisy. The silky-smooth **conductive-plastic faders** actuate from the side, not the top, so dirt and grunge stay out. The **high-impact Lexan** module overlays have their color and printing applied on the back, where it **can't wear or chip off**. The frame is made from **thick aluminum extrusions** that are stronger than truck-stop coffee. To find out even more about Element, visit **AxiaAudio.com/Element/** . Grab some coffee and prep for a good, long read — remember, our marketers get paid by the word.

Come together, right now • Now that you know what you can do with PowerStation, let's build a studio. The diagram below shows how a typical Talk Studio might look. Mics and headphone feeds plug into the built-in Mic inputs and Analog outputs... your playout PC, using the **Axia IP-Audio Driver** for Windows®, connects to a built-in Ethernet port... and so does the Telos Nx12 Talkshow System (which sends 12 lines of caller audio, mix-minus and take/drop/next commands over **one skinny CAT-5 cable**). Send a **backup audio feed** to your TOC for extra peace of mind. And after all that, there's still plenty of I/O left to plug in the turntables for the Saturday night Oldies show.

The standalone network • You want your console to be more than just reliable — you want it **built like a battleship.** You want the absolute peace of mind that comes from knowing your gear will **never let you down.** And if you take one studio down for maintenance, you want the rest to be completely unaffected. So we designed PowerStation to be the world's **first networked broadcast console that doesn't *need* a network.** It's completely self-contained: sure, it plays nice with others, but unplug its network cable and it keeps right on truckin'. Build just one studio, or a dozen, at any pace you choose — your PowerStation network is ready to expand when you are.



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WORKBENCH

(continued from page 14)

also to niftily jump some solder traces. To limit the current flow through the LED to its optimal 20 mA, the 13.3 ohm resistor combination is replaced with a 270 ohm 1/2 watt (Radio Shack part # 271-1112) in each of the supply paths of the two meter bulbs, as shown in Fig. 4.

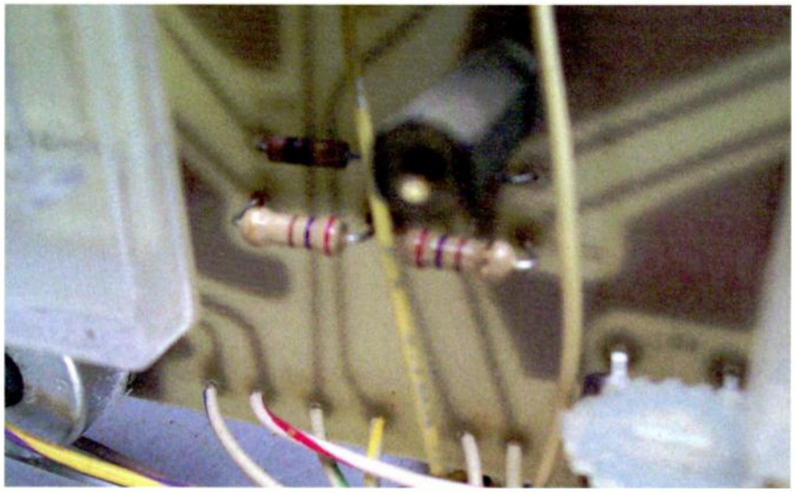

Fig 4: The current limiting resistors must also be changed.

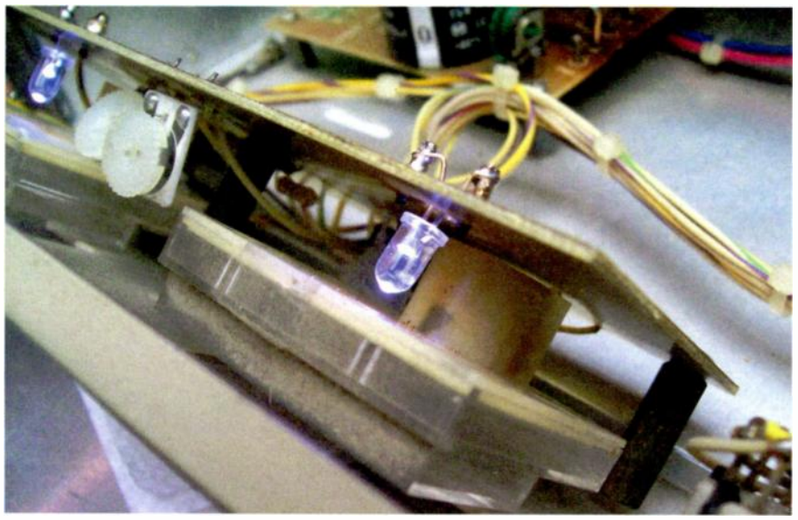

Fig. 5: LEDs are in place and you're ready to button it up.

Buc cautions that although the Marti schematic for the meter board indicates that the bulb supply is AC, be aware that there is an upstream diode inline on the power supply board on one of the "AC" legs so you will need to keep the + polarity of the LEDs connected to the post nearest the outside edge of the PCB for proper operation. Completed LED mounting is seen in Fig. 5.

A similar meter light mod works as well in such diverse units as the CBS 400 series Audimax and Volumax and various audio boards such as the venerable Gates Dualux.

The STL-10 does have some more serious difficulties such as the famous "spur problem" and meter switch replacement. If readers express interest in these subject areas, we'll address them in future *Workbench* columns.

We asked you in our May 20 column to comment on reliable "air chairs" that work well in the studio.

Mike McClain is with the National Park Service and based in Yellowstone, where they're using Domore Chairs. These rugged seats carry a five-year warranty; they were purchased about 10 years ago and are still in use 24/7.

Mike says it's a good chair with only one problem: The arms would sometimes catch under the counter on which the console was sitting.

Domore specializes in "intensive use" seating solutions. Its Web site is *www.scopedomore.com*. Mike McClain can be reached at *mike_mcclain@nps.gov*.

As I put together *Workbench* articles, I'm constantly amazed at the various disciplines of which broadcast engineers must have knowledge. We are one smart breed of engineer!

It's not just studios and transmitters but things like the best jock chair and maintaining site security. They never taught these things in electronics school or college.

Engineer Alan Shea at HCJB's Technology Center likes a security blog, Schneier on Security, compiled by Bruce Schneier.

In a recent discussion, Bruce discussed the "broken windows" theory of crime fighting, which argues that disorderly conditions invite bad behavior and fixing them can help prevent vandalism and crime.

After reading the blog and also seeing our seedy-weedy transmitter site photo in the Feb. 1 *Workbench*, Alan recalled visiting a number of transmitter sites on a mountaintop in upstate New York during a vacation trip.

He noticed a difference in his own attitude if he walked up to a building where grass was trimmed and everything appeared shipshape, compared to a building with grass and bushes growing all over, dirty windows and security/motion lights that didn't work.

In fact, Alan didn't explore too close to buildings where everything was cared for because he felt like someone might be watching him.

When he got back to his station, he related this experience. He and his staff decided to engage a person who lived near their transmitter/tower to mow the grass regularly, keep things trimmed and alert the station to anything unusual.

Alan writes, "We never had a problem with any unwanted visitors."

There was another benefit: The clear brush and working security lights made midnight visits to the site a lot easier and safer. Can you imagine needing to get into the ATU in Fig. 6 at night?

Bruce Schneier's site is *www.schneier.com*. Click on "Blog."

While you're there, take a look at Password Safe, a free Windows utility designed by Schneier. With all the passwords we have to commit to memory, most people either write them down (defeating security) or just use one, which, if compromised, can give unlimited access to the thief.

With Password Safe, users can keep all their passwords securely encrypted on their computers. A single Safe Combination, just one thing to remember, unlocks them all.

John Bisset has worked as a chief engineer and contract engineer for 39 years. He is international sales manager for Europe and Southern Africa for Nautel, and a past recipient of SBE's Educator of the Year Award. Reach him at johnbisset@myfairpoint.net. *Faxed submissions can be sent to (603) 472-4944.*

Submissions for this column are encouraged and qualify for SBE recertification credit.

Fig. 6: Avoid a fine and deter vandals. Trim vegetation from your tower, building and satellite dish.

> **Clear brush** and working security lights made midnight visits to the site a lot easier and safer.

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FreeNAS: A Simple Data Storage Solution

It's a BSD-Based Distribution That Handles FTP and NAS in About a 70 MB Package

BY TODD DIXON

Call it what you will, but several years ago when the venerable Stephen Poole, chief engineer here in the Crawford Broadcasting Birmingham cluster, introduced me to open source software, he created a monster.

RADIO IT MANAGEMENT

My curiosity regarding open source software solutions is insatiable. To his dismay, I rarely stick with one Linux distribution and learn it inside and out; I am always toying with the next piece of innovative software.

This is how I found LTSP (the Linux Terminal Server Project), which I wrote about in the July 16, 2008 Radio World and which has ended up saving our company a small fortune in Birmingham by prolonging the lives of older office computers and re-purposing one of our old Nexgen HP file servers.

Admittedly, the version I wrote about took some real computer knowledge to put into place, but later upgrades of the LTSP software (*http://k12ltsp.org*) make the setup a more plug-and-play experience.

With that success beginning to wane, I was primed to find another purpose for that file server's counterpart — another Nexgen HP file server that had been used at our studio.

BSD-BASED

We had a local FTP server here in Birmingham running SUSE Linux for use by our production staff and creative writers and by engineering to reference product manuals that we have either downloaded or acquired from manufacturers.

We were considering upgrading the FTP server's OS from SUSE 9.3 to OpenSUSE 11.1. At about that time, I had become fascinated by a computer product called a Pogoplug. It is basically a little networked computer the size of a "wall-wart" type power supply that you plug to a wall outlet. You then attach a USB thumb drive or hard drive and have instant network attached storage (NAS).

The two ideas collided when I saw FreeNAS, a BSD-based distribution that handles FTP and NAS in about a 70 MB package.

BSD is not Linux but a UNIX-like operating system used in high-traffic Web servers across the Internet and is virtually bulletproof with regard to network security.

While we hadn't had an ounce of trouble with our current FTP server, a new OpenSUSE installation would easily have been about a 5 GB install. Pogoplug was a bargain for personal use, but not for the volume we were planning on.

This HP file server was loaded with a dozen 36 GB SCSI drives, which FreeNAS set up in a software RAID and we were off and running.

After some simple user and group setup, we backed up our FTP server. We also house a nightly file backup from our Denver cluster in Birmingham. It was backed up to our FreeNAS server too, a double backup.

The main configuration screen for FreeNAS

FreeNAS (*www.freenas.org*) is optimized to not only handle FTP and HTTP traffic, but can also provide MS Windows shared folders with Samba/CIFS for our employees here in Birmingham.

After a pretty basic installation process, you are left with the Web GUI shown in the illustration.

FreeNAS works fine with an old Pentium III (933 MHz), showing only 1 percent CPU usage and 20 percent of the 1 GB total of RAM. I'm not exaggerating, the thing screams. We are about to put it online full time as our complete replacement for our FTP server, but it has ended up giving us much more. Amanda Alexander at our company's Denver cluster has had some issues with one of their file servers. She has packaged it up and sent it to us and we are planning on putting FreeNAS on it.

Each of us probably has a storage room filled with machines that have lost a step in speed or need a $50 hard drive. The echoing sentiment among these pages and elsewhere is to extend life, troubleshoot, fix and reuse. We need to always be searching for how we might repurpose a computer or server so that we can get the maximum benefit from it.

FreeNAS has helped us to accomplish this. It is elegant in function and a perfect option for us to continue to give even more data services to everybody here in Birmingham even while our budgets have been tightened.

Todd Dixon, CBNT, is assistant engineer for Crawford Broadcasting in Birmingham, Ala. This article appeared in slightly different form in Crawford's Local Oscillator newsletter.

Comment on this or any article. Write to radioworld@nbmedia.com.

MARKETPLACE

POGOPLUG STEPS OFF ITS CLOUD

Todd Dixon's article above mentions Pogoplug.

Cloud Engines makes this small device, which connects external hard drives to the Internet, making personal files shareable and accessible. It is targeted to the consumer market and retails for $99.

"Pogoplug enhances the mobile lifestyle by providing seamless access to digital content from any computer or mobile device around the globe," the company says.

Cloud Engines argues that while consumers are buying millions of external drives to store personal content, extending the content outside the home has been too difficult.

Setup is done in moments and requires no networking configuration or installation. "Users simply plug the Pogoplug into an electrical outlet, connect the supplied Ethernet cable to their home network router and attach their external hard drive. Lastly, the product's registration code is entered at *my.pogoplug.com*, after which the Pogoplug is online and ready for use."

The device is compatible with any external USB 2.0 hard drive or memory stick. Content is accessible with Web browser, Windows Explorer, Mac Finder and through the Pogoplug iPhone application.

"According to industry analysts, consumers have purchased over 7 million external hard drives in the past year alone," Cloud Engines states. "The Pogoplug is the perfect accessory to any external hard drive or USB thumb drive, adding desirable functionality at an affordable price, with no monthly service fees."

Cloud Engines was founded in 2007 by entrepreneurs from the digital media and security industries; it's based in San Francisco.

Info: www.pogoplug.com.

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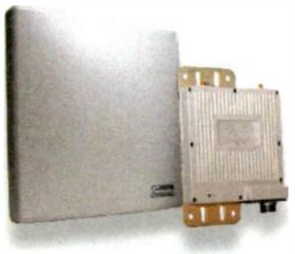

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MARKETPLACE

LARCAN INTRODUCES ENCORE IBOC FM TRANSLATOR

FM stations broadcasting IBOC and wishing to employ a translator have a new option in the DRT-01 Encore, an IBOC translator from Larcan.

The company says the DRT-01 employs a complex IF filter design and linear conversion techniques to shift frequency from the input to another FM band channel. By eliminating the demodulation/remodulation reconstruction process, signal-to-noise performance and integrity of the analog and digital sidebands are maintained. The DRT-01 is based on linear amplifier technology developed for the television industry.

Power output levels of 25–100 and 100–250 Watts are available using a separate broadband linear amplifier. The DRT-01 is frequency agile and is shipping. It may also be operated as an on-channel booster, conditional to adequate separation between transmit and receive antennas.

For information contact the company in Ontario at (905) 564-9222 or visit www.larcan.com.

SURGEX, LYNTEC FORM ALLIANCE

Industry AC power protection and control companies SurgeX and LynTec formed an alliance.

The companies said they will "cross-pollinate" their software and hardware engineering departments "with the goal of delivering vastly improved solutions for professional applications."

LynTec President Mark Bishop stated that his customers were asking for integrated power control and electrical protection systems. Michael McCook, founder of SurgeX, said the companies will collaborate "on the most critical aspect of system integration, the AC power foundation. Our mutual efforts will also move forward on a global scale to provide product solutions for international power platforms." Bishop, left, and McCook are shown.

LynTec is a manufacturer of AC power sequencing products for sound and theatrical lighting systems headquartered in Lenexa, Kan. It also makes automatic gain control systems, isolation transformers, paging switchers, masking generators and other professional tools.

SurgeX, based in Zebulon, N.C., makes power conditioners and surge eliminators for the professional audio, video, broadcast and multimedia marketplace.

For information visit www.surgex.com or www.lyntec.com.

GSS, SILICON LABS PROMOTE DATA CHIPS

Global Security Systems this spring debuted FM radio data chips and RDS-based protocol for cell phones and consumer electronics.

GSS has worked with IC maker Silicon Laboratories to develop FM-based message distribution systems and receiver chip designs that support the Radio Data Service aspects of FM broadcasting.

"The integrated technologies provide cell phone users with FM listening, and add the important feature of state and federal emergency messaging via the FM broadcast infrastructure," GSS stated. "The benefit of this system is the ubiquitous FM broadcast infrastructure and its reliability during natural disasters, weather events and man-made emergencies."

GSS says Silicon Labs' embedded FM antenna technology enhances its system by allowing the receiver to use internal antennas inside a mobile device instead of requiring plugged-in headphone wires.

"This allows mobile devices to remain constantly connected to the FM alerting system, while capitalizing on power-saving mechanisms inherent in the GSS protocol to consume very little current."

In addition, the RDS-based signaling supports targeted messaging to micro geographies, over-the-air programming and activation, scanning algorithms to allow receivers to roam uninterrupted nationwide and addressability down to the chip level, "much like an ESN in a cellular devices," GSS states.

Silicon Laboratories said in the announcement that GSS protocols in conjunction with its FM RDS receiver technology will enable cellular and portable device makers to differentiate their products.

Silicon Labs makes a line of FM receiver ICs that support integrated antennas, digital audio out, worldwide FM band support and RDS on a chip measuring 3 millimeters on a side.

"Silicon Labs' ICs use a patented tuned-resonance technology which allows integrated FM antennas constructed of printed circuit board (PCB) traces, loops, stubs or other devices to perform as well or better than the headset-cord wired antennas they replace," the companies stated.

For information visit www.gssnet.us and www.silabs.com.

RFS OFFERS MOTORIZED RF SWITCHING WITH INTERNAL MONITORING

RFS has debuted the CS Series motor-driven RF coaxial switch and MVS2 monitoring system.

The combination is available in two configurations, one with 1-5/8-inch hardware, the other with 3-1/8-inch.

The CS Series and MSV2 combo is a versatile means of switching antennas and/or transmitters locally by using the HMI LCD touch screen display or laptop computer, or remotely via the Internet, while providing status of the switching position and Forward/Reflected power levels in the system.

The user can remove the motorized switch by using two quick-release handles without the need for hand tools. While the motorized switch is removed for maintenance or inspection, a U-patch plug may be quickly inserted to restore RF transfer by means of two quick-release handles.

All switching functions are interlocked to prevent hot transfer. Motorized switches may be manually mechanically manipulated.

The system maintains a log file of all events and alarms. Alarms may be cleared locally or remotely. A large number of inputs may be accommodated by employing the appropriate number of switches.

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

PEOPLENEWS

Crawford Broadcasting named **Joseph M. Huk**, P.E., CPBE, CBNT as market chief engineer of CBC-Detroit, replacing **Tom Gardull**, who left to pursue other interests.

Huk had been in private practice for the past 18 months as a consulting engineer; prior he worked for Visteon/Ford in the auto receiver manufacturing world and for John F.X. Browne & Associates.

Jennifer Parsons

Jennifer Parsons, GM of WZBG(FM) in Litchfield, Conn., was named chairman of the **Connecticut Broadcasters Association.** Past Chairman **Jon Hitchcock** resigned, having taken a broadcast position in Philadelphia.

Neutrik USA appointed **Thomas Chudyk** as distribution manager of Neutrik USA Inc. He had been regional sales manager of Panasonic Industrial and earlier worked for Arrow Electronics.

Tim Bealor this spring was named VP of sales for **Broadcast Electronics**, in charge of its RF and AudioVault customer base and network of local representatives. He began his career at BE as a technician in 1975 and has served a variety of technical, support, product management and marketing positions with the company, most recently as vice president of RF products. He took over sales duties from Debra Huttenburg, who moved to Panduit.

Radio supply industry exec **Lynn Turner** became sales and marketing manager for **Ozone Water Technologies** in Tryon, N.C. Turner, who has worked in the radio industry since 1975 and is the daughter of two broadcasters, has worked at Harris, Broadcast Electronics and PTEK.

Lynn Turner

Radio Frequency Systems named **Jay Martin** as broadcast technical sales director for the Americas. Martin has worked at WLBZ(TV) in Bangor, Maine, at Shively Laboratories and, from 1985 to 2008, in several prominent roles at Dielectric Communications.

Clear Channel Radio named **Jon Zellner** as senior VP of programming. He had been Sirius XM's senior vice president of music programming. He reports to Executive Vice President of Operations Mark Kopelman.

Sirius XM Radio in turn named **Steve Blatter** as senior VP of music programming. He continues to oversee its Talent and Industry Relations Department as well as the Virus Channel.

Tom Layson

Systems integration firm **Advanced Broadcast Solutions** hired **Tom Layson** as a broadcast consultant to head its Web-based education efforts. Layson is a former TV news reporter and anchor who founded New Media Solutions.

Salzbrenner Stagetec Mediagroup said **Vinnie Macri** joined its U.S. team as VP of broadcast solutions.

Arbitron's board elected **Philip Guarascio** as non-executive chairman of the board, replacing Stephen B. Morris.

WVUD(FM), Newark, Del., saluted charter members of its Hall of Fame. The 2009 class includes **Chuck Tarver**, veteran station manager who recently retired; **Greer Firestone**, the first GM when the station was WHEN(AM); the late **Tom Mees**, a station sports director who went on to national exposure at ESPN; **Ron Krauss**, credited with helping to convert the station from carrier current to FM; and the late **Bill Chambless**, a long-time vintage show jock.

The **Michigan Association of Broadcasters** chose to give its Lifetime Achievement Award to **Specs Howard**, founder of Specs Howard School of Broadcasting Arts in Southfield, Mich. Howard, born Jerry Liebman, began his broadcasting career in 1948 after graduating from Allegheny College and starting his own station.

Learning a New (Media) Language

It's Tough to Adopt a Second Tongue Late in Life, But That's Just What Broadcasters Need to Do

THE BIG PICTURE

Skip Pizzi

We considered in the Aug. 1 issue how broadband wireless brings Internet radio to places it has never gone before, attacking traditional U.S. radio in one of its former strongholds — the listener's car. Now let's look at some ways that radio could still compete in this space.

Broadcasters can indeed apply their existing assets to the new environment, but they must fully acknowledge some fundamental caveats. While basic concepts, they deeply affect things we take for granted about the radio business, so they must be stipulated from the start.

First, radio exists in an environment of scarcity.

There are only so many radio stations allocated to any particular area; and short of band extensions, this doesn't change much over time. (Of course, IBOC multicasting also affects this, but only for the still very small percentage of listeners with IBOC receivers.) Internet radio has no such scarcity, and the environment can accommodate an almost infinite number of services.

Second, the Internet's point-to-point nature allows users to personalize the presentation of media content to their individual tastes.

This is almost diametrically opposed to radio, in which formatics never reduce their granularity below the level of demographic groups.

Third, radio broadcasting is geographically limited, and the Internet is globally accessible — or at least becoming so.

In the United States, all but the most rural areas are already covered by broadband, at least via wired means. Most places that don't yet have wireless broadband will soon.

Thus if radio broadcasters want to play in this new space, they should say goodbye to scarcity and hello to personalization. While it's still "radio" — in the sense that it's the presentation of audio content in real time — it's almost completely orthogonal to the traditional broadcasting business.

PARLEZ-VOUS RADIO NUMÉRIQUE?

So how does traditional radio morph itself into this new game?

The good news is that what radio has been doing all along will continue to exist for the foreseeable future. The estimated 20 billion radio receivers out there aren't going away, and audience usage of them will continue in reasonably large volumes for some time.

Whatever broadcasters try in the new media area, they are still working with a traditional-media net — at least for awhile. The most important thing to remember in this context is to still pay adequate attention to the legacy service while developing new offerings.

The real key is to optimize content across multiple services for what they can each provide best, and differentiate them so they each will attract unique users — or at least extend the same users' listening during different dayparts (e.g., over-the-air listening at home and online listening at work).

This means content on-air should be of the widest possible appeal, and focus on material with the greatest real-time value (e.g., live sports, call-in shows, breaking news coverage, etc.). It should also continue as a free-to-the-listener, advertiser-supported service.

Meanwhile, online offerings can be less timely but offer more variations for personal choice, and can develop either as ad-based or as premium, subscription services. On-air should also remain (or return to) highly localized service, while online can be less so — although local online service can also have strong value.

Note that while the barriers to entry for Internet radio are lower than for broadcast, they are not negligible. Infrastructure, operations and royalty payments still require Internet radio providers to have significant capital, and this is where traditional radio's existing business can serve as a good launching point — whereas "pure-play" Internet radio services must generally rely on venture capital or other speculative investment.

SPRECHEN SIE FACHIDIOTISCH SPRACHE?

Technical solutions must evolve, as well.

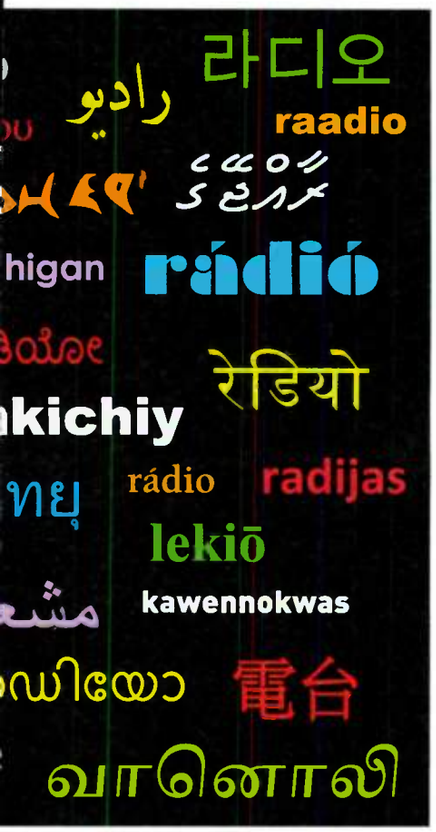
This has already begun to happen organically, but must continue with more purposeful design. For example, the RBDS data stream many stations already provide has grown in significance recently, with newer devices displaying text in graphical form, some even showing multiple fields simultaneously, and even offering music tagging. Some of this same data is also used for "now playing" information on station Web sites.

In this respect, broadcasters are already providing backwards-compatible, "hierarchical" content that is dis-

played on advanced devices (in multiple forms) and ignored by legacy systems. IBOC provides a similar approach, with analog and HD1 channels sharing content, and multicast services appearing only on new devices. This important trend is fundamental to the viable growth and future success of radio's technical infrastructure.

The ability quickly to extend and evolve technical capabilities in online radio also means that broadcasters will have to keep up with a much faster pace of technical improvement than in the dedicated-hardware device world they used to occupy.

New codecs providing improved audio quality, more metadata, surround-



sound and accompanying photos or videos are a few examples. A flexible back-end infrastructure will be required to hit these moving targets.

Consider also how online users navigate to a station's streaming services. They won't always go to a station's Web site for access to the stream, but are more likely to use an aggregation site and select a service they want to listen to from there. So getting broadcasters' services onto these aggregation sites — and making them attractive in whatever listing format the site provides — is also critically important.

Wherever these streams are hosted, though, radio stations still have the unique power to drive listeners there via cross-promotion on the air.

The emerging *mobile* streaming environment requires even more specialized development, given that online radio is most elegantly (or perhaps *only*) offered to these devices via a mobile "app" — and these apps are (at least today) specific to each mobile platform (i.e., iPhone vs. Android vs. BlackBerry, etc.).

Device-manufacturer, mobile-carrier and application/aggregation-site developer negotiations and approvals put even more gateways between broadcasters and listeners, so radio stations will have to become accustomed to working as "content-only" providers in a multi-platform/multi-carrier world. (Don't despair — there may be new opportunities for profit in this space.)

Meanwhile, the content+service provider world of over-the-air radio delivery will continue — and probably seem surprisingly straightforward to broadcasters in retrospect. Audience measurement in such a fragmented world will provide additional challenges, but we'll leave that issue for another day.

It might be hard to imagine, but radio broadcasting eventually could become like TV, where a minority of users are served end-to-end by broadcasters' own over-the-air signal delivery, and the bulk of the audience receives broadcasters' content via a third-party-delivered last-mile.

This doesn't mean broadcasters' service will be any less valuable. To survive in this new environment, broadcasters must learn not to confuse the transmitter with the enterprise.

Skip Pizzi is contributing editor of Radio World.

A PUZZLE for the linguists out there: How many languages can you identify in the word box? We'll print the answers in our next issue.

Barix Provides Multiple IP Audio Feeds

Wired, Wireless, Solar-Powered, Barix Boxes Fill In the Gaps

USERREPORT

BY MARK PARTHE
Owner
Arizona Broadcast Service

PHOENIX — A few years ago an engineer in Phoenix, Dennis Gilliam, told me about the Barix audio-over-IP devices and how he was using them to stream program audio to a translator in New Mexico.

Arizona Broadcast Service, a broadcast equipment and service integrator based here, has since installed multiple **Barix** Instreamer and Exstreamer devices, with six live installations. The devices provide a cost-effective and reliable way to distribute audio locally and around the state via Internet streaming, and both studio-to-studio and studio-to-transmitter IP connections.

Our first Barix system was installed to improve the audio quality of a live, weekly remote broadcast for Prescott Valley Broadcasting originating from The Lariat, a restaurant in the Prescott Inn.

FIRST STOP

The Barix system replaced a remote relay over a phone line and continued for 18 months. The station group owner, Sanford Cohen, requested a higher quality connection to send audio back to the studio.

Simultaneously, Cohen and the owner of Bulleri Wireless, a wireless Internet provider in Prescott, Ariz., were working out agreements to share tower space on his KPPV(FM) solar-powered STL repeater site on Glassford Hill in Prescott Valley.

Bulleri required a node to link Prescott Valley and its main building in Prescott. I arranged for a Bulleri wireless link installation at the hotel and configured a fixed IP address for the Barix connection. I then installed an Instreamer 100 at the hotel and connected it to the wireless link node.

Bulleri installed a node on the studio roof and I installed an Exstreamer 100 with an MCM unbalanced-to-balanced converter. This audio was then wired into the house router.

The first show was nothing short of perfect, and management was blown away by the quality of audio.

We have also used this setup to air local Prescott parades and other live events. Bulleri provides a portable 2.4 Gbps antenna node, and the Instreamer finds an immediate connection to the Extreamer once connected to the wireless antenna.

The second Barix system is a studio-to-studio connection between the Prescott studio and KPKR(FM) in Parker, Ariz. We were unable to air the program audio via an IP connection due to extremely high packet loss from local provider NPG Cable in Parker, but the arrangement worked well enough for an on-air monitoring application. We installed a Barix Instreamer 100 at the KPKR studio and wired an Exstreamer 100 to the main studio audio router. This enabled the local Prescott personnel to monitor the KPKR signal off-air.

Our next Barix installation was to provide an Internet streaming platform for KPPV and KDDL(FM) using Barix Instreamer 100 encoding devices. The only requirement was to enable an Icecast MP3 streaming format and configure the fixed IP addresses supplied by Bulleri Networks.

CHALLENGES

There was initially a challenge interfacing the Barix output stream with Amellus, our Internet streaming provider. Amellus requested a constant bit rate and the Barix devices stream a variable bit rate output. Daniel White, an engineer at KGCB in Prescott, Ariz., also works with Amellus and was able to solve the problem using conversion software that only slightly affects the audio quality due to multiple conversions of the stream.

Barix Instreamer 100 encoders and Exstreamer 100 decoders at work at the KPPV(FM) studios.

The next Barix installation was completed this year when Prescott Valley Broadcasting took advantage of the new AM-over-FM rule change and purchased a local translator on 99.9 MHz.

This transmitter is on the same site as the KPPV main transmitter and a large Bulleri wireless node. An Instreamer 100 was installed at the studio with a MCM matching box for the audio. At the receive site, an Exstreamer 100 was installed with a MCM matching box to raise the level to feed the FM processor. Bulleri ran a shielded Cat-5E from its node router 80 feet away directly to the Barix Exstreamer 100 at the transmitter site.

We initially experienced dropouts on the links when the system was put online. Bulleri did an analysis and found that we were maxing out our bandwidth allotment between the main studio and the Glassford site. We solved the problem by replacing the original 1.5 MHz shared link with a dedicated 20 MHz point-to-point link.

KQNA(AM), Prescott Valley Broadcasting's daytime signal on 1130, recently launched our latest Barix installation. Here, an Instreamer 100 passes

(continued on page 27)

TECHUPDATE

SCOOPY+ CODEC NEEDS (ALMOST) NO WIRE

The Scoopy+ from **AETA Audio Systems** (AAS) can transmit live audio over all types of mobile networks: EDGE and 3G/3G+ but also GSM. Because the mobile access parts are built in, including the antenna, the only devices users have to plug are a SIM card, cables for the microphones and headphones. Thanks to the GSM capability, Scoopy+ is not limited to places that benefit from high-performance networks. Live reports from the field are possible from almost everywhere.

However, in some locations there may be no possible remote connection except satellite. Under a partnership with Inmarsat, AAS has been able to design an integration for its codecs with Inmarsat BGAN satellite terminals. Users connect the terminal to the unit and point it to the satellite. Scoopy+ handles the process to set up an audio over IP link, using the suitable streaming-class service for a reliable connection. No need for a PC for setting up the terminal.

Scoopy+ is battery-operated (with internal charger) and provides audio mixing and monitoring functions, featuring three microphone/line inputs with phantom power, two line outputs and two headphone sockets. The codec is capable of transmitting audio over a number of "wired" networks: POTS, ISDN, Ethernet/IP, using algorithms such as G.711, G.722, 4SB ADPCM, MPEG Layer II, MPEG AAC. For wireless transmission, beyond the built-in capabilities listed above, additional wireless networks can be accessed using a plug-in USB or ExpressCard device.

The user interface is intuitive, featuring a comfortable OLED graphics display. The navigation joystick is supplemented by dedicated buttons and knobs for access to the essential controls. With storage capabilities (internal flash and removable SD card), the unit is ready for the introduction of recording features, scheduled for Q4.

For information, contact AETA Audio Systems at 011-33-1-41-36-12-61 or visit www.aeta-audio.com.

BARIX

(continued from page 26)

an icecast MP3 signal to Amellus for online program distribution and streaming.

Only one device has failed through all of these applications, which Broadcasters General Store quickly replaced under warranty. I have found the Barix devices reliable. My only suggestion is that Barix add an audio indicator to the Exstreamer along with a variable/fixed bandwidth setting.

The Barix boxes have been a cost-effective way to distribute audio around our market and the state of Arizona. Indeed Barix has provided the only cost-effective way to monitor our on-air operation in Parker. I have also been fortunate to have the services of Bulleri Wireless Neworks Company in Prescott. The help of Robert Clark, the Bulleri staff and the ability to configure my Barix devices on fixed IP addresses has made my Barix network work smoothly.

For information, contact Barix at (866) 815-0866 or visit www.barix.com.

Harris Connects Booster System

Intraplex SynchroCast Conquers Mountain Ranges for Utah Broadcaster

USERREPORT

BY KEVIN TERRY
Vice President
BERT GOLDMAN
Vice President
Independence Broadcast Services

SALT LAKE CITY — Independence Broadcast Services provides comprehensive AM and FM broadcast engineering and construction services, from signal enhancements and spectrum analysis to turnkey construction and FCC application processing.

One of the company's specialties is the design and implementation of synchronous booster systems for transmitter networks. The company was hired recently by KYLZ(FM) to improve its coverage throughout the Salt Lake City market.

HUMPY PEAK

KYLZ signed on the air in April. The station is the seventh "Humpy Peak" station to sign on the air, having been relocated from its previous community of license, outside of the market.

Humpy Peak is on the western end of the Uinta Mountains, a sub-range of the Rocky Mountains. The Salt Lake City/Ogden/Provo market lies to the west of Humpy Peak and on the other side of another range of mountains — the Wasatch Mountains, which rise nearly 12,000 feet high. The Wasatch Range is in the direct transmission path from Humpy Peak to the Salt Lake valley, creating various transmission challenges throughout the market.

To ensure full market coverage, KYLZ hired Independence Broadcast Services to design, build and integrate a booster system that would cover the entire Interstate 15 corridor from Ogden through Salt Lake City and south to Provo.

The company selected a **Harris** Intraplex SynchroCast T1 digital multiplexer system to connect the main KYLZ transmitter with four synchronous co-channel boosters. A fifth booster will come online later this year, providing even more fill-in coverage.

The primary role of the Intraplex SynchroCast system is to provide synchronization for the co-channel boosters. The fact that KYLZ's is the seventh installed system in this market demonstrates the success that area radio stations have had using SynchroCast for signal transmission across very challenging terrain.

SynchroCast overcomes the mountain "wall" created by the Wasatch Range by providing fill-in service in the valley. Along with proper antenna and RF design, the synchronization technologies enable seamless coverage from north to south. Without SynchroCast, co-channel interference created between the main antenna site and the various booster sites would render the signal unusable in many areas. Overlaps are significantly reduced with SynchroCast and the handoff from one transmitter to another while driving through the overlap areas is nearly impossible to discern.

An installed Harris Intraplex SynchroCast quietly coordinates transmission.

GPS digital timing is the critical element of this synchronization. The unit's internal GPS system provides KYLZ with a common time reference so the station can delay audio at each booster site as required. This means that when a specific frame of audio is transmitted, it arrives at the overlap areas at the precise moments required to maintain a synchronized signal across the booster network.

GPS provides this precision down to the microsecond. The ability to achieve that precise of a time measurement is critical to maintaining a clean broadcast throughout the market.

TRANSPORT SYSTEM

Furthermore, SynchroCast incorporates dynamic, hitless delay control, so that if the actual T1 circuit delay to any site changes, the system automatically will adjust to compensate without disturbing the audio broadcast in any way.

The Intraplex SynchroCast essentially is a digital multiplexer that can transport audio, data, voice and LAN capability between multiple sites. The LAN capability is significant to this operation, as SynchroCast enables high-speed Internet between all five sites and the KYLZ studio.

More important, the LAN connectivity allows KYLZ to use IP-compatible telemetry systems for confidence monitoring and signal reporting at every site. This allows the station to utilize a more reliable, less expensive way to gather readings and respond to operational issues instead of using land lines and cell phones to dial into sites. Confidence monitoring is achieved through automatic feeding of audio received on tuners at the transmitter and booster sites back to the studio, where operators can listen to each site as it transmits over the air. This would be cost-prohibitive using legacy equipment with leased land lines.

Harris has also provided Intraplex CrossConnect servers with this system. CrossConnect servers enable backup paths to distribute information in the event that a specific link is taken down for maintenance or otherwise temporarily offline. The automatic switchover features enable the booster system to redirect itself seamlessly to another booster site, and automatically retime the signal for proper synchronization across the network.

The CrossConnect servers are perhaps the most powerful components of the entire system, providing redundancy capabilities that are critical to the success of the transmission and booster network.

Intraplex SynchroCast was the first system on the market to enable synchronization across multiple transmission points, and the product has been updated and enhanced in a manner that continually meets the needs of Independence Broadcast Systems and our radio broadcast clients including its newest IP-based NetXpress SynchroCast system.

For information, contact Harris Broadcast Communications at (513) 459-3400 or visit www.harris.com.

TECHUPDATE

ISDN BACKUP FUNCTION FOR AVT IP AUDIO CODECS

AVT Audio Video Technologies GmbH is now providing an automatic ISDN backup function for its IP audio codecs of the Magic series.

If the IP connection between two Magic AC1 XIP codecs drops out during an audio transmission, the systems switch automatically to the ISDN interface, and the codec that has been selected as the master establishes an ISDN backup connection with the parameters that have been configured in the software.

The backup function provides various configuration settings with which the backup solution can be adapted to the user's requirements.

Users can select, for example, the time in milliseconds for which the IP connection must drop out before the backup is activated. In this way users can avoid backups initiated by short disturbances.

The maximum backup time, as well as the time frame during which no errors may occur before the systems switch back to the IP connection, are configurable.

To make sure that the ISDN backup connection is working properly, a scheduled or manually triggered backup test can be carried out via the software without interrupting the main connection over IP.

The IP audio codecs of the Magic AC1 XIP family are energy-efficient and fanless. The systems provide G.711, G.722, ISO/MPEG-1/-2 Layers II and III, standard apt-X and Enhanced apt-X as well as MPEG 4 AAC-LD coding algorithms.

The IP operation modes "Leased Line Mode with RTP" and "Dial up Mode with SIP" — defined by the N/ACIP working group of the European Broadcasting Union — are implemented.

In addition to the IP interface, the audio codecs contain an ISDN and an X.21 interface.

If the X.21 interface is used, the Magic AC1 XIP systems encode audio signals with data rates from 8 kbps up to 384 kbps. The system measures the incoming X.21 clock and automatically adapts the data rate of the audio codec to the X.21 line clock.

In the ISDN mode (1 x BRI), the audio codecs use the Auto Dynamic Sync (ADS) functional. With this procedure, an automatic synchronization with almost every audio codec on the market is guaranteed, AVT states.

Due to ADS, the Magic AC1 XIP systems detect the parameters of the calling or the called codec for 1B and 2B ISDN connections and adapt to them automatically.

For information, contact AVT at 011-49-911-5271-0 or visit www.avt-nbg.de.

Zephyr Z/IP Mixer 'Gets It Right'

Telos System Combines Codec and Mixer Into One Effective Package

USERREPORT

BY BRANDON MICHAELS
Independent Commercial Radio Contractor

SAN BERNARDINO, CALIF. — Have you ever had one of those moments with a new product and realized that they got it right? Not just right, but when the new one is everything the old one was, and much better. I recently had one of rare those moments with the **Telos** Zephyr/IP on a remote.

A client station sent me with a Zephyr/IP to an unfamiliar venue that the salespeople had just "discovered" while looking for new clients. Normally, this would have put me into panic mode, unsure of what I would find on the other end. The engineering manager said that it was fine and that everything was in place. I've heard this before.

When I arrived at the club, the night manager showed me where to set up. Just as the engineering manager had predicted, there was an RJ-45 Ethernet IP cable labeled with our call letters, and a couple of AC outlets available and ready for service. I whipped out the Z/IP and plugged in the network cable, powered it up and watched as the system recognized its connectivity. When I hit the "Auto Dial" button on the front panel a list of available units appeared. At the top of the list was our studio unit back at the station.

EASY OPERATION

That's when it hit me … this is even better than before. No ISDN numbers to remember, the units can be given meaningful names, such as their function or location, and then look at the map. The front panel can display a trace map that shows the path of your IP connection. That is really cool.

The unit has a huge display on it, making setup in the field easy. The big, bright, high-contrast display has plenty of room to show lots of detail, including one screen dedicated to all the current operating parameters and instantaneous system performance. One screen is split into send and receive performance charts, showing packet traffic detail. You can monitor how well the system has been behaving for the last few minutes, hour or 10 hours.

Getting back to the task at hand, I plugged our wireless mic receivers into three of the inputs on the Z/IP Mixer. The fourth was to be audio from the venue that was mixed with our talent and sent back to the station to give our listeners a taste of the event. Although I was expecting to be told I would have to get an ambiance mic for the audio, the manager of the venue asked what type connection I needed for the feed: XLR or 1/4-inch. Since I had already been behind the Z/IP, I knew that the connector panel contained the combo style connectors that accept either. I plugged my XLR cable into a junction box below the counter and into my Z/IP Mixer. In no time at all, we had our mix ready and cued up back at the station.

The Z/IP Mixer has the same capabilities as the familiar Zephyr Xstream MXP ISDN codec but is intended for use over public Internets. The mixer section provides four inputs, each individually selectable to either mic or line, including phantom power if you need it. Each input has a knob on the front to adjust the level into the mix, there is a main headphone feed that I use to monitor the program, and three headphone feeds for talent, each with its own pot. I adjust these pots into the two-way wireless, for the mics and headsets, and get the right mix into each earpiece.

People were already starting to show up, and our crew was set to arrive. They like to get there early to greet the guests and stake out their favorites for the night. Right on time the "Hosts" arrived, made their way through the crowd, and picked up their headsets, along with a handheld for interviews. We did a quick level check, tested the return mix and then the talent was off to get the crowd warmed up.

For me, it couldn't have been easier. My earlier concerns about the untested hardware were uncalled for as the Zephyr/IP can even turn a DSL line into a great conduit. The Z/IP Mixer is durable and built to withstand the rigors of remote travel. We have had access to IP codecs before, but none of the other units connected this easy and none of them sounded this good. Telos did a fantastic job building a box that is easy to use, easy to transport and really easy to connect.

After this experience I did a little research to discover why the Zephyr sounded so good and worked so well over the public Internet. The keys to the superior performance of the Z/IP are the Fraunhofer codec developed specifically for this use, AAC-ELD that includes error concealment so that lost packets don't affect the audio. And the system continuously monitors the connection performance and adjusts both the bit-rate and buffer size to maintain the ultimate balance to keep the connection right.

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

TECHUPDATE

MOSELEY EVENT 5800 OPERATES ABOVE THE CHATTER

The **Moseley** Event 5800 transports up to nine radio stations with uncompressed digital audio to create a cost-effective multi-station STL. Couple the Event with the Starlink T1, and create a high-capacity audio, voice and data transport system.

Linear uncompressed audio produces clean, artifact-free on-air sound. Moseley says the Event doesn't rely on fidelity-robbing algorithms to achieve its high capacity. This combination of multiple uncompressed audio channels and Ethernet payload provides the signals necessary for HD Radio and HD2/HD3 multicasting.

Event's wideband IP Ethernet capacity supports network applications, remote servers, surveillance and security, Internet and e-mail connections. It is bidirectional for the backhaul of confidence monitoring, RPU or satellite downlink.

Event 5800 is quick to deploy. It operates in the ISM 5.8 GHz and U-NII 5.3 GHz unlicensed bands. The overcrowded 950 MHz STL band can be avoided. Time-consuming frequency coordination and licensing costs and delays are not required. A new STL system can be up and running cost effectively.

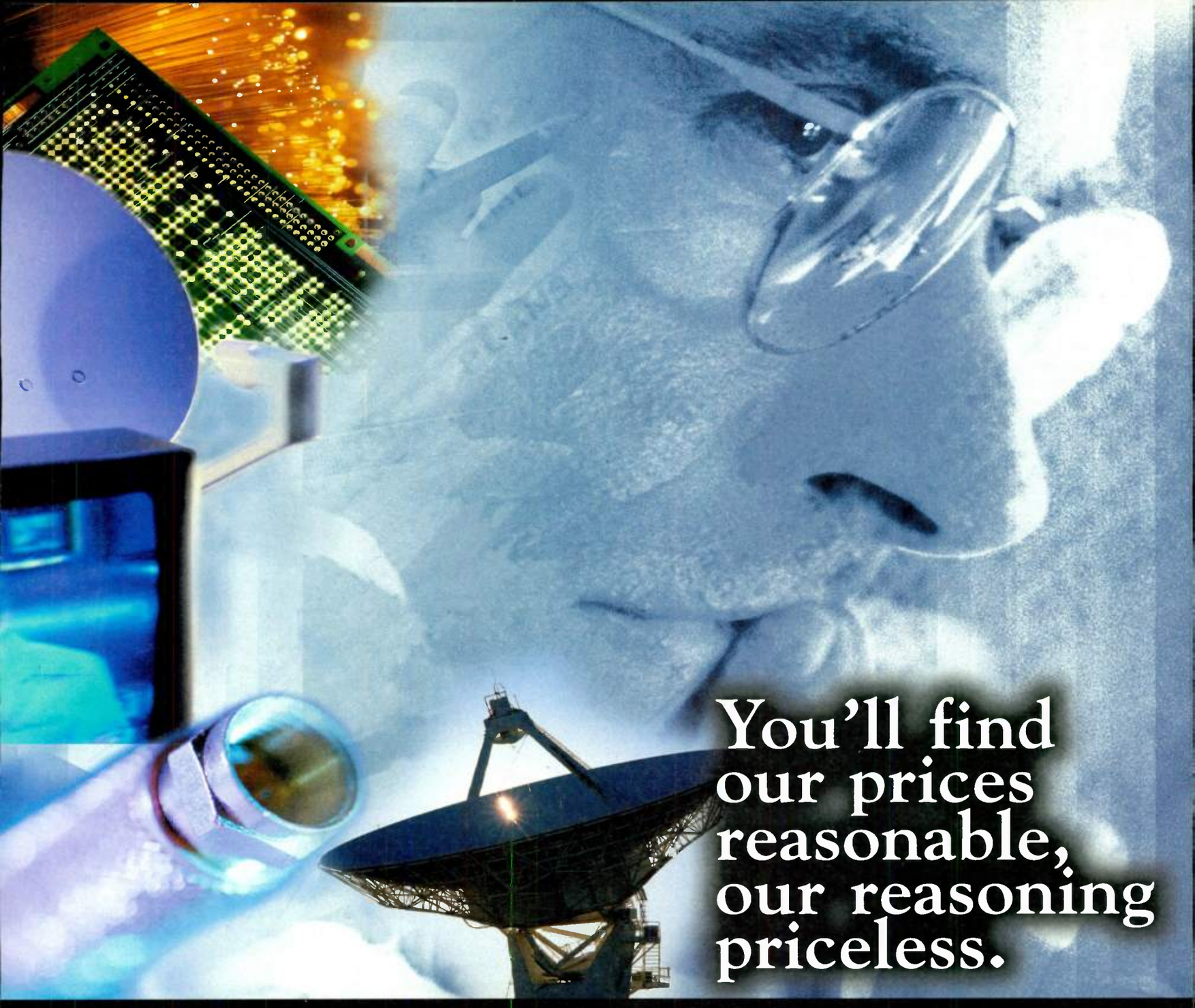
Previous attempts at using data radios for audio transport met with mixed reviews, Moseley states. The Event 5800 is a true carrier-class transport system. It can obtain distances of 20 miles or greater using external high-gain antennas. Conservative use of the radio's capability, adaptive power control and Reed-Solomon error correction give the Event robust performance.

Dave Chancey, Moseley Broadcast sales manager, commented, "Using QPSK or 16 QAM with 4X forward error correction, the Event 5800 successfully operates in previously problematic ISM band 5 GHz environs."

Combining payload over a single bidirectional digital circuit saves stations money when compared to multiple discrete audio, voice and data circuits.

George Corso, Beasley Broadcast Group's regional director of engineering for Miami, is among users who endorse the system.

For information, contact Moseley Broadcast at (805) 968-9621 or visit www.moseleysb.com.



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APT Installed at Clear Channel

WorldCast Eclipse Proves Cost-Effective and Flexible for Satellite Network Traffic

USERREPORT

BY MONTY DENT
Sales & Marketing Manager
Clear Channel Satellite

ENGLEWOOD, COLO. — Many top-rated radio programmers and networks rely on Clear Channel Satellite for their satellite audio distribution needs, ensuring that their programming is delivered reliably and with no loss of quality to their various affiliates.

Traditionally, we would have received an audio backhaul from our clients using ISDN or a copper T1 line and these technologies have served us well. However, like many other broadcasters, we have been keen to move toward an IP-based system as it is more cost-effective and provides us with the increased flexibility to be able to respond to our clients' changing needs. Therefore we have recently deployed a number of MPLS (Multi Protocol Label Switching) circuits for this purpose.

To complete the new circuits, we needed a professional and reliable IP audio codec that would ensure we delivered optimum service to our broadcasting clients and, after extensive testing and investigation, we went for the WorldCast Eclipse from Northern Ireland's **APT** (now part of the Audemat Group).

When searching for the ideal IP codec, we had a few criteria in mind.

Obviously we needed something that worked well with the MPLS network and we also required a lot of support to get the system up and running as this was a new venture for us.

We were aware that a number of major broadcasters had already installed APT's WorldCast codecs in large-scale MPLS deployments so we were keen to trial them alongside a few of the other competitor units.

The author, left, and Clear Channel Satellite Network Operations Manager Byron Miller are Shown with the APT Eclipse Codec at the Network Operations Center

The Eclipses performed well in the tests and APT provided us with quick responses on all our queries and a lot of support without extra cost. This was comforting for us and a major factor in our decision to go with the WorldCast units.

The WorldCast Eclipse codec also came in at a price that was affordable and offered the functionality that we required.

Reliability was a key issue and we needed a unit that would ensure no dropped packets across the IP network and provide us with a log of any issues that occurred on the link.

SOFTWARE

The Codec Management System (CMS) software that was provided along with the Eclipse enables us to conduct performance monitoring of the IP statistics and alerts us to any problems. It also provides logs of any alarms and events that occur which we can export to provide performance reports for our clients.

For backup, the units offer both a V.35 interface and four ISDN ports that can enable from one up to eight B channels to be bonded together for high-quality backup transport. We can configure the unit to back up automatically to either of these links should the primary IP connection fail and then automatically restore when the original link becomes stable again. For additional reliability, the unit's opto-inputs and relays can trigger other remedial action should any issues occur.

Another critical advantage for us was the choice of the Enhanced apt-X algorithm among the available coding technologies on the unit.

Many of our audio backhauls are used to check quality of the IP and provide radio talkback, etc. ... which means that delay is an important issue. Given the inherent delay in IP connections, it is essential that we at least have the option of using a low-delay algorithm such as Enhanced apt-X. This technology also ensures that we have no issues with concatenation as apt-X is resilient to multiple passes within the broadcast chain — very important for backhaul services.

With the WorldCast Eclipse, we can also use linear audio if the bandwidth is available or MPEG Layer II if delay is not a critical factor.

We have six WorldCast Eclipses installed and have plans to order more in the coming months as our MPLS state network expands. With the CMS software, we can configure and monitor these units from a central location over IP, which enables us to get an "at-a-glance" status at any point of our backhaul network.

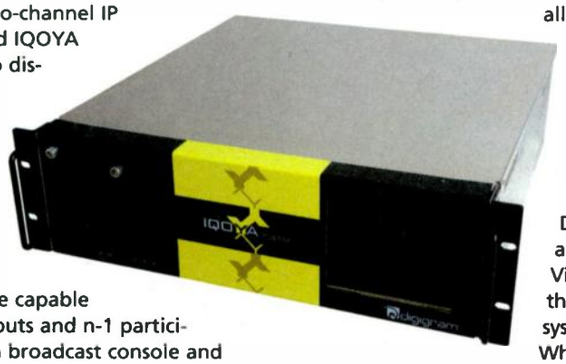
The WorldCast Eclipses were a great choice for our MPLS network deployment. The performance has been extremely reliable and the apt-X algorithm is a great enhancement to the other selections of algorithms available.

For information, contact APT at (800) 955-2789 or visit www.aptcodecs.com.

TECHUPDATE

DIGIGRAM IQOYA LINE EXPANDS

Digigram's IQOYA *Serv/Call and IQOYA *Serv/Link are multi-stereo and multichannel (e.g., 5.1 or 7.1) versions of IQOYA *Call, a two-channel IP audio contribution codec, and IQOYA *Link, a two-channel IP audio distribution codec.



IQOYA Serv*Call is designed for applications such as conferencing with multiple remote contribution participants in a single talk show program. By integrating many audio codecs into a single processing device capable of generating the studio outputs and n-1 participant mixes, it integrates both broadcast console and multiplex functionalities. Broadcasters will save studio space, console channels and associated costs.

Typically, the entire show will only require a single console channel for the multiplex mix, instead of one per participant. In addition, remote control of each participant's IQOYA contribution codec settings is achievable. This feature works with IQOYA V*MOTE software codec or IQOYA *Call, hardware codec.

The IQOYA Serv*Link is for IP audio distribution applications. When multiple studio-to-transmitter links (STL) or studio-to-studio links (SSL) are required from a single point, IQOYA *Serv/Link provides multiple codecs on a single processing platform, thus facilitating deployment, centralizing management and keeping costs at a reasonable level, compared to several stacked stereo "boxes."

The grouping of several distribution codecs also allows for advanced features such as program cross-fades or program backups, sharing what would be unachievable with multiple, independent codecs.

Consistent with other IQOYA solutions developed by Digigram, IQOYA *Serv/Call and IQOYA *Serv/Link are Visiblu-based devices. Visiblu is the network audio operating system developed by Digigram. When used in conjunction with Visiblu-enabled solutions developed by Digigram Development Partners and Digigram's audio management system, broadcasters can benefit from remote resource monitoring and integrated management.

Visiblu features an N/ACIP (EBU Tech 3326)-compliant IP audio codec engine, FluidIP. It brings interoperability with third-party IP codec devices, as well as QoS optimization, stream integrity and Digigram audio quality in a robust format.

For information, contact Digigram at (703) 875-9100 or visit www.digigram.com.

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RoadWarrior LC is a new full-duplex, two channel (Program & talkback) audio codec. Its new design, robust, compact and with a flat control surface, prevents accidental damage to the controls and makes it easier to use. It is a portable audio codec with all Suprima functionality built in.

RoadWarrior LC

- **IP/ISDN**
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- **Lightweight & rugged design**
- **Can be controlled remotely from its web page**

Rear panel of RoadWarrior LC

Suprima

- **Includes LAN, ISDN, U & ST, and X.21 interfaces Standard**
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AudioTX STL-IP Allows WPR to Expand

IP STL Helps Extend Network Reliably and Out of State

USERREPORT

BY STEVE JOHNSON
Director of Engineering and Operations
Wisconsin Public Radio

MADISON, WIS. — Wisconsin Public Radio is a three-network, 31-station public radio group based in Madison, Wis. Some stations in the group are licensed directly to the state, some are held as a part of the University of Wisconsin System, and others are operated by local school systems.

In early 2006, WEPS — a noncommercial FM station in suburban Chicago operated by the Elgin Area School District — expressed interest in becoming a part of Wisconsin Public Radio's "Ideas Network." Because it was outside Wisconsin and well beyond the practical and economical reach of our existing terrestrial digital telco distribution systems, I sought a creative method to deliver high-quality audio from WPR headquarters to the WEPS facilities.

INTERNET SOLUTION

Realizing that school systems usually have high-bandwidth Internet service already in place, I shopped for a method to pass near-real-time audio across computer networks.

With WEPS operating mostly unattended in a distant city, a top priority was reliability. Other needs on my list included adequate buffering to compensate for occasional network congestion, automatic restart and reconnection on loss of power and/or network, and professional balanced analog and AES digital inputs and outputs.

Thinking ahead to the future possibilities of additional stations being fed via both our private networks and the Internet, I also was interested in a system that could provide both single-point and multipoint connections, a wide variety of bitrates, both bidirectional and unidirectional audio and both acknowledged TCP/IP and unacknowledged UDP connections.

At that time only one product seemed to meet all these specifications: the AudioTX STL-IP from **MDOUK**, a company based in the United Kingdom and distributed by Broadcast Electronics in the United States.

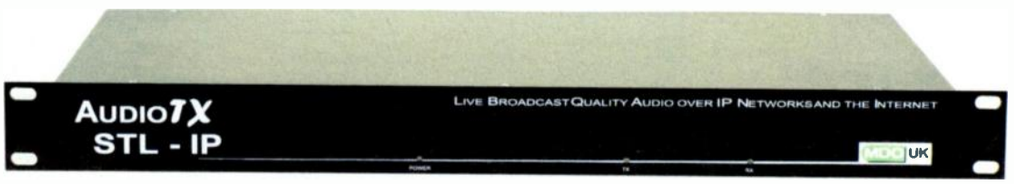
A pair of units was ordered and we soon had the units set up back-to-back on the bench. An ordinary $20 Ethernet switch was used to link the two 1 RU units together and to also connect a laptop for configuration. The STL-IP unit has a Web browser-based management interface for setup and configuration of all the important network and audio parameters.

Feeding typical "Ideas Network" program audio to the unit that would become the WPR "transmit" end of the link, I experimented with the STL-IP's available linear and compressed coding methods and listened to the results out of the unit that would become the WEPS "receiver."

Uncompressed, linear coding sounded wonderful at high bit rates, and my favored MPEG Layer II compression algorithm provided excellent results at lower bandwidth settings. The "Ideas Network" is a single-channel audio service, saving additional bandwidth over similar stereo configurations.

I figured it would be wise to keep my bandwidth demands reasonable to avoid overtaxing the networks (and causing unnecessary dropouts when things get crowded), so I settled on a configuration that sounded sweet at a conservative throughput: a bidirectional connection using TCP-IP protocol, 44.1 kHz sampling for the A/D conversion, and 96 kbps MPEG Layer II mono encoding. Other choices include linear (uncompressed) audio at up to 24-bit, 96 kHz, near-linear J.41 and DAT12, MPEG Layer II and III, MPEG-4 aacPlus, AAC Low Delay and HE-AAC.

Having confirmed that the units worked fine on the bench, the next step was to put them on the WPR-HQ and WEPS computer networks. After consulting the IT staff at each of the two networks, I assigned a static IP address to each unit, and asked that the IT security gang allow an outside exception in the network firewalls for a connection between those two addresses and the specified ports. A single port is used regardless of whether the audio runs one- or two-way, and this port (as well as the management port) can be set by the user.



Left: STL-IP Multi-channel Unit
Below: STL-IP Single Channel

Installing the units in their final racks was certainly no problem, and the units immediately connected to each other and started to pass audio. Everything sounded good, so I called it good and went home. The WEPS manager monitored his station closely for the next few days and reported solid audio, no dropouts.

FEW PROBLEMS

The AudioTX STL-IP feed to WEPS has now been running for about three years.

Any problems encountered have been primarily related to network outages: once at the WPR end when a LAN switch failed, and a few times at the WEPS end (their IT folks confirmed that their Internet access was completely down in those periods).

After the first outage I sent an XLR A3F-to-A3M jumper to the WEPS manager so he could connect the unused but active right channel output directly to the input of his unit, looping the audio back to me at WPR. This provided a form of confidence monitoring that aided future troubleshooting efforts. The units can also be setup to send alerts of any problems by e-mail or SNMP.

MDOUK has provided useful and timely technical support when questions arise. But not many issues have come up. The units run reliably and do what they are told.

WPR's use of STL-IP has since grown. We use the same unit at the Wisconsin Public Radio headquarters (that feeds WEPS) to provide Ideas Network programming to a third STL-IP device at WRST in Oshkosh, Wis. Similar techniques were used for this connection with one exception: after a firewall software upgrade at the WRST network, the link went down. After much wailing and gnashing of computers we discovered that by setting the units for unidirectional UDP protocol the connection could be restored. Not needing a return feed on this link, UDP was considered fine and the IT gang withdrew from their battle with the firewall.

The STL-IP unit at WPR headquarters has also been used to provide a high-quality program link back from a remote broadcast location. At the same time it was feeding Ideas Network programming to WEPS and WRST, we temporarily installed a fourth unit at a location in far northern Wisconsin where no ISDN service was available and allowed the units to connect. This worked only because of exceptionally good cooperation from the IT staff at the remote venue. I imagine that it might often be more difficult to convince the host IT personnel to let strangers pass through their firewall — though, in reality, only an outgoing TCP/IP or UDP connection is needed for this kind of remote contribution, which should be allowed by default on most corporate networks.

In addition to these deployments, we have purchased several sets of AudioTX STL-IP units as all-purpose links for use on our private network linking our bureaus and transmitter sites. The STL-IP units have been useful as temporary program paths while T1 and other permanent links were down for maintenance or reconfiguration.

There is also now a companion software product offered designed for remotes, news and sport coverage called STL-IP Connect. This runs on a standard laptop and makes a one- or two-way connection back to an STL-IP unit at the studio and is designed for use by non-technical staff. And the STL-IP product is available in two larger versions, the STL-IP-8 and STL-IP-16, which can be used both for multi-channel links and also to distribute various audio channels to far-end units at different locations.

The AudioTX STL-IP units aren't perfect; what is?

These units are almost literally a "black box." The front panel has only are only three two-color LEDs to show system and link status (TX and RX, green = okay, red = problem), and if you have more than one connection in play those lights can be ambiguous.

There are no audio level indicators on the front panel. Instead, a suite of software programs are provided that show the state of all STL-IP units on your network at a glance and can show live audio levels on any units, whether local or remote. It would be great to have at least LEDs right on the front panel that flicker in response to the presence of audio on the inputs and outputs.

For information, contact Broadcast Electronics at (217) 224-9600 or visit www.bdcast.com.

TECHUPDATES

INNKEEPER LTD IS A DIGITAL HYBRID

Plain and simple may be the best words to describe the new innkeeper LTD digital hybrid from **JK Audio**.

The company says this is its simplest digital hybrid. The innkeeper LTD allows users to send line-level signals into the phone line while maintaining excellent separation between studio voice and the caller. The balanced XLR output jack contains only the caller's voice, making this a suitable companion to mixers and consoles that demand talk show quality audio from a phone line.

This digital hybrid connects audio signals to a standard analog telephone line without the transmit/receive crosstalk common to analog hybrids. Its 16-bit digital signal processor (DSP) continuously monitors both the phone line and audio signals to deliver maximum separation. A proprietary, dual-convergence echo canceller algorithm can achieve excellent separation, typically exceeding 50 dB, without any setup and without sending a noise burst down the line, according to the manufacturer. "While this may sound complicated, it's all done automatically during every call."

An auxiliary telephone may be used to place outgoing calls. The auxiliary telephone is disconnected when the "call" button is pressed, and reconnected when the "drop" button is pressed. The "remote" jack allows connection to a JK Audio Guest Module, allowing remote control and dialing without an auxiliary telephone.

Innkeeper LTD features auto-answer/auto disconnect for use in monitoring applications. JK says this simple design features recessed volume controls and no confusing DIP switches, yet works reliably on standard analog phone lines around the world.

The RA2 Rackmount accessory holds two innkeeper LTDs in a one rack space.

For information, contact JK Audio at (815) 786-2929 or visit www.jkaudio.com.

MUSICAM USA TURNS LAPTOPS INTO CODECS

Transporting audio over IP vs. ISDN does not require an overhaul of equipment or a large investment, according to **Musicam USA**, if you use its PCip software.

PCip enables audio over IP from any press conference, music concert, news or sporting event simply with a laptop. It's a low-cost solution to increase programming possibilities, and it eliminates the cost of long-distance phone bills.

Musicam USA's PCip features a user-friendly interface (like its Suprima), audio streaming over any TCP/IP network (including 3G/EvDO and Wi-Fi), easy configuration for optimizing low delay and jitter, and compatibility with Windows 2000, 2003 Server, XP and Vista.

The CCS Nat Traversal protocol simplifies the remote process, as engineers and reporters can make calls without router configuration (no third-party server is required).

New to the PCip is the file streaming feature. When covering a remote, a reporter connects to the studio and using PCip with the optional file player, he or she can file a live wrap with audio cuts or "nat sound" immediately. The PCip connects to Suprima or Suprima LC in the studio to transport the audio to audiences. A simple Internet connection can enable users to deliver programming on the air within minutes.

"We are fully aware of the toll the economy is taking on the majority of station budgets," President Alvin Sookoo noted. "New users can link a Suprima LC to a PCip without stressing capital expenditures, and the ease of use makes the transition from ISDN to IP quick and smooth."

For information, contact Musicam USA at (732) 739-5600 or visit www.musicamusa.com.

Tieline G3 Codec Simplifies Life

3G Wireless Connectivity Adds a New Weapon to Entercom's Arsenal

USERREPORT

BY MIKE RABEY
Chief Engineer
Entercom Indianapolis

The Author and Tieline G3 Codec

INDIANAPOLIS — I remember how we used to do remotes: Park the van. Put up the mast. Run the coax into the van. Connect the RPU transmitter. Call the studio. Aim the yagi antenna for best signal at the studio. Set up the monitor system.

This is how it used to be. Some people still do it this way. Heck, we still use our RPU equipment once or twice a year. But usually I find it a lot easier to take the **Tieline** G3 codec to the site, and choose from a variety of connection options. One of the most appealing of these options is 3G wireless.

A NEW DAY

3G wireless has completely changed the dynamic of broadcasting from a remote site.

With RPU, you always had to stay within RF range of the receive site. With 3G, receive sites are everywhere: in your own market, or in another state.

With RPU, the 8-second profanity delay (and/or the HD encoding delay) made setting up an air monitor at the remote site difficult. With the Tieline G3's 3G connection, it's as simple as setting up a mix-minus backfeed at the studio.

With RPU, setting up the equipment was beyond the capabilities of many air talent. Wireless 3G isn't idiot-proof, but it's possible to train most talent to set it up themselves. It's not unusual here in Indianapolis for the morning crew to grab the Tieline and head out for some arcane locale with no warning. And it's a huge convenience to be able to use the backfeed as a studio talkback channel.

Wireless IP isn't always the answer, of course. When you log onto a shared public network, you are taking your chances that the necessary bandwidth will be available, and will remain for the duration of the broadcast. Depending on the location and the time of day, that is not always a sure bet. Murphy's Law dictates that the wireless IP connection will work perfectly when you go to check out the site, but not always when air time rolls around. A test from a concert venue works great in the morning, but that evening when it's packed with hundreds of people on their cell phones, it can be a lot harder to get the required chunk of bandwidth from the cellular provider. This also applies to wired IP connections and, in some cases, POTS connections.

In cases like this, I have learned to always have a backup position. The Tieline G3 has POTS and wired IP capability, in addition to wireless. Sometimes wireless IP is the primary connection, sometimes I use it as the backup. It depends on what facilities are available at a given venue. In rare cases, I have had to fire up the trusty RPU transmitter!

In any case, I would strongly dissuade any engineer who is considering saving a buck by ordering a codec without POTS capability. Being able to use the telephone network for your remotes is a powerful option.

And remember that while wireless IP can deliver near-CD sound quality, even stereo, it has measurable latency. My Tieline is set for a buffer of 250 ms when used in the IP mode. That doesn't sound like much, but it's enough to throw off the timing between studio talent and remote talent, or to cause problems when the remote talent is taking phone calls from the studio. (Tieline is now offering new software which automatically optimizes buffer time, and significantly reduces latency, on IP connections. I have not tried it yet.)

When I'm setting up a Tieline broadcast that requires a lot of interaction, I usually look for a POTS line first. The POTS delay is significantly less, and the sound quality is not quite as transparent but still quite good, making this an acceptable tradeoff.

Having the capability to broadcast from anywhere via wireless IP is a powerful tool. In this era of trimmed-back staffs and sales people eager to sell remotes anywhere, 3G provides a welcome measure of flexibility to our remote broadcast arsenal. I can't imagine living without it.

For information, contact Tieline at (888) 211-6989 or visit www.tieline.com.au.

TECHUPDATE

SONIFEX PUTS DSP INTO HYBRID

Sonifex has been selling telephone hybrids internationally since 1986. There are two series: the analog-based HY-03 range offering typically 30 dB of rejection, and the DSP-based DHY-03 unit with a rejection ratio of between 70 dB and 80 dB, which Sonifex says is the best rejection rate possible using POTS telephone lines and hybrid technology.

The DHY-03 telephone hybrid has excellent impedance matching between the central exchange and the hybrid. It can cope with impedances from many foreign exchanges and some digital exchanges, often used in modern telephony systems. The company says there is a calibration routine that can detect and match to the line impedance to which it is connected. The unit conditions the electrical interface between the hybrid and the communications network, e.g. maximum signal levels, line current limits, ringing conditions, etc. The unit has embedded international country settings for telephony impedance and conditions and these values can be preset if it is known where the unit is going to be installed.

Two echo cancellation routines run using internal memory allowing echo cancellation to 127 ms and improved distortion of other mixed signals. This improves the hybrid's ability to take calls on mobile phones, or where there are other delays, for example, on satellite and conference calls. It can also recall signals from its memory buffer and allow for these delays without impairing performance.

In addition to echo cancellation across the network the DHY-03 is able to perform local acoustic echo cancellation. This is used when there is feedback from the audio output to the audio input, usually due to the output being sent to speakers and being picked up by a microphone input. It is able to perform an echo cancellation algorithm on the return signal and subtract the content due to the original caller from the signal sent to the line.

The DHY-03 has serial control of dialing and of the configuration parameters. These can be accessed with free control software available on the Sonifex Web site.

The feature set includes a balanced mic/line input and a balanced line output from and to the mixer, with input and output gain adjustment from and to the telephone line respectively and input and output metering of these signals. Users can switch from local to remote line hold either by using the front-panel push button, by serial connection or by using a GPI remote input, usually connected to the on-air mixer.

In addition, it also has a conferencing facility, integrated auto-answer, automatic call disconnection, auto-ducking and DTMF tone recognition.

For information, contact Sonifex/Independent Audio at (207) 773-2424 or visit www.independentaudio.com or www.sonifex.co.uk.

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Voice Artist Relies on Mayah Sporty

Mondy Likes Its Simplicity, Reliability and Auto-Recognition Feature

USERREPORT

BY BILL MONDY
Voice-Over Artist

VANCOUVER, BRITISH COLUMBIA — As a voice-over actor, I always tell people that I have no marketable skills, which is why I talk for a living.

I came to the microphone by way of the camera and entered into voice work with no connection to radio or gear whatsoever. So it's funny to me that I'm writing about equipment, especially for a radio industry publication.

However, if I was to maintain my voice clients after the move from Los Angeles to Vancouver I had to become a daily user of a crucial piece of equipment to many in commercial production and the radio industry: a codec.

EASY, QUIET, SMALL

When I committed to living in Vancouver I needed to build a home studio with ISDN to use the codec. Since I'm "technically challenged," that was a scary thought for me. I bought my first codec about nine years ago and have owned three others since. My requirements for a codec have been pretty simple. Make it: 1. Easy. 2. Quiet and 3. Small. And so enters the Mayah Sporty.

Bill Mondy and his Mayah Sporty

I have used products from two other familiar codec suppliers but those never really fit the bill. One codec worked well and was fairly straightforward but it was a double-rack-space-beast. When doing a session I am both engineer (kinda) and talent, and my equipment needs to be right next to me. I have a compact workspace and don't like feeling swallowed up by too much equipment.

Another model was just too clunky and loud for me. A third, a software-based codec, I liked at first because it was compact, but I soon discovered it was subject to all the vulnerabilities of a PC (e.g., not Mac-compatible) and it didn't allow me to record and send audio at the same time. The ideal way to use it was with a separate computer and that brought me back to more equipment.

I've always looked for the least amount of gear with the best possible sound. So my pursuit for the ideal codec lead me face-first into the Mayah Sporty.

Aside from looking extremely cool, it was about the size of a Mac mini. It has its own mixer so I could toss away my old Mackie board. At first glance, I thought the Sporty was too complicated, but I quickly got over my anxiety.

Mayah codecs have a setting called "Reporter 1," which is pretty idiot-proof and suited this idiot pretty well. Once I set it to "Reporter 1" mode the world quickly fell into place. Also, Mayah designed an easy way of controlling the Sporty by networking it to the computer. I can add and store my clients' dial-ups and connect to them with the click of a mouse.

HIGH END

One of my favorite things about the Sporty is its auto-recognition feature. It literally recognizes any codec or algorithm that is thrown at it. No need to set the Mayah at all, it automatically knows what it's talking to and how. I love it!

I also use the Sporty for phone patch sessions. When my clients call my Sporty from a landline, the Mayah recognizes that it's communicating with a regular phone. It has truly changed my recording life.

Ron Guensche of EDnet (who now sells and supports them) helped me successfully put the Sporty through its paces against just about every codec out there.

Another amazing feature is that the Sporty can connect to an APT codec

(continued on page 40)

Sony UK Selects AEQ Phoenix for Remote Vans

Codec to Handle Audio From the Field for Algerian Radio/TV Broadcaster

USERREPORT

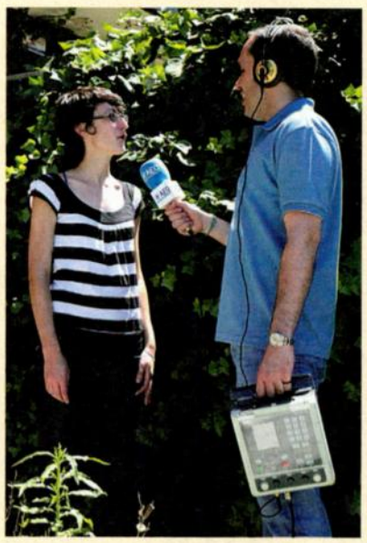
BY TADEUSZ KRZEMINSKI
Project Manager
Sony Professional Services UK

READING, ENGLAND — Sony Professional Services has obtained a major deal with Algerian state broadcaster, Algerian Public Television, L'Entreprise Nationale de Télévision (ENTV). ENTV has commissioned Sony to build five high-definition (HD) remote vehicles for the TV channel. An important piece of the audio component will be **AEQ** Phoenix codecs.

ENTV was created in 1986 as successor of RTA Radiodiffusion Télévision Algérienne, which was founded in 1962 after the independence of the country. ENTV is responsible for transmitting five channels of locally produced news, entertainment, culture and sports programming to Arabic, Tamazight and French speakers in the country. ENTV is also a member of the European Broadcasting Union, the EBU.

PHOENIX FITS THE BILL

Sony is building five HD remove vehicles as part of a major ENTV internal modernization strategy and its move toward HD production. The HD trucks will include 48 cameras; 80 LMD line LCD monitors; 10 VTRs and five video switchers among the numerous Sony-branded products to be installed. Along with this contract came the opportunity to also provide 12 audio codecs; AEQ's Phoenix Mobile was selected.



The Phoenix Mobile is a compact, light and portable multi-function IP audio codec compliant with the N/ACIP EBU Tech 3326 recommendations.

AEQ Phoenix is a flexible and versatile communications platform that includes several communication interfaces: built-in IP and two slots which accommodate additional interfaces, allowing users to use POTS/PSTN and ISDN lines, or any type of line that can be adapted to the USB interface such as 3G/GSM.

Phoenix comes equipped with a variety of encoding modes including AAC, allowing users to link with other compatible IP codecs, and through its additional coms modules, with virtually any ISDN codec on the market. The equipment allows users to choose the encoding mode and output bit rate suited to the bandwidth and type of network available at any time. This is perfect for the electronic news gathering operations.

The Phoenixes, fitted with both POTS/PSTN and ISDN modules, were selected not only because of their portability but because the codec is "future-proof" with the IP encoding already in place. The fact that it has expansion slots with a variety of available interfaces that suited the customer's needs also appealed as this would allow future upgrades if necessary. An ideal small mixer (Phoenix has an internal digital router) is included making the Phoenix Mobile more than just an audio encoder.

The Phoenix Mobile is made of tough ABS materials making it especially resistant to the rigors of working on the road, and its high-capacity Li-ion battery (2.5 hours) is more than adequate to cover most remote events.

For information, contact AEQ at (954) 581-7999 or visit www.aeqbroadcast.com.

TECHUPDATE

COMREX BRIC-LINK SOLVES STL, SSL PROBLEMS

Comrex says its new BRIC-Link IP is becoming a popular choice for audio over IP transmission.

Public radio broadcasters and LPFMs, among others, are using BRIC-Link for STL and studio-to-studio applications. BRIC-Link provides multi-streaming and IP multicast capabilities as well as performance on a variety of IP data circuits including satellite and ISM band 5.x GHz IP radio links.

There are several audio coding modes available on BRIC-Link that are desirable for use on larger bandwidth data circuits. Both mono and stereo linear modes offer delay as low as 25 ms while supporting 32 kHz, 44.1 kHz and 48 kHz sampling rates. BRIC-Link also includes mono and stereo FLAC (Free Lossless Audio Compression) modes; this offers 30 to 40 percent data reduction without the concern of tandem coding affects or audible artifacts. Advance Audio Coding modes such as standard AAC, HE-AAC and HE-AAC v2 are included to provide audio quality while maintaining a significant reduction in required bandwidth.

BRIC-Link features a Streaming Server mode that will allow for multiple HE-AAC streams to be fed to media players such as WinAmp, VLC and Windows Media with the Orban/Coding Technologies aacPlus plug-in. It can also provide a source feed for both SHOUTcast and icecast servers. BRIC-Link has also been tested with low-cost streaming audio decoders that support HE-AAC.

BRIC-Link comes in a compact, half-rack metal enclosure that can be dual-mounted in a 1U rack-mount kit. Balanced stereo audio inputs and outputs are provided on 1/4-inch TRS connectors (XLR adapters are included). The audio input/output is switchable for AES Digital. Ports for RS-232 serial data and four contact closures are also provided.

For information, contact Comrex at (800) 237-1776 or visit www.comrex.com.

PRODUCTS & SERVICES SHOWCASE

SHOWCASE

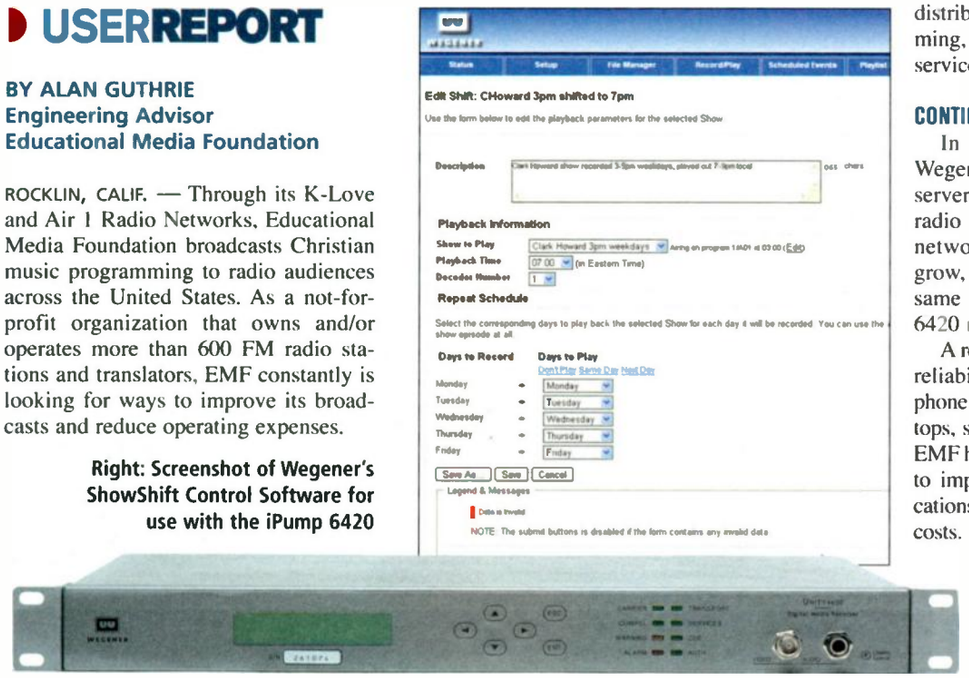
Sat System Upgrade Reduces Costs

Christian Broadcaster Uses Wegener Media Servers to Provide Content for Far-Flung Network

USERREPORT

BY ALAN GUTHRIE
Engineering Advisor
Educational Media Foundation

ROCKLIN, CALIF. — Through its K-Love and Air 1 Radio Networks, Educational Media Foundation broadcasts Christian music programming to radio audiences across the United States. As a not-for-profit organization that owns and/or operates more than 600 FM radio stations and translators, EMF constantly is looking for ways to improve its broadcasts and reduce operating expenses.



Right: Screenshot of Wegener's ShowShift Control Software for use with the iPump 6420

In order to introduce "store and forward" technology and improve space segment costs, EMF invested in an MCPC (Multiple Channels Per Carrier) system in August 2004, after 10 years of running satellite radio networks via multiple SCPC (Single Channel Per Carrier) satellite channels.

EMF selected a Wegener solution for network control and satellite receiver technology, since Wegener Unity satellite receivers are DVB compliant and offered several modular options, saving EMF substantial time and money during the upgrade. The central operation hub uses Wegener's COMPEL network control and MediaPlan content management systems to control, schedule and distribute content for programming, public affairs and public service announcements.

CONTINUED EXPANSION

In 2006, EMF integrated Wegener iPump 6400 media servers for live and file-based radio broadcasts and, as the networks have continued to grow, has continued with the same technology with iPump 6420 media servers.

A remaining problem was the reliability or availability of phone lines on remote mountaintops, so over the past four years EMF has reviewed many options to improve two-way communications while reducing operating costs. EMF decided to enhance its existing program distribution satellite system by adopting a VSAT network for monitoring and control.

Historically, EMF has used a terrestrial connection to monitor the Wegener satellite receivers and media players, but has now started to replace terrestrial links with a VSAT low-data wide-area network (WAN) for transmit and backhaul operations between affiliates and our central operation hub. A ViaSat LinkStar IP system was chosen because it can multiplex into the existing MCPC carrier, and enables EMF to operate the IP network at a lower data rate than would be needed for a second DVB carrier on the satellite.

Simultaneously, EMF is switching its satellite network to use DVB-S2 modulation, which offers performance gains over DVB-S modulation and helps achieve significant operational cost savings. EMF is really taking advantage of the internal modular design of the Wegener receivers to create a cost-effective network upgrade path, upgrading its 600 Wegener Unity 4600 satellite receivers deployed at sites across the country by simply installing new DVB-S2 tuner cards in the field.

EMF is also installing VoIP modems at all remote sites to further leverage EMF's existing VoIP phone system. This will provide further cost savings by eliminating the substantial monthly phone bills that result from all remote sites dialing in for remote control readings, EAS data delivery, as-run log information and more. All that data will now be delivered via IP without the security concerns of connections to the public Internet. As a further cost savings, EMF has been able to upgrade the existing 1.8-meter receive-only satellite dishes to transmit /receive, which saves on replacement and shipping costs, as well as space rent for a second dish.

Combining DVB-S2 modulation, point-to-multipoint data distribution, and file-based broadcasts has created excellent cost savings opportunities. The servers and receivers link into the VSAT network to create a more consistent and cost-effective flow of data reporting back to the central COMPEL network control system.

With hundreds of receive sites, many of which are unmanned, reliable monitoring of digital files and receiver health and status is critical to ensure on-air operational success. The Wegener network control solution provides end-to-end management of live and digital media files in addition to the ongoing network programming, and the ViaSat IP system and Wegener satellite upgrades will have a return on investment (ROI) of less than three years.

For information, contact Wegener at (914) 764-4531 or visit www.wegener.com.

TECHUPDATE

DAWNCO HELPS WITH THE DISHES

Dawnco, a Michigan-based satellite products company, offers a line of satellite reception and distribution products for radio and television broadcasters.

Available products include dishes, feedhorns, LNAs, LNBs, receivers, processors, modulators, filters and translators along with ancillary products such as power products, heaters, motors, mounts and test equipment. Digital and analog, Ku and C bands.

Equipment is available by the part or in turnkey packages.

The latest from the company are new LNBs (low-noise blocks) for C and Ku band satellite dishes and digital receivers. The new LNBs promise ±5 kHz stability performance.

Dawnco also has a new 3.7 meter high-gain dish designed for digital reception. The Starlook-D is a portable, battery operable satellite spectrum analyzer and identifier for analog and digital satellites. The receiver operates from 920 to 2150 MHz and can identify the satellite and channels available. It is computer compatible and has a 4.5-inch black & white monitor for use with NTSC/PAL/SECAM video reception.

Dawnco also has outdoor-rated satellite fiberlink products for linking stations to distant satellite dish sites.

For information, contact Dawnco at (248) 391-9200 or visit www.dawnco.com.

MAYAH

(continued from page 38)

without any bridging. [*Editor's Note: High-end high-bandwidth APT codecs are popular with many commercial and film post-production studios.*] That's a cost saver for everyone in my business.

The Sporty's not cheap, but I believe it's a great investment because Mayah has made it "future proof."

My line of work is high-fidelity and mission-critical so connections have to be reliable and high quality. Though Source-Connect is a popular player for real-time gigs using the Internet (instead of ISDN), it's pretty clear that the Internet is where it's all heading. While for commercial production, ISDN remains my choice, the Mayah is equipped with many ways of connecting via the Internet (and otherwise). That's territory I've not yet needed to explore, but I do know that as we evolve, the Mayah Sporty is designed to evolve with us.

Could the Sporty be even more user friendly? Sure, but I understand that Mayah is working on that as well as making its Web-based software Mac-compatible. Overall, I think the Sporty is a great product for anyone looking for compact size, sleek design, stellar quality and ease of use.

For information, contact Mayah Communications at (360) 618-1474 or visit www.mayah.com.

Receiver Helps Service Provider

Feature-Packed DSR01 Fills the Differing Needs of Clients

BY OLAF MÜHLBAUER
Expert for FM Broadcast
Media Broadcast GmbH

BERLIN — Media Broadcast is a leading service provider for the broadcast and media industries in Germany. The company is a driver of technical development and provides consultation for all products and solutions.

For a long time, my colleagues and I have searched for a reliable satellite audio receiver to feed FM transmitters. Due to our desire to provide excellent service for our customers, the best quality and state-of-the-art technology along with specific product requirements, our search was not particularly fruitful.

NETWORKED

With the **2wcom** DSR01 satellite receiver we found a device that fits our needs nearly completely. The DSR01 is fully controllable via an integrated Ethernet interface. Purchasers have the option of a front display or not. For Media Broadcast we decided that we did not need one because we operate a huge network where all receivers are linked to and controlled remotely by that network. In most of the cases the devices will be configured by a laptop at installation.

Working with the DSR01 is easy for a technician because the Web interface is mostly intuitive. The Web GUI is easily understood. The integrated SNMP interface is able to send alarms to designated recipients. Every alarm can be configured independently via the Web interface concerning thresholds and times.

The availability of several options makes it possible to set up the DSR01 for your needs. By utilizing an optional DVB-S2 tuner module users have the ability to decode low symbol rates and therefore receive SCPC signals. For us this was also an important need because Media Broadcast operates SCPC links on leased transponders.

The receiver also has an adjustable, accurate audio decoding delay. This feature has become more and more important for us over the last few years because the FM network in Germany has become very crowded. Because of that FM radios are switching with the help of RDS-AF, sometimes very often, between the different frequencies carrying the same program. In many cases listeners notice if the satellite receivers have different audio delays. That's why we had some trouble with other receivers in the past but no longer now that we can synchronize the delay.

The main reason for choosing the DSR01 is the large number of excellent audio features of the receiver. Users can choose between analog L/R and digital AES/EBU or X.21 output of the audio signal. For RDS you can choose between RS-232 and LAN (UECP over IP).

To set up several DSR01s with the same configuration users can download the settings via the Web interface and upload the configuration to the other DSR01s. After a reboot the DSR01 keeps its IP address so the receiver is always reachable. After startup the receiver is ready to operate within two seconds. That's really fast and it is absolute necessary because at remote transmitter sites the power supply is not always stable. With that short startup time you can shorten your failure time.

2wcom has built a very interesting satellite audio receiver. The engineers at 2wcom always pricked up their ears for the needs of Media Broadcast. That's one reason why we are satisfied with the device.

For information, contact 2wcom at 011-49-461-97892-0 or visit www.2wcom.com.

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COMPLETE FACILITIES

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RADIO WORLD *Equipment Exchange*

MICROPHONES/ HEADPHONES/ SPEAKERS/AMPS

WANT TO BUY

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 214 738-7873 or sixtiesradio@yahoo.com.

MISCELLANEOUS

WANT TO BUY

Collector wants to buy: old vintage pro gears, compressor/limiter, microphone, mixing consoles, amplifiers, mic preamps, speakers, turntables, EQ working or not, working transformers (UTC Western Electric), Fairchild, Western Electric, Langevin, RCA, Gates, Urei, Altec, Pultec, Collins. Cash - pick up 773-339-9035.

Equipment Wanted: obsolete, or out of service broadcast recording gear, amplifiers, preamps, outboard, radio or mixing consoles, microphones, etc. Large lots acceptable. Pickup or shipping can be discussed. 443-854-0725 or ajkivi@gmail.com.

WANT TO SELL

I'm looking for San Francisco radio recordings from the 1920's through the 1980's. For example newscast, talk shows, music shows, live band remotes, etc. Stations like KGO, KFRC, KSFO, KTAB, KDIA, KWBR, KSFX, KOBY, KCBS, KQW, KRE, KTIM, KYA, etc, I will pay for copies... Feel free to call me at 925-284-5428 or you can email me at ronwtamm@yahoo.com.

PLAYBACK HARDWARE

WANT TO SELL

Tascam DA 88 eight-track DAT rcdr/plyr; Tascam DA-38 eight-track DAT rcdr/plyr; Sony DTC-690 DAT rcdr/plyr; Tascam 112 MKII cassette rcdr/plyr; Tascam 122 cassette rcdr/plyr; Tascam M-2524 24-chnl audio console & Tascam TM-D4000 32-chnl console; all BO + shpg. Steve, 719-955-4625 or stuzeneu@wayfm.com.

Large or small collections of 16" transcriptions or 12" transcriptions, not commercial LPs. Bill Cook, 719-687-6357.

WANT TO BUY

Schnader telescriptions 16 mm musical films produced in the early 50 s. Bill Cook, 719-687-6357.

RECEIVERS/ TRANSCEIVERS

WANT TO SELL

(2) Wegener Unity 4000 receivers in good condition. One has 4 stereo audio ports and the other has two. Best offer plus shipping for one or both. Steve, 719-955-4625 or stuzeneu@wayfm.com

RECORDING & RECORDING MEDIA

WANT TO BUY

Looking for TM Programming Stereo Rock automation reels & jingle packages. Jim, 513-922-7049 or wjim@roadrunner.com.

REMOTE & MICROWAVE

WANT TO SELL

STATIONS

WANT TO SELL

For Sale: AM in Rome, NY, xlators in Enid, OK, Jacksonville, NC, Temple, TX. Email mraley@bbnradio.org.

Oregon CP, 161191, 775-317-7887 or vernongsnyder@hotmail.com.

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The following distributors serving the broadcast industry would be glad to help you with any of your requirements.

EMPLOYMENT

POSITIONS WANTED

Extensive freelance writing experience. Competitive and enjoys a challenge. Vast knowledge of sports, and teams. Strong on-air, play-by-play, and production ability. Blake, 214-733-1614; blakegibbs1818@hotmail.com.

Humorous and creative broadcaster with natural on-air presence. Knowledge from sports to pop culture. Strong copywriting/editing skills. Very determined and dependable. Josh, 817-986-1791; josh.l.johnson89@gmail.com.

Strong on-air ability, with creative writing and good communication skills. Good show prep; tight boards, and technical abilities. Motivated with positive attitude. Steven, 817-888-1303; sperkins81@yahoo.com.

Media/journalism/photography experience. Extremely computer and technical savvy on both PC & Mac. Proficient copy/news writer. Optimistic, friendly and an Eagle Scout. Noe Ponce, 817-500-3968; NPonce23@gmail.com.

Good on-air/promotions ability. Very adventurous, friendly and outgoing. Talkative, able to carry conversations. Determined. Respectful. Bilingual; able to read, write/speak English/Spanish. Jennifer, 214-708-9966; gueraambriz18@hotmail.com.

Witty, enthusiastic, outgoing and friendly broadcaster. Motivated, loyal, and dedicated employee. Takes pride in work, and pays attention! Good copy/production, and on-air. Helena, 361-633-9076; hc-chapa2006@hotmail.com.

Extremely knowledgeable and articulate racing writer/talk show host Adam Amick is available for shows, correspondent, features, etc. Check out www.bleacherreport.com for samples. Call 214-384-5812 or email: adam@rubbinsracingshow.com.

Are you a small market station needing a good nuts & bolts engineer in the Los Angeles area? I will make your station shine! CET, fully FCC Licensed. Available for Full/Part-time/Contract work. Available immediately. Mitchell Rakoff, 917-324-8466 mitchellrakoff@yahoo.com.

TAX DEDUCTIBLE EQUIPMENT

Donations Needed: All Volunteer, Non-profit Low Power community radios stations need Equipment. Will offer tax deduction letter, You determine donation value, We will pay shipping. Equipment shared between three Wisconsin stations. Looking for Mics, Mixers, field equipment, etc. You name it. Email: Dan@WIECradio.org.

TEST METERING-MONITORING

WANT TO SELL

Gentner 710 silence sensor, worked well when removed from service, documentation & phone interface incl, $150. L Smith, 518-725-7175.

TRANSMITTERS/EXCITERS /TRANSLATORS

WANT TO SELL

3kW Harris Gates FM-3H transmitter, WYKS FM in Gainesville, FL is offering for sale, our very reliable 3kW FM transmitter which was recently pulled out of service after a 20 year run, includes original technical manual and support documentation as well as harmonic filter and various spare parts, this box would make a great backup transmitter, or could be useful for parts, you will be responsible for transportation. Kevin Quinn, 352-331-2200 or Kevin@kiss1053.com.

Sparta 602-FM 25 kW xmtr, free for the taking; RCA 25kW FM xmtr, free for the taking. B Bradley, 360-918-9000 x.102 or bill@southsoundbroadcasting.com.

CCA AM 10,000 D – Call John KQSS **928-595-0263** between 10 & 6 PM Pacific Time.

FM Translator at 104.5 – Manchester, KY Call Joey Kesler 606-843-9999.

Energy-onix 4kW FM, brand new, still in crate, includes exciter & spare parts kit, $15,000. A Harris, 307-871-1173.

WANT TO BUY

AM Phasors, Phasor Parts, Phase Monitors, Rf Switches, AM Transmitters. Continental Communications 314-664-4497, Contcomm@Sbcglobal.Net

TUBES

READER'S FORUM

SOME COMPANIES DO CARE

Kyle Hammer ("Hammer Steps Up to the Plate," May 6) mentioned that companies don't design technical products for sports radio. He goes on to say that communication equipment in particular is impractical.

Since this is his "pet peeve," I would love to hear more specific comments on the subject. We are always looking for ways to help customers and improve their efficiencies. Please pass my e-mail on to Kyle, he certainly has my ear on the subject.

Rick Molina
Pro Audio Product Manager
HM Electronics
Poway, Calif.

THE CART BEFORE THE IBOC HORSE

Am I missing something here? It seems to me the National Radio Systems Committee is putting the cart before the horse ("NRSC Adopts IBOC Measurement Guide," May 20).

The text of the article even admits "the FCC has not yet adopted technical standards for IBOC." So *if* the FCC has *not* developed technical standards, how in the hell will making measurements tell you *if* you're in "compliance" with a standard that does not *yet* exist?

The article also claims this guideline should "help measure one station's interference with another." Terrific! So now we'll all be able to quantify the interference that iBiquity claimed wasn't going to happen.

Now that we can put a number to this interference, at least the FCC will now know how badly it is interfering with all of us when they do nothing to resolve it. I mean, it *will* make the commission *appear* to be doing their job, as they continue their cozy relationship with iBiquity and give us all the knowing wink and nod regarding "compliance."

Jerry Arnold
Midwest Communications
Terre Haute, Ind.

REST WELL, STEVE

On May 28, the radio broadcast engineering community lost a leader and many of us lost a dear friend.

Steve Schott of Continental and a 40-year veteran of the industry passed away. He was 65.

Those who knew Steve know of his calm manner, total integrity and utmost competence. He served the companies for which he worked and their customers with complete dedication.

Who among us have not used his collection of "Technical Programs," which he provided free for 25 years? More personally, there are those of us who think


Steve Schott

of Steve as a brother. We were brought together in the late '70s at Collins Radio, and while we have changed company associations over the years, have remained close and dear friends.

For that 30-year friendship, we will always be grateful. Today, there is emptiness; and while Steve is out of our embrace, he will always remain in our hearts.

John Abdnour
Regional Sales Manager, Asia/Pacific
Nautel
Streator, Ill.

WE'LL BE PAYING FOREVER

Great article by Tom Vernon on the 30th anniversary of the CD's debut ("From Pinkeltje to Ubiquity," May 20). The CD is a terrific consumer electronics product that's been wildly successful.

I know there were many patents over many years related to CD technology, but I picked the years 1976–1982 to do a quick search for ones assigned to Philips. I found seven. All of them are expired now.

Consumers, radio stations and society in general now benefit even more from Philips' intellectual property because the technology in the expired patents can be used royalty-free.

While the CE industry was developing and patenting CD technology, many songs were copyrighted. Just a few of them include "It's Still Rock & Roll to Me" by Billy Joel (1980), "Crazy Little Thing Called Love" by Queen (1979) and "Hurts So Good" by John Cougar Mellencamp (1982).

But in contrast to the innovative technology used in the CD, the copyrighted songs may still be monopolized by their owners for another hundred years, give or take, thanks to our out-of-control copyright law. We'll probably be paying forever unless we get enough consumer (*a.k.a.* voter) momentum going to get the law changed.

Dave Wilson
Owner, WHDX(FM)/WHDZ(FM)
Sr. Director, Technology & Standards
Consumer Electronics Association
Arlington, Va.

Wilson also is a contributor to Radio World. His views are his own and not necessarily those of RW, CEA or its member companies.

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OPINION

Radio's Future Is in Your Hands

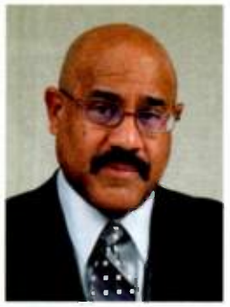
NAB's Radio Board Chairman Says Performance Royalty Fight Is Crucial

BY CHARLES WARFIELD

Every radio station — from large operators in major markets to small mom and pop stations in rural America — is facing a fight for its very survival in the ongoing battle over the performance tax.

COMMENTARY

Our success to date is a direct result of unprecedented unity demonstrated by radio broadcasters across America. And our future success will hinge squarely on our collective ability to educate lawmakers on the cynical campaign by the record labels to rescue a failed business model on the backs of local radio stations.



ting up one-sided "town hall" meetings to show support for the legislation. And in July, the record labels circled back with the House Judiciary Committee — the only venue to give them traction thus far — in an attempt to embarrass broadcasters who are aggressively standing up for the future of free and local radio.

As I write, a bipartisan group of 19 senators and more than 240 House lawmakers have expressed their support for the Local Radio Freedom Act, a resolution that emphatically opposes the imposition of any new tax, fee or other charge on local radio stations for music broadcast over-the-air.

> **I urge radio station employees** across America to schedule a meeting with your lawmakers when they return home to meet with constituents.

Even as congressional opposition to the performance tax grows, the Recording Industry Association of America is refusing to back down from its push to impose new fees on radio stations that broadcast music free to listeners.

They've taken their battle to the FCC, where they filed a complaint alleging that unnamed radio stations were refusing to play music by unidentified musicians who support a performance tax. They've taken their fight to individual cities, setting up one-sided "town hall" meetings to show support for the legislation. And in July, the record labels circled back with the House Judiciary Committee — the only venue to give them traction thus far — in an attempt to embarrass broadcasters who are aggressively standing up for the future of free and local radio.

The growing support for local radio is a testament to both the merits of our argument as well as the strong grassroots engagement coordinated by individual station owners, broadcast state associations, and our talented NAB staff in Washington.

DON'T LET UP

But now is not the time to let up on the brakes. With the August congressional recess approaching, I urge radio station employees across America to schedule a meeting with your lawmakers when they return home to meet with constituents. Invite your elected representatives to your station; take them on a tour of your studio. If they have already co-sponsored the Local Radio Freedom Act, thank them for their support.

If they have yet to take a position, ask them for their support. Explain why a performance tax would have such a negative impact on your station's ability to serve listeners. Educate them on the utter bankruptcy of an RIAA campaign based on the purported desire for "fairness to artists," and follow that up with a reminder of the well-documented abuse of artists by RIAA member companies. Explain to them that if this new tax is imposed, 50 percent of the proceeds will be funneled from local radio stations directly into the coffers of record labels headquartered in the U.K., France and Japan.

This should not be a tough sell. In addition to providing musicians with an unparalleled promotional platform to expose music to listeners, local radio stations serve constituents with unique, local programming unmatched by any other medium. From lifesaving emergency weather warnings to AMBER Alerts, hometown radio stations provide a critical local link during times of crises. And when the flood waters have receded and the rebuilding efforts have begun, it is local broadcasters who are out in their community, collecting clothing, canned food, water and building supplies.

No matter how many accommodations and carve-outs are proffered in this legislation, most radio stations simply cannot bear the burden of a new performance tax and remain the viable service our 235 million weekly listeners have come to rely on.

As every radio broadcaster knows, this issue is critical to the future of radio. The NAB staff in Washington is representing our interests well, but the true strength of broadcasting will always come from our grassroots support.

To ensure our ultimate success, radio must remain steadfast, engaged and united. Radio's future — your station's future — is in your hands.

Charles Warfield is the president and COO of ICBC Broadcast Holdings. He serves as the chairman of the National Association of Broadcasters Radio Board of Directors.

READER'SFORUM

NAILED

"Why the Record Labels Are Wrong" by Tony Coloff of KIOW(FM) in Iowa, in Radio World's May 20 issue, nailed the record labels right on the head.

Way to go, Tony, for a well-thought-out commentary. I would suggest that everyone copy Page 37 from that Radio World and mail it to their record reps.

Wouldn't it be interesting to track a label's songs and plays for the month, attach even your lowest ROS rate, and send a fake invoice too?

Daniel Slentz
Director of Engineering
WSFL(TV)
Ft. Lauderdale, Fla.

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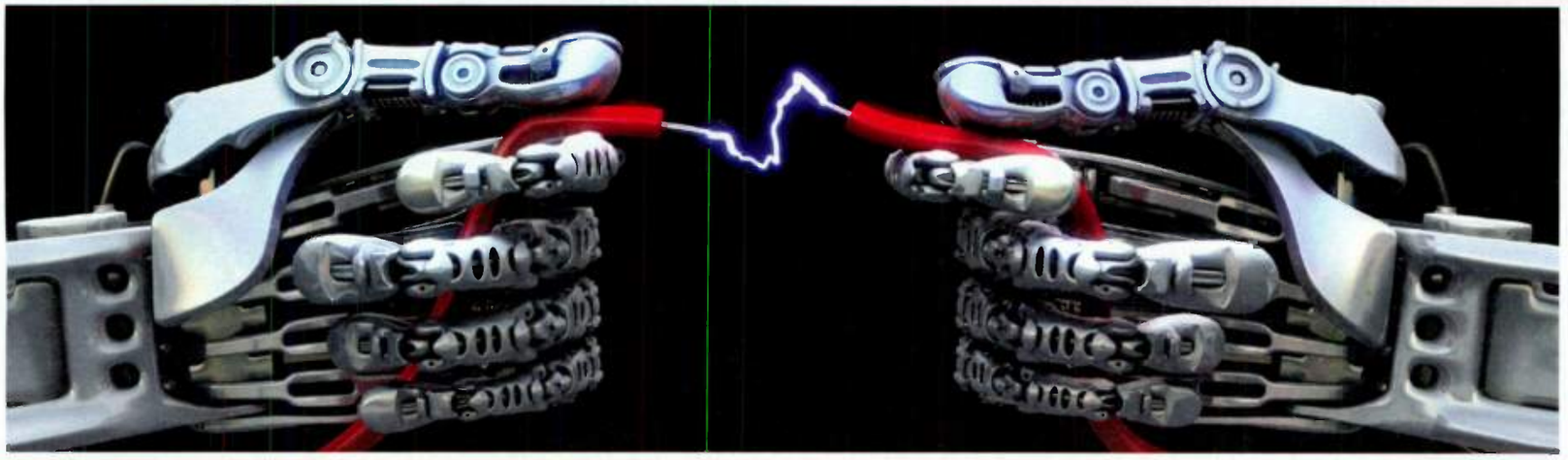

Not since Axia audio-over-IP was introduced to the broadcast industry have we at BGS been so excited! It is with great enthusiasm we'd like to invite you to take a look at the new Op-X Radio Automation delivery system for any single or multi-station cluster. Op-X works seamlessly with Axia IP-Audio networks or as a stand-alone system.

*"The merging of traffic and music logs takes a mere :30 seconds, making it among the easiest I have ever worked with. Once you get used to your adjustable personal color scheme, everything is pretty easy to follow. The best part about this system is the LACK of "dead-air" or "hangups" during automation. PD's will breathe a sigh of relief at this. Another thing that stands out is the absolute ease with which you can build your personal hot keys for each air talent. If you organize your show properly ahead of time and know where you are going, this system will make your show much easier and let you concentrate on *sounding good* on the air."*

~ Jim Franklin, Program Director
WVBO, Appleton/Oshkosh - Wisconsin

"Finally, an automation system that keeps in mind that not every jock is also a computer whiz. This system is easy to operate from the word go..... yet offers all the bells and whistles that help make your station sound great. The clock builder option makes interfacing with satellite shows very easy. Plus, it has the best voice-tracking capabilities available."

~ Matt Scurry, Operations Manager
WWFN/WHLZ Florence - SC

"A fast paced station needs a system that can keep up and is easy to use. Op-X gives us the tools we need to deliver the sound Houstonians have come to expect from KRBE."

~ Leslie Whittle, Program Director
KRBE, Houston - TX

If you're looking for an audio delivery system~ you owe it to yourself to find out more about Op-X. Give us a call or email info@bgs.cc!

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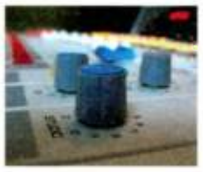

It's no secret that Wheatstone is the #1 name in radio consoles and networking, known for top quality performance and ruggedness. That heritage is apparent in every aspect of the Audioarts D-75 Digital Audio Consoles.

Fully modular plug-in construction. Built-in mic preamps. Analog or digital inputs wherever you want them. Optional dual phone mix-minus module. Four stereo output buses. Built to last and last. Hinged meter bridge for easy access to wiring and logic programming without having to crawl under the furniture.

Need to network your plant? Easy! Install Wheatstone or Audioarts network I/O frames and a switch in your TOC/rack room. Install D-75N consoles in your studios. The D-75N includes six networked input channel modules that access any source from anywhere in the network, plus two locally connected sources that appear on your consoles and on your network. And the D-75N's four output buses are available on the network as well.

When we conceived the D-75, the idea was to make it digital, affordable and networkable. And it's incredible just how fine it turned out. We're proud of the D-75 and it's ability to play well with others. We think you're going to find it pretty incredible, too.

D-75 major market features:

- Fully modular
- 18 slot frame with 12 input modules
- 26 slot frame with 20 input modules
- Input channel A/B source select
- Optional dual phone mix-minus module
- Optional line selector and control modules
- Opto-isolated control ports on every input module
- Four stereo output buses: PGM, AUD, AUX, UTIL
- Clock and timer
- External rackmount power supply

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