INSIDE THE BROADCASTER TRAFFIC CONSORTIUM. Page 4

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When Do We Stop Calling It New Media?

Rebrand radio as just one delivery platform within a media provider's market presence.

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Contradictions In Digital Media

In many ways, the revolution is of two minds.

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Radio World

$2.50 The Newspaper for Radio Managers and Engineers August 1, 2008

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Jim Withers visits auto dealers eastern Missouri to see how HD Radio sales effort looks the buying end.

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On the scoreboard: The lout trend over three years graphic form.

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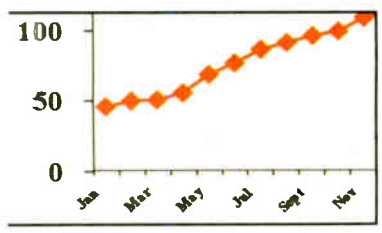

PINION

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NEWS ANALYSIS

HD Radio Power Boost Is on the Table

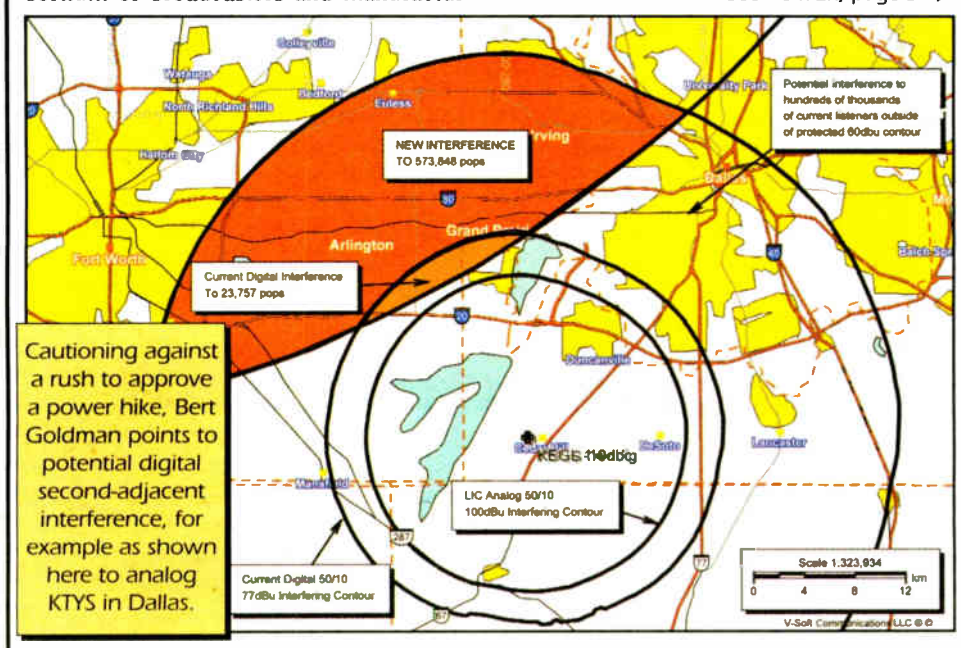
But the Official Request for an IBOC Hike Raises Questions Even as Its Seeks to Answer Others

by Leslie Stimson

One official shoe of the IBOC power issue has dropped, with a formal request submitted in June to the FCC by a consortium of broadcasters and manufacturers. Now the industry faces questions about whether the approval shoe should fall — and what might happen if it does.

The idea of allowing FMs to raise digital power on a voluntary basis by up to

See POWER, page 3 ▶



Cautioning against a rush to approve a power hike, Bert Goldman points to potential digital second-adjacent interference, for example as shown here to analog KTYS in Dallas.

Digital Radio Advances, Slowly

How Are Eureka-147, Its Mobile Offshoots & Other Formats Faring?

by Daniel Mansergh

It's safe to say that the introduction of digital radio technologies around the world has had a rough road. Although a few countries have succeeded in deploying viable digital radio services, most have experienced very slow adoption by consumers or are still considering their options about which systems to implement.

Two presenters at the Broadcast Engineering Conference of the spring NAB Show shared their perspectives on the state of digital radio worldwide and what broadcasters and regulators need to consider as they move to adopt new digital radio services in their countries.

Charles Kelly of Nautel Ltd. has analyzed the effect of existing band plans and allocations on the technology choices available to countries as they consider which in-band digital radio system to authorize. The suitability of specific

See GLOBAL, page 6 ▶

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World Radio History

NEWSWATCH

ALLIANCE: The HD Digital Radio Alliance expanded its marketing aimed at converting consumer interest to radio purchases. The alliance campaign, including a 13-week flight of ads on 700 or so alliance stations and valued by the group at $75 million, incorporates cellphone texting and promotes an online guide to HD main and HD2 stations that can be printed in stores by retailers, car dealers and consumers.

TAGGING: Clear Channel Radio says all of its 352 multicast channels now are ready to support Apple iTunes tagging. Earlier this year the company announced it had made its 340+ primary HD Radio stations compatible. Thus more than 700 Clear Channel HD Radio channels are now tagging-capable.

LIMBAUGH: Radio's biggest conservative talk icon renewed his contract through 2016 with Premiere Radio Networks and Clear Channel. The New York Times reported the value at $400 million or $50 million per year, a raise of $14.4 million a year. Rush Limbaugh's contract is thought to be radio's largest since Howard Stern's move to Sirius in 2004.

NDS: Rupert Murdoch's News Corp., the majority shareholder of NDS Group Plc, proposed to take NDS private in a transaction financed by private equity firm Permira. The complex deal would leave News Corp. with a 49 percent stake, and Permira would own 51 percent, Reuters reported. NDS makes conditional access technology.

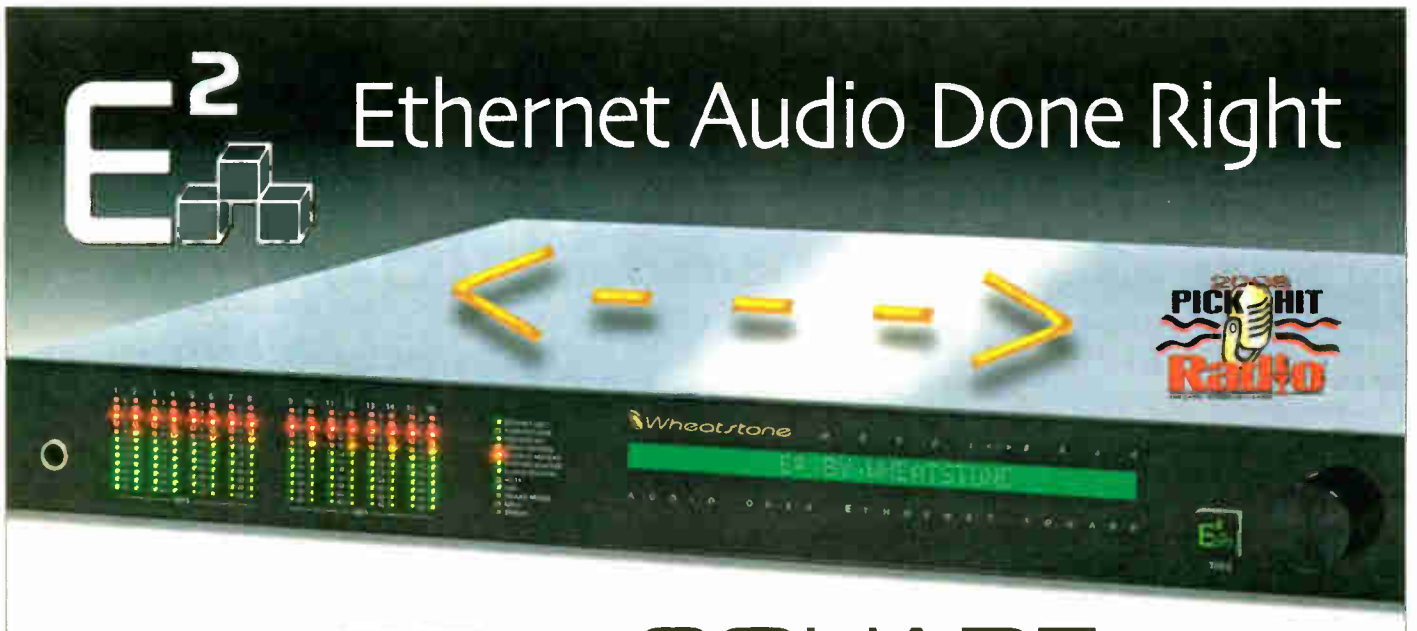
MERGER: Sirius Satellite Radio and XM Satellite Radio would enjoy combined savings of $400 million in 2009 if they merge, Sirius said in financial guidance to the investment community. Separately, some Democrats in Congress told the FCC that if a merger is approved, conditions should include provisioning a certain portion of satellite spectrum for non-com use as well as mandating HD Radio in all satellite radios.

HOGAN: John Hogan, Clear Channel Radio's chief executive, signed a five-year renewal. He took the position in 2002 following Randy Michaels. He'd been radio COO before that.

ANALOG SHUTOFF: Analog radio would be shut off in the United Kingdom in 2020 under a recommended interim timeline in a government-commissioned report. The report is from the UK Digital Radio Working Group, which includes representatives of industry, manufacturers and regulators. It recommends establishment of a timetable to switch from analog to DAB digital radio in the U.K. with a suggested completion date of 2020.

STEREO PIONEER: Carl G. Eilers died at age 83. A senior scientist with Zenith Electronics Corp. for five decades, he was credited with helping to bring stereophonic sound to FM listeners. Eilers was a charter member of the Consumer Electronics Hall of Fame. "While seemingly mundane in today's digital world, Eilers' stereo FM innovations meant that, for the first time, radio stations could transmit two stereophonic channels with full high-fidelity on each channel, signals that could also be received by existing monophonic FM receivers without loss of quality," CEA wrote at the time. Eilers also innovated in multichannel television sound and secondary audio programming.

WIFI: Chrysler said it will offer in-car WiFi connectivity on its 2009 models as an aftermarket option for Chrysler, Dodge and Jeep vehicles. Called uConnect Web, the in-car WiFi capability essentially will turn a vehicle into a "hotspot," the automaker promises.



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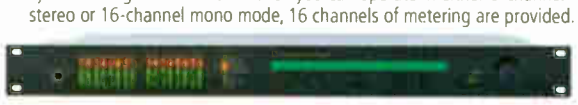

88A I/O: 8 analog inputs and outputs. You can bring a new SQUARE up in seconds and of course use the front panel encoder for your X-Y control. Front panel status LEDs give you continuous link, status, and bit rate information as well as confirmation of any GPIO activation.

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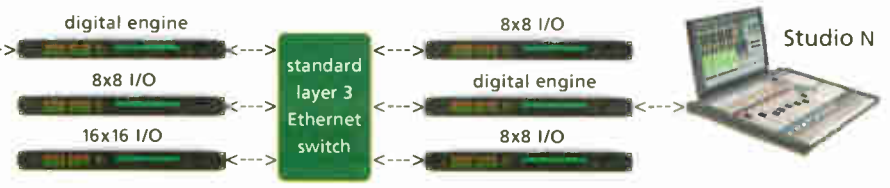

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Power

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10 dB — from the current –20 dB below analog carrier to –10 dB — is touchy.

A power increase involves operational transmission costs. Critics also raise questions about increased interference that may result from higher IBOC power levels.

Some broadcast engineers involved in the digital rollout are asking if other ways of extending a station's digital coverage to match analog can be explored without placing additional cost burdens on stations at a time when managers are coping with soft revenue and steeper power costs.

Proponents say it's critical to allow higher digital power to improve building penetration to home and office IBOC receivers as well as robustness of the digital signal in time for the introduction of HD-R portables. Ibiquity Digital predicts portables will be available to consumers at year-end or in the first quarter of next year.

The consortium pushing for the increase says tests demonstrate it would help improve radio's digital FM performance "with minimal risk of harmful interference to existing analog service."

'Largely replicate'

"Whatever is done needs to be done in a timely manner," said Milford Smith, vice president of radio engineering of Greater Media.

"If [the rollout] goes on with no corrective action, I think we've got some real issues with the continued viability of HD Radio. People have a certain expectation. HD Radio needs to largely replicate the FM [analog] service if it's to be logical."

Smith was careful to say that he was stating his personal view on the power issue. Greater Media is one of the early adopters of IBOC and one of the broadcast groups supporting a power increase. He also chairs the National Radio Systems Committee.

He is not alone in his opinion; other sources close to the issue said they believe the next couple of years are telling for the future of IBOC.

The group of 18 organizations asked the FCC in June to approve the power boost, and they would like the FCC to act quickly. While Smith would prefer to see the increase approved by the time HD-R portables hit the market, he said if the issue is resolved within a year or so, that would still help stations that have converted to digital.

Smith also noted that not every station would immediately raise its digital power if the agency approved a boost. Costs and other implementation issues determine that timing.

Mike Troje, sales manager for Continental Electronics, one of the manufacturers supporting the power increase, agrees.

"The reality is anyone in a major market with a TPO of 20 kW or greater will need to modify their transmission system" in order to implement the power increase up to the full 10 dB, he said.

Marty Hadfield, a broadcast consulting engineer and former vice president of engineering for Entercom, said some stations may have the headroom in their digital transmitters now to implement an increase of perhaps 1 to 6 dB; however he doubts "that many can simply go out to their site now and have it be fully functional."

A station that leases rather than owns its tower space could face rent increases if it wanted to increase digital power, especially if a tower already is overloaded and the station can't modify the antenna to handle the HD-R signal separately, he said.

Higher power levels have a ripple effect, said Hadfield, in the necessary extra footage for additional transmission equipment, more air conditioning and higher electricity costs.

A typical FM was paying approximately $150,000 to convert its plant before the recent introduction of the embedded exporter. That figure is now more like $130,000 to $140,000, Troje said.

Troje concurs that the timing of a power increase approval is crucial. "The ball is rolling now. As a manufacturer, this has our attention. We have to be prepared to give somebody an adequate solution whenever or however this gets resolved."

Yet getting the commission's attention on the issue may be difficult. Chairman Kevin Martin's time leading the agency could be winding down, with a new administration coming in; the agency, like other organizations, tends to get less done in the summer season; and come the fall,

See POWER, page 5 ▶

In Support of an Increase

A group of 18 organizations asked the FCC in June expeditiously to approve the power boost, the equivalent of an increase from 1 percent to 10 percent of a station's authorized analog power.

Those requesting the increase include broadcast owners, transmission manufacturers and Ibiquity Digital. The NAB and the HD Digital Radio Alliance filed public comments at the commission supporting the request.

Equipment manufacturers on the filing include Broadcast Electronics, Continental, Harris and Nautel. Broadcasters include American Public Media, Backyard Broadcasting, Beasley, Black Crow Media Group, Bonneville, CBS, Clear Channel, Commonwealth Broadcasting, Commonwealth Public Broadcasting, Cox, Emmis, Entercom, Greater Media, Journal, Lincoln Financial Media, NRG Media, Radio One and WNYC.

A power boost was a major topic among technical managers during the spring NAB Show and is likely to be so again at the fall NAB Radio Show.

Test results submitted to the commission by CBS, Ibiquity, Greater Media and Clear Channel compared performance with digital power at –20 dB and at –10 dB to determine the extent of the digital coverage improvement on a total of seven stations.

Class B FMs in Detroit, Los Angeles and New York experienced an average increase of 24 percent in service radius and an average 65 percent gain in coverage area, according to the group, while Class As saw an average increase of 30 percent in service radius with an average 67 percent gain in coverage area.

"[T]he increased power significantly reduced the area within each station's core coverage area in which the digital signal could not be received," the group states in the June 10 FCC filing (Docket 99-325).

The consortium says its test results demonstrate that the power increase would help improve radio's digital FM performance "with minimal risk of harmful interference to existing analog service."

The tests included an analysis of super-powered FMs and short-spaced stations.

Testing inside the protected contour area of stations highlighted one area of potential concern: severely short-spaced Class Bs may be at increased risk of receiving interference from the digital signal.

Outside the protected contour, Super Bs operating at the higher digital power level were shown to have the potential to impact first-adjacent Class Bs, according to NAB, which supports the consortium's recommendations on limits on the digital power for Super Bs.

Also included in the submission was a test by CBS on HD-R receiver penetration using KROQ(FM), Los Angeles at the higher FM IBOC power level (RW May 21, page 8).

— *Leslie Stimson*

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World Radio History

Radio Groups Build a Shared Data Channel

Brenner Sees Radio as a Data Distribution Service to Support User-Specific Applications

Paul Brenner likes HD Radio. But not because he thinks it sounds better or sprinkles lots of new multicast stations around the dial. He thinks HD Radio's data distribution capabilities could add millions of dollars to radio's revenue bottom line and he's trying to make that happen.

If Brenner's hopes are realized, content providers looking for a national data distribution platform to reach consumers in their vehicles or on mobile devices will have a new choice soon, one that relies on the HD Radio data delivery capabilities of hundreds of U.S. radio stations.

This year, eight radio ownership groups announced the Broadcaster Traffic Consortium, a joint venture that essentially will sell bandwidth to content providers and divvy up the income, helping the broadcasters pay for, and profit from, their new digital infrastructures.

This also puts the consortium squarely in competition with Clear Channel, which has been building an HD Radio-based data distribution platform of its own.

'Audio plus'

The new consortium has just one customer at present, but it's a notable one: Navteq, a provider of digital map information that enjoys a lion's share of that market. If you own a vehicle navigation or location-based system, there's a good chance the digital maps and content come from Navteq. Further, that company is now about to become part of mobile phone giant Nokia, which is in the final stages of purchasing it in an $8.1 billion deal.

The BTC's immediate goal is to build a nationwide network to distribute Navteq traffic information — such as traffic flow and points of interest — via HD Radio technology. In doing so it hopes not only to make more money but also to accelerate the penetration of HD receivers.

Paul Brenner is the vice president of integrated technologies for Emmis Communications, which administers the consortium, and he was recently named president of the BTC — although this seems like a formality, given that he has been spending a great deal of his time for two and a half years envisioning and then helping birth it.

Radio, Brenner says, needs to position itself as a provider of "audio-plus" applications. He believes the BTC is a big step

Paul V. Brenner

in that direction, taking advantage of radio's strengths — meaning low-cost distribution, localized content and digital capacity — to re-establish itself as a means of engaging consumers.

Further, for HD Radio to succeed, he said the industry needs to emphasize the same "audio-plus" argument. Digital audio and new channels are not sufficient to make the business model work, he feels. The data capacity is key.

The consortium effort was prompted several years ago by traffic content provider Traffic.com, which later became part of Navteq. Eight broadcasters put up the money for the consortium: Beasley Broadcast Group, Bonneville International Corp., Cox Radio Inc., Emmis, Entercom Communications Corp., Greater Media, NPR and Radio One.

Emmis took the lead in organizing it, and Brenner — a new technology executive with a background in electronic engineering, e-business and information systems, to whom the Emmis engineering staff also reports — has been its chief architect.

Also contributing spectrum as partners are Lincoln Financial Media, Cumulus Media, Hubbard Broadcasting and Cobalt Operating LLC, though these four are not part of the BTC ownership.

The result, Brenner says, is a formidable organization with some 1,300 stations within its umbrella. Thus BTC can be a "one-stop shop" for any content provider that wants national distribution.

"HD Radio has huge amounts of capacity compared to FM. If there are content providers out there looking for a low-cost, high-return way to reach the complete U.S. market, they don't have to just go to Clear Channel. They can have the same conversation with BTC about distributing data across the United States."

To participate, a station must have a full-market HD Radio signal, an importer and Internet access. It must meet the BTC's infrastructure stability guidelines for factors like IT readiness, up time, power redundancy, bandwidth capability, ISP and so forth.

Each of the owners assigns a lead manager responsible for implementing the technology. At Greater Media it's Milford Smith, at Bonneville Talmage Ball, at Radio One John Mathews, at Entercom Alex Keddie, at Cox Radio Roz Clark, at NPR Mike Starling, at Beasley Mike Cooney and at Cumulus Gary Kline.

The technical process isn't complicated, though a handful of stations have had to upgrade an STL or obtain an Internet circuit.

Navteq worked with Ibiquity Digital and wrote the software that allows its data to be fed into the importer.

The role of RDS

What about RDS? Couldn't this new service just as well be provided in the analog FM spectrum today?

"RDS is too slow — low capacity and limited speed," Brenner said.

"RDS-based traffic services are just now coming in to maturity. They will continue to thrive while HD systems are developed. The amount of content serviceable over HD is so much greater in size and faster in delivery."

He feels RDS is likely to continue to thrive for some time because it can provide greater coverage — at least until HD power levels increase — and can be implemented by a manufacturer at a lower cost than HD receivers.

"BTC provides the broadcast distribution channel for Navteq. SCA was discussed; however, with great analysis, the decision was to use RDS in the short term and focus application development on HD."

Navteq airs data via RDS in 54 cities now.

Brenner noted there are SCA digital technologies such as FMeXtra available. "However we felt that Ibiquity was more advanced on providing the Advanced Application Services interface that Navteq needed.

"An investment in SCA, like MSN Direct SPOT, creates a proprietary solution for broadcaster and receiver and unknown amounts of time and dollars for adding an interface — physical and software — to format, transmit, receive and activate the software content. Digital SCAs are traditionally audio only."

Competition

The group of broadcasters has ample competition in this niche.

See BTC, page 5 ▶

From the Editor

Paul J. McLane

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World Radio History

Power

▶ Continued from page 3

commissioners and the rest of the country can be expected to turn their focus toward the presidential race. Politics does make itself felt in the halls of the Portals.

John Garziglia of the law firm Womble Carlyle Sandridge & Rice said, "Nothing happens at the commission unless someone [in Congress] is behind it."

Proponents say they believe the power hike request has sufficient political backing to pass, although certainly the big broadcast groups, in addition to the NAB, will need to lobby for it.

First and second

Not all broadcast groups with stations airing HD Radio believe this is the time to push for a power boost.

Bert Goldman, vice president of engineering for Independence Media and a member of the NRSC, questions whether enough studies have been done and wonders if there is another way to accomplish an increase in digital coverage.

Tests conducted by the backers of the power increase focused on possible interference to the host analog and first-adjacent digital neighbors, in the belief that these would be the most likely to suffer interference.

Goldman believes tests for possible interference for second-adjacent channels should have been completed before the request was filed.

So-called rim-shot stations will receive increased analog interference from their neighboring second-adjacent, in-town digital neighbors if the digital power is increased, he said, using a coverage map of Dallas station KTYS(FM) as an example.

"Before we go rushing into something, we need to evaluate the impact. So far everyone I've turned my map over to has gone into hiding or said it's conservative," said Goldman.

He said he's not trying to stop the HD Radio rollout and that indeed he is a proponent of the technology.

"I would like nothing more than to have someone tell me that I'm all wrong and why. Unfortunately nobody has yet done that, and if my suspicions are correct, then substantial harm could be inflicted upon hundreds of FM analog stations that count on their fringe 60 dBu signals."

Hadfield agreed that more questions need to be asked, especially of receiver and chip manufacturers.

"Why is the onus for the success of the power level increase on the broadcasters? Why not on the receiver manufacturers? I have not heard that receiver manufacturers have come to the game with improved sensitivity," he said, believing radio makers are keeping their costs down to keep prices low for consumers.

HD Radios that are much less expensive have lower sensitivity and are less able to pull in the IBOC signals, Hadfield said.

Of the receiver question, Smith said, "Based on what I know, there is not a lot of improvement possible on the receiver side to improve IBOC reception, especially for receivers that have to sell for a competitive price. What actually happens in many cases is that the IBOC signal becomes reduced to a point where it is actually below the noise floor of the FM band and would not be recoverable by *any* conventional receiver."

He deems the current crop of HD-R receivers "reasonably decent" in terms of sensitivity.

The power increase tests were not conducted under the auspices of the NRSC; that standards body wasn't asked to consider the issue by NAB or CEA, its sponsoring organizations, Smith said.

The group has discussed whether to take up the issue and was waiting to see results of NPR Labs' separate testing. Those findings would be released by the Corporation for Public Broadcasting, which funded the NPR tests. Sources said those could be released in July.

NPR found that an IBOC power increase would benefit home listening most but that the resulting increased interference likely would hurt analog mobile coverage (RW July 2, page 22).

Members of the testing and standards community at the NRSC and NPR Labs have been discussing whether further work can be done, Smith said, describing the power increase request as the start of a process.

"Initially, there's going to be people with different thoughts about where we're going. Part of the reason (the consortium) wanted to get this out there is to let people weigh in and get this moving forward.

"When all is said and done, there's an issue here that needs to be resolved, and in a timely fashion."

If my suspicions are correct, then substantial harm could be inflicted upon hundreds of FM analog stations that count on their fringe 60 dBu signals.

— Bert Goldman

BTC

▶ Continued from page 4

Last year Microsoft and Clear Channel Radio announced a collaboration to build a data delivery service using HD Radio technology. MSN Direct HD is an extension of Microsoft's MSN Direct service, which transmits traffic, weather, movie times, sports and stocks to Smart Watches, weather stations, GPS nav devices and home appliances. The expansion of that service into HD Radio was part of Microsoft's Smart Personal Objects Technology (SPOT) initiative.

Other competitors to BTC include Sirius and XM. Clear Channel also operates its own Total Traffic Network.

So what's the pitch to attract businesses to the BTC system in particular? Brenner says the group is structured to accomodate the acquisitions and divestitures common to the radio broadcast industry.

"The consortium is founded by operators who understand the framework of the broadcast business and are eager to broadcast Navteq content — meaning, our HD and RDS distribution channel is not reliant on a single organization's business decisions, which is a key point in the current economic client of commercial broadcasters."

Diverse station ownership provides more site diversity of FM and HD Radio transmitters, he says; and BTC has competence, breadth and depth of experience that are relevant to the industry.

"The individuals managing this organization come from NPR Labs, NRSC leaders, SBE leaders on the tech side, and senior exectives — legal, business, sales — from across the majority of major broadcast groups."

But BTC is not soliciting business beyond Navteq at this point. "We will evaluate the need as it occurs. At this time, our primary purpose is to aggressively build up and meet the needs for Navteq to compete in the current and active market for their market verticals."

I asked Brenner why the consortium members didn't work with Clear Channel.

"Clear Channel signed their own deal with Microsoft. They have their own structure. And I wouldn't say they're viewed as inclusive.

"Most broadcasters probably aren't comfortable donating that kind of infrastructure to Clear Channel's efforts. Most people, as I went around to build this, were interested in having their own alternative to Clear Channel and creating competition."

OK, I pointed out, but the consortium still involves eight competitors who now must work together. He agreed it's an unusual arrangement and noted that negotiations over how to divide the BTC revenue occupied several months (they settled on a formula based on Arbitron population). But, he says, "everyone I deal with, all of them are quite cooperative with one another."

Meanwhile, a CBS or a Citadel also might be a logical candidate to join, "but they don't have the station ownership to provide 100 to 150 markets," Brenner continued. "Navteq dictates what coverage they want; we're in lockstep with their demand. Their road map is to be in market 100 by Q1."

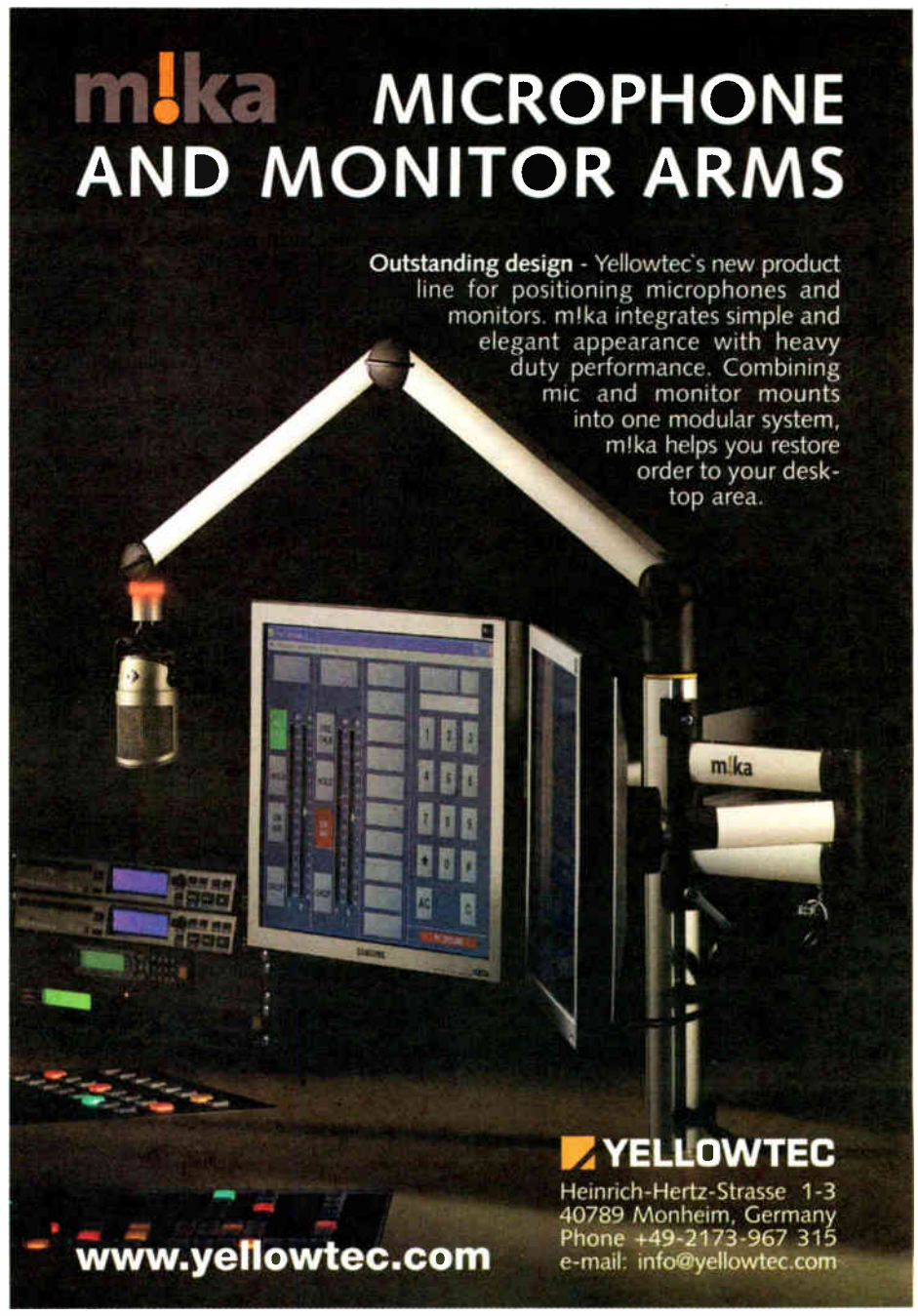
I also wondered if the Navteq service will offer non-traffic info like weather, gas prices and movie times.

"Yes. Navteq works with OEM automaker and personal navigation device makers to provide all the things you listed and more," he said, though he declined to discuss the "more."

Dashboard utility

Radio has had mixed results in efforts to generate business using its bandwidth

See BTC, page 27 ▶



World Radio History

Global

▶ Continued from page 1

systems for a particular region largely depends upon the existing regulatory conditions, channel spacing and usage of the AM and FM bands, he concludes.

In the medium-wave (AM) bands, broadcasters have a choice of two in-band systems: Digital Radio Mondiale and HD Radio. DRM is an easily adaptable system with many configuration options, Kelly said, but it requires a vacant allocation for each new digital transmission. HD Radio, on the other hand, occupies an existing analog channel (and its first-adjacent channels), but its 10 kHz channel spacing may be a challenge to implement in countries with fairly congested 9 kHz channels.

Channel allocation considerations

Where there are a large number of available channel allocations, such as in countries where AM stations have gone dark due to limited listenership, the DRM system offers advantages in flexibility and data capacity that make it the logical first choice.

In more congested environments where analog AM listening is still popular, Kelly said, HD Radio may the only viable option, but the risk of first-adjacent interference between stations must be considered.

By way of example, Kelly discussed the results of his analysis of the crowded allocation conditions in Manila, the most populous city in the Philippines. Since there is a station allocated every 36 kHz, HD Radio would appear to work nicely with a 6 kHz guard band between each station's nearest digital sidebands.

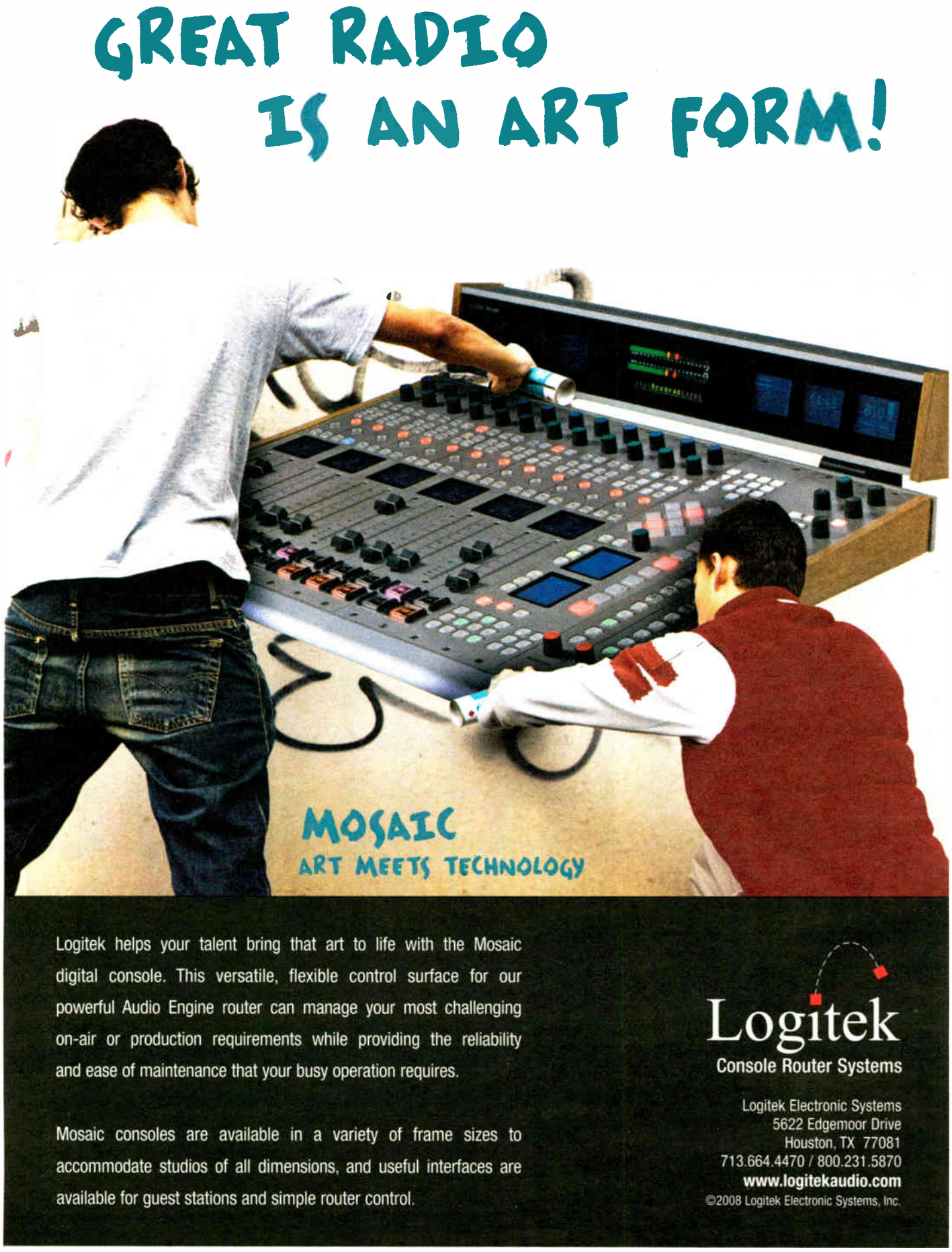
However, a number of closely-spaced first-adjacent stations would likely receive interference to some portion of their current analog coverage area due to the new digital sidebands, as well as limiting the digital coverage of one of the Manila stations at the fringes of its coverage area. For this reason, Kelly recommends that the potential interference effects of any proposed digital system be analyzed to determine the extent of any compromises in coverage that will result when the system is fully deployed.

In the FM band, HD Radio, the FMeXtra subcarrier system and the proposed digital-only DRM+/DRM120 system currently in development are all possible options.

Of these, HD Radio is the most widely deployed, Kelly said, but the other two systems offer much different approaches to in-band digital radio and may be a better fit in certain countries.

In Seoul, South Korea, where the FM allocations are widely spaced, Kelly determined that all existing stations could operate with HD Radio and several new allocations for DRM+ stations were possible as well. In Taipei, Taiwan, however, the allocation spacing is much less consistent, with a number of stations only 400 kHz or 200 kHz apart.

Although some of these stations may be able to deliver a receivable digital signal with one sideband, Kelly explained, a reallocation of several stations would be required to ensure that all the signals could be received without interference. In markets such as Istanbul, Turkey, where stations are allocated every 200 kHz, FMeXtra may be the only option for digital radio service, he said.



Perhaps the slow pace of digital radio deployment will begin to accelerate as more countries find ways to successfully transition their broadcast services from an analog world to a digital one.

Summarizing his findings, Kelly concluded that the operational differences between the various in-band digital radio systems ensure that broadcasters and regulatory authorities will be able to select new technologies appropriate to the specific requirements of their allocation plans and existing stations.

DAB receiver costs

Alexander Zink, presenting a paper authored by his Fraunhofer IIS colleague Olaf Korte, outlined the current status of digital radio technologies in Europe.

Zink readily admits that the experience of DAB (Eureka-147) deployment in various countries has been mixed; it has seen success in the United Kingdom and Denmark, but other countries have ceased DAB broadcasts entirely.

He attributes the slow adoption of DAB to the high cost of receivers in the early years, regulatory impediments such as transmission power restrictions and the lack of unique and compelling programming on the digital channels.

However, he is now optimistic that these challenges have been overcome and that DAB is primed to be successful in more countries, through efforts similar to Germany's plans for a "Big Bang" rollout of new digital services in 2009.

Part of the reason for this resurgence is the approval of two significant enhancements to the DAB specification in the past several years, Zink said. The first of these is Digital Multimedia Broadcasting, designed to deliver anything from

See GLOBAL, page 8 ▶

World Radio History

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*Top: **Saskia Falken**, Heart 104.9FM Mid Morning Mix host broadcasting from Table Mountain.*

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World Radio History

Global

▶ Continued from page 6

MPEG-4 full-motion video to static images within the bundle of DAB service channels known as an ensemble.

Zink characterizes the service as a great success in South Korea, where it was developed, and reported that DMB is currently in use in Germany and several other European countries. France is planning to roll out T-DMB service for multimedia and to use what it's terming "DMB Audio" for digital radio services. With a T-DMB-capable phone, users have video and audio services.

The second enhancement, dubbed DAB+, allows broadcasters to use the MPEG-4 HE-AAC v2 audio coding instead of the original less-efficient MPEG Layer II codec, which Zink estimates will enable two to three times as many audio channels to be multiplexed within an ensemble with comparable audio quality as current services.

The first commercial receivers capable of decoding the new audio format will be available soon. Revo, in fact, has a model on the market now. Australia will be the first country to deploy an exclusively DAB+ digital radio service, according to Zink.

Since both new services do not require modification to the core DAB channel coding and can coexist with legacy services in the same ensemble, a clear upgrade path exists for current DAB broadcasters to introduce the new capabilities without facing the costly replacement of existing transmitters.

Still, Zink notes, the biggest hurdle to introducing DMB or DAB+ into markets where DAB already exists is on the receiver side, since current generation receivers are unable to decode either of the new services.

DRM appears to be the clear choice for digital broadcasting on medium-, short- and long-wave bands, since it was designed by an international consortium for exactly that purpose, Zink observed. The biggest problem for DRM continues to be a lack of affordable receivers, although he speculates that the use of DRM in large markets such as Russia and China will help to speed receiver development.

A number of other systems are being used or considered in Europe, Zink reported.

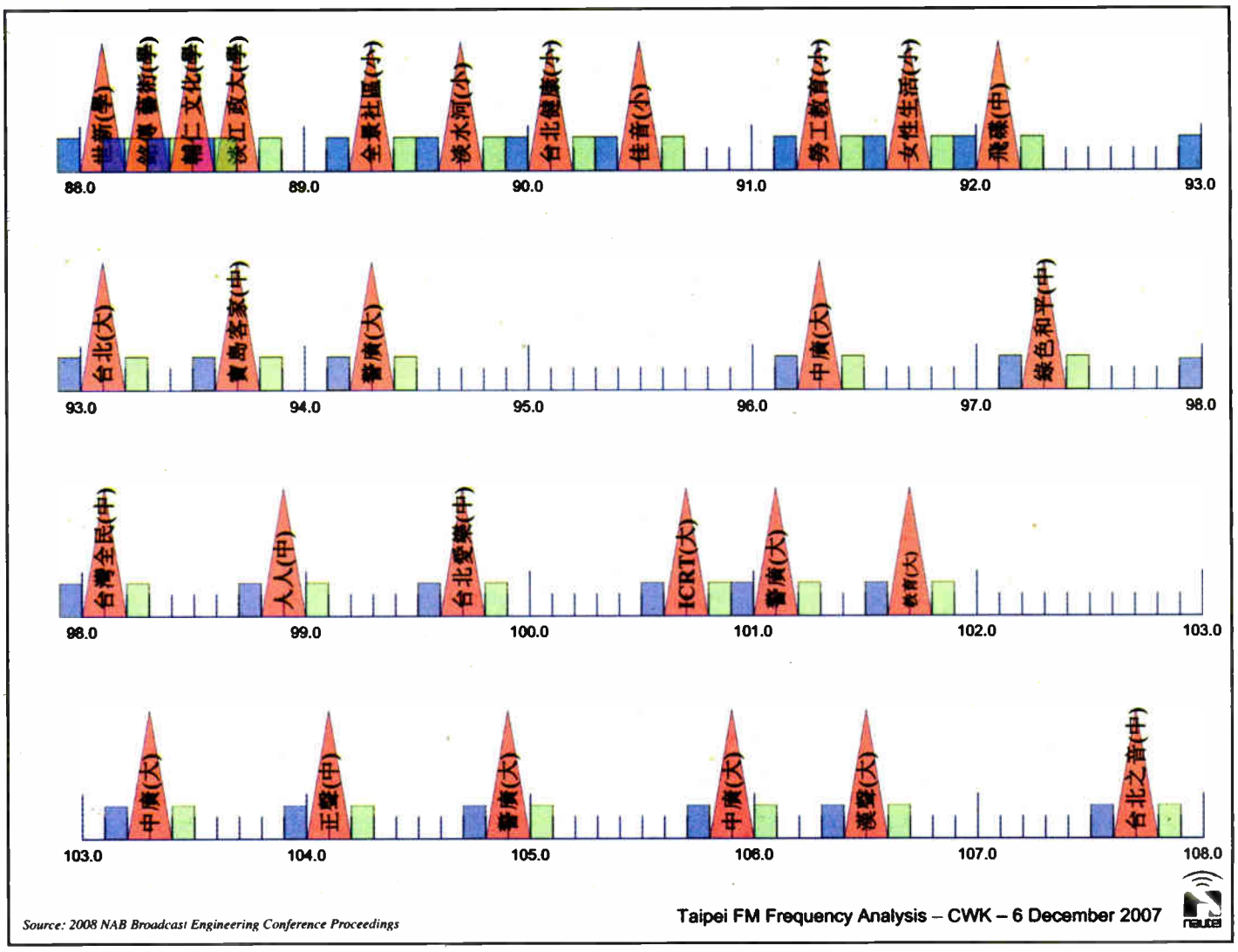
DVB-H is on the air in Italy and is being tested in Germany and Austria. Although it is primarily seen as a video transmission system, it also supports audio-only channels and could arise as a potential competitor to the DAB family of services if support for certain radio data services were included, he speculated.

DRM+ proposes to extend the DRM specification to cover VHF frequencies up to 120 MHz, which Zink theorizes may become an attractive option for broadcasters that have distinct local coverage areas they wish to serve and do not require the higher bandwidth of DAB to support their services.

HD Radio is attractive for its hybrid mode support for analog services, and Zink reports that Switzerland is broadcasting HD Radio services, Germany is testing the system, and many East European countries have shown high interest in the technology.

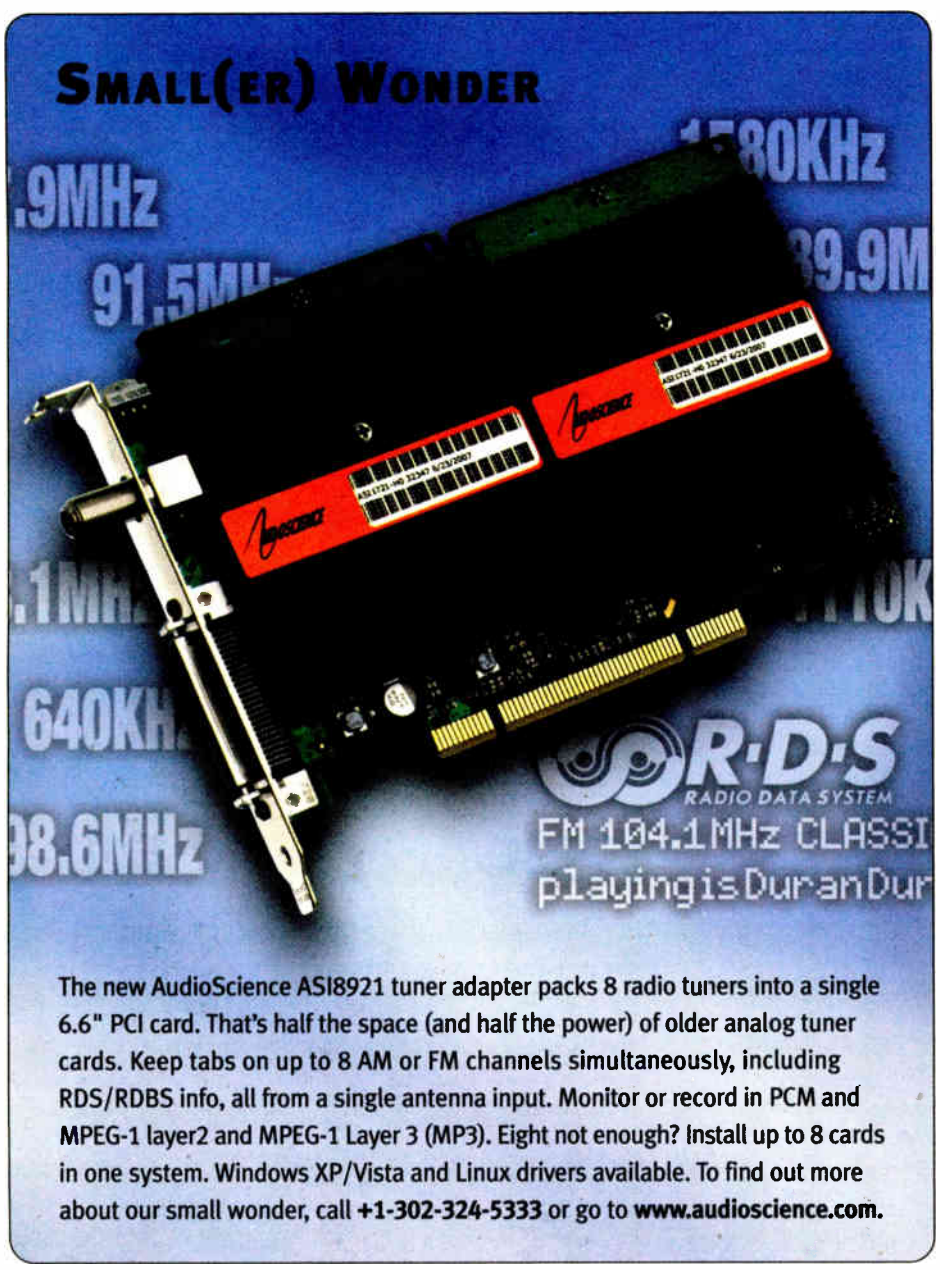
Both presenters felt strongly that broadcasters the world over benefit from having so many viable technologies to consider as they weigh which systems will be most appropriate for use in their markets. Perhaps the slow pace of digital radio deployment will begin to accelerate as more countries find ways to successfully transition their broadcast services from an analog world to a digital one.

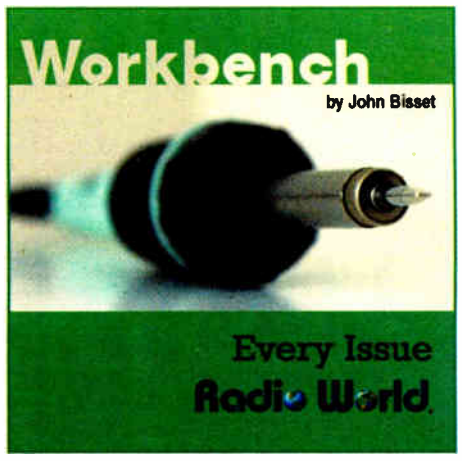
Daniel Mansergh, DOE of KQED(FM), San Francisco, and vice-chair of the Association of Public Radio Engineers, is a contributor to Radio World.



Source: 2008 NAB Broadcast Engineering Conference Proceedings

Charles Kelly of Nautel depicted the FM spectrum in Taipei, Taiwan. 'Between 88 and 89 MHz, there are four educational FM stations which are spaced by only 200 kHz,' he wrote. 'The HD Radio sidebands are on top of each other, and it is likely that poor coverage would result, with HD Radio reception possible only where one station has a significantly higher field strength that the adjacent channels. Between some of the stations, such as the ones at 89.3 MHz and 87.7 MHz, there is only 400 kHz separation. Theoretically, this will work, however the reception of one of the sidebands may be impacted if the immediately adjacent sideband is significantly higher in received strength.'





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World Radio History

Workbench

Radio World, August 1, 2008

Past columns are archived at *radioworld.com*

Built-in Headlights Illuminate the Way

by John Bisset

Sunbury Broadcasting Chief Engineer Harry Bingaman always gets his brother a funny present for Christmas. The rules are it has to be funny but also practical.

One weekend Harry was surfing the L.L. Bean site and found the hat shown in Fig. 1. He called it to my attention; my reaction was, "That's a nice hat, but no big deal."

Then Harry showed me Fig. 2. The brim has two ultra-bright LEDs sewn inside that run off a small battery cell in the adjustment band in the back. Now he had my attention!

He ordered the hat and Harry saw a million uses for it, like finding the keyhole in a lock on the transmitter site gate; illuminating the combination lock at the fence surrounding the base of the tower; as a replacement trouble lamp when you are looking inside the back of a dark equipment rack; and negotiating your way in a darkened equipment room or transmitter building when power is lost and the generator didn't start.

He was so pleased with its performance that he ordered a second hat for himself. The hat is of good quality and discreet enough not to draw nerd comments from your coworkers.

It was designed as a fishing cap with a broad bill to keep the sun out of your eyes. The LEDs help you see your way to the car after night fishing. The hat rates 4.5 out of 5 stars among purchasers, with many of the comments mentioning the inclusion of a bright light that doesn't require a heavy battery.

Go to *www.llbean.com* and enter "Two Lights Fishing" in the search box. Harry Bingaman can be reached at *kc3qhhmb@aol.com*.

★ ★ ★

I was reminiscing with an older broadcast engineer about the mentoring we both enjoyed early in our broadcasting careers and how much of that is missing now.

Although today's engineer may not have the luxury of learning at the side of a seasoned veteran, the next best thing is the Internet, to which we didn't have access in the 1970s and '80s. The various SBE listservs are great places to get a lot of opinions on a variety of subjects.

Case in point was a friend who was building a tube audio processing amplifier.

Fig. 1: A nice cap with a broad bill keeps the sun out of your eyes.

Unfortunately, the power transformer he purchased had excessive secondary voltages. For example, the 6 volt AC filament voltage measured nearly 8 volts and the high voltage was nearly 130 percent of the rated voltage in the transformer schematic. Even under load, the high voltage was 550 volts.

A 25 ohm, 50 watt power resistor was placed in series with the primary in order to drop the input voltage to 109 volts. This gave a reasonable filament voltage on the secondary. A 1200 ohm resistor was placed in the HF lead to drop the plate voltage to 300.

But there had to be a better way. Curiously, the manufacturer of the transformer could not offer suggestions.

Going back to electronics theory, Roger DuFault with the CBS Radio cluster in Washington suggested adding a buck-boost transformer on the AC input leads of the original transformer.

Fig. 2: But this one doubles as a flashlight with two high-intensity LEDs.

For those not familiar, a 24 V or less filament transformer is connected normally to the 120 VAC line. The 24 volt secondary is then placed in series with the 120 VAC input of the original transformer. Measure the outputs, and if the voltage is again too high, the buck-boost is in phase and must be reversed.

When the phasing of the filament transformer is 180 degrees out of phase with the original transformer, you get the "buck" action of reducing the voltage to the original transformer (wire it in phase, and the voltage is "boosted," hence the term).

It's a technique you may recall from Electronics 101, still applicable today. Thanks, Roger, for cracking open the electronics book for a lesson we may have forgotten.

Reach Roger DuFault at *ccachicken@aol.com*.

★ ★ ★

It was fun receiving all the messages on the wireless mic modules and other kits that allowed one to play DJ through their AM and FM radios.

Radio World contributor Grady Moates wrote that he used a Knight-Kit Radio Broadcaster Amplifier, which you can see at *www.knightkit.com*.

Grady didn't have one of the earlier models; his had a cover on the bottom and an AC/DC power supply. There was no power transformer. the chassis was connected directly to one side of the power outlet in the wall.

As a boy, Grady's summer house had a concrete floor, and the Knight Kit was wired so that the fuse was in line with one side of

See KNIGHT, page 16 ▶

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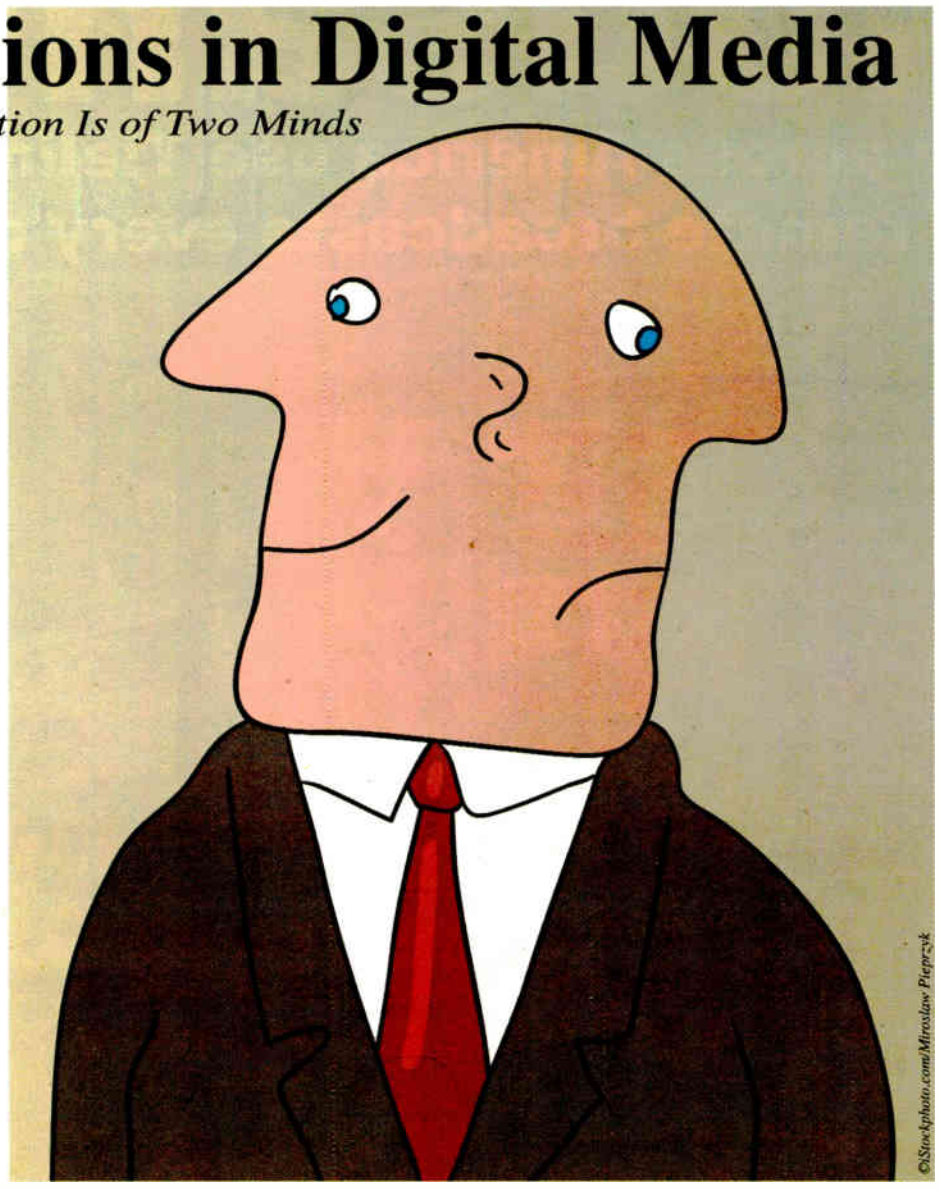
World Radio History

Contradictions in Digital Media

In Many Ways, the Revolution Is of Two Minds



Like many periods of dramatic change that preceded it, the digital media revolution is coping with internal struggles as it finds its way. In some cases, the divergent paths it faces are diametrically opposed.

Since good summer reading should be thought-provoking, let's look at a few fascinating instances of such conflict, for your reflection during this contemplative time of year.

For better or for worse

The first is a technical bifurcation — and one that has been touched upon previously in this column.

As digital technologies improve and Moore's law continuously drives their cost lower, audio engineers have been blessed with the ability to sample and quantize signals with ever-better audio quality.

The higher bit rates and larger file sizes thus produced are no problem to accommodate, as digital audio recordists strive toward that elusive "perfect" capture of sound.

At the same time, other developments in digital technology allow more to be done with less, as perceptual coding ("data compression") techniques also continue to improve.

Application of these techniques unavoidably causes some degradation, but the resulting bandwidth savings often makes their use worthwhile. Where transmission bandwidth or storage capacity are scarce or costly, these systems can enable delivery of audio quality levels that would otherwise be prohibitive.

These two modalities are each worthy pursuits, and not mutually exclusive, but they do cause some degree of schism within the industry.

Purists decry the quality loss inherent in perceptual coding systems and, in particular, lament their use by increasingly popular online music distribution systems.

While the high end of uncompressed digital audio continues to excel, its developers fear no one will ever enjoy the fruits of their labor, as compressed online distribution becomes the preferred (and perhaps eventually, the exclusive) method of music acquisition by consumers. A chain is only as strong as its weakest link.

This concern certainly applies to digital radio, which is a digitally compressed medium, of course, but here the critics are often less strident given the understandable concern for scarce spectrum.

Nevertheless, in the ultimately fungible world of digital audio, a quality-vs.-quantity battle always looms, in which the number of channels offered is a function of the amount of data compression applied.

IBOC multicasting and satellite radio (as well as Eureka DAB) have been criticized for pushing the quantity limit too far, thereby causing audio quality to suffer untenably. This is an argument with no real arbiter or solution, and like the loudness wars before it, one that is likely to be perpetually with us.

Such is the result of an industry pursuing two opposing directions simultaneously. Vector addition results in no net movement — or small movement toward a place that neither party is trying to reach.

Expand and contract

Another interesting paradox of the day is that as the value of *diversity* grows within U.S. society, media companies continue to *consolidate*.

So as individual voices of the American people expand their range, the breadth of venues in which they can be widely reflected to the rest of the nation are shrinking. (This is a thesis well articulated in academic circles by Henry Jenkins, head of the MIT Comparative Media Studies program, but others in less lofty locales have also made this point.)

The consolidation trend is found in practically all traditional media, and again, radio is prime among them. Our industry continues to press quietly for further reduction in regulation that would allow even greater consolidation than has already taken place.

What impact will this have on the diversity upon which Americans recently seem to be placing such a high priority?

What some critics find most insidious is the "pseudo-diversity" of media outlets. Although their overall number has not declined but has in fact increased over time, *control* of these outlets rests in the hands of a steadily decreasing number of players. What looks like a group of competitive media channels on the surface often is simply a market strategy.

Thus the political landscape for discourse may be shaped in ways that are not initially evident, and some positive social trends may be squelched in the process — or at least not given their due.

Interestingly, there is strong evidence showing that minorities in the United States are among the heaviest users of new communication technologies. They are also the demographic groups that will comprise the bulk of U.S. population growth in the next decades.

Factor this in and one could conclude that these merger-happy media providers are swimming against the tide with their continued penchant for consolidation. The pursuit of ever more concentrated market power may ultimately prove to be their undoing.

Fourth Estate

A final conflict occurs in the field of journalism.

Ernest Wilson, dean of the Annenberg School of Communication at USC, recently presented the following syllogism: If democracy relies on a free press (as our founding fathers strongly believed) and the press today is suffering through disruptive or even damaging change from the digital transition, then democracy itself could be at risk.

This scary premise seems quite at odds with the common wisdom that democracy

See TWO MINDS, page 16 ▶

The Big Picture

Photo: Gary Hayes, BBC

by Skip Pizzi

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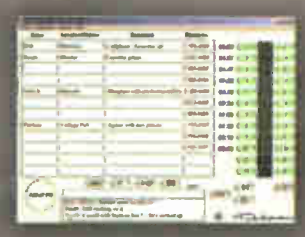

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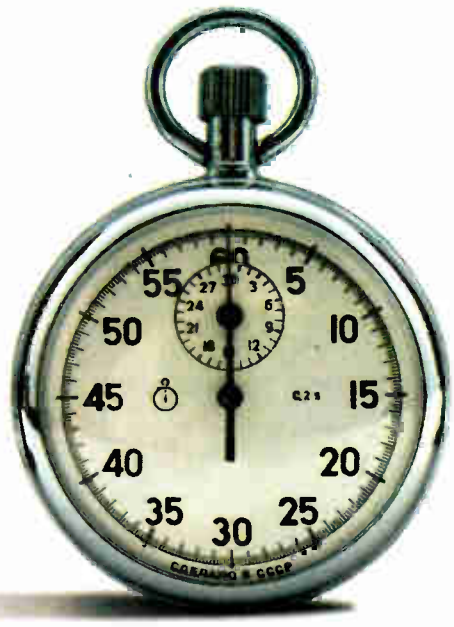

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World Radio History

Knight

▶ Continued from page 10

the two-wire power cord — no polarized plugs back then. The on-off switch was in line with the other side.

With the unit on, the plug had to be in the wall one way to *not* shock him.

Grady writes he is extremely lucky he's not dead. I think many of us who experimented with electronics as kids can make that same statement!

He finally got in the habit of turning the device off by just pulling the AC plug out of the outlet.

Grady Moates is at *grady@loudandclean.com.*

★ ★ ★

Here's something that should be useful if you deal with large-scale remotes and wireless microphones.

Sennheiser has announced its new Frequency Finder, a customized live Web interface that enables users to retrieve information on open radio frequency ranges based on a city or Zip code search.

The site is at *www.sennheiserusa.com/frequencyfinder.*

With election season here and the ever-decreasing availability of open radio spectrum for wireless mics, it is more important than ever to plan and organize the deployment of wireless systems.

What makes this site particularly useful is that users can search FCC data without entering specific coordinates. This makes it easier to find the information needed for a specific location.

High-profile acts like the Dave Matthews Band, Justin Timberlake, Rod Stewart and The Police have tested the beta version, the company says.

The Frequency Finder color-codes the results, showing channels in blue that are vacant, yellow for vacant channels but with strong TV transmitters on adjacent frequencies, and red for channels that cannot be used due to land mobile or radio astronomy applications.

Selectable attenuation values allow engineers to compensate for different areas, such as outdoor, indoor or mixed environments. A device selector also displays Sennheiser wireless system ranges.

★ ★ ★

It's time to remember those forgotten air conditioner filters.

Who knows what lurks behind the aluminum grate? Probably something like Fig. 3.

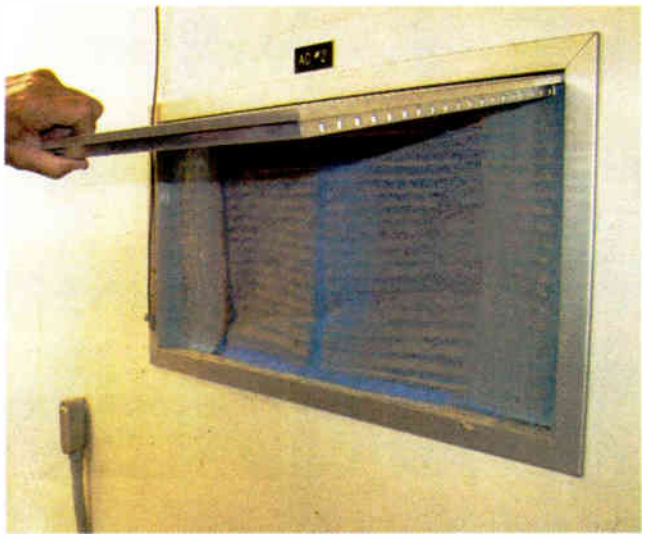

Fig. 3: Summer is a good time to check and replace dirty air conditioner filters.

Check and change the filters, or assign to an intern. The job doesn't have to take up your time but it needs to be done for reliable cooling system operation.

John Bisset has worked as a chief engineer and contract engineer for 39 years. He is the northeast regional sales manager for Broadcast Electronics and in 2007 received the SBE's Educator of the Year Award. Reach him at (571) 217-9386 or jbisset@bdcast.com. *Faxed submissions can be sent to (603) 472-4944.*

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

Two Minds

▶ Continued from page 12

is well served by the Internet's egalitarian nature, and that it espouses the very principles of that philosophy, by providing every individual with a venue in which their voice can be widely heard.

We all realize that user-generated content is no substitute for professional journalism, but the latter is an expensive product. (In the context of this discussion, it could be considered part of the cost of democracy.)

If these new alternative media sources — and the rest of the Internet — draw enough eyeballs away from the channels that carry professional journalism, the survival of that industry could be threatened. And if it should fail, or even be significantly curtailed, we could suffer a serious loss to our culture, and to the very workings of our governance models.

The harm to professional journalism is already being felt, so this threat is not merely an academic discussion. It is a real and frightening prospect, but one that is not often considered as potential fallout from the digital revolution.

Unintended consequences happen; just ask anyone in the record business if they ever thought releasing music on CDs would bring the industry to its knees a decade or so later.

So as we travel down the digital highway, remember it's a two-way street — and not everyone is driving their bits in the same direction.

Skip Pizzi is contributing editor of Radio World.

Channel Partners Meet at Harris

Harris Corp. held its first Channel Partner Training in Mason, Ohio, this spring. A three-day event provided training on Harris analog AM/FM and HD Radio transmission, studio systems and Intraplex STL products for the company's radio broadcast market.

Harris launched its channel partners team program in 2006, as reported here at the time. The company uses the equipment dealers, distributors and systems integrators to offer services such as planning and design assistance, disaster recovery, regionalized field resources, quicker response times and specialized integration teams.

Representatives from 12 channel partners attended. Officials from Ibiquity Digital and Harris Finance also made presentations.

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World Radio History

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World Radio History

DRM: Behind Its Targets, But Catching Up?

Continental's Adil Mina Says Lower-Cost DRM Receivers Are Coming 'Soon'

by Jeff White

The author is vice chairman of the U.S. DRM Group and president of the National Association of Shortwave Broadcasters.

CARY, N.C. Adil Mina grew up in his native Lebanon listening to radio stations from around the world on a large shortwave radio, with all of the inherent static, fading and interference.

Eventually he would find himself working for Dallas-based Continental Electronics as vice president of business development. Mina is also chairman of the U.S. DRM Group.

Continental is an NASB member and manufacturer of shortwave transmitters. For the past 43 years he helped to design, build and commission many high-power medium-wave and shortwave transmitters and systems. Lately he has been traveling selling shortwave transmitters to religious, government and commercial stations globally.

Mina is a true believer in shortwave.

"I can really tell you that shortwave is alive and it is going forward," he told the U.S. DRM annual meeting in Cary, N.C., in May. (See related stories in the July 2 issue of RW.)

He admits that sales have been a little slow during the past four or five years. "Except for some huge numbers of transmitters that have been sold to China during the period from 2000 to now, shortwave has been a little bit quiet, especially in the building of new stations."

But he says that even with a worldwide recession, many international customers are still making plans to modernize and buy new transmitters.

Why is Mina bullish on shortwave?

"I once asked a friend from Saudi Arabia if he was going to put all of his programming on satellite. He said: 'Mr. Mina, do I look that stupid? Do you think for one moment I would trust my broadcasting to anyone who controls a satellite or a local radio and who could shut me off at any moment they desire?'

"There's what the beauty of shortwave is. Whatever your faith and your belief in shortwave is, it is justified. Shortwave — no matter how many other ways of broadcasting are invented in the world — DAB, DMB, DVD, whatever it is — is still the only medium that you can broadcast from your backyard to any country in the world.

"What's happening today," he said, "is that we finally realize that we, the technical people, should help you [the broadcasters] make that sound clear and make it practical. And that's what DRM is all about."

Two years behind

But Mina acknowledges DRM is not quite where it should be.

"I'll be very honest about it," he said. "DRM is about two years behind, in our opinion. It's not because of transmitters or antennas or exciters. It's because of the receivers."

Photo by Jeff White

Adil Mina with the author's wife Thais

The DRM Consortium launched 10 years ago. For that period, Deutsche Welle's director of DRM, Peter Senger, has chaired the DRM consortium. Senger had been Deutsche Welle's first chief engineer and later became DW's director of distribution for its terrestrial and satellite networks. Most DRM administrative responsibilities during this time have been centered at Deutsche Welle, but Senger had to retire in March due to German law, and his project director Anne Fechner also has retired.

The BBC stepped forward to take over the leadership of DRM. The controller of business development for BBC World Service, Ruxandra Obreja, is the new chairwoman of the DRM Consortium.

The BBC believes DRM has matured, according to Mina, which is why the broadcaster nominated a person with a business rather than technical background.

"Ruxandra, with her experience in

See DRM, page 19 ▶

World Radio History

DRM

▶ Continued from page 18

business development, will do a great job in promoting DRM worldwide," he said.

Until three and a half years ago, DRM was a digital system for long-wave, medium-wave and shortwave — up to 30 Megahertz. Then DRM+ was introduced.

Now DRM works with frequencies up to 108 MHz — basically FM, so theoretically, it could someday compete with FM IBOC, according to Mina.

Unfortunately, Mina points out, no transmitter manufacturer has yet made FM IBOC transmitters with DRM+, because, he believes, they have spent so much money developing IBOC transmitters.

As to the question of economical receivers and why they aren't yet readily available: "Part of the reason," said Mina, "is maybe we took our time on the standard, deciding what we want the receiver to do."

DRM is about two years behind, in our opinion. It's not because of transmitters or antennas or exciters. It's because of the receivers.

— Adil Mina

Another reason is some manufacturers decided to wait to introduce a lower-cost DRM tuner until the DRM+ standard was set. There are DRM radios available from Roberts, Morphy Richards and Himalaya. However some of the tuners exhaust their batteries in six to eight hours, Mina said.

New DRM chips

But Mina is hopeful. A new consortium member, Analog Devices, introduced new DRM chips a few months ago, and a new receiver is expected to be built in India.

"We've seen the prototype," said Mina. "They're very encouraged. And we hope that we will have [a] $100 receiver."

DRM Consortium members began talking about getting the receiver price down six years ago, he said. "There are receivers you can buy today for 200 Euros. The 200 figure we were hoping for six years ago is here, but it's in Euros," which was about $315 U.S. in June.

Mina is encouraged about a new tuner coming out of China. Thomson Broadcast found and worked with Dr. Lin Liang who founded a private company, Newstar Electronics; it plans to make DRM receivers. The design is being completed on what he called "very small" radios, he said.

The new Chinese receiver will have a small LCD screen, GPS, a built-in photo album and a DRM receiver.

Other DRM receivers are also being developed. Students at LeTourneau University in Longview, Texas, are working on a DRM unit, as are some three groups in China. There is also a group in South Africa developing a DRM receiver, specifically for use on shortwave, Mina said.

Last year at this convention there was hope that the Chinese would have DRM transmissions on air in time for the Olympics. "That's not going to happen," said Mina. "But eventually we will see DRM broadcasts in China."

China is buying DRM-ready transmitters, he said. "China uses shortwave to talk to their own people. Because of that, they will go to DRM to cover their own territory. People in rural China need shortwave."

He predicted low-cost DRM receivers would "soon" be on the market.

Mina said most shortwave transmitters bought during the last 20 years that have solid-state modulators are ready for DRM with a minor modification and new exciter. Older transmitters with high-level plate modulation can be modified for DRM. "We have done many of them. We just finished one in Saipan."

Although DRM isn't being used on medium-wave in the United States, there have been successful medium-wave simulcast tests in Mexico, Brazil and India, according to the consortium. There are also regular DRM broadcasts on medium-wave from several European broadcasters.

If you order a new shortwave transmitter today from companies like Continental, there's no extra cost for DRM capability; it's built in. If you need a DRM exciter for an existing transmitter, it's a slightly different story. "Our exciters are still a little bit too expensive," said Mina. But he noted prices have dropped and said that HCJB World Radio is trying to develop a lower-cost DRM exciter.

Mina said prices are still a bit prohibitive for most potential 26 MHz DRM operations. A TCI study showed that a 200-watt AM transmitter could cover the San Francisco Bay Area with one antenna, providing the FCC would license it.

"But exciters are still 40,000 to 50,000 Euros," he lamented, which is roughly $62,000 to $78,000 U.S. "That is discouraging." In contrast, IBOC exciters cost about $20,000 he said.

Jeff White is general manager of WRMI - Radio Miami International in addition to his roles with the U.S. DRM Group and NASB.

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World Radio History

HD Radio News

Radio World — Covering Radio's Digital Transition — August 1, 2008

JVC's KD-AHD39 Page 22

FIRST PERSON

A Steep Climb for Auto HD Radio

In Eastern Missouri, a Tour of Auto Dealerships Yields Few HD Radios

by James G. Withers

When asked if he shouldn't offer the Model T in various colors, Henry Ford supposedly said that his customers could order a Model T in any color they wanted as long as it was black.

Until around 1960, the same was true for car radios: Customers could order any kind they wanted, so long as it had a single speaker in the dash and tuned any AM station between 550 and 1600 kc (this being the abbreviation for kilocycles in use back then). Then on June 1, 1961, the FCC authorized FM stereo. Slowly, automobile manufacturers responded, first offering FM as an option, eventually as standard equipment.

In 1963, GM offered an AM/FM radio as standard equipment on the Corvette, but as late as 1965, FM was still an option on the Pontiac GTO, as the picture of my '65 convertible will attest.

Today, consumers have a dizzying selection of automobile audio accoutrements from which to choose: from plain vanilla AM/FM, all the way through satellite digital radios with a dozen speakers, powered subwoofers and iPod connectivity. But where does HD Radio fit into all of this?

Are auto manufacturers "pushing" this technology to consumers? Are consumers "pulling" the technology from car dealers? Is reality somewhere in between? And what does all of this mean on the street?

Morning and afternoon drive remain critical ratings and revenue generators at most stations; so car listening is vital. Radio World sent me out to do a seat-of-the-pants survey to find out.

I am a child of the '60s (and thus desperately clinging to youth), so the first car into which I planned to lower the seat of my pants was the Corvette. But before jumping into my non-HD Radio-equipped 2005 minivan to head out to the closest Chevrolet dealer, I decided to do a little searching on the Internet.

iPod, MP3 connectivity

A trip to the GM Web site turned out to be disappointing. I found an entire section of the GM Parts and Accessories page devoted to iPod and MP3 connectivity, but nothing on HD Radio. Specifically, the page advised me to "See the full range of GM vehicles with the fully integrated iPod PAL system, PMPC audio input jacks and exclusive Music Device Capability." Uh, HD Radio, guys?

The Ford site did not yield better results; when I typed in the search words "HD Radio" on the accessories page, I received seven results, six of which referred to a special outside mirror option. Clearly, the number one and number two American car companies need some education about this technology.

And the Japanese?

At the Nissan site, I found a very nice sound system ($1,850 MSRP), but no HD Radio option. It did, however, require me to choose the luxury moon-roof option, in order to get the upgraded radio.

What the sound system has to do with the moon roof, I could not decipher, but nevertheless, there it is; to get the nice (and still not HD-equipped) radio, you also get a hole in the roof. My new Nissan Murano LE, should I choose to buy one, would have a great vertical view, if somewhat lacking in the audio department.

Photo by Jim Withers

The author's daughter Kayley tunes his Delco AM radio, circa 1965 — definitely not HD-R.

I was getting nowhere fast. Time to get in the car and head out to hear the real scoop from the dealers.

'Vette demo

My trip to Elco Chevrolet in Manchester, Mo., just outside St. Louis, was a kick, since Mark Gerecke, the salesman who helped me, was, like all of us 50-to-60-somethings, a Corvette nut.

I introduced myself and Radio World, and asked if he could give me any info on, or an actual demo of, an HD Radio (preferably one mounted in the center console of the Z05 'Vette) right there on the showroom floor.

He mused about the "HD" nomenclature for a minute, then asked me if I meant satellite radio.

No, HD Radio. Like regular AM and FM radio, but digital and with more signals.

Now, I could weave all kinds of fancy verbiage around his answer, but the short strokes were: "No." As in "No, I can't demo it," and "No, we don't sell it," and "No, I don't know when GM will make it available for sale."

He did say I could get one from Best Buy; he also took my card and promised to call when he found out more from the corporate guys at GM. (He never got back to me.)

Not an auspicious start, but I remained undaunted and climbed out of the Corvette and into the minivan for the trip down the road to the nearby Ford dealer, Bo Bueckman Ford.

There I ran into Larry the new car salesman; I do mean "ran into," since he practically leaped out the front door to greet me, car sales being a bit anemic lately.

Again, he was a knowledgeable and likeable car guy, but one without any specific info on HD Radio. He did, at least, know what it was (not satellite; no subscription charges; extra channels) and knew where at Ford to call for more information.

See CARS, page 22 ▶

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										Total
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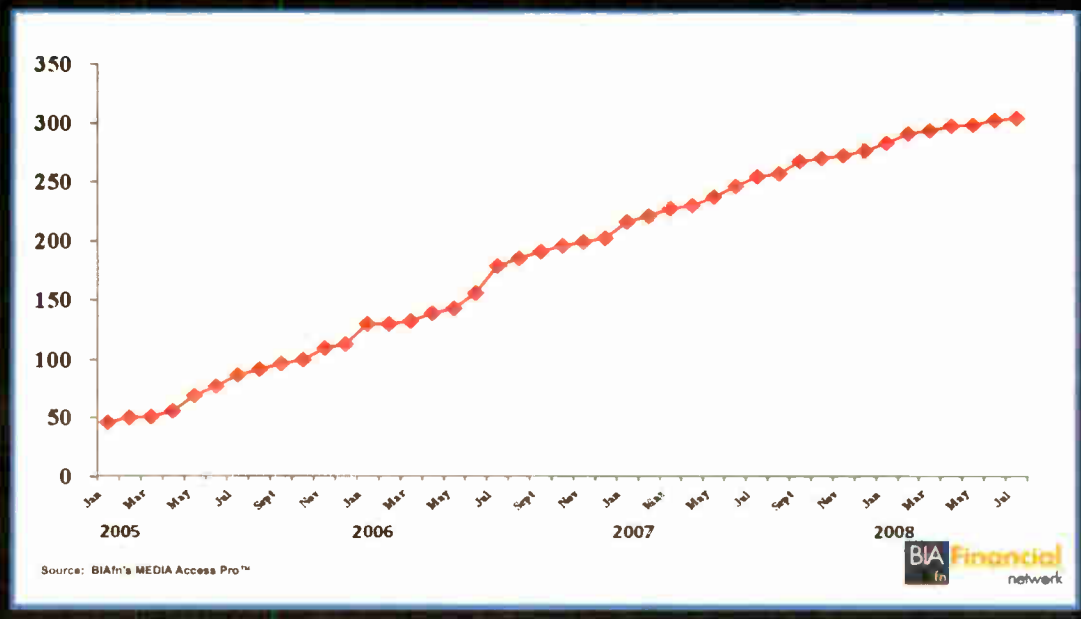
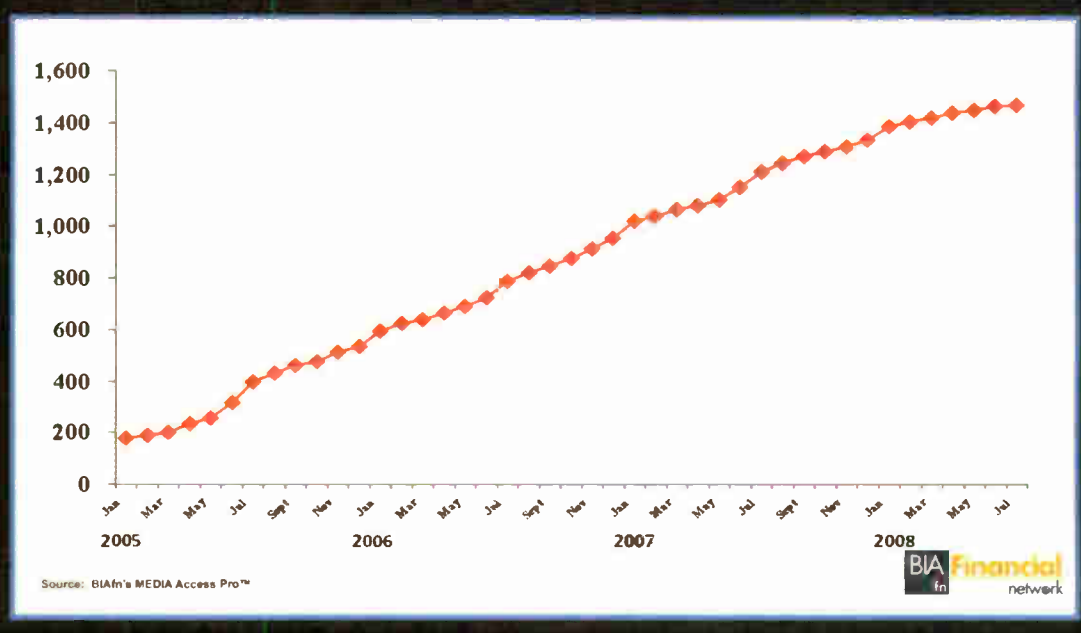
Radio World's HD Radio™ Scoreboard

The HD Radio Scoreboard is compiled by Radio World using information supplied by iBiquity Digital Corp., the HD Digital Radio Alliance BIA Financial Network and other sources. Data reflect best information as of late June. This page is sponsored by Broadcast Electronics. HD Radio is a trademark of iBiquity Digital Corp

Number of HD Radio AM Stations on Air



Number of HD Radio FM Stations on Air



Source: Data is from BIA Financial Network's data service MEDIA Access Pro ™ and also includes Ibiquity information. Visit www.bia.com

HD Radio at Saga Communications

Total stations: 91

The HD Radio Bottom Line

	Total Licensed	On the Air	FMs Multicasting
	2,173	1,775	888
Last Month:	2,170	1,713	885
Last Year:	1,859	1,349	661

World Radio History

PRODUCT EVALUATION

JVC's KD-AHD39 Packs a Punch

From the Company's Arsenal Line Comes the KD-AHD39 With Built-In HD-R Tuner

by Amanda Alexander

As you may remember, I bought a Dual XHD6420 late last year.

This was a good HD Radio, and in my opinion that's about it.

I also wrote about having issues with the CD player not working properly. After the article in Radio World was published in the March 12 issue, more things happened. I ended up calling Crutchfield, and they allowed me and my fiancé to return our radios and get full credit back.

By this time, I had been looking around for a new HD Radio. I like Kenwood the best; however, they have not made a radio yet with a built-in HD Radio tuner.

I noticed a JVC KD-HDR30 radio. It is the upgrade to the KD-HDR1 that Ed Dulaney, chief engineer here at Crawford Broadcasting's Denver cluster, owns. This radio had everything I wanted: an auxiliary input on the front panel, easy display buttons and MP3/WMA compatibility. The only problem was, it was sold out at Crutchfield.

It had been for a month when I finally started talking to Chad Vogelsong, general manager of marketing for JVC. I was surprised he took the time to talk to me via e-mail. I am sure he had more important things to do than talk to some woman in Colorado who wanted a radio.

He told me they were making the HDR30s, but demand was too high for them to keep up. He sent me a link to JVC's Arsenal line and told me about the KD-AHD39. It was basically the same radio as the HDR30, except it was slightly better thanks to a few enhancements.

After doing some research, I realized the Arsenal line was for higher-end cars. I own a Ford Escape — nothing fancy. This radio, at the time, was only $159.99 through Crutchfield.

Simple installation

The unit hadn't been released just yet, but he said JVC had recently shipped it to Crutchfield. I didn't see it on their Web site, so I called.

Crutchfield told me they did not have it but gave me the price. I went ahead and paid, not expecting to get it for a few more weeks.

That very day, Crutchfield must have received the shipment. The next day I got my shipment notification and before I knew it, I finally had a new HD Radio.

The installation of the radio is simple. Connect the Crutchfield-supplied vehicle-specific wiring harness to the harness supplied with the radio, then just put it in the hole left by the other radio.

I was eager to play with it to see how it worked. I will admit I have never liked JVC all that much because I find the radios confusing.

I would play around with Ed's radio every once in a while and just get confused. I don't know if it is the "blonde factor" or just because the radio isn't logically laid out. So, yes, I got the book out.

I did not see anything anywhere about bass and treble controls as you would find on most radios. I found the balance and fade controls easily. I showed my dad the book and he found it quickly. I'd been looking for the wrong thing.

JVC does their treble/bass controls with what amounts to a seven-band graphic equalizer. I am still not entirely sure how the frequency bands provided correspond to the sound I am looking for. I tend to tweak my settings from time to time to get just what I want.

I have had the radio now for a little over a month and I must say I love it. No problems yet. The AHD39 has an easy display button. You just push it and it comes up with what you want: time, station frequency, title.

HD2, HD3 presets

The thing I really like is when an artist tags their CD with the music info, the CD

See JVC, page 26 ▶

Product Capsule:
JVC KD-AHD39 Receiver

Thumbs Up
- ✓ Easy-to-use display button
- ✓ Easy-access SRC button
- ✓ Input level control
- ✓ Removable faceplate for added security

Thumbs Down
- ✓ Treble/bass controls confusing
- ✓ Remote control too small

PRICE: $199.95 MSRP

Info: *Mobile.jvc.com*. Click on "HD Radio"

Cars

▶ Continued from page 20

He was kind enough to print out the official Ford position on HD Radio; I was amused to see that it was a reprint from *www.hdradio.com*. Turns out HD Radio will be offered as an option on certain models in 2009, but exactly which models is uncertain at this time.

I took the printout, thanked Larry and, since I had passed on buying the Corvette, did a quick calculation to see if I had enough equity in my house to buy the 650HP Saleen Mustang. I definitely did not, so I saddled up in the van to find the next dealership.

At this point I had an inspiration. The Germans! These guys know audio (not to mention cars). Heck, they invented magnetic tape recording; and old Gottlieb Daimler was building cars before Henry Ford had left the farm. They will know all about HD Radio.

I found a 2008 Mercedes C350 on display, a great-looking car, with every imaginable option ... except HD Radio. Nor was there anything about "coming soon" on their showroom brochures.

Back to the van and over to the Chrysler dealer. HD Radio? No. Honda? No. Toyota? No.

Cadillac; Volkswagen (another stab at the Germans); Lincoln? No, nein and no. (I spoke with sales reps at Volkswagen and Cadillac, and relied on a touch screen "Build Your Car" display and print material at Chrysler, Honda and Toyota.)

I hadn't been to the Koreans (Hyundai), and we don't buy cars from China (yet), but I was running out of dealerships.

Not yet at least

The unfortunate conclusion of this story is that, in my part of Missouri, HD Radio essentially is absent from new cars at this point.

Now, gas being pricier than bottled water these days, I didn't drive all over St. Louis; but I touched on a dozen dealerships up and down "auto row" in suburban St. Louis County and inquired into numerous brands.

Given the lack of knowledge among salespeople about the product, it is also fair to say (and these salepeople acknowledged) that there is little, if any, customer demand here.

As to whether auto dealers would look further into HD Radio, or what might cause them to do so, my impression is they will respond when customers demand information, not before. I was clearly the first, or one of the first, to ask about the new radios during my visits and inquiries in May.

On the bright side, though, HD Radio is coming to a new Ford dealership near you, if not until calendar 2009.

I did find a smattering of knowledge about the technology on the Web and among people I met. But I also found confusion about the availability, the cost, the number of channels, the delivery mechanism, and most important, the consumer proposition of more free, over-the-air, local radio choices.

A semi-bright spot was Best Buy. There, I wandered back to the Car Audio department and met Scott, a nice young guy who knew more than anyone should know about subwoofers, equalizers and audio systems. He showed me several aftermarket radios that included HD-R receive capability.

He demoed two for me and they sounded terrific. He knew the difference between satellite ("You have to pay for a subscription") and HD Radio ("It is part of your regular radio stations; it's digital, you get more channels, and it sounds a little better"). He also editorialized that there was no way he would pay for satellite radio, since HD-R was just as good and was free.

Still, there was a cloud around this silver lining: "Of course, I just use my iPod when I'm in my car, so ..."

Where HD-R Stands With Automakers

According to HD Radio business announcements, an HD Radio receiver is a factory-installed option on all new BMWs and Minis. HD Radio receivers are a dealer-installed option on all Ford, Lincoln and Mercury models; and, in 2009, the technology will be factory-installed on those vehicles. Volvo has announced that HD Radio technology will be a factory-installed standard across its product line.

Toyota said after the NAB Show in April it would offer HD-R receivers as an option in the Scion soon.

Mercedes has said it will include HD-R in its vehicles.

Jaguar will offer the technology in its redesigned 2008 luxury XJ sedan. Hyundai will offer HD Radio receivers in its rear-wheel drive premium sports sedan, Genesis, introduced in 2008.

Ibiquity has said some "hundreds of thousands" of HD-R receivers have been sold as of 2007, the latest figures available, according to a spokeswoman. The company has not separated out how many of those sales originated from automakers or dealerships.

— *Leslie Stimson*

Radio World's HD Radio Scoreboard is published in alternating issues. Selected data is from BIA*fn*'s MEDIA Access Pro™; the scoreboard also uses information supplied by sources including iBiquity Digital Corp., the HD Digital Radio Alliance and RW's own research.

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World Radio History

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World Radio History

Can a radio console be over-engineered?

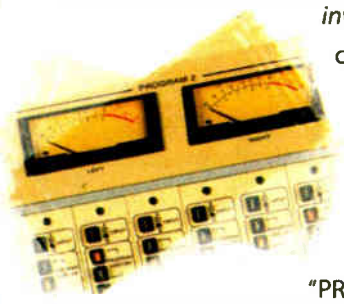
(Only if you think "good enough" really is good enough.)

"OCD" redefined

Building great consoles is more than punching holes in sheet metal and stuffing a few switches in them. Building a great console takes time, brain-power and determination. That's why we've hired brilliant engineers who are certified "OCD": **Obsessive Console Designers,** driven to create the most useful, powerful, hardest-working consoles in the world.

How it began

"20-odd years ago," says Axia President Michael "Catfish" Dosch, "I was designing custom consoles for recording studios. Somebody at **PR&E** – it was still called **Pacific Recorders** then – liked what I was doing and invited me to move there. Work with Jack Williams, the guy who practically *invented* the modern radio console? I jumped at the chance; BMX consoles were ultra-reliable, sounded great, and nearly indestructible!



"PR&E was a dream job. Jack taught me how to design consoles without compromise — how to **over-engineer** them. It's great to see, 15 or 20 years later, that many of the boards I designed are still on the air.

"By the late 1990s, computers and routing switchers were becoming an essential part of the broadcast studio, and I'd been thinking about how useful it would be to combine console, router, and computer network. I shared some of my ideas with Steve Church, who'd introduced digital phone hybrids and ISDN codecs to radio. He thought the same way I did about computers in radio studios, and we decided to work together."

A new kind of console

In 2003, Axia was launched to make digital consoles, but with a twist: Axia consoles would be integrated with the routing switcher, and **networked** to share resources and capabilities throughout the studio complex. This intelligent network of studio devices lets Axia build consoles that are **more powerful** and easier to use than ever.

Our team of engineers blended the best ideas from old-school analog consoles with innovative new technology to produce **bullet-proof boards** that can actually make shows run smoother and sound better.

There's a reason these board-ops are smiling. Axia consoles are in more than 100® studios worldwide.

And we invented a way to network studios, consoles and audio equipment using Ethernet. It's called **Livewire™**, and it's now an industry standard. Livewire carries hundreds of channels of real-time, uncompressed audio plus synchronized control logic and program-associated data on just one skinny CAT-6 cable.

Lots of well-known broadcast software and hardware companies (over two dozen already) now make products that work directly with Livewire. Thanks to this scalable network technology, **integrated router control** is a standard feature of every Element. Any source in any studio can be loaded on any fader with no need for add-on panels.

And Livewire lets you bring computer audio into the air chain without going through multiple A/D/A conversions. Our **IP-Audio Driver** lets you connect computers directly to the network without any intermediate I/O — all that's needed is a CAT-5 cable and your computer's Ethernet port.

Feature packed

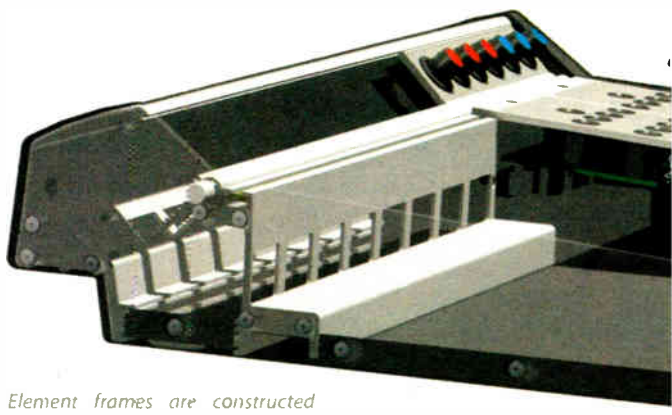
Board-ops told us they wanted a console that's **powerful, yet easy to use.** So we designed Element to be user-friendly, yet still have all the power of a full-on production board.

For example, Element Show Profiles can **recall each operator's favorite settings** with the push of a button — audio sources, fader assignments, monitor settings and more. And each jock's Show Profile contains personalized **Mic Processing** and **Voice EQ** settings that load every time they're on the air (so the midday guy will stop badgering you for "just a little more low end"). There's even a "panic button": one key-press returns a Show Profile to its default state instantly. (No more 3 A.M. "Help!" calls.)

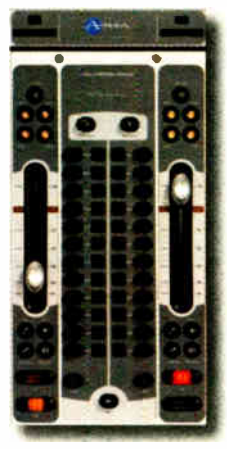
First Axia console prototype. Nice test stand, Catfish.

Did we say "mic processing"? You bet. Every voice channel gets **studio-grade compression, de-essing and expansion** from the processing experts at Omnia, plus three-band parametric EQ to sweeten the deal. There's even built-in **headphone processing** so you don't have to waste money building a separate side-chain just for the studio cans.

Jocks have complained for years that making a mix-minus is too hard — so Element **constructs mix-minuses automatically**. Plus, mix-minus settings are saved for each audio source, so that sources, backfeed and machine logic all load at once. And every fader has a "Talkback" key to **communicate with phone callers,** remote talent or other studios using the console mic.



Element frames are constructed from custom aluminum extrusions for maximum rigidity. Module face plates and console side panels are machined from thick plate aluminum. Even the hand rest is a beefy extrusion. With all this heavy metal, even that ham-handed overnight jock won't be able to dent it.



Speaking of phones, board-ops have enough distractions without having to reach for an outboard phone control panel. Element has **hybrid controls with dedicated faders** for Telos talkshow systems; there's even a **dial pad** so jocks can dial, pick up, screen and drop calls without ever diverting their attention from the console.

Nearly every air talent has accidentally changed a fader's audio source while it was on-the-air. To prevent that error, **Element "queues" source changes**: the operator must turn the fader off before the next assigned source "takes".

World Radio History

The radio console, redefined.

Element was designed to fulfill either a **production or on-air** role, with amazingly powerful features waiting just beneath the intuitive surface. For instance, Element can mix in 5.1 Surround as well as stereo. That's standard; **nothing extra to buy** (except more speakers). There are four stereo Aux Sends and two Aux Returns, so production guys can use their favorite outboard FX boxes. Great for **custom IFB feeds**, too.

Clear the junk out of your studio. Element has 8 submixers built in.

Got a PA mixer tucked away in a studio corner to mix mics for live performers, talk shows and such? Element has **8 Virtual Mixers** — no outboard gear needed. And the Virtual Mixers emulate ACU-1s, allowing tight integration with automation and satellite systems.

You can **administer Element remotely**, from home, the airport — wherever there's network access. A password-protected web server lets you examine the state of the console, see what's on the air and even fix operator mistakes, without ever leaving the comfort of that new Aeron™ desk chair you (ahem) "requisitioned" from the Sales department.

Small VU meters mounted at desk level are hard to read, so we re-invented the traditional meter bridge. Element's **big meters** are presented on an easy-to-read computer monitor along with large analog and digital clocks, event and countdown timers, and tallies that light when mics are open, delay is active, or during phone calls. You can even customize the display by adding your station's logo.

Beneath the surface

There's more to building a great board than just features. **Consoles have to be rugged,** to perform flawlessly 24/7, 365 days-a-year, for years at a time. So when it came time to choose the components that would go into Element, we literally scoured the globe for the absolute best parts — parts that would take the torture that jocks dish out on a daily basis.

First, Element is fabricated from thick, **machined aluminum extrusions** for rigidity and RF immunity. The result: a board that will stand up to nearly anything.

With so many devices in the studio these days, the last thing anyone needs is gear with a noisy cooling fan. That's why Element's **power-supply is fanless**, for perfectly silent in-studio operation.

Element modules are **hot-swappable**, of course, and quickly removable. They connect to the frame via CAT-5, so pulling one is as simple as removing two screws and unplugging an RJ — no motherboard or edge connectors here.

Faders take massive abuse. The ones used in other consoles have a big slot on top that sucks in dirt, crumbs and liquid like the government sucks in taxes. By contrast, our silky-smooth conductive-plastic faders actuate from the side, so **grunge can't get in**. And our rotary controls are high-end optical encoders, rated for more than **five million rotations**. No wipers to clean or wear out — they'll last so long, they'll outlive your mother-in-law (and that's saying something).

Element's **avionics-grade switches** are cut from the same cloth. Our design team was so obsessed with finding the perfect long-life components that they actually built a mechanical "finger" to test switches! Some supposedly "long life" switches failed after just 100,000 activations; when they found the switches used in Element, they shut off the machine after **2 million operations** and declared a winner. (The losers got all-expense-paid vacations to the landfill.)

Individual components are **easy to service**, too. Faders come out after removing just two screws. Switches and rotary volume controls are likewise easy to access. And all lamps are LEDs, so you'll likely never need to replace them.

Engineers have said for years that console finishes don't stand up to day-to-day use. Silk-screened graphics wear off; plastic overlays last longer, but they crack and chip — especially around switches and fader slots, where fingers can easily get cut on the sharp, splintered edges. We decided that we could do better. Element uses high-impact Lexan overlays with color and printing on the back, where it **can't rub off.** And instead of just sticking the Lexan to the top of the module like some folks do, our overlays are **inlaid on the milled aluminum module faces** to keep the edges from cracking and peeling — expensive to make, but worth it. For extra protection, there are **custom bezels** around faders, switches and buttons to guard those edges, too. Element modules will **look great for years.**

By the way, those on/off keys, fader knobs and bezels are our own design, custom-molded to give **positive tactile feedback**. The switch is flush with the bezel, so it's easy to find by touch. But if something gets dropped on it, the bezel keeps the switch from being accidentally activated.

More than just products

Catfish learned something else important from his time at PR&E: "Even the best products are nothing without **great support.**" So Axia employs an amazing network of people to provide the best support possible: Application Engineers with years of experience mapping out radio studios... the most **knowledgeable, friendly** sales people in the biz... Support Engineers who were formerly broadcast engineers. Plus a genius design team, software authors who dream code... one of the **largest R&D teams** in broadcast.

And now Axia has become radio's **first console company to offer 24/7 support**, 365 days a year. Chances are you'll never need that assistance, but if you do, we'll be ready for you. Our 'round-the-clock help line is +1-216-622-0247.

Proudly Over-Engineered

Are Axia consoles over-engineered? **You bet.** If you're looking for a cheap, disposable console, there are plenty out there — but this ain't it. Not everyone appreciates this kind of attention to detail, but if you're one who seeks out and appreciates excellence wherever you may find it... Axia consoles are built **just for you.**

AXIA
A TELOS COMPANY

www.AxiaAudio.com

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World Radio History

WAMU HD2 Kicks Ups Its Heels With Bluegrass Open House

Hundreds of visitors turned out for an open house for the HD2 channel of WAMU(FM) in Washington in June. The channel airs "Bluegrass Country."

WAMU staff gave studio tours for more than 300 visitors; listeners also heard five bluegrass bands on the lawn, according to Richard Cassidy, director of content operations for WAMU. Ibiquity Digital staff brought car demos, handouts of HD Radio facts, and some 10 radios for display.

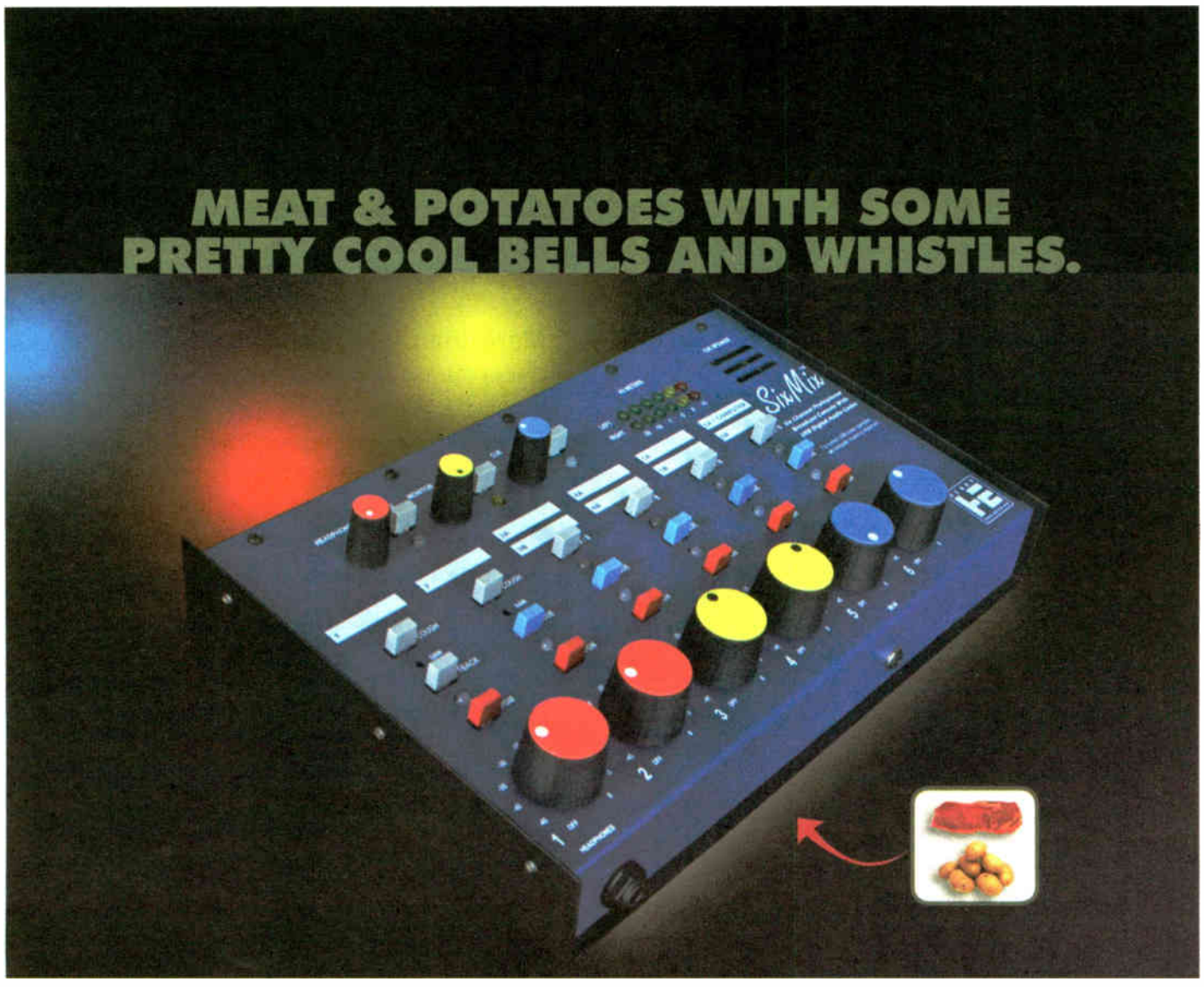
The station gave away more than 1,000 Radiosophy HD Radios last fall for membership donations of $100.

"We have had a great time building our Bluegrass Country station on HD2," said Cassidy.

You can see some of the pictures in the gallery at *bluegrasscountry.org*.

— Leslie Stimson

Nanci Gius, WAMU business manager, and show host Katy Daley stand in front of an HD Radio sign.



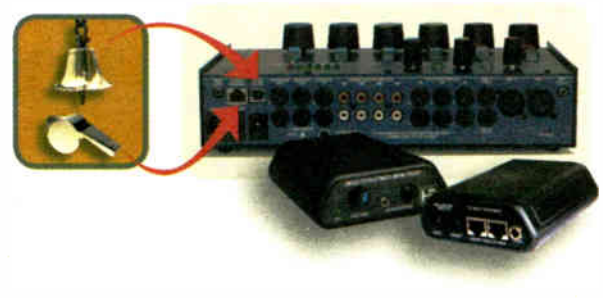
Finally, a super compact ultra-portable broadcast mixer that's perfect for any job you want to throw at it. It's loaded with the staples big professional radio consoles have to ensure your shows come off without a hitch. And unlike the big boys, it's got a bell and whistle or two that make it the essential centerpiece part of any ad hoc studio.

Intuitive and easy to use, with large color-coded controls and bright LED meters, it gives you superb audio quality with ten mic and line-level inputs across six mixing channels for real versatility. And you can seamlessly add a guest announcer with their own headphone mix with our optional Multiphones MiniPod (bell).

With its built in DA/AD audio codec via a USB port (whistle), simply connect the SixMix to any USB-compatible computer and you're on the air. Use your favorite software to serve up tunes or any recorded program material through the SixMix. Push your program back to your computer for recording or streaming. Need to send a separate feed to another PC or server? There's even a dedicated S/PDIF port to handle it.

Factor in its cue speaker and automatic monitor muting, mix-minus output, comprehensive headphone and monitor systems, plus a wealth of output options and it's clear to see that SixMix will transform your laptop or desktop computer into a full-fledged professional broadcast studio.

SixMix. You're on the air.



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JVC

▶ Continued from page 22

player will read that information and the text will scroll just like it would for an MP3 CD. There is an AUX jack on the faceplate to make for easy connection of an MP3 player.

There is also an easy-access SRC button to switch between the radio, a CD or the AUX input. There are 18 FM presets and six AM presets. This radio, unlike the HDR1, stores HD2 and HD3 presets.

The faceplate is detachable so you can keep your radio secure when you are not in the car. There is also a surround sound decoder for HD Radio for those stations that transmit surround. It certainly makes the sound fuller, even if you only have four speakers like I do. The radio also comes with a small remote control, but it's so small that it could easily get lost.

One other thing I have found that I like about this radio, since my MP3 player audio is low when connected, there is an input level control that you can set from –10 to +10. By adjusting this control, I was able to make the audio from my MP3 player the same as the rest of the audio from the radio.

There is a "Hold" button that you can use when the station you are listening to switches back from analog to digital constantly (such as in a transition area). You can have it set on "Auto," which means if there is an HD-R signal it will decode it; "Analog," which locks the analog signal only, so if the digital is weak, it won't switch back and forth; and "Digital" which — you guessed it — locks only on digital signals and keeps it from going to the analog signal.

This feature has proved useful for me as there are a few places around Denver where the signal jumps back and forth due to power lines and terrain.

The radio has some optional add-on features such as the JVC iPod adapter, a Bluetooth adapter, satellite radio and a CD changer.

So far I have had zero problems with this radio. I have been pleased with how it works. The audio quality is great. Everything was relatively easy to figure out.

I would definitely suggest anyone who wants a good HD Radio and is willing to spend a little extra cash to go out and buy the JVC KD-AHD39. I don't think anyone will be disappointed.

The author is an engineer for Crawford Broadcasting in Denver.

World Radio History

BTC

▶ Continued from page 5

for data and specialized services. To Brenner, the difference is the content and the partner.

"Navteq has greater than 90 percent market share in digital mapping; they have relationships with every automaker out there. They have content that makes the dashboard a utility.

"If we're the partner, it's the perfect marriage," because by putting content like traffic and weather on a Navteq map, radio extends its traditional involvement in such information.

"It's not just 'traffic on the 10s' anymore. It's a logical next evolution of technology serving the next function. (Consumers) want to be able to touch a screen to know where traffic is, not have to wait. It's a natural fit."

It's important to note, though, that this is not an arrangement under which a station brand is visible to the consumer.

"Navteq owns the content. For broadcasters, it's hard for them to give up that 'public face' to the consumer, but they're not getting a piece of real estate that says 'WABC.'" Each navigation device will know how to seek the signals out without consumer involvement, so a station's role is invisible to the user. The benefit to a broadcaster is monetization of digital technology, not telling listeners about it.

Brenner believes the traffic data concept could translate into millions of dollars for broadcasters if HD Radio is successful. Beyond the revenue angle, he is excited to have Navteq promoting HD Radio to its automaker partners. "We're really dragging the premier content partner for dynamic dashboards into our industry," he said.

At a recent automaker event in Detroit, he said the "audio-plus" applications concept drew attention. "'Multicast' and 'sounds better' is not an argument that woos people, especially when (carmakers) are getting subsidies from the satellite guys. In general, I was shocked at the amount of interest the automakers showed (about) applications without audio. They found it very appealing."

BTC has six markets online with the new digital data distribution; they are Los Angeles, New York, Chicago, Boston, Tampa and Detroit. Brenner hopes to have 60 cities up by September and 100 by early next year.

Navteq licenses the deals under its moniker of Navteq Connected Services, or NCS. For its plan to work, Navteq must convince application service providers, original equipment manufacturers and automakers to carry its traffic and location content and services, so it is working with various portable navigation companies, hoping to put products on the shelf, and with carmakers, aiming to get its offerings into the dash. The latter can take years.

Meanwhile, Brenner hopes broadcast equipment manufacturers and Ibiquity will invest more time and effort into the data side of HD Radio's growth.

"As an industry we need to think differently, to be there and support these kinds of application providers. That's how the money funnels to us for HD. The vendors put a lot more priority on the audio side of HD. I'm not faulting them; but this data capacity is very big."

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

HD Radio Goes to Kiev

Ibiquity Digital says interest in HD Radio is increasing in Europe.

It shared a photo from a broadcast event in Ukraine in May, when Ukraine Radio Group, which runs two IBOC stations and is part of the European HD Radio Alliance, sponsored a display at the annual Radio-Television Expo in Kiev, including receivers and a Nautel transmitter demonstrating multicast broadcasts.

Pictured from left: Sergiy Voronov (technical support), Andriy Karpiy (UGR president), Taytyana Kozyr (GM), Hal Kneller (Ibiquity, director of international broadcast business development), Evgeniy Dvoretskiy (technical support), Alyona Kryvets (external relations), Neil Pole (Radyne), Valentina Boklan (marketing) and Norman Carpenzano (World Family of Radio Maria).

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AudioTX STL-IP-16 / STL-IP-8

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World Radio History

USER REPORT

Z/IP Sustains Longtime Connection

Telos Systems' IP Codec Connects Two Studios, Delivers Audio Stream for Three-Hour Talk Show

by Ed Rusch
Independent Producer

ATLANTA The prevalence of broadband Internet connectivity, along with today's robust VoIP technology, made me think a few months back that a broadcast-quality application was just around the corner. I was excited to learn that Telos Systems was developing a resource to do just that.

I was invited to beta test the Zephyr/IP and eager to see how feasible it was to use the Internet to deliver reliable broadcast-quality sound over long periods of time.

Going the distance

The Telos Zephyr/IP (Z/IP) uses an IP codec that is optimized for operation over the Internet. My experience using the Z/IP over the past three months has exceeded my expectations.

Before first using the Z/IP, I had a few biases: How would an Internet application like this sustain a reliable and consistent audio stream over long periods of time? How distinguishable would the audio from the Z/IP be vs. the sound from the main studio? Would there be a significant delay from one end to the next, wreaking havoc on dialogue between hosts in different studios? What about configuring the Z/IP to even connect through a variety of networks, firewalls, routers and switches?

The Z/IP's ability to sustain a reliable audio stream was the biggest concern of mine because I am using the Z/IP to connect two studios for a talk show that runs for up to three hours.

The main studio is located in Akron, Ohio, the other is in Atlanta. There are two main personalities involved, one located in each city, and they are joined by others in the main Akron studio. The Atlanta studio is a home office environment with a typical consumer DSL Internet application installed.

After working through the installation, my biggest concern became a non-issue. I have yet to experience any problems with the Z/IP's ability to deliver over long periods of time. The end of the third hour is always at the same quality level as the first five minutes, and I have never experienced a dropped connection.

What about the host in the remote studio sounding significantly inferior to the rest? I am delighted to report that this has been a non-issue as well.

With the remote studio set to stream at a 128 kbps rate, the quality difference is negligible. Listeners are surprised to hear of the remote nature of one of the hosts when it is mentioned by them during a show. It takes a person with a discerning ear to know that one participant is outside the universe of the others.

These challenges were behind me, so I turned my attention to the impact of a delay between Z/IP boxes.

I am, notoriously, one to step on a person's next sentence when speaking on a cell phone, and thought this same effect could cause problems for the personalities during a broadcast. After all, I would be jamming a whole lot more information over the Internet than a typical cell phone.

Though a slight delay does exist, it is negligible and does not interfere with their ability to interact seamlessly. Another concern off the checklist.

Missing link

My smallest bias ended up becoming my only challenge.

When I received the Z/IP from Telos, I could not get a link between the router and the Z/IP. It seemed as if the Z/IP recognized some networking hardware but not others. I am smart enough to know that it is unrealistic to expect everything to go perfectly, especially with a beta Z/IP, so I figured this would give me an opportunity to better understand Telos' repair and service team.

The staff was great to work with and they responded quickly to resolve the problem. It was good to build a rapport with them through this issue, as they gave me additional skills and insight that I benefit from today.

After getting the hardware to talk, I had to get the Z/IP to talk to the Z/IP server at Telos so the studios could be linked. The Z/IP includes a studio codec and a PC-based server that addresses firewall and Network Address Translation issues. With a little configuration, we were in business.

The Z/IP also has the capability to connect via WiFi connection. This was a nice surprise. I have used this feature on several occasions and it performs as reliably as if it were connected with a network cable.

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

TECH UPDATES

Moseley STL Supports Ethernet, HD-R

Moseley Associates offers digital STL products with Ethernet capability for HD Radio and multicasting as well as IP network connections to transmitter sites.

"In addition to HD Radio, Ethernet connectivity brings new innovative and money-saving IP-based applications to remote transmitter sites," said Dave Chancey, broadcast sales manager.

The company's Starlink SL9003Q-2SLAN STL provides AES audio and UDP IP for HD Radio and multicasting on the 950 MHz band.

Starlink SL9003T1 STL/TSL for T1 circuits or wideband microwave links transports bidirectional digital audio and IP for HD Radio and multicasting plus an IP LAN connection, remote control and telephone extension.

LanLink HS 900D license-free data radio is a 1 Mb bidirectional Ethernet and serial data link for IP-based equipment control, RBDS, security surveillance and Internet and e-mail.

"The ability to mount an IP surveillance camera at a remote site can avert a copper theft that could cost the station thousands to repair," said Chancey.

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

Radio Systems Offers IP-Connect

Radio Systems has debuted IP-Connect, a broadband licensed studio-transmitter data link. The company says IP-Connect offers options for Ethernet-based, bi-directional multichannel audio and broadband data connectivity for transmission applications.

IP-Connect's IPC-100 data link is the first is Radio Systems' series of programmable, scalable and spectrally efficient 11, 18 and 23 GHz band radios. The units are fully configurable due to their single-chip ASIC modem featuring integrated FEC with selectable coding rates allowing transport data rates from 8 to 32 T1s, 2xDS3, 50 to 250 Mbps Ethernet, or up to 2xSTM1 + 2xT1. Mixed data rates and formats also can be supported allowing the IPC-100 to act as a transparent data pipe for a network plant.

Due to the IPC-100's frequency and bandwidth agility, it offers licensed applications for program audio "last mile" studio to transmitter links in the 18 GHz band, according to the company.

For more information, contact Radio Systems at (856) 467-8000 or visit www.radiosystems.com.

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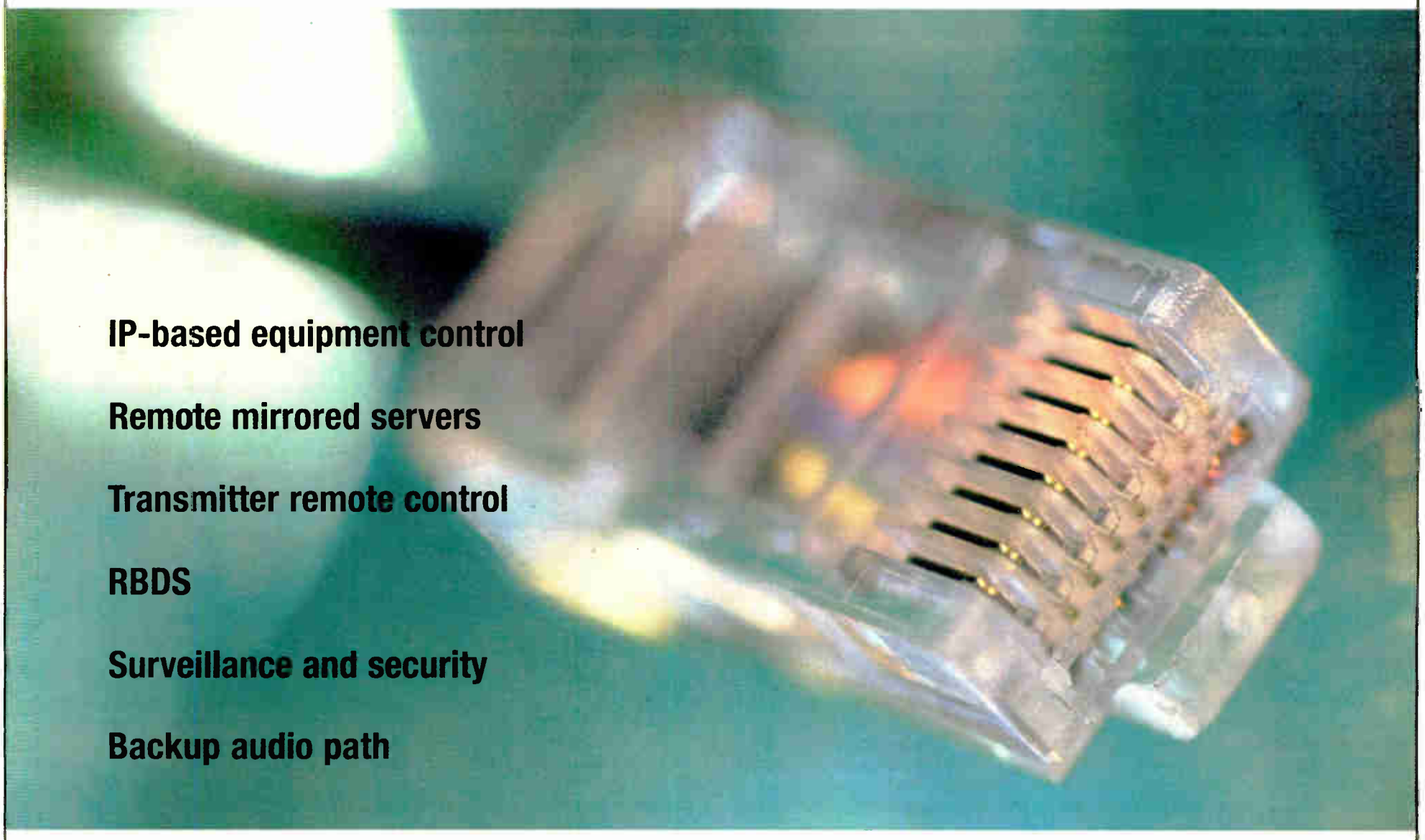
World Radio History

Ethernet path...



IP-based equipment control

Remote mirrored servers

Transmitter remote control

RBDS

Surveillance and security

Backup audio path

to the transmitter site.

Innovative IP-based applications save money, save time and protect valuable station assets. But how to get IP connections at remote transmitter sites?

LanLink HS-900 provides IP Ethernet and RS-232 data where no wires or cables exist. And without licenses, leases or new antennas.

Ask the digital STL experts today.

Moseley

Dave Chancey 805.968.9621 Bill Gould 978.373.6303 www.moseleysb.com

World Radio History

USER REPORT

Harris Eliminates Problems for Pubcaster

Intraplex T1 Connectivity Improves Coverage Area And Quality for Two Radio Stations in Anchorage

by Chuck Lakaytis
Director of Engineering
Alaska Public Broadcasting Inc.

ANCHORAGE, Alaska Alaska Public Broadcasting consists of 27 radio and four television stations. We are independent licensees, comprising a mixture of university, community and school board licensees. The radio network reaches well more than 90 percent of the state population.

Two of the radio stations, KBBI(AM) in Homer and KDLL(FM) in Kenai, broadcast much of the same mixed format, but — with the exception of news programming — air very different programs.

KBBI operates KDLL under a LMA. About 80 percent of KDLL's transmitted content is sent from the KBBI studios as a customized, independent program stream. The content is transported via a private T1 circuit over a 90-mile distance. A **Harris** Intraplex STL HD Plus platform provides connectivity at each studio to send and receive compressed analog program audio, as well as data, voice and remote control signals.

The Intraplex platform operates over a large fiber network that replaced two bonded 64 kbps lines provided by a common carrier. The older service, used for several years, was hampered with frequent outages, artifacts and buffering problems that had an adverse effect on the terrestrial output. It was a high-priced service with unsatisfactory customer support.

Seeking a better solution, KBBI contacted Homer Electric Association, an electric cooperative that had recently installed a large fiber network.

KBBI's general manager at the time, Susan Kernes, worked out a long-term underwriting agreement with Homer Electric to secure a cost-effective T1 circuit using excess fiber from the network. A different common carrier, Alaska Communication Services (ACS), signed on to manage the first and last mile of the fiber connectivity between the two studios.

The Intraplex platform provides a high-quality, compressed analog audio signal that is reliably delivered without degradation. (The analog audio is digitized at KDLL for HD Radio transmission.) The system was commissioned to send a return stereo audio feed back to KBBI that splits into two mono feeds. One channel carries the KDLL air signal for confidence monitoring; the other channel can relay feeds from the KDLL console, including news stories.

The Intraplex system also interfaces with a group of codecs to transport live audio of public meetings from remote locations for broadcast. This allows the two stations and a repeater station in Seward to broadcast zoning discussions, borough assemblies and other public meetings throughout the lower Kenai Peninsula, a task not possible prior to installing the Intraplex platform.

Two-way street

The audio improvements with Intraplex transport over T1 have been significant. Service interruptions, clicking and other strange noises and artifacts have been eliminated from the chain, resulting in a much cleaner transmission.

Setting up the system was simple. Harris representatives explained which cards would meet our requirements, as well as how to install the modules, set the DIP switches and put the system into service.

The system includes a wide-area network card for IP and WAN connectivity between the two studios. This primarily is used by KDLL operators to access the company server in Homer. It occasionally is utilized to download audio files for local use, including fundraising broadcasts at KDLL.

A voice frequency module enables intercom services across the 90-mile path. Board operators and news staff can use this as a talkback circuit to talk offline and coordinate cues prior to going live. Various live talk and news programs are the only regular program simulcasts on both stations, and on occasion there are guests for the same show at each studio location. The two-way connectivity between studios makes this easy.

A final serial data card provides remote control capabilities. KBBI engineers can use the Intraplex link to control the KDLL transmitter in the event of a service issue.

The system has never had a module failure, gone out of alignment or been forced to switch to a redundant power supply. The only service interruptions were caused by equipment issues with the common carrier and an unauthorized patch by an IP technician at a company located in the same building as the KDLL studio. There have been a total of four outages since the Intraplex system was installed in late 2002, for a total time of approximately six hours.

For more information, including pricing, contact Harris at (513) 459-3400 or visit www.broadcast.harris.com.

USER REPORT

Suprima Enables IP Remote From the Met

WQXR Uses MusicamUSA Codecs to Broadcast 'Summer Concert' in New York

by Rodney Belizaire
Chief Engineer
WQXR(FM)

HOLMDEL, N.J. Approximately 50,000 classical music devotees were seated outdoors at the Metropolitan Opera's "Summer Concert: Live in Prospect Park," and many more were tuned into WQXR(FM)'s exclusive broadcast on air and online around the world.

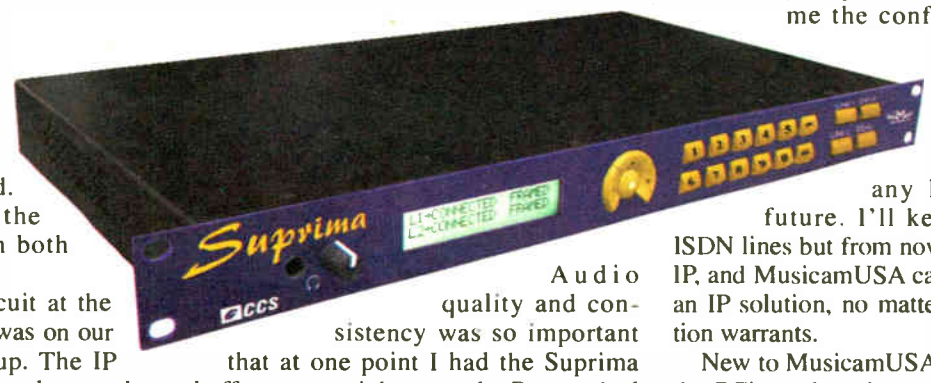
I use **MusicamUSA**'s Prontonet to keep the nation's most-listened-to classical station humming 24/7 on Radio@AOL, and encountered an interesting challenge for the remote broadcast: no available ISDN lines and no IP access at the location, as the Met was recording the performance on video.

My IP solution to direct the signal out of the park and over the airwaves and Internet was genius. Enter four MusicamUSA Suprimas for the remote and presto. History was made in New York.

All Mobile Video originated the video link, uplinked it to satellite and downlinked to the Jumbotrons in the park.

AMV has downlink facilities in Carteret, N.J., and Manhattan. They sent our audio from the park (mixed by Director of Operations and Distribution Harold Chambers) onto a pair of the satellite audio subchannels via Ku band. We picked it up from the downlink locations with both Suprimas for redundancy.

I had a static DSL circuit at the station and the other unit was on our company WAN for backup. The IP streams were then converted to analog audio via Suprima.



A New York first?

Everyone was excited as this was our first our IP remote, even though we've been using IP to feed Japan and AOL WQXR content for years.

Up until now our remotes have been exclusively ISDN. I needed a codec with multiple algorithms, particularly the apt-X, which is why I chose MusicamUSA's Suprimas. This was a music concert, and quality of audio was a top priority for the remote.

I was a little hesitant at first to do IP, but we had a successful 2-1/2 hour continuous music remote that I believe was the first one ever done via IP in New York.

Other stations have broadcast talk and news content with breaks via IP, but this was a music concert and it was the Met. Audio quality and consistency was so important that at one point I had the Suprima buffers up to eight seconds. But we had no dropouts and the sound was excellent.

One key Suprima feature of which I'm particularly fond is the simple front panel and its large buttons, which do make a difference. The setup time is so quick; you can do it within two minutes. I didn't have to open my laptop until much later in the configuration process to do the QOS.

Another excellent aspect is the graphical user interface; you can see the amount of buffer and QOS. I love seeing the amount of jitter, the quality of the line and being able to access the other unit remotely. I was even able to go back and forth on all the units with four pages up. And of course the fact that it's in a 1 RU box is beneficial for saving rack space.

Most of all, I can't say enough about the technical support at MusicamUSA. I had a technician help me configure my router, remotely looking over my shoulder and using the Suprima Web interface to connect to mine in order to make sure I had everything set correctly. That gave me the confidence to know this would be a successful broadcast.

In fact, I don't plan to add any ISDN lines the future. I'll keep my existing ISDN lines but from now on I plan to use IP, and MusicamUSA can assist you with an IP solution, no matter what the situation warrants.

New to MusicamUSA's IP repertoire is the PCip codec, the software version of Suprima that enables engineers and reporters to turn their laptops into portable IP codecs.

The company said interest was strong at the MusicamUSA booth at BroadcastAsia, where it debuted.

Other features include compatibility with Windows 2000, 2003 Server, XP and Vista; a user-friendly interface; CCS NAT Transversal protocol (makes hotel and stadium remotes easier, as it makes calls without router configuration); multiple algorithms (PCM, G.722, MPEG Layer II and optional MPEG4/AAC HE); easy configuration for optimizing low delay and jitter; and automatic detection of encoding mode and independent encoder/decoder operation.

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

World Radio History

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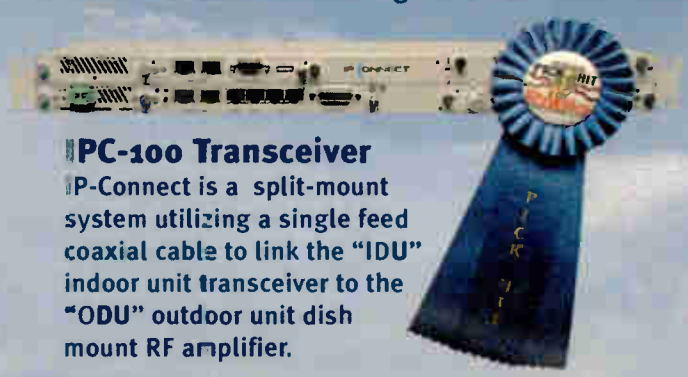

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World Radio History

USER REPORT

Tieline Takes Command of WAMU Show

Field, Rack Models of Commander Codec Serve as 'Primary Connection' for Ray Davis

by Richard Cassidy
Manager
WAMU(FM)

WASHINGTON WAMU(FM) 88.5 is renowned for its commitment to the broadcasting of bluegrass music for more than 40 years. It also is committed to HD Radio and was the first public radio station to offer three digital channels as well as an analog signal to listeners in Washington, Maryland and Virginia.

WAMU's dedicated bluegrass country station broadcasts on 88.5-2 in full stereo HD. WAMU is a station steeped in history and home to the programming of legendary sound engineer, broadcaster and musicologist Ray Davis.

Davis has been broadcasting on WAMU since 1985 and his programs are hugely popular. He lives 75 miles from the studio, which made it difficult for him to broadcast his show live six days a week. As a result, we needed to find a solution that would allow him to broadcast from his home studio in Falling Waters, W.Va.

We heard some great reports about the **Tieline** codecs being used by WXPN in Philadelphia for concert remotes, so we decided to give them a try. We called the folks at Tieline and they sent us a pair of demo Commander codecs to try out.

We installed one of the codecs in Davis's studio and attached it to a dedicated Comcast cable modem connection. We dialed into the other codec at the studio in Washington using the default stereo profile settings and the sound quality was tremendous. We connected at 192 kbps over IP using the Tieline Music Plus algorithm, and the audio we sent was flawless.

Work from home

We were so impressed we bought a field unit Commander codec for Davis's place and a rack unit Commander for the studio. The rack unit is connected to a dedicated symmetrical DSL connection and is programmed with a static IP address. We used the default codec port settings and we have had no problems negotiating firewalls.

This is now the primary connection for Ray Davis' show and he connects between 3 and 6 p.m. each weekday, and on Sundays from 10 a.m. to 1 p.m. Our automation system at the studio switches directly to the Tieline codec so all Davis has to do is dial in to connect and he's on the air. The Tieline Commander at the studio sends really low latency return program to Davis's codec so he takes his cue from this feed.

Davis is comfortable with the system and during his shows he sends high-bandwidth program audio to the studio containing music and voice. The quality is terrific; it is reliable and has never let us down.

The only time we have had an issue was when the Comcast cable went offline after a storm. Luckily, we had a DSL connection as a backup and we simply plugged the codec into this connection to keep broadcasting.

Richard Cassidy and John Holt

"I believe that we are definitely in a transition phase from ISDN to IP-based technologies in broadcasting," said John Holt, director of engineering at WAMU, with whom I've worked in broadcasting for 30 years. "ISDN is harder to get and we are finding that it is being phased out in many places."

"IP and 3G technologies are totally changing the way we approach contribution links," said Holt. "For example, we have a second Commander field unit that is programmed to connect over the EV-DO 3G network, and we plan to use this for the election coverage in November."

Our progression to HD was evolutionary, I suppose.

When we first started broadcasting,

See TIELINE, page 33 ▶

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Flashman II also uses MAYAH's FlashCast technology to automatically recognise remote codecs & audio formats, and its two new coding algorithms, MPEG-4 HE AACv2 & MPEG-4 AAC ELD* (enhanced AAC Low Delay), increase performance even further.

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*working name of MPEG-4, implementation from Coding Technologies

World Radio History

USER REPORT

Bext Enables STL Boost at WWKR

Michigan Station Uses Amplifiers to Increase Power Output of Its LC-T System

by Todd Mohr
President
Synergy Broadcast Group

LUDINGTON, Mich. WWKR(FM) is located in beautiful Ludington, Mich., and serves West Michigan's Lakeshore area from Muskegon to Manistee, a Midwest tourist mecca. Our format on WWKR is classic rock, with the popular "Bob & Tom" in the mornings.

We recently moved our studios for both WWKR and our sister station WMLQ to Ludington, a move that proved to be an incredible challenge for getting STL paths back to both transmitter sites. We could not get paths back to the transmitter sites from our new studio location because of height restrictions on our STL tower, due to local ordinances and the proximity to an airport. We had to come up with an alternate plan fast.

My engineer, Craig Bowman, came up with a brilliant idea: We send the audio from the studio using a 5.8 GHz wireless network system to a hop tower two miles away. Luckily, there was a 199 foot tower owned by the county on which we were able to get a favorable lease.

Power up

From the hop site we feed each station with a 950 MHz aural STL. This hop site is centrally located between both transmitter sites, one north and one south. But, as a result, both paths are long.

The path for WMLQ is pretty clear of obstructions and ended up working well, but the path for WWKR has some hilly terrain and obstructions, making it more of a challenge to get a clean signal to the transmitter site.

We came to the conclusion that despite the use of quality dish antennas, low-loss cable and various efforts at improving all we could, we never seemed to have a consistent full quieting on the receive end of the path of WWKR.

We considered going to larger, higher-gain dish antennas, but physical limitations of the real estate available did not allow us to pursue that avenue.

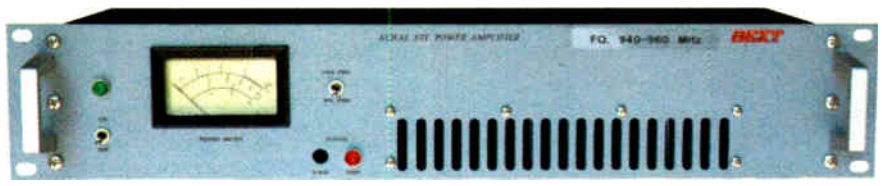
Other methods, such as sending the audio through a T1, also were out of the question. That left us wondering if we could approach the problem in another way, by adding a little extra power on the transmitter end.

We already use a **Bext** LC-T STL system on WWKR, so we decided to contact Bext about the possibility of increasing the power output of our STL transmitter, and learned that it has amplifiers that would do the job.

We decided to go for the highest power available in the Bext line and purchased the LKA 40, a 40 W STL amplifier. It turned out to be a simple and straightforward unit, two rack spaces high and rack mountable.

The front panel has a standard forward and reflected power meter, along with a temperature protection alarm indicator, in addition to the on/off power switch and indicator light. On the back we found several fuse holders: one for the AC line, one for internal power amplifier 1, one for internal power amplifier 2 (the unit has two combined internal amplifier modules) and one for external DC feed.

See BEXT, page 34 ▶



Bext LKA 40

Tieline

▶ Continued from page 32

bluegrass was a major part of our station's content. Over the years, as the programming became more news-oriented, bluegrass programming was reduced. The only way to offer news/talk and serve our bluegrass audience adequately was to take advantage of HD multichannel broadcasting.

"One of the most important things about choosing the Tieline codecs was how they handled further compression for HD transmission and Internet broadcasting," said Holt. "The performance was outstanding and we didn't notice any artifacts."

"HD has provided us with the best of both worlds," he said. "We can provide tailored content to both our news and bluegrass audiences — and Tieline codecs play a big part in making this happen for us."

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

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World Radio History

USER REPORT

STL-IP Nabs On-Campus Job

Boston's Lasell College Selects AudioTX From MDOUK/Broadcast Electronics to Send, Receive Live Audio

by Jeffrey Rosenberg
President
Modulation Magic Inc.

BOSTON The density of broadcasters, the new rules for frequency coordination, the cluttered RF spectrum and the rising cost of wire line services has created the need for alternative STLs.

We were reminded of this recently when Lasell College contacted us to move signals around their campus for their college radio station. We had built $160,000 studios for them and due to their success with listenership, they wanted a top-notch signal in the bookstore and student center.

Copper wiring was our first thought, but it was unavailable. Although the campus was wired with Ethernet, a standard streaming solution did not provide the quality they wanted or the reliability they required. Leased lines were out of the question, as they were too expensive.

Lasell College Radio uses the AudioTX STL-IP, bottom right, to send audio out and receive audio from the student center's live stage. 'For future use we may even use it with unlicensed band radios to extend our backbone to buildings not on the network,' said Rosenberg.

Atypical remote

Then we discovered the AudioTX STL-IP, part of a range of products designed primarily for broadcast users who need to deliver reliable live audio over IP networks. The STL-IP product range is manufactured by **MDOUK** and distributed and supported in the United States by **Broadcast Electronics**.

The AudioTX STL-IP is the smallest unit in the range, featuring stereo inputs and outputs (analog and digital). It is described as a "transmission-grade unit for live audio over IP," so it's designed for performance as needed in live audio distribution applications, including STLs, live program syndication, studio grade connectivity between sites and the like.

This unit is spec'd to transmit and receive up to 96 kHz audio, 24 bit. It's a professional-grade unit and can be used for wireless networks, satellite and Internet — anywhere it can transport IP packets similar to a computer network.

The idea of an IP-based STL was not new to me. I had been involved in several unusual circumstances in the past requiring some thinking outside the box to create STLs where the terrain was uncooperative for RF and the phone company in Northern Maine was unable to make working lines of any kind.

Once, I was trying to get a signal for broadcast from a Phish concert in Limestone, Maine, at the retired Loring Air Force base to a local station we rented for the event. When all else failed, in order to serve the 100,000-plus in attendance with safety information and entertainment, I used a laptop to encode the audio. The audio bounced through four consumer wireless 802.11b hubs using each one as a repeater until it reached the leased wireless backbone, where it traveled about 20 miles to their head end.

From there we sent the stream over the public Internet and to the station, where it was received via a Comcast cable modem and a workstation using Windows Media Player. It worked, and with only minor glitches we made it through the multiple days of the event. It seemed strange, however, that 100,000 watts could be powered by WiFi. Though definitely not your typical remote and not exactly a professional solution, it worked in an emergency situation.

I was hoping we'd have a similar experience using the AudioTX STL-IP for Lasell College. This professional-grade IP STL not only met our needs, it exceeded them.

College try

Installing the AudioTX STL-IP was a snap.

Ethernet wiring was in place in the bookstore, studio and student center. Audio was taken from the studio distribution amps that also feed the Internet air processor, and the 70 volt system that supplies the tunes to the building where the studio is located. We just added XLR connectors and +4 audio and were off and running.

We followed the simple steps in the AudioTX STL-IP instructions to set the IP address, encoding algorithm, transmission type and ports to meet the parameters of the network. We quickly set up passwords for security purposes and to keep out prying college kids. We watched our TX and RX LED indicators go from red to green. It was on air so fast the IT guy was floored.

From the get-go, the audio quality has been flawless and the IP service exceptional. The unit can be set up as single- or bi-directional, stereo or mono, linear

See STL-IP, page 36 ▶

Bext

▶ Continued from page 33

This unit can be powered by 120 V/220 V AC (selectable) or 24 volt DC, which means it could run on two 12 volt batteries if needed. The 120 V/220 V connection is through standard AC receptacle for power cords, and the 24 volt DC is through screw-type direct terminals. Also on the back panel are the input and output RF connections (both are "N" type), two interlocks, two openings for two cooling fans and the power connections.

Installation was easy. We just added it to the RF chain, right after the existing STL transmitter and before the transmission line going to the transmit antenna.

The absolute maximum allowable RF input drive power is factory stated at 2 W, but we already got full 40 W nominal power with about 1.5 W of drive from our Bext STL transmitter, which brings me to an important point: Anyone who considers buying this amplifier must be able to turn down the power of their STL transmitter to 2 W or less. Driving this amplifier with any more would result in heavy smoking.

Should one want to have less than 40 W of output power, just reduce drive power, as the output power is determined by and proportionate to the input power level.

After installation, we were able to confirm a measurable improvement in our STL quality.

This amplifier is not rocket science, as it certainly doesn't rely on any particularly innovative technology. Rather, it is a good ol' RF amplification device. But it is well packaged and efficient, and a simple plug-and-play solution for those who want to implement a fast improvement on an already existing marginal aural STL but don't have the time or resources to make radical changes.

For more information, contact Bext at (888) 239-8462 or visit www.bext.com.

World Radio History

USER REPORT

Philadelphia (Streaming) Freedom for WXPN

StreamGuys Houses and Rebroadcasts Programming, Archived Material to Internet Radio Listeners

by John Bartol
Director of Non-Broadcast Distribution
WXPN(FM)

PHILADELPHIA WXPN(FM) is the non-commercial public radio service of the University of Pennsylvania, and the premiere radio showcase for contemporary music that spans the progressive edges of rock, folk, rhythm and blues, and American roots music.

The station is known around the country, producing programs for national syndication. Its signature series "World Café With David Dye" is distributed by Public Radio International and broadcast on numerous public radio stations. The station also is home to the Peabody Award-winning "Kids Corner" hosted by Kathy O'Connell.

Chain gang

Located in Philadelphia, WXPN has satellite transmitters in the Baltimore area; Harrisburg, Pa.; and the Lehigh Valley in eastern Pennsylvania, giving it a far wider audience in the mid-Atlantic than most terrestrial radio stations.

In addition to the terrestrial FM and HD Radio multicast signals, WXPN offers a variety of live and on-demand audio streams at *www.xpn.org*, where listeners can hear the station's main program service; YRock, an alternative music program broadcast on the station's HD2 outlet; and XPoNential Radio, an un-hosted audio stream of bands that appear on WXPN. The Web site also hosts a series of streams featuring archived material including station-hosted concerts and weekly specialty programs.

Since joining the WXPN staff two years ago, the station has increased its audio streaming properties to more than 60, including a mix of live and archived streams. **StreamGuys**, a content delivery network based in northern California, is responsible for managing the backend server architecture to house and rebroadcast these streams to Internet radio listeners around the world.

The company also provides an attractive price point for streaming services that subtracts costs incurred at the heaviest traffic points, while lowering our cost of stream delivery by 60 percent compared to our previous service.

StreamGuys operates an enterprise-level server cluster on behalf of WXPN to stream audio in Windows Media and MP3. The latter service uses Shoutcast technology operating out of Linux encoders to distribute the streams to online listeners, and includes all of WXPN's on-demand content. The Linux cluster also hosts basic Web services, and is our preferred choice at the server backend due to scalability, reliability and low cost of open source software.

WXPN's streams are delivered to StreamGuys from Philadelphia, where seven studios produce and share audio content over the Radio Systems StudioHub+ networking platform. Audio sources from various studio feeds are distributed over Cat-5 cables and sent through the signal processing chain to maintain audio quality.

Prior to hitting the STL platform for delivery to the transmitter, the signal is split and encoded with separate Arbitron signals for audience measurement: one measures the over-the-air local audience, and one measures the streaming audience. The over-the-air signal is then sent to the transmitter, while the streaming signal is routed back to the studio.

The streaming signal is encoded into Windows Media and MP3 at the studio before delivery to the StreamGuys server bank. Each live and on-demand signal is streamed separately so StreamGuys can manage the multiple streams at the receiving point.

StreamGuys' location in multiple U.S. and international data centers supports our scalability requirements as our streaming properties grow. Customer support also is outstanding, with the technical team always working to create solutions to our service or technical challenges.

Representatives from the company keep the station informed about new

See WXPN, page 36 ▶

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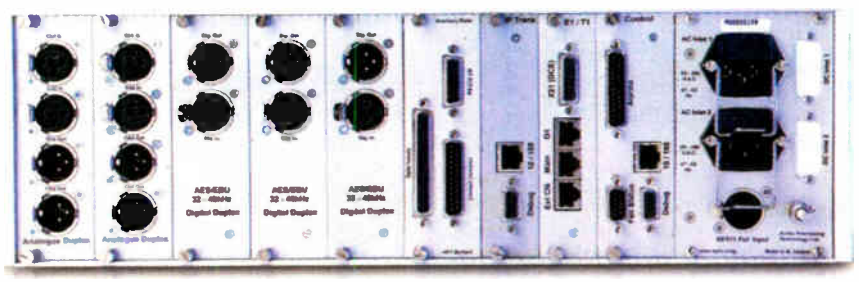
Uncompromised Audio Quality
The WorldNet Oslo offers both linear PCM and Enhanced apt-X coding options. Enhanced apt-X will deliver the same audio quality as linear with under 2ms delay and at a fraction of the data rate. Other options include MPEG L2, J.57 and J.41 companding. With four channels of audio per plug-in module, up to seven audio modules per unit, and a choice of over 20 different audio modules, each WorldNet Oslo has the capacity of up to 28 mono channels / 14 stereo pairs.

Rock Solid Reliability
On the WorldNet Oslo, solid dependability comes courtesy of DSP-based architecture, hot-swappable modules, passive backplane, redundant PSUs, automatic back-up switching and a user-configurable suite of audio, link, sync and PSU alarms.

Throw your terminal screwdriver in the trash can!
No Dip Switch settings here - configuration and control of the WorldNet Oslo is straight-forward and simple thanks to APT's powerful and intuitive Codec Management System (CMS). Offering extensive real-time management of multiple codec units, the CMS enables alarm monitoring, logging and performance monitoring as well as configurable user and audio profiles.



apt soundconnections

For more information, call APT on 800 955 APTX or 617-923-2260 www.aptx.com

World Radio History

USER REPORT

BluePack Plays the Field for WLOY

by John Devecka
Operations Manager
WLOY Loyola College Radio

BALTIMORE We've all heard what happens when field reporters use inferior gear. We know how bad a cellphone is for reporting live news, and how dictation recorders compress audio to something your grandparents can eat without their teeth. But, we need field reporting; it keeps us up to date, gets the news out to our listeners and makes us a powerful resource. Remember radio as a resource? Lots of people still do and they turn to us when something happens.

I had been interested in some new live reporting gear for a while but hadn't found the right tools. I first looked at the new JK Audio BluePack units as prototypes at the 2008 NAB Show. It appeared to meet many of the needs we have for students who do field reporting around campus and in town events.

John Devecka

Expansion unit

As WLOY has expanded its community presence and sports coverage, we have been seeking options for "on-the-fly" reporting. We already use the JK Audio RemoteMix Sport for basketball and lacrosse events, and have carried it to tournaments without failure. Each of our studios have JK Audio Innkeeper units for telephone interfaces as well, so my confidence in the product line is pretty high.

The BluePack is a combination of microphone preamp, headphone amp, mixer and Bluetooth wireless interface. The small metal case (less than 5 x 4 x 2 inches) includes a long belt clip for easy carrying and the case is slightly curved to make it more comfortable on a hip. Power comes from a 9 V battery that should last about 10 hours in the field. It has nice, large dials on the face for control of the microphone, auxiliary and headphone levels, and a clip indicator. LEDs also indicate Bluetooth and power status.

Connections include XLR for the microphone: 1/4 for the headphones, and 1/8 for the stereo line output and auxiliary send input jacks. The auxiliary send allows you to add an additional stereo audio device to the microphone-based interview (or field report) so you can carry along station IDs, music beds or additional audio materials prepared in advance. MP3 devices and iPods will make a great companion to this for field reporters.

JK Audio sent over a pre-production unit for us to test and we had great results. WLOY General Manager Tim McGee has some experience with all of the technology at the station and field recording so he was a natural to test the device. With an EV635A and some headphones we were ready to test the basics.

Tim uses a Nokia 5300 Xpress Music cellphone on Cingular, so we set it in Bluetooth pairing mode and pressed the blue button on the BluePack. His phone and the BluePack paired up almost immediately and we were ready to go. I had him call into the station production studio (via a JK Audio Innkeeper Ir unit) on his phone while the Bluetooth connection was hot and we got great audio immediately, dumping straight to ProTools for replay tests. We experienced a bit of handling noise with the EV635A so we switched to the better-damped RE50B, which eliminated the noise.

Obviously you can hear the difference between someone speaking into the microphone built into a cellphone and a professional handheld microphone, but it was considerably cleaner than we expected.

In outdoor operations, studio operations and even with the cellphone 30 feet away, the system performed without a hitch, never losing the Bluetooth pairing and only experiencing noise when we kept the phone on the other side of two 52 dB steel studio doors.

The only issue we noted was a high-pitched RF noise in the headphones from the Bluetooth antenna. According to the folks at JK Audio, this issue has been addressed with a new PCB that was not in my pre-production sample unit. It was not noticeable in the recordings of the audio so it appears to mainly affect the user experience.

Nearly identical results were achieved with a Motorola KRZR phone (Sprint service) as the test device. We made several calls to other people over the system with/without using the BluePack and EV combo; they all noted an audible improvement to the call with the BluePack.

The BluePack allows you to connect an audio recorder for both recording and playback, depending on your needs. If you are doing a live event from the field, an iPod with station IDs and music breaks can give you some breathing room easily. The auxiliary input has its own level control so you can even dial it in as a music bed.

Pack and play

We connected the output jack of the BluePack to a Marantz PMD620 (Thanks to Broadcasters General Store.) and did some quick field recordings. The output has great fidelity (it sends your microphone to the left channel and the Bluetooth input to the right), and we quickly made some airworthy interview clips. A reporter could sit in their car, dial up someone for an interview, record the interview and then play it back during their live report.

We have already made plans to include a BluePack in our sports reporting. It was easy for the students to understand the value of the unit and various applications for the station, especially on-campus field reports. One suggested using his EVDO phone to pull our Web stream and play it at in-town events instead of a radio. The BluePack runs 17 kHz on the Bluetooth headphone connection so we could really be on to a new application here.

For more information, contact JK Audio at (800) 552-8346 or visit www.jkaudio.com.

STL-IP

▶ Continued from page 34

(PCM uncompressed) audio or compressed audio using a variety of built-in algorithms, including MPEG Layer II, Layer III, J.41, ADPCM, G.722, AAC, AAC Low-Delay and HE-AAC v2.

We chose the AAC codec option to reduce bandwidth, without affecting quality. The IT guys who always scream "Don't clog my bandwidth" haven't said a word. I do not think they even noticed the traffic we created, although they were blown away that the STL-IP used professional versions of the same codec as their beloved iPod.

The system has been in place for seven months now and we haven't had a problem. It has lived through power failures, network outages (the audio automatically started in each case without intervention) and even the college user (this can be rougher then broadcast).

We used the AAC at 128 kbps. The audio quality was excellent; I do not think anyone could tell the difference between the compressed audio and the studio source.

We now use the AudioTX STL-IP not only to send the audio out, but also to receive audio back from the student center where there is a live stage. For future use we may even use the AudioTX STL-IP with unlicensed band radios to extend our backbone to buildings not on the network.

A variety of professional wireless IP network solutions are now available at low cost, and these can deliver reliable connections, together with the STL-IP, at ranges of more than 70 miles. Send audio from one location to up to six others using this system, or an unlimited number of other locations using multicast. The station hopes to create a network all over campus as budget permits.

I have tried many audio-over-IP units/STL technologies from the super-cheap to the mega-expensive telecom infrastructure components. All have worked, some of course better than others. But the AudioTX STL-IP gave us the robustness of the telecom infrastructure with the simplicity of a single-box solution.

It's also flexible, allowing us to send to multiple locations using any network available, including wireless if we choose. All we have to do is plug it in, set it up and turn it on; then listen to how well it works.

For larger projects, in addition to the stereo in/out STL-IP unit, the range also includes the STL-IP-8 and STL-IP-16 units, with up to 16 inputs and outputs in a single box. These can be used to distribute multiple channels between locations of course.

But, more interesting, they also can be used in a central, larger facility or hub/control room to send and receive different audio channels to and from multiple units in separate locations, like having multiple STL-IP units in one box; a multiplexer if you like thinking of it in the old vocabulary of such devices.

MDOUK/BE also offer STL-IP Connect software, designed for news/sports reporters and quick/flexible remotes. This software runs on a standard laptop or PC and connects back to one of the STL-IP units back at base, typically using the Internet, for reliable, fuss-free remotes that can get on air without worries about organizing connectivity in advance.

I wish I'd had this box for the Phish concert. I think I would have had more sleep that night.

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

World Radio History

WXPN

▶ Continued from page 35

technologies and delivery platforms. My team is in the process of designing an embedded flash media audio player for our Web site with StreamGuys that will allow the station to add a skin for branding purposes, and allow StreamGuys to rebroadcast native MP3 streams without the need for compression at the studio.

Billing is established to drop the heaviest usage time from the monthly invoice. This is referred to as the "95th percentile range," meaning activity levels with the highest 5 percent of listener traffic are not charged to the station. This is useful for our Friday afternoon concerts broadcast live from our in-house concert venue, World Café Live, when streaming traffic is at its highest on our Web site.

Streaming radio is ideal for stations with an audience outside of its terrestrial market. WXPN has listeners tuning in online from Europe and Japan, among other international countries and regions. StreamGuys allows us to reach our listeners around the world as opposed to only our local community. This is helpful to listeners of "World Café With David Dye" and many of our other programs popular outside our terrestrial coverage area.

StreamGuys is among the best companies I have worked with in my 15 years of IT experience, and I recommend it often to other radio stations. It provides us with reliable global streaming services to increase our listener base at a lower price point than many other content delivery networks.

For more information, contact StreamGuys at (877) 287-2938 or visit www.streamguys.com.

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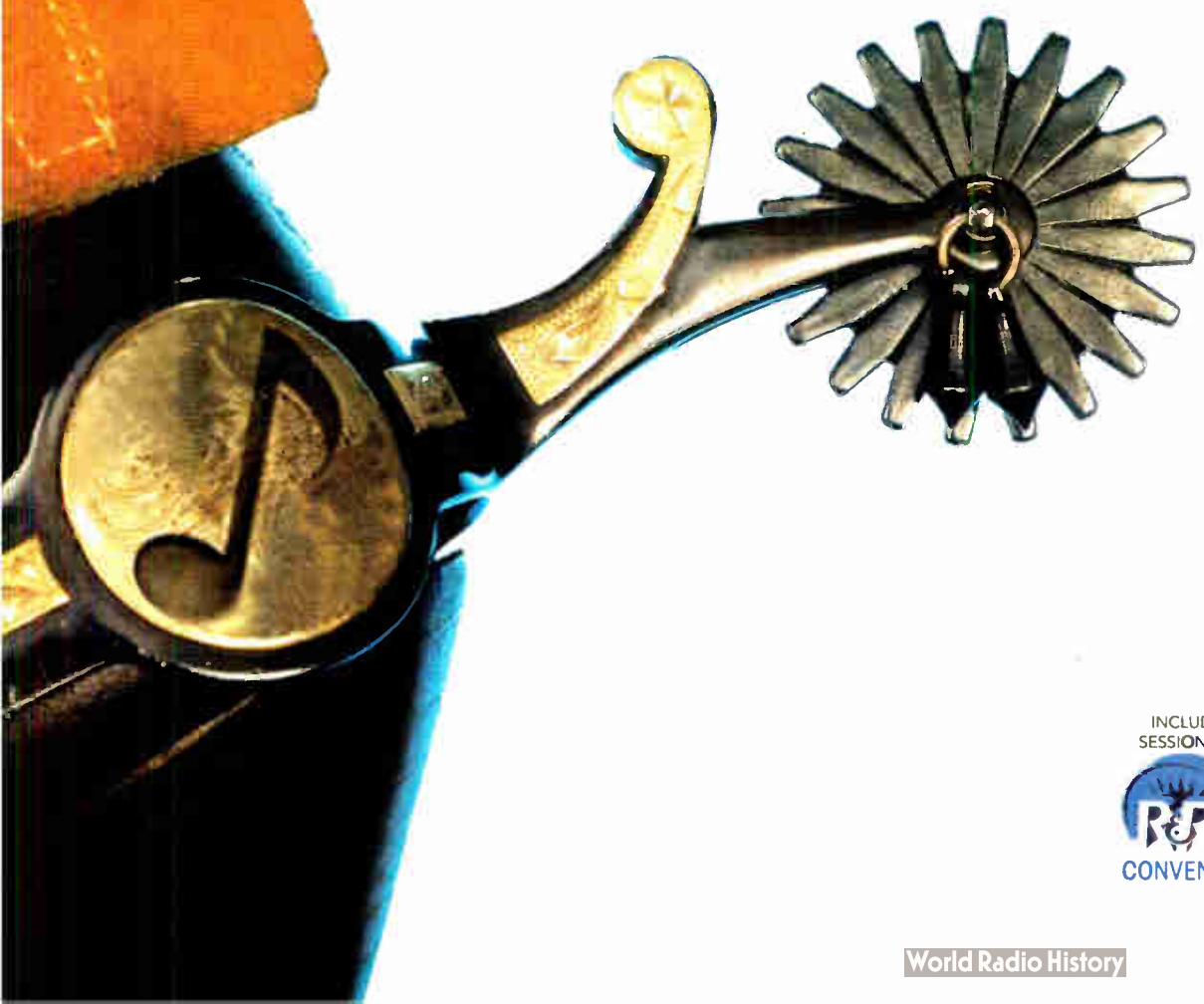

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World Radio History

USER REPORT

APT Keeps Regent on the Right Path

Broadcaster Uses WorldNet Oslo to Transport Audio for Five Stations Across Ohio River

by David Remund
Vice President, Engineering
Regent Communications

CINCINNATI Putting your program channels through a single STL path is a risky strategy. Backup and redundancy are critical factors in planning any professional broadcast network, and at Regent Communications we have been working hard to ensure we deliver the 24/7 reliability essential to the broadcast engineer.

Regent Communications owns and operates 62 stations (50 FM and 12 AM) clustered in 13 markets in Colorado, Illinois, Indiana, Kentucky, Louisiana, Michigan, Minnesota, New York and Texas. One of our current projects is moving our five stations in Evansville, Ind., to a new and expanded downtown studio.

At the new location, the potential STL shots are limited; there are buildings blocking the line-of-sight paths to most of our transmitter sites. As a result, we only have one viable RF path along which to send the program audio.

Here and there

We are sending stereo audio for five radio stations — WKDQ(FM), WDKS (FM), WJLT(FM), WGBF(FM) and WGBF(AM) — from the studio 6.5 miles across the Ohio River and into Kentucky to the WKDQ tower. From there, the program audio is relayed by conventional 950 MHz STL to the respective transmitter sites for the other stations.

We also send the audio from two RPU receivers from the WKDQ tower back to the studio for use by the five stations.

The failure of one path could take all five stations off the air. I wanted a backup plan to get the audio to the relay tower and return audio from our RPU receivers to the studio in the event that the RF STL path goes down.

This involved setting up a second route capable of transporting audio between the studio and the WKDQ tower site. The program audio needed to be professional broadcast-quality, the system had to be reliable and, as always, the overall cost to purchase the equipment and any recurring costs needed to be within budget.

We asked the local telco to provide a T1 circuit and started to source equipment to deploy on the link. The codecs I had been using, both in the Evansville market and others, were limited in the number of program channels they could transport so I had to research alternatives.

David Remund

I had come across the WorldNet Oslo from **APT** at last year's NAB convention. I was impressed with its flexibility of configuration, the number of channels and audio quality so when this project came along, it was the first codec that came to mind.

The modular audio multiplexer easily accommodates our five stereo programs, allows for a return path from each and also gives us room for expansion should we need to add more audio or data channels. We went for the T1 transport option but there also is the option for an IP transport card, which means we can be flexible in the deployment of it in our network should our current setup change.

Prior to deployment, we tested the WorldNet Oslo for audio quality and reliability and were impressed enough to push forward with the move. We started to roll the systems out through our network in May 2008, moving one station each weekend to the new studio location and completed the final one, WGBF(AM), on June 21.

Installation was virtually "plug-and-play" and, thankfully, there were no surprises from the system. As the move progressed, we ran into some trouble getting the main RF path up and running. From our pre-deployment tests and initial installation, we had gained a lot of confidence in the stability and operation of the WorldNet Oslo, so we made the decision to set aside the RF STL Link until we completed moving the studios and could go back to finishing work on the main STL path.

Thus, the initial move has been made using the WorldNet Oslo as our sole means of transporting program audio to the WKDQ site for relay to the other transmitter sites.

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

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USER REPORT

Sporty Eases 3G Transm

Singapore Systems Integrator Likes Its Compliance With EBU Standard N/ACIP

by Xavier Edward
Director
Daxco Digital Pte Ltd.

SINGAPORE In years past we have had great experiences with the Mayah Centauri II IP/ISDN gateway codecs, as well as with the Ganymed line, which have been deployed by public and private radio broadcasters in South-East Asia.

When we found out **Mayah** was bringing the Sporty reporter codec to the market we were immediately interested.

We never thought it would be so easy: Get the SIM card, plug the 3G card in the Sporty, set the PIN, APN and press Connect. That's it — we're on-air with superb quality.

Stable connection

The small and truly portable Sporty provides virtually the same power over contemporary networks and protocols and also eases wireless communication.

As a systems integrator, we like that it's compliant with the EBU audio-over-IP standard for higher compatibility, N/ACIP. We asked our partners, Mayah, to bring us one of its first units at Broadcast Asia. Clients we brought over to the Mayah booth were impressed with its operational modes and quality.

3G/UTMS coverage is quite good in Singapore so we were able to launch the tests and perform real-time audio transmission using speech and music.

First, we were not sure how stable the connection was, even though Sporty had displayed a full 3G signal strength on its status bar at the bottom of the screen. We started with 64 kbps MPEG-4 HE AACv2 and then proceeded further with MPEG-4 AAC 128 kbps, which provided a great quality at that bit rate.

World Radio History

USER REPORT

AEQ Earns Trust in Murcia

by Paco Marin Galindo
Technical Manager, Remotes
Onda Regional de Murcia

MURCIA, Spain At Onda Regional de Murcia Radio we have used AEQ's ISDN equipment for our remote broadcasts for many years.

We normally do at least 30 percent of our programming from outside locations each day. Now, a new piece of transmitting equipment has come into our possession. We put the Phoenix codec to the test as soon as it arrived.

What we like

We've had the Phoenix connected for days without a problem. It has held its connection with both stable lines and others that are less stable, and produced no functional or operating errors.

In the IP format, the audio quality is phenomenal. When conventional (POTS) telephone lines are used, the quality varies depending on the line but it is always better than the sound we can get with ISDN equipment in G.722.

The color LCD screen, accompanied by lots of direct access keys distributed over the surface of the codec, lets us to make adjustments quickly and display the status of the device.

Another thing we like is the little patch bay with internal mixer; it gives the Phoenix great flexibility when configuring inputs, outputs and monitoring for the equipment.

We also like the cover that protects the control surface against accidental dialing, which can cause a connection to be interrupted or alter the configuration of the equipment.

It has an internal connection bus we find important for future applications; an internal battery; and balanced XLR and TLS connectors, all on the front.

This type of transmission is subject to a delay longer than 50 milliseconds, and the Phoenix is prepared to have the right mix in the headsets (RX + TX) to enable its user to work comfortably.

The unit we tested had a module for POTS and another for IP. Soon Phoenix will have a module that will allow its users to operate it with mobile telephony, an indispensable feature in these mobile times.

An interesting option being considered by AEQ is a free, high-availability SIP server that the company would place at its customers' disposal when they used the module for communications over IP.

Talents Marta Ferrero and Carmen Maria Conesa use the Phoenix for a remote broadcast.

Real work

After having the codec for a couple of days, we decided to test it under real, working conditions. It didn't disappoint.

We tried it out in several scenarios. The first involved using communications over IP during a political event.

The Phoenix was connected to a switch with five more PCs that were connected to the Internet and transferring data to remote servers while sending and receiving electronic mail. The Phoenix and computer network traffic shared the channel over two 11-hour working days without a single hitch or broadcast interruption.

The Phoenix makes point-to-point connections over IP without using an intervening SIP server, and the process is as simple as making a phone call. The sound was broadcast at the top quality offered by the codec, and we were quite satisfied. This news event is probably our most important event of the year.

For the other test scenario, we used POTS and left a Phoenix unattended (there was no one present), and used its automatic off-hook feature to make a jump with a mobile unit receiver. The mobile unit transmitted and the audio from the receiver was injected into the Phoenix, which sent the audio via POTS to the main studios.

The codec did its job at all times with the highest quality offered by the line, and without any interruption or degradation in quality.

We think this codec is practical and necessary for any medium that requires sound communication with quality consistently similar or greater to the typical ISDN and G.722 broadcasts, but with the independence of being able to use communication systems already installed where we must work with a conventional telephone line.

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

ssions for Daxco

No glitches or interruptions were noticeable throughout the transmission. Pure RTP, as well as SIP-based connections, were established over the public Internet to Mayah Centauri II codecs in Germany. They were provided by a manufacturer and placed in a DMZ ("de-militarized zone"; usually an additional logical network in the company's IT-infrastructure, easily reachable from the outside).

Considering wireless access and the long route over the many different Internet routers, the audio delay was impressively low, around 300 ms from end-to-end.

However, as we tried to increase the bit rates to test a higher-quality transmission based on the older algorithms, like MPEG Layer II at 256 kbps, we heard a couple of glitches. These effects we eliminated by increasing the buffer size at the decoder end, which in turn increases the audio delay.

The more efficient coding algorithms, like HE AACv2 or AAC ELD (Enhanced Low Delay) provided in Sporty, can be fully recommended for wireless transmissions over the different Internet service providers.

Overall we were impressed by the ease of use and reliability of the reporter codec. It's exciting to have everything you can imagine in one box: rechargeable batteries working for long hours, 48 V phantom power for condenser microphones, choice of algorithms and communication interfaces. Mayah also added 3G to its IP and ISDN portfolio, plus the good old POTS interface.

Recording/playback from the SD card or USB stick also is available. During our transmissions we could mix in the pre-recorded material from an 8 GB SD Card. We also could log the entire audio flow: the microphones and the signals coming from the remote codec. Storage size limitations have come a long way; recordings can be made with no compromise in audio quality

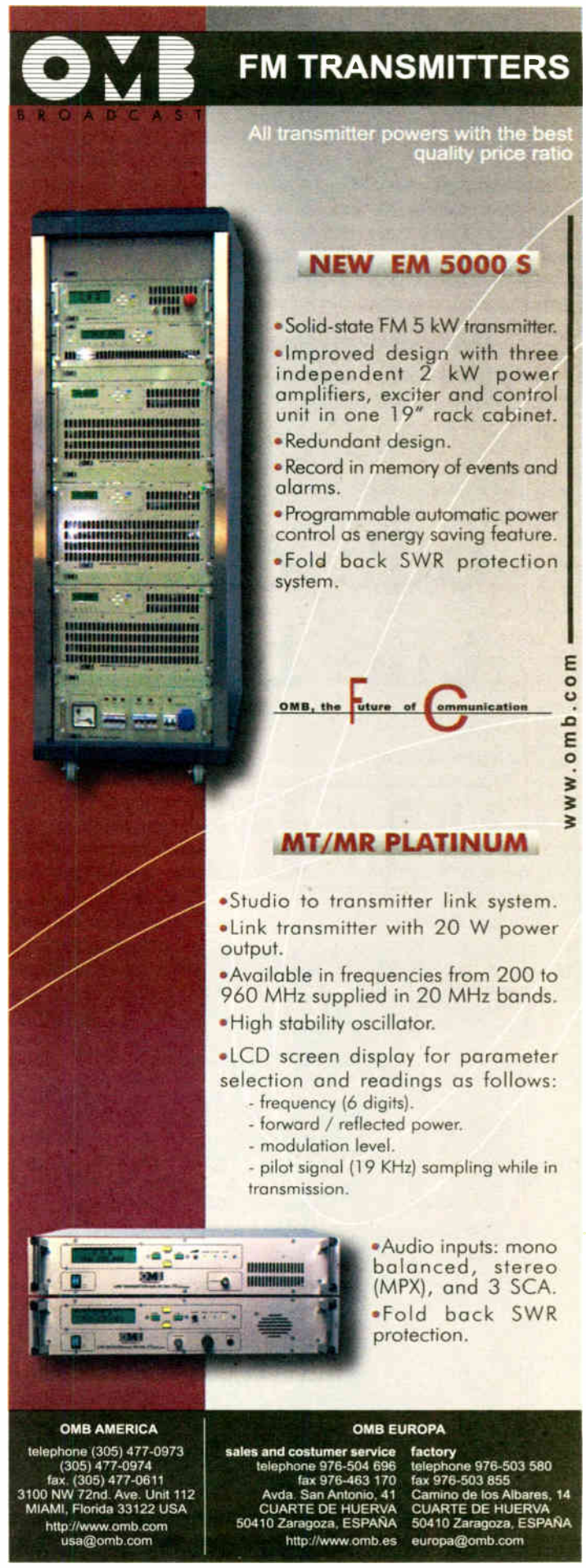
Another great feature: the mixer profiles. Recreate previously saved audio routing configurations, or combine them with codec and interface settings. This is useful for routine operations like visiting the same venues with the same access types and audio sources.

Once the connection was established, a system preset can be saved and re-used any time with audio levels from microphones, line input and storage media, as well as network configuration and the transmission algorithms.

Sporty's user interface and display make it suitable for indoor or outdoor situations. It is a versatile device for the modern-day reporter.

For more information, contact Mayah North American Business Development at (360) 618-1474 or visit www.mayah.com.

World Radio History



TECH UPDATE

NRK Uses Sonifex DHY-03 for Upgrades

The Norwegian Broadcasting Corp. (NRK) is a government-owned broadcaster, and has its headquarters in Oslo.

NRK consists of three TV channels, three major radio channels and several niche channels on radio, Internet, podcast and mobile phone. It has approximately 3,500 employees, 57 offices and is a founding member of the European Broadcasting Union.

Egil Eide, product manager of Siv Ing Benum A/S, the Norwegian Sonifex distributor, is a supplier to NRK Radio of **Sonifex** telephone hybrids, particularly the DHY-03 digital hybrid.

When asked why NRK uses Sonifex products, Eide told Sonifex, "They are always pleased with the performance of the DHY-03s and have found them to be of a good quality, reliable and easy to use."

NRK's radio expansion has been significant; in 2006 it launched three new digital radio stations. As old hybrids need replacing, they are replaced with Sonifex models, and as radio expansion occurs the organization buys more Sonifex hybrids.

The DHY-03 hybrid has several features that combine to offer a rejection ratio of between 75 and 80 dB. International settings and universal line compatibility allow a technical impedance match with the line regardless of location.

The unit has internal memory allowing echo cancellation to 127 msec, and distortion of other mixed signals is improved. Sonifex says 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. The DHY-03 recalls signals from its memory buffer.

The DHY-03's feature-set also includes input and output gain adjustment; input and output metering; conferencing; local/remote line hold switching; integrated auto-answer; automatic call disconnection; auto-ducking; DTMF tone recognition; a balanced mic/line input; and a balanced line output and serial control. Free control software is available on the Sonifex Web site.

For more information, contact Sonifex's U.S. distributor Independent Audio at (207) 773-2424 or visit www.sonifex.co.uk.

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World Radio History

USER REPORT

Comrex Hits the High Seas With Moby

'Moby in the Morning' Uses the Access Portable For Weeklong Broadcast from the Caribbean

by James Carney
Founder/Host
Moby in the Morning Radio Network

ROSWELL, Ga. On my driver's license it says James Carney but I've been called Moby for more than 40 years, and "Moby in the Morning" since 1982. I'm now a multi-decade veteran broadcasting personality — a kind way of saying "aging DJ."

Thank goodness for the engineers who have worked with me to keep me on the air. I have been blessed to have worked with great technical minds who made sure things always went as smoothly as possible for any broadcast I was on.

If something didn't work, I only knew it was broken and to call the engineers. I always got along with and highly respected those guys.

In July of 2004, after I was released (fired) from WKHX(FM) following an 11-1/2 year run, my wife and I made the decision to not move anymore. I told my wife that with the reputation I'd developed over the years and the current affordability of satellite time, we could build our own studio, establish an uplink and develop the Moby in the Morning Radio Network. It would be an independent venture in an arena where some mighty big players were at the table, but it was possible.

We've done very well in the four-year history of Moby Enterprises.

Cruise control

If the **Comrex** Access weren't so user friendly, there's no way I could have done my independent network show in the form of the "Moby Cruise," for an entire week during spring of this year, from the middle of the Caribbean Ocean on the cruise ship Millennium with 50 winners/listeners on board, without a staff engineer on site.

My contract engineer, Charlie Nettleman, (who pretty much built WKHX and my network studio), set up the rack-mount end for me. I waved goodbye with the portable end of the Access in my hand.

The good folks on the ship provided a data port plus a 110 V outlet, and all of the sudden we were on the air in the middle of the ocean sounding as if we were in my studio. The signal was immaculate.

Plug it in, hit connect and, "Hello radio cousins. We're on the Moby Cruise, and it's a shame you're not here with us." It's as easy as that.

On the ship, we were using the Access Portable (configured to receive a dynamic IP address) with the optional mixer, which features a total of six mic inputs and headphone outputs, which were more than enough ins and outs to cover everyone that needed to be on mic.

Our on-board data connection was a dedicated 128 kbps (UL/DL) Internet connection via C band VSAT provided by MTN Satellite Services, a division of SeaMobile, utilizing Intelsat 707. The Access used Comrex's BRIC-HQ1 dual mono algorithm (56 kbps) for receiving separate mix-minus and talkback feeds from the studio. We used BRIC-HQ2 12 k Mono (24 kbps) for sending audio from ship back to studio for the live broadcast.

Back in the Moby in the Morning Studios we had the Access rack-mount configured with a static IP address. Our studio data connection was a dedicated T1 provided by Broadriver Communications with a 1.5 MB UL/DL speed. The average roundtrip for the broadcast was about 1.35 seconds, which was not too bad considering the 600 ms per side satellite delay.

Moby's wife, Mary Beth, looks on as Moby interviews the director of the ship's on-board computer center with the Access Portable.

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

USER REPORT

Network Expansion, One Barix at a Time

Wallace Radio Syndication Builds Sports Network Site by Site on Instreamer/Exstreamer

by Matt Wallace
Owner
Wallace Radio Syndication

WEST ST. PAUL, Minn. Wallace Radio Syndication began building out its radio network several years ago with the goal of delivering high school sports programming to radio stations throughout Minnesota. The early objective was to provide a single program with scores and stories relevant to specific regions, yet enjoyable to listeners across the state.

The 10-station operation, then part of the Minnesota Sports Radio Network (MSRN), initially distributed the one-hour program via satellite. This had proven costly and not worth the expense given the program's 10–11 p.m. time slot.

After two years of high-latency Web distribution — during which we added several new shows including a live football program — we discovered **Barix** and its Instreamer/Exstreamer solution for studio-to-studio distribution over IP.

Growing stations

The introduction to Barix audio over IP technology further changed my approach. I broke away from the Minnesota Sports Radio Network in favor of a new endeavor: building out radio networks for third parties (including MSRN).

Today, Wallace Radio Syndication delivers live and recorded games, news and sports programs to more than 35 radio stations in Minnesota, North Dakota, South Dakota, Iowa and Arizona. The network continues to grow, with plans to add more stations in Iowa soon. The Barix units are priced so low at $195 apiece that I deliver the devices to new stations in the network at no cost.

Adding a station to the network is as simple as installing a Barix Exstreamer 100 audio decoder. Each Exstreamer device is assigned a dedicated IP address that communicates over a server network architecture built and managed by StreamGuys, a content delivery network that distributes the content between our studio headquarters in West St. Paul and the three dozen stations that receive the content.

The end-to-end workflow begins at the origination point in Minnesota or out of state, such as a high school football stadium game or a remote studio. The external source is delivered point-to-point from an Instreamer audio encoder to an Exstreamer 100 decoder at the St. Paul studio. The Instreamer-to-Exstreamer connection on the first mile is transported at 160 kbps of MPEG-2 compressed audio to maintain pristine quality from the origination point.

Matt Wallace

Once decoded at St. Paul, the signals are mixed using a TASCAM board, which mixes two programs simultaneously. The signals are sent out of the TASCAM and directly into another Instreamer 100 for encoding.

Once encoded, the signal is transported to the destination studio(s) over the StreamGuys network, also taking advantage of the BRTP (Barix Real-Time Protocol) solution from both companies to ensure low latency of the live signals. The low-latency feature maintains low delay of the live feed for an up-to-the-minute listening experience.

Each of the remote studios has an Exstreamer 100 to receive and decode the program signals sent over the IP distribution network, along with tone decoders to trigger advertisements, station identification and to signal start and end times for each feed, allowing the stations to be 100 percent automated and unmanned.

Outstanding audio quality is maintained throughout the transport architecture, using MPEG-2 compression at slightly lower bit rates for the purpose of managing bandwidth in the streaming architecture.

The network stations have appreciated the low-maintenance aspects of the Barix Exstreamers. Each device is assigned an IP address and programmed with BRTP to communicate with the StreamGuys network for low-latency delivery. The device is then mailed to the station, where an engineer or board operator connects it to an Ethernet cable. Once connected, audio begins coming through immediately.

The Exstreamer's main purpose is to deliver audio, and it does the job well and with great efficiency.

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

World Radio History

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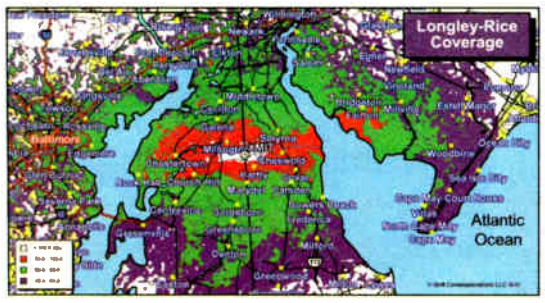

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NEW APPLICANTS

NUUF: Redefining 'Religious Station'

Hoping to Encourage a 'National Chorus of Progressive Voices,' It Applies for License

by Mike Janssen

This text was part of a series from the Future of Music Coalition profiling groups that applied for non-commercial FM radio licenses. It is reprinted with permission.

The next radio station to sign on in Norman, Okla., might be operated by a religious group, much like the majority of the stations already serving the market.

But this one would sound like few other religious stations. In fact, it would be devotedly secular — which is exactly the point.

"We're getting pretty darn tired of listening to all the religious programming here in Oklahoma," said Mary Francis, a retired teacher of reading and former public radio commentator.

Seeking to counter central Oklahoma's conservative culture and right-wing Christian broadcasters, the passionate activist recently took up a new cause. She's now leading the charge to start a progressive FM radio station under the auspices of the Norman Unitarian Universalist Fellowship.

Unitarians call their faith a religion, but their congregations often welcome atheists, agnostics and pagans as readily as Christians and Jews.

Likewise, NUUF's radio station would set up a big tent, airing diverse musical genres, connecting Norman's social service organizations, and covering local issues that would otherwise get little coverage.

For example, Francis said, the station could promote groups that address the needs of children, homeless people and African-American men returning to free life after serving prison sentences. And it could focus on topics such as Norman's storm-water problems and rural farmers upset about federal livestock standards.

The station also would air Amy Goodman's "Democracy Now!" and other left-leaning fare. City residents can listen to a local NPR affiliate, but the station does not air progressive programming such as Goodman's show.

A dash of flavor

Francis, a feisty 65-year-old, talks and writes with enthusiasm about her drive to spice up the airwaves.

She learned about the opportunity to apply for a station from a fellow Unitarian who serves on the board of the Pacifica Foundation, a progressive radio network that produces programming and operates five FM stations around the country.

With help from Pacifica and its partners in the Radio for People coalition (which included FMC), Francis raised funds, found legal and technical aid and prepared NUUF's application.

"When I started this, I knew absolutely nothing about radio or applying for an FCC license," she said, laughing. "This has been the steepest learning curve of my life, I guarantee you."

Francis and her fellow would-be broadcasters have been cheered to find enthusiastic support from their Norman neighbors. The NUUF has raised more than $5,000 from 275 contributors, many of whom are not Unitarians, Francis said.

The group also has applied to the national Unitarian organizing body for an additional $5,000. Meanwhile, other supporters have promised loans to cover $100,000 in station construction costs.

If the station's application for an FCC permit is granted, NUUF would ask for additional funding from the Corporation for Public Broadcasting and from the Public Telecommunications Facilities Program, which assists public broadcasters with technical costs. And Pacifica has offered Francis's group a year of free programming, "so we are darn well going to take advantage of that," she said.

Photo courtesy of iStock

Eager to stand out among the majority, NUUF envisions a station that promotes left-leaning fare such as civil and rural concerns, and welcomes all spiritual congregations.

Like many other applicants, Francis must wait to learn whether her application will prevail because of potential conflicts with the signals of other would-be broadcasters.

She is confident, however, that the FCC will decide on her request within a year. NUUF's application conflicts with only two other broadcasters, and Francis believes its status as a local non-profit will give it an edge. Until then, the group will begin to publicize its efforts via podcasts and Web streams.

These may be NUUF's first steps toward spawning what Francis envisions as a growing national chorus of progressive voices. The movement could start by uniting Unitarian congregations, but grow to encompass other progressives as well, Francis said.

A city in the Bible Belt's buckle might seem like an odd place for such a movement to find a foothold, but that seems to make the matter all the more urgent to Francis.

"I think that the whole nation will go through a major change come November," she said. "And I think Oklahoma will see a major change as well."

Mike Janssen is a freelance writer and contributor to the Future of Music Coalition.

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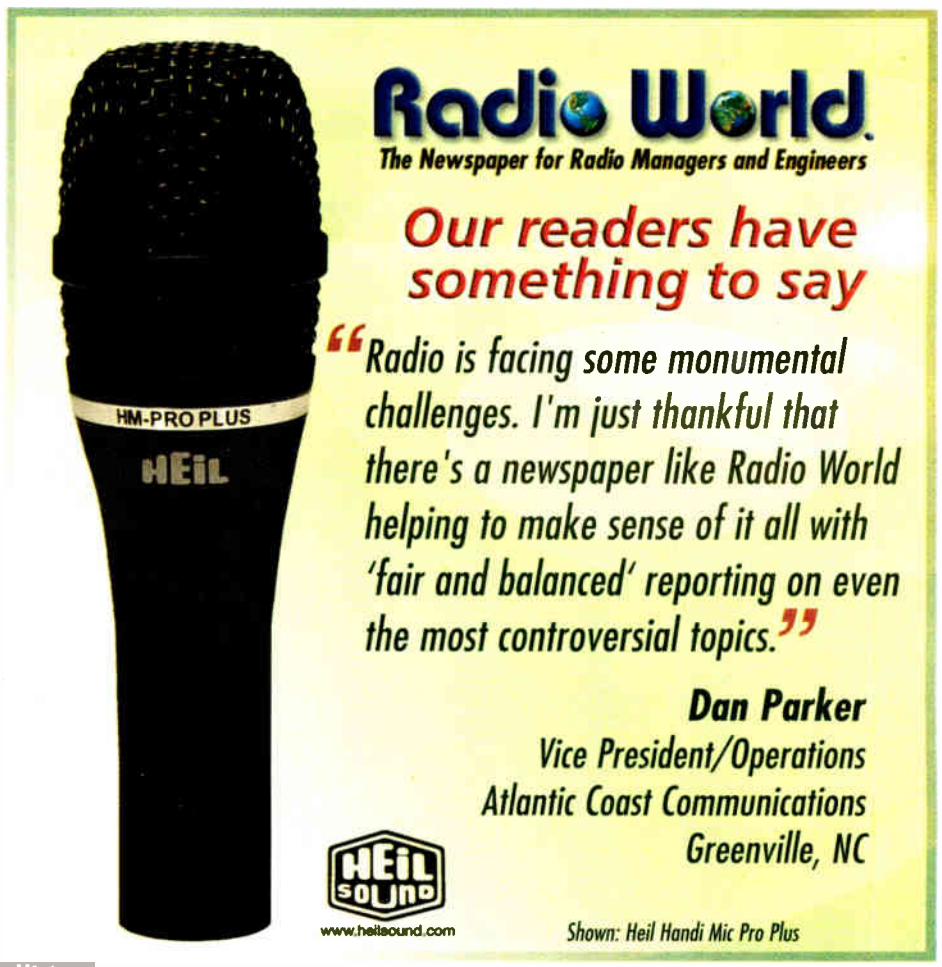

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NewBay Media

When Do We Stop Calling It New Media?

Rebrand Radio as Just One Delivery Platform Within a Media Provider's Market Presence

The headline above asks a valid question as we move into the second quarter century of digital media's existence. For a growing percentage of today's radio audience, digital media is not new and never has been.

If you define the start of the digital media era with the CD, which moved into the mainstream in the mid-to-late 1980s, then anyone up to legal drinking age doesn't really think of that format as replacing anything. It's certainly not new to them, now or ever — especially when you consider that for most people, their first exposure to playing recorded music for themselves, and thus the awareness of a "format," started around age 5 or later (you do the math).

For these Millennials, the CD is the music distribution method of their youth; now, almost nostalgically, that format is itself being eclipsed by online distribution.

If instead you set the new media boundary at the start of the Internet's mainstream popularity, the era begins in the mid-1990s, or perhaps a bit later if you particularly focus on audio/video media on the Web.

This means that the truest of digital natives are just moving into the rated audience demographics (12+) zone. For them, "new media" hasn't been invented yet; it's just "media."

Meanwhile, radio to these audiences has always been there and has stayed about the same all along. So while digital media may not seem in any way *new* to these younger cohorts, they certainly perceive radio (and anything else from the analog era) as truly "*old* media."

They look at radio from the other direction, not with the excitement of digital-immigrant Boomers over the promise of transition, but with a kind of pity reserved for aging relics that have outlived their relevance.

This labeling goes well beyond semantics. In the media world, perception can have strong market impact, often stronger than the force of empirical analyses.

That's why it has become so important for radio to shift such perceptions now before these new generations of consumers hit their stride as the prime audiences of tomorrow.

So forget the "new media" terminology, unless you want to sound quaintly obsolete. It's like calling a car "the horseless carriage" to these younger audiences. And if unchecked, this problem will only worsen with time.

Perception is power. It's time to rebrand broadcast radio as but a single delivery platform within a media provider's market presence — and one that's fast becoming a legacy component, at that.

If current perceptions of these younger audiences toward radio service can be altered, this could be considered in retrospect as the industry's most important digital transition.

— Radio World

◆READER'S FORUM◆

'If It Doesn't Run on Windows, Who Cares?'

Paul, I liked your "death of broadcast engineers" editorial ("A Person Cries for Work That Is Real," May 21).

Your mystery engineer brings up an issue that is not exclusively limited to SBE members. The IEEE is acutely aware of the same drop-off of incoming engineering majors. Even the AIChemE, the American Institute of Chemical Engineers, bemoans the same lack of incoming chemistry majors.

The social perception is that scientists and engineers are the people who have caused and are continuing to cause the maladies that afflict our world.

As a PR "fix," DuPont once changed its slogan to "better things for better living," deleting the famous last two words, "through chemistry." One of central New Jersey's oldest and largest industries, National Lead, located along the N.J. Turnpike, changed its name to simply "NL" to hide the lead affiliation.

Another contributor is the reputation for engineers of all types to be laid off all the time. Leslie Berlin's book "The Man Behind the Microchip: Robert Noyce and the Invention of Silicon Valley," which I reviewed for the IEEE, describes this employment fragility in gory detail. Lately, there have been several books published that identify and describe the not-so-recent trend of Americans to worship stupidity.

An excellent book for engineers to read is Richard Sennett's "The Craftsman." It fits in very nicely with Marge Piercy's poem you cited (which is nice if you read its entirety).

My definition of "professional" includes not only being a subject matter expert and a bearer of high ethical standards, but also the obligation to teach and mentor. I have taught photography (privately) since the '70s. And as an engineer, I am always as ready to offer as well as receive instruction and more light.

Even in this competitive, backstabbing world, this much remains true: A candle does not lose its brilliance when it lights another candle.

As an engineer, I am always ready to offer as well as receive instruction and more light. A candle does not lose its brilliance when it lights another candle.

I wouldn't know a fraction of what I do about radio and TV broadcasting if it weren't for the Socratic Method. My mentors are the Ron Simpsons, Larry Wills, Ed Kushners and Rich Archuts of the world. Their zeal for their craft is infectious and that, too, has to be passed along.

If Maslow's scale of self-actualization is true (and I believe it is), I would say I am pleased and gratified by what I've learned to do with my hands and brain cells. However, you can't pay the bills with the personal satisfaction. The Ancients (who were usually self-employed) were paid handsomely for what they did or made. The rest of us who are salaried have to rely on what others think we're worth.

One of the reasons I'm actively seeking to leave state government is because I am not being properly compensated. I'm straddling the world of becoming a self-employed consultant or going to work for a consulting consortium.

To get an idea of what an engineer should make, I went to the IEEE Web site and used the salary calculator. Any member can do this. I was shocked to learn how much an engineer with my background and experience and length of service makes in the mid-Atlantic region in 2007 figures. I am really getting screwed working for state government.

As a quasi-outsider in the broadcast business, I think I know why your Mystery Engineer is unhappy. Working for a greedy, cutthroat employer hardly provides an environment for self-satisfaction.

It's no wonder that would-be engineers are turned off when they read the trades or hear first-hand stories of how poorly some broadcast engineers get treated or paid.

And engineering schools hardly prepare its engineering students for the real world of high-power, high-current, "big iron" equipment. If it doesn't run on Windows and can't fit on an iPod, who cares? Schools just don't teach this stuff. Vacuum tube finals and filament transformers? Ha! And hand wiring and lacing? Forget about it.

You can kiss troubleshooting a telco remote line goodbye. Even most Verizon techs don't know how to do that.

Ron Simpson once told me that a Bell of Pennsylvania "technician" came to WCHR one day and was unable to identify the Western Electric passive equalizers on the wall.

Like the obscene profits and increasing gas prices, I don't think Mystery Engineer's problems are going to go away any time soon.

Robert Schroeder
President
Adro!t Scientific Consulting
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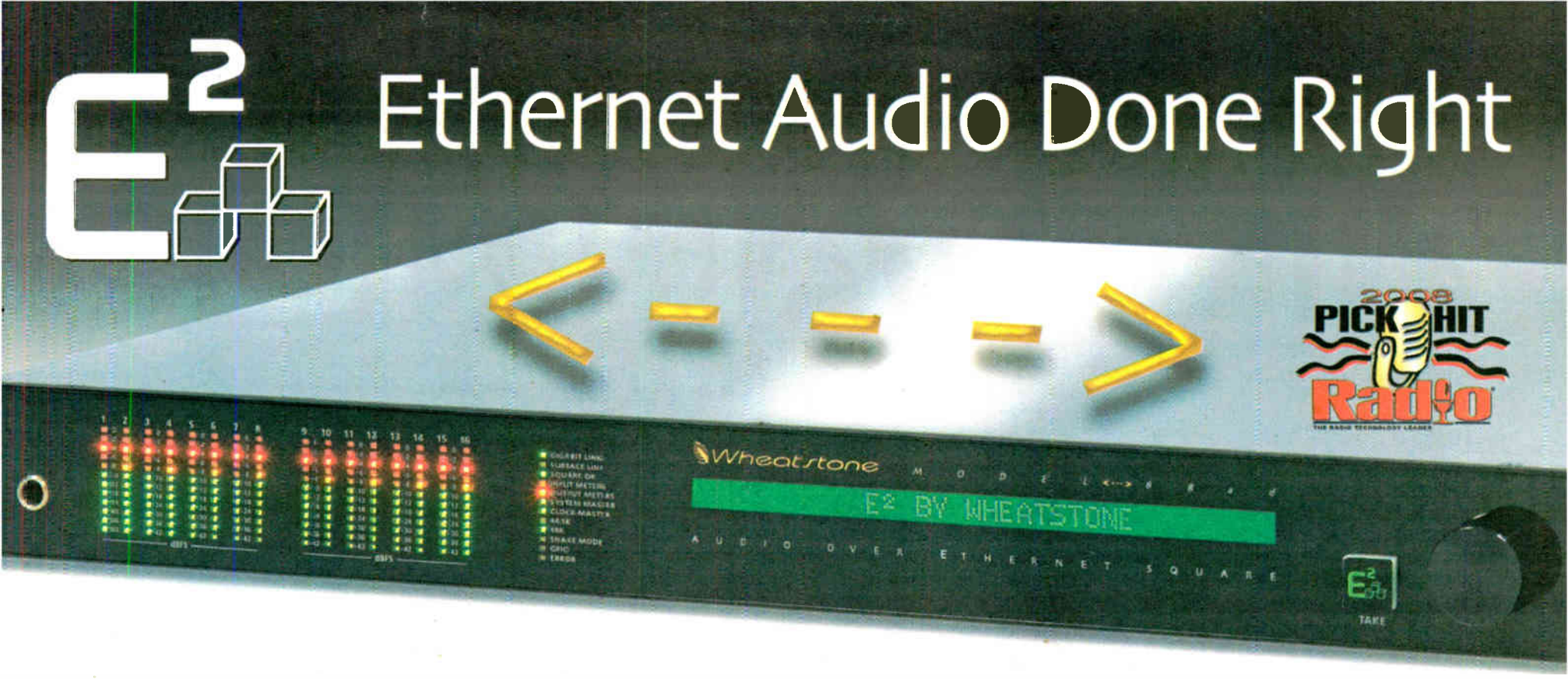
World Radio History

E² Ethernet Audio Done Right



MEET THE SQUARE

The Wheatstone E² (E SQUARE) gives you the convenience of Ethernet audio without all the IP hassle. It just *knows*. The built-in Setup Wizard lets you configure an entire system with just your browser and a laptop. Unplug it when you're done and there's no PC between you and system reliability.

SQUAREs are totally scalable: use one as a standalone 8x8 studio or transmitter site router, with browser access from anywhere. Plug two together and have a standalone digital snake. Add a fanfree mix engine and build yourself a studio using analog and digital I/O SQUAREs.

All the power is *in* the SQUARE. Distributed intelligence replicates all configuration data to every unit. Profanity delay and silence detection are done *in* the SQUARE. Even virtual mixing (w/automation protocol) —it's *in* there; all with real front panel meters, 32 character status indicators and SNMP capability.

88E DIGITAL ENGINE: Just plug an E-SERIES control surface or GLASS E computer interface into this engine and get all the mixes, mic and signal processing you need. Fanfree, so it can stay in the studio where it belongs.

Because the E² system doesn't rely on a third party GUI, tech support is straightforward (and 24/7). Likewise, system operation doesn't require external PCs for continued full functionality. Best of all, 1 Gigabit protocol eliminates the latency and channel capacity restrictions associated with older technology.

E-SQUARE is Ethernet audio done RIGHT!

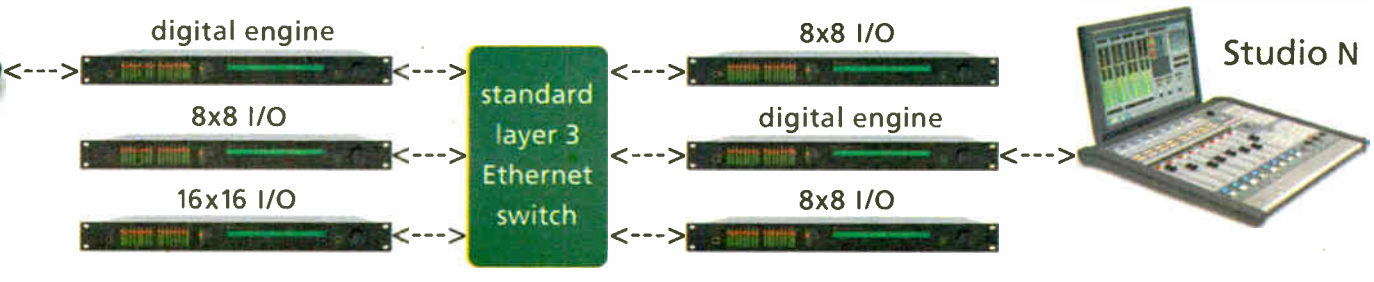
88D I/O: 8 digital inputs and outputs. You can headphone monitor and meter any of the SQUARE's inputs or outputs in real time. The 32 character display gives you all the information you need about your audio and system configuration. And because you can operate in either 8-channel stereo or 16-channel mono mode, 16 channels of metering are provided.

88A I/O: 8 analog inputs and outputs. You can bring a new SQUARE up in seconds and of course use the front panel encoder for your X-Y control. Front panel status LEDs give you continuous link, status, and bit rate information as well as confirmation of any GPIO activation.

88AD I/O: 4 analog plus 4 digital inputs and outputs—perfect for small studios or standalone routing.

88 I/O CONNECTIONS: E² has both DB-25s for punchblock interface and RJ-45s for point-to-point interface. All SQUAREs have 12 individually configurable opto-isolated logic ports that can be either inputs or outputs.

STUDIOS DONE EASY!



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