MULTICASTING

A Special Report from Radio World Newspaper

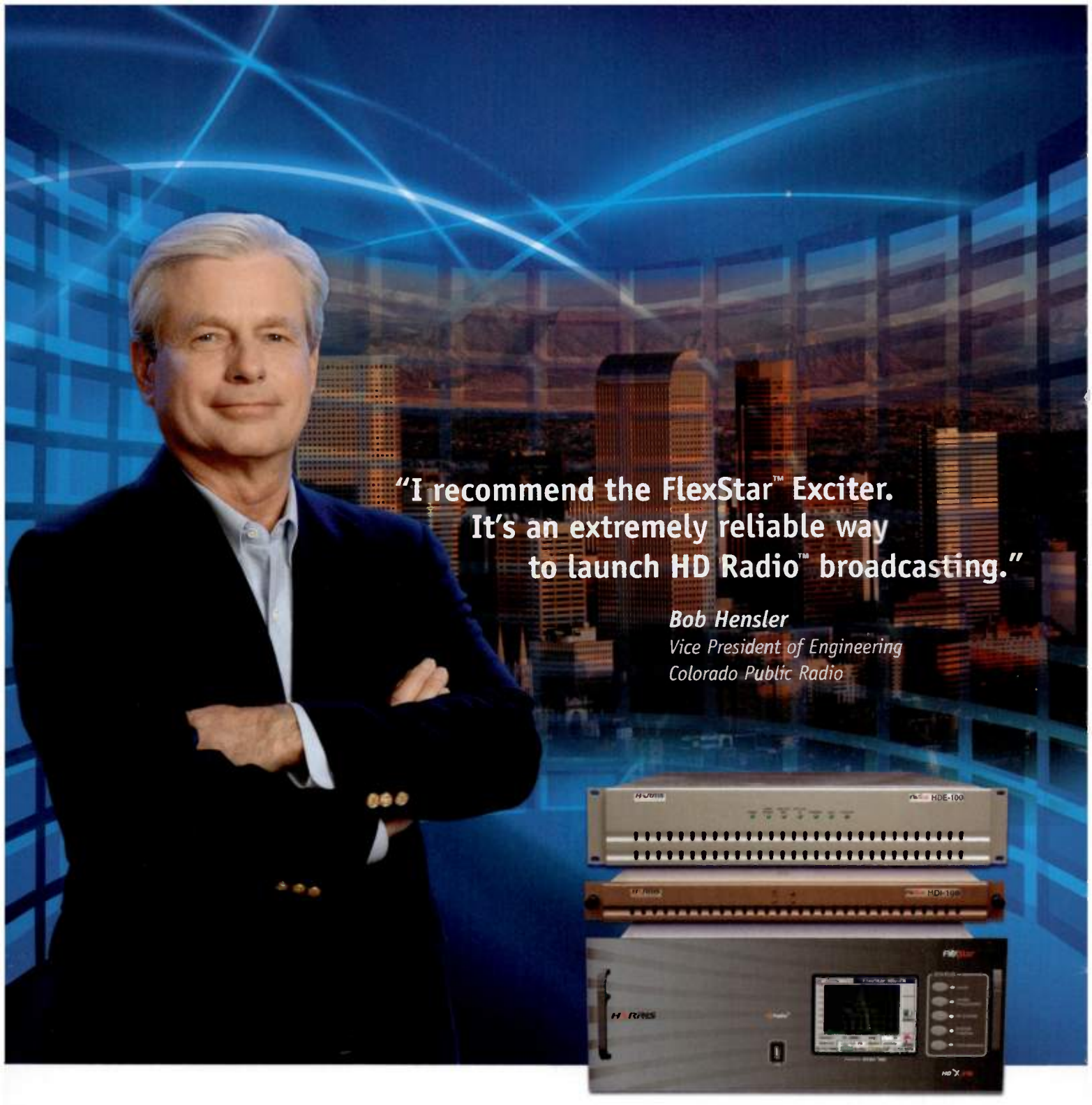
On The Inside

HD Radio Expands the Dial — Will Listeners Follow?

Ferrara and the Alliance

Multicasting in Los Angeles

A Supplement to Radio World Newspaper • March 15, 2006



FlexStar™ HDI-100 Importer HDE-100 Exporter HDX-FM/HD Exciter **Managing Content. Delivering Results.**

Real Time Spectral Display
This exclusive Harris feature provides easy verification of FCC mask compliance.

"We've found Harris' new Exciter, along with the Importer and Exporter, to be very flexible and reliable. There are more inputs on this Exciter than any other brand, allowing flexibility and minimal downtime. Plus, Harris is the first to include iBiquity's Exgine Architecture which gives us a simplified, more reliable installation. With the help of Harris, we now provide more streams and channels to the Denver population without adding transmission sites. I recommend the Harris FlexStar family to other radio groups. It's as easy as new technology can be to operate and helps us accomplish our goals."

HARRIS®

*assured**communications***™

Broadcast • Microwave • RF • Government Systems **www.harris.com**

For information call: 800-622-0022

HD Radio is a trademark of iBiquity Digital Corporation 2006.

Ferrara Talks the HD-R Talk

Peter Ferrara is head of the HD Digital Radio Alliance. The group of station owners wants to convey that broadcasters and manufacturers are behind the new technology and ready to promote it. Members have committed more than $200 million, mostly in 2006 radio ad time, towards the promotional effort.

Radio World News Editor/Washington Bureau Chief Leslie Stimson spoke with Ferrara.

***RW:** How soon might we see an HD Radio in a domestic vehicle?*

Ferrara: Certainly that's what we want to see happen, but … it takes time to bring those to market across a broad vehicle segment. I think you're going to see more things in some of the luxury automobiles and stuff like that.

The good news is we're pretty far along with a number of the automakers and I think you'll be seeing some more coming online shortly.

***RW:** The automotive industry is one of the largest advertising categories for radio.*

Ferrara: Automakers know that advertising on the radio can sell cars, lots of cars. By putting HD Radios in cars and then knowing that we are going to be promoting HD Radio in cars, and knowing that we are going to be promoting *them*, it's tremendous currency and incentive for them to become part of that momentum while this is going on.

Peter Ferrara

> *'The alliance has this amazing footprint by which to talk to the consumers who are currently using our products and services, to sell them on the next generation of technology.'*

***RW:** Who are the alliance members?*

Ferrara: There are 12: Greater Media, CBS, Clear Channel, Entercom, Susquehanna, Beasley Broadcast Group, Emmis Communications, Bonneville International, Citadel Broadcasting, Cumulus, ABC Radio in Los Angeles and Minneapolis, and WBEB(FM), Jerry Lee's station in Philadelphia.

***RW:** You've said members are looking at HD Radio with a long-term lens.*

Ferrara: People who are focusing in on, "Well, you're doing this HD2 format and somebody else is doing that HD2 format" are missing the whole point.

We want to give the consumer this amazing value proposition, that says not only is HD Radio great because it sounds better, but, what we really want to say is, "Isn't HD Radio great because I have all of these new choices, and all of these new choices are really cool stuff that I want to hear."

***RW:** Is HD2 really offering new choices?*

Ferrara: The whole point of having the alliance, relative to that part of it, is to act as a facilitator on the HD2 format selections to assure the best possible consumer listening experience in each local market. Each one of these is locally driven.

Again, it's all about the consumer. We want them to see this new content is unique, diverse and not duplicative. If we just simply offer more of the same, I doubt anybody's going to rush out and buy a new HD Radio.

***RW:** One of the reasons the alliance was created was to show the consumer electronics manufacturers that terrestrial radio is serious about going HD. Are you having an effect?*

Ferrara: Not only show it's serious but putting our money where our mouth is by advertising it and promoting it and giving them the opportunity to share in that currency.

Boston Acoustics … dropped their price $200 on one radio, which is a 40 percent price drop. I call that pretty successful. …

***RW:** The alliance is crafting a deal with Crutchfield to carry seven HD Radios.*

Ferrara: It means a couple of things. It's "carry them all." It's pricing favorably for the consumer. But really, what's important right now, and what Crutchfield brings to the table, (is that) they have some amazing salespeople on the phone.

What we want to do is utilize them as sort of the consumer sounding-board expert. When somebody says, "I want to know more about it from a technical standpoint," or "I want to understand how do I get this in my car?" that we make Crutchfield the go-to place. …

***RW:** You have a new Web site for consumers. Will stations say on-air, "Go to HDRadio.com and they'll tell you how to hook up your radio?"*

Ferrara: Yes. On that site, for the first time, is the complete listing of the first 28 markets and all 264 stations and formats in one place.

***RW:** Some stations have told me they're waiting to promote their HD2 channels until there are more radios in the market.*

Ferrara: Those who are "waiting," if you had asked that previously of alliance members, were probably waiting until we had initiated the launch on the first 28 markets, because we had agreed we would do that as a coordinated effort.

Having said that, you're about to hear a major on-air (campaign) for HD Radio among those member companies in those 28 markets. All I can tell you is that it will be historic in terms of proportion and market penetration.

***RW:** Are you thinking of national TV ads?*

Ferrara: No. … You always want to attempt to talk to your prospect in the best possible environment at the right possible moment closest to the point of purchase or point of decision. What could be better than selling HD Radio *on* the radio to people who are *listening* to the radio? It just doesn't get any better than that.

If you do a bunch of television advertising, it's great, I'm not saying people wouldn't see it and it would be good exposure and all of that;

See Ferrara, pg 8

About This Supplement

Multicasting, as U.S. radio broadcasters use the term, is the creation of additional audio program channels using the new delivery capacity created by HD Radio. This is what has allowed stations to begin adding HD2 channels and new formats.

Here, Radio World newspaper explores what multicasting means for radio managers and programmers. Leslie Stimson talks to the head of the new HD Digital Radio Alliance, Peter Ferrara; Jeff Borden visits with the head programmer at a multicast cluster in Los Angeles; and Skip Pizzi provides an overview of how we got here and what might come next.

Now All They Need Are Listeners

The Clear Channel Cluster in Los Angeles Sees Niche for Classics, Disco, 'KIIS En Español'

by Jeff Borden

It's hurry-up-and-wait for John Ivey, vice president of programming for Clear Channel Radio in Los Angeles.

His stations are embracing HD Radio and multicasting by launching variations on existing formats, a move he sees as a logical brand extension — even if the vast majority of audience is listening to the new second-channel programming on their computers at present.

"The goal right now is to build awareness and build interest," Ivey said. "There are almost no receivers. There are no measurable listeners. But we're streaming the stations on our Web sites to encourage our listeners to buy" — this is, to buy receivers capable of receiving the signals.

"It's kind of the cart before the horse."

BRAND EXTENSION

As owners confront the new landscape offered by multicasting, they can follow more than one programming path.

In markets with fewer signals, the temptation might be to launch entirely new formats. But in Los Angeles, with more than 60 measurable signals and the fattest advertising revenues in the country, the emerging strategy at one major cluster, at least, is to tweak existing formats gently rather than pursue more radical departures.

"It's very difficult to attract both men and women, so you pick a target," Ivey said. "Some stations in some markets are doing different things, maybe filling the holes of formats that are not available. We decided to use this as a brand extension. This was the direction we were moving in from the beginning."

The decision on an ancillary format for adult contemporary KBIG(FM) evolved in a similar manner. A typical mix on the station includes everything from Maroon 5 to Marvin Gaye to Grandmaster Flash & the Furious Five, leading Clear Channel to program the multicast signal as Studio 104, a disco outlet.

The name of the HD format echoes the famous New York City dance club, Studio 54, which was the epicenter of the disco lifestyle. The format is laden with the bass heavy beats of classic disco from the likes of Donna Summer and the Bee Gees.

> *We decided to use this as a brand extension. This was the direction we were moving in from the beginning.*
>
> *— John Ivey*

Most of Clear Channel's holdings in Los Angeles skew heavily female, with its KIIS(FM) the highest-rated in women 18–49. Ivey said it would make little sense to use digital signals to chase male listeners.

The result? At KIIS, a contemporary hit powerhouse, the multicast HD signal is Kiss en Español. The music is similar to the FM mainstay, but with more of a Latin flavor, while bumpers and promotional announcements are delivered in Spanish. The hope is the format will attract more Hispanic women as the Latino population in the metropolitan area continues to grow.

The HD signals are programmed by staffers at the stations; there are no live voices on the new channels, which are automated. The station IDs and other notices are prerecorded and dropped into the musical mix.

So far, employees who are doing double-duty aren't grousing about additional work, Ivey said, though he admits the process of creating and launching the formats has consumed the staff for the past six to eight months.

"I think everybody is pretty excited about this," he said. "They believe in giving listeners what they want, and they see that Clear Channel is a leader in new technology.

"We're all a bunch of radio geeks. When

continues on pg 6

Omnia Multicast

Omnia Multicast is engineered for the challenges of reduced bit-rate.

Multicast has introduced the ability to broadcast multiple content streams within the 96 kbps HD Radio channel. Multicast requires lower bit-rate audio coding. A broadcaster can choose the bit rate for each content channel. It is possible that extremely low bit-rate audio channels will exist, and those will require audio processing capable of consistent sound quality that yields low, or no sonic artifacts.

Omnia Multicast is a processor designed for coded audio, especially low bit-rate signals. A new innovative codec-provisioning algorithm, known as Sensus Technology, yields consistent audio quality that contains little, if any, coding artifacts. Audio quality does not suffer the dull or muffled quality caused by conventional processing, which is due to extreme bandwidth reduction to mask codec "nasties."

The Sensus algorithm detects troublesome content for a codec, then modifies the processor's internal architecture, and makes the appropriate changes. The result is consistent increased quality through the coded transmission system, even at low bit rates; i.e. 16 kbps–21 kbps, believe it or not! Dry voice, by example, is very difficult to code at low bit rates, without quality and intelligibility suffering. The Sensus algorithm inside Omnia Multicast creates clean, smooth, intelligible and clear audio that is consistent-sounding no matter what the content is.

For information contact Omnia at (216) 241-7225, e-mail info@omniaaudio.com or visit www.omniaaudio.com.

Omnia
A Telos Company

Product information is provided by suppliers

WorldNet Oslo is the perfect solution for 5.1 contribution and distribution applications, transporting high quality content over an E1, T1 or IP link.

MAKE YOUR THE STRONGEST LINK

Introducing WorldNet Oslo from APT. Now you can have up to eight full bandwidth audio channels with low delay, cascade-resilient, Enhanced apt-X™ coding on a single T1 line.

Each WorldNet Oslo gives you a choice of Encoder, Decoder and Duplex Audio Modules, AC and DC redundant power supplies, a flexible auxiliary data system and automatic backup. WorldNet Oslo supports 16, 20 or 24-bit Enhanced apt-X™ audio, delivering lossless audio quality with under 2ms delay.

WorldNet Oslo comes complete with an easy to use IP-based Management System so you can set up, configure and monitor your installation across town or across the globe. To see just how useful this user interface can be, download a demonstration version from www.aptx.com.

Contact us to find out what WorldNet Oslo can do for your air chain or request a demo.

Highly intuitive user-friendly interface with level meters and programmable fault monitoring, all via IP

Features & Benefits

- Multiple Channel Audio Codec
- Designed for your STL and Studio-to-Studio Links
- Redundant Power Supplies
- Modular Architecture
- Audio over E1, T1 or Ethernet
- Up to 4 audio channels per audio card
- Up to 6 audio cards per chassis
- Analog and AES/EBU audio interfaces
- Enhanced apt-X™ coding

APT
AUDIO PROCESSING TECHNOLOGY

Audio Processing Technology Ltd
Tel: +44 28 9037 1110
Fax: +44 28 9037 1137

Audio Processing Technology North America
Toll-free: 800-955-APTX
Fax: 732-796-0304

Audio Processing Technology Japan
Tel: +81 (0) 3 5771 1191
Fax: +81 (0) 3 5771 1192

Email: info@aptx.com
Web:www.aptx.com

Belar FMHD-1

The FMHD-1 has been designed with the new multicasting environment in mind.

The unit's eight analog and six AES/EBU assignable audio outputs provide plenty of capacity as the broadcaster adds additional audio streams.

Currently, the FMHD-1 can decode the analog L/R program and one HD program simultaneously, as shipped with one HD decoder module. Adding the optional second HD module provides decoding of two HD programs at the same time. This allows monitoring the main HD program and one supplemental HD program continuously, as well as providing the analog L/R.

All decoded audio is metered and displayed on the unit's graphical color display along with the associated PAD data for the selected audio streams.

For information contact Belar Electronics at (610) 687-5550, e-mail sales@belar.com or visit www.belar.com.

Harris Exgine

Harris Corp. placed the first "Exgine" Generation 3 HD Radio system on the air at Colorado Public Radio/KVOD Denver last November, using the Harris FlexStar HDX exciter at the transmitter and the HDE-100 Program Exporter and HDI-100 Data Importer at the studio. This new technology permits audio processing, codecs and multiplexing to be done at the studio, greatly simplifying STL requirements.

KVOD is multicasting its sister AM news-talk station KCFR on the FM HD2 channel, greatly extending the coverage of the 1 kW AM station. The station relays its signal to the transmitter site over a T1 line using a Harris Intraplex STL-HD with an AES audio card for the analog, and a LAN extension card for the HD.

Harris Design Engineer George Cabrera, Colorado Public Radio Director of RF Engineering Al Stewart and Harris Product Engineer Gary Liebisch are shown at the KVOD installation site.

For information contact Harris Corp. at (513) 459-3597, e-mail hkneller@harris.com or visit www.broadcast.harris.com.

Product information is provided by suppliers

Los Angeles *continued from pg 4*

you can get involved in new technology, you like it. It's been time-consuming, but you want it to be great, so you take your time with it."

How digital will shake out as a business remains to be seen, Ivey said, though he dismisses fears of audience cannibalization. He envisions an evolutionary track that begins with audiophiles drawn to the clarity and commercial-free aspect of the signals. The critical component — particularly in sprawling Southern California, with its long commutes — is getting into cars.

"I'm guessing we'll see some aftermarket radio sets," Ivey said. "But the next big step is to get the car manufacturers to start installing them. We can move on from there."

The signals are so new, Ivey said, the sales staffs have yet to embrace a particular marketing strategy. "It's so infantile that it remains to be sorted out."

What's the reaction to the HD formats? Ivey said it's too early to tell, since the channels have been operating for only a few weeks. He's convinced there will be more feedback as more listeners discover the streaming signals on the Internet.

HD Radio is a growing part of radio groups' marketing. Clear Channel offers a page on www.clearchannelmusic.com that lists HD Radio stations by market, with "Listen Now" buttons.

NOISE VS. REALITY

There's been little infighting on this topic among group owners since the debut of HD Digital Radio. Credit the alliance formed by several of the largest broadcasters with easing the move.

The broadcasters agreed to a process in which the HD Digital formats would be doled out. Peter Ferrara, president and CEO of the HD Digital Radio Alliance, facilitated the agreements. He refuses to discuss how the allocations were made — all participants signed a non-disclosure agreement — but said the level of cooperation among the competing firms was surprising.

"It's gone very well," said Ferrara, a former radio manager, owner and senior executive at Clear Channel before joining the alliance. "We got the companies together and involved to create a formal list (of formats) everyone could agree with. Nobody came to fisticuffs over the formats. Instead, there was a lot of discussion, a lot of great ideas, a real sense of purpose."

While satellite radio is grabbing so many headlines these days, Ferrara strongly denies the HD Digital move is a response. Instead, he said, it's the radio industry's reaction to a wider array of music delivery systems.

"Satellite is not *the* competitor, it is just *a* competitor," Ferrara said. "On a pure scale, satellite is a little business. They've done a wonderful job creating a lot of noise, but the bigger concern for us is where people are getting their entertainment: Ipods, computers and cellphones. That said, there is no question that terrestrial radio broadcasters don't want to lose ground to anybody."

Still, with fewer than 100,000 radios and receivers capable of receiving HD Digital sound in an American radio universe that includes 700 million analog tuners, Ferrara acknowledges terrestrial radio has a long road before the technology captures more than the imaginations of audiophiles.

> *There's still the same number of radio listeners. I don't think you're going to get any new people just because of HD.*
>
> *— Edward J. Atorino*

"This technology has taken a decade to develop," he said. "It's taken too damned long to get it into the market. That's why the alliance was formed, to get us down that road faster."

Ferrara is encouraged by developments such as a decision by Boston Acoustics to lower the price of its HD Digital radios. He's also hopeful automobile manufacturers will quickly embrace the technology.

continues on pg 8

Multicasting.

It's like trying to fit —

well, you know.

Management has decided to multicast. Which seems like a terrific idea — until you consider just how little bandwidth each channel will get. How will the sound of your station(s) survive these shrinking bitrates? Omnia can help.

New Omnia Multicast with SENSUS™ restores the fullness and depth that bit-reduction steals. Our DSP gurus teamed up with the codec experts at Telos (the folks who introduced broadcasters to MP3 and MPEG AAC). Together, they developed a unique suite of tools to pre-condition audio for HD Radio™ multicasting.

Omnia Multicast with SENSUS codec conditioning, Omnia Bass Management system and distributed look-ahead limiter significantly improves the sound of HD multicast and other bit-reduced streams.

SENSUS technology enhances punch, preserves presence, and reduces artifacts. Even heavily bit-reduced channels (like multicast) can be significantly improved by Omnia running SENSUS. And like all Omnia processors, Omnia Multicast delivers the smooth, clean, pure signature sound that grabs your listeners and holds them hour after hour. No wonder the top stations around the world choose Omnia over all other processor brands.

Multicast like you mean it... with Omnia Multicast.

Omnia
A Telos Company

OmniaAudio.com

Neural Audio Corp. and Multicasting

More channels. Lower bit rates. Higher quality.

Neural Audio unveils NeuStar HD 4.0 — the only codec pre-conditioner built from the ground up for low-bit-rate audio applications, guaranteeing instant codec performance.

As your audio becomes squeezed through continually narrowing data pipes, arm yourself with the correct tools. NeuStar HD 4.0 guarantees consistent levels, tonal balance and codec pre-conditioning, which perform seamlessly with audio codecs.

NeuStar HD 4.0 performs as a stand-alone solution or in tandem with traditional audio processing to maximize the potential of any low-bit-rate audio path. (HD Radio, Internet, ISDN/POTS, Sat, DAB, DRM, etc.)

neural audio

Fully networkable, field upgradeable, this unique tool will grow alongside your audio demands.

New for NAB2006, Neural will open a new era in signal processing. Visit the Harris Broadcast Booth, C-807, for demonstrations of amazing things at the Neural Audio kiosk.

For information contact Neural Audio Corp. at (425) 814-3200, e-mail info@neuralaudio.com or visit www.neuralaudio.com.

APT WorldNet Oslo

The WorldNet Oslo has been designed specifically to offer broadcasters the ability to transport several programs from radio station to transmitter site over a T1 circuit or IP network. Fundamental to the WorldNet Oslo is the preservation of content, in light of the compression techniques used for digital broadcasting. The WorldNet Oslo can send up to three stereo signals (fully duplex) over a T1 circuit at 48 kHz Fs and a word depth of 24 bit. In addition, the WorldNet Oslo can also embed an IP stream for WAN/LAN connectivity and a four-wire circuit for engineering talkback.

For information contact APT North America at (732) 796-0203, toll-free (800) 955-APTX, e-mail to nasales@aptx.com or visit www.aptx.com.

Product information is provided by suppliers

Los Angeles continued from pg 6

CONTENT

Even if HD Radio matches or outperforms satellite signals, however, more than a few observers wonder if the industry can match the creative output of XM and Sirius.

"I don't know if the public cares whether their radio is digital or analog," said Edward J. Atorino, a managing director at Benchmark Co. in New York City, who has followed the media industry for decades.

"What they want is interesting programming. It's like HD television. When you compare it side by side with analog, there's no comparison, but if you're watching a comedy show, you don't care about the format. You care about whether it makes you laugh."

That's been the major draw of satellite radio — the large number of commercial-free channels, not the delivery system, Atorino feels.

Terrestrial radio risks cannibalizing its audience with additional formats, Atorino said, adding, "There are only so many people out there. There's still the same number of radio listeners. I don't think you're going to get any new people just because of HD."

Meanwhile, Atorino expects satellite radio to become a more muscular competitor within the next few years, primarily because the fixed costs of building the systems and stocking them with programming and talent will have been recovered.

"When that happens, you'll see satellite really cranking the revenues," Atorino said. "Right now, there are only 9 million satellite listeners, but 200 million cars on the road. When (satellite systems) get to a place where they have 20 percent of all cars, they'll be a cash machine."

Ferrara agrees content will be the ultimate decider of whether HD Digital radio succeeds, though he said the quality of the digital signals is impressive, particularly digital AM signals.

"The real driver for the consumer will be content," he said. "Not just music, but talk, entertainment, news, data content. Digital radio has a lot of depth to it in terms of where we can take it."

Jeff Borden is a Chicago-based freelance writer and editor. A journalist for more than 30 years, he has covered the media industry for the Columbus Dispatch, Charlotte Observer and Crain's Chicago Business. ■

Ferrara continued from pg 3

but the reality is, the alliance has this amazing footprint by which to talk to the consumers who are currently using our products and services, to sell them on the next generation of technology. That's pretty powerful. That's why XM and Sirius bought so much time on terrestrial radio when they got started.

***RW:** You've mentioned iPod listening and all the media young people are listening to that Arbitron says are nibbling away at listening. Will extending stations' brands via multicasting capture more listening?*

Ferrara: I think it will. One of the most exciting things about this whole HD2 format process has been watching, hearing and now listening to some amazing creativity on the radio.

Rewind to the emergence of FM and all of the formats that came out of that development when it occurred off of AM. There was experimentation. There was risk-taking. There was just stuff out there that people thought of that they put in front of the consumers. They all went, "This is great. I love it." I think that's what HD Radio and HD2 are going to offer.

There's no question that people will always listen to "their music" on a device, whether that's an iPod now, or an 8-track or a cassette player years ago. People will always want to have access to just their music. But I think from an experience standpoint, terrestrial radio, local radio, free radio, is going to give the consumer another "oh wow" factor that currently they can't get with their iPod or anything else.

***RW:** Are you going to hire a staff or are you managing?*

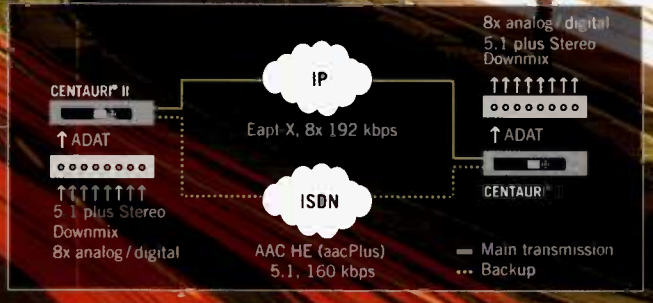
Ferrara: Since I started this job in early December, I've felt somewhat like the guy in the Ed Sullivan show keeping all of the plates spinning in the air on the little sticks. I have been almost constantly on the road, meeting with receiver manufacturers and with retailers and with representatives with the auto industry. I'm also trying to keep a presence at both radio functions and consumer electronic industry functions to advance both the awareness of and the excitement about HD Radio. ...

I was very fortunate to be able to hire Diane Warren as my senior vice president of marketing and communications. ... Right now, it's just the two of us, in terms of staff, but we're fortunate in that we can tap into the experience and expertise of our member companies. For example Gary Kline at Cumulus is heading up the Alliance Engineering Cooperative. David Goodman, who's the president of marketing for CBS Radio, is helping us with strategy development and messaging. ■

Go with the flow of innovation

5.1 MULTICHANNEL

CENTAURI® II
GATEWAY
5.1 MULTICHANNEL
STREAMING SERVER
POINT-TO-MULTIPOINT
FLASHCAST
DUAL CODEC



CENTAURI® II – the clear way ahead for your surround sound. Building on six years experience with the ground-breaking CENTAURI audio codec, the new CENTAURI II is the first audio codec to support 5.1 multichannel streaming in Eapt-X, AAC and AAC+ as well as linear. The extremely low data rates attainable offer major benefits; instead of 6 Mbit/s linear, CENTAURI II needs just 1.2 MBit/s using Eapt-X, 320 Kbit/s using AAC, and a mere 128 kBit/s using AAC+.

Conventional Audio Transmission: Compatible to Zephyr, XStream & Prima codecs via ISDN, X.21, L2, L3 & G.7xx

Modern Audio-via-IP 24/7: CENTAURI II follows all relevant RFCs, talks to Hardware Codecs, Software Players, Set-top Boxes, PDAs and Mobiles and, with more than 4000 units in use worldwide, is **the** reliable audio codec for Audio-via-IP in contribution, STLs, reporting, emission and more!

The CENTAURI II – the only audio codec you'll ever need.

CENTAURI II
Multichannel Gateway Codec

MAYAH COMMUNICATIONS
www.mayah.com

Mayah Communications Centauri II

With Flashcast compatibility to existing audio codecs, the new Centauri II Audio Gateway for 5.1/7.1 Multichannel supports bi-directional transmission of 5.1/7.1 as well as mono/stereo via IP, ISDN and X.21/V.35 applying all MPEG 1, 2, and 4 standards including aacPlus v2, Enhanced apt-X and others.

RTP, RTCP, RTSP, ISMA 2.0, SAP and SDP allow interoperability with professional hardware codec devices for distribution/contribution as well as STBs, PDAs and SW-Players for DVB-H, 3G/UMTS, ipTV.

With its built-in Mayah Twin/Quad technology it supports up to four parallel stereo codecs in 2RU for various broadcast HD applications such as: Gateway, bridging audio from one network to the other; Backup, IP-to-IP or IP-to-ISDN; as well as Dual/Twin/Quad Codec, Point-to-Multipoint, Multicast and Flashcast.

Control of the devices via SNMP, browser, Telnet, Windows-application or available third-party products.

For information, contact distributor Lamar Systems at (918) 770-0941 or Mayah via e-mail to info@mayah.com or visit www.mayah.com.

High-Definition Wiring?!

With all the excitement of multi-channel/digital/surround performance, let's not forget the role of the lowly cable plant in making high definition work.

Simply put, no one should be wiring for analog-only anymore. Every cable in your facility should be capable of full-bandwidth AES-EBU performance.

StudioHub+ was an early adopter of shielded CAT-5/RJ-45 and digital wiring standards as a plant-wide solution for a uniform efficient and digital-ready performance. So regardless of when and how you make the digital transition, Radio Systems recommends StudioHub+ wiring for the backbone of your plant.

For information contact Radio Systems at (856) 467-8000, e-mail jo-ann@radiosystems.com or visit www.radiosystems.com.

Product information is provided by suppliers

Multicasting: In the IBOC Driver's Seat

The Multicasting Movement Seems to Be Today's Primary Motivator For Broadcasters' Conversion to HD Radio. Will Consumers Feel the Same?

by Skip Pizzi

The IBOC buzz among broadcasters seems to be all about multicasting lately. This makes sense, for obvious reasons (and if they're not obvious, read on); but it's first worth noting that IBOC multicasting almost never happened. It was a last-minute addition to the IBOC feature set, and one that for quite a while many broadcasters didn't want to see included.

For most of IBOC's gestation, the format was exclusively intended to be used as a digital duplicate of an AM or FM station's analog signal. There was always a minority view that held out for the option of using IBOC bandwidth for additional, separate content, but until the 11th hour, this approach was never embraced (and in some cases, was actively opposed) by the mainstream.

Many commercial broadcasters considered the downsides of further market fragmentation too great, particularly in the shadow of recently completed consolidations intended to reduce intra-market competitive pressures. Nevertheless, a few persisted with the notion that new services would be key to the ultimate success of IBOC.

It took the early success of satellite radio to convince the majority of broadcasters that the application of IBOC technology to a *quantitative* — as well as a qualitative — increase in service made sense.

With its hundreds of new channels, but no better (some would say lesser) audio quality, satellite radio's meteoric rise proved that increased content choice, not digital audio, was the primary motivator of consumer selection. That realization, coupled with the work of the Tomorrow Radio project and the dusting off of some technology put on the shelf awhile back by Ibiquity Digital, ultimately made IBOC multicasting possible.

The Tomorrow Radio project, launched in 2003 and spearheaded by NPR, Harris and Kenwood Electronics, proved the practicality of broadcasting supplemental services as digital-only IBOC content (see Fig. 1). NPR also showed in subjective listening tests that the FM-IBOC Hybrid Mode's 96 kbps payload could support more than one audio stream with adequate audio quality.

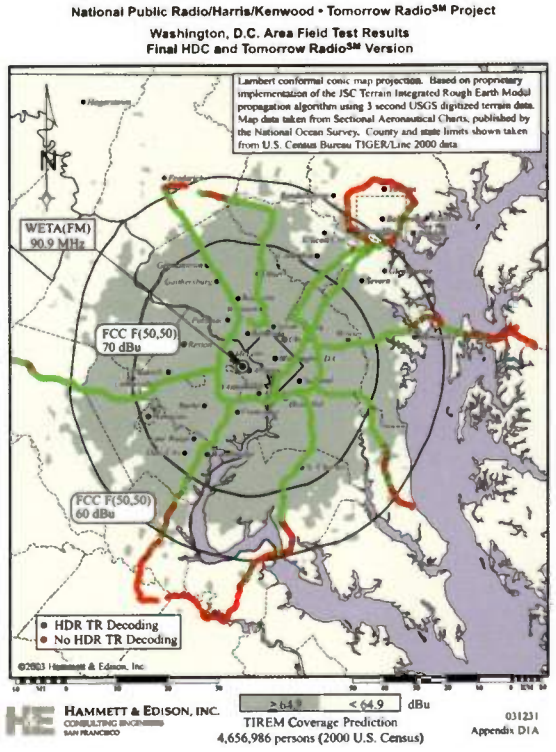


Fig. 1: In early 2004, the Tomorrow Radio project report predicted coverage of digital-only IBOC signals based on field measurements, such as this chart showing the Washington market. (Courtesy Hammett & Edison and NPR)

Recall also that Ibiquity's legacy includes both the USADR and Lucent Digital Radio development work, and the latter contained significant multicasting capabilities. Once a critical mass of interest had turned toward multicasting, Ibiquity produced technology making it possible. After the results of the Tomorrow Radio tests were in, the NRSC-5 standard emerged in 2005 with Supplemental Program Services (SPS) — the official terminology for multicasting — included.

MARKETING MULTICAST

The most recent activity in this space has moved beyond technology and into the marketing sphere. In late 2005, a consortium of commercial broadcasters was formed in an attempt

to coordinate the multicast defense against satellite radio and other emerging competition. The *HD Digital Radio Alliance* was initially created by eight of the top U.S. radio groups, and has since announced the launch of over 250 new "HD2" multicast services in 28 cities, including all of the country's top 12 radio markets, within the first quarter of 2006.

According to the alliance, most broadcasters have so far opted to keep their second service closely related to their existing analog (and thus to their IBOC *Main Program Service*, or MPS) format and branding. For example, Chicago's country-format WUSN(FM) added a country new releases channel as a supplemental service.

A smaller group of stations will explore different formats that are likely to appeal to the same or closely similar demographic groups as their existing service, like Boston's soft-rock WMJX(FM) adding a smooth jazz HD2 service.

While these approaches will make the eventual selling of spots on supplemental services relatively easy, a minority of stations will offer completely divergent supplemental services, like another Boston station, talk-radio WTKK(FM), which has launched a classical music HD2 channel. Importantly, most of these new services are commercial-free (for now, at least), and many are simply continuous music services without announcers.

Meanwhile, public radio stations generally are presenting a different (often counter-programmed) assortment of typical public radio fare on their second services. At least one public station is providing a "triplecast" of a main plus *two* supplemental services on its IBOC broadcast.

Elements of the radio business are beginning to conform to the different nature of a multicast world.

Other elements of the radio business are also beginning to conform to the different nature of a multicast world. Arbitron has confirmed that it is ready and able to measure IBOC multicast services' audience levels, including via PPM, if and when stations desire this data.

Clear Channel also announced an agreement with AFTRA that allows reduced wage rates and other accommodations for production of multicast content, which may serve as a model for broader industry application.

UPSIDE/DOWNSIDE

With its listenership at around 10 million and growing fast, satellite radio provides a credible threat to terrestrial radio. IBOC multicasting could be the best technological defense terrestrial broadcasters have against audience erosion, particularly with the coordinated strategy that is now emerging.

Multicasting is not a panacea, however. There are some negatives that must be acknowledged and optimally managed. At issue is the digital-only nature of multicast service, exacerbated by its late addition into the IBOC format.

This produces two significant operational problems. The first is simply the cliff effect experienced at loss of signal.

There is at present no graceful degradation capability for IBOC supplemental services, so when a receiver tuned to a multicast channel reaches a location where the signal strength goes below threshold, the audio simply mutes.

continues on pg 12

Moseley STL Solutions

Moseley provides STL options for multicasting, which requires both AES digital audio and an Ethernet link to the transmitter site.

Moseley's Starlink SL9003Q-2SLAN is the first STL to provide AES audio and Ethernet data on the traditional 950 MHz band.

Lanlink 900D license-free data radio link is a perfect companion to a new or existing STL system creating a bi-directional Ethernet data and remote control link.

Starlink SL9003T1 STL/TSL for T1 circuits or license-free 5.8 GHz radio links transport bidirectional digital audio and Ethernet for IBOC plus LAN, control and telephones.

These Moseley digital STL solutions are ready today for multicasting.

For information contact the company at (805) 968-9621, e-mail info@moseleysb.com or visit www.moseleysb.com.

Product information is provided by suppliers

Multicasting *continued from pg 11*

Signal reacquisition, even if the signal strength quickly returns to an adequate level, may take several seconds. In a moving vehicle, this process may happen repeatedly when traveling through marginal signal locations.

A more substantial problem, and one that will be encountered more frequently, is the latency upon initial selection of a multicast channel when tuned directly. This means that if a listener were to store an HD2 service in a radio's preset memory location, then recall it when listening to any station other than the multicast signal's host, the HD2 audio would not commence until about five seconds had elapsed (or possibly longer in cases of marginal signal strength).

This is a function of the IBOC format (its intrinsic three-frame *diversity delay*, with each frame occupying ~1.5 seconds), and not something that might be reduced over time by improved transmission or receiver technology.

Alternatively, the radio might only allow the user to proceed to supplemental services after acquiring the digital MPS signal on the host channel. In this case, it would still take the user several seconds to access a desired SPS channel, but at least *some* program audio would be playing throughout the process.

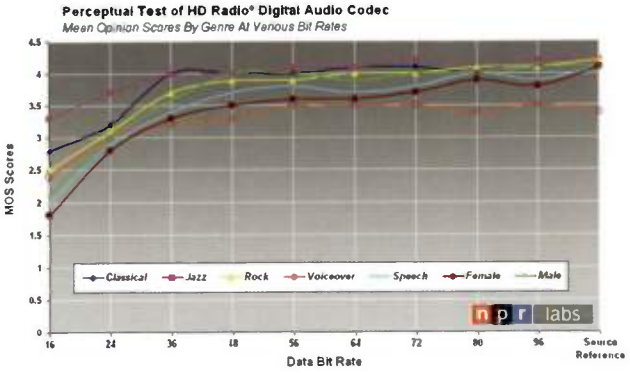


Fig. 2: NPR conducted listening tests in 2003 indicating that IBOC audio performance was relatively similar at HDC coding rates from 96 kbps down to 48 kbps. Below 48 kbps, performance became noticeably impaired, particularly for voice content. This made it feasible to consider the multicasting of at least two services — one main and one supplemental — on an FM IBOC service. (Courtesy NPR Labs)

Many broadcasters feel that this is not a dealbreaker, and that some kind of supplemental audio capability is better than none. They also note that channel switching on satellite radio receivers experiences its own degree of latency.

Yet this has engendered numerous discussions on the navigation capabilities in SPS-enabled IBOC receivers — which will soon encompass most available receivers.

For example, if an SPS service is directly selected, should some visual display alert the listener to stand by while the signal is being acquired? What about seek/scan tuning, particularly in the downward direction? Should the radio stop at all SPS channels? Ultimately these are questions for receiver manufacturers, and there will likely be differentiation in such behavior between products — as there are today among AM/FM radios' user interfaces and operations.

One area where broadcasters and receiver makers do need to agree, however, is on SPS naming conventions, so radio stations can announce and promote their new multicast channels to listeners in ways compatible with how receivers access and display the services. Last year NRSC convened the Supplemental Identification Task Group (SIDTG) to consider this issue, which made some progress along these lines, but was unable to achieve consensus on the full nomenclature to be used.

This has left receiver manufacturers essentially on their own in determining how multicast services will be identified. The early lead seems to be for the *HD2, HD 3*, etc. approach, and it seems likely that this will emerge as a de facto standard.

IBOC multicasting today is like webcasting in the late 1990s: an exciting new technology with very few listeners.

WHAT NEXT?

The next year or two will be critical to the development of multicasting, as broadcasters and consumers get their feet wet in this new environment.

The theoretical fungibility of the IBOC format's qualitative/quantitative tradeoff will be tempered by practical realities on the number

continues on pg 14

DaySequerra Model M2.0

The DaySequerra Model M2.0 Modulation Monitor with optional remote control capabilities is a powerful off-air monitoring solution for AM/FM analog and HD Radio broadcasts.

Designed to meet the rigorous demands of the professional broadcast market, the DaySequerra M2.0 provides display of program specific data (PSD) for MPS and SPS Multicast signals; bright, accurate bargraph metering of HD Radio and analog programming; and an HD Radio digital-to-analog program time-alignment monitor.

The M2.0 was the first "Tomorrow Radio-Ready" modulation monitor available, and its robust, modular architecture ensures that it will never become obsolete. DaySequerra M2.0 options include display of SCA injection levels and HDR•Network application software and network interface for HD Radio signal diagnostics. The M2.0 has been certified by Ibiquity and is now shipping to broadcasters.

Contact the company at (856) 719-9900 or visit www.daysequerra.com.

Product information is provided by suppliers

Multicasting *continued from pg 13*

of services offered, the coded data rates used, whether surround sound broadcasting can coexist and how to best cross-promote and build audiences for multicasting. Sensible programming for these channels, and other business accommodations will likely also be developed.

Peter Ferrara, president and CEO of the HD Digital Radio Alliance, reports that his organization will continue to push the multicasting agenda. The alliance will also place over $200 million worth of on-air advertising and has launched a promotional Web site, HDRadio.com.

The next level of exploration could involve how datacasting fits with multicasting, since it, too, will have to share the same payload bandwidth. This in turn may accelerate movement toward the IBOC Extended Hybrid mode, which would allow a total payload of up to 150 kbps to be so subdivided, rather than the 96 kbps available in Hybrid mode. Of course, this implies that regulations will evolve that allow the Extended Hybrid mode to be used, but recall that today even multicasting is not officially permitted. (The FCC has temporarily allowed stations to begin multicasting with simple notification of the commission.) On the subject of regulation, however, there is still some concern that the FCC may enact some additional public service requirements from broadcasters who wish to use multicasting, as a quid pro quo for the effective multiplication of spectrum that the technology enables for radio stations. This issue will bear close observation as final IBOC rules emerge.

Multicasting's future might also include new subscription services enabled by conditional access or some other form of content protection, allowing stations to more directly compete with satellite radio. For FM broadcasters, IBOC multicasting today is like webcasting in the late 1990s, an exciting new technology with very few listeners. But unlike webcasting, multicasting simply extends the traditional broadcast model of cheap, one-way, point-to-multipoint service, so it may fit more comfortably into the broadcaster's portfolio, and thus ultimately could become more advantageous to broadcasters than webcasting.

Multicasting's future might also include new subscription services.

At present, multicasting represents one of the three necessary ingredients to success of a new format, with its exclusive availability of new, desirable content. The other two required elements are plentiful, inexpensive, reliable receivers and strong, effective marketing. If these other essentials can be mustered with the gusto that multicasting currently enjoys, IBOC may enjoy true success.

Skip Pizzi is contributing editor of Radio World. ■

President.....Stevan B. Dana
CEO.....Carmel King
Publisher.....John Casey
Sales.....Dale Tucker, Claudia Van Veen, Raffaella Calabrese
Editor in Chief/U.S.....Paul J. McLane
Production/Creative.....Lourdes Lilly

Radio World (ISSN: 0274-8541) is published bi-weekly with additional issues in February, April, June, August, October and December by IMAS Publishing (USA), Inc., P.O. Box 1214, Falls Church, VA 22041. Phone: (703) 998-7600, Fax: (703) 998-2966. Periodicals postage rates are paid at Falls Church, VA 22046 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 1214, Falls Church, VA 22041. REPRINTS: For reprints call or write Emmily Wilson, P.O. Box 1214, Falls Church, VA 22041; (703) 998-7600; Fax: (703) 998-2966.

—Printed in the USA—

HD RADIO™?

I'M GOING WITH MOSELEY.

My challenge is to make the right STL choice for today, as well as for tomorrow.

With Moseley, it's no problem.

Check out their **Starlink SL9003Q-2SLAN**, the first STL to provide AES digital audio and Ethernet data over the traditional 950 MHz band.

Or add a bi-directional Ethernet LAN extension and serial data link to a new or existing STL with the license-free 900 MHz **Lanlink 900D**.

For T1 lines or license-free 5.8 GHz links, the **Starlink SL9003T1** STL/TSL transports bi-directional AES digital audio, Ethernet LAN extension, remote control, and telephones.

Your best connection to the future is a smart STL choice today. Take it from me, Moseley will insure that your station is ready for HD Radio™ and the new digital services of tomorrow.

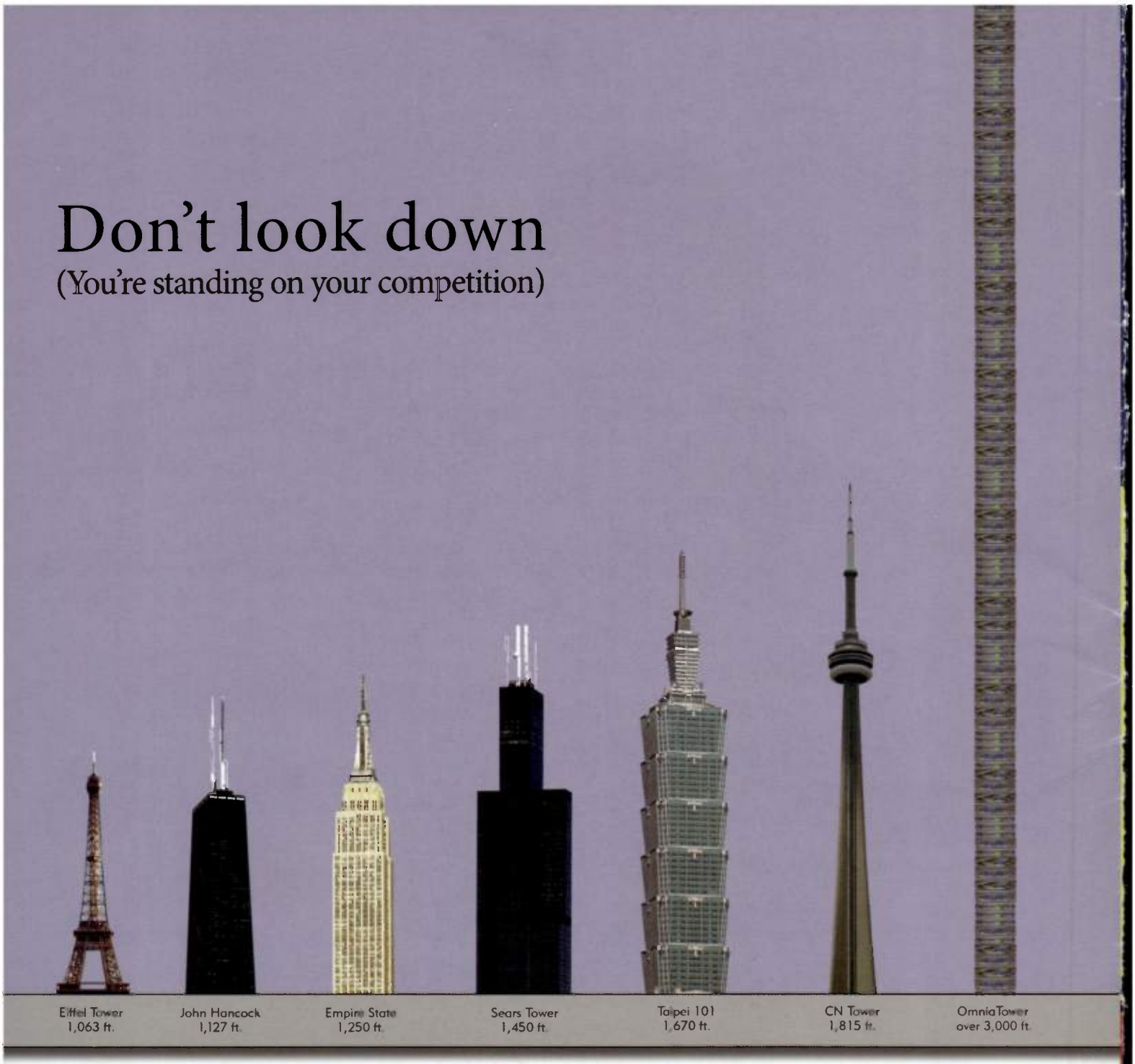
Give the digital STL experts at Moseley a call for more details.

Moseley

Dave Chancey 805 968 9621
Bill Gould 978 373 6303
www.moseleysb.com

Don't look down

(You're standing on your competition)



The Empire State building is pretty tall. Taipei 101? CN Tower? Even taller. But Omnia dwarfs them all. In fact, if you stacked up all the Omnia audio processors in use around the world, you'd have a tower well over 3,000 feet high.

In just a few short years, Omnia has emerged as the best-selling audio processor in the world. More importantly, it's the most successful stations in top markets like New York, London, Paris, Rome, Beijing, Tokyo, Amsterdam and Berlin, that have put Omnia on top. And more broadcasters are upgrading every day, using Omnia as their secret weapon to stay miles above the competition.

Speaking of heights, did you know that Omnia processing now powers stations broadcasting from every one of the famous structures pictured above?

Big or small, isn't it high time you upgraded to Omnia?

Ready to Multicast?

Omnia Multicast with SENSUS codec conditioning, Omnia Bass Management system and distributed look-ahead limiter significantly improves the sound of HD multicast and other bit-reduced streams.

Leaders choose Omnia, listen and you'll know why.

Omnia
A Telos Company
www.omniaaudio.com