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**JUNE
2021
EBOOK**

Streaming for Radio in 2021

The revolution in digital audio platforms is challenging radio's leadership to think in new and different ways



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- ▶ regionalization ▶ Reliable transport: SMPTE 2022-7, SRT, RIST

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Streaming for Radio in 2021



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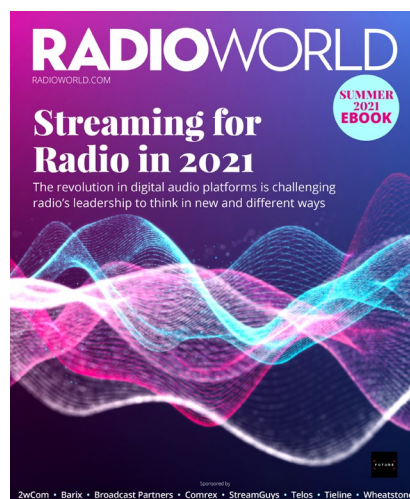
Streaming and its variant podcasting are crucial parts of the audio ecosystem now. But their integration into the fabric of the radio business varies wildly.

Certain large entities have rethought their business structures, seeking to become "360 degree" audio service providers in which radio is an important but not necessarily leading part. But what about the rest of the industry?

Radio World asked expert observers like Pierre Bouvard, Steve Goldstein, Fred Jacobs and David Bialik, as well as our manufacturing and service provider sponsors, to comment on the state of AM/FM streaming and the broader implications of an audio world in which consumption is measurable, specialized ads can be inserted and morning shows can be repackaged into "catchup" versions to be sold separately.

We heard one industry observer recently say that radio's expansion into digital platforms has "rehabilitated" it in the eyes of advertisers. Another commented that we are in a "golden age of radio attribution." These remarks are reflective of our times. We will probably see more radio companies venture into launching paid subscription services next. To paraphrase Bob Pittman, audio is radio's birthright. But are we taking full advantage of it? This ebook explores that question.

As always I welcome your comments on this ebook or any other Radio World content at radioworld@futurenet.com. That email address comes right to me.



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Streaming is the new FM

Bouvard says smart speakers and improvements in PPM have changed the conversation



Pierre Bouvard

Chief Insights Officer
Cumulus Media
and its national-facing arm
Westwood One.



Radio World: How do you think broadcasters are doing at leveraging streaming?

Pierre Bouvard: The real accelerator for streaming has been the smart speaker. Years have gone by since stations started streaming, and it was always maybe 5% of total tuning; the arrival of the smart speaker caused radio stations to really wake up to the fact that the smart speaker brings radio back into the home.

Increasingly, homes do not own a radio, but a third now have smart speakers. Radio stations have been aggressively promoting that “You can listen to our station on your Alexa or Google Home.”

Now 15% of 25-to-54 listening in America occurs through the stream. That’s a substantial number. I think an advertiser needs to understand that if you’re going to spend a dollar on radio, 85 cents can be for the over-the-air and 15 cents should be for the stream.

By the way, we did a study. If you ask the average American, “Do you know how to listen to a radio station on a smart speaker,” there’s still a fair chunk who say no. We need to do a more forceful job of explaining how somebody can use a smart speaker to listen to a radio station.



Your Cumulus colleague Doug Hyde blogged recently about some substantial research on streaming.

Bouvard: That is a study done quarterly called “Share of Ear,” conducted by Edison Research. It’s the gold standard study on how Americans consume audio. They have been showing over the last couple of years a steady and persistent increase in the share of listening that’s going to the audio stream.

The second part of this has been Nielsen. Since the Portable People Meter launched in 2010, broadcasters have asked Nielsen, “The PPM does a great job of picking up

listening in an ambient fashion in the room, but if I put my headphones in for streaming, how can the PPM pick it up?”

A headphone listening adjustment for streaming went in place in October of last year. In essence, streaming listening doubled from 5% to about 10% of 12+ listening.

Broadcasters now have the confidence that Nielsen is picking up streaming; so it can be monetized.

You’ve seen a number of stations doing Total Line Reporting, combining the over-the-air and the stream. Ratings increases when you combine those have been significant; in some markets, especially sports and spoken-word stations are seeing significant increases with the combination of the stream, over-the-air signal and the new headphone adjustment from Nielsen.



There’s been this common comment that radio managers have struggled to monetize streaming. Has that changed?

Bouvard: When streaming was 5% of radio listening, yes, it seemed like a rounding error. But now that streaming is 15% of adults 25–54, it’s substantial. That is something we’re seeing across the Cumulus platform: Advertisers are seeing the value of the stream.

There’s something else: Streaming is the soundtrack of the American worker.

If you look at the hour-by-hour data, when is streaming strongest? Nine-to-five. This is a workplace audience. It’s one of the most valuable qualitative targets for an advertiser. They have a job. They have incomes.

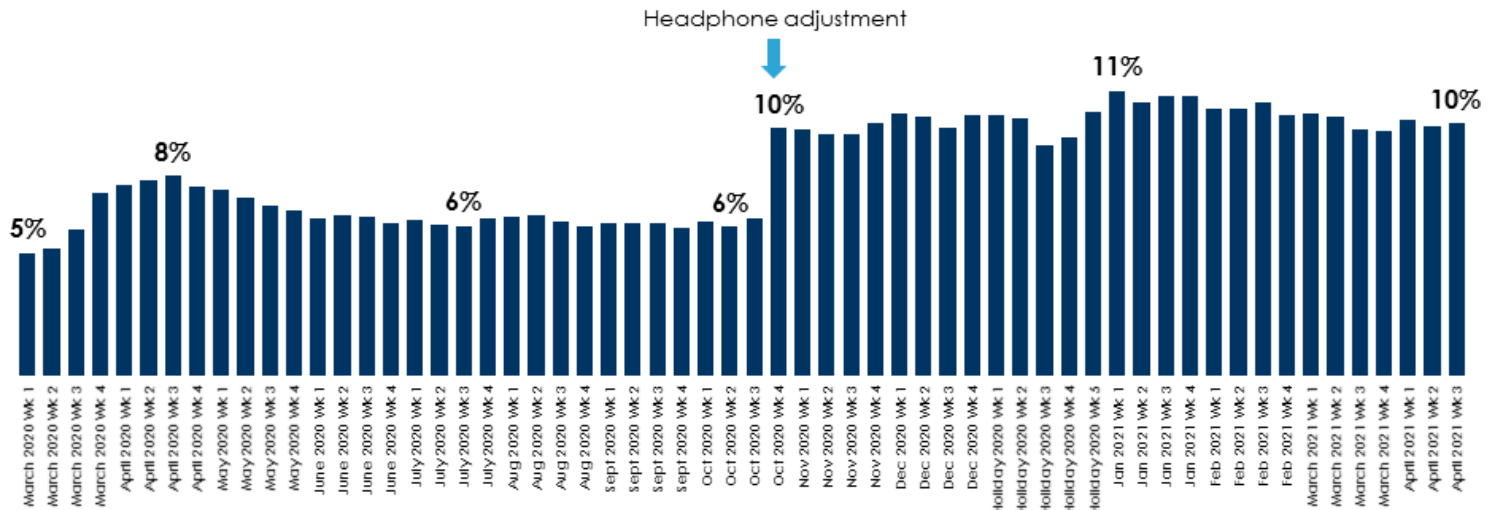
What you have is a huge amount of audience that’s between the very desirable younger 20s all the way up to the 60s. The audience skews female, which is important for advertisers, since women either control or basically are responsible for most American consumption; and the profile is nicely upscale.

And the majority of the people are from that market.

“There’s going to be a point in time, maybe five years from now, maybe 10 ... where half of all American radio listening will be occurring through the stream.”

AM/FM radio streaming represents 10% of AM/FM radio listening among persons 12+

% of total PPM AM/FM radio AQH from encoded streams, M-Su, 6a-mid, persons 12+



Source: Nielsen; % of total PPM AM/FM radio AQH from encoded streams (including TLR), M-Su, 6a-mid, persons 12+



Westwood One

The local advertiser can buy ads in the stream with the confidence that the majority of the people reached are from that town.



Which organizations do you think are incorporating streaming well into their strategies?

Bouvard: Spoken-word radio stations by nature, especially sports stations, have done an extraordinary job. I might have grown up in San Francisco, have allegiances to the San Francisco team; now I'm living somewhere else. Sports has done an amazing job of bringing those out-of-town people back to their hometown teams.

There are certain top personalities who aren't in every market; streaming is also a way to reach them. We have a podcaster, Dan Bongino. He launched his radio show about two weeks ago. In the press release, we indicated a couple of the stations that would be carrying the show and their stream; the amount of traffic and interest basically crushed our websites and the streaming.

What radio does well is have compelling, funny and entertaining personalities. Streaming is a way for listeners to get to talents that they love even if they're somewhere where they don't have access to a radio. When we ask listeners, "What do you like about streaming," that's the answer: "It gives me the ability to listen to my favorite radio

station, no matter where I am. I like that flexibility."

That's the voice of the customer saying, "Give me my station so that I can enjoy it more frequently." That's what streaming can do.



What have we learned about analytics, measuring audience and verifying that people are actually hearing this content?

Bouvard: That's the benefit radio has that Pandora and Spotify don't. Pandora can tell you, "I delivered a thousand impressions" but you actually don't know. The ad could have been playing to the empty room. Or the Spotify app could have been played so softly that nobody ever heard it.

The Nielsen Portable People Meter is tuned to the ear; that PPM is only capturing audible signals. We know if the ad was playing at a level that the person could hear.

The other big opportunity is that, by putting the audio stream in a digital format, we can append data to that stream. We can do a study to see: Did the people who heard the radio ad go to the advertiser website? Did the people who heard the radio ad go to the advertiser's store? Did we grow awareness and interest for the advertiser?

Streaming opens up a whole new world of accountability and measurement.

Above

Bouvard said Nielsen's recent PPM adjustment for headphone listening revealed a doubling of 12+ listening. "Broadcasters now have the confidence that Nielsen is picking up streaming; so it can be monetized," he said.

RW Sometimes we hear about audio quality and loudness problems, or ads that don't run, or that you listen to a stream and can tell that no one is paying attention to it. Do you think that remains a problem?

Bouvard: If 15% of radio listening is occurring via the stream, that's bigger than the entire AM band, which is about 10% of radio listening. That's significant. When it gets that big, you start paying attention.

It's like another radio station — we have to give it just as much love and attention. The ads have to run as scheduled. The volume has to be consistent and pleasurable. If we're going to substitute music, we're going to need to do that elegantly.

RW Do you think our industry has gotten its message to potential advertisers that there's a benefit over the Pandoras and Spotifys?

Bouvard: Interestingly if you look at the "Share of Ear" data, AM/FM streaming is bigger than Pandora and AM/FM streaming is bigger than Spotify. That speaks for itself.

RW But is that message getting to the advertising community?

Bouvard: Yes I think it is — thanks to folks like Audacy, who have rebranded and are going to market with a consistent offering. Thanks to iHeart. There are a lot more feet on the streets telling the story of AM/FM streaming.

RW How you see the role of streaming continuing to evolve?

Bouvard: Jacobs Media runs an annual study called the Techsurvey. Every year they ask listeners, "How do you listen to your favorite radio station? Do you listen over the air, or do you listen with a device like a smart speaker, cell phone, laptop?" If you trend those lines, it has been going up consistently for streaming at the expense of over-the-air. That's a nine-year trend.

If you keep extrapolating that, there's going to be a point in time, maybe five years from now, maybe 10, where those lines are going to cross — where half of all American radio listening will be occurring through the stream.

I'm reminded of AM radio. At the beginning of the '70s, AM dominated and FM was this experimental hippie thing. FM wasn't in the car. But by 1980, half of all American listening was on FM.

Well, streaming is the new FM. It's growing, and it's something to be taken seriously.

Every radio salesperson should be saying, "Every buy on my radio station should have streaming, because it is now getting to be so significant. The audiences are growing so much."

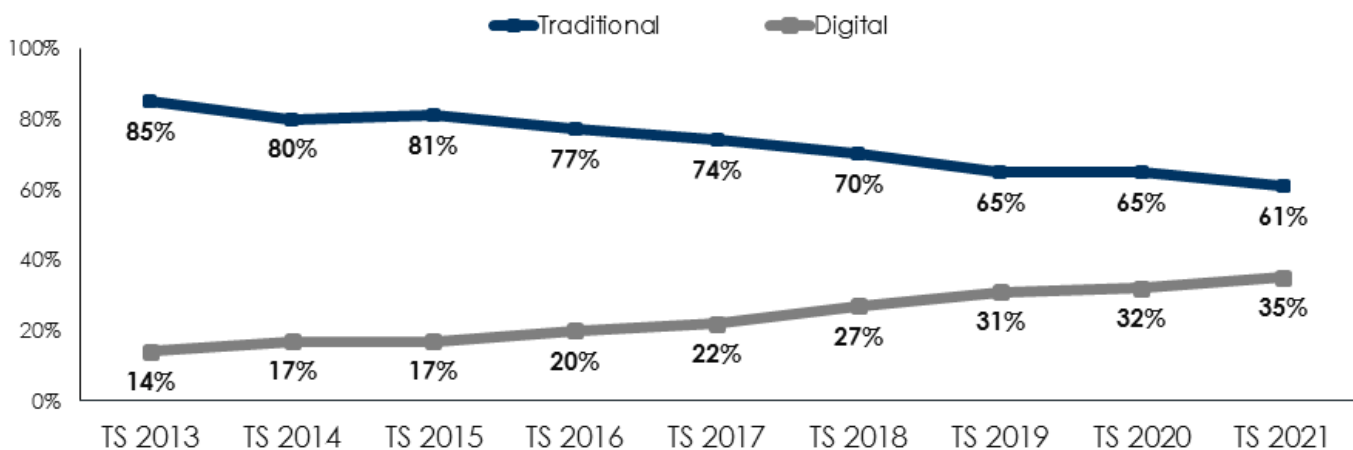
Every proposal and every buy should have streaming. **RW**

Below

The Techsurvey from Jacobs Media asks AM/FM radio listeners how much time they spent listening to their most preferred station via traditional platforms (AM/FM radios at home, at school, at work or in a vehicle) versus digital platforms (via computer, mobile, smart speaker or podcast). The convergence of the trend lines is apparent over time.

Digital streaming has been steadily growing since 2013

% of time spent with P1 station in a typical week via traditional platforms (an AM/FM radio at home/school/work or in a vehicle) vs. digital platforms (computer, mobile, smart speaker, podcasts)



Source: Jacobs Media TechSurvey 2021

CUMULUS
Westwood One

Stream? What do you mean?

Streaming can mean different things, depending on who you ask.

Comrex IP audio codecs are frequently used for point-to-point connections like studio-to-transmitter links and remote contribution. However, these multifunctional devices can also operate in a couple of different and really useful ways.

Multistreaming

Most Comrex IP audio codecs can run one full-duplex connection at a time (with the exception of ACCESS MultiRack, which can run up to five). However, that encoder produces an audio stream that can be sent to multiple locations simultaneously. This is called multistreaming.

If you want to connect to a translator or distribute your content to multiple studios, your Comrex codec can be configured to do so! You can learn more about Comrex codecs and multistreaming here.

Streaming Server

Comrex IP audio codecs also have the ability to act as a streaming server, delivering AAC and HE-AAC to compatible PC-based media players. Currently tested media players include WinAmp, VLC, and Windows Media Player 12

and up.

"The HTTP streaming feature has been a surprise and a delight when unexpected projects pop up," said Ben Blevins, IMG College (now Learfield IMG College). While IMG initially purchased their Comrex BRIC-Link units for point-to-point transmitting, they found that the codecs' streaming capabilities were very useful.



"The standalone streaming server function — very easy to set up — has really come through for us on a number of occasions for customers like Notre Dame, University of Texas and Central Michigan University among others."

"This application is a perfect solution for some of our schools that need to get a program feed using VLC or another media player," said Blevins.

In addition to being able to function as its own streaming server, Comrex IP audio codecs can also act as source feeds for both SHOUTcast and Icecast servers – with a single unit, you can expand your radio presence to the Internet without the need for a dedicated PC.

Codecs that can do anything. Powered by Comrex.

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Multimedia approach opens many possibilities

2wcom's Schneider says the discussion is about more than streaming



Anke Schneider

Manager of sales,
marketing and
PR for [2wcom](https://www.2wcom.com)
Systems GmbH.

RW We're asking our respondents whether they agree that streaming needs to be a bigger part of radio's strategy.

Anke Schneider: For here and now, it depends on how well the internet is expanded in a given country.

In the long term, the topic will likely be indispensable. It's more and more obvious that the way media content is consumed has changed significantly. Like the expansion of IP, this deeply impacts the convergence of media production and distribution units for video, radio and the internet.

Streaming, or the multimedia approach to production, opens up many possibilities for broadcasters. They have the chance to adapt to this changed consumer behavior and use it for their benefit.

Watermarking can be used to better identify listener preferences. Other characteristics for describing the target group can be derived from preferences for music and other contributions. This can result in better marketing of advertising space, since more key data can be made available to media agencies.

Above all, the program offering can be better oriented to consumer preferences, or features such as skipping can be offered so that a listener can decide to listen to a contribution or song, or not.

Such features will make radio more attractive again, to gain back ground in relation to smart speakers. From my point of view, radio organizations should keep in mind that, besides the most attractive younger audience, it's crucial to offer each group of people the medium and content they want — whether mobile, via the internet or traditional.

There are also benefits in cost and time efficiency. By treating a contribution as a multimedia project, the video, radio and internet elements are no longer separated.

And it expands the value chain and achieves interaction. Multimedia content production and distribution imply the possibility that all playout sources can refer to each other — radio, video and online —which leads to significantly higher coverage.

Moreover, by integrating with social networks, opportunities for interaction with the audience increase. And both aspects offer the chance of deploying new marketing formats.

RW How can radio leaders become more successful streamers?

Schneider: The old and new worlds of radio program transmission will continue to exist in parallel for some time.

That means that, on the one hand, the streaming world should be built up promptly or strategically, depending on the situation.

In parallel, however, distribution channels such as SAT and DAB must also be served. In addition, it's important to consider that cable network operators, for example, want to feed not only FM programs but also the broadcasters' web radio programs into their networks.

As a result, the transformation to streaming and/or multimedia production can only be achieved with a solid technical foundation. The decision over which general approach meets the system requirements and associated applications must be made carefully.

For example, a best-of-breed approach is focused on using only those components per device that best meet the technical requirements. However, this can be expensive, and each eligible solution must be evaluated in regards to, for example, compatibility aspects or compliance with IT security guidelines.

Moreover, bandwidth and stream management is mandatory. It's obvious that redundancy by software does not come with low bandwidth. By using an SDN or Software-defined Networking Controller, the optimal path through the network can be chosen for the traffic. In addition, an orchestrator enables the handling of large numbers of streams.

RW What are the most important developments in streaming as it pertains to radio?

Schneider: It's thinking not only about streaming but the new concept of multimedia production and the opportunities of virtualization.

The multimedia working method is an opportunity and a challenge at the same time. To produce a contribution in parallel for the internet, radio and video implies collaborating, saving time through multiple uses of a contribution and so on. In addition, as departments grow together, you get to know colleagues you've never met before, and can benefit from their expertise.

On the other hand, the staff must have the ability to view productions conceptually and operationally from

various angles. A sound engineer who has produced radio broadcasts needs to know how to handle audio content for the internet or television. The content management system must be understood and operated, as well as tools for audio or video editing.

Virtualization helps through scalability and maintenance. Most broadcasters want to be able to expand their networks as easily as possible, add services with just a mouse click or mirror the configuration of one device to another.

Scalability can be improved by using virtualization strategies. The possibilities introduced by Docker or VMware — to copy instances, take snapshots or run them across multiple devices — are a great improvement.

That has also had a major impact on necessary rack space. Due to AES67, SMPTE ST 2110 and other audio over IP standards, the requirements for real hardware interfaces are slowly disappearing, and that is opening the door for virtualized solutions that depend on an all-IP infrastructure.

What concepts should a streaming manager be thinking about?

Schneider: Mainly it's all about flexibility in system design and interoperability.

There's the conversion of audio formats, protocols and standards according to the use case. For example, for publication on a website, it makes sense to convert an audio stream to Icecast or an adaptive bitrate protocol like HLS and provide different audio qualities and/or bit rates respectively. Or to provide a stream not only for web radio but also for IP or DAB+, it must be possible to transform from HLS to Ravenna or AES67.

Transmission robustness is another crucial aspect. Stable internet connections cannot be taken for granted.

SRT (Secure Reliable Transport) and RIST (Reliable Internet Streaming) were originally designed for video, but support audio perfectly, too. Both only request for a packet if it's lost and offer a much better protection against packet loss than other mechanisms with lower latency and lower bandwidth. In comparison, SRT is a proprietary mechanism and supports unicast streams. RIST follows well-known broadcast standards and supports multicast. Both offer facilities for encryption.

SMPT ST2110 is bridge-building between the AES67-based but proprietary standards, and increases interoperability significantly (Ravenna, Livewire and Dante). The section of the SMPTE ST 2110 standard related to PCM digital audio (ST 2110-30) refers to the AES67 and defines six conformance levels to achieve AES67 compliance. Thus it is possible to exchange data transparently for example between a Dante and a Ravenna network.

Besides, the SMPTE ST 2110 suite specifies the transmission, synchronization and description of separated elementary streams in real time. It separates audio, video and ancillary data, so each can be handled depending on

the playout source. An uncomplicated negotiation and management of all connections is possible for Unicast and Multicast streams because all relevant protocols are supported — SIP for Unicast and RTSP/SDP for Multicast. Each essence flow may be routed separately and brought together again at the endpoint.

Finally, AES67 doesn't contain any standardized specification for discovery and connection management. SMPTE ST 2110 closes this gap by the NMOS specification. It enables interoperability and management of IP-connected audio devices. And NMOS lets you find, connect and configure media devices to enable video and audio on your IP network.




Finally, what does 2wcom offer streamers?

Schneider: The 4audio-IP series, IP-4c codec, IP-8e encoder and the MoIN Multimedia over IP network software.

Their transcoding features for audio codecs, standards and protocols allow them to be integrated into almost any production ecosystem and connect it to the distribution channels, regardless of whether it is audio over IP, DAB, SAT, a cable network or a CDN.

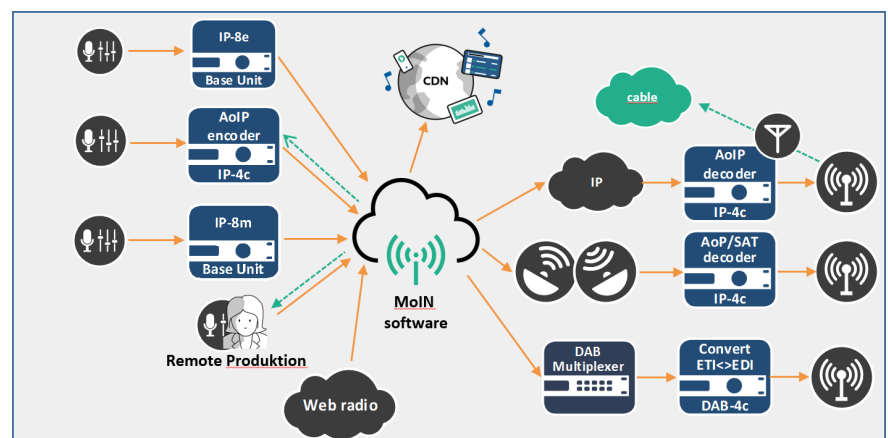
SMPTE ST 2110 is supported to achieve compatibility between all AES67-based standards and to be open for video formats in the future. Mechanisms like Pro-MPEG FEC, Dual Streaming, Stream4Sure, SRT and RIST assure robust transmission even under poor network conditions.

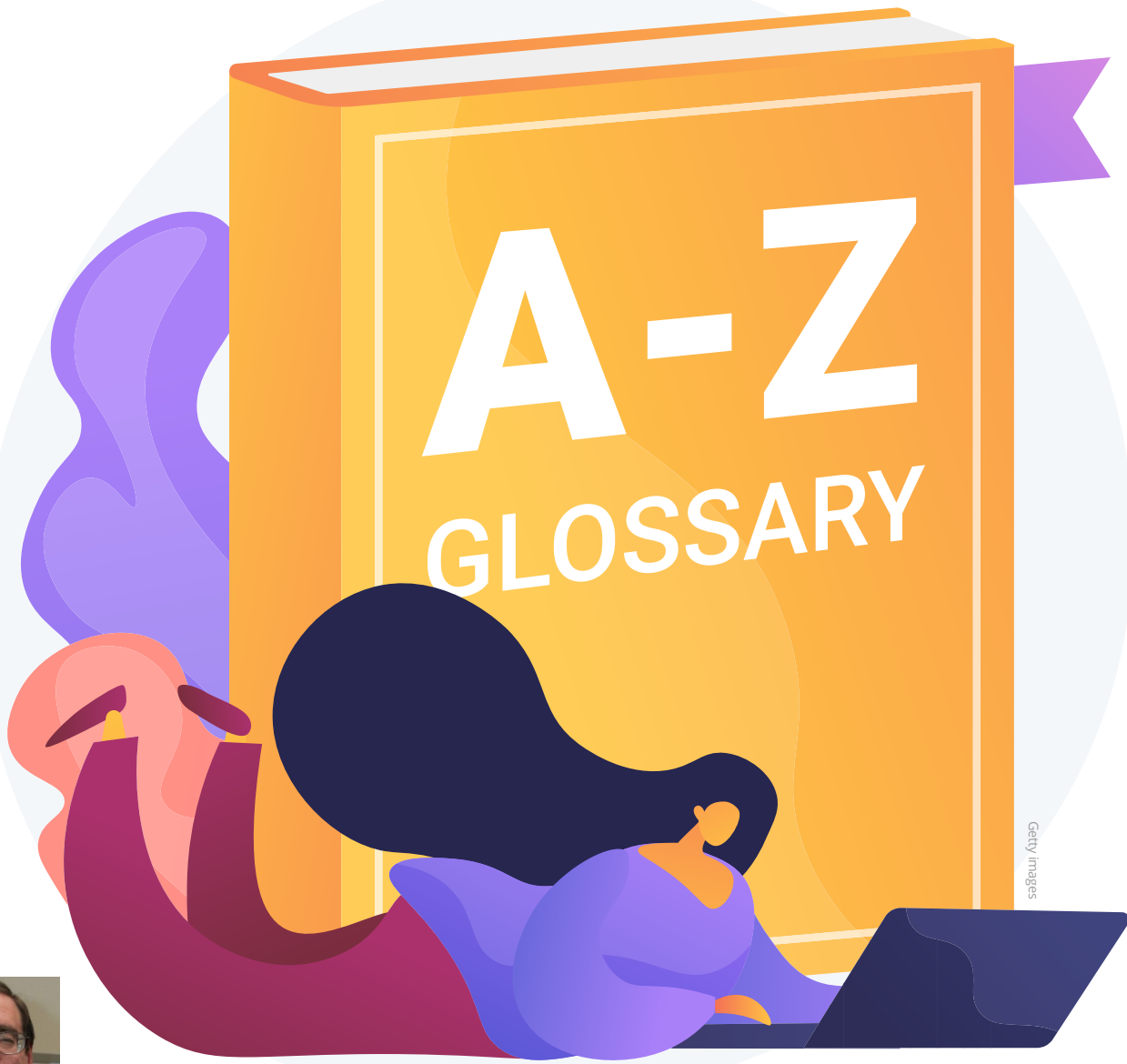
The MoIN software also offers flexibility for system design, as it can be installed on hardware servers, VMs or in the cloud as a containerized service. All solutions offer perfect synchronization (1PPS, PTP or NTP) to avoid assembling audio streams in the wrong chronological order. Think of the referee's penalty whistle heard after a goal celebration.

In addition, our new product up2talk fully integrates remote teams into the stationary studio environment. This allows exchanging contributions between remotely working teams and studios completely barrier-free. 

Below

2wcom's MoIN solution is shown connecting studio, distribution and streaming.





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AES Technical
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of stream
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A simple streaming glossary

The meaning of some common terms you'll hear

The following may help you navigate the language around streaming. It is not intended to be comprehensive but to give you a head start in this growing medium with new technology emerging daily.

AAC — Advanced Audio Coding, an audio coding format for lossy digital audio compression. Usually preferred over MP3, it promises comparable or better quality at lower bitrates. AAC has been standardized by ISO and IEC as part of the MPEG-2 and MPEG-4 specifications.

Ad Delivery Network — An on-demand file serving network that can deliver commercial content for the streamer.

Ad Replacement — When ads broadcast over the air are replaced with different content on the stream.

AES TD1004 — The Audio Engineering Society's Recommendation for Loudness of Audio Streaming and Network File Playback. These recommendations primarily are intended for "radio-like" mono and stereo streams.

Bitrate — Bitrate = Sample rate X bits per sample used to encode the music. The number of bits per sample also depends on the number of audio channels.

CDN — Content Delivery Network, a scalable distributor of streams.

Client-Side Ad Insertion (CSAI) — Advertising that only happens within the website or app streaming your content. Banners, video pre-rolls, other items specific to a player or page.

CMAF — A container format (see below).

Codec — Digital audio compression algorithm used.

Container Format — Otherwise known as a wrapper, this may contain the audio and video plus all the associated metadata (i.e. MP4, CMAF). The container carries the payload (audio, video, or data files).

Cuepoint — A marker residing in the metadata, triggering a new action.

Decoder — A component that is part of the player, used to reassemble the content.

Direct Ad Insertion (DAI) — Personalized ad replacement that is unique to the listener. This can be based on listener location, browsing preferences, etc.

Encoder — The system used to take the content and send it to the stream, usually by compressing your linear audio into an MP3 or AAC stream.

Encoding Format — The method of converting to a digital format (i.e. AAC, MP3)

FLAC — Free Lossless Audio Codec, a compressed audio format with no loss of quality.

FLV - Flash Video Format, a container file format used to deliver digital video content over the internet via Adobe Flash Player.

HE-AAC / HE-AAC v2 / AAC+ — “High-Efficiency AAC,” a lossy audio codec for low bit rate streaming, expanding on the quality vs. size gains made by standard AAC.

HLS — HTML Live Streaming, a high-quality transport format used by Apple.

Icecast — A streaming media project released as free software, maintained by the Xiph.org Foundation.

ID3 or ID3 tag — A metadata format that stores information (Title, Artist, etc.). This may be called the data container.

Injected content — Content from another source, usually replacing other content.

Interstitial — One or more recorded elements used in stream production (i.e. bumpers, jingles, promos, etc.)

LKFS — “Loudness, K-weighted, relative to full scale.” A standard loudness measurement. Sometimes referred as LUFS.

Lossless Streams — A high-bitrate non-compressed stream.

Lossy Streams — Digitally compressed sampled streams (i.e. MP3/AAC).

LUFS — “Loudness units relative to full scale,” synonymous with LKFS.

Metadata — The data stream that accompanies the media content. This can hold the “Now Playing” information, commercial cues, time code or any other information needed to play the stream.

MP3 — An audio coding format for lossy digital audio compression developed by Fraunhofer and Bell Labs. This supports very low bit rates.

MP4 — One of the earliest digital video file formats. Can be used for high-quality video or audio while maintaining relatively small file sizes.

MPEG-DASH — Dynamic Adaptive Streaming over HTTP, an adaptive bitrate streaming technique that allows for high quality of content. This is comparable to HLS.

Now Playing Information — “What the stream is playing” can be displayed, usually sent by metadata.

Ogg — A container format.

Ogg Vorbis — An audio coding format with lossy audio compression.

Player — The program used on the audience side to play the content; it could be an app.

Podcast — A digital audio file that can be downloaded to a personal device and/or player.

RTMP — Real Time Messaging Protocol, a TCP-based protocol that maintains persistent connections and also allows communication with low latency. This allows for a stream to be delivered correctly.

Server-Side Ad Insertion (SSAI) — Advertising added to audio as it is streamed or delivered, rather than from the studio layout. Ads become part of the audio itself.

Shoutcast — A software application that allows anyone to stream audio over the internet.

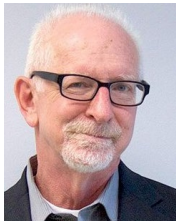
Total Line Reporting — When the stream and over-the-air product are the same and no segments are substituted.

Transport Format — How the stream is delivered (e.g. HLS, Icecast, rtmp)

xHE-AAC — A lossy audio codec for low bit rate streaming. It also is used by Digital Radio Mondiale (DRM).

Streaming has proved its value proposition

Fred Jacobs says stations should treat streaming as a core asset



Fred Jacobs

President and founder of research and consulting firm [Jacobs Media Strategies](#). He speaks and blogs often about digital audio for radio.

RW **Comment on this statement: “If radio organizations want to succeed in the new wider world of audio, streaming needs to be a bigger part of their business strategy.”**

Fred Jacobs: Agree totally. The streaming value proposition was proved during COVID.

We’ve seen for years in our Techsurveys how “regular radios” have been disappearing in homes. And our respondents tend to be core radio listeners. It’s even worse when you’re looking at all consumers.

When the pandemic forced millions of us to stay home and in many cases work from home, that put these listeners in an either/or position — either find another way to listen to your favorite station or morning show, or go elsewhere.

Radio brands that had invested in and marketed their streams as alternative ways to listen — on computers, phones, smart speakers — had a competitive advantage. In most cases, these stations saw robust streaming numbers during COVID. While in-car listening is recovering, millions of listeners have formed new habits for accessing their favorite stations. It will have a lasting effect.

RW **What are the biggest challenges that radio managers need to solve to become more successful streamers?**

Jacobs: The key to succeeding with a streaming initiative isn’t different from succeeding in broadcasting. It

requires great content, a seamless technical interface and an excellent user experience.

Simple, right? But if you listen to most radio station streams, they are almost always lacking. The stream quality is often dubious, and the integration of commercials and breaks leave much to be desired. You cannot compete against brands like Spotify or Pandora with substandard products.

Broadcasters typically compartmentalize their streaming platforms as second-class citizens to their traditional broadcast effort. It’s an appendage, rather than as a viable distribution outlet. Because they have trouble monetizing it — at anywhere near the levels they derive from their terrestrial offerings — they treat their streams as afterthoughts, rather than key conduits that connect modern consumers with great local entertainment and information.

RW **It seems that many managers still question whether they can monetize their streams.**

Jacobs: Monetization will come when radio treats streaming like a core asset — that means performance incentives for both programming and sales, as well as dedicated sellers.

It is also smart to eat your own dog food. That is, critically listen to your stream on multiple devices to be sure it is a quality product. Put as much effort and attention into the stream as you do for the broadcast sound chain, transmitter and tower.

Then market it. Strategically remind the audience of the different ways they can listen to your station wherever they are — on road trips, working out, walking the dog or when they’re sitting in front of a computer.

Your best ambassadors are usually your talent. In the same way clients pay a premium to have personalities read and adlib their copy, “hire” your talent and “purchase” a schedule on your own station to market your stream. Record “How to listen to _____” videos that you can post on your website, send out in email blasts, and post on your social media pages — the more focused, the better.

“Meet the audience where they are” by crafting messaging customized to the lifestyle of your target demographic. Your marketing will differ whether you’re a CHR station or you play Led Zeppelin and Queen.

“Strategically remind the audience of the different ways they can listen to your station wherever they are.”



How should streaming strategies overlap with how managers approach smart speakers, apps and voice-controlled infotainment systems?

Jacobs: They're similar, but different. This is why we recommend radio stations make the investment in audience research — our Techsurveys do just that — to determine the streaming platforms your listeners use most.

Create a product hierarchy, and adjust your efforts and your marketing to address audience priorities and usage patterns. I prefer “flying” campaigns — that is, don't try to sell both mobile apps and smart speakers in the same message. One gadget, one campaign at a time. Keep your messaging simple and focused.



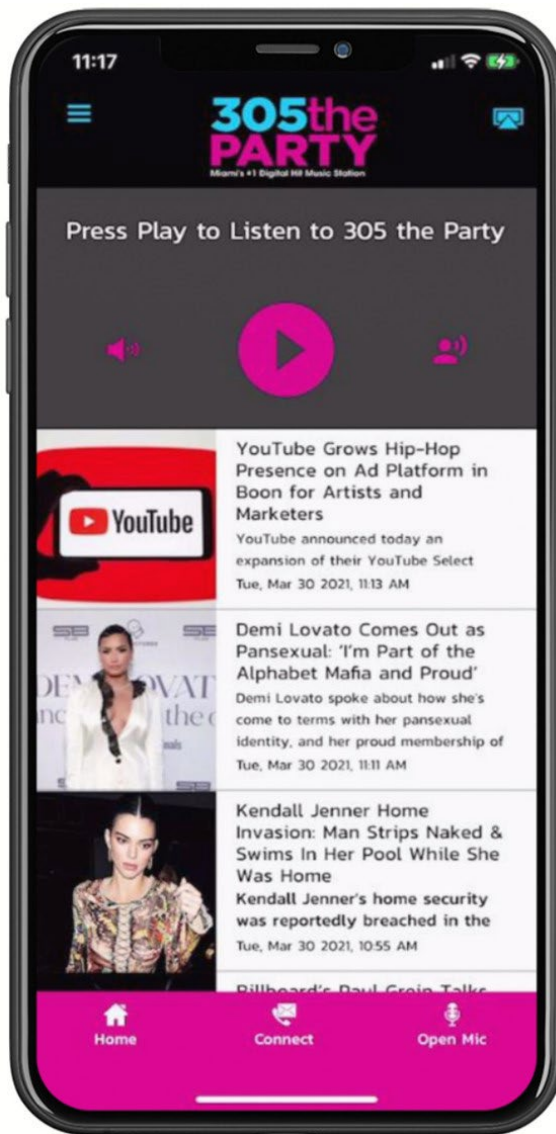
What about the role of metadata, how will that evolve?

Jacobs: Metadata on car dashboards will emerge as a great tool for both programming and sales.

Used judiciously and strategically, metadata can effectively provide powerful information about the content whether its songs, program names, guest or contest entry.

For sales, metadata can supplement audio advertising with visual reminders — phone numbers, URLs, sales specials — that can enhance a campaign and make it more memorable. It takes more work to get metadata right, but the rewards are obvious.


For the NAB, Jacobs Media conducted a metadata audit in three markets, and then with engineer Glynn Walden we wrote a follow-up DIY guide for broadcasters to fine-tune their metadata efforts. The NAB is updating it and will make it available to the entire radio broadcasting industry.



What product or service does your own company offer for streamers?

Jacobs: Jacapps, our mobile app company, was launched 100 days after Apple opened its iconic App Store in the summer of 2008. Our goal was to help broadcast radio regain its portability in a world where Walkmans had died out.

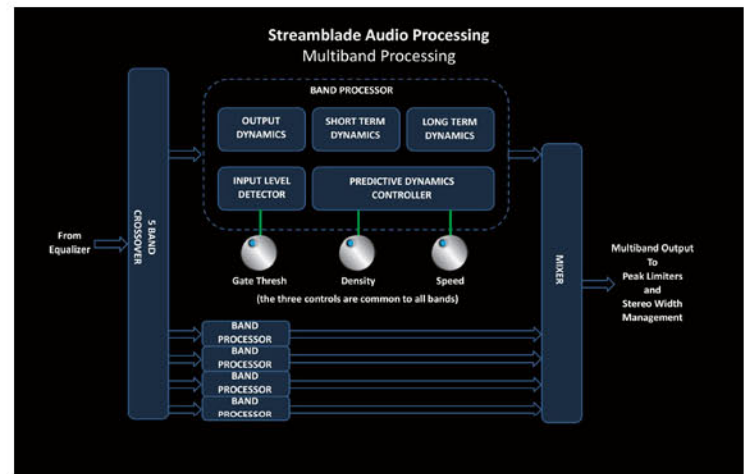
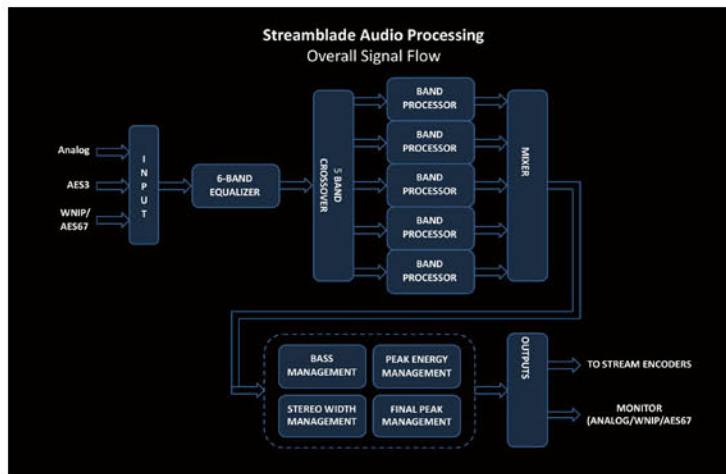
All these years later, our vision was spot-on. Jacapps has developed north of 1,300 mobile apps — mostly for radio and related media — on both the iOS (Apple) and Android platforms.

Unlike “umbrella apps” (TuneIn, iHeartRadio), jacapps customizes its mobile software development or individual stations on the premise that great local brands deserve their own apps — not scrolling through or searching a directory. And the COVID streaming numbers for scores of jacapps stations blew up during the pandemic. 

Above
Sample streaming
apps from jacapps.

What Streaming Codecs Wished You Knew About Processing

The job of a streaming codec is to remove details from the audio and then hide the fact that those details have been taken away. Perceptual codecs do a pretty good job of removing details your listeners probably wouldn't hear...unless the wrong audio processor gets a hold of it.



Air chain processors are the worst processors for streaming because they trick the codec into mistaking artifacts for audio. Noise, hum, large phase errors between left and right channels, clipping distortion byproducts and non-audio signals are treated like audio by the codec, and sometimes multiplied by it.

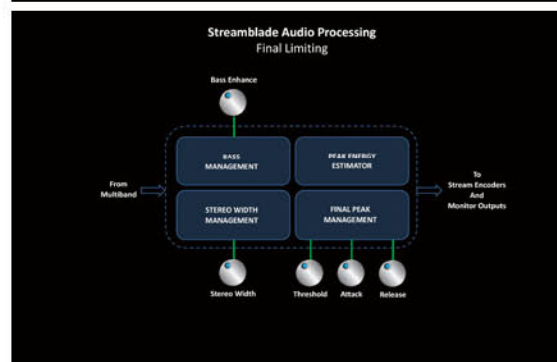
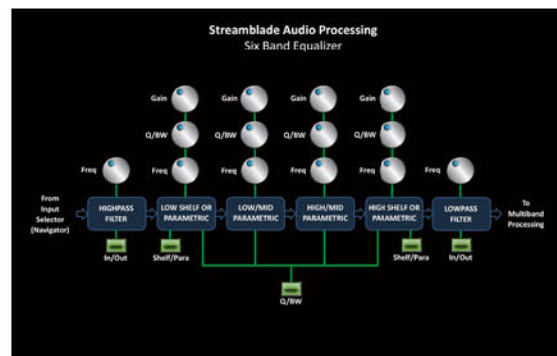
Still, we use audio processing for streaming for many of the same reasons we use processing for our on-air signals.

Those streams need to be processed for level consistency, spectral balance and absolute peak control to keep the codec input level below 0dBFS (there's nothing above 0dBFS but distortion, i.e. you're "out of bits").

Streams require audio processing developed specifically for the limitations and characteristics of codecs, which is why we returned to the processing lab and with the help of our AoIP engineers, designed an AoIP appliance that would do that and more. We introduced Streamblade for our WheatNet-IP audio network users and soon after introduced Wheatstream, for adding on to any existing AoIP network.

These are Linux and AoIP appliances that can stream a few or as many as eight stream instances. In addition to built-in codecs and advanced metadata capability, they include audio processing developed specifically for optimizing the performance of encoded audio.

The AGC and multiband compression sections are codec-friendly in that they anticipate overshoots earlier in the processing chain



in order to avoid the thick program density that can set off issues with the codec. The five-band AGC is designed to eliminate aggressive RMS attack times that can interfere with codec performance. A Predictive Dynamics Controller utilizes Neural Network techniques to manage each band's gain for extremely natural management of program dynamics. Sophisticated algorithms utilize current and historical data to steer the processing to exactly what is required at that instant.

For the occasional peak that might go over the recommended peak input level of -3 dBFS for most codecs, our [Streamblade/Wheatstream](#) appliances rely on dual-band limiting rather than clipping to do the heavy lifting. Clipping by nature creates additional harmonics that the codec re-appropriates as distortion and is therefore not recommended for peak control of streamed content.

Final limiting occurs separately in two bands, above and below 180Hz, which can be helpful when balancing perceived quality/loudness against finite bitstreams. For low bitrate streams especially, separately managing low frequencies means being able to selectively remove low frequencies in the stereo difference channel (L-R). This leaves more bits available for encoding those frequencies that are more perceptible.

All of these processing techniques come together to help the codec perform better downstream.



THE STREAM MACHINES

Streamblade & Wheatstream



Stream up to eight programs at once, each with four outputs for a total of 32 streams. Stream all or just a few and add on later.

- All-inclusive Linux and AoIP appliances. No Windows® audio drivers, updates or PC needed.
- Full suite of audio processing tools developed specifically for streaming.
- Selectable AAC, MP3 and Opus encoders target high to low bit rates for reaching a broad range of end user devices and players. No additional hardware/encoders needed.
- Metadata agnostic. Lua transformation filters adapt metadata input from any automation system into any required output format for streaming of song title, artist and artwork data.
- AoIP appliances. Add Streamblade or Wheatstream to your existing system including WheatNet-IP or any AES67 compatible network.
- Cloud-ready for the future, yet compatible now with standard CDN and streaming platforms. Supports HLS, Icecast, RTMP, and RTP streaming protocols.

Getting The Most Out Of Sports Streams

Subtle audio details such as crowd ambiance and ball throws are critical to the sports radio experience.



Unfortunately, aggressive compression can create distortion that masks those subtle details, or worse, cause the streaming encoder to allocate bits to that distortion instead of to the desired program content.

Our AoIP streaming appliances **Streamblade** and **Wheatstream** use neural network techniques to precisely apply the right amount of processing to select passages in order to provide consistent loudness and density from one program element to the next without adding distortion.

Precision processing is important for all streamed content, but it is especially critical for sports related content, which has a much higher than usual noise level. Depending on the acoustics of the stadium, noise can vary between 94 decibels (as loud as a lawn mower) and 108 decibels (the revving of a motorcycle engine).

In addition to neural network techniques, Streamblade and Wheatstream AoIP appliances use a two-band final limiter to effectively hold audio below 0dBFS, the point at which digital runs out of bits. This is why our AoIP streaming appliances are able to manage pop flies and other peak overshoots without the “pumping” or other artifacts that can further degrade the quality of audio passing through the codec.

Metadata, Madness And Lua Filters

Woe be to those who try to get metadata out of the automation system and into a format that is suitable to the CDN.

That’s because there are no standards, or rather, no format standards we can count on as of yet.

CDNs each take similar but slightly different metadata formats, as do automation systems. Song title and artist name readouts, local commercial inserts, station IDs and promos – all that metadata needs to flow from the automation to the content delivery system for streaming out to listeners.

How we solve this problem is by using Lua transformation filters to adapt metadata input from any automation system into any required output format for transmission to the CDN server. “There are certain format commonalities, but the details don’t always match up so it requires a little bit of coding,” explained Wheatstone Senior Development Engineer Rick Bidlack, who has been working with broadcasters on formatting metadata specifically for individual CDNs.

Lua filters are a big part of what makes it possible for streaming appliances like our Streamblade and Wheatstream to put out accurate metadata along with program streams.



Streaming. The AoIP of it all.

Chris Verdi was one of the first to use an AoIP appliance strictly for streaming

Internet radio predates AoIP by a decade, and it's hard to imagine what those early years of streaming were like for broadcasters such as Great Eastern Radio.

Today we can siphon two or four or eight program channels straight off the station's AoIP network like it's nobody's business, each processed specifically for streaming and delivered to the CDN along with relevant metadata.

But before AoIP, streaming required so many dedicated computers and "for a long time it was whatever processor was sitting around," said Chris Verdi.

He's the chief technology officer for Great Eastern Radio LLC, a regional broadcaster in West Lebanon, N.H., now streaming 19 radio stations.

"There was a point in time when we just didn't have any more old Compellors or Optimods, plus you couldn't get any kind of streaming consistency or quality through them," he added.

Multipurpose AoIP processors like Wheatstone's Aura8IP used for cleaning up mics and mixes provided a stop-gap measure.

Verdi bought one and added it to his Wheatstone TDM router for streaming a half-dozen music channels out to the CDN. He was still maintaining PCs for streaming and having to keep up with Windows updates and drivers, but



Writer Dee McVicker

The author is affiliated with [Wheatstone](#), which manufactures the WheatNet-IP audio network.

life was good.

Soon enough, Great Eastern Radio had amassed an online following and was adding to the bottom line as a result. The regional broadcaster was streaming regular programming, with 16 transmitters putting out everything from Red Sox games to Classic Rock in greater New England and another three on the tourist island of Nantucket off Cape Cod.

All joined the Apple and Google ranks, going from a player app for each station to a single player app for all Great Eastern Radio and another for its Nantucket stations that you could download off of Apple and Google app stores.

Streaming had arrived, and Verdi, along with other broadcasters, was now becoming acutely aware of what those streams actually sounded like.

Too often, streaming codecs were spitting out distortion caused by the aggressive processing techniques used in the past—and worse, it was at the expense of quality program content. Processing designed specifically to optimize the performance of codecs was still in development, along with ways to handle song title, artist and other metadata.

Meting out metadata

Taking a page out of the RDS/HD Radio playbook, Great Eastern Radio scrolled song title and artist data on player apps along with regular music programming and added in the occasional weather update or sports score between

“Soon enough, Great Eastern Radio had amassed an online following and was adding to the bottom line as a result.”

“What used to require a row of computers for streaming and another PC for metadata along with an audio processor for each channel was now contained in one Linux appliance.”

stop sets. More and more frequently, they would tag a sponsor or scroll an advertiser's slug line, phone number or website.

It made sense initially for Verdi to capture RDS/HD Radio metadata and process the PAD data through Arctic Palm's Center Stage program for the formatting needed by their CDN provider Securenet, which would then send the metadata and program streams onto the Great Eastern Radio online app at various bit rates. "That worked, using Arctic Palm. But that meant another computer to run Arctic Palm," he said.

Later, he would bypass the Arctic Palm and pull metadata directly from the Nexgen automation system using a new AoIP appliance called Streamblade, which uses Lua transformation filters to adapt the data to the format required of his CDN provider. (CDNs each take similar but slightly different metadata formats, as do automation systems.)

Verdi was one of the first to use an AoIP appliance strictly for streaming. He had added a few AoIP access units to the TDM routed studios in New Hampshire and had talked to Wheatstone about an appliance to handle multiple stream instances, metadata and audio processing. What used to require a row of computers for streaming and another PC for metadata along with an audio processor for each channel was now contained in one Linux appliance that hung off his studio's WheatNet-IP audio network. No more Windows drivers, updates or PCs needed.

Cutting its streaming ties to the PC meant Great Eastern Radio could not only stream multiple instances from one RU, but also easily add an occasional channel for a sporting event or seasonal promotion.

"At Christmastime we added a button with all Christmas music that our sales sold exclusively to six or eight sponsorships. We will also be adding high school sports so we can stream out those games to the parents of kids in sports without taking up a lot of air time. And with

Dartmouth college games, Dartmouth alumni will be able to hear the latest game from wherever they are on the offseason," said Verdi.

He can send encoded OPUS or AAC audio direct to the group's player app using Streamblade along with his regular streams to his CDN for distribution to the players.

Processing the stream

Being able to process each of those stream instances separately and specifically according to the rules of streaming codecs proved to be one of the biggest benefits of an AoIP appliance.


"This is really the first time we've had processing made for streaming, and that's giving us far more control over how to make the bit-reduced stream sound good," said Verdi.

Specifically, aggressive limiting and other similar techniques used in on-air processing can be problematic to codecs, causing them to multiply limiting distortion and other byproducts to the point of being objectionable and often at the expense of removing frequencies that add to the quality of music.

Instead, Streamblade, which has a processing chain for each individual stream instance, adapts to incoming programming on the fly to process where and when needed to eliminate the aggressive processing that can interfere with the performance of the codec.

Great Eastern Radio continues to expand streaming to augment radio.

"Most fascinating to us, besides the streaming numbers and who's listening, is where they're listening from," said Verdi. Tracking Dartmouth college alumni and Nantucket summer visitors in the offseason indicates that Great Eastern Radio stations are going home with their listeners.

"We don't see streaming as ever replacing terrestrial, but we do see it as being integral to our future," he said. "If the two work together, both can be very effective." 

Below
Wheatstone
Wheatstream





INTRODUCING TIELINE'S NEW GATEWAY 4 CODEC

The Gateway 4 is a powerful 4 channel DSP-based 1RU IP codec designed for mission critical live broadcasting applications. The Gateway 4 supports 4 full-duplex audio channels in 1RU and includes support for AES67, ST 2110-30, AES3 and analog I/O as standard. Gateway 4 also supports AES67 and ST 2110-30 interoperability with AoIP protocols including WheatNet, Ravenna®, Dante® and Livewire+™. An optional WheatNet-IP card can be purchased.

Applications

The new generation Gateway 4 delivers best-in-class DSP-based reliability and performance for a range of broadcast streaming applications and is ideal for:

- Remote broadcast applications.
- Studio-to-Transmitter Links (STLs)
- Studio-to-Studio Links (SSLs)

The Gateway 4 provides two stereo connections, or one stereo and two mono connections, or up to 4 mono connections.



Gateway 4 Codec at a Studio Connects 4 Full-duplex Mono Remote Streams

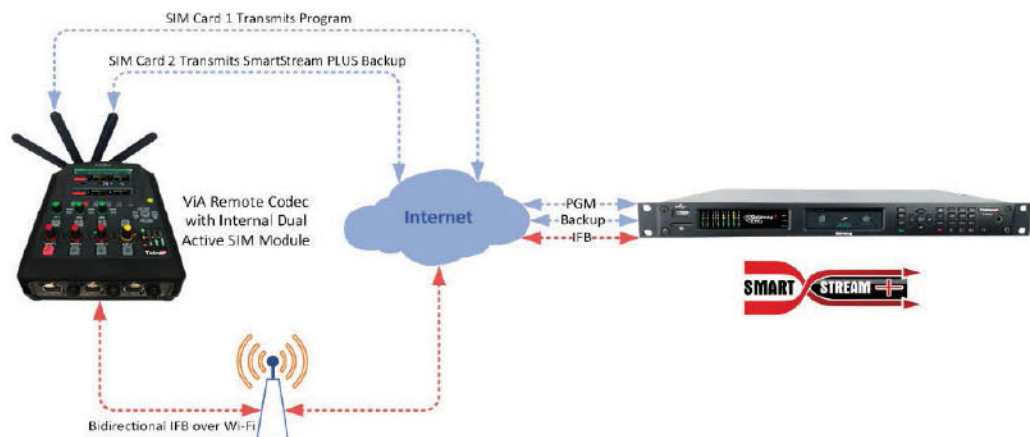
Flexibility and Redundancy

The Gateway 4 seamlessly integrates with all Tieline IP codecs and delivers hitless packet switching using SmartStream PLUS redundant streaming, plus bandwidth aggregation using Fuse-IP technologies over internet connections.

It features dual internal power supplies, dual LAN ports and dual AoIP ports, with unrivalled redundancy features and remote web-GUI configuration and control.

An optional Gateway EURO ISDN module is also available.

More info at www.tieline.com/gateway-4



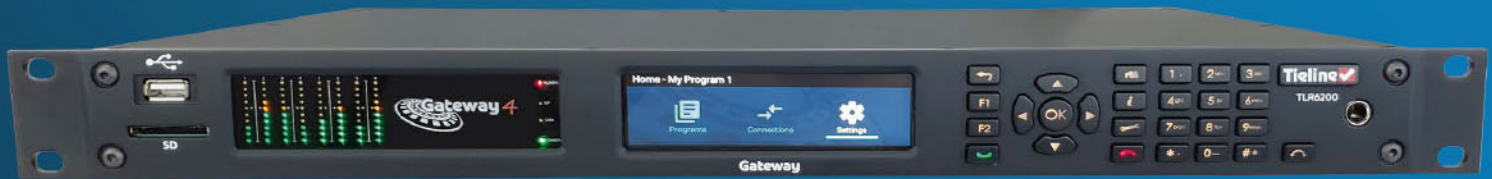
Remote ViA codec streaming bidirectional stereo program audio and IFB communications with Gateway4 at the studio

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Meet our latest audio codec...



The Gateway 4 provides two stereo connections, or one stereo and two mono connections, or up to four mono connections.

The Gateway 4 is designed for solutions requiring up to 4 audio streaming channels* with traditional broadcast connectors, or AoIP standards AES67 and ST 2110-30 straight out of the box.

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* The Gateway 4 codec supports 4 channels only and is not upgradable to support more channels.

Radio should be seen as a platform

Tieline's Ferber says distribution channels must be packaged to succeed



Doug Ferber

Vice president of sales for the Americas at [Tieline](https://www.tieline.com).

Above Right
Tieline Gateway
codec

RW Does streaming need to be a bigger part of the radio business strategy?

Doug Ferber: If you believe that you have to be where the listeners are migrating to, then yes, streaming needs to be a bigger part of a radio company's strategy. At least 10% of a station's listening is done online, and growing rapidly, right? I think it would be a careless decision to ignore this trend.

RW What are the problems radio managers need to solve to become successful streamers?

Ferber: Define successful for me. If success means higher listenership, then programmers should be promoting their streams and creating unique content to capture online listening. If driving increases in revenue from online listening is the measure, I'm afraid I don't have the answer to that question. If I did I'd likely be speaking with you from a big boat on a big lake near a great golf course.

Last I heard nobody makes a profit that is directly attributable to streaming. This is the biggest challenge presented by streaming.

RW It seems that many radio managers still question whether they can monetize their streams. What advice do you have for them?

Ferber: They should support the NAB and hope that their trade organization can negotiate better music royalty deals. Otherwise they will have to treat the streaming as another necessary cost of doing business.

RW What misconceptions do many people have about streaming that you'd like to dispel?

Ferber: There are still radio operators out there that don't believe it to be a critical distribution channel for their content. Remember cable TV in the '70s? How many people do you know today that watch television using an over-the-air signal?



RW Do streaming and podcasting benefit or conflict with one another in a media strategy?

Ferber: I think they are complementary. While I'm not convinced of the commercial efficacy of streaming and podcasting (yet), radio should be seen as a platform ... over-the-air, streaming, podcasting, live events, digital, etc.

Package these up for advertisers and they will reach your listeners no matter which element of your platform that they are using.

RW There was an article in *Variety* with the headline, "As Streaming Dominates the Music World, Is Radio's Signal Fading?" I'm interested to hear your take on this bigger question of radio's future in this world of so many audio choices.

Ferber: The effect of competing media is significant, but what some don't know is that people are consuming more audio in general. Another thing ... not everyone has access to the internet. No internet? You won't find them online. Radio a fading signal? Not yet ... it is still very important to hundreds of millions of people in the U.S. market.

RW Is there a major difference between how commercial and public radio strategize streaming?

Ferber: Public radio is much better at streaming mostly because they offer more local and original programming. Content is king.

RW What does your company offer for streamers and what sets it apart?

Ferber: Tieline specializes in distributing high-quality broadcast audio between remote locations, studios and affiliates with best-in-class AoIP audio codecs.

These codecs currently integrate Icecast client support as one of several fail-over options when distributing broadcast audio signals over all IP network types. In recognition of the importance of streaming, Tieline Gateway and Gateway 4 codecs will also deliver support for HTTP streaming to servers in 2021, e.g. Icecast.

Along with a range of other IP innovations, this will deliver greater streaming flexibility to broadcasters employing a range of streaming applications across diverse radio network infrastructure. **RW**

“Remember cable TV in the '70s? How many people do you know today that watch television using an over-the-air signal?”

Redundancy, failover and quality

Labelle of StreamGuys talks about key concepts to consider



Tim Labelle

Senior account manager with StreamGuys.

RW What key concepts should a streaming manager should be thinking about?

Labelle: Do you have redundancy throughout your signal flow? For example, you can have multiple encoders, multiple ISPs, multiple origins with your CDN and multiple edges. I encourage streaming managers to think about what happens when an ISP goes down, the power goes out and your encoding hardware dies, etc. You can't engineer around every catastrophe, but many causes of downtime can be mitigated.

Failover is the next step. If redundancy is in place, how do your failovers perform? Is it seamless, or does it need manual intervention? Failover at the CDN level should almost always be quick as long as you still have an encoder connected.

Stream quality starts upstream from the encoder, but choosing an AAC codec transported in the HLS protocol will provide the best audio quality and mobile experience — 32 kbps to 64 kbps AAC should sound great.

Keep in mind that stereo streams halve the bitrate, so a stereo 64 kbps stream is two channels at 32 kbps. This is a critical concept if you're broadcasting in MP3 still, because the lower bitrate can really hurt your audio quality.

RW What do we need to know about ad insertion?

Labelle: It's not just about ads. Anytime you need to customize a stream for a listener, ad-insertion technology might be the right fit. That listener doesn't have to be a streaming listener either — it can be a hardware decoder at your transmitter or in a store. It allows you to dynamically insert audio content into a live audio stream or podcast file. That inserted content can be local news, weather, and traffic.

Inserting ads remains the primary use for ad insertion technology, though. Large broadcasters have understood how to use ad-insertion technology for a while. They seem to be widely taking advantage of direct sales and programmatic ad-insertion across their live streams and podcasts. I see exciting growth potential for medium-sized broadcasters who are just starting to enable programmatic.

RW What is the role of metadata, and how will that evolve?

Labelle: Metadata's role is far-reaching. It's used for royalty reporting, song/program display, mid-roll ad-insertion and automatically controlling things like sports blackouts, content switching and turning broadcasts into podcasts.

I expect to see more interest in using metadata for production automation as broadcasters become more

digitally sophisticated. Sports and talk broadcasters have the most to gain by automating blackouts or source switching, and automatically turning live content into on-demand content.

As a sports/talk station you likely already get a contact closure or have data in your playout system when a game or talk show starts. The same goes for ad breaks. It makes logical sense to re-use that work in your post-production workflows by automatically starting the blackout, or recording and preserving those ad-breaks to be re-monetized dynamically. It requires a little engineering but is achievable with off-the-shelf products and services.

RW And do you agree that radio organizations need to make streaming a larger part of their strategy?

Tim Labelle: I agree. Younger generations do not own over-the-air radios as commonly as older ones. New infotainment systems emphasize the digital experience.

The move from over-the-air to digital has been happening for years. We can expect more of it in the future. Radio organizations need to understand that and include streaming as an important component of their business strategy.

RW So how can radio leaders become more successful streamers?

Labelle: Medium-sized broadcasters need a tech-savvy employee who is responsible for streaming. The larger broadcasters seem to have this down, but it remains hit or miss at medium-sized organizations. If nobody at your organization "owns" your streaming, that's a problem.

They should understand your analytics, and how the sales team can incorporate them into a pitch. They should understand your audio signal flow in the facility, and at the CDN. They should be able to explain these things to the rest of the organization.

A streaming provider can somewhat fill this role. However, to be successful at streaming, you need an employee that owns the product and generally understands it.

RW And what services does StreamGuys offer?

Labelle: Hosting and monetization toolsets for live streaming and podcasting. Our automated content repurposing suite enabled broadcasters to repurpose — and re-monetize — audio without additional staff hours. This gives broadcasters a unified platform for delivery, monetization and production of live and on-demand audio. **RW**



StreamGuys

CAPTIVATE YOUR LISTENERS BY PUTTING THEM IN CONTROL

10

StreamGuys' SGrewind brings on-demand flexibility to live streaming broadcasts with the ability to rewind, pause, resume, and restart live streams

The unique value of live radio is undeniable. From news and sports to talk shows, audiences crave the up-to-the-second immediacy that on-demand content simply cannot deliver. At the same time, listeners love the degree of control they get with recorded content.

StreamGuys' SGrewind solution gives audiences and broadcasters the best of both worlds, bridging the gap between live and on-demand content by offering listeners greater control of their live-streamed audio. Consumers can pause and resume streams without missing any content; rewind to hear something they missed; or restart the stream at a specific earlier segment or the beginning of the program.

DON'T WANT TO MISS A THING

The most obvious benefit of being able to rewind live streams is the audience experience. Missed a headline or sports play because of background noise, a phone call, or connectivity issues? Just rewind to hear what you missed. Mobile internet interruptions when getting onto a subway or elevator? Just pause the live stream in the station's mobile app and resume it later. Joined a talk show late and missed important context? Restart from the beginning to hear what you missed.

SGrewind brings huge value not only to radio consumers but also to broadcasters and their advertisers or sponsors. Enabling listeners to rewind live streams means they can hear more of the station's content that they might have otherwise missed, expanding monetization opportunities.

SGrewind is an optional module for StreamGuys' flagship, cloud-based SGrecast podcast management and live stream repurposing platform – the company's revenue-enhancing "Swiss Army knife" solution for recording, reusing, replaying, and rewinding enterprise content. If certain hours of programming can't be rewound for contractual reasons, SGrewind will replace the rewind segments with a looped message about the program being only available live.

SGrewind is CDN agnostic, so even broadcasters who aren't using StreamGuys' CDN for primary live stream delivery can still take advantage of SGrewind's functionality. StreamGuys' CDN will deliver the rewind content, with the main stream still delivered via the broadcaster's existing CDN.

PLAY IT YOUR WAY

SGrewind-enabled live stream control is available immediately in StreamGuys' managed, embeddable SGplayer HTML5 player, helping broadcasters quickly implement rewindable live streams with no development needed. Buttons within the SGplayer interface let listeners rewind, jump forward, pause, or restart the current program, while an Electronic Program Guide (EPG) lets listeners access recently streamed live programs.

Straightforward SGrewind URL parameters also enable developers to seamlessly integrate SGrewind support into their own custom players and mobile apps. SGrewind's live audio rewind capabilities are processed at the server rather than client-side, enabling broadcasters to integrate multiple players and apps with the same rewindable stream without using precious storage on listeners' devices.

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Kirk
Harnack
Senior Solutions
Consultant at
Telos Alliance.

Sound great, promote your stream, be easy to find

Your competition is high-quality audio via any transmission media

RW Do you agree with the premise that streaming needs to play a bigger role in radio strategies?

Kirk Harnack: Eagerly! Consumers can simply say “Alexa, play some Frank Sinatra music” and Ol’ Blue Eyes is there. It’s the same for “Play my wake-up playlist,” or “Hits of the ‘80s.”

Radio broadcasters do have a place in the on-demand audio world, but we’ve got to be right there and offer content worth listening to. Compelling talk breaks, short spot sets and a playlist that just fits the listener’s expectations. Oh, and the audio quality had better be the same or better than our competitors’.

RW Some still question whether they can monetize their streams.

Harnack: Pre-roll sponsorship or underwriting can certainly be sold and implemented. I would caution against full-length ads in a pre-roll; that’s a big turn-off. A short dry-voice pre-roll can be very effective, respecting the listeners’ time and intelligence. Rotating the pre-roll message is critical, so the listener doesn’t learn to tune-out to an announcement already heard too many times.

RW Who does streaming well?

Harnack: Audacy — formerly Entercom and CBS — streams very well, technically speaking. Good audio processing and consistently listenable streams.

RW What misconceptions would you want to dispel?

Harnack: Streaming used to be a lower-quality alternative to over-the-air listening. Now, with sophisticated and widely-adopted streaming algorithms like AAC, HE-AAC and xHE-AAC, listeners can hear audio that’s less processed and perhaps cleaner than your on-air signal.

RW What’s the state of audio quality in streaming by radio organizations?

Harnack: Whether the audio codec used is MP3 or one or more of the AAC family, the right audio processing is essential. Streams must be listenable both in the short and long terms.

Proper audio processing implies using audio processing that is specifically designed to enhance the sound of a psychoacoustic coding algorithm.

Now, speaking of audio codecs, let’s get away from MP3.

Most every modern device on the planet can play the AAC family of audio codecs, and the audio quality is truly better.

Best is to also provide streams in a multirate format such as Apple HLS. Adaptive multirate streaming allows the player to decide which bitrate stream to play, based on current connection speed. This way the listener always gets the best-sounding stream consistent with available bandwidth.

The good news is that last-mile bandwidth to our listeners generally gets better every year. Using a combination of audio processing designed for coded audio, along with an AAC family codec like HE-AAC v2, a bit rate of just 56 kbps can provide a perfectly good “entertainment-quality” experience.

Some stations are experimenting with membership-based streaming wherein the listener gets a high bitrate, like 160, 192 or 256 kbps along with fewer commercials, for a low monthly or annual subscription or membership.

RW Do some of these concepts trip people up?

Harnack: Broadcast engineers tend to get the basic terminology right, but it’s worthwhile to review these basic tech terms:

Sample rate: Usually 48 kHz or 44.1 kHz. This is the number of times per second that analog audio is sampled or digital audio is re-sampled to turn it into the desired digital sample rate. 48 kHz is typically used in professional digital audio systems, whereas 44.1 kHz is typically used in consumer-facing digital audio systems. Commonly, a 48 kHz professional sample rate is converted or resampled to 44.1 kHz just prior to stream encoding.

Bit rate: This is the target rate of digital bits after algorithmic audio encoding. It’s the number of bits per second that represent the coded audio, prior to packetization into a stream. A higher target bit rate results in higher-quality audio playback.

Low bit rates for MP3 or AAC encoding would be around 24 or 32 kilobits per second (kbps) and would have very audible encoding artifacts like a “watery” sound. Medium bit rates might range from 48 to 96 kbps and typically sound reasonably good, especially when the coding algorithm is from the AAC family of codecs, like xHE-AAC, HE-AAC or HE-AAC v2. High bit rates might range from 128 kbps to 320 kbps or even higher.

Toward the high end of bit rates, coded audio can

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Above
A Telos
Z/IPStream
promotional
image.

sound very good. There is an important caveat regarding good quality audio, however; algorithms should not be cascaded, especially if the source material is from a lower bit rate source. The best coded audio is derived from linear audio sources.

Bandwidth: This is the total throughput required of a given stream, and includes the overhead of packetization. Streaming audio data is carried in IP packets, and these require some overhead for addressing, description and sequencing. This overhead is typically about 15%. So an audio stream coded at 128 kbps will require about 150 kbps of total bandwidth through an IP transport.

How are streaming service providers responding to our industry's trend toward virtualization?

Harnack: One way is by offering flexibility in stream sourcing. A broadcaster can change — on demand or by dayparting — where a stream is originating. If a broadcaster wants to “go live” from an event, an encoder at that event location can override the streaming encoder at the broadcaster’s usual facility location.

New AES loudness guidelines plan to improve audio quality by slight reductions in online loudness, which permits — but doesn’t require — a large reduction in dynamic compression.

Harnack: This seems a difficult question and a problematic solution — at least in practice thus far. One consequence of lowered loudness standards has been a huge difference in loudness between adherents and non-adherents. Another problem has been not enough volume available from many consumer devices when “tuned” to a channel that is following a loudness standard that allows for plenty of headroom. Most broadcasters are accustomed to using much or most of the delivery system’s loudness that’s available to them.

Yes, one result can be audio that’s ridiculously over-processed. However, judicious application of audio

processing technologies can result in beautifully processed and consistently delivered audio that’s easy for the consumer to enjoy at whatever volume level they choose.

RW Most non-radio streams present music without added audio processing. Hybrid radio requires its stream to have the same audio processing as that for on-air. If some listeners are turning to original-music sound, would this encourage stations to change how their on-air sound is processed?

Harnack: Indeed, it might encourage stations to adjust their on-air processing for a less dense and packed-up texture. Today’s audio processing certainly allows for consistent loudness and sweetening without fatiguing side effects.

One of our jobs as processing experts is to educate broadcasters that our competitors are far more numerous than our nemesis up or down the radio dial. Our competition is high-quality audio delivered sweetly and consistently no matter what the transmission medium.

What does your company offer for streamers?

Harnack: Telos Alliance offers the Z/IPStream family of stream encoders with built-in audio processing.

Since the early days of internet streaming, too many streams have suffered from varying audio levels. Telos Alliance recognized that proper audio processing is critical to short-term and long-term listenability.

Every Z/IPStream encoder — in hardware or software form — includes sophisticated three-band audio processing and intelligent look-ahead limiting. Internet streams produced by Z/IPStream encoders sound bright and dynamic with excellent level consistency.

Two Z/IPStream family members offer optional Omnia.9 audio processing with Undo and Declicking, providing the cleanest possible audio with even more powerful multiband processing. Z/IPStream encoders also feature built-in customizable metadata parsing or filtering, giving listeners consistently readable metadata text for song title, artist, branding and additional messaging. **RW**

“With sophisticated and algorithms like AAC, HE-AAC and xHE-AAC, listeners can hear audio that’s less processed and perhaps cleaner than your on-air signal.”

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Remember, we are in the content delivery business

Consider the benefits that streaming technology offers you



Writer
David
Bialik

The author is a consultant and co-chair of the Audio Engineering Society's Technical Committee for Broadcast and Online Delivery. He is former director of stream operations for CBS Radio and Entercom.

Radio broadcasters are beginning to wake up and treat their streams as another avenue for content delivery. Consider some of the benefits — to sales, programming and your overall business plan — of having an active and well-maintained streaming presence.

- For many years, salespeople at radio stations have wanted to know where their listeners are physically located. With streaming this is possible. Yes, you have the capability of geo-locating the IP addresses of the listeners of your stream.
- For many years, station ownership and talent have wanted to know how many listeners there are at any time. With streaming analytics this is possible. You can even learn what type of device they are listening on.
- With direct ad insertion technology, as long as your ad inventory is abundant and your metadata is correct, commercials can be targeted to the individual, based on browsing history or location.
- Over-the-air broadcast commercials can easily be substituted on the stream, also enabled by metadata.
- Streaming allows you to surpass your licensed coverage area. A listener can hear the same radio talent throughout the country without changing frequencies on a radio.

Stations are realizing that the stream has different needs and parameters than the over-the-air terrestrial broadcast. For example, the audio processing is different. No more loudness war! Streaming is now a destination!

Here are some additional thoughts about how to get the most out of your streams.

Opportunity for quality

Loudness levels should differ between broadcast and your streams.

Programmers traditionally want their broadcast signals to be the loudest in the market and stand out to a listener scanning the dial. Streamers are realizing that they can deliver clear, enjoyable audio with an audio-processed signature and still be within the loudness recommendations of the Audio Engineering Society of -16 to -18LUFS.

For the best listening experience, you should normalize the loudness levels of commercials that come from

“For many years, station ownership and talent have wanted to know how many listeners there are at any given time. With streaming analytics this is possible.”

Getty Images/Ryan McVay



multiple sources to match the rest of your content.

Streamers also have the ability to deliver their content at different bit rates. Whether bit rates are 16, 32, 64, 128, etc., the station can deliver multiple or single streams. A station can design the app on which the listener receives its stream. If your target listener is paying by the amount of data being downloaded, you can provide a low-bandwidth stream. If you are providing music, you may want to provide a 64- or 128-bit stream to sound all the better.

Streamers feel they have to be carried by an aggregator; but the aggregator may replace the ads, run a pre-roll promoting another station or somehow redirect the listeners that have tuned in. Is the aggregator the best solution for you? Do you want to be listed with your competitors? Does this bring in new listeners? Would you be better with a standalone application?

Podcasts are a way that a station can promote their talent and package advertising. This is reselling content inventory the station already has, creating more avails. Revenue should increase.

Streaming requires thought. How does the station want to be presented?

We can do better

I wrote above that radio broadcasters are beginning to realize the potential of streaming, especially at the largest corporate level. But all too many stations still care for their terrestrial broadcast content while treating their stream as

an afterthought.


Yet nobody can argue that the public is unaware of the stream. Many people work or own computers where they can listen; the smartphone revolution has enabled the public to be mobile and hear the stream; smart speakers and digital assistants have infiltrated our homes.

When someone asks their speaker to play their favorite station, they are listening to the stream!

The stream of a radio station in New York is now competing with a stream in Wisconsin or California. This should cause stations to up their game, but in my experience, this is not happening nearly enough. Sales people are having issues selling the streams (many don't understand the difference between AM and FM, but that is a whole other issue).

Many professional sports leagues don't allow coverage of the games to be heard on the streams of their broadcast partners, choosing to stream on their own apps. Why? Because the value is apparent and the station didn't fight for it.

The lesson is that radio managers and staff should give equal attention to their digital offering. Professionals in our industry need to replace the concept of "radio" with the concept of "audio," and realize that streams and podcasts give them far more ways to package their products and to serve their clients.

A broadcaster is in the content delivery business, whether the content is delivered by an encoder or a transmitter. 

Below

Whether on their computers, smart speakers or phones, consumers expect to be able to find your content.



“We are just at the beginning of what is possible”

Brader of Barix says it's crucial to strategize for the non-linear consumer

30



Reto Brader

CEO of
[Barix AG](#).

RW Comment on this statement: “If radio organizations want to succeed in the new wider world of audio, streaming needs to be a bigger part of their business strategy.” Do you agree?

Reto Brader: Absolutely. I believe it is only a question of time when even every car will be connected permanently to the internet, making streaming the predominant way of distributing radio content in the near future.

However, streaming is not just another way of distributing a radio program. A “streaming” strategy must include the possibilities that the internet and IP infrastructure opens up to broadcasters. A large variety of add-on services become available, and this is

where radio needs to be creative.

Location-aware content with a resolution much beyond what broadcasters support today, interactivity and cross-platform connectivity are just a few of these creative services.

We are just at the beginning of what is possible. Broadcasters do have these ideas but with internet connectivity; finally the technology is here to implement them successfully.

For example, DAB+ can send graphical content to the car radio. From my point of view this is clearly a great idea with plenty of potential. Unfortunately, this was ahead of technology. and DAB+ is not the technology to deliver that. IP streaming is, however.

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“A ‘streaming’ strategy must include the possibilities that the internet and IP infrastructure opens up to broadcasters.”

The display could also be used to bridge the gap between media by showing QR codes, or any other code like vouchers, so it works well to support promotions on the radio.

An even fancier application would be to implement live games, where people connect with their smartphones to play together on air.

RW For streaming success, what are the biggest challenges that radio managers need to solve?

Brader: The younger demographic consumes audio and other content in a non-linear way. They listen to content segments and use referral to jump to the next.

I am more than 50 years old and I consume linear radio most of the time in my home or in the car. My adult children however, while consuming much more audio and video content, do this in a non-linear fashion. That includes radio broadcast segments, sports and music and is truly cross-platform. There is no barrier to jump from a local TV soap to Netflix to Spotify and to some YouTube videos referred by friends in a social media channel.

I believe the challenge for broadcasters will be about how to distribute their content successfully and reach the audience (and advertisers) in this increasingly non-linear consumer world.

A key topic for broadcasters is a cross-platform strategy. A first step is to bring your radio into the internet. However, that is just the beginning.

RW What are the misconceptions about streaming?

Brader: By some, streaming is seen as just another means to deliver the radio signal to the end user. This can be done, and solutions exist. They

ignore the abilities, beyond the classical unidirectional anonymous distribution that broadcast used to be.

It is vital for broadcasters to explore new capabilities in terms of client interaction, visual content and non-linear information access when defining their streaming strategy.

RW I'm interested to hear your take on the bigger question of radio's future in this world of so many audio choices.

Brader: Broadcasters have different assets: They have the connectivity to the listener, they have unique content of interest and they are professionals in how to package content to deliver it and sometimes they have a brand. The “streaming” strategy needs to explore all these assets.

Broadcasters need to approach technologies differently to survive. Once you stream, you are part of the internet. This means broadcasters compete with other content provisioning. But more important, it means they can take advantage of all the new services out there.

No longer is the question about which technology is best. The question is: Who can help me trial and measure my new ideas quickly?

Technology is changing fast these days, and with the right partner everything is possible in a short period of time. Some broadcasters are used to equipment and solution providers that work at the pace of the 1990s. Making a codec took years of development. Today a new codec or new function, such as a metadata extractor or intelligent failover play-out device, can be implemented in weeks or months with the right partner such as Barix.

RW On that note, what does your company offer for streamers?

Brader: Barix is a leader in audio over IP encoding. We bring audio to the internet and the streaming world.

A key differentiator at Barix is our agile product development and fast proof-of-concept cycle. Innovative broadcasters around the world come to Barix to contract us for providing proof of concepts and later on implementing new solutions and ideas when it comes to audio over IP distribution.

What future solution for broadcasters will succeed? Nobody knows. The answer is found by “trial and measure.”

The times of extensive new technology planning on some formal broadcast association level are gone when it comes to streaming and the internet. Key in today's world is not only to be innovative, but mainly to be fast: fast in trialing and fast in adopting new ideas. This is where Barix is a true partner to our broadcast clients in this brave new world. **RW**

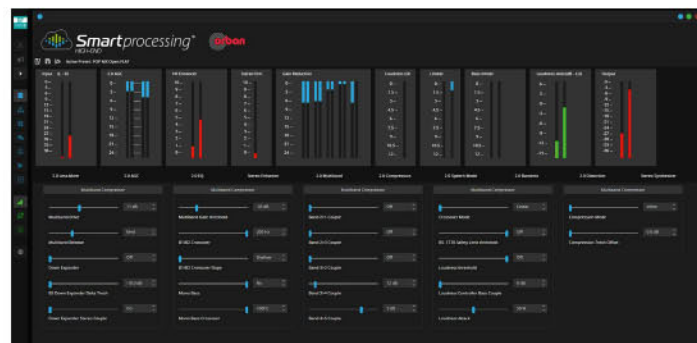


SMARTRADIO ADDS A BRAND NEW SMART "FORMAT" SCHEDULER

SMARTRADIO - RADIO-AS-A-SERVICE

Hilversum, Broadcast Partners from The Netherlands develops SmartRadio, a modern radio-as-a-service platform. "SmartRadio is designed to help media companies with digital transition..." explains Rene van de Kolk, Manager R&D at Broadcast Partners. "Our main objective is to create a dynamic, hybrid, fully cloud-and web-based innovative platform that could create, edit, and publish audio content to anywhere on the planet, on any platform. Companies often invest in costly hardware, software, and personnel that have been made redundant after a short time. So why not create a more flexible complete new hybrid solution and start multiple online streaming channels besides your main radio channel?" For optimal streaming services SmartRadio recommends the recent launched Dutch Media Exchange.

"To stay relevant and stay under budget, great thought needs to be put into every Euro spent, investing in solutions must be scalable, flexible, simple to use and affordable" explains Christiaan Pladdet, Sales Manager at Broadcast Partners. "Just being on-air or online isn't enough anymore, you have to test various marketing channels on multiple platforms, evaluate available data, and chose what works best for you."



SmartRadio consists of various API based microservices. These microservices run in a virtualized cloud environment, and can be set up to offer tailor-made solutions for our customers. **Smart Database**, **Smart Playlist**, and the **Smart Non-Stop Player**. The Smart Non-Stop Player can be monitored through a very user-friendly web interface. An overview of all playlists and hours can also be seen. If desired, mix points can be adjusted, without latency, in the **4 channel Multitrack editor** in Chrome browser. Most recent add-on is a full option web-based **Smart "Format" Scheduler**, to define your unique format and schedule in a very user-friendly way multiple radio-stations.

To create a unique, world-class sound **Smart Processing** is available. This innovative product, cloud- and web-based audio processing, created through a **unique collaboration between Broadcast Partners and Orban Labs**, enables stations to make their own audio choices through the Smart Processing web interface. For this, Orban has supplied its software which uses its unique algorithms. This software is comparable to Orban's hardware products.

Christiaan Pladdet (SmartRadio Sales):

"Broadcast Partners is very proud to have delivered innovative SmartRadio services already to several clients worldwide. The SmartRadio platform creates a variety of possibilities and solutions for both program makers and engineers. For more information, visit www.smartradio.nl or e-mail smartradio@broadcastpartners.nl



Radio has unique strengths

Van de Kolk says audiences are looking for your brand on multiple devices



Rene van de Kolk

Manager R&D
at [Broadcast Partners](#).



How important is streaming?

Rene van de Kolk: Radio organizations should deliver audio to multiple platforms to stay relevant. FM, DAB+ or HD Radio, and streaming. A hybrid environment. Audiences expect their favorite brands on mobile phone, laptop, car radio and a receiver at home. Besides linear, I strongly believe in delivering more on demand so the audience can decide where and when to listen to their favorite content on multiple devices.



What are the biggest problems managers need to solve?

Van de Kolk: The challenge is to have a good evolving business case — on the one hand, delivering on multiple platforms, knowing the audience is more divided; and on the other hand, managing the operational, staff and equipment costs that come when an organization launches more channels. Successful digital strategies require cooperation with innovative partners but also need to be affordable.



We saw a piece in Variety with the headline, “As Streaming Dominates the Music World, Is Radio’s Signal Fading?” It was focused on music labels but it also talked about programming staff cuts in radio and overall changes in how people consume audio.

Van de Kolk: Music labels can promote their product of course; they can also create a playlist on Spotify, they can even launch a temporary channel by using SmartRadio services. But the added value of radio is that they can create unique content and stay in touch with their audience.

Many creative people are working at radio stations. The DJs or hosts work with music, news, variety and listener interaction. In my opinion radio is alive and will be successful through unique and relevant audio content distributed on several platforms.

There’s great opportunity in recognizing these developments using affordable hybrid as-a-service software solutions to produce and distribute multichannel. On a daily basis I receive feedback from markets in Europe moving in that direction.



Is there a major difference between how commercial and public radio entities approach this?

Van de Kolk: The major difference is based on their KPI goals. In a commercial environment, of course, commercial targets are more important. Data insights from streaming platforms can tell you about reach and listening time in multiple ways.

SmartRadio is working with the best streaming platform in the Netherlands and recently combined streaming, distribution and publication services in the Dutch Media Exchange. Relevant and detailed data of streaming is available to all clients.

For both public and commercial managers, data should provide relevant information about success, engagement, relevancy, shares, comments and likes. That info is key for stakeholders. Data is key to remain relevant and can be used to optimize your production workflow and to deliver tailor-made solutions.



What do we need to know about ad insertion?

Van de Kolk: There’s a lot to tell, but in the case of SmartRadio, pre- and midroll are supported.

My experience has been that advertorials on streaming audio channels are organized in two ways: by connecting to a streaming platform with an integrated ad platform, or by scheduling an ad in the scheduler of an existing production environment at radio organizations. In SmartRadio both are possible.



What is the role of metadata, and how will that evolve?

Van de Kolk: Metadata can add extra engagement with the listener by adding relevant info about music, weather, station information, even a picture of a Coca-Cola bottle on the screen during the ad. Visual radio is also

“Data should provide relevant information about success, engagement, relevancy, shares, comments and likes.”

increasing rapidly worldwide, and most of the integrations are based on reusing metadata information. So for streaming stations, metadata absolutely adds value and functionality.

RW How are streaming service providers responding to the trend toward virtualization?

Van de Kolk: Streaming providers are focused on their own business, improving services and service levels and adding new innovations.

The virtualization of broadcasting services is interesting and real. With SmartRadio we provide these solutions from our Broadcast Partners cloud environment. All products are in fact microservices, standalone, connected by an intelligent data model. This API can be connected with the streaming provider environment and provides a future-based product. We can develop tailor-made solutions as well. In the Netherlands we are working closely with Jet-Stream in the Dutch Media Exchange.

RW What's your projection for the uptake of hybrid radio, in which station streams are an important part of the technology?

Van de Kolk: Hybrid radio can be useful, but it all depends on the availability of other services and on development in various automotive brands. If FM or digital radio is fine in coverage, and if many radio stations are available on-air without extra costs or extra devices required, then a listener is fine with that.

RW New AES loudness guidelines plan to improve audio quality of online content by slight reductions in online loudness, which permits a large reduction in dynamic compression.

Van de Kolk: I am an R&D manager on the provider side, working for Broadcast Partners in the Netherlands with clients all over the world, not at a radio station or publisher where content is produced. But I strongly believe that the quality of sound is the responsibility of the producer, the radio station or the publisher. We can provide them with smart solutions to obtain the best quality audio. AES loudness guidelines, I have never been a fan of that.

RW Online, on-demand services and other non-radio music streams generally don't add audio processing. So thinking about hybrid radio, which requires the stream and OTA content to have the same processing, will this prompt stations to change their on-air processing approach?

Van de Kolk: This is important: Let the customer decide



whether they want to listen to on-demand services or to radio.

In my opinion, audio processing is part of radio. It adds so much extra value. The power, the sound, the levelling, the way a transition is made between songs with a jingle. The DJ or guests are always loud and clear. Audio processing is key in radio. It gives a unique signature to your brand, to AC, CHR, news/talk or full-service formatted radio.

Hybrid radio solutions may demand tailor-made audio-processing solutions. All platforms can and should have their own processed signals, FM, DAB+ online, HD Radio.

RW And what does your company offer for streamers?

Van de Kolk: With SmartRadio, we provide a modern, innovative cloud- and web-based solution to publishers and radio organizations that want to add or launch one or more (temporary) radio channels. It can be integrated to existing environments with an API connection as well.

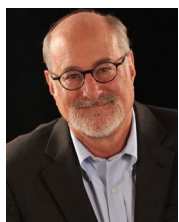
SmartRadio works as-a-service, meaning monthly costs are based on the functionality used, for example Payout, Scheduling, Content Delivery Network, Watchdog and Smart Processing.

SmartRadio can be provided to public- and private cloud-based environments directly from Broadcast Partners' private cloud, but also on-prem at the server environment of a radio organization.

It provides maximum flexibility and decreases operational costs. Connectivity with other products is possible as well. In the platform, Smart Processing is available. The famous Orban sound is exclusively available for streaming and digital radio as well in three different options, 100% software based and available in the highest possible audio quality.

All SmartRadio and Smart Processing can be defined by the user in the Chrome browser. RW

Above
SmartRadio user screen with Smart Database, a cloud database for multichannel production.



Steve Goldstein
Founder/CEO of [Amplifi Media](#), whose consulting clients include Dave Ramsey Media and Beasley Media. He was founding partner of Saga Communications and its EVP/group PD from 1986 to 2015.

Innovate across platforms for success

Bridging broadcast and podcasts, Steve Goldstein says radio should play to its strengths

RW What are your thoughts about streaming right now?

Steve Goldstein: Streaming audio is growing, and with the friction of listening in car becoming less of an issue, it will get even larger, especially with younger audiences.

When I think of radio stations repurposing their linear broadcast content into a stream, I view this as a fail. Only

about 10% of a radio station's audience is listening on any digital device. That means 90% are still listening in a traditional broadcast form.

That either is a fail or an opportunity, depending on one's perspective.

RW Conversations about digital always seem to be accompanied by the caveat, "Well, we're not really making money at it yet, but we will someday."

Goldstein: I think it's a great opportunity, but a lazy solution.

The stream can be used to do way more than just take the broadcast and put it onto different speakers.

During the pandemic, it's great having this content on smart speakers and other devices. But what else can a radio station do?

They can create custom streams, they can take Some of their most valuable content and chop it up into bite-size pieces for later use. The audience expectation is on-demand content — that's what we do primarily at Amplifi, we focus on on-demand content, which is what podcasting is. It's aligns really well with how people use smart speakers. We work with clients developing content that fits with smart speakers, which tends to be short-form.



national radio audience is 47. That's a big difference. I have a client who puts the show out on the radio but also makes it available in podcast form; there is a 12-year difference between the broadcast version and the podcast version.

RW As you speak to radio clients, what misconceptions do you think that they bring?

Goldstein: Many of them don't think that podcasting is a lucrative business. They don't, unfortunately, have the capacity. There are few people in the hallways of a radio station, so who is going to take responsibility for something like podcasting which is new and requires curation?

RW Your advice, presumably, is to make sure somebody has that explicit responsibility?

Goldstein: I think it's essential.

The TV business forever was all about the primary networks. They saw their consumption levels drop when cable networks came about. Bob Wright, who was the chairman of NBC, built up its cable networks like MSNBC, CNBC and later The Weather Channel.

Now you see NBC and the other networks developing apps so that their content is available in the form that's appealing to consumers: on-demand on multiple platforms.

The future of the networks is streaming and creating content for these devices.

I find it to be useful to stop talking "radio" and start talking about "media," and you can more easily see the trends that are occurring.

RW And yet I continue to hear broadcasters say, "I'm really having trouble monetizing this."

Goldstein: Some ideas will pay off, many will not. But failing to experiment means nothing pays off.

There's two ways to view this, one is growth and the other is retention.

Retention would be that client who has a podcast version of their broadcast show and draws significant audience for the podcast with a different audience.

"Wait, Wait ... Don't Tell Me" in broadcast form does 2 million listeners; in podcast form it also does 2 million listeners but not the same people. They've actually grown "Wait, Wait" by being on other platforms.

Until you invest in projects, there's zero chance of making any money on it. I understand sales dollars chase ears; if you're not seeing the revenue right away, it can be frustrating to continue to invest. [But] I don't know how to short-circuit that.

RW Can you point to other examples of radio companies doing this well?

Goldstein: The client that I was talking about was Dave Ramsey. Ramsey Solutions has the fourth-biggest syndicated radio show and also the fourth-largest podcast in the United States. It just passed 1 billion downloads. But

The whole broadcast even could be made available in more bite-size form.

It's much more about using one's imagination, coming up with audio that's focused on the needs and desires of how people consume today.

I have three science projects, a 31-year-old, a 29-year-old and a 22-year-old. When I watch them, I learn an awful lot. My 22-year-old listens to a lot of NPR podcasts but would not know how to find the NPR radio station in Connecticut. He's an NPR listener, but a different kind of NPR listener.

RW We tend to hear about digital initiatives of large entities — iHeart, Cumulus, Audacy, NPR. How do you have the conversation with companies that don't have those kinds of resources?

Goldstein: For several years, broadcasters have been focused on paying debt and just making the month of May. The pandemic accelerated some of those concerns.

Every broadcast company needs to be doing science projects, thinking about their future. They need a little bit of Q from the James Bond movies inventing new things. It has become more essential for all broadcasters to think in terms of innovation, especially as we're talking about a younger audience.

The median age of the podcast audience is 34, while the

the Ramsey audience that's listening in podcast form is not the same that listens in broadcast form. So they have positioned themselves well for the future — and they are monetizing that.

RW What do we need to know about data analytics to better leverage that tool?

Goldstein: The data is richer in digital, and it's evolving rapidly.

On the podcast side, when I got into this six years ago the only way an ad ran was what they call baked-in. The host read the commercial. Today, you can do ad insertion just as has been done on the streaming audio side for years. You're able to take the stream audience and the podcast audience and aggregate that data in a sales effort that becomes bigger and richer.

That wasn't available 18 months ago. That's how fast it's changing.

RW And we hear about digital audio marketplaces where advertisers can buy across platforms and across campaigns. It's becoming more of an institutionalized process, it seems.

Goldstein: All you have to do is look at how companies have stacked themselves.

SiriusXM, which forever was a satellite company, is a satellite company, it's a streaming audio service via Pandora, it's a podcast company through its acquisition of Stitcher and Midroll. And they are able to cross-platform a lot of content on all of their different assets. Oh, and they own AdsWizz, the largest programmatic piece in podcast and streaming audio.

So they're able to become a full-spectrum audio solution. You're seeing that replicated differently, but similarly, with iHeart and everything they've put together brilliantly on the streaming and podcasts side and the app —with Triton, Spreaker and Voxnest.

They've built a beautiful portfolio of assets. They have their challenges in terms of adoption; not so many people are listening to their streams on their app or other devices; but they are now becoming more of a 360 audio store, which makes a great deal of sense.

We should mention Spotify as another aggregator of content in streaming and on demand, they are a huge force.

RW I hear often that the issue of audio quality is a nagging one.

Goldstein: Fidelity or sequencing? I've been out of that operationally for ears. Six years ago, there was a tremendous amount of upcutting, and the same spots running in every break, it was not a very pleasant experience.

I've seen many initiatives to improve the fidelity of audio, but consumers value portability way more than features such as spatial audio or enhanced sound. Having a thousand songs in your iPhone is where the consumer is likely to be for a long time.

RW How will this conversation evolve in the next two to five years?

Goldstein: Radio is a lean-back medium, they produce a lot of great content. Podcasting is a lean-forward medium; its challenge is getting people to find the content, download it and listen to it.

Both are good. Both are viable models, but they're essentially different. Radio's opportunity is taking some of that lean-back content, the great sportscasts or talk shows, and making it available in a more easily digestible, easy-to-understand method.

RW And again for the reader who is not Bob Pittman or Mary Berner, what's their best approach?

Goldstein: Look, local radio has an advantage, and it really is their primary marketing advantage: They can surface local content. And that's becoming harder to find.

As newspapers go away and newsrooms are cut, there is a limited opportunity to serve the local marketplace.

If I'm guiding a mid-sized radio company today, I am protecting the local content, knowing that the bigger guys are going to have a tough time doing that. The big guys will scale their content, but that creates the opportunity for the medium and smaller radio broadcaster.

RW Glad to hear you talk about localism. I can't help but feel we continue to move away from that with what some of the bigger companies are doing.

Goldstein: What other opportunity does a local broadcaster really have if not local? And they need to be local beyond the simple stuff. Mentioning the weather forecast and the fair going on this weekend is just a starter, they need to be able to cover issues.

Isn't it crazy when you think about newscasts for Columbus, Ohio that come out of Detroit?

I was at a dinner with Jarl Mohn, who was running NPR at the time. There were other people at the table. He said, "If commercial stations are going to divest of their local news effort, we at NPR are going to double down on that. We will be the local news source." And that's paid off for them significantly. I think there's a lesson in there for local broadcasters. **RW**

“I find it to be useful to stop talking about ‘radio’ and start talking about ‘media.’”