

ATSC 3.0 Audio: A Big Bet?

Competing technologies turn up the heat

BY IAN MACSPADDEN

PHOENIX—It's been nearly two decades since the first version of ATSC 1.0 was adopted, setting the standard for digital television today. With this advancement came additional new technologies to distribute audio and video in digital television, which at the time was the dominant form of media consumption.

Today there are more mobile devices per household than there are televisions. During this transition for broadcasters, an updated standard is about to be approved that will not only greatly improve the television audio experience, but may provide broadcasters the technology pathway to compete against OTT delivery and reach into the mobile viewership market. The new standard of ATSC 3.0 promises cinematic quality audio and video for home viewing and an efficient enough codec to provide an immersive viewing and binaural audio experience for mobile device users on the go.

INDUSTRY INFIGHTING

The new standard for broadcast distribution will be called ATSC 3.0 and it's a high stakes bet on a technology that may make or break traditional broadcasting (see "ATSC Sounds Out 3.0 Audio Propo-

als," June 2015). Along with the intense anticipation around all the promises of its potential, it also has prompted serious debate and political infighting surrounding of all things, the audio portion of the standard. The debate centers on the two remaining candidates under consideration for the audio codec, AC-4, proposed by Dolby Laboratories, and MPEG-H, supported by the MPEG Audio Alliance.

"Unfortunately the process has gotten extremely political."

—Tim Carroll
Telos Alliance

"Unfortunately the process has gotten extremely political," explains Tim Carroll, Linear Acoustic founder and Telos Alliance CTO. From rumors to unproven claims, supporters from both sides have been making their arguments heard.

"There isn't a right or wrong in this case, but rather which of the systems is more suited to fit industry requirements and provide the most deliverables," says

Joel Wilhite, solutions manager with Harmonic in San Jose, Calif. His company manufactures encoders that will be used in the broadcast chain for the new standard. He sees the new features to be offered as big wins for the broadcast audience.



Tim Carroll, Linear Acoustic founder and Telos Alliance CTO.

"Both proposed systems have passed all the tests and achieved the goals set out by the ATSC," Carroll said. Linear Acoustic, like

Harmonic, provides key systems for broadcast audio management and distribution.

Though both proposed systems have passed the basic technological hurdles, beyond that there are many questions yet answered: What are their abilities to integrate content on a global scale? How easy will it be for consumers to adopt? What are the costs associated with implementation? And how robust is the ecosystems surrounding their technologies?

PUTTING BROADCAST BACK INTO PLAY

The audio component for ATSC 1.0 is called AC-3 and was developed in the 1990s by Dolby. "When AC-3 was developed for broadcast there was no need to worry about the codec's ability to scale," said Jeff Reidmiller, senior director, sound group at Dolby, who adds that the ATSC tuner in TVs and AVRs (audio video recorders) were the only devices at the time that were in play. Today broadcasters not only want to reach TVs and DVRs, but PCs, tablets and smartphones.

Alex Kosiorek, senior audio engineer and media technology consultant, sees the ATSC 3.0 audio technology and its benefits to consumers as one of the broadcast world's best bets for success. "This could be to the broadcaster's advantage, where consumers turn back to over-the-air viewing for a superior experience."

There are OTT providers that currently support Dolby ATMOS delivering a pre-

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TOWER

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that could slow the overall repack program. Weather can be a big player with windy conditions halting a job and low temperatures greatly impeding progress.

"You can work through the winter," said Silliman, reflecting on a job he did in Chicago. "But it's painful and you're not nearly as efficient."

Another slowdown may come from a pending industry requirement. "There's a new TIA [Telecommunications Industry Association] code that's probably going to come out within the next year that's going to make things even tougher for tall tower jobs," said Burdette. "There're going to be changes in things like wind loading, metal fatigue and other areas. Even if you install a smaller antenna, you must follow the latest code."

Dielectric's Pelletier also flagged the interrelationship between some television markets as a potential retarding factor.

"The whole eastern seaboard is going to be problematic," he said. "You've got so many large markets in a small geographical area—Philadelphia, New York City, Baltimore, Washington, all the way down the coast—that a change in Boston may trigger changes all the way down to Charlotte, N.C."

ARE THERE ANY SOLUTIONS?

Given the "Mission Impossible" nature of the pending repack, is there anything that broadcasters can do now to speed up matters when the flag drops?

"Do some homework," said Pelletier. "Get a VSWR sweep of your system and determine what is band-limited and what is not, and figure out what channels will work with the transmission line length you have now. It would be good to speak with your RF system and antenna manufacturer to get a high-level understanding of system capabilities and what they may be able to do to help you with a frequency change."

"In some cases the old analog antenna is still on the tower," Pelletier continued. "This could come down in advance to make way for a new antenna. The more things you can do proactively now—structural studies, transmission line inspection and sweeps—the better."

ERI's Silliman also offered suggestions.

"If a station really wants to get ahead of the game and they're worried that they're going to go down in frequency they ought to have someone look at the tower—have it analyzed in terms of capacity and possibly do some reinforcement work."

Asked if ERI will establish a "waiting list" for prioritizing repack work, Silliman was quick to answer.

"It's strictly going to be first-come, first-served."

IN THE NEWS

AUDIO

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mium audio experience at home; the new standard could place broadcasters on par with the same experience.

The benefits of the new audio standard include better overall sound quality and tools to improve the consumer's media consumption experience. "It's not just about immersive sound, it's also about interactivity," said Robert Bleidt, general manager of audio visual codecs for Fraunhofer USA. Fraunhofer, a member of the MPEG-H alliance, sees the ability to eliminate certain sounds, boost the audio of preferred tracks, or even selecting which language is preferred as a big win for consumers.

Reidmiller says that Dolby has been engaged in a great deal of outreach to the consumer electronics industry about the concept of audio personalization. There are many tools available in the new standard, but he believes implementation and success will ultimately depend on how the consumer electronics industry responds. The new features will need an interface that consumers of all skill levels can understand and use and feels if the

tools are not implemented properly, consumers will not reap the benefits.

LOBBYING EFFORTS

Carroll says that a lot of rumors are being spread, "which makes it difficult to keep the technology focus on track." He explains that one of the rumors claims that one standard makes audio "too complicat-

"It's not just about immersive sound, it's also about interactivity."

**—Robert Bleidt
Fraunhofer USA Digital
Technologies**

ed" and that the other can simplify it. He believes neither is true, as both standards have their own unique direction with the technology, but in the end the consumer experience will depend on how well TV and smartphone manufacturers provide access to the new tools.

Each side has touted what they believe to be some of the benefits they uniquely

bring to the table beyond the basic codec technology. The MPEG-H alliance, due to its partnership with Qualcomm, is touting their existing penetration onto the all-important mobile market. "We feel that



Robert Bleidt, general manager of audio visual codecs for Fraunhofer USA

we are much stronger in mobile, in that Fraunhofer codecs are already in iOS and Android devices," says Bleidt.

In contrast, Dolby's Reidmiller points out that "The MPEG-H system is not compatible with MPEG decoders on those existing devices right now." He explains that the new standard is not backwards-compatible with the old one, so existing devices won't natively be able to decode MPEG-H audio.

"In my opinion, Dolby is really well adept at the marketing of their solutions," Kosiorek opines, adding that he feels that Fraunhofer has tremendous engineering expertise, but that does not always translate into success for their business' marketing model.

The costs surrounding the new standard also have been a focus of much discussion. Bleidt says that if comparing "Dolby versus MPEG-H, we are half the price." This is a claim that will be challenging to prove in the long term for an organization with so many contributing members and a history of licensing issues.

Dolby also has its own pricing argument to make. "The big advantage Dolby has is that we touch everything end to end, from content creators, to broadcasters, to the end consumer," says Reidmiller. Here the proposed benefit of a sole source solution is placed in contrast to a system derived from multiple contributors.

But who can provide better support long term is a hard question to answer.

THE END GAME

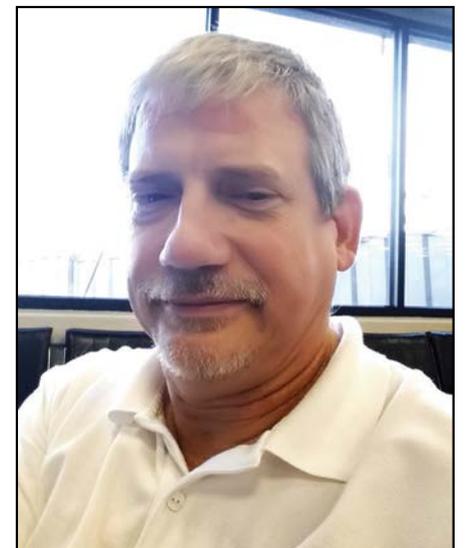
"Both proposed standards can take today's ATSC 1.0 audio, whether stereo or 5.1, and deliver it to consumers more efficiently than the current AC-3 standard, which has been on the air for two de-

cadec," said Carroll.

The companies vying for approval of their proposed systems both have financial and prestige motives in winning. "The parties that get into the ATSC commercial standard will reap some financial benefits as a return for the work they put into the development of their systems," said Bleidt. He went on to say "As a company, Fraunhofer believes the two systems are roughly equivalent feature wise," though, not surprisingly, he believes their sound quality is better.

"I hope to see more options and control for the end user, but not so many that it is too hard to work," says Kosiorek. He feels the win will come with consumers being provided an interface to the features they most want, in a way they can actually use. As an AES member and an audiophile himself, he feels that once consumers get access to better-quality audio, they will be more likely to consume the content through the medium that best delivers it.

"As far as implementation, they both have similarities and a few differentiators to consider," says Harmonic's Wilhite. He enthusiastically adds that regardless of the winner, "the quality delivered in these two systems is breathtaking." Both Harmonic



Joel Wilhite, solutions manager with Harmonic

and Linear Acoustic see the biggest challenge for broadcasters as not which standard is chosen, but how it will be implemented. "This will be a sit, crawl, walk, run transition, very similar to the transition to 5.1 audio," says Carroll. He feels that broadcasters will figure out what their consumers want and make it work.

ATSC 3.0 will be a technology foundation that carries multiple new aural and interface experience opportunities. Making this a success will require the coordination of components upstream in the content creation community, through the broadcast chain and ending with the CE industry. All the parts in this ecosystem will need to leverage both the new technologies and tools in ways they have never done before.



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