

### PAMA Members on Implications of 5G



In a recent survey, professional audio companies ranked 5G capabilities as offering “good potential” in terms of enabling high-resolution audio content for streaming and cloud-based storage, with “some potential” indicated for cloud-based production, low-latency distance collaboration and their companies to enhance products with 5G access and complementary features.

The survey was conducted by the Professional Audio Manufacturers Alliance (PAMA) of industry leaders to track attitudes and opinions about the state of 5G, its impact on professional audio, and the potential that 5G’s spectrum usage, wireless connectivity and high-speed internet access offers for professional audio applications and products.

Many concerns were raised that need resolution before 5G’s potential can be effectively realized in workflow and products due to limitations presented by the current standards in terms of infrastructure and hardware components across the industry.

Chris Hansen, Director of Recording, Harman International, noted a current limited scope of 5G application for Harman’s product line and added, “Broader applications are being discussed but need to be defined.”

“Currently, the biggest challenge is for 5G to meet latency requirements for pro live audio productions,” remarked Prakash Moorut, Shure Senior Director of Spectrum and Regulatory Affairs. “Furthermore, it is no guarantee that mobile network operators employ chipsets in their devices that cater to our internal guidelines. If these issues can be effectively solved, then 5G can play a much bigger role in the development of future products.”

Dennis Stegemerten, Solution Architect at Sennheiser, agreed: “5G offers a lot of potential, but currently latencies are still very high. A lot of work has to be done before it can really enhance a brand’s product portfolio. There are also uncertainties about the performance of public 5G networks and the ease of use of private 5G networks.”

5G has potential in device management, as long as certain obstacles are addressed, per Chris Regan, RF Venue Co-Founder and President (and current chair of PAMA's Board of Directors). "Currently," he noted, "IT-enabled products can be cloud-managed through various apps and managed services, but those devices need local network configuration. If standards evolve such that these devices could inexpensively and efficiently connect to the cloud over 5G without any integration on the local network, that could offer a real benefit and allow technicians to inexpensively monitor and manage equipment remotely."

"Some concern" was the overall response to the question of how 5G (and the evolving RF spectrum considerations that have gone along with it) may affect users of wireless microphone, instrument and IEM systems. Stegemerten reiterated that 5G does not currently fulfill the requirements of most of the Sennheiser product line, and any further widespread re-allocation of spectrum space may adversely affect the operation of the brand's established wireless solutions. However, he also notes that Sennheiser is fully engaged with the subject and is active in several European and international working groups around the 5G topic (e.g., 5G MAG and 5G Records). "There we experiment with broadcasters and other audio companies (e.g., Shure) to evaluate the potential of 5G networks," he remarks.

Moorut expressed cautious optimism about spectrum impact: "It is possible that, in the future, we could leverage shared/local spectrum available for 5G, especially in the context of private networks using bands like the Citizens Broadband Radio Service (CBRS) band in USA, 3.8-4.2 GHz in the UK, 3.7-3.8 GHz in Germany, etc. However, if more spectrum is cleared and auctioned, then it could severely limit the range that we have available for Shure products to operate. So I believe our goal as an industry should be to advocate for other options, such as sharing bandwidth. We have been successfully sharing spectrum with TV for decades, and we're open to exploring any number of other options. Shure has been active in sharing our perspective with the FCC, and we recently made an ex parte filing on the matter."

Regan notes how the 5G spectrum re-allocation that took place a few years ago has required manufacturers to troubleshoot and uncover new solutions: "Some of these mobile providers operate right 'next door' to wireless mics and in-ears, and that has caused interference in concentrated population centers. So far, it's been manageable, but there is certainly the possibility for some problematic times ahead if the spectrum keeps getting chipped away for 5G and its successors. But some 5G frequency bands are well above anything that might affect conventional wireless solutions, so we are hopeful that future 5G developments will stay in those ranges. Overall, I am optimistic. 5G audience interaction is an interesting area in development, where people will be able to use their phones to access various parts of an audio mix or stream content related to the live performance."

PAMA will continue to track developments in the state of 5G and the wider world of wireless in the future, keeping its manufacturer partners up-to-date with the most current info and forecasts. Currently marking its 20th anniversary, PAMA is the collective voice and forum for the leading manufacturers of professional audio

## **PAMA members speak out on the implications of 5G**

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products and the people who use them, continues to serve as an informal data aggregator for new and future developments in pro audio.

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