



Steve Temme

President and CEO, Listen, Inc.



Question 1: How did your current business evolve in the past 12 months and what were the main trends and factors (good and bad) affecting your business?

Temme: I am sure that no one will dispute that these are challenging times! COVID-19, working from home, travel restrictions, global parts shortages, and the AKM fire, which temporarily wiped out one of the world's largest audio chip vendors, have all played a part in making it a tumultuous year or two. That said, there have been some bright spots. On an industry level, the demand for improvements in communications quality due to continued remote work has diversified measurement opportunities far beyond traditional telecommunication devices into other communication devices, such as smart speakers, Bluetooth speakers, headsets, microphones and more. We've thrived on the challenges of developing software features that enable these devices to be accurately measured, such as including the POLQA algorithm and expanding capabilities to facilitate the measurement of Doubletalk and other metrics required for communications standards.

Question 2: What are the perspectives for your business in the next 12 months?

Temme: I believe the next 12 months will continue to be a phase of continual re-adjustment based on changing global situations. Personally, I can't wait to get back visiting customers and attending events again! While I am sure things won't be the same as they were back in 2019, there is no substitute for visiting customers in their labs and production facilities where you can truly understand their measurement challenges. Of course, some of the activities that we invested over the past couple of years, such as the development of our online training courses, applications seminars and popular video series, have been so well received that they are here to stay, even as we start to travel again.

Question 3: What were the most exciting developments, technology innovations, and trends happening in your field of interest over the last 12 months?

Temme: This is what I love about audio—there is always so much going on. In my specific area—audio measurement—the most

exciting developments are in the area of perceptual measurement. Perceptual measurement metrics are extremely valuable for end-of-line tests as they offer significant impact on yield and waste reduction in a world of ever-shrinking margins. This has been a field of research for Listen, and for me personally, for more than 10 years now. We led the way with our first perceptual metric in 2011, but our recently launched enhanced Perceptual Rub & Buzz (ePRB) algorithm is the first time any perceptual metric has truly delivered the repeatability necessary for widespread end-of-line testing, and it has the potential to make a huge impact, worldwide. Outside of my own company, I am always fascinated by those innovations that will present interesting measurement challenges. Right now, many of these involve spatial and perceptual audio in applications, such as automotive infotainment sound zones and virtual and augmented reality hardware. Communications devices are also posing some interesting measurement challenges as they incorporate increasingly sophisticated digital signal processing in pursuit of higher quality audio.

Question 4: What technology innovations and trends do you consider to be the most promising in the audio industry for the next five years?

Temme: The convergence of the hearing aid market with the headphones, hearables and wearable technology, along with industry deregulation presents some hugely promising opportunities for the audio industry and for healthcare as a whole. These devices will make hearing assistance more accessible and remove some of the stigma associated with conspicuous hearing aids, improving the quality of life for the world's aging population. This developing market is driving many exciting downstream developments throughout the audio industry, such as DSP, miniaturization, control, and of course, the development of new test and measurement methodologies that can cope with the complex signal paths and internal electronics that are inherent to these devices. Autonomous cars also present exciting opportunities, driving the advancement of spatial audio as they move toward being mobile offices and entertainment systems with sound zones, quality communications systems, and more. Lastly, I think robots that listen, talk, and move will present some exciting audio challenges as some creative acoustic designs will be necessary to overcome mechanical noise and vibration issues.

Question 5: How do you currently listen to music? Did your music listening habits change in the last 12 months?

Temme: My proper “listening setup” is 100% vintage with—Apogee Diva full-range ribbon loudspeakers (that I helped design back in the early 1980s), a Luxman dual tone-arm turntable, Nakamichi tape deck, OPPO Digital CD player, Benchmark DAC, a behemoth of a Pass Labs X-350 amplifier, and other miscellaneous components. Naturally most of the content that I own is on CD or vinyl. Elsewhere in the house,

I use Sonos and Dynaudio speakers with various streaming music sources, such as Tidal. Of course, we also have smart devices in every room, and although I don’t particularly rate the sound quality or my kids’ taste in music, and I am plagued with problems caused by my daughter sharing a name with one of the voice assistants, they do provide both entertaining and useful functionality. I have also amassed quite a collection of high-end headphones and earphones, although it’s probably fair to say that I have spent more time measuring them than actually using them for my listening pleasure! **LIS**

