

# Woodstock, Apollo 11, And The Music Industry

**T**he summer of 2019 marked the 50th anniversary of two historic but seemingly unrelated events: The Apollo 11 moon landing, a triumph of technology, and the Woodstock festival, a launching pad for musical careers and a seminal cultural event. Both have been exhaustively chronicled, and their significance continues to generate commentary. Less well known is their impact on the music products industry. The digital technology spawned by the moonshot, and the audio innovations that made music audible at Max Yasgur's farm, have led to a range of products that now account for over 50% of the industry's current revenues. Were these products and technologies destined to emerge anyway? Maybe. But, Woodstock and the lunar landing were unquestionably catalysts that speeded their arrival.

Apollo astronauts needed real-time computing power to direct space crafts traveling at 24,000 miles per hour. This required the development of integrated circuits, the now ubiquitous computers on a chip that are embedded in just about every home appliance. At NASA's goading, semiconductor companies learned to mass-produce them for pennies a piece. In 1969, lead developer Rockwell Collins began looking beyond the space program to see if there were any civilian applications for the new technology. Surprisingly, there was little interest. The exception was Allen Organ founder Jerome Markowitz. A gifted engineer, he recognized that the processing power of an IC would allow for more nuanced and complex electronically generated tones. He believed so strongly in the new technology, he effectively bet his company on it, investing \$1.5 million (\$11 million in current dollars) to develop it.

In 1971, Allen introduced the first musical instrument to incorporate digital sampling, which was also the world's first "digital" consumer product. Markowitz patented his sampling technology and aggressively defended it in court. But since the early 1980s, as patents lapsed, it found its way into virtually every keyboard on the market, not to mention effects processors and digital recording devices.

About the same time NASA engineers were finalizing plans for the Apollo 11 launch, Woodstock producer Michael Lang approached Bill Hanley about providing a sound system that would deliver quality audio to an audience of 400,000 dispersed over a 600-acre field. Hanley was the obvious choice for the job, as he was the "go-to" guy for outdoor sound systems, having worked with the Newport Jazz Festival and the Boston Pops. However, he

had concerns about Woodstock, reportedly saying, "Sound for an event like yours doesn't exist, but I think I can build it." The pro audio industry as we know it today was in its infancy, and few had a clue about how to amplify a musical act, let alone an event on the scale of Woodstock.

The readily available audio components we take for granted today didn't exist in 1969—the only commercially available p.a. system was the feeble 100-watt Shure Vocal Master. Thus, Hanley and his crew had to hand-build dozens of enclosures, using raw speaker components from JBL and Altec Lansing. The finished enclosures weighed about 500 lbs. and were stacked on 16 70-foot towers strategically placed throughout the field. Power amps from Crown and MacIntosh, designed for hi-fi applications, delivered the 10,000 watts needed to drive the system. The audio was mixed on a hand-built 20-input console. Although crude by contemporary standards, Hanley's system enabled the 400,000 Woodstock attendees to actually hear the performances.

Reminiscing about Woodstock in a recent interview, Hanley remarked, "Back then, you simply couldn't go and buy this sort of equipment at Guitar Center. You either made what you needed or went without." In the same way Formula One technology gradually found its way into street-legal vehicles, Hanley's pioneering audio developments were embraced by dozens of audio manufacturers and incorporated into a wide range of off-the-shelf



products that generated \$1.6 billion in revenue for the music products retail channel last year.

It's doubtful that the 400,000 people in and out of NASA working on the space program had the slightest idea that their efforts would someday reshape the way music was played and recorded. Similarly, as Bill Hanley was building a sound system to make performers audible to a large crowd, he probably wasn't thinking about launching a thriving pro audio industry. Yet in both cases, that's what happened. This type of "progress-driving" serendipity is also nothing new. Music entrepreneurs have been seizing on technology since at least 1820, when Jonas Chickering harnessed the iron casting techniques used in fabricating the large canons for the frigate USS *Constitution*, also known as "Old Ironsides," to cast the iron plate that made the grand piano possible.

Fifty years from now, someone will probably detail the unanticipated impact some nascent 21st century technology has had on the world of music. No doubt, they'll also wonder why its potential wasn't obvious at the time. Some things never change.

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