

Turnkey system design guarantees quality, timeliness and a superior user experience

The CEO of a successful chain of 25 casinos understood that the quality and excitement of gaming machines maximize customer satisfaction and casino revenue. He wanted to develop games and machines that were unique to his casinos, rather than use the same off-the-shelf games found at competitive casinos. His goal was to bring the gaming experience to new levels of fun.

To achieve that end, he set up a separate company to develop unique games and the machines to run them.

"We started by importing off-the-shelf gaming cabinets. The cost was low, but the audio system sound quality was mediocre. There were quality problems and a high rate of failure," said the CEO. "Machine downtime means lost revenue, and we could not put up with that for long. We switched to consumer-grade off-the-shelf audio systems which sounded better than the imported systems but were not robust enough to stand up to the heavy use and high sound volumes required in our casinos."

After an extensive search, the CEO found MISCO and learned about MISCO's experience and success with turnkey audio solutions for a variety of applications, including gaming. A call to MISCO followed in late February 2018 to see if MISCO could custom design an audio system that perfectly met the needs of the new machines. MISCO president Dan Digre said "of course," but was taken aback when the customer



said that they needed production quantities shipped in July—a mere five months away.

MISCO's expertise is in designing and manufacturing custom audio systems for their clients but this aggressive timeframe was a very tall order. If there was any hope of making the deadline MISCO and the customer needed to get right to work to tightly define the product specifications and milestones.

Shortly after the initial call and a follow-up video conference, the casino's CEO and its president flew to Minneapolis for an all-day design meeting with Dan Digre and MISCO's engineering team. The meeting started with listening demonstrations of some MISCO-built multi-channel audio systems that approximated what the casino was looking for. "With just a few minutes of listening I knew that we had come to the right place," said the CEO.

With the selection of MISCO as the supplier settled, the team set to work to specify the

system and establish milestone dates for design, prototypes, first article samples, and fully approved production quantities. Thanks to MISCO's nearly 70 years of speaker manufacturing and the company's prominence in the casino gaming arena, the design team had "on the shelf" tweeters, full range drivers and gaming cabinet -sized subwoofers to build around.

The customer chose an unusual 2.2.1 channel system with two fully enclosed two-way speakers tied into the casino's PA system mounted at the top of the cabinet, and two fully enclosed 2-way speakers and a ported subwoofer in the cabinet. Instead of the low-tech components usually found in casino gaming consoles, MISCO used the kinds of speaker parts found in high-grade home audio component systems. The 2-way speakers feature 1-inch titanium dome tweeters with an integrated phase plug. The racetrack-shaped midrange driver cones are injection-molded, mineral-filled polymer with long lasting butyl rubber surrounds. The subwoofer features a 5.25 inch long-throw driver in a low resonance MDF enclosure for bass that truly excites the player. It is not exaggeration to say that this audio system would be right at home in your home theater system.

MISCO 2.2.1 digital amplifiers powered all of the speakers, one amplifier channel for each speaker in the system. Digital Signal Processing (DSP) circuitry handled all crossover functions as well as frequency equalization and volume limiting. Eliminating all passive crossover components from the system significantly improved audio performance, allowing for custom tuning of the system once installed in the cabinet, and helped

to shorten development time. MISCO also used its extensive experience in designing rigid but cost-effective plastic enclosures and its 3D printers to make prototype speaker enclosures. "The prototype systems proved again that MISCO was the right choice," said the casino CEO. "The sound was far better than anything else."

To shorten development and delivery time, the system was manufactured in MISCO's Minneapolis factory under the watchful eyes of the engineers who designed the components and system. Like every MISCO audio system in production, every speaker was tested using SoundCheck for full performance including



The system uses hi-tech speaker components commonly found in high performance home audio systems



The multi-channel Class D amplifier features advanced Digital Signal Processing (DSP) for superior sound quality

frequency response, distortion, sensitivity, rubs & buzzes, and phasing. The production audio systems were shipped from MISCO on schedule in late July.

The casino's CEO is a happy MISCO customer. "We have built and deployed in our casinos hundreds of cabinets equipped with the MISCO audio systems and plan to build more. They sound fantastic and have been very reliable. We are MISCO customers for life."

If you want to save yourself time, money and aggravation, MISCO offers a variety of pre-engineered audio systems perfect for kiosks, casino gaming consoles and other product categories that need high quality audio. Browse available systems at www.miscospeakers.com/systems.