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## JAMES LOUDSPEAKER CASE STUDY.



### ACCOMMODATE THE CLIENT

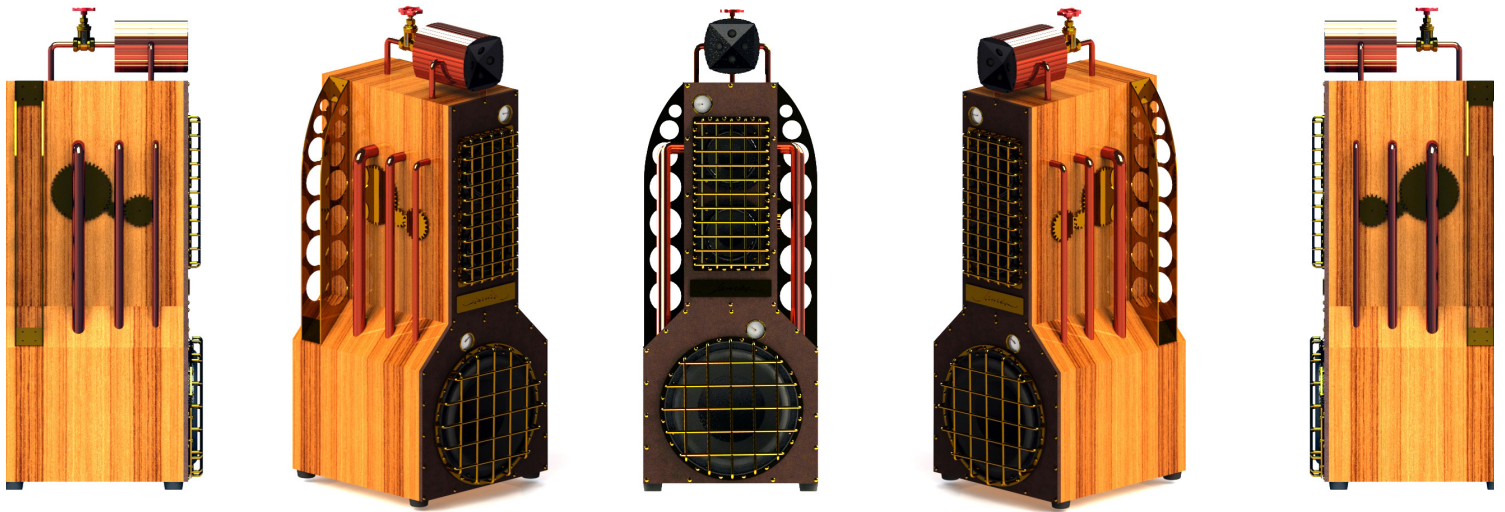
James Loudspeaker Designs  
And Builds A Steampunk-Themed  
High-Performance Home  
Theater Speaker

### INTEGRATOR:

CDI Services, Denver, CO

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535 Airpark Road, Napa, CA 94558

## JAMES LOUDSPEAKER STEAMPUNK CASE STUDY (April, 2016)



*Early renderings of the James Loudspeaker Steampunk concept.*

### Case Study

We at James Loudspeaker always love a challenge. And a challenge is what we accepted with open arms when we received a call from custom integrator Matt Durbahn of CDI Services in Denver, CO. CDI had a client getting the works—home automation, security, outdoor entertainment and more. But this client was also an avid Steampunk enthusiast, and we were asked to explore the possibility of designing and manufacturing a pair of speakers that would enhance the Steampunk experience as the visual centerpiece of an entertainment room—and deliver exemplary performance for both music playback as well as the main left/right channels in a 7.2 home theater. We began by researching the Steampunk theme and creating some rough drawings, from which the final product evolved.

We set to work—our engineers employed the driver configuration from existing James Loudspeaker components (QX530 for the 80Hz to 22 kHz range and a 2 x 10-inch subwoofer section). Our completely hand-assembled Steampunk-themed features include five vacuum tubes, pressure gauges, control valves, interlocking gears, brass accents and copious copper tubing to connect it all together. The team at James elegantly finished the speakers in a combination of walnut veneers, brass and genuine leather.

## The Technology

The driver array for the Steampunk speakers includes two 10-inch woofers, two 5.25-inch midranges and the famous James Loudspeaker proprietary Quad-array tweeter. The Quad tweeter utilizes four  $\frac{3}{4}$ -inch aluminum dome tweeters in a 22.5-degree offset array for wide dispersion, high power handling and low distortion. When combined with two 5.25-inch high-excursion aluminum woofers selected to deliver supreme performance, this output configuration delivers an impressive 92dB sensitivity and delivers bass down to 68Hz. A multi-element crossover network blends the high and low frequencies into a smooth and wide frequency response, delivering audiophile quality sound throughout the listening area. The sealed cabinet design is constructed from internally braced MDF for strength and optimized sonic performance. The bass region is managed by two 10-inch subwoofers per speaker in precisely tuned enclosures. This gives the Steampunk speakers superb extended low frequency response to manage both music and movie content.

## All Hands on Deck

With the engineering and design teams leading the charge, the Steampunk loudspeaker project was executed with precision and amazing efficiency considering the unusual nature of this custom order. Based on the rather tall tower speaker form factor supplying plenty of space for internal box volume, the team was able to create a bi-amplified speaker that included a dedicated subwoofer section. Working based upon dimensions provided by the integrator, the team decided to use two active 10-inch drivers per speaker for low frequency reproduction. The satellite portion of the speaker, housing the two 5.25-inch drivers, fit optimally behind custom grilles. The frame of these drivers is a little boxy, which provided a stylish appearance with the combination of curved and straight portions of the grille frame. Utilizing the Quad tweeter array for high frequency output enabled the engineers to leverage an existing crossover network platform rather than having to re-voice the speakers from scratch.



The choice to put the Quad tweeter in a separate module was simply part of the industrial design, selected in order to make the speakers look more Steampunk-ish. The idea started with an old-school looking glass/telescope perched on top of the speaker enclosure. Steampunk is all about using industrial age inspired technologies, such as a telescopes from that era. Once the Quad tweeter had been selected for this project, the decision was made to adapt an aluminum enclosure traditionally used for the 42AT landscape speaker in order to house the Steampunk tweeter assembly. The trick at that stage was to engineer a solution for securing the module in place. Since Steampunk is based on the idea of steam power, the team decided that copper piping would be the perfect way to affix the module, enhance the Steampunk theme and provide a structural path for the tweeter wiring. The space between the subwoofer and satellite sections of the speaker gave the appearance of a steam engine with multiple chambers. The bottom portion was modeled to look like a steam drum and then elongated to both increase the height of the speaker as well as provide space for a second subwoofer driver. The overall design was engineered to deliver stunning dynamics and musical detail within the spatial constraints of the room—while simultaneously maintaining emphasis on the Steampunk theme.

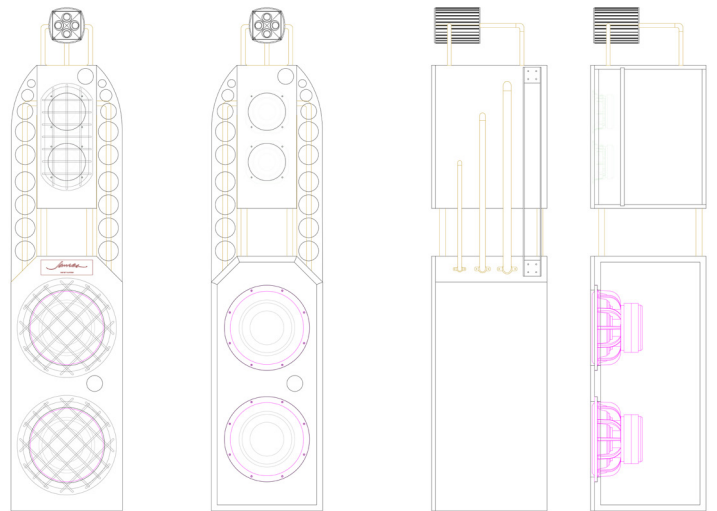
## Additional Details



Each loudspeaker's baffle was adorned with leather and brass-headed decorative screws. Walnut veneered MDF was used to give the speaker a more antique and steam-warped appearance. Pressure gauges were added that move back and forth as the drivers alter the pressure within each chamber. Aluminum fins were attached to the sides of each speaker, powder coated in brass to match the tweeter modules. For the grilles, the team decided it would be appropriate to fabricate something that looked like a steam grate. For the wire mesh and ring grille design, the team used several hand cut and bent steel rods to create each individual piece of the grille. All of the grille components were then spot welded together, followed by matching powder coat using the same brass finish as the tweeter modules to give the grilles a matching old-school appearance.

Then came the gears! The search was on for some bulk-packaged metal gears but nothing quite fit the bill, so wooden gears were fabricated—and they even turn. The gears, featured prominently on the finished product along with some water valves, really contribute significantly to creating the Steampunk

aura, which is all about seeing the inner workings of technology. The final touch was the (fake) vacuum tube amplifiers. Once the woofer enclosure had been separated from the satellite cabinet leaving an empty space between them, the team pondered the use of transformers or relay switches for visual effect, but finally settled on the concept of old-school style tube amplifiers as the perfect addition. Several tubes and sockets were sourced and a small aluminum chassis was constructed that could be used as the foundation for the little non-functioning amplifier.



## Delivery

Most critically, the client loved the James Loudspeaker Steampunk speakers. They anchor a premium home entertainment system while delivering a one-of-a-kind visual experience supporting the Steampunk décor. CDI Services was able to rely on a premium supplier for a custom solution in order to satisfy their customer, and integrator Matt Durbahn noted that the speakers looked and sounded amazing. However, the words of the homeowner are most telling; "...nothing was overlooked to bring the final product to a stunning artistic work of art."