

# CH PRODUCTS

## Tilting joystick development in a new direction with SolidWorks



*Using SolidWorks Professional design and SolidWorks Premium design and simulation software, CH Products has successfully introduced motion-control products for military, industrial, and aviation simulation applications.*

When the popularity of computer gaming exploded in the late 1980s, joysticks, controllers, and flight simulators from CH Products pioneered an industry. However, as the market became saturated—with the entry of heavyweight competitors like Logitech and Microsoft and a plethora of overseas low-cost manufacturers—the Vista, California, company sought to leverage its expertise in advanced motion-control technologies through the development of new markets.

CH Products now operates two distinct businesses—Industrial Controls and Simulation Products. The individual businesses have elevated CH Products' technology far beyond its roots in computer gaming. CH Products' Industrial Controls Business manufactures a wide range of resistive and hall-effect joysticks, used to operate equipment such as snowplows, construction vehicles, and video security cameras. The Simulation Business manufactures an expansive line of high-end USB avionic controllers that are ideal for both general aviation and military simulation.

Making the transition from gaming to more sophisticated motion-control applications compelled CH Products to revamp its entire product development operation, according to Senior Mechanical Engineer Shane Beams. "In the past, our product designers were constrained by limited CAM software in developing products," Beams explains. "The new markets that we are targeting demand a more dedicated and well-equipped product development effort. When you are designing simulation products for the military and controllers that drive actual vehicles and equipment, the design constraints are stricter, requiring more organic and complicated designs."

To meet these challenges, CH Products needed to integrate a highly capable 3D design environment with its state-of-the-art manufacturing facility, which is equipped with injection-molding, tooling, production assembly, and quality control systems.

### Challenge:

Transition from its traditional gaming controller business by efficiently developing new joystick and motion-control products for industrial, military, and aviation simulation applications.

### Solution:

Implement new processes and procedures that are empowered by state-of-the-art solutions like SolidWorks Professional and SolidWorks Premium design and analysis software.

### Results:

- Cut development time by 50 percent
- Reduced prototyping time investment by 90 percent
- Entered strategic markets through the development of new products
- Increased innovation with surface modeling and design visualization

"We decided to use SolidWorks® Professional and SolidWorks Premium software, in conjunction with our MasterCAM® machining software, in 2006," Beams recalls. "Constrained by limited software, our product designers found highly organic shapes impractical. We wanted a 3D design platform that was user-friendly—to facilitate the transition—but also robust enough to develop sophisticated products. We used Pro/ENGINEER® software for a time, but ultimately chose SolidWorks as the best package for CH Products."

### Faster development fuels new markets

Since implementing SolidWorks solutions, CH Products has dramatically reduced its design cycles while simultaneously increasing the complexity of its products. These competitive advantages have enabled the motion-control manufacturer to develop a range of new products that has cemented its leadership position in industrial, military, and aviation simulation markets.

"Using SolidWorks, along with new procedures and processes related to our ISO 9001 certification, we have cut our development time in half," Beams stresses. "In addition to gaining productivity, we are boosting product quality and innovating new concepts. CH Products has reinvented itself to pursue strategic markets, and SolidWorks is helping us achieve our product development goals."

### Rapid prototyping saves time and money

Not long after implementing SolidWorks, CH Products added a rapid prototyping capability through the acquisition of a 3D printer from Z Corp. Because the company's joysticks and controllers utilize organic, ergonomic shapes, physical prototyping is an important requirement.

"When you're designing a hand grip for a flight control simulator, you absolutely have to get a sense of how it feels in your hand," Beams says. "Before we added SolidWorks and our 3D printer, we machined these prototypes, which was more costly and consumed valuable tooling resources. With 3D prints of solid models, we have reduced the prototyping time investment by 90 percent.

"When we make a prototype, we can focus on the tactile aspects of the design," Beams adds. We have been able to optimize structural performance through the use of SolidWorks simulation tools to validate our designs, such as establishing the load limit for a particular joystick."

### Increasing innovation via surfacing and visualization

SolidWorks also helps CH Products develop more innovative products by using surface modeling and design visualization tools. "By their very nature, our products require curvy, organic shapes," Beams notes. "The surface contours of our products—how they feel in your hand—are becoming more challenging and require robust surfacing tools. Since we began using SolidWorks, our team has driven a sharp increase in the level of innovation and sophistication in our designs.

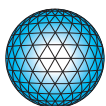
"In addition to the benefits that we realize with SolidWorks surface modeling, design visualization tools like RealView and PhotoView 360 enable us to ensure that our designs not only are ergonomic, but also look great."

*"CH PRODUCTS HAS REINVENTED ITSELF TO PURSUE STRATEGIC MARKETS, AND SOLIDWORKS IS HELPING US ACHIEVE OUR PRODUCT DEVELOPMENT GOALS."*

Shane Beams  
Senior Mechanical Engineer



SolidWorks design and simulation tools have enabled CH Products to shorten development time, cut costs, and increase innovation.



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