



## Success Story

# hyperMILL® helps NASA’s Quest for Knowledge

Just a few miles from the Atlantic Ocean and surrounded by lush forest, the 24,000 sq ft. Ramco Machine, LLC facility (Rowley, MA U.S.A) sits back from the main road and is not easily seen...

... Tourists and passerby’s on their way to enjoy the area’s delicious clams and seaside activities might be surprised to learn the significance of what is being made at the facility behind the veil of trees. For more than 30 years, RAMCO has been manufacturing products that have enriched our lives.

Christian University and the historic Hatfield House in England. And now RAMCO is helping to impact the future of space exploration by making parts for an advanced NASA satellite mission.



### About Ramco

Ramco Machine, LLC is a family owned and operated CNC machine shop that is fully equipped to meet virtually any job requirements. Their 24,000 square foot facility utilizes highly skilled, self-reliant employees combined with the latest CNC machine tools available to apply every advantage that modern technology provides. This structure enables Ramco to effectively produce the “hard to manufacture” parts common in today’s fast paced environment and also work with the customer to manufacture impractical parts efficiently. Ramco is a dependable and cost effective source for complex machined components ranging from prototype work through moderate quantity production runs, including JIT deliveries.

> [www.ramcomachine.com](http://www.ramcomachine.com)

Back in the early 80’s, Randy Jezowski and his wife Carolyn founded Ramco Machine. They began with a small machine shop, taking on every conceivable machining job thrown at them, and have grown the business over the years into a large facility with 30 employees. Randy is Ramco President and Carolyn is Office Manager. The day-to-day operations are handled by their two sons, Tim and Mike Jezowski, both Vice Presidents, who work 24/7 to keep the company growing profitably.

Today according to Mike, Ramco specializes in complex milled and turned parts that must meet stringent tolerances and be delivered with fast turnaround times. They take on many interesting projects, and among other types of work they support robotics companies, medical manufacturers, and occasionally build replacement parts for vintage Ferrari’s and other exotic cars. On the highly creative side, projects include sundials for The University of Notre Dame, Texas



Mike Jezowski, Ramco Vice President used hyperMILL® CAM Software from OPEN MIND and 5-axis machining to make mounting brackets for a four-camera system to be used on a NASA TESS satellite mission.

“We got *hyperMILL*<sup>®</sup>, because when you buy a high quality piece of equipment you need high quality CAM Software to program it. *hyperMILL*<sup>®</sup> CAM software handles the complex parts that we make and I haven’t found anything that it can’t do.”

**Mike Jezowski, Vice President  
of RAMCO Machine**



### First 5-Axis

To get to this point, Ramco entered the world of 5-axis machining. Mike explains, “In order to efficiently produce some of the complex parts that come in, we had to go to 5-axis machining. To be competitive, we had no other choice.” Ramco decided to purchase a DMG Mori, DMU 65 FD monoBLOCK high-end mill and turn machining center. They then searched for highly reliable CAM software that would efficiently control all the capabilities of this sophisticated 5-axis machine.

Ramco chose *hyperMILL*<sup>®</sup> from OPEN MIND Technologies. Mike explained that, “We chose *hyperMILL*<sup>®</sup>, because when you buy high quality equipment like the DMU 65 you need high quality CAM software to program it. *hyperMILL*<sup>®</sup> was the perfect solution. I had already researched CAM software for several years before we bought the machine, so the day we received the 5-axis machine, I ordered *hyperMILL*<sup>®</sup> software. *hyperMILL*<sup>®</sup> CAM software handles the complex parts that we make and I haven’t found anything that it can’t do.”

With the help of OPEN MIND’s professionals, setting up the post processor for the new machining center was seamless. Mike continued, “The post has worked excellently, with no problems at all. Some of the parts I’ve done are fairly complex and I’ve had absolutely no issues with the post processor. When I first started using the machine, I had a job that required drilling an eighth inch hole 4 3/4” deep that intersected 5 other holes, and *hyperMILL*<sup>®</sup> worked flawlessly. You just can’t do that with any other CAM package - I was impressed.”

Mike has had a similar positive experience with the *hyperMILL*<sup>®</sup> support team, and said that, “I really enjoy working with *hyperMILL*<sup>®</sup> support. Everyone I’ve worked with is top quality. They answer all my questions and the bottom line, is it helps me cut metal fast.”

### Discovering new horizons takes accuracy

Ramco was recently contracted by MIT Lincoln Laboratory to fabricate the critical camera mount brackets for an important NASA TESS satellite mission. NASA’s TESS mission is designed to explore and survey nearby bright stars to analyze planets, both smaller and larger than earth, as the planets circle their host stars and the earth orbits the sun. In July 2018 or sooner, a solar powered in-space satellite equipped with four ultrasensitive cameras will be launched aboard a two-stage SpaceX Falcon 9 rocket on its way beyond earth’s solar system to outer space. The four-camera system being developed at the MIT Lincoln Laboratory is key to the mission, and will monitor the brightness of more than 200,000 stars during the two-year mission and search for minute drops in brightness as the planets transit in front of each star.

Making the mounting brackets required machining Invar, a nickel-iron alloy with a low thermal expansion coefficient, allowing it to meet the rigors of launch and enabling it to compensate for the extreme temperature swings of outer space. The mounting bracket has exceedingly tight tolerances. The central rib’s thickness is .050” +/- .001”, perpendicularity between surfaces is held to .001” and the bracket’s two opposing surfaces must be in-line with each other to within .001”.



**Ramco handles  
a wide variety of  
projects, including  
artistic sundials.**

To cut Invar and achieve the required tolerances Mike used a *hyperMILL*® generated 5-axis profile finish tool path. By doing this, he was able to achieve an accurate finish across each part, keeping them within these very tight tolerances. The four-camera mounting brackets were shipped on time, and will soon be on their way to explore outer space, helping us learn more about the universe we live in and hopefully discovering planets that may be habitable.

Mike said, “*hyperMILL*® helps my bottom line because I can be sure the part we make is perfect. That makes a big difference. If you’re making bad parts it’s hard to meet costs. I haven’t found anything that the software isn’t able to do.

Also, the OPEN MIND *hyperMILL*® website was very impressive. One of the real selling points for me was looking at OPEN MIND testimonials and customer list in order to understand the success of *hyperMILL*®. We chose *hyperMILL*® because we felt it was the best program available to work with our high-end 5-axis machine.” ■



To cut Invar and achieve required tolerances, Mike Jezowski, Ramco Vice President, used a *hyperMILL*® generated 5-axis profile finish tool path to create the mounting brackets for NASA’s four-camera system.

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## About OPEN MIND Technologies AG

OPEN MIND is one of the world’s most sought-after developers of powerful CAM solutions for machine and controller-independent programming.

OPEN MIND develops optimized CAM solutions that include a high number of innovative features not available elsewhere to deliver significantly higher performance in both programming and machining. Strategies such as 2.5D, 3D as well as 5-axis milling/mill turning, and machining operations like HSC and HPC are efficiently built into the *hyperMILL*® CAM system. *hyperMILL*® provides the maximum possible benefits to customers thanks to its full compatibility with all current CAD solutions and extensive programming automation.

OPEN MIND strives to be the best and most innovative CAD/CAM manufacturer in the world, helping it become one of the top five in the CAM industry according to the NC Market Analysis Report 2017 compiled by CIMdata. The CAD/CAM solutions of OPEN MIND fulfil the highest demands in the automotive, tool and mold manufacturing, production machining, medical, job shops, energy and aerospace industries. OPEN MIND is represented in all key markets in Asia, Europe and America, and is a Mensch und Maschine company.



We push machining to the limit

[www.openmind-tech.com](http://www.openmind-tech.com)