



BUSINESS PROBLEM

A student group designs and builds robots for various competitions. While they are able to make many of the parts themselves, other parts would simply take too long to make or require precision that is beyond the capabilities of the machining resources available at the school. They also must operate on a limited budget and parts are often needed in relatively short order.

SOLUTION

RoboJackets, the student robotics competition team from Georgia Tech, designs and builds robots to compete with other collegiate teams in a variety of national and international competitions including the Intelligent Ground Vehicle Competition (IGVC), RoboCup, BattleBots, and others. Each of these competitions presents unique challenges.

- In RoboCup, teams of coffee can-sized robots compete head-to-head in a game of soccer.
- Autonomous (self-guided) IGVC robot vehicles navigate an outdoor obstacle course littered with barrels, sand traps, ramps, and sidelines.
- BattleBot robots attempt to destroy each other with axes, maces, and hammers.

Using AutoDesk Inventor CAD software and SolidWorks, the team designs a robot for the needs of the specific competition, then produces

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***-Jason Kulpe**
Member of RoboJackets*

and assembles the units. While they are able to fabricate many of the needed parts in the school's shop, they can't do them all. "Some of the parts for RoboCup would have taken about 400 hours of machining to produce," says team member Jason Kulpe, a third-year mechanical engineering major. "That just isn't going to happen." Other parts must meet tolerances that are beyond the capabilities of the school's machines. Add in tight deadlines and limited funds and you can understand the tough position the RoboJackets team found themselves in when it became clear that they would have to outsource some of the work.

The team, made up of engineering and science students from a number of disciplines, tried outsourcing some of this work to local machine shops, but they could not afford the costs in many cases, and often the turn-around time was just too long. There had to be a better way to get these critical parts. "Some friends are on the GT Motor Sports Formula SAE automotive teams here, and they have to outsource a lot," Kulpe



Customer SHOWCASE Program

Case Study RoboJackets

says. "They use MFG.com and told us about it."

The RoboJackets team joined the MFG.com network and put their parts out for quote. They were pleased to learn that most of the quotes were much more affordable compared to local resources, and the Suppliers were willing to meet their deadlines. "Most of the work we've sourced through MFG.com has been delivered ahead of schedule," Kulpe says. "We released a contract over winter break, around the first of the year, with a lead time of about three weeks. The parts were delivered five days later."

ABOUT ROBOJACKETS

RoboJackets is the robotics competition team at Georgia Tech. The team participates in the Intelligent Ground Vehicle Competition, BattleBots, RoboCup, and International Robotics competitions, among others. The 35 to 40 active members, mostly undergraduate engineering and science majors, also act as mentors to high school teams competing in the FIRST (For Inspiration and Recognition of Science and Technology) robotics challenge. RoboJackets members also engage in independent projects, as time and funding allow, including development of control algorithms for the Inverse Kinetic Arm, the HexaPod small-scale six-legged stable walking robot, and building a downhill racer for both Emory University's Dooley Derby and the Starlight Six Downhill Challenge.

The support team at MFG.com has been just as helpful as they are with other members. "We had a problem with uploading some drawings," says Stefan Posey, third year aerospace engineering major and RoboJackets' public relations chair, "the people at MFG.com were right there and we solved the problem right away."

The RoboJackets experience is very rewarding for these students in a number of ways. The challenge and the excitement of the competitions is fulfilling and fun in and of itself. In addition, the students are able to hone newly acquired skills solving real-world problems and facing the kinds of issues they will no doubt encounter in engineering jobs after graduation - experiences that will enhance their resumes for prospective employers. Team members come from a number of different academic departments within Georgia Tech including mechanical, electrical, automotive and aeronautical engineering, computer science, and others. Most are undergraduates, with some graduate student participation.

Their introduction to, and use of MFG.com is a fine lesson in the realities of engineering and manufacturing, involving project management, financial management, collaboration, and contract management.

BENEFITS

- Find Suppliers for precision parts, at reasonable cost, on tight deadlines.
- Experience dealing with contract Suppliers and Internet sourcing.
- Experience collaborating, communicating with vendors, cost control, management.