

Students Assume Roles in Propulsion Competition

By Randy Siniard, AMRDEC Public Affairs

REDSTONE ARSENAL, Ala. (July 22, 2010) – Rocket Wars ... Let the competition begin!

build a boost-sustained rocket motor within certain parameters for thrust and pressures.

Manson said they first received a writ-



TEAMMATES— Preparing for Rocket Wars at AMRDEC are, from left, Jerald Faylorsey, team leader Justice Manson, Faith Ryder, Corey Davis and Drew Johnson.

In early August, four teams from the Propulsion Technology Function of the Aviation and Missile Research Development and Engineering Center will take part in the second annual Rocket Wars during which they will present their designs, tell how they built their motors and then ... fire them!

Justice Manson, team leader and third-year summer hire, majoring in mechanical engineering at the University of Alabama, explained that his team's objective was to

ten presentation that gave them the guidelines and numerics on what to build; then they received the quick and dirty on what specifically they were building through a briefing from Dr. Jay Lilley, chief of propulsion technology. Teamwork became a definite must early on.

No one person had specific duties and everyone helped with everything. However, everyone had a strong interest so they assumed roles and took the lead in that area, said Manson. He explained that his team members all

had their place on the team.

Corey Davis, a first year co-op, majoring in aerospace engineering at Purdue University, works on the excel programming; Drew Johnson, a second-year summer hire, majoring in mechanical engineering at University of Alabama-Huntsville, does the engineer drawings; Jerald Fayorsey, a first-year summer hire, majoring in aerospace engineering at Tuskegee University, does Solidworks 3D modeling; and Faith Ryder, majoring in electrical engineering at UAH, works on power point, poster displays and nozzle research.

As always, stress reared its ugly head early on in the competition.

Manson's team had to cope with the fact that they had to schedule meetings around their other work and then there were the changes that had to be made -- because, as Manson put it, "hey, this is the real world."

Each motor consists of the basics: a cylinder, a nozzle, a bulkhead (top), and a propellant (in this case a solid propellant).

The team made engineering drawings and then submitted all the drawings to specific technicians who made the parts for them.

The teams work on the designs of the nozzle and the propellant's grain. Each team has the same cylinder or sleeve and they make different mandrels which they use to form their propellant. Changing the propellant's shape provided each team the flexibility to create a unique propellant to meet the requirement to compete in Rocket Wars.

The mandrel is pressed down into the rocket cylinder containing propellant to a specified depth. It is left there until the propellant hardens and then removed leaving the grain geometry. The grain geometry affects the surface area of the propellant that is being burned, thus varying the thrust, Manson said.

The team hopes that the competition goes well for them but there was more to the competition than just winning.

The summer was a great learning experience.

"At Propulsion you see things happen," Ryder said. "You do the numbers, you do the drawings and the designs, you do the builds then you see the results."