

About the Broncobots

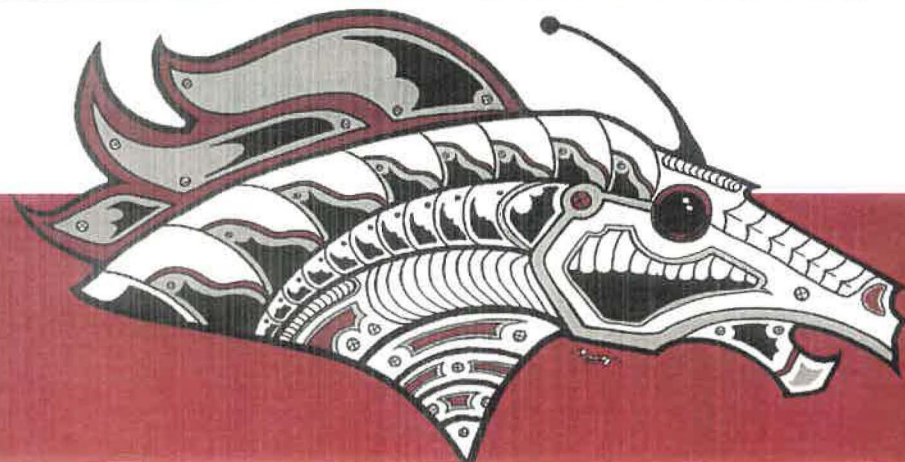
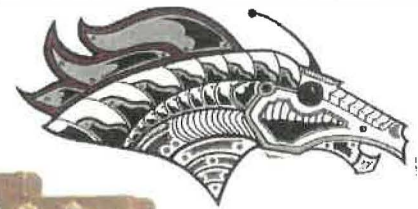
As a 3rd year team, the Broncobots are stationed in Lee's Summit, Missouri, a suburb of Kansas City. We rely on the creativity of our students and the experience of our mentors to produce economical, lightweight, and functional designs. For the third year running, we have about 20 student members, 10 mentors, and 2 teacher sponsors. Over our 3 years, we have sent over 850 letters to government officials and have collected over 600 pounds of food for our local social services. We hold annual summer camps, present at local schools and hold community events. Team 1987 focuses on community outreach and innovation. Visit our website at:

www.teambroncobots.com



The Broncobots Team 1987

Lee's Summit North HS
Lee's Summit, MO



The Robot

Complete Robot

The final robot uses polycarbonate panels to protect the mechanisms and the electronics. Velcro® is used on the panels that need to be removed quickly. The robot was significantly underweight so weight was added to give a 55% to 45% split (rear to front) with sides balanced at 50/50%.

A camera is used to locate and track the opposing alliance trailer.

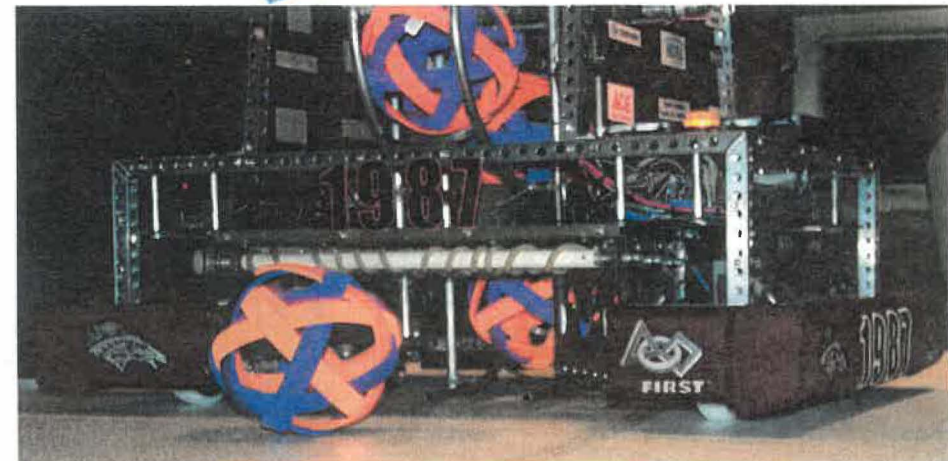
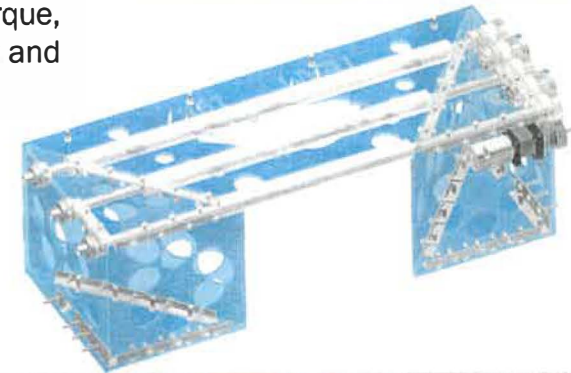
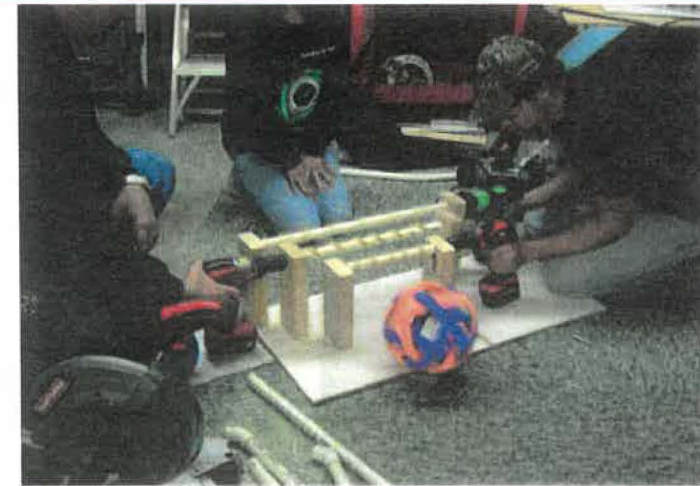
All wiring is carefully placed, labeled, and terminated.

Team 1987's robot for 2009 is robust and easily serviceable. The combination of parts chosen, the special sensors added, and the programming used provides a highly functional robot.



Herding

After designing, building, and testing a prototype, a light-weight, and efficient herding module was built from aluminum shafts mounted inside three PVC tubes wrapped with latex rubber tubing. These are geared together and driven with a high torque, RS 545 motor and gear box.

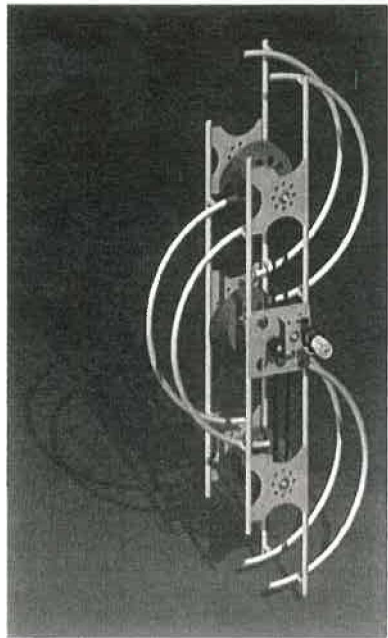


Conveying

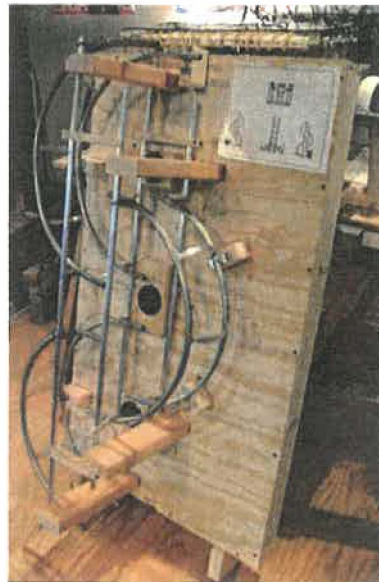
Brainstorming led to a slick way of how to “convey” game pieces to the scoring module. A curved rail system was sketched in Inventor® and a successful steel conduit prototype was built.



Inventor® was used to plan an all aluminum version. Using a conduit bender, 5/8” diameter aluminum tubing was bent into three “C’s”. A wooden jig was built to hold them in place for welding.

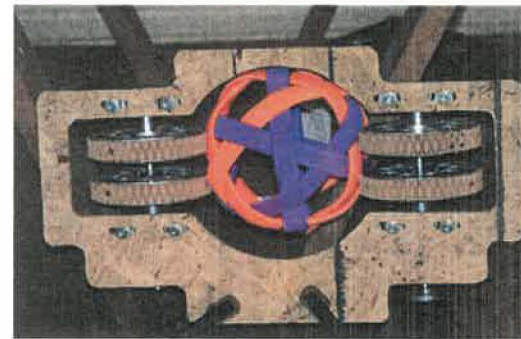


Using another jig, the three “C’s”, vertical supports, and six bearing plates were TIG welded. A Globe Motor drives IFI 2.0” wide traction wheels through a jack shaft and #25 chain; the top wheel is overdriven 20%.



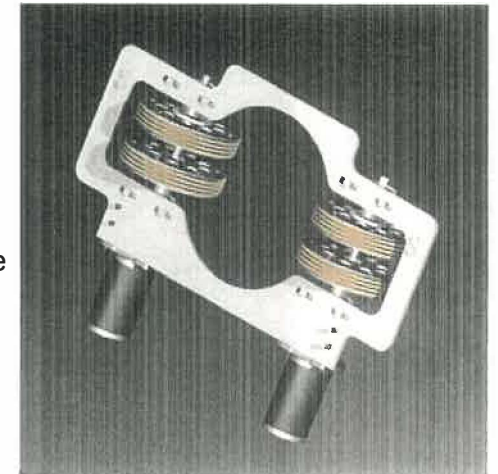
Scoring

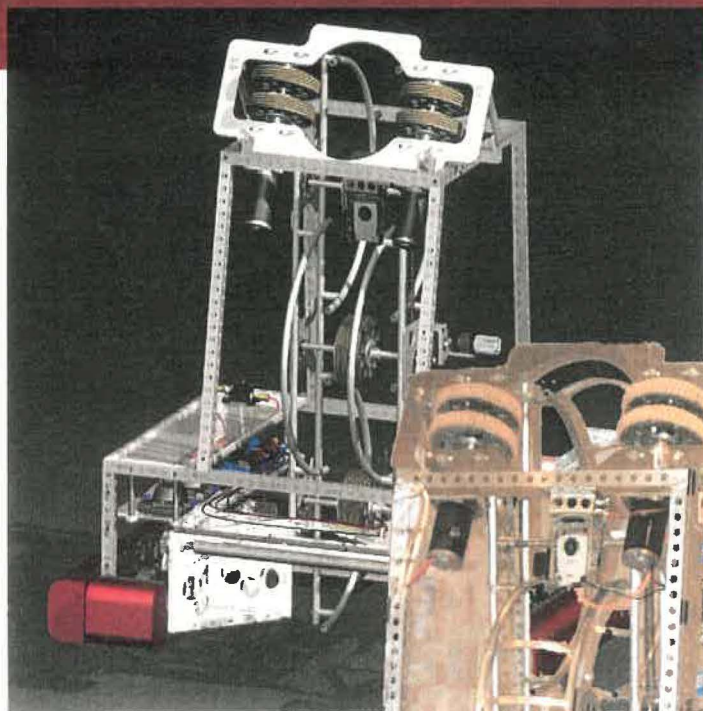
Several prototypes were sketched and fabricated from wood. From these, a simple baseball shooter design, which normally uses two counter rotating wheels, was chosen. Instead of two wheels, four are used to compress and shoot the game pieces.



CAD models were created of the final design and a wooden sample was tested.

After successful testing, water jet-cut aluminum plates, brackets, and motor mounts were assembled and direct-drive CIM motors were attached. The wheels are adjustable, and the CIM motors are operated by variable voltage to give close and long range scoring capability.





Team 1987 can start the game possessing six game pieces, score them from close to far range, herd more, convey them to the scoring unit, and score again. Along with the three basic modules (the herder, the conveyor, and the scorer), sensors are used to provide traction control and time movement of the game pieces through the robot. Here is how it was designed, developed, and built.