

About the Broncobots

In our **2nd year**, Team 1987 is excited to be part of the 2008 *FIRST*™ Overdrive competition. We come to Minnesota from 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.



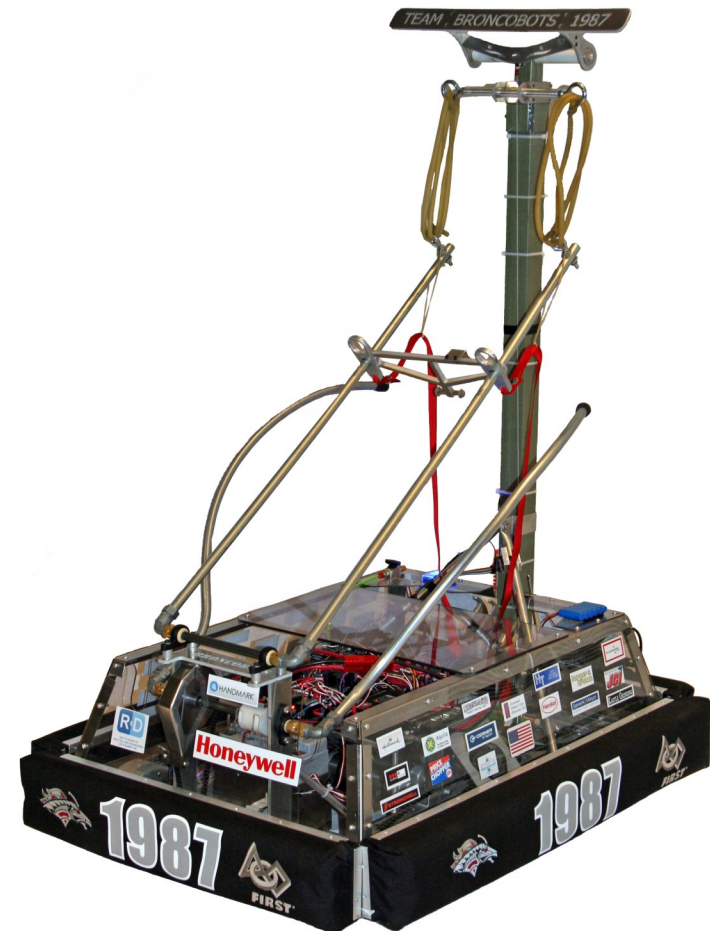
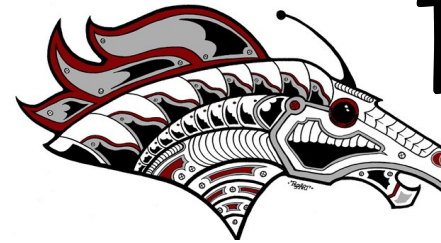
Team 1987 is made of **21 students**, of which about one-third are girls. We are very fortunate to have nine mentors; five Honeywell engineers, a Honeywell buyer, a Kansas City firefighter, a machining company CEO, manager of a computer company, and one software company director. These mentors are a great bunch of teachers. The most important and inspiring thing they do is help us use our ideas. They encourage us to think critically and they help advance the ideas into reality. Our student-created designs are found throughout this year's "Mammoth" robot.



The Broncobots

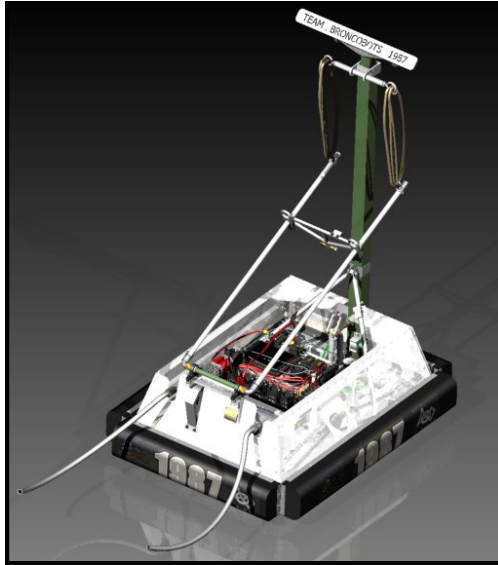
Team 1987

Lee's Summit, MO



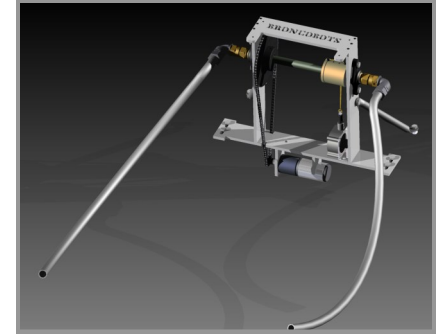
Drivetrain

The robot uses the "Kit-of-Parts" chassis, assembled with aluminum nuts, bolts, and rivet nuts to minimize weight. The drive train consists of four CIM motors mounted to two AndyMark Toughbox transmissions spinning 21 tooth gears driving 22 tooth sprockets at the wheels for a combined gear ratio of 13.4:1. The four wheel drive robot has front-mounted, 2" wide, IFI Traction wheels and rear AndyMark Omni Wheels.

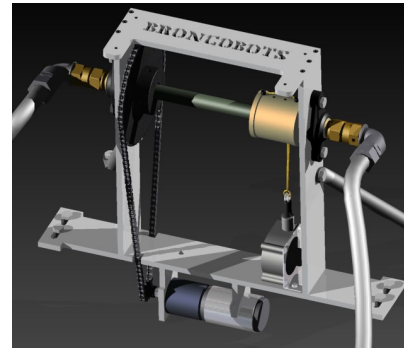


Ball Herder

The Herder is a low tech solution to a high tech problem. Constructed from a 0.625" anodized aluminum axle, flange mounted bearings, 0.625" compression fittings, 0.50" conduit, and 0.50" compression conduit fittings, the



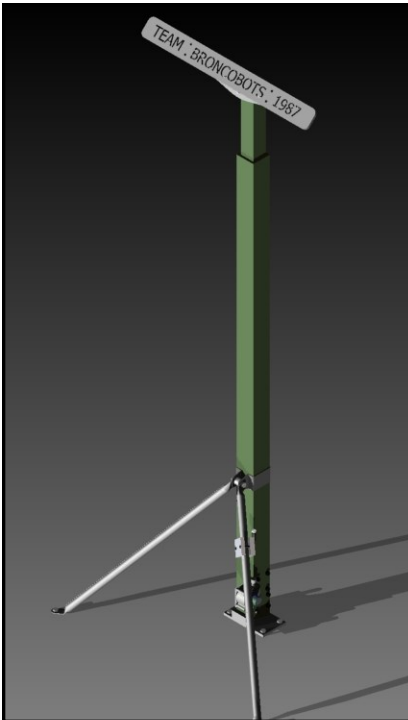
herders can scoop and lift the trackball. The herder arms are moved up and down using a Globe motor, geared down at 6:1, driving through a #25 pitch chain. The location of the herding "tusks" is provided by a Celesco linear, cable-extension position transducer.



Ball Removal

The Trackball is removed from the overpass by a water jet-cut paddle mounted on top of a telescopic, pultruded fiberglass arm assembly. The paddle is mounted on top of a 1.5" square beam that telescopes in and out of a 2.0" square beam.

The inside beam is driven by a 36" long, 1" pitch, anodized aluminum lead screw coupled to a 48:1 Banebots RS-540 planetary gear box. The center beam can be lifted to its extended height in four seconds.



Ball Hurdler

The Ball Launcher is a motor driven, pneumatic controlled catapult. It consist of 38" long, aluminum-reinforced arms accelerated by two, 6' long latex tubes wrapped 5 times to achieve the correct force. The launcher is pulled into tension by nylon straps connected to a winch drum. The winch drum is driven by a Globe motor through a pneumatically-controlled differential and 1.33:1 gearing.

The launcher is latched and released using a 0.75" bore, 1.5" stroke pneumatic cylinder. The launcher is capable of being armed in seven seconds and can be fired while the robot is stationary or in motion. The maximum height of the launched ball's arc is approximately 12' and it can be hurdled up to 8' away from the overpass.

