

Last Saturday, Team Thrust, 1501 from Huntington invited PhyXTGears to their workshop for a clinic on Monocoque construction. Fourteen 1720 students and mentors spent over 5 hours under the careful instruction of Jerry, Al, Mike, Steve, Sonny, Chris and Harley. We learned from their experiences and successes with Monocoque construction on their last two robots: Scorpion and Sidewinder.

The lectures centered around Jerry's Cardinal Rules:

1. Debur all holes and edges.
There are several tools for this: a drill bit or deburring tool for holes, file or belt sander for edges
2. Make all flanges 5/8" wide
3. Use a #30 drill for 1/8" aluminum pop rivet holes
4. Minimum distance between pop rivet hole and sheet edge = 2 diameters (1/4")
5. Distance between rivets in line = 1 1/8" - 1 1/2". Minimum distance = 3 diameters
6. Distance between rows = 2 diameters (1/4")
7. Use Clekos to hold position until the part is complete
8. Holes in ribs or bulkheads can be up to 1/3 the width of the rib or bulkhead.

Besides these specific techniques, Jerry shared many of his design principles and explained how to apply them to FIRST robotics. The process was explained from start to finish; from the 2D drawings to the finished uni-body product. Jerry also explained each of the specialized tools, why they were needed and how to use them.

It wasn't long before Team Thrust put our students and mentors to work. We learned how to drill, debur, crimp, flange, use Cleko fasteners and finally, pop rivet. Several of last year's backer blocks were clamped up and parts formed. The parts were deburred, drilled and jigged up.

The hands on experience brought out many questions and all of them received complete and accurate answers. We brought back a little homework for our Jan. 3rd meeting, but more than that, a basic understanding of how to use this design and construction technique to create a light weight, strong, competitive robot.