OBSERVATION OF OTHER ROBOTS

* Electrical
  + Modular battery
  + Multiple batteries
  + Smaller batteries 70 amp hour
  + GPS
    - Don’t have to place GPS so high—space is very open so GPS can be very robust in the open space
  + LIDARS
    - Can have it lower to the ground
    - Almost every obstacle has a solid base (except saw horses)
    - Need to be protected, fragile (some mounted upside down)
    - Use of alternate range finding for blind spots
  + Controls
    - User control RC transmitter for kill switch and override
    - Use a Joystick or X-Box controller for libraries
    - Using professional grade kill switches from 3rd party manufacturers
  + CAMERAS
    - Using webcams
    - Using multiple cameras
    - Birdseye view camera
    - Low to ground camera to catch blind spots
    - Shade and/or blind the cameras from sun
  + IGCV REQUIREMENTS
    - Lights—light strings
    - Alternate means of control (cop rotating lights to get blink from a steady light)
    - E-stops (multiple)
    - Some are latch-based (best)
    - Special indicators for various behaviors/functions
* Hardware
  + Drive Train
    - Geared down
    - Fine resolution encoders
    - Brushless Hall effect
    - Some very steady and over-accuated
    - Closed loop systems are finely tuned or at appropriate power so tuning doesn’t matter
  + Ergonomic
    - All geared for easy field programming—easy access to computer—Cal Tech upright at height for chair-sitting
    - Leave the chair untouched so you can sit in the robot with the LIDAR at your feet—be able to debug outside
    - Elemental
  + Pre-fabed bases
    - Husky
    - Handicapped chairs
    - Large diameter wheels for grass terrain
* Software