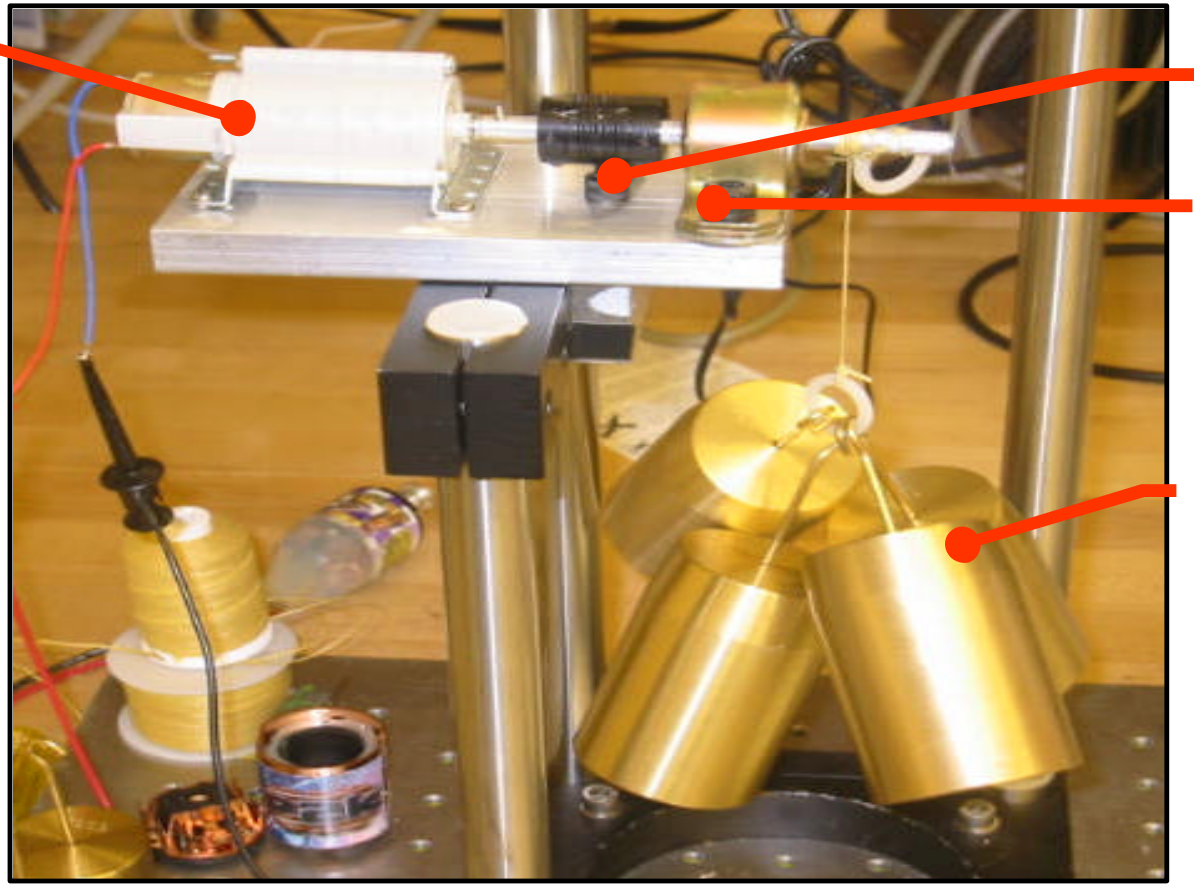
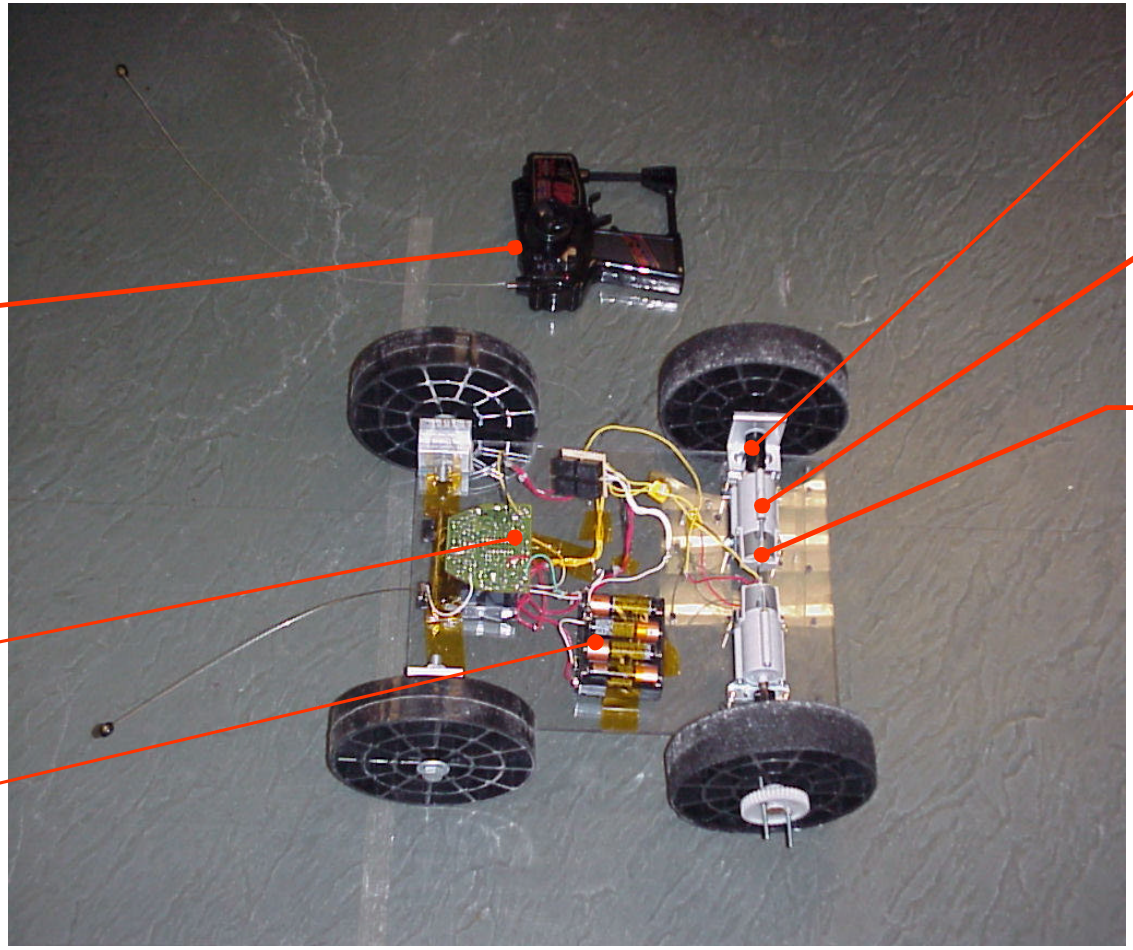
Motor and Gear Charts: **Design I**

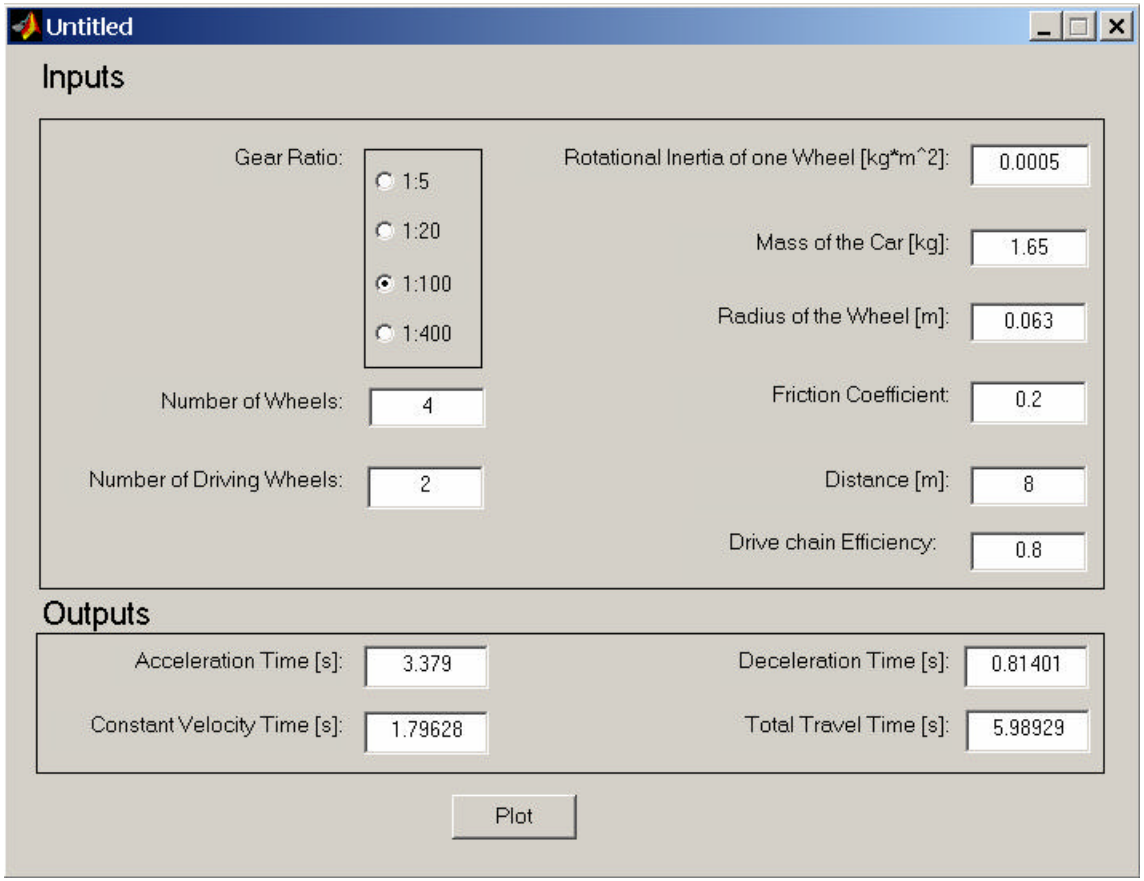


Motor and Gear Ratio: **Design II**



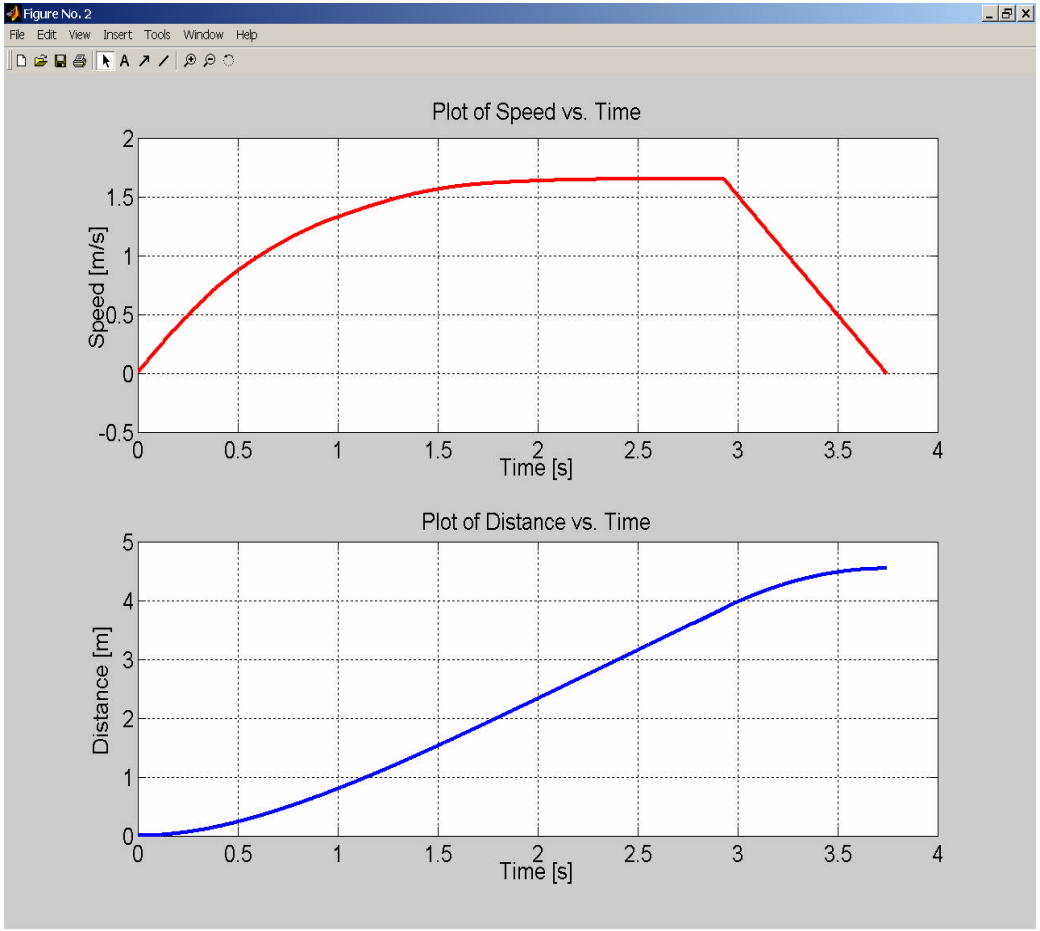
MATLAB® Script: Simulation

- MATLAB® program and Torque-speed files on 2.007 website software/tools
- Interface: Inputs and Outputs
  - Car parameters
  - Distance
  - Choose Gear Ratio to minimize your time
  - Output time you needed
- Drive chain efficiency determined by experiments
- Choose different parameters to ***optimize*** the performance of your car



Output Plots

- Acceleration limited by torque-speed and friction
- Maximum speed from acceleration and time
- Deceleration limited by friction and torque
- Two plots
  - Speed vs. Time
  - Distance vs. Time



Compare Simulation & Experiment

- Using the simple car
- 1:100 Gear Ratio
- Two wheel drive
- Efficiency about 50%