2.70/2.77
Practical Uploadable Problem Set # 9: Complete Machine Design Detail

Remember when doing this problem set:
- Problems must first be completed individually, and then group effort starts with peer review, then:
  - With your Peer Review Evaluation Partners and no talking, review each other’s work.
  - THEN discuss and make changes as needed.
- It is important the teacher see the original work, the PREP comments and then any changes needed.
- All math should also be done with a spreadsheet or Matlab script, so you can easily play “what if”.

Problem (Opportunity!):
From the previous PUPS you should be able to select a ”best” design for which you will now do the design details. The first step is to create the detailed design for a (the primary or Most Critical Module) linear motion axis of your machine.

1. Based on results of testing (and closing the design loop) the MCM, evolve the design for structure, bearings, actuator... for the rest of the machine. (2 pts)
2. Update error budget and FRDPARRC table and if needed iterate on the design. (1 pt)
3. Complete the solid model of the machine with enough detail to enable you to build your entire machine: (3 pts)
   a. Safety review
      i. Would you operate your machine? Your most loved one?
   b. ‘Manufacturing review
      i. Can you build and test the machine in the time you have left.
4. Check the error budget one last time. (1 pt)
5. Make part toleranced part drawings, thinking carefully how everything will fit together. (2 pts)
6. Bill of Materials so you can acquire everything needed. (1 pt)

Peer review can be done along the way or at the very end after all the individual elements done. The former is suggested