ASEN 5010 Homework Assignment No. 6

Due Date April 30, 2013

READ CHAPTERS 1, 2, 3, 4.1-4.3, 8.1-8.6

Note: if you don't attempt to solve a problem or sub-problem, then you'll be deducted the points you would have been given. Yes, it is possible to make negative points. For example, if a problem is worth 15 points, and you chose simply ignore it, then you'll receive -15 points for this part. If everything else is correct in the homework, you'll end up with a 70.

Problem 1: S&J, Problem 8.10

Problem 2: S&J, *(Optional)* Problem 8.11 (Illustrate your control performance by running numerical simulations where the body tumbles and you do the proper MRP switching!)

Problem 3: S&J, Problem 8.12 (Only do the MRP case, and treat $\boldsymbol{L}$ as a unknown torque!)

Problem 4: S&J, Problem 8.13

Problem 5: S&J, *(Optional)* Problem 8.14

Problem 6: Derive the equations of motion of a rigid spacecraft with N VSCMG devices attached. Start with the general Euler's equation $\dot{\boldsymbol{H}} = \boldsymbol{L}$, and show all steps to yield the final EOM in Eq. (4.137).