Satellite Navigation Techniques and Applications
Assignment #4 Orbit Transfers

1) Programming Exercises

Simulate the following orbit delta V maneuvers. For the following exercises assume circular orbits.

a) Transfer a 100 kg satellite from a 500 km to 700 km orbit. Address the following,

1) Assuming your ground station is in Montreal, design a transfer time line which allows you to monitor the satellites telemetry in the transfer orbit.
2) Specify the times, directions and magnitudes of the delta V maneuvers.

Hint: Make it possible to switch orbital elements in your simulation.
Start in orbit 1 → perform delta V → propagate orbit 2 → perform delta V, etc.

b) Simulate a de-orbit delta V for a 500 kg satellite in a 800 km orbit using the following criteria:

a) Bring the orbit perigee below 300 km.
b) Bring the orbit perigee below 100 km.

What are the biggest design considerations between the two cases above?
What are the simulation problems in demonstrating a successful de-orbit?