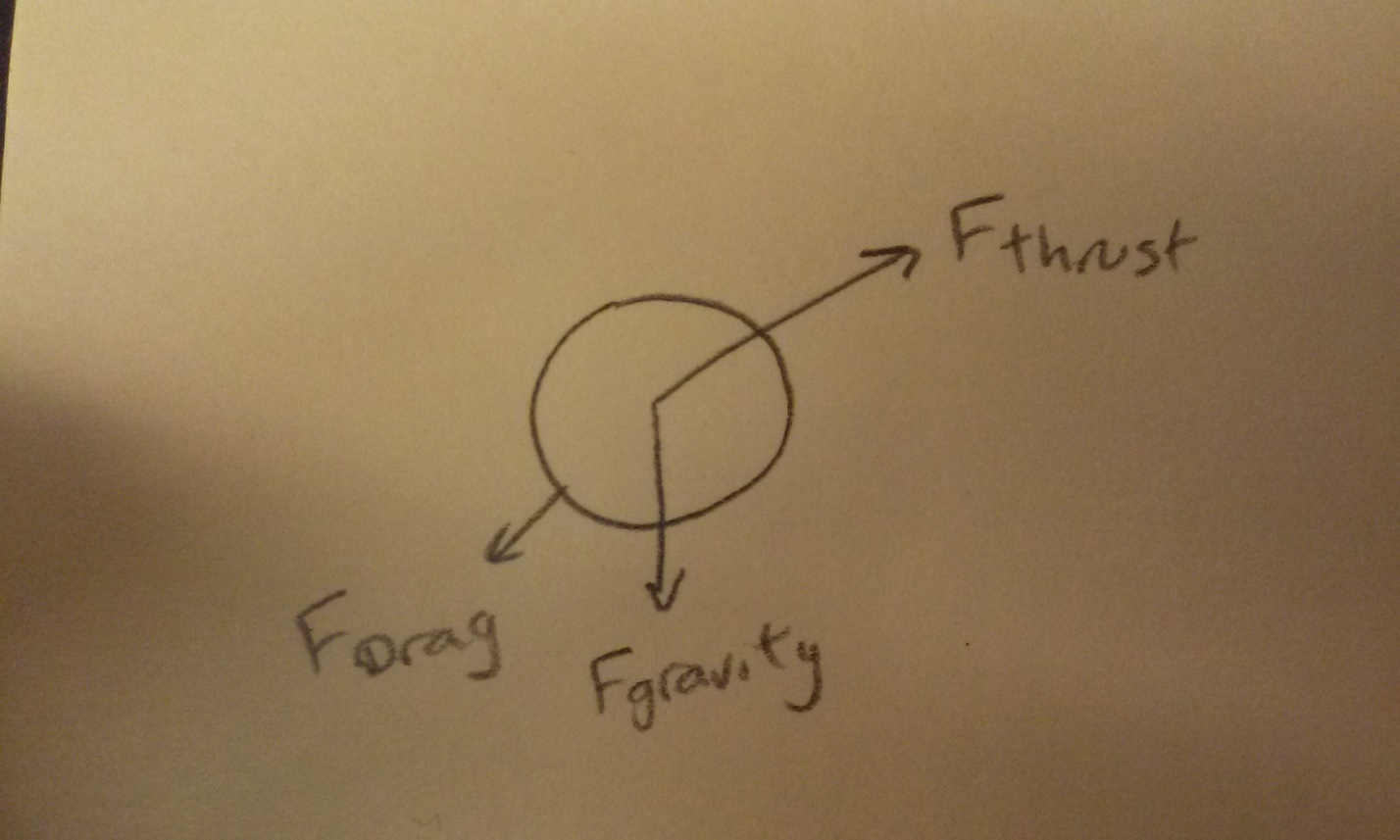
Miranda Lao and Liz Leadley

Machine Gun Jetpack

**Question:** How can you cross the Atlantic Ocean with a machine gun jetpack?

**Model:**

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**Equations of motion:**

Fdrag\_x = -.5\*rho\*coeff\_drag\*area\*(v\_x^2+v\_y^2)\*(v\_x/sqrt(v\_x^2+v\_y^2));

Fdrag\_y = -.5\*rho\*coeff\_drag\*area\*(v\_x^2+v\_y^2)\*(v\_y/sqrt(v\_x^2+v\_y^2)); Fgravity = -9.8\*mass;

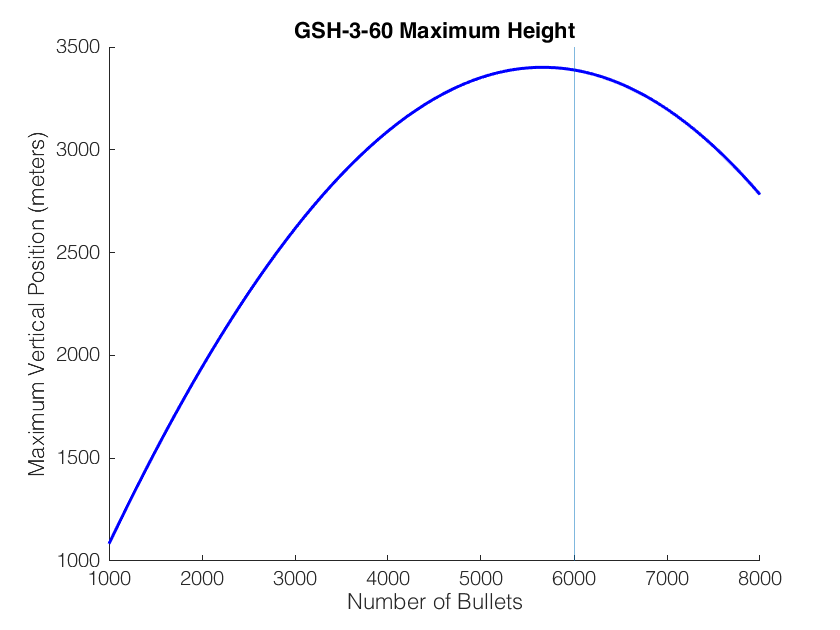
Fthrust\_x = firing\_rate\*(bullet\_mass+casing\_mass)\*-muzzle\_velocity\*cos(theta\_rad);

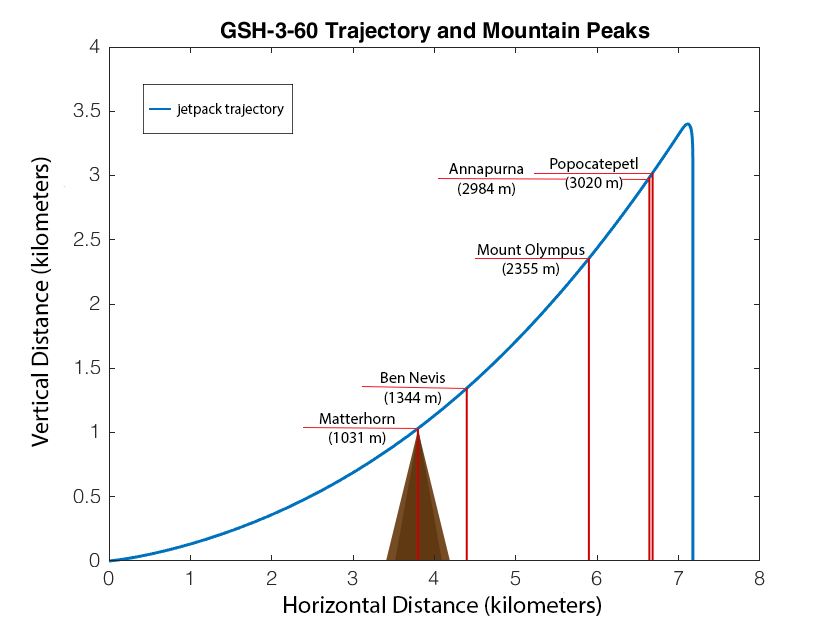
Fthrust\_y = firing\_rate\*(bullet\_mass+casing\_mass)\*-muzzle\_velocity\*sin(theta\_rad);

dmass = - firing\_rate \* (bullet\_mass + casing\_mass);

Thrust is on at 45° until the bullets run out, and then the model runs with thrust set to 0 until the pack hits the ground.

**Graphs:**

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(These graphs will have some validation attached to them)

**Poster Layout:**

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