Mission Report: Orbit and Land

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Objective Overview:

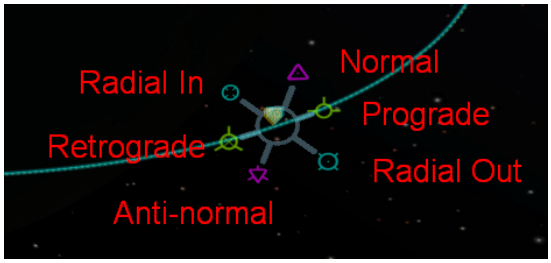
The objective of this milestone was to launch a rocket into Kerbin orbit, at approximately 80,000 meters above sea level, and then get the crew (and the rocket, if possible) back to Kerbin safely.

Flight Events:

Initial Difficulties and Analysis:
There were MANY difficulties throughout this challenge. This challenge was approached with a trial-and-error brute force method, as nearly no previous knowledge regarding this challenge was really comprehended by the team.

Regarding the assembly of the rocket, there were many tech components that were missing that would've been of great utility. For example, the engines and aerodynamics available were of suboptimal quality, meaning that more efficiency was required for the successful orbital launch of the rocket. Moreover, the context that SRBs are useful for launching was unknown, so the rocket was originally only powered by Liquid Fuel Engines, which is not very efficient. Furthermore, there were no small blasters to help give decoupled rockets horizontal velocity, so after being decoupled, many engines / fuel tanks would just explode.

Regarding the launch of the rocket, there were perhaps over 20 attempts. Knowledge of the different vectors (prograde, retrograde, normal, antinormal, radial-in, and radial out).



Design Solutions:
I ended up using a two-stage system. The first stage had

Mk16 Parachute
Mk1 Command Pod
Heat Shield (1.25m)

TD-12 Decoupler

FL-T200 Fuel Tank
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LV-T30 "Reliant" Liquid Fuel Engine

TD-12 Decoupler

FL-T200 Fuel Tank
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FL-T200 Fuel Tank + 4x(TT-38K Radial Decoupler -> RT-10 "Hammer" Solid Fuel Booster + Cubic Octagonal Strut + Aerodynamic Nose Cone) + 4x(Cubic Octagonal Strut)
LV-T45 "Swivel" Liquid Fuel Engine

What I learned:
I talked a bunch about this in my initial challenges, but I learned about different directional vectors, the fundamentals of orbits, what the apoapsis and periapsis are, how to manipulate orbits, and some more about rocket design.

Going Forward:
Going forward I will try to do more research / thinking / planning before a mission.