

Features from KSP

Functionality in KSP that we should have for feature parity

- VAB/SPH
- Career/sandbox/science modes
- Science experiments (this is going to be fun to implement, we should be creative)
- Money
- Contracts
- Basic parts
 - Pods
 - Fuel tanks
 - Engines
 - Decouplers
 - Structural components (adapters, struts, etc)
 - Antennae
- Docking
- SAS (via reaction wheels, RCS, control surfaces, gimbals...)
 - https://en.wikipedia.org/wiki/PID_controller
- Orbital mechanics
 - Ideally via patched conics, but may be n-body at first (easier)
- Atmospheric flight
- Wheels
- Communications network
- Translation support (we don't need to have it translated but the support should be there)
 - https://godot.readthedocs.io/en/stable/learning/features/misc/internationalizing_games.html
- Map view
 - Maneuver nodes
- Navball
 - Can we use KSP's icons for prograde/retrograde/etc?
 - maybe write Squad legal :P
 - These symbols are standard on aeronautics (I believe), but I suppose we couldn't use the exact same file as KSP!
- Support for IVAs (interiors) with clickable elements (yes, this is stock)

Other core features

Functionality that isn't in KSP (but may be via mods) that we should have in stock

- Easily moddable solar systems
- Delta-V calculator
- Enable/disable mods without uninstalling
- Enable/disable mods on a per-save basis
- Superior IVA system than KSP In-flight action group editor
- Different kinds of resources to harvest
 - This is in Stock KSP, but should be considered lower priority feature-parity-wise
 - KSP was originally going to have a system like this:
<https://i.imgur.com/08hdJyj.png>
 - Surface, atmospheric, and ocean harvesters
 - (We should also consider space harvesters, e.g. ramscoops, gas clouds, etc)
 - Ideally all resources can be produced in situ
 - Resource Systems could be swappable (IE - pick between Simple, Moderate, Complex, Custom)
- Procedural parts
- Limit rate of throttling/gimballing (in KSP both are instant -> unrealistic)

Advanced features

Functionality that we should eventually implement but isn't as high priority

- Choose different solar system per save
- Built-in mod manager
- Multiplayer
 - Investigate how to avoid floating origin
 - High-precision floats?
http://chschneider.eu/programming/mpfr_real/ (performance bad)
 - Different timewarp modes
- Advanced terrain system (not just a heightmap, so supporting caves)
 - Deformable terrain / 3D Voronoi Oct-Maps

Nice-to-haves

Ok

Functionality that would be nice to have (sorry) but shouldn't necessarily be a priority. If one of these were to be implemented by a mod, we should consider integrating it into stock.

- Advanced aerodynamics model (possible to port FAR?)
- Scriptable flight computer
 - Python? Lua? GDScript? Custom language? Emulated hardware?
- Better atmospheric rendering à la Scatterer/EVE
 - <http://proland.inrialpes.fr/>
- Servomotors (Infernal Robotics)
- Ability for astronauts to handle tools or carry things
- Telescopes
 - Would require some thinking about how to handles LoDs
- Relativistic effects
- Head Tracking (TrackIR, OpenTrack, etc)
- VR