Kerbal Space Program - Feedback #16063

Jet engine speed modifier does not properly scale with altitude.

10/03/2017 08:51 AM - Ruedii

Status:	New		
Severity:	Normal		
Assignee:			
Category:	Gameplay		
Target version:			
Version:	1.3.0	**Language:**	English (US)
Platform:	Linux, OSX, Windows	**Mod Related:**	No
Expansion:			

Description

The jet engine power output modifier for speed is currently a fixed curve regardless of altitude.

Instead there is a separate curve for each altitude and speed, and the two are combined by a formula, hence limiting proper replication of jet engine behavior.

This creates unrealistic behavior where the jet engine's ideal flight speed does not change with altitude, and in order to overcome this the engines have to be poorly balanced in the extremes of their operation range.

I propose a simple solution to simply use a matrix for these values with one axis being speed the other being altitude. This would also reduce the calculations done by the computer actually improving performance.

A similar matrix could be applied to the intakes to further their realism.

This would fix the problem with minimal bloat. (Slight increase to config footprint with an actual decrease in physics computations. A good tradeoff if you ask me.)

For mod compatibility "Legacy Parts" could still use the old methods to fill in the matrix. They will work as before, just without the added flexibility in behavior.

As a note, I set this to normal because the ease of the solution I suggested and the potential benefit.
If you think it should be reduced to low, then do so.

Likewise it's a bug, because the current system makes gameplay balance on jet engines near impossible.

History

#1 - 10/05/2017 02:20 PM - Squelch

- Tracker changed from Bug to Feedback

- Project changed from KSP Pre-Release to Kerbal Space Program

- Category changed from Aerodynamics to 291

- Version changed from Build 01863 to 1.3.0

Thanks for the great information. This is worthy feedback, but does fall into the balance category and therefore not a bug. It is also not specific to the 1.3.1 Pre-Release, so this report has now been moved to the main tracker. This does not mean that it has been ignored however.

#2 - 03/11/2018 04:28 PM - Ruedii

Thank you.

It would be notable that the cutoff speed should be pretty much flat until you hit the altitude limit range of the jet engine.
It is only the curve that needs adjustment based on air pressure.

According to my research, intakes should also have cutoff speeds (except for the two hypersonic/supersonic models) and airflow curves based on speed. I'll add a feature request for that one.

The effectiveness of thrust at supersonic/hypersonic speed is dependent on the exhaust coil. (The RAPIER design should be only limited by it's intake, while the two afterburning high supersonic jet engines should start to taper off in high supersonic, and cut out completely in low to mid hypersonic. The switch mode one should run mid-supersonic with afterburner off, low-mid hypersonic with afterburner on.)

As a note, the Wheezy should have a much flatter taper curve when entering the supersonic range. It should get a sharp drop either shortly before or after Mach 1 and then taper quite a ways into low-supersonic. The sharpness of the drop, the point of the drop and extent of the taper should depend on the compression of the bypass turbine which really does pretty much all the work.