USERS GUIDE

General

This is a package of kOS scripts for stock gameplays. The scripts are designed to be efficient in terms of file size, so are less advanced cutting-edge than simple and robust.

autostage

Purpose: automatic staging.

How it works: The script decides to stage if KSP's DeltaV-Readout for the current stage is zero. Therefore, you have to release the launch clamps manually and stop the script, before it deploys the parachutes in space.

ldg

Simple propulsive autolander. Purpose: Automatic propulsive landing.

How it works: Set the maximum and minimum allowed landing speed. The scripts offers two landing modes:

- Bang-Bang: all-or-nothing mode in terms of thrust. Either the engine fires at full thrust or it fires not at all.
- Throttle: use-the-throttle mode.

The script calculates a conservative simplified allowed vertical speed dependent of the altitude above terrain. It uses the throttle to keep the craft's vertical speed beyond the calculated "red limit" (Suicide burn). When the vertical speed drops below the maximum landing speed, the script switches to touchdown control and holds the vertical speed between the maximum and minimum landing speed. When the crafts vertical speed drops below 0.1m/s (because it touches down), the throttle is cut and the program exits.

The thrust vector must be parallel to the longitudinal axis. The script is not multi-stage capable.

CAUTION: the script does not land in a certain place. It just controls the vertical speed with the throttle dependent of the mode.

CAUTION: a too shallow descent (depends from TWR) results in a too late upthrottling resulting in lithobraking. This is caused by a negative-radicand-prevention, which is necessary to avoid math errors.

WARNING: Because the script uses the current altitude above terrain, landing at mountainous terrain can end with lithobraking.

ldg2

Advanced propulsive autolander. Purpose: Advanced automatic propulsive landing.

How it works: Set the maximum and minimum allowed landing speed. The scripts offers two landing modes:

- Bang-Bang: all-or-nothing mode in terms of thrust. Either the engine fires at full thrust or it fires not at all.
- Throttle: use-the-throttle mode.

The script calculates the time to impact and compares is with the time needed to kill the velocity. It uses the throttle to maintain a constant ratio between impact time and burn time. When the vertical speed drops below the maximum landing speed, the script switches to touchdown control and holds the vertical speed between the maximum and minimum landing speed. When the crafts vertical speed drops below 0.1m/s (because it touches down), the throttle is cut and the program exits.

Parameter s (optional, default is 1): safety factor. A higher safety factor results in a lower deceleration, decreasing the chance of lithobraking and increasing gravity losses, a lower safety factor results in the opposite. A safety factor lower than 0.8 ends nearly always in lithobraking.

The thrust vector must be parallel to the longitudinal axis. The script is not multi-stage capable.

CAUTION: the script does not land in a certain place. It just controls the ratio of time-to-impact to burn time with the throttle dependent of the mode.

ndexe

Node executor. Purpose: Execute maneuver nodes.

How it works: The script orientates the spacecraft in node direction. It throttles up to execute the node and cuts the throttle when the node is executed. The script is not multi-stage capable, so it works only well, when the full burn is executed with the same stage.

The thrust vector must be parallel to the longitudinal axis.

simplelaunch

Launch script. Includes autostage. Needs ndexe. Purpose: Simple launch.

How it works: The vessel climbs vertically until the surface velocity exceeds the GT velocity. Then it pitches over at 85° pitch angle in the heading direction. When the pitch angle of the surface-prograde vector drops below 85°, the vessel follows in pitch the surface-prograde vector and in heading the entered heading. When the periapsis height reaches the target periapsis height, the throttle is cut. After leaving the atmosphere, the due to drag dropped periapsis height is corrected. A maneuver node is created and executed at periapsis, which sets the apoapsis to the target height.

startup

File loading program.

How it works: by clicking on the buttons, the files are loaded into local storage.