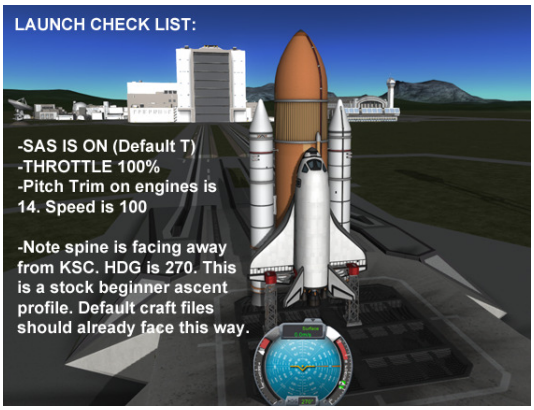
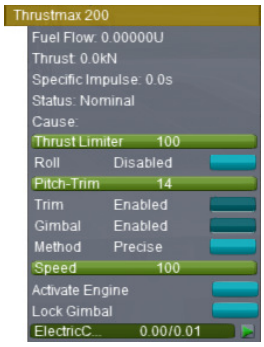
KERBIN SHUTTLE ORBITER SYSTEM

QUICK LAUNCH GUIDE

NOTE: KSO Stack Mounted Base craft file is intended for advanced users wishing to mount the KSO centerline. An adapter shroud is provided for this purpose. Novice and first time users should use the standard stack mounted KSO/KSO EWBCL (NASA, Buran style stack). This guide assumes a traditional (NASA, Buran) stack mounted configuration.



1- Default craft files have the shuttles facing at a heading of 270°. The spine of the orbiter should already be facing 90°. This makes it easier for beginners to pitch to horizon without having to rotate.

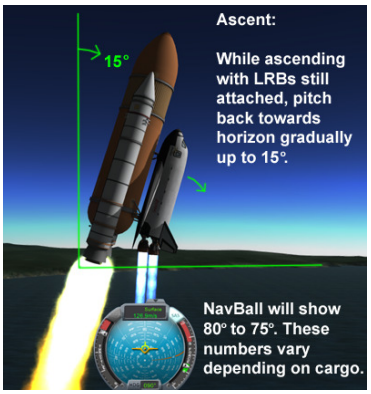


2- Make sure all engines have their Pitch Trim set to 14, and Speed is 100.

3- SAS must be **ON**. Default key is **T**.

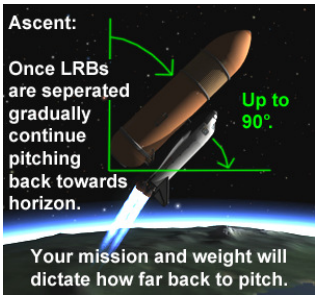
4- Set power to 100%. Default keys are **Left Shift** and **Left Control** adjusts the throttle.

5- Hit **Spacebar** to activate engines. Hit **Spacebar** again to release from the restraining frames.



6- As you ascend past 1000 meters, gradually pitch back towards the horizon up to 15°.

7- As you ascend, right click on your LRBs and observe the fuel amount. Once they reach zero (and not before), release the LRBS. Your KSO should continue on its current trajectory with its three main engines and the EFT.



8- Once the LRBs are separated, gradually continue pitching back up to 80°. Your mission and weight will dictate how much towards the horizon you will pitch.

9- After jettisoning the LRBs, see your Map (default **M** key) and check your Apoapsis. Once it reaches between 74km to 80km, cut power to engines. Continue on this path until you are near the desired apoapsis.

10- As you coast towards the apoapsis, in the Map screen (default **M** key), create a circularization node. You should have enough fuel remaining in the EFT to help you circularize.

11- You can monitor the amount of fuel in the EFT by opening the Resources tab (upper right hand corner of the screen). Once the liquid fuel amount is 360, the EFT is empty. Cut power and separate from the EFT (default **Spacebar**). Maneuver away from the EFT by using **RCS** (default **R** key to activate). Once you've maneuvered away, turn **RCS** off.

12- (First Option) Since the EFT is separated, you must set your main engines trim to 0 (default engines are the Thrustmax 200s KSO, or Thrustmax 300s KSO Super 25). Right click each engine and set the Pitch-trim to 0.

13- (Second Option) For a more efficient burn after separating from the EFT, you can shut down the two bottom Thrustmaxes. Leave the top center Thrustmax on and leave its Pitch Trim at 14. Activate the two OMS engines and leave their pitch trim at 14 as well.

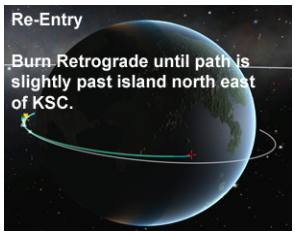
14- Continue your circularization burn until you're at your desired profile.

QUICK DESCENT GUIDE FOR KSO STANDARD

1- Before descending back to KSC, make sure that the liquid fuel amount in the KSO is less than 90. You can check this by openning the Resources tab on the upper right hand side of the screen. Landing with a fuel amount greater than 90, will cause the KSO to be too tail-heavy.

2- Continue to orbit Kerbin until the orbiter is approximately in the middle of the mountain range in the desert.

3- If you have less than 90 Liquid Fuel available, do the retrograde burn using the OMS engines. If you have more than 90 Liquid Fuel, use the main engines instead. Power up the desired engines and burn retrograde.



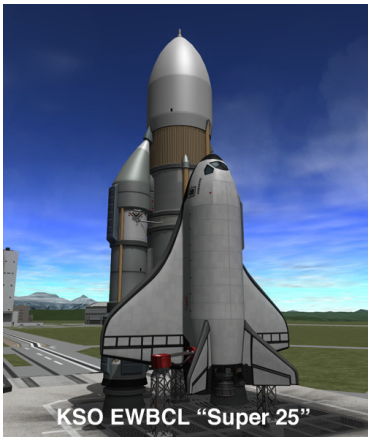
4- As you burn retrograde, note the landing target. You want to shoot for a spot slightly past the island north east of KSC.

5- Cut power to engines once the landing target is roughly at this point. As the KSO descends it will naturally be slowed down by the atmosphere. You should have more than enough distance, altitude and speed to glide into KSC.

6- Use the airbrake (default **3** key) to slow your ascent if the KSO is coming in too fast.

7- **NOTE: Landing gear (default G key) must be extended once before they will actually extend.** Extend the landing gear once the KSO is over the grass at KSC. The Landing Gear can be used to airbrake the KSO if needed.

8- Upon touchdown, extend the airbrake (default **3** key). Use gentle adjustments to keep centerline with the runway. Continue braking (default **B** key) until the KSO has slowed down enough to safely turn SAS off without it pitching up. You can also push down (default **W** key) to keep the nose down when you transition into a taxi and turn SAS off.



DESCENT NOTES FOR KSO SUPER 25

1- Use the same descent profile as the standard KSO above, starting your retro burn at about the same spot in the desert.

2- You do not need to worry about the minimum fuel in the KSO super 25. It is designed to return heavy, as such it shouldn't have issues returning full of fuel.

3- Unlike the KSO Standard, the KSO Super 25 needs a longer return trajectory. Aim for about three island lengths past the island north east of KSC.

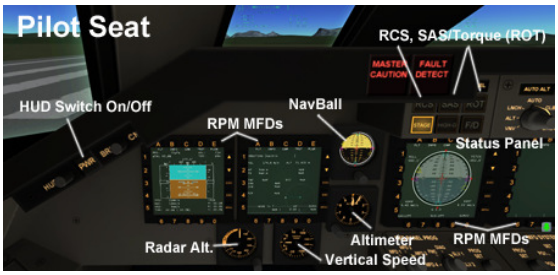
ADDITIONAL NOTES

-When EVAing out of the shuttle and on the ground, you must extend the ladder by right clicking on the cockpit and selecting Extend Ladder. If the ladder is not extended before a Kerbal exits, there is a chance he may be killed by the drop. On the KSO Super 25, do not EVA out of the KSO, without a ladder truck. There is a high likelihood your Kerbal will die if he falls from that height.

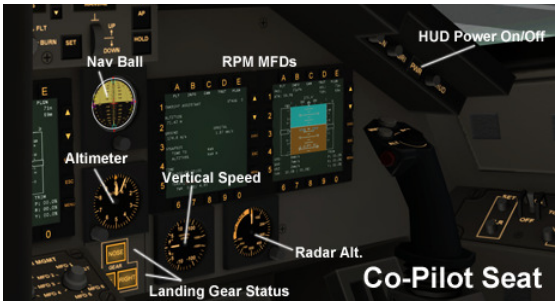
-The default KSO craft files include KSO Avionics and the Hinged Radome. Both components provide torque therefore over powering the KSO. This makes maneuvering the KSO in space much easier and helps counter rotations caused by the non-symmetrical RCS vectors. Removing the KSO Avionics and replacing it with a docking port for example, will reduce this extra torque.

-The KSO Super 25 default craft file includes an action group to turn on or off the rudder RCS. When in space in order to make Yaw much easier and more accurate turn off RCS with the action group (Default 7 Key).

KSO STANDARD COCKPIT GUIDE



Pilot Seat: The only switch in this location is the HUD power switch (click once to turn on or off) and the RasterProp Monitor screens. The RCS, SAS, and Torque status lights turn on or off when you activate these spacecraft components by using the default **R** and **T** key. They do not turn on or off by clicking these graphics. The Flight Director (F/D) and High-G maneuver warning lights have no direct KSP function currently.

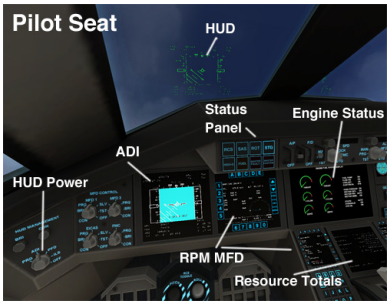


Co-Pilot Seat: The only switch in this location is the HUD power switch (click once to turn on or off) and the RasterProp Monitor screens. The gear status lights come on or off when ever you extend the gear with the default **G** key. On a fresh launch, the lights will be on even though the gear is retracted. Press **G** once to turn them off.

Overhead Panel: To activate the cabin lights and be able to see them lit externally, click once in the Interior Cabin Lights location. To get a HUD scope view, double click either of the HUDs. For a panoramic view of the KSO cockpit, click on the middle switch. Aside from the RPM monitors, no other switches or buttons activate anything.

Crew Deck: To get a panoramic view of the crew deck below the mission deck, click on the hatch that is on the floor of the mission deck. Alternatively you can simply cycle through the various Kerbals sitting in the crew deck (default **V** key).

KSO EWBCL "SUPER 25" COCKPIT GUIDE



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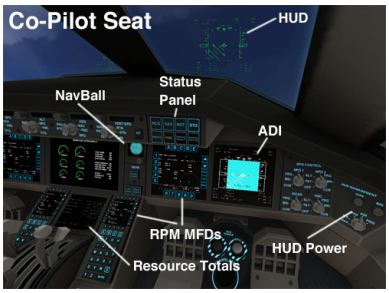

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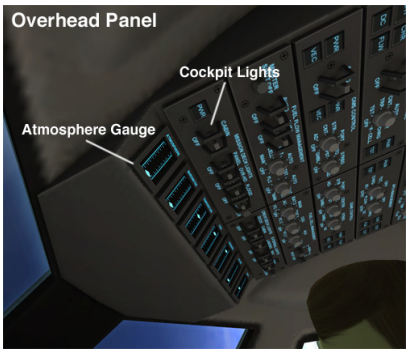
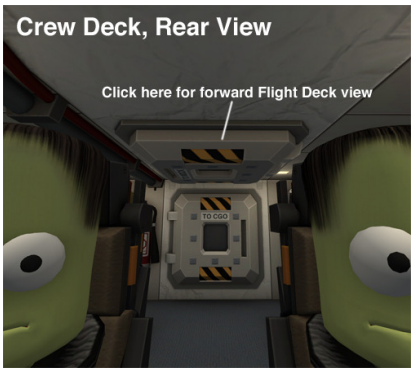


Overhead Panel: To activate the cabin lights and be able to see them lit externally, click once in the Cabin Lights location. To get a HUD scope view, double click either of the HUDs.

Crew Deck: To get a panoramic view of the crew deck below the Flight deck, click on the Camera. Alternatively you can simply cycle through the various Kerbals sitting in the crew deck (default **V** key).

Flight Deck: To get a panoramic view of the flight deck above the crew deck, click on the hatch that is on the roof. Alternatively you can simply cycle through the various Kerbals (default **V** key).



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Windows Installer: FREEMANtsinq

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without their support this project would not be possible!

TESTERS

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…and everyone else on the KSOS thread and the Twitch stream!

Support Thread: http://forum.kerbalspaceprogram.com/threads/68429-Kerbin-Shuttle-Orbiter-System
Twitch Stream: http://www.twitch.tv/fanbus/

LISENCE