

Duna Or Bust (page 1)

"Where No Kerbal Has Gone Before": The Duna Probe

From the "Space Center" main screen, click on the launchpad, and load the craft named "Duna Or Bust." This is an uncrewed space probe which is capable of reaching Duna (a fictional Mars-like planet), landing by parachute, and deploying a small rover. Staging is as follows:

- 5 | ignite solid boosters and launch engine
- 4 | jettison solid boosters
- 3 | jettison launch engine; ignite orbital engine
- 2 | jettison orbital engine; ignite interplanetary engines
- 1 | jettison heat shield; deploy secondary parachutes
- 0 | deploy primary parachute

In addition, you will want to make use of the following "hotkeys":

- G : deploy/retract landing gear
- B : activate aerobrakes (when entering Duna atmosphere)
- 1 : deploy/retract solar panels and antenna (use in space only!)
- 5 : (after landing) open bay doors and deploy rover
- 6 : deploy/retract rover antenna

To begin with, launch the craft (spacebar to activate next stage as usual) and get it into orbit as you did with the Munshot II. This should be possible using only the boosters, the launch engine, and perhaps a little help from the orbital engine to complete the orbit.

Once you are out of the atmosphere (70km up), you should press 1 to deploy the solar panels and antenna so you don't run out of power. (They are fragile and will break off with any wind resistance, so retract them before you re-enter an atmosphere again.) You should also save your game (alt-F5) so if something goes wrong you can restore (alt-F9) instead of starting over from scratch.

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"Mr Sulu, Take Us Out Of Orbit": Going Interplanetary

Establishing an interplanetary trajectory is similar in principle to your trip to the moon, but involves more complicated maneuvers, some of which are far less intuitive. Rather than trial and error, you should make use of KSP's built-in planning system: *maneuver nodes*.

From the map view, click on a point in your orbit (somewhere far ahead of your current position) and select "Add Maneuver." You should see a little circle with six "handles," each corresponding to one of the six cardinal directions we discussed earlier. Try clicking and dragging on the handle that looks like the "prograde" symbol. You should see a new trajectory marked in a different color that shows how your orbit *would* change *if* you executed that maneuver! You can also "slide" the maneuver node along your trajectory by dragging its center circle.

The maneuver still needs to be executed manually, though. Somewhere on the navball you should see a dark blue three-pronged symbol which represents the direction of your planned maneuver. To the right of the navball is a meter displaying the required v ("delta vee") that this maneuver will require. v represents the change in your craft's velocity during the maneuver; any maneuver requires a certain amount of "push." Note that this is not just about the amount of force; it's also about how long the force lasts: a weak engine firing for a long time can provide the same v as a strong engine firing for a short time.

Try it: create a maneuver node and adjust it so that your craft will *leave Kerbin orbit* and become a satellite of the Sun itself, and then execute the maneuver. (You can always restore your saved game if needed.) Once you're in solar orbit, try setting up another maneuver to put yourself on a collision course with Duna. (Clicking on Duna and setting it as your target will help.) If you need more guidance, look up "Hohmann transfer orbit" online. Good luck, and fly safe!