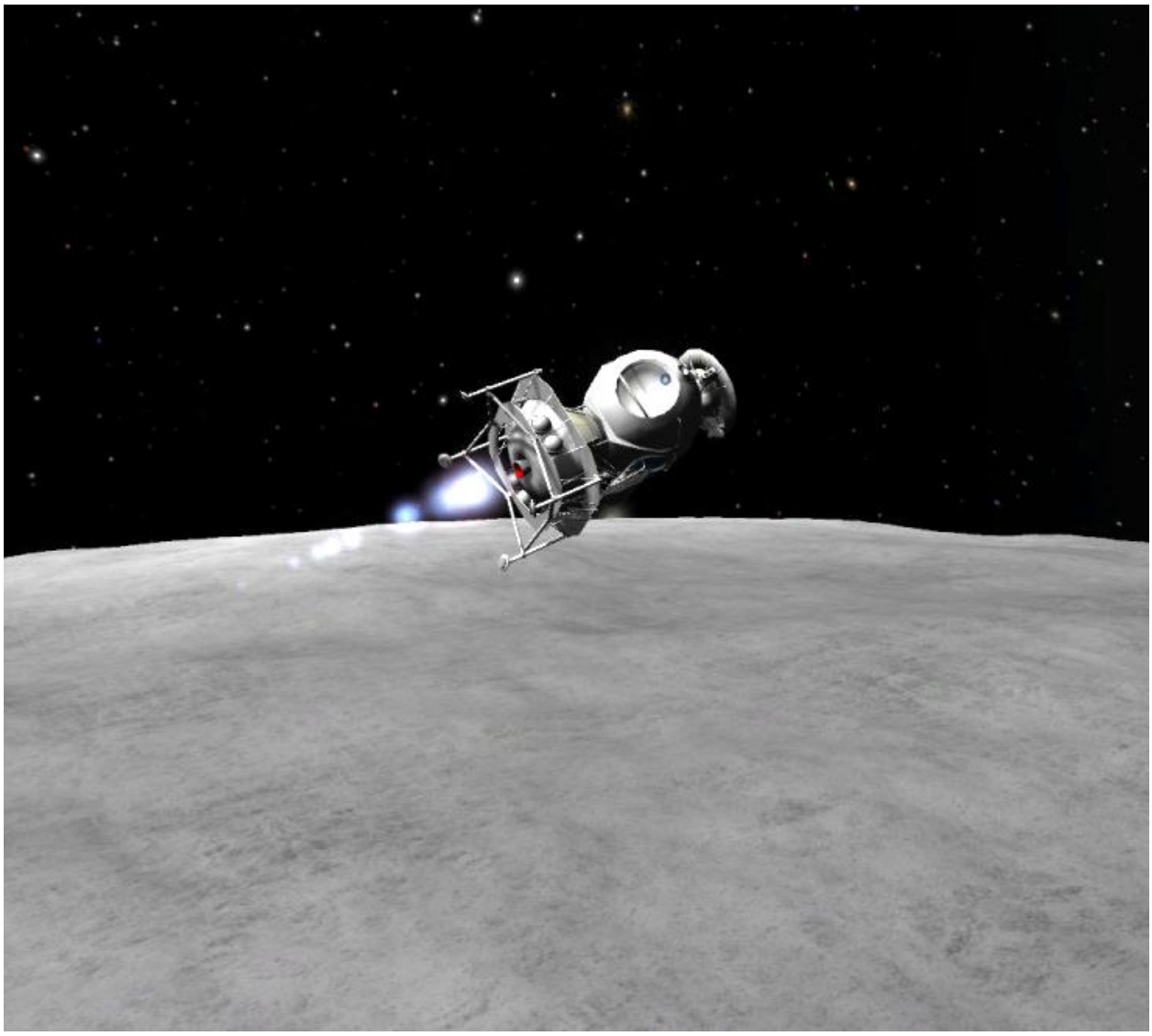
"LK" - LUNAR SPACECRAFT (USSR)



Assembly and flight manual

HISTORICAL BACKGROUND

MOON RACE

In 1961, President Kennedy defined the goal of the U.S. space industry - until the end of the decade to land a man on the moon. This desperate move was dictated by a shameful gap from the USSR in the pace of space exploration. Lunar race was entirely unnecessary to the Soviet Union. Soviet designers were prepared not to pompous and stupid sticking flag ceremony, but for the long, gradual planned development of the Moon. Besides moon program had military value and, therefore, was more of a dream enthusiast than a requirement of the state.

The belated inclusion in the lunar race, chronic underfunding, dispersion of funds among several projects, low interest military and State, as well as the difficult personal relationships between the Chief Designers resulted that collapsed manned part of the Soviet lunar program.

However
- Automatic lunar station and rovers had a unique research and brought to Earth lunar soil,
- The spacecraft "Soyuz", created as part of this program, still in service and is the main vehicle of manned space flight,
- The launch rocket "Proton" is the primary means of delivering large satellites and orbital station modules into orbit.

Engines designed for the "Moon rocket" H-1 and their descendants are established in the American rockets. This powerful rocket engines today.

LK LUNAR SPACECRAFT

As a system, the LK spacecraft consisted of the lunar module itself and the Block E propulsion system. However, structurally, the spacecraft would be subdivided into the Lunar Landing Aggregate, (Lunnyi Posadochnyi Agregat, LPA) and the Lunar Ascent Vehicle, (Lunnyi Vzletnyi Apparat, LVA). In turn, LPA consisted of a lattice-structured main body with a diameter of 2.27 meters and a four-legged lunar landing device, (Lunnoe Posadochnoe Ustroistvo, LPU). The LVA ascent vehicle consisted of the cosmonaut compartment, another avionics compartment, the attitude control section and a Block E propulsion unit. Like in Apollo's lunar module, the 2.3 by 3.0 meter's cabin had a complex geometrical shape dictated by its dual function as a landing and docking command center. However where Apollo featured an angular multiplying shape, the LK crew module sported a complex combination of semi-spherical structures. In its architecture, it clearly borrowed from the original design of the Soyuz spacecraft.

A circular cutaway in the front of the cabin contained a window which would afford a good view of the surface below the ship during landing. The pilot could steer the spacecraft to a touchdown while standing at the controls, in case of problems with the nominal automated descent mode. To save space and room, the cabin famously had no seat. However, like all Russian spacecraft and unlike Apollo, LK's cabin featured a normal nitrogen-oxygen atmosphere, instead of the oxygen-only life-support system in early NASA spacecraft.

The flight control system featured an onboard computer and enabled the cosmonaut to select the final landing site and conduct the approach and touchdown manually.

LOK LUNAR ORBITAL SPACECRAFT

Design of LOK is almost identical to the "Soyuz".
Lunar Orbiter consisted of Descent module, Orbital module, in which was located the special compartment with RCS engines and docking system, fixed-a modular cylindrical cage with a conical "skirt", which housed a missile unit, and power supply systems for oxygen-hydrogen fuel cell. A household compartment of the Airlock Chamber at one time served when astronauts in Lunar ship through free space (after donning the Lunar space suit "Krechet").

The lunar expedition would utilize the lunar-orbit rendezvous method for reaching the surface. In this way the mission could be accomplished in just one launch of an improved N1. The lunar flight plan was as follows:
-The L3 complex would be injected into a 220 km, 51.8 degree inclination parking orbit of the earth. Up to one day could be spent in earth orbit before trans-lunar injection.
- The Block G stage burned to propellant depletion, putting the complex into translunar trajectory. The Block G then separated.
- During a 3.5 day translunar coast the Block D stage would perform two mid-course corrections. It then would put the LOK/LK/Block D stack into an equatorial elliptical lunar orbit. The Block D would be restarted twice to adjust the orbit, first to a circular 110 km orbit, then to bring the pericynthion down to 14 km. The Block D could restarted for up to 4 days in lunar orbit.
-The LK pilot-cosmonaut would spacewalk from the LOK to the LK and check out the lander and Block D systems.
-The LK/Block D then separated from the LOK. As it approached the landing site, the Block D then began its main burn and braked the LK to 100 m/s at four kilometers above the lunar surface. The Block D then separated and crashed on the moon.
-The LK ignited its engines and hovered to a precision piloted soft landing on the surface.
-The LK cosmonaut would exit the LK to the lunar surface. From six to 24 hours would be spent on the lunar surface.
-The LK Lunar Cabin and Block E ascent stage launched itself from the LK landing gear (LPU) into lunar orbit. It rendezvoused with the LOK and docked using the 'Kontakt' docking system. The LK cosmonaut spacewalked from the LK back to the LOK with the lunar samples. The LK was then cast off.
-After up to one additional day in lunar orbit, the LOK's Block I engine would put the LOK into trans-earth trajectory. 3.5 days was to be spent on the coast back to earth with two midcourse corrections en route.
-Before re-entry, the descent module separated from the LOK with the two cosmonauts aboard. It re-entered the earth's atmosphere over the South Pole at 11 km/sec, skipped back out to space after slowing down to 7.5 km/s, then soared 5,000 km before making final re-entry and landing on the territory of the USSR.

Total mission time was to be 11 to 12 days.

INTRODUCTION

The package contains

		NAME IN PACKAGE
Parts	Soyuz LK Booster Block D	Soyuz_LK_BlockD
	Soyuz Block D decoupler	Soyuz_LK_BlockD_decoupler
	LK Descent Module	Soyuz_LK_descent module
	Soyuz LK Module	Soyuz_LK_pod
Internals	Soyuz LK Module	Soyuz_LK_pod

For the proper use requires a plug-in Lazor System (not included). This plugin is required for the functioning of the docking camera. You can download it from here: http://kerbalspaceport.com/lazor-system/ The installation instructions are there.

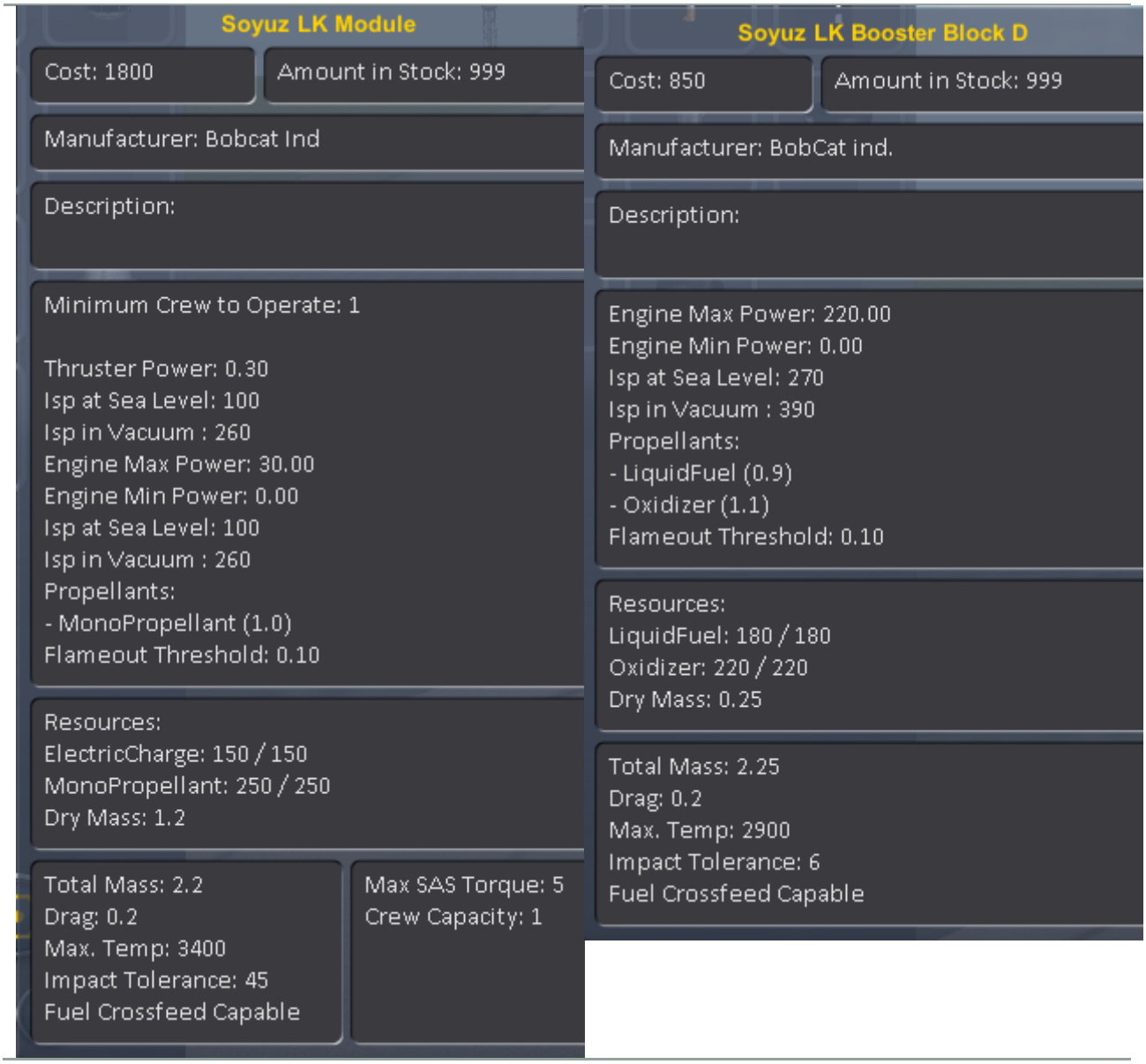
INSTALLATION

To install you should unpack the zip file to the directory in which the executable file (ksp.exe) is located.

If the installation is successful, you will find parts in VAB in these sections:

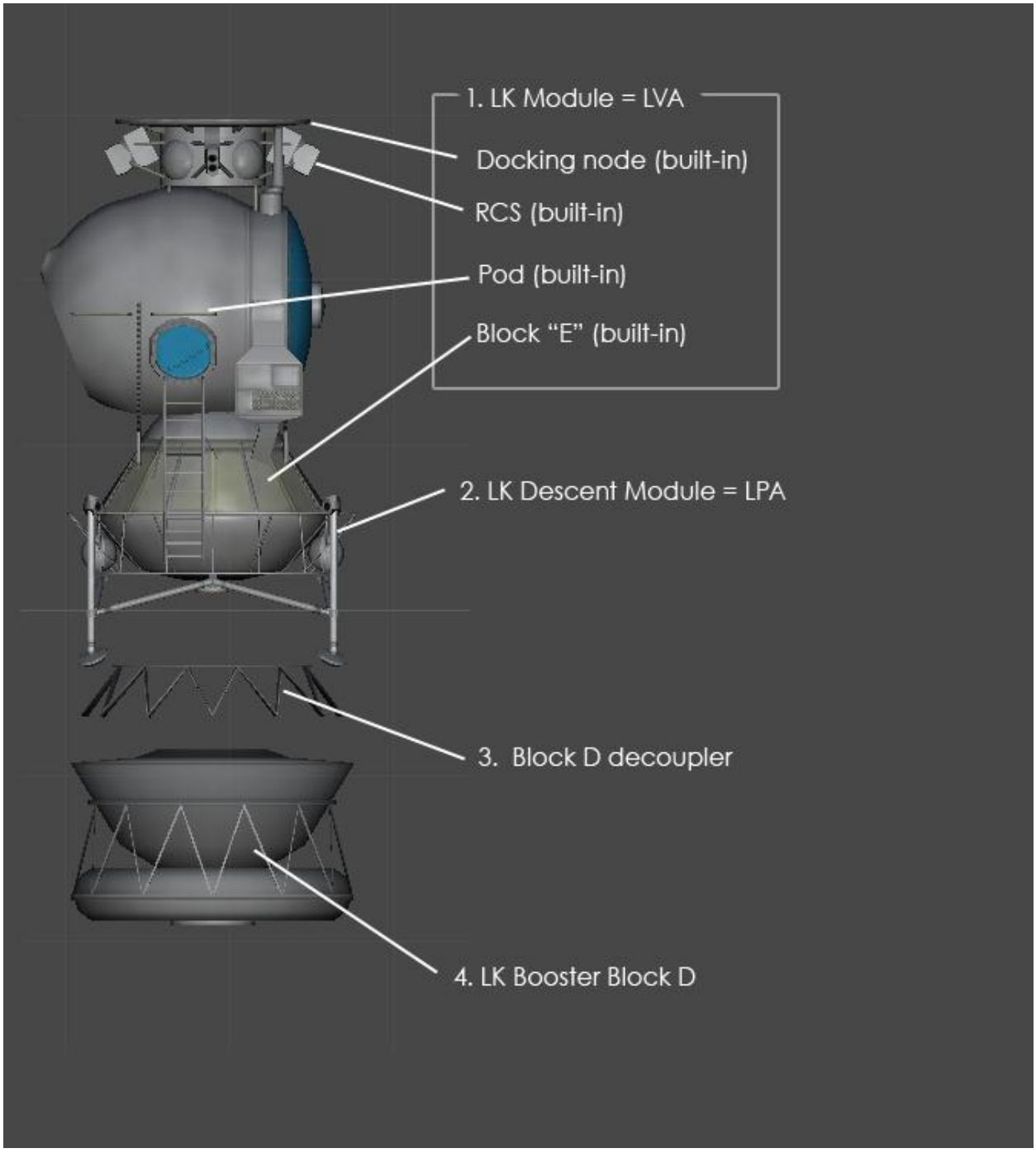
Install the plugin **Lazor System**, follow the installation instructions.

SPECIFICATION



All settings can be changed in configuration files.

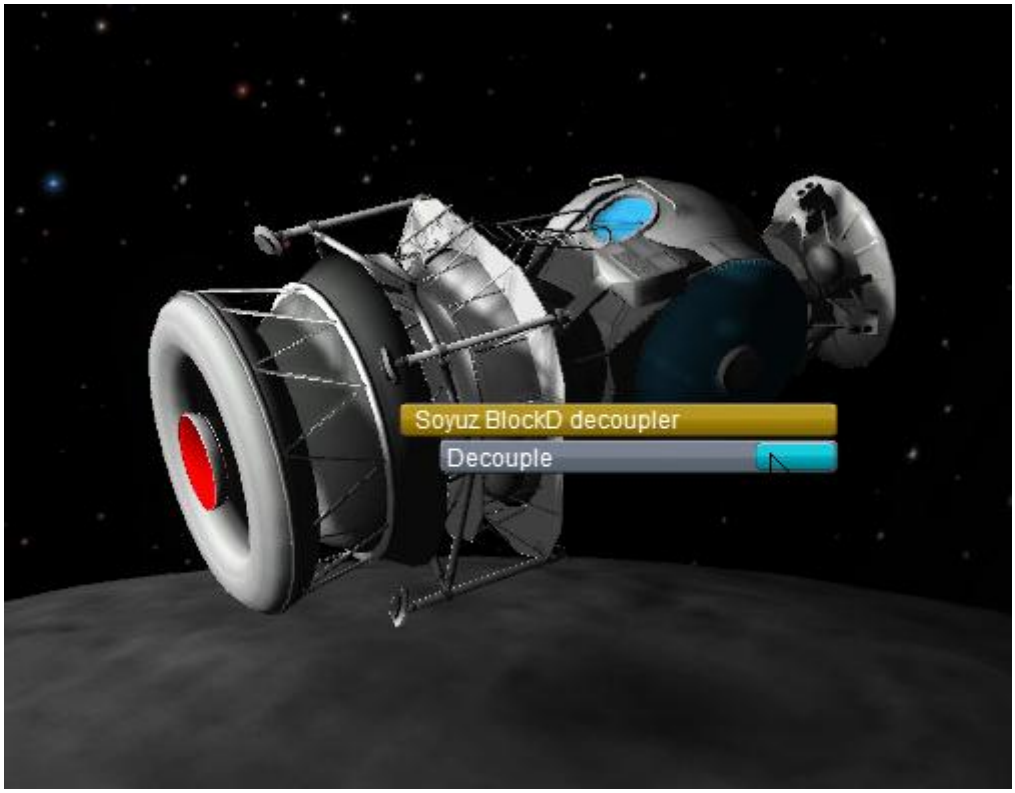
ASSEMBLY


1. LK Module = LVA
Docking node (built-in)
RCS (built-in)
Pod (built-in)
Block "E" (built-in)
2. LK Descent Module = LPA
3. Block D decoupler
4. LK Booster Block D

OPERATION

LANDING

Use any of the available autopilots (not included) or its exceptional piloting skills to land a lunar vehicle in the selected point. After braking burn, decouple the Block "D": menu-item [Decouple]



Before landing it is desirable to expand the legs. ([G] on your keyboard or the [Lower] in the menu.

TAKE-OFF

Click [Decouple], separate the LPA and fly off. Integrated engine Block "E" delivers the LPA in orbit (optimally – up to 70 km). Where brave astronaut will have to wait for a prepared LOK.

Note that LVA not intended for active on-orbit maneuvering. This is a passive device, and all operations on the convergence and the dock does LOK.

FAQ	
I don't have enough fuel. What should I do?	Edit .cfg file in the folder of the device to which you want to add the fuel.
Is he single-seated?	Yep
Where Is LOK? Where Block "E"? Where N-1???	Use your imagination, mods, add-ons & plugins. JoolV, "Soyuz" and "Proton" have nice stuff.

CREDITS

3D modeling and texturing - BobCat

Programming – CrashnBurn

Documentation, Testing – CCCP

Testing -- BlazingAngel665

Used information from websites:
http://www.astronautix.com
http://www.russianspaceweb.com

DISCLAIMER