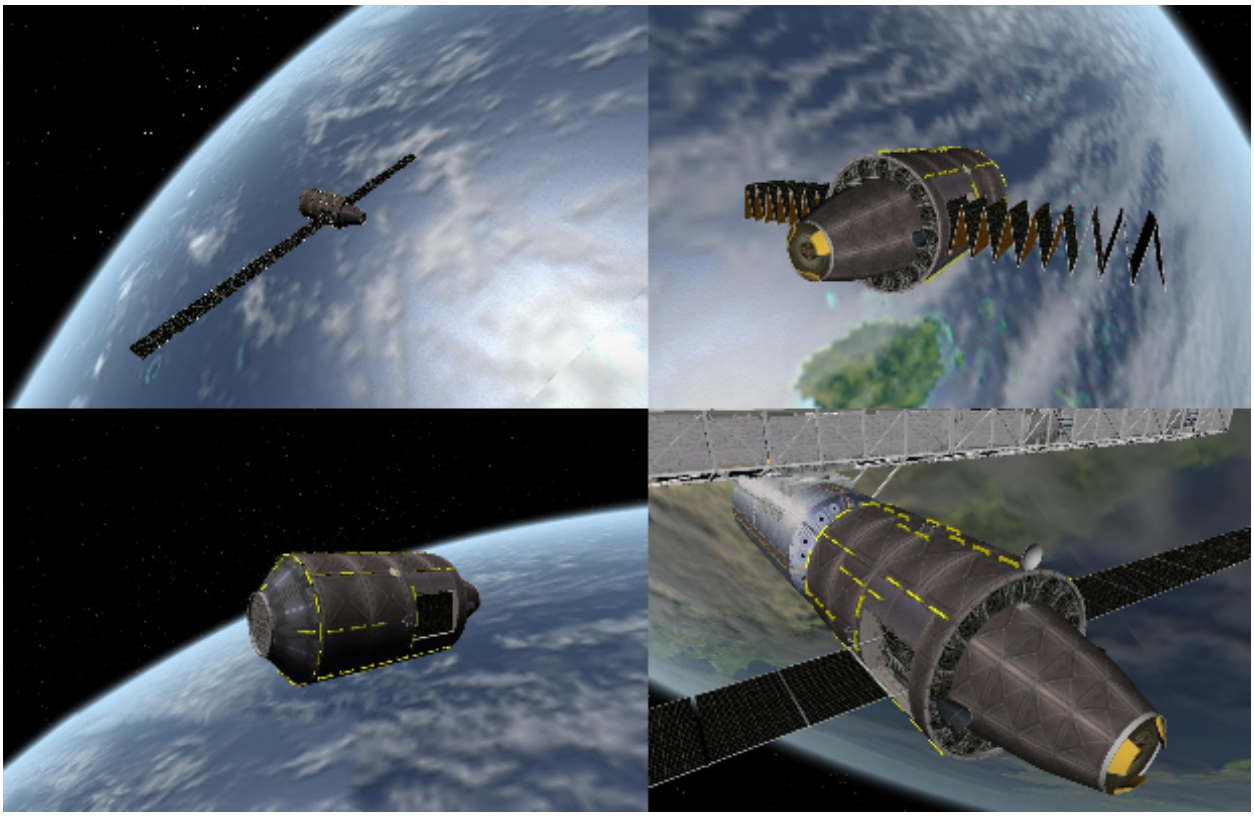

Solar Service Module

By Zatnikitelman

Contents

1. Legal/Credits
2. Description
3. Quick-start
4. Use
5. Controls
6. Scenario File Parameters
7. Specifications
8. File List

Legal/Credits

This addon is offered as-is without any warranty. The creator thereof accepts no liability whatsoever for your use of this addon. The creator (Zatnikitelman) specifically allows this addon to be distributed freely for strictly non-commercial interests with the original creator to be conspicuously identified and credited. No payment may be recovered from distribution except to cover the costs of distribution (CD, DVD, etc.).

No part of this addon has been directly copied from any other source however inspiration has been derived from multiple sources. The only sources this addon specifically derives inspiration is from the Russian Zarya and Zvezda International Space Station modules.

Thanks are owed to Dr. Martin Schweiger for developing the Orbiter Space Flight Simulator for which this addon is specifically created; ar81 for creating the Orbiter Mesh Wizard which was useful in deriving various dimensions and correcting parts of meshes; Hielor of the Orbiter Community for occassionally assisting in the coding of this vessel; Schimz for making the CBMp CBM texture used in this module (CBMp license and documents included in this addon's doc folder); the entire Orbiter

community for at one point or another offering guidance and help without which this addon would not be possible; Microsoft for creating the VC++ IDE with which this addon was coded; the creators of the open source Wings3d with which this addon was modeled; and the creators of GIMP with which the textures were created for this addon.

Description

The Solar Service Module is similar to the Russian Zarya and Zvezda modules, but it designed to represent an American version. In the form of this addon, it is a simple module representing only the visual model of solar panels, and active thrusters and engines. On each end is a docking port, the forward end has a representation of the Common Berthing Mechanism while the aft end contains a representation of the Androgynous Peripheral Attach system used by the American space shuttle orbiter. For use with the space shuttle, there is a non-visual attachment point on the bottom of the module for attachment to the payload bay, and an attachment point on the top of the module tilted 45 degrees visually represented by a PDGF or FRGF for grappling by a robotic arm.

Quick-Start

Several scenarios are included in this addon under the SSM folder under the main Orbiter scenario folder. The default scenario called _SSM should be the first scenario in the folder. This scenario contains the Solar Service Module in its fully extended configuration above the Earth in daylight.

Use

The Solar Service Module is intended to provide service to a space station. Currently, the only modeled “usable” service is that of propulsion and attitude. Because the module is designed to be

highly realistic, don't expect Deltaglider-like performance. The propulsion system is designed to enable either a highly efficient rendezvous, or to grab another module from a delivery-upper stage, or to boost a space station by a few kilometers. Its RCS is relatively weak meaning that you should manually position the craft before enabling an autopilot. Even once you're aligned, it is recommended that you use Attitude MFD instead of the regular built-in attitude modes as I have found that it is better at holding an attitude while the engines are firing. When you do fire the engines, it is HIGHLY recommended that you make sure the thrust vector is through the docked-components's center of mass. The weak thrusters do not have enough strength to correct an off-center engine burn.

With the default Space Shuttle Atlantis, there is currently no way of using the RMS to dock the ODS to the APAS on the SSM. You will probably need to use the thrusters on Atlantis to perform the final docking maneuvers. Also with Atlantis, the payload bay attachment point is located away from the surface of the bay so an attachment point as been added to SSM's config file to allow correct visual alignment. This is attachment point 2 for the SSM (see SSMAtlantis scenario for example).

Controls

K	Used to deploy the dish antenna at the back (small/ APAS) end of the module.
J	Used to deploy the solar panels, pause them, and if paused, resume deployment.
CTRL+J	Used to retract the solar panels, pause them, and if paused, resume retraction

Scenario File Parameters

The scenario format is no different from any other orbiter vessel plus 3 unique parameters.

DISH STATUS int float
DISH STATUS is used to indicate the animation state of the dish antenna. The int value stands for the status (Retracted, Extended, Extending, Retracting, Paused) and corresponds to a 0-based integer (0,1,2,3,4). The float value is a number between 0 and 1 that corresponds to the position of the animation

SOLAR STATUS int float
This is the exact thing as the DISH STATUS, status, and position.

UNDOCK
This flag in the scenario will enable the auto-undock feature for space station building. When this flag shows up in the ship-definition of the scenario file, whenever one of the two attachment points gains a parent (like a robotic arm) it will automatically disengage the docks so on release, the module will not snap back into its docked position. Without this flag, auto-undocking is disabled by default.

Specifications

Length	10.3m
Diameter	4.49m
Weight	18,000Kg Empty
Solar Panel Width	20m
Fuel	Nitrogen Tetroxide, Monomethyl Hydrazine
Fuel Mass (combined)	1,000Kg
Engine Thrust	13,000N
Thruster Thrust	1,000N
Specific Impulse	3334.261 m/s (340s)
Docks	1 APAS -Z, 1 CBM +Z
DeltaV Budget	180.2 m/s
Burn Time	256.4s (main engines only)