

ORBITER

Space Shuttle Atlantis

Operations Manual

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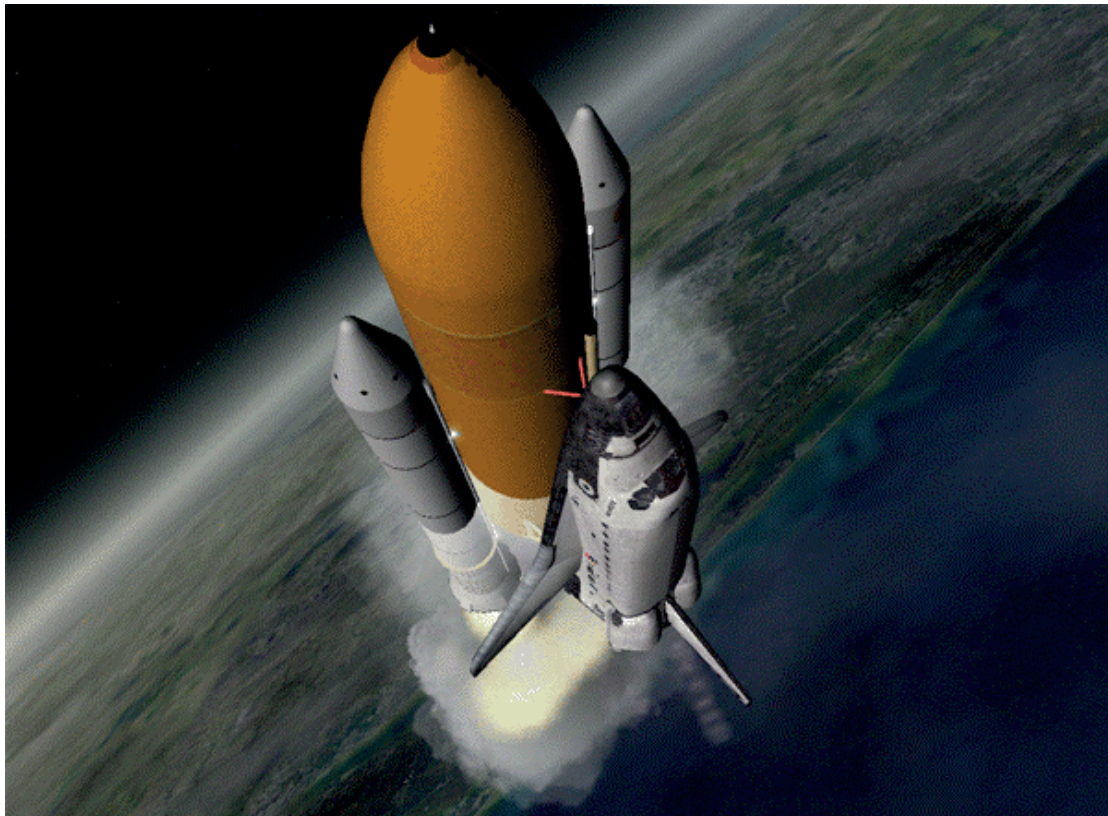
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1 Introduction

Space Shuttle Atlantis represents the only “real” spacecraft in the basic Orbiter distribution (but there are many more available as addons). Its flight characteristics are less forgiving than fictional models like the Delta-glider, and just reaching orbit is a challenge.

The Atlantis orbiter features a working payload bay with remote manipulator system (“Canadarm”), so you can simulate the deployment or even recapture of satellites, or the shipment of resupplies to the International Space Station.

The model now also features a virtual cockpit, with working MFD instruments and head-up display.



2 Notes on operation

This section contains some details on launch, docking and payload operations of the default Atlantis model distributed with Orbiter. To test the procedures described here in practice, launch Orbiter and try any of the scenarios in the *Space Shuttle Atlantis* folder.

2.1 Shortcut keys

The following Atlantis-specific keyboard shortcuts are supported:

	Jettison: separate SRBs or main tank
	Operate cargo bay doors. (shortcut – for the full procedure see Section 2.4)
	Operate landing gear (activated only after tank separation)
	Operate split-rudder speed brake.
	Deploy/retract Ku-band antenna. (shortcut – for the full procedure see Section 2.4)
	Open payload bay and RMS control dialogs.

2.2 Launch

The default Atlantis does not implement an autopilot or launch computer, so you need to adjust the ascent to orbit manually. (You can download 3rd party addons which provide more realistic launch and flight operation modes). Here is a quick checklist you can follow to get Atlantis into orbit:

- Fire main engines at 100%.
- SRBs are ignited automatically when main engines reach 95%. SRBs are not controlled manually. Once ignited, they cannot be shut off.
- During launch, attitude is controlled via SRB thrust vectoring. Roll shuttle for required heading, and decrease pitch during ascent for required orbit insertion.
- SRBs separate automatically at T+2:06min. In an emergency, SRBs can be jettisoned manually with .
- Ascent continues with Orbiter main engines. Throttle down as required for 3g max acceleration.
- Tank separates at T+8:58min (alt 110km) when empty, or manually with .
- After tank separation, orbiter switches to OMS (orbital maneuvering system) using internal tanks, for final orbit insertion. Attitude thrusters (RCS – reaction control system) are activated.



Unlike the futuristic spacecraft designs, Atlantis provides only a small margin of error for achieving orbit. Try some of the other ships before attempting to launch the Shuttle. Limited fuel *must* be selected, otherwise Atlantis is too heavy to reach orbit!

2.3 Docking

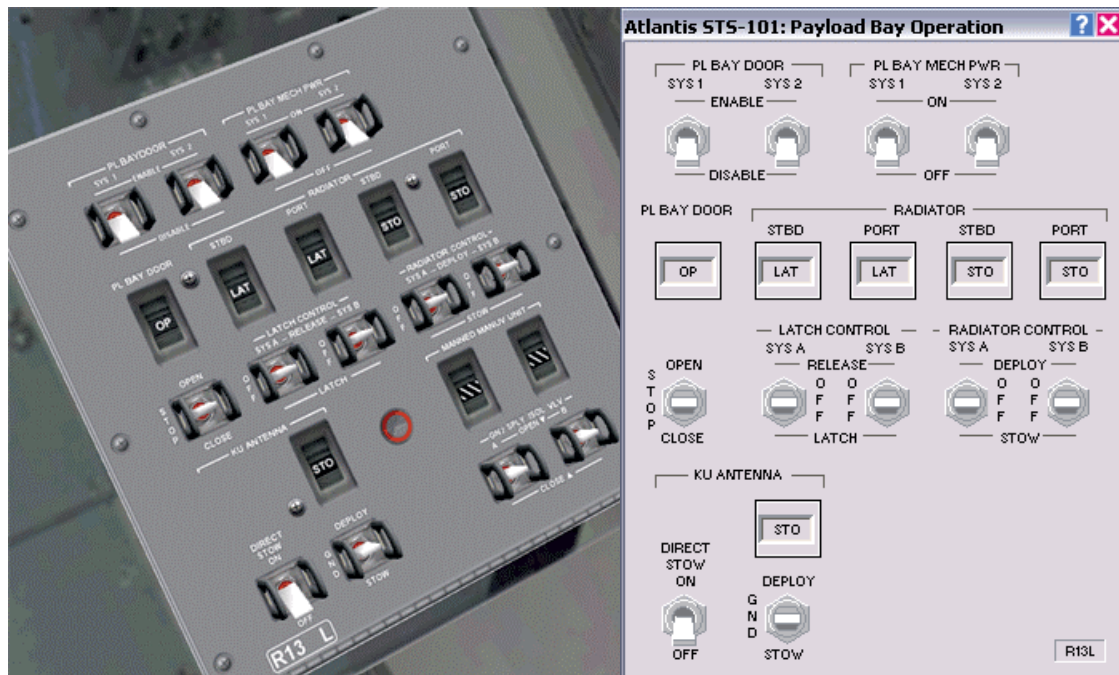
- The orbiter carries a docking attachment in the cargo bay.
- Open cargo bay doors before docking.
- Docking direction is in orbiter's +y direction (up). The Docking MFD must be interpreted accordingly.

2.4 Payload bay operations

The payload bay operations in the default Atlantis model consist of

- opening and closing the payload bay doors
- deploying and retracting the forward radiator panels
- deploying and retracting the Ku-band antenna
- operating the RMS arm for deploying and stowing payload

The bay door, radiator and Ku-band antenna operation closely follows the real shuttle procedures, using panel R13L. This panel is accessible from the payload operator position of the VC (via **Ctrl** **Alt** **←**). Alternatively, a dialog representation of the panel is available by pressing **Ctrl**-Space, and selecting *Payload door operation*. The dialog is also available in external views.



Bay Door Operation

Bay door opening sequence:

- Set the *PL BAY DOOR* switch to STOP.
- Set the *PL BAY DOOR SYS 1* and *SYS 2* switches to ENABLE.
- Set the *PL BAY DOOR* switch to OPEN.
- Wait until the OP/CL status of the talkback indicator shows OP.
- Set the *PL BAY DOOR* switch to STOP.
- Set *PL BAY DOOR SYS 1* and *SYS 2* switches to DISABLE.

Bay door closing sequence:

- Make sure that the radiators, Ku-band antenna and RMS arm are stowed.
- Set the *PL BAY DOOR* switch to STOP.
- Set the *PL BAY DOOR SYS 1* and *SYS 2* switches to ENABLE.
- Set the *PL BAY DOOR* switch to CLOSE.
- Wait until the OP/CL status of the talkback indicator shows CL.
- Set the *PL BAY DOOR* switch to STOP.
- Set *PL BAY DOOR SYS 1* and *SYS 2* switches to DISABLE.

Ref: Operations Manual Sec. 2.17.

Radiator Operation

The Space Shuttle has four radiators to dissipate heat from the coolant loops - two on the inside of each of the payload bay doors. The forward radiator panels on each side can be deployed when the doors are open; the aft panels are fixed. The bay doors and radiators are

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