G42-200 Starliner

###### The G42-200 is a state-of-the-art aircraft capable of accelerating out of the atmosphere and into low earth orbit - Categorized as a spaceplane, the G42 features airliner-like handling characteristics which makes it optimal for low-cost space travel and cargo lifting based on conventional or mildly adapted airfields at a fraction of the costs usually associated with space operations.

###### Fitted with a set of two RT66 Turbo-Rocket Hybrid cycle jet engines, and the ground-breaking RAMCASTER ram/scramjet system, the G42 can reach orbital velocity by simply flying out of the atmosphere, ascending as an airplane relying on its wings for lift, ultimately firing its engines in pure-rocket mode for a final boost towards orbit.

## Requirements & Installation

In order to enable cargo management and sound support, you need to install [UCSO](https://www.orbithangar.com/showAddon.php?id=6f05850c-8b74-484b-a0c0-c6a908ccfe81), [XRSound](https://www.alteaaerospace.com/index-3.html), and [SoundBridge](https://www.orbithangar.com/showAddon.php?id=c4dbdf26-e2ca-4ed4-ad82-3d48fdbfc457), all available for free.

To install, simply unpack the archive file directly into the Orbiter installation folder.

## Features and limitations

The spaceplane has 2 RCS modes: normal and docking.

In the docking mode, the RCS thrusters are set to act as if the docking port is in the ship’s front, so it’s much easier to dock, and weaken to 40% of its power to allow more accurate docking.

The RCS mode can be set with ‘COORD REF’ knob. Set it on ‘FWD’ for the normal mode, and ‘DOCK’ for the docking mode.

The parking brake will completely stop the spaceplane when engaged. It can be set from the red handle from the captain seat. If the parking brake is engaged while the spaceplane is moving, full brakes will be applied until the plane stops.

The nose wheel can steer the spaceplane below 250 m/s. The steering performance diminishes with speed. Oversteering at high speeds may cause the spaceplane to flip.

The spaceplane comes with UCSO support for cargo management. It can carry up to 8 UCSO cargoes in the bay. UCSO must be installed to enable cargo support. If not installed, install it from here.

The slots are numbered from 1 to 8, starting directly behind the docking port towards the end of the bay.

## Keyboard Shortcuts

|  |  |
| --- | --- |
| Keyboard Shortcut | Action |
| Tab | Switch view to F/O - Captain |
| G | Toggle the landing gear |
| N | Toggle the canards |
| V | Toggle the visor |
| B | Toggle the bay doors |
| Shift + B | Toggle the burner |
| Shift + P | Toggle the parking brake |
| S | Select a cargo slot in the bay to use |
| F | Select a tank to drain fuel to from cargoes |
| D | Display cargo information in the selected slot on the HUD |
| Shift + S | Select a cargo to add |
| Shift + A | Add the selected cargo to the selected slot |
| Shift + G | Grapple the nearest cargo to the selected slot |
| Shift + R | Release the cargo in the selected slot |
| Shift + F | Drain fuel from the selected slot cargo or the nearest UCSO station to the selected tank |
| Shift + D | Delete the cargo from the selected slot |

## ***Checklists***

ENGINE START

|  |  |
| --- | --- |
| MASTER FEED PUMPS | ON |
| APU FEED PUMP | ON |
| APU PACK A | START |
| ENGINE MODE | CHECK EXT ON EICAS |
| BURNER/REHEAT | OFF |
| TURBINE CYCLE | START |

TAKEOFF

|  |  |
| --- | --- |
| CANARDS | EXTENDED |
| VISOR | DOWN |
| WINGS | TAKEOFF/LANDING |
| BURNER/REHEAT | ON |
| ACS | FULL |
| FLIGHT CONTROLS | CHECK ON ACS EICAS |
| PARKING BRAKE | OFF |
| THROTTLE | FULL POWER |
| AIRSPEED 140 M/S | V1 SPEED |
| AIRSPEED 190 M/S | ROTATE SLOWLY TO 10 DEGREES |
| POSITIVE RATE | GEARS UP, PITCH UP TO 15 DEGREES |

CLIMBOUT

|  |  |
| --- | --- |
| BURNER/REHEAT | OFF |
| AIRSPEED | HOLD SUBSONIC |
| ALTITUDE | CLIMB TO 10 KM |

SUPERSONIC TRANSITION

|  |  |
| --- | --- |
| AIRSPEED | ABOVE MACH 0.85 |
| ALTITUDE | APPROACHING 10 KM |
| CANARDS | RETRACT |
| VISOR | EXTEND |
| BURNER/REHEAT | ON |
| THROTTLE | 80% TO 100% |

T1 (RAMCASTER INSERTION)

|  |  |
| --- | --- |
| FLIGHT ENVELOPE | CHECK EICAS GRAPH ON T1 |
| APU RAMX | PUMP |
| RAMCASTER DOOR | OPEN |
| RAMCASTER THROTTLE | ENG |
| BURNER/REHEAT | OFF |
| RAMCASTER | IGN, CONFIRM MODE:LO ON EICAS |
| ACCELERATION | CONFIRM INCREASED RATE |
| MAIN ENGINES THROTTLE | CLOSE |
| RAMCASTER THROTTLE | FULL |
| TURBINE CYCLE | CUT |
| MAIN ENGINES MODE | INT |
| WING POSITION | HPC AFTER MACH 3.5 |

T2 (RAMCASTER MODE TRANSITION)

|  |  |
| --- | --- |
| FLIGHT ENVELOPE | CHECK EICAS GRAPH ON T2 |
| RAMCASTER MODE | HIGH |
| RAMCASTER MODE TRANSITION | CONFIRM MODE:HI ON EICAS |
| FLIGHT ENVELOPE | PROCEED TO T3 |
| MFDS | SET AS REQUIRED |

T3 (ROCKET MODE TRANSITION)

|  |  |
| --- | --- |
| FIGHT ENVELOPE | CHECK EICAS GRAPH ON T3 |
| MAIN FUEL SUPPLY | 80K |
| OXIDIZER FEED PUMPS | BOTH ON |
| STBY IGNITION | RCS ON |
| RCS FEED PUMP | ON |
| MAIN ENGINES THROTTLE | 25% |
| ENGINE MODE | CHECK INT ON EICAS |
| TURBINE CYCLE | START |
| GEN PCT | RISING |
| ROCKET START | CONFIRM TAPE GAUGE ON EICAS |
| RAMCASTER THROTTLE | CLOSE |
| RAMCASTER | CUT |
| MAIN ENGINES THROTTLE | FULL |
| RCS MODE | ROTATION |
| ORBIT PROGRESS | MONITOR |

ORBIT INSERTION

|  |  |
| --- | --- |
| HUD | ORBIT |
| ApA | AS REQUIRED |
| APA REACHED | CHECK |
| THROTTLE | CLOSED, ENGINES WILL SHUT DOWN |
| TURBINE CYCLE | CUT |
| MASTER FEED PUMPS | ALL OFF |
| OXIDIZER FEED PUMPS | BOTH OFF |
| ApA/ApT | CHECK AND MONITOR |
| ATMOSPHERIC PRESSURE | CHECK SURFACE MFD ZERO DYNAMIC PRESSURE |
| VISOR | RETRACT |
| RCS DOORS | OPEN |

ORBIT CIRCULAIZITION

|  |  |
| --- | --- |
| ApT | T-100s |
| STBY IGNITION | OMS ON |
| OMS FEED PUMP | ON |
| THR AUTHORITY | OMS |
| OMS CAPABILITY | CHECK OMS SHOWN ON HUD |
| ApT | HOLD FOR MARK AS REQUIRED |
| THROTTLE | OPEN AS REQUIRED |
| ApA/PeA/Ecc | MONITOR UNTIL OMS CUTOFF |

ON ORBIT

|  |  |
| --- | --- |
| BAY DOORS | OPEN, PRESS B SWITCH NOT INSTALLED |

## Credits

[Moach](https://www.orbiter-forum.com/member.php?u=1303): original developer.

[Face](https://www.orbiter-forum.com/member.php?u=293): Orbiter 2016 support.

[dgatsoulis](https://www.orbiter-forum.com/member.php?u=3516): Meshes, textures and contrails.

## About

G42-200 Starliner is a free open-source spaceplane for Orbiter 2016, under MIT license. The source code can be found on the [GitHub repository](https://github.com/abdullah-radwan/G42-200). Any contributes are appreciated.

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