REENTRY

AN ORBITAL SIMULATOR

REENTRY

USER MANUAL
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I. INTRODUCTION
I. INTRODUCTION

1. ABOUT

Thank you for buying REENTRY – An Orbital Simulator!

REENTRY – An Orbital Simulator is an educational game/simulator that allows you to fly and operate spacecrafts in a realistic manner. The available spacecrafts have been programmed using the real manuals provided by NASA, with some modifications and simplifications made to allow this to be an enjoyable experience.

Please note that the game is in its early phase of development, and might crash or malfunction at any time. I’m working hard to fix bugs, and if you encounter an error, I highly suggest you send me the player log file located here:

C:\Users\<your user>\AppData\LocalLow\Wilhelmsen Studios\ReEntry\output_log.txt

LEGAL AND EULA

The assets in Reentry resembles properties created by NASA. By downloading and/or using Reentry – An Orbital Simulator, you agree to the EULA located here:

https://store.steampowered.com/eula/882140_eula_0

DOWNLOAD

The game can be downloaded from http://reentrygame.com/download/ - the game package comes with the Mercury, Gemini and Apollo spacecrafts.

JOIN THE COMMUNITY

Use the Community Hub to discuss the game, as well as talk with the community, get help and give feedback to the developer.

The community hub for REENTRY can be found here:

https://steamcommunity.com/app/882140/

An official Discord server can be found here:

https://discord.gg/Gaeec9K

The reddit subreddit can be found here:
WHAT IS THIS MANUAL?
This manual contains most of the information you need to understand how REENTRY works. This manual covers the game itself, such as installation, setup and how to get you started. The Academy and the Flight Manuals are used to teach you the REENTRY spacecrafts.
II. INSTALLATION
II. INSTALLATION

1. DOWNLOADING
REENTRY is distributed through Steam on the following link:
https://store.steampowered.com/app/882140/Reentry__An_Orbital_SIMUlator/

You will need to purchase the game to start the download, and to play it.

2. SYSTEM REQUIREMENTS
The system requirements can be seen on the Steam page for REENTRY, and will have the latest known system requirements. It is not guaranteed that the game will run on your system, even if you meet the requirements.

**MINIMUM**
Requires a 64-bit processor and operating system
OS: 64-bit Windows 7, Windows 8.1, Windows 10
Processor: Intel Core i5-4430 / AMD FX-6300
Memory: 8 GB RAM
Graphics: NVIDIA GeForce GTX 960 2GB / AMD Radeon R7 370 2GB
DirectX: Version 11
Storage: 7 GB available space

**RECOMMENDED**
Requires a 64-bit processor and operating system
OS: 64-bit Windows 7, Windows 8.1, Windows 10
Processor: Intel Core i5-6600K / AMD Ryzen 5 1600
Memory: 16 GB RAM
Graphics: NVIDIA GeForce GTX 1060 3GB / AMD Radeon RX 580 4GB
DirectX: Version 11
Storage: 7 GB available space
III. SETUP
III. SETUP

1. GENERAL
Once the game is installed, the can be configured in the SETTINGS menu accessible from the main menu.

2. REENTRY SETTINGs
The REENTRY SETTINGS menu can be accessed from the main menu of REENTRY.

![SETTINGS](image)

It has seven sections, one for Graphics and another for Input.

2.1. GRAPHICS
The graphics quality setting allows you to set the general level of the graphics quality setting of the game. The lowest setting will set the level to a mode that performs well, but reduces the quality of the graphics. The highest setting lowers the performance of the game, but increases the quality of the graphics.

The checkboxes below allows you to further enable different special effects used in-game, in some cases.
2.2. AUDIO
The Audio section allows you to enable or disable in-game music and SFX.

2.2. LANGUAGE
Some aspects of Reentry will be converted into different languages, and this is where you will be able to set this. Currently only English is supported.

2.2. INPUT CONTROLS
The Input section allows you to change the keyboard buttons and joystick axes assigned to control the various in-game systems such as attitude, translational control, what hotkey that is assigned to turn on the flashlight etc.

The following table lists the default keys and axes used in REENTRY:

<table>
<thead>
<tr>
<th>Function</th>
<th>Primary Button / Axis</th>
<th>Secondary Button / Axis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

2.2. EARTH TEXTURES
The Earth Textures tab allows you to select the detail level of Earth. High will increase loading time and the performance of the game, and requires a lot of memory. Low requires less.

2.2. RESOLUTION
This dropdown allows you to set the screen resolution you wish to display REENTRY in. Please note that some resolution options might render the simulator incorrectly, such as incorrect UI
placements etc. You can also check the Windowed flag to render the game in window modes instead of full screen mode.

2.2. DATA
The Data tab allows you to delete all the progress you have made, level data, settings and so on. Don’t use this unless you know what you are doing.
IV. QUICKSTART
IV. QUICKSTART

1. GETTING INTO ORBIT

This chapter will guide you through the minimum steps required to get into Orbit. The quickstart will use the Gemini Titan launch vehicle to do the job.

To get started with the Quickstart campaign, please launch Reentry – An Orbital Simulator.

If your hardware can handle it, it is recommended that you first go to SETTINGS from the MAIN MENU, and set the graphics mode to maximum, and turn on the special effects. I also recommend you to check the other settings and input controls.
Then press BACK to return to the MAIN MENU, and from there, select CAMPAIGNS.

From the CAMPAIGNS menu, select the QUICKSTART campaign:

The Campaign Page will load. Read the briefing, then select the first mission: LAUNCH REHERSAL.

The simulator will load and take you through the basics.
V. GETTING STARTED
V. GETTING STARTED

1. THE ACADEMY
The academy is accessed from the main menu, and is where you can read and learn about the supported spacecrafts.

The main source of information for each spacecraft is its flight manual, however, the academy will teach you the basics of each, and take you through hands-on lessons.

The academy has one theoretical section, and one practical section for each of the supported spacecrafts. I recommend reading the short theoretical information about the spacecraft you wish to learn to know the basic components and major systems that works together to make it operational.

2. CAMPAIGNS
A campaign is a collection of missions set in sequence. The missions are not limited to only be within one space program, so a campaign can host missions from all of the supported space programs.

The Bridge to the Moon

The space race has started. The Russians has beaten the U.S. an almost every front by putting the first man in space, and in Orbit.

Project Mercury followed tightly, and after successfully putting an American in space, NASA is working hard on their next space program; Project Gemini.

The year is 1962. NASA has just announced that they are accepting new astronaut applications for Project Gemini, and you decided to give it a go.
3. EARLY ACCESS / FICTIONAL MISSIONS
The fictional mission contains out-of-the-box missions where you will learn about the rockets and features of the game.

4. HISTORIC MISSIONS
The historic missions are realistic missions based on real flown missions. It will have a more involved communication with Mission Control and the astronauts based on the real mission transcripts, and have some of the same objectives. These usually take a bit more time to fly.

5. CUSTOM MISSIONS
You can create custom missions where you decide the objectives and communication flow. Separate Mission Editors for each of the supported space programs are available, and the mission is stored as a .json file.

A dropdown will automatically populate on load when custom missions are available.

The custom missions are stored in the following directories:

Steam:
C:\Users\<Your Windows User>\AppData\LocalLow\Wilhelmsen Studios\ReEntry\CustomMissions

Windows Store:
C:\Users\<Your Windows User>\AppData\Local\Packages\37806WilhelmsenStudios.ReEntry-AnOrbitalSimulator_akeytc0kfiv8xy\LocalState\CustomMissions
VI. VIRTUAL COCKPIT
VI. VIRTUAL COCKPIT

1. GENERAL
The virtual cockpit is where you control and operate the various systems in each of the supported spacecrafts.
VII. PHOTO MODE
VII. PHOTO MODE

1. GENERAL
The photocamera is used to take pictures and photos in the cockpit. The photos you take will be stored locally in the following locations:

Steam:
C:\Users\<Your Windows User>\AppData\LocalLow\Wilhelmsen Studios\ReEntry\n
Windows Store:
C:\Users\<Your Windows User>\AppData\Local\Packages\37806WilhelmsenStudios.ReEntry-AnOrbitalSimulator_akeytnc0kfv8xy\LocalState\n
To access the photocamera, press [V] to open the view menu and press Photo Mode.
VIII. MISSION EDITOR
VIII. MISSION EDITOR

1. GENERAL
The mission editors are used to create your own missions and tutorials for Reentry, or even your own story mode/campaign!

Each of the different supported spacecrafts in Reentry has their own mission editor. There are minor differences between them as each spacecraft has different types of missions.

Please note that the Mission Editors are quite basic and not very user friendly as I haven’t had the time to prioritize them yet, however each mission are just stored as JSON and the editors will be refined over time.

Each of the Mission Editors has 8 tabs, all used to build various components of a space flight mission.

2. FILE TAB
The file tab is used to load and save missions.
Save As will save the mission, and Load will load a mission into the editor.

3. DETAILS TAB
The details tab is used to set the time and date of the launch, the mission title and description, and details such as the names of the crew and if the mission should start in Orbit or on the launch pad (Start in Orbit is unchecked).
The Mission ID is used to store the rating and completion of the mission, and thus won’t really be used for custom missions.

The Mission Title and the Short Description is used when you select the mission from the main menu. Please try to keep this short.
These details are also accessible in the Mission Pad:

**MISSION PLAN FOR APOLLO LESSON 5 - APOLLO GUIDANCE COMPUTER**

The Apollo Guidance Computer (AGC) is a highly sophisticated digital control computer used onboard the Apollo spacecraft, and in the Lunar Module. It is used for computation and as an electronic interfaces for guidance, navigation, and control of the spacecrafts.

Launch Time:
6/9/1967 2:00:00 PM

- Complete the lesson

4. BRIEFING TAB

The briefing tab is used to set the briefing page of the in-game mission tab. This can be used to explain the mission, set the story, or as a flight plan.
When the mission is loaded in Reentry, the Mission Pad displays this section:
5. ORBIT TAB
The Orbit tab is used to set the target initial orbit of the mission, just after ascent. This is not what the guidance computer will try to achieve, but what orbit the crew will need to maneuver to using on-board systems such as OAMS (Gemini) or the RCS/SPS of Apollo.

The ascent will take these numbers into account, and in the long term, the guidance computer should try to reach these values if given within limits.
6. RETROGRADE TAB
The Retrograde tab is used to set the initial retrograde time of the mission. This will most likely be overridden by mission actions, however, this is indicating when the retrograde sequence should start in Mercury or Gemini, and in a few cases for Apollo.
7. TIMELINE

The Timeline tab is used to program the mission flow and sequence. It can display radio messages from MCC, or messages from the flight crew. It can be used to check the state of the mission, for example that the timeline flow won’t move forward before the Tower has been jettisoned, or until a switch has been placed into a given position.
KEYWORDS
Some reserved keyword surrounded by {{x}} can be used to insert variables into the messages, such as names, mission time, ETAs and so on. When writing a communication message, you can for example write: {{capsuleName}}, this is X, please do Y. The {{capsuleName}} keyword will be converted into what the player has configured in the Profile menu.

A complete list can be seen below:

Mercury

{{Value1}}
{{Value2}}
{{Value3}}
{{String1}}
{{String2}}
{{String3}}
{{profileName}}
{{capsuleName}}

{{ap}}
{{pe}}
{{inc}}
{{period}}
{{endOfOrbitTime}}
{{timeToAp}}
{{timeToPe}}
```plaintext
{{timeToRetro}}
{{retroTime}}
{{currentRadioStation}}
{{g}}
{{cabinPSI}}
{{voltMainBus}}
{{voltIsolBat}}
{{ampsMainBus}}
{{fuelAB}}
{{oxygenAB}}
{{pitch}}
{{roll}}
{{yaw}}
{{bloodStatus}}

Gemini

{{Value1}}
{{Value2}}
{{Value3}}
{{String1}}
{{String2}}
{{String3}}
{{profileName}}
{{capsuleName}}
{{coPilotName}}

{{ap}}
{{pe}}
{{inc}}
{{period}}
{{endOfOrbitTime}}
{{timeToAp}}
{{timeToPe}}
{{timeToRetro}}
{{timeToTransferBurn}}
{{retroTime}}
{{currentRadioStation}}
{{g}}
{{cabinPSI}}
{{voltMainBus}}
{{ampsMainBus}}
{{pitch}}
{{roll}}
{{yaw}}
{{valueInCore_Value3}}

{{IVIs}}

Apollo

{{Value1}}
{{Value2}}
{{Value3}}
{{String1}}
{{String2}}
{{String3}}
{{profileName}}
```
8. ACTIVITIES
The Activities tab is used to create in-game activities. An activity is a sub-mission that can be used of you wish that the player should do a more involved step than what’s possible in the timeline. You can set the timeline to play an activity, and not move on until that activity is completed or failed, or even skipped.

Mission goals can be completed using activities too.

9. GOALS
The Goals tab is used to set the goals of the mission.
<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Targ</th>
<th>Tang</th>
<th>String1</th>
<th>String2</th>
</tr>
</thead>
<tbody>
<tr>
<td>OrbitEarthNomTimes_Value1</td>
<td>Orbit the Earth</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Splashdown</td>
<td>Splashdown in the Pacific</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>CompleteActivity/HitIndex_Target1</td>
<td>Complete the Control Systems Check</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>CompleteActivity/HitIndex_Target1</td>
<td>Complete the 80° Yaw Maneuver Check</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>CompleteActivity/HitIndex_Target1</td>
<td>Complete the Day Horizon Check</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>CompleteActivity/HitIndex_Target1</td>
<td>Complete the Night Horizon Check</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
IX. CAMPAIGN MAKER
IX. CAMPAIGN MAKER

1. GENERAL
The campaign maker allows you to make custom campaigns for Reentry.

A campaign is built up of the following items:

- Campaign Title
- Tile
- Campaign page background
- Campaign page sections, describing the campaign using Headers, longer text or images (PNG)
- A set of Missions

The Title and the Tile Background Image builds up the tile that makes it selectable in the campaign menu if your campaign is located in the Campaigns folder:
Steam:
C:\Users\<Your Windows User>\AppData\LocalLow\Wilhelmsen Studios\ReEntry\Campaigns

Windows Store:
C:\Users\<Your Windows User>\AppData\Local\Packages\37806WilhelmsenStudios.ReEntry-AnOrbitalSimulator.akeytc0kf8xy\LocalState\Campaigns

The selection screen looks like this, with each of the campaign you have installed listed: