

HyperPASS Demo Readme

September 8, 2022

The demo version of HyperPASS can be used on Windows or Mac OS X.

****NOTE:** The HyperPASS “Export to Excel” output option only works on Windows.

Introduction

The Hypersonic Planetary Aeroassist Simulation System (HyperPASS) is an aeroassist simulation software package coded using the MATLAB language. HyperPASS is intended for doing mission studies of aerocapture systems at planets with atmospheres and for carrying out trade studies to investigate performance with alternate aeroshell and ballute types, varying flight path angle and entry velocity, different g-load limits, angle of attack and angle of bank variations.

HyperPASS enables users to perform simulations at any of six planetary bodies (Venus, Earth, Mars, Jupiter, Titan, or Neptune) using pre-programmed vehicles or user-entered vehicles. It allows users to perform trade study simulations without prior knowledge of MATLAB, by way of graphical user interfaces (GUIs). Functions currently implemented include Unguided Aeroassist Simulations, Guided Aerocapture Simulations, Guided Ballute Aerocapture Simulations, Aerobraking Simulations, and Orbit Decay Simulations.

During mission setup, the planet, atmosphere, gravity model, and vehicle parameters are chosen. Atmosphere models are exponentially interpolated tables. HyperPASS includes numerous atmosphere tables or the user can enter his own (up to 21 data points). Gravity models include inverse-square rotating, J2 rotating, and inverse-square non-rotating. HyperPASS currently assumes that the atmosphere rotates with the planet. Therefore, simulations specifying a non-rotating model assume zero atmosphere rotation and zero planet rotation. In such cases, inertial and planet relative values are equal. Vehicles include Apollo, Viking, Elliptical Raked-Cone (AFE), or user-entered vehicles.

After completing a simulation, the simulation data can be saved, plotted, or exported to another format.

This demo version only allows the running of the standard guided and unguided aeroassist HyperPASS cases. Changes to the inputs for these runs are not allowed in the demo version. However, full plotting and data export capabilities are enabled.

System Requirements

PC: HyperPASS Demo has been tested with MATLAB Version 7.5.0 (R2007b) thru R2021a

MAC: HyperPASS Demo has been tested with MATLAB R2009a thru R2010b running on Mac OS X 10.5.8 (Leopard). HyperPASS may run on later versions of Mac OS but has not been tested.

HyperPASS may work on earlier versions of MATLAB but has not been tested on any version earlier than indicated.

Installation (Windows or Mac)

NOTE: The following steps assume that MATLAB is already installed on the user's system. If MATLAB is not installed, be sure to install it prior to beginning HyperPASS installation.

- Download the HyperPASS_Demo_2022_p.zip from <http://www.gaerospace.com/projects/HyperPass/HyperPass.html>
- Unzip the file and save the HyperPASS_Demo2022_p folder in the desired location on your PC or Mac.
- Each time you want to run HyperPASS:
 - Start MATLAB.
 - Change the MATLAB “Current Directory” to the HyperPASS_Demo2022_p folder.
 - Type *startup* in the MATLAB Command Window.
 - If the HyperPASS GUI is displayed, installation was successful.

Alternate Installation (Windows Only)

NOTE: The following steps assume that MATLAB is already installed on the user's system. If MATLAB is not installed, be sure to install it prior to beginning HyperPASS installation.

- Download the HyperPASS_Demo2022_p.zip from <http://www.gaerospace.com/projects/HyperPass/HyperPass.html>
- Unzip the file and save the HyperPASS_Demo2022_p folder in the desired location on your PC.
- It is recommended that you copy it to a location with an easy “path” (i.e. C:\HyperPASS_Demo2022_p). *When moving the folder from one location to another you may get a warning about moving a “read only” folder.” This warning can either be ignored or you can change the folder properties by removing the “read only” attribute.*
- Return to your Desktop and “Right-click” on the existing MATLAB shortcut icon and select “Create Shortcut”. (The MATLAB shortcut icon is automatically placed on your Desktop when MATLAB is installed).



Figure 1 MATLAB shortcut icon (courtesy of MathWorks)

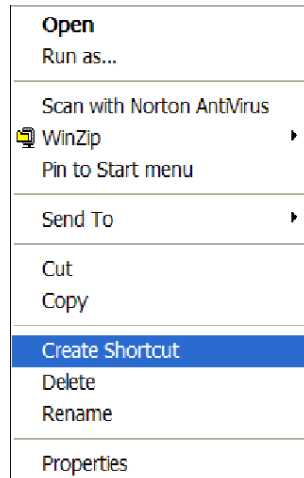


Figure 2 “Create Shortcut”

- “Right-click” on the newly created shortcut and select “Rename”. Rename the shortcut “HyperPASS”.

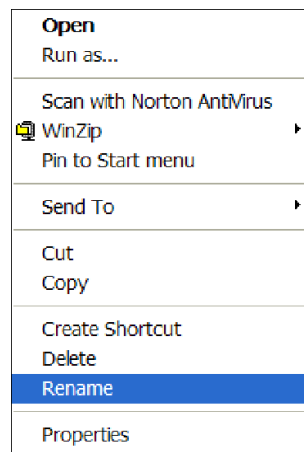


Figure 3 “Rename”

- “Right click” on the newly created HyperPASS shortcut and select “Properties.”

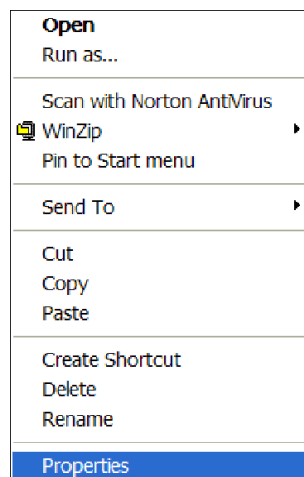


Figure 4 “Properties”

- Select the “Shortcut” Tab in the Properties Window.

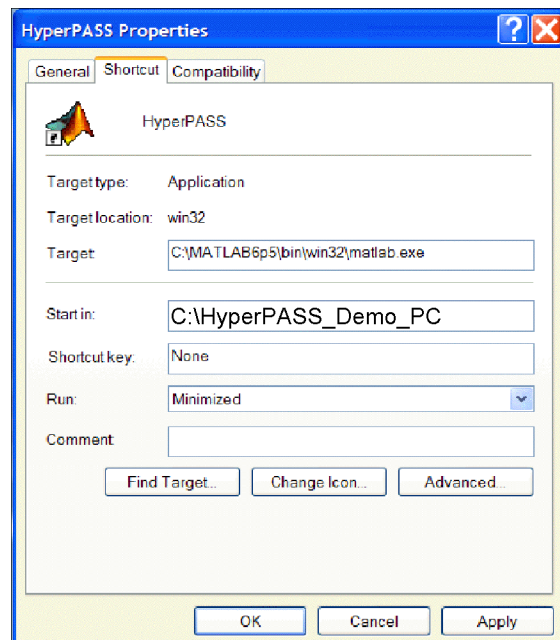


Figure 5 Properties Window – “Shortcut” Tab

- Where it says “Start in:” type the path where HyperPASS_Demo2021_p is located. If the path is incorrect, HyperPASS will not run.
- Click “Apply”. If the path is typed incorrectly, a warning will appear.
- Once the path is correct, click “OK” to close the Properties Window.
- This completes the installation process. “Double-click” on the new HyperPASS shortcut icon to begin HyperPASS. If the HyperPASS GUI is displayed, installation was successful.