HOMEWORLD2

How to Generate Flight Maneuvers

Version	Date	Changes	Who
0.2	24-October-03	RDN Additions	Nick Waanders
0.1	12-November-02	Initial Doc	Nick Waanders

1 Introduction

This document is meant to be a guide on how to setup flight maneuvers in Maya, export and testing them in the game.

2 Maya

The flight maneuvers all need to be in one file. This is because the flight maneuvers are also exported in one file. This file is located in '**DataSrc\FlightManeuvers\FlightManeuvers.ma**'.

If you open up this file, you can see the flight maneuvers that were made previously. If you have a good look at them, you can see that they are animated like docking paths (see the dockingpath document).

The flight maneuvers can be edited in Maya, but it is **NOT GUARANTEED** to look exactly the same in the game. In fact, it will very probably *not* look the same. The reason for this is that the plug-in just exports the *orientations*, and not the positions. This means that the ship that is doing the flight maneuver only tries to match up the orientations, not the positions of the flight maneuver.

The forward and up vector are the orientation in relation to the ship orientation when the maneuver *starts*. This means that if you have a loop, and the ship is rotated on it's side, the loop will be in a horizontal plane.

The **Delay** variable is there to have the ships spend at least this amount of time in this orientation. This can be used if you want ships to fly straight for a few seconds.

Wish Forward Backward Speed: This is the speed at which you want the ship to fly during the maneuver. 1 is it's normal cruise speed, and 0 is stop completely. 2 would be twice as fast.

Delay	0
Wish Forward Back	0
Wish Left Right Spee	0
Wish Up Down Spee	0
Wish Rotation XSpee	0
Wish Rotation YSpee	0
Wish Rotation ZSpee	0
Ignore Orientation	off
Acceleration Multiplie	1
Rotation Acceleration	1

Wish Left Right Speed: This is the speed at which you want the ship to fly sideways. So sort of a strafing motion. Negative is to the left, positive is to the right. Again, 1 is normal speed to the right, and –1 would be normal speed to the left. This could be used for creating a barrel roll for example: have the ship fly to it's side while rotating.

Wish Up Down Speed: This is the speed at which you want the ship to fly up/down. Positive is up, negative is down.

Wish Rotation Xspeed: The speed at which you wish the ship to rotate around the X-axis. Only used when ignoreOrientation is set to on.

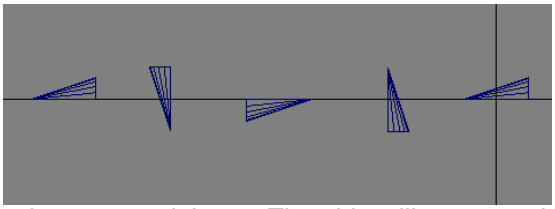
Wish Rotation Yspeed: The speed at which you wish the ship to rotate around the Y-Axis (up-axis).

Wish Rotation Zspeed: The speed at which you wish the ship to rotate around the Z-Axis (forward-axis). This could be used to make a fast roll. Set this value to 4, set the delay to 1, and set ignoreOrientation to true. This would make the ship spin around its forward axis at 4 times it's usual speed for 1 second.

Ignore Orientation: When this is set, the Wish Rotation variables are used for rotating the ship instead of the given orientations in the maya keyframe.

Acceleration Multiplier: Multiplier that can be used to speed up the acceleration during the flightmaneuver. If it's a fast flightmaneuver, you sometimes need the ships to be snappier, so you would increase this value.

Rotation Acceleration Multiplier: Multiplier that can be used to speed up the rotational acceleration during the flightmaneuver.



Again, **the position of the objects does not matter**. Therefore, the picture to the right shows a looping if the 5 cones represent the animation frames (from right to left). It may not seem like it, but what the ship will do is a looping. This is because it keeps the defined speed, and tries to get to an orientation. So, from right to left, it's going forward first, then if needs to go straight up. The ship will rotate to the upward position, while going forward. This will result in an arc-like path. Then it needs to go to the upside down position. It will rotate further while going forward, basically making the arc bigger. This will continue until it did a 360 degrees loop.

If you would add a delay to each of these points, the ships would do a square looping.

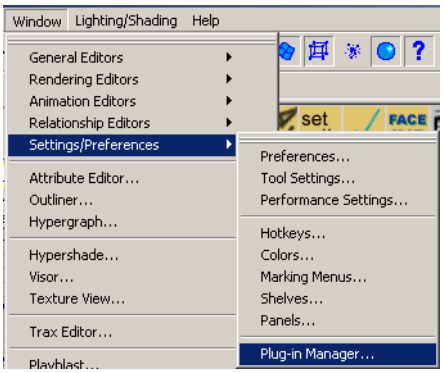
The predefined flightmaneuvers in the maya file do have somewhat the right position. This is to make it easier to imagine what is going on. Do bear in mind though that the ships might not fly like you see them in Maya!

The other thing to note is that the simulation in Homeworld2 updates 10 times per second. For extremely fast flightmaneuvers this means that you will encounter situations where this update frequency is not enough to perform the flightmaneuver. In these cases you're better off using the wish rotation values instead of actual keyframes.

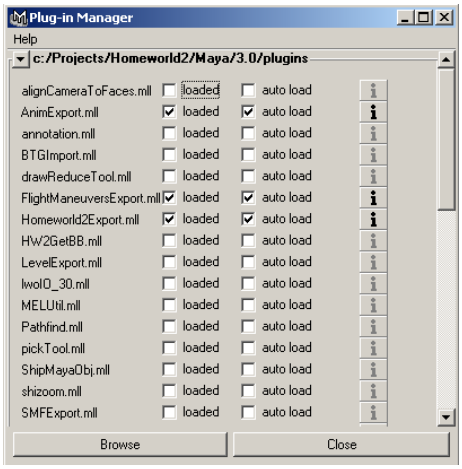
3 Exporting

Exporting the maya file is easy. Make sure you have loaded the flight maneuver exporter plugin.

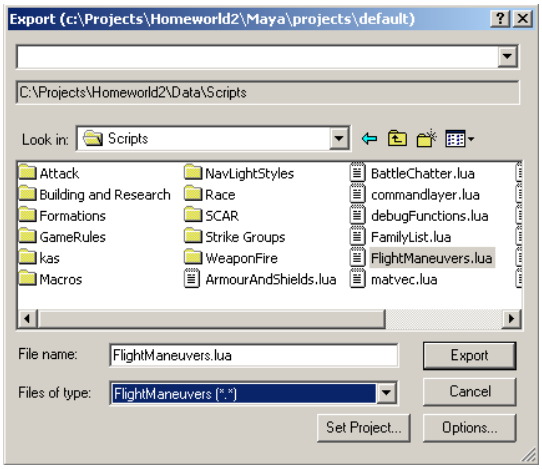
To test this open up the plugin manager by clicking Window \ Settings/Preferences \ Plug-in Manager...



The plug-in manager will open. You have to make sure that the FlightManeuversExport.mll is loaded and autoloaded.



If this is all in place, you can export the file by choosing export all from the file menu. Then Select the file type to be FlightManeuvers. Also, you have to 'Open for Edit' the file **'Data\Scripts\FlightManeuvers.lua'** from **Perforce**. Now export the scene over this file. That's it!



4 Testing In the Game

4.1 Ship Tuning File

There is a system to test new flight maneuvers in the game. In the **'Data\Ship\ShipTuning.xls'** file there are a number of flight maneuvers you can fill in. If you don't fill in anything, there is no flight maneuver assigned for that specific action.

Flight Maneuvers

	Maneuvers				
		mirrorAboveManeuver	Quoted	mirrorAboveManeuver	ImmelMann_speedy, OneEightyDegRight1
		mirrorBelowManeuver	Quoted	mirrorBelowManeuver	Split_S_speedy, OneEightyDegRightTurn,
		specialTurnLeftManeuver	Quoted	specialTurnLeftManeuver	NinetyDegLeftTurn, None, None
		specialTurnRightManeuver	Quoted	specialTurnRightManeuv	NinetyDegRightTurn, None, None
		specialTurnUpManeuver	Quoted	specialTurnUpManeuver	
		specialTurnDownManeuve	Quoted	specialTurnDownManeuver	
		testManeuver1	Quoted	testManeuver1	
		testManeuver2	Quoted	testManeuver2	
		testManeuver3	Quoted	testManeuver3	

As you can see there are a number of maneuvers that can be defined. For each maneuver type you can set multiple (comma separated) flightmaneuvers. 'None' is reserved for not playing a flightmaneuver. A random flightmaneuver will be selected out of all the given flightmaneuvers. This means that if one flightmaneuver is in the list twice, it has twice the chance of getting chosen.

4.1.1 mirrorAboveManeuver and mirrorBelowManeuver

In the picture above, you can see that there is a mirrorAboveManeuver and a mirrorBelowManeuver. These two maneuvers are the flightmaneuvers the formations perform when the formation is instructed to move directly behind themself. This mirrors the formation (if the mirrorAngle is set to anything other that 0). The above and below are for when a formation is instructed to move behind and slightly above or below the current position. As you can see for the Hiigaran Scout the mirrorAboveManeuver is the ImmelMann (which by itself ends up a little higher). The below maneuver is the Split-S (which by itself ends up a little lower).

4.1.2 specialTurn maneuvers

The special turn maneuvers are used when the ships are ordered to make a very sharp (like 90 degree) turn in that direction. The angles for the special turn are set in the Ship Physics section of shiptuning, and the variable is called secondaryTurnAngle.