SILANTRO HELICOPTER SIMULATOR

USER MANUAL

Thank you for purchasing this asset, please don't forget to rate it on the asset store. This document will guide you on how each component works and how-to setup and use them.

CONTENTS

SIMULATOR COMPONENTS

1. **POWER SYSTEM**: these components provide operational power to any aircraft they're attached to. Comprises of;
   - Engines
   - Fuel Tanks
   - Fuel Distributor

   - **PISTON ENGINE**

▼ ⓖ ☑ **Phantom Piston Engine (Script)**	▣ ✿
Script	ⓖ PhantomPistonEngine ⊙
Engine Factor	0

Engine Properties

Stroke	3.875
Bore	5.125
Displacement	319.8
Compression Ratio	5.6
No of Cylinders	4
Carburettor Type	RAE Corrected ‡
Supercharger	☐

Engine Configuration

Norminal RPM	2700
RPM Acceleration	0.5

Fuel Configuration

Mass Factor	0.000
Fuel Type	AV Gas 100 ‡
Combustion Energy	42.8 MJoules
Combustion Factor	1.02

Fuel Usage Settings

Fuel Tank	None (Phantom Fuel Tank) ⊙
Fuel Remaining	0.00 kg

Power Specific fuel consumption in lb/hp.hr

Fuel Consumption	0.52
Actual Consumption Rate	0.00 kg/s
Critical Fuel Level	10

Connections

Engine Parent	⚓ Robinson R-22 (Rigidbody) ⊙
Thruster	⚓ Thruster (Transform) ⊙

Sound Configuration

Ignition Sound	🔊 Piston Engine Start ⊙
Engine Idle Sound	🔊 Piston Engine Running ⊙
Shutdown Sound	🔊 Propeller Shutdown ⊙
Show Pitch Settings	☐

Throttle Configuration

Throttle Level	20.00 %
Throttle Speed	0.15

Data Configuration

Log Engine Data	☐

Engine Display

Engine State	Off
Engine Power	0.00 %
EGT	0.0 °C
Core Speed	0.0 RPM

Engine Output

Brake Power	0.0 Hp
Show Extras	☑

Effects	Destruction

Engine Effects Configuration

Exhaust Smoke	🎖 Exhaust Smoke(Clone) (Particle System) ⊙
Maximum Emission	50
Exhaust Distortion	🎖 Engine Distortion (Particle System) ⊙
Maximum Emission	18

- **PROPERTIES**

Property:	Function:
Engine Properties	
Stroke	Stroke of the engine in inches
Bore	Diameter of each cylinder (bore) in inches
Displacement	Volume of the engine cylinder in cubic centimetres
Compression Ratio	Amount to which air is compressed in the engine before being ignited.
No of Cylinders	No of available engine cylinders
Carburettor Type	Select which Carburettor to use. Note: The SU carburettor is driven by gravitational force and will lose power or shutdown in negative G manoeuvres, while the RAE Corrected carburettor corrects this defect.
Supercharger	Select if and which supercharger to use
Engine Configuration	
Nominal RPM	Base RPM of the piston engine
RPM Acceleration	Speed of increase or decrease of the engine RPM
Fuel Configuration	
Fuel Type	Type of fuel used by the engine. Available options: AV Gas 82UL, AV Gas 100LL and AV Gas 100.
Combustion Energy	Specific energy of combustion of the selected fuel in MJ/kg.
Fuel Usage Settings	
Fuel Tank	Fuel tank connected to the engine
TSFC	Thrust specific fuel consumption of the engine during normal operation in lb/hp.hr
Current tank fuel	Amount of fuel left in the attached fuel tank
Critical fuel level	Minimum fuel required for normal operation, the engine starts behaving erratically if the fuel is lower than this value. *Note: Engine shutdown automatically when fuel reaches 0 kg.*
Actual fuel Consumption	Fuel consumption in kg/s
Engine Sounds	
Ignition Sound	Audio clip to be played when engine is starting.
Shutdown Sound	Audio clip to play when the engine is stopped.

Engine Idle Sound	Audio clip played while engine is active.
Connections	
Connected Aircraft	Rigidbody airplane which the engine is attached to. *Note: Highly required for the engine to function.*
Thruster	Transform at point where the engine thrust is applied to the aircraft.
Engine Display	
Engine State	Current State of the engine {Off, Starting, Running}
Engine Power	Current Percentage of the engine power
EGT	Exhaust Gas Temperature (will be used for infra-red radar signature in the future)
Core Speed	Current RPM of the engine core
Brake Power	Power output of the engine in Horsepower
Extra Settings	
Effects	
Exhaust Smoke	Exhaust particle system
Maximum Emission	Rate of emission of the exhaust particle over time at full throttle.

- **TURBOSHAFT ENGINE**

PROPERTIES

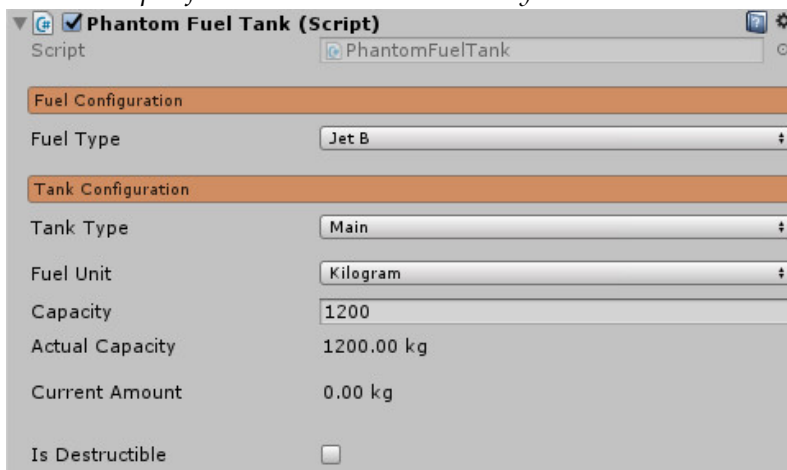| Property:	Function:
Engine Dimensions	
Engine Diameter	This is the total diameter of the engine in meters
Intake Diameter Percentage	This is the diameter of the engine intake relative to the total engine diameter expressed as a percentage. It is depicted by a blue circle in front

	of the engine to aid adjustment. *Note: This should closely match the intake fan model if available.*
Exhaust Diameter Percentage	This is the diameter of the engine exhaust relative to the total engine diameter. Depicted by a red circle at the back of the engine**.** *Note: This value would be adjustable for variable nozzle engines in coming update.*
Weight	Weight of the engine in kg. **Note: this value is only used if engine model is detachable.**
Overall Length	Length of the engine in meters.
Turbine Configuration	
Low Pressure fan RPM	RPM of the intake or low-pressure fan
High Pressure fan RPM	RPM of the turbine or high-pressure fan
N1	Current speed of the Entry fan Blade
N2	Current speed of the Turbine fan Blade
Overall Pressure Ratio	Difference in the pressure after the compressor relative to the pressure before the engine i.e. basic aeronautical pressure ratio. E.g. 26 for the GE F404 used in the F117 Nighthawk.
Fuel Configuration	
Fuel Type	Type of fuel used by the engine. Available options: Jet B, Jet A1, JP6, JP8.
Combustion Energy	Specific energy of combustion of the selected fuel in MJ/kg.
Fuel Usage Settings	
Fuel Tank	Fuel tank connected to the engine
TSFC	Thrust specific fuel consumption of the engine during normal operation in lb/lbf.hr
Current tank fuel	Amount of fuel left in the attached fuel tank
Critical fuel level	Minimum fuel required for normal operation, the engine starts behaving erratically if the fuel is lower than this value. *Note: Engine shutdown automatically when fuel reaches 0 kg.*
Actual fuel Consumption	Fuel consumption in kg/s
Engine Sounds	
Ignition Sound	Audio clip to be played when engine is starting.
Shutdown Sound	Audio clip to play when the engine is stopped.
Engine Idle Sound	Audio clip played while engine is active.
Engine Afterburner Pitch	Audio source pitch when afterburner is activated.
Connections	

Parent	Rigidbody airplane which the engine is attached to. *Note: Highly required for the engine to function.*
Intake fan point	Point along the engine where the intake fan is located.
Rotation Axis	Axis of rotation of the intake fan transform
Rotation Direction	Direction of rotation of the intake fan i.e. Counter Clockwise or Clockwise.
Thruster	Transform at point where the engine thrust is applied to the aircraft.
Engine Display	
Engine State	Current State of the engine {Off, Starting, Running}
Engine Power	Current Percentage of the engine power
EGT	Exhaust Gas Temperature (will be used for infra-red radar signature in the future)
Core Speed	Current RPM of the engine core
Shaft Power	Power output of the engine in Horsepower
Extra Settings	
Effects	
Exhaust Smoke	Exhaust particle system
Maximum Emission	Rate of emission of the exhaust particle over time at full throttle.

- **FUEL TANKS**
  The fuel tanks are designed to be independent of each other and can be individually attached to each engine (Not advised though). The fuel tanks can either be **Main** or **Auxiliary.**
  Finally, with another component **Fuel Distributor**, fuel from the tank can be dumped to reduce aircraft weight and can also be refilled. *Note: Only the Main tank can be refilled, but fuel can be dumped from the Main and Auxiliary tank.*

Property:	Function:
Fuel Configuration	
Fuel Type	Type of fuel contained in the tank
Tank Type	Main or auxiliary
Fuel Unit	Measurement unit of capacity input. Note: actual capacity will be automatically calculated from the inputted value based on the selected unit.
Capacity	Maximum amount of fuel the tank can contain in kg.
Current Amount	Amount of fuel currently in the tank
	Bool to control if tank is attached to the aircraft.

- **FUEL DISTRIBUTOR**

This component is used to control fuel distribution in the aircraft and allow it to use multiple tanks. It is designed in such a way that the fuel in the internal tank is used first before that in the external tanks. It can also be used to dump and refill the tanks.

PROPERTIES

Property:	Function:
Fuel Tanks	
Main Fuel Tank	Main tank located inside the aircraft body. *Note: it is used first even if external tanks are attached.*
Auxiliary Tanks	List of auxiliary tanks attached to the aircraft.
Total Fuel Remaining	Total amount of fuel remaining in all the attached fuel tanks combined.
Tank Selection Display	
Current Tank	Current tank selected for use by the distributor
Tank Type	Indicates whether the selected tank is **main** or **auxiliary.**
Current tank Fuel	Amount of fuel remaining in the selected tank
Time left	Amount of time left before the fuel in the selected tank is completely depleted.
Burn Rate	Total consumption rate of all the engines combined.
Fuel Dump System	
Dump Fuel	Switch to activate and deactivate fuel dump
Fuel Dump Rate	Rate at which fuel is released from the tank in kg/s
Tank Refill System	

|	
Refill Tank	Switch to activate and deactivate tank refill
Refuel Rate	Rate at which fuel enters the tank in kg/s. *Note Only the internal fuel tank can be refilled.*
Warning System	
Low Fuel	Indicates if the total fuel remaining is lower than the specified minimum amount.
Minimum Fuel Amount	Least amount of total fuel permissible for normal flight. Warning system is activated when the fuel amount goes beyond this amount.
Fuel Alert	Audioclip to be played by the warning system

- **ROCKET MOTOR:**
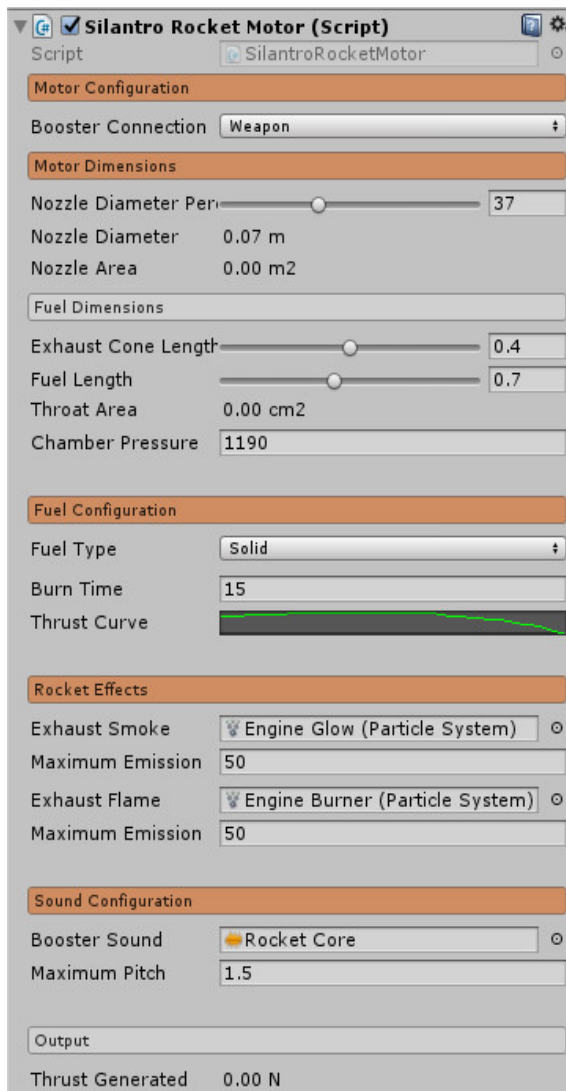
PROPERTIES

Property:	Function:
Motor Configuration	
Booster Connection	Functionality of the rocket motor
Motor Dimensions	
Nozzle Diameter Percentage	Percentage of the rocket nozzle relative to the main diameter
Exhaust Cone Length	Length of the burner part of the motor relative to the rocket length

Fuel Length	Length of the solid fuel or liquid fuel tank
Chamber pressure	Pressure inside the fuel chamber
Fuel Configuration	
Fuel Type	Type of fuel used by the motor
Burn Time	Time required to completely burn the onboard fuel
Thrust Curve	Curve plot of the rocket thrust vs burn time
Rocket Effects	
Exhaust Smoke	Rocket Smoke particle effect
Maximum Emission	Maximum emission of the smoke particle effect
Exhaust Flame	Rocket Flame particle effect
Maximum Emission	Maximum emission of the motor fire particle effect
Sound Configuration	
Booster Sound	Audioclip used by the rocket booster
Maximum Pitch	Maximum audio source pitch float

**2. AEROFOIL SYSTEM:** Component which generates additional lift and control for the helicopter.
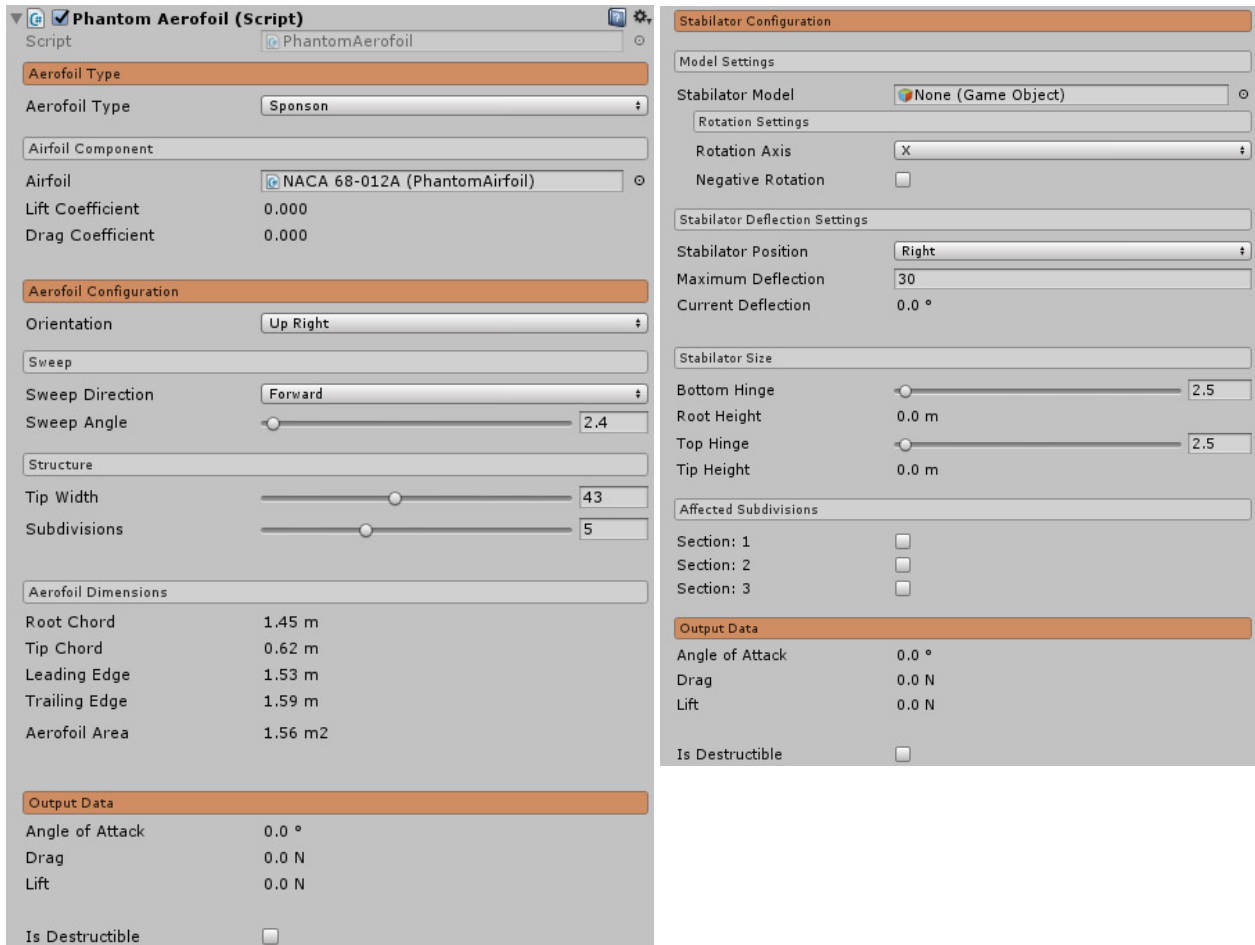
PROPERTIES

Property:	Function:
Aerofoil Properties	
Aerofoil Type	Type determinant of the aerofoil either Sponson or Stabilizer.
Airfoil Component	
Airfoil	Component containing lift and drag coefficient at different angles of attack.
Lift Coefficient	Coefficient of lift at current angle of attack
Drag Coefficient	Drag coefficient at current angle of attack.
Aerofoil Settings	
Orientation	Whether the aerofoil is upright or inverted

Sweep Direction	Determines if the aerofoil is swept or not. Options; Unswept, Backwards or Forward.
Sweep Angle	Angle to which the aerofoil is swept.
Tip Width	Ratio of aerofoil tip to root expressed as a percentage. 100% means root width and tip width are equal which gives a completely rectangular aerofoil.
Subdivisions	No of sections which the aerofoil is divided and determines how smooth the lift generation system is. *Note: Higher values reduces performance, therefore values between 3-6 is advisable. High Performance systems can go higher.*
Aerofoil Dimensions	
Root Chord	Length of aerofoil root.
Tip Chord	Length of aerofoil tip.
Leading edge length	Length of the aerofoil along the leading edge.
Trailing edge length	Length of the aerofoil along the trailing edge
Output Data	
Angle of Attack	Current angle of attack of the aerofoil
Drag	Current drag force generated by the aerofoil
Lift	Total Lift generated by the aerofoil
Stabilator Configuration	
Stabilator Model	Stabilator surface gameObject
Rotation Axis	Rotation axis of the selected control surface gameObject
Negative Rotation	Determines if the model rotates in the opposite direction
Stabilator Position	Position of the stabilator on the tail boom
Maximum Deflection	Maximum angle to which the surface can deflect in both directions
Current Deflection	Current angle of the Stabilator surface
Negative Deflection	Determines if the Stabilator surface deflects in the opposite direction.
Bottom Hinge	Position of the control surface root along the aerofoil chord
Top Hinge	Position of the control surface tip along the aerofoil chord

| Control Sections | Sections of the aerofoil covered by the Stabilator surface |

AIRFOIL SYSTEM:

- **WINGFOIL:** Contains data to calculate properties for aircraft surface aerofoils and blades
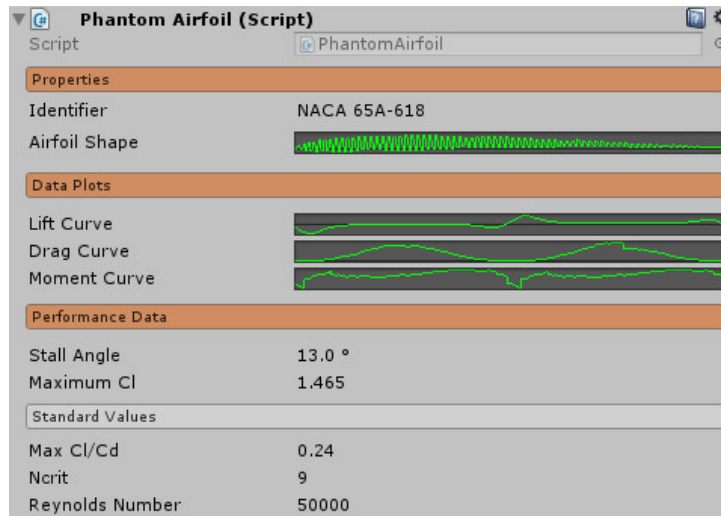
PROPERTIES

Property:	Function:
Wingfoil Properties	
Identifier	Name or ID of the Wingfoil
Airfoil Shape	Curve plot of the selected Wingfoil
Lift Curve	Curve of the lift coefficient against angle of attack
Drag Curve	Curve of the drag coefficient against angle of attack
Moment Curve	Curve of the moment coefficient against angle of attack
Stall Angle	Maximum lift angle of attack. Note: Maximum Collective should be at most 2 degrees away from this value
Maximum Cl	Maximum Lift coefficient of the airfoil
Max Cl/Cd	Used to roughly predict the glide ratio of the airfoil
Ncrit	Airfoil analysis turbulence level
Reynolds Number	Reynolds Number used for the airfoil analysis

- **WINDOW**

PROPERTIES

Property:	Function:
Creator Fields	
Identifier	Name or ID to be used for the Airfoil
Use default shape	Used the default A18 airfoil shape
Airfoil Plot	Csv file containing the coordinates of the airfoil shape. *Note: the values must be comma decimated.*
File Type	Type of file containing the airfoil performance data
Data	File containing the performance data from Javafoil

3. CORE SYSTEM

PROPERTIES

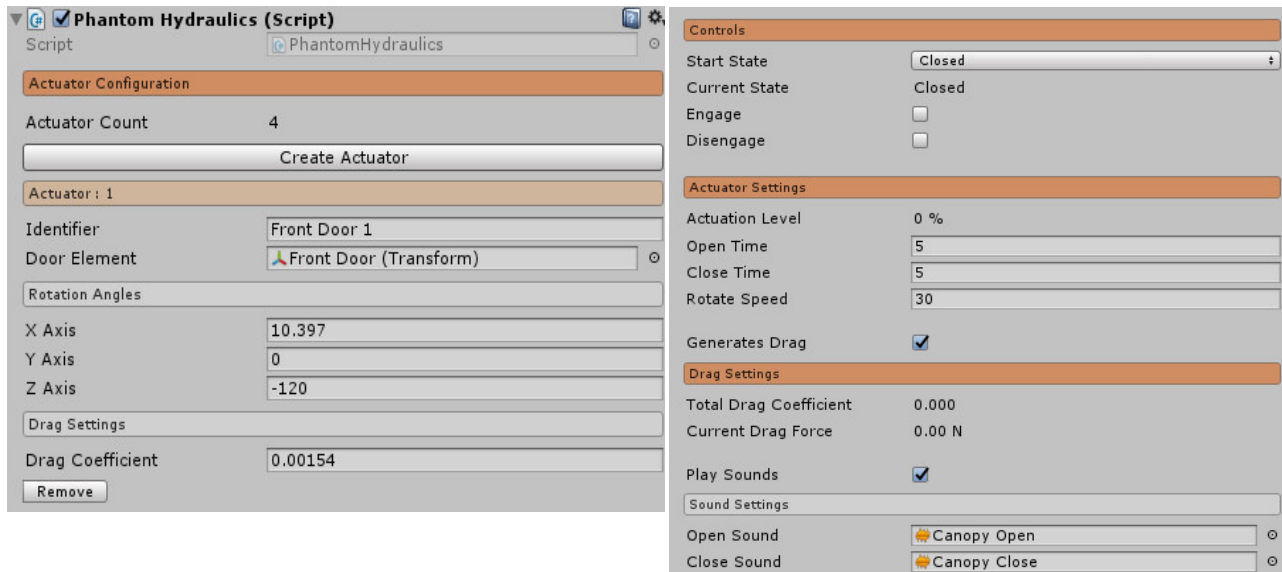| Property:	Function:
Core Configuration	
Empty COG	Centre of gravity of the aircraft without fuel, crew and cargo
Pitch Inertia	Moment of Inertia of the helicopter in the X Axis, determines how responsive the helicopter is to both cyclic control and balance
Yaw Inertia	Moment of Inertia of the helicopter in the Y Axis, determines how responsive the helicopter is to anti torque control
Roll Inertia	Moment of Inertia of the helicopter in the X Axis, determines how responsive the helicopter is to Roll Control

SILANTRO MAGIC

Use this to obtain a rough set of inertia values. Just input the loaded weight of the helicopter and check the apply bool. Note: The generated values still must be adjusted to get the right handling characteristics.

4. HYDRAULIC SYSTEM

Used to operate movable parts of the helicopter e.g. Gears, Gear Doors, Canopies etc.

PROPERTIES

Property:	Function:
Actuator Configuration	
Actuator Count	Number of attached actuators
Identifier	Name of the selected part
Door Element	Actuator Part/Component
X Axis	Amount of part rotation in the X axis
Y Axis	Amount of part rotation in the Y axis
Z Axis	Amount of part rotation in the Z axis
Drag Coefficient	Drag coefficient of the selected part when opened
Open Time	Time it takes to open the actuator part
Close Time	Time it takes to close the actuator part
Rotate Speed	Speed of movement of the actuator part
Play Sounds	Select to play sounds for the actuator
Open Sound	Sound to play when actuator is opened
Close Sound	Sound to play when the actuator is closed.

GEAR SYSTEM: Landing system of the helicopter, handles the rotation and alignment of the wheel models to the selected wheel colliders.
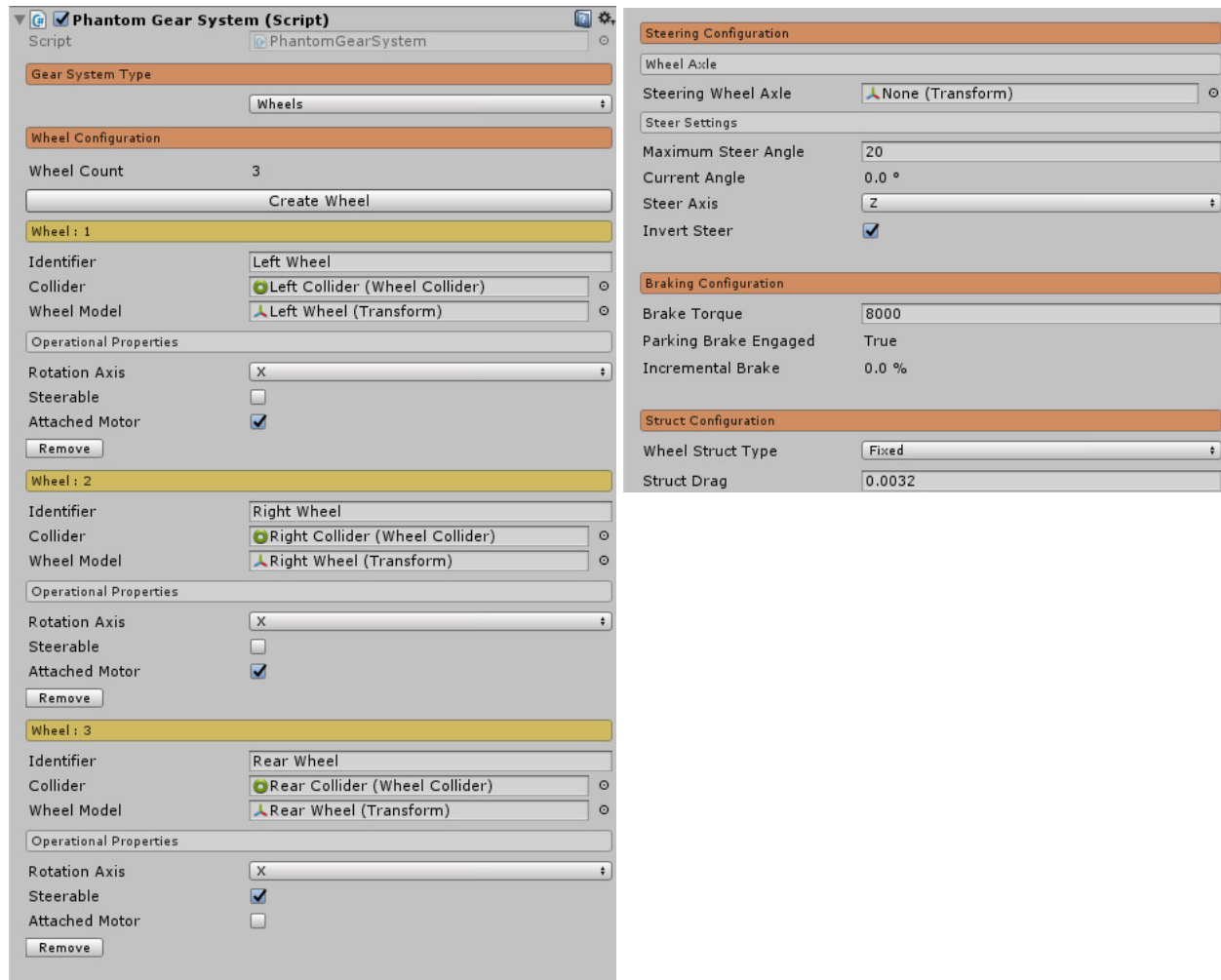
PROPERTIES

Property:	Function:
Gear Configuration	
Gear Type	Type of the landing gear system either wheel config or skids
Wheel Count	Number of wheels attached to the helicopter
Identifier	Name of the Wheel
Collider	Attached wheel collider
Wheel Model	Model of the helicopter wheel

Rotation Axis	Axis of rotation of the wheel model
Steerable	Determines whether the wheel can be steered with the helicopter pedals
Attached Motor	Determines whether the wheel is attached to the drive and braking system.
Steering Wheel Axle	Transform axle of the steering wheel
Maximum Steer Angle	Maximum angle to which the wheels can be steered
Steer Axis	Axis of steering of the wheel
Invert Steer	Steer the wheels in the opposite direction
Brake Torque	Maximum torque to brake the wheels
Wheel struct type	Type of the gear attached to the helicopter either Fixed or Retractable
Struct Drag	Drag coefficient of the gear in the open position.

- **RADAR:** Helps to detect aircrafts, airfields or any specified object within a given range from the aircraft

Functionality			Color Settings		
Type	Military	⇕	Transparency	———————○ 1	
Support Radar	☐		General Color		⌀
			Label Color		⌀
Radar Configuration					
Effective Range	25000		**Camera Configuration**		
Weapons Range	10000		Radar Camera	◆ None (Camera)	⊙
Critical RCS	0.5		Locked Camera	◆ None (Camera)	⊙
Ping Rate	5		View Settings		
Last Ping	0.0 s		Camera Height	30	
Display Extents	☑		Camera Distance	40	

Object Identification	
Visible Objects	0
Filtered Objects	0
Selected Target	
Locked Target	

Display Configuration		
Radar Size	250	
Object Scale	2.5	
GUI Skin	☐ SilantroSkin (GUISkin)	⊙
Rotate	☐	
Mark Objects	☐	

Texture Settings

Radar Background   [Select]

Compass   [Select]

Radar Screen Icons

Selected Target   [Select]

Locked Target   [Select]

Sample Radar Screen showing a nearby airfield.

PROPERTIES

Property:	Function:
Radar Properties	
Type	Type of the radar either a basic (civilian) or Advanced (Military)
Effective Range	Maximum detection range of the radar in meters
Critical RCS	Smallest radar signature which can be detected i.e signatures above this value will be seen by the radar
Ping Rate	Time interval between each radar pings
Radar Size	Size of the radar on the screen
Object scale	Size of the objects identified on the radar screen
GUI Skin	Skin used by the radar display
Mark Objects	Draw visible line to each detected object
Radar Background	Radar background Texture
Compass	Radar compass needle texture
Transparency	Transparency of the radar on the screen
Radar Colour	Colour overlay of the radar
Radar Camera	This camera will follow and look at the current object being observed by the radar
Locked Camera	This camera will follow and look at the locked target
Camera Height	Height of the camera above the object being observed
Camera Distance	Camera distance from the object

- **TRANSPONDER:** sends information about the object its attached to.

Definition	
	Aircraft ⇕
RCS	1
Radar Texture	[texture icon] Select
Sensor Data	
Is Tracked	False

PROPERTIES

Property:	Function:
Type	**Component Type**
RCS	Radar Signature of the component
Radar Texture	Texture icon used by the object

- **MISSILE**

Munition Configuration	
Identifier	AGM-114 Hellfire
Munition Type	
	Missile ⬍
Missile Configuration	
Mode	ASM ⬍
Warhead Configuration	
Explosive Type	RDX ⬍
Density	1.762 gm/l
Detonation Velocity	8639 m/s
Streaming Velocity	2213 m/s
Detonation Pressure	338 e+8 Mpa
Energy	5763 J/g
Explosion Prefab	🔵 Missile Explosion ⊙
Performance	
Explosive Force	200.0 N
Explosive Radius	100 m
Detonation System	
Armed State	False
Current Speed	0 m/s
Detonation Type	Proximity ⬍
Trigger Distance	20
Current Target	Null
Maximum Range	11000
Missile Dimensions	
Diameter	0.178
Length	1.6
Weight	45.5
Propulsion	
Rocket Motor	🔵 Aerojet SR115-AJ-1 Motor (Silan ⊙

PROPERTIES

Property:	Function:
Mode	Operation mode of the missile
Explosion Prefab	Explosion prefab to be instantiated during destruction
Detonation Type	Mechanism used to trigger the missile

Maximum Range	Maximum distance the missile can travel before triggering self-destruct
Weight	Total weight of the missile
Length	Length of the missile from nose to tail
Diameter	Maximum external diameter of the missile
Rocket Motor	Rocket motor connected to the missile

- **ROCKET**

Munition Configuration	
Identifier	R4M Orkan (1)

Munition Type

	Rocket

Rocket Type

Mode	Unguided

Warhead Configuration	
Explosive Type	RDX
Density	1.762 gm/l
Detonation Velocity	8639 m/s
Streaming Velocity	2213 m/s
Detonation Pressure	338 e+8 Mpa
Energy	5763 J/g
Explosion Prefab	Rocket Explosion

Performance	
Explosive Force	60.0 N
Explosive Radius	30 m

Detonation System

Fuze Type	MK193 Mod 0
Trigger System	Nose Impact
Armed	False
Maximum Range	8000

Rocket Dimensions

Diameter	0.055
Length	0.812
Weight	3.85

Propulsion	
Rocket Motor	Motorkanone Motor (SilantroRoc

PROPERTIES

Property:	Function:
Mode	Operation mode of the rocket
Explosion Prefab	Explosion prefab to be instantiated during destruction
Fuze Type	Mechanism used to trigger the rocket
Maximum Range	Maximum distance the missile can travel before triggering self-destruct
Weight	Total weight of the rocket
Length	Length of the rocket from nose to tail
Diameter	Maximum external diameter of the rocket
Rocket Motor	Rocket motor connected to the missile

- **BULLET**

PROPERTIES

Property:	Function:
Ammunition Type	Type of the bullet
Ammunition Form	Form/Shape of the bullet
Fuze Type	Detonation fuze used by the bullet
Mass	Mass of the bullet in grains
Case Length	Length of the bullet case in mm
Overall Length	Length of the round in mm
Diameter	Diameter of the round in mm
Ballistic Velocity	Maximum exit velocity of the bullet in m/s
Damage	Amount of damage done by the bullet
Destroy time	Time from instantiation to destruction of the bullet

- **MICROCHIP**

PROPERTIES

Property:	Function:
Type	Functionality of the computer system either Complete or Pure Data collection
Range	Maximum detection range of the radar in meters
Ping Rate	Time interval between each radar pings
Homing Type	Type of guidance used by the missile
Rotation Rate	How fast the missile steered towards the target
Navigation Constant	Kp constant used for the Proportional navigation PID

- **GUN:** Designed after the normal Gatling guns used in attack aircrafts and helicopters.

Bullet Type	Rigidbody
Ballistic Settings	
Weight	281
Barrel Length	2.3
Muzzle Velocity	1010
Maximum Range	3600
Rate of Fire	650
Actual Rate	0.00
Fire Timer	0.00
Recoil Effect	
Recoil Force	0.00 N
Damper	95.5
Ammo Settings	
Infinite Ammo	☐
Capacity	1000
Current Ammo	0
Drum Weight	0 kg
Release Shells	☐
Accuracy Settings	
Accuracy	80
Current Accuracy	0.00
Advanced Settings	☐
Bullet Settings	
Bullet	30x200mm NATO HEI B
Barrel Count	7
Barrel 1	Muzzle (1) (Transform)
Barrel 2	Muzzle (2) (Transform)
Barrel 3	Muzzle (3) (Transform)
Barrel 4	Muzzle (4) (Transform)
Barrel 5	Muzzle (5) (Transform)
Barrel 6	Muzzle (6) (Transform)
Barrel 7	Muzzle (7) (Transform)

Bullet Settings	
Bullet	30x200mm NATO HEI B
Barrel Count	7
Barrel 1	Muzzle (1) (Transform)
Barrel 2	Muzzle (2) (Transform)
Barrel 3	Muzzle (3) (Transform)
Barrel 4	Muzzle (4) (Transform)
Barrel 5	Muzzle (5) (Transform)
Barrel 6	Muzzle (6) (Transform)
Barrel 7	Muzzle (7) (Transform)
Revolver	
Revolver	Gun Barrel (Transform)
Rotation Axis	Z
Rotation Direction	CCW
Barrel RPM	0.0 RPM
Effects Configuration	
Muzzle Flash	Default Muzzle Flash
Impact Effects	
Ground Hit	Ground Impact
Metal Hit	Metal Impact
Wood Hit	Wood Impact
Sound Configuration	
Fire Sound	None (Audio Clip)
Sound Volume	0.75

PROPERTIES

Property:	Function:
Weapon Properties	
Weapon Type	Type of the gun
Bullet Type	Type of bullet system used by the gun
Weight	Weight of the gun in kg
Barrel Length	Length of the gun barrel in meters
Muzzle Velocity	Speed of exit of the bullets in m/s

Range	How far the weapon can shoot to hit a component.
Rate of Fire	Rate of fire of the minigun in Rounds per minute
Damper	Level of absorption of the recoil force
Ammo Capacity	Number of bullets which the aircraft is loaded with on start.
Unlimited Ammo	If selected, available bullet is unlimited and is not depleted.
Accuracy	How accurate the raycast shot is. 100 means the raycast lands on exactly the point selected
Connections	
Barrels	List of transforms from with bullets can be ejected from. *Note: The weapon cycles through each transform one after the other in a circular fashion.*
Revolver	Rotating barrel of the minigun
Rotation Axis	Axis of rotation of the barrel
Rotation Direction	Direction of rotation of the barrel
Shell Eject Point	Transform point from which bullet shell prefabs is ejected from.
Effects	
Muzzle Flash	Flash prefab when bullet is ejected.
Bullet Case	Prefab of bullet shell to be ejected.
Impact Effects	
Ground Hit	Prefab to be instantiated when bullets hits a gameObject with "Ground" tag.
Metal Hit	Prefab to be instantiated when bullets hits a gameObject with "Metal" tag.
Wood Hit	Prefab to be instantiated when bullets hits a gameObject with "Wood" tag.
Fire Sound	Audioclip to be played when weapon is fired

- **WARHEAD**
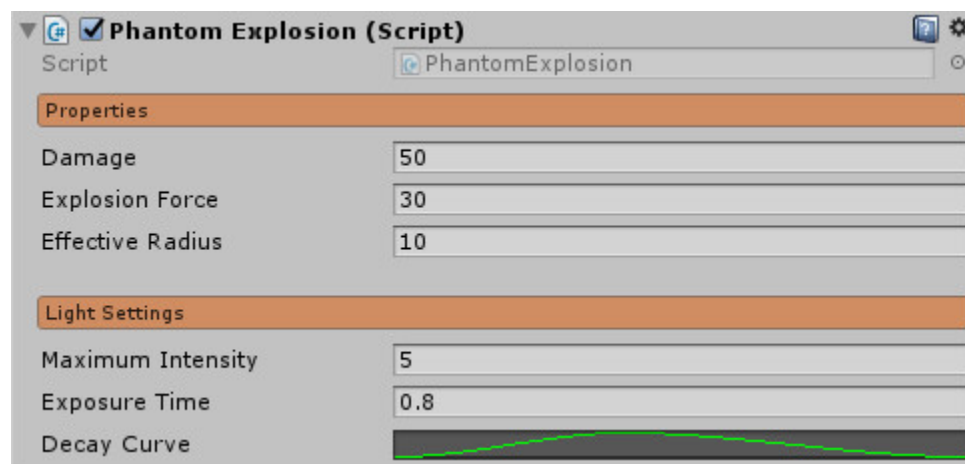
- **PROPERTIES**

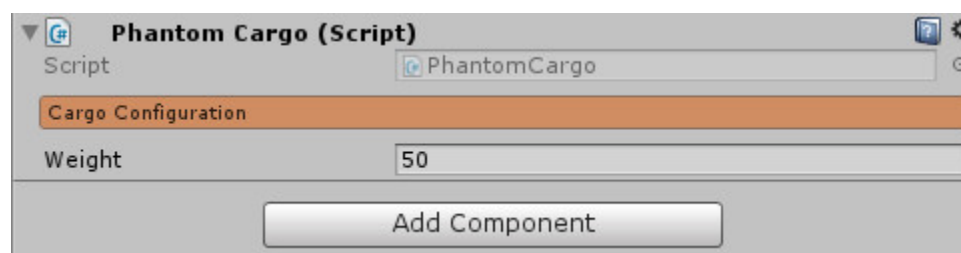| Property:	Function:
Damage	Value to subtract from collider health
Explosion force	Force to apply to the collider within effect range
Effective radius	Explosion effect radius in meters
Maximum Intensity	Cap intensity of explosion flash
Exposure time	Time for which the explosion flash is active
Decay Curve	Curve guiding the behaviour of the explosion flash

- **CREW**
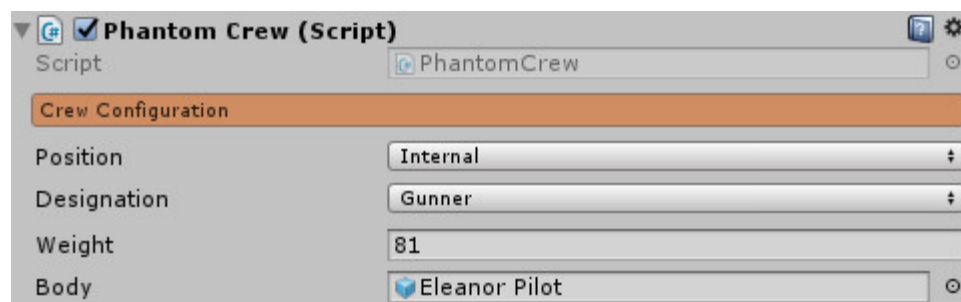
- **PROPERTIES**

Property:	Function:
Position	Location of the crew man/woman.
Designation	Designation of the crew
Weight	Weight of the crew in kg
Body	Attached gameObject with animations

- **CARGO**

- **PROPERTIES**

Property:	Function:
Weight	Weight of the cargo in kg

- DIAL
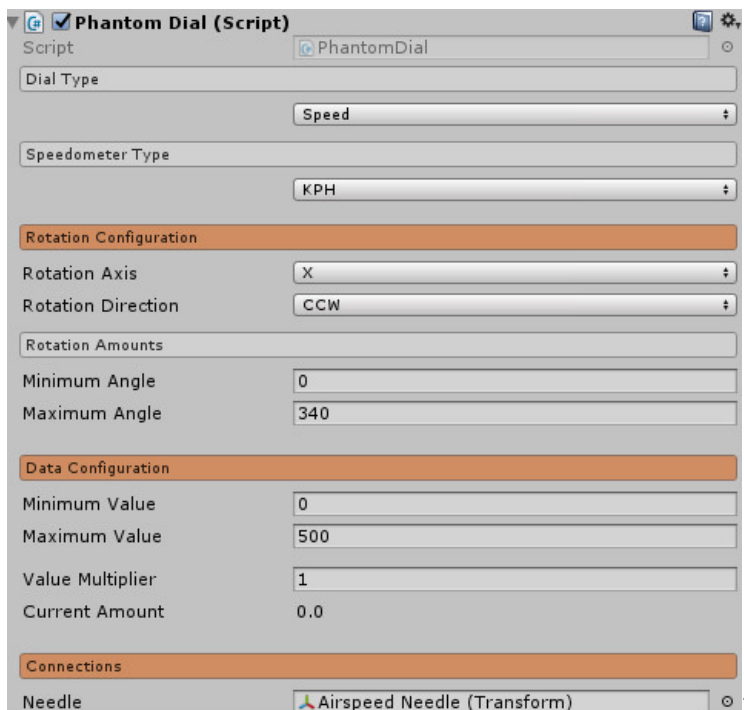
- PROPERTIES

Property:	Function:
Dial Type	
Rotation Axis	Axis of rotation of the dial needle
Rotation Direction	Needle rotation direction
Minimum Angle	Minimum angle of rotation of the dial needle
Maximum Angle	Maximum angle of rotation of the dial needle
Minimum Value	Lowest Input variable value
Maximum Value	Maximum input variable value
Value Multiplier	Scale value of the input variable, 1 for straight usage, 1000 for thousands etc..
Needle	Dial needle transform

- **LEVER**
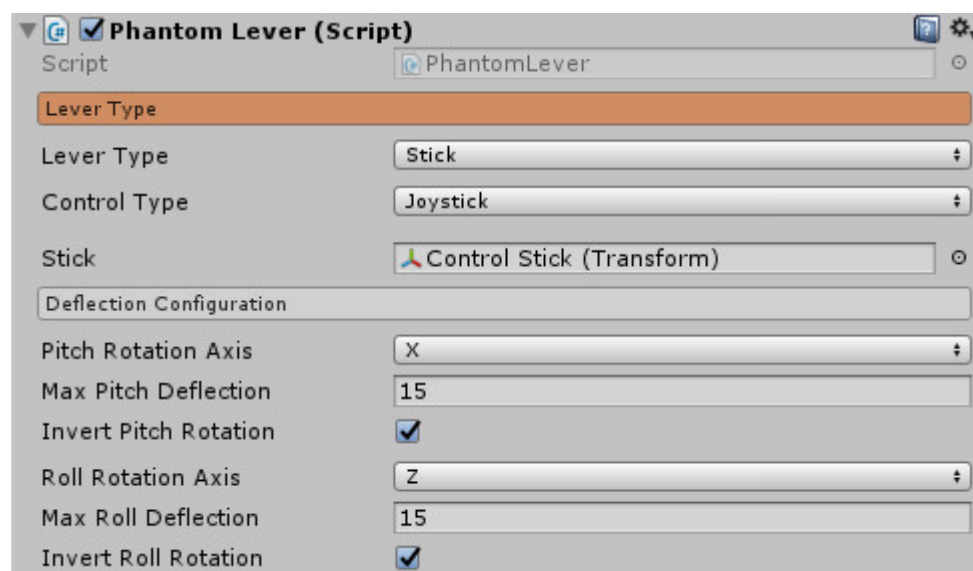
- **PROPERTIES**

Property:	Function:
Lever Type	
Rotation Axis	Axis of rotation of the connected lever
Maximum Deflection	Maximum angle of rotation of the lever
Invert Rotation	Make the lever rotate in the opposite direction

1. **CAMERA SYSTEM:**
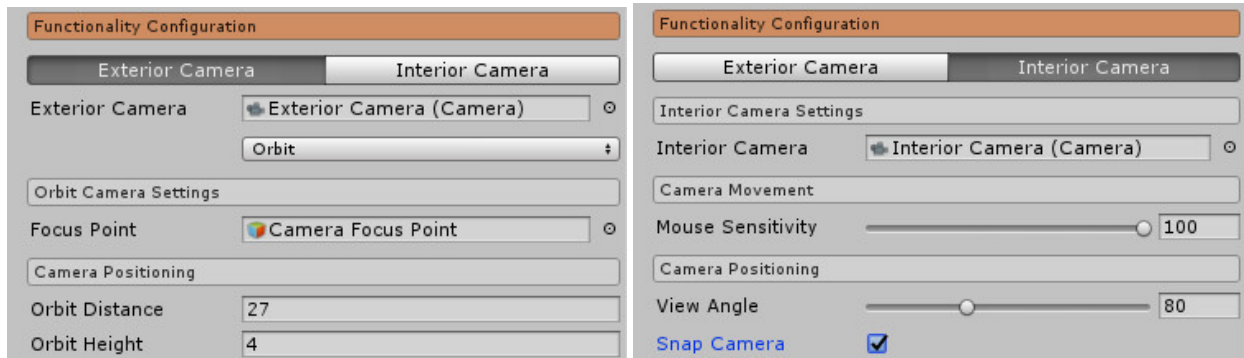
PROPERTIES

Property:	Function:
Properties	
Function	Configuration of the camera
Focus Point	Transform or point to use as camera reference
Orbit Distance	Distance of the camera from the focus point
Orbit Height	Height of the camera above the reference point
Mouse sensitivity	How fast the camera moves around with the mouse
View Angle	Maximum viewing angle of the camera

- **HEALTH:**

PROPERTIES

Property:	Function:
Properties	
Component	Type of component the health system is attached to
Maximum Health	Maximum health value of the component
Explosion Prefab	Prefab to be instantiated when the component is destroyed
Model	Model attached to the component to be detached
Weight	Weight to be assigned to the model after detachment

5. CONTROL SYSTEM

- **CONTROLLER**

- **PROPERTIES**

Property:	Function:
Craft Type	Type of the aircraft either Helicopter or Drone

Control Type	Determines whether the aircraft is controlled from inside or on the outside i.e if Enter-Exit is available
Input Type	Determines how the component inputs are collected and distributed
Combine Throttle-Collective	Combines the collective control input to match the throttle input so that a single lever can be used to control both.
Combine Yaw-Roll	Same as above
Empty Weight	Weight of the aircraft without crew, cargo and fuel
Maximum Weight	Maximum allowable weight of the helicopter

- **JUNCTION BOX**
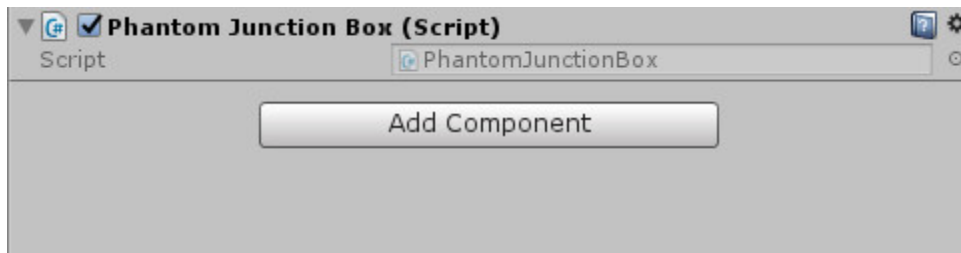
Controls the aircraft lights.

6. ROTOR SYSTEM

- ### ROTOR

- ### PROPERTIES

Property:	Function:
Craft Type	Type of the aircraft either Helicopter or Drone
Roto Type	Configuration of the rotor system type and position
Rotor Transform	Transform containing the 3D rotor model i.e the rotating parts

Force Point	Point of application of the Rotor lift force and control
Swing Factor	Tries to mimic the pendulum effect of the helicopter i.e if it'll return to its original rotation once the control is removed. This factor determines how fast this effect is calculated.
Ground Layer	Layers to be taken as ground to direct lift force application
Force Damper	Force factor to apply in the opposite direction of vertical motion to dampen/smoothen out the lift or decent. Note: Might reduce the climb rate and give a sense of autorotation during decent.
Apply Rotor Torque	Determines if the torque generated by the rotor is applied to the helicopter rigidbody. Note: This option is only available for conventional rotors it is a must for other rotor systems.
Functional RPM	Operating RPM of the rotor
Rotation Axis	Axis of rotation of the rotor transform
Rotation Direction	Direction of rotation of the rotor system. Note: American Helicopter use a CCW rotation while European Helicopters use a CW rotation
Minimum Collective	Minimum tilt angle of the blades for collective control
Maximum Collective	Maximum angle of collective control. Note: Should be al least 2 degrees less than the stall angle of the selected blade airfoil
Maximum Pitch Cyclic	Maximum forward tilt angle of the rotor swashplate
Minimum Pitch Cyclic	Maximum backward tilt angle of the rotor swashplate
Maximum Roll Cyclic	Maximum rightward tilt angle of the rotor swashplate
Minimum Roll Cyclic	Maximum leftward tilt angle of the rotor swashplate
Visuals Configuration	Determines what system is used for the rotor blur system. Partial; The rotor blur is activated leaving the main 3D model untouched. Complete: The rotor blur fades in while the 3D model fades out

|	
Blurred Rotor Materials	Materials assigned to the blurred Rotor. Note: Should use the Fade Material selection
Normal Rotor Materials	Materials assigned to the 3D rotor model: Note should also use the Fade Material selection
Audio Configuration Active	Determines if the rotor makes sound or not
Rotor Sound	Sound to be played by the rotor
Maximum Pitch	Maximum Pitch of the rotor sound

- **SWASH PLATE:** Rotates the rotor swash plate accordingly
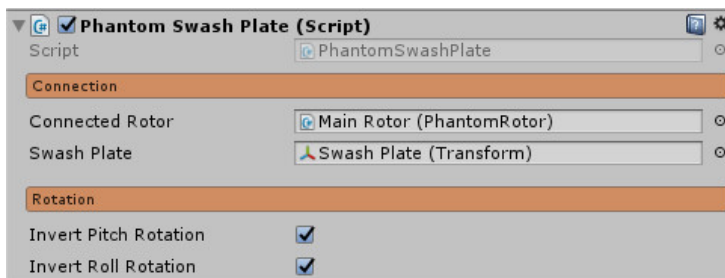
- **PROPERTIES**

Property:	Function:
Connected Rotor	Rotor system in consideration
Swash Plate	Swashplate transform

- **TRANSMISSION:** Will still be refined in the future to effectively distribute power within the helicopter system
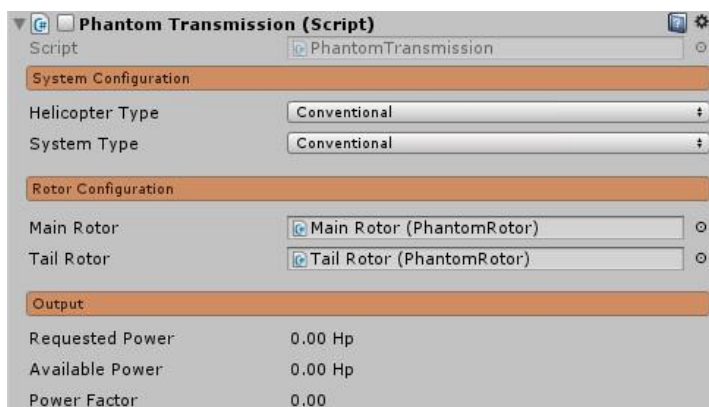
- **PROPERTIES**

Property:	Function:
Helicopter Type	Type of the helicopter system either Convention or Compound
System Type	Operational rotor system

- **BLADE:** This component generate lift from the rotor movement

- **PROPERTIES**

Property:	Function:
Blade Material	Material from which the blade is made from
Airfoil	Component containing lift and drag coefficient at different angles of attack.
Lift Coefficient	Coefficient of lift at current angle of attack
Drag Coefficient	Drag coefficient at current angle of attack.
Subdivisions	No of sections which the aerofoil is divided and determines how smooth the lift generation system is. *Note: Higher values reduces performance, therefore values between 3-6 is advisable. High Performance systems can go higher.*

Simulate Model	Determines if the 3D blade movement should be applied

- **BLADE MAGIC:** This component is used to reorient and reposition the blade component for proper operation. The Z (Blue) axis of the blade transform should be pointing in the leading-edge (Yellow line) direction.
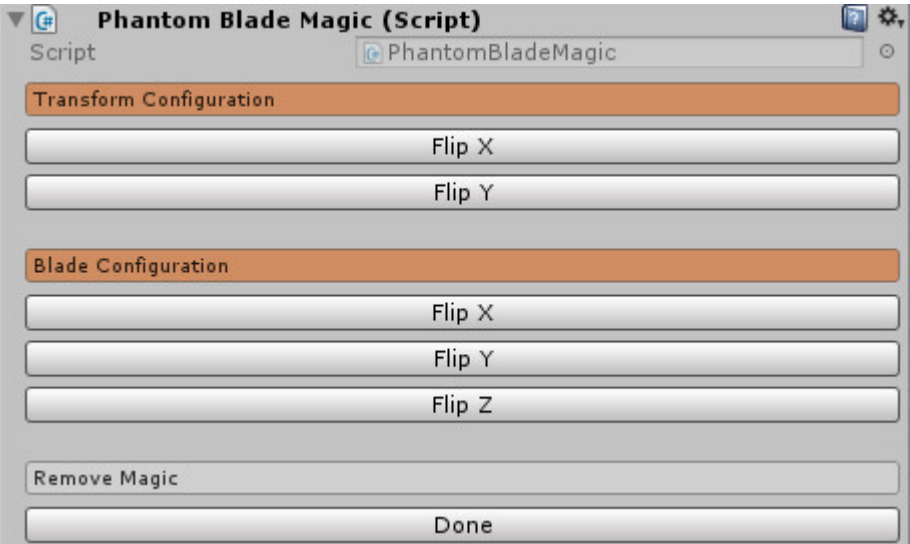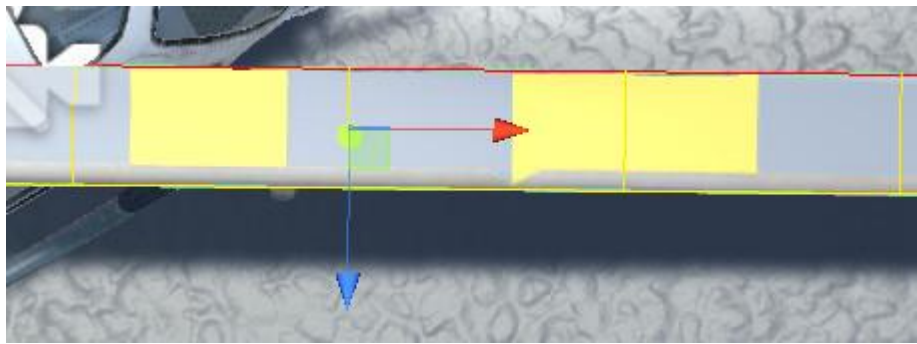
- **PROPERTIES**

Property:	Function:
Transform Configuration	
Flip X	Flip or turn the rotor transform around in the X axis
Flip Y	Flip or turn the rotor transform around in the Y axis
Blade Configuration	

Flip X	Flip or turn the blade component around in the X axis
Flip Y	Flip or turn the blade component around in the Y axis
Flip Z	Flip or turn the blade component around in the Z axis
Done	Press this button to automatically remove the component once the configuration is done.