Documentation

Helicopter System
for NEO-FPS Seating Controller

Table of Contents

Setup

First Steps

To begin with you will need to have Ultimate Seating Controller setup and ready to go, and your character should also be setup ready to board any BoardSource. These steps can be found in the Ultimate Seating Controller Documentation.

From there it is as simple as as adding the Helicopter Controller Component along with the Helicopter Input Component, then adding the Rotors and whatever other visual fields you wish to make use of. OR As always you can use the quick setup features of the editor windows, they will include the option for helicopter setup once you install this package.

The Attack Helicopter in the demo scene is setup with a Pilot seat and a Copilot seat within the Board component as per any other vehicle. Both copilot and pilot have Vehicle Weapon Shooters making this helicopter a perfect example of the flexibility.

If you wish to utilise the Fullscreen Pilot HUD UI, you can add the Helicopter Full Screen UI Monitor to a child of the canvas, much like a regular Full Screen UI Monitor. You can see an example of an accurate setup in the demo scene.

Helicopter Input

Simple by design, it utilises the NeoFPS input.

You can change the inputs to any other inputs you may have setup yourself by naming the input axis/button in the designated fields.

This input component catches the OnSetSeat event to get the input component from the pilot character.

Helicopter Controller

This component is the main driver script for the helicopter and it also drives values for the UI.

Units of Measurement

 - **Speed Units** Select from Knots, Feet Per Second, Feet Per Minute, Miles Per Hour, Kilometres Per Hour, or B

 - **Measurement Units** Select from Feet or Meters

UI and Cockpit

 - **Driver Seat ID** The seat index of the BoardSource Driver Seat.

 - **Gunner Seat ID** The seat index of the BoardSource Gunner Seat.

 - **Driver Full Screen UIID** The Helicopter UI index for Pilot HUD.

 - **Gunner Full Screen UIID** The Helicopter UI index for Gunner HUD.

 - **Visual Elements** The models joystick and pedals can move with input, add any that need to move here.

Altimeter and Radar

 - **Ground Layers Layers** The altimeter raycasts will look for.

 - **Altimeter Sensor** The center point of the ground sensors.

 - **Grounded Altitude Threshold Front** The distance from the ground at the front altimeter sensors to be considered grounded.

 - **Grounded Altitude Threshold Rear** The distance from the ground at the rear altimeter sensors to be considered grounded.

 - **Altimeter Sensor Offset Front** The distance from the ground at the front altimeter sensors to be considered grounded.

TIP: Best at center of wheel and just outside of it. For skids, just above and to the outside of the skid

 - **Altimeter Sensor Offset Rear** The distance from the ground at the rear altimeter sensors to be considered grounded.

TIP: Best at center of wheel and just outside of it. For skids, just above and to the outside of the skid

- **Use Closest Hit For Altitude** Use the closest ground hit for altitude? Will average out the values if false.

Pilot Assist

- **Pilot Assist Constant Ballast Dampening** Helps to keep the helicopter upright

- **Pilot Assist Constant Ballast Adjust Rate** Helps to keep the helicopter upright

- **Pilot Assist Angle Threshold** Helps to keep the helicopter upright (0 for no Angle Assist)

- **Pilot Assist Over Angle Dampening** Helps to keep the helicopter upright

- **Pilot Assist Over Angle Adjust Rate** Helps to keep the helicopter upright

- **Pilot Assist Over Pitch Dampening** Helps to keep the helicopter upright (0 for no Over Pitch Assist)

- **Pilot Assist Over Pitch Adjust Rate** Helps to keep the helicopter upright

- **Pilot Assist Under Pitch Dampening** Helps to keep the helicopter upright (0 for no Under Pitch Assist)

- **Pilot Assist Under Pitch Adjust Rate** Helps to keep the helicopter upright

- **Pilot Assist Over Roll Dampening** Helps to keep the helicopter upright (0 for no Over Roll Assist)

- **Pilot Assist Over Roll Adjust Rate** Helps to keep the helicopter upright

- **Auto Hover** Automatically apply throttle to maintain altitude when no throttle input

- **Auto Level When Hovering** Automatically level out the helicopter to maintain altitude when no yaw, pitch and roll input

- **Auto Hover Dampening** Dampening to apply when Auto Hover Leveling.

- **Auto Hover Adjust Rate** Return rate to apply when Auto Hover Leveling.

Agility

- **Realistic Mode** Use realistic physics?

- **Simple Yaw** Rather than adding torque for yaw, rotate around the world up. good for beginner pilots. (takes away realism somewhat) This option is available when Realistic Mode is set to true.

- **Max Altitude** The maximum sea level altitude the helicopter is allowed to reach.

- **Power Agility Factor** How fast the throttle response is.

- **Pitch Agility Factor** How fast the pitch response is.

- **Roll Agility Factor** How fast the roll response is.

- **Yaw Agility Factor** How fast the yaw response is.

- **Max Pitch** How much the helicopter can pitch.(0 = Unrestricted)

- **Max Roll** How much the helicopter can roll.(0 = Unrestricted)

- **Lift At Max Power** How much lift force the helicopter has at maximum power.

- **Lift At Min Power** How much lift force the helicopter has at minimum power.

- **Max Rate Of Climb** How fast the helicopter is allowed to raise its altitude.

- **Max Rate Of Descent** How fast the helicopter is allowed to drop its altitude.

- **Max AirSpeed** Limit the helicopters maximum overall air speed.

Physical Properties

- **Centre Of Mass** An optional reference to adjust the centre of mass.

- **Mass Running Airborne** How heavy the helicopter is while it is off the ground and the engine is fully started.

- **Drag Running Airborne** How much drag will affect the helicopter while it is off the ground and the engine is fully started.

- **Angular Drag Running Airborne** How much angular drag will affect the helicopter while it is off the ground and the engine is fully started.

- **Mass Stopped Airborne** How heavy the helicopter is while it is off the ground and the engine is off.

- **Drag Stopped Airborne** How much drag will affect the helicopter while it is off the ground and the engine is off.

- **Angular Drag Stopped Airborne** How much angular drag will affect the helicopter while it is off the ground and the engine is off.

- **Mass Running Grounded** How heavy the helicopter is while it is on the ground and the engine is on.

- **Drag Running Grounded** How much drag will affect the helicopter while it is on the ground and the engine is on.

- **Angular Drag Running Grounded** How much angular drag will affect the helicopter while it is on the ground and the engine is on.

- **Mass Stopped Grounded** How heavy the helicopter is while it is on the ground and the engine is off.

- **Drag Stopped Grounded** How much drag will affect the helicopter while it is on the ground and the engine is off.

 - **Angular Drag Stopped Grounded** How much angular drag will affect the helicopter while it is on the ground and the engine is off.

 - **Max Angular Velocity** Limit the helicopters maximum angular velocity.

Engine

 - **Auto Start Engine** Should the engine automatically start when the driver is set?

 - **Auto Stop Engine** Should the engine automatically stop when the driver is set?

TIP: With this false, you can change seats and the helicopter can keep hovering, perfect for single player game that require a switch from pilot to gunner, or for testing UI etc.

 - **Engine Start Up Duration** How long it takes to fully wind up the engine and rotors.

 - **Engine Shut Down Duration** How long it takes to fully wind down the engine and rotors.

 - **Main Rotor Rotate Velocity** How fast the Main Rotor/s rotate.

 - **Sub Motor Rotate Velocity** How fast the Sub Rotor/s rotate.

 - **Throttle Rotor Speed Multiplier** How much the throttle output affects the speed of the Main Rotor/s rotation.

 - **Yaw Rotor Speed Multiplier** How much the throttle and yaw output affects the speed of the Sub Rotor/s rotation.

 - **Main Rotors** A reference to the main lift rotor/s, that rotate around their Y axis.

 - **Sub Rotors** A reference to the sub rotors usually the rear/yaw rotor/s that rotate around thier X axis.

Damage

 - **Horizontal Impact Threshold** Horizontal collision force must be above this threshold to do horizontal impact damage.

 - **Vertical Impact Threshold** Vertical collision force must be above this threshold to do vertical impact damage.

 - **Horizontal Impact Damage Amount** How much base damage to apply when collision force is above the threshold (multiplies by collision force).

 - **Vertical Impact Damage Amount** How much base damage to apply when collision force is above the threshold (multiplies by collision force).

- **Nose Landing Threshold** Higher values allow less accurate landings. Lower values require more accurate landing. The lower the value the less angle the helicopter must have to successfully land.

 - **Tail Landing Threshold** Higher values allow less accurate landings. Lower values require more accurate landing. The lower the value the less angle the helicopter must have to successfully land.

 - **Nose Landing Damage Amount** Landing accuracy failure damage to apply.

 - **Tail Landing Damage Amount** Landing accuracy failure damage to apply.

 - **Side Landing Threshold** Higher values allow less accurate landings. Lower values require more accurate landing. The lower the value the less angle the helicopter must have to successfully land.

 - **Side Landing Damage Amount** Landing accuracy failure damage to apply.

 - **Nose Crash Threshold** Lower values consider crashing at less angle. The higher the value, the more the helicopter must be on its nose to be considered a crash.

 - **Tail Crash Threshold** Lower values consider crashing at less angle. The higher the value, the more the helicopter must be on its tail to be considered a crash.

 - **Nose Crash Damage Amount** Nose crash damage to apply.

 - **Tail Crash Damage Amount** Tail crash damage to apply.

 - **Side Crash Threshold** Lower values consider crashing at less angle. The higher the value, the more the helicopter must be on its side to be considered a crash.

 - **Side Crash Damage Amount** Side crash damage to apply.

 - **Upside Down Crash Damage Amount** Crash damage to apply if the helicopter is upside down.

 - **Immobilize On Impact** Optionally immobilize throttle on impacts above the threshold.

 - **Immobilize On Bad Landing** Optionally immobilize throttle on bad landing.

 - **Immobilize On Crash** Optionally immobilize throttle on crash landing.

 - **Immobilized Duration** When immobilized the helicopter can recover after this delay. (-1 to never recover)

Audio

 - **Throttle Up Pitch Value** The amount of pitch difference to apply to the engine audio.

 - **Engine Audio Clip** The engine audio clip to play.

 - **Engine Audio Source** The engines audio source.

- **Immobilized Audio Clip** The immobilized warning audio clip to play.

- **Immobilized Audio Source** The immobilized warning audio source.

Weapons

- **CoPilot Weapon Indicator Offset** The offset for the UI monitor copilot weapon indicator (start weapon angle)

- **Pilot Weapons** The Pilot weapons, can be empty

- **CoPilot Weapons** The CoPilot weapons, can be empty

Helicopter UI Monitor

This Component is designed to relay flight and weapon information to the fullscreen HUD typically found in battle helicopters.

- **Character** Left blank this will set itself at runtime.

- **Visible** Should the UI be visible?

- **ID** The ID the helicopter uses to register with the UI component

- **I Beam Container** A reference to the container the I Beam will float around in.

- **I Beam** A reference to the I Beam.

- **Pitch Ladder** A reference to the pitch ladder.

- **Pitch Ladder Pivot** A reference to the pitch ladder pivot point.

- **Heading Indicator** A reference to the heading indicator (compass).

- **Roll Indicator Pivot** A reference to the roll indicator pivot point.

- **Vertical Velocity Indicator** A reference to the vertical velocity indicator.

- **Vertical Velocity Indicator Container** A reference to the container the vertical velocity indicator will slide up and down in.

- **Pilot Weapon 1 Ready Image** A reference to the image to display if the pilots weapon 1 is ready.

- **Pilot Weapon 2 Ready Image** A reference to the image to display if the pilots weapon 2 is ready.

- **CoPilot Weapon 1 Ready Image** A reference to the image to display if the copilots weapon 1 is ready.

- **CoPilot Weapon 2 Ready Image** A reference to the image to display if the copilots weapon 2 is ready.

- **CoPilot Weapon Indicator Container** A reference to the container that the copilot weapon indicator will float around in.

- **CoPilot Weapon Indicator** A reference to the copilot weapon indicator.

- **CoPilot Firing Color** The color that the copilot weapon indicator will change to if the copilot is firing.

- **Side Slip Indicator Container** A reference to the container the sideslip indicator will slide sideways in.

- **Side Slip Indicator** A reference to the side slip indicator.

- **Altitude Bar** A reference to the altitude fill bar.

- **Throttle Text** A reference to the throttle text.

- **Sea Level Altitude Text** A reference to the sea level altitude text.

- **Radar Altitude Text** A reference to the radar altitude text.

- **Airspeed Text** A reference to the airspeed text.

- **Warning Image** A reference to the warning image to display when immobilized.

- **Warning Flash Speed** The speed that the warning image will flash.

- **Max Warning Flash Alpha** The maximum alpha to apply to the warning image and or children when the warning is flashing.

- **Fade Warning Children** Should the child warning images be faded when the warning flash is active?.

Helicopter Controller Pun

Simply have this component attached to your helicopter to sync the values.