Naval Cutter – 14-Carronade Cutter

Description:

High quality 3D model of a 14-carronade cutter which were in use in the French Navy during the 1830s. This 3D model is based on a scale model of those cutters which can be seen in the Musée national de la Marine in Paris. It comes with many separated and rotatable parts, all of them parented and ready for rotation. A prefab with a helper script is included to hoist and lower sails, set wind speed, set wind direction, open and close gun ports, rotate carronades, rotate rudder, yard and boom. The geometry of the sails is flat, to simulate wind they are set up for Unity's cloth system. Raising and lowering the sails works via blend shapes (unfortunately blend shapes are currently not compatible with cloth, a quick smooth transition between wind blown cloth and flat geometry is done when switching to blend shapes which might cause a tiny flicker). The sails and flag uses a double sided variant of the Standard Shader. To make them work with rotatable parts some of the ropes are handled by a script – those ropes are based on the line renderer. Please note that due to the complex nature of the rigging of a sail ship this will not always work perfectly: sometimes ropes will go through sails and sometimes cloth might go through colliders. The Asset has a simple setup of deck colliders for 3rd person prototyping usage. Size of the textures is up to 4096x4096 but it still looks good if you reduce texture size on import. The ship uses the Unity Standard Shader (Albedo, Metallic/Smoothness, Normal Map, Height Map, Ambient Occlusion) and a custom shader for the sails when using the Built-in Render Pipeline. Comes with packages for URP and HDRP (Unity 2019.4.31f1 and higher) Please note: The smoke of the carronade effects is slightly less complex in URP and HDRP pipelines than in the built-in render pipeline.

Statistics as shown in Unity (shadows disabled)

LOD0: Tris: 124.5k, Verts: 107.1k – SetPass calls: 11 – Battches: 78 – Saved by batching: 76

LOD1: Tris: 52.2k, Verts: 49.7k – SetPass calls: 6 – Batches: 19 – Saved by batching: 49

LOD2: Tris: 22.0k, Verts: 21.2k – SetPass calls: 6 – Batches: 18 – Saved by batching: 22

Two included demo scenes show how to control the rotations of rudder, sails, gun ports and carronades with a GUI

New in 1.2:

Support for more render pipelines: Unity 2019.4.31f1 and higher: Built-in Render pipeline, URP & HDRP

New in 1.1.2:

Fixed cloth (sails) issues with Unity 2019.1 and higher

New in 1.1:

Added particle and audio effects for the carronades. Offers simulation of single shots or broadsides with a short delay between the carronades and a simulation of reloading time by a simple timer. (e.g. carronade was fired 10 seconds ago, reloading timer is set to 27 seconds, carronade won't fire until time went up – even if it gets the order to fire.)

New in 1.0.1:

Added float CutterControl.SailClothDamping to offer a quick way to set the motion damping for all sail clothes. It will be helpful to increase motion damping if the sails start to stutter when the cutter moves at a unrealistically high velocity.

Usage:

Drag the prefab into the scene and call the functions to control sails, gun ports etc. from your own script or call the functions from your GUI (like done in the demo).

Script Reference:

Namespace: Hessburg

_____

CutterControl.WindDirection(float)

Sets wind direction (valid range: 0.0 to 360.0) – Note: this can be overriden by
CutterControl.windDirectionFollowsShipRotation

CutterControl.WindSpeed(float)

Sets wind speed (valid range: 0.0 to 1.0)

_____

CutterControl.OpenGunPort(int)

Opens a gun port (valid range: 0 to 13)

_____

CutterControl.CloseGunPort(int)

Opens a gun port (valid range: 0 to 13)

_____

CutterControl.OpenAllGunPorts()

Opens all gun ports

_____

CutterControl.CloseAllGunPorts()

Closes all gun ports

_____

CutterControl.OpenStarboardGunPorts()

Opens all gun ports on starboard side

_____

CutterControl.CloseStarboardGunPorts()

Opens all gun ports on port side

_____

CutterControl.OpenPortGunPorts()

Opens all gun ports on port side

_____

CutterControl.ClosePortGunPorts()

Closes all gun ports on port side

CutterControl.FireBroadsideStarboard()

Fires particle and audio effects to simulate a broadside of firing carronades (for all loaded carronades on starboard side)

CutterControl.FireBroadsidePort()

Fires particle and audio effects to simulate a broadside of firing carronades (for all loaded carronades on port side)

CutterControl.FireCannonNumber(int)

Fires particle and audio effect to simulate a firing carronade (if loaded) (valid range: 0 to 13)

CutterControl.CannonsFXcontrol.BroadsideMaximumDelay : float

Maximum delay between the firing of the cannons when firing a broadside.

CutterControl.CannonsFXcontrol.ReloadTime : float

A timer to simulate the reloading pause of the carronades.

CutterControl.CannonsFXcontrol.Cannon[int].LastFired : float

Read only. Gives last time a carronade was fired. (Valid range of the array is 0-13,)

CutterControl.DeckCollidersActive(boolean)

Enable/disable deck colliders

CutterControl.RudderAngle(float)

Sets rudder angle (valid range: -1.0 to 1.0)

CutterControl.YardsAngle(float)

Sets yards angle (valid range: -1.0 to 1.0)

CutterControl.BoomAngle(float)

Sets boom angle (valid range: -1.0 to 1.0)

CutterControl.HeadsailsAngle(float)

Sets headsails angle (valid range: -1.0 to 1.0)

CutterControl.SetJib(boolean)

Set or take in jib sail

CutterControl.SetJibTopsail(boolean)

Set or take in jib topsail

CutterControl.SetStaysail(boolean)

Set or take in staysail

CutterControl.SetMainsail(boolean)

Set or take in mainsail

CutterControl.SetSquareSail(boolean)

Set or take in square sail

CutterControl.SetTopSail(boolean)

Set or take in top sail

CutterControl.SetTopgallantSail(boolean)

Set or take in topgallant sail

CutterControl.SetStuddingSailPort(boolean)

Set or take in port studding sail

CutterControl.SetStuddingSailStarboard(boolean)

Set or take in starboard studding sail

CutterControl.AllBarrelAngles(float)

Sets vertical angle of all carronades (valid range: -1.0 to 1.0)

CutterControl.AllBarrelAnglesPort(float)

Sets vertical angle of all carronades on port side (valid range: -1.0 to 1.0)

CutterControl.AllBarrelAnglesStarboard(float)

Sets vertical angle of all carronades on starboard side (valid range: -1.0 to 1.0)

CutterControl.BarrelAngle(int carronade, float angle)

Sets vertical angle of a certain carronade (valid range carronade: 0-13 – valid angle range: -1.0 to 1.0)

CutterControl.AllPedestalAngles(float)

Sets horizontal angle of all carronades (valid range: -1.0 to 1.0)

CutterControl.AllPedestalAnglesPort(float)

Sets horizontal angle of all carronades on port side (valid range: -1.0 to 1.0)

CutterControl.AllPedestalAnglesStarboard(float)

Sets horizontal angle of all carronades on starboard side (valid range: -1.0 to 1.0)

CutterControl.PedestalAngle(int carronade, float angle)

Sets horizontal angle of a certain carronade (valid range carronade: 0-13 – valid angle range: -1.0 to 1.0)

CutterControl.AllCarriagePositions(float)

Moves carriage of all carronades back and forth (valid range: 0.0 to 1.0)

CutterControl.AllCarriagePositionsPort(float)

Moves carriage of all carronades on port side back and forth (valid range: 0.0 to 1.0)

CutterControl.AllCarriagePositionsStarboard(float)

Moves carriage of all carronades on starboard side back and forth (valid range: 0.0 to 1.0)

CutterControl.CarriagePosition(int carronade, float angle)

Moves carriage of a certain carronades back and forth (valid range carronade: 0-13 – valid angle range: 0.0 to 1.0)

CutterControl.adjustNorth float

override compass north direction valid range (0.0-360.0)

_____

CutterControl.windDirectionFollowsShipRotation boolean

if set to true wind direction will always follow the rotation of the ship to blow the sails from the aft. Note: this overrides CutterControl.WindDirection(float)

_____

CutterControl.clearTransformMotion()

Clear the pending transform changes from affecting the cloth simulation of the sails.

This is useful if you want to teleport the ship from one point in the scene to another, without having the sails suddenly jerk into place.

See also: https://docs.unity3d.com/ScriptReference/Cloth.ClearTransformMotion.html

_____

CutterControl.SailClothDamping float

Sets the Cloth.damping for all sails. Valid range (0.0-1.0)

_____

Support:
assets.support @ hessburg.com