Swimming Pack for Opsive Character Controllers

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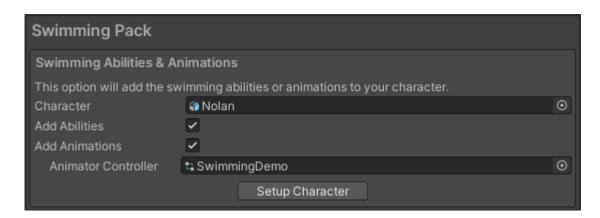
Swimming Pack

Getting Started

Import Errors

If you receive any import errors after importing the Swimming Pack it is likely for one of the two reasons:

- You don't first have one of the Opsive Character Controllers imported. The Swimming Pack requires any of the controllers to first be imported in order for it to work.
- The Opsive/UltimateCharacterController/Demo folder is not imported. This directory is required from the character controllers in order for the Swimming Pack demo scene to work correctly.

Swimming Animations

An editor tool has been created that allows you to easily add the swimming animation states to your existing animator controller. You can create the states for all of the abilities used within the Swimming Pack by opening the Add-Ons Manager (Tools -> Opsive -> Ultimate Character Controller -> Add-Ons Manager) and specifying the character that you want to add the animations to:

After selecting "Add Animations" all of the agility states will be added to the specified animator controller.
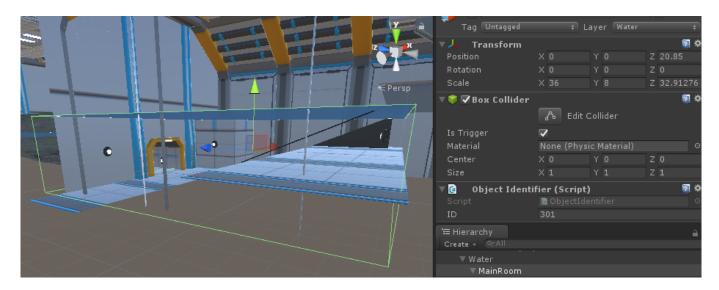
Lightmapping

In order to reduce the download size the demo scene does not contain any lightmapping. When the scene first opens it will appear dark and this can be corrected by baking the scene. If the lights are not baked before hitting play they will automatically be disabled.

Water Setup

The swim ability activates when it comes into contact with a water trigger. This trigger should be setup by performing the following:

1. Create the GameObject that will contain the trigger collider.
2. Set the GameObject layer to water
3. Add a Box Collider to the GameObject, ensuring *Is Trigger* is set to true.

In the demo scene the water mesh is a child of the water trigger but this is not a requirement.

Custom Water Assets

The Swim ability is designed to be able to work with other water assets than what is included in the demo folder. By default the Swim ability will determine the height of the water by the top of the trigger's bounding box, but this can also be set to a custom value. In order to set a custom value the *SetWaterSurfacePosition* method can be called on the Swim ability. This method takes a float which specifies the upper vertical position of the water plane. In the example below the position will be set to a value of 5.

```
using UnityEngine;
using Opsive.UltimateCharacterController.Character;
using Opsive.UltimateCharacterController.Character.Abilities;
using Opsive.UltimateCharacterController.AddOns.Swimming;

public class MyObject : MonoBehaviour
{
    [Tooltip("The character that contains the swim ability.")]
    [SerializeField] protected GameObject m_Character;

    /// <summary>
    /// Starts and stops the jump ability.
    /// </summary>
    private void Start()
    {
        var characterLocomotion =
m_Character.GetComponent<UltimateCharacterLocomotion>();
        var swimAbility = characterLocomotion.GetAbility<Swim>();
        swimAbility.SetWaterSurfacePosition(5f);
    }
}
```

Climb from Water

The Climb From Water ability allows the character to climb out of the water onto a horizontal platform. The ability will detect the climbing object set by the inherited [Detect Object Ability Base](#) ability.

Setup

1. Select the + button in the ability list under the "Abilities" foldout of the Ultimate Character Locomotion component.
2. Add the "Swimming Pack/Climb From Water" ability. This ability should be positioned above the Swim ability.

Inspected Fields

Max Water Depth

The maximum water depth that the character can climb from.

Climb Offset

The offset that the character should start climbing from.

Move To Position Speed

The speed that the character should move towards the target when getting into position.

Dive

The Dive ability will allow the character to dive head first from an elevated area. The Dive ability inherits from the [Detect Ground Ability Base](#) ability to determine that the character is on an object that they can dive from.

Setup

1. Select the + button in the ability list under the "Abilities" foldout of the Ultimate Character Locomotion component.
2. Add the "Swimming Pack/Dive" ability. This ability should be positioned above the Swim ability.

Inspected Fields

Min High Dive Height

The minimum distance from the dive platform to the water for the dive to be considered a high dive.

Dive Force

The amount of force to apply when the dive ability starts.

Frames

The number of frames that the Start Force is applied in.

Will Enter Water Distance

The distance at which the character should play an animation which prepares the character for entering the water.

Entrance Splash

[Water Effect](#) that should play when the character enters the water.
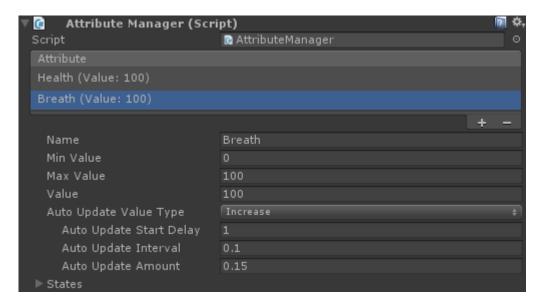
Retained Gravity Amount

The percentage that the gravity force is retained each frame after the character enters the water.

Drown

The Drown ability plays a drowning animation when the character is out of breath. This ability works with the [Attribute System](#) and the [Swim](#) ability in order to determine that the character is out of breath.

Setup

1. Select the + button in the ability list under the "Abilities" foldout of the Ultimate Character Locomotion component.
2. Add the "Swimming Pack/Drown" ability. This ability should be positioned above the Swim ability.
3. Ensure the Breath attribute has been added to the [Attribute Manager](#). The *Breath Attribute Name* should be set to the same name as the attribute created within the Attribute Manager.

Inspected Fields

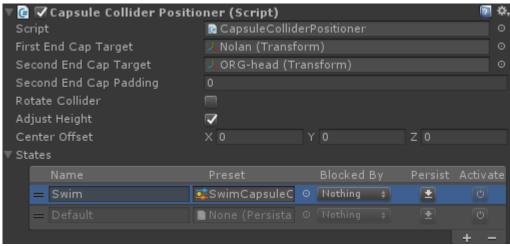**Breath Attribute Name**

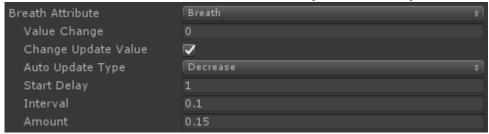The name of the breath attribute.

Swim

The Swim ability will allow the character to traverse through water and is activated on collision with water layer triggers. The swim ability inherits the [Detect Object Ability Base](#) ability allowing for a broad range of water detection modes. It is recommended that the water uses a [trigger setup](#).

Setup

1. Select the + button in the ability list under the "Abilities" foldout of the Ultimate Character Locomotion component.
2. Add the "Swimming Pack/Swim" ability. This ability should be positioned above the Fall ability but below the [Dive](#) and [Climb from Water](#) abilities.
3. Perform the [water setup](#).
4. Set the Detect Object Ability Base parameters. In the demo scene *Detect Layers* is set to the Water layer.
5. Set the *Start Swim Depth*, *Surface Swim Depth*, and the *Surface Height Adjustment.*
6. Add the Swim Capsule Collider Positioner preset to the character's Capsule Collider Positioner component. This component is located on the Character/Colliders/Capsule Collider GameObject. Ensure the Capsule Collider Positioner's *Rotation Bone* and *Position Bone* fields are set to a Transform on the character. This can be set by enabling the *Rotate Collider* toggle.

7. Add the Breath attribute and [Drown](#) ability (if necessary).

8. Specify any [Water Effects](#).

Inspected Fields

Start Swim Depth

The water depth that the character can start to swim at.

Surface Swim Depth

The water depth that the character should swim and the surface at.

Surface Height Adjustment

Modifies the default height that the character will swim on the surface at.

Can Swim Underwater

Can the character swim underwater?

Start Underwater Swim Pitch

Specifies the camera pitch that the character will transition from a surface swim to underwater swim.

Min Underwater Swim Depth

The minimum surface depth that the character can swim underwater.

Start Underwater Swim Name

The button mapping to start swimming underwater. An empty value will prevent the

mapping from being used.

Surface Buoyancy Amount

The amount of buoyancy that should be applied to the character while underwater.

Underwater Buoyancy Amount

The amount of buoyancy that should be applied to the character while underwater.

Water Height Detection Mode

The percentage that the gravity force is retained each frame after the character enters the water.

Water Height Detection Mode

Specifies the method for detecting the water height:

- *Collider*: Detect the water height based on the collider above the character.
- *Custom*: A custom water height can be set with the *SetWaterSurfacePosition* method.

Breath Modifier

The breath attribute that should be modified when the character is underwater.

Entrance Splash

Effect that should play when the character enters the water from the air.

Surface Swim Splash

Effect that should play when the character is swimming on the surface.

Underwater Swim Movement

Effect that should play when the character is swimming underwater.

Underwater Bubbles

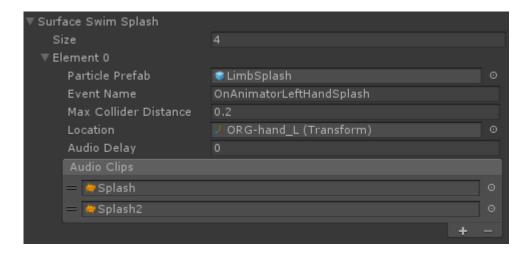Effect that should play when the character is swimming underwater.

Underwater State Name

The state that should activate when the character is underwater.

Water Effects

Water Effects are specified on the [Swim](#) and [Dive](#) abilities. Water Effects allow for particle and sound effects to be played at certain events. The following effects are supported by the Swim or Dive ability:

- Entrance Splash
- Surface Swim Splash
- Underwater Bubbles

The Entrance Splash will play if the character enters the water from the air at a high velocity. Surface Swim Splash is triggered by an [animation event](#) and will play when a limb makes a splash while doing a surface swim. Underwater Bubbles occur when the character is swimming underwater.

The Entrance Splash and Underwater Bubbles are single events while the Surface Swim Splash is an array allowing for multiple events. In the demo scene the character has 4 Surface Swim Splash elements: left hand, right hand, left foot, and right foot. Each element contains the animation event that should trigger the effect. The Water Effects also can specify multiple audio clips allowing for a random sound to be played with each effect.