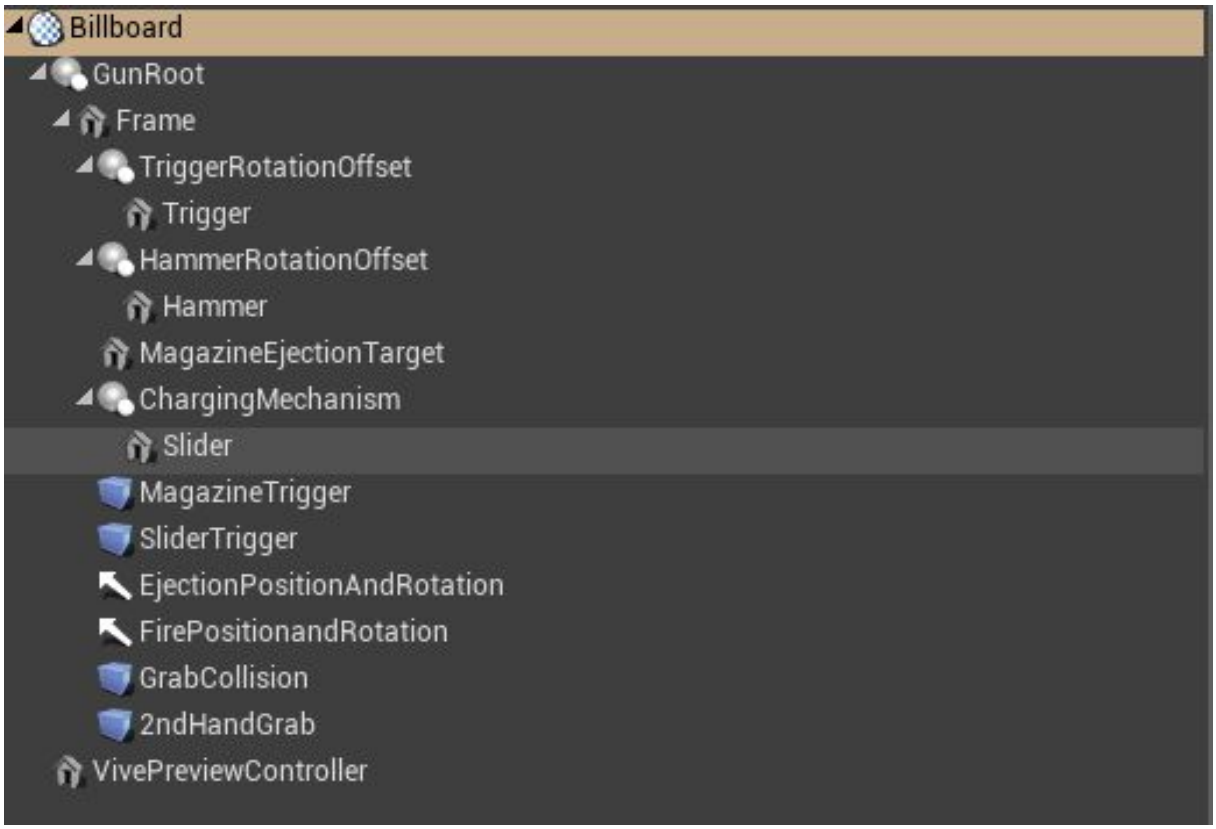
VR Realistic Gun Documentation

Gun

There are two areas that need to be edited on the Blueprint when setting up a new gun:

Components:



This is the anchor of the gun, you should move this in the viewport to make sure your gun is correctly placed, there is a 

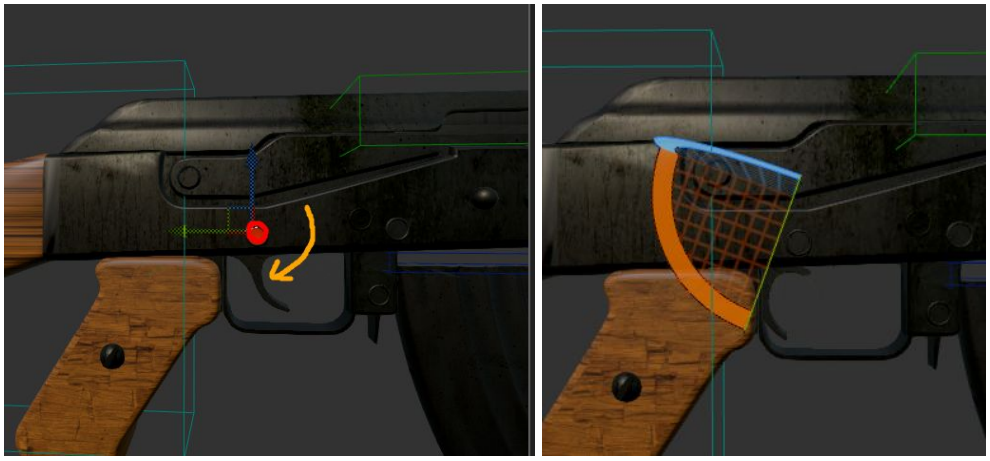
mesh that you can take as reference to show where the gun will be located when you grab it. This is the only component that you should move to adjust position, <u>don't move the</u> 

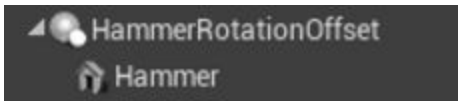
<u>to adjust position of the gun.</u>

This is the main part of the gun, you should put your frame mesh here (more details on how to split the mesh on the “How to prepare your mesh” documentation.)

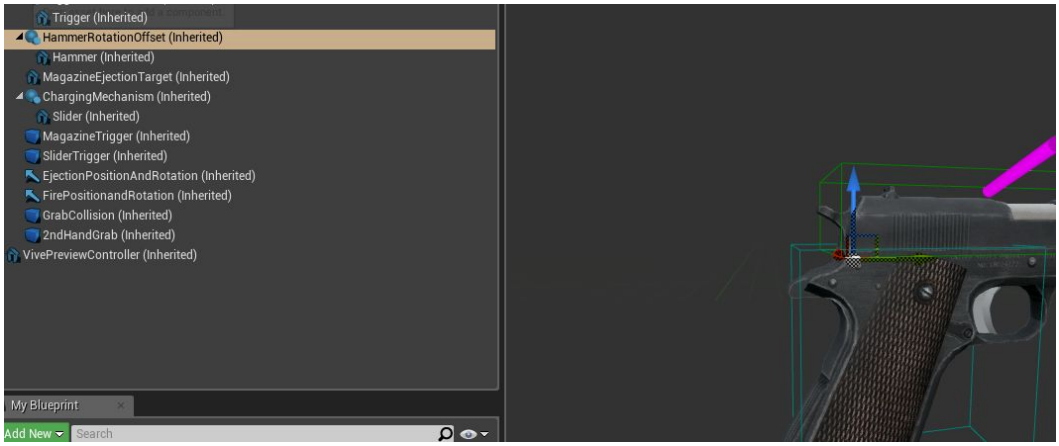
You should put the Trigger mesh here if your gun has one, if not leave blank. After adding your trigger mesh, move the Rotation offset to where you want the rotation pivot point to be, this will make the trigger rotate around the offset, you can test this by rotating the offset to make sure it’s producing a realistic result. Don’t forget to leave the rotation at 0 when you’re done testing. 

When you press on the controller trigger, the trigger mesh will move



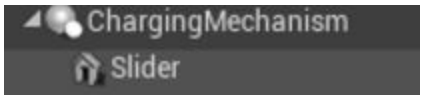


- Similar to the Trigger, you should put the hammer mesh if your gun has one. The offset works in the same way, and you should place it on the rotation pivot of the hammer.



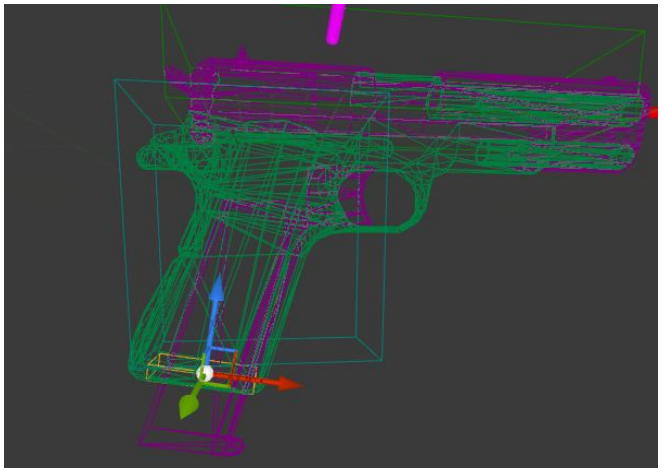
This is where your Gun magazine should go.
This component is actually not seen in-game, but rather this is used for us to “help” the physics a little bit. Depending on the gun you’re using, you may need to increase or decrease how far away this needs to be from your gun.
In the code, when you eject a magazine, we first do a non-physics animation that sets the location of the magazine to this ejection target and only after do we set the magazine to simulate physics.

Different guns will require more/less of this. For instance, our *Colt1911* has a very narrow, snug fit for the magazine, this makes it particularly hard to eject the magazine since the magazine was getting stuck. On the other hand the *AK* does not need this and is set at 0, since there’s no friction being applied on the magazine.



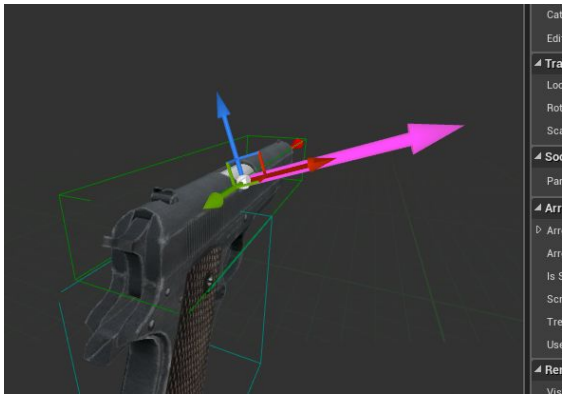
There’s an important distinction between the Charging mechanism and slider in the toolkit. Slider is the mesh that, if the gun is semi/automatic, will have the “blowback” effect. This means that each shot fired, the “Slider” mesh will move if you set an offset in the variables (more on this on next chapter).
While this covers most firearms, some don’t have a “one piece” slider, and rather have a charging handle that does not move when firing. This is where the Charging mechanism component comes into play. If your gun has a charging mechanism (an example is the m4a1 firearm), you should set the Slider mesh to the part of the gun that moves on every shot, and add a child to the charging mechanism of the charging handle. When cocking the gun, every child of “Charging Mechanism” will move back, but only the slider mesh will animate on each shot. Most firearms will only need the slider mesh set up.

This is the trigger for when we bring a magazine close to the gun, you should set this where the magazine inserts into the gun.

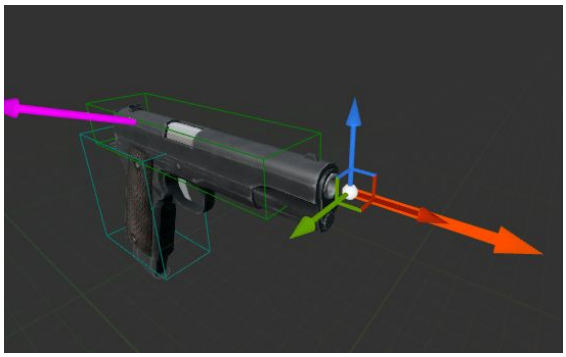


This is the “grab-able” part or the slider, should be placed near the slider, attempting to grab the gun on this volume will allow you to cock the weapon.

This is where the shells will be ejected, you should point this outwards from the gun near the ejection port of the gun.



FirePositionandRotation This is where the bullets will be spawned, the arrow should face away from the barrel of the gun.



GrabCollision An extra component to improve grab location.

This component will only appear if you have set the gun as two handed. This component is where you will grab to trigger the two handed hold of the weapon.

Variables:

In the child blueprints you will have access and should edit the following variables:

Gun Settings:

- **Double action -** Means the gun fires even if the hammer was not pulled back (note: This does not mean the gun will fire without a round in the chamber).

- **Full auto -** The gun will keep firing, until it runs out of bullets, while you keep the trigger pressed.

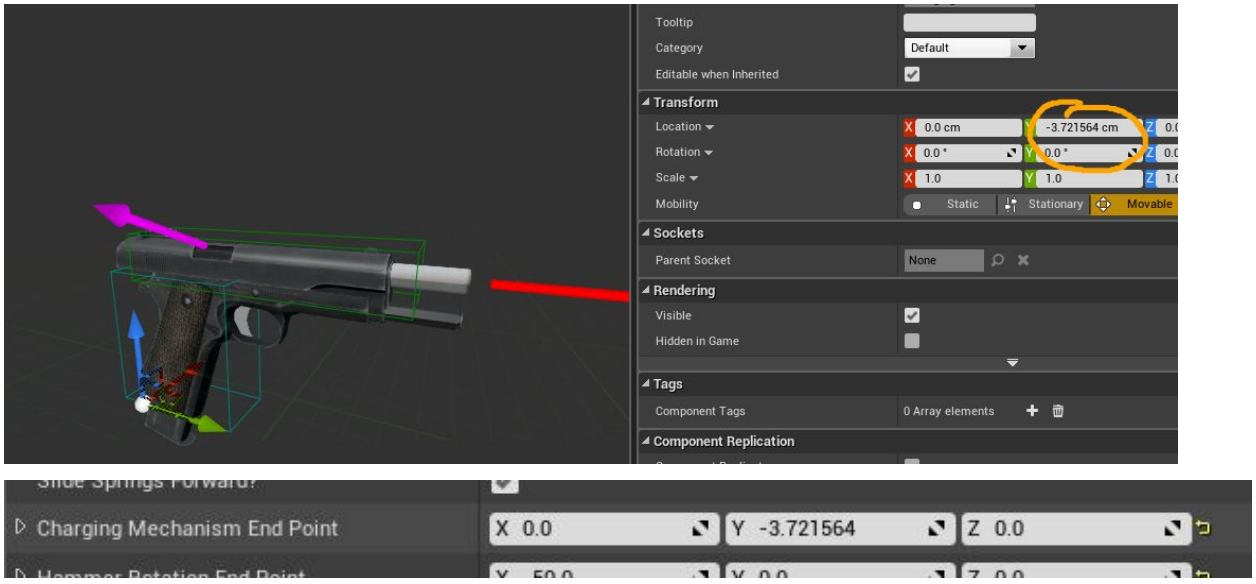
- **Semi auto -** Semi auto means the gun reloads and cocks itself after each shot, this needs to be on for full auto.

- **Slide Locks -** If the slide locks when it runs out of bullets, this means you can switch magazines and unlock the slider without having to reload with two hands.

- **Allows 2 hand grip -** Will enable the 2nd hand grab collision and allow the gun to be held with 2 hands.

- **Slide Springs forward -** If, after pulling the gun back, and you release the slider, the gun should spring the slider forward. As an example. most modern handguns have this feature, a shotgun usually does not, and if you release the slide mid way, it will stay in the same place.

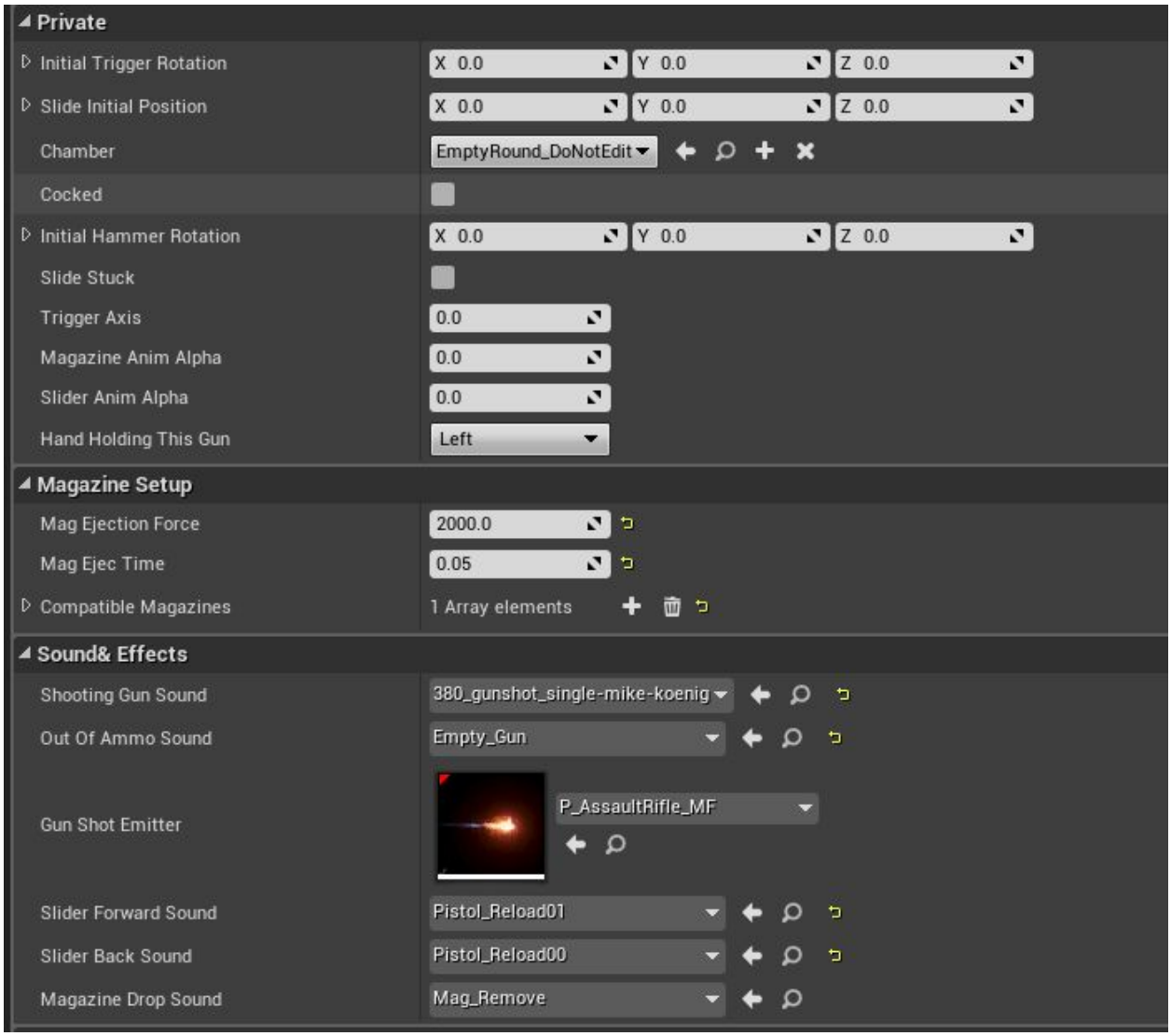
- **Charging Mechanism end point -** In the viewport, move the **charging mechanism** to the endpoint location, set that relative location to this variable. Don't forget to put the relative location back to 0.



These will be the endpoints for the slider animation in-game.

- **Hammer Rotation EndPoint and Trigger Rotation End Point -** Similar to the Charging Mechanism end point, rotate the hammer and trigger **offsets** to their end points, save the offsets in these variables, these will be used in game for the trigger and hammer animations.

- **Full auto Delay -** Controls how fast the gun shoots in full auto.
- **Shell Ejection Force -** Amount of force we add to the shell after we fire the gun.
- **Slider Firing movement Speed -** How fast the slider moves when a shot is fired.
- **Infinite Ammo -** Toggles infinite ammo.
- **Allow Magazine Release -** Allows for the Magazine to be ejected from the gun.



Private

For most cases, you should not edit these values. Possibly, only “Chamber” could be edited if you want to already have a bullet in the gun at game start.

Magazine Setup

- **Mag Ejection Force -** Amount of force we add to the magazine to make sure it ejects the gun.

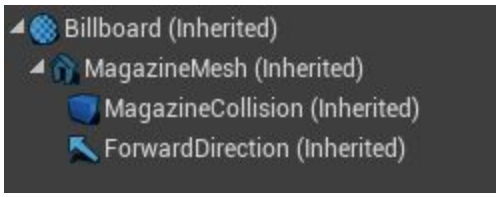
- **Mag Ejection Time -** Amount of Time for the “fake”/non-physical animation of the magazine.

- **Compatible Magazines -** Only Magazines on this list, and their children, can be placed on this gun. This prevents us from loading a AK magazine on a Colt for example.

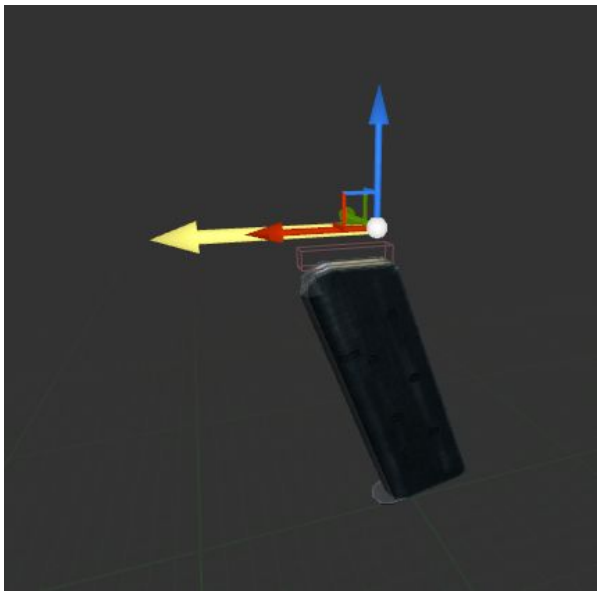
Sound Effects
Gun Sound effects for each action.

Magazine

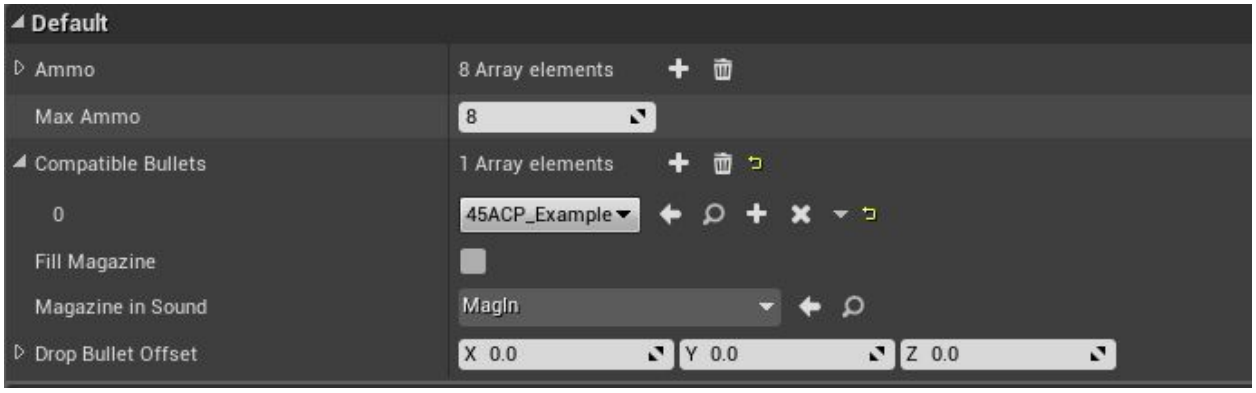
Components:



Magazine Mesh - Set this to the Magazine Mesh.
Magazine Collision - This is where the magazine will collide with the magazine collision of the gun.
Forward Direction - This is the direction the we will pick up this magazine, should point “forwards”.



Variables:



- **Ammo -** Ammo currently inside the magazine.

- **Max Ammo -** Max Ammo this magazine can take.

- **Compatible Bullets -** Only Bullets on this list, and their children, can be placed on this gun. This prevents us from loading a AK bullet on a Colt magazine for example.

- **Fill Magazine -** Takes the first index of “Ammo” and **fills the remaining Array with that bullet**, useful time saver!

- **Magazine In Sound -** Sound the magazine makes when you load it on the gun.

- **Drop Bullet Offset -** We spawn the bullets that we drop from the mag at Magazine Collision location + this offset.

Bullet

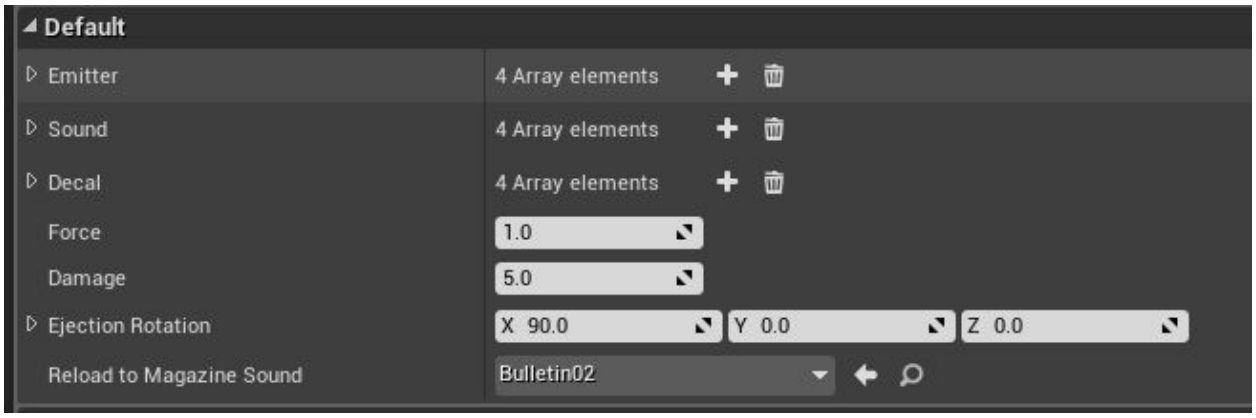
Components:

Sphere - How large is the bullet collision

Shell - Shell Mesh

Bullet - Bullet mesh

Variables:



- **Emitter -** Emitter for particle collision, the array element is choosen depending on the physical material we hit.
- **Sound -** Sound for the Hit collision, the array element is choosen depending on the physical material we hit.
- **Decal -** The decal spawned on Hit Collision, the array element is choosen depending on the physical material we hit
- **Force -** Physics Force of the impact
- **Damage -** Damage the bullet does
- **Ejection Rotation -** The rotation offset of the bullet when ejected
- **Reload Magazine Sound -** Sound of the bullet when placed on a magazine.