Sound System Documentation

Brandon Coffey

Welcome to the Sound System used for the game, Ghost House, from the UTD Game Lab!

Organization in the Project:

Audio Clips (.mp3 or .wav) go in _Game/Audio

Sound System Stuff goes into _Game/Data/Audio

Examples currently in Project:

Sfx Clips, Sfx Randomized, Music Track (_Game/Data/Audio/Ex-Clips)

Audio Mixer, Mixer Controller, Sound Manager (_Game/Data/Audio/Ex-Clips)
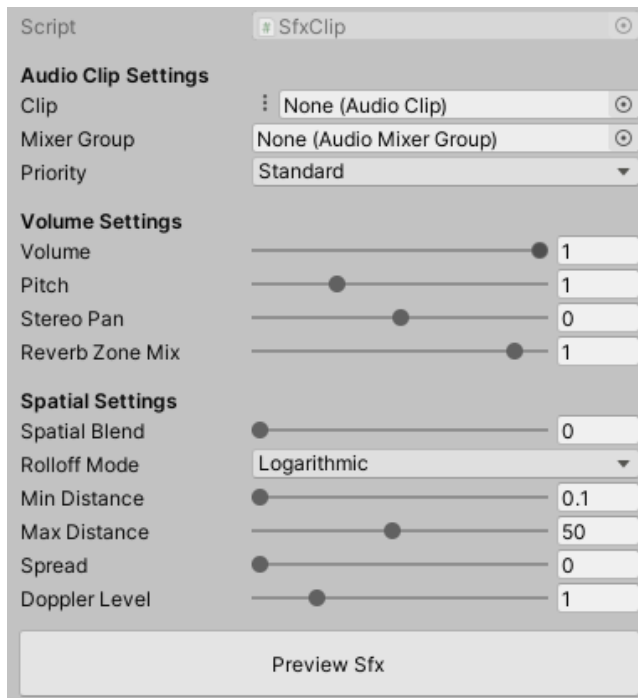
Documentation Outline:

SFX System

To create a new Sound Effect:
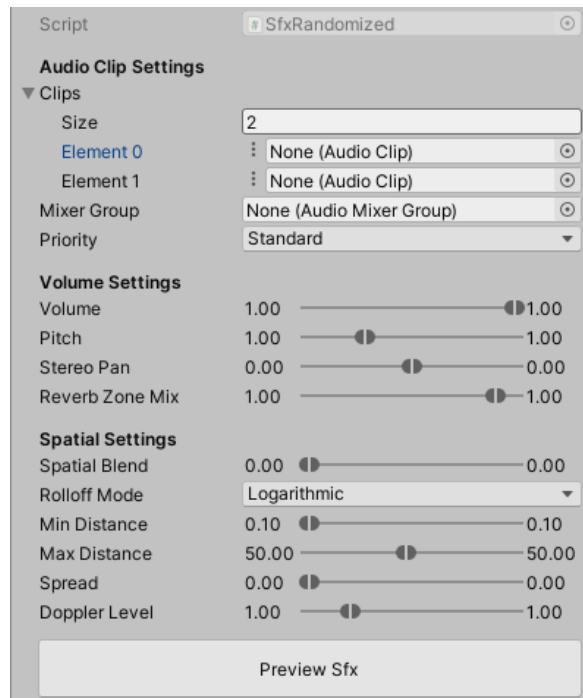
- Right click in Project View, go to Create > Sound System > Sfx Clip or Sfx Randomized

Create	>	Sound System	>	Music Track
Show in Explorer		Yarn Spinner	>	Sfx Clip
Open		Folder		Sfx Randomized

In the Inspector, an Sfx Clip looks like this: and a Sfx Randomized looks like this:

Both sound effects will have the same set of parameters in the Volume and Spatial settings.

Sfx Clip will have only a single clip assignable at the top and the sliders are simple, single number sliders. Every time it is played it will sound the same.

Sfx Randomized has a list of clips (assign how many at the top where it says size) and each time it is played, it will randomly choose one of the clips. Then, for each parameter it will choose a random number between the given minimum (left) and maximum (right). This allows for the sound effect to have many similar sounds that are slightly different to avoid repetition.

Both sound effects can be previewed at the bottom of the screen.

SFX System

Where the audio clip is inserted, it has some special properties.
There are three vertical dots on the right to switch its functionality, as shown:
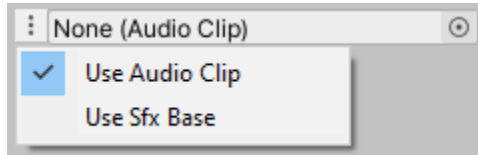
Use Audio Clip will simply allow a basic .mp3 or .wav file to be inserted.
Use Sfx Base will allow other Sfx Clips or Sfx Randomized to be inserted.

This is useful when mixing a random collection of sound effects, where they are not around the same volume level. So, you can take a sound effect and give it a Sfx Clip, turn down or up the volume, and then add it back to the Sfx Randomized to better match the other clips included. There can be other times this is useful as well, but typically just Use Audio Clip will be used.

Sound Effect Parameters are as follows:

Volume:	The volume of the clip
Pitch:	The pitch of the clip
Stereo Pan:	Pans a playing sound in a stereo way (left or right)
Reverb Zone Mix:	The amount by which the signal from the AudioSource will be mixed into the global reverb. Does nothing on its own.
Spatial Blend:	Sets 3D spatialization effects (attenuation, doppler etc.). 0.0 makes the sound 2D (Always same) - 1.0 makes it 3D (Spatial)
Roll-off Mode:	Sets how the AudioSource attenuates over distance
Min Distance:	Within the min distance the AudioSource will be at max volume
Max Distance:	The distance a sound stops playing at
Spread:	Sets the spread angle of a 3D stereo sound in speaker space
Doppler Level:	Sets the doppler scale for this AudioSource. Requires 3D sound.

- All of these have tooltips in Unity when you hold your mouse over them as well.

SFX System

To play sound effects, you can play them through a UnityEvent, such as on a Button in UI:
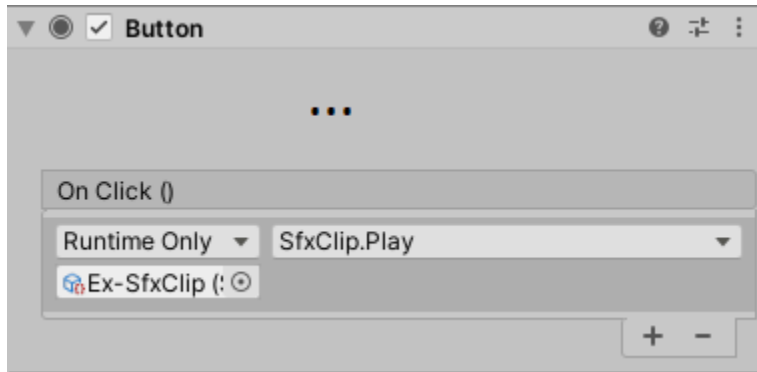
Or for environmental sounds that loop and stay around for the entire level, add an empty GameObject and give it the component: Audio Source Controller.

Then you can add in an Audio Clip, or more accurately, an Sfx Clip or Sfx Randomized. Be sure to use the three vertical dots to switch it to an Sfx Base to make it work!
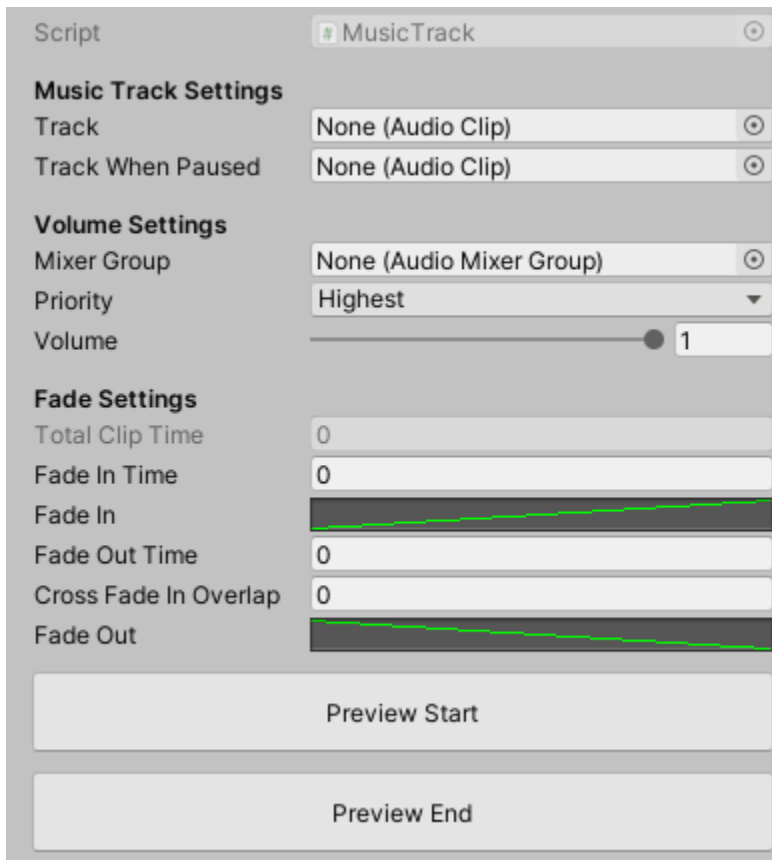
Music System

To create a new Music Track:
- Right click in Project View, go to Create > Sound System > Music Track

Create	>	Sound System	>	Music Track
Show in Explorer		Yarn Spinner	>	Sfx Clip
Open		Folder		Sfx Randomized

In the Inspector, a music track looks like this:

Insert the music track into Track at the top.
A paused track will fade in and out when the player pauses the game.

You can assign a custom mixer group, talked about later, or modify the priority (not recommended to change) or volume level of the track (Preview it at the bottom to test)
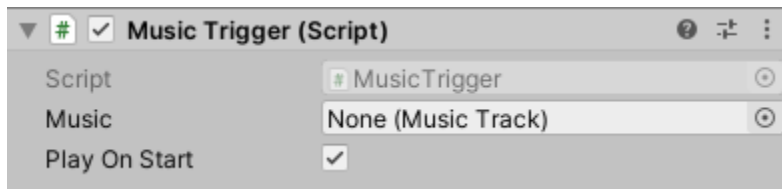
There are various fade options to adjust how the track fades in / out.
'Cross Fade in Overlap' will allow the previous song to start fading in X seconds before this song is fully faded out.

Music System

To play a music track, go to the desired scene where the music will be played and do the following:

- Create a new game object
- Add the component: 'MusicTrigger'

- Assign the music track
- If you wish for the track to be played by some other logic (UI button, code, etc.) then there is a function called PlayMusic() that can be triggered. Make sure to disable Play On Start if that is the case.
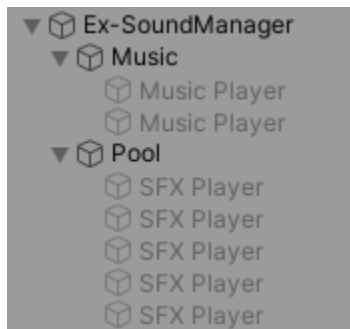
Sound Manager

The Sound Manager should exist across the entire game and should be a prefab.

The sound mixer in the inspector:
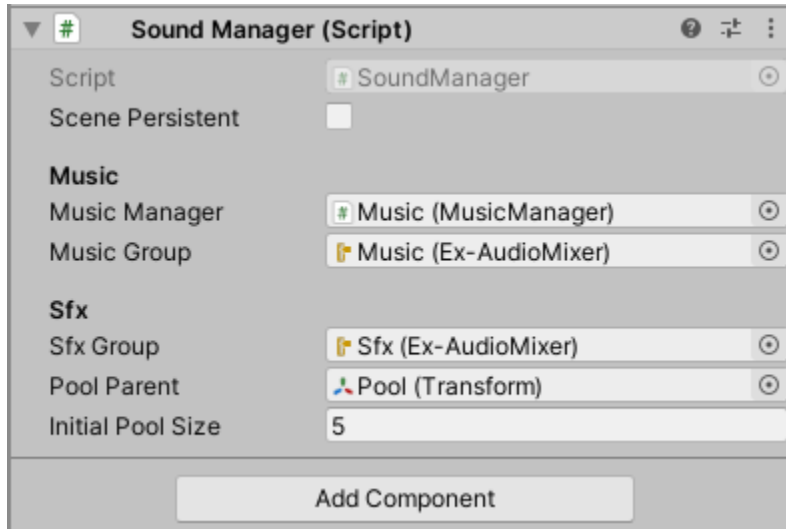
Please assign the Music Mixer Group and Sfx Mixer Group, as talked about on the next page.

The Sound Manager consists of two separate audio pools. One for Sfx and one for Music.

The music players here are used to fade and crossfade between tracks and their subsequent paused variations.
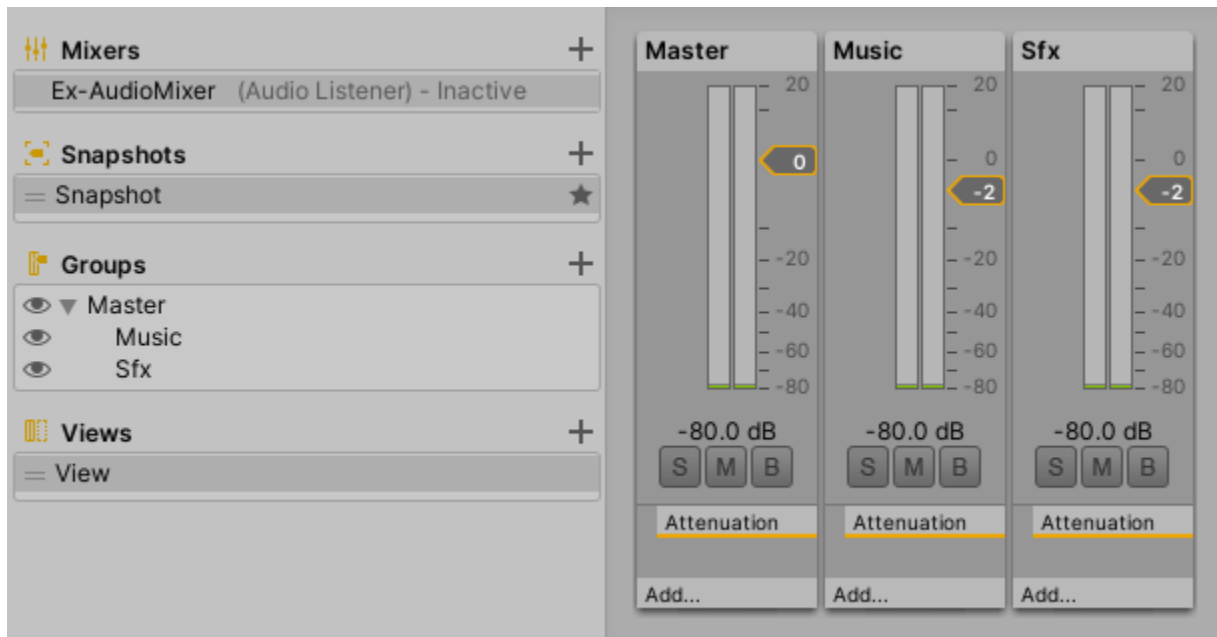
The Sfx players here should mainly be used for 2D sounds, where 3D sounds should be placed around the scene to better control their falloff and range.

Mixer Groups

To create an Audio Mixer
- Right click Create > Audio Mixer or Assets > Create > Audio Mixer

The Audio Mixer and Groups seen in the Audio Mixer Tab:

There is a large list of options available under the Add… option at the bottom of each mixer:

Please check Unity Docs for information on these

Mixer Groups

To allow external modifications of the mixer group (namely volume from the settings menu), you have to expose parameters on the mixer group:

A list of exposed parameters is available on the top right of the Audio Mixer Tab

Exposed Parameters (3) ▾	
MasterVolume	Volume (of Master)
MusicVolume	Volume (of Music)
SfxVolume	Volume (of Sfx)

You can select on the groups (Master is the parent group of all the others) and view them in the Inspector.

Then you can right-click on any setting, for instance 'Volume', and expose that parameter.
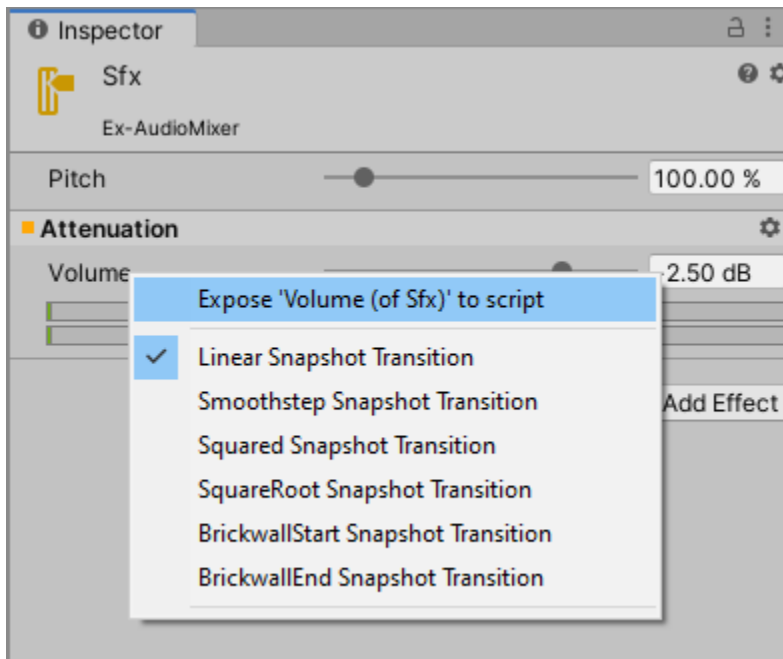
Other effects can have other options on here, I have not researched into them, but if you are interested, feel free to message me and we can talk about implementing it.

Mixer Controller

The Mixer Controller is used to modify the parameters of a mixer group via UI.

Mixer Controller in Inspector:

Then, the UI team can create a menu with sliders and connect it all together.

An example of this can be found in _Game/Data/Audio/Ex-SoundSystem

Sound System for Programmers

Unity Event Implementation
- Add a Unity Event to an action that might require Sfx
- Sound designers can follow on Page 4 to add in sound effects

Direct Implementation
- Add a SerializedField of type 'SfxReference' and assign it 'null' or 'new SfxReference()'.
- This will give the designers the ability to add in Audio Clips, Sfx Clips, or Sfx Randomized.
- You can call the SfxReference.Play() to play the sound effect.
- Note: It will not error if no clip is assigned. If you wish to know if a clip is null, call SfxRefererence.NullTest() to check.

For anything more, please message me (Brandon) elsewhere on Discord and I can help 😊