Synthesis?

for one loudspeaker

Electronics documentation

Shu-Yu Lin

Table of Contents

Technical specification 3

Stage plan 3

Performance instruction 4

Hardware setup 4

Digital audio workstation setup 5

Track setup 9

Technical specification

Mono playback:

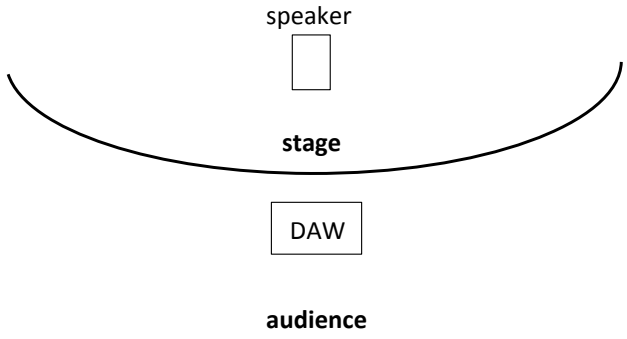
1 loudspeaker
a laptop computer
an audio interface with at least 1 out
digital audio workstation
mono sound file of the piece

5.1 playback:

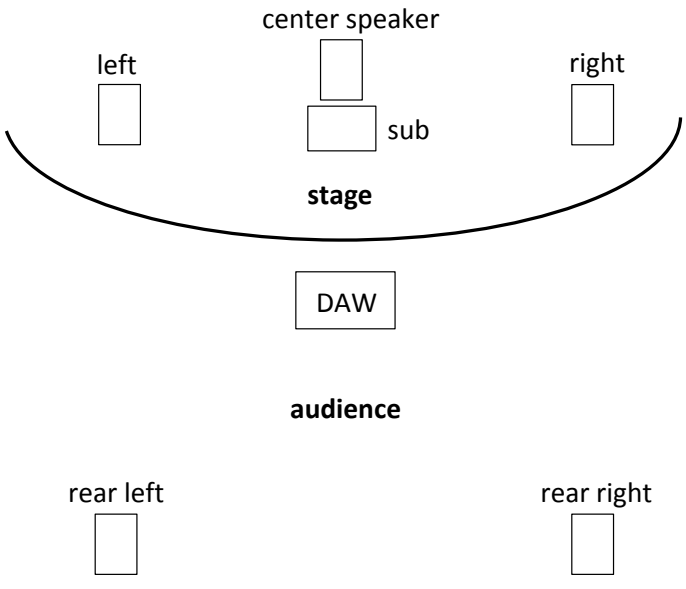
4 mid-range speakers
1 subwoofer
a laptop computer
an audio interface with at least 6 outs
digital audio workstation
L, R, rear L, rear R, sub and center sound files of the piece

Stage plan

Mono



5.1



Performance Instruction

Hall with natural reverberation

The mono sound file should be played back through the loudspeaker at the centre of the stage. Amplitude should be the only parameter that may be adjusted during the performance.

Hall with minimal reverberation

Playback the 5.1 sound files. Adjust amplitude and reverberation during the performance if necessary.

Hardware setup

Audio interface

1. Connect audio interface to your laptop computer.

2. Choose output to be the audio interface. If are using Mac OS, go to Systems Preferences -> Sound -> Output -> [name of the audio interface].

3. Choose the sample rate of the interface. If you are using a Mac OS, open Audio Devices application. On the left panel choose your interface. Click on Output, and from the Format drop down menu, choose 44,100 Hz as sampling rate. Also choose 44,100 Hz as Input sampling rate. Click on Input and select 44,100 Hz as input sampling rate.

Speakers

-> Mono setup

1. Place one mid-range speaker at the center front of the stage.

2. Connect the speaker to your audio interface.

3. Connect power to the speaker.

4. Turn on the speaker.

-> 5.1 setup

1. Place two mid-range speakers at the left and the right of the stage, preferably towards the front of the stage.

2. Place one mid-range speaker in between the L and R speakers.

3. Place the subwoofer in front (or below) of the center speaker.

4. Place two mid-range speakers at the left and right at the back of the audience. Align the rear speakers to the two mid-range speakers on the stage.

5. Connect the speakers to your audio interface sequentially.

6. Connect power to the speakers.

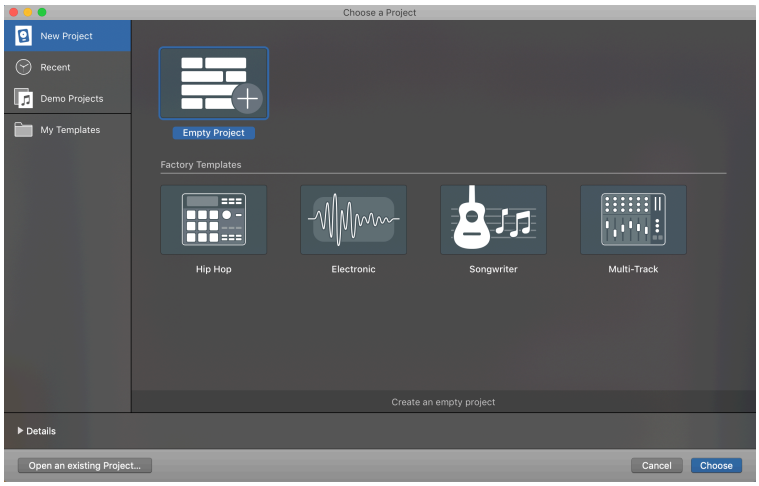
7. Turn on the speakers.

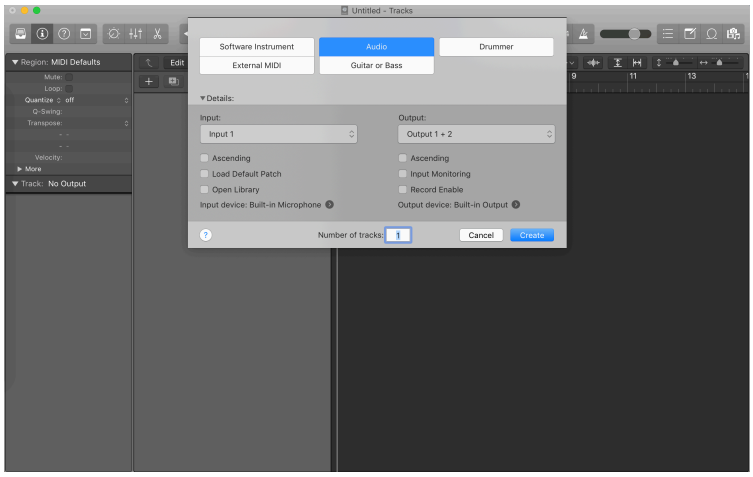
Digital audio workstation setup

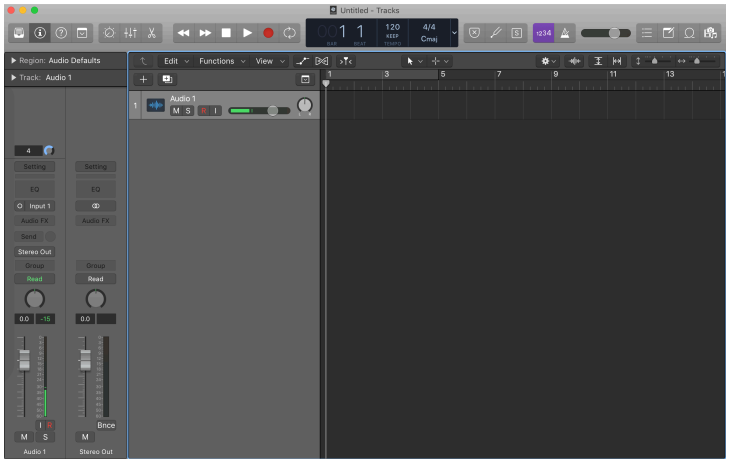
1. Download and install the digital audio workstation of your choice.
-> If you would like to use Logic Pro X on a mac computer, open App Store application and in the search field type in 'logic pro x' and press return. Search results will include related application. Click on 'Get' under the Logic Pro application to purchase and open the DAW.

-> If you are using windows operating system or you prefer to use an open source DAW, Reaper may be your choice. Download Reaper at https://www.reaper.fm/download.php Install and open the application.

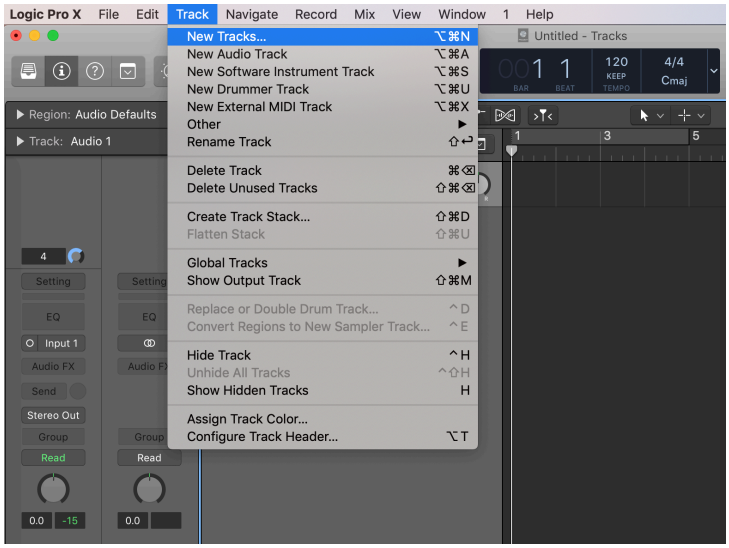
2. Open DAW application and import sound file into the project.
If you are using Logic Pro X, open a new project by selecting 'Empty Project', and then select 'Audio'. In the number of track field, type in 1, then click 'Create'. This will create a mono track in your project. If you are performing the 5.1 version, then type in 6 in the track field to create 6 tracks.

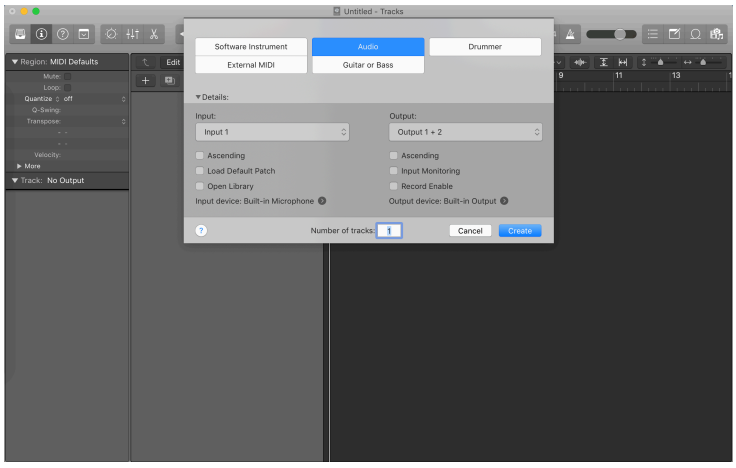


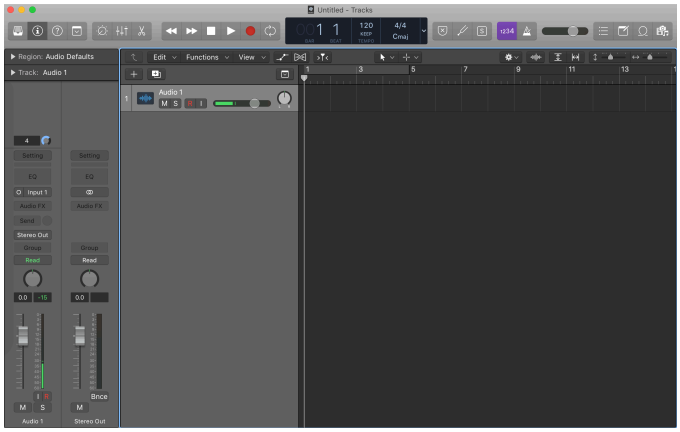




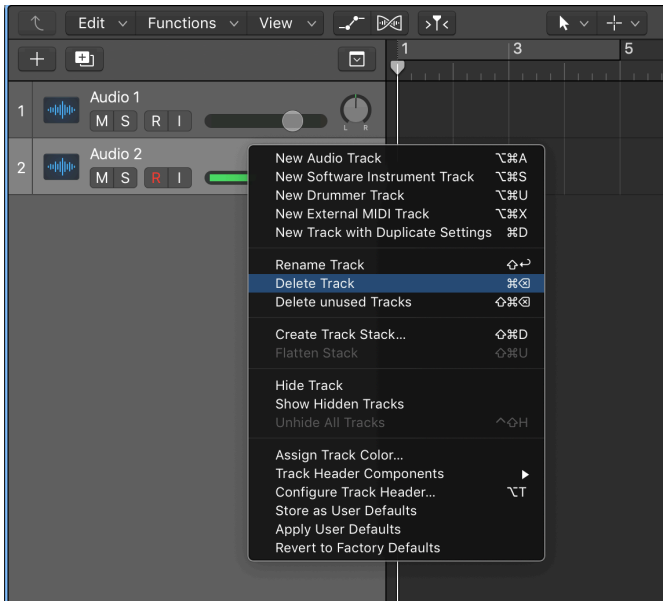
You may create a track by clicking on ‘Track’ and selecting ‘New Tracks’. The same pop up window will show to ask for the type of track and the number of tracks. In the number of track field, type in 1, then click ‘Create’. This will create a mono track in your project.



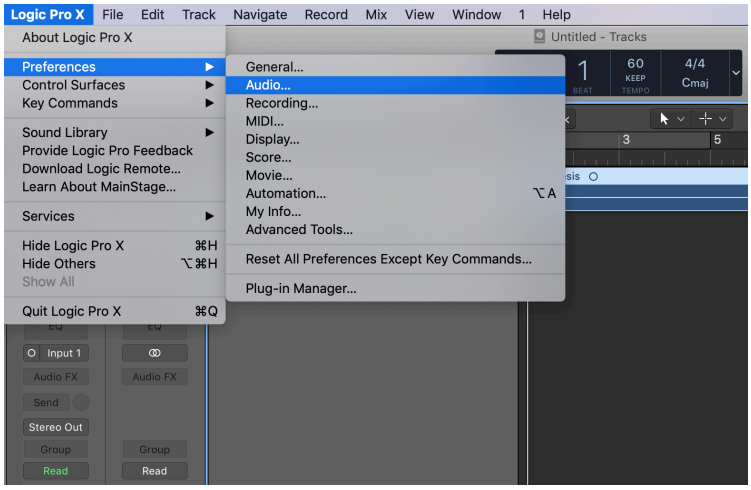


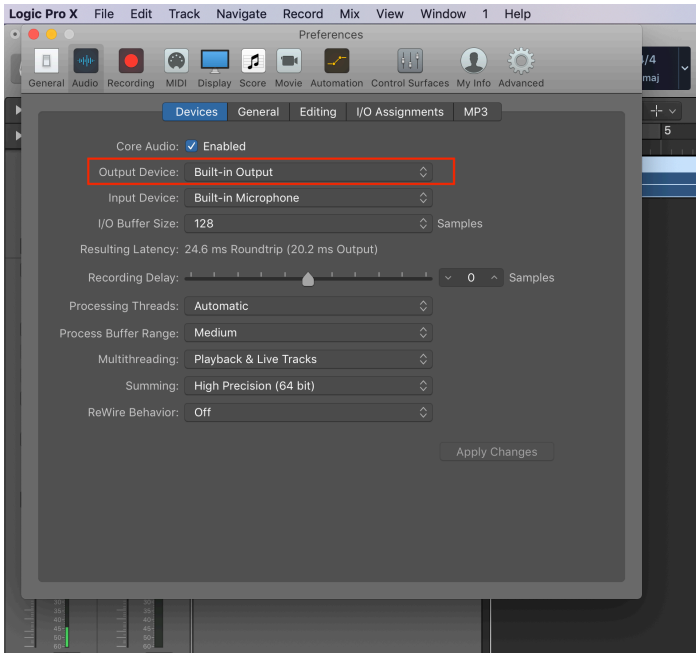


To delete a track, right click onto the track and select ‘Delete Track’.



3. Select the audio interface in your DAW. If you are using Logic Pro X, go to ‘Logic Pro X’ in the menu bar, click on ‘Preferences’ and then ‘Audio…’. A pop up window will show. Within the window, select ‘Devices’ then select your audio interface in ‘Output Device’.



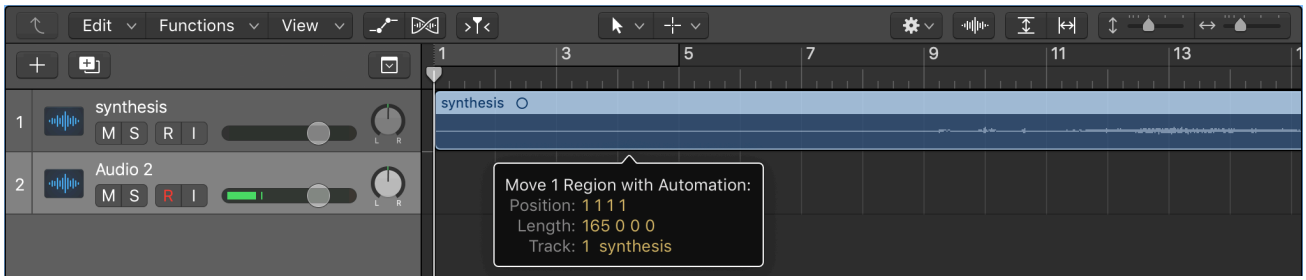

Logic Pro X File Edit Track Navigate Record Mix View Window 1 Help
Preferences
General Audio Recording MIDI Display Score Movie Automation Control Surfaces My Info Advanced
Devices General Editing I/O Assignments MP3
Core Audio: Enabled
Output Device: Built-in Output
Input Device: Built-in Microphone
I/O Buffer Size: 128 Samples
Resulting Latency: 24.6 ms Roundtrip (20.2 ms Output)
Recording Delay: 0 Samples
Processing Threads: Automatic
Process Buffer Range: Medium
Multithreading: Playback & Live Tracks
Summing: High Precision (64 bit)
ReWire Behavior: Off
Apply Changes

Track setup

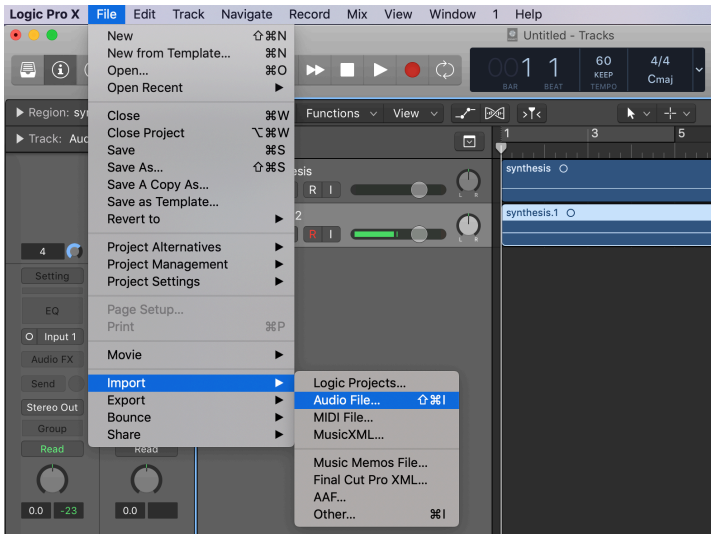
Request *Synthesis?* sound file from Shu-Yu by email at shuyuslin@gmail.com
* The mono sound file is 87.5 MB and the 5.1 file is 524.4 MB.

<u>Mono performance</u>

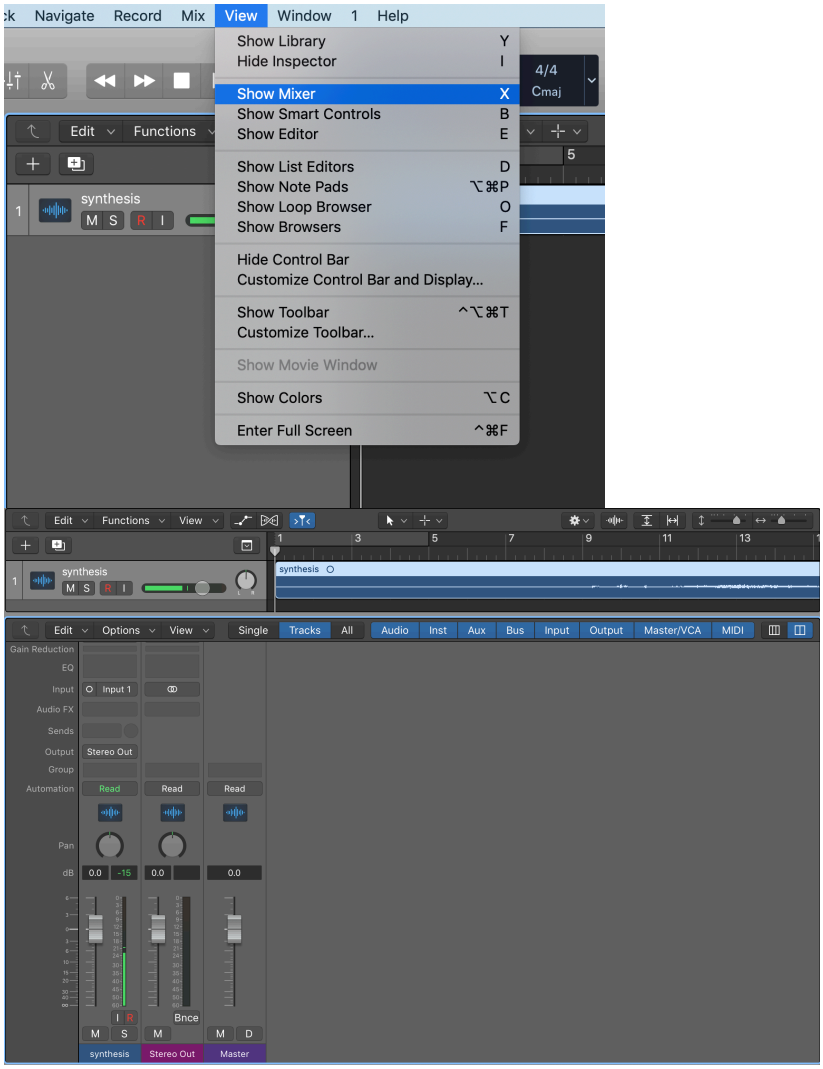
1. Import mono sound file into the DAW project. Drag the sound file onto the track. Move the sound file to the start of the track aligning at position 1 (time 0").



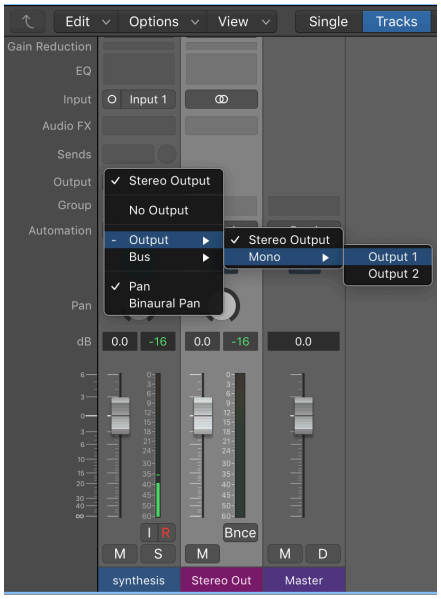
You may import by clicking on 'File' in the menu bar, then 'Import'. Select 'Audio File…' and select the sound file, then click on open.



2. Open mixer in your DAW.



3. Select number of output. Right click on the ‘output’ on the track in the mixer, select ‘Output’, then ‘Mono’, and then ‘Output 1’ for mono playback. If your speaker is connected to Output 2, then select ‘Output 2’.

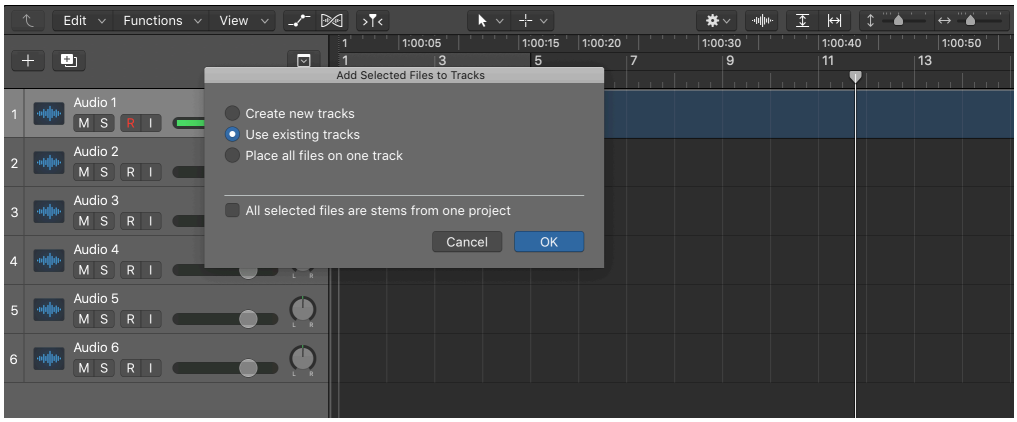


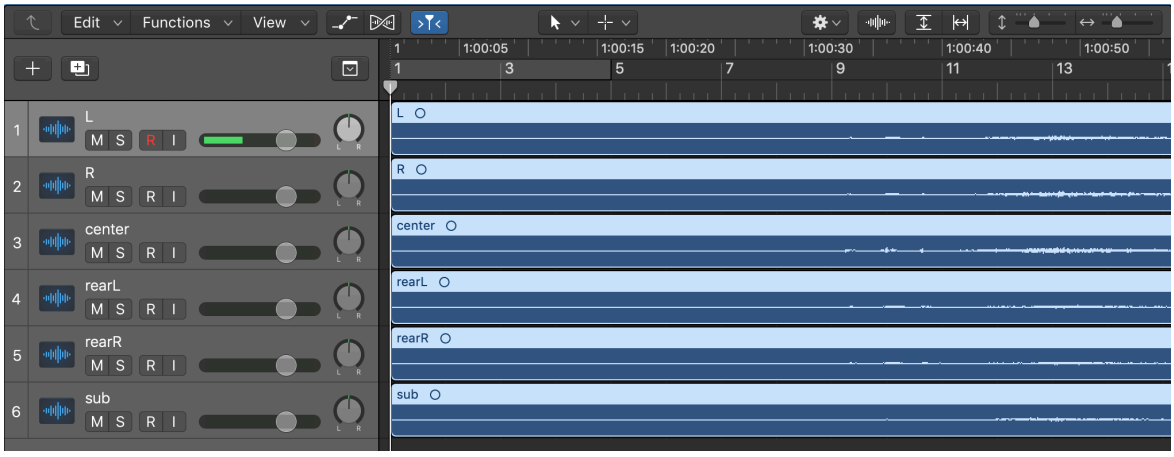
* The number of output options depends on the number of outputs of your audio interface. Find out which output on the audio interface the speaker is connected to, then select the output number in Logic accordingly.

4. Make sure the start time of the track is at 0". Press space bar on the keyboard to playback the mono track. If necessary, adjust volume by moving the volume fader in the mixer.

5.1 Performance

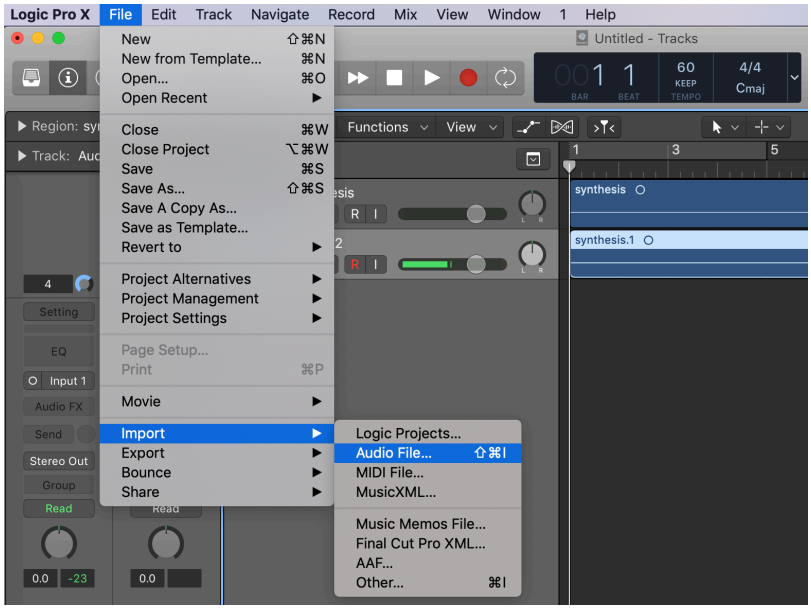
1. Import the 6 sound files into the DAW project. Select track 1 in the project. Select the 6 sound files in your folder and drag them onto track 1. A pop up window will show, select 'Using existing tracks'. This will import the 6 sound files onto the tracks you created. Move the sound files to the start of the track aligning at position 1 (time 0").



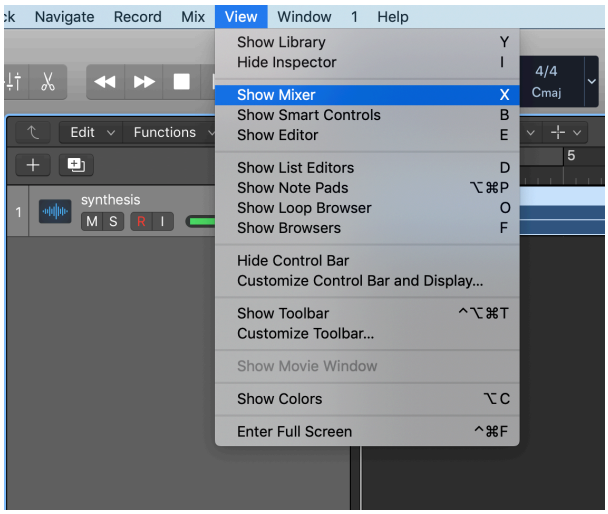


You may choose the option 'Create new tracks' from the pop up menu. This will create 6 new tracks in which each carries each sound files.

If you have created 6 empty tracks, you may import the sound files from the file menu. Click on an empty track in the project, click on 'File' in the menu bar, then 'Import'. Select 'Audio File…' and select the sound file from your folder, then click on 'open'. Before each import, you need to select an empty track in the project so the imported sound file do not overwrite any of the already imported file.



2. Open mixer in your DAW.



3. Select output for each track. In the mixer, right click on the ‘output’ on the track, select ‘Output’, then ‘Mono’, and then ‘Output 1’ for L sound file. Select ‘Output 2’ for R sound file.

Select ‘Output 3’ for center sound file. Select ‘Output 4’ for sub sound file. Select ‘Output 5’ for rearL sound file and ‘Output 6’ for rearR sound file.

* The number of output options depends on the number of outputs of your audio interface. Find out which output on the audio interface the speaker is connected to, then select the output number in Logic accordingly.

4. Make sure the start time of the tracks is at 0”. Press space bar on the keyboard to playback. If necessary, adjust volume by moving the volume fader in the mixer.