

Splitter user guide



The following guide shows how to set up an Ableton session with Radars multichannel speaker system *Audiocanvas* while using the Max for Live device *Splitter*. *Splitter* is developed by Thomas Thomsen and any technical questions or bugs should be emailed to thomas.thomsen.16@gmail.com

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What is Splitter?

Splitter is a Max for Live device that allows you to split an incoming sound into 6 different frequency bands with each band by outputted to a specific speaker either via static placement or via a step sequencer.

What is Audiocanvas and why work with it?

Audiocanvas is Radars multichannel speaker system consisting of a computer with Ableton & Max MSP installed and with a RME HDSPe RayDAT soundcard, 2 Behringer Ultragain Pro-8 Digital ADA 8000 AD/DA converter, 8 Lab Gruppen LUCIA 120/2 amplifiers and 16 Tannoy CMS speakers. The speaker system is installed in the foyer, hall and bathroom.

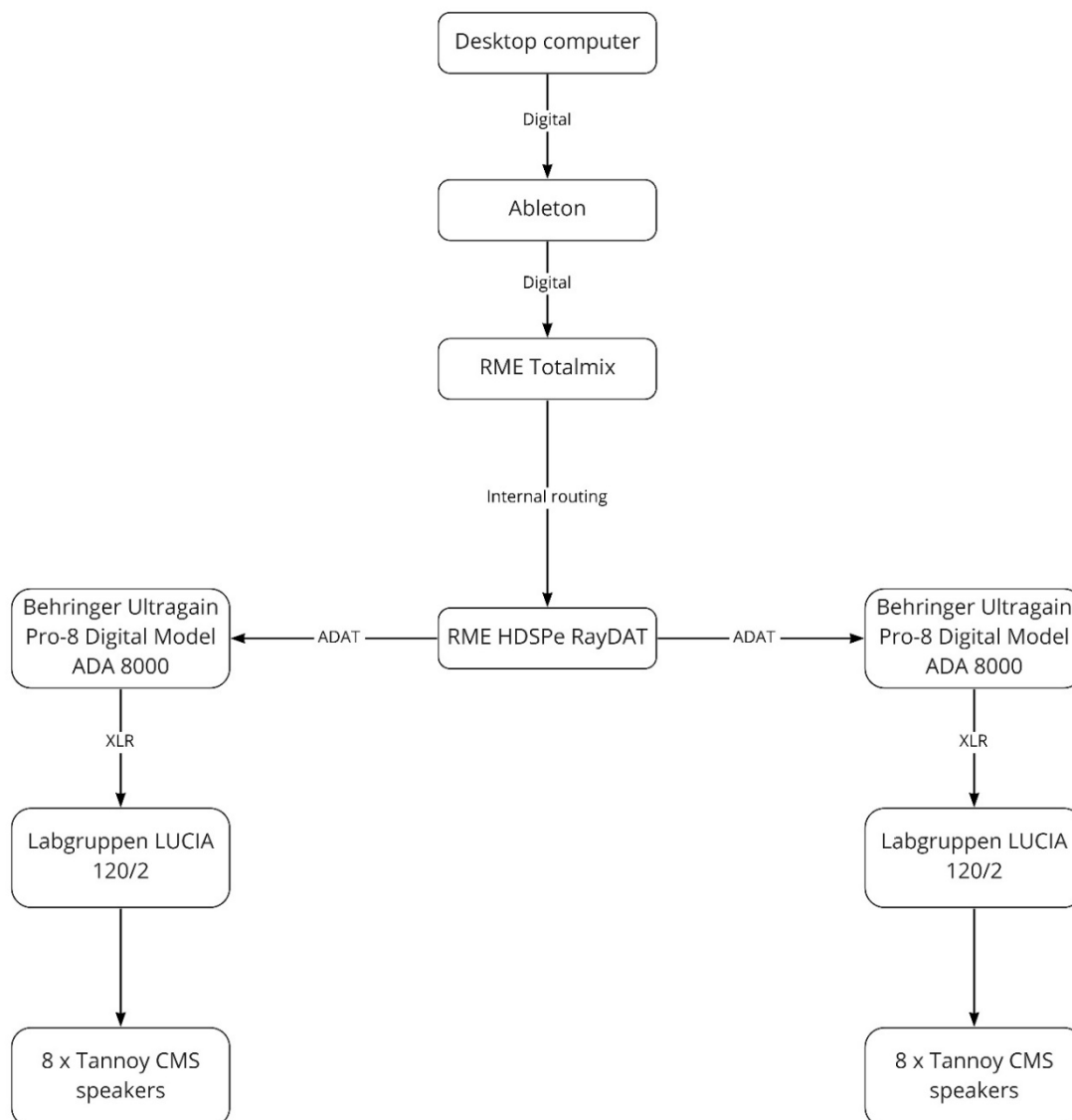


Figure 1: The signal chain for the Audiocanvas system.

Besides the technical setup, the question is: Why is it interesting to work with 16 speakers and not just a traditional stereo speaker setup? Audiocanvas' multichannel speaker system allows one to work with spatialization in the music – that is, an intentional placement of sounds in a given space through multichannel speaker arrays. Radars Audiocanvas allows you to place and move sounds throughout the 16 speaker and create a unique three-dimensional soundscape that the listener can move through, thereby expanding and intensifying the musical experience.

How do you set up an Ableton session for Audiocanvas?

However, before you can start using Splitter you need to set up an Ableton session, that allows Splitter to send sound to the 16 speakers. You can find a template at Radars webpage or in the Radar venue manual. Otherwise, the guide below shows how to set up a template:

1. The first step is to create 8 audio tracks in Ableton. This can be done by right clicking and then selecting "Insert Audio track" or via the short "Ctrl+T" on Windows or "Cmd+T" on Mac
2. Next, rename the newly created audio tracks to "Output 1/2" up until "Output 15/16". The name of the output track can be any name, but for clarity's sake its name should correspond to its output
3. A good idea is to group the 8 newly created tracks, so that they can be hidden by collapsing the group. To group the tracks, select the audio tracks, right click and select "Group tracks" or use the shortcut "Ctrl+G" on Windows or "Cmd+G" on Mac.
4. Then select the output corresponding to the name of the track in the "Audio To" menu. The track named "Output 1/2" should have output 1/2 selected and so forth. Important: This can only be done at the computer at Radar, where 16 outputs are available via the sound card. If you are creating the Ableton session for Audiocanvas at your own studio, you can only select the available outputs from your soundcard. This step can therefore only be done at Radars computer.
5. Lastly, set each output track to "In" in the "Monitor" menu.
6. When loading Splitter onto a track, set the track to "Off" in the "Monitor" menu and set the audio to "Sends Only"



Figure 2: The correct setup of the 8 output tracks in an Ableton session for using Audiocanvas and Splitter.

How does Splitter work?

Splitter works by filtering the incoming sound into 6 bands using band filters, where the frequency, Q value and gain can be adjusted for each band. Each band can then be outputted to a specific speaker either via the “Speaker” dial or via the step sequencer.



Figure 3: A sound playing through Splitter and its six bands.

How does the filter section of Splitter work?

Each band in Splitter can be adjusted individually. To show the filter section, click the “Filter” button in the upper left corner. To select a band, use the menu on the left side. A band can be turned off and on, so that the band doesn’t output sound, using the “Band on/off” button. For each band, the frequency can be adjusted by using the “Freq” dial. By adjusting the dial, the band will output a different frequency band in the specified speaker. The “Q” dial can be adjusted to narrow or widening a frequency band, while the “Gain” dial can be adjusted to increase or decrease the volume for a specific band.



Figure 4: The frequency, Q and Gain dial for a band in the filter section.

How does the Attack/Decay and Speaker section work?

Each band can be outputted to a to 1 of the 16 speakers using “Speaker” dial, which can be adjusted individually. The “Attack” and “Decay” dials controls a crossfade in volume when switching between to speaker, which can be used to avoids click and pops when a sound from a band switches speaker in the middle of a waveform. The “Attack” dial controls how quickly a sound will go from silence to full volume in the new speaker, while the “Decay” dial controls

how quickly a sound will go from full volume to silence in the old speaker. The “Attack” and “Decay” dials works globally across all 6 bands.



Figure 5: The Attack/Decay dials with the speaker dial.

How does the sequencer in Splitter work?

Which speaker a band is outputted to can be controlled either manually via the “Speaker” dial or via the build in step sequencer in Splitter. Each band has an individual step sequencer. To show the step sequencer, click the button with a downward triangle below the “Band on/off” button in the upper left side. The step sequencer can be turned off or on via the “Seq on/off” button in the upper left side, so that either the step sequencer or the “Speaker” dials controls which speaker a band is outputted to. If the step sequencer is turned on for a band, the “Speaker” dial will be greyed and can’t be edited, and the step sequencer now controls the outputting for that band. If the step sequencer is turned off, the “Speaker” dial controls the outputting again. The step sequencer is synced to the “Start/stop” and tempo in Abletons transport.



Figure 6: Seq on/off and hide/show

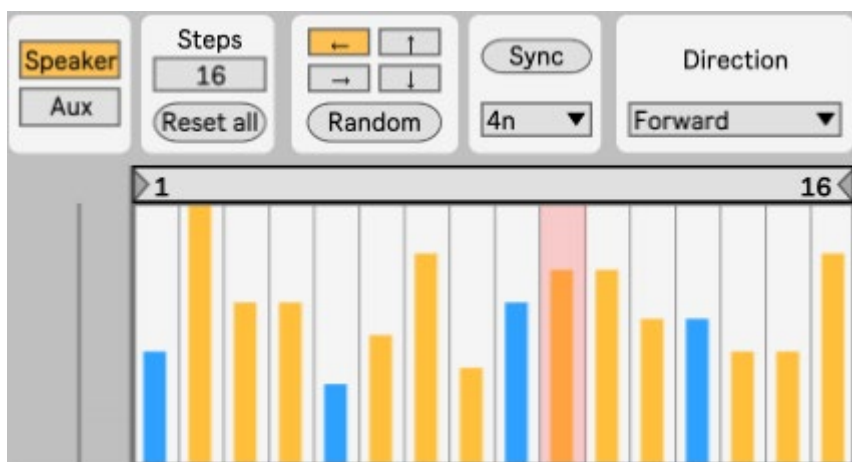


Figure 7: The step sequencer in Splitter. The red highlight indicates which steps that is currently playing.

To create a sequence for band, move the yellow and blue sliders in the bottom of the sequencer. Each slider represents one step. A slider value of the bottom represents speaker 1 and a slider at the top represents speaker 16. The specific speaker number is shown in left side of sequencer while adjusting a slider. The steps menu sets the number of steps globally for all 6 bands. The maximum number of steps is 64. The “Reset all” resets all 6 bands sequences to 16 steps while restricting a bands number of steps within the 16 steps to previous value. The number of steps in a band can be restricted by dragging the horizontal slider above the yellow and blue sliders. By having different values in different bands, it is possible to create polymeric sequences.

The slider values can be randomized by clicking the “Random” button. The slider values can also be shifted left, right, up or down via buttons above the “Random” button. The direction for the steps sequencers can be changed via the drop-down menu in “Direction” menu. This sets the direction globally across all 6 bands.

The subdivision for all 6 bands can be set globally via the drop-down below the “Sync” button. The subdivisions are set according to Abletons current tempo and time signature. The “Sync” buttons syncs all 6 bands step sequencers to the first step. This can be used when creating polymeric sequences across the 6 bands, so that they can be synced to the same starting step. This especially useful when adjusting a band’s number of steps, which can make them become unsynchronized with the others 5 bands

How does the “Routing” section of Splitter work?

Before outputting sound via Splitter, the routing section in Splitter need to be set up correctly. The output section for Splitter can be located by clicking the “Routing” button in the upper right corner. Each speaker pair, 1/2 and so forth, need to be routed to its corresponding output track that was set up in “How do you set up an Ableton session for Audiocanvas?”. To set up the correct routing for a speaker pair, click on the drop-down menu for a speaker and select the corresponding output track for the speaker pair – e.g. speaker pair 1/2 should be routed to the output track with the outputs 1/2 and so forth.



Figure 8: The routing section of Splitter.

Where in the signal chain should Splitter be?

Since Splitter routes the sound from its parent track (e.g. a track for a guitar loop) to 8 audio tracks that works as output tracks to the 16 speakers, Splitter should only be at the end of signal chain. That means that all instruments and sound processing via effects such as reverb should take place before Splitter.

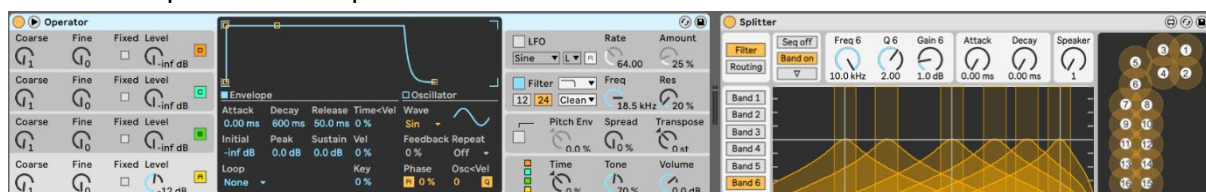


Figure 9: The Operator synth and with Splitter at the end of the signal chain.

Splitter can also be used on group in Ableton, which can be a good idea for drums or other instruments consisting of multiple audio or MIDI tracks. To group tracks Ableton Live, select the tracks you want to group, right click and select "Group tracks" or use the shortcut "Ctrl+G" on Windows or "Cmd+G" on Mac. Splitter should then be on the group track and at the end of the signal chain. The output for each track in the group should then be routed to the group track with Splitter.

Parallel processing: Using return tracks and Effect Racks with multiple chains

It is not possible to use return tracks while using Splitter, since it grabs the audio before it is sent out to the master channel or return channel. It is also not possible to use multiple chains in Effects Racks while using Splitter. That means that you can't do parallel processing with two or more Splitter devices.

The way to do parallel processing with Splitter is by creating three tracks: The first tracks should have your sample or MIDI instrument in it with its output set to "Sends Only". The two other tracks can then be used for parallel processing by setting their input audio to the track with the sample or MIDI instrument. The two effect tracks should each have Splitter at the end of the signal chain. You can now load different effects on each track to process the original sound differently. You could have a track with no effect on, a dry track, and track with effects on, a wet track, and automate their individual volume to create evolving spatial sound.

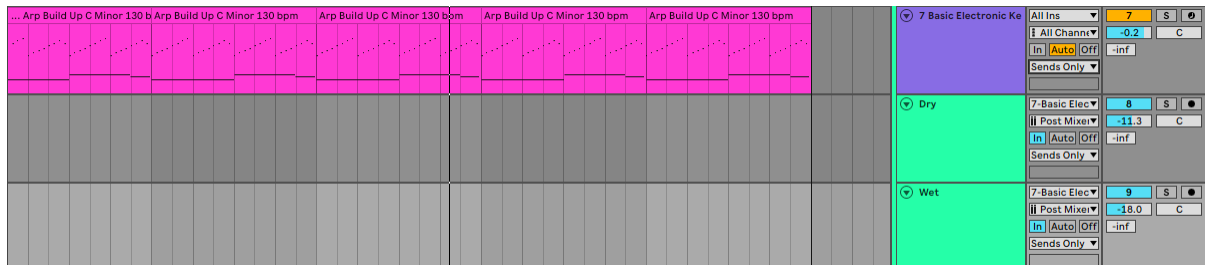


Figure 10: An example of using two audio tracks for parallel processing with a dry track and a wet track. Notice how the two tracks has the MIDI track called "7 Basic Electronic Keys" as their input tracks.