

The Loomer logo consists of a stylized white circle with a square cutout on the right side, positioned to the left of the word "Loomer".

Loomer

Aspect Manual

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End User Licence Agreement

Software Licence Agreement for Aspect

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Credits

Development Credits

Aspect © 2009 Loomer

Developed by Loomer
Interface by Kevin Barry @ www.inquer.co.uk

Tested by Clifton Cameron
 kuniklo
 Scott Simons (rexlapiin)
 taoyoyo

VST PlugIn Technology by Steinberg Media Technologies GmbH. This software is based in part on libpng, zlib, and JUCE.

Requirements

Mac OS X requirements

- Requires Mac OS X v. 10.4 or later
- Intel x86 based processor 1.0Ghz, or above, with SSE
- or
- PPC based processor 1.0Ghz, or above
- 512 MB RAM

Windows requirements

- Windows XP or Windows Vista, or above
- Intel x86 based processor 1.0Ghz, or above, with SSE
- 512 MB RAM

Linux requirements

- Intel x86 based processor 1.0Ghz, or above, with SSE
- 512 MB RAM

The following shared object libraries are required:

- libfreetype
- libasound
- libjack
- libXinerama

Aspect Overview

What is Aspect?

Aspect is a 32 note polyphonic software instrument that combines a great-sounding, powerful synthesis engine, with a flexible semi-modular architecture and unparalleled ease of use.

The core of Aspect's superb sound are two analog modeled oscillators, each capable of producing a powerful selection of raw waveforms, and dual filters that can be routed in series, in parallel, or even blended into unique combinations.

Modulation sources comes in the form of three analog modeled envelopes, capable of producing quick, snappy attacks, and three flexible LFOs, which can be synced to tempo.

A flexible patch section allows sources to be combined and processed to produce complex modulations from simple sources, whilst a versatile modulation architecture allows practically anything to be used as a modulation source and destination.

With optimized audio algorithms that won't overload your processor, rock-solid stability, and easy integration with any MIDI hardware controller, Resound is ideal for live work. With a simple and intuitive interface, flexible Bank and Program management, and total parameter automation, Resound fits right into your studio environment.

Plug-in vs Standalone

Depending upon your individual studio setup, Aspect can either be used as a plug-in component of a host application, or as a standalone application requiring no other dependencies. Generally, by using the host application's routing flexibility, running as a plug-in allows easier integration with existing plug-in effects and instruments. If this integration is not required, the standalone version, without the extra layer of complexity added by the host consuming resources, performs slightly better.

Bank and Program information, as well as MIDI Mapping assignments, are identical in both standalone and plug-in versions. This means any sounds created in one format can be opened in the other.

Aspect formats

For the Mac, the following formats are provided:

- Standalone Application
- Audio Unit (AU) Plug-In
- VST Plug-in
- RTAS Plug-In

These formats are available for Windows PC:

- Standalone Application
- VST Plug-in
- RTAS Plug-In

Linux have the following formats:

- Standalone Application
- VST Plug-in

Supported channel configurations

For maximum flexibility, Aspect can be used in several possible output channel configurations. The following configurations are possible:

- mono output
- stereo output

Note that some host applications may not support one or more of these configurations; consult your host's documentation for further details.

Installation and Registration

Mac OS X installation

1. Start the installation process by double-clicking the Aspect installer application.
2. Read the introduction screen dialog text. Press **Continue** when you are ready to proceed.
3. Read the Licence Agreement. Click **Continue**, then **Agree** to confirm you have read and agree to the licence terms.
4. Select a destination volume into which to install Aspect, and then click **Continue**.
5. From the list of installable components, uncheck any formats that you do not wish to install. Click **Continue** to proceed.
6. To complete the installation, press **Install**.

The components are, by default, installed into the following directories:

- VST plug-in into */Library/Audio/Plug-Ins/VST*
- Audio Unit plug-in into */Library/Audio/Plug-Ins/Components*
- RTAS plug-in into */Library/Application Support/Digidesign/Plug-Ins*
- Standalone application into */Applications*
- Documentation into */Library/Documentation*
- Default Bank into */Library/Application Support*

Windows installation

1. Start the installation process by double-clicking the Aspect installer application, Setup.exe.
2. Read the welcome screen dialog text. Press **Next** when you are ready to continue.
3. Read the Licence Agreement. Click **I Agree** to confirm that you have read and agree to it.
4. From the list of installable components, uncheck any formats that you do not wish to install. Click **Next** to continue.
5. If you have chosen to include the VST plug-in format, select the directory into which it will install. Click **Next** to continue.
6. Select a directory into which the common files will install. The user documentation, default Bank, and the Standalone application (if selected in the the list of components), will be placed in this location. To complete the installation, press **Install**.

Unless any other directories are selected during the installation, the components are installed into the following directories:

- VST plug-in into the VST plug-ins folder, which is, unless configured otherwise, *C:\Program Files\Steinberg\VSTPlugins*
- RTAS plug-in into *C:\Program Files\Common Files\Digidesign\DAE\Plug-Ins*
- Standalone application, documentation and default Bank into *C:\Program Files\Loomer\Aspect*

Linux installation

Aspect for Linux is distributed as a standard Linux tarball. To install, extract the package using any unarchiving utility; the following command-line invocation will suffice:

```
tar xzvf Aspect.tar.gz
```

If you have a Linux VST host and have configured your VST Path, the VST plug-in can be moved into the required directory with the following commands:

```
cd Aspect
mv AspectVST.so $VST_PATH
```

Without the VST Path configured, you will need to ensure that your host uses the Aspect directory when searching for VSTs; consult your host's documentation for information on how to do this.

Aspect requires the following shared object libraries to be installed:

- libfreetype
- libasound
- libjack
- libXinerama

Without these libraries installed, the application will not launch. Install the libraries using your distribution's particular package management system, such as apt-get; consult your Linux distribution documentation for more information.

Product registration

Having installed Aspect, it will run in evaluation mode with the following limitations:

- User created Program and Bank configurations can be saved, but not loaded.
- Audio output will stop after 30 minutes of continuous use. The only way to continue using Aspect is to restart the application.

These limitations can be removed by purchasing a licence and registering your licence information into the product. Note that registering Aspect on a particular machine will remove the evaluation limitations for all Aspect plug-in formats installed on this machine; you don't need to individually register all plug-in formats. Licence information will be in the form of a user name and licence key.

To purchase a Aspect licence:

1. Launch Aspect. This can be either the standalone application, or as a plug-in.
2. From the **Options** menu, choose **Purchase Aspect Licence**. This will launch the shop website, from where a Aspect Licence can be purchased by clicking **Add To Cart**, followed by **Checkout**. Follow the on-screen prompts to enter your payment details and confirm your purchase.
3. Once you have purchased Aspect, you will receive your licence key information via email. It is important to keep this information safe because you will require the licence key if you ever need to reinstall and re-register Aspect.

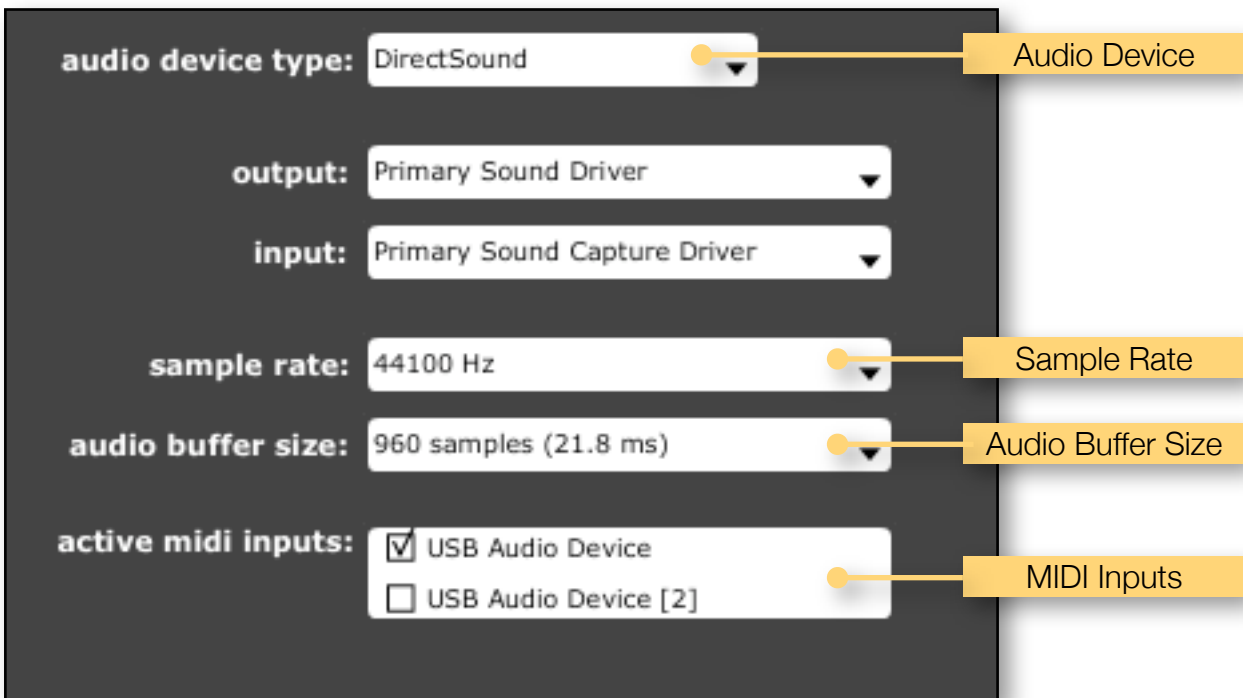
To register your copy of Aspect:

1. Choose **Enter Aspect Licence** from the **Options** menu.
2. Enter your name in the **Name** field. This must match exactly the name that was used to purchase your Aspect licence, including capitalization of letters.
3. Enter your licence key in the **Licence Key** field. This must match exactly the licence that you received when you purchased Aspect, including any hyphens.
4. Press **OK** to confirm that your name and corresponding licence key have been entered. You will be informed that the application must be restarted in order for registration changes to take effect. If you are currently running the standalone application, close and relaunch it. If Aspect is currently running as a plug-in, remove it from the host and add a new instance of it.
5. Aspect should now be registered. If the label on the bottom of the interface still reads Unregistered Evaluation, you must have entered the licence information incorrectly. Go back to step 1, paying careful attention that the name and licence key entered match exactly the licence information in the registration email.

Audio and MIDI Configuration

Setup Audio and MIDI

When running Aspect as a Standalone application, you will need to setup your audio and MIDI interfaces. Note that when running as a plug-in, audio and MIDI routing is provided by the hosting application; consult the host's documentation for details. To open the Audio & MIDI Configuration dialog, select **Audio & MIDI Configuration** under the **Options** menu.



The following dialog will be displayed:

From this dialog, the following details of your Audio and MIDI setup can be configured:

- **Audio Device.** Select the Audio Device you want to use from the list of available devices. Certain devices tend to perform better than others, so if multiple devices are available, you should favour: on Mac, using Core Audio; on Windows, using ASIO; on Linux, using JACK.
- **Sample Rate.** The Sample Rate dictates the overall quality of the audio output. Using a lower Sample Rate will reduce the presence of high-frequency components. Higher Sample Rates should therefore be preferred. However, be aware that the CPU Usage is directly proportional to the Sample Rate. A good compromise between quality and CPU Usage is 44100Hz, which is the Sample Rate of CD audio. Select the Sample Rate you require from the available list.

- **Audio Buffer Size.** The Audio Buffer Size governs latency; a smaller buffer means that Aspect will respond more quickly to MIDI messages and Parameter changes. However, a smaller Audio Buffer Size will require more CPU Usage. Select the required Audio Buffer Size from the available list. Using too small of an Audio Buffer can overload your computer to the extent that audible clicks are heard. In this case, increase the Audio Buffer Size until clicks are no longer present..
- **MIDI Inputs.** Check any MIDI Input devices that you want to use with Aspect.

Program Management

Parameters, Programs and Bank

You can modify the audio output that Aspect produces by setting the value of *Parameters*. Each Parameter, such as Delay Time, Feedback, or Highpass, will affect a specific element of the sound. The state of all Parameters are collectively called a *Program*. Programs are given a suitable name, displayed in the Menu Bar, to describe the sound they produce.

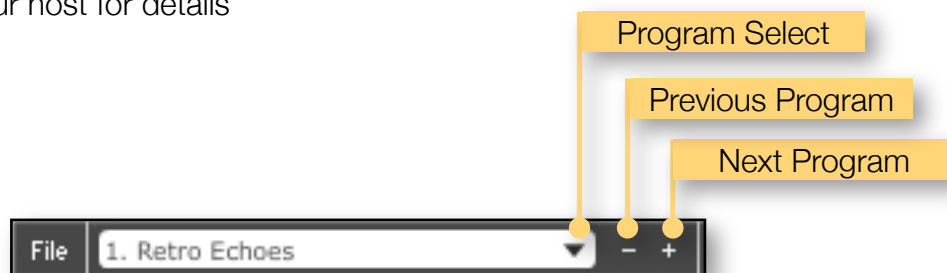


Programs are grouped together into a *Bank*. You can only load a single Bank at a time. Although there is no requirement or limitation on how Programs are grouped, it is often useful to collect related Programs together, for example: a Bank of percussion sounds, a Bank containing sounds required to perform a specific set-list.

Selecting Programs within a Bank

There are several ways of selecting a Program within a Bank:

- **Menu Bar Previous and Next Controls.** If you wish to browse quickly through all the Programs within a Bank, you can do so using the the Previous and Next controls.
- **Program Select Control.** The Program Select Control will display a list of all programs contained within a Bank. The required program can be selected from this list.
- **Program Change MIDI Messages.** You can change programs by using MIDI Program Change commands. This requires a MIDI keyboard or a control surface with the ability to send MIDI Program Change commands; consult your controller's documentation for details. If using Aspect as a plug-in, this functionality is dependent upon the host correctly forwarding MIDI messages to the plug-in; check the documentation provided with your host for details.
- **Host Application Program Management.** If Aspect is being used as a plug-in, the host may provide a mechanism to change the currently selected Program. The operation of this is entirely host dependent, and varies greatly from host to host; check the documentation provided with your host for details



File Management

If you wish to keep any changes to a Program, it will need to be stored in the current Bank. A program that needs storing is marked by an asterisk (*) suffix beside its name. Any changes will be lost if you change the currently selected Program without first storing it. The steps required to store a Program depend upon where you want to save it:

- To store the Program changes over the current version of itself in the bank:
 1. Click **Store**. Notice that the asterisk disappears, indicating that the Program no longer has any outstanding changes that require storing.
- To store the Program changes to a different position in the Bank:
 1. Click **Store To**. All the Programs within the Bank will be displayed in a list.
 2. Click on the required Program to overwrite it. Notice that the asterisk disappears, indicating that the Program no longer has changes that require storing, and that the newly stored Program is now selected.

To permanently keep Banks and Programs you have created, you will need to save them as files. Banks can be saved in their entirety, or you can save individual Programs from within a Bank. When Aspect is closed, any unsaved changes to a Bank will be lost.

To save an entire Bank to a file:

1. Under the **File** menu, choose **Save Bank...**
2. Choose a location and enter a filename for the Bank.

To save a Program to a file:

1. Select the Program you want to save
2. Under the **File** menu, choose **Save Program...**
3. Choose a location and enter a filename for the Program.

To load a saved Bank from a file:

1. Under the **File** menu, choose **Open...**
2. Browse to the location and select the required Bank file.

To load a saved Program from a file:

1. Decide where in the Bank you want the Program to be loaded.
2. Select this Program.
3. Under the **File** menu, choose **Open...**
4. Browse to the location and select the required Program file

Create a new Bank

Select **New Bank**, under the **File** menu, to create a new Bank. All Programs within the Bank will be in their initialized state.

Create a new Program

Select **New Program**, under the **File** menu, to create a new Program. This Program will be in its initialized state.

Compare a changed Program to the original Program

Often you'll want to compare a Program that you have amended to see if it is actually an improvement on the original. Pressing the **A | B** button temporarily reverts a changed Program back to its original state. Pressing the **A | B** button a second time returns to the changed Program. This method allows you to easily contrast the Program changes you have made to the original Program.

MIDI Controller Mapping

MIDI controllers

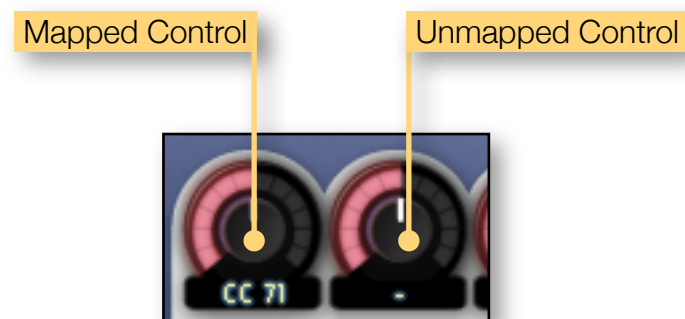
Instead of configuring a Program using a mouse, you can change any Parameter values using a MIDI keyboard or a control surface. This is done by mapping each Parameter to a *MIDI Continuous Controller (CC)*. A Parameter can only be mapped to a single MIDI controller; the same MIDI control can, however, be mapped to several different Parameters.

MIDI Controller mappings are global; once defined, the same mapping assignments will be used by all Aspect Programs. This means that you only need define mappings once for your particular controller.

Display current MIDI controller mappings

To view the current MIDI controller mappings:

1. Enter MIDI Learn Mode by choosing **Start MIDI Learn** under the **Options** menu. Each Parameter's mapped MIDI controller will now be displayed beside it in yellow text. Parameters without any mapping will be labelled -.
2. When you have finished viewing the MIDI controller mappings, choose **Stop MIDI Learn** under the **Options** menu.



Assign MIDI controllers to controls

To map a MIDI controller to a Parameter:

1. Enter MIDI Learn Mode by choosing **Start MIDI Learn** under the **Options** menu.
2. Click on the Parameter you wish to map to a MIDI controller.
3. Turn your MIDI controller. The Parameter should now be labelled with the MIDI CC number of this controller.
4. You can now either:
 - Map another Parameter by repeating these steps from Step 2.
 - Finish mapping Parameters by choosing **Stop MIDI Learn** under the **Options** menu.

Remove MIDI controller mappings from controls

To remove a mapped MIDI controller from a Parameter:

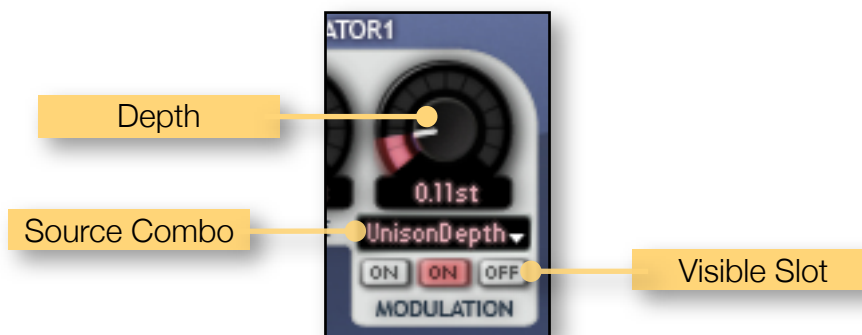
1. **Enter MIDI Learn Mode** by choosing Start MIDI Learn under the **Options** menu.
2. Click on the Parameter from which you wish to remove the mapping. This Parameter will become unmapped, and the CC number label on the Parameter will disappear to reflect this.
3. You can now either:
 - Remove the mapping from another Parameter by repeating these steps from Step 2.
 - Finish removing Parameter mappings by choosing **Stop MIDI Learn** under the **Options** menu.

Using Aspect

Aspect can either be used a Standalone application, or as a plug-in. When used as a plug-in effect, Aspect is placed directly in a host instrument channel. Consult your host's documentation to find out how to add a plug-in instrument.

Modulations

Each section has a number of Parameters that can be modulated (varied in real-time), by any of the modulation sources. Parameters that can be modulated are identified by having Modulation Slots:



Each Parameter's slots allows for up to three modulation sources to be used (although, if required, more than three can be used by summing several modulation sources into a single one using the Patch Section's Adder component, and using the Adder's summed output as a source). To select which slot is currently visible, click on either **View Slot 1 Button**, **View Slot 2 Button** or **View Slot 3 Button**. To select the source for the currently visible slot, click on the **Source Combo** and choose the required modulation source from the visible list. As well as a source, each modulation has a **Depth** control. This depth governs how much the modulation source changes the Parameters: at small depth values, the modulation affects only small Parameter changes; at larger values, the modulation source causes much more pronounced changes.

The following modulation sources are available:

- Selecting **Off** disables this modulation slot
- Using **Note Pitch** as a modulation source allows a Parameter to follow the pitch of the currently playing MIDI note. Because in most cases you will expect the audio oscillators to correspond to the playing note, assigning Note Pitch to Oscillator Pitch is a very common configuration. Note Pitch is also often used to modulate a filter's cutoff, ensuring that the filter follows the playing note.

- The **Velocity** modulation source corresponds to how hard the playing note is struck. This is often used to modulate the Amplifier, meaning that the harder a note is struck, the louder it gets.
- As well as producing the raw audio signal, **Oscillator 1** and **Oscillator 2** can also be used as a modulation source. This can, amongst other uses, be used to generate FM (Frequency Modulation) sounds, wherein Oscillator 1 can be used to modulate the pitch of Oscillator 2.
- Choosing **Noise** allows the white noise audio signal to be used as a modulation source.
- **Envelope 1, Envelope 2** and **Envelope 3** can be used as a modulation source. Note that, although it can additionally be assigned other modulation duties, Envelope 1 will always modulate the Amplifier, and so will always be used to govern the overall sound level.
- **LFO 1, LFO 2** and **LFO 3** can be used as modulation sources.
- Selecting **S&H** uses the Sample & Hold output as a modulation source.
- **Adder 1, Adder 2, Multiplier 1, Multiplier 2, Inverter 1, Inverter 2,** and **Lag Generator** correspond to the modulation source outputs in the patch section.
- Select either **Aftertouch**, or **Channel Pressure** to use polyphonic (in the case of Aftertouch) or monophonic (in the case of Channel Pressure) aftertouch as a modulation source.
- The **PitchBend** modulation source corresponds to the Pitch Bend control on a MIDI keyboard or sequencer. Likewise, the **ModWheel** modulation source corresponds to the Modulation Wheel control.
- **VoiceNumber** corresponds to the number of the currently playing voice (1 to 32). When in monophonic (1 voice) mode, this will always be 1. This can be used to add subtle variation to individual voices.
- The **Random** modulation source produces a random number between -1 and 1 every time a new note begins, which will remain at the same value until this voice produces a new note. This can be use to add subtle variation to individual notes.
- The **UnisonDepth** modulation source corresponds to the voice number within a group of unison notes. Variations in each note within a unison group can be produced by assigning UnisonDepth to any parameter (for example, assigning it to Oscillator Pitch Modulation for a classic thick unison sound.)

Global Section

The Global Section contains master controls for the Program:

- The **Master Volume** Parameter controls the overall sound output level. A meter provides a visual cue to the current level: the louder the output, the higher the meter will register. Too loud of an output will produce digital clipping, a usually undesirable form of distortion. When this occurs, the meter will display a red warning indicator. Click the meter to reset the warning display.
- The **Glissando** Parameter controls the time taken for a note to slide from one pitch to the next. The pitch transitions are instant when Glissando is set to 0%, but will become slower and more prominent as the Glissando percent increases. When **Always Glide** is turned off, glissando will only affect notes that are currently playing. With it turned on, glissando will affect every note.
- The **Polyphony** Parameter specifies the maximum number of voices that can be heard simultaneously. Polyphony can range from 1 to 32. Select 1 voice to use Aspect as a monophonic synthesizer.
- The **Unison** Parameter controls the number of voices that will be allocated to each note, from 1 (Unison Off), to 5. The Polyphony Parameter must be equal to or greater than the Unison Parameter in order for the required number of Unison voices to be heard. In order to produce variations within the voices within the Unison group, the UnisonDepth modulation source should be allocated to one or more parameters (such as Pitch or Pan Modulation).

Oscillator Section

The Oscillators are the basic sound sources in Aspect. They produce raw periodic waveforms which can be manipulated with filters and envelopes or modulated from a variety of sources into complex, dynamic timbres. Oscillators are controlled using the following parameters:

- The **Shape** Parameter decides which waveform shape the oscillator will produce. Each shape has its own sound, and certain waveform shapes are more appropriate for certain sounds than others. The possible waveform shapes are: The **Sawtooth** waveform (so called because it resembles the teeth on a saw) produces a rich, full sound; The **Pulse** waveform is a flexible shape that can produce a range of sounds, from hollow and reedy, to harsh and buzzing. Its tonal range arises from the technique of changing the shape's pulse-width: a pulse-width of 50% produces a reedy square wave; increasing or decreasing the pulse-width beyond this produces a more buzzy tone; The **Triangle** waveform makes a smooth, rounded sound, resembling that of an organ; The **Sine** waveform produces a pure, fine, tone.
- The basic pitch of the oscillator is set by the Octave, Transpose, and Detune Parameters. The **Octave** Parameter is used to shift the pitch up or down by entire Octaves (12 semitones). Choose 1, 2, or 3 to shift the pitch up by that number of octaves. Choose -1, -2, or -3 to shift the pitch down. Choose 0 if you require no octave shifting.

- The **Transpose** Parameter allows the pitch to be shifted by semitone increments. Choose between 1 and 12 to shift the pitch up by that number of semitones, or between -1 and -12 to shift down. A Transpose of 0 provides no transposition.
- The **Detune** Parameter allows for the smallest of changes to pitch by tuning up and down by mere cents (one hundredth of a semitone). Choose between 1 and 50 to tune the pitch up by that number of cents, or between -1 and -50 to tune down, or 0 to use no detuning. Playing both oscillators together, but detuning one by several cents produces a classic 'fat' synth sound.
- When the **Sync** Parameter (which is available only on Oscillator 2) is switched on, the pitch of Oscillator 2 will follow that of Oscillator 1 (restarting Oscillator 2's waveform period when Oscillator 1's waveform completes a period). This produces timbres more complex than is possible to synthesize with a single oscillator.
- Each Oscillator also has three **Pitch Modulation Slots** to allow the pitch to be varied. The most widely used Oscillator pitch modulation source is Note Pitch. When the Oscillator is modulated by Note Pitch, it will track any MIDI notes and the Oscillator pitch will match the MIDI note pitch. In most cases, the Note Pitch modulation depth should be set to maximum (64 semitones) in order to exactly track the MIDI notes.
- The **Pulse-width** Parameter only has any effect when the oscillator shape is set to Pulse. This Parameter will then govern the width of the oscillator's output. The pulse-width can also be modulated using the three **Pulse-width Modulation Slots**.

Mixer Section

The Mixer section is used to combine Oscillator 1, Oscillator 2, and the Noise source into a single audio stream. The relative balance of each component can be altered using the **Oscillator 1 Volume**, **Oscillator 2 Volume**, and **Noise Volume** Parameters. Each volume Parameter will have a value between 0% and 100%: at 0%, the component is completely removed from the audio; at 100%, the component volume is at a maximum. If required, the Mixer section can be bypassed entirely by routing the Oscillators and Noise sources directly to the Filter inputs.

Filter Section

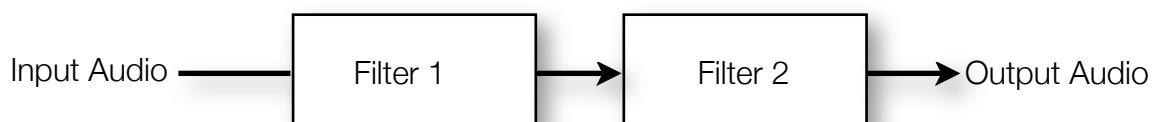
A Filter is one of the primary tools for sound design available to synthesizers. The Filter Section changes the raw Oscillator timbre by reducing the amplitude of some frequencies, whilst allowing other frequencies through unattenuated. The Cutoff frequency marks the crossover point between attenuated and unattenuated areas. When using a Lowpass filter, frequencies below the Cutoff are unaffected, whilst those above are reduced; a Highpass filter attenuates frequencies below the cutoff, but allows those above to pass through without change; finally, a Bandpass filter allows a small band of frequencies around the Cutoff to pass through unattenuated, but diminishes all frequencies outside this band.

- The **Input** Parameter controls which audio source to use as an input into the Filter.
- Use the **Type** Parameter to choose which type of Filter this will be, from **Lowpass**, **Bandpass**, or **Highpass**.
- The **Cutoff** Parameter controls the frequency at which crossover occurs. This can be modulated using the **Cutoff Modulation Slots**. If you want the cutoff to track the pitch of the note being played, assign Note Pitch as a modulation source.
- The **Resonance** Parameter produces an accent in frequencies around the Cutoff frequency. Resonance is expressed as a percentage: at 0%, no cutoff boost is perceived, whilst at 100% there is a massive amplification around the cutoff.

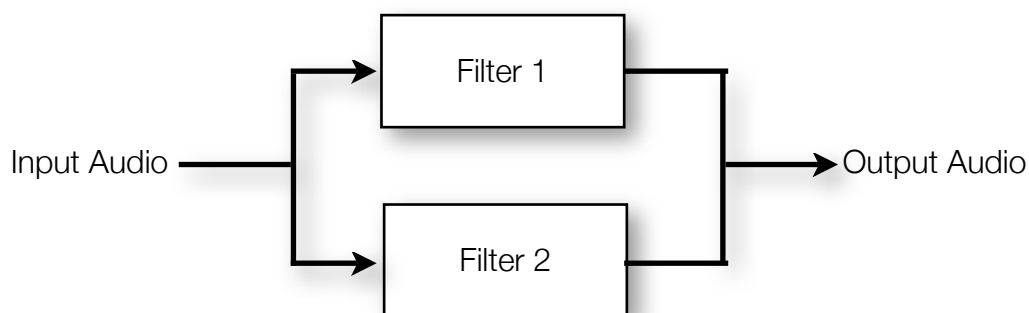
Output Section

- The **Filter Mix** Parameter controls the relative output of Filter 1 and Filter 2: at 0%, only Filter 1 is heard; at 50%, both Filter 1 and Filter 2 are mixed in equal proportions; at 100%, only Filter 2 is heard. This Parameter can also be modulated using a modulation matrix. Using this Parameter in conjunction with the Filter input will enable Aspect Filters to run in either series or parallel:

When filters are used in **Series**, the output produced when the audio input runs through Filter 1, is then processed by Filter 2. To use this configuration, enable Filter 2 and use Filter 1 as its input. The Output Mixer should be set to 100% so that only Filter 2's output is heard.



When filters are used in **Parallel**, the audio input is processed by both Filter 1 and Filter 2, and then recombined into an audio signal that is the sum of both Filter's outputs. To use this configuration, enable Filter 2 and ensure that it has the same input as Filter 1. The Output Mixer should be set to 50% to ensure that both Filter's output signals are present.

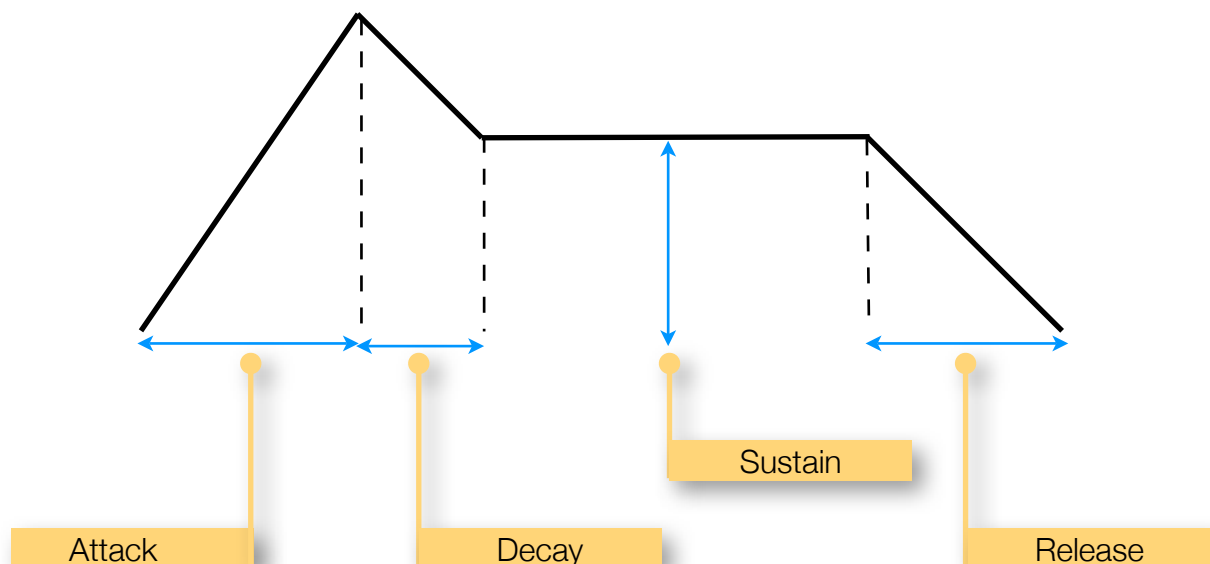


Note that due to Aspect's flexible architecture, hybrid combinations of series and parallel filters are also possible.

- The **Pan** Parameter allows the signal to be placed in the stereo panorama. Choose C to keep the signal centered, L1% to L100% to place the signal to the left (where L1% is slightly left of centre, and L100% is to the extreme left). Use R%1 to R100% to place the signal to the right (where R1% is slightly right of centre, and R100% is to the extreme right). This Parameter can also be modulated using the Pan Modulation Matrix.
- The **Amplifier Modulation Slots** are used to change the volume of a voice. Note that Envelope 1 is permanently connected to the Amplifier, and so will always govern the overall voice volume. The Modulation Matrix allows other source to also influence the volume, for example, using Velocity as a modulation source will produce a sound that is louder when the note is played with more velocity, and quieter when played at a lower velocity.

Envelope Section

The Envelopes components (Envelope 1, Envelope 2 and Envelope 3) generate time-varying modulation sources. The Envelopes are controlled by note-on and note-off events. If a note-on is received, the Envelope will start from the Attack stage and progress onto the Decay, and Sustain stages. A note-off event, regardless of the current envelope stage, will move onto the Release stage.



- The **Attack** Parameter, measured in milliseconds, controls how quickly the modulation output reaches its peak. At smaller values, the envelope output reaches the maximum value almost instantly. At larger values, the envelope output slowly and gently increases over a longer period of time until the peak is reached.

- The **Decay** Parameter, specified in milliseconds, controls how quickly the modulation output falls from the peak value (reached during the attack stage) to the sustain value. Short values cause a quick fall; longer values cause a slower descent.
- The **Sustain** Parameter, expressed as a percentage, specifies the steady-state level. The envelope will remain in this stage as long as a note is held.
- The **Release** Parameter, specified in milliseconds, controls how quickly the modulation output falls from the current value to zero. Short values cause a quick fall; longer values cause a slower descent.

Whilst each Envelope can be used as a modulation source for any component, there is a hard-wired connection (which cannot be removed) from Envelope 1 to the Amplifier. Envelope 1 can additionally be used as a modulation source for any other components; it will however always still control the voice's amplitude.

LFO Section

A Low Frequency Oscillator (LFO) produces simple waveform shapes, similar to the output of the main Aspect oscillators. The difference, however, between the LFO and Audio Oscillators is in the pitch of these waveforms; LFOs, as their name suggest, produce a waveform at a much lower frequency. Because the LFO signal is too low a frequency to be audible, they are usually not routed into the main sound output, but instead used as modulation sources.

- The **LFO Shape** Parameter, which can be set to **Sine**, **Triangle**, **Square**, or **Sawtooth**, controls the shape of the LFO waveform.
- An LFO can be made to synchronize itself with a the host's tempo by switching the **LFO Tempo Sync** Parameter on. When the LFO is synced, its period is based upon musical subdivisions. Without syncing, the period is expressed as a value in Hz. A non-synced LFO period can also be modulated with the three LFO modulation slots.

The **Time** Parameter controls the LFO frequency. This is expressed in Hz (cycles per second) when sync is disabled, and in musical note subdivisions when sync is enabled.

Patch Section

- The Inverter components (**Inverter 1** and **Inverter 2**), each take a modulation source and produce a flipped version. For example, using an envelope modulation source that usually increases to a positive maximum during the attack phase, will instead produce a signal that decreases to a negative minimum during the attack phase.
- The Adder components, **Adder 1** and **Adder 2**, both take two modulation sources and produce an output that is equal to the sum of the inputs.

- The Multiplier components, **Multiplier 1** and **Multiplier 2**, both take two modulation sources and produce an output that is equal to the product of the inputs. This is particularly useful for producing scaled modulation sources: for example, assigning both LFO 1 and the Mod Wheel to a multiplier produces an LFO output, with which the depth can be controlled with the Mod Wheel.
- The purpose of the Sample and Hold (**S&H**) component is to hold a modulation source's value steady for a short time. The component takes two inputs, a Source and Clock; whenever the Clock input source changes from a negative to a positive value (known as a zero-crossing), the current value of the input source will be taken, output, and held steady until the next zero-crossing.
- The **Lag Generator** slews the input modulation source, producing a portamento type effect and reducing the speed of changes. The **Lag** Parameter affects how much the input is slewed: at 0%, the input source passes through unaltered, whilst at higher values the slewing is more pronounced.

Backward Compatibility

From Aspect 1.5, the oscillator algorithms have been improved to reduce CPU usage, remove aliasing at extreme frequencies, and improve the overall sound. By default, the new oscillators are enabled.

If perfect compatibility with previously created presets is required, the previous oscillators can be used instead. To return to the previous oscillators, enable the **Legacy Oscillators** option under the **Backwards Compatibility Options**. A restart of Aspect is required for changes to the Backwards Compatibility options to take effect.

Backwards Compatibility options are only available to registered Aspect users.

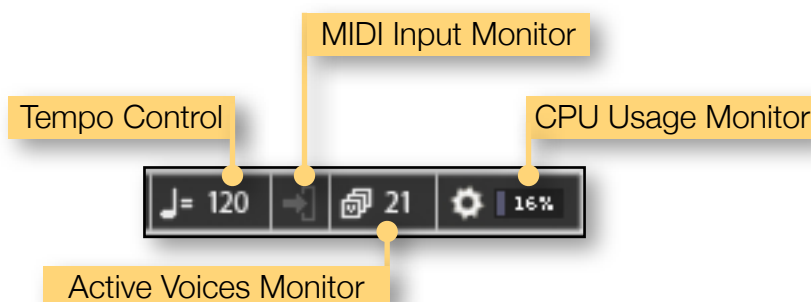
Control types

- Click on a **rotary control** and drag either upwards to increase the value, or downwards to decrease it. Hold down *shift* and drag to make smaller and more precise changes. Hold down *ctrl* and click to return the control to its default value. Rotary controls can also be changed by hovering the mouse cursor over the control and scrolling the mouse-wheel up or down.
- Click on a **button control** to toggle its value between On and Off. Hold down *ctrl* and click to return the control to its default value.
- Click on a **combo control** to display a list of possible values, from which the required value can be selected. Hold down *ctrl* and click to return the control to its default value. Combo controls can also be changed by hovering the mouse cursor over the control and scrolling the mouse-wheel up or down.



Status Display

Status Display information is displayed at the bottom right area of the Aspect interface:



CPU Usage monitor

The CPU Usage monitor displays the percentage of processor resources dedicated to producing the audio output. The total processor resources on a computer are limited, so when Aspect increases its CPU usage, there will be less CPU resources remaining for other plug-ins and applications. CPU Usage will differ depending on which Program is currently loaded, how that particular Program is configured, and how many voices are being played.

A value of 100% indicates that your computer is running at maximum capacity and will not have enough processing power remaining for anything else. You might notice audio output become temporarily glitchy, or that the user interface becomes sluggish. There are several methods for resolving this:

- Choose a different Program that has less CPU Usage.
- If running in Standalone mode, you can increase the latency or decrease the sample rate. See section *Setup Audio & MIDI*.
- Reduce the Polyphony or number of Unison voices in the current Program.
- If your host offers Freeze or Offline processing, you might be able to render the audio output in non-realtime.

MIDI Input monitor

The MIDI Input monitor flickers to show that a MIDI Message has been received. You can use this to confirm that your MIDI controller is configured correctly for Aspect.

Active Voices monitor

The Active Voices monitor displays the number of voices that are currently playing.

Tempo control

The Tempo control only appears when running Aspect in Standalone mode; when running as a plug-in, the host application will provide the tempo for Aspect. The Tempo control displays the current Tempo, in beats per minute (bpm). It can be changed by either:

- Double-clicking the tempo control, typing the required bpm and pressing return.
- Clicking on the tempo control and dragging either upwards to increase the tempo, or downwards to decrease the tempo.