

Plug-in Reference



CUBASE ESSENTIAL₄

Personal Music Production System



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The included effect plug-ins

Introduction

This chapter contains descriptions of the included plug-in effects and their parameters.

In Cubase Essential, the plug-in effects are arranged in a number of different categories. This chapter is arranged in the same fashion, with the plug-ins listed in separate sections for each effect category.

⇒ Most of the included effects are compatible with VST3, this is indicated by an icon in front of the name of the plug-in as displayed in plug-in selection menus (for further information, see the chapter “Audio Effects” in the Operation Manual).

Delay plug-ins

This section contains descriptions of the plug-ins in the “Delay” category.

MonoDelay



This is a mono delay effect that can either be tempo-based or use freely specified delay time settings.

The parameters are as follows:

Parameter	Description
Delay	This is where you specify the base note value for the delay if tempo sync is on (1/1–1/32, straight, triplet or dotted). If tempo sync is off, it sets the delay time in milliseconds.
Tempo sync on/off	The button below the Delay Time knob is used to turn tempo sync on or off. If set to off, the delay time can be set freely with the Delay Time knob, without sync to tempo.
Feedback	This sets the number of repeats for the delay.
Filter Lo	This filter affects the feedback loop of the effect signal and allows you to roll off low frequencies from 10Hz up to 800Hz. The button below the knob activates/deactivates the filter.
Filter Hi	This filter affects the feedback loop of the effect signal and allows you to roll off high frequencies from 20kHz down to 1.2kHz. The button below the knob activates/deactivates the filter.
Mix	Sets the level balance between the dry signal and the effect. If MonoDelay is used as a send effect, this should be set to maximum as you can control the dry/effect balance with the send.

PingPongDelay



This is a stereo delay effect that alternates each delay repeat between the left and right channels. The effect can either be tempo-based or use freely specified delay time settings.

The parameters are as follows:

Parameter	Description
Delay	This is where you specify the base note value for the delay if tempo sync is on (1/1–1/32, straight, triplet or dotted). If tempo sync is off, it sets the delay time in milliseconds.
Tempo sync on/off	The button below the Delay Time knob is used to turn tempo sync on or off. If set to off, the delay time can be set freely with the Delay Time knob, without sync to tempo.
Feedback	This sets the number of repeats for the delay.
Filter Lo	This filter affects the feedback loop and allows you to roll off low frequencies up to 800Hz. The button below the knob activates/deactivates the filter.
Filter Hi	This filter affects the feedback loop and allows you to roll off high frequencies from 20kHz down to 1.2kHz. The button below the knob activates/deactivates the filter.
Spatial	This parameter sets the stereo width for the left/right repeats. Turn clockwise for a more pronounced stereo “ping-pong” effect.
Mix	Sets the level balance between the dry signal and the effect. If PingPongDelay is used as a send effect, this should be set to maximum as you can control the dry/ effect balance with the send.

Distortion plug-ins

This section contains descriptions of the plug-ins in the “Distortion” category.

AmpSimulator



AmpSimulator is a distortion effect, emulating the sound of various types of guitar amp and speaker cabinet combinations. A wide selection of amp and cabinet models is available.

The parameters are as follows:

Parameter	Description
Drive	Governs the amount of amp overdrive.
Bass	Tone control for the low frequencies.
Middle	Tone control for the mid frequencies.
Treble	Tone control for the high frequencies.
Presence	Use this to boost or damp the higher frequencies.
Volume	This controls the overall output level.
Amplifier	This allows you to select between various amplifier models. Click on the currently selected amplifier name to open a pop-up with all the available amplifier models. This section can be bypassed by selecting “No Amp”.
Cabinet	Various speaker cabinet models. Click on the currently selected cabinet name to open a pop-up with all the available amplifier models. This section can be bypassed by selecting “No Speaker”.
Damping Lo/Hi	Further tone controls for shaping the sound of the selected speaker cabinet. Click on the values, enter a new value and press the [Enter] key.

DaTube



This effect emulates the characteristic warm, lush sound of a tube amplifier.

The parameters are as follows:

Parameter	Description
Drive	Regulates the pre-gain of the “amplifier”. Use high values if you want an overdriven sound just on the verge of distortion.
Balance	This controls the balance between the signal processed by the Drive parameter and the dry input signal. For maximum drive effect, set this to its highest value.
Output	Adjusts the post-gain, or output level, of the “amplifier”.

Distortion



Distortion will add crunch to your tracks.

The parameters are as follows:

Parameter	Description
Boost	Increases the distortion amount.
Feedback	This parameter feeds part of the output signal back to the effect input, increasing the distortion effect.
Tone	Lets you select a frequency range to which to apply the distortion effect.
Spatial	Changes the distortion characteristics of the left and right channel, thus creating a stereo effect.
Output	Raises or lowers the signal going out of the effect.

Dynamics plug-ins

This section contains descriptions of the plug-ins in the “Dynamics” category.

Gate



Gating, or noise gating, silences audio signals below a certain set threshold level. As soon as the signal level exceeds the set threshold, the gate opens to let the signal through.

The available parameters are as follows:

Parameter	Description
Threshold (-60–0dB)	This setting determines the level where Gate is activated. Signal levels above the set threshold trigger the gate to open, and signal levels below the set threshold will close the gate.
state LED	This indicates whether the gate is open (LED lights up in green), closed (LED lights up in red) or something in between (LED lights up in yellow).
Filter buttons	When the Side-chain button (see below) is activated, you can use these buttons to set the filter type to either Low Pass, Band Pass or High Pass.
Side-chain (Off/On)	This button (below the Center knob) activates the filter. The input signal can then be shaped according to set Center and Q-Factor parameters which may be useful in tailoring how the Gate operates.
Center (50Hz–20000Hz)	Sets the center frequency of the filter.
Q-Factor (0.01–10000)	Sets the Resonance of the filter.
Monitor (Off/On)	Allows you to monitor the filtered signal.

Parameter	Description
Attack (0.1–1000 ms)	This parameter sets the time it takes for the gate to open after being triggered. If the Live button (see below) is deactivated, it will ensure that the gate will already be open when a signal above the threshold level is played back. Gate manages this by “looking ahead” in the audio material, checking for signals loud enough to pass the gate.
Hold (0–2000ms)	This determines how long the gate stays open after the signal drops below the threshold level.
Release (10–1000ms or “Auto”)	This parameter sets the amount of time it takes for the gate to close (after the set hold time). If the “Auto” button is activated, Gate will find an optimal release setting, depending on the audio program material.
Analysis (0–100) (Pure Peak to Pure RMS)	This parameter determines whether the input signal is analysed according to Peak or RMS values (or a mixture of both). A value of 0 is pure Peak and 100 pure RMS. RMS mode operates using the average power of the audio signal as a basis, whereas Peak mode operates more on peak levels. As a general guideline, RMS mode works better on material with few transients such as vocals, and Peak mode better for percussive material, with a lot of transient peaks.
Live mode (On/Off)	When activated, Live mode disengages the “look ahead” feature of the Gate. Look ahead does produce more accurate processing but will add a certain amount of latency as a trade-off. When Live mode is activated, there is no latency, which might be better for “live” processing.

Limiter



Limiter is designed to ensure that the output level never exceeds a certain set output level, to avoid clipping in following devices. Limiter can adjust and optimize the Release parameter automatically according to the audio material, or it can be set manually. Limiter also features separate meters for the input, output and the amount of limiting (middle meters).

The available parameters are the following:

Parameter	Description
Input (-24–+24 dB)	Allows you to adjust the input gain.
Output (-24–+6 dB)	This setting determines the maximum output level.
Release (0.1–1000ms or Auto mode)	This parameter sets the amount of time it takes for the gain to return to its original level. If the “Auto” button is activated, Limiter will automatically find an optimal release setting that varies depending on the audio material.

MIDI Gate



Gating, in its fundamental form, silences audio signals below a certain set threshold level. That means, when a signal rises above the set level, the Gate opens to let the signal through while signals below the set level are cut off. MIDI Gate, however, is a Gate effect that is not triggered by threshold levels, but instead by MIDI notes. Hence it needs both audio and MIDI data to function.

Setting up

MIDI Gate requires both an audio signal and a MIDI input to function.

To set it up, proceed as follows:

1. Select the audio to be affected by the MIDI Gate.
This can be audio material from any audio track, or even a live audio input (provided you have a low latency audio card).
2. Select the MIDI Gate as an insert effect for the audio track.
The MIDI Gate control panel opens.
3. Select a MIDI track to control the MIDI Gate.
This can be an empty MIDI track, or a MIDI track containing data, it doesn't matter. However, if you wish to play the MIDI Gate in real-time – as opposed to having a recorded part playing it – the track has to be selected for the effect to receive the MIDI output.

4. Open the Output Routing pop-up menu for the MIDI track and select the MIDI Gate option.
The MIDI Output from the track is now routed to the MIDI Gate.

What to do next depends on whether you are using live or recorded audio and whether you are using real-time or recorded MIDI. We will assume for the purposes of this manual that you are using recorded audio, and play the MIDI in real-time.

Make sure the MIDI track is selected and start playback.

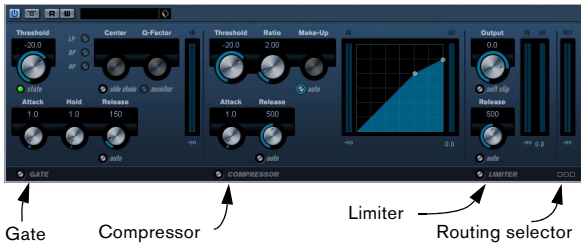
5. Now play a few notes on your MIDI keyboard.

As you can hear, the audio track material is affected by what you play on your MIDI keyboard.

The following MIDI Gate parameters are available:

Parameter	Description
Attack	This is used for determining how long it should take for the Gate to open after receiving a signal that triggers it.
Hold	Regulates how long the Gate remains open after a Note On or Note Off message (see Hold Mode below).
Release	This determines how long it takes for the Gate to close (in addition to the value set with the Hold parameter).
Note To Attack	The value you specify here determines to which extent the velocity values of the MIDI notes should affect the Attack. The higher the value, the more the Attack time will increase with high note velocities. Negative values will give shorter Attack times with high velocities. If you do not wish to use this parameter, set it to the 0 position.
Note To Release	The value you specify here determines to which extent the velocity values of the MIDI notes should affect the Release. The higher the value, the more the Release time will increase. If you do not wish to use this parameter, set it to the 0 position.
Velocity To VCA	This controls to which extent the velocity values of the MIDI notes determine the output volume. A value of 127 means that the volume is controlled entirely by the velocity values, while a value of 0 means that velocities will have no effect on the volume.
Hold Mode	Use this switch to set the Hold Mode. In Note-On mode, the Gate will only remain open for the time set with the Hold and Release parameters, regardless of the length of the MIDI note that triggered the Gate. In Note-Off mode on the other hand, the Gate will remain open for as long as the MIDI note plays, and then apply the Hold and Release parameters.

VSTDynamics



VSTDynamics is an advanced dynamics processor. It combines three separate processors: Gate, Compressor and Limiter, covering a variety of dynamic processing functions. The window is divided into three sections, containing controls and meters for each processor.

Activating the individual processors

You activate the individual processors using the buttons at the bottom of the plug-in panel.

The Gate section

Gating, or noise gating, is a method of dynamic processing that silences audio signals below a certain set threshold level. As soon as the signal level exceeds the set threshold, the gate opens to let the signal through. The Gate trigger input can also be filtered using an internal side-chain.

The available parameters are as follows:

Parameter	Description
Threshold (-60–0dB)	This setting determines the level where Gate is activated. Signal levels above the set threshold trigger the gate to open, and signal levels below the set threshold will close the gate.
state	This indicates whether the gate is open (LED lights up in green), closed (LED lights up in red) or something in between (LED lights up in yellow).
Side-chain (On/Off)	This button activates the internal side-chain filter. This lets you filter out parts of the signal that might otherwise trigger the gate in places you don't want it to, or to boost frequencies you wish to accentuate, allowing for more control over the gate function.
LP (Lowpass), BP (Bandpass), HP (Highpass)	These buttons set the basic filter mode.
Center (50–22000Hz)	This sets the center frequency of the filter.
Q-Factor (0.001–10000)	This sets the resonance or width of the filter.

Parameter	Description
Monitor (Off/On)	Allows you to monitor the filtered signal.
Attack (0.1–100ms)	This parameter sets the time it takes for the gate to open after being triggered.
Hold (0–2000ms)	This determines how long the gate stays open after the signal drops below the threshold level.
Release (10–1000ms or "Auto")	This parameter sets the amount of time it takes for the gate to close (after the set hold time). If the "Auto" button is activated, Gate will find an optimal release setting, depending on the audio program material.

The Compressor section

Compressor reduces the dynamic range of the audio, making softer sounds louder or louder sounds softer, or both. Compressor functions like a standard compressor with separate controls for threshold, ratio, attack, release and make-up gain parameters. Compressor features a separate display that graphically illustrates the compressor curve shaped according to the Threshold, Ratio and MakeUp Gain parameter settings. Compressor also features a Gain Reduction meter that shows the amount of gain reduction in dB, and a program dependent Auto feature for the Release parameter.

The available parameters work as follows:

Parameter	Description
Threshold (-60–0dB)	This setting determines the level where Compressor "kicks in". Signal levels above the set threshold are affected, but signal levels below are not processed.
Ratio (1:1–8:1)	Ratio determines the amount of gain reduction applied to signals over the set threshold. A ratio of 3:1 means that for every 3dB the input level increases, the output level will increase by only 1dB.
Make-Up (0–24dB)	This parameter is used to compensate for output gain loss, caused by compression. When Auto is on, gain loss will be compensated automatically.
Attack (0.1–100ms)	This determines how fast Compressor will respond to signals above the set threshold. If the attack time is long, more of the early part of the signal (attack) will pass through unprocessed.
Release (10–1000ms or "Auto")	Sets the amount of time it takes for the gain to return to its original level when the signal drops below the Threshold level. If the "Auto" button is activated, Compressor will automatically find an optimal release setting that varies depending on the audio material.
Graphic display	Use the graphic display to graphically set the Threshold or the Ratio value.

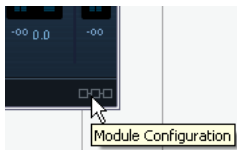
The Limiter section

Limiter is designed to ensure that the output level never exceeds a certain set output level, to avoid clipping in following devices. Conventional limiters usually require very accurate setting up of the attack and release parameters, to prevent the output level from going beyond the set threshold level. Limiter adjusts and optimizes these parameters automatically, according to the audio material. You can also adjust the Release parameter manually.

The available parameters are the following:

Parameter	Description
Output (-24--+6dB)	This setting determines the maximum output level. Signal levels above the set threshold are affected, but signal levels below are left unaffected.
Soft Clip (On/Off)	Soft Clipper acts differently compared to the limiter. When the signal level exceeds -6dB, SoftClip starts limiting (or clipping) the signal "softly", at the same time generating harmonics which add a warm, tubelike characteristic to the audio material.
Release (10–1000ms or "Auto")	This parameter sets the amount of time it takes for the gain to return to its original level when the signal drops below the threshold level. If the "Auto" button is activated, Limiter will automatically find an optimal release setting that varies depending on the audio material.

The Module Configuration button



In the bottom right corner of the plug-in panel you will find a button with which you can set the signal flow order for the three processors. Changing the order of the processors can produce different results, and the available options allow you to quickly compare what works best for a given situation. Simply click the Module Configuration button to change to a different configuration. There are three routing options:

- C-G-L (Compressor-Gate-Limit)
- G-C-L (Gate-Compressor-Limit)
- C-L-G (Compressor-Limit-Gate)

Filter plug-ins

This section contains descriptions of the plug-ins in the "Filter" category.

DualFilter

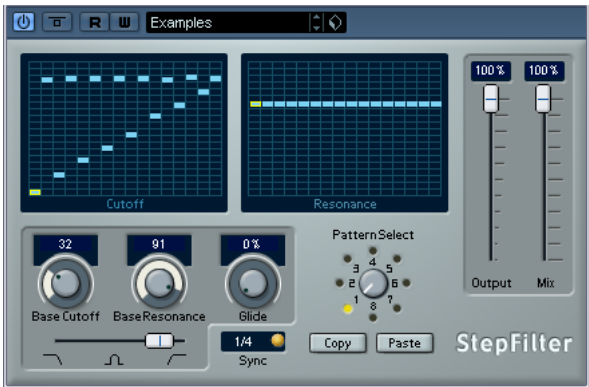


This effect filters out certain frequencies while allowing others to pass through.

The following parameters are available:

Parameter	Description
Position	This parameter sets the filter cutoff frequency. If you set this to a negative value, DualFilter will act as a low-pass filter. Positive values cause DualFilter to act as a high-pass filter.
Resonance	Sets the sound characteristic of the filter. With higher values, a ringing sound is heard.

StepFilter



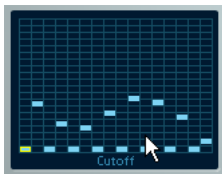
StepFilter is a pattern-controlled multimode filter that can create rhythmic, pulsating filter effects.

General operation

StepFilter can produce two simultaneous 16-step patterns for the filter cutoff and resonance parameters, synchronized to the sequencer tempo.

Setting step values

- Setting step values is done by clicking in the pattern grid windows.
- Individual step entries can be freely dragged up or down the vertical axis, or directly set by clicking in an empty grid box. By click-dragging left or right, consecutive step entries will be set to the pointer position.

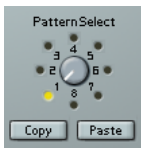


Setting filter cutoff values in the grid window.

- The horizontal axis shows the pattern steps 1–16 from left to right, and the vertical axis determines the (relative) filter cutoff frequency and resonance setting. The higher up on the vertical axis a step value is entered, the higher the relative filter cutoff frequency or filter resonance setting.
- By starting playback and editing the patterns for the cutoff and resonance parameters, you can hear how your filter patterns affect the sound source connected to StepFilter directly.

Selecting new patterns

- Created patterns are saved with the project, and up to 8 different cutoff and resonance patterns can be saved internally. Both the cutoff and resonance patterns are saved together in the 8 Pattern memories.
- To select new patterns you use the pattern selector. New patterns are all set to the same step value by default.



Pattern Selector

Using pattern copy and paste to create variations

You can use the Copy and Paste buttons below the pattern selector to copy a pattern to another pattern memory location, which is useful for creating variations on a pattern.

- Select the pattern you wish to copy, click the Copy button, select another pattern memory location and click Paste. The pattern is copied to the new location, and can now be edited to create variations using the original pattern as a starting point.

StepFilter parameters

Parameter/Value	Description
Base Cutoff	This sets the base filter cutoff frequency. Cutoff values set in the Cutoff grid window are values relative to the Base Cutoff value.
Base Resonance	This sets the base filter resonance. Resonance values set in the Resonance grid window are values relative to the Base Resonance value. Note that very high Base Resonance settings can produce loud ringing effects at certain frequencies.
Glide	This will apply glide between the pattern step values, causing values to change more smoothly.
Filter Mode	This slider selects between lowpass (LP), bandpass (BP) or highpass (HP) filter modes (from left to right respectively).
Sync 1/1 to 1/32 (Straight, Triplet or Dotted)	This sets the pattern beat resolution, i.e. what note values the pattern will play in relation to the tempo.
Output	Sets the overall volume.
Mix	Adjusts the mix between dry and processed signal.

ToneBooster



ToneBooster is a filter that allows you to raise the gain in a selected frequency range. It is particularly useful when inserted before AmpSimulator in the plug-in chain (see “AmpSimulator” on [page 7](#)), greatly enhancing the tonal varieties available.

The following parameters are available:

Parameter	Description
Tone	This sets the center filter frequency.
Gain	Allows you to adjust the gain of the selected frequency range by up to 24 dB.
Width	This sets the resonance of the filter.
Mode	This sets the basic operational mode of the filter; Peak or Bandpass.

WahWah



WahWah is a variable slope bandpass filter that can be auto-controlled via MIDI modeling the well-known analog pedal effect (see below). You can independently specify the frequency, width and the gain for the Lo and Hi Pedal positions. The crossover point between the Lo and Hi Pedal positions is at 50.

The parameters are as follows:

Parameter	Description
Pedal	This controls the filter frequency sweep.
Freq Lo/Hi	Sets the frequency of the filter for the Lo and Hi Pedal positions.
Width Lo/Hi	Sets the width (resonance) of the filter for the Lo and Hi Pedal positions.
Gain Lo/Hi	Sets the gain of the filter for the Lo and Hi Pedal positions.
Slope	Specifies the slope of the filter; 6 dB or 12 dB.

MIDI control

- For real-time MIDI control of the Pedal parameter, MIDI must be directed to the WahWah plug-in.
- Whenever the WahWah has been added as an insert effect (for an audio track or an FX channel), it will be available on the Output Routing pop-up menu for MIDI tracks. If WahWah is selected on the Output Routing menu, MIDI will be directed to the plug-in from the selected track.

Mastering – UV 22 HR



The UV22 HR is a dithering plug-in, based on an advanced algorithm developed by Apogee. For an introduction to the concept of dithering, see the chapter “Audio Effects” in the Operation Manual.

The following options can be set in the UV 22 HR control panel:

Option	Description
Hi	Try this first, it is the most “all-round” setting.
Low	This applies a lower level of dither noise.
Auto black	When this is activated, the dither noise is gated (muted) during silent passages in the material.
Bit Resolution	The UV22 HR supports dithering to multiple resolutions: 8, 16, 20 or 24 bits. You select the desired resolution by clicking the corresponding button.

⚠ Dither should always be applied post output bus fader.

Modulation plug-ins

This section contains descriptions of the plug-ins in the “Modulation” category.

Chorus



This is a single stage chorus effect. It works by doubling whatever is sent into it with a slightly detuned version.

The parameters are as follows:

Parameter	Description
Tempo sync on/off	The button below the Rate knob is used to switch tempo sync on or off. The button is lit when tempo sync is on.
Rate	If tempo sync is on, this is where you specify the base note value for tempo syncing the chorus sweep (1/1 to 1/32, straight, triplet or dotted). If tempo sync is off, the sweep rate can be set freely with the Rate knob, without sync to tempo.
Width	This determines the depth of the chorus effect. Higher settings produce a more pronounced effect.
Spatial	This sets the stereo width of the effect. Turn clockwise for a wider stereo effect.
Mix	Sets the level balance between the dry signal and the effect. If Chorus is used as a send effect, this should be set to maximum as you can control the dry/effect balance with the send.
Delay	This parameter affects the frequency range of the modulation sweep, by adjusting the initial delay time.
Shape	This changes the shape of the modulating waveform, altering the character of the chorus sweep. Sine and triangle waveforms are available.
Filter Lo/Hi	These parameters allow you to roll off low and high frequencies of the effect signal, respectively.

Flanger



Flanger is a classic flanger effect with added stereo enhancement.

The parameters are as follows:

Parameter	Description
Tempo sync on/off	The button below the Rate knob is used to switch tempo sync on or off. The button is lit when tempo sync is on.
Rate	If tempo sync is on, this is where you specify the base note value for tempo syncing the flanger sweep (1/1 to 1/32, straight, triplet or dotted). If tempo sync is off, the sweep rate can be set freely with the Rate knob, without sync to tempo.
Range Lo/Hi	This sets the frequency boundaries for the flanger sweep.
Feedback	This determines the character of the flanger effect. Higher settings produce a more “metallic” sounding sweep.
Spatial	This sets the stereo width of the effect. Turn clockwise for a wider stereo effect.
Mix	Sets the level balance between the dry signal and the effect. If the Flanger is used as a send effect, this should be set to maximum as you can control the dry/effect balance with the send.
Shape	This changes the shape of the modulating waveform, altering the character of the flanger sweep.
Delay	This parameter affects the frequency range of the modulation sweep, by adjusting the initial delay time.
Manual	If this is activated, the flanger sweep will be static, i.e. no modulation. You can instead change the sweep position manually by turning this knob.
Filter Lo/Hi	These parameters allow you to roll off low and high frequencies of the effect signal, respectively.

Metalizer



The Metalizer feeds the audio signal through a variable frequency filter, with tempo sync or time modulation and feedback control.

Parameter	Description
Feedback	The higher the value, the more “metallic” the sound.
Sharpness	Governs the character of the filter effect. The higher the value, the narrower the affected frequency area, producing sharper sound and a more pronounced effect.
Tone	Governs the feedback frequency. The effect of this will be more noticeable with high Feedback settings.
On button	Turns filter modulation on and off. When turned off, the Metalizer will work as a static filter.
Mono button	When this is on, the output of the Metalizer will be in mono.
Speed	If tempo sync is on, this is where you specify the base note value for tempo-syncing the effect (1/1 to 1/32, straight, triplet or dotted). Note that there is no note value modifier for this effect. If tempo sync is off, the modulation speed can be set freely with the Speed knob, without sync to tempo.
Tempo sync on/off	The button above the Speed knob is used to switch tempo sync on or off. The button is lit when tempo sync is on.
Output	Sets the overall volume.
Mix	Sets the level balance between the dry signal and the effect. If Metalizer is used as a send effect, this should be set to maximum as you can control the dry/effect balance with the send.

Phaser



Phaser produces the well-known “swooshing” phasing effect with additional stereo enhancement.

The parameters are as follows:

Parameter	Description
Tempo sync on/off	The button below the Rate knob is used to switch tempo sync on or off. The button is lit when tempo sync is on.
Rate	If tempo sync is on, this is where you specify the base note value for tempo syncing the phaser sweep (1/1 to 1/32, straight, triplet or dotted). If tempo sync is off, the sweep rate can be set freely with the Rate knob, without sync to tempo.
Width	The width of the modulation effect between higher and lower frequencies.
Feedback	This determines the character of the phaser effect. Higher settings produce a more pronounced effect.
Spatial	When using multi-channel audio, Spatial creates a 3-dimensional impression by delaying modulation in each channel.
Mix	Sets the level balance between the dry signal and the effect. If the Phaser is used as a send effect, this should be set to maximum as you can control the dry/effect balance with the send.
Manual	If this is activated, the phaser sweep will be static, i.e. no modulation. You can instead change the sweep position manually by turning this knob.
Filter Lo/Hi	These parameters allow you to roll off low and high frequencies of the effect signal, respectively.

Ringmodulator



The Ringmodulator can produce complex, bell-like enharmonic sounds. Ring modulators work by multiplying two audio signals. The ring modulated output contains added frequencies generated by the sum of, and the difference between, the frequencies of the two signals.

The Ringmodulator has a built-in oscillator that is multiplied with the input signal to produce the effect.

Parameter	Description
Oscillator LFO Amount	Controls how much the oscillator frequency is affected by the LFO.
Oscillator Env. Amount	Controls how much the oscillator frequency is affected by the envelope (which is triggered by the input signal). Positive and negative values can be set, with center position representing no modulation. Left of center, a loud input signal will decrease the oscillator pitch, whereas right of center the oscillator pitch will increase when fed a loud input.
Oscillator Wave	Selects the oscillator waveform; square, sine, saw or triangle.
Oscillator Range	Determines the frequency range of the oscillator in Hz.
Oscillator Frequency	Sets the oscillator frequency +/- 2 octaves within the selected range.
Oscillator Roll-Off	Cuts high frequencies in the oscillator waveform, to soften the overall sound. This is best used when harmonically rich waveforms are selected (e.g. square or saw).
LFO Speed	Sets the LFO Speed.
LFO Env. Amount	Controls how much the input signal level – via the envelope generator – affects the LFO speed. Positive and negative values can be set, with center position representing no modulation. Left of center, a loud input signal will slow down the LFO, whereas right of center a loud input signal will speed it up.

Parameter	Description
LFO Waveform	Selects the LFO waveform; square, sine, saw or triangle.
Invert Stereo	This inverts the LFO waveform for the right channel of the oscillator, which produces a wider stereo perspective for the modulation.
Envelope Generator (Attack and Decay dials)	The Envelope Generator section controls how the input signal is converted to envelope data, which can then be used to control oscillator pitch and LFO speed. It has two main controls: Attack sets how fast the envelope output level rises in response to a rising input signal. Decay controls how fast the envelope output level falls in response to a falling input signal.
Lock L<R	When this button is enabled, the L and R input signals are merged, and produce the same envelope output level for both oscillator channels. When disabled, each channel has its own envelope, which affects the two channels of the oscillator independently.
Output	Sets the overall volume.
Mix	Adjusts the mix between dry and processed signal.

Parameter	Description
Fast	Fine adjustment of the high rotor Fast speed.
Amp Mod	High rotor amplitude modulation.
Freq Mod	High rotor frequency modulation.
Slow	Fine adjustment of the low rotor Slow speed.
Fast	Fine adjustment of the low rotor Fast speed.
Accel	Fine adjustment of the low rotor acceleration time.
Amp Mod.	Adjusts amplitude modulation depth.
Level	Adjusts overall bass level.
Phase	Adjusts the phasing amount in the sound of the high rotor.
Angle	Sets the simulated microphone angle. 0 = mono, 180 = one mic on each side.
Distance	Sets the simulated microphone distance from the speaker in inches.
Output	Adjusts the overall output level.
Mix	Adjusts the mix between dry and processed signals.

Rotary



The Rotary plug-in simulates the classic effect of a rotary speaker. A rotary speaker cabinet features variable speed rotating speakers to produce a swirling chorus effect, commonly used with organs. Rotary features all the parameters associated with the real thing.

The parameters are as follows:

Parameter	Description
Speed (Stop/Slow/Fast)	This controls the speed of the Rotary in three steps.
Mode	Selects whether the Slow/Fast setting is a switch or a variable control. When switch mode is selected and Pitch Bend is the controller, the speed will switch with an up or down flick of the bender. Other controllers switch at 64.
Speed Mod	Selects the Rotary speed from 0 (Stop) to 100 (Fast).
Overdrive	Applies a soft overdrive or distortion.
Crossover Freq.	Sets the crossover frequency (200–3000Hz) between the low and high frequency loudspeakers.
Slow	Fine adjustment of the high rotor Slow speed.
Accel.	Fine adjustment of the high rotor acceleration time.

Directing MIDI to the Rotary

For real-time MIDI control of the Speed parameter, MIDI must be directed to the Rotary.

- Whenever the Rotary has been added as an insert effect (for an audio track or an FX channel), it will be available on the Output Routing pop-up menu for MIDI tracks. If Rotary is selected on the “out:” menu, MIDI will be directed to the plug-in from the selected track.

Tranceformer



Tranceformer is a ring modulator effect, in which the incoming audio is ring modulated by an internal, variable frequency oscillator, producing new harmonics. A second oscillator can be used to modulate the frequency of the first oscillator, in sync with the Song tempo if needed.

Parameter	Description
Waveform buttons	Sets the pitch modulation waveform.
Tone	Sets the frequency (pitch) of the modulating oscillator (1 to 5000Hz).
Depth	Governs the depth of the pitch modulation.
Speed	If tempo sync is on, this is where you specify the base note value for tempo-syncing the effect (1/1 to 1/32, straight, triplet or dotted). Note that there is no note value modifier for this effect. If tempo sync is off, the modulation speed can be set freely with the Speed knob, without sync to tempo.
Tempo sync on/off	The button above the Speed knob is used to switch tempo sync on or off. The button is lit when tempo sync is on.
On button	Turns modulation of the pitch parameter on or off.
Mono button	Governs whether the output will be stereo or mono.
Output	Adjusts the output level of the effect.
Mix	Sets the level balance between the dry signal and the effect.

⇒ Note that clicking and dragging in the display allows you to adjust the Tone and Depth parameters at the same time!

Tremolo



Tremolo produces amplitude (volume) modulation.

Parameters are as follows:

Parameter	Description
Tempo sync on/off	The button below the Rate knob is used to switch tempo sync on or off. The button is lit when tempo sync is on.
Rate	If tempo sync is on, this is where you specify the base note value for tempo-syncing the effect (1/1 to 1/32, straight, triplet or dotted). If tempo sync is off, the modulation speed can be set freely with the Rate knob, without sync to tempo.
Depth	This governs the depth of the amplitude modulation.
Spatial	This will add a stereo effect to the modulation.
Output	Adjusts the output volume.

Vibrato



The Vibrato plug-in produces pitch modulation.

Parameter	Description
Tempo sync on/off	The button below the Rate knob is used to switch tempo sync on or off. The button is lit when tempo sync is on.
Rate	If tempo sync is on, this is where you specify the base note value for tempo-syncing the effect (1/1 to 1/32, straight, triplet or dotted). If tempo sync is off, the modulation speed can be set freely with the Rate knob, without sync to tempo.
Depth	This governs the depth of the pitch modulation.
Spatial	This will add a stereo effect to the modulation.

Other plug-ins

This section contains descriptions of the plug-ins in the “Others” category.

Bitcrusher



If you're into lo-fi sound, Bitcrusher is the effect for you. It offers the possibility of decimating and truncating the input audio signal by bit reduction, to get a noisy, distorted sound. You can for example make a 24-bit audio signal sound like an 8 or 4-bit signal, or even render it completely garbled and unrecognizable. The parameters are:

Parameter	Description
Mode	Select one of four operating modes for the Bitcrusher. Each mode will produce a result sounding a bit different. Modes I and III are nastier and noisier, while modes II and IV are more subtle.
Sample Divider	This sets the amount by which the audio samples are decimated. At the highest setting (65), nearly all of the information describing the original audio signal will be eliminated, turning the signal into unrecognizable noise.
Depth	Use this to set the desired bit resolution. A setting of 24 gives the highest audio quality, while a setting of 1 will create mostly noise.
Output	Governs the output level from the Bitcrusher. Drag the slider upwards to increase the level.
Mix	This slider regulates the balance between the output from the Bitcrusher and the original audio signal. Drag the slider upwards for a more dominant effect, and drag it downwards if you want the original signal to be more prominent.

Chopper



Chopper is a combined tremolo and autopan effect. It can use different waveforms to modulate the level (tremolo) or left-right stereo position (pan), either using tempo sync or manual modulation speed settings. The parameters are as follows:

Parameter	Description
Waveform buttons	Sets the modulation waveform.
Depth	Sets the depth of the Chopper effect. This can also be set by clicking in the graphic display.
Speed	If tempo sync is on, this is where you specify the base note value for tempo-syncing the effect (1/1 to 1/32, straight, triplet or dotted). Note that there is no note value modifier for this effect. If tempo sync is off, the tremolo/auto-pan speed can be set freely with the Speed knob, without sync to tempo.
Tempo sync on/off	The button above the Speed knob is used to switch tempo sync on (the button lights up) or off.
Stereo/Mono button	Determines whether the Chopper will work as an auto-panner (button set to “Stereo”) or a tremolo effect (button set to “Mono”).
Mix	Sets the level balance between the dry signal and the effect. If Chopper is used as a send effect, this should be set to maximum.

Octaver



This plug-in can generate two additional voices that track the pitch of the input signal one octave and two octaves below the original pitch, respectively. Octaver is best used with monophonic signals. The parameters are as follows:

Parameter	Description
Direct	This adjusts the mix of the original signal and the generated voice(s). A value of 0 means only the generated and transposed signal is heard. By raising this value, more of the original signal is heard.
Octave 1	This adjusts the level of the generated signal one octave below the original pitch. Set to 0 means the voice is muted.
Octave 2	This adjusts the level of the generated signal two octaves below the original pitch. Set to 0 means the voice is muted.

Tuner



This is a guitar tuner. Simply connect a guitar or other instrument to an audio input and select the Tuner as an insert effect (make sure you deactivate any other effect that alters pitch, like chorus or vibrato). When the instrument is connected, proceed as follows:

- **Play a note.**
The key is shown in the middle of the display. In addition, the frequency in Hz is shown in the bottom left corner and the octave range in the bottom right corner. If the key is wrong (e.g. if you wish to tune the E string and the key is shown as Fb), first tune the string so that the correct key is shown.
 - **The two arrows indicate any deviation in pitch by their position.** If the pitch is flat, they will be positioned in the left half of the display, if the pitch is sharp they will be in the right half.
The deviation is also shown (in Cent) in the upper area of the display.
 - **Tune the instrument so that the two arrows are in the middle.**
- Repeat this procedure for each string.

Restoration plug-ins

This section contains descriptions of the plug-ins in the “Restoration” category.

Grungelizer



The Grungelizer adds noise and static to your recordings – kind of like listening to a radio with bad reception, or a worn and scratched vinyl record. The available parameters are as follows:

Parameter	Description
Crackle	This adds crackle to create that old vinyl record sound. The farther to the right you turn the dial, the more crackle is added.
RPM switch	When emulating the sound of a vinyl record, this switch lets you set the RPM (revolutions per minute) speed of the record (33/45/78 RPM).
Noise	This dial regulates the amount of static noise added.
Distort	Use this dial to add distortion.
EQ	Turn this dial to the right to cut off the low frequencies, and create a more hollow, lo-fi sound.
AC	This emulates a constant, low hum of AC current.
Frequency switch	This sets the frequency of the AC current (50 or 60Hz), and thus the pitch of the AC hum.
Timeline	This dial regulates the amount of overall effect. The farther to the right (1900) you turn this dial, the more noticeable the effect.

Reverb plug-ins

This section contains descriptions of the plug-ins in the “Reverb” category.

RoomWorks SE



RoomWorks SE is a high-quality reverb plug-in. RoomWorks SE has the following parameters:

Parameter	Description
Pre-Delay	The amount of time before the onset of reverb. This allows you to simulate larger spaces by increasing the time it takes for first reflections to reach the listener.
Reverb Time	Reverb Time in seconds.
Diffusion	This affects the character of the reverb tail. Higher diffusion is smoother while less diffusion can be clearer. This emulates changing the types of surfaces in a room (brick vs. carpet for instance).
High Level Amount	This affects the decay time of high frequencies. Normal room reverb decays quicker in the high and low frequency range than in the midrange. Lowering the level percentage will cause high frequencies to decay quicker. Values above 100% will cause high frequencies to decay longer than the midrange.
Low Level Amount	This affects the decay time of low frequencies. Normal room reverb decays quicker in the high and low frequency range than in the midrange. Lowering the level percentage will cause low frequencies to decay quicker. Values above 100% will cause low frequencies to decay longer than the midrange.
Mix	Determines the blend of dry (unprocessed) signal to wet (processed) signal. When using RoomWorks SE inserted in an FX channel, you will most likely want to set this to 100% or use the Send button.

Spatial plug-ins

This section contains descriptions of the plug-ins in the “Spatial” category.

MonoToStereo



This effect will turn a mono signal into a “pseudo-stereo” signal. The plug-in must be inserted on a stereo track playing a mono file to work.

The parameters are as follows:

Parameter	Description
Width	This controls the width or depth of the stereo enhancement. Turn clockwise to increase the enhancement.
Delay	This parameter increases the amount of differences between the left and right channels to further increase the stereo effect.
Color	This parameter also generates differences between the channels to increase the stereo effect.
Mono	This switches the output to mono, to check for possible unwanted coloring of the sound which sometimes can occur when creating an artificial stereo image.

StereoEnhancer



This plug-in will expand the stereo width of (stereo) audio material. It cannot be used with mono files.

The parameters are as follows:

Parameter	Description
Width	This controls the width or depth of the stereo enhancement. Turn clockwise to increase the enhancement.
Delay	This parameter increases the amount of differences between the left and right channels to further increase the stereo effect.
Color	This parameter also generates differences between the channels to increase the stereo enhancement.
Mono	This switches the output to mono, to check for possible unwanted coloring of the sound which sometimes can occur when enhancing the stereo image.

2

HALionOne

Introduction



HALionOne is a sample player that can play sound content in the *.hsb (HALion Sound Bank) format. These samples have associated preset files that store the panel settings and reference the HSB samples. Included are several presets (as *.vstpreset and *.trackpreset files).

The operation of HALionOne is very simple; load a preset (*.vstpreset or *.trackpreset file for an Instrument Track) and start playing! You do, however, have the option to tweak the basic parameters to tailor the sound to your liking.

HALionOne parameters

The HALionOne differs from other VST Instruments in that the panel parameters shown can vary according to which parameters are stored in the HSB file. HSB files cannot be created with HALionOne – you need the full version of HALion to do this – but when created, certain parameters are assigned as part of the file and the associated program (or preset). This means that for each preset, only these assigned parameters are shown on the instrument panel. Typically, these are filter cutoff, DCA and DCF parameters and any assigned effect parameters (the effects are “built in”).

If you load HALionOne for an Instrument track and select, for example, the “Draw Organ” preset, the following parameters are shown:

Parameter	Description
Cutoff	This allows you to adjust filter frequency or cutoff. The filter used is a Waldorf Low Pass filter with a 24 dB slope.
Resonance	Raising the filter resonance value will emphasize the frequencies around the set filter frequency.
DCF Amount	Controls the amount of the DCF (filter) envelope.
DCA Attack	Controls the time it takes for the DCA signal to reach its highest level.

Parameter	Description
DCA Decay	Controls the time it takes the DCA signal to decay to the sustain level.
DCA Sustain	Controls the DCA signal level after the Decay phase, as long as you press the key on your MIDI keyboard.
DCA Release	Controls the DCA signal after a key is released.
DCA Amount	Controls the amount of the DCA (amplifier) envelope.

These parameter assignments are used for many of the HALionOne presets, but not for all. As stated above, other parameters may be shown; these will be clearly labelled on the panel. For most of the presets there are also associated effects – the effect parameters are usually assigned to the quick controls on the right and typically control the dry/wet mix of the effect.

Effect Bypass

- This button, located at the bottom right in the box displaying the preset name, allows you to bypass any effects. The blue LED beside the button is lit if any effects are used in the preset.

Efficiency slider

The Efficiency slider provides a way of balancing audio quality vs. conservation of computer power. The lower the setting, the more voices are available. As a trade-off, sound quality is reduced.

Voices allocated

- The Voices field dynamically displays the number of voices currently used.

MIDI and Disk activity LEDs

The MIDI activity LED indicates received MIDI input. The Disk LED will light up green when samples are streamed from disk, and red when samples cannot be loaded from disk in time. In such a case you should consider lowering the Efficiency slider. When the disk LED doesn't light up, samples are read from memory.

Locate Contents

If you have moved the HALionOne content files to a different location (i.e. any other location than the folder in which it was stored at installation time), you need to use the Locate Contents function to inform HALion One about where to find its files. This is done as follows:

- Right-click anywhere on the control panel and select “Locate contents”.

A file dialog opens where you can navigate to the folder location.

HALionOne and MIDI files

When the Preferences option “Import to Instrument Tracks” is activated (on the MIDI–MIDI File page), importing a MIDI file into Cubase Essential will automatically set up instrument tracks, with HALionOne as the associated instrument. This allows you to quickly audition any imported MIDI files, to change parameter settings or to add effects, etc.

3

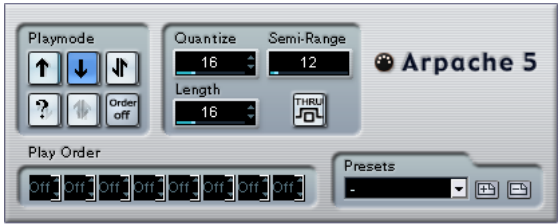
MIDI effects

Introduction

This chapter describes the included MIDI realtime effects and their parameters.

How to apply and handle MIDI effects is described in the chapter “MIDI realtime parameters and effects” in the Operation Manual.

Apache 5



A typical arpeggiator accepts a chord (a group of MIDI notes) as input, and plays back each note in the chord separately, with the playback order and speed set by the user. The Apache 5 arpeggiator does just that, and more. Before describing the parameters, let's look at how to create a simple, typical arpeggio:

1. Select a MIDI track and activate monitoring (or record enable it) so that you can play “thru” the track. Check that the track is properly set up for playback to a suitable MIDI instrument.
2. Select and activate the arpeggiator. For now, use it as an insert effect for the selected track.
3. In the arpeggiator panel, use the Quantize setting to set the arpeggio speed. The speed is set as a note value, relative to the project tempo. For example, setting Quantize to “16” means the arpeggio will be a pattern of sixteenth notes.
4. Use the Length setting to set the length of the arpeggio notes. This allows you to create staccato arpeggios (Length smaller than the Quantize setting) or arpeggio notes that overlap each other (Length greater than Quantize).
5. Set the Semi-Range parameter to 12. This will make the notes arpeggiate within an octave.

6. Play a chord on your MIDI instrument. Now, instead of hearing the chord, you will hear the notes of the chord played one by one, in an arpeggio.
7. Try the different arpeggio modes by clicking the Play-mode buttons. The symbols on the buttons indicate the playback order for the notes (up, down, up+down, etc.). The Play Order settings are described below.

Parameters

The Apache 5 has the following settings:

Setting	Description
Playmode buttons	Allows you to select the playback order for the arpeggiated notes. The options are down+up, up+down, up, down, random (“?” button) and “Order off”, in which case you can set the playback order manually with the Play Order fields below.
Quantize	Determines the speed of the arpeggio, as a note value related to the project tempo. The range is 32T (1/32 note triplets) to 1. (dotted note values).
Length	Sets the length of the arpeggio notes, as a note value related to the project tempo. The range is the same as for the Quantize setting.
Semi-Range	Determines the arpeggiated note range, in semitones counted from the lowest key you play. This works as follows: <ul style="list-style-type: none">– Any notes you play that are outside this range will be transposed in octave steps to fit within the range.– If the range is more than one octave, octave-transposed copies of the notes you play will be added to the arpeggio (as many octaves as fit within the range).
Thru	If this is activated, the notes sent to the arpeggiator (i.e. the chord you play) will be passed through the plug-in (sent out together with the arpeggiated notes).
Play Order	If the “Order on” playmode is selected, you can use these “slots” to specify a custom playback order for the arpeggio notes: Each slot corresponds to a position in the arpeggio pattern. For each slot, you specify which note should be played on that position by selecting a number. The numbers correspond to the keys you play, counted from the lowest pressed key. So, if you play the notes C3-E3-G3 (a C major chord), “1” would mean C3, “2” would mean E3, and “3” would mean G3. Note that you can use the same number in several slots, creating arpeggio patterns that are not possible using the standard play modes.



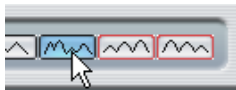
Autopan



This plug-in works a bit like an LFO in a synthesizer, allowing you to send out continuously changing MIDI controller messages. One typical use for this is automatic MIDI panning (hence the name), but you can select any MIDI Continuous Controller event type. The Autopan effect has the following parameters:

Waveform selectors

These determine the shape of the controller curves sent out. The results of most of these waveforms are obvious from looking at the buttons, but a few of them require some extra explanations:



This generates a “random” controller curve.



These generate curves with a “periodical envelope”. The amplitude will gradually increase or decrease over a time, set with the Period parameter (see below).

Period

This is where you set the speed of the Autopan, or rather the length of a single controller curve cycle. The value can be set in ticks (1/480ths of quarter notes), or as rhythmically exact note values (by clicking the arrow buttons next to the value). The lower the note value, the slower the speed. For example, if you set this to 240 (“8th”) the waveform will be repeated every eighth note.

Density

This determines the density of the controller curves sent out. The value can be set in ticks (1/480ths of quarter notes), or as rhythmically exact note values (by clicking the arrow buttons next to the value). The higher the note value, the smoother the controller curve. For example, if you set this to 60 (shown as “32th”) a new controller event will be sent out every 60th tick (at every 1/32 note position).

⚠ You should probably avoid extremely low Density values, as these will generate a very large number of events (which may cause the MIDI instrument to “choke”, delaying notes etc.).

AmpMod

This is only used for the two waveforms with “periodical envelopes” (see above). The period value (set in beats) determines the length of the envelope. In the following figure, Period is set to 4th and the AmpMod is 4 beats. This results in a quarter note-based curve in which the top amplitude decreases gradually, repeated each bar.

Controller

Determines which Continuous Controller type is sent out. Typical choices would include pan, volume and brightness but your MIDI instrument may have controllers mapped to various settings, allowing you to modulate the synth parameter of your choice – check the MIDI implementation chart for your instrument for details!

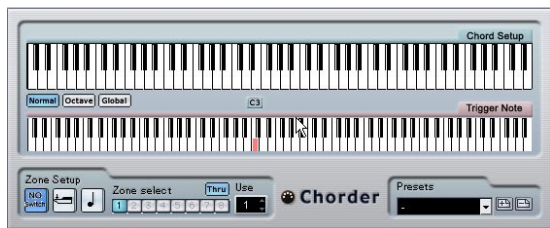
Min and Max

These determine the minimum and maximum controller values sent out, i.e. the “bottom” and “top” of the controller curves.

Chorder

The Chorder is a MIDI chord processor, allowing you to assign complete chords to single keys in a multitude of variations. There are three main modes of operation: Normal, Octave and Global. You switch between these modes by clicking the respective button to the left below the keyboard.

Normal mode

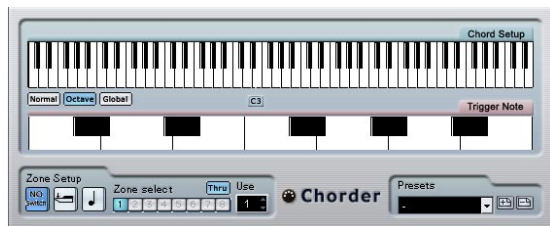


In this mode, you can assign a different chord to each single key on the keyboard. Proceed as follows:

1. Select the key to which you want to assign a chord, by clicking in the lower "Trigger Note" keyboard display.
2. Set up the desired chord for that key by clicking in the upper "Chord Setup" keyboard display. Clicking a key adds it to the chord; clicking it again removes it.
3. Repeat the above with any other keys you wish to use.

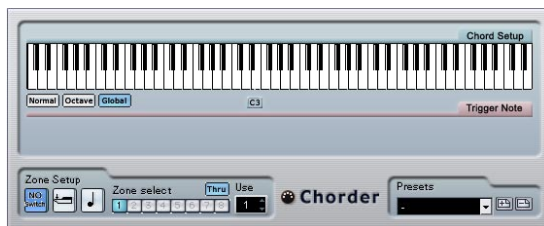
If you now play the keys you have set up, you will instead hear the assigned chords.

Octave mode



The Octave mode is similar to the Normal mode, but you can only set up one chord for each key in an octave (that is, twelve different chords). When you play a C note (regardless of whether it's a C3, C4 or any other octave) you will hear the chord set up for the C key.

Global mode



In the Global mode, you only set up a single chord, using the Chord Setup keyboard display (the lower keyboard display is hidden). This chord is then played by all keys on the keyboard, but transposed according to the note you play.

Using switches

The Switch Setup section at the bottom of the panel allows you to set up variations to the defined chords. This works with all three modes and provides a total of eight variations for each assignable key (that is, a maximum of 8 different chords in Global mode, 12 x 8 chords in Octave mode and 128 x 8 chords in Normal mode).

The variations can be controlled by velocity or note range. Here's how you set it up:

1. Select one of the two switch modes: velocity or note. How to use these is explained below.



The velocity switch mode selected.

2. Specify how many variations you want to use with the Use value box.
 3. Click the first Switch Select button and set up the chord(s) you want for the first variation.
 4. Click the next Switch Select button and set up the chord(s) you want for that variation.
 5. Repeat this for the number of variations you specified with the Use setting.
- Each Switch Select button corresponds to a variation.

6. Now you can play the keyboard and control the variations according to the selected switch modes.
These work as follows:

Switch mode	Description
Velocity	The full velocity range (1–127) is divided into “zones”, according to the number of variations you specified. For example, if you're using two variations (Max is set to 2) there will be two velocity “zones”: 1–63 and 64–127. Playing a note with velocity at 64 or higher will trigger the second variation, while playing a softer note will trigger the first variation.
Note	In this mode, the chorder will play one chord at a time – you cannot play several different chords simultaneously. When the Note switch mode is selected, you play a key to determine the base note for the chord, then press a higher key to select a variation. The variation number will be the difference between the two keys. To select variation 1, press a key one semitone higher than the base note, for variation 2, press a key two semitones higher, and so on.

- To turn the variation switch feature off, select the “No Switch” mode.

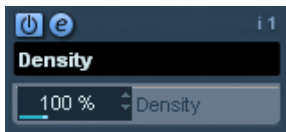
Compress



This MIDI compressor is used for evening out or expanding differences in velocity. Though the result is similar to what you get with the Velocity Compression track parameter, the Compress plug-in presents the controls in a manner more like regular audio compressors. The parameters are:

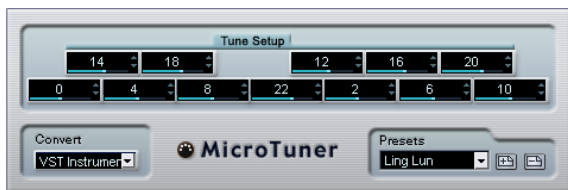
Parameter	Description
Threshold	Only notes with velocities over this value will be affected by the compression/expansion.
Ratio	This determines the rate of compression applied to the velocity values above the threshold level. Ratios greater than 1:1 result in compression (i.e. less difference in velocity) while ratios lower than 1:1 result in expansion (i.e. greater difference in velocity). What actually happens is that the part of the velocity value that is above the threshold value is divided by the ratio value.
Gain	This adds or subtracts a fixed value from the velocities. Since the maximum range for velocity values is 0–127, you may need to use the Gain setting to compensate, keeping the resulting velocities within the range. Typically, you would use negative Gain settings when expanding and positive Gain settings when compressing.

Density



This generic control panel affects the “density” of the notes being played from (or thru) the track. When this is set to 100%, the notes are not affected. Lowering the Density setting below 100% will randomly filter out or “mute” notes. Raising the setting above 100% will instead randomly add new notes.

Micro Tuner

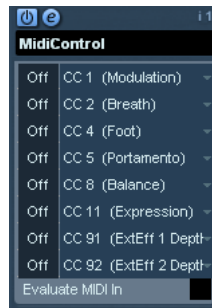


The Micro Tuner lets you set up a different microtuning scheme for the instrument, by detuning each key.

- Each Detune field corresponds to a key in an octave (as indicated by the keyboard display). Adjust a Detune field to raise or lower the tuning of that key, in cents (hundreds of a semitone).
- Set the Convert setting according to whether the track is routed to a VST instrument or a “real” standard MIDI instrument (capable of receiving microtuning information).

The Micro Tuner comes with a number of presets, including both classical and experimental microtuning scales.

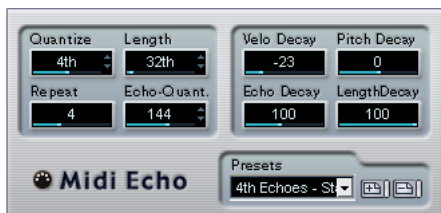
MIDIControl



This generic control panel allows you to select up to eight different MIDI controller types, and use the value fields or sliders (which are displayed when you click on a value field while holding down the [Alt]/[Option] key) to set values for these. A typical use for this would be if you’re using a MIDI instrument with parameters that can be controlled by MIDI controller data (e.g. filter cutoff, resonance, levels, etc.). By selecting the correct MIDI controller types, you can use the plug-in as a control panel for adjusting the sound of the instrument from within Cubase Essential, at any time.

- To select a controller type, use the pop-up menus to the right.
- To deactivate a controller slider, set it to “Off” (drag the slider all the way down).

MIDIEcho



This is an advanced MIDI Echo, which will generate additional echoing notes based on the MIDI notes it receives. It creates effects similar to a digital delay, but also features MIDI pitch shifting and much more. As always it is important to remember that the effect doesn't "echo" the actual audio, but the MIDI notes which will eventually produce the sound in the synthesizer.

The following parameters are available:

Quantize

The echoed notes will be moved in position to a quantizing grid, as set up with this parameter. You can either use the slider or type to set the value in ticks (1/480 ticks of quarter notes) or click the arrow buttons to step between the "rhythmically exact" values (displayed as note values – see the table below). This makes it easy to find rhythmically relevant quantize values, but still allows experimental settings in between.

An example: setting this to "16th" will force all echo notes to be played on exact 16th note positions, regardless of the timing of the original notes and the Echo-Quant. setting.

⇒ To disable quantizing, set this parameter to its lowest value (1).

Length

This sets the length of the echoed notes. This can either be the same as their original notes (parameter set to its lowest value, "Source") or the length you specify manually. You can either set the length in ticks or click the arrow buttons to step between the "rhythmically exact" lengths (displayed as note values – see the table below).

⇒ The length can also be affected by the Length Decay parameter.

Repeat

This is the number of echoes (1 to 12) from each incoming note.

Echo-Quant.

The Echo-Quant. parameter sets the delay time, i.e. the time between a played note and its first echo note. You can either use the slider or type to set the value in ticks (1/480 ticks of quarter notes) or click the arrow buttons to step between the "rhythmically exact" delay times (displayed as note values – see the table below).

For example, setting this to "8th" will cause the echo notes to sound an eighth note after their original notes.

⇒ The echo time can also be affected by the Echo Decay parameter.

Velocity Decay

This parameter allows you to add or subtract to the velocity values for each repeat so that the echo fades away or increases in volume (provided that the sound you use is velocity sensitive). For no change of velocity, set this to 0 (middle position).

Pitch Decay

If you set this to a value other than 0, the repeating (echoing) notes will be raised or lowered in pitch, so that each successive note has a higher or lower pitch than the previous. The value is set in semitones.

For example, setting this to -2 will cause the first echo note to have a pitch two semitones lower than the original note, the second echo note two semitones lower than the first echo note, and so on.

Echo Decay

This parameter lets you adjust how the echo time should be changed with each successive repeat. The value is set as a percentage.

- When set to 100% (middle position) the echo time will be the same for all repeats (as set with the Echo-Quant. parameter).
- If you raise the value above 100, the echoing notes will play with gradually longer intervals (i.e. the echo will become slower).
- If you lower the value below 100, the echoing notes will become gradually faster, like the sound of a bouncing ball.

Length Decay

This parameter lets you adjust how the length of the echoed notes should change with each successive repeat. The higher the setting (25 –100), the longer the echoed notes will be compared to their original notes.

About ticks and note values

The timing and position-related parameters (Echo-Quant., Length and Quantize) can all be set in ticks. There are 480 ticks to each quarter note. While the parameters allow you to step between the rhythmically relevant values (displayed as note values), the following table can also be of help, showing you the most common note values and their corresponding number of ticks:

Note Value	Ticks
1/32 note	60
1/16 note triplet	90
1/16 note	120
1/8 note triplet	160
1/8 note	240
Quarter note triplet	320
Quarter note	480
Half note	960

Note to CC

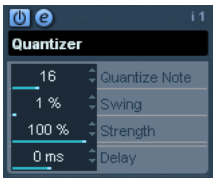


This effect will generate a MIDI continuous controller event for each incoming MIDI note. The value of the controller event corresponds to the note number (pitch) and the single parameter allows you to select which MIDI controller should be sent out (by default controller 7, MIDI volume). The incoming MIDI notes pass through the effect unaffected.

For example, if MIDI volume (controller 7) is selected, notes with low note numbers (pitches) will lower the volume in the MIDI instrument, while higher note numbers will raise the volume. This way you can create “keyboard tracking” of volume or other parameters.

⚠ Note that a controller event is sent out each time a new note is played. If high and low notes are played simultaneously, this could lead to somewhat confusing results. Therefore, the Note to CC effect is probably best applied to monophonic tracks (playing one note at a time).

Quantizer



Quantizing is a function that changes the timing of notes by moving them towards a “quantize grid”. This grid may consist of e.g. straight sixteenth notes (in which case the notes would all get perfect sixteenth note timing), but could also be more loosely related to straight note value positions (applying a “swing feel” to the timing, etc.).

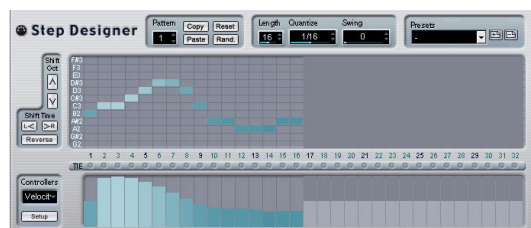
⇒ The main Quantize function in Cubase Essential is described in the Operation manual.

While the Quantize function on the MIDI menu applies the timing change to the actual notes on a track, the Quantizer effect allows you to apply quantizing “on the fly”, changing the timing of the notes in real time. This makes it easier to try out different settings when creating grooves and rhythms. Note however, that the main Quantize function contains settings and features that are not available in the Quantizer.

The Quantizer has the following parameters:

Parameter	Description
Quantize Note	This sets the note value on which the quantize grid is based. Straight notes, triplets and dotted notes are available. For example, "16" means straight sixteenth notes and "8T" means eighth note triplets.
Swing	This allows you to offset every second position in the grid, creating a swing or shuffle feel. The value is a percentage – the higher you set this, the farther to the right every even grid position is moved.
Strength	This determines how close the notes should be moved to the quantize grid. When set to 100%, all notes will be forced to the closest grid position; lowering the setting will gradually loosen the timing.
Delay	This delays (positive values) or advances (negative values) the notes in milliseconds. Unlike the Delay setting in the Track Parameters, this delay can be automated.

Step Designer



The Step Designer is a MIDI pattern sequencer that sends out MIDI notes and additional controller data according to the pattern you set up. It does not make use of the incoming MIDI, other than automation data (such as recorded pattern changes).

Creating a basic pattern

1. Use the Pattern selector to choose which pattern to create.

Each Step Designer can hold up to 200 different patterns.

2. Use the Quantize setting to specify the "resolution" of the pattern.

In other words, this setting determines how long each step is. For example, if Quantize is set to "16th" each step will be a sixteenth note.

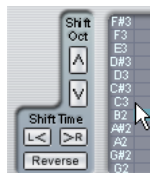
3. Specify the number of steps in the pattern with the Length setting.

As you can see in the note display, the maximum number of steps is 32. For example, setting Quantize to 16 and Length to 32 would create a two bar pattern with sixteenth note steps.

4. Click in the note display to insert notes.

You can insert notes on any of the 32 steps, but the Step Designer will only play back the number of steps set with the Length parameter.

- The display spans one octave (as indicated by the pitch list to the left). You can scroll the displayed octave up or down by clicking in the pitch list and dragging up or down. This way you can insert notes at any pitch. Note that each step can contain one note only – the Step Designer is monophonic.



Click and drag to view other octaves.

- To remove a note from the pattern, click on it again.

5. Select "Velocity" on the Controllers pop-up menu.

This pop-up menu determines what is shown in the lower controller display.

6. Adjust the velocity of the notes by dragging the velocity bars in the controller display.



7. To make notes shorter, select "Gate" on the Controllers pop-up menu and lower the bars in the controller display.

When a bar is set to its maximum value (fully up), the corresponding note will be the full length of the step (as set with the Quantize parameter).

8. To make notes longer, you can tie two notes together. This is done by inserting two notes and clicking the Tie button below the second note.

When the Tie button is lit for a note, it won't retrigger – instead the previous note will be lengthened. Also, the tied (second) note will automatically get the same pitch as the first note. You can add more notes and tie them in the same way, creating longer notes.

9. If you now start playback in Cubase Essential, the pattern will play as well, sending out MIDI notes on the track's MIDI output and channel (or, if you have activated the Step Designer as a send effect, on the MIDI output and channel selected for the send in the Inspector).

Adding controller curves

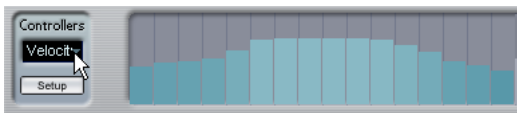
The Controllers pop-up menu has two more items: two controller types.

- You can select which two controller types (filter cutoff, resonance, volume, etc.) should be available on the pop-up menu by clicking the Setup button and selecting controllers from the lists that appears.

This selection is global to all patterns.

- To insert controller information in a pattern, select the desired controller from the pop-up menu and click in the controller display to draw events.

The MIDI controller events will be sent out during playback along with the notes.



⇒ If you drag a controller event bar all the way down, no controller value will be sent out on that step.

Other pattern functions

The following functions make it easier to edit, manipulate and manage patterns:

Function	Description
Shift Oct	These buttons allow you to shift the entire pattern up or down in octave steps.
Shift Time	Moves the pattern one step to the left or right.
Reverse	Reverses the pattern, so that it plays backwards.
Copy/Paste	Allows you to copy the current pattern and paste it in another pattern location (in the same Step Designer or another).
Reset	Clears the pattern, removing all notes and setting controller values to default.
Random	Generates a completely random pattern – useful for experimenting.
Swing	The Swing parameter allows you to offset every second step, creating a swing or shuffle feel. The value is a percentage – the higher you set this, the farther to the right every even step is moved.
Presets	Note that a stored Preset contains all 200 patterns in the Step Designer.

Automating pattern changes

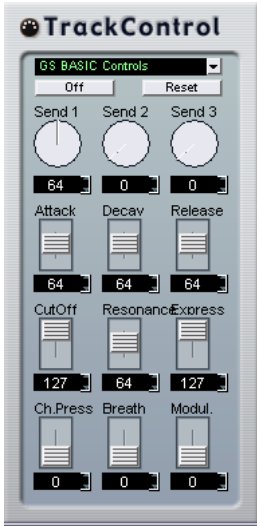
You can create up to 200 different patterns in each Step Designer – just select a new pattern and add notes and controllers as described above.

Typically, you want the pattern selection to change during the project. You can accomplish this by automating the Pattern selector, either in real time by activating the Write automation and switching patterns during playback or by drawing in the automation subtrack for the Step Designer's MIDI track. Note that you can also press a key on your MIDI keyboard to change patterns. For this, you have to set up the Step Designer as an insert effect for a record enabled MIDI track. Press C1 to select pattern 1, C#1 to select pattern 2, D1 to select pattern 3, D#1 to select pattern 4 and so on. If you want, you can record these pattern changes as note events on a MIDI track. Proceed as follows:

1. Select the desired MIDI track or create a new one and activate the Step Designer as an insert effect.
2. Set up several patterns as described above.
3. Press the Record button and press the desired keys on your keyboard to select the corresponding patterns. The pattern changes will be recorded on the MIDI track.
4. Stop recording and play back the MIDI track. You will now hear the recorded pattern changes.

⇒ This will only work for the first 92 patterns.

Track Control



The Track Control effect contains three ready-made control panels for adjusting parameters on a GS or XG compatible MIDI device. The Roland GS and Yamaha XG protocols are extensions of the General MIDI standard, allowing for more sounds and better control of various instrument settings. If your instrument is compatible with GS or XG, the Track Controls effect allows you to adjust sounds and effects in your instrument from within Cubase Essential.

Selecting a control panel

At the top of the Track Controls effect window you will find a pop-up menu. This is where you select which of the available control panels to use:

Control panel	Description
GS Basic Controls	Effect sends and various sound control parameters for use with instruments compatible with the Roland GS standard.
XG Effect + Sends	Effect Sends and various sound control parameters for use with instruments compatible with the Yamaha XG standard.
XG Global	Global settings (affecting all channels) for instruments compatible with the Yamaha XG standard.

About the Reset and Off buttons

Regardless of the selected mode, you will find two buttons labelled “Off” and “Reset” at the top of the control panel:

- Clicking the Off button will set all controls to their lowest value, without sending out any MIDI messages.
- Clicking the Reset button will set all parameters to their default values, and send out the corresponding MIDI messages.

For most parameters, the default values will be zero or “no adjustment”, but there are exceptions to this. For example, the default Reverb Send settings are 64.

GS Basic Controls

The following controls are available when the GS Basic Controls mode is selected:

Control	Description
Send 1	Send level for the reverb effect.
Send 2	Send level for the chorus effect.
Send 3	Send level for the “variation” effect.
Attack	Adjusts the attack time of the sound. Lowering the value shortens the attack, while raising it gives a slower attack. Middle position (64) means no adjustment is made.
Decay	Adjusts the decay time of the sound. Lowering the value shortens the decay, while raising it makes the decay longer.
Release	Adjusts the release time of the sound. Lowering the value shortens the release, while raising it makes the release time longer.
Cutoff	Adjusts the filter cutoff frequency.
Resonance	Adjusts the filter resonance.
Express	Allows you to send out expression pedal messages on the track's MIDI channel.
Ch.Press.	Allows you to send out aftertouch (channel pressure) messages on the track's MIDI channel. This is useful if your keyboard cannot send aftertouch, but you have sound modules that respond to aftertouch. The default value for this parameter is zero.
Breath	Allows you to send breath control messages on the track's MIDI channel.
Modul.	Allows you to send modulation messages on the track's MIDI channel (just as you normally do with a modulation wheel on a MIDI keyboard).

XG Effects + Sends

The following controls are available when the XG Effects + Sends mode is selected:

Control	Description
Send 1	Send level for the reverb effect.
Send 2	Send level for the chorus effect.
Send 3	Send level for the “variation” effect.
Attack	Adjusts the attack time of the sound. Lowering this value shortens the attack, while raising it gives a slower attack. Middle position means no adjustment is made.
Release	Adjusts the release time of the sound. Lowering this value shortens the release, while raising it makes the release time longer. Middle position means no adjustment is made.
Harm.Cont	Adjusts the harmonic content of the sound.
Bright	Adjusts the brightness of the sound.
CutOff	Adjusts the filter cutoff frequency.
Resonance	Adjusts the filter resonance.

XG Global Settings

In this mode, the parameters affect global settings in the instrument(s). Changing one of these settings for a track will in fact affect all MIDI instruments connected to the same MIDI output, regardless of the MIDI channel setting of the track. Therefore, to avoid confusion it might be a good idea to create an empty track and use this only for these global settings.

The following controls are available:

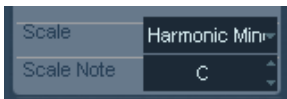
Control	Description
Eff. 1	This allows you to select which type of reverb effect should be used: No effect (the reverb turned off), Hall 1–2, Room 1–3, Stage 1–2 or Plate.
Eff. 2	This allows you to select which type of chorus effect should be used: No effect (the chorus turned off), Chorus 1–3, Celeste 1–3 or Flanger 1–2.
Eff. 3	This allows you to select one of a large number of “variation” effect types. Selecting “No Effect” is the same as turning off the variation effect.
Reset	Sends an XG reset message.
MastVol	This is used to control the Master Volume of an instrument. Normally you should leave this in its highest position and set the volumes individually for each channel (with the volume faders in the Cubase Essential mixer or in the Inspector).

Track FX

This plug-in is essentially a duplicate of the Track Parameter section. This can be useful if you e.g. need extra Random or Range settings, or if you prefer to have your track parameters in a separate window (to get this, [Alt]/[Option]-click the Edit button for the effect).

The Track FX also includes an additional function that isn't available among the track parameters:

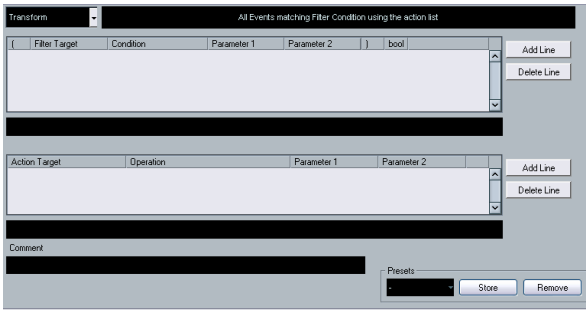
Scale Transpose



This allows you to transpose each incoming MIDI note, so that it fits within a selected musical scale. The scale is specified by selecting a key (C, C#, D, etc.) and a scale type (major, melodic or harmonic minor, blues, etc.).

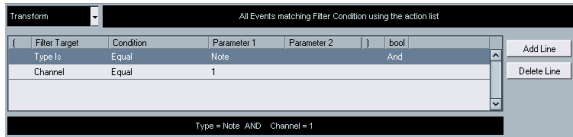
⇒ To turn Scale Transpose off, select “No Scale” from the Scale pop-up menu.

Transformer



With the Transformer you can perform very powerful MIDI processing on the fly, without affecting the actual MIDI events on the track.

Setting up filter conditions



The upper list is where you set up the filter conditions, determining which events to find. The list contains one or several conditions, each on a separate line.

- To add a new line (condition) click the Add Line button to the right.
The new line is added at the bottom of the list. If there are many lines, you may need to use the scrollbar to the right to view them.
- To remove a line, select it and click the Delete Line button to the right.

You set up a filter condition line by clicking in the columns and selecting options from the pop-up menus that appear. Here is a brief description of the columns:

Column	Description
Left bracket	This is used for “bracketing” several lines together when creating conditions with multiple lines and the boolean operators And/Or. See “Combining multiple condition lines” on page 42 .
Filter Target	Here you select which property to look for when finding events. Your choice here affects the available options in the other columns as well, see below.

Column	Description
Condition	This determines how the Transformer should compare the property in the Filter Target column to the values in the Parameter columns (Equal, Unequal, Bigger, etc. – see the separate table below). The available options depend on the Filter Target setting.
Parameter 1	Here you set which value the event properties should be compared to (a numeric value or a choice from a pop-up menu, depending on the Filter Target).
Parameter 2	This column is only used if you have selected one of the “Range” options in the Condition column. Typically, this allows you to find all events with values inside (or outside) the range between Parameter 1 and Parameter 2.
Right bracket	This is used for “bracketing” several lines together. See “Combining multiple condition lines” on page 42 .
bool	This allows you to insert the boolean operators And/Or, when creating conditions with multiple lines. see “Combining multiple condition lines” on page 42 .

Conditions

The options in the Condition column have the following meaning (note that the available Condition options depend on the Filter Target setting):

Condition	Events will be found if their Filter Target property...
Equal	...has the exact same value as set up in the Parameter 1 column.
Unequal	...has any value other than the one set up in the Parameter 1 column.
Bigger	...has a value higher than the one set up in the Parameter 1 column.
Bigger or Equal	...has a value that is the same as or higher than the one set up in the Parameter 1 column.
Less	...has a value lower than the one set up in the Parameter 1 column.
Less or Equal	...has a value that is the same as or lower than the one set up in the Parameter 1 column.
Inside Range	...has a value that is between the values set up in the Parameter 1 and Parameter 2 columns. Note that Parameter 1 should be the lower value and Parameter 2 the higher.
Outside Range	...has a value that is not between the values set up in the Parameter 1 and Parameter 2 columns.
Note is equal to	...is the note specified in the Parameter 1 column, regardless of octave (Pitch only). Lets you find e.g. all C notes, in all octaves.

⇒ The Conditions for the “Property” filter target are different, see [“Searching for properties”](#) on [page 41](#).

Below, the different Filter Targets (and their corresponding Condition and Parameter options) are described in more detail.

Searching for notes of certain lengths

Only note events have lengths (actually, a note is made up of separate note-on and note-off events but in Cubase Essential it is considered as a single event with a length). Therefore, the “Length” Filter Target is only valid if you’re specifically searching for notes – there has to be another condition line with the Filter Target “Type”, Condition “Equal” and Parameter 1 set to “Note”. See [“Combining multiple condition lines”](#) on [page 42](#) for more information about using multiple filter conditions.

Searching for Value 1 or Value 2

A MIDI event is composed of several values. The meanings of value 1 and 2 depend on the type of event:

Event type	Value 1	Value 2
Notes	The Note Number/Pitch.	The velocity of the note.
PolyPressure	The key that was pressed.	The amount of pressure for the key.
Controller	The type of Controller, displayed as a number.	The amount of Control Change.
Program Change	The Program Change number.	Not used.
Aftertouch	The amount of pressure.	Not used.
Pitchbend	The “fine tune” of the bend. Not always used.	The coarse amount of bend.

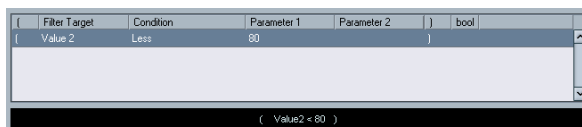
⇒ System Exclusive events are not included in the table above, since they don’t use value 1 and 2.

Since value 1 and 2 have different meanings for different events, searching for e.g. value 2 = 64 would both find notes with the velocity 64 and controllers with the amount 64, etc. If this is not what you want, you have to add an additional filter condition line with the Filter Target “Type”, specifying which type of events to find (see below).

⚠ This is particularly useful when searching for note pitch or velocity values, as described below.

The general procedures when searching for value 1 or 2 are:

- If you select any Condition other than the Range options, you set up a specific value in the Parameter 1 column.



Here, the Transformer will find all events with a value 2 less than 80.

- If you select the Inside or Outside Range option in the Condition column, the range consists of the values between Parameter 1 and Parameter 2.

Note that Parameter 1 must have the lower value.

Searching for note pitch or velocity

If you add another condition line with the Filter Target “Type”, Condition “Equal” and Parameter 1 set to “Note”, the Transformer will “know” you are searching for pitch or velocity. This has the following benefits:

- The Filter Targets Value 1 and Value 2 will be displayed as “Pitch” and “Velocity” respectively, making it easier to grasp the function of the filter condition.
- Pitch values in the Parameter columns will be displayed as note names (C3, D#4, etc.). When entering pitch values you can either type a note name or a MIDI note number (0–127).
- When Value 1 (pitch) is selected as Filter Target, an additional option appears in the Condition column: “Note is equal to”. When this is selected, you specify a note name in the Parameter 1 column but without any octave number (C, C#, D, D#, etc.). The Transformer can then find all notes of a certain key, in all octaves.

See [“Combining multiple condition lines”](#) on [page 42](#) for more information on working with multiple filter condition lines.

Searching for controllers

There is similar extended functionality when searching for controllers: If you’ve added an additional “Type = Controller” condition line, the Transformer will “know” you are searching for controllers. The Parameter 1 column will then show the names of the MIDI controllers (Modulation, Volume, etc.) when Value 1 is selected as Filter Target.

Searching for MIDI channels

Each MIDI event contains a MIDI channel setting (1-16). Normally, these settings are not used, since the MIDI event plays back on the MIDI channel set for its track. However, you can come across MIDI parts with events set to different channels, for example in the following scenarios:

- If you have recorded MIDI from an instrument sending on several different channels (e.g. a master keyboard with different key zones).
- If you have imported a MIDI file of type 0 (with a single track, containing MIDI events with different channel settings).

Searching for MIDI channel values is straightforward; you select a Condition and enter a MIDI channel (1-16) in the Parameter 1 column (and, if you've selected one of the Range Conditions, a higher channel in the Parameter 2 column, creating a value range).

Searching for event types

Selecting Type as the Filter Target allows you to find events of a certain type only.

The Condition column contains only three options: Equal, Unequal and All Types.

Clicking the Parameter 1 column displays a pop-up menu, listing the available event types (Note, PolyPressure, Controller, etc.).

The Transformer will find all events matching or not matching the selected type (depending on the Condition).

⚠ As mentioned above, selecting "Type = Note" or "Type = Controller" adds some additional functionality to the Transformer. You should make it a habit to add a Type condition when applicable.

Searching for properties

On the Filter Target pop-up menu you will find an option called Property. This allows you to search for properties that are not part of the MIDI standard but rather event-specific program settings.

When the Property option is selected, the Condition column has two options: "Property is set" and "Property is not set". Which property to look for is specified in the Parameter 1 column. The options are "muted" and "selected". Two examples:

Filter Target	Condition	Parameter 1	Parameter 2	bool
Property	Property is set	Event is muted		
(Flag flagSet muted)				

Here, the Transformer will find all muted events.

Filter Target	Condition	Parameter 1	Parameter 2	bool
Property	Property is set	Event is selected		And
Property	Property is set	Event is muted		
(Flag flagSet selected AND Flag flagSet muted)				

Here, the Transformer will find all events that are selected and muted.

Searching for event contexts

On the Filter Target pop-up menu you will find an option called "Last Event". This can be used to perform context-dependent searches.

"Last Event" indicates the state of an event which has already passed the Transformer. The condition has to be combined with Parameter 1 and Parameter 2.

Below follow a few examples on how the Last Event filter target can be used.

Here, the action will only be performed when the sustain pedal is down:

Filter Target	Condition	Parameter 1	Parameter 2
Last Event	Equal	MIDI Status	176/Controller
Last Event	Equal	Value 1	64
Last Event	Bigger	Value 2	64

In this example, the action will be performed when the note C1 is pressed:

Filter Target	Condition	Parameter 1	Parameter 2
Type is	Equal	Note	
Last Event	Equal	Note is playing	36/C1

In this example, the action will be performed after playing the C1 note:

Fiter Target	Condition	Parameter 1	Parameter 2
Last Event	Equal	Value 1	36/C1

Combining multiple condition lines

As described above, you can add condition lines by clicking the Add Line button to the right of the list. The result of combining condition lines depends on the boolean And/ Or operators and the brackets.

The bool column

By clicking in the “bool” column to the right in the list, you can select a boolean operator: “And” or “Or”. A boolean operator combines two condition lines and determines the result in the following way:

⇒ If two condition lines are combined with a boolean And, both conditions must be fulfilled for an event to be found.

(	Filter Target	Condition	Parameter 1	Parameter 2	)	bool
(	Type Is	Equal	Note			And
	Property	Property is set	Event is muted)	
(Type = Note AND Flag flagSet muted)						

The Transformer will only find events that are notes and are muted.

If two condition lines are combined with a boolean Or, one of the conditions (or both) must be fulfilled for an event to be found.

(	Filter Target	Condition	Parameter 1	Parameter 2	)	bool
(	Type Is	Equal	Note			Or
	Property	Property is set	Event is muted)	
(Type = Note OR Flag flagSet muted)						

The Input Transformer will find all events that are notes (regardless of mute status) and all events that are muted (regardless of their type).

⚠ When you add a new condition line, the boolean setting defaults to And. Therefore, if all you want to do is set up two or more conditions that all must be met for an event to be found, you don't have to think about the boolean column – just add the required lines and make the usual filter settings.

Using brackets

The bracket (parenthesis) columns let you enclose two or more condition lines, dividing the conditional expression into smaller units. This is only relevant when you have three or more condition lines and want to use the boolean Or operator. This is how it works:

⇒ Without brackets, the conditional expressions are evaluated according to their order in the list.

(	Filter Target	Condition	Parameter 1	Parameter 2	)	bool
(	Type Is	Equal	Note			And
	Property	Property is set	Event is muted			Or
	Channel	Equal	1)	
Type = Note AND Flag flagSet muted OR Channel = 1						

In this case we have the expression Type = Note AND Event is muted OR Channel = 1, without brackets. This means that the Transformer will find all muted MIDI notes, as well as all events (regardless of their type) set to MIDI channel 1.

Maybe you wanted to find all notes that are either muted or use the MIDI channel 1 (but no non-note events)? Then you need to add some brackets:

(	Filter Target	Condition	Parameter 1	Parameter 2	)	bool
(	Type Is	Equal	Note			And
	Property	Property is set	Event is muted			Or
	Channel	Equal	1)	
Type = Note AND (Flag flagSet muted OR Channel = 1)						

Here the expression is Type = Note AND (Event is muted OR Channel = 1), which will find what you want. The rule behind this is:

⇒ Expressions within brackets are evaluated first.

If there are several layers of brackets, these are evaluated “from the inside out”, starting with the innermost brackets.

You add brackets by clicking in the bracket columns and selecting an option. Up to triple brackets can be selected.

Editing filter conditions as text

(	Filter Target	Condition	Parameter 1	Parameter 2	)	bool
(	Type Is	Equal	Note			And
	Property	Property is set	Event is muted			Or
	Channel	Equal	1)	
Type = Note AND (Flag flagSet muted OR Channel = 1)						

The area directly below the filter condition list shows you the current filter conditions as text. It also allows you to enter and edit the filter conditions in textual form. For tips on the syntax, please study the included presets.

⇒ There is no additional functionality involved when editing filter conditions as text; it is simply another way to make settings.

When you enter something in the text field you will see the corresponding settings appear in the filter condition list (provided that you have used the correct syntax).

Selecting a function



The pop-up menu in the top left corner of the Transformer is where you select the function – the basic type of editing to be performed. When you select an option from the pop-up menu, the field to the right displays a clarifying text, making it easier to see what the function does.

The current settings are automatically applied in real time during playback or live playing.

The following options are available:

Delete

This function will remove (or “mute”) all found events from the “output stream” – the actual events on the track are not affected.

Transform

Changes one or several aspects of the found events. You set up exactly what should be changed in the action list, see below.

Insert

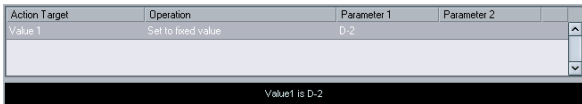
This will create new events and insert these into the output stream. The new events will be based on the events found by the Transformer effect’s filter conditions, but with any changes you have set up in the action list applied.

Another way of expressing this is that the Insert function copies the found events, transforms them according to the action list and inserts the transformed copies among the existing events.

Insert Exclusive

This will transform the found events according to the action list. Then, all events that were not found (that didn’t meet the filter conditions) are removed from the output stream.

Specifying actions



The lower list in the Transformer window is the action list. This is where you specify any changes that should be made to the found events (relevant for all function types except Delete).

The handling of the action list is similar to the filter condition list, but without the brackets and booleans. You simply add lines by clicking the Add Line button to the right, and fill out the columns as required. To remove a superfluous action line, select it and click the Delete Line button.

Action Target

This is where you select the property that should be changed in the events:

Option	Description
Value 1	This adjusts value 1 in the events. As described in the section “Searching for Value 1 or Value 2” on page 40 , the property of value 1 depends on the event type. For notes, value 1 is the pitch.
Value 2	This adjusts value 2 in the events. As described in the section “Searching for Value 1 or Value 2” on page 40 , the property of value 2 depends on the event type. For notes, value 2 is the velocity value.
Channel	Allows you to change the MIDI channel setting. See “Searching for MIDI channels” on page 41 .
Type	Allows you to change an event from one type to another, e.g. transform aftertouch events to modulation events.
Value 3	This adjusts value 3 in the events, which is used for handling note-off velocity when searching for properties. See “Searching for properties” on page 41 .

Operation

This setting determines what to do with the Action Target. The options on this pop-up menu are different depending on the selected Action Target. Below, all available operations are listed:

Add

Adds the value specified in the Parameter 1 column to the Action Target.

Subtract

Subtracts the value specified in the Parameter 1 column from the Action Target.

Multiply by

Multiplies the Action Target value with the value specified in the Parameter 1 column.

Divide by

Divides the Action Target value by the value specified in the Parameter 1 column.

Round by

This “rounds” the Action Target value using the value specified in the Parameter 1 column. In other words, the Action Target value is changed to the closest value that can be divided by the Parameter 1 value.

Set Random Values between

This will set the Action Target value to a random value within the range specified with Parameter 1 and 2.

Set Relative Random Values between

This will add a random value to the current Action Target value. The added random value will be within the range specified with Parameter 1 and 2. Note that these can be set to negative values.

For example, if you set Parameter 1 to -20 and Parameter 2 to +20, the original Action Target value will get a random variation, never exceeding ± 20 .

Set to fixed value

This sets the Action Target to the value specified in the Parameter 1 column.

Transpose to Scale

This is only available when Action Target is set to Value 1, and when the filter conditions are specifically set up to find notes (a “Type = Note” filter condition line has been added). When “Transpose to Scale” is selected, you can specify a musical scale using the Parameter 1 and 2 columns. Parameter 1 is the key (C, C#, D, etc.) while Parameter 2 is the type of scale (major, melodic or harmonic minor, etc.).

Each note will be transposed to the closest note in the selected scale.

Use Value 2

This is only available when Action Target is set to Value 1. If this option is selected, the Value 2 setting in each event will be copied to the Value 1 setting.

For example, this would be useful if you are transforming all Modulation controllers to Aftertouch events (since controllers use Value 2 for their amount, while Aftertouch uses Value 1 – see [“Searching for Value 1 or Value 2” on page 40](#)).

Use Value 1

This is only available when Action Target is set to Value 2. If this option is selected, the Value 1 setting in each event will be copied to the Value 2 setting.

Mirror

This is only available when Action Target is set to Value 1 or Value 2. When this option is selected, the values will be “mirrored” or “flipped” around the value set in the Parameter 1 column.

In the case of notes, this will invert the scale, with the key set in the Parameter 1 column as “center point”.

Applying the defined actions

When using the Transformer effect, the processing is applied to the events played back from the track (or played live “thru” the track) as soon as you set it up.

Since no existing events on the track are affected by the Transformer setting, there is no need for undo.

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