Claw Synthesizer Manual

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About Claw

Claw is only an appetizer of the power of the **Beast** synthesizer. **Beast** has four-oscillators, two filtering sections, two amplitude control sections plus the stereo-delay and reverb effects.

Check out the **Beast** and download the demo version from:

http://www.reFX.net/

Signal Generation

Claw is a subtractive synthesizer. Subtractive means that a filter is used to filter out unneeded harmonic contents from a generated, harmonically rich signal. Below is a diagram and explanation on how the sound generation in Claw works:
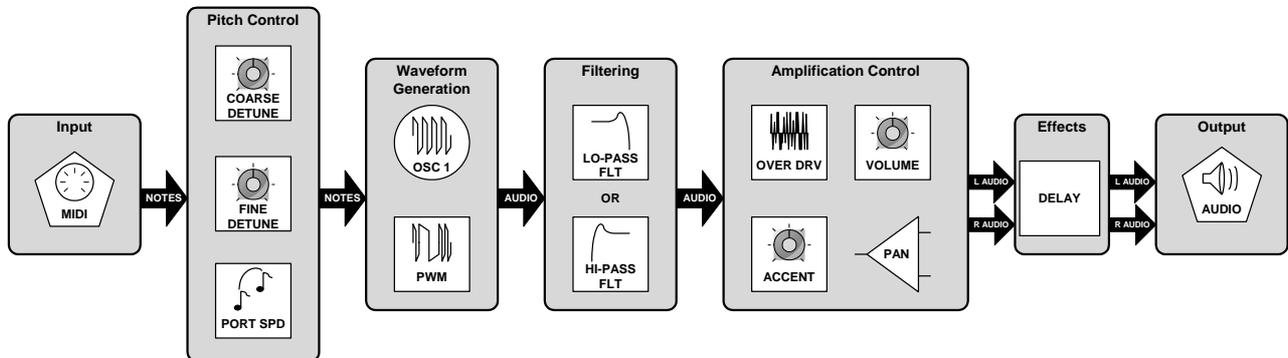
Pitch Control

When a note is played on your midi-keyboard or in your host software, Claw starts to play the one oscillator with the frequency depending on the note and the current "detune" settings you have used. Also the current portamento speed affects how fast the pitch slides from the old note value (if any) to the new note value.

Waveform Generation

The oscillator can generate a mixture of three different waveforms. The first is a triangle waveform that morphs into a pulse-width-modulated saw waveform that morphs into a pulse-width-modulated square waveform. The Pulse-Width-Modulation (PWM) control changes its duty-cycle-length and animates the sound.

Filtering

The filtering part can be configured to either act as a hi-pass filter (filters out frequencies lower than the set frequency) or as a lo-pass filter (filtering out frequencies higher than the set frequency).

Amplitude Control

The amplitude control part is used to affect the loudness of the signal and add overdrive effect. Accentuation is a velocity sensitive volume control. Also the panning of the signal in the left-right stereo field is decided at this point.

Effects

The stereo-delay effect then adds its finalizing touches to the signal, allowing you control over how much delay and with what parameters you want in the sound.

User Interface

As you can see, the user interface layout is quite close to the functional diagram in chapter "Signal Generation". This is by design, not by accident. The aim of the user interface in Claw is to help you generate the sounds you want.

Pitch Control
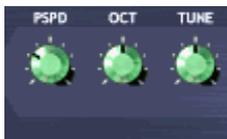
PSPD – Portamento Speed
Controls how fast the note slides from previous to next.

OCT – Octave Detune
Detunes the signal from –2 octaves to +2 octaves.

TUNE – Fine Detune
Finer adjustment of the detuning from –1 octave to +1 octave. Provided to make it easier to do slight bends with automation tools.

Waveform Generation Controls

WAVE – Generated Waveform
Chooses what of the three waveforms (or what kind of morph) is generated.

PWM – Pulse Width Modulation Depth
Chooses the pulse width modulation depth applied to the generated signal. Note: the pure triangle waveform is unaffected by the pulse-width-modulation.

PWM Synchronization Control

	(Off)	When the LED is off, the PWM is unaffected by key-on MIDI events. The PWM just cycles independently.
	(Green)	When the LED is green, the PWM is synchronized to 50% upon each key-on MIDI event.
	(Red)	When the LED is red, the PWM is synchronized to 99% upon each key-on MIDI event.

Filtering Controls

CUTOFF – Filter Cut-off Frequency
Chooses the filter cut-off frequency. How this affects the signal is dependant on the current filter mode (hi-pass or lo-pass).

Filter Mode Selection
(White)   In this mode the filter acts as a low-pass filter that lets only frequencies lower than the selected cut-off frequency pass.

(Yellow)   In this mode the filter acts as a hi-pass filter that lets only frequencies higher than the selected cut-off frequency pass.

Filter Velocity Control
(Off)   When the LED is off, the filter cut-off frequency is unaffected by the note velocity. Whatever the note velocity is, the filter cut-off frequency stays in the value defined by the knob.

(Green)   When the LED is green, the filter cut-off frequency increases with note velocity up to the current setting. If you set the filter cut-off to rightmost position and choose this velocity control mode, the note velocity will have full control over the filter cut-off.

(Red)   When the LED is red, the filter cut-off frequency decreases with the note velocity. If you set the filter cut-off to rightmost position and choose this velocity control mode, the note velocity will have full **inverse** control over the filter cut-off.

RESO – Resonance Level
Defines how much the frequencies near the cut-off frequency are emphasised. When this is set high enough you will get acid-like sounds.

ENVMOD – Envelope Modulation
Sets the amount of envelope-modulation the filter receives. The envelope is a simple decaying ramp. You can control the decay-speed with the decay-control.

DECAY – Decay Control
Controls the decay speed of the ramp envelope.

Amplitude Controls

ACCENT
Provides an additional velocity sensitive volume control. Ranges from 20% to 100%.

Accent Velocity Control

	(Off)	When the LED is off, the accent is unaffected by the note velocity. Whatever the note velocity is, the accent stays in the value defined by the knob.
	(Green)	When the LED is green, the accent increases with note velocity up to the current setting. If you set the accent to rightmost position and choose this velocity control mode, the note velocity will have full control over the accent.
	(Red)	When the LED is red, the accent decreases with note velocity. If you set the accent to rightmost position and choose this velocity control mode, the note velocity will have full **inverse** control over the accent.

DRIVE
The drive knob determines how much the sound gets distorted. Use this to remove the clean-ness which most people don't like. The drive-level can also be controlled by velocity in the same manner as the cut-off

Drive Velocity Control

	(Off)	When the LED is off, the overdrive amount is unaffected by the note velocity. Whatever the note velocity is, the overdrive amount stays in the value defined by the knob.
	(Green)	When the LED is green, the overdrive amount increases with note velocity up to the current setting. If you set the overdrive amount to rightmost position and choose this velocity control mode, the note velocity will have full control over the overdrive amount.
	(Red)	When the LED is red, the overdrive amount decreases with note velocity. If you set the overdrive amount to rightmost position and choose this velocity control mode, the note velocity will have full **inverse** control over the overdrive amount.

VOLUME
Controls the volume of the generated sound.

PAN
This knob defines where in the stereo-field the sound will be positioned. When you enable the small button below this knob you switch the panning into basis-mode. This will move each other note to the other side of the stereo-field. The knob then controls how wide the stereo-field is.

Panning Mode

(White)   In this mode the pan knob controls directly the positioning of the signal in the stereo field. Far left knob position means the signal is routed only to the left channel. Far right knob position means the signal is routed only to the right channel.

(Yellow)   In this "basis" mode the pan knob controls how wide the panning field is. Every other note is panned to the left and every other to the right. Far left knob position means that the signal is always centred. Far right knob position means the every other note is panned far left and every other is panned far right.

Effect Controls

DLY – Delay Level
Controls the level of the delay effects. The greater the level, the better you'll hear the effect.

TIME – Delay Time
Controls the delay-time (synced to host tempo).

FBCK - Feedback
Controls the feedback level of the effect. The higher the feedback level is, the longer the signal will remain in the feedback effect after its been released.

The MIDI-Controllers

Every parameter is connected to a MIDI-Controller. By sending MIDI-Controllers messages you can change this parameter at any time from your host.

MIDI-Controller	*Parameter*
5	Portamento speed
78	Octave
Pitch Bend	Tune
71	Wave
79	PWM
74	Cutoff
75	Resonance
76	EnvMod
77	Decay
11	Accent
6	Drive
7	Volume
8	Pan
84	PWM mode (free, 50%, 99%)
73	Filter mode (low/high)
80	Cutoff velocity (none, +, -)
81	Accent velocity (none, +, -)
82	Drive velocity (none, +, -)
83	Pan mode (direct, basis)
91	Delay mix
92	Delay time
93	Delay feedback

Contact and Support

We have tried to keep **Claw** as bug-free as possible, but you never can be 100% certain things work as they should in the world of software. So if you should encounter any problems or if you have suggestions for future revisions, don't hesitate to contact our technical support at:

support@refx.net

Or come and visit us at:

http://www.reFX.net/

Thank you.

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