



Native Instruments Absynth 5: An overview of the synthesizer control elements in the Patch and LFO Window

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Abstract

This document gives an overview of the GUI input elements of the Native Instruments Absynth 5 software synthesizer in the Patch and in the LFO Window. A number of tables list the common and different input variables and elements in the various GUI subwindows. Ranges of input parameters are shown; this document can be used as a Quick Reference, in addition to existing documentation. Document history: created March 2013.

1 The Patch Window

The **Patch Window** contains three parallel (Signal) Channels and a combined Master Channel. The Signal Channels are shown as vertical elements in the GUI. They are labeled A, B and C and each channel has a column of three slots. Each signal channel may contain up to four types of modules:

The Oscillator module. This is the signal source and will always go in the upper slot in the channel (at top of page). See Section 1.1 for the types of oscillators and their parameters;

The Filter, Modulator, or Waveshaper modules (Module Slot 1 and 2) These will process the output of an upstream module. They may be loaded in either the middle or lower slot in each signal channel;

Each Signal Channel has a **Volume Slider** and **Pan** control element at the bottom of the column. Each Module in the Patch Window has an **Edit** pulldown menu for copying and pasting modules, channels and handling templates. The **Master Channel** at the bottom of the page combines the A, B and C signals after the Volume Slider and with Pan Position. See Section 1.5 for further details.

1.1 The Oscillator Module

An **Oscillator Module** GUI may have up to three tabs, labeled: **Main**, **Mod** and **Uni**. These open the **Main Panel** (with parameter settings for the main oscillator), the **Mod Panel** (settings for the modulator) or the **Uni Panel** (multiple voices, see Section 1.1.1). The oscillator mode can be selected in a pulldown menu in the **Main Panel**; see Table 1 for a comparison between the parameter sets for these modes.

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Table 1: The **Oscillator Module** in the Patch Window. **WF**: Waveform Selector (opens dialog window with waveform list), **SW**: Sample waveform selector, **f**: Frequency Control (see Table 3). Parameters and ranges: $\phi_O = [0.0 \leftrightarrow 0.999]$, $\phi_M = [-1.0 \leftrightarrow 1.0]$, Balance $G_B = [0.0 \leftrightarrow 1.0]$, Modulation Index $I_M = [0.0 \leftrightarrow 32.0]$, Iterations $N_I = [2, \dots, 7]$, Amount $A = [0.0 \leftrightarrow 100.0]$, Displace $D_i = [0.0 \leftrightarrow 100.0]$, Density $D_e = [3, \dots, 8]$, Scatter $S_c = [0.0 \leftrightarrow 100.0]$, Transposition $N_T = [-128.0 \leftrightarrow 64.0]$. Sample start time $T_b = [0.0 \leftrightarrow 100.0]$, **PM**: Play Mode = [No Loop | Loop All | Loop Edit], Time (playback speed) $T_G = [0.0 \leftrightarrow 9999.99]$ %, Density $D_G = [1, \dots, 8]$, Grain Size $N_G = [128 \leftrightarrow 10,000]$ samples, Random number $N_R = [N_{rF}, N_{rT}, N_{rA}] = [0, \dots, 100]$, **M/S**: Mono/Stereo, Level $G_V = [-103.0 \leftrightarrow 12.0]$ dB, Input channel **Inp** = [None | Input 1 | ... | Input 6]

Synthesis	Main Panel			Mod Panel			Uni Panel	Comment
Parameter: →	WF	f	ϕ_O	G	WF	f	ϕ_M	
Mode: ↓								Wavetable Modes:
All Wavetable modes have an Anti-Alias Switch and Phase Inversion Switch								
Single	+	+	+				+	Single osc mode
Double	+	+	+	G_B	+	+	+	Main and mod osc
FM	+	+	+	I_M	+	+	+	Frequency mod
Ringmod	+	+	+	G_B	+	+	+	Ringmodulation
Parameter: →	WF	f	ϕ_O	P1	P2	P3	P4	Sample-Based:
Fractalize	+	+	+	N_I	A	D_i		Fractalizer
Sync Granular	+	+	+	G_B	D_e	S_c	N_T	Grains
Parameter: →	SW	f	T_b	P1	P2	P3	P4	
Sample	+	+	+	PM				Sample source
Granular	+	+	+	T_G	D_g	N_G	N_R	Sample grains
Audio	M/S			G_V	Inp	[Inp]		Audio in



1.1.1 The Uni Panel

The **Uni Panel** sets the number of voices at the oscillator (signal source) stage. The parameters in this panel determine the relationship between the multiple voices, as shown in Table 2.

Table 2: The **Uni Panel** parameters in the Oscillator Module

Parameter	Value range	Comment
Voices	[1, . . . , 8]	Number of voices
Trans.	[0.0 ↔ 24.0]	The amount of detuning between voices (even voices: ↓, odd-numbered voices: ↑)
Rand Trans	[0.0 ↔ 72.0]	Random detuning in semitone units

1.1.2 The Frequency Control

The **Frequency Control** contains a pulldown menu and a numerical value field. The four menu options are summarized in Table 3. The value field has the format $\pm dd.dddd$ (i.e., positive and negative values, 2 digits before and 4 digits after the decimal point).

Table 3: The pulldown menu options in the **Frequency Control**

Menu Item	Value Range	Comment
Trans	[-128.0 ↔ 64.0]	MIDI pitch key follower. in semitone units (resolution 0.001 cents)
Ratio	[0.001 ↔ 32.0]	Frequency ratios according to the harmonic sequence (2 is an octave higher, 3 an octave plus fifth, etc.)
Hz	[0.001 ↔ 22,000.0]	Fixed frequency in Hertz
Note	[0.0 ↔ 128.0]	Fixed pitch according to MIDI note number (60 = C_3 , i.e., central C)

1.2 The Filter Module

Most filter modes in the **Filter Module** GUI have two tabs, labeled: **Main**, and **FB** (there are a few exceptions). The filter mode can be selected in a pulldown menu in the **Main Panel**; see Table 4 for a comparison of the parameter sets for these modes. For the **FB (Feedback) Panel** settings, see Subsection 1.2.1. The **Cloud Filter Mode**, based on granular delay, has different tabs and parameters; see Table 5.

1.2.1 The FB Panel

The **FB (Feedback) Panel** in the Filter Module contains a pulldown menu for selecting the feedback mode shown; see Table 6.



Table 4: The **Filter Mode** selector in the Filter Module of the Patch Window. **FB Panel:** Feedback Panel, see Table 6. Parameters and ranges: Cut-off frequency $f = [20.0 \leftrightarrow 22,000.00]$ Hz, Feedback $FB = [-1.0 \leftrightarrow 1.0]$ or $|FB| = [0.0 \leftrightarrow 1.0]$, Output Gain $G = [-48.0 \leftrightarrow 24.0]$ dB, Resonance $R = [0 \leftrightarrow 1.0]$, Passband width $Q = [0.0 \leftrightarrow 1,000.00]$ Hz, Reject bandwidth $BW = [0.01 \leftrightarrow 8.0]$ octaves,

Filter	Main Panel	FB Panel	Comment
Parameter: \rightarrow	f	P1	P2
Mode: \downarrow			
Lowpass Filter with analog design and resonance control:			
LPF 2P	+	$ FB $	G + 2-Pole Lowpass Filter
LPF 4P	+	$ FB $	G + 4-Pole Lowpass Filter
LPF 8P	+	$ FB $	G + 8-Pole Lowpass Filter
Allpass Filter that modifies the signal phase:			
AP 2	+	FB	G 2-Pole Allpass Filter
AP 4	+	FB	G 4-Pole Allpass Filter
AP 8	+	FB	G 8-Pole Allpass Filter
Lowpass Filter with resonance control:			
LPF -6dB	+		1-Pole Lowpass Filter
LPF -12dB	+	R	G 2-Pole Lowpass Filter
LPF -24dB	+	R	G 4-Pole Lowpass Filter
Highpass Filter (with resonance control):			
HPF -6dB	+		1-Pole Highpass Filter
HPF -12dB	+	R	2-Pole Highpass Filter
Bandpass and Bandreject Filter:			
BPF	+	Q	G Bandpass Filter
Notch	+	R	BW Notch (band-reject) Filter
Filter based on signal time delay:			
Comb	+	FB	G Comb (time delay) Filter
Supercomb	+	FB	G + Comb Filter with feedback

Table 5: The **Cloud Filter Mode** in the Filter Module of the Patch Window

Parameter	Value	Comment
Grain Tab		
Trans	$[-24.0 \leftrightarrow 12.0]$	Transposition (semitones)
R_T	$[0.0 \leftrightarrow 100.0]$	Random transposition
Rate	$[20.0 \leftrightarrow 999.0]$	Number of grains per second
R_R	$[0.0 - 100.0]$	Random grain rate
Del	$[0.1 \leftrightarrow 500.0]$	Grain Pre-delay time in ms
R_D	$[0.0 - 100.0]$	Random delay
Tone Tab (Filter Switch)		
Hz	$[20.0 \leftrightarrow 22,000.0]$	LPF cutoff frequency f_{co}
R_f	$[0.0 \leftrightarrow 100.0]$	Random f_{co}
Q	$[0.5 \leftrightarrow 1000.0]$	Filter resonance
R_Q	$[0.0 \leftrightarrow 100.0]$	Random resonance
Mix Tab		
Balance	$[0.0 \leftrightarrow 100.0]$	Wet/Dry mix
Gain	$[-48.0 \leftrightarrow 12.0]$	Make-up gain

 Table 6: The **FB (Feedback) Panel** parameters in the Filter Module. **WF**: Waveform Selector. Parameters and ranges: Amount $A = [0.0 \leftrightarrow 100.0]$, Phase $\phi = [-1.0 \leftrightarrow 1.0]$, **f**: Frequency Control (see Table 3), Mix $G_M = [0.0 \leftrightarrow 1.0]$

Mode	WF	P1	P2	Comment
Normal				
Waveshape	+	A	ϕ	See also Waveshaper Module, Section 1.4
Freqshift	+	f	G_M	See also Frequency Shift Modulator Module, Section 1.3
Ringmod	+	f	G_M	See also Ring Modulator Module, Section 1.3



1.3 The Modulator Module

The **Modulator Module** has two modes: **Frequency Shift** and **Ring Modulation**. Frequency Shift is based on a feedback loop, producing either sum or difference frequencies. Ring Modulation is a frequency multiplier, producing sum and difference frequencies (it is analogous to the ring modulation oscillator module). The **Main Tab** has the parameters and their ranges, shown in Table 7

Table 7: The **Modulator Module (Main Tab)** in the Patch Window

Parameter	Value	Comment
Frequency Shift Mode		
Sign	[+ -]	Frequency sums or differences
WF		Waveform Selector (opens dialog window with waveform list)
f		Frequency Control (see Table 3)
Feedback	[0.0 ↔ 0.5]	Feedback amount
Ring Modulation Mode		
WF		Waveform Selector
f		Frequency Control (see Table 3)
Balance	[0.0 ↔ 1.0]	Balance modulated with incoming signal

1.4 The Waveshaper Module

The **Waveshaper Module** has one mode and one **Main Tab**: parameters and ranges are shown in Table 8

Table 8: The **Waveshaper Module (Main Tab)** in the Patch Window

Parameter	Value	Comment
WF		Waveform Selector (opens dialog window with waveforms)
In dB	[-48.0 ↔ 12.0]	Input level in dB
Out dB	[-48.0 ↔ 12.0]	Output level in dB
Phase	[-1.0 ↔ 1.0]	Starting position of wave

1.5 The Master Channel

The **Master Channel** at the bottom of the **Patch Window** combines the three signal channels. It contains three modules in series, where Module 1 and 2 can be either a **Filter Module** (see



Section 1.2) or a **Waveshaper Module** (see Section 1.4). These two modules can operate in two modes:

Mono Mode. Signal Channels A to C are summed before processing (one processing channel in the module)

Poly Mode. The Master Channel module processes the three signal channels in parallel,

The third and last module of the Master Channel is fixed: it is the **Effect Module**. Its parameter settings are determined in the **Effect Window**.

2 Controllers in the Patch Window and the LFO Window

The numerical parameter fields in the **Patch Window** and the **LFO Window** can be modified using **Controllers**. These can be assigned by right-mouse clicking (or [Ctrl]+Click) the parameter field. Table 9 gives an overview of the assignable controllers.

Table 9: Assignable parameter field **Controllers** in the **Patch Window** and the **LFO Window**. Note that only a subset of these controllers can be assigned in the LFO Window.

Controller	Comment
Patch Window and LFO Window	
Not assigned	No controller is assigned (default value)
Macro Control 1–12: CC21–32	One of twelve controllers with corresponding MIDI Control Change number (CC#). see the Controller Page and the Assignments Page in the Perform Window for finetuning (sensitivity and polarity) or the assignment.
Modwheel: CC1	Modulation Wheel (with corresponding MIDI CC)
Channel Volume: CC11	The parameter value depends on the channel volume.
PanLR: CC10	Controller value determined by left-right pan position
PanFB: CC20	Controller value determined by front-back pan position
Patch Window only	
Audio Mod: Not assigned	Default value
Audio Mod A-D	Four audio envelope followers as controller trigger; see the Audio Mod Page in the Perform Window for finetuning the controller.
Create Envelope	Use an envelope to controller the parameter value; see the Envelope Window for finetuning the controller assignment.

3 The LFO Window

The **LFO (Low Frequency Oscillator) Window** contains three similar and parallel LFOs. These are labeled LFO1, LFO2, and LFO3. They may modulate a large set of either Channel, and Master parameters, or assign Controllers to modulate the LFO itself.



Each LFO has a **Oscillator Section** and three **Modulation Sections**; see Table 10 for the parameter ranges.

Table 10: The **Oscillator Section** and the **Modulation Sections** in the LFO Window

Parameter	Value	Comment
Oscillator Section		
LFO1-3		On/Off Switch
Mono/Poly		Modulate all voices (mono) or one LFO per voice (poly)
WF		Waveform Selector (opens dialog window)
Phase	[0.0 ↔ 1.0]	Starting position (between start and end)
Beat/Sec	[0.1 ↔ 999.9]	Rate in BPM (Beat mode) or ms (play once in Time mode)
Sample/Hold	[0.01 ↔ 999.9]	Hold (in ms) or Sample mode
Channel Parameters Section		Assign to Module 1 and/or 2 on Channel A, B, C, [Master] Inversion switch (polarity change)
Pitch	[0.0 ↔ 72.0]	Pitch modulation depth in semitones
P1, P2, P3	[0.0 ↔ 100.0]	Three target parameters (see Table 11)
Master Parameters Section		
P1	[0.0 ↔ 100.0]	One target parameter (see Table 12)
Pan	[0.0 ↔ 100.0]	Panning LR and FB modulation depth
Controller Section		
Master Depth	[0.0 ↔ 100.0]	Controller assigned to the LFO Master Depth
LFO Rate	[0.0 ↔ 100.0]	Controller assigned to LFO Rate
S/H Rate	[0.0 ↔ 100.0]	Controller assigned to Sample/Hold Rate
Retrigger	(MIDI CC#)	On/Off. LFO reset for Mono Mode. Retriggers (LFO phase reset) when MIDI CC# value > 0

The **Channel Parameter Targets** are listed in Table 11, the **Master Parameter Targets** in Table 12, and the **Controller Parameter Targets** in Table 9 (see Section 2).

4 Conclusion

The Native Instruments software distribution comes with PDF format documentation. These extended documents describe all the GUI elements and parameter setting input fields; I read through these files regularly. However, this documentation contains quite a bit of redundancy, since most control elements are described sequentially, and input ranges are missing. Knowing the order of magnitude (tens, hundreds, etc.) of the input parameters speeds up the sound editing process. The instruction and demo movies on YouTube are a most helpful addition, that I consult as additional material and to get a feel for the acoustic effect of the input settings.

The set of tables in this document may be considered as a *Quick Reference* and overview of the interface elements. That was a thing I needed for rapid lookup when analysing existing

Table 11: The **Channel Parameter Targets** in the LFO Window

Oscillator	Filter	Other
Main Pitch	Frequency	Channel Volume
Main Morph	Resonance	
Mod Pitch	Bandwidth	Modulator Pitch
Mod Index/Bal	Waveshape Amount	Modulator Balance
Mod Morph	Supercomb Tone	Modulator Feedback
Uni Transpose	Supercomb Position	Modulator Wave Morph
Uni Random Trans	Supercomb HP	
Sample Start	Supercomb LP	Waveshaper In Gain
Sample Jump	Cloud Transpose	Waveshaper Out Gain
Grain Time	Cloud Rand Trans	Waveshaper Phase
Grain Rand Freq	Cloud Rate	Waveshaper Wave Morph
Grain Rand Time	Cloud Rand Rate	
Grain Rand Amp	Cloud Filter Hz	LFO Wave Morph
Grain Size	Cloud Rand Filter	LFO Depth
Scatter	Cloud Filter Q	LFO Rate
Fract Displacement	Cloud Filter Quant	LFO SH Rate
Fract Amount	Cloud Filt Rand Quant	
	Cloud Del	Master Volume
	Cloud Rand Del	
	Cloud Bal	

Table 12: The **Master Parameter Targets** in the LFO Window

Effect Master Time
Effect Time
Effect Feedback
Effect Filter Frequency
Effect Balance Wet
Effect Balance Dry
Effect Input



presets or creating new sound in the impressive Absynth 5 software synthesizer. Feel free to use it yourself, and hopefully it will speed up the understanding of the numerous possibilities for sound and effect editing.

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