

# WhispAir

## Performance Synthesizer

Version 1.0

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## Introduction

*WhispAir* is a software synthesizer plug-in for Microsoft Windows (VST) and Apple macOS (VST/AU). It is written in native C++ code for high performance and low CPU consumption. The main features are:

- All parameters on one single page
- Three flexible wavetable oscillators
- Classic *Full Bucket* stereo filter
- Three modulation and four envelope generators
- Unison mode and Chorus
- TUN/SCL/KBL micro-tuning file import
- MTS-ESP (<https://oddsound.com/>) dynamic micro-tuning support
- All parameters can be controlled by MIDI controllers
- Plug-in supports Windows and macOS (32 bit and 64 bit)

*WhispAir* is based on the new **iPlug2** framework maintained by **Oli Larkin and the iPlug2 team**. Big thanks, guys!!! Without your work it would not have been possible to create a resizable *WhispAir* user interface.

To resize the plug-in you just grab the yellow triangle at the bottom right of the *WhispAir* window and drag it. You can save the current window size using the menu entry "Save Window Size" in the *Options Menu*.

If you have trouble with the standard version of *WhispAir*, please grab the (sound-wise identical) "N" version of the plug-in which is based on the original **iPlug** framework.

## Acknowledgments

**kraftraum** (<https://soundcloud.com/kraftraum>) has designed the version 1.0 default patches 37 to 62 and was Beta testing – thank you so much, my dear friend!!!

**Oli Larkin** and the iPlug/iPlug2 team.

**Laurent Bergman** for translating the *Full Bucket* manuals to French.

## Digital Oscillators

WhispAir features three wavetable oscillators – each oscillator holds one of 40 wavetables (37 built-in and 3 user tables). Oscillator 1 offers additional Amplitude Modulation by oscillator 2 and/or oscillator 3, while the other two oscillators allow for Hard Sync and Linear Frequency modulation.



### Pitch Section

The three parameters MASTER TUNE ( $\pm 100$  cents), PORTAMENTO (Portamento time) and PITCH BEND ( $\pm 12$  notes) of the Pitch section affect all oscillators. Also note the micro tuning options – see section *Micro Tuning*.

### Common Oscillator Parameters

The following parameters are common for all three oscillators:

- ON/OFF switch
- Wavetable selection and modulation (see section *Wavetables*)
- OCTAVE (16', 8', 4', and 2'), PITCH ( $\pm 12$  notes), and TUNE ( $\pm 100$  cents)
- FREQUENCY modulation ( $\pm 48$  notes) and AMPLITUDE modulation
- START PHASE (start of the current waveform;  $0^\circ$  to  $360^\circ$ )

Note that one can select whether the oscillator should run continuously or restart on the next note event.

### Specific Parameters To Oscillator 1

Oscillator 1 allows for Amplitude Modulation (AM) by the two other oscillators; the amount of AM can be set individually. Furthermore it is possible to modulate the overall AM amount by any of the available modulation sources (see section *Modulation Sources*).



## Specific Parameters To Oscillator 2 And 3

Oscillators 2 and 3 can be hard-synced by oscillator 1 or mutually by each other. The same is true for Linear Frequency Modulation (FM). The amount of Linear FM can be modulated by any of the available modulation sources (see section *Modulation Sources*).



## Wavetables

The wavetables can be selected by clicking on the respective wavetable screen and are grouped in four categories:

- **Standard Waveforms**  
Classical waveforms like *Sawtooth* or *Square* that are well-known from analog synthesizers.
- **Additive Synthesis**  
Waveforms that are derived via additive synthesis.
- **Resynthesis**  
Waveforms that are re-synthesized from various samples.
- **User-Defined**  
Wavetables that can be imported from *Xfer Serum* or *Waldorf blofeld* wavetable files or even from standard WAVs.



You can also step through the different wavetables by clicking the UP/DOWN buttons. For a complete list of wavetables see section *Built-In Wavetables*.

Imported WAV files will be treated as a single wavetable consisting of subsequent waves with 2048 samples each. The maximum number of imported waves (i.e. the length of the wavetable) is 64.

The SHAPE parameter controls which wave of the selected wavetable will be played. As known from the famous *PPG Wave* synthesizers (and others), this parameter can also be changed/modulated by one of the modulation sources. Therefore, two modes are available:

- **INTPL.** (Interpolated)  
The waves are "morphed" into each other. This will result in a smooth transition between adjacent waves of the wavetable.
- **RAW**  
The wave are "stepped through" i.e. there is no smoothing between adjacent waves. This will result in rather harsh transitions.





## Oscillator Mixer

The signals of the three oscillators as well as an additional white noise signal are sent to the Oscillator Mixer. Each signal has its own **LEVEL** and (stereo) **PANORAMA** control. The output of the mixer is finally sent to the filter.

## Filter

The potentially self-resonating stereo filter can work in three modes: **LP24** (lowpass with 24dB/Octave characteristics), **LP12** (lowpass with 12dB/Octave characteristics), and **HP24** (highpass with 24dB/Octave characteristics).

Besides the standard cutoff, resonance, keyboard tracking and modulation controls it features an individual ADSR envelope generator (EG) with exponential slopes. The EG can be triggered for each key pressed (multiple) or only for the first key when played *legato* (single).

## Amplifier And Chorus

The stereo filter signal is sent to the amplifier section which has its own envelope generator (identical to the EG of the Filter section). The overall amplitude can be modulated by Velocity and additionally by any modulation source.



Finally the signal is processed by a wide-range stereo Chorus unit (which also can be deactivated). The Chorus has controls for effect mix, manual delay time, modulation depth and speed, and positive or negative feedback.

## Modulation Sources



Apart from the filter and amplifier envelope generators, *WhispAir* adds two general purpose EGs with linear slope characteristics, two modulation generators (MGs) and a third Vibrato MG. All three MGs can be synchronized to the host tempo. MG1 and MG2 have different waveforms while the Vibrato MG always produces a sine wave.

All the EGs and MGs feature an amount control that allows for modulation of the generator signal level by any of the available modulation sources. This way for example a vibrato can be controlled by the modulation wheel or velocity, or the modulation amount of an MG can itself be modulated by an envelope generator.



Other modulation sources are Modulation Wheel, Pitch Bend, Velocity, Poly and Channel Aftertouch, and Note value. Most of these sources are available in a bipolar and unipolar (positive) version.

## Key Assign Modes

In POLY mode, *WhispAir* can be played polyphonically or monophonically – the number voices can be chosen from 1 to 64.

In UNISON mode, these voices will be “stacked” i.e. played monophonically

all for the same note value while it is possible to set the overall detune and stereo spread amount. Thus it is possible to play all 64 voices for one key at the same time – note that this may have a severe impact on your CPU performance though.

X-MODE is a special performance mode where the enabled oscillators are played in sequence per key (in contrast to all at the same time). For example if oscillators 1 and 2 plus X-MODE are enabled, the first note pressed will cause only oscillator 1 to play while the next note plays oscillator 2 etc. This way you can produce very different sounds per note.

Finally, you can set whether the polyphonic Portamento should only be activated during *legato* play.



## Control Section

The Control section has controls for selecting and handling programs as well as MIDI (un)learn and micro tuning.



Note that the COPY, PASTE and INIT buttons are shortcuts to the respective function of the *Options Menu*.

## MIDI Learn And The Config File "whispair.ini"

Every parameter of *WhispAir* can be controlled by one MIDI controller. If you want to change the assignment of MIDI controller (CC; *MIDI Control Change*) to *WhispAir* parameter the *MIDI Learn* function comes in quite handy: Just click the *MIDI Learn* button in the Control Section (caption turns red) and wiggle both the MIDI controller and the parameter you want to assign (you can abort *MIDI Learn* by clicking the button again). If you want to unlearn the assignment, right-click the *MIDI Learn* button (the label now reads "UNLEARN") and activate it. Now wiggle the MIDI controller or the parameter that you want to unlearn. To save the controller assignments use "Save Configuration" in the *Options Menu* (see below); they are stored in the `whispair.ini` configuration file. The exact location of this file depends on your operating system and will be displayed when you click on "Reload" or "Save Configuration".

## Micro Tuning

*WhispAir* features 14 built-in microtonal scales and can import various tuning files (Scala SCL/KBM, TUN). Scales are selected by clicking on the TUNING control which also displays the name of the current scale.

Furthermore, *WhispAir* is compatible with MTS-ESP by ODDSound, a very cool framework for dynamic micro tuning. For more (and how to get) MTS-ESP plug-ins see <https://oddsound.com>.



## Options Menu

When clicking on the *MENU* button, a context menu opens with the following options:

<b>Copy Program</b>	Copy current program to internal clipboard
<b>Paste Program</b>	Paste internal clipboard to current program (either the full program, only the sound, or only the sequencer data)
<b>Init Program</b>	Initialize the current program
<b>Load Program</b>	Load a program file containing a patch to <i>WhispAir's</i> current program
<b>Save Program</b>	Save <i>WhispAir's</i> current program to a program file
<b>Load Bank</b>	Load a bank containing 64 patches into <i>WhispAir</i>
<b>Save Bank</b>	Save <i>WhispAir's</i> 64 patches to a bank file
<b>Select Startup Bank</b>	Select the bank file that should always be loaded when <i>WhispAir</i> is started
<b>Load Startup Bank</b>	Load the Startup bank file; can also be used to check what the current Startup bank is
<b>Unselect Startup Bank</b>	Unselect the current Startup bank
<b>MIDI Thru</b>	Set globally if MIDI data sent to <i>WhispAir</i> should be sent through to its MIDI output (stored in configuration file)
<b>Ignore Program Change</b>	Set globally if MIDI Program Change data sent to <i>WhispAir</i> should be ignored (stored in configuration file)
<b>Reload Configuration</b>	Reload <i>WhispAir's</i> configuration file
<b>Save Configuration</b>	Save <i>WhispAir's</i> configuration file
<b>Window Size...</b>	Change the window size of <i>WhispAir</i>
<b>Save Window Size</b>	Stores the current window size to the configuration file so that it will be restored on the next loading of <i>WhispAir</i>
<b>Check Online for Update</b>	When connected to the Internet, this function will check if a newer version of <i>WhispAir</i> is available at fullbucket.de
<b>Visit fullbucket.de</b>	Open fullbucket.de in your standard browser

## Built-In Wavetables

Category	Wavetable	Number of Waves
Standard Waveforms	Saw	1
	Pulse	1
	Full PWM	1
	Tri	2
	Sine	2
	Sine-Tri-Square-Saw	4
	Saw-Square	2
	Saw-Sine	2
	Saw-Tri	64
	Square-Tri	64
	Square-Sine	2
	DW-8000	16
Additive Synthesis	Dirac Meltdown	64
	Odd	16
	Even	16
	Even to Odd	9
	Primes	12
	Octaves	8
	Frequency Up	16
	Phased Saw	64
	Drawbar Full	16
	Drawbar Mixed	16
Resynthesis	Acoustic Piano	33
	Pianet	33
	Slap Low	33
	Slap High	33
	Re-PWM	33
	Resonance 1	33
	Resonance 2	33
	MP4 Cross Modulation	33
	Formant Shift	33
	A-O-E	3
	Geesh	33
	TD 'Teh'	33
	Texture 1	33
	Texture 2	33
	Ladies & Gentlemen	33

## Parameters

### Common

parameter	ID	description
<i>Volume</i>	0	Total volume
<i>Master Tune</i>	1	Master tune ( $\pm 100$ cents)
<i>Number of Voices</i>	2	Number of voices (1 – 64)
<i>Unison Mode</i>	3	Unison off/on
<i>Unison Detune</i>	4	Unison detune
<i>Unison Spread</i>	5	Unison stereo spreading
<i>X-Mode</i>	6	X-Mode off/on
<i>Pitch Bend</i>	7	Amount of pitch bending ( $\pm 12$ notes)
<i>Portamento</i>	8	Portamento time
<i>Portamento Legato</i>	9	Portamento Legato off/on

### Digital Oscillator 1

parameter	ID	description
<i>Osc Off/On</i>	10	Oscillator on/off
<i>Wave Table</i>	11	ID of the current wavetable
<i>Wave Shape</i>	12	Wavetable shape
<i>Wave Mode</i>	13	Wavetable shape mode ( <i>Interpolated/Raw</i> )
<i>Wave Shape Mod</i>	14	Wavetable shape modulation amount
<i>Wave Shape Mod Source</i>	15	Wavetable shape modulation source
<i>Restart Mode</i>	16	Restart wave off/on
<i>Start Phase</i>	17	Start phase (0 to 360°)
<i>AM by Osc 2</i>	18	Amplitude Modulation by oscillator 2
<i>AM by Osc 3</i>	19	Amplitude Modulation by oscillator 3
<i>AM Mod</i>	20	AM modulation amount
<i>AM Mod Source</i>	21	AM modulation source
<i>Octave</i>	22	Octave (16', 8', 4', 2')
<i>Pitch</i>	23	Pitch ( $\pm 12$ notes)
<i>Tune</i>	24	Tune ( $\pm 100$ cents)
<i>Frequency Mod</i>	25	Frequency modulation amount
<i>Frequency Mod Source</i>	26	Frequency modulation source
<i>Amplitude Mod</i>	27	Amplitude modulation amount
<i>Amplitude Mod Source</i>	28	Amplitude modulation source

## Digital Oscillator 2

parameter	ID	description
<i>Osc Off/On</i>	29	Oscillator on/off
<i>Wave Table</i>	30	ID of the current wavetable
<i>Wave Shape</i>	31	Wavetable shape
<i>Wave Mode</i>	32	Wavetable shape mode ( <i>Interpolated/Raw</i> )
<i>Wave Shape Mod</i>	33	Wavetable shape modulation amount
<i>Wave Shape Mod Source</i>	34	Wavetable shape modulation source
<i>Restart Mode</i>	35	Restart wave off/on
<i>Start Phase</i>	36	Start phase (0 to 360°)
<i>Hard Sync</i>	37	Hard Sync (by oscillator 1 or 3)
<i>Linear FM</i>	38	Linear FM amount
<i>Linear FM Source</i>	39	Linear FM source (oscillator 1 or 3)
<i>Linear FM Mod</i>	40	Linear FM modulation amount
<i>Linear FM Mod Source</i>	41	Linear FM modulation source
<i>Octave</i>	42	Octave (16', 8', 4', 2')
<i>Pitch</i>	43	Pitch ( $\pm 12$ notes)
<i>Tune</i>	44	Tune ( $\pm 100$ cents)
<i>Frequency Mod</i>	45	Frequency modulation amount
<i>Frequency Mod Source</i>	46	Frequency modulation source
<i>Amplitude Mod</i>	47	Amplitude modulation amount
<i>Amplitude Mod Source</i>	48	Amplitude modulation source

## Digital Oscillator 3

parameter	ID	description
<i>Osc Off/On</i>	49	Oscillator on/off
<i>Wave Table</i>	50	ID of the current wavetable
<i>Wave Shape</i>	51	Wavetable shape
<i>Wave Mode</i>	52	Wavetable shape mode ( <i>Interpolated/Raw</i> )
<i>Wave Shape Mod</i>	53	Wavetable shape modulation amount
<i>Wave Shape Mod Source</i>	54	Wavetable shape modulation source
<i>Restart Mode</i>	55	Restart wave off/on
<i>Start Phase</i>	56	Start phase (0 to 360°)
<i>Hard Sync</i>	57	Hard Sync (by oscillator 1 or 2)
<i>Linear FM</i>	58	Linear FM amount
<i>Linear FM Source</i>	59	Linear FM source (oscillator 1 or 2)

parameter	ID	description
<i>Linear FM Mod</i>	60	Linear FM modulation amount
<i>Linear FM Mod Source</i>	61	Linear FM modulation source
<i>Octave</i>	62	Octave (16', 8', 4', 2')
<i>Pitch</i>	63	Pitch ( $\pm 12$ notes)
<i>Tune</i>	64	Tune ( $\pm 100$ cents)
<i>Frequency Mod</i>	65	Frequency modulation amount
<i>Frequency Mod Source</i>	66	Frequency modulation source
<i>Amplitude Mod</i>	67	Amplitude modulation amount
<i>Amplitude Mod Source</i>	68	Amplitude modulation source

## Oscillator Mixer

parameter	ID	description
<i>Level Osc 1</i>	69	Level of oscillator 1
<i>Level Osc 2</i>	70	Level of oscillator 2
<i>Level Osc 3</i>	71	Level of oscillator 3
<i>Level Noise</i>	72	Level of white noise
<i>Pan Osc 1</i>	73	Panorama of oscillator 1
<i>Pan Osc 2</i>	74	Panorama of oscillator 2
<i>Pan Osc 3</i>	75	Panorama of oscillator 3
<i>Pan Noise</i>	76	Panorama of white noise

## Filter

parameter	ID	description
<i>Type</i>	77	Filter type ( <i>LP24</i> , <i>LP12</i> , <i>HP24</i> )
<i>Cutoff</i>	78	Cutoff frequency
<i>Resonance</i>	79	Resonance
<i>Keyboard Track</i>	80	Keyboard tracking
<i>Filter EG Intensity</i>	81	Intensity of the Filter EG
<i>Filter cFM</i>	82	Cutoff frequency modulation amount
<i>Filter cFM Source</i>	83	Cutoff frequency modulation source



## Amplifier

parameter	ID	description
<i>Velocity</i>	84	Velocity
<i>Amplitude Mod</i>	85	Amplitude modulation amount
<i>Amplitude Mod Source</i>	86	Amplitude modulation source

## Chorus

parameter	ID	description
<i>Chorus</i>	87	Chorus off/on
<i>Chorus Delay</i>	88	Chorus delay
<i>Chorus Speed</i>	89	Chorus modulation speed
<i>Chorus Depth</i>	90	Chorus modulation depth
<i>Chorus Feedback</i>	91	Chorus feedback ( $\pm 100\%$ )
<i>Chorus Mix</i>	92	Chorus effect mix

## Filter EG

parameter	ID	description
<i>Filter EG Trigger</i>	93	EG Trigger ( <i>Multiple/Single</i> )
<i>Filter EG Mod</i>	94	EG level modulation
<i>Filter EG Mod Source</i>	95	EG level modulation source
<i>Filter EG Attack</i>	96	Attack time
<i>Filter EG Decay</i>	97	Decay time
<i>Filter EG Sustain</i>	98	Sustain level
<i>Filter EG Release</i>	99	Release time

## Amplifier EG

parameter	ID	description
<i>Amp EG Trigger</i>	100	EG Trigger ( <i>Multiple/Single</i> )
<i>Amp EG Mod</i>	101	EG level modulation
<i>Amp EG Mod Source</i>	102	EG level modulation source
<i>Amp EG Attack</i>	103	Attack time
<i>Amp EG Decay</i>	104	Decay time
<i>Amp EG Sustain</i>	105	Sustain level
<i>Amp EG Release</i>	106	Release time

## Linear EG 1

parameter	ID	description
<i>Lin EG 1 Trigger</i>	107	EG Trigger ( <i>Multiple/Single</i> )
<i>Lin EG 1 Mod</i>	108	EG level modulation
<i>Lin EG 1 Mod Source</i>	109	EG level modulation source
<i>Lin EG 1 Attack</i>	110	Attack time
<i>Lin EG 1 Decay</i>	111	Decay time
<i>Lin EG 1 Sustain</i>	112	Sustain level
<i>Lin EG 1 Release</i>	113	Release time

## Linear EG 2

parameter	ID	description
<i>Lin EG 2 Trigger</i>	114	EG Trigger ( <i>Multiple/Single</i> )
<i>Lin EG 2 Mod</i>	115	EG level modulation
<i>Lin EG 2 Mod Source</i>	116	EG level modulation source
<i>Lin EG 2 Attack</i>	117	Attack time
<i>Lin EG 2 Decay</i>	118	Decay time
<i>Lin EG 2 Sustain</i>	119	Sustain level
<i>Lin EG 2 Release</i>	120	Release time

## MG 1

parameter	ID	description
<i>MG 1 Frequency</i>	121	Frequency
<i>MG 1 Waveform</i>	122	Waveform ( <i>Sine, Triangle, Rectangle, Saw Down, Saw Up, S/H</i> )
<i>MG 1 Sync to Host</i>	123	Sync to host tempo on/off
<i>MG 1 Sync Rate</i>	124	Sync to host tempo rate
<i>MG 1 Mod</i>	125	MG level modulation
<i>MG 1 Mod Source</i>	126	MG level modulation source

## MG 2

parameter	ID	description
<i>MG 2 Frequency</i>	127	Frequency
<i>MG 2 Waveform</i>	128	Waveform ( <i>Sine, Triangle, Rectangle, Saw Down, Saw Up, S/H</i> )
<i>MG 2 Sync to Host</i>	129	Sync to host tempo on/off
<i>MG 2 Sync Rate</i>	130	Sync to host tempo rate
<i>MG 2 Mod</i>	131	MG level modulation
<i>MG 2 Mod Source</i>	132	MG level modulation source

## Vibrato MG

parameter	ID	description
<i>Vibrato Frequency</i>	133	Frequency
<i>Vibrato Sync to Host</i>	134	Sync to host tempo on/off
<i>Vibrato Sync Rate</i>	135	Sync to host tempo rate
<i>Vibrato Mod</i>	136	Vibrato level modulation
<i>Vibrato Mod Source</i>	137	Vibrato level modulation source

## Frequently Asked Questions

### ***How do I install WhispAir (Windows 32 bit version)?***

Just copy the files `whispair.dll` from the ZIP archive you have downloaded to your system's or favorite DAW's VST plug-in folder. Your DAW should automatically register the *WhispAir* VST plug-in the next time you start it.

### ***How do I install WhispAir (Windows 64 bit version)?***

Just copy the file `whispair64.dll` from the ZIP archive you have downloaded to your system's or favorite DAW's VST plug-in folder. Your DAW should automatically register the *WhispAir* VST plug-in the next time you start it.

Note: You may have to remove any existing (32 bit) `whispair.dll` from your VST plug-in folder or else your DAW may screw the versions up...

### ***How do I install WhispAir (Mac VST/AU 64 bit)?***

Locate the downloaded PKG package file `whispair_1_0_0_mac.pkg` in Finder (!) and do a right- or control-click on it. In the context menu, click on "Open". You will be asked if you really want to install the package because it comes from an "unidentified developer" (me ☺). Click "OK" and follow the installation instructions.

### ***What is the "N" version of WhispAir?***

The "N" version is the non-resizable version of *WhispAir* that should run on almost any older Windows or Mac machine. So if you have problems with the standard *WhispAir* version, this is the one to go for.

### ***What is the plug-in ID of WhispAir?***

The ID is `w h s p`.

### ***How do I know if a new version of WhispAir is available?***

When connected to the Internet, open the File menu (see section *Options Menu*) by clicking the MENU icon and select the entry "Check Online for Updates". If a new version of *WhispAir* is available on [fullbucket.de](http://fullbucket.de) the respective information will be shown in a message box.

### ***How do I resize WhispAir window?***

Just grab the yellow triangle at the bottom right of the *WhispAir* window and drag it. You can save the current window size using the menu entry "Save Window Size" in the *Options Menu*.