Icebreaker Audio's

GRID II

HEAVYOCITY
RAW INSPIRATION®

1 CONTENTS

2   WELCOME TO GRID II

Thank you for purchasing **GRID II** from **ICEBREAKER AUDIO** and **HEAVYOCITY**. This guide will show you how to use the instrument, give you an overview of the controls, and offer some useful hints and tips along the way.

I personally hope you enjoy this release and find it to be an inspirational addition to your musical toolkit.

2.1   SYSTEM REQUIREMENTS

- PC/Mac running Native Instruments **REAKTOR 5.9.3** or later (**GRID II** is compatible with **REAKTOR 6**). **GRID II** does not run in **REAKTOR PLAYER**, only the full version of **REAKTOR**.

More information on REAKTOR can be found on the Native Instruments website:
http://www.native-instruments.com/en/products/komplete/synths/reaktor-6/

3 ABOUT GRID II

GRID II is a sound sequencer.

Most sequenced instruments are either based on triggering individual sounds (like in most drum machines), or triggering different notes from one sound source (e.g. a sequenced synthesizer). **GRID II** takes a hybrid approach: it is neither directly designed for percussion, nor melody, but it can do both. It is what you make of it - this was the fundamental concept behind **GRID II**.

GRID II uses 8 voices to produce its sound, but direct control over these voices was kept to a minimum. Instead you control the relationship between the voices to sculpt the output; because if this, controlling **GRID II** can sometimes feel like an abstract experience, though it is not random. Another concept that drove the development of **GRID II** is that you collaborate with the instrument, rather than use it as a tool to get a job done.

In practice, **GRID II** works best for minimal and electronic music, but it also has a nasty, glitchy side for those who love noise. That said, the heart of **GRID II** is experimentation, so it will find a place in any genre if you touch it the right way.

3.1 KEY FEATURES

- 8 Voice sound generation system
- Built-in Filter and Delay Master Effects
- Automatic Host Synchronization
- Feedback modulation system
- An 8x8 FM/Sync modulation matrix
- Per voice bit-designer effect
- Four assignable modulation sources: two modulation sequences, and two LFOs

4 GETTING STARTED

4.1 USING REAKTOR

For help and guidance with using REAKTOR, either as standalone or in a host, please refer to the REAKTOR user manual. The full details of REAKTOR's features will not be covered in this manual.

For additional help and support with using REAKTOR, use the Native Instruments' user forum, or contact the Native Instruments' support team. Only contact **ICEBREAKER AUDIO** if you are having a problem with the **GRID II** instrument specifically.

4.2 INCLUDED FILES

GRID II is included in REAKTOR's *.ens format, which is REAKTOR's main instrument and effect format.

This file can be placed anywhere on your hard drive, but for use in REAKTOR's browser we suggest you place it in the REAKTOR user folder, located here:

- `<user>/Documents/Native Instruments/Reaktor5/Library/Ensembles`

Or, for REAKTOR 6:

- `<user>/Documents/Native Instruments/Reaktor 6/Library/Primary`

4.3 OPENING GRID II

To open **GRID II**, either:

- Double click on the GRID II.ens file
- Open REAKTOR and go to `File -> Open Ensemble` … (or press [Ctrl]+O or [Cmd] + O)
- Drag and drop the GRID II.ens file onto the REAKTOR desktop icon, or into REAKTOR itself.
- Browse for GRID II in REAKTOR's file browser.

GRID II should now be open and ready to use.

4.4 PLAYBACK

Because **GRID II** is a sequenced instrument, it will not make sound until REAKTOR's clock is running.

To start pattern playback, either click on the play button in REAKTOR, or press the spacebar on your computer keyboard.

If you are using **GRID II** in a host, playback will be slaved to the host transport.

4.5 CONTROL HELP

All controls in **GRID II** have info text. You can use this to better understand what each control in **GRID II** does without the need to refer to this manual. You can view these by activating **Info Hints**, either by clicking on the **i** symbol beside REAKTOR's transport controls, or by pressing [Ctrl] + I ([Cmd]+I on OSX). With Info Hints active, you can view the info text by hovering your mouse pointer over any control.

5 USING GRID II

5.1 VOICES

Voices are an important concept in **GRID II**, you can think of them as individual oscillators, as partials of an additive synthesizer, or as notes in a scale, but in this manual they will always be referred to as voices.

GRID II uses 8 voices to create sound. Sometimes you will have individual control over the voices (like in The Grid Sequence, The Central Mixer, and the Bit Designer), but most of the control over the voices is abstracted so that you control the sound parameters for all voices from a single set of controls.

5.2 INSTRUMENT MODES

GRID II has two main modes of operation:

- **Sequenced**
- **Played**

The mode can be selected using the **MODE** buttons in the **MASTER** section to the bottom left of the interface.

When in **Sequenced** Mode, the instrument plays back like a step sequencer. Each step is played sequentially at a set rate. The fundamental pitch of the Voices is set using a master control.

When in **Played** Mode, the instrument is more like a synthesizer, with each step triggered via MIDI notes. The fundamental pitch is that of the note played. The steps can either cycle automatically with each note (**AUTO-CYCLE**) or you can select the step via keyswitches on the white keys from C1 to C2.

6 THE GRID II INTERFACE

1 THE GRID II INTERFACE

6.1 MASTER CONTROLS

In the bottom left of the interface are the **MASTER** controls.

The **MODE** buttons select the instrument mode, which are described in section 5.2 Instrument Modes. The rest of the Master Controls depend on the mode selection.

In **SEQ** mode, you will have access to the following controls:

2 THE MASTER SECTION IN SEQ MODE

- **PLAY** – Activates the sequencers.
  (note: the host sequencer must also be running for the sequence to play back)
- **RATE** – Sets the rate at which the sequences will play back.
- **SWING** – Sets the swing amount (i.e. how much the off-beat steps will be delayed, giving a more relaxed feel to the rhythm).
- **PITCH** – Sets the fundamental pitch of the voices.

In **PLAYED** mode, you will have access to the following controls:


3 THE MASTER SECTION IN PLAYED MODE

- **AUTO-CYCLE** – When active, the current step in the sequencer will progress with each new note. When off, steps can be selected using keyswitches on the white keys from C1 to C2
- **GLIDE** – Sets the time it takes for a note to glide to the next. Also known as Portamento.
- **TUNE** – Controls the tuning of the incoming MIDI notes.

6.2 THE LEFT SCREEN

6.2.1 THE GRID SEQUENCE

Click on the **Grid** tab to open the Grid Sequencer.
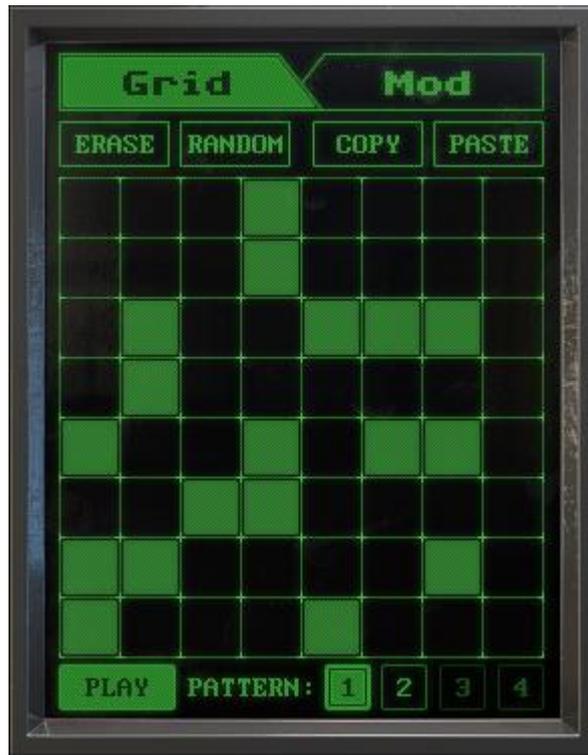
4 THE LEFT SCREEN: GRID VIEW

The main body of the sequencer is an 8x8 matrix of buttons.

- The X-axis represents the steps of the sequencer.
- The Y-axis represents the voices.

Click on a step to activate/deactivate it.

Right-click and drag to set the pattern length for each voice.

Setting the pattern length per voice can be used to create complex polyrhythms.

6.2.2 THE MODULATION SEQUENCES

Click on the **Mod** tab to open the Modulation Sequencers.
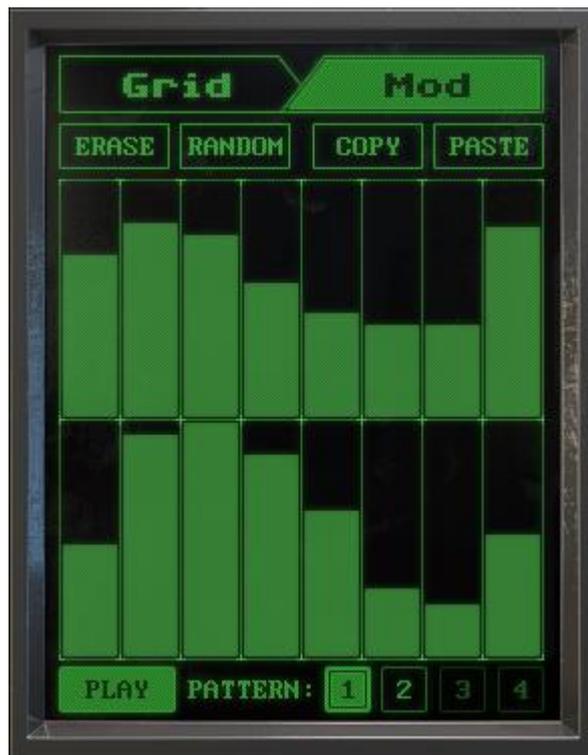
5 THE LEFT SCREEN: MOD VIEW

There are two modulation sequences that you can edit by clicking and dragging to set the values per step.
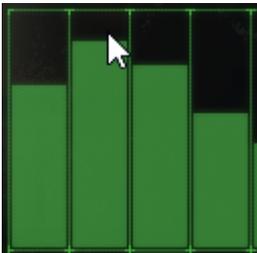
Like the Grid Sequencer, each modulation sequence can have a different pattern length, which is set by right-clicking on the sequence.
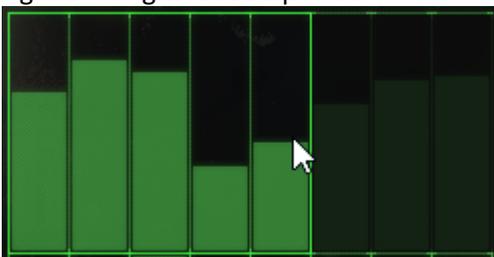
The modulation sequences can be used to modulate various parameters in **GRID II**. Read section 6.6 Modulation to learn more about assigning modulation destinations.

6.2.3 EDIT BUTTONS

Both the Grid Sequence and the Modulation Sequences have four edit buttons:

- **ERASE** – Clears the current pattern.
- **RANDOM** – Randomizes the current pattern.
- **COPY** – Copies the current pattern into temporary memory.
- **PASTE** – Pastes any copied pattern into the current pattern.

6.2.4 THE PATTERN SELECTOR/SEQUENCER

Whether you are viewing the Grid Sequencer or the Modulation Sequences, the lowest part of the left screen will always display the Pattern Selector/Sequencer.

6 THE PATTERN SEQUENCER/SELECTOR

GRID II has four available patterns for holding the settings of the Grid and Modulation Sequences.

You can view a pattern by clicking on one of the buttons labelled **1** to **4**. When a pattern is selected for viewing, the button will be filled green. When a pattern is playing back, its outline will be highlighted.

In the above example, pattern 1 is selected to be displayed for editing, but pattern 3 is the one playing back.

The **PLAY** button defines how patterns will play back:

- When **PLAY** is off, the displayed sequence will be the one that plays back.
- When **PLAY** is on, the patterns will cycle every 8 steps.

The length of the Pattern Sequence can be defined by right-clicking on the pattern buttons.

6.3 THE CENTRAL MIXER

In the central mixer you can set the output volume and output routing for each voice.
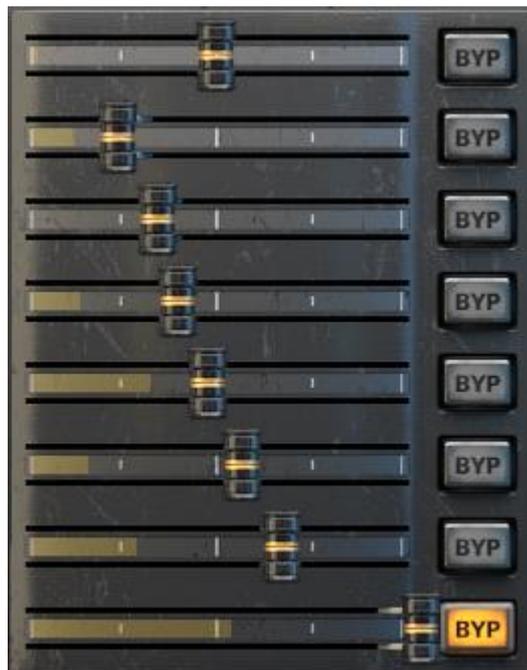
7 THE CENTRAL MIXER

Click and drag on the sliders to set the volume of each voice.

The **BYP** (bypass) buttons select whether the voice is routed through the Master FX, or not. When **BYP** is off, the voice will be processed by the Master Filter and Delay effects; when it is on, the voice will be routed to the main output.

Voices that bypass the Master FX are not routed to the feedback path, which is described in the **FEEDBACK** *sub-chapter.*

6.4 THE RIGHT SCREEN

The Right Screen contains two 8x8 matrices for further altering the sound of each voice.

6.4.1 MODULATION MATRIX

The Modulation Matrix allows you to route the output of any voice into a modulation input for any voice.

Click on the **Matrix** tab to display the Modulation Matrix.
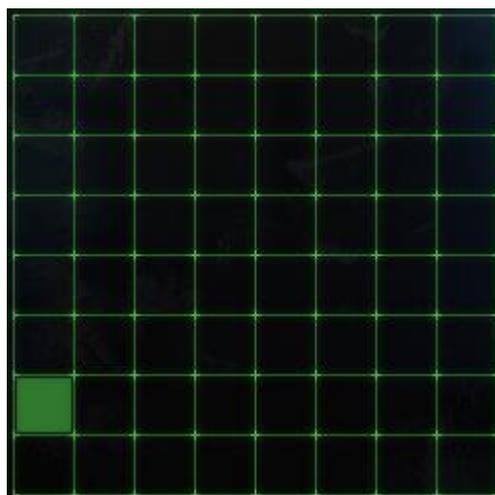

8 THE RIGHT SCREEN: MATRIX VIEW

Along the Y-axis are the voice outputs, and along the X-axis are the voice inputs. So, in the following example, voice 2 is routed into the input of voice 1.

9 VOICE 2 MODULATING VOICE 1

In the next example, voice 3 is modulating itself.
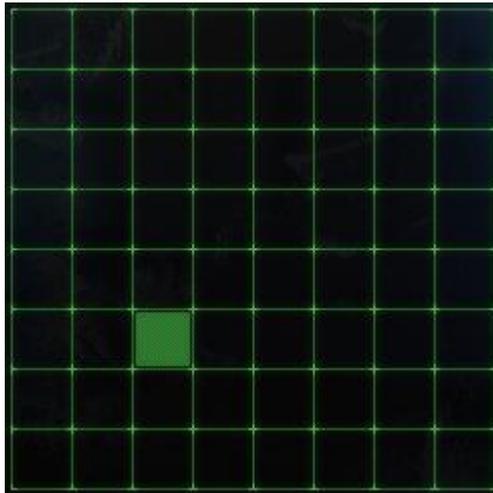
10 VOICE 3 MODULATING ITSELF

Click on a square to activate/deactivate the routing.

Below the main matrix are the options for the modulation destinations:

- **FM** – when active, the voices will be routed to the frequency modulation input of the other voices.
- **SYNC** – when active, voices will be routed to the hard-sync (i.e. waveform re-start) of the other voices.

*Note: if neither **FM** nor **SYNC** is selected, the Modulation Matrix will have no effect on the sound.*

The modulation routing happens pre-amplifier, so even if a voice has its output volume turned all the way down in the Mixer, modulation from that voice will still occur.

Above the modulation matrix are two edit buttons:

- **ERASE** – Clears the matrix, setting all the squares to zero.
- **RANDOM** – Randomizes the modulation matrix.

6.4.2 BIT DESIGNER

The Bit Designer allows you to alter the 8-bit data stream of each voice. The result is something like a waveshaper/bitcrusher hybrid.

Click on the **Bits** tab to open the Bit Designer.

11 THE RIGHT SCREEN: BIT DESIGNER VIEW

The Y-axis of the 8x8 matrix represents each voice, and the X-axis represents each bit.

Bits are ordered from most significant (on the left) to least significant (on the right).

Click on a square to mark a bit for processing.

The Bit Designer mode is selected using the buttons below the 8x8 matrix:

- **INVERT** – the marked bits will be inverted, so a 1 will become a 0, and a 0 will become a 1.
- **DEACTIVATE** – the marked bits will always be set to 0.
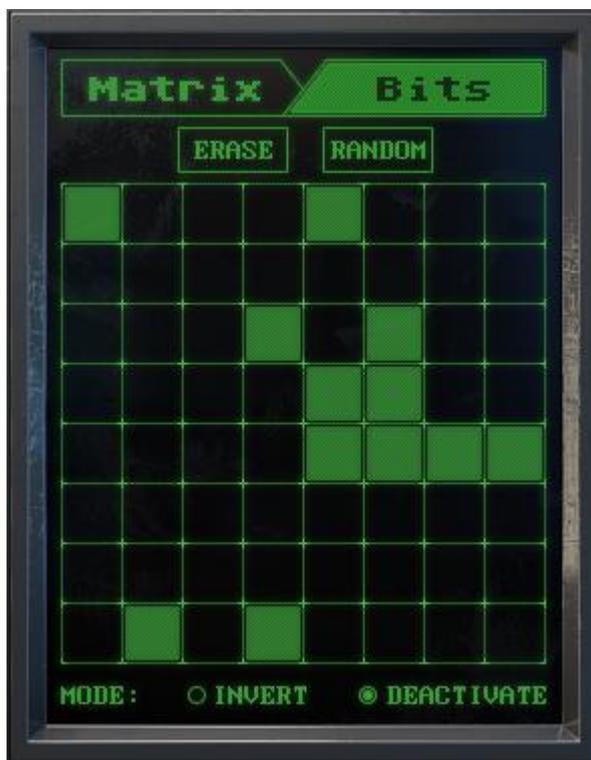
Above the Bit Designer are two edit buttons:

- **ERASE** – Clears the matrix, setting all the squares to zero.
- **RANDOM** – Randomizes the modulation matrix.

6.5 SOURCE

The Source Page is located in the bottom right section of the interface. The controls here are used to control the various parameters of the voices.

If they are not already visible, click on the **SOURCE** tab to display the Source controls.

12 THE SOURCE PAGE

There are six sections in the Source page, each with a handful of controls.

AMP ENV
The Amplifier Envelope controls for the voices:

- **ATTACK** – Sets the attack (fade-in) time of the volume envelope.
- **DECAY** – Sets the decay (fade-out) time of the volume envelope.
- **SCALE** – Sets the scaling of the envelope decay time. Positive values give faster decay times for higher voices; negative numbers give slower decay times for higher voices.
  Decay times will be equal for all voices when this control is in the center position.

FREQ
This section contains the controls that select the frequency of each voice:

The buttons are used to select the frequency control mode:

- **HARM** - Harmonic Mode. The frequencies of the voices are spread by harmonic intervals.
- **MEL** - Melodic Mode. The frequencies of the voices are set by selecting melodic scales and tunings.

Harmonic Mode Controls:

- **HARMONIC** – Controls the harmonic spread of the voices.
- **EQUAL** – Controls the pitch spread of the voices.

Melodic Mode Controls:

- **SCALE** – Selects the scale for the voices.
- **TUNING** – Selects the tuning (temperament) for the scale.

See the Error! Reference source not found. for a list of the included scales and tunings.

PITCH ENV

The voices all have a pitch envelope, which can shape how the pitch of the sound changes when a voice is triggered. The pitch envelope has three controls:

- **DECAY** – Controls the decay (fade-out) time for the pitch envelope.
- **AMOUNT** – Controls the intensity of the pitch envelope.
  This control is bipolar - the pitch envelope has no affect when the knob is in the central position.
- **STEPS** – Sets the resolution of the pitch envelope (i.e. the number of steps in the envelope)

RING MOD

The voices also have a Ring Modulator, which can be used to make the waveforms more complex.

The Ring Modulator has two modes:

- **RATIO** – The frequency of the RM oscillator is based on the frequency of the each voice.
- **FIXED** – The frequency of the RM oscillator is set to a fixed pitch for all voices.

The controls for the Ring Modulator are as follows:

- **RATIO/PITCH** – When in **RATIO** mode, this controls the ratio of the RM frequency to the voice frequency; when in **FIXED** mode this controls the absolute pitch of the RM oscillator.
- **AMOUNT** – Controls the intensity of the Ring Modulation effect.

OSC

The Oscillator controls affect the shape of the main oscillators for all of the voices. There are three controls:

- **SHAPE** – Controls the shape of the oscillators. At the lowest position, the oscillators use sine waves. At higher values the oscillator shape is more like a saw wave.
- **BRIGHT** – Controls the brightness of the voices.
- **SCALE** – Sets the scaling of the **SHAPE** and **BRIGHTNESS** parameters. Positive values give higher values for higher voices; negative numbers give lower values for higher voices.
  SHAPE and **BRIGHTNESS** will be equal for all voices when this control is in the center position.

FEEDBACK

The main output of the Master FX section can be fed back into parameter inputs for the voices. This can be used in moderation to alter the tone of the voices; or heavily to create noise and glitches.

- **DELAY** – Sets the delay time between the FX output and the feedback input.
- **ALLPASS** – Defines the frequency of the allpass filter in the feedback chain.
- **FM** – Defines the amount the main output will feed back to frequency modulate the voices.
- **SYNC** – Defines the amount the main output will feed back to restart the oscillators.
- **SCALE** – Sets the scaling of the feedback. Positive values give higher values for higher voices; negative numbers give lower values for higher voices.
  Feedback will be equal for all voices when this control is in the center position.

6.6 MODULATION

The Modulation Page is located in the bottom right section of the interface. In this page you can assign modulation destinations and control certain parameters for the modulation sources.

If the Modulation page is not already visible, click on the **MOD** tab to display the Modulation controls.

13 THE MODULATION PAGE

There are four modulation sources:

- Two Low Frequency Oscillators (**LFO 1** and **LFO 2**)
- Two Modulation Sequences (**MOD 1** and **MOD 2**)

For information on how to edit the modulation sequences, refer to section 0

The Modulation Sequences.

Each modulation source has its own section in the Modulation Page. At the top of each section is a menu, from which you can select the destination parameter for the modulation.

At the bottom of each section is the **AMOUNT** knob that is used to control the intensity of the modulation. Note that this control is bipolar, so set it to the central position if you want no modulation to occur.

Each section has one other parameter control:

- LFO **RATE** – Sets the rate of the LFO.
- MOD **SMOOTH** – Controls the amount of smoothing between steps in the Modulation Sequence.

6.7   MASTER EFFECTS AND OUTPUT

The Master Effects and Output Page is located in the bottom right section. You can view it by clicking on the **FX** tab.

14 MASTER FX AND OUTPUT PAGE

Voices that have their **BYP** (bypass) button turned off will be routed through the Master Effects. Voices that have bypass active are sent straight to the **OUTPUT** section.

There are two Master Effects in **GRID II**: a Filter and a Delay.

FILTER

The **GRID II** filter is a combination of high-pass and low-pass filters with an internal overdrive circuit. It has the following controls:

- **CUTOFF** – Controls the cutoff frequency of the filter.
- **RESO** – Controls the level of the resonant peak at the cutoff frequency.
- **DRIVE** – Controls the amount of distortion in the filter effect.
- **LP/HP** – Cross-fades between the Low-pass (LP) filter and the High-pass (HP) filter.
- **ENV** – Controls the amount the volume envelopes of the voices will modulate the filter cutoff. This control is bipolar and is neutral in the middle position.
- **FM** – Controls how much of the filter input is also fed into modulating the cutoff frequency of the filter.

DELAY

A delay effect can also be thought of as an echo effect – it can be used to create rhythms, or to add space to a sound.

The **GRID II** delay has the following controls:

- **INPUT** – Sets the level of the signal entering the delay effect.
- **FEEDBACK** – Controls the amount of signal to be fed from the delay output back into its input; i.e. controls the number of repeating echoes.
- **DELAY L** – Sets the delay time for the left channel.
- **DELAY R** – Sets the delay time for the right channel.
- **TEMPO SYNC** – Toggles tempo sync on/off. When active, the delay time will synchronize with the host tempo.

OUTPUT

The Output section is used to control the final output of the instrument. It has five controls:

- **DRY** – Sets the output level for the voices that bypass the master effects.
- **WET** – Sets the output level for the master effects.
- **WIDTH** – Controls the panning of the voices - i.e. the stereo spread of the voices. Higher voices will be spread more than lower voices.
- **LEVELLING** – Applies dynamics compression to the main output.
- **SOFT CLIP** – When active, the main output will be softly clipped. This may cause light distortion, but will keep the output from overloading.

7 APPENDICES

7.1 APPENDIX 1: INCLUDED MUSICAL SCALES

CHROMATIC
Standard chromatic scale with all notes one semitone apart.

MAJOR
Standard western major scale.

MINOR
Standard western minor scale.

WHOLE TONE
Each note is one tone apart.

HIRAJOSHI
Typical Japanese pentatonic scale, generally used as a tuning for Koto strings.

ARABIC
Typical Arabic-style scale.

AEOLIAN
The modern Aeolian mode. Can also be used as an extended blues scale.

DORIAN
The modern Dorian mode.

PHRYGIAN
The modern Phrygian mode.

LYDIAN
The modern Lydian mode.

MIXOLYDIAN
The modern Mixolydian mode, sometimes called the dominant scale.

FREYGISH
Also known as the Phrygian dominant scale.

3/2 TONE
Each note is a minor third (3 semitones) apart.

4TH, 5TH, 6TH
A scale based only on 4th, 5th, and 6th intervals (5, 7, and 9 semitones respectively).

4TH, 5TH, 7TH
A scale based only on 4th, 5th, and minor 7th intervals (5, 7, and 10 semitones respectively).

7.2 APPENDIX 2: INCLUDED TUNINGS/TEMPERMENTS

All tunings in the following tables are based on their deviation in cents from the standard equal temperament in which all 12 tones of the western chromatic scale are 100 cents apart.

EQUAL
Standard western equal temperament, found on most modern keyboard instruments.

Interval	0	1	2	3	4	5	6	7	8	9	10	11
Tuning	0	0	0	0	0	0	0	0	0	0	0	0

JUST
A basic just temperament.

Interval	0	1	2	3	4	5	6	7	8	9	10	11
Tuning	0	+11.7	+3.9	+15.6	-13.7	-2	-17.5	+2	+13.7	-15.7	+17.6	-11.8

SUPER JUST
The Super Just temperament developed by Wendy Carlos.

Interval	0	1	2	3	4	5	6	7	8	9	10	11
Tuning	0	+5	+3.9	+15.6	-13.7	-2	-48.7	+2	+40.5	-13.6	-31.2	-11.7

MEANTONE
A popular European tuning used before equal temperament.

Interval	0	1	2	3	4	5	6	7	8	9	10	11
Tuning	0	-24	-6.8	+10.3	-13.7	+3.4	-20.5	-3.2	-27.4	-20.3	+6.8	-17.1

WERKMEISTER III
A well temperament from 1691, developed by Andreas Werkmeister.

Interval	0	1	2	3	4	5	6	7	8	9	10	11
Tuning	0	-9.8	-7.8	-5.9	-9.8	-2	-1.7	-7.8	-11.7	-3.9	-7.8	0

YOUNG
Another well temperament.

Interval	0	1	2	3	4	5	6	7	8	9	10	11
Tuning	0	-6.1	-4.2	-2.2	-8.3	-0.1	-8.1	-2.1	-4.2	-6.2	-0.2	-8.2

JOHNSTON
A just tuning based on the work of Ben Johnston.

Interval	0	1	2	3	4	5	6	7	8	9	10	11
Tuning	0	+5	+3.9	-2.5	-13.7	-29.2	-48.7	+2	+40.5	+5.9	-31.2	-12.7

PYTHAGOREAN
The classic Pythagorean tuning based on simple fractions.

Interval	0	1	2	3	4	5	6	7	8	9	10	11
Tuning	0	+13.7	+3.9	-5.9	+7.8	-2	+11.7	+2	-7.8	+5.9	-3.9	+9.8

CARLOS HARMONIC
A scale based on the harmonic series, developed by Wendy Carlos.

Interval	0	1	2	3	4	5	6	7	8	9	10	11
Tuning	0	+5	+3.9	-2.5	-13.7	-29.2	-48.7	+2	+40.5	+5.9	-31.2	-11.7

LU
A Chinese tuning from the Han Dynasty.

Interval	0	1	2	3	4	5	6	7	8	9	10	11
Tuning	0	-1	+3.9	+15.6	-5.7	-2	+8.4	+1.9	+0.9	+5.9	+17.6	+6.4

VALLOTTI & YOUNG
A well temperament from the work of Thomas Young.

Interval	0	1	2	3	4	5	6	7	8	9	10	11
Tuning	0	-5.9	-3.9	-2	-7.8	+2	-7.8	-2	-3.9	-5.8	0	-9.8

BAGPIPE
An approximation of the natural tuning of the Scottish bagpipe. The exact tuning was truncated so no note was tuned by more than +/-50 cents.

Interval	0	1	2	3	4	5	6	7	8	9	10	11
Tuning	0	-50	-12.3	-43.4	-50	-6.1	-50	-15.3	-50	-28.1	-14.2	-50

8 CREDITS

Instrument Design/Programming: Adam Hanley

GUI Design: Voger Design

Artwork: Alex Zhukov

Snapshot Programming: Adam Hanley, Luis Delias, Ryan Mallen