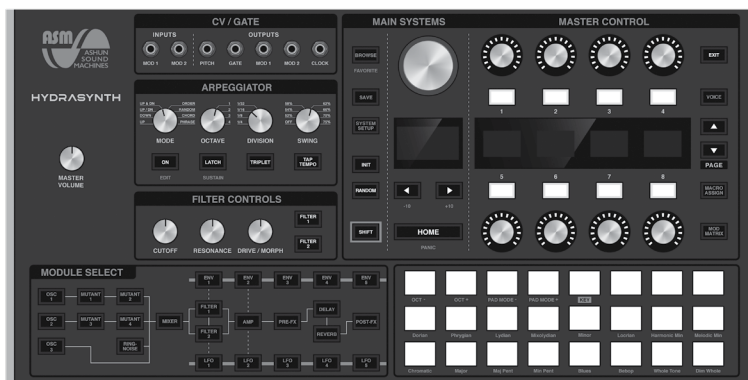


V. 1.5 Addendum

ASM HYDRASYNTH



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Hydrasynth made a huge splash in the synthesizer world when it was introduced by [Ashun Sound Machines](#) in 2019. Synth users recognized immediately that Hydrasynth provides an unprecedented combination of sound generation methods and processing power, coupled with hardware that is perfectly tailored for live interaction and real-time tweaking, all at a very affordable price. And perhaps best of all, a new generation of synth users were introduced to an amazingly expressive way to shape individual notes: polyphonic aftertouch.

With the release of version 1.5 firmware the Hydrasynth gains an exciting range of new features. Here's a brief summary:

Sound engine

- Filter 1 has five new filter models: LP Stn12, BP Stn12, HP Stn12, LP 1 Pole, and LP 8 Pole.
- Filter 2 adds a second filter type: Low Pass / Notch / High Pass.
- There's a [New Mutant: PhazDiff \(p. 6\)](#).
- The noise generator now has 7 noise types, with the addition of Red, Blue, Violet and Grey noise.
- 32 user microtuning scale slots that can receive MIDI Tuning Standard files. See [Microtonality \(p. 5\)](#).
- Envelopes can be triggered by a number of new sources, and as many as four trigger sources can be assigned to each envelope. See [Envelope Trigger sources \(p. 7\)](#).
- Step LFOs
 - Step LFOs can now have up to 64 steps. See [LFO STEP \(p. 8\)](#).
 - Step LFOs have a new Semitone Lock feature (SemiLock) that quantizes the steps for pitch control of the oscillators. See [SemiLock \(p. 8\)](#).

Modulation matrix

- Quick, direct mod route assignment of specific parameters: See [Direct Assignment \(p. 9\)](#).
- The modulation destination list has grown: Macros have been added, as have more parameters from the Voice module. See [Modulation Matrix improvements \(p. 9\)](#).

Randomization

- Random percentages: this allows you to specify how much randomization will happen in each module. See [Percent of Randomization \(p. 10\)](#).
- Randomize from patches: hold [SHIFT] and press [RANDOM] twice to pull values for each module from different patches in memory.

New effect: Distortion

- The Pre-FX and Post-FX modules now have a distortion effect. See [Distortion Effect \(p. 9\)](#).

Performance enhancements

- Latch mode now works with or without the Arpeggiator running. This means you can Latch notes on and have them play drones while you adjust parameters with both hands.
- Master volume can now be controlled by MIDI CC #7.

System Setup changes

- The new Save System state feature allows you to boot up on the patch of your choice. See [System Setup changes \(p. 11\)](#).
- New shorter timing options for the lightshow are available: 10 sec, 30 sec, 1 minute.
- Ribbon can now send NRPN or Pitchbend data.
- Parameter TX/RX now has MIDI CC mode as well as NRPN mode.
- The CV Outputs support another common format: 1.2V per octave.

The next chapter describes the newest features, and provides page numbers where related information can be found in the original Owner's Manual. For full coverage of every feature, please download the Hydrasynth manual from the [Ashun Sound Machines](#) website.

And while you're there, check for firmware updates! We're an insane bunch of synth freaks, and you don't want to miss out on any new features and fixes that we release. Plus you'll find new patches, more microtuning scales, helpful video tutorials, and more.

We know you'll be as excited about these new features as we are. Dive deep!

—*The Hydrasynth team*

This chapter describes the new features in greater detail.

Microtonality

Microtonal scales open up a new world of musical expression beyond the 12 tones most prevalent in the music of the West. Now you can compose and perform music from any culture or harmonic discipline.

There are now 32 memories for loading custom scales. Version 1.5 includes scales provided by musicians from around the world, but any of these can be replaced. You can create your own scales using a freeware application such as Scala, for example, as well as download new scales from the [Ashun Sound Machines](#) website.

Selecting a Microtuning Scale

To select a microtuning scale, navigate to the Scale options on page 3 of the [VOICE] menu and use Control knob 2 to scroll through the list of scales. The 32 microtuning scales show up at the end of the list. The name of the selected microtuning scale is shown in display field 3.

For more information about Scales, see page 66 of the printed manual that shipped with your Hydrasynth. For a description of the other parameters in the Voice module, see page 63 of the printed manual.

Microtuning menu

Here's how to load scales into the Hydrasynth:

- Navigate to page 2 of the [SYSTEM SETUP] menu
- Press Control button 8 to access the Microtuning menu.

The following options are shown in the Master Control section.

Control	Parameter	Range	Description
Knob 1	Scale select	1–32	Selects the Microtuning scale location
2 (view only)	Scale name	1–16 characters	Define with third-party software (Scala, etc.)
Button 3	Receive Scale	–	Puts Hydrasynth into Scale Receive mode (send scale from computer)
Button 4	Send Scale	–	Press to send selected scale sys-ex from Hydrasynth via MIDI / USB

Scale Select

Use this field to choose the scale location that will receive a new scale or send its scale via MIDI / USB.

Scale Name

The scale name is shown in this field. It cannot be edited here. When creating your own scales, be sure to set the scale name in the third-party software before exporting it as an MTS file (MIDI Tuning Standard). In Scala, for example, the name is taken from the Description section for the scale, not from the file name. Note that Hydrasynth only uses the first 16 characters in the name.

Receive Scale

Press Control button 3 to put the Hydrasynth into sys-ex waiting mode. At this point, you can send the sys-ex scale file from your computer.

Send Scale

Press Control button 4 to send your scale via sys-ex.

For a description of the other parameters in the System Setup pages, see page 87 of the printed manual that shipped with your Hydrasynth.

New Mutant: PhazDiff

PhazDiff generates the difference of the incoming wave and a version that is inverted and phase-shifted.

PhazDiff parameter	Range	Description
Depth	0-128 in increments of 0.1	Controls the phase of the output waveform
Feedback	0-150%	Feeds the phase-shifted output back into itself
Dry/Wet	0-100%	Mix raw and phase-shifted waveforms; 100% = pure Mutant

Here's how to check out the new Mutant:

1. Initialize the patch by pressing [INIT] twice.
2. Press [MUTANT 1] to access that Mutant module.
3. Use Control knob 1 to select the Mode. PhazDiff is at the end of the list, after the Harmonic mode.
4. Use Control knob 8 to set the Dry/Wet control to 50%. This provides an equal blend of the raw wave and its mutation.
5. Experiment with different values of Depth and Feedback to hear what they do.
6. Note: Be careful with high Feedback values! The results can be very loud.

Descriptions of the other mutants start on page 38 of the printed manual. They are powerful sound-sculpting tools!

New Noise Types

The noise generator now has 7 noise types, with Red, Blue, Violet and Grey noise added to the original types (White, Pink, and Brown). Here's how to audition them.

- Initialize the patch by pressing [INIT] twice.
- Press [MIXER] and use Control knob 1 to turn OSC 1 level to 0.
- Use Control knob 6 to bring up the Noise level.
- Press [RING-NOISE] to access that module.
- Use Control knob 5 to select the Noise Type. The four new noise types are at the end of the list.

Filter additions

Filter 1: Five new models

Filter 1 has five new filter models. To locate them, access [FILTER 1] and use Control knob 1 to select the filter Type. The new models are located toward the end of the list between the HP 3-Ler and Vowel types.

Name	Description
LP Stn12	Our version of a popular 12dB Low Pass filter
BP Stn12	Our version of a popular 12dB Band Pass filter with dual 6dB slopes
HP Stn12	Our version of a popular 12dB High Pass filter
LP 1 Pole	A gentle 6dB Low Pass filter
LP 8 Pole	A steep 48dB Low Pass filter

Pages 45-47 of the printed manual describe the other Filter 1 models and features.

Filter 2 Type change

Version 1.5 adds a second multi-mode filter type to Filter 2. Now it can be a Low Pass / Band Pass / High Pass filter or a Low Pass / Notch / High Pass filter.

To select the filter type, press [FILTER 2] to access the Filter 2 module and use Control knob 1 to change the Type.

For a description of the other parameters in the Filter modules, see page 45 of the printed manual that shipped with your Hydrasynth. Information specific to Filter 2 begins on page 48.

Envelope Trigger sources

Normally envelopes are triggered and gated by the action of pressing and releasing a key. Prior to version 1.5 the ribbon could do this too, but only when set to Theremin mode.

Version 1.5 adds the ability to trigger envelopes from a variety of sources, including the ribbon in any mode. Once a voice is active, each envelope can have as many as four trigger sources. These are found on page 3 of the Envelope menus:

Control	Parameter	Range
Knob 1	TrigSrc1	OFF [1], Note On, LFO 1-5, Rbn On, Rbn Release, SusPed On, Mod In 1, Mod in 2
Knob 2	TrigSrc2	OFF, Note On, LFO 1-5, Rbn On, Rbn Release, SusPed On, Mod In 1, Mod in 2
Knob 3	TrigSrc3	OFF, Note On, LFO 1-5, Rbn On, Rbn Release, SusPed On, Mod In 1, Mod in 2
Knob 4	TrigSrc4	OFF, Note On, LFO 1-5, Rbn On, Rbn Release, SusPed On, Mod In 1, Mod in 2
Button 5	Tap Trigger	Tap this button to trigger the envelope. The envelope does not sustain while the button is held.

[1] In order for audio output to be possible, TrigSrc1 of Envelope 2 is set to Note On and cannot be changed. All four TrigSrc values can be changed for the other envelopes.

See page 50 of the printed manual for a description of the other Envelope module parameters.

LFO STEP

In version 1.5 the LFOs have been upgraded to allow up to 64 steps when set to Step mode. Select an LFO module, select Step as the Wave, and then navigate to page 2. The following options are shown:

Control knob	Parameter	Range	Description
1	Steps	2-64	Specific LFO points can be selected and defined
2	Smooth	0-127	Slows waveform changes (hidden for Triangle waveform)
4	One-Shot	Off, On	On = LFO completes 1 cycle and stops
7	SemiLock	Off, On	Displays steps in semitone amounts inside the Step Edit page
8	Step Edit..	(access)	Enters the Step Edit page

SemiLock

SemiLock is a new parameter that displays the steps inside the Step Edit page in semitones instead of values of +/- 64.0.

For example,

- Set SemiLock to On.
- Enter the Step Edit page (Control button 8).
- Select a semitone value.
- Press [EXIT].
- Disable SemiLock.
- Now re-enter the Step Edit page.

You'll see that each semitone value actually changes the step value in increments of 5.

When SemiLock is Off, if you select values that are not multiples of 5 and then enable SemiLock, an asterisk (*) is shown at the end of the value to indicate that it is not set to a tuned semitone.

Here's how to put this to work. If you have an LFO with an output level of 128 and use it to modulate OSC Pitch with a depth of 128 in the Mod Matrix, then the semitone values produce standard 12-tone pitches.

See page 76 of the printed manual to learn more about the Mod Matrix. The LFO chapter starts on page 54.

Key / pad note entry

You can select semitone values inside the Step Edit page with the keyboard or pads.

Keyboard: Hold the Control button for the desired step, then press a key inside the 2-octave range around middle C to set the value.

Pads: Results may vary according to the Pad Scale/Key/Mode settings (see pages 27-32 in the manual). But here's the basic process:

- Hold the Control button for the step you want to edit.
- A 2-octave range of pads sets the values. Change the Pad Octave as needed to reach the full range.
- The "no transposition" pad is based on the selected Pad Key. For example:
 - If the Pad Key = C, one of the yellow pads is middle C. The pad below that selects -1 semi (B), etc.
 - If the Pad Key = F, one of the yellow pads is middle F. The pad below that selects -1 semi (E), etc.
- If the Pad Octave is set too high or low, most or all of the pads will provide only the extreme values of +/-12.
- If the pads are set to a non-chromatic scale, some notes might not be available on the pads. Play the nearest pad and then use a Control knob to adjust the note as needed.

See page 54 of the printed manual for a description of the other LFO parameters.

Distortion Effect

The Pre-FX and Post-FX modules have a new distortion effect. Press [PRE-FX] or [POST-FX] and use Control knob 1 to select the FX type. Distort appears at the end of the list, after the Compressor. It offers the following parameters:

Control knob	Parameter	Range	Description
2	Preset	Drive 1-3	Selects a preset template
3	[Drive]	0.0-128.0	Sets the signal level sent to the distortion circuit
4	[Tone]	+/- 64.0	Controls output bandwidth: -64.0 to -0.1: high cut 0.0: bypass 0.1 to 64.0: low cut
5	Asym	0-128	Changes how the clipping effect is applied: 0 = a balanced (symmetrical) output Higher levels = increasingly asymmetrical output
6	Curve	0-128	Changes the saturation curve in the distortion: 0 = an overdrive type of effect Higher levels = increasingly harsh distortion
7	Output	-36 / +24 dB	Gain compensation control
8	[Dry/Wet]	0.0-100.0%	Blends unaffected and affected signals



The parameter names shown above in [brackets] are available as mod destinations for Macros and the Mod Matrix. The values for these parameters have finer increments than the others, which ensures maximum resolution when they are being modulated.

For information about the other Effects, see page 58 of the printed manual that shipped with your Hydrasynth.

Modulation Matrix improvements

Direct Assignment

Version 1.5 makes setting up a mod route even easier by allowing direct mod route assignments of specific parameters. After you access the page with the parameter to be modulated, hold the modulation source button and press the Control button next to the parameter in the Right display. This creates a link between the source and destination in the fewest possible number of steps.

For example, here's how to route ENV 5 to the LFO 1 Amount of Filter 1:

- Press [FILTER 1] to access that module.
- Press and hold [ENV 5] to select it as the mod source.
- Press Control button 6 to select LFO1amt as the destination.
- The mod route ENV 5 to Filter 1's LFO 1 Amount is created.
- Use the Control knob on the bottom row to set the modulation amount, and you're done!

Note that this new implementation supersedes the information in the Shortcuts section on page 76 of the printed manual. You can still use that technique if you want; it's just a couple of steps longer.

More Mod Destinations

The modulation destination list has grown: Macros have been added, as have more parameters from the Voice module. To view them:

- Access [MOD MATRIX].
- Select an active mod route by pressing one of the top Control buttons.
- Press the bottom Control button to access the Destinations field.
- Hold [SHIFT] and turn the top Control knob to jump through the destination groups.
- The Macro and Voice groups appear between the ModMtrx and CV groups.
- Select either the Macro or Voice group again.
- Press the bottom Control button to access the parameter field.
- Turn the top Control knob to view the parameters within the selected group.

Type	Group	Parameters
(new)	Macro	Macro 1 - Macro 8
(new)	Voice	Detune, AnalogFL, PitchBnd, Vib Amt, Vib Rate, GlidTime

See page 78 of the printed manual for a list of the other modulation sources. Again, these two groups appear between the ModMtrx and CV groups in that list.

New Randomize Features

Percent of Randomization

The random page has been updated so you can specify how much randomization takes place in each of the modules. Press [RANDOM] to access two pages of randomization percentages for the modules listed below.

Page	Module(s)	Range
1	OSC 1-3, Mutant 1-4, Mixer, Filters, Macro, ModMtrx, ENV, LFO	0-100%
2	Voice, Amp, FX, Arp, Ribbon	0-100%

Here's one way to take advantage of this new feature:

- After the modules have been randomized according to your settings, if you like the results on one of the modules and don't want them to change, set the percentage for that module to 0% before using the Randomize feature again. This prevents changes from being made to that module while you "roll the dice again" for the other modules.
- Repeat the cycle, and each time you get a favorable result, set the randomization percentage for that module to zero, or merely reduce the percentage to allow less randomization to occur.

After a few times using this technique it's likely you'll achieve one of those "happy accident" patches that you might never have thought to construct yourself.

Random extraction from other patches

Version 1.5 adds a second patch randomization option that generates a new patch by pulling in a random selection of values from other patches, which themselves are selected at random from other banks. This results in many more useable patches, because it combines various aspects of patches that are already known to be useful.

To do this, hold [SHIFT] and press [RANDOM] twice. To differentiate this process from the other patch randomization technique, the Left display shows “PATCHRND” instead of the word “GENERATE” (which is what is shown when you merely press [RANDOM] without holding [SHIFT]).

Note that as described in the previous section, you can also set randomization percentages for this process before pressing [RANDOM] the second time. This allows you to focus the randomization process only on those aspects of the current patch that you don't want to keep.

For a description of the other Random features, see page 20 of the printed manual that shipped with your Hydrasynth.

System Setup changes

Save System state

Version 1.5 lets you specify which patch you see first when the Hydrasynth is powered up. This way your most inspiring patch is available immediately! You could also use this to make sure the first patch you use in your performance is ready for the sound check as soon as you're set up.

The process couldn't be simpler:

- Select your favorite patch (that's the hard part).
- Hold [SAVE] and press [SYSTEM SETUP].
- The display shows “STATE SAVED!” to confirm the action.

For the desktop unit this process also saves the Pad Mode (Octave Row, Fretboard, etc.), the Pad Scale, and the Pad Key.

Lightshow

New shorter timing options for the lightshow are available: 10 sec, 30 sec, 1 minute. These are found on page 1 of [SYSTEM SETUP].

Ribbon settings

Ribbon can now send NRPN or Pitchbend data. These options are found on page 5 of [SYSTEM SETUP]. The ribbon sends Pitchbend data when RbnPB TX is set to On; it sends NRPN data when this parameter is set to Off.

Parameter send/receive options

The Hydrasynth can now transmit or receive standard 7-bit MIDI CC's. This allows for more user-friendly automation on DAWs that do not support the MIDI NRPN standard.

To enable MIDI CC's to transmit and receive, navigate to page 6 of the [SYSTEM SETUP] menu and set the Param TX and Param RX to CC. The MIDI CC assignments are listed on the next four pages of this document.

But keep this in mind: Since MIDI CC's are only 7-bit, this means they only have 128 steps of resolution. NRPNs are 14-bit and support up to 16,384 steps of resolution. This means that you may experience stepping of values in some parameters.

CV Outputs: new voltage range

The CV Outputs support another common format: 1.2V per octave. These options are found on page 7 of [SYSTEM SETUP].

Descriptions of the other System Setup parameters begin on page 87 of the printed manual.

Sorted by Module

Module	Parameter	CC
Amp	Amp LFO2amt	62
ARP	ARP Division	106
ARP	ARP Gate	107
ARP	ARP Mode	108
ARP	ARP Ratchet	109
ARP	ARP Chance	110
ARP	ARP Octave	120
ARP	ARP Length	122
Delay	Delay Feedback	14
Delay	Delay Time	15
Delay	Delay Wet tone	63
Delay	Delay Dry/Wet	92
ENV 1	ENV1 Attack	81
ENV 1	ENV1 Decay	82
ENV 1	ENV1 Sustain	83
ENV 1	ENV1 Release	84
ENV 2	ENV2 Attack	85
ENV 2	ENV2 Decay	86
ENV 2	ENV2 Sustain	87
ENV 2	ENV2 Release	88
ENV 3	ENV3 Attack	89
ENV 3	ENV3 Decay	90
ENV 3	ENV3 Sustain	96
ENV 3	ENV3 Release	97
ENV 4	ENV4 Attack	25
ENV 4	ENV4 Decay	27
ENV 4	ENV4 Release	124
ENV 4	ENV4 Sustain	125
ENV 5	ENV5 Attack	102
ENV 5	ENV5 Decay	103
ENV 5	ENV5 Sustain	104
ENV 5	ENV5 Release	105
Filter 1	Filter 1 Drive	50
Filter 1	Filter 1 Keytrack	51
Filter 1	Filter 1 LFO1amt	52
Filter 1	Filter 1 Vel Env	53
Filter 1	Filter 1 ENV1amt	54

Filter 1	Filter 1 Res	71
Filter 1	Filter 1 Cutoff	74
Filter 2	Filter 2 Cutoff	55
Filter 2	Filter 2 Res	56
Filter 2	Filter 2 Type	57
Filter 2	Filter 2 Keytrack	58
Filter 2	Filter 2 LFO1amt	59
Filter 2	Filter 2 Vel Env	60
Filter 2	Filter 2 ENV1amt	61
LFO 1	LFO1 Gain	70
LFO 1	LFO1 Rate	72
LFO 2	LFO2 Gain	28
LFO 2	LFO2 Rate	73
LFO 3	LFO3 Gain	75
LFO 3	LFO3 Rate	76
LFO 4	LFO4 Gain	77
LFO 4	LFO4 Rate	78
LFO 5	LFO5 Gain	79
LFO 5	LFO5 Rate	80
Macros	Macro 1	16
Macros	Macro 2	17
Macros	Macro 3	18
Macros	Macro 4	19
Macros	Macro 5	20
Macros	Macro 6	21
Macros	Macro 7	22
Macros	Macro 8	23
Mixer	Noise Vol	03
Mixer	Noise Pan	08
Mixer	Ring Mod Vol	09
Mixer	Ring Mod Pan	10
Mixer	RM12 Depth	43
Mixer	OSC1 Vol	44
Mixer	OSC1 Pan	45
Mixer	OSC2 Vol	46
Mixer	OSC2 Pan	47
Mixer	OSC3 Vol	48
Mixer	OSC3 Pan	49

Mixer	OSC 3 FRate	114
Mixer	Noise FRate	115
Mixer	Ring Mod FRate	116
Mixer	OSC1 FRate	118
Mixer	OSC2 FRate	119
Mutator 1	Mutator1 Ratio	29
Mutator 1	Mutator1 Depth	30
Mutator 1	Mutator1 Dry/Wet	31
Mutator 2	Mutator2 Ratio	33
Mutator 2	Mutator2 Depth	34
Mutator 2	Mutator2 Dry/Wet	35
Mutator 3	Mutator3 Ratio	36
Mutator 3	Mutator3 Depth	37
Mutator 3	Mutator3 Dry/Wet	39
Mutator 4	Mutator4 Ratio	40
Mutator 4	Mutator4 Depth	41
Mutator 4	Mutator4 Dry/Wet	42
OSC 1	OSC1 wavscan	24
OSC 1	OSC 1 Cent	111
OSC 2	OSC2 WavScan	26
OSC 2	OSC 2 Cent	112
OSC 3	OSC 3 Cent	113
Post-fx	POST-FX Param1	68
Post-fx	POST-FX Param2	69
Post-fx	POST FX Mix	94
Pre-fx	PRE-FX Param1	12
Pre-fx	PRE-FX Param2	13
Pre-fx	PRE-FX Mix	93
Reverb	Reverb Time	65
Reverb	Reverb Tone	67
Reverb	Reverb Dry/Wet	91
System	Bank select MSB	00
System	Modulation wheel.	01
System	Master Volume	07
System	Expression pedal	11
System	Bank select LSB	32
System	Sustain pedal	64
System	All notes off	123

Voice	GlidTime	05
Voice	Glide	66
Voice	Detune	95
Voice	StWidth	117

Sorted by CC Number

Module	Parameter	CC
System	Bank select MSB	00
System	Modulation wheel.	01
Mixer	Noise Vol	03
Voice	GlidTime	05
System	Master Volume	07
Mixer	Noise Pan	08
Mixer	Ring Mod Vol	09
Mixer	Ring Mod Pan	10
System	Expression pedal	11
Pre-fx	PRE-FX Param1	12
Pre-fx	PRE-FX Param2	13
Delay	Delay Feedback	14
Delay	Delay Time	15
Macros	Macro 1	16
Macros	Macro 2	17
Macros	Macro 3	18
Macros	Macro 4	19
Macros	Macro 5	20
Macros	Macro 6	21
Macros	Macro 7	22
Macros	Macro 8	23
OSC 1	OSC1 wavscan	24
ENV 4	ENV4 Attack	25
OSC 2	OSC2 WavScan	26
ENV 4	ENV4 Decay	27
LFO 2	LFO2 Gain	28
Mutator 1	Mutator1 Ratio	29
Mutator 1	Mutator1 Depth	30
Mutator 1	Mutator1 Dry/Wet	31
System	Bank select LSB	32
Mutator 2	Mutator2 Ratio	33
Mutator 2	Mutator2 Depth	34
Mutator 2	Mutator2 Dry/Wet	35
Mutator 3	Mutator3 Ratio	36
Mutator 3	Mutator3 Depth	37
Mutator 3	Mutator3 Dry/Wet	39
Mutator 4	Mutator4 Ratio	40
Mutator 4	Mutator4 Depth	41
Mutator 4	Mutator4 Dry/Wet	42

Mixer	RM12 Depth	43
Mixer	OSC1 Vol	44
Mixer	OSC1 Pan	45
Mixer	OSC2 Vol	46
Mixer	OSC2 Pan	47
Mixer	OSC3 Vol	48
Mixer	OSC3 Pan	49
Filter 1	Filter1 Drive	50
Filter 1	Filter1 Keytrack	51
Filter 1	Filter1 LFO1amt	52
Filter 1	Filter1 Vel Env	53
Filter 1	Filter1 ENV1amt	54
Filter 2	Flt2 Cutoff	55
Filter 2	Flt2 Res	56
Filter 2	Flt2 Type	57
Filter 2	Filter2 Keytrack	58
Filter 2	Filter2 LFO1amt	59
Filter 2	Filter2 Vel Env	60
Filter 2	Filter2 ENV1amt	61
Amp	Amp LFO2amt	62
Delay	Delay Wet tone	63
System	Sustain pedal	64
Reverb	Reverb Time	65
Voice	Glide	66
Reverb	Reverb Tone	67
Post-fx	POST-FX Param1	68
Post-fx	POST-FX Param2	69
LFO 1	LFO1 Gain	70
Filter 1	Filter1 Res	71
LFO 1	LFO1 Rate	72
LFO 2	LFO2 Rate	73
Filter 1	Filter1 Cutoff	74
LFO 3	LFO3 Gain	75
LFO 3	LFO3 Rate	76
LFO 4	LFO4 Gain	77
LFO 4	LFO4 Rate	78
LFO 5	LFO5 Gain	79
LFO 5	LFO5 Rate	80
ENV 1	ENV1 Attack	81
ENV 1	ENV1 Decay	82

ENV 1	ENV1 Sustain	83
ENV 1	ENV1 Release	84
ENV 2	ENV2 Attack	85
ENV 2	ENV2 Decay	86
ENV 2	ENV2 Sustain	87
ENV 2	ENV2 Release	88
ENV 3	ENV3 Attack	89
ENV 3	ENV3 Decay	90
Reverb	Reverb Dry/Wet	91
Delay	Delay Dry/Wet	92
Pre-fx	PRE-FX Mix	93
Post-fx	POST FX Mix	94
Voice	Detune	95
ENV 3	ENV3 Sustain	96
ENV 3	ENV3 Release	97
ENV 5	ENV5 Attack	102
ENV 5	ENV5 Decay	103
ENV 5	ENV5 Sustain	104
ENV 5	ENV5 Release	105
ARP	ARP Division	106
ARP	ARP Gate	107
ARP	ARP Mode	108
ARP	ARP Ratchet	109
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