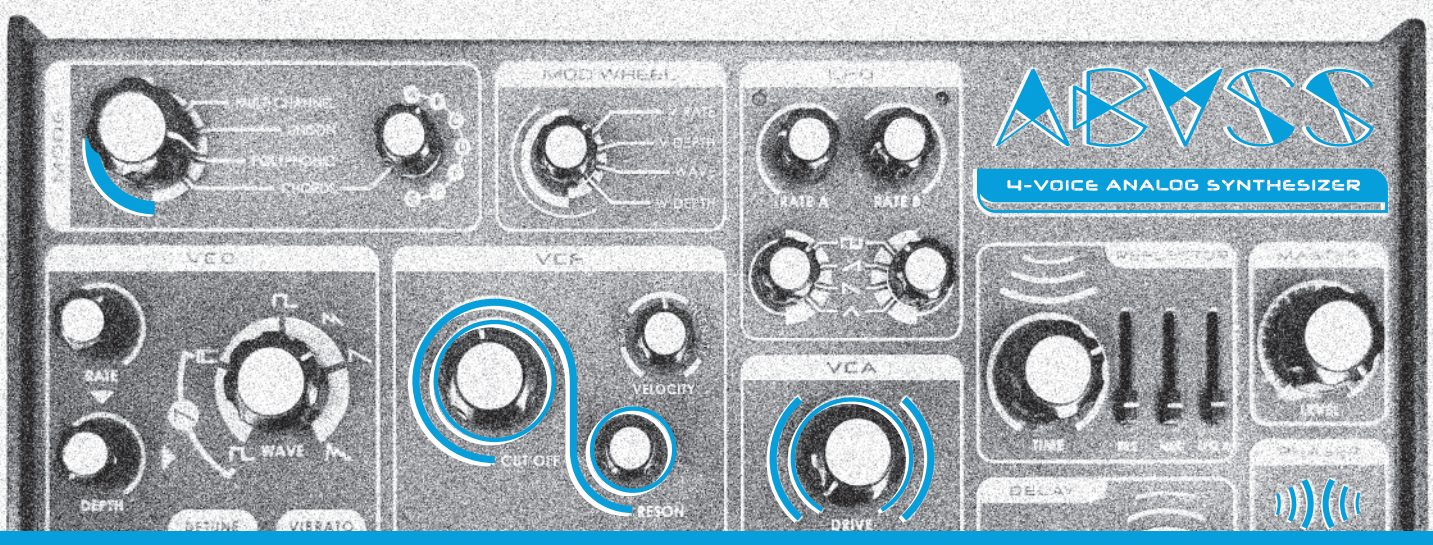


User's Manual



dre:adbox

CONTENTS

Introduction ***3***

Schematic diagram ***4***

Manual ***5***

1. Voice Modes ***5***

2. Oscillators ***6***

3. Filter ***7***

4. Amplifier ***8***

5. Reflector ***8***

6. Delay ***9***

7. Phaser ***9***

8. Dual Analog LFO ***9***

9. Mod Wheel ***10***

10. DIP Switch and MIDI interface ***10***

11. MIDI Channel ***10***



INTRODUCTION

Thank you for purchasing the Dreadbox ABYSS 4-Voice Plolyphonic Synthesizer !

Abyss is an analog synthesizer, consisted of 4 murmux voices with some digital modulations followed by 4 analog effects (exept for the Hybrid Delay Circuit). Playing around with the Abyss is really easy as there is almost none hidden controls, no menu diving and everything is one knob per function.

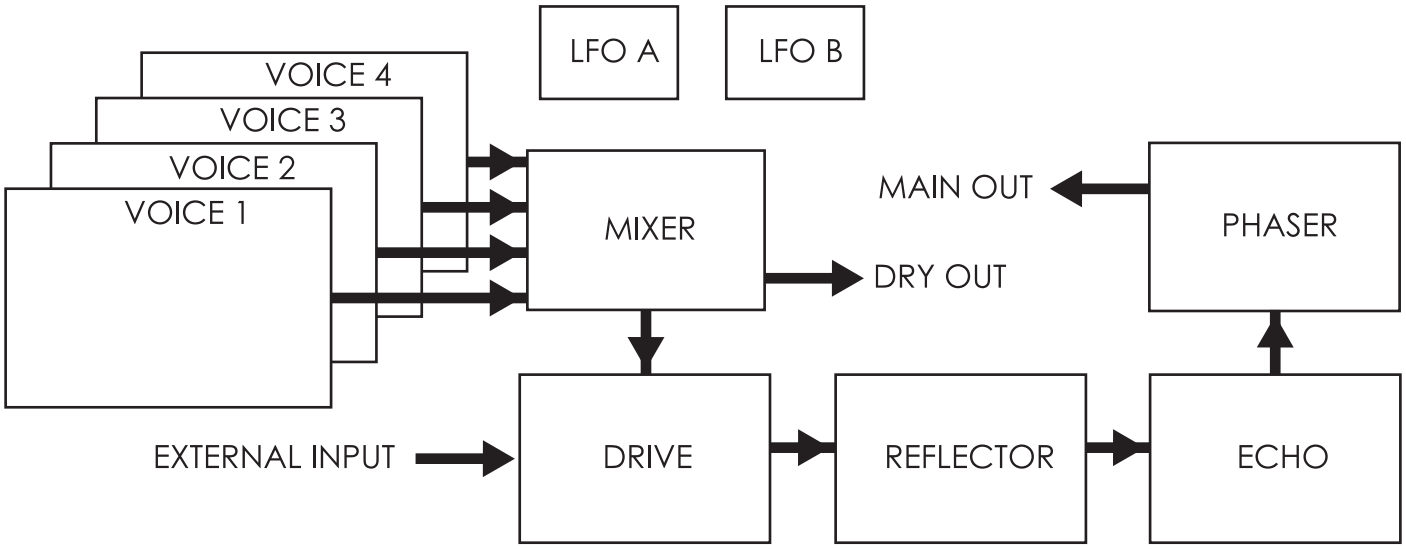
It was the March of 2016 when we decided to create the Abyss. The initial goal was to create a polyphonic instrument with the warmth and the power of the Murmux series. At that time, we had a lot of issues to solve, as we had never made any polyphonic synthesizers and problems like how to keep all 4 voices in tune without using DCO's needed some brain scratching. As months of development were passing, we ended up stacking some effects and it was the december of 2016 that we really had the 1st version of the Abyss at hand. We both have very different playing styles and taste in music, which helped us a lot into scalpturing the Abyss and making it versatile.
We are having real fun playing with the Abyss and we hope that you enjoy this as much as we do!

The Developers
Yiannis Diakoumakos
Stratos Bichakis

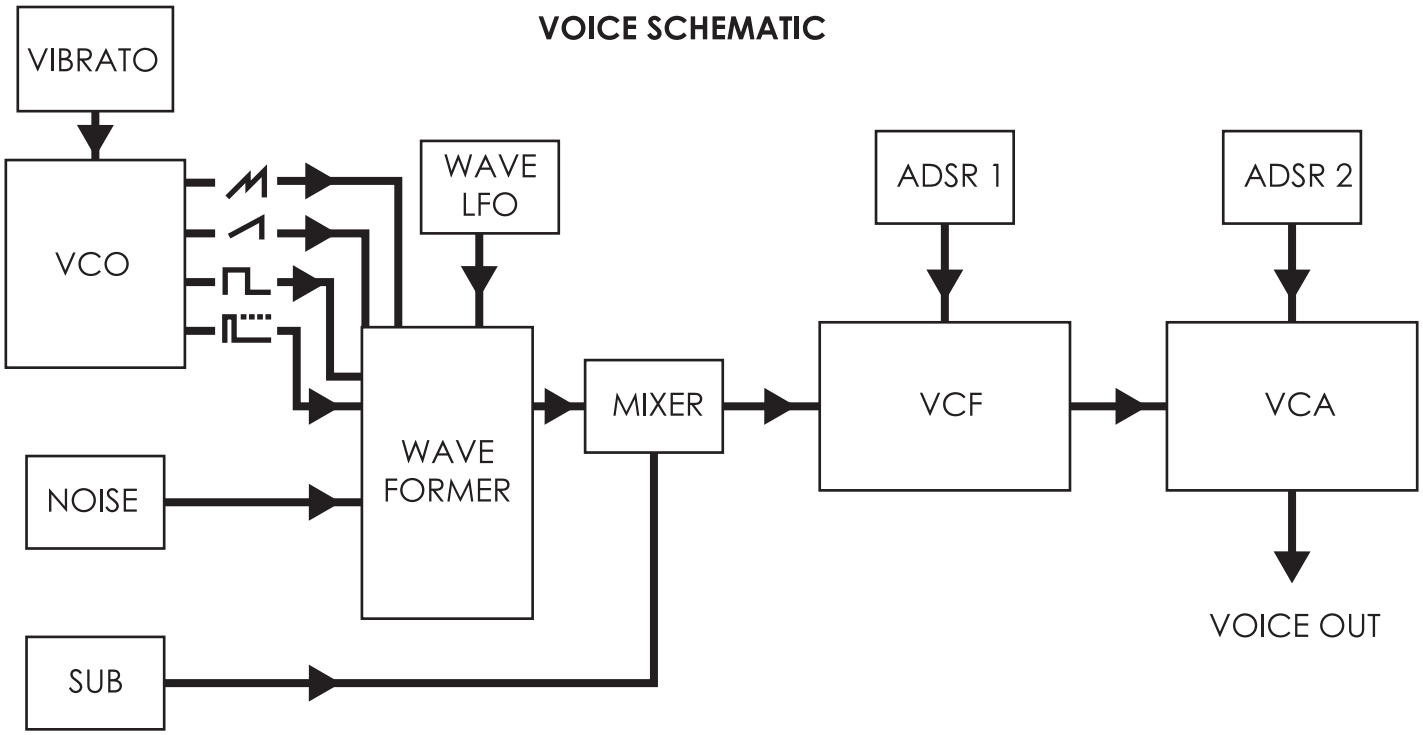
Athens -Greece
May 2017

SCHEMATIC DIAGRAMM

GENERAL SCHEMATIC



VOICE SCHEMATIC



1. Voice Modes

You can operate the Abyss in any of the four different voice allocation modes by selecting one from the rotary switch, located on the front panel.

MULTICHANNEL mode: In this mode each of the four voices is controlled via a consecutive midi channel, starting from the midi channel assigned from the four midi channel switches. This way you can independently play four different melodies or use each voice of the Abyss as a monophonic instrument. This mode is also useful for creating complex melodic or rhythmic lines, using four monophonic sequencer channels. If for example you have selected channel 10, the Abyss voices from 1 to 4 will respond to midi channels 10 to 13 accordingly. When you have selected OMNI channel mode, while in Multichannel voice mode, the unit will respond to channels 1, 2, 3, 4, spreading the four voices to these four channels.

UNISON mode: In this mode Abyss brings all voices into play to create a massive monophonic sound, don't forget to play with the VCO detune parameter for a wide and lush sound!!

POLYPHONIC mode: This mode allows you to play polyphonic chords or melodies, spreading the different notes to different voices. Each Abyss voice is individual, that means you have individual notes, individual envelopes plus glide and vibrato delay retriggered when each of the voices is in use.

CHORDS mode: In this mode you can play one note at a time and the Abyss will respond by playing a four voice chord. You can select any of the 6 pre-configured chords or you can play your own custom chord using the chords' rotary switch.

Chords in semitones from
the base note

A {0, -12, 12, 24} //octaves

B {-5, 0, 7, 12} //fifths

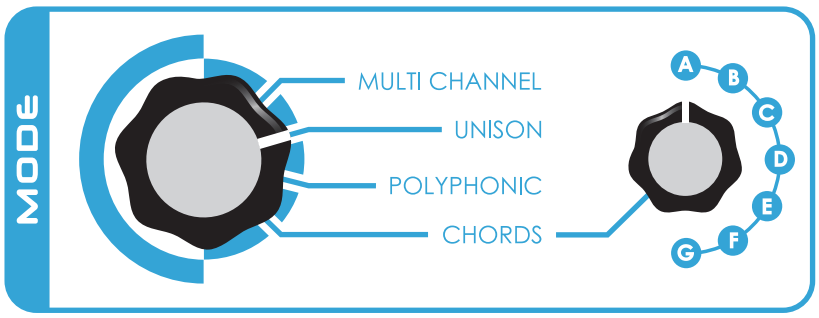
C {0, 3, 7, -5} //minor

D {0, 4, 7, -5} //major

E {0, 3, 7, 10} //minor 7

F {0, 4, 7, 11} // major 7

G user chord



The positions A to F correspond to six pre-selected chords and the last one, named G, is a position in which you can recall a chord of your choice.

Storing the chord is as easy as switching to poly mode and playing four notes, either one after the other or all at once. The last 4 notes played in the poly mode are stored in the G chord.

2. Oscillator (VCO)

Abyss uses our classic saw core VCO design, and we strongly believe that this is its main feature. Those oscillators, tend to be unstable, but not too unstable - they go up to the sweet spot, where we would call them "liquid".

Each of the Abyss VCO is equipped with :

1 oscillator
1 sub octave
1 dedicated vibrato
1 dedicated glide control

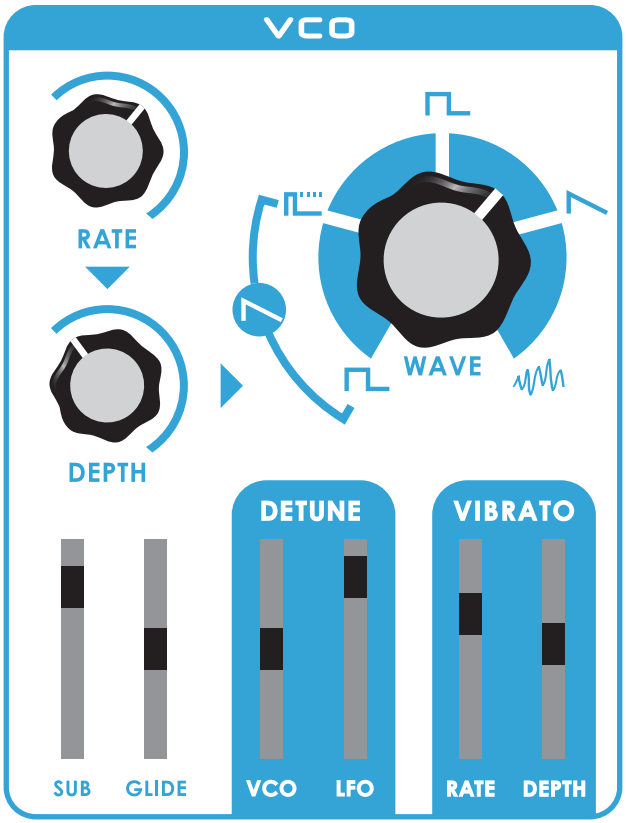
By looking to the panel, you can notice that the oscillator part of the Abyss, is consisted of 4 areas:

A. Wave forming and its assosiated LFO

WAVE: Choose the VCO's wave form. This can also be controlled via the deticated LFO on its right. In some units, the doted line of the knob might be a little bit higher than it's indicated on the panel -this is normal and it is caused by the analog roll off of the potetiometer.
By setting the depth control knob at maximum, the wave will be altered in a range of 2 areas. Please notice that the depth will always be added to the current wave value.

B. Sub oscillator and the Glide control

SUB: add a square wave 1 octave lower than the frequency of the oscillator currently tracks.
GLIDE: add portamento to the tracking.



C. Detune controls

DETUNE VCO: add a pitch offset to each of the 4 voices.
DETUNE LFO: can either send the lfo of all 4 voices out of phase or, act as a vibrato delay when the DIP switch 6 is ON

D. Vibrato

Adds vibrato to the oscillator pitch.

RATE: speed of the vibrato
DEPTH: vibrato amount

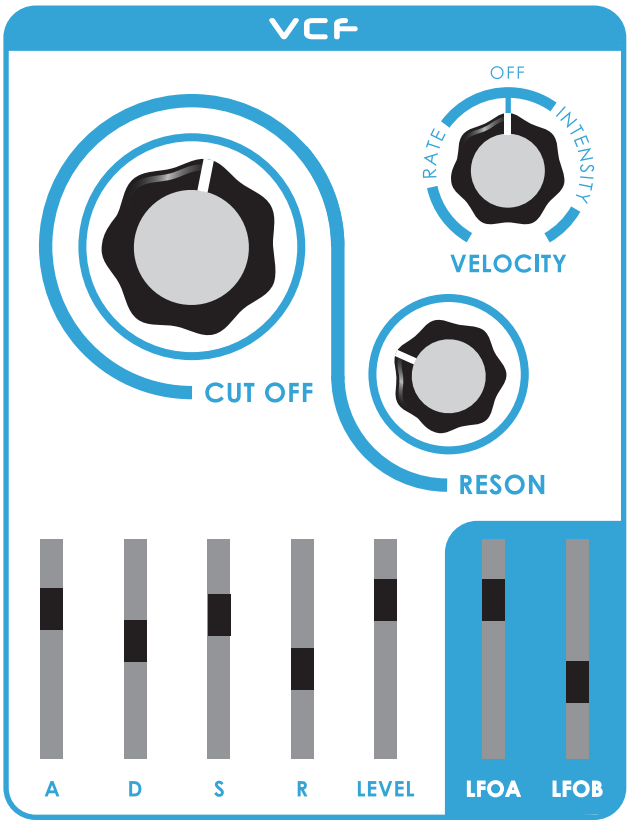
3. Filter (VCF)

Each of the 4 Abyss voices has a 24dB/octave filter (4 pole) with a deticated envelope generator .

Like on the VCO, again looking to the panel, you can notice that the filter part of the Abyss, is consisted of 4 areas:

A. The actual filter controls

CUT OFF: The roll off frequency of the filter
RESON: The amount of feedback of the filter. When at max, self-oscillation will occure.



B. The ADSR enevelope generator

These will control and morph the dedicated envelope generator.
ATTACK: rise time
DECAY: fall time until the sustain level is reached
SUSTAIN: the value that the envelope stays until a key is released
RELEASE: decay time until a key is released
DEPTH: the amount of envelope, going to the filter's cut off

C. The LFO controls

These will add modulation from the 2 analog LFO's to the filter. For more info regarding the analog LFO, check "8.Dual analog LFO, p. 9"

D. The Velocity control

You can alter the behaviour of the filter's envelope, based on the velocity value of each note, by tweaking this knob. Turning the knob towards the left side, you can affect the speed of the envelope's attack phase. That means that the harder you play the keyboard, the higher the velocity value and the faster the attack response will be. You can control the amount of this change by turning the knob anti clockwise from the 12 o' clock (middle position). The maximum time of the attack time is set by the fader control named A.
Past the middle position, you can increase the influence of the velocity value to the level of the envelope applied to the filter's frequency accordingly. The maximum amount of the envelope applied, is set by the fader control named LEVEL.

4. Amplifier (VCA)

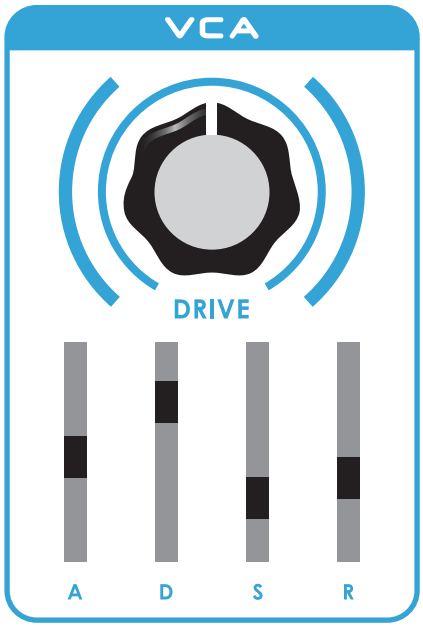
Abyss is using an OTA amplifier, which adds even more dimension to its sound. The OTA can be overdrived, almost to a distortion point. The VCA has also a dedicated ADSR envelope.

ATTACK: Rise time

DECAY: Fall time until the sustain level is reached

SUSTAIN: The value that the envelope stays until a key is released

RELEASE: Decay time until a key is released. At max level the release is infinite.

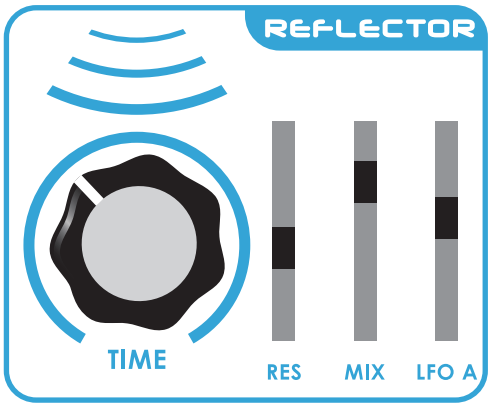




One thing to notice is that the final level of the unit is controlled via the Mastel level. By adding drive, this will alter the total level of the unit, so you need to be carefull when tweaking this.

5. Reflector

The second effect in line (the 1st one is the drive), is the reflector. The reflector ,actually, is a 1054 BBD delay (50ms delay time at max), which in combination with an LFO can produce Chorus, Flangers, Static flanges, tape effects and vibratos.
In order to master the controls of the reflector and produce these effect you'll need some serious practicing and experimentation. In the end you'll adore this great tool!



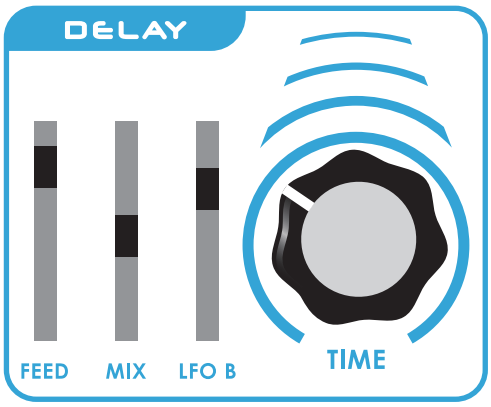
TIME: Alters the delay time from 5ms up to 50ms

RES: Controls the Feedback

MIX: Blends beetween the dry signal and the delayed one

LFO A: Adds modulation via from the LFO A

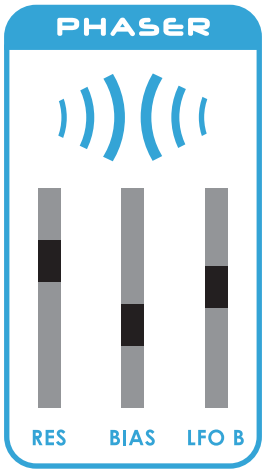
6. Delay



Delay is the third effect in series. The delay of the Abyss is a hybrid circuit - very dark- but it's great for modulations.

FEED: the feedback of the delay (or number of repeats). It can self-oscillate.
MIX: Blends between the dry signal and the delayed one
LFO B: Adds modulation via the LFO B. Please note that in saw, raw and square wave setting, when the cv input is not filtered to allow high frequency external FM , a click will occure- and it is absolutely normal.
TIME: Sets the Delay time, from 40ms up to 180-200ms

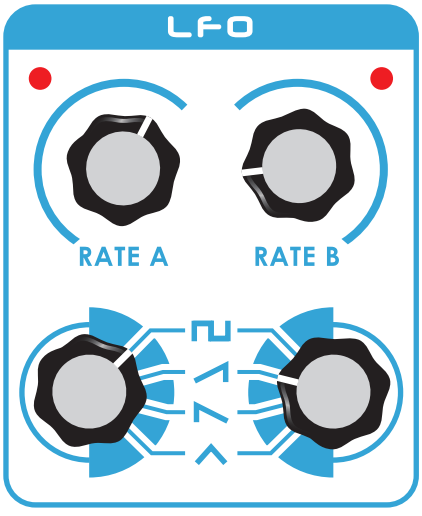
7. Phaser



Abyss has a 4 stage phase shifter, which is based on an OTA circuit and it is the final effect in series.

RES: Sets the feedback amount.
Also acts as a mix control (when at 0%, the effect is by-passed)
BIAS: Sets the Initial frequency of the phase
LFO B: Adds modulation via the LFO B. Please note that in saw, raw and square wave setting, when the cv input is not filtered to allow high frequency external FM , a click will occure- and it is absolutely normal.

8. Dual analog LFO

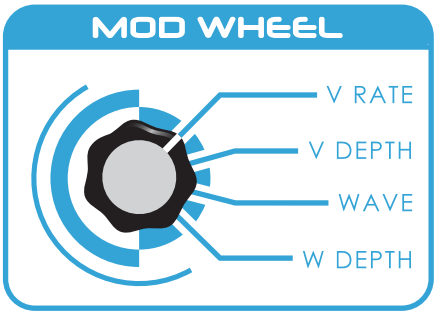


Two analog LFO's can be found on the Abyss. Those are shared between the filter, the reflector, the delay and the phaser.

RATE A: Alters the LFO A speed
RATE B: Alters the LFO B speed
WAVE SELECTORS: Changes the wave shape of the LFOs. Please note that when on saw and raw wave, the rate will be doubled in frequency.

9. MOD WHEEL

With this switch you can choose what the modulation wheel of your midi keyboard controls



V RATE: Sets the Vibrato's Rate Speed
V DEPTH: Sets the Vibrato's Depth
WAVE: Sets the Wave Shape
W DEPTH: Sets the Depth of the Wave Shaper LFO

10. DIP switch and MIDI interface

You can control the Abyss by connecting a MIDI controller/keyboard/sequencer or through a MIDI interface to your computer (this way you can use a variety of compatible software with the MIDI communication protocol).
The MIDI protocol can effectively send unique commands to 16 units, this is possible by assigning each unit to a different MIDI channel. You can select the MIDI channel that the Abyss responds to, from the first four DIP switches located on the back panel of the unit.

A. MIDI CC

In addition to the use of the modulation wheel (MIDI CC #1) you can use a few other midi commands with the Abyss.
MIDI Control #64 acts as a sustain or hold and MIDI Control #63 acts as a portamento switch, enabling and disabling the glide function. The last Command that Abyss responds to, is the All Notes Off Function on MIDI Control #123.

11. MIDI CHANNEL SELLECTION DIP SWITCH 1,2,3,4

OMNI mode means that the unit responds to MIDI commands regardless their channel. You can control Abyss by using any of the 16 midi channels.

The modes 1 to 14 indicate the MIDI channel that the unit will react to. Abyss will respond only to commands from this channel.

SERVICE mode (all switches 1,2,3,4 ON) bypasses any tuning adjustments made by the autotune mode. This will make the Abyss sound out of tune!!!
The purpose of this mode is to enable a specialist during a repair to check each oscillator's default scaling.

DIP SWITCH	1	2	3	4
ALL Channels	OFF	OFF	OFF	OFF
Channel 1	ON	OFF	OFF	OFF
Channel 2	OFF	ON	OFF	OFF
Channel 3	ON	ON	OFF	OFF
Channel 4	OFF	OFF	OFF	OFF
Channel 5	ON	OFF	OFF	OFF
Channel 6	OFF	ON	ON	OFF
Channel 7	ON	ON	ON	OFF
Channel 8	OFF	OFF	OFF	ON
Channel 9	ON	OFF	OFF	ON
Channel 10	OFF	ON	OFF	ON
Channel 11	ON	ON	OFF	ON
Channel 12	OFF	OFF	ON	ON
Channel 13	ON	OFF	ON	ON
Channel 14	OFF	ON	ON	ON

C. MULTI TIMBRAL DIP SWITCH 5

This switch enables the multi-timbral function of the Abyss, in which you can shape the envelopes of each voice independently. While on this mode, you can select the voice you are treating by using the positions A to D of the chord rotary switch. The rest of the positions will affect all four voices. This works only if you are not in chord mode.

D. VIBRATO DELAY DIP SWITCH 6

This switch enables an additional feature of the Vibrato function. While on this mode the fader control named LFO under DETUNE, is disconnected from its basic function, to accommodate the new role of changing the lag time after a new note event, before the vibrato kicks in. This feature simulates a typical expression element of many instrumentalists and singers.

E. FINE TUNE DIP SWITCH 7

This switch alters the function of the WAVE knob. When this switch is set to ON the WAVE knob acts as a main tune offset for all four voices.

F. AUTOTUNE DIP SWITCH 8

This switch starts the auto-tuning process of the Abyss oscillators. When enabled you will hear each voice going through several octaves, one at a time. It is essential that you start this process after the unit has reached the full operational temperature, which is 20 minutes after the initial power up. Under normal conditions you should not need to repeat the process each time, only after you have noticed a severe drift of the oscillators tuning.

ABYSS

4-VOICE ANALOG SYNTHESIZER

Specifications

- 15VDC POWER INLET: Accepts +15VDC, 1A at 2,5mm center pin
- MONO AUDIO IN (6,3mm TS-UNBALANCED)
- MONO MAIN AUDIO OUT (6,3mm TS-UNBALANCED)
- MONO DRY AUDIO OUT (6,3mm TS-UNBALANCED)
- PATCHES (6,3mm strereo)

- CUT OFF +/- 12V or expresion pedal
- REFLECTOR +/-5V or expresion pedal
- ECHO 0-5V or expresion pedal
- PHASER +/-12V or expresion pedal

Suggested room temperature for best oscillator stability: 18°-32° Celsius

Size: 35 x 19.5 x 17 cm
Weight: 2.38 kg

dreadbox