EREBUS

ANALOG SYNTHESIZER

USER'S MANUAL

dre::adbox

CONTENTS

Introduction ***3***

Schematic diagram ***4***

Manual ***5***

1. Paraphony ***5***

2. Midi interface ***5***

3. Oscillators ***6***

4. Volatage controlled Filter ***7***

5. Voltage controlled Amp ***7***

6. Attack,decay,sustain,release (ADSR) envelope generator ***8***

7. VC low frequency oscillator ***8***

8. Lo-fi Echo ***9***

9. Patching ***9***

9a. Patching outputs ***10***

9b. Patching inputs ***11***

10. Polychain ***12***

EREBUS

ANALOG SYNTHESIZER

Version 2.0

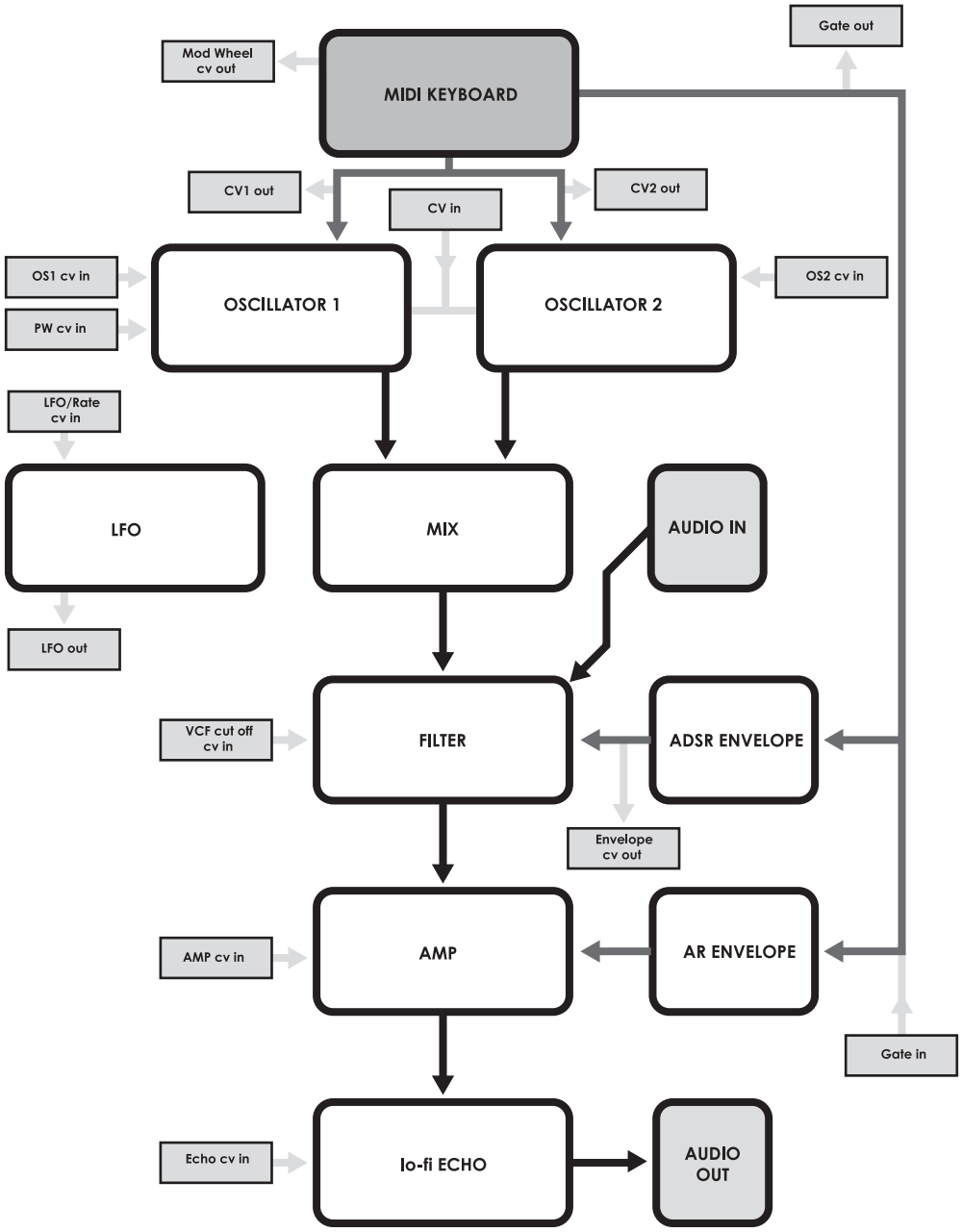
INTRODUCTION

Thank you for purchasing the Dreadbox EREBUS synth module!
The EREBUS is an all analog synthesizer with various patching options. It's 100% analog (except for the Midi interface and a part of the delay effect) and 100% handmade, only with Through Hole components. It's a versatile synth machine, capable of producing some huge bass sounds, piercing leads and great ambience! Advanced synthesis knowledge is required to successfully use the EREBUS.
It is strongly suggested that you read the rest of the manual to get the most out of your instrument.
I hope you enjoy playing with EREBUS as much as i do - although the best part for me was the developent.

John Diakoumakos,
Dreadbox developer

Athens -Greece
July 2015

SCHEMATIC DIAGRAM



MANUAL

1. Paraphony

We call Paraphonic Synthesis, when the oscillators can work in polyphony but the signal path is common for all voices. In EREBUS we have 2 voices sharing the same filter and VCA. But to be more specific :

- 1 key pressed : both oscillators will play the pressed note
- 2 keys pressed : Oscillator 1 will play the low note, Oscillator 2 will play the high note
- 3 or more keys pressed: Oscillator 1 will play the low note, oscillator 2 will play the 2nd lowest note and all the other notes will be ignored.

2. Midi interface

EREBUS Midi interface will allow the following actions:

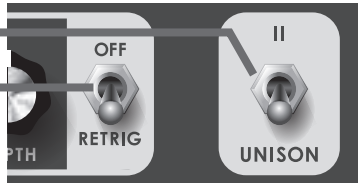
- Note(s) on / off. Gate out patch, converts midi gate-to analog gate

- Pitch tracking up to 5 octaves (C -1 up to C 4). The pitch is converted to 1v/ocv which can be accessed via the CV1 - CV2 outputs.

- 2 voice paraphony or Unison mode

- Keyboard retrigger on the ADSR envelope

- Pitch wheel for 1 whole tone up/down. This is also transmitted on the CV1 -CV2 outputs



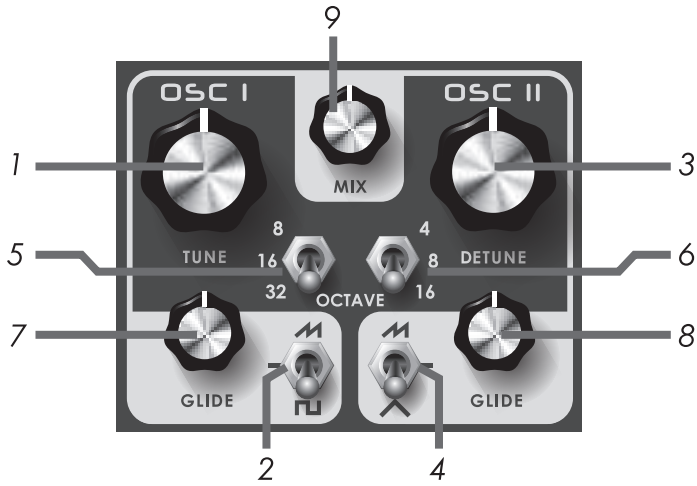
- Modulation wheel (accessible only via patch) 0- 5v

- Midi channel selection OMNI or 2-7. The midi channel can be changed via a DIP switch located inside the EREBUS(see page 13).
All off -> OMNI
2 on -> MIDI ch 2
1,2 on -> MIDI ch 3
3 on -> MIDI ch 4
1,3 on -> MIDI ch 5
2,3 on -> MIDI ch 6
All on -> MIDI ch 7

- Midi through function (the polyphony is not transmitted)

3. Oscillators

The EREBUS oscillators need about 5 to 20 minutes to warm up. You can just turn on the synth and play but the tuning will change during that time. They work with the classic 1v/octave controllers or a midi source. By default the tune knobs should point at about 12.00 o'clock for a correct tuning. Always keep in mind that the osc2 triangle waveshape will have the feeling of a lower volume on low frequencies.



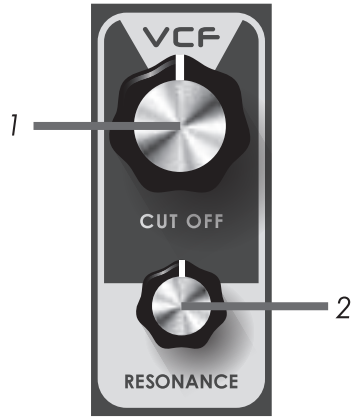
1. Both Oscillators Master Tune.
2. Oscillator 1 wave selection. Center position sets the osc1 OFF
3. Oscillator 2 deTune.
4. Oscillator 2 wave selection. Center position sets the osc2 OFF
5. Oscillator 1 octave selector.
6. Oscillator 2 octave selector.
7. Set the glide rate for oscillator 1 (portamento)
8. Set the glide rate for oscillator 2 (portamento)
9. Set the mix level between the oscillators.

TIP: How to isolate osc2 from MIDI keybord's 1V/oct
Set the Erebus at paraphony (II) mode. Press and hold 2 keys on your MIDI keyboard. While holding the keys change to Unison mode. Now os2 is completely independent from the keyboard and will play the note you were holding while shifting between the modes.

4 . Voltage controlled Filter

The filter of the EREBUS is a 2-pole 12db/octave pre-fed resonating low pass filter. Pre-fed means that it has a build in pre-resonance accent that it's always active on the 1/6th of the filters' total input gain and completely independent from the normal resonance control, thus making the EREBUS a much more aggressive and edgy synth.
Resonating means that with the resonance control at 100% you get a self oscillation.

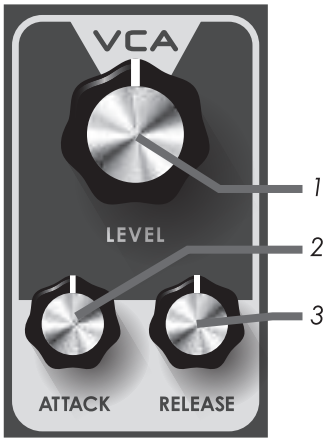
1. Set the cut off frequency of the filter.
2. Set the post resonance amount.



5. Amplifier

EREBUS amplifier has a build in AR envelope genarator. Notice that when the output Level is at max you get 10 volts p/p, so be careful not to hurt your ears or damage your speakers.

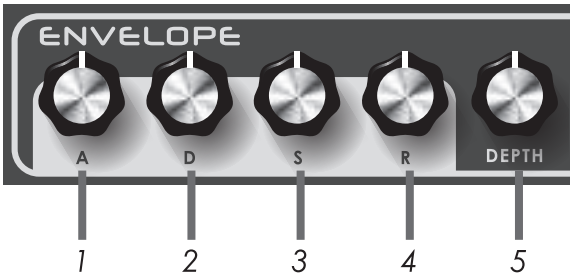
Note that when a cable is plugged in the VCA patch, the onboard AR envelope will be deactivated.



1. Master volume
2. Attack speed
3. Release speed

6. Attack, Decay, Sustain, Release (ADSR) envelope genarator

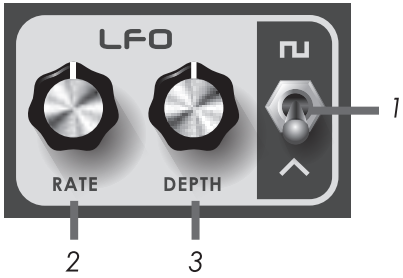
EREBUS's ADSR is dedicated to the filter at all times. It may deliver up to 6,6V of envelope (also accessible on a patch).
The sustain level below 8 - 8.30 o'clock can have negative values. To understand this better, set all the ADSR controls to 0% and the depth at 100%. Set the cut off knob at 9 o'clock and the VCA's release at max. Hitting a key will now send the cut off to a lower point than its preset.



1. Envelope attack speed
2. Envelope decay speed
3. Envelope sustain point
4. Envelope release speed
5. Envelope portion to filter

7. VC Low frequency Oscillator

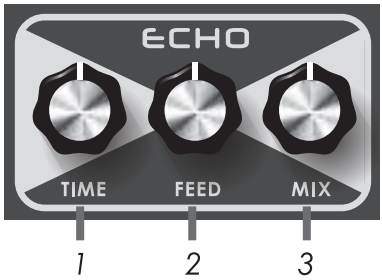
The LFO can be accessed only via its patch. It has a wide range of frequencies, 0,009 Hz (110 sec) up to 30 Hz (0,033 sec).



1. Select the output waveform
2. Set the initial rate of the lfo
3. Set the initial depth of the lfo

8. Lo-fi ECHO

EREBUS is equipped with an all analog signal path CV controlled echo module.
The mix knob allows you to go from a dry to a completely wet mode of sound. Setting the feed pot at max, it will start the self oscillation process. Note that the time knob allows you to get long echo times with a very lo-fi sound. This module serves as a reverb, chorus (modulation with the lfo on very low time settings), lo-fi machine, tape echo sounds , pitch shifting modulations or a standard delay.



1. Echo time
2. Feedback depth
3. Mix between dry and wet echo

9. Patching

EREBUS's right side is dedicated to patching. Learning to patch needs lots of experimentation. We strongly suggest spending lots of time and trying as much connections as possible. You will find out that half the possibilities of the synth comes from it.
Patching is divided in 2 areas:

A. OUTPUTS - those patches only send voltage. You can send their CV to other devices, but first be sure that the receiver can accept such a voltage.

B. INPUTS - those patches can only receive voltage. It's safe to send much more voltage than indicated (see specs or chap. 9B) but it won't always have results.

NEVER CONNECT
AN OUTPUT WITH ANOTHER OUTPUT or AN INPUT WITH ANOTHER INPUT
This might cause serious damage to the unit and
we will not take any responsibility.

9A. Patching outputs

NEVER CONNECT
AN OUTPUT WITH ANOTHER OUTPUT
This might cause serious damage to the unit and we will not take any responsibility.



1. MOD: modulation wheel. Send 0-5V controlled by the midi's modulation wheel. The small depth knob above acts as an attenuator , it limits the maximum voltage to be delivered.

2. GATE: sends note on/off from the midi keyboard in the analog form of 0V(off) 5V(on).

3. ENV: sends 0-6,6V from the ADSR envelope generator. Again the small knob above acts as an attenuator.

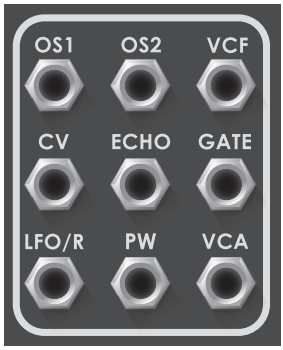
4. CV1: sends the 1v/ocv that oscillator 1 is currently using.

5. CV2: sends the 1v/ocv that oscillator 2 is currently using. When in Unison mode this is exactly the same amount of voltage as CV1.

6. LFO: sends the LFO output to a +/-5V form. This is the only way to use the LFO.

TIP:
CV1,CV2 and gate are great to use with other cv/gate controlled devices to achieve paraphony. You may also multiply the gate to control two different devices at a time. Sending CV1 at one and CV2 to the other will make them work in a paraphonic way between them.

9B. Paching inputs



1. OS1: CV input that controls oscillator 1. Best operated at 1v/ocv. Max +/-12V

2. OS2: CV input that controls oscillator 2. Best operated at 1v/ocv. Max +/-12V

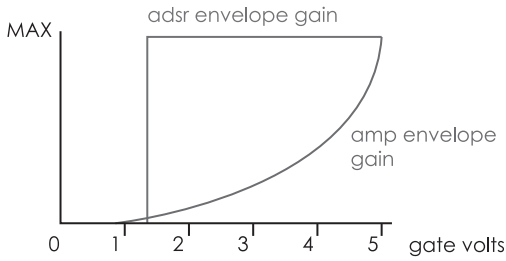
3. VCF: CV input that controls the filters cut off. Best oparated at +/-5V. Max +/-12V

4. CV: this input controls both oscillators at the same time. Best operated at 1v/ocv. Max +/-12V

5. ECHO: input that controls the echo's time. Best oparated at 0-2,5V. Max +/-5V

6. GATE: input to control the envelope's on-off. The EREBUS gate is diferent from common gate controls because the ADSR envelope works in an on/off function but the amps envelope has a logarithmic opening function.

7. LFO/R: input that controls the rate of the LFO. Works best at 0-5V, accepts +/-12V



8. PW: input to control the pulse width of the osc1 square wave. Best works at 0-5V, accepts +/-12V

9. VCA: input to control the ampitude modulation of the AMP. Note that when a cable is plugged in the VCA patch, the onboard AR envelope will be deactivated.

10. Polychain

Up to 4 Erebus units may be connected to obtain more than 2 voice paraphony:
1 erebus - 2 voices
2 erebus - 4 voices
3 erebus - 6 voices
4 erebus - 8 voices

Setting the Erebus order:
You need to programm each unit to set their playing order. For example, if you want to connect 2 erebus, one of them must have Oscillators 1 and 2 and the other unit oscillators 3 and 4. By default every Erebus is set to play oscillator 1 and 2. To change this, follow this process:
1. Open the bottom cover.
2. Plug in the power supply. If you change between unison and paraphony mode (II) 3 times in the first 5 seconds (for example if the switch is in the Unison mode when you plug the power go - II - unison- II)the midi channel DIP switch located inside the box, will become the paraphony order setting.
3. Without unplugging the power supply, turn the unit upside down and change the DIP switch according to the following:
ALL OFF : Master unit (osc1,2)
1 ON : 2nd unit (osc 3,4)
2 ON : 3rd unit (osc 5,6)
1 and 2 ON : 4th unit (osc 7,8)
4. Turn off the unit by unplugging the power supply. Now the DIP switch sets the midi channel again. Set it back where you had it. Note that all polychained units must be set at the same midi channel.
5. Close the back cover.

How to connect them:
Send a midi keyboard to the midi in of the master Erebus Use the midi through to send it to the midi in of the next unit.
For connection in series, set all units at the tuning preset (see page 15). Set osc 2 octave at 16' and the VCA level at 14.00. Send the last unit's output to the previous unit's input (ex. Unit 2 output at Master unit input). Get the final output from the master keyaboard and use it as your main controller.

For parallel connection send again all the midi in and throughs and get each individual output into a mixer or send each erebus to its own amp or monitor.

Voicing priority:
1 key pressed : All voices follow the same note.
2 keys pressed: All voices will follow the low note, oscillator 2 follows the 2nd note
3 keys pressed: All voices will follow the low note, oscillator 2 follows the 2nd note and oscillator 3 follows the 3rd note
4 keys pressed: All voices will follow the low note, oscillator 2 follows the 2nd note, oscillator 3 follows the 3rd note, oscillator 4th follows the 4th note.

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Specifications

- 12VAC POWER INLET: Accepts +12VAC, 1A at 2,5mm center pin
  15VDC POWER INLET: Accepts +15VDC, 1A at 2,5mm center pin
  (units that have a serial number above #1000)

- MONO AUDIO IN (6,3mm TS-UNBALANCED): Accepts up to 3v p/p inputs

- MONO AUDIO OUT (6,3mm TS-UNBALANCED): 10v p/p output max

- PATCHES (3,5mm mono)
- Gate in: activation at 0,7v in a low gain up to 5v for max gain
- Gate out: 0 - 5v
- Os1,Os2, CV in: works at 1v/oct, can accept from +/-12v
- CV1, CV2 outs: Sends 1v/oct (converted to analog from the midi in)
- Mod Wheel out: Converts the midi modulation wheel to analog 0-5v out
- Envelope out: 0-6,6v depending on the depth setting
- LFO out: +/- 5v
- LFO frequency range: 0,009 hz (110 sec) up to 30 hz (0,033 sec)
- LFO rate cv in: 0-5v
- PW cv in: 0-5v
- Echo cv in: 0-5v (works best up to 2,5v)
- VCA cv in:+/-5v

Suggested room temperature for best oscillator stability: 22°-30° Celsius

Weight: 1,4 kgr
Size: 225mm X 160mm X 65mm

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