EASY CV

#### Test Equipment: CV-Destination MB33 MAM:

## Introduction

All Parameters are saved as a preset as a song (programchange...) Digital created LFO+ENV with CV-Output. No Displays, No Menues, Minimal buttons, much Scopes, much Led-Ring-Rotarys (LRE-8x2CS) one big UI with complete functions for one LFO+ENV Voice + 4xChannelstrip Controlls...

LFO+ENV are mixed together softwareside, to use only one CV-Output

Each Channel = Filter need 8xCV-Outputs

Copy Paste for LFOs and ENVelopes between the Voices

Copy Paste for a Song aka Preset aka Bank aka Program(change)

Jam Style Pattern load (next Preset Display) + Preset Morph between Current-Preset and Next-Preset

The Early Design was a EuroRack-Module: A Breakoutmodule for each CV-Output, with Depth-rotary, Focusswitch (Pushrotary), 2x Scopes (LFO+ENV) and LFO/ENV-Switch to show on one Display the Mixed Waveform & to switch the Rotary to "ENV" or "LFO" Mode (there is only space for one Encoder maybe just make PAN Style, instead of 2 individual level -maybe more live feel?, how ever when using an 3Stage switch, i could disable MIX-View, or display it on ENV or LFO...maybe a good choise ;) ) The Depth-rotary has no Ledring, want to display it as a bar or as Value in the scope...



### FrontPanel

#### Brain

<u>THE LEFT SIDE of the BRAIN > Preset-Management</u>: Save & Load the PROGRAM, can be done by Midi-ProgramChange -or With the LOAD-PRESET-Encoder

then press LOAD -or Morph to the next Program slowly with the MORPH-Encoder

-Another option is to take a **PUSH-ENCODER** for **LOAD** & **STORE** > and load and store it by pushing it... would free 2 buttons for other functions.

MORPH?:

-The Upper 7 Segment LED- Display: is the **LOAD Display** indicate the new Program with ENV+LFO -The downer7 Segment LED- Dsipaly: is the **STORE Display** it indicates also the current Program with ENV+LFO

-with morph you crossfade between both Presets (be carefull, first Store the current Preset **Paste** & **Copy** do their job @ the whole PROGRAM Memory

**ENV-PASTE** & **ENV-COPY** do their job @ the selected Envelope > (ENV-Voice selection is done by the breakout Modules) ... LFO..same

Midi-Channel Note NR or Number of Envelope is a real programmer job (C), with usb-upload from computer .... this is a individual device, and once set, it has to play > and it just should do LFOs and Envelopes Fixed routed, no generic, special > in my case for a filterbank.



THE **RIGHT** SIDE of the BRAIN > LFO + ENV Settings (one Voice): ADSR with:

**CURVE** Paremter which give exponentially to it (no straight lines While Fall and Rise) **Short:** just shorten the Maximal lenght of a Envelope, haveing more Feeling on Encoders should change Scope Display also...

LFO: get synced with Midi, and there is a retrigger by Notes...

**Phase:** offsets the start-Phase

**Delay:** simple delay (nte-Trig)

Rate: clear from 8 wholes to 128th or so

Wave: access to the Waveforms

**Duration:** interpret Midisync in trippled, whole notes or whatever...

**DEPTH:** is the maximal Value of FALL and RISE and SUSTAIN, i know i loose resolution with this...but i have to have a memory filterbank,...doing depth instead with Potentiometers on Filtermodules... would give no memory...

#### BreakOut

# this will not be supportet > since i dont want a Euro-Module Setup > i want one big filterbox.

1. Discharged UserInterface for the Brain in "Island mode" (Scopes + Digital-CV-Amount)

2. CV-Breakout EuroModule to be located near the CV-Destination (example: a Filter).

2 Waveforms (ENV+LFO) are mixed together softwareside

that bring 2 advanteges:

1.save one CV-Output

2. the Amplitude of each Waveform is saved in the patch, so the CV-Amount to a Filter is saved in the Patch

That bring 2 disadvanteges:

1.LFO or ENV cant get patched to individual destination

2.the Resulution gets lower 2 very low, and the code has to be adptet much... or have to be made from scratch Because I use the device for a Memory-Filterbox (VCF+VCA), i am ok with the pros and cons, so i call it EASY-CV



Envelope Scope: show the ENV-Waveform

or the Mixed-CV-Output-Waveform (when Switch is in LFO Mode) and show the Envelope-Amount with a BAR or as numeric Value? **MIXED CV Plug:** CV-Output > Mixed Waveform ENV+LFO **Switch @ ENV:** 

- 1. Depth-Encoder change ENV Amount of the CV-MIX
- 2. ENV Scope will show ENV Wave
- 3. LFO Scope will Show CV-Mix

Switch @ LFO: visa versa ENV Press the Encoders built in ENCODER-BUTTON:

will switch the BRAIN-A-D-S-R and L-F-O ENCODER to the Page for THIS Module...

workflow, see what you have with a Scope, over a filter, and edit exact this selected CV on the brain in full detail...

#### VCA-VCF

#### CVś(AOUT):

1.VCF-CUT 2.VCF-RES 3.FILTER DRIVE

4.VCA-ENV 5.VCA-DRIVE

6.DRY-WET (Orginal vs Filtered Mixer) 7.Send 2 EFX1

8.Send 2 EFX2

So 1x 8AOUT-Module for each "Channelstrip", makes a total of 4x8AOUT-Modules. The Module of Choise is a 16Bit, since i control with the the same AOUT-Channel ENV+CUT-OFF... so there is no analog potentiometer for Cutoff or resonance... it is all saved in the Preset.

the VCA is basicly a simple VCA (MS20Like) or something

the VCF are a 303 18dB for the 24db Filter it will be a SSM2044, where bords are available.

#### **Original Schematics 303 - VCA-VCF**



In order to not use those **overprized MATCHED-PAIR-TRANSISTORS** (over 2€ on the cheapest place) i have to use standart Transistors and make a **VBE-MATCH** on my own, i have already a PCB from here - to measure the transistors with a Multimeter: https://midisizer.com/other/vbe-matching/

#### Example for a Filterbank

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					ONAIN .
		(6) (	0) (0		ENV IVERT
LOAD PRESET MOR	PH CURVE	A	D S	R	DEPTH RETRIG SHORT
ACTUAL BBBB STOR CPY CPY ENV LFO	DELAY	WAVE F	HASE DURAT	ION RATE	
	U BREAKOUT	IREARDUT	BREAKDUT	BREAKDUT	EASYLV BREAKOUT
THE BRAIN - LEFT SDE Preset Management: Save and Load the "SONO" or call it "BANK" The Song is loaded by Program/Change OR With the LOAD-PRESET/Encoder BUT it, will not be head you must first press-LDAD or Morph to it sheety with MORPH-Encoder MORPH - New He current ENV + LPO @ LDAD You have the KW-ENV+LPO @ LDAD You have the current ENV + LPO @ LDAD You have the current ENV + LPO @ LDAD	ENV LFO	ENV ENV LFO LFO	ENV LFO	ENV ENV LFO LFO	ENV LFO LFO
Poste, and Copy do then job ig the full BAYK. ENVARYSE EXX-COPY do then job ig the selected Envelope (selection is done by the breakost Modules)	0				
Multi-Channel Note NR or Number of Envelope is a real programmer job, with usb-upload from computer this is a individual device, and once set: 3 has to play and it just should do LFDs and Envelopes.					MIXED ENV MIXED ENV
in my case for a filterbank.	EASY-CV	EASTER EASTER	EASTON	EAST-CV EASY-CV	EASTICN EASTICY
	L IN R CV		EV L <sup>OUT</sup> R	L IN R CV LOUT R	L IN R CV LOUT R
MPE_C-VArain & UI-MMIN (Scopes + Digital CAAmount) and near the CV-Destination (e.g. a Riter). tigether softwareside		EFX-SEND DRIVE	EFX-SEND +DRY EFX -DRY	DRIVE EFX-SEND +DRY DETAILS EFXDRY	DRIVE EFX.SEND DRIVE EFX.SEND +DRY +DRY -DRY
dividual destination w, and the code has to be adolect much or have to be made from scratch ny-Filterbox (VCF+VCA), i am ok with the pros and cone, so. i call it Simple-CV	DRIVE POST-VCF DRY/WET				DRIVE POST-VCT DRIVNET VOLUME

A not EUROMODULE-BASED Version of something like this is the FILTERBOX: (this is the Design I prefer @ the moment)

easy\_cv http://wiki.midibox.org/doku.php?id=easy\_cv&rev=1471217070

XO			FL	EKK	חברד	ITAI,	BB	DUI-3 OUI-4 DU DUC CROSS-FF			BACK
FILTE	RBOX										EDANT
-0+	VCFVCA 1824	SHORT dB OPEN	18 24dE	HORT 3 OPEN	18 24d	SHORT IB OPEN	SHC 18 24dB	ORT 1-4 OPEN 5-8			
FILT-RELEASE									GAI	N	
MAIN-ADD	1		1	2	1.1.4776	3					
-0+		DEC		DEC		DEC		DEC	FILTER-OUT-1	MAIN	
AMP-RELEASE	AMP-GAIN	FILT-DISTORT	AMP-GAIN	FILT-DISTORT	AMP-GAIN	FILT-DISTORT	AMP-GAIN	FILT-DISTORT	$\bigcirc$		
-0+									FILTER-OUT-2	HALL	
VELO	CUT-ENV AMP-ENV	RES-ENV REVERB	CUT-ENV AMP-ENV	RES-ENV REVERB	CUT-ENV AMP-ENV	RES-ENV REVERB	CUT-ENV AMP-ENV	RES-ENV REVERB			
									FILTER-OUT-3	DELAY	
-0+	LFO/ENV-F	LFO/ENV-R	LFO/ENV-F	LFO/ENV-R	LFO/ENV-F	LFO/ENV-R	LFO/ENV-F	LFO/ENV-R			
MOD	LFO/ENV-A						LFO/ENV-A		$\bigcirc$		
MORPH VELO MOD									FILTER-OUT-4	DUCKING	
	CUT-GAIN VCA-DISTORT	RES-GAIN DRY/WET	CUT-GAIN	RES-GAIN DRY/WET	CUT-GAIN	RES-GAIN DRY/WET	CUT-GAIN VCA-DISTORT	RES-GAIN DRY/WET	l	A-LIN	
									RET	RIG SHRT	
PAST PAST ENV 333	LOAD	MORPH	CURVE	A	D	s	R	DEPTH	ENV	INV	
005 – ENV CPY CPY									LFO		
	STORE						DATE	ПЕРТН	т — т	ig SYNC	

Filterbox OneChannel > first idea of Block-shematic:



### **General Design**

The Panel is made of transparent but shadet (black transparent) Plexiglass.

The Panel is directly mounted into a Flightcase.

The 3x LRE8x2 (LEDRING) are mounted with the Encoder Nuts, the rest of the PCBs are mounted with normal thruhole screws.

#### FrontPanel

#### **PCBs**

#### The Analog-IO Board on the Backpanel, holds:

-the ENV-VCAs -the DryWet-VCAs, Filter-Releay-Switch -SEND-EFX-VCAs -the Summing Mixer -the Ducking-Cross-AMP-Follower+Ducking-VCAs -VCF+ENV-VCA-Distortion-Driver-VCAs -the Connectors to connect the Filter, AOUT, Poti-Boards

Left-Part of the Brain on Breathboard: OLED-Display Button: ShadowSE/ITT ENCODER: with built in Pushswitch a early state with 7Segment Displays to indicate the Patches



#### **1. UI Parts Listing**

#### **BRAIN + BREAKOUT**

- 6,3 Neutrik Connector
- FLASH-Switch @ Rs-components

Value	Туре	Qty
Switch	SPDT Vertical PCB-Mount ON-OFF-ON	1

**Fix Me!** Fill Table

#### Pots / Knobs

- Alps RK11K Series
- Alpha Pots @ Thonk
- Knobs Suppliers

🔧 Fix Me!

which Values for the Audio-Mixer?

### **3.Footprint Making in KiCAD**

- ALPS Pots
- Alpha Pots
- 6,3mm Jack
- Switch
- Momentary Switch
- SSD-Displays
- OLED DIsplay
- Rotary Encoder



#### 4. Schematics in KiCAD

**Fix Me!** have to be done

#### **5.PCB Making In Kicad**

#### **PCB Making Order**

- BRAIN PCBs:

a.Left-Brain

b.Right-Brain

- 3x LRE8x2CS - is a generic PCB which i already have (fairlightiiś)

- Backpanel PCB

- FILTER PCBs

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EASY CV

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