# 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

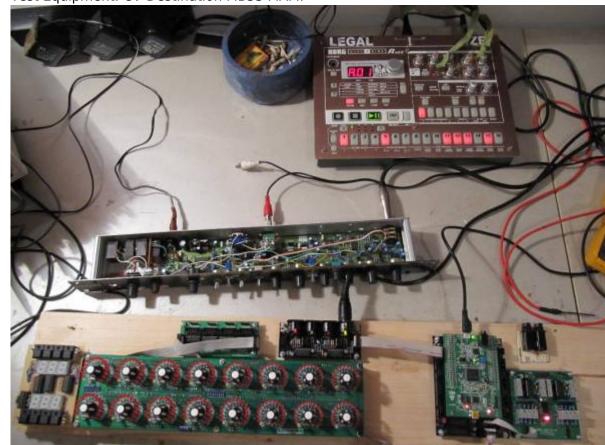
Each Channel = Filter need 8xCV-Outputs

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.

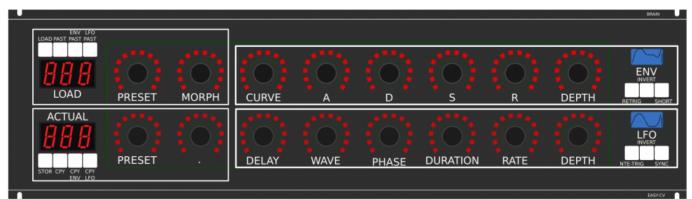
MORPH?:

-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 EFX1

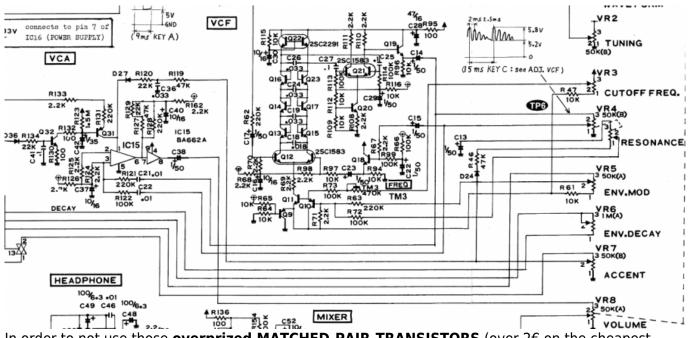
8.Send Z EFXZ

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

Here are 8Envelopes 4xfor VCF 4xfor VCA... in fact there could be used more then this for example

8xVCF and 8xVCA...since the BREAK-OUT-Modules are Modular, and they share the same "Main-UI"...the only limiting factor is the CODE...i am not a C-Guru, and maybe i will still have timing problems with 8x CV-Outs...we will see.

5/8

ENV LFO				onun. U
LOAD PRESET MORPH			S R	DEPTH
ACTUAL BBBB STOR CPY CPY ENV LEPO PRESET		VE PHASE DU	RATION RATE	
THE BRAIN - LEFT SIDE Preset-Management: Save and Goad the "SONG" or call IT "BANK" The Song is loadet by ProgramChange OR With the LOAD-PRESET-Encoder BUT is will not be hered you must first press LOAD or Object: South and the text Not have the Management ENV 4FD Q ACTIVAL With morph you crossfade between both	BREAKOUT BREAKOUT ENV ENV LFO LFO	ENV LFO LFO	ENV LFO LFO	EASYCY BREAKOUT BREAKOUT ENV LFO LFO LFO
Paste, and Capy do their join (ji-the full BANC ERV-MASTE ENV-Colf do their join (ji-the selected Envelope (aslection is dane by the breakout Modules) Midl-Channel Riote NR or Mumber of Envelope is a real programmer jab, with usb-sploud from computer this is a individual device, and once set, it has to play and it just round do EPOs and Envelope Fixed rounds on derest, special in my caso fur a filterbank.	DEPTH DEPTH ILKED ENV MIXED ENV UPO CV UPO	DEPTH DEPTH MIXED ENV UFO CV UFO	DEPTH MIXED ENV MIXED ENV UPO CV UPO	
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	DRY/WET VOLUME VCF OCUTOFF GREATFLUITION	POST-VCF DRV/WET VOLUME VCF OLTOFF GREATFULCTION	POSE-VCF DRY/WET VOLUME VCF OLUTOFF CUTOFF	

#### I will use it to filter:

2xGuitar-Loopstations 1xGuitar 1xPercussion-Master

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

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FILTER	RBOX										FRONT-PANEL
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-0+									FILTER-OUT-1	MAIN	
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-0+	CUT-ENV	RES-ENV	CUT-ENV	RES-ENV	CUT-ENV	RES-ENV	CUT-ENV	RES-ENV	FILTER-OUT-2	HALL	
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									RE		
PAST PAST ENV 333 005 -	LOAD	MORPH	CURVE	A	D	s	R	DEPTH	ENV	INV	
ENV CPY CPY									LFO	INV	
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# **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.

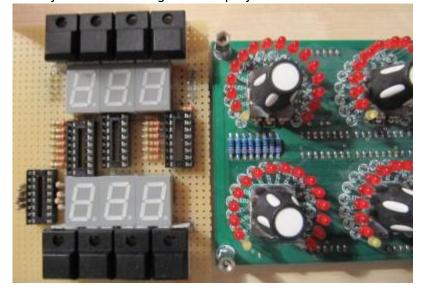
# **FrontPanel**

### **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

≚ Fill Table

### Pots / Knobs

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

본 have to be done

# 4. Schematics in KiCAD

본 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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