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

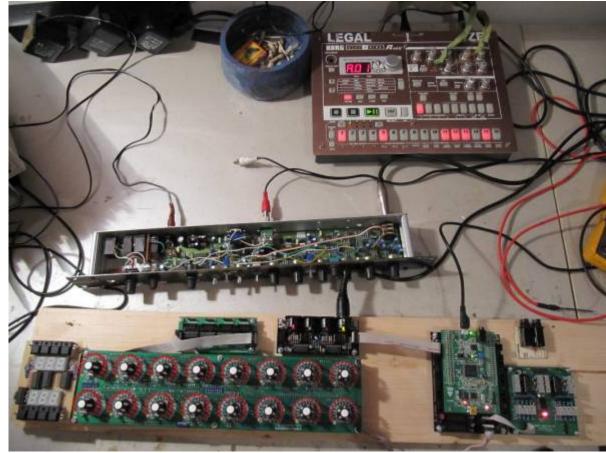
Each Channel = Filter need 8xCV-Outputs

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.

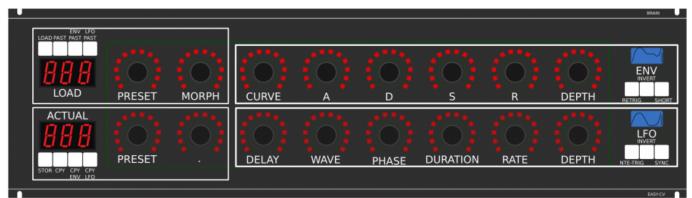
MORPH?:

-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...

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

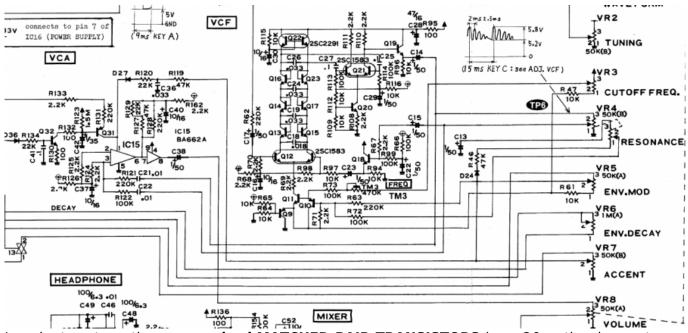
8.Send 2 EFX2

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

5/8

-				DNAM U
LOAD MST MST PAST LOAD PRESET MORPH			S R	DEPTH RETRIC SHORT
ACTUAL BBB STOR CPY CPY ENV. LPO PRESET	DELAY WA	VE PHASE DUP	RATION RATE	
THE BRAIN - LEFT SIDE: Preset-Management:	BREAKOUT	EREAKOUT	BREAKDUT	
Save and Load the "SORO" or call it "BANK" The Song is loaded by ProgramChange OR With the LOAD PRESETERCODE BUT it will not be heard you must find press LOAD or Morph to it slowly with MORPH-Encoder MGRPH". Not have the NEW-ENV+LFO (§ LOAD You have the NEW-ENV+LFO (§ LOAD You have the Current ENV+LFO (§ ACTUAL with morph You Crosside between both	ENV ENV LFO LFO	ENV ENV LFO LFO	ENV ENV LFO LFO	ENV ENV LFO LFO
Reste, and copy do their loo (i) the full BANK ERV MASTE EXPLOYING of their loo (i) the selected Envelope (selection is done by the breakout Modules)				0 0
this is a individual device, and once set, it has to play and it just should do LEOs and Envelopes	DEPTH DEPTH KED ENV MIXED ENV	DEPTH DEPTH MIXED ENV MIXED ENV LFO CV LFO	DEPTH DEPTH MIXED ENV MIXED ENV LTO CV LTO	DEPTH DEPTH MIXED ENV MIXED ENV UTO CV LTO
in my case for a filterbank.	EASYCY CASYCLIF		LASTECY VEANVELIFF	
MP(E-CV Brain & U)-MAIH (Scopes + Digital-CV-Amount) and near the CV Destination (e.g. a Filter), tagether softwareadde is saved in the patch, so the CV-Amount to a Filter is saved in the Patch	AMP CUT AMP CUT DRIVE DRIVE DRIVE EFX -DRY	L IN R CV L OUT R AMP CUT DRIVE EFX.SEND POST-VCA EFX FX EFX -DRV	L IN R CV LOUT R AMP CUT DRIVE EFX.SEND POSTACA EFX -DRY	L IN R CV L DUT R AMP CUT DRIVE EFX-SEND -DRIV POSTACA EFX -DRY
w, and the code has to be adolet much, or have to be made from scratch any Filembox (VCF+VCA), i am of with the pros and cons, so i call it Simple-CV		POSTVCF DRY/WET VOLUME	DRIVE POST-VCF DRY/WET VOLUME	DRIVE POSE-VCF DRIVWET VOLUME
RES				

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

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POWEPCON-TI 2300 XOO				ash BEKK			0UT-1 0UT-2 CE	DU	UCK MAIN HU	ALL DELAY	Back-Pan	
FILTE	RBOX										FRONT-PAN	
-0+ FILT-RELEASE	VCFVCA 1824	SHORT 4dB OPEN	18 24di	HORT 3 OPEN	18 24d	SHORT B OPEN	SH 18 24dB • •	ORT 1-4 OPEN 5-8	GA	INI	01260000000000	
MAIN-ADD		1		2		3		4	GA			
-0+									FILTER-OUT-1	MAIN		
AMP-RELEASE	CUT AMP-GAIN	RES FILT-DISTORT	CUT AMP-GAIN	RES FILT-DISTORT	CUT AMP-GAIN	RES FILT-DISTORT	CUT AMP-GAIN	RES FILT-DISTORT				
-0+									FILTER-OUT-2	HALL		
\bigcirc	CUT-ENV	RES-ENV	CUT-ENV	RES-ENV	CUT-ENV	RES-ENV	CUT-ENV	RES-ENV				
VELO												
-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	FILTER-OUT-3	DELAY		
	LFO/ENV-A	DELAY	LFO/ENV-F LFO/ENV-A		LFO/ENV-F LFO/ENV-A		LFO/ENV-F LFO/ENV-A					
MOD 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		A-LIN		
									RET	RIG SHRT		
PAST PAST ENV 333	LOAD	MORPH	CURVE	A	D	s	R	DEPTH	ENV	INV		
005 - ENV CPY CPY									\sim			
									LFO	rig SYNC		
	STORE		DELAY	WAVE	PHASE	DURATION	RATE	DEPTH				

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.

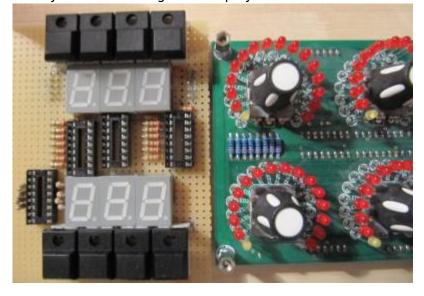
FrontPanel

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

본 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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