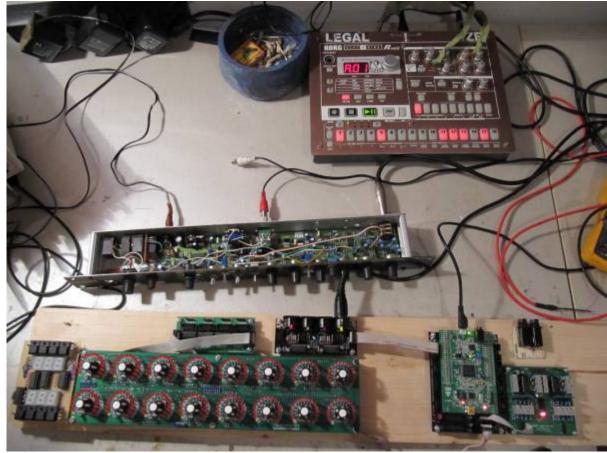
EASY CV

Test Equipment: CV-Destination MB33 MAM:



Introduction

Digital created LFO+ENV with CV-Output. No Displays, No Menues, Minimal buttons, much Scopes, much Led-Ring-Rotarys (Planed for LRE-8x2CS), one big UI with complete functions for one LFO+ENV Voice... switching between the UI-Voices is done from the BREAKOUTMODULES...to this later

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

8xCV-Outputs (VOICES) are supported > if u are on a VCF+VCA-Setup = 4 Voices on the Analog-Side (4xFilterbank)

Copy Paste for LFOs and ENVelopes between the Voices

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

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

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...

Whole thing will not be compatible on MB-CV concepts... i will copy code snippets and so on, but i

have to understand it from scratch... anyhow this is not generic

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.

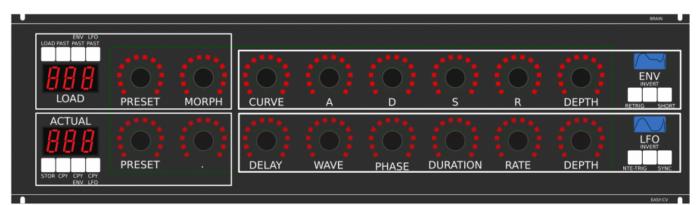
MORPH?:

-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...

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...

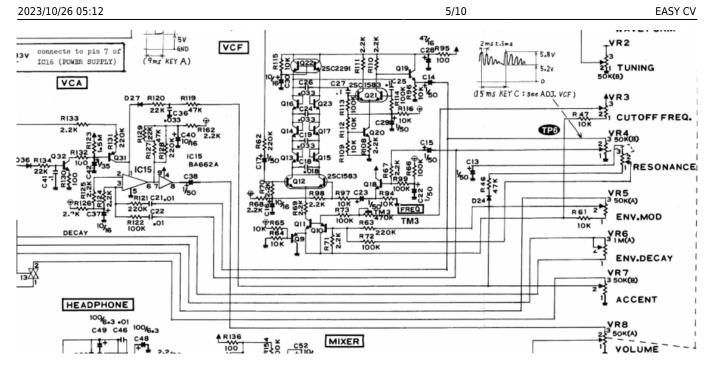
so there is no analog potentiometer for Cutoff or resonance... it is all saved in the Preset.



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

Original Schematics 303 - VCA-VCF

here is the 18dB filter... for the 24db Filter it will be a SSM2044, where bords are available.



Mod Sources

Fill with 303 mods take orginal VCA (have a bunch of this ICS) or make MB33 Style with standart components...

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.

•				BRAIN .
ENV LFO LOAD PAST PAST]			
nnn :				
LOAD PRESET MORPH	CURVE /	A D	S R I	DEPTH RETRIG SHORT
			01 (01)	LFO
STOR CPY CPY PRESET .	DELAY WA	WE PHASE DUP	RATION RATE	DEPTH NTE-TRIG SYNC
ENV LFO				EASYCV
THE BRAIN - LEFT SIDE	BREAKOUT U BREAKOUT U	U BREAKOUT U BREAKDUT U	BREAKDUT	
Preset-Management: Save and Load the "SONG" or call it "BANK" The Song is loadet by ProgramChange OR				
With the LDAD-PRESET-Encoder BUT is will not be heard you must first press LDAD	ENV ENV	ENV ENV	ENV ENV	ENV ENV
or Morph to it slowly with MORPH-Encoder MORPHIT You have the NEW-ENV+LFO @ LDAD	LFO LFO	LFO LFO	LFO LFO	LFO LFO
You have the current ENV+LED @ ACTUAL with morph you crossfade between both	\sim			
Reste, and copy do their job (II: the full BANK ENV-NESTE ESV-COPY do their job (II: the selected Envelope (selection is done by the breakout Modules)				
Midi-Channel Note NR or Number of Envelope is a real programmer job, with usb-tipload from computer	DEPTH DEPTH IIXED ENV MIXED ENV	DEPTH DEPTH MIXED ENV MIXED ENV	DEPTH DEPTH MIXED ENV MIXED ENV	DEPTH DEPTH MIXED ENV MIXED ENV
this is a individual device, and once set, it has to play and it just chould do LFOs and Envelopes fixed routed, no generic, special				
m my case for a filterbank.		EAST-CV CALIFY EAST-CV	EAST-CV VEASVOUP	EASYCY EASY-CV
		L IN R CV L OUT R	L IN R CV LOUT R	L IN R CV LOUT R
MPLE-CV Brain & UI-MAIH (Scopes + Digital-CV-Amount) ated new the CV Destination (e.g. a Filter).	DRIVE EFX-SEND +DRY	DRIVE EFX-SEND +DRY	DRIVE EFX-SEND +DRY	DRIVE EFX-SEND + DRY
together softwareside Is saved in the patch, so the CV-Amount to a Filter is saved in the Patch	OST-VCA EFX	POST-VCA EFX -DRY		POSTVCA EFX -DRY
Invitual destination w, and the code has to be adotet much or have to be made from scratch by-Riterbox (VCF+VCA), I am oil with the pros and cons, so I call it Simple-CV	DRIVE			DRIVE POSTACE DRY/WET VOLUME
	SONANCE CUTOFF	RESONANCE CUTOFF	RESONANCE CUTOFF	RESONANCE CUTOFF
	GREATFLALTEKK	GREATFULLTERX	GREATFULLTERX	GREATFULLTEKE

I will use it to filter:

2xGuitar-Loopstations 1xGuitar 1xPercussion-Master

A not EUROMODULE-BASED Version of something like this is the FILTERBOX:

8/10/26 05	5:12							7/10			E/
POWERCON-TR 230V XOO		MIDI OUT		2 Connections			001F1 001F2 (BB		DUCK MAIN H	R ALL DELAY	BACKI
FILTE	RBOX										FRONT-
-0+	VCFVCA 1824	SHORT 4dB OPEN	18 24di	SHORT 3 OPEN	18 24d	SHORT IB OPEN	SH0 18 24dB	ORT 1-4 OPEN 5-	8		0.1500011
FILT-RELEASE									GA	IN	
MAIN-ADD -0+				2		3			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			
									FILTER-OUT-2	HALL	
-0+	CUT-ENV	RES-ENV	CUT-ENV	RES-ENV	CUT-ENV	RES-ENV	CUT-ENV	RES-ENV		TIALL	
VELO							AMP-ENV				
									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											
MORPH VELO MOD	CUT-GAIN	RES-GAIN	CUT-GAIN	RES-GAIN	CUT-GAIN	RES-GAIN	CUT-GAIN	RES-GAIN	FILTER-OUT-4	DUCKING	
	VCA-DISTORT	DRY/WET	VCA-DISTORT	DRY/WET	VCA-DISTORT	DRY/WET	VCA-DISTORT	DRY/WET		A-LIN	
PAST PAST									RE		
ENV 333	LOAD	MORPH	CURVE	A	D	s	R	DEPTH	ENV	INV	
005 – ENV CPY CPY											
									LFO	Trig SYNC	
	STORE		' DELAY	WAVE	PHASE	DURATION	RATE	DEPTH			

General Design

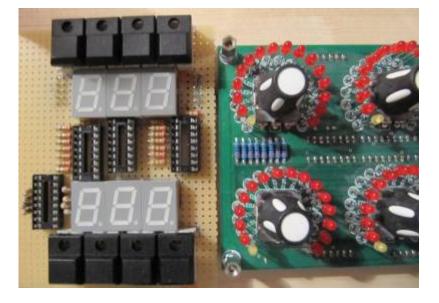
The panel size is 3U, Eurorack compliant

FrontPanel

PCBs

The Analog Circuits (VCF+VCA) get sandwitch as normal (not90° angeled)

Left-Part of the Brain on Breathboard: 7Segment: LTS547AP Button: ShadowSE/ITT



3D View of Sandwitches

🗵 make concept

1. UI Parts Listing

BRAIN + BREAKOUT

- Jacks 3.5mm @ Thonk
- SPDT Switch ON-OFF-ON @ Rs-components

Value	Туре	Qty
3.5mm Jack	Vertical PCB-Mount	13
Switch	SPDT Vertical PCB-Mount ON-OFF-ON	1

본 Fill Table

Pots / Knobs

- Alps RK11K Series
- Alpha Pots @ Thonk
- Knobs Suppliers
- 🗷 need special 4gang 50KB potentiometers for a STEREO Resonance (stereo filter, one UI)
- 🗷 need special 4gang xxKB (50?) potis for a Stereo DRY/WET Mix
- 🗷 need special 2gang xxKB (50?) potis for EFX Send Mix Stereo
- 🗷 need special 2gang 50KA potis for CUT-OFF Stereo
- Ineed special 2gang Post Transformator Potentiometer (Value have to look in my prototype which is used)

Value	Туре	Qty	
5K	Linear	Х	

Value	Туре	Qty
10K	Linear	x
50K	Linear	x
50K	Logarithmic	x
100K	Linear	х
1M	Linear	х
2M?	Linear	х
Knobs	Soft/Plastic/Alu	х

2. Analog Parts Listing

VCA-VCF-Board

본 Fill Table

3.Footprint Making in KiCAD

- ALPS Pots
- Alpha Pots
- 3,5mm Jack
- Switch
- Momentary Switch
- 7 Segment LED Display
- OLED DIsplay
- Rotary Encoder

🗵 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

- LRE8x2CS is a generic PCB which i already have (fairlightiiś)
- BREAKOUT PCBs (maybe have to sandwitch because of shiftregisters and less space)
- FILTER PCBs (have to sandwitch)

From: http://www.midibox.org/dokuwiki/ - **MIDIbox**

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