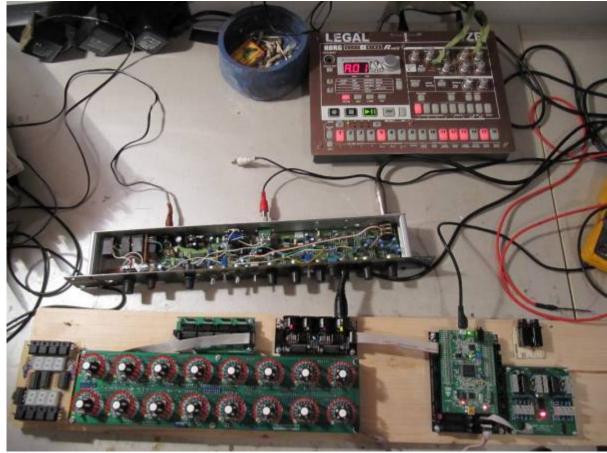
EASY CV

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.

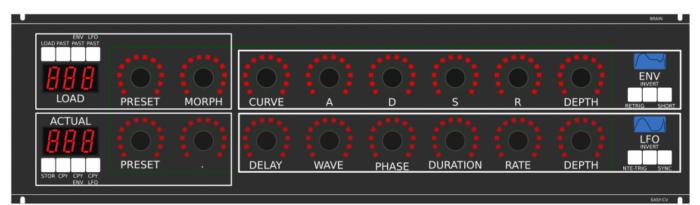
MORPH?:

-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...

BreakOut

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

Discharged UserInterface for the Brain in "Island mode" (Scopes + Digital-CV-Amount)
CV-Breakout EuroModule to be located near the CV-Destination (example: a Filter).

That bring 2 disadvanteges:

that bring 2 advanteges:

1.LFO or ENV cant get patched to individual destination

2 Waveforms (ENV+LFO) are mixed together softwareside

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

BREAKOUT



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...

EASY-CV

VCA-VCF

CVś(AOUT):

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

4.VCA-ENV 5.VCA-DRIVE

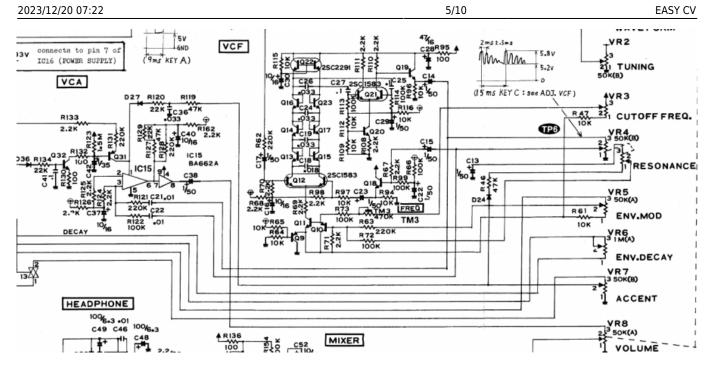
6.DRY-WET (Orginal vs Filtered Mixer) 7.Send 2 EFX1 8.Send 2 EFX2 So 1x 8AOUT-Module for each "Channelstrip", makes a total of 4x8AOUT-Modules. The Module of Choise is a 16Bit, since i control with the the same AOUT-Channel ENV+CUT-OFF... so there is no analog potentiometer for Cutoff or resonance... 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



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.

				DIAIN.
ENV LFO LOAD PAST PAST]			
nnn / ///	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			
LOAD PRESET MORPH	CURVE /	A D	S R I	DEPTH RETRIG SHORT
ACTUAL		*** ***** ****************************	···· • • • •	
STOR CPY CPY	DELAY WA	VE PHASE DU	RATION RATE I	DEPTH NTE-TRIG SYNC
ENV LFO				
	BREAKOUT	U BAEAKOUT U U BREAKOUT U	BREAKDUT	EASYCV
THE BHAIN - LEFT SIDE Preset Management Save and Load the "SONG" or call it "BANK"				
The Song is loadet by ProgramChange OR With the LOAD-PRESET-Encoder				
BUT it will mat be heard you must first press LDAD or Morph to it slowly with MORPH-Encoder With PAP	ENV ENV	ENV ENV LFO LFO	ENV ENV LFO LFO	ENV ENV LFO LFO
Notifiend the NEW-ENV+LTO (8 LDAD Not have the current ENV+LTO (8 LDAD with morph you crossfade between both				
Paste, and Copy do their job () the full BANK ERV/MSTE ERV/COPY do their job () the selected Envelope (selection is done by the breakout Modules)				0 0
Midi-Channel Note NR or Number of Envelope ta a rest programmer job, with usb-upload from computer MID	DEPTH DEPTH ED 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 should de LFOs and Envelopes fixed routed, no generic, special	0 / 0	1 P. 10 P.	1 10 Cv 10	1 9 6 9
in my case for a filterbank.	EASY-CV EASY-CV	EAST-CV. CASTICU	EASTER UNDERSTON	
	IN R CV LOUTR		LIN R CV LOUT R	
	AMP CUT	AMP CUT	AMP CUT	AMP CUT
MMELCV4riain & ULMAIN (Scopes + Digital CV-Amount) and next the CV-Destination (e.g. a Riter). together softwareside	RIVE EFX SEND +DRY	DRIVE EFX.SEND +DRV	DRIVE EFX-SEND +DRY	DRIVE EFX-SEND +DRIV
is saved in the patch, so the CV-Amount to a Filter is saved in the Patch	ST-VCA EFX -DRY	POST-VCA EFX -DRY	POSTVCA EFX -DRY	POST-VCA EFX -DRY
Invidual destination w, and the code has to be adplet much or have to be made from scratch vy-Fiterbox (VCF+VCA), i am or with the pres and cons, so i call it Simple-CV	RIVE	DRIVE	DRIVE	DRIVE
	STVCF DRY/WET VOLUME	POST-VCF DRY/WET VOLUME	POST-VCF DRY/WET VOLUME	POST-VCF DRY/WET VOLUME
	VCF	VCF	VCF	VCF
RES	DNANCE CUTOFF	RESONANCE CUTOFF	RESONANCE CUTOFF	RESONANCE CUTOFF
	GREATFLALTERK	GREATFULLTEKX	GREATFULLTEKK	GREATFULLTEKK

I will use it to filter:

2xGuitar-Loopstations 1xGuitar 1xPercussion-Master

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

2023/12/20 07:22							7/10			EASY CV
			LASH				DUG	KING REQUENCY	ALL DELAY	BACK-PANEL
FILTERBOX										FRONT-PANEL
-0+ VCF VCA 1	SHORT 3 24dB OPEN	18 24di	SHORT B OPEN	18 24d	SHORT B OPEN	SH 18 24dB	ORT 1-4 OPEN 5-8			
MAIN-ADD	1		2		3		4	GA		
-0+								FILTER-OUT-1	MAIN	
AMP-RELEASE CUT	RES N 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	
CUT-EN	RES-ENV	CUT-ENV	RES-ENV	CUT-ENV	RES-ENV	CUT-ENV	RES-ENV			
VELO										
								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 MOD										
MORPH VELO MOD								FILTER-OUT-4	DUCKING	
	N RES-GAIN RT DRY/WET	CUT-GAIN	RES-GAIN DRY/WET	CUT-GAIN	RES-GAIN DRY/WET	CUT-GAIN	RES-GAIN DRY/WET		A-LIN	
									RIG SHRT	
PAST PAST ENV 333 LOAD	MORPH	CURVE	A	D	s	R	DEPTH	ENV		
ENV L I I I I I I										
CPY CPY								LFO	Frig SYNC	
STORE		DELAY	WAVE	PHASE	DURATION	RATE	DEPTH			

General Design

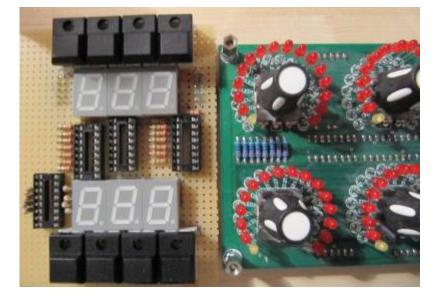
The panel size is 3U, Eurorack compliant

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	х
50K	Linear	х
50K	Logarithmic	х
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**

Permanent link: http://www.midibox.org/dokuwiki/doku.php?id=easy_cv&rev=1470796339



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