Story
I bought a bunch of Thomas Henry books from Magic Smoke and I got really curious about the circuits in the 'Making music with the NE570 compander' book. I decided to make a compact module with as much as I could fit from the book. And then the 570 Galore was born: 5 separate dynamic functions that are normalled to the first input (only the first input has a gain control, if you need more than you need to change the levels with other modules). It features a Compressor, Expander, AGC (automatic gain control, some sort of compressor), Limiter and an Envelop Follower).

It is a tight build, only for the experienced builders and putting it together will be a little puzzle, but it is a fun and versatile module packed with sound shaping tools (and the envelope follower is also very good), especially for drums!

This is not a hi-fi project, but the functions it performs can be still be useful. Be aware that when you have noise in your system a module like this can highlight the noisefloor.
There is not much to tweak so it is possible that for some materials it doesn't sound good (changing levels already makes a big difference).

Here is a demo

Acquiring the book is recommended for understanding, tweaking and debugging.
I have permission from Thomas Henry to sell this project.

There are 2 versions of the chip: 570 and 571. The 571 is said to be lower specced, but I think for this project it doesn't matter so much which one you choose (I built them with both the 570 and the 571 and didn't hear a noticable difference).

Assembly
Solder these first (ordered from top to bottom):
C1c (1µF), R4 (27k)
R10 (27k)
C4a (2.2µF)
R6L (100Ω)
C2f (2.2µF)
R24 (27kΩ)
R11f (100kΩ)
The reason for this is that they are between the ics (and one half under a trimpot) and very hard to get to if you don't do them first.

The following smd parts are on the top side:
C1,C2,C3,C5,C6,C7,C8,C9,C10 (all 100nf) and Cda (560pF)
Maybe the best moment to do this is when you are done with all the smd on the bottom side.

For orientation of the ic's: Look for the double lines on the silkscreen that should correspond with the beveled edge of the chip (apart from IC7 where pin 1 is indicated by a dot).
For orientation of the electrolytic caps: the minus side is noted with a - on the silkscreen.
Even though the silkscreen of the trimmers is also on the top, I advice to place them on the bottom.

Calbration

The 10k trimmer (R7f) is used to get rid of a dc offset when there is no signal. Simply plug nothing in and turn until the Envelope jack output is 0v

The 20k trimmers in series with a 47k resistor set the voltage reference used for the limiter

R16L sets the top limit, can be measured at mid wiper or pin3 of the lm393 2.885 = 1.085
R17L sets the bottom limit, can be measured at mid wiper or pin pin6 of the lm393 1.108 = -0.7
The input signal has a bias of 1.8v so if you want to activate the limer above 2Vpp your measurements should be:
high ref = 2.8v (R16L)
low ref = 0.8v (R17L)

2Vpp is roughly the equivalent of 7.4Vpp at the input (it is scaled down with R19/R18=27/100).

Schematic/Tweaking/Debugging

The parts that are mentioned in the original circuits from 'Making music with the NE570 compander' are denoted with a suffix:
c = compressor
e = expander
a = agc
L = limiter
f = envelope follower
If you have that book it makes it easy to understand what the circuit does, to debug it and to tweak it if wanted/needed.

BOM

10x	thonkiconns
1x	10 pin eurorack header, shrouded if preferred

<u>ceramic capacitor (x7r) 0603 >=16v</u>

12 x	100nF	C1/12

<u>electrolytic capacitor through hole (100mil >=16v)</u>

2 x	47µF	C13,C14

capacitor (x7r or better, c0g or film preferred but not always feasible in this size) 0603 >=16v

2 x	47pF	C1a,C1L
6 x	560pF	Cda,Cdc,Cde,Cdf1,Cdf2,CdL
1 x	0.22µF	C1f
10x	2.2µF	C2f,C2L,C3e,C3f,C3L,C4a,C4c,C4L,C5a,C6a
9x	1µF	C1c,C1e,C2a,C2c,C2e,C3a,C3c,C4e,C5c
3x	10µF	C5L,C6c,C7a

2x	1n5819	D1,D2	in SOD123	
3x	TL074		IC1/IC3	in SO-14
3x	NE570DRG2, v571m or similar		IC4/IC6	in SO(w)16
1x	LM393,		IC7	in SO-8

L1,L2	0603 or 0805 filter beads

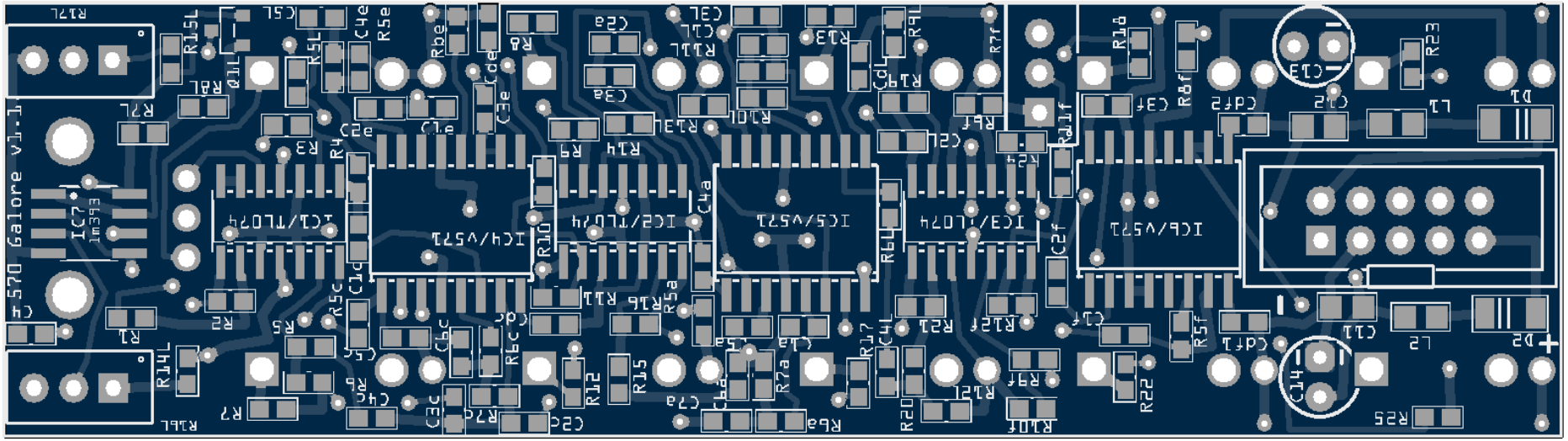
P1	9mm alpha style potmeter 100kA
R16L	multiturn trimpot 20k
R17L	multiturn trimpot 20k
R7f	multiturn trimpot 10k

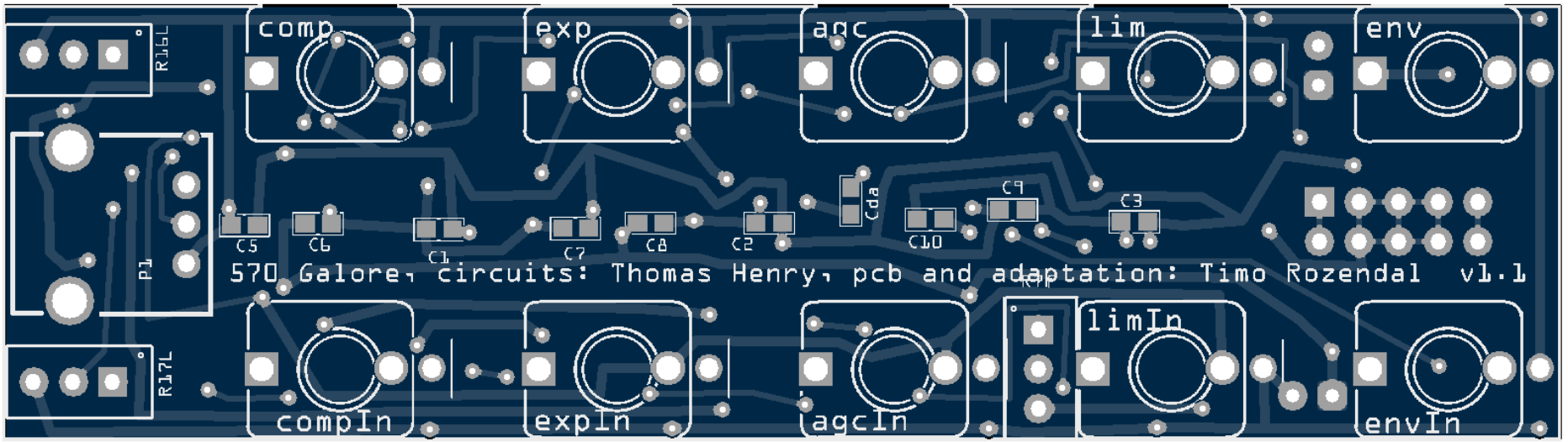
Q1L	MMBT3906 transistor in SOT-23

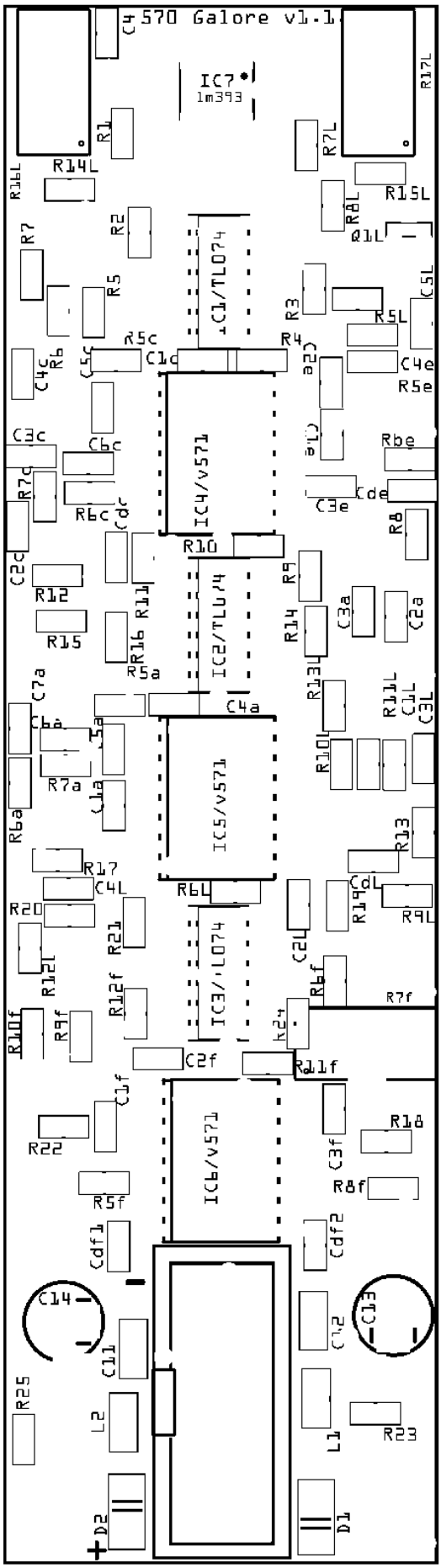
Resistors 1% 0603

2x	100Ω	R5L,R6L
5x	1kΩ	R7, R12,R17,R22,R25
2x	3.3kΩ	R5f,R6f
2x	10kΩ	R7L,R8L
2x	22kΩ	R8f,R15
7x	27kΩ	R4,R5,R9,R10,R14,R20,R24
4x	36kΩ	R6a,R6c,R7a,R7c
3x	47kΩ	R14L,R15L,R16
1x	56kΩ	R19
1x	68kΩ	Rbe

14x	100kΩ	R1,R3,R6,R8,R9f,R9L,R10f,R10L,R11f,R11L,R12L,R13,R18,R23
1x	130kΩ	R11
1x	200kΩ	R2
2x	470kΩ	R12f,R21
2x	2MΩ	R5a,R13L
2x	10MΩ	R5c,R5e


570 Galore v1.1
IC7
1m393
IC1/TL074
IC4/v571
IC2/TL074
IC5/v571
IC3/TL074
IC6/v571


comp
exp
agc
lim
env
570 Galore, circuits: Thomas Henry, pcb and adaptation: Timo Rozendal v1.1
compIn
expIn
agcIn
limIn
envIn


570 Galore v1.1
IC7
1m393
IC1/TL074
IC4/v571
IC2/TL074
IC5/v571
IC3/TL074
IC6/v571
R1
R2
R3
R4
R5
R5a
R5c
R5e
R5f
R6
R6a
R6b
R6c
R7
R7a
R7c
R7f
R8
R8f
R9
R9f
R10
R10f
R11
R11f
R12
R12f
R13
R13L
R14
R14L
R15
R15L
R16
R16L
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R18
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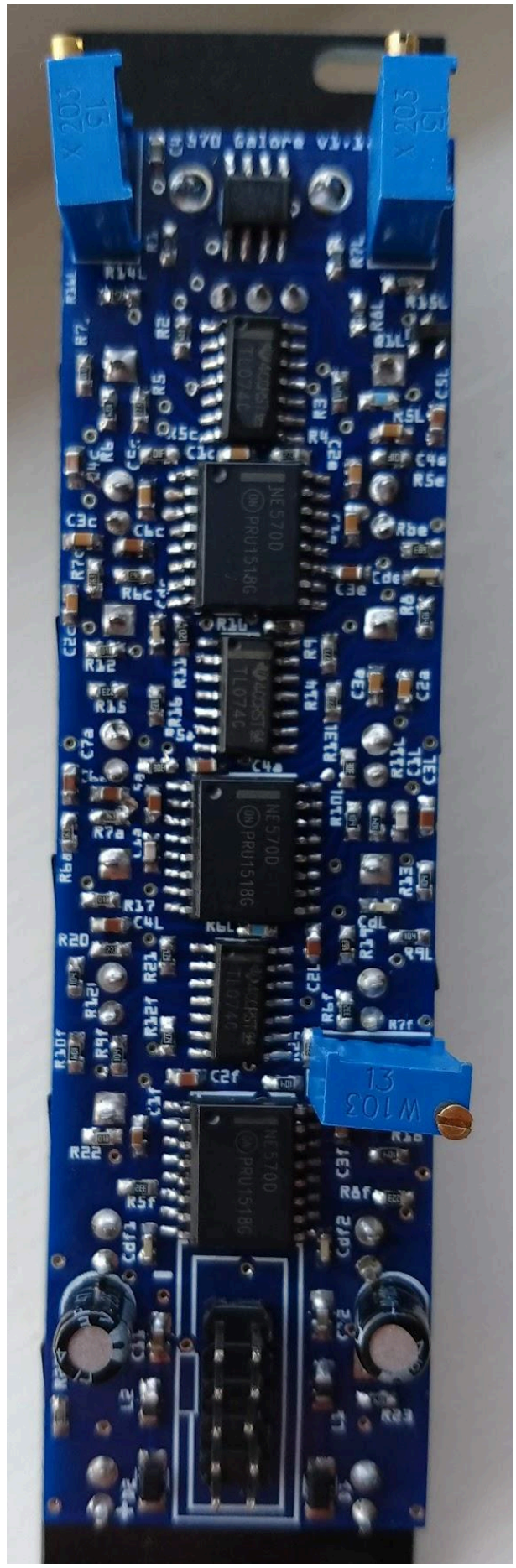
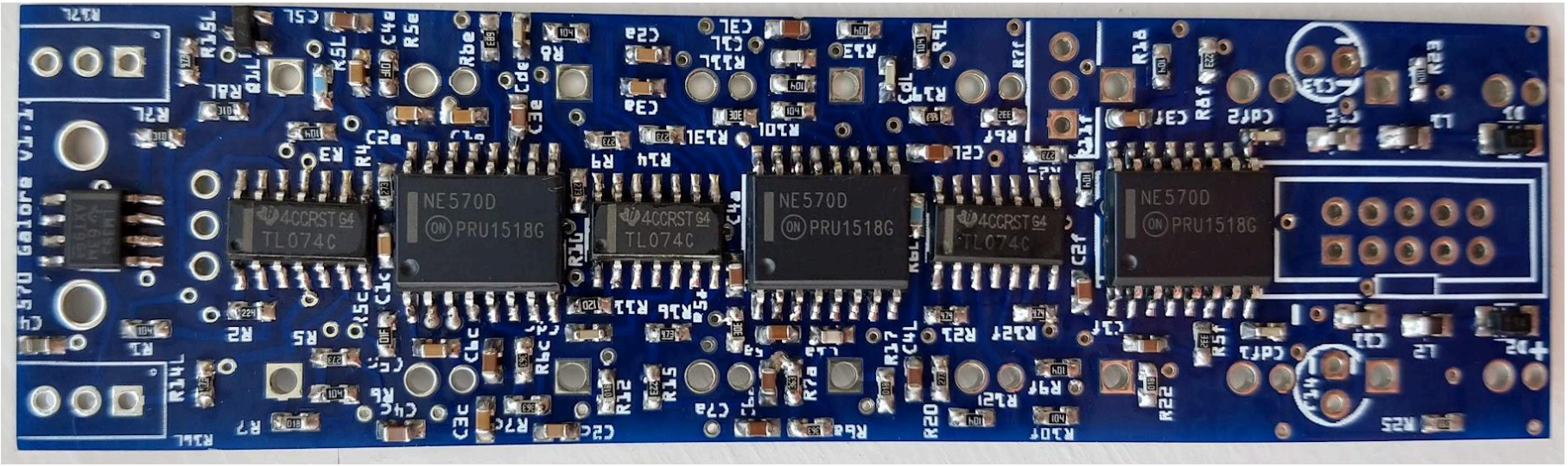
R23
R24
R25
R6L
R7L
R8L
R9L
R10L
R11L
R12L
Q1L
C1a
C1c
C1e
C1f
C2a
C2c
C2e
C2f
C3a
C3c
C3e
C3f
C4a
C4c
C4e
C4L
C5L
C6a
C6c
C7a
C7c
C8a
C8c
C8e
C8f
C9a
C9c
C9e
C9f
C10a
C10c
C11
C11a
C12
C13
C14
C1L
C2L
C3L
C4L
C5L
C6L
C7L
C8L
C9L
Cdc
Cde
Cdf1
Cdf2
L1
L2
D1
D2


570 Galore v1.1
NE570D
PRU1518G
TL074C
W103
13

comp
exp
agc
lim
env
570 Galore, circuits: Thomas Henry, pcb and adaptation: Timo Rozendal v1.1
compIn
expIn
agcIn
limIn
envIn


NE570D
PRU1518G
TL074C