

## 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 normalised 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 noise floor.

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 (1 $\mu$ F), R4 (27k)

R10 (27k)

C4a (2.2 $\mu$ F)

R6L (100 $\Omega$ )

C2f (2.2 $\mu$ F)

R24 (27k $\Omega$ )

R11f (100k $\Omega$ )

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

ceramic capacitor (x7r) 0603 >=16v

12 x 100nF C1/12

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

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 | 0.22 $\mu$ F | C1f                                     |
| 10x | 2.2 $\mu$ F  | C2f,C2L,C3e,C3f,C3L,C4a,C4c,C4L,C5a,C6a |
| 9x  | 1 $\mu$ F    | C1c,C1e,C2a,C2c,C2e,C3a,C3c,C4e,C5c     |
| 3x  | 10 $\mu$ F   | 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  | 100 $\Omega$  | R5L,R6L                                                  |
| 5x  | 1k $\Omega$   | R7, R12,R17,R22,R25                                      |
| 2x  | 3.3k $\Omega$ | R5f,R6f                                                  |
| 2x  | 10k $\Omega$  | R7L,R8L                                                  |
| 2x  | 22k $\Omega$  | R8f,R15                                                  |
| 7x  | 27k $\Omega$  | R4,R5,R9,R10,R14,R20,R24                                 |
| 4x  | 36k $\Omega$  | R6a,R6c,R7a,R7c                                          |
| 3x  | 47k $\Omega$  | R14L,R15L,R16                                            |
| 1x  | 56k $\Omega$  | R19                                                      |
| 1x  | 68k $\Omega$  | Rbe                                                      |
| 14x | 100k $\Omega$ | R1,R3,R6,R8,R9f,R9L,R10f,R10L,R11f,R11L,R12L,R13,R18,R23 |
| 1x  | 130k $\Omega$ | R11                                                      |
| 1x  | 200k $\Omega$ | R2                                                       |
| 2x  | 470k $\Omega$ | R12f,R21                                                 |
| 2x  | 2M $\Omega$   | R5a,R13L                                                 |
| 2x  | 10M $\Omega$  | R5c,R5e                                                  |





