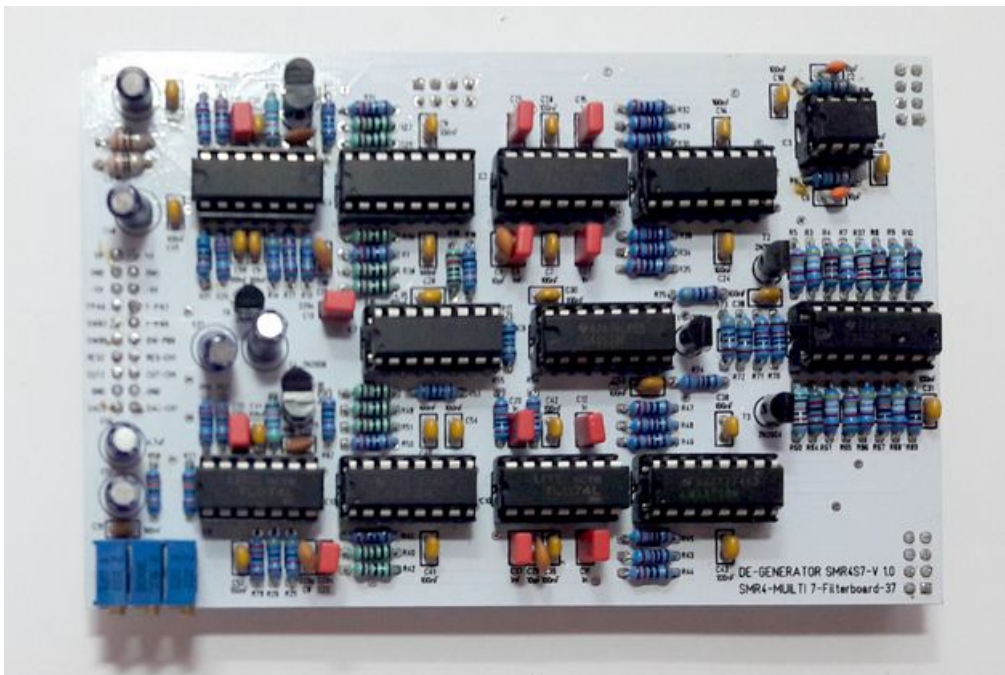


# De-Generator

DIY sample Synthesizer

## Building instruction 3, the filterboard

V 1.04 english  
Date 08.04.2019



[www.tubeohm.com](http://www.tubeohm.com)

Hello, now we come to the third building instruction. In this manual we will assemble the -stereo multimode filter.

As always, take a look at the board first – and Hoooommmmm -, the only thing you have to watch out for is that the three connectors K1,2,3,4 come down.

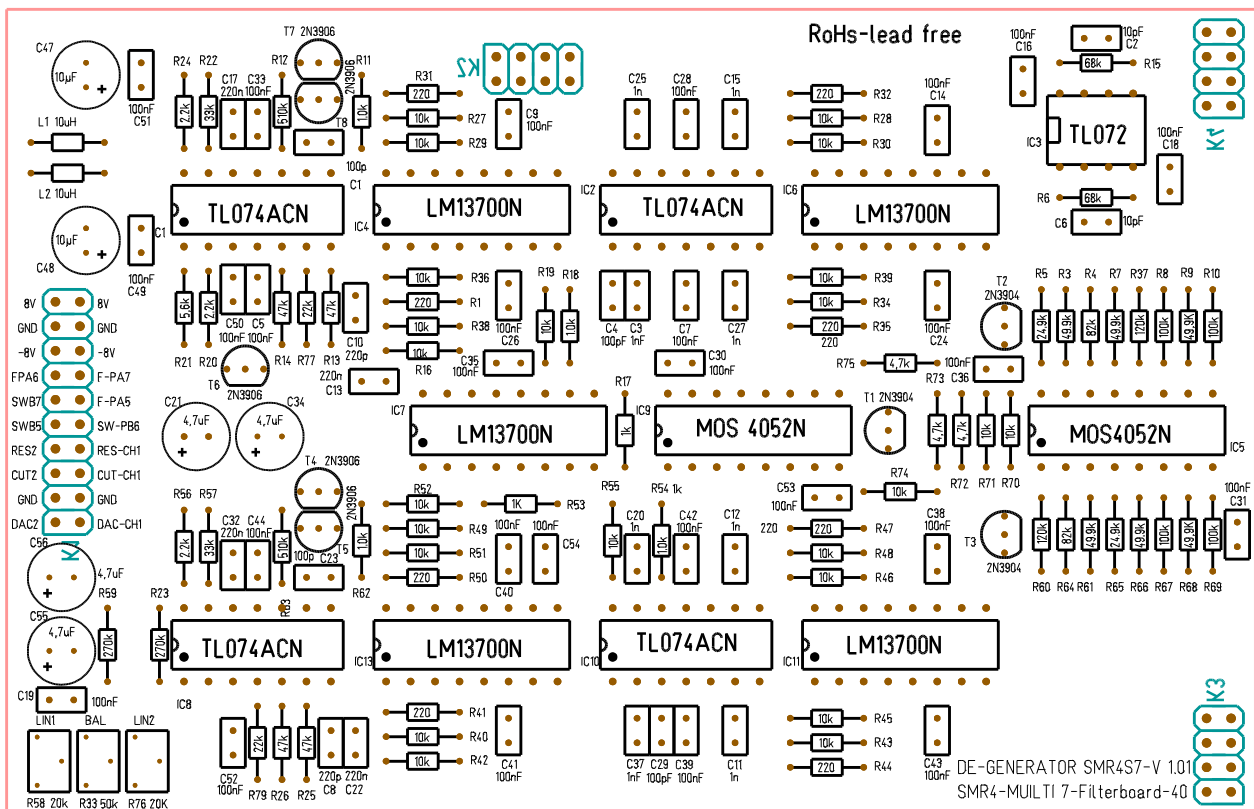
Tip: the resistors should always be measured with a multimeter before soldering.

People who want to source parts by themselves - Attention both IC's 4052 must be C-Mos IC's are. These work with a higher operating voltage of 8 Volt!

first we will solder in the coils/resistors, then the capacitors, then the IC sockets and finally the transistors and potentiometers.


Everything ready ?

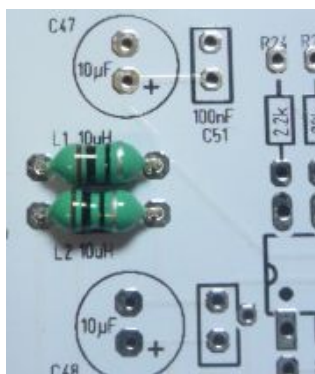
Here is first of all the layout .




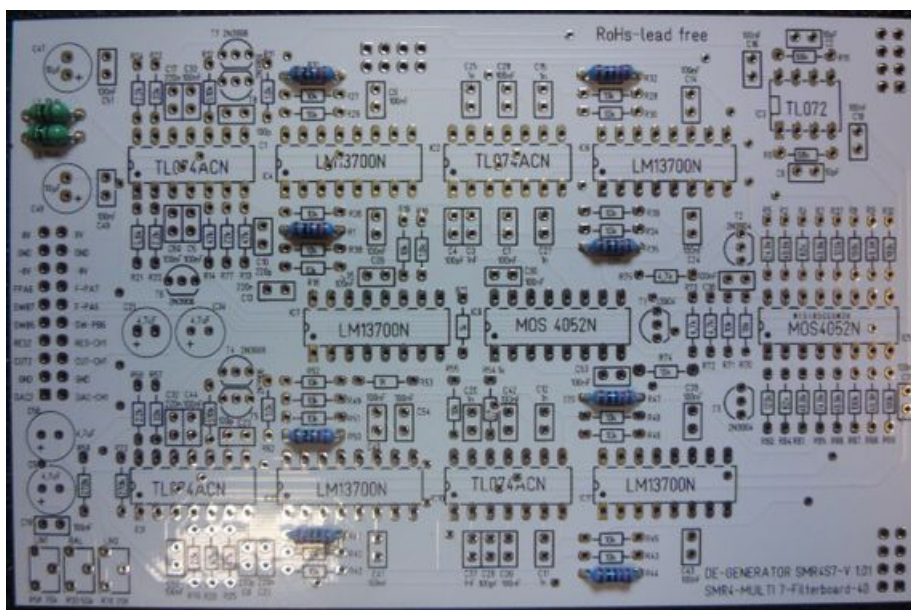
**We now solder the following components :**


2 Bauteile/2 parts

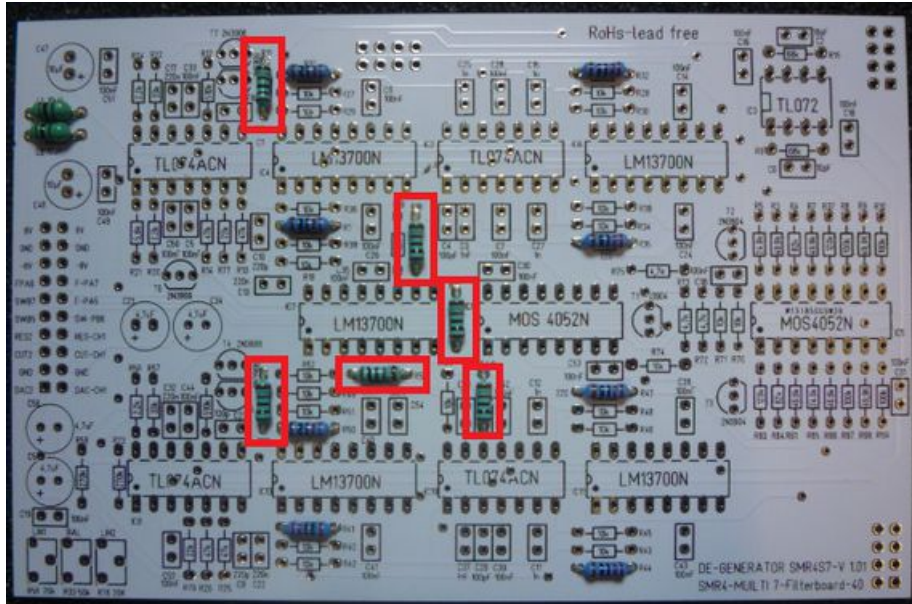
L1,L2	Coil 10 uF	2x
	Can be that the bigger or smaller one is in the kit	2x10uH coil 320 mA




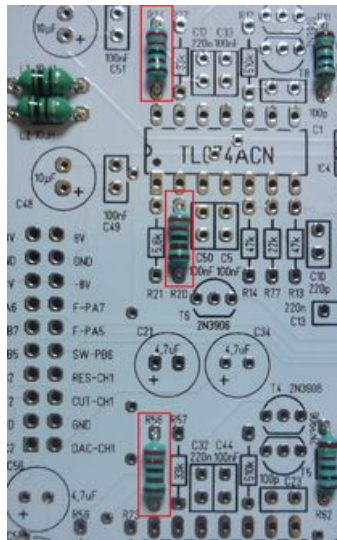
8 Bauteile /8 parts	220R	Position value
 Red,red,black,black,brown	Metall film resistor	8x220R R1,R31,R32,R35,R41,R44, R47,R50




6 Bauteile / 6 parts	1k	Position value
 <p>1K Ohm</p> <p>Brown,black,black,brown,brown</p>	Metall film resistor	6x1K= R11,R18 R17,R53,R54,R62

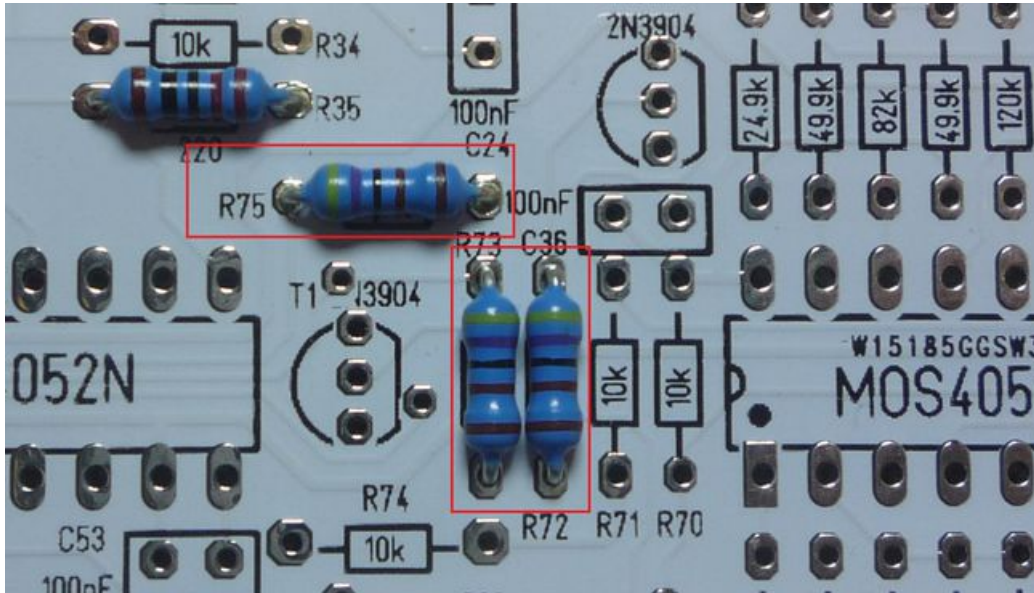


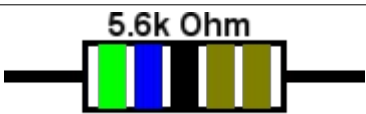
3 Bauteile / 3 parts	2,2K	Position value
 <p>2.2K Ohm</p> <p>Red,red,black,brown,brown</p>	Metall film resistor	3x2,2K R20,R24,R56

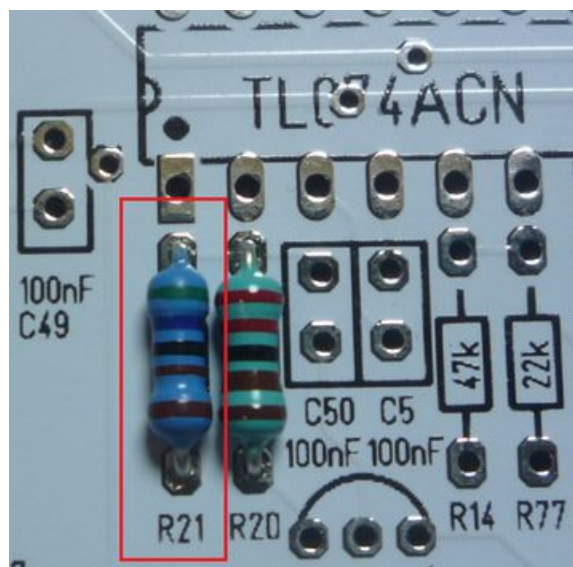





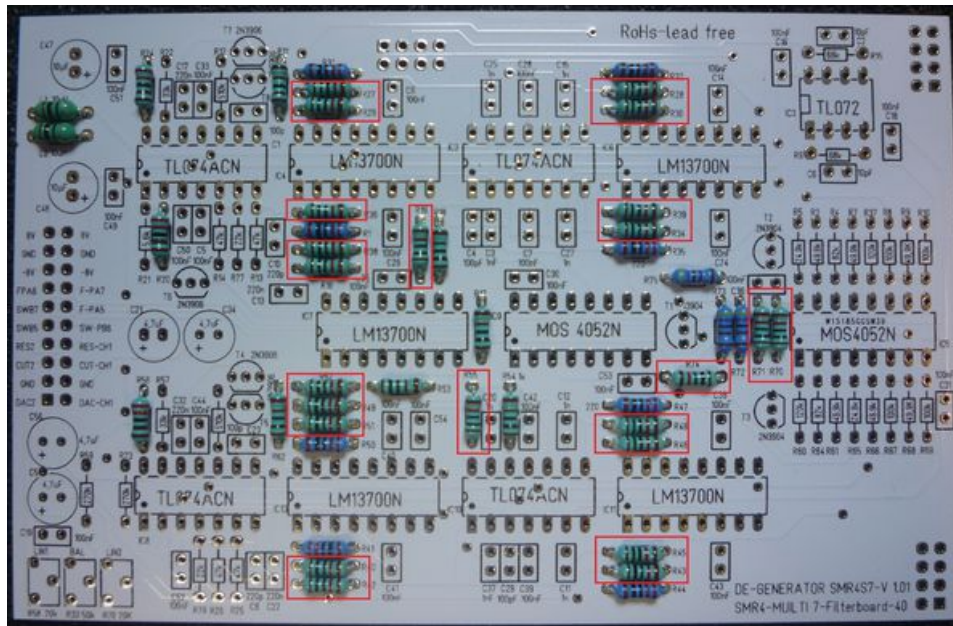
3 Bauteile / 3 parts	4,7K	Position value
 <p>4.7k Ohm</p> <p>Yellow,purple,black,brown,brown</p>	Metall film resistor	3x4,7K R72,R73,R75






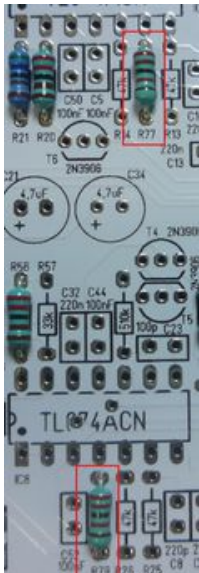

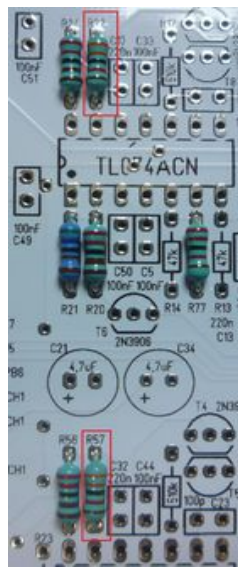
1 Bauteile / 1 parts	5,6K	Position value
 <p>5.6k Ohm</p> <p>Green,blue,black,brown,brown</p>	Metall film resistor	1x5,6K R21





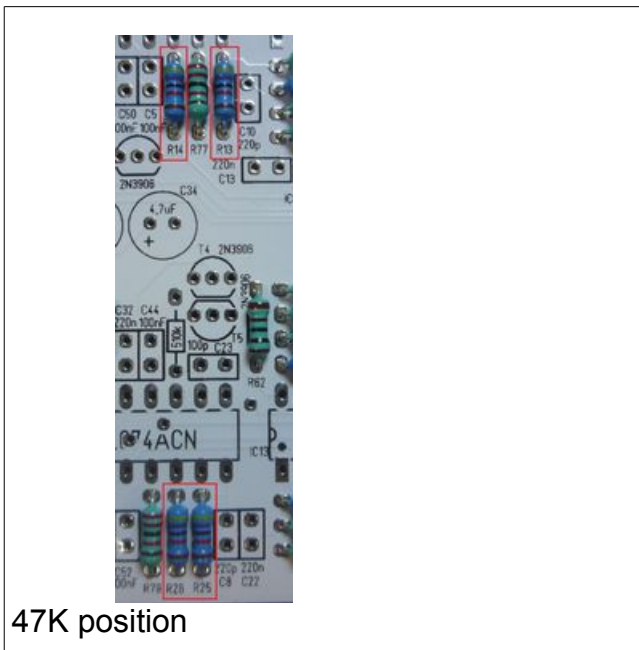
23 Bauteile / 23 parts	4,7K	Position value
 <p>10k Ohm</p> <p>Brown,black,black,red,brown</p>	Metall film resistor	<p>23x10K</p> <p>R16,R19,R27,R28,R29,R30,R34, R36,R38,R39,R40,R42,R43,R45, R46,R48,R49,R51,R52,R55,R70, R71,R74</p>






6 Bauteile / 6 parts		
<p><b>22k Ohm</b></p>  <p>Red,red,black,red,brown</p>	Metall film resistor	2x22k R77,R79
<p><b>24.9k Ohm</b></p>  <p>Red,yellow,white,red,brown</p>	Metall film resistor	2x24,9K R5,R65
<p><b>33k Ohm</b></p>  <p>Orange,orange,black,red,brown</p>	Metall film resistor	2x33K R22,R57

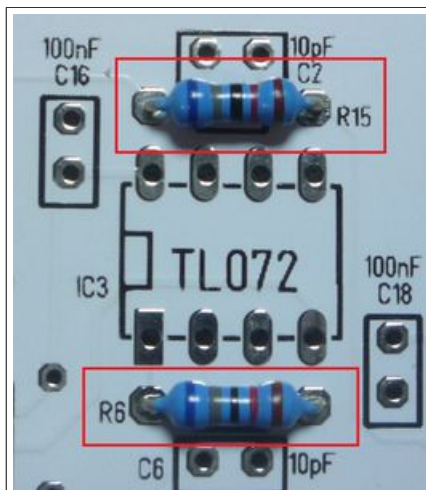
 <p>22k position</p>	 <p>24,9K position</p>	 <p>33K position</p>
--	--	--

10 Bauteile / 10 parts		
<p><b>47k Ohm</b></p>  <p>Yellow,purple,black,red,brown</p>	Metall film resistor	4x47K R13,R14,R25,R26
<p><b>49.9k Ohm</b></p>  <p>yellow,white,white,red,brown</p>	Metall film resistor	6x49,9K R3,R7,R9,R68,R61,R66





8 Bauteile / 8 parts		
<p><b>68k Ohm</b></p>  <p>Blue,gray,black,red,brown</p>	Metall film resistor	2x68k R6,R15
<p><b>82k Ohm</b></p>  <p>Gray,red,black,red,brown</p>	Metall film resistor	2x82K R4,R64
<p><b>100k Ohm</b></p>  <p>Brown,black,black,orange,brown</p>	Metall film resistor	4x100K R8,R10,R67,R69






68K position

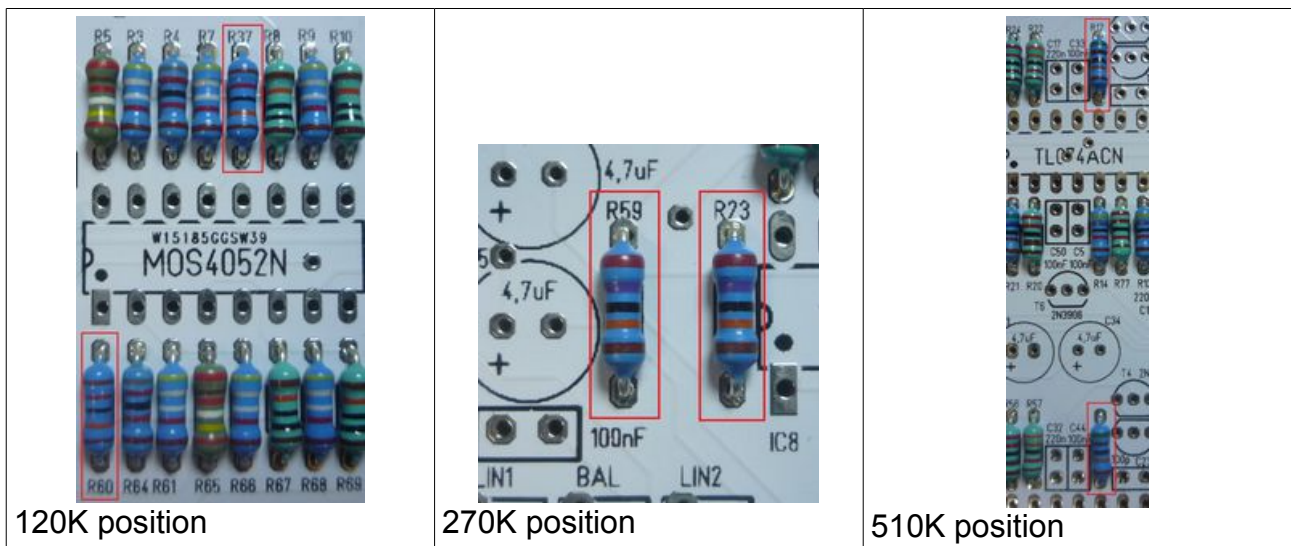


82K position

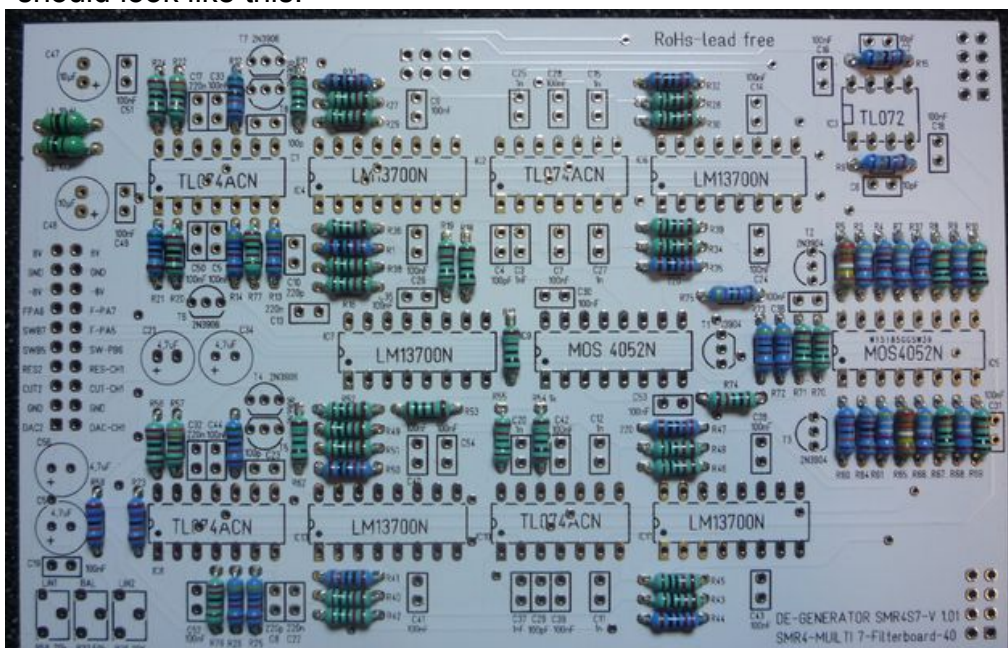


100K position




6 Bauteile / 6 parts		
 <p>120k Ohm</p> <p>Brown,red,black,orange,brown</p>	Metall film resistor	2x120k R37,R60
 <p>270k Ohm</p> <p>Red, purple,black,orange,brown</p>	Metall film resistor	2x270K R23,59
 <p>510k Ohm</p> <p>Green,brown,black,orange,brown</p>	Metall film resistor	2x510K R12,R63

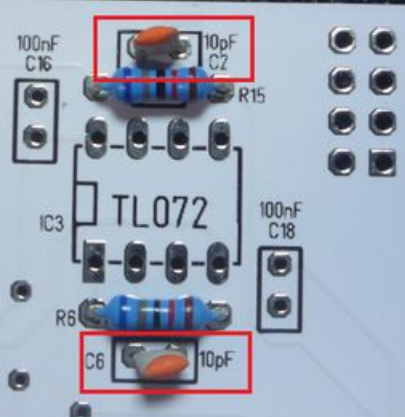
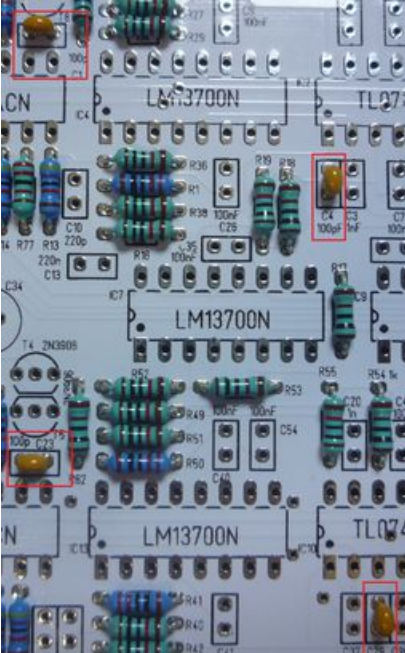



Now we have solder all resistors into the PCB .  
The PCB should look like this:





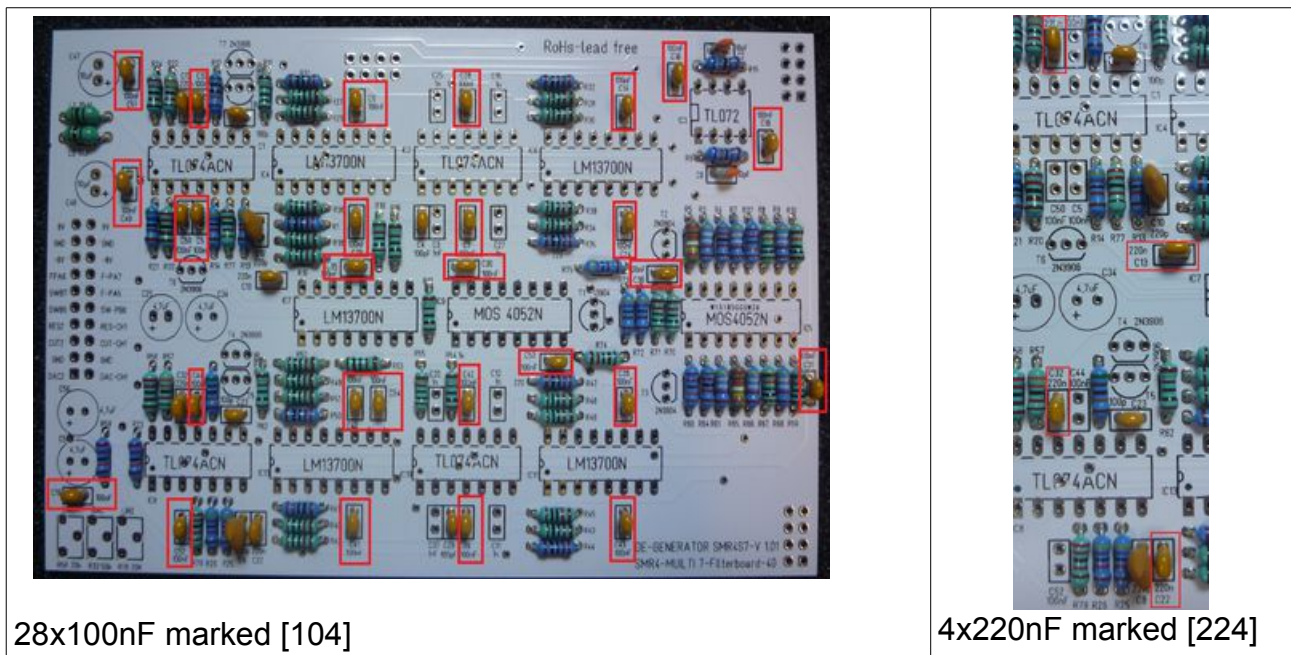
Now we're going to solder in the capacitors.

8 Bauteile / 8 parts		
 10pF marked [10] or 10pF	Ceramic cap RM2,5	2x10pF C2,C6
 100pF marked [101]	Ceramic cap RM2,5	4x100pF C1,C4,C23,C29
 220pF marked [221]	Ceramic cap RM2,5	2x220pF C8,C10

 <p>2x 10 pF</p>	 <p>4x100pF</p>	 <p>2x220pF</p>
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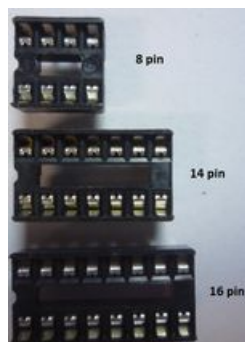
28 Bauteile /28 parts		
 100nF marked [104]	Ceramic cap RM2,5	28x100nF C5,C7,C9,C14,C16,C18,C19,C24, C26,C28,C30,C31,C33,C35,C36, C38,C39,C40,C41,C42,C43,C44, C49,C50,C51,C52,C53,C54
 220nF marked [224]	Ceramic cap RM2,5	4x220nF C13,C17,C22,C32



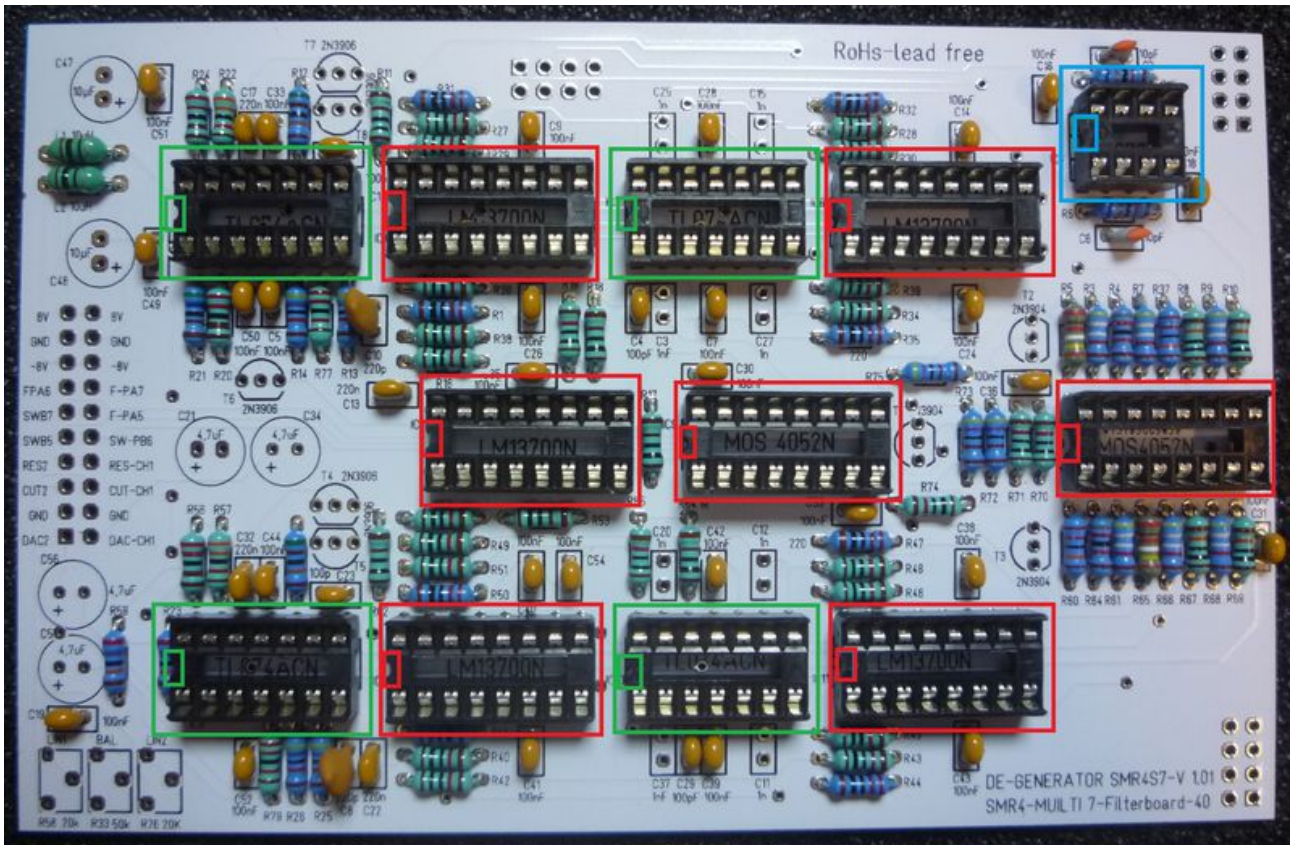
Before we solder the remaining capacitors it is easier to solder the IC sockets first.

We need:

- 1x8 pin IC socket
- 4x14 pin IC socket
- 7x16 pin IC socket










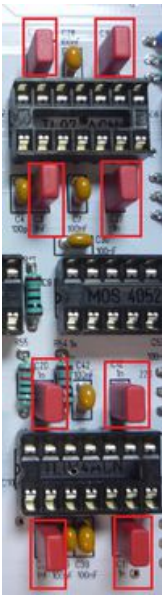
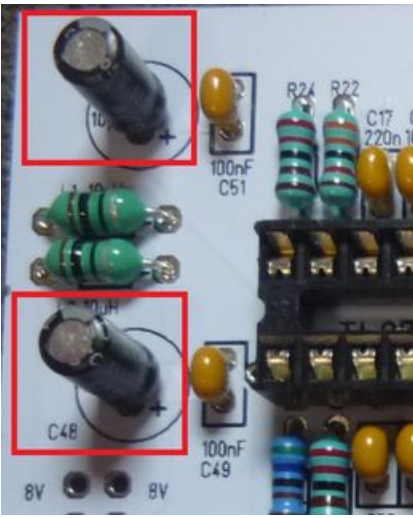
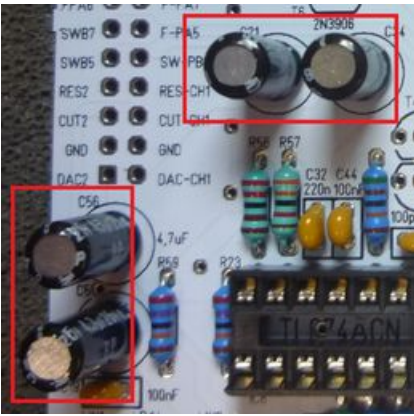
the 8 PIN IC socket is marked blue and is installed so that the notch points to the left .

the 14 PIN IC socket is marked green and is installed so that the notch points to the left.


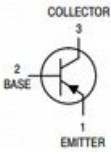

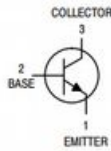

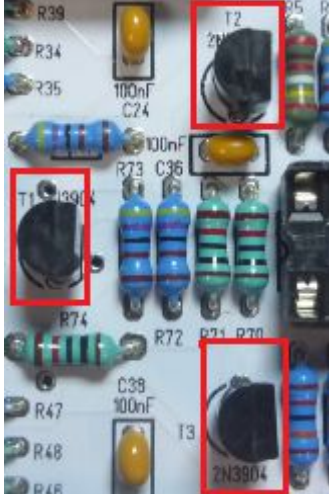
the 16 PIN IC socket is marked red and is installed so that the notch points to the left.

Now the remaining capacitors are soldered.




14 Bauteile/ 14 parts		
 1nF marked 0,001	Wima cap RM2,5	8x1nF C11,C12,C15,C20,C25, C27,C3,C37
 10uF Elko polarized	Mini 10 uF Elko attention polarized , minus is the short leg	2x10uF elko C47,C48
 4,7uF non polarized	4,7 uF NP (non polarized) Elko	4x4,7uF NP C21,C34,C55,C56

 8x1nF Wima RM2,5	 2x10uF polarized	 4x4,7uF NP
--	---	--



Finally, the semiconductors, trimming potentiometers and connectors are soldered.

<p>8 Bauteile/ 8 parts</p>		
 <p>2N3906 Transistor</p>	 <p>PNP Transistor</p>	<p>5x2N3906 T7,T8,T4,T5,T6</p>
 <p>2N3904 Transistor</p>	 <p>NPN Transistor</p>	<p>3x2N3904 T1,T2,T3</p>
 <p>5x2N3906</p>	 <p>3x2N3904</p>	

## The trimmer

7 Bauteile/ 7 parts		
 2x Trimmer 20 K	Trimmer 20K Marked Z 203	2x20k trimmpot R58,R76
 1x trimmer 50 K	Trimmer 50K Marked Z 503	1x50K trimm pot R33
	 Here the 3 pots left 20K , middle 50 K , right 20k	

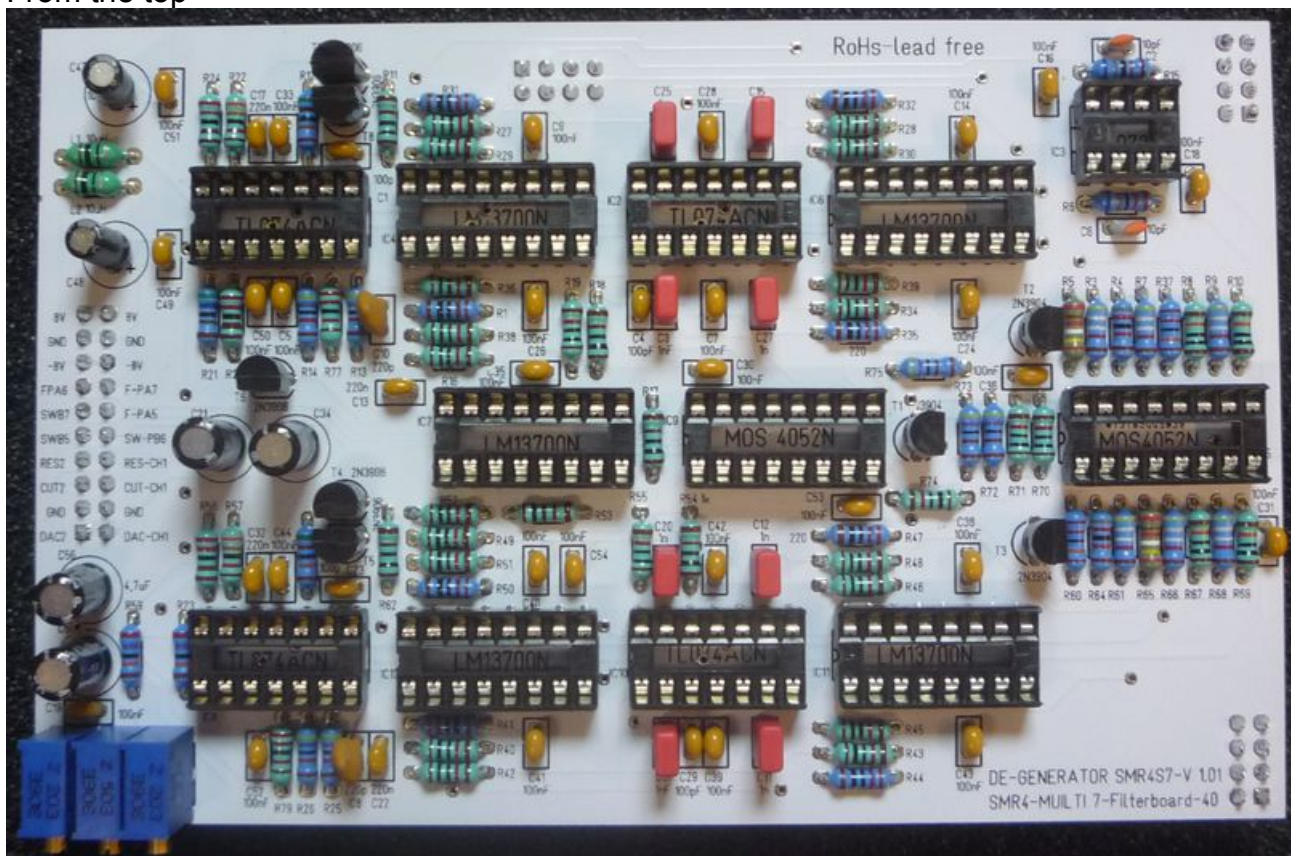
## The header

3 Bauteile / 3 parts		
 1x (2x10)PIN header	Position K1 Attention this header is soldered from top and goes to the backside	1x (2x10)pin header K1
 3x (2x4)pin header	Position K2,K3,K4 K2 is audio our , K3,4 is ground Attention this header are soldered from top to the backside	3x (2x4)Pin header K2= audio out K3,K4= ground

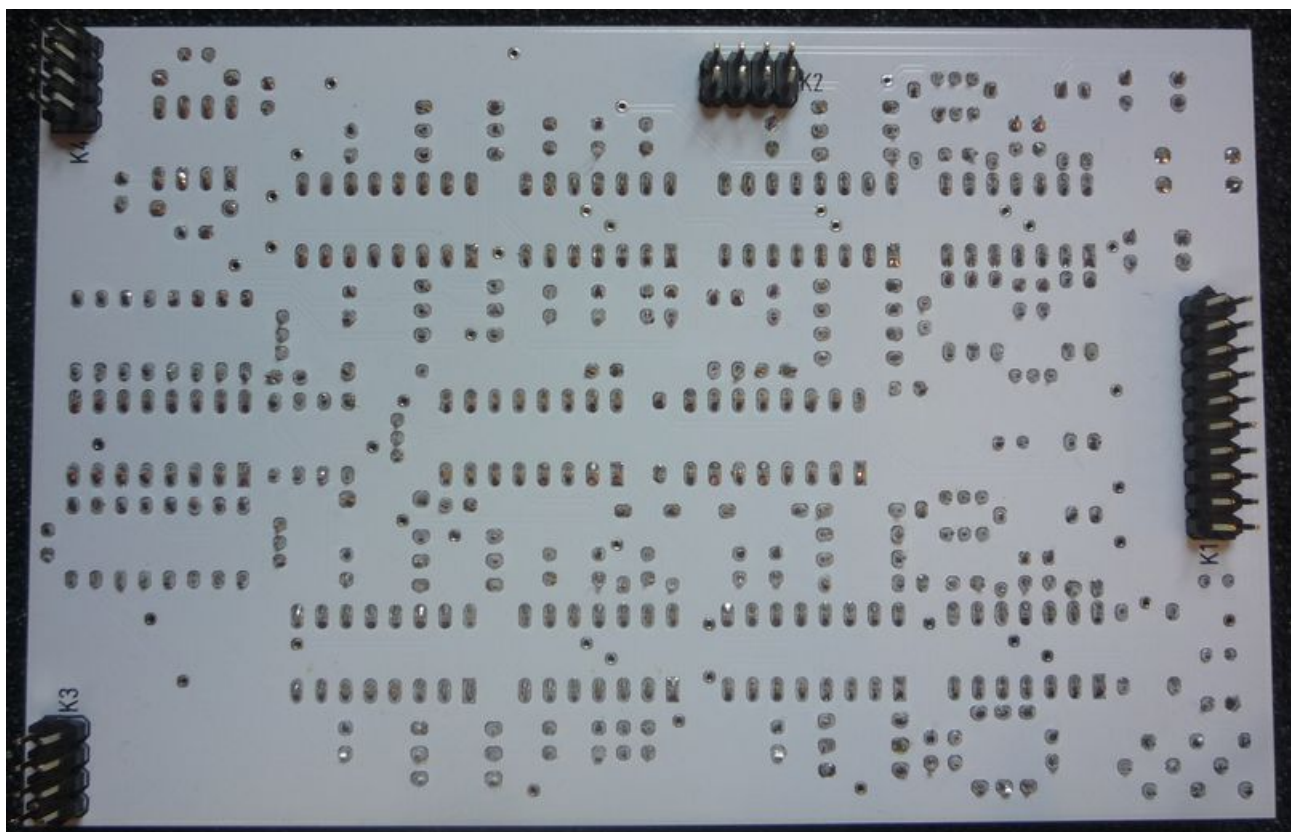


Now it should look like this

From the top



and from below \*\*\* the circuit board is cleaned



Measuring points.

We work with the following operating voltages / potentials.

-8 Volt  
+8 Volt  
GND

Attention, the 4052 switch must be a C-MOS type !!!

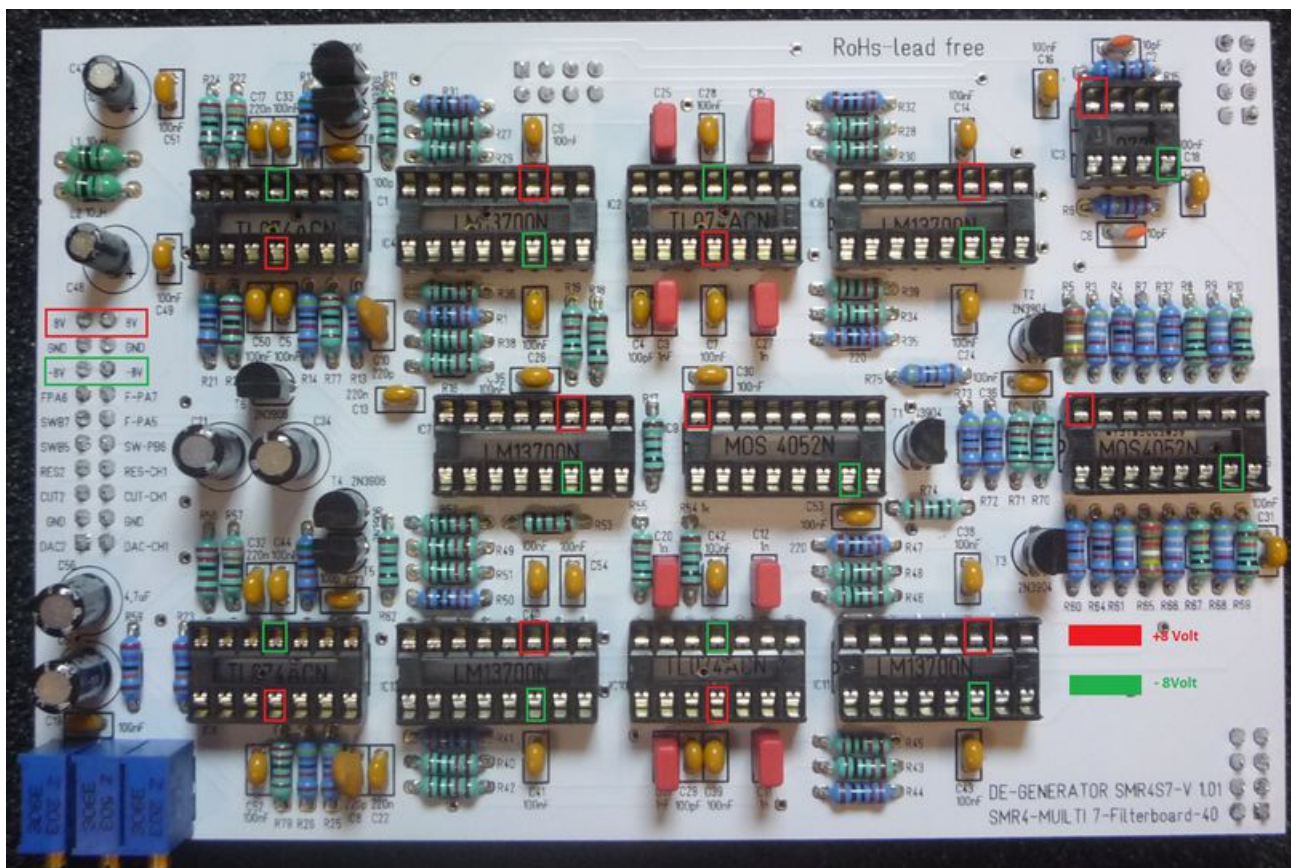
red = (plus) 8Volt >>> 7,5...8,5 is OK

green = (minus)-8Volt >>> -7,5...8,2 is OK

is measured against ground /GND .

The filterboard is plugged onto the motherboard. Please make sure that the connectors are plugged in correctly. The CPU Board/Pannel Board should not be plugged into the motherboard.

After the motherboard has been switched on, the voltages on the filter board should be checked.



Now the filterboard is soldered and voltage checked.

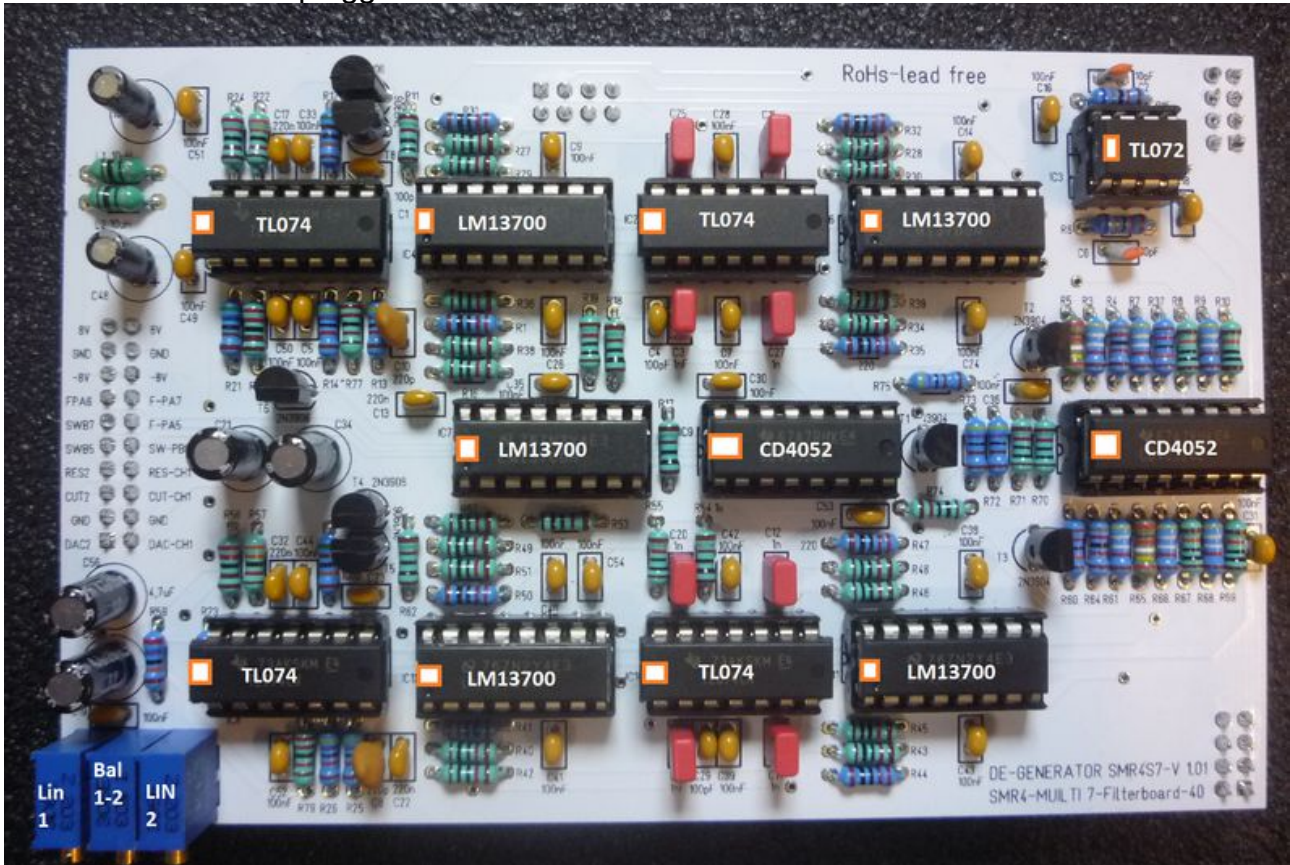
Before you plug in the IC's you should clean the board. After that please check all solder joints again and best with a magnifying glass. People, I still find one or the other solder joint with which I am not satisfied yet and solder it again.



It's better to invest another 15 minutes in checks than to spend hours searching for mistakes afterwards.

Attention, the 5051 and 52 are C-Mos IC'S and very sensitive to static charging.

Now the IC's can be plugged in.



As you can see, the markings of all IC's point in one direction. Please check twice if all IC's are a:) in the right direction, and b:) in the right place.

### The Adjustment

For the adjustment of the complete electronics, please refer to the 'ADJUSTMENT Manual'.

So much in advance. The filter installed in the de-generator is a stereo filter!

That means that each filter must be adjusted individually in V/OKT and then again among each other ! Sounds complicated , but it is not .

You see three trimmers.

Lin 1 sets the linearity of filter 1 in V/OKT.

Lin 2 adjusts the linearity of filter 2 in V/OKT

If both filters are set, the lower cutoff frequency of both filters is set to the same frequency via BALANCE - and that's it.

A detailed instruction for adjusting the filter can be found in the 'Adjustment Manual'!

Congratulations - the filter board is now ready.

A few words . There are some 100 parts and a lot to write - in all manuals. In order to avoid mistakes, the boards were built up parallel to all manuals and checked for function afterwards.

We hope that this manual is nearly error free - but if you should find any errors ( wrong part name or misleading terms ) please let us know about these errors. We will change the manual immediately.

Andre'  
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