SLPRE-LEDBOARD
REV B

Introduction

Let me Introduce this PCB-Update for all SL_Pre-amps we are offering. The benefits are a better calibration of the unit. In this manual you get infos about this new PCB and the Calibration process of all SL_ Preamps. This PCB contains variable High Pass and Low Pass Filters, DIYRE Colour Module Control and LED Meter.

TABLE OF CONTENTS

Stuffing Boards

This Manual follows mostly follows mostly the main manual. There are just 6 New/Different Parts(R_M_128, Rmeter1, R_LC_TRIM,R_HC_TRIM, IC_M_5,IC_M_6). There will be some left over parts after you assembled the unit.

Change RM126 to 2k and RM127 to 1k, they are in the kit as well.

First Step is to place all Resistors and Diodes. Check before Soldering if your Diode-Placement is right. Check for right Diode orientatation before soldering! After Placing and Soldering all Resistors, we solder the next bigger parts like IC-Sockets and small capacitors, like Yellow 100nF and capacitors next to IC Sockets. On the LED Meter Board we also add the electrolytics and Wima Capacitors and Board connections, and cut leads after soldering as short as possible. We will do this process later with Potentiometers also, since we need to make sure that this Preamp doesn't touch any neighbour modules of any kind.

DISCLAIMER: Proceed at your own risk. I am not liable for any damage, harm or loss of any kind resulting from the assembly and/or use of this PCB set. Safety provisions should always be exercised whenever working with any electronics. The following instructions are guidelines only. I can make no guarantee of the accuracy of contents contained within this document.

Potentiometers and Switches

We add the three Potentiometers to their described positions. Check the pictures if you are not sure which Pots goes on which position. It is important to press them in place during Soldering, we need them to sit flush and straight because of the mechanical assembly later. Put all pots on the PCB and solder just one pin. After Soldering one Pin make sure the alignment of the pot is straight. You can check that with the printed silkscreen on the PCB. We don't solder the other Pins at this point to make a final alignment later on.
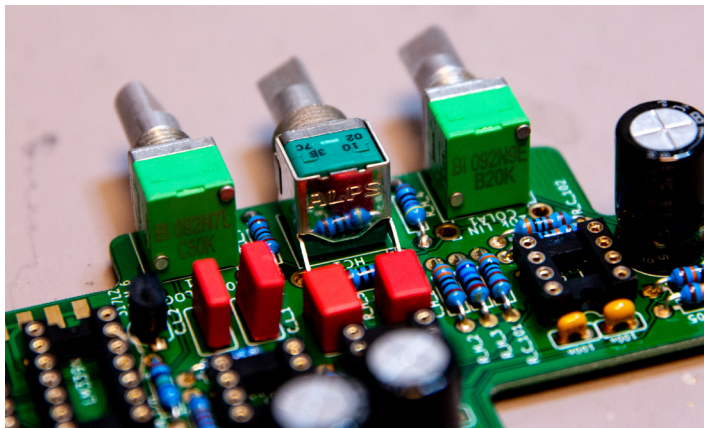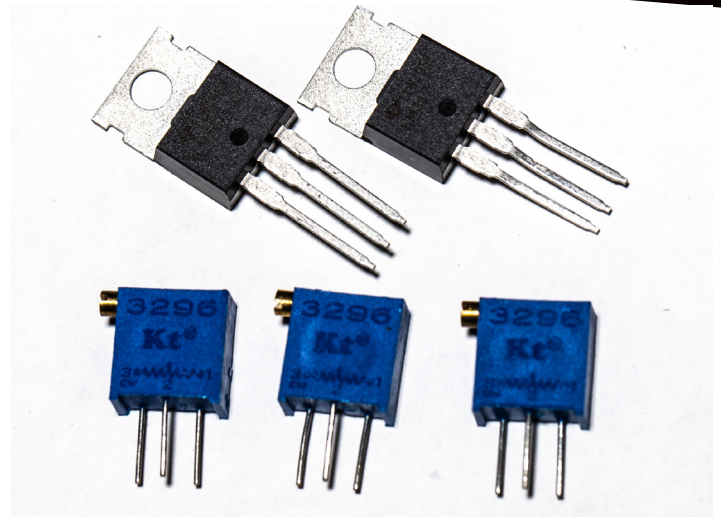
If not already done before we cut all leads on the upper subboard as short as possible.
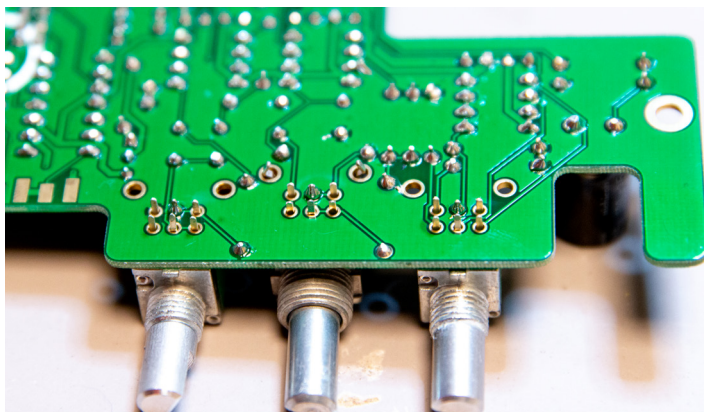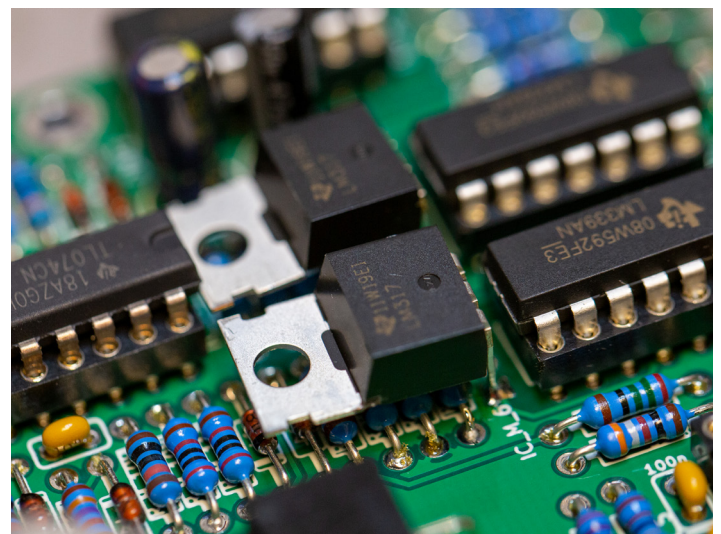
The next step is to add the new parts provided with the PCB. Bend the LM317 and place them like in the pictures.
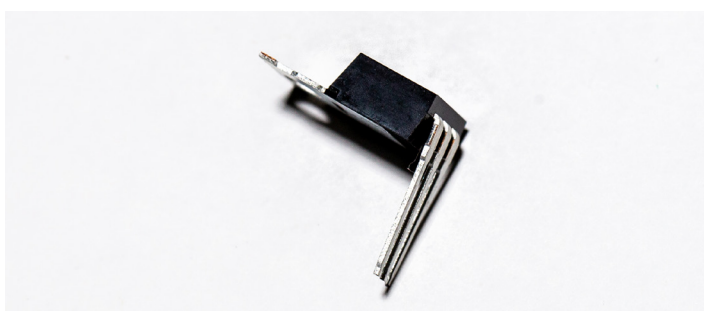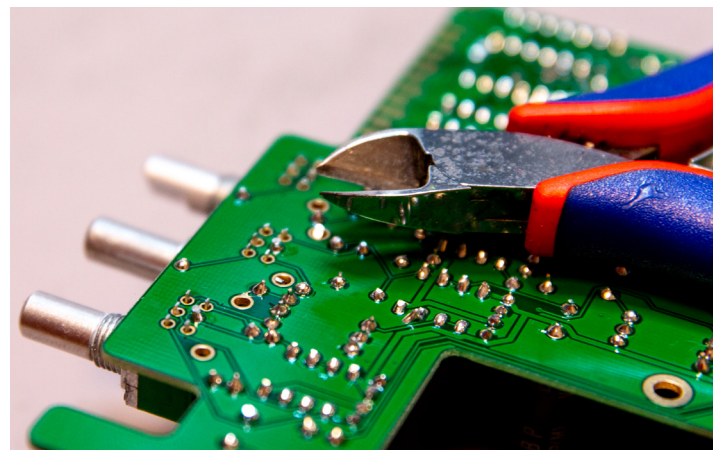
Final Assembly

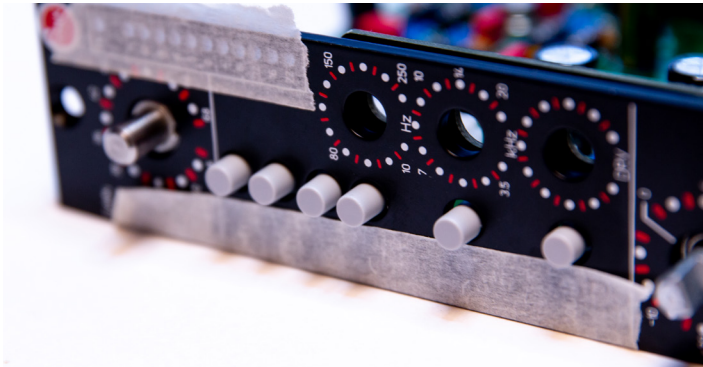Now it's time to use the Frontpanel to get the LEDs in place. Use the spacers and bring the Frontpanel in place with just the Mainboard. You should use the nuts to screw them together. For the next Step we will use some paper masking tape to perfectly place all the LEDs. Place the tape just where the LEDs will be installed.

Now we will cut the LEDs legs. Make sure you have the right leg for + and - (Long leg is + and short leg is -). I usually don't cut them straigt and keep two different size legs, so you still know which leg is + and which is -.

For the LED Meter we need LEDs with long leg measured cut to 12-14mm (8/16 to 9/16)
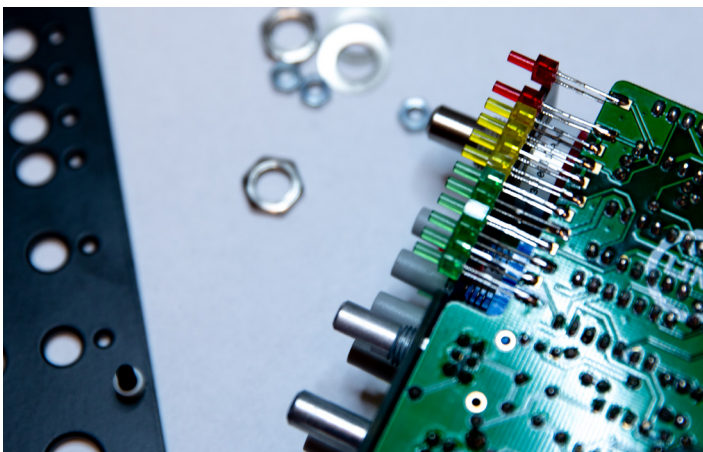
For LED-Meter we need:
2x RED
6x GREEN
4x YELLOW

Make sure the LED is sitting flush with the frontpanel in one level. First solder one leg to make sure the LED is in place, then solder the other leg(s).

After that we will install all of the Meter LEDs. The Meter-LEDs Solder Points have short and long dashes. A long dash is + and is meant for the long leg of the LED. Short dash means - and the short leg of the LED. Add all LEDs step by step and solder them all just from the top. After installing all LEDs remove the Frontpanel again and Solder all points from the backside of the LED-Meter Board.

Now we have soldered all parts and want to check without IC and Opamps installed if the Voltages are on the right. For that we don't use the Frontpanel or the bracket. We use the ribbon cables to connect the boards. Use an adapter for your lunchbox/or power it up on another way to measure all Voltages near the ICs. The Voltage Meter should show something like +/-15,3V, because of the drop of the diodes at the power input. Check if the LEDs are working and the relais are switching. Without LM339 inserted all Meter-LEDs should light up. If everything seems good install the ICs. IMPORTANT: Check the Orientation of each IC before installing. Check also which Opamp goes where. There aredifferent Opamps used in the whole unit. Complete the unit like described in main manual. After that we will calibrate the unit in this Guide.

Calibration

Calibration of this unit is no Rocket Science and it's quite easy. You need to playback different Sinus and Noise signals in different levels and frequencies. Make sure you have enough headroom that you don't get clipping when capturing the response of the Preamp. I try to have at least 10dB headroom before my interface clips. That Calibration works with every DAW but the easiest way to calibrate this EQ is using the freeware sofware REW(Room EQ Wizard).

First of all we need a constant reference level, I use the Software REW. I calibrated my Output Measure signal to +6dBU as my maximum output and Input, you should read on your multimeter 1,545Volts. My reference Sine signal for the pramp is set at -40dBU. The Voltage equilvalent on your multimeter should be 0,007Volts. I switch in REW for a better Overview to dBFS scaling.

To calibrate your Measuring System and learning about levels I highly recommend. The Setup of REW by DIYRE (3 parts on Youtube):

https://www.youtube.com/watch?v=OwwKV-4QTfwU

To calculate levels i use the Calculator of Sengpiel:

http://www.sengpielaudio.com/Rechner-db-volt.htm

Testing the Unit

- All Switches Off
- Gain at lowest setting
- Output Fader at 0
- Send a constant White Noise signal through the unit at -40dBu,
- Set the gain to good starting level that you can check if all functions work,
- check Low Cut and High Cut
- Check PAD and POL functions
- Check 48V only with phantom power device connected (microphones/ active di boxes)
- You can check that with a scope, in REW or by hearing on a control system if the unit changes the sound
- If all of the above mentioned conditions are set we can calibrate the unit

Output Fader Calibration
- All Switches Off
- Gain at lowest setting
- Output Fader at 0
- Set the Oscillator frequency to 1kHz (-40dBU)
- Adjust Gain of the preamp and Output level of your reference signal until you read with your Multimeter 0,775Volts between TP2(PREAMP_OUT) and TP1(GND)
- Set the **0dB_TRIM** that you read 0,775Volts between TP3(OUTPUT FADER) and TP1(GND)

LED Meter Calibration
- All Switches Off
- Gain at lowest setting
- Output Fader at 0
- Set the Oscillator frequency to 1kHz (-40dBU)
- Adjust Gain of the preamp and Output level of your reference signal until you read with your Multimeter 0,775Volts between TP2 and TP1
- Set the **R_meter1** that all green LEDs of the LED Meter light up.

Low Cut Calibration
- All Switches Off
- Gain at lowest setting
- Output Fader at 0
- Set the Oscillator frequency to 1kHz (-40dBU)
- Adjust Gain of the preamp and Output level of your reference signal until you read with your Multimeter 0,775Volts between TP2 and TP1
- Switch Low Cut on
- Set the **R_LC_TRIM** that you read also 0,775Volts between TP3 and TP1
- Or you read Input of your measuring system, the input level should stay the same

High Cut Calibration
- All Switches Off
- Gain at lowest setting
- Output Fader at 0
- Set the Oscillator frequency to 1kHz (-40dBU)
- Adjust Gain of the preamp and Output level of your reference signal until you read with your Multimeter 0,775Volts between TP2 and TP1
- Switch High Cut on
- Set the **R_HC_TRIM** that you read also 0,775Volts between TP3 and TP1
- Or you read Input of your measuring system, the input level should stay the same

PCB layout for reference

Bill of Materials (BOM)

ID	PART ON PCB	TYPE	COUNT	VALUE
1	R_H_7,R_L_9,R_C_105	RESISTOR	3	10R
2	R_H_5,R_H_4	RESISTOR	2	470R
3	R_M_119	RESISTOR	1	715R
4	R_M_120	RESISTOR	1	634R
5	R_C_102,R_C_101	RESISTOR	2	3k
6	R_M_110,R_M_102	RESISTOR	2	13k7
7	R_M_107,R_M_103,R_M_109,R_M_101,R_M_113	RESISTOR	5	10k
8	R_M_123	RESISTOR	1	160R
9	R_M_118	RESISTOR	1	1k
10	R_M_128	RESISTOR	1	2k2
11	R_M_108,R_M_105,R_M_111,R_M_104	RESISTOR	4	20k
12	R_C_103,R_H_6,R_L_8,R_C_104	RESISTOR	4	100k
13	R_M_115	RESISTOR	1	1k78
14	R_M_126 (change to 2k)	RESISTOR	1	2k (before 604R)
15	R_M_124,R_M_125	RESISTOR	2	137R
16	R_M_121	RESISTOR	1	392R
17	R_L_7,R_L_4	RESISTOR	2	1k8
18	R_L_6	RESISTOR	1	2k7
19	R_M_116	RESISTOR	1	2k
20	R_M_106,R_M_112	RESISTOR	2	360R
21	R_M_114	RESISTOR	1	5k1
22	R_M_117	RESISTOR	1	1k4
23	R_M_122	RESISTOR	1	255R
24	R_M_127(change to 1k)	RESISTOR	1	1k(before 330R)
25	R_L_5	RESISTOR	1	6k81
26	C_L_4,C_H_4,C_H_5,C_L_5,C_C_2,C_M_6,C_M_5,C_C_1	CERAMIC 2,5mm	8	100nF
27	C_H_1	WIMA 5mm	1	6n8
28	C_L_2	WIMA 5mm	1	330nF
29	C_L_1,C_M_2,C_M_1	WIMA 5mm	3	220nF
30	C_H_2	WIMA 5mm	1	3n3
31				
31	C_L_3,C_C_5,C_H_3	ELECTROLYT	3	100u 25V/35V BiPolar
32	C_M_3	ELECTROLYT	1	22u50V
33	C_M_4	ELECTROLYT	1	4.7u50V
34	Rmeter1,R_LC_TRIM1,R_HC_TRIM1	TRIMMER	3	10k TRIM

35	DM7,DM6,DM1,DM2,DM3,DM4,DM5,DM8	DIODE	8	1N4148
36	FLAT LED	GREEN LED	6	FLAT LED
37	FLAT LED	YELLOW LED	4	FLAT LED
38	FLAT LED	RED LED	2	FLAT LED
39	JSUB1	CONNECTOR	1	Conn_02x7_Odd_Even
40	IC_M_5,IC_M_6	RECTIFIER	2	LM317
41	HC1	POT	1	10K LIN
42	LC1	POT	1	50K NLOG
43	COLA1	POT	1	20k LIN
44	IC_L_1,IC_C_1,IC_H_1	OPAMP	3	NE5532N
45	IC_M_4,IC_M_2,IC_M_3	OPAMP	3	LM339N
46	IC_M_1	OPAMP	1	TL074P
47	B1	RECTIFIER	8	1N4148
48	SOCKET-08	SOCKET	3	GS 8P
49	SOCKET-14	SOCKET	4	GS 14P
50	Subboard1	LED BOARD	1	Subboard1