

## VOLUME AND TONE CONTROL - PREAMPLIFIER



# K8084

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When using one of our amplifiers (big or small), you always need a volume control and preferably also a tone control. This kit comes complete with all input / output connections and potentiometers. Furthermore it is possible to amplify or attenuate the input signal.

### **FEATURES:**

- stereo volume control
- stereo Baxandall bass and treble control
- bass and treble potentiometers with centre click
- customizable attenuation or amplification
- complete with knobs

### **SPECIFICATIONS:**

- supply voltage: 2 x 12VAC / 100mA
- frequency response: 3Hz - 500kHz (-3dB)
- standard amplification: x1
- signal to noise ratio: 98dB
- harmonic distortion: < 0.005% (@1KHz)
- maximum output: 5V RMS
- tone control:
  - + and -15dB @ 20Hz
  - + and -15dB @ 15kHz
- Input impedance: 50k ohms
- PCB dimensions: 105 x 70mm / 4,1 x 2,75"

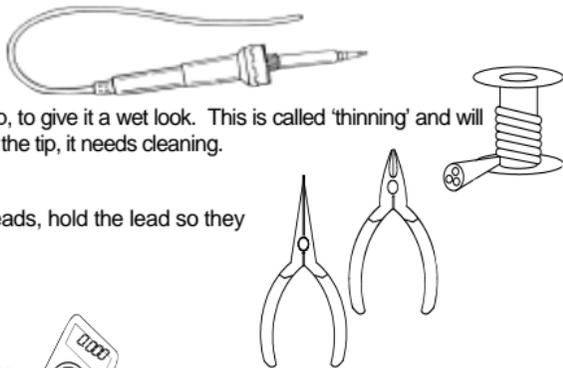
modifications reserved

## 1. Assembly (Skipping this can lead to troubles !)

Ok, so we have your attention. These hints will help you to make this project successful. Read them carefully.

### 1.1 Make sure you have the right tools:

- A good quality soldering iron (25-40W) with a small tip.
- Wipe it often on a wet sponge or cloth, to keep it clean; then apply solder to the tip, to give it a wet look. This is called 'thinning' and will protect the tip, and enables you to make good connections. When solder rolls off the tip, it needs cleaning.
- Thin raisin-core solder. Do not use any flux or grease.
- A diagonal cutter to trim excess wires. To avoid injury when cutting excess leads, hold the lead so they cannot fly towards the eyes.
- Needle nose pliers, for bending leads, or to hold components in place.
- Small blade and Phillips screwdrivers. A basic range is fine.



**For some projects, a basic multi-meter is required, or might be handy**



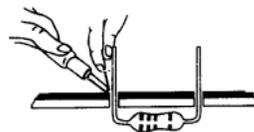
### 1.2 Assembly Hints :

- ⇒ Make sure the skill level matches your experience, to avoid disappointments.
- ⇒ Follow the instructions carefully. Read and understand the entire step before you perform each operation.
- ⇒ Perform the assembly in the correct order as stated in this manual
- ⇒ Position all parts on the PCB (Printed Circuit Board) as shown on the drawings.
- ⇒ Values on the circuit diagram are subject to changes.
- ⇒ Values in this assembly guide are correct\*
- ⇒ Use the check-boxes to mark your progress.
- ⇒ Please read the included information on safety and customer service

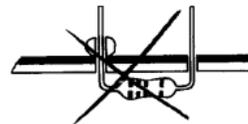
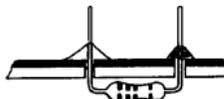
\* Typographical inaccuracies excluded. Always look for possible last minute manual updates, indicated as 'NOTE' on a separate leaflet.

### 1.3 Soldering Hints :

1- Mount the component against the PCB surface and carefully solder the leads



2- Make sure the solder joints are cone-shaped and shiny

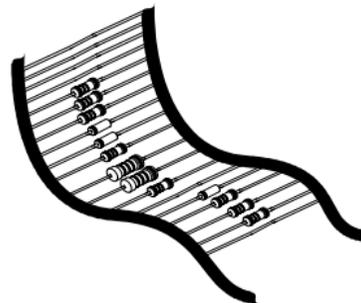


3- Trim excess leads as close as possible to the solder joint



**REMOVE THEM FROM THE TAPE ONE AT A TIME !**

**DO NOT BLINDLY FOLLOW THE ORDER OF THE COMPONENTS ONTO THE TAPE. ALWAYS CHECK THEIR VALUE ON THE PARTS LIST!**

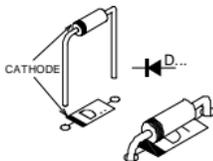


### 1. Zenerdiodes. Watch the polarity !

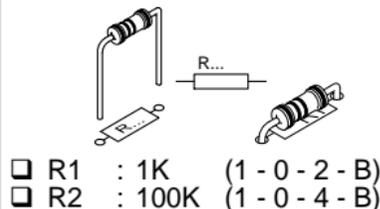


### 2. Diodes. Watch the polarity !

- D1 : 1N4007
- D2 : 1N4007
- D3 : 1N4007
- D4 : 1N4007



### 3. Resistors



### Hint for R2 and R4:

To weaken the input (divide)

*E.g. to connect the input with an amplifier output.*

Choose an inferior value for R2 and R4.

The dividing factor =  $(R1/R2) + 1$

*E.g. a value of 100Ω for RD (R2 and R4) will divide the input by 11.*

- R3 : 1K (1-0-2-B)
- R4 : 100K (1-0-4-B)
- R5 : 10 (1-0-0-B)
- R6 : 10 (1-0-0-B)
- R7 : 1K (1-0-2-B)
- R8 : 1K (1-0-2-B)
- R9 : 3K3 (3-3-2-B)
- R10 : 1K (1-0-2-B)
- R11 : 1K (1-0-2-B)
- R12 : 10 (1-0-0-B)
- R13 : 3K3 (3-3-2-B)
- R14 : 3K3 (3-3-2-B)
- R15 : 10K (1-0-3-B)

- R16 : 10K (1-0-3-B)
- R17 : 10K (1-0-3-B)
- R18 : 10K (1-0-3-B)
- R19 : 10K (1-0-3-B)
- R20 : 10K (1-0-3-B)

### Hint for R21 to R24

Modify the resistances marked RF and RA to increase the input sensitivity (more amplification).

The formula is:

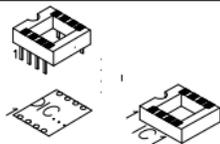
amplification =  $(RF/RA) + 1$

*E.g. to double the amplification because the input of the connecting device is too weak, mount 100K for RF (R22 and R23).*

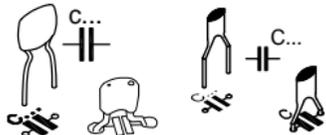
- R21 : 100K (1-0-4-B)
- R22 : 1K (1-0-2-B)
- R23 : 1K (1-0-2-B)
- R24 : 100K (1-0-4-B)

#### 4. IC sockets, Watch the position of the notch!

- IC1 : 8p
- IC2 : 8p

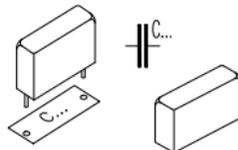


#### 5. Capacitors.



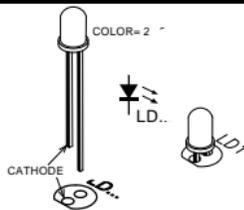
- C1 : 15pF (15)
- C2 : 15pF (15)
- C3 : 100pF (101)
- C4 : 100pF (101)
- C5 : 4,7nF (472)
- C6 : 4,7nF (472)
- C7 : 4,7nF (472)
- C8 : 4,7nF (472)
- C9 : 47nF (473)
- C10 : 47nF (473)

- C11 : 47nF (473)
- C12 : 47nF (473)
- C13 : 47nF (473)
- C14 : 47nF (473)
- C15 : 47nF (473)
- C16 : 47nF (473)



- C17 : 1µF / 63V
- C18 : 1µF / 63V

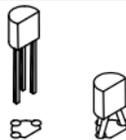
#### 6. LED. Watch the polarity !



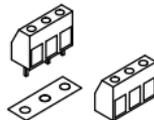
- LD1 : 5mm Red "Power"

#### 7. Transistors

- T1 : BC547
- T2 : BC557



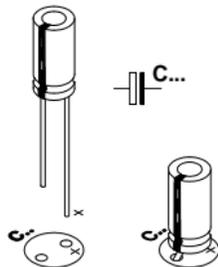
#### 8. Terminal block



- SK1 : 3p AC input

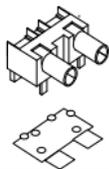
#### 9. Electrolytic capacitors

- C19 : 47µF
- C20 : 47µF
- C21 : 220µF
- C22 : 220µF

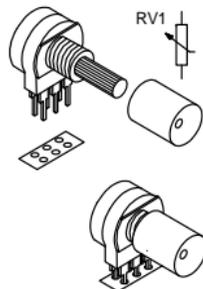


## 10. Dual RCA Jacks

- SK2 : input
- SK3 : output



## 11. Potentiometers

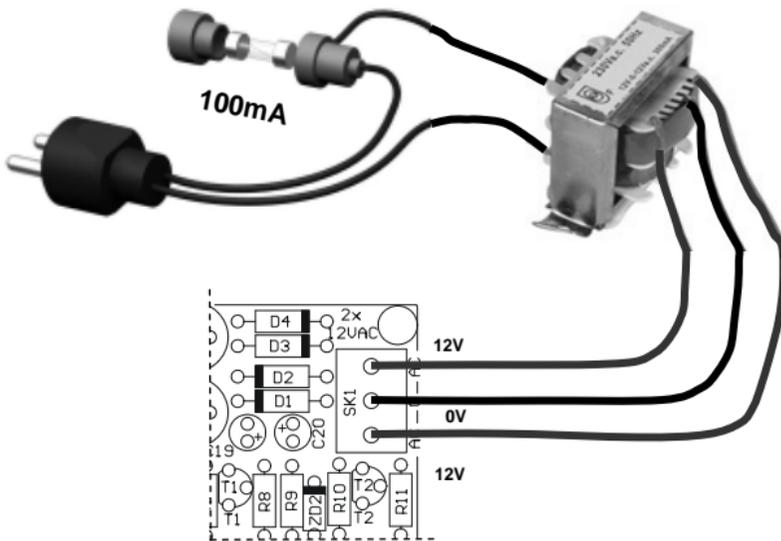


- RV1: **A** 50K (Volume)
- RV2: **B** 50K (Bass)
- RV3: **B** 50K (Treble)

## 12. Test

Connect a 2 x 12V / min. 100mA transformer with power connector SK1 (e.g. our 212007C). This is a 2 x 12V 3-wire transformer, 1 wire is the common 0 and generally of another colour.

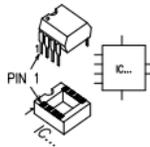
A transformer without connecting wires will be marked 12 – 0 – 12.



Connect the mains voltage to the transformer; mount a 100mA security fuse in series with the transformer. Use a high-quality power cord and plug for the connection to the mains.

When the transformer is live, the LED will light.

- Disconnect from mains.
- Mount the ICs into the socket (mind the position of the notch)
- Reconnect the mains.
- Check if the LED lights.
- Connect a device with the input e.g. MP3 player, CD player.
- Connect the output with a power amplifier.
- Turn down the volume to its minimum.
- Switch on the power amplifier.



**Hint:** you can also connect headphones instead of a power amplifier. You can use connections GND-TPR-TPL; GND is the ground.

### 13. Building into a enclosure

To avoid hum, it is recommended to mount the K8084 and the transformer into a Metal housing.

Drill the holes for the connections and the potentiometers.

👉 **Hint:** You can drill the holes for the knobs or the potentiometers and mount the knob afterwards.

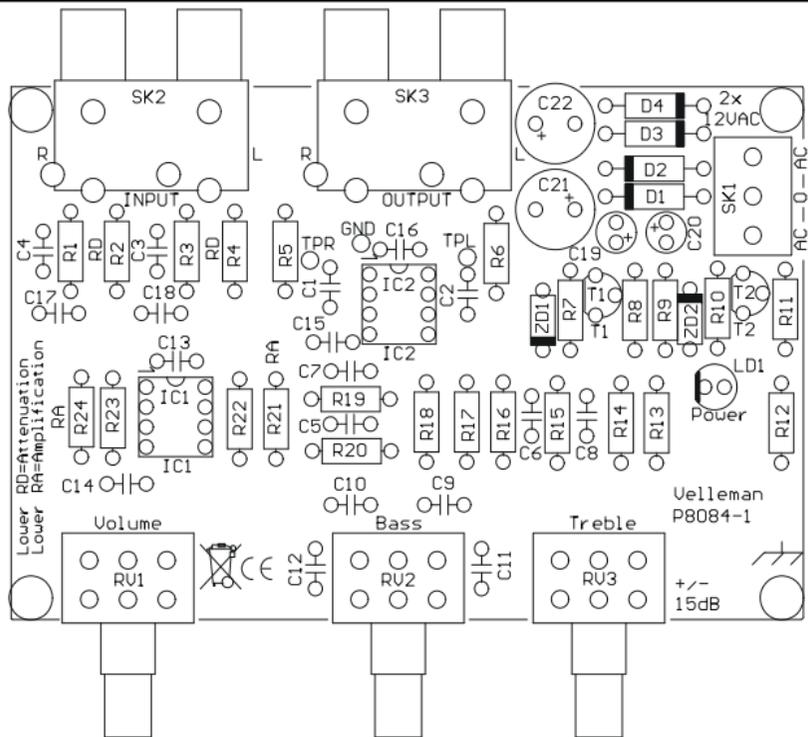
1 hole in the print (next to RV3) is provided to connect the earthing to the housing through the metal spacers or bolts.

**Hint:**

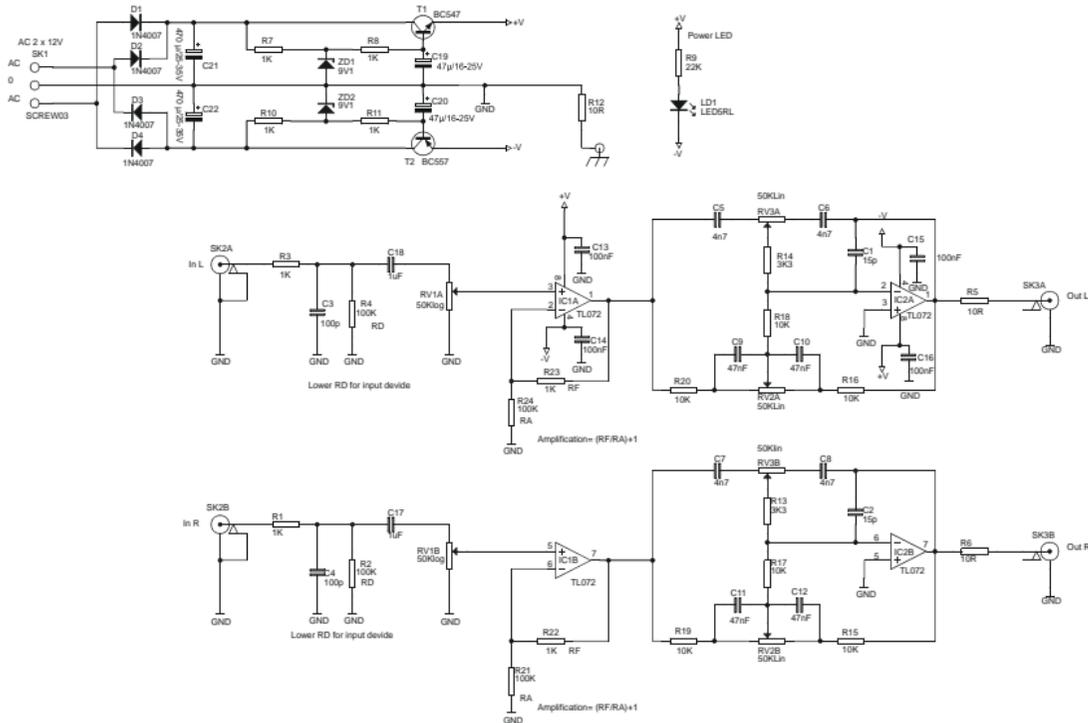
👉 Mount the transformer as far away as possible from the circuit to avoid humming.

👉 It is recommended to leave this circuit under voltage; disconnect the voltage only when not in use for a long time. Always switch off the power amplifier first before switching off the preamplifier.

## 14. PCB



## 15. Schematic diagram





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