Contents

AF LEVEL MATCHING

The matching circuit consists of a variable passive attenuator and an amplifier with variable gain: 0–20 dB. The attenuator reduces the signal by 0, $^1/_4$, $^1/_2$ or $^3/_4$. If required, the circuit may be adapted for other reduction factors.

When the upper section of DIP switches S_1 and S_2 is closed, the attenuation is 0 dB. The input impedance of the circuit, 40 kΩ, can then be changed to 30 kΩ, 20 kΩ or 10 kΩ by closing one of the other switches.

The buffer/amplifier is formed by IC_1. Potentiometers P_1 and P_2 serve to set the amplification factor. Make sure that they are both set to exactly the same value since presets have a tolerance of 20%; if they are not, the amplification in the left-hand and right-hand channels is not the same. If the circuit is used primarily as an attenuator, set both presets to their minimum value; the op amp then functions as a voltage follower.

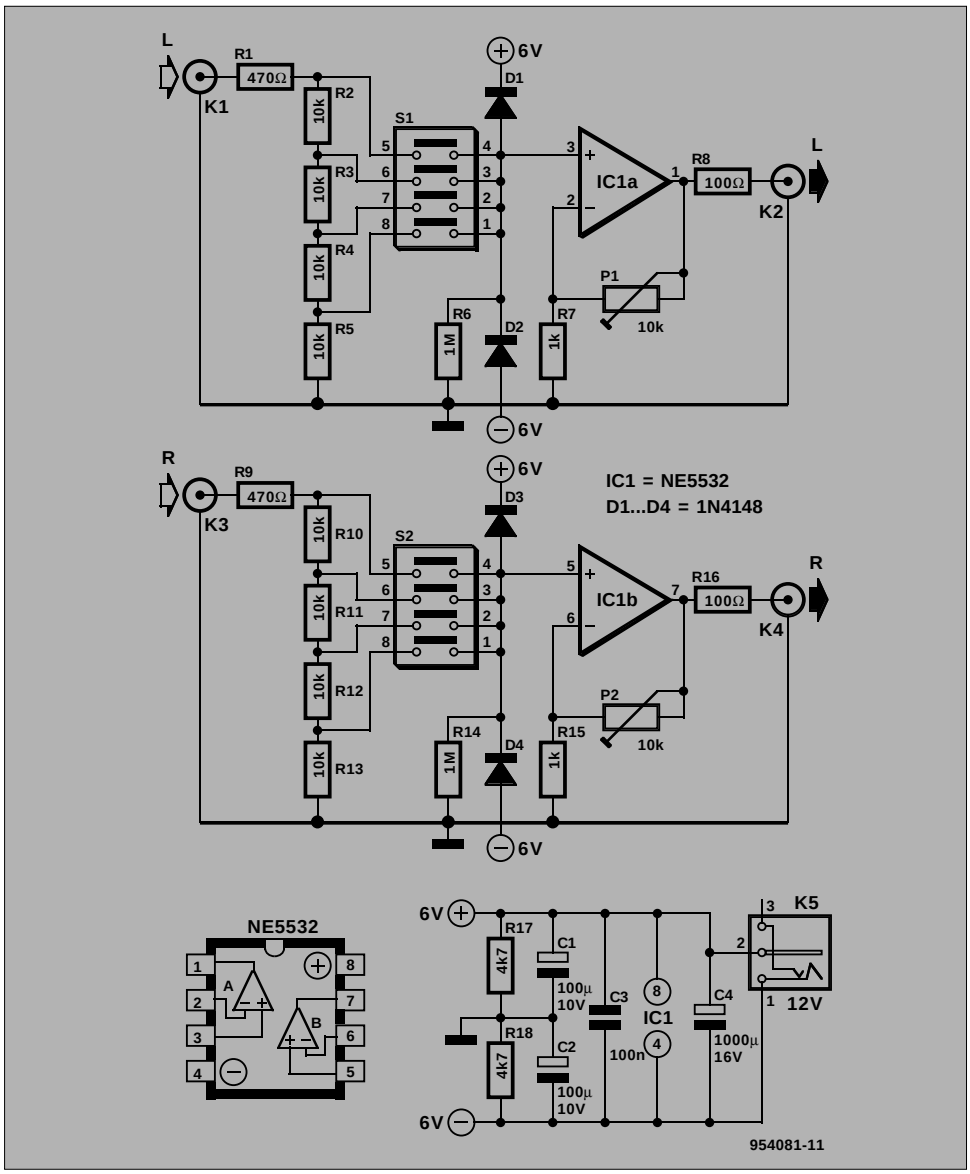
Power may be derived from a mains adaptor. Since the matching circuit should work with a symmetrical supply (when coupling capacitors may be omitted), a virtual earth is provided with the aid of R_{17}, R_{18}, C_1 and C_2. The specified values of these components apply to a load impedance of 50 kΩ. For lower load impedances, the values of the resistors must be reduced and that of the capacitors increased accordingly. The mains adaptor is decoupled by C_4.

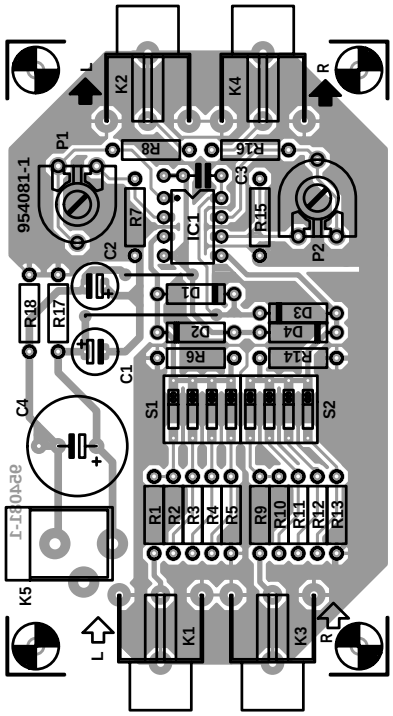
Diodes D_1–D_4 protect the inputs of IC_{1a} and IC_{1b} against too large input signals.

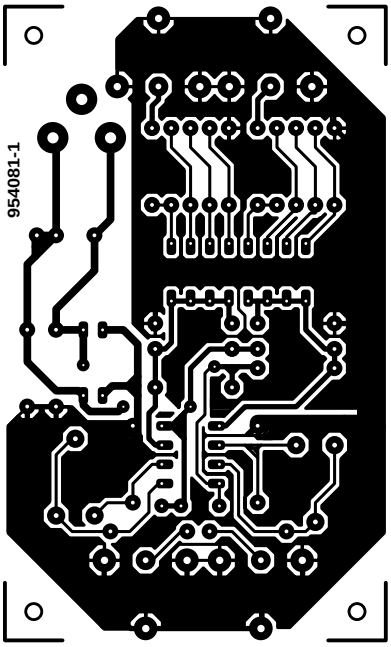
Resistors R_6 and R_{14} provide a bias current for the op amps when all switches are open.

The total harmonic distortion plus noise measured in the prototype working with a gain of 0 dB, a frequency of 1 kHz, an output voltage of 2 V, and a load of 50 kΩ was smaller than 0.0004% (at a bandwidth of 80 kHz). When the gain is raised to 20 dB and the input signal is 200 mV, the distortion rises to 0.0012%. Channel separation is >100 dB at 1 kHz and >80 dB at 20 kHz.

The circuit draws a current of not more than 10 mA.



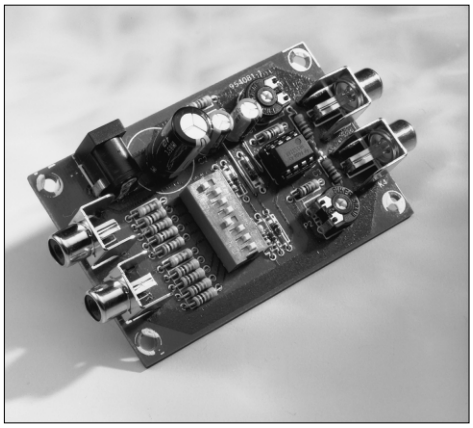




Parts list

Resistors:
R_1, R_9 = 470 Ω
R_2–R_5, R_{10}–R_{13} = 10 kΩ
R_6, R_{14} = 1 MΩ
R_7, R_{15} = 1 kΩ
R_8, R_{16} = 100 Ω
R_{17}, R_{18} = 4.7 kΩ
P_1, P_2 = 10 kΩ preset

Capacitors:
C_1, C_2 = 100 µF, 10 V, radial
C_3 = 100 nF
C_4 = 1000 µF, 16 V, radial



Semiconductors:
D_1–D_4 = 1N4148

Integrated circuits:
IC_1 = NE5532A

Miscellaneous:
K_1–K_4 = Audio socket for board mounting
K_5 = Plug for accepting mains adaptor socket
S_1, S_2 = 8-position DIP switch
PCB not available ready made

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[954081]