

# 027

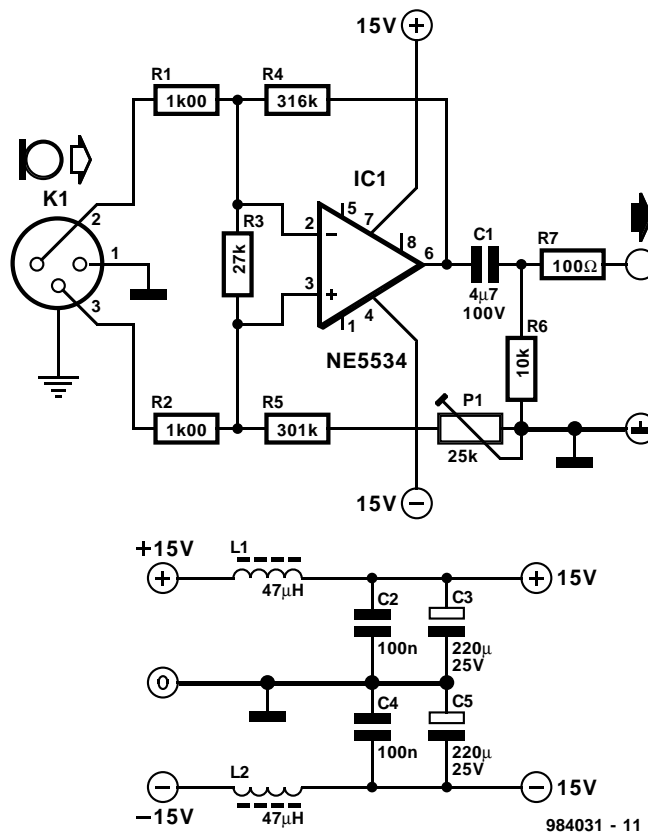
# balanced microphone preamplifier

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The preamplifier is intended for use with dynamic (moving coil – MC) microphones with an impedance up to 200 Ω and balanced terminals. It is a fairly simple design, which may also be considered as a single stage instrument amplifier based on a Type NE5534 op amp.

To achieve maximum common-mode rejection (CMR) with a balanced signal, the division ratios of the dividers ( $R_1$ – $R_4$  and  $R_2$ – $R_5$  respectively) at the inputs of the op amp must be identical. Since this may be difficult to achieve in practice, a preset potentiometer,  $P_1$ , is connected in series with  $R_5$ . The preset enables the common-mode rejection to be set optimally.

Capacitor  $C_1$  prevents any direct voltage at the input, while resistor  $R_7$  ensures stability of the amplifier with capacitive loads. Resistor  $R_3$  prevents the amplifier going into oscillation when the input is open circuit. If the microphone cable is of



reasonable length,  $R_3$  is not necessary, since the parasitic capacitance of the cable ensures stability of the amplifier. It should be noted, however, that  $R_3$  improves the CMR from > 70 dB to > 80 dB.

Performance of the preamplifier is very good. The THD+N (total harmonic distortion plus noise) is smaller than 0.1% with an input signal of 1 mV and a source impedance of 50 Ω.

Under the same conditions, the signal-to-noise ratio is –62.5 dBA.

With component values as specified, the gain of the amplifier is 50 dB ( $\times 316$ ).

After careful adjustment of  $P_1$  at 1 kHz, the CMR, without  $R_3$ , is 120 dB.

The supply voltage is  $\pm 15$  V. The amplifier draws a current at that voltage of about 5.5 mA. Note the decoupling of the supply lines with  $L_1$ ,  $L_2$ ,  $C_2$ – $C_5$ .

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