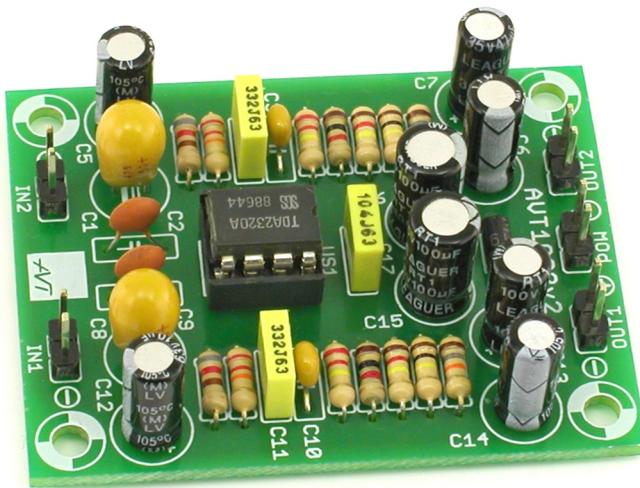


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ASSEMBLY DIFFICULTY



Despite the explosive growth of digital audio technology, "black" vinyl records remain an enduring favorite among fans. To listen to them, you need a turntable with an MM cartridge (with a moving magnet) equipped with an amplifier with RIAA characteristics.

Recommendations: kit recommended for all music fans using an analog turntable as a signal source.

Characteristics

- two-channel stereo system
- gain: $k = 38 \text{ dB}$ ($f = 1 \text{ kHz}$)
- input voltage: (maximum) 55 mV
- signal-to-noise ratio: $> 78 \text{ dB}$
- non-linear distortion: $< 0,08\%$ (across the band)
- power supply: 12 V DC
- board dimensions: $41 \times 53 \text{ mm}$

Circuit description

The kit uses a good-quality dual operational amplifier of the TDA2320A type. The features of this circuit include a low-noise input stage that introduces minimal linear and nonlinear distortion, full frequency compensation (optimized for audio applications), nearly 100 dB of channel separation, and high open-loop gain. Due to the relatively low value of the SR parameter (the rate of rise of the output voltage), the circuit is designed for operation with signals with small amplitudes. RC elements in the negative feedback loop (the same for both channels) cause the amplifier's frequency response to be established in accordance with the RIAA standard.

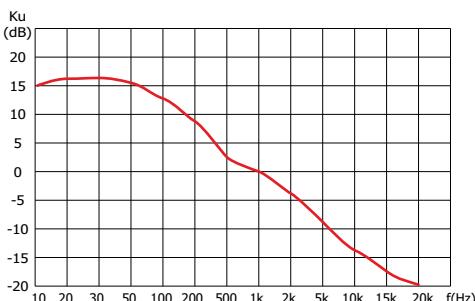


Figure 1. Characterization waveform $K_u = f(f)$.

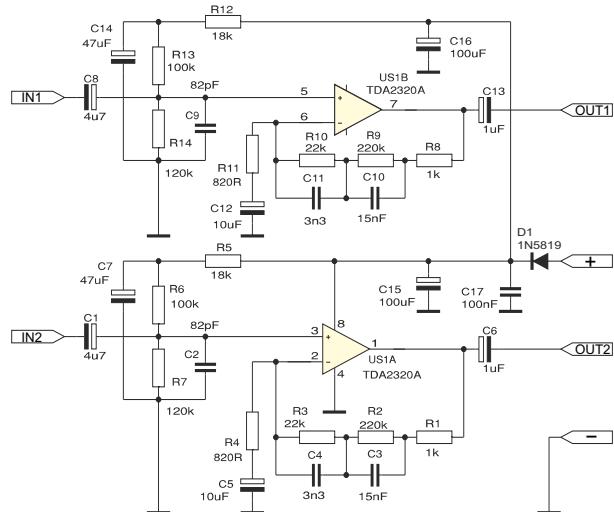


Fig. 1 Schematic diagram

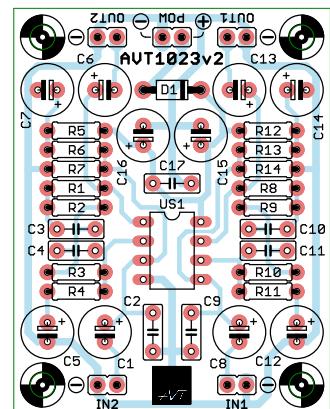


Fig. 2 Assembly diagram

Assembly and start-up

The assembly should be carried out in accordance with standard considerations. In case of problems with circuit excitation or "collecting" interference from the environment (e.g., mains hum), the device should be enclosed in a shielding box or the circuit board be encased with appropriately cut pieces of sheet metal.

The layout of the components is shown in Fig. 2. The supply voltage should be well filtered and stabilized. The input and output wires should be shielded, paying attention to the very accurate addition of the shield to the circuit ground.

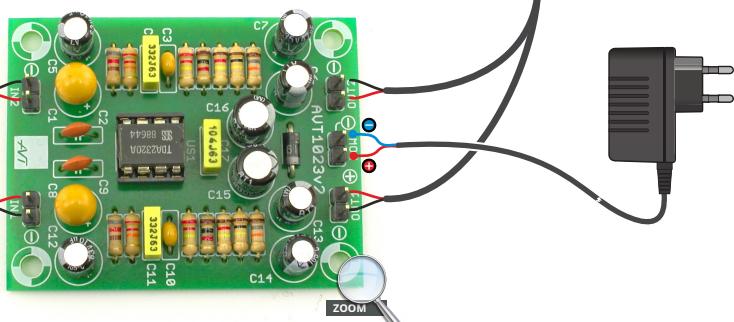


Fig. 3. Example of connection

List of elements

Resistors:

- R1, R8: 1 kΩ (brown-black-red-gold)
R2, R9: 220 kΩ (red-red-yellow-gold)
R3, R10: 22 kΩ (red-red-orange-gold)
R4, R11: 820 Ω (gray-red-brown-gold)
R5, R12: 18 kΩ (brown-gray-orange-gold)
R6, R13: 100 kΩ (brown-black-yellow-gold)
R7, R14: 120 kΩ (brown-red-yellow-gold)

Capacitors:

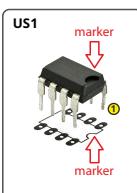
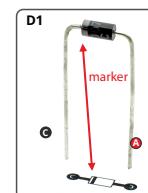
- C2, C9: 82 pF (may be labeled 82)
C3, C10: 15 nF (may be labeled 153)
C4, C11: 3,3 nF (may be labeled 332)
C17: 100 nF (may be labeled 104)
C1, C8: 4,7 μF ! (may be labeled 475)
C5, C12: 10 μF !
C6, C13: 1 μF !
C7, C14: 47 μF !
C15, C16: 100 μF !

Semiconductors:

- D1: 1N5819 or similar !
US1: TDA2320A !

Other:

- IN1, IN2: goldpin 1×2 pins
OUT1, OUT2: goldpin 1×2 pins
POW: goldpin 1×2 pins



The assembly should be started with soldering the components onto the board in order of size, from smallest to the largest. When installing components marked with an exclamation mark, pay attention to their polarity. You may find it helpful to have a wireframe with drawings of the leads and symbols of these components on the board printed and photographs of the assembled set.

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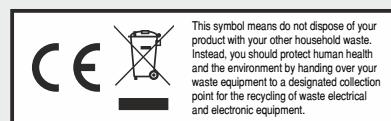


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Notes