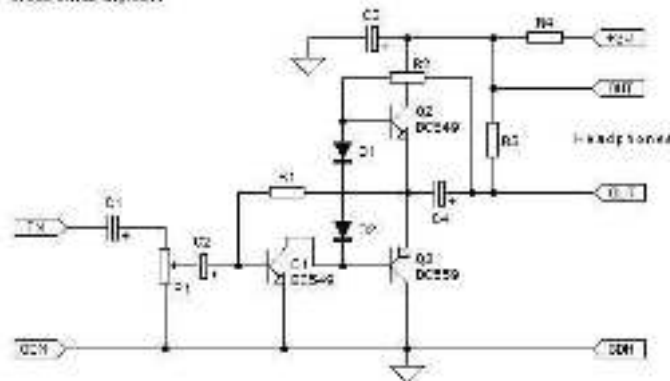




4x4 - Three Transistor Headphone Amplifier - Class AB

4x4 - High Quality Three Transistor Headphone Amplifier - Class AB
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Part's List:

R1 - 100K
R2 - 330
R3 - 100
R4 - 22 (2 - 4.5V)
R4 - 100 (5 - 12V)

C1 - 4.7uF
C2 - 4.7uF
C3 - 100 - 1000uF
C4 - 220uF

P1 - 100K
D1, D2 - 1N4148
Q1, Q2 - BC549
Q3 - BC559

Technical Specifications:

Supply Voltage: 2 - 12V
Energy Consumption: 10mA/3V - 30mA/12V
(measurements taken using a stereo version)
Output Power: 300mW



About this Circuit

This is an improved version of headphone amplifier I've built many years ago. I wanted so much to share it with you because this simple circuit has done a great service to me through all these years. It is very simple and reliable, hard to break, offers a lot of power, excellent sound quality, it is built with just a few simple parts and more importantly it has a very little power consumption. With just two AA batteries it can work for a very loong loooong time ;).

New Features

Since I built this amplifier a long time ago I decided to make an improved version now. The schematic has two protections added that aim at the similar purpose. First protection that consists of R4 and C3, simply reduces the noise while turning the amp ON and OFF. Instead of applying the full supply voltage to the amp, resistor R4 slowly charges the capacitor C3 and produces the soft turn ON and soft turn OFF effect. Second protection is resistor R3 and this one reduces the noise while connecting and disconnecting the headphones from the headphone jack. The resistor doesn't lower the volume of the amp but simply simulates the headphone resistance when headphones are not connected to the amp.

What's in the Name

When designing the PC Board for this circuit I overestimated the size of the board a little bit and the board was simply too large (4cm x 5cm). In result I decided to cut the unneeded board thus making the project smaller. After looking at it for a while and measuring the size again I thought about the familiar name. Since the size of the project is 4cm by 4cm it would be nice to give it a name 4x4 since the amp is pretty powerful as for its small size.

What can it be used for?

This handy amplifier can find endless uses around the house. For example it can be used as a general purpose stereo amplifier for devices like walkmans, radios, CD Players, computers, DVDs, VCRs, TVs, etc. Or in electronic field as a great audio amplifier for radios, microphones, or used as an audio tester.

As for myself I decided to build three stereo versions, one for my computer for my newly added front panel headphone jack, another one in an external enclosure for my TV/DVD/VCR that lets me watch the movies at night while not interrupting anybody in the house, and the last one I am using as an audio tester for my electronic projects.

