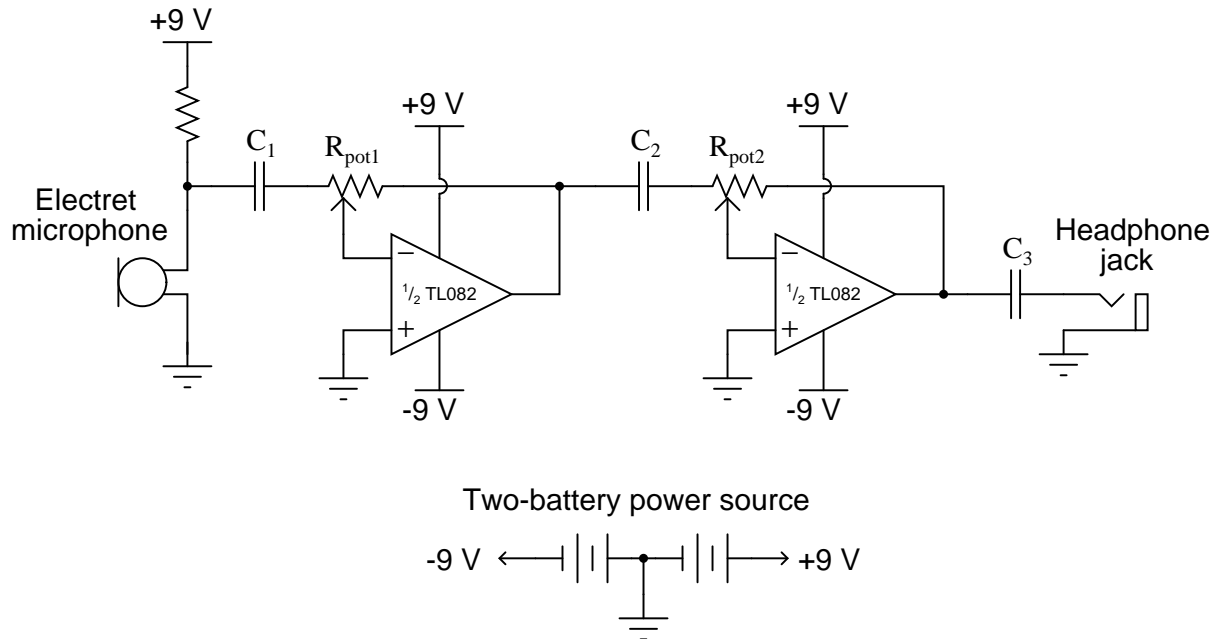


Design Project: Sensitive microphone amplifier

This worksheet and all related files are licensed under the Creative Commons Attribution License, version 1.0. To view a copy of this license, visit <http://creativecommons.org/licenses/by/1.0/>, or send a letter to Creative Commons, 559 Nathan Abbott Way, Stanford, California 94305, USA. The terms and conditions of this license allow for free copying, distribution, and/or modification of all licensed works by the general public.

Your project is to build and test a multi-stage amplifier circuit for an electret microphone:



Of course, you are not restricted to using this exact design.

Deadlines (set by instructor):

- Project design completed:
- Components purchased:
- Working prototype:
- Finished system (used to test at least two kinds of components):
- Full documentation:

Question 1

Identify which direction each potentiometer wiper must move in this circuit to provide more volume at the headphone.

file 03810

Answer 1

Moving each wiper to the *left* will increase volume.

Notes 1

This question simply asks students to interpret potentiometer action in the context of a negative-feedback opamp circuit. Many students seem to experience confusion on the subject of three-terminal potentiometer operation (when *not* used as a rheostat), so be sure to spend adequate time discussing this with them.

Question 2

What purpose(s) do the capacitors serve in this amplifier circuit? Could we remove one or more of them and still have a working circuit?

file 03811

Answer 2

The capacitors block DC from being amplified at any stage, which may cause the amplifier(s) to saturate. The last capacitor (C_3) prevents any possible DC from getting to the headphone.

Notes 2

The circuit design shown is a bit conservative. That is, it should work well without *all* the capacitors shown. However, experience has taught me a little over-building is good when it comes to increasing circuit reliability.