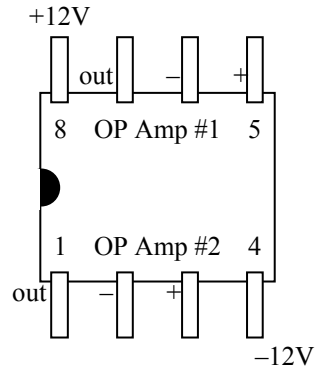


# EE411 Experiment #1. Op Amp Audio Pre-Amplifier

**Introduction:** This is an individual experiment. It is not required. Build and test it for extra credit.

The TA is Yakub Syed, [siyakub@mail.utexas.edu](mailto:siyakub@mail.utexas.edu), ENS324. Yakub's office hours are MWF 3-5. Find him in either ENS324, or in the Power Lab (ENS212). Check-in with Yakub. If you decided to proceed, he will have the parts and tools needed.

The op amp is a dual, Texas Instruments TLE2072CP (Newark #08F9176, or Mouser #595-TLE2072CP). The pin diagram is



**Objective:** To amplify the output of a button microphone, and perform some basic frequency compensation. To be awarded the extra credit, successfully test your circuit with Yakub no later than Friday, Oct. 8.

**Procedure:** Connect a voltage-follower to the output of a microphone (with frequency compensation network), and then amplify the voltage-follower output with an inverting amplifier that has a gain of approximately 1000. Then, perform the following steps:

1. Whistle test. Use an oscilloscope to view the unloaded  $V_{out}$  while whistling into or near the microphone. Whistle in the 500Hz to 2kHz range. If you whistle loudly enough, you will observe clipping in  $V_{out}$ .
2. Gong test. Repeat the whistle test, but use the gong as the audio source. Measure the frequency of the gong tone.
3. Gong test with loaded  $V_{out}$ . Repeat the gong test, using a  $1k\Omega$  load resistor. Then, repeat with  $500\Omega$ , and then again with  $100\Omega$ . Expect to see  $V_{out}$  reduce significantly and become distorted as the load resistance decreases. Can you estimate the Thevenin resistance of the circuit from these tests?

