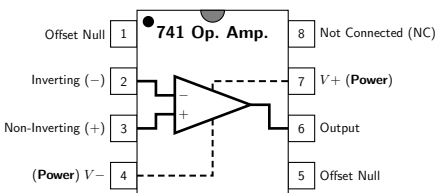


# Part Pinouts\*

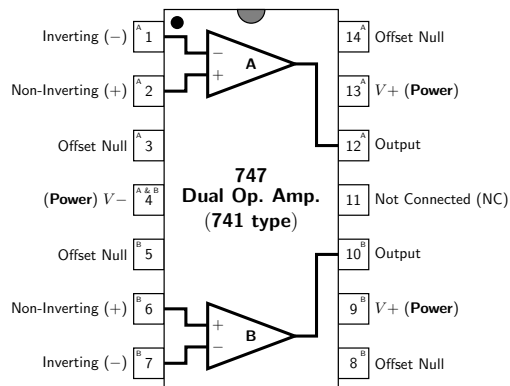
ECE 209: *Circuits and Electronics Laboratory*

“Think of an op-amp as fodder for feedback.” — Horowitz and Hill<sup>1</sup>



The devices within these two parts are **identical**. If one part is not available, then **use the other**.

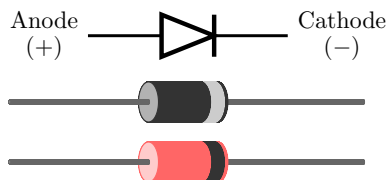
The Offset Null pins can usually be left **disconnected**.



741/747 general purpose operational amplifier

“ACE” — “Anode Current Enters”

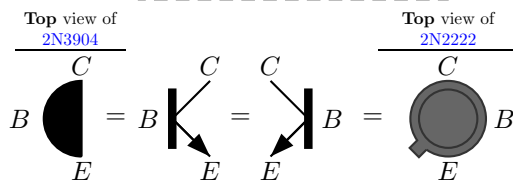
“CCD” — “Cathode Current Departs”



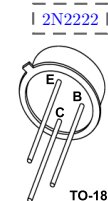
~0.6 V @ 1 mA  
~0.7 V @ 10 mA

1N914/1N4148 silicon general purpose small signal diode

$V_{EC,saturation} \approx 0.2-0.3 V$   
 $\beta \approx 100$

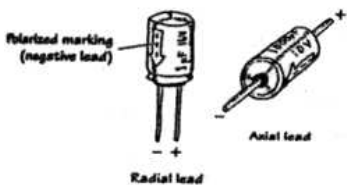


“Not Pointing iN”



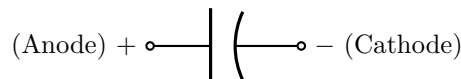
2N3904/2N2222 NPN BJT transistor<sup>2</sup>

**Electrolytic**



“ACE” — “Anode Current Enters”

“CCD” — “Cathode Current Departs”



Electrolytic capacitor<sup>3</sup>

\*Document from <http://www.tedpavlic.com/teaching/osu/ece209/>. Source code at <http://hg.tedpavlic.com/ece209/>.

<sup>1</sup> *The Art of Electronics* (2<sup>nd</sup> edition) by Paul Horowitz and Winfield Hill. Cambridge University Press, 1989. Page 176.

<sup>2</sup> 3D TO-92 and TO-18 images from Fairchild Semiconductor 2N3904 and Philips Semiconductors 2N2222 datasheets.

<sup>3</sup> 3D capacitor drawings modified from [http://www.geocities.com/dsaproject/electronics/data\\_book/capacitors.html](http://www.geocities.com/dsaproject/electronics/data_book/capacitors.html).