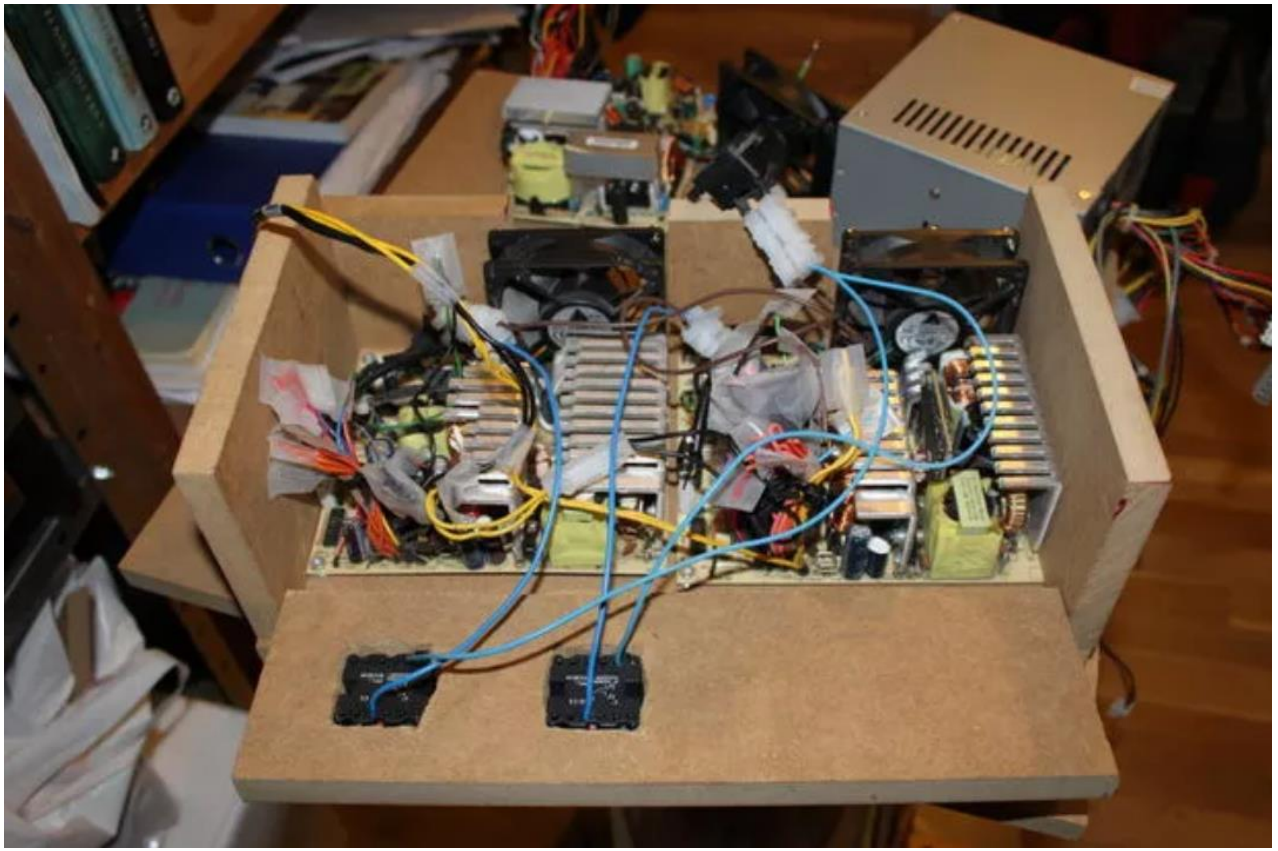
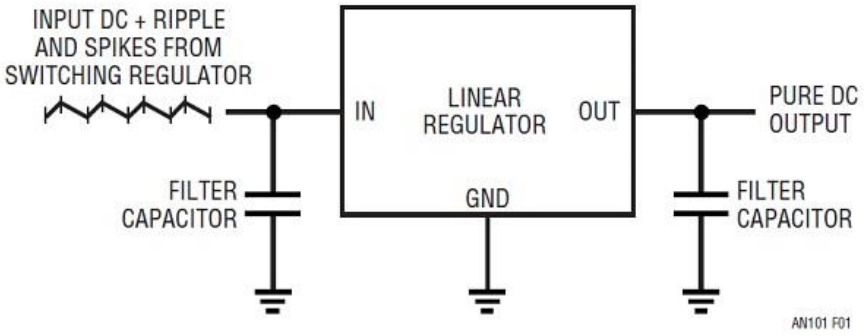
Power Supplies 101
DC-DC Converters

10-Feb-2018



Using Fixed Voltage Linear Regulators

V_{IN}

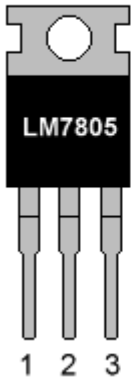


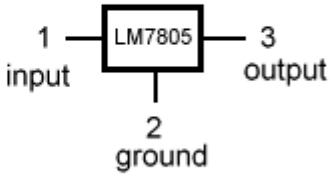
V_{OUT}

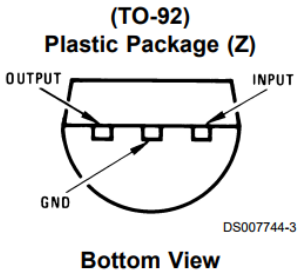
0.1uF ceramic caps are good, easy choices

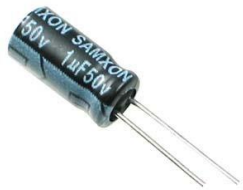
Try a 1uF electrolytic, too, watch polarity!

LM7805 PINOUT DIAGRAM

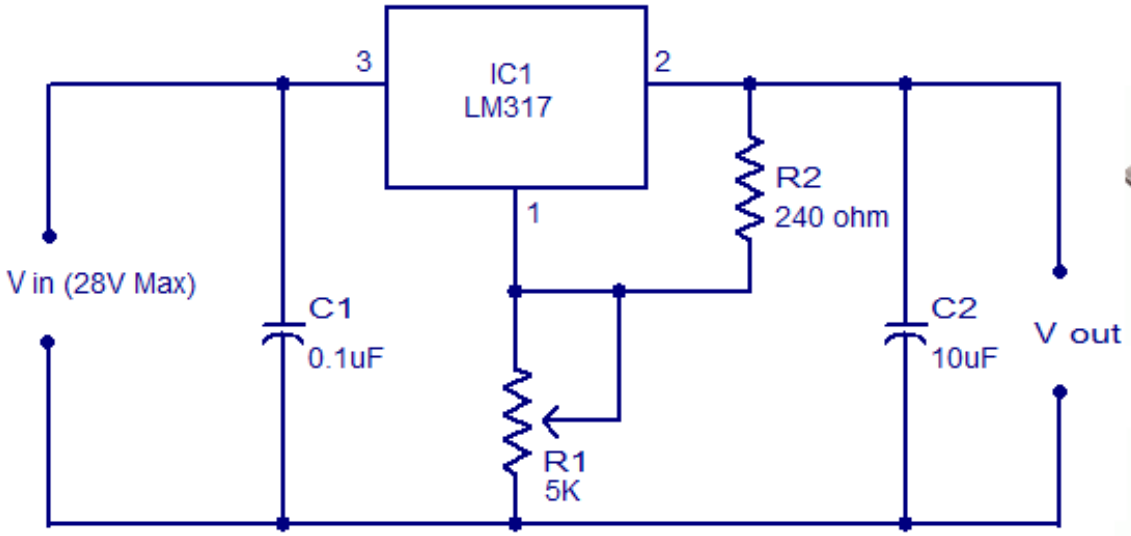




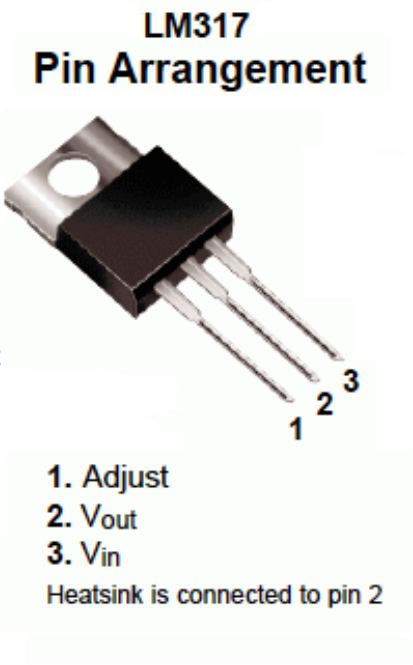




Using the LM317 Adjustable Regulator

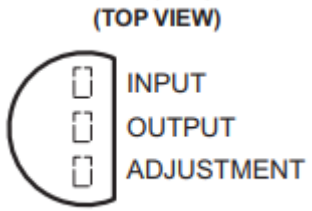


Typical adjustable regulator using LM317 www.circuitstoday.com



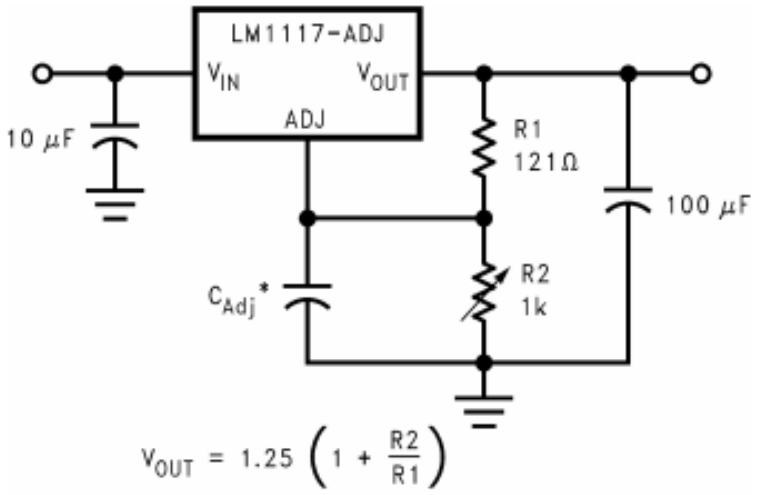
Vout = 1.25V (1+ (R2/R1)) + (I adj x R2)

Vout (Volt)	R2 (Ohm)	R1 (Ohm)
12.00	860	100
9.00	620	100
6.00	380	100
5.00	300	100
3.00	140	100
1.50	20	100



Using the LM1117 Adjustable Regulator

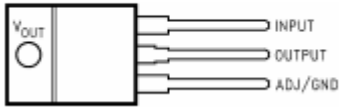
Adjustable Output Regulator



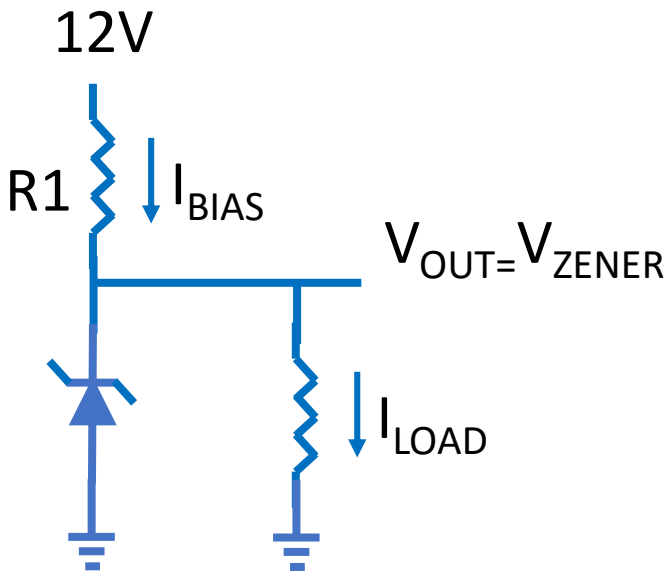
*C_{Adj} is optional, however it will improve ripple rejection.

Voltage	R1	R2	Error	Use
3.3V	1.2k	1.8k	3%	3.3V IC
5V	270	820	2%	5V IC
6V	180	680		Servos
9V	560	3.3k	2%	
12V	510	4.3k	1%	
15V	62	680	1%	
24V	560	10k	1%	

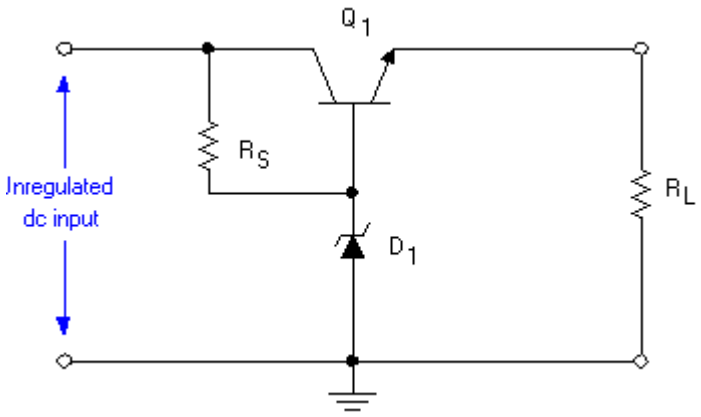
3-Pin TO-220
Top View

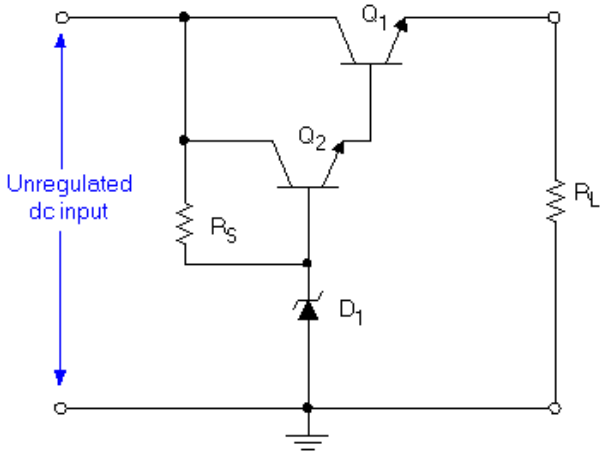


Zener Supply



Zener with Transistor Supplies





Discrete Linear Regulator