

Regulator for op amps practically powers itself

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Here's a rather novel way to build a dual-voltage regulator for powering operational amplifiers that offers good tracking, as well as low ripple. Tracking between the two output voltages is good because only one reference source is used for both the positive and negative sides of the regulator. Although the circuit employs two op amps itself, they are powered by their own outputs. Furthermore, the circuit's output-current capability is on the order of several amperes, and output ripple is held to less than 1 millivolt peak-to-peak.

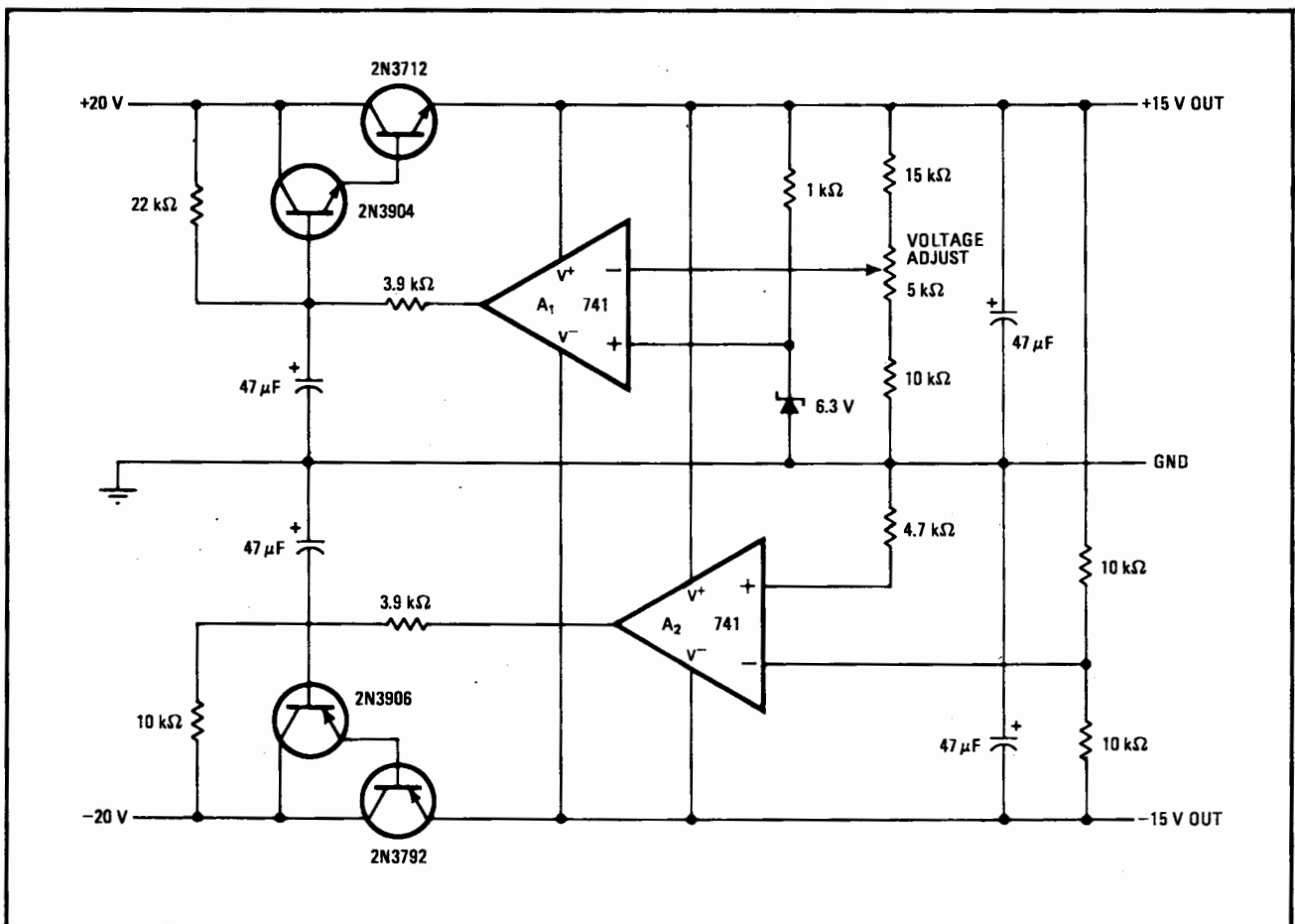
The circuit, shown in the figure, operates as a conventional series-pass regulator on its positive side to de-

velop its +15-volt output. Amplifier A_1 is used for error-detection. The pass transistor for the positive side is biased on from the unregulated +20-v input supply voltage. The output voltage from amplifier A_1 then adjusts this transistor's output.

On the negative side (-15-v output) of the regulator, amplifier A_2 operates as a unity-gain follower. The pass transistor on the negative side is biased in a manner similar to its positive counterpart. The value of the biasing resistor for the negative pass transistor is different from the value of the biasing resistor for the positive pass transistor in order to bring A_2 's output closer to the negative supply voltage.

Since amplifier A_2 is wired in a follower configuration, the reference voltage developed by the zener diode can be used for both the positive and negative sides of the regulator. The two output voltages, therefore, track each other within approximately 50 mV.

With suitable modification, the same circuit approach can be used to build a regulator for devices other than op amps that require a split supply. □



Split supply. Regulator circuit for op amps develops ± 15 -V outputs from a ± 20 -V unregulated source with less than 1 millivolt of ripple. Although the regulator uses op amps itself, they receive their power inputs from their own outputs. Amplifier A_1 acts as an error detector, while amplifier A_2 is a voltage follower. The single zener voltage reference means that tracking is good between the positive and negative sides.