# -tips

## Anti-surge Voltage Regulator

A. Wey

This high gain voltage regulator with only two transistors has characteristics superior to those of the commonly used compound emitter-follower type.

The circuit was used in a 30 watt stereo amplifier which not only required a well regulated supply. but also an output voltage that would rise slowly from zero volts when the system was first turned on. This slow application (about 2 seconds) to the power amplifiers allowed the 2000$\mu$F output capacitors to charge without causing excessive collector current in the output transistors.

Typical regulator output impedance is 0.1 ohm.

Output voltage is expressed by:

$$V_O = V_Z - V_{BE1}$$

Output voltage rise time is expressed by:

$$T = R_B C_1 \ln(1 - V_Z/V_I)$$

Some digital systems require a preset turn on sequence for their power supplies. By setting appropriate $R_B/C_1$ values, the circuit's output rise time can be set to provide this sequence or delay.