

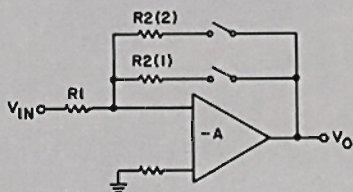
Modified feedback simplifies programmable voltage supply

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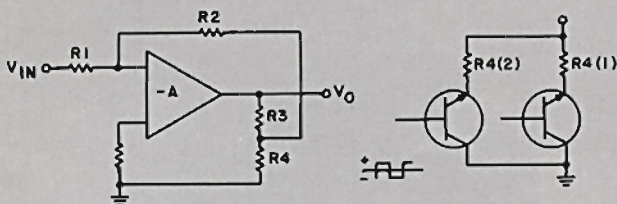
In a programmable voltage supply, using operational amplifiers, the output voltage is usually altered by varying R2 with series switches, generally relays (Figure a).

When transistors are used as switches, they require isolated transformer drive, adding to size and cost. To avoid this, the feedback network can be modified as shown in Figure b and output is varied by programming R4 only. The transfer function is given by:

$$V_o/V_{in} = (R2/R1) + (R3/R4) + (R2/R1)(R3/R4)$$
, assuming large input resistance and large open-loop gain. Proper values of R4 are switched in by using 2N2432 as switches, to give required output voltages.



a



b

Transistor switching to program a power supply which uses operational amplifiers is possible when a standard circuit (a) is modified as shown (b).