

Differential input and output with op-amps

This circuit uses three op-amps to provide an amplifier with differential output as well as differential input. It was designed to drive a meter with a signal of either polarity when a centre-tapped power supply was not available, but could have other uses.

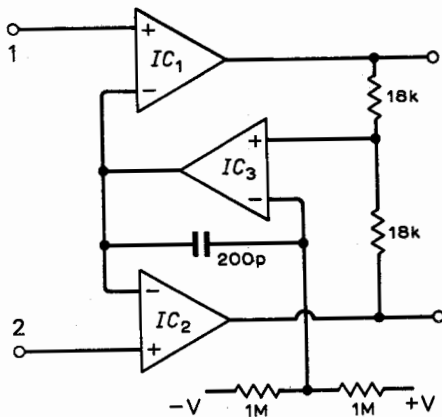
The 18-k Ω resistors form a potential divider across the outputs of the complete amplifier. The voltage at the non-inverting

input of IC_3 is therefore the average of the two output potentials. The divider consisting of the two 1-M Ω resistors maintains the inverting input of IC_3 at a fixed potential; IC_3 acts to keep its inputs nearly equal, as it forms part of a negative feedback loop, and therefore the average of the two output potentials, i.e. the common mode output, is determined by the resistor values.

To obtain negative differential feedback with the circuit as shown, output 1 should be connected to input 2 and output 2 to

31

input 1, in both cases via a suitable resistor. If it is more convenient, the connections to the inputs of each op-amp could be reversed, in which case the feedback connections would be output 1 to input 1, and output 2 to input 2.



If IC_1 and IC_2 are combined in a dual op-amp, then p.c. board space will be saved, and differential temperature drift reduced. I used a 741 for IC_3 , and a 747 (dual 741) for i.cs 1 and 2.

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