# Single gang pan-pot

The use of a single-gang linear potentiometer as a balance control is well known. Shown here is a simple pan-pot for stereo audio mixers using the same technique. The circuit was designed to give the best approach to a sine law so that $A^2 = B^2$ is a constant, whatever the position of the wiper. The output was normalized at $90°$ (potentiometer at maximum) so:

$$\text{error } E = 20 \log \frac{A/A_{max}}{\sin(90 \times R/R_{max})}$$

is 0dB at $R = R_{max}$
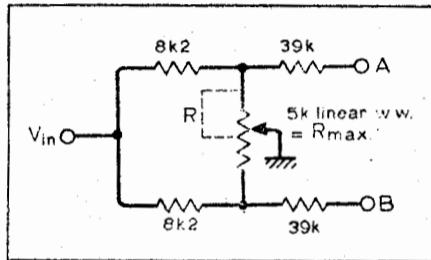
The calculated error for the circuit is less than 1dB over the full range of the potentiometer. The input impedance, about $5k\Omega$, is constant within 10% over the same range $A_{max} = 0.35V_{in}$.

If zero error at $45°$ (signal panned to centre) is required and some deviation from the sine law can be tolerated, the $5k\Omega$ should be changed to $10k\Omega$ which gives $A_{max} = 0.49V_{in}$. Clearly for higher input impedances all the values may be multiplied by a constant. Outputs A and B are virtual earth summing points and the potentiometer should be wire-wound for minimum cross-talk. In practice there is no audible change of level as the image is panned.

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