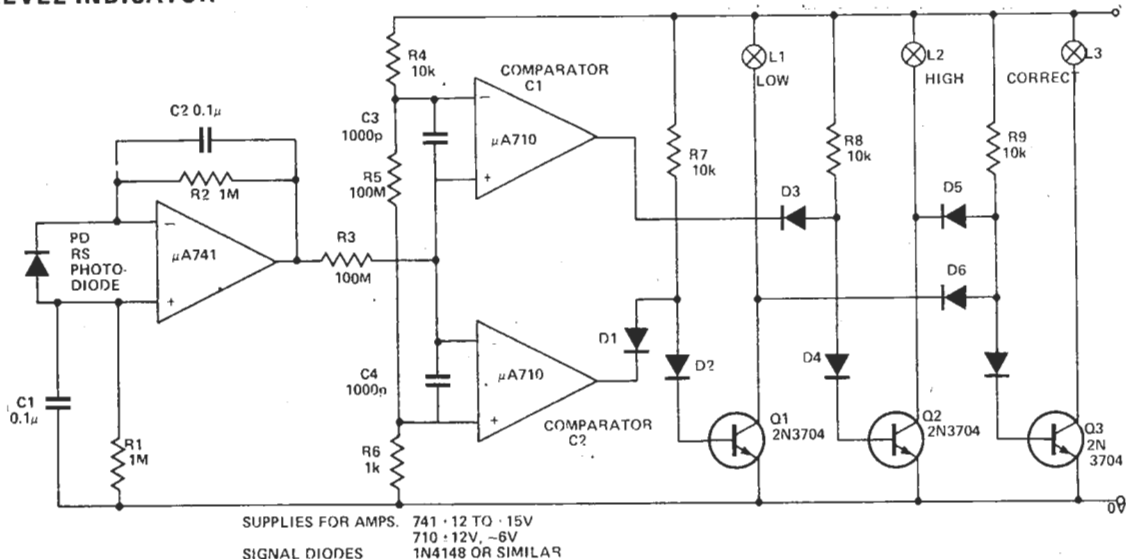


## LIGHT LEVEL INDICATOR



When conducting optical experiments, or calibrating photocells, it may be necessary to set a known light level; each time before the experiment is performed. The circuit provides a simple means of setting a light level to a particular value.

A silicon planar photodiode, strategically placed in the optical system, generates a photocurrent proportional to the incident illumination which is fed to the input of an op amp connected as a current amplifier. The output is thus the equivalent photocurrent developed across a 2Mohm resistor.

Two comparators are used to compare the output voltage with a fixed reference set by a potential

divider chain. Comparator 2 is set at nominally 1V and Comparator 1 at 1.1V.

The amplifier output is fed via R3 to the inverting input of comparator 2. When the output is below 1V, the output of comparator 2 is positive which enables the current in R7 to turn on Q1, lighting lamp 1 indicating "Too Low". When the output of the amplifier is above 1.1V the output of comparator C1 will be positive, enabling current in R8 to turn on Q2 and lighting lamp L2 indicating "Too High". If the amplifier output is between the two thresholds, both comparator outputs will be low, both lamps will be off, and the current

in R9 will be enabled to Q3 and L3 will light giving the green indication "Correct".

Changing the values of R1 and R2 alters the basic sensitivity of the system, C1 and C2 provide decoupling of noise pick up for remote direction or small content of AC lighting and R3, C3, and C4 minimise instability in the comparators as they pass through their linear region.

Values in the diagram shown give an acceptance band of 10%. Reducing the value of R4 to 50ohms reduces the pass band to 5%. For closer bands, higher gain comparators may be used (eg. μA734 or LM311), but light levels closer than this are rarely necessary.