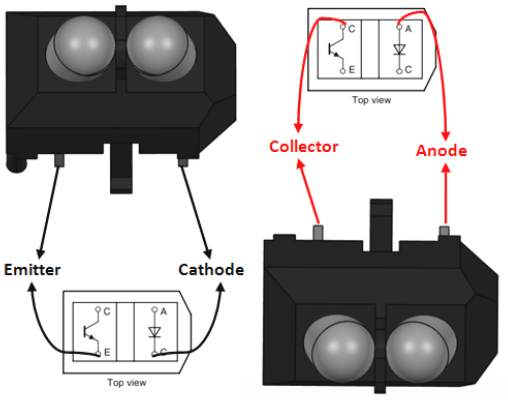
Sensor Panel

Components

i. TCRT5000 *7
ii. 330ohm *7
iii. 10k *7
iv. 10k Variable Resistors *7
v. LM324N Operational Amplifier *2

TCRT5000…….



TCRT5000 is a reflective sensor which include an infrared emitter and phototransistor. It can be used for identifying the difference between white and black.

Features

- Sensing Distance: 0.2 mm to 15 mm

- Dimensions (L x W x H in mm): 10.2 x 5.8 x 7

- Output Device: Phototransistor

- Collector- Emitter Voltage VCEO Max: 70 V

- Maximum Collector Current: 100 mA

- Forward Voltage: 1.25 V

- Reverse Voltage: 5 V

- Operating Temperature Range: - 25 C to +85 C

- Sensing Method: Reflective

- Wavelength: 950 nm

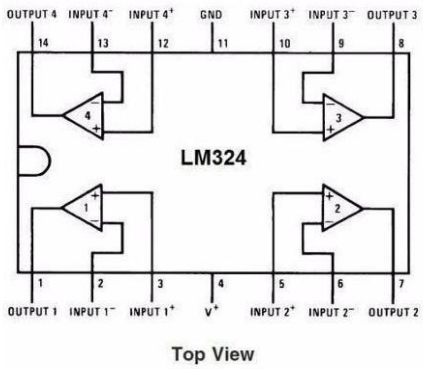
Advantages

- Constant distance between transmitter and receiver
- Noise protected
- Operating temperature range is suitable for srilankan climate

Purpose of variable resistors……

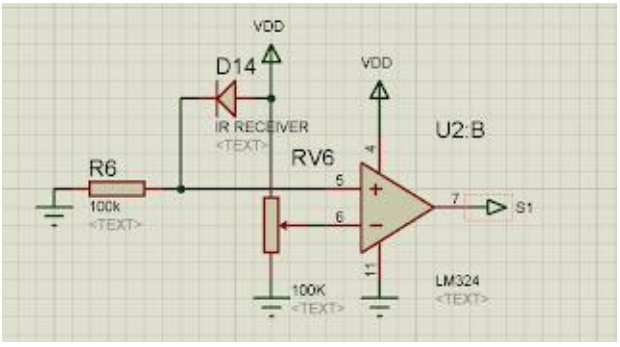
To calibrate in different lightning conditions.

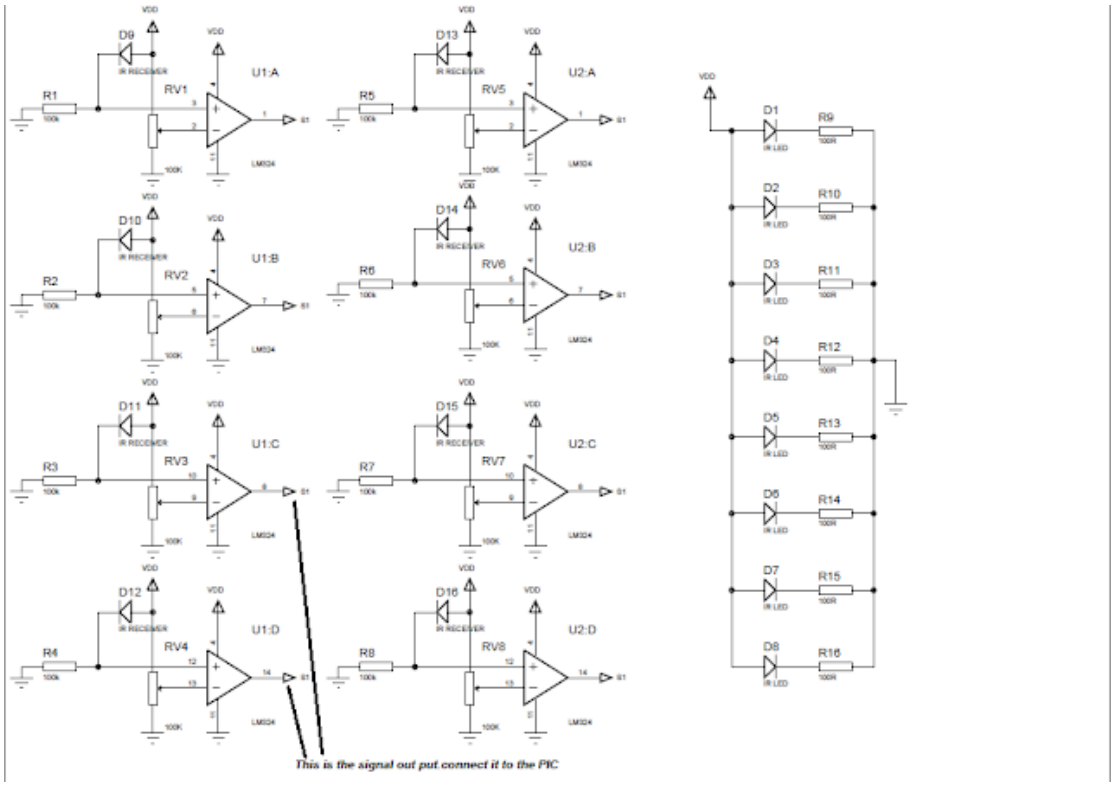
LM324N Operational Amplifier



It is used to compare the output voltage of the phototransistors against a fixed voltage and output 5V or 0V corresponding to the digital 1 and 0.

Tentative circuit plans…..





Source - http://supuntharanga.blogspot.com/

For obstacle avoidance…..

Sensor selected - HC-SR04 ultra sonic sensor

- Working voltage -DC 5V
- Working current-15mA
- Frequency-40kHz
- Maximum Range-4m
- Minimum Range-2cm
- Effectual angle – 15^0
- Dimension-45mm x 20mm x 15mm

First a 10us pulse is applied to the trigger pin of the sensor, then 8 ultrasonic pulses of 40 kHz are transmitted from the transmitter, once the pulses are transmitted the logic state of the echo pin is changed to high state and once the echo is arrived the logic state of the echo pin is changed to logic low. Distance can be calculated using following formula

Distance =time difference between transmission and receive/58.82 cm