"DUAL AXIS SOLAR TRACKING SYSTEM"

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OUTLINE

- Introduction
- Circuit designing

  Main components use

  a) LDR

  b) LM339

  c) L293D

  d) Gear Motors

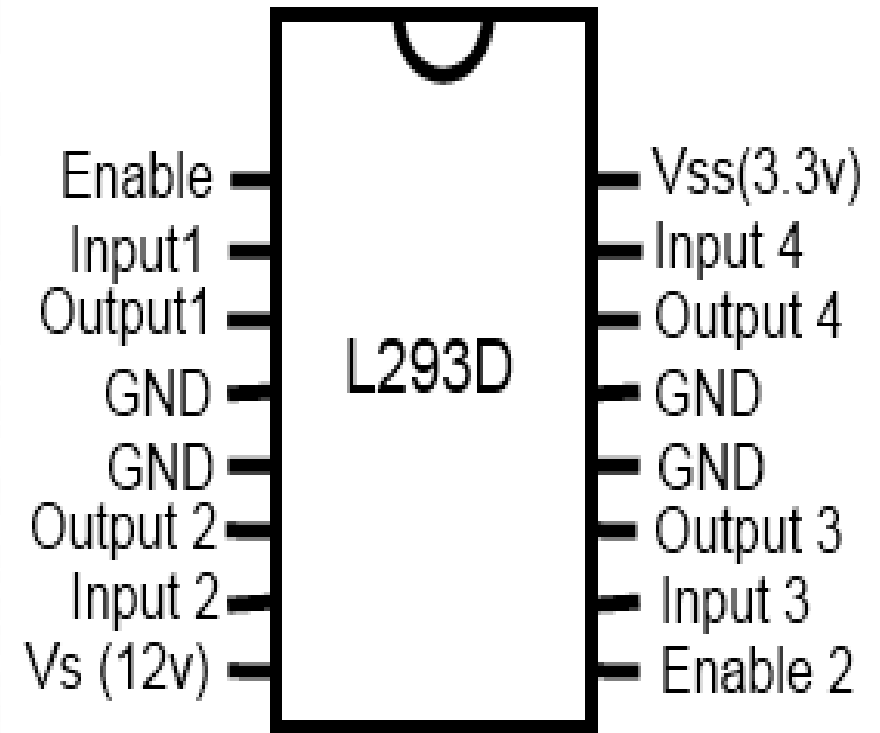- Working of the circuit
- Conclusion and Advantages.

INTRODUCTION

Solar energy is one of the abundant source of energy provide by nature and one of the most efficient form of renewable energy. Generally, solar panel is stationary and do not follow the movement of the sun and hence cannot obtain maximum sunlight throughout the day. **Solar Tracker System** that tracks the sun's movement across the sky and tries to maintain the solar panel perpendicular to the sun's rays, ensuring that the maximum amount of sunlight is incident on the panel throughout the day till evening, and starts all over again from the dawn next day.

# Main Components

➢IC L293D

➢LM339

➢LDR

➢Gear Motor

L293D

- L293D is a motor driver IC. Basically Motor drivers act as current amplifiers since they take a low-current control signal and provide a higher-current signal

- We use these amplifying current to operate motors.

Enable — L293D — Vss(3.3v)
Input1 — — Input 4
Output1 — — Output 4
GND — — GND
GND — — GND
Output 2 — — Output 3
Input 2 — — Input 3
Vs (12v) — — Enable 2

IC LM339

•The main function of this IC is the comparator has two inputs where it compares the two inputs with each other then generates a differential output like high-level signals or low-level signal.

•LM339 IC has four inbuilt comparators.

the variation among the two voltages is 2 volts to 36 volts.
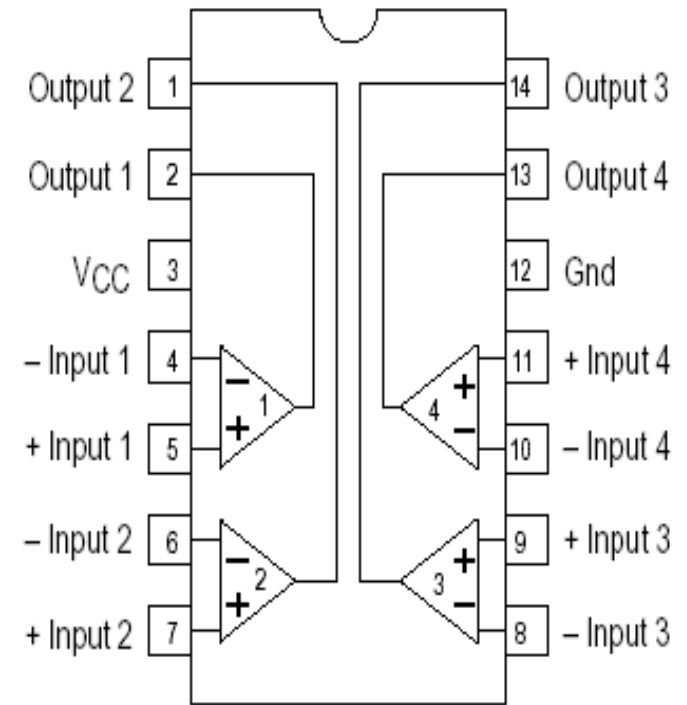
LDR

The working principle of an LDR is photo conductivity. When the light falls on the LDR, then the electrons in the valence band of the material are eager to the conduction band. But, the photons in the incident light must have energy superior than the band gap of the material to make the electrons jump from one band to another band (valance to conduction). Hence, when light having ample energy, more electrons are excited to the conduction band which grades in a large number of charge carriers. When the effect of this process and the flow of current start flowing more, the resistance of the device decrease

METAL FILM CONTACT

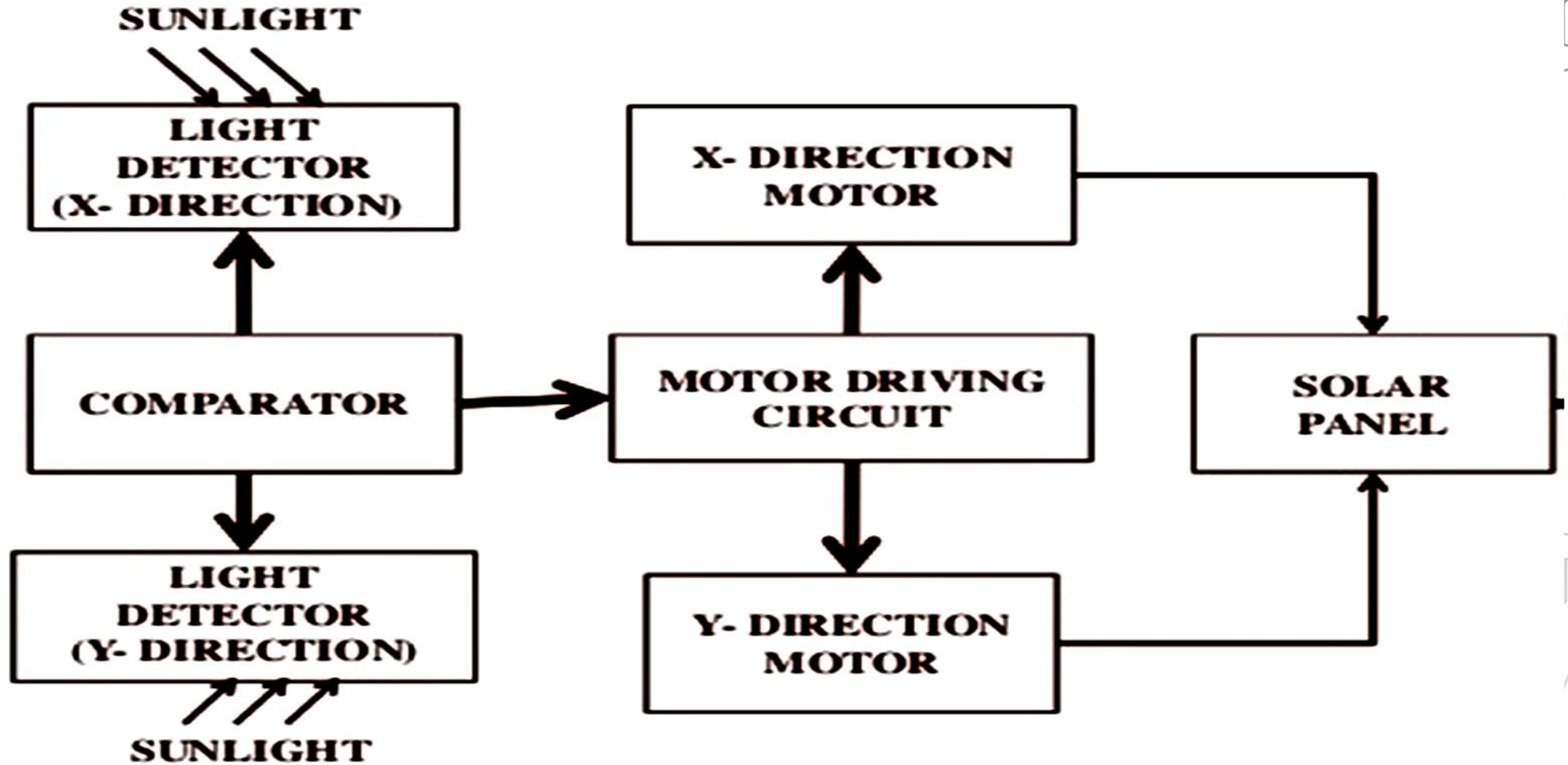CADMIUM SULPHIDE TRACK

METAL FILM CONTACT
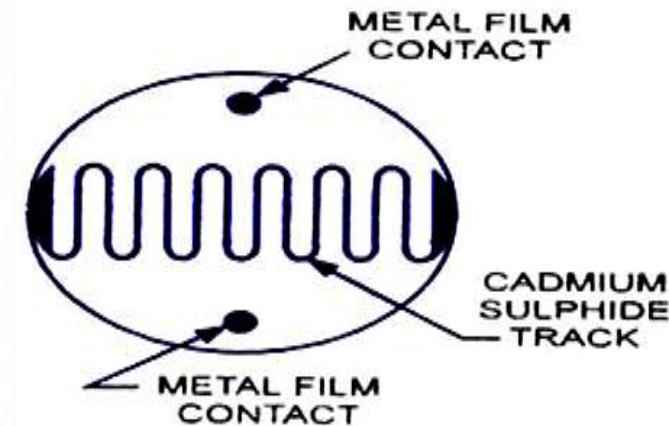
(a) Basic Structure

GEAR MOTOR

•In this project, two gear motor of 3.5RPM are used. The gear assembly helps in increasing the torque and reducing the speed.

•The DC motor works over a fair range of voltage. The higher the input voltage more is the RPM (rotations per minute) of the motor.
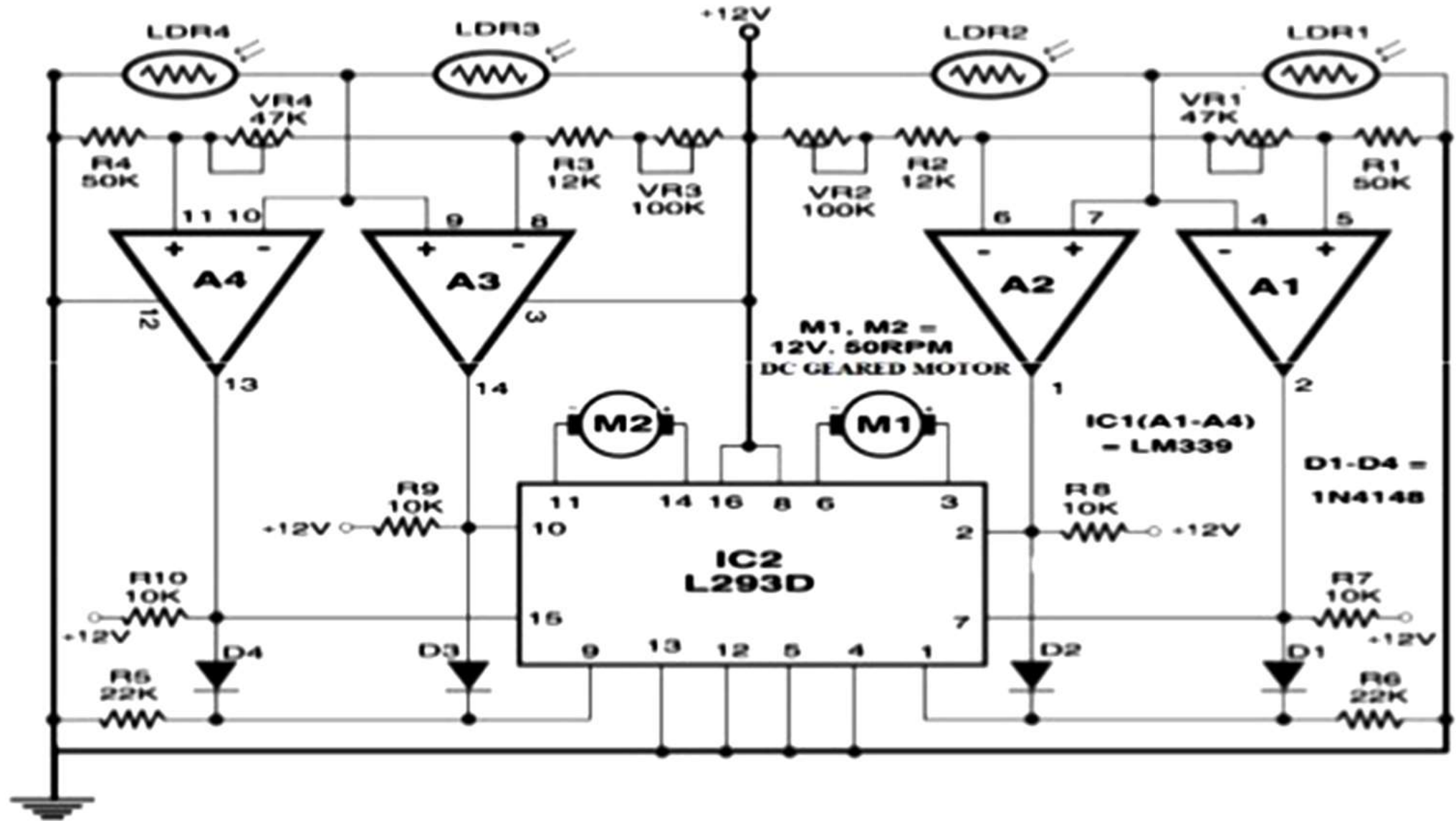
BASIC BLOCK DIAGRAM

CIRCUIT DIAGRAM

WORKING OF CIRCUIT

- LDR1 and LDR2 are fixed at the edges of the solar panel along the X axis, and connect the comparators A1 and A2, resp. Presets VR1 and VR2 are set to get low comparator output at pins 2 and 1 of comparators A1 and A2 resp. so as to stop motor M1 when the sun's rays are perpendicular to the solar panel.

- When LDR2 receives more light than LDR1, it offers lower resistance than LDR1, providing a high input to comparators A1 and A2 at pins 4 and 7, resp. As s result, output pin 1 of comparator A2 goes high to rotate motor M1 in one direction (say, anti-clockwise) and turn the solar panel.

- When LDR1 receives more light than LDR2, it offers lower resistance than LDR2, giving a low input to comparators A1 and A2 at pins 4 and 7, resp. As the voltage at pin 5 of comparator A1 is now higher than the voltage at its pin 4, its output pin 2 goes high. As a result, motor M1 rotates in the opposite direction (Say Clock-wise) and the solar panel turns.
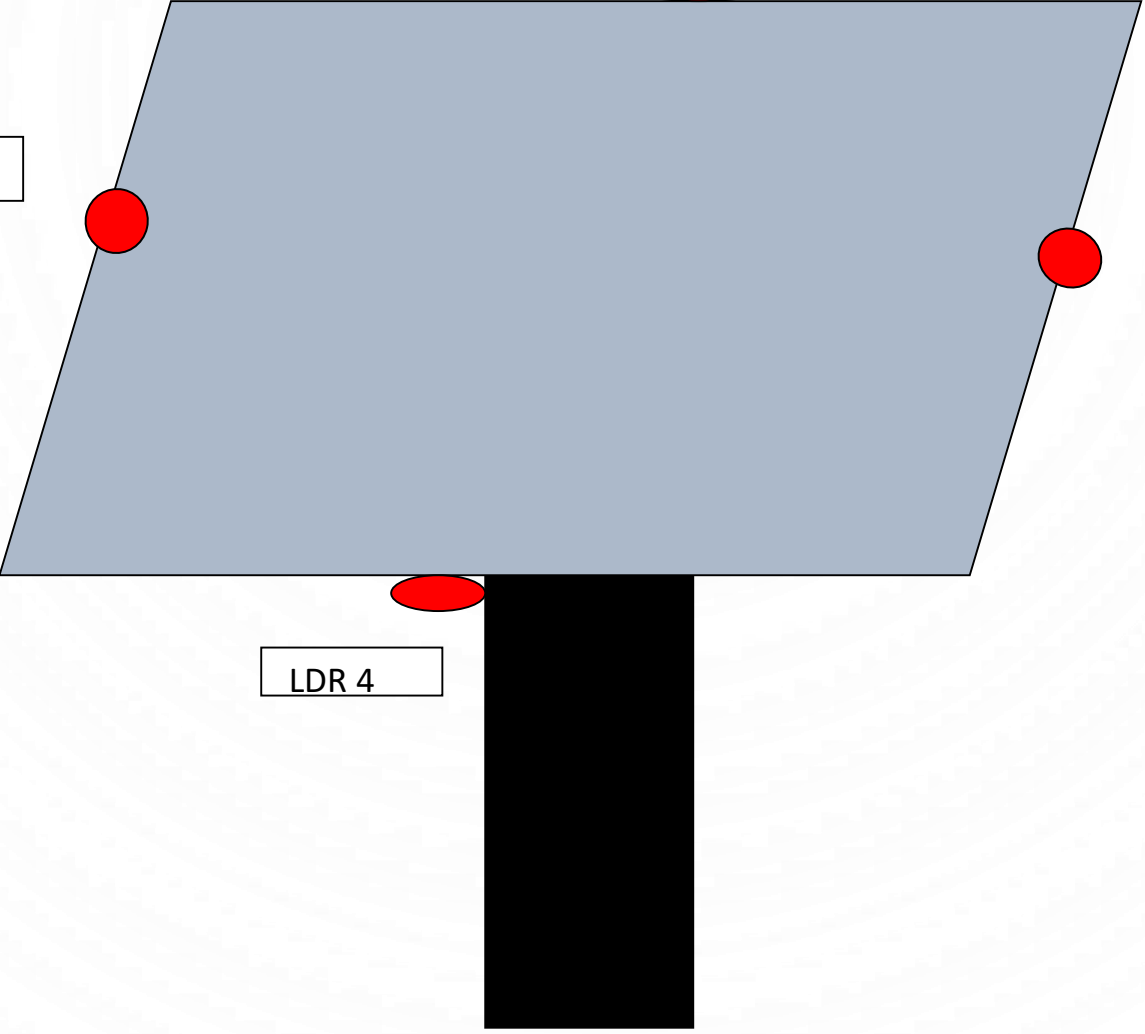
- Similarly, LDR3 and LDR4 track the sun along Y-axis.
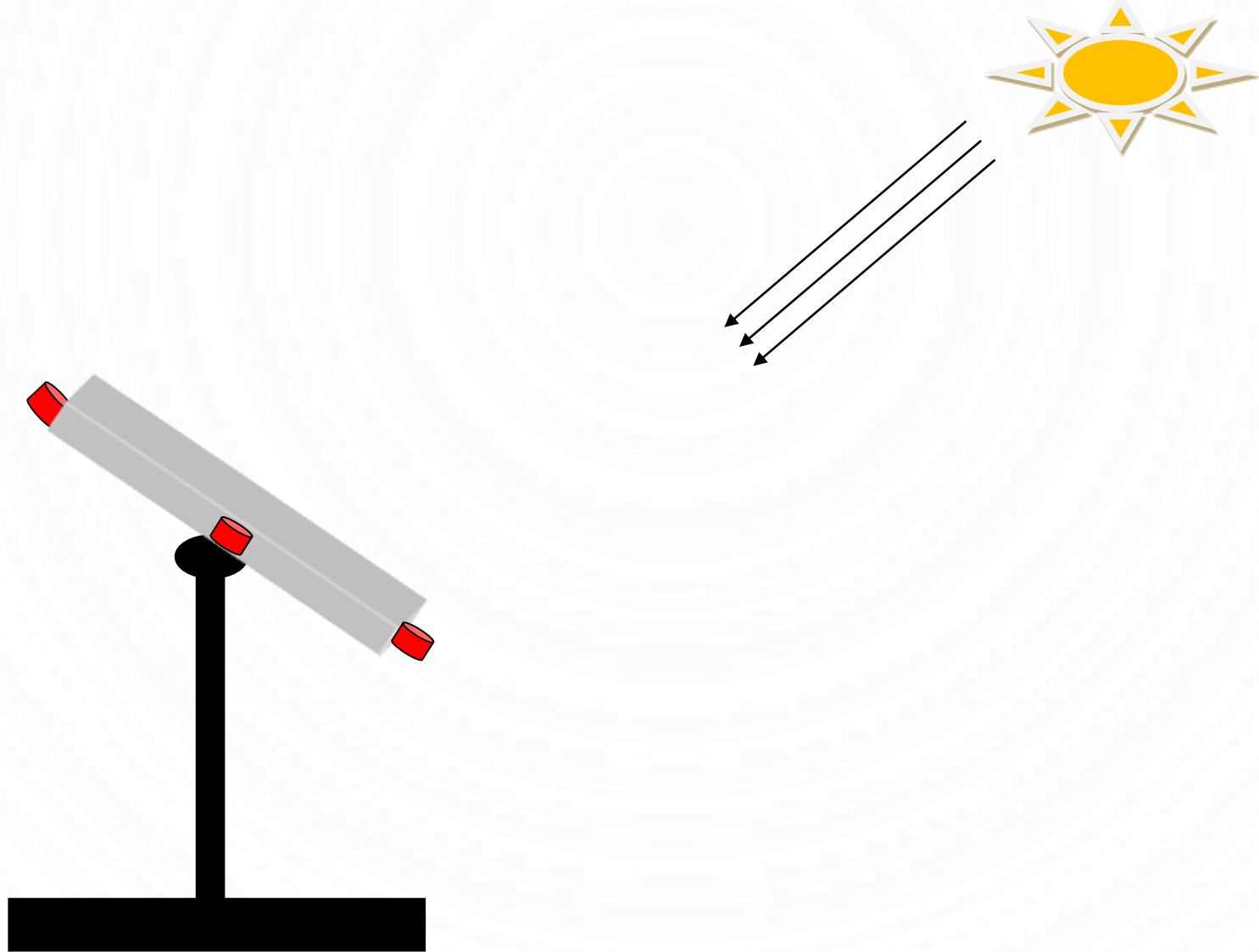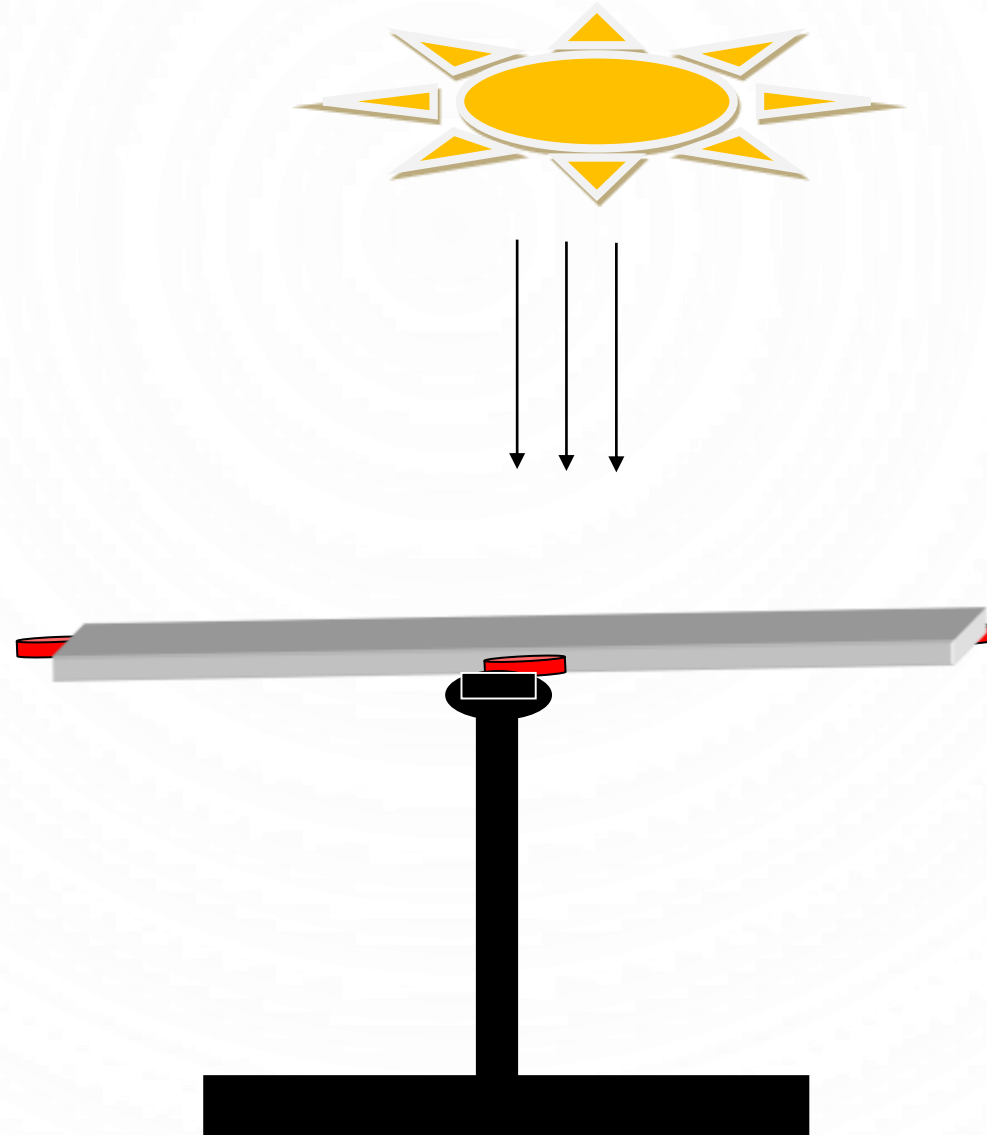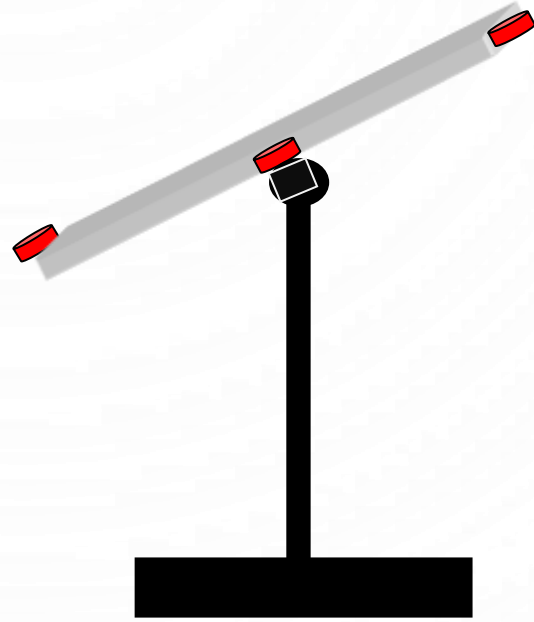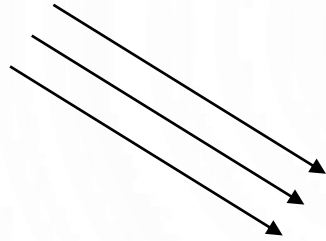
LDR 3

LDR 1

LDR 2

LDR 4

Fig :- Front View

Fig -: At morning

Fig -: At afternoon

Fig -: At evening

Conclusion

A predetermined Solar Tracking System has been designed economically.

This project presented simple control implementation of sun tracker.

This System not require programming and a computer interface.

Advantages

1) A simple and cost effective control implementation

2) Ability to move the two axes simultaneously within respective ranges.

3) Ability to adjust the tracking accuracy.

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THANK YOU...