

Solar-Powered Bluetooth Arduino Car Report

1. Introduction

The Solar-Powered Bluetooth Arduino Car is a sustainable, eco-friendly robotic project that combines wireless control with renewable energy. The car uses a solar panel to charge its battery, which powers the Arduino, motor driver, and Bluetooth module. Users can control the car remotely via a smartphone app using Bluetooth commands.

2. Objectives

- Build a car powered by solar energy.
- Enable wireless control using Bluetooth.
- Integrate Arduino with motors, Bluetooth, and solar power for practical application.

3. Components Required

Component	Quantity	Purpose
Arduino Uno	1	Microcontroller
L298N Motor Driver	1	Motor control
HC-05 Bluetooth Module	1	Wireless communication
DC Motors	2	Wheel movement
Solar Panel	1	Charge battery
Rechargeable Battery	1	Power source
Jumper Wires	As needed	Connections
Chassis	1	Base for car

4. Circuit Diagram

- Motor1Pin1 -> Arduino Pin 5
- Motor1Pin2 -> Arduino Pin 6
- Motor2Pin1 -> Arduino Pin 9
- Motor2Pin2 -> Arduino Pin 10
- HC-05 TX -> Arduino RX
- HC-05 RX -> Arduino TX
- HC-05 VCC -> 5V
- HC-05 GND -> GND
- Motors powered by battery charged from solar panel
- Arduino powered from battery output

5. Working Principle

1. Power Supply: Solar panel charges the battery, which powers all components.
2. Wireless Control: Bluetooth module receives commands from the smartphone app.
3. Motor Movement: Arduino interprets commands and controls motors via L298N driver:
 - F -> Forward
 - B -> Backward
 - L -> Left
 - R -> Right
 - S -> Stop

6. Arduino Code

```
const int motor1Pin1 = 5;
const int motor1Pin2 = 6;
const int motor2Pin1 = 9;
const int motor2Pin2 = 10;

char command;

void setup() {
  Serial.begin(9600);
  pinMode(motor1Pin1, OUTPUT);
  pinMode(motor1Pin2, OUTPUT);
  pinMode(motor2Pin1, OUTPUT);
  pinMode(motor2Pin2, OUTPUT);
}

void loop() {
  if (Serial.available()) {
    command = Serial.read();
    controlMotor(command);
  }
}

void controlMotor(char cmd) {
  switch(cmd) {
    case 'F':
      digitalWrite(motor1Pin1, HIGH);
      digitalWrite(motor1Pin2, LOW);
      digitalWrite(motor2Pin1, HIGH);
      digitalWrite(motor2Pin2, LOW);
      break;
    case 'B':
      digitalWrite(motor1Pin1, LOW);
      digitalWrite(motor1Pin2, HIGH);
      digitalWrite(motor2Pin1, LOW);
      digitalWrite(motor2Pin2, HIGH);
      break;
    case 'L':
      digitalWrite(motor1Pin1, LOW);
      digitalWrite(motor1Pin2, HIGH);
      digitalWrite(motor2Pin1, HIGH);
```

```
    digitalWrite(motor2Pin2, LOW);  
    break;  
case 'R':  
    digitalWrite(motor1Pin1, HIGH);  
    digitalWrite(motor1Pin2, LOW);  
    digitalWrite(motor2Pin1, LOW);  
    digitalWrite(motor2Pin2, HIGH);  
    break;  
case 'S':  
    digitalWrite(motor1Pin1, LOW);  
    digitalWrite(motor1Pin2, LOW);  
    digitalWrite(motor2Pin1, LOW);  
    digitalWrite(motor2Pin2, LOW);  
    break;  
}  
}
```