WIRED ROBOTIC CAR

Primary Step in the Field of Robotics...
Objective

To design a manually controlled car capable of crossing a track flooded with various hurdles in minimum possible time.

This basically requires:
• A good design
• A good control
• Team co-ordination
Design
Wired Robotic Car

A simple assembly of various components like

- **For Bot:**
  - Motors
  - Wheel Set
  - Grip

- **For Remote:**
  - DPDT Switches
  - Circuit Board

- **AC to DC Converter**
Introduction
General Constraints

Every Robotic Hurdle Race involves various constraints like:

- **Size Constraint**
  (Generally 30x 30x 30cm or 25x 25x 25cm)

- **Voltage Constraint**
  (Generally 24 V DC)

- **Power Constraint**
Power Source
(AC to DC Conversion)

We are already familiar with the concept of AC & DC supply and conversion of AC into DC. Various methods used for this purpose are:

- Rectifier
  - Transformer – step down transformer
  - Diode & Capacitor – to convert a.c to d.c
- Battery – for onboard operations of car
- Adapter – should be minimum of 12v and 500mA
- Laptop Charger
Transformer

Advantages:
- Easily Available
- Cheap

Disadvantages:
- Current Weakens Due to Heating Effect
- Bulky
Transformer » Rectifier
Specifications

- Transformer » Rectifier
  - 12-0-12 (Center Tapping)
  - 5 Ampere
  - Diode: 5608
  - Capacitor: 4700 μF, 36 V

- Laptop Charger
  - 18.5 – 19.5 V
  - 3.5 Ampere
Remote Design

DPDT Connections
(Double Pole Double Throw)
PCB Circuits
(Printed Circuit Board)
Motors

- AC Motor
- DC Motor
  - Toy Motor
  - Geared Motor
    - Self Locking, High Torque
      - Internal Geared
      - External Geared
Specifications

- Voltage Rating
- Current Rating
- RPM
- Weight
- Shaft Dimension
General Basics

- Linear Speed = RPM x Radius
- RPM x Torque ≡ Power ≡ V x I
- Control Vs. Speed
- Gear Ratio
Wheels

- Robotic Wheel
  - Expensive
  - Weak

- Bicycle Supporting Wheel
  - Cheap
  - Easily Available
  - Robust
Specification
how to select wheel

- External Diameter
- Internal Diameter
  - Bush
- Thickness
  - Doubling
- Material & Surface
Wheel Surface
(Track Belts & Grips)

- Floor Mat
- Cricket Bat Grip
- Tyre Tube
- Front to Rear Belt
  - Tank type track belt
Assembly of Components

- Using Internal Geared Motor
- Using External Geared Motor
Simplest Car

Material Used:

- 4 x 100 rpm Motors (Robokit, Vega)
- 8 Wheels (Diameter = 6 cm)
- Floor Mat as Track Belt
- Iron Chassis
- DPDT Remote Control
- Laptop Charger as Power Source
Chassis

- **Step 1:** Take an iron strip of around 1 mm thickness
**Chassis**

- **Step 2:** Drill the strip as shown:
Chassis

- **Step 3**: Bend the strip perpendicularly at a distance of 4cm from left & right edge

- **Step 4**: Screw up motors & other accessories.
Slight Change

Step 1: Take an iron strip of around 1 mm thickness

Step 2: Drill the strip as shown
Step 3: Mark lines on the strip as shown.

Repeat Step 1-3 to make a similar strip.

Step 4: Take two another strips of shown dimensions
Step 5: Place the two strips made in Step1-3 in the vertical plane and weld them together with the help of strips made in step 4.
Most Successful Design

- 4 x 100 rpm Motors (External geared)
- 4 Wheels (Diameter = 10 cm)
- Floor Mat as Track Belt
- Iron Chassis
- DPDT Remote Control
- Transformer as Power Source
Milind Singal: 9873243053
Ajay Verma: 9911982505
Mohit Gupta: 9466643004
Thank You!