

7 Bill Of Materials

| No | Name | Part No | Description | Qty | Cost per unit | Total Cost | Manufacturer |
|----|----------------|---------|---------------------------|-----|---------------|------------|--------------|
| 1 | Wheels | – | Plywood wheels | ×4 | £6.80 | £0.93 | In house |
| 2 | Base (Plywood) | – | Base platform | ×1 | £6.80 | £2.79 | In house |
| 3 | Base (Acrylic) | – | Base platform | ×1 | £7.49 | £4.81 | In house |
| 4 | Hubs | – | Plywood hubs | ×4 | £6.80 | £0.25 | In house |
| 5 | Hub connectors | – | Steel connectors | ×4 | £6.99 | £6.99 | Amazon |
| 6 | Screw and Lead | – | Lead screw with nut | ×2 | £8.99 | £4.50 | Amazon |
| 7 | Plastic Tube | – | Hollow plastic tube | ×1 | £4.27 | £4.27 | Amazon |
| 9 | Datum | – | Reference point component | ×1 | – | – | Amazon |
| 10 | Gears | – | 3D printed | ×1 | £10.99 | £0.13 | In house |
| | | | | | | Σ = £31.66 | |

Table 1: Bill of Material for the Mechanical Components

7.1 Mechanics

This table lists the components and materials used to build the chassis for the competition. Key parts include gears for motion transfer and structural elements like plywood, acrylic, and plastic tubes. The hubs and connectors provide stability. The total cost of the components is **£31.66**, covering both in-house and purchased materials.

| No | Name | Part No | Description | Qty | Cost per unit | Total Cost | Voltage/Rating | Manufacturer |
|----|------------|-----------------------------|-----------------------------------|-----|---------------|------------|----------------|---------------------------------|
| 1 | IC/Chips | SN7404N | Hex Inverter IC | ×1 | £1.99 | £1.99 | 5V | Texas Instruments |
| | | SN74LS08N | AND Gate IC (Quad 2-input) | | £0.57 | £0.57 | 5V | Texas Instruments |
| | | CD74HC73E | Dual JK Flip-Flop IC (Dual 1-bit) | | £0.64 | £0.64 | 5V | Texas Instruments |
| | | SE555P | Timer IC (Astable, Monostable) | | £0.27 | £0.27 | 5V | Texas Instruments |
| 2 | Resistors | CF14JT27K0CT-ND | 27kΩ Fixed Resistor | ×1 | £0.08 | £0.08 | 1/4W | Stackpole Electronics |
| | | CF12JT10K0CT-ND | 10kΩ Fixed Resistor | ×2 | £0.08 | £0.16 | 1/2W | Stackpole Electronics |
| | | CF14JT220RCT-ND | 220Ω Fixed Resistor | | £0.08 | £0.16 | 1/4W | Stackpole Electronics |
| 3 | Capacitors | 738-CML0603X7R104KT50VCT-ND | 100nF Ceramic Capacitor (X7R) | ×1 | £0.08 | £0.08 | 50V | Stackpole Electronics |
| | | 16ZLJ470MTA8X11.5 | 470μF Electrolytic Capacitor | | £0.38 | £0.38 | 16V | Rubycon |
| 4 | LEDs | 754-1264-ND | Red Diffused LED (T-1 3/4) | ×1 | £0.15 | £0.15 | 2V | Kingbright |
| | | 754-1263-ND | Green Diffused LED (T-1 3/4) | | £0.15 | £0.15 | 2V | Kingbright |
| 5 | MOSFETs | IRLZ44NPBF-ND | N-channel MOSFET | ×2 | £0.96 | £1.92 | 55V/47A | Infineon Technologies |
| | | IRF5305PBF-ND | P-channel MOSFET | | £1.35 | £2.70 | 55V/31A | Infineon Technologies |
| 6 | Switch | CKN10157-ND | SPDT Snap Action Switch | ×1 | £0.76 | £0.76 | 100mA/125V | C&K |
| | | EG5619-ND | Rocker Switch SPST | | £0.55 | £0.55 | 10A/125V | E-Switch |
| | | MS0850506F020P1C-ND | SPST-NO Snap Action Switch | | £0.92 | £0.92 | 5A/125V | E-Switch |
| 9 | Buzzer | 433-1028-ND | 5V Magnetic Buzzer | ×1 | £0.39 | £0.39 | 5V | Soberton Inc. |
| 10 | Fuse | BF310-ND | Fuse Holder with 3A Fuse | ×1 | £1.53 | £1.53 | 250VAC | MPD (Memory Protection Devices) |
| | | F2707-ND | FUSE GLASS 3A 250VAC 5X20MM | | £0.92 | £0.92 | 250VAC | Littelfuse Inc. |
| | | | | | | Σ = £14.40 | | |

Table 2: Bill of Materials for the Electronical Components

7.2 Electronics

Creating a Bill of Materials (BOM) for electronics can be a complex and dynamic task. Unlike other types of materials, electronic components are subject to continuous testing, changes, and improvements during the design process. It’s not uncommon for designs to evolve, which means the BOM may need to be updated frequently as parts are tested, replaced, or modified. This makes it especially difficult to finalize the BOM until the product reaches the final stages of manufacturing.

The list of components here includes key electronic parts such as ICs, resistors, capacitors, LEDs, MOSFETs, switches, buzzers, and fuses. These components were selected to meet the required specifications, but further modifications and testing are expected as the design is refined.

The total cost for the electronics components as currently planned is **£14.40**.

Bulk Buy Basket: <https://www.digikey.co.uk/short/75mq0qh1>

Miscellaneous Items (purchased on the general internet): Some additional components, such as the DC motor, battery pack, and jumper wires, may be sourced from general suppliers as needed.