Tardygrade BOM

Valid for pcb v0.31

Apart from the Tardygrade PCB and 3d printed parts, this is the complete list of components needed to build the robot.

I usually include the exact web store links from where I bought each component. Since I sourced my parts locally from Sweden these are mainly for reference. You should get the components from wherever is convenient from your location.

ESP32 dev board

Qty.	Alt.	Part	Description
1	A	Adafruit Feather HUZZAH32 – ESP32	https://www.adafruit.com/product/3405
	B	TinyPICO	https://www.tinypico.com/ Webstore link (Tindie)

Miscellaneous parts

Qty.	Part	Description
1	3.7V lipo cell 1500 mAh Type 803450	Dimensions: 8 x 34 x 50 mm. You can also use any cell smaller than that. https://www.electrokit.com/produkt/batteri-lipo-3-7v-1500mah/
1	JST-PH connector extension cable	Length: ~150 mm Wire diameter: 1.2 mm (max) https://www.electrokit.com/produkt/kabel-med-vinklad-kontakt-jst-ph-2-pol-150mm/
1	Micro servo 360° continuous rotation	"Tower Pro 9g" form factor https://www.electrokit.com/produkt/servo-msr-1-3-9-360/
1	Micro servo 180° rotation	https://www.electrokit.com/produkt/mg90s-micro-servo/ (The link shows a metal gear servo, but nylon gears works just as well)
1	Neodymium magnet	Dimensions: 6 x 3 mm Webstore link (Amazon)

PCB components

<table>
<tr><td colspan="3" align="center">Through-hole</td></tr>
<tr><td>Qty.</td><td>Part</td><td>Description</td></tr>
<tr><td>2</td><td>Electrolytic capacitor 220 µF
Dia: 5 mm
Pitch: 2 mm</td><td>Exact value not important for this part.</td></tr>
<tr><td>1</td><td>Male pin header 1 x 40, right angle
2.54 mm</td><td>https://www.electrokit.com/produkt/stiftlist-2-54mm-1x40p-vinklad-brytbar/</td></tr>
<tr><td>1</td><td>Female pin header x 40
2.54 mm</td><td>https://www.electrokit.com/produkt/hylslist-2-54mm-1x40p/</td></tr>
<tr><td>1</td><td>Pushbutton off-(on)
2.54 mm</td><td>Optional. Needed for older TinyPICO boards with no onboard reset button.
https://www.electrokit.com/produkt/skhlaba010-omkopplare/</td></tr>
<tr><td>1</td><td>Switch on-on
2.54 mm</td><td>Optional. Used only with Adafruit board to power down its boost regulator.
https://www.electrokit.com/produkt/skjutomkopplare-1-pol-on-on-pcb-2/</td></tr>
<tr><td colspan="3" align="center">Surface mount</td></tr>
<tr><td>Qty.</td><td>Part</td><td>Description</td></tr>
<tr><td>2</td><td>P-channel MOSFET
Logic level
Package: SOT-23</td><td>Gate-Source Threshold: < 3V
Rds On: (The lower the better)
I used this one: Datasheet</td></tr>
<tr><td>1</td><td>Resistor 200Ω
Package (in): 0603</td><td></td></tr>
<tr><td>1</td><td>Resistor 10kΩ
Package (in): 0603</td><td></td></tr>
<tr><td>1</td><td>Boost regulator,
Microchip MCP1642B/D</td><td>There are two variants, named B and D.
They are interchangeable for this application.
Datasheet</td></tr>
<tr><td>2</td><td>Ceramic capacitor, 10 µF
Package (in): 0603</td><td>Refer to MCP1642B/D datasheet section 5.4 for details on cap selection.
I used this one: Webstore link (Mouser)</td></tr>
<tr><td>1</td><td>Inductor,
Wurth 744052005</td><td>If you can't source this part, the MCP1642B/D datasheet table 5-2 lists other suitable inductors.
Webstore link (Mouser)</td></tr>
<tr><td>4</td><td>Hall switch,
Diodes AH1902-Z-7
Package: SOT-553-5</td><td>Webstore link (Mouser)</td></tr>
<tr><td>4</td><td>Ceramic capacitor, 10 nF
Package (in): 0603</td><td>Webstore link (Mouser)</td></tr>
</table>

Revision history

Rev.	Date	Comment
2	2021-10-10	Updated for pcb v0.31. Changed hall switch component.
1	2021-09-21	First revision