



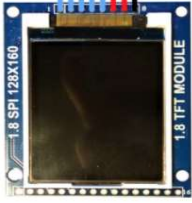



Mechanical Parts:	Qty	Cost	Comment/part number
MGN9-rails + carriages	3	£40.00	
GT2 drive pulley for 6mm belt, 16T, 3mm bore	2	£5.78	
GT2 6mm belt 2metres.	1	£4.00	
GT2 toothed idler pulley for 6mm belt, 16T, 3mm bore	2	£5.18	
GT2 smooth idler pulley for 6mm belt, 3mm bore	4	£10.60	
NEMA-17 4wire stepper motor	2	£20.00	
Wooden box. Amazon description: Creative Deco XL Large Wooden Box Storage Keepsake Wood   40 x 30 x 14 cm   with Lid   Plain Unpainted Chest without Handles   Perfect for Documents,	1	£18.00	See instructions regarding make/buy a box.
Laser-cut baseplate	1	£18.00	See instructions
Lipo battery 11.1V 2200mAh+	1	£15.00	
Spray on lacquer	1	£14.00	(optional, will mean watercolours can be wiped off wood).
Ecoline brush pen	1+	£10.00	(£10 for a set of 5 colours) 
Battery charger for 11.1V Lipo battery.	1	£6.50	
2020 extrusion	2	£6.25	(order cut to 270mm length from eBay).
3m coiled USB cable	1	£5.00	
Leather drawer handle	1	£4.95	The one I purchased had item number: 312975520195
SuperLube 10ml syringe	1	£4.00	
Cork stepper motor damper	2	£3.75	
Rubber feet	4	£3.25	
Harwin spacers 3mm	10	£2.00	Available from eBay
Mini clothes pegs (10 pack)	1	£1.80	The ones I purchased: Mini Wooden Pegs 3.5cm Peg Clip Clamp Wood Natural Small. 3.5cm pegs seem like a common size, but if the spring does not fit into the paper clamps, you will need to go into Fusion 360 and edit the design slightly.
Kitronic FS-90 servo linear actuator	1	£9	This is quite a specialised part, made by a small UK company for educational purposes. They ship worldwide. If they stop making these, a 3D printed design might be a good alternative - the preloading spring mean that the tolerances are not critical. Consider a 0.2mm nozzle. <a href="https://kitronik.co.uk/products/2595-linear-actuator">https://kitronik.co.uk/products/2595-linear-actuator</a>
Igus linear guide + carriage	1	£15.30	I regret using this overpriced bearing, sorry.
Magnets	12	£5.00	ø5mm x 10mm
Extension spring	1	£6.25	Assorted springs - Amtech: AM-S6210 Ext. ø6.4 x 22.2mm
Compression spring	1	£0.00	Amtech AM-S6210 assorted springs: Comp. ø5.6 x 17.5mm
550 paracord (1m)	1	£3.00	
Cable ties 3mm width 100mm length	2	£3.00	Buy a pack

Fasteners	Qty	Cost	Comment
I recommend kayfast.co.uk for buying fasteners.		£15.00	
M3 x 40mm button head	2		
M3 x 35mm button head	2		
M3 x 30mm button head	4		
M3 x 25mm button head	4		
M3 x 20mm button head	2		
M3 x 16mm button head	2		
M3 x 12mm button head	19		
M3 x 10mm button head	15		
M3 x 8mm button head	14		
M1.2 x 12 slotted head	8		
M4 x 8mm button head	1		
M5 x 8mm button head	4		
M2 x 10mm button head	2		
M3 flange nut	4		
M3 hex nut	14		
M3 square nut	14		
M3 2020 Tee nut	4		
M3 rubber anti-vibration washer	12		
M1.2 hex nuts	8		
Wood screws 3.5x10mm	12		
∅4mm x 20mm steel dowels	4		
∅3mm x 24mm steel dowels	2		
Brass threaded inserts press fit 105pc set	0	£12.89	(I got a set rather than buy individual inserts). 
M3 threaded insert 4mm length, 4.3mm OD	3		
M3 threaded insert 5.2 mm length, 4.3mm OD	1		
M5 threaded insert 5.6mm length, 6.3mm OD	4		

Electrical Parts	Qty	Cost	Comment
16mm Anti-Vandal Momentary Metal Stainless Steel Push Button Switch Flat	3	£10.47	It's important that these are momentary switches, not latching switches. 
On-On Mini Miniature Toggle Switch 4PDT	1	£2.50	
Limit switches D2FS-FL-N	4	£5.53	
PCB	1	£10.00	See instructions
Silentstepstick protectors	2	£11.99	(pack of 5)
SilentStepStick TMC2208 drivers	2	£10.00	
PCB 4pin terminals 5.08mm spacing	2	£2.65	
Robotdyne Arduino MEGA2560 Pro	1	£12.95	Robotdyne
SW-520D ball tilt sensor (optional)	1	£1.99	
mini-DIN panel mount connector pair.	1	£6.00	MD-40SN MD-40
1.8" inch ST7735 SPI 128x160 TFT LCD Colour Display Module	1	£5.00	 The exact model I bought is now quite rare on ebay, but I expect they are all similar. Make sure to check the mounting hole pattern before ordering the wooden baseplate! It might need to be adjusted if you buy a different module.
OV7670 camera	1	£4.00	
DC 12V Battery Low Voltage Protection Module With Alarm	1	£5.00	
Power wire	2	£5.00	I used 22AWG wire in two colours for wiring the power/charging circuit (see instructions).
Equipment wire	1	£16.00	I have a kit of 10m wires in 11 colours. 23-24 AWG.
1/4W 1% metal film resistors	0	£7.00	I recommend buying resistors from Tayda or LCSC. (£7 = ~400 assorted resistors of your choice).
Resistor 680 ohm	6	£0.00	
Resistor 1k ohm	6	£0.00	
Resistor 10k ohm	2	£0.00	
Resistor 500k ohm	1	£0.00	
Resistor 1M ohm	1	£0.00	
100 nF ceramic capacitor (104)	1	£4.00	(assorted pack of 300 ceramic capacitors)
100uF 16V electrolytic capacitor	2	£2.00	(pack of 20)
4 Pin 5.08mm (2.54mm X 2) Pitch PCB Mount Screw Terminal Block Connector	2	£2.65	
MP2307 mini buck converter	2	£4.00	

**TOTAL:**  
**£396**