Bill Of Material: The turtle

Wooden Parts

Part	QTY	Material	Volume (mm³)	Surface (mm²)	Total surface (mm³)
Houderlineairelagers	8	MDF (3mm)	12460,022	4153,340667	33226,72533
Houderlineairelagers1	16	MDF (3mm)	3152,21	1050,736667	16811,78667
Houderlineairelagers2boven	4	MDF (3mm)	13006,062	4335,354	17341,416
Bovenstelangelagerhouder	2	MDF (3mm)	19977,013	6659,004333	13318,00867
Bovenstekortelagerhouder	14	MDF (3mm)	12249,013	4083,004333	57162,06067
Bovenbody	1	MDF (3mm)	152066,076	50688,692	50688,692
Middenbody	1	MDF (3mm)	151444,083	50481,361	50481,361
Onderbody	1	MDF (3mm)	24427,088	8142,362667	8142,362667
Voorachterbody	2	MDF (3mm)	78653,588	26217,86267	52435,72533
Voorachterkleinbody	4	MDF (3mm)	46368	15456	61824
Zijbody	2	MDF (3mm)	73211,545	24403,84833	48807,69667
Onderbody-midden	1	MDF (3mm)	18172,087	6057,362333	6057,362333
Onderbodymiddenjuist	1	MDF (3mm)	13453,884	4484,628	4484,628
Zijkantwielhouder	8	MDF (3mm)	12648,077	4216,025667	33728,20533
Zijkantwielhouder1	2	MDF (3mm)	44295,611	14765,20367	29530,40733
Zijkantwielhouder2	2	MDF (3mm)	33990,664	11330,22133	22660,44267
Zijkantwielhouder3	2	MDF (3mm)	32134,354	10711,45133	21422,90267
Zijkantwielhouder4	2	MDF (3mm)	15924	5308	10616
Zijkantwielhouder5	2	MDF (3mm)	23160	7720	15440
Bearing houder	8	MDF (3mm)	2267,19	755,73	6045,84
				Total surface:	560225,6233

Bearings

Part	QTY	Material
Linear bearings Ø8mm - Ø15mm-24mm	8	Stainless Steel
Roller bearingsØ8mm-Ø 22mm - 7mm	12	Stainless Steel

Motors

Part	QTY
DC-motor 0,66W - 8 rev/s	2
Stepper Nema 14	4

3D-Printed Parts

Part	QTY	Material
Staafhouder	6	PLA
Tandwielring	4	PLA

Metal Parts

Part	QTY	Material	Description
Hollow cold-rolled bars	4	Steel	Length: 25mm - Ø 8mm
Threaded bars M8 for system	2	Steel	Length: 25mm - M8
Threaded bars M8 for wheels	4	Steel	Length: 15mm - M8

Gears

Part	QTY		Description		
Spur Gear1 (System)	2	MDF	Module : 1,5mm - number of teeth : 10ul - inside hole : hexagon with dimensions nuts M8		
Spur Gear2 (DC motor)	2	Birch	Module : 1,5mm - number of teeth : 23ul - inside hole : Ø4mm		
Spur Gears (Stepper motor)	4	MDF	Module : 1,7mm - number of teeth : 10ul - inside hole : Ø4mm		
Spur Gears (Wheels)	4	MDF	Module : 1,7mm - number of teeth : 25ul - inside hole : Ø8mm		

Wheels

Part	QTY	Description			
Wheels (Rubber wheel and rim)	4	External diameter: 66mm/ inner diameter for axes: 8mm / enough grip			
Small wheels	3	These are the small wheels underneath the robot, and can be bought in any hardware store.			

Screws And Nuts

Part	QTY	Material
Chamfered Bottom Hex Machine Screw Nuts M8	5	Steel, Mild
DIN 439 - M8 (Hex Nut)	2	Steel, Mild
DIN 6912 - M6 x 70 (Cylinder Head Cap Screw)	8	Steel, Mild
DIN 555-5 - M6 (Hex Nut)	8	Steel, Mild

Springs

Part	QTY
Spring	1

Electrical Components

Part	QTY		Description
Switch	7		
Distance sensor	3		
Lithium-Polymer battery	1		11,1V, 2,2Ah
Arduino	2		
Xbee	2		
A buzzer	1		
Cable for motors and power		Minimum diameter: 0,8mm	
Cable for sensors, switches and buzzer			
Fuse rated at 5A	1		
Kill switch	1		
Sparkfun USB Explorer	1		Connects a Xbee to your computer
A male to male B-USB to A-USB cable	1		To program the Arduino's
A male to male mini-USB to A-USB cable	1		To plug in the Sparkfun USB Explorer
Voltage sensor with seven-segment display	1		

Bill of Materials For PCB Document [Stepper-Shield.PcbDoc]

Source Data From: **Stepper-Shield.PcbDoc**

Project: **Stepper-Shield.PrjPCB**

Variant: **None**

Footprint	Comment	LibRef	Designator	Description	QTY one Circuit Board	QTY five Circuit Boards
CONN-HDR-0.1-1x6-FEMALE	Analog Pins	Header 6	A1	Header, 6-Pin	1	5
CAP-0.1-CERA1	47n	Cap	C12, C34	Capacitor	2	10
CAP-0.1-TA1	100n	Cap	C-2, C-L	Capacitor	2	10
CAP-0.1-ELCO-5x12	100u	Cap Pol1	C-S1	Polarized Capacitor (Radial)	1	5
CONN-HDR-0.1-1x6H	Power and Steppers	Header 6	CONN	Header, 6-Pin	1	5
LED-3MM-GREEN	LED0	LED0	D1, D2, D3, D4	Typical INFRARED GaAs LED	4	20
DIODE-0.3-SCHOTTKY	D Schottky	D Schottky	D11, D12, D21, D22, D31, D32, D41, D42	Schottky Diode	8	40
CONN-HDR-0.1-1x8-FEMALE	Digital pins 0-7	Header 8	DP1	Header, 8-Pin	1	5
CONN-HDR-0.1-1x8-FEMALE	Digital Pins 8-13	Header 8	DP2	Header, 8-Pin	1	5
IC-Multiwatt-15	L298D (H-Bridge)	L298D (H-Bridge)	IC1		1	5
CONN-HDR-0.1-1x6-FEMALE	Power	Header 6	P1	Header, 6-Pin	1	5
RES-0.4	Res1	Res1	R12	Resistor	1	5
RES-0.4	470R	Res1	R34	Resistor	1	5
					25	125

Bill of Materials For PCB Document [Power_Switches&Other.PcbDoc]					
Source Data From:		**Power_Switches&Other.PcbDoc**			
Project:		**Power_Switches&Other.PrjPCB**			
Variant:		**None**			
Footprint	**Comment**	**LibRef**	**Designator**	**Description**	**Quantity**
CONN-HDR-0.1-1x6-FEMALE	Analog Pins	Header 6	A1	Header, 6-Pin	1
CONN-HDR-0.1-1x8-FEMALE	Digital Pins 8-13	Header 8	DP1	Header, 8-Pin	1
CONN-HDR-0.1-1x8-FEMALE	Digital pins 0-7	Header 8	DP2	Header, 8-Pin	1
CONN-HDR-0.1-1x6-FEMALE	Power	Header 6	P1	Header, 6-Pin	1
HDR2X7	Header 7X2	Header 7X2	P2, P3, P5	Header, 7-Pin, Dual row	3
HDR1X3	Header 3	Header 3	P4, P6, P8, P9, P10	Header, 3-Pin	5
CONN-SB-0.2-2WAY	Power in	Header 2	P7	Header, 2-Pin	1
RES-0.4	470R	Res1	R1, R2	Resistor	2
					15

Bill of Materials For PCB Document [XBeeShield.PcbDoc]

Source Data From:	**XBeeShield.PcbDoc**
Project:	**XBeeShield.PrjPCB**
Variant:	**None**

Note: **This Shield was designed by Yannick Verbelen**

Footprint	Comment	LibRef	Designator	Description	Quantity
CAP-2.5-ELCO-11X6.3	10uF	Cap Pol1	C1	Polarized Capacitor (Radial)	1
CAP-9.6-CERA	1uF	Cap Pol1	C2	Polarized Capacitor (Radial)	1
CAP-0.2-CERA	100nF	Cap	C3	Capacitor	1
CAP-0.2-POLY2	100nF	Cap	C4	Capacitor	1
LED-3MM-GREEN	Receive	LED0	D1	Typical INFRARED GaAs LED	1
LED-3MM-RED	Network	LED0	D3	Typical INFRARED GaAs LED	1
DIODE-0.3-2	3V3	D Zener	D4	Zener Diode	1
XBEE	XBee	XBee	IC1	XBee header	1
LOGO-APERTURE-BTM	Logo	Logo	M1	Logo	1
MECH-FID-ALL	Fiducial	Fiducial	M2, M3, M4, M5	Fiducial marking	4
CONN-HDR-0.1-1X8-FEMALE	Digital IO	Header 8	P1, P8	Header, 8-Pin	2
CONN-HDR-0.1-1X6-FEMALE	Power	Header 6	P7	Header, 6-Pin	1
CONN-HDR-0.1-1X6-FEMALE	Analog Inputs	Header 6	P9	Header, 6-Pin	1
RES-0.4	22R	Res1	R1, R2	Resistor	2
RES-0.4	2k2	Res1	R4	Resistor	1
RES-0.4	1k	Res1	R5, R8	Resistor	2
RES-0.4	47k	Res1	R6	Resistor	1
RES-0.4	3k3	Res1	R7	Resistor	1
SW-SLIDE-0.1H	Enable XBee	SW-SPST	S1	Single-Pole, Single-Throw Switch	1
TO-92-T	BC547B	BC547B	T1, T2	Amplifier Transistor NPN Silicon	2
					27