

# Bertram BOM - Sub-Assembly BOM

	Part	Quantity
<b>Rotary Base</b>	M5 x 14mm Screw	8
	5mm x 16mm x 5mm Bearing	8
	8mm x 22mm x 7mm Bearing	2
	M5 Heat-Set Inserts	8
<b>Rotary Plate</b>	M4 Heat-Set Inserts	6
	M8 x 65mm Screw	1
	65cm T5 Belt	1
<b>Shoulder Base</b>	8mm x 22mm x 7mm Bearing	2
	M3 Heat-Set Inserts	6
	M3 x 25mm Screw	2
	M5 Heat-Set Inserts	8
	Nema 23 Motor	2
	M4 Heat-Set Inserts	2
	M4 x 20mm Screw	2
	T5 Pulley 8mm Bore	2
	M5 x 14mm Screw	8
	8mm x 140mm Smooth Rod	1
<b>Shoulder Belt Tensioners (parts for both)</b>	M3 Nut	2
	M4 x 20mm Screw	2
	4mm x 13mm x 5mm Bearing	6
	M4 Nut	2
<b>Shoulder Joint</b>	M4 Heat-Set Inserts	8
	M4 x 40mm Screws	4
<b>Elbow Base</b>	8mm x 22mm x 7mm Bearing	2
	M3 Nut	1
	M3 x 40mm Screw	1
	Nema 17 5:1 Geared Motor	1
	M3 x 10mm Screw	4
	M3 Heat-Set Inserts	6
	T5 Pulley 1/4" Bore	1
	M4 x 10mm Screw	4
	M4 x 20mm Screw	1
	8mm x 115mm Smooth Rod	1
<b>Elbow Belt Tensioner</b>	4mm x 13mm x 5mm Bearing	3
	M4 x 20mm Screw	1
	M4 Nut	1
<b>Elbow Joint</b>	M3 Heat-Set Inserts	6
	5mm to 8mm Shaft Coupler	1
	8mm x 22mm x 7mm Bearing	1
	M3 x 10mm Screw	2
	M3 x 40mm Screw	6
	M8 x 40mm Threaded Rod	1

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	Nema 17 Motor	1
	50cm T5 Belt	1
<b>Wrist Base</b>	M8 Locknut	1
	8mm x 22mm x 7mm Bearing	3
	M3 Heat-Set Inserts	6
	M4 Heat-Set Inserts	2
	M3 x 10mm Screw	6
	M3 x 30mm Screw	1
	M3 Nut	1
	Nema 14 Motor	1
	T5 Pulley 5mm Bore	1
	M4 x 20mm Screw	1
	8mm x 80mm Smooth Rod	1
<b>Wrist Tensioner</b>	3mm x 10mm x 4mm Bearing	3
	M4 x 20mm Screw	1
	M4 Nut	1
<b>Wrist Joint</b>	M3 x 25mm Screw	3
	M3 Heat-Set Inserts	7
	35cm T5 Belt	1
<b>Gripper</b>	M3 x 16mm Screw	10
	M3 Washer	7
	M3 Heat-Set Inserts	10
	M3 x 10mm Screw	4
	Servo Motor	1
	M3 Thread-Forming Screw	4
<b>Base Motor</b>	Nema 17 Long Motor	1
	M3 x 10mm Screw	4
<b>Base and Electronics</b>	16" x 16" x 0.75" Plywood	1
	M4 x 55mm Screw	4
	M4 x 45mm Screw	4
	M4 x 40mm Screw	4
	M4 Washer	12
	M4 Nut	8
	Arduino Mega 2560	1
	RAMPS Shield	1
	DRV8825 Stepper Drivers	5
	24V 240W Power Supply	1
	Power Supply Interface PCB	1
<b>Base Legs (parts for all four)</b>	M4 Heat-Set Inserts	4
	M4 x 40mm Screw	2
	M4 Nut	2