

Programmable Roboxsumo – Parts List – R1 083015

There is a required parts list and an optional parts list for the Roboxsumo program. Two lists are provided below. The first list is parts that students must have to assemble the basic functional robot. The second list is accessories for the experiments and further exploration. Pricing is provided where available, but you need to go to each source to confirm pricing. If you can get the same part at another location for a better price, please do so... and let me know.

Required Parts

PART	Qty	Suggested Source	Part number	Price
Base Plate	1	Fab in house – See (1) Lowes	See (1)	\$0.50
Servo Plate	2	Fab in house – See (2) Lowes	See (2)	\$0.14
Arduino Uno Controller	1	Digikey	1050-1041-ND	\$19.00
Servo – Cont. Rotation	2	Pololu	#2820	\$4.46
Wheel – Futaba design	2	Pololu	#226, #227, #228, #229 (3)	\$2.80
Ball Caster 3/8"	1	Pololu	#950	\$1.99
9V Battery holder w/2.1mm plug	1	Jameco	2207030	\$2.95
9V Battery	1	Various	Various (4)	NA
Spacer 3/16" OD ½ Length	4	McMaster Carr	94639A640	\$0.09
4-40 x 1 Screw	8	McMaster Carr	90279A115	\$0.06
4-40 nut	8	McMaster Carr	90480A005	\$0.01
4-40 washer	8	McMaster Carr	90126A505	\$0.01
Double Sided foam tape	3"	Lowes	237168	\$0.09
Main Harness	1	Fab in house – See (5)	See (5)	NA
USB Cable – A-B – 3'	1	Monoprice	#5437	\$1.02

- (1) The base plate is fabricated locally by cutting up pieces of inexpensive ¼" plywood material. Lowes part number 68239 was used for this. The dimensions and hole locations are provided on the base plate drawing available in documents section of the Roboxsumo website.
- (2) Servo brackets are made from ½" x 1/8" aluminum strip. Lowes part number 11285 was used for this. Wood or other materials could also be used. Dimensions for the standard servo bracket are provided on the servo bracket drawing available in the documents section of the Roboxsumo website.
- (3) There is no wheel that directly mounts to the servo listed. However, you can use this wheel with good results by using the adapters that come with the servo. That is described in the assembly instructions. Pololu states they are looking at producing a custom wheel for this servo. Note... there are several colors available in this style. Each color has a different part number, but the wheel is the same. Four different part numbers are given for four different color options.
- (4) The 9V battery is the simplest and most cost effective way to operate this robot. Purchase good quality batteries or use rechargeable. The servos will drain the battery quickly and low quality batteries will not last very long.
- (5) The main harness can be made in house... There are several variations and each requires a slightly different manufacturing method. See the harness assembly document for additional details on construction and parts.

Activity parts

These are suggested parts for additional development activities. These parts are required to follow through on the activities described in the posted camp program.

PART	Qty	Suggested Source	Part number	Price
Servo – Standard Rotation	1	Pololu	#1053	\$4.46
Snap Action limit switch	1	Digikey	CH994-ND	\$4.30
Red hookup wire with terminal	1	Various (6)	See (6)	NA
Black hookup wire with terminal	1	Various (6)	See (6)	NA
Green hookup wire with terminal	1	Various (6)	See (6)	NA
Red Light Emitting Diode	1	Digikey	C566C-RFS-CT0W0BB2CT-ND	\$0.22
Resistor 150 Ohm – 1/8W	1	Digikey	CF18JT150RCT-ND	\$0.04
Alligator clips	2	Various (7)	See (7)	\$0.30

- (6) These hookup wires were developed to provide a ready connector to the snap action switch and extra wire for other experiments. Each wire is a 3' piece of colored 22ga wire with a single female ¼" spade terminal. The wire is McMaster Carr part number 8251T2 (specify color when ordering) and the terminal is Digikey part number A27817-ND. Students can cut the wire to length for required functions.
- (7) Alligator test leads are available from many sources. A source for very cost effective alligator clips is All Electronics Corp. However, they are not high quality and it is important to check or test them to make sure the wires are properly connected. See All Electronics Corp part number MTL-10 (10 leads for \$2.95).

Parts Sources Listed

All Electronics Corporation - www.allelectronics.com

Digikey – www.digikey.com

Jameco Electronics – www.jameco.com

McMaster Carr – www.mcmaster.com

Monoprice – www.monoprice.com

Pololu Robotics and Electronics – www.pololu.com