

Appendix A: List of Parts

The following is a complete list of all parts used in the project, grouped by assembly, and numbered for use in this report. The part numbers on the far left are the numbers by which parts are referred to in this report.

#	PART NAME	QTY	MFG/PART #	DESCRIPTION	MANUFACTURED (Y/N)
Rice Container					
1C	Rice Container	1	[Manufactured from raw material]	Rigid enclosure that holds rice	Yes
2C	Rice Container Door	1	[Manufactured from raw material]	Rice container door	Yes
3C	Hinges	1	Lowes, 138838	Hinges for the grain door	No
4C	Rice Clip	1	[Manufactured from raw material]	Attaches solenoid to rice container door	Yes
5C	Solenoid	1	Jameco, 142463CR	Solenoid for pulling pin out and opening door mechanism	No
6C	Edge Brackets	14	Lowes, 2460254	Brackets for assembly of container	No
7C	Solenoid Clip	1	Lowes, 52315		No
8C	Nuts (1/8")	8	Lowes, 31289		No
9C	Rod Retainers	4	Lowes, 264058		No
10C	Bolts (.125" x 1.75")	2	Lowes, 31289		No
11C	Bolts (.5" x .125")	8	Lowes, 35202		No
Drive Assembly					
1D	Drive Pulleys	2	SDP/SI, A 6R 4-B024585	Front Drive Pulleys, Nylon	No
2D	Drive Belts	2	SDP/SI, A 6R 4-D064075	Drive Belts	No
3D	Bushings	30	McMaster-Carr, 6389K352	Nylon Bushings for Axles	No
4D	Rail Spacers	8	Lowes, 30251	1" aluminum spacer cylinder	No
5D	Sprockets	4	SDP/SI, 25B12-1/4	Sprockets on axles and motor shaft	No
6D	Drive Motors	2	Jameco, 253526CR	Individual Drive Tread Motors	No
7D	Chain	2	[AME Dept]	Connects drive shafts to motor; 6 in length	No
8D	Non-Drive Pulleys	4	[RPT Strebinger]	Support the drive belts in the center and rear of vehicle	Yes
9D	Front Traction Wheels	2	[RPT Strebinger]	Extra Drive Wheels attach to front axle and give extra grip	Yes
10D	Washers	4	Lowes, 82715		No
11D	Bolts (.5" x .125")	6	Lowes, 31289		No
12D	Front Axle Support	1	[Manufactured from raw material]		Yes
13D	Frame Rail	4	[Manufactured from raw material]		Yes
14D	Front Wheel Axle	2	[Manufactured from raw material]		Yes
15D	Rear Wheel Axle	2	[Manufactured from raw material]		Yes
16D	Drive Motor Mount	1	[Manufactured from raw material]		Yes
17D	Drive Motor Mount II	1	[Manufactured from raw material]		Yes
Electronics					
1E	Microcontroller	1	[AME Dept]	Mini-max microcontroller with a PIC16f877A microprocessor	No
2E	H-Bridges	3	Newmicros.com,NMIH 0036	3A H-bridges for motors	No
3E	Rotary Encoder	1	Mouser, ECW0J-C24-BE0024	Senses Angular Position of Swing Arm	No
4E	9V Batteries	4	Ebay, Energizer 9V 4 pcs	9V Alkaline Batteries	No
5E	AA Batteries	144	Ebay, Energizer AA 144 pcs	AA Alkaline Batteries	No
6E	Master switch 1	1	Jameco, 196754CR	Black rocker switch	No
7E	Master switch 2	5	Jameco, 196154CR	Black rocker switch	No
9E	Pushbutton switches	1	Jameco, MS102	Red pushbutton switches	No
11E	Umbilical connector	4	[AME Dept]	Wiring for umbilical cord, solenoid conn., battery packs, etc.	No
12E	Wiring	1	[AME Dept]	10 pin connector for umbilical cord	No
13E	Plastic Enclosure	1	PacTec.com, XP9 RB	Handheld controller	No
14E	Linear potentiometer	2	Mouser, RA4520-10-20D1-B53	5K ohm, 45mm	No
15E	Fuse	10	Jameco, 103915	5 mm by 20 mm miniature fuse	No
16E	Fuse holder	1	Jameco, 109330CR	Miniature Fuse Holder; Low profile.	No
17E	Battery holder	1	Jamco, 216240	8-AA Battery Holder	No
18E	9V Clip	2	Jameco, 11279	BAT CLIP, For 9V	No
19E	Encoder Bracket	1	[Manufactured from raw material]	Bracket to attach encoder	Yes
Frame Assembly					
1F	Bolts and Nuts (.125" x 1.75")	10	Lowes, 31289	Bolts and nuts for attaching the frame rails together	No
2F	Bolt Spacers	4	Lowes, Hillman 7828	Spacers for frame bolts, needed to separate the rails	No
3F	Frame Rails	1	Lowes, 55959	6010 Aluminum Plate	No
4F	Aluminum Plate Material	1	[AME Dept]	6000 Grade Aluminum sheeting for chassis connection	No
5F	Front Axle Connector	1	[AME Dept]	6000 Grade Aluminum block to stabilize front axles	No

6F	Chassis Bracket	1	[Manufactured from raw material]		Yes
7F	Chassis Bracket 2	1	[Manufactured from raw material]		Yes
8F	Chassis Bracket B	1	[Manufactured from raw material]		Yes
9F	Bottom Supports	2	[Manufactured from raw material]		Yes
10F	Top Sheet	1	[Manufactured from raw material]		Yes
11F	Bolts (.5" x .125")	16	Lowes, 31289		No
12F	Rice Container Support 1	2	[Manufactured from raw material]		Yes
13F	Rice Container Support 2	2	[Manufactured from raw material]		Yes

Swing Arm Assembly

1S	Gear Motor	1	Russell Sales, 8124	Gear motor	No
2S	Axle Sprockets	2	SDP/SI, 25B12-3/8	Sprockets on axles - 3/8" diam	No
3S	Motor Sprockets	2	SDP/SI, 25B12-5/16	Sprockets on motor - 5/16" diam	No
4S	Chain	2	[AME Dept]	Connects drive shafts to motor; 6 in length	No
5S	Axles	1	Lowes, 74602	6010 Machinable Aluminum bars	No
6S	Bushings	20	McMaster-Carr, 6389K352	Nylon Bushings for Axles	No
7S	Wheels	4	Waxman 2650	Wheels take off roller caster	No
8S	Spacers	4	Lowes, Hillman 880440	Nylon Spacers, 1 per Swing arm	No
9S	Roll Pins	4	Lowes, Hillman 881421	Wheel Roll Pins	No
10S	Retaining Rings	8	Lowes, Hillman 881384	External Retainer Rings for Roll Pins	No
11S	Axle Gear	1	SDP/SI, 35442193	Connects Axle to Encoder Gear	No
12S	Encoder Gear	1	SDP/SI, 35442193	Connects Axle to Encoder Gear	No
13S	Front Swing-arm Rail	4	[Manufactured from raw material]		Yes
14S	Rear Swing-arm Rail	4	[Manufactured from raw material]		Yes
15S	Arm Block	4	[Manufactured from raw material]		Yes
16S	Swing arm axles	2	[Manufactured from raw material]		Yes
17S	Bolts (.5" x .125")	16	Lowes, 35202		No
18S	Nuts (.125")	16	Lowes, 35252		No
19S	Encoder motor bracket	1	[Manufactured from raw material]		Yes
20S	Swing-arm motor mount	1	[Manufactured from raw material]		Yes

* **Bolded red** part numbers denote manufactured parts