

FIRST ROBOTICS- PARTS AND SUPPLIERS LIST FOR 2012

rev Jan 31, 2012

(adapted from FIRST's Where to Get More database by Team Paragon Robotics-571)
 This parts list not endorsed or approved by US FIRST, so use with you best judgement
 Send suggestions for additional parts for the list to part-571@hotmail.com

---ELECTRICAL (WIRING + PARTS)---

Part Description	Supplier	Part Number	2012 KOP	Where to get more...	Notes	Price (10)
2-wire jumper cable	PCCables.com	3203	Y	www.pccables.com		\$ 1.65
Adapter, DB9 to RJ12	??	31D1-16400	Y			
	Marlin P Jones	14646PL		www.mpja.com		\$ 1.95
Battery	EnerSys	NP18-12	Y	www.enersys.com or www.dantona.com		
		am-0795 (set of 2)		www.AndyMark.com		\$ 83.00
		ES17-12 MK	N	www.mkbattery.com		
		am-0844 (set of 2)		www.AndyMark.com		\$ 83.00
Battery plug (charge status marker)	AndyMark, Inc	am-0122	Y	www.andymark.com		\$ 1.00
Battery Base Kit	AndyMark, Inc	am-0477	Y	www.andymark.com		\$ 14.00
Battery Charger	Batteries Plus	SC-600A	Rookie	many online retailers have carry this item. No specific outlet has been arranged.		
	Schumacher	SC-600A			www.amazon.com	
Battery Charger (3 bank)	AndyMark, Inc	am-2026		www.andymark.com		\$ 189.00
Battery plug and harness (assembled)	AndyMark, Inc	am-0009	Y	www.AndyMark.com		\$ 15.00
Battery plug (unassembled) SB50 #6 RED	Anderson Power Products, Delphi	6331G1		helmar fork lift parts	1	
		am-0546		www.AndyMark.com		\$ 3.50
Battery charger plug (unassembled) SB50 #10 RED	Anderson Power Products, Delphi					
		6331G2		helmar fork lift parts		
Cable Assembly, Ethernet	Lyme Computer Systems		Y	ubiquitous		
	PC Cables	02710 (10ft cable)		www.pccables.com		\$ 1.90
Cable Assembly, Ethernet crossover	Lyme Computer Systems		Y	ubiquitous		
	PC Cables	02219 (10ft cable)		www.pccables.com		\$ 2.99
Cable, RJ12 (6 conductor flat) (100ft spool) (1000ft spool)	??	8102-66107	Y			
	Digikey	H0061R-X-ND		www.digikey.com	6	\$ 20.85
	Marlin P Jones	6286WI		www.mpja.com		\$ 69.95
Cable RJ12- 6C x 7ft	Steren	306-707SL		www.amazon.com		\$ 0.99
Cable RJ12- 6C x 25ft	Phillips	SWL6160/17		www.amazon.com		\$ 2.09
C-Base	AndyMark, Inc	various		www.andymark.com		
Circuit breaker (20A)	Snap Action	VB3-A20-F57	Y	Cooper Bussman	1	
		am-0289		www.andymark.biz		\$ 6.00
Circuit breaker (30A)	Snap Action	VB3-A30-F57	Y	Cooper Bussman	1	
		am-0290		www.andymark.biz		\$ 6.00
Circuit breaker (40A)	Snap Action	MX5-A40	Y	Cooper Bussman	1	
		am-0288		www.andymark.biz		\$ 7.00
Circuit Breaker (120A)	Terminal Supply Company	CB3-SM-120	Y	http://terminalsupplyco.com/default.aspx	1	
		am-0282		www.andymark.com		\$ 29.00
DC/DC Pwr Converter (12V-5V)		CLL25-24S05	Y			
DB37 Extension Cable	Cables ToGo	02688	Y	www.cablestogo.com		\$ 19.99
DB37 Ribbon Extension Cable	AndyMark, Inc	am-0672		www.andymark.com		\$ 35.00
E-Stop Button	Engraved Pens	am-0515		www.andymark.biz	1,5	\$ 13.00
Jumper	FCI	68786-102LF	Y	ubiquitous		

		am-0658		www.AndyMark.com		\$ 0.25
Microswitch (large-without roller)	Honeywell	V7-2B17D8-048	Y	ubiquitous		
	Allied Electronics	642-2173		www.alliedelec.com		\$ 2.52
	McMaster-Carr	7090K37		www.mcmaster.com		\$ 7.91
Microswitch (mini-with roller)	Radio Shack	275-017		www.radioshack.com		\$ 3.19
Mini-Anderson Connectors		various		www.powerwerx.com		
Mini-Anderson Connectors		various		www.robotmarketplace.com		
Panel signal device (signal lamp)	Rockwell Automation	855PB-B12ME522	Y	http://shop.rockwellautomation.com	3	
				discontinued- Dec 2011		
Power connector, cRio	LXI Components	CTF040V8	Y	www.andymark.com or www.ni.com		
		am-0295		www.andymark.com		\$ 3.50
Power connector, Wago	Diamond Technologies	734-102	Y	www.diamonddt.com or 866-837-1931		
		am-0296		www.andymark.com		\$ 2.25
RC Extension cable (??)	Robot Marketplace	RC-218FJ36		www.robotmarketplace.com		
Repl #6 contacts for batt conn	Anderson Power Products, Delphi	903G1		helmar fork lift parts		
Repl #10 contacts for batt conn	Anderson Power Products, Delphi	904G1		helmar fork lift parts		
Rotary Limit Switch	AutomationDirect	AAP2T51Z11		www.automationdirect.com		\$ 14.25
Rotary Selector Switch (binary-16pos)	C&K	RTAC-22.5BSAD25S				
Serial Cable	Latham Time			not available - do not contact source		
Servo 6" extension cable (PWM cable)		SEA-01		LynxMotion		\$ 1.95
		276-1427 (pack of 4)		www.ifirobotics.com		\$ 19.95
Servo 12" extension cable (PWM cable)		SEA-02		LynxMotion		\$ 1.95
		am-0693	Y	www.andymark.com		\$ 2.50
		2184		www.pololu.com		\$ 2.49
Servo 24" extension cable (PWM cable)		SEA-03		LynxMotion		\$ 1.95
		am-0694		www.andymark.com		\$ 2.75
		2185		www.pololu.com		\$ 3.49
Servo 36" extension cable (PWM cable)		am-0695	Y	www.andymark.com		\$ 3.00
		276-1976 (pack of 4)		www.ifirobotics.com		\$ 19.95
Servo Y-splitter cable	Pololu	788 (modified, plastic covers removed)		www.pololu.com		\$ 3.25
		276-1423 (pack of 2)	Y	www.ifirobotics.com		\$ 14.95
				www.andymark.com		
Solderless Breadboard	Twin Industries	TW-E40-1020	Rookie	www.twinind.com		\$ 6.99
Terminal blocks (12pos, 10A, 8mm centers)	AutomationDirect	BM-M092CS (pack of 50)	Y	www.automationdirect.com		\$ 51.00
		274-680 (similar)		www.radioshack.com		\$ 2.99
Terminal Lug (bag of 8) (copper,screw compression terminal)	BURNDY	KPA4CUNPL	Y	BURNDY is not yet ready to take orders, in process www.homedepot.com		
Terminal Lugs (#6AWG, 1/4" lug))	BURNDY	YAZV6CTC14FX	Y	BURNDY is not yet ready to take orders, in process		
		am-0805		www.andymark.com		\$ 1.25
Terminal lugs- assorted			Y			
Tie wraps, 4"	BURNDY	CT18075C	Y	BURNDY is not yet ready to take orders, in process		
Tie wraps, 8"	BURNDY	CT50175C	Y	BURNDY is not yet ready to take orders, in process		
Window Motor Connector Housing		12129487	Y			
Window Motor Connector Pin		12110845	Y			
Wire- #6AWG red			Y			
Wire- #6AWG black			Y			

Wire- #10AWG red					
Wire- #10AWG black					
Wire- #12AWG red					
Wire- #12AWG black					
Wire-#12AWG red/blk zip cord		OC-12gZIP (per foot)		www.robotmarketplace.com	\$ 0.99
Wire- #14AWG red			Y		
Wire- #14AWG black			Y		
Wire-#14AWG red/blk zip cord		OC-14gZIP (per foot)		www.robotmarketplace.com	\$ 0.65
Wire- #18AWG red			Y		
Wire- #18AWG black			Y		

---ELECTRICAL (CONTROL)---

Part Description	Supplier	Part Number	2012 KOP	Where to get more...	Notes	Price
Analog Breakout	Diversified Systems	A003266 am-0867	Y	www.andymark.biz www.andymark.com	1	\$ 24.00
Analog Input Module	National Instruments	9201		www.ni.com/FIRST	1 & 3	
Camera, Axis 206	Anixter	288635		many online retailers have carried this item, however it has been discontinued. No outlet has been arranged.		
Camera, Axis M1011			Rookie			
Camera-Axis Case	NH Precision	Axis Case	Rookie	www.andymark.biz , drawings available at www.usfirst.org		
Camera Base	NH Precision	Axis Case	Rookie	www.andymark.biz , drawings available at www.usfirst.org		
Camera Pan Plate	NH Precision	Axis Case	Rookie	www.andymark.biz , drawings available at www.usfirst.org		
Camera Servo Brace	NH Precision	Axis Case	Rookie	www.andymark.biz , drawings available at www.usfirst.org		
Classmate Netbook	Intel/CTL Corp		Rookie	www.ctlcorp.com/shop	1	
Classmate battery						
Cypress Breakout PCB		am-0543		www.andymark.com		\$ 22.00
Digital I/O Module	National Instruments	9403		www.ni.com/FIRST	1 & 3	
Digital SideCar	Diversified Systems	A003333 am-0866	Y	www.andymark.biz www.andymark.com	1	\$ 82.00
Digital Sourcing Module	National Instruments	9472		www.ni.com/FIRST	1 & 3	
FirstTouch I/O Module	Cypress		Rookie	www.cypress.com > buy > development kits (use PSoC-U code for discount)		
		am-0564		www.andymark.com		\$ 30.00
FRC Controller and I/O kit (8slot)	National Instruments	NI-cRIO-FRC		www.ni.com/FIRST	1 & 3	\$ 750.00
FRC Controller and I/O kit (4slot)		NI-cRIO-FRC II	Rookie			\$ 525.00
Jaguar Kit (motor/jag/wire)		am-0990		www.andymark.com		\$ 129.00
Joystick, Attack 3	TigerDirect	963291-0403	Rookie	www.tigerdirect.com	6	
	Andy Mark	am-0598		www.andymark.com		\$ 24.00
NI Rookie packet	National Instruments		Rookie	www.ni.com/FIRST		
Power Distribution Board	Diversified Systems	A003206 am-0865	Y	www.andymark.biz	1	\$ 189.00
Radio, Driver Station	Insight/Calence	WRT160N		ubiquitous	1	
Radio, Robot	TigerDirect/Insight	WGA600N		www.tigerdirect.com	6	
	Linksys	WGA600N				
Radio, Robot	D-Link	DAP-1522	Rookie	many online retailers have carry this item. No specific outlet has been arranged.		
	Amazon			www.amazon.com		\$ 65.88
	New Egg			www.newegg.com		\$ 76.99

Relay Module (Spike)	Innovation First	SPIKE-RELAY-H 217-0220	Y	www.vexrobotics.com www.ifirobotics.com	1	\$ 34.95
Solenoid Breakout	Diversified Systems	A003265 am-0268	Rookie	www.andymark.biz	1	\$ 24.00
Speed Controller (Jaguar)	Texas Instruments (fma Luminary Micro	MDL-BDC 726-1189ND am-0878	Y	www.luminarymicro.com/jaguar Digikey www.andymark.com	3	\$ 99.00
Speed Controller (Victor 884)	Innovation First	FR-VIC884 VICTOR	Rookie	www.vexrobotics.com www.ifirobotics.com		\$ 89.99
USB 4-port hub	Targus	ACH74US (?)	Rookie	www.targus.com		\$ 26.99
VEX Motor Controller 29		276-2193	Y			

---MOTORS FANS SERVOS---

Part Description	Supplier	Part Number	2012 KOP	Where to get more...	Notes	
2½" CIM Motor	Vertical Engineering Sales, LLC	FR801-001	Y	www.andymark.com , www.banebots.com , www.robotshop.ca , or www.trossenrobotics.com		\$ 25.00
		am-0255		www.andymark.com		\$ 25.00
		217-2000		www.ifirobotics.com		\$ 28.00
		M4-R0062-12		www.banebots.com		\$ 13.00
9015 Motor (RS-500 series)	Andy Mark	am-0912	Y	www.andymark.com		\$ 13.00
Compact Fan (Large)	ebm papst	4212/12H	Y	Contact Dottie Reeve @ 860.284.4801 or dottie.reeve@us.ebmpapst.com		
Compact fan (mini)	ebm papst	412	Y	Contact Dottie Reeve @ 860.284.4801 or dottie.reeve@us.ebmpapst.com		
Mabuchi motor	Mabuchi	RS555SH-2670		not available - do not contact source		
Mabuchi motor	Mabuchi	RS555VC-3754		not available - do not contact source		
Window Motor - Left	Denso International America, Inc.	262100-3040	Y	not available - do not contact source		
Window Motor - Right	Denso International America, Inc.	262100-3030	Y	not available - do not contact source		
FisherPrice Motor (2011-12)	FisherPrice/PowerWheels	am-0821		www.andymark.biz		\$ 13.00
FisherPrice Motor (2009-10)		am-0316		www.andymark.biz		\$ 13.00
Mounting screw (M3x0.5 x 30mm)	McMaster-Carr	92005A132	Y	www.mcmaster.com	11	\$ 3.72
PG-71 Planetary Gearbox with RS775 Motor (2012)	Andy Mark	am-0914	Y	www.andymark.com		\$ 75.00
PG-71 Planetary Gearbox with 9015 Motor (2011)	Andy Mark	am-2084		www.andymark.com		\$ 89.00
RS-375 Motor	Bane Bots	M5-RS550-12	Y	www.banebots.com		\$ 5.25
RS-500 Motor	Bane Bots	M5-RS550-12	Y	www.banebots.com		\$ 7.25
RS-775 Motor (12V nominal)	Bane Bots	M7-RS775-12	Y	www.banebots.com		\$ 12.75
RS-775 Motor (18V nominal)	Bane Bots	M7-RS775-18		www.banebots.com		\$ 17.50
Servo	Hitec RCD	HS-322HD	Rookie	www.hitecrhd.com		
		LXDEL7		www.towerhobbies.com		\$ 9.99
Throttle Control Motor	Denso International America, Inc.	AE235100-0160	Y			
Two Wire Motor 393		276-2177	Y			

---MECHANICAL---

Part Description	Supplier	Part Number	2012 KOP	Where to get more...	Notes
Bearing Assortment	Triangle Manufacturing	various	Y	www.triangleOshkosh.com/robotics	
Bearing Block (1.5"squ x 3/8" bore)	Bane Bots	PB-S3751-BB		www.banebots.com	\$ 10.00
Bearing Block (2.5"squ x 1/2" bore)	Bane Bots	PB-S5002-BB		www.banebots.com	\$ 12.50
Belting - custom order	Gates Corporation	www.gates.com		www.gates.com/FIRST	2
Belting - FIRST kit	Gates Corporation		Y	www.gates.com/FIRST	
Chain, #25, 10ft length	MSC Direct	58636853		www.mscdirect.com	\$ 40.75
	McMaster-Carr				
Chain, #35, 10ft length 20ft length	MSC Direct	58636671	Y	www.mscdirect.com	\$ 29.58
	McMaster-Carr	6261K172		www.mcmaster.com	\$ 62.80
Coupler, Denso motor	Pelham Plastics	Denso-6	Y	an outlet has not been arranged - do not contact source	
DryLin N Linear Guide System	igus	NK02-40-2-610		www.igus.com	3
DryLin S Aluminum Shaft (5/8")	igus	AWI-10		www.igus.com	3
Energy Chain Cable Carrier	igus	05-4-038-0		www.igus.com	3
Energy Chain Mounting Bracket Set	igus	050-20-12		www.igus.com	3
FIRST Wheel, acetal, 8"	AndyMark, Inc	am-0494		www.andymark.com	\$ 12.00
FIRST Wheel, rubber, 8"	AndyMark, Inc	am-0420		www.andymark.com	\$ 12.00
FisherPrice Gearbox	FisherPrice/PowerWheels		Y	not available - do not contact source	
Gears (misc)	Boston Gear			www.bostongear.com	
	McMaster-Carr			www.mcmaster.com	
	PIC Design			www.pic-design.com	
	AndyMark, Inc			www.andymark.com	
Gear 19T, 32DP	AndyMark, Inc	am-0604		www.andymark.com	\$ 10.00
Gear 60T, 32DP	AndyMark, Inc	am-0927		www.andymark.com	\$ 15.00
igus bag (assortment)	igus		Y	www.igus.com	
iglide bearing (5/8" sleeve)	igus	JSI-1012-08		www.igus.com	3 \$ 2.60
iglide bearing (5/8" flanged)	igus	JFI-1012-08		www.igus.com	3 \$ 3.09
iglide bearing (5/8" thrust)	igus	MTI-10		www.igus.com	3 \$ 2.70
iglide bearing (3/8" bushing)	igus	MCI-06-02		www.igus.com	3 \$ 1.62
igubal Flange Bearing (5/8") (adjustable flanged bearing)	igus	EFOI-10		www.igus.com	3 \$ 10.28
igubal Rod End Bearing	igus	EBRI-10R		www.igus.com	3 quote
Latex Tubing	Kent Elastomer		Y	ubiquitous	
Lazy Susan (3in square)	Triangle Manufacturing	3C		www.triangleOshkosh.com/robotics	
Lazy Susan (4in square)	Triangle Manufacturing	4C		www.triangleOshkosh.com/robotics	
Lazy Susan (6in square)	Triangle Manufacturing	6C		www.triangleOshkosh.com/robotics	
Lazy Susan (6in round)	Triangle Manufacturing	6C2501		www.triangleOshkosh.com/robotics	
Lazy Susan (9in round)	Triangle Manufacturing	9C		www.triangleOshkosh.com/robotics	
Lazy Susan (12in round)	Triangle Manufacturing	12C		www.triangleOshkosh.com/robotics	
Lead Screw w/ nut	Haydon Kerk Motion Products	BZ8M16 X 15"		www.haydonkerk.com	
Master Link for #35 Chain	MSC Direct	58639006	Y	www.mscdirect.com	\$ 0.87
		6261K191		www.mcmaster.com	\$ 0.72
One-pitch link	PEER Chain	??		www.peerchain.com	
Output sprocket, double, 15 tooth	AndyMark, Inc	S35-15DHE			
		am-0421		www.andymark.com	\$ 10.00

Output sprocket, double, 12 tooth	AndyMark, Inc	am-0736	Y	www.andymark.com		\$ 9.00
P60 Planetary Gearbox (for 375 motor)	Bane Bots	various		www.banebots.com		\$44-74
P60 Planetary Gearbox (for 500 motor)	Bane Bots	various		www.banebots.com		\$44-74
P60 Planetary Gearbox (for 775 motor)	Bane Bots	various		www.banebots.com		\$44-74
P80 Planetary Gearbox (for CIM motor)	Bane Bots	various		www.banebots.com		\$79-157
PG-71 Planetary Gearbox Only (2011)	Andy Mark	am-0939		www.andymark.com		\$ 60.00
Reflective Material	Reflexite	GP020	Y			
	AndyMark, Inc	am-0905				\$ 20.00
Shaft Collar assortment	Ruland		Y			
Shaft Coupling assortment	Ruland		Y			
Sprockets - custom order	Gates Corporation	www.gates.com		www.gates.com/FIRST	2	
Toughbox (transmission)	AndyMark, Inc	various		www.andymark.com		
Wheel, 6" Hi-Grip	AndyMark, Inc	am-0940	Y	www.andymark.com		\$ 10.00
Wheel bearings, 1614ZZ (3/8"ID 1-1/8"OD)	AndyMark, Inc	am-0209		www.andymark.com		\$ 5.00
	McMaster-Carr	6384K58		www.mcmaster.com		\$ 7.25
Wheel bearings (1/2"ID 1-1/8"OD)	AndyMark, Inc			www.andymark.com		\$ 5.00
	McMaster-Carr			www.mcmaster.com		\$ 7.25
	Bane Bots	MB-S500B-1		www.banebots.com		\$ 1.75
Wheel sprocket, 22-tooth, alum	AndyMark, Inc	am-0245		www.andymark.com		\$ 9.00
Wheel sprocket, 22-tooth, steel	BandB Manufacturing	35A22 (min bore)		www.bbman.com		\$ 6.70

---SOFTWARE---

Part Description	Supplier	Part Number	2012 KOP	Where to get more...	Notes
Autodesk Software Tools	Autodesk			www.autodesk.com/first	2
Designer software	Altium	n/a		www.altium.com	2
FRC Software Bundle	National Instruments			frcparts@usfirst.org	
Java Postcard	Sun Microsystems	n/a		http://first.wpi.edu/FRC/frcjava.html	
Mathcad	PTC			www.ptc.com/go/first or firstsupport@ptc.com	2
Pro/ENGINEER	PTC	for creating CAD models	Y	www.ptc.com/go/first or firstsupport@ptc.com	2
ProductView	PTC	for visualizing your robot design	Y	www.ptc.com/go/first or firstsupport@ptc.com	2
Restoration Key (USB)	TigerDirect.com			www.tigerdirect.com to purchase a drive, frcparts@usfirst.org to have it reimaged	
Windchill	PTC	for team collaboration	Y	www.ptc.com/go/first or firstsupport@ptc.com	2

---SENSORS---

Part Description	Supplier	Part Number	2012 KOP	Where to get more...	Notes
Encoder, 360PPR, kit of 2 sets	US Digital	am-0791		www.andymark.com	\$ 62.00
Encoder, 250PPR, kit of 1 set	US Digital	am-0180		www.andymark.com	\$ 33.00
Encoder, 250PPR, 1 set, no cable	US Digital	am-0174		www.andymark.com	\$ 23.00
Encoder -Base	US Digital	E4P-360-250-S4149		www.usdigital.com/first	
Encoder - Codewheel	US Digital	E4P-360-250-S4149		www.usdigital.com/first	
Encoder - Cover	US Digital	E4P-360-250-S4149		www.usdigital.com/first	
Encoder - Installation Tool	US Digital	E4P-360-250-S4149		www.usdigital.com/first	
Magnetic encoder, board	austria microsystems	AS5030		http://www.austriamicrosystems.com/eng/Products/Magnetic-Encoders	

Magnetic encoder, magnet	austria microsystems			http://www.austriamicrosystems.com/eng/Products/Magnetic-Encoders		
Miscrosoft Kinect	Microsoft		Y			
Sensor panel	Analog Devices/Diversified Systems	Gyro	Y	The gyro is unique and is not available for purchase. Comparable gyro is available at www.digikey.com		
Sensor panel	Analog Devices/Diversified Systems	Accelerometer	Y	www.digikey.com		
Sonar Range Finder	Max Botix Inc	LV-MaxSonar-EZ1	Y	www.maxbotix.com		

---PNEUMATIC---

Part Description	Supplier	Part Number	2012 KOP	Where to get more...	Notes	
Air Compressor	Gardner Denver Thomas, Inc.	405ADC38/12		www.drillspot.com		\$ 365.81
	Viair	am-2005	Rookie	www.AndyMark.com		\$ 64.00
Accumulator (16cu in)	Clippard	AVT-32-16		www.clippard.com		\$ 29.60
Accumulator (32cu in)	Clippard	AVT-32-32	Y	www.clippard.com		
Accumulator (30cu in)	Andy Mark?	am-2007		www.AndyMark.com		\$ 14.00
Accumulator mtg bracket (lg)	Andy Mark?	am-2008		www.AndyMark.com		\$ 3.00
Bimba Cylinders - custom order	Bimba Manufacturing			www.bimba.com	2	
Brass bag	Parker - Brass Division	PKT12326	Y	to find distributors, click http://www.parker.com/portal/site/PARKER/menuitem.5f7d57d9c19d0b688621d68a237ad1ca/?vgnextoid=2f2880961f66e010VgnVCM1000000308a8c0RCRD&vgnextfmt=default . Follow <i>Product Selection: FITTINGS > INDUSTRIAL FITTINGS > BRASS AND PLASTIC INDUSTRIAL FITTINGS > BRASS AND PLASTIC INDUSTRIAL FITTINGS - INCH ></i>		
Brass Reducer 1/4F x 1/8M		6MN88		www.grainger.com	9	\$ 18.04
Dump Valve		am-2023		www.AndyMark.com		\$ 7.50
		CMVL-25		midwest control?		
Main Regulator, adjustable	Norgren	R07-100-RNEA	Y	www.norgren.com/usa		
		am-2020		www.AndyMark.com		\$ 28.00
Main Regulator Mounting Kit	Norgren	18-025-003	Y	www.norgren.com/usa		
Pneumatics base kit	various	am-2000		www.AndyMark.com		\$ 269.00
Pneumatic fitting pack	various		Y			
Pneumatic tubing	Freelin-Wade	1J-151-48P-FW		www.protubing.com	3	
Pressure Gauge	Norgren	18-013-212	Y	www.norgren.com/usa		
		am-2003		www.AndyMark.com		\$ 15.00
Pressure Switch	Nason	SM-2B-115R/443	Y	www.nasonptc.com		
		am-2006		www.AndyMark.com		\$ 29.00
Relief Valve	Norgren	16-004-011	Y	www.norgren.com/usa		
		am-2002		www.AndyMark.com		\$ 32.00
Secondary Regulator (1/8" ports, 100PSI, yellow ring)	Monnier	101-3002-1		www.monnier.com		
Secondary Regulator Bracket	Monnier	13536	Y	www.monnier.com		
Solenoid valve (double coil)	FESTO	VUVG-L10-B52-T-M5		http://www.festo.com/cms/en-us_us/9697.htm		
		VUVG-L10-B52-T-M7				
Solenoid valve (single coil)	FESTO	13026684				\$ 31.95
Teflon tape	HPE Automation		Y	www.hpeco.com		
Teflon tape (1/4"W x 43ft)	Amazon	FRA900063		www.amazon.com		\$ 4.63
Teflon tape (1/4"W x 50ft)	McMaster-Carr	4591K11		www.mcmaster.com		\$ 2.31

---RAW MATERIALS---

Part Description	Supplier	Part Number	2012 KOP	Where to get more...	Notes	
Aluminum angle (1"x1" x 8ft)	Home Depot	56760				\$ 13.28
	Metals Depot	A311116-6063		www.metalsdepot.com		\$ 8.88
Aluminum extrusion (1"x1")	80-20	10-10		www.80-20.net		
Aluminum extrusion (1"x1" x8ft)	McMaster-Carr	47065-T101		www.mcmaster.com		\$ 26.36
Aluminum extrusion (1"x2")	80-20	10-20		www.80-20.net		
Aluminum extrusion (1"x2" x8ft)	McMaster-Carr	47065-T107		www.mcmaster.com		\$ 44.64
Aluminum sq tube 1"x1" x6ft	Home Depot	42330				\$ 21.64
	Metals Depot	T31116		www.metalsdepot.com		\$ 23.36
Bumper Fabric (Blue)	Seattle Fabrics	FC1-4345 Mariner Blue		www.seattlefabrics.com	7,8	\$ 13.50
	AH&H Fabrics			www.ahh.biz	7,8	\$ 15.30
Bumper Fabric (Red)	Seattle Fabrics	FC1-1500 Red		www.seattlefabrics.com	7,8	\$ 13.50
	AH&H Fabrics			www.ahh.biz	7,8	\$ 15.30
Pool Noodles (bumper core)	Ocean State Job Lot					\$ 1.99
Strut nut (1x 1/4-20)	80-20	3382		www.80-20.net		
	McMaster-Carr	47065-T142		www.mcmaster.com		\$ 2.30
Strut nut (2x 1/4-20)	80-20	3280		www.80-20.net		
	McMaster-Carr	47065-T147		www.mcmaster.com		\$ 4.29

---TOOLS ETC---

Part Description	Supplier	Part Number	2012 KOP	Where to get more...	Notes	
CD - Basic Electronic Measurement	Fluke Industrial			use www.fluke.com , "Where to Buy", enter zip code or online		
Chain Breaker (#25-60)	McMaster-Carr	6051K15		www.mcmaster.com		\$ 26.65
Chain Break/Splice Tool	Dave's Discount Motors	Dark Soul Chain Tool		www.davesmotors.com	6	\$ 26.99
	221 Robotic Systems	Dark Soul Chain Tool		www.team221.com		\$ 30.00
Crimper- #6AWG lugs	Burndy	Y1MRTC				
		am-0806		www.AndyMark.com		\$ 199.00
Crimper- #8-#2AWG Wire		360-646		www.parts-express.com		\$ 39.71
Crimper- #20-#6AWG Wire		360-644		www.parts-express.com		\$ 39.59
Crimper- #22-#10AWG Wire		360-642		www.parts-express.com		\$ 19.55
Crimper- RJ11/RJ12 Connectors	Radio Shack	279-405		www.radioshack.com		\$ 39.99
Crimper- mini Anderson Conn		TRICRIMP		www.powerwerx.com		\$ 39.99
Digital Multimeter	Fluke Industrial	2100135D		use www.fluke.com , "Where to Buy", enter zip code or online		
Gloves, pair	Grainger	2RA69	Y	ubiquitous		
Hand Tools- Misc	ACE Hardware Stores					
	Enco					
	Grainger					
	Home Depot					
	Lowe's					
	McMaster-Carr			www.mcmaster.com		
	MSC					
PTC Sticker	PTC			www.ptc.com/go/first or firstsupport@ptc.com	2	

- NOTES:
- 1) Per the game rules, this is the only permitted part of its kind in the FIRST Robotics Competition in order to facilitate a fair and even-handed competition.
 - 2) These items were not physically in the kit, but were donated to each FRC team through FIRST. To take advantage of the donation, please follow the link.
 - 3) This item may be available at a discount for FRC participants. The discount may be limited in availability, please contact supplier for details.
 - 4) Please note that terminals, hardware, and wire are ubiquitous and are not included on this list.
 - 5) Not used in 2012 game
 - 6) Not presently available (Dec 2012) from this supplier
 - 7) Price per yard
 - 8) 1000 Denier Cordura fabric
 - 9) Bag of 10 pieces
 - 10) Prices for reference only, not guaranteed- accurate at the moment they were investigated. Check price and availability.
 - 11) Pack of 100 pieces
 - 12) Send suggestions for additions to the list to parts-571@hotmail.com

