

Current Total	\$1297.34		\$3641.166				Dimensions										Total	Design Total
System	Part	Description	Build Qty Needed	Qty Have	Qty Per Package	Order Qty	Price per Package	Length (in)	Width (in)	Thick (in)	Diameter (in)	Material	Vendor	Part #	Total	Design Total		
Chassis																		
LIFT	ActionJac Ball Jack		2	2	1	0	\$500.00						Wellin		\$0.00	\$1,000.00		
LIFT	Ball Nut	for ActionJac	2	1	1	1	\$195.35						Nook Industries	SBN10325	\$195.35	\$390.70		
LIFT	Thrust Bearing	for 5/8" shaft	2	0	1	2	\$2.76						McMa	5909K32	\$5.52	\$5.52		
LIFT	Thrust Washer	for bearing	4	0	1	4	\$1.00						McMa	5909K45	\$4.00	\$4.00		
LIFT	Shaft Collar	for 1/2" shaft	2	0	1	2	\$3.30						McMa	6436K14	\$6.60	\$6.60		
LIFT	Flanged Radial Bearing	Radial support for leadscrew top end	2	0	1	2	\$7.46						McMa	6383K247	\$14.92	\$14.92		
LIFT	Ball Screw Support	welded to side walls	2	0	1	2		3.375 MIN	2.25	0.875 MIN		Steel		BULK	\$0.00	\$0.00		
LIFT	Rigid Coupling	for .375" Shaft	2	0	1	2	\$5.18							6412K13		\$10.36		
LIFT	Stepped Coupling	for .375" Shaft	1	0	1	1						Steel		BULK				
LIFT	Driveshaft	.375" shaft	1	0	1	1		11.5			0.375	Steel		BULK		\$0.00		
LIFT	Motor Bracket	3x3x.1875 Angle	1	0	1	1		3.5	3	0.1875		AL		BULK		\$0.00		
GUIDE RAILS	T Rails		4	4	1	0	\$100.00	18					Wellin		\$0.00	\$400.00		
GUIDE RAILS	T Rail Bearing	PTFE Linear Closed Bearing, 0.75ID 1.25OD 1.635L	4	0	1	4	\$5.69						McMa	2570K13	\$22.76	\$22.76		
GUIDE RAILS	External Retaining Ring	for Linear Bearings	4	0	1	4	\$0.59						McMa	9968K26	\$2.36	\$2.36		
GUIDE RAILS	Bearing Housing	housing for linear bearings	4	0	1	4		3.25	1.75	1.25		AL		BULK	\$0.00	\$0.00		
RAILS	Rail Support	machined block to hold spreader rails	4	0	1	4		2.625	1.5	1		AL		BULK	\$0.00	\$0.00		
RAILS	Rail	0.75" Rail from t-rails	2	2	1	0		24					Wellin		\$0.00	\$0.00		
RAILS	Flanged Radial Bearing	0.25 ID for leadscrew support, 1/16 FLANGE THK	5	0	1	5	\$2.87						McMa	6383K213	\$14.35	\$14.35		
RAILS	Flanged Radial Bearing	0.1875 ID for leadscrew support, From Fab@Home	3	3	1	0												
RAILS	Wave Spring Washer	For bearing thrust loading, need 3, 10 to a pack	3	0	1	3	\$8.06						McMa	9714K24	\$24.18	\$24.18		
RAILS	Timing Belt Gear	Reuse fab@home gears	2	2	1	0									\$0.00	\$0.00		
RAILS	Timing Belt	200" (XL) Pitch, 153 Teeth, 3/8" Wide, Neoprene Belt	1	0	1	1	\$8.19						SDP/SI	A 6R 3-153037	\$8.19	\$8.19		
RAILS	Motor Drive Gear	Miter Gears	2	0	1	2	\$3.16						McMa	7297K15	\$6.32	\$6.32		
RAILS	Leadscrew	3/8"-12 X 36" long	2	0	1	2	\$14.32						McMa	9903A001	\$28.64	\$28.64		
RAILS	Motor Bracket	1/8" sheet	1	0	1	1		4.3175	1.875	0.125		Steel		BULK	\$0.00	\$0.00		
CARRIAGE	Leadscrew Nut	for 3/8"-12 screw	2	0	1	2	\$19.84						McMa	95365A111	\$39.68	\$39.68		
CARRIAGE	Linear Bearing	PTFE Linear Closed Bearing, 0.75ID 1.25OD 1.635L	2	0	1	2	\$5.69						McMa	2570K13	\$11.38	\$11.38		
CARRIAGE	External Retaining Ring	for Linear Bearings	4	0	1	4	\$0.59						McMa	9968K26	\$2.36	\$2.36		
CARRIAGE	Carriage Block	machined aluminum block to mount spreader to	2	0	1	2		2.765 MIN	1.5 MIN	1.25		AL		BULK	\$0.00	\$0.00		
BUILD PLATE	Supports	may be steel rod in shop, actual metal here doesn't matter	6	0	1	6		8.5			1	AL		BULK	\$0.00	\$0.00		
BUILD PLATE	Build Platform		1	0	1	1		18	12	0.25		Steel		BULK	\$0.00	\$0.00		
BUILD PLATE	Short Rib		2	0	1	2		12	1	0.25		Steel		BULK	\$0.00	\$0.00		
BUILD PLATE	Long Rib		1	0	1	1		18	1	0.25		Steel		BULK	\$0.00	\$0.00		
BUILD BOX	End Wall		2	0	1	2		12	8		0.125	Steel		BULK	\$0.00	\$0.00		
BUILD BOX	Side Wall		2	0	1	2		24	8		0.125	Steel		BULK	\$0.00	\$0.00		
FRAME	Base Width	2" Square 0.125" Wall Al Tube	2	0	1	2		20.3				AL		BULK				
FRAME	Jack Mount	2" Square 0.125" Wall Al Tube	1	0	1	1		27				AL		BULK				
FRAME	Height	2" Square 0.125" Wall Al Tube	4	0	1	4		22				AL		BULK				
FRAME	Top Supports	2" Square 0.125" Wall Al Tube	2	0	1	2		16				AL		BULK				
FRAME	Base Spans	2" Square 0.125" Wall Al Tube	4	0	1	4		5				AL		BULK				
							Total Length =	17.3										
BOLTS	10-24 Set Screw		4	0	1	4								90251A240				
BOLTS	10-24 Bolt	Standard Head, 1/2" Length, for linear bearing attach	16	0	1	16								90128A220				
BOLTS	10-24 Bolt	Standard Head, 1/2" Length, for ball screw support attach	4	0	1	4								90128A220				
BOLTS	10-24 Bolt	Standard Head, 3/4" Length, for motor to bracket attachment	8	0	1	8								90128A222				
BOLTS	10-24 Washer	motor to bracket attachment	8	0	1	8								91083A011				
BOLTS	10-24 Nut	for motor to bracket attachment	8	0	1	8								90480A011				
BOLTS	3/8-16 Bolt	Flat Head, 3/4" Length, for build platform supports	6	0	1	6								91263A582				
BOLTS	3/8-16 Bolt	Standard Head, 5/8" Length, for supports to frame	6	0	1	6								90128A621				
BOLTS	1/4-20 Bolt	Standard Head, 7/8" Length, For ball screw attachment	8	0	1	8								90128A246				
BOLTS	1/4-20 Bolt	Standard Head, 1/2" Length, For Spreader rail attachment	9	0	1	9								90128A242				
BOLTS	1/4-20 Bolt	Standard Head, 5/8" Length, For Spreader rail attachment	3	0	1	3								90128A243				
BOLTS	1/4-20 Bolt	Standard Head, 5/8" Length, For motor bracket to frame	2	0	1	2								90128A243				
BOLTS	1/4-20 Washer	For motor bracket to frame	2	0	1	2								98029A027				
BOLTS	1/4-20 Nut	For motor bracket to frame	2	0	1	2								95505A601				
BOLTS	1/4 Shoulder Bolt	Standard Head, 2.25" Shoulder Length, For actionjac attachment	4	0	1	4								91259A104	\$30.00			
Spreader Head																		
Hopper	Container, Flap	Acrylic Sheet	1	0	1	1	\$32.76	36	12	0.25	-	Acrylic	McMa	8560K356	\$32.76	\$32.76		
Hopper	Flap Spring	2 inch lbs	1	0	1	1	\$5.50	1.25 (leg)		-	0.045 (wire)	302 Stainless	McMa	9287K141	\$5.50	\$5.50		
Hopper	L-Bracket	-	2	0	1	2	\$0.51	1	0.5	0.118		Steel	McMa	1556A26	\$1.02	\$1.02		
Hopper	Ball Bearing	-	2	0	2	1	\$8.96	0.5	0.4375	-	0.5 (inside)	Steel	McMa	6384K361	\$8.96	\$8.96		
Roller	Toner Roller		1	1	1	0		15.2	-	-	1.125	Aluminum	Scrap	-	\$0.00	\$0.00		

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Roller	Bracket		2	0	1	2	\$5.00	3.5	0.25	0.5		Steel	Scrap	-	\$10.00	\$10.00
Flapper	C Clamp	C Clamp to hold bracket in place	4	0	10	1	\$8.94				0.5		McMa	91590A122	\$8.94	\$3.58
Flapper	Extension Spring		2	0	10	1	\$1.00								\$1.00	\$0.20
Blade	Blade	Can use from bulk?	1	0	1	1	\$13.14	12	1	0.125	-	Steel	McMa	8131K351	\$13.14	\$13.14
Blade	Holder Clamps	Estimated Cost	2	0	1	2	\$10.00	2	1	0.5	-	-	Scrap	-	\$20.00	\$20.00
Blade	Bracket		2	0	2	1	\$5.00	3.5	1.25	0.25	-	Steel	Scrap		\$5.00	\$5.00
Base	Connector Bar		1	0	1	1	\$57.61	18	3	0.5	-	4140 Steel	McMa	8892K287	\$57.61	\$57.61
Base	Compression Spring	200 lbs./in	2	0	1	2	\$3.71	1.5			0.75		McMa	9575K32	\$7.42	\$7.42
Misc.	Bolts	Estimated Cost	20	0	10	2	\$10.00								\$20.00	\$20.00
Motion Control																
Motion	Arduino Mega 2560	MicroController	1	0	1	1	\$63.99						RobotShop	RB-Ard-19	\$63.99	\$63.99
Motion	Power for Z Axis Motor	24 Volt 2.7Amp Power Supply	1	0	1	1	\$100.00	5.75	3.25	1.74	-		Anaheim Automation	PSAM24V2.7A	\$100.00	\$100.00
Motion	Chassis Motor (Z)	Step Motor with Built In Driver	1	0	1	1	\$237.00	1.73	1.73	2.452	0.1968		Anaheim Automation	23MD306S-00-00-00	\$237.00	\$237.00
Motion	Carriage Motor (X)	Step Motor with Built In Driver	1	0	1	1	\$237.00	1.73	1.73	2.215	0.1968		Anaheim Automation	23MD306S-00-00-00	\$237	\$237.00
Motion	Relay (If Solenoid)	Relay (24V)	1	1	1	0	\$32.58	1	1	0.25	-		McMasterCarr	7456K14	\$0	\$32.58
Motion	Trough Door Motion	Solenoid	1	0	1	1	\$27.41	1.575	0.784	1.437	-		McMastercarr	69905K48	\$27.41	\$27.41
Motion	DB25 Breakout Board	Male Connection onboard	1	0	1	1	\$19.99						WindfordEng	BRK25M-R-FT	\$19.99	\$19.99
Motion	IDC26 to DB25	IDC26Female to DB25Female	1	0	1	1	\$3.99						Frys	257247	\$3.99	\$3.99
Motion	Xylotec Step Motor Controller	amplifier circuit for arduino items	1	1	1	0	\$185.00						Xylotec	XS-3525/8S-4	\$0	\$185.00
Motion	Sprayer Motor (Y)	Step Motor from Fab@Home	1	1	1	0	\$150.00						HSI	E35H4B-05-012ENG	\$0	\$150.00
Motion	Sifting Screw Motor	Step Motor from Fab@Home	1	1	1	0	\$145.50	1.1	-	-			HSI	E35H4B-05-013ENG	\$0	\$145.50
Motion	Rotating Roller Motor	Step Motor from Fab@Home	1	1	1	0	\$132.00	1.73	1.73	2.215	0.1968		HSI	E35H4P-05-010ENG	\$0	\$132.00
Motion	Sprayer Syringe Motor	Step Motor from Fab@Home	1	1	1	0	\$129.20						HSI	28F47-05-023ENG	\$0	\$129.20

Part	Notes	QTY NEEDED	TYPE	Length (in)	Width (in)	Thick (in)	Diameter (in)	Area (in^2)	Total Length (in)	Material
CHASSIS										
Ball Screw Support	weldable to side walls	2	Bar	4.25	2.375	0.875			8.5	Steel
Spreader Rail Support		4	Bar	2.5	1.625	1.125			10	AL
Linear Bearing Housing		4	Bar	3.375	1.875	1.375			13.5	AL
Lift Bracket	3" x .1875" Angle bracket	1	Angle	4	3	0.1875				Al
End Wall	weldable	2	Sheet	12.125	8.125	0.125		197.03125		Steel
Side Wall	weldable	2	Sheet	24.125	8.125	0.125		392.03125		Steel
Spreader Bracket		1	Sheet	4.125	3.125	0.125		12.890625		Steel
Build Platform	weldable	1	Plate	18.125	12.125	0.25		219.765625		Steel
Short Rib	weldable	2	Plate	12.125	1	0.25		24.25		Steel
Long Rib	weldable	1	Plate	18.125	1	0.25		18.125		Steel
Supports	actual mat'l doesn't matter	6	Rod	8.125			1		48.75	AL
Thrust Support		4	Rod	2.125			0.5		8.5	AL
Driveshaft	.375" shaft	1	Rod	13.625			0.375		13.625	Steel
Frame Rails	2" x .125" square tube, 18 ft	18	Tube	12					216	Al
ALL DIMENSIONS HAVE AT LEAST 1/8" MACHINING CLEARANCE ON EACH DIMENSION										
SPREADER HEAD										
Carriage Block		2	Bar	2.765 MIN	1.5 MIN	1.25				AL