



# UAV DASL Antenna

Team D1:  
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Dustin Branges  
Daniel Johnson

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# PROJECT DESCRIPTION

- Dr. Shafer - Dynamic and Active Systems Lab (DASL)
- National Science Foundation (NSF)
- Unmanned Aerial Vehicle (UAV) to track wildlife
- Using Very High Frequency (VHF) telemetry tag tracking
- Need to gimbal antenna for better data



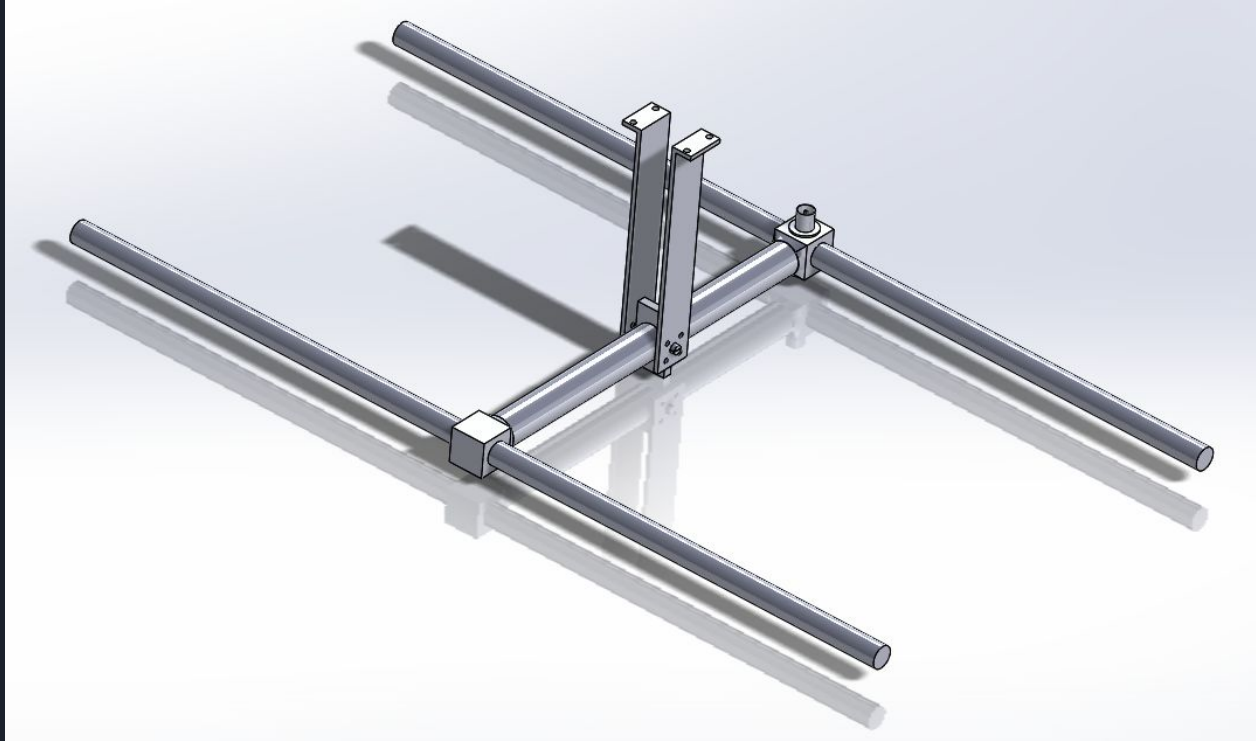


# BACKGROUND

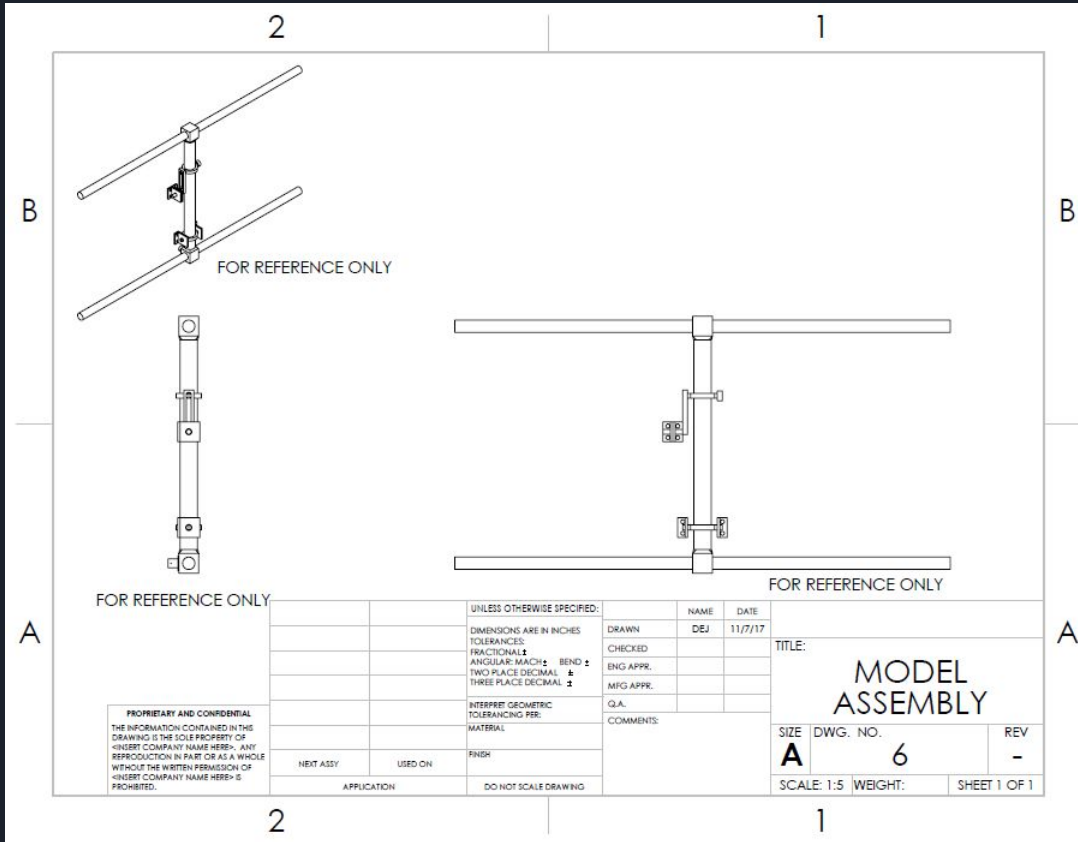
- Modular octagon housing
- Gimbal antenna to the bottom housing plate



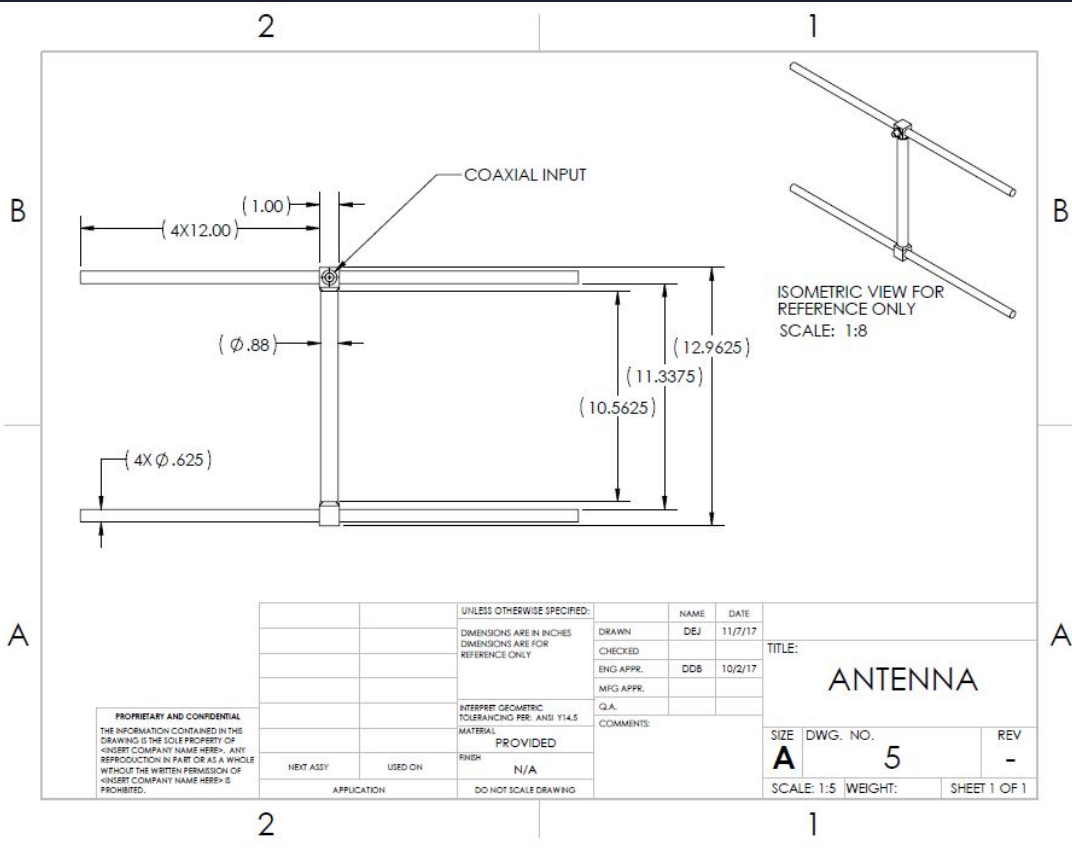
# INITIAL DESIGN



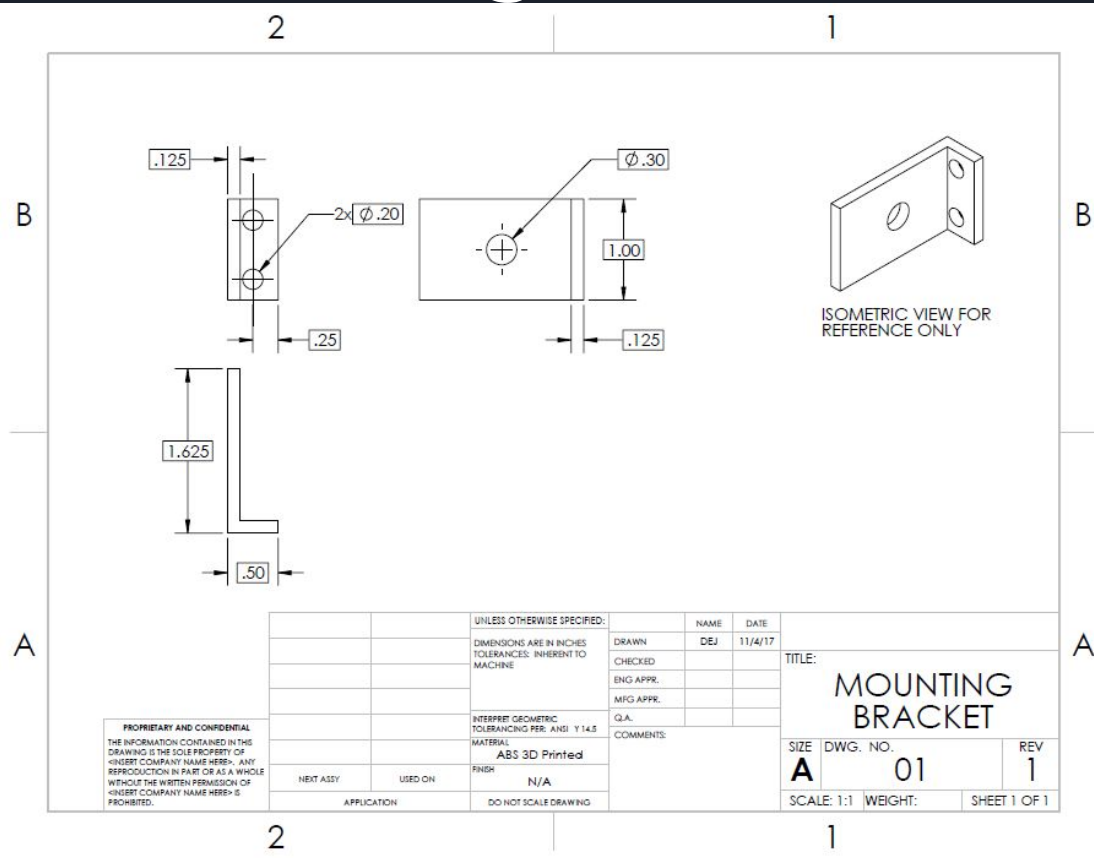
# Assembly Drawing



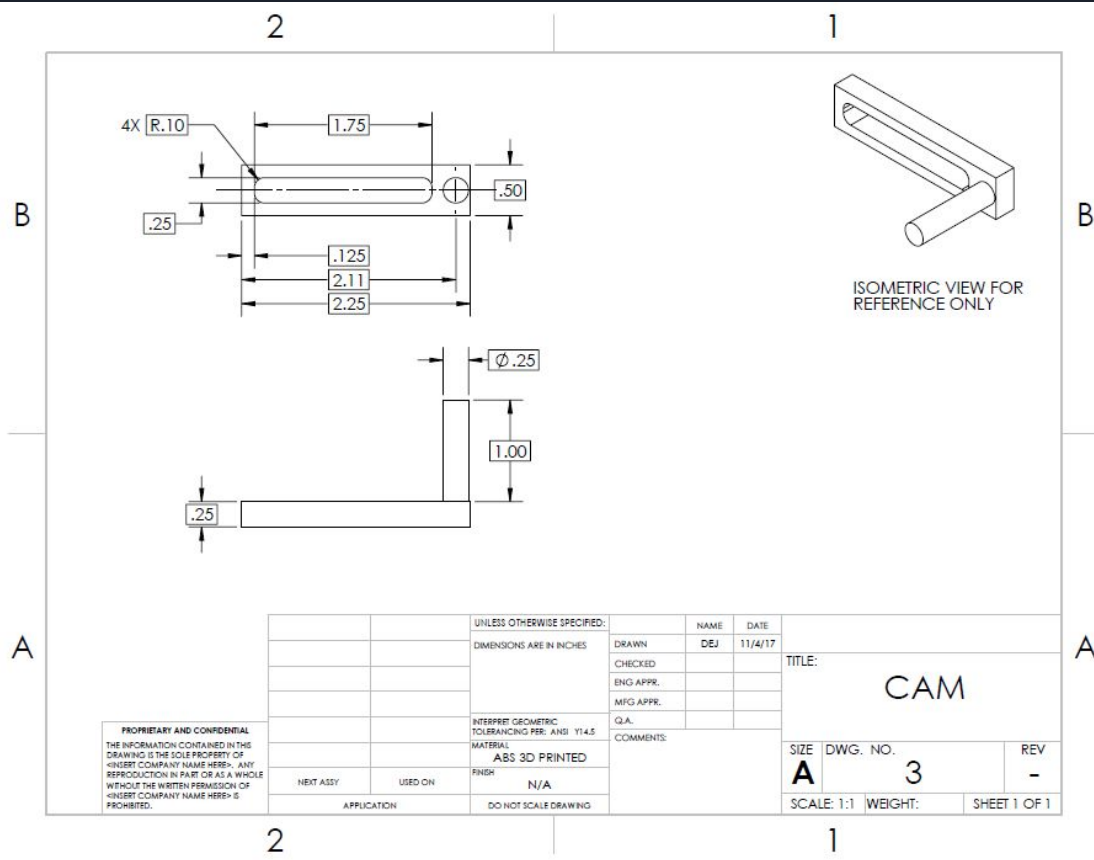
# Antenna



# Mounting Bracket

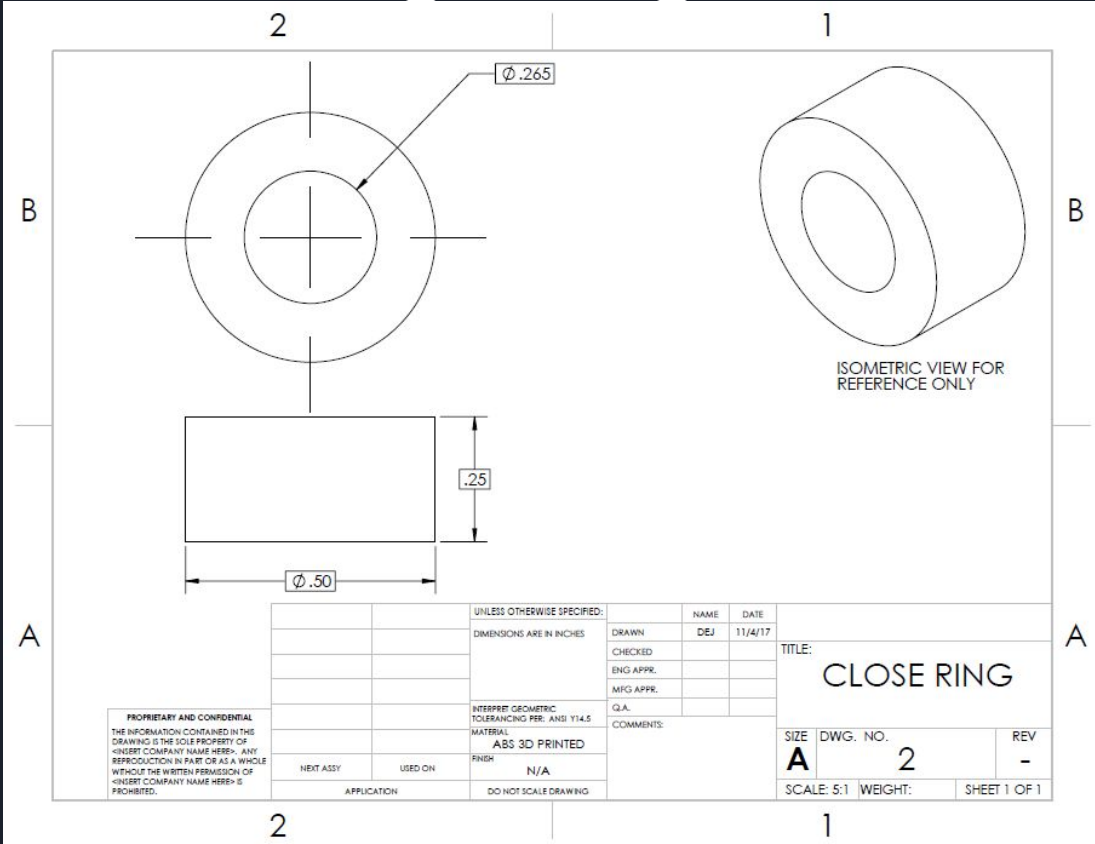


# Cam

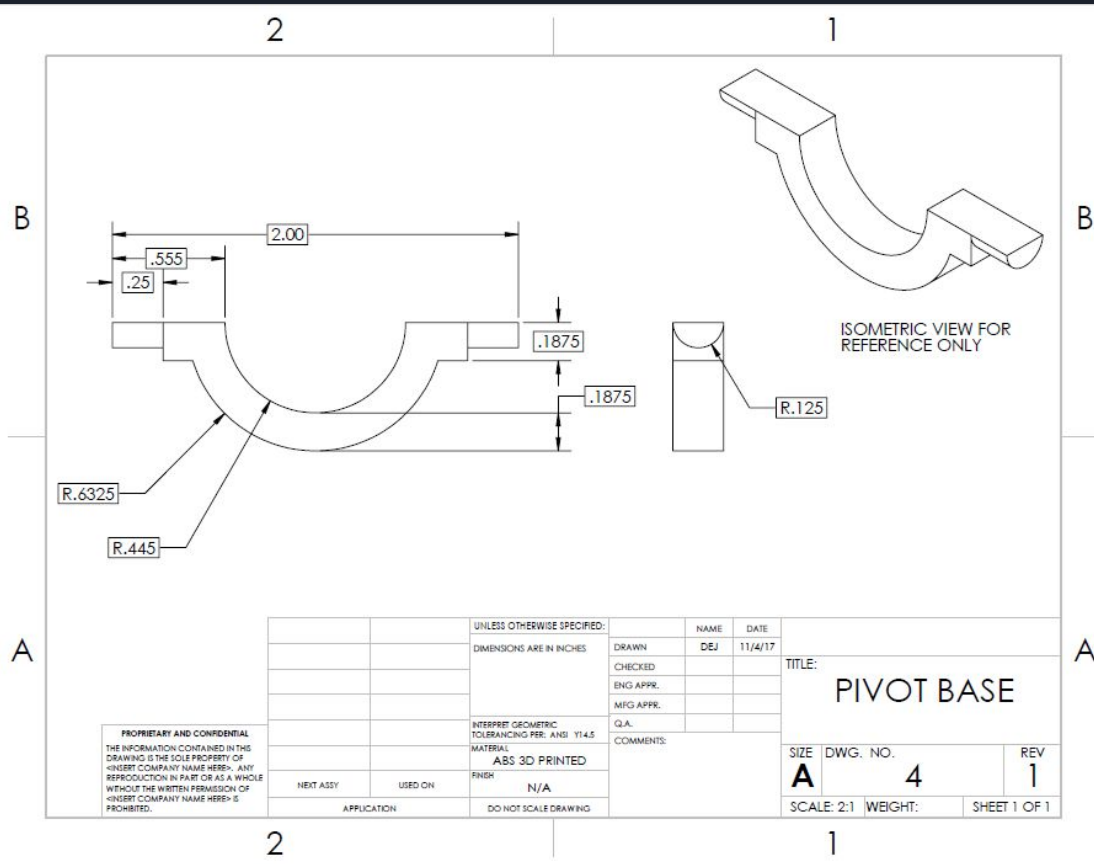




# Holding Ring



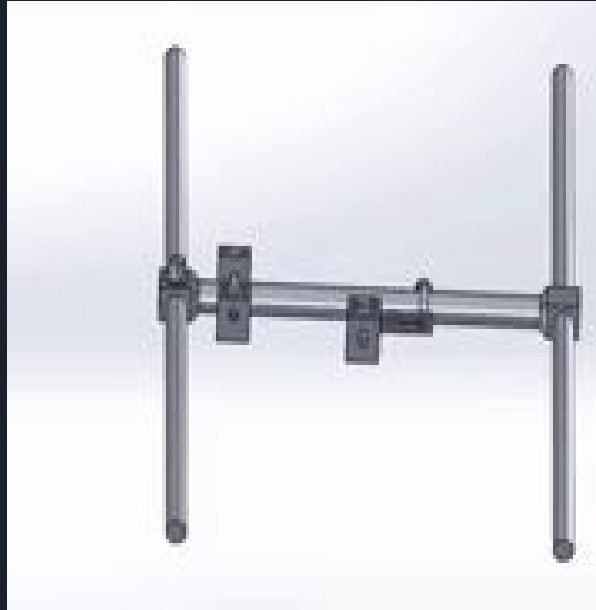
# Pivot Base



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		UNLESS OTHERWISE SPECIFIED:			NAME		DATE	
		DIMENSIONS ARE IN INCHES			DRAWN	DEJ	11/4/17	
					CHECKED			
					ENG APPR.			
					MFG APPR.			
					Q.A.			
					COMMENTS:			
		INTERPRET GEOMETRIC TOLERANCING PER: ANSI Y14.5			TITLE: <b>PIVOT BASE</b>			
		MATERIAL: ABS 3D PRINTED						
		FINISH: N/A			SIZE		DWG. NO.	
		NEXT ASSY			A		4	
		USED ON			SCALE: 2:1		REV	
		APPLICATION			WEIGHT:		1	
		DO NOT SCALE DRAWING			SHEET 1 OF 1			

# DESIGN MOTION STUDY



# BUDGET

- Budget Goal < \$500
- Budget Allowance < \$1,000

Part Name	Part #	Cost (\$/part)	Quantity	Total (\$)	Location
Arduino Pro Mini 5V	DEV-11113	9.95	1	9.95	SparkFun
FTDI Cable 5v	DEV-09718	17.95	1	17.95	SparkFun
Break Away Headers - Straight	PRT-00116	1.50	1	1.50	SparkFun
Break Away Male Headers- Right Angle	PRT-00553	1.95	1	1.95	SparkFun
Female Headers	PRT-00115	1.50	1	1.50	SparkFun
Real Time Clock Module	BOB-12708	14.95	1	14.95	SparkFun
Jumper Wires Premium 12" M/F	PRT-09385	4.50	1	4.50	SparkFun
Juper Wires Premium 6" F/F	PRT-08430	3.95	1	3.95	SparkFun
Jumper Wires Premium 6" M/M	PRT-08431	3.95	1	3.95	SparkFun
OpenLog	DEV-13712	14.95	1	14.95	SparkFun
Stepper Motor- 68 oz.in (400steps/rev)	ROB-10846	39.95	1	39.95	SparkFun
EasyDriver-Stepper Motor Driver	ROB-12779	29.95	1	29.95	SparkFun
Fasteners	MISC	0.25	20	5.00	
3D Printing (ABS)		0.1	50 grams	5.00	RAPIDLab
Acetone	N/A	5.95	1	5.95	Amazon
			<b>Total Part Cost</b>	<b>161.00</b>	
			<b>Est. Tax &amp; Shipping</b>	<b>35.00</b>	
			<b>Final Total</b>	<b>196.00</b>	

# MEETING THE REQUIREMENTS

## Relay Angle

Rotational Range  
0-60

BAUD Rate  
9600 bit/s

## Simple

Linkages  
 $\leq 4$

## Modular

Size  
 $\leq 25 \text{ in.}^2$

Mass  
 $\leq 0.5 \text{ lb}$

Voltage  
 $\leq 5 \text{ V}$

## Maintainable

Cost  
 $\leq 500 \$$

Installation Time  
 $\leq 60 \text{ min}$

Number of Tools  
 $\leq 3 \text{ tools}$

## Multiple Modes

Rotation Modes  
 $\geq 2 \text{ modes}$



# NEXT SEMESTER SCHEDULE

Task	Responsible Party	Week 1			Week 2			Week 3			Week 4			Week 5			Week 6			Week 7			Week 7			Week 9		
		1/15	1/17	1/19	1/22	1/24	1/26	1/29	1/31	2/2	2/5	2/7	2/9	2/12	2/14	2/16	2/19	2/21	2/23	2/26	2/28	3/2	3/5	3/7	3/9	3/12	3/14	3/16
Post Mortem	All	█																										
Building for Hardware Review 1	All	█	█	█	█	█	█	█	█	█																		
Peer Evaluation	All												█															
Form Analysis Topics	All										█	█	█	█	█													
Individual Analysis	All													█	█	█	█	█										
Building for Hardware Review 2	All															█	█	█	█	█	█							
Manufacturing Section	Dustin Branges																			█	█	█						
Design Changes Section	Daniel Johnson																			█	█	█						
Testing Section	Kalli Albright																			█	█	█						
Midpoint Report Editing	Kaitlyn																					█	█	█	█			
Peer Evaluation	All																								█			
Continue Build Work	All																								█	█	█	

# NEXT SEMESTER SCHEDULE

Task	Responsible Party	Week 10			Week 11			Week 12			Week 13			Week 14			Week 15		
		3/26	3/28	3/30	4/2	4/4	4/6	4/9	4/11	4/13	4/16	4/18	4/20	4/23	4/25	4/27	4/30	5/2	5/4
Continue Build Work	All																		
Poster Work Draft	Kalli Albright																		
Operations Manual Draft	Daniel Johnson																		
Poster Work	Kaitlyn Barr																		
Operations Manual	Dustin Branges																		
Final CAD Package	All																		
Final Report	All																		
Peer Evaluation	All																		



# QUESTIONS

- Use of multiple cam linkages rather than one?
- Second rotational degree of freedom?
- Any other suggestions?