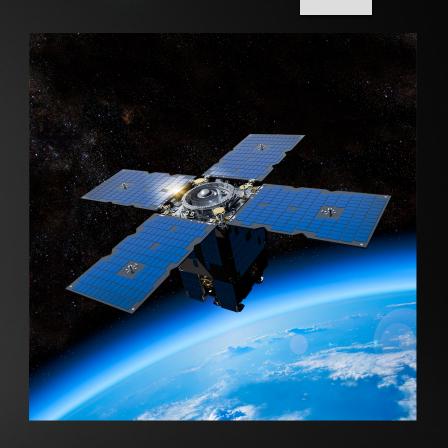
HDRM Hardware Check 1/3

TEAM STELLARHOLD

Recap

- ► Hold-down release mechanism serves to be a simple, reliable actuation device that releases folded solar panels from their folded position on a satellite.
- Opted for a pin-puller using Nitinol spring
- Designed for a 12U CubeSat



Design Iteration: First Iterations



Prototype 1: Rough visual of concept



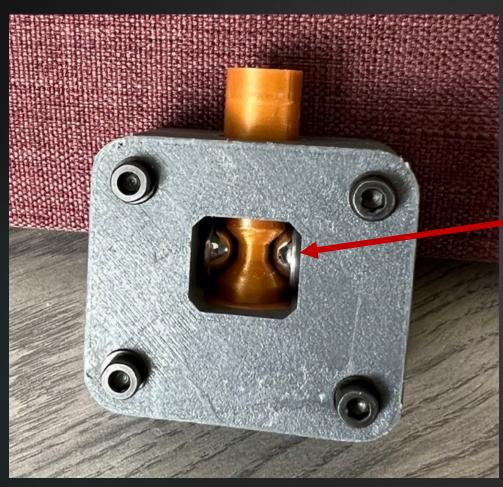
Prototype 2: Rough Demo of concept

Design Iteration: Latest Iteration



Prototype 3: Optimized demo of concept

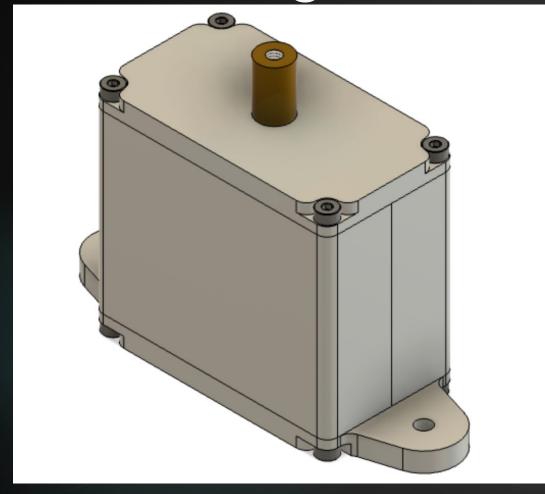
Design Iteration: Alternative Design

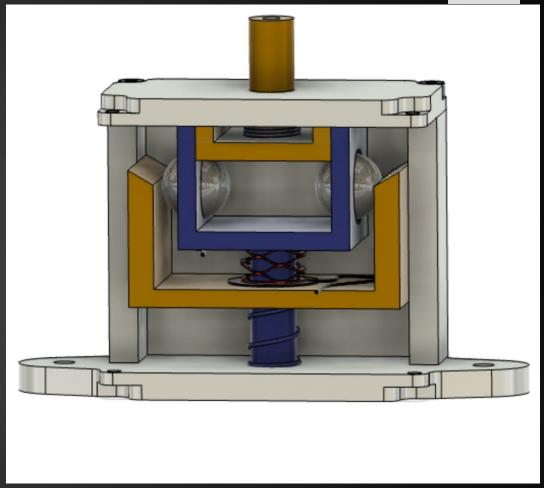




Alternate Design: Proof of concept

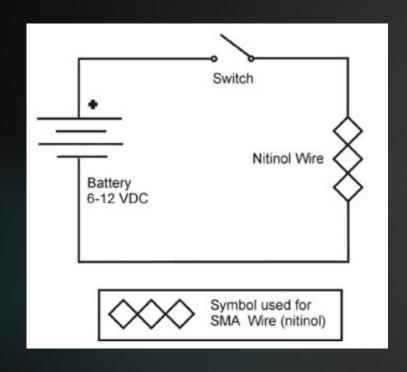
Final Design: CAD Model

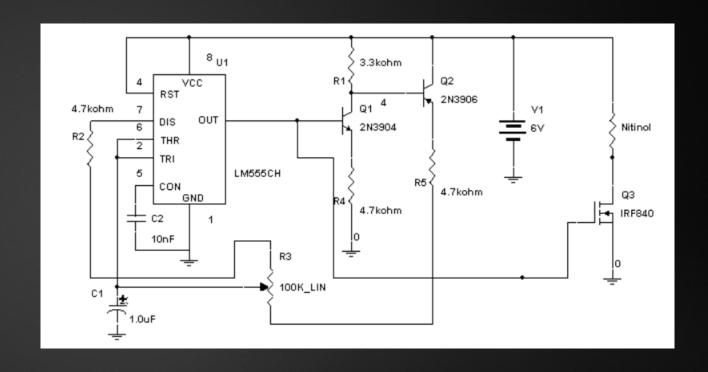




Final Design: Parametric CAD, DFM and fully optimized.

Electrical Schematics





SMA DC Circuit

SMA Pulse Width Modulated Circuit

Purchasing Plan (Updated)

- Green = Ordered and Received
- Yellow = Ordered but Not Received
- Red = Not Yet Ordered
- SMA spring in design process
- Possible updates to come (mylar, PID, Power Supply, etc.)

Part Descriptions	Cost:	Quantity:			Primary	Manufacturer:	
Description: Acrylic	21.83	2	Status: 09/06/22	Buy:	Vender: Amazon	Acrylic Mega	
Sheets						Store	
Nitinol Spring (2.4 mm)	19.58	1	02/23/22	Buy	Amazon	Kellogg's Research Lab	13777 Marian
Aluminum Block	40.39	2	09/06/22	Buy	Amazon	VERNUOS	
Generic Springs	14.18	1	09/06/22	Buy	Amazon	Ninoge	
Custom SMA Spring	.100 (estimate)	1	09/25/22 (latest)	Buy	Memry	Memry	WYW
Ball-Nose Plunger	8.38	2	04/05/22	Buy	McMaster- Carr	-McMaster-Carr	
Arduino	49.12	1	09/06/22		Amazon	Arduino	
Testing Tota	1:	5100				100	
Part Total:	ith Towas (ostimata-1		\$324.08			
Part Total w Total:	nn raxes (estimated)		\$400.00 \$600.00			
I Otal.				ψ000.00			20
Ordered and	Received		Ordered	but Not	Received	Not Yet (Ordered

Manufacturing Plan

Component	Who	Start	Finish	Duration (Days)	Materials	Percentage of Build
CubeSat Demo	Maia	9/12/2022	9/23/2022	11	Acrylic	10%
PWM Circuit	Valentin	9/12/2022	9/23/2022	11	Arduino/ wires	25%
Lock Piece	Nate	9/30/2022	10/14/2022	14	Aluminum	10%
Bearing Lock	Valentin/ Nate	9/30/2022	10/14/2022	14	Aluminum	10%
Bottom Pin Platform	Maia	10/3/2022	10/14/2022	11	Aluminum	10%
SMA Integration	Team	10/3/2022	10/14/2022	11	Nitinol	20%
Pin	Maia	10/15/2022	10/28/2022	13	Aluminum	5%
Base	Valentin	10/20/2022	10/28/2022	8	Aluminum	5%
Front Plate	Valentin	10/20/2022	10/28/2022	8	Aluminum	5%

Demonstration

	D	isplay Week:			29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
TASK	ASSIGNED TO	PROGRESS	START	END	M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S
Part 1: Hardware Review 1					
Project management Review	Team	100%	8/29/22	9/2/22	
Analysis / Self Learning	Individual	100%	8/29/22	9/12/22	
SMA Analysis / design	Team	90%	9/2/22	9/12/22	
Hardware review 1	Team	100%	9/5/22	9/26/22	
Part 2: Hardware Review 2					
Website Check	Team	50%	9/27/22	10/10/22	
Hardware Review 2	Team	25%	9/27/22	10/17/22	
Part 3: Hardware Review Final					
Finalize Testing Plan	Team	5%	10/10/22	10/31/22	
Hardware Review 100%	Team	0%	10/17/22	10/31/22	
Part 4: Finalization					
Poster Draft	Team	0%	10/17/22	10/31/22	
Powerpoint & Poster Final	Team	0%	10/31/22	11/14/22	
Final CAD	Team	0%	11/1/22	11/21/22	
Manual/assembly	Team	0%	11/8/22	12/12/22	
Expo	Team	0%	11/28/22	12/2/22	
Final Report	Team	0%	11/14/22	12/5/22	
Final Website	Team	0%	11/14/22	12/5/22	
Testing Results	Team	0%	11/14/22	12/5/22	