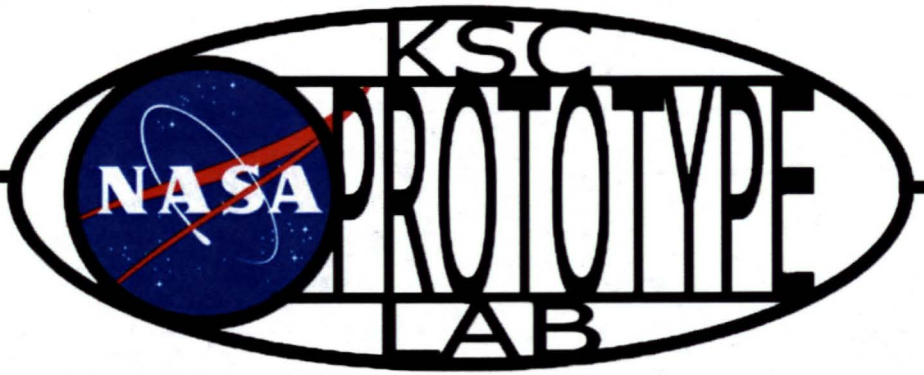


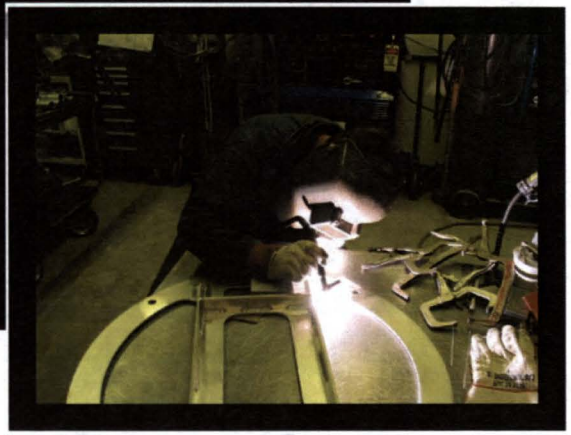
Prital "Pri" Thakrar
University of Florida
Mechanical & Aerospace Engineering
Projected Graduation: Spring 2015

Spring 2013 Student Showcase

NE-L3

Prototype Development Laboratory

The Shop

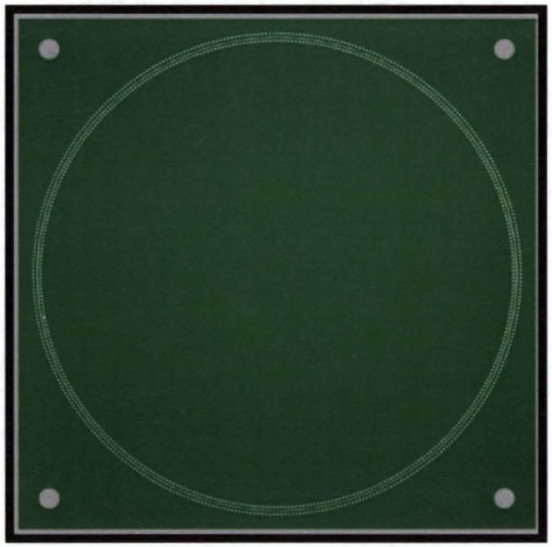


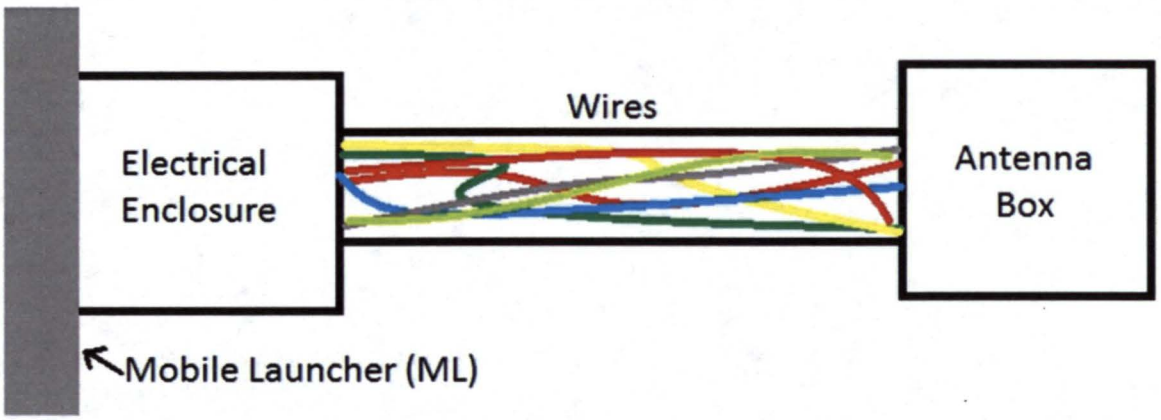
My Projects

- WX B-Dot Antenna Enclosure Mount
- MLAS Data Acquisition Prototype Mounting Plates
- ISS-derived Deep Space Habitat Development
- MIST / Microbes Project
- Modeling!
- Engineers Without Borders

B-Dot Antenna Enclosure

WX B-Dot Antenna





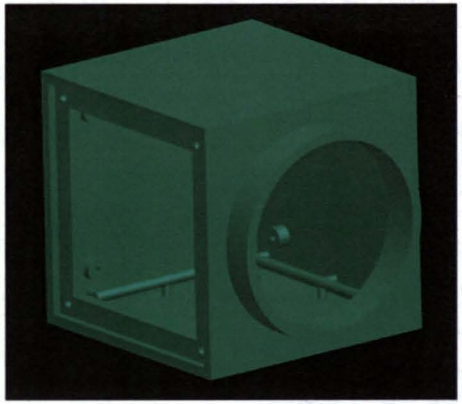
B-Dot Antenna Enclosure:

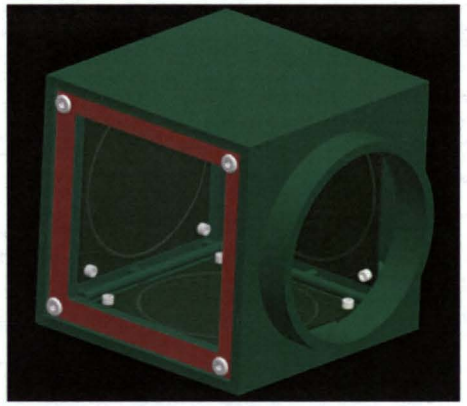
Requirements

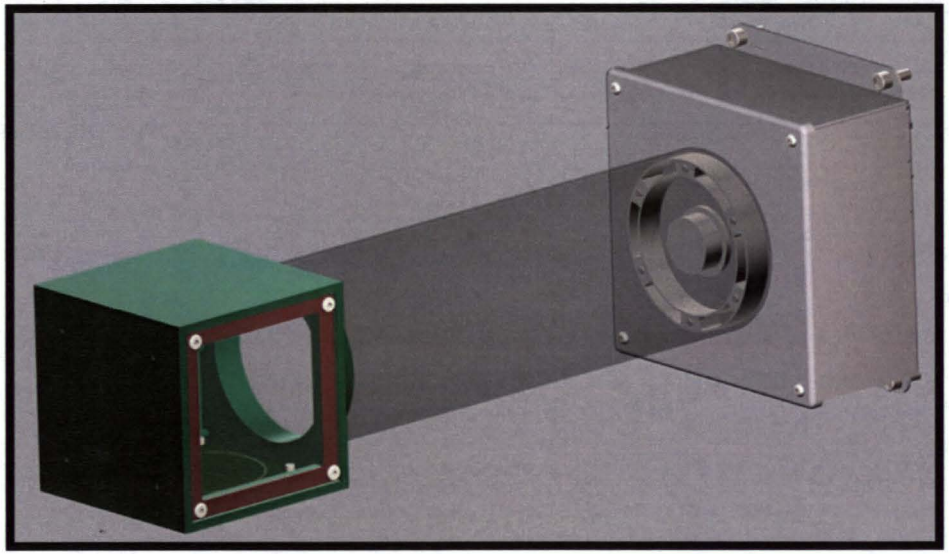
- Central axes of the three antennas must intersect at a point
- Antenna box must be at least 15” away from anything conductive
- Antenna box cannot use fasteners requiring tethering
- Must be durable in an outside environment
- Must have emergency access to antennas
- Antenna box must have tie-down points for wires

B-Dot Antenna Enclosure:

Chosen Design Concept

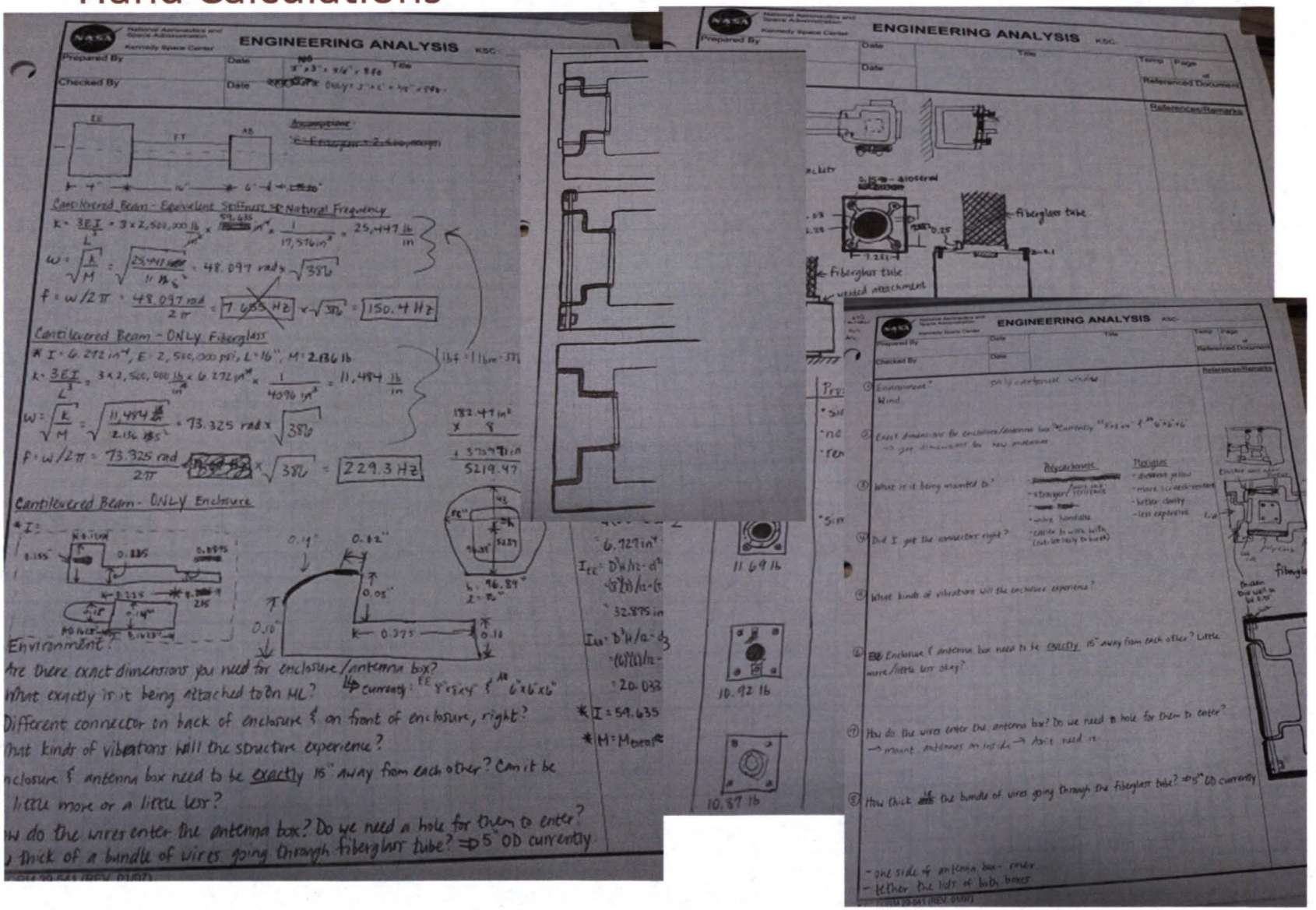






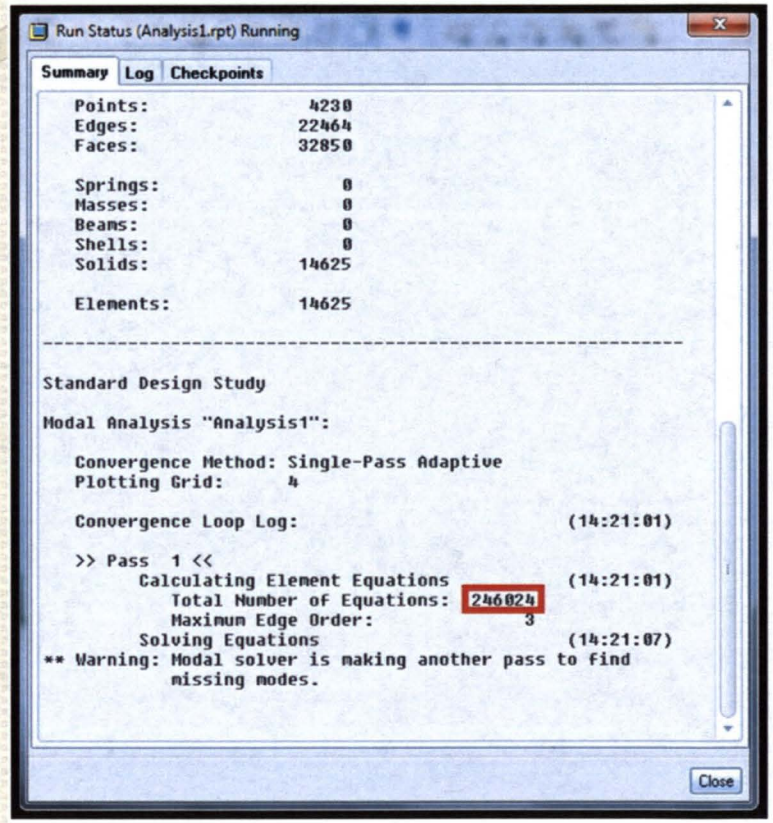
B-Dot Antenna Enclosure:

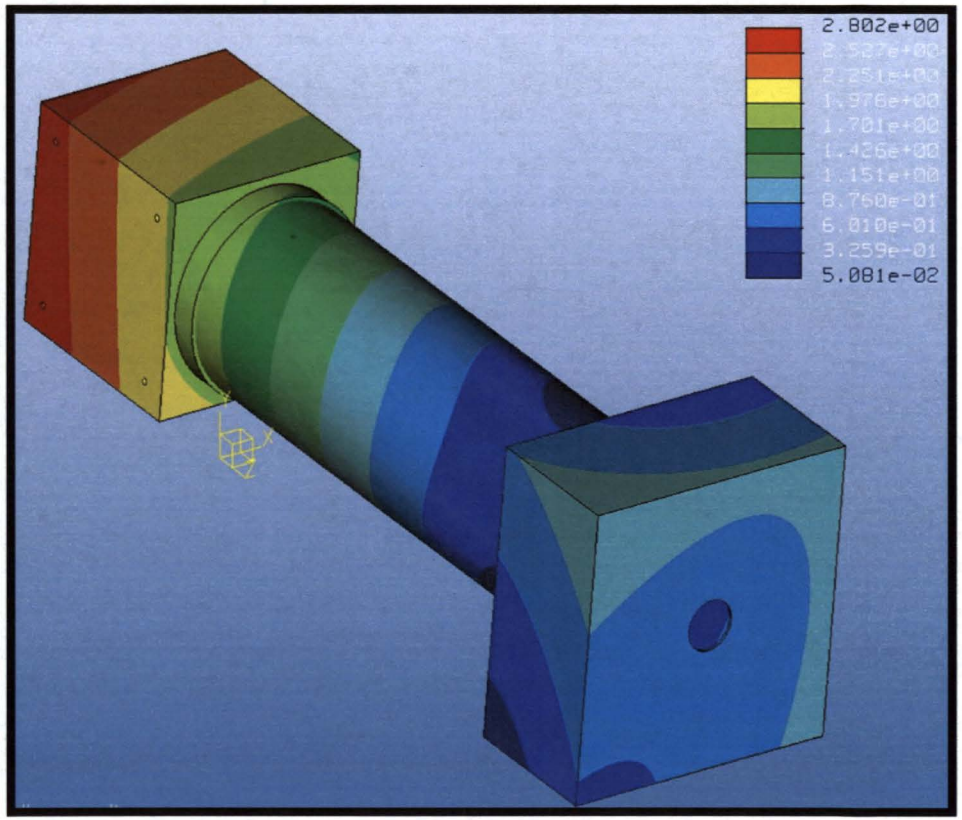
Hand Calculations

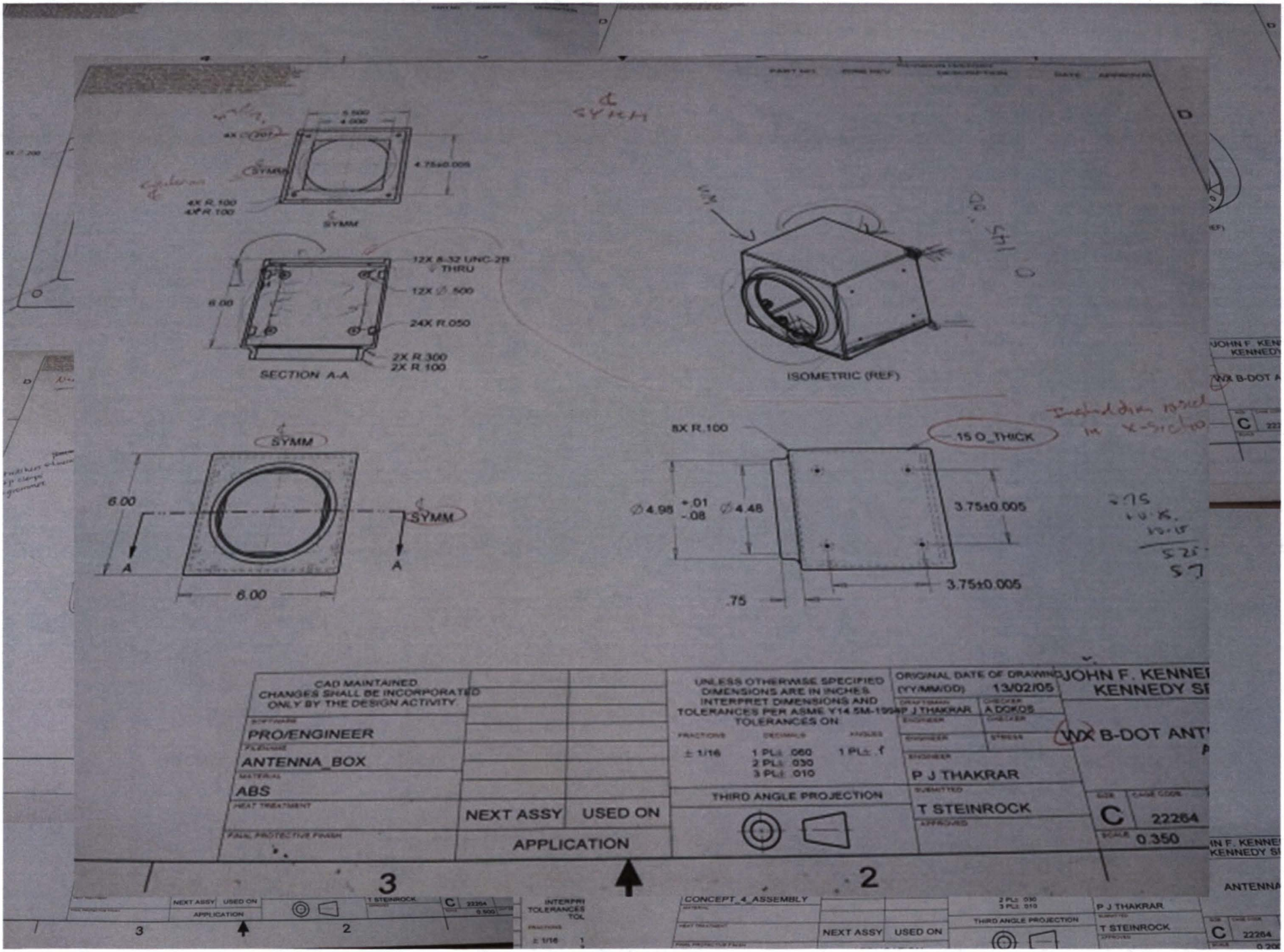


B-Dot Antenna Enclosure:

Finite Element Analysis (FEA)






SYMM
4.75±0.005
4X R.100
4X R.100
SYMM
12X 8-32 UNC-2B
↧ THRU
12X Ø.500
6.00
24X R.050
2X R.300
2X R.100
SECTION A-A
ISOMETRIC (REF)
SYMM
6.00
SYMM
A
A
6.00
8X R.100
15.0_THICK
Ø4.98 +.01 -.08
Ø4.48
3.75±0.005
3.75±0.005
.75
CAD MAINTAINED
CHANGES SHALL BE INCORPORATED
ONLY BY THE DESIGN ACTIVITY
PRO/ENGINEER
ANTENNA_BOX
ABS
HEAT TREATMENT
FINAL PROTECTIVE FINISH
NEXT ASSY
USED ON
APPLICATION
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
INTERPRET DIMENSIONS AND
TOLERANCES PER ASME Y14.5M-1994
TOLERANCES ON
FRACTIONS
DECIMALS
ANGLES
± 1/16
1 PL± .060
2 PL± .030
3 PL± .010
1 PL± .1°
THIRD ANGLE PROJECTION
ORIGINAL DATE OF DRAWING
(YY/MM/DD) 13/02/05
DRAWN P J THAKRAR
CHECKED A.DOKOS
ENGINEER
ENGINEER
STRESS
ENGINEER P J THAKRAR
SUBMITTED T STEINROCK
APPROVED
JOHN F. KENNEDY
WX B-DOT ANT
SIZE C
CAGE CODE 22264
SCALE 0.350
3
2
CONCEPT_4_ASSEMBLY
NEXT ASSY
USED ON
THIRD ANGLE PROJECTION
P J THAKRAR
T STEINROCK
C
22264

B-Dot Antenna Enclosure:

Parts List

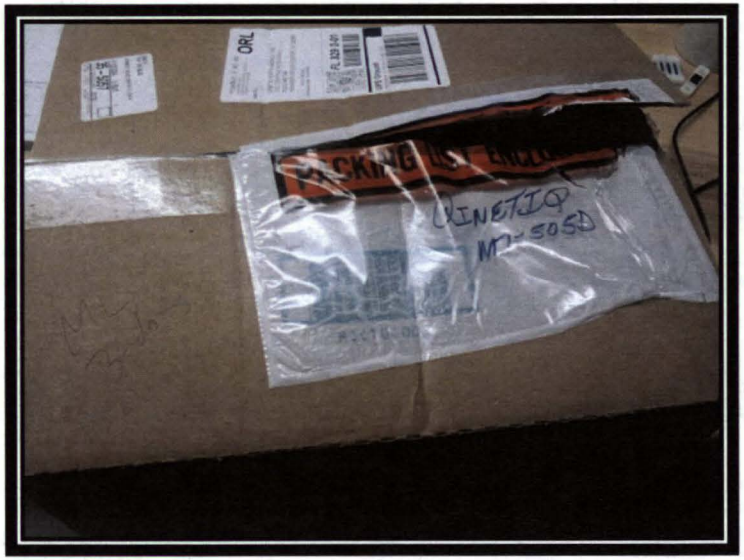
Parts List

WX B-Dot Antenna Enclosure Mount

Cage Code	Item	Qty	Unit	Materials Unit Cost	Materials Total
4S6H8	Pack of 1 Fullcure 705 Support Resin 3.6Kg	1	ea.	$ 468.00	$ 468.00
4S6H8	Pack of 1 Fullcure 835, VeroWhitePlus, 3.6Kg	1	ea.	$ 1,011.00	$ 1,011.00
1FEX9	Fiberglass Round Tube, 5" ID x 5.3" OD x 240" (P/N: 100)	1	ea.	$ 1,310.00	$ 1,310.00
1WSN4	Hoffman Electrical Enclosure 8" x 8" x 4" (P/N: A808SC)	1	ea.	-	-
0KVE6	316 Stainless Steel Socket Head 10-32 x 7/8" Screw (P/N: 92185A960)	1	pkg.	$ 9.54	$ 9.54
0KVE6	Glass-Filled Nylon Socket Head 8-32 x 0.5" Screw (P/N: 91221A445)	2	pkg.	$ 6.56	$ 13.12
0KVE6	Plastic Blind Rivets 0.197" Dia. - 0.512" Lg. (P/N: 90219A045)	1	pkg.	$ 12.22	$ 12.22
0KVE6	Plastic Blind Rivet Tool (P/N: 97540A210)	1	ea.	$ 54.44	$ 54.44
0KVE6	Scratch and UV Resistant Polycarbonate 1/8" x 12" x 12" (P/N: 8707K111)	1	ea.	$ 19.24	$ 19.24
0KVE6	Ultra-Strength Silicone Rubber Sheet 1/16" x 12" x 12" (P/N: 5787T11)	1	ea.	$ 13.66	$ 13.66
0KVE6	316 Stainless Steel No. 10 Washers (P/N: 90107A011)	1	pkg.	$ 3.85	$ 3.85
0KVE6	Nylon No. 8 Washers (P/N: 90295A400)	1	pkg.	$ 5.35	$ 5.35
Grand Total				**$ 2,913.86**	**$ 2,920.42**

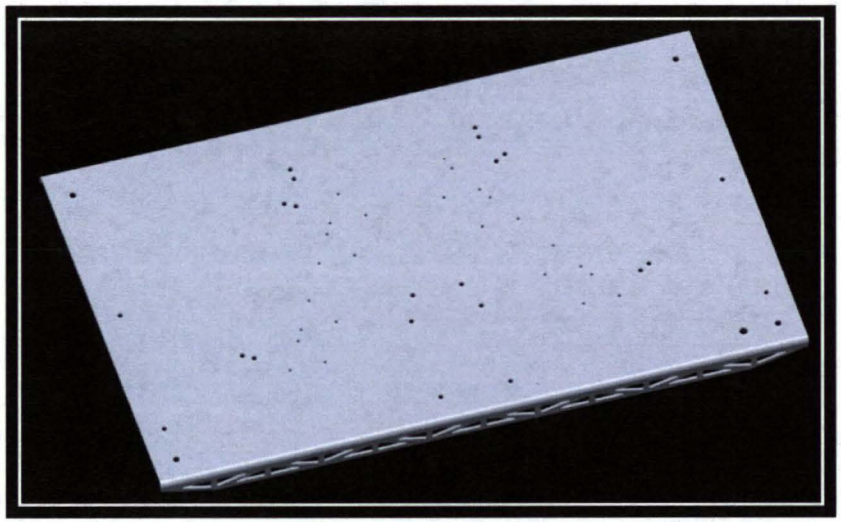
B-Dot Antenna Enclosure:

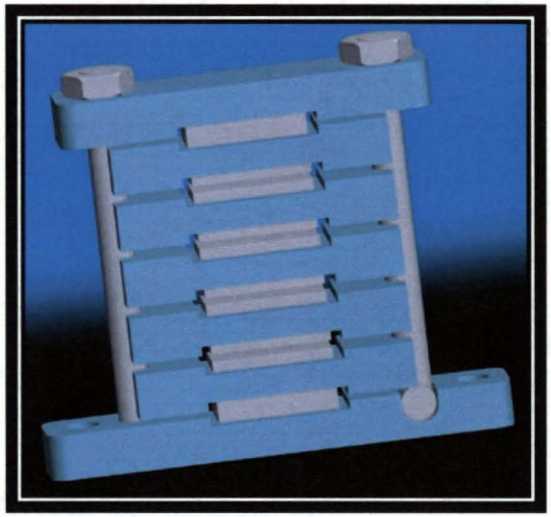
Parts!

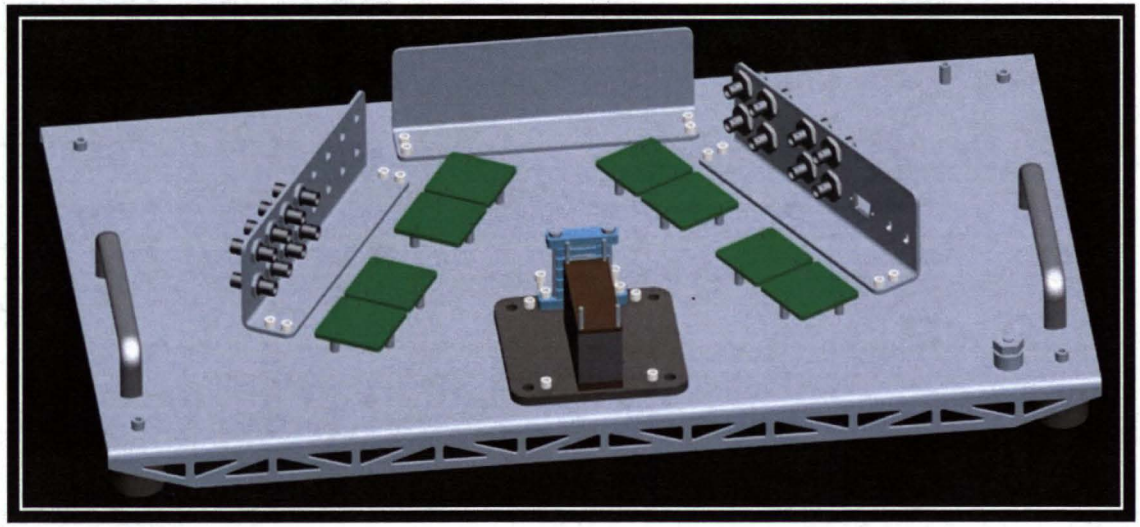


MLAS

CAD Models

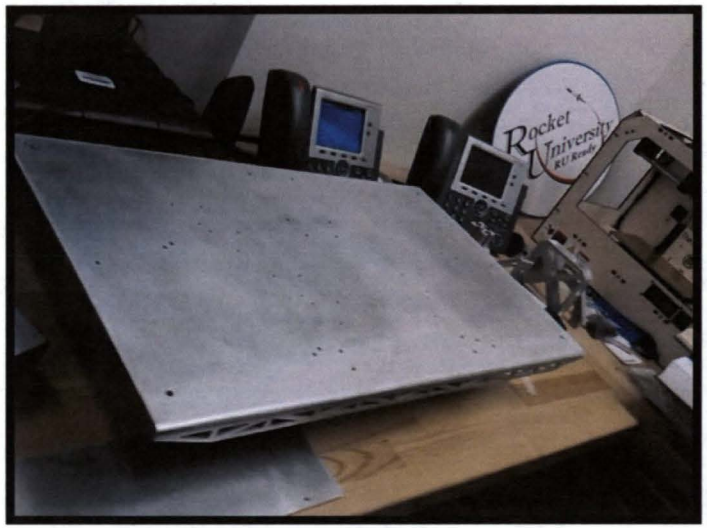


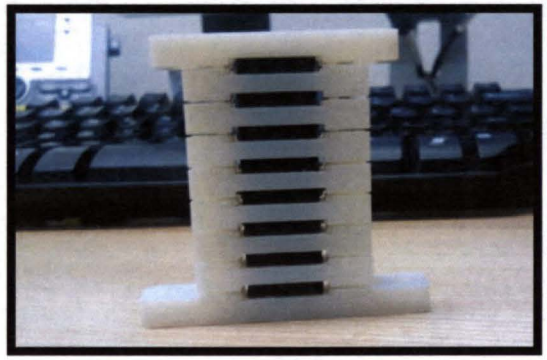


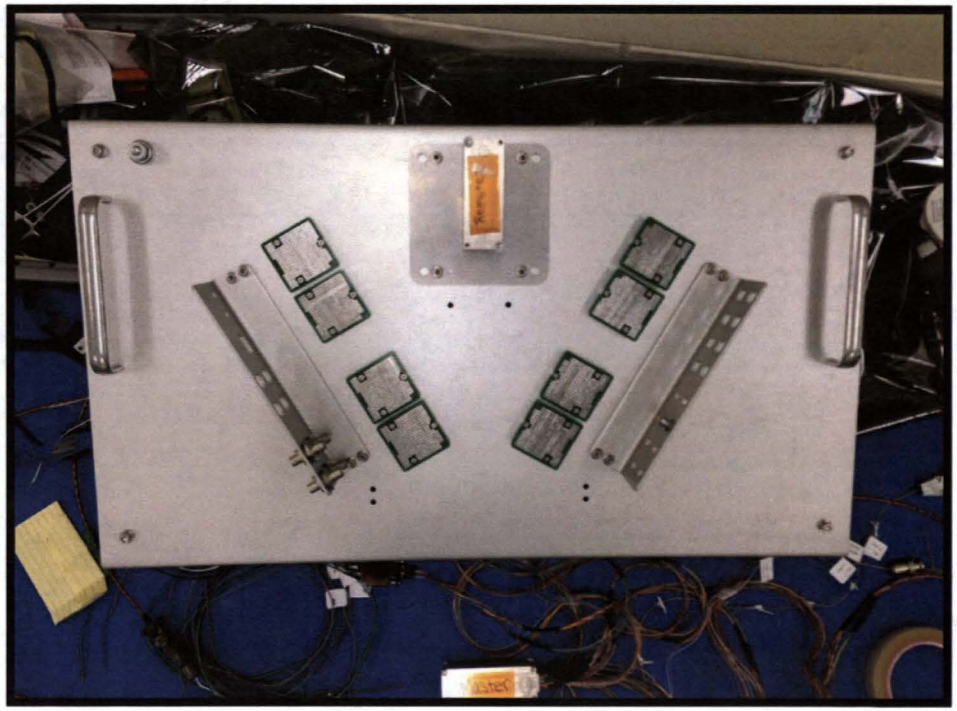


MLAS

Prototype

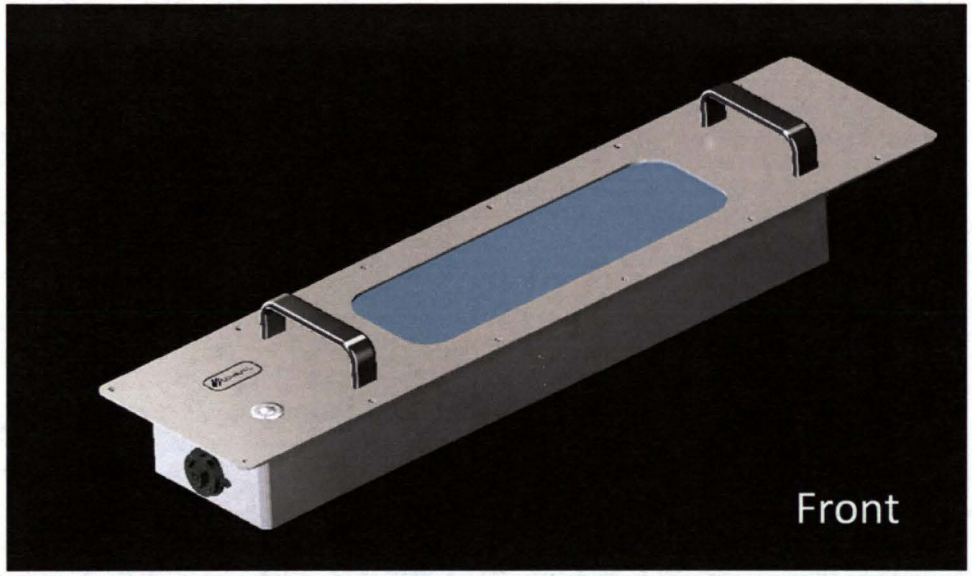


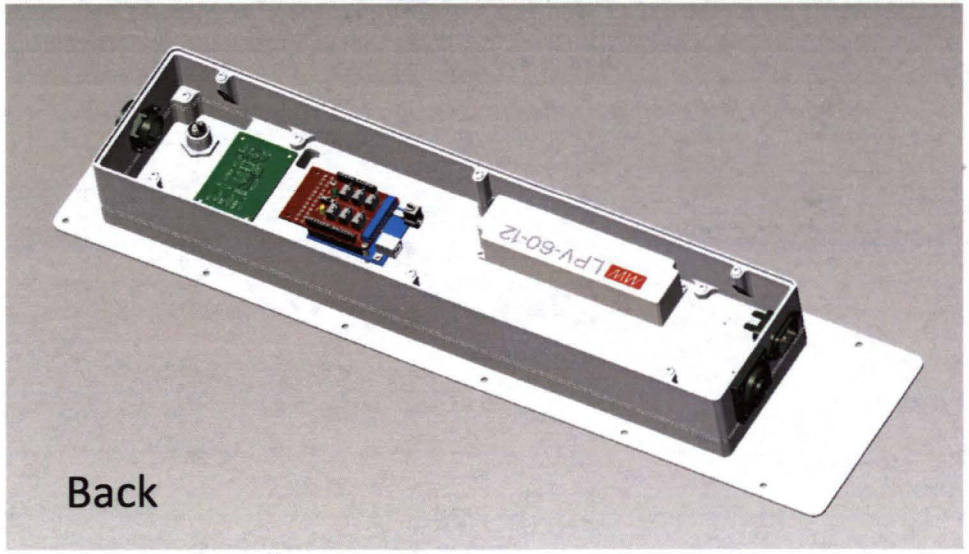




Deep Space Habitat

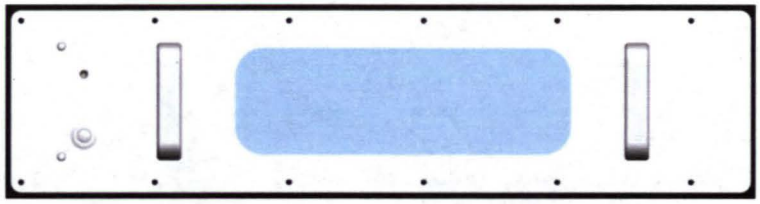
Lights

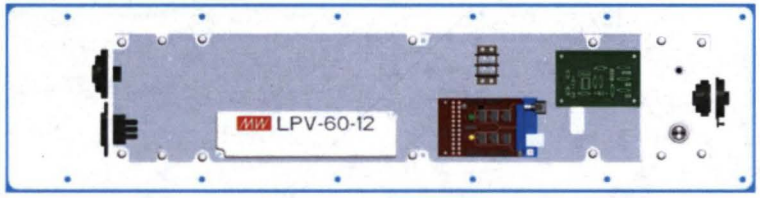


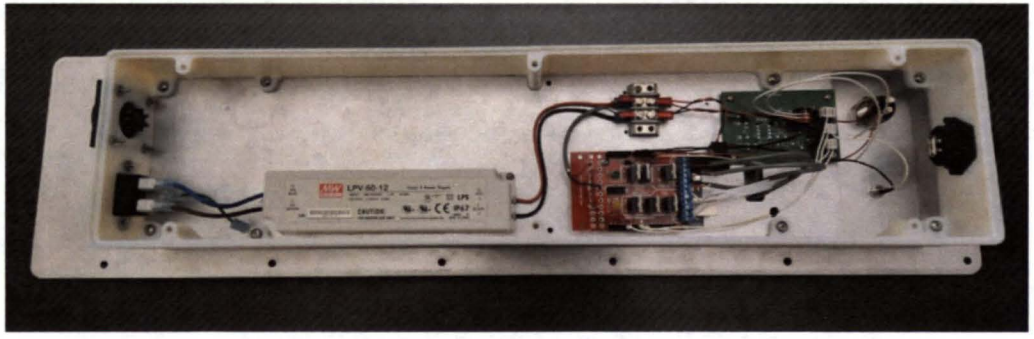


Deep Space Habitat

Lights





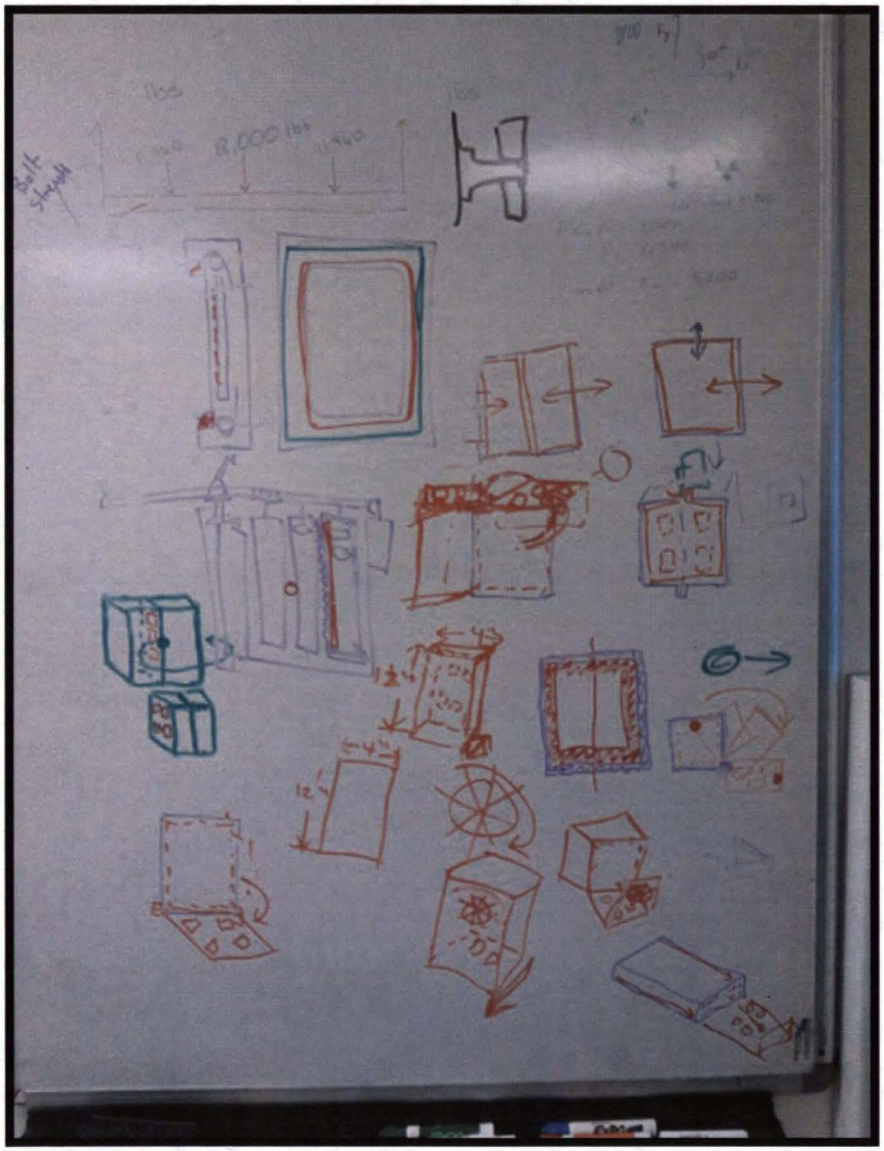


Deep Space Habitat

Core Module

MIST / Microbes Project

Coupon:



MIST / Microbes Project

Kepner-Tregoe Matrix

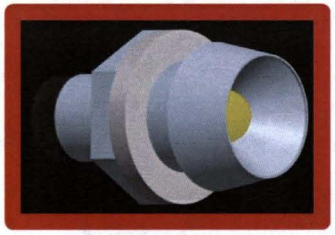
		A			B			C			D			E		
Objectives		**Alternative A**			**Alternative B**			**Alternative C**			**Alternative D**			**Alternative E**		
MIST Box Designs		Drawer			Sliding Door			Swinging Door			Rotating Strips			Belt		
Musts:		Must Information	Go	No Go	Must Information	Go	No Go	Must Information	Go	No Go	Must Information	Go	No Go	Must Information	Go	No Go
Hold a Radiometer in Center of Coupon Array			X			X			X			X			X	
Enclose the Coupon Array Completely			X			X			X			X			X	
Meets Ultimate Stress Requirements			X			X			X			X			X	
Wants:	Weight	Want information	Score	Wt. Score	Want information	Score	Wt. Score	Want information	Score	Wt. Score	Want information	Score	Wt. Score	Want information	Score	Wt. Score
Score: Best = 10, Others relative to the Best				261			245			263			230			171
Maximize ...																
Maximize Sealing out Light	10		10	100		10	100		10	100		8	80		6	60
Maximize Sun Exposure When Open	9		8	72		6	54		7	63		10	90		5	45
Minimize Shadowing																
Maximize Simplicty of Door Mechanism	5		9	45		9	45		10	50		4	20		6	30
Minimizing Components Minimizing Chance of Door Not Closing Properly								Doesn't need rails								
Maximize Ease of Assembly	4		9	36		9	36		10	40		5	20		5	20
								Doesn't need rails								
Minimize Size	2		4	8		5	10		5	10		10	20		8	16
Minimze Size When Door is Open		Door is Pulled out Avoiding Shadowing by Increasing Length														
Best Radiometer Exposure				0			0			0			0			0

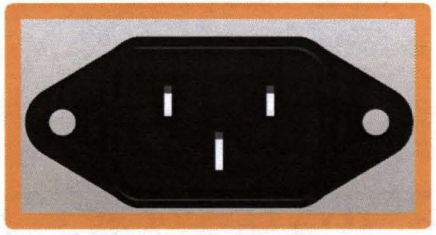
Modeling!

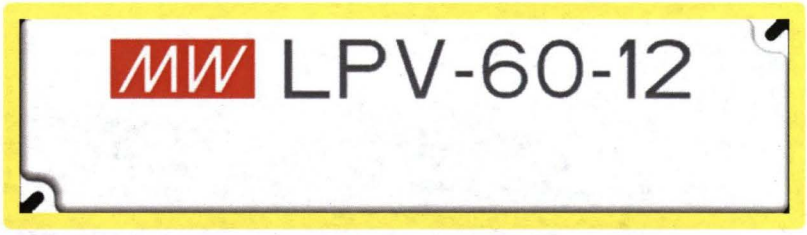

RDL
TX-AFC1M AUDIO CONVERTER
STUDIO QUALITY AUDIO TRANSFORMER
INPUT
OUTPUT
UNBALANCED TO
BALANCED CONVERSION
CE

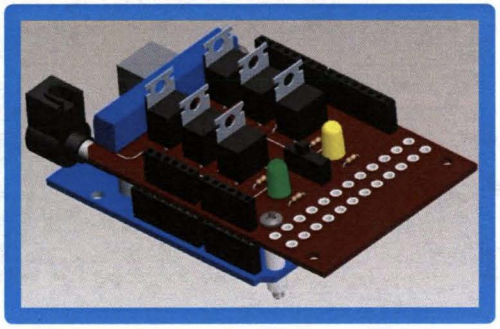

DELL
TX-AFC1M AUDIO CONVERTER
STUDIO QUALITY AUDIO TRANSFORMER
INPUT
OUTPUT
UNBALANCED TO
BALANCED CONVERSION

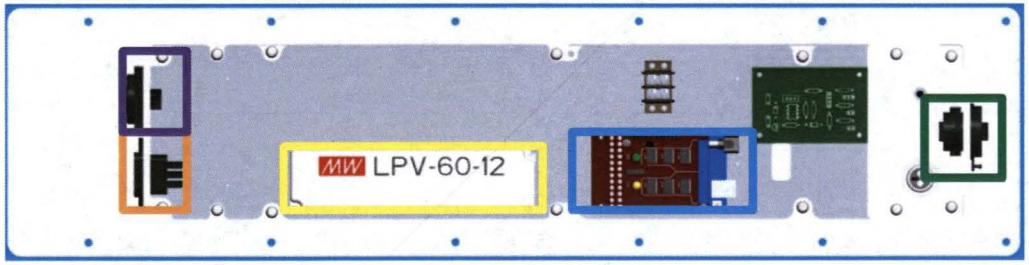
Modeling!

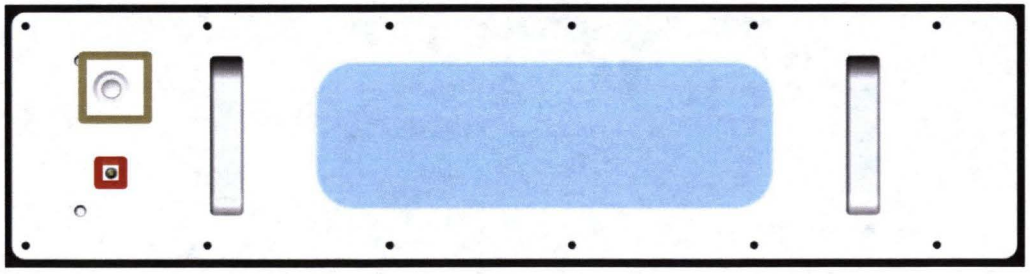




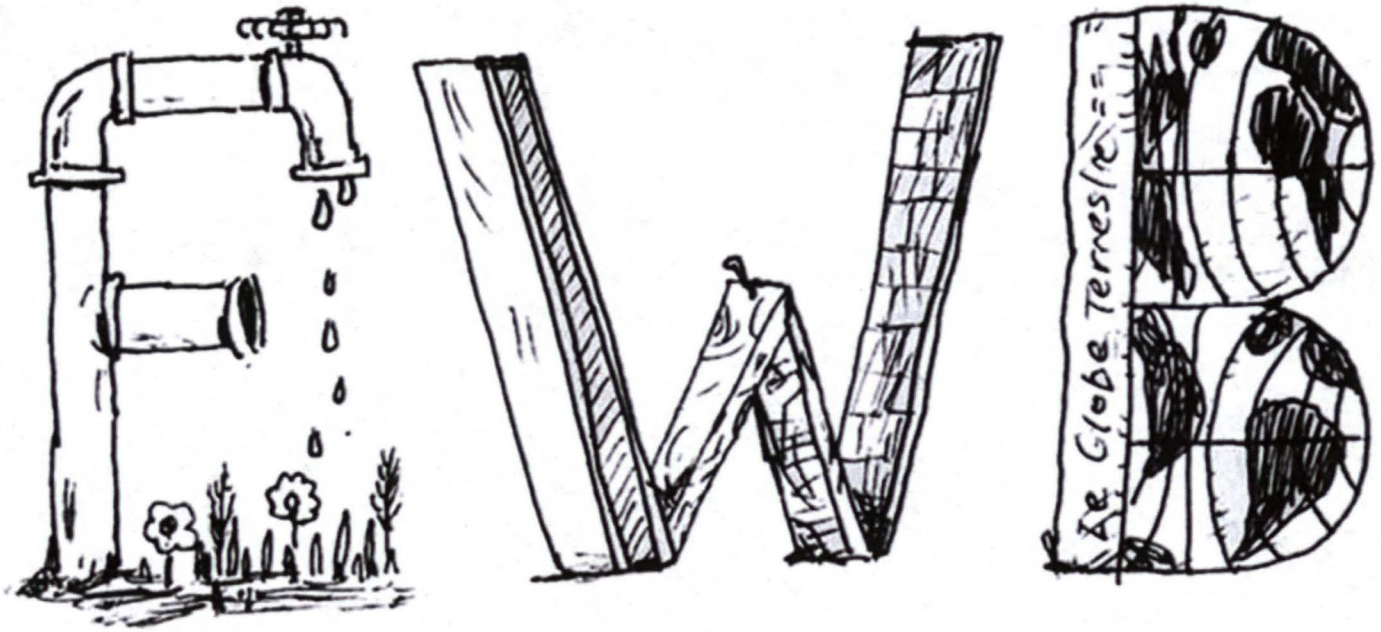








Engineers Without Borders



ENGINEERS WITHOUT BORDERS USA

Thank you!

KSC PROTOTYPE LAB

Questions?