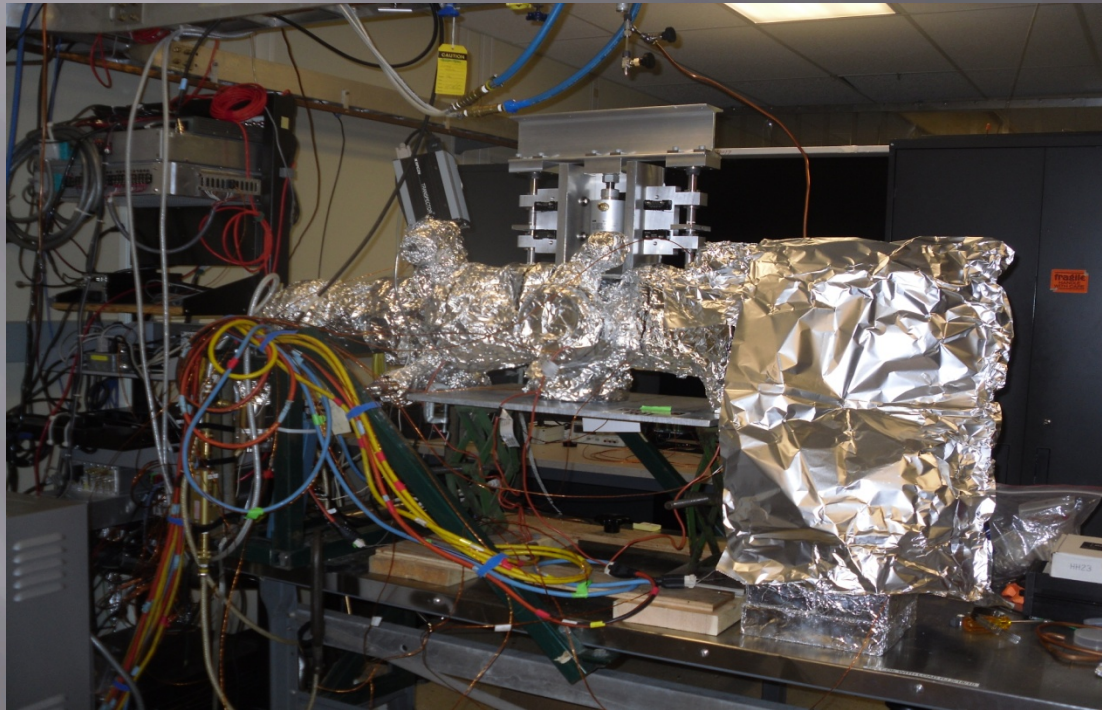


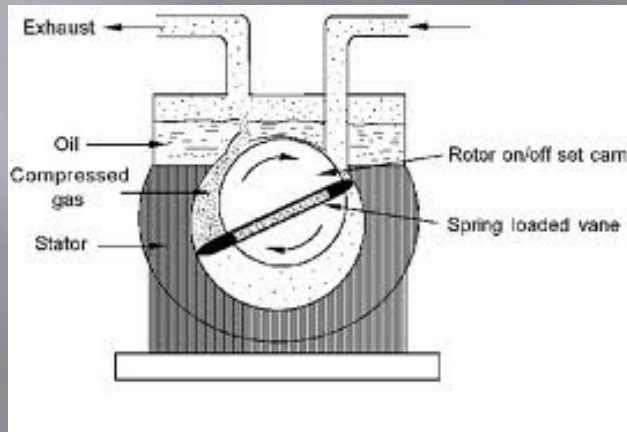
AUTOMATED BAKE OUT ASSEMBLY



Tim Ramos

What is a Bake Out?

- First, subject to roughing and turbo pumps
- Subject to large RGA scan (Ultra High Vacuum) using roughing and turbo pumps



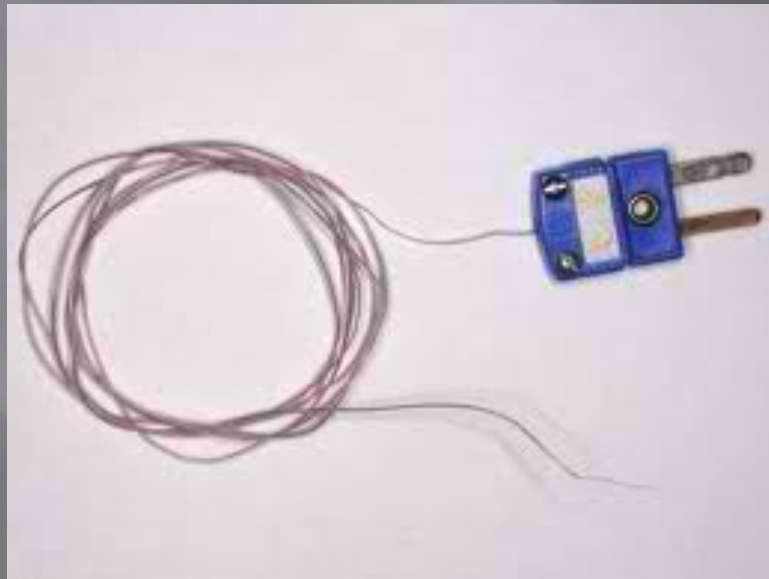
Roughing
“Rotary Vane
Pump”



“Turbo Pump”

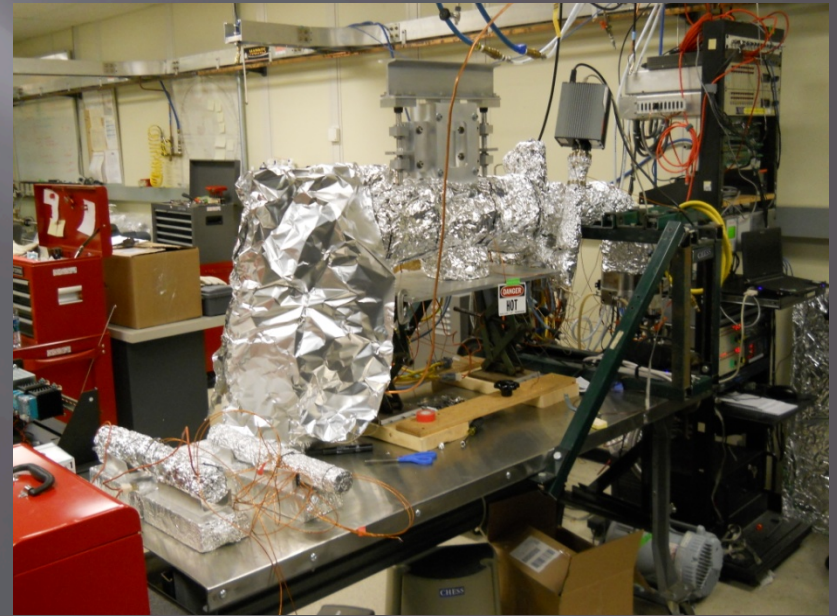
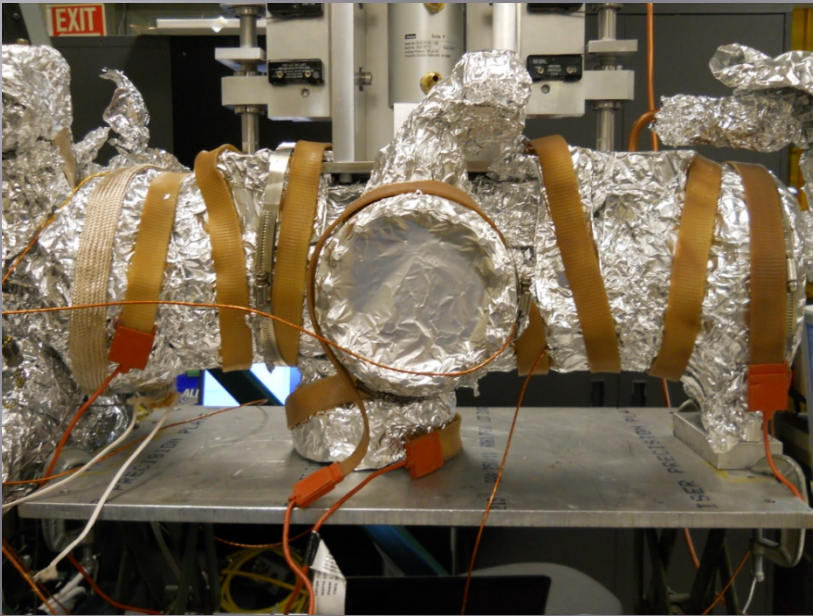
What is a Bake Out?

- Thermocouples used to record temperature



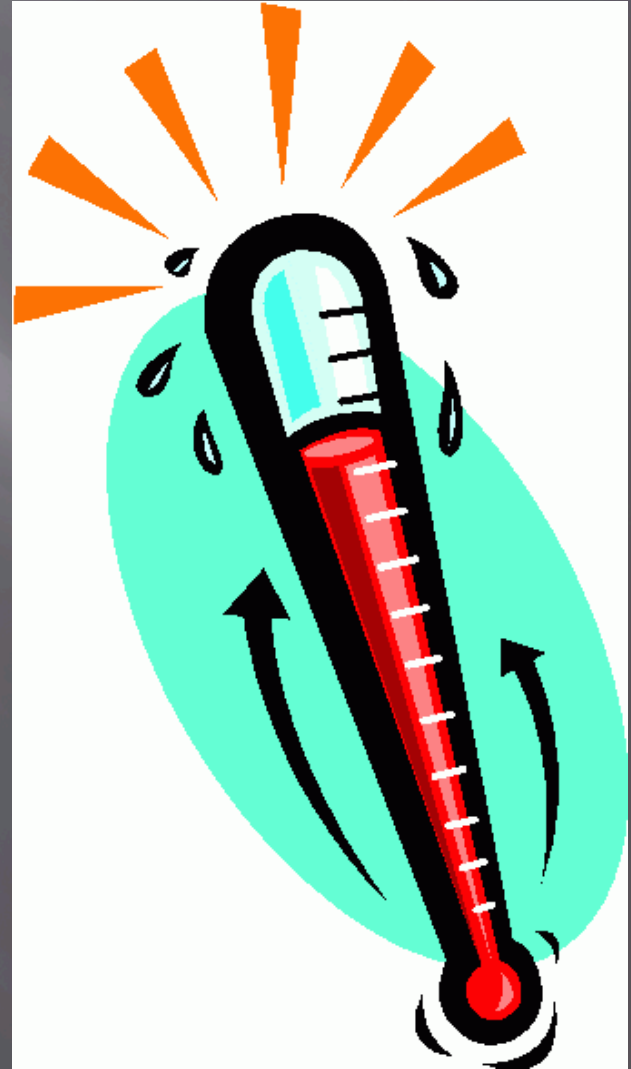
What is a Bake Out?

- Subject wrapped in aluminum foil, heat tapes, and more aluminum foil



What is a Bake Out?

- Subject then heated anywhere up to 400C (Vac lab temps are usually 140C)
- Once Subject is up to temp. a “Soaking Period” commences



What is a Bake Out?

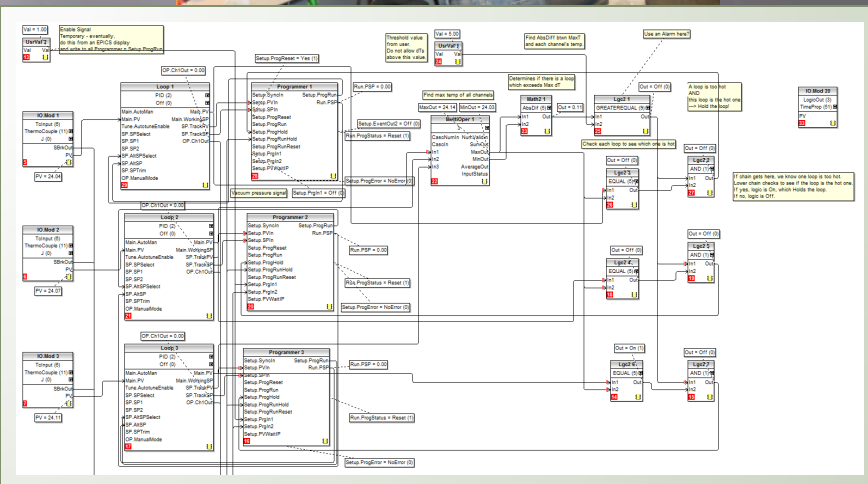
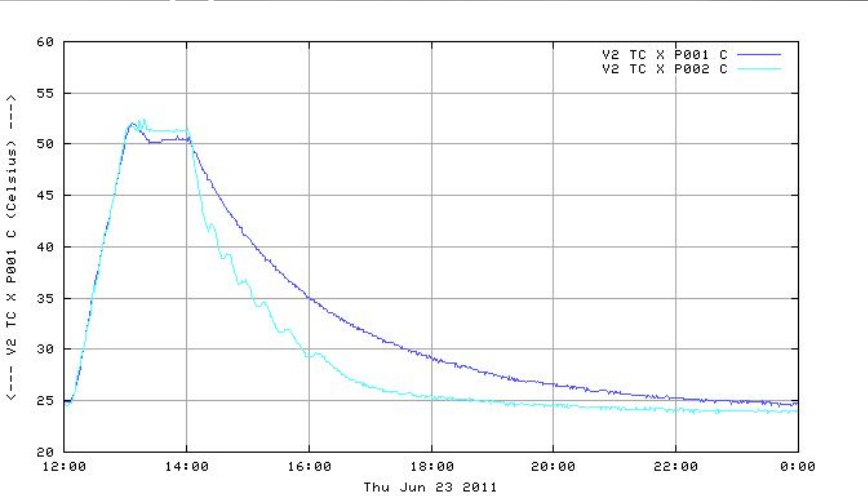
- Subject is then brought back down to room temp. at (roughly) same rate as it rose
- Subject is then vented with nitrogen gas until atmospheric pressure is reached
- A leak check and final RGA scan is then performed
- Finally, the subject is prepared for use or storage



“Nitrogen
Tank”

The Project

- To Myealtronics' ruggedized and portable bake out apparatus



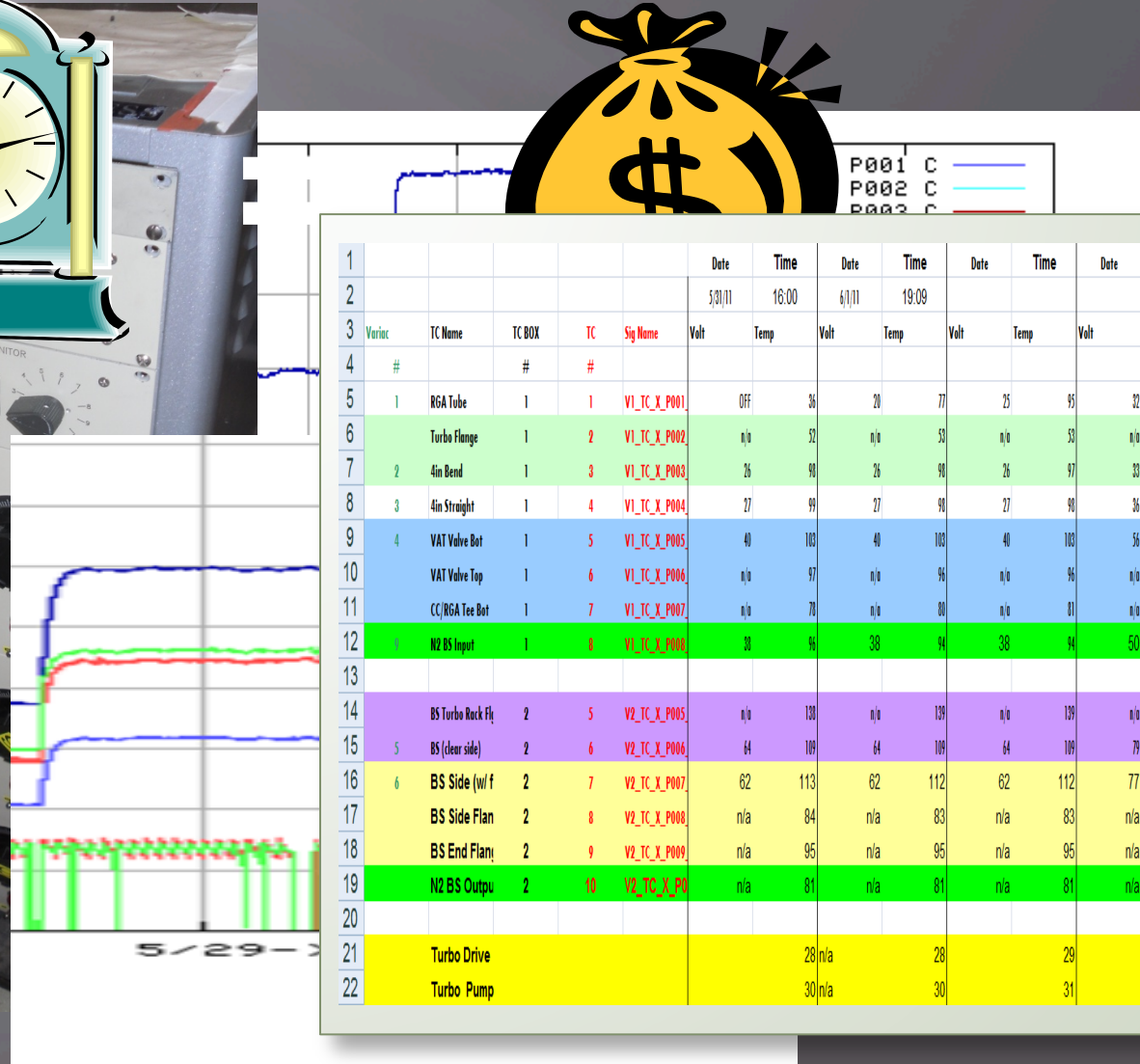
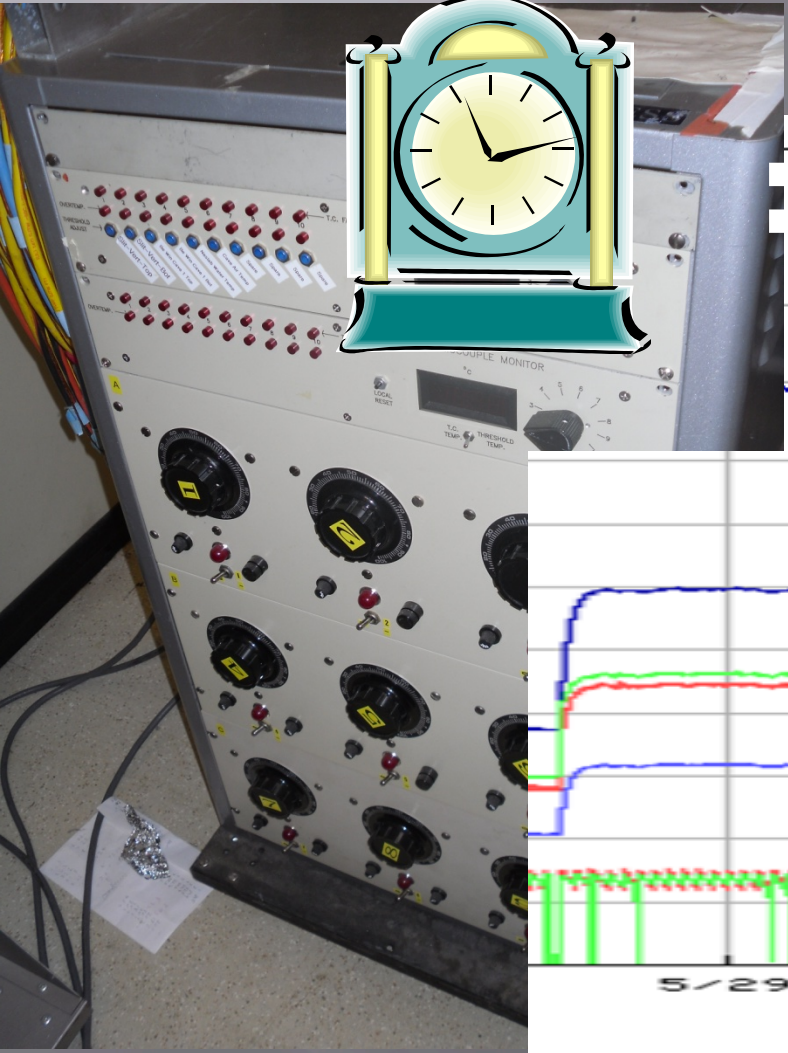
The Project

Must Be

- Portable
- User Friendly
- SAFE



The Need for Automation

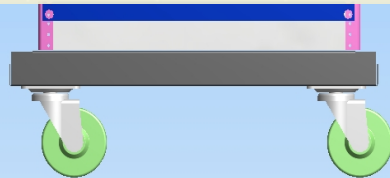
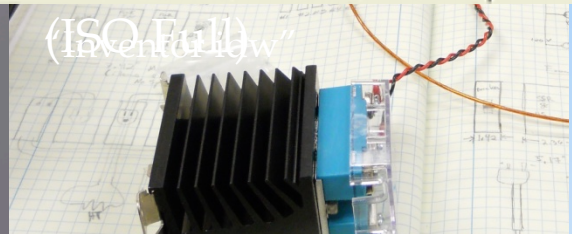
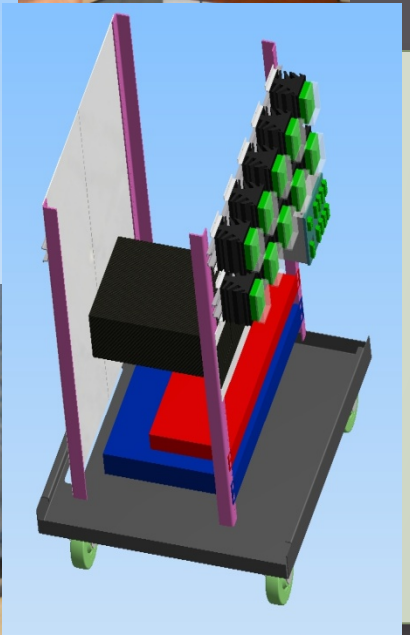
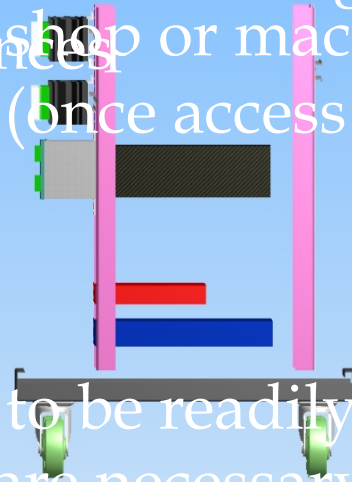
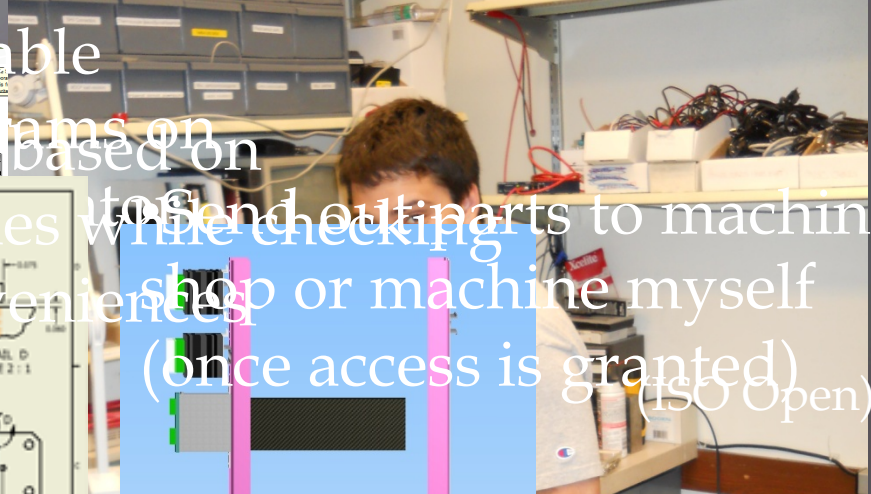
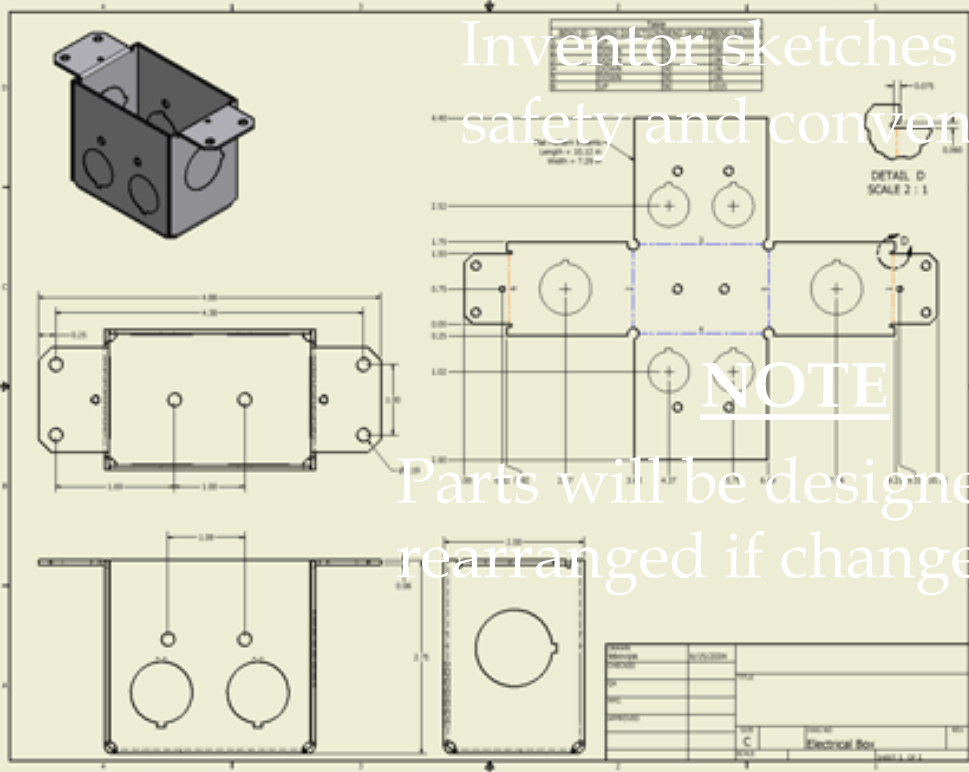


					Date	Time	Date	Time	Date	Time	Date	Time	Date	Time
1														
2					5/31/11	16:00	6/1/11	19:09						
3	Varioc	TC Name	TC BOX	TC	Sig Name	Volt	Temp	Volt	Temp	Volt	Temp	Volt	Temp	Volt
4	#		#	#										
5	1	RGA Tube	1	1	V1_TC_X_P001	OFF	36	20	77	25	95	32		
6		Turbo Flange	1	2	V1_TC_X_P002	n/a	52	n/a	53	n/a	53	n/a		n/a
7	2	4in Bend	1	3	V1_TC_X_P003	26	90	26	90	26	97	33		
8	3	4in Straight	1	4	V1_TC_X_P004	27	99	27	90	27	90	36		
9	4	VAT Valve Bot	1	5	V1_TC_X_P005	40	103	40	103	40	103	56		
10		VAT Valve Top	1	6	V1_TC_X_P006	n/a	97	n/a	96	n/a	96	n/a		n/a
11		CC/RGA Tee Bot	1	7	V1_TC_X_P007	n/a	70	n/a	80	n/a	81	n/a		n/a
12	5	N2 BS Input	1	8	V1_TC_X_P008	33	96	38	94	38	94	50		
13														
14		BS Turbo Rack Fl	2	5	V2_TC_X_P005	n/a	130	n/a	139	n/a	139	n/a		n/a
15	5	BS (clear side)	2	6	V2_TC_X_P006	64	109	64	109	64	109	79		
16	6	BS Side (w/ f	2	7	V2_TC_X_P007	82	113	62	112	62	112	77		
17		BS Side Flang	2	8	V2_TC_X_P008	n/a	84	n/a	83	n/a	83	n/a		n/a
18		BS End Flang	2	9	V2_TC_X_P009	n/a	95	n/a	95	n/a	95	n/a		n/a
19		N2 BS Output	2	10	V2_TC_X_P010	n/a	81	n/a	81	n/a	81	n/a		n/a
20														
21		Turbo Drive					28	n/a	28		29			
22		Turbo Pump					30	n/a	30		31			

What's The Plan!?

- Create scaled idw's
- Assemble parts that need to be tested
- Create portable cabinet diagrams based on inventor sketches

to send out parts to machine shop or machine myself (once access is granted)



(ISO Full)

(Right)

Parts Needed (Tentative)

Part	Qty.
Relay	10
Heat Sink	10
Cabinet	1
Logic Controller	1
Ethernet Box	1
Vacuum Control	1
Gauge Control	1
Power in	5
Power out	10
Breakers	5
Breaker Box	1
Fuses	10
Heat Tape Power	10
Heat Tape Panel	1
Extension Cord	Tentative
Sheet Metal	1-3x4ft.

Tools Being Used

- Autodesk Inventor
 - Lab notebook, pencils, rulers/measuring tapes
 - Tools in machine shop (cutters, saws, drills etc.)



“Inventor”



Schedule

Task	Completion Date
Receive Machine Shop Certification	6/28/2011
Design Inventor Parts	6/29/2011
Complete Inventor Model	7/1/2011
Complete Inventor idw's	7/5/2011
Machine Needed Parts	7/8/2011
Assemble Cabinet	7/12/2011
Test Prototype	7/14/2011
Finish Poster	7/15/2011
Submit Poster	7/19/2011
Create Reports	7/20/2011
Submit Reports	7/29/2011

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