

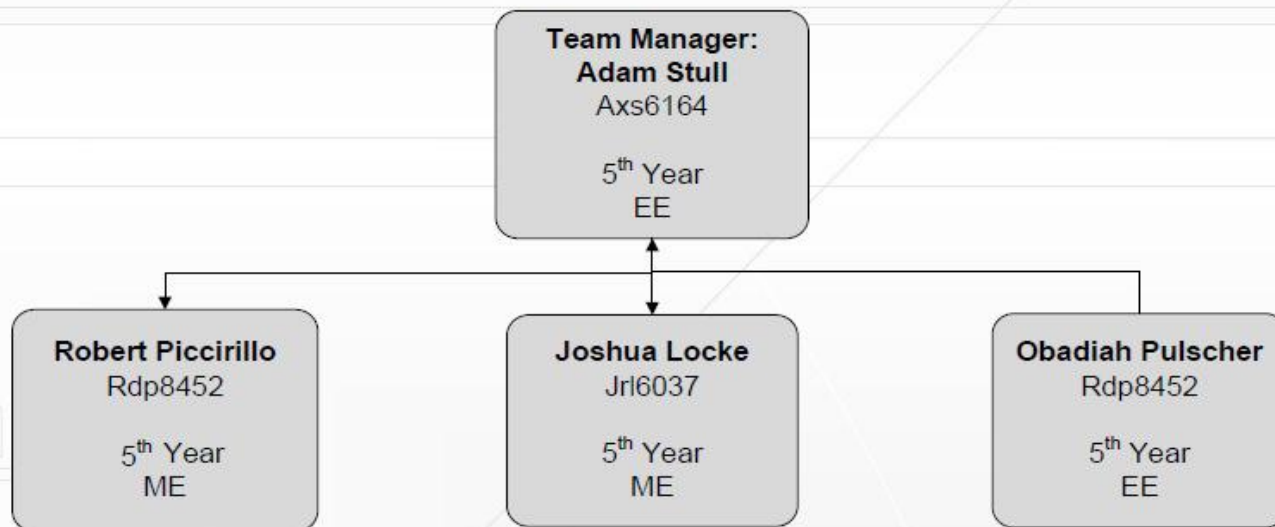


dynamic keyboard

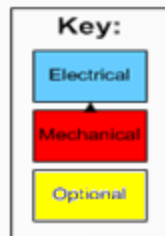
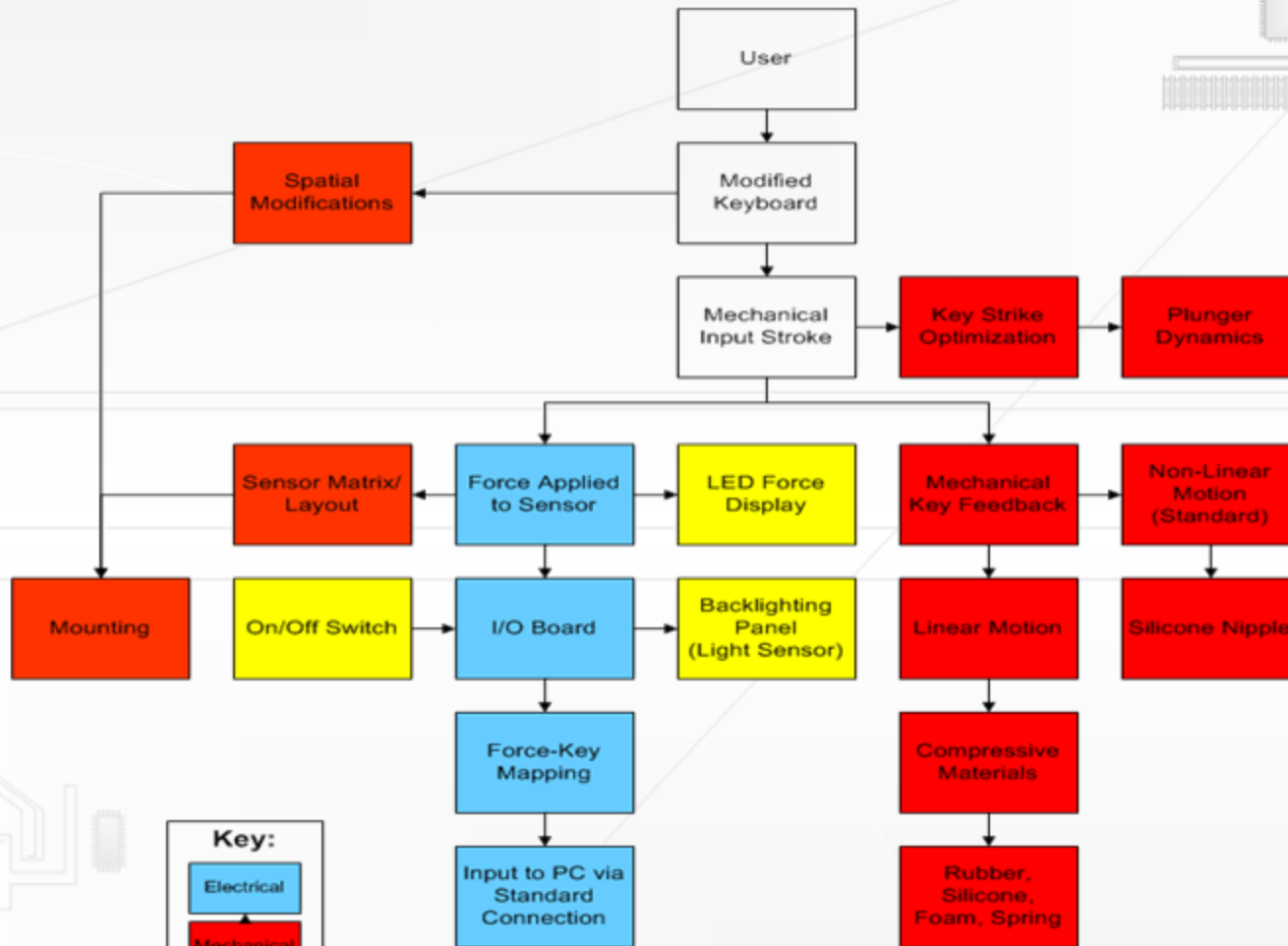


P10003: Dynamic Keyboard Phase II

Team Structure



Project Breakdown

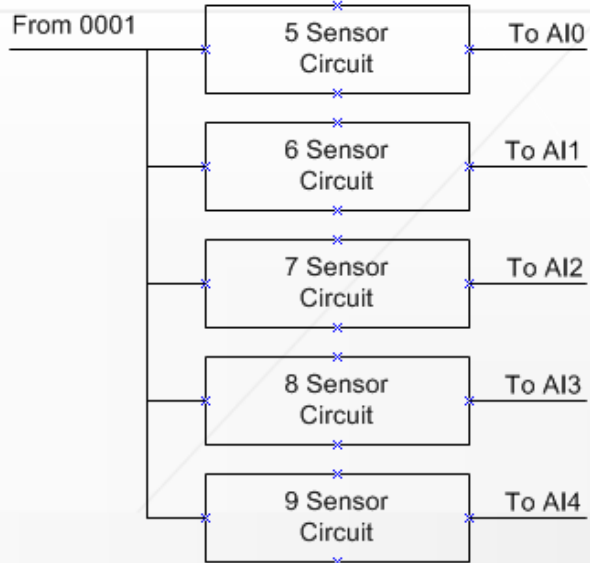
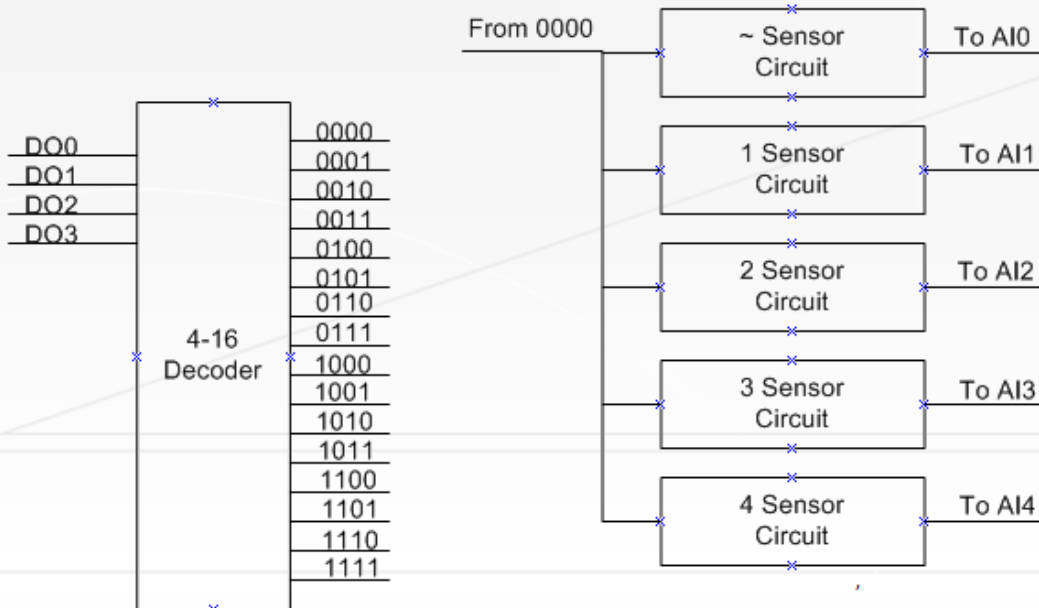


Concept Selection - Electrical

P10003 Dynamic Keyboard: Phase 2

Step #1 Electrical Screening

Selection Criteria	Importance	A		B		C		F		G	
		New Controller		New I/O Board		DAQ Unit		Force on/off	Button	Software on/off Option	
Concept	Wt.	Score	Total	Score	Total	Score	Total	Score	Total	Score	Total
Cost	4	5	20	3	12	1	4	4	16	5	20
Phase 3 Ease	3	4	12	3	9	4	12	5	15	3	9
Phase 2 Ease	3	1	3	5	15	4	12	3	9	5	15
Relatable Data	5	4	20	4	20	5	25	NA	NA	NA	NA
Complexity	2	1	2	5	10	4	8	5	10	4	8
Reads Force	5	5	25	5	25	5	25	NA	NA	NA	NA
Low Maintenance	3	5	15	5	15	3	9	4	12	5	15
Ease Maintenance	3	1	3	4	12	5	15	4	12	5	15
USB Powered	3	5	15	5	15	5	15	NA	NA	NA	NA
Precision	5	3	3	3	3	5	5	NA	NA	NA	NA
Durability	4	5	20	4	16	3	12	4	16	5	20
Size	3	5	15	5	15	3	9	NA	NA	NA	NA
Accuracy	5	3	3	3	3	5	5	NA	NA	NA	NA
Expandability	2	1	2	5	10	1	2	NA	NA	NA	NA
Sum			158		180		158		90		102
Rank			3		1		2				



Key Look Up Table

Decoder Outputs	Analog Inputs				
	AI0	AI1	AI2	AI3	AI4
0000	~	1	2	3	4
0001	5	6	7	8	9
0010	0	-	=	Q	W
0011	E	R	T	Y	U
0100	I	O	P	[]
0101	\	A	S	D	F
0110	G	H	J	K	L
0111	;	'	Z	X	C
1000	V	B	N	M	,
1001	.	/	TAB	BCKSP	ENTR
1010	SPACE	SPACE	ESC	PGUP	PGDN
1011	DEL	UP	DOWN	LEFT	RIGHT
1100	NUM/	NUM*	NUM-	NUM+	NUMENT
1101	NUM1	NUM2	NUM3	NUM4	NUM5
1110	NUM6	NUM7	NUM8	NUM9	NUM0
1111	NUM.	EXTRA	EXTRA	EXTRA	EXTRA

Concept Selection - Mechanical

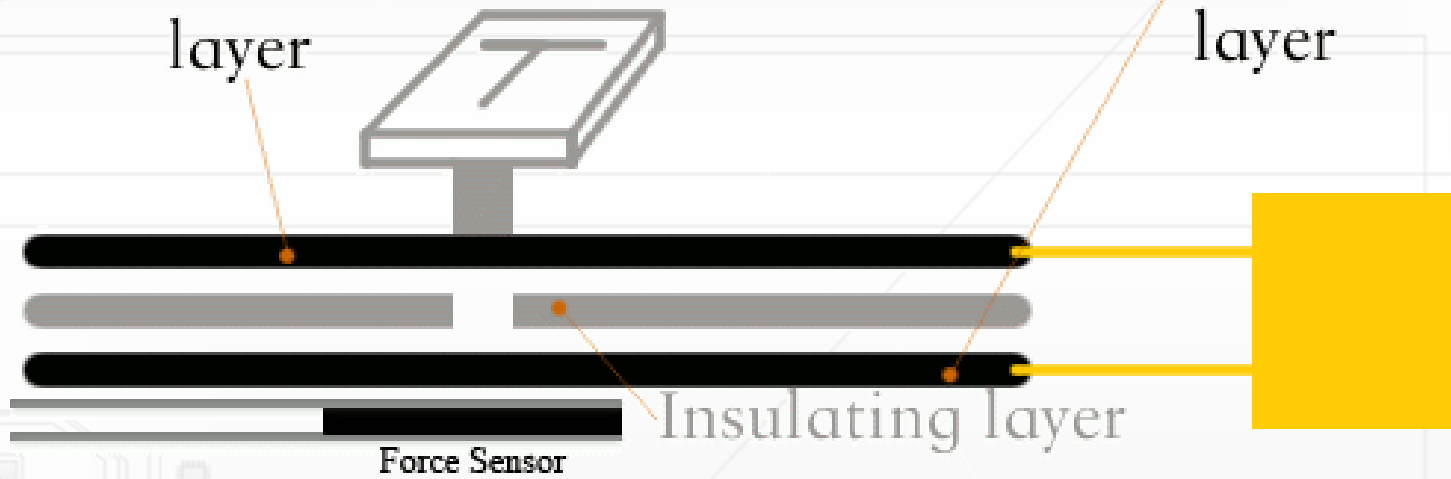
P10003 Dynamic Keyboard: Phase 2

Step #1 Mechanical Screening - Estimations needing research

Selection Criteria	Importance	D		E	
		Silicone Nipple		Compressive Material	
Concept	Wt.	Score	Total	Score	Total
Cost	4	5	20	3	12
P2 Ease	3	5	15	3	9
Complexity	2	5	10	4	8
Low Maintenance	3	5	15	5	15
Ease Maintenance	3	5	15	5	15
Precision	5	5	25	5	25
Durability	4	5	20	4	16
Accuracy	5	4	20	5	25
Sum			140		125
Rank			tied		tied

Upper
conducting
layer

Lower
conducting
layer



Insulating layer

Force Sensor

Project Plan

Project Plan Rev.1 P10003 Dynamic Keyboard P2

Initial Concepts

- Review phase 1 components and designs
- Analyze key componets of keyboard
- Investigate modifying pre-existing keyboard structures Vs. creating new
- Final investigation of measurement systems (Force, Acoustics, Velocity, Pressure)
- Formulate multiple concepts for customer needs
- Establish preliminary engineering specs and requirements

Concept Research

- Research component materials
- Investigate types of keyboards
- Force sensor positioning
- USB/ps/2 EE research
- Microcontroller research
- Methods of integration with existing electronics
- Investigate tactile feedback
- Force matrix layout
- Extended functionality research

Concept Selections

- Establish detailed engineering specs/risks for each concept
- Develop concept pro's & con's based on research
- Concept Decision
- System level design

Design

- Software plan
- Detail level design
- Schematics (electrical and mechanical)
- Develop a CAD of keyboard
- FEA, silicone
- BOM
- Develop test plan
- Part ordering
- Prepare for design review

Prototype

- Machine necessary parts
- Build circuit boards
- Assemble prototype

Test

- Individual component testing
- Durability Testing
- Flexibility Testing
- Break Stuff
- Full System Testing
- Forces
- Demo
- Prepare for design review

Work Breakdown Structure

