

Capstone: Quality Tugs Budget

Project: Electric Airplane Tug
 Last Updated 5/2/2019

Expense Items	Year								Item Total
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
Travel:									
Trip to CDA (09/20)	\$ 101.38								\$ 101
Trip to CDA (March)								\$ 110.00	\$ 110
Supplies / Parts / Services:									
3D printing filament					\$ 50.00				\$ 50
Linear Accuator							\$ 309.00		\$ 309
Wiring, Switch,and Relay for Actuator							\$ 34.95		\$ 35
1.5"x1.5"x42" 8020							\$ 48.42		\$ 48
1.5"x1.5"x13" 8020							\$ 8.84		\$ 9
1/4-20 Slide in T-Nut							\$ 14.22		\$ 14
5/16-18 Slide in T-Nut							\$ 8.40		\$ 8
Bearing Pad							\$ 23.60		\$ 24
45 Degree 8020 Support Frame							\$ 27.00		\$ 27
UHMW Tube							\$ 30.18		\$ 30
Latch Torsional Spring							\$ 5.19		\$ 5
Gate Torsional Spring							\$ 1.59		\$ 2
1/4-20 Hex Bolt							\$ 5.04		\$ 5
1/4-20 Par Thru Bolt							\$ 1.23		\$ 1
1/4-20 Nut							\$ 0.12		\$ 0
Nylon Spacer							\$ 0.26		\$ 0
Gate Actuator Bar Stock							\$ 21.30		\$ 21
Latch Actuator Bar Stock							\$ 26.00		\$ 26
Laser Cut Parts							\$ 254.24		\$ 254
2x2x1/4 Square Tubing							\$ 25.89		\$ 26
2.5x2.5x1/4 Square Tubing							\$ 37.00		\$ 37
UHMW Sheet/Tape for Actuators							\$ 6.44		\$ 6
Cotter Pins							\$ 5.00		\$ 5
12.25x.5 Steel Rod							\$ 9.14		\$ 9
uxcell voltage buck converter 24v to 12v							\$ 20.09		\$ 20
Powder Coating							\$ 120.00		\$ 120
Shop Usage (est. Hrs):									
Machining							20.00	5.00	0
Welding							30.00	15.00	25
									45
									0
									0
									0
									0
Graduate Student Support									\$ 519 including fringe
Shop Overhead									\$ 500
University Overhead									\$ 116 5% of all expenses
Totals									\$ 2,440 \$ 2,500 \$ 60
									Budget Excess