

AEM 1905 -- High-Power Rocketry Homework -- Fall 2016
 Center of Gravity and Center of Pressure Calculation Spreadsheet
 Name **SAMPLE**

part	material	# of pieces	present/absent	total length (in)	outer diameter (in)	weight per piece (oz)	CG from top of part (in)	CP from top of part (in)	dist. top from tip of nose (in)	CG station	CP station
										CG from tip of nose (in) or NA if not applicable	CP from tip of nose (in) or NA if not applicable
Conical nose cone (solid)	balsa	1	1	4.00	4.00	2.00	3.00	3.00	2.66	0.00	3.00
body tube	Quantum tubing	1	1	10.00	10.00	2.00	4.00	5.00	5.00	4.00	9.00
motor-mount tube	Kraft phenolic	1	0	7.00	7.00	1.65	1.43	2.50	NA	7.00	9.00
front centering ring	1/2" aircraft plywood	1	0	0.50	0.50	2.52	0.25	0.25	NA	7.25	
aft centering ring	1/2" aircraft plywood	1	0	0.50	0.50	2.52	0.25	0.25	NA	13.25	
fins	G-10 fiberglass	4	1	3.00	3.00	NA	0.50	1.73	1.10	11.00	12.73
H125 motor in casing "Cessaroni H125 classic"	solid fuel & aluminum	1	0	6.00	6.00	1.50	10.34	3.00	NA		

Fin & body dimensions

root chord (in)	a =	3.00	Fin set coefficient
tip chord (in)	b =	2.00	6.97
sweep length (in)	m =	1.00	
semi-span (in)	s =	2.00	3- or 4-fin/body
mid-chord (in)	l =	2.06	interference factor
body radius (in)	r =	1.00	1.33
body diameter (in)	d =	2.00	

CALCULATE OVERALL CENTER OF GRAVITY

part	total weight (oz)	CG station * weight (in * oz)	CG overall (in)
Ogive nose cone (solid)	3.00	9.00	7.83
body tube	4.00	36.00	
motor-mount tube			
front centering ring			
aft centering ring			
fin (set of 4)	2.00	25.47	
H125 motor in casing			
sum	9.00	70.47	

CALCULATE OVERALL CENTER OF PRESSURE

part	normal coeff ()	CP station * normal coeff ()	CP overall (in)
Ogive nose cone (solid)	2.00	5.33	10.43
body tube	0.00	0.00	
motor-mount tube	NA		
front centering ring	NA		
aft centering ring	NA		
fin (set of 4)	9.29	112.42	
H125 motor in casing	NA		
sum			117.75

CALCULATE OVERALL STATIC MARGIN

SM (caliper)	1.30
Stable	