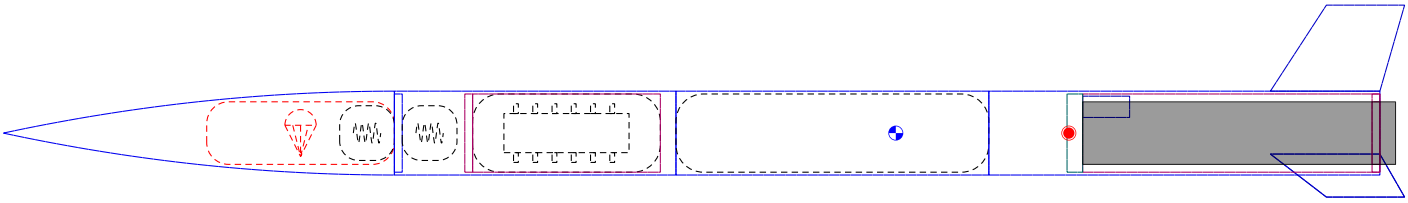
Rocket Design



Rocket

Stages: 1

Mass (with motor): 1132 g

Stability: 2.06 cal

CG: 571 mm

CP: 681 mm

G74W-4

Altitude	310 m
Flight Time	64.6 s
Time to Apogee	8.18 s
Optimum Delay	7.02 s
Velocity off Pad	12.8 m/s
Max Velocity	84.3 m/s
Velocity at Deployment	11.7 m/s
Landing Velocity	5.55 m/s

Motor	Avg Thrust	Burn Time	Max Thrust	Total Impulse	Thrust to Wt	Propellant Wt	Size
G74W	76.2 N	1.12 s	91.2 N	85.3 Ns	8.74:1	39.3 g	29/83 mm

F37-6

Altitude	105 m
Flight Time	24.5 s
Time to Apogee	5.35 s
Optimum Delay	3.75 s
Velocity off Pad	8.18 m/s
Max Velocity	40.4 m/s
Velocity at Deployment	9.6 m/s
Landing Velocity	5.62 m/s

Motor	Avg Thrust	Burn Time	Max Thrust	Total Impulse	Thrust to Wt	Propellant Wt	Size
F37	32.6 N	1.55 s	46.5 N	50.7 Ns	3.66:1	28.2 g	29/99 mm

E15-7

Altitude	51.8 m
Flight Time	14.3 s
Time to Apogee	4.29 s
Optimum Delay	1.7 s
Velocity off Pad	6.19 m/s
Max Velocity	23.3 m/s
Velocity at Deployment	14.2 m/s
Landing Velocity	5.47 m/s

Motor	Avg Thrust	Burn Time	Max Thrust	Total Impulse	Thrust to Wt	Propellant Wt	Size
E15	15.7 N	2.53 s	28.8 N	39.8 Ns	1.87:1	20.1 g	24/70 mm

B1-P

Altitude	0 m
Flight Time	2.91 s
Time to Apogee	0 s
Optimum Delay	N/A
Velocity off Pad	N/A
Max Velocity	0 m/s
Velocity at Deployment	N/A
Landing Velocity	0 m/s

Motor	Avg Thrust	Burn Time	Max Thrust	Total Impulse	Thrust to Wt	Propellant Wt	Size
B1	1.88 N	2.42 s	3.87 N	4.61 Ns	0.21:1	24 g	24/40 mm

F46-P

Altitude	147 m
Flight Time	31.5 s
Time to Apogee	6.19 s
Optimum Delay	4.8 s
Velocity off Pad	7.82 m/s
Max Velocity	50.1 m/s
Velocity at Deployment	7.91 m/s
Landing Velocity	6.05 m/s

Motor	Avg Thrust	Burn Time	Max Thrust	Total Impulse	Thrust to Wt	Propellant Wt	Size
F46	47.9 N	1.47 s	52.5 N	70.3 Ns	4.27:1	142 g	40/70 mm

F87-P

Altitude	133 m
Flight Time	28.2 s
Time to Apogee	5.53 s
Optimum Delay	4.91 s
Velocity off Pad	11.2 m/s
Max Velocity	50.5 m/s
Velocity at Deployment	5.55 m/s
Landing Velocity	6.1 m/s

Motor	Avg Thrust	Burn Time	Max Thrust	Total Impulse	Thrust to Wt	Propellant Wt	Size
F87	91.9 N	0.686 s	119 N	63.1 Ns	8.14:1	130 g	40/200 mm

G168-P

Altitude	409 m
Flight Time	76.5 s
Time to Apogee	9.06 s
Optimum Delay	8.41 s
Velocity off Pad	15.6 m/s
Max Velocity	103 m/s
Velocity at Deployment	10.1 m/s
Landing Velocity	6.08 m/s

Motor	Avg Thrust	Burn Time	Max Thrust	Total Impulse	Thrust to Wt	Propellant Wt	Size
G168	176 N	0.686 s	240 N	121 Ns	15.62:1	130 g	40/200 mm

E17-P

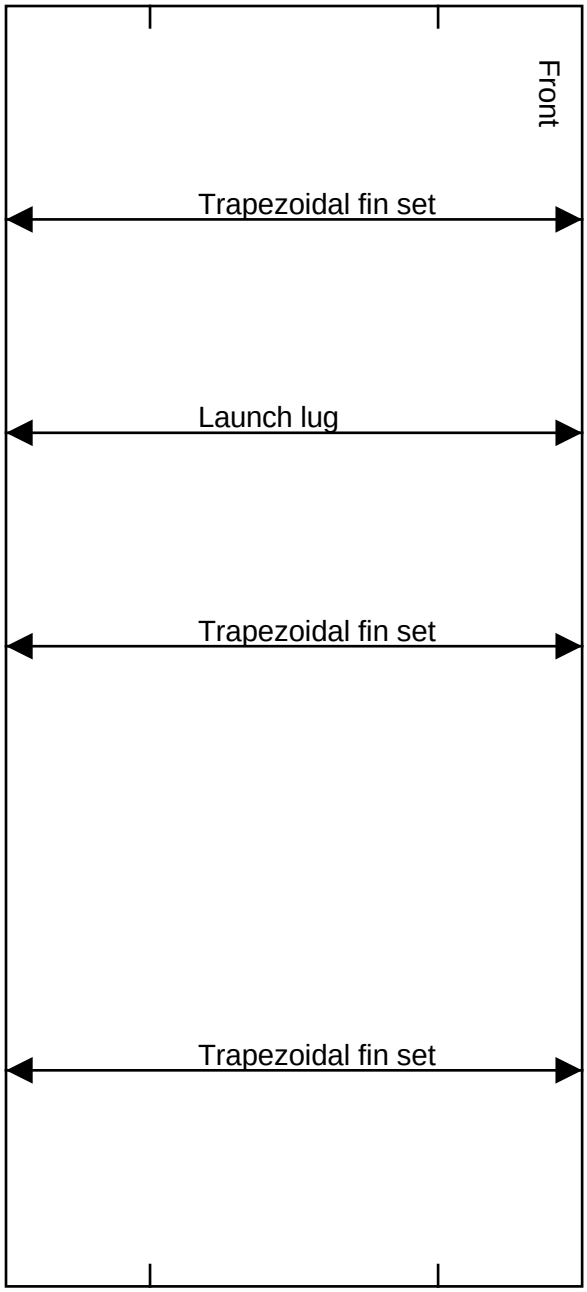
Altitude	36.4 m
Flight Time	10.4 s
Time to Apogee	3.58 s
Optimum Delay	1.55 s
Velocity off Pad	8.28 m/s
Max Velocity	19.5 m/s
Velocity at Deployment	3.64 m/s
Landing Velocity	5.99 m/s

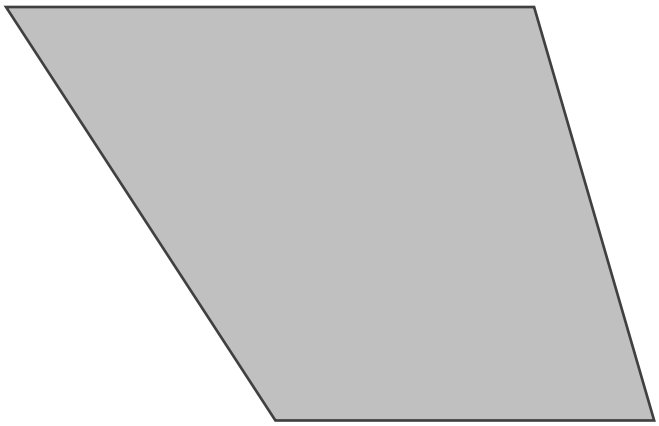
Motor	Avg Thrust	Burn Time	Max Thrust	Total Impulse	Thrust to Wt	Propellant Wt	Size
E17	20.9 N	1.71 s	50.9 N	36.3 Ns	1.88:1	140 g	40/200 mm

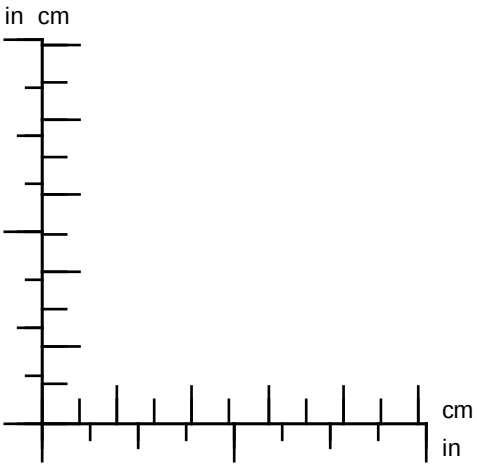
Parts Detail

Sustainer

	Nose cone	PLA (1.3 g/cm³)	Parabolic series	Len: 250 mm	Mass: 64.4 g
	Parachute	Polyethylene (heavy) (40 g/m²)	Dia_{out} 1000 mm	Len: 120 mm	Mass: 34.9 g
	Shroud Lines	Elastic cord (flat 6 mm, 1/4 in) (4.3 g/m)	Lines: 8	Len: 100 mm	
	Shock cord	Tubular nylon (25 mm, 1 in) (29 g/m)		Len: 200 mm	Mass: 5.8 g
	Body tube	PLA (1.3 g/cm³)	Dia_{in} 50 mm Dia_{out} 53.6 mm	Len: 180 mm	Mass: 68.5 g
	Shock cord	Tubular nylon (25 mm, 1 in) (29 g/m)		Len: 100 mm	Mass: 2.9 g
	Altimeter		Dia_{out} 50 mm		Mass: 200 g
	Electronics bay	PLA (1.3 g/cm³)	Dia_{in} 48 mm Dia_{out} 50 mm	Len: 120 mm	Mass: 24 g
	Altimeter block	PLA (1.3 g/cm³)	Dia_{in} 0 mm Dia_{out} 50 mm	Len: 5 mm	Mass: 12.8 g
	Extra trube	PLA (1.3 g/cm³)	Dia_{in} 50 mm Dia_{out} 53.6 mm	Len: 200 mm	Mass: 76.2 g
	Tolerance		Dia_{out} 50 mm		Mass: 100 g
	Tail	PLA (1.3 g/cm³)	Dia_{in} 50 mm Dia_{out} 53.6 mm	Len: 250 mm	Mass: 95.2 g
	Trapezoidal fin set (3)	PLA (1.3 g/cm³)	Thick: 3.6 mm		Mass: 46.3 g
	Launch lug	PLA (1.3 g/cm³)	Dia_{in} 10 mm Dia_{out} 13.6 mm	Len: 30 mm	Mass: 2.6 g
	Motor bracket	PLA (1.3 g/cm³)	Dia_{in} 48 mm Dia_{out} 50 mm	Len: 190 mm	Mass: 38 g
	Engine block	PLA (1.3 g/cm³)	Dia_{in} 0 mm Dia_{out} 50 mm	Len: 10 mm	Mass: 25.5 g
	Centering ring	PLA (1.3 g/cm³)	Dia_{in} 40 mm Dia_{out} 50 mm	Len: 5 mm	Mass: 4.59 g


Front
Trapezoidal fin set
Launch lug
Trapezoidal fin set
Trapezoidal fin set




in cm
cm
in