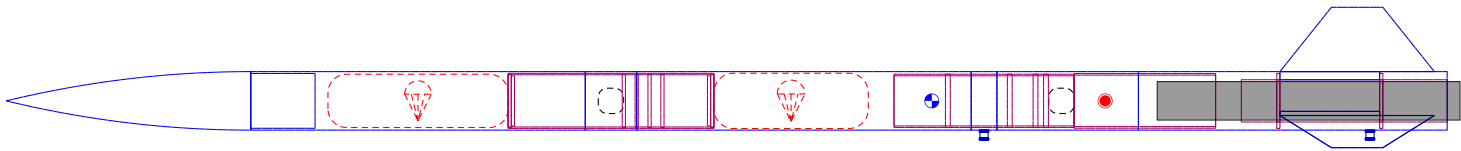


# Rocket Design



L1 Fun I with Ext  
Stages: 1  
Mass (with motor): 1759 g  
Stability: 2.96 cal / 12 %  
CG: 35.969 in  
CP: 42.707 in

## I225FJ-12

Altitude	3863 ft	Motor	Avg Thrust	Burn Time	Max Thrust	Total Impulse	Thrust to Wt	Motor Wt	Size
Flight Time	90.1 s	I225FJ	46.4 lbf	1.7 s	62 lbf	350 Ns	12.25:1	242 g	1.5/9.45 in
Time to Apogee	14.4 s								
Optimum Delay	12.9 s								
Velocity off Pad	51.7 ft/s								
Max Velocity	619 ft/s								
Velocity at Deployment	52.9 ft/s								
Landing Velocity	24.9 ft/s								

## I435T-14


Altitude	6336 ft	Motor	Avg Thrust	Burn Time	Max Thrust	Total Impulse	Thrust to Wt	Motor Wt	Size
Flight Time	136 s	I435T	106 lbf	1.27 s	158 lbf	596 Ns	27.22:1	287 g	1.5/11.8 in
Time to Apogee	17 s								
Optimum Delay	N/A								
Velocity off Pad	91.1 ft/s								
Max Velocity	1046 ft/s								
Velocity at Deployment	52.9 ft/s								
Landing Velocity	24.9 ft/s								

## I59WN-12

Altitude	5903 ft	Motor	Avg Thrust	Burn Time	Max Thrust	Total Impulse	Thrust to Wt	Motor Wt	Size
Flight Time	132 s	I59WN	13.4 lbf	8.15 s	38.6 lbf	487 Ns	3.53:1	272 g	1.5/9.13
Time to Apogee	19.7 s								in
Optimum Delay	11 s								
Velocity off Pad	41.3 ft/s								
Max Velocity	502 ft/s								
Velocity at Deployment	52.4 ft/s								
Landing Velocity	24.7 ft/s								

## Parts Detail

Stage: Stage

	Nose cone	Polypropylene, bulk (0.547 oz/in <sup>3</sup> )	Ogive	Len: 9.5 in	Mass: 109 g
	Main Tube 13" Always Ready Rocketry BT_2.15_48	Vulcanized Fiber (0.667 oz/in <sup>3</sup> )	Dia <sub>in</sub> 2.15 in Dia <sub>out</sub> 2.274 in	Len: 13 in	Mass: 106 g
	Parachute, 28 in., 1.9oz nylon, 10 lines, spill hole	Nylon fabric, ripstop, 1.9 oz actual (0.193 oz/ft <sup>2</sup> )	Dia <sub>out</sub> 28 in	Len: 7 in	Mass: 48.3 g
	Shroud Lines	Nylon Paracord, 275 lb, 2.38 mm dia. (0.038 oz/ft)	Lines: 10	Len: 28 in	
	Switchband 2" Always Ready Rocketry BT_2.15_48	Vulcanized Fiber (0.667 oz/in <sup>3</sup> )	Dia <sub>in</sub> 2.15 in Dia <sub>out</sub> 2.274 in	Len: 2 in	Mass: 16.3 g
	AV Bay 2" x 8"	Blue tube (0.751 oz/in <sup>3</sup> )	Dia <sub>in</sub> 2.03 in Dia <sub>out</sub> 2.14 in	Len: 8 in	Mass: 61.4 g
	AV Lid Fwd Outer	Aircraft plywood (LOC) (0.419 oz/in <sup>3</sup> )	Dia <sub>out</sub> 2.07 in	Len: 0.125 in	Mass: 5 g
	AV Lid Fwd Inner	Aircraft plywood (LOC) (0.419 oz/in <sup>3</sup> )	Dia <sub>out</sub> 1.95 in	Len: 0.125 in	Mass: 4.44 g
	Mass Component		Dia <sub>out</sub> 0.984 in		Mass: 256 g
	AV Plate 1	Aircraft plywood (LOC) (0.419 oz/in <sup>3</sup> )	Dia <sub>out</sub> 2.07 in	Len: 0.125 in	Mass: 5 g
	AV Plate 2	Aircraft plywood (LOC) (0.419 oz/in <sup>3</sup> )	Dia <sub>out</sub> 2.07 in	Len: 0.125 in	Mass: 5 g
	AV Plate 3	Aircraft plywood (LOC) (0.419 oz/in <sup>3</sup> )	Dia <sub>out</sub> 2.07 in	Len: 0.125 in	Mass: 5 g
	AV Plate 4	Aircraft plywood (LOC) (0.419 oz/in <sup>3</sup> )	Dia <sub>out</sub> 2.07 in	Len: 0.125 in	Mass: 5 g
	AV Lid Aft Inner	Aircraft plywood (LOC) (0.419 oz/in <sup>3</sup> )	Dia <sub>out</sub> 1.95 in	Len: 0.125 in	Mass: 4.44 g
	AV Lid Aft Outer	Aircraft plywood (LOC) (0.419 oz/in <sup>3</sup> )	Dia <sub>out</sub> 2.07 in	Len: 0.125 in	Mass: 5 g
	Drogue tube 13" Always Ready Rocketry BT_2.15_48	Vulcanized Fiber (0.667 oz/in <sup>3</sup> )	Dia <sub>in</sub> 2.15 in Dia <sub>out</sub> 2.274 in	Len: 13 in	Mass: 106 g



Parachute, 15 in., nylon, 6 lines

Top Flight Recovery PAR-15

Nylon fabric, ripstop, 1.7 oz actual  
(0.173 oz/ft<sup>2</sup>)

Dia<sub>out</sub> 15 in

Len: 6 in

Mass: 9.67 g

Shroud Lines

Top Flight Recovery PAR-15

Nylon Paracord, 110 lb, 1/16 in. dia.  
(0.017 oz/ft)

Lines: 6

Len: 15 in



Banded Baffle 1"

Always Ready Rocketry BT\_2.15\_48

Vulcanized Fiber  
(0.667 oz/in<sup>3</sup>)

Dia<sub>in</sub> 2.15 in  
Dia<sub>out</sub> 2.274 in

Len: 1 in

Mass: 8.14 g



Baffle 2" x 7"

Blue tube  
(0.751 oz/in<sup>3</sup>)

Dia<sub>in</sub> 1.949 in  
Dia<sub>out</sub> 2.07 in

Len: 7 in

Mass: 57 g



Bulkhead

Birch  
(0.394 oz/in<sup>3</sup>)

Dia<sub>out</sub> 2.07 in

Len: 0.187 in

Mass: 7.04 g



Bulkhead

Birch  
(0.394 oz/in<sup>3</sup>)

Dia<sub>out</sub> 2.07 in

Len: 0.187 in

Mass: 7.04 g



Bulkhead

Birch  
(0.394 oz/in<sup>3</sup>)

Dia<sub>out</sub> 2.07 in

Len: 0.187 in

Mass: 7.04 g



Bulkhead

Birch  
(0.394 oz/in<sup>3</sup>)

Dia<sub>out</sub> 2.07 in

Len: 0.187 in

Mass: 7.04 g



Mass Component

Dia<sub>out</sub> 0.984 in

Mass: 157 g



Extension

Always Ready Rocketry BT\_2.15\_48

Vulcanized Fiber  
(0.667 oz/in<sup>3</sup>)

Dia<sub>in</sub> 2.15 in  
Dia<sub>out</sub> 2.274 in

Len: 5.5 in

Mass: 44.8 g



Tube Coupler

Vulcanized Fiber  
(0.723 oz/in<sup>3</sup>)

Dia<sub>in</sub> 2 in  
Dia<sub>out</sub> 2.124 in

Len: 5.5 in

Mass: 45.2 g



Fin can 12"

Always Ready Rocketry BT\_2.15\_48

Vulcanized Fiber  
(0.667 oz/in<sup>3</sup>)

Dia<sub>in</sub> 2.15 in  
Dia<sub>out</sub> 2.274 in

Len: 12 in

Mass: 97.7 g



Rail Button

Delrin  
(0.821 oz/in<sup>3</sup>)

Len: 0 in

Mass: 1.65 g



Blue Tube 8" MMT

Vulcanized Fiber  
(0.667 oz/in<sup>3</sup>)

Dia<sub>in</sub> 1.644 in  
Dia<sub>out</sub> 1.644 in

Len: 8 in

Mass: 0 g



Centering ring

Aircraft plywood (LOC)  
(0.419 oz/in<sup>3</sup>)

Dia<sub>in</sub> 1.64 in  
Dia<sub>out</sub> 2.14 in

Len: 0.125 in

Mass: 2.2 g



Centering ring

Aircraft plywood (LOC)  
(0.419 oz/in<sup>3</sup>)

Dia<sub>in</sub> 1.64 in  
Dia<sub>out</sub> 2.14 in

Len: 0.125 in

Mass: 2.2 g



Trapezoidal Fin Set (3)

Plywood (birch) Thick: 0.118 in  
(0.364 oz/in<sup>3</sup>)

Mass: 35.6 g