

Latest Data for Parachute Sizing

Vehicle Total
Launch Mass

13.7780

Final Vehicle
Mass, kg

11.5906

CO2 Propellant
Margin, %

37.1485

Motor Name

CTI 2946-L820-
SK-P

Apogee time, sec

19.652

Drogue Deploy
Altitude, AGL

1517.77

Drogue Deploy
Velocity, m/sec

46.6297

*Drogue Deployment Altitude
MSL: 1757.77 meters*

Launch Altitude, km



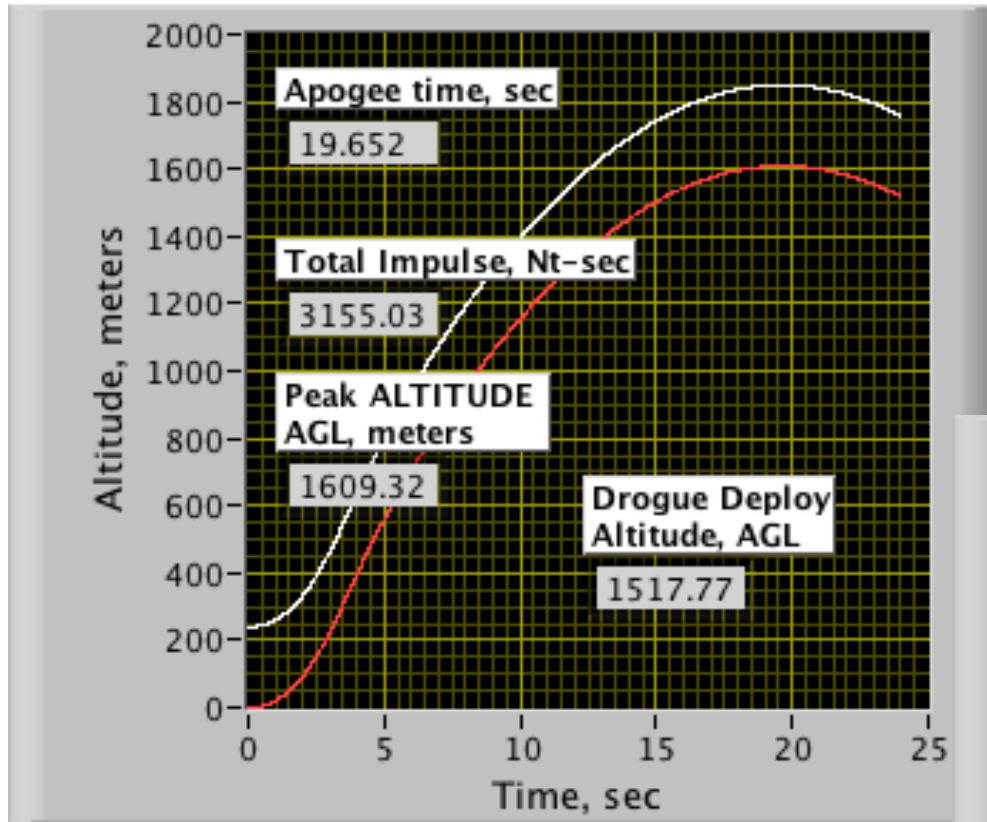
0.24

Drogue Deploy
Qbar, kPa

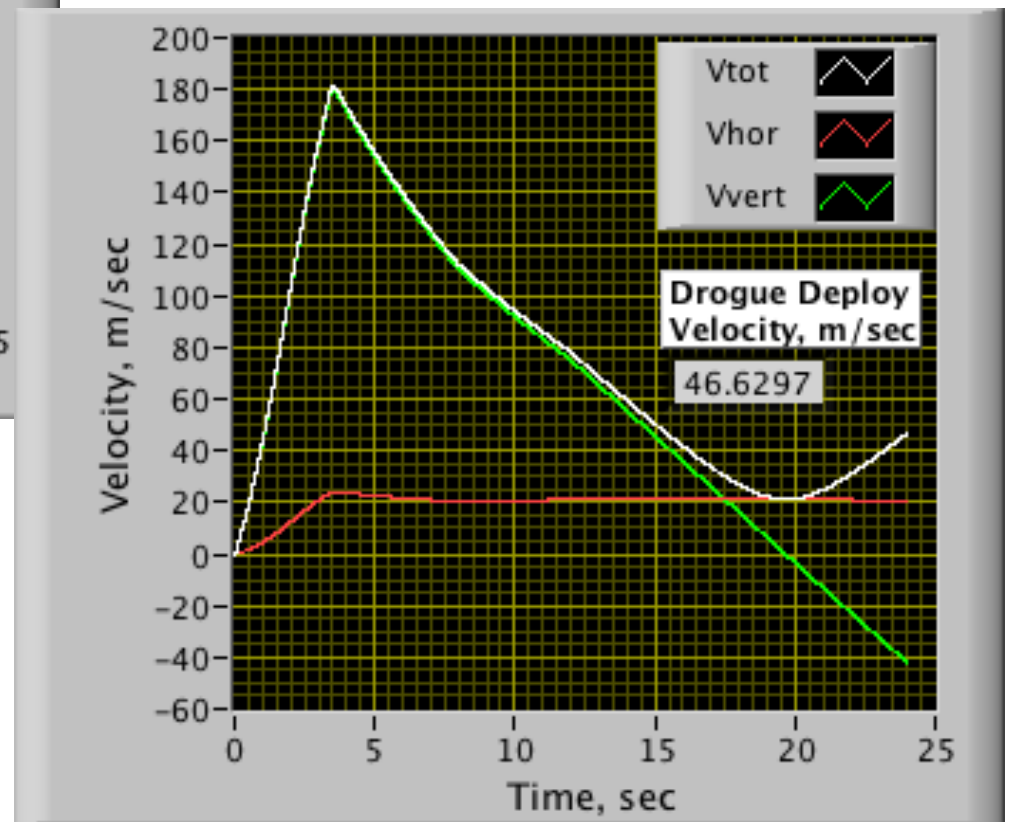
1.12112

Latest Data for Parachute Sizing

Altitude




Drogue deploy 4 seconds after apogee




Drogue Deployment Calculations I

Desired Terminal Velocity, m/sec


 21.336

Opening Trajectory Data

Deployment Velocity m/sec

 46.6297

Deployment Altitude (AGL), meters

 1517.77

Launch altitude, (MSL) meters


 240

Vehicle Drag /mass data

Vehicle CD

 0.35

Vehicle Aref, m²

 0.015328

Mass, kg

 11.768

Parachute Inflation Parameters

Parachute CD

 0.8

Parachute Inflation Constant, n

 4

Parachute Inflation Exponent

 0.85

Fill Time Shape exponent

 2

Opening Load Shock factor

 1.8

Chute

Drogue

Drogue Deployment Calculations I

Desired Terminal Velocity, m/sec

21.336

Parachute Geometry

Required Parachute Diameter, m

0.875265

Required Parachute Constructed Area, m²

0.601685

Required Parachute Drag Area, m²

0.481348

Qbar, at Terminal Velocity, Pa

234.721

Qbar, at Opening Velocity, Pa

1121.11

Intermediate Geometry Parameters

UNreefed Fill time, sec

0.133609

Ballistic Parameter, Ab

7.61059

Opening Load Reduction Factor, X1

0.924159

Opening Load, Newtons

897.687

Chute

Drogue



Main Deployment Calculations I

Desired Terminal Velocity, m/sec

5.182

Opening Trajectory Data

Deployment Velocity m/sec

18.9228

Deployment Altitude (AGL), meters

300

Launch altitude, (MSL) meters

240

Vehicle Drag /mass data

Vehicle CD

0.35

Vehicle Aref, m²

0.015328

Mass, kg

11.768

Parachute Inflation Parameters

Parachute CD

0.8

Parachute Inflation Constant, n

4

Parachute Inflation Exponent

0.85

Fill Time Shape exponent

2

Opening Load Shock factor

1.8

Chute

Main

Opening velocity Accounts for Chute deceleration due to higher density at Opening Altitude

Main Deployment Calculations I

Desired Terminal
Velocity, m/sec

5.182

Chute Output Parameters

1

Parachute Geometry

Required Parachute
Diameter, m

3.42846

Required Parachute
Constructed Area, m²

9.23185

Required Parachute
Drag Area, m²

7.38548

Qbar, at Terminal
Velocity, Pa

15.6116

Qbar, at Opening
Velocity, Pa

208.171

Intermediate Geometry Parameters

UNreefed Fill
time, sec

1.12647

Ballistic Parameter,
Ab

0.128577

Opening Load
Reduction
Factor, X1

0.161432

Opening Load,
Newtons

446.746

Chute

Main

Need to balance the opening Loads more

Drogue Deployment Calculations II

Desired Terminal Velocity, m/sec

←

Opening Trajectory Data

Deployment Velocity
m/sec

Deployment Altitude
(AGL), meters

Launch altitude, (MSL)
meters

Vehicle
Drag /mass data

Vehicle CD

Vehicle Aref, m²

Mass, kg

Parachute Inflation
Parameters

Parachute CD

Parachute
Inflation
Constant, n

Parachute
Inflation
Exponent

Fill Time
Shape exponent

Opening Load
Shock factor

Chute

Drogue Deployment Calculations II

Desired Terminal
Velocity, m/sec

Balanced opening load



25.67

Parachute Geometry

Required Parachute
Diameter, m

0.723852

Required Parachute
Constructed Area, m²

0.411519

Required Parachute
Drag Area, m²

0.329215

Qbar, at Terminal
Velocity, Pa

339.764

Qbar, at Opening
Velocity, Pa

1121.11

Intermediate Geometry Parameters

UNreefed Fill
time, sec

0.110496

Ballistic Parameter,
Ab

13.4551

Opening Load
Reduction
Factor, X1

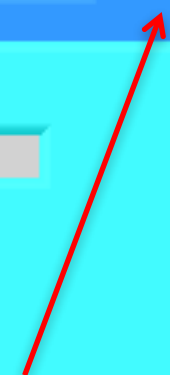
0.960365

Opening Load,
Newtons

638.021

Chute

Drogue



Main Deployment Calculations II

Desired Terminal Velocity, m/sec

5.182

Vehicle Drag /mass data

Vehicle CD

0.35

Vehicle Aref, m²

0.015328

Mass, kg

11.768

Parachute Inflation Parameters

Parachute CD

0.8

Parachute Inflation Constant, n

4

Parachute Inflation Exponent

0.85

Fill Time Shape exponent

2

Opening Load Shock factor

1.8

Opening Trajectory Data

Deployment Velocity m/sec

22.7666

Deployment Altitude (AGL), meters

300

Launch altitude, (MSL) meters

240

Chute

Main

Opening velocity Accounts for Chute deceleration due to higher density at Opening Altitude

Main Deployment Calculations II

Desired Terminal
Velocity, m/sec

Balanced opening load

5.182

Chute Output Parameters

1

Parachute Geometry

Required Parachute
Diameter, m

3.42846

Required Parachute
Constructed Area, m²

9.23185

Required Parachute
Drag Area, m²

7.38548

Qbar, at Terminal
Velocity, Pa

15.6116

Qbar, at Opening
Velocity, Pa

301.332

Intermediate Geometry Parameters

UNreefed Fill
time, sec

0.962622

Ballistic Parameter,
Ab

0.12506

Opening Load
Reduction
Factor, X1

0.159286

Opening Load,
Newtons

638.08

Chute

Main

Loads are now essentially balanced