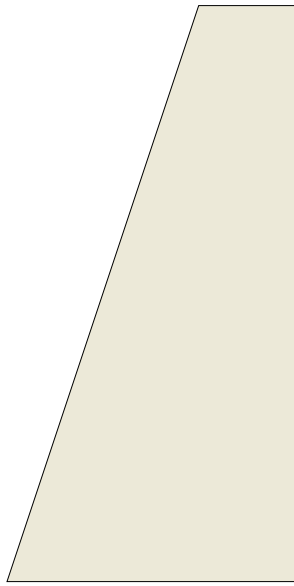


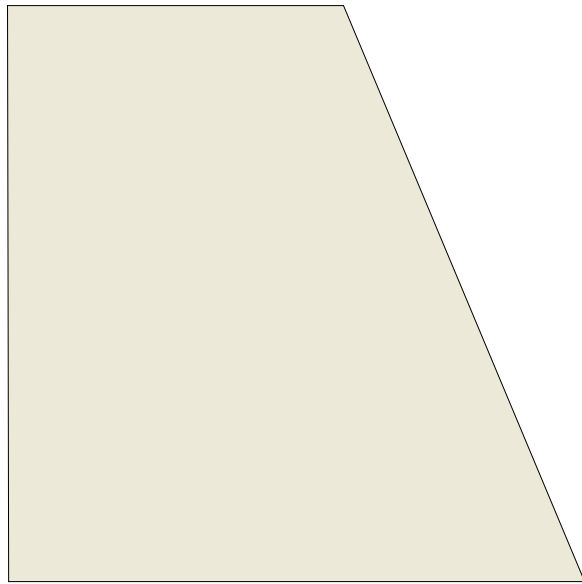
DOUG GARDEI'S

TITAN MISSILE





Titan AE - Top Fin set - Custom, Material: Balsa Page 1 of 1



Titan AE - Main - Custom, Material: Balsa Page 1 of 1



Titan AE - Fin set - Custom, Material: Balsa Page 1 of 1

Sustainer parts

Nose cone Estes - Estes - BNC-70AJ, Material: balsa

Nose shape: Hollow Ogive, Len: 4.000 In., Dia: 2.217 In.

Wall thickness: 0.125 In.

Body insert: OD: 2.092 In., Len: 0.750 In.

CG: 2.575 In. , Mass: 0.053 lb.

Radius of gyration: 0.043447681597 (m) , 4.344768 (cm)

Moment of inertia: 0.000045487932 (kgm²) , 454.879319 (gcm²)

Body tube Estes - Estes - BT-70, Material: Paper

OD: 2.217 In. , ID: 2.180 In. , Len: 17.500 In.

CG: 8.750 In. , Mass: 0.091 lb.

Radius of gyration: 0.129972291913 (m) , 12.997229 (cm)

Moment of inertia: 0.000694226036 (kgm²) , 6942.260361 (gcm²)

Tube coupler Estes - Estes - JT-70A, Material: paper

Tube coupler OD: 2.180 In., Len: 4.000 In.

Location: 15.625 In. From the front of Body tube

CG: 2.000 In. , Mass: 0.049 lb.

Radius of gyration: 0.035081905501 (m) , 3.508191 (cm)

Moment of inertia: 0.000027302765 (kgm²) , 273.027655 (gcm²)

Fin set - Custom, Material: Balsa

Planform: trapezoidal, Root chord: 2.000 In., Tip chord: 1.750 In., Semi-span: 1.000 In., Sweep: 0.245 In., Mid-Chord: 1.007 In.

Misc:

Location: 15.500 In. From the front of Body tube

Thickness: 0.125 In.

Profile: rounded

CG: 1.059 In. , Mass: 0.004 lb.

Radius of gyration: 0.015630246944 (m) , 1.563025 (cm)

Moment of inertia: 0.000000480967 (kgm²) , 4.809666 (gcm²)

Body tube Estes - Estes - BT-70, Material: Paper

OD: 2.217 In. , ID: 2.180 In. , Len: 17.500 In.

CG: 8.750 In. , Mass: 0.091 lb.

Radius of gyration: 0.129972291913 (m) , 12.997229 (cm)

Moment of inertia: 0.000694226036 (kgm²) , 6942.260361 (gcm²)

24mm motor tube Estes - EST 3086 - BT-50, Material: Paper

OD: 0.976 In. , ID: 0.950 In. , Len: 4.000 In.

Location: 0.000 In. From the base of Body tube

CG: 2.000 In. , Mass: 0.006 lb.

Radius of gyration: 0.030612400200 (m) , 3.061240 (cm)

Moment of inertia: 0.000002707245 (kgm²) , 27.072454 (gcm²)

Engine block Apogee - EB-50 - , Material: Paper

Engine block OD: 0.950 In., Len: 0.250 In.

Location: 3.500 In. From the base of 24mm motor tube

CG: 0.125 In. , Mass: 0.003 lb.

Titan AE - Parts list - Page 2

Radius of gyration: 0.007872173203 (m) , 0.787217 (cm)
Moment of inertia: 0.000000079350 (kgm²) , 0.793497 (gcm²)

13mm motor tube 1 Estes - EST 3084 - BT-5, Material: Paper
OD: 0.544 In. , ID: 0.518 In. , Len: 1.772 In.
Location: 0.000 In. From the base of Body tube

CG: 0.886 In. , Mass: 0.002 lb.
Radius of gyration: 0.013854024685 (m) , 1.385402 (cm)
Moment of inertia: 0.000000135624 (kgm²) , 1.356239 (gcm²)

Engine Block - Custom, Material: Paper
OD: 0.512 In. , ID: 0.433 In. , Len: 0.250 In.
Location: 0.000 In. From the front of 13mm motor tube 1

CG: 0.125 In. , Mass: 0.001 lb.
Radius of gyration: 0.004640430263 (m) , 0.464043 (cm)
Moment of inertia: 0.000000005780 (kgm²) , 0.057802 (gcm²)

13mm motor tube 2 Estes - EST 3084 - BT-5, Material: Paper
OD: 0.544 In. , ID: 0.518 In. , Len: 1.772 In.
Location: 0.000 In. From the base of Body tube

CG: 0.886 In. , Mass: 0.002 lb.
Radius of gyration: 0.013854024685 (m) , 1.385402 (cm)
Moment of inertia: 0.000000135624 (kgm²) , 1.356239 (gcm²)

Engine Block - Custom, Material: Paper
OD: 0.512 In. , ID: 0.433 In. , Len: 0.250 In.
Location: 0.000 In. From the front of 13mm motor tube 2

CG: 0.125 In. , Mass: 0.001 lb.
Radius of gyration: 0.004640430263 (m) , 0.464043 (cm)
Moment of inertia: 0.000000005780 (kgm²) , 0.057802 (gcm²)

13mm motor tube 3 Estes - EST 3084 - BT-5, Material: Paper
OD: 0.544 In. , ID: 0.518 In. , Len: 1.772 In.
Location: 0.000 In. From the base of Body tube

CG: 0.886 In. , Mass: 0.002 lb.
Radius of gyration: 0.013854024685 (m) , 1.385402 (cm)
Moment of inertia: 0.000000135624 (kgm²) , 1.356239 (gcm²)

Engine Block - Custom, Material: Paper
OD: 0.512 In. , ID: 0.433 In. , Len: 0.250 In.
Location: 0.000 In. From the front of 13mm motor tube 3

CG: 0.125 In. , Mass: 0.001 lb.
Radius of gyration: 0.004640430263 (m) , 0.464043 (cm)
Moment of inertia: 0.000000005780 (kgm²) , 0.057802 (gcm²)

13mm motor tube 4 Estes - EST 3084 - BT-5, Material: Paper
OD: 0.544 In. , ID: 0.518 In. , Len: 1.772 In.
Location: 0.000 In. From the base of Body tube

Titan AE - Parts list - Page 3

CG: 0.886 In. , Mass: 0.002 lb.
Radius of gyration: 0.013854024685 (m) , 1.385402 (cm)
Moment of inertia: 0.000000135624 (kgm²) , 1.356239 (gcm²)

Engine Block - Custom, Material: Paper
OD: 0.512 In. , ID: 0.433 In. , Len: 0.250 In.
Location: 0.000 In. From the front of 13mm motor tube 4

CG: 0.125 In. , Mass: 0.001 lb.
Radius of gyration: 0.004640430263 (m) , 0.464043 (cm)
Moment of inertia: 0.000000005780 (kgm²) , 0.057802 (gcm²)

Ring - Custom, Material: Lexan
Centering ringOD: 2.180 In., Hole #1: : 0.976 In.
Hole #2: : 0.544 In.
Hole #3: : 0.544 In.
Hole #4: : 0.544 In.
Hole #5: : 0.544 In.
Len: 0.115 In.

Location: 17.125 In. From the front of Body tube

CG: 0.058 In. , Mass: 0.010 lb.
Radius of gyration: 0.015207508716 (m) , 1.520751 (cm)
Moment of inertia: 0.000001090679 (kgm²) , 10.906793 (gcm²)

Ring - Custom, Material: Lexan
Centering ringOD: 2.180 In., Hole #1: : 0.976 In.
Hole #2: : 0.544 In.
Hole #3: : 0.544 In.
Hole #4: : 0.544 In.
Hole #5: : 0.544 In.
Len: 0.115 In.

Location: 16.125 In. From the front of Body tube

CG: 0.058 In. , Mass: 0.010 lb.
Radius of gyration: 0.015207508716 (m) , 1.520751 (cm)
Moment of inertia: 0.000001090679 (kgm²) , 10.906793 (gcm²)

Ring - Custom, Material: Lexan
Centering ringOD: 2.180 In., Hole #1: : 0.976 In.
Hole #2: : 0.544 In.
Hole #3: : 0.544 In.
Hole #4: : 0.544 In.
Hole #5: : 0.544 In.
Len: 0.115 In.

Location: 15.625 In. From the front of Body tube

CG: 0.058 In. , Mass: 0.010 lb.
Radius of gyration: 0.015207508716 (m) , 1.520751 (cm)
Moment of inertia: 0.000001090679 (kgm²) , 10.906793 (gcm²)

Ring - Custom, Material: Lexan
Centering ringOD: 2.180 In., ID: 0.976 In., Len: 0.115 In.

Titan AE - Parts list - Page 4

Location: 13.750 In. From the front of Body tube

CG: 0.058 In. , Mass: 0.015 lb.
Radius of gyration: 0.015207508716 (m) , 1.520751 (cm)
Moment of inertia: 0.000001584234 (kgm²) , 15.842339 (gcm²)

Main - Custom, Material: Balsa

Planform: trapezoidal, Root chord: 3.000 In., Tip chord: 1.750 In., Semi-span: 3.000 In., Sweep: -0.006 In., Mid-Chord: 3.066 In.

Misc:

Location: 14.375 In. From the front of Body tube

Thickness: 0.125 In.
Profile: rounded
CG: 1.212 In. , Mass: 0.016 lb.
Radius of gyration: 0.028598196096 (m) , 2.859820 (cm)
Moment of inertia: 0.000006118488 (kgm²) , 61.184883 (gcm²)





Top Fin set - Custom, Material: Balsa

Planform: trapezoidal, Root chord: 1.500 In., Tip chord: 0.500 In., Semi-span: 3.000 In., Sweep: 0.998 In., Mid-Chord: 3.041 In.

Misc:

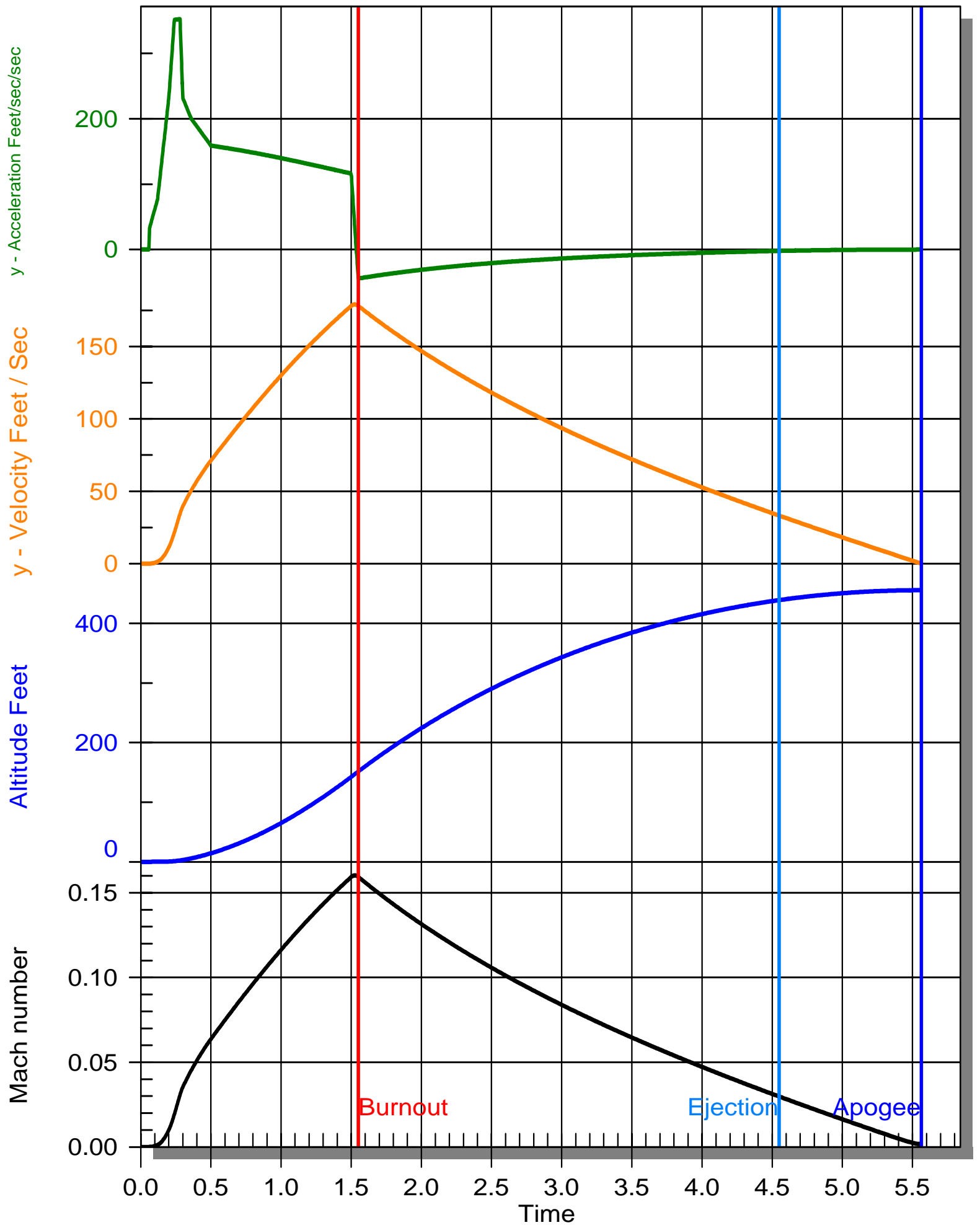
Location: 12.375 In. From the front of Body tube

Thickness: 0.125 In.
Profile: rounded
CG: 0.957 In. , Mass: 0.007 lb.
Radius of gyration: 0.022868590943 (m) , 2.286859 (cm)
Moment of inertia: 0.000001647335 (kgm²) , 16.473355 (gcm²)

Sim #	Results	Engines loaded	Max. Altitude	Max. Velocity	Max. Acceleration	Time to apogee	Velocity at deployment	Altitude at deployment	Optimal delay
			Feet	Feet / Sec	Feet/sec/sec	Seconds	Feet / Sec	Feet	Seconds
0		[E9-8 ,A10-None,A10-None,A10-None,A10-None]	1179.30	281.28	836.06	8.05	n/a	n/a	5.12
1		[E9-8 ,A10-None,A10-None,A10-None,A10-None]	1179.95	281.28	836.06	8.06	n/a	n/a	5.13
2		[D12-5 ,A10-None,A10-None,A10-None,A10-None]	718.36	240.73	734.58	6.34	n/a	n/a	4.79
3		[D12-3]	454.62	179.11	320.04	5.55	n/a	n/a	4.00

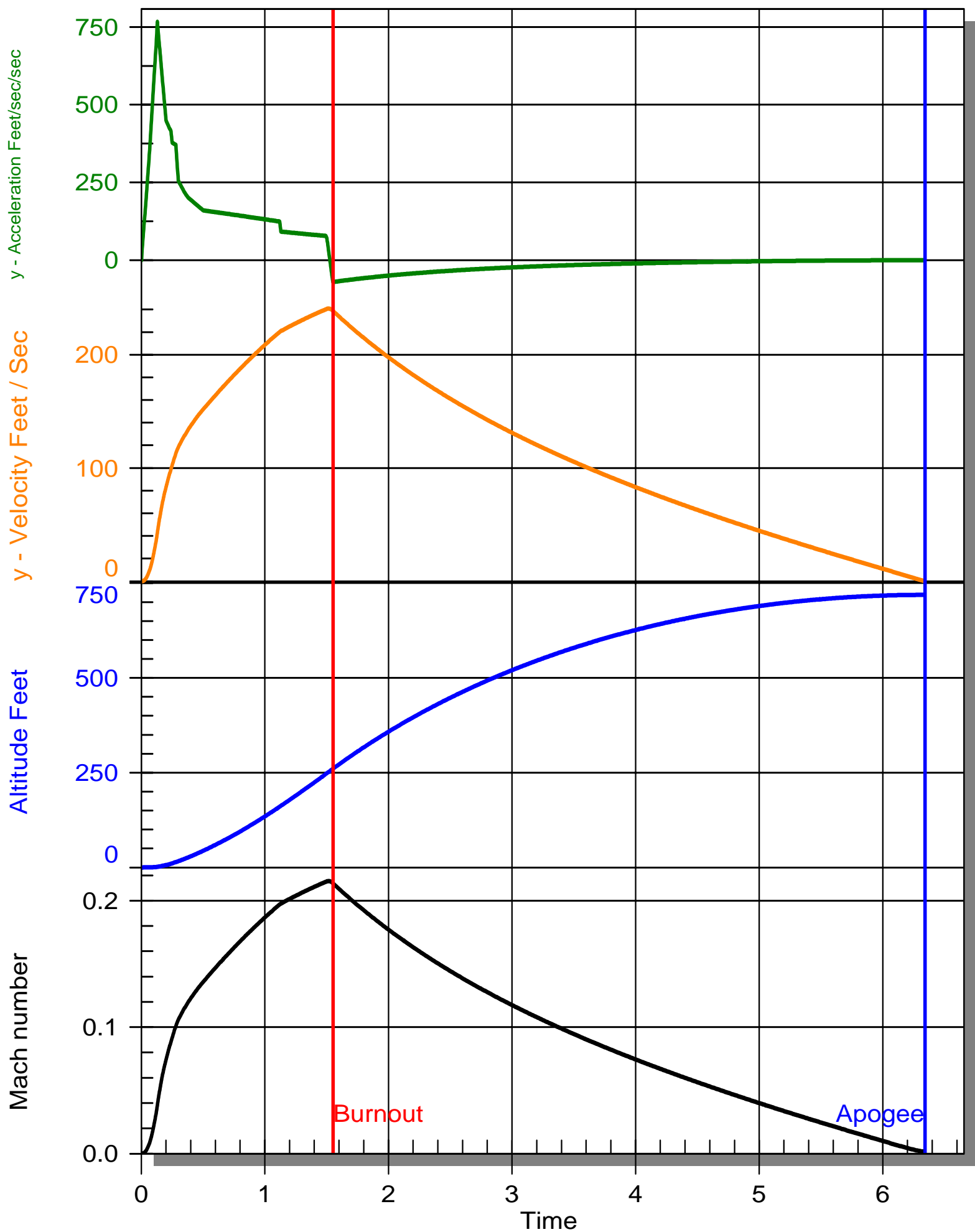
Titan AE

Launched with [D12-3]



Titan AE

Launched with [D12-5 ,A10-None,A10-None,A10-None,A10-None]



Titan AE

Launched with [E9-8 ,A10-None,A10-None,A10-None,A10-None]

