VI. Estimated Maximum Flight Altitude Tables:

By Dean Roth 3/29/2000

The tables do NOT predict the altitude for a specific rocket and motor, but predict the maximum altitude for a particular rocket and motor class. A rocket with a 25% I motor, for example, will have a lower apogee than the same rocket with a 50% I motor, but the table for a 50% I will provide a maximum altitude that the rocket will not exceed.

Find the matching motor class and airframe diameter. Rocket weight is with the motor.

Example:

- 5,000' Waivered Altitude
- Clouds at 4,000'
- 4" Diameter, 4 pound rocket
- Aerotech I195 motor - 426 Newton-seconds total impulse (33% I)

Use the 50% I table. According to the table the rocket will go less than 2900' and can be flown provided other factors are safe (thrust-to-weight ratio).

These tables may not apply to rockets with low Cd such as rockets with boattails.

1/4 pound = 4 ounces
1/2 pound = 8 ounces
3/4 pound = 12 ounces

NOTE: This is not an altitude prediction program like a flight simulator. It estimates the maximum altitude for a motor total impulse class, not precise altitudes for specific motors.

Use at your own risk. Dean Roth assumes no liability for use of this data.

100% F 80 Newton-seconds

	Weight with Motor						
Airframe Diameter	**0.25#**	**0.5#**	**0.75#**	**1#**	**1.5#**	**2#**	**2.5#**
1.625" (38mm)	3000	3300	3000	2600	1700	1200	900
2.25" (54mm)	2000	2200	2100	2000	1500	1100	800
2.6	1700	1900	1900	1800	1400	1000	

50% G 120 Newton-seconds

	Weight with Motor							
Airframe Diameter	**0.25#**	**0.5#**	**0.75#**	**1#**	**1.5#**	**2#**	**2.5#**	**3#**
1.625" (38mm)	3200	4000	4100	3800	2900	2100	1600	
2.25" (54mm)	2500	2900	3000	2900	2400	1900	1400	
2.6		2300	2400	2400	2100	1700	1400	
4				1500	1400	1200	1100	1000

100% G 160 Newton-seconds

	Weight with Motor						
Airframe Diameter	**0.5#**	**0.75#**	**1#**	**1.5#**	**2#**	**2.5#**	**3#**
1.625" (38mm)	4700	5000	4800	3900	3000	2300	1800
2.25" (54mm)	3500	3600	3500	3100	2600	2100	1700
2.6	3000	3000	3000	2800	2300	1900	1500
4		1800	1800	1700	1600	1400	1200

50% H 240 Newton-seconds

	Weight with Motor							
Airframe Diameter	**1.5#**	**2.5#**	**3.5#**	**4.5#**	**5.5#**	**6.5#**	**7.5#**	**8.5#**
2.6	3100	2800	2100	1600	1100			
4		1800	1600	1300	1000			
6		1100	1000	900				
7.5								

100% H 320 Newton-seconds

	Weight with Motor								
Airframe Diameter	**1.75#**	**2.75#**	**3.75#**	**4.75#**	**5.75#**	**6.75#**	**7.75#**	**8.75#**	**9.75#**
2.6	4000	3900	3300	2600	1900				
4		2400	2200	1900	1600	1300			
6		1500	1400	1300					
7.5									

50% I 480 Newton-seconds

	Weight with Motor									
Airframe Diameter	**3#**	**4#**	**5#**	**6#**	**7#**	**8#**	**9#**	**10#**	**11#**	**12#**
2.6	5000	4500	3800	3200	2600					
4	3200	2900	2600	2400	2000	1800	1500	1300	1100	
6			1700	1600	1500	1400	1200			
7.5			1400	1300						

100% I 640 Newton-seconds

	Weight with Motor										
Airframe Diameter	**3.2#**	**4.2#**	**5.2#**	**6.2#**	**7.2#**	**8.2#**	**9.2#**	**10.2#**	**11.2#**	**12.2#**	**13.2#**
2.6	5500	5500	5000	4300	3700						
4		3500	3300	3100	2800	2500	2300	2100	1900		
6			2200	2200	2100	2000	1800	1700	1600	1400	
7.5			1700	1600	1500						

50% J 960 Newton-seconds

	Weight with Motor									
Airframe Diameter	**4.75#**	**5.75#**	**6.75#**	**7.75#**	**8.75#**	**9.75#**	**10.75 #**	**11.75 #**	**12.75 #**	**13.75#**
2.6	7400	6900	6200	5400	4800	4100				
4		4400	4200	3900	3600	3300	2900	2600		
6		2800	2800	2700	2600	2300	2200	2100		
7.5		2200	2200	2100						

100% J 1280 Newton-seconds

	Weight with Motor									
Airframe Diameter	**5#**	**6#**	**7#**	**8#**	**9#**	**10#**	**11#**	**12#**	**13#**	**14#**
2.6	8000	8000	8000	8000	7000	6000				
4	4600	4900	4900	4800	4600	4300	4100	3800	3500	3200
6		3000	3000	3000	3000	3000	2800	2700	2600	2500
7.5		2300	2300	2300	2300	2300	2300	2300	2300	2200

50% K 1920 Newton-seconds

	Weight with Motor												
Airframe Diameter	**8#**	**9#**	**10#**	**11#**	**12#**	**13#**	**14#**	**15#**	**16#**	**17#**	**18#**	**19#**	**20#**
4	6600	6800	6800	6600	6400	6100	5800	5500	5200	4900	4600	4300	4100
6		4300	4300	4300	4300	4100	4000	4000	3800	3600	3500		3200
7.5				3400	3400	3300	3300	3200	3100	3000	2900		2800
9.25													
11.5													

100% K 2560 Newton-seconds

	Weight with Motor											
Airframe Diameter	**9#**	**11#**	**13#**	**15#**	**17#**	**19#**	**21#**	**23#**	**25#**	**27#**	**29#**	**31#**
4												
6		7000	7000	7000	7000	6000	6000	6000	5000	4000	4000	4000
7.5		5000	5000	5000	5000	5000	4000	4000	4000	4000	3000	3000
9.25				4000	4000	4000	4000	3500	3000	3000	3000	2500
11.5					3000		3000		2500		2500	

100% L 5120 Newton-seconds

	Weight with Motor											
Airframe Diameter	**17#**	**19#**	**21#**	**23#**	**25#**	**27#**	**29#**	**31#**	**33#**	**35#**	**37#**	**39#**
4												
6	7600	7800	8000	8100	8300	8300	8100	8000	7600	7300	7200	6800
7.5	6200	6400	6500	6600	6600	6500	6300	6200	6100	6000	5900	5700
9.25					5600			5400			5000	
11.5					4300			4200			4000	

50% M 7680 Newton-seconds

	Weight with Motor								
Airframe Diameter	**40#**	**50#**	**60 #**	**70#**	**80#**	**90#**	**100#**	**110#**	**120#**
4	17000	13000			5500		3300		2100
6	13000	10000			5000		3200		2100
7.5	10000	8400			5000		3100		2000
9.25	7700	6900			4200		3000		2000
11.5	6100	5500			3800		2800		1900

100% M 10240 Newton-seconds

	Weight with Motor								
Airframe Diameter	**40#**	**50#**	**60#**	**70#**	**80#**	**90#**	**100#**	**110#**	**120#**
4									
6	14000	14000	13000	11000	10000	8000	7000	6000	5000
7.5	11000	11000	11000	10000	8000	8000	6000	5000	5000
9.25	9000	10000	9000	8000	7000	7000	6000	5000	4000
11.5	8000	8000	7000	7000	6000	6000	5000	5000	4000

100% N 20480 Newton-seconds

	Weight with Motor						
Airframe Diameter	**70#**	**90#**	**110#**	**130#**	**150#**	**170#**	**190#**
6							
7.5	15000	15000	14000	13000	11000	10000	7000
9.25	11000	12000	12000	11000	10000	9000	7000
11.5	9000	9000	9000	9000	9000	8000	7000