

APPENDIX 3.

NATIONAL ASSOCIATION OF ROCKETRY **CERTIFIED MODEL ROCKET MOTORS** **APPROVED FOR USE IN TEAM AMERICA 2007**

The commercially-made model rocket motors listed below have been subjected to rigorous safety and reliability testing conducted by the NAR Standards & Testing (S&T) Committee and are the only ones approved for sale in the U.S. or for use in this Challenge. All motors listed here are in current production. Every motor listed here will continue to be approved for use in the Team America 2007 event regardless of any subsequent announced changes to the NAR's overall official engine certification list. This list may be expanded if new motors are certified during the period of the Challenge; this expansion and any revised list will be communicated to all those teams enrolled in the Challenge.

Download "Motor Data Sheets" from the NAR web site if you desire additional information. Each data sheet contains a thrust curve together with values from a test firing, including measured average thrust and total impulse, plus 32 data points for use in altitude simulation computer programs.

<u>Abbreviation</u>	<u>Full Manufacturer Name</u>
Aerotech	Aerotech
Cesaroni	Cesaroni Technology Incorporated
Estes	Estes Industries
PML	Public Missiles, Ltd.
Quest	Quest Aerospace Education
Rdrunner	Roadrunner Rocketry

Note: (R) following the listed casing dimensions denotes that the motor is a reloadable motor system certified only with the manufacturer-supplied casing, closures, nozzle, and propellant. Reloadable motors (and "G" power class motors of any kind) are not available for sale to persons under age 18, per U.S. Consumer Products Safety Commission regulations. Also, the metal casings that reloadable motors use are quite expensive. But if the performance of these types of model rocket motor happens to be exactly what you need for your design, your supervising teacher/adult advisor can purchase them and supervise your use of them.

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As of July 20, 2006

<u>Designation</u>	<u>Mfgr.</u>	<u>Casing Size (mm)</u>	<u>Propellant Mass (grams)</u>	<u>Total Impulse (N-sec.)</u>
1/4A3-3T	Estes	13 x 45	0.8	0.62
1/2A3-2T,4T	Estes	13 x 45	2.0	1.25
1/2A6-2	Estes	18 x 70	2.6	1.25
A3-4T	Estes	13 x 45	3.3	2.50
A6-4	Quest	18 x 70	3.5	2.50
A8-3,5	Estes	18 x 70	3.3	2.50
A10-3T,PT	Estes	13 x 45	3.8	2.50
B4-2,4	Estes	18 x 70	6.0	5.00
B6-0	Estes	18 x 70	5.6	4.90
B6-2,4,6	Estes	18 x 70	5.6	5.00
B6-0,2,4	Quest	18 x 70	6.5	5.00
C6-0,3,5,7	Estes	18 x 70	10.8	9.0
C6-0	Quest	18 x 70	11.0	8.8
C6-3,5	Quest	18 x 70	11.0	8.5
C11-3,5	Estes	24 x 70	12.0	9.0
D9-4,7	Aerotech	24 x 70	10.5	20.0
D11-P	Estes	24 x 70	24.5	18.0
D12-0,3,5,7	Estes	24 x 70	21.1	17.0
D13-4,7,10	R Aerotech	18 x 70	9.8	20.0
D15-4,6	R Aerotech	24 x 70	8.9	20.0
D21-4,7	Aerotech	18 x 70	9.6	20.0
D24-4,7	R Aerotech	18 x 70	8.8	18.5
E9-4,6,8,P	Estes	24 x 90	35.8	28.5
E10-6,10	Ellis	24 x 102	28.3	35.8
E12-6,10	Ellis	24 x 102	28.3	35.8
E15-4,7,PW	Aerotech	24 x 70	20.1	40.0
E16-4,7	R Aerotech	29 x 124	19.0	40.0
E18-4,8	R Aerotech	24 x 70	20.7	39.0
E23-5,8	R Aerotech	29 x 124	17.4	37.0
E28-2,5	R Aerotech	24 x 70	18.4	40.0
E30-4,7	Aerotech	29 x 70	19.3	40.0
F12-2,5	R Aerotech	24 x 70	30.0	45.0
F20-4,7	Econojet Aerotech	29 x 73	30.0	64.0
F20-6,10	Ellis	24 x 140	31.2	67.9
F21W-4,6,8	Econojet Aerotech	24 x 95	30.0	55.0
F22-4,7	R Aerotech	29 x 124	46.3	65.0
F23FJ-4,7	Econojet Aerotech	29 x 73	32.0	56.0
F23-6,10	Ellis	24 x 140	31.2	67.9
F24-4,7	R Aerotech	24 x 70	19.0	50.0
F25W-4,6,9	Aerotech	29 x 98	35.6	80.0
F26FJ-6,9	Aerotech	29 x 98	43.1	62.2
F35-4,10	Rdrunner	29 x 112	40.1	76.5
F37-6,10,14	R Aerotech	29 x 99	28.2	50.0
F39-6,9	R Aerotech	24 x 70	22.7	50.0
F40-4,7,10	R Aerotech	29 x 124	40.0	80.0
F42T-4,8	Econojet Aerotech	29 x 83	27.0	52.9
F50-4,6,9	Aerotech	29 x 98	37.9	80.0

F50T-6		PML	29 x 98	37.9	80.0
F52-6,8,11	R	Aerotech	29 x 124	36.6	78.0
F60-4,7,10		Rdrunner	29 x 112	38.1	75.9
F62T-S,M,L	R	Aerotech	29 x 89	30.5	51.0
G20-3		Ellis	29 x 149	62.0	124.2
G35-4,7	Econojet	Aerotech	29 x 98	50.0	105.0
G35-6,10		Ellis	29 x 165	62.0	124.2
G37-6,10,P		Ellis	24 x 181	62.0	110.5
G38FJ-4,7		Aerotech	29 x 98	55.0	94.0
G40W-4,7,10		Aerotech	29 x 124	55.1	120.0
G40W-4,7		PML	29 x 124	55.1	120.0
G54-6,10,14		Aerotech	29 x 124	46.0	85.0
G61W-S,M,L	R	Aerotech	38 x 106	62.3	120.0
G64-4,8,10	R	Aerotech	29 x 124	62.5	120.0
G67R-S,M	R	Aerotech	38 x 106	60.0	110.0
G69-12A	R	Cesaroni	38 x 125	62.5	128.8
G77R-S,M	R	Aerotech	29 x 150	58.0	105.0
G79W-S,M,L	R	Aerotech	29 x 150	62.0	115.0
G80-4,7,10		Aerotech	29 x 124	56.9	120.0
G80T-4,7		PML	29 x 124	56.9	120.0
G80-4,7,10		Rdrunner	29 x 140	54.7	105.7

Additional note:

- The manufacturer-reported total impulse of several Aerotech motors differs from the values reported above due to a recent motor design change. Both the new and the old motors (both of which have the same label) are approved for use in TARC.