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I. BRIEF DESCRIPTION OF RSO DUTIES & REQUIREMENTS:

The primary duty of the Range Safety Officer is to examine each high power rocket to verify that it conforms to the Safety Code and to determine that the rocket will fly safely as configured. In short, to guard against unsafe flights. **Requirements:** The RSO shall be a mature individual, at least 21 years old, certified Level 2 in TRA, and knowledgeable about rocket theory, motors and the high power rocketry safety regulations (NFPA 1127).

II. DETAILED JOB DESCRIPTION:

Job Description:

1. Check the individual's TRA or NAR card to verify current membership and certification level. Apart from a certification attempt, they may not use a motor outside their certification level.

2. Visually inspect each rocket to determine if it is structurally sound for flight and that the materials used in construction conform with the safety code (any metal used must be ductile and only enough metal should be used for structural integrity. See the TRA document in this handbook for information on the use of metal.). Check the integrity of the body tube, nose cone and fins. Make sure the fins are not loose or damaged. Make sure the nose cone or payload is not too tight or too loose. Check the Launch Lugs or Rail Clips. See that the motor is properly secured.

3. Determine if the motor is appropriate for the rocket's weight. Weigh the rocket and check the Thrust to Weight Tables available in the RSO Handbook to see if it falls within the safe flight category. You are checking to see that the rocket falls within the minimum and maximum guidelines for thrust to weight ratio. While it is easy to determine if a rocket has less than a safe thrust to weight ratio, it usually takes experience to tell if the rocket will not be able to take the thrust. When in doubt, consult with other, more experienced people or the officers of TWA.

4. Verify the stability of the rocket:

   - If it is a kit, it is *probably* stable. If you don't know if it is a kit, ask. If it is a kit, ask if it has been modified, and if so, was the stability re-checked. If it is a kit, is the installed motor *approved* by the manufacturer (in terms of stability or structural integrity?)

   - If the rocket was scratch-built, make sure the stability was checked.

   - If the rocket looks marginal in any way -- structural strength, stability or appropriate motor -- pursue the issue. You can ask the individual if the rocket has flown safely before with the same motor. You can ask for proof of stability. You can ask TWA officers or other experienced individuals for a second (or third) opinion. Do not over-rule safety for the sake of fun or convenience.

5. Determine that the rocket will not fly into the clouds or above the waiver height. The person wanting to fly a high performance rocket should know the expected altitude. We must try to keep rockets from flying into clouds. When in doubt, consult the charts in the RSO Handbook to determine the approximate altitude the rocket will reach.

6. Verify that an ignitor is NOT in the motor & electronics are NOT armed.

7. Determine that the recovery system will work properly. In general, you can check with the individual to verify that they have the proper delay, didn't forget batteries, ejection charges, etc. A few quick questions can save a rocket or a person's life.

8. Determine if the flight will be "heads up." A heads up flight is any of the following:

- The first flight of any rocket.
- A rocket you consider marginal in any way.
- A multiple-staged rocket.
- A clustered rocket.

Put the appropriate sticker on the flight card for every heads up flights. (These will be available at the RSO table.)

9. Determine if the flight will be for certification. If it is, note the level and place the appropriate sticker on the flight card. (These will be available at the RSO table.)

10. Verify that the motor is approved by the Tripoli Motor Testing committee. If you are in doubt, have the individual who wants to fly the motor in question check the TMT booklet and show you that it is OK. DO NOT let unapproved motors through.

11. Check to see that all important information on the flight card is filled out, especially weight, expected altitude, if it is a "heads-up" or cert flight, etc.

12. If everything looks safe and you are comfortable with the rocket, go ahead and sign the card. Remember, you are responsible for determining the safety of the rocket. If you think the rocket is unsafe or that the flight should be delayed, due to clouds or wind, politely inform the person of your decision. You can get a second opinion from a TWA officer if you wish. It is our intent to stand by your decision. The individual may be offended or upset, but *the safety of the fliers and spectators is more important.* If we do our job right, we WILL offend people at times. It's all part of the job.

III. RSO CHECK LIST:

⇒ Read the Flight Card to see if it is Filled Out Properly

⇒ Verify TRA or NAR current membership and Certification level with the motor being used.

⇒ Check the Structural Integrity of the Rocket

⇒ Determine if the Motor is Appropriate for the Rocket

⇒ Determine if the Motor is on the TMT-Certified List

⇒ Verify that an Ignitor is not in the Motor & electronics are not armed.

⇒ Verify the Stability of the Rocket

⇒ Determine if the Rocket Will Fly into the Clouds or higher than the waiver

⇒ Ask if the Recovery System is Ready: (Ejection Charge, Batteries, etc.)

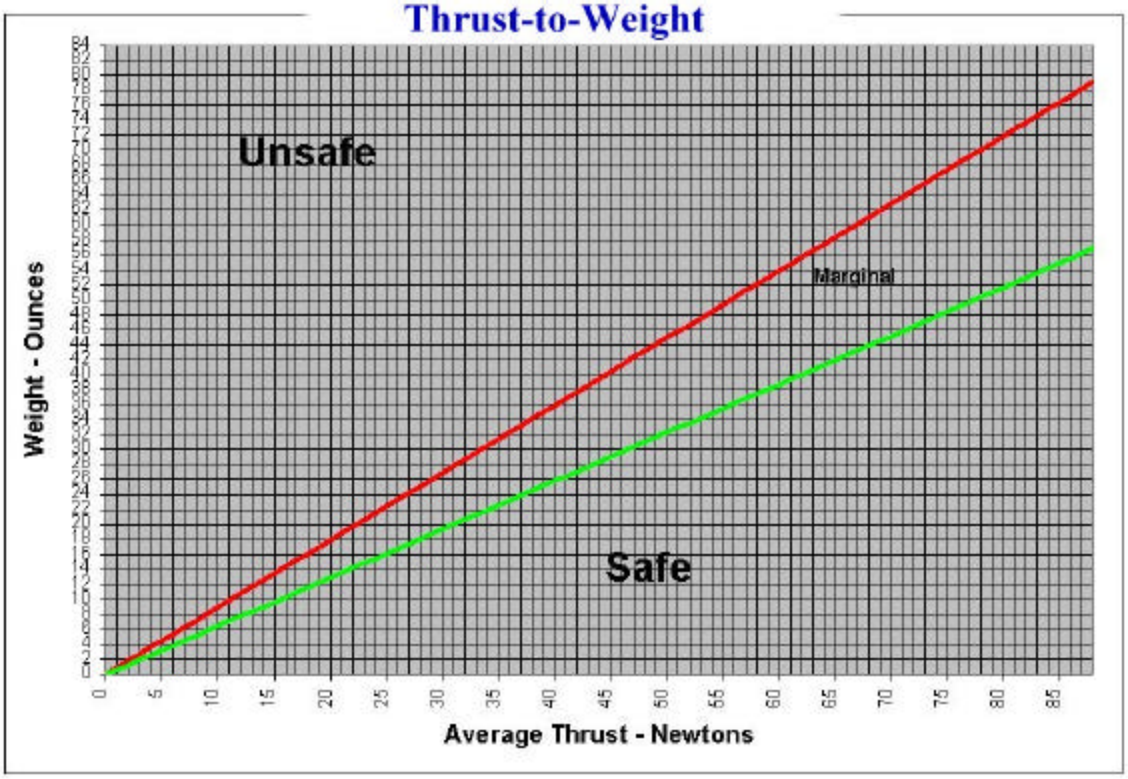
⇒ Determine if the Flight will be Heads Up. Apply a Sticker if it is.

1. First Flight of any Rocket
2. A Rocket that Might be Marginal in any way
3. A Multi-Staged Rocket
4. A Clustered Motor Rocket

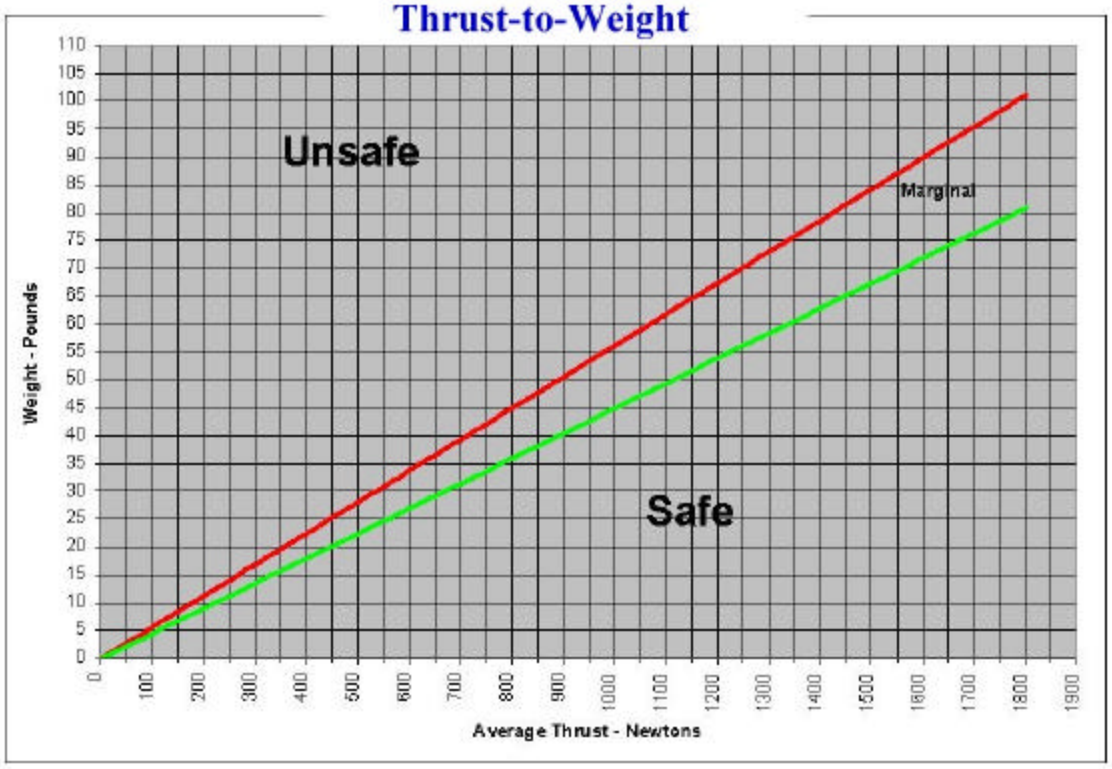
⇒ Determine if the Flight is for Certification. Apply a Sticker if it is.

⇒ Sign the Card if You are Satisfied that the Rocket will be Safe.

IV. Thrust to Weight Table for Smaller Rockets:



V. Thrust to Weight Table for Larger Rockets:



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

VII. MOTOR TOTAL IMPULSE & DATA LIST:

Manufacturer	Motor	Diam.	Tot. Impulse	Isp	Org.	Date Tested
Centuri	1/2A6	18	1.25N	63	NAR	?
Apogee	1/2A2	10	1.25N	127	NAR	?
Estes	1/2A6	18	1.25N	63	NAR	?
Estes	1/2A3	13	1.25N	63	NAR	?
Apogee	1/4A2	10	0.62N	0	NAR	?
Apogee	1/4A3	13	0.62N	63	NAR	?
Estes	1/4A3	13	0.625N	79	NAR	?
Flight Systems	A6	18	2.4N	81	NAR	?
Estes	A8	18	2.5N	84	NAR	?
MRC	A8	18	2.5N	84	NAR	?
Quest	A6	18	2.5N	84	NAR	?
Quest	A8	18	2.5N	84	NAR	?
Apogee	A2	10	2.5N	84	NAR	?
Apogee	A3	13	2.5N	84	NAR	?
Centuri	A8	18	2.5N	84	NAR	?
Estes	A10	13	2.5N	84	NAR	?
Estes	A3	13	2.5N	84	NAR	?
MRC	B6	18	4N	67	NAR	?
Flight Systems	B6	18	4.9N	83	NAR	?
Estes	B6	18	5N	101	NAR	?
Estes	B4	18	5N	84	NAR	?
Apogee	B7	13	5N	254	NAR	?
Apogee	B2	10	5N	84	NAR	?
Centuri	B4	18	5N	84	NAR	?
Centuri	B6	18	5N	101	NAR	?
Centuri	B8	18	5N	101	NAR	?
Quest	B6	18	5N	84	NAR	?
Quest	B4	18	5N	63	NAR	?
MRC	B4	18	5N	84	NAR	?
Estes	B8	18	5N	101	NAR	?
MRC	C6	18	8.6N	73	NAR	?
Quest	C6	18	8.8N	81	NAR	?
Estes	C6	18	9N	91	NAR	?
Centuri	C6	18	9N	91	NAR	?
Apogee	C4	18	9.5N	242	NAR	?
Estes	C5	18	9.5N	88	NAR	?
Flight Systems	C6	18	9.5N	80	NAR	?
Centuri	C5	18	9.5N	88	NAR	?
AeroTech	C12	18	10N	254	NAR	?
AeroTech	C6	18	10N	254	NAR	?
Apogee	C10	18	10N	254	NAR	?
Apogee	C6	13	10N	145	NAR	?
Flight Systems	D18	21	14.6N	93	NAR	?
Centuri	D12	24	17N	82	NAR	?
Flight Systems	D20	21	17N	86	NAR	?
Estes	D12	24	17N	82	NAR	?
Estes	D11	24	18N	76	NAR	?
Apogee	D3	18	19.5N	220	NAR	?
AeroTech	D15	24	20N	254	NAR	?
AeroTech	D21	18	20N	226	NAR	?
AeroTech	D7	24	20N	203	NAR	?

AeroTech	D9	24	20N	203	NAR	?
Apogee	D10	18	20N	226	NAR	?
AeroTech	D13	18	20N	226	NAR	?
Flight Systems	E5	21	21.5N	104	NAR	?
AeroTech	E25	18	22N	203	NAR	?
AeroTech	E27	18	23N	234	NAR	?
Flight Systems	E60	27	29N	73	NAR	?
AeroTech	E7	24	30N	179	NAR	?
AeroTech	E11	24	35N	142	NAR	?
AeroTech	E12	24	36N	122	NAR	?
AeroTech	E23	29	37N	221	NAR	?
AeroTech	E18	24	39N	198	NAR	?
AeroTech	E45	18	40N	214	NAR	?
AeroTech	E30	24	40N	214	NAR	?
Rocket Vision	E15	24	40N	239	NAR	?
AeroTech	E28	24	40N	226	NAR	?
AeroTech	E16	29	40N	214	NAR	?
AeroTech	E15	24	40N	239	NAR	?
AeroTech	E6	24	40N	194	NAR	?
Apogee	E6	24	40N	194	NAR	?
AeroTech	F101T-5	24	17.7#	177	TMT	10/11/97
Flight Systems	F100	27	41.6N	84	NAR	?
Flight Systems	F80	27	41.6N	84	NAR	?
AeroTech	F12	24	43.2N	146	NAR	?
AeroTech	F39	24	50N	231	NAR	?
AeroTech	F37	29	50N	182	NAR	?
Flight Systems	F7	27	50N	87	NAR	?
AeroTech	F24	24	50N	268	NAR	?
AeroTech	F23	29	56N	178	NAR	?
AeroTech	F13	32	63N	200	NAR	?
AeroTech	F20	29	64N	217	NAR	?
AeroTech	F14	29	65N	132	NAR	?
AeroTech	F22	29	65N	144	NAR	?
AeroTech	F52	29	78N	220	NAR	?
AeroTech	F10	29	80N	203	NAR	?
AeroTech	F16	32	80N	131	NAR	?
AeroTech	F25	29	80N	233	NAR	?
AeroTech	F32	24	80N	220	NAR	?
AeroTech	F40	29	80N	203	NAR	?
AeroTech	F44	24	80N	220	NAR	?
AeroTech	F50	29	80N	220	NAR	?
AeroTech	F60	29	80N	220	NAR	?
AeroTech	F72	24	80N	226	NAR	?
Apogee	F10	29	80N	203	NAR	?
Estes	F62	29	80N	159	NAR	?
Rocket Vision	F72	24	80N	226	NAR	?
MRC	FX	8	0N	0	NAR	?
AeroTech	G75J-M	29	33.2#	133	TMT	06/28/97
AeroTech	G54	29	85N	188	NAR	?
AeroTech	G42	24	90N	191	NAR	?
Estes	G70	29	90N	148	NAR	?
AeroTech	G12	32	93N	185	NAR	?
AeroTech	G38	29	94N	174	NAR	?
AeroTech	G33	29	100N	141	NAR	?
AeroTech	G35	29	105N	214	NAR	?
AeroTech	G25	29	120N	197	NAR	?
AeroTech	G80	29	120N	218	NAR	?

AeroTech	G40	29	120N	222	NAR	?
AeroTech	G64	29	120N	197	NAR	?
Kosdon	G40	29	120N	254	NAR	?
Rocket Vision	G55	24	125N	205	NAR	?
AeroTech	G55	24	125N	205	NAR	?
Kosdon	G75	29	150N	228	NAR	?
Kosdon	H155	29	36.4#	202	Manufacturer	1/11/97
AeroTech	H128W-L	29	40.2#	191	TMT	07/27/97
AeroTech	H238T-S	29	40.2#	223	TMT	06/29/97
AeroTech	H73J-S	38	42.5#	129	TMT	06/29/97
AeroTech	H97J-S	29	42.9#	143	TMT	06/28/97
AeroTech	H70W-14	29	49.6#	191	TMT	10/11/97
Kosdon	H105	29	51.0#	159	Manufacturer	1/10/93
AeroTech	H180W-S	29	52.8#	196	TMT	06/29/97
AeroTech	H123W-L	38	53.1#	188	TMT	10/23/99
AeroTech	H242T-M	38	55.3#	213	TMT	06/29/97
AeroTech	H123W-S	38	55.5#	198	TMT	06/29/97
AeroTech	H242T-M	38	57.2#	224	TMT	10/16/99
Kosdon	H200	25	57.3#	220	Manufacturer	1/10/93
AeroTech	H112J-M	38	59.0#	141	TMT	09/13/99
Kosdon	H365	25	59.6#	213	Manufacturer	1/10/93
Kosdon	H255	29	60.2#	194	Manufacturer	1/11/97
AeroTech	H45W-10	38	65.7#	152	TMT	05/31/98
Kosdon	H470	25	68.9#	191	Manufacturer	1/10/93
AeroTech	H125W-14	29	72.2#	172	TMT	10/11/97
Kosdon	H70	29	180N	226	NAR	?
AeroTech	H55	29	200.0N	246	RASP	?
AeroTech	H220	29	220N	211	NAR	?
Kosdon	H135	29	240N	218	NAR	?
AeroTech	I200W-M	29	74.0#	182	TMT	09/11/99
Kosdon	I385	29	74.2#	218	Manufacturer	1/11/97
AeroTech	I161W-S	38	75.4#	178	TMT	05/16/98
AeroTech	I357T-L	38	80.9#	202	TMT	07/27/97
Kosdon	I145	38	81.9#	171	Manufacturer	1/10/93
AeroTech	I154J-M	38	86.9#	155	TMT	10/24/99
Ellis Mountain	I150	38	87.9#	229	TMT	07/25/98
AeroTech	I195J-M	38	95.5#	144	TMT	09/12/99
AeroTech	I211W-S	38	97.8#	177	TMT	09/11/99
Kosdon	I560	29	98.1#	178	Manufacturer	1/11/93
AeroTech	I195J-M	38	107#	153	TMT	04/20/96
Ellis Mountain	I160	38	112#	213	TMT	07/25/98
Kosdon	I220	29	120#	214	Manufacturer	1/10/93
AeroTech	I435T-S	38	128#	215	TMT	09/12/99
AeroTech	I284W-M	38	134#	191	TMT	07/27/97
AeroTech	I284W-S	38	136#	197	TMT	10/17/99
Kosdon	I255	38	136#	170	Manufacturer	1/11/97
AeroTech	I435T-S	38	136#	212	TMT	04/20/96
AeroTech	I132W-15	38	136#	166	TMT	04/19/98
HyperTek	I310	54	140#	156	TMT	03/14/98
Ellis Mountain	I230	38	141#	223	TMT	07/25/98
AeroTech	I65W	54	150#	163	TMT	10/11/97
Kosdon	I145	38	360N	201	NAR	?
AeroTech	I300	38	440N	203	NAR	?
Kosdon	I170	38	440N	156	NAR	?
Kosdon	I130	38	550N	210	NAR	?
Kosdon	I120	54	580N	150	NAR	?
Kosdon	I150	54	640N	192	NAR	?

Kosdon	I155	?	?	?	TMT	?
Kosdon	I420	?	?	?	TMT	?
Kosdon	I300	?	?	?	TMT	?
HyperTek	J250	54	148#	164	TMT	03/14/98
Kosdon	J280	38	151#	216	Manufacturer	1/10/93
AeroTech	J90W-L	54	155#	163	TMT	05/31/98
AeroTech	J350W-M	38	157#	187	TMT	07/19/98
HyperTek	J175	54	159#	170	TMT	03/14/98
HyperTek	J110	54	161#	166	TMT	03/14/98
HyperTek	J220	54	162#	174	TMT	03/14/98
Ellis Mountain	J270	38	163#	214	TMT	07/25/98
HyperTek	J150	54	169#	177	TMT	03/14/98
AeroTech	J180T-S	54	179#	186	TMT	07/19/98
AeroTech	J145H-2J	54	188#	205	TMT	10/23/99
AeroTech	J275W-18	54	191#	182	TMT	05/17/98
AeroTech	J460T-M	54	195#	211	TMT	07/18/98
Ellis Mountain	J330	38	197#	217	TMT	07/25/98
Kosdon	J180	54	201#	151	Manufacturer	1/11/97
Kosdon	J850	38	204#	204	Manufacturer	1/11/93
AeroTech	J570W-10	38	235#	192	TMT	04/18/98
AeroTech	J135W-S	54	236#	170	TMT	07/19/98
Kosdon	J480	54	257#	222	Manufacturer	1/10/93
AeroTech	J125	54	272#	192	TMT	07/27/97
Kosdon	J295	54	279#	159	Manufacturer	1/10/93
HyperTek	J300	81	286#	168	TMT	03/14/98
AeroTech	J800T-XL	54	288#	210	TMT	04/18/98
AeroTech	J415W-M	54	292#	191	TMT	04/19/98
Kosdon	J230	54	950N	193	NAR	?
Kosdon	J275	75	1150N	187	NAR	?
Kosdon	J530	?	?	?	TMT	?
AeroTech	J261	?	?	?	TMT	?
AeroTech	J211	?	?	?	TMT	?
AeroTech	J168	?	?	?	TMT	?
Kosdon	J340	?	?	?	TMT	?
Kosdon	J450	?	?	?	TMT	?
AeroTech	J390	?	?	?	TMT	?
HyperTek	K240	81	326#	185	TMT	03/14/98
AeroTech	K1100T-M	54	361#	212	TMT	04/18/98
AeroTech	K550W-M	54	368#	179	TMT	07/18/98
AeroTech	K485HW-3J	54	379#	187	TMT	09/12/99
AeroTech	K700W	54	518#	180	TMT	05/31/98
AeroTech	K560W	75	560#	178	TMT	07/18/98
AeroTech	K1050W	54	569#	189	TMT	04/18/98
AeroTech	K250W	54	580#	170	TMT	04/19/98
AeroTech	K458W	98	597#	187	TMT	04/19/98
Kosdon	K350	54	1320N	197	NAR	?
Kosdon	K700	54	1430N	213	NAR	?
AeroTech	K185W	54	1457.6N	190	RASP	?
Kosdon	K450	75	2400N	226	NAR	?
Kosdon	K777	75	2400N	226	NAR	?
AeroTech	K650	?	?	?	TMT	?
Kosdon	L850	54	597#	213	Manufacturer	1/11/93
Kosdon	L1860	54	600#	227	Manufacturer	1/11/93
HyperTek	L460	111	624#	175	TMT	03/14/98
HyperTek	L150	111	644#	170	TMT	03/14/98
Ellis Mountain	L330	76	656#	200	TMT	07/25/98
Kosdon	L585	76	698#	163	Manufacturer	1/11/93

HyperTek	L280	111	739#	198	TMT	03/14/98
AeroTech	L850W	75	838#	182	TMT	07/18/98
Ellis Mountain	L600	76	1116#	205	TMT	07/25/98
AeroTech	L1120W	75	1117#	182	TMT	07/19/98
HyperTek	L490	111	1120#	185	TMT	03/14/98
AeroTech	L952W	98	1144#	188	TMT	04/18/98
AeroTech	L1500	54	3617.0N	224	RASP	?
Kosdon	L1175	?	?	?	TMT	?
Kosdon	L630	?	?	?	TMT	?
Kosdon	M1015	76	1186#	151	Manufacturer	1/11/93
AeroTech	M1315W	75	1503#	195	TMT	10/23/99
Ellis Mountain	M1000	76	1640#	211	TMT	07/25/98
Kosdon	M1845	76	1692#	198	Manufacturer	1/11/93
AeroTech	M1419W	98	1743#	194	TMT	04/18/98
AeroTech	M1939W	98	2355#	187	TMT	04/18/98
Kosdon	M3200	?	?	?	TMT	?
AeroTech	M845	?	?	?	TMT	?
AeroTech	M2500	?	?	?	TMT	?
AeroTech	M2400	?	?	?	TMT	?
Kosdon	M1130	?	?	?	TMT	?
Kosdon	M2240	?	?	?	TMT	?
AeroTech	N2000W	98	3024#	177	TMT	02/15/97

VIII. CERTIFIED MOTOR LIST:

31 November 99:

(r) indicates reloadable motor (h) indicates hybrid motor (n) NAR certified motor

G Class Motors

AeroTech G12-RC (r) (n)
AeroTech G25-5/10/15 (n)
AeroTech G33-5/7 (r) (n)
AeroTech G35-4/7 (n)
AeroTech G40-4/7/10 (n)
Kosdon G40-P (r) (n)
AeroTech G42-4/8/12 (n)
AeroTech G54-6/10/14 (r) (n)
AeroTech G55-5/10/15 (n)
AeroTech G64-4/8/10 (r) (n)
North Coast G70-5/7/10 (n)
AeroTech G75J-S/M
Kosdon G75-7 (r) (n)
AeroTech G80-4/7/10 (n)
Kosdon G65-11 (r)

H Class Motors

AeroTech H45W-10/15
AeroTech H55W-6/10/14
AeroTech H70W-6/10/14
Kosdon H70-P (r) (n)
AeroTech H73J-S/M (r)
AeroTech H97J-S/M (r)
Kosdon H105-Plug (r)
AeroTech H112J-6/10/14 (r)
AeroTech H123W-6/10/14 (r)
AeroTech H125W-S/M/L
AeroTech H128W-S/L/M (r)
Kosdon H135-11 (r) (n)
Kosdon H155-7 (r)
AeroTech H180W-S/M/L (r)
Kosdon H200-13 (r)
AeroTech H220-6/10/14 (r) (n)
AeroTech H238T-S/M/L (r)
AeroTech H242T-6/10/14 (r)
Kosdon H270-10 (r)
Kosdon H365-15 (r)
Kosdon H470-Plug (r)

I Class Motors

AeroTech I65W-Plug
Kosdon I120-P (r) (n)
Kosdon I130-5 (r) (n)
AeroTech I132W-M/L
Kosdon I145-7 (r) (n)
Kosdon I145-9 (r)
EllisMnt I150-Plug (r)
Kosdon I150-6 (r) (n)
AeroTech I154J-6/10 (r)
EllisMnt I160-Plug (r)
AeroTech I161W-S/M/L (r)
Kosdon I170-11 (r) (n)
AeroTech I195J-6/10/14
AeroTech I200W-6/10/14 (r)
AeroTech I211W-6/10/14 (r)
Kosdon I220-9 (r)
EllisMnt I230-Plug (r)
Kosdon I255-10 (r)
AeroTech I284W-6/10/14 (r)
Kosdon I300-Plug (r)
AeroTech I300-6/10/14 (r) (n)
HyperTek I310 440-172-J (h)
AeroTech I357T-S/M/L (r)
Kosdon I385-12 (r)
Kosdon I420-12 (r)
AeroTech I435T-6/10/14
Kosdon I560-20 (r)

J Class Motors

AeroTech J90W-S/M/L (r)
HyperTek J110 440-076-J (h)
HyperTek J150 440-086-J (h)
AeroTech J125-Plug
AeroTech J135W-S/M/L(r)
AeroTech J145H-2jet (r) (h)
HyperTek J175 440-098-J (h)
AeroTech J168-3jetstd (r) (h)
HyperTek J250 440-125-J (h)
AeroTech J211-4jetstd (r) (h)
Kosdon J230-8 (r) (n)
AeroTech J261-3jetEFX (r) (h)
EllisMnt J270-Plug (r)
AeroTech J275W-S/M/L/XL (r)
Kosdon J275-6.5 (r) (n)
Kosdon J280-11 (r)
Kosdon J340-10 (r)
AeroTech J350W-S/M/L (r)
AeroTech J390-Turbo (r) (h) 5 gr.
AeroTech J415W-S/M/L/XL (r)
Kosdon J450-10 (r)
AeroTech J460T-S/M/L/XL (r)
Kosdon J480-17 (r)
Kosdon J530-10 (r)

AeroTech J180T-S/M/L (r)
Kosdon J180-13 (r)
HyperTek J220 440-110-J (h)
Kosdon J290-17 (r)
HyperTek J300 835-172-J (h)
EllisMnt J330-Plug (r)
AeroTech J570W-S/M/L (r)
AeroTech J800T-S/M/L/XL (r)
Kosdon J850-21 (r)

K Class Motors

AeroTech K185W-S/M/L (r)
HyperTek K240 835-125-J (h)
AeroTech K250W-Plug
Kosdon K350-9 (r) (n)
Kosdon K450-12 (r) (n)
AeroTech K458W-Plug (r)
AeroTech K485HW-3jet (r) (h)
AeroTech K550W-S/M/L/XL (r)
AeroTech K560W-Plug
AeroTech K650T-Plug (r)
AeroTech K700W-Plug (r)
Kosdon K700-P (r) (n)
Kosdon K777-11 (r) (n)
AeroTech K1050W-Plug
AeroTech K1100T-S/M/L/XL (r)

L Class Motors

HyperTek L150 1685-098-L (h)
HyperTek L280 1685-125-L (h)
EllisMnt L330-Plug (r)
HyperTek L460 1685-172-L (h)
HyperTek L490 2800-172-L (h)
Kosdon L585-8 (r)
EllisMnt L600-Plug (r)
Kosdon L630-7 (r)
Kosdon L850-12 (r)
AeroTech L850W-Plug
AeroTech L952W-Plug (r)
AeroTech L1120W-Plug
Kosdon L1175-30 (r)
AeroTech L1500T-Plug (r)
Kosdon L1860-23 (r)

M Class Motors

EllisMnt M1000-Plug (r)
Kosdon M1015-Plug (r)
Kosdon M1130-Plug (r)
AeroTech M845 (h) (was M1150)
AeroTech M1315W-Plug (r)
AeroTech M1419W-Plug (r)
Kosdon M1845-Plug (r)
AeroTech M1939W-Plug (r)
Kosdon M2240-Plug (r)
AeroTech M2400T-Plug (r)
AeroTech M2500T-Plug (r)
Kosdon M3200-Plug (r)

N Class Motors

AeroTech N2000W-Plug (r)

IX. EXPIRED MOTORS:

Dated: 31 August 99
These motors are no longer Tripoli Rocketry Association Certified motors. They may be flown at regular TRA launches until
31 December 2000
only if the manufacturing date of the motor falls during the certification period as verified by the RSO. This Three Year Consumer Protection Policy was adopted by TRA in 1997.

D Class Motors

AeroTech D24T-S/M/L

E Class Motors

Propulsion Ind E30
Synerjet E43

F Class Motors

AeroTech F55T
AeroTech F62T-S/M/L
Plasmajet F-SMOKEY
Plasmajet F-MOON
Plasmajet F-CORE
Propulsion Ind F57
Rocketflite F50
Rocketflite F104ss
Synerjet F32
Synerjet F64
Vulcan F50

G Class Motors

AeroTech G104T-S/M/L
AeroTech G300
AeroTech G345
Plasmajet G-MOON
Plasmajet G-CORE
Plasmajet G-SMOKEY
Propulsion Ind G80
Propulsion Ind G80R
Rocketflite G100
Rocketflite G220ss
Synerjet G41
Synerjet G101
Vulcan G200ss
Vulcan G210

H Class Motors

AeroTech H35j
AeroTech H90w
AeroTech H100-05/10/15
AeroTech H120t
AeroTech H140t

PlasmaJet LO-H-MOON
PlasmaJet H-MOON
PlasmaJet LO-H-CORE
PlasmaJet LO-H-SMOKE
PlasmaJet H-SMOKEY
PlasmaJet HCORE
Propulsion Ind H140
Propulsion Ind H140R
RocketFlite H220
RocketFlite H330ss
SynerJet H150
SynerJet H192
Vulcan H80hf
Vulcan H100ss
Vulcan H115ss
Vulcan H142ls
Vulcan H260ss
Vulcan H300ls

I Class Motors

AeroTech I65W-10/15
AeroTech I112j (r) (replaced by the easy access H112j (certified))
AeroTech I115-15W
PlasmaJet I102
Vulcan I160hf
Vulcan I250ss
Vulcan I283ls
Vulcan I500 (r)
Wood I200 (r)
Wood I300 (r)

J Class Motors

AeroTech J100-10/15
AeroTech J125-5/10/15
AeroTech J220-10/15
AeroTech J285-10/15
AeroTech J355-5/10/15
AeroTech J700-15/20
Hypertek 500-125-J J180
Hypertek 800-125-J J190
Vulcan J250hf
Vulcan J340ss

K Class Motors

AeroTech K125-PLUG
AeroTech K250W-15/20/25
AeroTech K400-15/20
AeroTech K458W-S/M/L/XL/XX
AeroTech K900-15/20
AeroTech K1050W-5
AeroTech K1500-15/20
Dragon's Breath K440
Hypertek 2085-098-L K170
Hypertek 2085-110-L K205

Hypertek 940-125-J K210
Hypertek 2085-125-L K270
Hypertek 2085-213-L K340
Prodyne K700
Vulcan K500hf

L Class Motors

AeroTech L430
AeroTech L585
AeroTech L952W-S/M/L/XL/XX
Dragon's Breath L1260 (r)
Energon L1100
Hypertek 2085-150-L L405
Vulcan Systems L750ls

M Class Motors

AeroTech M1419W-S/M/L/XL/XX
AeroTech M1939W-S/M/L/XL/XX
Dragon's Breath M1670

N Class Motors

Ace Aeronautics N1940p

X. TRA Policy on Use of Metal in High Power Rocket Construction:

Some of you have been wanting an official statement on this subject. Here it is, and you can copy this and paste it into your Handbook until it is changed by the Board of Directors:

****

Tripoli allows certified members, as well as certified NAR members, to attend our launches and safely launch rockets that are "made of paper, wood, fiberglass, or plastic." Their rockets may also be made of a "minimum amount of metallic parts" in whatsoever percentages "necessary for airframe integrity dependent upon the installed total impulse, and whose primary use is for purposes of education, recreation, and sporting activities." Whatever material is used in the rocket's construction, the rocket and materials must conform "to the other requirements" of the Safety Code. Undergirding and overarching all of this, "a high power rocket shall be constructed in such a manner and with suitable materials to withstand the operating stresses and retain structural integrity under conditions expected or known to be encountered in flight." For the purposes of this policy, the flight includes placement on the launch pad, the launch sequence, flight to apogee, descent, and landing. The practice of constructing a rocket to withstand "operating stresses and retain structural integrity" while anticipating possible unknown conditions is not discouraged.

****

BruceE.Kelly,
President
Tripoli Rocketry Association
Member, NFPA Committee on Pyrotechnics

DISCUSSION:

There are two parts of NFPA 1127 (HPR Safey Code) that mentions metal in rockets; 1-3 Definitions, High Power Rocket, (e), and 2-6 Rocket Airframe Materials.

The typical mistake made by most people is to "narrowly interpret" the Safety Code, focusing on a small part rather than the whole. For example, take both sections as quoted above (from the 1995 edition):

1-3 Definitions, High Power Rocket, (e) -- (High Power Rocket) That is made of paper, wood, fiberglass, or plastic with a minimum amount of metallic parts (Note: most people arguing for the non-use of metal in rocket construction stop right here.) necessary for airframe integrity dependent upon the installed total impulse, and whose primary use is for purposes of education, recreation, and sporting activities.

and

2-6 Rocket Airframe Materials -- A high power rocket vehicle intended to be propelled by one or more high power rocket motors shall be constructed using lightweight materials such as paper, wood, rubber, plastic, fiberglass, or, when necessary, ductile metal so that the rocket conforms to the other requirements of this code.

Now for the example of how people typically focus on a small part rather than the whole code when trying to promote a point of view. The very last sentence quoted says that the rocket must conform "...to the other requirements of this code." Look at the paragraph in the Safety Code immediately above the one just quoted (2-5): "A high power rocket shall be constructed in such a manner and with suitable materials to withstand the operating stresses and retain structural integrity under conditions expected or known to be encountered in flight."

In reality, with the excepted mention of what the metallic material is to be (ductile material), we could end the chapter on rocketry construction with that statement. If we do not construct our rockets "in such a manner and with suitable materials to withstand the operating stresses and retain structural integrity under conditions expected or known to be encounteredin flight" we are, at best, unsafe both to ourselves and to others.

Here are most of the elements of everything referenced or quoted so far, including some obvious conclusions:

-- HP rockets made of many materials, including metal.
-- When made of metal, if complying with the Safety Code, HP rockets are made of ductile metal.
-- When made of ductile metal, HP rockets are made with a minimum amount of metallic parts.
-- When made of ductile metal, the HP rocket must have a minimum amount of metallic parts for the purpose of sustaining airframe integrity. Minimal may include whatsoever percentage of ductile metal NECESSARY TO ACCOMPLISH THAT REQUIREMENT.

-- The HP rocket using ductile metal to sustain airframe integrity must do so to withstand conditions expected or known to be encountered in flight. This will require a sufficient amount of ductile metal to accomplish that requirement.
-- The duration of the flight is from start to finish, which includes recovery. (Not quoted above, but a part of the safety Code. This means that the rocket must contain whatever materials are required, along with the recovery system, to withstand "the operating stresses and retain structural integrity under conditions expected or known to be encountered..." during recovery as well.)
-- Factors to consider when using ductile metal in HP rocket construction, and what amount of ductile metal to use for "airframe integrity" are (a) installed total impulse, (b) rocket to conform to the other requirements of this code, (c) rocket to withstand the operating stresses, and (d) rocket to retain structural integrity under conditions "expected" or "known" to be encountered in flight."
-- Since the rocket is to be recovered and reused as stated in this Safety Code, the rocketeer may determine that a particular rocket will be flown more than once, i.e. several times. A particular rocket may fly well one time using materials other than ductile metal, but continued use and the resultant stresses after the first flight may prove to render a non- metallic rocket unsafe. Such circumstances may include, but not be limited to, continual flights using M motors. Therefore, a particular rocket, in order to conform "to the other requirements of this code," shall be so constructed using any materials specified as being approved for use in a HP rocket, and in what ever amounts are required for compliance. Keep in mind that this interpretation takes into account the "installed total impulse (continual use of M motors), and whose primary use is for purposes of education, recreation, and sporting activities."
-- Finally, note the use of the words "when necessary" [2-6]. This is subjective and really up to the interpretation of (a) the person building the rocket, weighing all the factors of the entire Safety Code, and (b) the RSO who will ultimately make the decision whether or not to allow the flight.

XI. MOTOR FAILURE REPORT:

If you have a motor failure and there is not a manufacturer's representative at the launch to help with the post mortem, please enter at a minimum:

1. Name and contact info of the person making the motor failure report.

Name_____
_____

Address_____
_____

City_____State_____Zip_____Country_____
_____

Phone_____Email
Address_____

2. Name and contact info of the person who built and flew the motor (if same enter "same").
Name_____
_____

Address_____
_____

City_____State_____Zip_____Country_____
_____

Phone_____Email
Address_____
3. Motor manufacturer:_____

4. Motor designation._____

5. Date of incident (what launch?):_____

6. Date of motor manufacture (This date or code is either on the paper delay cap or on the instruction sheet included with the motor. This is important to track the batch.):_____

7. Describe what happened using as much detail as possible. (i.e., Any preflight/motor building anomalies, amount/placement/type of BP/grease/tape used to build motor, "parts all there?", motor retention/baffle/recovery system used, weight/diameter/length of airframe, motor delay/electronic ejection, type of igniter used, description of flight anomaly, post mortem of airframe/motor case condition, etc.).
_____
_____
_____
_____
_____
_____

8. Was manufacturer contacted and what was the response.

_____
_____
_____

9. Weather conditions would also be nice. (Was the motor laying out in the sun, was the motor in a dark airframe on the pad a long time, was the magazine in the sun/shade/frozen to the ground, was it calm or windy, info like that.).

_____
_____
_____

If TMT has any remaining questions after all that, TMT would like to be able to talk to the rocketeer. Please be aware that the purpose of the questions is to as accurately as possible document the motor failure and background conditions and track the failure modes/trends for a particular motor. TMT will not be able to help you get your airframe/motor case replaced, but if a failure mode stabilizes for a particular motor, TMT will help get the problem fixed with that motor.

Copy/Paste this document into a word processor, fill in the requested information and attach the document to an email and send it to the Tripoli Web Page. Or, fill out the requested information and mail it to the following address:

TMT Motor Failure Report
4719 Borina Dr.
San Jose, CA 95129

XII. Federal Aviation Administration (FAA) Rules for Rockets:

One pound (453 grams) rockets or less (including motor/engine weight); that are made of paper, wood, or breakable plastic; with 113 grams or less of propellant have no restrictions (local restrictions may apply).
One pound (453 grams) rockets or less (including motor/engine weight); that are made of paper, wood, or breakable plastic; with between 113 grams and 125 grams of propellant require FAA notification (local restrictions may apply) under the 1 to 3.3 pound rule. *
One pound (453 grams) to 3.3 pounds (1500 grams) rockets (including motor/engine weight); that are made of paper, wood, or breakable plastic; with less than 125 grams of propellant require FAA notification (local restrictions may apply) under the 1 to 3.3 pound rule. *
Rockets greater than 3.3 pounds (1500 grams) (including motor/engine weight); that are made of paper, wood, or breakable plastic; or, rockets with greater than 125 grams of propellant require a FAA waiver. *
* Additional restrictions apply to rockets to be flown within 5 miles of any airport.

FAA 1 to 3.3 Pound Rules for Rockets

The October 3, 1994 Federal Register contained the final FAA Part 101 rule.
The Text of the Rule
"2. Section 101.22 is added to read as follows:
S101.22 Special provisions for large model rockets
Persons operating model rockets that use not more than 125 grams of propellant; that are made of paper, wood, or breakable plastic; that contain no substantial metal parts, and that weigh not more than 1,500 grams, including the propellant, need not comply with S101.23 (b), (c), (g) and (h), provided:
(a) that the person complies with all provisions of S101.25; and
(b) The operation is not conducted within 5 miles of an airport runway or other landing area unless the information required in S101.25 is also provided to the manager of that airport.
3. Section 101.25 is amended by revision the introductory text and paragraphs (a), (b), (c) and (d) to read as follows:
S 101.25 Notice requirements:
No person may operate an unmanned rocket unless that person gives the following information to the FAA ATC facility nearest to the place of intended operation no less than 24 hours prior to and no more than 48 hours prior to beginning the operation:
(a) the names and address of the operators; except when there are multiple participants at a single event, the name and address of the person so designated as the event launch coordinator, whose duties include the coordination of the required launch data estimates and coordinating the launch event;
(b) the estimated number of rockets to be operated;
(c) the estimated size and estimated weight of each rocket; and
(d) the estimated highest altitude or flight level to which each rocket will be operated."
The rule took effect November 2, 1994.
Obtaining the Full Text of the Rulemaking
You can read the FAA's full analysis of letters sent in, and the full rationale of the ruling by obtaining a copy of the October 3, 1994 Federal Register. Call the Federal Information Center at 800-366-2998 to see where you might find a copy. Many regional libraries serve as government document repositories, you can ask your local librarian for assistance, or look in your phone book under US Government for the Government Printing Office.
Summary of the Rule:
Rules for rockets with 113 or less grams of propellant and less than 453 grams liftoff weight remains unchanged.
If you wish to operate 1-3.3 lb. models or models with between 113-125 grams of propellant, you must:
(a) notify the Air Traffic Control facility over your airspace with
- either the names and addresses of the rocket owners or a launch coordinator who can get the required information to the FAA, and
- the ESTIMATED number, size, weight and expected altitudes of the rockets to be flown.
(b) if your launch site is within 5 miles of an airport, you must provide the same information to the airport manager
(c) requests must be made between 48 and 24 hours prior to the launch; letter, fax or phone constituted acceptable notification to the ATC.
(d) Also pointed out that as written, the FAA cannot deny you a 3.3 lb. flight operation if you give proper notice. This contrasts with the previous waiver process for such models where waivers could be (and have been) denied.

AeroTech Motors That can be used on the 3.3 pound rule:

Motor	Propellant Weight - grams

G75J (TMT "H")	105.6
H128W	92.2
H238T	79.8
H180W	123.0
H220T	106.4
H73J	125.0
H123W	125.0
H242T	110.8

XIII. Tripoli Launch Insurance Liability Coverage for Events:

Tripoli Rocketry Association carries General Liability Insurance covering launch events, meetings, classes, seminars and other Tripoli Sanctioned Events. This policy covers events hosted by a Tripoli Prefecture, or member. The policy limit is $1,000,000 *per occurrence, $3,000,000 aggregate and the deductible is $2,500*. The policy runs for each calendar year, (Jan 1 through Dec 31), and all sites, and locations *require* re-filing every year with the Tripoli insurance office for continuation of coverage.

The policy covers injury and property damage to spectators, other Tripoli members, and to the landowners, but does *not cover accidents to the flyer themselves.*

The $2,500 deductible is the responsibility of the member or parties causing the damages. The deductible must be paid prior to filing a claim. The hosting prefecture will be responsible for the deductible if they do not or cannot identify the flyer causing an incident.

THE INSURANCE COMPANY WILL INVESTIGATE ANY INCIDENTS!

To file for coverage of a Launch event:

1. Fill out the Tripoli Insurance Application form, which can be found here on the web site, and can be obtained by contacting the Tripoli Insurance office.

2. Include copies of Landowners Authorization for each landowner. This can be the sample Landowners form, (see above), or a letter from the landowner. *The application will not be filed without this information!*

3. Aviation clearance: *The insurance certificate is not valid, unless copies of these documents are on file at the insurance office.*

    1. For rockets over 3.3 lbs.

        1. If an FAA waiver is required for this event, a copy of the COMPLETE waiver, or if not issued yet, a copy of the Waiver Application must be filed, and the copy of the waiver sent as soon as you obtain it. (The same applies for CFA's, Controlled Firing Area's). Remember, if the FAA sends it to you, you must send the Insurance office a copy.

    2. For rockets between 1 and 3.3 lbs.

        1. For the 3.3-pound rule send a copy of the ATC Notification. If notification is by phone indicate "by phone" (if you have not notified the ATC you do not have insurance).

4. IMPORTANT! The schedule information on the application form is critical. The insurance carrier REQUIRES this, and the application will not be filed without it. New dates cannot be added without 15 days notification to the insurance carrier, so take into account 1 week for me to complete the notification. It is best if you include a rain date for each and every date submitted, in case of cancellation, as there is no variance from the 15 day notification. The insurance certificate will only be valid on the dates submitted in compliance with this requirement.

Launches will be subject to the following for insurance to be valid:

1. You must adhere to the Tripoli Rocketry Association Inc. safety code, (most recent edition) and BYLAWS to be covered for liability coverage.
    1. Violations to the Tripoli Rocketry association Safety Code, or its Bylaws will not be covered.
2. RSO must be on site during event.
3. FAA requirements must be met.
    1. Violations to the FAA regulations will not be covered.
4. Non-Tripoli members may ***NOT*** participate in the event, with the following exceptions:

SPECIAL NOTE: NAR INSURANCE HAS BEEN RE-INSTATED. NAR MEMBERS MAY NOW FLY AT TRIPOLI HIGH POWER LAUNCHES "AS LONG AS THEY CAN PROVE THAT THEY ARE CURRENT NAR MEMBERS, I.E. DISPLAY MEMBER CARD SHOWING EXPIRATION DATE." THIS APPLIES TO "ALL" NAR MEMBERS ELIGIBLE TO FLY HIGH POWER (non-members and non-certified members are limited to A to G motors).

NEW INSURANCE INTERPRETATION AS OF 4/03/00

Our insurance broker has interpreted our insurance as covering model rocketry under our education provisions. I am still expecting some word, but I have this verbally.

1. Any person, with or without any association affiliation, may launch A to G motors at a TRIPOLI launch - provided they follow our Safety Codes. They may cluster up to the impulse of two (2) G motors. Anything above this will require insured membership.

2. Any person participating in high power activities (H and above) shall be a member of Tripoli or a "current" NAR member.

1. NAR members who have current membership cards WILL BE ALLOWED ACCESS TO LAUNCHING HIGH POWER ROCKETS AT TRIPOLI LAUNCHES, to the level they are certified.

2. Youths who are non-members of ANY organization shall be allowed to fly model rockets powered by model rocket motors A-G. This applies to anyone under 18 and their leaders (Scout leaders, school teachers, etc.) However, ANYONE OVER 18 NOT WITH a scout troop or similar group MUST BE a member of Tripoli or NAR to participate in any launching at a TRA HIGH POWER, H and above motors.*

The insurance company will not allow the "uninsured" rocketeer to participate with HIGH POWER (H and above motors) in flying at a TRA high power launch. Unlike some states who will insure you against

damages caused by an "uninsured motorist" our company WILL NOT insure *US* against damages caused by an "uninsured rocketeer."

INSURANCE Q & A:

All "yes" responses are subject to the deductible and are excess over any valid and collectible insurance

1. If a member damages another member's property, is there coverage for that loss?

Yes, since the party suffering the loss is 3rd party to the member creating the loss.

2. If a member damages a rental vehicle rented by the member, is it covered?

No, since the claim is not considered 3rd party. The physical damage loss should be settled under their personal auto policy. (Note: Rental agencies have damage waivers. I would suggest everyone attending the launch pay the $10 or so per day to insure a rented vehicle. We have actually had a member damage his own property before, so this can and does happen.)

3. If a member damages another member's rental vehicle, is it covered?

Yes, since the claim is considered 3rd party.

4. If a member injures their own family member, can the family members claim bodily injury losses?

Yes, since the family member is considered 3rd party.

5. Is there coverage under Medical Payments?

No, limits are not provided under this coverage for medical expenses incurred at the time of accident "regardless of fault."

6. Are the members covered for activities outside of Tripoli, such as at NAR events?

Yes, NAR Insurance now covers Tripoli members at NAR events.

7. Are NAR members, who participate in Tripoli's activities, covered under Tripoli's policy?

Yes, as long as they can they are active NAR members.

Insurable Event

If the questions below have been answered "yes" consecutively, then an insurable event has occurred.

1. Is the loss triggered from a Tripoli-group sponsored and planned activity/event?

2. Did a current Tripoli member cause the loss?

3. Have Tripoli safety codes been followed?

4. Is there a Tripoli Range Safety officer supervising the event?

Why do I have to file for insurance?

The main reason is that our insurance company requires it. Secondarily, we want to make sure that this is a Tripoli sponsored event, that there is a valid waiver for the launch and to validate that the landowner approves of the use of his property.

XXII. TRIPOLI EMERGENCY CHECKLIST

1. NAME OF LAUNCH	2. DATES OF EMERGENCY
_____ Tripoli Wisconsin Association Launch	

3. LAUNCH ORGANIZATION	4. LAUNCH POC
Tripoli Wisconsin Association of Tripoli Rocket Association Inc	Dave Sutton (Primary) Dave Halberslaben (Alternate) Frank Nobile (Alternate)
5. LAUNCH SITE - CITY, STATE Bong State Recreation Area Township of Brighton Kenosha County, Wisconsin	**6. NATURE OF EMERGENCY: PROPERTY DAMAGE OR INJURY**

7. IF EMERGENCY MEDICAL ATTENTION OR OTHER SUPPORT IS REQUIRED, ENTER TIME CALLED AND TIME ON SCENE

8. IF FIRST AID IS REQUIRED, USE THE PA AND CALL FOR A DOCTOR , NURSE OR EMT, ENTER THE NAME OF THE PERSON(S) ADMINISTERING AID.

9. IS THE ACCIDENT SITE SECURE? DELEGATE 2-4 PEOPLE FOR CROWD CONTROL.

10. SECURE ANY PROPERTY (ROCKET) AND DOCUMENTATION (FLIGHT CARDS) RELATING TO THE ACCIDENT. THIS PROPERTY IS TO REMAIN IN THE CUSTODY OF TRIPOLI ROCKETRY UNTIL RELEASED. NOTE THE ITEMS SECURED.

11. ANNOUNCE THAT THERE HAS BEEN AN ACCIDENT, AND THAT COOPERATION WITH THE AUTHORITIES IS REQUESTED. REQUEST THAT ALL MEDIA CONTACTS BE DIRECTED TO THE LAUNCH POC FOR COMMENTS. CONTINUE WITH THE LAUNCH IF AT ALL POSSIBLE.

12. BRIEFLY STATE THE NATURE OF THE ACCIDENT INCLUDING DETAILS REALTING TO THE TIME, NATURE OF THE INJURIES OR PROPERTY DAMAGE.

13. GET THE NAME(S), ADDRESS AND PHNE NUMBER OF INJURED PARTIES. USE ADDITIONAL PAPER IF NECESSARY.

14A.	**14B.**
15. GET THE NAME(S), ADDRESS AND PHONE NUMBERS OF ANY WITNESSES ALONG WITH A BRIEF STATEMENT. BE SURE THAT THE DUTY RSO AND LCO ARE INCLUDED.	
15A. RSO	
15B. LCO	
15C. OTHER	
15D. OTHER	
16. CONTACT THE TRA EMERGENCY POC AND PROVIDE DETAILS OF THE INCIDENT.	
17. THE INFORMATION PROVIDED HERE IS CORRECT TO THE BEST OF MY ABILITY, SIGN AND DATE	

Based on *Tripoli Report* - October 1996 (p. 46-47)