AERONAUT

The Newsletter for the Association of Experimental Rocketry of the Pacific

Tripoli Rocketry Association, Inc.
Prefecture No. 23

AERO-PAC

February 1994 Vol 6 No 1

Time to Renew!

It's February again which means membership renewal time for 1994. The fees are the same as last year – $13.00 for renewing regular members.

Please fill out the membership application enclosed with this newsletter and mail in with your check today to the address:

2206 Roosevelt Avenue
Berkeley, CA 94703

1994 Launch Schedule

The schedule for AERO-PAC's 1994 launches at Black Rock has been set. Be sure to carefully read the new range safety regulations (in this issue) if you going to be flying an 'L' or larger motor. Anyone with a project requiring special equipment, e.g. a launch tower, should contact Chet Geyer, (408) 356-5107, or Jerry Vaughn, (805) 239-8611.

The FAA has eased its preregistration requirement for AERO-PAC, therefore advanced registration for launches is no longer needed. Launch fees will be a flat $20.00 – no per-day fees.

Aeronaut 5	May 14–15
Black Rock VI	July 23–24
NXRL (FireBalls 004)	Sept 10–11

Election Results

The 1994 AERO-PAC board election results are in:

Ballots Mailed:	61	
Ballots Returned:	30	49%
First Commissioner:		
Pius Morozumi	28	93%
Second Commissioner:		
Jerry Vaughn	27	90%
Launch Director:		
Chet Geyer	27	90%
Secretary/Editor:		
Tom Hedges	29	97%
Treasurer:		
Randy Helmonds	14	47%
Paul Campbell	16	53%

Request for Aeronaut Contributions

by Tom Hedges

As the new editor of *Aeronaut* for 1994, I want to repeat the usual request to all members (and any other readers for that matter) to contribute articles and/or photographs for future issues. I can accept personal computer word processor documents in most DOS, Windows and Macintosh formats as well as paper manuscripts – mail, email or FAX to address below. Photos can be B&W or color, although they will be reproduced in halftoned B&W.

Tom Hedges
377 Bowen Ave.
Aptos, CA 95003
work: (408) 688-2496
home: (408) 688-1265
FAX: (408) 688-8836
Internet: hedges@fractal.com

Upcoming Launches

LUNAR **March 20**
Livermore chapter of NAR monthly Class C launch at Livermore, CA
contact: Mark Weiss (510) 447-9025.

M.D.A.R.S. **April 9**
Tripoli Mojave Desert monthly launch at Aerial Acres (near Mojave, CA)
contact: Karl Baumann (805) 943-7176.

Hayburner II **April 16**
Vaughn Brothers Rocketry Class C launch at Paso Robles, CA (see below on this page)

AERO-PAC
Range Safety Regulations
February 1994

Background: FireBalls 003, the National Experimental Rocket Launch sponsored by AERO-PAC on September 4-6, 1993 was notable for several potentially dangerous mishaps that caused the AERO-PAC Board to reconsider the safety code.

Goals: It is not the intent of these regulations to supplant or replace the regulations contained in the Tripoli Safety Code, but rather to extend the safety code in order to increase the safety of spectators and participants during the preparation, launching, and recovery of large, complex, high performance rockets at AERO-PAC sponsored high power launches.

AERO-PAC High Performance Rocketry Safety Rules

1. Scope.

1.1 These regulations shall apply to the preparation, launching, and recovery of specific rockets flown at high power rocket launches sponsored by AERO-PAC.

1.2 These regulations do not supplant or reduce in any way the Tripoli Safety Code or the National Fire Prevention Association (NFPA) Code applicable to the launching of high power rockets.

1.3 These regulations shall apply to specifically designated high performance rockets, as well as to special rockets that incorporate on board motor ignition and more than 2560 N-sec (576 lb-sec) of total impulse.

1.4 A high performance rocket is a rocket that by its design and weight is capable of achieving extreme altitudes and impacting with sufficient force as to likely cause severe bodily injury.

2. Purpose.

2.1 It is the intent of these regulations to ensure the safety of the participants and spectators at AERO-PAC high power launches by adding further guidelines regulating the preparation, launching, and recovery of high performance and special rockets.

2.2 These regulations are intended to specify conditions for the flying of high performance and special rockets that go beyond those described in the Tripoli Safety Code and the National Fire Prevention Association Code.

3. Definitions.

Arming. The final action that enables an electrical ignition system to fire, usually by either throwing an arming switch or pulling a safety pin.

Away Cell. A special launch area for specific rockets that is located at a distance farther from the main launch control area than is reached by the main launch controller cables.

Final preparation. The action of making the final electrical connections to the ignitor wires after it is placed in a rocket motor.

High performance rocket. A rocket with impulse of 2560 N-sec or greater, and capable of attaining a significantly high altitude so as to pose a special hazard.

Launch Control Officer (LCO). The person who is responsible for operating the launch controller and initiating the ignition sequence.

Launch Director. The person elected to the AERO-PAC Board of Directors who is officially responsible for the operation of all AERO-PAC rocket launches.

On board ignition system. Refers to an electric or electronic device, such as a timer, mercury switch, motion detection switch, or altimeter switch, that uses a battery contained within the rocket to ignite a rocket motor.

Ignitor preparation. The placing of an ignitor into a rocket motor, exclusive of the final preparation which consists of electrically connecting the ignitor.

Range Safety Officer (RSO). The person who is officially responsible for the safe launching of a rocket which he inspects and certifies as air worthy prior to its flight.

Safety device. An electrical switch or pin that reduces the risk of accidental ignition by either shunting across the ignitor leads and/or opening the power circuit to the ignition device.

Safety Team. A team of at least three Senior RSOs designated by the AERO-PAC Launch Director.

Special rockets. Refers to staged and other multi-motor rockets that incorporate on board ignition systems and more than 2560 N-sec of total impulse.

Senior RSO. A Tripoli member with extensive experience in high power rocketry as identified by the Board of Directors of AERO-PAC.

Special Preparation Area. An area away from the spectator and parking area that is designated by the AERO-PAC launch director for motor and ignitor preparation of special rockets.

4. Preparation of rocket motor ignitors.

4.1 High performance rockets with total impulse of 2560 N-sec or greater, and all special rockets using on board ignition systems, shall have the motor ignitor(s) placed into the rocket motor(s) only while at the designated Special Preparation Area, Away Cell, or at the launch pad with the rocket secured in an upright position.

4.2 Rockets using low current ignitors, such as electric matches or flash bulb ignitors, with combined total impulse of 2560 N-sec or greater, shall have the motor ignitor(s) placed into the rocket motor(s) only while at the designated Special Preparation Area, Away Cell, or at the launch pad.

4.3 All rockets in the Special Preparation Area and Away Cells must be oriented so that if a premature ignition accidentally occurs, the rocket will be propelled in a safe direction away from the spectators and other fliers.

4.4 No smoking is permitted while placing an ignitor into a rocket motor, carrying a motor with an ignitor in it, standing in the flight line awaiting pad assignment, or at the rocket pads. No smoking is permitted in the Special Preparation Area.

4.5 Only authorized crew, launch officials, and persons directly involved in the preparation of high performance and special rockets, will be permitted in the Special Preparation Area.

5. Inspection of special rockets.

5.1 High performance rockets, and multi-stage rockets using on board ignition systems, shall be inspected and certified by the Safety Team before being taken to the Special Preparation Area or given a pad assignment.

5.2 The design of the recovery system and any safety system, if applicable, shall be reviewed and approved by the Safety Team before the rocket will be allowed to go out to the Special Preparation Area or the Away Cell.

6. Final preparation and arming.

6.1 Following motor and ignitor placement in the Special Preparation Area or the Away Cell, the ignitor(s) shall be shorted until ready for final preparation.

6.2 Final preparation, consisting of electrically connecting the ignitor wires to the ignition circuit, shall be done only after the rocket is placed in the launch device and is secured in an upright position.

6.3 A minimum of persons needed to assist the main operator shall be present at the time of final preparation.

6.4 Arming of onboard ignition systems shall be accomplished as the last step by the main operator only.

6.5 High performance rockets shall be launched at an angle of no less than 3 degrees from vertical and oriented in a direction away from the LCO and spectator area.

6.6 The Safety Team has the right to require a larger launch angle if indicated by wind and flying field conditions.

7. Minimum clearance distances.

7.1 The minimum distance for high performance rockets to be launched from the LCO and spectator areas is specified in the Safe Distance Table (see below).

7.2 High performance rockets that are flown from Away Cells will be in two-way communications with the AERO-PAC LCO at all times.

7.3 The launch of a high performance or special rocket from an Away Cell shall be under the voice control of the AERO-PAC LCO who shall announce the final countdown on the public address system.

8. Public notification.

8.1 Signs shall be posted at AERO-PAC high power launches to alert passersby that potentially hazardous activities are being conducted in the vicinity.

9. Conduct.

9.1 It is expected of all participants and spectators that they will conduct themselves in a manner that will not place themselves or anyone else in a potentially hazardous situation.

9.2 The discharge of any weapon or pyrotechnic device,including fireworks, explosives, and hand held launchers such as bazookas, is expressly prohibited at all AERO-PAC launches.

SAFE DISTANCE TABLE (ft.)

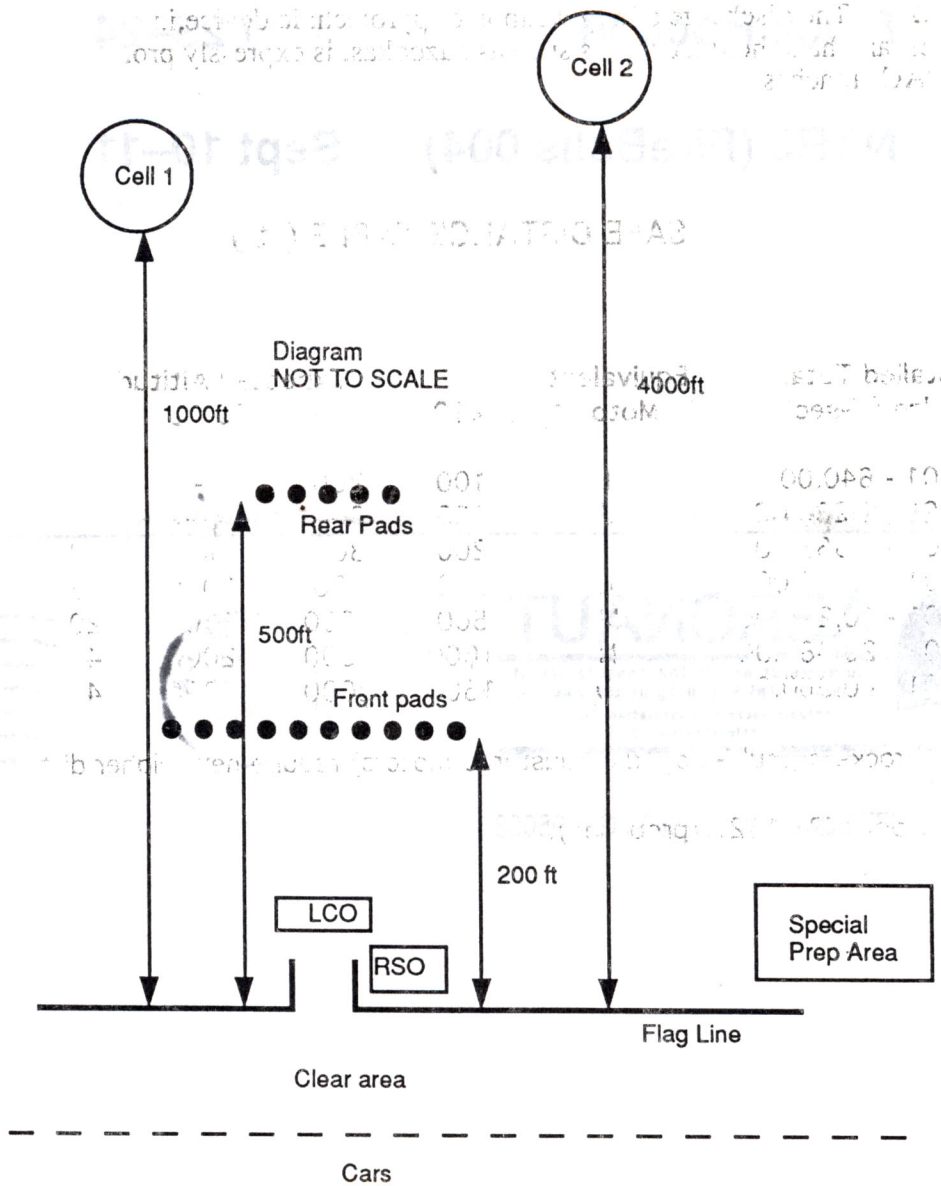
Installed Total Impulse (N-sec)	Equivalent Motor *	Expected Altitude (1000 ft.) <10	10-19	20-29	30-39	40-49	>40
320.01 - 640.00	I	100	200	-	-	-	-
640.01 - 1,280.00	J	100	300	500	-	-	-
1,280.01 - 2,560.00	K	200	300	500	1000	-	-
2,560.01 - 5,120.00	L	300	500	1000	1500	2000	-
5,120.01 - 10,240.00	M	500	1000	1500	2000	4000	4000
10,240.01 - 20,480.00	N	1000	1500	2000	4000	4000	4000
20,480.01 - 40,960.00	O	1500	2000	4000	4000	4000	4000

* Complex rockets (multi-staged or clustered motors) require next higher distance.

Adapted from NFPA 1127 (proposed).

Approved and adopted by the AERO-PAC Board of Directors, February 20, 1994.

Diagram of Launch Area under new Range Safety Regulations



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editor: Tom Hedges, 377 Bowen Ave., Aptos, CA 95003

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