



# AERONAUT

The Newsletter for the Association of  
Experimental Rocketry of the Pacific

Tripoli Rocketry Association, Inc.  
Prefecture No. 23

Spring/Summer 1993 Vol. 5 No. 2

## *3 Day Launch Event!*

**Aeronaut 4 and Fireballs 03 Combined!**

**New Date:**

**Labor Day Weekend**

**September 4th, 5th, and 6th**

**Black Rock Launch Site**

## **AERO-PAC Donates to Tripoli Legal Fund**

By unanimous approval of the board of directors, AERO-PAC donated \$250.00 to the Tripoli Legal Fund. As many of you may have heard, reloads up to I284 excluding the Black Jack series are now shippable. This is great news for the rocket community. However, California is still plagued by the State Fire Marshall's ruling on rocketry. The following is a list of rocket motors that are legal in the State of California. Notice that there is nothing above a "G"! This motor list was obtained from the State Fire Marshall:

### **AEROTECH**

D7, D8, D21, E6, E10, E15, E25, E28, E30, E50, F9, F10, F15, F20, F25, F30, F32, F41, F44, F60, F72, F80, G25, G40, G55, G80, G125

### **ESTES INDUSTRIES, INC.**

1/2A3, A3, 1/2A6, A8, A10, B4, B6, B8, B14, C5, C6, D11-P, D12

### **FLIGHT SYSTEMS**

A6, B6, C6, D18, D20, E5, E60, F7, F100

### **MODEL RECTIFIER CORP.**

A8-3, B4-2, B4-4, B6-4, C6-3, C6-5, FX (no thrust)

**A Special Thanks to:** LOC Precision for offering us 2 launch heads at their cost. David Cotriss donated two six foot quarter inch stainless steel launch rods. Pius Morizumi donated a deep cycle lead-acid battery. The next time that you see any of these individuals, give them your thanks for supporting you and AERO-PAC.

**Our membership is growing,** let's welcome the following new members of AERO-PAC - Larry Liggett, Alan Cooper, Randy Helmonds, Jeff Proschold, Jerry Vaughn, Stanley Batchelor, Mike Markert, Jeff Bryant, Richard Lee Costello, and John A. Lilleland.

**Bill Lewis** has mailed the 1993 membership cards. If you haven't received yours, please contact Bill.

**ROCKET MAIL** covers are still available. Contact Jeff Boyle at 16977 Bissell Place, Grass Valley, CA. 95949. The proceeds from the sale of ROCKET MAIL supports AERO-PAC's education fund. More news to come in the next newsletter.

**Stu Barrett** of Round Rock Texas sends his job well done to AEROPAC for the job that we did at LDRS-XI. Thanks to all of you who participated as part of the AERO-PAC team at LDRS-XI - it was noticed!

**Pius Morizumi** submitted the following inventory of AERO-PAC launch equipment:

1 - Launch Control Panel, 5 - Control Cables (100' each), 2 - Distribution Boxes, 20 - Relay Leads, 25 - Relay Boxes, 32 - Ignitor Leads, 2 - Battery Distribution Boxes, 14 - Battery Leads, 1 - Auxilliary Launch Button, 1 - 12v. Lead-acid Battery, 5 - Launch Rod Holders, 5 - Launch Stands, 4 - 1/4" Launch Rods, 4 - 7/16" Launch Rods, 1 - 1/2" Launch Rod, 2 - PA Amplifiers, 2 - Microphones, 4 - Loudspeakers, 2 - Speaker Coupling Boxes, 2 - Speaker Stands, 2 - Speaker Cables (50' each), 1 - Microphone Stand, 1 - Booster Amplifier, 20 - Pad Signs, 20 - Sign Stakes, 2 - Tables, 2 - Lawn Chairs, 1 - Ladder, 2 - Bottles Tracking Powder, 1 - First Aid Kit, 1000 - Rocket Flight Data Cards, 5 - Hats, 1 - Small Tool Kit, 100' - Flag Line (very used).

*It is time to  
write that article!*

"Double Trouble" built by David and Jim Cotriss. They plan to tower launch this scratch built 2 stage rocket at Black Rock "V". It will be 2.375" o.d. and 117.75" long. The rocket will have an ogive nose cone with a 5:1 ratio. The recovery system will employ 2n - 44" parachutes (1 in the booster and 1 in the sustainer) plus a 24" X-form drogue 'chute for the upper stage.

This rocket will be powered by a K1100-6 "Blue Thunder" in the booster and a K250 AeroTech "White Lightning" in the sustainer stage.

The rocket is built from Cotriss Technologies Black Dog carbon composite airframe and nose cone. The tubing consists of five layers: phenolic core, carbon fiber, S2-glass (high strength fiber glass), fiberglass, and surface and finish coat. The fins will be constructed from G-10 phenolic composite laminate (fiberglass)

The rocket will use two Adept electronic mercury switches for staging. The second unit is for redundancy - just to insure upper stage ignition. The recovery system will be controlled by an Adept Rocketry RA52A Recording Altimeter with switches for drogue 'chute at peak altitude and main 'chute at 250' above ground. This is for the upper stage.

David and Jim are doing this for sport and altitude. They calculated the expected altitude using the Rogers Aerospace programs. Join them at Black Rock "V" and let's see if they make the expected altitude of 25,000+ft.

Walt Rosenberg has two projects in the works. His first is: "Triacus Epsilon" - For you Startrek fans, you know that Triacus is a planet in the Epsilon Indi star system. Why the name? It's three colors and he likes Startrek. The rocket is a 2.152 o.d. 82" tall two stage rocket. It's painted Bright Yellow, bright red and black.

The booster stage is scratch build from Public Missiles phenolic tubing. The sustainer stage is a modified PML Phobos kit. The fins were trimmed and the motor mount was recessed to allow the insertion of the staging coupler. All fins are from 0.125 G-10 phenolic and are through-the-wall on the sustainer and surface mounted on the booster. The fins on the booster are attached with Fiberglas cloth that wraps the body tube between the fins. After the 'glas cloth was epoxied on the booster. Holes were drilled so that 10 pins could be inserted through each of the fins next to the body tube. This will add more surface area to help the epoxy to bond the fins and body tube.

The booster stage will accept a 54mm motor and the sustainer stage will accept a 38mm motor. The planned motors are a J180

for the booster and an I284 for the sustainer. An Adept Rocketry Electronic Mercury switch will do the staging.

Using the Rogers Aeroscience programs, the calculated rocket altitude with 2 seconds delay will be approximately 14,600 ft. With no delay, the altitude calculated out to 13,800ft. We will find out how close we come at Fireballs.

"Black Brant II" This is an upscale version of the Canadian sounding rocket. It is 8" in diameter and will be close to 14 ft tall. The body tube consists of re-enforced concrete forms. The conical nose cone was turned by Chuck Sackett of Innovation Rocketry. The motor mount assembly is made from Public Missiles parts with the centering rings custom made by PML.

The recovery system will use the RA52S recording altimeter and recovery deployment system. The Rocket has one 12 foot and one 16 foot X-form parachute. The rocket will separate at recovery time and come down in two pieces.

It will be powered by a central K1100 with three air started G160SS' and three H125 motors.

Why am I doing it? - just for the fun of it!

## BLACK ROCK V UPDATE

The FAA waiver has arrived. We are set for some great launches. We have a blanket 25,000 ft. AGL waiver for the entire launch (Saturday and Sunday). We have the following windows - 20,000ft AGL from 8:00pm Saturday night to 10:30pm Saturday night and 60,000ft. AGL from 9:00am to 11:00am and 2:00pm to 3:00pm Saturday and Sunday. 20,000ft AGL for a night launch - A night to remember!

## Bay Area Launches

LUNAR (Livermore Unit of NAR) Launch Schedule

July 4 (Sunday) - Demo flights also at Robertson Park as part of the city celebration. Although it is not an open launch, LUNAR personnel will be there to answer questions and have fliers, etc.

July 11 (Sunday) - Open launch at Robertson Park. Following our schedule of the 3rd weekend of the month, this would normally be on the 17th, but we wanted to keep that day open for any members who wanted to go to Black Rock.

July 23, 24, 25 (Fri, Sat, Sun) - Livermore Airshow demo at Livermore Airport. Demo will be held noon to 12:30 on Friday and 11:30 to noon Saturday and Sunday. Obviously a closed launch, but LUNAR will have an info table there all day for all three days.

August - We will have two launches at Robertson Park, most likely on the 2nd and 4th weekends, but this hasn't been firmed up yet.

September - NAR sanctioned contest with BAYNAR on the 25th at Robertson Park. Events still TBD. The contests will be run first with an open launch to follow.

FROM THE NORTH AND EAST BAY -

Take 580 towards Livermore and get off at the "Livermore Ave" exit. Turn south towards town. Keep going until you've driven clear through town and are going out the other side (about three miles). After you pass the City Hall/Police station (our old launch site) get ready to turn right at Wente St in about 1/2 mile. After a very short (1/4 mile) stretch, turn right again onto Stadium Road then into the parking lot. We lauch from the large Soccer field north of the parking lot.

FROM THE SOUTH BAY -

Take 680 north over the Mission Grade. After you're on the far side of the grade, prepare to take Hwy 84/Vallecitos Rd which peels off to the right. Follow this ~7 miles to Livermore. As you come into town, start counting stoplights. The fourth lighted intersection is 4th St (just a coincidence). Turn right onto 4th then turn right again IMMEDIATELY (like in 100 ft) onto College Ave. Follow College about 2 miles until it ends at a "T" with Livermore Ave. In front of you will be City Hall/Police station (our old launch site). Turn right onto Livermore Ave, then right again at Wente St in about 1/2 mile. After a very short (1/4 mile) stretch, turn right again onto Stadium Road then into the parking lot. We lauch from the large Soccer field north of the parking lot.

## AERO-PAC Board Meeting

4 August 1992

Meeting opened at 6:15

In attendance were:

Bill Lewis, Pius Morizumi, Ron Devine, Walt Rosenberg, Mike Rosenberg

### 1. Balls

89 LDRS, 44 Fireballs Registration forms, AERO-PAC to receive approximately. \$440.00

### 2. Volunteers

Bill Lewis will FAX the Fireballs volunteers to Ron and Walt. There is a multitude of problems with the forms that Bill will address. Bill will write a cover letter to the FAA stating that the Rockets flying at LDRS-11 will also fly at Fireballs and vice versa.

### 3. Radio communications

The owner of the handhelds will contact Phil Hayton. If he gets no where, AERO-PAC will get involved. Jeff Boyle cannot get ahold of Phil.

4. Discussion revolved around the tracking of rockets for altitude and what time tracking should start. Also, last year HAM radios were used. Bill will contact Bill Wood about tracking and communication direction.

### 5. Campsite control:

Bill Morrow will get the volunteers

### 6. Porta Potties:

Ron contacted Bruce Kelly about the porta potties. Bruce wants to put 4 at the campsite and 4 at the launch site. We recommend 3 at the campsite and 5 at the launch site.

### 7. Signs:

1 sign at the road saying LDRS-11. Stake markers will be placed 1 mile apart. The stakes will have fluorescent streamers and reflective tape. At campsite will be a sign saying campsite this way and launch site that way. A sign will be posted in the campsite with the site rules. The BLM intends to put stakes in at the campsite borders. Bill will call them to discuss the problem that the boundaries may be too small and discuss what we are

doing to manage the campsite. Main area and overflow area may be a solution to this problem.

### 8. Launch stands:

Dave Bucher needs the dimensions of the stands so that he can make the rest of them. Bill Lewis will give them to him.

### 9. Rocket Mail:

Bill talked to Jeff Boyle and will set up the article for the Tripolitan and stamps etc.

### 10. Launch site:

The Equipment was sent to Reno. We will have 6 Tripoli pads and the complete Tripoli launch equipment. We will have 20 AERO-PAC pads and 6 Tripoli pads.

Pius Morizumi donated a used ladder to AERO-PAC. This will be used for tower launch set up. Bill will talk to Bruno about a storage site for AERO-PAC. We have two alternatives if Bruno says no. Pius' Reno place or a new member (Charlie Sipra) who lives just off of 80.

Battery needs: 1 to run PA and the control panels. Pads 1-10 need 2 more batteries, pads 11-20 need 5 batteries for a total of 8 batteries. We are short 3 batteries. Jeff Boyle has procured 4 or 5 batteries Walt will charge 3 batteries and bring them to the launch.

Pius presented the launch pad layout. Bill will track down the tracking form used for Fireballs. Variations to the range head were discussed.

A suggestion was made for a message board to be placed at the launch site.

Bill will call Bruce Kelly for the volunteer information. Discussed flight cards, RSO, LCO and Pad Manager duties and locations at the launch site.

Ron will do the maps to the launch site for the windows

Meeting closed at -9:21pm.

**Send your  
Newsletter articles  
to:  
Walt Rosenberg  
3090 Balmoral Dr.  
San Jose, CA 95132**

## Aero-Pac Board Meeting

30 January 1993

Meeting started at 10:10am

Attendees...Walt Rosenberg, Bill Lewis, Pius Morizumi, Ron Devine, Chet Geyer

1. Bill outlined the ground rules for the meeting procedures. We will be more formal in the process.

### Agenda.

- I. Old Business  
Review next meeting
- II New Business
  1. Launch Director
    - a. Launches and dates.
    - b. Bio-wadding
    - c. Launch Stand
  2. Secretary - editor
  3. Other - Bill
    1. Education - March 6

2. Old business....Re-address Biodegradable wadding - moved to new business.

a) Launch cards, we don't have any. Some of them went with Tripoli. We are missing the Balls cards.

b) Launch stand - move to new business.

### New Business:

1 - logistical support for launches

Pius may not be able to attend all launches. We may have some flexibility to change dates, but he may possibly not attend the revised launch. Proposal; that Pius as launch director has the authority to appoint an assistance launch director (with no voting rights) who will have his authority in his absence. Vote 3 to 0 passed. Proposal number two: 1993 launch season pre launch applications (FAA waivers and Launch applications) should be the responsibility of the acting treasurer. Treasurer receives payment with the forms. Vote 3 to 0 passed.

a. Launches and dates:

Aeronaut in May 15th and 16th. Bill second vote 3 to 0 passed.

Black Rock - July 10 or 11. Pius seconded the proposal. 3 to 0

passed.

Fireballs - August 21 and 22. Seconded by Walt vote 3 to 0 passed (contingent on being an insured sanctioned launch).

Proposal - Aeronaut and Black Rock launches are proposed as Tripoli sanctioned launches. Second Pius Morizumi, Vote 3 to 0 passed. National experimental rocket launch. Proposal to Tripoli as a replacement for FIREBALLS. Propose that the launch would take place only as an experimental Tripoli sanctioned insured launch with the approval of the Tripoli board. Seconded, Walt Rosenberg, vote 3 to 0 passed. Proposal The fireballs launch will not be restricted as to total Newton seconds on the first day of the launch and will give preference/priority on availability of launch pads to 1300 N/S rockets on the second day of the launch. Seconded: Pius, Vote 3 to 0 passed.

There will be no fireworks, discharge of firearms, or any form of pyrotechnics permitted at the launches At both the campsite or launch area.). NOTE: This will be published in the Aeronaut and flight package. a separate document will be signed in the launch package by the person applying for the launch.

Biodegradable wadding - Proposal: Ban fiberglass and other non-biodegradable wadding. This notice will be included in the launch package and published in the Aeronaut. Seconded: pius Vote: 3 to 0 passed.

Proposal: We need a bulletin board for the launches, a small amount of money is to be provided to build/purchase one. Seconded: Bill Lewis Vote: 3 to 0 passed

Launch Stands: We have one in our possession. We don't know if Dave Bucher has the aluminum heads Ron Devine will check to see what he has. We have a launch system and no pads. Pius and Chet will come back with a minimum inventory list of what we will supply at a launch. Proposal will be made in their proposal to a modification be taken on the launch controller to provide a lockout for launches.

Secretary/Editor - Next Aeronaut

- Launch schedule
- Meeting minutes
- Rocket Projects
- Application Blanks
- Black Rock Launch IV
- Launch Package
- No fireworks etc. at launches
- Next general meeting
- Board meeting date (schedule)
- Pub date 27th, cutoff 19th.
- Election
- Donation to Tripoli Legal fund.

LDRS-XII Estimate of number attending LDRS - PUT sign-up form in Aeronaut.

Where HIGH-POWER is sold.

Follow-on Jim's art.

Any interest in FEA (finite element analysis) as an article in the future. yes

General Meeting date: February 21, 1993 Sunday. Pius to call Bob Walker, and Walt to produce the flyer. Sell Rocket Mail at meeting. Round table. videos, show and vote, open discussion, adjourn to fly with BAYNAR.

Treasurer. approx. \$630.00 in the bank. Will be reported in the next Aeronaut. Proposal: AERO-PAC to donate \$250.00 to Tripoli Legal Fund. Will challenge other prefects to match it. Publish as main article in the Aeronaut.

EXCEL student Launch. Chet Geyer will check with Wavemasters to see if they are willing to allow their field to be used for a model rocket launch for the underprivileged children sponsored by the Society of Hispanic Engineers (SHPE). Proposal: Support the launch as an education event, through SHIP as a dual event - building and flying. Second: Pius Vote: 3 to 0 passed.

Lost Hills site discussion was tabled for the next meeting. Lost hills is being entertained for a boost glider site.

Meeting adjourned at 1:15

## Advertising in the Aeronaut

The board of directors has laid out the following guidelines for advertising in the Aeronaut Newsletter.

1. Classified: Open to members as free advertising. This is non-commercial advertising.

2. Commercial: 1/4 page adds are free to all vendors and hobby shops who give AERO-PAC members a 10%-15% discount on their list price. A special form must be completed and mailed to Bill Lewis.

3. Non-member Commercial: 1/4 page ad. This pertains to vendors who support the AERO-PAC launches. They will be able to advertise for free the following class of items - expendable launch supplies (no kits). These supplies would be of the following nature: Motors, re-loads, ignitors, thermalite, parachutes, shock cord, etc. The only caveat is that they sell their merchandise at the launches.

## Classified Ads

### MISCELLANEOUS ITEMS FOR SALE OR TRADE

Estes supplies / parts

1 BT-55 body tube, 18" long, 1.325" dia., \$1.50

1 BT-20 body tube, 18" long, 0.736" dia., \$1.25

1 BT-20 body tube, 15" long, \$1.00

1 BT-60 body tube, 9" long, 1.637" dia., \$1.75

1 BNC-5S balsa nose cone, 1.5" long, fits BT-5, conic shape, \$1.00

1 BNC-20R balsa nose cone, 2.75" long, fits BT-20, conic shape, \$1.50

1 NB-20 solid balsa bulkhead, 0.75" long, fits BT-20, \$1.00

1 NB-50 solid balsa bulkhead, 1" long, fits BT-50, \$1.25

1 TA-2050 solid balsa tube reducer, reduces BT-50 to BT-20, 2" long, \$1.50

1 PNC-55AC plastic nose cone, 5.4" long, fits BT-55, conic, \$2.00

1 PNC-50KA plastic nose cone, 2.735" long, fits BT-50, ogive, \$1.00

4 small screw eyes, 0.75" long, \$0.10 ea.

7 launch lugs for 1/8" rods, 2-3/8" long, \$0.15 ea.

1 24" plastic parachute (PK-24), unopened, \$1.25

1 JT-55 tube coupler, fits BT-55, 1.3" long, \$1.00

Other items

2 North Coast (NCR) MA-3 motor adapters, 1.5" to 29mm, include all parts and instructions, \$2.00 ea.

1 NCR shock cord mount, fits 4" tube, includes parts and instructions, \$1.00

1 LOC shock cord mount, small, includes instructions, \$1.00

1 NCR tube coupler for 1.5" airframe, 3" long, \$1.00

1 NCR ejection baffle ring, plywood, glues into airframe above motor mount; reduces but does not eliminate the need for wadding, fits 4" tube, \$1.00

1 NCR ejection baffle ring, same as above but for 1.8" tube, \$1.00

1 NCR thrust ring for 1.5" motor tube, \$1.00

6 NCR thrust rings for 29mm tubes, \$0.20 ea.

2 LOC MMT-0.95 24mm motor mount tubes, 34" long, \$2.00 ea.

1 LOC 5.54" nose cone (standard / original shorter shape), painted but needs re-painting, undamaged, \$15.00

2 sheets of black vinyl letters, 1/2" tall letters, great for decaling rockets, \$2.00 ea.

1 audible rocket locator, similar to LOC style beeper (NOT Cotriss Technology style), loud continuous tone, runs on single 9V battery (included), \$10.00

David Cotriss, 3653 Slopeview Dr., San Jose, CA 95148-2828. (408) 238-3467.

NOTE: AERO-PAC 10% DISCOUNT DOES NOT APPLY TO THESE ITEMS.