

# Aeronaut

Volume 16 Issue 2 July 2009

Tripoli Rocketry Association, Inc Prefecture no. 23



## Presidents Pad

Tony Alcocer

I for one really enjoyed our last newsletter. It contained a lot of useful information. I could not remember what HAM frequencies we used out at Black Rock. Lo and behold it was right there in the newsletter. Newsletters are only possible by somebody or a group of some bodies taking a few minutes and writing stuff. In our case it's a few people writing stuff. At some point we are going to run out of things to write about. If you have something you'd like to share, please feel free and write it up and submit it to Ken Adams. Or if you have a question about something feel free to drop me an e-mail [tfish38@aol.com](mailto:tfish38@aol.com) with your questions. If I can't answer it, there's some pretty smart people in AeroPac that can.

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Banner Photo By Steve Wigfield

## 2009 Launch Schedule

Aeronaut July 30 — August 2

ARLISS September 13th-18th

XPRS September 17th-21st

**Aeronaut** setup day begins on Thursday July 30th with Research day on Friday. *Saturday night launch 8—10 PM.*

**ARLISS Fall** setup day Sunday September 13 with ARLISS activities thru Thursday the 17th and the student presentation banquet on Friday the 18th.

**XPRS** Setup Day Thursday the September 17th XPRS flight operation beginning on Friday the 18th with a Research Day on Monday the 21st.

## The End of the Beginning

-Mike Brest, AeroPac Secretary



The AEROPAC election coming up in September will mark the End of the Beginning for the recently formed Non-Profit Corporation. Our Board is currently made up of nine members, and the plan is to keep it that way. The Board will continue into the future with the nine members serving staggered terms of three years. This coming election will mark the first election that is a "Normal" election since the non-profit was formed. The *normal* that I am referring to simply refers to a normal election with a field of candidates running for three seats on the Board.

The formation of a non-profit in 2007 required us to legally declare AEROPAC to be a corporation through the Articles of Incorporation

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## **AERO-PAC Officers**

**President / Prefect - Tony Alcocer**

**Vice President / Equipment Manager - Richard Hagen**

**Secretary - Mike Brest**

**Chief Financial Officer - Eric Kleinschmidt**

**FAA Liaison Officer - Steve Wigfield**

**Education Director - Ken Biba**

**Social Outreach Director - Peter Clay**

**Launch Director - Peter Clay**

**Assistant Launch Director - Seth Wallace**

**Webmaster - Jamie Clay Contest Director - Cliff Sojourner**

**Contact: [officers@aeropac.org](mailto:officers@aeropac.org)**

## **AERO-PAC Board Of Directors**

**Chairman — Ken Biba**

**Tony Alcocer**

**Erik Ebert**

**Steve Wigfield**

**Gary Rosenfield**

**Mike Brest**

**John Coker**

**Eric Kleinschmidt**

**Karl Baumann**

**Contact: [bod@aeropac.org](mailto:bod@aeropac.org)**

*(Presidents Pad continued from page 1)*

As the last issue of the newsletter was going to press the deadline for the ATF to appeal the courts ruling on APCP not being an explosive was ending. The ATF did not appeal and APCP was (or is going to be dropped from the list of explosives). That will give many fliers relief from flying with a "LEUP buddy". One thing to keep in mind is that this ruling does not remove ematches or igniters (now being referred to as rocket motor initiators) from the list of explosives. NAR and TRA are trying to recover \$395,000 in legal fees from the ATF, The ATF keeps asking the court for extension, citing various reason's for the delay, people of vacation dog ate the paper work etc.

ARLISS has been busy with putting up a few rockets at Mudroc and working with Sonoma State University and NASA on a program that would bridge the gap between TARC and ARLISS programs. Additionally, LDRS has just concluded and next years event will be hosted by ROC. ROC is working with the California State Fire Marshal in an attempt to clear up some issues in regards to research motors and possibly a higher Newton-Seconds limit.

I really enjoyed Mudroc this year. It was well attended even with the iffy weather. For those that made it out there it was clear why its' call "Mudroc". I don't know of anyone that got stuck. We did have enough rain to make things a bit sticky and slippery for a few hours. There was plenty of opportunities to fly with periods of little or no wind and clear blue sky. There seemed to be more then normal on-board video cameras at this launch. You can see some of the videos at AEROPAC's web site. Another notable is that there has been some talk about streamlining the FAA Class 3 paper work which will be helpful for some of our members. I'm looking forward to seeing what TRA and the FAA come up with. AEROPAC's 99K group has had their Class 3 rocket waiver approved. They hope to get it in the air at Aeronaut and if not at XPRS. -Tony



( End Of the Beginning continued from page 1)

document. That document required us to name the initial Directors.

This naming process however is a declaration, not an election by the members. And the corporation can't legally have members until it is a corporation.

It's a bit of a *Chicken & the Egg* conundrum. Nobody was comfortable operating any longer than necessary without a Board that was elected by the members.

We decided in one of our formation meetings that we did not want the entire Board up for reelection every year so we chose the plan discussed above. This plan insures there will be continuity on the Board from year to year. We initially declared with six Directors in 2007. And we agreed to expedite the transition process to a Board completely made up of Directors elected by the membership. To accomplish that, we first held an election later in 2007 to add three members, bringing the Board back up to nine members. These first three members, elected to three year terms, were Karl Bauman, John Coker and Eric Kleinschmidt. Then in 2008 we declared the expiration of the terms of the initial six members. And the election was held to elect six new Directors. Three Directors were elected to three year terms, and three elected to one year terms. This year, the one year terms expire. And so ends *the beginning* of AEROPAC, the Non-Profit Corporation. For the foreseeable future, starting with the election results of 2009, AEROPAC will elect one third of the Board each year, for three year terms.

If this hasn't put you to sleep, and you just have to read more, I cordially invite you to read the Bylaws. You can find these on our web site at: <http://www.aeropac.org/bylaws/index.html>



## High Definition Rocketry

By George Wagner and Pat Wagner

At Mudrock 2009, we launched a joint project rocket which took some pretty nice video. While the project had its usual share of glitches, the rocket rolled very little during recording (and when not being boosted), so much of the video was very stable

and provided some very nice high altitude views of Blackrock and the



surrounding hills. In this article we will try to pass on a bit about how we built and flew the rocket.

The basic rocket was a classical Level 2 vehicle built with extra care to fin construction to prevent roll. The rocket, we called HD-2 (for High Definition-2) was a scratch built 2 stage, 4", design to launch up into the K range of motors. It used "G-Whiz HCX" electronics, had a 70 cm Beeline GPS and an Aiptek HD video camera.

### Getting It Straight:

To make the fins George used 1/8" G10 plates purchased from a local composite supplier. He found a fin pattern he liked on the internet and printed a scale sized template on a laser printer. Using a hand held jig saw, he cut the fins out and evened them up to each other with a belt sander. He wanted the fins especially straight and well mounted, to be able to take hit the ground on the fin can. To do this, he built oak cleats with a router. The cleats were contoured to the motor tube on one side and grooved to accept the fin on the other. After gluing the cleats with JB weld to the motor tube this assembly was glued into the coupler tubing. The coupler tubing was slotted to expose the cleats. The last step was to align and glue the fins in place with a simple home made fin jig. The body was a



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*(High Definition Rocketry continued from page 3)*

standard 3 piece design with drogue bay aft extending from the fin can, and the main chute bay up front attached to the nosecone. Both fore and aft sections were secured to the electronics bay with shear pins.

#### **Making movies:**

The camera is an Aiptek Action HD (HD-DV 1080P). Pat found this at Walmart, and bought it from their web site (\$149). The camera records video as .mov files. The mode used, 720p, shoots 60 frames per second. The camera uses a standard variety small cell phone battery, so it is easy replaced. It records to flash memory and a 2 gig card was plenty for a flight, plus the 30 minutes before and after. Still it could have been better, if you could shut off the autofocus, and turn the camera on with the remote. But for the price, it was great.

#### **Holding it steady:**

The video camera cradle was built into the nosecone. With no mirror, the view was toward the horizon. The nosecone was a 4" fiberglass unit from Jack Garibaldi. The cradle base was 3 layers of 1/4" aircraft plywood, with 8-32 inserts set so the base can be slid into the nosecone and screwed down quickly before launch. The camera was secured to the base by its 1/4"-20 screw mount, and braced using styrofoam (the kind used in car bumpers). This styrofoam is very easy to work, it cuts with a hot wire cutter (We used a old soldering iron with a 14 gauge wire shaped like a big "D"). It is glued with hot glue. The camera was additionally secured with a brace on top, made with a piece of 1/8" plywood and more styrofoam. All of this was cut to hold the camera rigidly in a very repeatable set, so that when or if a mirror was put on the nosecone the camera would stay aligned with the mirror. This launch no mirror was used in order to see the horizon on the way up.

Three, Two, One.....:

George handled the basic rocket prep and motor building, Pat handled the electronics prep, and videocamera prep. We made launch prep list to follow during the excitement of final preparations. We launched 4 times at Mudrock, and

*(Continued on page 5)*

#### **A note from AEROTECH**

I will be at Aeronaut with "demos" 38/480 I59WN boost/sustain-end burner, 54/1280 (J99N) end burner, 54/2560 (K375NW) boost/sustain, 75/2560 (K1070T ) 75/5120 (M1780NT), 98/2560N (L339N) end burner and some odd & ends motors we have been working on. As usual I will have parts and stuff to support our motors.

First come/first ride...see me at our EZ up.

**-Karl Baumann AEROTECH**



#### **Help Wanted**

Do you have a story, project, review, feature, cartoon or a "that's the one" photo you would like to share? Well, we have a format to help get it out; AERONAUT Newsletter. We are actively seeking contributing content for upcoming publications. Contact us at : [newsletter@aeropac.org](mailto:newsletter@aeropac.org)





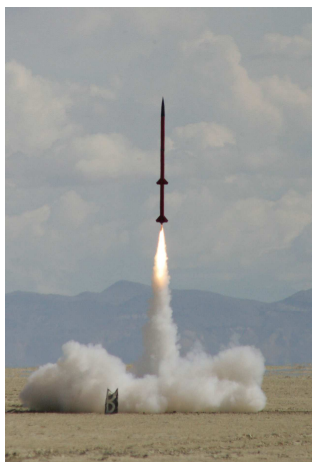
(High Definition Rocketry continued from page 4)

there were the usual litany of rocket problems. Once the video wasn't recorded right. Once the sustainer didn't light. On the last flight, the rocket weathercocked, so at apogee it had a lot of horizontal velocity. The drogue was big, so at apogee ejection, it may have zippered the compartment, although were still not sure about that. The charge for the main chute wasn't enough to break the shear pins, and the rocket hit the ground hard. Still all the electronic survived, and a lot of great video was collected.



#### Musings, Lessons Learned and HD-3:

We learned a number of lessons that "Level 3" types already know by heart. The most important improvement would be to have redundant electronics. Still, we were really happy with the results. The extra care in attaching fins paid off with an extraordinarily straight flying rocket. The fin can appears to have survived the last impact, and may be rebuildable. Still, we want to see if repeating the construction techniques will repeatably make the same



stable rocket. If we put a mirror on the rocket, it will be removable, or on a nosecone that can be switched out, because we really liked the horizon view.

Expect HD-3 to launch at XPRS 2009.

Video available at the following links:

<http://www.youtube.com/watch?v=k4P2sEOd7hY>

<http://www.youtube.com/watch?v=P2GyeThVMzU>.

## ARLISS Report July 2009

By David Raimondi

AeroPac hosted the first ARLISS launch at Mudroc this year. We had three Teams attend. Santa Clara University flew an optical nephelometer experiment, which measures pollution and dust in the atmosphere. Montana State University built a 3-axis magnetometer mapping experiment. An HD video camera was also added to the cansat at the last moment to record the cansat deployment. Saratoga High School's experiment was a microp recording 3D acceleration, pressure and other simple sensors. This is not bad for the first year hosting the June ARLISS launch.

The ARLISS line up for the fall is shaping up to be the largest launch to date. There will be 17 Teams from Japan, and 1 Team from Hawaii, New Hampshire, Stanford, and San Jose State. Each Japanese Team is looking for two M flights and there will also be a couple of K flights as well. I have been asked to join the ARLISS committee. In my duties as the LUNAR president, I do a lot of public outreach for the Team America Rocketry Challenge (TARC). My initial task for ARLISS will be focusing on outreach and recruiting schools to develop CANSAT projects for the 2010-flying season.

I have already started doing some research and quickly realized that there are lots of CANSAT programs available across the country. The ARLISS program offers the highest flights available to the student community. Most of the other programs reach altitudes between 2,000 to 5,000 feet while ARLISS rockets can deliver the projects between 8,000 to 12,000 feet. Over the years, there have been some airframe mishaps, but the ARLISS flyers have a perfect track record delivering the student payloads to altitude and releasing them.

The ARLISS website, <http://arlist.org/> could use a face-lift and we would like to hear some ideas on how to improve the site. If you have any ideas, please let the ARLISS committee know what they are. The ARLISS committed members are: Paul Hopkins, Ken Biba, Becky Green, Tom Rouse and myself.

Thank you for the opportunity Paul, Ken, Tom and Becky! -David





## Did You Know?

In the early 80s the Naval Weapons Center developed an extremely simple and cheap surface-to-air missile simulation rocket. It was designed to provide a realistic visual Surface to Air Missile (SAM) engagement during air warfare exercises by actually launching an ultra light rocket. The airframe is made of phenolic paper, a Styrofoam fin can and blunt nose. With such construction even in the highly unlikely event of an aircraft strike, little to no damage to the aircraft should occur. The rocket is currently designated **DGTR-18A Smokey Sam** because everything in the military needs an alphanumeric designation right? From a rocket person's perspective, given the size of rocket and the amount of highly visible white smoke generated it is impressive. On the other hand, from a pilot's perspective in a high-speed low-level configuration, it must be Oh-SHIRT moment followed by the appropriate countermeasure.

The DGTR-18A can be launched from ground or in some applications a ship by using the single or four-bay launcher; notably on one of the links, it appears to use a .38 special brass casing and standard primer for ignition but no confirmation on that. The launchers and controllers look like Mil-Spec Estes, being they have cables, switches, rods and blast plates. There is a complete Smokey Sam Simulator (SSS) system, which also includes a vehicle-mounted tracking radar and launchers. In doing some searches, it appears the system is widely deployed at US Military training facilities as well in other NATO countries.

### Smokey Sam

Single use, no recovery by design.

Length 15 in

Fin span 6 in

Diameter 2 in

Ceiling 1500 ft +/- 500 ft

Propulsion Solid Rocket Motor

Additional searches resulted in the links worth passing on:



Video 1 [http://s219.photobucket.com/albums/cc292/maverick\\_65g/?action=view&current=P1000796.flv](http://s219.photobucket.com/albums/cc292/maverick_65g/?action=view&current=P1000796.flv)

Video2 <http://www.patricksaviation.com/videos/ComputerGuy/2848/>

Motor builders may enjoy this [Production analysis](#)



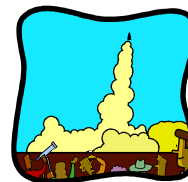
## Launch Duty Reminder

There are still plenty of holes in the Launch Duty roster. Many of the main shifts are empty and none of the assistant slots have been filled in.

This launch seems like its going to be well attended with lots of the usual suspects, it would be great to see some of those names fill those slots.

We have heard from the powers above that no launch will begin until all the slots for that day have been filled, lets not have to make that a game time volunteer process each morning. We have specials on RSO and LCO positions. Get your spot today at:

<http://www.aeropac.org/launchduty.html>







## Elections!

Mike Brest, AEROPAC Secretary

It's that time of year when we need to start thinking about who sits on the AEROPAC Board of Directors. Three of our Directors terms expire this year. Those Directors are:

**Ken Biba**

**Erik Ebert**

**Gary Rosenfield**



We sincerely thank these gentlemen for their service through the end of this season, and hope that they will keep their hats in the ring. But nobody likes an un-contested election. So give it some thought if you are interested. If you aren't interested, but you know of somebody you think should consider a run, elbow them in the gut and tell them to write a note to me, your humble Secretary, or another Board member, and we'll get it on the table.

**Who Should Run?** We need to have people on the Board who are willing and able to put the business of running AEROPAC ahead of some of their would-be free time. The people we need are the ones who will do the right thing for AEROPAC, even if it's not the most advantageous thing to do for themselves. The pay is zero, and the work can cut into rocket building time. So who wouldn't want this job?

**What Do You Get Out Of It?** You get the feeling of having contributed some of your brain cells to a good cause. You get the responsibility of making a few decisions that have potentially important ramifications. You get a little less spare time. But the only potential for financial benefit from being a member of the Board, is the possibility that money spent directly in support of performing Board member duties *may* qualify for a tax deduction (*your mileage may vary; talk to your own tax consultant; deduct expenses at your own risk; don't blame AEROPAC if you get to chat with the IRS.*) The rest of what you get is intangible.

**What Don't You Get Out Of It?** Board members do not get paid. Board members are currently required to pay dues just like everyone else (unless and until such time as the membership sees fit to change that.) You don't get throngs of fans that want you to sign their underwear. And you don't get any exemptions from gravity, wind, heat, dust, rain or physics.

## Community Outreach

Peter Clay

Aeronaut is almost here. As far as vendors go we have 5 known vendors coming to this launch. RCS, Gary and Karl will be there with demo motors and support. Jack Garibaldi of What's Up Hobbies, Jim Myers of Discount Rocketry, Gene Engelgau of Fruity Chutes, and Bob Grossfield of Sunriver Rocketry will all be there to handle all of your rocketry needs!



Now for XPRS.....

In years past we used to have a Pot luck on Saturday night at XPRS; for many reasons that "tradition" was discontinued. This year I have found an awesome traveling BBQ caterer that is very excited at the possibility of attending XPRS and providing dinner for Saturday night.

When a few of us went up for the Black Rock Rendezvous we had the pleasure of stopping off in Colfax for lunch at the **Drooling Dog BBQ** [www.droolingdogbarbq.com](http://www.droolingdogbarbq.com), all I can say is that it was amazing, amongst the best I have had. In chatting it up with the owner, it turns out he spends several days a week taking his wares on the road. I spoke to him about doing a catered dinner at XPRS and he was very interested and totally intrigued by what we do and where we do it.

In order to make this happen we need to pre-sell 150 - \$19 dinner tickets by September 5<sup>th</sup>. Drooling Dog BBQ will also bring extras so that he can do an ad hoc lunch.

So this is what the Sept 18th Launch Menu looks like;

The \$19 adult dinner ticket buys you;

Tri Tip & Skinless Boneless Chicken Breast ~ cooked on site with our wood fired trailer.

Baked Beans ~ smoked pulled pork & another secret sauce added for extra flavor.

Spring Green Salad ~ dried cranberries, walnuts & a honey, raspberry vinaigrette dressing

Garlic Bread.~ buttered with our garlic butter

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(XPRS BBQ Continued from page 7)

For Kids 6 thru 12 the price is \$13 and under 6 years old, \$5. It will be the same menu just smaller portions.

Bottled water will be available for \$2 extra.

If available, a second serving goes for \$5 first come first serve, does not need to be pre-paid, and you need to hang on to your plate and utensils as he will not have extras of those.

People would come by his camp, redeem their tickets for their dinners and then take them back to camp.

It is possible people will set up tables and dine together, however everyone is responsible for cleaning up their individual trash. The caterer will not be hauling out garbage (other than his own). To be clear, there are no 'playa bus boys' clearing any setup tables, you are responsible for your own garbage.

During the day Saturday and Sunday he will have Pulled Pork Sandwiches with a bag of chips for \$6 for anyone wanting to stop by and grab one. I can tell you from personal experience that his pulled pork is the best I have ever had, awesome.

Any food allergies or health issues. Special needs please contact the caterer at [doug@droolingdogbarbq.com](mailto:doug@droolingdogbarbq.com) explaining what your concerns are or call Doug (10:a till 5:p) @ 530 . 320 . 0831

If you would like to partake in this feast, please fill out the request form at <http://www.xprs.org/dinner.html> - Once I get close to the 150 that we need I will then send out a communication with payment instructions (for PayPal and for those of you who prefer to send a check - wow, people still do that?) so that we can make it happen.

Believe me, finding a food vendor that is willing to come all the way out there is not easy, Doug is the only one that I have found willing to do it. Think about it, \$19 buys you an excellent meal that you do not have to haul the food up, cook it or clean up after (other than throwing your plate in the trash) all the work is done for you.

If I start collecting money and it ends up that we do not have enough, it will be refunded to you via PayPal (less the fees of course) or your check will be destroyed or returned to you.

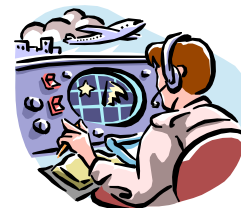
Doug's food is delicious -- Richard and Laura Hagen as well as Jen and Evan Curtis can attest to this. A fully prepared dinner is well worth the \$19.00! Get a plate, kick back and then enjoy the night launch! You can learn more about Doug and Linda at [www.droolingdogbarbq.com](http://www.droolingdogbarbq.com) or [www.doggonegoodcatering.com](http://www.doggonegoodcatering.com)

Cheers -Peter

## FAA GUY

Steve Wigfield

### Night Launch Update



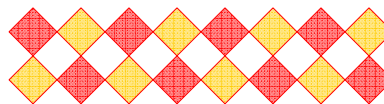
Illumination requirements for night launch rockets have changed due to the new FAA rocket classifications.

Class 1 rockets (amateur rockets using less than 125 grams of slow-burning propellant and weighing no more than 1500 grams including propellant) may use a variety of illumination devices.

Class 2 rockets must have a strobe light.

### Mudroc Report

On Saturday I received a call from Oakland ATC notifying us that they need our airspace to be able to route air traffic around the numerous thunder storms over the western US. I requested and received 15 minutes so we could launch all of the rockets that were currently sitting on launch pads. When I call Oakland back, I asked for 15k MSL ceiling to continue launching and they granted us that for the remainder of the day. Within 15 minutes of my call we spotted a commercial airliner overhead.



## Amateur Radio Repeater Frequency

Paul Hopkins KE6DAX will be fielding his portable simplex repeater again this year on **147.470** with a **PL of 100.0**

Paul's repeater has been very helpful extending the communications reach for folks that have needed assistance and coordinating flight and recovery operations. FRS will be coordinated for local flight line activities as well, Thanks' Paul.







## Membership Information

AERO-PAC memberships expire January 31 of each year. All members receive a membership card, subscription to Aeronaut Newsletter and notification of all meetings and launches. Voting and office-holding privileges are restricted to Premium and Regular members in good standing. Premium Membership and Family Add-On Members of Premium memberships include all launch fees for the year. Launch fees for Regular Memberships and Family Add-On Members of Regular Memberships are \$20.00 per person per launch. Launch fees for non-members are \$30.00 per person per launch. Spectator fees are \$10.00 per day. The AERO-PAC website <http://www.aeropac.org> provides specific meeting and launch information, AERO-PAC contact information, membership application and other useful information for all visitors to our launches.

## TRAVEL TO BLACK ROCK

### Road Construction Continues



An interesting Caltrans web site that could help to takes some grief out of your I-80 travels to and from the launches.

[www.getacross80.com](http://www.getacross80.com)

This website was designed to offer construction schedules and timelines, detour information and project updates. There are also links to weather, traffic cams and other relevant travel information. Nevada NDOT has a like utility to check out construction project on the Nevada side as well.

<http://safetravelusa.com/nv/>

Happy Trails.



HDR Photography by P. Wagner