

TRIPOLI

Vegas

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Official Newsletter of Prefecture #24 of the Tripoli Rocketry Association, Inc.

March 1996

February 96 Launch by Blaine Hath

The weather on the morning of February 17, 1996 was perfect, with a few high clouds and no noticeable wind. After gazing on an almost perfect sky, I got in my car and headed off to the El Dorado dry lake with only one short stop for water and snacks. I spent \$6.66 at the store and wondered as I paid the cashier if the triple 666s were a bad omen. I figured I would soon find out.

I arrived to find that everything was almost set up and ready for launching. Because Brent didn't clue me in about writing an article for the newsletter till after the launch, I don't remember a lot of the specific details. Anyway, if I forgot to mention anything, I apologize in advance.

The first flight of the day was Dave Pacheco's son, flying an orange and blue rocket on a G motor. After that Steve's son sent his Arcus up (spiraling up into the air as usual). I went on my way checking out the other flyers as they prepped their rockets. Dave had started to assemble his revamped

"Ultimate" for another flight using his two stage parachute deployment and adding five motors into the mix. The flight didn't go to well; the parachutes didn't deploy (crash). Ron Denton flew his VB extreme 54 on a K600. The rocket flew high and far; no one was able to track it. However, Ron did recover the rocket about a half mile east of the launch site. While Ron and Dave went to find Ron's rocket, I launched my PML Explorer on an I400. The flight went great, but I decided afterwards that I should change the color of my parachute and rocket to something more visible.

Brian prepped and flew his green rocket on a J275 for a perfect flight. Steve flew another Aerotech hybrid in his EZI65 camera ship for a great flight. Later Gary and Steve came back to the pad with another hybrid combining a solid propellant and nitrous oxide. This was a definite heads up flight. The motor performed perfectly and the rocket had a nice recovery.

Brent prepped and flew an Aerotech

Chaparral on an H motor for a perfect flight and recovery. After that Ron flew a scratch built with three D12s. Dave and Co. prepped a two stage U.S. Rockets Banshee with an I284 stage to an H123. The rocket staged and flew nicely. My last flight was my PML Ariel powered by an H238t to test the PML quick switch. The quick switch worked like a charm. Brent followed with the last flight of the day, his Planet Design Orbiter which took four tries on the pad to get ignited and off the ground. The rocket really climbed into the air with a J275 loaned by Brian. Although the payload separated early due to air pressure changes, the rocket only suffered a big zipper down about three foot of tubing—about seven dollars to repair. Even though the day started a bit on the chilly side with a few clouds overhead, it turned into a beautiful afternoon and a good time had by all.

Letter from the President

by Les Derkovitz

A lot has changed in the three years we've been an organization, or has it? Do you charter members remember getting mailings and calls from a guy named Tom Blazanin? Tom encouraged any and all of us interested in rockets to come to a "get together" and form a local Prefect of Tripoli. We had about 12-15 people come to that historic meeting. Tom gave us a pep talk and said he would serve as an officer, but not a president. When we asked him how he felt about being Prefect and vice president—he agreed. Denise Rosenfield said she'd serve as Secretary/Treasurer, and I made the mistake of walking in with the biggest rocket and got rail roaded into being president (I didn't kick and scream too much!).

Now that we had our officers, we set off to get some work done. Charter/Bylaws were written (we're recognized by national), launches were planned and it wasn't

long before a long term project—our own altitude attempt—was planned. At that time most of us weren't too "mature" in our high power endeavors. But after couple years flying, building, and launching our altitude rocket combined with holding a couple of "Turkey Shoot" and Delamar launches changed all that. These days you'll see our members building projects with fiberglass and metal, using all kinds of electronic do-dads, clustering, and staging—and even making home brew motors/propellant. Our personal interest in the hobby and the support/help from each other have "propelled" us to becoming the builder/flyers you see today.

Our original member list of over 35 people has boiled down to less than half for paid members and maybe half of them come to the meetings. Some new members have come in, some old members have dropped out, but the old reliables still show up to the meetings and launches. Like most clubs, only a few of our members make

each meeting and volunteer to do the work details. When you asked me to be president, you guys assured me you'd give me lots of help—so don't worry. For the most part you've honored your promises and I appreciate that very much. I must admit that at some launches I've felt like I have been the one to pull the LCO/RSO duties all day. At times I wanted to say "I quit—just leave me alone so I can fly and enjoy myself too." As a result I have decided that I'll pull back at our launches to let you guys take over so I can walk the lines, BS with everyone, and even fly when I can afford it.

All in all it has been a great tour of duty that I've really enjoyed. For those of you who have helped so much, thank you very much. And for those of you who have been reluctant to pitch in, I hope you'll find a niche and take the plunge. By the way—this will be my last year as President—I need to step down before I screw up too bad.

Hybrid History in the Making

by Steve Ainsworth #2454 and Gary Rosenfield #022

February 17, 1996, 11:00 a.m., El Dorado Dry Lake, just south of Las Vegas, NV, high power rocket history was made. Gary Rosenfield of Aerotech had assembled a specially designed composite "white lightning" propellant motor to be turbocharged with 299 grams of Nitrous Oxide, for a total output of approximately 1,850 N-S with a four second burn time, approximating a K448 motor. The turbocharge increased the ISP of the J415w composite propellant essentially raising the output from an 1100 N-S J to an 1800 N-S K for only \$3.00 worth of Nitrous Oxide! This motor flew in a 4" diameter PML Aurora—the very first time the motor was tested (and the maiden flight of my PML Aurora)! An excellent flight. You could hear the igniter "pop," then the eight-pound rocket left the pad like a champagne bottle cork trailing the seven-foot flame and dense plume of white lightning exhaust. The estimated altitude was 7,000 feet. The chute deployed at apogee (we all started to breathe again) by an Adept apogee detector for a perfect flight.

The RMS/Turbo 54/1900 motor uses the identical hardware set as the paper-fueled RMS/Hybrid™ 54/300-900 motor already Tripoli certified. Three White Lightning propellant grains weighing 194 grams each (similar to those in a standard J415W reload) were used in the Turbo reload kit, along with an oversized nozzle adjusted for proper operation with 299 grams of 4-jet nitrous oxide injection. The is configuration is known in the rocket propulsion industry as a "gas generator hybrid" (or GGH).

Aerotech is pursuing the Turbo concept since a significant boost in delivered solid propellant motor total impulse can be achieved at the cost of a dollar or two of nitrous oxide, with very little weight or volume penalty. The motor used in the demonstration weighed 4.2 pounds fully loaded, and was 27.9 inches in length (this is the same length, but weighing only .8 lbs. more than the current 54.300-900 paper fueled hybrid motor). This improvement is possible because nitrous injection can raise the delivered specific impulse (Isp) of a solid propellant by as much as 30% in addition to the total impulse provided by the supplemental mass of the nitrous oxide.

Aerotech is investigating the application of RMS/Turbo technology to the 38, 54, and 98mm RMS motor sizes, and will be conducting more demonstrations of RMS/Turbo motors during the upcoming flying season. Reload kit cost per newton-second is predicted to be in the range of existing Aerotech RMS/Hybrid rocket motor pricing.

Earlier the same day, I successfully flew a gyro-controlled movable fin guidance section atop a heavily modified EZI-65 with an Aerotech J210 hybrid (it was the gyro-controller's maiden flight also—a good day all around). The rocket was heavy—14 pounds including the motor—and was launched off a short (6') rod. The rocket cocked as it left the rod and the guidance system made corrections. All observers could see the corrections take place—except me. I was watching through a video camera. The adept apogee detector deployed the chutes on schedule and the booster and payload drifted down on separate chutes. Many thanks to Futaba for technical assistance with the gyros, and to Brian Rierdon for design modification and construction of the on-board electronics needed to drive the gyros and servos. The next flight of the guidance system is planned for March 9th at Springfest.

The gyros (there are two-pitch and yaw) are standard helicopter gyros from Futaba. The gyro motors are driven by a 6.25 volt Ni-Cad pack, with the electronics driven by a standard 5 volt flight pack. The gyros can operate from the 5v pack, but their sensitivity is diminished. The servos are also fast response helicopter servos operating a 100% movable F-16 style fin, which is positioned ahead of the center of gravity of the rocket. For the maiden flight, the fins were about 12" ahead of the CG. The gyros are positioned as close to the CG as possible.



Leadership List

President Leslie Derkovitz • 875-1904
 Vice President Tom Blazanin • 388-9644
 Secretary/Treasurer Lance & Robbie Tharpe • 262-9131
 Prefect Tom Blazanin • 388-9644
 Newsletter Editor Brent McNeely • 873-8222

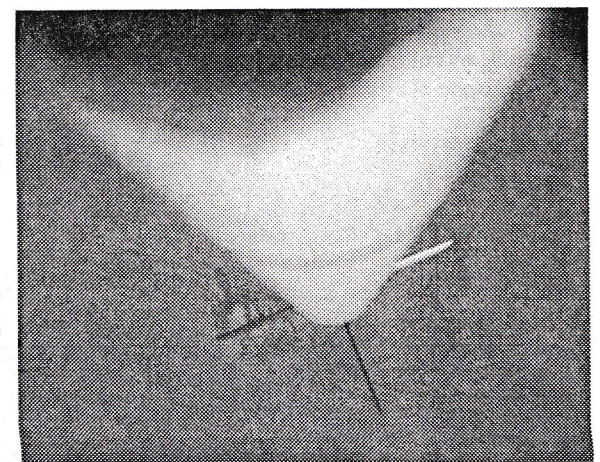
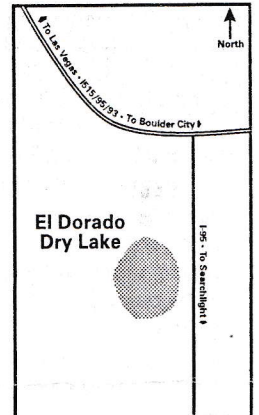
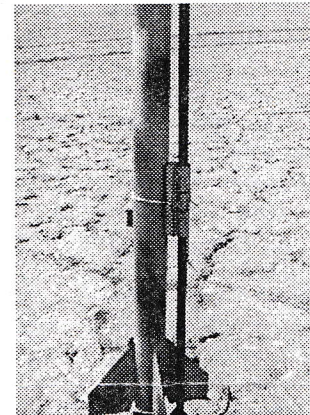
Launch Dates

April 20 El Dorado Dry Lake Bed
 May 18 Delamar Dry Lake Bed
 June 22 El Dorado Dry Lake Bed
 July 20 El Dorado Dry Lake Bed
 August 17 El Dorado Dry Lake Bed
 September 21 El Dorado Dry Lake Bed

Meeting Dates

Every Thursday prior to a launch date

Graphic Design Courtesy of
 Brent McNeely & Planet Design, 873-8222



left: Brent & the Orbiter; above: Ron's Fly-Away Lug; bottom: Steve's camera shot