

MEMBERSHIP
\$25.00 US
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The Crank Calls

Feb 2008

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<p>NEXT MEETING Feb 16, 2008 at Hiller Aviation Museum Doyle Room 601 Skyway Rd, San Carlos 94070 Doors open at 9 AM Meeting Starts at 10 AM</p>

<p>Upcoming Events</p>

MEETING NOTES

1-19-08

Carl Wilson

Way back in October of last year, well that's not really so long ago, we were singing the Boll Weevil Song: Looking for a Home!!! So let's sing another chorus, because we have lost our meeting place at the Hiller Aviation Museum. Our February meeting will be at the museum and that is the last time, and the March meeting will probably be back in Hayward. Details of that will be available at the next meeting. The future of Bay Area Engine Modelers depends upon having a regular meeting place that is convenient to most of the club members. Pat O'Connor suggests the Oakland – Hayward area as the best location. We may have to consider changing days and time to suit the availability of a building.

Our guest this month was Dwight Giles brother Zellnar.



We were supposed to have election of new officers for the forthcoming year. I'd be hard pressed to describe the scene as an election as there were no nominations or seconds. Fortunately there were some volunteers: Ken Hurst will be Treasurer; Don Jones (right) and Paul

Bennet (left) will jointly cover the functions of President and Tech Topics.



Lew Throop (left) received this plaque in honor of his nearly ten years service to the club as Treasurer.

We have advance notice of two events this year: The Aircraft Engine Historical Society will have its 2008 national convention in Sacramento July 9-12. More info at: <http://www.enginehistory.org/>.

The Good Guys car show will be August 22-24

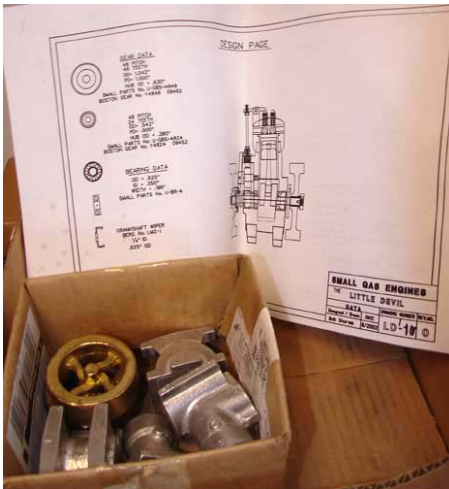
From Don Jones; as some may know I teach part time at Chabot College in Hayward, I have approached the Dean of the Machine Tool Technology group Tom Clark (my boss) about being able to hold our club meetings at the college. He has been very enthusiastic about the prospect and thinks it could be a win- win for Chabot and us, with space available on Saturdays and more exposure for the club (new members) and on their end a reason to promote the machine shop program. More at the next meeting.



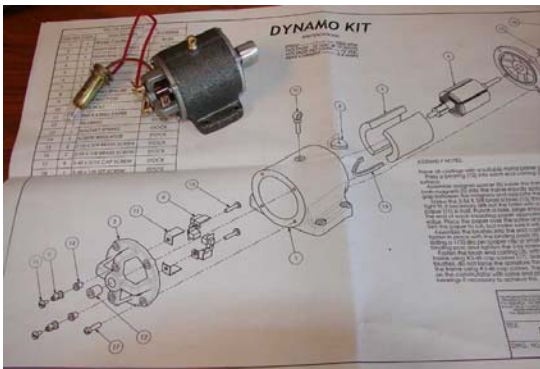
A free-lance water-cooled engine by Frank Kurtz. It features a single cylinder of 1" bore and a displacement of 18cc's. The timing shaft is parallel to bore, carries two cams that operate the valves via long pushrods and rocker arms. On the other side of the engine is a magneto from a bicycle engine that supplies the spark. Just visible at the rear is a DC motor that operates both as a starter and a dyno load.



Red Devil by Dwight Giles



A Little Devil casting kit – a Bob Shores design, and the drawings and patterns are owned by Bay Area Engine Modelers. Ken Hurst is selling the kits on behalf of the club for \$85. Be the first on your block to own one!



The Dyn-1 dynamo kit by PM Research

TECH TOPICS



Grant Saviers brought two of his one cylinder, no piston, continuous firing internal combustion engines. No carburetor, no cams or crankshafts, no valves: and lots of excitement: model rockets. Rocketry began in the 1930's with Robert Goddard in the United States; and Hans Oberth, Willy Ley, and Werner von Braun in Germany. Model rocketry began in the United States in the 1950's, and by 1960 rocket motors in several sizes were available from Estes Industries.

An excellent brief article on model rocketry is at:
http://en.wikipedia.org/wiki/Model_rocket.

There are four basic types of rocket motors:
Liquid: usually a fuel plus an oxidizer (bipropellant) (see below for monopropellant)
Solid: fuel, oxidizer, and a binder mixed and extruded or pressed into shape
Hybrid: solid fuel (rubber, plastic, or phenolic) plus a gaseous or liquid oxidizer
Exotic: Nuclear and ionic

Most model rocket motors use solid fuel.
Liquid motors can be subdivided into:
Monopropellant: a liquid fuel that reacts with a catalyst lining the combustion chamber
Bipropellant: fuel and oxidizer that are pumped into the combustion chamber and ignited
Hypergolic: a bipropellant that is self-igniting
Solid motors include:
Black powder: Estes hobby motors and others
Zinc dust and sulfur
Potassium nitrate and sugar or sorbitol
APCP: Ammonium perchlorate composite propellant, used in both hobby, military, and commercial rockets - safe, stable, easy to store
Nitrocellulose and nitroglycerine - not recommended for amateur use!

Propellants have a relatively low rate of burning (in the range of 5 inches per second) - in technical terms they deflagrate. They are also fairly hard to ignite.

Explosives have very high burn rates (in the range of thousands of feet per second) : they detonate. They require a detonator to initiate the explosion.

Solid fuel hobby rocket motors are simple: an aluminum tube closed at one end and a nozzle at the other. A wide range of power (thrust) is available in sizes ranging from 6 to 98 millimeters diameter. The motor also includes at the top of the main fuel a small black powder charge that deploys the recovery parachute.

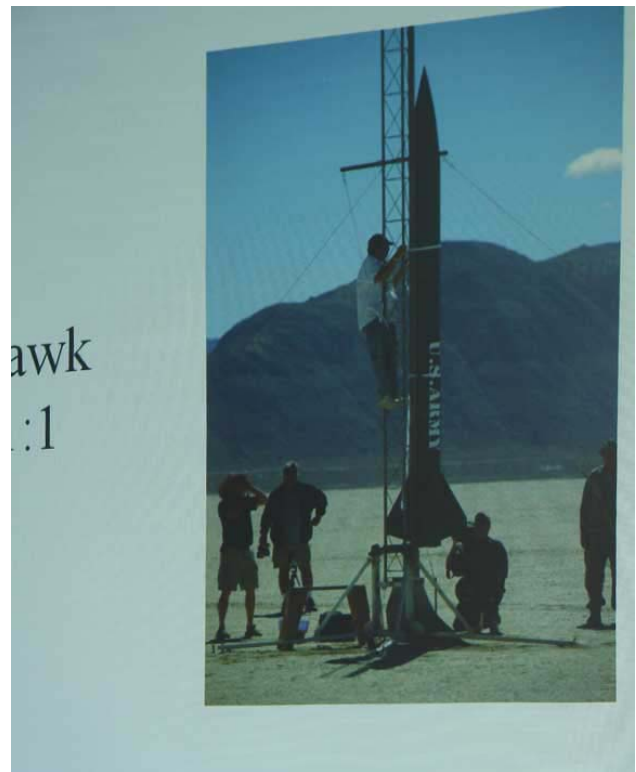
Details at:
http://en.wikipedia.org/wiki/Model_rocket_motor_classification

The hobby of model rocketry is loosely regulated at the low power levels, but the higher power rockets are regulated by both hobby organizations and the federal government, in particular the Federal Aviation Administration (FAA) and the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATFE.) Rocket flights that may impinge upon aviation airspace require FAA waivers of airspace which are issued for specific locations and dates.

California requires Pyrotechnician Class 3 licenses for high power rockets. In addition rockets must be aerodynamically stable, must be free-flight ^ no guidance equipment allowed, and no vertebrate animals may be launched.

There are a number of styles or purposes of model rockets:
Certification: Slow, low, and findable: intended to establish the qualifications of the hobbyist
Models of real rockets, V2, Saturn V, Mercury, etc.
Speed and altitude records for specific engines
Education: vehicles for student experiments

Fun and oddball rockets



WHOOSH – BOOM Thrills

- **Cato** – “catastrophic” - the motor blows up
- **Shred** – the airframe comes apart under acceleration; 800# thrust on a 20# rocket
- **Zipper** – the parachute line zippers the side of the airframe if deployment is too early or too late
- **Lawn dart** – “uncontrolled descent”; bring your pick and shovel.

Resources:

Organizations:

National Association of Rocketry:

<http://www.nar.com>

Tripoli: <http://www.tripoli.org>

LUNAR: Livermore unit of NAR:

<http://www.lunar.org> hobby rockets and local launches

AEROPAC: <http://www.aeropac.org> high power launches 3 times a year at Black Rock, NV

Rocket Mavericks: <http://www.rocketmavericks.com> very high power and experimental

Reaction Research Society: <http://www.rrs.org> LA area, liquid fuel and hybrid

Books:

Modern High Power Rocketry 2, Mark Canepa: basic introduction to high power rocketry

Rocket Boys, Homer Hickam, nice true story of his youth

Von Braun: Dreamer of Space, Engineer of War, Michael Neufeld

Rocket Propulsion Elements, George P. Sutton, 7th ed: classic introductory engineering text

Suppliers:

Estes: <http://www.estesrockets.com> hobby rockets

Discount Rocketry:

<http://www.discountrocketry.com> hobby to high power

Public Missiles: <http://www.publicmissiles.com> high power kits

Aerotech: <http://www.aerotech-rocketry.com> largest supplier of high power motor reloads

Simulation software:

Rocksim: <http://www.rocksim.com> predicts flight profile, most models and motors are in its database

Stuff for Sale