

THE SENTINEL

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Hot Rod Pheord: Learning to Use Reloadable Motors on the Low-and-Slow Principle

By Mike Sherrod

One of my goals for this summer's flying season is to make my Level 1 Certification flight. More on that later. But one of the first things I felt I needed to do was to familiarize myself with the use of reloadable composite engines.

I wanted to keep things as simple as possible, without the hassles of a high-altitude flight (and the subsequent long walk given the standard CMASS "breeze"), or the complexities of an altimeter-driven recovery system.

I chose to get an Aerotech 18/20 reloadable motor case (fits a standard 18mm motor mount), and use D reloads in my FlisKits Pheord X150, a flying saucer-type model rocket. I figured that this combination would give me some good practice with reloads, while keeping flights "low and slow".

First, I should say that I overbuilt my Pheord. When constructing the rocket, I a) gave the fins a coat of thin CA and a sanding before I applied the decals; b) attached the fins to the engine tube with CA; c) attached the shroud to the fins with CA; and d) reinforced all joints with epoxy fillets, including the attachment of the wire landing gear.

Safety Note: A Pheord built in the stock manner with white glue and with minimal reinforcement may shred at launch with a higher-powered, non-recommended motor.

I obtained the Aerotech 18/20 reloadable motor case and a set of 3 D13-7 reloads from Commonwealth Displays. I found that assembling the

motor was actually "easier done than read," since the instructions were complete, but rather confusing until I went into hands-on mode.

The real key here is to get organized and have everything you need on hand before getting started: the reload case, the reloads, a suitable type of grease to coat things with, and a good supply of wet-wipes and dry paper towels. A 1/2" wooden dowel was also handy to aid in cleaning the case after use—something like running a rag through a gun barrel, for those of you with firearms experience.

I did find it necessary to peel off an outer layer of the tube-liner to get it to fit into the reload case. Fortunately, this simple technique had been mentioned to me by an experienced high-power flyer when I first started asking the inevitable newbie questions. Otherwise I would still be cussing and trying to get the silly thing assembled.

I made my first test flight in the church parking lot next door. A C6-0 motor started things off for comparison. It was the usual, cool flight for a flying saucer type of rocket, with a bit of noise and a trail of white smoke to about 75 feet.

Then I put in the D13. A beautiful,

related paraphernalia.



My Pheord X150 - A bit battered at this point, but ready for action!

noisy, crackling composite motor flight to about 100 feet, and with a lovely black smoke trail. The wife and kids, who had come along to witness the test, were a bit taken aback by the extra noise and smoke. So was I.

Pheord..... Continued on Page 2



The Aerotech 18/20 reload case, the D13 reload, and related paraphernalia.

President's Corner

I'm happy to we've say made a lot of progress in the past few years in people volunteering for setting up and tearing down the range. Besides the regulars, a lot of different people have come up to help and it's enabled us to get the job done in record time without wearing out the people who have been doing this for many years. There are still areas where we could use some help.

Consider volunteering to do safety check. The job is not difficult. If you've flown rockets for any time at all you have an eye for what works and what doesn't and if you're in doubt there's always somebody nearby to back you up. Much of the job involves making sure the new flyers understand stability and good construction techniques and making sure the old flyers haven't done anything stupid.

Launch control officer is another job that's simpler than you might think it is. You can learn how to use our launch controller in five minutes and, as I've demonstrated at every launch, you don't have to say anything clever or pronounce everyone's name properly.

Hot dog chef and cashier are probably the easiest jobs we have but they're also the jobs nobody volunteers for. Hot dog sales are very important to our club, they're one of the reasons our dues are so low. And if none of these jobs appeal to you try writing an article for The Sentinel. Ed says I won't have to write as much if he gets more submissions.

Only a small fraction of our membership attends the meetings. While we do conduct some business and planning at the meetings, don't be under the impression that these are formal gatherings with minutes and things like that. The meetings are the perfect opportunity to show off your new design or get advice on that model you're working on. Sometimes everyone will be building and sometime we just sit and shoot the bull. You'll be at an advantage if you have a working knowledge of Monty Python. For some reason several of our regulars have all the dialogue memorized and will spontaneously quote from it causing me great confusion. ["If you think you got a nasty time this taunting, you ain't heard nothing yet."] But don't worry, it always comes back to rockets. If you want some input on how the club

is run, come to a meeting.

Field use fees is a hot topic. We continue to be fortunate in this area. We currently pay \$120 per day for Tewksbury, \$60 for Acton (it's really \$120 because we reserve Sunday as a rain day), and nothing for Amesbury. We've been able to cover this with dues, food sales, and generous donations from FlisKits of a percentage of their on-field sales. It is unlikely that Amesbury will be free forever and the Parks and Recreation committee has told us they're considering fees. Fortunately CMASS has enough in its treasury that, when the time comes, we can experiment until we find a way to raise funds that will be fair to everyone.

We're also always ready to consider a new launch site. Rotating between different locations gives more people an opportunity to fly and it keeps us from wearing out our welcome at the fields we use now. While another Woodsom Farm would be great,

Pheord.....Continued from Page 1

One of my neighbors popped out of his back back door and came out with the equivalent of "What in the heck was that?"

The only thing I could think to say was "Cool!", though I had to give a full explanation later.

I made my second flight of the Pheord X150 with a D13 reload at the June 25th CMASS launch in Tewksbury. It was another great, noisy, smoky flight which got some appreciative noises out of the otherwise tired and overheated crowd. Jim Flis was even heard to say, "That one must've had a Hemi!"

I missed the launch photo on both occasions—my electronic camera just doesn't seem to cooperate at critical moments. But otherwise, I got to learn a new rocketry skill, build and fly a cool kit, and get a few "Wow!"s out of a launch-day crowd. It doesn't get much better than that.

References:

Pheord X150:

www.fliskits.com

www.rocketreviews.com/reviews/kits/flis_pheord.html

Aerotech 18/20 RMS

www.aerotech-rocketry.com

www.commonwealth.net/rocketstore/home.html

Bill Spadafora, CMASS President

something smaller will work too. Personally, I enjoy the Tewksbury and Acton launches as much as Amesbury. If you know of a potential field, do some legwork. Find out who owns it and ask him if it's available. If you get any kind of a positive response, point him to our Web site or give him a copy of the Sentinel. We can provide safety and insurance information or whatever it takes to close the deal. Keep in mind that we're always only one bad flight from losing any of the fields we have now.

Finally, we're always open to new ideas. In the past we've had high power seminars, field trips, cookouts, and group purchases of motors and parachutes. If you've got an idea or, even better, if you have an idea and would like to work on it and make it happen, contact me or send it to the CMASS mailing list.



The hot-rod Pheord ready for takeoff. All it needs now is some chrome headers and pipes...

Dave's Hobbies N Others Attends its First CMASS Launch

By Dave Cuscuna, Proprietor

At the June CMASS launch, a beautiful day gave promise to an eventful day. We arrived and after meeting the CMASS staff and set up was completed, we enjoyed watching the rocket launches and meeting new members and nonmembers alike.

In between the selling and talking with potential customers, we had the opportunity to launch our own birds. My daughter Carolyn and I brought along a number of rockets to fly, for example, Estes Shuttle Express, Quest Super Cruiser, and the newest rocket of our product line, the Sunward Aerospace "Phoenix" and others. (By the way if anyone happens to find a Quest Super Cruiser at the Tewksbury site, please let me know, It's mine. In high winds the cruiser should be on a streamer not a parachute I learned.)

As the Phoenix was on its first launch, after giving it a stability test, we sent it up on an A8-3. The rocket flew well but take off was a little slow and altitude only about 100'.

On it's next flight I decide to skip the B6-4 flight and proceeded directly to a C6-3.

It was off the pad like a shot. Altitude was now approximately 300 to 400 ft. I was really pleased with the performance and it is a nice Skill Level 3 Model to build. This kit allows you to build it as either a B/C engine rocket or a D engine. Next one I build will be a D model.

Well, as I was telling most of the people I talked to that day, Dave's Hobbies N Others will make an attempt to be there at launches whenever other situations—like rain or previous commitments—don't prevent it. But if we can't make it on a particular launch, please feel free to go to our online store at www.daveshobbiesnothers.net and let us know what you want and we will be grateful to be able to service your modeling needs. We are continually looking for new and exciting products to bring on board for your Rocketry pleasure.

Thanks for visiting our store and Happy Flying.

Kitbashing OOP Estes Models

By Mike O'Malley

There are many terrific models available from manufacturers today, yet the old, out-of-production (OOP) models are wonderful and bring back fond memories of rocketry's early years. To build one of these OOP models, we have to bash an existing kit. To kitbash is to take pieces from several kits and create an entirely different item, also known as a bash, or bashing.

A local retailer, Michaels Arts and Crafts Store, sells a small number of Estes kits. It is intriguing to see how many OOP models could be crafted from these few kits. In addition, Michaels offers a 40-percent discount coupon on a regular basis. So, while the selection of kits is limited, Michaels can be an economical place to purchase kits.

One main component which makes a kit unique is the nose cone. Researching the few kits at the Michaels store turned in to a larger project than expected. With 19 models available at Michaels containing 11 unique nose cones, there are 134 possible OOP models which could be built. That's considering nose cones and body tube diameter only. A more accurate count should include body

tube lengths and the fin planform, but this breakdown hasn't been done yet. If needed, however, balsa stock can be found at Michaels, and extra body tubes and other components can be found at local vendors like FlisKits.

The Internet contains a wealth of information regarding rocketry. The JimZ Web site has old, OOP kit plans. Ye Olde Rocket Shoppe has a master cross-reference list of all Estes models grouped by nose cones. Finally, Ninfinger Productions has old Estes product catalogs listing kits and specifications.

Your kitbash possibilities are listed on the the next page. The 19 kits available at Michaels are italicized and in bold. The 134 OOP models follow, grouped by the unique nose cone. This list, as well as a more detailed kitbash list and a price list can be found on the Web at the following site:

www.cmass.org/member/Michael.OMalley/kitbash.htm

This kitbash list ought to motivate a few CMASS flyers to construct models that have not been seen on the flying field in many years. Enjoy!

References:

Estes Nose Cone & Kit List Reference, John Brohm, Ye Olde Rocket Shoppe
www.rocketshoppe.com/info/Estes_Nose_Cone_Reference_lg.pdf

Estes Expanded Rocket Kits 1961-2005, Ye Olde Rocket Shoppe
www.rocketshoppe.com/info/estes_expanded_kit_list.htm

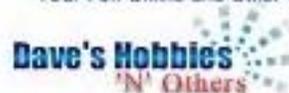
Ninfinger Productions, Estes Product Catalogs
www.ninfinger.org/~sven/rockets/rockets.html

Hobbylinc.com
www.hobbylinc.com

Michaels, The Arts and Crafts Store
www.michaels.com

JimZ Rocket Plans, Estes Industries Rocket Kit Plans
www.darz.org/jimz/estes.htm

Your Fun Online and Other Stuff!



Kitbashing OOP Estes Models

<u>Model</u>	<u>Kit No.</u>	<u>Model</u>	<u>Kit No.</u>	<u>Model</u>	<u>Kit No.</u>
PNC-5A		PNC-50BB		BNC-55AC	
<i>Gnome</i>	<i>886</i>	<i>No. 2 Sky Writer E2X</i>	<i>1260</i>	<i>Meteor Masher</i>	<i>2184</i>
<i>Quark</i>	<i>802</i>	Black Brant III	1293	ARCAS	1226
ARV Condor	2075	Black Hole Space Probe	1350	AIM-120 AMRAAM	2153
Fire Flash	2159	Satellite Interceptor	1296	Big Dawg	2151
Hawkeye	873	Stiletto	1323	Bullpup 12D	1972
Leprechaun	887	Wildfire	2154	Cherokee-D	1247
Mini Tri-Pak [SCRAM]	866	PNC-50V (like PNC-50BB)		Defender	1924
Mini Tri-Pak [Star Seeker]	866	Maverick	1904	Nike-X	1270
Mini Tri-Pak [Sting Ray]	866	Meteor	1370	Sky Raider	1290
Mini-Cobra	898	Starship Vega	1320	SM-3 Seahawk	2149
Nike-Apache	1957			Tartar	1360
Nike-Arrow	835	PNC-50YR		PNC-55IR	
Pulsar	870	<i>Gemini DC</i>	<i>2136</i>	<i>Shuttle Xpress E2X</i>	<i>2183</i>
Rainmaker	2009	<i>Guardian</i>	<i>2179</i>	Astrosat LSX	2133
Rattler-7	2150	America (gold plated nose)	2042	Greyhawk	2068
Searcher	1945	ARV Condor	2075	Interceptor II	1973
Skinny Mini	880	Athena (chrome plated nose)	2026		
Sparrow	872	Blackhawk	2053	PNC-56A	
Sprite	885	Cajun	2028	<i>Chrome Dome Gold SRS E2X</i>	<i>2181</i>
Surveyor	2046	Calypso	2006	<i>Cosmic Cobra E2X</i>	<i>1262</i>
Vector	871	Clipper	1979	Challenger II	1330
PNC-20A		Cougar	1923	Chrome Dome Silver E2X	2180
<i>Gemini DC</i>	<i>2136</i>	Dasher	1992	Helio Copter	1995
<i>Hi-Flier</i>	<i>2178</i>	Deep Space Transport	2034	Long Shot	2128
<i>Sizzler</i>	<i>2171</i>	Echostar	2176	Mach-12	2130
<i>Star Dart</i>	<i>2170</i>	Fireaero	1953	Maniac	2091
<i>Viking</i>	<i>1949</i>	Halley's Tail	1952	Sky Winder	2077
<i>Wizard</i>	<i>1292</i>	Hercules	1377		
Astro	1937	Hornet	2030	PNC-60AH	
Big Yank	868	IRIS	2007	<i>Blue Ninja E2X</i>	<i>1300</i>
Blazer	1956	Lancer	1993	<i>Screamin' Mimi</i>	<i>2185</i>
Blue Star	1991	Long Shot	1980	Army Hawk	2031
Courier	1911	Manta E2X	2097	Arrow	1983
Echo	1950	Menace	2041	Der Big Red Max	1977
Eclipse	846	Monarch	2172	Long John Silver	1778
Javelin	2005	Nova Payloader	1960	Maxi Icarus	1331
Laser	1938	Orbital Transport (re-release)	1259	Mean Machine	1295
Micron	876	Pegasus	2076	Omega	K-52P
Mini-Patriot	896	Polaris	2174	Omega	1200
Nebulon Warrior	1939	Scorpion	1333	Patriot	652
Ninja	882	Silver Streak (chrome plated nose)	2027	Patrol Cruiser Excalibur	1339
Orbital Transport	1259	Sizzler	1906	Red Max	651
Ram Jet	1994	Solar Probe	2051	Renegade	1271
Reliant	1986	Starbird	1954		
Solar Warrior	895	Super Neon	2050	PNC-60NA	
Stinger	2040	Supernova	2011	<i>Stormcaster</i>	<i>1301</i>
Sunbird	1936	Thunderhawk	2002	Bail Out!	2070
Tornado	2004	Transwing Super Glider	2112	D-Region Tomahawk	1944
Turbo Copter	2096	White Tiger	2055	Loadstar	1760
X-Ray E2X	834	Yellow Jacket	2008	Marauder	1922
Zinger	1917			Prowler	2156
Zipper	1991	PNC-1090		Scrambler: 2	1908
		<i>Wacky Wiggler E2X</i>	<i>2182</i>	Tomcat	2086
		Bandit	2060	Transtar Carrier	1982
		Banshee	2132	Warp II	2022
		Cork Screw	2114		
		Dagger	2062	PNC-80BB	
		Delta Clipper	2067	<i>Fat Boy</i>	<i>2139</i>
		MK-109 Sting Ray	2131	Broadsword	2093
		Rampage	2061	Super Big Bertha	2018
				Super Big Bertha (re-release)	2165

The 19 kits available at Michaels are italicized and in bold; following them are the OOP models that use the same nose cone.

Rants, Rambles and Rocket Science: Flight Failures and Safety

By Bob Krech

I told Ed I'd be willing to write a regular column for the Sentinel and have decided that the first one will be on flight failures and safety.

Over the past year there has been a lot of talk about flight failures and near-misses in the Model Rocketeer and on The Rocketry Forum (TRF), a Web site for rocket related discussions at www.rocketryforum.com. I decided to investigate and went looking for real failed-flight data and statistics. I came to the conclusion that no one has been collecting this type of data, or, at least, haven't made it available on the Web.

What recently caught my eye was a thread on safety in "The Coffee House" section of TRF entitled "An Open letter to Mark Bundick, NAR President", started by Silverleaf (aka RS Barker). In the course of this thread GL-P, a Canadian rocketeer, quoted an HPR Magazine article on failed flights that had a large enough sample size for a statistically valid analysis. He reported the following.

"According to the report in the 'Crash and Burn' issue of HPR magazine, the most common failures are *overall*:

No Problem: 93.33%

Motor: 2.49%

Recovery: 2.04%

Flight: 1.02%

Structural: 0.57%

Stability: 0.45%

Staging: 0.11%

From a total of 884 flights, of which 59 were considered failures.

For *HPR only*, it is:

No Problem: 83.64%

Motor: 7.28%

Recovery: 4.84%

Flight: 2.42%

Structural: 1.82%

From a total of 165 flights, with 27 failures

Seems motor and recovery failures are a bigger issue. Most of the motor failures come from EX I figure which is understandable. The next highest is recovery."

The modroc rates are in line with my undocumented recollections that at big CMASS launches it is not uncommon to have more than 10 motor failures of

all types on a good summer day with 400 flights. I replied to the thread with:

"I think I would agree with GL-P on the causes of flight failures: but since NAR does not allow EX, I would guess that more modroc failures are related to motor issues, and more HP failures are due to recovery issues.

Motor failures or recovery system failures are responsible for most of the flight failures I have witnessed. Motor failures can be attributed to CATOs, incorrect assembly, or ejection charge failures. Recovery failures can be attributed to motor ejection charge failures, inadequate parachute protection, incorrect delay selection, and incorrect use of electronic deployment systems.

At any launch, all rockets must undergo a hands-on inspection by the Range Safety Officer (RSO), who should know what is required for a safe flight. The safety check should include, at a minimum, a weight and balance check, a mechanical integrity check and a verification of the info on the flight card. The verification should include questions of thrust to weight ratio, ejection delay, altitude, and recovery system actuation if the RSO is not familiar with the rocket or the flier. This level of checking should eliminate the vast majority of unsafe flights.

Failed flights due to a motor failure are difficult to prevent, particularly at the modroc level unless MESS forms are filed with the NAR S&T. Last year only 44 forms were filed, far too few for statistical analysis and remediation.

Peer pressure is important for safety. In our club, the launch crew reviews the problems of the day after each launch, and if a flier has had a flight that is deemed unsafe, he is reminded of it at the next launch and his safety checks are more intensive. If a CATO occurs, the LCO requests that the flier fills out a MESS form; however, based on the statistics, I believe few do.

I think that a Failed Flight Report (FFR) should be filed for every

flight that fails, so that the NAR can collect statistics on the actual numbers and types of flight failures. In addition, NAR flight cards should have check boxes for the LCO to fill out if the motor fails or the recovery system fails. This would provide a cross-check on the number of MESS (motor failure) and FFRs that actually get filed. MESS and FFR cards should be available at the Safety check Table, and the Section, not the individual, should mail these forms to S&T after each sanctioned launch to insure that better statistics are obtained.

I would also like to see an annual section reporting requirement detailing the number of modroc, L1, L2 and L3 flights made during the year, and the number of MESSs and failed flights. This would go a long way to providing the necessary information to improve flight safety."

Another thread in The Coffee House section on TRF entitled "Unhappy Landings" was started by [teflonrocketry1](#) (aka Bruce S Levison) to discuss NAR President Bunny's article by the same name published in the June 2005 Model Rocketeer. In this thread, problems at our October 23, 2004 launch were highlighted in a rather unfavorable and inaccurate manner by a rocketeer named Vanel (aka Bill Cooke).

"I recently had lunch with a friend who has retired from a certain federal agency - much of our discussion naturally focused on rocketry. His opinion can be summarized as follows: Rocketry will not be doomed by the power of the motors used in HPR, but by the rocketeers who, in their zeal for more, continuously bend or break the rules. One example he threw at me was the increasing use of metal in rocketry, like the metal eyebolts used to attach nose cones and payload sections in large models. Instead of avoiding metal and other non-destructive materials, we are embracing them, enabled to do so by the increased power of our motors.

The second example he used really took me aback: He cited a post here on TRF from 'that Neil kid' about club launches where dozens of HPR rockets were landing near houses. 'If we were so safe,' he challenged, 'then why did the RSO not order pads to be reoriented or put a stop to launches where this might occur?'

When I got home, I did a search on the forum and located the thread; sure enough I found:

'My only serious concern is all the condos and houses scattered around the field's boundaries. We get at least twenty-five or fifty rockets landing outside the field, usually in the neighborhoods. And if a large rocket were to lawn-dart up there, which isn't impossible, it would be very dangerous...'

I was dumbfounded - These guys read TRF!

I have a real concern that our hobby may soon go away unless we start seriously emphasizing safety at all power classes. Folks pay attention to the words we speak, and we will get hung by those same words if we don't abide by them.

I go to launches to fly, and I would rather have an aggressive RSO who seems like a real pain-in-the-a** about safety than one who signs off on every bird that passes through. Sure, it is quite possible that I may have to choose another bird to fly if I can't prove that that scratch-built is safe. But at least I get to fly... and so do other rocketeers."

I felt I had to respond because unlike the impression in the thread, CMASS follows NAR Safety policies and has a good safety record and the RSOs and LCOs quickly addressed the issues and implemented changes to prevent future occurrences. I replied:

"The CMASS field in Amesbury is more than adequate for HPR activities and has sponsored national NAR events in the past. The nearest occupied buildings are more than 1500 feet from the HP launch pads in any direction, and has about 250 acres in the main

field and an additional 100 plus acres of fields and swamp. L1 flights are permitted to the waiver altitude of 4900 feet agl, and L2 flights (Js and certain Ks) are restricted to 3000 feet agl according to NAR HP safety rules. All rockets are safety checked and assigned pads, and the club LCO launches all rockets from a central 14 pad launch controller.

Occasionally a rocket on a chute may drift into the neighborhood north of the field, but this does not present a safety problem. That day was a bit windy and a few rockets under chute did drift into the northern neighborhood, but most ended up in the woods. Unfortunately on the day in question, a very experienced L2 flyer had 3 deployment problems, one being a late deployment at the northern limits of the field that ended up on a local power line, and another non-deployment which landed near the parking area.

What we had failed to see from the LCO area during the launch is that one of the HP pads had been readjusted and was angled to the north to compensate for the wind vs straight up. (The LCO area was north of the pad, so the northern tilt of the rod was not apparent.) It was corrected after the late recovery flight.

All the problem flights observed that day were discussed in detail after the launch by the LCOs and RSOs and procedures were implemented to insure that it would not happen again, and it has not. The individuals involved were spoken to as well. That's how a good safety system works.

Furthermore, at that launch we had an FAA flight controller observing our operations. The FAA was clearing a 6 mile diameter circle when we launched and it was making their job a bit difficult. We suggested that they could reduce it to 2 miles and after observing our procedures, they concurred, and commended us on our range operations which he thought was quite professional."

What have we learned from all of this? We're not perfect, but the CMASS

range crew is really concerned about safety. Range Safety is very important to us all, if for no other reason that we are financially responsible for any damages caused by our activities. You might think that NAR's insurance will take care of it, but you would be incorrect. NAR's insurance policy provides secondary coverage: the rocketeers own liability insurance pays out first. The details are online at: www.nar.org/insurancefaq.html In the case of an organized CMASS launch, the RSO, LCO and the club would likely be sued in addition to the owner of the rocket if a major incident occurred, so we all have a vested financial interest to keep our activities accident free.

From the above data, we see that 1 out of 15 modroc flights fail, and more importantly 1 in 7 HP flights fail. Our NAR minimum safe launch distances protect us very well from CATOs, but protections from other motor failures, such as failed staging or failed ejection charges, or recovery system failure requires that the trajectory of the rocket be directed away from the crowd and the parking area, so that if the recovery system fails to deploy, the rocket will impact in an unoccupied down range area. This means if it's windy, you simply don't fly a rocket that requires angling it over the crowd to have an infield recovery. This one simple detail—angling the launch rod straight up or, better yet, away from the crowd—reduces the probability of a serious incident enormously, and is even more critical in HPR where the kinetic energies are much higher. Let's endeavor to keep the pointy end up and going in the right direction.

*You don't have to rant
to contribute to
The Sentinel.
Just send an article to:
sentinel@cmass.org*

THE SENTINEL

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Please feel free to contact any or all of us with questions you have about CMASS, the NAR, or rocketry in Massachusetts.

CMASS Membership Form

Name _____ Birth Date _____
Street _____ Phone _____
City _____ State _____ Zip _____ Email _____

Membership type

NAR: Member number _____ HPR level: None 1 2 3

Associate: I agree to abide by the NAR Safety Codes when flying at CMASS launches.

Dues for twelve month's membership

\$4, 14 or younger

\$6, 15-17

\$8, 18 or older

Membership renewals are due either January 1st or July 1st, whichever is closest to the day you joined. Your membership expiration date is printed on the mailing label.

Make check payable to CMASS and mail with this form to:

CMASS, 248 Millbury Street, Auburn, MA 01501

CMASS Launches

2005 Proposed Launches

April 30	Amesbury
May 14	Tewksbury
June 25	Tewksbury
July 9	Amesbury
July 23	Amesbury
August 20	Acton
September 17	Tewksbury
October 10	Amesbury
October 22	Amesbury
November 5	Amesbury
November 19	Amesbury

Launch Day Schedule

9:30 setup range
10:30 launching starts
4:30 take down range

Amesbury: Woodsom Farm Park,
Amesbury, MA

Tewksbury: Livingston Street Park,
Tewksbury, MA

Acton: North Acton Recreation Center,
Acton, MA

Directions. Send email to:
secretary@cmass.org

Schedule Changes. Our schedule may change, for the latest information go to our Web site:
www.cmass.org

Weather Cancellation. *After* 8:00 AM on the day of the launch, if the weather looks questionable, call 781-231-1018 before heading to the site.

CMASS Club Meetings

Meeting Schedule

Aug 9, 23	Saugus
Sept 6, 20	Marlborough
Oct 4, 18	Saugus
Nov 1, 15	Marlborough
Dec 6, 20	Saugus

Meetings are held the first and third Tuesday of each month from 7:00-10:00 pm. The location alternates each month between:

☞ Bill Spadafora, 5 Granby Street, Saugus, MA 781-233-0339

☞ Doug Steinfeld, 72 Prendiville Way, Marlborough, MA 508-481-9337

Please call for directions or to confirm a meeting. Changes in date or location are sent to the meeting@cmass.org mailing list (email webmaster@cmass.org to be added).

Note: due to NARAM, August meetings are on the 2nd and 4th Tuesdays.

THE SENTINEL

Central Massachusetts Spacemodeling Society
248 Millbury Street
Auburn, MA 01501