



THE SENTINEL

1132 LAUNCHES IN ONE DAY

by Ed Pattison-Gordon



Photo by Len Fehskens

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Launching Quickly

The CMASS launch range is designed to help rocket launching proceed with minimal delay. Since the pads are placed 15 feet apart, a flyer can safely load one pad while rockets using "D" or smaller motors are being launched on neighboring pads. After a rocket is launched, a flyer has at least two minutes to reload the pad before the LCO will be ready to launch at that pad again (assuming all of the

other pads had rockets to launch). This is often enough time.

"At least two minutes" is derived as follows: at least two minutes = 140 seconds = 14 pads * 10 seconds where: 14 pads = 11 pads in the circle + 4 "away" pads - 1 pad being loaded; 10 seconds = the shortest amount of time in which one can safely launch a rocket (five seconds to scan the area plus a five second countdown).

Thus the maximum launch rate is six launches per minute and, with 15 pads, flyers have 140 seconds to reload a pad. There were periods of perhaps a minute

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The world record for the most model rocket launches in one day now stands at one thousand one hundred thirty two (yup, 1,132). That was the final tally for "The Grand Rocket Day", held Saturday May 19, 2001 from 8:00 am until 6:00 pm at Livingston Park in Tewksbury, Mass. The event was conceived and organized by Paul Manning and included a rocket building session during the morning. CMASS provided the launch equipment and ran the launch range.

The goal was to reach a thousand launches, which was achieved at 4:43 pm EDT, with the launch of CMASS member Peter Chestna's Estes Mercury-Atlas. But there were still rockets on the

pads and flyers waiting in line for safety check, so the launch continued and another 132 rockets were flown. Many of the flights were by kids with their families, launching their first rocket, which had been constructed during the build session, for the first time. The majority of the flights were with low-power engines, with a sprinkling of mid-power flights. High-power could not be flown due to the size of the field and the lack of a waiver.

Success depended on launching rockets quickly and having enough flyers to keep the pads loaded. How each was achieved is discussed in the sections that follow.

THE SENTINEL

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Membership in CMASS is open to all area NAR members (and non-NAR members). Dues are:

\$4/year	For ages 14 and under;
\$6/year	For ages 15-17;
\$8/year	For ages 18 and up

For others, newsletter subscriptions are \$8 for four issues. Check your mailing label for expiration. Make checks payable to CMASS.

All area modelers who agree to abide by the NAR Safety Codes are always welcome to sport fly at any of our launches.

NAR S&T TEST PHOTOS

by *Len Fehskens*



Test stand



Redline 'T' Impulse



A single-use 'T' motor

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Feel free to contact any or all of us (officers@cmass.org) with any questions you have about CMASS, the NAR, or rocketry in New England.

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MEETING GENE KRANZ

by *Steven Michaels*

I met Gene Kranz, a former NASA Flight Director at the Aviation Heritage Festival at Daniel Webster College on Sunday September 16, 2000. He was flight director during Apollo 11 and 13. I first heard about his arrival through the CMASS common e-mailings. This was the first such event at this college campus.

When I arrived at the festival people were streaming in, gathering around the historic static aircraft being displayed on the runway of the campus. Occasionally the B-17 would take off, do a flyover and then land again. It was a dramatic sight, a ghost from the historic past come to life. I met some fellow model rocket friends at the event. First I saw George Paschalides, who was a former fellow Goddard Society member. Goddard Society was a NAR chapter in Merrimack NH in the 1983-86 or so time frame. I then saw George Stamas, a science teacher from Lowell, with a friend of his. I had helped George stage some model rocket flight sessions for his science classes in Lowell years ago.

I then went to the Vagge Gymnasium building for the Inside Exhibits. Various organizations were exhibiting there, one was a book store which was selling copies of Gene Kranz's book "Failure Is Not An Option". Also there was an adult representative of the Civil Air Patrol, he was wearing the Civil Air Patrol uniform. His exhibit included some model rockets, and he mentioned CMASS during his discussion to some folks there. I made it a point to mention that I am a CMASS member, that we are very ac-

tive, and that we launch a variety of rockets.

2:30 PM was approaching, so with a copy of "Failure Is Not An Option"



Another CMASS member, Senior Advisor Ron Quattrochi, meets Gene Kranz at the book signing

tucked under my arm I started my way to the Collings Auditorium Building for the "Space Exploration : Apollo and Beyond" Speaker Session. It was one of several speaker programs at the festival, but the only one that I attended. The session featured Gene Kranz, and two astronauts, Michael "Rich" Clifford and Ken Reightler. The moderator for the discussion was Doug Joyce of Daniel Webster College.

As people were filing into the auditorium, I went up to the stage and asked Mr. Kranz to sign my copy of his book. He said yes, and then he said that I looked a lot like Dutch Von Ehrenfried,

some one he mentions in his book that now lives in Florida. Mr. Kranz said "I almost said 'Dutch is that you?'". He signed the book "To Steve, Aim High! Gene Kranz" How fitting a thing to write to a model rocketeer! He then gave me a bookmark that advertized his book and gave his website, which I had already visited prior to the aviation festival.

During the discussion, the two astronauts related their experiences in space, with some humorous anecdotes. Gene Kranz spoke of how the various milestones and accomplishments in space built up NASA's confidence to undertake the manned moon landing. Then each speaker gave his vision of what we need to do in space now to secure a progressive space program. This was followed by a question and answer period. One of the questions came from a school teacher. She asked how can she contact someone at NASA who can help her in her efforts to get more students involved. Each speaker provided her with a contact.

After the speakers were done I ran into yet another fellow Goddard Society member whose name I can not recall. Using each other's camera, he and I took turns taking each other's photo with Gene Kranz. After that I went to the Aviation Art Exhibit. It was then time to head home.

Mr. Kranz's remarks about the history of the space program reminded me of the glory days of the space age, the excitement of those days, and how as a result of all this model rocketry was very popular among teenage boys, such as myself. It was an inspiring time to grow up, having men as Mr. Kranz and company serving as role models to those of us who became engineers because of our interest in the technological accomplishments of that era. Our interests in the space program back then became our teen age interest in model rocketry which in turn became our on going careers in engineering today.♦

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SHUTTLE LAUNCH STS-102

by John Buscaglia

photos by Gary Miller



I have a confession to make. Model rocketry is not my only vice. I'm also a baseball addict. Every spring for the past several years, I've joined my teammates from Wisconsin, Gary and Fran Miller, on a trip south to escape the winter cold and to see some baseball. Most years we've gone to Arizona, but last year we found ourselves in Florida and decided to go back there this year. We had been trying for a couple of years to persuade Lila Schmaker from Launch Crue to join us, since she is also a baseball junkie. This year, she decided to come along. Also, my parents had planned a Florida trip to coincide with ours and they joined us for part of their time down there.

As we were in the planning phase, Lila

1. One of Lila's co-workers has a relative who works at the Kennedy Space Center and she managed to obtain VIP passes to the launch.

NASA threw a monkey wrench into our plans. We had all made plans to arrive in Florida on Wednesday, February 28 and had made reservations for the first couple of nights in a hotel in Melbourne, which is not too far from both KSC and Port St. Lucie, which is where Saturday's ballgame would be played. After that, we had rented a house in the Orlando area for a week. When the planned launch in February was delayed because of me-

fore. Wednesday morning we all piled into a minivan and headed to the Space Center.

The briefing gave us an overview of the mission and the crew. Discovery would be bringing up replacements for the crew of the International Space Station along with the Italian-made Leonardo Multipurpose Logistics Module. The Leonardo module was described as being like a moving van. It would be loaded with supplies and equipment. Once docked to the Space Station, it would be unloaded and then loaded with stuff to be brought back to Earth. It would then be undocked and returned to Earth aboard the Shuttle. It could also be used as work space, if necessary.

After the mission briefing, we were treated to a presentation on the various creatures that reside at the Kennedy Space Center. In addition to alligators and various birds, KSC is home to a large percentage of the manatees in Florida. The presenter went on to say that they don't know exactly how many manatees there are, because Palm Beach County is still counting its manatees. There is also an eagle's nest which they say is the size of a queen-size mattress.

Then it was time for the tour. They took us past the Vehicle Assembly Building and the Orbiter Processing Facility, where an unexpected treat awaited. Columbia, which had just returned to the Space Cen-

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“We have liftoff”: *Launch STS-102 is off to the stars*

chanical problems, our launch, STS-102, was pushed back a week to March 8 and liftoff was now scheduled for 6:42 AM.

discovered that the Mets (my favorite team) were playing the Dodgers (Lila's favorite team) on Saturday, March 3 and the Space Shuttle Discovery was scheduled to be launched on Thursday, March

There was one good thing that came out of the schedule change. The VIP passes included a special briefing and tour the day before the launch, which we would have missed if it had gone the week be-

BLAST OFF!—A HOBBY WITH HIGH ANXIETY

by Jennifer Carter

(Reprinted by permission of Wells Junior High Newspaper, Wells, Maine, February 2001, Volume 2, Number 1)

(During one of our launches last fall, Steve Boy graciously allowed Jennifer to tag along behind him, besieging him with questions for part of the afternoon. All this was while preparing the High Anxiety for launch. The results of Jenn's interview with Steve appear below and were printed as an article for her student newspaper. Thanks again to Steve for allowing Jennifer to interview him.—Jeff Carter)



Have you ever seen a 10 foot long, 8 inch diameter rocket that weighs 17 pounds with a six-foot parachute launched into the sky? Well here's the rocket that does it: *High Anxiety*.

High Anxiety is operated by three people, Nikita Piankov (a Harvard student), Paul Askins, and the owner of the rocket, Stephen Boy. Steve has been flying rockets since he was 11. After a time away from flying rockets Steve is back, and he has been flying model rockets for the last 15 years.

The *High Anxiety* uses J's and K's (engines). The builders made the rocket so it can use three engines. Our field is too small, so for that they go to Cherryfield, Maine, 260 miles away. For Nikita, Paul and Steve this is a five and a half hour trip. Just so you know, with a J-340 engine, the engine will heat up to about 2000 degrees Fahrenheit!

The recovery system is electronic. A controller tells the rocket when to launch the parachute. Once the parachute is out the rocket starts to beep so you can find it, should the rocket land out of sight. The recovery starts to work when the motor burns

out. The rocket keeps moving, then the black powder blows the rocket's top (nose cone) off: like gun powder.

The flight of *High Anxiety* is usually 2.3 seconds long. It can be longer, sometimes the flight is over 10 seconds with high enough engines. During the flight the owner is very nervous and worried. Rockets and engines this size are very expensive.

The *High Anxiety* uses a C-rail made of aluminum. This rail was modified for the *High Anxiety*. This rail weighs a lot.

The *High Anxiety* took a [great deal of time] to build. To fly, or even buy, the engines for this rocket, you must have level two certification.

Why do these people do this, if it takes so much time and money? Easy! It is fun, they like it, it's their hobby! So, if you're interested, go to a local hobby shop and try to build your own rocket.♦

Weare Middle School Students Learn Science with Rocketry

CMASS member science teacher Mark Kibler has been teaching the scientific process to his Weare, New Hampshire eighth graders, using model rocketry as his guide.

Last summer Mark attended NASA's space camp at the Kennedy Space Center and a rocket-building seminar during school break. He decided to bring back to the classroom what he learned that summer, and see if he could get his students hooked on the science of rocketry. By all accounts, he's succeeded.

His students first pose a hypothesis about the flight behavior of their rocket designs, and then using software simulation, test those hypotheses. Once they can prove that their pre-flight calculations and designs are correct and stable, they then build their rockets and test fly them. Some even have payloads of electronic data gathering devices that check flight parameters against the software simulations.

Mark and his group traveled from New Hampshire to Tewksbury for "Grand Rocket Day" (see front page) to test their designs and to contribute their flights to the record-setting event.♦

FIN REPAIR ON HIGH POWER ROCKETS

by Peter Luthi

Over the years that I have been building and flying high power rockets, I have unwillingly gained considerable experience in the art of repairing rockets. One of the most common repairs I have had to make is the replacement of a broken plywood fin in through-the-wall-to-the-motor-mount (TTW/MM) construction. I have discovered several repair techniques in this area which do not work at all. I won't bore you with these failed approaches, but I will describe one technique that I have found which produces acceptable results. This approach is flavored considerably by the tools I have available and by my preferred construction methods.

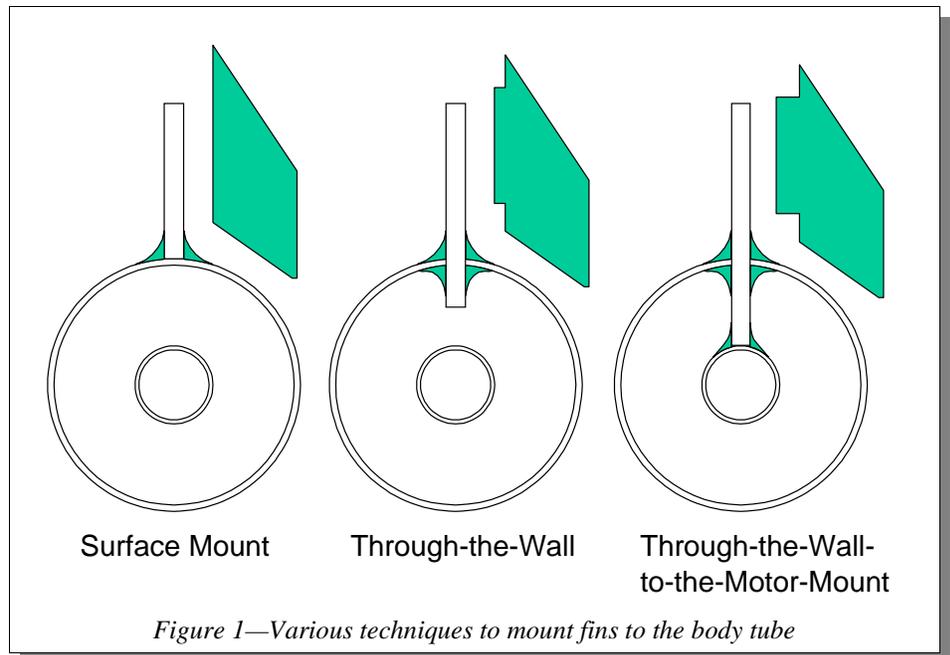
Fin Attachment Techniques

As background material, I'll review the different ways to mount fins to a body tube. The simplest approach is surface mount. This is the technique used on most model rockets, such as most Estes rockets. It is a relatively easy approach where the edge of the fin is glued perpendicular to the body tube and fillets (a line of glue) is placed along the root edge at the joint between the fin and the body tube. This technique is most commonly used on model rockets in the A through D range and is often employed in midpowered rockets in the E through G range. Getting the fin straight both radially (perpendicular to the body tube) and axially (lined up straight with the length of the tube) can be a challenge, especially for first time rocket builders. If a fin like this breaks, the repair is simple: the remainder of the fin is cut off, the body is sanded smooth, a replacement fins is glued on and the rocket is repainted.

The problem with this approach is that it

generally cannot withstand the forces of mid- and high-power flights. The forces of a hard landing of a heavy rocket, or even the drag forces of high velocity flight, can cause the body tube to

mount tube). A slot is cut in the body tube. The width of the slot is made to match the thickness of the fin. A tab is added to the root edge of the fin to fit into the slot. The fin tab usually does not include the entire root edge of the fin; the fin is surface mounted on a por-



delaminate and the fin and fillets rip free from the body tube. To strengthen the fin/body tube joint, through-the-wall (TTW) construction is used when the

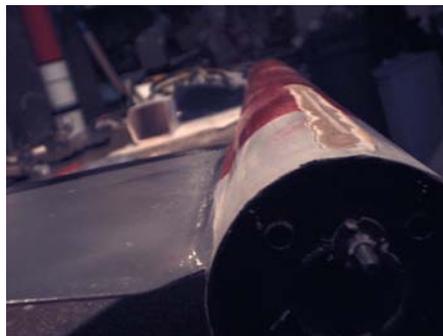


Figure 2—Broken fin is cut off and sanded to the surface of the body tube

rocket is not a minimum diameter rocket (a rocket where the motor just fits inside the body tube without using a motor

tion of the root edge at both ends. This controls the depth to which the fin is inserted into the body tube and give the fin a better finished appearance. The through-the-wall construction technique allows fillets to be added to the root edge of the fin inside the body tube as well as outside of the tube. The fin cannot come loose from the rocket through delimitation of the body tube because the inside fillet is pressing against the entire thickness of the tube, not just its surface. This technique has the added benefit of making axial alignment of the fin easier. As long as the slot is cut straight, you don't have to worry about axial alignment when you are gluing the fin, you just have to worry about radial alignment making the process much simpler.

If you are going to go through the trou-
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Fin Repair

(Continued from page 6)

able of cutting a slot in the body tube to mount the fins, the technique I prefer is

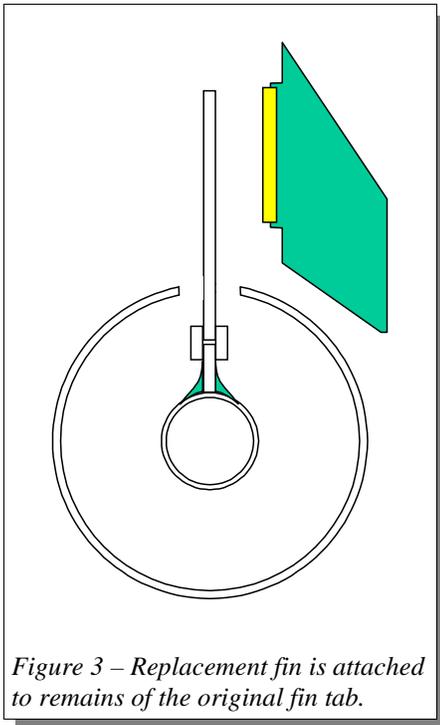


Figure 3 – Replacement fin is attached to remains of the original fin tab.

through-the-wall-to-the-motor-mount (TTW/MM) construction. The difference in this technique is to make the fin tab long enough to reach the motor mount tube. This permits additional fillets to be used to mount the fin to the motor mount. The advantage of this technique is that it does not depend on the stiffness of the body tube to control fin fluttering. At high velocity (especially when approaching Mach) there is a tendency for fins to flutter back and forth. While this can add an interesting buzzing sound to your flight, it doesn't do much for the reliability of the rocket.

Repair Technique

Every time I've launched my two stage Terrier Sandhawk, I gained some experience in rocket repairs. The last time I launched it resulted in the total loss of the

booster (parachute failed to deploy) and a broken fin on the sustainer (drogue deployed, but something went wrong with the main chute deployment). The sustainer is a 3" diameter body tube with a 29mm motor mount. One fin hit the ground hard and cracked.

The first thing to do is to cut off the fin as close to the body tube as possible. I used a saber saw to do this, but almost any cutting tool would do this job. To eliminate the outside fillet, I used a belt sander to grind down the fin and fillet down to the level of the body tube. From that point, I used a router to cut the remaining fin tab below the surface of the body tube. I used a router bit that is at least three times the thickness of the fin. I routed out the slot to a depth equal to half the distance from the motor mount to the body tube.

The replacement fin has the same shape as the original fin (of course)



Figure 4 – Fin slot opened up using a router

except that the tab is only half as long as the original. This allows the re-

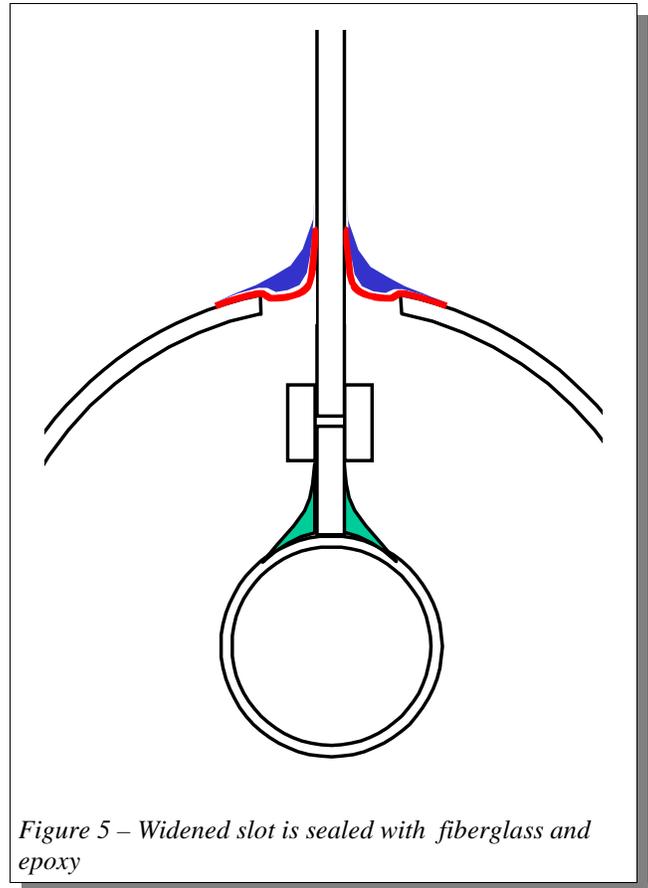


Figure 5 – Widened slot is sealed with fiberglass and epoxy

placement fin to seat on the surface of the body tube and also touch the remains of the old fin tab. I also cut out a pair of strips of wood from the same plywood material about half an inch wide and about the same length as the fin tab. I used these two strips to attach the new fin to the old fin tab. This is epoxied into place (see figure 5).

In the past, I have tried removing the entire fin using a router, but my router couldn't cut deep enough for that. In addition, the epoxy at the base of the fin tab is not the nice neat fillet shown in the figures, but more like a random pool of epoxy around the body tube. I found it very difficult to get a clear surface on the body tube. Leaving a portion of the old fin tab has proved to be a simpler and you to get a solid base to

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ON THE WIND

Club News, National News, and Galactic Rumors

Talking Rockets—CMASS to Bid as NARCON 2002

Host

A group of CMASS members has decided to step forward and volunteer to host next year's NAR Convention (NARCON). It turns out not to be as simple as raising your hand. The NAR Board of Directors (BOD) requires that sections wishing to host an event submit a proposal and a budget. The BOD's selections are then based on the proposals that they receive.

CMASS has two unique attractions to offer NARCON attendees: Robert H. Goddard and the NAR Standards and Testing Committee (S&T), which happens to be composed entirely of CMASS members. For the Goddard tie-in, we propose to hold the event over the weekend of the anniversary of Goddard's first successful flight of a liquid-fueled rocket, March 15-17, at the place that Goddard taught, Clark University, which has offered to open its Goddard Exhibition Room in the Robert H. Goddard Library for the convention. While making these arrangements, CMASS member Peter Chestna learned that the library's archivist loves to give presentations about Goddard and signed him up, giving us a start on putting together a roster of speakers for

the convention. Also on that roster will be a presentation by S&T, featuring their motor testing machine. We are hoping to arrange for a live demonstration.

Volunteers are welcome. If you would like to help with the convention, please contact president Bill Spadafora (billspad@mediaone.net) or committee chair Ed Pattison-Gordon (epgordon@bbn.com).

TOO AWFUL

CMASS will hold the TOO AWFUL (The Only Other Amesbury Woodsom Farm Unnamed Local) contest during the September 29 launch. Events will be 1/4A parachute duration, B streamer duration, and C eggloft duration.

Kevin Cuomo Earns Level 3 Certification

CMASS member Kevin Cuomo finalized some big plans this summer. He achieved a Level 3 certification flight on an M1315 motor at the NYPOWER event in Geneseo, NY on July 6-8. Read more about it at: http://www.cmass.org/member/Kevin.Cuomo/level_3

New Releases from Estes

Estes recently announced the return of

black powder "E" motors, three kits especially designed for them, along with a launch pad and controller as well.

The E9 motor comes in three delay lengths, 4, 6, and 8, has a total impulse of 28.62 N/sec with a thrust duration of 2.8 seconds. The maximum recommended lift-off weight for these motors is 15 oz with a peak thrust of 25.04 N, averaging 10.59 N during the life of its burn. The diameter of the motor is 24mm (same as the D motors) with a length of 95mm (6mm longer than the now discontinued Estes E15 motors).

The three rockets introduced are the Eliminator, the Executioner, and the V-2. There's no new additional information on the launch pad and controller.

Along with these new product announcements, Estes also announced the return of the D12-7 and D11-P motors, as well as the introduction of an A10-PT motor (plugged). That latter motor should make for some interesting scale displays.

Finally, in a letter from Barry Tunick, President of Estes Industries to a CMASS club member, the following information is hinted: "...no..." to a re-release of "F" or "G" motors; a confirmation that the D12-0 will continue to be produced; and in a reference to a higher thrusting "B" or "C" motor, "...we will do C11 - soon". C11!? That should make an interesting replacement for the now OOP C5 motor!♦

Fin Repair

(Continued from page 7)

which to mount the new fin.

To seal the now much-to-wide slot, I used a couple of fiberglass strips. The fiberglass covers the slot, overlaps the body tube and runs up the fin for about half an inch. This is done on both sides of the fin. An epoxy fillet is added over the fiberglass and some epoxy is placed under the fiberglass to form a bit of an interior

fillet.

The fillets are sanded smooth. The rocket is taped off to expose only the area around the new fin. I used sandpaper to rough up the old paint job to ensure that the new paint will adhere. I primed, sanded and re-painted the new fin and surrounding area to match the old paint job. It is now difficult to tell which fin was replaced. As far as I can tell, the new fin is as strong as the original one.

I'm not sure that this is the absolute best approach to fixing a broken fin on a high power rocket, but it wasn't all that difficult and gave very good results. As I mentioned, the technique described was developed partially because I have a belt sander and a router. I suppose I'll continue to improve my skills and techniques in fin repair as I prang more rockets.♦

Grand Rocket Day

(Continued from page 1)

or two during the day when this rate was achieved, but there were several sources of delay that led to an achieved rate of just under two launches per minute (1.88). Delays were caused by: ignition failure, holding the launch for over flying aircraft, holding the launch during wind gusts, the need to clear neighboring pads for mid-power launches, and empty pads. Although launch times were noted for only a few rockets, Table 1 gives some indication of how the launch tally progressed over the course of the day.

Keeping the Pads Loaded

The second major factor contributing to the launch's success was avoiding empty pads. Although some pads were left waiting for flyers at the very beginning and at the very end of the day, usually there was a waiting line. Credit for that line has to go to Paul Manning. Paul not only publicized the event, but came up with ways to encourage participation.

Grand Rocket Day benefited from the enormous success of an event that Paul organized last year. Space Day was held on August 12, 2000, at the same location and included not only a build session and rocket launch (also run by CMASS), but parachutists, helicopters, a flyover of vintage aircraft, a screening of the movie "October Sky", and speeches by astronaut Henry "Hank" Hartsfield Jr. and others. Consequently, when Paul proposed a one thousand rocket launch, people believed him and showed up. The town of Weare, New Hampshire even sent a school bus load of students from one of their science classes. Leading up to the Grand Rocket Day, Paul and his wife taught rocket construction to the fourth grade at Tewksbury's Traban School. By the day of the launch, these students were ready to go with a



Group picture around the 1000th flight

photo by Keith Young

rocket of their own.

Paul also organized a building session at the John W. Wynn Middle School cafeteria for the day of the launch, where he had 350 Estes Generic E2X kits for sale, with a B6-4 motor included. More B6-4s for subsequent flights were available for purchase at the field.

Notices about the launch and building session were sent home with Tewksbury students. The announcement, kits, and on-site motors encouraged hundreds of kids to build, fly, and fly again. The number of kids who took advantage of the kit and motors are reflected in Table 2, which totals the different types of motors used, and Table 3, which lists the 10 most frequently flown rockets. Both B6-4s and Grand Rocket Day kits are by far the most numerous.



Omega liftoff

photo by Len Fehskens

Grand Rocket Day

(Continued from page 9)

Lainhart, Tony Vincent, Steve Setzer with Nick and Ben, and Robert Klinkhammer. Appropriately, the range was

turns serving as Launch Control Officer. They were the first to use the club's new wireless mike, which went through two sets of batteries and was ready for a third at day's end.

Time of Day	Flight Number	Rocketeer	Kit	Motor
8:00am	1	Ben Setzer	GRD Kit	B6-4
	2	Nick Setzer	Naboo Star Fighter	C6-3
	100	Shea Alterio	Fat Boy	B6-4
	200	Ankur Kanjia	GRD Kit	B6-4
	300	Tommy Joyce	US ARMY	A8-3
	400	Dave Giasullo	Walmart	B6-4
1:00 pm	500	Sawn Leonard	?	??
	501	Ashley Toland	GRD Kit	B6-4
	600	Joe Blanco	?	C6-3
	700	Sean	GRD Kit	B6-4
3:00 pm	900	Eddie Bromander	GRD Kit	B6-4
4:43 pm	1000	Pete Chestna	Mercury Atlas	D12-3
	1001	Dr. Eben Alexander	Ionizer	B6-4
6:00 pm	1131	Jonathan Blackwood	US Flyer	B6-4
	1132	Joseph Villeneuve	GRD Kit	B6-4

Table 1: Selected Flights

Demonstrating CMASS's contribution to kitchen utensils, the hot dog spear screw driver, were hot dog chefs Kathie and Steve Setzer.

Those who stayed until 7:00 pm to help take down the range were Don Castle, Peter Chestna, John LoVerso, Ed Pattison-Gordon, Ron Quattrochi, and Bill Spadafora. As the crowds dispersed and the range equipment was packed away, a couple of golfers appeared to hit a few in the gathering twilight.

Further Information

<http://www.cmass.org> - links to photographs of Grand Rocket Day

<http://www.cmass.org/member/Ron.Quattrochi/grd1132.pdf> - listing of flight cards

Motor Type	Total
1/2A	13
A	119
B	677
C	200
D	57
E	8
F	5
G	11
Not Indicated	47

Table 2: Motors Used

Acknowledgements

The Town of Tewksbury waived all fees for the event. The Department of Public Works provided trash service and the Police Department provided officers for traffic control.

Arriving at 7:00 am to set up the range were President Bill Spadafora, pulling the club trailer, Peter Chestna, Todd

set up next to one of three signs that the town erected several years ago that read, "Reserved for Golf and Model Rocketry."

Because of the relatively large number of first timers, CMASS provided help with both preparing rockets for flight and with installing rockets on the pads. Prep assistants, and the first line of defense against rockets with wet glue, were Eric Johansson and John LoVerso. Pad assistants also were numerous, with conspicuous appearances by Jim Baker, Jillian Castle, Todd Lainhart, Ed Pattison-Gordon, and Emma and Evan Ross.

Taking turns as Safety Check Officer, and the second line of defense against rockets with wet glue, were John LoVerso, Evan Ross with his daughter Emma, Doug Steinfeld, Tony Vincent, Peter Chestna, and William "Bill" Spadafora.

Ron Quattrochi and Peter Chestna took

Kit Name	Number of Flights
GRD Kit	384
Estes "Tidal Wave"	26
Estes "Astrocam"	25
Estes "Code Red"	24
Estes "Flash"	16
Holverson Designs "Wicked Winnie"	16
Estes "R2-D2"	15
Estes "Skywinder"	14
Estes "Heatseeker"	12
Estes "Recon"	11

Table 3: Most Frequently Flown Kits

<http://www.spacemanning.com> - Paul Manning's Web site ♦

Shuttle Launch

(Continued from page 4)

ter the previous day, was parked outside.

Our first stop was Launch Complex 39A, which was vacant. The tour guide confiscated all matches and cigarette lighters before we went "inside the perimeter". She pointed out the various features of the tower and explained their workings. Of note was the tank containing 300,000 gallons of water which is dumped onto the launch pad prior to main engine start to act as a sound deadener.

We headed over to Launch Complex 39B, where Discovery sat poised for launch, but were turned away. Apparently, there were already too many tour busses there. We felt a little disappointed, but that faded when the driver took our bus to a parking area that was very close to the pad and we were allowed to get off the bus and take pictures.

We were told to arrive no later than 5:30 AM the following morning, so at 2:45,

fueled almost entirely by adrenaline, we left Orlando. We arrived a little after 4:00 and boarded a bus to the viewing site. The viewing site was next to the Saturn V exhibit, which was open, so we killed some time in there until we staked out our spot in the bleachers. Everything was going smoothly. The only concern was the temperature. A cold front had moved through the area a couple of days earlier and there was concern that the temperature might drop below the 40 degree mark, at which point the launch would be scrubbed. It got as low as 44, but that was acceptable.

Just as the first rays of sunlight were peeking over the eastern horizon, Discovery launched, right on schedule. The main engines threw out great clouds of water vapor as the Shuttle sat on the pad building thrust. When the solid boosters kicked in, Discovery jumped off the pad. A cheer went up as the announcer reported that Discovery had cleared the tower. Even from more than three miles away, the staccato roar of the engines was

impressive. Soon, all that was visible to the naked eye was a bright orange dot against the clear blue sky. Another cheer

went up when the SRBs separated and again at main engine cut-off. Before we were back on the bus, Discovery was in orbit.

The Visitor's Center was open, so we spent some time in the rocket garden and the Early Space exhibit. Then, exhausted and exhilarated, we headed back to Orlando for breakfast and some much needed sleep.♦



**Confused?
Amused?
Or just owe dues?**

If you'd like to know more about sport rocketry, and want to participate in our regular launches, join CMASS!

If you enjoyed reading this newsletter and would like to receive it as it's published, join CMASS!

If your mailing label says your dues are due, do your duty today with the handy form below!

Wow! I'm psyched! I want to join CMASS!

Name: _____ Date of Birth: _____
 Street: _____ Age: _____
 City: _____ State: ____ Zip Code : _____ Phone: (____) _____
 Internet Address, if any: _____ Work: (____) _____

- I am a NAR member (Number: _____) HPR Certification Level: None; H/I; J/K/L
- I am not a NAR member and wish Associate status.

CMASS dues cover twelve months and are due January 1 or July 1. Check according to your age:

- 14 or younger: \$4
- 15-17: \$6
- 18 or older: \$8

Make checks payable to CMASS. Send to CMASS, 72 Prendiville Way, Marlboro, MA 01752

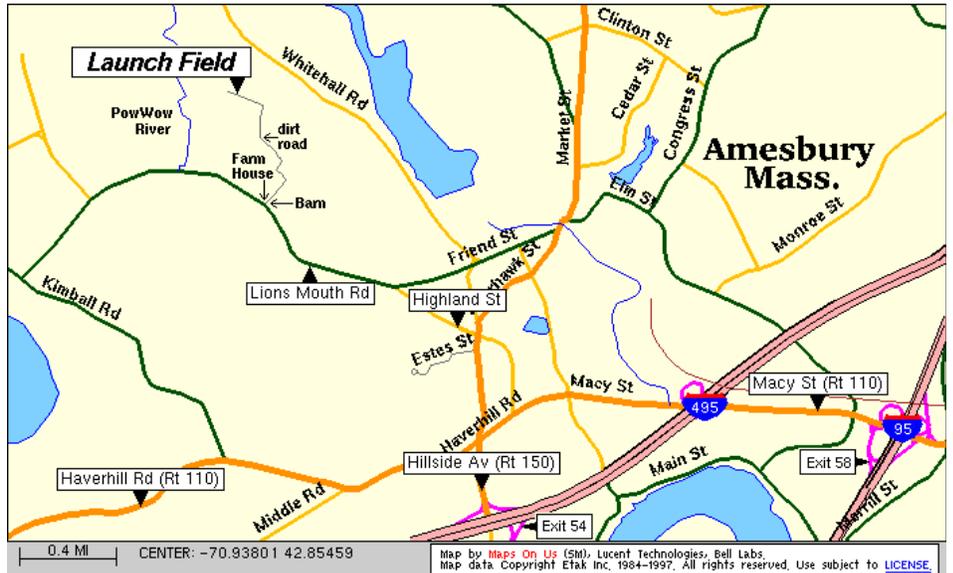
COUNTDOWN CALENDAR

Visit <http://www.cmass.org> for the latest information

Scheduled Launches Launches at Woodsom Farm Park in Amesbury MA have a 9:00am setup and a 10:00am start. Saturday launches may be postponed to Sunday in case of inclement weather. If the weather looks questionable, on the day of the launch, call **781.231.1018** before heading out to the field. **PLEASE DRIVE SLOWLY ON ALL ACCESS ROADS TO THE FIELD!**

ALL DATES ARE TENTATIVE, PENDING APPROVAL!

- July 28: Sport launch, Amesbury, MA
- August 18: Sport launch, Amesbury, MA
- September 15: Sport launch, w/ Frontier Rocketry, Halifax, MA
- September 29: Sport launch, Amesbury, MA
- October 20: Sport launch, Amesbury, MA
- November 3: Sport launch, Amesbury, MA



1st and 3rd Tuesday of Each Month

CMASS Meetings and Building Sessions
7:00-10:00pm. Meetings alternate between Bill Spadafora's and Doug Steinfeld's houses.
Visit <http://www.cmass.org> or call **508.481.9331** for the latest information.



The Sentinel

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