

Team 18-4053

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Who are we?

We are Team 4053 of Explorer Post 1010,
a group of high school students with interests
in computers, robotics, rockets and engineering.

Joe Camobreco
Abhinav Yedla
Aneesh Bellam
Bhavesh Kemburu

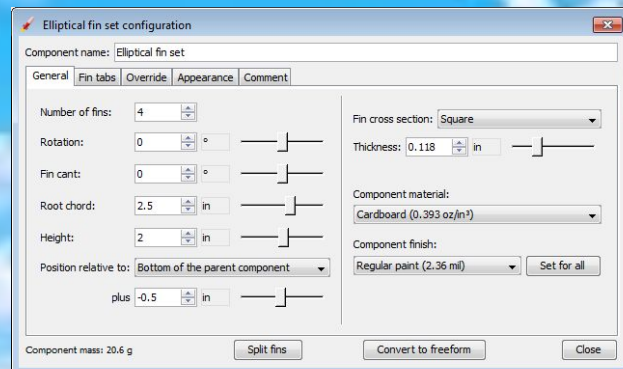
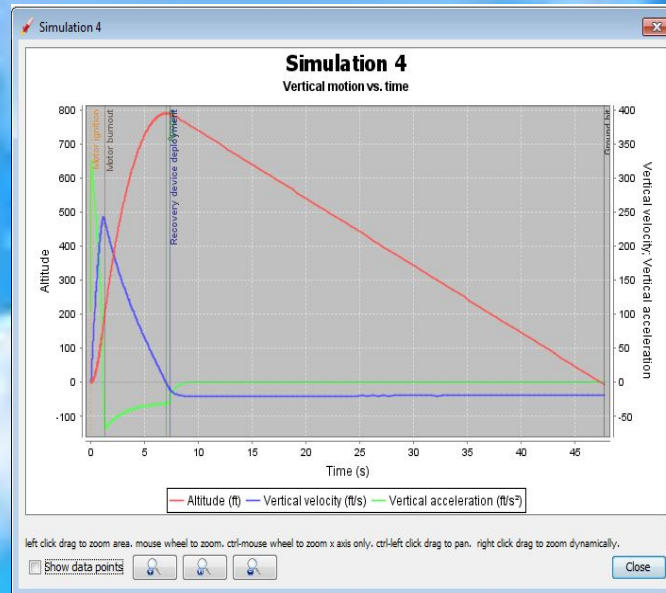
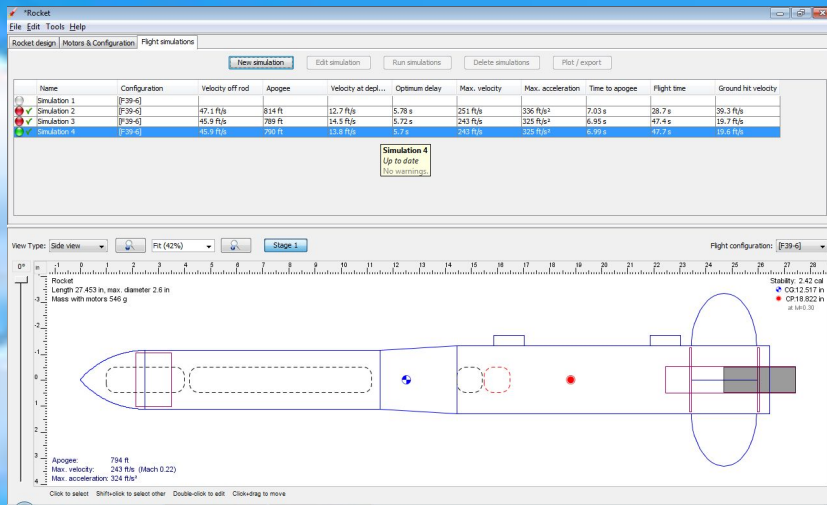


Rocket Design

- Use Open Rocket for designing and simulation
- Print out the fin design from Open Rocket to create the perfect fins
- Build the rocket
- Testing the parachutes by doing test drops
- Testing the Rocket and then modify anything that broke during testing or changing of parts



OpenRocket



How was the rocket built

- Body Tube (BT-80/BT-70)
- Motor (Aerotech F39-6T)
- Dimensions of Rocket (at least 25.6" long)
- Altimeter (PerfectFlite PNUT)
- Single Parachute (24"-X)
- Scissors, Wood Glue, Masking Tape, Balsa Wood, Cardboard, Plastic, Shock cord, screws



Our Plan this Season

- Introduce new members to TARC
 - Go over TARC 2018 Rules
 - Guide to OpenRocket
 - How to: use tools, build rocket, assemble motors
 - Go over how to launch rocket
- Collaboratively design a rocket
 - Compatible with this year's rules
 - Using OpenRocket
- Fly early, fly often
 - Starting in November, fly once a month,
 - In February and March fly every other week
 - Plan to fly three times at each launch
 - Hopefully at least two members will go out at every launch



Teamwork

- All-nighter at ShadowLand, weekly meetings, practice launches at Walkersville Maryland, and Great Meadow Virginia
- Going to engineering events in our area including the Science and Engineering Festival at the Washington Convention Center
- Everyone had something to build on the rocket as well. Each team member was assigned to build a specific part of the rocket so everyone was involved.

Joe - Motors

Aneesh - Built Second Rocket

Bhavesh - Body section from

Abhinav - Booster and Fins

Testing Process

- Research location and time for launch site, taking into account weather (wind speed, precipitation, air pressure)
- Before launch
 - Assembled motors
 - Load motor, eggs, and altimeter
- At launch site
 - Fold chute, load chute
 - Insert igniter with masking tape

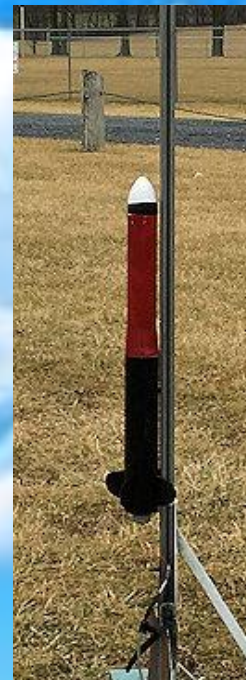


Test Launches & Data

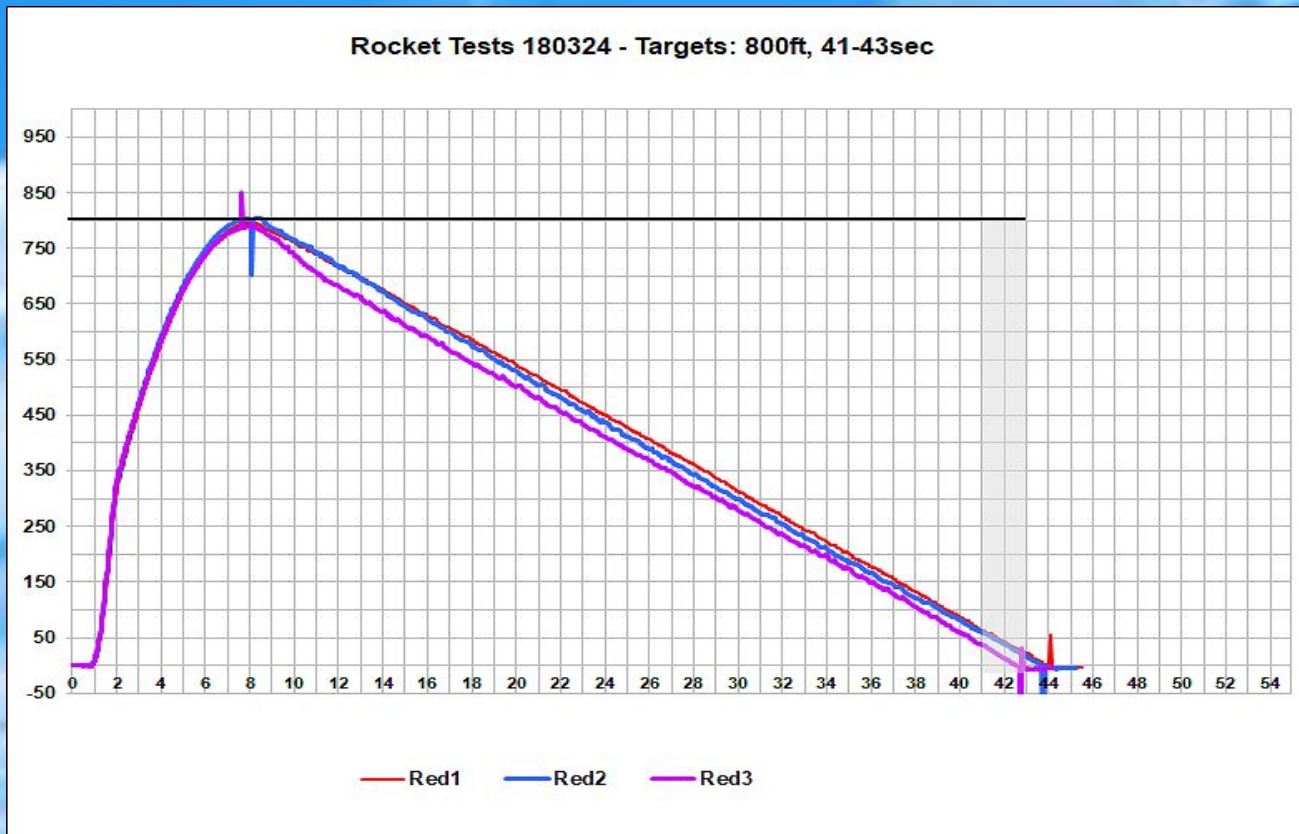
Recovery	Altitude	Time	Comment
18"	858ft	42sec	Good flight, broke fin
18"	859ft	41sec	Nice flight, score 59
18"	808ft	37sec	Nice flight, score 24
24"X	824ft	48sec	Nice flight, score 44
24"X	798ft	42sec	Perfect flight, score 2
24"X	749ft	29sec	tangled chutes
20"	786ft	58sec	too much chute
24"X	783ft	42sec	nice flight, score 17
24"X	783ft	43sec	nice flight, score 17
24"X	829ft	44sec	Nice flight, score 33



Recovery	Altitude	Time	Comment
24"X	806ft	45sec	Nice flight, score14
24"X	830ft	48sec	Nice flight
24"X	806ft	44sec	Nice flight, score 10
24"X	792ft	38.33sec	Qual 1, score 18.68
24"X	735ft	39sec	Strange ejection
24"X	771ft	43sec	Nice flight, score 29
24"X	794ft	41sec	Nice flight, score 6
24"X	802ft	42.36sec	Qualification 2, score 2.00
24"X	789ft	41.435sec	Qualification 3, score 11.00
24"X	806ft	45sec	Nice flight, score14



Qualification Data



These are our
three
qualification
flights.

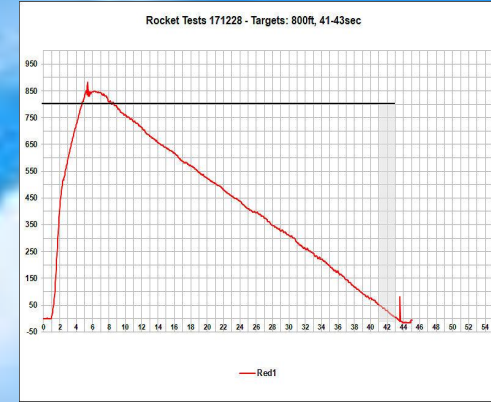
Analysis of Data

- 24 Separate Launches, fly often
- Changed Parachutes(18"--> 24"-X)
- Motors worked successfully for all launches
- Problems:
 - Tangled Chutes,
 - Breaking Eggs,
 - Blast Shield(Removed)
- More Practice = Success!
 - Qualification scores all less than 20



Reflection & Improvements

- Work on Engineering Notebook,
 - we did not record any of our launches in an engineering notebook
 - we just held on to the Altimeter data
 - A notebook could have helped us look back at the data more clearly.
- We learned from our team leader to assemble Aerotech motors.
- The small team forced everyone to learn all aspects.
- We had good flights early, and we just improved.





That's all folks