Rockets

Body:

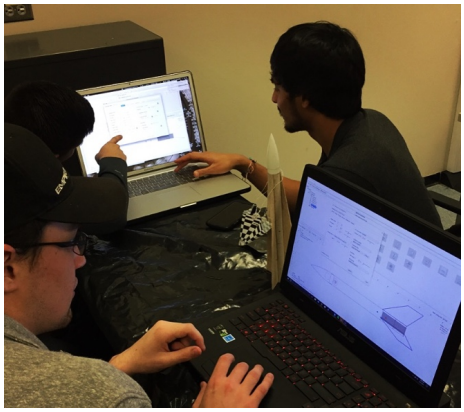
Aeronautics and Rocketry Club at the University of Texas at San Antonio. Given no background or information about how rockets work, new members are given the task to construct their very own model rocket; provided with all parts and components to put together a B rocket from scratch. Building knowledge throughout the years to work up to F engine rockets and even high powered mile high/transonic rockets. The software used is "Open Rocket" which allows members to fully design/test their rockets before actually putting it together, this software even predicts apogee and flight time. After one semester, every member gains a strong foundation on rocketry and aeronautics.

Components:

- Body tube
- A-F Engine
- Centering rings
- Payload
- Nose cone
- Shock cord
- Parachute
- Fins (balsa wood)

How it Works:

With the use of "Open Rocket", ARC engineers begin with designing their rocket from the body tube to the shape of the fins they desire. Once they have tested their rocket with the help of this software, they are eligible to start working on their rocket.



(Members designing in open rocket)

The rocket set up must be exactly as designed in open rocket for quality of flight time and apogee. Typically starting with working on the engine and installing the centering rings with the use of epoxy.

(Engines & centering rings)

Once the centering rings are properly installed, the epoxy has to dry for some time in order to adjust the engine inside the body tube.

The fin fabrication usually takes place while waiting for the centering rings epoxy to dry. With the use of a ruler, a marker and an exacto knife, fins are properly cut into designated shape.

Providing the rocket with the appropriate aerodynamics during flight time.

(Body tube, balsa wood for fins and parachute displayed)

It is a good idea to install the engine prior to installing the fins, this makes it much easier to adjust the fins and avoid breaking them during installation. When the engine is placed in desired location, epoxy the fins evenly spaced out for balance.

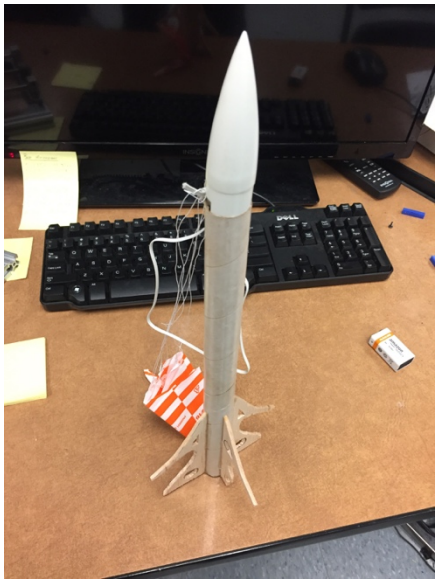
Once fins and engine are fitted accordingly, payload is inserted from the top opening of the rocket. This is carefully inspected as the center of

mass and center of pressure must be precisely measured for assurance of flight.

(Mechanical Engineers James McGehee & Ramon Vazquez adding payload to their rocket)

After several trials of identifying the center of mass. The nose cone is the last thing for a finished product. The set up includes; a parachute and a shock cord attached to the nose cone. The parachute must be of adequate size to provide a safe trip to the ground; but too big of a parachute can provide too much lift and thus cause a rocket to glide miles away and be un retrievable.

The parachute and shock cord is securely tied to the nose cone, and the other end of the shock cord is epoxied to the inside of the body tube. Once this is done, all that is left to do is wait for the epoxy to dry to prevent the parachute and nose cone to stick to the inside of the body tube. The final step is to add the nose cone, now the rocket is ready to fly.



(fully assembled B rocket)

Flying a rocket is fun but safety is always a priority in ARC, this includes a locating a big open space to fly, away from buildings and other pedestrians. Especially with higher power rockets, it is a good idea to contact the FAA to mandate a no fly zone in the area of launch. This will

prevent any accidents from happening. Communication is very important when flying to make sure everybody in the perimeter is aware of the rocket, walkie talkies are provided for each member to communicate from far distances and acknowledge flight is about to take place.

(F engine Rocket ready for launch)

(F engine Rocket ready to Fly)

ARC
AERONAUTICS & ROCKET CLUB