

Shadow Phoenix

Shadow Phoenix is a rather unique scratch built rocket designed to loft two eggs. It consists of two stages, sporting 16 fins each. The Airframe is 45 inches long, three inches in diameter, and made of phenolic tubing. The Motors used to launch the rocket are either an Aerotech G79-4 RMS or G80-4 for the booster and an Estes E 9-6 for the sustainer. Fully loaded, the rocket weighs 1400 grams and reaches a peak altitude of approximately 1,000 ft. Recovery for both the sustainer and booster is done using a rear ejection, wadding less system which deploys 36" and 12" chutes, respectively.

The 11" Booster section houses a black sky timer which ignites the upper stage E9-6 two seconds after liftoff. Also, it contains a 12" homemade rip stop nylon parachute, deployed via rear ejection shortly after separation from the sustainer.

The 34" Sustainer houses two eggs in a cartridge located in the nosecone. Recovery is facilitated by a 36 inch parachute deployed by (you guessed it) rear ejection.

In case someone isn't familiar with rear ejection systems, I'll give a quick synopsis. Instead of the "norm" of having a parachute above the motor that gets blown out where the nosecone is, the parachute for a rear ejection system is located between the centering rings of the motor. Instead of gluing the outside of the centering rings to the motor mount and airframe tube, only glue them to the motor mount. Then, glue a bulkhead above where the motor mount would go in the airframe. Attach a thick shock cord from the bulkhead to the motor mount to the parachute. When the ejection charge fires, the motor mount will be pushed out the back of the rocket because it is now acting like a piston. Because the upper centering ring protects the chute from hot gasses, no wadding is ever needed.

