

DF-15B (CSS-6 Mod 3)

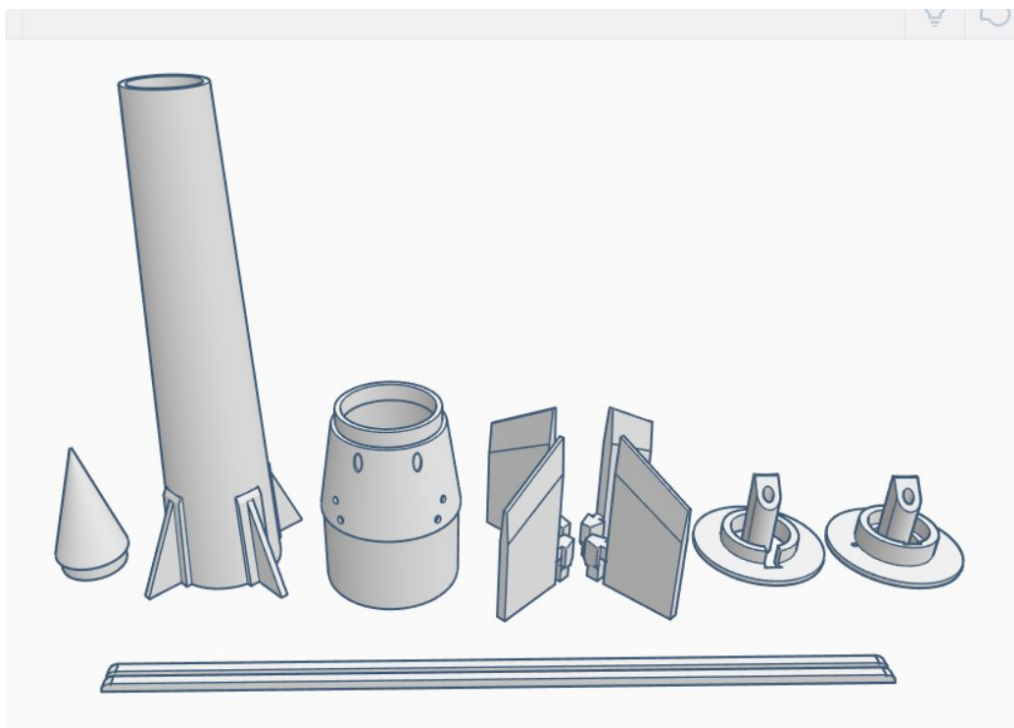
Builder's Kit Parts List

<u>Quantity</u>	<u>Part</u>
2	Centering Rings
2	Launch Lugs
4	Main Fins
1	Nose kit (nose tip, long frustum section, short frustum section)
2	Plastic Conduits
1	Template Sheet

Parts Needed to Complete

~1.6 ounces	Nose Weight
1	Body Tube, BT-60, 9.75" long (247.7mm)
1	18mm Motor Tube, 2.25" long (57.2mm)
1	Shock Cord, ~36" long (~915mm) elastic
1	Shock Cord, ~12" long (~305mm) Kevlar
1	18" Parachute (457mm)
1	Motor clip (if desired)

3D Printed Builders Kit Parts



BACKGROUND

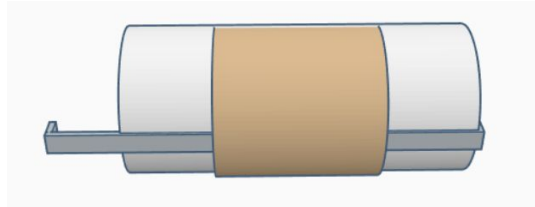
The Dong Feng-15B (DF-15B) is a single-stage, solid propellant, road-mobile short-range ballistic missile. “Dong Feng” is Mandarin Chinese for “East Wind” – a reference to a famous speech by Mao Zedong, where he predicted “the east wind shall overcome the west wind.” The DF-15B (called the “CSS-6 Mod 3” in the West) is

one of many ballistic missiles created by China to assert their national prestige and power – particularly against Taiwan. The original DF-15 was lengthened to produce the DF-15A. The DF-15A was then further enhanced with a maneuvering reentry vehicle (MaRV), similar to the US Pershing II, to create the DF-15B. The Chinese claim the DF-15B achieves extremely high accuracy thanks to its terminal maneuverability. The DF-15B stands as a prime example of China’s new “missile diplomacy.”

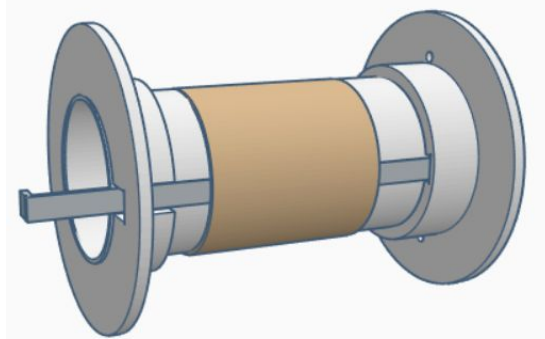
This model was created using photos and drawings of the DF-15B available on the internet. Based on reported dimensions, this model is approximately 1:24 scale.

KIT ASSEMBLY

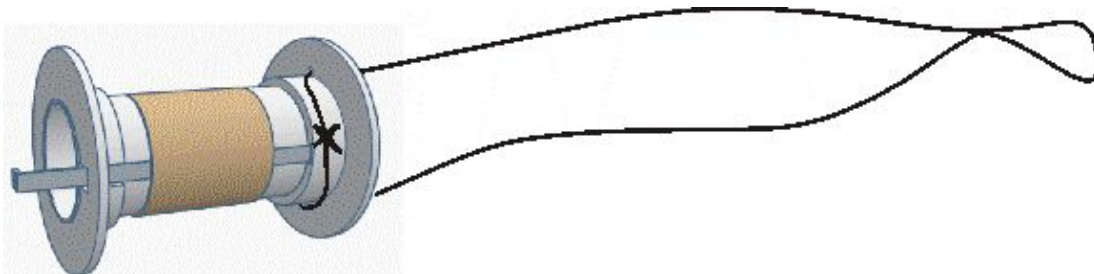
1. Assemble the motor mount. You’ll need an 18mm (BT-20) motor tube 2.25” (57.2mm) long. Note, this motor mount is intended for a “friction fit” of the rocket motor. If you want a motor clip (not included), place the clip over the motor tube so the forward edge of the clip is even with the forward edge of the motor tube. Secure the clip to the tube in the center of the motor tube with a wrap of 1” (25.4mm) masking tape. Then follow the directions below.



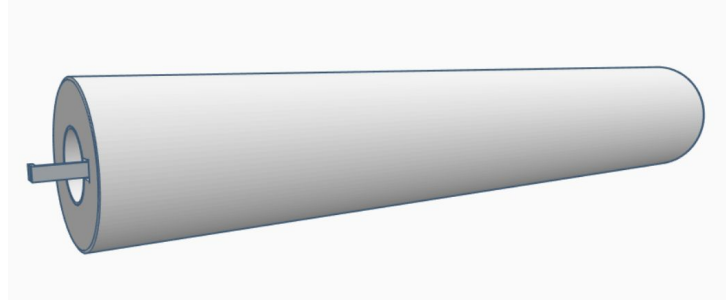
The forward centering ring has a built-in motor block and attach points for a shock cord. Using cyanoacrylate (CA) glue, or “super glue,” glue this ring to one end of the motor tube. Glue the other ring to the aft end of the motor tube, flush with the end of the tube. Apply fillets, if desired, to the tube/ring joints and allow to dry.



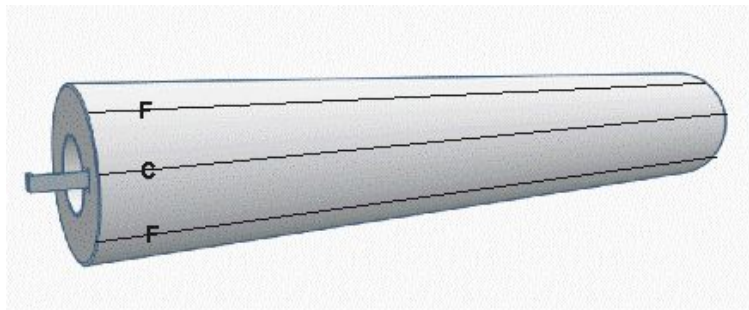
2. Attach the shock cord. The motor mount is designed to use a Kevlar anchor. 100-pound Kevlar works well. The length should be approximately 24” (610mm). Thread one end of the Kevlar through a hole in the forward centering ring tghen do the same with the other end. Wrap the Kevlar around the motor tube and tie a knot. Try to keep the Kevlar tight against the 3-D plastic, as this is preferable to the Kevlar “digging into” the motor tube. At the other end of the Kevlar, make a loop about 1” in diameter. To this loop, attach an elastic shock cord roughly 36” long (915mm). We prefer ¼” (6.35mm) braided elastic.



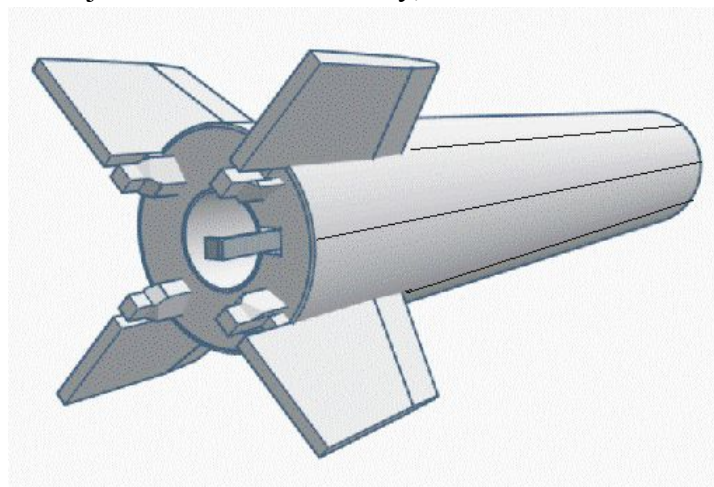
3. Install the motor mount. The body tube for the DF-15B is BT-60. The length should be 9.75", or 247.7mm. Test fit the motor mount assembly in body tube. If the fit is too tight, lightly sand the centering rings until you get the right fit. Apply a generous ring of CA inside the body tube, drop the shock cord through the tube, then insert the motor mount until the aft centering ring is flush with the end of the body tube. Allow to dry. Apply a bead of epoxy or CA to the exposed front ring/body tube joint for extra strength.



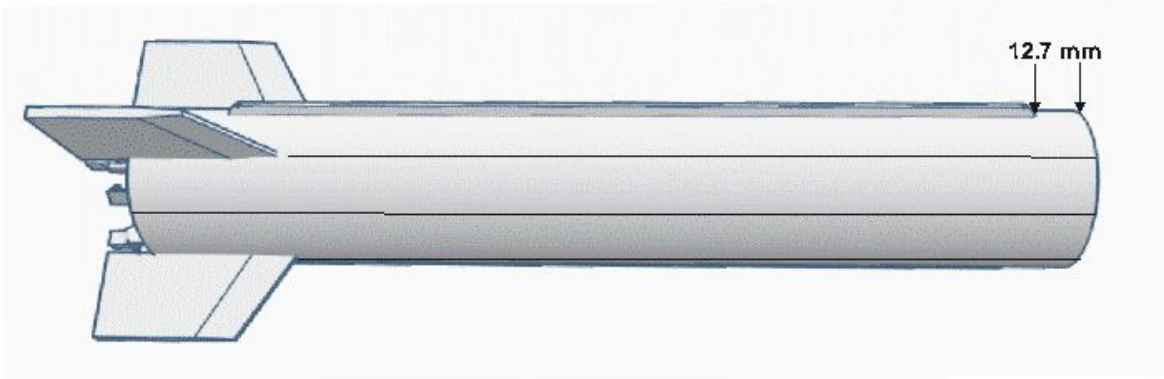
4. Mark the body tube. Place the body tube (aft end down) on the fin location guide. Mark the fin locations, the launch lug location, and the conduit locations. We recommend marking the fin locations with an "F," the launch lug location with an "L," and the conduit locations with a "C." Using a straight edge, extend the fin marks about 4" (~102mm) along the tube. Extend all lines the entire length of the body tube.



5. Assemble the fins. Glue one main fin on each of the fin lines. The plastic piece at the bottom of each fin (a fixture the actual missile rests on, when it is upright on the launch table) will sit up against the aft centering ring (apply glue to this joint, as well as the fin/body tube joint). Make sure the fins are straight when drying. Apply CA or epoxy fillets to the fin/tube joints. For scale accuracy, the fillets should be thin – just for added strength.

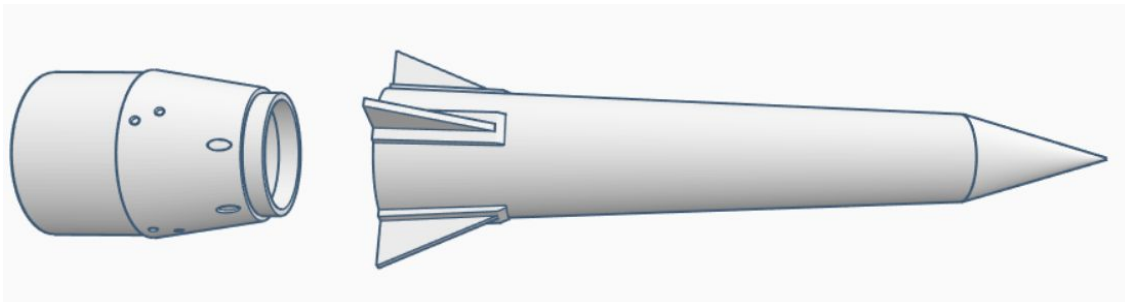


6. Airframe details. Mark the two conduit (“C”) lines 1/2” (12.7mm) from the FRONT of the body tube. Glue one conduit on each of the conduit lines, with the front end of the conduit at the 1/2”/12.7mm mark. Make sure the conduit is straight along the tube. It should be parallel with the sides of the body tube. Cut out the four thrust-termination port covers (black oval shapes) from the template sheet. Mark the fin (“F”) lines 1/8” (3.2mm) from the FRONT of the body tube. Glue one oval on each port cover line at the 1/8”/3.2mm mark. The ovals should be centered on the lines, with their longer axis along the line. The ovals should be centered on the lines, with their longer axis along the line.

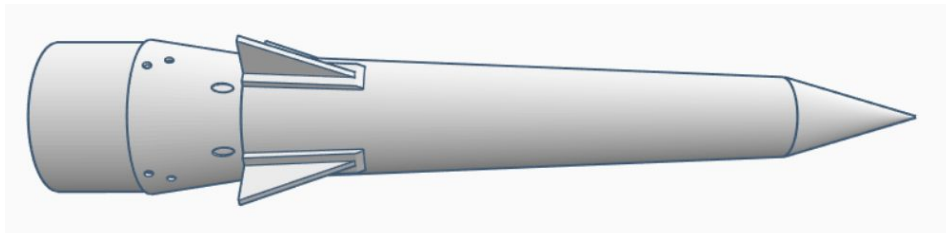


7. Attach the launch lugs. The launch lugs are, of course, located on the launch lug line. Mark this line 1.5” (38.1mm) and 7” (177.8mm) from that AFT end of the body tube. Attach the launch lugs with their aft ends at these marks using CA glue, making sure the launch lugs are aligned. Apply CA or epoxy fillets to the launch lug/body joints. Allow to dry.

8. Assemble the nose cone. Use CA glue when attaching nose cone sections. Glue the 3D-printed nose tip to the long frustum section (with fins), but do not glue the large frustum section yet.

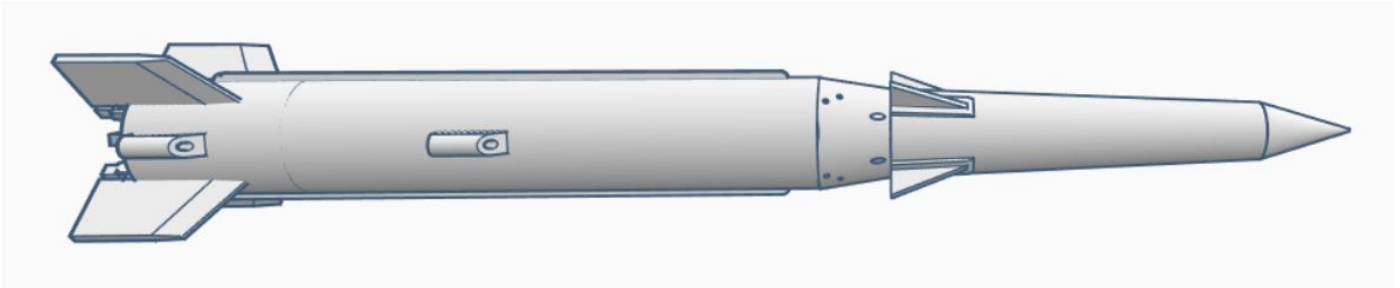


Epoxy weight into the tip of the nose cone. Add 1.75 oz of weight for standard Estes C motors. Remember epoxy gets hot as it hardens. To protect the plastic, you can place the cone tip-down in cool water while the epoxy dries. Once you have added sufficient nose weight, glue the nose/long frustum section to the large (base) frustum section.



9. Finish the 3D-printed pieces. To finish the 3D-printed pieces, sand all pieces thoroughly, then spray with a sandable, filling primer. Sand the primer, then repeat the process at least once more. After two rounds of primer and sanding, the grooves from the 3D printing should all but disappear. Note, there are thruster ports molded into the large frustum section. You do not want these details to be filled in!

10. Final assembly. Use a 18" (457mm) parachute for your model, due to the nose weight. Attach the parachute to one of the attach points on the nose cone. Attach the free end of the elastic shock cord to the other attach point on the nose cone. As an alternative, tie a loop in the free end of the elastic shock cord and attach the parachute to the loop. Run a roughly 6" (152mm) length of Kevlar through one of the attach points on the nose cone and attach it to the elastic loop.



11. Finishing. We recommend painting your model with regular primer and sanding until you achieve a smooth finish. Internet photos of the DF-15B reveal a number of paint schemes. We recommend you search the internet for the paint scheme you prefer. Parade missiles are painted glossy white, with gloss red and black details. Operational missiles are mostly painted olive drab with yellow stripes (which denote handling points for the missile), as shown on the prototype model. There are two stripes on the long frustum section, forward of the fins. There is one stripe between the main fins, just behind the aft launch lug. Sometimes the tip section of the reentry vehicle is a different color (usually gray) from the rest of the reentry vehicle, implying this section might be a radome. Some Chinese DF-11 missiles sport interesting camouflage, so you could attempt one of those schemes on your DF-15B. The square ends of the missile rests are silver.

12. Flying. Unless you added a motor clip, the motor must be “friction-fitted” in the model. Wrap tape around the motor and insert into the motor mount. The motor should be snug (so it won’t be ejected) but not so tight you won’t be able to remove it later. A C6-3 is the recommended motor. We haven’t tested larger (18mm “D”) motors, so try larger motors at your own risk!

