



# HAWK

The **AMROCS Hawk** is designed around a simple hand glider that has been altered to fly as a model rocket as well as a glider. If you follow the instructions carefully and cut out all the parts with care, you should have a great deal of enjoyment and your Hawk will last through many flights.

The following tools are needed to properly build the Hawk: modeling knife, modeling cement or white glue, sheet of fine and very fine sandpaper, and a pen or pencil.

**Step 1.** Identify the parts in the kit:

1. 2 sheets of printed balsa (3" x 9")
2. a 1" balsa nose cone
3. a 2 $\frac{3}{4}$ " body tube
4. a launching lug (small tube)

**Step 2.** Cut out all balsa parts, being careful to follow the solid lines drawn on the balsa wood; label all the parts as shown in Fig. 1.

**Step 3.** Glue the thin end of F-1 to the stabilizer so that it fits between the dotted lines printed on it. Set aside to dry.

**Step 4.** Glue P-1 and P-2 together so they form a solid pylon. Set aside to dry.

**Step 5.** If the construction of step 3 is dry, attach F-2 to it as shown in Fig. 3 and apply a liberal fillet of glue to the joint between F-1 and F-2. Set aside to dry.

**Step 6.** Glue completed pylon to body tube and glue launching lug at joint between pylon and tube. Set aside to dry.

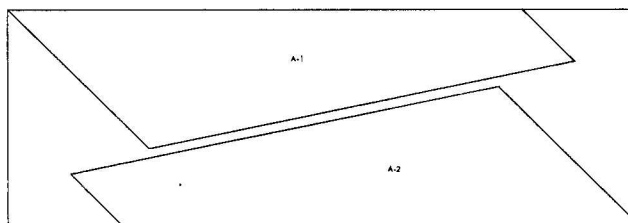
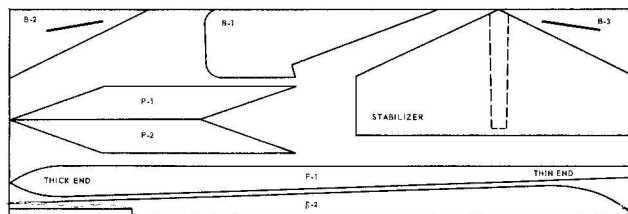


Figure 1

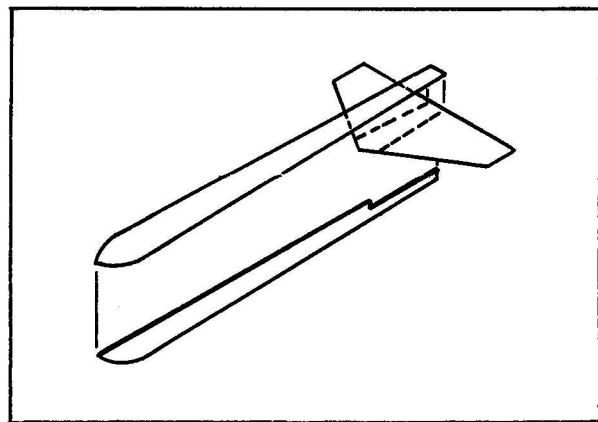


Figure 3

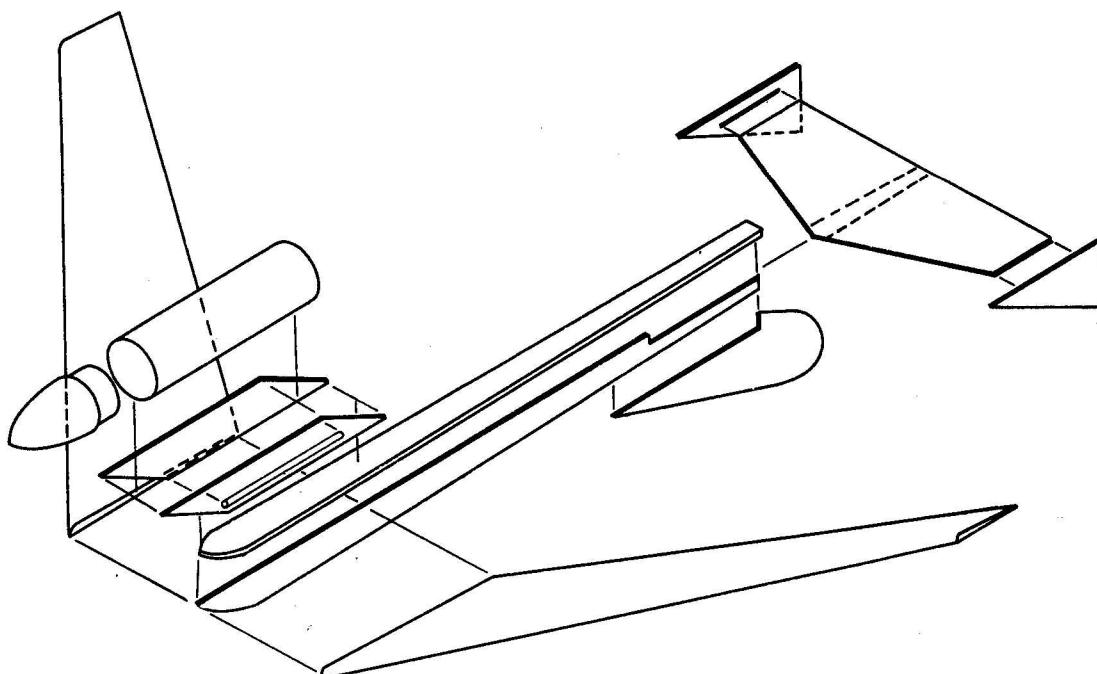


Figure 2

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**Step 7.** If the assembly of step 5 is dry, attach pylon-tube assembly at thick end being careful to assure that body tube and fuselage assembly (F-1 and F-2) are parallel. This may be done by raising the tail to a height of about  $1\frac{1}{4}$ " by placing it on a book or a box as shown in Fig. 4.

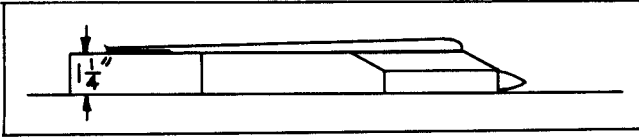


Figure 4

**Step 8.** Attach wings at joint between F-1 and F-2 (just under the pylon) so that they will slope upward when the plane is held with the body tube up. (See placement of wings in Fig. 6 and Fig. 5.) Allow to dry before proceeding.

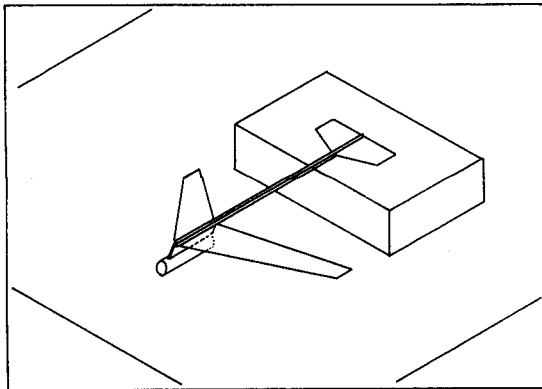


Figure 5

**Step 9.** Attach B-1, B-2, and B-3 so that lines on B-2 and B-3 are used as contact points between B-2 and B-3 and the stabilizer.

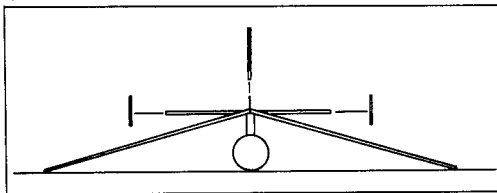


Figure 6

**Step 10.** Insert nose cone (do not glue) and check fit. If too loose, wrap tape around shoulder.

**Step 11.** When wings are completely dry, sand them so that the upper surface is rounded at the leading edge and tapered at the trailing edge as shown in Fig. 2 and Fig. 7. This is the most important part of the construction, since a proper airfoil (wing shape) is necessary for a proper glide. The theory behind this shape is relatively simple. It has been found that the air speed on a wing of a shape like that of Fig. 6 (a cross section view) will be greater on the top surface than the lower surface. Thus, the pressure is greater on the lower surface and this greater pressure tends to force upward, or "lift", the wing and the whole plane.

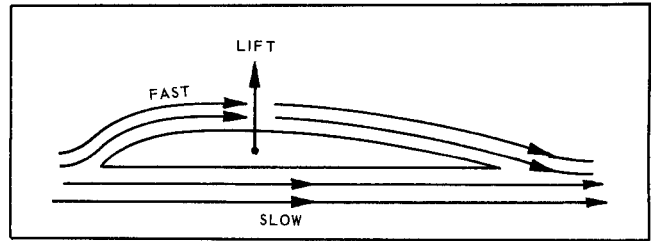


Figure 7

If your plane tends to pull to one side when you hand glide it, add weight to the wing on the outside of the turn by gluing small pieces of scrap balsa or cardboard to that outside wing tip. You may also alter the glide characteristics of your plane by slightly reshaping the wing, but such changes are not recommended for the beginner. If your plane consistently dives or stalls, add weight to the tail or nose, respectively. After you have achieved a suitable glide, glue the nose cone in and check the glide again; you may have to add weight to the tail to account for the added glue weight.

**Step 12.** It is suggested that all surfaces, other than the wings, be rounded to decrease air drag. This drag may be further decreased by painting your plane with two coats of sanding sealer, sanding between coats, and covering with a colored dope paint for better visibility. A fluorescent red orange, orange or cerise is very good, but other colors (such as black, red or combinations) are also quite good.

**Step 13.** When launching your glider, be careful of high winds, use a 36" rod and always use electrical ignition. A good glide is in the area of 30 to 60 seconds with a  $\frac{1}{4}$ A or  $\frac{1}{2}$ A engine.

**Step 14.** If you wish to modify your glider in accordance with NAR safety rules, the following procedure is recommended:

- remove the rear 1" of the body tube
- tape a streamer to each engine and wrap it around the casing 4 or 5 times so that the casing is held tightly enough so the streamer will not unravel during liftoff.

If you are careful with your glider, it should be good for many flights. Never use a Series II engine in this glider, and don't use a B engine if you have limited flying space. Good luck and good flying!

