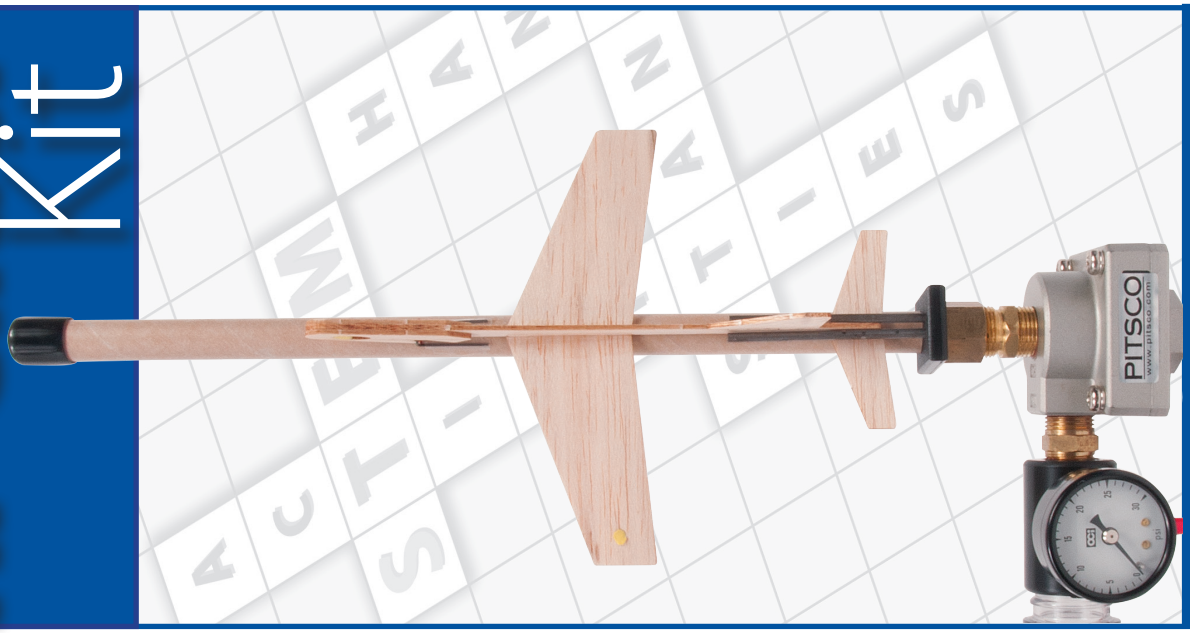
AP Glider Kit



User Guide

PITSCO EDUCATION

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P.O. Box 1708 • Pittsburg, KS 66762
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Materials Included

- 3 sheets of laser-cut balsa wood parts for wing dihedral gauge
- 3 sheets of laser-cut balsa wood parts for gliders
- Rocket tube
- Glider clip
- Rocket cap
- Clay

Items Required (not included)

- Hobby knife
- CA adhesive such as Insta-Cure or IC-GEL
- CA accelerator such as Insta-Set (if using IC-GEL)
- Ruler
- Pen or pencil
- Transparent tape
- AP Rocket Launcher II
- Glider Launch Stabilizer

Cautionary and Warning Statements

- This kit is designed and intended for educational purposes only.
- Use only under the direct supervision of an adult who has read and understood the instructions provided in this user guide.
- Read warnings on packaging and in manual carefully.
- Never launch at people.
- Make sure launch site and flight path are clear of all people prior to launch.
- Never attach sharp objects to this product.
- Safety glasses required.
- Always exercise caution when using sharp tools.

Gluing Tips

When using a thinner CA adhesive such as Insta-Cure, you can place the balsa wood parts together and apply the adhesive on the seams where the parts meet (Figure 1). This type of adhesive will wick, or absorb, into the wood crevices.

If using a thicker adhesive such as IC-GEL, you need to apply the glue on the balsa wood parts before putting them together (Figure 2). Apply the adhesive wherever the parts will touch.

Assembling the Wing Dihedral Gauges

The parts for the gauges are on the short sheets of balsa wood.

1. Place one short sheet of balsa wood flat on a work surface. Using a hobby knife, carefully cut the contact points that hold the parts to the sheet (Figure 3). Remove the parts from the sheet.

2. Glue the two B pieces to the bigger A pieces by sliding them together where they have slots (Figure 4). Let dry for several minutes.

3. Repeat Steps 1 and 2 for the other two gauges.

Building the Gliders

1. Select one sheet of laser-cut balsa wood (there are three different glider shapes). Place the sheet flat on a work surface. Using a hobby knife, carefully cut the contact points that hold the parts to the sheet. Remove the parts from the sheet.

2. Examine the line down the center of Part E, which is the glider's wing. The line should be cut halfway into the depth of the balsa wood. If not, carefully cut halfway into the wood's depth along the centerline with a hobby knife – be very careful not to cut all the way through the wood (Figure 5).

Figure 1

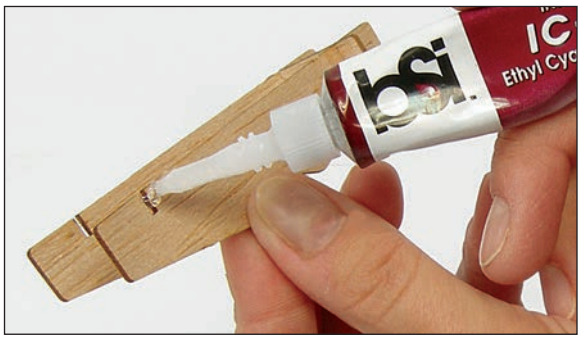

Figure 2

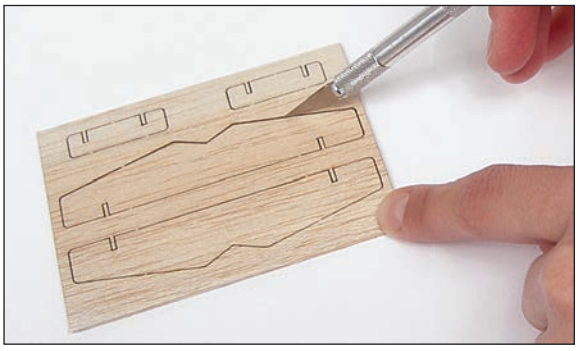

Figure 3

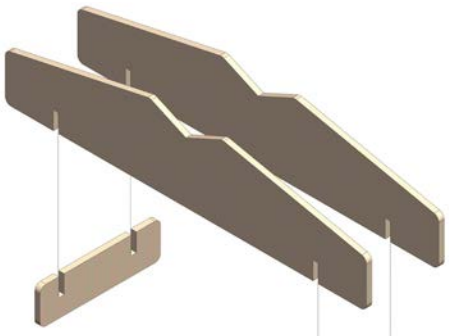

Figure 4

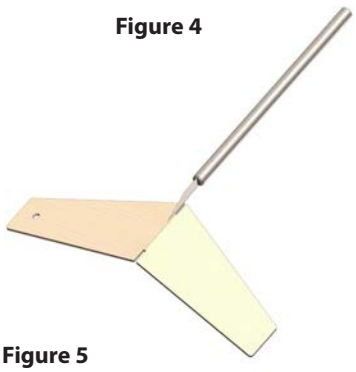

Figure 5

3. Along the wing's centerline, carefully bend the wing. Center it on top of a wing dihedral gauge and continue to bend the wing to fit the angle on the gauge (Figure 6). Place a thin bead of glue on the centerline – this will ensure the angle on the wing doesn't change. Let this dry as you build the rest of the glider. **Note:** If using IC-GEL for this step, you will also need to use a CA accelerator such as Insta-Set.

Figure 6

4. Take Part A, which is the glider's fuselage, or body, and lay it flat on its side. Glue Part C to the underside of Part A toward the tail, which is on the opposite end of the hole (Figure 7).

5. One at a time, glue the Part B pieces to either side of the fuselage nose (where the hole is). Be sure to align the parts carefully before gluing them together (Figure 7). **Note:** If using IC-GEL, you must put the glue on the face of the parts and align them before letting them touch.

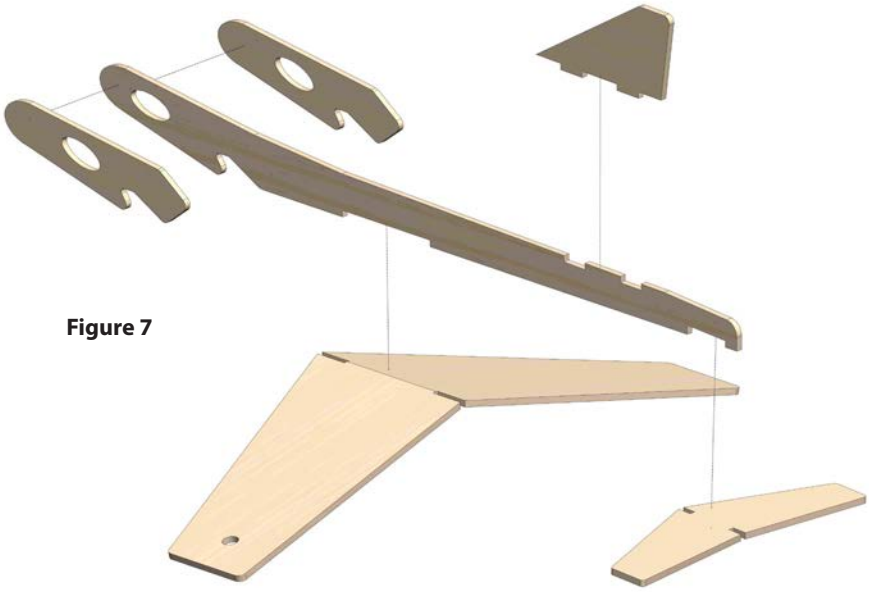

Figure 7

6. Glue Part D, which is called the stab, on top of the tail end of the fuselage (Figure 7). Make sure it is pointing toward the nose and is square to the fuselage.

7. Remove the wing from the wing dihedral gauge. Make sure it fits into the slot in the middle and on top of the fuselage with the wing pointing toward the fuselage nose and the wing ends angled up (Figure 7). If the wing doesn't fit, use the hobby knife to trim the parts so the wing does fit. Glue the wing onto the fuselage. Hold the glider up so you look down the nose at the length of the fuselage. Tip it slightly so you can see if the wings are at even points against the stab. Let the assembled glider dry completely.

8. Take the clay and fill the hole in the fuselage halfway full with the clay – make sure the clay is smoothed to be even with the fuselage sides. Test fly the glider. If it has a smooth glide, it is ready. If not, add a little more clay to the hole in the fuselage. Retest the glider. Continue to do this until the glider flies smoothly.

9. Insert a tiny bit of clay in the hole on the wing. Fill the hole, but make sure there's no extra clay protruding out the sides. This will help the glider fly down in a spiraling path rather than flying in a straight line. **Note:** If you want the glider to fly in a straight line, leave the wing hole empty.

Constructing the Rocket

1. Place the rocket tube on a work surface. From one end, measure 6-1/2 inches and mark the spot (Figure 8).

2. Take the glider clip and tape it onto the rocket tube at the mark. Be sure the prongs of the clip point down from the mark on the 6-1/2-inch side of the tube (Figure 9).

3. Place the rocket cap on the short side of the rocket tube.

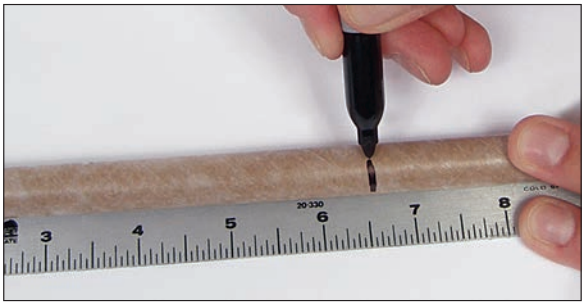

Figure 8

Figure 9

Launching the Gliders

Note: The AP Gliders are best suited as an outdoor activity. However, if you choose to launch them in a gymnasium or other indoor area with a high ceiling, we recommend not using more than 5 psi to launch. A higher psi might cause the rocket and glider to hit the ceiling hard and become damaged.

1. Set up the AP Rocket Launcher II as directed by its user guide. Be sure the launch tube is vertical – AP Gliders will not work properly if launched at an angle. Place the Glider Launch Stabilizer over the launch tube (Figure 10). Let it rest on the brass fixture at the bottom of the launch tube.

2. Place the rocket tube with clip onto the launch tube (Figure 10). Hook the glider onto the clip at the groove near the glider's nose while sliding the tail fins between the tube and the guides on the stabilizer (Figures 11 and 12). Apply the amount of pressure desired and launch the rocket and glider. The glider will ride the rocket straight up until reaching apogee and then separate from the rocket tube and glide down. Be sure to follow all the safety rules outlined in the AP Rocket Launcher II User Guide.

Figure 10

Figure 11

Figure 12

Other Activities

For more activities using the AP Rocket Launcher II – as well as the AquaPort II Water Rocket Launcher (38826) and the Straw Rocket Launcher (20426) – consider purchasing the *Aerospace Engineering Guide* (59796) by Celeste Baine, which is available at www.pitsco.com.