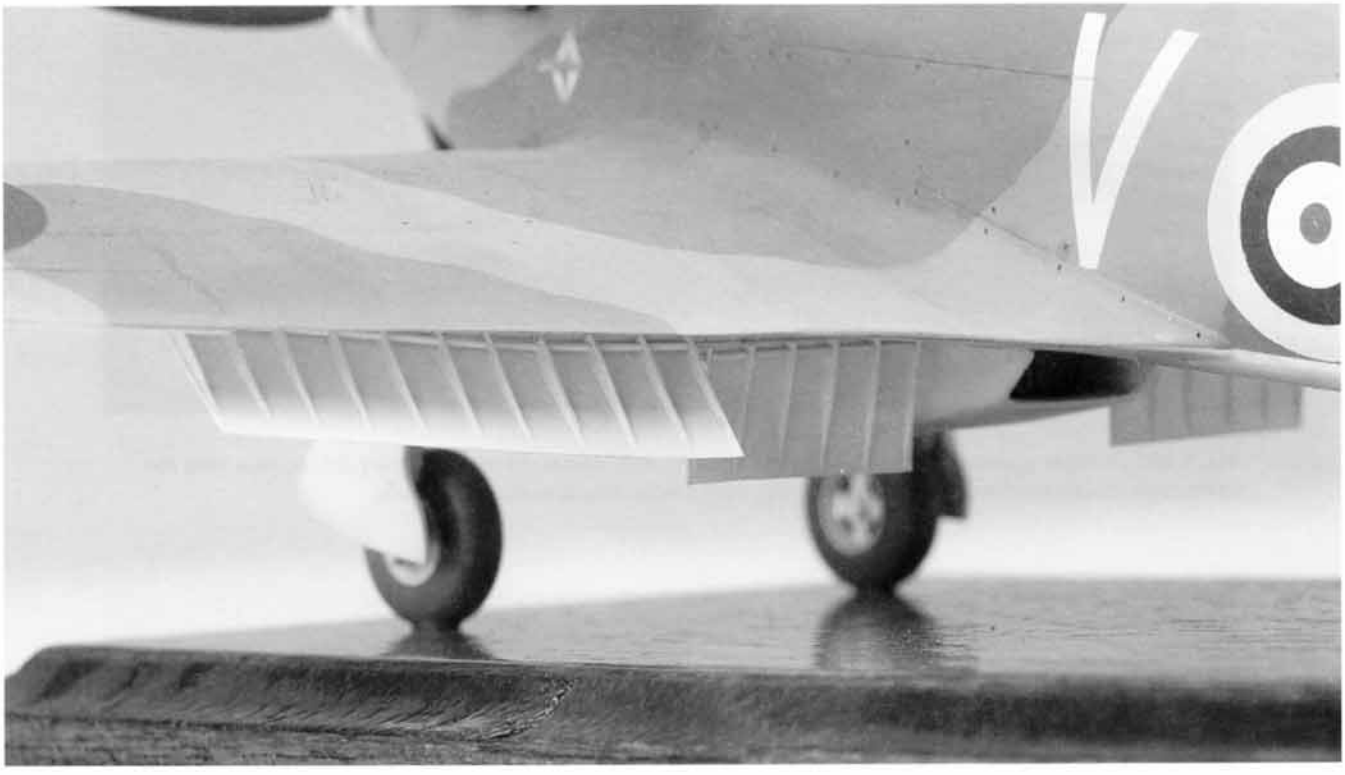
5

CONTROL SURFACE DETAILING



The overall appearance of aircraft models can be greatly improved by repositioning the control surfaces. This is especially valuable if you are creating any type of diorama. Aircraft are seldom seen with all their control surfaces in neutral positions with flaps retracted. There are several different approaches to repositioning control surfaces that you can take. The first one is to carefully cut out the control surfaces and flaps, fill in the voids, make new hinges, and then reattach them. The second approach is the same as the first except you use two kits. One is the finished kit and one is the sacrifice kit. Sometimes it is almost impossible to cut out the control surfaces and flaps on some aircraft kits without damaging the cut-out parts. Using this second approach you can cut out the control surfaces from one model without worrying about damaging the control surfaces and flaps, and then cut around the control surfaces and flaps on the second kit without worrying about the surrounding wing surfaces. Then all you need to do is mate the wings from the first model to the control surfaces and flaps of the second model, fill in the voids on these parts, make new hinges, and reattach them. The third approach is to cut out the control surfaces and flaps without worrying about damaging them and replace them with aftermarket ones made from resin. Most of the resin detail sets for control surfaces are in 1/48 and 1/72 scale, and companies like KMC and Aeromaster, as well as several others, produce excellent parts that are easy to use. I do suggest that you make sure you can get a set of resin control surfaces before you start hacking away at the kit's wings.

The secret to cutting out control surfaces and flaps is to glue the wing sections together and use a Bare Metal Foil plastic scriber to cut through the engraved channels around a control surface and the flaps that form the outline of the parts. Other tools that can be of assistance in cutting out control surfaces and flaps are a razor saw, a jeweler's saw, and a plastic scriber. If you do not have a plastic scriber, use a sewing needle and a pin vise. If you are working with control surface outlines that are raised instead of engraved you will need to secure some type of guide

along the edge where you want to cut. The same type of labeling tape that you use to scribe panel lines works great for setting the outlines and providing an edge to guide your cutting tools. When using a razor saw be careful that you do not cut too far into the plastic. A jeweler's saw will have a tendency to migrate away from a cutting line because the saw blade is so thin—so be careful.

When cutting out the parts, cut through one side and then turn the wing over and cut through the other side. Sometimes there can be a slight difference in the locations of the engraved lines and if you cut all the way through from one side, you may end up cutting into the wing. How the hinges are set on the control surfaces will dictate whether you fill the voids created by removing the part first or cut out the hinge locations and then fill in the voids. You can fill the voids with a variety of materials including Evergreen strip and sheet stock, thick gel super glue, and resin. You may also find that combinations of these materials may be beneficial, depending on the shape of the control surface and the void areas in the wing. You also need to be careful when filling these voids, especially in the wing, so that you do not change the shape of the wing. The best way to avoid this is to carefully set small spacers between the inner area of the wings first and then fill in the area between the spacers.

The big difference between working with control surfaces and flaps is that you may also need to add detail to the flaps as well as the interior of the wing area depending on what type of aircraft you are working with and also how the flaps work. Some flaps just rotate while others both extend and rotate at the same time. As an example, a B-17's flaps rotate down, exposing the interior of the trailing edge of the wing and the underside of the flap. In this case you would need to add wing rib and stringer detail to the underside of the wing and reinforcing framing to the underside of the flap. Other types of aircraft, like a P-51, have flaps that just rotate a section of the trailing edge of the wing. This is the simplest type of flap to reposition. The flaps on an F4U Corsair, on the other hand, have sections of the trailing edge of the wing that rotate as well as extend, exposing the interior of the wing. When adding this type of interior detail, reference material and drawings are important. If you do not have any, add some details like wing sections and stringers if the interior of the wing is exposed.

When repositioning the control surfaces, be sure that the ailerons are set in opposite positions and that the angle between the wing surface and the ailerons is the same. Typically, ailerons have a slight upward and downward position when aircraft are parked. Rudders do not usually move very far from left to right so be careful how far you reset them. Elevators need to be set at the same angles, either up or down, and typically they are set downward. This is so that if a strong wind hits the aircraft from the front or back the aircraft will be pushed down by the position of the elevators. Flaps can be set to any angle, but typically the angle is not much except when the aircraft is ready to take off. Be sure that the flaps are all set at the same angle and position and that all flaps on each wing are set at the same angle and position.

Another important detail on control surfaces that modelers sometimes overlook is the positioning of the control surface tabs. These tabs are adjusted by the pilot to relieve the pressure of the control stick so that the pilot can almost take his hand off the stick. To enhance their appearance, run the plastic scriber into the channel that forms their outlines so that they will have an enhanced appearance. If there are external cables that position these tabs, add them. This is a great visual enhancement on 1/32 and 1/48 scale kits. Many World War I biplanes had external control, pulleys, and cam systems for the control surfaces, and adding these little details can really enhance the realism of these types of airplanes, especially the 1/48 and larger scales. For 1/48 scale kits use nylon sewing thread for these cables; on 1/32 and 1/28 scale kits you need a slightly thicker cable, so use stretched clear sprue. Do not use cloth sewing thread because it attracts dust and is very difficult to get taut.

Cutting out and repositioning all the control surfaces as well as adding detail to them can become overwhelming, especially if you have a lot of voids to fill, hinges to add, and clean-up work to do. Sometimes it's best to select just some control surfaces to do or just do the flaps. This is especially good advice if you have not done this type of detailing before.

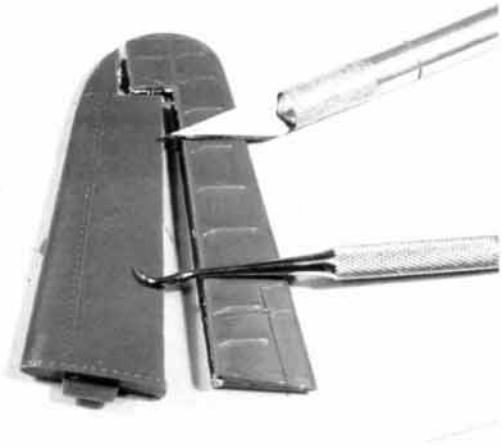


Fig. 5-1. There are several different ways to remove control surfaces; the method you use depends on the situation. In most cases using Bare Metal Foil's plastic scriber to cut most of the way through the plastic and then using a sharp no. 11 X-acto blade to cut the rest of the way through works very well.

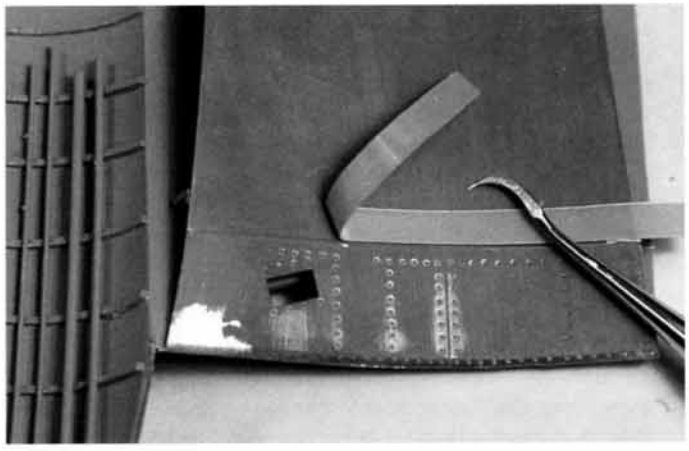


Fig. 5-2. While almost all control surfaces have engraved outlines, some models have flaps that have raised lines to define their shapes. In these cases, use labeling tape to outline the shape and then use your plastic scriber to remove the part.

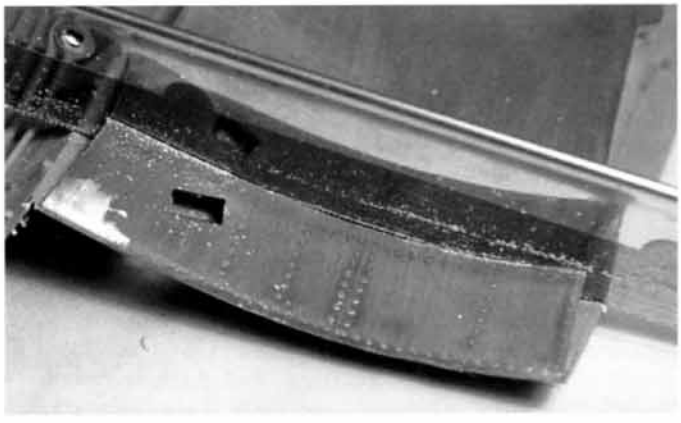


Fig. 5-3. Once you have cut a deep channel in the plastic, to speed up the process you can use a razor saw to finish cutting through the plastic.

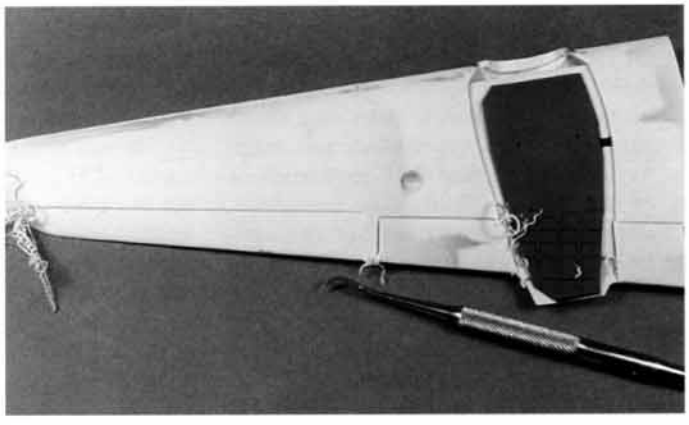


Fig. 5-4. The ailerons and flaps on AMT's 1/48 scale A-20G Havoc have been deeply cut with a Bare Metal Foil scriber. Because of the odd shape of these parts, they will have to be segmented to remove them.

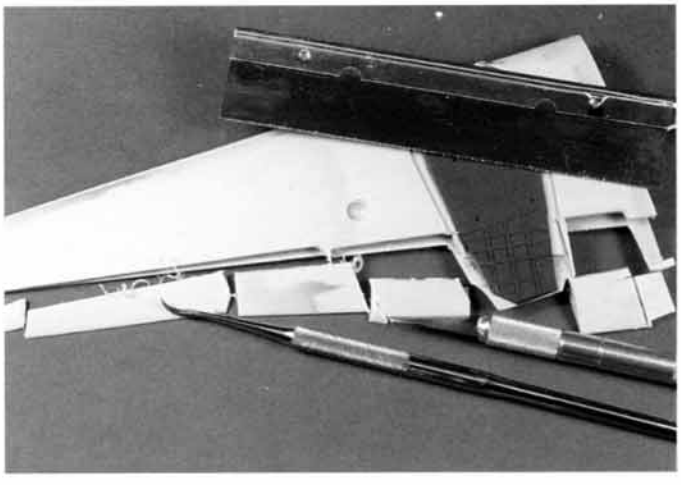


Fig. 5-5. Here the ailerons and flaps have been removed. The next step will be to clean and square the edges and thin the inside surfaces of the wing where these parts will attach. In order to remove these control surfaces, the parts were damaged. Thanks to resin manufacturers, modelers can buy ready-made control surfaces, which reduces the amount of repair work that you have to do.

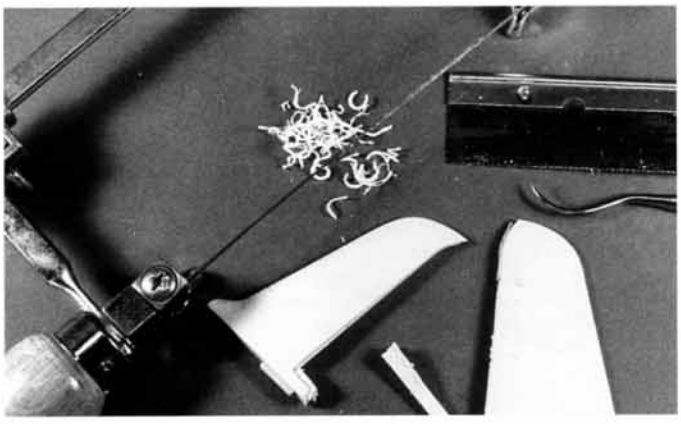


Fig. 5-6. Some control surfaces are stepped and you have to use a combination of scribing tool, a razor saw, and a jeweler's saw. Here again the rudder on this part has been severely damaged, but it will be replaced with a new resin rudder.

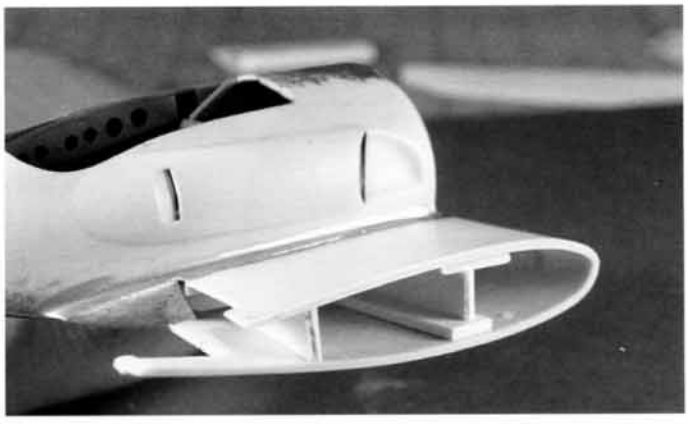


Fig. 5-7. Removing both the ailerons and flaps on wings can make them very fragile. I recommend that you add scraps of plastic to the inside area of the wing wherever possible to reinforce it.

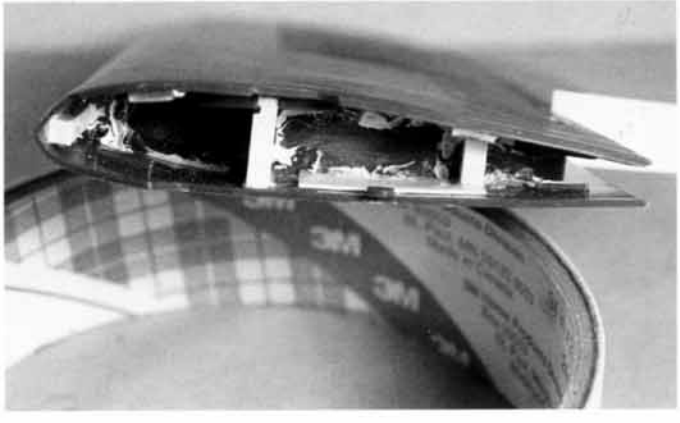


Fig. 5-8. Another good example of reinforcing the inside area of a wing. Since this wing is in two parts, you can seal off a small area inside this section of the wing. Once you glue the wing halves together, pour resin into the void, which will strengthen this two-part wing.

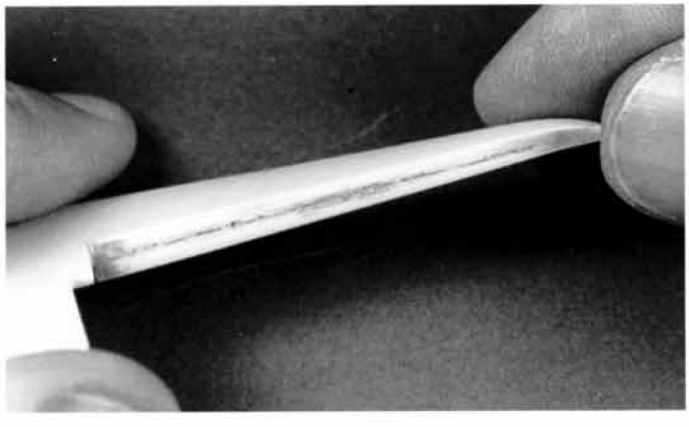


Fig. 5-9. To fill small voids that are created when you remove control surfaces such as elevators or rudders on 1/48 or 1/72 scale kits, simply fill the void with thick gel super glue and sand it smooth.

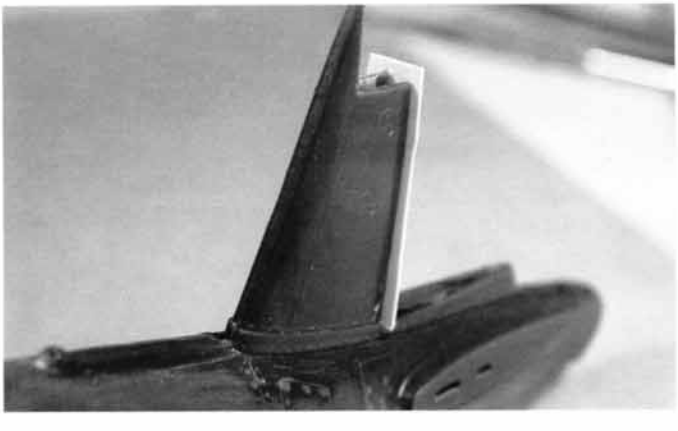


Fig. 5-10. On large-scale kits you can use thin sheet stock or a combination of sheet stock and resin to fill the large voids that are created when you remove the control surfaces.

Fig. 5-11. Here the completed tail of Revell's 1/32 scale Corsair has been sealed using sheet stock, and silver paint was used to check the seams.

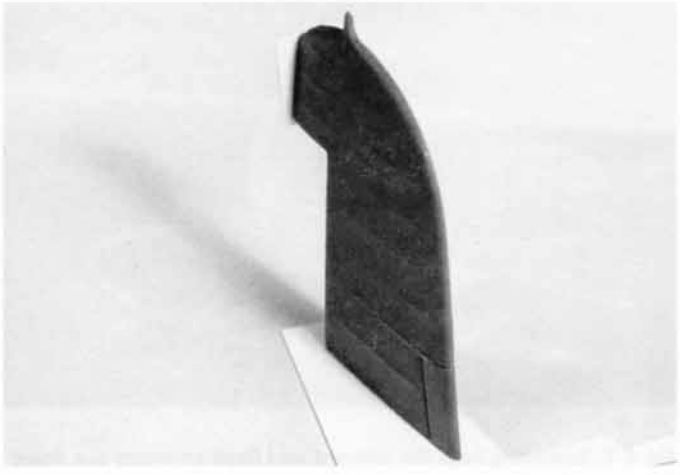


Fig. 5-12. The corresponding rudder for this Corsair will be sealed using a combination of sheet stock and resin. Here oversize sheet stock was glued to the openings. Once the glue is dry, the sheet stock will be cut down and shaped.

Fig. 5-13. Here the elevator opening has been sealed on this wing surface and the excess plastic has been slowly peeled off.

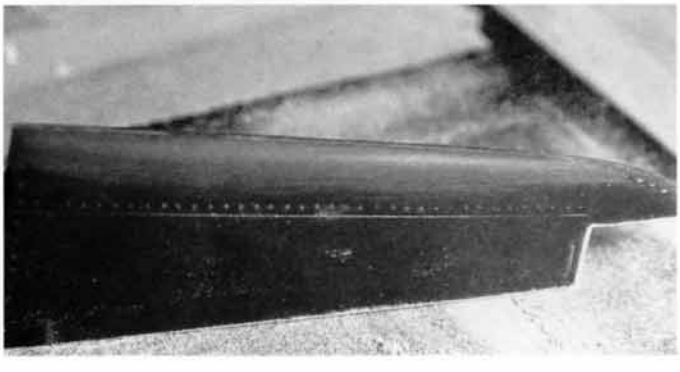


Fig. 5-14. The quick way to get the edges straight is to run the part across a stationary piece of sandpaper.

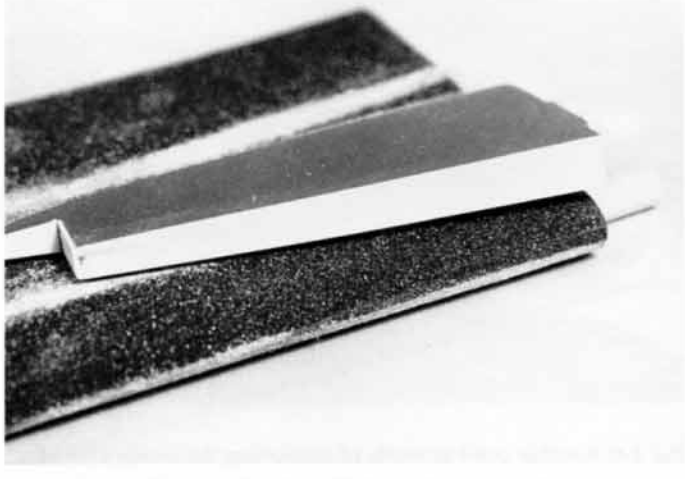


Fig. 5-15. To achieve a curved inner surface, simply run the plastic across an appropriate-sized dowel wrapped in rough-grit sandpaper.

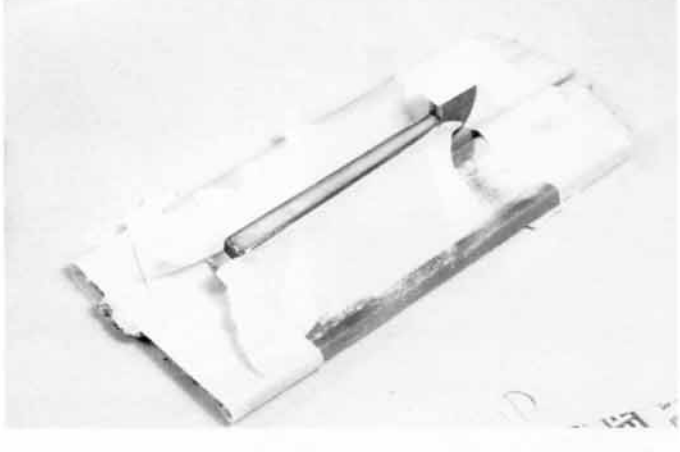


Fig. 5-16. To facilitate filling a control surface with resin, sandwich the control surface between two strips of balsa wood so that it is level and then cover the sides with masking tape. The advantage to using resin is that it is a quicker way to fill a void area than to cover it with plastic and shape it.

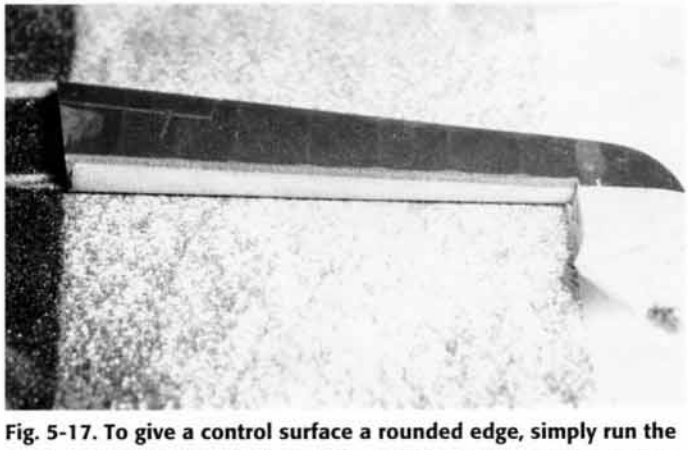


Fig. 5-17. To give a control surface a rounded edge, simply run the part across a stationary piece of sandpaper and rotate the part as it moves across the surface. A nice advantage to using resin is that it shapes easily.

Fig. 5-18. Another good example of using resin to fill a control surface. Resin also adds a great amount of strength to these small parts by completely filling the cavity.

Fig. 5-20. Here thick plastic stock has been added to the inside portion of these Corsair flaps to create a longer flap. After the glue dries the parts will be cut and sanded to shape.

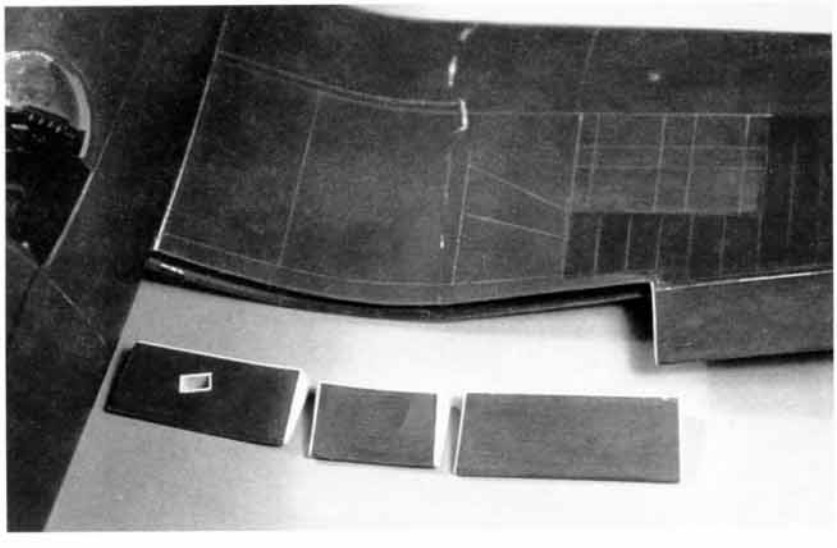


Fig. 5-19. The flaps on this 1/32 scale Corsair have been cleaned and the sides sealed. At this point they are going through their final fit checks before plastic is added to the inside area.

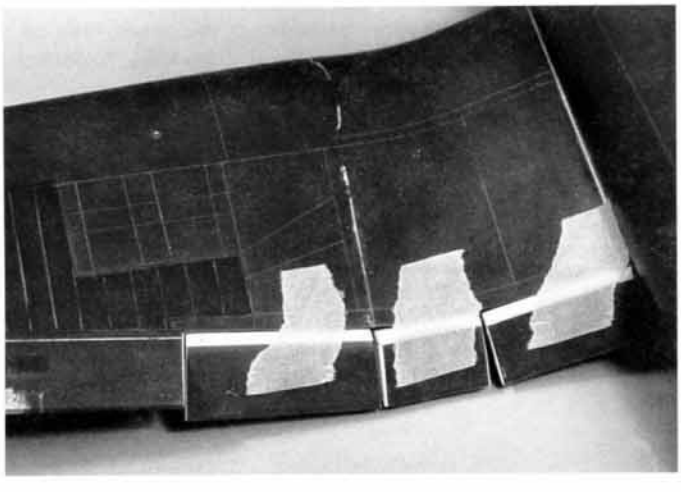


Fig. 5-21. Here the completed flaps with their added plastic are receiving their final fit check.

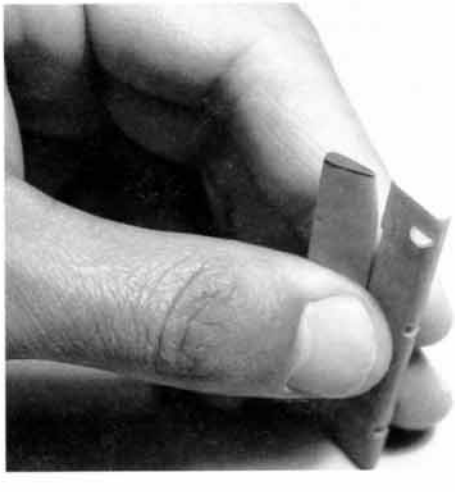


Fig. 5-22. Plastic was added to the edges of these control surfaces so that they would fit snugly into their openings. Don't forget to check for these small details.

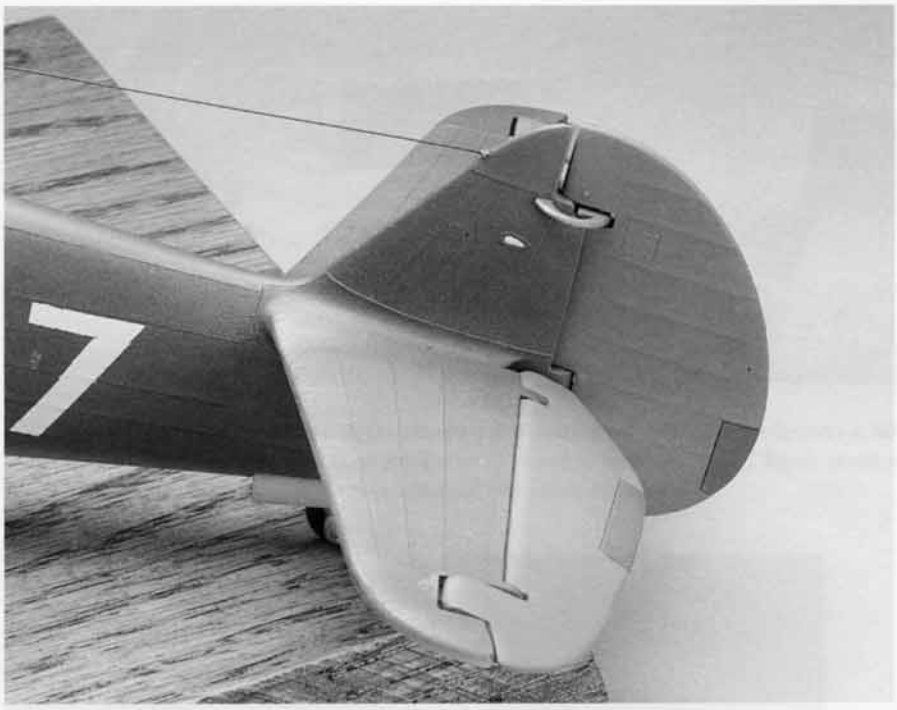


Fig. 5-23. The tail control surfaces on Revell's 1/32 scale P-40 Warhawk were designed as separate parts but there are spacing problems. To fix these spacing problems use the same techniques of adding small strips of plastic. Photo by Glenn Johnson.

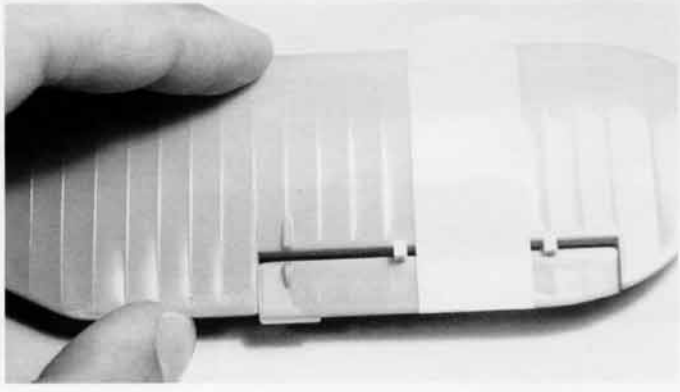


Fig. 5-24. The first step in adding hinges is to pick a strip stock size close to the hinge size that you want, install the hinges in the control surface, and tape it into place. Next apply a tiny amount of super glue to the back side of each hinge so that it is attached to the wing.

Fig. 5-25. At this point remove the control surface and run a bead of super glue around the entire perimeter of strip stock. Then cut the strip stock to size using a razor saw or sharp knife. To protect surface detail cover it with masking tape.

Fig. 5-26. Shape the hinges by wrapping a piece of sandpaper around a sanding block and rotating the sanding block around the edges of the plastic strip to give it a curved shape.

Fig. 5-27. Here a final fit check is done on the hinges to ensure that they fit correctly.

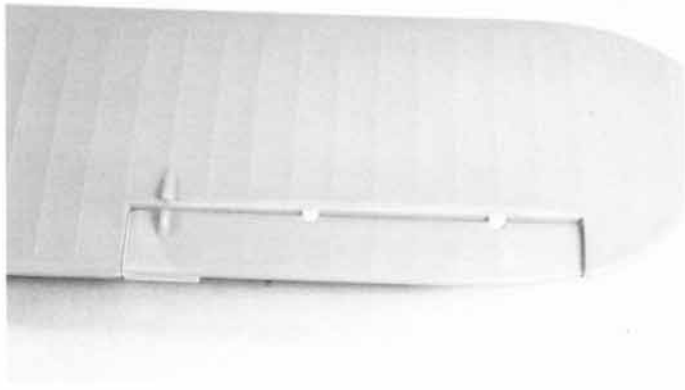


Fig. 5-28. A good example of control surfaces with multiple hinges that have been removed and reattached. Careful cutting, measuring, and shaping will always give you good results. Photo by Glenn Johnson.

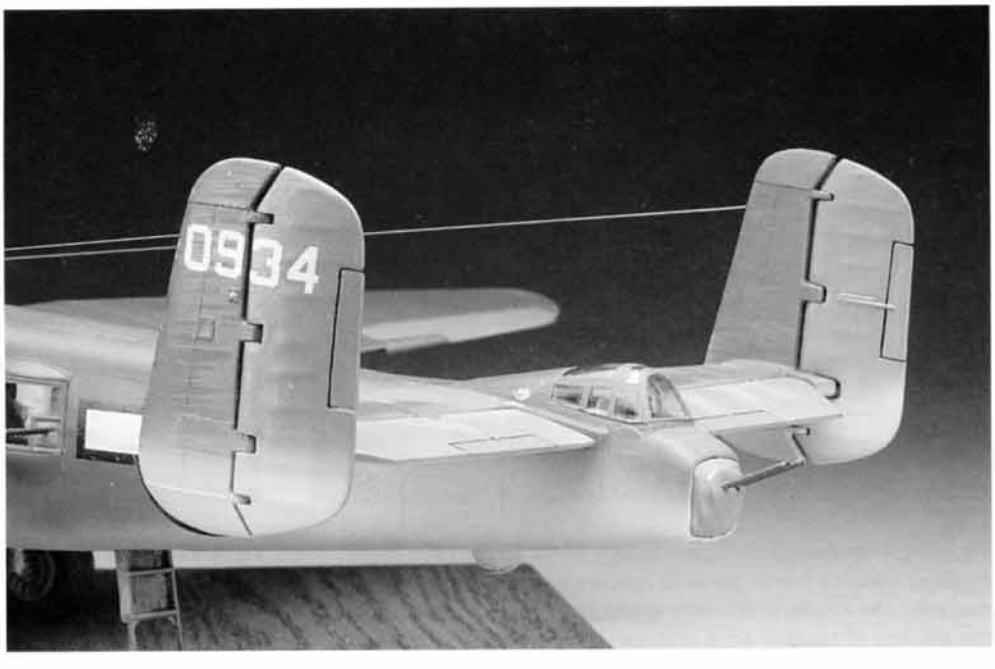


Fig. 5-29. The hinges on the flaps of this F4U Corsair were made with a Waldron punch tool. Photo by Glenn Johnson.

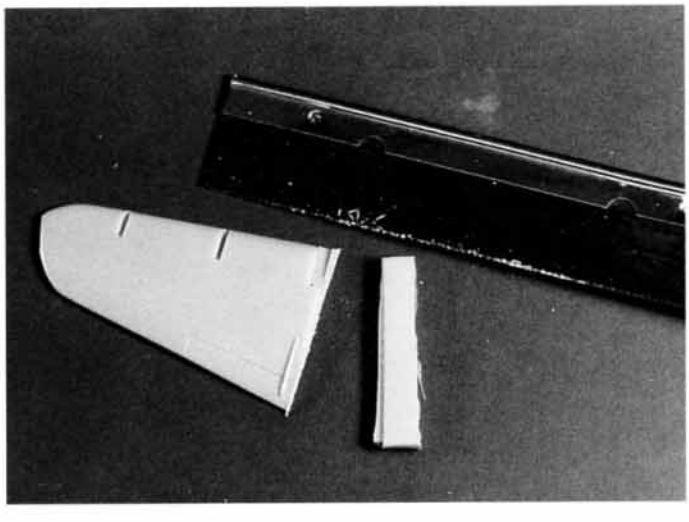


Fig. 5-30. The first step in working with resin control surfaces is to remove the part from its pour block. Be careful when you do this, as these parts are easily damaged.

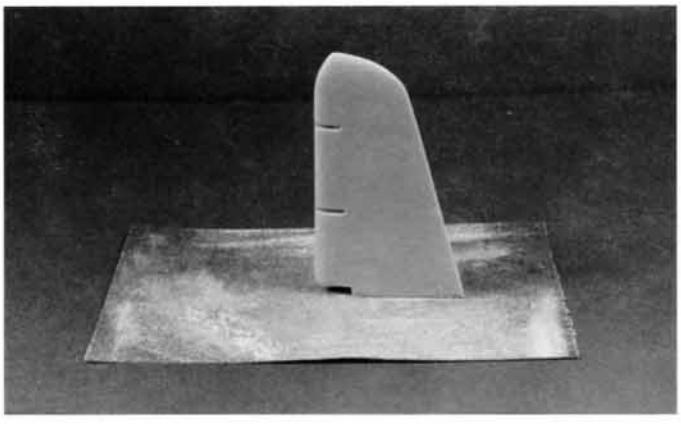


Fig. 5-31. To flatten the contact point between the control surface and the pour block, run the control surface across a stationary piece of sandpaper. You need to be extra careful to hold the part flat so that you don't end up with an angled surface.

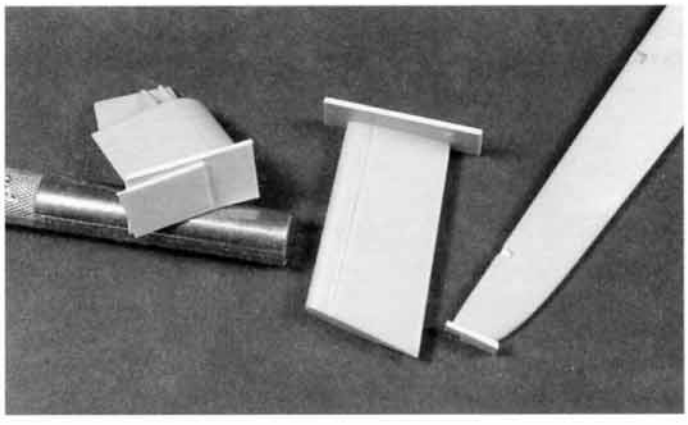


Fig. 5-32. Some resin control surface detail sets need additional plastic so they fit tightly in their openings.

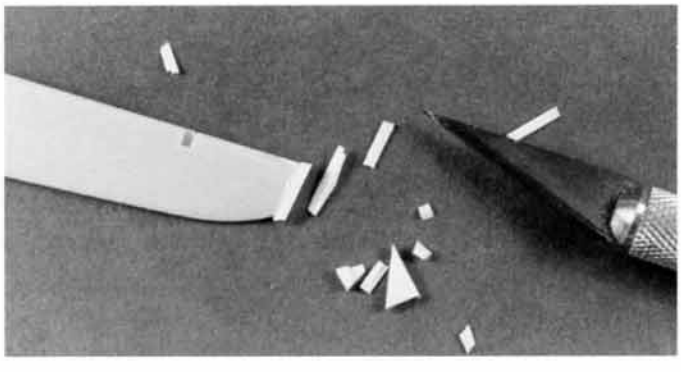


Fig. 5-33. Trim the excess plastic with a sharp single edge razor blade or a no. 11 X-acto blade to remove as much of the plastic as possible. Since resin sands very easily, it's important to minimize the amount of sanding work that you have to do.

Fig. 5-34. These resin flaps and aileron are getting a final fit check to determine if they need additional plastic.

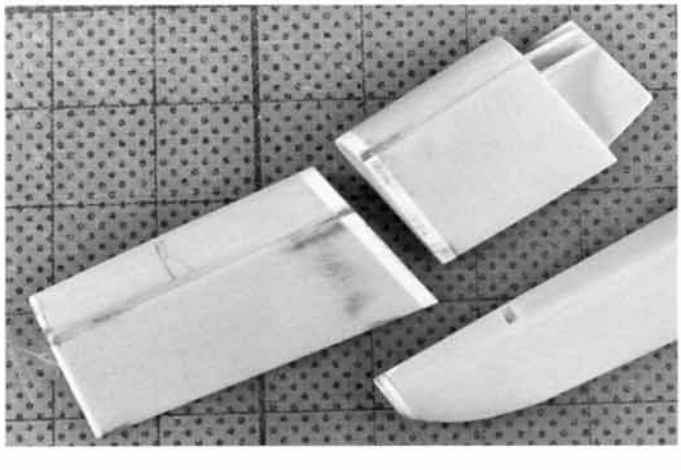


Fig. 5-35. These resin flaps and aileron are now ready to be painted and then installed into the wing. While the ends of these parts needed a significant amount of additional plastic, it was quicker than having to build up the control surfaces and flaps that were cut out of the wing.

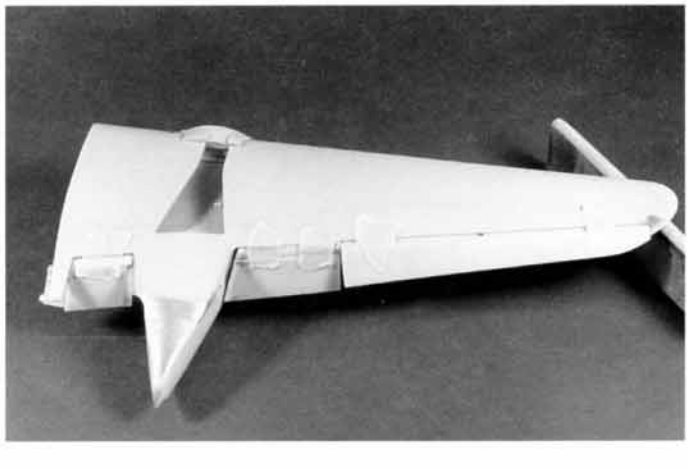


Fig. 5-36. Here the ailerons and flaps have been taped into place to ensure that enough plastic has been scraped from the inside area of the wings so that these parts will sit in place correctly.

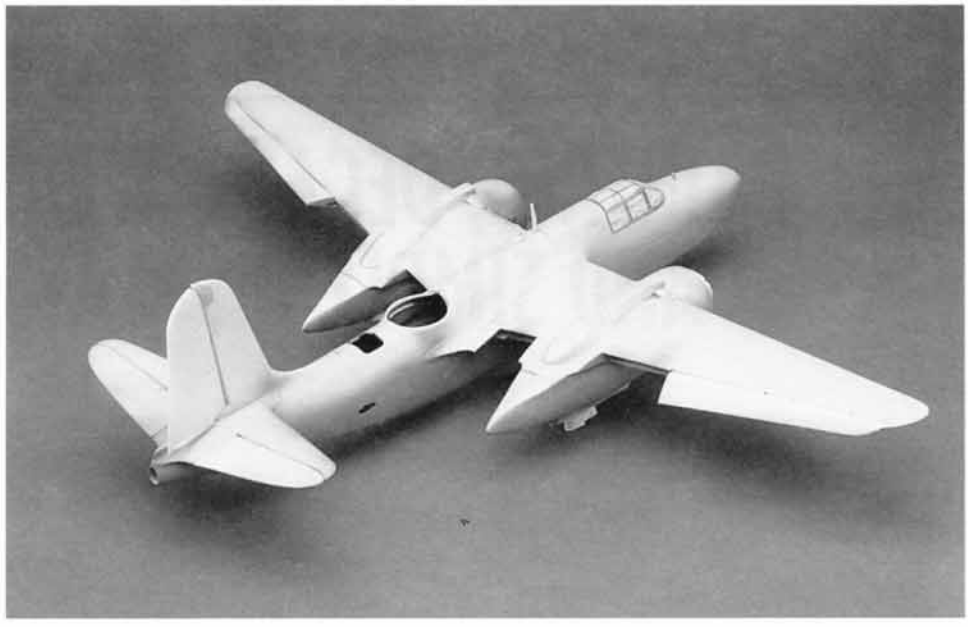


Fig. 5-37. With control surfaces attached and clear parts masked, this A-20G is ready for painting.

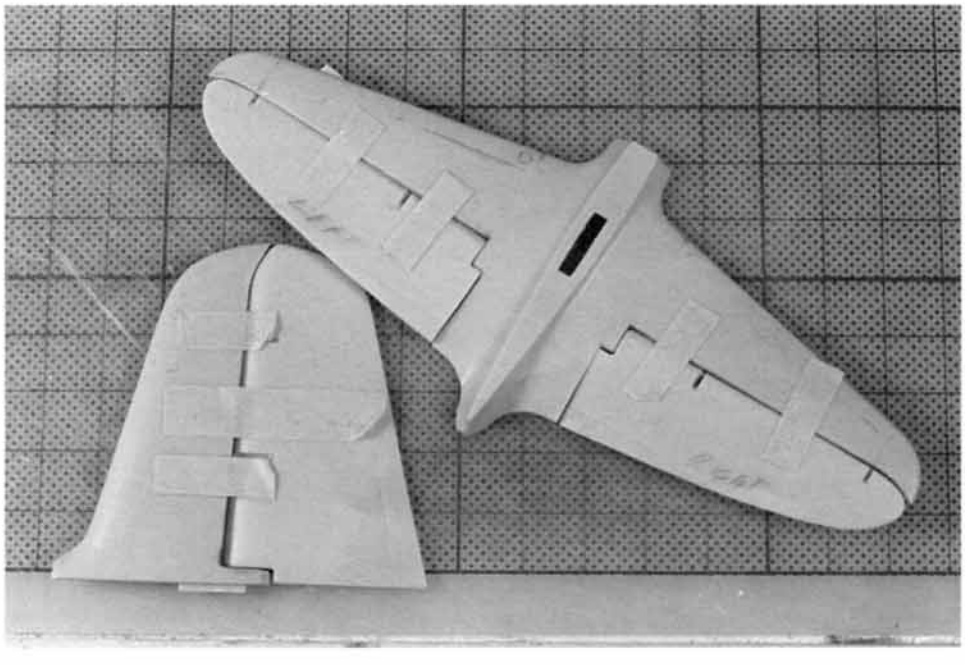


Fig. 5-38. Resin elevators and rudders are usually a lot less complicated to add, but you need to be careful not to damage the shape of these parts or the corresponding wing area as you sand and shape them.