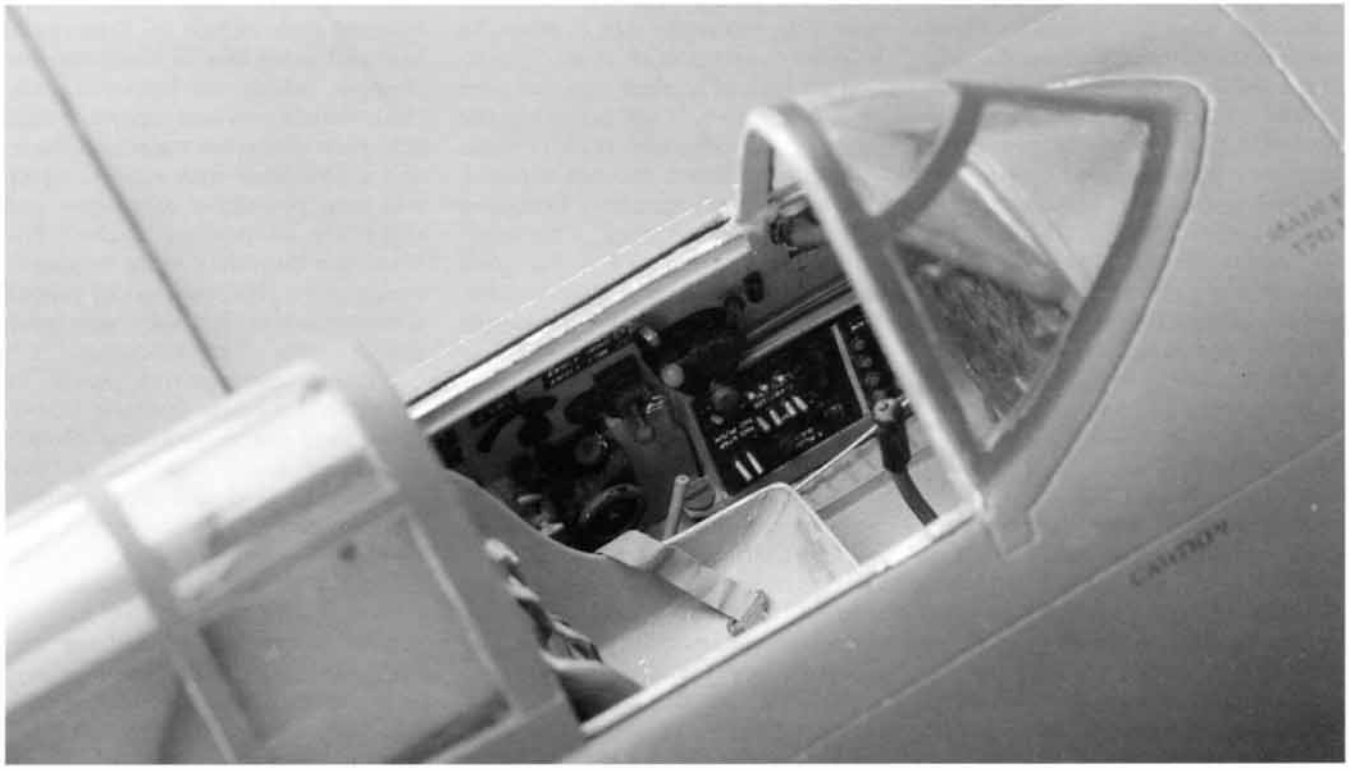
# 1

# SCRATCHBUILDING COCKPITS AND INTERIOR PARTS



There are three easy ways to make interior parts such as wing gun boxes, bulkhead framing, cockpit firewalls and consoles, and the interior areas of wheel wells. The method you use depends on the cost of the model and what part you want to make. If you are making interior bulkhead parts or framing for the fuselage you can use a contour gauge to determine the cross-sectional shape of the fuselage at a particular location, draw the part onto sheet plastic, rough-cut the part, and then form-fit the part into place. While the contour gauge will get you fairly close to the interior shape of the fuselage, it is not a precise instrument and you may have to repeat this procedure several times until you get the hang of it. The one drawback to using a contour gauge is that the resulting shape will be for only half the fuselage. You have to be very careful about how you set up the gauge and also how you set up the drawing on the plastic sheeting so that you get the complete cross-sectional shape of the fuselage.

Another method for getting the cross-sectional shape of a fuselage or wing is to use resin to fill in the interior area, then remove it and cut it up into the cross-sectional parts that you need. This technique also works well for just about any part, especially the cross-sectional shapes of wings. You can then cut up the casting and use the resin parts as templates to draw the outlines onto plastic sheeting. The trick with using resin is to use a mold release agent and to be sure all the seams and openings are sealed so the resin will not leak out. Pam cooking oil spray makes a great mold release agent. A very light coat is all you need. Do not use resin mold release agents that are designed to be used with RTV rubber molds, as they may attack plastic and possibly ruin it. To confine the resin to the area that you want to mold, use fresh, soft modeling clay. This works great for the interior areas of fuselages where large volumes of resin would be necessary if you tried to fill the entire fuselage. The last step is to seal all the openings with masking tape. To reduce the amount of heat generated

by the resin as it is drying, pour in small quantities at a time, and let the resin cool before the next application.

Finally, a third method is to use two kits. The second kit is a sacrifice kit that gets cut up to produce the cross-sectional shape. This method works well for either wings or fuselages. The first step is to glue the halves together and then draw the cut lines on the part. These cut lines will become the cross-sectional shapes at the particular locations that you want. Once you have the locations identified, run labeling tape along the edge of the cut line and either cut the plastic with a razor saw or use a combination of a plastic scribing tool and a razor saw. I recommend making two or three passes with the scribing tool first and then finishing off the cutting with the razor saw. The labeling tape will act as a guide for the scribing tool and the scribed line will act as a guide for the razor saw. You only get one shot at this, so as the carpenter says, measure twice and cut once! Once the cut is complete, carefully smooth the surface. Now you are ready for the last step, which is to transfer the cross-sectional shape to plastic sheet stock. To do this run a grease pencil along the face of the plastic and then carefully press the opening onto the plastic sheeting. Be very careful that you do not change the shape of the cross section by holding the part too tightly, and be sure that the imprint is the same thickness as the cut surface. Another way to get the correct shape is to simply draw the outline of the outer surface of the cross section onto the sheet plastic using a .5 mm lead pencil with a sharp tip. Next, determine the thickness of the plastic, and compensate for this thickness on the cross-sectional drawing by measuring along the outer line. Use French curves to draw an identical cross-sectional shape inside the outer line. Since this is an iterative process, it may take two or three tries to get it right.

The last step is to cut the part along the inside of the imprint line. I recommend that you rough-cut the part, test-fit it, and then form-fit the part into place. To help secure the cross-sectional shape in place inside the fuselage or wing, run a tiny strip length of Evergreen strip stock along the interior area. The cross-sectional shapes will sit against the edge of the strip stock. You do not have to glue strips to both sides of the fuselage or wing, but gluing strips on both sides does help secure the part in place. To help set the strip stock in place, position a length of labeling tape along the edge of the area. It will act as a guide when you glue the strip stock in place.

Scratchbuilding cockpits is easy if you have a small supply of Evergreen strip, rod and sheet stock, a fair selection of brass rod sizes, some good reference material, and photos. Also, it is important to keep in mind that absolute accuracy is not practical or possible when you are working in scales such as 1/32, 1/48, or 1/72. What is important is a perception of scale and the size and spatial relationship between all the parts that you want to scratchbuild. In other words, appropriate sizes and shapes are more than sufficient, and the relationship and position of these sizes and shapes within such a confined area as a cockpit are what is important.

All the different shapes that you may need can be made by layering or stacking various size plastic sheet or strip stock and gluing them with super glue to achieve the thickness and sizes that you need. It is also easier to cut, sand, and shape a part to size than it is to try to stack or layer precut parts together in the hopes of getting a perfect shape. Sometimes you may have to make a part more than once to get it to look right. As long as you keep in mind that you may not get it right the first time, your scratchbuilding efforts will go a lot smoother. I have also found that using pieces of the kit parts can help you when scratchbuilding interior components. In some instances you can get away with just modifying some of the kit-supplied parts, which will save you some scratchbuilding time. There are also several tools that are essential to scratchbuilding. One of these is a Waldron Products punch tool set. This tool is great for making consoles, but it also has a thousand and one uses in scratchbuilding, such as producing various size disks, curves, hinges, and holes. Other essential tools include an X-acto razor saw and miter box, a Northline true chopper, which will help you make clean straight cuts and reproduce multiple parts of the same size and shape, and a Northline true sander, which will help you make sure edges and sides are at perfect angles. The Northline products were originally designed for HO scale model railroad scratchbuilding, but they also work great for scale aircraft modeling.

Using accessories such as Waldron Products console instruments and placards, Reheat Models instrument decals and interior brass photoetched detail accessories, Eduard Company's photoetched interior detail sets, or Model Technologies photoetched accessories, just to name a few, will also help to achieve a more realistic looking interior, and these accessories will also save you a lot of scratchbuilding time. Last but not least, creativity and imagination play a key role in scratchbuilding and the only way to get good at scratchbuilding is to just do it!! Actually, once you jump into the world of scratchbuilding, you will get bolder and bolder in your endeavors. A final note to this discussion of scratchbuilding interior parts and cockpits: do not forget to pay attention to achieving a perception of depth and highlighting detail by using different shades of the same color paint in combination with some weathering and drybrushing when you paint all your scratchbuilt parts.

Fig. 1-1. The first step in creating an interior part using a contour gauge is to remove any interior details such as aligning pins. Here the interior section of Revell's F4F has been cleaned up and the plastic has been sanded smooth.

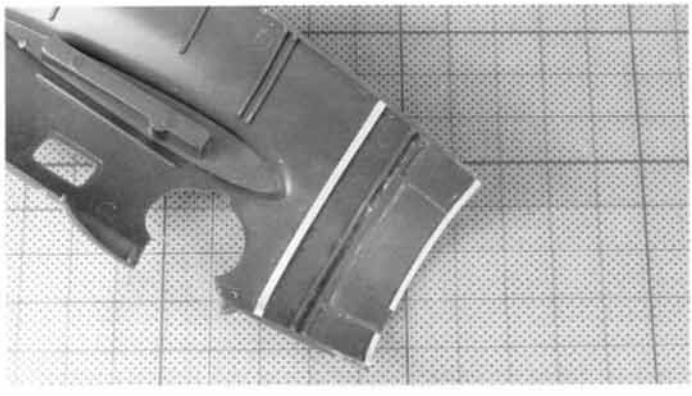


Fig. 1-3. Next use the labeling tape as a guide to glue a small section of Evergreen strip stock into place. This strip stock will act as a lip guide for the contour gauge as well as a positioning tab for the interior part.

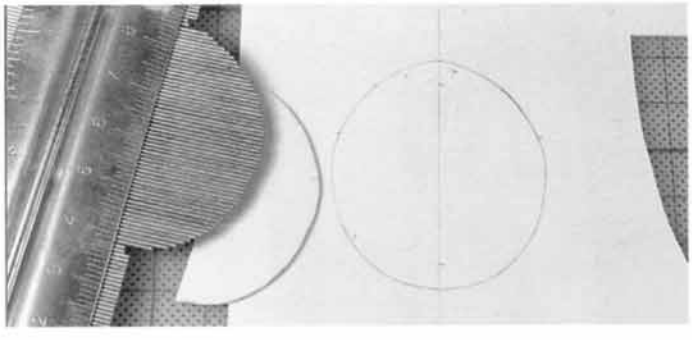


Fig. 1-5. Once you are satisfied that the contour gauge has the shape of the interior, remove the gauge and transfer the shape to sheet stock. Be sure to strike a straight line on your sheet stock so that you can use the line to position the top edge of the contour gauge. The resulting shape will appear to be a stepped curve and you will need to carefully smooth the steps into a curve. Cut out this half shape and then use it as a pattern to reproduce the full interior section.

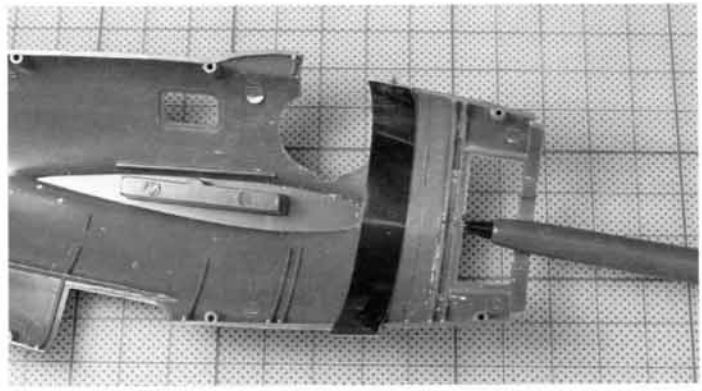


Fig. 1-2. The next step is to position a section of labeling tape along the interior of the fuselage where you want to make the part.

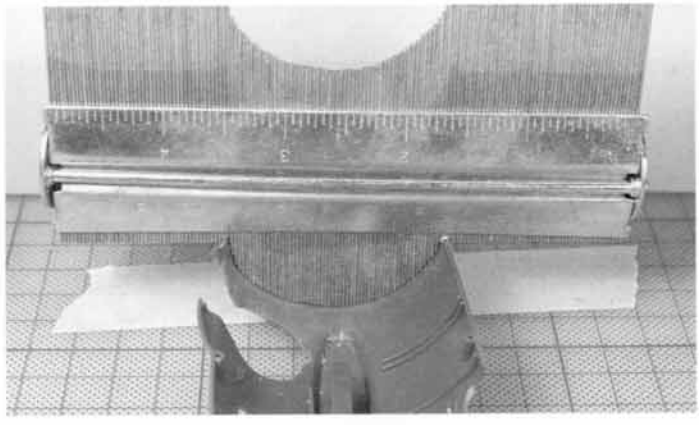


Fig. 1-4. A contour gauge is a good instrument to use to determine the interior contours of fuselage halves. Set the edge of the contour gauge against the lip of the Evergreen strip stock and slowly push the individual rods of the contour gauge down until they touch the surface of the fuselage.

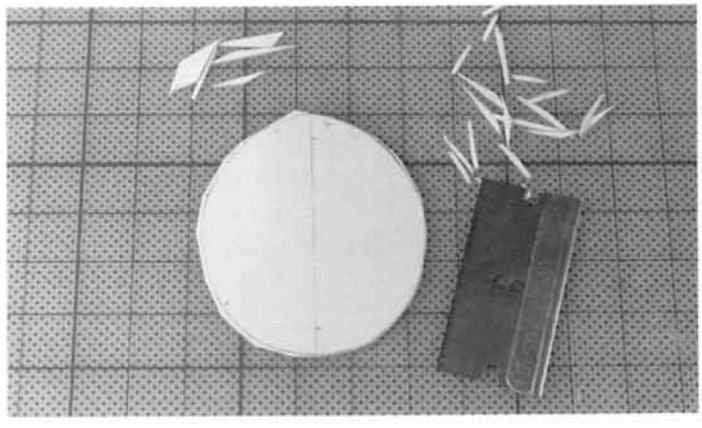


Fig. 1-6. Cut out the full interior shape using a single-edge razor blade, making tangential cuts along the edge of the shape. Form-fit the part into place and use a Flex-I-File sanding stick to adjust and smooth the edges. The contour gauge will get you close, and minor adjustments to the curve of the part should be all that are needed.

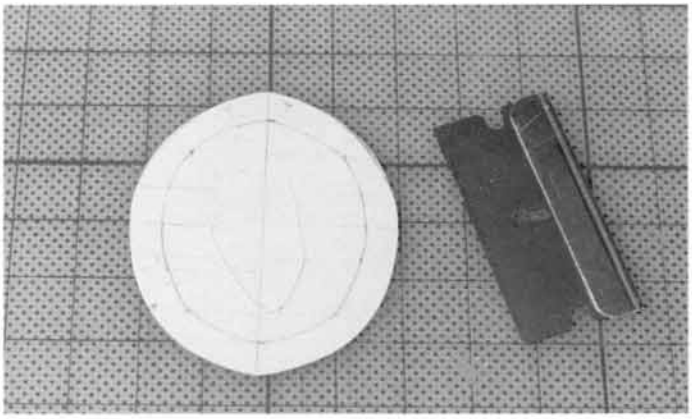


Fig. 1-7. If the part is going to become an interior frame, draw a parallel interior circle to make the part into a ring. Cut the part out, again using a single-edge razor blade, and smooth the edges.

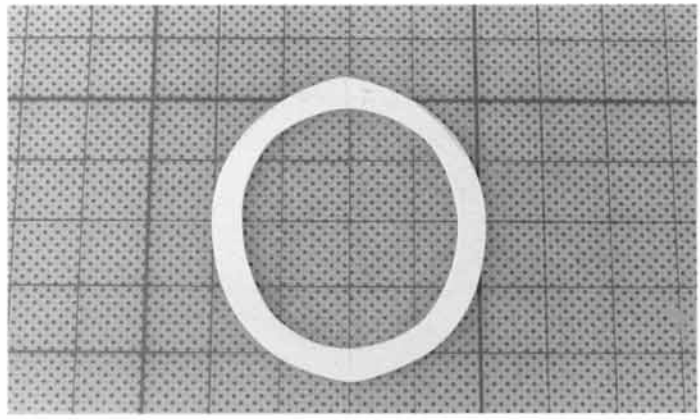


Fig. 1-8. This interior frame is now ready to be installed inside the fuselage.

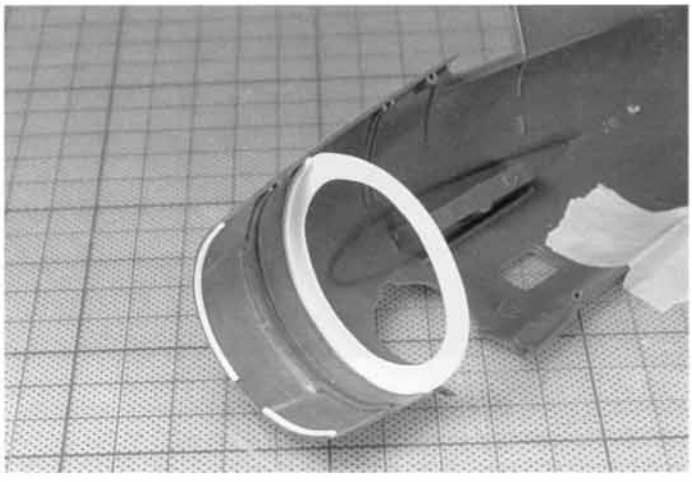


Fig. 1-9. Here the interior part has been installed along the back side of the lip of the strip stock so that the strip stock will be hidden from view.

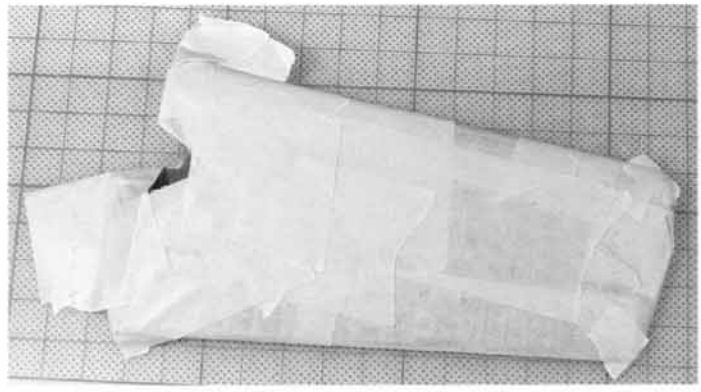


Fig. 1-10. Filling the interior area of a wing with resin is a better way to get the interior cross section of these types of parts. The first step is to clean the mating edges of the wing halves, spray the interior with Pam cooking oil spray, and then tape the halves together. You also need to completely seal the edges and any openings. Scotch 3M painter's masking tape works great for this.

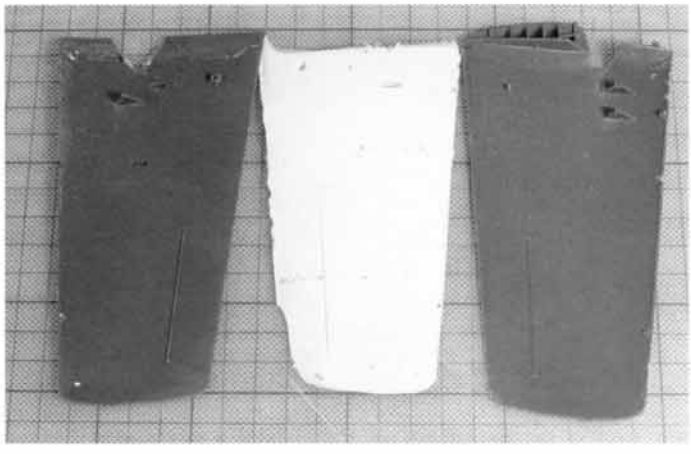


Fig. 1-11. After the resin has cooled, remove the tape and separate the part halves. You may have to use a no. 11 X-acto blade to help pry the halves apart. Here the wing halves have been separated, displaying an exact duplicate of the interior area of the wing.

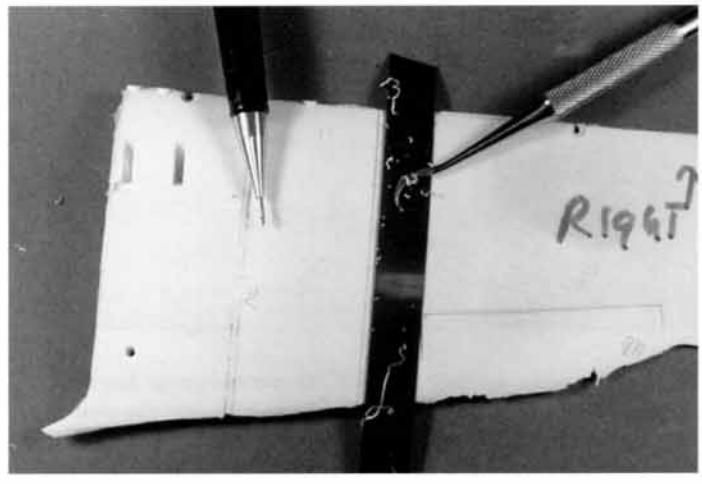



Fig. 1-12. Mark the locations where you want to cut the casting in half to create a cross-sectional shape. Use labeling tape to set the lines, and then scribe a trench using your plastic scriber.

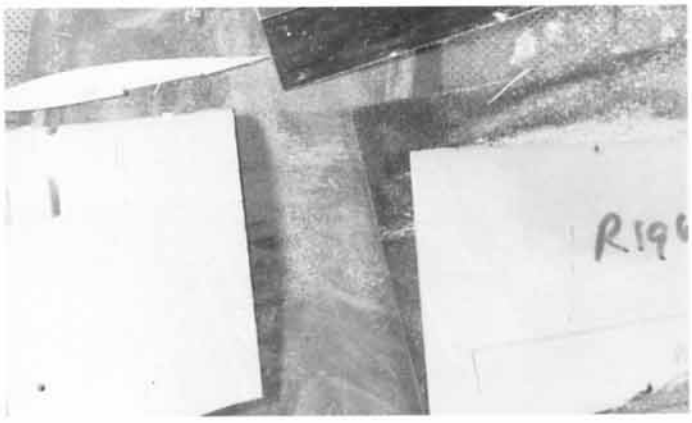


Fig. 1-13. To cut the resin casting in half use a razor saw. The trench that you scribed with the plastic scriber will act as a guide for the razor saw. After the part is cut in half, carefully run the cut surfaces across a stationary piece of sandpaper to smooth them out.

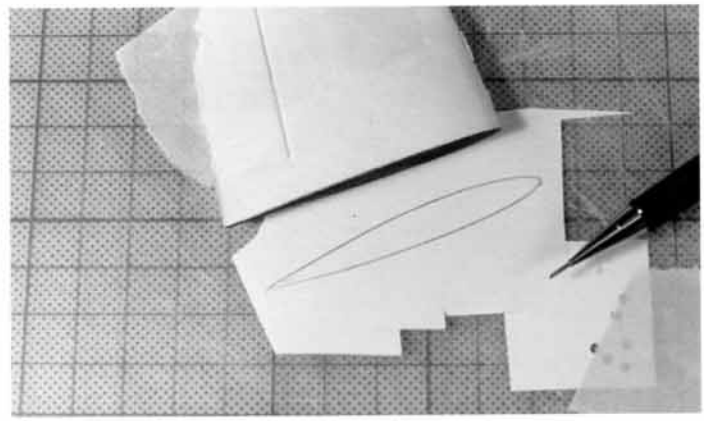


Fig. 1-14. To trace the cross-sectional shape, tape a piece of sheet stock to your cutting board. Position the cut part onto the sheet stock and carefully trace along the edge using a .5 mm or smaller lead pencil. Be very careful not to move the part while you are tracing it.

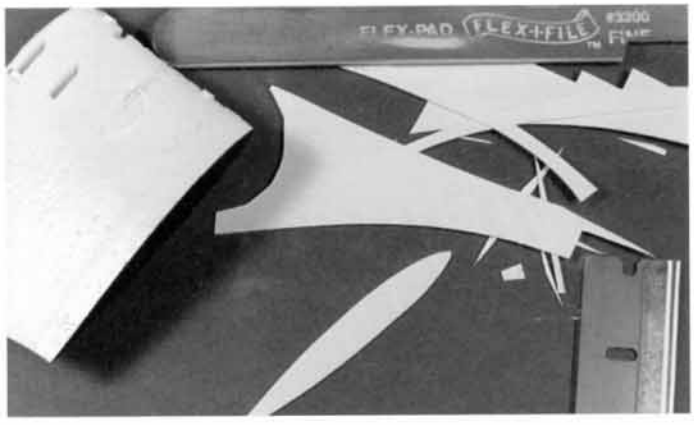



Fig. 1-15. Rough-cut the shape, make tangential cuts along the edge of the line using a single-edge razor blade, and then smooth the surface with a Flex-I-File sanding stick.

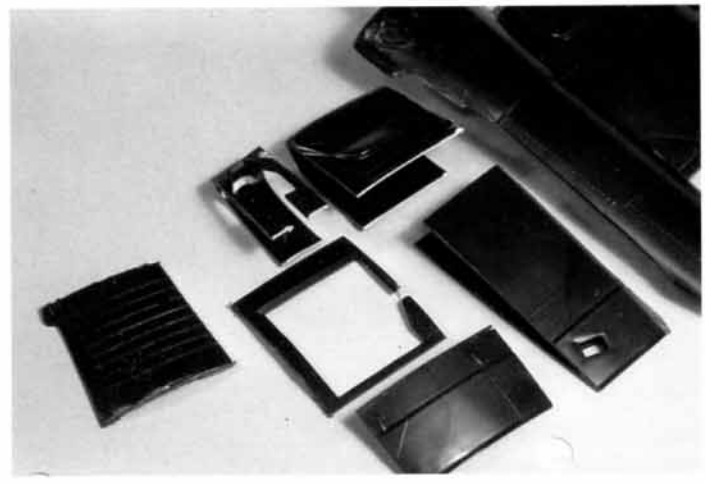


Fig. 1-16. Another technique for determining the interior shapes of wings is to use a second kit. The wings are glued together and cut lines are drawn onto the surface at the locations where interior parts need to be made. Then the wing is cut along those lines. To transfer the shapes to sheet stock, run a grease pencil along the edges of the cut-up parts and then press the edges onto the sheet stock.

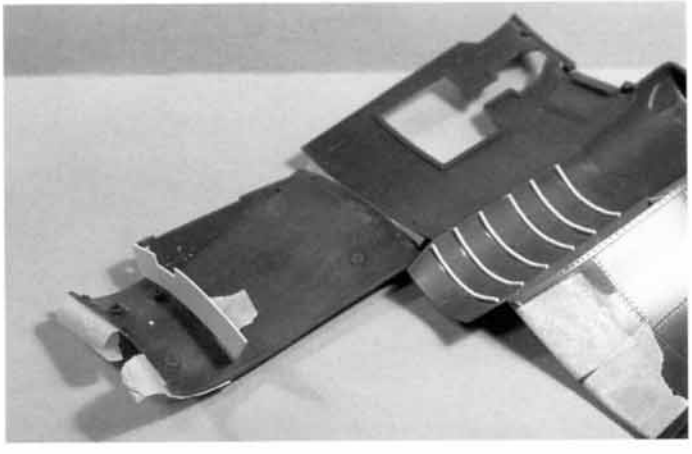


Fig. 1-17. To construct complex-looking interiors like the landing gear wells for an F4U Corsair you need to measure, cut, and form-fit the interior parts one at a time. Here the first interior section is being form-fit into place.

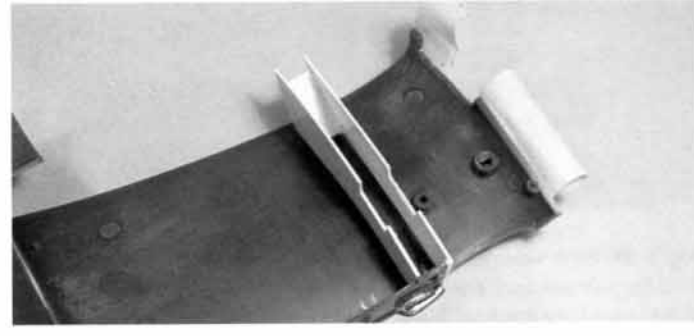


Fig. 1-18. The next step is to start to build up the interior box areas, being careful to cut, shape, and form-fit the parts into place.

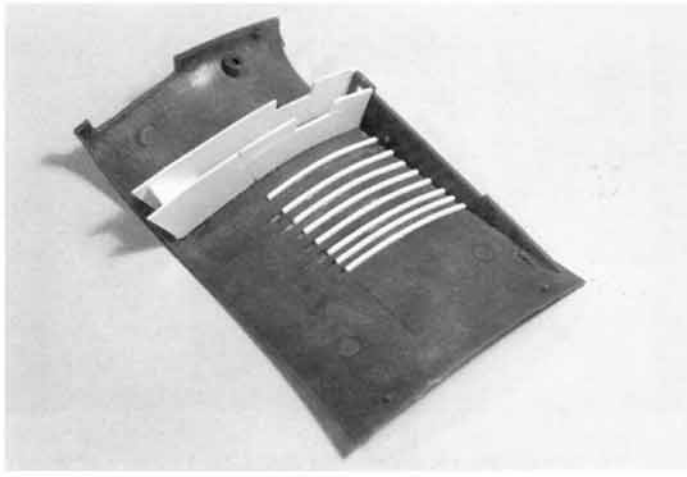


Fig. 1-19. The ribbing on the underside of the wing is easier to install before completing the boxed-in area. Note that the strips were glued in place and then cut to length.

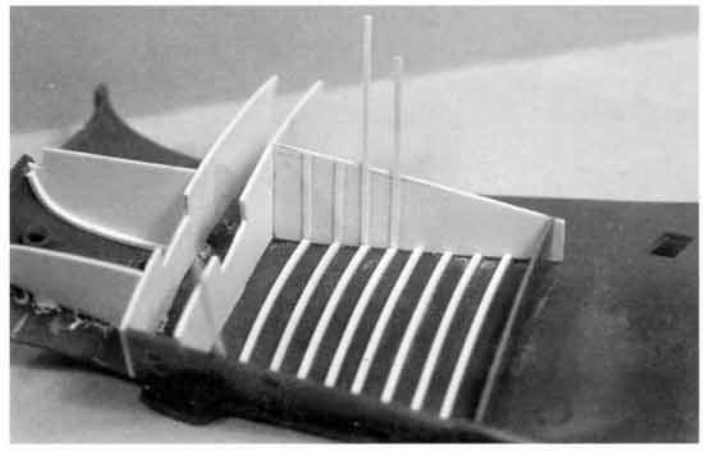


Fig. 1-20. The remaining interior sides have been installed and the interior ribbing is being attached. Use long strips, which are easy to handle, and glue into place. When the glue is dry, simply cut to the correct length.

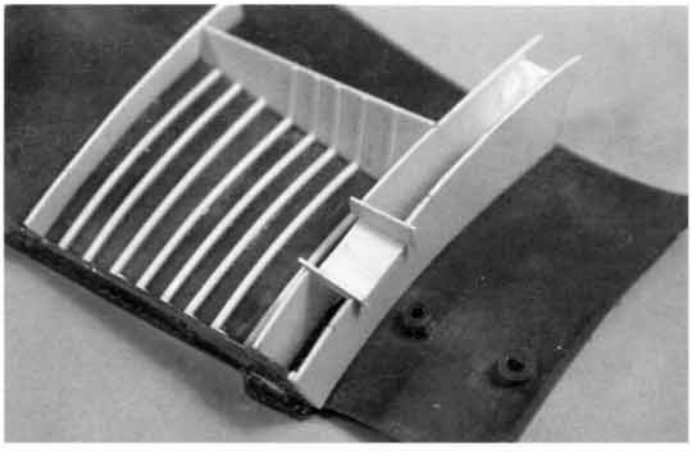


Fig. 1-21. Here the final parts are being added to the interior area.

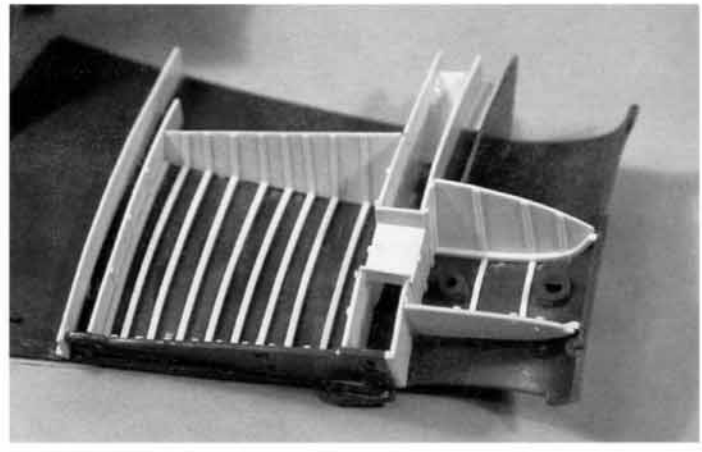


Fig. 1-22. Here the completed interior along with all its ribbing detail is finally ready.

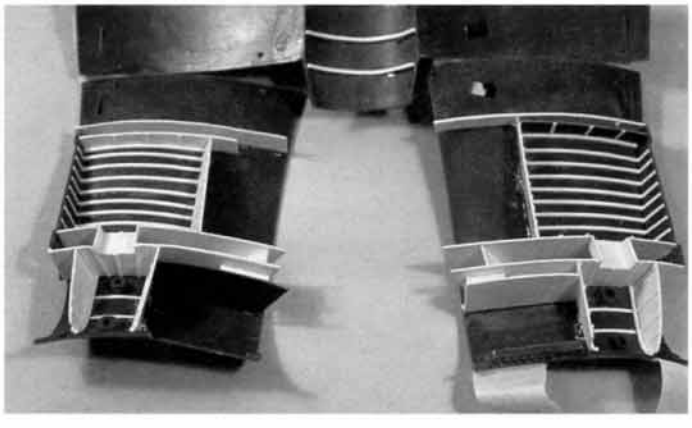


Fig. 1-23. Both sides of the interior landing gear wheel wells of this F4U Corsair are now complete. The secret to duplicating left and right sides is to work with both halves at the same time, completing each step of the construction process before proceeding to the next one. While the parts don't need to be exactly the same, by working in tandem you will get very close.

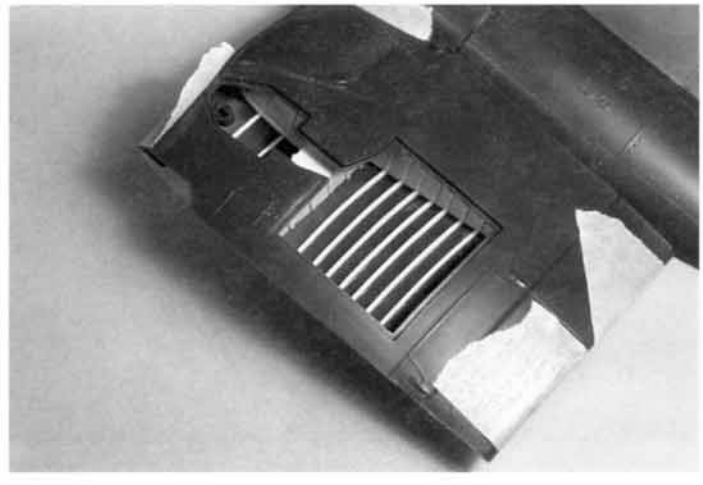


Fig. 1-24. As a final check, the completed landing gear wheel well is positioned in place to show how all the interior detail will appear.

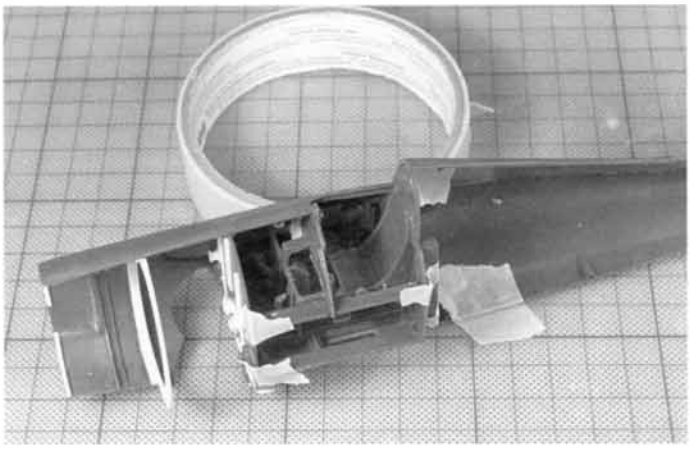


Fig. 1-25. If you plan to do a complete scratchbuild job on a cockpit, I recommend that you tape all the kit's cockpit parts in place so that you get a visual appreciation of the cockpit. This is also the time to start taking measurements of parts so that you know how much space you will have to work with.

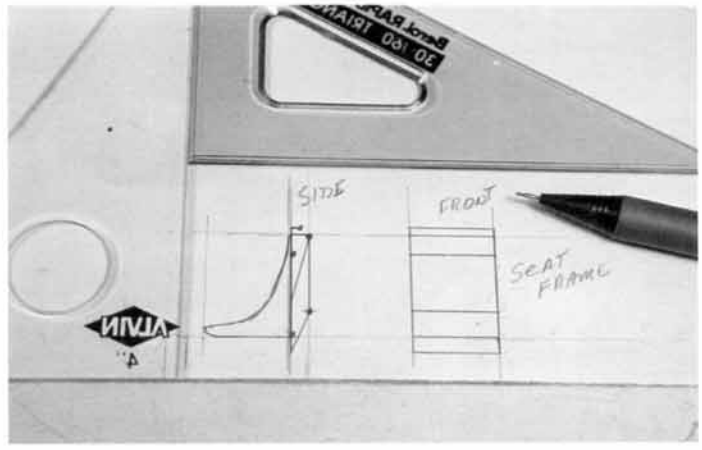



Fig. 1-26. If the aircraft has a seat frame, this is usually a good place to start when beginning a scratchbuilt interior. The first step in making a seat frame is to draw the side and front views.

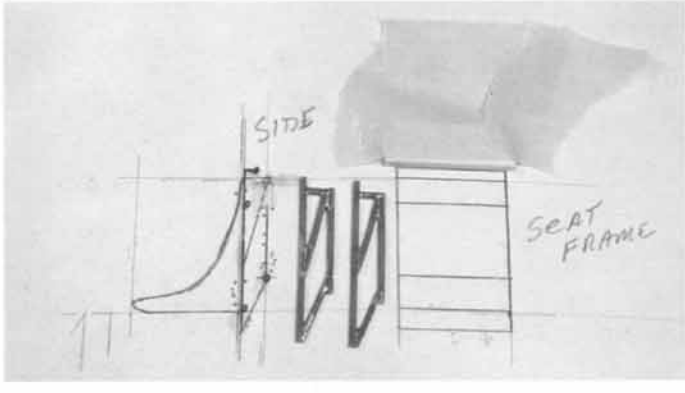



Fig. 1-27. Next set the individual parts in place on top of the drawing, using pins to hold the parts in place. As you set the part apply a tiny amount of super glue to each joint, using a thin wire as an applicator. Gluing the joints as you build up the seat frame helps the pins hold everything in place.

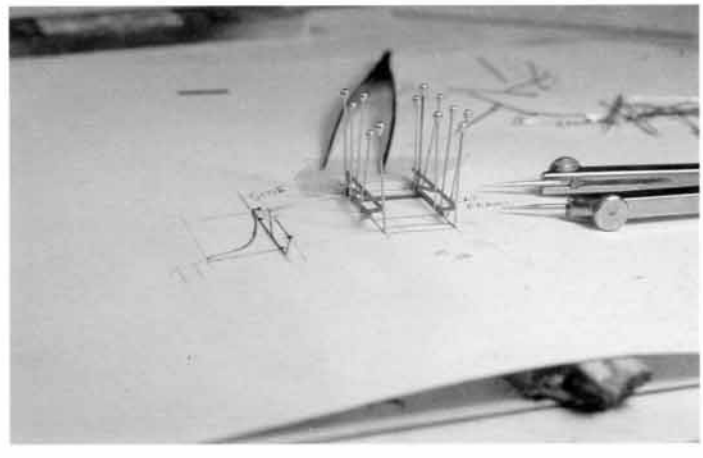


Fig. 1-28. Once the sides are completed, position them on the front view drawing. Again position the parts with pins and then glue the cross-sectional members in place.

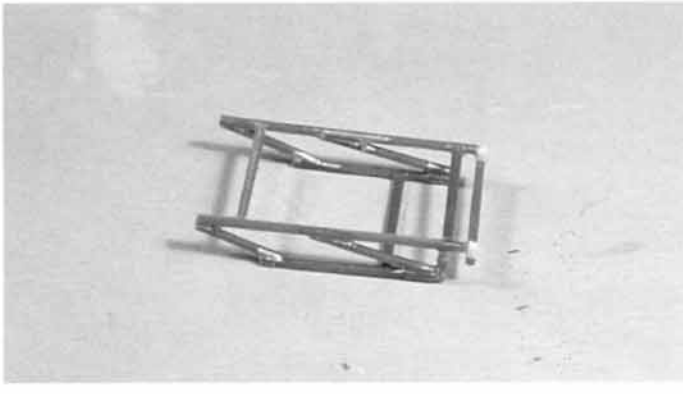


Fig. 1-29. The completed seat frame is now ready for taking measurements for the seat. Also note that Testor's silver paint was applied to the joints to ensure that the super glue was applied all the way around each connection point.

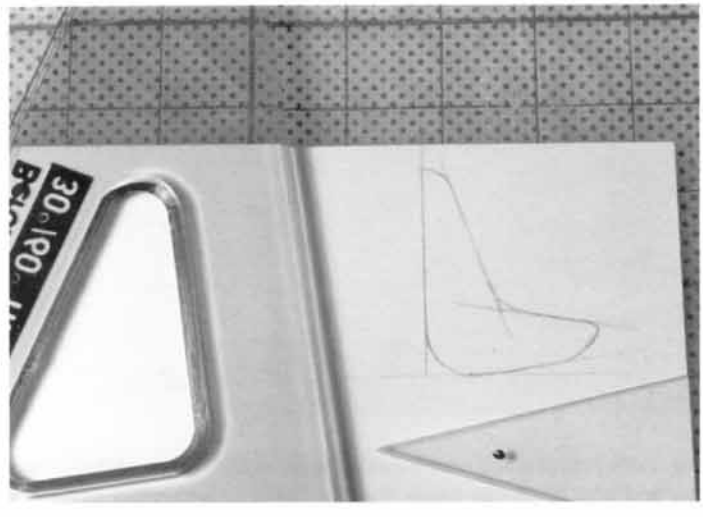


Fig. 1-30. The first step in scratchbuilding a seat is to draw one side of the seat.

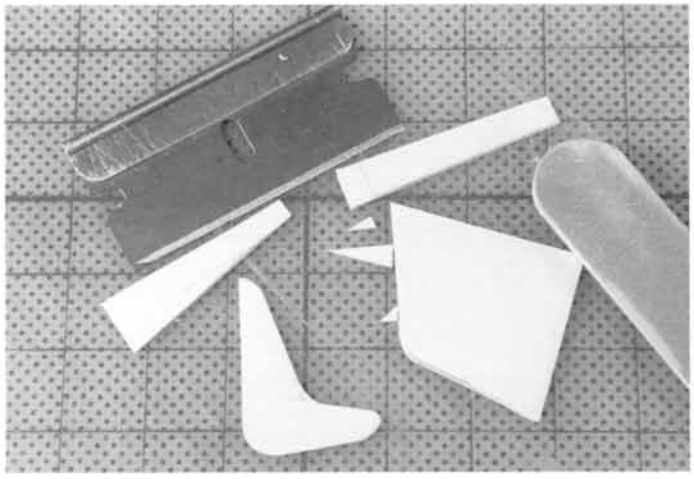


Fig. 1-31. Once you are satisfied with the shape of the seat side, carefully cut it out and shape it with a Flex-I-File sanding stick.

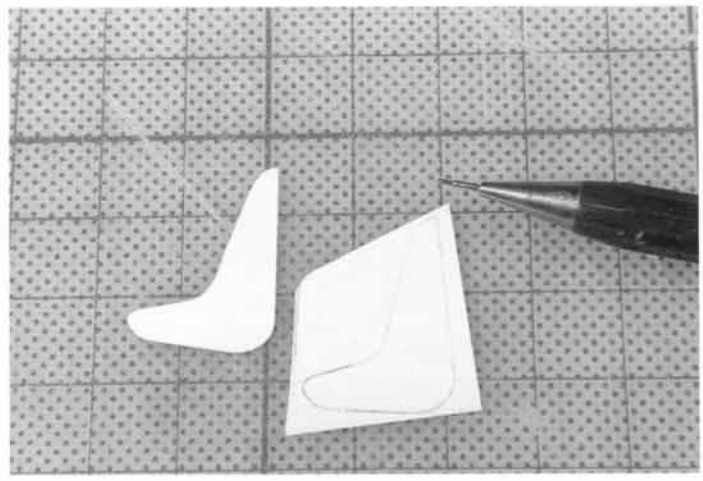


Fig. 1-32. Now use this side piece as a pattern for the other side. Trace the pattern and then cut out the part.

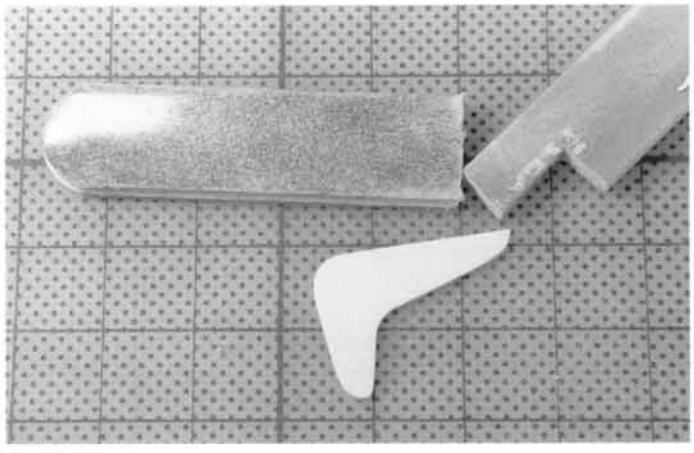


Fig. 1-33. Glue both halves together with white (Elmer's) glue, and then shape them so that they are exactly the same.

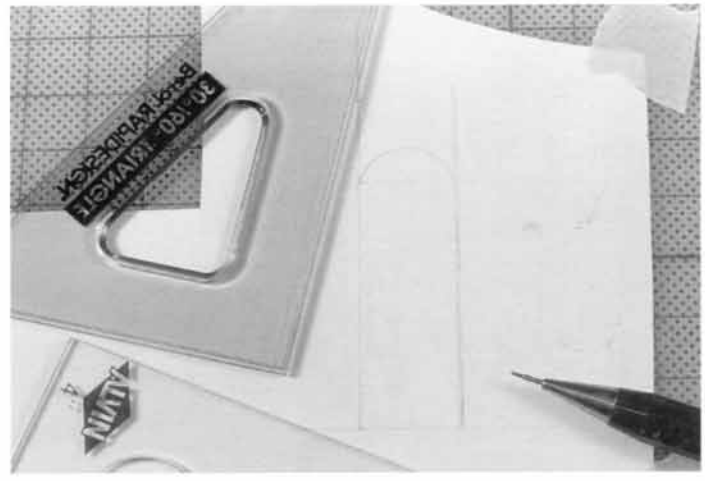


Fig. 1-34. Draw the seat backing onto sheet stock. The length of the drawing should include seat back and bottom. The sheet stock should be no more than .010 inch in thickness.

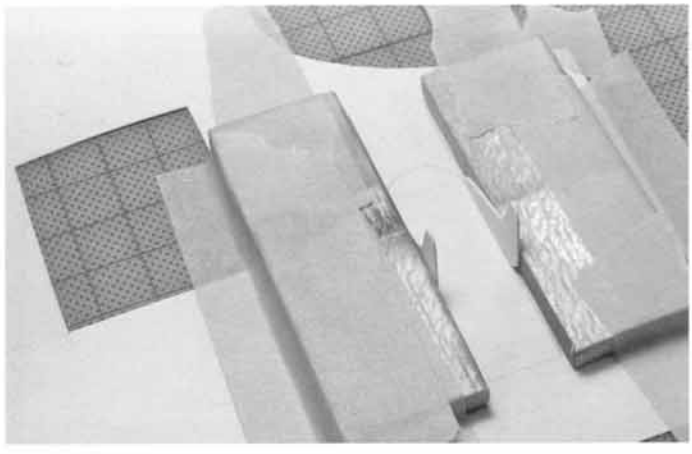


Fig. 1-35. Position strips of balsa wood along the sides of the drawing and tape them into place. You also need to secure the sheet stock that has the drawing on it. Next carefully position the sides of the seat and run a bead of super glue applied with a thin wire applicator along the edge of the joint.

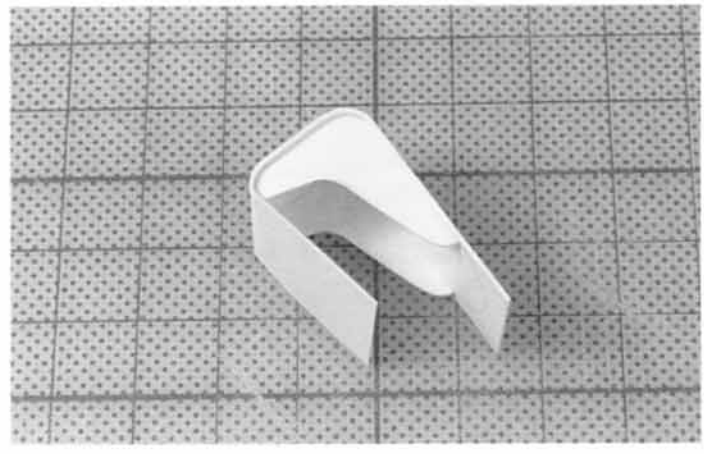


Fig. 1-36. Rough-cut the seat and then roll the plastic sheeting around the seat base, gluing it as you roll. This is why the seat backing needs to be made of thin sheet stock.

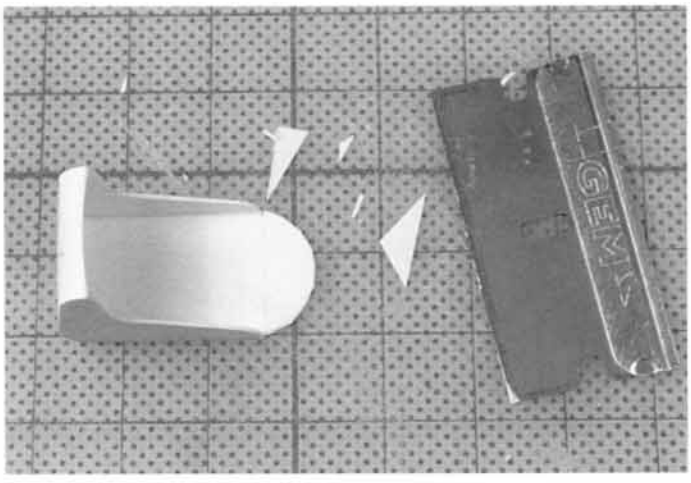


Fig. 1-37. Run beads of super glue along all the interior and exterior joints and then trim off the excess plastic.

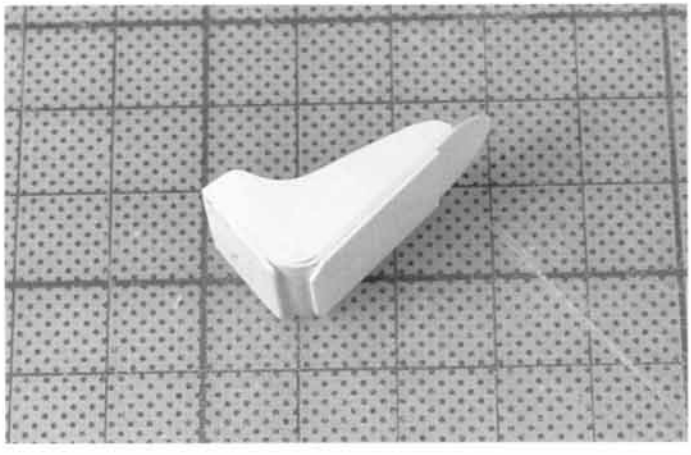


Fig. 1-39. To reinforce the thin plastic sheeting and to represent bulletproof steel plating, glue thicker sections of sheet stock in place on the back and bottom of the seat.

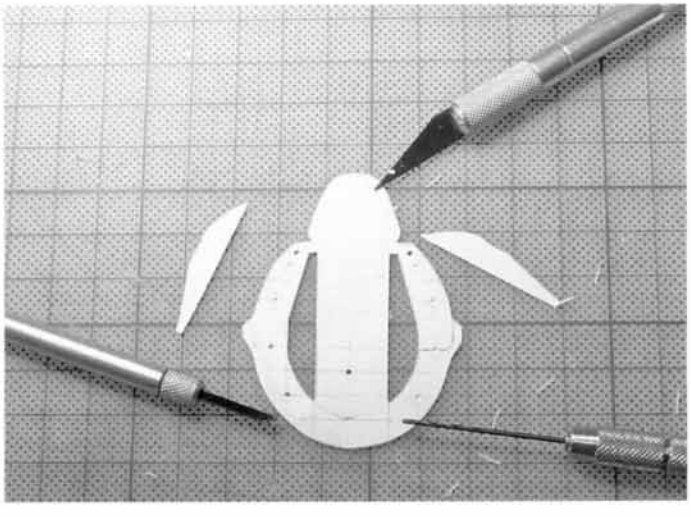


Fig. 1-41. Next the interior openings of the rear bulkhead were drawn and then cut out.

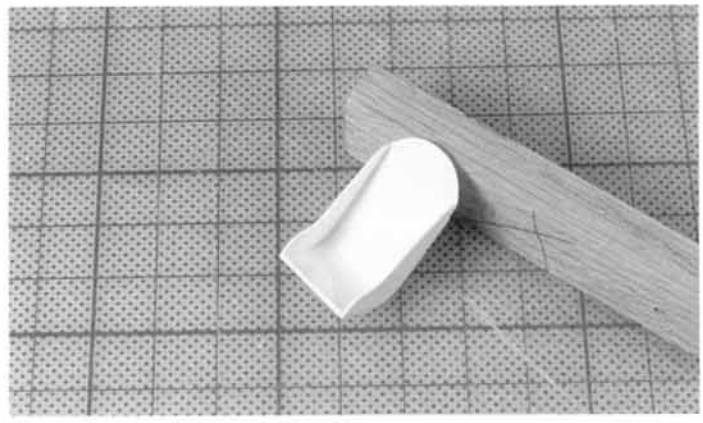


Fig. 1-38. Carefully sand the sides to smooth out the plastic joints by running the sides along stationary pieces of 400- to 600-grit sandpaper.

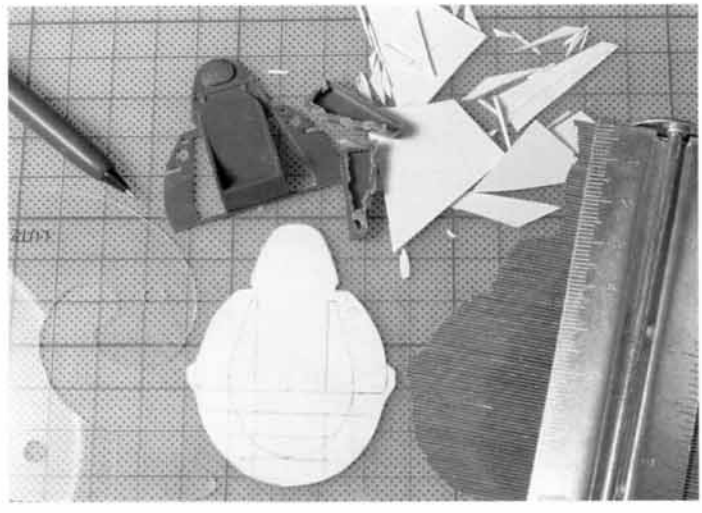


Fig. 1-40. Scratchbuilding the rear cockpit bulkhead is the first big step in building up the rest of the interior. Here a contour gauge, the kit's bulkhead, and a French curve were all used to shape the part. The outer edges of the shape were also form-fit into the fuselage so that it would fit very tightly in place.

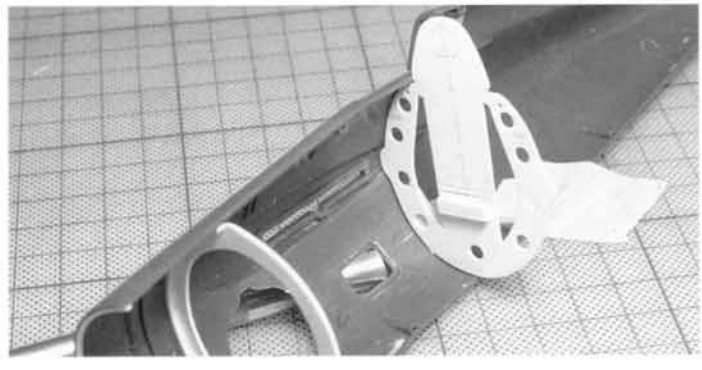


Fig. 1-42. Here the round openings in the bulkhead have been added. To ensure that they are symmetric on both sides, carefully measure and draw the locations of the center points of these openings.

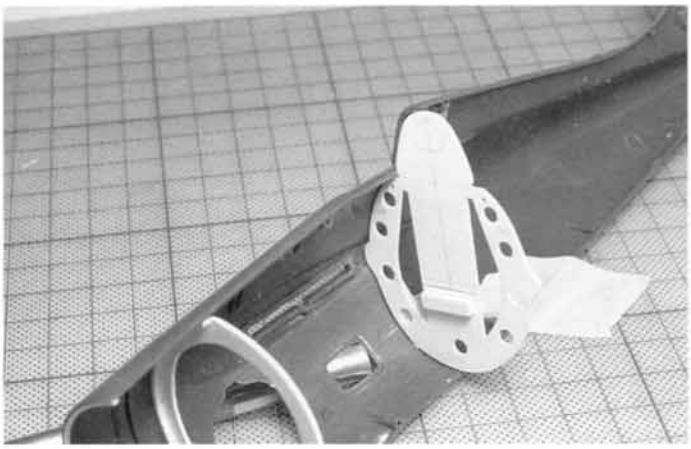


Fig. 1-43. The new rear bulkhead is given a final fit check before proceeding to the next step.

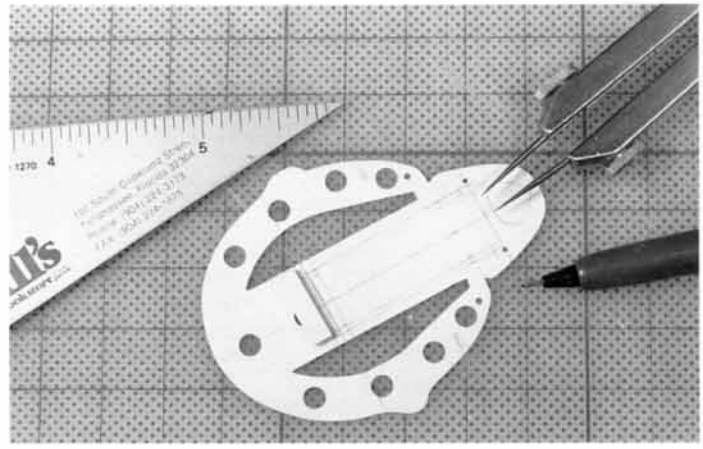


Fig. 1-44. Drawing the locations of the seat frame bars and the head cushion ensures that all these parts will fit into place correctly.

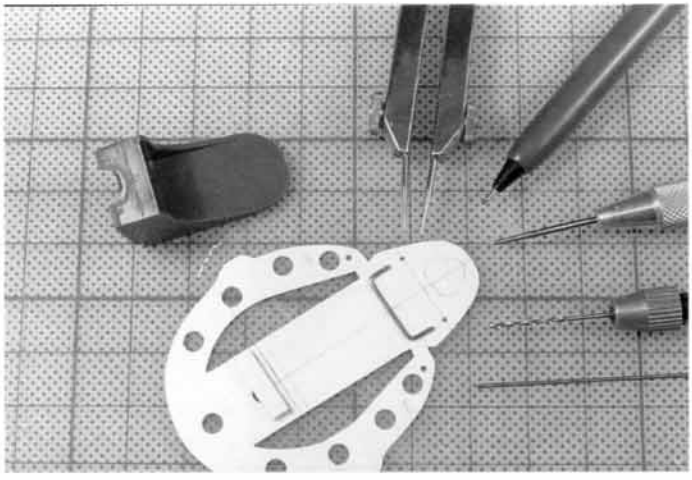


Fig. 1-45. Holes are drilled to accept the seat frame bars, and the brass wire is cut to length and bent into the correct shape.

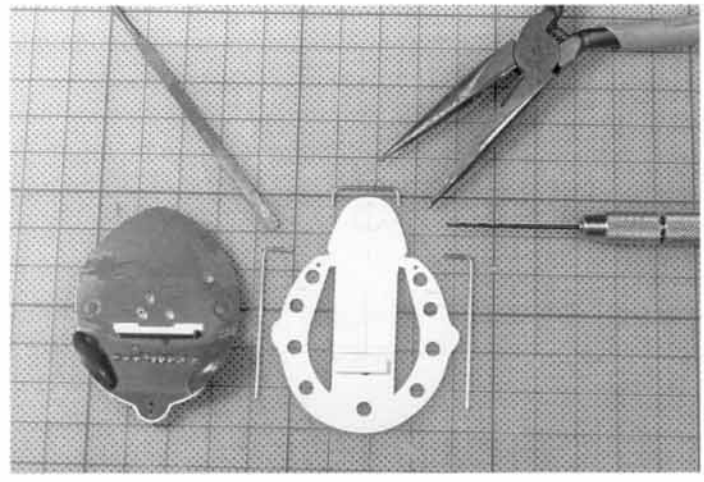


Fig. 1-46. The seat frame bars are all bent to shape and are ready to be installed at the appropriate time in the assembly sequence.

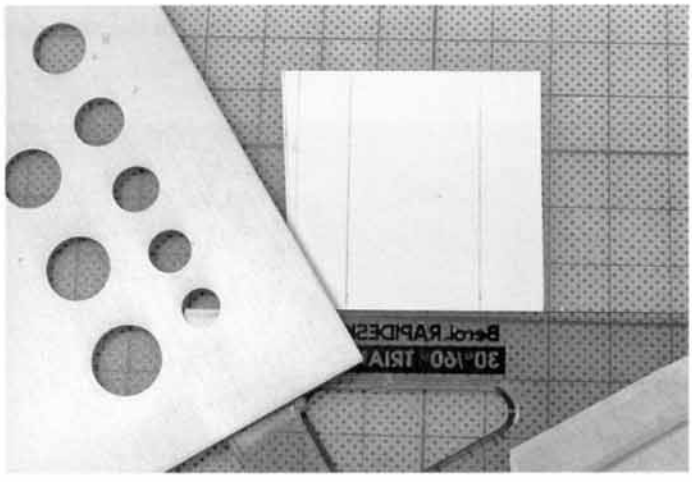


Fig. 1-47. Once the rear bulkhead is complete the next step is to make the floor. Securing a piece of sheet stock to your cutting board and then setting up small triangles to help you draw straight lines at the correct angles will always guarantee you a good part.

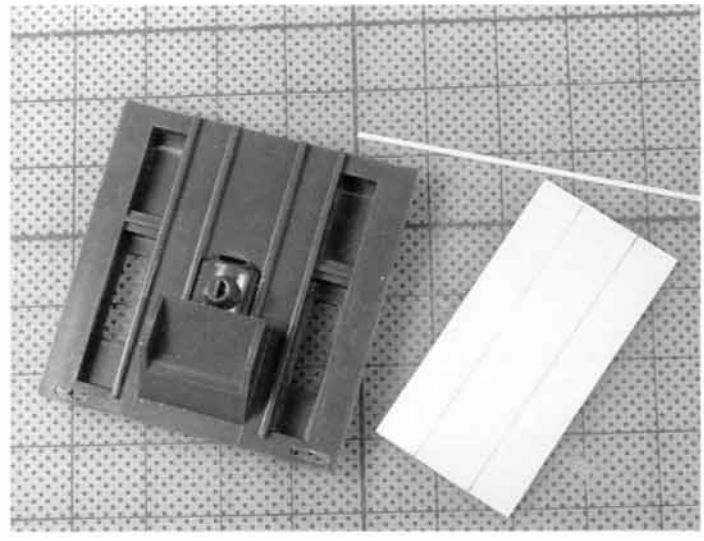


Fig. 1-48. Using the kit's flooring to help design a new one helps make the job easier.

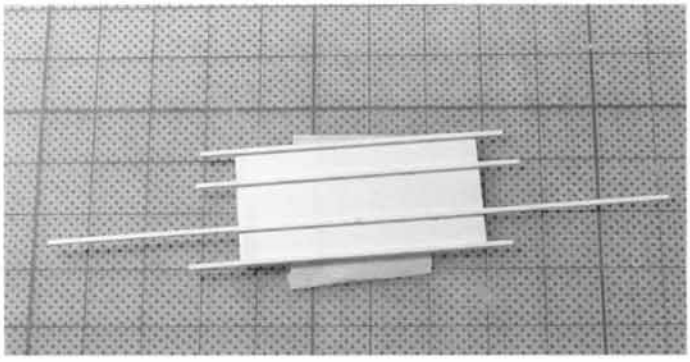


Fig. 1-49. The floor's raised framing is easily added using extra long strips of strip stock. This allows you to easily position the strips in place along predrawn lines.

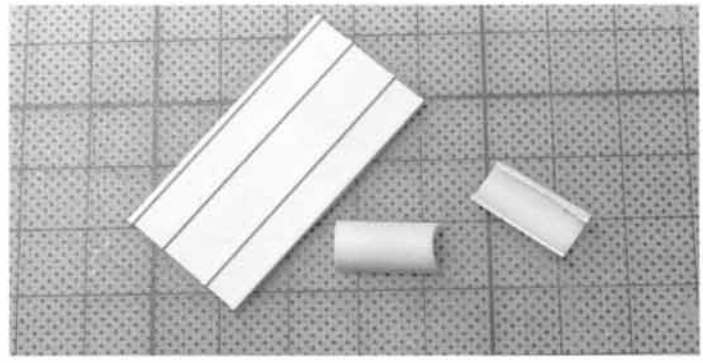


Fig. 1-50. Many control stick bases had cone-shaped covers to protect the mechanisms that connected to them. To reproduce this simply cut tube stock in half.

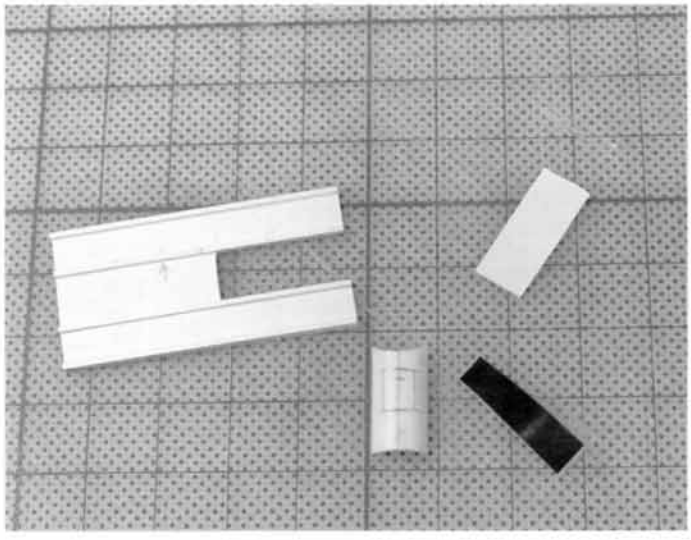


Fig. 1-51. To reproduce the opening that the control stick sits in draw the outline of the hole that you need using a small length of labeling tape.

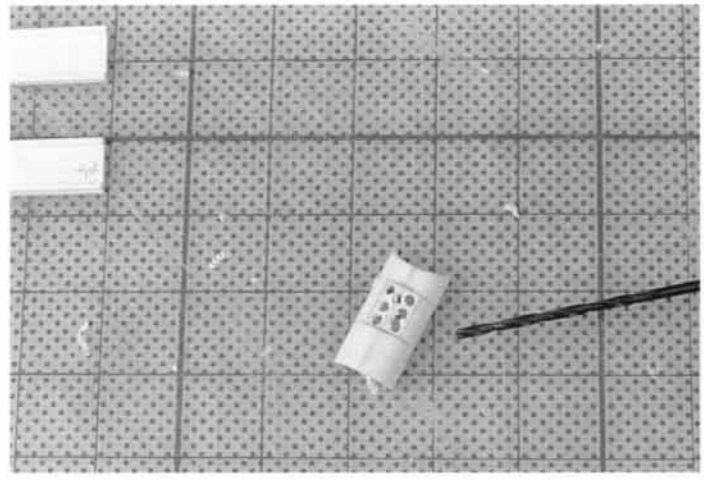


Fig. 1-52. Next drill small pilot holes inside the area to be removed and then cut and shape the remaining plastic using the tip of a no. 11 X-acto blade.

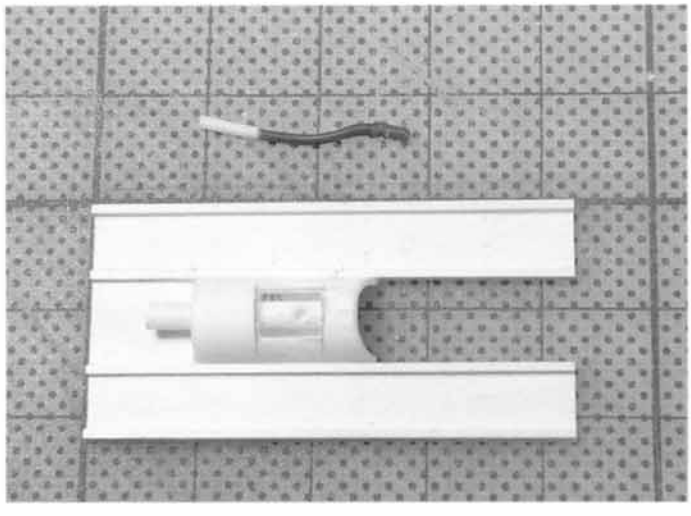


Fig. 1-53. Adding rod stock to lengthen the kit's control stick saved time instead of scratchbuilding a new one.

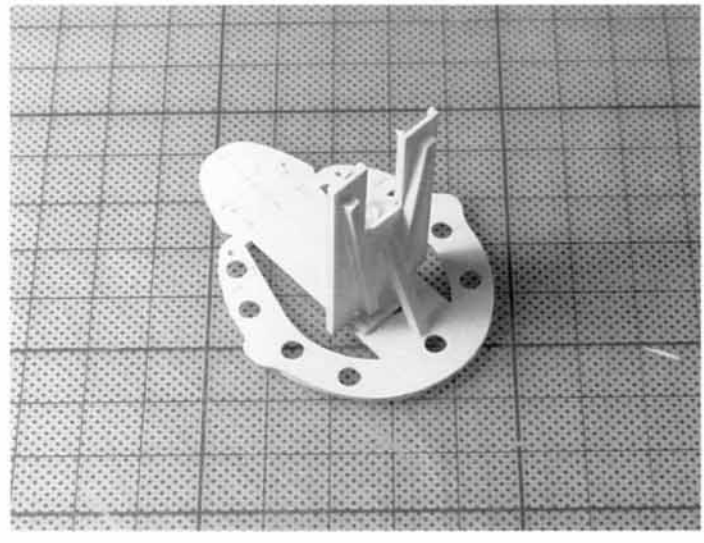


Fig. 1-54. The flooring is glued to the rear bulkhead and reinforcing strips are added to the underside of the floor where they cannot be seen.

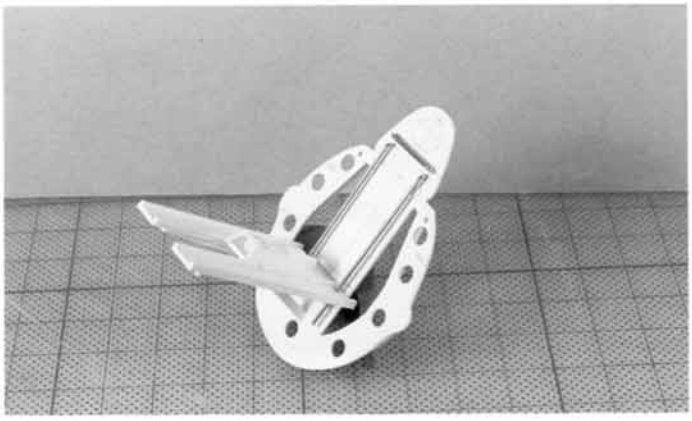


Fig. 1-55. The seat tube framing is getting one last fit check. At this point the cockpit interior is starting to take shape.

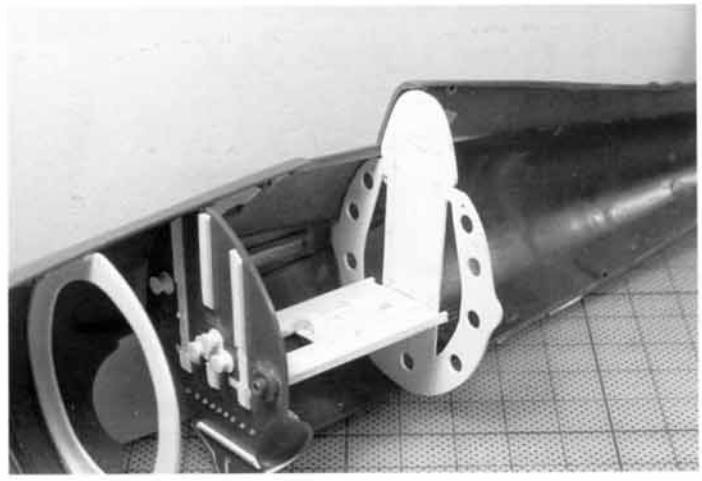


Fig. 1-56. Here the newly scratchbuilt part is positioned inside the fuselage along with the modified forward kit-supplied bulkhead. The two parts were glued together and then removed from the fuselage so that the remaining cockpit parts could be scratchbuilt and added.

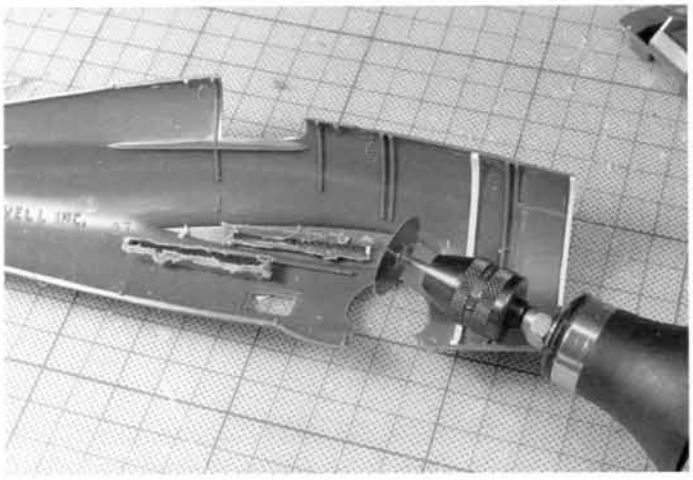


Fig. 1-57. Scratchbuilding cockpits typically calls for some major surgery to the interior areas so that all the scratchbuilt parts will fit into place. Here a motor tool with a circular saw attached has removed a large interior section that would have been very time-consuming to do by hand.

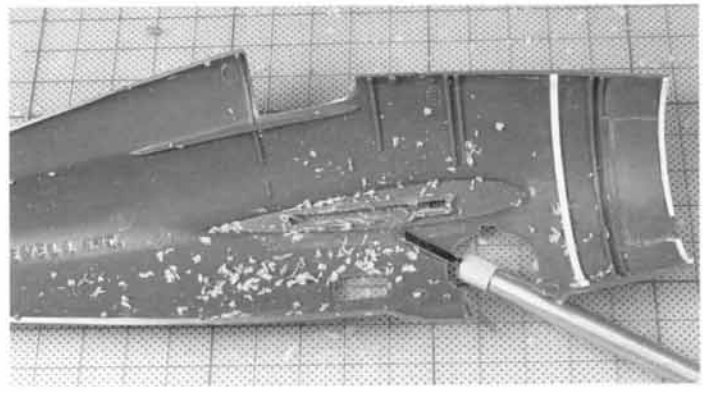


Fig. 1-58. The remaining plastic is scraped flat using a small stencil X-acto blade.

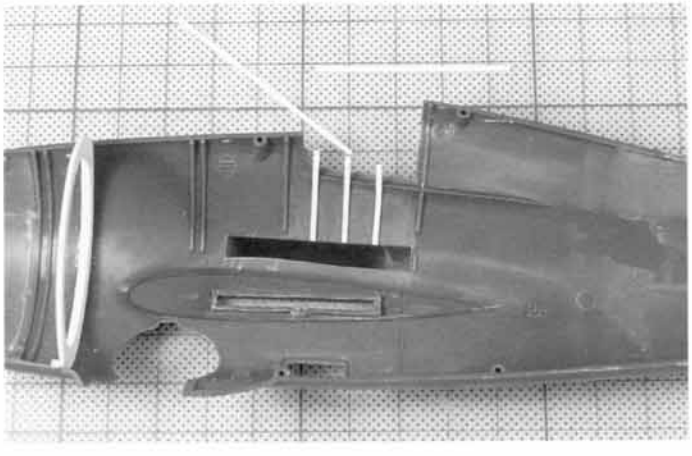


Fig. 1-59. Interior ribbing also needs to be added and here again using small thin strips that are oversize in length helps locate them correctly.

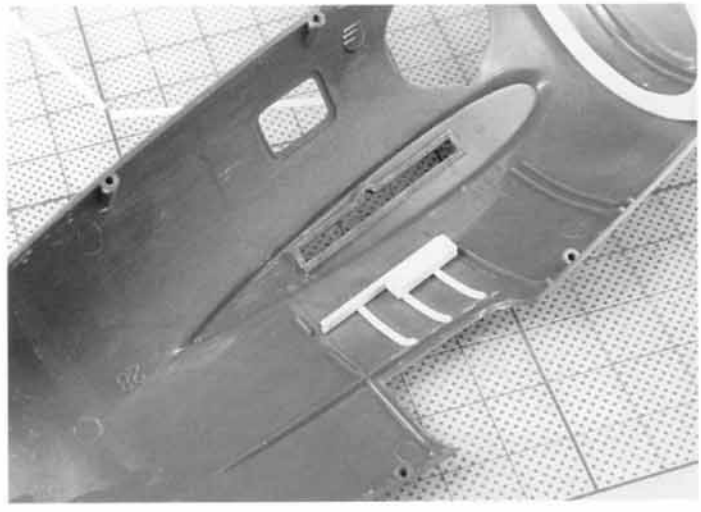


Fig. 1-60. Once the framing is cut to shape, additional lengths of strip stock are added to start forming the interior shapes.

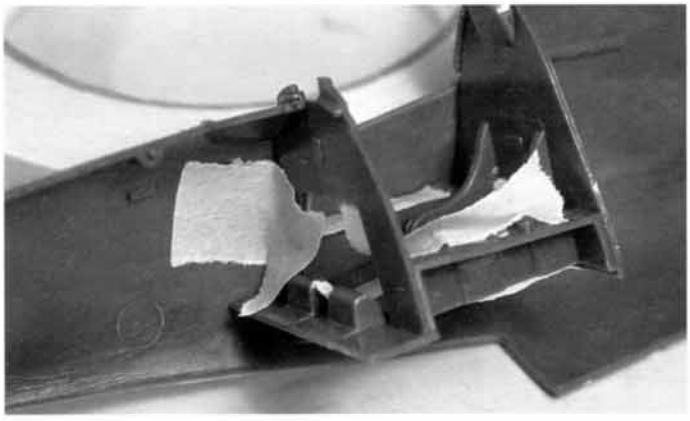


Fig. 1-61. Before we go on to scratchbuilding other interior parts, let's review how to set up interior framing. When adding interior ribbing and other shapes you need to draw the free space areas onto the side of the fuselage where strips will go. To do this you need to locate the cockpit parts in place.

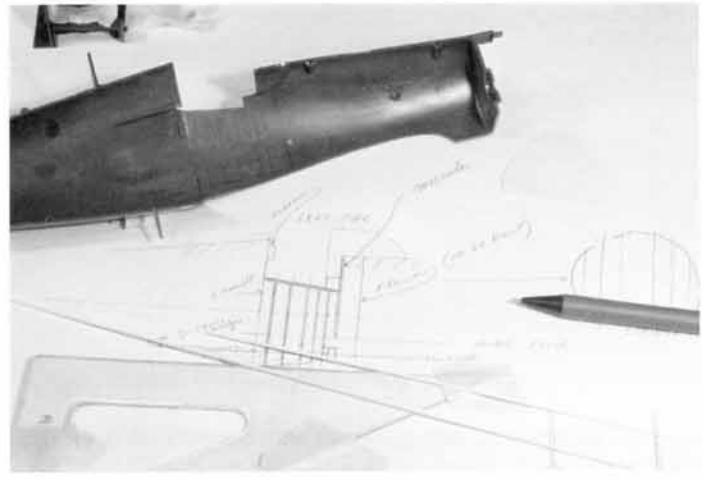


Fig. 1-62. Draw an interior picture of the cockpit and then draw in the locations of the framing.

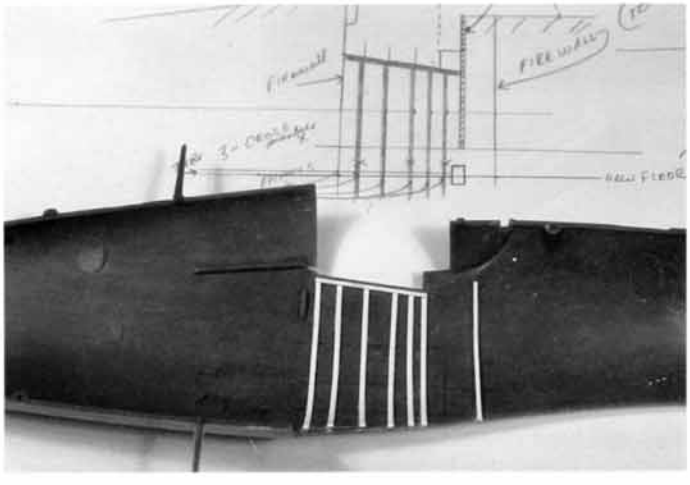


Fig. 1-63. Use the picture that you drew to locate the framing and draw these lines onto the inside area of the fuselage sides, using labeling tape to set the initial lines.

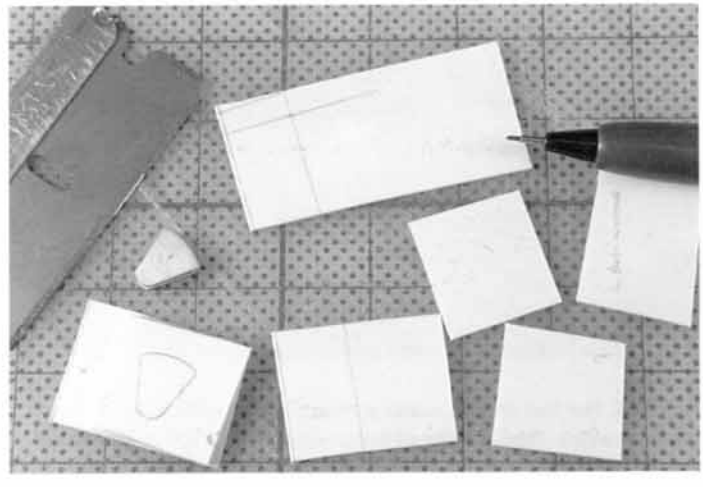


Fig. 1-64. The first step in making a throttle quadrant is to get the correct thickness. Using super glue, fasten layers of sheet plastic together to achieve the thickness that you need.

Fig. 1-65. Rough-cut the shape of the throttle quadrant and then sand it to the correct shape.

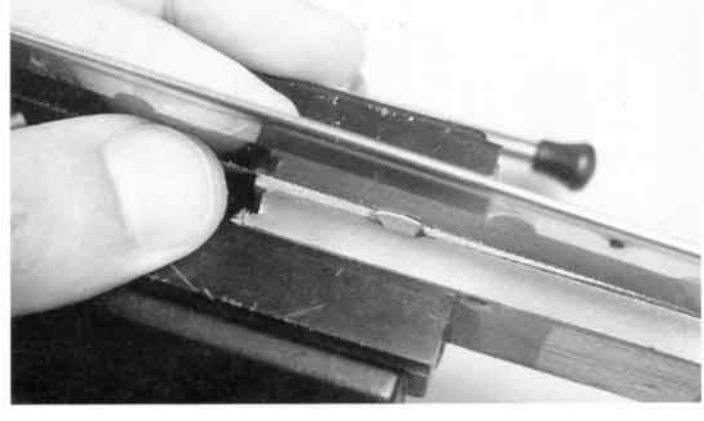


Fig. 1-66. The next step is to cut channels into the top of the throttle quadrant to accept the levers. To do this, sandwich the part between two strips of balsa wood, install it in a vise, and then use a razor saw to cut the channels.

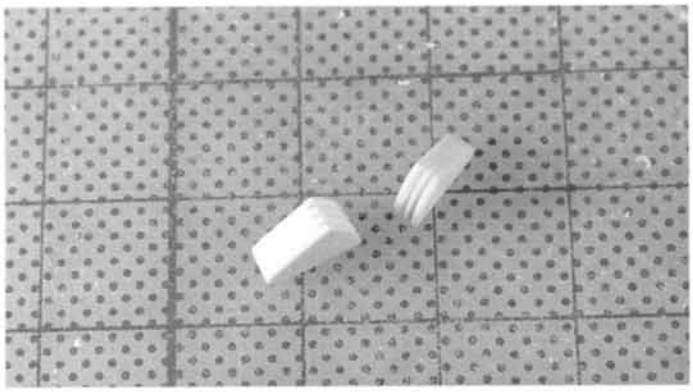


Fig. 1-67. Here, two throttle quadrants with channels cut in them are ready for the next step, which is to make the throttle handles and levers.

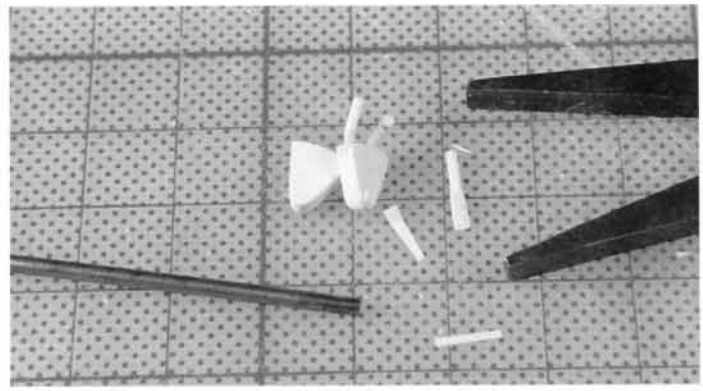


Fig. 1-68. Use combinations of rod and strip plastic to make the levers. Flat-nose pliers are great for flattening out plastic rod, and white glue applied to the tips of the levers will simulate levers that have balls for tips.

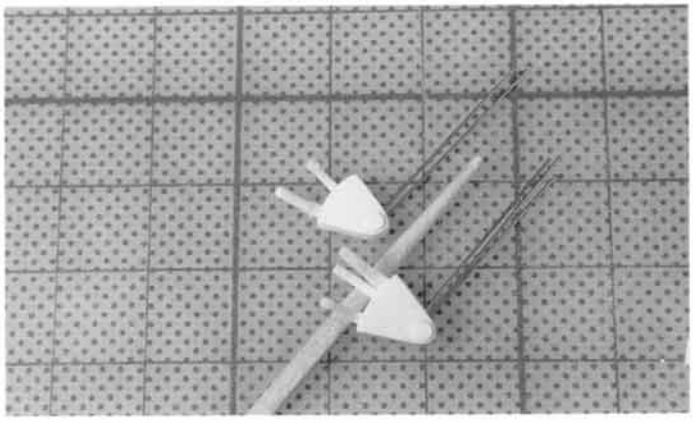


Fig. 1-69. The last step in making throttle quadrants is to add the control cables. Thin lengths of brass wire work great to simulate these stiff cables. Simply drill small holes into the sides of the quadrant and then glue the brass wire into place. Cut the brass wire in long lengths so that you can form-fit them into the fuselage when it's time to glue them into place.

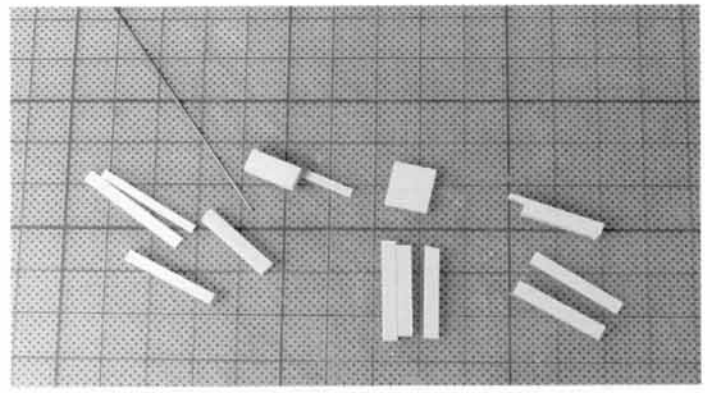


Fig. 1-70. The next step in scratchbuilding is to build up the switch, radio, and electrical boxes as well as adding parts such as switches, dials, and hand cranks. I assemble pieces of various sizes and lengths of plastic strip to begin this process. These bits and pieces of plastic will soon become shapes that will form the left and right side cockpit details.

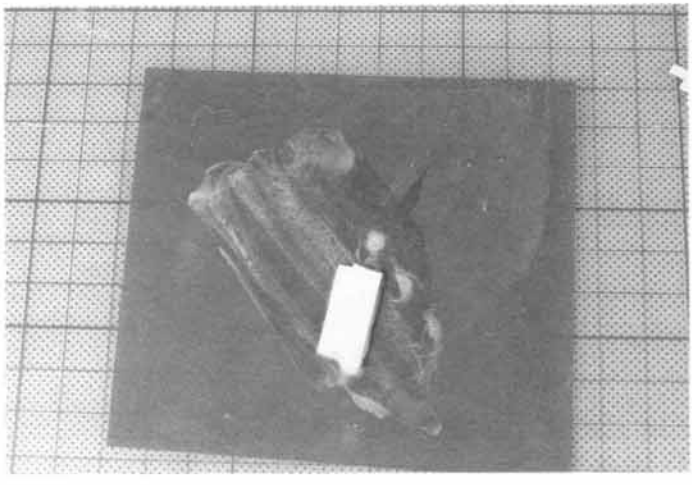


Fig. 1-71. Glue three small lengths of plastic together and smooth the sides by running the piece across sandpaper.

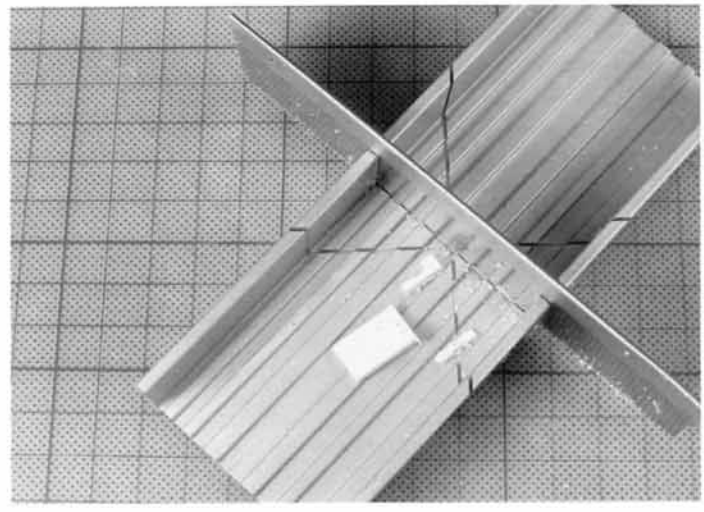


Fig. 1-72. The next step is to cut the newly formed shape to size. To do this use a miter box and a razor saw.

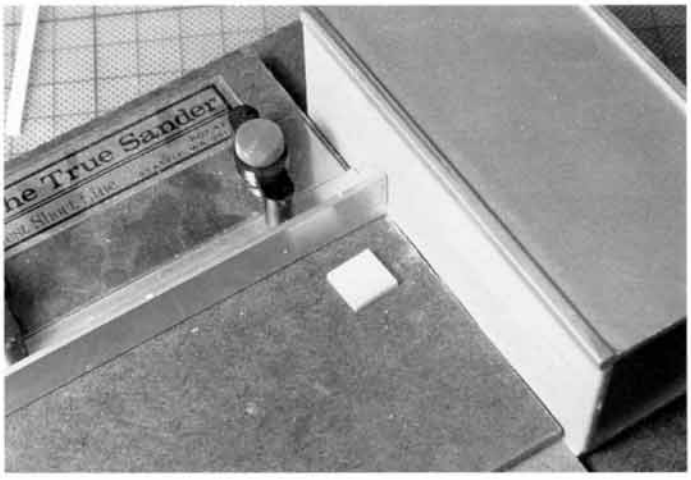



Fig. 1-73. To ensure that the edges are square use a Northline true sander to lightly sand the edges. This handy little device is used by the model railroad community and it works well for scratchbuilding aircraft parts.

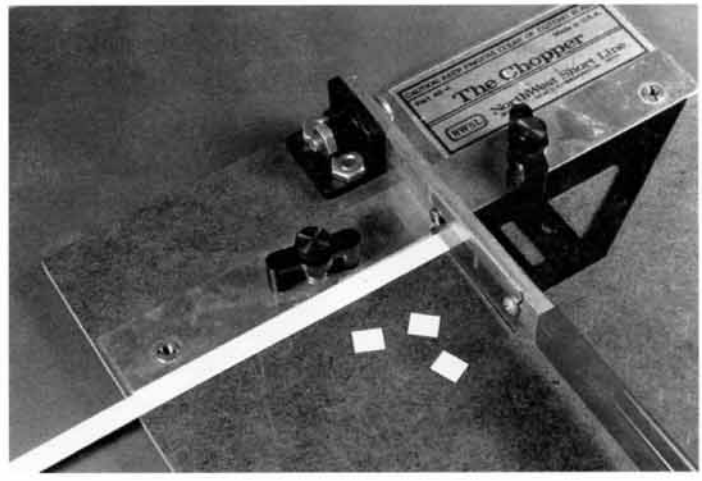



Fig. 1-74. Another great model railroader's tool is the Northline true chopper. This gem will duplicate shapes and angles and is a must for scratchbuilding.

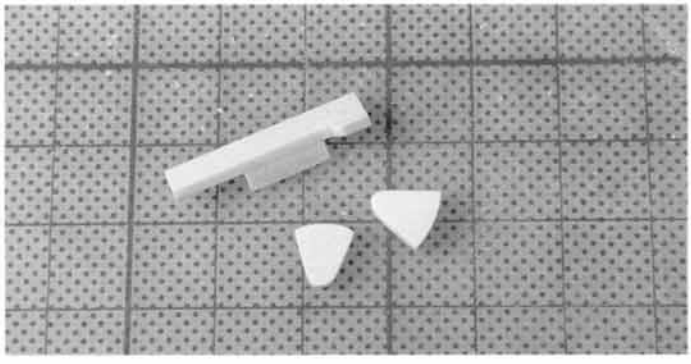


Fig. 1-75. The left side console has been shaped using three different sizes of plastic stock, the larger of which is a small length of Evergreen channel stock. This is also the side where the throttle quadrants will be attached.

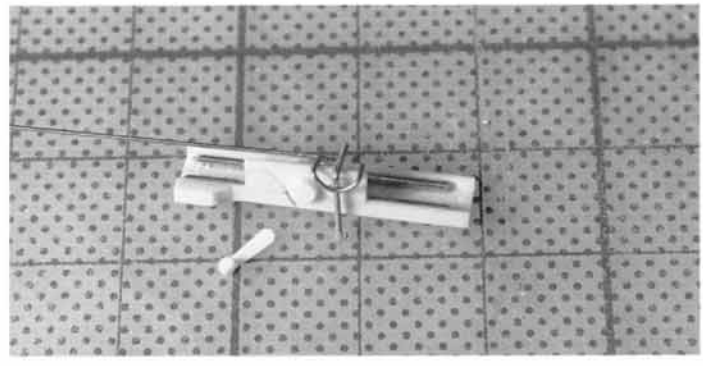


Fig. 1-76. Brass wire has been added to the underside of the left console to strengthen it, and small thin lengths of brass wire have been shaped and attached. A dial, as well as the handle tip on the crank arm, were made using Waldron's punch tool.

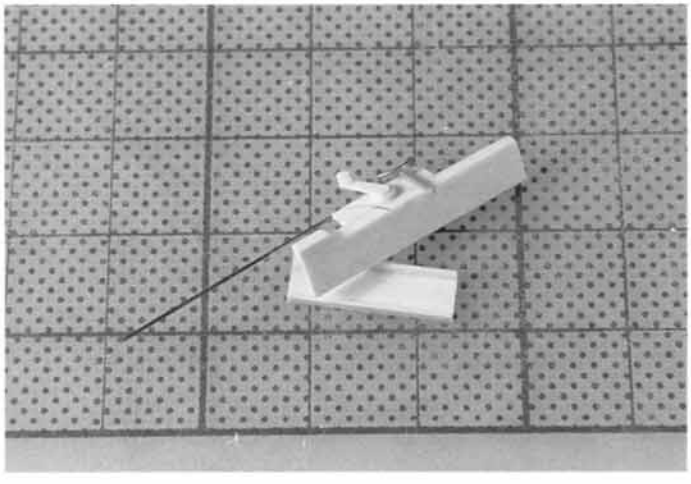


Fig. 1-77. Here the crank arm has been attached and a length of brass wire has been added to represent the cable attachment for the lever arm.

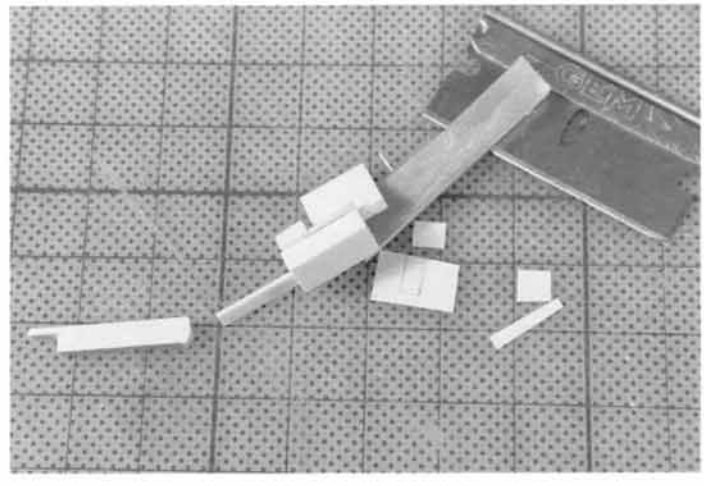


Fig. 1-78. The right side console and radio and switch boxes start out as simple box shapes glued to a length of strip stock.

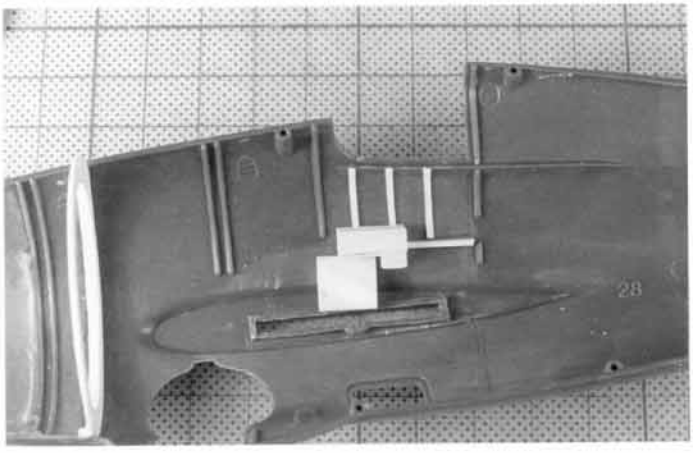


Fig. 1-79. As you are building up these parts always check your work to ensure that it will fit into its location. This is a trial and error process and you may have to modify the part several times to get it just right.

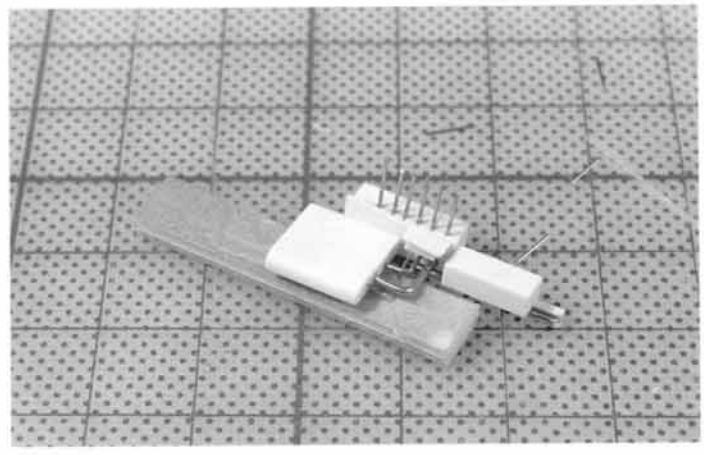


Fig. 1-80. At this point several different diameters of brass wire have been added to represent cabling and plumbing. Lengths of thin brass wire have been glued in place at the location of the switch banks.

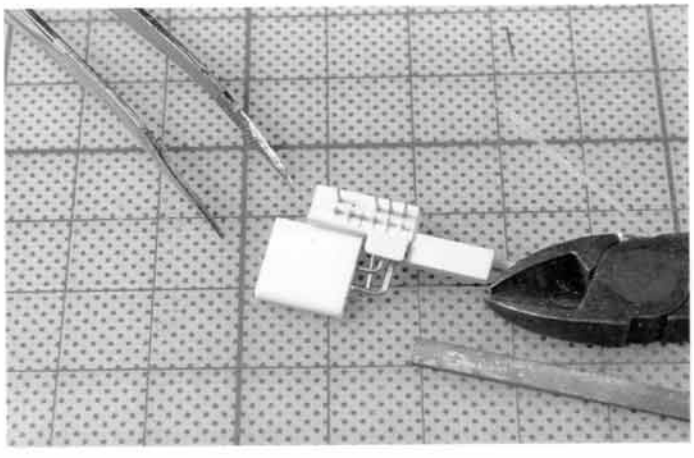


Fig. 1-81. The thin brass lengths are then cut to length using a sharp set of small wire cutters.

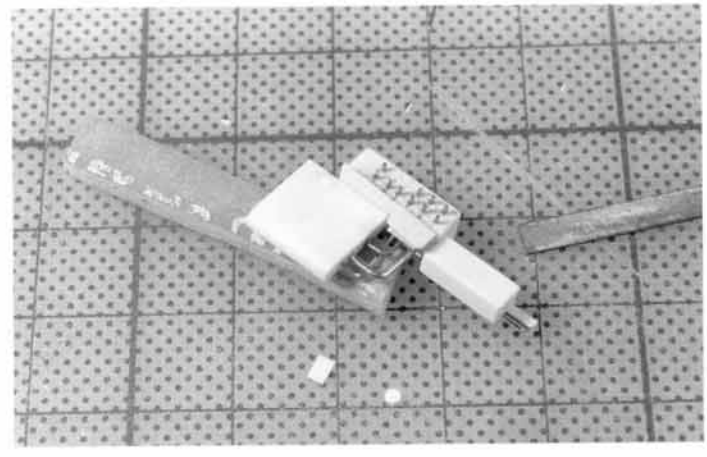


Fig. 1-82. Once all the brass wire lengths are cut to size use a micro file to give the tips of the wire a flat look.

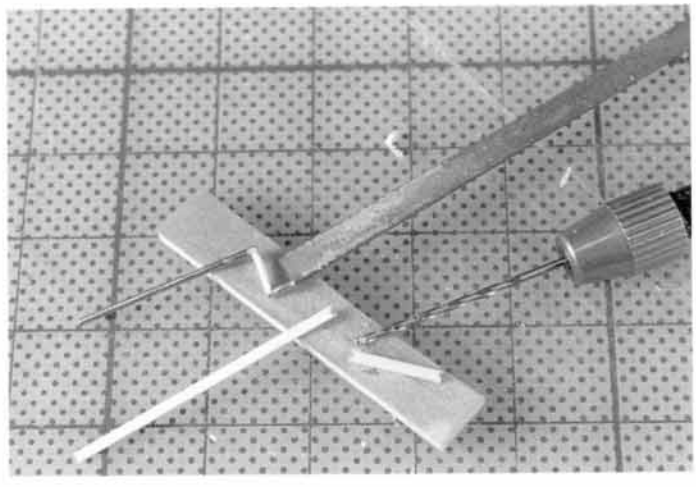


Fig. 1-83. Making a large crank handle is as easy as it appears. The trick is to drill into the ends of the arm so that the brass wire will seat into the plastic, forming a good strong bond.

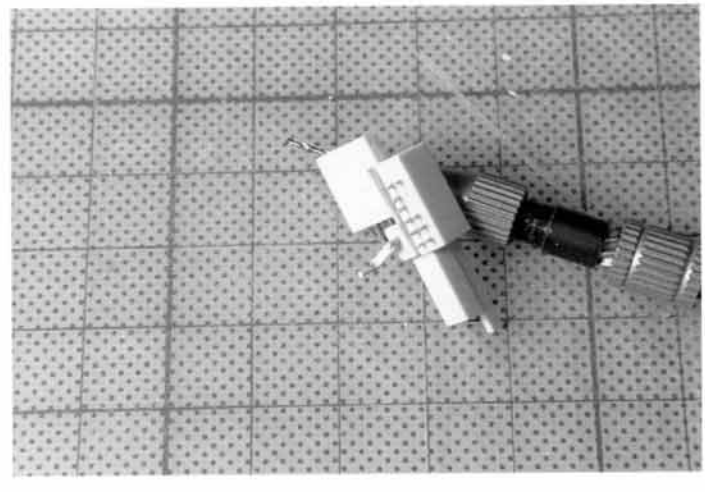


Fig. 1-84. The large crank has been installed on the right side console and the part is now ready for installation between the rear and forward bulkheads.

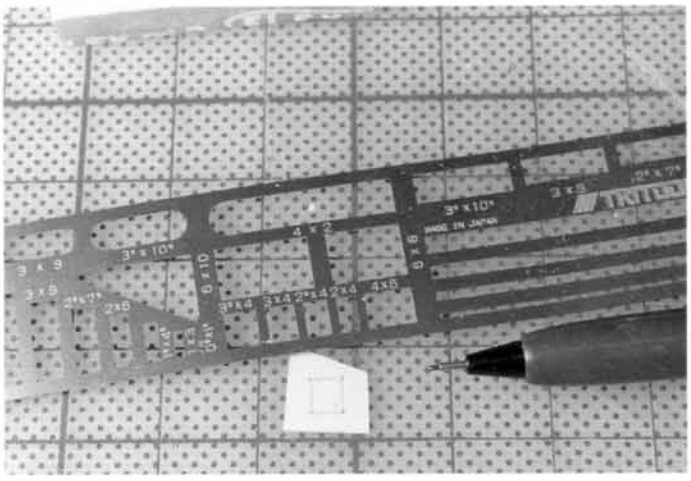


Fig. 1-85. To make small raised surface shapes use your scribing template to draw these outlines and then cut them out.

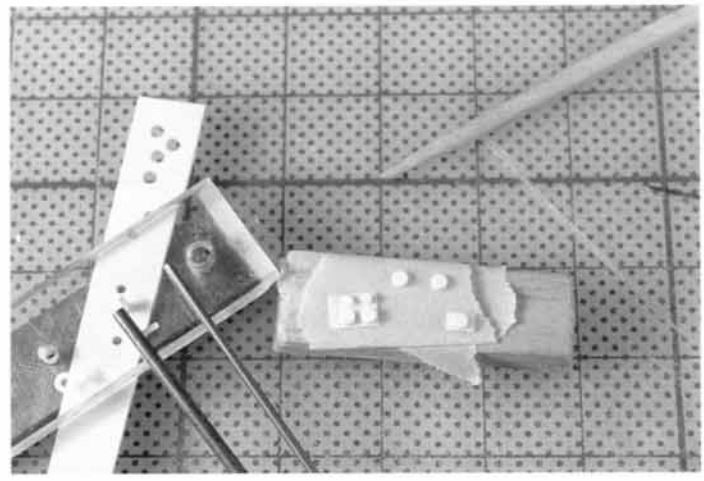


Fig. 1-86. Dials can easily be made using Waldron's punch tool. The edges of these small disks will have small burrs; to get the disks to sit flat, run them across a stationary piece of 600-grit sandpaper with your finger.

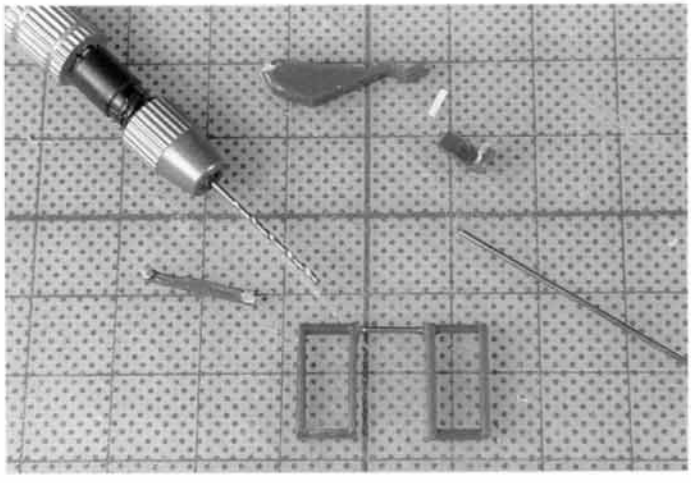


Fig. 1-87. Wherever possible I like to use kit parts in my scratchbuilding efforts. Here the rudder pedal frames from the kit have been modified and a length of brass wire has been glued between them.

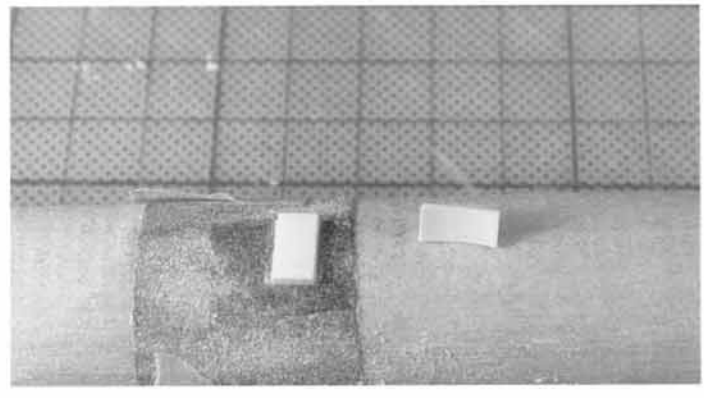


Fig. 1-88. Making curved rudder pedal shapes is easy if you have different diameter wood dowels and some sandpaper.

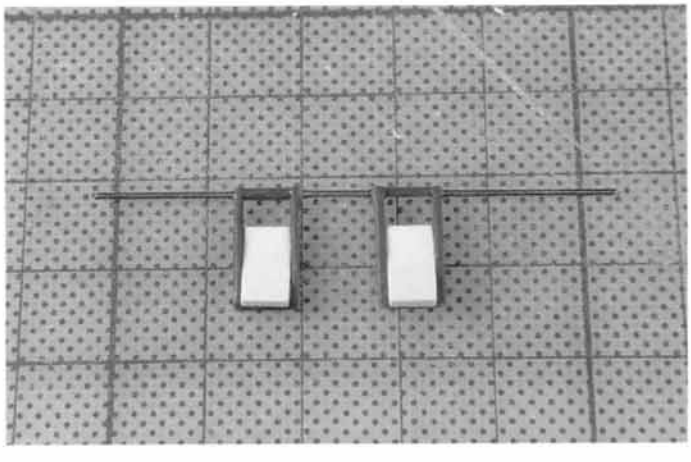


Fig. 1-89. The new rudder pedals have been installed into the pedal frames and wire lengths have also been added to the outer ends. The long length of wire will help set the part in place.

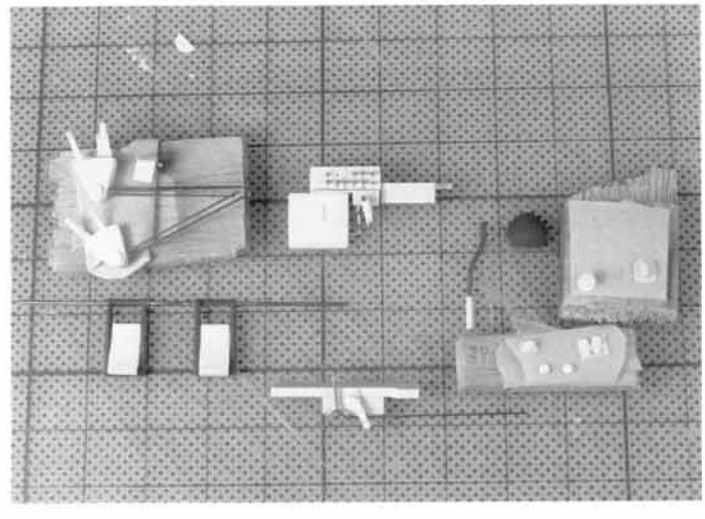


Fig. 1-90. All the subassemblies for this scratchbuilding project are now complete, and all that is left is to assemble them and also to make the console.

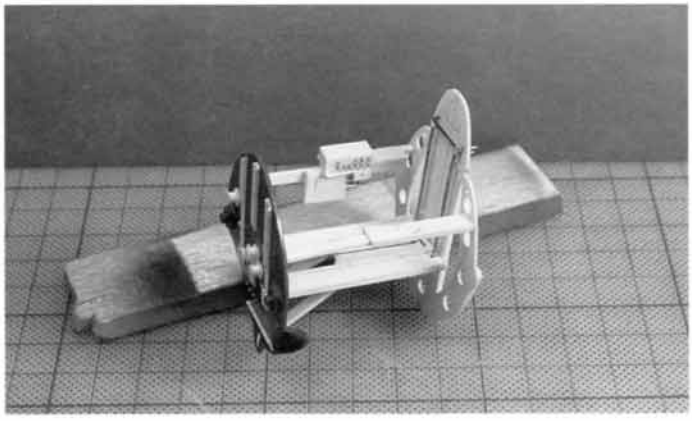


Fig. 1-91. The right side console has been attached between the rear and forward bulkheads and the left side is next. To set the right and left sides correctly, the entire section is set into the left and then the right fuselage halves so that the parts can be positioned correctly.

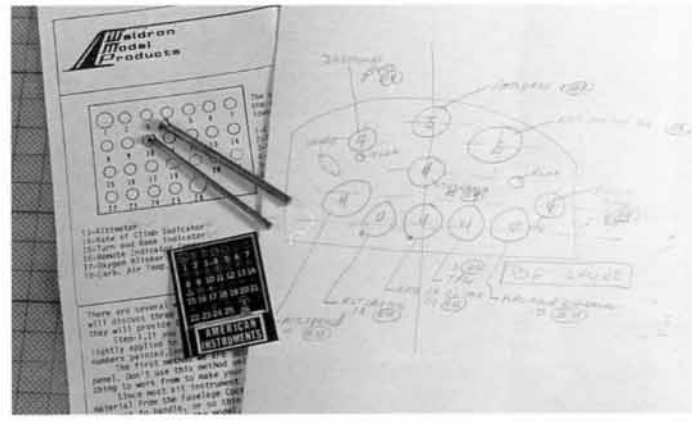



Fig. 1-92. The first step in making the console is to draw a picture of the console and identify all the instruments that you will need. For this console I used Waldron's instrument faces, but Reheat Models dial decals also work great for these types of scratch-building efforts.

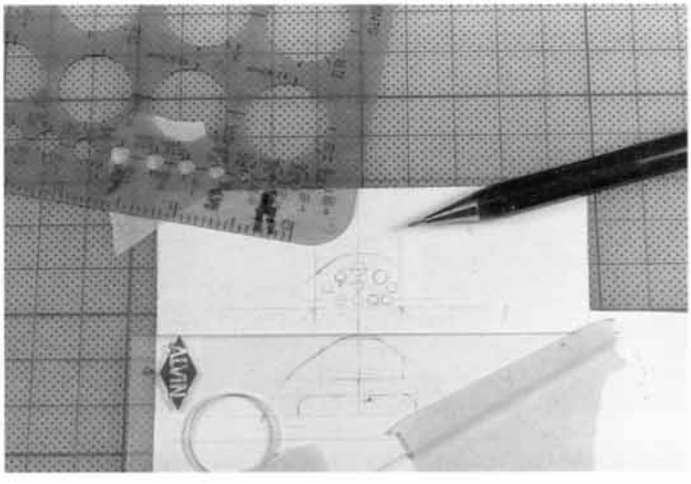


Fig. 1-93. The next step is to draw the console shapes onto sheet plastic and then start locating the dial faces on the console.

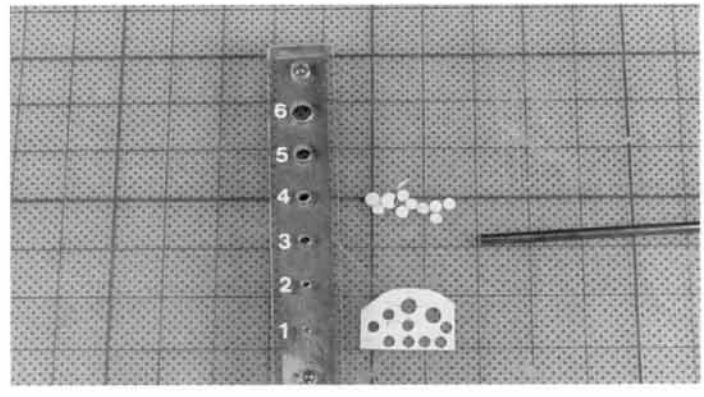



Fig. 1-94. Cut out the console and then punch out the holes where the individual instruments will go. The size punch you use must be coordinated with the size of the instrument. Write this information on the drawing that you made to lessen your chances of a mistake.

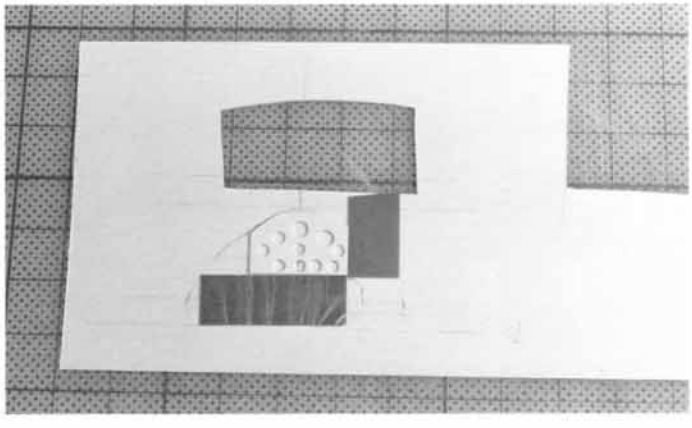


Fig. 1-95. The next step for this console is to glue it to the larger backing so that the entire console will be formed. Labeling tape was set in place on the drawing to ensure that the smaller console faces were correctly positioned onto the larger part.

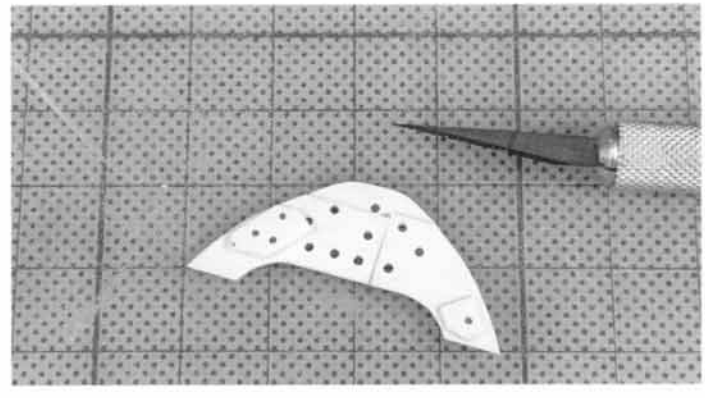


Fig. 1-96. Sometimes consoles are made from more than one or two parts and you may want to add extra material to the back side to help strengthen it. The holes that are drilled through the console will allow the white glue that will be used to attach the instruments to the front of the console to seep out the back.

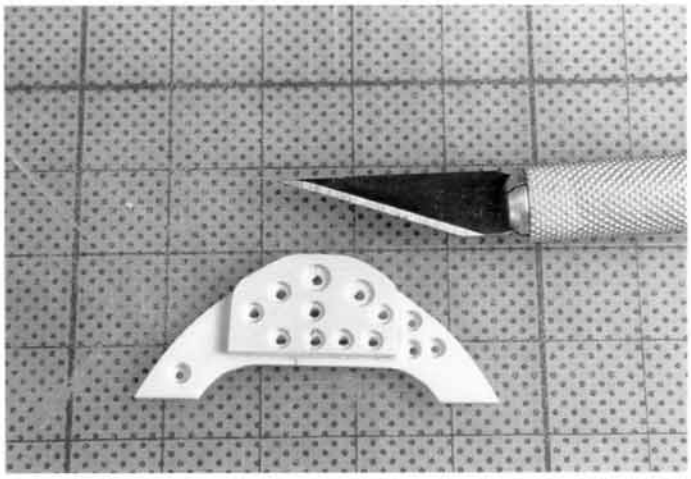


Fig. 1-97. Here the completed console is ready to be painted. After painting, you'll insert the instrument faces into the holes.

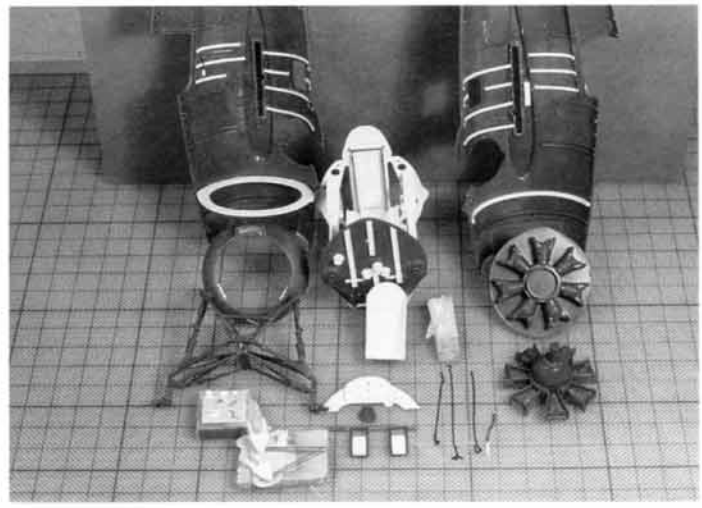


Fig. 1-98. Here are all the parts for this F4F Wildcat, and they are ready for painting and installation.

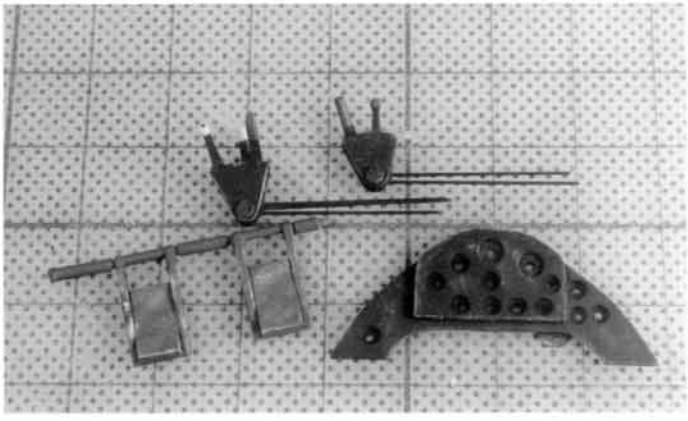


Fig. 1-99. As smaller parts are completed you can paint and weather them.

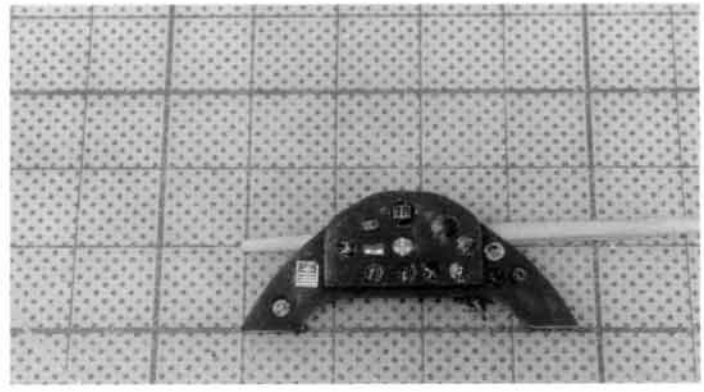


Fig. 1-100. The completed instrument console with a small instruction plate added. Waldron as well as several other companies make these small instrument plates from thin sheet aluminum or with decals.

Fig. 1-101. Another way to make a good-looking console is to take the kit's part and sand it down to get it to a thickness at which the Waldron punch tool can punch holes through it. This saves you the time in making a new console, but it works only if the kit's part is an accurate size.

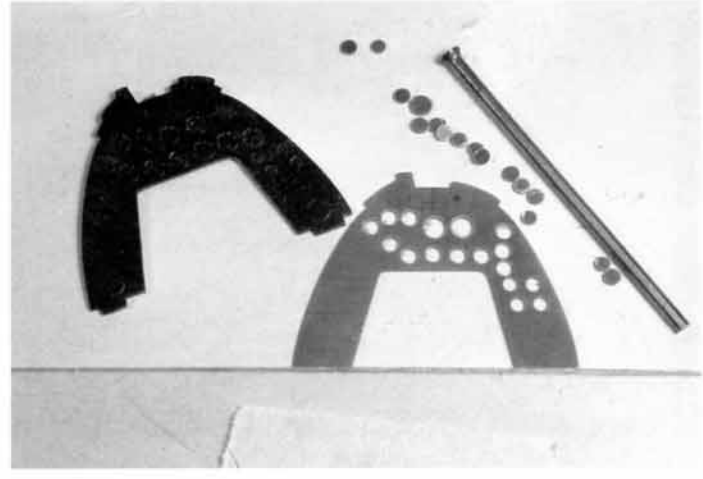


Fig. 1-102. First draw the instrument locations on the face of the thinned kit console and then punch out the holes.

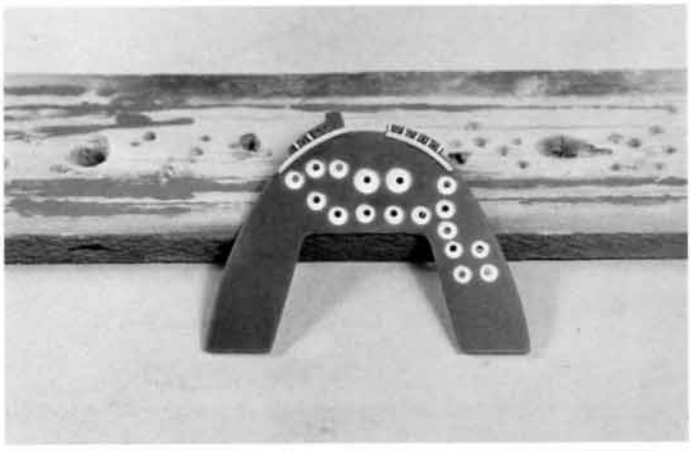


Fig. 1-103. A backing for the console was made, small holes were drilled for the white glue to seep out, and small framing was added to the switch banks across the top rim of the console.

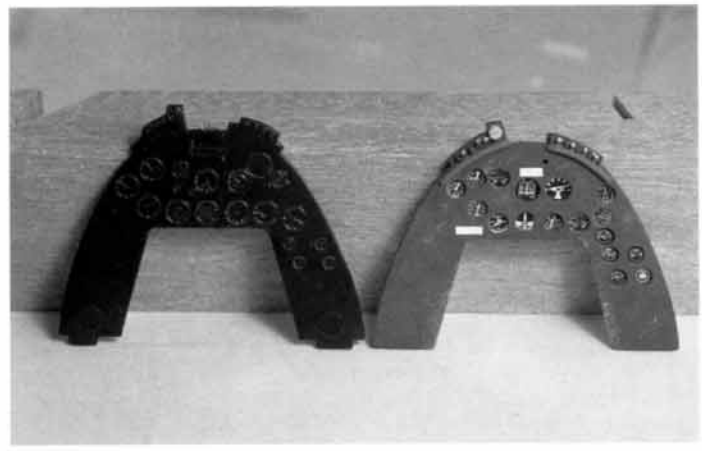


Fig. 1-104. The modified kit's console looks much more realistic and it only took some patience and a little time.

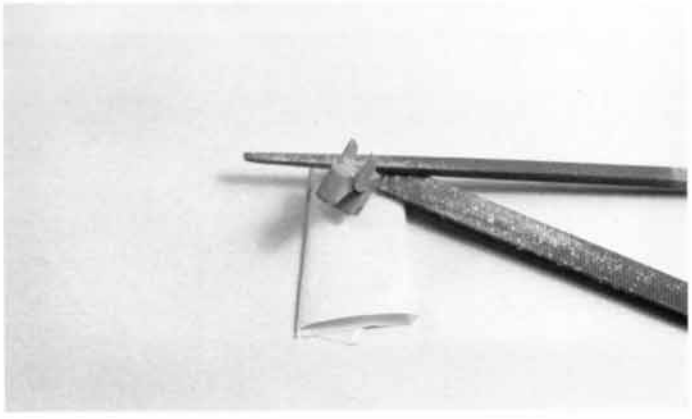


Fig. 1-105. Sometimes kit-supplied gunsights can be modified to make them appear much more realistic. The center section of the plastic of this P40 gunsight was removed with micro files so that the edges will become the frame of the reflecting glass.

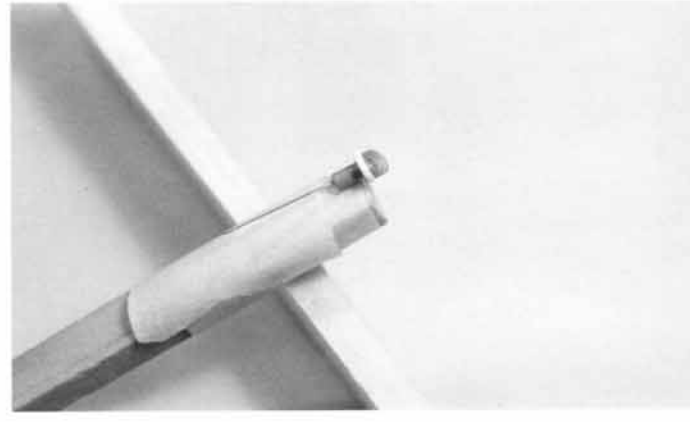


Fig. 1-106. Scratchbuilding gunsights is easy. This gunsight was made from two small lengths of plastic tubing, a small stick of Evergreen strip stock shaped in a semicircle, and a piece of brass wire.

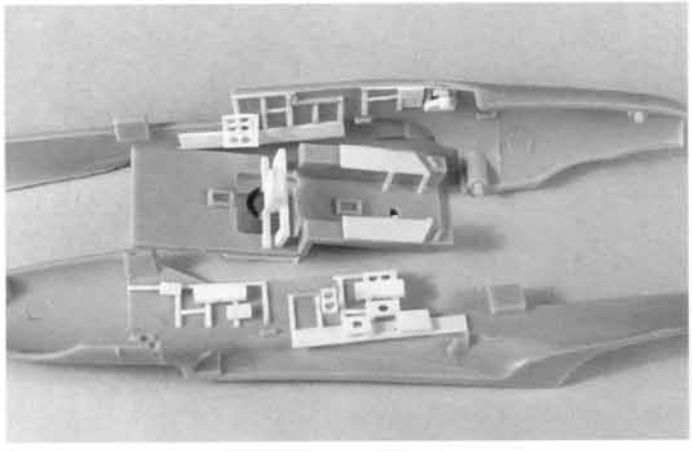


Fig. 1-107. Even 1/72 scale aircraft can have scratchbuilt interiors. About 50 cents worth of Evergreen plastic was all that was needed to enhance the appearance of the interior of Fujimi's Gekko Model 21 Nightfighter. Model by Scott Weller.

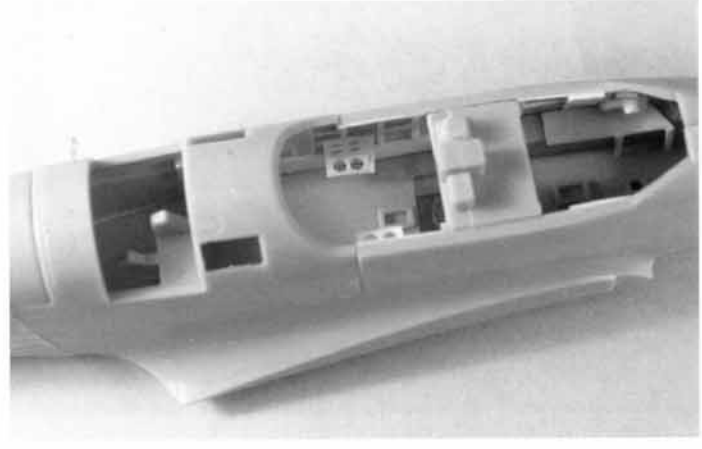


Fig. 1-108. Even 1/72 scale scratchbuilt projects need fit checks to ensure that all the parts fit in place correctly. While this is a small kit, the scratchbuilt parts are clearly evident. Model by Scott Weller.

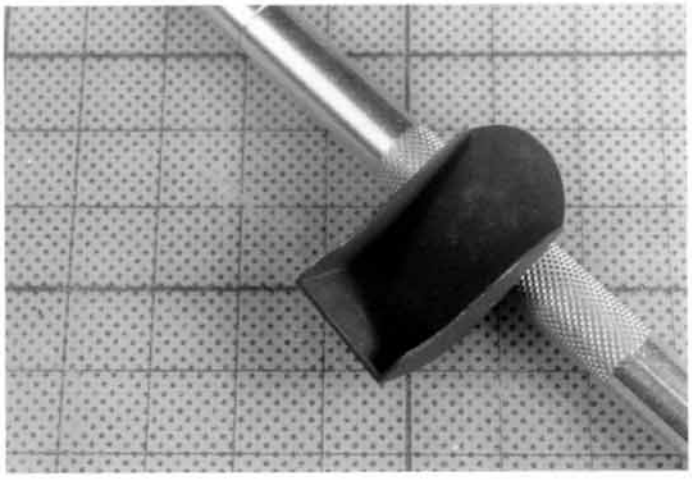


Fig. 1-109. The first step in applying seatbelts is to paint and weather the seat.

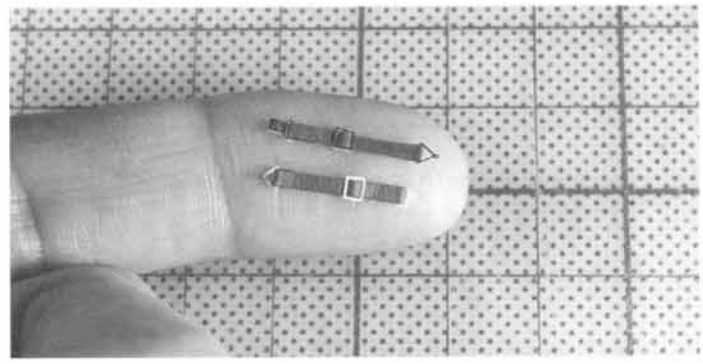


Fig. 1-110. Seatbelts were made from masking tape and painted with Polly S earthbrown color. The seatbelt hardware is from Model Technologies. While photoetched seatbelts that come complete as one piece are easy to install, using separate hardware for the seatbelts and seat buckles on 1/32 or 1/48 scale aircraft definitely gives the seatbelts a three-dimensional appearance.

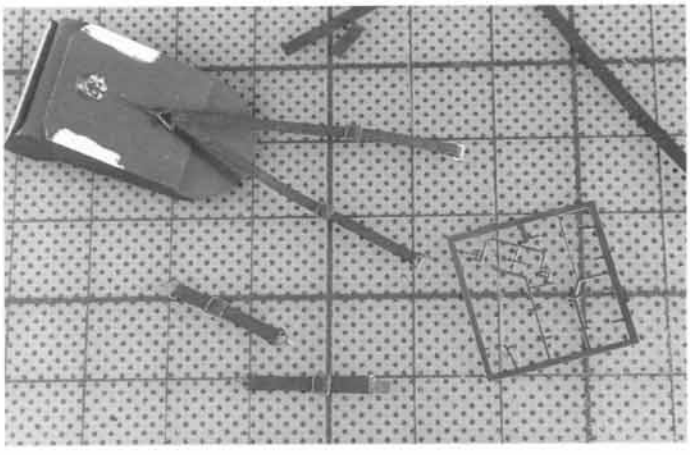


Fig. 1-111. The shoulder harnesses are easily made with a long piece of masking tape cut and painted. The length of the seatbelt needs to be bent in half and positioned through the rear hardware frame before the adjusting buckles and clips are attached.

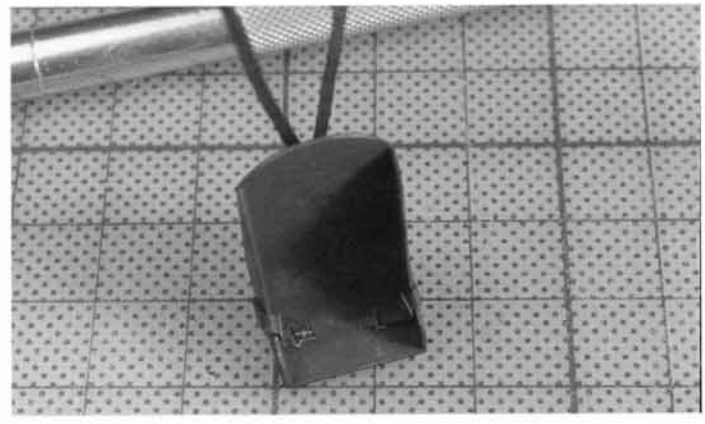


Fig. 1-112. To get the seatbelts to lie correctly fold them over the rims of the seats and then glue them in place with tiny amounts of super glue.

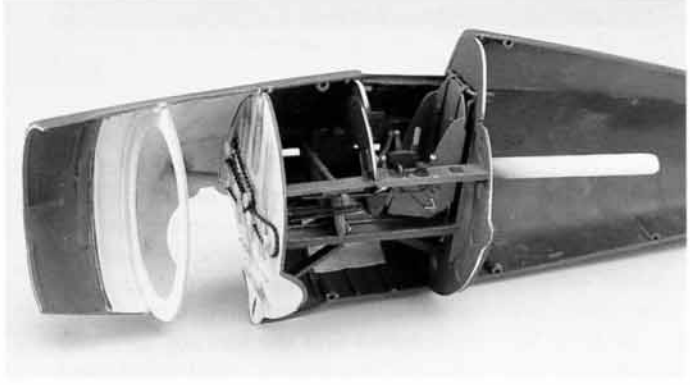


Fig. 1-113. The seat has been positioned into the scratchbuilt cockpit and the shoulder harnesses has been brought over the top of the rear seat frame. The completed cockpit has been painted and weathered and is ready to be installed in the fuselage. Photo by Glenn Johnson.

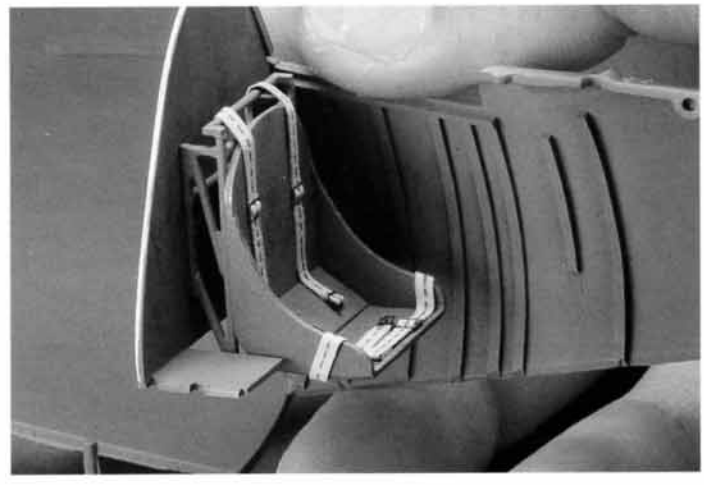


Fig. 1-114. Seatbelts don't always have to be brown. The seatbelts on this F4U Corsair were painted white and the center lines on the seatbelts were done with a 000 inking pen. Photo by Glenn Johnson.