

## CHAPTER THREE

# SUPERSTRUCTURE ASSEMBLY AND PHOTOETCHED RAILINGS AND LADDERS

Next to assembling the hull and main deck, the biggest challenge is to assemble the superstructure and add additional detail such as photoetched hatches, fire hose reels, and life preservers. In addition, you can drill out portholes or add new ones and add external piping to dress up an otherwise bland superstructure. One of the biggest challenges for model ship builders has always been railings. All ships have them, and the larger the ship, the more complex and numerous the railings are. Over the years manufacturers have tried to reproduce railings by molding them onto the deck and superstructure, or providing individual railing stanchions. In either case the results were unrealistic and they detracted from the model's appearance.

There are two basic approaches for adding railings to models, and the correct approach depends on the scale. For models that are approximately 1/300 scale or smaller I recommend photoetched railings sold by cottage industries such as Gold Medal Models, Flagship Models, Tom's Model Works or Classic Warships. They sell photoetched designs and detail sets for specific ships in specific scales, and general photoetched sheets in various scales. Photoetched sheets in one

scale can also be used in other scales so long as you don't stretch it too far.

In other words, you can use 1/350 scale rails on ship models ranging from 1/300 to 1/380 in scale, use 1/400 scale ship rails for models ranging from 1/380 to 1/440 in scale, use 1/500 scale ship rails on ship models ranging from 1/450 to 1/540 in scale, use 1/600 scale ship rails on models ranging from 1/550 to 1/640 in scale, and use 1/700 for models in the 1/650 to 1/800 scales. I recommend undersized ship rails if you have a scale that falls close to one of the breaking points. As an example I would use 1/500 scale ship railings on Hasegawa's 1/450 scale ships instead of using 1/400 scale railings. The smaller ones will look more to scale than oversized ones. On anything larger than 1/300 I recommend scratchbuilt railings, which is easy to do in the larger scales. See chapter 5 for details on scratchbuilding ship railings.

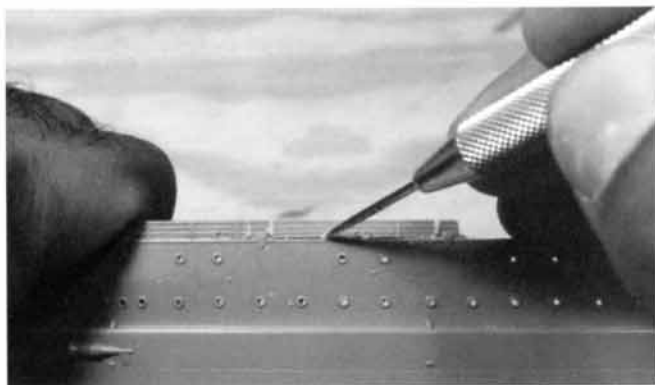
### REMOVING MOLDED SHIP RAILINGS

If your model has molded railings you must remove them before you attach photoetched or scratchbuilt railings. The technique you use will depend on the railing's location. Check your documentation and pictures to

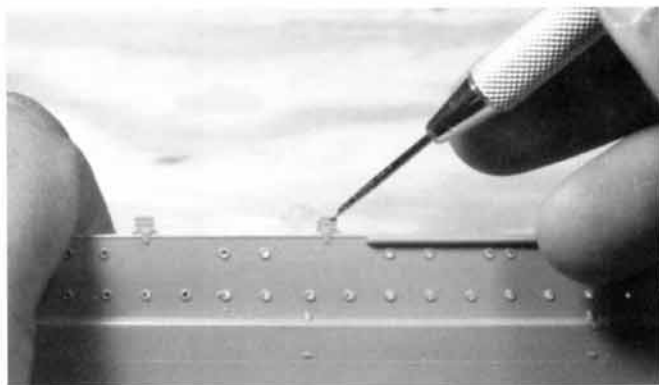
see where the railings stop and the shields start. Sometimes manufacturers combine railings and gun or splinter shields into one continuous length. Unless you plan to also replace the kit's shields you will have to mark these locations so you don't remove them by mistake. On some kits this may be hard to do because there may be no noticeable difference between the molded railings and the shields.

The technique you use to remove railings depends on how they are molded onto the hull. On most kits they are molded slightly inward of the edge of the hull, and the larger the scale the more pronounced this ridge is. This ridge serves as an excellent guide and also helps prevent the cutting tool from slipping. For this job I recommend using a Bare Metal Foils plastic scriber or a pin vise and needle. The scriber will do the job more quickly and there will be less finishing work because it actually removes the plastic, while the needle just pushes the plastic aside while it is cutting. To help protect the hull from gouges, lay a few layers of tape along the edge of the hull.

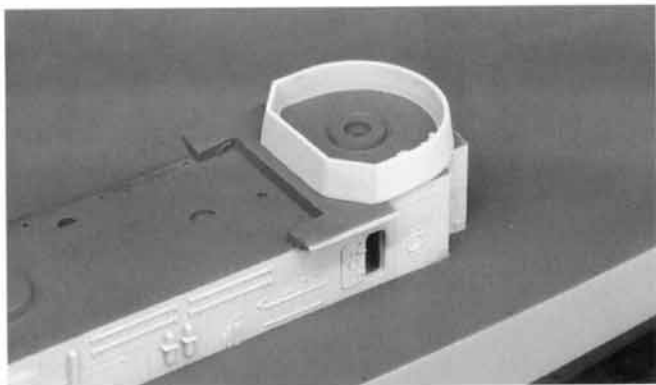
If the railings are flush with the sides of the hull you must apply a guide for the scriber. Labeling tape works well and is easy to apply.



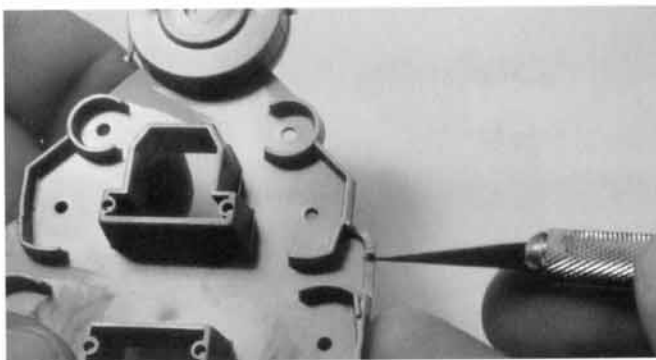
A pin vise with a needle or Bare Metal Foil's plastic scriber works best to remove molded railings.



Whenever possible cut around details when removing molded ship railings.



The deck on Revell's *Buckley* looks much more realistic without the molded-on railings. Photo by Glenn Johnson.



Cutting out the railings while leaving the gunshields intact on Revell's 1/426 scale *Arizona* is easy to do if you go slowly and mark the locations of the railings.

Measure a length slightly longer than the hull. If the hull has a shear line you can make the tape more flexible by cutting it in half—and this also saves tape. Peel back the first few inches and apply it to the edge of the hull. As you move along the length of the hull pull more backing off, position the tape, and press it down. Once you have completed both sides, apply a few layers to the hull to protect it. Now you are ready to cut.

When using either the Bare Metal Foil scriber or the pin vise and needle, make several passes along the area you are cutting before you actually cut through the plastic. Since the lengths of cuts may be very long on large scale kits like Revell's 1/426 *Arizona*, cut the railing into sections a few inches long. This will reduce your cutting to manageable proportions and decrease your chance of slipping. To do this, make some vertical cuts into the railings with a razor saw every few inches, but be careful not to cut into the hull. When using the scriber or needle, cut at an angle of approximately 45 degrees. If you try to cut at steep angles or at a 90-degree angle the cutters will start to bind. Don't force the scriber or needle into the plastic. Let it cut layers at a time and use only moderate pressure. Cutting with a scriber or needle takes some practice. As you get better at it you will be able to feel the plastic as it is cut.

Aside from railing details, manufacturers also mold things like cleats, chocks, and bitts into the railings. Trying to cut around these is difficult, even in 1/400 scale, so I recommend that you don't try. If details actually

stick out from the surface of the railing, you can cut them out after you have removed the railing from the hull and then reattach them to the deck later on. Another reason for removing cleat, chock, and bitt detail is that these can be difficult to work around when you are filling, sanding, and scraping the seams where the deck sections meet the hull—and they always seem to get damaged.

Once you have removed the railing detail, smooth the surface and remove excess plastic. The best way is to wrap a section of sandpaper around a small wood block and lightly sand the surface smooth. You need a hard sanding block surface so the edge of the hull where you removed the railing will be uniform and flat from bow to stern and across the top surface of the hull. Be sure the sanding block is not angled or you will cut curves into the edge of the hull that will be hard to fix.

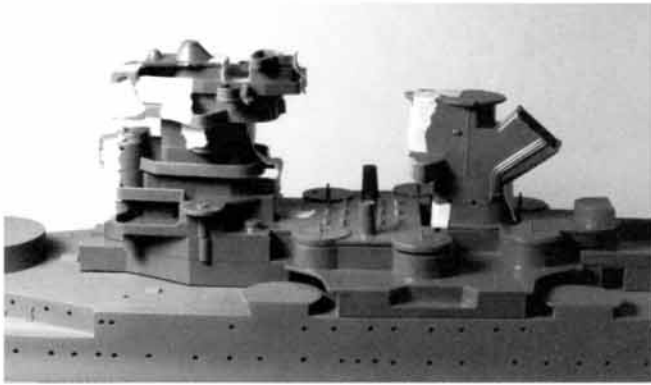
If railings are attached to the deck instead of the hull, as on Revell's 1/317 scale *Sherman* class destroyer or their 1/400 scale seaplane tender, you can't use a scriber or pin vise because it will cut into the plastic at an angle. Your only alternative is a number 11 X-Acto blade—cut the plastic down to where it meets the deck and sand with a small, hard sanding block.

Removal of railings in these locations takes a lot of work, and I recommend you do it section by section. Make vertical cuts down to the deck every few inches using a number 11 X-Acto blade and make V-shaped cuts into the plastic. The V cut will allow you to make deep cuts along the lengths of the railing without binding

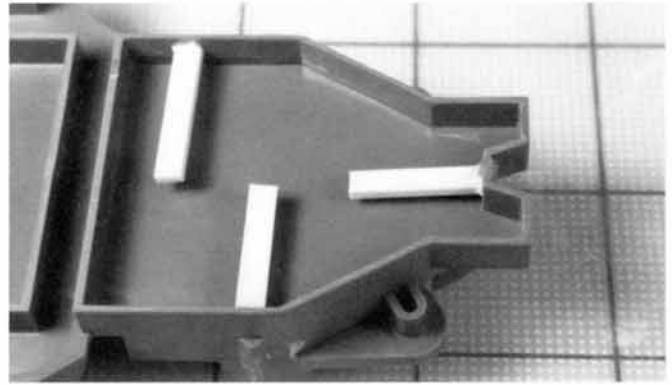
the blade when you make an initial cut. When you make the cuts along the railing, maintain positive control of the blade and hold the deck securely. Don't try to cut a consistent thickness, and always guide the blade toward the top of the railing and away from the deck. To protect the deck, mask as much of the surface as possible.

Essentially you will be shaving layers of the molded railing. As you get closer to the surface of the deck you must use less of the length of the blade so the tip will not damage the surface detail of the deck. You will have a tendency to angle the blade as you get closer to the deck. Since it is important to get a flat, even surface, go slowly and check your work as you progress. If you rush cutting the railings you will most likely slip and damage the deck. If you have a thin layer of plastic left, use a combination of scraping with the number 11 X-Acto blade and the hard sanding blocks to get the deck flat.

Cutting railings from components of the superstructure is essentially the same. The procedure is different only where railings are attached to the sides of the superstructure or where they blend into gun or splinter shields. Both of these problems occur on the superstructure gun deck of Revell's 1/426 *Arizona*. The gun shields of the 5-inch .50-caliber guns are curved around the guns, and in between these curved shields are molded-on railings. The ends of the railings also are attached to the sides of the superstructure. To remove railings like this, make a shallow, straight slice along the side of the shield or superstructure with the tip of a number 11 X-Acto



Doing a preconstruction check on the superstructure parts will help you identify any problem areas.



To secure resin inside superstructure parts glue some tabs to the inside area, but be sure that they will not interfere with any portholes.

blade and then make an angled slice into the railing that connects with the depth of the first slice.

If the other end of the railing connects to another gun shield or part of the superstructure, repeat the process. At this point, remove a layer of the railing down to the depth of the wedge cuts and go back to the edges, repeat the wedge cuts, and remove more. Continue until the entire length is removed. As you get closer to the deck, scrape away the remaining railing by angling the blade at approximately 45 degrees.

When slicing into the railing along the gun shield or superstructure leave a minute amount of plastic protruding. You can sand and shape this plastic smooth without gouging. If you do cut or gouge in these areas use white tube super glue applied with a thin wire to fill, then sand smooth. Here again, protect as much of the surrounding plastic as possible with tape and go slowly.

When you are ready to shape the sides of these areas, use a small length of balsa wood with sandpaper attached or cut a thin length of a Flex-I-Pad sanding stick with a straightedge razor and use the file.

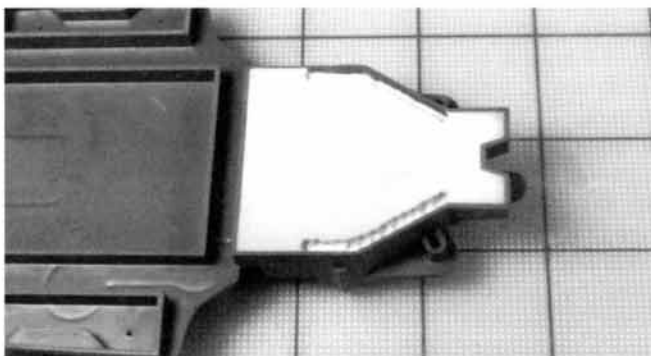
### SUPERSTRUCTURE ASSEMBLY AND DETAILING

Superstructure assembly is pretty straightforward, but plan your assembly sequence so you can fill seam areas as you go. Remove the parts, clean up gluing surfaces, and tape them together. This allows you to identify problem areas and plan the assembly sequence. This is also the time to identify changes that you want to make, such as hollowing out portholes and windows or removing molded ladders and railings so you can replace them with photoetched ones. If the superstructure lacks detail, mark porthole and hatch locations you want to add and mark the changes and

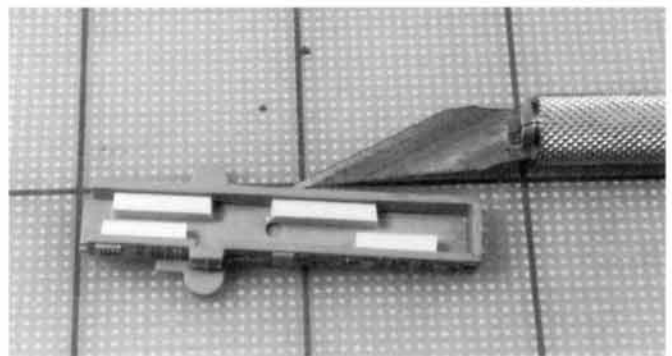
additions on the kit's instruction sheets so you won't forget.

For ease in gluing large scale superstructure components to the deck, I recommend you fill the base of the superstructure with resin. This will give you a large contact surface to apply glue to and will keep glue away from the edges of the superstructure. To keep the resin in place, glue some tabs inside the superstructure and seal all openings so resin won't leak out. If there are portholes, glue .005"-thick sheeting strips inside to seal them. Position the superstructure part upside down so it is level and pour the resin in up to the lip. When it is dry run it across a stationary piece of sandpaper to flatten the resin. Check the fit on the deck as you sand and be sure not to sand the sides of the part. Once you are finished you can redrill the portholes.

**Completing subassemblies.** Assemble the left and right halves of the



After the resin cures, you have to form-fit the superstructure onto the deck and cut out areas in the resin where the deck aligning tabs will be located.



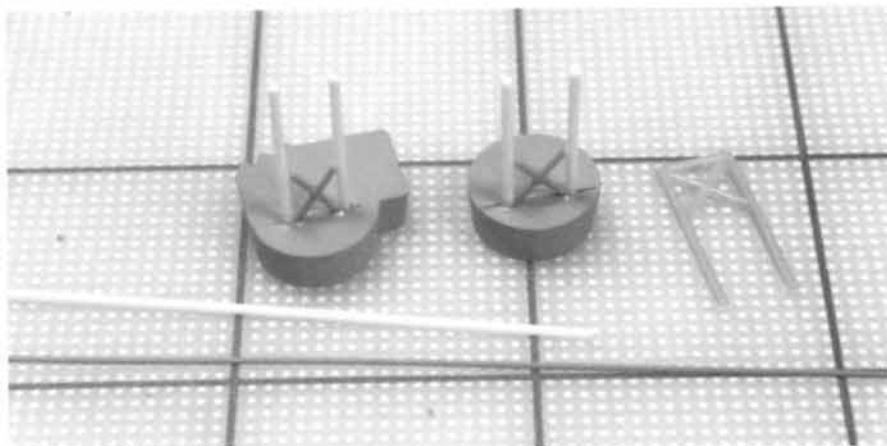
To help reinforce superstructure sections, especially in the 1/700 scales, use small strips of Evergreen strip stock as interior bracing.

superstructure components first. Take special care with both boxy structures and rounded ones like smokestacks. I usually remove the locating pins on these and sand the surfaces smooth by running them across 320-grit sandpaper. I then position the parts together for the best fit, checking to ensure that edges match up. If you have a steady hand you can hold the part between your fingers and apply some glue along enough of the seam to hold them. Once the glue has set, which should take about 30 seconds, you can finish gluing the seam. If the parts are big, tape them together with small strips of masking tape, glue between the tape locations, and then remove the tape and finish the job.

To sand seams across flat surfaces I run the part across wet stationary sandpaper. Be sure the part is sitting flat so you don't distort the surface. To smooth out curved surfaces like smokestacks and to prevent distortion to these areas, use a Flex-I-File. These instruments are great for removing seams on curves and for reshaping curved areas.

For those hard-to-get places or in areas with raised detail, use small strips of sandpaper wrapped around strips of balsa wood. You can create small sanding surfaces by compressing the balsa wood to fit. Flex-I-File sanding sticks are also excellent tools for sanding and shaping, and you can cut them down so they will fit into those tight places.

Once you have assembled all the parts you are ready to do another dry fit to ensure that location pins are not interfering with the positioning of



The framing under these 20 mm gun platforms was scratchbuilt using plastic rod because the kits parts were not the right size.

parts and that they are sitting straight and level. If pins are a problem, remove them and sand the base flat. Sometimes you have to run parts across sandpaper to get them to sit straight, but be careful if you do this because it is easy to overcompensate for a part that is leaning very slightly to one side.

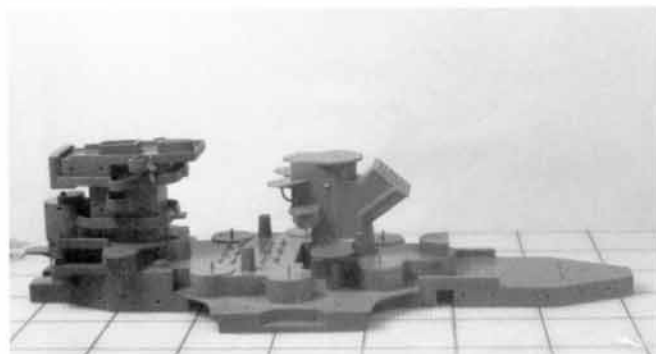
Large superstructures like those on battleships sometimes come in layered sections, especially if the model is larger than 1/450 scale. Give them an extra check to ensure that they are level from left to right and front to back. They usually stack easily, so all you have to do is position them in place to check.

Sometimes ship kits have large superstructure panels that rest against one another, like those found on DML's 1/350 scale ship series or Monogram's 1/400 scale *Halsey*, that are not quite

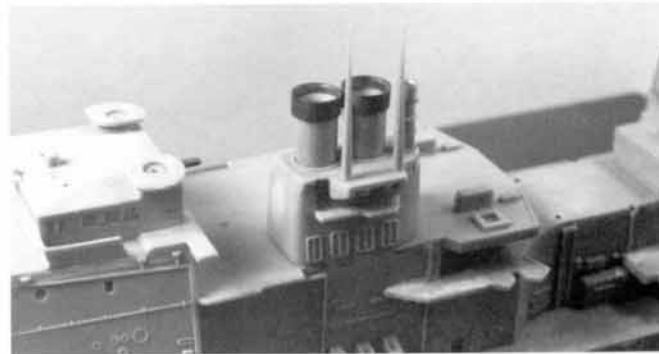
the right size. Fix this by adding a layer of Evergreen sheeting or strip stock to the edge that is short, sand it smooth, and trim the top and bottom areas. I always glue more than I need to a part and form-fit it into place.

Look out for raised and indented ejection marks on the small deck surfaces of the superstructure. These are sometimes impossible to remove, so the next best solution is to hide them. Punch out disks of photoetched screening using your Waldron Punch tool and glue them over the marks. After you paint the deck the screening will look like a drain grating cover or hatch cover. You can also use Gold Medal Models hatches to cover some of these as well as dimples.

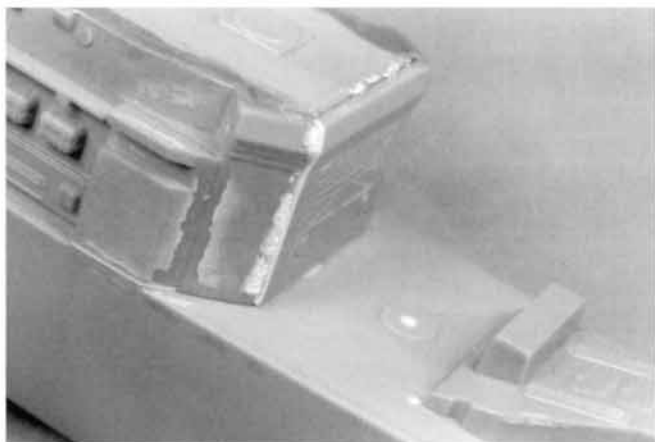
If you decide to remove molded ladders and replace them with photoetched ones use wet Flex-I-File sanding sticks to remove the raised detail.



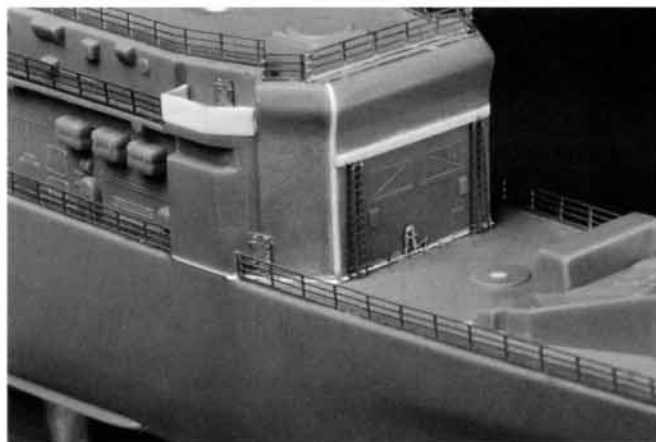
Superstructure subassemblies that are stacked must be checked to ensure that they are sitting correctly from front to back and from left to right. This is also the time to start making notes on the location of photoetched railing.



Small sections of brass tubing replaced the plastic parts on the exhaust stacks of DML's 1/350 scale *Ticonderoga* to enhance the appearance of the stacks. Model by John Ficklen.



Thin layers of plastic sheeting and lots of super glue are the items needed to fix the seam lines on Monogram's 1/400 scale *Halsey*.



The superstructure areas of Monogram's *Halsey* look very different once the seams are sanded smooth and the plastic is reshaped. Photo by Glenn Johnson.

Here again cut the sanding sticks down to size to get into tight areas. Start with 280 grit to remove the plastic and work up to 600 grit to smooth out and polish. Mark the removed ladders on the kit's instruction sheet so you will not forget where they go.

**Portholes and windows.** Once you have all the subassemblies completed you can drill out portholes and clean up square openings and windows like those found on Revell's 1/426 scale *USS Arizona*. This kit has the seams running across many of the windows on the superstructure area as well as the bridge, and once the parts are glued together you have to reshape the openings. Micro files and the tip of a number 11 X-Acto blade are the only tools you can use to get at them. Be careful here because it is just about impossible to repair any mistakes.

If the openings are formed by raised framing, as are those found on Tamiya's 1/350 scale *Iowa* class battleships or on resin kits like Gulfstream Model's or Commanders Series 1/350 *USS California*, just paint them. First paint the superstructure the overall color and then give the area around the windows a good coat of clear gloss. When it is completely dry, hand paint the windows with a water-base flat black color with some flat white added so it is almost a dark gray. Carefully paint the windows using single strokes and always work away from a frame. If you get some paint on the frame, let it dry and scrape the excess off with a round toothpick with a pointed end. The clear gloss undercoat does not provide a good adhesion surface for the black color and it can be easily scraped off. Once you have finished

painting and scraping, give the surface a coat of clear flat.

Another approach is to use Gold Medal Model's 1/350 scale ship decal sheets, which contain small black squares for simulating windows. These squares are not the exact size so you need to trim them slightly. The best way to do this is to cut them off the decal sheet, form-fit them into place, and apply the decal. This is tedious, but it works. You can also use these squares to replace windows on ship models that are nothing more than raised engravings. Simply sand off the detail and lay them down.

Another detail you may want to add is vertical support bracing along splinter shields, which you can simulate using small lengths of Evergreen strip stock. Mark the locations of the strips on the shield so they will be evenly



Seam lines that run across porthole detail are not hard to fix, but it takes a little time. Wrapping sandpaper around a piece of balsa wood fixed this problem on Revell's 1/426 scale *Arizona*.



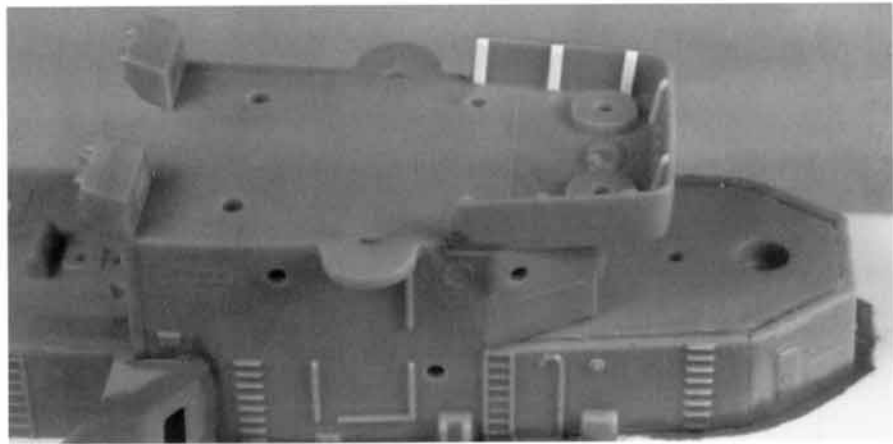
A good paint job along with the application of very subtle hints of a lighter color make the windows on Commander Model's 1/350 scale *California* really stand out. Model by Lonnie Ottzen.

spaced. Cut 1" sections of whichever size strip stock you want to add. Next apply a thin coating of super glue to a strip and position it at the marked location. The extra length will allow you to position the strip, and the super glue will set in a few seconds. Once you have completed a row, trim off the excess and lightly run a Flex-I-File sanding stick across the surface to contour the strip into the top of the shield.

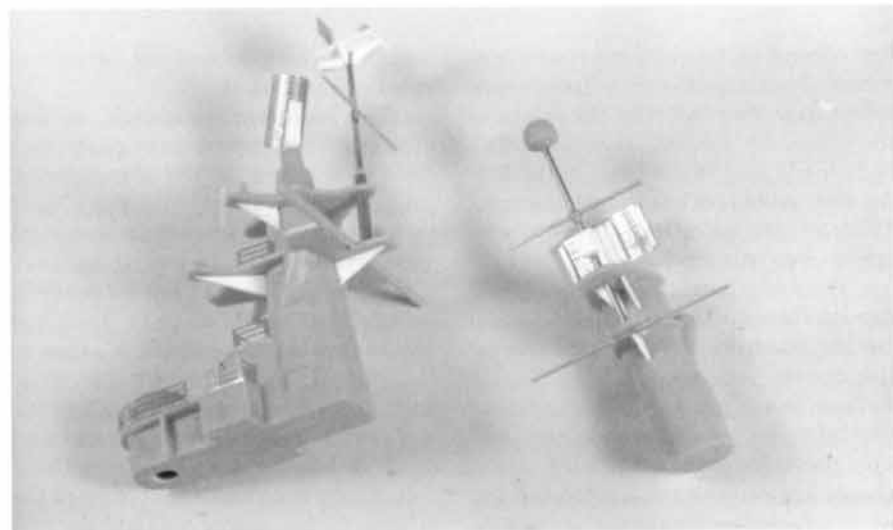
Many ships had overhangs on the superstructure and masts that were supported by angled bracing. If the model doesn't have any bracing you can easily add some using plastic sheeting and a chopper. Cut the sheet stock to the height you want and use the chopper to cut the angles. Experiment to get the right height and angles, and check each part by form-fitting it. Once you are satisfied with the size you can adjust the chopper to cut duplicate parts. Before gluing, run the sides and edges across fine-grit sandpaper to smooth out edges. Hold the bracing with small tweezers, apply some super glue along one side, and set the part in place. Once the glue is dry run a bead of super glue around the perimeter of the brace. If you use minute amounts of super glue you won't be able to detect it once the parts are painted.

If you decide to add more portholes, use small strips of labeling tape to set the height and ensure that the porthole line is straight. Mark the height of the porthole locations at the beginning and end of a line of portholes and lay the labeling tape along the two marks. I usually cut the tape strips in half so I get twice as much from a roll. The thinner tape also gets into small places. Mark the locations of the holes using a pin vise and drill them out.

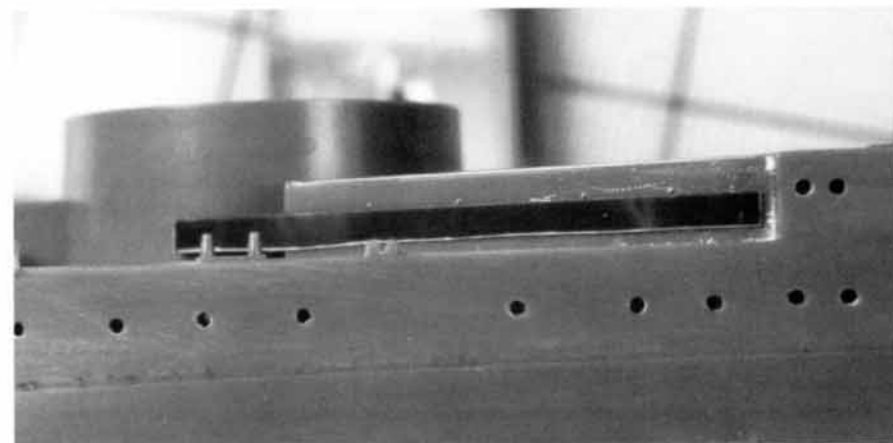
**Splinter and gun shields.** Another detail to check is the thickness of splinter and gun shields. The originals are not very thick, and on most ship models they are usually way out of scale. You can easily replace them. Remove the existing ones by carefully shaving them down using a number 11 X-Acto blade. Once you get close to the deck, scrape off the remaining plastic. Straight sections of gunshields can be duplicated with thin strips of Evergreen strip cut to the correct height and length with your chopper.



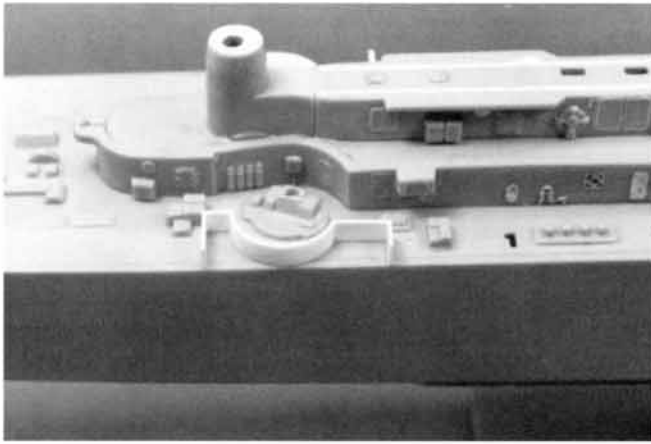
Adding bracing support to splinter and gunshields adds yet another element of realism to your model.



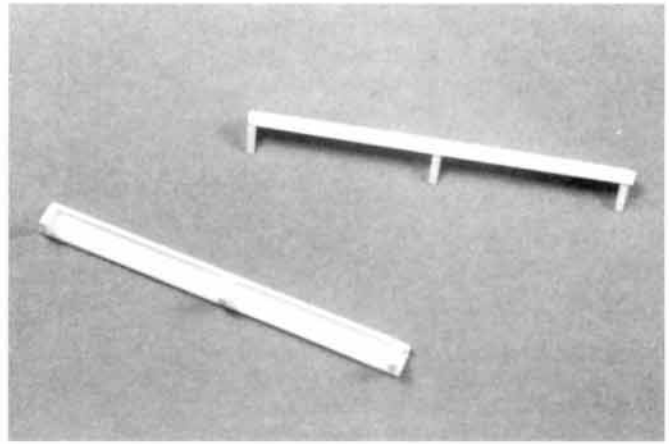
The addition of support bracing as well as scratchbuilt masts and radar assemblies greatly improve the upper superstructure parts of Monogram's 1/400 scale *Halsey*.



To add portholes use labeling tape to guide the pin vise when you are setting the pilot holes for the drill bits.



Monogram's *Halsey*, sporting a scratchbuilt gunshield made from Evergreen strip stock and tubing.



These assembled gunshields will be added to Glenco's 1/225 scale *Oregon*. Scratchbuilding these parts is easy if you take it a step at a time.

For curved sections or for round gun tubes I recommend using Evergreen's tube sizes. You can thin the edges of the tubing by running a number 11 X-Acto blade across the edge of the tubing and peeling off layers one at a time. Then all you have to do is sand the upper edge smooth.

Once you have thinned the lip you can cut the tube to the right height and cut the resulting ring into sections for the curves you need. Gluing can be tedious, but if you use a small amount of white glue you will be able to position them correctly. Once the white glue is dry you can run a small bead of white tube super glue along the base of the shield. Here again, if you are careful when you apply the bead of glue you should not have to do any sand-

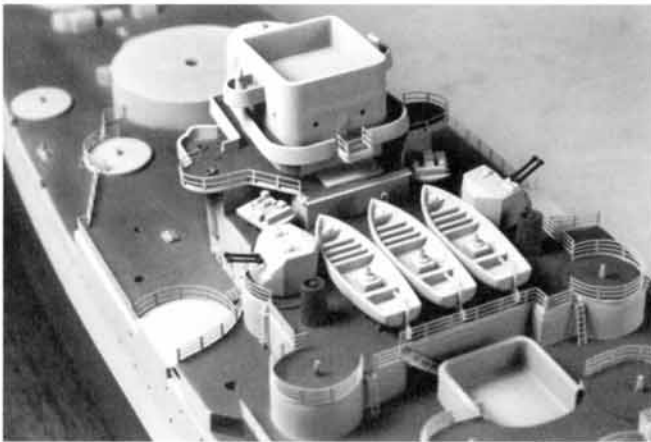
ing, since the glue will not be noticeable once you paint.

**Adding photoetched detail.** As you assemble superstructure parts you need to account for the placement of photoetched railings. You don't want to assemble components to the point where you can't add railing because you no longer have access to the deck section that needs it. Once you have finished the subassemblies, it's time to cut, bend, and form-fit the photoetched railings and ladders for the superstructure, paint them, and add them as you build up the superstructure. Sometimes it is easier to paint the subassemblies before you add the railings and sometimes it is better to add the railings first. Be sure they don't interfere with any small parts and fit-

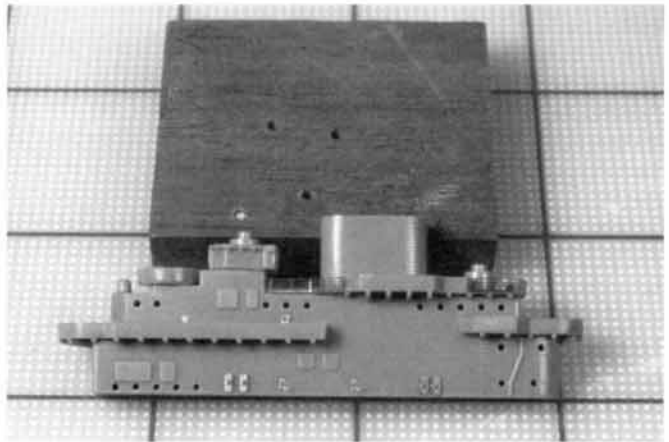
tings you will be adding once the superstructure is assembled.

I like to paint my subassemblies and add photoetched railings, hatches, ladders, and fire-hose reels as I go. You can add hatches either before or after you paint the plastic. If you are gluing hatches to unpainted plastic, use Duro's thick-gel super glue. This will give you a second or two to position it straight.

I pick up the photoetched hatches using a round toothpick with the end cut off and moisten the tip with my tongue to hold the hatch against the toothpick. I apply a tiny amount of the thick-gel super glue to the plastic first and then pick up the hatch with the toothpick. If you wait until after the superstructure and the hatches are



To ensure that photoetched railings will not interfere with other kit parts put them into position, and don't forget to include the guns.



The island superstructure of Hasegawa's 1/700 scale *Essex* class carrier looks much better with the addition of photoetched railings, hatches, and fire hose reels.

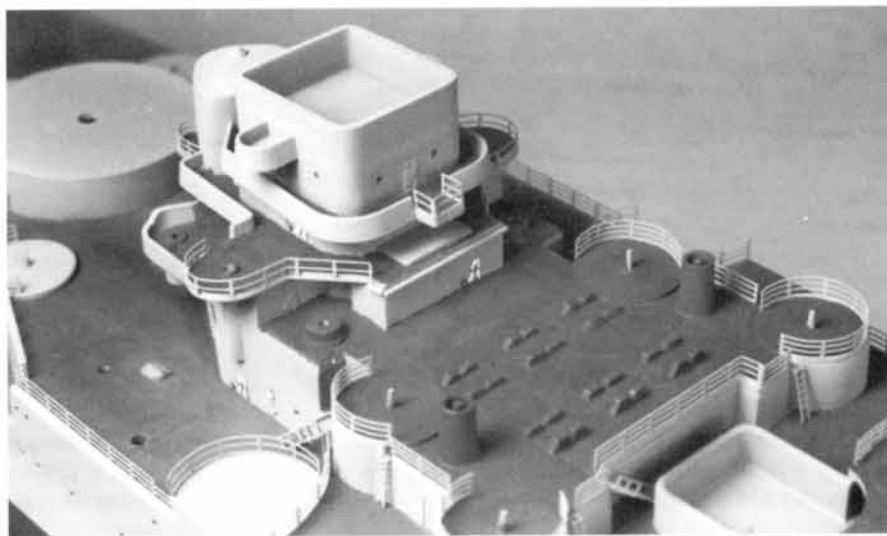
painted, use white glue to attach the hatch. This gives you more time to get the hatch straight and level. Paint photoetched hose reels before removing them from the photoetch trees and attach them with white glue.

**Voids** that form as you glue superstructure sections together or to the deck can be easily filled with white glue. They form when you mate a horizontal and vertical section together. For large voids apply the glue with a round toothpick, and for small seams water down the glue a little and apply it with a thin wire. Work in small sections. Once you are done with a section remove the excess glue with a damp Q-Tip. You may have to repeat this two or three times until you fill in all the voids. Check the dried glue for small bubbles. Sometimes two connecting vertical sections of superstructure have seams that cannot be filled with super glue and sanded smooth because of the nature of the construction of the model. In these cases, hide them by applying tiny lengths of painted brass wire or plastic rod to simulate piping. Cut the rod or wire to the exact length you need, paint the part, and attach it with white glue. Remove excess glue with a thin wire applicator.

## RESIN SUPERSTRUCTURES

Resin ship kits usually have sections of the superstructure already molded as part of the one-piece casting for the hull and main deck, so a lot of your work is already done. Give the resin and white-metal parts a bath in a solution of Ivory soap and warm water, using a soft-bristle toothbrush to scrub the parts. Resin and white-metal parts have mold release agents on them, and if you don't remove this stuff it may affect the glue and the paint.

Check resin parts for pinholes and casting flaws and fill them with either white glue or super glue. Where it is not possible to use sandpaper or Flex-I-Files to smooth the super glue, use white glue as the filler. To get the white glue into small bubbles or voids, dilute it a little with water. In areas where you can sand, use Duro's white tube super glue applied with a thin wire applicator. Sometimes the surface tension of the glue will prevent it from filling a void, so you need to poke the end of the wire applicator into the



Sometimes it's impossible to work on seams, and in these cases you can hide them. Small lengths of brass rod were cut to shape, painted, and glued over the seam on the back side of the superstructure area just above the boat deck, using white glue.

hole as you apply the glue. If it will not fill the void, enlarge it slightly and try again.

Next, check overhang areas of the superstructure for excess resin. Remove it by cutting it out, using combinations of flat-ended blades, number 11 and 16 X-Acto blades, and an X-Acto stencil knife. As you remove the excess be careful not to gouge the surrounding resin, although you can protect it by adding several layers of masking tape. If you must smooth it out afterwards, use small sections of Flex-I-File sanding sticks to get into the small areas. The last step in preparing the superstructure is to redrill the portholes just as you did on the hull.

Separate superstructure parts are usually made from either resin or white metal, while thin parts such as the gun and splinter shields are sometimes photoetched.

For resin superstructure parts, remove the pour plugs from the base. If the plug is small you can remove it by running the part across sandpaper. If it is big, remove as much as possible using a razor saw to minimize sanding. Check your work frequently by checking the fit on the superstructure as you sand. Be sure the part is resting flat against the sandpaper so you will have a flat surface on the base after you have removed the plug. To ensure that you sand evenly, run a thin strip of

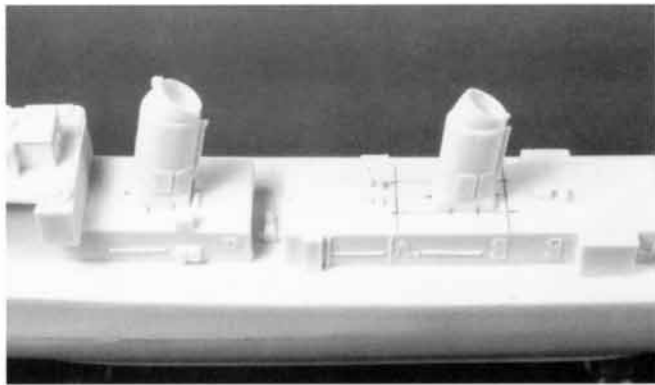
tape around the base of the part where it meets the plug. This helps provide a point of reference as you sand.

White-metal parts usually have small plugs on them that can easily be removed using an X-Acto blade. The white metal responds well to both sandpaper and micro files, and since it is soft you can remove excess just as quickly as on resin parts. Inspect these parts closely for seams, which can easily be scraped off. As a last check for seams, give the white-metal parts a coat of primer. Sometimes the shiny appearance of the metal can hide seams that will easily show up after a coat of primer.

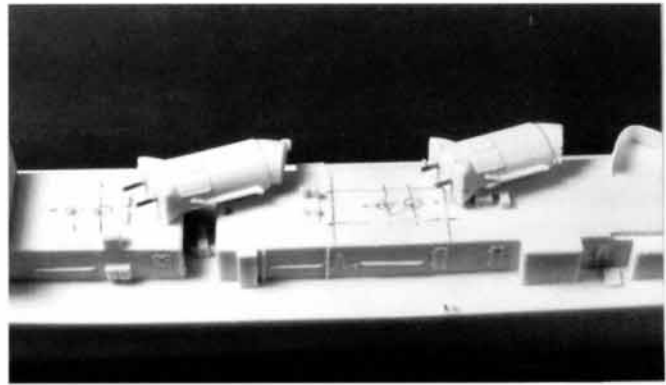
You can reposition bent parts easily, but be sure you move the metal slowly. If the part is a tube shape like a gun barrel, lay the part on a hard surface like glass and roll it along the length of the glass while you press down along its entire surface with your fingers.

Some resin superstructure parts, especially large flat ones, are easy to position and glue while others, like smokestacks, greatly benefit from the addition of small aligning pins. Aligning pins are easy to install, they help you set and position parts, and they add strength. To install aligning pins, temporarily glue the part to the superstructure with white glue. Let it set for a few minutes. Using a soft lead pencil, mark six points on the front and back





The first step in installing guide pins for resin parts is to temporarily glue them in place with white glue, and mark six points on the part and the deck.



To set the points where the brass locating pins will go, remove the parts and then connect the lines on both the deck and the underside of the part. The intersection of the lines will be approximately the same on the deck and the part if you carefully drew the lines to connect the marked points.

and two on the left and right sides of the part. This will give you two guide pins per part. You only need to approximate where the six points are on the part. What is important is that the pencil marks be the same for both the part and the superstructure. Now remove the part and clean off the white glue. Connect the points across the base of the part and on the superstructure. Use either labeling tape or masking tape to set the lines between the marked points. The intersection of the two lines on both the base of the part and on the superstructure is at approximately the same location.

Now drill pilot holes into the base of the part at the intersection of the lines and glue small lengths of brass wire into the holes. Be sure the drilled

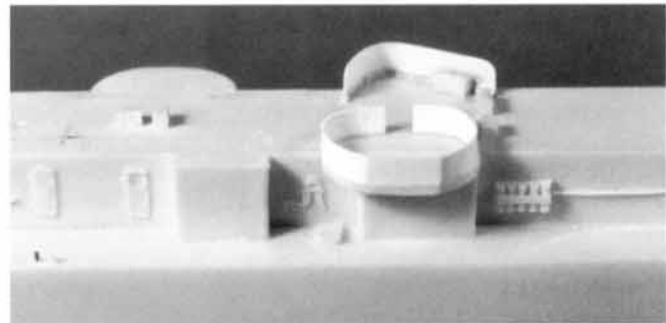
holes are as straight as possible, and when you glue the brass rod into place use a minute amount of super glue. If there is any excess around the base of the rod, remove it. Drill a slightly larger-diameter hole in the superstructure at the points where the lines cross. This slightly larger hole will help compensate for any misalignment between the brass rod and the hole in the superstructure. As you check the part for its fit and positioning you may need to bend the brass rod slightly or enlarge the hole in the superstructure. When you are ready to glue the part into place, simply add a small drop of super glue to the base and into the hole on the superstructure and then slide the part into its location. If you use quick-gel super glue you will have

a few seconds to position it before the resin is bonded. You can also use white glue to attach the parts. To give this glue a stronger bonding surface give both the base of the part and the attachment point on the superstructure a coat of primer.

Photoetched superstructure parts are usually splinter or gun shields or framing. Bend the shields by form-fitting them onto their locations on the superstructure using combinations of wood dowels to get curves and a flat-nosed set of needle-nosed pliers to get sharp bends. The photoetched shields will respond to bending and shaping just as railings do, but there is a lot more spring to these larger parts. I recommend replacing round shields that completely enclose an area with



Gulfstream Model's 1/350 USS *Ward* is an impressive model with a fully detailed bridge interior. To blend in the bridge windows apply small amounts of Duro's white tube super glue and carefully sand the brass flush with the resin. Model by John Ficklen.



The quad 40 mm photoetched gunshields on MB Models' USS *Gearing* were replaced with thin Evergreen strip stock. The stock was cut to the approximate length, positioned, and glued along the flat face of the deck first. Then the plastic was slowly bent around and as it was bent small amounts of super glue were applied to hold it in place. Once the shield was tacked into place a bead of glue was applied to both sides to secure it.

Evergreen tubing or brass tubing cut to size. Even if the tubing is slightly larger or smaller than the required size it will look better than the rolled and glued photoetched part. It is difficult to remove the seam on these photoetched parts and much easier to replace them with tubing. Fortunately, these are not common on resin ship models. All photoetched shields and framing must be attached with super glue so you can blend the edges of the photoetch into the resin.

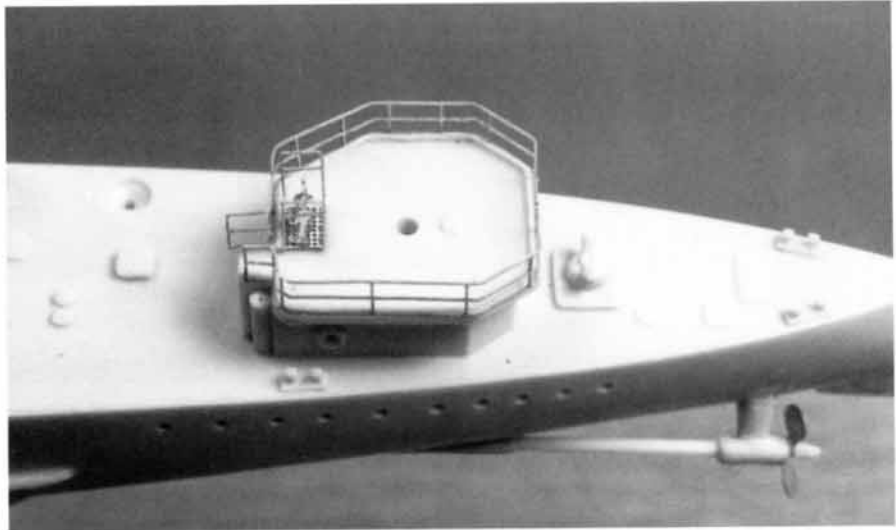
### MEASURING AND FITTING PHOTOETCHED RAILINGS

When you are ready to attach the railing, clean up your workbench first. You don't want tiny scraps of plastic floating around as you cut and attach railings because they have a tendency to get under the sheets. If you press down while scrap is underneath, you can bend or distort the brass or stainless steel.

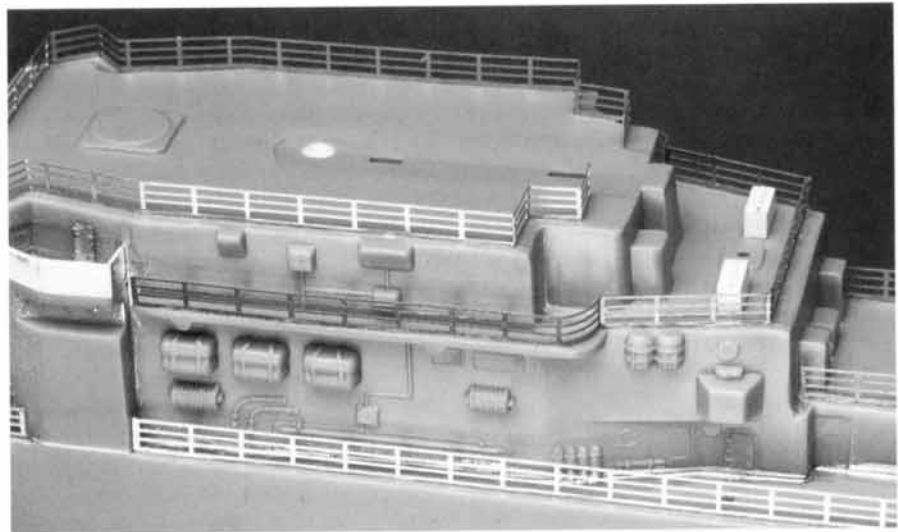
**Cutting.** Photoetch must be cut on a flat surface. I cut it on the same glass sheet on which I cut decals, using combinations of straightedge razor blades, X-Acto stencil blades, and a number 11 X-Acto blade. Photoetched brass cuts pretty easily, but stainless steel is strong and hard to cut. You are going to go through a lot of blades when using photoetched stainless steel, so invest in a box or two of them. Don't cut photoetch with a pair of scissors—it's too easy to bend parts while cutting the stubs that hold them in place. Finally, photoetched parts have a tendency to become projectiles when they are cut off the main trees, so wear safety glasses to protect your eyes.

If you are building a resin kit, study the instructions carefully, especially the pictures. Most photoetched railing parts you will use are specifically designed for the model, so there will be a minimum of measuring and cutting. The photoetched parts are all numbered, but sometimes it can be hard to tell which numbers on the photoetched sheets go with what parts—so match the parts to the pictures and also determine how they are positioned.

Sometimes the photoetched railing has stubs along its length or at bending points that correspond to indentations in the deck, so check the instructions before you cut any stubs



Some resin manufacturers like Gulfstream Fine Scale Models use tiny lips to help the modeler install photoetched railings. Model by John Ficklen.



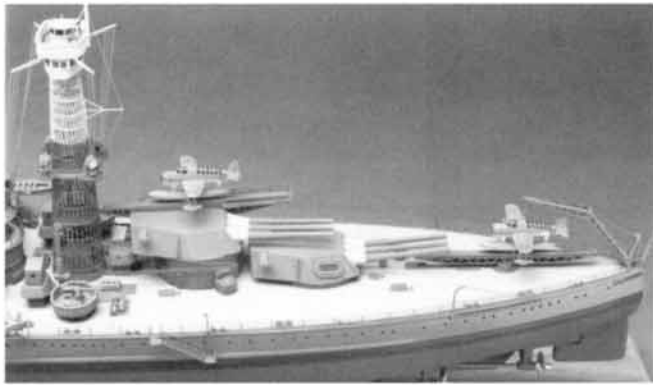
The vast majority of photoetched railing installations are slightly recessed from the edge of the deck, which makes them easy to install. Photo by Glenn Johnson.

you think are flaws. Moreover, some resin ship designers like Gulfstream Models provide tiny lips along the main deck and around superstructure areas for the sections of photoetched railing to sit up against. This thoughtful addition will make your positioning and gluing easier.

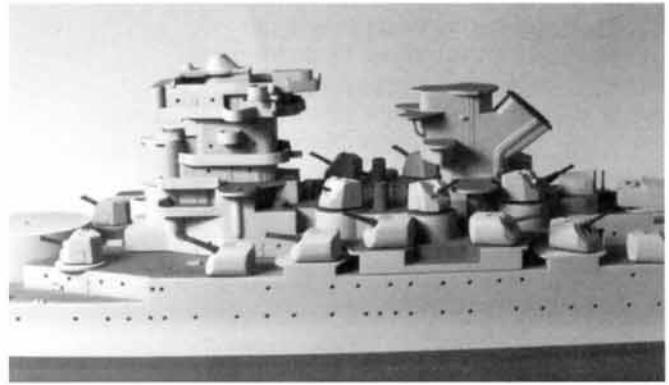
Photoetched railing usually comes in long sections, so first you must remove an entire length. Lay the photoetched sheet on the glass plate and rough-cut the thin stubs that hold the railing to the sheet. I usually cut the stubs in half and remove the remain-

der later. Don't gouge the edges of the railing when cutting the stubs, as this type of mistake is not repairable. Sometimes you have minute bumps along a length of railing, or a tiny section of a stub that you just can't cut off without gouging the edge of the railing. In these cases use a fine grit Flex-I-Pad sanding stick to remove the excess. To prevent the railing from bending while you are sanding, hold it between your fingertips so it won't flex and lightly stroke the edge with the sanding stick.

Keep two things in mind when using photoetched parts. First, keep



The long railing lengths on 1/350 scale ships make for easy installation. Putting a slight bow in the railing length is all you have to do to get these long lengths to sit correctly. Model by Lonnie Ottzen, master pattern designed by John Ficklen, photo by Glenn Johnson.



When measuring deck railings where guns are located be sure to put them into position as you measure, bend, and cut the photoetched material.

your hands clean. This will reduce the amount of skin oil deposited on the brass. If it is inconvenient to get to a sink, use rubbing alcohol and a soft cotton cloth. Second, photoetched brass and stainless steel are stronger than they look, so don't be afraid to work with them. There may be residual chemicals on the photoetch. Clean them off by running the railings across fine-grit sandpaper. Here again, lightly stroke it across the surface of the sandpaper to reduce the likelihood of distorting the part. Also, use several fingers to press the length of railing onto the sandpaper.

Photoetched railing can be attached to decks in three ways. First, railings can be flush with the edge of the decking. You will most likely find this arrangement on the upper decks and catwalks of the superstructure or the walkways along the sides of flight decks. Second, railings can be slightly recessed from the edge. This occurs on the main deck and the lower superstructure decks. Third, the base of the railing can be attached to the edge of the lip of the deck. This lowers the height of the railing, which may be necessary in order to accommodate large parts that overhang the deck.

There are two ways to measure a length of railing. Along the main deck you may find that the length you cut from the photoetched sheet is not enough. A good example of this is on Heller's 1/400 scale battleships or Tamiya's 1/350 scale ship series. These are big models that may require

several lengths to finish just one side of the main deck. In instances like this, when you can lay the railing on the deck without interference, just mark the lengths you need and cut them on the glass plate. Often, however, you must form-fit railings, especially where there are multiple curves and sharp bends. If you have to mate long sections of railing, cut the end stanchion of one of the lengths so you won't have two stanchions side by side. Also, cut around details such as bitts and chocks along the edge of the deck.

Attachment is simplest if the railing is straight or slightly bowed. This is typical along the main deck. Lay the railing along the deck and mark the end points with a soft lead pencil, and also mark any cutouts to accommodate deck details such as bitts and cleats. I usually add an extra stanchion length to the measurement just in case and form-fit the railing into place. Consider the location of the end points of the railing. If there are superstructure sides at both ends you may want to cut the end stanchions off so the railing bars appear to terminate in the superstructure. This is a good trick to keep in mind if the length is slightly more than the distance between the ends of the stanchions. In these instances try to center the railing so there are horizontal bars on each end that will attach directly to the sides of the superstructure.

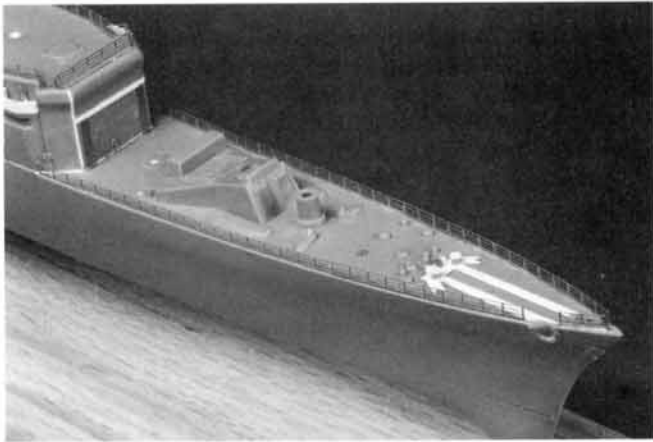
If there are ladders that reach up to the deck you are attaching railings to, stop and start the railings at these

locations. Here again, the trick of attaching the horizontal bars into the side of the superstructure will come in handy if cutting locations for ladders leaves you with an odd length of railing. If you do cut the stanchion off, be careful how you handle the railing because the horizontal bars bend easily.

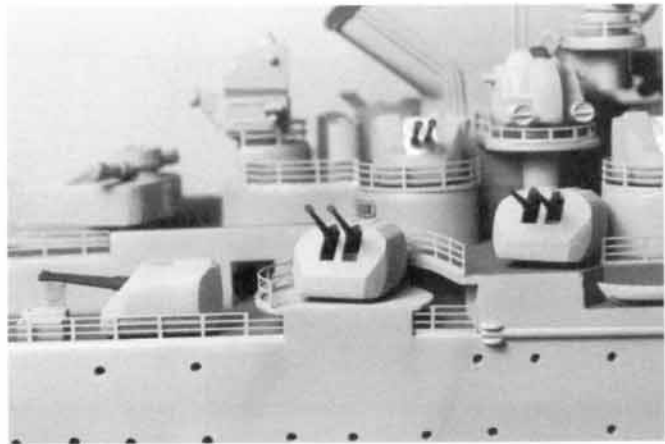
You can also use ladders to compensate for odd lengths or locations that require you to bend the railing between stanchions. In other words, you can add a ladder, which in turn creates a space along the deck you are adding railing to. This small space can compensate for an odd railing length or a mid-stanchion bend.

Some chock and bitt details along the edge of the deck are larger than the span between two stanchions. You can stop and start the railing leaving a space above the chock or bitt, or you can cut out the space from the railing, leaving the one or two horizontal bars in place.

If you decide to do this you also must cut out the remaining stanchion from between the horizontal bars. Hold the railing on the glass cutting sheet and carefully cut the stanchion length using a single-edged razor blade or a stencil knife. If you hold it firmly between your fingers the horizontal railing lengths will bow but not bend while you are cutting. If you do bend a bar length, carefully bend it back into place using the end of a round toothpick. The railing will become very fragile at this cut point, so be careful how you handle it.



Because of the shear on the deck of Monogram's *Halsey*, several lengths of railing were used and connected together so that they appear to be one length. Photo by Glenn Johnson



The end stanchions on these lengths of railing were cut off and the horizontal bars were glued directly to the superstructure.

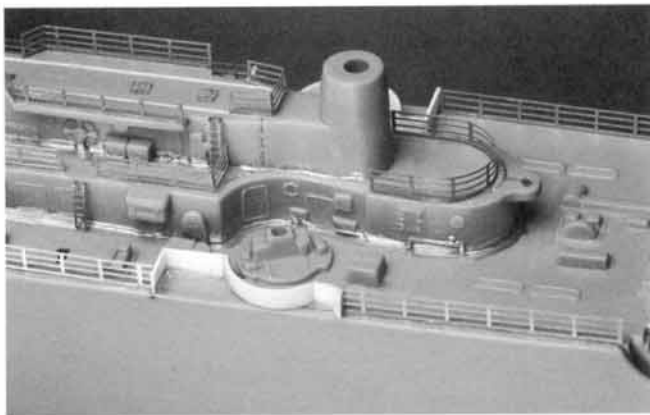
Adding photoetched railing to small sections of the superstructure such as the bridge is more tedious than working with long, continuous lengths. It is easier to measure, cut, and bend photoetched railings for the upper superstructure parts before assembling the superstructure, then set them aside until you're ready to install them. Another way to approach this is to have two kits, one to build and one to use for measuring and cutting photoetched parts. The advantage to using two kits is that you build the ship model without interruption. It also allows you to experiment with different railing configurations. I used two kits when I built Revell's 1/426 scale USS *Arizona* and it really helped. I found that while I was busy removing all the molded railings on this kit I was

able to use the second kit's railings as a form guide for the photoetch. I laid a section of photoetch along a length of molded railing and pressed the photoetched railing around the curve or bend. The trick is to ensure that the photoetched railing is set on the molded railing where you want it to start on the model, and that the photoetched railing is sitting perfectly straight on the molded railing as you shape it.

**Bent and curved railings.** Areas where you will attach the railings to curved or semicurved areas take a little planning. Pick a wood dowel or other round object such a micro file handle slightly smaller in diameter than the curved area where the railing will go. Wrap a length of railing around the dowel to shape it. When you bend

the railing, be sure not to skew it. What I mean is that after you bend it and set it down, it should sit flat. It will not assume the complete curve of the dowel, and that's okay because you need some play in it. That is why you should use a dowel with a smaller diameter than the place where the curved railing will go.

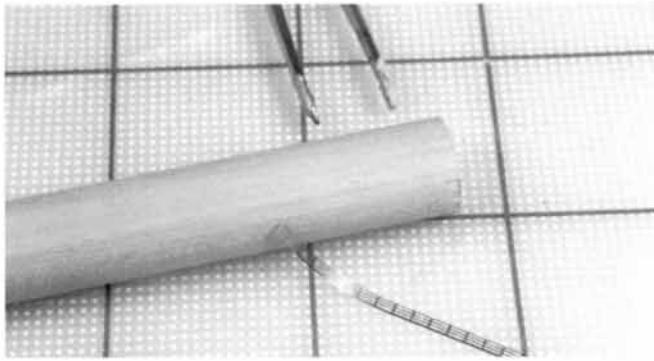
Check your work after bending, and if a stanchion must be cut out, now is the time to do it. You will be using tweezers to pick up the railings as you check and form-fit them into place, so pick up the railing at a stanchion point because the horizontal bars can bend if you squeeze too hard. To help protect the railing, place masking tape on the tweezer tips. Photoetched railings must be form-fitted into these tight locations and you



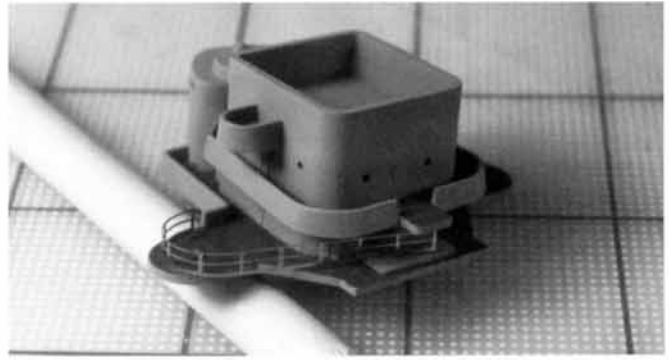
Railings must stop and start at ladders. You can also use these ladders to help compensate for odd lengths of railings. Photo by Glenn Johnson.



Railings can stop and start at deck fittings, or you can cut stanchions out of a length of railing so that you have a continuous length.



To make curves in photoetched railings use round dowels or even the handles of your files. Always use a round shape that is smaller than the actual curve you need because the photo-etch will spring back some.



It is easier to make curves first so that you can adjust the length of the railing if needed. Always cut a slightly longer railing than you need so that you have some extra to play with.

must be in the right mindset to do this. If you get nervous, tired, or impatient, set the job aside for a while.

If a length of railing has a bend, curve, or a combination of both, make every effort to start and terminate curves and bends at a stanchion. Too many sharp bends between stanchions will look funny. If sharp bends are required, lay the railing at its location on the model, mark where the bend will occur, and bend the brass using flat-tipped needle-nose pliers. Use pliers that have flat inner surfaces or you may imprint the brass. You also want pliers with a flat tip so the bend will be straight. Once you have the pliers positioned correctly, be sure they are straight. To check this, use a stanchion location to ensure that the ends of the pliers are parallel with the stanchion.

When you are bending a railing right at a stanchion, be sure to bend

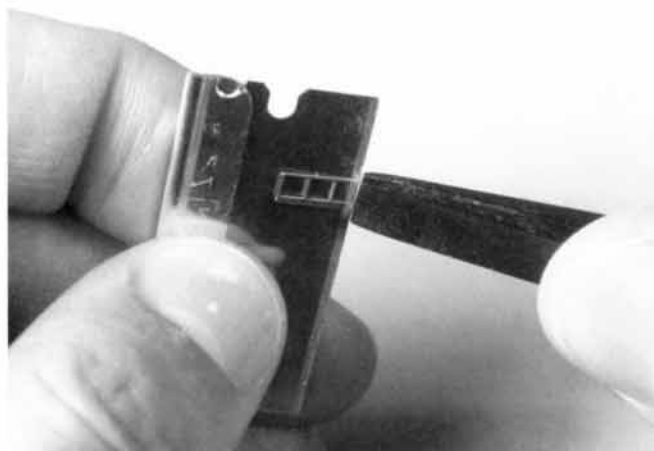
only the horizontal bars where they are attached to it. The stanchions are just too small to bend in half. To ensure a sharp bend, use a thick piece of Evergreen plastic stock or a single-edged razor blade to bend the railing once you set it in the pliers. Lay the plastic strip or razor against the railing with one end against the ends of the pliers and then rotate the plastic strip or razor. Don't put a greater angle in the railing than necessary. The best way to prevent this is to make slight bends and check your work frequently.

Adding curves is done the same way as bends, except that you use dowels to make the curves. As in making sharp bends, mark the location where the curve starts and try to plan it so it starts at a stanchion. Once you have the location marked, lay the railing on the dowel and bend. Again, use a dowel that is smaller than the curve

and frequently check your work. Sometimes a railing only has a bend or two along its length. In these instances a single length can be used if you carefully mark and form-fit it.

If there are multiple curves and bends along a length, install it in sections and attach them to one another as you go. If you add sections together, cut the stanchion from one of the railings so there will not be two stanchions together. Using multiple sections along a length of railing with several curves and bends will simplify your marking and form-fitting.

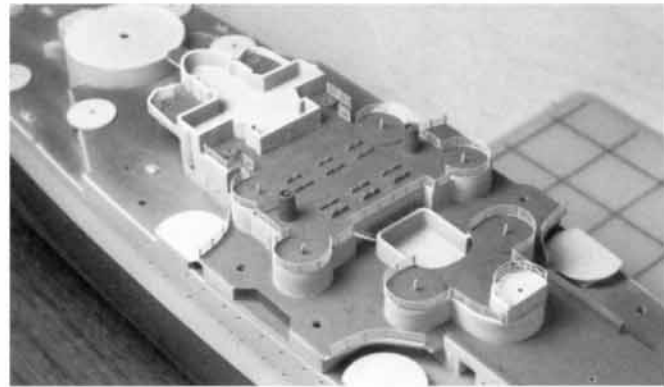
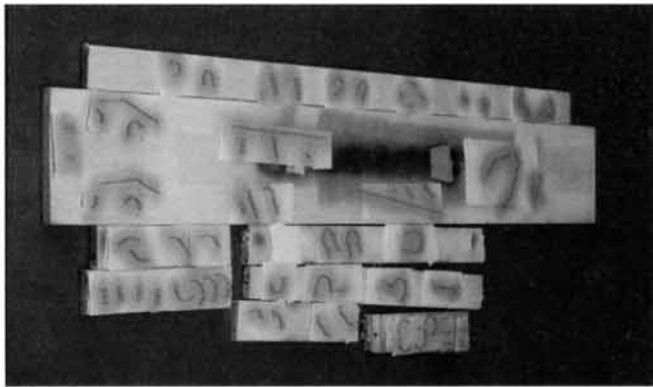
Once you have completed a section, trim away excess. I frequently end up cutting two or three lengths of stanchions from the railing. Its better to have too much than too little. Once you have a length measured and fitted, check for deck fittings that may require you to cut away a layer of the rails.



Bend photoetched railing using a single-edged razor blade.



The railing lengths on the upper deck of this resin model were done in sections because of the numerous small bends and curves along the deck line. Model by Lonnie Ottzen, master pattern designed by John Ficklen, photo by Glenn Johnson.



If you are working with a large kit and you have a lot of photoetched parts it can be easy to mix them up, so you need some type of organizational system. Photo by Glenn Johnson.

The railing installation on Heller's *Jean Bart* started in the center of the superstructure because of the way the ship model is designed.

To ensure that you duplicate railing bends, curves, and cutouts, work on railings for both sides of a superstructure part or deck location at once. This will ensure that both lengths are the same. As you finish form-fitting you can set them aside until you are ready to install them. Once I have completed a section I attach it to a length of balsa wood with masking tape on it. I also keep sets of railings together, and I try to keep railing lengths located at the same superstructure level grouped together so I won't get confused when I'm ready to attach them. If you are working with a large model like Heller's 1/400 scale ships you will have numerous lengths of railing ranging from approximately 1/2" to 8" long. Take the time to establish a system so you know where all these railings will go.

Once I finish cutting, measuring, and bending the railings I airbrush them. Be sure the paint covers all sides of the railing. The easiest way to ensure this is to airbrush from the sides, the top, and then at about a 45-degree angle so you get the inner surfaces along the horizontal bars. When they're dry, turn them over and repeat.

**Repairing a mistake.** If you bend a length at the wrong place you can repair it and start again, but this will only work once or twice at each bend. Removing curves is usually not a problem as the metal has not really been stressed. To flatten out a bend, lay the length of railing on your glass cutting sheet with the bend touching the glass and then slowly roll a 1/2" wood dowel or the handle of your X-Acto knife across the bend. Don't apply a lot of

pressure and don't try to flatten it on one pass. Roll the dowel back and forth a few times.

Turn the railing over so the remaining bend is pointing up. The railings close to the bend will also be slightly elevated above the glass cutting sheet. Now repeat the process. You may need to flip the railing over a few times to completely flatten it out. Curves are fixed the same way. The trick is to unstress the metal slowly, and that's why you roll the dowel along the bend or curve first. Unfortunately, bends in stainless steel can not usually be fixed more than once because of the hardness of the metal, but curves are not a problem.

When fitting photoetched railings, the smaller the scale the more tedious the process. To get good at working with photoetched railings, build a few 1/700 scale kits. Working with these small railings will hone your skills. Once you have worked in this scale, working in the larger scales will be a piece of cake.

### ATTACHING PHOTOETCHED RAILINGS

There are two general approaches to attaching railings. The first is to attach them as you build up the model before painting. The second is to complete the model, paint the railings separately, and then attach them. Your assembly techniques and paint scheme will also play an important role in how and when you attach the railings. For example, if the upper hull and main deck are the same color, say light sea

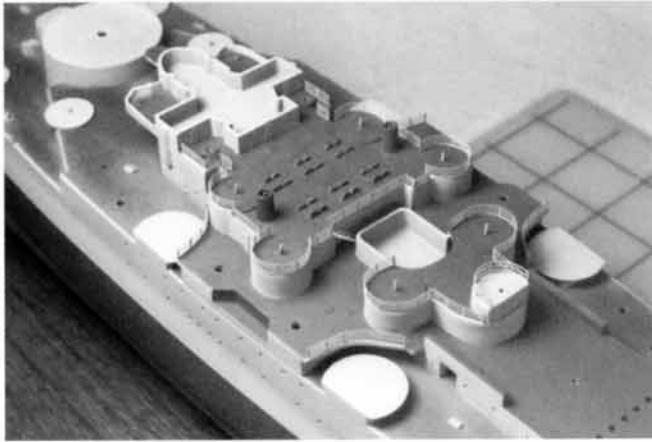
gray, you can attach the railings before you paint the hull and deck.

On the other hand, if you have a wooden deck or a steel deck that is dark sea blue and the upper hull is light sea gray, form-fit the railings, paint them, then attach them after you paint the hull and deck. Once railings are attached they can be easily damaged and bent, so start at the top deck of the superstructure and work down to the main deck.

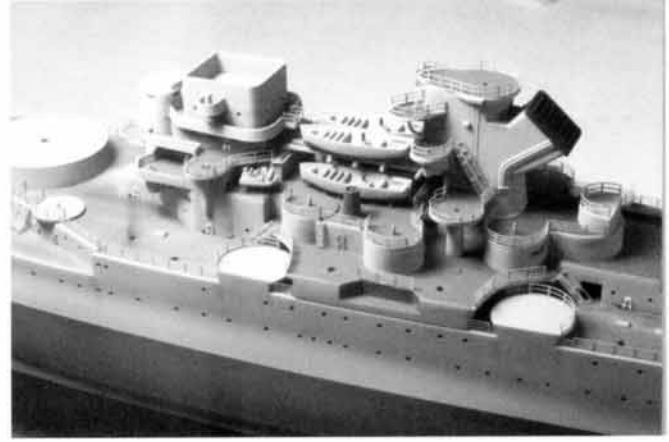
Although manufacturers suggest attaching photoetched railings with white glue, I recommend Duro's white tube super glue instead. I use small amounts applied to sections of the railing to help set and position it in tight locations, but I use super glue to bond it to the plastic. This holds for painted and unpainted railings. The flow and capillary properties of this glue make it an excellent adhesive under any conditions.

To attach straight lengths of railing that are set back from the edge of the deck, place the railing in its location and, starting from one end, apply a minute amount of super glue along its length every 1/8" to 1/4" or so. As you work along a length you can make minute adjustments in the alignment and location of the railing. If the railing has bends and curves in it, set it at these locations first so they line up with the deck. Apply super glue here first and work away from these areas, attaching the railing every 1/8" to 1/4" and adjusting its location as you go.

To attach lengths of railing that are set flush with the edge of the deck, apply the super glue to the back side



Once the center is finished, the next step is to install the rest of the railings on the entire superstructure area.



As you complete each deck level of railings, add the upper structure areas as well as interior parts such as the small boats. Also install the photoetched railings on the upper superstructure subassemblies prior to installing the part onto the model.

of the railing using the technique described above. You don't want to distort the face of the edge of the deck with a bead of super glue. Another approach is to apply super glue along the base of the railing while holding it with tweezers and then set the railing in place. You have to have a steady hand to do this, and you have to get the placement right the first time.

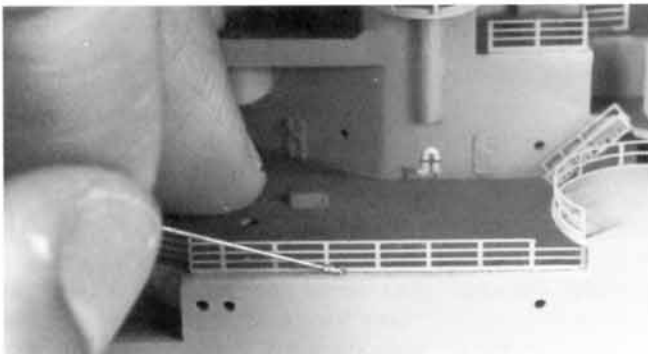
Once you have it attached you can run a bead of dilute white glue along the attachment point between railing and deck to fill the seam. The white glue should be runny but not like water. Using a thin wire applicator, apply it in minute amounts, work it into the seam as you apply it, and use a damp Q-Tip to smooth out the glue.

Clean up the excess with a damp Q-Tip. The exception to this is where you have a catwalk or other thin plastic surface, like the walkway areas on the sides of flight decks. Here you can run a bead of super glue along the edge of the surface. Although the glue will run across the plastic, it will cover the entire surface and will be impossible to detect once it is painted.

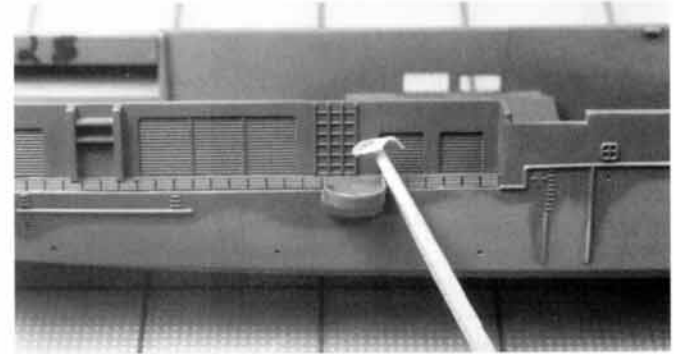
To attach railings that are set along the front of a deck length, position the railing and apply tiny amounts of glue to the base. The capillary qualities of the glue will ensure it will seep between the base of the railing and the side of the deck. Use super glue sparingly, use a thin wire as an applicator, and be sure to use fresh glue.

To apply Duro's super glue, squeeze an amount onto a piece of paper, dip a thin wire applicator into the puddle and then touch the front side of the base of the railing. Once you have tacked a length in place, go back and run a bead along the base of the railing so it will be contoured consistently along its length. It only takes minute amounts to attach the railings, so don't overdo it.

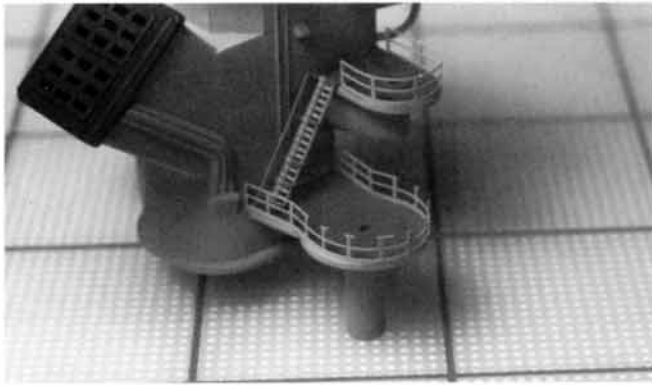
Be sure the railing is resting flat along the surface before you begin gluing. Sometimes the opposite end will be slightly above the surface, especially if there is a slight upward bend in the length of railing. This problem is usually associated with lengths that have several bends and curves.



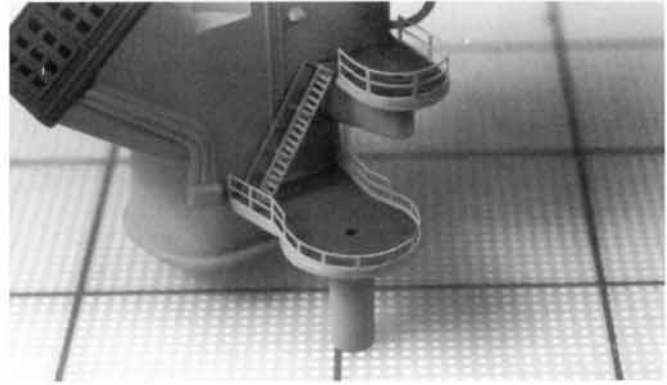
All photoetched railings are best attached using a thin wire applicator and Duro's white tube super glue. After positioning the railings, tack them into place and run a bead of glue along the base. Then paint the area at the base using a detail brush.



In some locations on 1/700 scale models it is easier to position the railings using a toothpick with a small piece of masking tape wrapped around it. Position the railing and then tack it into place. When the glue is dry, run a glue bead along the base of the railing.



The railings on this deck area were too high to allow the gun directory to sit correctly, so the railing had to be trimmed. To trim railings once they are installed use a set of wire cutters or Testor's sprue cutter.



After removing the top railings, trim the stanchions and sand the entire surface smooth with a Flex-I-File sanding stick. Touch it up with a detail brush.

If you are attaching the railing before you paint the plastic surface, go back and check the base after you have painted it to ensure that there is a smooth and consistent bead of super glue. If you attached the railing to the plastic after it was painted, repaint the base of the railing to cover the bead of glue. Use the same paint you used to airbrush the railings and apply it with a detail brush. After it has dried check the base. Fill in any areas you missed and paint them.

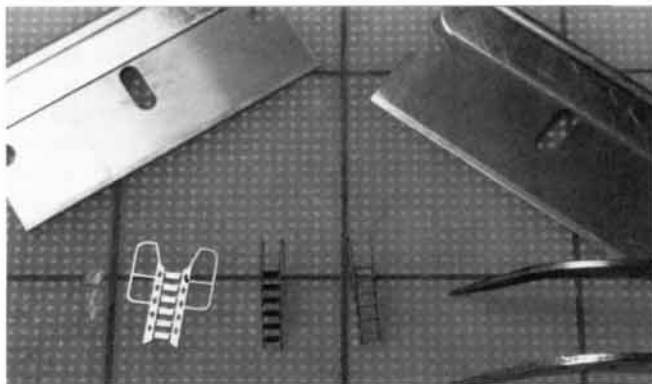
Once you get some experience in form-fitting, attaching, and painting railings the work and time needed to install them will decrease. You'll also develop your own tricks to deal with problems as they crop up. The key to success is to plan your work, take your time, use the right tools, and put it aside when you get nervous.

If you damage a length of brass railing after it is attached you can usually bend it back up using flat-nosed needle pliers. If you bend a horizontal bar between two stanchions, use a flat toothpick to try to straighten it. If the damage is severe you may have no choice but to replace the railing. Removing damaged or bent photoetched railings after they have been attached without damaging the surrounding painted surface is not hard, but you have to be careful and proceed slowly.

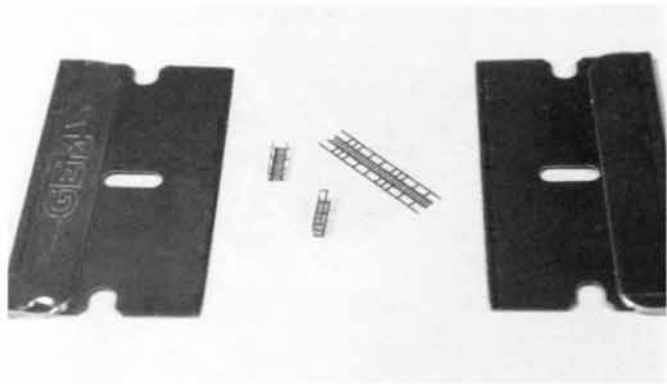
Work the tip of a very sharp number 11 X-Acto blade beneath the railing to slice it away from the deck. If you used minute amounts of super glue to attach the railing you should be able to remove it without damaging the surface too badly. Once you have removed the railing clean up the

affected surface so it is flat again. Attach the new railing, apply a bead of glue along the base, and repaint it. Chances are any super glue you didn't remove when you cleaned the surface will blend in with the new bead. You may also have to paint the surface nearby, as some of it may have been pulled up when you removed the damaged railing. The best way to proceed is to plan your work to minimize the chance of damage. This is why I recommend that you plan your work carefully at the very start and work from the top of the superstructure down.

Sometimes, despite the care you took in measuring the photoetch and ensuring that railings would not interfere with other parts, you are going to overlook one or two areas. If you don't catch the mistake until after you have installed the railing you can trim it

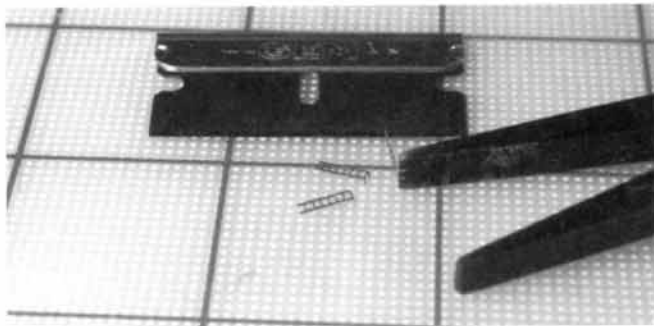


The inclined photoetched ladders on some resin ship kits have individual steps that must be bent into shape. This is easy to do if you bend the steps from the back side of the ladder with the tips of your tweezers.

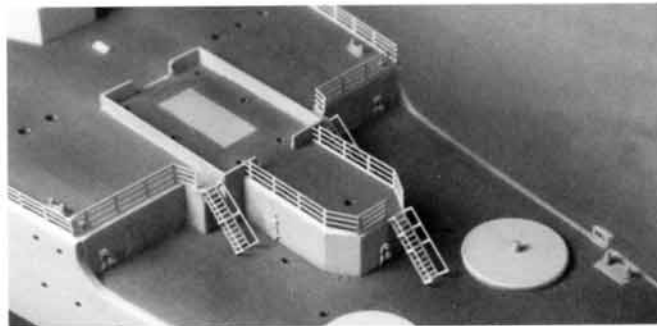


Inclined ladders are best bent to shape using two single-edged razor blades to hold the part and bend the sides up.





Vertical ladders should have stubs at both ends to offset the ladder from the surface of the superstructure.



Applying minute amounts of white glue to the underside of inclined ladders is the easiest way to attach them.

down, but you have to work slowly. For trimming you need a sharp set of small wire cutters. First determine how much of the railing you need to cut down. Usually removing the top row will give you the clearance you need. First cut the horizontal bars on the top row. You will need to do two cuts per length so only the stanchions are left. Next, trim off as much of the stanchion as you can and remove the rest by sanding it off with a Flex-I-File sanding stick.

If you have to remove more than one layer don't try to cut two layers of horizontal bars at once. The stress you put on the railing may cause it to distort or bend. Once you finish trimming and sanding you can touch up exposed brass with a detail brush. If you bend individual stanchions or horizontal bars, bend them back into shape with a round toothpick.

### PHOTOETCHED LADDERS

Two types of ladders come with photoetched sheets. The first is a stairway ladder with attached side railings and the second is the traditional type you find attached to masts and the vertical walls of the superstructure. Ladders of both types usually come in long lengths that you can cut to size, and manufacturers usually supply more than you can use.

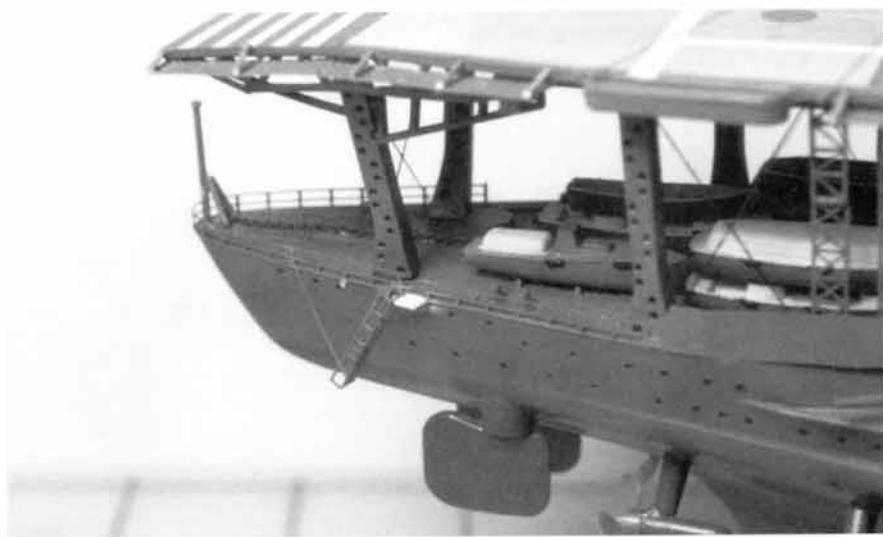
Both types of ladders are cut from the photoetched sheet in the same way as railings, and I recommend cutting an entire length off so you have plenty to work with. To prepare stairway ladders, first approximate the length you need and then form-fit the ladder into place. Since you have not bent the railing up yet, the ladder will not exactly fit into place, but you can estimate the length pretty closely by just laying it at

its location. Trim off the excess and bend the railings up 90 degrees. The easiest way to do this is to position one single-edged razor blade along the base of the railing, slip another one under the railing, and rotate the blade under the railing upward. When the tops of the razor blades touch you have a 90-degree bend.

After you cut a section (longer than you will need) of vertical ladder, remove the last rung from the length, and bend the remaining side lengths 90 degrees using flat-nosed needle pliers. Position the ladder sideways in the pliers and use the next rung on the ladder as a visual reference to ensure that it is sitting straight in the pliers. For a sharp bend, use the same technique as for bending railings. The small stubs you bent will act as spacers between the ladder and the superstructure, and also as gluing bases. Next, form-fit it in place and mark the top location. You need to add an extra ladder rung to your measurement; cut this extra rung and bend the stubs in the same direction as the first ones.

Ladders are airbrushed along with the rest of the railings, and you can attach both stairway and vertical ladders with white glue. It only takes a tiny amount to secure them. I hold them with tweezers, apply white glue using a thin wire applicator at the attachment points, and position them.

Install railings and ladders as port and starboard sets. If you measure and bend them as sets and organize them on your balsa sheets as sets they will be easy to locate and easy to install as matched sets. This will prevent you from installing a wrong length of railing, especially if you have several that look similar.



Inclined ladders can also be modified to be used as other types of ladders. Nimicho's 1/500 scale *Akagi* looks much more realistic with the addition of this little detail. Model by Scott Weller.