

Chapter Four

Working with Brass and Stainless-Steel Photoetching



1/350 scale *USS West Virginia* built by Chris Preston

Photoetched sets are an absolute must for ship modeling, as they add a level of detail that can turn an average plastic model into a masterpiece. From multibar railings to inclined ladders, detailed radar sets to multilevel etched hatches and boat davits, these detail sets have it all! In addition, most resin ship kits have photoetched sheets that can include details ranging from railings to superstructure shapes.

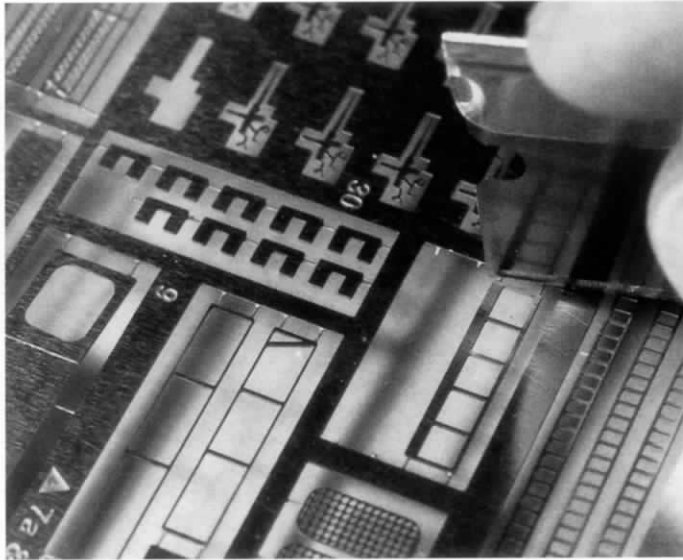
Most photoetched sheets are made from brass, although a few small scale sets in 1/700 scale are done in stainless steel. Whether they are brass or stainless steel, they are made using the same technology that is used to make printed circuit boards. An image is imprinted onto a super thin sheet of brass or stainless steel and then the metal is immersed in a chemical that eats away the areas of the metal that are not imprinted with the image. The cost of photoetched sheets has been rising steadily over the past few years, mostly because of the cost of production and the expense of safely disposing of the chemical etching liquid. These detail sets are, however, still well worth the investment.

Always cut photoetching with a sharp blade and cut the parts on a hard surface such as glass or Plexiglas. Some manufacturers' instructions suggest that you can cut off parts with metal scissors. I recommend against this, since it is too easy to damage parts or cut into adjacent parts. Generally, it is easier to cut a photoetched part off its tree by leaving a little of the stub attached. You can easily remove the remaining stub from the part by using a number 11 X-acto blade and then smoothing the edge with a Flex-I-File sanding stick. Stainless-steel photoetched parts can be more difficult to cut off their trees because the metal is very strong, so be prepared to go through several blades.

As a general rule, photoetched sheets are between five thousandths (.005) and seven thousandths (.007) of an inch thick, but I have also worked with brass sheet as thin as three thousandths (.003) of an inch. With photoetched sheets getting thinner and thinner, you have to be extra careful not to distort the parts as you cut them off and clean them up. An important point here about cutting photoetching—wear your glasses or use a pair of safety glasses. Small photo-

etched parts, especially the stubs, have a bad habit of becoming projectiles when they are cut—so be careful and protect your eyes! I use Flex-I-File sanding sticks for a lot of cleanup work on photoetching. A great place to find sanding sticks is the nail care section of your local drug or grocery store. You will find a huge assortment in many colors and grits, and they are inexpensive.

Once a part is cut off, clean its surface by lightly running it across a stationary piece of 400- or 600-grit sandpaper taped to your workbench. Some modelers prefer to clean the surface of the entire detail sheet at once by laying the sheet flat and carefully running the sandpaper over it. This may be quicker, but you also stand a good chance of damaging individual parts. I recommend doing them one at a time. For long lengths of railings, lay the part on



Always cut photoetching on a hard surface with a sharp blade. A piece of thick glass or a Plexiglas sheet works best. And be sure to wear safety glasses when cutting photoetching.

a flat surface and gently run the sandpaper across the surface of the part lengthwise and away from you. Do not slide the sandpaper back and forth. Only a few passes at the surface will clean it up—when it is shiny it is clean.

Cleaning up photoetched surfaces is a must if you're gluing sections together,

such as parts of an aircraft crane or a catapult launch, because the glue won't stick well to dirty photoetching. You'll have to clean the edges of railings and gun or splinter shields for the same reason; Flex-I-File sanding sticks are great for this. Gun and splinter shields that must be blended into the superstructure will need a strong bond with the resin. Sanding the surface will also rough it up, which helps the glue adhere better.

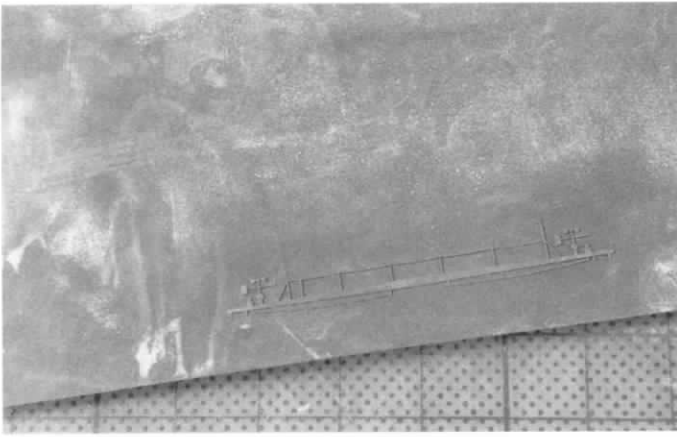
To get curves in photoetching, bend the part around a wood dowel or other round object with a diameter slightly smaller than you need—the photoetching will spring back a little. You can get sharp bends and angles with flat needle-nose pliers or by using two single-edge razor blades. If you are bending a part such as a crane into shape, take extra care to be sure

that you're bending the entire length of the part at once. Then you'll get a straight bend. Make longer bends, such as on catapults, by using two single-edge razor blades. Hold the part down along the bending edge with one blade, and slide the other blade underneath along the bending edge. Then fold the part up.

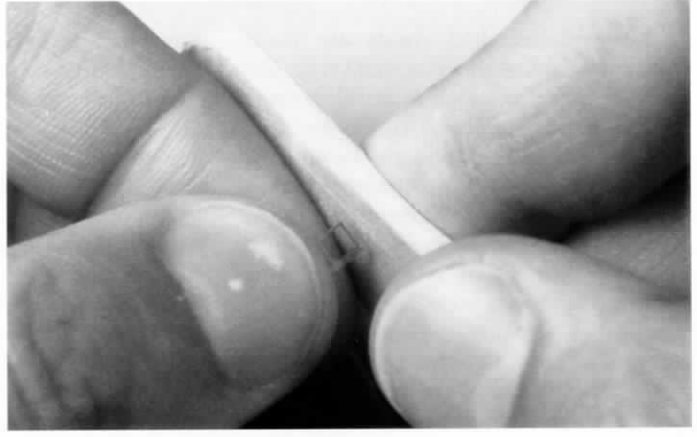
Super glue is an excellent bonding agent for both brass and stainless-steel photoetching. When strength is not an issue, white glue also works well. Using white glue will allow you some flexibility in positioning pieces together, but be sure to prime the parts prior to gluing—the white glue will stick better to flat paint than to bare metal. White glue is also an excellent filler for cracks and voids when using photoetch-

ing. Be sure to prime photoetching before applying a paint finish.

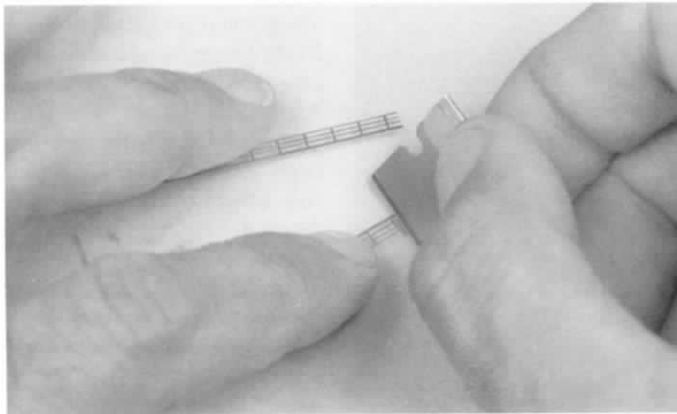
To strengthen parts such as superstructure shapes and airplane catapults, use small lengths of Evergreen strip and round stock. Cut them to size and then glue them to the inside areas of these delicate parts.



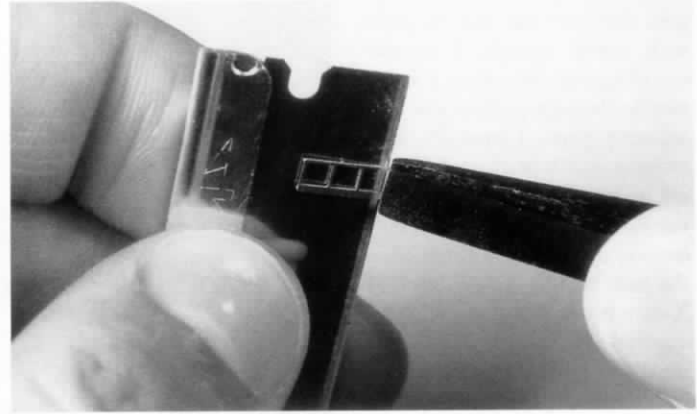
To clean the surface of photoetching, carefully run the parts across a stationary piece of sandpaper. If the parts are delicate, do not run them back and forth, because this motion may damage them. A sweeping motion in one direction works best.



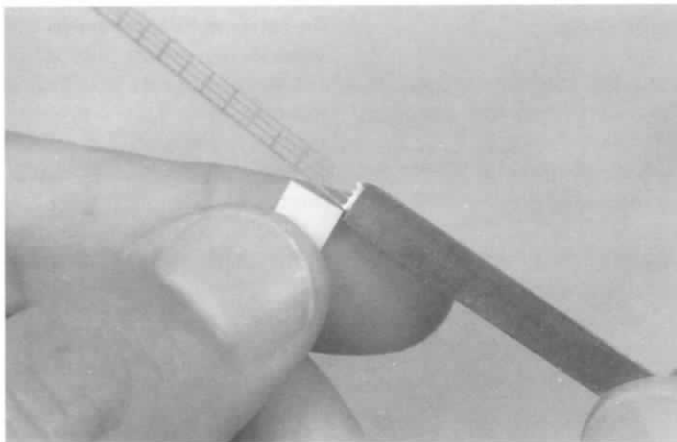
To clean the sides of photoetching, use a Flex-I-File sanding stick. It is especially important to clean the gluing surface of the railing to ensure that the super glue will stick.



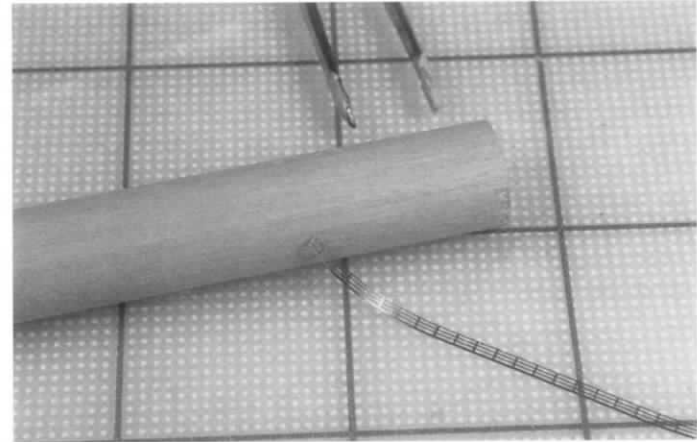
To trim the edges of railings, use a single-edge razor blade. Cut the entire length at one time so that the cut will be straight.



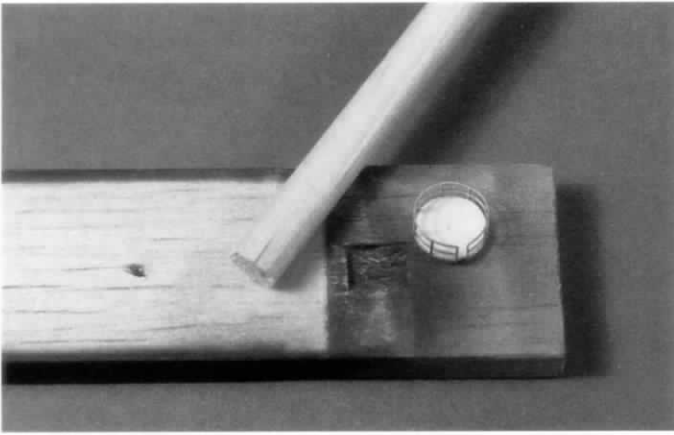
To get a sharp bend in photoetched railings, use a set of flat-faced needle-nose pliers to hold the part. Then bend the photoetching, using the edge of a single-edge razor blade.



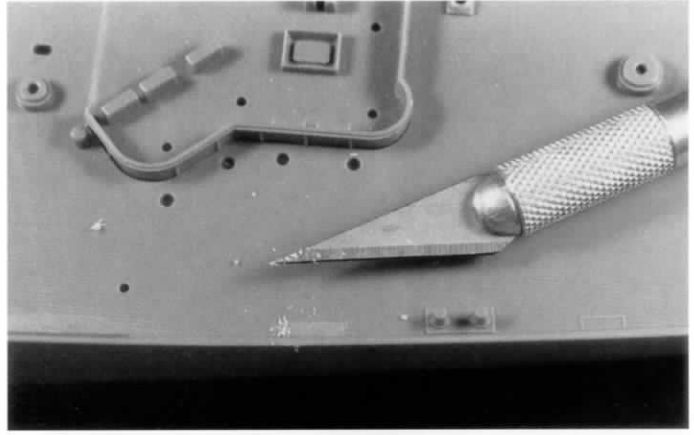
If you do not want to use a razor blade to make sharp bends, use a thick length of Evergreen strip.



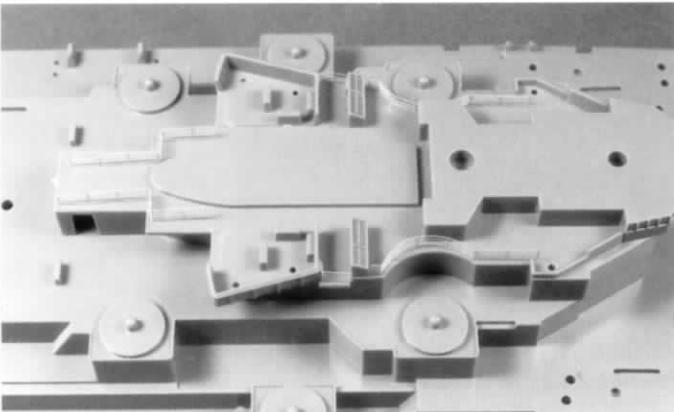
Curves in photoetched railings can be achieved with wood dowels or any other smooth-surface dowel or curved object. Since photoetching will spring back, use a dowel slightly smaller than the curve you need.



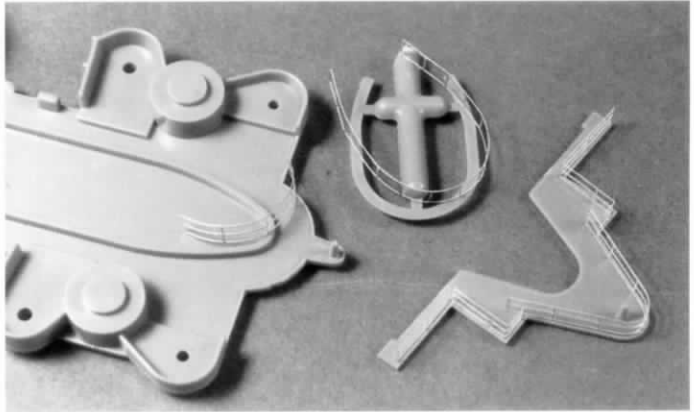
You can also make complete circles with wood dowels. Here again, it is best to use a slightly smaller dowel.



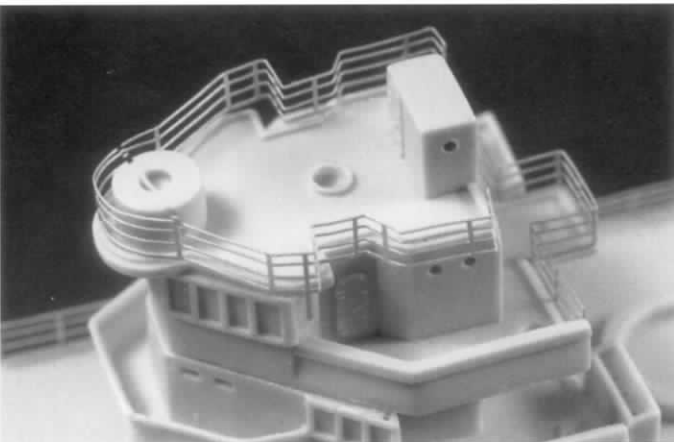
Planning the placement of photoetched railings is important. Plastic ship kits are not designed to accommodate them, so slight modifications are necessary. Here the locating outline for the bits on Tamiya's 1/350 scale *USS Missouri* are scraped off so they will not interfere with the placement of the photoetching.



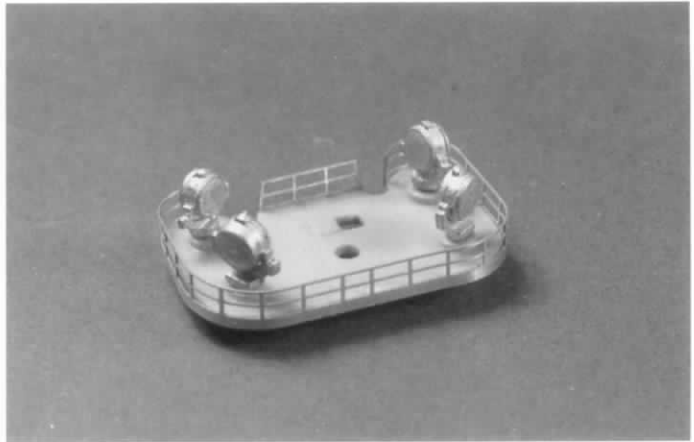
Whenever possible measure, cut, and form photoetching on the kit parts in the early stages of construction. Then if you have to add photoetching as you build up the superstructure, you can just glue the parts into place.



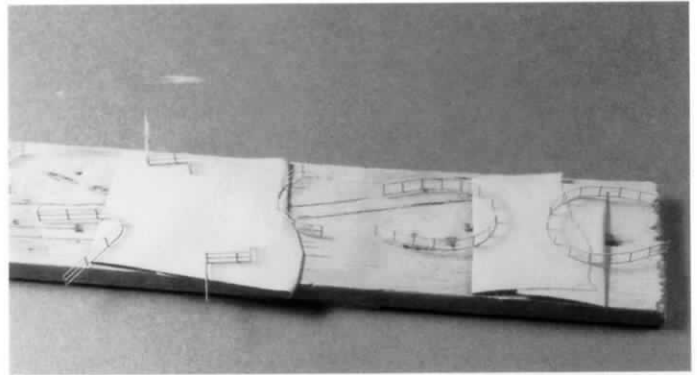
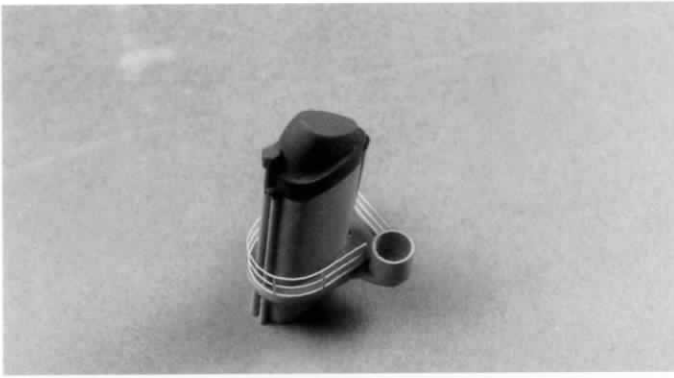
I like to form all the photoetched railings on small parts as well as on the large superstructure parts.



You can wrap long sections of railings around complex curves and bends, but you'll have to work carefully. Check your work often as you move around the part.

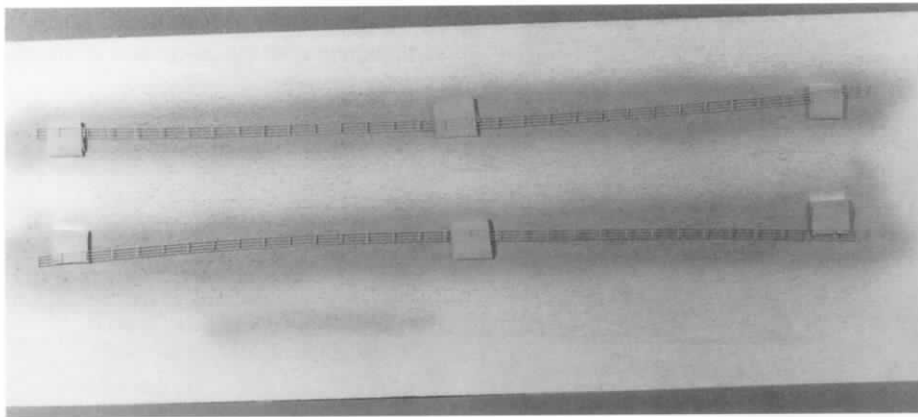


In almost all cases photoetched railings should be attached to the deck, but sometimes lengths of railings are designed to be glued to the sides of the part. If you glue the railings to the deck instead, the railings will interfere with other deck details.

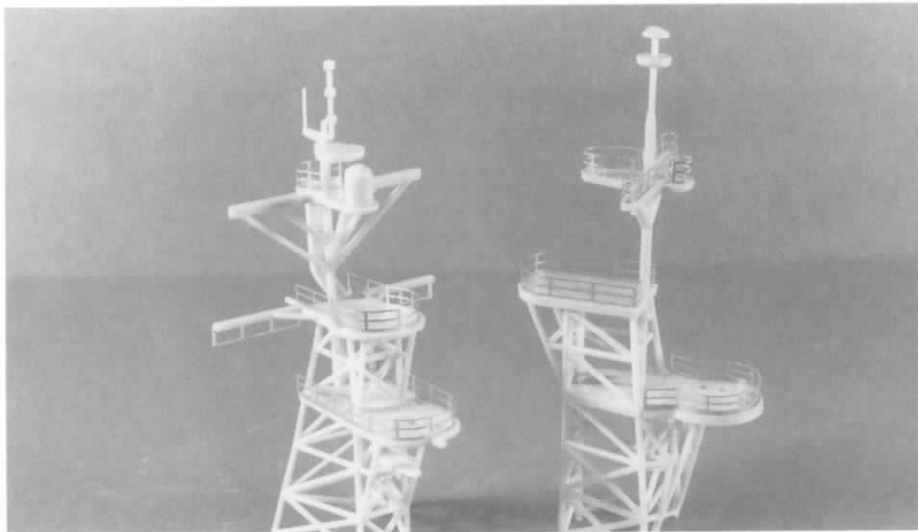


Whenever possible, work in subassemblies. Add the railings on the smokestack of Classic Warships *USS Miami* before gluing the stack onto the superstructure.

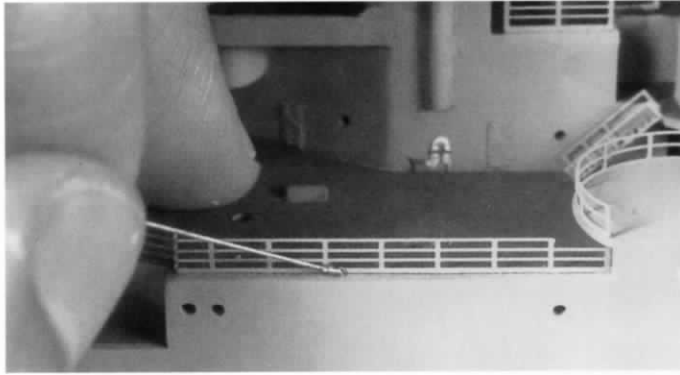
When painting photoetched railings, use masking tape to hold down the parts. When the paint is dry, flip the parts over to paint the undersides of the railings.



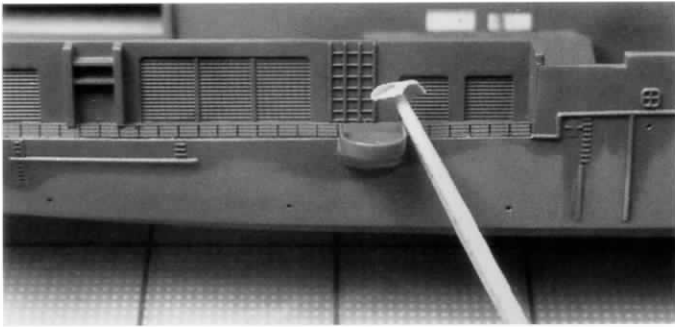
Paint long lengths of railings on their sides, especially railing lengths with bow curves. Use a minimal amount of tape when holding down these long parts, and be very careful when you flip them over. It's easy to distort the shape of these long railings, especially if the thickness of the photoetching is five thousandths (.005) of an inch or less.



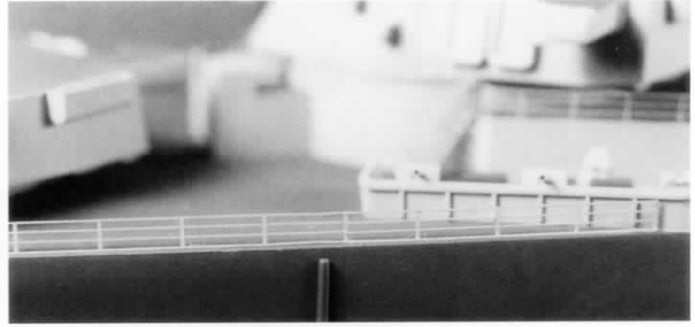
Here is another example of working in subassemblies. Since both mast structures will be painted black, it made a lot of sense to attach the photoetched railings to the structures before gluing. This approach also eliminates any touchup work, which is normally necessary when you glue photoetched railings to painted surfaces.



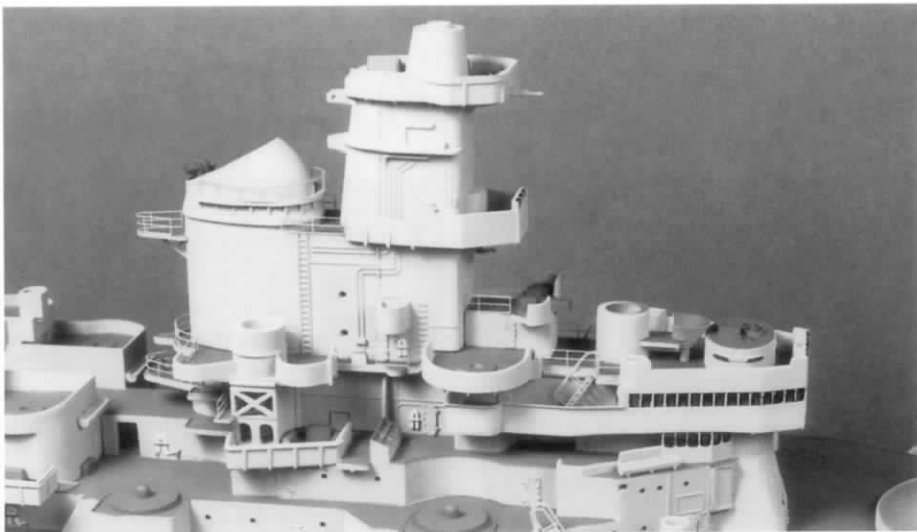
Glue photoetched railings with super glue applied with a thin brass wire applicator. Dip the tip of the wire in super glue and run it across the base of the railing. Glue down the entire base of a railing length; otherwise the railing may bow. The glue will appear glossy when dry. To dull it, use a detail brush to paint the super glue with Testors Dullcote.



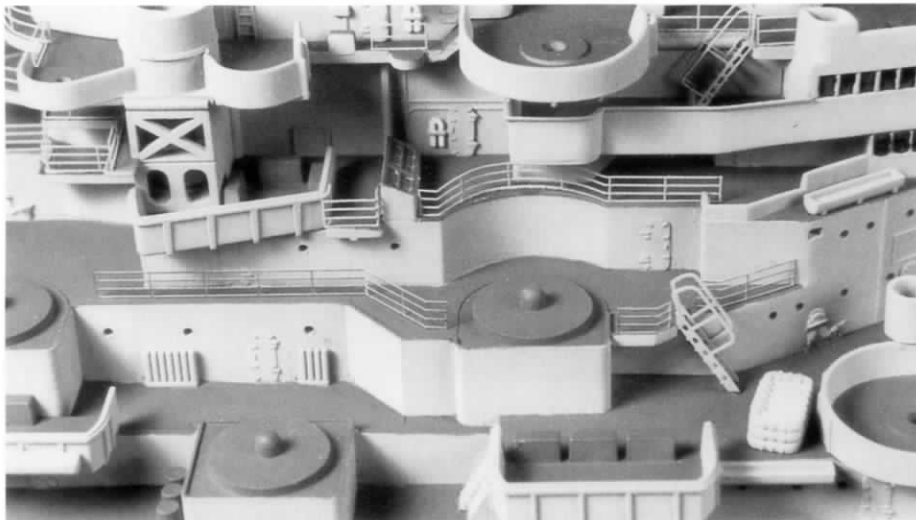
To help position 1/700 scale railings, you can use tweezers or a toothpick with a piece of masking tape attached to the tip.



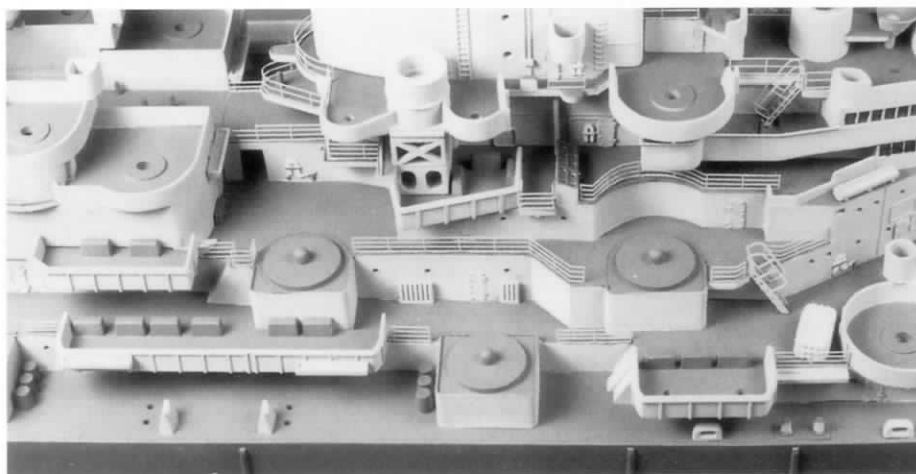
When you're working on 1/350 scale ships, you will have to splice railing to achieve a continuous length. When splicing them, cut the railing stanchion on one length and position the bars onto the stanchion of the other railing length. Then apply a tiny amount of super glue to each bar.



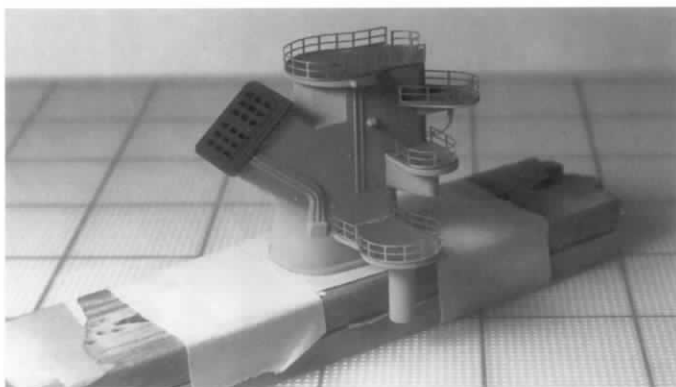
On large complex superstructures it's a good idea to add railings and ladders as you build up the kit. Work from the inside areas towards the outside areas.



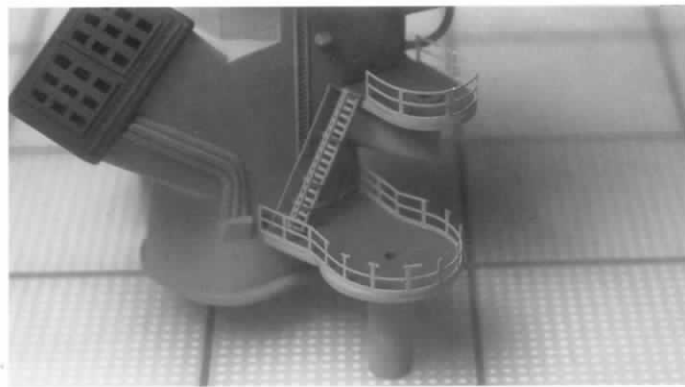
It's now time to install this railing. Just to be sure, give it one final fit check. Put the twin 5-inch mount in position as well to ensure that the railing does not come too close to the side of the gun mount.



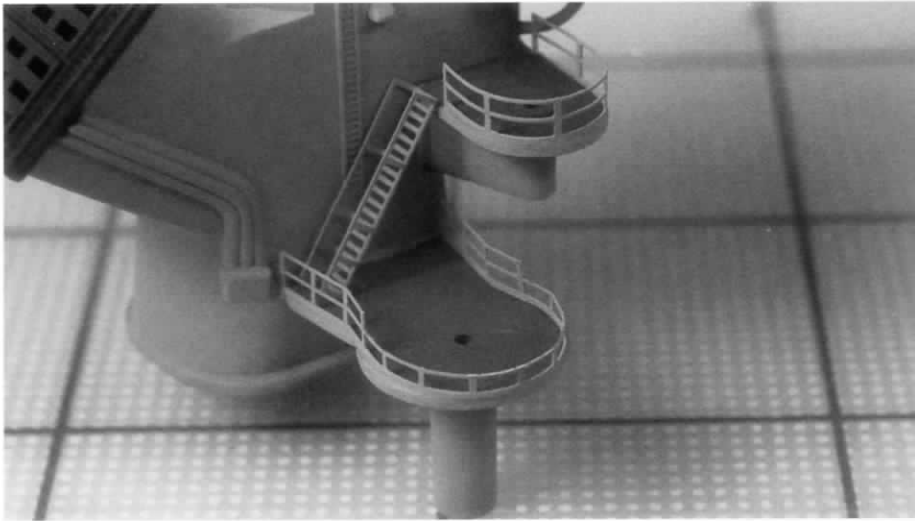
Install all the railings on the forward superstructure area on Tamiya's 1/350 scale *USS Missouri*. Now it's time to start adding the guns and other fittings.



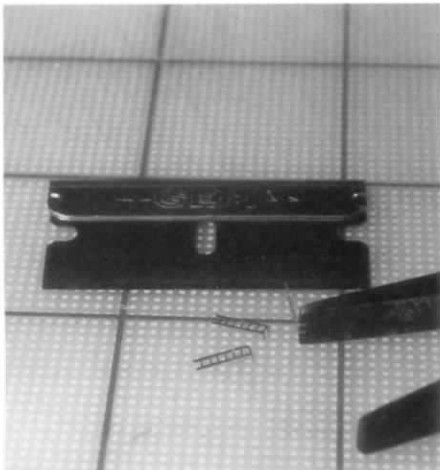
The lower level railings on these kit parts need trimming because they interfere with the placement of the gun director.



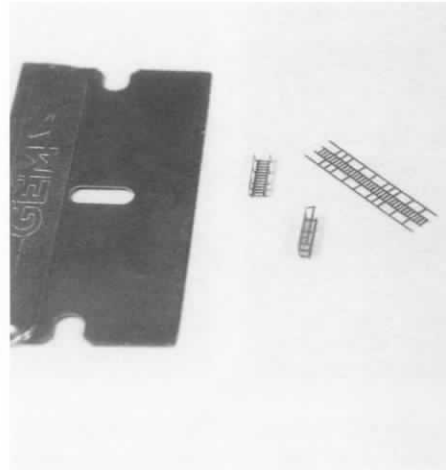
Carefully snip the crossbars and then cut off the upper stanchion lengths. A sharp set of small wire cutters does all the cutting.



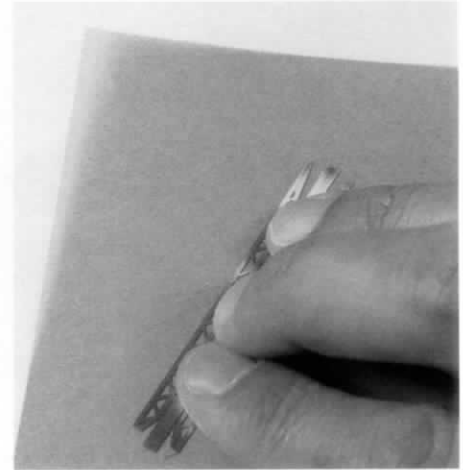
Sand down the remaining stubs using a Flex-I-File sanding stick and repaint the surfaces. (I was lucky I caught this problem before the part was glued onto the superstructure, as it would have been ten times harder to fix it.)



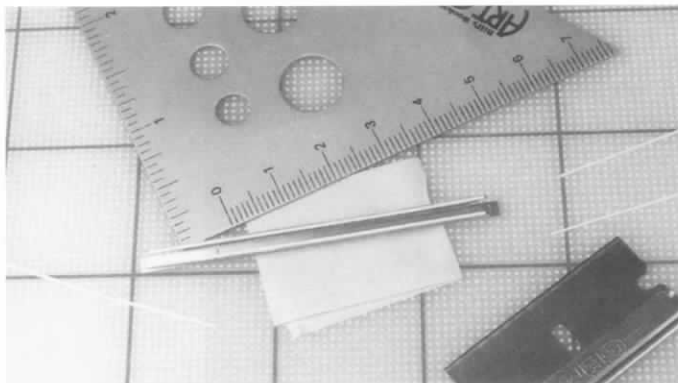
Vertical ladders must have stubs on both ends to offset the ladder from the side of the superstructure.



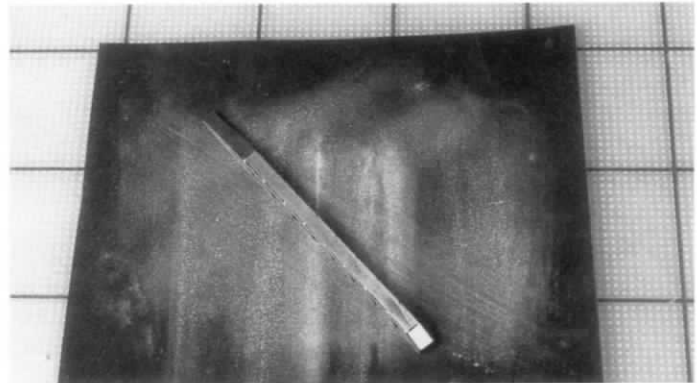
It's easy to bend inclined ladders using two single-edge razor blades. Hold the part in place along the fold line with one edge, and slip the other under the part along the bend.



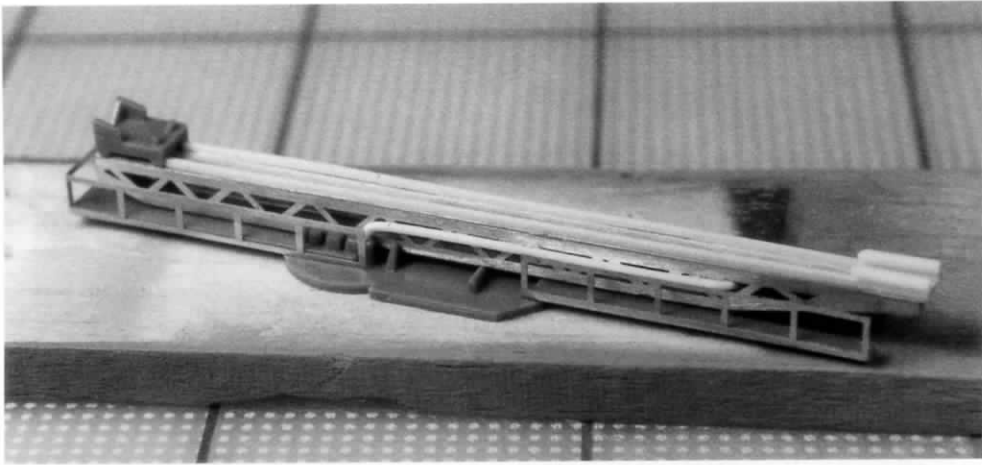
Here again, be sure to clean the surfaces and the gluing edges of photoetched parts. This is especially critical when photoetched parts are to be assembled.



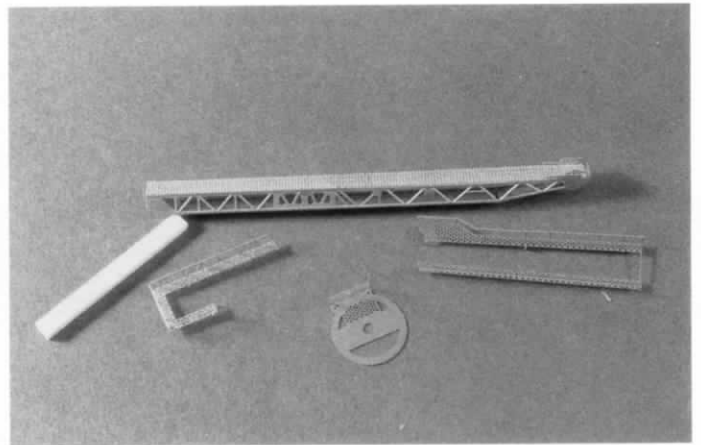
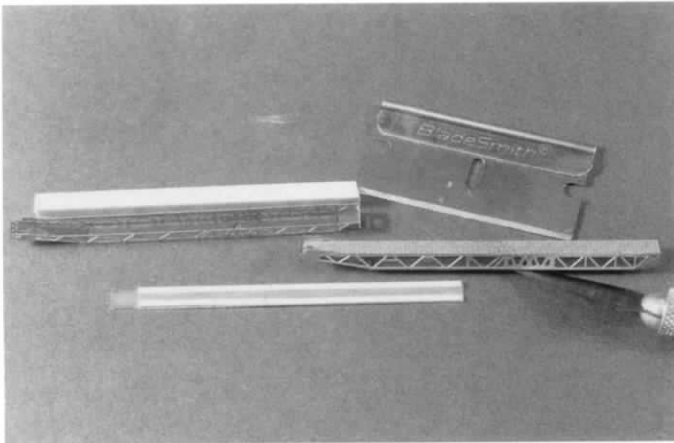
If a catapult has a separate photoetched surface, I like to reinforce the inside of the catapult with strip stock so there will be a larger gluing edge for the surface.



You can also use a stationary piece of sandpaper to clean super glue from the surfaces of photoetching.

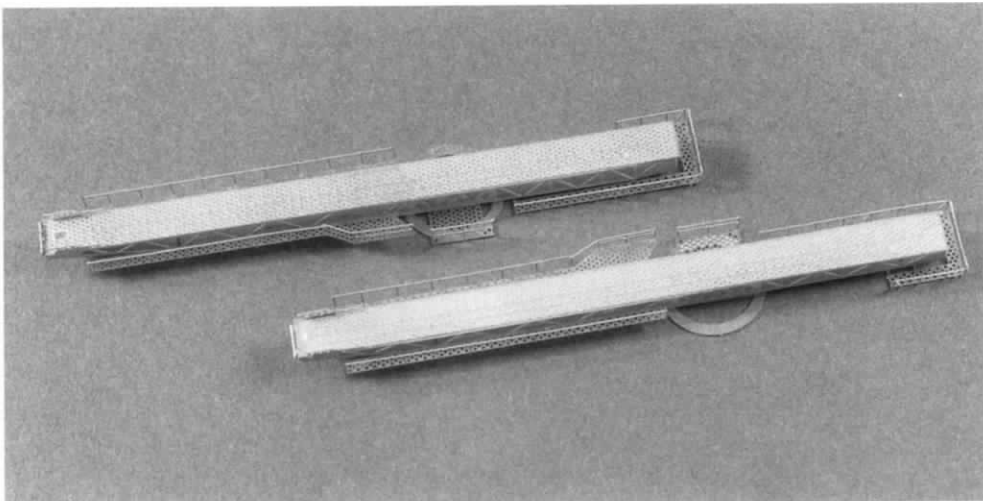


I built up this early Gold Medal Models catapult design with a combination of photoetched parts and kit parts.

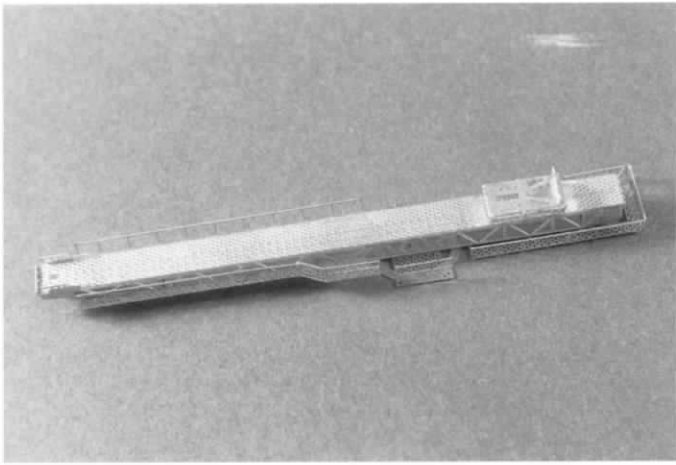


Newer photoetched designs have complete catapults that do not require the use of kit parts. Use Evergreen strip stock as an interior form to bend the sides of the photoetched catapult. Attach the reinforcing strips to the underside of the catapult top.

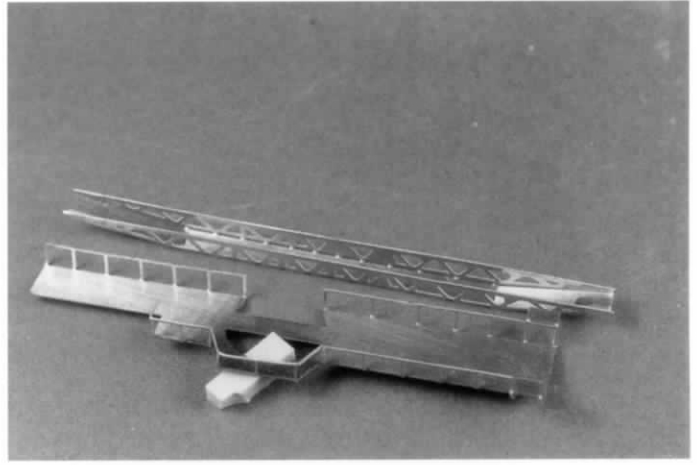
The subassemblies on this Gold Medal Models 1/350 scale catapult are now ready for final assembly.



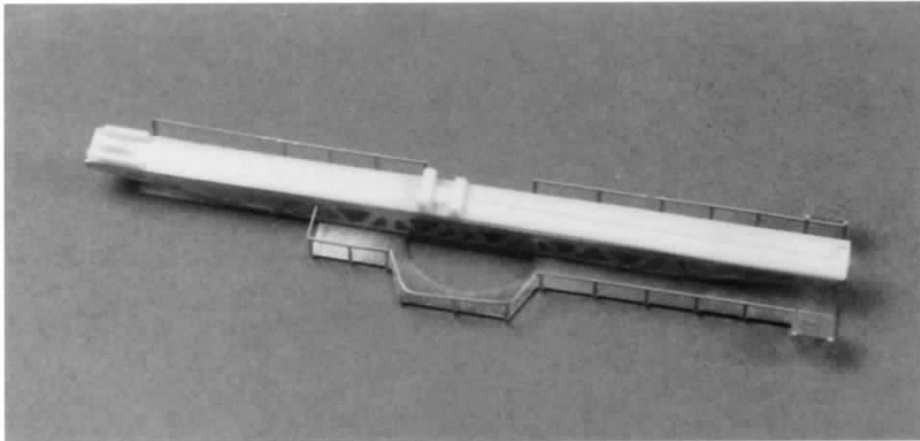
It is a good idea to build up sets of parts together. Then the chance is less that one completed assembly will be different from another.



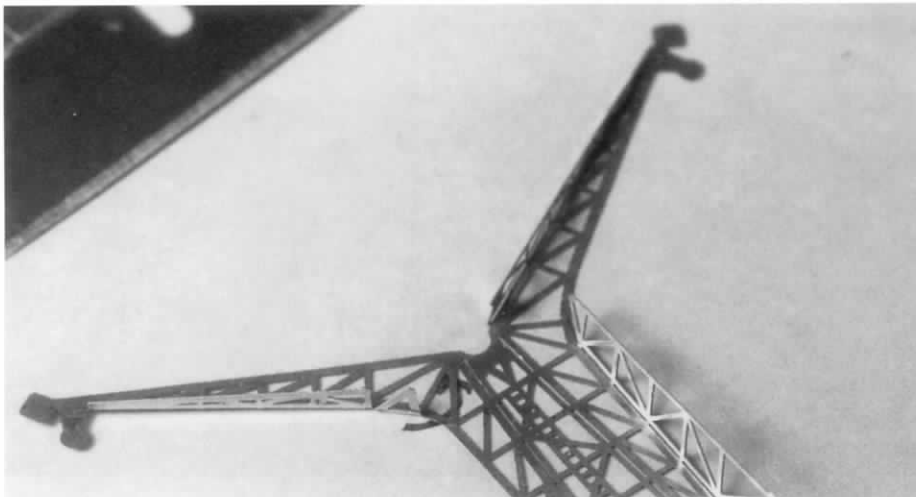
Here is the photoetched catapult complete with the aircraft stand. This part is now ready to be painted and installed.



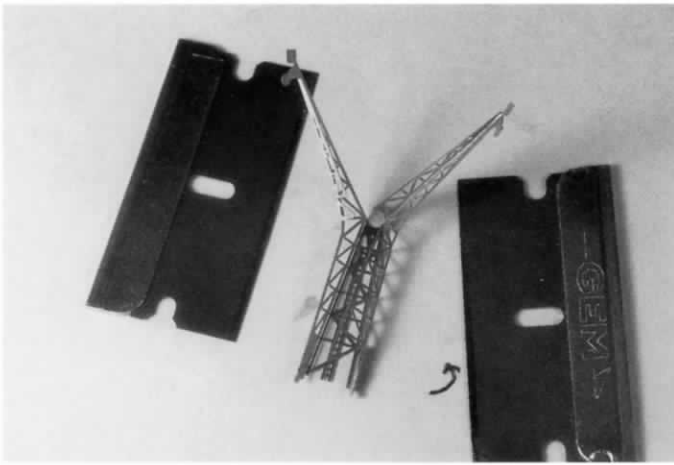
A photoetched catapult for a resin ship kit. While not as accurate as the Gold Medal Models catapult designs, it is simpler to build.



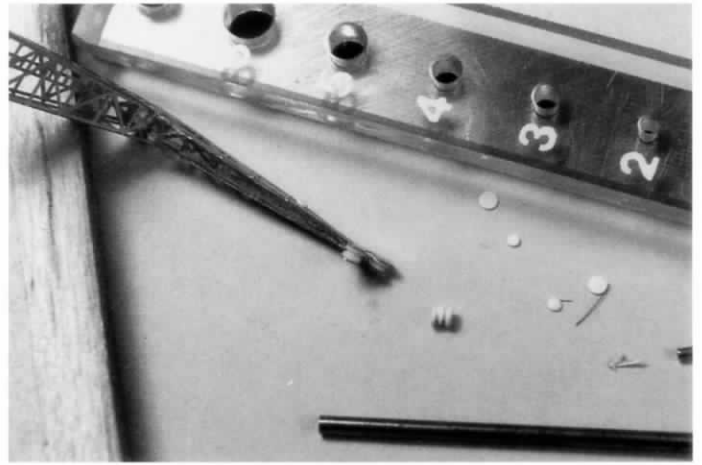
Instead of several photoetched parts, the surface of the catapult and all the detail are cast as one resin piece that fits into the top of the catapult frame.



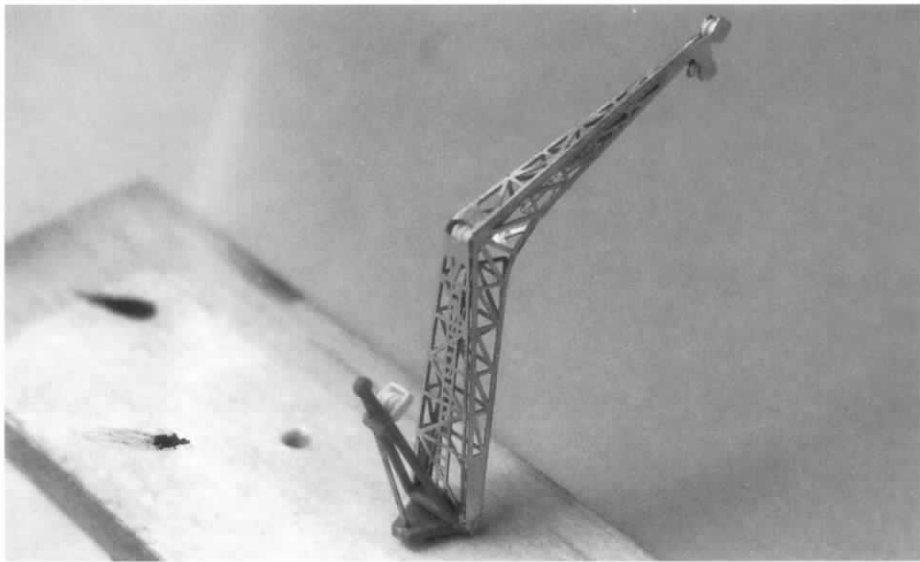
Cranes can be a bit touchy to bend into shape. I fold the sides up on one side of the lower arm and both sides of the upper arm.



I then use two single-edge razor blades to carefully make the two interior folds. I bend along alternate fold lines until the crane is almost closed. Then I use a pair of tweezers to complete the enclosure.



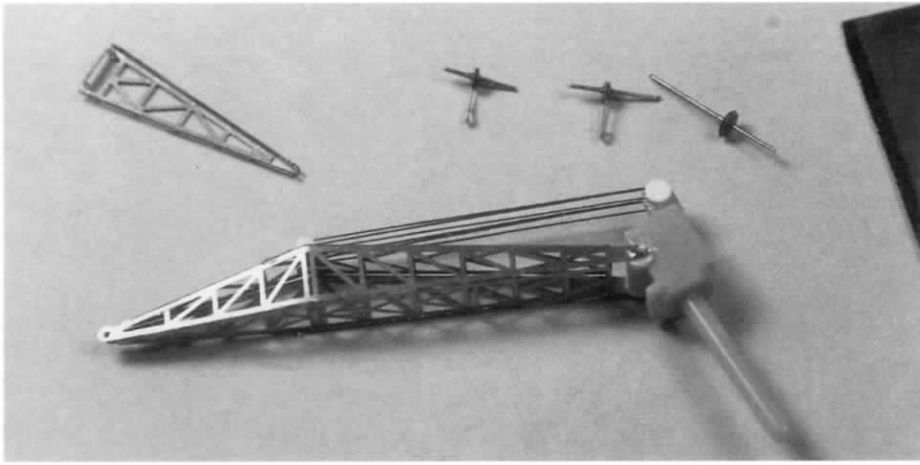
With a Waldron punch tool you can make just about any size pulley you need to add detail to a crane.



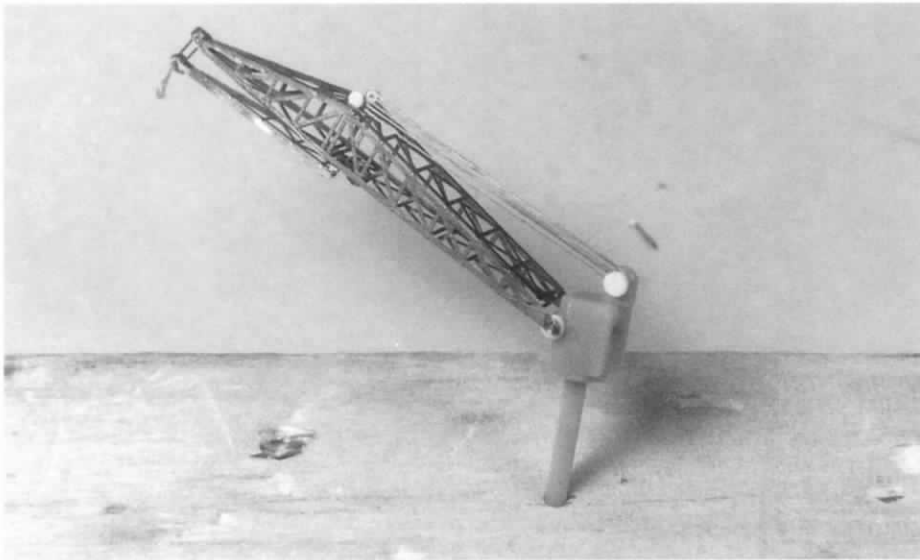
This 1/350 scale Gold Medal Models crane is now complete. After painting and rigging, it will look great.



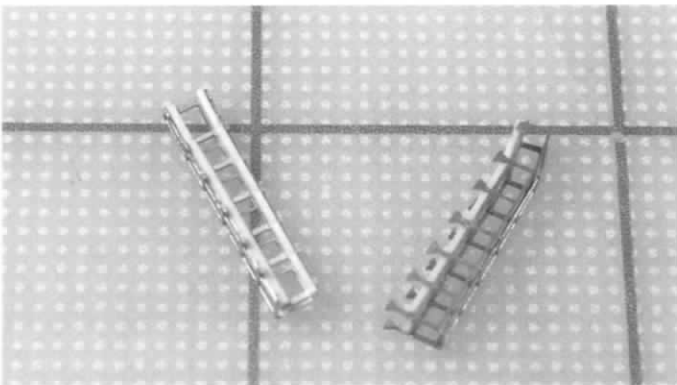
Here is the same crane painted, rigged, and installed.



You can also use a Waldron punch tool to hide tiny flaws or take care of fit problems between photoetched parts and kit-supplied parts.



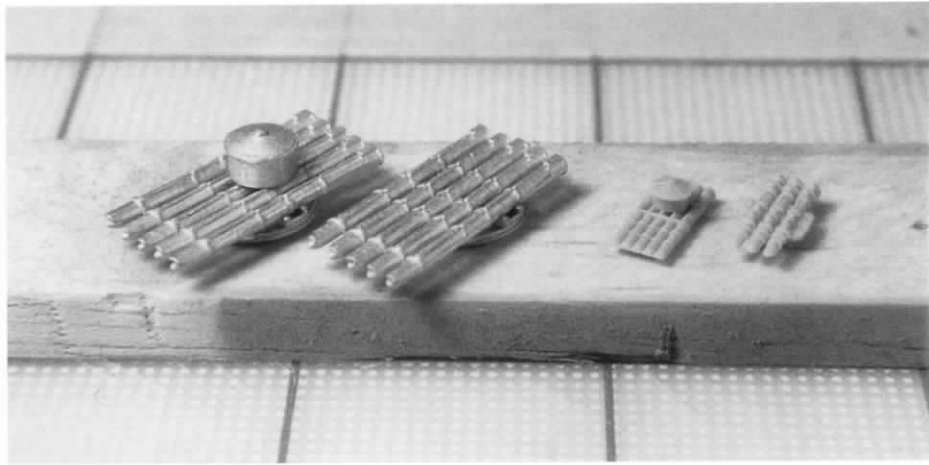
Several different-size disks have been attached to this completed 1/600 scale crane to cover flaws and help the photoetched part fit better.



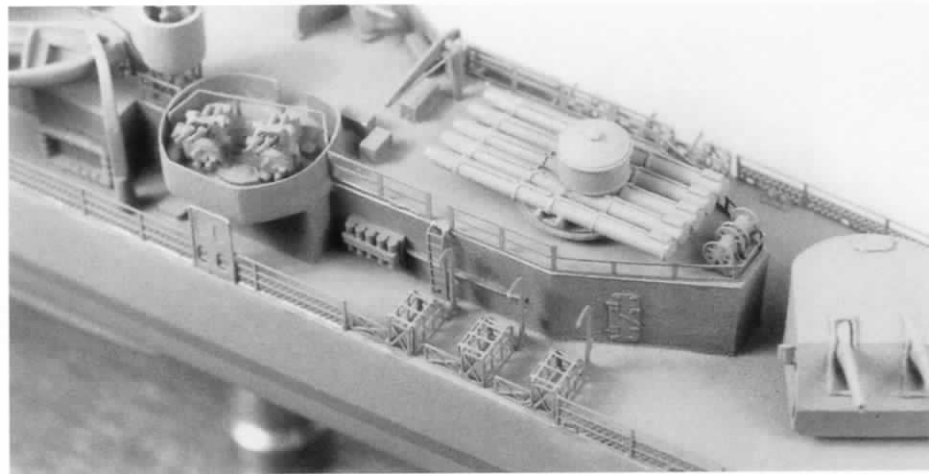
Photoetched depth charge racks can also be made stronger by gluing small lengths of Evergreen strip to the underside.



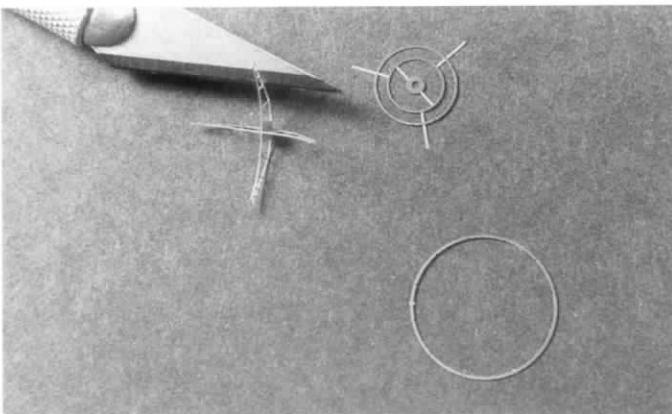
These 1/700 scale depth charge racks increase the level of detail and realism on this small kit. Working in small scale can be quite a challenge, but the end results are rewarding.



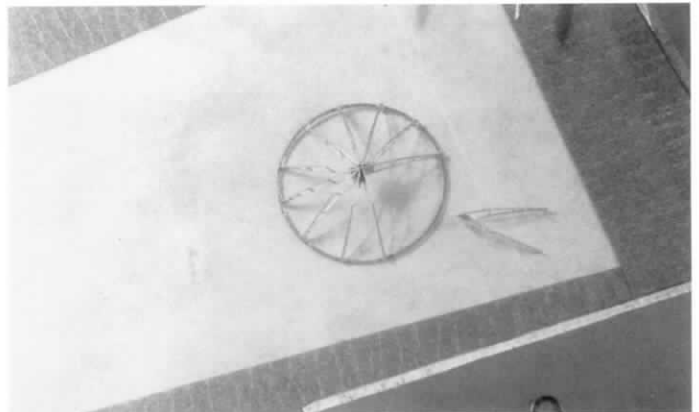
White-metal torpedo tubes can come as separate parts or as one casting. If the individual tubes are separate, be very careful when gluing them into place. If they are skewed, they will stand out like sore thumbs.



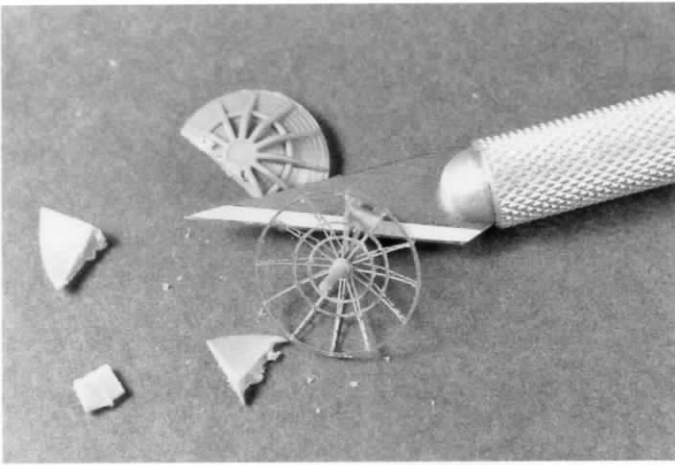
These K racks and hoists look great on this 1/350 scale MB Models *USS Gearing*. Note that all the racks look the same.



Photoetched radars can be a bit tricky to build up. Carefully remove and trim these subassemblies.



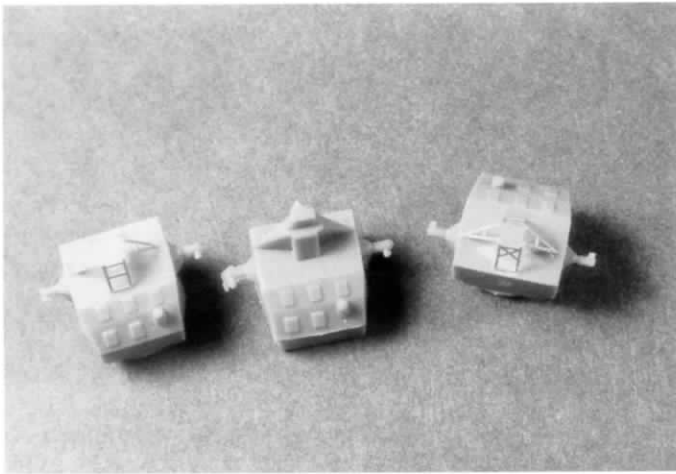
To assemble this SK-2 radar, I glued it together on a piece of wax paper. The super glue overspill tacked the part down to the wax paper, but the glue will not stick to the wax. I attached the cross piece first and then glued the V-shaped pieces into place.



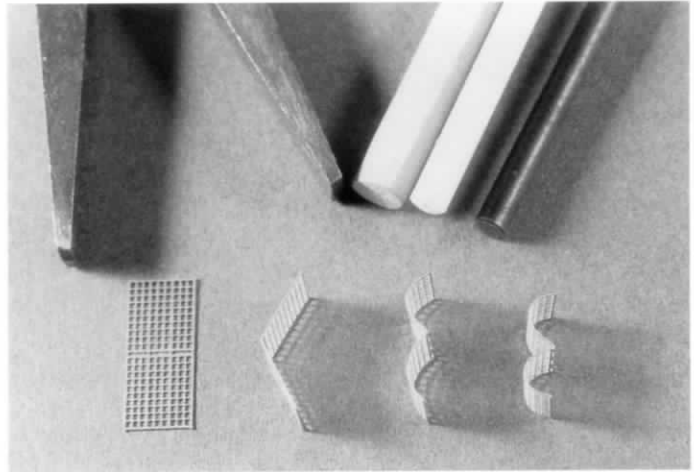
Although photoetched parts were supplied for the base of the radar, I cut up the kit-supplied part and used it as the base.



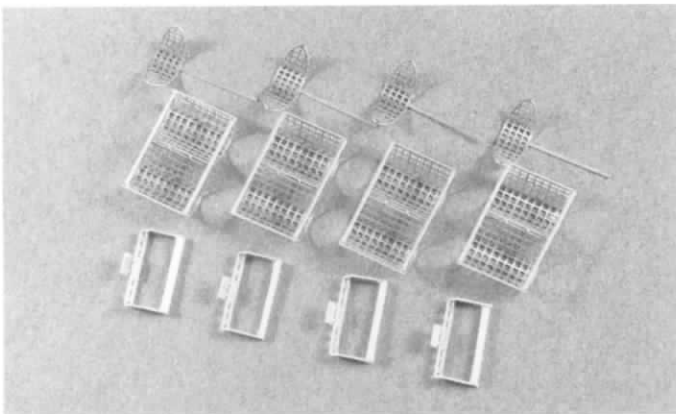
Here is the completed radar sitting atop the main mast of Tamiya's 1/350 scale *Missouri*.



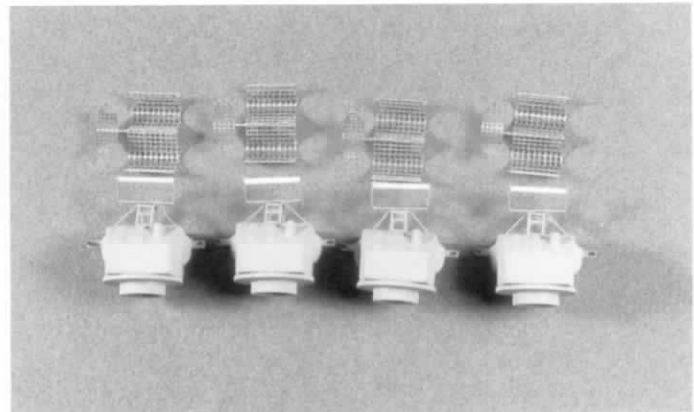
Photoetched MK-37 radars require some surgery to the MK-37 bases. Remove the cast parts from the top of the director and add photoetched frames.



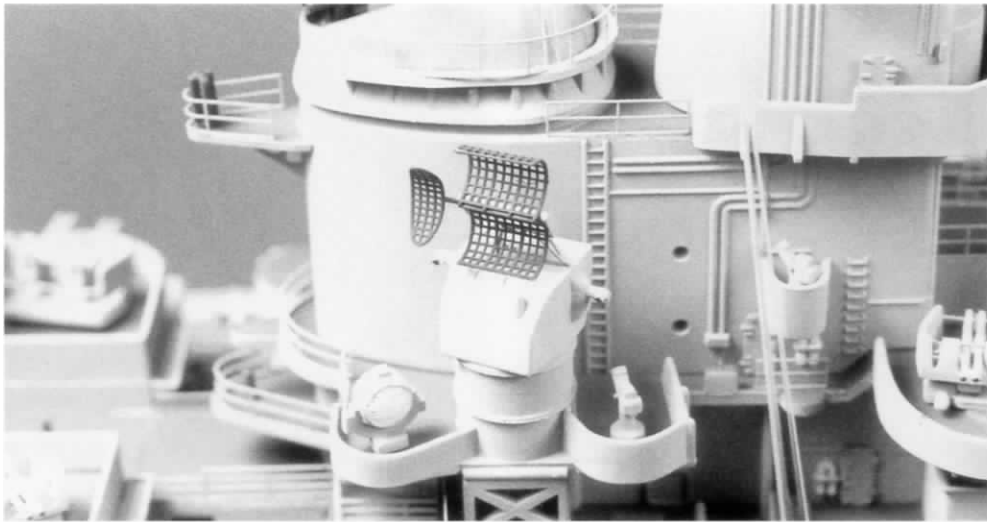
Bending the MK-37 radars is a three-step process. I use combinations of dowels and pliers.



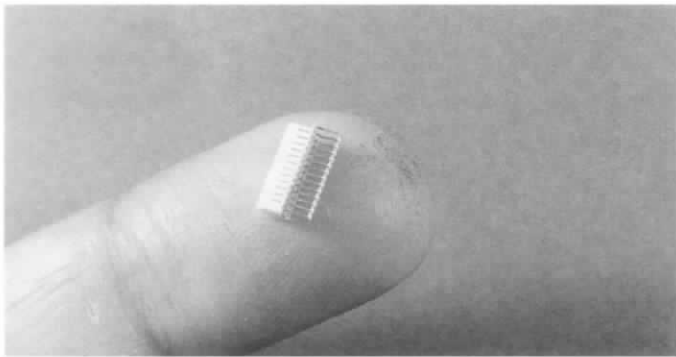
Here again, it is important to work in sets so that all the parts will be similar in appearance. The radar frames and the radars are now ready for final assembly. Add small lengths of Evergreen rod to the frames so that the radars will have a good gluing surface.



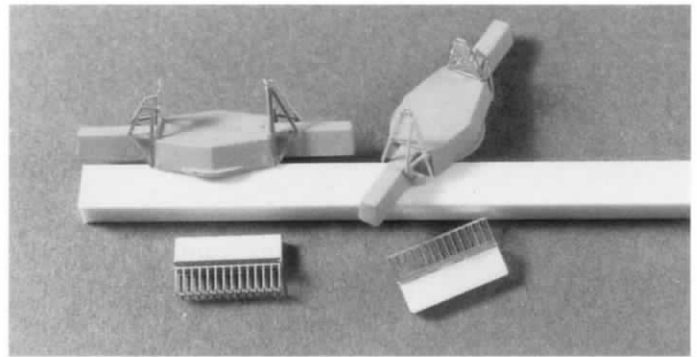
This is the final step in the assembly before painting. Paint the radars black, and the bases light gray.



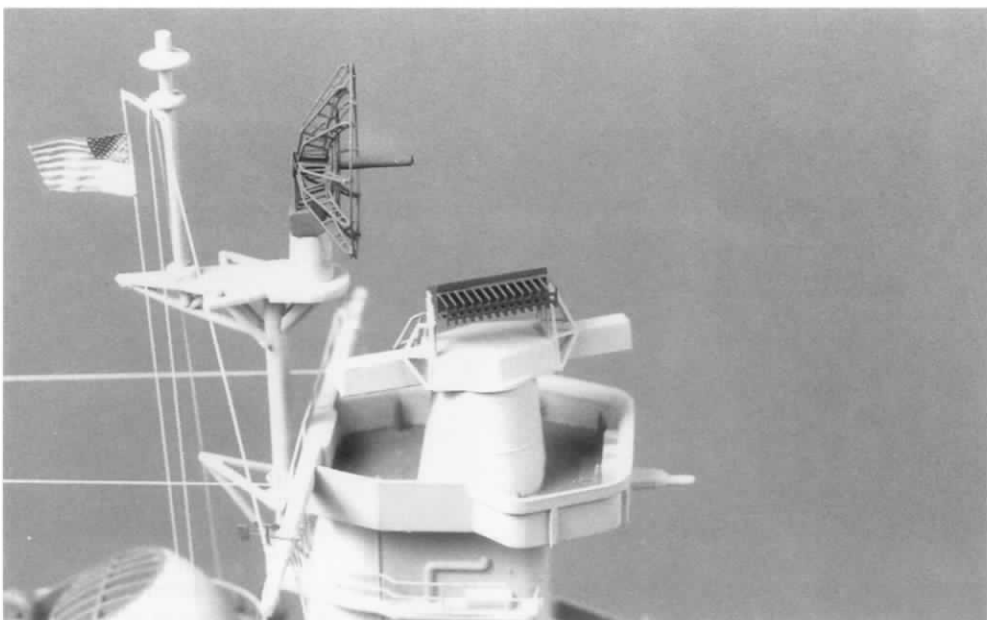
Here is the completed MK-37 radar painted and installed. This is a Gold Medal Models design and it looks great.



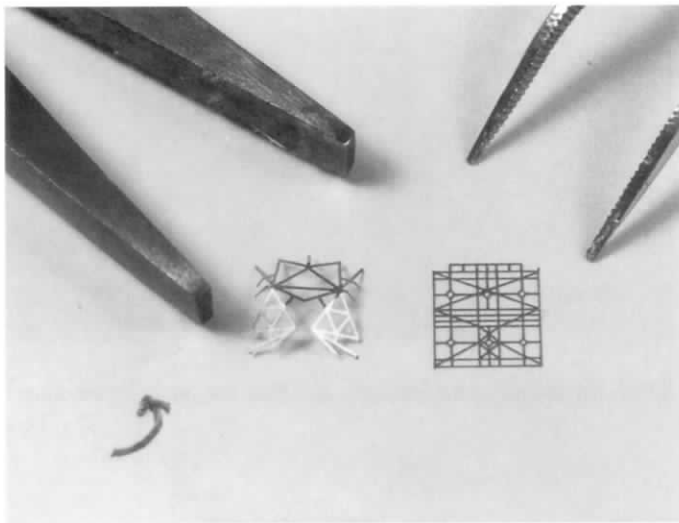
Enhance this MK-8 16-inch gun director radar with a small strip of Evergreen strip stock.



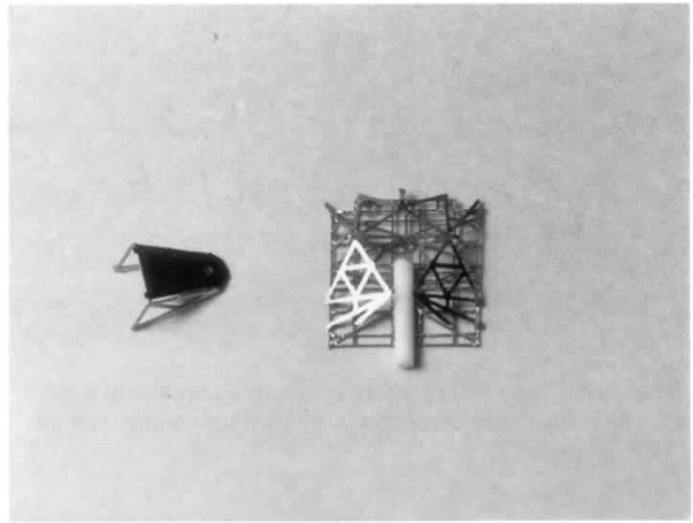
The subassemblies for both 16-inch gun directors are complete and ready for painting.



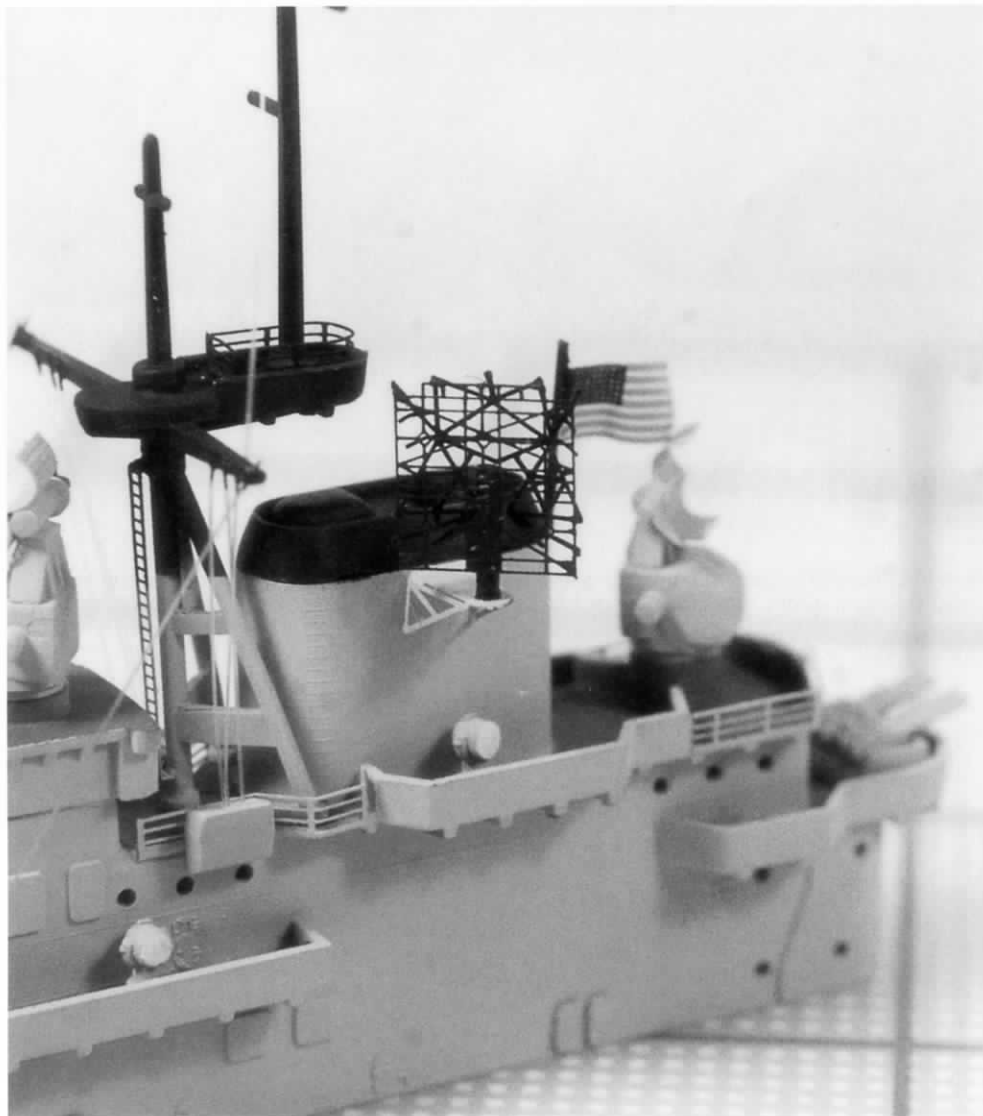
The complete 16-inch director. The photoetched version looks a lot more impressive than the stock kit parts.



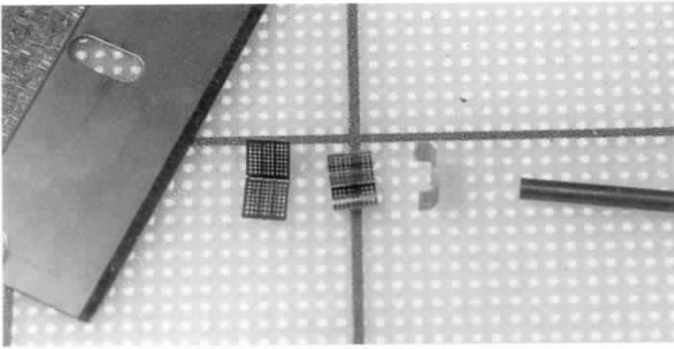
Assembling SK radars is a lot easier than putting together the SK-2. Basically there are four parts: front, back, stem, and base.



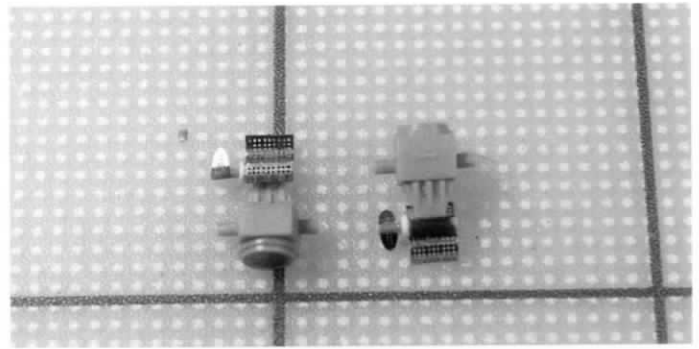
Here the radar is assembled and ready for painting.



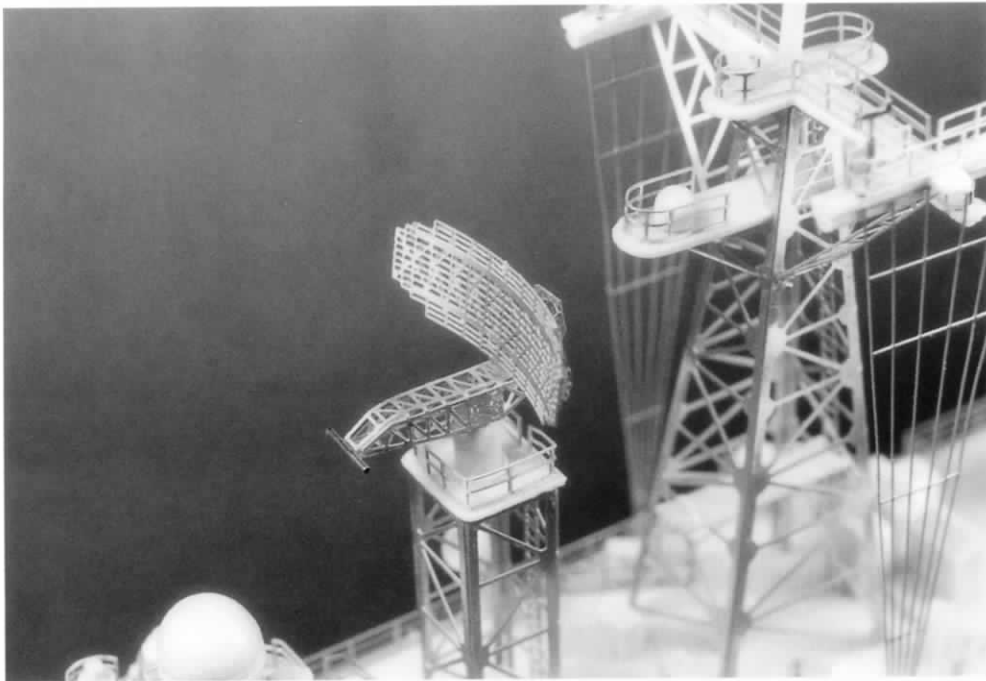
This 1/700 scale SK radar really enhances the appearance of the superstructure.



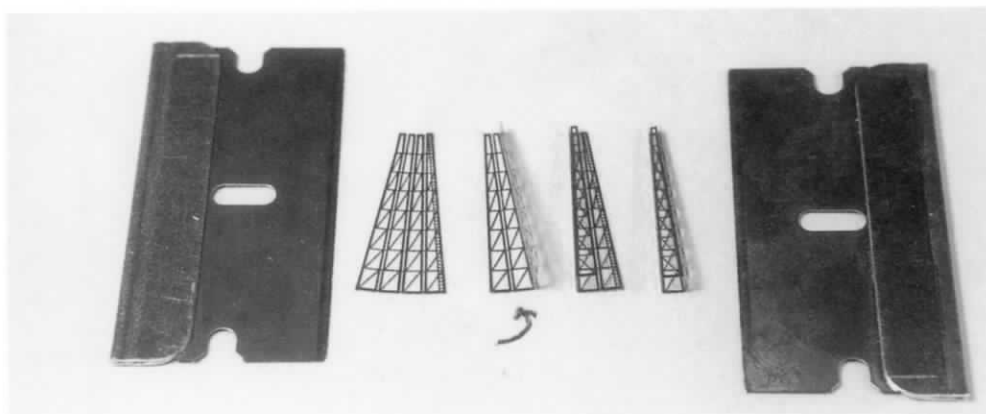
These 1/700 scale MK-37 radars are also a lot simpler to build than their large scale counterparts. A few simple bends, and the part is shaped.



Attach the radars to the kit parts, and they are ready for painting.



Assemble modern radars in much the same way, although they look a lot more impressive when they're finished. This 1/350 scale MB Models modern radar will look great once it is painted.



Fold antenna towers in the same way as cranes. Work the part into shape by alternating between bends until you get it just about closed up. Then finish the job with a pair of tweezers.