Building the *Higaki Kaisen*

A Japanese Edo Period Coastal Transport

(Part 2)

By Clare Hess

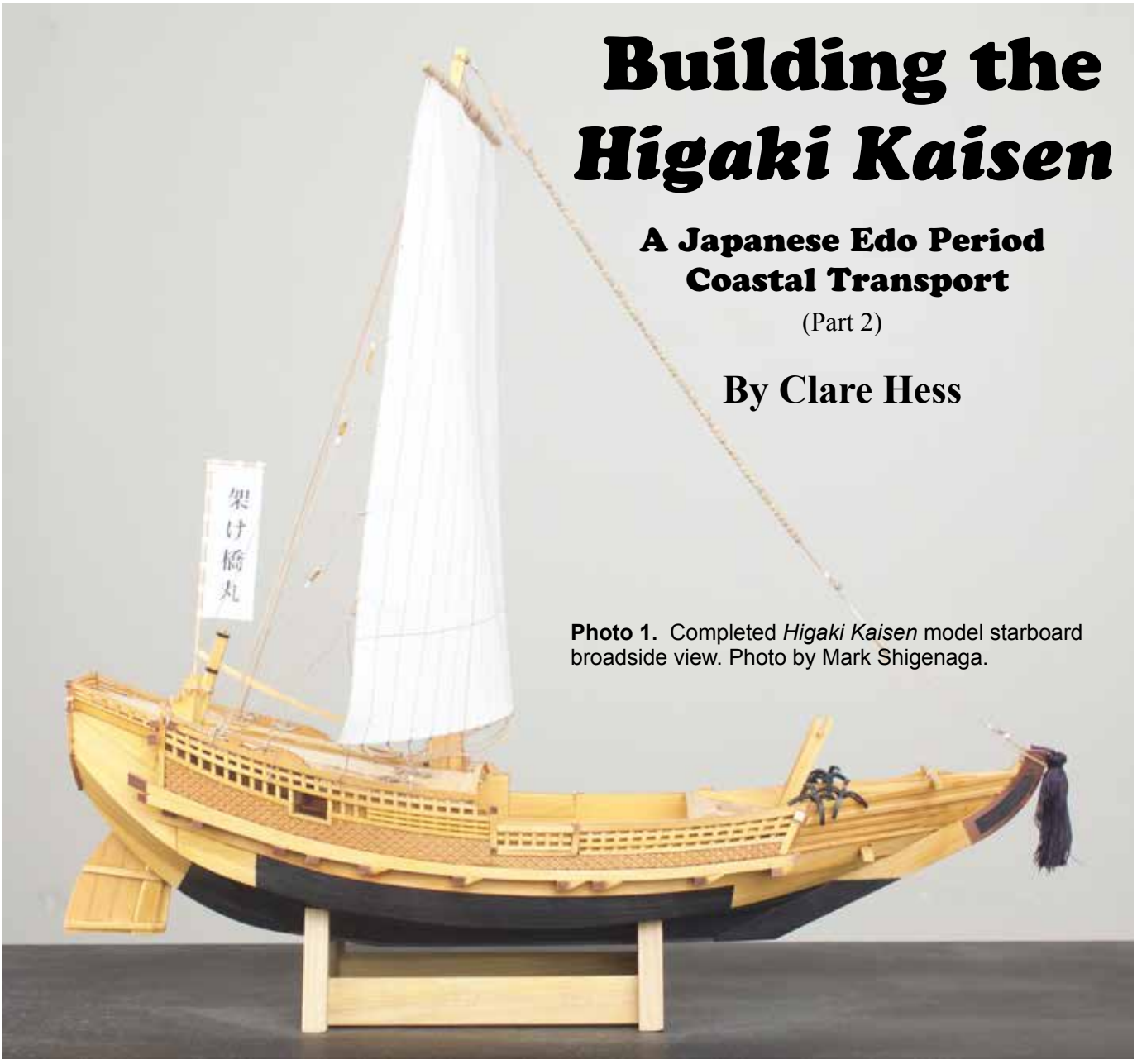

Photo 1. Completed *Higaki Kaisen* model starboard broadside view. Photo by Mark Shigenaga.

Instructions – Gluing and Not Gluing

Woody Joe's *Higaki Kaisen* instructions are 32 pages of color illustrations and text, all of which are in Japanese. The build is divided up into 91 steps, each of which is fairly limited in scope. While the text is in Japanese, the illustrations are pretty easy to follow. There is one snag to the building of this kit, and that is that some parts that show up in one step are not to be glued in place until a later step. This is indicated only by the Japanese text.

I'll try to point out those steps, but there is some Japanese text that would be helpful for the builder to watch for. In particular, this text that is always printed in red in the instructions:

接着しません or 接着しない

These words begin with the characters for gluing or bonding, 接着, followed by a verb ending. These endings can look similar, so look carefully at their differences.

- 接着します, 接着する, or simply 接着 = glue the parts indicated
- 接着しません or 接着しない = don't glue the parts into place

In some steps, it's pretty clear which parts not to glue, and you can use your common sense, but in other places, it's not so obvious, so just be careful to check each step carefully during construction. To help out, I've listed the steps to watch out for in the table below.

Table of steps where a part is not to be glued

- **Step 2:** I can't tell if it says this in some other way, but it should be clear that you are not to glue the hull parts to the temporary hull formers. These structures are used only to temporarily hold the parts of the hull into place.
- **Step 4:** Again, don't glue the hull parts to the framework of temporary hull formers
- **Step 5:** The transom piece is not to be glued to the hull former. Also, the "frame" pieces, 2A, 2B, and 2C are glued only to the bottom hull piece and not to the formers.
- **Step 6:** Glue planking sheets to the hull bottom, stem and transom, but not to the formers.
- **Step 14:** Bow Deck Beam is not to be glued in place until Step 18.
- **Step 15:** Stern Deck Beam is not to be glued in place until Step 30.
- **Step 19:** The decorative bulwarks piece shown here is not to be glued yet. Just use it here for alignment purposes.
- **Step 32:** Don't glue the dowel into place until Step 51.
- **Step 58:** When putting the capstans in place, don't glue them if you want to be able to turn them.
- **Step 66:** If you want to be able to see inside the cabin section, don't glue the cabin roof / upper deck planking panels into place.

Coloring the Wood

The *Hinoki* wood (Japanese cypress) in the kit gives the project a wonderful aroma as you work on it. It is a very light-colored wood, and you can certainly build the model with this natural wood coloring. Natural *Hinoki* has it's own aesthetic, and I almost built the model without coloring the wood. But, I was also experimenting with wood dyes, so I decided to give the dyes a try on this model.

The wood dye I used is pretty safe to apply to the wood before any assembly. You can use stains instead if you prefer, but glue won't stick properly to oil-based stains, so it may be necessary to stain the wood after completing the various assemblies. That seems a bit tricky to me for this model, but I know other ship modelers building this kit who have been successfully using water-based wipe-on poly.

I ended up using a product called Transtint that I bought at a local woodworking store. The stuff comes in small bottles and is rather pricey at around $20 per 4 oz bottle, but a little goes a long way. To use it, you have to thin it with water or denatured alcohol. I chose to use denatured alcohol, which dries very quickly and there's no concern of raising the wood grain when it is applied. I made my mixture by trial end error using two colors, Amber and Dark Vintage Maple.

I applied the dye onto the laser-cut wood sheets before removing the pieces from them. This allowed me to get a fairly uniform color across all the wooden parts. The dye seemed to reach the edges of the laser-cut parts okay, but after cutting the parts from the sheet; there are un-dyed spots where the wood was attached to the sheet. I tried different ways to get an even color but found that it was easiest to simply use a very small brush to "paint" little spots of dye where needed.

There was only one problem I had with dying one of the *Hinoki* sheets. I don't know why, but it seemed that one of the sheets had a large spot that wouldn't take the dye at all. I suspect my particular kit had a piece of wood that had gotten some glue or other material on it. It wasn't visible until I tried to dye it. Fortunately, once the part was glued into place, the blotch was pretty well hidden by other pieces,

A couple of words of caution if using dye. The more you apply, the darker the wood gets, so it's best to apply it only once. If you have to sand a part and end up with a pale spot, just be careful about applying the dye to just the sanded area. Also, if you're going to mix dye, it may be harder to match the color later, so make sure you either make a sufficient batch to handle the whole model, or record your exact mixture so you can make more if needed. I ended up using two full 1 oz. jars of my mixture for the build.

Painting the Model

Some of the large galleys belonging to high-ranking nobility (daimyo) were known to have been painted red, much like some of the shrines you might see in Japan. However, to the best of my knowledge, *bezaisen* were not painted except for the lower hull and sometimes some decorative work, usually on the stem or at the stern.

The paint scheme of the lower hull seems to be a very common one and can be seen on all the replica ships as well as in contemporary drawings and paintings. It seems to be a protective coating, but it doesn't follow the waterline. I used photos of the replica ships as a guide to laying out the pattern for my model.

Replacement Wood

I'm not aware of any way to get replacement

Photo 7.

Photo 8.

parts from Japan, so I recommend being extremely careful with this build. I did end up having to replace a piece that I thought I had lost, but I just used a similar part as a pattern. For the replacement material, *Hinoki* is pretty hard to find. I lucked out and managed to find a Japanese tool supplier in nearby Berkeley, CA, who dug up a couple of old scrap pieces that they gave to me for free.

If you find a Japanese goods store, you might try to find a cutting board made from *Hinoki*. Also, Woody Joe sells *Hinoki* strip woods, and if you find a helpful Japanese dealer, he might be willing to order them for you.

I'd heard that Port Orford cedar is a very close match to *Hinoki*. I recently managed to get some, but I had to have it shipped from Oregon. The wood wasn't expensive, but the shipping was. From what I can tell, it looks and smells much the same, and might as well be called *Hinoki*.

For this model, I imagine basswood will look pretty close, and it's certainly much easier to obtain. But, as it turns out, there was more than enough scrap wood left over between all the many laser-cut sheets in the kit to be able to fabricate the smaller parts that are most likely to get lost or broken.

Following directions

This may seem like an obvious statement, but on this kit, I found it extremely important to follow directions. The illustrations are very good and mostly very clear. It is necessary to look over each step carefully. If there is a diagram, particularly a close-up image, it's there for a reason, and you should look at it carefully to make sure you're not missing something.

I make this comment, not because the instructions are in Japanese, but because construction relies heavily on pre-cut parts. That means the model is engineered to be built a certain way. If you deviate from the plans, there a good chance that something's not going to fit right afterwards.

If you do decide to make modifications to improve the accuracy of some features, just make sure to study the kit instructions very carefully and look ahead to make sure your changes don't mess up construction in later steps.

Lower Hull Structure (Steps 1 – 5)

The construction of the *Higaki Kaisen's* hull differs from Western ships where a keel was laid, frames raised and then planked. The ship's hull is essentially frame-less and keel-less with planks being edge fastened and supported by transverse beams, notched to lock securely into the hull planking.

The Woody Joe kit attempts to mimic this design by using temporary formers to set up the hull's shape as laser-cut sections of hull planking are attached. There are two separate formers, one for the forward section of the hull and one for the aft. The parts for the formers are made from MDF board. Because these formers are temporary, it is important not to accidentally glue parts to them.

The floor piece of the hull is made from two parts, and it's important to lightly file the area where these pieces come into contact with each other at a shallow angle. The angle is set by placing the parts on the aft former. A short, wedge-shaped piece of wood needs to be cut to fit into a hole to lock the floor assembly to the former.

There is a square stock wood strip that is glued flush with the bottom of the floor pieces. These create a nice groove that the lower plank sheet will fit nicely into in an upcoming step. I think it's

Photo 9.

easiest to glue this strip into place before the floor pieces are glued together.

Note that there are several holes in the floor assembly that are used mostly for alignment purposes with the formers. In a later step, after the formers are removed, laser-cut pieces are provided which fit into the holes to close them up.

The large, heavy stem is shaped next and is one of the few pieces in the kit that you must carve or sand to shape. It is a tapered piece that is widest at its tip and tapers down to a narrow edge that continues to its base.

Because the top of the stem will later be completely covered with some etched copper pieces, the stem has to be properly shaped so that the copper fits over the stem completely. I suppose if you taper a little too much, it might not be the end of the world, as the copper completely covers the end of the stem.

The kit instructions show how a copper covering-piece is used as a guide to get the proper shape of the stem. Being cautious about damaging or losing pieces, I chose to make a photocopy of the etched copper sheet, cut out the copy of the needed piece, and glue it to the stem as my guide.

Step 4 in the instructions is the first step where a flat piece of *Hinoki* wood has to be bent to shape (**Photo 10**). The important thing to note is that *Hinoki* is very brittle when dry. Do not try to bend it dry – you won't hear it start to crack–it will just snap all at once.

Fortunately, *Hinoki* becomes very flexible when wet, and it doesn't take much soaking to bend it to shape. I was able to effectively bend most of the *Hinoki* by just wetting it well. Before bending any parts, I strongly recommend experimenting with some scrap pieces – some part of a laser cut sheet that is not being used.

Lower Hull Planking (Steps 6 – 15)

The hull planks are in the form of laser-cut sheets that are pre-scribed with lines of planking. Most sheets represent an assemblage of several planks on the real ship. As with all the laser-cut sheets, they are pre-scribed on only one side, so it's important to place pieces with the correct side facing out. Many pieces are also scribed with a letter identifying the part. In most cases, it's obvious which way the parts fit, but pay attention and double-check the plans and your parts anyway. In my case, I did have one step where I switched a pair of parts, and an identifier ended up on the visible side, but fortunately in a place that was hard to spot.

After adding the transom piece and the first sheet of planking, I recommend pre-bending the planking sheets and test fitting as much as possible. I had some

Photo 10.

Photo 11.

trouble getting the planking to fit nicely at the bow. I didn't want to trim too much to get the plank to fit properly as I was worried about how this might affect the position of the aft end of the planking. But, as it turns out, the aft edge of lower planking is covered by another piece in a later step. So, it shouldn't be a problem if you have to bevel the bow edge a bit. Also, note that the aft edges of the planking sheets don't have to line up with each other.

The planking of the hull then jumps ahead, and an upper strake is next glued on that has openings for beams. The upper edge of this upper strake requires alignment to a pair of laser-etched marks on the back of the stem post and with the top edges of the hull formers. A pair of beams that are glued in at this stage help line things all up.

The next planking piece fits into place, leaving a large gap at the bow, which is closed up with another pair of planks. The formers are removed, and these bow planks are bent and fitted into place.

The shape of these bow planking pieces is a little odd. I suspect the reason is to create a little overlap in the planking to make up for any small amount of error that might have been introduced in the build. Unfortunately, my build was off by a bit too much, and I ended up with small gaps. I did my best to fill these with slivers of scrap wood I cut. Had I to do it again, I would have instead tried to cut new pieces slightly larger to create a better fit. Or better yet, done a better job fitting the upper planking sheets.

The trickiest part up to this point is not a skill

Figure 6.

issue, or at least not a model-building skill issue. Rather, the trickiest part is catching the Japanese text that tells you NOT to glue specific pieces into place. This text in Step 15 was the first item that really couldn't be figured out from the illustrations. As a result, I did end up gluing the part in place. Specifically, the aft-most beam cut from 3mm x 4mm strip wood. I figured out later on that this wasn't supposed to be glued until a later step. It may not be critical if this piece is glued in too early, but it does make it extremely difficult to get the a part of the deck framing correctly made with this beam in the way. As it was, I was able to pop the beam loose.

Lower Hull Details (Steps 16 – 29)

The steps detailing the lower hull are fairly straightforward and involve adding various structural details. The first piece of rigging on the model goes into place early on. This is a simple loop of line that you are instructed to thread through a sheave and then tie off. This saves you from a potentially trickier task later on. This is one trick that comes up more than once on this model. It's nice to be able to deal with certain lines while they are easily dealt with but does result in you having pieces of line hanging off the model while you work on it. To protect the line and possibly the model itself, I recommend using low-tack painters' tape to fix the line out of the way until needed.

Aligning Parts

The first time you have to deal with the careful alignment of laser-cut parts deals with something like a raised crosspiece (Part 5C) that supports the vertical timbers of the forward windlass. The legs of the crosspiece are affixed at an angle that is easiest to set by using the end of the bulwarks fence (Part 21B) as a temporary guide, although this fence piece is not glued into place until a later step.

At about this point in the build, it was becoming apparent to me that the model was more complicated than it first seemed. I began to question if I was aligning the parts correctly because it's extremely important that you do so. So many pre-designed laser-cut parts depend on angles being correct.

In fact, it was about this time when I realized that my hull planking was just a bit off, making the hull a little too wide, which is why I had those gaps earlier in the build. Also, as a result, the vertical legs of the crosspiece I just mentioned were a bit too narrow and didn't fit nicely into place, so I ended up having to widen the vertical supports

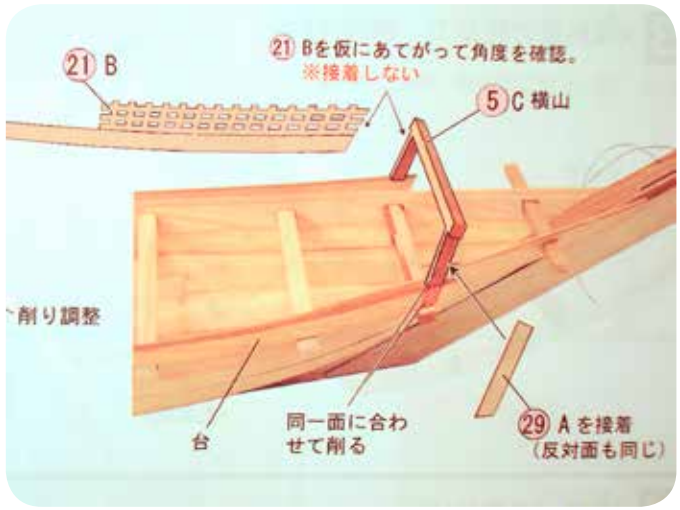

Figure 7.

with some scrap wood. Fortunately, the error didn't propagate any further, and only the appearance would have been affected had I not widened the supports.

The remainder of this section involves building the stern of the boat. I didn't find any problems here except for my lack of understanding of the function of some of the parts. Being a modeler of primarily North American and European ships, most components on a ship model are familiar, and if one doesn't understand a part's function, it can usually be looked up online or in available books. Asian shipbuilding is an entirely different matter. The ship designs are very different from Western ships, and it's difficult to research their details, as there are almost no English language resources.

The design of the stern is interesting in that the *Higaki Kaisen* and all other *bezaisen* share a feature with small Japanese boats: The stern planking extends along the hull, sticking out beyond the transom. On this ship, the result is a kind of a protected cove for the rudder and for any crew that are on the small section of deck located within the cove. I don't know the function of that small deck, but, I have seen photos of the replica ships, and they have what looks to be a large round wooden structure that resembles a tub on one side of it. The object does not appear on the model. The function of that tub and the deck are a mystery to me – one to be added to the list.

Getting back to model construction, there is one thing I thought a bit odd in that the instructions (Step 28) have you thin down the leading edge of a hull planking piece by sanding that end on the laser-scribed side, sanding away some of the scribed detail. Had I to do this over again, I think I would have sanded the backside of the pieces instead, leaving the scribed details intact.

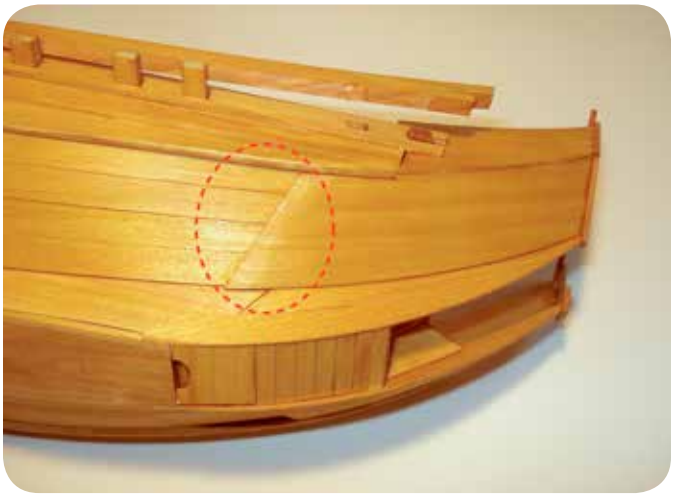

Photo 12.

Next issue

In the next issue the focus will be on the deck and cabin details.