

# MODELING THE *H.M.S BOUNTY'S LAUNCH, 1789*



**MODEL SHIPWAYS**  
• QUALITY KITS SINCE 1946 •

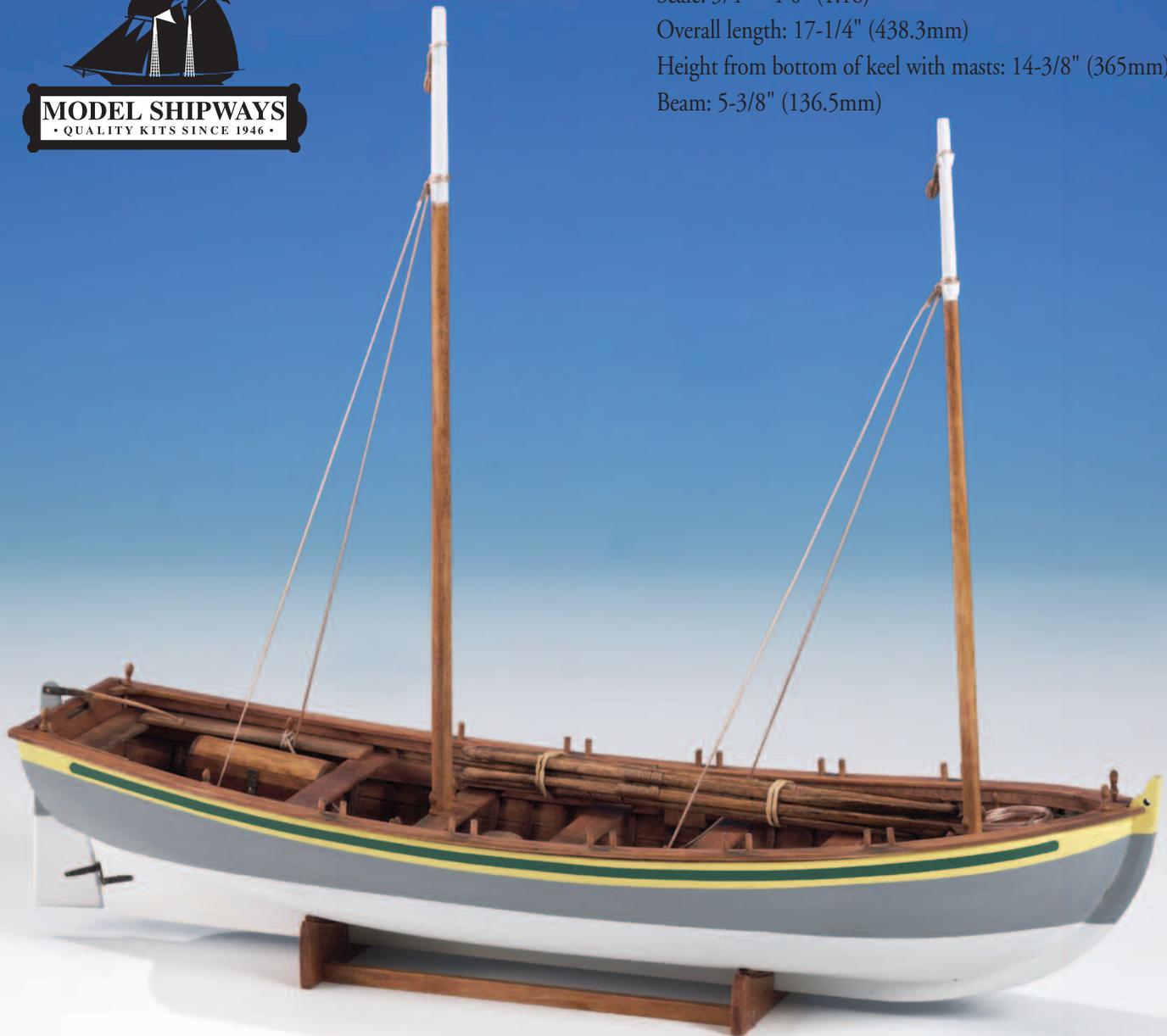
## Technical Characteristics

Scale: 3/4" = 1'0" (1:16)

Overall length: 17-1/4" (438.3mm)

Height from bottom of keel with masts: 14-3/8" (365mm)

Beam: 5-3/8" (136.5mm)



Kit design, instructions and  
prototype model by Bob Crane

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**Model Shipways Kit No. MS1850**

# A BRIEF HISTORY

The Mutiny on the *Bounty* is without doubt one of the best known and most often written about sea stories of all time. It is also probably the most thoroughly documented mutiny in history. In the 18th century and before, mutiny on shipboard was commonplace. Horrible living conditions, atrocious food, vicious discipline, grueling labor and endless tedium interspersed with moments of peril, bred discontent among crews. Driven like animals in floating barns, seamen often saw mutiny, and the probability of a hangman's noose, as a more acceptable course of action than enduring further life as dutiful sailors.

But seldom did mutineers write down their adventures. Most ordinary seamen were illiterate, and so incapable of recording their actions even if inclined to do so. Officers involved in mutinies most often wound up dead. So the record of successful mutinies is thin. We can only wonder how many of the ships designated "lost at sea" disappeared at the hands of mutineers as opposed to those of nature.

The mutiny on the *Bounty* is unique in that a number of officers, including Captain Bligh, lived to tell and write about it. And from these accounts of the participants, dozens of books have been written as well as at least three major motion pictures.

Lieutenant William Bligh, Royal Navy, commanded *H.M.S. Bounty* on a voyage that departed Spithead in England, December 23rd 1787, bound for Tahiti. His mission was to collect 1000 breadfruit saplings for transplantation to the English West Indies. The objective was to see if breadfruit could become a worthwhile food crop outside of its natural South Pacific habitat.

After a tough, outbound voyage in which *Bounty* failed to weather Cape Horn and was forced to reach the Pacific by an eastward passage through the Indian Ocean, ship and crew tarried for six months in Tahiti. They had to wait for the breadfruit to be ready for transplantation.

Shortly into the return voyage, as *Bounty* reached the vicinity of the Friendly Island group, Master's Mate, Fletcher Christian, led the mutiny. Early in the morning of April 28, 1789, Christian captured Bligh in his cabin and subsequently took command of the ship by force of arms.

Bligh and eighteen others were set adrift in the *Bounty's* 23' launch, while Christian and the rest of the mutineers variously made their way to Pitcairn Island, Tahiti, and freedom in England or death at the end of a rope. The last was the fate of three of them.

Knowledge of the extraordinary adventure that followed is due to the fact that Bligh kept a log and submitted it to the admiralty after his return to England. It recounts the events of the 4000 plus mile small boat voyage that took place after the mutiny, and recounts, as Bligh notes, a voyage that was "... one of the most extraordinary nature that ever happened in the world ...!" The story is an amazing study in navigational skill, human endurance, and scarcely believable luck likely to raise the hair of even the most intrepid mariner.

Dangerously overloaded with 19 men and short provisions, the launch traveled from the site of the mutiny near Tofua in the Friendly Island group to Timor near the northwest corner of Australia in 48 terrifying days. Day after day, Bligh and his crew experienced mountainous seas, rain, wet sleepless nights, and a diet consisting of crumbs of bread and teaspoons of rum. On lucky days they enjoyed seagull entrails and blood. Without doubt theirs is among the most remarkable sea adventures in literature and we cannot but admire Bligh and his men for having survived it. The closing words of Bligh's log ...

"Thus happily ended through the assistance of Divine Providence without accident a voyage of the most extraordinary nature that ever happened in the world, Let it be taken in its extent, duration, and so much want of the necessaries of life"

The *Bounty's* launch was typical of boats issued to Royal Navy ships of the period. She was a standard issue 23 footer built by a contractor to the Navy, Mister John Burr. It has been calculated that when overloaded with 19 men, gear and provisions, she floated with a bare 6 inches of freeboard.

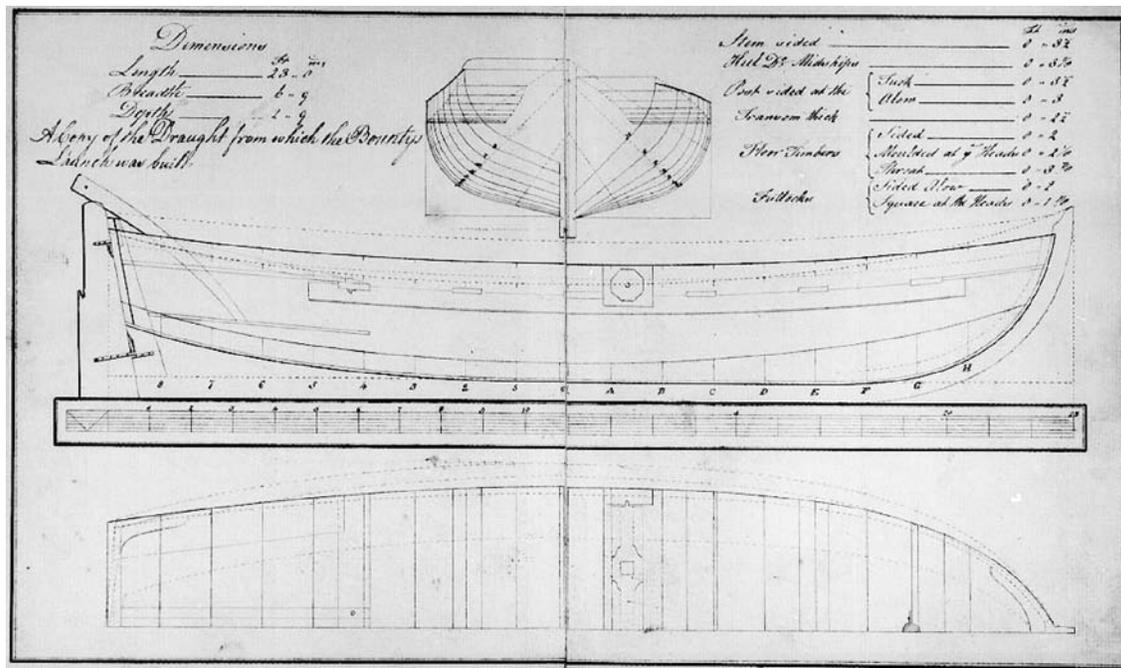
The launch had a beam of 6'-9", a depth of 2'-9" and a maximum displacement of about 2.5 tons. One can estimate that crew and gear probably weighed 2.25 tons, leaving only 500 pounds as the difference between functional buoyancy and sinking. No wonder Bligh's men bailed almost constantly.

The above short history was taken from "*The JOURNAL of BOUNTY'S LAUNCH*" published by Kittiwake Publications, ISBN 0-929834-00-3, authored by A. Richard Mansir. This is a delightful little book and contains Bligh's entire Journal of the voyage, excellent reproductions of paintings of the launch at sea, and some notes on building a model of the launch. Unfortunately, the book seems to be out of print but copies are often available by searching the internet.

The model is designed to a scale of  $3/4" = 1'$  resulting in a model of 17-1/4" overall length. At this scale a 5'-9" tall man would be 4-5/16" tall. It is difficult to imagine 19 such souls

crowded into this small craft navigating through tall seas under sail. The model construction method is in the traditional fashion for carvel planked hulls of this size, upside down with a form or mold at each station. The frames are bent around the molds and the planking individually spiled in place. The rigging, casks, toolbox, grapnel, and other boat gear are as Bligh

described in his log. The lines and scantlings of the launch are from the original builder's plan of the launch from the Nautical Maritime Museum, Greenwich, with additional information from the publication above cited. For more history on the voyage of the launch, refer to the bibliography.



*Copy of the Draught from which the Bounty's Launch was built from the Nautical Maritime Museum*

## Table of Contents

A Brief History .....	2	3. Installing the Thwart Risers .....	15
Before You Begin .....	4	4. Mast Steps .....	15
Working With The Plans & Parts .....	4	5. Floorboards .....	15
What You'll Need To Start .....	5	6. Staining & Painting.....	16
Painting & Staining.....	5-6	7. Mounting Cradle.....	16
<b>Stage 1: Building the Construction Jig</b>		8. Gunwales.....	16
1. General.....	6	9. Backrest and Quarter Knees .....	16-17
2. Preparing the Keel, Stem & Sternpost.....	7	10. Bow Grate, Thwarts & Mast Partners .....	17
3. Preparing the Molds .....	7	11. Rudder, Pintles & Gudgeons	
4. Cutting the Rabbet.....	8	<b>Stage 5: Masts, Spars, Sails &amp; Boat Gear</b>	
5. Assembling the Building Jig.....	8-9	1. Shaping and Tapering Masts & Spars.....	18
<b>Stage 2: Bending on the Frames</b> .....	10-11	2. Sail Making .....	18
<b>Stage 3: Planking the Hull</b> .....	11-13	3. Blocks.....	19
<b>Stage 4: Fitting Out</b>		4. Lines.....	19
1. Fitting the Tween Frames and Cant Frames .....	14	5. Boat Gear .....	19
2. Installing the Sheer Clamps .....	14	<b>Stage 6: Displaying Your Model</b> .....	20
		<b>Bibliography</b> .....	20

## Before You Begin

The launch is an interesting boat and makes a splendid model. The model is well suited for the beginning ship modeler. At  $3/4" = 1' 0"$  scale, it is easy to build and obtain precise detail. Plank-on-frame hull construction on a building jig with laser-cut parts offers a unique building method. It assures an accurate hull form built in the same way as the original full size boat.

Britannia, brass, and wooden fittings eliminate creating many parts from scratch. However, some require final finishing before they are suitable for the model. This is especially true for the Britannia fittings and will be discussed later. In this kit there is only the grapnel hook in cast Britannia metal.

Always complete one construction stage before moving to the next. When things go awry, consider doing them over.

## Working with the Plans & Parts

The following modeling tips are general in nature and were written by Ben Lankford. Edits and additions for this particular model are by Bob Crane. For more of Ben's tips see the bibliography.

Before starting the model, carefully examine the kit and study the plans. First, determine if all the listed parts are present. Handling them will produce a better understanding of the kit's requirements. Try to visualize how every piece will look on the completed model. Also, determine the building sequence - what must be done first - ahead of time. The instructions will help, but a thorough knowledge of the plans at the outset is essential.

### 1. The Plans

Five plan sheets are provided:

1. Laser Cut Wood Patterns
2. Hull Construction
3. Finishing Out
4. Spars, Sails, and Rigging
5. Laser Cut Planking and Floorboards

Model Shipways' Launch of the Bounty kit is manufactured to a scale of  $3/4" = 1' 0"$  (1:16). Each sheet is drawn to that scale except areas enlarged to show detail. A scale of 2X noted on the plans is twice scale, or  $1-1/2" = 1' 0"$ . Most dimensions can be lifted directly off the plans by using draftsman dividers or a "tick" strip (strip of paper). Lay the paper strip over the plan, carefully mark the item's length with a sharp pencil, then transfer the marks to the wood. This is general model practice but will not be likely necessary since nearly every part in the kit is laser cut.

The table below compares full-size dimensions with scale model inches and millimeters:

Full Size Inches	Model Scale Inches	Model Scale Millimeters
1/4"	1/64"	0.40mm
1/2"	1/32"	0.79mm
3/4"	3/64"	1.19mm
1"	1/16"	1.59mm
1-1/2"	3/32"	2.38mm
2"	1/8"	3.18mm
4"	1/4"	6.35mm
6"	3/8"	9.53mm
8"	1/2"	12.7mm

## 2. Making Allowances Along the Way

Try to be exact when following the plans, but use common sense. Adjustments may be necessary to compensate for small differences in how your model is shaping up; i.e., perhaps the mast has too much rake (the angle at which it sits). Lines should not drape over fittings or conflict with other lines when belayed (secured). Put yourself on the boat, imagine performing the task, and use logic.

## 3. Understanding Hull Lines

Beginners may not be familiar with the following hull lines. Buttock lines are vertical longitudinal planes cutting through the hull. Waterlines are horizontal planes, and Sections are transverse vertical planes. Diagonals are planes cut almost perpendicular to the station lines. These lines define the hull's shape and are used by the draftsman to fair it (create smooth curves).

A complete set of hull lines is not needed for this model, because lasercut molds and the center keel define the hull's shape. The planking layout on Plan Sheet 2 shows the station lines. They are the same as the boat's body plan or sections, and illustrate how the hull curves from top to bottom.

The boat's lines can be seen in the reproduction of the Nautical Maritime Museum draught shown on page 3.

## 4. Kit Lumber

Strips and sheets of basswood are supplied in the kit. Sorting the wood in the kit by thickness and wood-type will save time. After selecting and cutting what you need, return the remaining stock to the proper thickness and wood-type pile. Don't worry about using a piece for one item intended for another. Model Shipways supplies enough extra wood to complete the model before running out.

## 5. Britannia Metal Fittings

There is only one Britannia fitting in this kit, the grapnel hook. This item will require final finishing before mounting on the model. First, remove mold joint flash with a #11 hobby blade, then file or sand with fine sandpaper. Second, wash fittings in dishwashing liquid and warm water to remove traces of mold release agent and the body oils your fingers deposit. Allow the parts to dry thoroughly before applying primer and painting or chemically blackening.

## 6. Soldering & Working with Brass

Here are some tips for working with brass.

Cut brass sheets and strips with a small pair of tin snips or heavy scissors. Thicker brass will require a jeweler's saw. After cutting, smooth the edges with needle files followed by wet-or-dry fine sandpaper used dry. Cutting slivers from brass sheet curls and bends it sideways. To straighten, grip the ends with a pair of small pliers and pull in opposite directions. Thin brass sheets can be scored with a utility knife and metal straightedge, then snapped off. Use two or three light passes, cutting against a maple chopping block, birch board, or glass.

Drilling holes in brass with a pin vise is a slow process. The solution is to use a small hobby rotary drill. Several companies manufacturer these tools and they are worth the cost. The cordless models are especially useful. When working with brass, use a 1/4" or thicker piece of maple or birch for backing. (Avoid softwoods, as these flare the exit hole.) To prevent the bit from wandering, mark the spot with a small center punch. Lubricate the bit with light oil and drill slowly to avoid breakage. The brass will become hot, so watch your fingers and use a piece of wood to hold the brass down. If possible, keep the RPM below 2000. Anything higher can generate enough heat to break small drill bits.

In the past, many modelers used pure silver solder to avoid the corrosive qualities of lead in soft solder. Today, most solders are lead free. They're composed of tin and antimony, or tin and a small amount of silver (3 to 4%). These solders are strong and melt at approximately 430° F. Consequently, unless you have high strength requirements there is no reason exists to use pure silver solder (melts at 1300° F).

The key to soldering is keeping the brass clean. Use a solvent made especially for cleaning metal parts or a simple substitute such as vinegar, lightly sand, or both. Rinse parts in clean water that have been cleaned with a solvent. Once the parts are cleaned, don't touch them. Your fingers will leave greasy spots. Soldering is easy if your work is set up properly. First, immobilize the parts in a fixture or other holding device, then add just enough rosin or acid paste flux to the joint to do the job. Solder flows where flux is applied. Next, heat the joint with a small torch or pencil soldering iron. This sequence is important. The larger the parts, the longer it takes to heat the brass and melt the solder. Remove excess solder with needle files. Better yet, use a desoldering syphon or braid to remove globs of solder before it hardens. The joint should look like the real thing, not a big glob of fillets.

## What You'll Need To Start Construction

The following items are recommended for building models. Those who have modeled before may have their favorites. Not all of these items are needed for the launch model. Almost all are available at Model Shipways web site - [www.modelexpo-online.com](http://www.modelexpo-online.com).

### A. Knives and Saws

1. Hobby knife with #11 blades, chisel blades
2. Razor saw or jeweler's saw, miter box

### B. Files

Set of needle files; steel or diamond coated

### C. Clamps

1. Small spring clamps available from hobby sources
2. Clamps from office supply stores, bulldog clips and/or binder clips
3. Wooden spring-type clothespins
4. Alligator clips
5. Rubber bands

### D. Tool Set

Small carving tool set or individual gouges and chisels for carving tasks.

### E. Sharpening Stone

Keeps tools razor sharp.

### F. Boring Tools

1. Miniature bits sizes #60 to #80
2. For this model bits #70 and #67 are especially useful
3. 1/32, 1/16", 3/32", 1/8", and 3/16" bits
4. Pin vise, rotary tool, cordless rotary tool especially useful

### G. Miscellaneous

1. Tack hammer
2. Tweezers (a few)
3. Small, fine pointed scissors
4. Miniature pliers
  - a. small round needle nose
  - b. small flat needle nose
5. Small bench vise
6. Soldering iron or torch
  - a. solder
  - b. flux
7. Beeswax block (for treating rigging lines)
8. Masking tape
9. Wire cutters (for cutting fine wire and strip metal)

### H. Sandpaper

1. Fine & medium grit garnet or #100 to #220 aluminum oxide
2. #400 wet-or-dry sandpaper
3. The sanding sticks sold for fingernail care are excellent and very handy. These have medium and fine sandpaper and a foam core, great for most sanding tasks.

### I. Sail Cloth

Light weave cotton or linen cloth if sails are desired. For furled sails, a light material such as Silkspan is ideal. Model Expo sells a suitable cotton cloth and Silkspan.

### J. Finishing

1. Paintbrushes
  - a. Fine point for details
  - b. 1/4" to 1/2" flat square for hull

### K. Supplies

1. Paints
2. Primer
3. Stains and varnish
4. White or woodworker's (yellow) glue
5. Cyanoacrylates (generic name is Super Glue)
6. Five-minute epoxy
7. Wood filler

**Note :** White or woodworker's glue in yellow or tan will suffice for most of the model. Fiveminute epoxy provides extra strength for some cases. Super glues, such as Jet, Flash, or Zap, produce quick adhesion. For most applications, the medium viscosity, gap-filling variety is best. The thin type is recommended for filling a narrow crack and wicking into laminate joints.

## Painting and Staining the Model

Beginning this manual with directions on applying finishes may seem strange. Not so! Much time and effort can be saved and more professional results obtained if the finishing process is carried on throughout construction. Proper timing in applying finishes and using masking tape to define painted edges should eliminate unsightly glue marks and splotchy, stained surfaces. Take advantage of these general suggestions:

### 1. Preliminaries

**Sanding and cleaning:** Rub down external surfaces with 220 grit sandpaper, then wipe off every speck of dust. Give surfaces to be painted two light coats of primer. Sand lightly after the last application. Don't sand down to bare wood. After washing your hands, gently dust the hull with a soft brush and clean, soft cloth or tack rag. Use a spackling compound, such as Model Magic or DAP, or Elmer's wood filler to fill any scratches and defects, then sand and prime again.

**Choosing paint:** Glossy surfaces are not desirable on ship models. A flat finish or one with a slight sheen is best, because it doesn't reflect daylight or artificial lights. Consequently, details show up better. However, the undercoat or primer should be dead flat. A primer gives the surface a little tooth and helps top coats adhere better.

Any of the hobby paints are satisfactory such as Model Shipways, Testors, Humbrol, and Tamiya. Jo Sonja artists' paints (used by bird carvers) are also acceptable. They are a combination acrylic-gouache and dry dead flat.

Hobby paints have a variety of reflectance levels from flat to gloss. When using a mixed group of reflectance levels, finish the completed model with a flat, clear coat. It also provides durability and seals

any decals or dry transfer lettering.

**Brush painting:** Painting with fine, soft bristle brushes is probably best for the beginner. Many skilled model makers prefer the brushed-on technique, because its subtle imperfections impart a more lifelike appearance to the model. Brushes must be soft and of the highest quality. Artist grade sable or synthetics are the best. Use wider brushes for painting broad surfaces. If too narrow, the bristles will cause excessive streaking.

When applying paint or stain with a brush, lay down one thin coat in a single stroke, then move to an adjacent area and coat it with a single stroke. Never go back over fresh paint. That will tear up the surface. Wait until it has dried to a hard finish before applying a second coat.

**Spray painting:** Although slightly expensive, a Paasche, Badger, Testors, Revell-Monogram, or similar airbrush will produce a first-rate job and is worth the investment. Airbrushes are either single action (trigger controls only airflow) or double action (trigger controls air and paint) and easy to use. Spray patterns can vary from thin to about 1/2" wide by either adjusting the needle or installing a different, sealed nozzle. In some brands, paint travels through the airbrush body to the needle. These require disassembling to clean. Other designs bypass the body and bring paint directly to the nozzle. These clean by simply spraying solvent through them.

Paints are either water (acrylic) or solvent based. Solvent-based paints spray best. Acrylics are difficult to spray and must definitely be used with the manufacturer's special thinner. Thinning water-based paints with water creates surface tension problems, resulting in poor coverage and spray atomization. If a manufacturer's thinner is not available, alcohol can be used as a substitute. Experiment when using acrylics. Some modelers have success and others don't.

When using solvent-based paints, work outdoors or equip your shop with a spray booth. These fumes are toxic.

Many brands of aerosol paints produce good results. However, test

them on scrap wood before spraying the model. Aerosols put out a lot more paint than an airbrush, so be careful to avoid runs. Spray on several light coats.

Most paint manufacturers have special thinners for their various paint lines. Follow each manufacturer's recommendations. Mixing brands is not a good idea, because they may not be compatible. Sometimes, however, no other option exists. If so, apply each brand separately and allow to thoroughly dry before adding the next. Always test to make sure the final flat or gloss finish is compatible with the paint it will cover.

**Masking surfaces:** Masking can be a tricky process. Some brands of masking tape are worthless, because they allow paint to seep underneath their edges. For masking fine stripes or straight and curved lines, use a graphic arts tape such as Chart Pak. It comes in widths as fine as 1/64". Chart Pak tapes have superb adhesion and won't bleed when firmly applied (burnishing is recommended). Black plastic electrician's tape and Scotch Removable Magic Tape are also excellent. Scotch's tape has the same, low stick adhesive as its famous PostIt pads. In fact, PostIt tape flags can be used for masking.

## 2. Bounty's Launch Color Scheme

The color scheme is shown on the plans and the box art for the various parts and areas. This color scheme is after Mansir and it is not known what source material he may have used if any. At any rate it is an attractive color scheme and is of paint pigments known to be available for the period.

The following Model Shipways acrylic paints match the colors noted on the plans:

**White** - Warm White, MS4832

**Primer** - MS4839

**Yellow Ochre** - Hull Yellow Ochre, MS4829

**Gray** - Deck Medium Gray, MS4826 or Deck Light Gray, MS4825

**Green** - Bright Green, MS4836

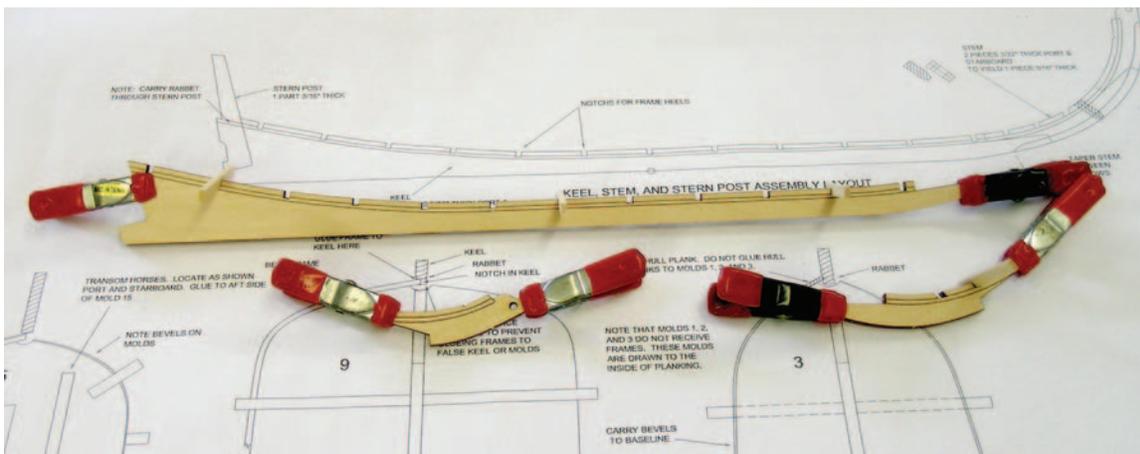
**Cherry Stain** - MS4979 • **Tung Oil** - MS4978

## STAGE 1: BUILDING THE CONSTRUCTION JIG

### 1. General

The model is built over a construction jig which consists of a center piece commonly called a false keel, and molds numbered 1 through 15 located at stations. The molds are shaped to the lines of the hull but reduced in size by the thickness of the frame. Once the frames

are bent on to the molds the outside of the frames coincide with the hull lines inside of the planking. The exception is that molds 1, 2, and 3 do not receive frames and are shaped to the inside of the planking. This is so because the cant frames will later be installed to the inside of the hull after planking.



*Photo 1, preparing the stem, keel, and sternpost*

## 2. Preparing the keel, stem and sternpost

The keel and the two pieces of the stem are laminated from 3/32 basswood. An innovation introduced by Model Shipways is that the rabbet and bearding lines are laser engraved on these parts completely eliminating the need to transfer these lines from the plans to the wood pieces. This greatly improves the accuracy of these lines and eases the carving of the rabbet in the next step.

Make sure you have firmly in mind that these parts are to be assembled so the rabbet and bearding lines are visible port and starboard. Do not use a heavy coat of water based glue to laminate these parts as the water content may cause them to warp. A better method is to use a few spots of carpenter's glue, clamp the parts together and then run a little thin CA glue around the seams. The CA will wick into

the joint welding the parts together. A few scrap pieces of 3/32 thick basswood in the frame heel slots as shown in photo 1 above will help you to align the pieces.

Assemble and glue together the 3 pieces, stem, keel, and sternpost. Note that the sternpost is a single piece of laser cut 3/16 thick basswood. Do this over the plans on sheet 2 as shown in photo 2 below. It is more important that the inside curve of the assembly match the plans than that the scarf joints are a tight fit. Any gaps in the joints can be filled. Protect your plans with a sheet of waxed paper or cling wrap. Weight these pieces in place until the glue has dried.

Check the fit of the keel assembly to the false center keel piece and make any adjustments.

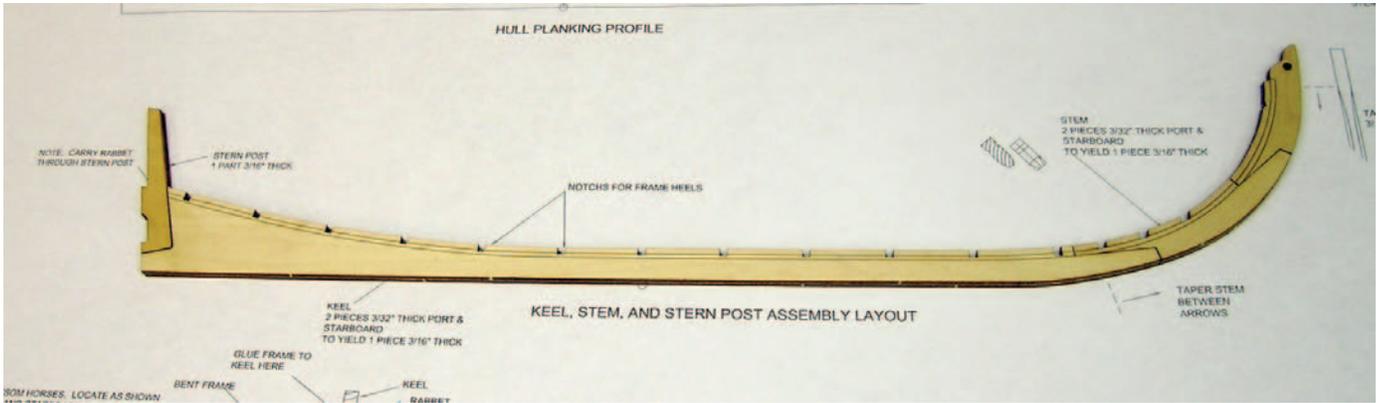


Photo 2, stem, keel and sternpost assembly

## 3. Preparing the molds

While the glue is drying on your keel assembly is a good time to get out the molds, 1 through 15, and glue on the sheer tabs. Cut 30 pieces of 3/32 x 3/16 basswood to about 1 1/2 inches length.

Glue these to the molds aligned with the laser engraved lines on the molds as shown on sheet 2 and photo 3 below. They should project from the molds about 3/8 inches. The sheer tabs define the sheer and also provide a clamping surface.

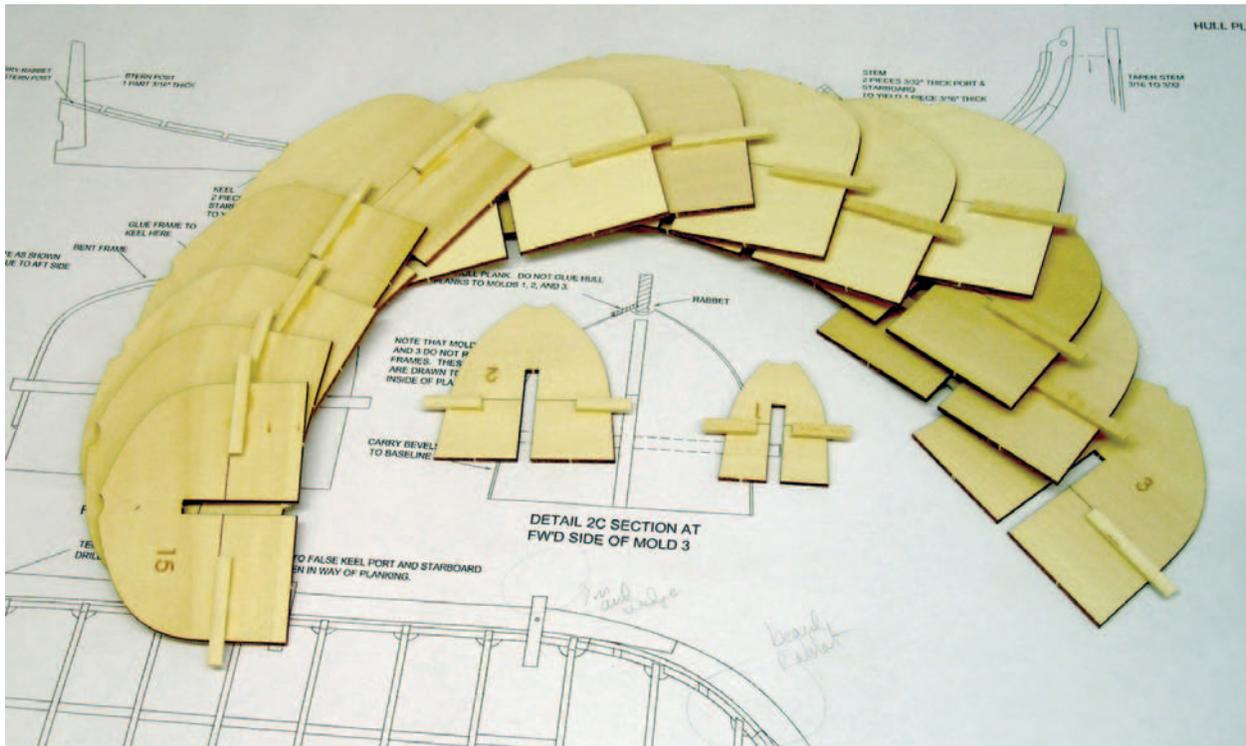
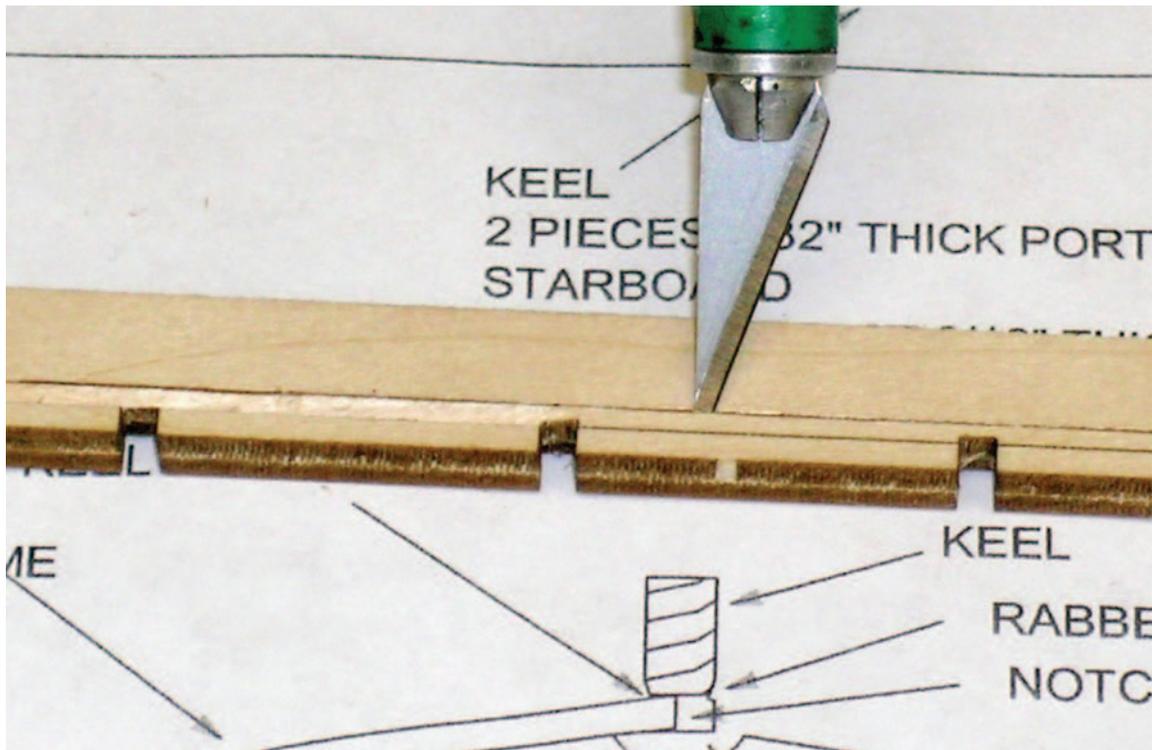


Photo 3, applying the sheer tabs



*Photo 4, cutting the rabbet*

#### 4. Cutting the rabbet

The rabbet is a generic term referring to the entire groove where planks are fitted along the stem, keel, and sternpost. The rabbet consists of three basic lines. A rabbet line is the line where the outer face of the planks butts with the keel, stem, and sternpost. The bearding line is the intersection of the center keel with the planks inner face. A third line, called the middle line, is where the edge or end of a planks inner surface butts in the rabbet groove. These three lines are illustrated in detail on plan sheet 2.

Note: As shown in the detail, the rabbet shape varies depending upon its location along the hull. Cut the depth of the rabbet (rabbet line to middle line) to suit the thickness of the planking (1/16"). Do this with a #11 hobby blade. In full size practice, the rabbet groove must be cut very precisely. In model work, the middle line and the bearding line are not critical at all since they will never be seen. So, you can just about forget about the middle line and cut

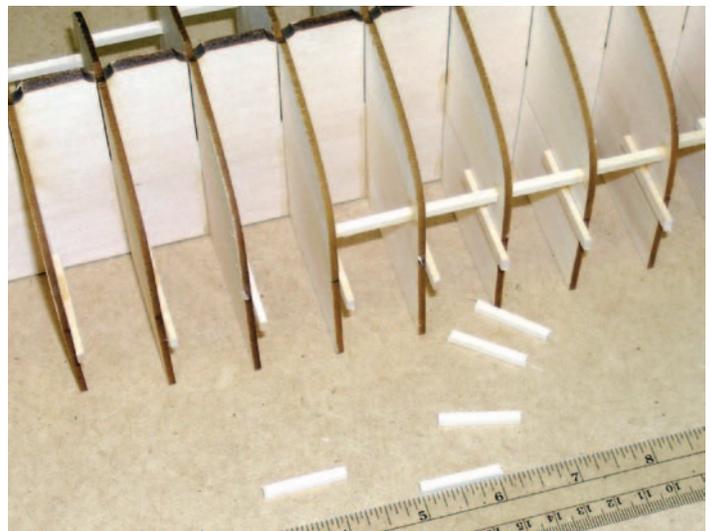
the rabbet from the bearding line to the rabbet line. Of course, the rabbet is cut on both sides of the keel.

As you carve the rabbet, fit a scrap piece of 1/16" plank stock against the keel, stem, and sternpost to make sure it fits in the rabbet at the approximate angle that the planking will take to the rabbet at that point. The objective is to have the planking fit nicely into the rabbit with the plank edge on the rabbet line. The laser engraved rabbet line makes this a simple task. Take care in the cutting to preserve the crisp engraved rabbet line. Mark the rabbet line on the sternpost and carry the rabbet groove through the sternpost as shown on sheet 2. A pattern for marking the tapered portion of the stem is provided on sheet 2. Your options here are to cut the pattern out of the plans or trace the pattern on tracing paper or having a copy made of this portion of the plans. Glue to stiff paper (3M 77 spray glue is handy here) and cut out.

#### 5. Assembling the building jig

The molds and center keel being CAD designed and precision laser cut should fit together very nicely. Test fit each mold to the center keel verifying that the slots slide together neatly. Make any adjustments necessary. You will need a nice flat building surface to assemble the jig. Note that it is not necessary to glue the building jig to the building board. Glue each mold to the center keel in its proper place referring to sheet 2. Carpenters glue is ideal for this step. IMPORTANT: note that the sheer tabs from mold 9 through 15 are on the forward side of the molds and from 8 through 1 are on the aft side of the molds. Ensure that the molds and keel meet on the surface of the building board and that the molds are square to the center keel.

**Stiffening struts:** Cut 1/8 square basswood strip wood pieces to fit between the molds as stiffening struts as shown in photo 5 and on sheet 2. This adds a great deal of rigidity to the structure and prepares us for the fairing process. The nominal distance between molds is 1 and 1/32 inch.



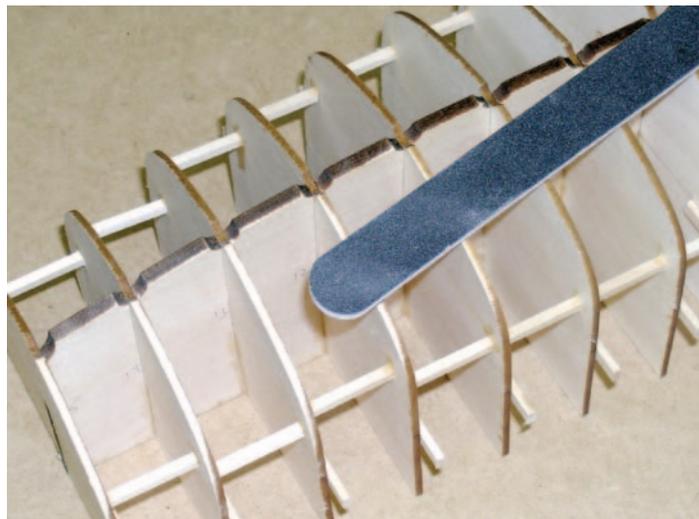
*Photo 5, adding the stiffening struts*

**Fairing the molds:** We are now ready to fair the molds. Fairing is a most important part of hull construction. Beginners tend to rush this step and jump right into planking. Take your time and check the fairness thoroughly. Then you won't run into problems when you start planking.

Fairing is the process of beveling the edges of the molds so they lie in a fair curve. Before you begin, note that molds 1, 2, and 3 are lofted and cut to the inside of the planking and do not receive frames while molds 4 through 15 are lofted and cut to the inside of the frames and do receive frames. Therefore these two sections must be treated as separate entities. That is, fair molds 1, 2, and 3 separately from the rest. It would also be reasonable to wait to fair molds 1, 2, and 3 until after the frames are installed.

Some of the molds at the bow and stern are laser engraved with a bevel line that was determined when the hull was lofted in CAD. Begin by rough carving the bevels on these molds with a knife, leaving some material to be removed by sanding. The bevel is so slight on the rest of the molds that they are best sanded in. Note that the bevels should be carried all the way down to the building board. This is so the frames we will later bend on will lie properly on the mold edges and follow the bevels. Lay a basswood batten against the mold edges at various locations to check for fairness. This process will show you where you need to sand in bevels that were not pre-cut on the bulkhead edges, and where bumps and dips may need to be corrected. Proceed slowly and carefully. If you should snag and break a mold, that's what glue is for. Patience is the ticket here.

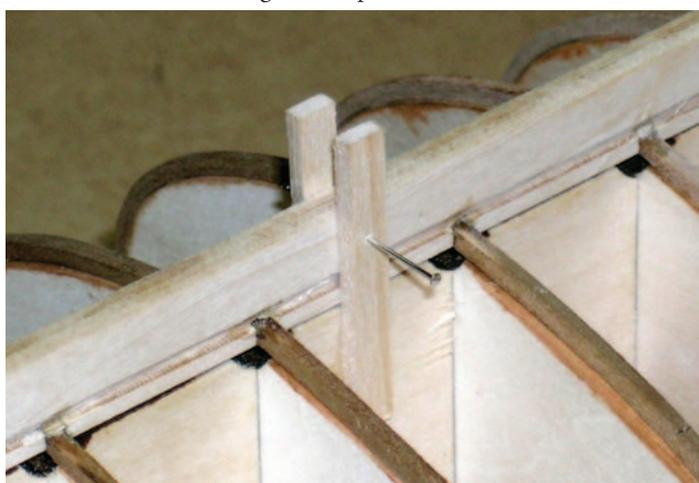
Use a sanding stick that is long enough to cross at least 3 molds. The manicure type sanding stick shown in the photo is ideal.



*Photo 6, fairing the molds*

Otherwise glue sandpaper to a suitable backing. Note that the laser burn on the edge of the molds gives an indication of how well you are proceeding with the fairing process. When the laser burn is nearly gone, you are pretty well faired. Also note that in the photo the fairing of the molds has yet to be taken down to the building board level. The need for this will become obvious when we begin to bend on the frames. Molds 1, 2 and 3 require the most material removal in the fairing process.

**Fitting the keel, the keel alignment tabs:** Once you are satisfied with your fairing, test fit the keel assembly to the jig structure. Molds 1, 2, and 3 may require trimming a bit in way of the keel assembly to allow it to lie directly on the center keel. Align the frame heel notches in the keel with the molds. When all is well lay the keel aside and let's install the temporary keel alignment tabs as shown on sheet 2. Spot glue these tabs in place; they will be removed during the planking process. When dry, slip the keel assembly between the tabs and make a final alignment and positioning. Drill through the tabs and keel and pin the keel in place. For the prototype, ordinary sewing straight pins were used, see photo 7. The drill size is 0.028" dia., a #70 drill. These tabs and pins align the keel fore and aft and also hold the keel down while the frames are being bent in place.



*Photo 7, the keel alignment tabs*

**Stem alignment blocks:** Glue the laser cut stem alignment blocks to mold 1 on each side of the stem as on sheet 2 ensuring the stem is centered. Cut a short piece of 3/32 dowel to temporarily lock the stem head in place.



*Photo 8, stem alignment blocks*

#### **Transom horses, installing the transom:**

Glue the transom horses to mold 15 as on sheet 2. Lay a straight edge across the faces of the horses and the stern post. If necessary shave or add material to the horses so that the horses and the stern post are all in the same plane. Note and cut the bevel in the transom where it meets the keel. The transom may now be glued to the stern post. Take care that the transom is

centered on the stern post and is square with the world. That is measure up from the building board (baseline) so that the transom is at the same height on either side of the keel. Drill #70 drill through the transom into the horses and tack nail the transom to the horses with brass nails as in photo 9. This fixes the transom firmly in place and readies it for fairing. Note that the transom is also lofted to the inside of the planking and should not be finish faired until the frames are in place.

This finishes the building jig and with the keel, stem, sternpost and transom in place we are ready to start building a boat hull.



*Photo 9, affixing the transom*

## STAGE 2: BENDING ON THE FRAMES

Now we are going to have some fun bending on the frames. As previously noted this method of boat building is as in full size practice for this size and type of boat hull. Molds were set up at stations just as we have for the model and frames were steam bent around them. This is a good time to note that our building jig is not part of the boat! A word of caution, we do not want any part of the boat to end up glued to the building jig. Therefore it is a good idea to wax the edges of the molds lest a drop of glue later run down and wick in between a frame and a mold. You can use paste wax, beeswax, a candle or any other suitable wax you have around. For the prototype a paste furniture wax applied with a brush was used. Also a reminder that molds 1, 2, and 3, do not take frames. These only provide shape to the bow of the boat and are lofted to the inside of the planking, not the inside of the frames. Note in photo 10 these molds have been colored to remind the builder that planks are not to be glued to these molds.

Some comments on bending wood. Building the launch requires quite a lot of wood bending. Namely, the frames, planks, sheer clamps, thwart risers, and floorboards. What we are after is to pre-bend each piece of wood so that it will lie in its intended place without undue force and/or distortion, and with a minimal amount of persuasion. Not doing so stresses glue joints and makes the pieces difficult to install and clamp. Wood is bent by:

**Steam bending:** Hold the plank over a kettle of boiling water and bend. Hold the wood in position until it cools. Although the plank should remain in that shape, it may spring back slightly. Gloves are desirable, hot steam can severely burn.

**Microwave steaming:** Wrap the planks in a wet paper towel before heating. Since microwaves differ in wattage, experiment to determine what power level to use and for how long. Experiment with scrap pieces first as it is quite possible to start a fire in your microwave:

**Soaking:** Submerge the plank in warm water for several hours. Try adding a little household or pure ammonia. This speeds up the process, making the fibers slippery so the wood bends more easily. After soaking, and bending, clamp the plank in its intended position until completely dry.

**Soldering iron:** Large soldering irons with a tubular end are ideal. Clamp the iron upright in a vise. While the iron heats, soak the strip of wood in tap water. Some modelers prefer bending around the tube near the handle (it's not as hot), while others use the shank. Move the strip back and forth against the iron. Its heat turns water into steam and drives it into the wood. The trick is to wait until you feel the wood wanting to yield before starting the bend. Begin too soon or apply too much pressure and the strip will break. The wood dries rapidly, so care must be taken to avoid scorching. Re-soak and reapply it to the iron until the desired shape is achieved. Once the piece

is formed, it can go directly on the model. Because the wood's memory has been permanently altered, it will never spring back to its former shape, meaning no stress on any timber or fasteners. Spend some time acquainting yourself with this method and you'll never bother with fixtures again.

Another soldering iron approach is to lathe-turn a tip from hard aluminum, then file a 45° angle on one end. Insert the tip in a 20- or 30-watt soldering iron and heat it. Soak the wood for five minutes, then let dry for five minutes. (Woods take on water faster than they can release it.) Hold the tip against the wood to heat it. When supple, bend the plank over a form, or simply lift the end as heat is applied and bend by hand.

**Commercial plank benders:** Model Expo sells an electric plank bender designed for controlled heat, item no. MS7205. Another tool (Amati's FormAStrip available from Model Expo) bends planks without soaking or heating. It looks like a pair of pliers with one flat jaw and a chisel for the other. When squeezed on a plank, the chisel depresses one side of the wood, causing it to bend. Repeat the process along the plank until it assumes the correct curve. However, squeezing too hard will cut the wood in half. This tool bends planks in only one direction, so it's good for bow planks, but not those at the stern that are concave. This treatment is not recommended for the launch since unlike a plank on bulkhead hull, our planks are visible on the interior of the hull.

The frame stock supplied in the kit is 3/32 square cherry. Cherry bends much more readily when hot and wet than does basswood. The prototype model was built by soaking each frame in boiling

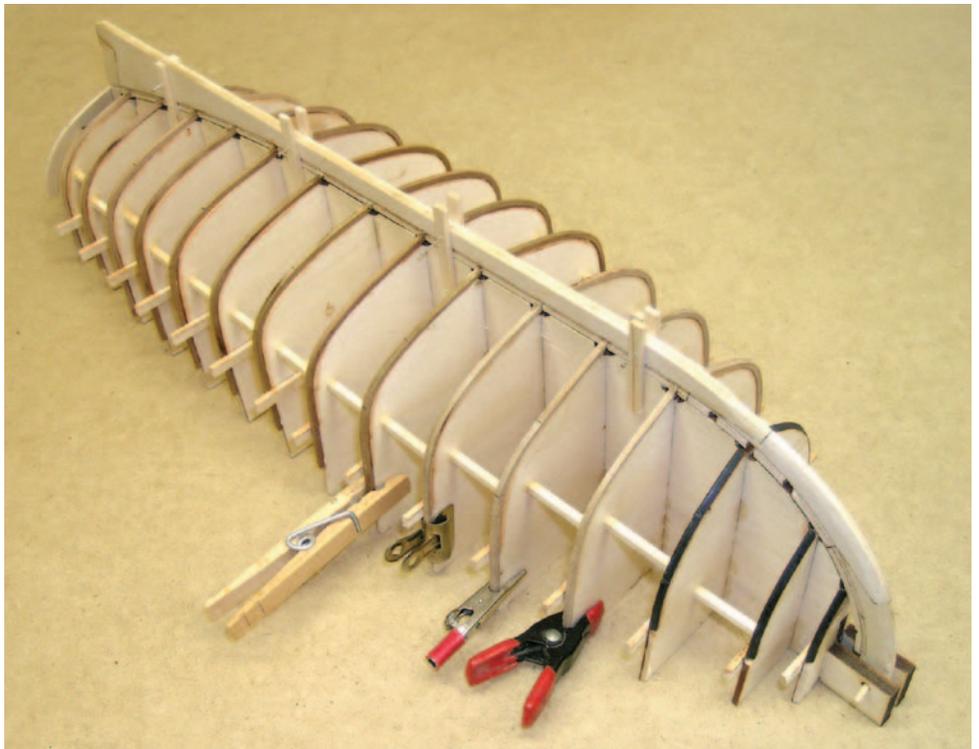


Photo 10, frames 4 through 15 bent and installed

water for about 5 minutes. This can be as simple as a coffee can of water boiling on the kitchen stove. What ever method you use it is useful to begin bending and shaping a frame in your fingers before

bending to a mold, i.e., a pre-bend. This, of course, is after you have hot soaked the frame. As you bend a frame in your fingers you will develop a sense of how much the wood can take and where to apply pressure on the frame to achieve the desired bend. You may break a few frames as you go, but there is plenty of frame stock in the kit.

Cut a supply of 3/32 square frame stock to about 4-1/2 inches length. This length is suitable for all frames except molds 15 and 14 which require a slightly shorter length. Frames are bent by hooking the keel end under the keel in the sockets about halfway through and then wrapping the frames down over the mold and clamping them below the sheer tabs. Refer to sheet 2, hull construction. The most severe bends are at the turn of the bilge near midships. Begin your frame bending elsewhere; say around molds 4 and 5 where the bends are not so severe. This will give you a feel for the process. The hot, wet frames must dry completely before any further work as the wood swells when wet and shrinks as it dries out. Clamp the frames to the molds below the sheer tabs and let them dry overnight. Also clamp them anywhere along the mold where the frame may tend to lift away from the mold. Photo 10 shows a variety of clamps that can be used for this.

The frames must not only bend but twist as they wrap around the molds due to the fairing of the mold edges. There is very little twist near midships but quite a bit near the ends. You may have to “help” your frame take this twist by twisting it with your fingers. Frames may also twist naturally as they are bent due to the peculiarities of

the wood grain. This may have to be “wrestled” with to make your frame conform and lay as you want it. If you encounter a particularly stubborn frame, throw it out and try another. The goal here is to have the frames make intimate contact with the mold conforming to both bend and twist while in the wet state. When they dry they will retain this shape and become quite stiff and strong. When your frames have completely dried (preferably overnight) they are ready to install. The wetting of the frame stock will raise the grain and make the wood feel rough. There is little chance of sanding the frames after the planking stage so now is a good time to sand the interior surfaces of the frames before gluing them down. The frames are SPOT glued to the molds below the sheer tabs as indicated on sheet 2. This spot glue is easily popped off after planking is completed and the hull is ready to be removed from the building jig.

When all frames have been installed is the time to fair in the transom. Use a batten and fair the edge of the transom to receive the planking. Also use a batten to check the fairness of the frames. Some slight sanding may be in order if some frames seem to be out of fair. Since the frames are only attached where we glued them to the molds they will seem a bit flimsy for this operation. Sand along the frame vertically and/or clamp the frame to assist in the fairing. If you should discover a frame that just does not satisfy you as to its fit and shape, throw it out and bend on another.

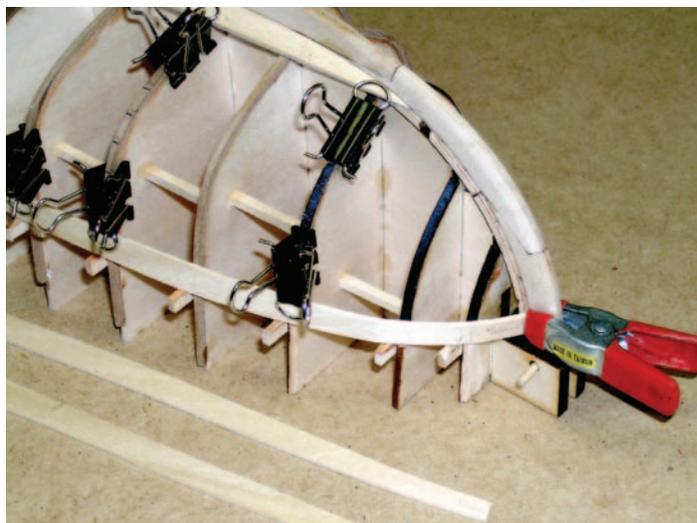
Now we can check the rabbet by using a strip of 1/16” material to see how it flows into the rabbet. Make any final adjustments to the rabbet you deem necessary. We are now ready for the planking.

### STAGE 3: PLANKING THE HULL

Spiling and fitting planks is perhaps one of the most daunting tasks in model ship building. Spiling is the process by which the developed plank shapes are obtained so that they fit the hull properly in their designated position. The process is begun by belting and lining off the hull as shown on plan sheet 2. For this model, the lining off was done in CAD and the plank seam lines are laser engraved on the molds. The planks were developed for the prototype by spiling and then traced and digitized so they could be laser cut. This is an innovation in model ship building.

It is important to note that the laser cut planks are a little oversize and must be further shaped and fitted so as to conform to the laser engraved line off marks on the molds. It is also important to note that the laser engraved marks need to be projected to the outside of the frames (inside of the planking) as that is how the lines on sheet 2 are drawn. It is a good idea to use a straight edge and pencil to project these lines to the frame surface so that parallax does not cause errors to creep in. If your pre-cut planks are properly finish shaped to conform to the line off marks, they should fit nicely.

It is a good idea to lightly pencil the plank numbers on the planks before removing them from the basswood sheet. Some of the planks are very similar in shape and can possibly be misidentified when installing. All planks must be pre-bent and completely dry and fitted to the marks before installation. The plank ends that meet the rabbet at the stem are called hood ends. The hood ends are shaped and positioned by using the patterns provided on sheet 2. It is important to note that it is the inside edge of the plank that is positioned such that its projection forward would flow nicely into the marks on the pattern. Study the illustration on sheet 2. This projection distance ranges from the most at the garboard to



*Photo 11, garboard and sheer planks bent and clamped in place to dry*

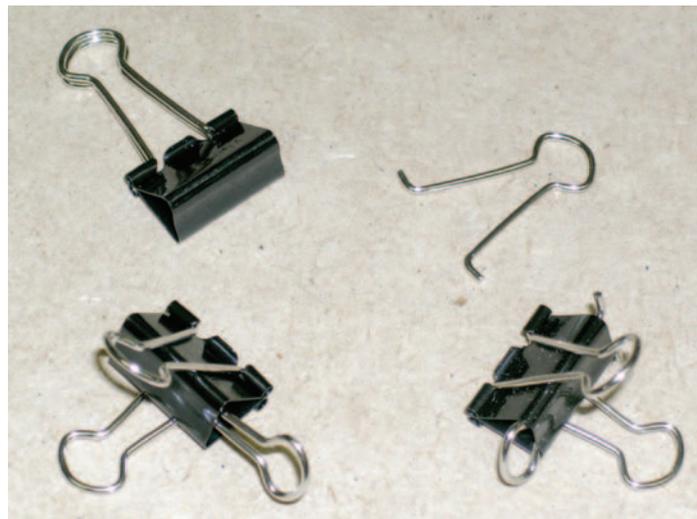
practically none at the sheer plank. Remove the keel alignment tabs from one side of the keel. When the garboard is fitted and glued to the frames and keel on that side the tabs on the other side may be removed.

We will apply the sheer and garboard planks first and then work downward from the garboard and upwards from the sheer plank until we meet at the turn of the bilge at plank 6. This last plank is called the shutter plank and/or sometimes the whiskey plank. You may as an option start at the sheer plank and work upward. The method of bending the planks for the prototype model was a coffee can of boiling water on the stove. Place the hood end of the plank

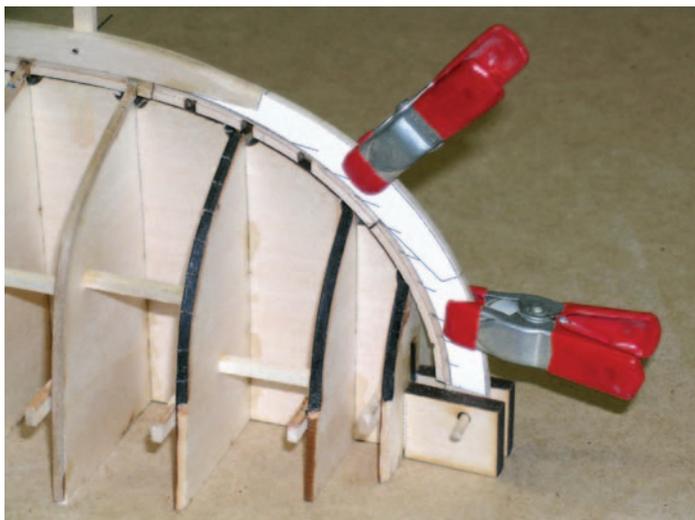
in the water for about 1 minute or less. Remove the plank and with your fingers test the plank for its willingness to bend. They should bend easily. They will be hot when removed from the water but will cool rapidly in a few seconds so they can be safely touched. Clamp hot/wet plank into position to dry as shown in photo 11. It is important to note that while the hood end of the garboard looks symmetric in its taper, it is not. Refer to plan sheet 4 to ensure you apply the correct side of the garboard to the keel.

A very useful clamp to hold the planks in place as they dry can be made from the common binder clips available at office supply stores. Photo 12 illustrates how they are made.

Once the garboard and sheer clamps have dried we are ready to shape them if needed to meet the lining off marks on the hull. This can be done with the cosmetic sanding boards previously mentioned. It is important from here through the planking stage that the planks come close to meeting the marks. If you should find your self with a plank that doesn't meet the marks shape the next one to get back to the marks. The sheer plank is easy to shape and align at the stem since the top edge of the plank hardly twists at all. Just shape it to meet the line on the hood end pattern.

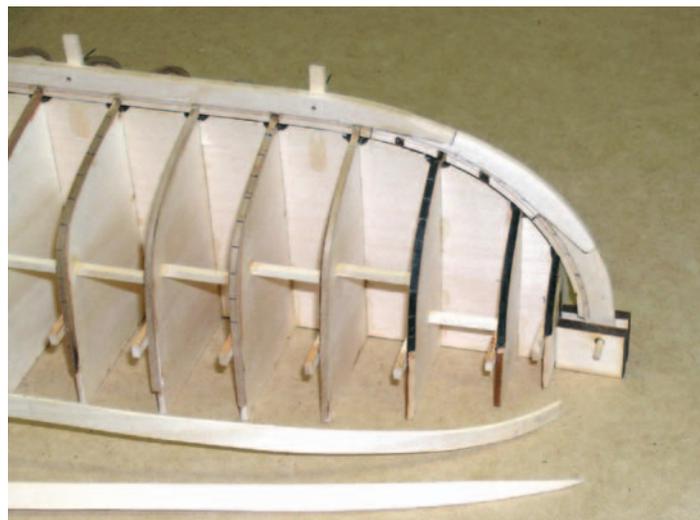


*Photo 12, making clamps from binder clips*



*Photo 13, plank hood end locating pattern*

The garboard must be carefully aligned as shown on sheet 2. The garboard twists quite a bit where it meets the rabbet requiring more care to locate it properly. Study the illustration on sheet 2 showing the placement of the garboard. A straight edge aligned along the mark on the pattern may help to accomplish this. When you are satisfied that the sheer and garboard planks are properly bent and shaped to the marks they are ready to glue to the frames. Remember that the planks are not glued to molds 1, 2, and 3.



*Photo 14, sheer plank & garboard bent, shaped, fitted and ready to install*

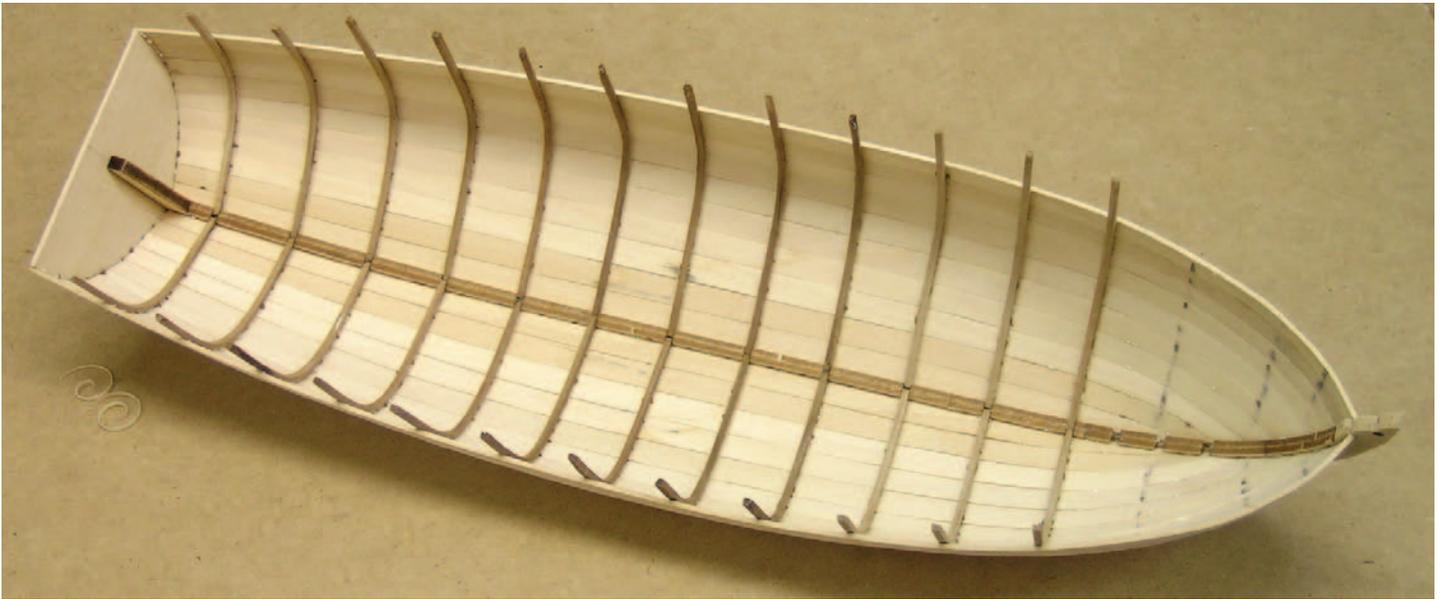
Proceed with each pair of planks as you did the garboard and sheer plank, moving up from the sheer and down from the garboard. Hot/wet bend, clamp in position, let dry, shape and fit to the marks, glue in place. Planks 2, 3, and 4 also have considerable twist at the bow and require careful shaping and fitting referring to the line off marks and the hood end locator pattern. The remaining planks are easier to fit. As you approach the turn of the bilge the gap between the lower and upper planks diminishes. It is a good idea to put the bend in the remaining planks while the gap is still wide enough to get your clamps in. The smallest size of binder clip is useful here. With all the planks bent proceed to fit and glue until you reach the shutter plank, plank 6.



Begin fitting the shutter planks at the bow. Sand both edges of the plank until it fits at the bow. Continue along the length fitting a little at a time until the whole plank will drop in. The planking is done, time to sit back and admire your work.

You may wish to rough sand the hull at this point while it is still attached to the building jig. Remove the pins from the transom and the dowel from the stem alignment blocks. Using your knife, work the blade in between the frames and the molds and pop the spot glued frames from the molds. If you have not glued the hull to the building jig somewhere the hull should easily come away from the building jig.

*Photo 15, ready for the shutter planks*

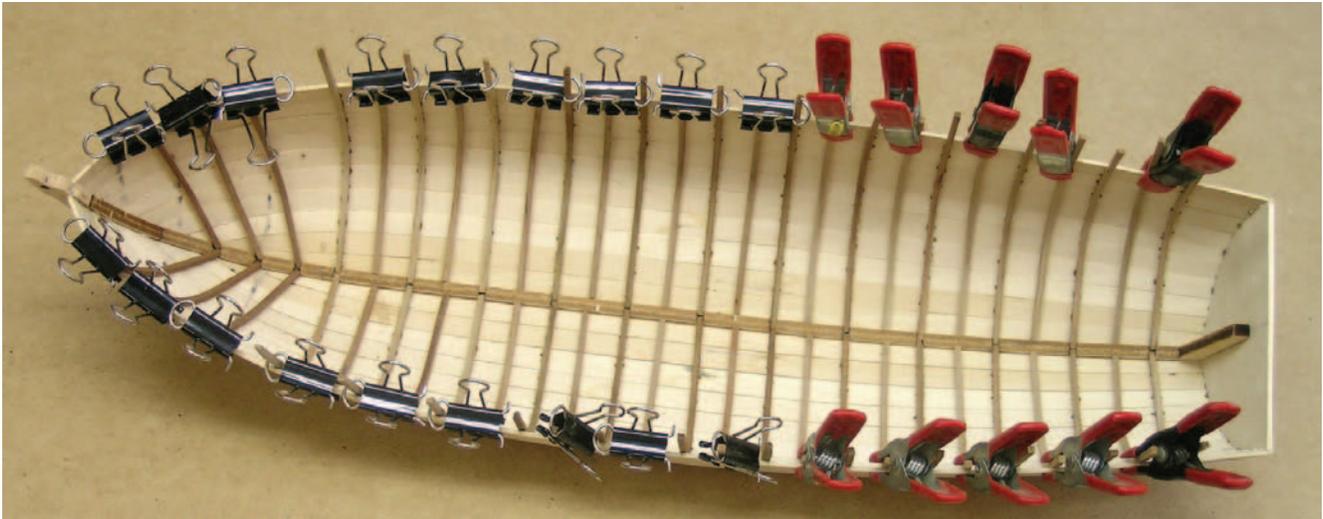


*Photo 17, the hull removed from the building jig*



*Photo 16,  
the completed  
planking*

## STAGE 4: FITTING OUT



*Photo 18, installing the 'tween frames and cant frames*

In this stage we will complete the interior structural members and details. These include the sheer clamps, thwart risers, windlass keepers, mast steps, cap rails and thwarts. Study the plans to familiarize yourself with these parts.

### 1. Fitting the 'tween frames and cant frames

The launch was built with more frames than we have currently installed. Frames 4 through 15 have an additional frame installed between each frame called the "tween frames. Also the bow of the boat is fitted with angled frames called cant frames. Prepare a quantity of frame lengths, soak and heat them just as we did for the previous frames and push them in place between the frames. These should bend easily and are held in place to dry by clamping them to the sheer strake as shown in photo 18.

Mark the location of the cant frames at the sheer and bend them in place placing their bottom ends at the slots in the keel. These ends need not fit in the slots as the slots are laser cut straight across the keel and the cant frames meet them at an angle. The slots are there just for the convenience of locating the heel end of the cant frames. Bevel the heel ends of the cant frames to fit flush against the keel. This area of the hull will not be seen once we are finished. When the frames have dried, sand them if you wish and glue them in place. We now have 26 frames port and starboard for a total of 52. Now is the time to clean up any glue gobs. Very little of the frames

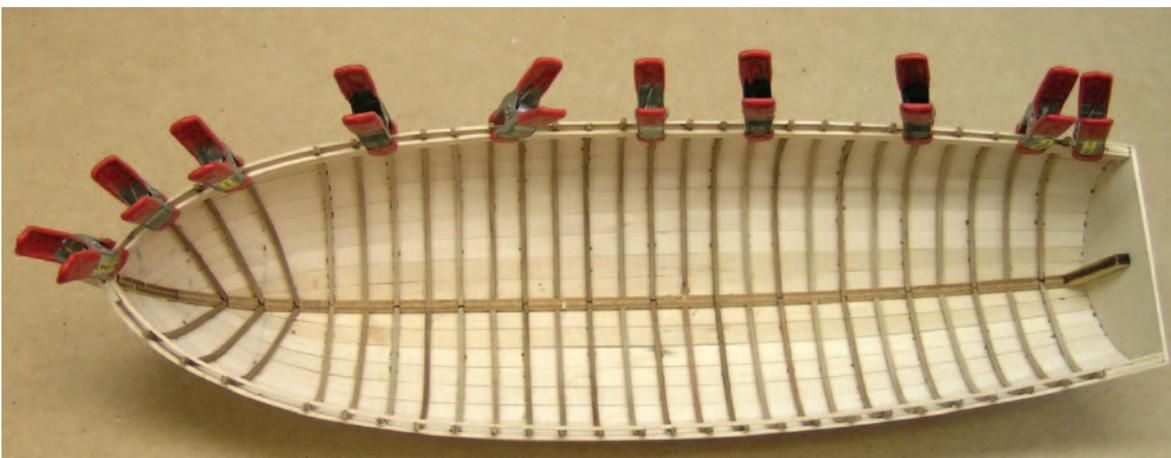
are visible in the finished model. Review the plans and photos and concentrate on those areas of frame and plank that will be visible.

### 2. Installing the sheer clamps

The sheer clamps are  $3/32 \times 3/16$  basswood strips that run along the sheer inside of the frames. Refer to sheet 3 and photo 19. Prepare a landing for the sheer clamps at bow and stern as shown on sheet 2 by gluing in a small piece of  $3/32 \times 3/16$  strip to the inside of the sheer strake. This brings the sheer clamp to the same level as the frames. The forward section of the sheer clamp will need to be hot/wet bent to form the curvature of the bow. Bend these in place and allow them to dry then glue in place as shown in photo 19. Use a length of strip wood to ensure the sheer clamp is at the same level as the sheer plank all along the sheer.

Now we can cut off the projecting tops of the frames. These are easily cut off with a pair of sharp nippers, or a modelers saw. Sand these flush with the sheer plank and the sheer clamp using a rigid sanding board to ensure that we don't dip down into the areas between frame tops.

The hull is now a rigid structure and it is a good time to finish sand the exterior. This was a work boat and would not have had a yacht like finish. Sand the hull as smooth as you like in preparation for painting. If you have gaps they can be filled at this point.



*Photo 19, installing the sheer clamps*

### 3. Installing the thwart risers

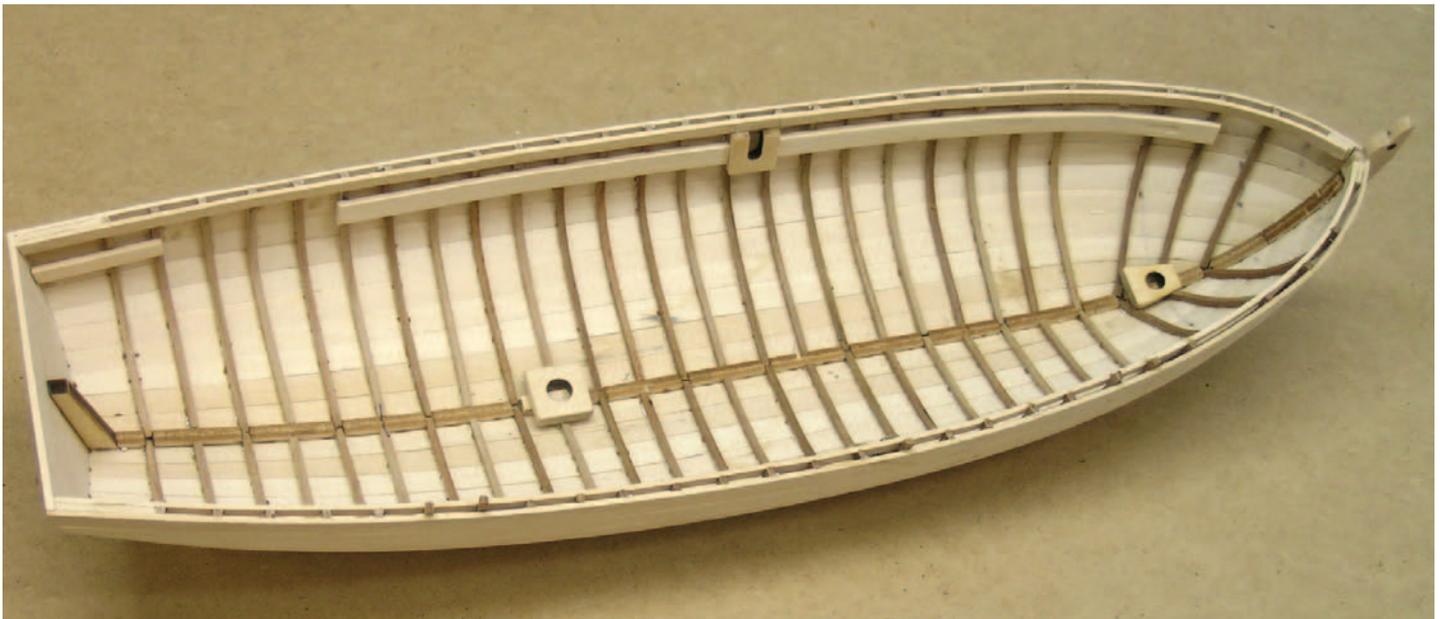
The thwart risers are from 3/32 x 5/16 basswood and are the support structure for the thwarts (seats). Cut the supplied material into two 12 inch lengths. The risers will need to bend in two directions, to fit the shape of the hull and to conform to a curve parallel to the shear. Give these pieces the hot wet treatment and clamp into place as shown in photo 20.

Use scrap pieces of 3/16 material to space the risers 3/16 below the sheer clamps. When dry remove and set aside. Shape and install the winch keepers. The back side of these pieces should be shaped to fit in place with the inside face more or less vertical. This is not



*Photo 20, forming the thwart risers to shape*

critical, just shape them so they fit well and look right. There is an old axiom in the boat building trade that says “if it looks right it is right.” Cut away that portion of the thwart risers in way of the winch keepers and glue them in place spacing them as before, about 3/16 below the sheer clamps. Install the 3/32 x 3/16 stern thwart risers as shown on the plans.



*Photo 21, winch keepers, thwart risers, and mast steps installed*

### 4. Mast steps

It is a good idea to check the fit of the mast dowels in the mast steps before proceeding. Make any adjustments for fit as necessary. Shape the bottom of the laser cut mainmast step for a good fit and glue in. The foremast step requires a little more shaping as shown on the plans. Its position is important as this will determine the relationship between the fit of the bow grate, fore thwart, and the foremast rake angle, if any. The sources used to design this model show the mast rake (angle with the vertical) both in a slightly raked and no rake configuration. The choice is yours. The prototype model was built with a slight rake to the masts. Dry fit the bow grate, fore thwart and foremast step in place. Insert the foremast 1/4 diameter dowel, check the mast rake, and determine where you want the fore and aft position of the foremast step. Mark this position and glue the foremast step in place.

### 5. Floorboards

The floor boards are laser cut. The center floor board is provided in two pieces. The ends that meet the mainmast step will need to be trimmed to fit. A 1/32 x 3/16 basswood strip is provided for a sub-floor filler piece that extends from the mainmast step forward to frame 5 1/2. That is the ‘tween frame just aft of frame 5. Glue it on top of the keel. This piece gives a good gluing surface for the center floor board. Now glue in the center floor board noting that the aft end of all floor boards terminate at the ‘tween frame just aft of frame 12. The forward ends terminate just at or a bit forward of cant frame 3. You may be able to glue in the floorboard without hot/wet pre-bending if you use a superglue gel. If not you are now adept at soaking and bending wood. The spacing between the floor boards is about 1/32 of an inch. Use suitable spacers during installation to make a neat job.



*Photo 22, interior stained, exterior painted. Note filler blocks for installing the gunwale*

## 6. Staining and painting

Before installing the remaining parts, now is the time to think about finishes. Basswood is not a very attractive wood in its unfinished state. The prototype model was stained with a cherry stain on all unpainted parts and given a coat of tung oil. You may choose to paint the interior of the model, it's your choice. Photo 22 shows the interior hull stained. If you are going to stain, do this before attempting to finish paint the hull exterior since the stain will almost certainly bleed through the planks seams staining the exterior of the hull. Not a problem as paint will cover the stain. It is a good idea to finish sand and round all edges of the thwarts, stern sheets, backrest, and bow grate then stain and finish them before installation. When you have finished the interior of the hull to your satisfaction, it is time to turn to the exterior finish.

Unless you are not going to paint the hull, prime the exterior of the hull with the primer of your choice. Model Expo sells primer and paints in their line of marine model paints. A paint set of primer, paints, and stains is available for this model. A word about plank seam gaps; in real boat construction the plank edges are chamfered before installation to provide a groove to take caulking. Caulking is driven into the seams and probably coated with some kind of pine tar. This is illustrated on plan sheet 3. The plank seams would have been visible through any finish paint. In model work our planks are simply butted and faired off with sanding. After sanding the plank seams will probably be visible in some areas and perhaps not in other areas depending on the tightness of the joint. After applying primer to the hull the seams will become even more visible. You have a choice to leave the seams visible, or if deemed unsightly you can fill the seams with wood filler and sand to a smooth finish. You can also safely turn the boat upside down and finish it with aerosol spray can primer and paint. Also sand and finish the rudder to match the hull paint scheme. The water line can be marked by turning the hull upside down and blocking it up on a flat surface. A pencil clamped to a vertical member at the appropriate height is used to mark the location of the water line on the hull. It is better to make a few spaced marks,

say every inch or so than to attempt to scribe the entire line.

## 7. Mounting cradle

A ship's boat like the launch would have been carried on shipboard on a cradle. Laser cut parts are provided in the kit. Assembly is self evident. Assemble and finish the cradle at this point. We now have our hull exterior finished and the cradle will allow us to continue to work on the interior without damaging our hull finish. The cradle end pieces are deliberately cut about 1/16 scant so as to allow for the fitting of some soft material to the cradle edges to protect our hull. On the prototype this material was leather. Find something suitable around the house.

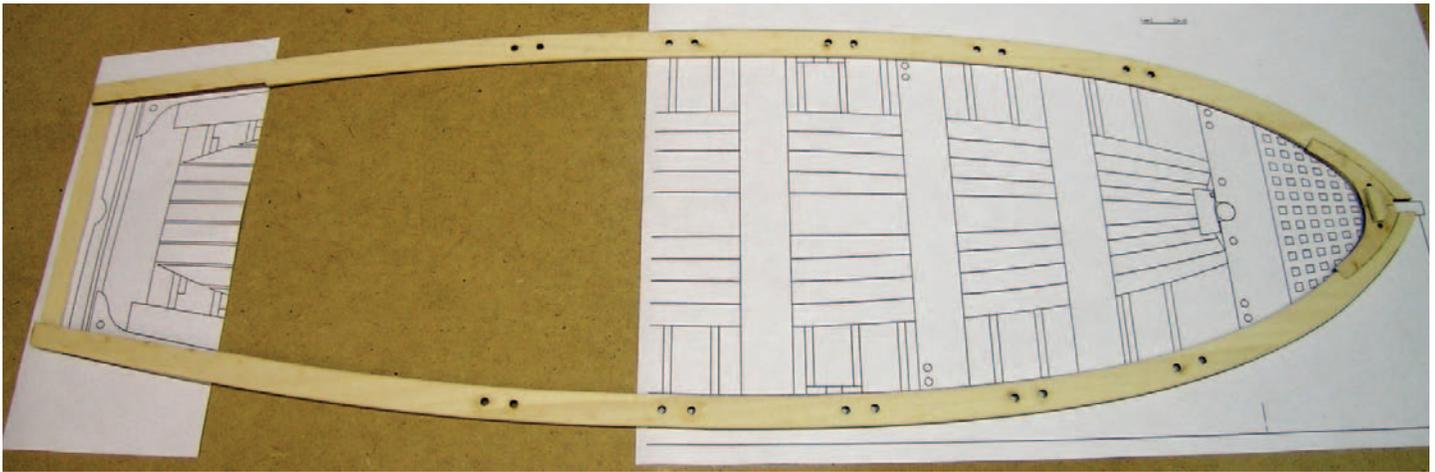
## 8. Gunwales

The gunwales, usually pronounced 'gunnel' or 'gunnels' are laser cut. Sand these parts and round all exposed edges before assembly. Assemble and glue these over the plans, sheet 3. The gunwales are deliberately cut long at the stern to allow for trimming after installation and to give us an area to glue the temporary spreader as shown in photo 23. It is also a good idea to glue a scrap piece across the breasthook joint on the underside of the assembly.

Apply the finish of your choice, stain or paint to this assembly before installation. Leave the bottom surface unfinished for gluing. If you have not already noted and installed the filler blocks between the sheer plank and sheer clamp, do so now. Refer to photo 22, above. These are to provide more gluing surface for the gunwale. Check the fit of the gunwale assembly on the model. Use a slow drying glue to attach the gunwale assembly. Weight the assembly to make it conform to the curve of the sheer. On the prototype model holes were drilled with a #70 drill through the gunwale into the filler blocks for brass nails partially driven in. After the assembly had dried, the nail heads were cut off and the nails pushed in flush with the surface. A tiny drop of brass black on the nails made them almost invisible.

## 9. Backrest and quarter knees

Fit and glue in the backrest. Bevel the aft end of the quarter knees



*Photo 23, assembling the breasthook and gunwales*

to match the angle of the backrest, trim the fore ends if necessary and glue in place. Sand and round edges then finish to match the gunwale finish.

### **10. Bow grate, thwarts, and mast partners**

Make the mast partners from strip brass as shown on sheet 3. Remember that the masts are two different diameters so bend and fit as required. If not done already, glue the thwart doublers on the bottom side of the fore thwart and the fifth thwart. Drill and nail the mast partners in place as shown in photo 24.

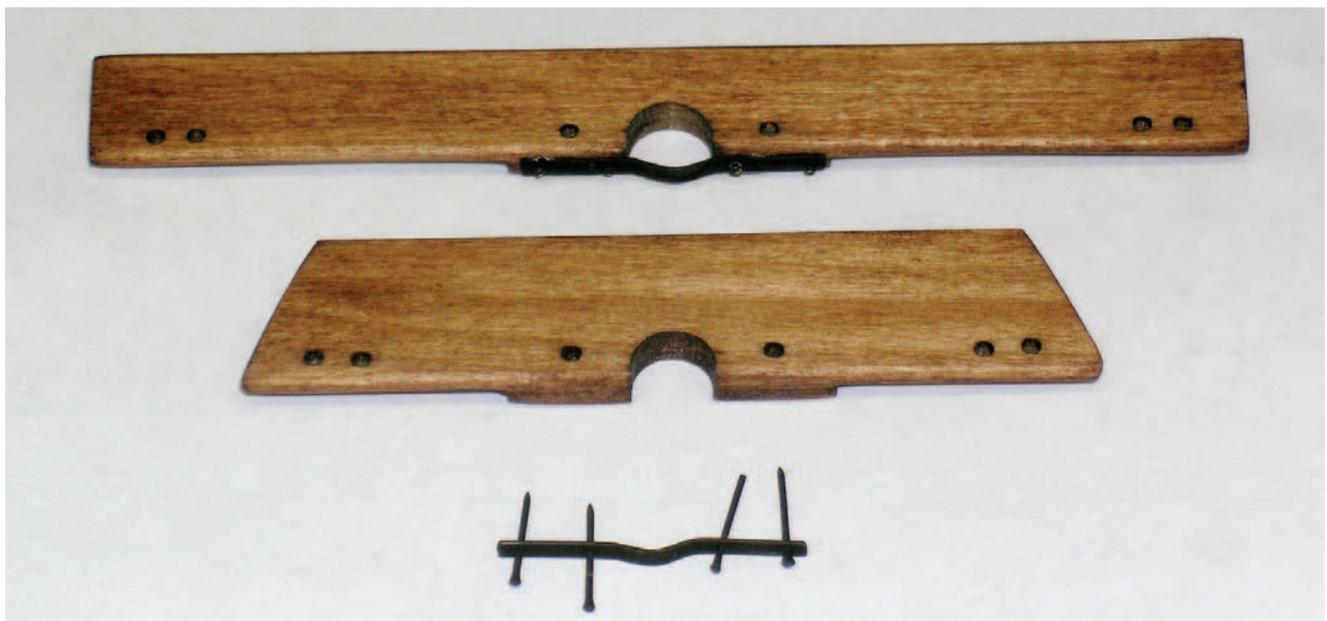
Glue in the bow grate, thwarts, and stern sheets. Take care to check the rake of the main mast by adjusting the location of the fifth thwart on the thwart risers.

### **11. Rudder, pintles and gudgeons**

Prepare the supplied pintles and gudgeons as shown on sheet 5. Form the brass to fit the 3/32 thick rudder and the 3/16 thick keel. Shaping these parts to a taper as shown on the plans improves their appearance. After forming, trimming and shaping these parts the small brass ferrules and pins are inserted. These can be soldered or super glued in place. These parts look best if chemically black-

ened, or they can be painted black. Begin the rudder installation by locating and installing the upper gudgeon on the transom. Drill and install with brass pins. The pins should come out under the aft thwart and thus are not visible. Fit the upper pintle to the rudder and engage the pintle pin in the gudgeon. Clamp the pintle to the rudder, remove and drill through a pin hole. Place a pin through the holes and put a slight bend in the protruding end. Reengage the pintle and gudgeon and check alignment. Fit a pin through the other hole and bend. The slight bend will retain the brass to the wood when the nails are snipped off. Repeat this process to attach the lower pintle and gudgeon. Attach the pintle to the keel first with both the pintle and gudgeon fitted in place. The launch pintle and gudgeon arrangement is a bit unusual in that the lower pintle is attached to the keel and points upward rather than to the rudder pointing down as is the more common practice.

A laser cut tiller is provided. Glue small pieces of scrap wood to the sides of the ball end. This thickening is to enable the carving of a full round ball. Sand and shape the tiller to the cross sections shown. Make the cheek plates from brass. Super glue the cheek plates to the tiller then drill through and pin.



*Photo 24, mast partner installation*

## STAGE 5: MASTS, SPARS, SAILS AND BOAT GEAR

### 1. Shaping and tapering masts and spars.

Details of all mast and spars with dimensions are shown on plan sheet 5.

Beech dowels are provided for the masts and spars but require shaping and tapering. Being round, a dowel is difficult to taper. The best approach is to first cut, plane, or file the dowel from round at maximum diameter to square at the ends, then to eight sided, and perhaps even 16 sided. Now sand or file it round. The process is illustrated on plan sheet 5. This approach prevents turning a dowel into an oval. If the taper is very slight you may not be able to cut it square at the end. Try to cut the taper on four sides down to the approximate diameter, then sand round. Although a little tricky, another way is to chuck a dowel into an electric drill or lathe and sand in the taper.

The cleats on the masts are made from the 1/16 square stock provided. The easy way to attach these is to cut the stock longer than required, glue to the mast and then trim them to length and carve them to the tapered shape shown. The 1/16 stock is a little too big to be scale so slim the cleats down a bit in the carving process.

### 2. Sail making

Newcomers to the nautical world should learn the following rigging terms used on the plans and in instructions. Only those terms applicable to this model are mentioned. For more nautical terms refer to the books in the bibliography.

**Sail terms:** Each edge and corner of a sail has a name. On a fore and aft sail as we have for this model, the top is the **head**, bottom the **foot**, aft side the **leech**, and forward side the **luff**. The lower forward corner is the **tack**, aft lower corner the **clew**, upper forward corner the **throat**, and the aft upper corner the **peak**. A triangular sail is similar, but the upper corner is called the **head**. It has no throat or peak.

**Halliards or halyards:** Lines for raising and lowering a sail, boom, gaff, or flag. For gaffs, the outer halliard is the **peak halliard**. At the gaff jaws is a **throat halliard**, named for the part of the sail it operates. **Downhauls**, **outhauls**, and **inhaul** drag a sail along a boom or up and down a stay. The launch model is very simple having only a foresail halyard and a mainsail halyard.

**Blocks:** Wooden or metal shells with **sheaves** (pulleys) for handling lines. A **purchase** (tackle) consists of several blocks and a line to provide a mechanical advantage for handling sails and spars. **Jig tackle** is a term describing a tackle at the deck end of a rig. The launch model has only two blocks for the halyards.

**Sheets:** Lines holding the lower corners of a sail or boom.

**Reef bands:** Horizontal reinforcing bands on a sail. They have short lengths of rope called **reef points**. In heavy weather, sailors tie the reef points to the boom to shorten the sail. In the case of the launch, the sails would have been reefed to the spars (lugs).

**Material:** Sailcloth must be lightweight, yet fairly opaque. Tightly woven cotton is acceptable and provided in the kit by Model Expo.

The making of sails is a controversial subject among ship modelers. The controversy arises over the fact that real sails are sewn but it is impossible to create scale stitchery. Also scale woven fabric does

not exist. Even the smallest stitch that can be made is grossly out of scale. This fact is just simply accepted by some as an inevitable fact and they prefer the look of sewn sails in spite of over scale stitches and fabrics. Others devise various methods to attempt to make sails look realistic on a model. Two methods are presented here, the sewing method and a simplified method wherein the seams, hems, and reinforcements are represented by simple pencil lines. The latter method is illustrated on plan sheet 5 and is self explanatory. The discussion that follows illustrates the methods of sewing sails.

**Sewing Aids:** Visit a fabric shop and purchase a bottle of *Fray-Chek*. Running or brushing it along the edge of the cloth prevents the material from unraveling when cut and produces a sharp edge. Apply it to the sail before rolling the hem, on in the case of the simplified method before cutting out the sail shape.

*Stitch-Witchery* and *Wonder-Under* are basically the same product. They are heat fusible bonding tapes. *Stitch-Witchery* comes in a roll and is bond sensitive on both sides. *Wonder-Under* comes in sheets with a thin, paper backing on one side. To join two pieces, simply place a strip between them and iron. Use *Wonder-Under* for tabling (hemming) the sail if sewing it is too difficult.

**Preparation and sewing:** Wash sailcloth several times to pre-shrink it. Many modelers prefer to alter the stark white color of the material by dyeing or staining it. Some use tea; others use commercial products such as Rit dye. If you are going to color your sail material do this before applying a fray check product. When dry, iron the cloth, but be careful not to scorch it. Next, lightly draw the seams and hem (tabling) lines in pencil, and then sew the seams using light tan cotton thread. The stitches look best when the thread is a color close to the color of the cloth. A sewing machine makes fast work of the project. Practice on scrap cloth. Balance the needle thread tension so it doesn't pucker the material. No reinforcement patches are required. Instead, simply stitch lines to represent corner reinforcements, reef bands, etc. If sewing a double seam, be sure the two lines are parallel. Those who lack the Betsy Ross touch can substitute a single seam.

When done, iron the sails. Be careful not to burn them. Next, cut the sail shape using Line A shown on plan sheet 5. Fold the hem, iron it flat, and sew as close to Line B as possible. Tuck the ends and hand-stitch the corners. The sail is now ready for stretching.

**Stretching the Sails:** This step assures the sail's proper shape, since sewing may have altered it. Using the original pattern, trace the sail's outline onto a piece of paper. Place the paper on a solid, but porous backing, such as a wood or cork board. Now wash the sail again and lay it over the outline. Stretch the wet material to the sail's outline, then secure with stick pins through its outer edges. When dry, the sail will have resumed its proper shape. Iron it one more time.

**Boltropes:** Although boltropes can be omitted, they add quite a bit to a model. Plan sheet 5 shows the process. Bolt ropes go all the way around the sail and form loops at the corners called cringles.

**Reef points:** Install reef points along the reef bands. To get the reef lines to hang naturally, moisten a length of line with glue and hang it with a weight to straighten and stiffen it. Cut equal lengths



*Photo 25, Boat gear: oars, casks, grapnel, tool chest, canvas, bags, coils of line*

of line and simply glue them to the reef points.

### 3. Blocks

Sometimes, commercial blocks supplied in kits do not have fully rounded tops and bottoms. To make them look better, round the ends with a sanding stick or needle file. Also, use a small drill bit or reamer and clean out and enlarge the sheave holes so lines reeve easier. Plan sheet 5 shows the real boat details for block stropping and seizing.

### 4. Lines

**Beeswax:** Protects lines against moisture and lays down fuzz. To soften beeswax, hold it to a light bulb. Run the line across the beeswax, then through your fingers to soften and smooth it. Do this several times to coat the line thoroughly.

**Seizing:** Seize lines with ordinary household thread, then touch with diluted white glue or thin super glue

**Belaying Lines:** Locations for belaying lines are shown on the belaying plan on Plan Sheet 5. All lines belay to belay pins on this model. Plan sheet 5 shows how to belay lines to a pin.

### 5. Boat gear

Little is known about what gear and provisions the launch carried. Bligh makes reference to his “water vessels” whatever they were, and wrote this statement. “Seamen who were to go in the boat collected...an eight and twenty cask of water...” The voyagers had some more containers aboard sufficient to carry a total of sixty gallons. These included “four empty beakers” and perhaps some

gourd calabashes. A carpenter’s chest of tools is believed to have been aboard. The seamen probably carried with them some personal gear likely carried in bags. There was sufficient extra canvas aboard for the rigging of “weather cloths” around the boat to increase the freeboard. He also had sufficient extra rope for the rigging of shrouds to the masts. The boat as issued had no shrouds. A grapnel for anchoring was aboard.

Boat gear supplied in the kit and illustrated in the photo below may be arranged as you wish for your model. Certainly this gear would have been lashed in place somehow. Bligh makes no comment about this. Just how it was done is left to the builder’s imagination. Perhaps lines were looped under and around floorboards or around thwarts or risers. There would have been 10 oars in the boat and it is difficult to imagine how these were stowed in way of the 19 souls on board.

It is known that 4 cutlasses and perhaps some native spears were on board. No materials are supplied for making these items if you wish.

**Oars:** Ten laser cut oars are provided cut from 3/16 sheet. Taper the blade end as show on plan sheet 5. Square up the handle end by cutting the same shape on all 4 sides. Carve the looms and handles, first to an octagon shape and then to round. The portion of the looms in way of the gunwale and thole pins would likely have been covered with leather or served with light line.

**Carpenter’s tool chest:** Parts for the tool chest are laser cut. Assemble as shown on plan sheet 3. An easy way to simulate hinges and latches for the toolbox is to flatten wire solder and cut to shape or fashion these out of brass strip.

## STAGE 6: DISPLAYING YOUR MODEL

At the moment Bligh and his men were cast away from the *Bounty* it is easy to picture the launch loaded with loose gear, masts down, sails rolled and in general disarray. This moment in time is one way to display your model. At some short time later, Bligh would have organized the boat gear and lashed it down, secured the

rations such as they had probably close to his station at the aft thwart. The masts would have been stepped and the sails bent to the yards and hoisted. Any of these situations will make for an interesting display of your model.



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### *The Armed Transport Bounty*

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### *The Ashley Book of Knots*

by Clifford Ashley. New York: Doubleday & Co., 1944.

The best book ever written on the thousands of knots used aboard old sailing ships and boats. Outstanding illustrations.

### *How to Build First Rate Ship Models from Kits*

by Ben Lankford. Hollywood, FL: Model Shipways, Inc., 2000.

A book designed especially for the kit builder. Covers all facets of building models from kits, and features Model Shipways kits as well as others. The Appendix has a wealth of nautical terms defined, especially useful for the beginner.

### *Planking the Built-Up Ship Model*

by Jim Roberts. Hollywood, FL: Model Shipways, Inc., 1987.

Topnotch publication on how to plank ships from all periods. Designed to help the kit builder if the plans don't show a planking scheme.

### *Ship Modeler's Shop Notes*

edited by Merritt Edson, Jr. and others. Nautical Research Guild, 1979.

Valuable collection of shop hints and articles extracted from early issues of the Nautical Research Journal. Many quality illustrations, tables, and techniques.

Note: Many books are available through Model Shipways website,  
[www.modelexpo-online.com](http://www.modelexpo-online.com).

Please check current catalog or website for availability.