

INSTRUCTION MANUAL

MODELING THE SULTANA

◆ COLONIAL SCHOONER, 1767 ◆



MODEL SHIPWAYS
• QUALITY KITS SINCE 1946 •

Technical Characteristics

Scale: 3/16" = 1' (1:64)

Overall Length: 17" (431.8 mm)

Width: 5-1/2" (139.7 mm)

Height: 15" (381 mm)



Instructions by Ben Lankford

Manufactured by Model Shipways, Inc. • Hollywood, Florida • Sold by Model Expo, a division of Model Shipways, Inc.
<http://www.modelexpo-online.com>

Model Shipways Kit No. 2016

History

Sultana was built in Boston in 1767 at Benjamin Hallowell's shipyard as a pleasure boat and small trader. The schooner was also said to be a dispatch carrier in the North Atlantic, carrying important papers, money, or objects overseas. In 1768, Sultana was purchased by the British Royal Navy and taken to the Deptford Naval Shipyard in England for Survey.

After being remasted, fitted out with weapons, and name the Sultana, the schooner returned to Boston as a dispatch boat and revenue cruiser. The Sultana patrolled the East Coast between Boston and Chesapeake Bay, enforcing Britain's Navigation and Stamp Acts.

The ship was involved in many incidents with colonial smugglers and seized significant amounts of contraband. After four years of service, and badly in need of repair and refitting, the schooner was sold out of service.

Sultana Instruction Manual

Written by Ben Lankford

The first Model Shipways plans of the Sultana were prepared in the late 1950's by Howard I. Chapelle, a historian and curator at the Smithsonian Institute. His first reconstruction was based on the lines and deck plans recorded during the Deptford survey. These documents are now in the National Maritime Museum in Greenwich, England. In 1973, the plans were updated by Harold E. Puls to reflect spar inventories found in the Admiralty File at the Public Records Office in London.

The 1993 plans provide more detail for model builders and incorporate further research from new information found in the Sultana Master's logs in the Public Records Office. This research was conducted by Dana McCalip. In addition, the rig of the ship has been modified to reflect the more common schooner practices of the time, as well as using simpler rigging more appropriate to a small schooner like the Sultana. In this regard, Dana McCalip and Merritt Edson provided valuable comments and suggestions. Their assistance is greatly appreciated.



Photo above has the following errors:
Phantom had no deck cannons, only swivel guns.
No deck cannons are provided with this kit.

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BEFORE YOU BEGIN

The *Sultana* is an interesting model for beginner and expert alike. This kit contains a solid hull which has been machined-carved from select, medium-hard, fine-grained basswood. This style hull provides a quick and easy lesson in the basic shapes and proportions of hull design and helps to develop woodworking skills. Although the exterior of the *Sultana* hull has been carved close to the hull lines as shown on the plans, further carving is necessary for reasons of accuracy. (Carving and finishing the hull to its final shape are discussed in the instructions.)

Constructing the *Sultana* model also will provide you with the opportunity to develop some scratch-building techniques. During construction, you may want to substitute some of the kit fittings with your own creations. By all means try them, especially if you think you can improve the model.

If you are a beginner, completing this model will prepare you for a more complicated model such as the *Fair American*, which is outfitted with a plank-on-bulkhead hull. In the meantime, happy modeling!

HOW TO WORK WITH THE PLANS & PARTS

Before starting model construction, examine the kit and study the plans carefully. Familiarizing yourself with the kit will serve two purposes. First, it will let you determine that all parts have been supplied as listed. And second, you'll be surprised at just how quickly handling the parts allows you to better understand the kit requirements. Try to visualize how every part will look on the completed model. Also, determine ahead of time what must be done first. The instructions will help you in this regard, but a thorough knowledge of the plans at the outset is essential.

It is also suggested that all small fittings and hardware be sorted into labeled boxes or compartments to avoid loss during the building process.

Two Plan Sheets and One Template Sheet are provided:

1. Hull Templates - 1 sheet of heavy stock
2. Hull Plan - sheet 1 of 2
3. Rigging Plan - sheet 2 of 2

In addition, a set of sketches appears throughout the instruction manual to further illustrate the various stages of construction.

The *Sultana* kit is manufactured to a scale of $3/16" = 1'0"$ and matches the plans. Consequently, most of the dimensions can be lifted directly from the plans using a "tick strip". This is simply a piece of paper (a roll of calculator paper tape works very well). Mark a dimension from the plan onto the tick strip and transfer it to the model. It would be a good idea to also obtain a $3/16"$ scale. Most triangular architect's scales have this measure.

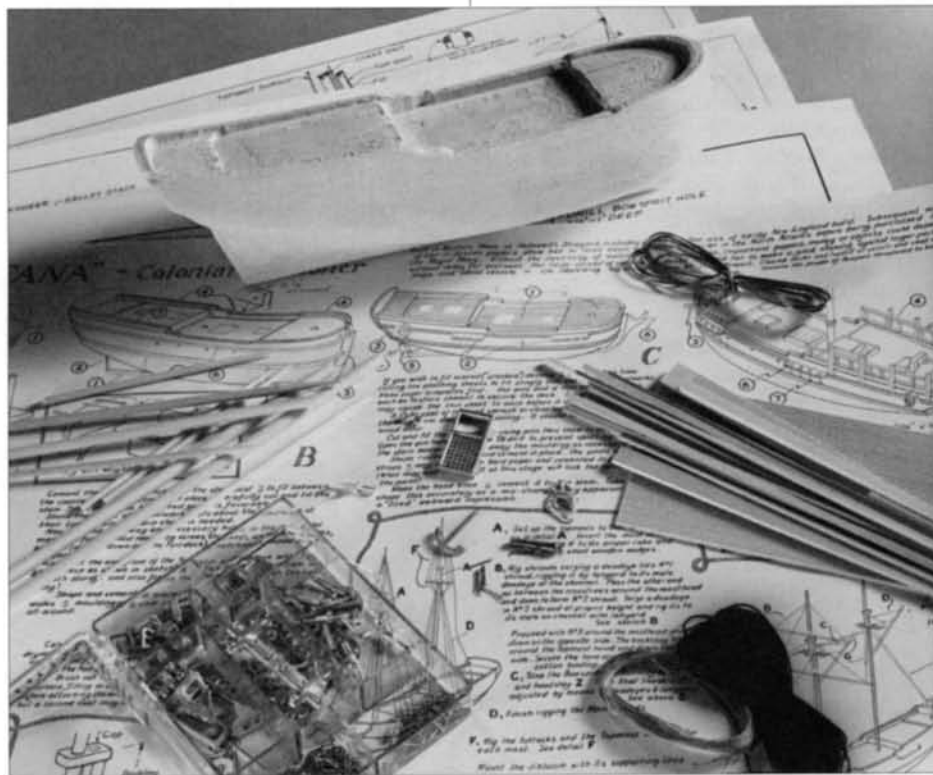
To assist in understanding how the sails were used and why the ship's rig is reconstructed as it is, several notes of explanation appear on the plans and throughout the instructions. Pertaining to rigging accuracy, you might want to consider the following information:

Much of the reconstructed rigging was developed using references from well-known books such as those by David Steel and Darcey Lever (A bibliography of references appears at the end of this manual). These texts provide many of the details, but lack some of the unique characteristics of the schooner rig. Consequently, in designing these plans additional references, along with contemporary paintings and etchings, also were used. Even so, many design decisions were made using good common sense: "If I were designing back then, what would I have done?" There is always doubt; no one can say for sure how the ship was actually rigged.

The plans illustrate the *Sultana* ready for action in the British Navy. There is a small drawing included that represents the schooner as received by the British, without topmasts and guns. The model could be built to this configuration if desired.

The *Sultana* kit also is supplied with Britannia metal, brass, as well as wooden fittings to eliminate problems in making such parts from scratch. Because the Britannia metals contain no lead, there are no possible corrosion problems. Many of these fittings will require final finishing before installing on the model.

Before painting the cast-metal fittings, clean them up by removing all the mold-joint flash. To do this, use a No. 11 hobby blade to cut the flash, then sand with fine sandpaper. It is also suggested that you clean the fittings thoroughly with warm soapy water before applying primer. Make sure they are rinsed thoroughly and allowed to dry before painting.



WHAT YOU'LL NEED TO START CONSTRUCTION

The following tools and supplies are recommended for the construction process. Modelers who have built before may have their own favorites.

A. Knives

1. Hobby knife
2. No.11 blades

B. Files

Set of Needle files

C. Sharpening Stone

Necessary to keep the tools razor sharp

D. Clamps

1. A few small C-clamps
2. Several wooden clothespins
3. Rubber bands

E. Tool Set

A small six-piece carving tool set with gouges and chisels for shaping the hull.

F. Boring Tools

1. Set of miniature drills: #60 to #80
2. A pin vise
3. Larger bits for mast holes

G. Miscellaneous

1. Tack hammer
2. Tweezers (a few)
3. Small fine scissors
4. Miniature pliers
 - a. small round
 - b. flat nose
5. Bench vise (small)
6. Soldering iron
 - a. solder
 - b. flux

Note: soldering is not essential for this particular model if the kit fittings are used.

7. Sewing thread (for seizings & lanyards; other rigging in kit)
 - a. Black
 - b. Tan
8. Beeswax (for treating rigging lines)
9. 1/2" or 3/4" masking tape

H. Sandpaper

Fine and medium grit garnet or aluminum oxide sandpaper (#100 to #220 grit)

I. Finishing:

1. Paint brushes
 - a. fine point for details
 - b. 1/4 to 1/2" flat square for hull

J. Supplies: (will be covered in detail in the Painting & Staining section and throughout instructions.)

1. Paints
2. Primer
3. Stain and Varnish
4. White or Carpenter's (yellow) wood glue
5. Five-minute epoxy
6. Contact or model airplane acetate cement
7. Super glue

Note about Glues: White or Carpenter's yellow wood glue will suffice for most of the model. Five-minute epoxy provides extra strength for gluing fittings. Because white or yellow glues will tend to warp the scored-sheet decking, use a contact cement or model airplane type acetate cement. Cyanoacrylate (Super) glue such as Jet, can be used for quick adhesion and is ideal for dabbing onto a rigging seizing to hold it in place. The best Super glue for most applications is a medium viscosity gap-filling type. The watery-thin type is recommended only to fill a narrow crack by capillary action.

PAINTING AND STAINING

It may seem strange to begin an instruction manual with directions on applying the finishes to the model. Not so! Much time and effort can be saved, and a more professional result can be obtained, if the finishing process is carried out during construction. Proper timing in application of finishes and the use of masking tape to define painted edges should eliminate unsightly glue marks and splotchy stained surfaces. In the end, following these general suggestions will be to your advantage.

Paint colors:

A suggested color scheme for *Sultana* is given on the plans.

Paint:

Use a flat-finish paint such as the model paints made by Floquil, Polly-S, Testors, Humbrol, and Model Masters. You could also use artist's paints by Jo Sonja (used by many bird carvers) or Holbein Acryla Gouache (the new boys on the block). These paints are a combination acrylic-gouache.

Floquil paint is a good choice because all the correct colors for the *Sultana* are available. Their color, Tallow Coat, is especially good because it is hard to describe for mixing. A ready-mix color saves guesswork.

Primer:

Use a grey primer. Floquil is excellent. The grey color will highlight sanding scratches and other defects better than white primer. Prime all woodwork to be painted, and prime all metal fittings. Lightly sand the primed items. Use a spackling compound such as Pic-n-Patch brand to fill any scratches and defects, then re-prime.

Stains and Finishes:

For natural finished wood, use a protective coating after staining, such as a low-sheen polyurethane varnish. You can also use an oil-resin mix such as natural Minwax.

For the deck and spars, Floquil stain or Minwax in pine or maple colors also can be used. These are a combination stain-finish that will provide a light tan, or light maple tone to the wood. The deck plank scores can be darkened with any dark color to simulate caulking. It would be best to first varnish the surface, wiping the dark color into the scores. Then wipe the surface of the planks clean.

Brushes & Procedures:

Use good quality soft sable or synthetic hair artist's brushes. A small pointed brush is good for details. For the main hull areas, use a 1/4 to 1/2-inch flat brush.

Before painting, clean the model with a tack rag. Apply your paint in smooth and even strokes, overlapping them as you go. Thin the paint enough to eliminate brush strokes, but not run. You will need four or five coats of the light colors to cover the grey primer, and maybe only two coats of the dark. Check your finish between coats and sand or add spackle as necessary to get rid of any blemishes.

You will be told how to mark the L.W.L. (load waterline) location in Stage "A". At this line, and anywhere else two colors meet, use masking tape. Electrician's black plastic tape is ideal. It leaves a nice edge and is not overly sticky. Do not use drafting tape unless it is Chartpak brand. The edges are wrinkled, and paint may run under them.

FIG. 1 - Kit Templates

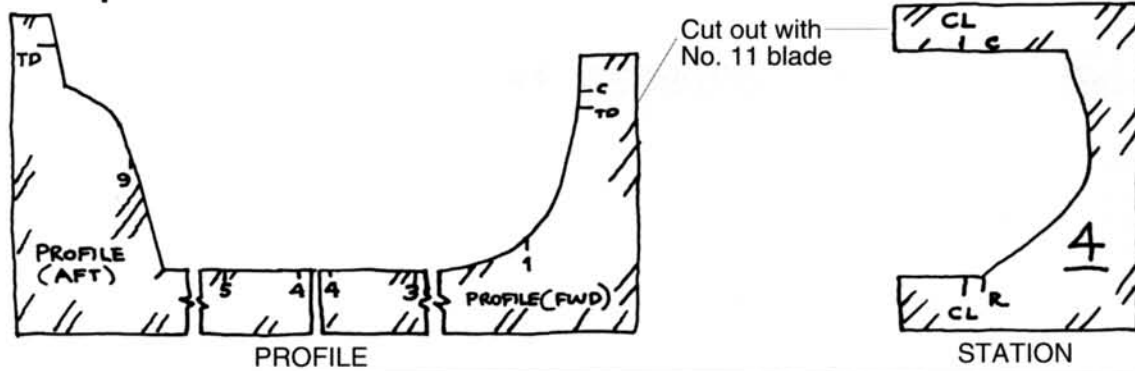
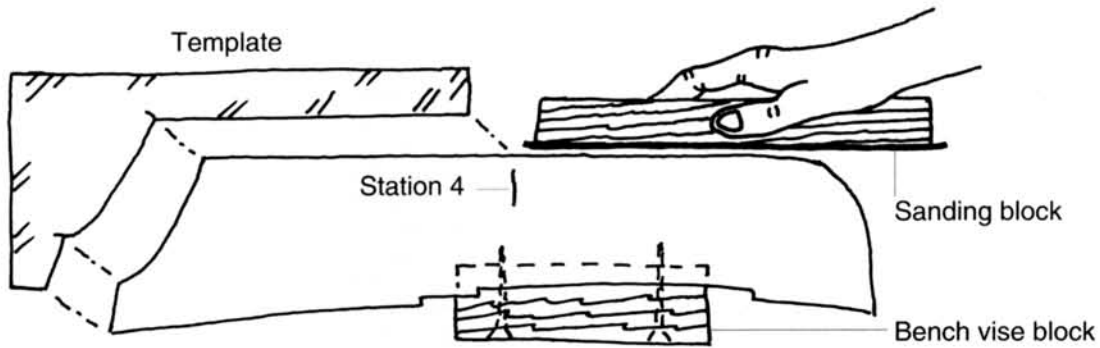


FIG. 2



STAGE A

SHAPING THE PRE-CARVED HULL

Sanding alone will not shape the hull enough to precisely match the hull lines. Some carving is required, especially at the rail, keel, bow, and stern areas.

1. Using the Templates

For exact carving to hull lines, a template is required for the hull profile and each of the nine stations (see figure 1). You will find a template set printed on heavy stock paper in the kit. Cut the templates out carefully with a No.11 hobby blade. Do not use scissors! You will want a nice smooth edge.

2. Carving the Hull

Cut a wooden block from scrap to about 3" x 1" x 3/4" thick. Screw the block to the lower deck so the model can be held in a bench vise for carving. First, check the accuracy of the profile and correct it as necessary, using a long sanding block (see figure 2).

Next, mark the centerline, rabbet lines (where hull meets keel), and station lines on the model (see figure 3). Place the station marks on the center of the hull bottom and on top of the rails so the marks won't be carved off as you work. This illustration also shows where excess wood must be removed from the hull.

Start carving approximately at Template Station 4 (maximum beam) and progress forward, then aft, using chisels and gouges to cut away excess wood. Avoid carving against the grain by shifting forward or aft of Station 4 until you find a spot where you are going with the grain. Basswood carves easily so you probably won't have much problem with the grain.

Carve very slowly, and take off a little wood at a time. Fit the templates as you go, and make sure they are fitted perpendicular to the keel. Carve until the template fits reasonably well, then use sandpaper to obtain the final shape. At first, the templates will not fit very well. You must compare the template to the hull and visually decide where to remove wood. Cut a little off, then re-check the template.

Finally, draw a few horizontal pencil lines (like waterlines) and the station lines on the hull. Use these to visually check the shape of the hull. Hold the hull at various angles, and look to see if the pencil lines are fair (even). If you have any unfairness, dips or bumps, they can usually be found with this visual check. You can also use a stiff stick of wood, about 1/8-inch square, and lay it on the hull at various locations. Dips in the hull will show up under the stick.

Sand the stern with a sanding block. A separate basswood transom will be made and glued to the hull later according to instructions.

FIG. 4 - Cradle

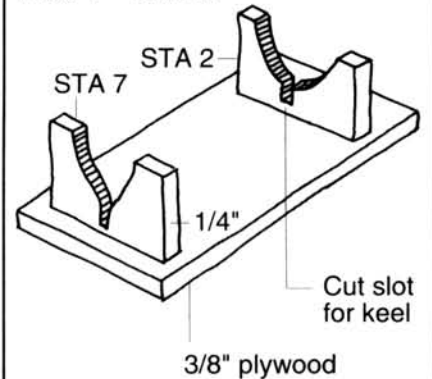


FIG. 5

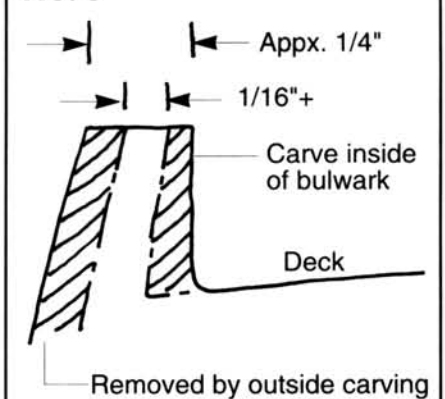
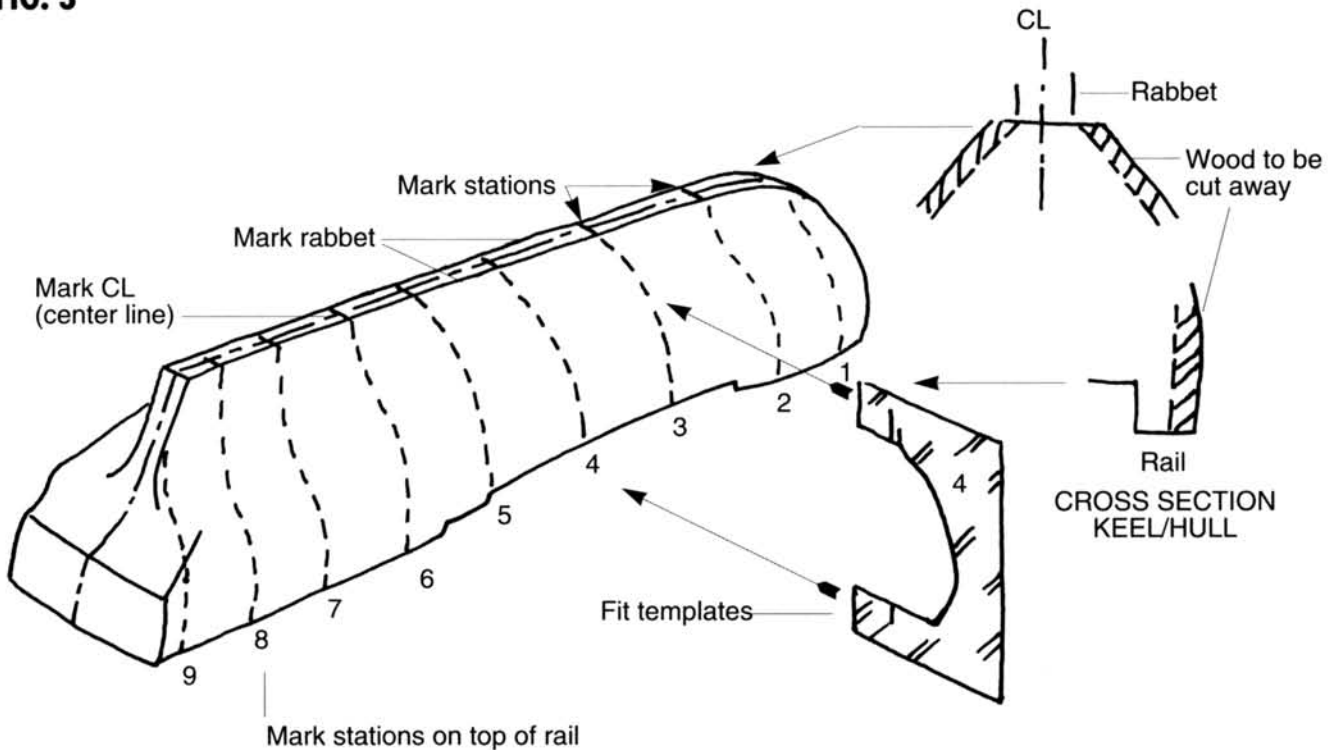


FIG. 3



3. Carving the Deck & Bulwarks

Make yourself a temporary cradle to secure the hull while carving (see figure 4). This cradle also will serve to hold the model for most of the remaining work. Make the cradle so the model sits in it with its load waterline (L.W.L. on the plans) parallel to the baseboard and table. The top of the cradle should be below the L.W.L. Later, when you are ready to paint, attach a pencil on top of a wooden block, and slide it along the table to mark the location of the L.W.L.

Before carving the bulwarks, refer to the instructions beginning on page 9 regarding deck, bulwarks, cap rail, and waterway details. In addition to these details, you might want to consider the following:

Bulwarks option: Instead of carving the bulwarks, they can be removed completely, cut off flush with the deck. The bulwarks, planksheer, waterways and cap rails can then be built up from the deck using strip wood (see figure 13 and discussion on page 10).

The machine-carved hull has bulwarks approximately 1/4-inch thick. They are thicker than required, so they won't break while inside the kit box. The upper surface is cut to the underside of the uppermost cap rail. After you carve the outside of the hull, the bulwarks will now be only about 3/32 of an inch thick. You must now carve the inside of the bulwarks so that the final bulwark thickness is a little over 1/16-inch thick (see figure 5 for what must be removed). This is the most difficult part, so work slowly and be careful not to break off the bulwarks as you carve (see figure 6). After carving, sand the surfaces smooth.

As noted previously, the transom will be a separate piece. Cut the stern bulwarks of the machine-carved hull completely out, flush with the deck (see figure 14).

Cover the deck with the scored planking included in the kit, unless you desire to lay individual planks as an option. In any case, you must first clean up the corners at the deck steps, and sand the deck smooth. First, take a chisel and square-off the three deck steps (see figure 7). Next, make a template of the deck camber and shape the deck curvature as necessary.

At this stage, the hull is fully carved. Sand the entire hull with #220 grit sandpaper for the final smoothing. Be careful not to round the upper edges of the rail or at the rabbet. These should be sharp corners.

FIG. 6 - Carving Bulwarks

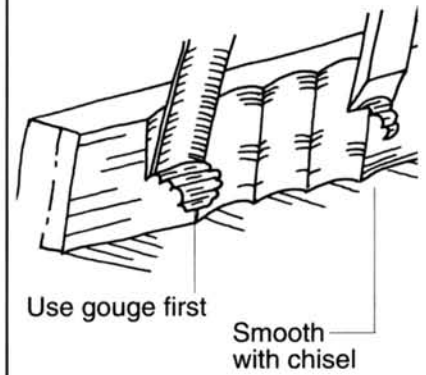


FIG. 7

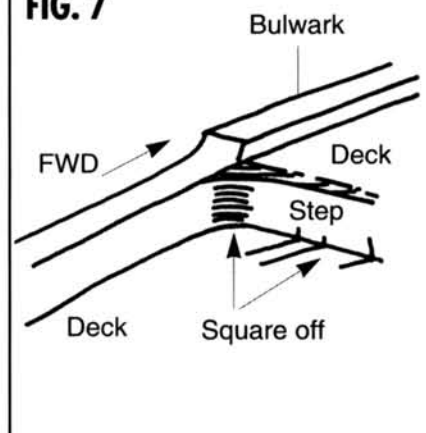
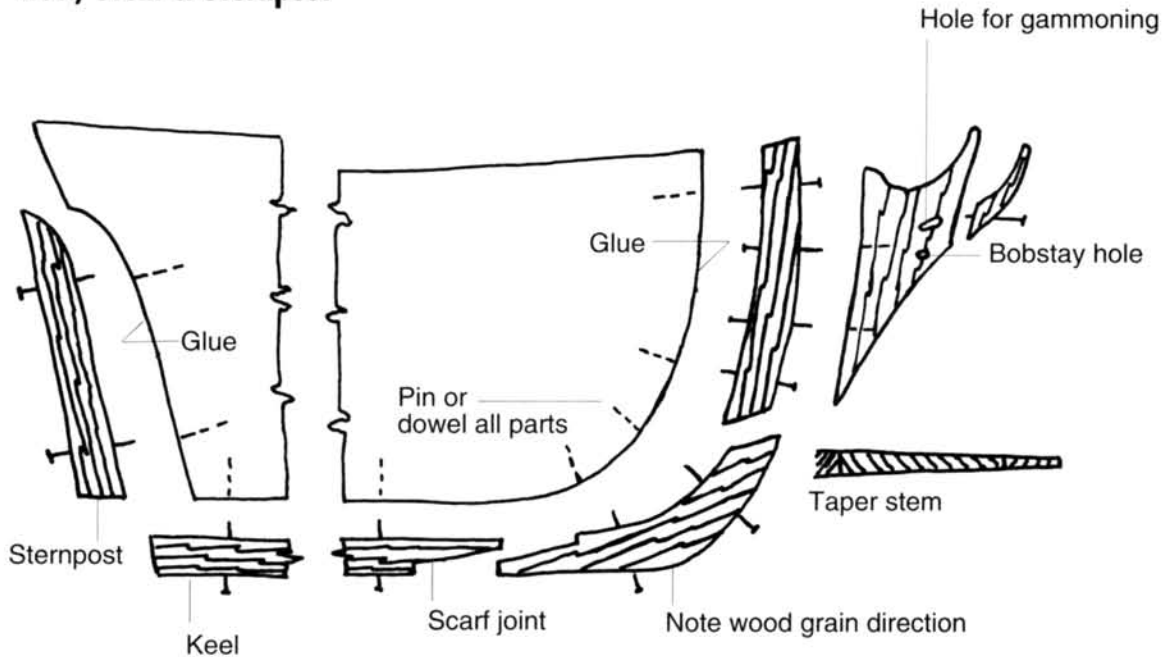


FIG. 8 - Keel, Stem & Sternpost



STAGE B

COMPLETING THE BASIC HULL STRUCTURES

1. Installing the Keel, Stem & Sternpost

Precut the keel, stem and sternpost and install them (see figure 8). Make sure the grain of the wood is in line with the piece. Use pins or dowels to position the parts before gluing. Note that the stem has a slight taper. Carve or sand the taper before gluing into place. Scrape off any glue squeeze-out. Fill any gaps remaining at the glue joints with wood filler and then sand.

2. Installing the Rudder

The rudder can be made now or later (see figure 9 for construction). The pintles and gudgeons are made from the brass strip provided in the kit, or by using paper strips. Also, note the option to replace the metal tiller arm with wood.

3. Drilling the Larger Holes in the Hull

Before going any further with the details, drill all the large holes in the hull. These would include a hole for the rudder post and bowsprit, two mast holes, and two pilot holes for the mounting pedestal screws. For the mast holes, make a template so you will drill at the correct mast angle (see figure 10 for some ideas).

Drilling pilot holes for the pedestals requires that you first set the model on the pedestals, with the longest pedestal forward (see mounting options beginning on page 10 before you begin). Place them about equal distance from the stem and stern. Mark the load waterline on the stem and sternpost. Adjust the pedestals forward or aft so that the two marks are the same distance above the table. This will insure that the final waterline is parallel to the baseboard when mounting. When set, mark and drill the pilot holes.

4. Holes to be Drilled as Work Progresses

There will be a few other holes to drill as the work progresses. For example, scupper holes are drilled through the waterway after it is fitted. The hawse holes for the anchor cable are drilled through the bulwarks forward. You will also need to drill small holes for inserting eyebolts that hold blocks for the rigging, and holes for pinning various parts in place.

FIG. 10 - Templates for Mast Holes

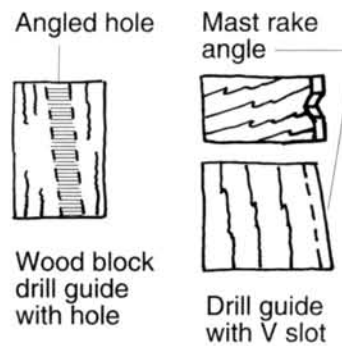


FIG. 11

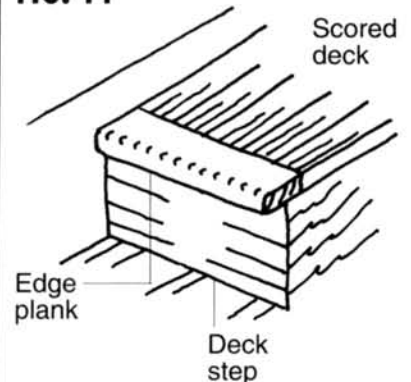
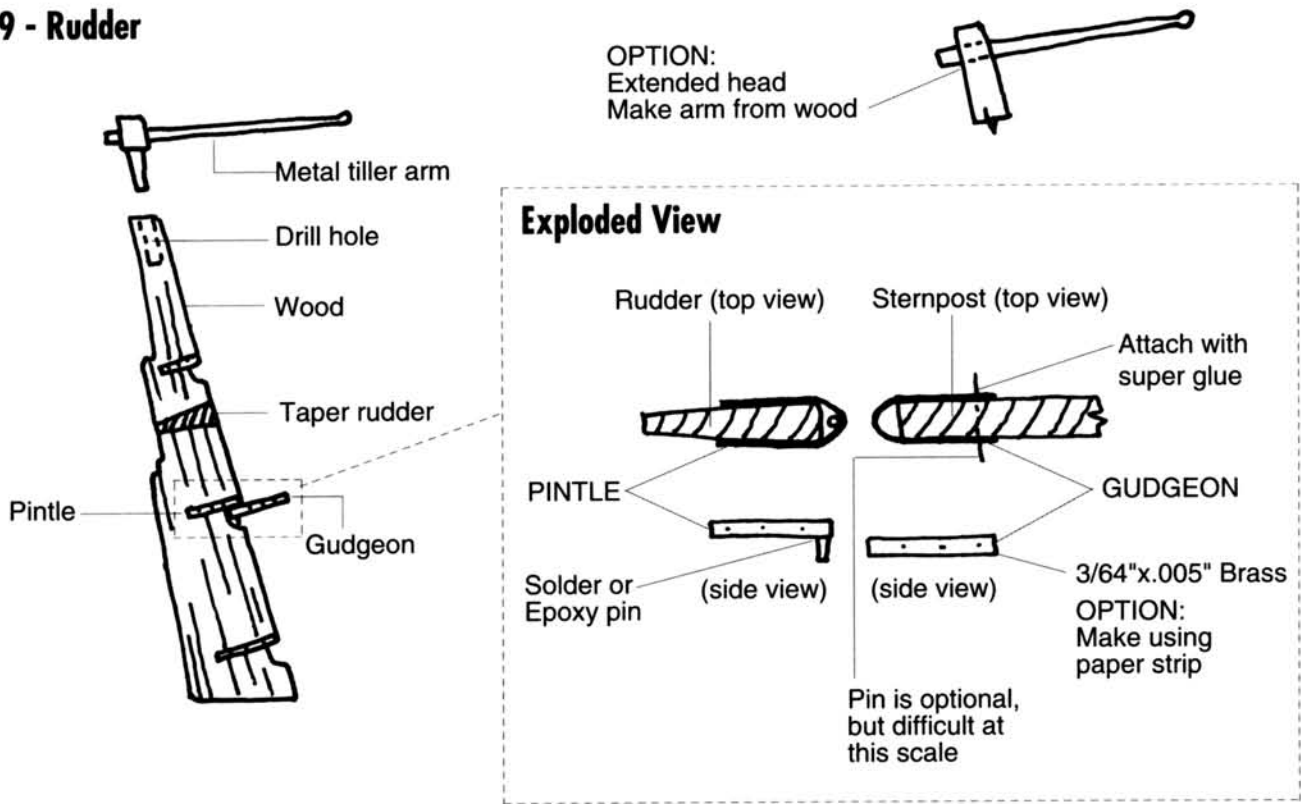


FIG. 9 - Rudder



5. Creating the Mid-Hatchway Ladder Hole

The ship has one ladder going below at the mid-hatchway which is open so you can add a ladder if desired. To do this, you will need to cut a hole in the hull. First drill a hole, then square it off with a chisel (see figure 18 for detail).

6. Planking the Deck Steps and Deck

At each of the deck steps, fit an edge plank (see figure 11 and plans for detail). Make a paper template for each of the four deck areas to fit snugly against the edge planks and the bulwarks. Cut the openings for the masts and ladder hole in the appropriate templates. Place the templates on the scored planking and cut the planking with a hobby knife. Make sure the scored lines of the planking are parallel to the centerline. *Glue the planking down with contact cement or model airplane-type cement (see gluing notes on page 5).

*Note: Before gluing the deck into place, you may want to darken the scored lines, as well as stain and varnish the decking. This would be easier to do off the model. (See the painting instructions on page 5).

As an option, you can discard the scored decking and lay individual planks that you create from scratch. If you choose to do this, first paint one edge of the planks black. When installed, this painted edge will look like caulking.

7. Installing the Planksheer, Waterways & Cap Rail to the Bulwarks

At this point, the already carved bulwarks are ready to receive the planksheer, waterways and cap rails (see figure 12).

Notice that the planksheer is not a complete plank, but only fake strips glued on each side of the pre-carved bulwarks. Similarly, the waterway is an added piece on top of the deck. It is located only on the lowest main deck area, and not on the poop and forecastle decks. Also, the planksheer is seen inboard only in this area. Forward and aft, the planksheer disappears into the hull inboard. However, it is still seen on the outboard side of the hull. Glue the strips to the outside of the hull to simulate these planks.

While adding the outboard planksheer strips, install the channels for the dead-eyes. Cut a notch for each chain plate. After they are installed, a strip is added to cover the notches. You should use a pin on the ends of each channel to help hold it in place.

FIG. 12

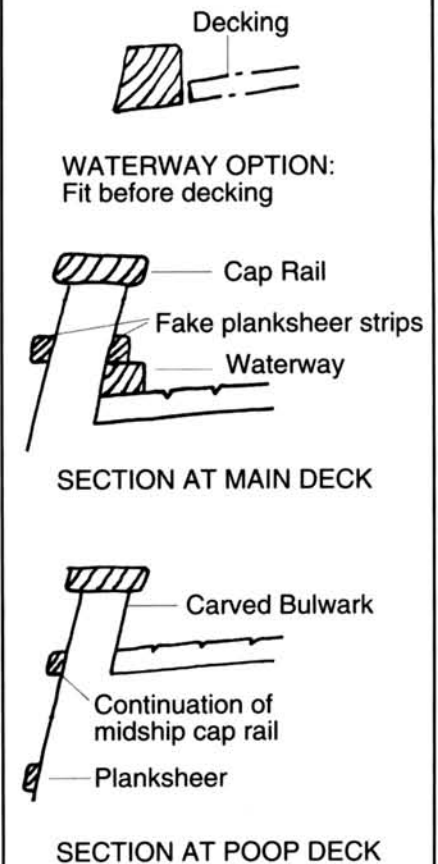
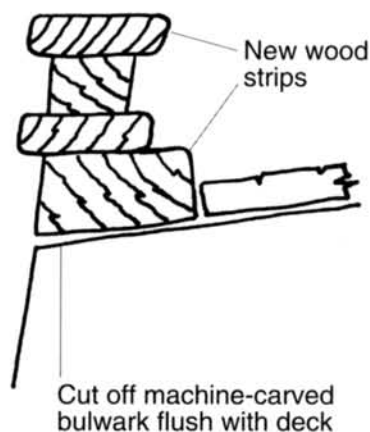


FIG. 13 - Bulwarks Option



8. Bulwarks Option

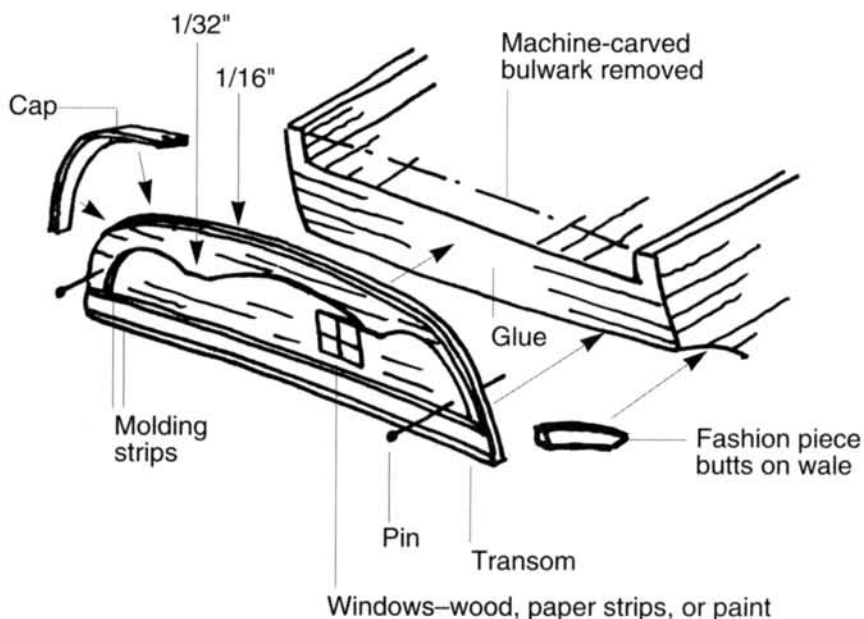
Previously you were advised of an important option to consider regarding the bulwarks. Instead of carving the bulwarks, they can be removed completely, cut down flush with the deck. The bulwarks, planksheer, waterway, and cap rail are then built up from the deck using strip wood (see figure 13). This option may seem drastic at first, since you are removing part of the machine-carved hull. However, it can actually be an easier approach than carving. Carving is a most difficult procedure since you must get the bulwarks thin enough without damaging them. Also, with the bulwarks out of the way, checking the deck camber and sanding are easier.

9. Constructing & Installing the Transom

The transom is made using a sheet of 1/16" basswood (see figure 14). A 1/32" piece of basswood is shaped and mounted into place above the window area. If you wish, you may omit this latter piece and simply paint on the desired effect. Position and glue a cap around the transom edge. A fashion piece fits between the transom and wale (see plans for detail—also, an expanded transom pattern is shown).

Glue the transom into place, using a few pins on each side to hold it. The window frames can be made with wood or paper strips, or just painted on.

FIG. 14 - Installing the Transom



Note: The middle window on the real ship was a fake one because it was positioned directly in back of the rudder post. The two outboard windows also could have been fake. It is probable that because these windows were positioned close to the hull sides, there may not have been enough room inboard of the framing for real ones. Adorning with fake windows was typical on old sailing ships.

10. Installing the Wale

For the bow area, you must first soften the wale strips so they can be bent without breaking. Even if they bend easily, there is a chance they may spring off later. Soak the wood in warm water for several hours. Try adding a little household ammonia to the water. This speeds up the soaking process considerably. OR, you could hold the ends of the strips over a kettle of steaming water and bend. This must be done VERY CAREFULLY to avoid breaking the wood. You may also bend wood quickly over a soldering iron, but don't let it get too hot, or it could scorch the wood. It also is possible to purchase model plank bending irons commercially.

It may be easier to make a wooden template the shape of the hull forward, and then bend the strips over the template (see figure 15). Hold the strips with rubber bands or clamps until they dry. When dry, they will hold their shape and then can be glued easily to the hull.

STAGE C

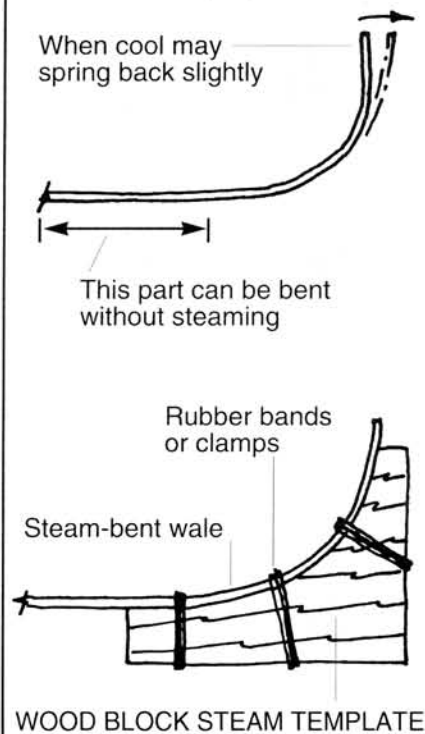
MOUNTING THE HULL

Before proceeding with additional work it is best to mount the hull. This step will help prevent details from becoming damaged during handling and will allow you to make any alignments that require a true waterline. Proper mounting of the hull is very important and will allow the accurate building and aligning of the remainder of the model. While any modeler can devise his own mounting, this kit contains a mounting board with two pedestals for your use (you may also purchase one pre-finished). A second option, called the launching ways, may be made by hand or purchased commercially, as well.

1. Mounting Board with Two Pedestals

The kit contains a baseboard and two brass pedestals. You can round the top edges of the baseboard, or cut a simple chamfer. If you own a router, or can borrow one, you will be able to cut a nice fancy edge on the baseboard. Finish the base with a dark stain or paint.

FIG. 15 - Shaping the Wale



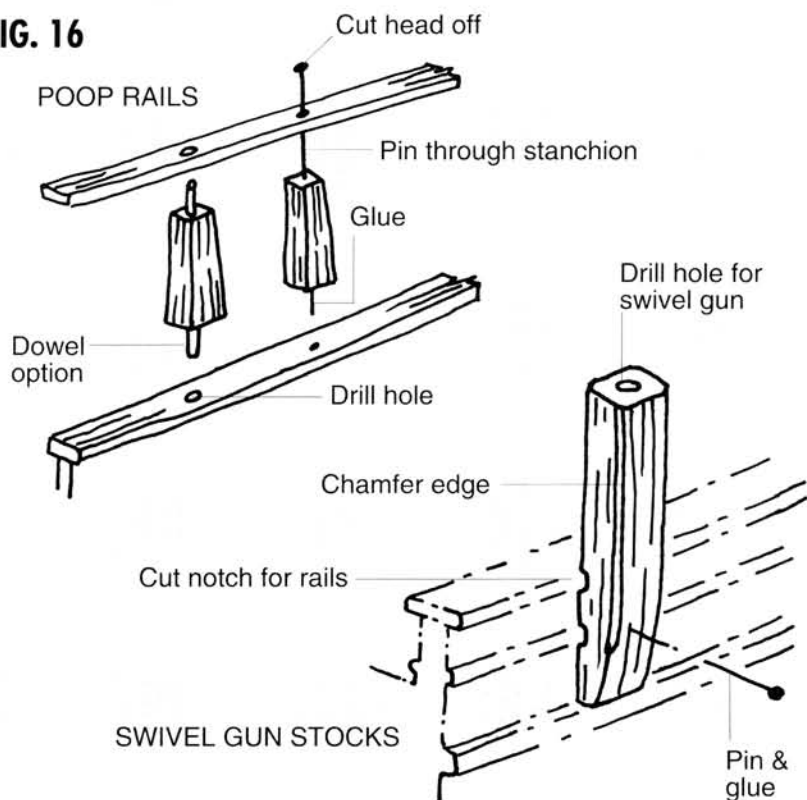
If you decided to use the mounting board and pedestals and have already correctly drilled the pilot holes for the pedestals, the model should sit with the waterline parallel to the baseboard. If something went awry and the balance is off, you can add a brass shim under one pedestal to correct it.

2. Launching Ways

The second type of mounting that can be employed is the launching ways, which are most suitable for models without sails. It is supplied in kit form with instructions. Drilling of the keel is still required to apply the rods that anchor the model to the ways. The launching ways are easily assembled and should be mounted on a minimal board size of 24" x 6." (Expanding the size of the board will allow you to create a mini-diorama comprised of boat yard ground activity.) Follow the directions supplied with the ways to achieve the proper waterline level.

Note: It is recommended that either choice mounting piece be finished before mounting the Hull Assembly into place. During mounting, be sure that the rails of the hull are level with the mount. Future alignments, especially the masting, will be gauged from this base.

FIG. 16



STAGE D

ADDING THE HULL DETAILS

1. Poop Rails & Swivel Gun Stocks

Refer to the plans for the number and placement of poop rails and swivel gun stocks (see figure 16 for construction detail). After cutting the chamfer edge on the gun stocks, use a sanding block to sand the chamfer. You also could omit the chamfer. Check the swivel gun fitting to determine the size hole to drill in top of the gun stock.

2. Timberheads, Catheads & Knightheads

These fittings can be introduced at this point. Their shapes are shown on the plans. Notice the variances with the tops of the timberheads and knightheads. To install, use a pin or dowel much like the poop rail stanchions.

The catheads (see figure 18) have two slots at the outer ends to represent the anchor hoist sheaves. Cut the slots about 1/16" deep, then drill a hole in each end of the slots for the hoist lines.

3. Head Timbers, Head Rails & Cheek Knees

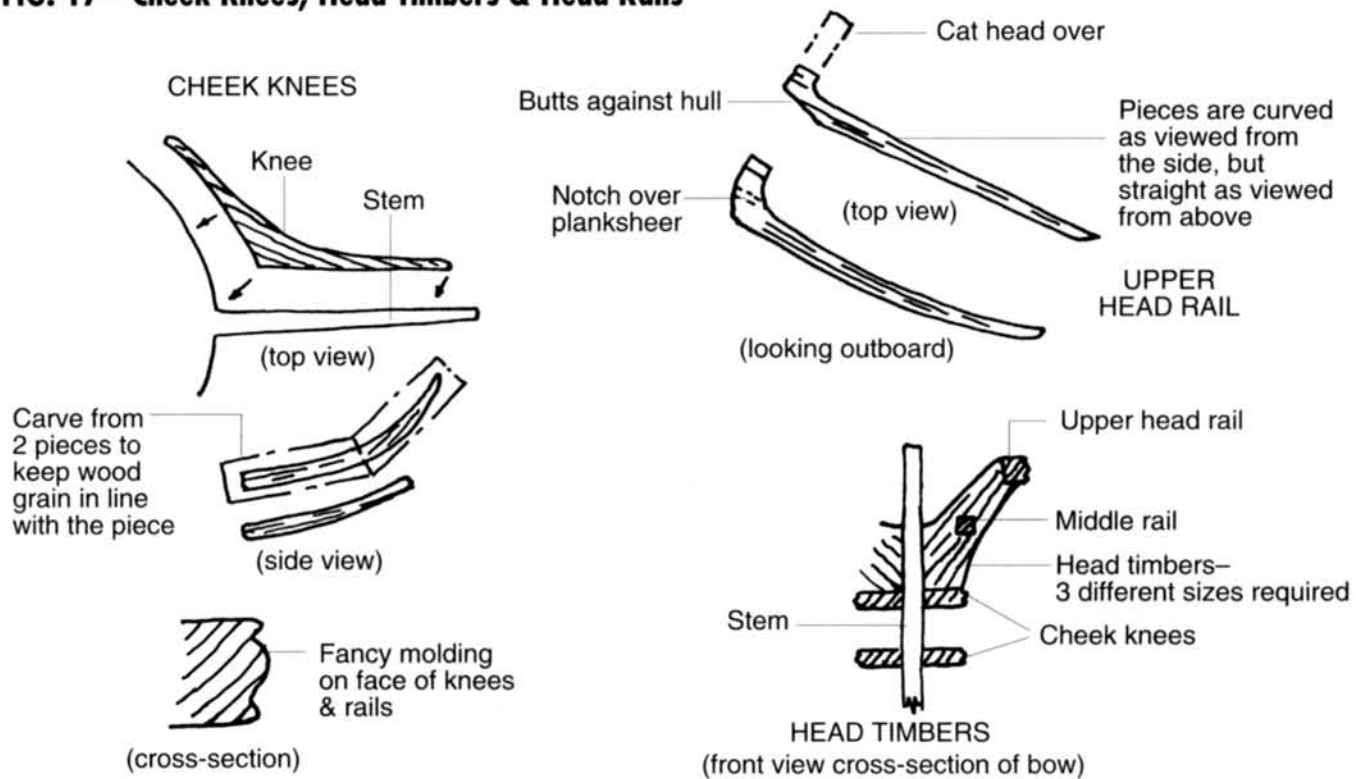
The head timbers, head rails and cheek knees are located at the bow area of the ship and are a little tricky to build. Refer to the location details shown on the plans (see figure 17 for construction close-ups). After fitting all the pieces into place, you may need to shape them further. Make sure you scrape off all glue squeeze-out as you proceed. These areas will be difficult to clean up and sand later.

Notice that figure 17 shows some sort of fancy molding on the rail and cheek knee edges. Creating a simple molding would allow you to simply "file" it in, or you could make a brass cutter-template and "scratch" the molding in. You also could carve some flower-like shapes on the edges, but the small scale makes it hardly practicable.

4. Figurehead

As noted on the plans, the figurehead was removed by the British. Consequently, the model is more authentic without it. If you decide to use it anyway, prime it and glue it on with epoxy, fitting it into the slot in the stem. Use the figurehead if you build the version prior to British ownership.

FIG. 17 - Cheek Knees, Head Timbers & Head Rails



5. Quarter Badges, Bitts, Galley Stack, Windlass, Hatches, Binnacle & Pumps

These fittings are made of Britannia metal and can be mounted into place now. First clean them, filing off any flash, and then prime them with a grey primer. Locate the deck pieces and place them into position. This can be done by measuring from the station lines and centerline (tick off from plans). The quarter port and starboard badges located at the stern end can be installed after the deck pieces have been completed. Next, mark their positions by drilling holes into the deck and inserting locating pins or dowels which will be inserted into holes that you will need to drill into each deck piece. Before permanent installation, paint them according to the *Sultana* color scheme. Having been pre-fitted, and with the pins in place, they will be easy to put back where they belong.

Option: You may substitute these fittings for those you make yourself (see figure 18 for substitution ideas). If you are a beginner, this is a good opportunity to try your hand at scratch-building. Try a hatch or two and see what results. You can always go back to the metal item substituted in the kit.

6. Swivel Guns

There were eight 1/2 pounder swivel guns on the *Sultana*. They fired a shot about 1-1/2" in diameter. The kit's eight metal guns can be placed at any of the twelve gun stock locations (on the real ship, they were moved around to suit the situation). See the plans and figure 19 for drawings that show some variations in the handle (grip) used to aim the gun. There were many different configurations.

Because of the small size, manufacturing restrictions and availability, the metal swivel guns in the kit may not always be shaped like the assumed real gun. To make them more like the plans, you can use a needle file to alter the shape. The grip can be modified, if desired, to simulate one of the alternate grips.

The swivel gun can also be made using a standard brass cannon barrel, about 5/8" long. To this barrel, add one of the grips made from brass wire.

7. Ship's Boat

The Admiralty records indicate that the *Sultana* did carry a small boat. A boat is shown on the plans, and it could be located most anywhere on the deck. It should be sitting either upright or upside down on some wooden chocks and lashed down to eyebolts.

STAGE E

MAST & SPAR CONSTRUCTION

Most references call a mast a mast, and anything else such as a boom, yard, gaff, and bowsprit, a spar. Let's stick with that definition. The mast and spar dowels included in the kit may or may not be tapered. If your kit has tapered dowels, they are only semi-shaped. True to scale, masts and spars should be tapered for their full length. Note also that the ends of the boom, yards, and gaffs are stepped down to provide a shoulder for a rigging line.

1. Shaping the Lower & Top Masts: Fore & Main

There are two mast assemblies for the *Sultana*. They are a fore mast and main mast and are built up in two sections: lower and top. Each should be connected at the doublings by mast caps and trestle trees which, in this kit are metal, and have the bibbs (or cheeks) built into the trestle trees. (You may notice there are no cross-trees on the *Sultana*. This is because there are no topmast shrouds. The topmasts on the real ship were lowered to deck so often that shrouds would only have gotten in the way.)

FIG 18 - Building Fittings from Scratch

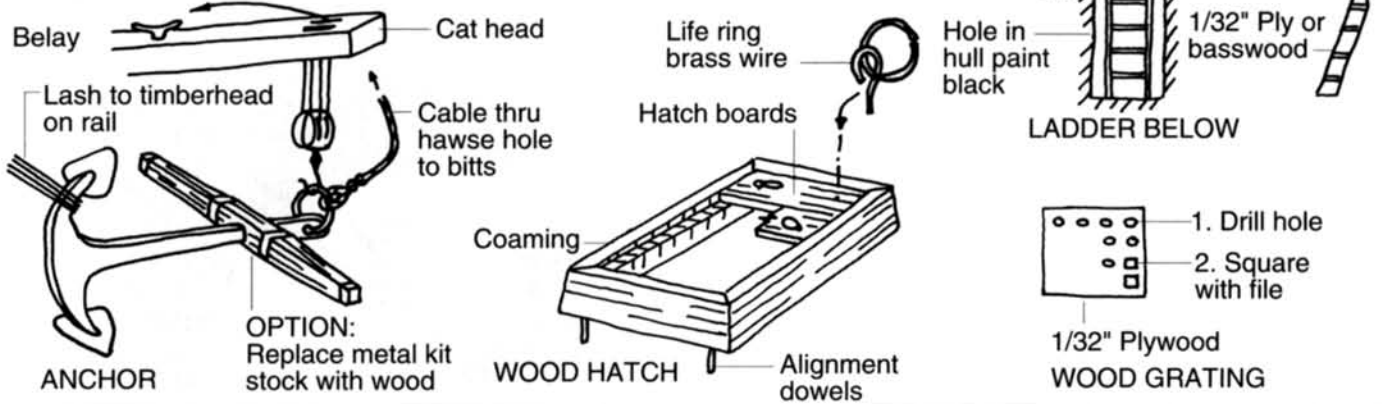


FIG 19 - Swivel Guns

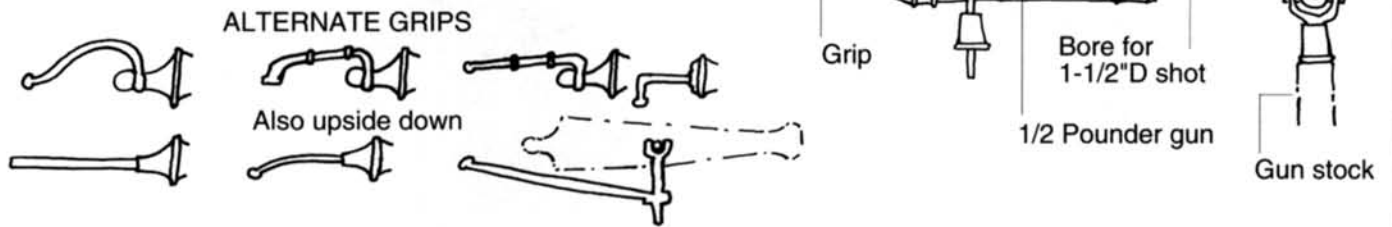


FIG 20A - Taper on Mast & Spars

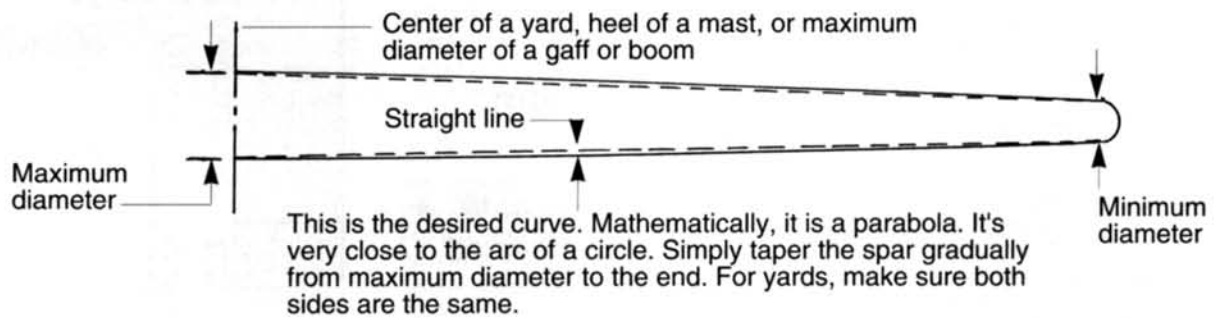


FIG 20B - Shaping the Masts

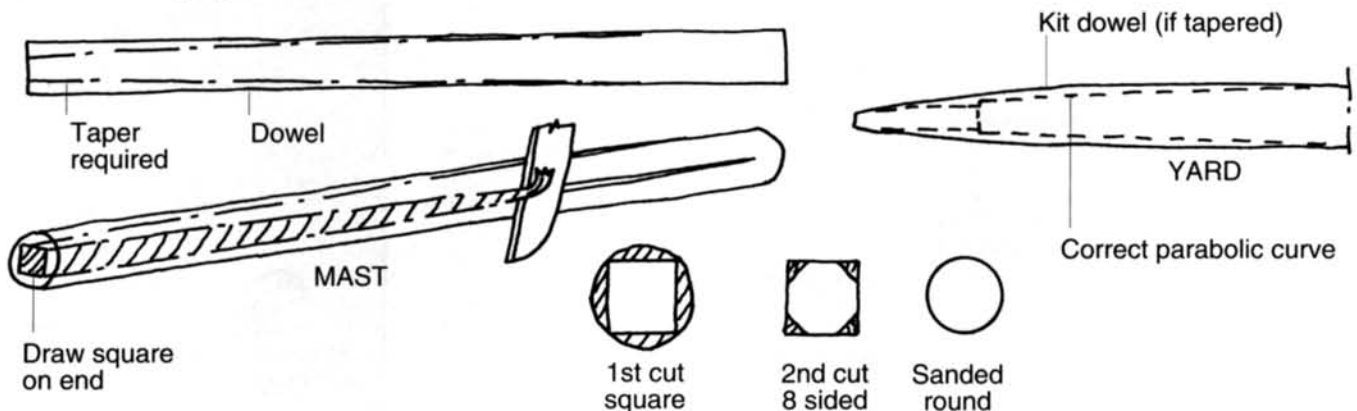
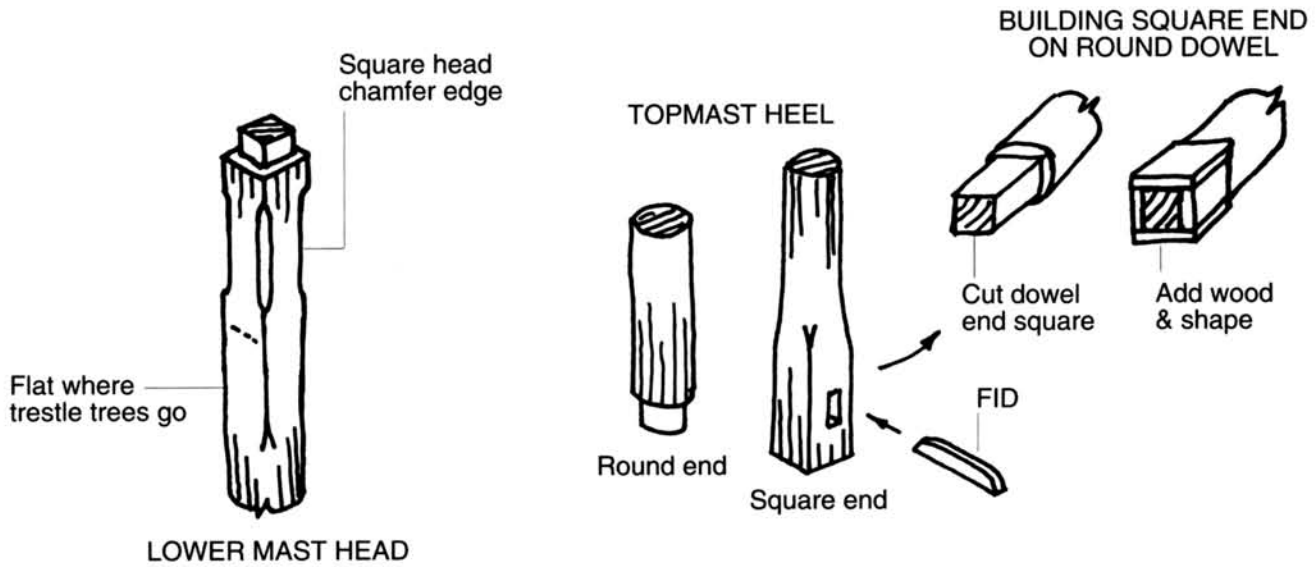


FIG. 21 - Shaping Mastheads & Heels



Establishing the Correct Curve of the Masts

The correct shape and dimensions of the masts are shown on the plans. Each of the mast sections should be tapered in a slight (parabolic) curve and not in straight lines (see figure 20a). The best way to taper the masts from dowels is to cut the taper into squares, then octagons, and finish by sanding into circles (see figure 20b).

Shaping the Mast Heads & Heels

The next areas of the masts to be shaped are the lower mast *heads* and topmast *heels* where the masts join together at an area known as the *doublings* (see plans for location). (Each mast has a head and heel located at its uppermost and bottom ends, respectively.) The mast head on the lower masts is from the *bibbs* (or *cheeks*, if you prefer), which hold the trestle trees, upward to the cap. The heel of the top mast is located from the cap downward to the cheeks.

To accommodate the mast caps and trestle trees which, in this kit, also incorporate the *bibbs*, the mast heads of the lower masts should be shaped square. The heel of the topmast should be either round, or square for about two scale feet (see figure 21 for the correct shapes). A *fid* (protruding bolt of wood or iron) is located in each topmast heel to prevent them from falling through the holes formed by the trestle trees.

Option: If you're going to do the squared version of the topmast heel, the figure also shows how to build the square ends by adding wood to the cut end. Adding wood is necessary in order to create the size square needed to fit the hole.

2. Assembling the Masts: Fore & Main

Next, assemble the two top masts onto the two lower masts by first gluing the caps and trestle trees onto the lower mast heads. When dry, install the topmasts, making sure they line up straight with the lower masts. Drill a hole in the topmasts in the location shown on the plans to represent the topsail yard halliard sheave.

When the mast assemblies are complete, stain and varnish them and set them aside to dry.

3. Shaping the Spars

Four Yards

Shape the yards in the same manner as the masts. The maximum diameter of each yard is at its center. Taper the yards outward from each center in a slight curve to the ends (see figure 20a).

Main Boom & Two Gaffs

The boom and gaffs also curve, but the maximum diameter of each spar is at about one-third from its fore end (also see figure 20a).

FIG. 23 - Setting Mast & Wedges

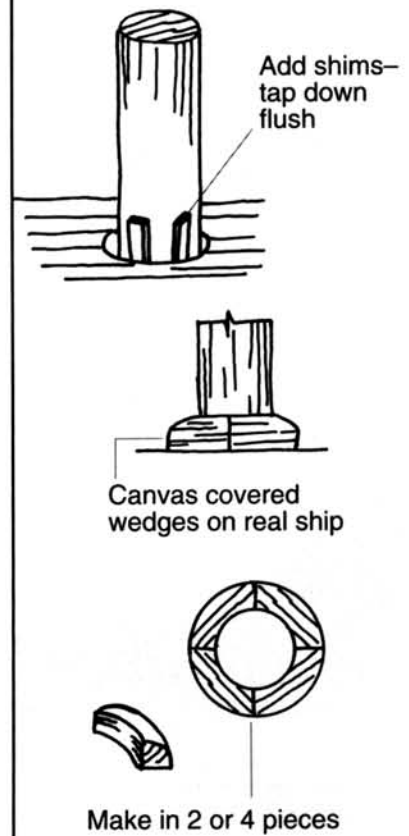
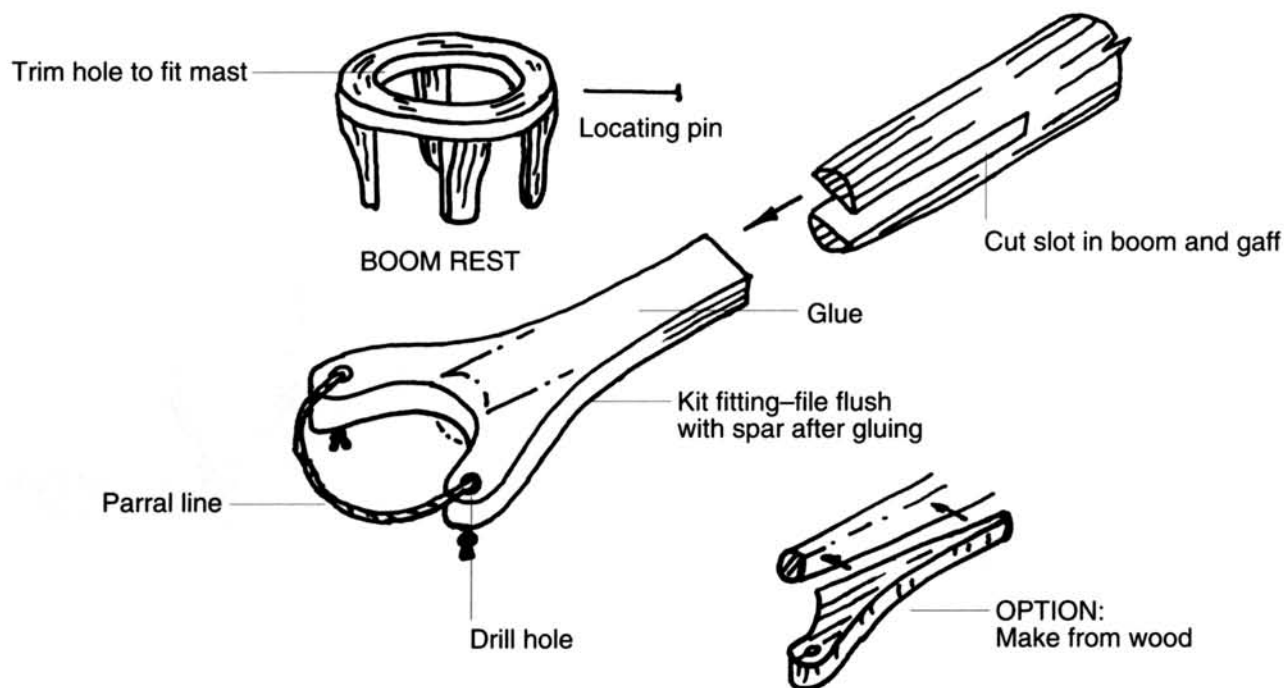


FIG. 22 - Boom & Gaff Jaws



Bowsprit & Jib-boom

The bowsprit should be tapered forward from the hull. At the end, cut the square shape to fit the bowsprit cap (Britannia casting found in kit). The aft end of the bowsprit should be shaped square inboard and octagon shaped for a few scale feet outboard. The jib-boom should be straight from the aft end to the cap, then tapered forward of the cap.

Finishing Spars

When shaping and fitting of each spar is completed, stain, varnish and set them aside to dry.

4. Main Boom & Gaff Assemblies

The main boom and two gaffs require that jaws be added to their throats for joining to the masts. The kit provides jaws made of Britannia metal. Cut slots into the fore ends of the spars to receive the jaws (see figure 22). When the jaws are glued into place, file the protruding jaw parts flush with each spar end. Locate the Britannia-made main boom jaw rest in the kit and trim its hole to fit the lower main mast (also see figure 22).

Option: If you prefer wood jaws, you can make alternatives from scratch as shown in figure 22. Two "half-jaws" can be glued to the ends of the spars as indicated by the illustrated single half-jaw. Drill holes to represent the sheaves in the main boom. Add the eyebolts, cleats and chocks to all spars as shown on the plans.

5. Bowsprit & Jib-Boom Assembly

Glue the bowsprit cap onto the bowsprit. Make the saddle for the jib-boom, then insert the jib-boom. Make sure the jib-boom lines up with the bowsprit and then glue it to the saddle. Add the eyebolts, lashing and chocks as shown on the plans.

6. Mounting the Mast & Bowsprit Assemblies

After staining and varnishing the mast and bowsprit assemblies, they can be placed in the holes you drilled into the hull. It is suggested that you do not glue the masts and bowsprit into the holes. The rigging will hold them in position. Furthermore, if the model gets restored in the future, the masts can be easily removed.

Check the alignment of the masts and bowsprit. If not straight, looking aft, or at the correct angle shown on the plans, you can shim the holes. If necessary, drill the holes larger to accommodate shimming. The canvas covered wedges for the masts at the mast partners (the framework which supports the mast at the deck) can be simulated with a carved wooden ring (see figure 23.)

STAGE F

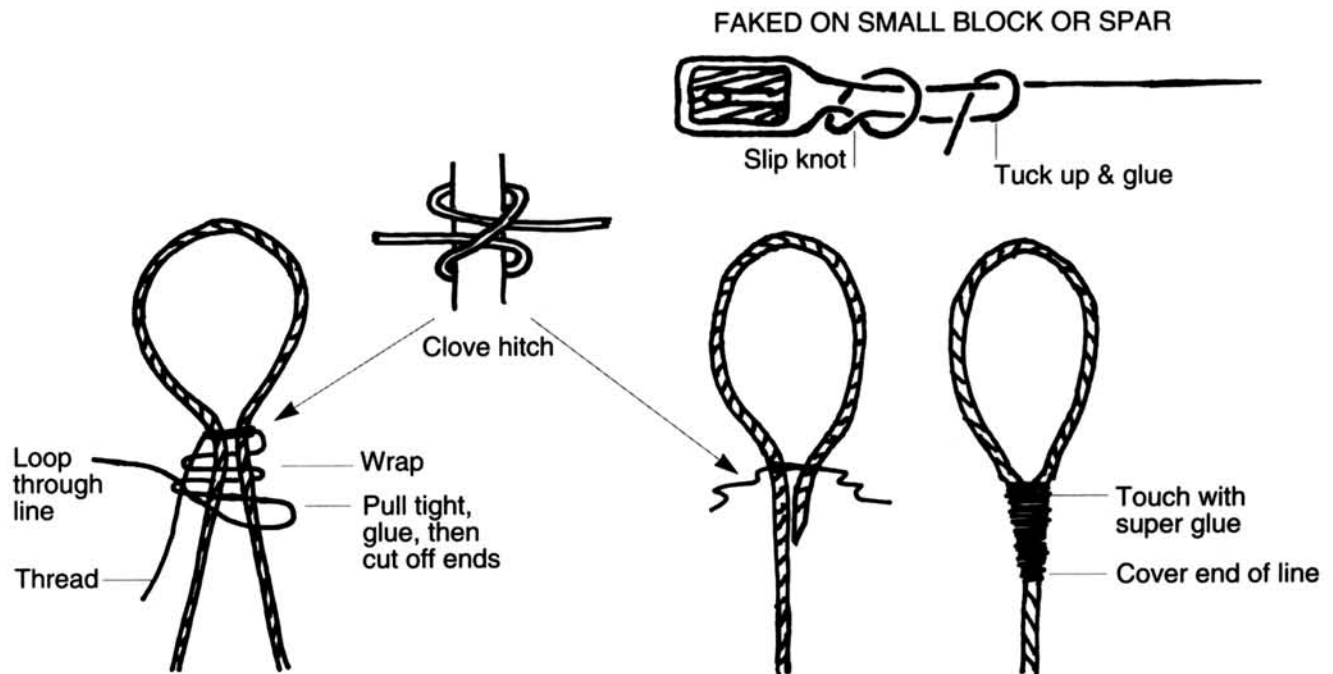
GENERAL RIGGING INFORMATION

The 1993 plans have been drawn with the modeler in mind. There is sufficient detail to define every rigging line. For this model you will be concerned with four different basic types of lines:

STANDING RIGGING—1. *Shrouds*: there are a total of 16, eight on each side of the ship. They are fixed lines that support the masts and run from the trestletrees on the lower mastheads to deadeyes and chainplates along the outside of the ship. They have ratlines tied to them creating the footropes used for going aloft; 2. *Stays*: are fore and aft fixed lines that support the masts and spars;

RUNNING RIGGING—3. *Halliards or Halyards*: these are lines that move and are used to hoist sails or flags; 4. *Downhauls, Inhauls, Outhauls, Braces, Sheets & Lifts*: all these lines move, are used to work the yards, gaffs, booms or sails and are named for the action they do: Downhauls are used to haul down a spar or sail; Inhauls & Outhauls haul in or out a spar or sail; Braces are lines on the yards for the purpose of trimming sail; Sheets secure the lower ends of the sails; Lifts pass through blocks at the mastheads and take the weight of the yards by lifting.

FIG. 24 - Seizings



1. Rigging Sail Lines

The *Sultana* model is intended to be completed with sails removed. However, even without sails, some of the rigging lines such as sheets, halliards and downhauls are to remain, along with their lead blocks. Some of the lines are to be hooked together, such as the jib halliards and downhauls (see view of jib-boom on the Rigging Plan). The running ends of these lines should be belayed at their proper locations.

Mounting the sail rigging lines on the *Sultana* adds tremendously to the look of the model, especially at the forward stays where the contrasting black stay and light running lines, along with their blocks, create interesting visual detail. On the plans, you will see that the belaying arrangement also indicates the inclusion of cleats for rigging lines such as the foresail brails and fore course sheets. And though without sails these cleats are unused, they should still be fitted on the model.

Sail Making Option: A small sail plan is provided on the Rigging Plan for those who wish to make them. Sailmaking details can be found in other Model Expo instruction books.

2. Choosing the Right Size Lines

All of the standing (fixed) rigging is done using the black line in the kit. The black color represents the permanently tarred rigging used on the real ship. Use the heavier line for the shrouds, the fore and main stays, and bobstay. Use the next size for the other stays, and use sewing thread (not in kit) for seizings and lanyards. Lanyards are lines which pass either through deadeyes or hearts to tighten the shrouds or stays (see plan DETAILS E and F). The natural color lines in the kit are used for the running rigging that is reeved through blocks.

3. Applying Beeswax to the Lines

Before placing the lines on the model, run the line through a block of beeswax several times. Then, run the line through your fingers. This heats the wax slightly and rubs it into the line. The beeswax will cut down on fuzz and protect the line from moisture.

4. Seizing the Lines

Seizing of lines (binding or securing two lines or different parts of the same line) can be done as shown in figure 24). To prevent seizings from unraveling, add a touch of super glue.

5. Blocks, Strops, & Fittings

Around the time the *Sultana* was built, the use of rope for stropping blocks, and for parrals and slings on yards, was more common than iron fittings. However, such items as iron-stropped blocks, hooks, and eyebolts were available. There is no sure way to determine exactly what was on the *Sultana*. The details shown in the sketches and plans illustrate only one of the ways it may have been done: a block shown lashed into an eyebolt could just as likely have been lashed around the spar without the use of an eyebolt.

Note: a strop is an iron or rope band or grommet round the shell of the block for attaching lines. A parral is any apparatus which keeps a yard, gaff or boom held fast to its mast.

The blocks in the kit are so small that it will not be easy for you to create the exact detailing. Some modeling shortcuts are in order (see figure 25 for some life-size ship details and model options.) Use the kit's 3/32" blocks to depict the 5" to 6" life-size blocks as shown on the plans. Use the 1/8" blocks for the 7" to 8" sizes, and the 3/16" blocks for the 12" size.

FIG. 25 - Blocks, Strops & Fittings

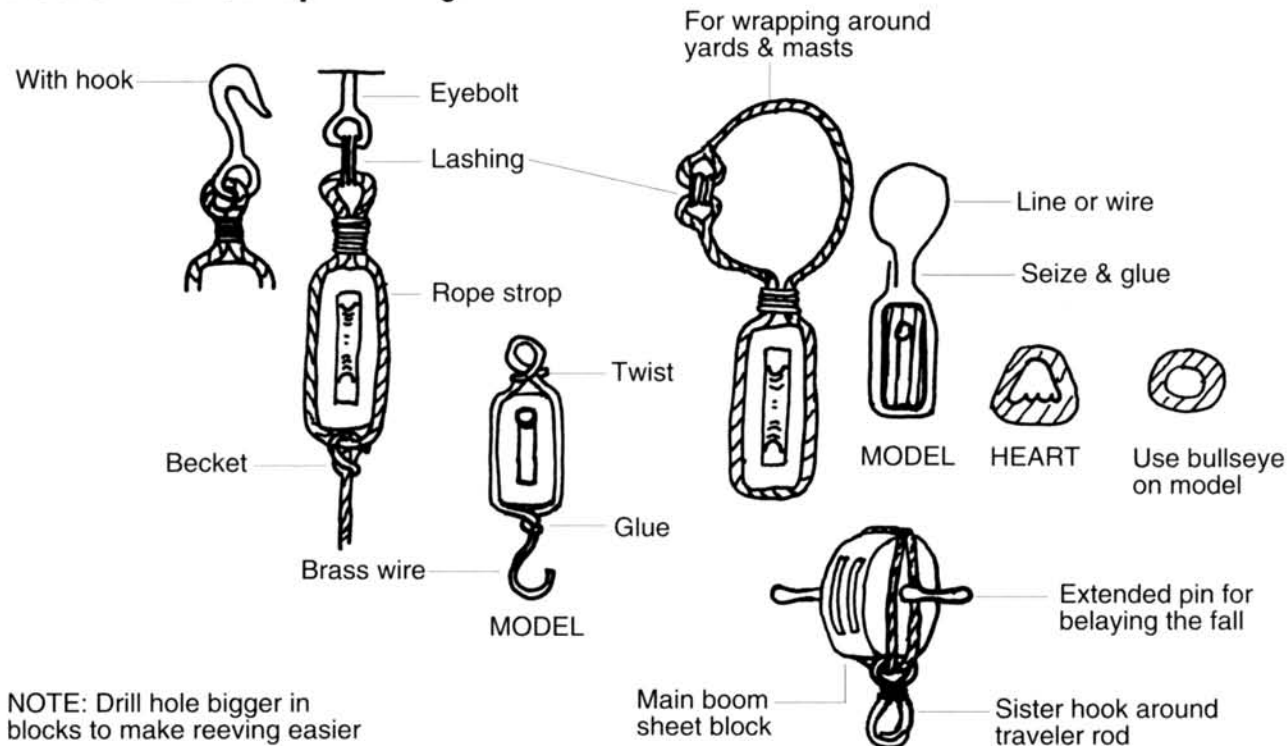
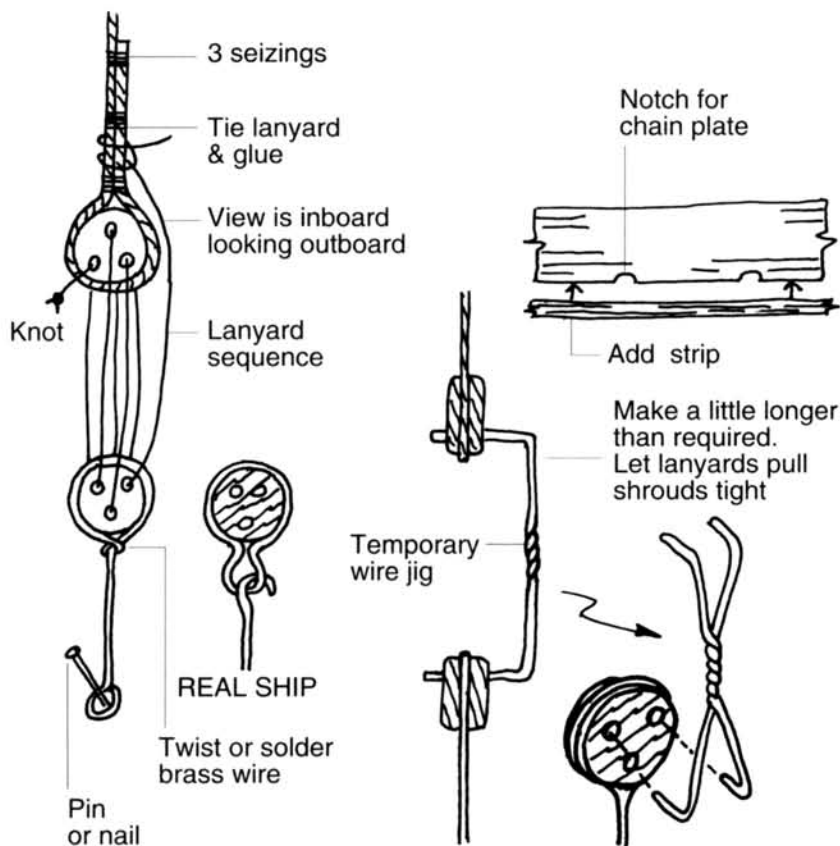


FIG. 26 - Spacing & Tying Deadeyes with Lanyards



STAGE G

STANDING RIGGING

1. Bowsprit Rigging

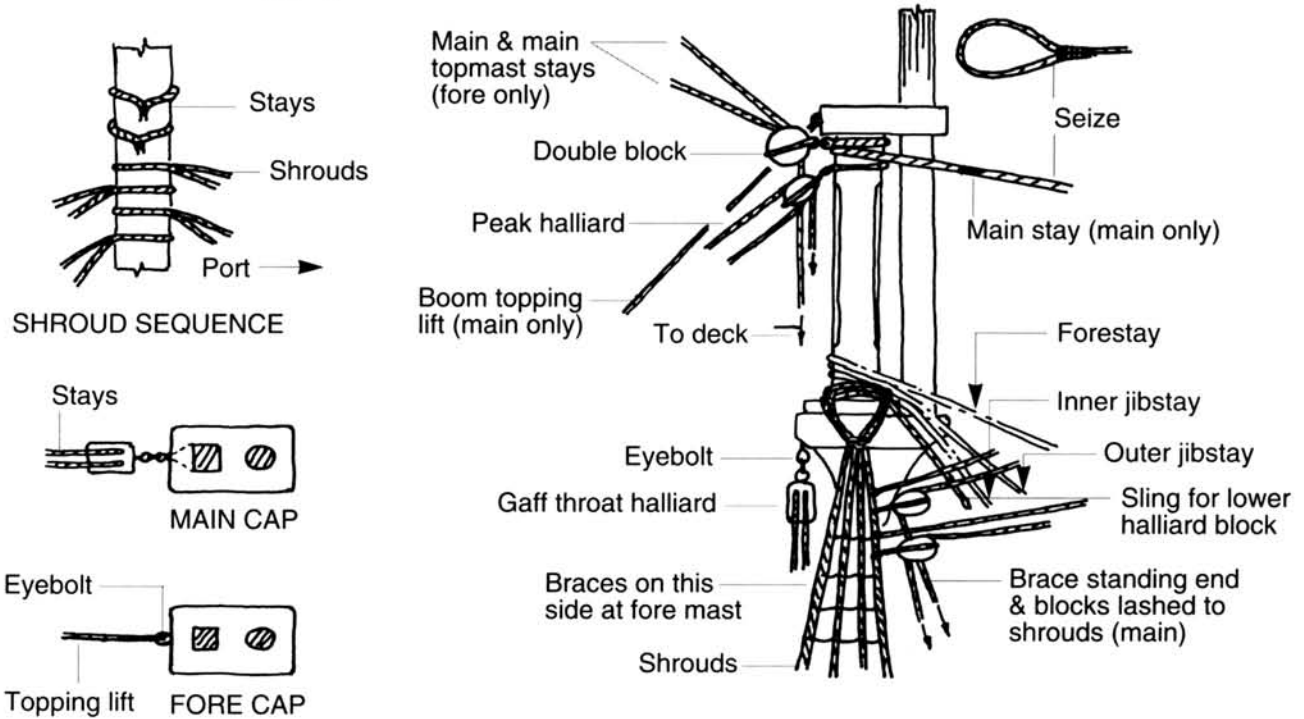
Begin the standing rigging with the bowsprit (see figure 30 and plan DETAILS A & B). When adding the gammoning, which ties the bowsprit to the stem, wrap the gammoning neatly, laying each part of the line side by side as it is wrapped. Notice how the center of the gammoning is seized after the line is wrapped.

2. Shrouds & Stays

Shrouds & Ratlines

The shrouds are the strong lines that support the masts and spars laterally. They are attached along the outside of the ship using chain plates, lanyards and deadeyes. The chain plates are made of brass wire provided in the kit. To set up the shrouds, make a temporary jig of brass wire to space the deadeyes as you do the seizings (see figure 26 and plan DETAILS G & K). This figure also shows the sequence for reeving the lanyards. Keep an eye on the masts as you rig the shrouds, so you will not pull them out of line (see figure 27 for proper sequence of shrouds and stays). After the shrouds are in place, proceed to add the ratlines (see figure 28 for several optional methods. The shroud cleats are also shown (also see plan DETAIL D).

FIG. 27 - Masthead Rigging—Fore or Main Noted



Fore & Aft Stays

Stays also are support lines for spars, but more especially for masts in a fore and aft direction. Install all the fore and aft stays after the shrouds are completed (see figure 27 for some detail at the masthead and proper sequence for the shrouds and stays—also see plan DETAIL C).

Note that the running back-stays set up to a tackle at the outboard side of the deck. The tackle is a running line, hence it is light colored. The fixed portion above the tackle is black like the other stays.

Main Stay & Main Topmast Stay

Figure 29 shows the run of the main stay and main topmast stay. On most square-rigged ships, the main stay leads from the main top directly to the deck at the foremast and sets up with hearts and lanyards. The *Sultana*, however, has a fore and aft sail on the foremast. The stay, along with the main topmast stay, leads through a large double block at the fore topmast in order to raise the stay above the fore and aft sail gaff (also see plan DETAIL E).

FIG. 28 - Options for Tying Ratlines & Cleats

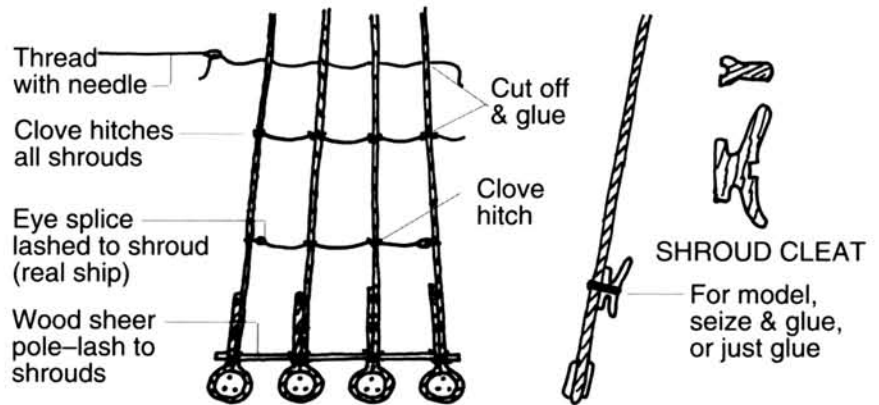


FIG. 29

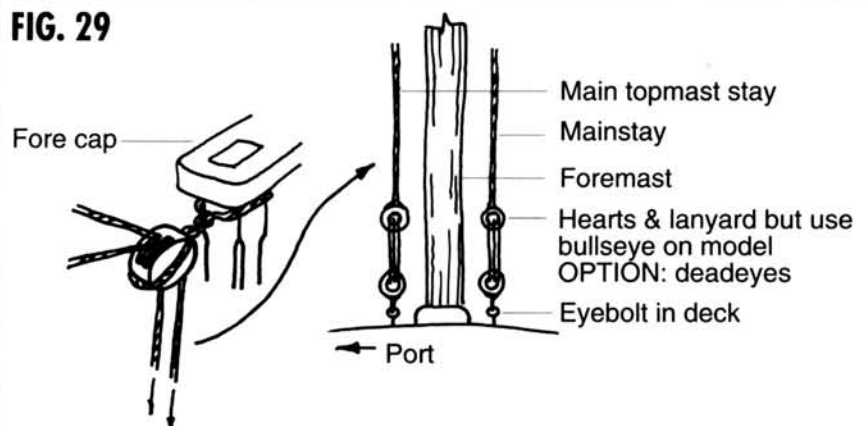
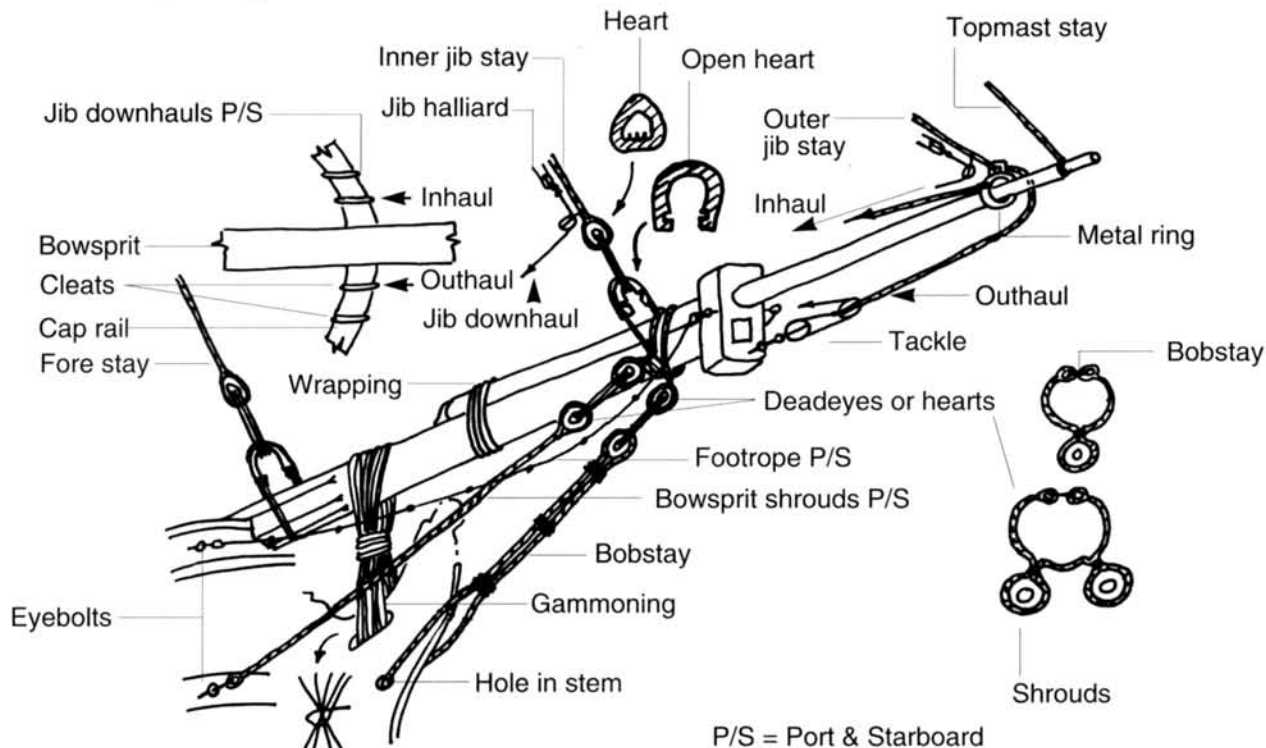


FIG. 30 - Bowsprit Rig



STAGE H

RUNNING RIGGING

1. Topsail Yard Rigging

Begin the running rigging with the topsail yard lines (see figure 31 for details). Notice the use of an easy-to-remove truss. According to Master's logs, the topmasts were often removed as were the topsail yards so a simple truss, which could be easily undone, was added to hold the yards against the mast (see DETAILS L and N in left margin on the Rigging Plan). Also, furling was accomplished at deck level, so note that the yards do not get fitted with clew lines or footropes.

Note: Adding trusses to your model is optional because it is possible they may not have been used at all. The yards could have been held by the halliards, lifts, and braces alone.

2. Lower Yard Rigging

Main Mast

The lower main yard is used primarily to hold the topsail sheet blocks and steady the topsails. There generally was no main course used. Many old illustrations prove this point. The main yard is still fitted with a halliard and a simple truss. This yard was probably removed often, like the topsail yards (see figure 32 and plan DETAIL M).

FIG. 31 - Topsail Yard

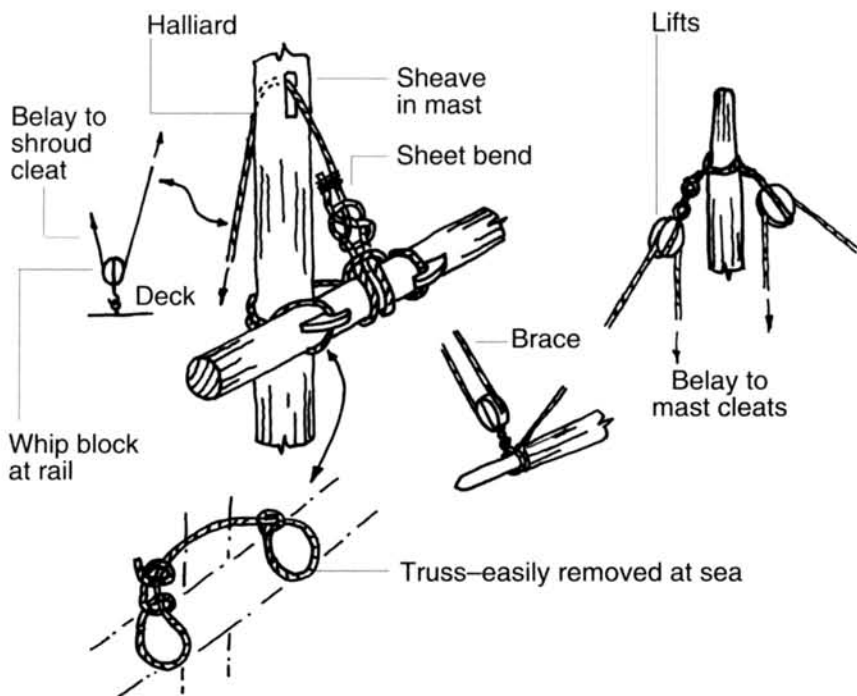
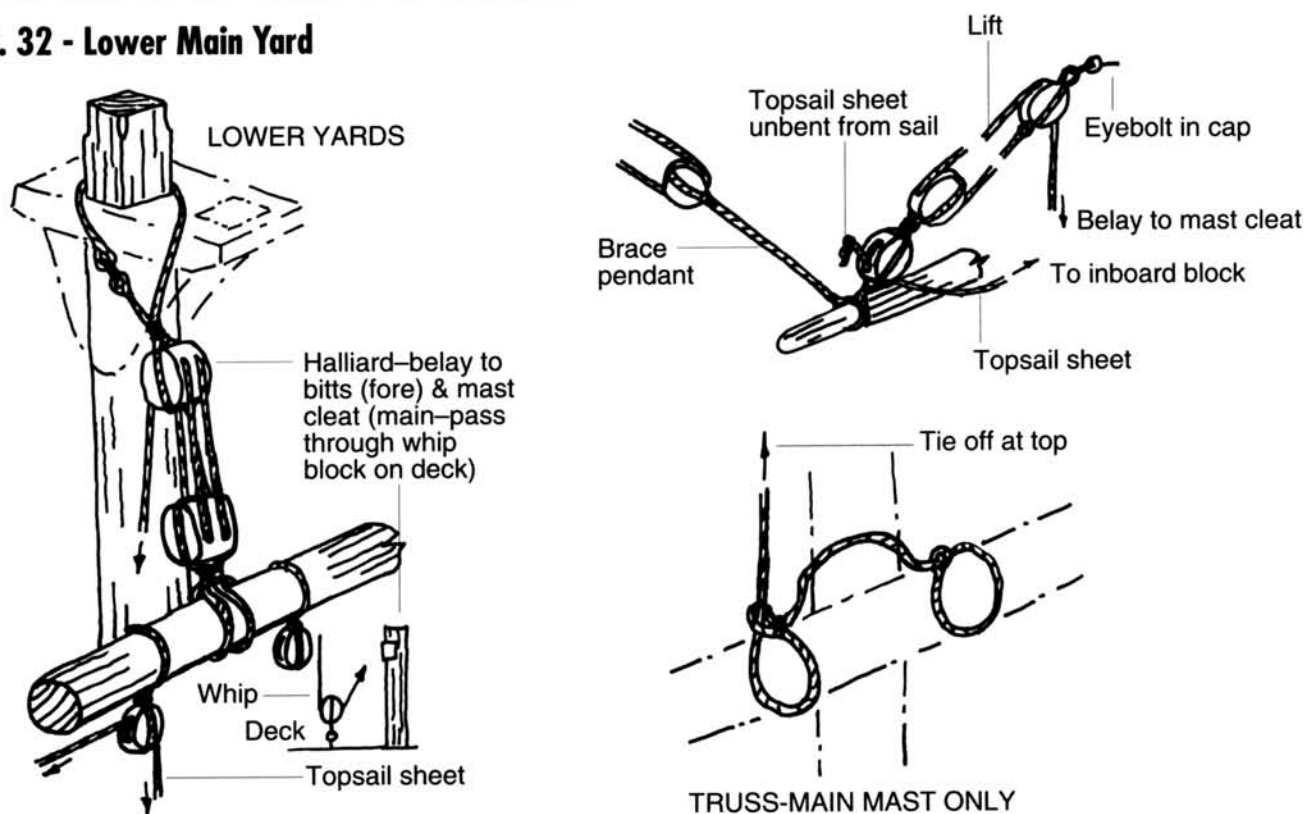


FIG. 32 - Lower Main Yard



For the fore lower yard, the center of the yard has no truss. The yard is held back by the halliards and the braces alone. This yard also has no footropes. The yard could be lowered rapidly to the deck for furling the sail.

Note: Some schooners have a rope horse running from the trestle trees to the deck in front of the mast. The fore yard would have a parral around the yard and horse, so the yard could ride up and down on the horse. Also, such a rigging used a small jack yard at the top of the sail and a large boom at the bottom of the sail. The jack yard would be supported by lines through blocks attached to the fore yard. This permitted the lowering of the sail without lowering the fore boom. This type of rigging, however, was ruled out for *Sultana* because it seemed overly complicated and because contemporary etchings of similar schooners do not show such a rigging. Simplicity is the key for *Sultana*.

3. Gaffs & Boom

Gaff and boom rigging details are next (see figures 33 and 34).

Fore Gaff & Foresail

The foresail on the fore gaff of the lower foremast is loose footed. The sail would have brails (encircling ropes) to pull the sail toward the gaff and mast for furling, but these are omitted on a model without sails. The gaff is fitted with vang (port & starboard) that extend from the peak of the gaff to the outboard deck to steady the gaff when the sail is furling.

Main Gaff/Boom & Mainsail

The mainsail on the lower main mast has a boom as well as a gaff. There are no vangs used because the sail is furled by lowering the gaff. A peak downhaul is fitted to aid in lowering the gaff. When setting up the main boom rigging, set the lengths of the boom sheets first (see plan DETAIL J). Then pull everything tight with the throat halliards followed by the peak halliards.

The gaff peak and throat halliards should be set up to a tackle at the deck (see figure 33 and plan DETAIL H). However, note on the plans how the halliard tackles alternate sides.

Note: The use of vangs with a boom sail is somewhat controversial. Darcey Lever (Reference 3) says they are not used with hoisting gaffs. However, many contemporary etchings show them. They were omitted on *Sultana*, again for simplicity, but could be considered optional.

Option: The main gaff on the model can be either up or down. If you have it in the hoisted position, and you do not use the optional vangs, then the gaff must be steadied by securing the gaff jaws to the mast with a pin or some glue.

4. Jib Rigging

Rig the jib halliards and downhauls as shown on the plans and in figure 30.

5. Belaying the Running Rigging

The *Sultana* is a small schooner and Admiralty records speak of installing cleats. Nothing is mentioned about belaying pins. Consequently, *Sultana* has been reconstructed using only cleats, bitts, and timberheads for belaying running lines.

The belaying arrangement illustrates a solution to belaying all the lines, but it is certainly not the only solution. Lines were belayed differently on various ships. You must use some common sense, however. The lines must lead easily to the belaying points. Each belaying point should have a coil of rope (see figure 35 for some modeling ideas).

6. Final Touches

After all the rigging is in place, re-check every line, and make sure all the seizings are sound. If necessary, add another touch of super glue to seizings. Check to see if there are any shiny places on the rigging. If necessary, touch-up standing rigging with black paint, or black liquid shoe polish. For running rigging, use a tan stain, or brown liquid shoe polish.

Check to see if any of the painted wooden parts were marred or scratched during the rigging process and touch-up as necessary.

Congratulations—you've done it! We look forward to helping you with your next ship modeling project.

FIG. 33 - Gaff

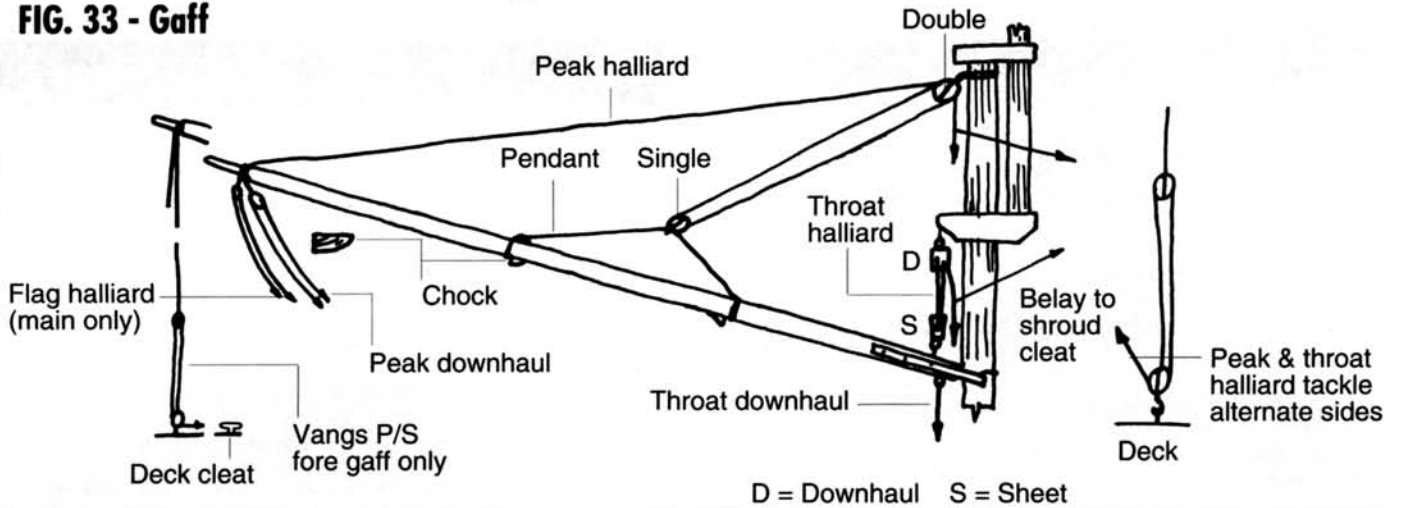


FIG. 34 - Main Boom

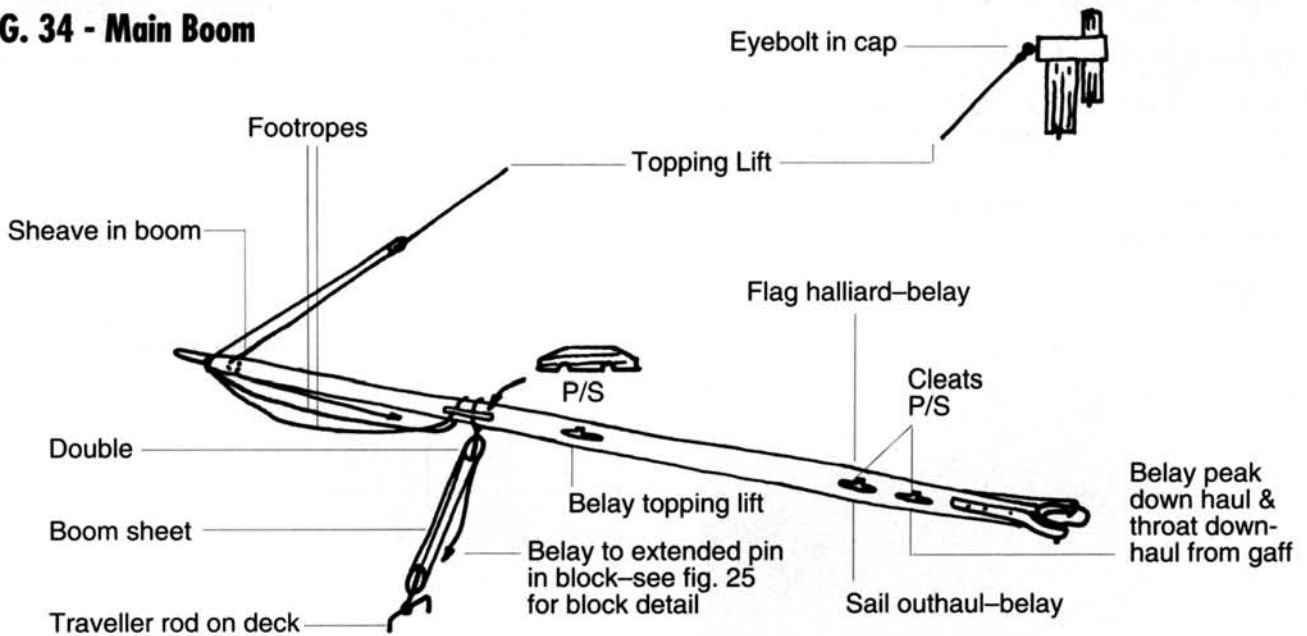
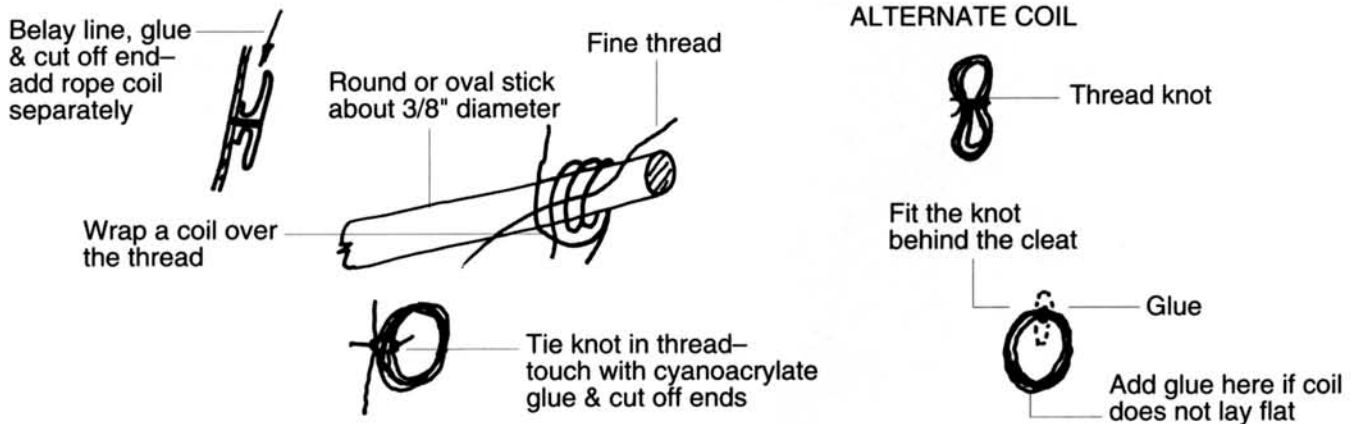


FIG. 35 - Rope Coils



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Contains an interesting chapter on the Sultana, with log book information, and copy of the British Admiralty draught of the lines and deck plan.
3. The Young Sea Officer's Sheet Anchor,
by Darcy Lever. 1819 (reprinted)
Block and spar details, and typical rigging techniques of the period.
4. Steel's Elements of Mastmaking, Sailmaking and Rigging,
by David Steel. 1794 (reprinted)
Details of masts and spars, blocks, rigging practices, and rigging sizes.
5. The Art of Rigging,
by George Biddlecombe. 1848 (reprinted)
This is essentially an update of David Steel's earlier work.
6. The Neophyte Shipmodeller's Jackstay,
by George F. Campbell. Model Shipways, 1962
Excellent visuals and background information on building models from kits. Good detail on hulls and rigging. Great for beginners.

Note: Most books available through Model Expo, Inc.
Please check current catalog for availability.

The Latest* Kits from Model Shipways



*As of the printing of this manual, some of these kits were not yet released. Please see our website (www.modelexpo-online.com) or call 1-800-222-3876 (Mon-Fri 9-5 ET for availability, prices and expected in-stock dates).



NEW!

HARRIET LANE, UPDATED! BACK BY POPULAR DEMAND

Built in New York for the U.S. Revenue Service in 1857, the *Harriet Lane* was powered by a combination of steam and sail. She was 180 ft. long, with a 30 ft. beam, and carried a 30 lb. Parrott rifle, plus three 9" smooth-bore Dahlgrens. Her design clearly illustrates the transition from sail to steam.

Harriet Lane features a machine carved hardwood hull which needs only light shaping and sanding. We provide plank-scored basswood for decking and cabins, spars and hardwood blocks. Ladders, anchors, paddle wheels, two ship's boats, four cannon with carriages and numerous other fittings are finely cast Britannia metal. We've upgraded the kit to include laser cut paddle wheel covers. Newly Detailed plans and newly written clear instructions by master ship modeler, Ben Lankford, are easy to follow. (Baseboard and brass pedestals are not included.)

Solid Hull Kit • Entry Level • No. MS2010 • Length 13-1/2" / Height 13-1/2" / Scale 1/8" = 1 ft. (1:96)

Harriet Lane Paint Set: Seven 1 oz. bottles of Model Shipways paint: No. MS2010MS

Walnut Display Base: Routed and ready for finishing. 20" x 4-1/2". No. RH4520

Brass Display Pedestals: Pre-drilled from top to bottom and slotted to fit the keel. You'll need three. Height 1-1/8" No. MS0812

DESPATCH #9 SOLID HULL KIT

The Diesel harbor tug *Despatch #9* was built for the Marine Corps in 1945 at Tampa, FL from a US Army design. Later sold to Standard Oil of California, she worked oil barges in the San Francisco Bay area. Powered by a Busch-Sulzer 6-cylinder engine, she was equipped with practically every modern device of the time, including electric capstan, electric towing machine and watertight doors. *Despatch #9* was 85 ft. long with a 23 ft. beam.

Kit features a pre-shaped, machine carved solid wood hull, shaped deck house and superstructure. Other wooden parts include dowels, strips, sheets and blocks. Brass wire and airports, plus over 80 cast Britannia metal fittings outfit your model just like the real tug. Clear plans and instructions make building easy. (Wooden display base and brass pedestals are not included.)

Entry Level • No. MS2011 • Length 13-1/2" / Height 7-1/2" / Scale 5/32" = 1 ft.

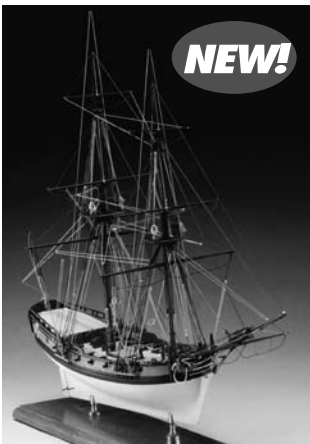
Despatch No. 9 Paint Set: Eight 1 oz. bottles of Model Shipways paint: 1 each/MS4839 Primer, MS4830 Hull/Spar Black, MS4801 Bulwarks Dark Green, MS4816 Deck House Dark Buff, MS4835 Bright Red Trim, MS4828 Iron/Cannon Black, MS4823 Clipper Pearl Gray, MS4962 Aluminum. No. MS2011MS

Walnut Display Base: Routed and ready for finishing. No. RH4512

Brass Display Pedestals: Pre-drilled from top to bottom and slotted to fit the keel. You'll need two. No. MS0812



NEW!



NEW!

FAIR AMERICAN, REVOLUTIONARY WAR BRIG, C. 1778 PLANK-ON-BULKHEAD KIT

Fair American is a reproduction of a model built over 200 years ago, now on exhibit at the U.S. Naval Academy Museum at Annapolis, MD. She is said to represent the 14-gun privateer *Fair American* sailing out of Charleston in 1778.

Plank-on-bulkhead construction uses high quality basswood, the preferred wood of professional modelers. All structural hull parts and major fittings are laser cut, so they fit together with remarkable ease. The kit contains over 60 cut or shaped wooden parts, plus 120 extra wood strips for a second layer of planking, should you wish to build your model with a double planked hull. More than 500 fittings of wood, brass and Britannia metal fittings include 14 brass guns on wooden carriages, cannon, chainplates, bell, anchors and wheel. Seven plan sheets a 48 page instruction book by Erik A.R. Ronnberg, Jr. and Ben Lankford, plus a 38-page guide to planking the hull make building easy.

(Display base and brass pedestals are not included.)

Intermediate Level • No. MS2015 • Length 26-1/2" / Height 22" / Scale 1/4" = 1 ft.

Fair American Paint Set: Six 1 oz. bottles of Model Shipways paint: 1 each/MS4839 Primer, MS4830 Hull/Spar Black, MS4803 Hull Tallow, MS4802 Bulwarks Red, MS4825 Deck Light Gray, MS4969 Gold. No. MS2015MS

Walnut Display Base: Routed and ready for finishing. 20" x 4-1/2". No. RH4520

Brass Display Pedestals: Pre-drilled from top to bottom and slotted to fit the keel. You'll need two sizes for level display. No. MS0812 Height 1-1/8" No. MS0813 Height 1-3/8"



NEW!

DAPPER TOM SOLID HULL KIT

During the early 19th century, many Baltimore clippers were granted privateering licenses by the US government. Only a fast, well handled ship could be reasonably sure of reaching its destination. Privateers like the *Dapper Tom* depended on their sailing abilities and fire power to prey on foreign shipping and to escape the British men-of-war patrolling the high seas.

Kit features a machine carved basswood hull with accurately shaped bulwarks and transom. Fittings include 8 cast metal cannon, mast caps, anchors, capstan and gratings, brass eyebolts and belaying pins, plus hardwood blocks and deadeyes. Scribed decking, wooden masts and yards, and three diameters of cotton rigging provide the finishing touches of authenticity. With the help of clearly drawn plans and illustrated instructions, even first time builders can finish an impressive model. (Display base and brass pedestals are not included.)

Entry Level • No. MS2003 • Length 24" / Height 18" / Scale 5/32" = 1 ft.

Dapper Tom Paint Set: Six 1 oz. bottles of Model Shipways paint: 1 each/MS4839 Primer, MS4830 Hull/Spar Black, MS4801 Bulwarks Dark Green, MS4803 Hull Tallow, MS4835 Bright Red Trim, MS4828 Iron/Cannon Black. No. MS2003MS

Walnut Display Base: Routed and ready for finishing. 20" x 4-1/2". No. RH4520

Brass Display Pedestals: Pre-drilled from top to bottom and slotted to fit the keel. You'll need two sizes for level display. No. MS0812 Height 1-1/8" No. MS0813 Height 1-3/8"

1:16 SCALE AMERICAN CIVIL WAR ARTILLERY

WHITWORTH BRECH-LOADING 12-POUNDER

Designed by Sir Joseph Whitworth, the cannon that bore his name became a favored weapon of the Confederacy. Unusual in appearance as well as operation, the Whitworth was a breech-loader that fired an elongated 12-pound iron shell from a finely rifled 1,100 pound barrel. Accurate and easy to maneuver, it had a range of 4.5 miles and made a shrill, whistling noise which could be distinguished from all other cannon of the period. The Whitworth saw action at Gettysburg, Charleston, Vicksburg, Fredericksburg and many other American Civil War battlefields.

- Historically accurate and perfectly scaled
- Cleanly cast Britannia metal components
- Authentically detailed cannon barrel
- One-piece ready to assemble wheels
- Clearly written illustrated instructions
- Easy to build – assembly and painting time 5-10 hours

Entry Level • No. MS4001
Length 10" / Width 4" / Height 3-1/4"
Weight 1 lb., 4 oz. / Scale 1:16



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NEW!

**PRECISION CAST
METAL PARTS**

1:16 SCALE AMERICAN CIVIL WAR ARTILLERY

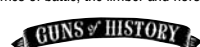
LIMBER AMMUNITION CHEST

The limber was an indispensable piece of equipment during the American Civil War. It was a simple two-wheeled cart designed to carry an ammunition chest containing gunpowder and shot for the artillery pieces. A team of horses was hitched to the limber and a cannon was hooked on to its rear when the army was on the move.

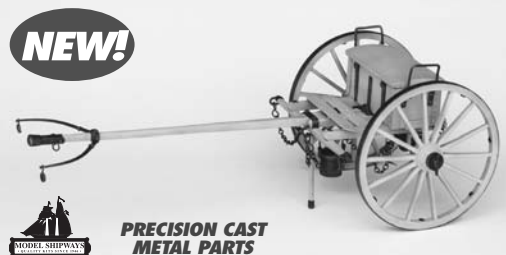
The ammunition chest lid was large enough to seat up to three men. However, sitting above the gunpowder was dangerous, so after the first few months of the War, only the driver rode on the limber. In times of battle, the limber and horses were left behind the lines of fire.

- Historically accurate and perfectly scaled
- Cleanly cast Britannia metal components
- Authentically detailed ammunition chest
- One-piece ready to assemble wheels
- Clearly written illustrated instructions
- Easy to build – assembly and painting time 5-10 hours

Entry Level • No. MS4002
Length 10" / Width 4" / Height 3-1/4"
Weight 1 lb. / Scale 1:16



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NEW!

**PRECISION CAST
METAL PARTS**

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Model Shipways Kit No. MS2645



WILLIE L. BENNETT
Model Shipways Kit No. MS2032



BLUENOSE
Model Shipways Kit No. MS2130



RATTLESNAKE
Model Shipways Kit No. MS2028



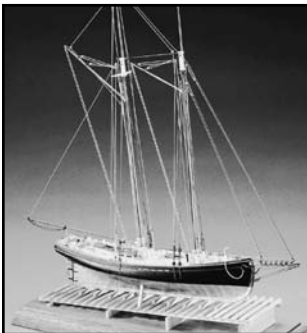
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BENJAMIN LATHAM
Model Shipways Kit No. MS2109

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