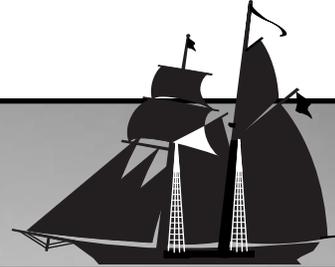


INSTRUCTION MANUAL

MODELING THE ARMED VIRGINIA SLOOP ◆ 1768 ◆



MODEL SHIPWAYS

• QUALITY KITS SINCE 1946 •

PREPARED BY BEN LANKFORD

Technical Characteristics

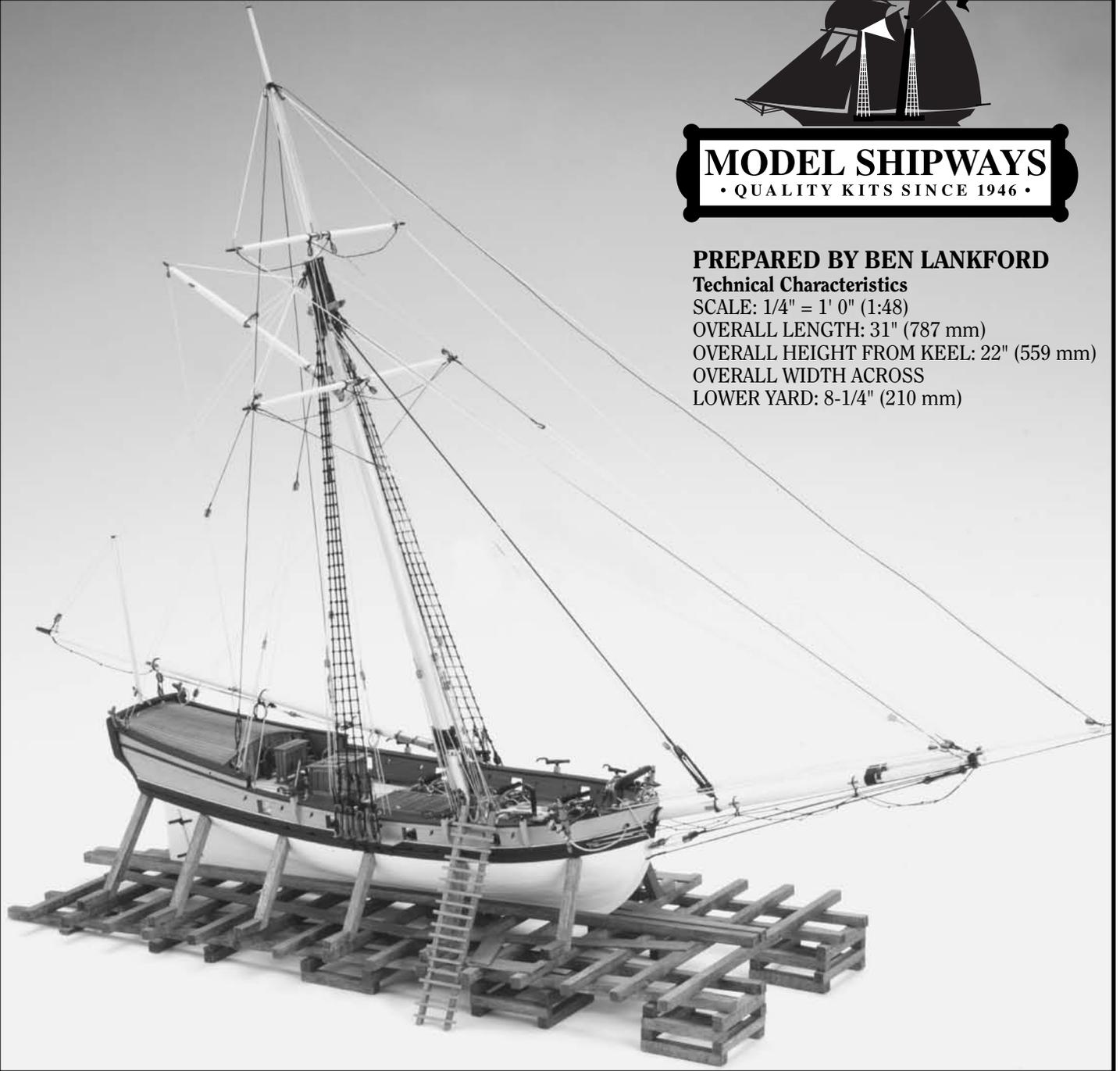
SCALE: 1/4" = 1' 0" (1:48)

OVERALL LENGTH: 31" (787 mm)

OVERALL HEIGHT FROM KEEL: 22" (559 mm)

OVERALL WIDTH ACROSS

LOWER YARD: 8-1/4" (210 mm)



Manufactured by Model Shipways
A Division of Model Expo, Inc., Hollywood, FL
<http://www.modelexpo-online.com>

Model Shipways Kit No. 2160

HISTORY

The *Virginia Sloop* is a single-masted privateer, or smuggler, an evolutionary development in the line of fast sailing ships linking the Bermuda sloop of c. 1740 and the trim, sharp model Virginia schooners found in *Steel's Naval Architecture of 1805*. It is a small, well-designed ship, with a graceful sheer and low freeboard.

The 18th century was a time of intense naval and maritime competition. In both peace and war, Britain, France, and America looked toward the development of a new vessel type that might further their national or regional interests at sea. Often, the private sector was more innovative, as the quest for quick profits spurred the production and refinement of fast sailing ships.

Jamaica had become rapidly established as a shipbuilding center in the prior century, with a reputation for fast, well-built ships. By the end of the century the shift to Bermuda had already begun, coincident with the decline in timber in Jamaica. When the same happened in Bermuda, the hull form seems to have moved to the Chesapeake.

Whether these ships were a new design development is not entirely clear. The basic form may have developed from the English cutter of the first quarter of the century. However, the Jamaica-Bermuda-Virginia sloops were sharper, lighter, and sleeker than their cutter cousins.

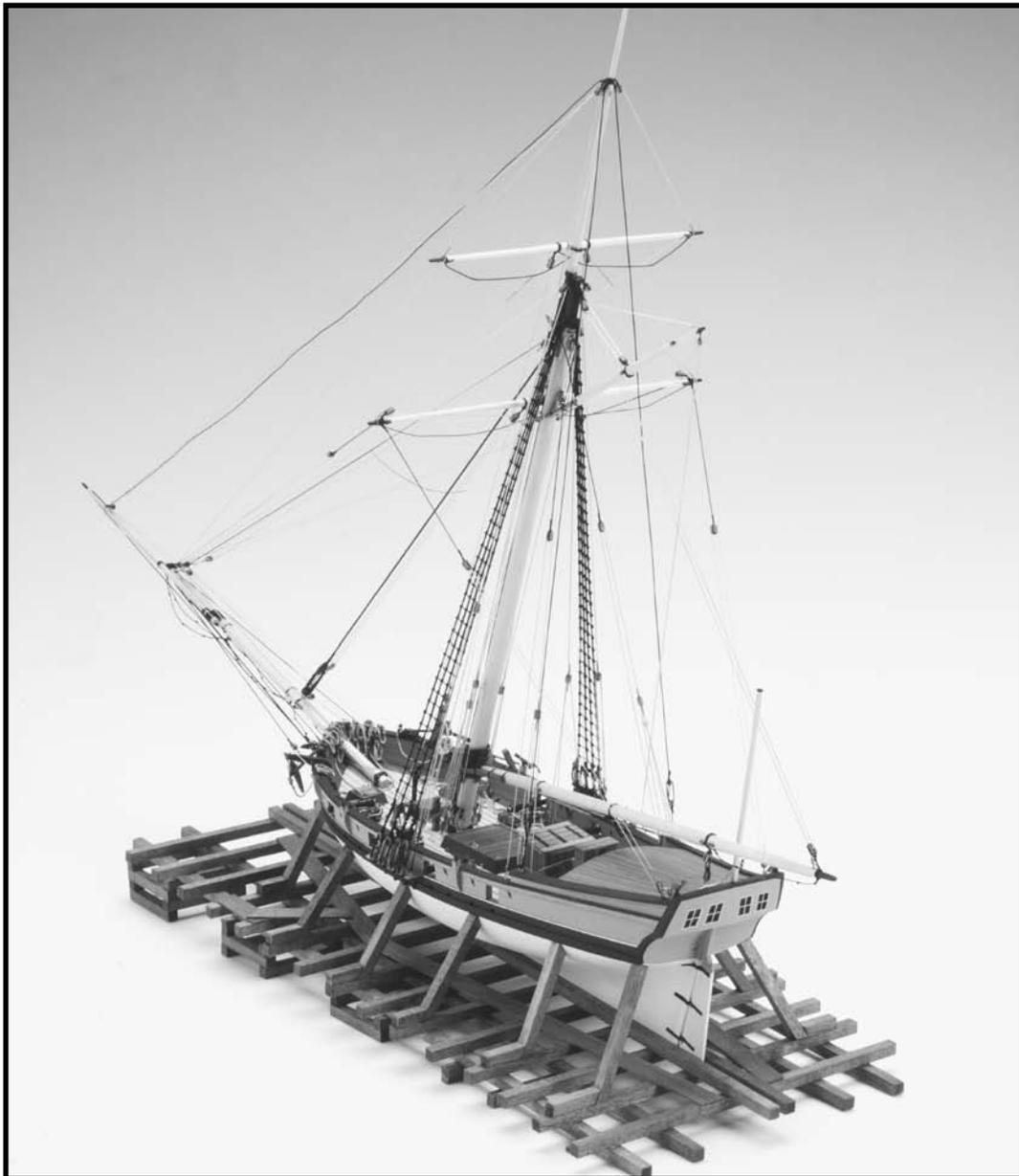


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Instruction Manual

ARMED VIRGINIA SLOOP ◆ 1768 ◆

Plans and Instructions by
Ben Lankford, Vienna, VA

Models by Bob Werner

Model Shipways developed its *Virginia Sloop* kit in 1998-2000. The design is based on a reconstruction developed by Clayton A. Feldman, M.D., Publisher of *Seaways' Ships-in-Scale* magazine. The original plan of the sloop, a Dutch copy of a French drawing, was found by noted nautical historian Howard I. Chapelle in European archives. The ship had apparently been sold to the French shortly after completion. Fragmentary notes and the plan passed from Chapelle to Joseph A. Goldenberg, author of *Shipbuilding in Colonial America*, and to John F. Millar, author of *Early American Ships*. Mr. Millar redrew the plan for his book. This plan is the basis for a reconstruction of the ship.

Dr. Feldman's original plans are accompanied by a book, *Modeling an Armed Virginia Sloop of 1768* (see bibliography). His book describes the development of the reconstruction and details for building a 3/8" = 1'0" scale model from scratch. Model Shipways has transformed Dr. Feldman's design into a 1/4" = 1'0" scale kit design. Some modifications have been made in keeping with Model Shipways design procedures, and some minor changes in the rig have been made based on further research. Model Shipways would like to thank Dr. Feldman for making this design available and for his assistance during the kit's development. Thanks also to Jack Silvia, Little Compton, RI, for his assistance in assembling prototype hulls and checking the accuracy of the laser-cut parts, and reviewing plans and instructions, and to Bob Werner, Hollywood, FL, for assembling the prototype model, photos of which are included herein.

Before You Begin

The *Virginia Sloop* is an interesting ship and makes a splendid model. The model is well suited for the beginning ship modeler. At 1/4" = 1'0" scale, it is easy to build and obtain precise detail. Plank-on-bulkhead hull construction with laser-cut parts offers a unique building method that assures an accurate hull form. The model has double outer hull planking (with single planking option suggested), and all exposed surfaces except for decks and spars are walnut, for those who desire a natural oiled finish. Color schemes are provided for those who prefer to paint the model.

The plans and instructions included have been expanded from previous Model Shipways kits in an effort to assist the beginner.

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

Working with the Plans & Parts

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.

To avoid losing small fittings and hardware, sort them into labeled boxes or compartments. These should have lids to keep out dirt.

1. The Plans

Seven plan sheets are provided:

1. Laser-Cut Wood Patterns
2. Hull Framing and Planking
3. Deck Plan, Profiles, and Deck Structures
4. Mast & Spar Details, Sail Plan, & Belaying Plan
5. Standing Rigging
6. Running Rigging (1 of 2 Plans)
7. Running Rigging (2 of 2 Plans)

Model Shipways' *Virginia Sloop* kit is manufactured to a scale of 1/4" = 1'0" (1:48). Each sheet is drawn to that scale except areas enlarged to show detail. Most dimensions can be lifted directly off the plans by using draftsman dividers or a

"tick" strip (piece of paper such as an adding machine roll). Lay the paper strip over the plan, carefully mark the item's length with a sharp pencil, then transfer the marks to the wood.

Because these are modelbuilding plans, actual measurements are given in model inches. For comparison, 1/32" on the model is equal to 1.5" on the real ship, 1/16" is 3", 1/8" is 6", and so on. The table on Plan Sheet 3 compares scale with full-size dimensions and converts imperial numbers to metric.

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). If necessary, move a belaying point. Put yourself on the ship, 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 even curves).

A complete set of hull lines is not needed for this model, because laser-cut bulkheads and the center keel define the hull's shape. Plan Sheet 2 shows the bulkhead lines. They are similar to a ship's *body plan*, or sections, and illustrate how the hull curves from top to bottom.

4. Kit Lumber

Strips and sheets of basswood and walnut are supplied in the kit. Model Shipways occasionally substitutes lime (*Tilia vulgaris*), a European wood, for basswood (*Tilia americana*) in its kits. Both have a fine, uniform texture and straight grain. Lime, however, has superior steam-bending qualities. It is often called basswood in Europe.

Some of the walnut supplied in the kit will be purchased from a foreign source in metric units. Consequently, there may be a slight variance from the walnut dimensions shown on the plans and in the instructions. However, this should present no significant problems.

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

These fittings 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. Next, wash fittings in dishwashing liquid and warm water to remove traces of mold release agent and the body oils your fingers deposit. Allow to dry thoroughly before applying primer and painting.

6. Soldering & Working with Brass

Extensive soldering isn't required to assemble the *Virginia Sloop*. However, here are a few tips:

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 straight edge, 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 mount a handpiece for flex-shaft machines in a hobby drill press. Several companies manufacture this tool, and it is worth the cost. 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 clamp the pieces to the drill press table or hold them down with a wooden stick. Do not touch the brass! If possible, keep the RPM below 2000. Anything higher will 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, many solders are lead free. They are 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, 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 do both.

Rinse parts in clean water after cleaning them 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 the model. Those who have modeled before may have their favorites.

A. Knives and saws

1. Hobby knife with #11 blades
2. Razor saw or jeweler's saw

B. Files

Set of needle files; steel or diamond coated

C. Clamps

1. A few small C-clamps
2. Wooden spring-type clothespins (craft shops have small versions)
3. #16 and #33 rubber bands

D. Tool Set

Small carving tool set or individual gouges and chisels for carving keel rabbets, stern wing transom, and filler blocks, and tapering the stem and rudder.

E. Sharpening Stone

Keeps tools razor sharp.

F. Boring Tools

1. Miniature bits sizes #60 to #80
2. 1/16", 3/32", and 1/8" bits
3. Pin vise

G. Miscellaneous

1. Tack hammer
2. Tweezers (a few)
3. Small, fine pointed scissors
4. Miniature pliers
 - a. small round
 - b. flat 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 and medium grit garnet or #100 to #220 aluminum oxide

2. #400 wet-or-dry sandpaper

I. Sail cloth

Light weave cotton or linen cloth if sails are desired. Model Expo sells a suitable cotton cloth.

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. Five-minute epoxy provides extra strength for affixing fittings. Cyanoacrylates, 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 or tacking hull planking to the bulkheads.

Painting & 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, to fill any scratches and defects, then sand and prime again.

Preparing walnut for painting: This kit contains walnut wood for most of the outer surfaces. Walnut is an excellent wood for a natural oil or varnish finish. However, if you intend to paint any walnut, the use of a paste filler or spackle is highly recommended. Walnut has a more pronounced grain than a wood such as basswood or cherry. Filling the grain will result in a more satisfactory painted surface.

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.

Many hobby paints are satisfactory, including 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 will provide durability and seal any decals or dry-transfer lettering.

Brush painting: Painting with fine, soft bristle brushes is probably best for the beginner. Many skilled modelmakers prefer the brushed-on technique, because its subtle imperfections impart a more life-like 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 they are 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 recommended thinner or with alcohol, a satisfactory substitute. Thinning water-based paints with water creates surface tension problems, resulting in poor coverage and spray atomization. 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 paint 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 dry thoroughly 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 Post-It pads. In fact, Post-It tape flags can be used for masking.

2. Virginia Sloop's Color Scheme

Three color schemes are suggested as follows:

Painted model

This scheme would be typical for an original ship of this period.

Note: Refer to the instructions in the previous section regarding painting of walnut before you proceed.

Main rail, quarter deck and cabin rail, taffrail, and fashion pieces – Black

Black strake and wales – Black

Molding on black strake (top edge of black strake) – Antique gold

Hull side and transom planking down to the black strake – Yellow ochre

Option: Paint the sheer strake under the main rail light blue, red, or green.

Swivel gun posts – Yellow ochre

Hull below the wales – Tallow

Stern window frames – Antique gold

Timberheads – Natural finish

Inside bulwarks – Dull red

Inside of gunports – Dull red

Decks, including waterway, and cabin top – Natural finish

Cabin front and doors – Natural finish

Companionway – Natural finish

Binnacle – Natural finish

Bits – Natural finish

Steering wheel – Paint casting color of natural wood

Steering wheel stand and drum – Natural finish

Hatch coamings – Natural finish

Hatch covers – Natural finish

Grating – Natural finish

Galley stack – Black

Quarter deck ladders – Natural finish

Catheads – Dull red inboard (same as bulwarks), black from inboard edge of rail and outboard

Iron work (pintles and gudgeons, chain plates, hatch rings and cannon carriage rings, mast cap, bowsprit straps, companionway hinges, cabin door hinges, and jibboom irons) – Black

Anchors – Black shank with natural finish stock

Cannon barrels and swivel guns – Black

Cannon carriages – Dull Red

Cannon trucks – Black

Boom crutches – Natural finish

Mast – Natural finish with black mast wedge/coat. Black masthead and very top of topmast.

Boom and gaff – Natural finish. Black at very end of boom and gaff.

Yards – Natural finish. Black yardarms.

Bowsprit – Natural finish

Jibboom – Natural finish. Black at very end of jibboom.

Blocks – Natural finish

Note: For the above colors, the following Model Shipways acrylic marine paints approximate the colors:

Black – Hull/Spar Black, MS4830

Yellow Ochre – Hull Yellow Ochre, MS4829

Tallow – Hull Tallow, MS4803

Dull Red – Bulwarks/Gun Carriage Red, MS4802

Antique Gold – Antique Gold Trim, MS4806

Note: For natural finished basswood decks and beech dowel spars, we suggest using a light tan or maple stain, followed by oil or low gloss polyurethane varnish. For natural finished walnut items, use a clear oil finish.

Natural finish

Many natural finished models are displayed in European museums. Consequently, the process is most popular overseas. It has also become popular as a result of foreign kit sales in the US. Most foreign kit models feature walnut planking. This scheme retains the natural beauty of walnut.

For all walnut areas, use an oil finish such as tung oil or Danish oil. No stain is required. For best results apply about three coats of oil, buffing between coats. The more oil you add the higher the sheen. For the basswood decks and birch dowel masts, stain the wood first. A light maple or pine stain would be most appropriate.

As an option, use a polyurethane satin varnish in lieu of oil.

Natural finish with touches of color

A pleasing balance between a natural and fully painted model.

Use an all-natural finish, except for touches of color. You could use the colors listed above for rails, bulwarks, catheads, black strake and wales, black strake molding, sheer strake, galley stack, and all ironwork, stern windows, cannon barrels, swivel guns, and anchors. Or, make a choice of your own.



Stage 1: Framing the Plank-on-Bulkhead Hull

Before getting started on this project, a few important terms and abbreviations are in order, especially if you are a beginner.

Port or (P) – Looking forward, this is the left side of the ship.

Starboard or (S) – Looking forward, this is the right side of the ship.

P/S – A designation you will see on plans and in instructions. This tells you that the same identical part, rig, or whatever, appears on both the port and starboard sides of the ship in the same location.

Model Shipways plans are drawn showing the starboard side of the ship. In this case, the bow is pointing to the right. This is common practice for model plans as well as real ship plans.

Some of the other stages will have specific terms defined to help you understand terms used on the plans and in the instructions.

1. Bending Wood

Building a plank-on-bulkhead hull requires bending some wood without distorting its desired position (doing so stresses glue joints and fasteners). Wood can be 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.

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.

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, place the plank in a fixture 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. Resoak 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 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 it 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. Another tool (Amati's Form-A-Strip, 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.

2. Preparing the Center Keel

The center keel is laser-cut from basswood. With a sharp pencil, draw lines below the bulkhead slots from the slot down to the bearding line to help align the bulkheads when slid into the slots. Then draw the bearding line shown on the pattern on Plan Sheet 1. Mark on both sides of the center keel. Be critical and measure from several points on the plans when marking the lines.

3. Installing the Stem, Keel, & Sternpost

The stem, keel, and sternpost are laser-cut from walnut. Add them to the center keel. Taper the stem as shown on the plans. Align and hold the pieces with dowels, located as shown on Plan Sheet 2 or wherever suits you (*Figure 1-1*).

Note: The Figure suggests tapering the parts before installing. However, you may find it easier to do this later. If something is not exactly square, tapering later will give you a chance to make the tapers more even on each side.

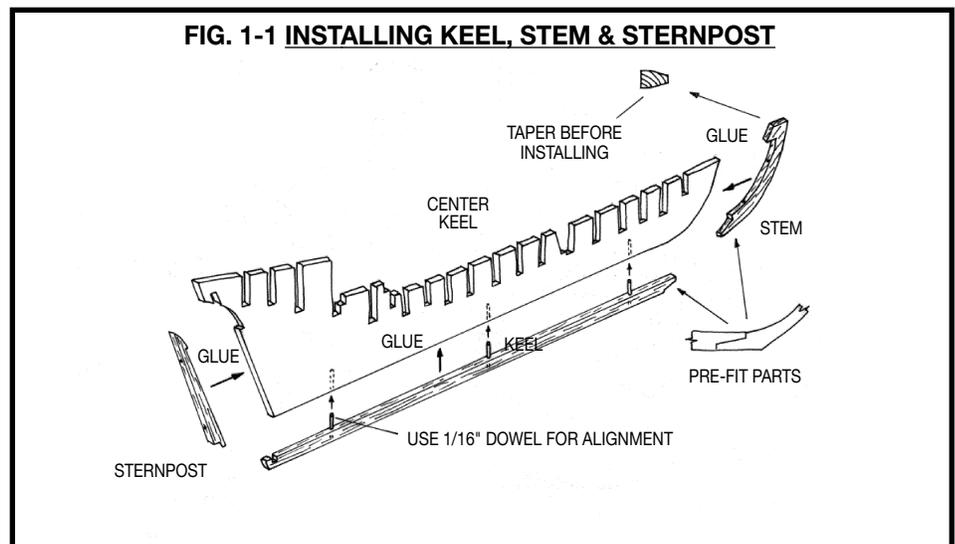
4. Cutting the Rabbet

The *rabbet* is a generic term referring to the entire groove where planks are fitted along the stem, keel, and sternpost. The *rabbet line* is the glue line between the stem, keel, and sternpost and the center keel. The *bearding line* is the intersection of the center keel with the planking's inner face. Measure the bearding line's location from Plan Sheet 1 (you already should have done this), then mark it on both sides of the center keel.

Note: The rabbet varies depending upon its location. Cut the depth of the rabbet to suit the thickness of combined outer and inner layer of planking. Do this with a #11 hobby blade. Using a 1/8" or 1/4" wide flat chisel, start the rabbet cut at the bearding line and cut a tapered groove toward the rabbet line. The plans show a sketch of the actual shape of the rabbet cut.

To judge the rabbet angle, position a scrap plank against the keel as you carve. The double planking scheme consists of a basic 3/64" thick first layer of basswood covered by 0.020" walnut strips. Glue a short piece of these strips together for your scrap test plank. When the hull is

FIG. 1-1 INSTALLING KEEL, STEM & STERNPOST



planked, these timbers should lie flush on the cut portion from bearding line to rabbet. When cutting the rabbet amidships and forward, temporarily insert the bulkheads in the center keel slots to determine the angle the planks will take when installed. Use your scrap plank at these angles when cutting the rabbet. The rabbet detail is shown on Plan Sheet 2 and in *Figure 1-2*.

When cutting the rabbet at the stern, work slowly. The port and starboard rabbet cut nearly meets at the center of the center keel. Work too fast and you might cut through the entire center keel.

5. Installing the Bulkheads

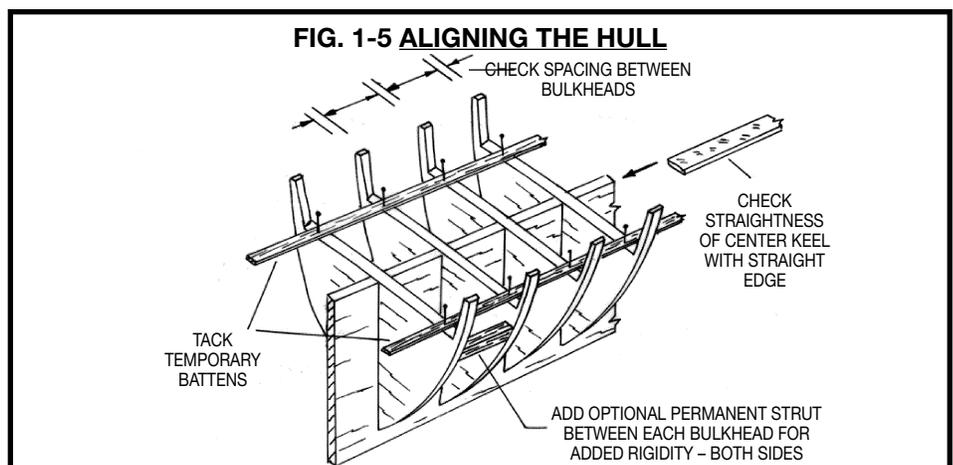
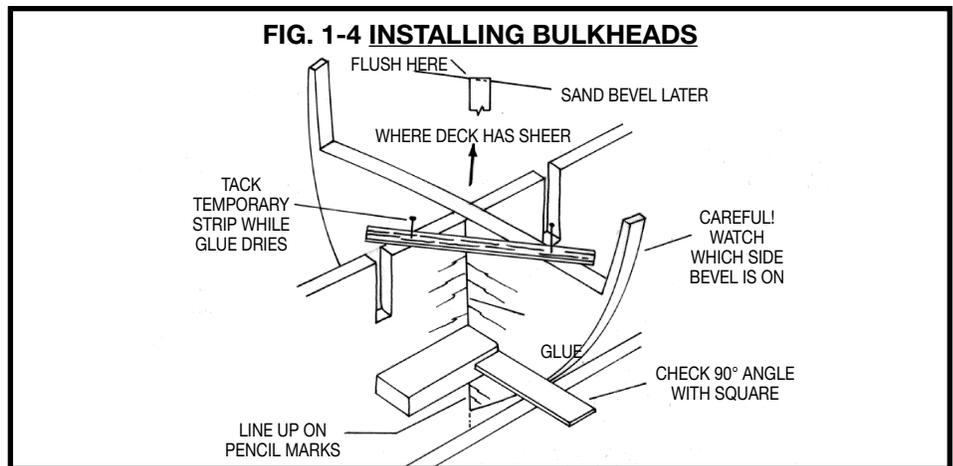
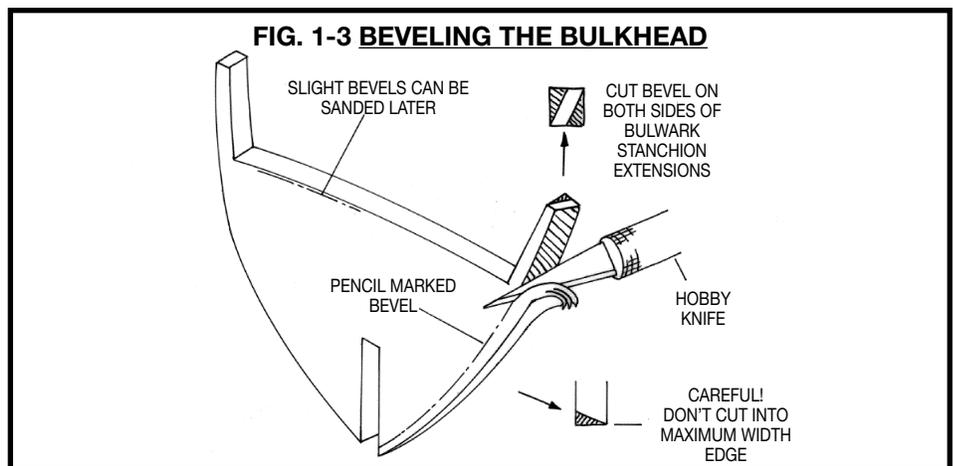
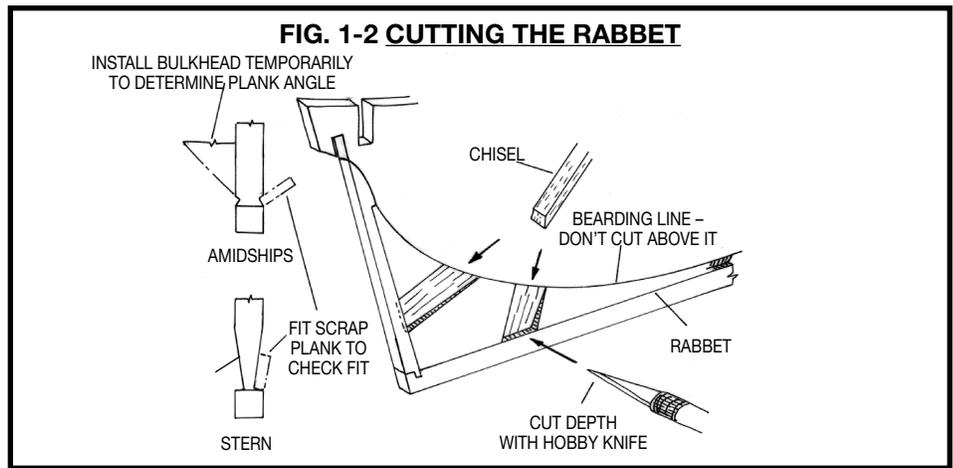
The bulkheads are laser-cut basswood. Label the bulkheads A through R. Test each one to make sure it slides into the correct center keel slot. If the fit is too tight, sand the slot. Bulkheads should fit snugly with a little tolerance for glue.

Use a tick strip to transfer the bevels shown on Plan Sheet 1 to the bulkheads. Mark them in pencil. Cut the bevels with a #11 hobby blade per *Figure 1-3*. Deck bevels and side bevels amidships are hardly measurable. These can be sanded in after the bulkheads are installed.

The bevels are required on both the inner and outer sides of the bulwark stanchion extensions (*timberheads*). The extensions on the forward bulkheads are rather thin, so be careful not to break them off as you work. Once the hull is planked with outboard planking and inboard ceiling plank, the bulwarks will have sufficient strength. As an option, you can cut the outside bevel for outer hull planking and wait until the hull is planked before beveling the inside. This would maintain a stronger bulwark as you work on the outer planking.

Glue the bulkheads in place. Make sure the top of each bulkhead is flush with the top of the center keel. Use a small machinist square to set each bulkhead perpendicular to the center keel, then tack a temporary strip to the top of the bulkhead to hold it in place while the glue dries (*Figure 1-4*).

After installing all the bulkheads, check the straightness of the center keel with a straight edge, then tack or tape a temporary batten (just a strip of wood) on each side of the hull on the outboard edge of the deck (*Figure 1-5*). This is a critical step. Measure the spacing between each bulkhead on both sides and retack the battens until the hull is aligned. These battens should remain in place until you do some planking, or better yet, add a permanent strut between each bulkhead for added rigidity, then remove the battens.



Be certain the bottom of each bulkhead feathers out at the bearding line. Trim as necessary to line up. Bottoms on the most narrow bulkheads may be slightly above the bearding line caused by laser burning the narrow wood (*Figure 1-6*).

Next, sand in the bevels that were not pre-cut. Lay a 1/8" thick square basswood batten against the bulkhead edges at various locations to check the hull's fairness (*Figure 1-7*). Sand or add shims to correct bumps and dips. This is an important check; hull planks must lie flat against the bulkheads. Due to the *Virginia Sloop's* numerous bulkheads, manufacturing or assembly errors can occur. 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.

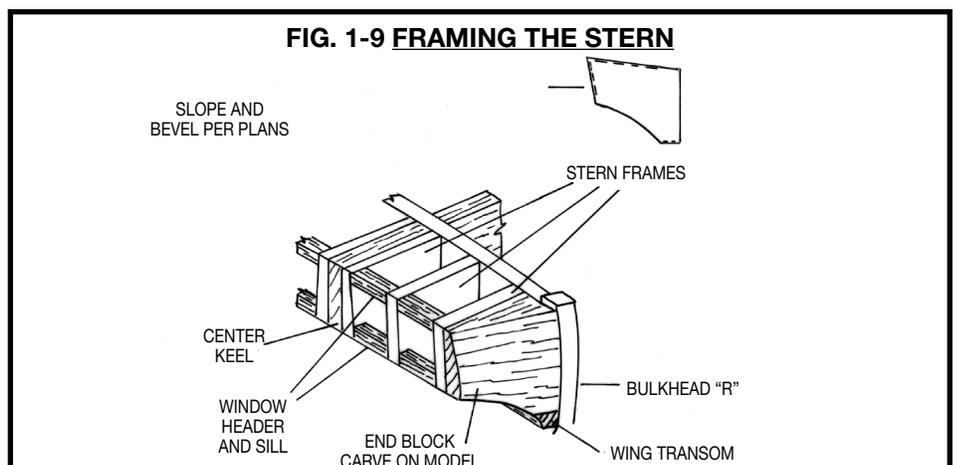
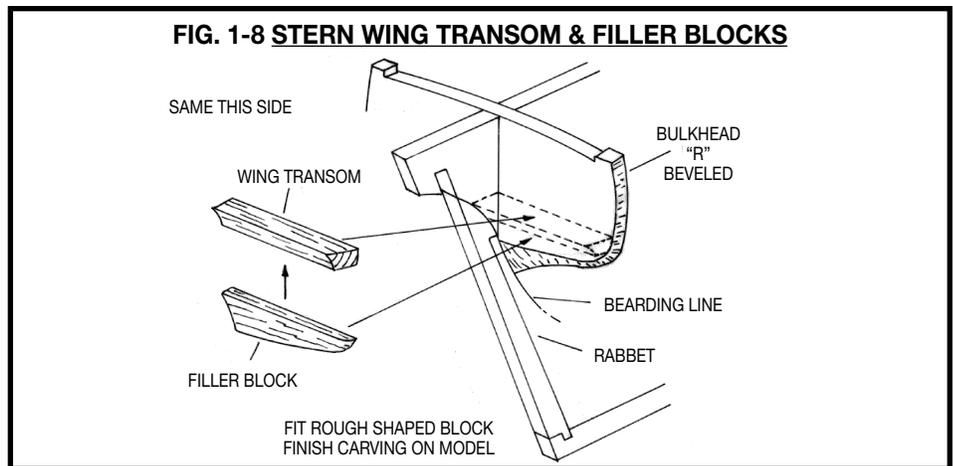
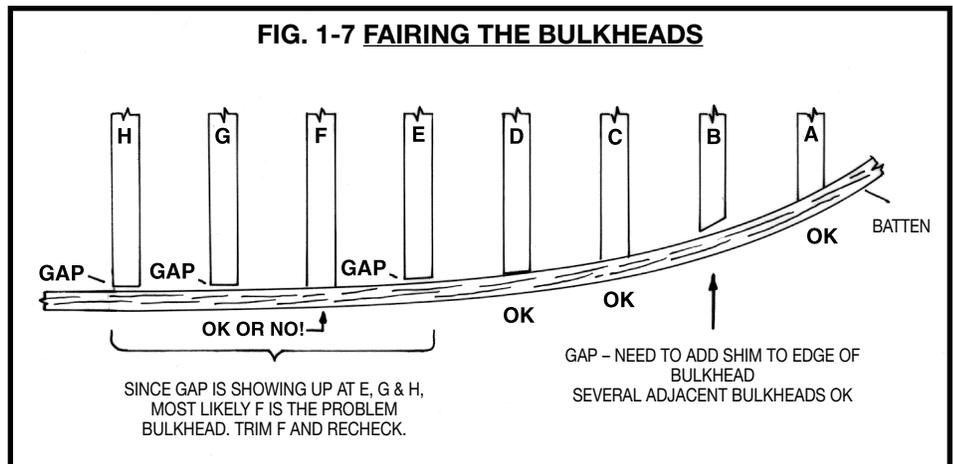
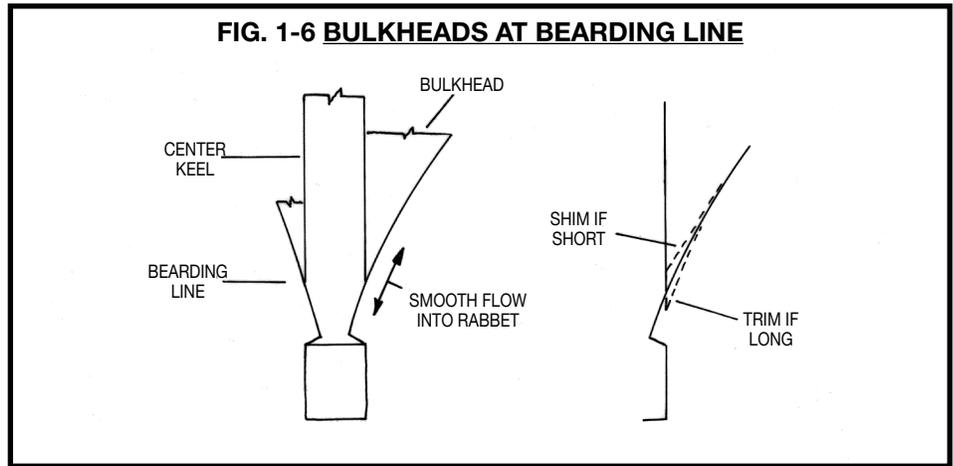
6. Installing the Wing Transom, Filler Blocks, and Transom Frames

Carve the wing transom (two halves) from a basswood block included in the kit. Use the shape shown on Plan Sheet 2, and glue the wing transom halves to the aft side of Bulkhead R and to the center keel. Below the wing transom, fit and carve the basswood filler pieces. This is nothing more than a filler between the edge of Bulkhead R and the wing transom so the hull planks have some gluing surface. On a real ship, this area would also be filled with stern framing (*Figure 1-8*).

On top of the wing transom and against Bulkhead R, glue the six laser-cut basswood stern frames. You will need to taper the top and bottom first, as they sit at an angle. Also, the center frames (one on each side of the center keel) must be tapered from bottom to top, or just taper an area in way of the windows. Angle the frames so they are in line with the sides of the stern windows. Double check the location of these frames, because the stern window frames (these windows are also called *stern lights*) will fit between them.

Fit a header and sill piece for each window. These can be basswood, since they do not show after the window frames are added. The header piece also serves to provide end support for the cabin top sub-deck and planking. Finally, fit and carve the filler blocks on each side out-board of the outer stern frame. These butt into Bulkhead R and are carved to the hull form.

Figure 1-9 illustrates the stern framing. This is a good time to paint the interior black so that nothing will show through the windows after the planking has been installed.



7. Installing the Bow Filler Blocks, Knightheads, and Timberheads

Forward of Bulkhead A, install the filler blocks on both sides. Carve from basswood blocks included in the kit. The plan provides some sections through the block. To aid you with carving the blocks correctly, make templates from these sections. Fit the templates as you carve the blocks – you could easily flatten the block and not have the fair waterline curves in way of the block. These blocks provide a gluing surface for the forward end of the hull planks. It is suggested that you pre-carve the blocks close to the waterlines before placing on the model, then finish the correct shape while on the model, using battens to make sure the blocks flow along hull lines. Fit the knightheads and timberheads in notches cut in the filler blocks. The plan shows the shape of these parts (*Figure 1-10*).

8. Installing the Mast Mortise

Since Bulkhead F interferes with the mast going into the hull very far, the heel of the mast must be tapered and fit into a socket (mortise box) on the center keel. *Figure 1-11* and Detail 2-C on Plan Sheet 2 illustrates the socket. Do the socket now, because you cannot get to it after the deck is planked. Cut the tenon in the bottom of the mast so it fits the socket.

9. Gunport and Sweep Port Framing

The bulkheads are located to form the sides of all the gunports but allow space for lining the sides of the openings with 0.020"-thick walnut strips. The walnut strips are not a required construction feature, but are added only to retain a walnut covering for those who desire a natural finish. Stage 2 discusses this further.

Fit a basswood header and sill between the bulkheads. Add these pieces to project slightly beyond the bulkhead extensions, then sand flush inboard and outboard (*Figure 1-12*).

The sweep ports are shaped like an oar blade with a hole in the center for the handle. Since these openings will be cut through the bulwark, you need a filler piece in between. Add a filler piece just wide enough to cover the opening (*Figure 1-13*). Like the gunport headers and sills, sand flush with the bulkhead extensions. The actual opening for the sweep ports can wait until the exterior hull and ceiling plank are installed; then, cut the openings through the entire side. However, it would be a good idea to drill the center hole for the ports through the filler piece at this time.

10. Installing Deck Beams, Sub-Decks, and Waterway

Deck beams: Before you can install the sub-decks and plank the deck you'll need some deck beams – one to support the ends

FIG. 1-10 FRAMING THE BOW

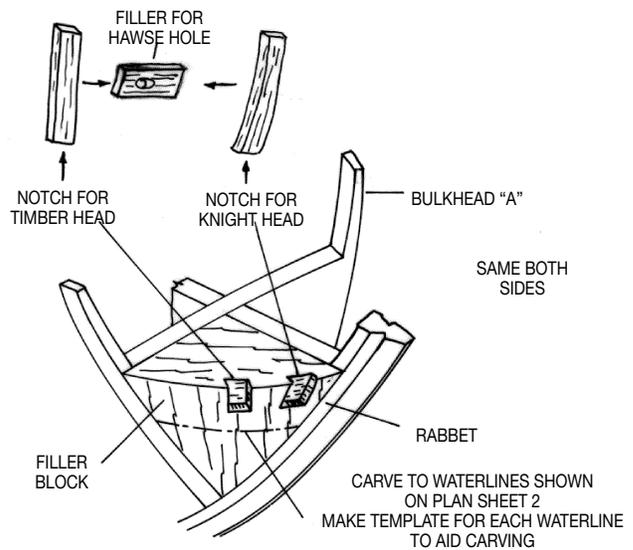


FIG. 1-11 MAST MORTISE

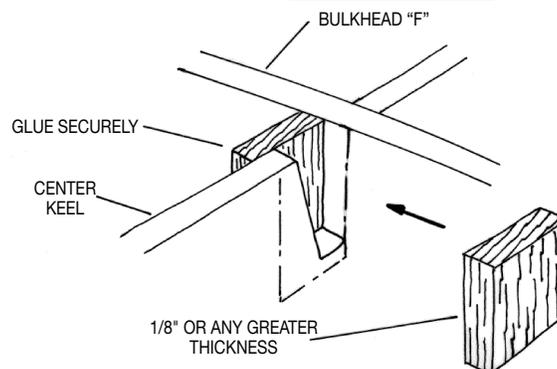


FIG. 1-12 FRAMING GUNPORTS

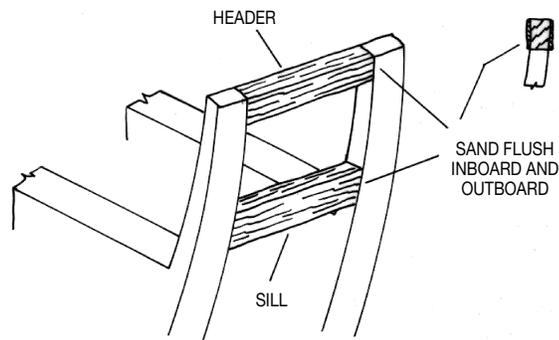
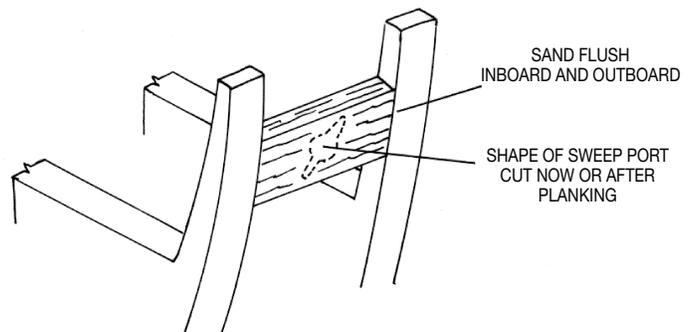


FIG. 1-13 SWEEP PORT FILLER BLOCK



of the main deck planking at the quarter-deck, and two to support the forward and aft ends of the quarterdeck planking. All three beams fit in pre-cut notches in the center keel. These beams are laser-cut basswood but will need trimming on the ends to fit. The two forward beams are butted against a strip fitted between bulkheads (*Figure 1-14*).

Sub-decks: The kit is supplied with laser-cut 1/32" thick basswood sheet as a sub-deck under the basswood deck planks and walnut cabin top planking. This provides a firm support for the hatch coamings and deck planks. Also, many modelers like to mark the planking runs in pencil on the sub-deck as a guide before actually installing the planks. The sub-decks include cut-outs for the bulkhead timberhead extensions and the locations of hatches, pumps, bits, and the mast mortise. The laser-cut sub-deck may need to be trimmed a bit to fit against the bulkhead timberheads (*Figure 1-15*).

Note: The decks have both camber and sheer. This means the sub-deck sheet must be bent in two directions to fit the top of the bulkheads. Before gluing, pin the deck bulkhead by bulkhead pinning at the center-line, then along the side. This sort of relieves the stress in the deck so it will fit. Just make sure the sub-deck will lie flat on all bulkheads and the center keel before gluing.

The sub-decks can be glued to the bulkheads from below, but you will need to use a brush or stick to reach the deck between the narrowly spaced bulkheads. A better way is to pre-drill small holes through the sub-decks in way of the bulkheads. With the sub-decks pinned securely to the bulkheads, squirt some super glue through the holes. Capillary action will distribute the glue along the bulkhead.

Waterway: The laser-cut walnut waterway runs from the quarter deck to the bow inside the bulwark extensions. The laser-cut is a rectangle in cross section. Shape it as shown on Plan Sheet 2, Section A-A and in *Figure 1-16*. Glue the waterway on top of the sub-decking and against the bulwark stanchion extensions.

11. Main and After Rails

These will be installed after the hull and bulwark planking is completed. Refer to Stage 2.

12. Before Moving On

Before proceeding with the hull and ceiling planking, check all the framing. Make sure it is all in place and all nice and flush. The framing sets the foundation for the final planking – you don't want to get started and find out that something is out of skew. Double check those bulkhead bevels, so you know when you plank you will have a fair hull form. Many beginners tend to rush through this stage only to find they are really not ready for attacking the planking.

FIG. 1-14 DECK BEAMS AT QUARTER DECK

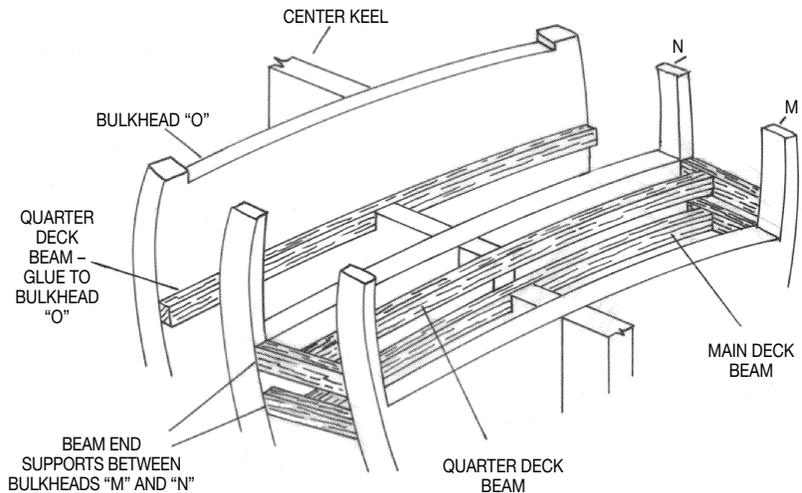


FIG. 1-15 INSTALLING SUB DECKS

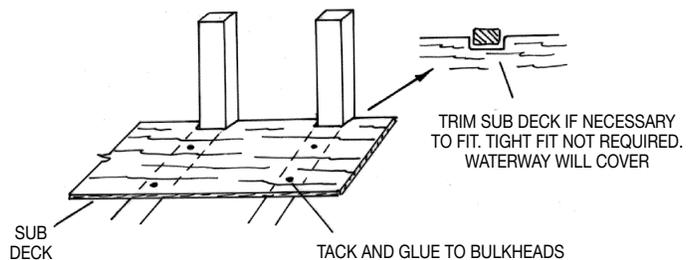
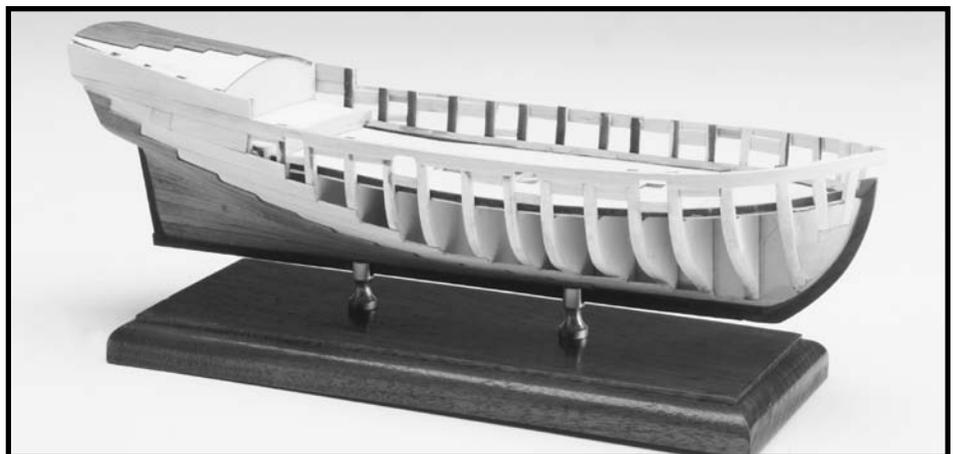
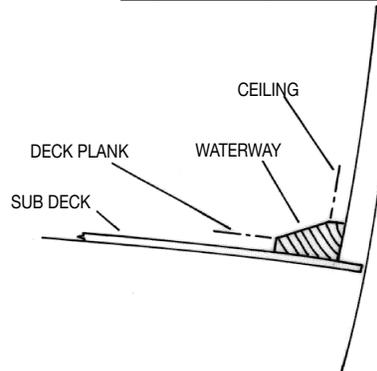


FIG. 1-16 INSTALLING THE WATERWAY



Stage 2: Planking The Hull And Installing The Rails

1. Getting Started

Most modelers find planking tedious. Work slowly and think of each plank as a project unto itself. Since hull sides are identical, simultaneously cut one pair of port and starboard planks to shape. Fit the plank on one side, then the other. Don't rush. Speed results in frustration and a poor job.

Before starting, secure the hull upside down in a vise or cradle. Something portable that rotates is ideal. Model Expo sells a planking vise for this purpose.

2. Planking Battens & Belts

Hulls are easier to plank when divided into belts. They flow along the hull in smooth curves. Each is designed to lay the planks against the frames without excessive edge bending. They gently sweep up at the ends like the deck sheer. Planks within a belt are usually evenly spaced, tapered, and fitted. Belts prevent errors from accumulating.

When selecting a belt width and the number of planks it contains, consider how the planks taper and lay against the frames (bulkheads on our plank-on-bulkhead model). If the planks are too wide, they won't lie flat against the bulkheads. Taper them too much and not enough stock is left for fastening. Should this happen, a larger plank must be substituted for two planks to increase the width. In some areas, the distance between planks widens rather than tapers. If it becomes too wide, a stealer must be added. While these alterations are acceptable and are employed on many ships, the best run of planking limits the number of stealers. *Figure 2-1* illustrates some inserts.

Plan Sheet 2 provides in-depth details on how to lay out the planking. Study the fore and aft views plus the profile view to gain a complete picture.

3. Planking Butts

Few trees grow as tall as ships are long. Consequently, real planks were generally 20 or 30 feet in length (5" to 7-1/2" model scale). Some modelers think a plank as long as the hull is easier to use. They scribe in fake butts or omit them.

Although this can be done, working with shorter planks is more realistic and has advantages. For example, tapers mark quicker and planks are easier to hold and fasten. Should a mistake occur, only a small piece is affected.

To emulate shipwright practice, stagger the butts (*Figure 2-2*). Follow the shipwright's rules (indicated as "real ship" in several drawings) as much as possible.

Common Shipbuilding Terms Used in the Planking Process

Plank: Single length of wood used to plank a hull or deck. A strake is a continuous line of planks from wherever it begins to where it ends.

Garboard strake: Planking strake adjacent to the keel.

Broad strakes: Several planks adjacent to the garboard; wider than most but not as wide as the garboard.

Sheer strake: Uppermost line of planking on a hull.

Black strake: Heavy hull strake along deck edge, so named because of its usual color.

Wale: Heavy plank or layer of hull strakes below the black strake.

Ceiling: Planks on the inboard side of frames or bulwarks.

Spirketing plank: First ceiling plank above the waterway inboard, usually forming the sill of gun ports.

Belts: Group of planks along the hull. Belts are laid out using battens (temporary strips of flexible wood).

Spiling: Process for marking and cutting a plank to a given shape.

Edge bending or springing: To bend a plank edgewise.

Fair: Refers to smooth, gradual curves when planking.

Nib: The pointed end of a tapered plank. Because nibs rot first, shipwrights squared them off, then notched the margin plank (covers outer edge of deck) to accept the butts. Consequently, they called the margin plank the nibbing plank.

Nibbing: Process of seating the squared, tapered end of one plank into the edge of another. Nibbing generally applies to decks, but sometimes hull planks, especially at the bow, are nibbed. The British call this procedure joggling.

Stealer: Plank inserted into another plank or between two adjacent planks to reduce their width and provide greater width of coverage. Or, when two planks taper toward a narrow end, both may have to be cut off and a wider plank substituted to leave enough wood for fastening.

Counter: Underside of the overhanging portion of a ship's stern.

FIG. 2-1 PLANKING WITH STEALERS

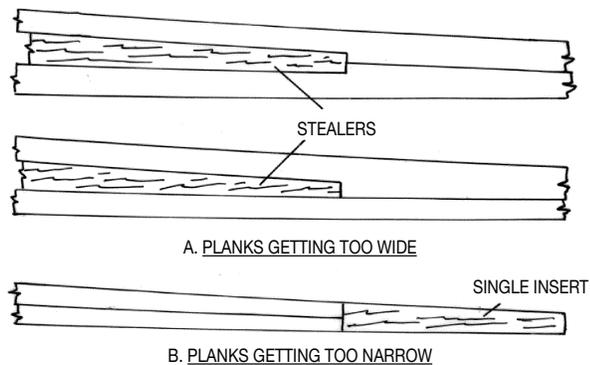
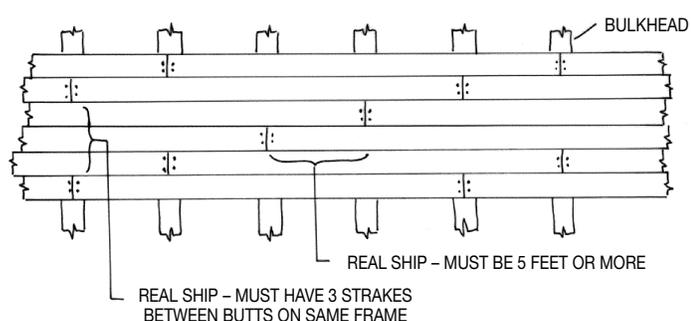


FIG. 2-2 STAGGERING THE PLANKING BUTTS



4. Spiling

Edge bending planks on real ships occurs on a limited basis. Wood is rigid, so many planks must be cut to shape. Spiling (Figure 2-3) is simply a matter of transferring curves to a straight plank, then sawing them out. Many narrow planking strips (especially on models) are flexible enough to edge bend in place. However, others must be spiled.

5. Fastening the Planks

Avoid the commercial plank clamp that screws into the edges of bulkheads. This leaves a big hole to contend with when installing subsequent planks. Instead, hold short pieces and use aluminum-head push pins to position them. Be careful not to split the wood. If necessary, drill a pilot hole first. Smear a light film of white or woodworker's glue along the edge of the plank, then touch each bulkhead with thin cyano to affix the plank quickly. Be careful not to glue your fingers to the model.

Another approach is to apply cyano to the edge of a plank already in place and on the bulkheads above it. Spray or brush the cyano's accelerator on the plank to be installed, then hold it in place. The glue sets instantly, and no clamps are necessary.

While glue alone will secure a plank, small brass brads or wooden treenails (pronounced *trunnels*) provide additional holding power and duplicate shipwright practice. If using brads, hammer them in after cutting off and discarding their heads.

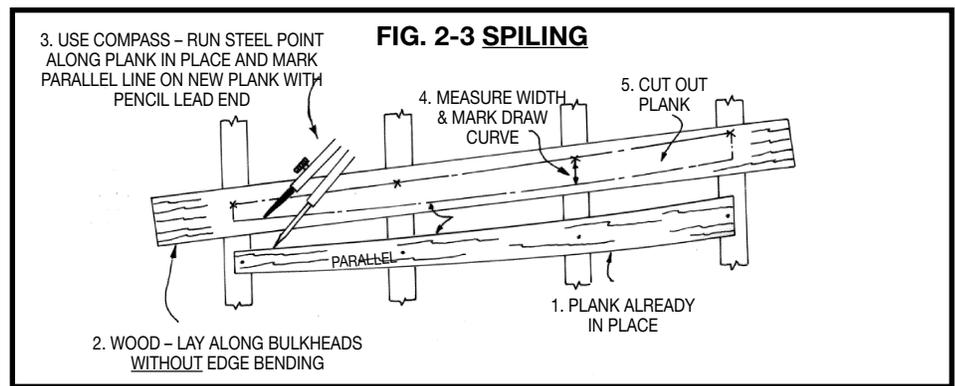
Treenails are commercially available, but making your own is easy. Buy a package of long bamboo skewers, strip off short lengths, and pull through a drawplate to the desired diameter. Drill holes through the plank into the frame, dip the treenail in white or yellow glue, and drive in place. Nip the dowel flush with the planking. For more authenticity, add treenails where each frame would be located on a real ship. Although time-consuming, this is visually correct.

Another alternative is to whittle flat toothpicks (round ones don't work as well) to a point. Place the entire toothpick in the hole, rap sharply with a 10-inch bastard file, and break off the remaining portion. A file works better than a hammer, because its serrated surface catches and firmly holds the head of the toothpick, permitting it to be driven in tightly. Exterior stubble is dressed and sanded smooth when treenailing is completed.

6. Hull Planking Scheme and Procedure

The planking scheme for this model is shown on Plan Sheet 2.

Double vs. single planking: Although single planking would be the real ship



approach, this kit is designed with double planking. The first layer of planking will be all 3/64" thick basswood strips. The outer layer will be 0.020" thick walnut for the basic plank, and thicker for the black strake, wale, and sheer strake below the rail.

As an option, you could single plank the hull. Suggested sizes are as follows:

Basic plank – Use the 3/64" basswood provided or 1/16" thick basswood or walnut. If 3/64" is used, use a thicker garboard strake to fit the rabbet that was designed for 3/64" plus 0.020" double planking.

Black strake – 3/32" thick basswood or walnut.

Wale – 1/8" thick basswood or walnut.

Sheer strake – 3/32" thick basswood or walnut.

The 3/64" basswood included in the kit for the double plank underlay could be used for the basic single plank. All other sizes and wood types would have to be purchased separately. Model Expo stocks all the sizes needed.

First layer of planking: There are two ways to approach applying the basswood under planking:

1. Plank the entire hull in any fashion you desire, with no regard for locations or proper plank widths except for the wales. You can use as many straight planks as possible and taper some at the ends if necessary. All you are trying to do is cover the entire hull with basswood. Fill all gaps and fill cracks with wood filler, then sand the entire surface so you have a solid base on which to apply the outer layer of walnut.
2. Lay out the basswood under-layer exactly as you would the finished walnut layer, using correct plank widths, and locating the wale, black strake, and other thicker plank areas in the correct locations on the hull. When the walnut layer is applied, it will be identical to the under-layer of basswood. However, in the event there are some mistakes with the first layer, these mistakes can be corrected on the final walnut layer.

The second approach is highly recommended. By planking to the rules and

correct locations of planks, you will gain some experience laying out the planking. Practice makes perfect. The final layer of walnut will be much easier, since you have already attempted it once.

The following paragraphs address the correct locations for both the first and final layers of planking.

Planking procedure: The transom and counter should be planked first, both the under planking and the walnut-finished planking. Next, the fashion piece at the stern should be added, followed by side planking, then end planking. The fashion piece is introduced early, because it covers the end grain of the transom and counter planks, but more importantly, the side planking above the wale butts into the fashion piece and the transom. The side planks do not go under the fashion piece. Likewise, the counter is done early since the lower hull planking will be butting into the lowest counter plank. This sequence will be described below.

7. Planking the Hull

Planking the counter and transom: The bottom of the lowest counter plank is in line with the bottom of the wales along-side. The transom and counter will be double-planked. Plank the transom with the under-layer of basswood first and follow with the outer layer of walnut. Leave the openings for the stern windows in the transom, and a hole for the rudder post in the counter. Extend the transom planks past the hull a bit to account for the quarter extensions. Then shape the edge to the correct shape for receiving the fashion piece. An expanded view of the transom is shown on the plans, which list exact plank lengths and widths.

Note: The upper basswood plank for the transom is actually two planks wide. This is because there is no backing of the plank above the cabin top. However, the walnut outer layer is two separate planks.

Next, add the walnut filler piece on the front side of the transom. This filler piece thickens the transom, but more importantly it covers the exposed portions of

the basswood planking on the transom. *Figure 2-4* illustrates the transom and counter planking. The filler in front of the transom is shown in *Figure 2-5*, along with the fashion piece discussed below.

Note: The counter planks are straight across, but the transom planks follow the curve of the taffrail. So, cut these planks from wider pieces. Make a template for the curved planks so you can cut them all the same.

Installing the fashion pieces: Shape and fit the walnut fashion pieces on both sides of the stern, covering the end grain of the transom and counter planks. The curved portion of the fashion piece must also be tapered slightly so its width winds up flush on top of the wale (*Figure 2-5*).

Installing the taffrail: You might as well go ahead and install the walnut taffrail on top of the transom at this time, or wait until you are working on other rails at your option.

Planking the hull sides: At this point, you can proceed with the hull side planking. Do all the basswood under planking first, then do the walnut-finished planking.

Installing the wale: The wale is the thickest stroke and located in line with the waterway inboard. It's a good stroke to start with.

Use a 3/64" thick basswood plank for the first layer. It will be covered with 1/16" x 3/16" walnut later. An important note: at the stern, the wale extends aft to the outside of the counter planking, so cut it off flush with the counter planks. Since the end of the basswood wale would show when looking at the stern, there are a couple of options for making the exposed end look like walnut. First, use a short length of walnut for the wale at the very end instead of basswood. Or, stain the end of the basswood to look like walnut.

The finished width of the wale is 3/16", but it may require cutting from a slightly wider piece, especially the walnut. Its natural bend is almost on the button, but you may need to cut a slight downward curve on the top side of the plank to fit the marks. Tick off the location for the top of the wale from the plans and mark it on the bulkheads. As noted, from the quarter deck forward where the inboard waterway is located, the top of the wale lines up with the top of the waterway. Bend and perhaps steam bend the wide wale piece around the hull as close to the marks on the bulkhead as possible. Using a spiling technique, mark the piece. There is no plank above as yet, so you can't spile along a plank. Draw a curve through the points and cut the top edge of the plank. Now fit it to the hull and see if it lines up on the marks. If not, trim a little and try again until it fits. Once the top of the plank fits, draw a parallel line 3/16" below the top edge for the bottom edge (*Figure 2-6*). You can now glue the wale to the hull.

FIG. 2-4 PLANKING THE TRANSOM & COUNTER

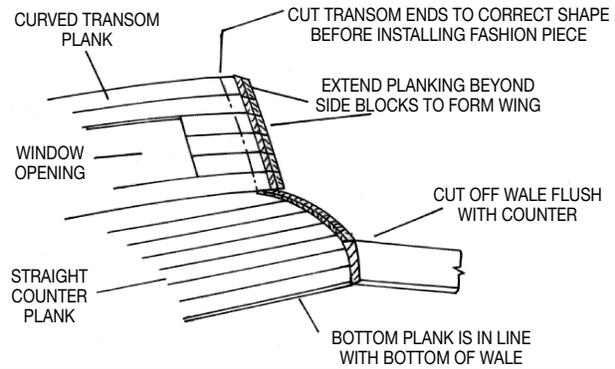


FIG. 2-5 TRANSOM FILLER, FASHION PIECE & TAFFRAIL

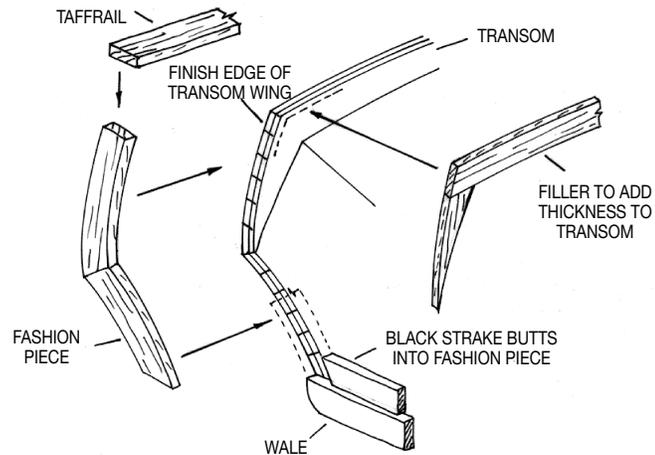


FIG. 2-6 FITTING THE WALE

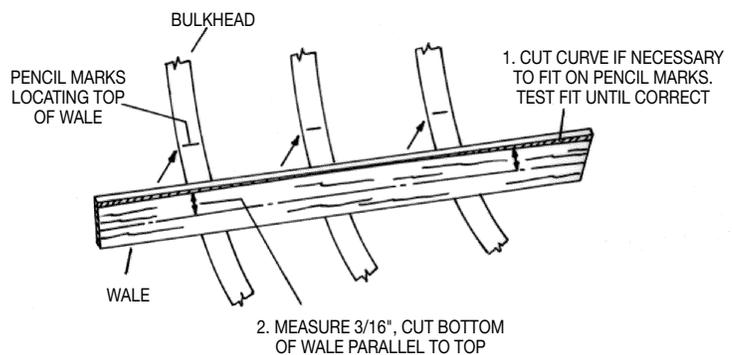
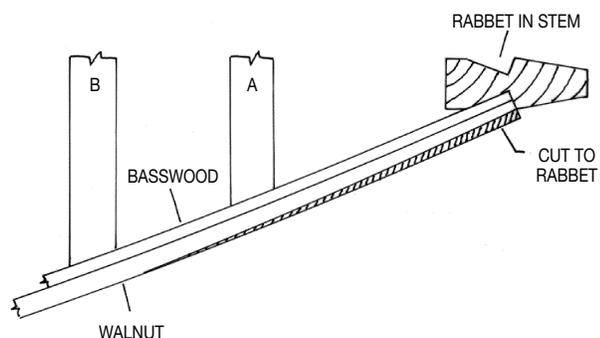


FIG. 2-7 TAPERING WALE AT BOW



Since the wale is thicker than the general hull planking, taper the forward end of the walnut layer for about 2 inches so it fits into the stem rabbet (*Figure 2-7*).

Installing the black strake: The black strake sits on top of the wale, and both the basswood and walnut planks will butt into the fashion piece at the stern. Its top edge will form the sill of the gunports. The black strake will require cutting to shape and steam bending.

Use 3/64" x 3/16" basswood for the first layer. The black strake will be covered later with 3/64" x 3/16" walnut.

Like the wale, taper the forward end for about 2 inches so it fits into the stem rabbet.

Before installing the black strake, cut the half round scuppers in the lower edge (*Figure 2-8*). This will require cuts in both layers. At the same time, if there are any fillers in way of the scuppers between bulkheads, cut these out also – it's easier now than later. The bottom of the inboard hole for the scuppers is in line with the top of the waterway.

After the walnut layer is added, sand the outboard top edge of the black strake to form a half-round molding. This saves adding a separate molding (*Figure 2-9*).

Planking above the black strake: The sheer strake at the very top of the bulwark forms the top of the gunports. It extends the full length of the hull.

Use 3/64" x 3/32" basswood for the first layer, to be covered by 3/64" x 3/32" walnut.

From the sheer strake down to the black strake, between the gunports, fit three equal width 3/64" thick basswood planks to be covered later with 0.020" thick walnut. These planks will require some tapering, and spiling forward.

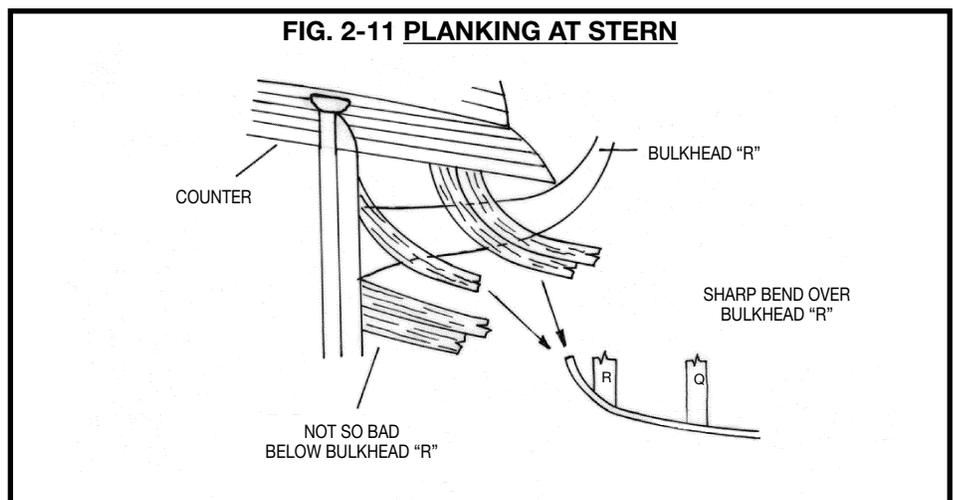
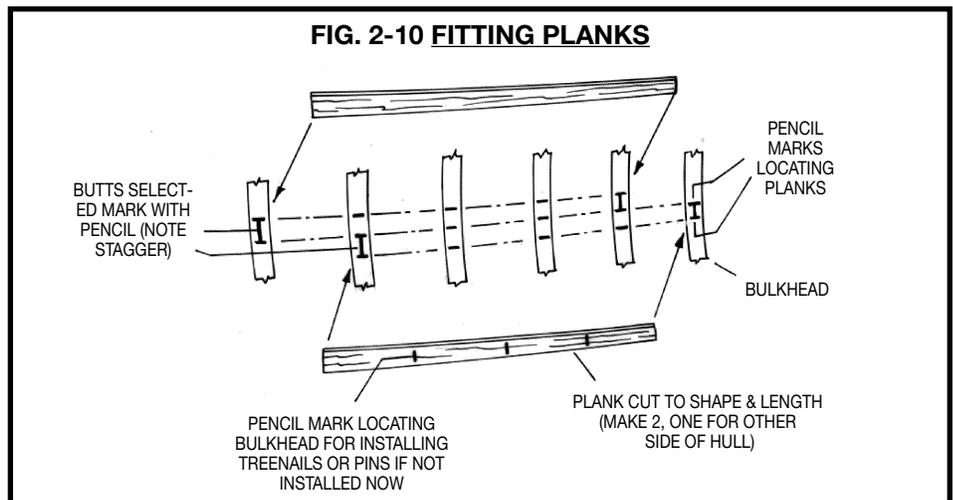
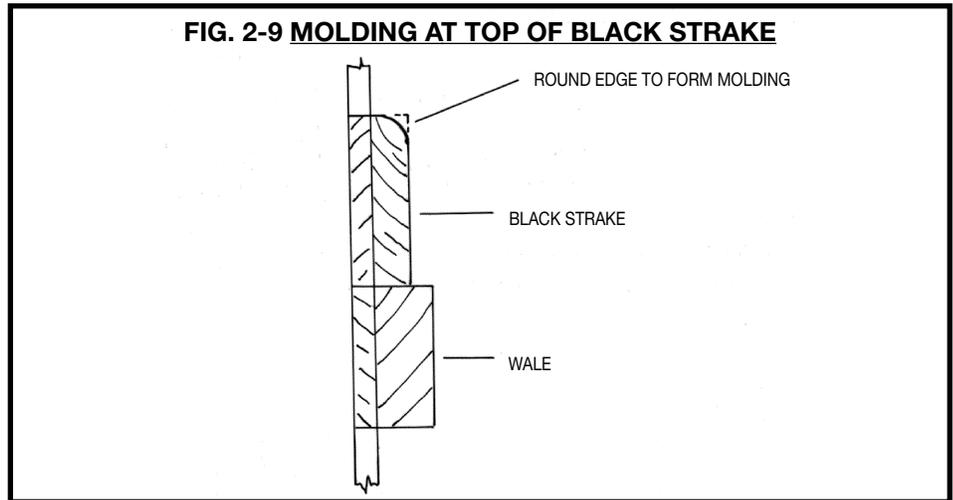
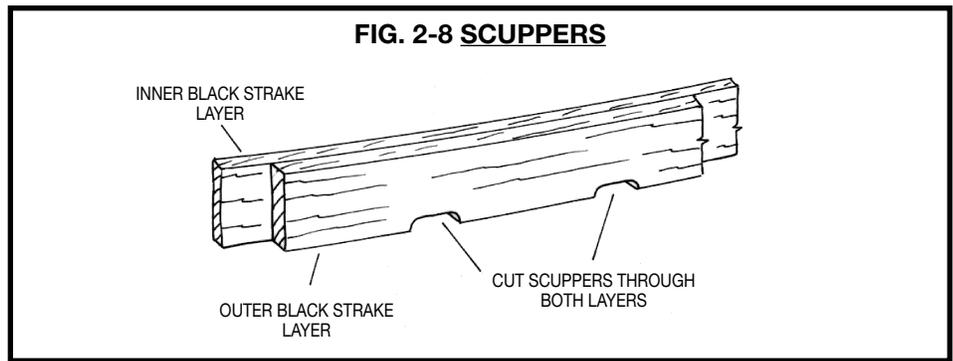
Under the cabin top rail there is a sheer strake similar to the sheer strake in way of gunports.

Note: The first three strakes of planks above the black strake butt into the curved portion of the fashion piece. Above these, the planks butt into the wing of the transom.

Planking below the wale: Use one layer of 3/64" basswood. You will cover the inner layer with 0.020" thick walnut strips. If you don't care how the inner layer looks, simply forget the discussion below and plank it anyway you like. Apply the process only to the final walnut layer.

However, it is highly suggested that you follow the rules on both layers. You will get to practice on the first layer, then really do a bang-up job on the final layer.

Planking from the bottom of the wale to the keel requires tapering fore and aft. Consequently, the hull below the wale is divided into Belts A through C.



Referring to Plan Sheet 2, lay a tick strip along each bulkhead and mark the two belt seams below the wale. Transfer these points in pencil to the model. Now temporarily tack two 1/16" x 3/32" basswood battens along the port and starboard belt lines. Battens assure an accurate run of planks by correcting errors in drafting, tick strip marking, or transferring. You don't need a batten at the top of Belt A, because the wale is already in place.

Once the two battens are in place, check their flow. Look at the model from the side and from the bow and stern. Do the battens have a pleasing, smooth curve? Are they symmetrical? If necessary, adjust the lower battens, referring to the planking profile on Plan Sheet 2. When everything is fair, make sure the belt seams are clearly visible. Remark those that aren't. Now, either remove the battens or leave them in place until they interfere with installing a plank.

Tapering plank edges: As planking proceeds, the edges of a particular plank may require tapering to butt flush against its neighbor. Properly machined planks have square edges. Butting them together on a hull may produce small gaps. Most are sealed with glue or wood filler, or caulked on a real ship. Plank edges are often deliberately tapered, to ensure they butt against each other while providing a sufficient gap for caulking. To create a perfectly smooth hull without gaps, trim each plank edge as it is fit. The decision to taper or rely on filler is yours.

Laying the planks in Belts A and B: Each belt is done separately, so planking can start with any one. Many planks will require spiling. You will know as soon as you try to fit a plank and can't edge bend it in place.

Belts A and B each include six equal width planks amidships which are about 3/16" wide or a little less and taper to 3/32" - 1/8" at the stem. Lift the plank widths from the hull planking layout (fore and aft view) with a tick strip. Mark these lines on the bulkheads in pencil. Mark any stealers as shown on the plans. Belts A and B are now completely marked.

The next step is to cut planks to fit between the marks. First, decide where you want plank butts to go. You may have two or three planks for each strake. Mark the butt locations on the bulkheads and don't forget to stagger the butts per the rules. Next, lay a piece of planking stock over the bulkheads and determine if it needs to be spiled. If so, spile the plank edge to fit the previous plank. Next, in pencil, mark the overall length and cut the plank to its final length. Then, mark the position of each bulkhead (important for measuring the plank width and to know the location of bulkheads for treenailing).

Using a set of dividers or tick strip, lift the plank widths from the marks on the bulkheads and transfer to the stock. Draw a line through the points and cut the plank. Trace this tapered plank to obtain another for the other side of the hull (Figure 2-10). Continue until this run is finished, then complete the others in Belts A and B. The planks going over Bulkheads Q and R and butting into the lower counter plank take a severe bend. So, steam bend the planks where they curve sharply at the counter. This is primarily for Belt A. Belt B planks start going into the sternpost rabbet (Figure 2-11). Steam bending may also be required at the bow for the upper planks. Test each plank to see how easily it bends. If it appears the plank may break or be difficult to fasten, then steam bend.

Laying the Planking in Belt C: This belt consists of the garboard strake a little wider than 3/16" and two broad strakes about 3/16" wide amidships. Mark the butts as you did on the other belts. Use the planking profile on Plan Sheet 2 to determine the plank widths in Belt C aft. The fore and aft planking view can't show all the planks aft, so this view is necessary. Make sure the garboard fits nicely into the rabbet along the keel. The garboard will be a most difficult strake to fit, so take your time.

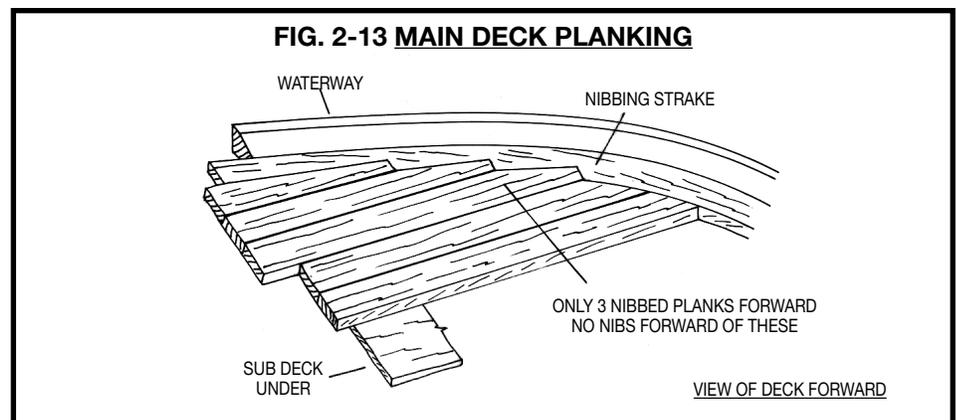
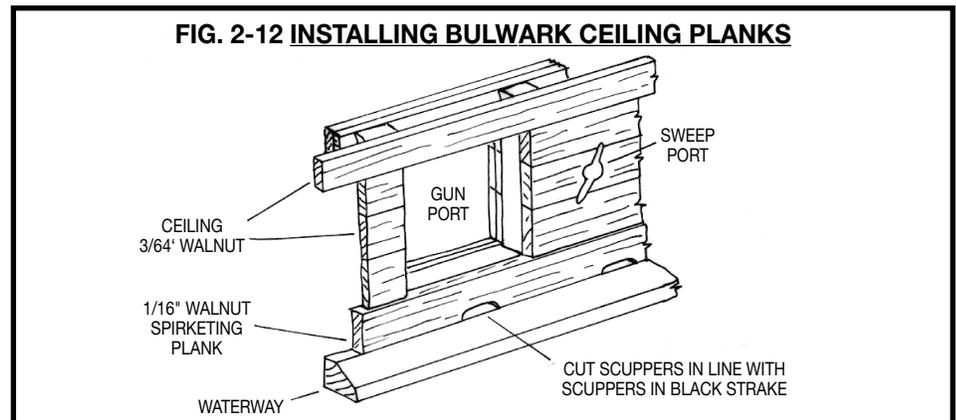
8. Completing the Double Planked Hull
Outer hull planking: If all went well above, you should have a completed first layer of

planks of 3/64" thick basswood. Sand the entire hull until smooth. Now is the time to add the outer layers of walnut for the basic plank, wale, black strake, and sheer strake. If you followed all the rules and laid out the inner layer properly, the walnut can be laid directly over the basswood, using the basswood seams as a guide for the walnut seams. If your under-layer below the wale was installed without regard for proper widths and tapered planks, then you must go back and follow the layout rules addressed in paragraph 6, following the belt approach.

Gunport lining: Within each gunport there will be some basswood showing - namely bulkhead extensions, sill, header, and black strake inner layer. To cover the basswood, line the entire gunport opening with 0.020" walnut. If the model is to be painted, this step could be ignored.

9. Installing Bulwark Ceiling Planks

The waterways were already installed on the sub-deck in Stage 1. The ceiling for the bulwark inboard is 3/64" thick walnut except for a 1/16" thick walnut spirketing plank at the waterway. This thick plank holds the fittings for cannon rigging. Before installing this plank, cut the scupper holes in the lower edge in line with the holes in the black strake outboard. Use one plank above the gunports, one for the spickering plank, and three equal width planks in way of the gunports (Figure 2-12).



10. Installing Coamings, Deck and Cabin Planking

Hatch and companionway coamings: The main hatch, galley hatch, scuttle, and companionway coamings are located on the laser-cut sub-decking. Install the walnut coamings before you add the final basswood decking strips. Deck planks look best if fitted around coamings rather than having them glued on top of them. Look ahead to Stage 5 for coaming details.

Main deck planks: The deck planking is 3/64" thick basswood. There is a nibbing strake adjacent to the waterway. Main deck planks are laid parallel to the centerline (Figure 2-13).

When installing the decking, leave openings like the ones on the sub-deck. There are openings for the galley stack, the bits, the pumps, and the mast mortise.

Front of quarter deck (step): Plank the vertical front of the quarter deck with the same width basswood planks used for the deck itself (Figure 2-14).

Quarter deck planks: This is the short deck where the steering wheel is located. Plank similar to the main deck. The planks at the

front go over top of the vertical step planks.

Cabin top planks: The walnut planks for the cabin top taper aft as shown on the plans. Before completing the planking, you should install the quarter deck/cabin rail (see paragraph 10).

Cabin front planks: Plank the front of the cabin with vertical walnut planks directly onto the bulkhead. At the same time, add the door planks. Chamfer (just sand) the edges of all the planks, including the door planks so the seams show up better. Refer to Stage 5 for door hardware.

Caulking deck planks: Paint one plank edge black or dark brown to simulate deck caulking. Be careful! Too much paint will penetrate too deeply with unsightly results. Do a test first. If it doesn't work, edge glue the planks with brown woodworker's glue. This adhesive dries dark enough to replicate caulking.

Procedure: Start planking the deck at the centerline and work outboard. Scrape off any glue that squeezes out before adding the next plank. Butts can be included or omitted. On a real ship, they don't show up as readily as the seams. Butts can also

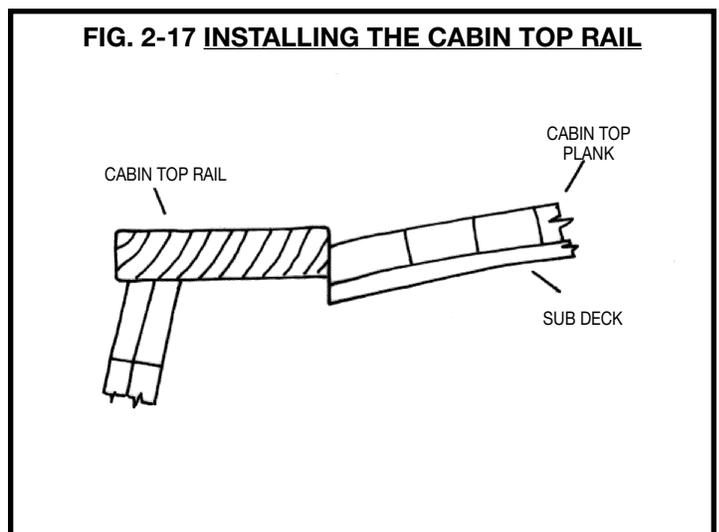
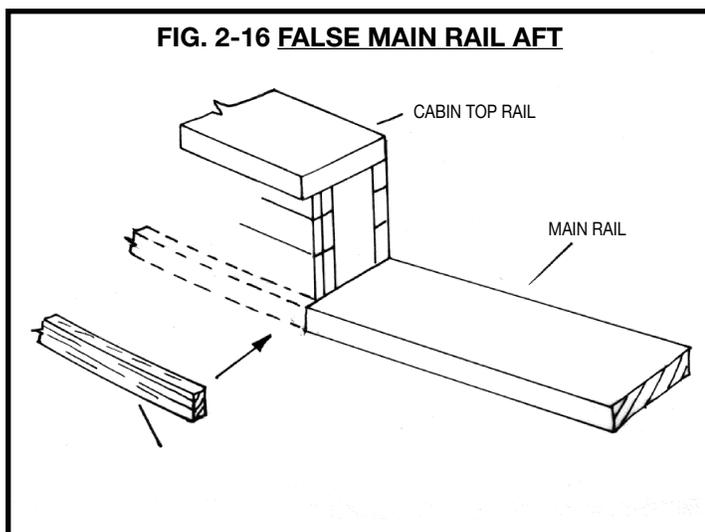
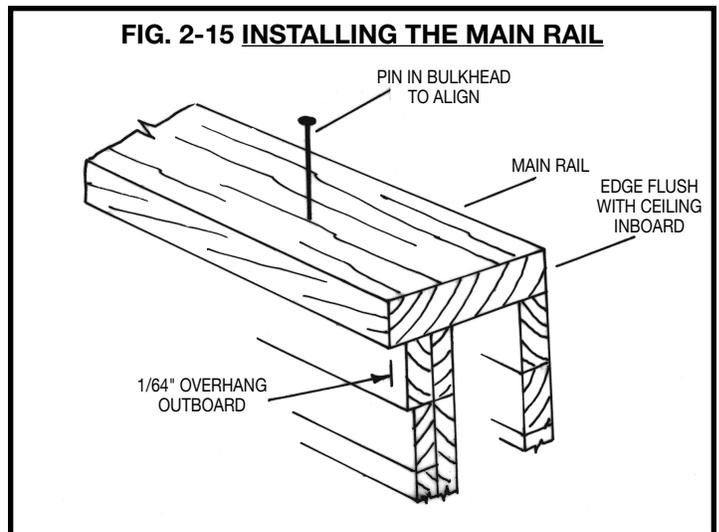
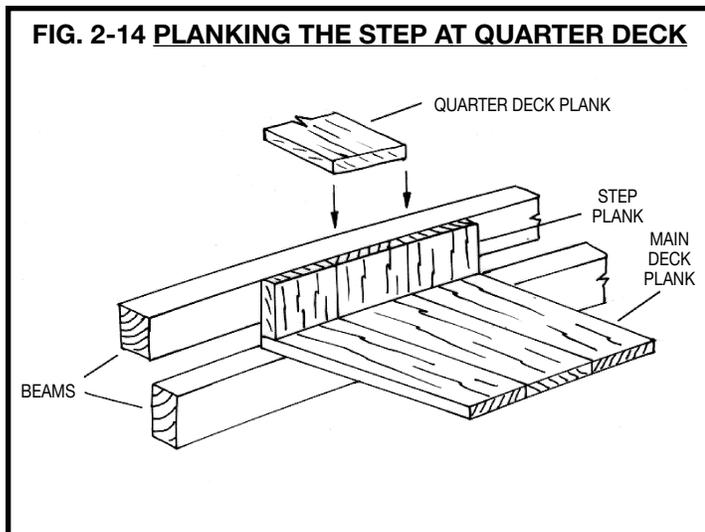
be scribed after the plank is laid.

11. Installing the Main and Quarter Deck, and Cabin Rails

Main rail: The main rail is laser-cut walnut and is slightly oversize (width) so it can be properly fitted. The rail should be sanded flush with the ceiling plank inboard and should overhang the outer hull plank by about 1/64". The finished width is 7/32" (Figure 2-15).

Roughly fit the rail, then sand the inboard side flush. Use some pins to help hold the rail in place. Check the rail outboard and sand until you have the 1/64" overhang all along the edge. The main rail on the real ship actually goes to the stern. For the model you can add a fake strip of walnut from the quarter deck rail aft to the stern (Figure 2-16).

Quarter deck/cabin rail: Apply this rail as you did the main rail. Use 1/16" walnut stripwood, 7/32" wide. The outboard edge overhangs the hull planking by 1/64". The inboard edge in way of the cabin is left square to act as a waterway for the cabin top (Figure 2-17).



Stage 3: Completing the Basic Hull Structure

Correcting and Sanding

After installing the planking, examine the hull for starved glue joints. Fill these with wood glue and, if necessary,

wood filler or model spackling compound, then smooth the hull and deck with sandpaper.

If a natural finish for the walnut is selected, use dark wood filler such as walnut for the seams.

Stage 4: Mounting the Hull

Mounting the hull now prevents damaging it when handling the model. Proper mounting is important, because future alignments will require a true waterline. While any modeler can devise his own mounting, this kit contains a launching ways system. Other options are noted below.

No baseboard is included in the kit. However, one can be purchased from Model Expo. Or, make your own from lumberyard stock. Cherry, walnut, and maple make nice bases that are relatively inexpensive. Or, you could use a simple plywood base and build a shipyard diorama – the choice is yours.

1. Launching Ways

This type of mounting is most suitable for models without sails. Basswood strips are provided in the kit. Stain the basswood to look like weathered wood or use a more finished looking stain. See *Figure 4-1* for assembly. Adjust the mounting as necessary so the model's load waterline is parallel with the baseboard.

2. Option – Mounting on Pedestals

Brass or wooden pedestals can be purchased from Model Expo. Drill the pilot holes for the pedestals. The model should sit with the load 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. One pedestal should be longer than the other, so buy the correct lengths.

3. Option – Dr. Feldman's Stand

Figure 4-2 illustrates the stand that Dr. Feldman made for his model, which is featured in his book.

Note: It is recommended that either choice mounting piece be finished before mounting the hull assembly into place.

Models should be cased to protect them from dirt and damage. Furthermore, most competitions require entries to be cased. A case is a cheap insurance policy. Those who wish to follow this route should use the baseboard as the bottom of the case. A case's outside dimension should be at least 4" longer than the model (2" fore and aft), 4" wider (2" port and starboard), and 2" higher.

For the gamblers who don't want a case, round the baseboard's top edges or cut a simple chamfer. Those with access to a router can cut mouldings along the edges. Paint or stain the baseboard.

FIG. 4-1 BUILDING THE LAUNCHING WAYS

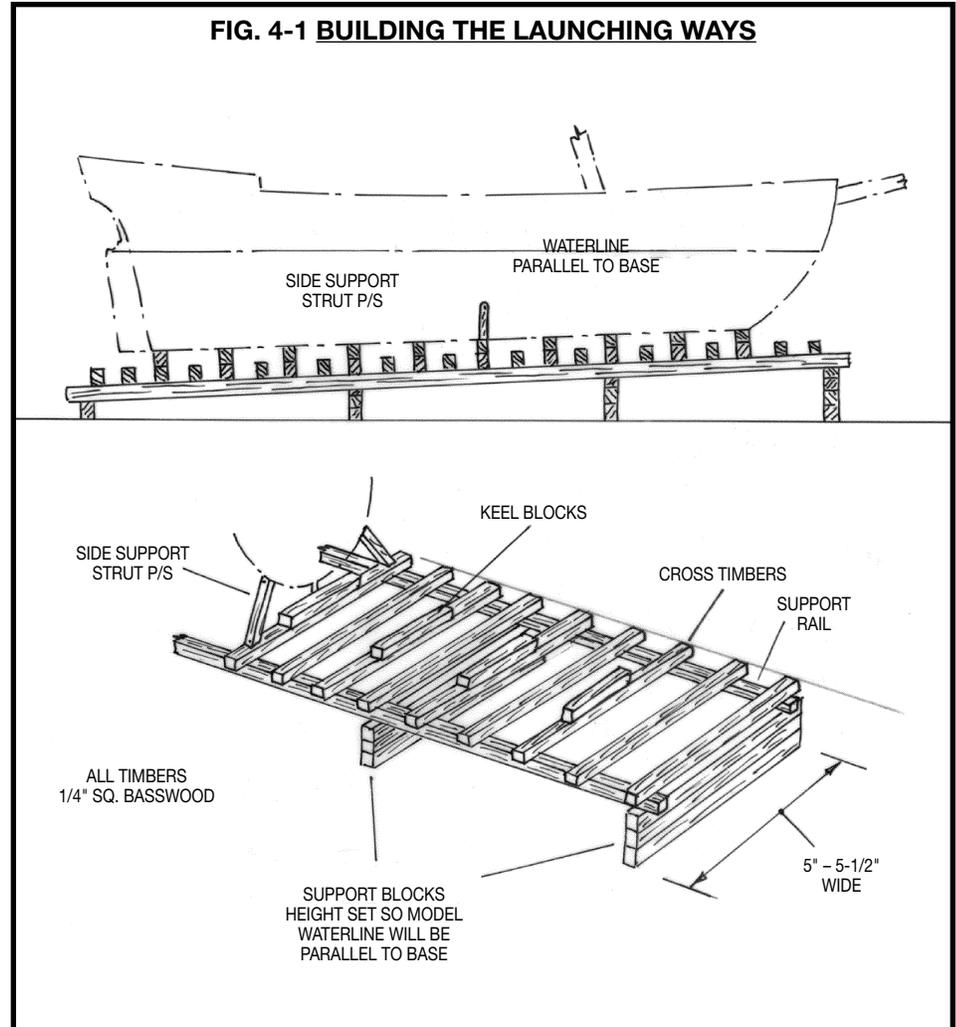
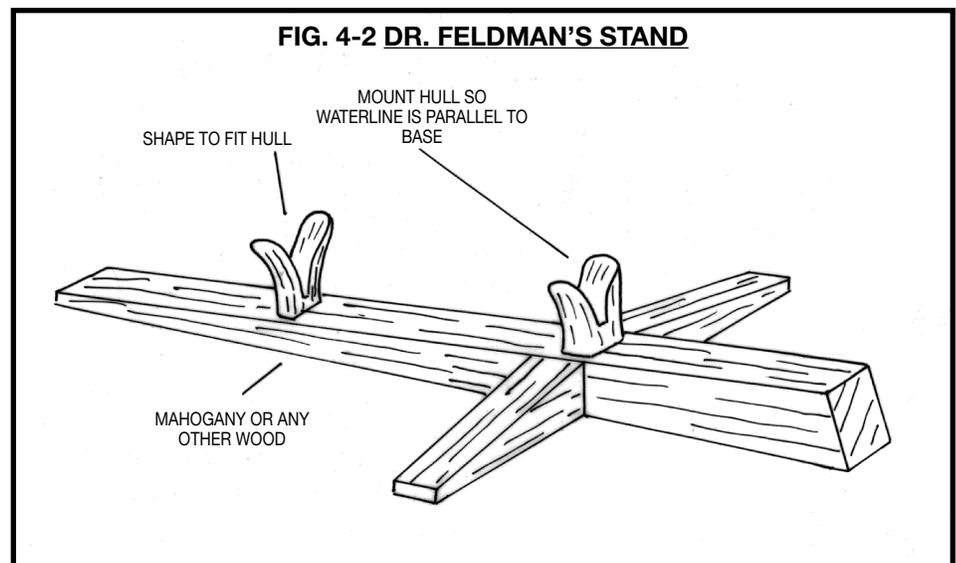


FIG. 4-2 DR. FELDMAN'S STAND



Stage 5: Adding The Hull Details

The cut-outs in the laser-cut sub-decks locate the hatch and companionway coamings, mast, galley stack, riding bits, and pumps. Other items such as catheads, timberheads, eyebolts, and cleats can be located in relation to these, or from some other benchmark such as a gunport. Lightly mark their positions in pencil.

1. Anchors, Catheads, and Anchor Stowage

The anchor shanks are britannia castings. Fashion the anchor stocks from wood strip either from walnut or basswood. The bands around the stocks can be 1/64" x 1/16" brass strip provided in the kit, or as an option, paper bands or just painted bands.

The catheads are laser-cut walnut. They need to be sanded down to 5/32" thick from the 3/16" thick laser-cut parts. (It was uneconomical to include 5/32" with the laser-cuts, as it would have been the only part in this thickness.) Also, you may need to shape the catheads a bit to fit the bulwark. Before installing the catheads, drill four holes at the outer end and cut a shallow groove between the holes to represent sheaves for the hoisting line tackle. Or, you can add real brass sheaves, but these are not included in the kit. An additional hole is required for the bitter end of the hoisting tackle just inboard of the sheave holes.

For stowage, the anchor can be hung from the cathead on the cat block hook, or hoisted up on the rail forward and tied off to the timberhead just ahead of the cathead. Make the cat hook from 0.020" dia. wire included in the kit. The hoisting line belays to the timberhead just aft of the catheads (*Figure 5-1*).

The actual length of the anchor and stowage are unknown. However, this ship most likely anchored in fairly shallow water most of the time, so about 100 feet of anchor cable on each anchor would be reasonable. That's 25 inches for the model. In use, the anchor cables would be hitched around the riding bits. For stowage, the cable could be in a long coil on deck behind the catheads, but was most likely removed and stowed below via the small scuttle. You could also leave the cables attached to the anchors and have the lines leading below through the scuttle with hatch cover set aside. No real answer here. Use whatever you think will look best on the model.

The anchor buoys can be stowed inboard on the timberheads. The buoy can be turned in a lathe or hand-carved. It's just a simple egg-shaped block. The rope harness for the buoy is rather small to detail. You can simply glue the lines, or even fake the lines with black paint (*Figure 5-2*).

FIG. 5-1 STOWING THE ANCHORS

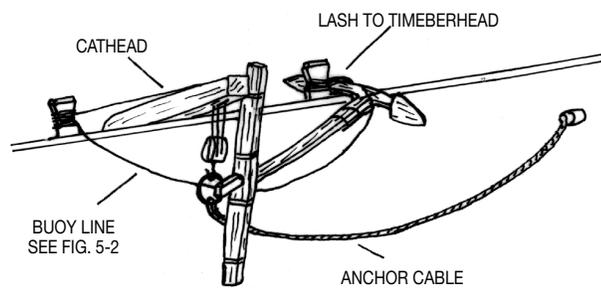


FIG. 5-2 STOWING THE ANCHOR BUOYS

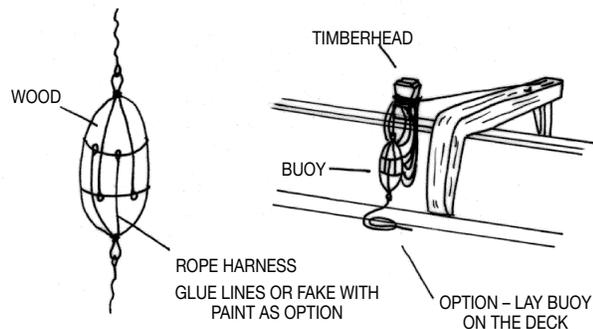


FIG. 5-3 BUILDING THE BINNACLE

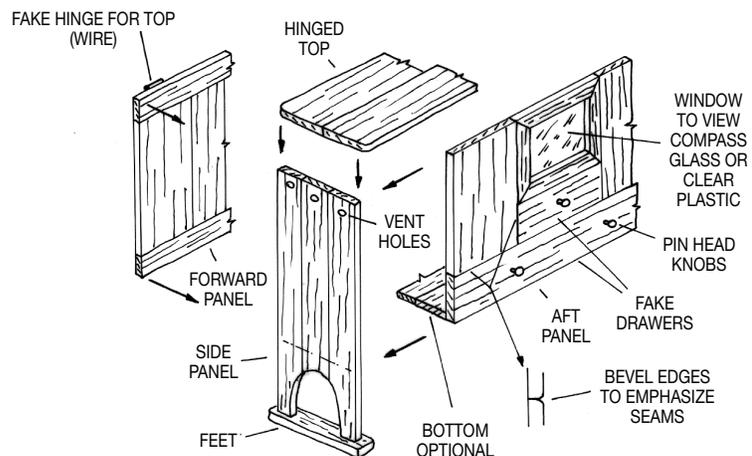
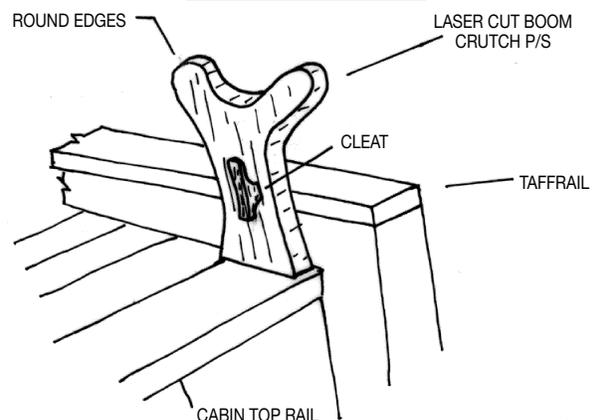


FIG. 5-4 BOOM CRUTCHES



2. Binnacle

Build the binnacle from walnut stripwood. Chamfer the edges (just sand) of the fake drawer fronts so the seams show up better. The drawer pulls can be made from the small nails included in the kit or a straight pin head (*Figure 5-3*).

On the real ship, the binnacle is assumed to be bolted to the deck and not lashed down to deck as you would find on other, larger ships. Just glue it to the deck. The inside of the binnacle can be painted black so you cannot see anything inside. As an option for more detail, add a small compass in the box and use a clear plastic sheet over the opening to represent glass.

On a real ship, the binnacle would have a lantern in the box on each side to illuminate the compass. The three small holes on the ends of the binnacle are vent holes for the lanterns.

3. Boom Crutches

The laser-cut walnut boom crutches fit on the outboard edges of the transom on top of the cabin top rail. Shape the bottom of the crutch as necessary for the correct angle. Round the top edges a bit. Add a cleat on the face of each for belaying the after spreader yard braces (*Figure 5-4*).

4. Cabin Doors

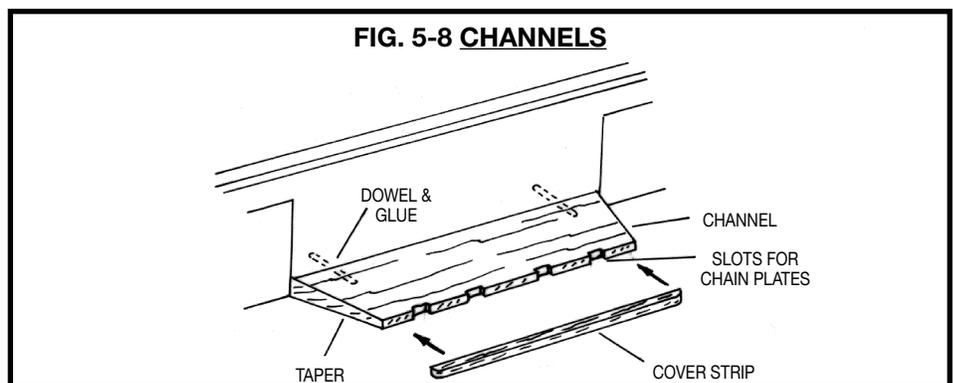
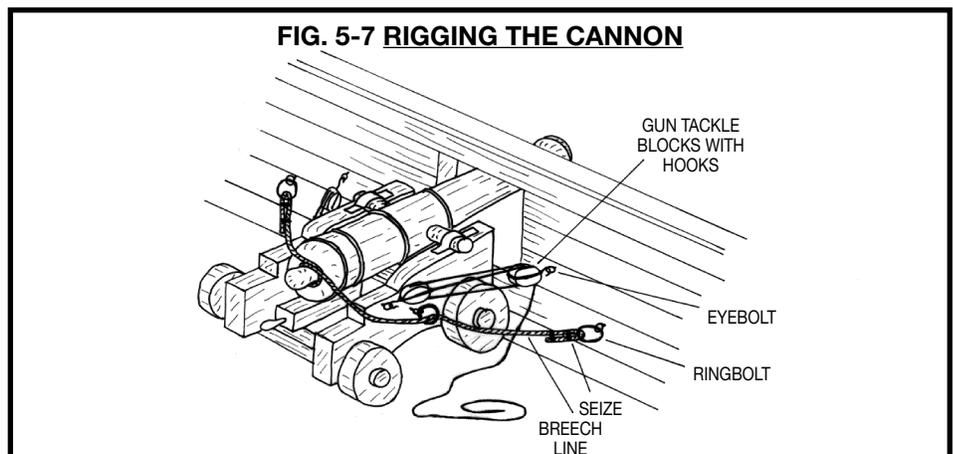
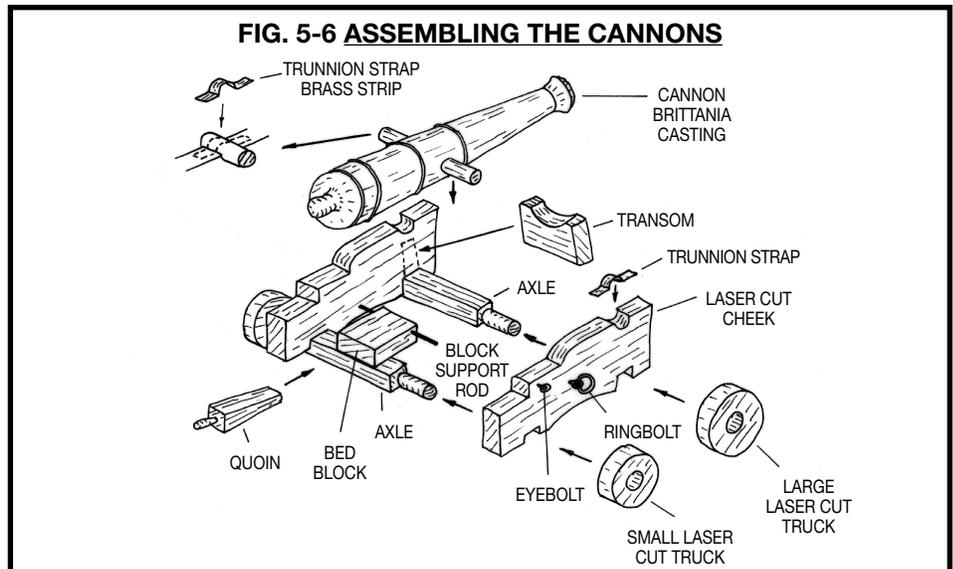
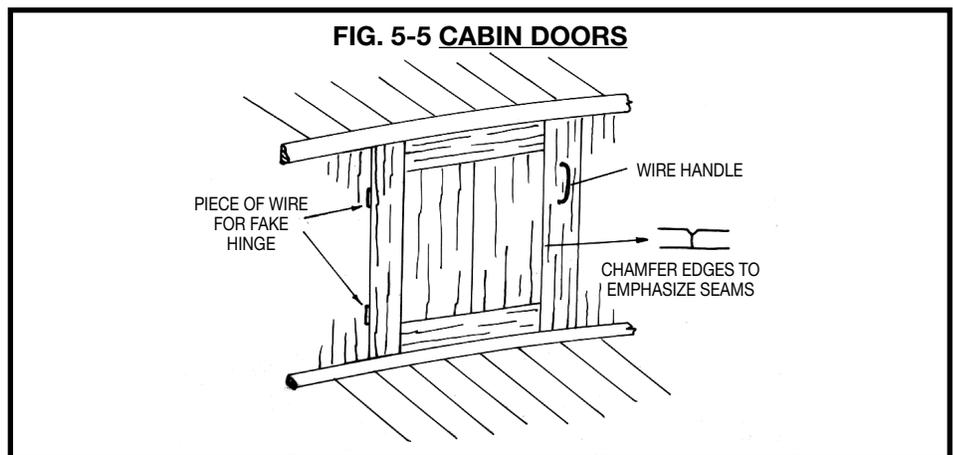
The doors were installed along with the planking for the front of the cabin. Refer to Stage 2. Fake hinges can be made from a short piece of 0.020" dia. brass wire glued at the seam. The handles are also made from wire (*Figure 5-5*).

5. Cannon

The cannon barrels are britannia castings. The carriage cheeks and the trucks are laser-cut walnut parts. Make the axles, transom, bed block, and quoin from walnut stripwood. The quoin handle could be a brass or wood belaying pin or carved from wood. The trunnion straps or bands (correct name is cap square) can be made from 1/64" x 1/16" brass strip supplied in the kit, or from a thinner brass sheet (not supplied) or paper strip. For the ringbolts on the cheeks, use the 3/32" split ring supplied in the kit. For the ringbolts on the bulwarks, use 1/8" split rings and the 1/16" o.d. eyebolts. Assemble the cannons as shown in *Figure 5-6*, and rig per *Figure 5-7*.

There is a ringbolt in the deck behind each gun that would be used to hook an inhaul or train tackle. The tackle is not rigged on our model, as it was most likely portable or not used at all. Use 1/8" split rings and 1/16" o.d. eyebolts for these.

The cannons are located at the first 3 gunports port and starboard. Although there are fittings on the after gunport, this was probably an emergency position. To rig a gun there, the pump handles would have to be removed.



6. Channels

Make the channels from walnut stripwood. They taper outboard. The outboard edge is a separate strip. Cut slots in the edge for the chainplates and, when installed, add the edge strip. Best dowel the channels on the hull for added strength (Figure 5-8).

7. Companionway

Build the companionway from walnut stripwood and fashion the hinges from 1/64" x 1/16" brass strip provided in the kit. The hinge pin can be faked using a piece of 0.020" dia. wire included in the kit. Chamfer (just sand) the edges of the planking so the seams show up better. Assemble the planked panels on a flat surface before gluing to the corner posts. The corner posts have two strips on the inside, forming a rabbet to support the panels. The companionway fits on top of a coaming similar to the main hatch. Add some tabs on the companionway sides to fit in the coaming and help hold the companionway in place on the coaming. Glue the tabs to the inside of the companionway first. Trial fit, then add glue to the tabs and insert into the coaming (Figure 5-9). Note that the coaming for the companionway should be installed before deck planking. Refer to Stage 2.

8. Eyebolts, Ringbolts, and Cleats

Both the hull plan and rigging plans show the locations of all eyebolts and cleats. Drill a hole wherever an eyebolt is required. Using a toothpick or microbrush, spread a thin film of cyano on the bolt, then insert. Don't overdo the glue. When all are mounted, tug on each eyebolt to test the bond.

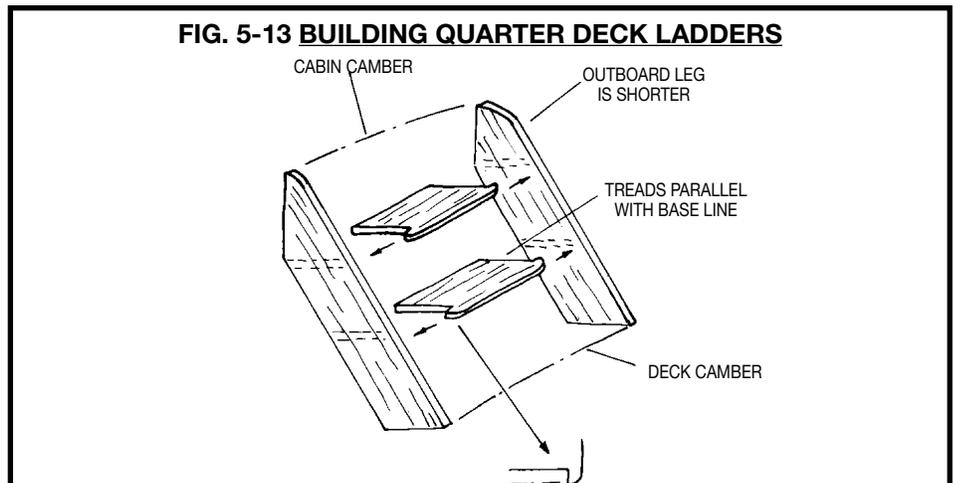
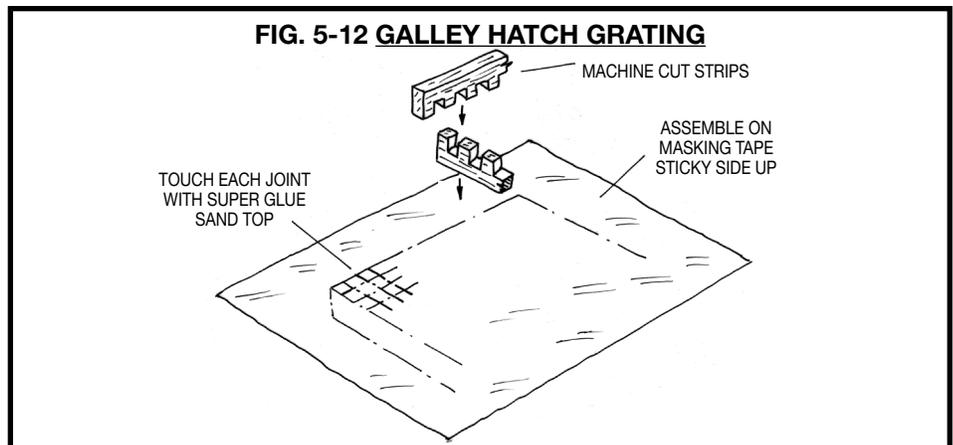
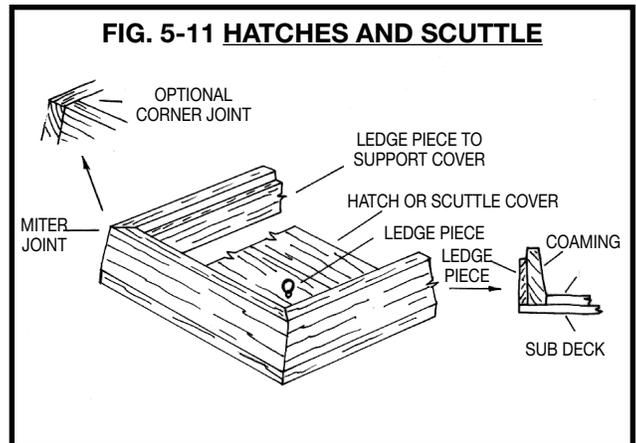
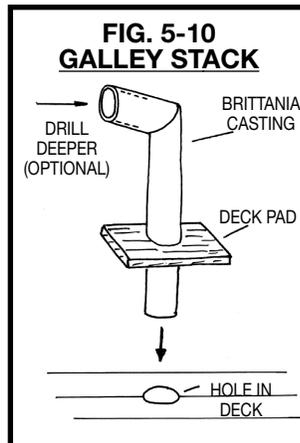
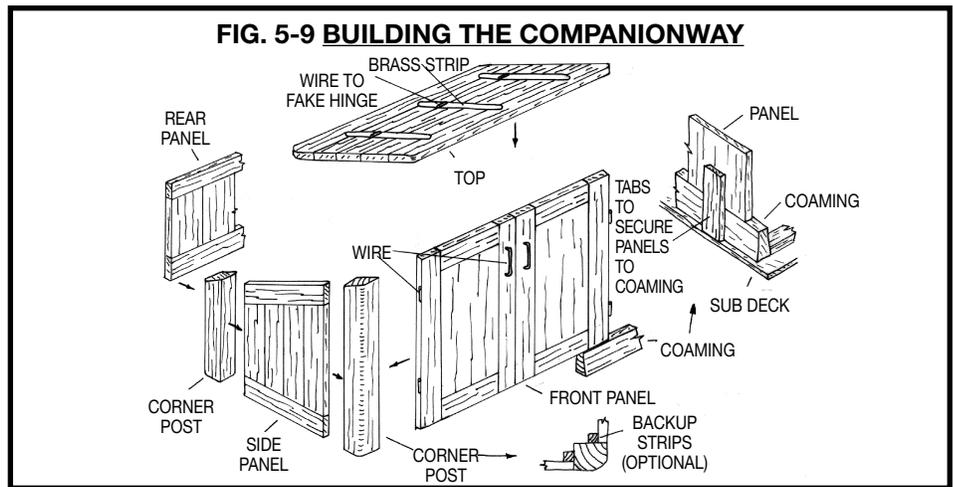
Eyebolts supplied in the kit are simply a wire bent into a loop. Bend the eye closed if there is a slight gap, or touch with a little solder or epoxy glue.

Ringbolts are composed of an eyebolt and split ring. For these, use the 1/16" o.d. copper eyebolts supplied in the kit. Use 1/8" split rings for hatch ringbolts and cannon ringbolts on the bulwarks. For the cannon carriage, use the smaller 3/32" split rings. After inserting the split ring into the eyebolt, solder or glue the joint.

Use the larger 3/32" o.d. brass eyebolts for those used to attach rigging lines and blocks. The cleats, though probably wood on the ship, are britannia castings. Use these, or make wooden ones from stripwood. The cleats for deck and spars have a pin molded on the bottom of the cleat. Drill a hole in the deck or spar and set the cleat with super glue or epoxy. The shroud cleats have a flange on the bottom. Seize each end around the shrouds with thread and glue.

9. Galley Stack

First, add a wooden walnut base plate for the stack on the deck. The hole for the



stack is prelocated by the hole in the laser-cut sub-deck. Glue the britannia casting stack in position (*Figure 5-10*).

10. Hatches, Scuttle, and Gratings

Note that the coamings should be installed before deck planking. Refer to Stage 2.

Figure 5-11 illustrates the hatch and scuttle details. Make from walnut stripwood. Notice that the inside face of the coamings is 3/64" out from the laser-cut sub-deck openings. A separate 3/64" ledge piece is glued on the inside of the coamings to support the hatch covers and grating. This sits on the sub-deck also. Cut the depth of the ledge piece so that the hatch covers and grating will be flush with the top of the hatch coamings. The hatch lift cover rings are made from eyebolts and 1/8" split rings provided in the kit.

The galley hatch grating is machine-cut boxwood strips, assembled like an egg crate. Cut the strips to length before assembly. Assemble the grating on a piece of tape to hold it together. Then, take a toothpick and touch a small amount of Cyano to each joint. After the glue dries sand the top of the grating smooth and use a small needle file to clean out any glue that got into the openings. Fit into the coaming on top of the ledge piece (*Figure 5-12*).

11. Ladders

Make the two small ladders at the quarter deck from walnut stripwood (*Figure 5-13*).

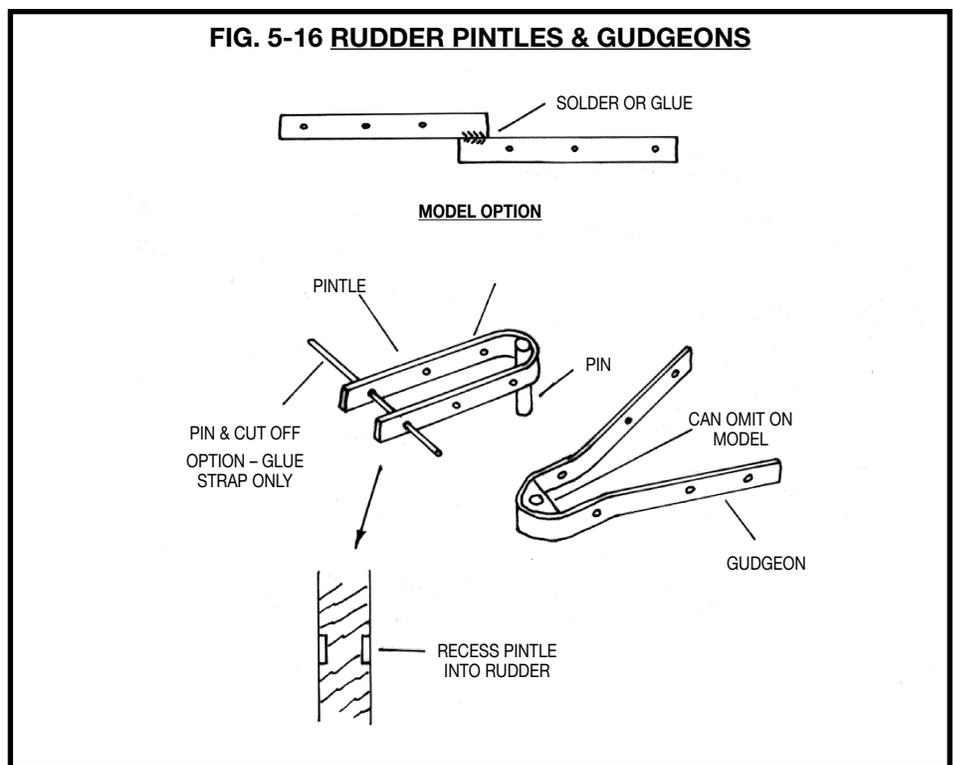
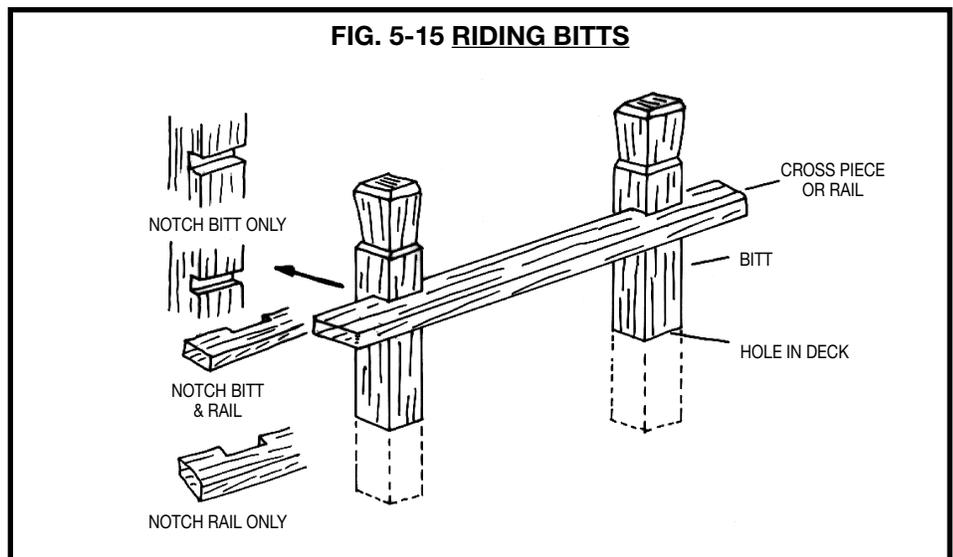
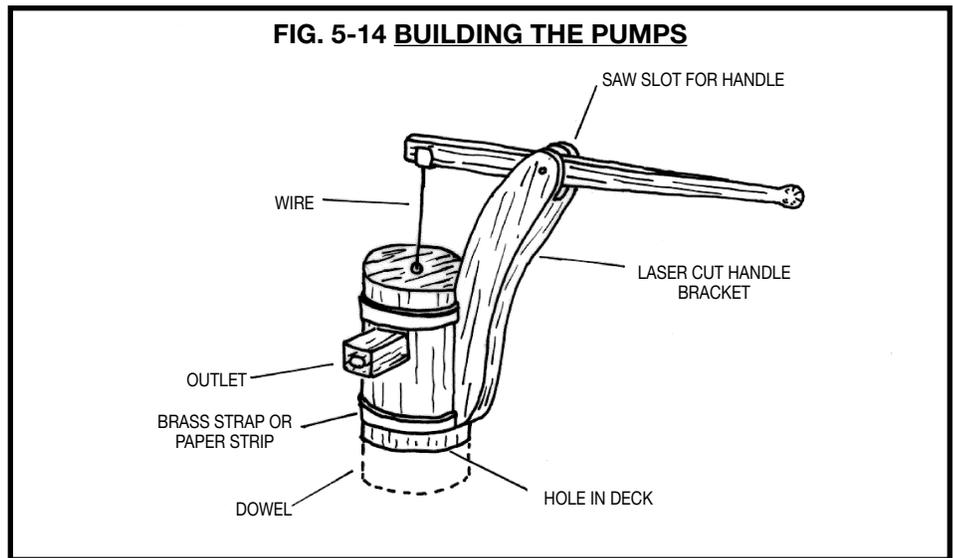
12. Pumps

The pumps on the real ship are wood, so for ultra-realism they should be wood on the model. The barrel is made from the walnut dowel included in the kit. The metal bands around the pump could be 1/64" x 1/16" brass strips included in the kit, paper, or even a black painted stripe. The handle bracket is laser-cut, but you need to saw a slot in the top for the handle. Make the handles from stripwood. The rod at the end of the handle is 0.020" brass wire. Fit the barrel through a hole in the deck (precut in the sub-deck) (*Figure 5-14*).

13. Riding Bitts

The bitts forward of the mast are built from walnut stripwood. Insert these in the square holes in the deck. These were already cut into the laser-cut sub-deck, and you should have left the openings when applying the deck planks (*Figure 5-15*).

These bitts are called riding bitts or anchor bitts, since their major function, along with the belaying lines, was to secure the anchor cable. The bitts were used before the windlass was invented.



14. Rudder

Shape the laser-cut walnut rudder according to the plans. Fashion pintles and gudgeons from 1/64" x 1/16" brass strips included in the kit. The pintles are flush with the rudder, so cut a recess for each (*Figure 5-16*).

The rudder is laser-cut in one piece. For more realism, especially if the model is natural finished, scribe seam lines into the rudder. The plans show the spacing.

15. Steering Wheel

The steering wheel support is laser-cut walnut, and the wheel is a britannia casting which is to be painted to look like wood. Make the line drum from the supplied walnut dowel. The drum must be turned down slightly using a lathe or chucking the dowel in a drill and filing it down. Drill a hole in the drum for a 1/16" dia. brass rod (provided in kit) to support the drum and wheel. The rod fits into a hole drilled into the cabin front. The tiller lines feed off the drum and go through two holes in the deck (*Figure 5-17*).

16. Stern Windows

The stern window frames are laser-cut walnut. For more realism, add some glass or plastic sheet on the backside (not supplied in the kit) (*Figure 5-18*).

You were told earlier to paint the area behind the windows black so you can't see inside. If you forgot, do it now.

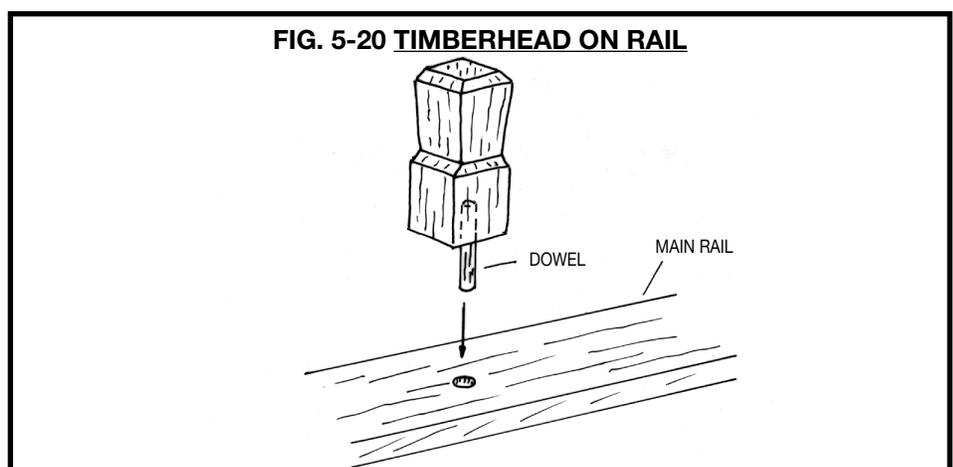
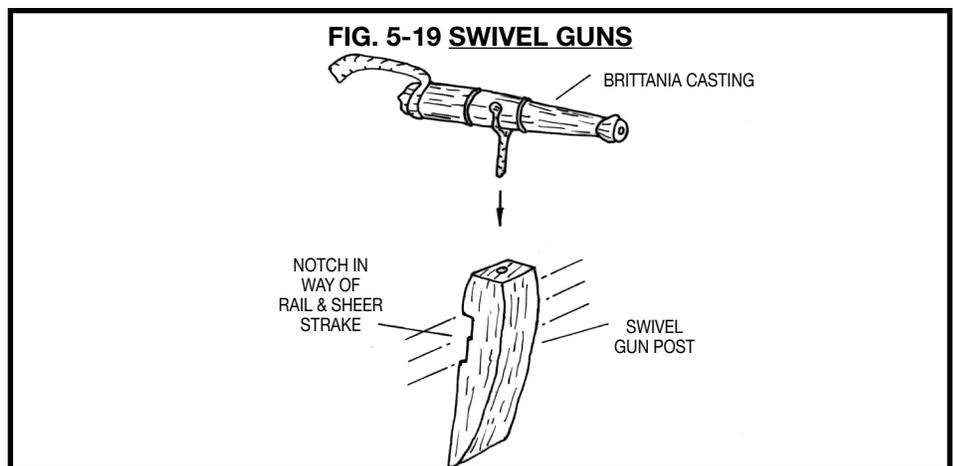
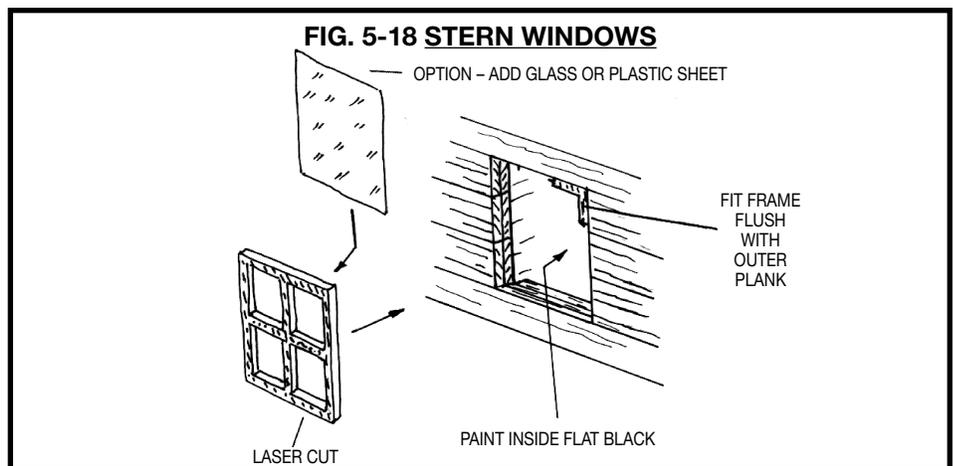
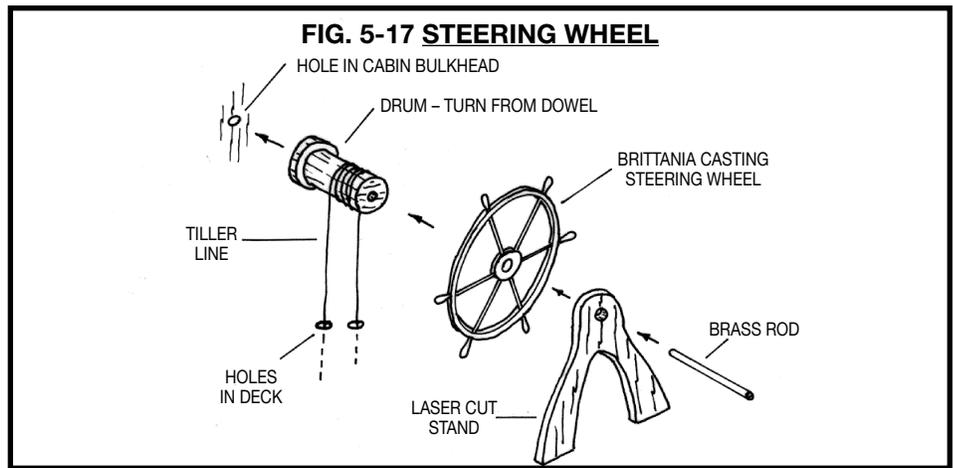
17. Swivel Guns and Support Posts

Fashion the swivel gun posts from walnut stripwood. You will need to notch the post in way of the main rail and sheer strake, and drill a hole in the top for the swivel. The swivel guns are britannia castings. Fit one into each of the eight posts (*Figure 5-19*).

18. Timberheads

There are three timberheads projecting above the rail forward. For the model, these are made from walnut stripwood and doweled in place (*Figure 5-20*).

Now that all the deck details are complete, get ready for the mast, spars, and rigging. Recheck everything before you proceed.



Stage 6: Mast and Spar Construction

There are various opinions regarding the use of the terms mast and spar. Is a mast also a spar? Herein, spars are defined as bowsprit, jibboom, boom, gaff, and yards. Masts are lower mast and topmast.

Details of all masts and spars with dimensions are shown on Plan Sheet 4.

1. Shaping & Tapering Masts & Spars

Beech dowels are provided for the masts and spars, but they 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. This approach prevents turning a dowel into an oval (*Figure 6-1*). 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 topmast has a square heel and needs to be wider than the supplied dowel across the corners of the square. *Figure 6-2* shows how to build up a dowel for extra width.

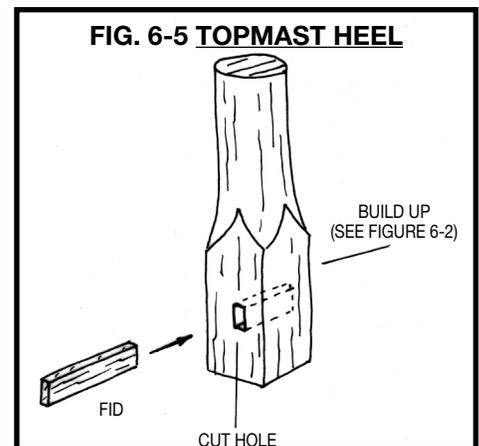
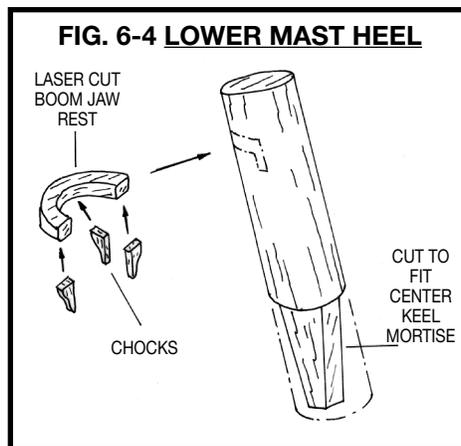
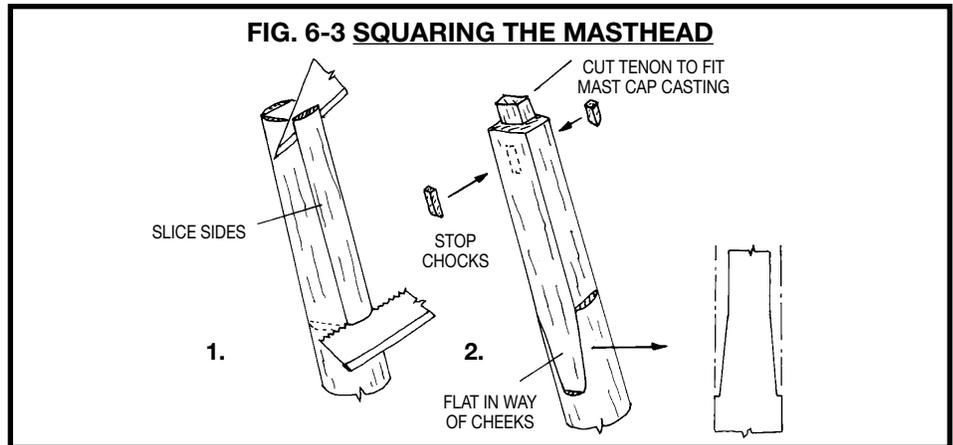
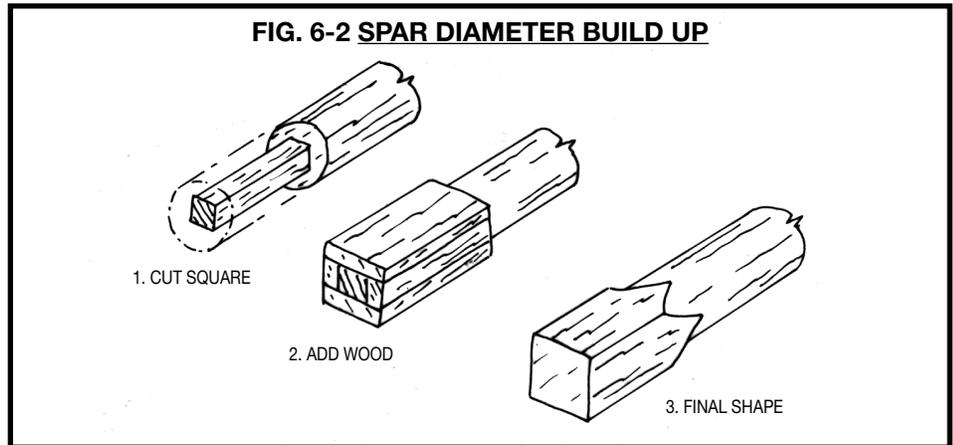
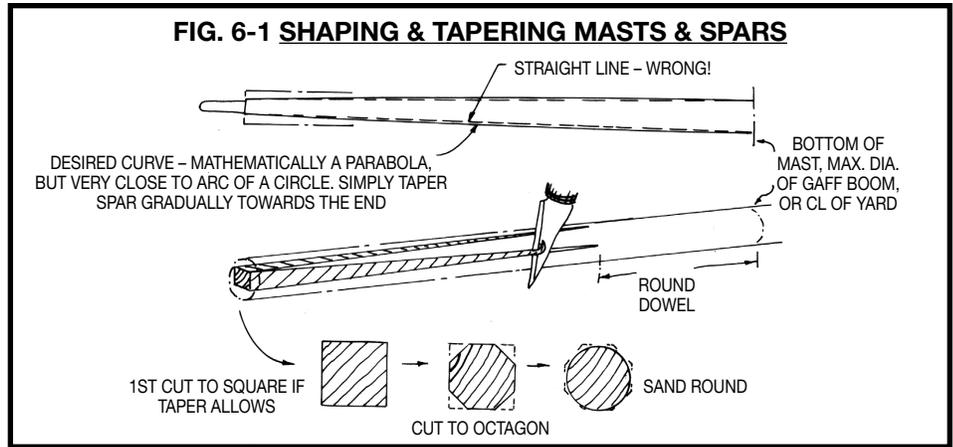
2. Building & Installing the Masts

Lower mast: The mast is round with a rectangular head. After shaping the head to its proper size, cut the tenon for the mast cap. Add the rigging chocks on the sides of the masthead. Flatten the sides of the mast in way of the laser-cut walnut trestle tree cheeks (bibbs) (*Figure 6-3*).

The heel of the mast must be shaped to fit the rectangular mast socket on the center keel (*Figure 6-4*). Make sure the mast rake is correct. Check the fit. Add the laser-cut walnut boom jaw rest on the mast with its supporting chocks (cut from walnut stripwood).

Topmast: This mast begins square at the heel, then round (*Figure 6-5*). The topmast heel has a rectangular slot for a *fid* (iron bar preventing the topmast from sliding through the top). Drill a hole and shape it with a file. The fid should be a press fit. Make the fid from walnut.

There is a sheave near the top for the top-sail yard halliard. For the model you can fake a sheave by simply drilling a hole, then use a gouge to cut a groove just below the hole so the line lays down flatter against the mast. Just above the sheave you need a shoulder for rigging. Cut this as you taper the mast.



Mast cap and trestle trees: The kit has laser-cut walnut cheeks. Make the trestle trees, filler chocks, and bolsters from walnut stripwood. The mast cap is an iron fitting and is a britania casting in the kit. *Figure 6-6* illustrates the assembly.

Note: Notice that the trestle trees are set perpendicular to mast. This was common practice on many of these ships. However, sometimes the trestle trees were installed parallel to the load waterline, as done on many ships. Consequently, this can be considered an optional arrangement if you so choose.

Mast assembly: Before assembling the masts, finish and slip on the mast hoops. You won't be able to do it after assembly. The hoops in the kit are britania castings. Paint to look like wood. Glue the cheeks and trestle tree assembly. Prefit the topmast and the mast cap, but don't install it yet. It will be easier to add the shrouds without the cap in place.

Mast wedge/coat and mast installation: On a real ship the mast is secured at the deck by wedges, then covered by a canvas cover called a *mast coat*. For our model, we have a simple ring to represent this. The mast wedge/coat is laser-cut walnut (*Figure 6-7*). File the edge and angle the hole to match the mast's rake. Slip it on the mast, then insert the mast in the mast socket. Check the fore and aft alignment and athwartships. The mast must rake at the angle shown on the plans. If it does not, file the mast heel to its correct slant, then wedge the mast in place with wood slivers. Finally, secure the mast wedge/coat to the mast with woodworker's glue, but do not glue it to the deck. The mast should be readily removable in the future in case of a restoration.

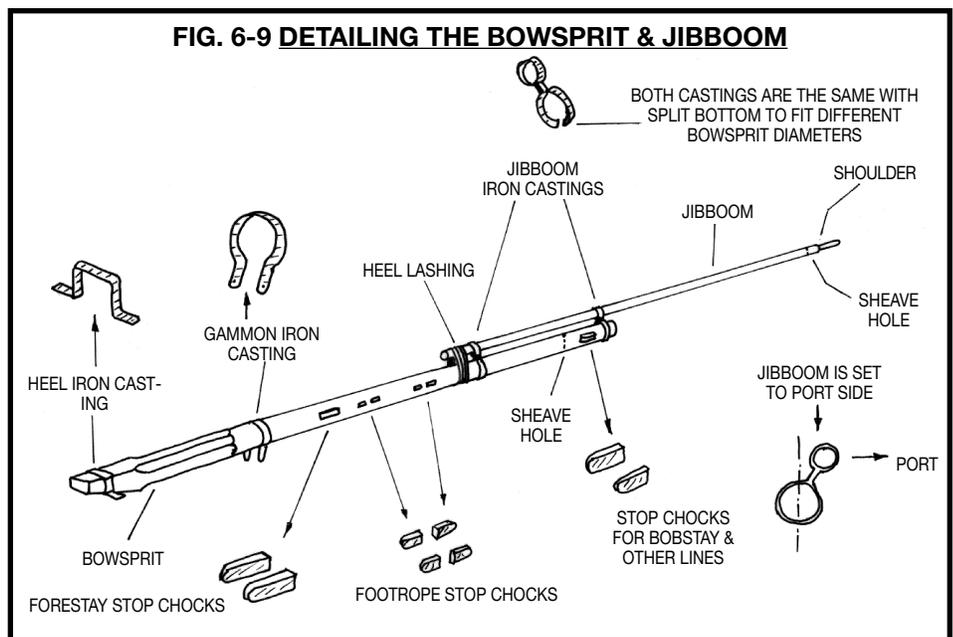
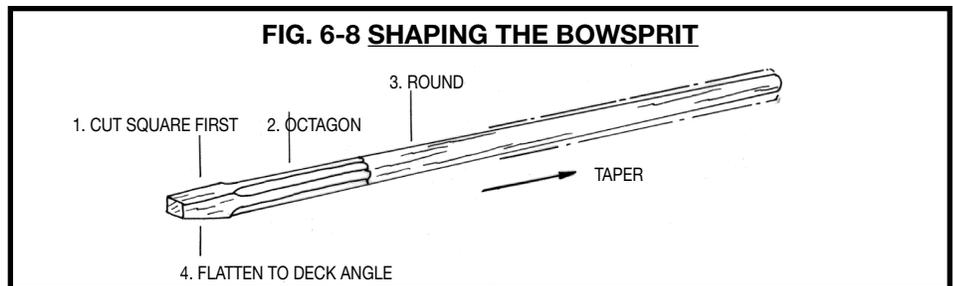
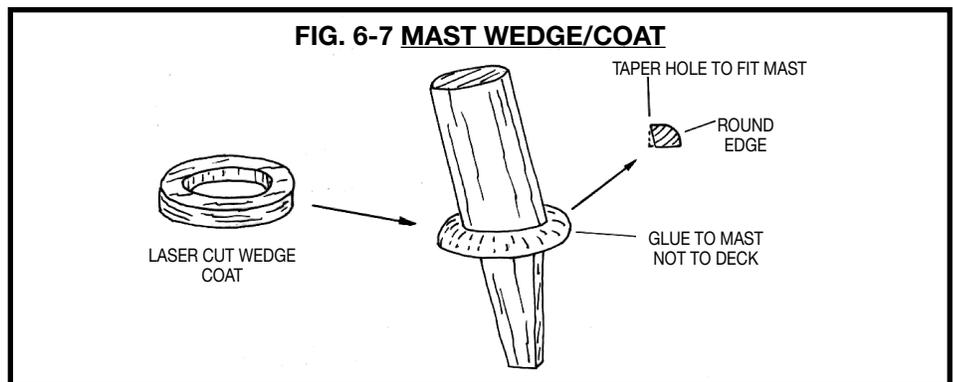
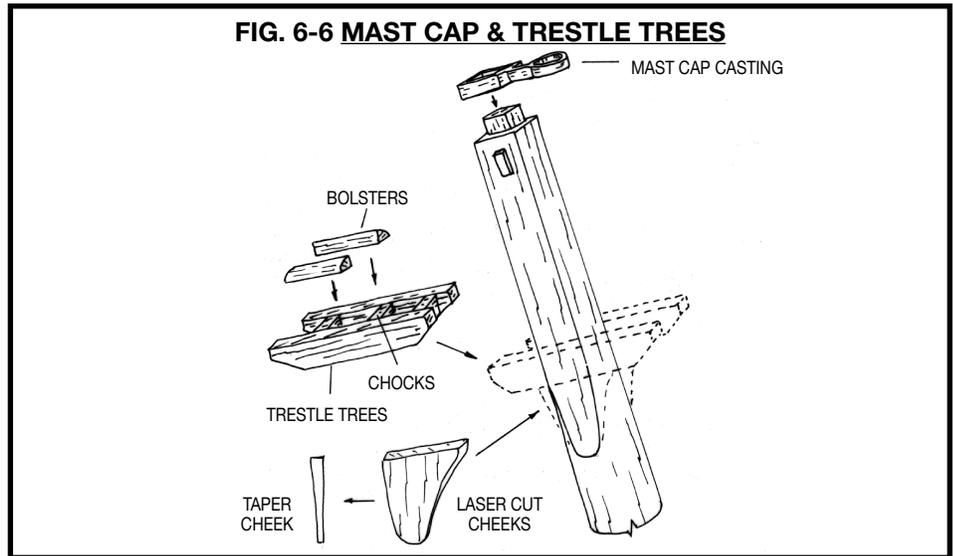
3. Building & Installing the Bowsprit and Jibboom

The bowsprit beech dowel supplied in the kit is oversized, since it is square at the heel, going to hexagon up to the head, then round outboard. The very end of the heel is flattened on the bottom so it sits flat on the deck. The bowsprit therefore requires a bit more wood removal than the other spars (*Figure 6-8*).

The bowsprit is supplied as a dowel so the wood matches other spars. However, you could purchase a square piece of similar color and grain wood if you feel it would be easier to shape.

There is a sheave (drill a hole) at the outboard end for the jibstay, and stop chocks on the sides for the forestay, bowsprit shrouds, bobstay collars, and footrope stirrups. Make the chocks from walnut stripwood.

The jibboom has a sheave (drill a hole) at its outer end for the topmast forestay. The jibboom is secured to the bowsprit by two



iron jibboom fittings (britannia castings), and these fittings angle the jibboom slightly to port of the bowsprit. This is done so the jibstay can go through the sheave in the end of the bowsprit. The castings are both the same but have a split bottom so they can be fitted to the tapered bowsprit in each position.

After the jibboom is installed, lash down the heel with line around the bowsprit. The bowsprit is held in place by an iron strap at the heel on deck and a gammon iron at the stem. These are britannia castings.

Figure 6-9 illustrates the entire bowsprit assembly.

4. Building the Spreader Yard and Topsail Yard

Note: The lower yard is designated a spreader yard, but could also be called a crossjack.

Both yards are round. Instead of shoulders at the yardarms, there is a fore and aft stop chock for rigging. In addition, add the sling cleats at the center of the yards.

Some rigging is included, because it's easier to do while holding the yards. Add the

footropes on both yards, the clewline blocks on the topsail yard, and the topsail sheet blocks on the spreader yard. These yards are installed once rigging commences. Figure 6-10 illustrates the yards.

Note: There are no jackstays on the yards. At this period in time, the sails were laced to the yards.

5. Building the Boom and Gaff

When tapering the boom and gaff, notice that the maximum diameter is not at the center like a yard, but more toward the aft end. The boom and gaff have laser-cut walnut jaws (Figure 6-11). Drill the sheave hole at end of boom for the outhaul tackle, then install the stop chocks on the gaff for peak halliards and the outhaul stop chocks, sheet stop chocks, and cleats on the boom.

Complete these spars in hand as much as possible. Add the footrope to the boom as well as other rigging. The boom and gaff will be installed later.

6. Building the Flag Staff

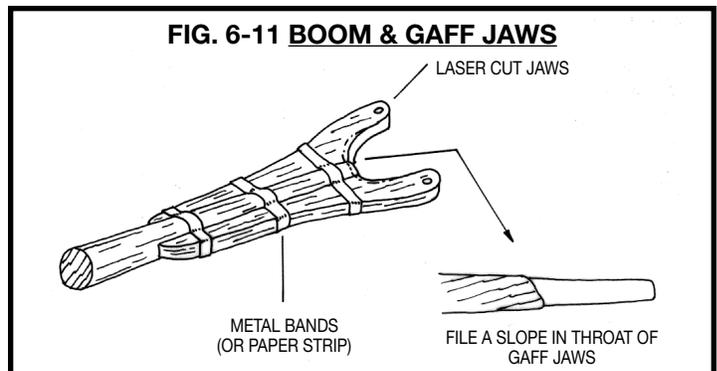
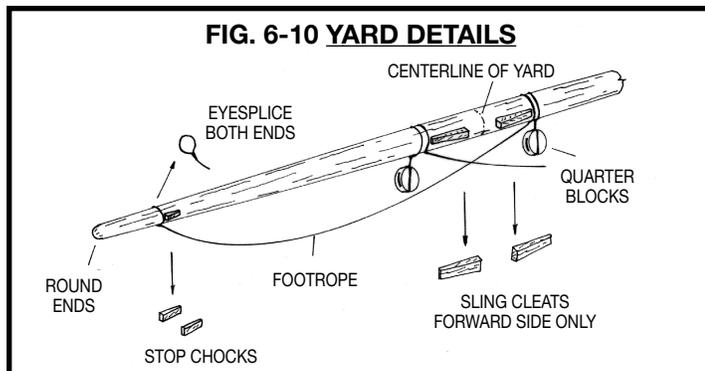
The flag staff for the stern is a simple tapered spar. Add the small cleat for the flag halliard.

7. Mast and Spar Bands, and Cleats

The mast cap, bowsprit heel band, gammon iron, and jibboom irons are all britannia castings in the kit. Because of casting limitations, these fittings are about 1/32" thick. Full size that's 1-1/2". Obviously, they should be thinner, about 1/2" to 1" full size. You can file these fittings down for a more scale-like appearance, or make your own using brass strip. The mast cap on the mast need not be filed down because it is flush with the square head anyway. You could file down the round part that holds the topmast.

The cleats for the mast and boom are britannia castings. They have a pin molded at the bottom. Drill a hole in the spar and insert the cleat. Use some super glue or epoxy to fix them. For the flag staff you will need to cut the cleat pin off a bit so it does not go all the way through the spar.

Reminder: Paint and detail yards, gaff, and boom before setting them aside. Once rigging commences, they must be ready to install on the mast.



Stage 7: General Rigging Information

Newcomers to the nautical world should learn the following rigging terms used on the plans and in instructions.

Each edge and corner of a sail has a name. On a square sail, the top is the *head*, the bottom is the *foot*, and sides the *leech*. The lower corners are the *clews*. On a fore and aft sail, 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.

Standing rigging: Fixed rigging supporting masts and yards. Generally, standing rigging is tarred; hence, it is black or dark brown.

Shrouds: Transverse lines supporting the masts. *Deadeyes* are wood and have three holes for reeving the *lanyards* (lines used

to tighten shrouds, stays, and other lines). A *heart* or *bullseye* is similar to a deadeye. The heart is somewhat heart-shaped and has a heart-shaped hole with grooves for the lanyards. It is used for more permanent installations. The bullseye is round with a round hole.

Chain plates: Iron bars or rods holding shroud deadeyes along the hull.

Footropes: Lines on yards, booms, and bowsprits on which seamen stand while working and furling sails. *Stirrups* hold the footropes, which are sometimes called *horses*. *Rattlines* are the footropes on shrouds.

Stays and backstays: Lines supporting the masts from fore and aft forces. A running backstay has a moveable tackle on deck.

Bobstays: Support the bowsprit from upward loads. *Bowsprit shrouds*, or *guys* support the jibboom and bowsprit from side forces.

Running rigging: Lines that move, *reeve* (go) through blocks, or operate sails and spars.

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.

Halliards or balyards: Lines for raising and lowering a sail, yard, boom, gaff, or flag. The part of a halliard attached to a yard is the *tye*. 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 *inbauls* drag a sail along a boom or up and down a stay.

Sheets: Lines holding the lower corners of a sail or boom. When not in use, sails are *furled* (bundled on the yards, booms, or

masts). *Clewlines* pull up the corners of a square sail, *leechlines* pull up the side, and *buntlines* pull up the belly for furling. *Brails* are like buntlines, but they pull loose-footed fore and aft sails toward the mast for furling.

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 a yard or boom to shorten the sail.

Parrels or parrals: Lines or devices like ribs and trucks for holding yards, booms, and gaffs to their respective masts and spars. A *truss*, *jeer*, and *sling* are similar to a parrel. These are lines or iron fittings holding a yard up and against the mast. They are most common on stationary lower yards.

Braces: Lines attached to *yardarms* (the ends of a yard) for directing a yard's angle and holding it taut. *Lifts* are standing or running lines for holding yards when lowered or tilting them. A *topping lift* is a line holding up the end of a boom when the gaff is down or absent. *Vangs*, port and starboard lines, prevent a gaff from swinging sideways.

1. Rigging Scheme

The *Virginia Sloop* model is designed to be rigged without sails. Even so, many of the sail lines, such as halliards and downhauls for headsails, and square sail sheets and clewlines, will be rigged.

A small-scale sail plan for those desiring to add sails is shown on Plan Sheet 4. No details for making model sails are included herein. However, as a reference consider Model Shipways' *Pride of Baltimore II* or *Flying Fish* instruction manuals. Both have instructions for making model sails. Steel's book listed in the bibliography has good details about real ship sails.

For information, the ship has 4 fore and aft sails; three headsails – a flying jib, jib, and foresail; and, abaft the mast, a main-sail. These are used for maximum windward performance. A single square topsail is for speed off the wind. The topsail sheets are lead by a spreader or crossjack yard that also serves as a yard for an optional lower square sail which would be used in light wind conditions. This sail could be called a main course, crossjack sail, or simply a square sail.

These instructions provide some general guidance for rigging sails if they are installed.

2. Rigging Plans

Plan Sheet 4 shows the scale details of masts and spars, a belaying plan, and a half-scale sail plan. In addition to the belaying locations, the belaying plan shows all the eyebolts required for rigging except for those at the bow on the hull. The eyebolts are also shown on the

FIG. 7-1 MODEL BLOCK STROPPING METHODS

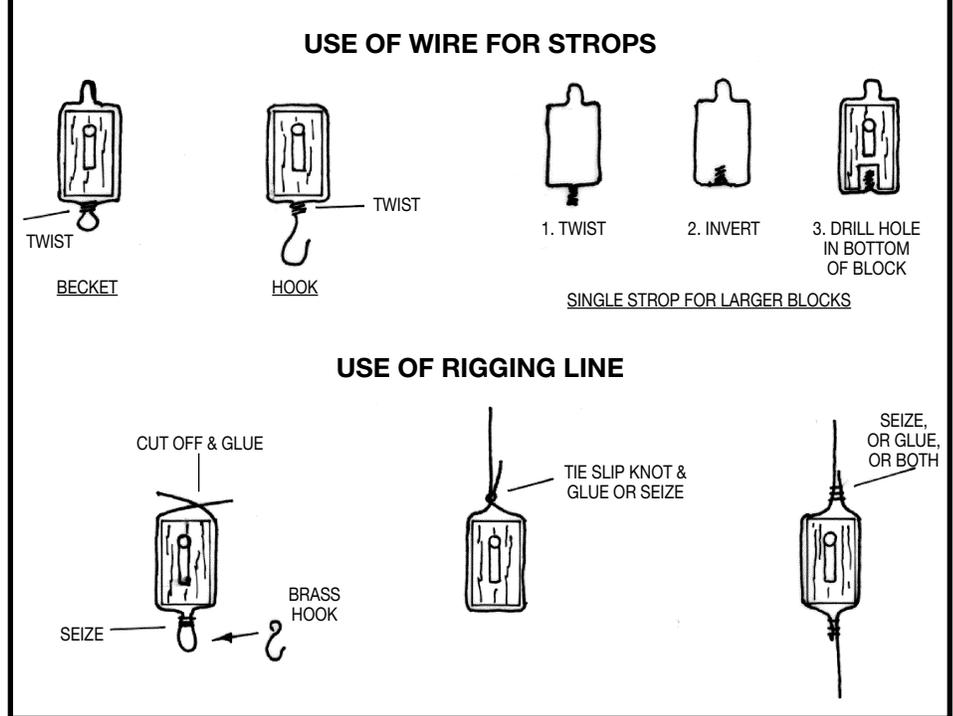


FIG. 7-2 SERVING RIGGING LINES

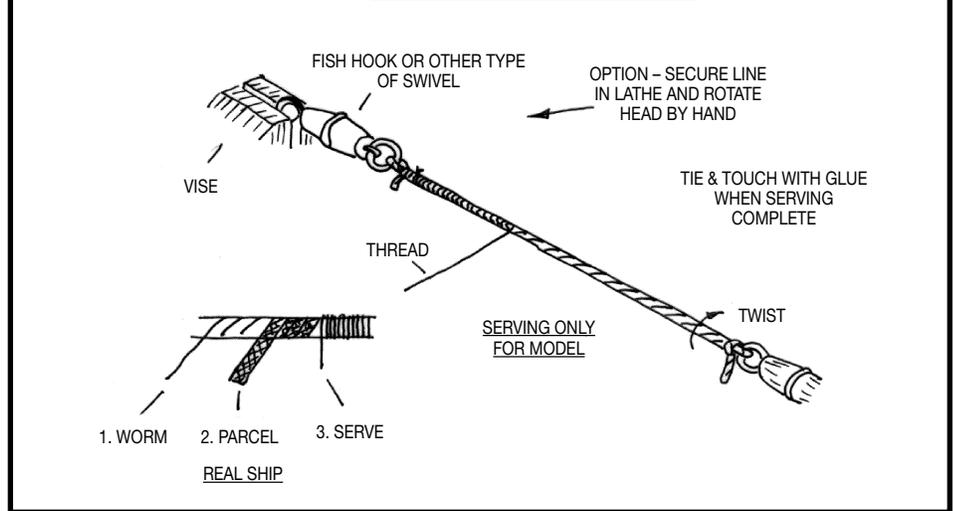
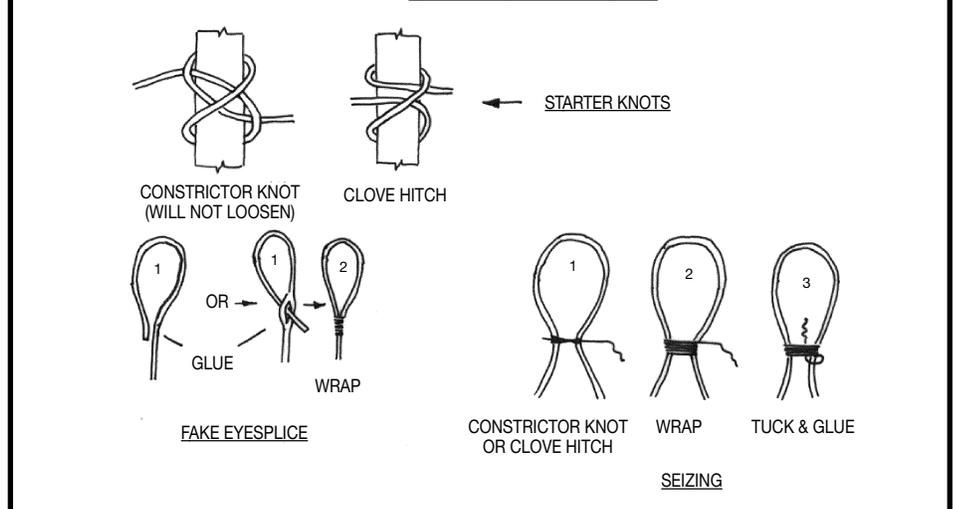


FIG. 7-3 SEIZING METHODS



hull plan, Sheet 3, including the ones at the bow. Refer back to Stage 5 for eyebolt sizes to use for rigging.

Plan Sheet 5 shows all the standing rigging lines, which are mostly black (tared lines on a real ship) except for any moving tackle lines. These would be tan lines (hemp or manila on a real ship).

Plan Sheets 6 and 7 show the running rigging, which are all tan lines (hemp or manila on a real ship). Since some of the blocks on the running rigging plans are actually attached to standing rigging lines, these standing lines are noted by short dot-dash lines on the running rigging plans where the block is attached. Sheet 6 shows some enlarged details of blocks, strops, and attachments to items such as eyebolts. There are also some sketches of how to belay lines to rails and cleats.

Study the plans and the sketches provided in these instructions, and have a complete picture of each rig before starting. Do this and everything will proceed smoothly.

3. Rigging Line, Blocks, Bullseyes, Hearts, and Deadeye Sizes

All block, bullseye, deadeye, and rigging line sizes are shown on the plans in model scale inches. These sizes relate to the lines and blocks supplied in the kit. The line, deadeye, and bullseye sizes are diameters. The block size is the length of the block. Plan Sheet 3 provides a conversion table for millimeters and for full ship size inches.

The large hearts for the forestay are laser-cut walnut. Cut or file the stopping groove around the heart, and round the inside hole a bit.

4. Block Details

Sometimes, commercial blocks supplied in kits do not have fully rounded tops and bottoms. To make them look better, round the ends with a needle file. Also, use a small drill bit or reamer and clean out and enlarge the sheave holes so lines reeve easier.

Plan Sheet 6 shows the real ship details assumed for the *Virginia Sloop* for block stopping and seizing to eyebolts and other fixtures. Notice there are several options you can use. *Figure 7-1* illustrates some model stopping methods to simplify the work. As the plans state, the use of metal hooks for securing blocks to eyebolts was certainly an option, but these are considered too expensive an item to include on this small sloop. However, the hook may be a simpler option for the model.

5. Treating the Lines

Worming, parceling, and serving: Lines on ships were wormed, parceled, and served wherever chafing might occur. Shrouds are a prime example. Worming inserts thin pieces of line (worms) between the strands. Parceling winds canvas strips saturated with tar around the wormed part. Then the wormed and

parceled area is served (bound in the opposite direction with spun yarn). Serving is the only procedure recommended for the model. However, most modelers omit it, preferring to use the line as is after applying a heavy coat of beeswax. Those striving for authenticity should serve only the largest lines, shrouds, and forestay with the kit's polyester, fine silk, or linen thread. Avoid unwaxed cotton if possible – it's too fuzzy. *Figure 7-2* illustrates a set-up for serving lines.

Seizings: Seize lines with the supplied polyester thread, then touch with diluted white glue or thin cyano (*Figure 7-3*).

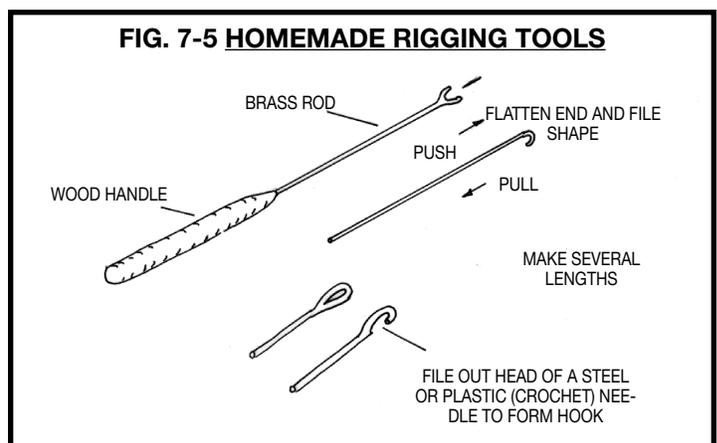
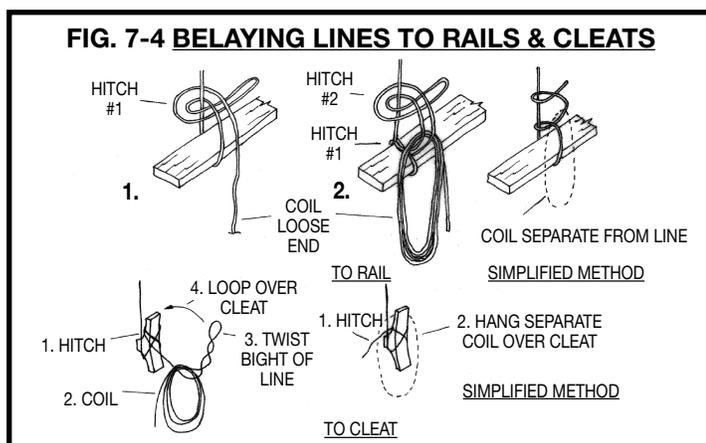
Beeswax: Protects lines against moisture and lays down fuzz. To soften beeswax, hold it to a light bulb. Run the line across the beeswax, then through your fingers to soften and smooth it. Do this several times to coat the line thoroughly.

6. Belaying Lines

Locations for belaying lines are shown on the belaying plan on Plan Sheet 4. The lines belay to the riding bitt rail, cleats on rails, bulwarks, shrouds, mast, and spars, or to timberheads on the rails. There are no belaying pins on this model. *Figure 7-4* shows how to belay lines and add a coil of rope.

7. Rigging Tools

Some homemade tools may be useful for the rigging process (*Figure 7-5*). Similar shapes are commercially available.



Stage 8: Installing Standing Rigging

All the standing rigging lines are shown on Plan Sheet 5. The color of the lines is noted on the plans. Most are black to represent tared lines, except for tan lines (not tared) used for a tackle. Before starting, sort lines by size, coat with beeswax, and keep them handy. For seizings, use the thread in the kit. It is prewaxed and doesn't require beeswax, but double duty won't hurt. Keep white glue and cyano ready for dabbing on a seizing if necessary. Usually, sewing through a shroud followed by a half hitch prevents the seizing from

unraveling. If you elect to serve the larger lines, do that first and serve a little more line than needed for each rig, just to make sure you don't come up short.

Plan Sheet 5 also shows a proper sequence for installing the shrouds, backstays, horse, and stays at the masthead.

1. Shrouds

Lower mast shrouds: The lower deadeyes have combined chain plate and deadeye strops. These are britannia fittings provided in the kit. Fit the deadeyes in the

strop, and either glue in place or squeeze down on the strop to fix in place. Each chain plate goes over a slot at the edge of the channel. After inserting the chain plate, cover the outer edge of the channel with a containing strip (*Figure 8-1*).

There are two pair of shrouds on each side. The eye at the top is seized together. This can be done off the model, because you have not yet installed the topmast. Start on the starboard side with the first

pair, then alternate them port and starboard (Figure 8-2). To set up the shrouds, make a temporary brass wire fixture to space the deadeyes as seizing progresses (Figure 8-3).

The fixture should be longer than the final spacing of deadeyes. *Reeving* (to pass a rope through a block or hole) the lanyards will tighten the shrouds to their final proper spacing. Make a test shroud first to see how much it stretches.

Figure 8-3 also shows the sequence for reeving lanyards. When looking outboard at any deadeye, start the knot in the upper deadeye left-hand hole. Consequently, port deadeyes have the knot aft, and starboard deadeyes have it forward. Rigging shrouds can pull the mast out of alignment, so keep checking on it.

The bitter end of the shrouds is on the opposite side from the lanyard knot, so on the port side the bitter end is forward, and on the starboard side it is aft (Figure 8-4).

Next, rig the ratlines. Figure 8-5 shows several methods. Give the line a generous coat of beeswax before installing. This will help hold the ratlines in a slight downward curve. If the ratlines tend to bow upward, tug them gently into position. Touching the loops with white glue or cyano will "freeze" them. Try holding a group of shrouds between your fingers so as not to alter their spacing while tying the knots.

Finally, install the cleats on the shrouds. The cleats are britannia castings and have a flange on the bottom, so the cleat can be secured to the shroud by wrapping both ends with thread. Touch with super glue.

Topmast shrouds: There are no topmast shrouds on this model. However, there are topmast backstays, discussed in paragraph 3 below. These do the same job as shrouds on the *Virginia Sloop*.

Note: Install the topmast when you are ready to do the upper rigging.

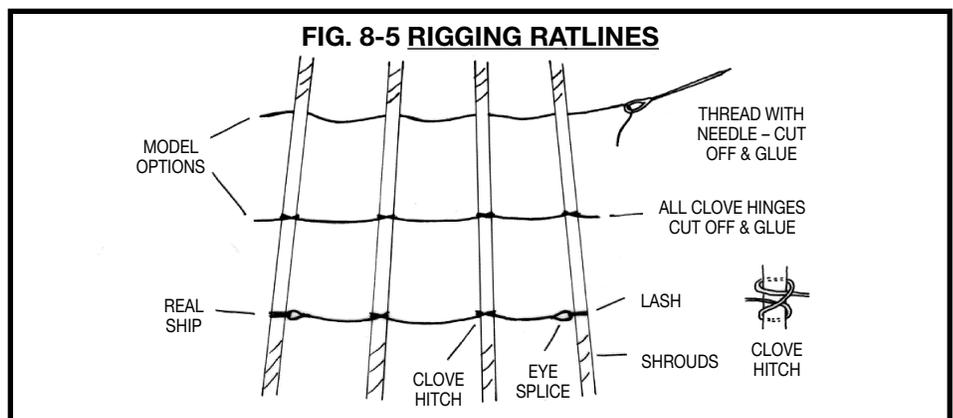
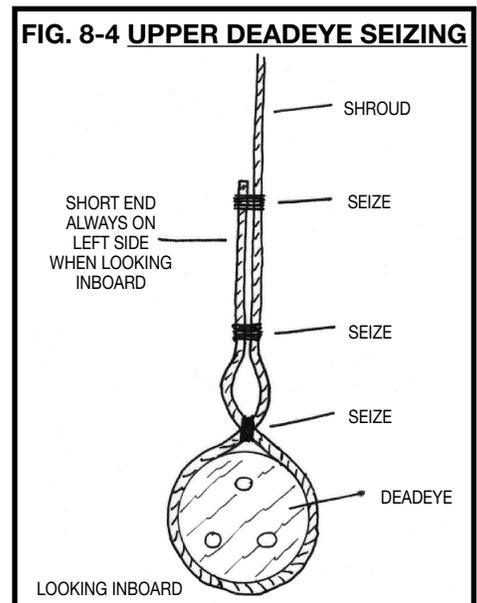
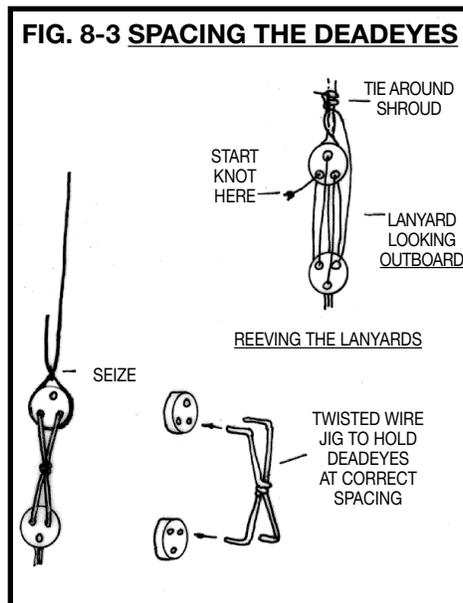
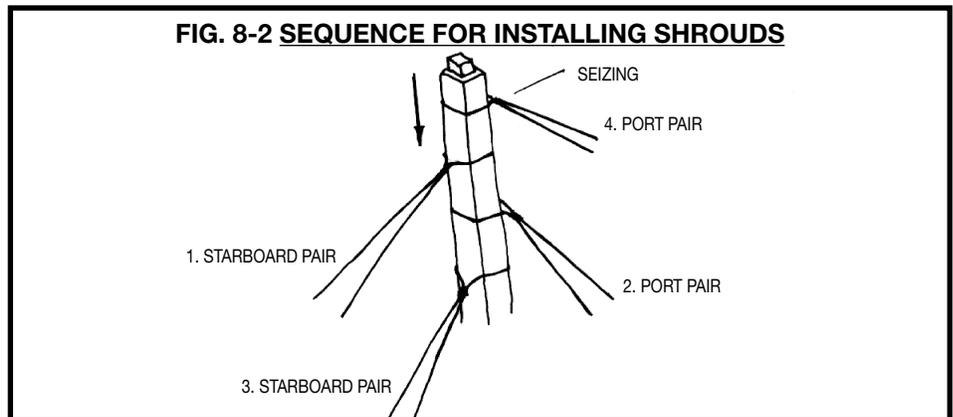
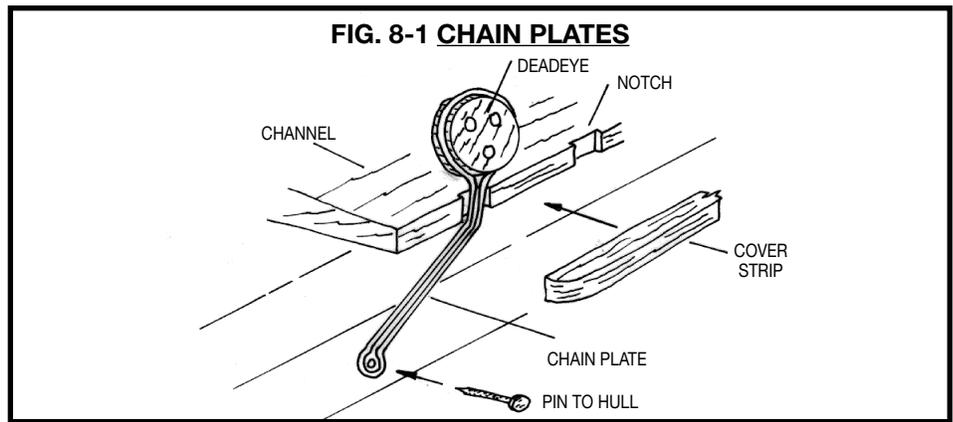
2. Spreader Yard Horse

This is a single line in front of the mast from the head of the mast down to the deck. It functions as an accessory mast to guide the spreader yard when raising and lowering. It is required because the yard parrel would hit the mainsail mast hoops if around the mast.

Fit the horse over the masthead using an eyespliced loop. Set the lower end to deadeyes in front of the mast (Figure 8-6).

3. Backstays

Lower mast backstays: These are running backstays port and starboard. The eye around the masthead is seized below



the trestle trees, and one end goes to port and the other end to starboard. From the eye there is a pendant port and starboard with blocks on the ends. Below that there is a tackle which has a standing end fixed to the rail eyebolt at the quarter deck. The line reeves through the upper pendant block and down to a jig tackle which is set to an eyebolt on the quarter deck/cabin rail. The fall of this tackle is belayed to a cleat on the inside of the bulwark below the rail eyebolt (Figure 8-7).

Topmast backstays: These port and starboard stays have an eye at the topmast and set up to thimbles with lanyards. The lower thimble has a short pendant which is seized to the same rail eyebolt used for the lower mast backstays. The kit contains small bullseyes that can be used for the thimbles. Or, just use a seized end loop in the line instead of actually installing a thimble (Figure 8-8).

4. Fore & Aft Stays

Forestay: The forestay has a moused eye over the masthead, then sets up to the

laser-cut walnut hearts with a collar around the bowsprit (Figure 8-9). One way to make the mouse on a model is to use a wooden tear-shaped bead and paint it black or serve over it. Or, just ignore the mouse and seize the end. The hearts need to be shaped up a bit, and cut a groove around them for the line and collar.

Jibstay: The jibstay at the head also has a moused eyesplice like the forestay. The stay leads down and through the sheave hole in the end of the bowsprit. From

FIG. 8-6 SPREADER YARD HORSE

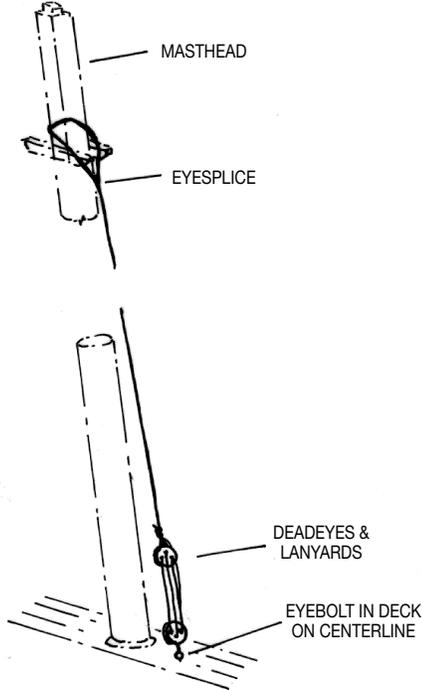


FIG. 8-7 RIGGING LOWER MAST BACKSTAYS

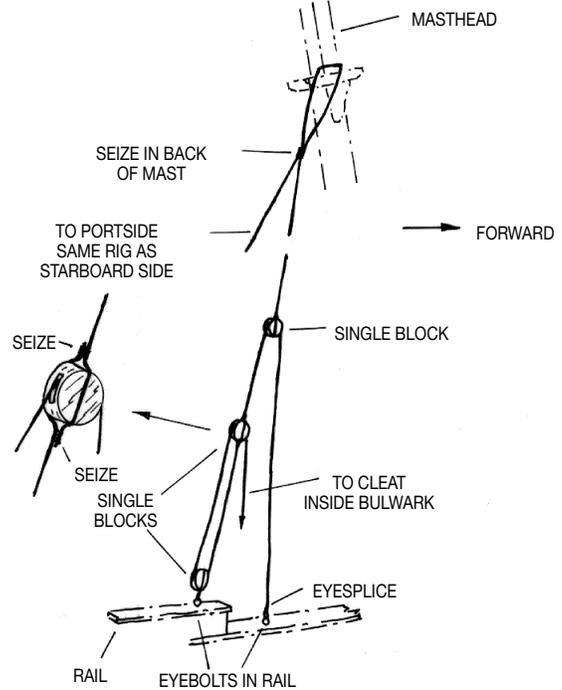


FIG. 8-8 RIGGING TOP MAST BACKSTAYS

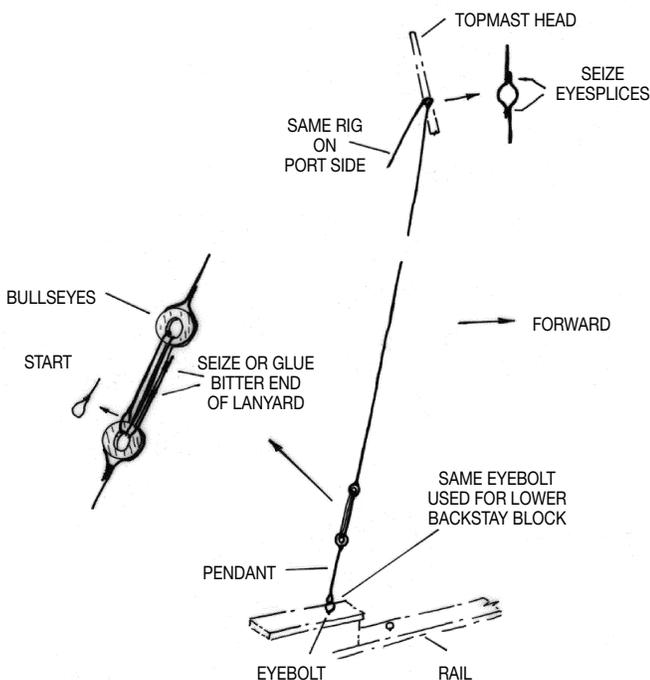
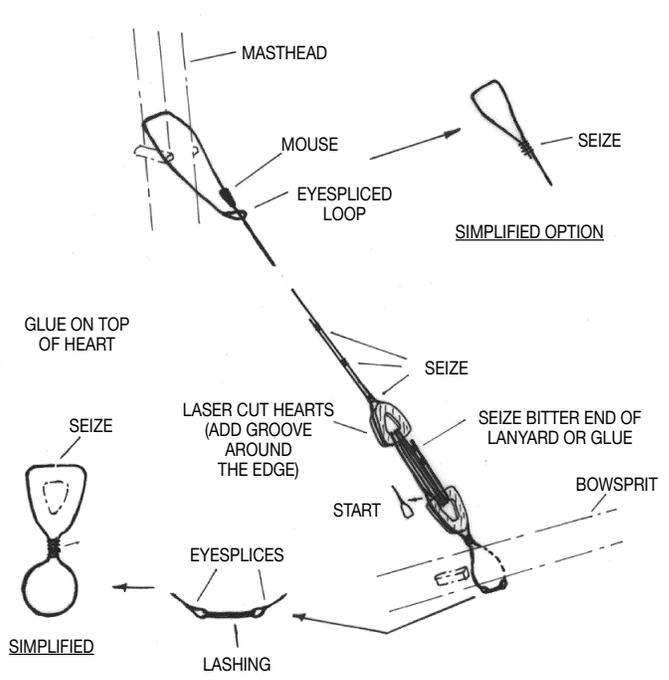


FIG. 8-9 RIGGING THE FORESTAY



there it terminates into a tackle seized to an eyebolt on the starboard side of the stem. The fall for the tackle is belayed to the first starboard timberhead on the rail (Figure 8-10).

Topmast forestay: From an eyesplice at the topmast (no mouse), the stay leads to the end of the jibboom, through a traveler inhaul ring on the jibboom, then through the sheave at the end, back to a tackle like the jibstay, but secured to an eyebolt on the port side of the stem. The fall belays to the port forward timberhead.

The traveler ring is used to inhaul or tighten the topmast forestay. Make the ring from brass wire. Attach inhaul lines (tan color running rigging) to each side of the ring and belay the lines to the port and starboard cleats just off centerline on the forward rail. Figure 8-11 illustrates the rigging.

5. Bowsprit Rigging

Bobstay: The bobstay is a single line going through a hole in the stem, and seized or eyespliced to itself. At the end of the bowsprit it sets to bullseyes with a collar (Figure 8-12).

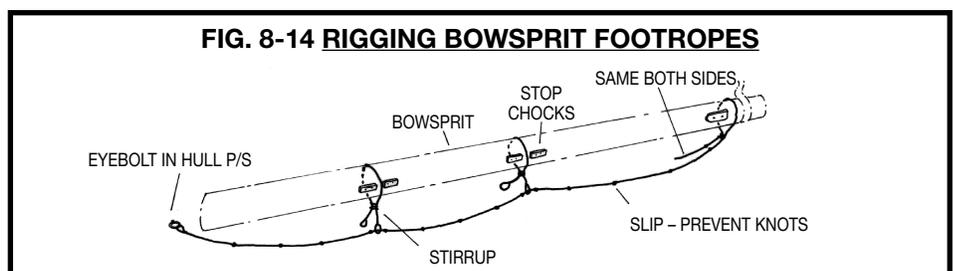
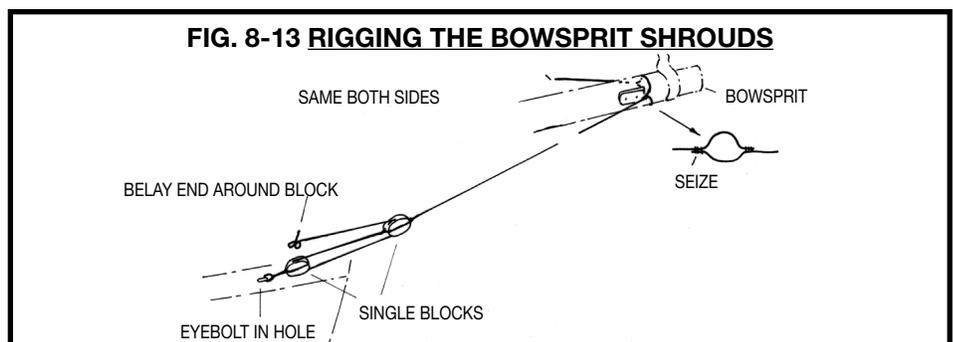
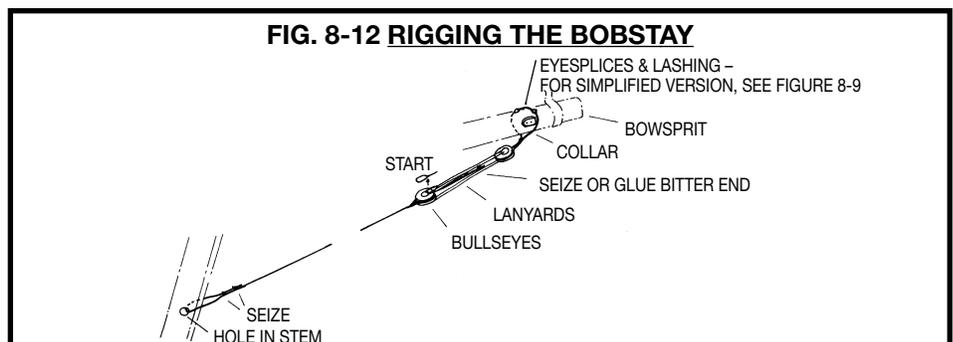
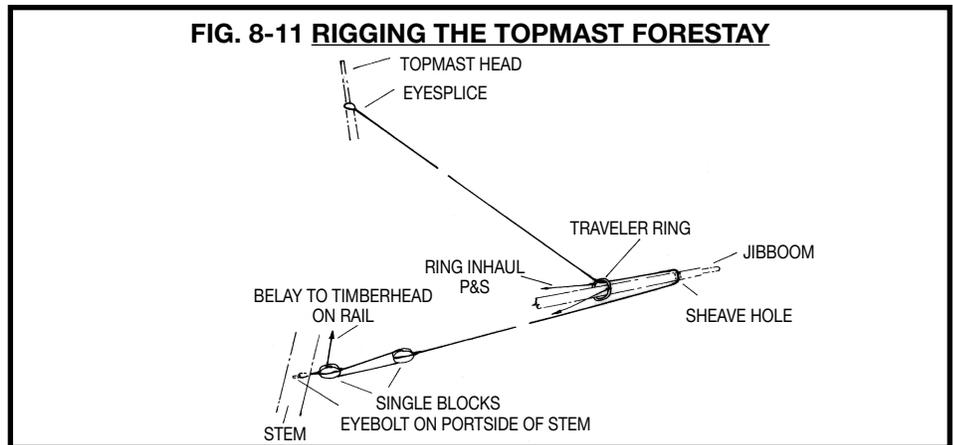
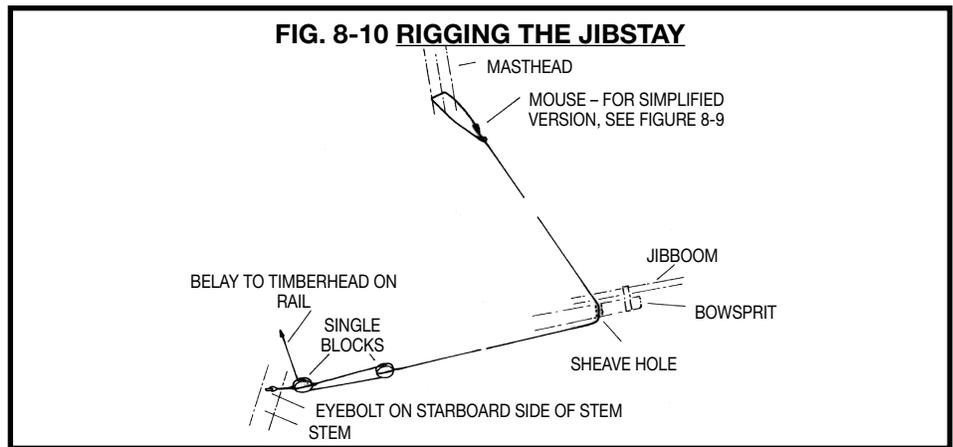
Bowsprit shrouds: These shrouds are port and starboard. An eyesplice is fitted around the end of the bowsprit, and the shroud terminates into a tackle set to an eyebolt on the hull side. The tackle fall is belayed to itself (Figure 8-13).

6. Footropes and Parrels

Footropes are required on the bowsprit (Figure 8-14). The bowsprit has stop chocks for the footrope stirrups. The aft ends of the footropes seize to eyebolts on the hull. The forward ends seize around the end of the bowsprit. The footropes have several knots in the line to keep a crew member from slipping along the footrope. Footropes are also on the yards and boom, but should have been installed earlier with yards in hand. The boom footropes have knots like the bowsprit footropes, but the yard footropes don't. Refer back to Stage 6.

Parrels for the spreader yard and topsail yard are also considered standing rigging, as they are black. However, refer to Stage 9 for a description of these lines.

This completes the standing rigging. Check for shiny glue spots and touch up with paint or shoe polish.



Stage 9: Installing Running Rigging

As noted earlier, even if this model is to be rigged without sails, it was common to leave many of the lines for handling the sails in place, obviously including their blocks. Having some running rigging on the model enhances its authenticity and appearance, so the more lines the better. Also, there will be some eyebolts and cleats on the model that are not used because of the sail omission.

Seize blocks in place before adding rigging. Although the rigging sequence isn't critical, starting at the bow and working aft is recommended. Do the fore and aft sail rigs first, then add the square sail rig. Plan Sheet 4 has a suggested belaying plan for belaying all lines. However, there are no hard and fast rules where to belay. Feel free to modify any belaying point if you feel a line runs better to another point.

All the standing rigging was installed using Plan Sheet 5. Plan Sheets 6 and 7 show all the running rigging lines and their blocks and where they are attached to any standing rigging.

If you have not done so already, install all the cleats necessary for belaying running rigging. The cleats are britannia castings. Cleats for the deck and spars have a pin molded into the bottom of the cleat. Set these cleats in a drilled hole with a touch of super glue or epoxy. Cleats on the shrouds have a flange at the bottom. Secure these to the shrouds with glue and thread.

1. Fore Staysail, Jib, and Flying Jib

These three sails, called headsails, would have a halliard tackle at the head and a downhaul that would also be attached to the head and run down to the bowsprit or jibboom, where it goes through a block and back to belay on the ship. The sails would also have port and starboard sheets.

For the model without head sails, it is assumed the sheets are removed with the sails and only the halliards and downhauls remain. The eyebolts and cleats for the sheets will be unused. When rigged, locate the lower halliard block (or just the halliard for flying jib) down near the bowsprit/jibboom close to the downhaul block. Belay the downhaul lines to the cleats at the bow as shown on the belaying plan. The head-sail halliards belay to cleats on the mast.

The fore staysail halliard and jib halliard blocks are seized to the throat of the stays. The flying jib halliard block is seized around the topmast head. *Figure 9-1* shows the entire rig for the jib. The other two sail rigs are similar, as shown on the plans.

Rigging with head sails: If the sails are added, you will need to include the sheets. Eyebolts and cleats are already

FIG. 9-1 RIGGING THE JIB HALLIARD AND DOWNHAUL WITHOUT SAIL

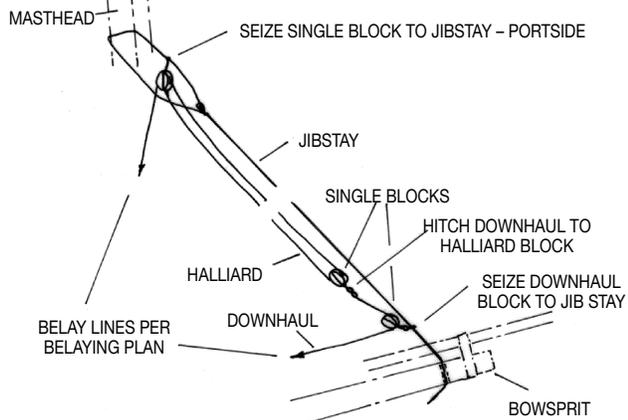


FIG. 9-2 RIGGING WITH A JIB SAIL

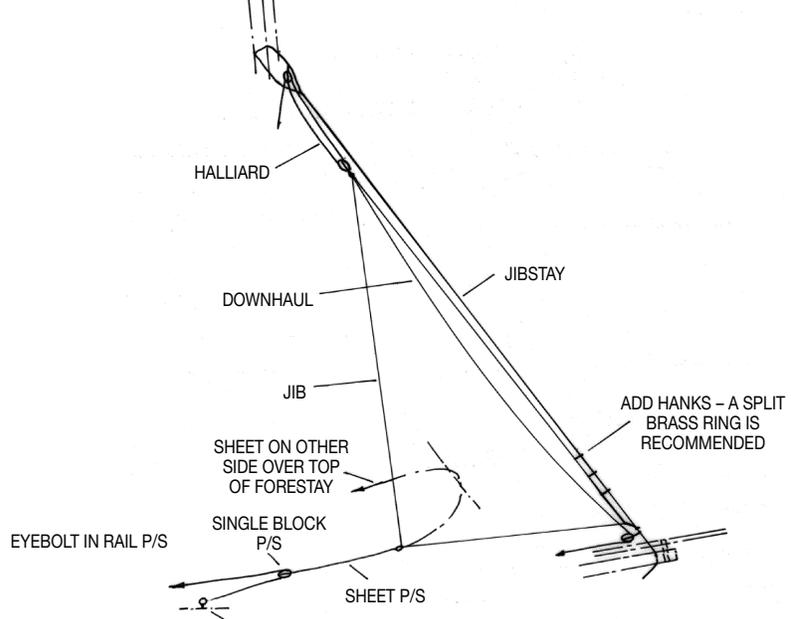
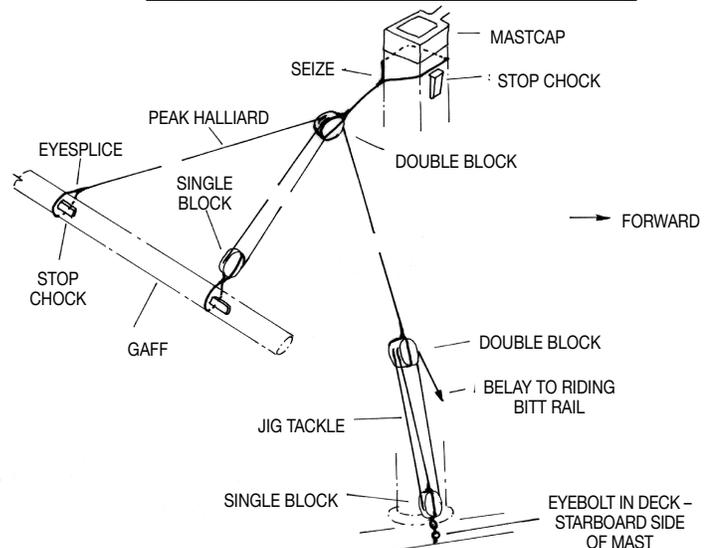


FIG. 9-3 RIGGING THE GAFF PEAK HALLIARDS



on the model for these lines and are identified on the belaying plan. Also, the halliard/downhaul connection would move up and be attached to the head of the sail. *Figure 9-2* illustrates the rig.

2. Mainsail

You should have all the mast hoops for the sail on the mast. Even with no sails, the hoops would still be around the mast in a pile. The mast hoops in this kit are britannia castings. Paint them to look like wood.

Gaff: The gaff is rigged with a peak halliard and throat halliard. The location of the gaff is optional. Realistically, if no sail is present, the gaff should be lowered so it sits parallel and just above the boom. This option is shown on the rigging profile. However, many modelers like the gaff hoisted so it fills up the space behind the mast. That's your choice. If the gaff is in the up position, there is nothing to hold the gaff taut, since this ship has no gaff vang. The only option is to pin or glue the gaff in a permanent position at the mast.

The gaff peak halliard block at the mast head is seized around the masthead supported by stop chocks on the masthead. The peak halliard fall goes to a jig tackle secured to an eyebolt at the forward starboard side of the mast (*Figure 9-3*). The throat halliard block is seized to an eyebolt in the chock between the trestle trees. The throat halliard has a similar jig tackle secured to an eyebolt on the forward port side of the mast (*Figure 9-4*). The falls of both jig tackles belay to the bitts rail forward of the mast.

Rig the flag halliard at the end of the gaff through a small block. The block is not included in the kit – here's your chance to make a block. Both ends of the halliard belay to a cleat on the boom (*Figure 9-5*).

Boom: For the boom, install the boom sheet. The lower block attaches to the traveler rod on top of the cabin. The sheet belays to a cleat on the underside of the boom (*Figure 9-6*). The topping lift standing end is secured to an eyebolt just below the mast cap at the masthead. It goes through a block at the end of the boom and back up through a block seized around the masthead. From there, it goes to a jig tackle set to an eyebolt on the starboard channel, and the fall belays to a cleat on the shroud (*Figure 9-7*).

The boom can be sitting on the port or starboard boom rest or just hanging from the topping lift. The flagstaff could be installed at the stern with the boom in one of these positions. It could also be installed with the boom hanging from the topping lift but slightly to port or starboard to miss the staff.

FIG.9-4 RIGGING THE GAFF THROAT HALLIARD

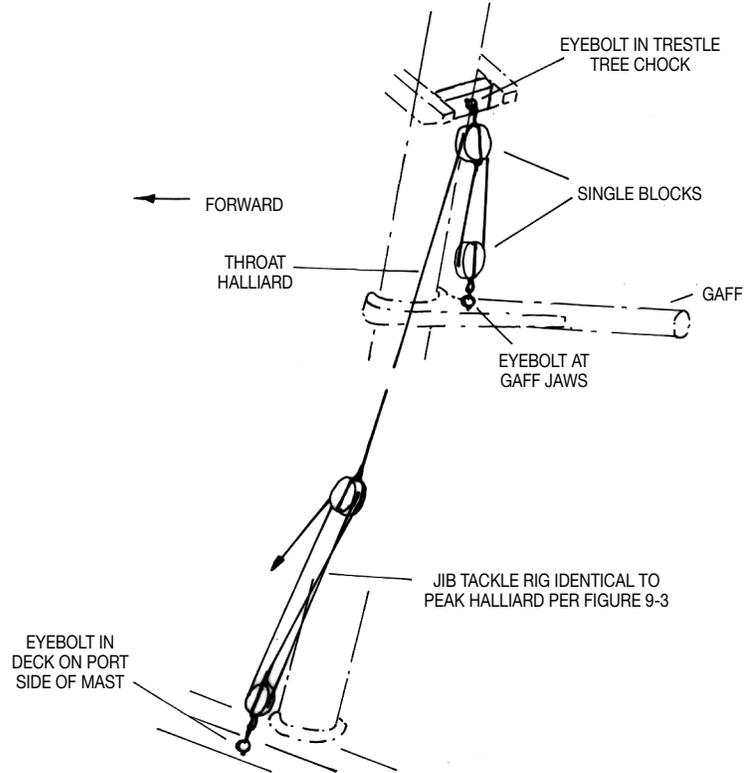


FIG.9-5 RIGGING THE FLAG HALLIARD ON GAFF

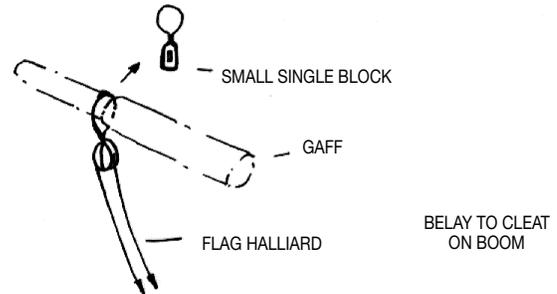
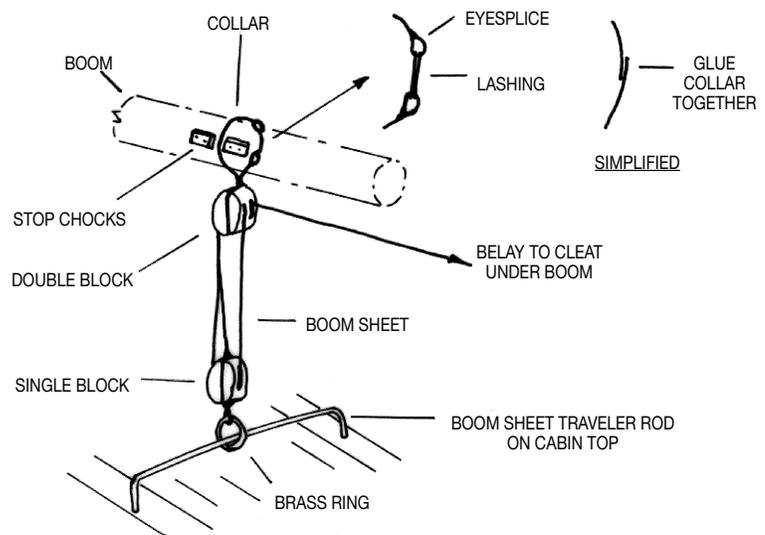


FIG.9-6 RIGGING BOOM SHEETS



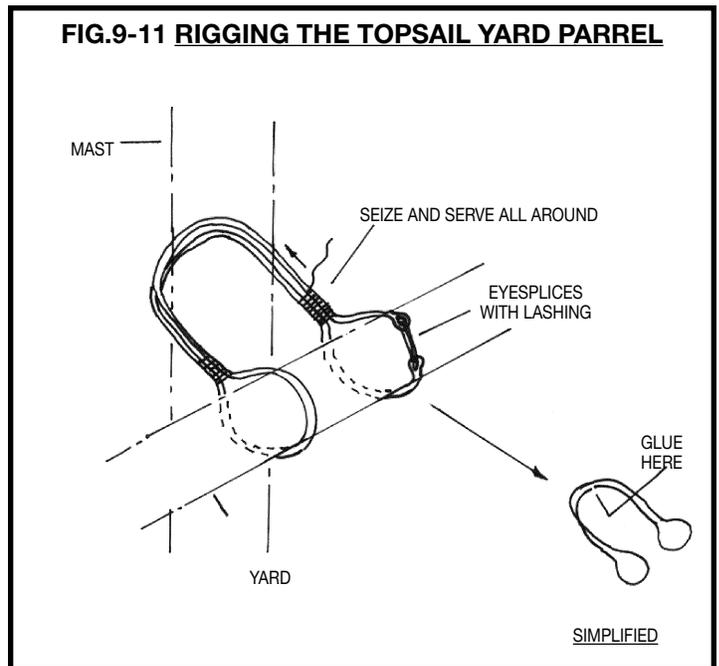
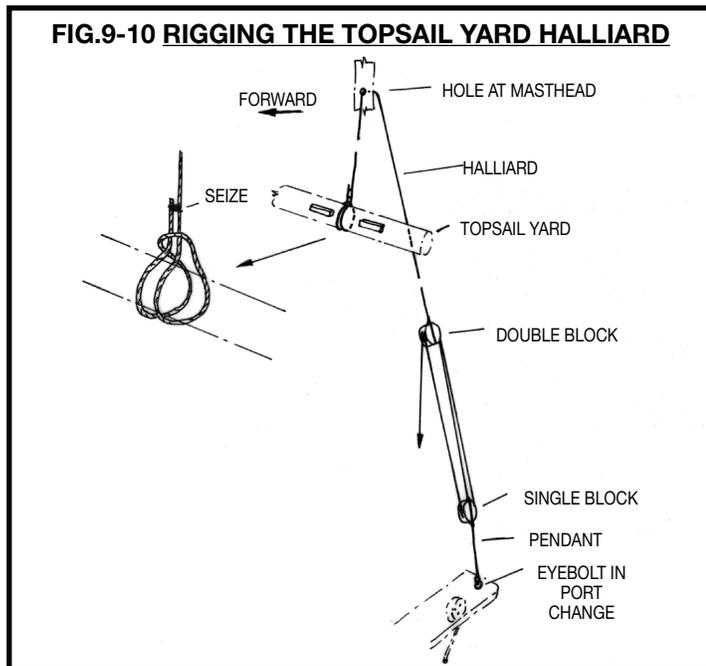
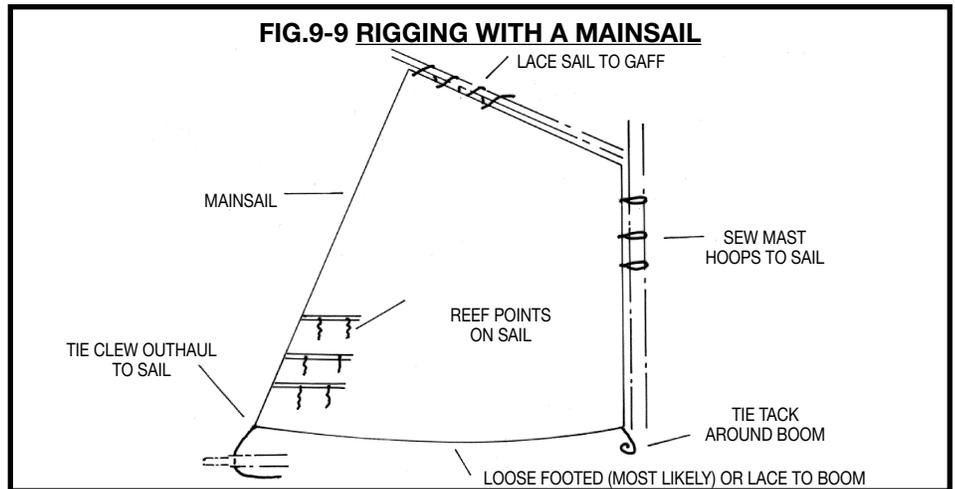
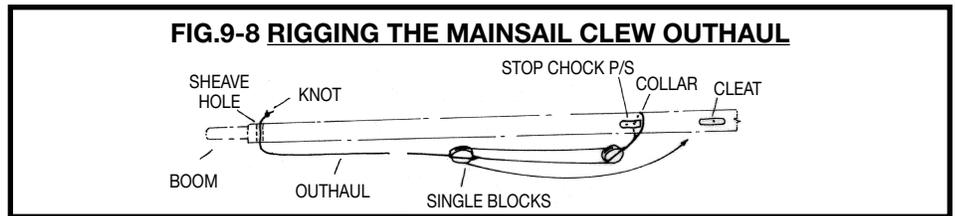
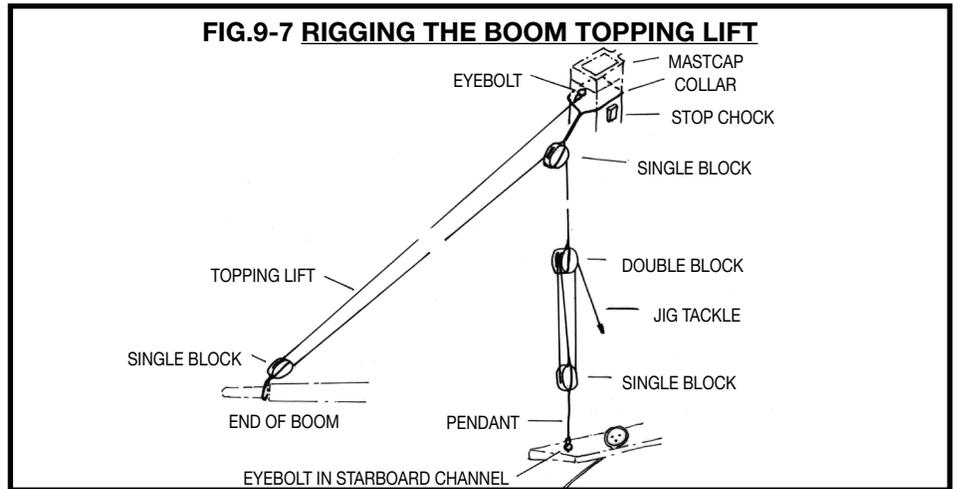
The lines rigged above are basic to the gaff and boom. However, the sail would have an outhaul at the clew of the sail. Knot off the outhaul tackle at the sheave in the boom, and rig the tackle along the boom (Figure 9-8).

Rigging with the mainsail: If the main-sail is actually installed, the only real difference is that the gaff must be in the up position, and the outhaul tackle is attached to the sail. Also, you will need to sew the mast hoops to the sail and lace the sail to the gaff. For this ship, the sail may be loose-footed at the boom, but it could have been laced to the boom (Figure 9-9).

3. Topsail

Topsail yard: If you have not rigged the yard footropes and installed the clewline blocks, do it now. Locate the yard just above the mast cap as if the yard has been lowered on its lifts. Rig the halliard first. The halliard goes through the sheave hole in the mast, then to a tackle just like the boom topping lift tackle, but secured to the aft end of the port channel, and the fall belays to a shroud cleat (Figure 9-10).

Next, add the parrel (really black standing rigging) to the yard around the mast (Figure 9-11). Then, rig the port and starboard lifts that feed through blocks seized to the mast, then down, and are belayed to the riding bitt rail (Figure 9-12).

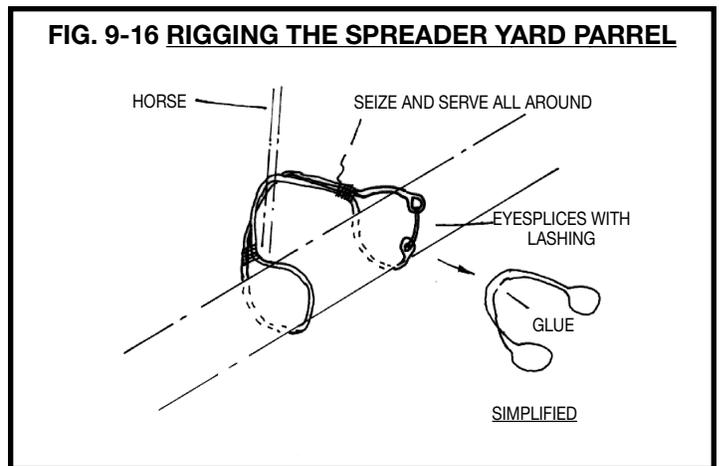
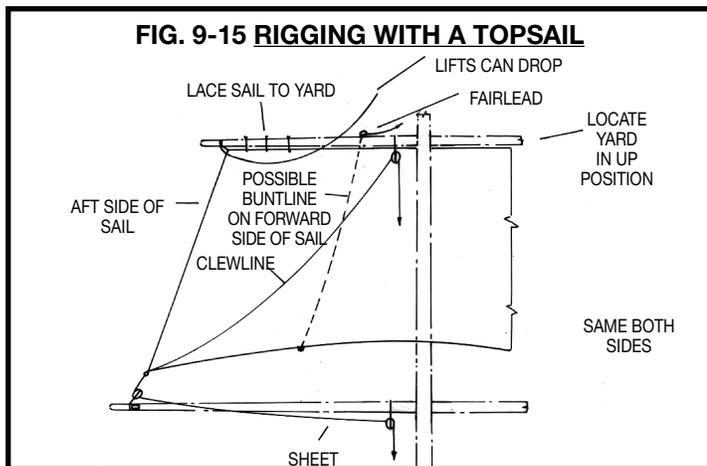
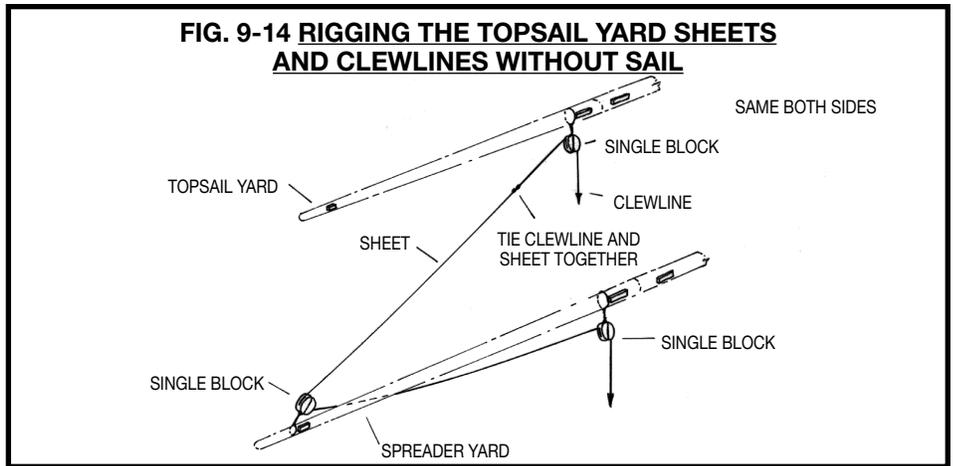
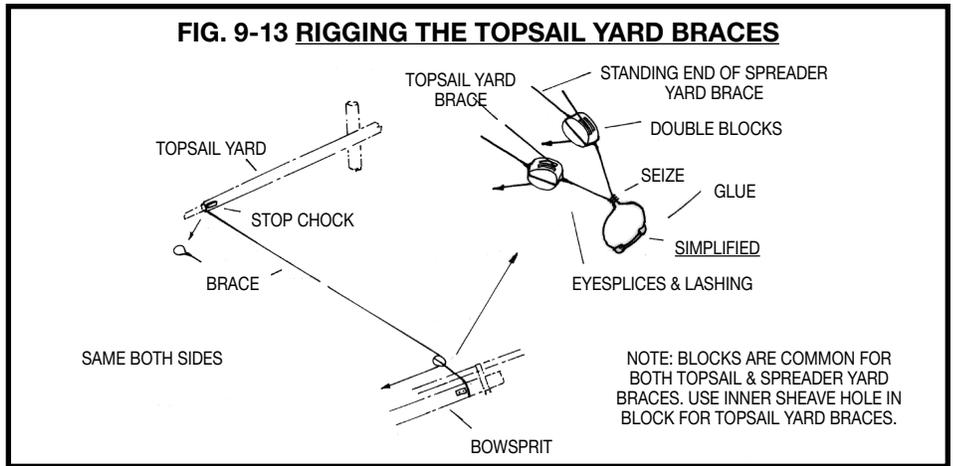
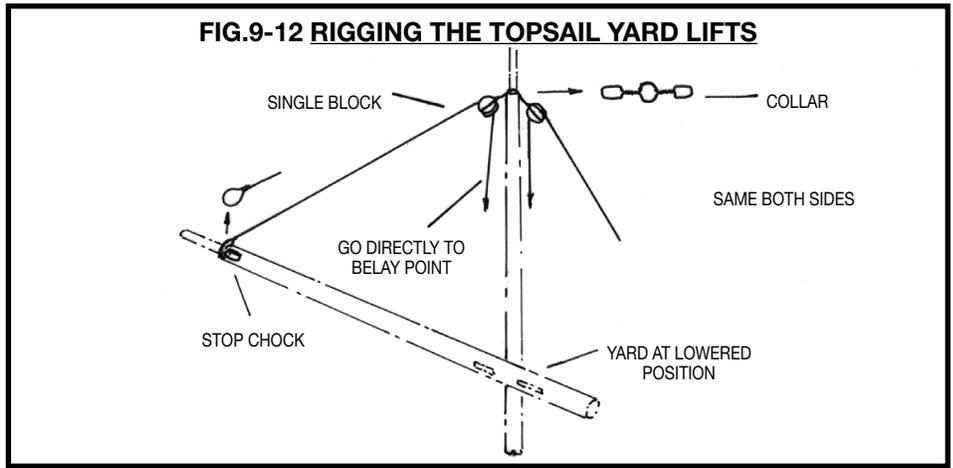


Port and starboard braces are seized to each yardarm, go down and through double blocks at the end of the bowsprit, then back to the hull and belay to cleats at the bow. The double blocks serve both the topsail yard and spreader yard braces (Figure 9-13).

The yard has a port and starboard clewline block for the topsail. With the sails off, tie the clewline to the topsail sheets up near the yard. The clewlines go through the blocks on the topsail yard, then down to belay to cleats on the shrouds. The sheets feed through the blocks at the spreader yardarm, then through the quarter blocks and down, and belay to the riding bitt rail (Figure 9-14).

Rigging with the topsail: If the sail is added, then the clewlines and sheets are actually attached to the sail. The sail is laced to the yard, and some buntlines would be fitted. Buntlines could belay to any spare cleats on the shrouds or mast (Figure 9-15).

Spreader yard: Rig the footropes and the topsail sheet blocks if you have not already done so. The parrel, black line, for this yard goes around the vertical horse line in front of the mast (Figure 9-16).



The halliard block (*jeers*) has an eye around the masthead. The lower block is seized around the yard. The halliard leads below to a jig tackle, secured to an eyebolt at the deck just forward and to port of the horse eyebolt. The fall belays to the riding bitt rail (*Figure 9-17*).

The port and starboard lifts go through blocks seized around the masthead, then

feed down to a tackle secured to an eyebolt in the deck near the bulwarks and about in line with the first shroud. The fall belays to shroud cleats (*Figure 9-18*).

Rig sheets per instructions under Topsail Yard above.

The forward port and starboard braces start as a pendant, then a tackle to the end of the bowsprit, and belay to cleats at the

bow. The blocks at the end of the bowsprit are double blocks, shared with the topsail yard braces (*Figure 9-19*).

The after braces start as an eyesplice on the yardarm with a pendant, down to a tackle fastened to an eyebolt just forward of the boom crutch on each side, and the tackle fall belays to a cleat fixed to the upright arm of the boom crutch (*Figure 9-20*).

FIG. 9-17 RIGGING THE SPREADER YARD JEERS

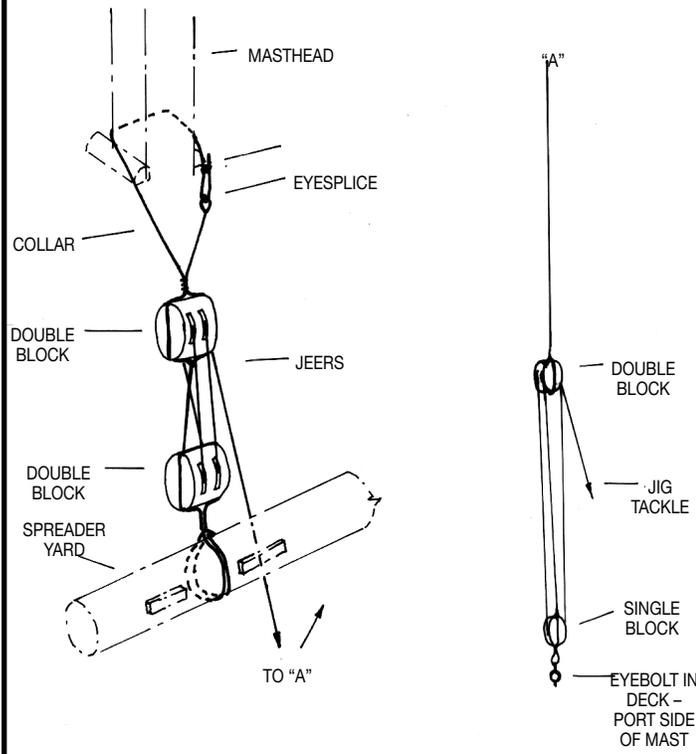


FIG. 9-18 RIGGING THE SPREADER YARD LIFTS

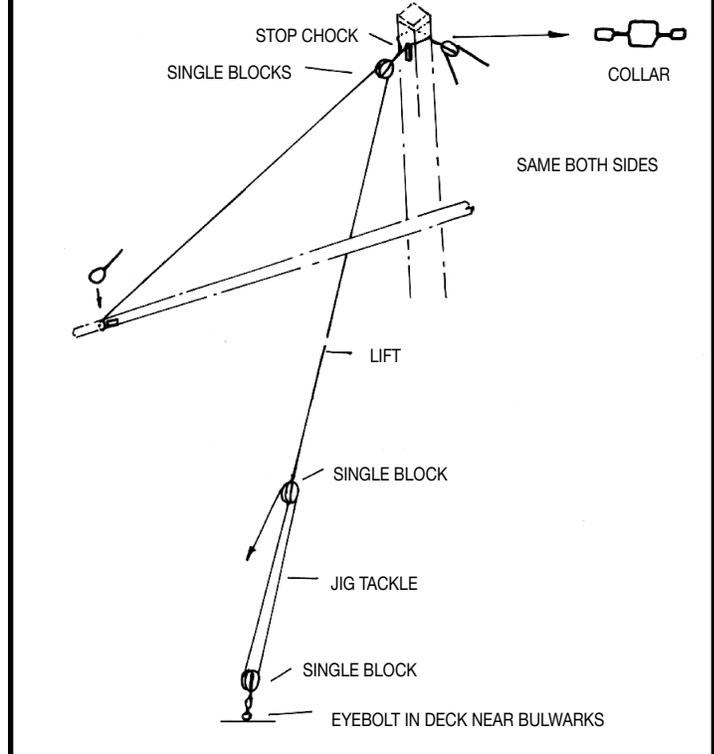


FIG. 9-19 RIGGING THE FORWARD SPREADER YARD BRACES

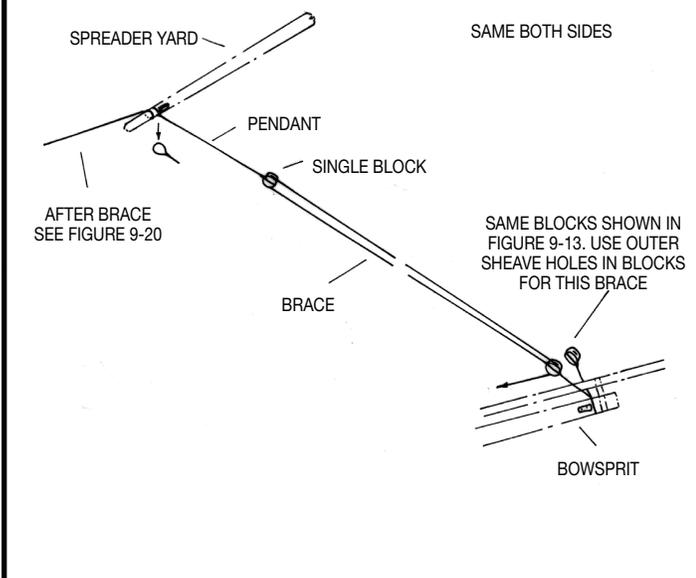
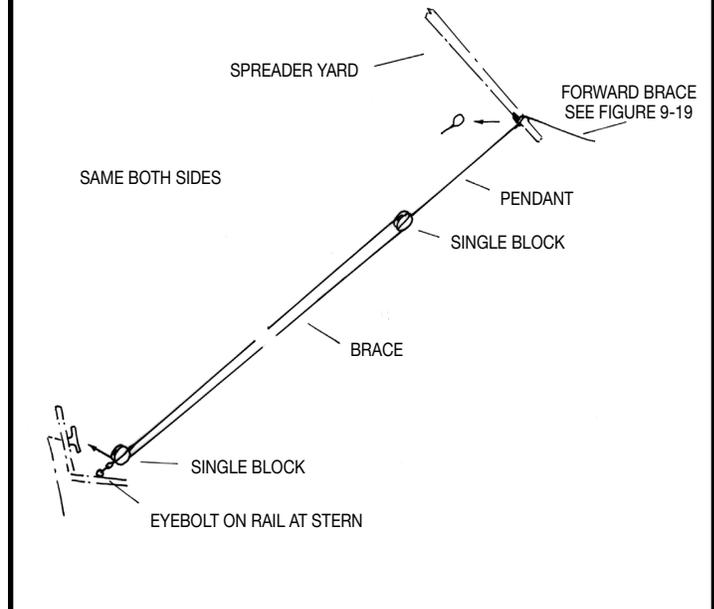


FIG. 9-20 RIGGING THE AFTER SPREADER YARD BRACES



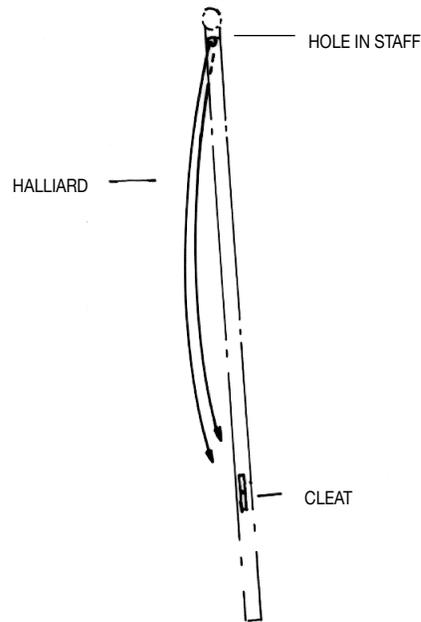
4. Course

Since a course sail has been considered optional, no rigging lines need be installed on this model. If such a sail were used, it would be a large square sail supported off the spreader yard. The sail would be set by lowering the spreader yard on deck. Sheets could be belayed back near the quarterdeck rail.

5. Stern Flag Staff

This is a simple flag halliard belayed to a cleat on the pole (*Figure 9-21*).

FIG. 9-21 RIGGING THE FLAGSTAFF HALLIARD



Final Touches

When the model is rigged, recheck every line. Be certain seizings are sound. Add another dab of glue if they aren't. Touch up shiny spots on standing rigging with black paint or liquid shoe polish. Use a tan stain or brown liquid shoe polish for running rigging. Check if any painted wooden parts were fouled during the rigging process and make repairs.

Congratulations!

Your *Virginia Sloop* is finished! Take a moment to revel in your accomplishment. You've persevered when the going became rough, and your effort has produced results. You've developed skills you never knew you had, increased your vocabulary, and become a time traveler. We hope you've enjoyed your voyage and look forward to sailing with you on your next shipmodeling project.



Bibliography

Modeling an Armed Virginia Sloop of 1768 by Clayton A. Feldman. Cedarburg, Wisconsin: Phoenix Publications, Inc., 1991.

Text with plans describing the research, design, and construction of a 3/8" scale model of a Virginia Sloop. Basis for the Model Shipways kit.

Early American Ships by John F. Millar. Williamsburg, VA: Colonies Press, 1986.

Contains original drawing for the Virginia Sloop. Basis for Dr. Feldman's research.

Elements of Mastmaking, Sailmaking and Rigging by David Steel (1794). Largo, FL: Sweetman Reprint, 1993.

Contains contemporary rigging sizes and descriptions for ships and includes small sloops. Basic text used by Dr. Feldman to rig the model.

The Young Sea Officer's Sheet Anchor by Darcy Lever (1819). Mineola, NY: Dover Reprint, 1998.

Outstanding text for rigging old ships. Many detailed drawings.

The Art of Rigging by Capt. George Biddlecombe. New York: Edward W. Sweetman Co., 1990 (reprint).

Classic text for various early 18th century ships with many tables on rigging and block sizes. Some excellent tables compare the tensile strength of chain and rope line.

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. Outstanding illustrations.

The following model building publications are especially useful for beginning model builders:

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.

Historic Ship Models by Wolfram zu Mondfeld. New York: Sterling Publications, 1989.

Modelbuilding techniques play a minor role in this heavily illustrated superb reference book. Covers practically every aspect of ship construction, outfitting, and rigging from many historical periods.

The Neophyte Shipmodeller's Jackstay by George F. Campbell. Hollywood, FL: Model Shipways Inc., 1962.

Written especially for the beginner building wooden ship models from kits. Well illustrated and covers many periods.

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.

The Ship Model Builders Assistant and ***The Built-Up Ship Model*** by Charles G. Davis. New York: Dover Publications, reprinted 1986 and 1989 respectively.

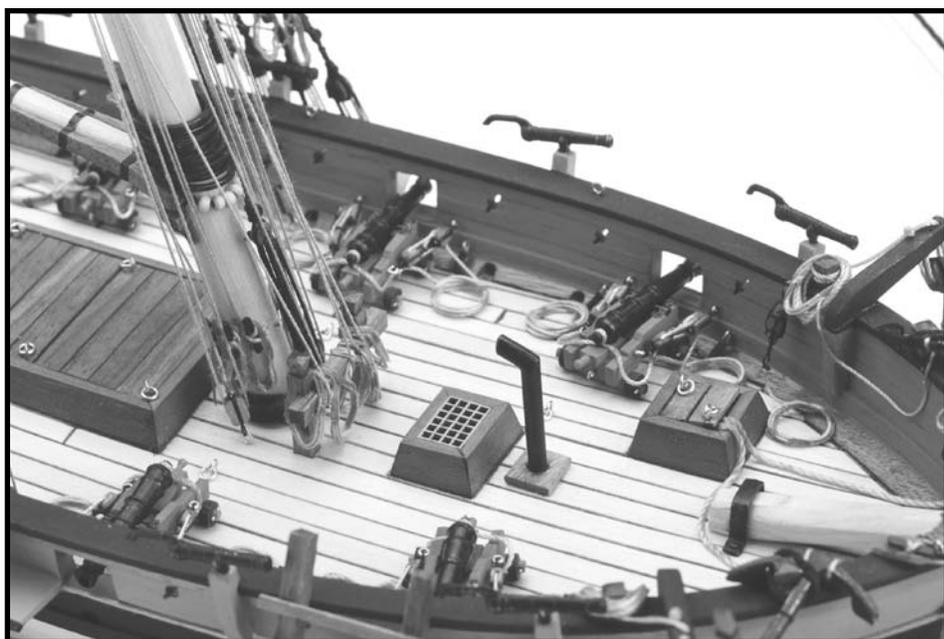
Two classics for the ship modelbuilder. Although dated, Davis' modelbuilding techniques are still excellent. More important is the wealth of information on how ships were built and outfitted. Many excellent drawings.

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.

Ship Modeling from Stem to Stern by Milton Roth. Blue Ridge Summit: Tab Books, 1988.

Entertaining text on ship modelbuilding techniques. The chapters on guns and ship's boats are especially useful. Numerous detailed drawings.



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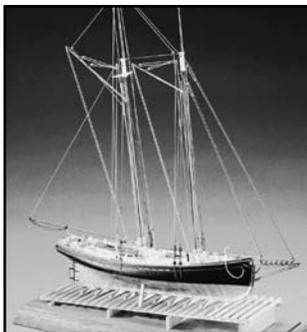
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