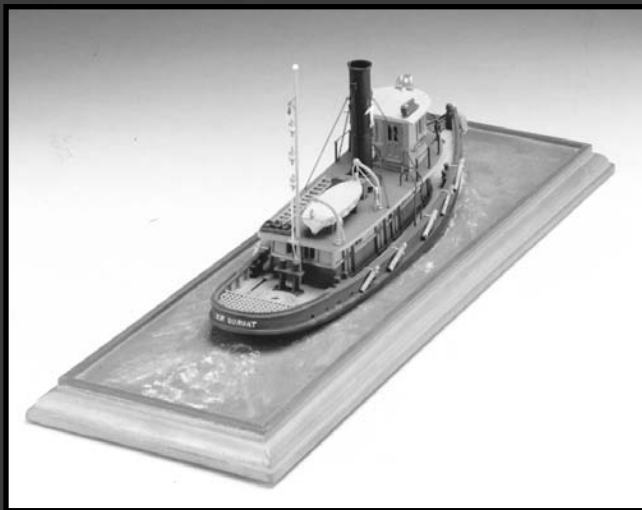


Steam Towboat **TAURUS**



MODEL SHIPWAYS
• QUALITY KITS SINCE 1946 •

Towboats, like the TAURUS, were a familiar sight in every American harbor and navigable tidal flat at the turn of the century. Graceful, yet functional, they pulled large liners and pushed heavy barges with ease. Dur-

ing the 1930's, steam engines lost ground to Diesel propulsion, and by the 1960's the steam units were all but gone. A few steam tugs survive today as museum relics.

Technical Characteristics:

Scale: 1/8" = 1' 0" (1:96)
Length: 9"
Height: 3-1/2"
Hull width: 2-1/4"

Model Shipways

Kit No. 2021

Instruction Manual

The Steam Towboat

Taurus

By Erik A. R. Ronnberg Jr., 1978

Instruction Manual Update By Ben Lankford, 1995

The Model Shipways kit is based on the tugs Betsy Ross of Philadelphia, 1903, and the Sommers N. Smith of Boston, 1887. Photos No. 2847 and 2156A, respectively, are in the collection of the Steamship Historical Society, now in the library of the University of Baltimore.

During the original development of the kit, Mr. Ronnberg was assisted by Mr. Willie Dunne, Mr. Alan Frazer, and the librarians at the Historical Society. Their assistance is greatly appreciated.

This new instruction manual expands on the original instructions prepared by Mr. Ronnberg. The manual takes you through a step-by-step procedure for building a fine ship model. Beginners and advanced modelers alike should find this a very rewarding project.

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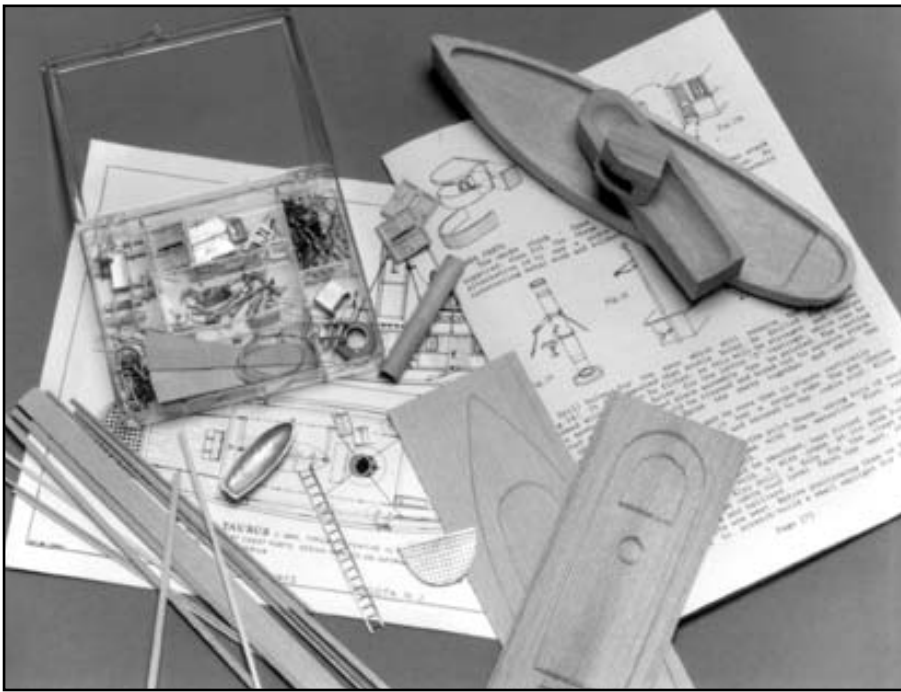
Model Shipways, Inc.

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BEFORE YOU BEGIN

The model is a waterline type (no hull below the waterline). At 1/8" scale, it makes a fine shelf model mounted on a "sea" baseboard. It can also be used effectively in an HO gauge model railroad setting. Although HO is 1/87 scale, 1/8" (or 1/96) is close enough for the HO layout. What you will have is slightly smaller boat.

This kit contains a solid hull which has been machined carved from select, medium hard, fine grained basswood. This style hull provides a quick and easy lesson in the basic shapes and proportions of hull design and helps to develop woodworking skills. The exterior of the TAURUS hull has been carved close to the intended shape, so a simple sanding is all that is required. Some carving is required for the bulwarks. Shaping and finishing the hull to its final shape are discussed in the instructions.

If you are a beginner, take your time. This model is fairly simple to build but still requires some time and concentration. Make sure you complete one stage before moving to the next. When things go awry, consider doing it over. Completing this model will prepare you for a more complicated solid hull model such as the Fishing Schooner ELSIE or the Colonial Schooner SULTANA. Good luck!

HOW TO WORK WITH PLANS AND PARTS

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

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

1. The Plan

One Plan Sheet is provided. However, many sketches throughout this manual further illustrate the various stages of construction.

The TAURUS kit is manufactured to a scale of 1/8" = 1'0". The plan is drawn to the exact scale that the model is to be built. Dimensions can be lifted directly off the plan by using a set of draftsman dividers or by using a "tick" strip, which is simply a piece of paper used to "pick up" the dimensions (a roll of calculator tape works very well). Lay your paper strip over the plan and mark the lengths of items carefully with a sharp pencil. Then use the strip to transfer the marks to the wood or item to be made to scale.

2. Kit Lumber

Your kit may contain limewood, a European wood, as a substitute for the basswood. Both woods are similar in workability and grain.

3. Cast Metal Fittings

The kit is supplied with Britannia metal castings. The Britannia metal is a great improvement over the white metal that was used in some older kits. Unlike white metal and pewter, Britannia does not contain lead, so there are no possible corrosion problems. The fittings, however, will require final finishing before they are suitable for installing on the model.

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

WHAT YOU'LL NEED TO START CONSTRUCTION

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

A. Knives & Saws

1. Hobby knife with No. 11 blades
2. Coping saw (or jeweler's saw frame) and fine blades

B. Files

Set of needle files

C. Carving Tools

Small chisel and gouge for shaping the bulwarks

D. Sharpening Stone

Necessary to keep the tools razor sharp

E. Clamps

1. Several wooden clothespins
3. Rubber bands

F. Wire Cutters & Tin Snips

For cutting fine wire & chain; for cutting brass sheet

G. Boring Tools

1. Set of miniature drills: #60 to #80
2. A pin vise
3. Larger bits: 1/16", 3/32", and 1/8"

H. Miscellaneous

1. Tack hammer
2. Tweezers (a few)
3. Miniature pliers
 - a. small round for forming rings and eyes
 - b. flat nose (with serrated jaws)
4. 1/2" or 3/4" masking tape

I. Sandpaper

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

J. Finishing:

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

K. Supplies:

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

1. Paints
2. Primer
3. Stains/varnish
4. White or Carpenter's (yellow) wood glue
5. Five minute epoxy
6. Super glue
7. Model airplane type glue

Note about Glues: White or Carpenter's yellow wood glue will suffice for most of the model. Five-minute epoxy provides extra strength for gluing fittings. Cyanoacrylate (Super) glue such as Jet, can be used for quick adhesion. The best cyanoacrylate glue for most applications is a medium viscosity gap-filling type. The watery-thin type is recommended to fill a narrow crack by capillary action. For scribed decking sheets, it is best to use a contact cement or model airplane type cement. White glue tends to warp thin sheet wood and makes it difficult to install.

PAINTING & STAINING THE MODEL

It may seem strange to begin an instruction manual with directions on applying the finishes to the model. Not so! Much time and effort can be saved, and a more professional result can be obtained, if the finishing process is carried out during construction. Paint the various small parts before they are installed on the model.

The painting sequence must be a well thought out procedure, otherwise you may have difficulty as you proceed with assembly. For example, it is easier to paint a cabin or hatch coaming before it is glued to the deck. Put the parts aside until they are ready to be installed. Proper timing in application of finishes and the use of masking tape to define painted edges should eliminate unsightly glue marks and splotchy stained surfaces. In the end, following these general suggestions will be to your advantage.

1. Preliminaries

Before painting, rub down all external surfaces with 220 grit dry sandpaper and wipe off all dust thoroughly. Give all unprimed surfaces two coats of primer. A very light sanding is recommended after the last coat of primer, but don't sand down to bare wood. With clean hands, a soft brush, and a clean, soft rag or tack rag, gently dust and wipe off the hull.

Choosing paint: For hand brushing, use a flat finish paint. Glossy finishes are not desirable. A satin finish will give the most satisfactory results, but the undercoat (primer) paint should be dead flat. Floquil marine color paints are ideal. If you object to solvent based paints, Floquil's Polly-S is an excellent water-based acrylic and brushes and covers well. Clear finishes are available for both types of paint so you can get the gloss or flatness you desire.

Masking off surfaces: It can be very tricky to mask off the surfaces you don't want to paint. Some brands of masking tape are absolutely no good because they allow paint to bleed under them, so be selective. The Scotch Brand removable magic tape is a good tape. The adhesive is low-tack, the same adhesive used for their Post-It note paper. A graphic design tape, such as the Chart Pak brand, is also good but the adhesive grips rather securely. If you use it, make sure your paint is thoroughly dry. It is available in widths as fine as 1/32" and 1/64". Black plastic electrician's tape is also acceptable.

A secret to good masking is to lightly paint a clear finish along the tape first.

This seals the edges so the color paints won't run under the tape. Floquil flat finish or crystal cote will do the trick.

Spray Painting: Spraying techniques work best with fast drying lacquers. The Floquil paints spray very well when thinned about 25%, used in an airbrush such as the Testors and Badger units. You will also find many brands of paint available in aerosol cans which give good results. Test them on a wood block as previously described before using them on the model. The aerosol cans put out much more paint than an airbrush, so you must spray lightly and fast. Don't let the paint build too heavily, or you will have a mess of runs.

Brush painting: Painting with fine, soft bristle brushes is probably best for the beginner. And many highly skilled modelmakers prefer the brushed on technique because a brushed surface, with its fine imperfections, imparts a more life like appearance to the model.

Choosing Brushes: Brushes must be very soft and of the highest quality. Artist grade sable or synthetics are the best. They should be a littler wider for painting the surface. A brush that's too narrow will cause excessive streaking of the finish.

Brushing Technique: When applying paint or stain with a brush, lay down one thin coat in a single stroke, then move the brush over to coat the adjacent areas with single strokes. Never make repeat strokes over fresh paint or you will tear up the surface of the first brush stroke. Wait until the paint has dried to a hard finish before applying a second coat.

2. TAURUS Color Scheme

Color schemes on tugs varied considerably. Here are some of the more common ones.

Hull: Black, or dull or weathered black; Boston tugs often were white.

Cap rails: Always black.

Deck: Well maintained but not fancy; use a greyish-umber, or teak stain.

Cabin and pilot house sides: Red was a favorite; Boston owned tugs may have a cherry or mahogany stained cabin to contrast with white hull. The box photo shows a cabin with mahogany for half the cabin and natural or oak finish for the upper half.

Cabin and pilot house top: Canvas covered, paint light grey or buff.

Doors and windows: Bright varnished oak.

Bulwarks inboard: Buff, grey or red oxide.

Stern grating: Dark brown holes and lighter brown top surface.

Quarter bits: Black or red oxide

Stack, rail stanchions, and deck plates: Black

Running lights: Brown box; port light is red, starboard light is green.

Eagle on pilot house: Gold

Boat: White with tan or light grey cover.

STAGE A

SHAPING THE PRE-CARVED HULL

1. Shaping the Outside of the Hull

The outside of the pre-carved hull can be shaped very easily with a sanding block. About all you need do is even up both sides with a sanding block. The stern has vertical sides down to a sharp edge, then tapers back to the waterline. Sand the bottom slope to obtain the sharp edge. Figure 1 illustrates a section at the bow, amidships, and at the stern.

Using the sanding block, smooth out the top of the bulwarks so you have a smooth curve (hull profile) and maintain a sharp edge along the bulwark.

Next, decide on how you want the stem to look. Figure 2 shows three variations that you can use. Using a sanding block, shape the bow to accept a stem piece. The "catboat" stem (Figure 2c) was very popular among tugs designed with a lot of barge pushing in mind.

2. Carving the Bulwarks and Deck

The machine-carved hull has bulwarks approximately 1/8" thick. They are thicker than required so they won't break while inside the kit box. The in-board sides of the bulwarks need to be cut down to a uniform thickness of about 1/32". However, this will be difficult and leave the bulwarks very weak. Although a little thick, you can cut them down to only 1/16". If you want to simplify the bulwarks and omit the timberheads, the bulwarks can be thicker. If timberheads will be added, strive for a thinner bulwark. The cap rail must cover the bulwark plank plus the top of each timberhead. If both are too wide the cap rail will be wider than scale and look very bulky. Figure 3 shows a method for cutting the bulwark thickness down. Use a gouge to cut to the depth, then smooth the surface with a flat chisel. A small sanding block will complete the task.

As you proceed around the stern, use the grating casting provided in the kit and test fit it as you go so the grating will fit snugly against the bulwarks.

The deck will be covered with the scored deck sheet included in the kit, unless you desire to lay individual planks as an option. In any case, you must first take a chisel and square up the corners at the bow and at the deck

FIG. 1 – Hull Sections at the Bow, Amidships and Stern

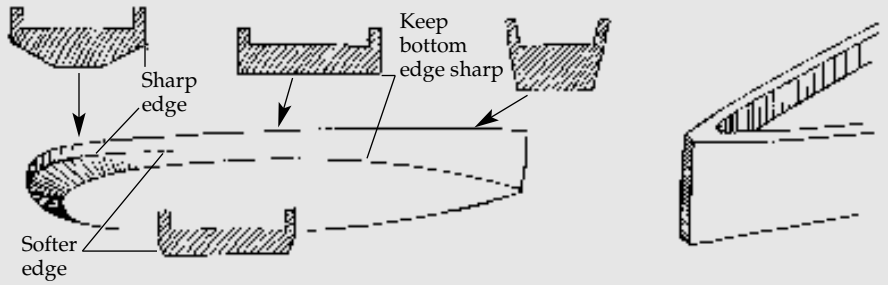


FIG. 2 – Variations of the Stem

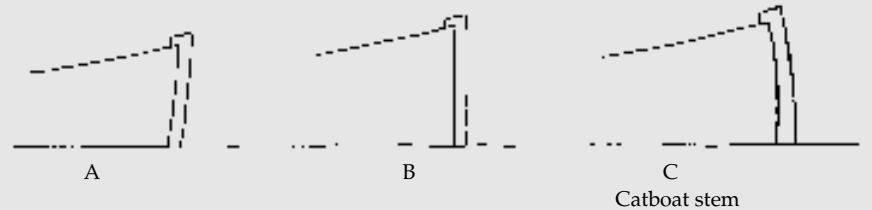


FIG. 3 – Cutting the Bulwark Thickness

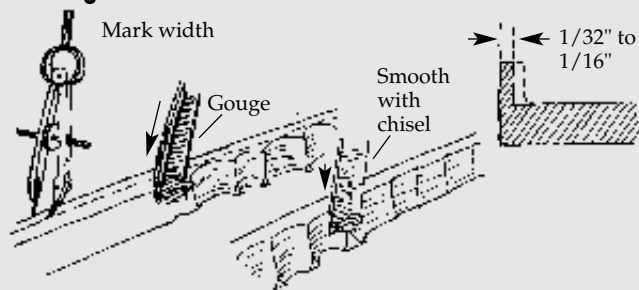
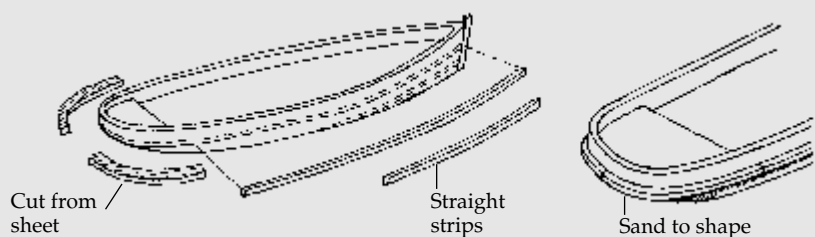


FIG. 4 – Carving the Deck



FIG. 5 – Installing the Rubbing Strakes



grating step aft. Square these areas and sand the deck smooth (see Figure 4).

At this stage, the hull is fully shaped. Go over the entire hull with sandpaper, using #220 grit for the final smoothing. Be careful not to round the upper edges of the rail, the hull angle aft, and the bottom (waterline). These should be sharp corners.

Before proceeding to the next stage, it would be a good idea to drill a couple of pilot holes in the bottom of the hull if you intend to have the boat mounted on a baseboard.

STAGE B

COMPLETING THE BASIC HULL

1. Installing the Stem

Precut the stem and glue it to the bow. The stem should have a very slight taper to it. Make sure the grain of the wood is in line with the piece.

2. Installing the Rubbing Strakes

Using a 1/16" strip, pre-shape the rubbing strakes. The straight sticks can be applied from the stem back to about the front of the deck grating (the lower strake feathers out at the waterline). Mark the location of the rubbing strakes on the hull with a pencil. For the stern you can cut the strakes out of a 1/6" sheet. Make it a little wider than necessary. After it is installed, sand it down to match the other section of strake (see Figure 5).

As an option for the stern, you could steam-bend or ammonia soak a strip to soften it for bending around the stern. Also, you may want to try laminating several thin strips to obtain the shape.

3. Planking the Deck

For this model, you can lay individual planks as an option, or use the scored decking included in the kit. For the scored sheets, first make a paper template to fit snugly against the bulwarks. Place the template on the scored sheet and cut the sheet with a hobby knife.

Glue the deck sheets down with model airplane type cement or contact cement. White or Carpenters wood glue tends to warp the wood. Make sure you have the scored lines lined up with the centerline of the boat.

The waterway along the bulwarks were generally planks flush with the deck. For the model they can be faked by adding a 1/8" wide paper strip, glued

FIG. 6 – Planking the Deck

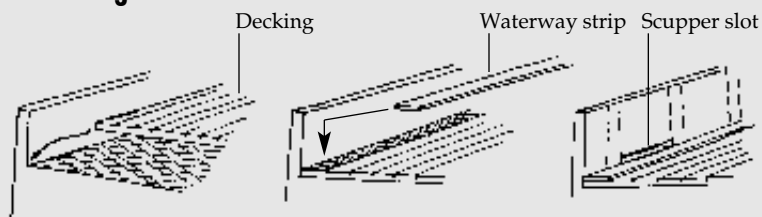


FIG. 7 – Installing the Rails

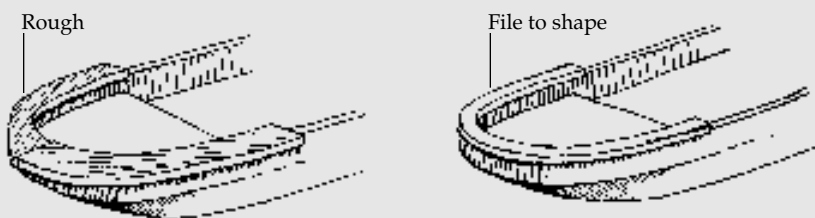
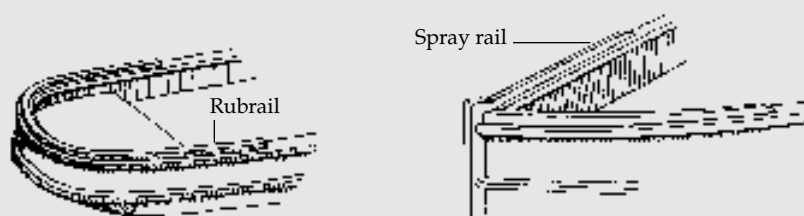


FIG. 8 – Installing the Rub Rail and Spray Rail



on top of the scored decking (see Figure 6). If you prefer a wood waterway, you can trim 1/8" off the edge of the scored decking and glue on a waterway piece.

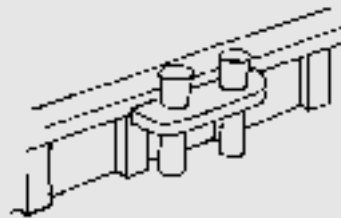
After the waterway is in place, cut the scupper slots through the bulwarks (also shown in Figure 6). Use a small drill and needle file to shape up the slots. The plan also shows a larger hole aft which is a freeing port. This is optional. The vertical lines are bars, added in the hole to prevent loosing a tow line through them.

4. Installing the Bulwark Stanchions and Rails

If you are going to add them, the bulwark stanchions should be about 1/32" square. Starting at the bow, space them about 1/4" apart. At the scuppers, the stanchions should be at the end of the slot, not in way of the slot. Cut each bulwark stanchion to length and glue in place. Cutting and mounting the stanchions is tedious work, so exercise great care in the installation.

Glue the main rail atop the bulwark and stanchions, making sure it extends slightly beyond the bulwark outboard and stanchions inboard. The rail portion around the stern can be made the same way as discussed for the rubbing strakes (see Figure 7). Finally, add the rub rail at the stern and spray rail forward (see Figure 8).

FIG. 9 – Installing the Bitts and Bow Post



STAGE C

MOUNTING THE HULL

If you are going to mount your model on a baseboard, as opposed to using it in a model railroad layout, now would be a good time to do it to prevent details from becoming damaged during handling.

For a boat sitting in the water you can add some strips of wood along the edge of the baseboard, projecting 1/8" or so above. The model can be mounted with screws into the pilot holes you drilled in the hull. For water, you can use paint, or paint the baseboard, then pour casting resin or acrylic gel over the paint. This makes a realistic looking sea bed. The photo on the kit box shows how it looks.

STAGE D

ADDING THE HULL DETAILS

Before beginning with the details, outline all topside items on the deck by marking their locations with a pencil. Take all measurements from the plans using tick strips.

1. Stern Grating

The stern grating is a Britannia casting. Clean it up, prime it and paint it before installation. If you carved the bulwarks using the casting as a pattern, it should fit nicely.

2. Hawse Pipe Lips

Drill holes in the bow and glue the Britannia hawse pipe lips over the hole. Shape the hole with a file so it blends in with the hawse pipe lips.

3. Bow Fender

The bow fender is provided as a Britannia casting but should be enhanced by adding "rope whiskers"; for the model glue on some short pieces of thread so it appears nice and fuzzy like the real fender.

FIG. 10 – Main Cabin Panel Construction

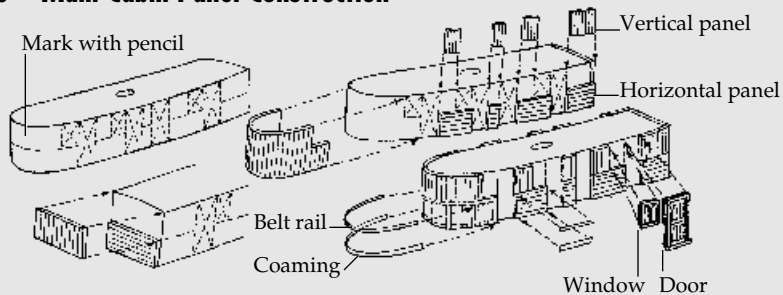
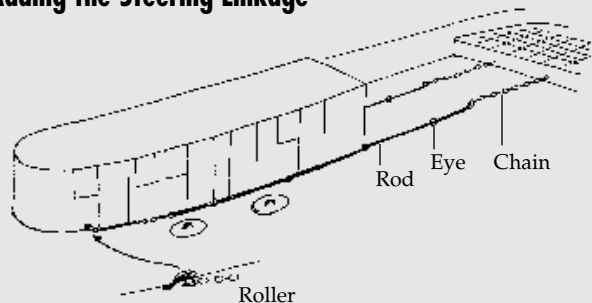


FIG. 11 – Adding the Steering Linkage



4. Bitts and Bow Post

The bitts and bow castings could be added later, but it is probably a good idea to get these in place before adding the cabin. Again, these are best painted before being installed (see Figure 9).

5. Deck Plates

The four deck plates on the deck, the round circles adjacent to the stack, are for passing coal to the bunkers located on both sides of the boiler. These plates are iron set flush with the deck planking. For the model, simple paper punchings from a 1/4" paper punch will serve the purpose, or you can cut out holes in the scored decking and insert a piece of wood cut to the correct diameter.

6. Main Cabin

The cabin is provided machine-carved. However, check the shape. The cabin should be about 1/16" smaller all around than the plan. To the sides of the cabin, you will add covering sheets and door and window castings. When added, the cabin should be the correct dimension.

With a pencil, lay out lines to locate all the doors, windows, and a horizontal line for the side panelling. The panelling is to represent tongue and groove sheathing on the real craft. Cut the panelling from the scored sheet provided in the kit. Arrange the panelling as shown on the plans and in Figure 10. Notice the panels are horizontal below the scribed line, and vertical above. As an option,

you could glue individual strips of wood to form each panel plank.

Glue each door and window casting in place. Since the windows are open, paint the cabin behind the windows black, or light blue to simulate the glass. Do this before installing the windows. You could also be daring and insert some plastic sheet in the window openings to create some reflection like real glass. Your choice.

Along the separation of the vertical and horizontal panels, and at the deck, you need to add a belt rail and coaming. Thin, stiff paper like bristol board is ideal. Make the rail about 1/32" wide, and the coaming at the deck 1/16" wide.

Next, center the cabin and glue it to the deck. At this point, it would be a good idea to add the steering linkage which connects the steering gear in the pilot house with the steering quadrant which is under the stern grating (see Figure 11). The linkage has a short chain on each end, with a connecting rod going through deck eyebolts. Although you can't see it, the forward chain is connected to a rope or light chain which passes over rollers up to the pilot house steering wheel drum.

Make another pattern for the cabin top and cut the top from sheet wood. Do not use scored sheet. The top is canvas covered so the plank seams do not show. For the edge of the cabin top, you can leave it as is, or glue a thin strip of paper or wood around the edge (see Figure 12). Glue the top in place, being careful to align it evenly. When it is set, mark the locations of the topside items in pen-

FIG. 12 – Adding the Cabin Top



FIG. 13 – Beveling the Pilot House

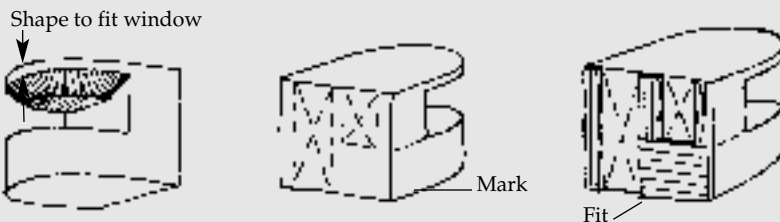
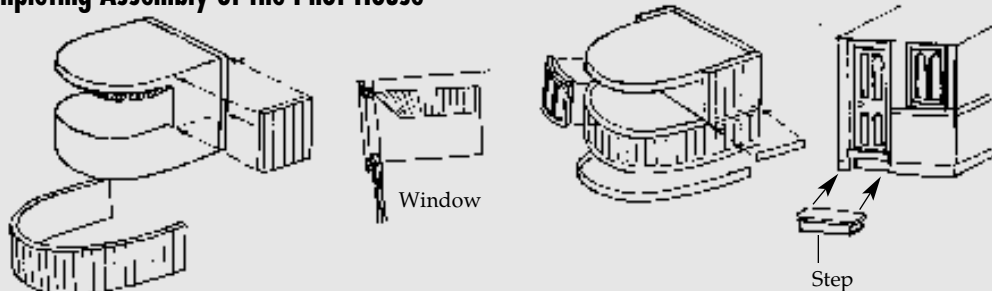


FIG. 14 – Completing Assembly of the Pilot House



cil, then drill holes for the rail stanchions and the towing light mast.

7. Pilot House

The pilot house is also a machine-carved structure. It is cut out in way of the windows so you can look through the opening. You may need to trim the opening so the windows fit properly. Paint the interior black so you can't see the wood. For the windows, leave open or add clear plastic sheet in each pane. The rest of the pilot house is done exactly like the main cabin. Check for fit on the main cabin, and sand the bottom if necessary to fit. Finally, glue the completed pilot house on top of the main cabin, and make a small step at the door (see Figures 13 and 14).

8. Smoke Stack, Whistle, and Steam Vent Pipe

Smoke stack parts include a wooden stack dowel, Britannia casting base and "T" emblems, brass rings and chain guys, and Britannia whistle and vent pipe (see Figure 15).

You may need to bore out the base a little to receive the stack dowel. Fit the brass rings over the dowel as shown. Drill a hole for the "T" emblems, and holes for the guy chain eyes at the mid ring. Insert a U-shaped staple of brass in the holes for attaching the chain. Install the whistle and vent pipe in the holes in the stack base. Prime and paint the entire unit.

Install the stack, making sure it is vertical and has the proper rake aft (see the

FIG. 15 – Vent Pipe



plan). File the bottom of the base if necessary. Attach the chains to the cabin top with similar staples.

9. Boat and Davits

The boats can be positioned as shown on the plan or moved closer to the cabin edge. The boat can be either on the port or starboard side. If at the cabin edge, you could scratch build a small skylight for the engine room. The kit box photo shows an old wooden ladder atop the cabin. Be inventive!

Make a cover for the boat out of fine cloth or paper (see Figure 16). The boat can be hung from the davits using thread or a piece of brass wire.

10. Mast and Towing Lanterns

Fit the mast through a hole in the cabin top, but first install a hanger from brass wire into the mast for the lantern halliard (see Figure 17). The halliard can be thread or brass wire. Notice on the kit box photo, a small block was added at

FIG. 16 – Boat Covering

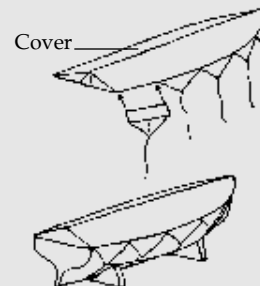


FIG. 17 – Lantern Halliard



the top for the halliard. It gives the model that extra touch.

11. Ladders

Add the port and starboard ladder going up to the cabin top. The top should be curved as a hand rail.

12. Stowage Chests

Install the forward stowage chest forward of the main cabin, and the lifebelt

stowage chest aft of the smoke stack. Glue with epoxy to set them securely.

13. Rail Stanchions

The rail stanchions fit into the holes you drilled on the cabin top. After gluing, feed the brass railing wire through the stanchions and touch with a little super glue.

14. Running Lights and Eagle

Make sure you have the lights painted the correct color. Remember Port (like wine) is red. The eagle is installed on the pilot house front.

15. Name Boards and Lettering

You could name this boat anything you like. TAURUS is Model Shipways name for a typical tug. The name can be hand painted, or you can use dry transfer lettering from an art store.

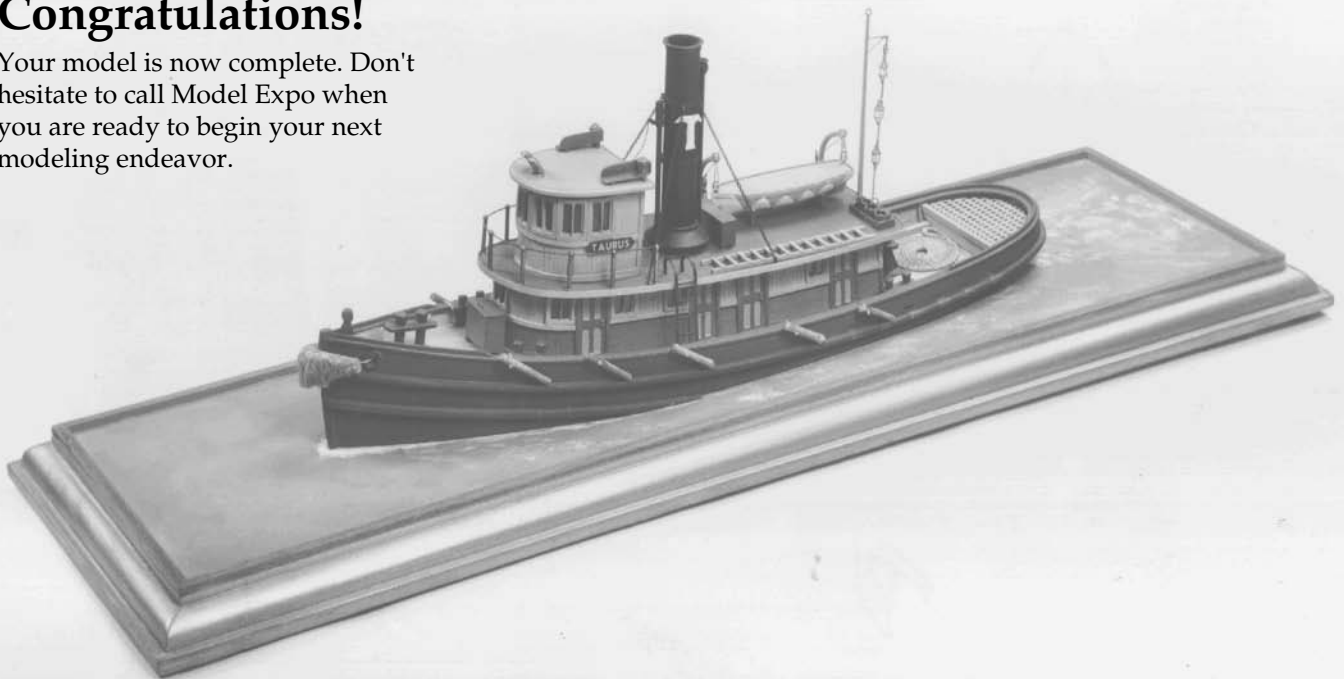
16. Side Fenders

On the real boats, fenders were made from old railroad ties or sawed-off logs. For the model, cut some twigs off your favorite bush and stain them to look weathered. These make nice realistic fenders. Glue to the bulwarks and use thread for the securing lines.

After all is done, look over your prize and touch up paint if necessary. Make a final check with the plan to see that you have included all parts. Add the water to your baseboard if you have not already done so.

Congratulations!

Your model is now complete. Don't hesitate to call Model Expo when you are ready to begin your next modeling endeavor.



BIBLIOGRAPHY

1. Brady, E. M., *Tugs, Towboats, and Towing*. Describes operation of modern tugs with many glances backward at steam units. Good stuff on towing gear and techniques.
2. Lang, Steven, *On the Hawser*. A tugboat album offering a varied photographic overview of tugs through time and in most regions of America.
3. Campbell, G. F., *The Neophyte Shipmodeler's Jackstay*, Model Shipways, 1962. Describes modelwork of a general nature, drawing examples from many types of sailing ships. Contains some good hints on crafts techniques. Excellent for the beginner.

TAURUS INSTRUCTIONS FOR LASER-CUT CABIN AND PILOT HOUSE

The *TAURUS* kit has been modified to include laser-cut lifts and cabin tops for the main cabin and pilot house. These laser-cut parts replace the solid wood machine carved structures supplied in earlier kits.

These instructions apply to assembly of the laser-cut parts. Once assembled, refer back to the Instruction manual for addition of siding, windows, and doors.

MAIN CABIN

Step. 1 - Glue the 1/8" cabin lifts together.

Step. 2 - Shape the top and bottom of the cabin lifts to follow the deck sheer line. The front also needs to be sloped back a bit. This can be done with a sanding block. See Figure 1.

Step. 3 - Glue on the 1/32" cabin top. The cabin top is slightly smaller than the plan to allow for adding the edge molding (see Instruction Manual).

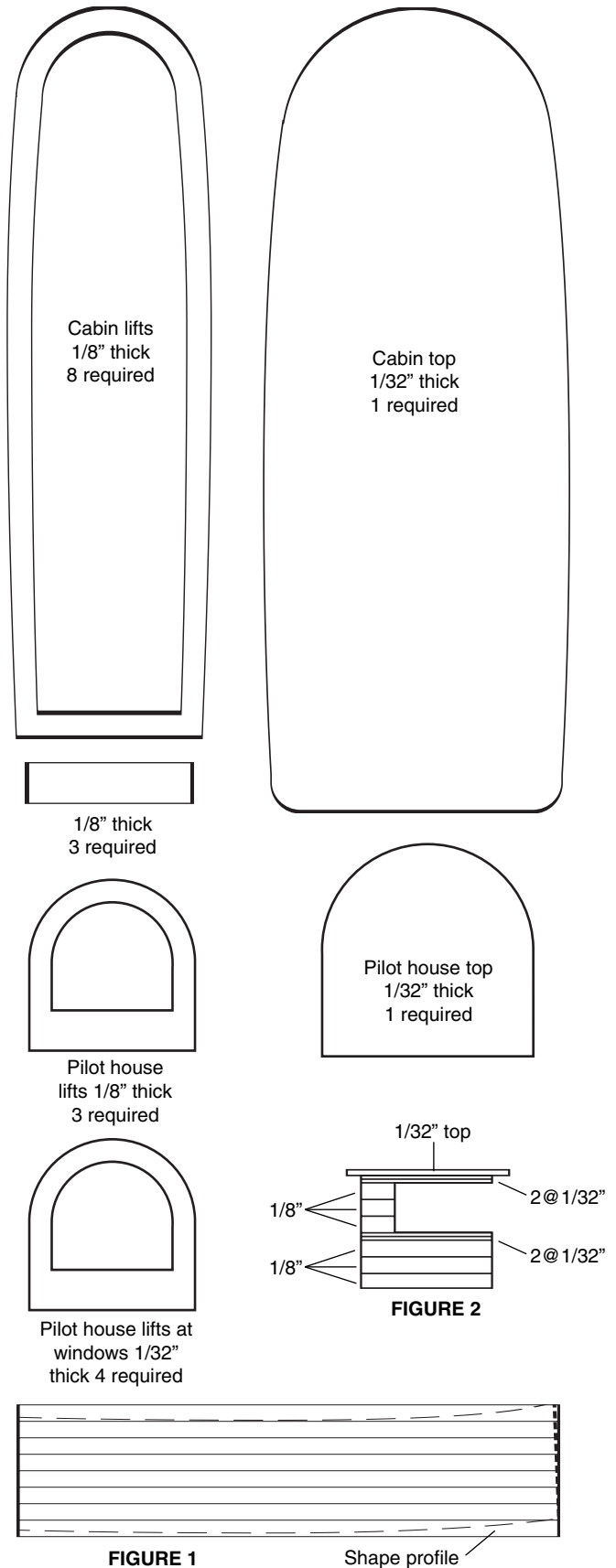
Step. 4 - Return to the Instruction Manual for instructions on installing the windows, doors, and siding.

PILOT HOUSE

Step. 1 - Glue up the three 1/8" lifts with curved front. On top of these glue on two of the 1/32" lifts supplied in the kit. Glue the three 1/8" rectangular lifts on the aft side. Next, add two more 1/32" lifts. You now have a pilot house with a cut-out in way of the windows, so you can see through.

Step. 2 - Glue on the 1/32" thick pilot house top. See Figure 2.

Step. 3 - Return to the Instruction Manual for instructions on installing the windows, doors, and siding.



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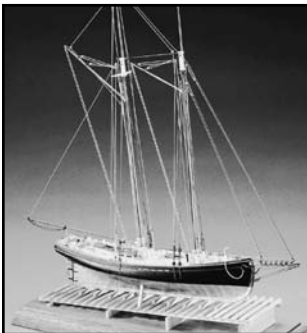
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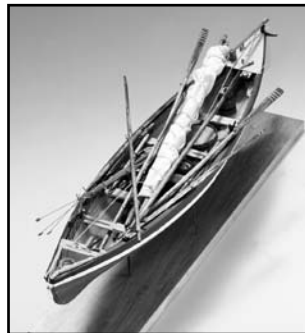
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