HMS Blandford 1720 Cross Section Project

1/27/2018

Building Instructions Part 1

Build Board and Keel Construction:

It is a lot easier to build a model if you use a building board. I am providing a saw-tooth type jig for this build, it is well suited for cross-sections.1/27/2018

The building board and jig do not have to be a work of art, unless you plan on making several models of this section it will be discarded at the end of the build.

The top can be made from plywood, Masonite or similar material attach the pattern to the top with spray adhesive, rubber cement or glue of your chose. Cut the center hatched section with a scroll or jig saw and attach it to the four support posts with wood glue and #4 finish nails or paneling nails.

The base needs to be a little thicker ¾" is preferred ½" can be used but make sure the posts are long enough to maintain the overall height of the jig. The top of the jig is set at the waterline.

If you are building the model "Naval Board Model" style there will not be any exterior planking below the waterline. You can do one side that way and fully plank the other. That is the way I will build my model.

After the keel assembly is finished it will be installed as shown on sheet 2,

The keel assembly consists of three pieces false keel, keel and rising wood I like to use a dark colored wood for the false keel, such as walnut, bloodwood or rosewood to differentiate it from the keel. The keel rising wood and all framing should all be of the same species of wood (personal opinion). I like to use European beech wood, it looks like oak and is easy to work. Cheery, maple, popular and basswood are also good for framing. Make sure when you cut the notches for the frames you stay on the waste side of the lines, you need to use a hand file with the keel in a vice to fit the notch to the frames I use a small piece of scrap wood the same thickness of the frames as a gauge to finish seizing the notches, it is easier than handling the frames the tips of the frames are easy to break off. By drilling two 3/32" holes in the keel as shown on the drawing you can

glue two pieces of 3/32” tubing in the keel that will hold it in place on the building board. The brass pins make it easy to remove and replace the keel from the board and can be used for mounting the model to the display stand.

I have included a cross-section and longitudinal section in this set of drawings to show what the model will look like, everything shown in the sections will be detailed with patterns.

This should get you off to a start, the next package of drawings will contain all the frames.

Mike

Building Instructions Part 2

Frame Construction:

The nine frames are all double frames, the forward frames are shown in blue and the aft frames red and all the pieces are labeled with the frame and part number to make the frame assembly easier (without labels they all look about the same).

The finished frame thickness is, 1:32 = ½” 1:48 = 3/8” as shown on the side view of the frame drawings.

After attaching the patterns, you will cut out the parts allowing a small amount of white space around the part for final sanding to the finished size, leave the tops of the frames a little long for trimming to the Plankshеer rail.

You will be assembling the frame over sheet 1 of each frame, placing the drawing under a piece of glass or plastic to keep glue off the drawing. Dry fit the parts over the drawing checking the joints between pieces and trim if required, they do not have to be perfect but a good fit looks better on the model.

Glue the pieces together, I use Elmer’s Carpenter’s Wood Glue it dries clear and if something goes bad you use water to disassemble stuff. After the two sides of the frame has dried for an hour, glue the sides together using clamps or a weight pressing the sides together. I like to leave the frame clamped for two hours (min) then drill the holes for the through bolts, use 20-gauge brass wire for the 1:32 frames and 22- gauge for the 1:48 frames. The outside and notch of the frame will require a small amount of bevel from frame four through nine.

Each frame has a small notch in the center of the spreader bar for a string or piece of wood to align and level the frames with, make sure everything looks good in the dry fit before attaching the frames to the keel. Before removing the pattern mark the location of the deck clamps and using a thin strip of check to see if they line up.

Remove the frames one at a time and glue them in place on the keel checking for square and level.

You have completed Part 2 of the build.

Part 2 Addendum:

Beginning with frame 5 through 9 the frames are beveled toward the stern, to create a trim line for the aft side of these frames complete the 5 frames and place frame 6 aft side up over frame 5 aft side up aligning the keel notches (the bevel for the keel notch is noted on sheet I of the plans) using small clamps to hold the frames together draw a trim line around frame 6, repeat this procedure for frames 6 through 8. For frame 9 using a small drawing compass set at the distance from the edge to the trim line on frame 8 with the point of the compass riding slightly below the edge of the frame draw a line parallel to the edge on the aft side of frame 9. You can use a drum sander in a Dremel, pad or belt sander.

After the frames are installed in the keel and the internal structure is complete you will do the finish sanding of all the frames.

Building Instructions Part 3

Hold Framing:

The Keelson is glued in place using clamps and a 20-gauge brass pin at each frame.

The first three Strakes and Footwaling boards on each side of the Keelson are glued and clamped in place, the limber boards are added next, per the Hold drawing and Part 3 Cross Section.

The Lower Deck Clamps are glued and clamped in place next.

After the Lower Deck Clamps are in place you can use the Part 3 Longitudinal Section drawing to mark the top of frames trim line and cut the frames to their finished height.

Mast Step:

The Mast step can be fabricated using the Well Details drawing and located using the Hold Plan. The mast step can be glued in place.

Pump Well and Shot Locker:

Using the Well Details drawing, and photos assemble the Well but do not install it until the lower deck beams are in place. I glued the sides and ends using magnets on a steel plate, this works well for small deck items. The photos show the well and shot locker setting in the hold but not glued, after the lower deck beams are in place you may need to trim the top of the well, if not you have done an excellent job.

The pumps and lower deck framing will be included in Part 4 of the

Building Instructions Part 4

Lower Deck Framing:

Check the location of the top of the deck clamps with the plans, marking the locations at frames 1 and 9 clamp and glue the clamps in place.

The lower deck beams are labeled LDB-1 thru LDB-4, when you cut the notches for the carlings leave a little white space around the notch and finish the notches with hand files in a vice. This also applies to the ledges in the carlings, you want a snug fit but do not force it into the notch.

Start with LDB-2, LDK-2 & LDK-5, bevel the knees at the frames for a good fit. The beam arms are the most difficult to fit Photo 6289 – 6291 shows my method of clamping the arm beams, don’t worry if they are not perfect you get another chance on the upper deck.

Photo 6292 shows the hanging knees LDHN-2 & LDHN-5 with LDB-3 installed. Photos 6293 thru 6299 shows the installation of the remaining beams, knees and carlings, notice the carlings are not glued in place, using the notches in the knees draw lines across the carlings for the ledge notches this keeps the ledges in line even if the notches in the beams are not the same depth, if you know all the notches are the same depth you can precut all the ledge notches. Photo 6300 – 6305 shows the rest of the framing in place.

Mast and Hatch Gratings:

Photo 6306 shows the mast as turned on the lathe notice I cut shallow groves for the rope woolding shown on photos 6311 and 6312.

Photo 6313 shows the mast guide/support in place.

Photo 6307 – 6309 shows the grating for the main and after hatchways.

Lower Deck Planking:

The lower deck plan shows the deck fully planked which you can do or leave part of the framing exposed as shown in photo 6315 and 6316

Waterway and Lower Deck Spirketting:

The waterways are made by ripping two strips of wood at a thirty-degree angle as shown in photo 6319, the lower edge should be slightly above the planking. Photos 6320 – 6322 shows the waterway installed.

The installation of the Spirketting is shown in photos 6223 – 6326 using small spring clamps and rubber bands

Chain Pumps:

The Cistern and pump dales can be built and installed at this time. Photos 6327 – 34 I used beechwood painted black for the pumps. The drawings are self-explanatory, but you do need to add pins at the cistern end pieces to attach it to the deck, pins also need to be added to the cistern end of the pump dales and the waterway ends need to be beveled at a 45-degree angle. The pump crank handles and their supports will be added in Part 5 of the build.

Building Instructions Part 5

Main Deck Framing:

The main deck framing is like the lower deck framing, the main exceptions are spacers between the arm beams and hanging knees at MDB-3. Dry fit the main beams and using the main deck plan mark and drill holes for the Main Jeer and Topsail Sheet Bitts pins in the lower deck. Locate and drill holes for the pins on Chain Pump handle supports at LDB-1 and LDB-4, these supports can be pinned at the top by drilling through the main deck beams. The Chain Pump handles and Bitts can be installed now. The rest of the framing can be installed using the same procedure used on the lower deck.

Main Jeer and Topsail Sheet Bitts:

By using an unusual color wood for the bitts, they will add a nice contrast and not blend in with the framing, this is just a personal preference. Photos 6338 through 6342 shows how I built the bitts, directly under the crosspiece there are sheaves, since there is no rigging I simulated theses by drilling a pair of holes and remove a small amount of wood between the hole as shown in photo 6342. Photos 6362 – 6371 shows the installation.

Main Mast:

The main mast is detailed on a drawing along with the deck beams and consists of a dowel rod turned to the dimensions shown on the drawing, if you do not own a lathe you can build the mast using three varied sizes of dowel rod. The mast is normally held in place by the shrouds and not glued in place, even though we have no shrouds I still recommend not gluing it in place.

Waterways and Spirketting:

The waterways and Spirketting ca be added at this time as shown in photo 6377.

Hatch Gratings:

For the main and after hatches I used bloodwood for the frame and boxwood for the grating. The construction and assembly are shown on photos 6372 – 6380, as you can see it is a very straight forward process.

Elm Tree Pumps:

The photos 6381 – 6384 show the assembly of the pump, if you are building the four–gun version you will need two pumps.

Main Deck Planking:

The planking only needs to be wide enough to support the rear wheels on the cannons. I used six planks using a three-plank shift for the trenails pattern as shown in the photos 6385 – 6392. I used basswood for the planking and bamboo for the trenails.

Canons:

The canons can be turned from brass or wood. I like to use ebony, it is easy to turn and takes a nice polish. I use bloodwood for the carriages and yellow heart for the quoins.

Building Instructions Part 6

Canons Rigging:

The bolts and rings are available from suppliers or you can make your own using brass wire, a small nail in a vise, pliers and side cutters. Wrap the wire around the nail and cut to the length you want. The blocks are available from hobby suppliers, I make my own using boxwood. The photos 6421 – 6426 show the rigging being installed.

Rails:

The Waist and Planksheer rails are installed next. The sides of the ship have a tumblehome of about 15 degrees, to keep the rails parallel to the water line you will need to cut the sides at the matching angle, if you have a small table saw with a tilting arbor it is easy to rip the sides, if not you can use a plane or sander to obtain the correct angle.

The outside of the waist rail has a molded surface, I used a round nose cutter in my mill to make the cut, if you do not have a milling machine you

can use a small gouge to make the cut. Photos 6427 – 6429 show the cut being made. The rails are assembled as separate units on the bench. Photos 6430 – 6433 shows the assembly. I used 5/64” diameter dowels through both rails and the supports, this is probably overkill but it is nice and sturdy. Photos 6434 – 64 shows the rails installed. I used ebony stain on the walnut rails.

Exterior Planking:

I am using yellow hart for the planking, black and yellow is a common paint scheme for English ships for the 18th century. Starting at the waist rail the first plank needs to be trimmed as shown on the drawing photos 6440 -6442. The rest of the planks do not require any trimming down to the last one above the wales it is about half as wide as the other planks. The installation is shown on photos 6443 – 6449

Wales:

The wales are made from walnut stained black. Photo 6459 shows the wales placed face up on masking tape to keep most on the stain off the glue surface, you will get a little around the edges, but it is easy to scrape and sand off leaving a clean surface. Photos 6450 – 6456 shows the installation.

Treenails:

After the wales are installed install the treenails per the pattern shown on the drawings. There are separate drawings for the starboard and port exterior to help with the placement of items. Photos 6449 – 6456 show the installation of the treenails.

Fenders Sweep Port & Ballast Port Covers:

After the fenders are cut out they will need to be fitted to hull wit a little sanding. I installed them first to have a place to work from.

The sweep port covers were to small for power tools, I used a miter box to cut the strip to length as shown in photo 6457. The hinges were made by wrapping a piece of black string around a nail and gluing them to the covers (low tech).

The ballast port covers are mad in a comparable manner see photo 6452.

Steps:

The steps run from the bottom of the Waistrail to the middle of the third wale from the top, the first nine steps need to match the color of the planking and the last three the wales. Photo 6459 shows the materials used and photos 6461 – 6463 shows the assembled steps. Photos 6465 – 6468 shows the steps installed, the back of the steps need to be beveled to match the hull and level with the waterline.

Main Channels:

The channels are made from yellow heart to match the planking, see drawings and photos for details'

Deadeyes:

The deadeyes are made from ebony or walnut stained black. I tried making chainplates from brass wire but at this small scale could not get them to look right used string instead photo 6479 – 6481 shows the installation.

Display Stand:

The photo 6484 shows the material for the stand, you will not use all those boards. I used some recycled mahogany from an old hot tub. I wanted to use a plain design to keep the focus on the model. Photos 6490 – 6494 shows the completed model.