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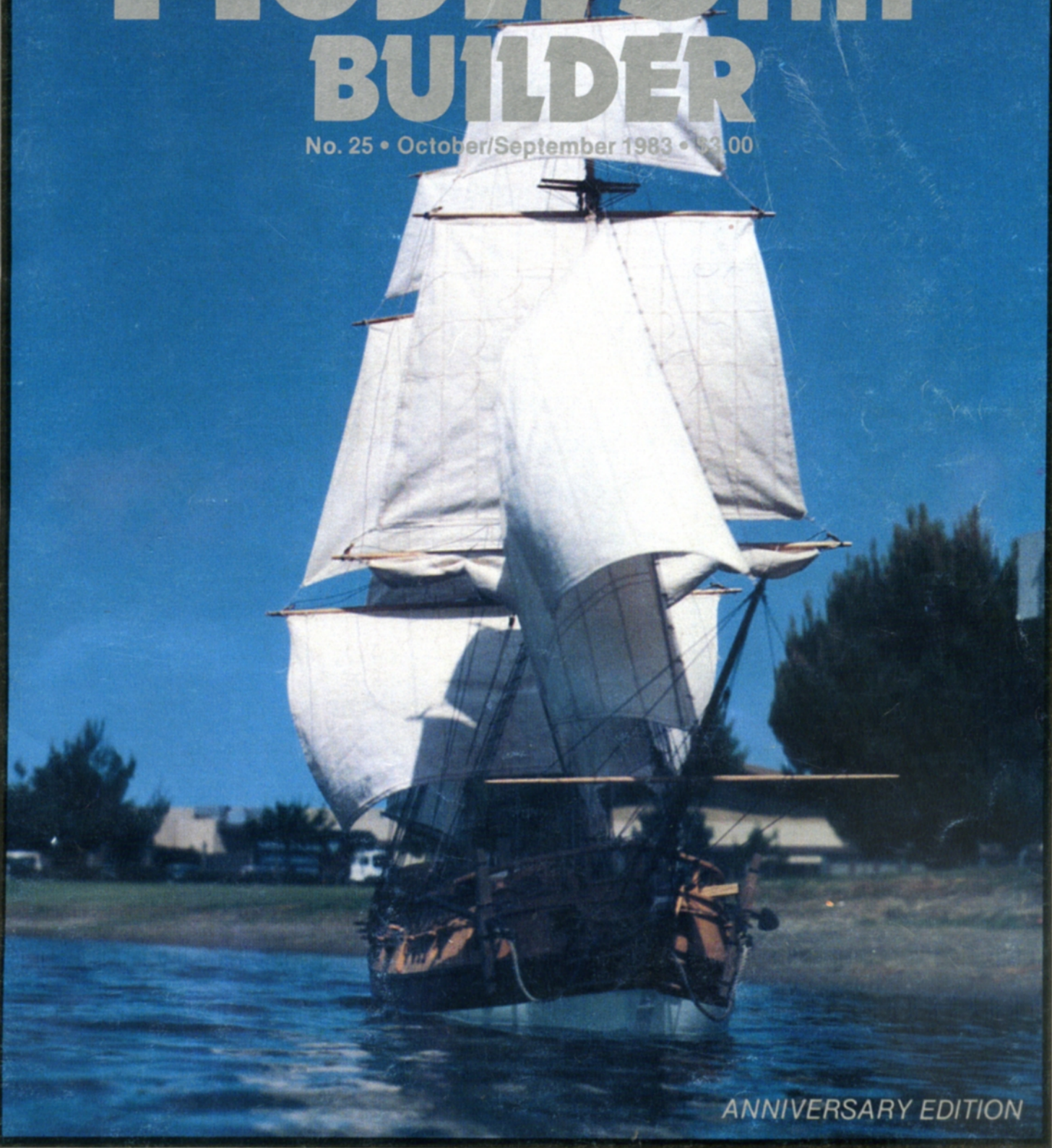


ANNIVERSARY EDITION

CLOSE UP UNDER SAIL. The RATTLESNAKE, a six-foot operational R/C sailing vessel. The long boat on deck was built by Robert Becker.

Part One

An Operational R/C RATTLESNAKE

by Albert Lheureux

When I recall some of my childhood memories, I invariably remember those long hours spent reading pirate adventure books. My imagination used to run wild with dreams of great sailing ships with their immense white sails against the blue sky and their bows slicing the green waters of faraway oceans. Later, the pirate movies of the 40's and 50's out of Hollywood stimulated my imagination.

After having built many radio control models of battleships, destroyers and submarines, I decided to give a touch of reality to the dreams of my youth. I decided to build an operating radio control 18th century sailing ship. It had to have working sails, firing guns with black powder, and taped sound effects of

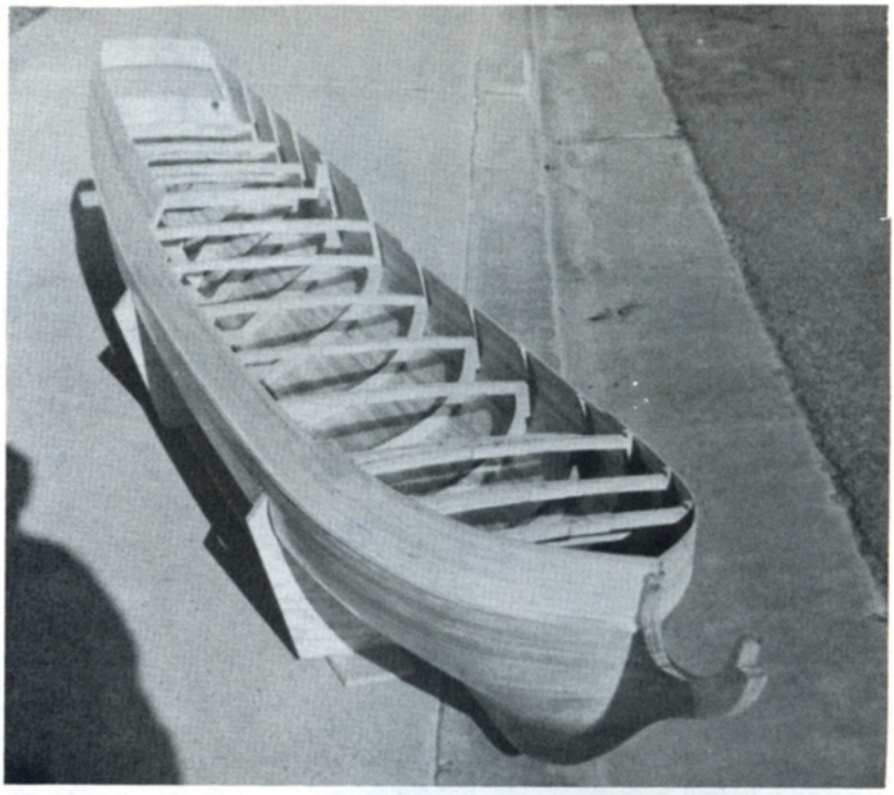
sailors and battle noises.

My secondary reason for building a square rigged ship was my desire to have an unusual model. I wanted a special challenge and a model that would stand out for its originality and beauty. The fact that I have owned a Santa Barbara Class sailing model and that I occasionally sail with a friend helped me a great deal with the technique of sailing and sail operation.

I chose the RATTLESNAKE to build as a model. She was a 20-gun frigate built as a privateer around 1779. She was 89-feet 3-inches in length, had a beam of 22-feet and her burden was 198 tons. She had three masts and was "shipped rigged". The RATTLESNAKE was also used as a Letter of Marque Ship by the British during the American Revolutionay War.

The reason I chose the RATTLESNAKE was that it met my specifications. I first looked and studied every ship illustration, drawing or book that I could get my hands on. I also observed various models of sailing ships of the 1700 to 1800 era. I wanted a three mast minimum, with gaff rig on mizzen and a simple one deck gun level for ease of construction and operation. I also wanted three sails maximum on each mast for simplified rigging. All of these requirements considerably narrowed my choice to a few ships of that period. My final decision was influenced by obtaining a very good drawing from Model Shipways. The drawing was reproduced from the original British Admiralty Draughts.

My next decision was how large to make the model. I believe that the success and ultimate result in an operating model depends on the decisions made at the early stages of construction.



THE *RATTLESNAKE'S* HULL with its frames and deck beam plainly visible.

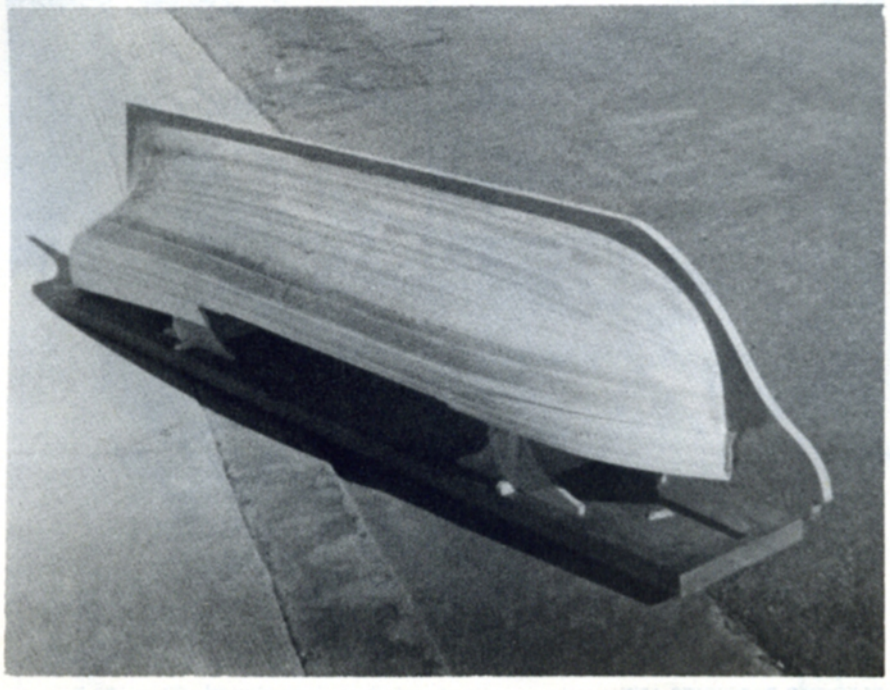
A working model differs from a static and display model. A display model has only to be true to construction, dimensions and finish of the real ship. However, an operational model, beyond those requirements, has to be operable in water (saltwater, if used in the ocean). Therefore, it has to be built in a way so as to be well balanced, sea worthy, waterproof, and extra strong to withstand the constant handling and transportation.

Size was not based on engineering principles, but on careful observation of existing models in action. Observing many models in action made it obvious to me that too small a model is usually unstable. It will float, move and bubble around at the smallest wave like a cork in the water. Increase the size and the stability also increases. A model that is too large cannot be easily transported, so a compromise needs to be reached.

I came to the conclusion that a three mast frigate would have to be at least six feet at the waterline. This would give it enough ballast to provide the necessary momentum to carry through maneuvers in the water. Anything less would let the wind stop the ship in the middle of a turn.

The major problem with a six foot ship is getting it into the station wagon. After dozens of sketches and taking into account the operation of those yards by radio, I finally chose to permanently install the lower part of each mast. The lower mast would keep its shrouds. The remaining top parts of the mast would come apart as a whole assembly unit without undoing any lines. To my surprise, it worked quite well thanks to the elasticity in the standing rigging. The ship fits into the back of my station wagon (on its side), and is quickly reassembled at the sailing pond.

If you build an operating sailing ship, it cannot be built like a static ship. The name of the game is "Compromise". The operation of the ship takes precedent to



FINISHED PLANKED HULL on its base.

HULL, WITH FIBERGLASSED bottom, and painted to the whale.

require soaking. I let the natural bend of the wood dictate where some of the frame would require trimming. This resulted in smooth curves in all directions of the hull.

All sanding, filling and finishing is done before the hull is removed from the base. This allows you to take advantage of the solid base for the rough work.

After cutting a small portion of frame at the deck beam level (Drawing #2), I removed the unwanted portions of frames. This left me with a complete hull, including deck beams. At this point, I should mention that I had to draw my own frames using Model Shipways drawing hull lines. I drew in the deck beam as an integral part of the frame for ease of construction and strength (Drawings Nos. 1, 2, and 3).

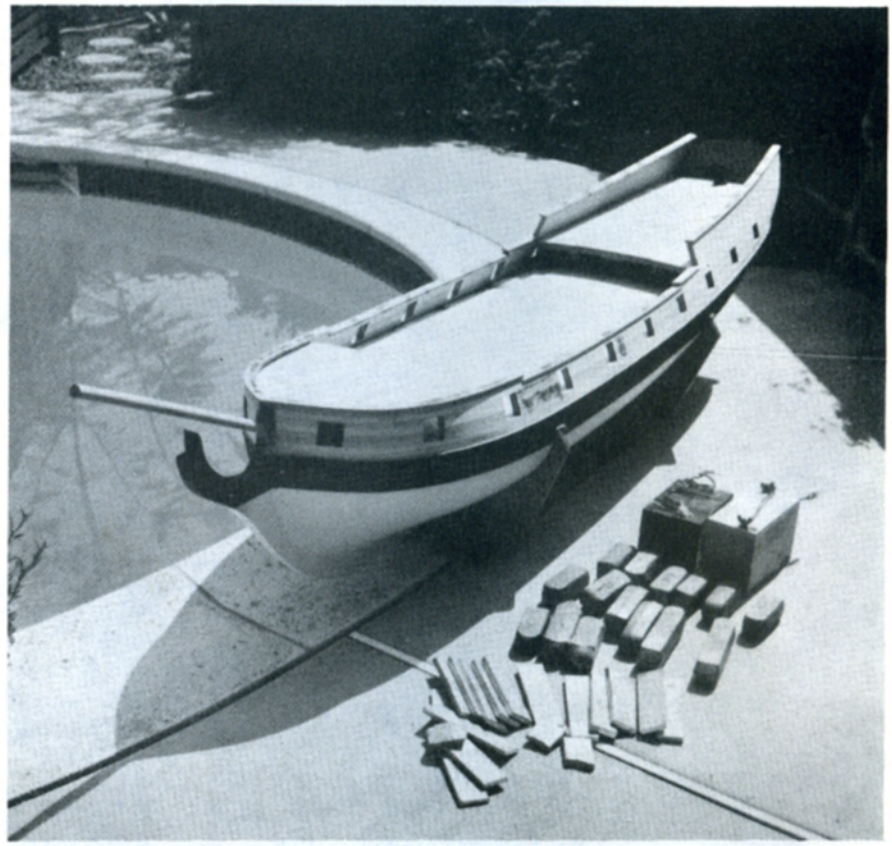
The inner hull is now ready to receive two coats of polyester resin. This helps bond it together and naturally waterproofs it. I then proceeded to fiberglass the exterior, up to the whale level, with the finest Glass Cloth I could find. The upper portion of the ship is finished with matte paint.

I planned the ship to have large hatches in order to give access to the radio, sail winches and other operating equipment. The main hatch is situated between the two gallows bitts on the main deck. It is just inside the gun carriages so that it could be opened without disrupting the guns. The second hatch is in the quarterdeck, behind the railing, all the way to the mizzen mast. They should be

the looks. Though realism must be followed when possible, changes must be made. Hatches have to be planned for easy access to the radio, batteries, sail winches and other mechanical devices. The hull must allow plenty of room for all that equipment plus 100-pounds of ballast. The hull must be totally waterproof, even on deck, to protect the radio equipment.

To make sure that this large hull would not twist during the planking operation, it was started on a 2" x 12" x 8' solid beam of redwood (kiln dryed). I chose what is called the extended frame system (please refer to drawings). This system permits the modeler to solidly screw all frames on the center line, with the keel parallel to the base. Once the planking is completed, all that is needed is to unscrew the frames from the base and cut the small portion of the extended frames. The frames were cut from ½-inch marine plywood. I cut the planks myself, ⅛-inch by ⅜-inch, from Sugar Pine boards with a hollow ground circular saw. I used pine planks because they cut and bend easily. The softness of the wood is not a handicap since the hull will be fiberglassed.

The keel was cut from solid ¾-inch thick oak stock. At the bow and stern, it was laminated as necessary to keep the grain of the wood parallel to the hull. All the planks were bent dry; they did not



ELECTRIC BATTERIES AND weights were used as ballast. Approximately 90 to 100 lbs. are needed to even out the ship.

FIGURE 1

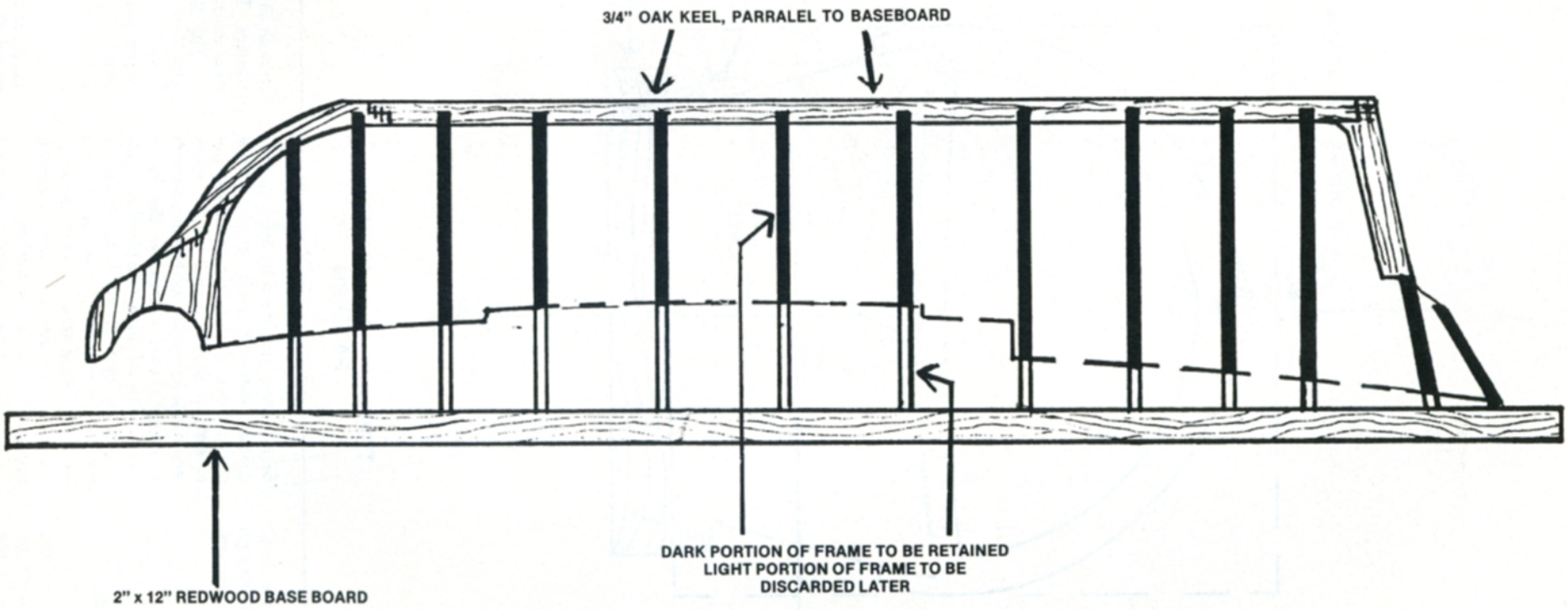
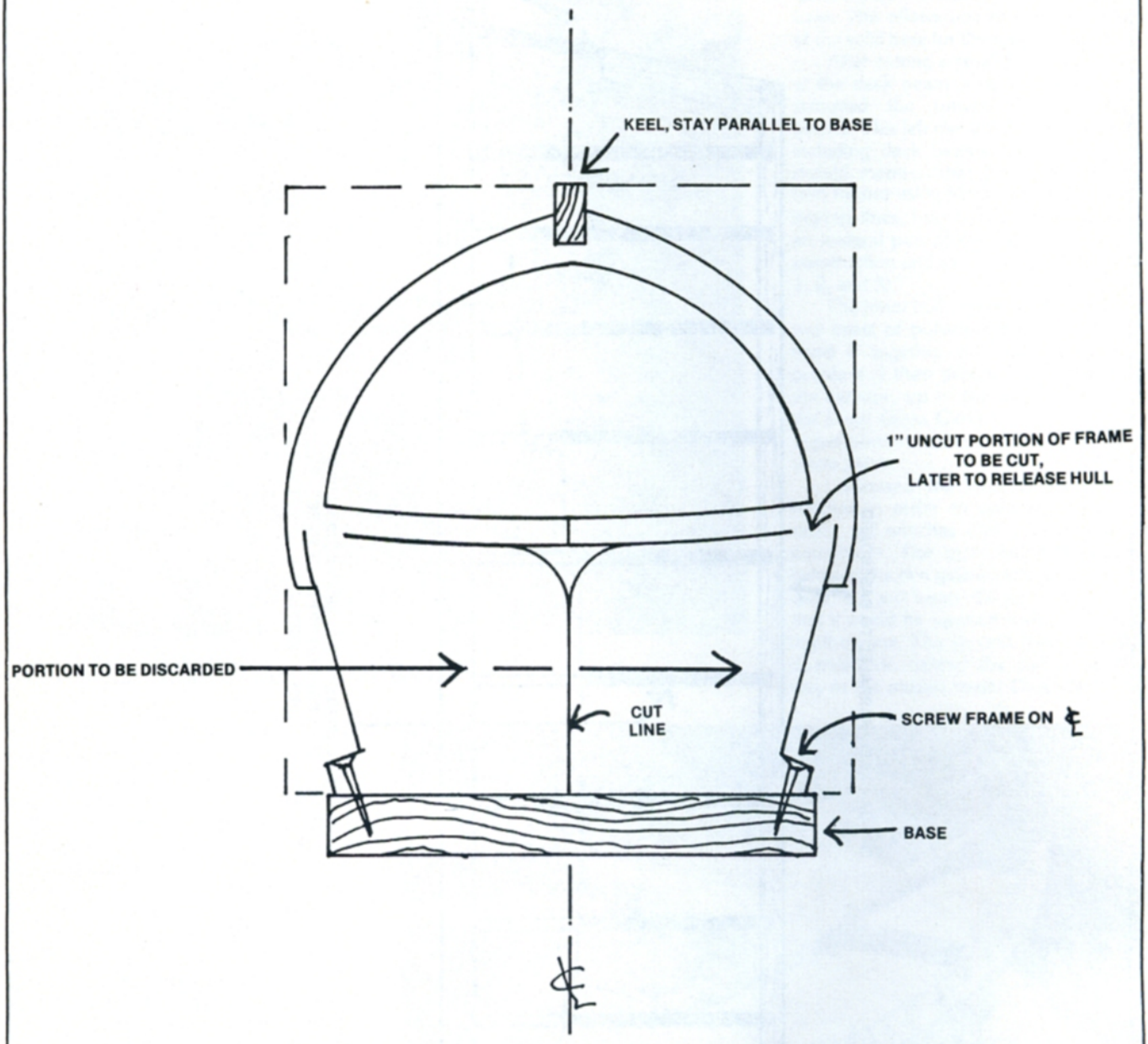

3/4" OAK KEEL, PARRALEL TO BASEBOARD
2" x 12" REDWOOD BASE BOARD
DARK PORTION OF FRAME TO BE RETAINED
LIGHT PORTION OF FRAME TO BE
DISCARDED LATER

FIGURE 2



TYPICAL FRAME CUTTING PATTERN

framed now, before putting on the deck. All equipment should be tried through the hatch to insure access for necessary future maintenance.

After the hatch frames were completed, I made a subdeck out of 1/16-inch plywood. Adjusting, trimming and sanding were needed for a smooth deck that curved as it should.

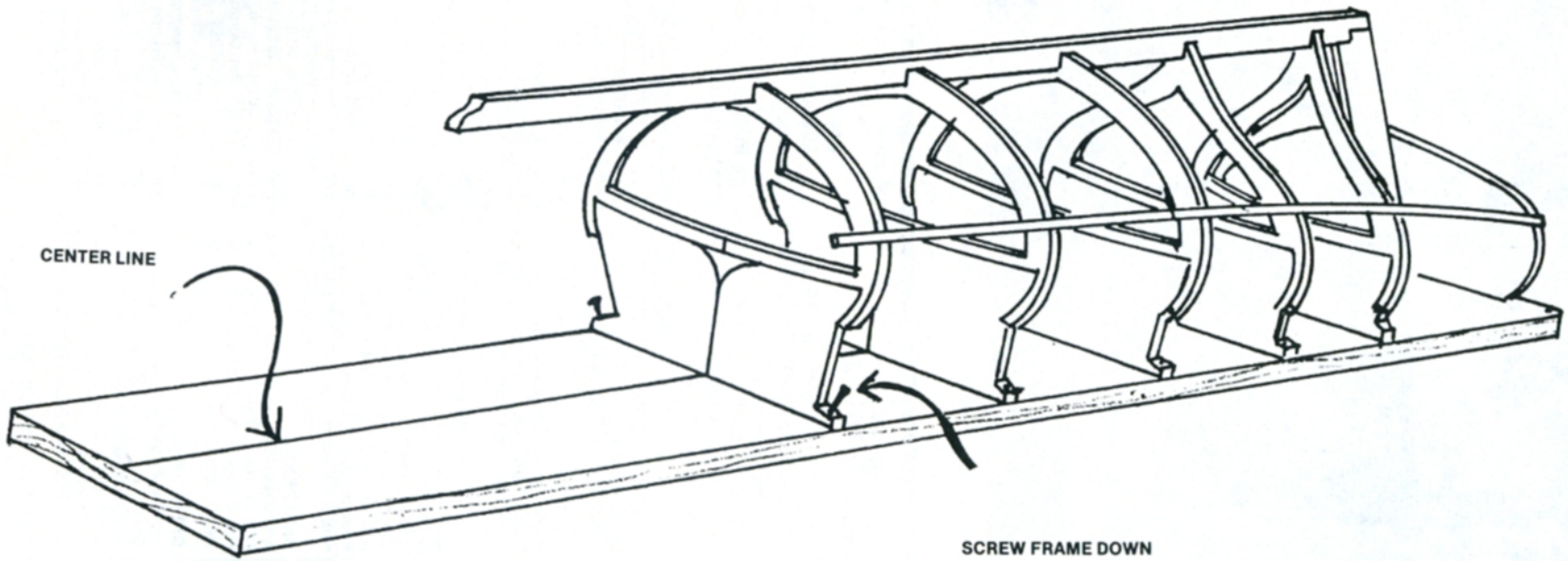
One of the most tedious jobs was planking the deck. I used 1/8-inch by 3/8-inch planks. I carefully started in the center, cementing them by using 1/32-inch spacers between each plank. While planking over the hatches, be careful not to cement BOTH SIDES of the joints lengthwise (crosswise will be cut later with a jeweler's saw to release the hatch cover). This will allow one plank cemented on the side of the hatch cover to overlap the joint lengthwise, making the hatch almost invisible. This is desirable because these oversize hatches cannot correspond to scale size hatches.

After the whole deck is planked, sand smooth all different thicknesses and irregularities. Then, seal with two coats of clear sealer.

The 1/32-inch spaces are then filled with dark grey acrylic enamel. I used a putty knife and it took seven attempts before all the cracks were filled. I had to resand the deck to take off excess grey enamel, then I gave it two coats of clear polyester plastic varnish.

In the next issue, I will discuss installing the radio equipment and finishing the model.

FIGURE 3



THE ENTIRE SHIP was able to be broken down in order to be transported in a station wagon.

THE *RATTLESNAKE* SAW sailing on both sides during the American Revolutionary war.

History of the RATTLESNAKE

The RATTLESNAKE was built at Plymouth, Massachusetts around 1779. The 16-gun privateer was designed by John Peck.

She was owned by several people who invested money in the construction. The principal owner was John Andrews from Salem. Mark Clark was the captain of the ship at its launching.

Though the RATTLESNAKE was originally an American ship, it was captured by the British in 1781. She was taken to England and renamed the CORMORANT. Her lines were copied and they are still on file today at the National Maritime Museum in Greenwich, England. She was renamed RATTLESNAKE in 1783 when the British discovered that they already had a ship by the name of CORMORANT.

It was never exactly determined what happened to the RATTLESNAKE. She was sold out of service in the mid 1780's. There is some thought that she became a French privateer. The French ship LE TONNANT of the 1790's has the exact same lines as the RATTLESNAKE.

This information on the RATTLESNAKE was found in the book, *American Ships of the Colonial and Revolutionary Periods*, by John F. Millar and published by W.W. Norton & Company, Inc., New York, NY.