R/C Steam-Powered LAUNCH

PHOTOS BY THE AUTHOR

By KILBURN ADAMS . . . Believe it or not, steam powered model boating is tremendously popular throughout the world. This very typical launch from the "Gay Nineties" era is nothing but class, from stem to stern.

• Steam launches are thought by many marine historians to be among the most graceful craft to travel the waterways of yesteryear. This particular one is typical of the steam launches of the "Gay Nineties", with its fantail stern, plumb bow, and sweeping sheer, and may evoke memories of the movie "African Queen".

Five channels of R/C are used to control steering, forward/reverse, throttle, whistle, and burner control, but the burner control is not really necessary. The R/C model was scaled to fit the Saito line of imported, ready-to-run steam engines. I chose the twin-cylinder version for its self-starting capability, since it has no dead centers. These engines can be purchased with or without the reverse, but the reverse seems especially fun on an R/C boat. Steam engines obtain reverse by changing the valve timing 180 degrees, and this makes reversing quick and easy. Steam engines also put out high torque at very low RPM, and can turn large propellers at low RPM. The power and speed of this boat have impressed all who have seen it cruising the local pond.

Since realism was one of the important goals of this project, the various woods were chosen much as they would have been in a full-sized launch. The R/C gear was hidden under the rear seat, but the beautiful engine and its brass accessories are in full view. All equipment and floorboards with seats are removable for easy servicing and cleaning, when necessary.

This project is not particularly difficult, but will require dedication to the job. Access to a table saw, jigsaw, and Dremel tool will be required. Many of the brass parts can be made from hobby store tubing and strip stock. Small pullies and turnbuckles can be purchased from Proctor Enterprises or model shipbuilding supply companies. Other small parts may be found in your spare-parts box. The whistle valve can be made from a tire valve and valve stem. These parts are brass, and therefore rustproof. Small parts can sometimes be chucked in an electric drill and worked with file and sandpaper, when a lathe is not available. Small brass machine screws can be obtained through model railroad hobby shops. Wood can be ordered from Craftsman, Dept. LX-18, 2729 Mary, Chicago, IL 60608. Their 144-page catalog is 50¢.

The glues used in construction were mainly epoxies. It is best to have two types available: one for quick set and one which will allow longer working time. Much of the work can be done using something like Sig "Quick-Set" epoxy, which has a working time of five minutes. "Hot Stuff" was used to fasten trim strips along the gunwales and edges of seats, etc., because it does not result in glue oozing out where removal would be difficult.

Construction should begin by preparing the frames for mounting to a building board. All frames will have vertical strips of wood attached to aid set-up to the building board. The hull will be built upside-down, so cut the vertical strips to hold each frame the correct distance off the board. The building board should be straight and warp-free. Particle board 3/4 x 12 x 60 inches works well. Draw lines 90 degrees to the center line of the board at each station location. Before gluing the frames to the board, assemble the stem, keel, filler piece, and stern post, and attach this assembly on the center lines which has been drawn on the board. Glue scrap supports between frames, and between each outer end of the frames and the building board, to give proper alignment. Check each frame for proper spacing, vertical alignment, and make sure each is 90 degrees to the center line. Cut out the curved stern formers with a jigsaw, and epoxy to frame no. 10 and to the stern post.

Using a 1/8 x 1/8 x 36 inch strip of spruce, check fairness of all frames. Fairness can be checked by laying the strip across the frames fore and aft, and looking for low or high spots in the curve of the strip. If you do this carefully, your eye can detect very small discrepancies in the required shapes of the frames. Any high areas on the frames can be carefully sanded down. Low areas can be built up later. When satisfied with the fairness of the frames, begin notching the frames to accept 1/8 in. sq. ribbands. Place the ribband closest to the gunwale first. Use the strip previously used for checking fairness to align and locate the positions of notches for ribbands. Cardboard gauges can be made for locating each notch for the ribbands. The gauge is used to get the spacing of one ribband from another to be approximately the same. Dividers could be used in place of gauges.

After all of the ribbands have been glued into place, the 1/8 x 1/16 spruce ribs can be individually boiled in water, to make them limber, and then glued over the ribbands. When all ribs have been glued, again check for fairness and sand any highs. Now is the time to fill the lows, by gluing on another rib to any frames that are low. If only a partial buildup is needed, this can be accomplished by sanding down the double rib.

Planking the hull can begin when the hull is fair. Start at the gunwales and work toward the keel. Always plank in right and left pairs. This will help assure that the hull ends up symmetrical about the centerline.

The first three plank pairs will have to be prepared for bending around the stern. This is done by sawing into the backside of the plank, in the area of major bending. The easiest way to do this is to clamp a strip of wood to the jigsaw table, behind the blade, to control the depth of cut on the planking. The cuts can be spaced about every 1/16 inch, and should be a little deeper than 1/2 the thickness of the planks. These areas of bending should then be soaked in hot water to make bending easier.

Getting the planks to stay in place while the epoxy is setting can be most easily done using clothespins and "C" clamps to clamp planks to the ribs and ribbands. Some of your clothespins can have wood removed from inside their jaws, to allow larger gripping size. Small scraps of wood can be used as wedges between a ribband and plank to hold the plank tight against the preceding plank. It is a good idea not to lay more than one plank per side until the epoxy has set. If planking progresses at only a few planks per day, it seems to take the drudgery out of the job. You can be preparing other parts, building whistles, valves, etc., during the rather long planking period. The important thing is to lay planks *every day*. Once you get five or six pairs of planks in place, you can begin the smoothing and sealing process described later. You will be surprised at your progress in just a few weeks of laying planks at the

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rate of just a few a day. A vertical disc or belt sander works well in tapering planks.

As planking progresses beyond the first three pairs, all planks will stop at the laminated rib over frame no. 10. From this frame aft, you will begin planking with the center plank laid along the stern post and tapering smoothly into the stern planks previously laid. Additional planks in the area from frame no. 8, aft along the turn of the keel toward the propeller shaft to frame no. 10, will require laying planks on edge to build extra thickness, and quite a bit of splicing and fitting will be necessary in this area. This hollow-shaped area will be sanded to shape using a dowel wrapped with sandpaper or emery cloth. Some roughing out can be accomplished with the coarse sanding drum of a Dremel tool.

In order to obtain a natural finish on the hull, and to seal cracks, epoxy should be used as a surface filler on the planking. After rough sanding the planking, epoxy should be rubbed into the wood, and any excess removed by scraping before the epoxy sets up. When the epoxy has hardened, the surface may be scraped again, using a single-edge razor blade, until you have produced a smooth surface. This should be done carefully to avoid scratching the wood with the corners of the blade. It might be a good idea to practice this on some scrap wood before attempting the actual hull. After the hull is scraped smooth, apply more epoxy and scrape off the excess. When hard, scrape again until smooth. Repeat this sequence until the hull is smooth, all cracks are filled, and all grain is filled. Wet-or-dry no. 400 paper can be used to further smooth the hull. Polyurethane varnish can then be applied. Five or more coats, applied with a one-inch wide "poly brush", gives a nice finish. The foam "poly brush" is inexpensive, reusable, does not leave brush marks, does not shed, and can be purchased in most paint stores and some hardware stores. Try it, you'll like it. All wood parts should be finished with varnish. The inside of the hull should be well sealed with at least three coats, but five or six coats would be even better. I used high-gloss varnish on the exterior of the hull and deck, but used satin finish on all interior parts.

With planking completed, you will be over the roughest part. The remainder of construction is straightforward and should need no explanation, other than the notes on the construction drawings.

If you use one of the Saito steam engines, you may have trouble reading the English-written-by-Japanese instructions, and so a few words about the operation of the engine are in order. The boiler should be filled with distilled water until the open overflow bleeds water. The oiler should be filled with the supplied cylinder oil, and bearing reservoirs should also be oiled. The burner valve should be closed until after the burner has been preheated properly. Preheating is done by putting a small alcohol burner under the main burner assembly. This heats the vaporization chamber, to cause vaporization of the alcohol. After several minutes of preheat, the burner valve can be opened and the burner lit with a match. If, on first opening the valve, liquid alcohol comes from the jet, then the burner was not heated sufficiently. If you had a flame-up from the raw alcohol, close the valve, blow out the fire, clean up the excess alcohol, and start over with preheat. When properly operating, the burner will have a forceful blue flame and a roaring sound similar to a blowtorch. The burner used for preheating can then be removed. The burner is supplied with a cleaning needle, and it may be necessary, after several hours of operation, to remove the screw plug at the rear of the jet and push the cleaning needle completely through the jet, to clean any gunk from the jet. Lifting out the front floorboard and removing the two mounting screws for the burner tank will allow you to service the burner more easily. You should *not* use rubbing alcohol in your burner, but rather, a good grade of stove alcohol, available in marine and paint stores.

Remember that all major components of the launch should be easily removable. The canopy just slips off the support poles, and the poles slip out of their mounting sockets. The boat can then be operated without the canopy.

All steam connections should be made with silicone rubber tubing (model airplane type), which will allow the floorboards to slip out without removing the engine and boiler. The condenser can be slipped out of the way to allow removal of the main floorboard assembly. The main floorboard assembly carries the two side seats, rear seat support, and servo tray, so make all pushrods quickly removable. The floorboard just rests in position; no screws are necessary.

The pushrod controlling the forward/reverse lever on the engine should have the spring override and shock absorber shown on the drawings, to avoid causing undue wear on the valve linkage components caused by overtravel on the control. The throttle should be set up so that, when at full low throttle position on the transmitter, the throttle valve on the boiler is not fully closed without also moving the throttle trim lever on the transmitter to full low throttle trim position. This is done to help prevent unnecessary strain on the throttle servo when stopping the engine with low throttle position. At full low throttle position and low trim position, you should have a fully-closed throttle.

At first, my boat was operated with no trim ballast, but I have since added ballast to the bow section to get the boat on the designed water line. No other changes have been necessary, and I have been very pleased with the boat. It looks good on the water, and also makes an interesting and beautiful display model. Take your time, do a good job, and you will have a valuable and unusual model. How many steam launches have you seen at the pond lately?

If you decide to build the model, it is assumed that you will purchase the full-size plans from **Model Builder**, since the exact shape of the frames is important. I hope this article will result in a new interest in the fine, classic designs of years past. Radio control seems so fitting for operation of these quiet and graceful models. ●