

(Please see the attached diagram when reading this section.)

The following is a description of how to build a simple "raft"-type style boat. Look first at the bottom set of drawings on the attached diagram, called the "side elevation." The three components of the hull, marked "A," "B" and "C," are shown in "exploded" form — that is, they are shown as if separated from each other. "A" is a thin, flat sheet of plywood — which is also shown above in the "overhead view." The size of this plywood sheet should be determined by the space requirements of the superstructure (the "creative element") you will build on top of it *plus* your crew's need for space in which to sit or kneel when paddling your boat. The plywood sheet is the "deck" for your boat.

"B" is an open frame of wooden 2x4s. This frame forms a kind of box without sides. Its outer dimensions should match the outer dimensions of the plywood deck. Its depth — the distance by which it will extend down into the water — should be determined by the size of the milk cartons you are using for flotation. The frame should be slightly deeper than the height of the carton, so that your boat can sit on dry land without its weight crushing — and puncturing — the milk cartons that provide flotation. (One-gallon plastic jugs and half-gallon paper cartons are both approximately 9-1/2 inches high.) Assemble the frame with nails and/or steel "tie-down" brackets screwed into position where the frame members meet. When it is securely assembled, nail the frame into position on the underside of the plywood deck. If necessary, nail "bracing" 2x4s across the underside of the deck to strengthen it.

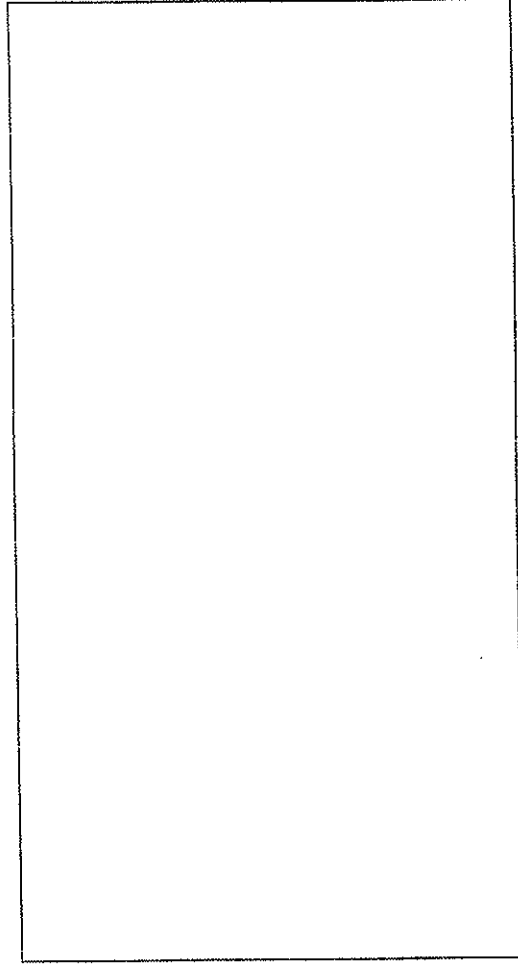
If you are planning to reuse the same deck-and-frame assembly for successive Derbies over a period of years, you would be well advised to apply a coat of primer and one or more coats of paint to all surfaces of your hull assembly. This will retard warping and decay that result from prolonged exposure to the water. Painting also enhances the look of your vessel.

If you wish, you may add "sides" to your boat by attaching very thin plywood sheets to the outer sides of the 2x4 frame. (*This step is not shown in the attached diagram.*) When combined with the plywood deck above, in effect what you will have done is to create a box with all of its sides except the bottom enclosed. **Do not enclose the bottom;** leave it open so that you can insert the milk cartons and so that Derby inspectors can examine your boat for compliance with the Derby Rules.

"C" represents a row of one-gallon plastic milk jugs. (You may choose to use half-gallon paper cartons.) These should be attached — bottom-side up — to the underside of the plywood deck with a good adhesive like "hot glue." Boats carrying a lot of weight sometimes feature a double row of milk cartons — with the second row mounted below and attached to the upper row. This requires a deeper 2x4 frame sufficient to enclose the double row of jugs. Once the cartons or jugs are in place, you can staple chicken wire or a similar metal or plastic mesh to the bottom edge of the 2x4 frame (attach the mesh to the sides of the 2x4 frame as well if you have not attached wooded sides to your boat). This will prevent those cartons which inevitably break loose upon contact with the water from floating away. Do not, however, use plastic or fabric sheets which screen the inside of your boat from the view of the inspector. **Doing so will result in disqualification.**

You are now ready to paint and decorate your boat's hull and construct whatever superstructure atop the plywood deck that you desire.

Style Boat

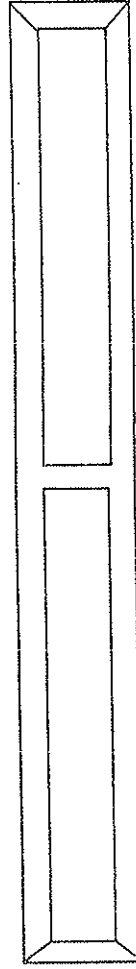


Overhead view

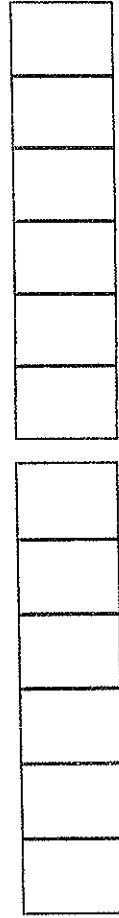
A



B



C



Side elevation
("exploded")

(Please see the attached diagram when reading this section.)

The following is a description of how to build a simple speed boat. Look first at the bottom set of drawings on the attached diagram, called the "side elevation." The four components of the hull, marked "A + "B," "C" and "D," are shown in "exploded" form — that is, they are shown as if separated from each other. "A + B" form the keel — the backbone — of your boat. "A" is a 2x4 approximately 12 feet in length (you may build a longer boat if you wish and you may use a different cut of wood if you wish). "B" is a 2x4 approximately 3 feet in length. The left end of "B" has been cut on an angle so that when it is attached to "A" it gives the overall keel an upward tilt — called a *sheer* — at the front end. Use a professional-strength wood glue to position "B" on the end of "A," then screw steel "tie-down" brackets (available at building supply stores) over both sides of the joint to reinforce it.

"C" is a thin, narrow plank of plywood or siding material about 15 feet in length. It will provide your boat with its deck. It should be nailed securely to the upper side of the 2x4 keel. As it passes over the area where "A" joins "B," it will not be possible to nail it to the keel — doing so will cause the deck to break. Instead, allow the deck to bend naturally over the area of the joint, forming a gradual upward sweep. It may be necessary to soak the deck in water to make it pliable enough to bend. The purpose of providing a *sheer* in the forward end of your boat is to prevent water from washing over the bow of your craft. When this happens, it causes the boat to bury its nose in the water — and that slows you down.

Once the deck is securely attached to the keel, nail a seat and foot braces into position on top of the deck. Position the seat no further forward than the mid-point of the boat's length. If you do, the balance of weight will shift forward — and your boat will bury its nose. Some racers position the seat slightly aft of the mid-point. You may need to experiment during your trial run to determine the optimum position. Seats can be a simple plank of wood or a seat taken from a bicycle, lawn mower or other vehicle.

Speed boat hulls can be re-used over a period of several years. But they must be protected from the warping and decay that result from contact with the water. Before you move on to the next stage of attaching the milk cartons, apply a coat of primer to seal the wood, then one or more coats of paint to protect the primer.

"D" represents a row of half-gallon paper milk cartons. (One-gallon plastic milk jugs should not be used on speed boats.) On a speed boat, these should be attached so that their bottoms face outward toward the sides of your boat. After sealing their mouths shut, hot glue them together — side-to-side — and then reinforce these "bundles" of cartons by wrapping them in clear, plastic shipping tape. (The "bundles" should consist of about four-to-eight cartons.) Then, staple the cartons onto the bottom side of the 2x4 keel, using the "lip" at the very top of the milk carton. Staple a row of cartons in this manner along the entire length of the keel (including the upswept "B" portion) on *both* sides (it may be necessary to overlap the carton "lips" if you are using a narrow cut of wood for the keel).

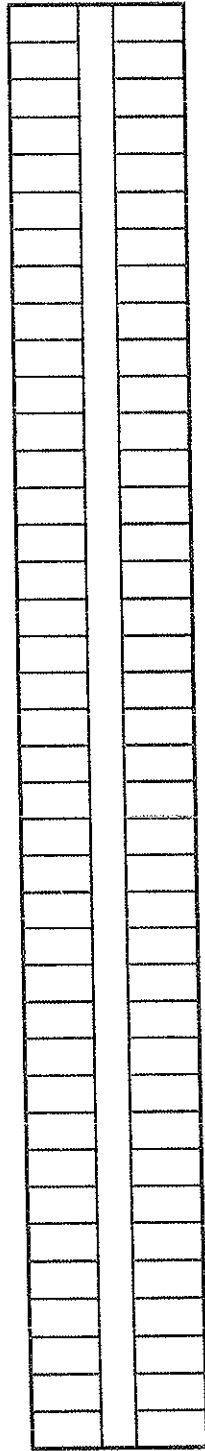
Once in position, use clear plastic shipping tape to secure the several "bundles" of cartons to each other. This in effect makes the many "bundles" one continuous "bundle." This is important, because unless the cartons are all attached to each other the separate "bundles" will "feather" in the water — that is, they will move up and down in a random fashion as the water washes over them. This will slow down your boat and make it less maneuverable.

"E" is a very thin, pliable piece of wood — like a 1x2 — that can be cut into two sections: one matching the length of "A" and the other matching the length of "B." Position the two sections of "E" over the lips of the milk cartons where they are attached to the bottom of the keel. Then screw them onto the bottom of the keel using an electric drill/screw driver. This will secure the milk cartons in place and prevent them from breaking or tearing loose in the water.

Your speed boat is now ready to race. Sit on your boat's seat and use a double-ended paddle to row from both sides. Speed boats are fast and require a little practice to handle effectively. Hint: reduce extraneous weights to a minimum and remember that the physical conditioning of the boat operator can make the difference between a first- and second-place showing.

Speed Boat

Overhead view



Side elevation ("exploded")

