

Frame for Line Following Robot

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The frame of the robot was constructed from $\frac{1}{2}$ inch thick plywood. Two rectangular holes were cut in the plywood with a saber saw. The smaller one toward the front of the frame accommodates the photoresistors and white LED headlights, which need clear access to the floor. The larger hole near the rear of the frame functions to reduce the weight of the frame and also to provide a route for wiring from the motors to the printed circuit board. The battery clip was mounted with #2, $\frac{1}{2}$ inch wood screws, at the rear of the frame, centered.

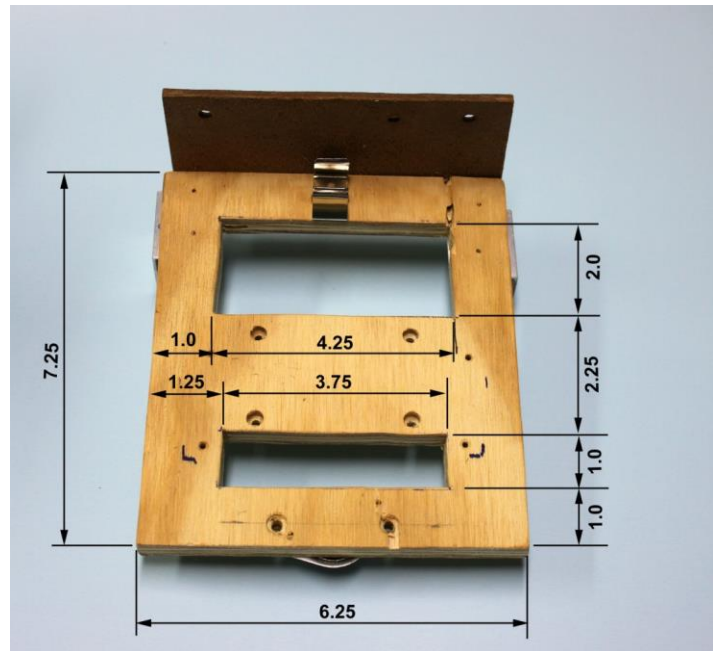


Figure 1 dimensions of frame in inches

A caster was mounted on the bottom of the frame at the front, centered, using #6, $\frac{1}{2}$ inch screws. The caster serves as the front wheel of the robot. Four $\frac{9}{64}$ inch holes were drilled in the plywood between the front and back large rectangular holes. These accommodate the machine screws for mounting the PCB to the frame. The PCB was used as a template to mark the position of the holes, with the front edge of the PCB positioned $\frac{1}{2}$ inch back from the front edge of the forward rectangular hole. The four holes were countersunk from the top surface of the plywood with a larger drill, to allow the $\frac{1}{2}$ inch spacers to recess $\frac{1}{4}$ inch into the plywood (therefore, the PCB bottom surface will be positioned $\frac{1}{4}$ inch above the top of the plywood when mounted). Mounting brackets for the



Figure 2 bottom view of frame

motors are attached to the bottom of the frame as seen in Figure 2 using #6, ½ inch screws. The largest hole in the bracket, which accommodates the motor axle, should align with the back edge of the large rectangular hole of the frame. Note that the brackets are offset from each other (one is closer to the back than the other). This is due to the fact that the motor housings are to be mounted differently, one with the axle toward the back and the other with the axle toward the front. In order for the axles to be equally distant from the back of the frame, it is necessary to offset the brackets.

The back panel of the robot frame (Figure 3) was made from 3/16 inch thick hardboard, 6 inches by 2 ½ inches. The panel was attached to the plywood back edge with two #6, 1 inch long screws. Two ¼ inch diameter holes were drilled into the panel for the power switch and DPDT (dark/light line) switch.

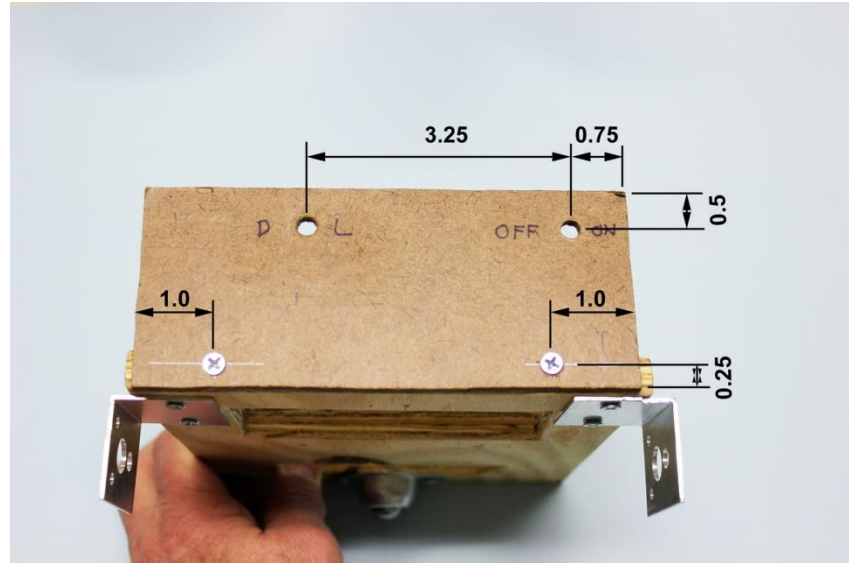


Figure 3 back hardboard panel of frame

The motor mounting brackets were fabricated from 1 ¼ inch aluminum angle, 1/16 inch thick and 1 ½ inches long. Holes were drilled into the bracket according to the dimensions provided in Figure 4. The 15/32 inch hole is for the motor axle. The 11/32 inch hole accommodates the intermediate gearbox shaft, which protrudes slightly from the gearbox. The 9/64 inch holes are for the #4, ¾ inch long machines screws used to attach the motor to the bracket.

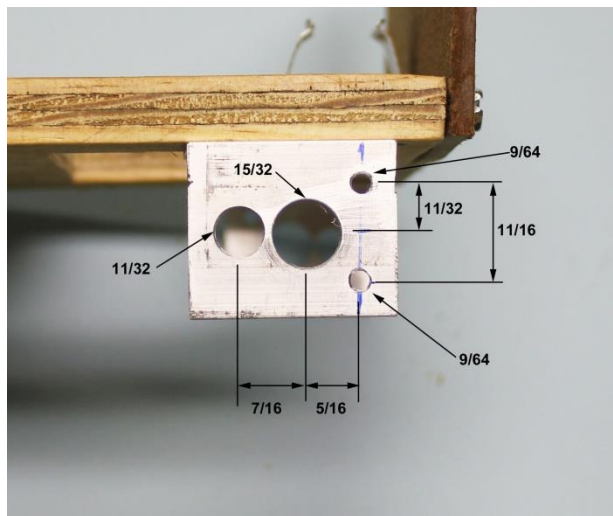


Figure 4 motor mounting bracket