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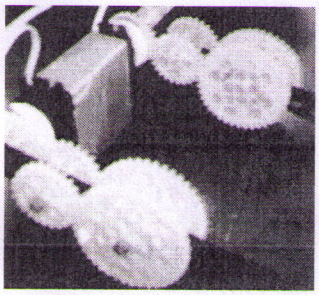
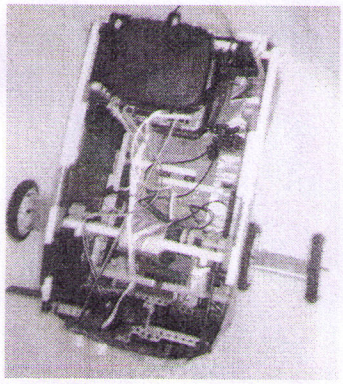
Amphibious robot

We decided to do a robot showcase involving the development, creation and testing of an amphibious robot because we did not want to do what every one else would do. We came upon the flat bottom and trapezoidal shape because that is the shape that was selected for the very successful "Higgins Boats" of the Second World War, and it would give us the most room inside the hull for all the electronics that we would need for the robot to move. The frame of the robot is made from Lego beams and rods because they are a light weight alternative to metal; they are also easy to connect to any part that has been in any BotBall kit. When we built the robot we realized that we would need to keep water out of the hull to prevent the robot from shorting out. The solution we first came up with was plastic wrap but during testing we found that it was too brittle. The solution was to trace the size of the aria we wanted to cover to a piece of paper then cover both sides of the paper with duct tape. This gave us ample strength and made a very tight seal.



The picture to the left is our drive train. We decided to run the robot using a drive train because it would keep the motors dry and it is more reliable than a bet drive. We designed the drive train to increase the torque, because the motor alone was did not have the required torque. This was our second attempt at a drive train because our first one could not withstand the strains applied to it from the motor and the weight of the robot.



The picture to the left is the completed robot during sea trials. The sonar sensor in the front is for the location of yellow and grey pillars that it will nock down using the arm in the front that is not in the picture. The CBC1 is mounted in the rear so that the center of balance stays near the middle of the craft. The wheels work in teams of two supporting the paddles that propel the robot while in the water. When we where designing the robot we had to take into account that the robot would need wheels protruding from the hull, this meant making holes and sacrificing water tightness. The solution to this problem was simple we sealed the hole with bushings pressed tight against the hull. This is probably the most difficult part of the robot because if it was done wrong the robot would begin to take on water at an exponential rate.