VIRGINIA MILITARY INSTITUTE
Mechanical Engineering Department
Cooperative Engineering Center (CEC)

# "SEWER RAT"
2001


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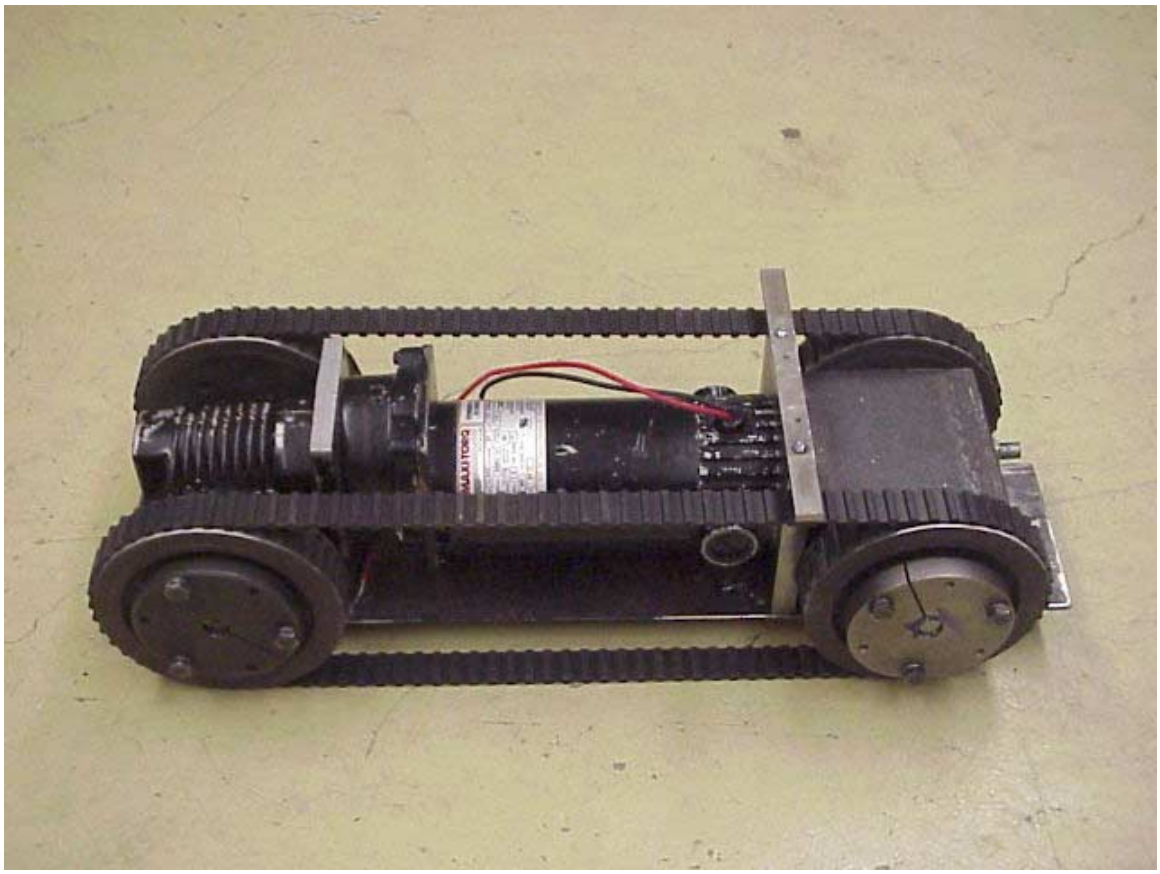

The client for our cooperative engineering center project was Mr. John Smith, Superintendent of Facilities at the Lexington Department of Public Works. We were tasked with designing and constructing a closed circuit television sewer line inspection camera transporter. In the past, Mr. Smith has utilized the camera with a “hard wire” which was used to push the camera through the pipe to a maximum length of 188 feet. Mr. Smith wanted a self-propelled transporter to carry the camera attached with “soft wire” through the terra cotta pipe to a length of 500 ft. Various commercial transporters were used in the past but proved to be difficult to use for their application due to the winding clay pipes. Our constraints for the project were to use the motor, controller, soft wire, and camera provided. The transporter was designed around the larger motor provided. The motor size itself limited our transporter’s use to pipe sizes eight inches or larger. After researching commercial transporters, we decided to design the transporter much like those in common use, four wheels connected by belt powered by one shaft from the motor. After determining the weight of the soft wire, and determining the friction in the pipe, we determined that the motor was two times as powerful as need be. With our constraints, we had to use the motor, which was beneficial anyway because of its large weight. To have the necessary friction between the power transmission belt and wheels to the pipe, our transporter needed to be greater than 60 pounds. This meant that as much steel as possible be used. The utilization of large amounts of steel in our design added to our design safety factor and thus a stronger transporter. Our project will culminate with the testing of our transporter in actual sewer pipes ending with written and oral reports to the faculty and client.