# MXEN 2002

**Project Report**

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# 1 Nomenclature

# 2 The Task

We were tasked with building, wiring, and programming a robot to complete a series of objectives, such as navigating a maze autonomously and moving a camera with a servo as to let the operator identify targets. We were to use the Arduino Mega hardware with a DC motor drive system along with several distance sensors to help achieve the objectives.

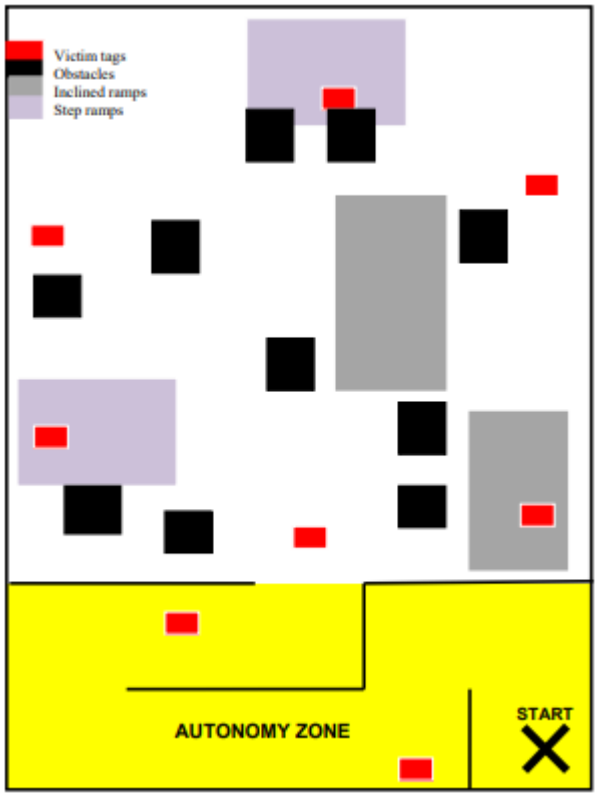


Figure 1: Supplied example of the task map

## 2.1 Autonomy Zone

The "Autonomy Zone" is the section of the map in which the robot is completely self controlled. The idea behind this challenge is that in the event of a connection dsiruption in a dangerous area for humans, the robot should be able to rescue it's self from danger.

## 2.2 Manual Control

The majority of the task is to control the robot through wireless communication. During this period the robot (controlled by the user) must drive through the zone and send a camera feed back to the user for "victim" tags to be recorded.

# 3 Our Solution

## 3.1 Overview

Mechanically constructed from the supplied robot base. It has two driving motors each attached to tank treads, on top there is a platform with mounting holes for an Arduino Mega and various sensor brackets. Initially our plan was to use the given prototyping breadboard with limited modification to the drivebase, however after some testing we identified several issues with this. The final product we created used a more permanent Arduino "Shield" that we created with a solder on prototyping board.

## 3.2 Issues and Solutions

Before starting we identified several potential issues and solutions that we thought may impact our project, listed below:

| Issue | Solution |
|---|---|
| During Lab G we found that the tracks would fall off if run too long as the nut would unscrew and as such unbolt the wheel | Initially we intended on using lock-tite, however we didn't want to use a potentiallly damaging product, to solve this issue we opted to use a second nut on each bolt to reduce the effect of vibration |
| We found throughout our labs we found that we had many issues with the wiring and using the bread-boards as the connections were loose | To remedy this we planned out our circuit and soldered a "prototyping shield" for an Arduino Mega to cre-ate our own "MXEN2002 shield" |
| The front sensor didnt have the res-olution to sense the in front of the robot from its initial position | We moved the sensor mounting around as to position it below the robot and sunk back slightly |

Table 1: Issues + Solutions