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| [Type the company name] |
| Project Plan |
| Embedded Systems |
|  |
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**8/29/2013**

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# Requirements

## Hello World Robot

Print “Hello World” through the serial connection on the Vex.

## Hello World Android

Create an application to have the Android device print “Hello World”.

## Robot and Android Not Damaged

Take good care of the equipment and return it in working order.

## Robot able to go Straight Forward and Backward

The robot will be programmatically made to travel forward in a straight line and additionally travel backwards in a straight line.

## Robot able to turn Left and Right

The robot will be programmatically made to turn left and then subsequently turn right.

## Obstacle Avoidance

The user should be able to use the controller to drive the Vex in real time while avoiding objects and obstacles.

## Communication between Android and Android

One Android device needs to host a Wifi network that will allow the other Android to connect to it. Commands must be able to be sent between the two Android devices.

## Communication between Android and Vex

One Android device needs to host a Wifi network that will allow the Vex to join it. Commands must be sent from the Android and received by the Vex.

## Robot Handles 10% Grade

The robot must be able to travel up a 10% grade incline.

## Remote Control using Vex Radio

Use the controller to drive the Vex.  
Remote Emergency Stop Mechanism

A button should be able to stop all movement of the robot.

# Risk Analysis

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Requirement | Estimated Time To  Completion (hours) | Points | Risk | Final Value (points/hour) |
| Hello World Robot | 2 | 5 | .5 | 1.25 |
| Hello World Android | 1 | 5 | 1 | 5 |
| Robot/Android not damaged | N/A | 10 | 1 | N/A |
| Robot goes forward/backwards  Turns left/right | 5 | 10 | .5 | 1 |
| Obstacle Avoidance | 1 | 10 | .8 | 8 |
| Communication Android to Android | 10 | 10 | .1 | 0.1 |
| Communication Android to Vex | 8 | 10 | .2 | 0.25 |
| 10% Grade | 1 | 10 | .9 | 9 |
| Remote Control Using Vex Radio | 2 | 10 | .8 | 4 |
| Remote emergency stop | 3 | 15 | .8 | 4 |
| Totals: | 33 | 95 | N/A | N/A |

## Hello World Robot

The objectives in this task are unknown. We are inexperienced in operating the Vex.

## Hello World Android

All groups member have experience with the Android platform.

## Robot and Android Not Damaged

A project locker will be used to store all the devices and equipment. Members of group will be careful when handling devices.

## Robot able to go Straight Forward and Backward and turn Left and Right

The task sounds straight forward, but involves using new technology.

## Obstacle Avoidance

The requirement is vague and is perceived to be steering the robot with the controller.

## Communication between Android and Android

The protocols that are in place to do this are unknown at the current time, and applications must be written that can send and receive messages. None of us have experience with Ad Hoc on Android.

## Communication between Android and Vex

The protocols that are in place to do this are unknown at the current time, and applications must be written that can send and receive messages. The Vex requires a separate application for listening as well.

## Robot Handles 10% Grade

The risk comes from an incorrect mechanical design, and needing to rebuild the robot.

## Remote Control using Vex Radio

Sounds straight forward, and the vex can just plug into the controller.

Remote Emergency Stop Mechanism

A button will need to be made to stop the motors by cutting either power or communication.

# Plan

|  |  |  |
| --- | --- | --- |
| What | Who | When |
| Hello World Robot | Jenny | 5-Sep |
| Hello World Android | Andrew | 5-Sep |
| Build drivetrain | Jason | 5-Sep |
| Attach motors | Jason | 5-Sep |
| Mount Vex to structure | Jason | 5-Sep |
| Plug in motors | Jason | 5-Sep |
| Remote Control Using Vex Radio | Andrew | 12-Sep |
| Robot goes forward/backwards/left/right | Jenny | 12-Sep |
| Obstacle Avoidance | Andrew | 12-Sep |
| 10% Grade | Jason | 12-Sep |
| Robot/Android not damaged | All | 19-Sep |
| Communication Android to Android | All | 19-Sep |
| Communication Android to Vex | All | 19-Sep |
| Vex Remote emergency stop | Jenny | 19-Sep |
| Setting up Ad Hoc Network | Jason | 19-Sep |
| Android Remote emergency stop | Andrew | 19-Sep |
| Send a command | Jenny | 19-Sep |
| Receive a Command on android | Andrew | 19-Sep |
| Receive a Command on vex | Jason | 19-Sep |
| Connect Android to Android | Andrew | 19-Sep |
| Connect Android to vex | Jenny | 19-Sep |