Test 1

Getting to grips with the Bluetooth, 28/10/2020: The device worked exactly how it should every command button worked as it should. The controls were very easy to understand and get to grips with which means I could use the buggy how I wanted with no issues. Only thing I would like to add is that the left and right turns be a little less aggressive. So instead of a 90 degree turn maybe a 45 instead. Also I would like the distance of the sensor to be displayed on the mobile device as well as the LCD screen on the buggy so I don’t have to be stood directly over the buggy to know this information, as I think this would make it more user friendly. Other than that, it was flawless.

Test 2

This test is like the last with a few minor changes. This time around the buggy is in a combined remote Bluetooth and autonomous mode. The autonomous element will allow the buggy to roam freely while avoiding obstacles.

Acting on the previous test a feature of being able to see the reading of the ultrasound sensor has now been added and can be viewed in the mobile device terminal as well as the turns being less harsh.

Test 2.1, using the combined autonomous and Bluetooth mode, 04/11/2020: self-roaming was effective, the buggy avoided obstacles well, although had trouble once it was under a certain distance from complex obstacles. commands were easy to pick up and the buggy was easy to manoeuvre, although lag time could be reduced, or possibly a cut off after x number of commands. possibly introduce a short cut to speed one and/or options for varying stop times, so that when flustered a driver can take time to re-think.

Test 2.2, test is the same as previous (code remains the same as the last test), 05/11/2020: the buggy avoided the obstacles well however due to lag it made it difficult to manoeuvre, also would be much easier and efficient for the driver if there was a cut off command so that the user can re-access the situation and move from there.

Test 3

The buggy now can roam around autonomously while avoiding obstacles and this can then be stopped and be used remotely again. It’s easy to switch between the two, using the mobile device terminal the "roam" hotkey enters the buggy into an autonomous mode(which can be seen when the android device is tilted on a landscape view and the screen will show more potential hotkeys). when any button/command is used in the terminal the buggy will then exit the autonomous mode and reverts to a remote mode.

Test 3, testing combined autonomous and remote modes, 07/11/2020: I enjoyed the new features on the handset. The fact that the buggy now had a roam feature was very interesting. The fact it could now make decisions on what was in front of it and change the course on which it was travelling due to an object being in its way was fascinating. A cool feature would be if it could decide which way it wanted to turn. For instance, left or right depending on the amount of space it has either side, this depends on the amount ultrasound sensors it has available. All the other buttons worked well and did what I wanted when I asked it to.

Test 4

A tilt sensor and servo motor have now been added, the use of WIFI connection is also up and running. Security measures have been added so if WIFI or Bluetooth connection is lost it will stop the buggy and turn on the front red LED. The servo motor allows the buggy to look left and right and then decide on which direction to move. The tilt sensor will monitor the buggy and if it capsizes or is flipped over it will stop the buggy and turn on a buzzer as well as notifying the user if in remote mode.

tests to be completed:

* turning system for servo ultrasound sensor, just to check its working right.
* tilt sensor while in autonomous mode while moving.
* temp and humidity sensor and water sensor while moving and stationary.
* disconnect functions via Bluetooth, by trying to connect another device (already known that two devices can’t connect over Bluetooth).
* disconnect from WiFi, turn off router.
* test overall usability.

Test 4, 23/11/2020, testing the new obstacle avoidance system, tilt sensor and the temp, humidity and water sensor (all in Bluetooth mode): I found the new obstacle avoidance system was very good the Buggy made very accurate adjustments when it came to an obstruction. the fact it was able to stop look around and decide for itself which way to go was very impressive. the tilt sensor that has been integrated into the buggy was a very impressive feature. especially since you had the use of this both in autonomous mode and just when controlling the buggy, yourself. also having the bonus of a water, temp and humidity sensor on it was very good. being able to see those readings was a nice feature to have the use of. I also found the use of the IR remote to be far more simplistic and easier to use than the Bluetooth device I much preferred it. there was a few points I feel could do with some improvement. for instance, when you are on the move and then ask the buggy to perform a water reading it stops does this command but then waits for another new instructions. I would like it to instantly carry on with the previous command once the reading has been carried out with no need to give it further instruction from either the Bluetooth device or IR remote. other than that, the buggy was very good.

Test 5

A RFID security tag has been added for security.

Test 5, first time using WIFI set up and looking at disconnection issues. To then compare the WIFI and Bluetooth usability, 11/12/20:

Using BLYNK: was detailed and easy to use. Very easy to read the screen. All commands worked straight away. Liked the safety feature as well the fact you had to use a key fob to be able to use the buggy. Also, the fact it tells you on the buggy with a red led that it is disconnected from the internet and you no longer have control of the buggy.

Standard WIFI: wasn’t as easy to use. Didn’t like the fact every time you placed a command the keyboard went away so you had to click on the box again to load a command. When I asked for a temp reading it wasn’t displayed on the WIFI app. Just gave me a random number. Also, when disconnected from the internet the red led light didn’t show on the buggy to indicate it was inoperable, however it did show on the WIFI app that it had been disconnected from the network.

Comparison to Bluetooth: WIFI was good but the Bluetooth was far better in my opinion as I can used the buggy anywhere at any time I like with ease. Whereas with the WIFI you must have that connected to be able to use the buggy. Also, the Bluetooth has the hot keys which made the whole experience of using the buggy more user friendly and easier.