# Automation

As a group we all believe full autonomy is an achievable goal. The aim is to create a fully autonomous system which completes all the required tasks in the allocated time. If for some reason a problem occurs, we have agreed manual override is the best way to fix it. This has led to two modes for our system, Manual mode and Autonomous mode. Implementing a manual mode is for a last resort if the worst possible circumstances happen.

## Autonomous Mode:

### DaNI Robot

The Dani robot for either mode will always remain autonomous. With incoming sensor data it will operate with no aid from a user.  It will navigate a narrow canyon using ultrasonic sensors. It will check it's on track with an RGB sensor and Infrared sensor using the given lit up lights. Once through it shall continue to scope out the area locating danger zones and obstacles then finally locating the black box using microphones in an Xbox Kinect. It will map out a 'safe' route which is then sent to the TriTrack Bot. The TriTrack will place the Black box on the DaNI where the DaNI locates the pickup zone and drops it off.

### TriTrack Robot

The TriTrack will use the data from the DaNI and follow the path provided. It will have its own backup ultrasonic sensors to detect hitting obstacles. It will enter the airlock then proceed to turning a valve until the correct pressure is shown. It will then join the DaNI robot at the black box, pick it up then place it on top of the DaNI bot before following its same path in to exit the area.

### ROV

The ROV consists of lasers in a triangle to help locate danger zones and obstacles. It sends data to the DaNI which it uses to help map out the best route.

## Manual Mode:

### DaNI Robot

The DaNI Robot will act exactly the same as if it were in Autonomous

### TriTrack Robot

The TriTrack if at any point on the mission can be taken over by the user. The only point foreseen which could perhaps need a user input is the manipulation of the valve using the arm controls. However if coms fails then the Tritrack will have no safe path and the user will have to use his/her's and navigate the robot remotely using a controller.

IMU Control – This will be classed as manual control. Which gives the user the ability to control the TriTrack robot arm with his/hers own arm.

Voice Control – The TriTrack will respond to voice commands.

## ROV

The ROV will be able to keep sending updates to the DaNI Robot unless coms was lost in which it would be unused.