As for Base Station Control, the team will have to control the rover via a command station or control tent where the controllers will not have any physical visualization of the rover’s position and status unless it is by a control system which is built in the rover. Every bit of movement that the rover will be doing will be specifically commanded from the Base Station.

In order to control the rover wirelessly, the team has designed a base station control software that will allow the team to control the rover and to know its exact status and position, as well as the surroundings around the rover. The base station control software will be designed using a variation of programs that will allow for the ease of its creation and that will handle the complex movements of the rover.

To control the rover, two joysticks will be used. These joysticks will have the ability to steer the rover with the use of the axes of the joysticks. Hence that each joystick will be mapped to different controls of the rover and the software will be one that will facilitate the change of any change in mapping for the rover’s control. This method will allow for a user friendly program in case there is any change or difficulty at the time of competition. Also, the joysticks will control the movements of the rover’s main camera; which include pan/tilt and zoom in/out.

These movements will be controlled by the hat switches in the joystick. The controls implemented for the camera will actually be visible through the serial link that the camera will have established, in order to actually see the rover’s position or any other things that the rover might need in order to complete a given task. Also a toggle button will be implemented in the joystick to allow the switch of the rover’s function. For example, a toggle button will switch from arm movement to the end effector movements. Further mapping of the controls will be implemented once the team recognizes which movements will be needed to be controlled and mapped to which buttons on both joysticks.

In order to know the status of the rover’s position, any other information, and to make any quick changes to the rover’s position a Graphical User Interface (GUI) will be implemented. The GUI will be written in Python with the help of a couple of modules like PySide, PySerial, PyQt, and Pygame. The MAVRIC UI will contain the current position of each of the joysticks axes, as it will contain any information about the speed of the rover, the current location of the rover, the angle of the point turning motors on the wheels, and any other information that the team may need to be represented in the GUI. Also, the GUI will contain a series of choices to change any movement of the rover, in case of any difficulties with the implemented controls.

It’s not likely that any problem will happen with the control software, but in order to complete a safe and worthy program, safety measures will be taken to ensure the success of the rover’s given task completion.