Control Award Content Sheet

****Please turn in this sheet during your Judge Interview along with your Engineering Notebook****

Team # 9774	Team Name: Nano Ninjas

Autonomous objectives: Set ResQ Beacon, Place 2 preloaded climbers in the shelter, Park on near or far mountain mid-zone

Sensors used:

Color Sensor – used for reliable beacon color state detection.
Light sensor – used for detection and alignment to white navigational aid line.
Ultrasonic Sensor – measure distance to beacon and detect objects in path.
Motor encoders – measure distance travelled.
Touch sensor – detect when debris scoop contains hits the back wall of the robot
Nav sensor - Navigation sensor used to accurately direct the robot based on its location relative to other objects in the field
IMU (Inertial Measurement Unit) – used for driving straight and control turns.

Key algorithms:

Navigation from start to beacon – use combination of IMU, light, ultra-sonic and motor encoders to reliably navigation to the beacon.
Beacon state detection – use color sensors to check both color states and avoid false detection and pressing wrong button.

Driver controlled enhancements:

Automatic debris scoop full detection and signal to operator.
Motor feedback algorithm to minimize slippage while climbing mountain.
Debris dumper and Climber dumber arm control system

Engineering notebook references:

Feature	Notebook Page
Autonomous Goals and Strategies	120, 130
Autonomous performance requirements	130, 121

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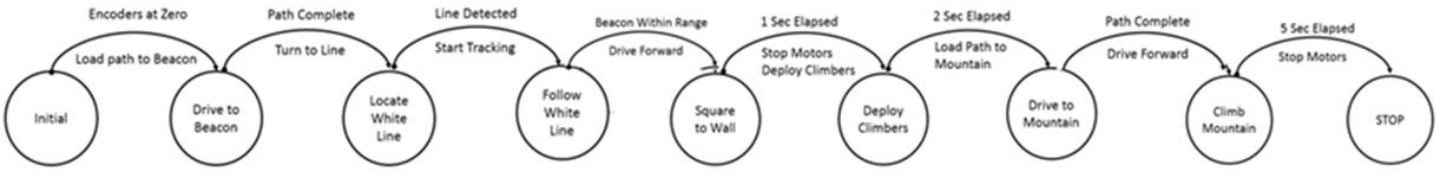
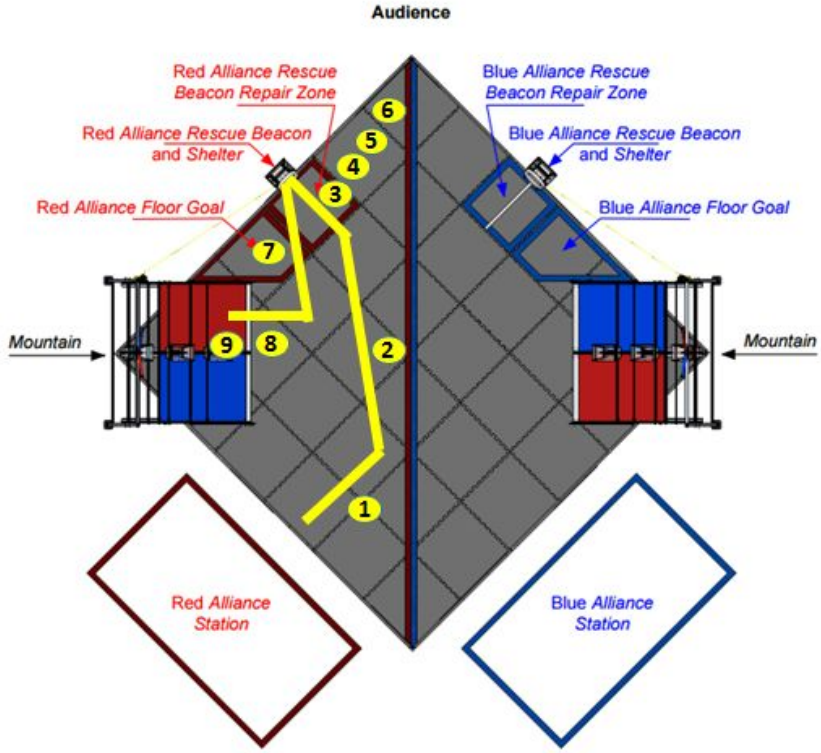
Autonomous program diagrams:





1	Initialize
2	Drive to Beacon
3	Locate White Line
4	Follow White Line
5	Square to Wall
6	Deploy Climbers
7	Drive to Mountain
8	Climb Mountain
9	Stop

Note: When operating on the blue alliance, the paths and operations are a mirror image.

Additional Summary Information:

FTC AutoCheck - Application that programmatically checks all connected devices and shows status Green or Red; running this app prior to the game significantly improves success rate.

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