CLAIMS

~~What is claimed is:~~

1.- A method for maintaining control of a robotic vehicle when control signals from a main controller are lost, comprising:

monitoring, by a detector circuit, control signals from a main controller of the robotic vehicle to an electronic speed controller (ESC) to detect a loss of valid control signals to the ESC; and

causing an auxiliary controller to begin issuing motor control signals to the ESC for controlling one or more motors to maintain control of the robotic vehicle in response to detecting a loss of valid control signals to the ESC~~.~~, wherein issuing, by the auxiliary controller, motor control signals to the ESC for controlling one or more motors to maintain control of the robotic vehicle comprises: executing a set of motor control instructions for issuing motor control signals to the ESC for controlling one or more motors to cause the robotic vehicle to perform a maneuver; determining whether the set of motor control instructions have been completed; and issuing motor control signals to the ESC for controlling one or more motors to cause the robotic vehicle to assume a safe mode of operation in response to determining that the set of motor control instructions has been completed.

2.- The method of claim 1, wherein causing an auxiliary controller to begin issuing motor control signals to the ESC in response to detecting loss of valid control signals from the main controller to the ESC comprises disconnecting a first signal path that couples the main controller to the ESC and connecting a second signal path that couples the auxiliary controller to the ESC.

3. -The method of claim 1, further comprising:

determining whether the main controller is capable of resuming sending valid control signals to the ESC; and

causing the auxiliary controller to stop sending motor control signals to the ESC in response to determining that the main controller is capable of resuming sending valid control signals to the ESC.

4. -The method of claim 3, wherein determining whether the main controller is capable of resuming sending valid control signals to the ESC comprises detecting that the main controller has completed a reboot process.

5.- The method of claim 1, wherein the auxiliary controller is configured by motor control instructions stored in memory to issue motor control signals to the ESC for controlling one or more motors to maintain control of the robotic vehicle.

6. -The method of claim 5, wherein the motor control instructions stored in the memory configure the auxiliary controller to issue motor control signals to the ESC for controlling one or more motors to cause the robotic vehicle to assume a safe mode of operation.

7. -The method of claim 5, further comprising:

receiving, by the auxiliary controller, motor control instructions from the main controller prior to the loss of valid control signals; and storing, by the auxiliary controller, the received motor control instructions in the memory.

8.- The method of claim 7, wherein the motor control instructions received from the main controller configure the auxiliary controller to issue motor control signals to the ESC for controlling one or more motors to cause the robotic vehicle to maintain an attitude, direction, or speed of the robotic vehicle prior to the loss of valid control signals.

9. -The method of claim 1, ~~wherein issuing, by the~~ further comprising: performing a test of the auxiliary controller~~, motor control signals~~; determining whether a fault in the auxiliary controller is detected; and taking an action to ~~the ESC for controlling one or more motors to maintain control of the~~ protect the robotic vehicle ~~comprises:~~ in response to detecting a fault in the auxiliary controller.

~~executing a set of motor control instructions for issuing motor control signals to the ESC for controlling one or more motors to cause the robotic vehicle to perform a maneuver;~~

~~determining whether the set of motor control instructions have been completed; and~~

~~issuing motor control signals to the ESC for controlling one or more motors to cause the robotic vehicle to assume a safe mode of operation in response to determining that the set of motor control instructions has been completed.~~

10. ~~The~~ The method of claim ~~9~~1, further comprising:

initializing a timer upon detecting a loss of valid control signals to the ESC;

determining whether the timer has elapsed in response to determining that the set of motor control instructions have not been completed; and

issuing motor control signals to the ESC for controlling one or more motors to cause the robotic vehicle to assume a safe mode of operation in response to determining that the timer has elapsed.

11. ~~The method of claim 1, further comprising:~~

~~performing a test of the auxiliary controller;~~

~~determining whether a fault in the auxiliary controller is detected; and~~

~~taking an action to protect the robotic vehicle in response to detecting a fault in the auxiliary controller.~~

~~12.~~ A robotic vehicle, comprising:

a motor;

an electronic speed controller (ESC) coupled to a motor;

a main controller coupled to the ESC;

a detector circuit configured to monitor control signals from the main controller to the ESC to detect a loss of valid control signals to the ESC; and

an auxiliary controller configured to issue motor control signals to the ESC for controlling the motor to maintain control of the robotic vehicle in response to a detection by the detector circuit of a loss of valid control signals from the main controller to the ESC~~.~~, wherein the auxiliary controller is further configured to: execute a set of motor control instructions for issuing motor control signals to the ESC for controlling the motor to cause the robotic vehicle to perform a maneuver; determine whether the set of motor control instructions have been completed; and issue motor control signals to the ESC for controlling one or more motors to cause the robotic vehicle to assume a safe mode of operation in response to determining that the set of motor control instructions has been completed.

~~13.~~ 12. The robotic vehicle of claim ~~12~~11, wherein the auxiliary controller is a component within the ESC.

13. The robotic vehicle of claim 11, further comprising a switch connected to the detector circuit and the auxiliary controller and configured to disconnect a first signal path that couples the main controller to the ESC and connect a second signal path that couples the auxiliary controller to the ESC to cause the auxiliary controller to begin issuing the motor control signals to the ESC in response to a detection by the detector circuit of a loss of valid control signals from the main controller to the ESC.

14. -The robotic vehicle of claim ~~12~~11, wherein the detector circuit is further configured to determine whether the main controller is capable of resuming sending valid control signals to the ESC.

15.- The robotic vehicle of claim 14, further comprising a switch connected to the detector circuit and the auxiliary controller and configured to disconnect a signal path that couples the auxiliary controller to the ESC to cause the auxiliary controller to stop sending motor control signals to the ESC and to connect a signal path that couples the main controller to the ESC in response to a determination by the detector circuit that the main controller is capable of resuming sending valid control signals to the ESC.

16. -The robotic vehicle of claim 14, wherein the detector circuit is further configured to determine that the main controller is capable of resuming sending valid control signals to the ESC in response to detecting that the main controller has completed a reboot process.

17. -The robotic vehicle of claim ~~12~~11, wherein the auxiliary controller is configured by motor control instructions stored in memory to issue motor control signals to the ESC for controlling one or more motors to maintain control of the robotic vehicle.

18. -The robotic vehicle of claim 17, wherein the motor control instructions stored in the memory configure the auxiliary controller to issue motor control signals to the ESC for controlling one or more motors to cause the robotic vehicle to assume a safe mode of operation.

19. -The robotic vehicle of claim 17, wherein the auxiliary controller is configured to:

receive motor control instructions from the main controller prior to the loss of valid control signals; and store the received motor control instructions in the memory.

20.- The robotic vehicle of claim 19, wherein the motor control instructions received from the main controller configure the auxiliary controller to issue motor control signals to the ESC for controlling one or more motors to cause the robotic vehicle to maintain an attitude, direction or speed of the robotic vehicle prior to the loss of valid control signals.

21. -The robotic vehicle of claim ~~12~~11, wherein the detector circuit is a component within the auxiliary controller ~~is further configured to: .~~

~~execute a set of motor control instructions for issuing motor control signals to the ESC for controlling one or more motors to cause the robotic vehicle to perform a maneuver;~~

~~determine whether the set of motor control instructions have been completed; and~~

~~issue motor control signals to the ESC for controlling one or more motors to cause the robotic vehicle to assume a safe mode of operation in response to determining that the set of motor control instructions has been completed.~~

22. -The robotic vehicle of claim ~~21~~11, wherein the auxiliary controller is further configured to:

initialize a timer upon detecting a loss of valid control signals from the main controller to the ESC;

determine whether the timer has elapsed in response to determining that the set of motor control instructions have not been completed; and

issue motor control signals to the ESC for controlling one or more motors to cause the robotic vehicle to assume a safe mode of operation in response to determining that the timer has elapsed.

23. -The robotic vehicle of claim ~~12~~11, wherein the main controller is configured with processor-executable instructions to:

perform a test of the auxiliary controller;

determine whether a fault in the auxiliary controller is detected; and

take an action to protect the robotic vehicle in response to detecting a fault in the auxiliary controller.

~~24. The robotic vehicle of claim 12, wherein the detector circuit is a component within the auxiliary controller.~~

~~25. The robotic vehicle of claim 12, wherein the auxiliary controller is a component within the ESC.~~

~~26. An auxiliary controller for use in a robotic vehicle configured to:~~

~~issue motor control signals to an electronic speed controller (ESC) for controlling one or more motors to maintain control of the robotic vehicle in response to a detection by a detector circuit of a loss of valid controls signals from a main controller to the ESC.~~

~~27. The auxiliary controller of claim 26, wherein the auxiliary controller is further configured to issue motor control signals to the ESC in response to the detector circuit controlling a switch to disconnect a first signal path that couples the main controller to the ESC and connect a second signal path that couples the auxiliary controller to the ESC.~~

~~28. The auxiliary controller of claim 26, wherein the auxiliary controller is further configured to:~~

~~determine whether the main controller is capable of resuming control the ESC; and~~

~~to stop sending motor control signals to the ESC in response to a determination by the detector circuit that the main controller is capable of resuming control of the ESC.~~

~~29. The auxiliary controller of claim 26, wherein the auxiliary controller is configured by motor control instructions stored in memory to issue motor control signals to the ESC for controlling one or more motors to maintain control of the robotic vehicle.~~

~~30. A robotic vehicle, comprising:~~

~~means for monitoring for a loss of valid control signals from a main controller of the robotic vehicle to an electronic speed controller (ESC); and~~

~~means for issuing motor control signals to the ESC for controlling one or more motors to maintain control of the robotic vehicle in response to detection of a loss of valid control signals from the main controller to the ESC.~~