

CLAIMS

What is claimed is:

1. An aerial vehicle comprising:
 - a power circuit;
 - an operational member configured to move responsive to receiving a power or control signal from the power circuit;
 - a structural member configured to stabilize one or more operational members of the aerial vehicle; and
 - a coupling member configured to secure the operational member to the structural member at a contact point, wherein the coupling member comprises a conductive material incorporated into the power circuit between a first terminal and a second terminal, and wherein a mechanical break of the coupling member results in:
 - (i) the operational member becoming unsecured from the structural member at the contact point; and
 - (ii) an electrical disconnect between the first terminal and the second terminal, wherein the electrical disconnect stops the power or control signal and thereby stops the operational member from moving.
2. The aerial vehicle of claim 1, wherein the coupling member comprises a screw, and wherein the mechanical break corresponds to one or more of stripped threads associated with the screw, a shearing break of the screw, and the screw pulling through the structural member.
3. The aerial vehicle of claim 2, wherein the operational member comprises a motor configured to move a propeller, wherein the structural member comprises a boom arm, wherein the stripped threads associated with the screw result in:
 - (i) the motor becoming unsecured from the boom arm, and
 - (ii) the electrical disconnect such that the propeller stops moving.
4. The aerial vehicle of claim 1, wherein the power circuit comprises a power bus connected to a power source, wherein the first terminal is connected to the power bus, wherein the second terminal is connected to a power input of the operational member, wherein the power or control signal comprises an input voltage received from the power bus

via the structural member, and wherein the mechanical break results in the second terminal being disconnected from the input voltage.

5. The aerial vehicle of claim 1, wherein the operational member comprises a controller configured to receive the power or control signal, wherein the power or control signal serves as an input to the controller that causes the controller to control movement of the operational member, and wherein the electrical disconnect corresponds to an input that causes the controller to stop the operational member from moving.

6. The aerial vehicle of claim 1, further comprising a computing device, wherein the power circuit comprises a failure detection loop, wherein the electrical disconnect corresponds to the failure detection loop being open, and wherein the computing device is configured to detect the mechanical break based on the failure detection loop being open.

7. The aerial vehicle of claim 6, wherein the computing device is further configured to:
cause the operational member to stop moving responsive to detecting the mechanical break; and
change operation of one or more other operational members based on causing the operational member to stop moving.

8. The aerial vehicle of claim 7, wherein the failure detection loop is associated with a type of operational member, and wherein changing the operation of the one or more other operational members is based on the type of operational member.

9. The aerial vehicle of claim 6, wherein the computing device is further configured to determine the mechanical break based on a vibration profile of the structural member; and
to corroborate the vibration profile based on the failure detection loop being open.

10. The aerial vehicle of claim 6, wherein the computing device is further configured to update a maintenance schedule of the aerial vehicle based on the failure detection loop being open.

11. The aerial vehicle of claim 6, wherein the computing device is further configured to alter a planned flight of the aerial vehicle responsive to determining the mechanical break.

12. A method comprising:
- causing an operational member of a system to move;
 - driving a power or control signal through a conductive coupling member, wherein the conductive coupling member is connected between a first terminal and a second terminal in a power circuit, and wherein the coupling member secures the operational member to a structural member of the system;
 - detecting an electrical disconnect between the first terminal and a second terminal;
 - determining a mechanical break associated with the coupling member based on the electrical disconnect between the first terminal and the second terminal; and
 - causing the operational member of the system to stop moving based on determining the mechanical break associated with the coupling member.
13. The method of claim 12, wherein the electrical disconnect corresponds to a failure detection loop for the operational member being open, and wherein determining the mechanical break comprises determining a voltage increase at the first terminal corresponding to the failure detection loop being open.
14. The method of claim 12, wherein the power or control signal comprises a pulse-width-modulation (PWM) signal or a Controller Area Network (CAN) signal that serves as an input to a controller of the operational member, and wherein detecting the electrical disconnect comprises detecting, by the controller of the operational member, that the PWM signal or CAN signal is not received.
15. The method of claim 12, further comprising:
- changing operation of one or more other operational members based on causing the operational member to stop moving.
16. The method of claim 15, wherein the failure detection loop is associated with a type of operational member, and wherein changing the operation of the one or more other operational members is based on the type of operational member.
17. The method of claim 12, further comprising:

determining the mechanical break based on a vibration profile of the structural member; and
corroborating the vibration profile based on the failure detection loop being open.

18. The method of claim 12, further comprising:
updating a maintenance schedule of the system based on the failure detection loop being open.

19. A system comprising:
a power circuit;
a plurality of operational members configured to move responsive to receiving respective power or control signals from the power circuit;
one or more structural members configured to stabilize the plurality of operational members; and
a plurality of coupling members configured to secure the plurality of operational members to the one or more structural members at a plurality of contact points, wherein each respective coupling member of the plurality of coupling members comprises a conductive material incorporated into the power circuit between a respective first terminal and a respective second terminal, and wherein a mechanical break of a respective coupling member results in:

- (i) a respective operational member corresponding to the respective coupling member becoming unsecured from a corresponding structural member at a corresponding contact point; and
- (ii) an electrical disconnect between the respective first terminal and the respective second terminal, wherein the electrical disconnect stops a respective power or control signal from reaching the respective operational member and thereby stops the respective operational member from moving.

20. The system of claim 18, further comprising a power source, wherein the power circuit comprises a power bus connected to the power source, wherein each respective first terminal is connected to the power bus, wherein each respective second terminal is connected to a power input of a corresponding operational member, wherein each respective power or control signal comprises an input voltage received from the power bus via a corresponding

structural member, and wherein the mechanical break results in the respective second terminal being disconnected from the input voltage.