[0010] The greater surface of area created by the nose plate or boom extensions moves a center of pressure of the UAV towards, or in alignment with, a center of gravity of the UAV, thereby reducing or eliminating a moment caused by a difference between the center of pressure and center of gravity and reducing the possibility that the UAV enters into a nose dive when the there is a system failure or the motors stop working.

[0011] In one aspect, an unmanned aerial vehicle (UAV) is provided that includes a fuselage, a pair of wings extending outwardly from the fuselage; and a deployable surface moveable from a first undeployed position during normal flight to a second deployed position when there is a system failure during flight. The fuselage includes a nose section and the deployable surface is a nose plate that extends forwardly from the nose section of the UAV when the nose plate is in the second deployed position.

[0011a] In another aspect, an unmanned aerial vehicle (UAV) is provided that includes a fuselage, a pair of wings extending outwardly from the fuselage, and a deployable surface moveable from a first undeployed position during normal flight to a second deployed position when there is a system failure during flight. The UAV includes first and second booms that extend forwardly in a direction parallel to a nose section of the UAV and the deployable surface comprises a first boom extension extendable from the first boom to increase the length of the first boom and a second boom extension extendable from the second boom to increase the length of the second boom.

[0012] In another aspect, a method of adjusting a center of pressure of an unmanned aerial vehicle (UAV) is provided, including the (i) providing a UAV with a fuselage, a pair of wings extending outwardly from the fuselage, and a deployable surface moveable from a first undeployed position during normal flight to a second deployed position when there is a system failure during flight; (ii) sustaining a system failure; (iii) moving the deployable surface from the first undeployed position to the second deployed position; wherein the fuselage includes a nose section and the deployable surface comprises a nose plate that extends forwardly from the nose section of the UAV when the nose plate is in the second deployed

position.

[0012a] In yet another aspect, a method of adjusting a center of pressure of an unmanned aerial vehicle (UAV) is provided, including the (i) providing a UAV with a fuselage, a pair of wings extending outwardly from the fuselage, and a deployable surface moveable from a first undeployed position during normal flight to a second deployed position when there is a system failure during flight; (ii) sustaining a system failure; (iii) moving the deployable surface from the first undeployed position to the second deployed position; wherein the UAV includes first and second booms that extend forwardly in a direction parallel to the nose section; and wherein the deployable surface comprises a first boom extension extendable from the first boom to increase the length of the first boom and a second boom extension extendable from the second boom to increase the length of the second boom.

[0013] The present embodiments further provide means for moving a center of pressure towards, or in alignment with, a center of gravity of the UAV using deployable surfaces.

[0014] These as well as other aspects, advantages, and alternatives will become apparent to those of ordinary skill in the art by reading the following detailed description with reference where appropriate to the accompanying drawings. Further, it should be understood that the description provided in this summary section and elsewhere in this document is intended to illustrate the claimed subject matter by way of example and not by way of limitation.

CLAIMS

What is claimed is:

1. An unmanned aerial vehicle (UAV) comprising:

a fuselage;

a pair of wings extending outwardly from the fuselage; and

a deployable surface moveable from a first undeployed position during normal flight to a second deployed position when there is a system failure during flight;

wherein the fuselage includes a nose section and the deployable surface is a nose plate that extends forwardly from the nose section of the UAV when the nose plate is in the second deployed position.

2. The UAV of claim 1, wherein the nose plate is deployable by rotating about a pivot point in the nose section.

3. The UAV of claim 1, wherein the nose plate is deployable by moving forward linearly from the nose section.

4. An unmanned aerial vehicle (UAV) comprising:

a fuselage;

a pair of wings extending outwardly from the fuselage; and

a deployable surface moveable from a first undeployed position during normal flight to a second deployed position when there is a system failure during flight;

wherein the UAV includes first and second booms that extend forwardly in a direction parallel to a nose section of the UAV; and

wherein the deployable surface comprises a first boom extension extendable from the first boom to increase the length of the first boom and a second boom extension extendable from the second boom to increase the length of the second boom.

5. The UAV of claim 4, wherein the first boom extension is deployable by rotating about a pivot axis on the first boom into the second deployed position extending forwardly from the first boom; and

wherein the second boom extension is deployable by rotating about a pivot axis on the second boom into the second deployed position extending forwardly from the second boom.

6. The UAV of claim 4, wherein the first boom extension is deployable by moving forward linearly from the first boom into the second deployed position extending forwardly from the first boom; and

wherein the second boom extension is deployable by moving forward linearly from the second boom into the second deployed position extending forwardly from the second boom.

7. The UAV of claim 4, wherein the first boom extension is deployable by rotating about a longitudinal pivot axis on the first boom into the second deployed position extending to a side of the first boom; and

wherein the second boom extension is deployable by rotating about a longitudinal pivot axis on the second boom into the second deployed position extending to a side of the second boom.

8. The UAV of claim 1, wherein deployment of the deployable surfaces moves a center of pressure of the UAV towards, or in alignment with, a center of gravity of the UAV.

9. The UAV of claim 5, wherein the first boom also extends rearwardly from the pair of wings and the deployable surface comprises a vertical stabilizer that extends from the first boom; and

wherein the second boom also extends rearwardly from the pair of wings and the deployable surface comprises a vertical stabilizer that extends from the second boom.

10. The UAV of claim 9, wherein the vertical stabilizer on the first boom is rotatable about a pivot axis on the first boom to the second deployed position with a major surface of the vertical stabilizer positioned facing a direction of forward travel of the UAV; and

wherein the vertical stabilizer on the second boom is rotatable about a pivot axis on the second boom to the second deployed position with a major surface of the vertical stabilizer positioned facing a direction of forward travel of the UAV.

11. A method of adjusting a center of pressure of an unmanned aerial vehicle (UAV) comprising the steps of:

providing a UAV with a fuselage, a pair of wings extending outwardly from the fuselage, and a deployable surface moveable from a first undeployed position during normal flight to a second deployed position when there is a system failure during flight;

sustaining a system failure;

moving the deployable surface from the first undeployed position to the second deployed position;

wherein the fuselage includes a nose section and the deployable surface comprises a nose plate that extends forwardly from the nose section of the UAV when the nose plate is in the second deployed position.

12. The method of claim 11, wherein moving the nose plate to the second deployed position comprises rotating the nose plate about a pivot point in the nose section.

13. The method of claim 11, wherein moving the nose plate to the second deployed position comprises moving the nose plate forward linearly from the nose section.

14. A method of adjusting a center of pressure of an unmanned aerial vehicle (UAV) comprising the steps of:

providing a UAV with a fuselage, a pair of wings extending outwardly from the fuselage, and a deployable surface moveable from a first undeployed position during normal flight to a second deployed position when there is a system failure during flight;

sustaining a system failure;

moving the deployable surface from the first undeployed position to the second deployed position;

wherein the UAV includes first and second booms that extend forwardly in a direction parallel to the nose section; and

wherein the deployable surface comprises a first boom extension extendable from the first boom to increase the length of the first boom and a second boom extension extendable from the second boom to increase the length of the second boom.

15. The method of claim 14, wherein moving the first boom extension to the second deployed position comprises rotating the first boom extension about a pivot axis on the first boom to a position extending forwardly from the first boom; and

wherein moving the second boom extension to the second deployed position comprises rotating the second boom extension about a pivot axis on the second boom to a position extending forwardly from the second boom.

16. The method of claim 14, wherein moving the first boom extension to the second deployed position comprises moving the first boom extension forward linearly from the first boom into a position extending forwardly from the first boom; and

wherein moving the second boom extension to the second deployed position comprises moving the second boom extension forward linearly from the second boom into a position extending forwardly from the second boom.

17. The method of claim 14, wherein moving the first boom extension to the second deployed position comprises rotating the first boom extension about a pivot axis on the first boom into a position extending to a side of the first boom; and

wherein moving the second boom extension to the second deployed position comprises rotating the second boom extension about a pivot axis on the second boom into a position extending to a side of the second boom.

18. The method of claim 11, wherein deployment of the deployable surfaces moves a center of pressure of the UAV towards or in alignment with a center of gravity of the UAV.