THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An apparatus for maintaining a support platform and a payload mountable thereon in near neutral equilibrium relative to a base structure, the support platform being spaced from the base structure by a plurality of actuators which provide the support platform with six degrees of freedom relative to the base structure about longitudinal, lateral and vertical axes, the apparatus including:

a substantially upright strut mountable between the base structure and support platform for supporting the weight of the support platform and payload,

a first balance assembly for counteracting forces imparted on the strut when the payload is moved longitudinally and/or laterally with respect to the base structure,

a second balance assembly for counteracting forces imparted on the support platform when the payload is pivoted about the longitudinal and/or lateral axes with respect to the base structure,

wherein the forces counteracted by the first balance assembly and the second balance assembly reduce the load imparted on the actuators by the payload.

2. The apparatus as claimed in claim 1 wherein the first balance assembly includes three or more resilient members connected between the strut and the base structure.

3. The apparatus as claimed in claim 2 wherein the resilient members extend outwardly from the strut and are angularly spaced apart a substantially equal distance on the base structure.

4. The apparatus as claimed in claim 3 wherein the base structure includes a three or more outwardly and upwardly extending mounting arms which are angularly spaced apart a substantially equal distance, each resilient member having one end secured to a corresponding mounting arm.

5. The apparatus as claimed in claim 4 wherein each resilient member includes one or more elastic cords which extend between the strut and the mounting arm.

6. The apparatus as claimed in any one of claims 1 to 5 wherein the strut includes a main housing pivotally mounted to the base structure, and a cylinder vertically displaceable with respect to the main housing.

7. The apparatus as claimed in claim 6 wherein the strut further includes a frame structure positioned around the main housing and the cylinder.

8. The apparatus as claimed in claim 7 wherein the one or more elastic cords of the resilient members are secured to the frame structure of the strut.

9. The apparatus as claimed in claim 6 or 7 wherein the one or more elastic cords of the resilient members are secured to the main housing of the strut.

10. The apparatus as claimed in any one of the preceding claims wherein the second balance assembly includes three or more tether lines having a first end connected to the support platform or payload and a second end connected to the strut.

11. The apparatus as claimed in claim 10 wherein the tether lines are angularly spaced apart a substantially equal distance on the support platform or payload.

12. The apparatus as claimed in claim 11 wherein the frame structure includes an upper end secured to the cylinder and a lower end extending around the main housing.

13. The apparatus as claimed in claim 12 wherein the lower end includes a plurality of rollers for travelling along an outer surface of the main housing when the cylinder is vertically displaced with respect to the main housing.

14. The apparatus as claimed in any one of claims 10-13 wherein the second end of each tether line is secured to the lower end of the frame structure.

15. The apparatus as claimed in claim 13 wherein the second balance assembly further includes a plurality of upper pulleys mounted on the outer surface of the main housing, and a plurality of lower pulleys mounted on the base structure, each tether line passing over an upper pulley and under a lower pulley.

16. The apparatus as claimed in any one of claims 10-15 wherein each tether line includes a resilient section arranged end to end with a non-resilient section.

17. The apparatus as claimed in claim 16 wherein the non-resilient section of the tether line is a cable.

18. The apparatus as claimed in either claim 16 or 17 wherein the resilient section of the tether line includes one or more elastic cords which extend between opposing first and second mounting blocks of the resilient section.

19. The apparatus as claimed in any one of the preceding claims wherein the support platform includes an upper section and a lower section, the lower section being able to swivel with respect to the upper section.

20. The apparatus as claimed in claim 19 wherein the first mounting block is mounted to the lower section of the support platform.

21. A motion platform including:

a base structure;

a support platform for mounting a payload thereon;

a plurality of actuators connected between the base structure and the support platform, the actuators providing the support platform with six degrees of freedom relative to the base structure about longitudinal, lateral and vertical axes, and

an apparatus including:

a substantially upright strut mountable between the base structure and support platform for supporting the weight of the support platform and payload,

a first balance assembly for counteracting forces imparted on the strut when the payload is moved longitudinally and/or laterally with respect to the base structure,

a second balance assembly for counteracting forces imparted on the support platform when the payload is pivoted about the longitudinal and/or lateral axes with respect to the base structure,

wherein the forces counteracted by the first balance assembly and the second balance assembly reduce the load imparted on the actuators by the payload.