CLAIMS:

1. A display system for use on the flight deck of an aircraft comprising:

a display operable for graphical display of data, and

a processor operatively coupled to the display and configured to receive:

terrain data from at least a terrain data base,

flight plan data from a source of navigational data, and

aircraft position data from one or more aircraft sensors,

wherein the processor is configured to operate the display to:

display a representation of the flight plan on the display screen,

display a representation of the terrain proximate the flight plan representation, and

display a representation of the aircraft relative to the flight plan and the terrain;

wherein the processor is further configured to allocate a surface area grid to terrain located below the aircraft,

receive data relating to the peak altitude of terrain and a terrain risk parameter located in each segment of the grid from the terrain database, and

display a representation of a floor at an altitude above the peak in each grid segment according to the risk parameter of the terrain in that segment.

2. A system as claimed in claim 1, wherein the terrain data comprises altitude data and location data representative of geographical terrain features, and the processor is further configured to generate the representation of the terrain by providing a sphere by representing earth and populating the sphere with the terrain data.

3. A system as claimed in claim 1 or claim 2, wherein the flight plan data comprises at least two waypoints, the waypoints having location and altitude data, and the processor is configured to generate the representation of the flight plan by

rendering a line spanning between the at least two waypoints.

4. A system as claimed in any one of claims 1 to 3, wherein the aircraft position data comprises heading, track, pitch and roll data and the processor is configured to display a representation of the aircraft that is pitching or rolling according to the pitch and roll data, and pointed and tracking in the direction provided by the heading and track data.

5. A system as claimed in any one of claims 1 to 4, wherein the processor is further configured to operate the display to show a graphical indication of the altitude difference between the aircraft and the desired flight path.

6. A system as claimed in any one of claims 1 to 5, wherein the processor is configured to, during an airport approach flight phase, determine the aircraft is above or below the desired flight path and determine a desired rate of descent of the aircraft that will intercept the desired flight path at or before the runway, and

the processor is further configured to operate the display to show a representation of the desired rate of descent of the aircraft.

7. A system as claimed in claim 6, wherein the displayed rate of descent is graphically represented as a glide slope.

8. A system as claimed in any one of claims 1 to 7, wherein the processor is further configured to generate a warning when the aircraft is outside one or more of a horizontal displacement from the desired flight path and/or a vertical displacement from the flight path.

9. A system as claimed in any one of claims 1 to 8, wherein the processor is further configured to generate a warning when the aircraft is outside one or more of a horizontal angular displacement and/or a vertical angular displacement thresholds from the flight path.

10. A system as claimed in claim 9, wherein the angular vertical displacement from the flight path is determined by the vertical angular difference between:

a vector from a touchdown location to the aircraft and a vector horizontal to the altitude of the touchdown location, and

a vector from the touchdown location to the desired aircraft position and a vector horizontal to the altitude of the touchdown location.

11. A system as claimed in claim 9 or claim 10, wherein the horizontal angular displacement from the flight path is determined by the horizontal angular difference between:

a vector from a touchdown location to the aircraft and a vector horizontal to the altitude of the touchdown location, and

a vector from the touchdown location to the desired aircraft position and a vector horizontal to the altitude of the touchdown location.

12. A system as claimed in any one of claims 9 to 11, wherein the warning comprises at least one of a graphical warning provided to the display and/or generating an output operable to generate an audible alert.

13. A system as claimed in any one of claims 9 to 12, wherein the displacement thresholds comprise two or more warning thresholds, the processor is configured to implement a new and/or intensified alert at each threshold.

14. A system as claimed in any one of claims 1 to 13, wherein the processor is further configured to:

determine the aircraft is above the desired flight path,

determine a touchdown location and altitude,

determine the glide slope for the aircraft to meet the touchdown point, and

output a warning if the determined glide slope is above a predetermined safe limit.

15. A system as claimed in claim 1, wherein the risk parameter is deemed high for mountainous terrain located in a grid segment, and the representation of the floor is displayed at a higher altitude for grid segments with a high risk parameter.

16. A system as claimed in claim 1 or claim 15, wherein the representation of the floor is displayed at 2000 ft for grid segments with a high risk parameter.

17. A system as claimed in any one of claims 1 to 16, wherein the representation of the floor is displayed at 1000 ft for grid segments that do not have a high risk parameter.

18. A system as claimed in any one of claims 1 to 17, wherein the representation of the floor is a translucent region that overlays the terrain in each grid segment.

19. A system as claimed in any one of claims 1 to 18, wherein the representation of a floor is displayed at a first colour when the aircraft is located above, and another colour when the aircraft is below.

20. A system as claimed in any one of claims 1 to 19, wherein processor is

configured to generate at least one of an audible or visual warning when the aircraft is located below the floor.

21. A method of generating a visual display for use on a display on flight deck of an aircraft, the method comprising:

receiving terrain data from a terrain data base,

receiving flight plan data from a source of navigational data, and

receiving aircraft position data from one or more aircraft sensors,

then, on the display:

displaying a representation of the flight plan on the display screen,

displaying a representation of the terrain proximate the flight plan representation, and

displaying a representation of the aircraft relative to the flight plan and the terrain;

wherein the processor is further configured to allocate a surface area grid to terrain located below the aircraft,

receive data relating to the peak altitude of terrain and a terrain risk parameter located in each segment of the grid from the terrain database, and

display a representation of a floor at an altitude above the peak in each grid segment according to the risk parameter of the terrain in that segment.

22. A non-transitory computer readable medium storing a program causing a computer to execute a visual display generating process, the process comprising:

receiving terrain data from a terrain data base,

receiving flight plan data from a source of navigational data, and

receiving aircraft position data from one or more aircraft sensors,

then, on the display:

displaying a representation of the flight plan on the display screen,

displaying a representation of the terrain proximate the flight plan representation, and

displaying a representation of the aircraft relative to the flightpath and the terrain;

wherein the processor is further configured to allocate a surface area grid to terrain located below the aircraft,

receive data relating to the peak altitude of terrain and a terrain risk parameter located in each segment of the grid from the terrain database, and

display a representation of a floor at an altitude above the peak in each grid segment according to the risk parameter of the terrain in that segment.