

Exercise code: DP-ATS  
Exercise type: Group Design Project  
Exercise title: Design of a manual airstairs for Boeing 737

### Exercise Assignment:

#### Task (Objective):

Produce an outline design of a manual passenger airstair for Boeing 737 models –300, -400 and -500.

#### WHAT and HOW to do:

##### 1. Design process:

**Form a group of 4 students.** Conduct all 10 phases of the design process and refer to each of these in the report. This is a group design exercise. You are not asked to perform engineering calculations but you should take into consideration dimensions of the system with the special consideration given to ergonomics, used materials, weight of the structure, joints and other design aspects. All group members should contribute to the project equally both in the design process and drawings. During the design process, specify 4 design criteria. The aim is to design system which will be save and which will have minimum weight. Give sketches of at least

##### 2. Design Specification:

Main door size 860 x 1830 mm. Clearance of the passenger floor to the ground 2600 – 2800 mm. Airstair carriage door dimensions: 1120 x 410. Carriage length 2500 mm. Clearance of the carriage top from the ground 2030-2490 mm. Maximum carriage overhung 900mm. Stair minimum length 240 mm, minimum clearance between stairs 200 mm. Minimum width of the airstair 850 mm. Airstair must have handrail with the minimum vertical clearance from the stair of 700 mm. Handrail should extend to the fuselage. Airstair must be light and strong to sustain wind of up to 90mph. All missing information read from attached drawings.

#### WHAT a report should contain:

- A title page, index, several pages of main project with the description of the design process conducted, conclusion and bibliography. Report should be conveniently bounded.
- Results of the search, constraints, criteria, and sketches of all alternative designs together with a decision matrix should be given on one or two A3 papers.
- CAD Detailed drawings of one stair. These drawings should include all dimensions, tolerances and indicate surface quality.
- CAD Assembly/General view drawing of the whole airstair including connection/attachment to the airplane. These drawings should include functional assembly dimensions and the specification table of used parts: Name of the part, number of used peaces and material.

#### Exercise tips:

*Always read the exercise assignment carefully and act accordingly. Drawings may be done in AutoCAD. Arrange the drawings neatly and ensure all letters and lines are in accordance with BS308.*

***This is a six-week project. It is worth 50 marks.***

*Each group should hand in one finished report not later than week 21. Use as many A3 drawing papers as necessary. CAD drawings should be both printed and submitted in electronic form to e-mail address: design@city.ac.uk. The report must be folded or stapled. List the names of all the members of the group on the title page. Indicate the contribution of each individual member by writing his/her initials next to each item for which that member was responsible. Fill in all relevant data in the title block.*