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Specification for

General requirements for equipment in aircraft —

Part 2: All equipment —

Section 2: Magnetic influence

Confirmed
November 2011

UDC 629.7.05/.06:538.6

Foreword

This British Standard is part of a composite standard in the Aerospace Series of British Standards that specifies general requirements for equipment in aircraft. An introduction to the complete British Standard is given in British Standard 3G.100-0.

This section of British Standard 3G.100 supersedes the magnetic influence requirements specified in Clauses **227** and **228** of British Standard 2G.100-2. It details limiting requirements of magnetic influence of aircraft equipment upon magnetic compasses and similar sensors in terms of "compass safe distance".

NOTE Information concerning metric (SI) units is given in BS 350, "Conversion factors and tables", and BS 3763, "The International System of units (SI)".

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 and 2 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

This British Standard, having been approved by the Aerospace Industry Standards Committee, was published under the authority of the Executive Board of the Institution on 14 June 1972

The following BSI references relate to the work on this standard:
Committee reference ACE/41
Draft for comment 70/26881

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Amendments issued since publication

Amd. No.	Date	Comments
2791	May 1979	Indicated by a sideline in the margin

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1 Scope

This British Standard defines, specifies requirements for and describes a test to determine the compass safe distance of equipment in aircraft. It should also be read in conjunction with British Standard 3G.100-0.

2 Definitions

For the purposes of this British Standard the following definition applies:

1) *Compass safe distance.* The minimum distance from a magnetic compass at which an item of equipment may be placed to limit the compass deviation to a stated value under all conditions of operation.

3 Design requirements

3.1 Equipment shall be so designed that the external magnetic fields produced by it under all conditions of operation are as small as is practicable.

3.2 The designer shall declare for each type of equipment the compass safe distance, determined in the manner described in Clause **4**.

3.3 When there is a requirement for a specific minimum compass safe distance it shall be specified in the relevant equipment specification.

It is recommended that the compass safe distance for other items of equipment likely to be mounted near a magnetic compass should not exceed the following values.

Type of equipment	Distance to produce a 1° deflection
	mm
Electrical	300
Non-electrical	125

4 Measurement of compass safe distance

4.1 It is not permissible for the equipment under test to be demagnetized before measuring the compass safe distance. The relevant equipment specification may however require, in special circumstances, the equipment to be demagnetized and then remagnetized to approximately 15 A/m.

4.2 The compass safe distance shall be measured from the pivot of the reference magnetometer or compass to the nearest point on the surface of the equipment under test in the manner described below.

4.3 Measurements shall be made in a uniform magnetic field. If the horizontal component of this field has a value outside the limits 13 to 16 A/m, then the compass safe distance shall be the distance at which the equipment under test produces the deviation D_c calculated by the following equation:

$$D_c = \frac{D \times 14.4}{\text{Actual field strength}}$$

where

D is the compass deviation at the safe distance in a horizontal field of 14.4 A/m and is defined by this specification as one degree.

Where the horizontal field is of such a value that the calculation above is necessary, all other absolute statements of a deviation in this specification shall be similarly adjusted.

The test area should be marked out with magnetic N–S and E–W lines, and a suitable magnetometer placed at the intersection of these lines. This magnetometer, which may be a compass, shall be capable of being read to an accuracy of $^1/_5$° and possess a corresponding sensitivity.

4.4 The equipment under test shall be placed on the E–W line at a distance from the magnetometer that induces a deviation of approximately 2°.

Experiments shall be made to determine the combination of attitude and degree of energization that gives the maximum deviation of the magnetometer. This combination shall be maintained while the equipment is moved outward along the E–W line until the magnetometer deviation is approximately ½°.

4.5 From the accurate readings taken at intervals during this movement, a curve shall be plotted showing magnetometer deviation against distance (see **4.2**). As a check on experimental error, a further curve shall also be plotted to correspond with an inward movement of the equipment.

4.6 The two curves should be substantially coincident and should be used to establish the distance at which one degree deviation of the magnetometer is experienced. The distance shall be the declared compass safe distance for the equipment.

5 Special measurements

5.1 When required by the individual specification an additional compass safe distance shall also be declared for a deviation of $^1/_8°$. This distance may be extrapolated from the curves required by **4.5**.

5.2 The compass safe distance of equipment that produces a significant directional magnetic effect shall be measured along other axes defined by the relevant specification and declared.

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