

Shipborne radar — Operational and performance requirements — Methods of test and required test results

The European Standard EN 60936:1993 has the status of a
British Standard

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Electronic Equipment Standards Policy Committee (EEL/-) to Technical Committee EEL/30, upon which the following bodies were represented:

- British Marine Equipment Council
- Civil Aviation Authority
- General Council of British Shipping
- Ministry of Defence
- Nautical Institute

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National foreword

This British Standard has been prepared under the direction of the Electronic Equipment Standards Policy Committee. It is identical with IEC 936:1988 “*Shipborne radar. Operational and performance requirements. Methods of tests and required test results*”, published by the International Electrotechnical Commission (IEC).

In 1993 the European Committee for Electrotechnical Standardization (CENELEC) accepted IEC 936:1988 as European Standard EN 60936:1993. As a consequence of implementing the European Standard this British Standard is renumbered as BS EN 60936 and any reference to BS 7168 should be read as a reference to BS EN 60936.

Cross-references

International Standard	Corresponding British Standard
IEC 417:1973 (including Supplements A to E)	BS 6217:1981 <i>Guide to graphical symbols for use on electrical equipment</i> (Identical)
IEC 872:1987	BS 6919:1987 <i>Specification for marine automatic radar plotting aids</i> (ARPA) (Identical)
IEC 945:1988	BS 7169:1989 <i>Specification for general requirements for marine navigational equipment</i> (Identical)

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 16, an inside back cover 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.

Descriptors: Ship, navigational instruments, radar, performance requirements, operational requirements, methods of testing, required test results

English version

Shipborne radar — Operational and performance requirements — Methods of test and required test results

(IEC 936:1988)

Radars de navire — Prescriptions techniques et opérationnelles — Méthodes d'essai et résultats exigibles
(CEI 936:1988)

Radar für die Seeschifffahrt — Betriebstechnische und Leistungsanforderungen — Prüfverfahren und geforderte Prüfergebnisse
(IEC 936:1988)

This European Standard was approved by CENELEC on 1993-07-06. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

At the request of the 73rd Technical Board, HD 551 S1:1991 (IEC 936:1988) was submitted to the CENELEC voting procedure for conversion into a European Standard.

The text of the International Standard was approved by CENELEC as EN 60936 on 6 July 1993.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1994-03-01
- latest date of withdrawal of conflicting national standards (dow) —

Annexes designated “normative” are part of the body of the standard. In this standard, Annex ZA is normative.

Section 1. Operational and performance requirements

1 Scope

This Standard specifies the performance and type testing of shipborne radar required by Regulation 12 of Chapter V, of the International Convention for the Safety of Life at Sea, (SOLAS), 1974, as amended, and which is associated with IEC 945.

NOTE Section 1 is based on IMO Resolution A.477 (XII). All text whose meaning is identical to that in the IMO resolution is printed in italics.

1.1 Radio frequency

The radio frequency of operation of the equipment shall at all times be within the limits defined in the Radio Regulations.

2 Object

The radar equipment shall provide an indication in relation to the ship of the position of other surface craft and obstructions and of buoys, shorelines and navigational marks in a manner which will assist in navigation and in avoiding collision.

Equipment shall be installed in such a manner that it is capable of meeting its recommended performance standards.

3 Performance requirements

All radar installations shall comply with the following minimum requirements.

3.1 Range performance

The operational requirement under normal propagation conditions, when the radar antenna is mounted at a height of 15 m above sea level is that the equipment shall, in the absence of clutter, give a clear indication of:

3.1.1 Coastlines

*At 20 nautical miles when the ground rises to 60 m.
At 7 nautical miles when the ground rises to 6 m.*

3.1.2 Surface objects

At 7 nautical miles a ship of 5 000 tons gross tonnage, whatever its aspect.

At 3 nautical miles a small ship of length 10 m.

At 2 nautical miles an object such as a navigational buoy having an effective echoing area of approximately 10 m².

3.2 Minimum range

The surface objects specified in 3.1.2 shall be clearly displayed from a minimum range of 50 m up to a range of 1 nautical mile, without changing the setting of controls other than the range selector.

NOTE The minimum range is the shortest distance at which, using a mandatory range scale of not more than 1 nautical mile, a target is still presented separately from the point representing the antenna position.

3.3 Display

3.3.1 *The equipment shall, without external magnification, provide a relative plan display in the head-up unstabilized mode with an effective diameter of not less than:*

3.3.1.1 *180 mm on ships of 500 tons gross tonnage and above, but less than 1 600 tons gross tonnage.*

3.3.1.2 *250 mm on ships of 1 600 tons gross tonnage and above, but less than 10 000 tons gross tonnage.*

3.3.1.3 *340 mm in the case of one display, and 250 mm in the case of the other, on ships of 10 000 tons gross tonnage and upwards.*

3.3.1.4 Optical magnification may be employed provided the display so magnified remains within the accuracy limitations of this standard.

3.3.1.5 Any information not associated with the use of the radar picture for navigational or collision avoidance purposes may be shown only outside the effective diameter of the display.

NOTE 1 The effective diameter of the display is the diameter of the central area into which any angular scale marking around its edge does not intrude. In the case of displays which are other than circular their smallest effective dimension is the effective diameter.

NOTE Effective display diameters of 180, 250 and 340 mm correspond respectively to 9, 12 and 16 in cathode-ray tubes.

3.3.2 *The equipment shall provide one of the two following sets of range scales of display:*

3.3.2.1 *1, 5, 3, 6, 12 and 24 nautical miles and one range scale of not less than 0,5 and not greater than 0,8 nautical miles, or:*

3.3.2.2 *1, 2, 4, 8, 16 and 32 nautical miles.*

3.3.3 *Additional range scales may be provided.*

3.3.3.1 These additional range scales shall be either smaller than the smallest range scale or greater than the largest range scale required in 3.3.2.

3.3.3.2 Range scales with delayed sweep origins shall not be provided.

3.3.4 *The range scale displayed and the distance between range rings shall be clearly indicated at all times.*

3.4 Range measurement

Range measurement is the determination of the distance of a target from the radar antenna.

3.4.1 *Fixed electronic range rings shall be provided for range measurements as follows:*

3.4.1.1 *Where range scales are provided in accordance with 3.3.2.1, on the range scale of between 0,5 and 0,8 nautical miles, at least two range rings shall be provided, and on each of the other range scales six range rings shall be provided, or,*