

INTERNATIONAL STANDARD

IEC 60872-3

First edition
2000-08

Maritime navigation and radiocommunication equipment and systems – Radar plotting aids –

Part 3: Electronic plotting aid (EPA) – Performance requirements – Methods of testing and required test results

*Matériels et systèmes de navigation et
de radiocommunication maritimes – Aides de pointage radar –*

*Partie 3:
Aide de pointage électronique (EPA) –
Exigences de fonctionnement – Méthodes d'essai
et résultats d'essai exigés*



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MARITIME NAVIGATION AND RADIOCOMMUNICATION
EQUIPMENT AND SYSTEMS – RADAR PLOTTING AIDS –**
**Part 3: Electronic plotting aid (EPA) –
Performance requirements –
Methods of testing and required test results**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60872-3 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

The text of this standard is based on the following documents:

FDIS	Report on voting
80/251/FDIS	80/274/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

Annexes A, B, C and D form an integral part of this standard.

The committee has decided that the contents of this publication will remain unchanged until 2008. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this standard may be issued at a later date.

Withdrawing

iTech Standards
(<https://standards.itih.ai>)
Document Preview

IEC 60872-3:2000
<https://standards.itih.ai/standards/iec/13b0b02d-405f-4aaa-99d2-303d18e95255/iec-60872-3-2000>

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – RADAR PLOTTING AIDS –

Part 3: Electronic plotting aid (EPA) -- Performance requirements – Methods of testing and required test results

1 Scope

This part of IEC 60872 specifies the minimum operational and performance requirements, methods of testing and test results for equipment that complies with performance standards not inferior to those adopted by the International Maritime Organization (IMO) in resolution MSC.64 (67) Annex 4 – Appendix 2. In addition, this standard takes account of IMO Resolution A.694 and is associated with IEC 60945.

When a requirement in this standard is different from IEC 60945, the requirement in this standard takes precedence.

The electronic plotting aid for manual direct plotting is intended for small ships fitted with either a gyrocompass or a transmitting marine electromagnetic compass conforming to ISO 11606 or a transmitting magnetic heading device conforming to IMO MSC.86(70) – annex 2, and a speed and distance measuring equipment (SDME) conforming to IMO Resolution A.824 and IEC 61023. This plotting aid is not suitable for ships classed as high-speed craft.

All texts in this standard, the wording of which is identical to that in IMO resolution MSC.64 (67) Annex 4 – Appendix 2, are printed in *italics* and the resolution and paragraph numbers are indicated in brackets.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60872. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60872 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60872-1:1998, *Maritime navigation and radiocommunication equipment and systems – Radar plotting aids – Part 1: Automatic radar plotting aid (ARPA) – Methods of testing and required test results*

IEC 60872-2:1999, *Maritime navigation and radiocommunication equipment and systems – Radar plotting aids – Part 2: Automatic tracking aid (ATA) – Methods of testing and required test results*

IEC 60936-1:1999, *Maritime navigation and radiocommunication equipment and systems – Radar – Part 1: Shipborne radar – Performance requirements - Methods of testing and required test results*

IEC 60945:1996, *Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results*

IEC 61023:1999, *Maritime navigation and radiocommunication equipment and systems – Marine speed and distance measuring equipment (SDME) – Performance requirements – Methods of testing and required test results*

IEC 61162 (all parts), *Maritime navigation and radiocommunication equipment and systems – Digital interfaces*

ISO: 11606, *Ships and marine technology – Marine electromagnetic compasses*

ISO 9000 (all parts), *Quality management and quality assurance standards*

IMO Resolution A.694:1991, *General requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids*

IMO Resolution A.823:1995, *Performance standards for automatic radar plotting aids (ARPAs)*

IMO Resolution A.824:1995, *Performance standards for devices to indicate speed and distance*

IMO MSC/Circular 603:1993, *Guidelines on display sizes and techniques for navigational purposes*

IMO MSC.64(67):1996, *Annex 4 – Performance standards for radar equipment, and Appendix 2 – Electronic plotting aids*

IMO MSC.86(70):1998, *Annex 2 – Performance standards for marine transmitting magnetic heading devices (TMHDs)*

IHO S-52: 1996, *Specifications for chart content and display aspects of ECDIS*

3 Performance requirements

3.1 Introduction

3.1.1 The electronic plotting aid (EPA) shall, in order to improve the standard of collision avoidance at sea:

- .1 reduce the workload of observers by enabling them to obtain information about plotted targets so that they can perform as well with several separate targets as they can by manually plotting a single target;
- .2 provide continuous, accurate and rapid situation evaluation.

3.1.2 The radar facilities provided by an EPA display shall comply with those clauses of IEC 60936-1 appropriate to its mode of use.

3.1.3 In addition to the general requirements contained in IEC 60945, the EPA shall comply with the following minimum requirements.

3.1.4 Additional ARPA or ATA facilities, not mandated in this EPA standard, may be provided. Such facilities shall comply with IEC 60872-1 and IEC 60872-2 as applicable.

3.1.5 Quality assurance

The EPA shall be designed, produced and documented by companies complying with ISO 9000, as applicable.

3.2 Definitions

Definitions of terms used in these performance standards are given in annex A.

3.3 (MSC.64 (67)/Annex 4/Appendix2/2) Performance standards

3.3.1 (App2/2.1) The electronic plotting aid (EPA) shall provide a means to plot a minimum of 10 targets on a radar display.

See annex D for a description of how manual plotting shall be implemented.

3.3.2 (App2/2.2) Range scales

3.3.2.1 *It shall be possible to plot targets on the 3, 6 and 12 nautical mile range scales. The facility may be provided on additional range scales. There shall be a positive indication of the range scale in use. Plots shall be maintained when switching between range scales. The methods of operation that are provided shall be clearly described in the manufacturer's manual.*

3.3.2.2 *After changing range scales on which the EPA facilities are available or on resetting the display, full plotting information shall be displayed within a period of time not exceeding one scan of 360°.*

3.3.3 (App2/2.3) *It shall be possible to plot targets with a relative speed up to 75 knots.*

3.3.4 (App2/2.4) *It shall be possible for the operator to adjust the CPA/TCPA limits and the vector time.*

3.3.5 Plot positions and identification

3.3.5.1 (App2/2.5) *Plot positions shall be identified by an approved symbol (see annex C symbols 1, 4 or 6) and an associated plot number. It shall be possible to switch off the plot number.*

3.3.5.2 *Automatically applied 'target identities' shall not be re-used until, as a minimum, the number assigned equals the maximum number of plotted targets.*

3.3.6 (App2/2.6) *The minimum lapsed time between any two plots shall be greater than 30 s.*

3.3.7 (App2/2.7) *After the second plot, a vector shall be displayed on the target. It shall be possible to select a true or relative vector. There shall be a positive indication of vector mode, including an indication of sea or ground stabilization.*

.1 vectors displayed shall be time-adjustable;

.2 a positive indication of the time-scale of the vector in use shall be given.

3.3.8 (App2/2.8) *The vector origin shall move across the screen at a rate and direction defined by the calculated true course and speed.*

3.3.9 (App2/2.9) *It shall be possible to correct the position of a plot.*

3.3.10 (App2/2.10) *It shall be possible, on demand, to display the following data on a selected target:*

- .1 plot number: time since last plot (min);*
 - .2 present range of the target;*
 - .3 present true bearing of the target;*
 - .4 predicted target range at the closest point of approach (CPA);*
 - .5 predicted time to CPA (TCPA);*
- NOTE If the CPA has passed, it shall be indicated by a TCPA with a negative (–) sign.
- .6 calculated true course of target;*
 - .7 calculated true speed of target.*

The selected plot shall be clearly identified with an approved symbol (see annex C, symbol 12) and the plot data shall be displayed outside of the screen radar area. If data is required for more than one target at the same time each symbol shall be separately identified, for example with a number adjacent to the symbol.

3.3.11 (App2/2.11) *There shall be an indication by a text message including the plot number of any plot that is not updated for 10 min. The plot shall be dropped if the time between consecutive plots exceeds 15 min.*

3.3.12 Display

3.3.12.1 The display may be a separate or integral part of the ship's radar. However the EPA display shall include all the data required to be provided by a radar display in accordance with the performance standards for navigational radar equipment.

3.3.12.2 The design shall be such that any malfunction of EPA parts producing data additional to information to be produced by the radar, as required by the performance standards for navigational equipment, shall not affect the integrity of the basic radar presentation.

The equipment shall be regarded as complying with the above requirement if the design is such that, where practicable, correct operation of the radar system in accordance with IEC 60936-1 will not be affected by malfunction of any EPA sub-system that is not an essential part of the radar.

3.3.12.3 The EPA shall be capable of operating with a relative or true motion display with "north-up" azimuth stabilization. There shall be a positive indication of the display mode and orientation in use.

3.3.12.4 The EPA information shall not obscure the visibility of radar targets. The display of EPA data (vector and associated symbol) shall be under the control of the radar observer. It shall be possible to cancel the display of unwanted EPA data within 3 s of command.

3.3.12.5 Means shall be provided to adjust independently the brilliance of the EPA data and radar data, including complete extinction of the EPA data.

3.3.12.6 The method of presentation shall ensure that the EPA data is clearly visible in general to more than one observer in the conditions of light normally experienced on the bridge of a ship by day and by night. Screening may be provided to shade the display from sunlight but not to the extent that it will impair the observer's ability to maintain a proper lookout. Facilities to adjust the brightness shall be provided (see IMO MSC/Circular 603).