



SLOVENSKI STANDARD

SIST EN 60872-2:2004

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Maritime navigation and radiocommunication equipment and systems - Radar plotting aids - Part 2: Automatic tracking aids (ATA) - 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 aids (ATA) - Methods of testing and required test results

Navigation- und Funkkommunikationsgeräte und -systeme für die Seeschifffahrt - Radar -Plathilfen -- Teil 2: Automatische Trackhilfen (ATA) - Prüfverfahren und geforderte Prüfergebnisse

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EUROPEAN STANDARD

EN 60872-2

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April 1999

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English version

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

Navigations- und
Funkkommunikationsgeräte
und -systeme für die Seeschifffahrt
Teil 2: Automatische Trackhilfen (ATA)
Leistungsanforderungen, Prüfverfahren
und geforderte Prüfergebnisse
(IEC 60872-2:1999)

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This European Standard was approved by CENELEC on 1999-04-01. 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.

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CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 80/195/FDIS, future edition 1 of IEC 60872-2, prepared by IEC TC 80, Maritime navigation and radiocommunication equipment and systems, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60872-2 on 1999-04-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2000-01-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2002-01-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annexes A, B, C, D, E and ZA are normative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60872-2:1999 was approved by CENELEC as a European Standard without any modification.

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Annex ZA (normative)

Normative references to international publications
with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE: When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60872-1	1998	Maritime navigation and radiocommunication equipment and systems Radar plotting aids Part 1: Automatic radar plotting aids (ARPA) Methods of testing and required test results	EN 60872-1	1998
IEC 60872-3	- ¹⁾	Part 3: Electronic plotting aids (EPA) Methods of testing and required test results	-	-
IEC 60936-1	- ¹⁾	Maritime navigation and radiocommunication equipment and systems Radar Part 1: Shipborne radar - Performance requirements - Methods of testing and required test results	-	-
IEC 60936-2	1998	Part 2: Shipborne radar for high-speed craft (HSC) - Methods of testing and required test results	EN 60936-2	1999
IEC 60945	1996	Maritime navigation and radiocommunication equipment and systems General requirements - Methods of testing and required test results	EN 60945	1997
IEC 61162	series	Maritime navigation and radiocommunication equipment and systems Digital interfaces	EN 61162	series
ISO 9000	series	Quality management and quality assurance standards	EN ISO 9000	series

1) To be published.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
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.820	1995	Performance standards for navigational radar equipment for high-speed craft	-	-
IMO A.823	1995	Performance standards for automatic radar plotting aids (ARPAs)	-	-
IMO A.824	1995	Performance standards for devices to indicate speed and distance	-	-
IMO MSC. 64(67)	1996	Annex 4 - Performance standards for radar equipment	-	-
IHO S-52	1996	Specifications for chart content and display aspects of ECDIS	-	-

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INTERNATIONAL STANDARD

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60872-2

First edition
1999-01

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

Part 2:

Automatic tracking aids (ATA) – Methods of testing and required test results

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International Electrotechnical Commission
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT
AND SYSTEMS – RADAR PLOTTING AIDS –**
**Part 2: Automatic tracking aids (ATA) –
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.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60872-2 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems. The IEC 60872 series, of which this is part 2, replaces IEC 60872 published in 1987 and amendment 1 (1991) and reflects the new requirements of the International Maritime Organization (IMO).

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

FDIS	Report on voting
80/195/FDIS	80/220/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.

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

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

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

Part 2: Automatic tracking aids (ATA) – Methods of testing and required test results

1 Scope

This International Standard specifies the minimum performance requirements, technical characteristics, methods of testing and test results for equipment that complies with performance standards not inferior to those adopted by the International Maritime Organisation (IMO) – resolution MSC.64(67) Annex 4.

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 shall take precedence.

Equipment intended for use on high speed craft (HSC) shall additionally satisfy the requirements of the HSC scenarios as defined in IEC 60936-2, annex D.

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

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2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60872. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and 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. 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 aids (ARPA) – Methods of testing and required test results*

IEC 60872-3, *Maritime navigation and radiocommunication equipment and systems – Radar plotting aids – Part 3: Electronic plotting aid (EPA) – Methods of testing and required test results*¹⁾

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

IEC 60936-2:1998, *Maritime navigation and radiocommunication equipment and systems – Radar – Part 2: Shipborne radar for high speed craft (HSC) – Methods of testing and required test results*

¹⁾ To be published.

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

IEC 61162, — *Maritime navigation and radiocommunication equipment and systems – Digital interfaces*

ISO 9000, — *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 and for electronic navigational aids*

IMO Resolution A.820:1995, *Performance standards for navigational radar equipment for high-speed craft*

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.64(67):1996, *Annex 4 – Performance standards for radar equipment*

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

3 Performance requirements

NOTE – The following requirements are from IMO MSC.64(67) Appendix 1 of Annex 4.

3.1 (MSC.64(67)/1) Introduction

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3.1.1 (MSC.64(67)/1.1) "Auto tracking aid" (ATA) 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 automatically 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 ATA display shall comply with those clauses of IMO Resolution MSC.64(67) annex 4 or A.820 appropriate to its mode of use.

3.1.3 (MSC.64(67)/Annex 4/1) In addition to the general requirements contained in resolution A.694(17), ATA shall comply with the following minimum requirements.

3.1.4 Where an ATA display is intended for use as the master display of a complete radar system, the system shall comply with IEC 60936-1. For high speed craft (HSC) ATA, the relevant clauses of IEC 60936-2 shall apply.

3.1.5 Where an ATA display is intended for use as a slave display of a complete radar system it shall comply with the relevant clauses of IEC 60936-1, where applicable to such a display. For HSC ATA the relevant clauses of IEC 60936-2 apply. In addition, the ATA display shall be capable of presenting readily, without significant degradation, the signals shown on the master display.

3.1.6 Additional ARPA facilities, not mandated in this ATA standard, shall comply with IEC 60872-1.

3.1.7 Quality assurance

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

3.2 (MSC.64(67)/2) Definitions

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

3.3 (MSC.64(67)/3) Performance standards

3.3.1 (MSC.64(67)/3.1) Detection

Where a separate facility is provided for detection of targets, other than by the radar observer, it shall have a performance not inferior to that which could be obtained by the use of the radar display.

3.3.2 (MSC.64(67)/3.2) Acquisition

3.3.2.1 (MSC.64(67)/3.2.1) *There shall be a facility to provide for manual acquisition with the relevant symbol (see symbol 1 of annex E) and cancellation for relative speeds up to 100 knots.*

3.3.2.2 (MSC.64(67)/3.2.2) *Manual acquisition shall have a performance not inferior to that which could be obtained by the user of the radar display.*

3.3.3 (MSC.64(67)/3.3) Tracking

3.3.3.1 (MSC.64(67)/3.3.1) *The "auto tracking aid" shall be able to automatically track, process, simultaneously display and continuously update the information on at least 10 targets. A target being acquired and tracked during the initial stage shall be shown by a symbol (see symbol 3 of annex E) within 3 s. Targets being tracked when tracking is in steady state shall be shown by symbols 4A or 4B and 5 of annex E within 20 scans.*

3.3.3.2 (MSC.64(67)/3.3.2) *The "auto tracking aid" shall continue to track an acquired target which is clearly distinguishable on the display for any 5 out of 10 consecutive scans, provided the target is not subject to target swop.*

3.3.3.3 (MSC.64(67)/3.3.3) *The possibility of tracking errors, including target swop, shall be minimised by "auto tracking aid" design. A qualitative description of the effects of error sources on the automatic tracking and corresponding errors shall be provided to the user, including the effects of low signal-to-noise and low signal-to-clutter ratios caused by sea returns, rain, snow, low clouds and non-synchronous emissions. Such descriptions shall be in the operating manual.*

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

3.3.3.5 *The ATA shall continuously track a manoeuvring target.*

3.3.4 (MSC.64(67)/3.4) Display

3.3.4.1 (MSC.64(67)/3.4.1) *The display may be a separate or integral part of the ship's radar. However the "auto tracking aid" display shall include all the data required to be provided by a radar display in accordance with the performance standards for navigational radar equipment.*

3.3.4.2 (MSC.64(67)/3.4.2) *The design shall be such that any malfunction of "auto tracking aid" 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 if the design is such that, where practicable, normal performance of the radar system in accordance with IEC 60936-1 or IEC 60936-2 will not be affected by malfunction of any ATA subsystem that is not an essential part of the radar.

3.3.4.3 (MSC.64(67)/3.4.3) *The "auto tracking aid" facilities shall be available on at least 3, 6 and 12 nautical mile range scales, and there shall be a positive indication of the range scale in use.*

3.3.4.4 (MSC.64(67)/3.4.4) *"Auto tracking aid" facilities may also be provided on other range scales. The methods of operation which are provided shall be clearly described in the manufacturer's manual.*

3.3.4.5 (MSC.64(67)/3.4.5) *The "auto tracking aid" shall be capable of operating with a relative motion display with "north-up" and "course-up" azimuth stabilization. In addition, the "auto tracking aid" may also provide for a true motion display. If true motion is provided, the operator shall be able to select for his display either true or relative motion. There shall be a positive indication of the display mode and orientation in use.*

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3.3.4.6 (MSC.64(67)/3.4.6) *The course and speed information generated by the "auto tracking aid" for acquired targets shall be displayed in a vector or graphic form which clearly indicates the target's predicted motion with the relevant symbols (see symbols 4A or 4B or 5 of annex E). In this regard:*

- .1 "auto tracking aid" presenting predicted information in vector form only shall have the option of both true and relative vectors. There shall be an indication of the vector mode selected and if "true" is selected, there shall be a display of whether it is stabilized with reference to sea or ground;*
- .2 an "auto tracking aid" which is capable of presenting target course and speed information in graphic form shall also, on request, provide the target's true and/or relative vector;*
- .3 vectors displayed shall be time-adjustable;*
- .4 a positive indication of the time-scale of the vector in use shall be given; and*
- .5 if stationary targets are being used for ground referencing then this shall be indicated with the relevant symbols (see symbol 13 of annex E). In this mode, relative vectors including those of the targets used for ground referencing shall be displayed when requested.*

3.3.4.7 (MSC.64(67)/3.4.7) *The "auto tracking aid" information shall not obscure the visibility of radar targets. The display of "auto tracking aid" data (vector, graphic and associated symbol) shall be under the control of the radar observer. It shall be possible to cancel the display of unwanted "auto tracking aid" data within 3 s of command.*

3.3.4.8 (MSC.64(67)/3.4.8) *Means shall be provided to adjust independently the brilliance of the "auto tracking aid" data and radar data, including complete extinction of the "auto tracking aid" data.*