

**Global maritime distress and safety system (GMDSS) -- Part 1: Radar transponder - Marine search and rescue (SART) - Operational and performance requirements, methods of testing and required test results**

Global maritime distress and safety system (GMDSS) -- Part 1: Radar transponder - Marine search and rescue (SART) - Operational and performance requirements, methods of testing and required test results

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 61097-1:2007 sisaldab Euroopa standardi EN 61097-1:2007 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 23.11.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 61097-1:2007 consists of the English text of the European standard EN 61097-1:2007.</p> <p>This document is endorsed on 23.11.2007 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b> transponders used in search and rescue operations at sea (SART), as required by Regulation 6.2.2 of Chapter III, and 7.1.3 and 8.3.1 of Chapter IV of the 1988 amendments to the 1974 International Convention for Safety of Life at Sea (SOLAS), and which is associated with IEC 60936 (Shipborne radar) and IEC 60945 (General requirements). This standard incorporates the performance standards of IMO Resolutions A.530 (13) and A.802 (19) (Survival craft radar transponders for use in search and rescue operations) and the technical characteristics for such transponders contained in ITU-R Recommendation M.628-4, and takes account of the general requirements contained in IMO Resolution A.694 (17).</p>	<p><b>Scope:</b> transponders used in search and rescue operations at sea (SART), as required by Regulation 6.2.2 of Chapter III, and 7.1.3 and 8.3.1 of Chapter IV of the 1988 amendments to the 1974 International Convention for Safety of Life at Sea (SOLAS), and which is associated with IEC 60936 (Shipborne radar) and IEC 60945 (General requirements). This standard incorporates the performance standards of IMO Resolutions A.530 (13) and A.802 (19) (Survival craft radar transponders for use in search and rescue operations) and the technical characteristics for such transponders contained in ITU-R Recommendation M.628-4, and takes account of the general requirements contained in IMO Resolution A.694 (17).</p>
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**ICS** 47.020.70

**Võtmesõnad:** methods of testing, navigational instruments, performance requirements, radar transponder, required test results, ship, technical characteristics

English version

**Global maritime distress and safety system (GMDSS) -  
Part 1: Radar transponder -  
Marine search and rescue (SART) -  
Operational and performance requirements,  
methods of testing and required test results  
(IEC 61097-1:2007)**

Systeme mondial de détresse  
et de sécurité en mer (GMDSS) -  
Partie 1: Répondeur radar -  
Recherche  
et sauvetage maritime (SART) -  
Exigences opérationnelles  
et de fonctionnement,  
méthodes d'essai et résultats exigibles  
(CEI 61097-1:2007)

Weltweites Seenot-  
und Sicherheitsfunksystem (GMDSS) -  
Teil 1: Radar-Transponder -  
Seenotrettung (SART) -  
Betriebs- und Leistungsanforderungen,  
Prüfverfahren und geforderte  
Prüfergebnisse  
(IEC 61097-1:2007)

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Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

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

## Foreword

The text of document 80/479/FDIS, future edition 2 of IEC 61097-1, 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 61097-1 on 2007-08-01.

This European Standard supersedes EN 61097-1:1993.

The main changes with respect to EN 61097-1:1993 are listed below:

- some amendments to bring the standard up to date with newer IMO resolutions and ITU recommendations. In particular, in 1995, the IMO adopted new performance standards for the SART in resolution A.802 (19) which replaced those of resolution A.697 (17). This new resolution introduced a new requirement for the SART to be provided with a pole arrangement. In 2006, the ITU-R revised recommendation M.628 to permit the optional use of circular polarisation with the SART;
- the Introduction has been deleted as it was of historical interest only;
- Annex A, which contained details of the parts of the EN 61097 series of standards, has been deleted;
- Annex B, which contained a Bibliography, has been deleted and the information moved into the normative references.

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) 2008-05-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2010-08-01

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 61097-1:2007 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

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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> <sup>2)</sup>
IEC 60936-1	- <sup>1)</sup>	Maritime navigation and radiocommunication equipment and systems - Radar - Part 1: Shipborne radar - Performance requirements - Methods of testing and required test results	EN 60936-1	2000 <sup>2)</sup>
IEC 60945	- <sup>1)</sup>	Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results	EN 60945	2002 <sup>2)</sup>
IMO Resolution A.222 (VII)	- <sup>1)</sup>	Performance standards for navigational radar equipment	-	-
IMO Resolution A.477 (XII)	- <sup>1)</sup>	Performance standards for radar equipment	-	-
IMO Resolution A.530 (13)	- <sup>1)</sup>	Use of radar transponders for search and rescue purposes	-	-
IMO Resolution A.694 (17)	- <sup>1)</sup>	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.802 (19)	- <sup>1)</sup>	Performance standards for survival craft radar transponder for use in search and rescue operations	-	-
IMO SOLAS 1974 Amendments	1988	Amendments concerning Radiocommunications for the Global maritime distress and safety system (GMDSS)	-	-
ITU-R Recommendation M.628-4	- <sup>1)</sup>	Technical characteristics for search and rescue radar transponders	-	-
ITU-R Report 1036-1	- <sup>1)</sup>	Frequencies for homing and locating in the global maritime distress and safety system (GMDSS)	-	-

<sup>1)</sup> Undated reference.

<sup>2)</sup> Valid edition at date of issue.

# INTERNATIONAL STANDARD

**IEC**  
**61097-1**

Second edition  
2007-06

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**Global maritime distress and  
safety system (GMDSS) –**

**Part 1:  
Radar transponder –  
Marine search and rescue (SART) –  
Operational and performance requirements,  
methods of testing and required test results**



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# INTERNATIONAL STANDARD

**IEC**  
**61097-1**

Second edition  
2007-06

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## **Global maritime distress and safety system (GMDSS) –**

### **Part 1: Radar transponder – Marine search and rescue (SART) – Operational and performance requirements, methods of testing and required test results**



Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**GLOBAL MARITIME DISTRESS AND  
SAFETY SYSTEM (GMDSS) –****Part 1: Radar transponder –  
Marine search and rescue (SART) –  
Operational and performance requirements,  
methods of testing and required test results**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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 61097-1 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

This second edition cancels and replaces the first edition published in 1992. This edition constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- some amendments to bring the standard up to date with newer IMO resolutions and ITU recommendations. In particular, in 1995, the IMO adopted new performance standards for the SART in resolution A.802(19) which replaced those of resolution A.697(17). This new resolution introduced a new requirement for the SART to be provided with a pole

arrangement. In 2006, the ITU-R revised recommendation M.628 to permit the optional use of circular polarisation with the SART;

- the Introduction has been deleted as it was of historical interest only;
- Annex A, which contained details of the parts of the IEC 61097 series of standards, has been deleted as this information is now available from this Foreword;
- Annex B which contained a Bibliography has been deleted and the information moved into the normative references.

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

FDIS	Report on voting
80/479/FDIS	80/485/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 2.

A list of all parts of IEC 61097 series, published under the general title *Global maritime distress and safety system (GMDSS)*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

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

# GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS) –

## Part 1: Radar transponder – Marine search and rescue (SART) – Operational and performance requirements, methods of testing and required test results

### 1 Scope

This part of IEC 61097 specifies the performance standards and type testing of marine radar transponders used in search and rescue operations at sea (SART), as required by Regulation 6.2.2 of Chapter III, and 7.1.3 and 8.3.1 of Chapter IV of the 1988 amendments to the 1974 International Convention for Safety of Life at Sea (SOLAS), and which is associated with IEC 60936 (Shipborne radar) and IEC 60945 (General requirements).

This standard incorporates the performance standards of IMO Resolutions A.530 (13) and A.802 (19) (Survival craft radar transponders for use in search and rescue operations) and the technical characteristics for such transponders contained in ITU-R Recommendation M.628-4, and takes account of the general requirements contained in IMO Resolution A.694 (17).

NOTE 1 The categories of SART operation which are applicable to the stated SOLAS Regulations, IMO Resolutions and ITU-R Recommendation are:

- a) integral with a survival craft;
- b) portable and capable of floating;
- c) as part of an EPIRB.

NOTE 2 This standard does not include non-SOLAS options for instance those envisaged in ITU-R Recommendation 628-4 - Considering (b).

All text whose meaning is identical to that in IMO Resolutions A.530 (13), A.694 (17), A.802 (19) and ITU-R Recommendation M.628-4 is printed in italics.

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60936-1, *Shipborne radar – Operational and performance requirements – Methods of tests and required test results*

IEC 60945, *Marine navigational equipment – General requirements – Methods of testing and required test results.*

IMO Resolution A.222 (VII): *Performance standards for navigational radar equipment.*

IMO Resolution A.477 (XII): *Performance standards for radar equipment.*

IMO Resolution A.530 (13): *Use of radar transponders for search and rescue purposes.*

IMO Resolution A.694 (17): *General requirements for shipborne radio equipment forming part of the Global maritime distress and safety system and for electronic navigational aids*

IMO Resolution A.802 (19): *Performance standards for survival craft radar transponders for use in search and rescue operations.*

Safety of Life at Sea (SOLAS) Convention (1974) – *Amendments concerning Radiocommunications for the Global maritime distress and safety system (GMDSS) (1988)*

ITU-R Recommendation M.628-4: *Technical characteristics for search and rescue radar transponders.*

ITU-R Report 1036-1: *Frequencies for homing and locating in the global maritime distress and safety system (GMDSS).*

### **3 Performance requirements**

#### **3.1 General**

*The SART shall be capable of indicating the location of a unit in distress on the assisting units' radar(s) by means of a series of equally spaced dots.*

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

#### **3.2 Operational**

*The SART shall:*

- a) be capable of being easily activated by unskilled personnel;*
- b) be fitted with means to prevent inadvertent activation;*
- c) be equipped with a means which is either visual or audible, or both visual and audible, to indicate correct operation and to alert survivors to the fact that a radar has triggered the SART;*
- d) be capable of manual activation and deactivation, provision for automatic activation may be included;*
- e) be provided with an indication of the stand-by condition, i.e. activated, but not triggered;*
- f) be capable of withstanding without damage drops from a height of 20 m into the water;*
- g) be watertight at a depth of 10 m for at least 5 min;*
- h) maintain watertightness when subjected to a thermal shock of 45 °C under specified conditions of immersion;*
- i) be capable of floating if it is not an integral part of the survival craft;*
- j) be equipped with a buoyant lanyard, suitable for use as a tether, if it is capable of floating (not less than 10 m length);*
- k) be not unduly affected by seawater or oil;*
- l) be resistant to deterioration in prolonged exposure to sunlight;*
- m) be of a highly visible yellow/orange colour on all surfaces where this will assist detection;*
- n) be of a smooth external construction to avoid damaging the survival craft, and*
- o) be provided with a pole or other arrangement compatible with the antenna pocket in a survival craft in order to comply with the requirements referred to in 3.5 together with illustrated instructions.*

#### **3.3 Battery**

*The SART shall have sufficient battery capacity to operate in the stand-by condition for 96 h and, in addition, following the stand-by period, to provide transponder transmissions for 8 h when being continuously interrogated with a pulse repetition frequency of 1 kHz.*