

INTERNATIONAL STANDARD

IEC
61909

First edition
2000-06

Audio recording – Minidisc system

*Enregistrement audio –
Système de minidisque*

*(<https://standards.iteh.ai>)
Document Preview*

[IEC 61909:2000](https://standards.iteh.ai/catalog/standards/iec/69d99c2-ad9d-4e7c-95e5-d4beaa5d1ed9/iec-61909-2000)

<https://standards.iteh.ai/catalog/standards/iec/69d99c2-ad9d-4e7c-95e5-d4beaa5d1ed9/iec-61909-2000>



Reference number
IEC 61909:2000(E)

Numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series.

Consolidated publications

Consolidated versions of some IEC publications including amendments are available. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

Validity of this publication

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology.

Information relating to the date of the reconfirmation of the publication is available in the IEC catalogue.

Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is to be found at the following IEC sources:

- **IEC web site***
- **Catalogue of IEC publications**
Published yearly with regular updates
(On-line catalogue)*
- **IEC Bulletin**
Available both at the IEC web site* and as a printed periodical

Terminology, graphical and letter symbols

For general terminology, readers are referred to IEC 60050: *International Electrotechnical Vocabulary* (IEV). <https://standards.iteh.ai/catalog/standards/iec-61909-2000>

For graphical symbols, and letter symbols and signs approved by the IEC for general use, readers are referred to publications IEC 60027: *Letter symbols to be used in electrical technology*, IEC 60417: *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets* and IEC 60617: *Graphical symbols for diagrams*.

* See web site address on title page.

INTERNATIONAL STANDARD

IEC 61909

First edition
2000-06

Audio recording – Minidisc system

*Enregistrement audio –
Système de minidisque*

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

[IEC 61909:2000](#)

<https://standards.iteh.ai/catalog/standards/iec/69d9f9c2-ad9d-4e7c-95e5-d4beaa5d1ed9/iec-61909-2000>

© IEC 2000 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission 3, rue de Varembé Geneva, Switzerland
Telefax: +41 22 919 0300 e-mail: inmail@iec.ch IEC web site <http://www.iec.ch>



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE **XH**

For price, see current catalogue

CONTENTS

| | | Page |
|----------------|--|------|
| FOREWORD | | 7 |
| Clause | | |
| 1 | General..... | 8 |
| 1.1 | Scope | 8 |
| 1.2 | Normative references | 8 |
| 1.3 | Basic parameters | 9 |
| 1.4 | Definitions..... | 10 |
| 2 | Disc specification | 16 |
| 2.1 | Validity..... | 16 |
| 2.2 | Conditions for measurement of the mechanical dimensions | 16 |
| 2.3 | Other test conditions | 16 |
| 2.4 | Optical pick-up unit for disc measurements | 16 |
| 2.5 | Read out system | 17 |
| 2.6 | Outer diameter..... | 17 |
| 2.7 | Centre hole | 18 |
| 2.8 | Thickness | 18 |
| 2.9 | Clamping block | 19 |
| 2.10 | Deflection | 19 |
| 2.11 | Protective coating | 20 |
| 2.12 | Optical requirements | 21 |
| 2.13 | Information area..... | 22 |
| 2.14 | Track pitch..... | 22 |
| 2.15 | Rotation | 22 |
| 2.16 | Vertical deviations of the information layer..... | 23 |
| 2.17 | Radial deviations of the track | 23 |
| 2.18 | Write conditions (valid only for recordable groove)..... | 24 |
| 2.19 | Read conditions | 25 |
| 2.20 | HF signals..... | 26 |
| 2.21 | Radial tracking signals (including lead-in and lead-out areas) | 27 |
| 2.22 | Tangential tracking signals (valid only for recordable groove and lead-out groove) . | 27 |
| 2.23 | Address encoding (valid only for recordable groove and lead-out groove) | 28 |
| 2.24 | Operating conditions | 28 |
| 2.25 | Storage conditions | 28 |
| 3 | Optical stylus | 35 |
| 4 | Cartridge..... | 36 |
| 4.1 | Size | 36 |
| 4.2 | Mass..... | 36 |
| 4.3 | Centre hole on the bottom | 36 |
| 4.4 | Windows | 37 |
| 4.5 | Shutter..... | 37 |
| 4.6 | Horizontal centring of the disc on the player/recorder..... | 37 |
| 4.7 | Horizontal pre-position of the disc in the cartridge..... | 38 |
| 4.8 | Vertical positioning of the disc on the player/recorder | 38 |
| 4.9 | Vertical clearance between the disc and the cartridge..... | 38 |

| | | |
|------|---|-----|
| 4.10 | Depth of the sensing holes | 39 |
| 4.11 | Depth of sensing ditch..... | 39 |
| 4.12 | Holding force | 39 |
| 4.13 | Operating conditions | 39 |
| 4.14 | Storage conditions | 39 |
| 4.15 | Protection of the information area on the disc..... | 39 |
| 5 | Address | 49 |
| 5.1 | Cluster concept..... | 49 |
| 5.2 | Pits | 49 |
| 5.3 | Groove..... | 50 |
| 5.4 | Disc layout..... | 50 |
| 5.5 | Border of a cluster | 51 |
| 5.6 | Conversion table from address to time | 51 |
| 6 | Pregroove modulation (valid only for recordable MD) | 52 |
| 6.1 | Validity..... | 52 |
| 6.2 | General parameters | 52 |
| 6.3 | FM modulation | 52 |
| 6.4 | Sector format | 52 |
| 6.5 | Data format..... | 53 |
| 6.6 | Error detection | 53 |
| 6.7 | Bit rate..... | 54 |
| 6.8 | ADIP encoder..... | 54 |
| 7 | EFM modulation | 55 |
| 7.1 | General..... | 55 |
| 7.2 | Subcode | 55 |
| 8 | ACIRC error correction system | 57 |
| 8.1 | General..... | 57 |
| 8.2 | ACIRC encoder..... | 57 |
| 8.3 | ACIRC decoder..... | 57 |
| 9 | Sector data structure..... | 62 |
| 9.1 | General..... | 62 |
| 9.2 | Scrambling..... | 62 |
| 9.3 | Sector sync..... | 62 |
| 9.4 | Sector header | 62 |
| 9.5 | Data field | 63 |
| 10 | Audio data..... | 68 |
| 10.1 | Audio sector data format | 68 |
| 10.2 | Audio data decoding..... | 80 |
| 10.3 | Additional information..... | 100 |
| 11 | Data organization | 118 |
| 11.1 | General..... | 118 |
| 11.2 | Synchronization rules | 119 |
| 11.3 | Linking rules (valid only for recordable grooves) | 119 |
| 11.4 | Lead-in area..... | 120 |
| 11.5 | Premastered area | 128 |
| 11.6 | UTOC area | 129 |
| 11.7 | Recordable user area..... | 138 |
| 11.8 | Lead-out area | 141 |

| | | |
|--|--|-----|
| 11.9 | Modified ISO 8859-1 code for the minidisc system..... | 157 |
| 11.10 | Music shifted JIS code for the minidisc system | 157 |
| 11.11 | Application rule for Japanese Katakana format | 164 |
| 12 | Serial copy management system | 167 |
| 12.1 | General..... | 167 |
| 12.2 | Recording rule on the MD..... | 168 |
| 12.3 | Playback rule to the digital audio interface..... | 169 |
| 13 | Shock proof memory system | 170 |
| 13.1 | Linear velocity..... | 170 |
| 13.2 | Shock proof feature..... | 170 |
| 14 | Application rules..... | 171 |
| 14.1 | Playback rules | 171 |
| 14.2 | Recording rules..... | 172 |
| 14.3 | Premastered MD | 172 |
| Annex A (informative) Recommendations and clarifications for the MD system..... | | 174 |
| A.1 | Principles of operation..... | 173 |
| A.2 | Measurement of the disc reflectivity..... | 174 |
| A.3 | Measurement of the optical disc unbalance | 175 |
| A.4 | Measurement of the groove wobble amplitude | 176 |
| A.5 | Beat of wobble and groove geometry | 179 |
| A.6 | Environment operating and storage conditions..... | 182 |
| A.7 | Measurement of the optimum recording power P_0 | 183 |
| A.8 | Measurement of jitter and signal frequency time errors | 184 |
| A.9 | Local defects..... | 187 |
| A.10 | Burst errors | 187 |
| A.11 | Push-pull tracking signal..... | 187 |
| A.12 | Noise in push-pull tracking signal..... | 187 |
| A.13 | Diagauges for centre hole on the disc | 188 |
| A.14 | Compliance test of the MD cartridge | 190 |
| A.15 | Aarea for braille..... | 192 |
| A.16 | Long shutter | 193 |
| A.17 | Extended volume and bend of cartridge | 193 |
| A.18 | Definition of air cleanliness | 194 |
| A.19 | Test of impact durability (recordable disc only)..... | 195 |
| A.20 | Measurement of the friction force..... | 196 |
| A.21 | Label area | 197 |
| A.22 | Wobble signal leakage into I_{sum} | 198 |
| Figure 1 – Layout of the MD..... | | 15 |
| Figure 2 – MiniDisc possible profile | | 29 |
| Figure 3 – HF signal | | 30 |
| Figure 4 – Spectral components of the time error versus the maximum allowed time error due to mastering or recording | | 31 |
| Figure 5 – Typical shape of the error signal for tracking versus radial position..... | | 31 |

| | |
|---|-------|
| Figure 6 – Open-loop transfer function of the radial servo for an MD-recorder | 32 |
| Figure 7 – Open-loop transfer function of the radial servo for tracking measurement | 32 |
| Figure 8 – Operating conditions | 33 |
| Figure 9 – Roughness and irregularity (recordable disc only) | 34 |
| Figure 10 – Optical stylus | 35 |
| Figure 11 – MD cartridge specifications for the premastered version | 40-43 |
| Figure 12 – MD cartridge specifications for the recordable version | 44-47 |
| Figure 13 – Maximum existing area of the disc | 48 |
| Figure 14 – ADIP encoder block diagram | 54 |
| Figure 15 – MD encoding/decoding system (main channel) | 56 |
| Figure 16 – ACIRC encoder (add-on de-interleave + encoder) | 58 |
| Figure 17 – Integrated ACIRC encoder | 59 |
| Figure 18 – ACIRC decoder (CIRC decoder + add-on interleave) | 60 |
| Figure 19 – Integrated ACIRC decoder | 61 |
| Figure 20 – Relation between 16 bit samples and data bytes | 64 |
| Figure 21 – Layout of a data block | 65 |
| Figure 22 – Scrambler structure | 65 |
| Figure 23 – Layout of the sync field | 66 |
| Figure 24 – Layout of the header field | 66 |
| Figure 25 – Sector construction of MD | 67 |
| Figure 28 – Sector structure of MD (general) | 144 |
| Figure 29 – Sector structure of MD (programme area) | 145 |
| Figure 30 – Sector structure of MD (TOC sector = 0 (mandatory)) | 146 |
| Figure 31 – Sector structure of MD (TOC sector = 1 (option)) | 147 |
| Figure 32 – Sector structure of MD (TOC sector = 2 (option)) | 148 |
| Figure 33 – Sector structure of MD (TOC sector = 3 (option)) | 149 |
| Figure 34 – Sector structure of MD (TOC sector = 4 (option)) | 150 |
| Figure 35 – Sector structure of MD (UTOOC sector = 0 (mandatory)) | 151 |
| Figure 36 – Sector structure of MD (UTOOC sector = 1 (option)) | 152 |
| Figure 37 – Sector structure of MD (UTOOC sector = 2 (option)) | 153 |
| Figure 38 – Sector structure of MD (UTOOC sector = 4 (option)) | 154 |
| Figure 39 – Mapping of JIS code to shifted JIS | 160 |
| Figure 40 – Example of transformation rule | 165 |
| Figure A.1 – Schematic set-up for reflectivity measurements | 174 |
| Figure A.2 – Unbalance versus read out time in a recordable MD system | 175 |
| Figure A.3 – Radial error signal | 178 |
| Figure A.4 – Groove wobble | 178 |
| Figure A.5 – Grooves “in phase” | 183 |
| Figure A.6 – Grooves “out of phase” | 180 |
| Figure A.7 – Groove geometry | 180 |
| Figure A.8 – ATER and BLER windows for a wide and deep groove | 181 |
| Figure A.9 – ATER and BLER windows for a narrow and shallow groove | 181 |
| Figure A.10 – Cyclic climatic test | 183 |

| | |
|---|---------|
| Figure A.11 – Recording power (mW) versus block error rate | 184 |
| Figure A.12 – Examples of time errors | 186 |
| Figure A.13 – Diagauge | 188 |
| Figure A.14 – Disc base..... | 189 |
| Figure A.15 – Measurement method | 189 |
| Figure A.16 – Test gauge | 190 |
| Figure A.17 – Test method (4-forces)..... | 191 |
| Figure A.18 – Test method (3-forces)..... | 191 |
| Figure A.19 – The area for braille..... | 192 |
| Figure A.20 – Extended volume and bend of cartridge..... | 193 |
| Figure A.21 – Number of particles..... | 194 |
| Figure A.22 – Test of impact durability | 195 |
| Figure A.23 – Arrangement of head and disc for the measurement of friction force..... | 196 |
| Figure A.24 – Label area | 197 |
| Figure A.25 – Wobble signal leakage | 198 |
| | |
| Table 1 – ASCII – Code table..... | 155 |
| Table 2 – 6 bit format | 156 |
| Table 3 – Modified ISO 8859-1 code table for the minidisc system | 158 |
| Table 4 – JIS code table for minidisc system (see JISX0208 except for MD external characters in table 5)..... | 159 |
| Table 5 – Contents of MD external characters..... | 161 |
| Table 6 – Caption of illustrated characters | 162-164 |
| Table 7 – The translation between the Roman alphabet and Japanese katakana | 167 |
| Table 8 – Recording rule..... | 168 |

INTERNATIONAL ELECTROTECHNICAL COMMISSION

AUDIO RECORDING – MINIDISC SYSTEM

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 specifications, 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 61909 has been prepared by subcommittee 100B: Audio, video and multimedia information storage systems, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

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

| FDIS | Report on voting |
|---------------|------------------|
| 100B/259/FDIS | 100B/268/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.

Annex A is for information only.

The committee has decided that the contents of this publication will remain unchanged until 2010-06. At this date, the publication will be

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

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

AUDIO RECORDING – MINIDISC SYSTEM

1 General

1.1 Scope

This International Standard applies to the MiniDisc (MD). It defines the mechanical and electrical characteristics necessary to ensure the interchangeability of both premastered optical discs and recordable magneto-optical discs of 64 mm diameter for the compressed digital audio recording system.

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard 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 60908:1999, *Compact disc digital audio system*

IEC 60958:1989, *Digital audio interface*

ISO 683-13:1986, *Heat-treatable steels, alloy steels and free-cutting steels – Part 13: Wrought stainless steels*

ISO 3901:1986, *Documentation – International Standard Recording Code (ISRC)*

ISO 8859-1:1998, *Information technology – 8 bit single byte coded graphic character sets – Part 1: Latin alphabet No. 1*

JISX0208:1990, *Code of the Japanese graphic character set for information interchange*

1.3 Basic parameters

1.3.1 Main parameters

| | |
|-------------------------------------|---|
| Maximum playing and recording time: | approximately 74 min (stereo) approximately 148 min (mono) |
| Cartridge size: | 68 depth × 72 width × 5 height (mm) |

1.3.2 Disc parameters

| | |
|--|-------------------|
| Diameter of the disc: | 64 mm |
| Starting diameter of the lead-in area: | 29 mm |
| Diameter of the centre hole: | 11 mm |
| Thickness of the disc: | 1,2 mm |
| Track pitch: | 1,6 µm |
| Scanning velocity: | 1,2 m/s ~ 1,4 m/s |

1.3.3 Optical parameters

| | |
|---|---------------------------|
| Laser wavelength: | 780 nm typical |
| Objective lens NA (numerical aperture): | 0,45 |
| Recording power: | 2,5 mW ~ 5,0 mW |
| Recording strategy: | magnetic field modulation |

1.3.4 Signal format

| | |
|--------------------------|-----------------------|
| Modulation: | EFM |
| Error correction system: | advanced CIRC (ACIRC) |

1.3.5 Transfer rates

| | |
|-----------------|--|
| Main data rate: | 292 kbit/s |
| Sub-data rate: | 36,5 kbit/s (premastered MD) 9,1 kbit/s (recordable MD) |

1.3.6 Audio format

| | |
|---------------------|---|
| Number of channels: | 2 channels. stereo or double play mono |
| Sampling frequency: | 44,1 kHz |
| Coding: | ATRAC (adaptive transform acoustic coding) |

1.4 Definitions

1.4.1 Definitions, symbols and abbreviations

For the purpose of this International Standard, the following definitions and abbreviations apply.

CLV: constant linear velocity

groove: the guidance track in which completely identical clocking and address information is seen at both edges on the recordable groove.

The pregroove is U-shaped

– a typical depth of $\frac{\lambda}{9n} \sim \frac{\lambda}{7n}$ ($n = 1,55 \pm 0,1$)

– a typical width of $1,0 \mu\text{m} \sim 1,2 \mu\text{m}$

pit: pits on the high reflectivity MD

Premastered effect (I_3 .. I_{11} effect)

– a typical depth of $//5n$ ($n = 1,55 \pm 0,1$)

– a typical width of $0,45 \mu\text{m} \sim 0,7 \mu\text{m}$.

Pits are U-shaped on the low reflectivity MD

– a typical depth of $\frac{\lambda}{9n} \sim \frac{\lambda}{7n}$ ($n = 1,55 \pm 0,1$)

– a typical width of $0,45 \mu\text{m} \sim 0,7 \mu\text{m}$.

land: area between the grooves

NOTE In HF measurements (e.g. jitter) 'Land' is often used as the area between pits.

MM: magnetic field modulation

the EFM encoded information is recorded on the disc by switching an external magnetic field between two opposite directions. At every transition in the EFM signal, the magnetic field is switched

H_{ext} : external magnetic field

the magnetic field that switches between two opposite directions (both perpendicular to the disc surface) according to the EFM encoded information

when laser heats up the magneto optic layer of the disc locally, this magnetic field causes a permanent magnetic domain in the magneto optic layer on the disc

H_0 : the optimum external magnetic field

the centre value of the range of external magnetic fields that will give results within specification

CW: continuous wave

the laser light output is at a constant level

P_0 : the optimum recording power

the centre value of the range of recording powers that will give results within specification. For the measurement of P_0 , see clause A.7

P_w : nominal recording power quantized by the write power table in TOC according to optimum recording power P_0 .

| | |
|---|--|
| wobble: | <p>the pregroove in the disc is not a perfect spiral but is wobbled with:</p> <ul style="list-style-type: none"> – a typical amplitude of 30 nm; – a spatial period of 54 µm to 64 µm. <p>When this wobble is locked to a frequency of 22,05 kHz, the velocity of the disc should be in the range of 1,2 m/s to 1,4 m/s</p> |
| ADIP: | <p>address in pregroove</p> <p>with an additional modulation of the groove wobble, the pregroove contains an address information called ADIP (see clause 6)</p> |
| ATER: | <p>ADIP error rate</p> <p>number of erroneous ADIP frames in proportion to the total number of frames.</p> |
| jitter: | <p>the 1 s value of the time variations between consecutive I3 transitions (land and pit) of the unequalized HF signal (random EFM data)</p> <p>For the measurement of jitter, see clause A.8.</p> |
| $\frac{\Delta P_O \times 100}{\Delta T \times P_O}$: | <p>temperature coefficient of the sensitive layer of the disc. It is expressed as the relative change in optimum recording power per degree Celsius temperature difference (%/ °C)</p> |
| HF signal: | <p>as defined in clause A.1, is measured before a.c. coupling (see figure 3).</p> <p>The highest and lowest fundamental frequencies that occur in the EFM signal are 720 kHz and 196 kHz.</p> <p>The peak-to-peak values of the highest and lowest fundamental frequencies are denoted by I_3 and by I_{11} respectively.</p> <p>The top level of HF signal, which is given by the lowest fundamental frequency, is denoted by I_{top}.</p> |
| BLER: | <p>block error rate</p> <p>number of erroneous EFM frames in proportion to the total number of frames.</p> <p>The BLER is measured at the entry to C1 decoder. At that stage, 1 block corresponds to 32 symbols</p> |
| crosstalk: | <p>the ratio between HF signal amplitude when on track and when between the tracks.</p> |
| push pull: | <p>an off-track position of the scanning spot results in a diffraction pattern that is asymmetrical in the radial direction of the disc.</p> <p>Subtraction of the powers into the two halves of the aperture of the objective lens yields a servo signal for the track following (this signal is called the push pull signal).</p> |
| enhancement: | <p>the use of polarization-dependent optics to improve MO system performance</p> |
| ODU: | <p>optical disc unbalance</p> <p>variation in the read signal amplitude with time as the optical pickup scans along the track due to non-uniformity of optical properties such as birefringence</p> |

1.4.2 Disc areas

Additional information about the areas mentioned below is given in clause 11.

The layout of the MD is given in figure 1.

The terms used to distinguish between the areas on the disc are:

information area: this area of an MD contains CLV clocking information and an address.

The information area of the disc is divided into five parts:

| | Area | Premastered MD | Recordable MD |
|---|-----------------|----------------|---------------|
| 1 | Lead-in | Yes | Yes |
| 2 | Premastered | Yes | Optional |
| 3 | UTOC | No | Yes |
| 4 | Recordable user | No | Yes |
| 5 | Lead-out | Yes | Yes |

lead-in area: contains premastered information with the table of contents (TOC).

premastered area: contains premastered information tracks.

UTOC area: contains:

- the user table of contents for the information tracks in the recordable user area after (partial) recording;
- the power calibration area;
- the reserved area.

recordable user area: in this area, the tracks with user information are recorded

lead-out area: contains premastered pits on the premastered MD, or premastered groove on the recordable MD.

NOTE 1 The premastered area together with the recordable user area is called the programme area.

NOTE 2 The UTOC area together with the recordable user area is called the recordable area.

NOTE 3 The recordable MD with the optional premastered area is called hybrid MD.