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**CLASS 1 LASER PRODUCT**

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# TECHNICAL SPECIFICATION

## General

**Dimensions (HxD):** 23.3x137.5 mm  
**Weight without batteries:** 187g

## Power supply modes

<table>
<thead>
<tr>
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<th>Voltage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC-in socket</td>
<td>2.5 - 6.0V</td>
</tr>
<tr>
<td>Primary batteries</td>
<td>2.0 - 3.6V</td>
</tr>
<tr>
<td>Rechargeable batteries</td>
<td>2.0 - 3.6V</td>
</tr>
</tbody>
</table>

## Battery lifetime

<table>
<thead>
<tr>
<th>Battery Type</th>
<th>ESP=ON</th>
<th>PSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Batteries 2 x LR6</td>
<td>≥12h (15h typ.)</td>
<td>≥18h (20h typ.)</td>
</tr>
<tr>
<td>Primary Batteries 2 x AAA</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Rechargeable Batteries AY3363</td>
<td>TBD</td>
<td>≥4h (6h typ.)</td>
</tr>
</tbody>
</table>

## Battery level detection

<table>
<thead>
<tr>
<th>DETECTION LEVEL</th>
<th>Vbatt. Alkaline</th>
<th>Vbatt. NMH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery empty</td>
<td>+1.8V ±100-50mV</td>
<td>+1.8V ±100-50mV</td>
</tr>
<tr>
<td>Battery week 1</td>
<td>battery empty level + 0.75V ±100mV</td>
<td>battery empty level + 0.5V ±100mV</td>
</tr>
<tr>
<td>Battery week 2</td>
<td>battery empty level + 0.50V ±100mV</td>
<td>battery empty level + 0.45V ±100mV</td>
</tr>
<tr>
<td>Battery week 3</td>
<td>battery empty level + 0.3V ±100mV</td>
<td>battery empty level + 0.3V ±100mV</td>
</tr>
</tbody>
</table>

## Current consumption CDDA-playback

<table>
<thead>
<tr>
<th>OPERATION MODE</th>
<th>DC-IN SUPPLY (4.5V)</th>
<th>BATT. SUPPLY (2.25V)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Powersave</td>
<td>ESP=ON</td>
</tr>
<tr>
<td>Play-mode</td>
<td>90mA typ.</td>
<td>100mA typ.</td>
</tr>
<tr>
<td>Charge-mode</td>
<td>160mA typ.</td>
<td>n/a</td>
</tr>
<tr>
<td>Jump-mode</td>
<td>220mA typ.</td>
<td>300mA typ.</td>
</tr>
<tr>
<td>Stand-by</td>
<td>30mA typ.</td>
<td>350μA typ.</td>
</tr>
</tbody>
</table>

## Shock resistance

<table>
<thead>
<tr>
<th>Direction</th>
<th>≥2.5g</th>
</tr>
</thead>
<tbody>
<tr>
<td>+X/-X direction</td>
<td></td>
</tr>
<tr>
<td>+Y/-Y direction</td>
<td></td>
</tr>
<tr>
<td>+Z/-Z direction</td>
<td></td>
</tr>
</tbody>
</table>

## Headphone out

- **Output power (THD=10%)**
  - 17 version only: 2x3mW (+1/-3dB)
  - all other versions: 2x3.5mW (+2/-2dB)
- **Frequency response (1mW)**: 100Hz-20kHz within 6dB
- **S/N ratio (unwght)**: ≥100dB
- **S/N ratio (A-wght)**: ≥75dB (80dB typ.)
- **THD+N (1kHz, 1mW)**: ≤1% (0.2% typ.)
- **Channel crosstalk (1kHz, w/o load)**: ≤-24dB (-58dB typ.)
- **Channel unbalance (-40dB)**: ≤-5dB
- **Volume attenuation (1kHz)**: ≥60dB

## Dynamic Bass Boost DBB

<table>
<thead>
<tr>
<th>DBB STAGE</th>
<th>Frequency response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>63Hz</td>
</tr>
<tr>
<td>DBB1</td>
<td>+9dB ± 2dB</td>
</tr>
</tbody>
</table>

## Measurement setup

**DUT**

- Low pass filter
- S/N and distortion meter
- Level meter

**Use Audio Signal disc SBC429**

4822 397 30184
FEATURES

<table>
<thead>
<tr>
<th>FEATURES OF CD-PORTABLE</th>
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<th>AX3301/00C</th>
<th>AX3301/00Z</th>
<th>AX3301/05Z</th>
<th>AX3301/01</th>
<th>AX3303/00C</th>
<th>AX3303/05Z</th>
<th>AX3305/01</th>
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</thead>
<tbody>
<tr>
<td>CD-RW COMPATIBILITY</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
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<tr>
<td>ELECTRONIC SKIP PROTECTION</td>
<td>45s 45s 45s 45s 45s 45s 45s 45s 45s</td>
<td>45s 45s 45s 45s 45s 45s 45s 45s 45s</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>ESP DRAM SIZE [Mbit]</td>
<td></td>
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<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
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<tr>
<td>HOLD / RESUME FUNCTION</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
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<tr>
<td>DBB STAGES</td>
<td>1 1 1 1 1 1 1 1 1 1</td>
<td>1 1 1 1 1 1 1 1 1 1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>ACOUSTIC FEEDBACK</td>
<td>--</td>
<td>--</td>
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<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
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<tr>
<td>PROGRAM MEMORY</td>
<td>30 30 30 30 30 30 30 30 30 30</td>
<td>30 30 30 30 30 30 30 30 30 30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>RECHARGE NiCd / NiMH</td>
<td>--/-- --/-- --/-- --/-- --/-- --/--</td>
<td>--/-- --/-- --/-- --/-- --/-- --/--</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>BELT-CLIP</td>
<td>--</td>
<td>--</td>
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<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>CORD REMOTE CONTROL</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
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<tr>
<td>LINE / OPT. DIGITAL OUTPUT</td>
<td>--/-- --/-- --/-- --/-- --/-- --/-- --/--</td>
<td>--/-- --/-- --/-- --/-- --/-- --/-- --/--</td>
<td></td>
<td></td>
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</table>

FEATURES OF CD-PORTABLE

ACCESSORIES

<table>
<thead>
<tr>
<th>ACCESSORIES FOR CD-PORTABLE</th>
<th>AX3300/10</th>
<th>AX3301/00C</th>
<th>AX3301/05Z</th>
<th>AX3301/01</th>
<th>AX3303/00C</th>
<th>AX3303/05Z</th>
<th>AX3305/01</th>
</tr>
</thead>
<tbody>
<tr>
<td>AY3171/00 AC/DC Adaptor</td>
<td>3140 118 31923</td>
<td>X X</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
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<tr>
<td>AY3171/02 AC/DC Adaptor</td>
<td>3140 118 32024</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>AY3171/05 AC/DC Adaptor</td>
<td>3140 118 33611</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AY3171/10 AC/DC Adaptor</td>
<td>3140 118 32182</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AY3501/00 Car Cassette Adaptor</td>
<td>3140 118 71842</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>AY3548/00 Car DC/DC Adaptor</td>
<td>3140 118 71901</td>
<td>X</td>
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<td></td>
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<tr>
<td>AY3363 Battery-NIMH-AAA</td>
<td>3103 308 84542</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>AY3363 Battery-NIMH-AAA-BYD</td>
<td>3103 308 84721</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Door-Battery-2A</td>
<td>3140 117 72151</td>
<td>X X X X X X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Door-Battery-3A</td>
<td>3140 117 71631</td>
<td>X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HE225/77 Headphone</td>
<td>9082 100 02542</td>
<td>X X X X X X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HS383/77I Headphone</td>
<td>9082 100 02544</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

X... supplied with the set
CONNECTIONS AND CONTROLS

Controls (see figure 1)

1. LINE OUT/G...3.5 mm headphone socket, socket to connect the player to another audio input of an additional appliance.
2. ▼...skips and searches CD tracks backwards.
3. ■...stops CD play, clears a program or switches the player off.
4. ▲...skips and searches CD tracks forwards.
5. ▼...switches the player on, starts or pauses CD play.
6. PROG...programs tracks and reviews the program.
7. MODE...selects the different playing possibilities: shuffle, shuffle repeat all, repeat, repeat all and 5 sec R/No display.
8. ▼...switches the bass enhancement on and off. This button also switches acoustic feedback (the beep) on/off when it is pressed for more than 2 seconds.
9. DBB...selects the power save mode.
10. VOL...adjusts the volume.
11. 4.5V DC...socket for external power supply.
12. OPEN...opens the CD lid.
13. ESP ON /POWER SAVE....to select between the battery power save mode and Electronic Skip Protection (ESP). ESP ensures continuous CD playback regardless of vibrations and shocks.
14. OFF...switches RESUME and HOLD off.
15. RESUME...stores the last position of a CD track played.
16. HOLD...locks all buttons.
17. ...battery compartment.

This set complies with the radio interference requirements of the European Union.

Batteries (supplied or optionally available)

For convenience, this model is designed with 2 different detachable battery doors. This allows you to operate the player using 2 choices of battery size. You can use the following batteries with this CD-player:

- alkaline batteries type AAA (LR03, UM4) or AA (LR6, UM3) preferably Philips.

Notes:
- Old and new or different types of batteries should not be combined.
- Remove batteries if they are empty or if the player is not going to be used for a long time.

Inserting AAA (LR03, UM4) or AA 3363 batteries

1. Open the AAA battery door.
2. Insert AAA batteries as shown onto the back of the door.
3. Replace the battery-loaded AAA door back onto the set.

Inserting AA (LR6, UM3) batteries

To double playback time, insert AA batteries into the battery compartment and use the AA marked battery door.

- Open the battery compartment and insert either 2 normal or alkaline batteries.

Battery indication

The approximate power level of your batteries is shown in the display.

- Battery full.
- Battery two-thirds full.
- Battery one-third full.
- Battery dead or empty. When the batteries are dead or empty, the symbol bAtt flashes, b-Rj z is displayed, and the beep tone sounds repeatedly.

QUICK START

MISE EN SERVICE RAPIDE

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17
INSTRUCTION FOR USE

POWER SUPPLY / GENERAL INFORMATION

<table>
<thead>
<tr>
<th>Battery type</th>
<th>ESP on</th>
<th>Power Save</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkaline AA</td>
<td>15 hours</td>
<td>20 hours</td>
</tr>
<tr>
<td>Alkaline AAA</td>
<td>7 hours</td>
<td>9 hours</td>
</tr>
<tr>
<td>Rechargeable ECO-PLUS NiMH battery</td>
<td>3 hours</td>
<td>5 hours</td>
</tr>
</tbody>
</table>

Batteries contain chemical substances, so they should be disposed of properly.

Recharging works only on players supplied with the rechargeable ECO-PLUS NiMH battery AY 3363.

Recharging the ECO-PLUS NiMH battery on board
1. Insert the rechargeable ECO-PLUS NiMH battery AY 3363.
2. Connect the mains adapter to the 4.5V DC socket of the player and then to the wall socket.
3. When the battery is fully recharged, FULL appears in the display.

Notes: – It is normal for the batteries to become warm during recharging.
– If the batteries become too warm, recharging will be interrupted for approximately 30 minutes.
– To ensure proper recharging on board, take care that contacts are clean.
– Use only the ECO-PLUS NiMH battery AY 3363.

Handling instructions
- Recharging already charged or half-charged batteries will shorten their lifetime. We therefore recommend that you let the rechargeable ECO-PLUS NiMH battery run till it is completely empty before you recharge it.
- To avoid a short circuit, do not let the battery touch any metal object.
- If the battery becomes empty soon after recharging, then either its contacts are dirty or it has reached the end of its lifetime.

Mains adapter (supplied or optionally available)
Use only the AY 3170 adapter (4.5 V / 300 mA direct current, positive pole to the center pin). Any other product may damage the player.
1. Make sure the local voltage corresponds to the power adapter's voltage.
2. Connect the power adapter to the 4.5V DC socket of the player and to the wall socket.

Note: Always disconnect the adapter when you are not using it.

Environmental information
- All redundant packing material has been omitted. We have done our utmost to make the packaging easily separable into two mono materials: cardboard (box) and polyethylene (bags, protective foam sheet).
- Your set consists of materials which can be recycled if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packing materials, exhausted batteries and old equipment.

CD player and CD handling
- Do not touch the lens A of the CD player.
- Do not expose the unit, batteries or CDs to humidity, rain, sand or excessive heat (caused by heating equipment or direct sunlight).
- You can clean the CD player with a soft, slightly dampened, lint-free cloth. Do not use any cleaning agents as they may have a corrosive effect.
- To clean the CD, wipe it in a straight line from the center toward the edge using a soft, lint-free cloth. A cleaning agent may damage the disc! Never write on a CD or attach a sticker to it.
- The lens may cloud over when the unit is moved suddenly from cold to warm surroundings. Playing a CD is not possible then. Leave the CD player in a warm environment until the moisture has evaporated.
- Active mobile phones in the vicinity of the CD player may cause malfunctions.
- Avoid dropping the unit as this may cause damage.

Headphones HE225
- Connect the supplied headphones to the LINE OUT/ socket of the player.

Note: LINE OUT/ socket can also be used for connecting this set to your HiFi system. To adjust the sound and volume, use the controls on the connected audio equipment and on the CD player.

IMPORTANT!
Hearing safety: Do not play your headphones at a high volume. Hearing experts advise that continuous use at high volume can permanently damage your hearing.

Traffic safety: Do not use headphones while driving a vehicle. It may create a hazard and it is illegal in many countries. Even if your headphones are an open-air type designed to let you hear outside sounds, do not turn up the volume so high that you cannot hear what is going on around you.

In-car use (connections supplied or optionally available)
Only use the AY 3545 or AY 3548 car voltage converter (4.5 V DC, positive pole to the centre pin) and the AY 3501 car cassette adapter. Any other product may damage the set.
1. Put the set on a horizontal, vibration-free and stable surface. Make sure it is in a safe place, where the set is neither a danger nor an obstacle to the driver and the passengers.
2. Plug the voltage converter into the cigarette lighter socket (only for 12 V car battery, negative grounding), then connect the wired end with 4.5V DC input socket on the set.
3. If necessary, clean the cigarette lighter socket to obtain a good electrical contact.
4. Turn down the volume and connect the cassette adapter plug to LINE OUT/ on the set.
5. Carefully insert the cassette adapter into the car radio’s cassette compartment.
6. Make sure the cord does not hinder your driving.
7. Decrease the volume on the set if necessary. Start playback on the set and adjust the sound with the car radio controls.

- Always remove the voltage converter from the cigarette lighter socket when the set is not in use.

Note: If your car radio has a LINE IN socket, it is better to use it for the car radio connection instead of the adapter cassette. Connect the signal lead to this LINE IN socket and to LINE OUT/ on the set.
INSTRUCTION FOR USE

CD PLAY

Playing a CD
This CD-player can play all kinds of Audio Discs such as CD-Recordables and CD-Rewritables. Do not try to play a CD-ROM, CDi, VCD, DVD, MP3-CD or computer CD.

1 Push the OPEN ▶ slider to open the player.

2 Insert an audio CD, printed side up, by pressing the CD onto the hub.

3 Close the player by pressing the lid down.

4 Press ▶ to start CD play.
   ➔ Playback starts with the selected track.

5 Press 9 to stop playback.

   ➔ The current track number and elapsed playing time are displayed.

   ➔ You can pause playback by pressing ▶ again.
   ➔ The time at which playback was paused starts flashing.
   ➔ You can continue playback by pressing ▶ again.

6 Press ▶ again to switch the player off.

   ➔ To remove the CD, hold it by its edge and press the hub gently while lifting the CD.

   ➔ If there is no activity, the set will automatically switch off after a while to save energy.

   ➔ If a CD-Recordable (CD-R) or a CD-Rewritable (CD-RW) is not recorded properly, NF dISC is displayed, indicating that the CD has not been finalized. In that case, use FINALIZE on your CD recorder to complete the recording.

   ➔ When playing a CD-Rewritable (CD-RW), please note that it takes 3–15 seconds after pressing ▶ for sound reproduction to start.

   ➔ Playback will stop if you open the CD lid.

   ➔ While the CD is read, 1-: - flashes in the display.

Volume and bass
Adjust the volume by using VOL –/+ on the CD player or the slider on your remote control.

Bass adjustment
Press DBB to switch the bass enhancement on or off.
   ➔ is shown if the bass enhancement is activated.

Selecting a track and searching
Selecting a track during playback
• Briefly press ◀ ◀ or ▶ ◀ once or several times to skip to the current, previous or next track.
   ➔ Playback continues with the selected track, and the track’s number is displayed.

Selecting a track when playback is stopped
1 Briefly press ◀ ◀ or ▶ ◀ once or several times to select the desired track. The track number is displayed.

2 Press ▶ to start CD play.
   ➔ Playback starts with the selected track.

Searching for a passage during playback
1 Keep ◀ ◀ or ▶ ◀ pressed to find a particular passage in a backward or forward direction.
   ➔ Searching starts while playback continues at low volume. After 2 seconds the search speeds up.

2 Release the button when you reach the desired passage.
   ➔ Playback continues from this position.

   ➔ If the player is in SCAN mode (see MODE chapter), searching is not possible.

Programming track numbers
You can store up to 30 tracks to play in a program. A single track may be stored more than once in the program.

1 While playback is stopped, select a track with ◀ ◀ or ▶ ◀.

2 Press PROG to store the track.
   ➔ Program lights up; the track number programmed and with the total number of stored tracks are displayed.

3 Select and store all desired tracks in this way.

4 Press ▶ to start playback of your selected tracks.
   ➔ Program is shown and playback starts.

   ➔ If you press PROG and there is no track selected or no tracks programmed, SEL or NO PRog is displayed.

   ➔ If you try to store more than 30 tracks, FULL is displayed.

Clearing the program
• While playback is stopped, press ▶ to clear program.
   ➔ is displayed once, program goes off, and the program is cleared.

   ➔ The program will also be cleared if the power supply is interrupted, or if the CD-player lid is opened, or if the set switches off automatically.

Note: The program will also be cleared if the power supply is interrupted, or if the CD-player lid is opened, or if the set switches off automatically.
INSTRUCTION FOR USE

**FEATURES**

Selecting different playing possibilities MODE

It is possible to play tracks in random order, to repeat a single track or the entire CD, and to play the first few seconds of each track.

1. **Press MODE during playback as often as required in order to activate one of the following ‘modes’. The active mode is shown in the display.**
   - **shuffle**: All tracks of the CD are played in random order until all of them have been played once.
   - **shuffle repeat all**: All tracks of the CD are played repeatedly in random order.
   - **repeat**: The current track is played repeatedly.
   - **repeat all**: The entire CD is played repeatedly.
   - **SC A**: The first 10 seconds of each of the remaining tracks are played in sequence.

2. **Playback starts in the chosen mode after 2 seconds.**
   - To return to normal playback, press MODE repeatedly until the display shows no active modes.

ESP / Power Save Mode

With a conventional portable CD-player you might have experienced that the music stopped e.g. when you were jogging. The ELECTRONIC SKIP PROTECTION prevents loss of sound caused by light vibrations and shocks. Continuous playback is ensured. However ESP does not prevent playback interruptions during vigorous running. It also does not protect the unit against any damage caused by dropping.

- Switch the slider to ESP ON during playback to activate the shock protection.
- To deactivate the shock protection and enter the power save mode, switch the slider to POWER SAVE.
  - **esp** goes off.

**TROUBLESHOOTING**

Troubleshooting

**WARNING:** Under no circumstances should you try to repair the set yourself as this will invalidate the warranty. If a fault occurs, first check the points listed, before taking the unit for repair. If you are unable to solve a problem by following these hints, consult your dealer or service center.

The CD player has no power, or playback does not start

- Check that your batteries are not dead or empty, that they are inserted correctly, that the contact pins are clean.
- Your adapter connection may be loose. Connect it securely.
- For in-car use, check that the car ignition is on. Also check player’s batteries.

The indication **NO DISC** is displayed

- Check that the CD is clean and correctly inserted (label-side upward).
- If your lens has steamed up, wait a few minutes for this to clear.

The indication **NO F. or ISC** is displayed

- CD-RW (CD-R) was not recorded properly. Use FINALIZE on your CD-recorder.

The indication **HOLD** is on and/or there is no reaction to controls

- If HOLD is activated, then deactivate it.
- Electrostatic discharge. Disconnect power or remove batteries for a few seconds.

The CD skips tracks

- The CD is damaged or dirty. Replace or clean the CD.
- resume, shuffle or program is active. Switch off whichever is on.

No sound or bad sound quality

- **PAUSE** might be active. Press **PLAY**.
- Loose, wrong or dirty connections. Check and clean connections.
- Volume might not be appropriately adjusted. Adjust the volume on the CD player or slider on your remote control.
- Strong magnetic fields. Check player’s position and connections. Also keep away from active mobile phones.
- For in-car use, check that the cassette adapter is inserted correctly, that the car cassette player’s playback direction is correct (press autoreverse to change), and that the cigarette lighter jack is clean. Allow time for temperature change.

RESUME and HOLD

You can interrupt playback and continue (even after an extended period of time) from the position where playback stopped (RESUME) and you can lock all buttons of the set so that no action will be executed (HOLD). Use the OFF–RESUME–HOLD slider for these functions.

**RESUME** – continuing from where you have stopped

1. Switch the slider to RESUME during playback to activate RESUME.
   - **resume** is shown.
2. Press **II** whenever you want to stop playback.
3. Press **II** whenever you want to resume playback.
   - **resume** is shown and playback continues from where you have stopped.
   - To deactivate RESUME, switch the slider to OFF.
   - **resume** goes off.

**HOLD** – locking all buttons

You can lock the buttons of the set by switching the slider to HOLD. Now, when a key is pressed, no action will be executed. This is of use, for example, when transporting the player in a bag. With HOLD activated, you can avoid accidental activation of other functions.

1. Switch the slider to HOLD to activate HOLD.
   - **HOLD** is shown when you press any button. If the set is switched off, HOLD will be shown only when **II** is pressed.
2. To deactivate HOLD, switch the slider to OFF.

**Note:** If you deactivate HOLD by switching the slider to RESUME, you will be activating the RESUME function.

CAUTION

Use of controls or adjustments or performance of procedures other than herein may result in hazardous radiation exposure or other unsafe operation.
SAFETY & WARNINGS

WARNING

All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the set via a wristband with resistance. Keep components and tools at this potential.

ATTENTION

Tous les IC et beaucoup d’autres semi-conducteurs sont sensibles aux décharges statiques (ESD). Leur longévité pourrait être considérablement écourtée par le fait qu’aucune précaution n’est prise à leur manipulation. Lors de réparations, s’assurer de bien être relié au même potentiel que la masse de l’appareil et enfiler le bracelet serti d’une résistance de sécurité. Veiller à ce que les composants ainsi que les outils que l’on utilise soient également à ce potentiel.

©

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used. Safety components are marked by the symbol .

AVAILABLE ESD PROTECTION EQUIPMENT:

- anti-static table mat
  - large 1200x650x1.25mm
  - small 600x650x1.25mm
- anti-static wristband
- connection box (3 press stud connections, 1MΩ)
- extendible cable (2m, 2MΩ, to connect wristband to connection box)
- connecting cable (3m, 2MΩ, to connect table mat to connection box)
- earth cable (1MΩ, to connect any product to mat or to connection box)
- KIT ESD3 (combining all 6 prior products - small table mat)
- wristband tester

DANGER: Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.

CLASS 1 LASER PRODUCT

AVOID DIRECT EXPOSURE TO BEAM.

After servicing and before returning the set to customer perform a leakage current measurement test from all exposed metal parts to earth ground, to assure no shock hazard exists. The leakage current must not exceed 0.5mA.
HANDLING CHIP COMPONENTS

SERVICE TOOLS

Audio signal disc SBC429
Playability test disc SBC444
Test disc 5 (disc without errors) + Test disc 5A (disc with dropout errors, black spots and fingerprints) SBC426/ SBC426A

ESD PROTECTION EQUIPMENT

Anti-static table mat large 1200x650x1.25mm
Anti-static wristband
Connection box (3 press stud connections, 1MΩ)
Extendible cable (2m, 2MΩ, to connect wristband to connection box)
Connecting cable (3m, 2MΩ, to connect table mat to connection box)
Earth cable (1MΩ, to connect any product to mat or to connection box)
KIT ESD3 (combining all 6 prior products - small table mat)
Wristband tester
SERVICE HINTS

REPAIR POSITION COPPERSIDE

To get access to the copperside of the printed board assembly proceed as follows:

1. Remove the bottom (3x) screws (2x of them under the rubber-foot) and the up (2x) screws (in the CD-door)
2. Lift the bottom -cabinet
3. Supply the unit via external DC-socket
4. Take care that the door switch is closed during measurements

REPAIR POSITION COMPONENTSIDE

To get access to the componentside of the printed board assembly proceed as follows:

1. Remove the bottom (3x) screws (2x of them under the rubber-foot) and the up (2x) screws (in the CD-door)
2. Open the CD-door
3. Lift the top-cabinet and put it backwards on the table
4. Supply the unit via the external DC-socket
5. Take care that the door switch is closed during measurements

DISMANTLING THE CD-DOOR

To dismantle the CD-door proceed as follows:

1. Dismantle bottom and printed board/drive assembly
2. Disconnect the sticker (flex-foil connector on the membrane keyboard)
3. Disconnect membrane keyboard (flex-foil connector on copperside of printed board)
4. Bend the cabinet rightwards downwards as indicated in the picture above

Remark: Do not use screwdrivers or tools. Sharp edges could damage hinge or cabinet part.
SERVICE TEST PROGRAM

1. PRELIMINARY SETUP
- To enter the service test program disconnect the AC/DC adaptor and remove batteries, open the CD-door and hold the buttons “PLAY” & “VOL+” depressed while turning power on (i.e. connecting the AC/DC adaptor).
- The display shows the software version of the built-in µP (i.e. “5.2-2.5”). Versions are counted from “COD” onwards; that means the higher the number the newer the software.
- The program is now in the main menu – various tests can be entered by pressing the corresponding buttons (see flow chart on next page or detailed description of available tests below).
- To exit the service test program press the “STOP” button or disconnect the set from the power source.

2. DISPLAY TEST
Purpose: Check functionality of display and display driver.
- To enter the display test start the service test program and press the “NEXT” button.
- The display shows test pattern 1. All segments are activated for finding open circuits (see flow chart on next page).
- To jump to the next pattern press the “NEXT” button.
- The display shows test pattern 2. All alternate pins (2, 4, ...) are activated for finding short circuits (see flow chart on next page).
- To jump back to test pattern 1 press the “NEXT” button, to exit the display test and return to the main menu press the “STOP” button.

3. KEY TEST
Purpose: Check operation of keys and cord remote control.
- To enter the key test start the service test program and press the “MODE” button.
- The display shows “- - -”.
- Hold key depressed and check corresponding key code on the display. Key codes can be found in table 1 (see flow chart on next page).
- To exit the key test and return to the main menu press the “STOP” button.

4. PLAYBACK TEST WITH ERROR ANALYSIS
Purpose: Analyze errors that occur during playback and search for intermittent failures.
- To enter the playback test start the service test program and press the “BASS” button.
- To start the error analysis press the “PLAY” button. Note that the playback test can only be entered if the CD-door is closed.
- The set will read the TOC and start playback.
As long as the playback is free of errors the display shows track and time information like in normal play-mode. In case of errors corresponding error codes will be displayed. The meaning of these error codes can be found in table 2 (see flow chart on next page).
Note: Errors can either be “fatal” or “non fatal”. Fatal errors always stop the playback, non fatal errors only cause a short interruption of the music. Fatal errors are displayed as long as the set is connected to the power source, non fatal errors are displayed until a new error occurs or a button is pressed.
- To stop the playback test disconnect the set from the power source.

5. SERVO TEST
Purpose: Check door switch, inner switch of CD-drive, movement of slide and acceleration of discmotor.
- To enter the servo test start the service test program and press the “PLAY” button.
- The display shows “x/y”.
- “x” indicates state of door switch; “y” indicates state of inner switch.
- x,y = “0” means switch is closed; “1” means switch is open.
- To move slide outside hold the “NEXT” button depressed.
- To move slide inside hold the “PREV” button depressed.
- To accelerate the discmotor clockwise hold the “MODE” button depressed.
- To accelerate the discmotor counter-clockwise hold the “PROG” button depressed.
- To enter the focus test press the “PLAY” button, to exit the servo test and return to the main menu press the “STOP” button.

6. FOCUS TEST
Purpose: Check movement of lens and operation of focus servo for CDDA and CDRW discs.
Since the CDRW reflects much less light than an ordinary CDDA, the gain of the HF-amplifier stage and the sensitivity of the ADC inside the Decoder&Digital Servo IC “CD10” must be adapted accordingly. The gain is switched via the CDRW input of the HF-preamplifier. The ADC-sensitivity is set via software parameters (sent from µP to “CD10”). In total, there are 4 sensitivity modes available: 1 for CDDA and 3 for CDRW. The modes are listed in table 3 (see next page).
In normal play-mode, the correct focus sensitivity is chosen automatically during start-up (see “Start-up procedure” on previous page).
In the service test program, the sensitivity can be chosen manually in order to allow individual measurements in several modes.
- The focus servo loop is switched on and the set starts searching the focus (“focus ramping”). As soon as the focus has been found the focus servo loop is closed and the state of the focus is monitored continuously.
- If the focus is OK the display shows “x”, else “y”. “x” indicates the sensitivity mode. Details can be found in table 3 (see flow chart on next page).
- To toggle between sensitivity modes press the “BASS” button.
- To move slide inside hold the “NEXT” button depressed.
- To move slide inside hold the “PREV” button depressed.
- To accelerate the discmotor clockwise hold the “MODE” button depressed.
- To accelerate the discmotor counter-clockwise hold the “PROG” button depressed.
- In case the focus is OK the discmotor test can be entered by pressing the “PLAY” button, to exit the focus test and return to the main menu press the “STOP” button.

7. DISCMOTOR TEST
Purpose: Check speed regulation of discmotor.
- The speed regulation is switched on and the discmotor starts rotating. If the speed reaches 75% of the nom. speed the display shows “- - -”. Details can be found in table 3 (see flow chart on next page).
- In parallel also the state of the focus is monitored continuously (display “x” or “y”). 
- In case the disc speed is OK and the focus is OK the radial test can be entered by pressing the “PLAY” button, to exit the discmotor test and return to the main menu press the “STOP” button.

8. RADIAL TEST
Purpose: Check if radial loop locks and an audio signal is audible at the headphone output.
- The radial servo loop is switched on, mute is released and the audio signal is audible. If the system is on track the display shows “- - -”, else “- - -”. 
- In parallel also the disc speed (display “x” or “y”) and the state of the focus (display “x” or “y”) are monitored continuously.
Note: In case of radial errors the audio output is muted and muting is not released automatically when the systems recovers from the error. “- - -” remains on the display.
To open mute again press the “NEXT” or “PREV” button.
- To jump 16 tracks outside press the “NEXT” button.
- To jump 16 tracks inside press the “PREV” button.
- To exit the radial test and return to the main menu press the “STOP” button, to exit the service test program disconnect the set from the power source.

Important remark:
In radial test mode data to the DRAM is written at 1.2 times the nominal speed, and read from the DRAM at nominal speed. Because writing is done faster than reading the DRAM gets full after a certain time.
In normal play mode the system would now wait until the DRAM is partly emptied again, jump backwards and resume filling at the last written position. However, in radial test mode the jumps would disturb measurements on the radial servo loop. Therefore this function has been disabled and filling restarts immediately from the current position of the pick-up unit. As a result “jumps” are audible during playback.
SERVICE TEST PROGRAM - FLOW CHART

To enter service test program open the CD-door first and hold "VOL+" & "PLAY" buttons depressed while turning POWER ON (i.e. connecting the AC/DC adaptor)

**PRELIMINARY SETUP**

Display shows software-version (e.g. "S-06")

**DISPLAY TEST 1**

display shows test pattern 1

- NEXT pressed?
- MODE pressed?

**KEY TEST**

Display shows "--"

- NEXT pressed?
- MODE pressed?

**DISPLAY TEST 2**

display shows test pattern 2

- NEXT pressed?

**MAIN MENU**

- PLAY pressed?
- "BASS" pressed?
- "PREV" depressed?
- MODE depressed?
- PROG depressed?

**SERVO TEST**

Display shows: 

- Cdxy

State of switches: 
- x: door switch
- y: inner switch 

0 = closed 
1 = open

**FOCUS TEST**

Focus status:
- F x" = focus OK 
- Fx" = focus error 
x = focus sensitivity 

Note: If focus has been lost, focus start-up procedure (ramping) is entered.

**ATTENTION:** FROM THIS TEST ONWARDS THE LASER IS SWITCHED ON !!

→ AVOID DIRECT EXPOSURE TO BEAM !!

**FOCUS SENSITIVITY**

Normal focus sensitivity for CDDA 
Low focus sensitivity for high-reflective CD-RW
Medium focus sensitivity for normal-reflective CD-RW
High focus sensitivity for low-reflective CD-RW

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**SERVICE TEST PROGRAM - FLOW CHART**
Note: Only these parts mentioned in the list are normal service parts.
## ELECTRICAL PARTSLIST

### - MISCELLANEOUS -

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</table>

Note: Only these parts mentioned in the list are normal service parts.