

**User Manual**

**for the**

**CD-ROM JUKEBOX Series**

**CDR 100**

## WARNING

TO REDUCE FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.  
TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE THE PLASTIC COVER INSIDE THE CHANGER.  
NO USER-SERVICABLE PARTS INSIDE.  
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL!

**NOTE: Replace fuses only with same type and values!**

In case hardware problems are encountered during installation or operation, it is recommended that you contact your supplier or the vendor from which you purchased the equipment.



according to IEC 825

### Important notice

Disassembling parts and changing any adjustments, apart from those specified within this manual, may result in exposure to hazardous laser radiation.

**CAUTION !** Use of controls or adjustment or performance of procedures other than those specified herein may result in hazardous radiation exposure.

The information and illustration contained in this manual are up to date at the time of publication.

Subject to technical modification without obligation to modify equipment already delivered!

This document is subject to change by NSM without notice.

**Version 12/98 - 1**

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NSM Jukebox GmbH, D 55411 Bingen am Rhein, Germany


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Part no. of this document: **141 464**

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## EG - KONFORMITÄTSEKTLÄRUNG

mit der Richtlinie 89 / 336 / EWG.

Hiermit wird bestätigt, daß das Produkt

CD-ROM Jukebox  
Serie CDR 100

mit den folgenden Normen bzw. normativen Dokumenten übereinstimmt:

**EN 50081-1**, EN 550 22,  
**EN 61000-3-2**, **EN 61000-3-3**,  
**EN 50082-1**,  
IEC 801-2, IEC 801-3, IEC 801-4,  
**EN 60950**.

Das Qualitätssicherungssystem der **NSM** garantiert die Konformität.

## NSM Jukebox GmbH

Im Tiergarten 20-30  
D-55411 Bingen am Rhein

26.02.96

Armin Frank

## EC - DECLARATION OF CONFORMITY

per 89 / 336 / EEC.

This is to confirm that the product

CD-ROM Jukebox  
Series CDR 100

is in conformity with the following standards or other normative documents:

**EN 50081-1**, EN 550 22,  
**EN 61000-3-2**, **EN 61000-3-3**,  
**EN 50082-1**,  
IEC 801-2, IEC 801-3, IEC 801-4,  
**EN 60950**.

**NSM** quality assurance system assures compliance.

## NSM Jukebox GmbH

Im Tiergarten 20-30  
D-55411 Bingen am Rhein, Germany

02-26-96

Armin Frank

## CE - DECLARATION DE CONFORMITE

avec 89 / 336 / CEE.

Nous déclarons que le produit

Jukebox CD-ROM  
Série CDR 100

est conforme aux normes ou autres documents normatifs suivants:

**EN 50081-1**, EN 55 022,  
**EN 61000-3-2**, **EN 61000-3-3**,  
**EN 50082-1**,  
IEC 801-2, IEC 801-3, IEC 801-4,  
**EN 60950**.

Le système d'assurance de la qualité de **NSM** garantit la conformité.

## NSM Jukebox GmbH

Im Tiergarten 20-30  
D-55411 Bingen am Rhein, Allemagne

26.02.96

Armin Frank

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**Important:** This product was FCC verified under test conditions that include use of shielded cables and connectors between system components. It is important that you use shielded cables and connectors to reduce the possibility of causing interference to radios, TV sets and other electronic devices.

If you have any problems contact your dealer.

Any change or modifications to the equipment by the user not expressly approved by the grantee or manufacturer could void the user's authority to operate such equipment.

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Control software and test software

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User manual

NSM Jukebox Series CDR 100

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## 1. The NSM Jukebox series CDR 100

The jukebox CDR 100 is a CD-ROM changer. It is based on the wellknown NSM CD-ROM changer for maximum 100 CD's. The jukebox includes a single ended Small Computer Systems Interface (SCSI - 2) for data exchange with a SCSI host and a RS232 interface for control purposes.

Up to 7 SCSI devices (as CDR 100 XA, WORM, HD-drives, ...) may be connected to a single SCSI host adapter by cascading the SCSI interface and the RS232 interface.

The volume of the jukebox is max. 100 CD's.

Digital Audio (Red Book, IEC 908, Compact Disc Digital Audio System) is routed through the embedded audio interface to two stereo line out connectors at the rear side of the jukebox.

The stereo line out signal may be connected to any stereo amplifier.

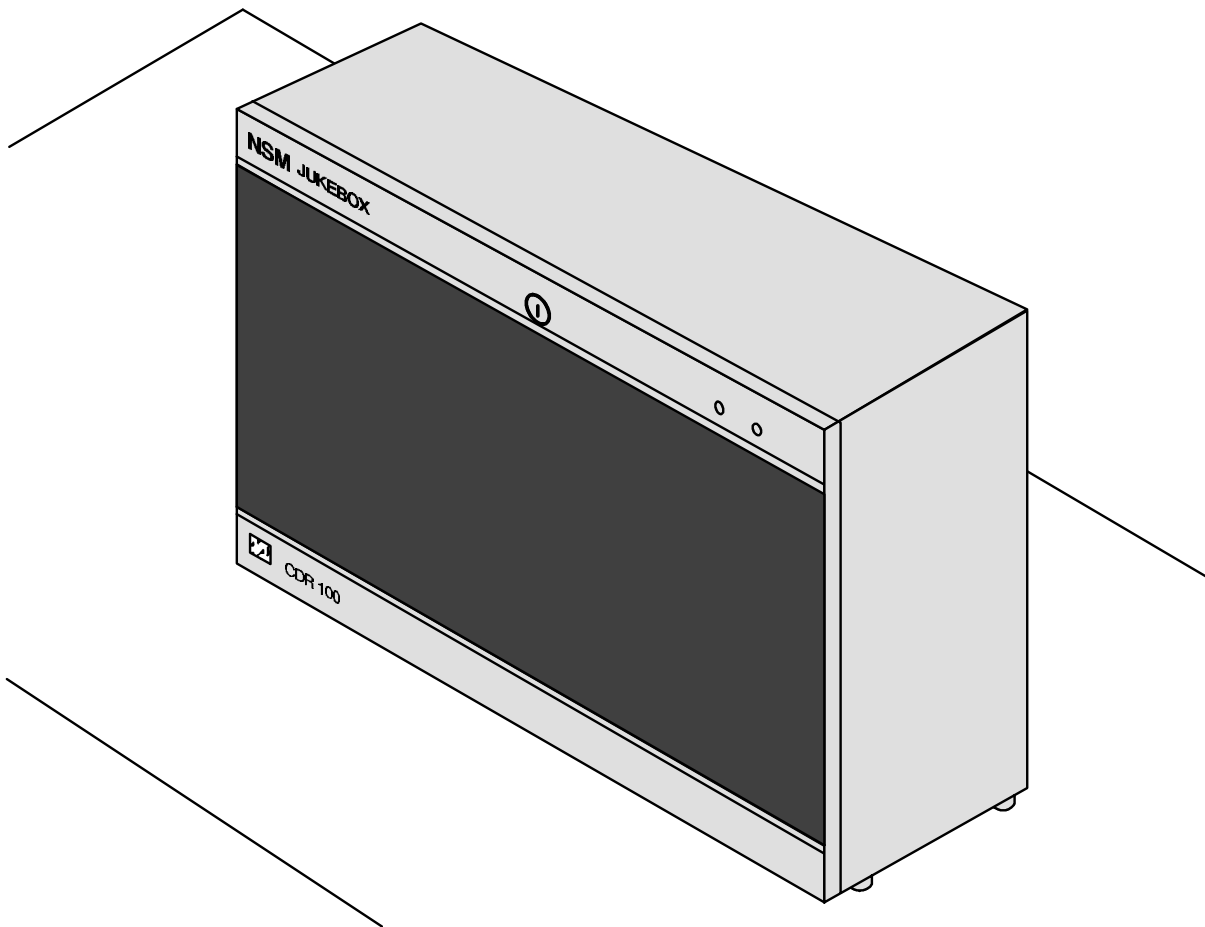


figure 1: The Jukebox CDR 100, general view





## 2. Unpacking

### 2.1 Packing List

The package of the jukebox should contain the following items:

- 1.) 1 CDR 100 jukebox
- 2.) 1 CD-ROM user manual
- 3.) 1 Quick installation guide
- 4.) 1 single ended SCSI-2 bus terminator
- 5.) 1 RS232 control cord NSM
- 6.) 1 power cord
- 7.) 2 CD magazines with room for 50 4,72" CDs each
- 8.) 100 trays for 4,72" CDs
- 9.) 2 keys for the front door lock
- 10.) 3 spare fuses
- 11.) 2 spare lamps

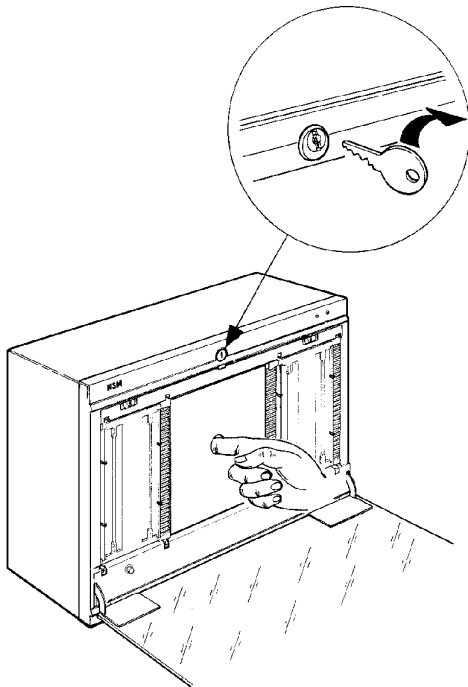
#### 2.1.1 List of Transportation Fixtures

- 1.) 1 paper transportation fixture/ CARD BOARD for the CD storage magazines
- 2.) 8 metal clamps mounted to the CD storage magazines
- 3.) 1 fixture profile, (slitted plastic pipe), which is fixing the CD jukebox
- 4.) 1 transportation security bracket within the DVD-drive}

### 2.2 Unpacking

Gently lift out the jukebox of the package and remove the packing pieces.

Make sure that the package contains all of the items listed in Ch. 2.1. If any of the items are missing, please contact your supplier immediately and request these parts.

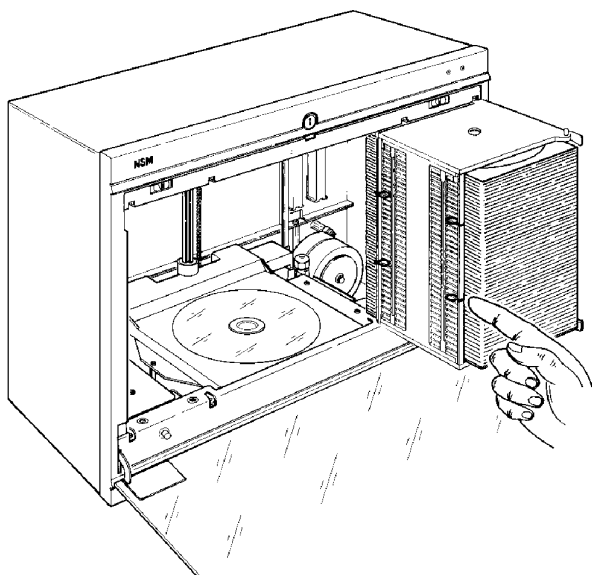


Please open the front door of the jukebox by inserting one of the supported keys into the lock and turning it to the right side. Gently push the lock with the key backwards into the appliance.

Now the front door will smoothly fold forward.

When the door is open, remove the paper transportation fixture, located between the two CD storage magazines.

figure 2: Opening of the CDR 100

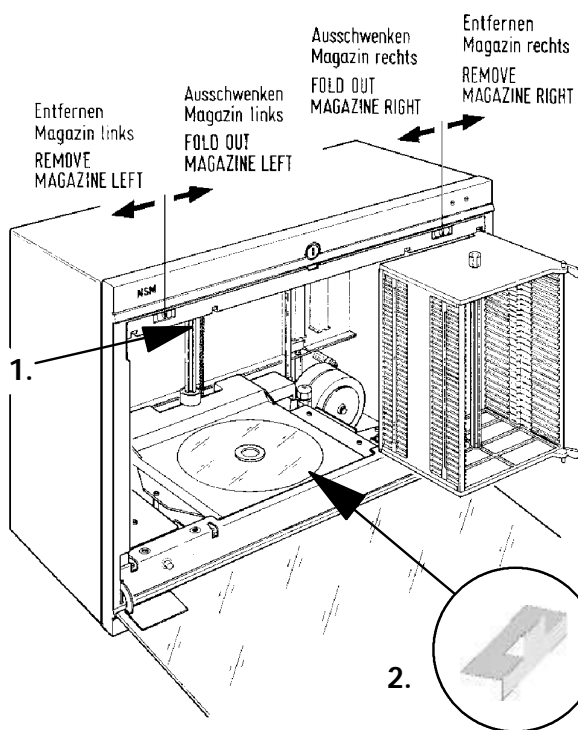


For simplified description only the right CD magazin is shown in figure 3.

Fold the two CD storage magazines to the outside by moving the two corresponding black knobs to the out side of the appliance and folding the left magazine to the left and the right magazine to the right.

Remove the red plastic splint (1.) mounted to the center metal bar by gently pulling it towards you.

Keep the storage magazines in their position.



Please remove the four metal clamps, mounted to each of the CD storage magazines, by taking the thick end of each metal clamp and slightly pulling it away from the CD storage magazine.

Please make sure that all transportation fixtures are removed from the inside of the jukebox (see Ch. 2.1.1).

Please fold back the two storage magazines and close the front door.

**Attention:** If you have got a CDR 100 jukebox with DVD-drive remove the transportation security bracket from the drive (2.).

figure 3: Removing of the transportation figures

**NOTE:** If the CDR 100 package shows evidence of rough handling or damage, and if the jukebox therefore does not function properly on initial start-up, please immediately return the unit and the damaged package to your supplier and request a replacement.

### 3. Installation

The necessary items to install your CDR 100 jukebox are:

- a host system,
- a 9 pin RS232 male - female interface cord
- a SCSI host adapter,
- a SCSI interface cord,
- a SCSI single ended bus terminator,
- a small screw driver.

#### Installation Note

**To prevent any damages to your CDR 100 or to any connected device please regard:**

**Before you connect the CDR 100 to any device, or before you make any changes to the connection between the CDR 100 and a device, please make sure to switch off the power supply of the CDR 100 and any connected device (i.e. host system, audio amplifier). Otherwise damages may be caused to the CDR 100 and the connected device(s).**

#### 3.1 Preparing the Installation Site

If you do not yet have a SCSI host adapter installed into your host system, please install the SCSI host adapter board and the corresponding SCSI device driver supported by the vendor of the SCSI host adapter first.

For detailed instructions on the installation of the SCSI host adapter and the SCSI device driver, please refer to the user manual supported with your host system and the user manual supported with your SCSI host adapter board.

#### 3.2 Setting the ID.number

The ID. switches of the CDR 100 allow to choose between 7 SCSI ID.s (0...6) and 16 RS232 ID.s (0...F).

If the CDR 100 is the only SCSI device connected to your system, it is not necessary to change the factory settings of the SCSI port and the serial port. In this case, reading this chapter is not necessary and you may continue reading chapter 3.3.

If the CDR 100 is to be added to previously installed SCSI devices such as CDR 100's, WORM's, MOD's or others, please select a SCSI ID.number (SCSI adress) and a serial ID.number (serial adress) for the CDR 100 that is not used by any of the previously installed devices. **Valid ID.numbers are 0 .. 6.**

*I.e.: If your host system already has two SCSI hard disc drives with ID 0 and ID 1, select ID 2 for the CDR 100.*

## Changing the ID. number of the CDR 100

To change the ID.number of the SCSI port and/or the serial port you first have to open the front door of the CDR 100 by inserting one of the supported keys and turning it to the right side. Gently push the lock backwards into the appliance. Now the front door will smoothly fold forward (see figure 2). When the door is totally opened fold out the right CD storage magazine to the outside by moving the corresponding knob to the inner side. Remove the right-hand storage magazine by holding it with your right hand and moving the knob to the outside. Put the storage magazine to a save place.

Locate the Interface board at the right side of the inner back plane of the CDR 100 unit. To select a new ID.number you have to use a small screw driver. Set the desired ID.number by turning the arrow of the switch to the position with the number that represents the ID.number.

Refer to the following figure.

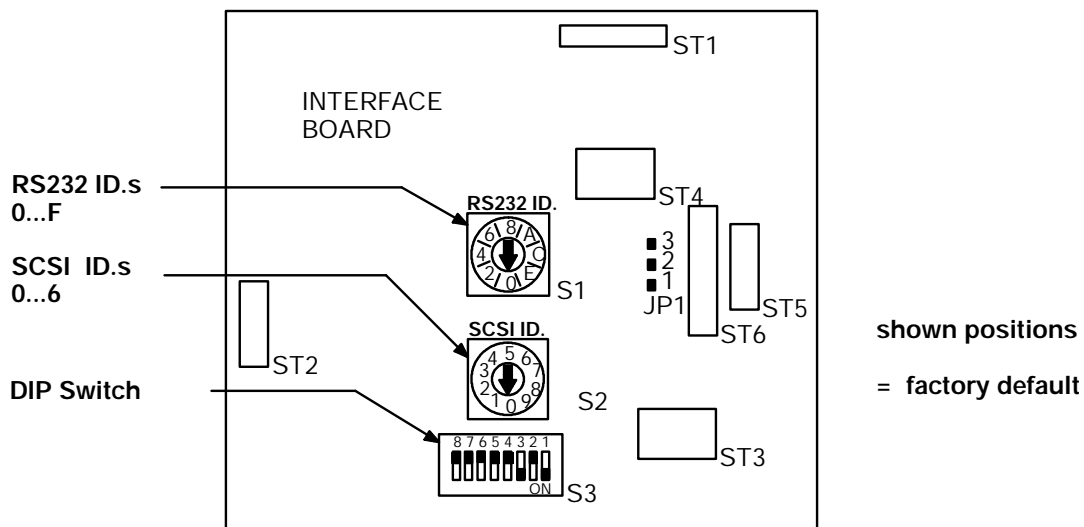


figure 4: Interface board inside the CDR 100

**NOTE:** We suggest that you choose the same selection for SCSI ID. as well as the serial ID.number.

In case of concatenating more than one CDR 100 by daisy chain, it is important to take care that all units (0...6) are set to the same baud rate. If you use a second SCSI host adapter we suggest to use the following setting:

**ID. 0...6** for SCSI and RS232 for the first seven jukeboxes and  
**ID. 0...6** for SCSI resp. **ID. 7...D** for RS232 for the second seven unit's of  
CDR 100.

### 3.3 Setting the DIP switch

Use DIP switch S3 to select baudrate for the serial interface and data parity for the SCSI bus.

To make any changes to DIP switch S3 use a small screw driver to move the switches into the appropriate position (ON or OFF).

**Please note, that** the setting off the DIP switch S3 depends on the type of installed drive. The following information will help you to choose the right setting

#### 3.3.1 DIP switch setting for jukeboxes with Yamaha CDR100 or Toshiba XM3501B drives

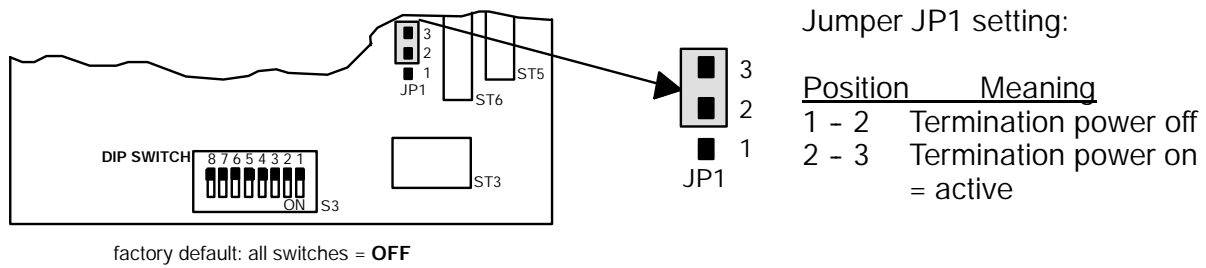


figure 5: Setting the DIP switch for jukeboxes with Yamaha CDR100 or Toshiba XM3501B

Switch	Function	ON	OFF
1	Data parity	disabled	enabled
2	Not used		
3	*		
4	*		
5	Baudrate setting	refer to Note 1	
6	Baudrate setting		
7	Not used		
8	*		

\* = **Factory use only; must always be OFF**

Note 1: Baudrate setting:

Baud	DIP 5	DIP 6
1200	OFF	ON
9600	OFF	OFF
19200	ON	OFF

### 3.3.2 DIP switch setting for jukeboxes with TEAC CD-516S drive

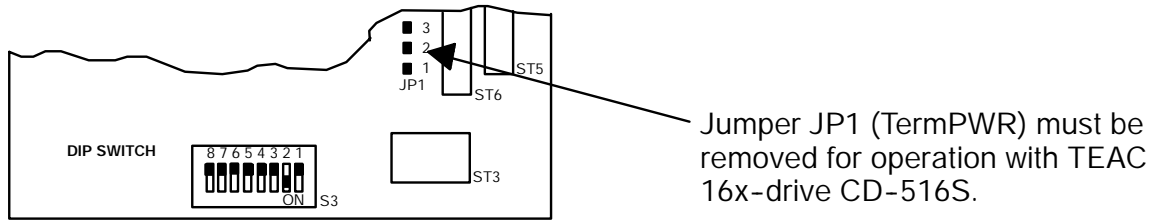


figure 6: Setting the DIP switch for jukeboxes with TEAC-CD 516S drive

Switch	Function	ON	OFF
1	Data parity	disabled	enabled
2	For TEAC drive CD-516S always set to ON		
3	Block size	512 Byte	2048 Byte
4	*		
5	Baudrate setting	refer to Note 1	
6	Baudrate setting		
7	Not used		
8	*		

\* = *Factory use only; must always be OFF*

Note 1: Baudrate setting:

Baud	DIP 5	DIP 6
1200	OFF	ON
9600	OFF	OFF
19200	ON	OFF

### 3.3.3 DIP switch setting for jukeboxes with Plextor PX-R412 drive

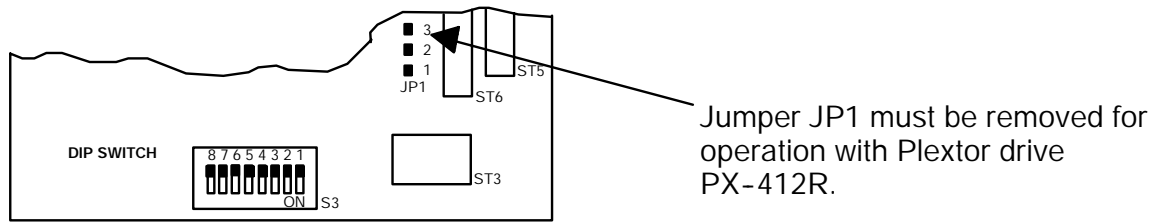


figure 7: Setting the DIP switch for jukeboxes with Plextor PX-R412 drive

DIP	Function	ON	OFF
1	Data parity	disabled	enabled
2	For Plextor PX-R412 always set to		OFF
3	Not used		
4	Block size	512 Byte	2048 Byte
5	Baudrate setting		refer to Note 1
6	Baudrate setting		
7	Not used		
8	<b>Factory use only; must always be OFF</b>		

Note 1: Baudrate setting:

Baud	DIP 5	DIP 6
1200	OFF	ON
9600	OFF	OFF
19200	ON	OFF

### 3.3.4 DIP switch setting for jukeboxes with Toshiba SD-W1101 DVD drive

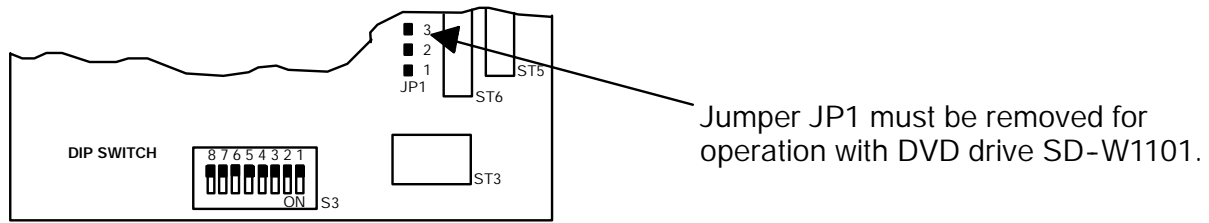


figure 8: Setting the DIP switch for jukeboxes with Toshiba SD-W1101 DVD drive

DIP	Function	ON	OFF
1	Not used		
2	Verify	enabled	disabled
3	One lun/two lun	two lun	one lun
4	Block size	512 Byte	2048 Byte
5	Baudrate setting	refer to Note 1	
6	Baudrate setting		
7	Not used		
8	<i>Factory use only; must always be OFF</i>		

Note 1: Baudrate setting:

Baud	DIP 5	DIP 6
1200	OFF	ON
9600	OFF	OFF
19200	ON	OFF

**Note: This DVD drive is tested and found to comply with the limits for electro-magnetically distortions defined by CE certificates, if it is connected to Adaptec 2949 / 3940 SCSI controller cards. With other controller cards the limits may be exceeded.**

#### Terminating the necessary settings

If you have made all changes, return the CD storage magazine by pushing it into the corresponding hinges and close the front door by latching it into its closed position.



### 3.4 Installation of the Terminating Resistor

The last device on the SCSI Bus has to be terminated with a SCSI bus terminator. Two kinds of bus termination are possible: Active termination is equipped with an internal power supply. Passive bus termination needs an external power supply. Such a passive bus termination resistor network is supplied with the CDR 100 jukebox(see Chapter 2.1).

To mount the terminator to the last device in a SCSI daisy chain gently push the terminator into one of the two 50 pin Delta Ribbon female connectors, located on the lower left corner of the CDR 100 back plane and fasten the two clamps to the connector by folding them towards the connector.

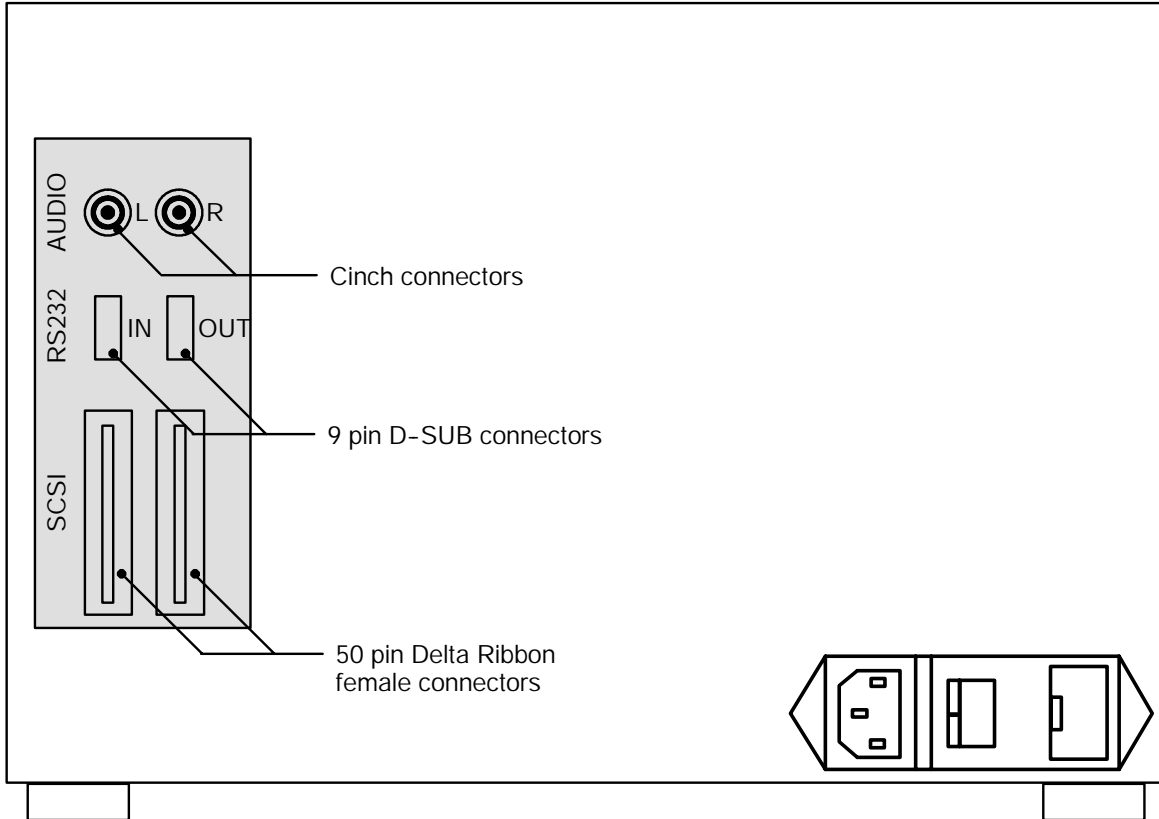


figure 9: Rear view of the CDR 100, placement of the interface connectors

### 3.5 Connecting the jukebox to the host system

Before you connect the CDR 100 to your host system, please make sure to switch off the power supply of the CDR 100 and the host. Do you have the correct SCSI and RS232 cord? Refer to the user manual of your host system.

**NOTE:** Using the wrong SCSI interface cord may damage your SCSI host adaptor permanently!

Take the supplied RS232 control cord and gently push the 9 pin D-Sub male connector into the 9 pin D-Sub female connector marked as **RS232 IN** (see figure 9). Gently push the 9 pin D-Sub female connector on the other end of the RS232 cord into the 9 pin D-Sub RS 232 interface male connector of your host system.

Gently push the 50 pin Delta Ribbon male connector on the one end of your SCSI interface cord into the remaining 50 pin Delta Ribbon female connector located on the lower left corner of CDR 100 back plane (see figure 9) and fasten the two clamps to the connector, by folding them towards the connector. Gently push the male connector on the other end of the SCSI interface cord into the female connector of the SCSI host adapter installed in your host system.

#### 3.5.1 Length of the SCSI cord for CDR 100 jukebox with TEAC drive CD-516S

Please note the following information if you operate a CDR 100 jukebox with a TEAC drive CD-516S:

- Disable the Plug & Play support in the Host-Adaptor-BIOS!
- The TEAC drive supports "Ultra-Wide-SCSI-Standard" (UW-SCSI).  
To guarantee a troublefree operation the length of the SCSI cord should not exceed 1,5m (internal length of the SCSI-bus = 0,8m).
- For operation with SCSI cord > 1,5m the UW-SCSI support has to be disabled in the Host-Adaptor-BIOS.

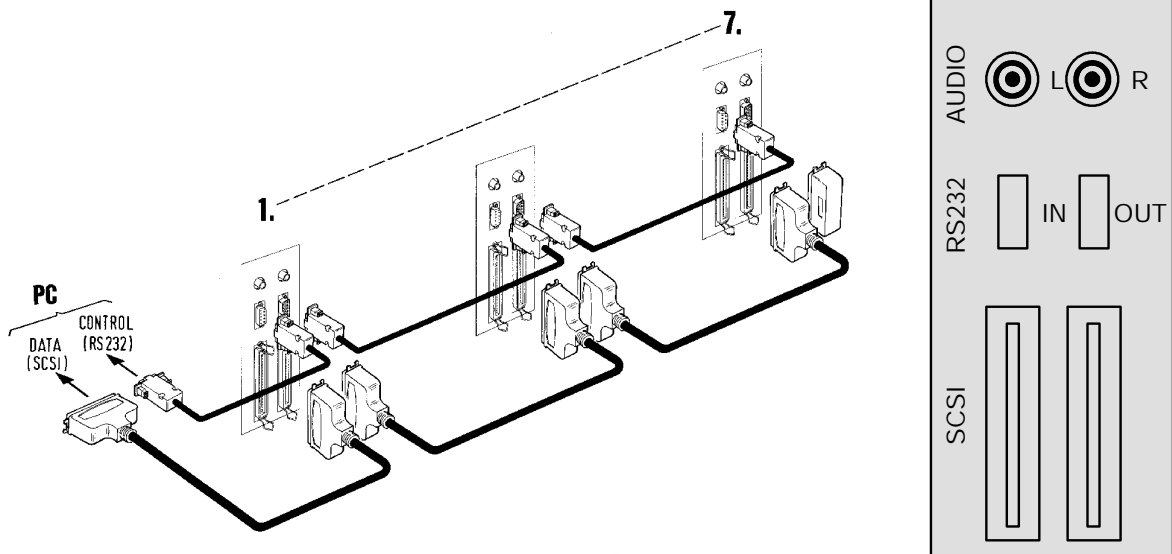


figure 10: Connecting one or more CDR 100 units

### 3.6 Concatenating of more CDR 100 jukeboxes

For concatenating two or more CDR 100 you need to have an additional SCSI interface cord and an additional RS232 control cord for each additional CDR 100 unit you wish to concatenate.

- Step 1: Set the RS232 ID. number as described in Ch. 3.2. Choose a different ID for each CDR 100 unit you wish to connect.
- Step 2: Set the SCSI ID. number as described in Ch. 3.2. For each CDR 100 unit choose the same SCSI ID. number as you have selected for the RS232 ID. number.
- Step 3: Connect the first CDR 100 unit of the daisy chain to the host system as described in chapter 3.4. Do not mount the terminating resistor network.
- Step 4: Take the additional RS232 interface cord and gently push the 9 pin D-Sub female connector located at the one end of the RS232 cord into the 9 pin D-Sub male connector marked as RS232 OUT, located at the back plane of the first CDR 100 unit of the daisy chain (see figure 10).
- Step 5: Gently push the 9 pin D-Sub male connector on the other end of the RS232 cord into the 9 pin D-Sub connector marked as RS232 IN, located at the back plane of the next CDR 100 unit (see figure 10) of the daisy chain.
- Step 6: Take the additional SCSI interface cord and gently push the 50 pin Delta Ribbon male connector located at the one end of the SCSI interface cord into the remaining 50 pin Delta Ribbon male connector located at the back plane of the first CDR 100 unit (see figure 10) of the daisy chain.
- Step 7: Gently push the 50 pin Delta Ribbon male connector on the other end of the SCSI interface cord into one of the 50 pin Delta Ribbon male connector located at the back plane of the second CDR 100 unit of the daisy chain (see figure 10).
- Step 8: If you are going to concatenate more than 2 CDR 100 units, proceed with Step 4 to Step 7 until you have connected the last CDR 100 unit to the chain.
- Step 9: Take the terminating resistor network and gently push it into the remaining 50 pin Delta Ribbon female connector of the last CDR 100 unit of the daisy chain.

- NOTE:**
- The total length of the RS232 bus shall not exceed 15 meters.
  - The total length of the single ended SCSI bus should not exceed 6 meters (regard that the internally used cable length of the jukebox is 0,8m!).
  - To a standard RS232 output 3 CDR 100 jukeboxes can be connected. If you want to connect more than 3 jukeboxes you must take care that the RS232-driver have the necessary output power.

### 3.7 Connecting the jukebox to an Audio Amplifier

Before you connect the CDR 100 to any audio amplifier, please make sure to switch off the power supply of either the CDR 100 and the audio amplifier.

You will only need a standard audio cord of the required length with two male cinch connectors at both ends. Gently push the male cinch connectors into the female cinch connectors located at the back plane of the CDR 100 unit (see figure 11) one after the other and connect the other end of the audio cord to your amplifier referring to the user manual of it.

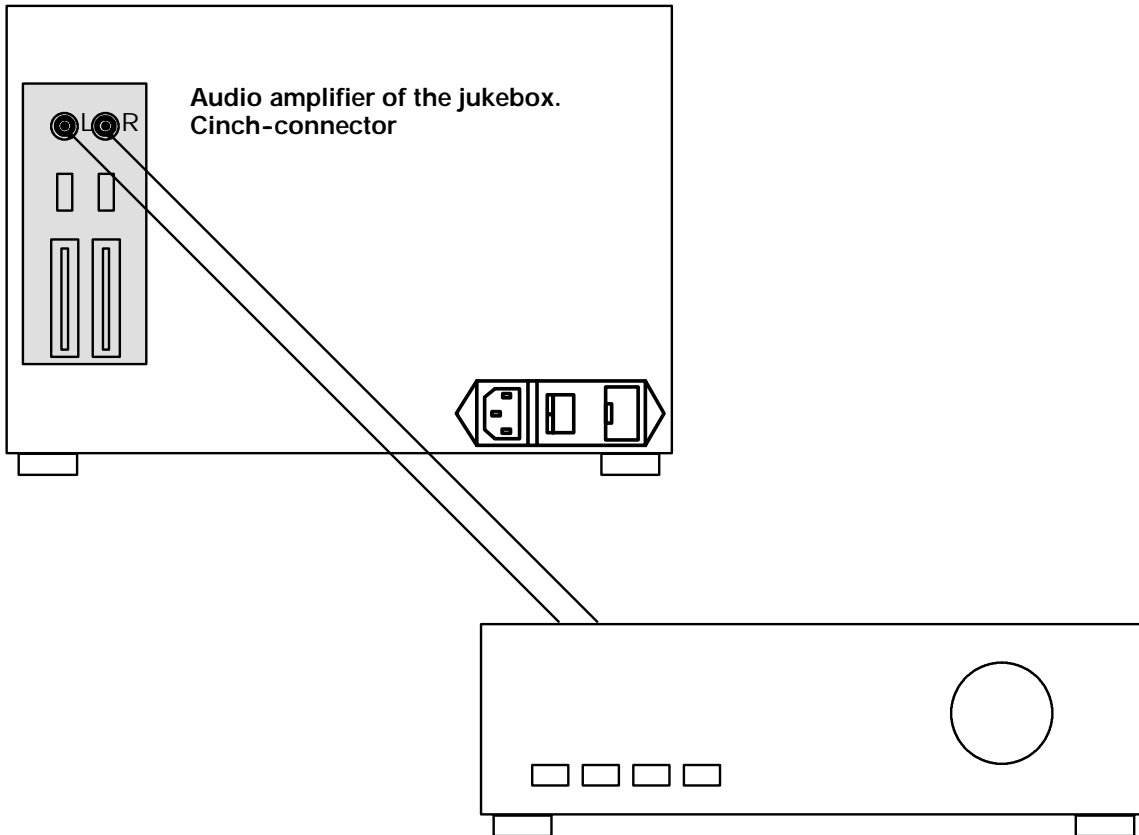


figure 11: Connecting the jukebox to an audio amplifier

### 3.8 Equipment of the CD Storage Magazines

To equip the CD storage magazines open the front door of the CDR 100 by inserting one of the supported keys into the lock and turning it to the right side. Gently push the lock with the inserted key backwards into the unit. Now the front door will smoothly fold forward.

When the door is totally opened fold the two CD storage magazines to the outside by pressing the corresponding black knobs to the inner side and folding the left magazine to the left and the right magazine to the right (see figure 3).

Remove the right-hand storage magazine by holding it with your right hand and pressing the right-hand, black knob to the right side (see figure 3).

Remove the left-hand storage magazine by holding it with your left hand and pressing the left-hand, black knob to the left side (see figure 3).

Remove a number of CD trays corresponding to the number of CDs you wish to insert into the magazine. Into the recess of each tray, place a CD **face up** (label up), and thereupon slide the tray into the first available slot of the magazine.

**NOTE:** CDs have to be placed **face up** respectively **label up** into the CD trays. Otherwise the CDR 100 may cause an error when accessing the wrong inserted CD.

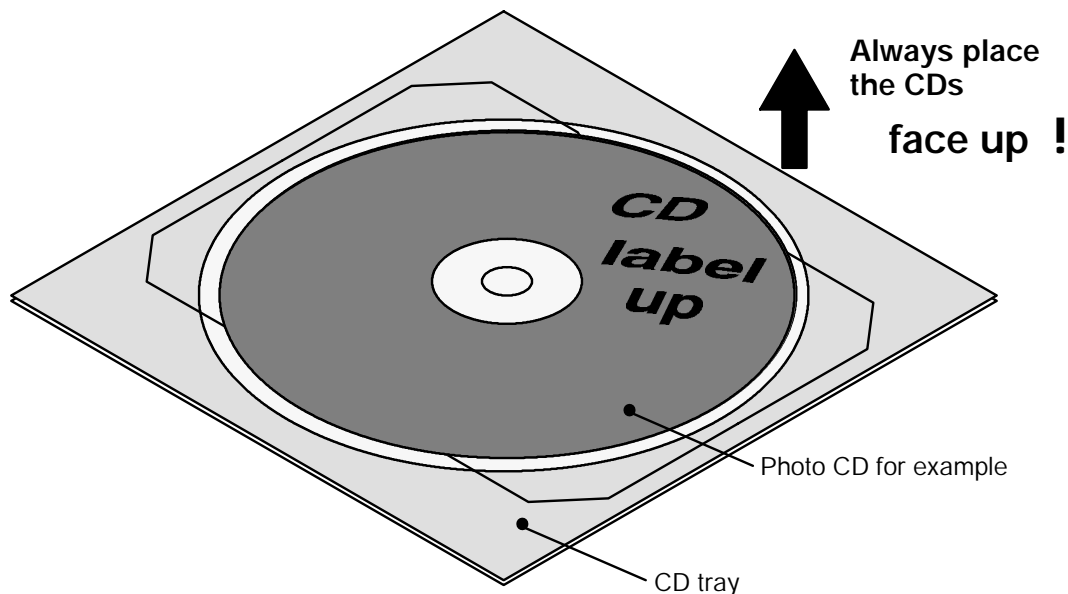


figure 12: CDR 100, disc handling and placing directives

Return the two CD storage magazines by pushing them into the corresponding hinges and close the front door by latching it into its closed position.

## 4. Operating instruction

### 4.1 Changing the Mains voltage:

To change the mains voltage you have to open the voltage selector and turn it to the desired voltage ( 120V or 230V).

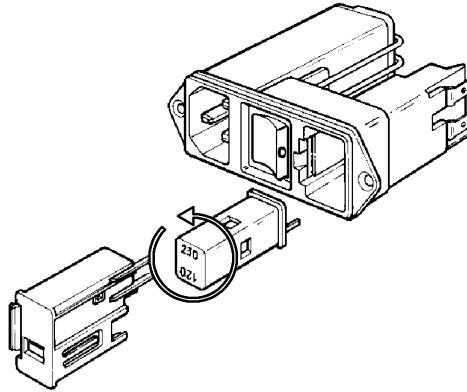


figure 13: Changing the Mains voltage

### 4.2 Switching ON the CDR 100

If you have installed the CDR 100 successfully and established all connections it is time to switch on the CDR 100. The power switch is located right hand on the back plane of the CDR 100 (see fig.14).

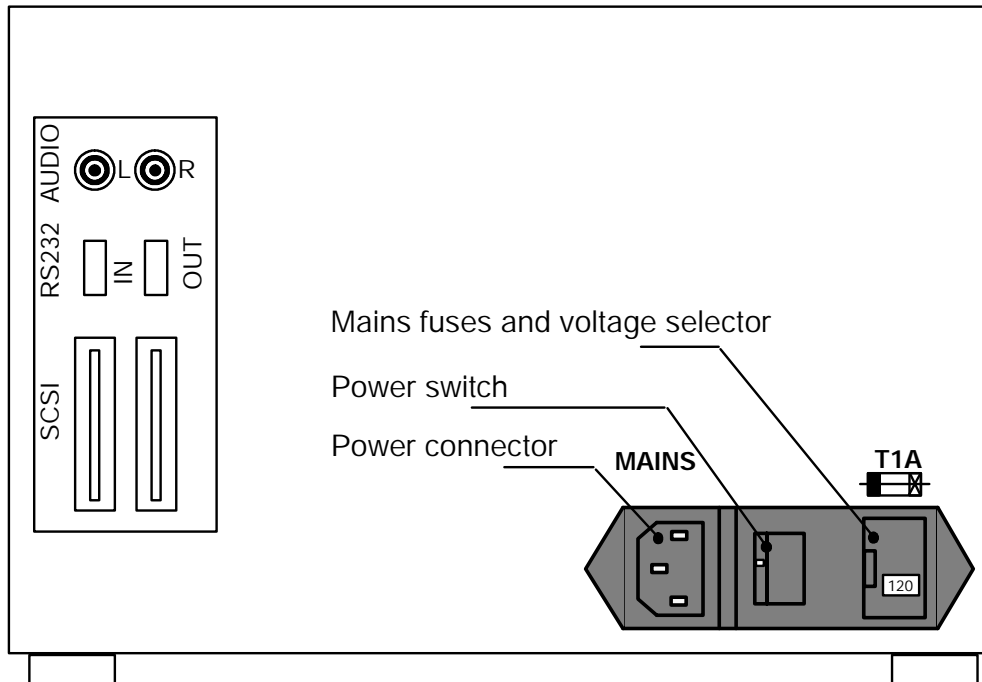


figure 14: Rear view of the CDR 100, power connection

**NOTE:** Always switch ON the CDR 100 before you boot your host system, otherwise the SCSI host adaptor may not be able to recognize the CDR 100 as a valid SCSI device!

### 4.3 LED operation display

The CDR 100 has two LEDs (yellow and multi-coloured) for displaying the status of operation.

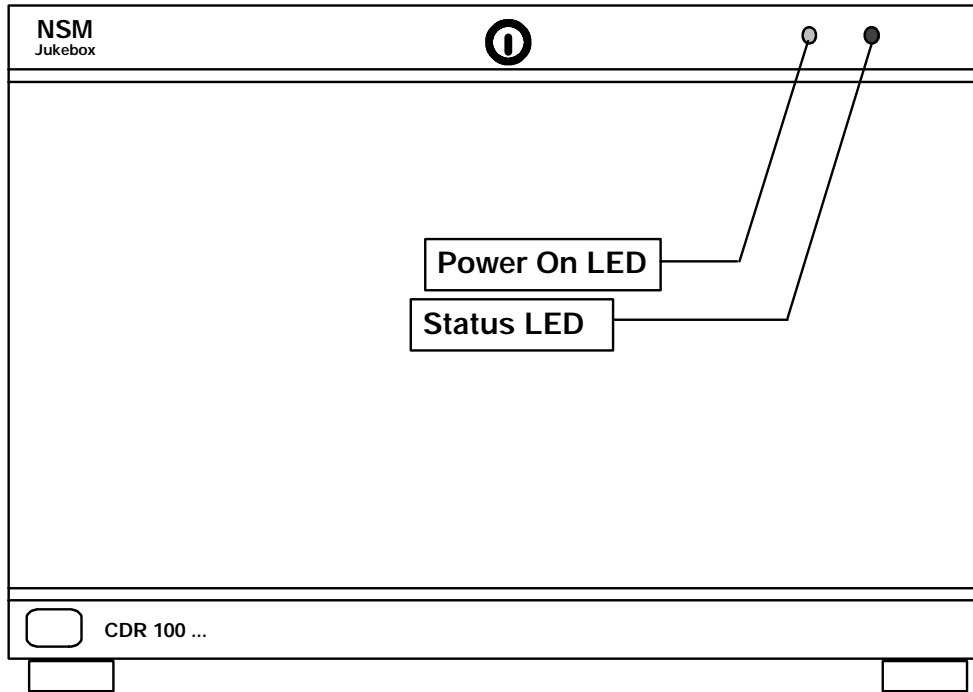


figure 15: Front view of the CDR 100, LED display

#### Meaning of the LED's:

Power On LED: While power on this yellow LED is on.

Status LED: Status indicator. This LED indicates several possible states:

table 1: Colour modes of the Status LED

COLOUR	ON	INTERMITTEND
green	Disc ready	CD-ROM drive
yellow	Stop, drive locked	Changer busy
red		Failure in lift movement

If the status is LED off, there is no CD loaded (pickup empty).

### 4.4 Care of discs

- 1) Whenever a disc is not in its sleeve or in an storage magazine, protect it from dust or other contaminants.
- 2) Handle discs only by the outer and inner edges.
- 3) If the data side of the disc becomes soiled, use a commercially available CD cleaning kit. Follow the kit instructions for cleaning the disc.





## EXAMPLES:

You have 1 CDR 100 unit connected to your PC via RS232 control port COM1 and wish to load disc no. 45:

**ACROM /L45 <ENTER>**

You have three CDR 100 unit control port ID 0, 1, 2 connected through a daisy chain. COM2 is configured as the CDR 100 control port, and you wish to load disc no. 99 in CDR 100 unit ID 2:

**ACROM /XCOM2 /I2 /L99 <ENTER>**

You wish to reload the loaded disc and stop the drive:

**ACROM /XCOM2 /I2 /R /S <ENTER>**

You wish to load disc no. 73 in CDR 100 unit ID 1, and wish to watch the command execution on the screen:

**ACROM /T /XCOM2 /I1 /L73 <ENTER>**

Screen Output: Remote Power On is active  
Load Disc No.73  
Return Code is 0

## 4.5.2 ACROMTSR

ACROMTSR is the TSR equivalent of ACROM.

<b>Invocation:</b>	<b>ACROMTSR</b> [Parameters]
<b>Parameters:?</b>	This Screen
<b>/XBAUDb, COMn</b>	b: Baud Rate 1200 .. 19200 (default: 9600) n: Port number 1 .. 4 (default: 1)
<b>/XBaudb,Adra,IRQi</b>	a: IO Base Adress 0 .. FFFFhex i: IRQ number 0 .. Fhex
<b>/In</b>	n: ID. number 0 .. 15
<b>/R</b>	Install Resident
<b>/H</b>	Hide Window
<b>/Kn</b>	Hot Keys to invoke: 0 = Alt+Esc (default) 1 = Ctrl+Esc 2 = LShift+Esc 3 = Ctrl+Alt+Esc 4 = Alt+LShift+Esc 5 = Ctrl+LShift+Esc

Activating ACROMTSR using the hot key will pop up the following window, if ACROMTSR is in visible mode (ACROMTSR was invoked not specifying the /H parameter):

### CD ROM

Enter Command Key (L,R,S,I,H,ESC)  
Loader Empty (LN), door closed, ID 00

**Commands:**  
**L** Load Disc n (1 .. 100)  
**R** Return Disc  
**S** Stop Disc  
**I** ID number n (1..15)  
**H** Toggle Window  
**ESC** Good Bye!

After input of **L** a number, specifying the disc you wish to load, has to be entered.

After input of **I** a number, specifying the ID of the control port of the CDR 100 you wish to access, has to be entered.

### 4.5.3 ACSCAN

With this software you can test the installation. This process checks the control ports of the installed jukeboxes. So you can find out which and how many jukeboxes are on the link of the daisy chain.

**Invocation:**        **ACSCAN** [Parameters]

**Parameters: ?**

	This Screen
<b>/XBAUDb, COMn</b>	b: Baud Rate 1200 .. 19200 (default: 9600) n: Port number 1 .. 4 (default: 1)
<b>/XBaudb,Adra,IRQi</b>	: IO Base Adress 0 .. FFFFhex i: IRQ number 0 .. Fhex
<b>/Fn</b>	First ID. number to scan (0 .. 63)
<b>/Ln</b>	Last ID. number to scan (0 .. 63)

## 5. Serial interface

Via the serial interface of the appliance it is possible to control the CD changing functions of the CDR 100. Communication is performed on this RS232 interface with ASCII coded data (8 bit). A command to the CDR 100 consists of an address byte and a command block. The CDR 100 responds to each command with an acknowledge block.

### Timing:

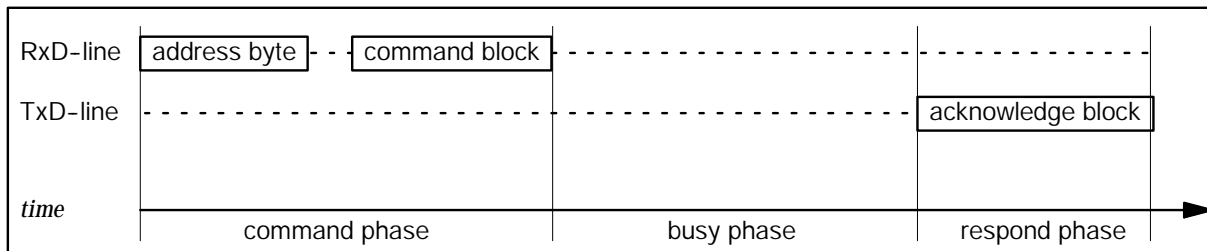


figure 16: Timing of one communication cycle

### 5.1 Address Byte

We strongly recommend that you always transmit the address byte before transmission of a command block to the CDR 100.

The address byte has the following structure:

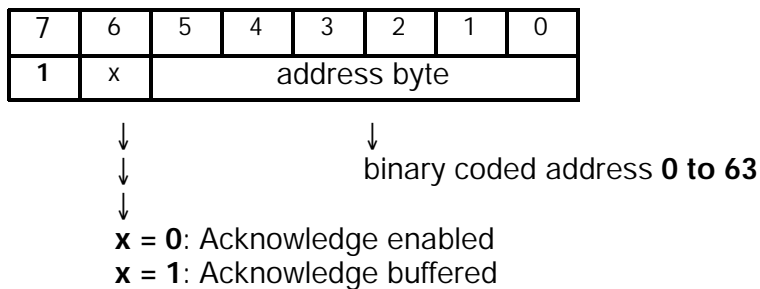


figure 17: Structure of the address byte

Definition of the contents of the different bits:

**Bit 7** of address byte is always set to **1**.

**Bit 6** controls the response mode of the CDR 100.  
If bit 6 is set to **0** the acknowledge block is always transmitted after the complete execution of a command.  
If bit 6 is set to **1** the acknowledge block is not transmitted but buffered. After the renewed transmission of an address byte with bit 6 = 0 the previous acknowledge block is released and then transmitted.

**Bit 5..0**, These bits can address one of 64 units. The address is binary coded.

**NOTE:** An address byte must not be transmitted between STX and ETX of a command block.  
After transmission of an address byte with bit 6 = 0 you always have to wait for the ETX of a possible acknowledge block, before you transmit any further address bytes.  
Before you transmit further commands to a CDR 100, you have to wait for ETX of the acknowledge block of the previous command to this CDR 100.

## 5.2 Command Structure

All commands to the CDR 100 are transmitted as a command block. The CDR 100 will receipt each command with an acknowledge block. If the transmission of a command or data was incorrect, the CDR 100 will acknowledge with NAK (15 hex).

While processing a command, an inquiry command (ENQ, 05 hex) may be send to the CDR 100. The receipt (EOT, 04 hex) of the inquiry command will be acknowledged within 2 seconds.

**NOTE:** The first ENQ of a command must be transmitted after the ETX of the command block and before a new address byte.

**A command block has to have the following structure:**

table 2: Command block structure

Byte	Length	Contents	Meaning
0	1	STX	Start of TeXt 02 hex
1	2	00..99	Number of bytes that follow, excluding ETX
3	2	00..99	Command code
5	n	Data	Command arguments
6+n	1	ETX	End of TeXt 03 hex

**An acknowledge block has the following structure:**

table 3: Acknowledge block structure

Byte	Length	Contents	Meaning
0	1	STX	Start of TeXt 02 hex
1	2	00..99	Number of bytes that follow, excluding ETX
3	2	00..99	Command code
5	2	00..99	Return code (0hex = OK)
7	n	Data	Acknowledge arguments
8+n	1	ETX	End of TeXt 03 hex

**Following commands are supported:**

table 4: List of available commands

Code	Argument	Function
00..13		Reserved
14		Request CDR 100 ID.-Code
15,20,21		Reserved
22	ADD	Load Disc R: A = absolute, +/- = relative DD: Number of disc to load (01..99)
23		Reserved
24		Return disc
25		Request status

**The following Return Codes are possible:**

table 5: List of possible return codes

Return-Code	Meaning
00	Command executed without error
01	Unknown command
02	Error in command format
03	CDR 100 busy
04	Door is open
11	No CD ROM disc loaded
12	Requested CD ROM not available
26	CD was stopped due to error
30	Error loading CD from magazine
31	Error putting CD back to magazine
32	Lift is stuck

These tables are referred to in the following section: "Command description"

## 5.3 Command description

### 5.3.1 Request CDR 100 ID. number

#### Command Code: 14

With this code you can command the following information:

- ID.number of the CDR 100 RS232 control port
- device type of the CDR 100
- firmware version of the CDR 100 jukebox.

Command Block:

Byte	Length	Contents	Meaning
0	1	STX	Start of TeXt 02 hex
1	2	02	2 bytes to follow, excluding ETX
3	2	14	Command code
5	1	ETX	End of TeXt 03 hex

Acknowledge Block:

Byte	Length	Contents	Meaning
0	1	STX	Start of TeXt, 02 hex
1	2	17	17 bytes to follow, excluding ETX
3	2	14	Command code
5	2	xx	Return Code (see table 5)
7	2	xx	CDR 100 ID Number
9	4	ROxx	Device Type
13	4	xxxx	Firmware Version
17	3	xxx	Text String
20	1	ETX	End of TeXt 03 hex



### 5.3.2 Load Disc

#### Command Code: 22

Loads a CD from the storage and puts it onto the CD-drive.

After successful initialization the drive will have the mode "DISC READY".

If there is a CD placed on the CD drive, the command "Load Disc" has integrated functionality of "Stop Disc" and "Return Disc" for the actual placed CD.

Command Block:

Byte	Length	Contents	Meaning
0	1	STX	Start of TeXt 02 hex
1	2	05	5 bytes to follow, excluding ETX
3	2	22	Command code
5	1	A	
6	2	xx	Number of the loaded CD (01, 02,..99, 00)
8	1	ETX	End of TeXt (03 hex)

Acknowledge Block:

Byte	Length	Contents	Meaning
0	1	STX	Start of TeXt, 02 hex
1	2	04	6 bytes to follow, excluding ETX
3	2	22	Command code
5	2	xx	Return Code (see table 5)
7	1	ETX	End of TeXt (03 hex)

### 5.3.3 Return Disc

#### Command Code: 24

Stops the CD-ROM drive turning, and returns the CD to its correct storage depot position.

Command Block:

Byte	Length	Contents	Meaning
0	1	STX	Start of TeXt, 02 hex
1	2	02	2 bytes to follow, excluding ETX
3	2	24	Command code
5	1	ETX	End of TeXt, 03 hex

Acknowledge Block:

Byte	Length	Contents	Meaning
0	1	STX	Start of TeXt, 02 hex
1	2	04	4 bytes to follow, excluding ETX
3	2	24	Command code
5	2	xx	Return Code (see table 56)
7	1	ETX	End of TeXt 03 hex

Note: Don't use this command between two loading commands (code 22).  
If necessary, the jukebox returns CD independently.

### 5.3.4 Request Status

#### Command Code: 25

Request status report of the CDR 100.

Command Block:

Byte	Length	Contents	Meaning
0	1	STX	Start of TeXt, 02 hex
1	2	02	2 bytes to follow, excluding ETX
3	2	25	Command code
5	1	ETX	End of TeXt, 03 hex

Acknowledge Block:

Byte	Length	Contents	Meaning
0	1	STX	Start of TeXt, 02 hex
1	2	09	9 bytes to follow, excluding ETX
3	2	25	Command code
5	2	xx	Return Code (see table 5)
7	2	xx	Status Code (see table 6)
9	1	x	O/C Door open/closed
10	2	xx	Disc No. 00..99
12	1	ETX	End of TeXt 03 hex

**The following Status Codes are possible:**

table 6: List of possible status codes

Status-Code	Meaning
LN	No CD ROM loaded
LE	Loader error
DR	Disc ready

## 6. Technical data

### 6.1 Factory settings

#### RS232 Settings

Control port ID:	<b>0</b>
Baudrate:	<b>9600 Baud</b>
Number of Start Bits:	<b>1</b>
Number of Data Bits:	<b>8</b>
Number of Stop Bits:	<b>1</b>
Parity:	<b>None</b>

#### SCSI Port Settings

SCSI ID:	<b>0</b>
----------	----------

#### Power Settings

Voltage:	<b>120 V AC (USA)</b>	230 V AC (Europe)
Frequency:	<b>60 Hz (USA)</b>	50Hz (Europe)

### 6.2 Environmental operating limits

Ambient Temperature:	<b>50 to 98,6° F</b> (10 to 37° C), operating
Temperature Gradient:	<b>51,8° F</b> (11° C/hr)
Relative Humidity (Non-condensing):	<b>10% to 68%</b> , operating

**NOTE:** These environmental limits apply to the drive only if the rates of temperature and humidity change do not combine to cause condensation on any part.

Power supply:	<b>120V ±15% AC (USA)</b> 230V±15% AC (Europe) (220V - 240V ±10% AC)
Frequency range:	<b>50Hz / 60Hz</b>
Power consumption max.:	<b>50VA</b>
Power consumption normal:	<b>20VA</b>

## 6.3 Dimensions

### Measurements

Width:	<b>472mm</b>
Height:	<b>365mm</b>
Depth:	<b>215mm</b>
Weight:	<b>18kg</b>





### 6.4.3 CD-ROM Drive "TEAC CD-516S"

Applicable Disc Format	CD-ROM Modus1, CD-DA, CD-ROM XA Modus2 Form-1, Form-2 Photo-CD (Multisession), CD-I, Video-CD
Data Capacity (Yellow-Book) User Data/Block	<b>2048 Bytes/Block</b> <b>2336 Bytes/Block</b>
Rotational Speed (ZCLV)	12X    Approx. <b>5960 rpm</b> (inside) 16X    Approx. <b>3620 rpm</b> (outside)
Transfer Rate (1 KByte = 2 <sup>10</sup> Byte = 1,024 Byte, 1 MByte = 2 <sup>20</sup> Byte = 1,048,576 Byte)	
Sustained Data Transfer Rate (ZCLV)	<b>2,4 MBytes/Sec max.</b> <b>2,3 MBytes/Sec typ.</b> <b>1,8 MBytes/Sec min.</b>
Burst (SCSI-2 Interface)	<b>5 MBytes/Sec (Async)</b> <b>10 MBytes (Sync)</b>
Acces Time Average Random Acces Time *1	<b>150 mSec typ.</b> (1/3 stroke)
Data Buffer Capacity	<b>512 KBytes</b>
<u>Line Output</u> RMS Output Voltage:	<b>1.0 V typ.</b>

#### Changing mechanism:

Load Time *2	<b>&lt; 4,5 sec average</b>
--------------	-----------------------------

#### Notes:

- \*1: Measured by performing multiple random access which means reads of data blocks over the whole area of media from 00 Min 02 Sec 00 Blk to 60 Min 01 Sec 74 Blk more than 3000 times.
- \*2: Time between transmitting the 'Load Disc' command and placing the disc on the drive.





## 6.4.5 DVD Drive "Toshiba SD-W 1101"

Applicable Discs	DVD-RAM, DVD-ROM, DVD-R, CD-ROM (multi-session), CD-DA, CD-R*1, CD-RW*1
Disc Diameter	<b>120 mm</b> (CD single, DVD-ROM single)
Rotational Speed	<b>2400 - 1028 rpm</b> (DVD-RAM) <b>2800 - 1200 rpm</b> (DVD-ROM single-layer) <b>3000 - 1300 rpm</b> (DVD-ROM dual-layer) <b>3516 rpm</b> (CD-ROM CAV max. 16X operation) <b>1758 rpm</b> (CD-ROM CAV max. 8X operation)
Transfer Rate (sustained)	<b>1350 KByte/s</b> (DVD-RAM) <b>2700 KByte/s</b> (DVD-ROM, DVD-R) <b>990 - 2400 KByte/s</b> (CD-ROM CAV operation 6.6 to 16X or equivalent) <b>330 - 1200 KByte/s</b> (CD-ROM CAV operation 3.3 to 8X or equivalent)
Burst (SCSI-2 Interface)	<b>5 MBytes/Sec</b> (Async) <b>10 MBytes</b> (Sync)
Physical Recording Size	<b>32 KBytes</b> (ECC block unit) (DVD-RAM)
Logical Sector Size	<b>2KBytes</b>
Data Buffer Capacity	<b>256 KBytes</b>
<u>Line Output</u>	analog
RMS Output Voltage:	<b>0,8 V</b>

### Changing mechanism:

Load Time \*2 < **4,5 sec** average

### Notes:

\*1: Depending on the feature of a recording unit that records data, playback function may not be guaranteed.

\*2: Time between transmitting the 'Load Disc' command and placing the disc on the drive.

**Disclaimer:**

Data presented in this user manual has been provided by sub-suppliers to NSM. While we believe such data to be accurate for purposes of comparison, we have not verified such data and it therefore should not be relied upon without independent verification by user. NSM expressly do not warrant or guaranty data provided by sub-suppliers.

**Caution:**

**During recording mechanical shock and vibration may cause damage to recorded data on CD-R!**

## Appendix

### Control- and test programs

On the delivered disc there are the described control - and test programs.