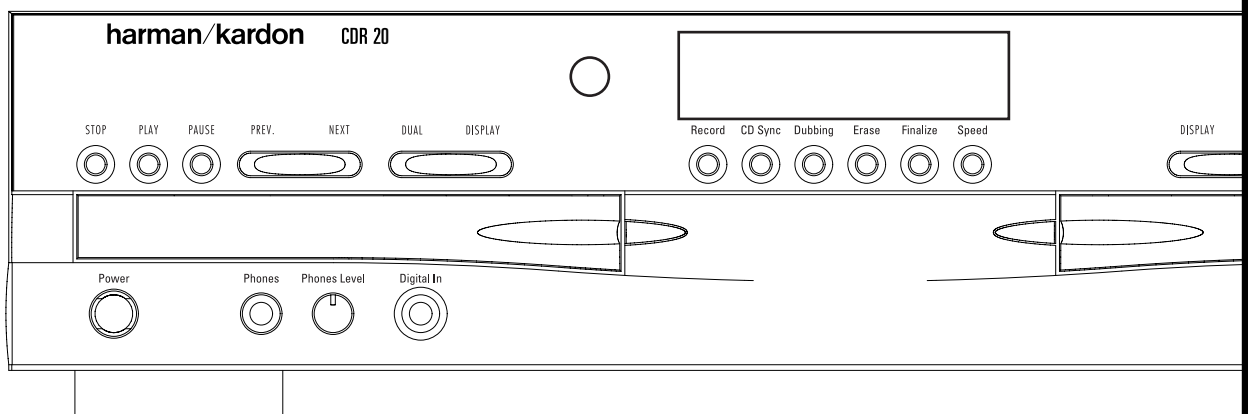


CDR 20 CD Recorder

OWNER'S MANUAL



harman/kardon®

Power for the digital revolution.™

CDR 20 Compact Disc Recorder

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Typographical Conventions

In order to help you use this manual with the remote control, front-panel controls and rear-panel connections, certain conventions have been used.

EXAMPLE – (bold type) indicates a specific remote control or front-panel button, or rear-panel connection jack

EXAMPLE – (OCR type) indicates a message that is visible on the front-panel information display

EXAMPLE – (outlined type) indicates a lit indicator in the front-panel information display

1 – (number in a square) indicates a specific front-panel control

1 – (number in an oval) indicates a button or indicator on the remote

1 – (number in a circle) indicates a rear-panel connection

A – (letter in a square) indicates an indicator in the front-panel display

Introduction

Thank you for choosing Harman Kardon.

The CDR 20 CD Player/Recorder is a unique product, designed not only to play back your existing library of compact discs, but also to record compact discs from either analog or digital programs. You may feed signals (for recording) to the CDR 20 from external sources such as an A/V receiver, a tuner, a tape deck or a CD player, or you may simply place a CD in one deck, and make a copy using a recordable CD in the other deck.

Designed and engineered by Harman Kardon, the CDR 20 is among the first audio CD recorders with x4 speed capability. This means that it will take only 15 minutes to copy a 60-minute disc.

The CDR 20 not only records with the highest speed and quality available but it is also an audiophile CD player. Through the use of audiophile-grade digital-to-analog converters (DACs), the CDR 20's performance rivals the most sophisticated high-end players. Should you wish to bypass the internal DACs and use an external digital processor, coax and optical digital outputs are available. Thanks to the CDR 20's dual-tray design, you may even play back two separate discs at the same time, for parties or multi-room applications. To make CD playback more enjoyable, the CDR 20 also features a wide range of program and repeat functions.

Since CD recorders are a relatively new technology, this may be your first CD-R product. Although CD recorders resemble play-only CD machines in many ways, there are some important differences between a standard CD and a CD-R. In addition, making a CD-R recording is also a different process than what you may be familiar with for making audio tape or cassette recordings. For that reason, we encourage you to read through this manual so that you are fully acquainted with the way CD recording works. This small investment in your time will pay major dividends in the enjoyment that will result from proper use of the CDR 20.

If you have additional questions about this product – its installation or operation – that are not answered in this manual, please contact your dealer, who is your best source of local information. You may also contact Harman Kardon via e-mail through our Web site at www.harmankardon.com.

Special Features

- **Dual-Deck CD Player and CD-R/CD-RW Recorder**
- **X4 Dub Speed for Both CD-R and Erasable CD-RW Discs**
- **Audiophile-Grade Digital-to-Analog Converters for Highest Audio Quality**
- **Dual-Play Capability**
- **Extensive Playback Programming Capabilities**
- **Coaxial and Optical Digital Inputs and Outputs**
- **Front-Panel Coaxial Digital Input for Use with Portable Devices**
- **Sample-Rate Converter Allows Use of DAT Players as Digital Source**
- **Ergonomic Remote Control**

Important Information About CD Recording

In order to get the most enjoyment from your new CD-R recorder, please pay special attention to the following sections of the manual that provide information about the special features and capabilities of CD Recorders.

- The CDR 20 plays all standard CD audio discs but for recording, the CDR 20 uses special CD-R and CD-RW discs designed only for audio use. CD-R discs designed for computer use will not work in the CDR 20. See page 14 for more information on which types of discs are used with the CDR 20.
- The last step in making a CD-R recording is the finalization process. Unless this step is properly done, the disc will not work in other players. See page 22 for information on finalizing discs.
- Once finalized, CD-R discs will play in any CD player, but CD-RW discs will only play in the CDR 20 and certain other machines. Check the specifications of your CD player if you have questions about compatibility with CD-RW discs.
- As with all CD players, except those designed specifically for portable use, you should never move a CD player while there is a disc inside one of the decks. **NEVER** move the CDR 20 until discs have been removed from both decks.

CAUTION

RISK OF ELECTRIC SHOCK DO NOT OPEN

CAUTION: To prevent electric shock, do not use this (polarized) plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Safety Information

Important Safety Information

Verify Line Voltage Before Use

Your CDR 20 has been designed for use with 100- to 240-volt AC current. Connection to a line voltage other than that for which it is intended can create a safety and fire hazard and may damage the unit.

If you have any questions about the voltage requirements for your specific model, or about the line voltage in your area, contact your selling dealer before plugging the unit into a wall outlet.

Do Not Use Extension Cords

We do not recommend that extension cords be used with this product. As with all electrical devices, do not run power cords under rugs or carpets or place heavy objects on them. Damaged power cords should be replaced immediately by an authorized service depot with cords meeting factory specifications.

Handle the AC Power Cord Gently

When disconnecting the power cord from an AC outlet, always pull the plug, never pull the cord. If you do not intend to use the unit for any considerable length of time, disconnect the plug from the AC outlet.

Do Not Open the Cabinet

There are no user-serviceable components inside this product. Opening the cabinet may present a shock hazard, and any modification to the product will void your guarantee. If water or any metal object such as a paper clip, wire or a staple accidentally falls inside the unit, disconnect it from the AC power source immediately, and consult an authorized service station.

CAUTION: The CDR 20 uses a laser system. To prevent direct exposure to the laser beam, do not open the cabinet enclosure or defeat any of the safety mechanisms provided for your protection. **DO NOT STARE INTO THE LASER BEAM.** To ensure proper use of this product, please read this owner's manual carefully and retain it for future use. Should the unit require maintenance or repair, please contact your local Harman Kardon service station. Refer servicing to qualified personnel only.

Installation Location

- To assure proper operation and to avoid the potential for safety hazards, place the unit on a firm and level surface. When placing

the unit on a shelf, be certain that the shelf and any mounting hardware can support the weight of the product.

- Make certain that proper space is provided both above and below the unit for ventilation. If this product will be installed in a cabinet or other enclosed area, make certain that there is sufficient air movement within the cabinet.
- Do not place the unit directly on a carpeted surface.
- Avoid installation in extremely hot or cold locations, or an area that is exposed to direct sunlight or heating equipment.
- Avoid moist or humid locations.
- Do not obstruct the ventilation slots on the top of the unit, or place objects directly over them.

Cleaning

When the unit gets dirty, wipe it with a clean, soft dry cloth. If necessary, wipe it with a soft cloth dampened with mild soapy water, then a fresh cloth with clean water. Wipe dry immediately with a dry cloth. NEVER use benzene, aerosol cleaners, thinner, alcohol or any other volatile cleaning agent. Do not use abrasive cleaners, as they may damage the finish of metal parts. Avoid spraying insecticide near the unit.

Moving the Unit

Before moving the unit, be certain to disconnect any interconnection cords with other components, and make certain that you disconnect the unit from the AC outlet.

IMPORTANT NOTE: To avoid damage to the CDR 20 which may not be covered by the warranty, be certain that all discs are removed from the unit before it is moved. Once the CDR 20 is installed, discs may be left in the unit when it is turned off, but the unit should NEVER be moved with discs left in either deck.

Important Information for the User

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. The 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 communication. However, there is no guar-

antee that harmful 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.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept interference received, including interference that may cause undesired operation.

NOTE: Changes or modifications may cause this unit to fail to comply with Part 15 of the FCC Rules and may void the user's authority to operate the equipment.

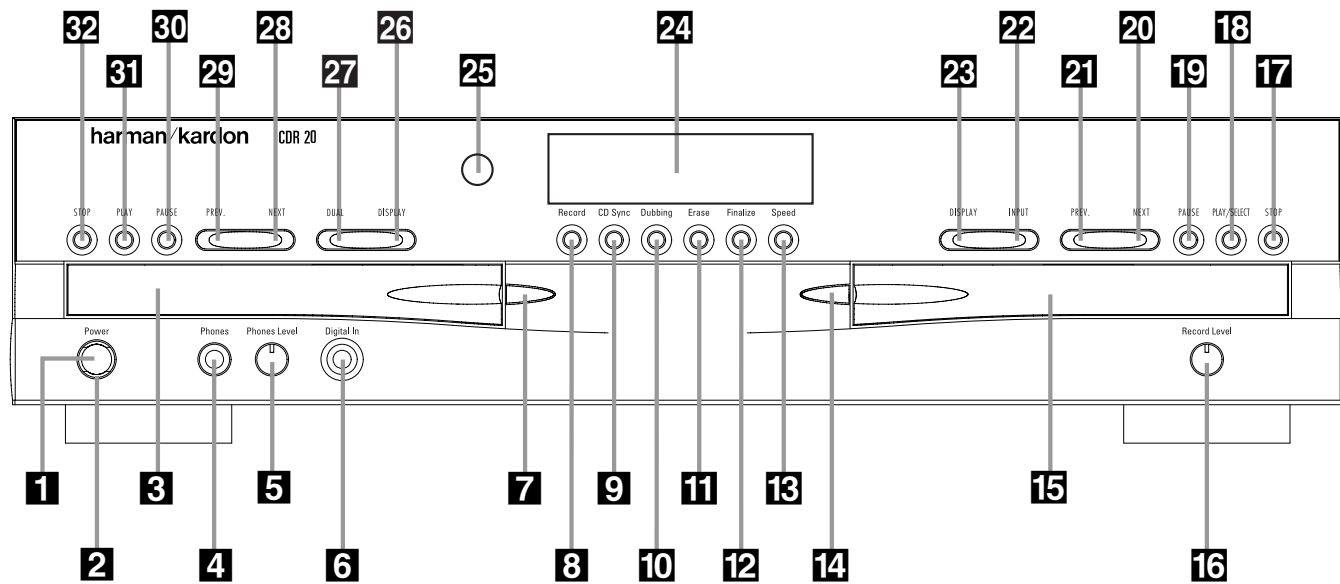
Unpacking

The carton and shipping materials used to protect your new receiver during shipment were specially designed to cushion it from shock and vibration. We suggest that you save the carton and packing materials for use in shipping if you move, or should the unit ever need repair.

To minimize the size of the carton in storage, you may wish to flatten it. This is done by carefully slitting the tape seams on the bottom and collapsing the carton down to a more two-dimensional appearance. Other cardboard inserts may be stored in the same manner. Packing materials that cannot be collapsed should be saved along with the carton in a plastic bag.

If you do not wish to save the packaging materials, please note that the carton and other sections of the shipping protection are recyclable. Please respect the environment and discard those materials at a local recycling center.

Front-Panel Controls



- | | | |
|----------------------------------|---------------------------------------|--------------------------------------|
| 1 Power Switch | 12 Finalize | 23 Record-Deck Display Select |
| 2 Status-Mode Indicator | 13 Speed | 24 Information Display |
| 3 Play Deck | 14 Record-Deck Open | 25 Remote Sensor |
| 4 Headphone Jack | 15 Record Deck | 26 Play-Deck Display Select |
| 5 Headphone Level Control | 16 Analog-Record Level Control | 27 Dual-Play Selector |
| 6 Digital Input | 17 Record-Deck Stop | 28 Play-Deck Next |
| 7 Play-Deck Open | 18 Record-Deck Play/Select | 29 Play-Deck Previous |
| 8 Record Button | 19 Record-Deck Pause | 30 Play-Deck Pause |
| 9 CD Sync | 20 Record-Deck Next | 31 Play-Deck Play |
| 10 Dubbing | 21 Record-Deck Previous | 32 Play-Deck Stop |
| 11 Erase | 22 Input Select | |

1 Power Switch: Press this switch to apply power to the CDR 20. When the unit is first turned on, the **Status-Mode Indicator 2** surrounding the switch will turn green. Once the unit has been turned on with this switch, it may be operated from either the front panel or remote control. Press the switch again to turn the unit completely off.

2 Status-Mode Indicator: When the CDR 20 is in the ON mode, this indicator will glow green. When the unit has been placed in the Standby mode by pressing the **Power-Off** button **32** on the remote, the indicator will glow amber, indicating that the unit is still connected to the AC main supply and is ready to be turned on from the remote control.

3 Play Deck: This disc deck is used to play back conventional CD discs and CD-R or CD-RW discs that have been finalized.

4 Headphone Jack: Connect standard headphones to this jack for private listening.

5 Headphone Level Control: Turn this control to adjust the volume level to the headphones. Note that the use of this control will not change the analog output levels at the rear-panel audio outputs **1 2**.

6 Digital Input: This coaxial digital input may be used to connect a portable digital audio player to the CDR 20 for digital recording. When an active digital signal is connected to both the front- and rear-panel coaxial inputs, the source connected to the front-panel input will be selected for recording.

7 Play-Deck Open: Press this button to open the Play Deck **3**.

8 Record Button: Press this button to begin the recording process. See pages 20-22 for more information on CD recording.

9 CD Sync: Press this button once to begin an automated recording of a single track from an external CD player when a digital connection is used. Press it twice to begin automated recording of an entire disc. See page 21 for more information on CD Sync recording.

10 Dubbing: Press this button to begin the process of making a complete copy of the disc in the Play Deck **3** to a CD-R or CD-RW disc in the Record Deck **15**. See page 20 for more information on dubbing.

11 Erase: Press this button to erase one or more tracks or the entire contents of an unfinalized CD-RW disc. When a CD-RW disc has already been finalized you may erase the entire disc or you may "unfinalize" the disc by erasing the **TOC** data. See page 22 for more information on erasing CD-RW discs.

Front-Panel Controls

12 Finalize: Press this button when a recording is complete to initiate the finalization process. The **Play/Select Button 13 10** must be pressed within three seconds to activate finalization. Until this button is pressed and the finalization process is complete, CD-R discs may not be played on conventional CD machines. See page 22 for more information on finalization.

13 Speed: Press this button to select the recording speed for internal dubs. See page 20 for more information on selecting the proper speed.

14 Record-Deck Open: Press this button to open the Record Deck **15**.

15 Record Deck: This Disc Deck is used to record or play back CD, CD-R and CD-RW discs.

16 Analog-Record Level Control: The control is used to adjust the input level when making recordings from analog sources such as cassettes, or when CDs are recorded in an analog mode. See page 22 for more information on record levels.

17 Record-Deck Stop: Press this button to stop the CD in the Record Deck.

18 Record-Deck Play/Select: This button has two functions. It may be pressed when a standard CD is in the Record Deck to put the machine in play, or it may be used to enter a selection or start certain record functions.

19 Record-Deck Pause: When the Record Deck is in the Play mode, pressing this button will pause the disc. If the disc has previously been paused, pressing this button will restart the playback.

20 Record-Deck Next: When a disc is playing in the Record Deck **15**, press and hold this button to play the disc in a fast-forward mode to quickly locate a desired passage. At any time, tapping the button and quickly releasing it will move to the next track on a disc in play.

21 Record Deck Previous: This button has two functions. When a disc is playing in the Record Deck **15**, press and hold this button to play the disc in a fast reverse mode to quickly locate a desired passage. At any time, tapping the button and quickly releasing it will move to the beginning of the current track, and the next press will move to the previous track. When a disc is stopped, each press will move back one for programming or play when the disc is stopped. Once a track is entered, it may be played by simply pressing the **Play** button **13 10**.

22 Input Select: Press this button to select the input source (analog or digital coax) for recording. See page 22 for more information on input selection.

23 Record-Deck Display Select: Press this button to cycle through the time display options for the Record Deck. See page 17 for more information on the time display.

24 Information Display: The indicators in the Information Display provide status reports on the operation of the CDR 20. See page 7 for complete explanations of each indicator.

25 Remote Sensor: The IR sensor that receives the commands from the remote control is behind this area. Do not cover or obscure this part of the front panel to avoid any malfunction with the remote.

26 Play-Deck Display Select: Press this button to cycle through the time display options for the Play Deck. See page 17 for more information on the time display.

27 Dual-Play Selector: Press this button to enable both CD decks to play at the same time and function as separate, independent CD units. In this mode it is also possible to record from an external source while the Play Deck is functioning as a standard CD player. See page 17 for more information on dual-play capability.

28 Play-Deck Next: When a disc is playing in the Play Deck **3**, press and hold this button to play the disc in a fast-forward mode to quickly locate a desired passage. At any time, tapping the button and quickly releasing it will move to the next track on a disc in play.

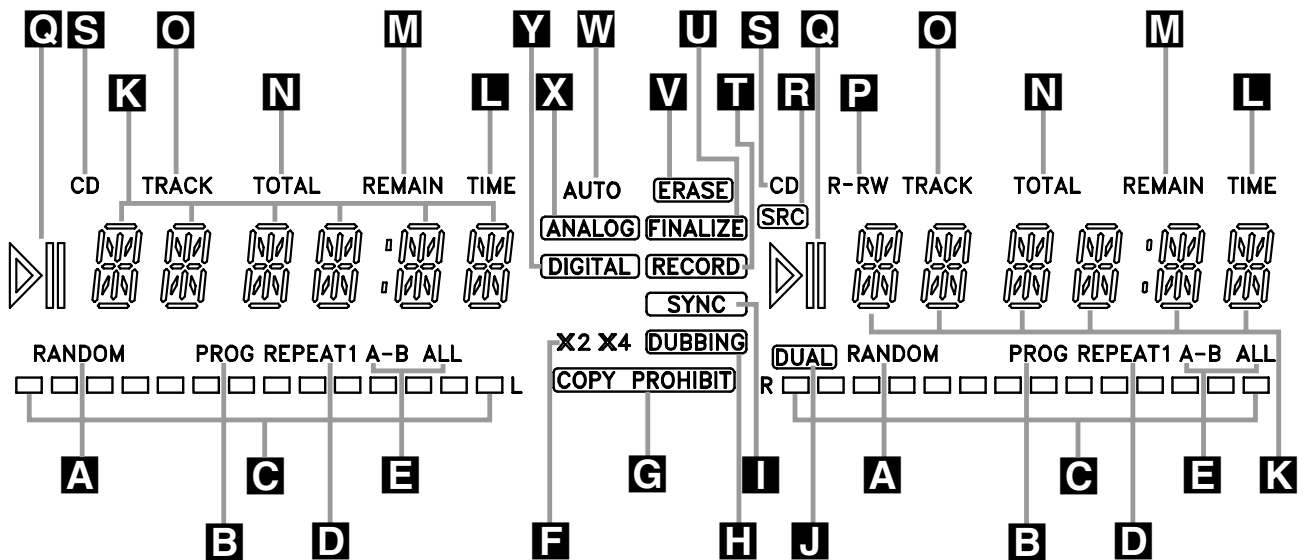
29 Play-Deck Previous: This button has two functions. When a disc is playing in the Play Deck **3**, press and hold this button to play the disc in a fast-reverse mode to quickly locate a desired passage. At any time, tapping the button and quickly releasing it will move to the beginning of the current track, and the next press will move to the previous track. When a disc is stopped, each press will move back one track for programming or play when the disc is stopped. Once a track is entered, it may be played by simply pressing the **Play** button **31 10**.

30 Play-Deck Pause: When the Play Deck is running, pressing this button will pause the disc. If the disc has previously been paused, pressing this button will restart the playback.

31 Play-Deck Play: Press this button to begin playback of a CD in the Play Deck or the dubbing process.

32 Play-Deck Stop: Press this button to stop the CD in the Play Deck.

Front-Panel Information Display



- A** Random Indicators
- B** Program Indicators
- C** Level Indicators
- D** Repeat Indicators
- E** Repeat-Status Indicators
- F** Speed Indicators
- G** Copy-Prohibit Indicator
- H** Dubbing Indicator
- I** Sync Indicator

- J** Dual-Play Indicator
- K** Information Displays
- L** Time Indicators
- M** Remaining-Time Indicators
- N** Total-Time Indicators
- O** Track-Time Indicators
- P** R/RW Indicator
- Q** Play/Pause Indicators
- R** Sample-Rate Converter

- S** CD Indicators
- T** Record Indicator
- U** Finalize Indicator
- V** Erase Indicator
- W** Auto Indicator
- X** Analog Indicator
- Y** Digital Indicator

Important Note: Since the CDR 20 is a dual-deck player/recorder, there are two separate sets of indicators for the Random, Program, Repeat, Repeat Status, Time, Total Time and Track Time. In addition, there is a separate Information Display, Play/Pause Indicator and CD Indicator for each deck. As the function of these indicators is identical for both decks, they are described in this manual with a common letter. When the CDR 20 is playing or recording a disc, any indicators that light on the left side of the display describe the status of the Play Deck, while those that light on the right side of the display describe the status of the Record Deck. Depending on the activity of the unit and the settings you select, different indicators may light on the two sides at the same time.

A Random Indicators: These indicators light when random playback has been programmed for one of the CD decks. See page 16 for more information on random play.

B Program Indicators: These indicators light when one of the CD decks is being programmed for playback options. See page 18 for more information on programmed play.

C Level Indicators: These LEDs display the input level during an analog recording, and the output level during playback. See page 22 for more information on record levels.

D Repeat Indicators: These indicators light when a repeat function is being used. See page 18 for more information on repeat play.

E Repeat-Status Indicators: These indicators display the type of repeat function being used. See page 18 for more information on repeat status.

F Speed Indicators: These indicators show which record speed has been selected for dub recordings. See page 20 for more information on record-speed selection.

G Copy-Prohibit Indicator: This indicator lights when a recording is not possible due to the intervention of the Serial Copy Management System (SCMS). See page 20 for more information on SCMS.

H Dubbing Indicator: This indicator lights when a dub is in progress between the two CD

Decks. See page 20 for more information on CD dubbing.

I Sync Indicator: This indicator lights when the unit has been programmed for a CD Sync recording. See page 21 for more information on CD Sync recordings.

J Dual-Play Indicator: This indicator lights when the unit is playing in the Dual mode, which allows both CD decks to act as playback decks at the same time. See page 17 for more information on the dual-play mode.

K Information Displays: These displays serve two functions, showing the time displays for discs playing, and displaying messages about discs or recordings.

Front-Panel Information Display

L Time Indicators: These indicators light in conjunction with one of the time indicators **M****N****O** to show which of the time status modes is active.

M Remaining-Time Indicators: These indicators light when the Information Display **K** shows the time remaining on a disc.

N Total Time: These indicators light when the Information Display **K** shows the total time of all tracks on a disc.

O Track Time: These indicators light when the Information Display **K** shows the running time of the individual track being played.

P R/RW Indicator: This indicator shows which type of recordable disc is present in the Record Deck **15**. When a CD-R disc is present, only the R is lit. The RW lights when an erasable CD-RW disc is in use.

Q Play/Pause Indicators: These indicators show the status of the individual CD decks. The ► lights when the CD is playing, and the ►|| lights when the unit is in a Pause mode.

R Sample-Rate Converter: This indicator lights when the Sample-Rate Converter is in use to change the digital sample rate when the incoming signal is not the standard 44.1kHz used by standard CDs. This is an automatic function and does not require any user intervention.

S CD Indicators: These indicators light when a standard CD is playing in either deck **3** or **15**.

T Record Indicator: This indicator lights when the unit is making a recording and flashes during the preparations for recording.

U Finalize Indicator: This indicator lights when the unit is in the Finalization process, which is required before a CD-R disc may be played on a standard CD machine. See page 22 for more information on Finalization.

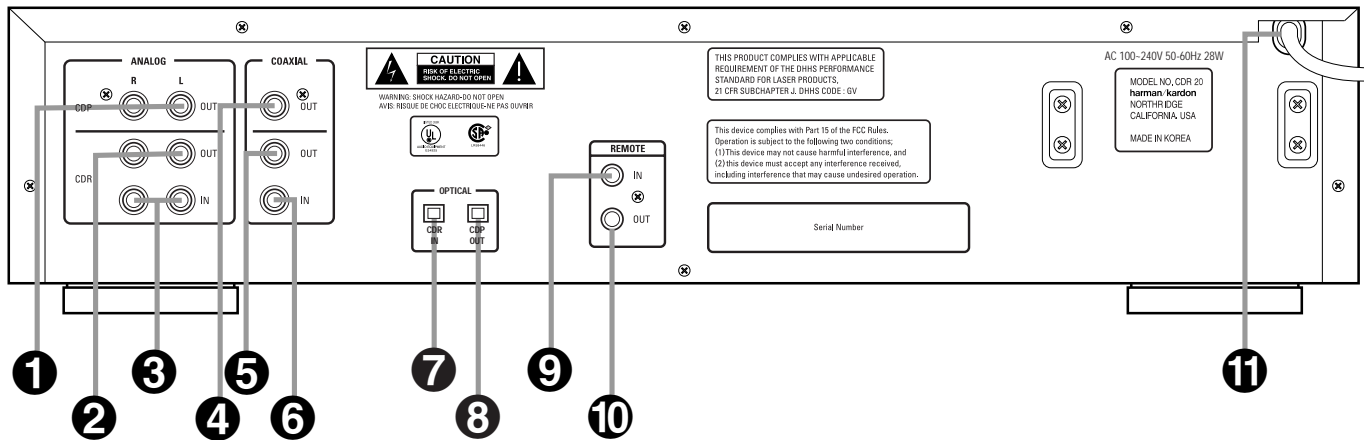
V Erase Indicator: This indicator lights when a CD-RW disc is being erased. Note that only CD-RW discs may be erased; it is not possible to erase a CD-R disc. See page 22 for more information on erasing discs.

W Auto Indicator: This indicator lights when the automatic method of incrementing tracks is selected for a recording session. See page 21 for more information on track increments.

X Analog Indicator: This indicator lights when an analog source is being recorded. See page 21 for more information on source selection.

Y Digital Indicator: This indicator lights when a digital source is being recorded. See page 21 for more information on source selection.

Rear-Panel Connections



- 1** Play Deck (CDP) Analog Output
- 2** Record Deck (CDR) Analog Output
- 3** Record Deck (CDR) Analog Input
- 4** Play Deck (CDP) Coaxial-Digital Output
- 5** Record Deck (CDR) Coaxial-Digital Output
- 6** Record Deck (CDR) Coaxial-Digital Input
- 7** Record Deck (CDR) Optical-Digital Input
- 8** Play Deck (CDP) Optical-Digital Output
- 9** Remote IR Input
- 10** Remote IR Output
- 11** AC Power Cord

1 Play Deck (CDP) Analog Output: These jacks carry the analog audio output signal from the **Play Deck 3**. Connect them to the CD input jacks on a receiver, preamp or processor.

2 Record Deck (CDR) Analog Output: These jacks carry the output signal from the **Record Deck 15**. Connect them to the **Tape Play/In** input jacks on a receiver, preamp or processor.

3 Record Deck (CDR) Analog Input: These jacks accept the analog signals that are used for CD recordings. Connect them to the **Tape Rec/Play** outputs on a receiver, preamp or processor.

4 Play Deck (CDP) Coaxial-Digital Output: This jack carries the digital-audio output signal from the **Play Deck 3**. Connect it to a coaxial-digital input on a receiver, processor or digital decoder.

5 Record Deck (CDR) Coaxial-Digital Output: This jack carries the digital audio output signal from the **Record Deck 15**. Connect it to a coaxial digital input on a receiver, processor or digital decoder.

6 Record Deck (CDR) Coaxial-Digital Input: This jack accepts the digital-audio input signal from a compatible digital audio product and should be connected directly to a digital player or to a coaxial-digital output on a CD or DVD player or an A/V receiver or processor.

IMPORTANT NOTE: The coaxial digital inputs should only be connected to **digital** input or output jacks. Even though they use the same RCA type connector as standard analog audio connections, **DO NOT** connect them to conventional analog input or output jacks.

7 Record Deck (CDR) Optical-Digital Input: This jack accepts the digital-audio input signal from a compatible digital audio product, and should be connected to the optical-digital output on a CD or DVD player or an A/V receiver or processor.

8 Play Deck (CDP) Optical-Digital Output: This jack carries the optical digital output signal from the **Play Deck 3**. Connect it to an optical digital input on a receiver, processor or digital recorder. This will typically be connected to the "CD" input.

9 Remote IR Input: Connect the output of a remote infrared sensor or the remote control output of another compatible Harman Kardon product to this jack. This will enable the remote control to operate even when the front-panel **Remote Sensor 25** is blocked. This jack may also be used with compatible IR remote control based automation systems.


10 Remote IR Output: Connect this jack to the IR input jack of another compatible Harman Kardon remote controlled product to have the built-in remote sensor **25** on the

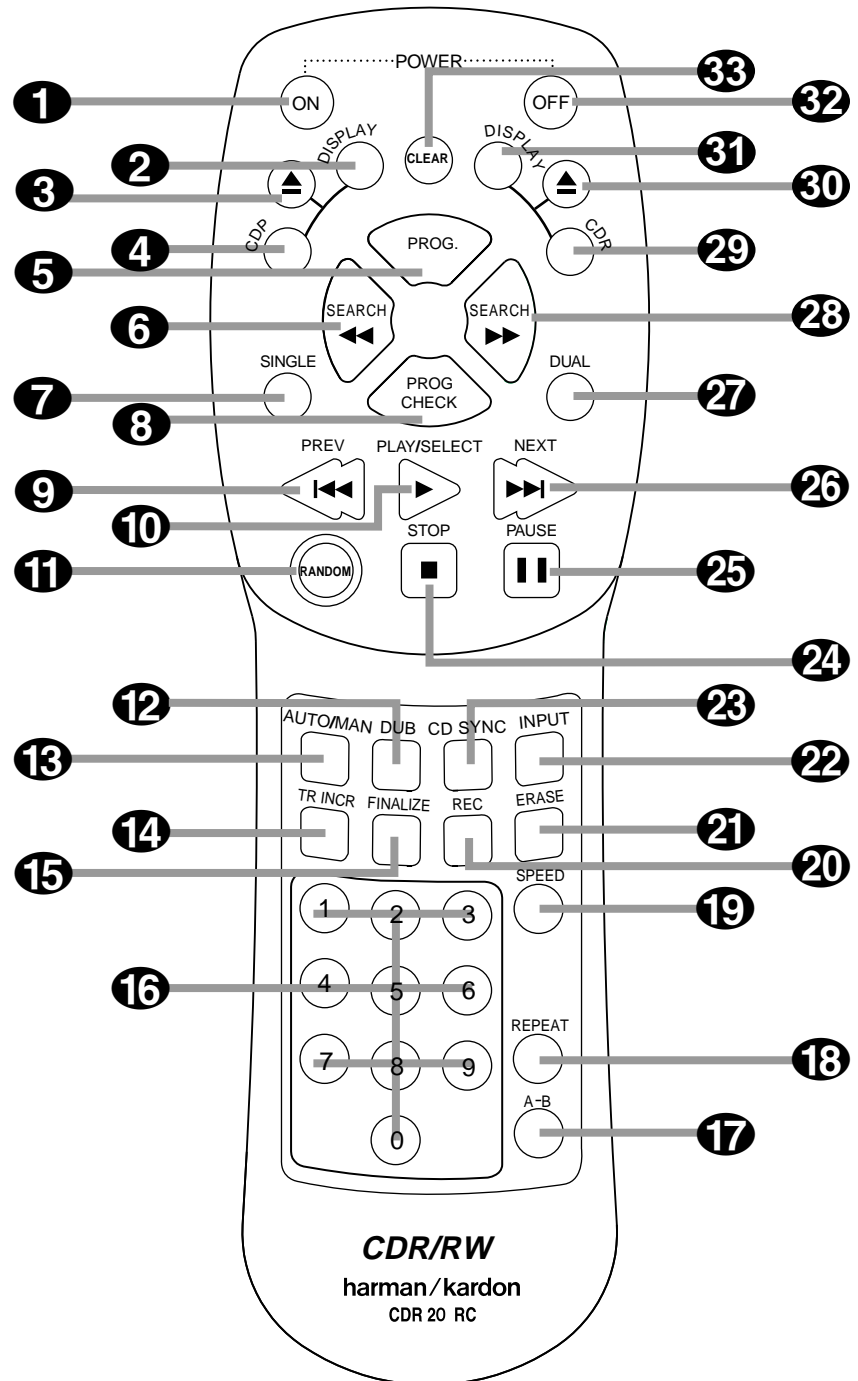
CDR 20 provide IR signals to other compatible products.

11 AC Power Cord: Connect this plug to an AC outlet. If the outlet is switch controlled, make certain that it is in the **ON** position.

Remote Control Functions

- 1 Power-On Button
- 2 Play Deck (CDP) Display Control
- 3 Play Deck (CDP) Open
- 4 Play Deck (CDP) Select
- 5 Program
- 6 Reverse Search
- 7 Single
- 8 Program Check
- 9 Previous-Track Skip
- 10 Play/Select
- 11 Random Play
- 12 Dub
- 13 Automatic/Manual Track Increment Selector
- 14 Track Increment
- 15 Finalize
- 16 Numeric Keys
- 17 A-B Repeat
- 18 Repeat
- 19 Speed Select
- 20 Record Button
- 21 Erase Button
- 22 Input Select
- 23 CD Sync
- 24 Stop
- 25 Pause
- 26 Next Track/Skip
- 27 Dual-Deck Playback
- 28 Forward Search
- 29 Record Deck (CDR) Select
- 30 Record Deck (CDR) Open
- 31 Record Deck (CDR) Display Control
- 32 Power Off
- 33 Clear

IMPORTANT NOTE: Some of the remote's functions, including Play, Pause, Stop, Search, Next and Previous Track, are shared between the two decks. Always remember to press the CDP Select button 4 to use the remote to control the Play Deck, or press the CDR Select button 29 to control the Record Deck. When you press one of these buttons, an indication of CDP or CDR will appear in the appropriate Information Display .



Remote Control Functions

- 1 Power-On Button:** Press this button to turn the CDR 20 on. Note that in order for this control to function, the **Front-Panel Power Switch 1** must first be pressed so that the unit is in the Standby mode.
- 2 Play Deck (CDP) Display Control:** Press this button to cycle through the various time display options for the disc in the **Play Deck 3**.
- 3 Play Deck (CDP) Open:** Press this button to open the **Play Deck 3**.
- 4 Play Deck (CDP) Select:** Press this button to control or program the functions of the disc in the **Play Deck 3**.
- 5 Program:** Press this button to begin the programming sequence for one of the CD decks. See page 18 for more information on programming the CDR 20.
- 6 Reverse Search:** Press this button to play the selected disc in reverse to locate a desired passage.
- 7 Single:** When this button is pressed, the CDR 20 will function as a two-disc CD player/changer. In the Single mode, the audio output will be routed to all output jacks **1 2 4 5 8** regardless of which CD deck is actually playing. See page 17 for more information on the Single-Play mode.
- 8 Program Check:** Press this button to check or edit a programmed playback sequence. See page 18 for more information on programmed playback.
- 9 Previous-Track Skip:** Press this button to skip backwards to the beginning of the track currently being played. Press it a second time to move back to the beginning of each previous track.
- 10 Play/Select:** This button has two functions. It will most often be used as a standard play button, but when setting up certain record functions, it is also used as an Enter or Select button.
- 11 Random Play:** When the CD deck is stopped, press this button to begin random play of all tracks on a disc.
- 12 Dub:** Press this button to begin a dub. See page 20 for more information on dubbing.
- 13 Automatic/Manual Track Increment Selector:** Press this button to select between automatic and manual track increments during a recording session. See page 21 for more information on track increments.
- 14 Track Increment:** When the Manual mode for track increments is selected during recording, press this button to increase the track number. **NOTE:** This function does not operate during CD Sync or dub recording.
- 15 Finalize:** Press this button when a recording is complete to initiate the finalization process. The **Play/Select** button **18 10** must be pressed within three seconds to activate finalization. Until this button is pressed and the finalization process is complete, CD-R or CD-RW discs may not be played on conventional CD machines. See page 22 for more information on Finalization.
- 16 Numeric Keys:** Press these buttons to access a specific track for playback or during the programming process. See page 18 for more information on programmed playback.
- 17 A-B Repeat:** Press this button to specify a segment of a disc for repeat play. See page 18 for more information on repeat play.
- 18 Repeat:** Press this button once to repeat the current track. To repeat an entire disc, press the button twice.
- 19 Speed Select:** Press this button to select the recording speed for internal dubs. See page 20 for more information on selecting the proper speed.
- 20 Record Button:** Press this button to begin a manual recording.
- 21 Erase Button:** Press this button to initiate the erasure of a track or of an entire CD-RW disc or to Unfinalize a disc. Note that erasure is only possible on CD-RW discs. See page 22 for more information on erasing discs.
- 22 Input Select:** Press this button to select the input source (analog or digital-coax) for recording. See page 21 for more information on input selection.
- 23 CD Sync:** Press this button once to begin an automated recording of a single track from an external CD player when a digital connection is used. Press it twice to begin automated recording of an entire disc. See page 21 for more information on CD Sync recording.
- 24 Stop:** Press this button to stop playback or recording.
- 25 Pause:** Press this button to momentarily pause playback. Press it again to resume playback.
- 26 Next Track/Skip:** Press this button to skip forward to the next track on a disc.
- 27 Dual Deck Playback:** Press this button to enable both CD decks to play back at the same time and function as separate, independent CD units. In this mode it is also possible to record from an external source while the Play Deck is functioning as a standard CD player. See page 17 for more information on dual-play capability.
- 28 Forward Search:** Press this button to play a disc in a fast-forward mode.
- 29 Record Deck (CDR) Select:** Press this button to control or program the functions of the disc in the **Record Deck 15**.
- 30 Record Deck (CDR) Open:** Press this button to open the **Record Deck 15**.
- 31 Record Deck (CDR) Display Control:** Press this button to cycle through the various time-display options for the disc in the **Record Deck 15**. See page 17 for more information on time-display options.
- 32 Power-Off:** Press this button to place the unit in a Standby mode.
- 33 Clear:** Press this button to clear an item in a program sequence. See page 18 for more information.

Installation and Connections

Important Note: To prevent possible damage to your speakers or other components in your audio system, we strongly recommend that ALL system components, including the CDR 20, be turned off and unplugged from their AC power source when any connections are made or a new component is installed.

Locating the CDR 20

Since the CD transports in the CDR 20 are precision instruments, they are subject to interference from vibration. To minimize the possibility of skipping during playback or recording, it is recommended that the unit be placed on a level, solid, vibration-free surface.

When installing the CDR 20 in a cabinet or tight space, always make certain that there is enough room in front of the unit for the disc drawers to open fully, and that there is enough space above the unit so that discs may easily be inserted in the disc drawers.

In addition to the safety considerations outlined on page 4, it is also recommended that the CDR 20 not be placed in a location that is subject to direct sunlight or extreme heat or cold, as these conditions may damage the discs used in the player, or the player itself. Note that audio amplifiers or high-power receivers, as well as certain other electronic products, may generate significant heat. For that reason, do not place the CDR 20 directly on top of an amplifier, receiver, or other heat source. Always allow at least one inch of free space on all sides of the CDR 20, as well as other electronic products, to allow for proper ventilation.

The unit should also be kept away from sources of water or damp conditions.

Connections to Your Audio System

When connecting the CDR 20, think of the process as if you were connecting a standard CD player and a tape or cassette recorder, with the addition of the digital connections.

Play-Deck Connections

The rear-panel connections labeled "CDP" refer to the outputs of the **Play Deck 3**, which functions as a standard CD player. Connect the analog left/right CDP outputs **1** to the CD inputs on your receiver, preamp or surround processor. For best playback results, a digital connection is recommended, using the coaxial or optical **4 8** outputs. Connect them to the matching digital inputs of your receiver, pre-amp, processor or external digital decoder. Note that you may have to change a setting on the receiver or processor to link the digital input to the "CD" button or input selector. Consult the owner's manual on that device for details, as this configuration may vary from unit to unit.

Record-Deck Connections

The rear-panel connections labeled "CDR" refer to the inputs and outputs for the **Record Deck 15**. Depending on the capabilities of your receiver, preamp or processor, you may find it convenient to connect the analog inputs and outputs to the jacks marked for a tape recorder. As the CDR 20's functions resemble those of a standard tape recorder, this might make it easier to select it as an input on your receiver or preamp. Connect the analog CDR-Out jacks **2** to the Play/In jacks of a Tape or Aux input on your receiver or preamp. Connect the CDR-In jacks **3** to the Tape Rec/Out jacks on your receiver or preamp.

To play the output of the Record Deck through the digital decoder in your receiver or an external processor, connect the **CDR Coax-Out 5** jacks to the matching digital-input jacks on your receiver or processor. Note that you may have to change a setting on the receiver or processor to link the digital input to the "Tape" button or the specific input selector associated with the digital inputs. Consult the owner's manual on your receiver or processor for details, as this configuration may vary from unit to unit.

To make recordings from external digital sources, such as a CD, DVD or MD player, connect the **CDR Coax-In jacks 6 6** or **CDR Optical In Jack 7** on the CDR to the digital output jacks on your receiver or processor. If your receiver does not have digital-output jacks, you may connect the **CDR Coax In jacks 6 6** or **CDR Optical In Jack 7** on the CDR 20 directly to the digital outputs on your CD player or other digital device.

Connections to a portable digital CD or MD player may also be made by connecting the Coax Digital Output of the player to the Front-Panel Digital Input **6** on the CDR 20. Note that when both the front and rear panel digital inputs are connected to external sources, the CDR 20 will give priority to the front-panel input **6**. If it is impractical to disconnect the front-panel input when you need to use the rear-panel jack, simply turn off the device connected to the front-panel input. This will stop the digital signal, and permit the rear-panel jack to be used.

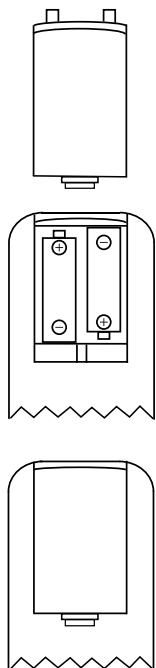
IMPORTANT NOTES ON DIGITAL CONNECTIONS:

Although digital-coax connections use the same type of "RCA" phono jack as standard analog signals, please take special care to connect digital signals only to digital jacks. In many cases, the digital jacks may be identified by an orange-colored insert ring around the center of the jack. When making digital connections, be sure to use coax-interconnect cables, such as the one supplied with the CDR 20 or cables intended for video applications. Even though they have the correct type of RCA connector, do not use audio-interconnect cables that have twisted-pair construction, as they are not appropriate for digital signal use. If you have any questions about the type of cables to use with the CDR 20, consult your dealer.

Installation and Connections

Batteries

Insert the two AA batteries supplied with the CDR 20's remote by turning the remote over so that the bottom of the remote is facing towards you. Gently lift the plastic tab on the battery cover up and away from you, and lift the lid off. Insert the batteries in the remote, being careful to follow the + and – polarity indications in the bottom of the compartment. Replace the cover by first seating the two small tabs into the mating holes at the top of the remote, and then gently push the cover down until the latch snaps into place with an audible click.



NOTE: When replacing batteries, it always a good idea to replace both at the same time. When the remote will not be used for an extended period of time, it is also a good idea to remove the batteries to avoid the possibility of damage due to corrosion. Batteries contain chemical substances and we recommend that you dispose of them properly and in compliance with any local regulations.

IR Remote Connections

If the CDR 20 is installed behind a cabinet or other obstruction that may block the path between the front-panel Remote Sensor **25** and the location where you will use the remote, an optional external IR sensor may be used. Connect the sensor to the **Remote IR In Jack 9** on the rear-panel. This jack may also be connected to the IR Output jack of another compatible Harman Kardon component or a compatible IR system remote product.

You may also use the IR Sensor in the CDR 20 to send commands to other compatible remote products. Connect the **Remote IR Out Jack 10** to the input of the other product or system.

Power Connections

Connect the **AC Power Cord 11** to an AC power source. The CDR 20 uses sensitive, high-performance computer-grade CD drives, and to protect them we recommend that you consider the use of a surge protector, just as you would for a computer.

If the rear-panel AC outlet on a receiver or other product is used, make certain that it provides at least 28 watts, and that the total power of all products connected does not exceed the maximum rated output of the product containing the outlets. If the CDR 20 is connected to a switched outlet, remember to turn on the outlet or product controlling it in order for the CDR 20 to operate.

CD Recording Basics

CD Recorders (CDRs) are similar to standard CD players, with the addition of the features and controls needed for recording. Functions such as play, search and programming for playback will be familiar, but the recorder will function slightly differently than what you may be used to for magnetic tape recorders.

Disc Types

Unlike a conventional CD player, the CDR 20 uses three types of discs, and it is important to understand how each one plays.



Both decks in the CDR 20 will play back any conventional CD that bears this logo.



Discs that bear this logo may be recorded on one time, and when they are finalized they will play in either deck in the CDR 20 or in any conventional CD player, including home, car and portable models. The **Record Deck 15** on the CDR 20 may also be used to record on these discs, and it will play CD-R/Audio discs even if they have not been finalized.



Discs that bear this logo may be used for recording on the CDR 20, and they may also be erased and reused. They may be recorded on or played on the **Record Deck 15** of the CDR 20 and in other CD-RW recorders or CD-RW compatible players. They will NOT play back in most current CD players unless the player is CD-RW compatible. CD-RW Audio discs will play on most DVD players once they have been finalized.



Discs designed for use in computer CD-R drives **may not** be used for recording in the CDR 20. Only discs specifically designed for use in consumer CD audio recorders may be used. If you attempt to use a blank-computer-type recordable disc for recording on the CDR 20 you will see a **N O AUDIO** message in the **Information Display 14** and recording will not be possible. However, discs that have been recorded in the CD-R drive of a computer may be played in the CDR 20, provided that they have been properly finalized in accordance with audio standard IEC958.

Note that the CDR 20 is specifically designed for the recording and playback of consumer audio discs, and cannot be used to copy data discs, DVD discs, or other optical discs used by video- or computer-game systems.

CDR Terminology and Display Messages

Compact disc recording has its own special terminology, and some of the messages displayed by the CDR 20 may be new to you. Before using the CDR 20, you may wish to familiarize yourself with some of the terms used by the CDR 20. Additional error message displays may also appear. Please see page 23 for a complete explanation of error messages.

Finalize: This term refers to the process that completes the recording of a disc by recording a final Table of Contents and preparing the disc so that it may be played on other machines. A CD-R disc may not be played on other CD players until it is finalized. However, once the finalization process is complete, a CD-R disc may not be recorded on again. Only CD-RW discs may be "Unfinalized," so that additional tracks may be recorded on a disc.

TOC: Stands for Table of Contents and it refers to the data recorded on each CD that tells the player how many tracks are on the disc, the total time of the disc and the running time of each individual track. Each time a disc of any sort is placed in the CDR 20, you will see a **TOC** to indicate that the unit is reading this data from the disc. This is required to copy the track information to any recording.

OPC: Stands for Optical Processing Calibration. When you see this message in the **Information Display for the Record Deck 14**, it means that the laser transport inside the unit is making the calibrations and adjustments needed so that the recording process is optimized for the specific disc in use.

BUSY: When you see this message, it means that the Record Deck is completing part of the record operation. When you see this message, do not press any buttons; simply wait until the message clears from the display.

DISC FULL: When there are only four seconds of record time remaining on a blank disc, a **DISC FULL** message will appear in the **Information Display 14**. When you see this message, you will need to stop the recording process and, when a CD-R is being recorded, insert a new blank disc or, when a CD-RW is in use, either use a new disc or erase existing tracks following the instructions on page 22.

Playback Basics

Playback of CDs on the CDR 20 resembles that for traditional CD players with a few exceptions to accommodate the availability of two separate playback decks. Before using the CDR 20, power-up the unit by pressing in the **Main Power Switch 1**. Note that the **Status-Mode Indicator 2** will turn green, indicating that the unit is on and functioning. At the same time, the Information Display **24** will illuminate and the legends behind the front-panel controls will also light up.

Once the **Main Power Switch 1** has been turned on, the CDR 20 may be powered-on or -off using the remote control. Pressing the **Power-Off button 32** on the remote will place the unit in a Standby mode, as indicated by the amber color of the **Status-Mode Indicator 2**. To turn the unit on using the remote, simply press the **Power-On button 1**.

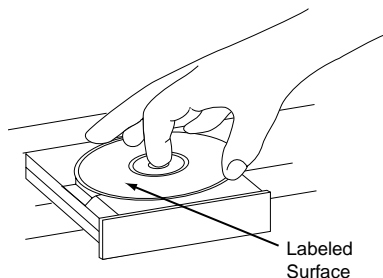
Note that when the unit is in the Standby mode, it is still drawing power from the AC main outlets. To turn the unit completely off, press the **Main Power Switch 1**. When the **Status-Mode Indicator 2** goes out, the CDR 20 is off and not drawing any power. When you will not be using the unit for an extended period of time, such as during a vacation, we recommend using the **Main Power Switch 1** to turn the unit completely off.

Although compact discs are very reliable, rough handling may damage them. Avoid scratching the bottom (nonprinted) side of the discs, as this will affect playback of standard CDs and interfere with the recording of CD-R and CD-RW discs. It is also a good idea to always handle discs by their edges to avoid fingerprints which may also interfere with playback quality and possibly cause damage to the laser and lens assembly.

Loading and Unloading Discs

To load a disc, first open the desired CD deck by pressing the appropriate **Open/Close button 7 14 3 30**. The word **OPEN** will appear in the **Information Display K**. Always make certain that there is sufficient room in front of the unit for the disc drawers to open. Note that if either disc drawer is blocked, the drawer will stop at the blocked position and an **ERROR** message will appear. Press the appropriate **Open/Close button 7 14 3 30** to reopen the drawer.

Load a disc in the tray with the printed (label) side facing up. Once the disc is seated, make certain that it is properly centered within the tray. When using 3" discs, take extra care to make certain that the disc is carefully centered within the smaller ridges in the disc tray.



To close the drawer, press the appropriate **Open/Close button 7 14 3 30** or gently press on the outside of the front cover of the disc tray. When the drawer is closed the word **CLOSE** will appear momentarily in the **Information Display K**, and the letters **TOC** will begin to flash in the display once the drawer is completely closed.

If the disc is a standard CD or a finalized CD-R or CD-RW disc, **TOC** will flash while the unit reads the disc's Table of Contents information. Once that data is read, the **Information Display K** will show the total number of tracks and the total time of all tracks on the disc. The **CD Indicator S** will also light to indicate that a standard CD is in use.

When an unfinalized CD-R or CD-RW disc is placed in the **Record Deck 15**, the letters **OPC** will flash once the Table of Contents has been read. This indicates that the unit is optimizing its circuits for maximum compatibility with the specific recordable disc in use. The number and total running time of any tracks that have already been recorded will appear in the **Information Display K**, and the appropriate indicator **SR** will light to tell you if a CD-R or CD-RW disc is in use.

If a computer data disc is placed in the CDR 20, a **DATA DISC** or **DISC ERROR** message will appear, depending on whether or not the data disc is finalized. Data discs will not play and cannot be recorded or dubbed on the CDR 20.

Using the Remote

The CDR 20's infrared remote control is designed to operate both CD decks, as well as control the playback programming and record functions. To allow for efficient use of the remote, its operation is different from standard CD players. Some buttons are dedicated to one specific CD deck, while others are shared between the two decks.

No matter which deck is playing, the **Play Deck (CDP) and Record Deck (CDR) Display 2 31** and **Open/Close buttons 3 30** will always send a command to their respective deck. The other transport and programming functions, however, are shared. To use any of the transport controls, such as **Play 10**, **Stop 24**, **Pause 25** or the **Search and Skip buttons 6 9 26 28**, the **Numeric Keys 16** or the **Programming Keys 5 7 8 11 18**, first press either the **CDP button 4** to command the **Play Deck 3** or the **CDR button 29** to command the **Record Deck 15**. When the button is pressed, a message reading CDP or CDR will appear in the appropriate **Information Display K** to confirm the selection.

To switch the remote from controlling one deck to controlling the other, simply press the **Select button 4 29** for the deck you wish to control at any time.

Note that features relating to the recording process, such as **Speed 19** and the double row of record-function buttons in the center of the remote **12 13 14 15 20 21 22 23** and the **Single/Dual buttons 7 27** are dedicated feature buttons that do not require any special selection.

Playback Basics

Normal Play

To play a disc, first make certain that the unit is properly installed and that the **Main Power Switch 1** is turned on. Turn the CDR 20 on by pressing the **Power-On button 1** on the remote and note that the front-panel display will illuminate.

Insert a disc following the instructions shown on the previous page. To start the playback, press the Play button on the front panel for the appropriate deck **18/31** or press the Select button on the remote for the desired deck **4 29** and then press the Play button on the remote **10**. The **Play/Pause Indicator Q** will show a right pointing triangle ▶ and the **Information Display K** will show the track number being played and the running time of the track. As each new track begins to play, the track time will reset to 00:00 and begin to count up for the new track.

NOTE: Remember that Unfinalized CD-R or CD-RW discs will only play in the **Record Deck 15**. If you attempt to play an Unfinalized disc in the **Play Deck 3**, a **DISC ERROR** message will appear to remind you to play the disc in the other deck.

To go directly to a specific track on a disk, enter the track number using the **Numeric Keys 16**. Note that when selecting a two digit track number, the second digit must be entered within three seconds after the first Numeric Key is pressed.

To play all of the tracks on a disc in random order, press the **Select Button 4 29** for the desired deck, and then press the **Random button 11**. The unit will briefly examine all of the tracks on the disc and the **Random Indicator A** will illuminate. Each track will be played in a random order until all tracks on the disc have been played. Note that there will be a brief pause in between each track as the unit searches for the next track to play. During the search, the left two positions in the **Information Display K** will show a clockwise circle to confirm the search.

To momentarily stop the disc at any time, press the **Pause button 25/19/30**. When a disc is paused, the **Play/Pause Indicator Q** will add two vertical lines to indicate a paused disc. Press either the **Play button 10/18/31** or the **Pause button 25/19/30** to resume playback at the point where the disc was paused.

When there is only one disc in the unit, it will automatically stop when all tracks on a disc have played through. To stop playback at any time, press the **Stop button 24/17/32** for the deck in use.

When there is a disc in each deck, the player will respond in one of two ways, depending on which way the dual-play setting is activated. In normal operation, when the disc in one drawer finishes, the disc in the other drawer will begin to play. When the **Dual button 27/27** is pressed so that the **Dual-Play Indicator J** is lit, each deck will operate as a separate, single-play CD unit without regard to the status of the other deck. For complete information on Dual-Deck and Dual-Play operation, see page 17.

At the end of a listening session, remove the discs from the decks by following the instructions shown on the previous page. Do not leave the disc drawers open when the unit is not in use to prevent dust and dirt from entering the unit and to prevent damage to the disc-drawer tray.

To place the unit in the **Standby** mode at the end of a listening session, press the **Power-Off button 32**. The word **OFF** will appear briefly in the **Information Display K**, any open disc trays will automatically close, and the **Status-Mode Indicator 2** will turn amber.

Search

You may quickly scan through the contents of a disc while listening to the playback at high speed in forward or reverse. To move forward through a disc, press the **Forward Search button 23** on the remote or press and hold the **Next button 20/28** on the front panel that is appropriate for the deck in use. To move backwards through a disc, press the **Reverse Search button 6** on the remote, or press and hold the **Previous button 21/29** on the front panel that is appropriate for the deck in use. When using the remote, always remember to make certain that you have selected the deck you wish to control by pressing the appropriate selector button **4 29** before entering the desired remote command.

Track Skip

To move from one track on a disc directly to another, enter the number for the desired track with the **Numeric Keys 16**. The disc will pause briefly to locate the track, and then immediately play it. When entering a two digit track number, the second digit must be entered within three seconds of the first digit.

To move to the next track on a disc by cycling through the individual tracks, press the **Next button 26** on the remote, or the appropriate front-panel **Next button 20/28** for the deck in use. Additional presses of the button will move forward through the tracks on the disc.

When a disc is playing, press the **Previous button 9/21/29** to return to the beginning of the track being played. Additional presses of the Previous button will move backwards through the tracks on the disc.

When a disc is stopped, you may press the Next or Previous buttons to locate a specific track that you wish to play. When the desired track number appears at the left side of the appropriate **Information Display K**, press the **Play button 10/18/31** to hear that track.

Playback Basics

Dual-Play Mode

Since the CDR 20 has more than one CD deck, you may play a disc in either drawer. When only one deck is playing, the unit is in the Single mode. In the Single mode, the audio output will be fed to all digital and analog jacks for both decks. This means you may select the input on your receiver, preamp or processor for either deck. For example, if you have the Play Deck connected to "CD" and the Record Deck connected to "Tape," when only one deck is playing, either input may be selected.

It is also possible to play two discs at once, using the Dual mode. To initiate dual-mode playback, press the **Dual** button on the front panel or remote **27** **27**. When the **Dual-Play Indicator J** is lit, you may play a different disc in both decks at the same time. The output of each deck will be sent to the appropriate output jacks, and you will need to select the deck you wish to listen to using the input selectors on your receiver, preamp or processor. You may also use the output of one deck to feed your main-room system, while the second deck is used to feed a remote room.

As long as the **Dual-Play Indicator J** is lit, each deck functions as a separate CD player, and will respond to its own set of controls on the front panel for either the **Play Deck 26** **28** **29** **30** **31** **32** or **Record Deck 17** **18** **19** **20** **21** **23**. To control the transports using the remote, remember to first press the Selector button for either the **Play/CDP Deck 4** or the **Record/CDR Deck 29**, and then press the desired command function.

NOTE: When in the Dual mode, you may return to Single play mode by pressing the **Single** button on the remote **7** or the **Dual** button **27** on the front panel. However, pressing the **Single** button while both decks are playing, will automatically stop playback of the disc in the **Record Deck 15** while the disc in the **Play Deck 3** continues to play. The output of the play deck will be sent to both sets of output jacks.

Dual-Deck Operation

Since the CDR 20 has two separate CD decks, it may be used as a two-disc changer, so that you can continually play two discs.

When the CDR 20 is in the Single-Play mode, as shown by the **Dual-Play Indicator J** *NOT* being lit, when the disc in one deck has played through to the end, the disc in the other deck will automatically begin to play. Each disc will play through, and when one deck is finished the other will start. To stop playback, press the **Stop** button **24** **17** **32** for the deck that is currently playing.

To have the CDR 20 function as two separate CD players, where the deck in use stops at the end of a disc, press the **Dual** button **27** **27** until the **Dual-Play Indicator J** lights. In the Dual mode, each deck acts independently of the other and when the disc in one deck finishes, it stops unless one of the Repeat functions has been activated.

Time Display

The CDR 20's time display is capable of showing a wide range of information about the contents of a CD.

Once the disc's Table of Contents or TOC data has been read, the **Information Display K** for any deck that has a CD inside will show the number of tracks on the disc in the two left digits of the display, and the total running time of the disc. When the disc is playing, the tracks will count up as each new track is reached, and time display will show the elapsed time for the track being played.

To view the time remaining in the track being played, press the **Display** button **2** **31** **23** **26** for the deck in use so that the **REMAINING TIME Indicators ML** illuminate. The **Information Display K** will count down the time remaining in the track, and at the start of the next track the counter will start to count down the running time of that track.

To view the total time remaining on the disc, press the **Display Button 2** **31** **23** **26** for the deck in use so that the **Total Time Indicators NL** illuminate. The **Information Display K** will show the total time remaining for all tracks on the disc and count down until the disc has finished playing. When the disc has played all the way through, the total number of tracks and the total running time of the disc will be displayed.

Headphone Listening

You may listen to the output of the CDR 20 through headphones at any time by simply plugging the headphones into the **Front-Panel Jack 4**. The volume of the headphone output may be adjusted with the **Headphones Level Control 5**. Note that changes to the headphone level will not alter the output settings to the analog outputs. Those levels are fixed, and the volume should be adjusted using your receiver, preamp or processor.

Note that when only one deck is playing back a disc in the Single-Play mode, the output of that deck will be fed to the headphone jack. When the unit is in the Dual-Playback mode, only the output of the **Play Deck 3** will be fed to the headphone jack.

Program Play

The CDR 20's advanced programming system enables you to program the order in which tracks are played, to repeat one track or all tracks, or to repeat any segment of a disc without regard to track numbers.

Programming Play Lists

To program the order of playback for the tracks on a disc, insert the disc, let the unit read the Table of Contents information, and wait until the disc has stopped and the number of tracks and total running time is displayed. Next, select the deck that will be programmed by pressing the **CDP Select** button **4** on the remote for the **Play Deck 3** or the **CDR Select** button **29** on the remote for the **Record Deck 15**.

To begin the programming sequence, press the **Program** button **5** and note that the **PR OG Indicator B** will illuminate and the **Information Display K** will show **00 00 : 00**.

Next, enter the track numbers to be played by pressing the **Numeric Keys 16**. For two-digit track numbers, be certain to enter the second digit within three seconds after the first number is entered. As each track is entered, the display will blink three times, alternating between two displays. The first display will show the track number just entered on the left side of the **Information Display K** under the **Track Indicator O**, while the right side will flash the number of steps that have been programmed. For example, after programming the first step to be track number 3, the display will flash **03 P - 01**.

Alternating with the track number and program step will be a display of the track and the total running time of all tracks that have been programmed so far. For example, a display of **06 11 : 25** will indicate that track number six was the last track programmed, and that the total time of all tracks so far is 11 minutes and 25 seconds. The **Total Time Indicators NL** will flash with this display to remind you of the display's contents.

These displays will alternate three times, and then show a steady display of the total time and last track programmed.

Continue to add tracks in the order you wish to have them played until the programming ses-

sion is complete. You may add up to 20 tracks, repeating a track if desired, as long as the total number does not exceed 20. If you exceed the 20 track limit, the display will read **FULL**. Tracks may also be added using the **Next 26 20 28** and **Previous** buttons **9 21 29** to locate the track, and the **Program** button **5** to enter that track to the programmed sequence.

When the complete list of tracks has been entered, press the **Play** button **10 18 31**. The tracks will then play in the order they have been entered. Note that a programmed list of tracks may also be recorded if the disc being programmed is in the **Play Deck 3**. Follow the instructions on page 20 for complete information on recording and dubbing.

Checking, Editing and Clearing Programmed Play Lists

Once you have entered a program list it will remain in the unit's memory until the disc is removed or the unit is turned off. Thus, if you play through a program list, simply press the **Play** button **10 18 31** again to replay the list. If you find that you wish to check the list or make changes, that is also possible by following a few simple steps.

To scroll through a program list, press the **Program Check** button **8**. Each press of the button will move through the tracks that have been programmed. The display will alternate between the track number of the program step number (e.g., **12 P - 03** tells you that track 12 on the disc is the 3rd program step) and the track number and the total running time so far in the program (e.g., **12 16 : 04** tells you that at this point you have programmed a total of 16 minutes and 4 seconds of material).

At any point in the list you may insert a new track by simply entering the track number using the **Numeric Keys 16**. Simply press the buttons that correspond to the number of the track you wish to add. Any tracks that are in the program will remain.

To remove a step in the program, first use the **Program Check** button **8** to locate the track you wish to delete. Next, press the **Clear** button **33**. The information in the display will blink and the step will be removed from the program list. Program steps need not be deleted

in any order; as long as you have located a step in the program list, it may be erased.

To cancel an entire program list while the program is playing, press the **Program** button **5** and note that the **Program Indicator B** will go out. To remove a total program list when the disc is stopped, simply open and close the disc drawer. Whenever a disc is removed or the unit is turned off, the program list is erased.

Repeat Programmed Play

The CDR 20's programming system enables you to repeat either a single track on a disc, the entire disc, or a specially programmed passage that you select.

Repeat One Track

To repeat the track you are currently listening to, press the **Repeat** button **18** and note that the **Repeat Indicator D** and the **Repeat-Status Indicator E** will both light 1. If the track is changed by using the **Next/Previous Skip** button **9 26 20 21 28 29** while the **Repeat 1** mode is active, the new track will now be repeated.

Once Repeat 1 playback has been started, it will continue until the unit is stopped by pressing the **Stop** button **24 17 32**, or the disc deck is opened by pressing the appropriate **Open/Close** button **7 14 3 30**. When playback is stopped, the Repeat sequence is erased and must be reentered if you wish to repeat a track on another disc.

Repeat All Tracks

To repeat all the tracks on a disc in order, press the **Repeat** button **18** twice while the disc is playing and note that the **Repeat Indicator D** and the **ALL Repeat-Status Indicator E** will light. Once the **Play** button **10 18 31** is pressed, the disc will play through from beginning to end continuously, until the **Stop** button **24 17 32** is pressed. The Repeat All function may be cancelled at any time by pressing the **Repeat** button **18** once until both the **Repeat Indicator D** and **ALL Repeat-Status Indicators E** go out. The Repeat All Function is also canceled when the disc drawer is opened.

Program Play

Repeat A-B

The CDR 20 may be programmed to repeat any section within a track, or a complete passage that includes material from a series of consecutive tracks.

To program the unit for A-B Repeat play, first play the disc and locate the point where you wish to begin the repeated section. At the start point, press the **A-B Repeat** button **17** and note that the **Repeat Indicator D** and the **Repeat-Status Indicator E** will show an **A** and flash. Let the disc play until the point at which the section to be repeated will end. At that end point, press the **A-B Repeat** button **17** again and note that the **Repeat-Status Indicator E** will stop flashing and will light showing **Repeat A-B**.

The unit will immediately begin to play the section you have programmed, and continually repeat it.

Note: The program material selected for **A/B Repeat** must be at least 4 seconds long for this feature to function.

To resume normal play, press the **A-B Repeat** button **17**. The **Repeat A-B Indicators DE** will go out, and the disc will continue playing through to the end. Stopping the disc or opening the disc drawer will automatically cancel the Repeat A-B programming.

CD Recording

Making recordings on the CDR 20 is simple and easy once you become accustomed to the basics of CD Recording. Before making your first recording, please take a moment to review the CDR Basics on page 14. In particular, you will need to become familiar with the types of discs that may or may not be used in the CDR 20. In addition, some terms used in the following pages may be new to you. The following definitions and information will help you to make CD recordings using the CDR 20's many features:

- The CDR 20 accepts analog inputs and digital coax or optical inputs. Before making a recording, be certain that you have selected the correct input.
- After a disc is recorded, it must be finalized. This process adds a table of contents data to the disc and makes it playable on other machines. Until a disc is properly finalized, it may not be played on standard CD players.
- The CDR 20 may record on either CD-R or CD-RW discs, but they must be of the type specifically designed for use in consumer-audio CD recorders. These discs may be recognized by looking for the words "Digital Audio" in the compact disc logo on the blank disc or its packaging. Discs with the logo reading only "Compact Disc/Recordable" are designed for computer data recording, and they will NOT work in the CDR 20.
- CD-R discs may not be erased or have material added to them once they have been finalized.
- At least four (4) seconds of blank recording time must remain on an unfinalized disc for recording to take place.
- The maximum number of tracks that may be recorded on a disc is 99.
- Note that some CD-R/CD-RW audio recording discs may be used for single-speed recordings only. If you use a disc with such a warning, make certain not to make a dub at x2 or x4 speed. However, the CDR 20 has been tested for compatibility with a wide range of blank discs from manufacturers throughout the world. In most cases, blank discs will produce high-quality recordings at any dub speed.
- In some rare cases, a CD player may not be compatible with CD-R discs. If you find that a CD-R disc plays in some players but not in others, the fault is most likely with the player, not with the recorded disc or the CDR 20. Remember that CD-RW discs made in the CDR 20 will play only in CD players that are specially designed to accommodate CD-RW discs. Note that most DVD players are compatible with finalized CD-RW discs.

- Some commercial CD discs may contain a copy protection data bit that will prevent a digital copy of the disc to be dubbed. In that case, the **Copy Prohibit Indicator G** will light to remind you that the inability to record is intentional, and not the result of a problem with the CDR 20.
- This product is equipped with the Serial Copy Management System (SCMS) to protect the rights of copyright owners. Although it is possible to make a copy of most CDs for your own personal use, it is not possible to make a digital copy from another digital copy but it is possible to make an analog copy of a digital copy.
RECORDINGS MAY BE MADE FOR PERSONAL USE ONLY, AND ANY UNAUTHORIZED COPYING IS SUBJECT TO THE APPLICABLE LAW.
- The CDR 20 will not copy DVD discs, computer-data discs, CD-based computer or video-game discs, or digital audio discs with a sample rate that is not compatible with the range of the CDR 20's sample-rate converter.

Recordings on the CDR 20 may be made in a number of ways:

- Discs may be dubbed using the playback deck on the CDR 20 as a source. These copies may be made in real time, at twice normal speed, or at four times normal playback speed.
- Recordings may be made from an external CD player or other digital source that is synchronized with the dub being made in the CDR 20.
- Recordings may be made from any compatible external digital source.
- Recordings may be made from an external analog source.
- CD-RW discs may not be erased and reused more than 99 times. This is a limitation of the CD-RW format, not a fault of the CDR 20.

Disc Dubbing

The easiest way to make a copy of an entire disc is to use the CDR 20's internal dub capability.

First, insert a blank or unformatted disc in the **Record Drawer 15**. When the disc is inserted, the CDR 20 will examine it to determine if it is a CD-R or CD-RW disc, and optimize itself for the best possible recording. This is indicated by **ⓀPC** message in the **Information Display K**.

Place the disc to be dubbed in the **Play Drawer 3** and wait until the Table of Contents data is read and the **Information Display K** shows the track and running time data for the disc.

Next, select a dub speed. The default speed is a real-time dub, where the recording takes as long as the actual running time of the disc. However, with the CDR 20 you may also select x2 dubbing or x4 dubbing. Press the **Speed button 19 13** to select a speed as indicated by the **x2/x4 Indicators F**. When no Speed Indicator lights, the unit is set to real-time recording. Note that the slower the record-dub speed, the more tolerant the unit is of errors on the blank disc. However, with most high-quality blank discs, the 2x and 4x speeds should not present a problem.

Before beginning a dub, make certain that there is sufficient blank space on the record disc. To do this, first determine the time available on the blank disc by subtracting the time of previously recorded material, if any, that is shown in the record side **Information Display K**, from the total time available on the disc. That number should be greater than the total time of the disc to be dubbed, which is shown in the play side **Information Display K**.

When you are ready to start the dub, press the **Dubbing Button 12 10**. During this process the **Dubbing Indicator H** will light, the **Record Indicator T** will flash and a **BUSY** message will flash in the Record Deck's **Information Display K**. When both Information Display Indicators return to normal, with indications of **01 00 : 00**, press the **Play/Select Button 10 18 31** to start the dub.

While the dub is in progress, you will see the track numbers and running time increase as the disc is copied. The Level Indicators will also flash but this is only for your reference, as record levels may not be adjusted during digital recordings. It is possible to listen to the source disc while it is being dubbed by selecting the appropriate input on your receiver, preamp or processor.

Important Note: When a high-speed (x2 or x4) dub is being made, you will hear the playback from the CDP outputs **1 4 8** at the faster speed. Fast speed playback increases the pitch of a sound, and when played back at high volume levels this may damage your speakers. DO NOT use high volume levels when listening to high-speed dubs while they are in progress.

The dub will stop automatically when the source disc has played through to the end. After the dub is finished, the Information Display will show an **UPDATE** message, and then return to normal operation. To manually stop a dubbing operation, press the **Stop button 24 17 32** for either deck.

CD Recording

As with all recorded CD-R/CD-RW discs, the disc must be finalized before it can be played in other machines. See page 22 for instructions on disc finalization.

Notes on Dubbing:

- If you wish to make a dub with the tracks in a different order from the original disc, omit tracks on a disc, or make a dub that mixes tracks from different discs, create a Program-Playback List before pressing the **Play/Select** button **10/18** to start the dub. Instructions for creating a Program List may be found on page 18. **NOTE:** Dubs containing Program Lists may be made at either the x1 or x2 speed. If you attempt to make a Programmed Dub at the x4 speed, the unit will automatically select the x2 speed.
- The Pause buttons do not operate while a dub is in progress.
- Tracks will be added automatically to mirror the track structure of the original disc.
- The Total Time indication of the recorded CD may vary slightly from the original due to variations in the spin speed of each drive, but this is normal. No information has been lost in the recording process.
- If the original disc being dubbed is a digital copy or if it contains copy-prohibit signals, the unit will automatically make an analog copy.

CD Sync Recording

CD Sync recording allows you to make an automatic digital recording from an external CD player or MD. During CD Sync Recording, the Record unit starts in sync with the source, and tracks are added automatically.

To make a CD Sync recording: First, make certain your playback source is selected and cued to the correct starting point. Next, select the appropriate digital input by pressing the **Input** button **22/22** until the desired **COAX** or **OPTICAL** indication appears in the **Record Deck Information Display K**. CD Sync recordings may not be made from an analog input.

Next, make certain that there is a fresh disc in the Record Drawer for the recording. Press the **CD Sync** button **23/9** and note that the **Sync Indicator I** will light and the **Record Indicator T** will flash. Select the type of recording to be made:

- To record only the first track from the source player, press the CD Sync Button once so that **1 TRK** appears in the **Record Deck Information Display K**.

- To record the entire disc or tape, press the CD Sync Button twice so that **ALL** appears in the **Record Deck Information Display K**.

When the desired mode has been selected, start the playback from the source machine. The CDR 20 will automatically recognize the incoming digital data and begin recording. If the source material is a CD, the track numbering from the original disc will be carried over to the dub. If the playback source is NOT a CD, you will have to increment the tracks manually.

The recording will continue until the CDR 20 senses that the playback is finished when there is no incoming signal for more than three seconds. At that point the recording will stop. You may also stop the recording at any time by pressing the **Record Deck Stop** button **24/17**. When there are only four seconds remaining on a blank disc, **DISC FULL** message will appear in the **Information Display ●**. When you see this message, you will need to stop the recording process and, when a CD-R is being recorded, insert a new blank disc or, when a CD-RW is in use, either use a new disc or erase existing tracks following the instructions on page 22.

After the recording is complete, an **UPDATE** message will appear briefly, and the unit will then return to normal operation. Remember to finalize the recorded disc so that it may be used in other machines.

Recording from an External Source

To record from an external source, first place a CD-R or CD-RW audio disc in the **Record Deck 15**. Next, select the input to be used by pressing the **Input** button **22/22**. Pressing the button will cycle between the input choices, which will be shown in the **Information Display K** as **COAX**, **OPTICAL** or **ANALOG**. In addition, the **Digital Indicator Y** will light when the coax input is selected, and the **Analog Indicator X** will light when the analog inputs are selected.

Note that when the digital input is selected, the connection may be made to either the rear panel **Coax Input 6** or the **Front-Panel Digital Input 6**. If a signal is present at both coax inputs when a recording is made, the front-panel input will be used as the source.

Press the **Auto/Manual** button **13** to select how tracks will be numbered on the recorded disc.

- The default mode is Manual. In that mode for either digital or analog recordings, you must

add track numbers manually by pressing the **Track Increment** button **14** when you wish to increase the track number. This mode is recommended for recordings made from analog sources.

- The Auto mode will add track numbers automatically, in one of two ways. When track data is present from a digital recording, it will be carried over to the new copy disc. Thus, when the CD being played moves from one track to the next track, the copy disc will also increase the track number by one. Activate the Auto mode by pressing the **Auto/Manual** button **13** once and note that the **Auto Indicator W** will light.
- In the Auto mode for recordings from an analog source or a digital source with no track data, the track number will be increased when the CDR 20 receives silence for 3 seconds. After 5 seconds of silence, the recording will stop. To activate the Auto mode, press the **Auto/Manual** button **13** once and note that the **Auto Indicator W** will light.

To prepare for a recording, press the **Record** button **20/8**. The **Record Indicator T** will flash, and the word **BUSY** will briefly appear in the **Information Display K**. When the Display returns to the track and running-time information, the unit is ready to record.

Once the source material is playing, start the actual recording by pressing the **Play/Select** button **10/18**. Note that the **Record Indicator T** will stop flashing and the **Information Display K** will begin to show the running time of the recording and the track data. Depending on which mode of track increment has been selected as described above, track numbers must be increased manually or they will be added automatically. Regardless of which mode has been selected, a track may be added at any time by pressing the **Track Increment** button **14**.

Note: If there is a pause in the playback signal for more than 5 seconds for digital recordings or 10 seconds for analog recordings, the CDR 20 will stop the recording. Also, when the Pause button is pressed during a recording, the track number will increase by one number and the recording will stop and must be restarted by pressing the **Play/Select** button **10/18**. When the recording is finished, press the **Stop** button **17/24**.

Unlike conventional analog tape recorders, the CDR 20 does not require level setting when recordings are made from a digital source.

CD Recording

Although the **Level Indicator C** will operate, this is only informative and the level may not be changed or adjusted. However, when you are making a recording from an external analog source such as a cassette recorder or the analog output of a receiver or preamp, you should adjust the input levels using the **Record-Level Control 16**. Adjust the levels so that the blue/white segments of the display are almost all lit, and the red segments flash only occasionally. If the red segments are constantly lit, the recording will be distorted and produce unacceptable quality.

To stop the recording, press the **Stop button 24 17**. The recording will automatically stop if it takes more space than is available on the CD-R/RW disc. A **DISC FULL** message will appear to remind you that a new disc is needed.

At the end of a recording, a **BUSY** message and an **UPDATE** message will appear briefly, and the unit will return to normal operation. Remember to finalize the disc after recording so that it may be used in other players.

Finalizing CD-R and CD-RW Discs

Finalizing is a simple process that completes the recording of a disc so that it may be used in other players. When a recording is finished, a disc must be finalized. Once that is done, a CD-R disc may not be changed or added to. CD-RW discs are "locked" once they are finalized, but they may be unfinalized to permit additional recording or erasure.

To finalize a disc, place it in the **Record Drawer 15**. Once the disc's Table of Contents information has been read and the OPC process has been completed, press the **Finalize button 15 12** and note that the **Finalize Indicator U** will begin to flash. Within three seconds, press the **Select button 10 18** and note that the **Finalize Indicator U** will stop flashing.

The finalization process will take up to two minutes, depending on the length of material recorded on the disc. During the finalization process the Record Deck will not accept any operating commands.

When the finalization process is complete the **Finalize Indicator U** will go out, and the **R/RW Indicator P** will also go out as an indication that the disc is now playable on

other players. The **CD Indicator S** will remain lit.

Unfinalizing and Erasing CD-RW Discs

CD-RW discs are unique in that they are both recordable and rewritable. This means that you may use them over again like a cassette tape. However, the process of reusing a CD-RW disc is slightly different from that used with tapes.

Unfinalizing a CD-RW Disc

To keep the material that is already recorded on a CD-RW disc but to add an additional track and erase single tracks, you must first unfinalize the disc. To do that, place the CD-RW disc in the **Record Deck 15** and wait until the Table of Contents data has been read.

Press the **Erase button 21 11** twice and check to make sure that the **Erase Indicator V** flashes and the word **TOC** appears in the **Record Deck Information Display K**.

Within three seconds, press the **Play/Select button 10 18** to start the process. The **Erase Indicator V** will remain lit and stop flashing, and the **Information Display K** will switch to **OPC** and then back to **TOC**.

When the process is finished, the **Erase Indicator V** will go out, and the display will return to normal. The disc is now ready to have single tracks removed or additional tracks added.

Erasing an Entire CD-RW Disc

Erasing the entire contents of a disc is simple, and it does not matter if the disc has been finalized or not. To erase the disc, press the **Erase button 21 11** twice if the disc has *NOT* been finalized and once if it has been finalized, so that the word **DISC** appears in the **Information Display K** and the **Erase Indicator V** flashes. To start the erasure, press the **Select button 10 18** and note that the **Erase Indicator V** will stop flashing. The erasure process takes about a minute, and it is complete when the Information Display resets to **00 00:00** and the **Erase Indicator V** goes out. The disc is now totally erased and may be reused.

Erasing a Single Track

The individual tracks on a CD-RW disc may be erased one at a time, starting with the last track on the disc, or you may erase more than one track. Note that before individual tracks

may be erased the disc must be unfinalized. If the disc is finalized, follow the instructions above for unfinalizing before proceeding with these steps.

To erase only the last track, press the **Erase button 21 11**. Note that the **Information Display K** will display **01 TRK** and the **Erase Indicator V** will flash. Press the **Play/Select button 10 18** within three seconds and note that the Erase Indicator will stop flashing. When the **Erase Indicator V** goes out the **Information Display K** will show the total number of tracks that now remain on the disc.

You may erase more than one track, counting backwards from the last track. First, press the **Erase button 21 11**. Note that the Information Display will display **01 TRK** and the **Erase Indicator V** will flash. Press the **Next button 26 20** or **Previous button 9 21** until the number of tracks to be erased appears in the **Information Display K**. For example, when **06 TRK** appears in the display a total of six tracks will be erased, counting back from the last track on the disc. Next, press the **Play/Select button 10 18** within three seconds of making the track selection and note that the **Erase Indicator V** will stop flashing. When the **Erase Indicator V** goes out the **Information Display K** will show the total number of tracks that now remain on the disc.

Important Note: Tracks at the beginning or in the middle of the disc may not be erased until all of the tracks after them have been erased.

Important Note on Erasure and Finalization Times:

Regardless of the speed at which a disc was recorded, the CDR 20 will erase and finalize discs at the x4 speed to minimize the length of the process. However, in some cases, it may be necessary for the unit to repeat the erasure or finalization due to the nature of an individual disc. For that reason, it is normal for the time required to complete these steps to vary from one disc to another.

Troubleshooting Guide and Error Messages

TROUBLESHOOTING GUIDE

SYMPTOM	POSSIBLE CAUSE	SOLUTION
Unit does not operate when Standby switch or remote Power-On is pressed	<ul style="list-style-type: none"> No AC power Main Power Switch is off 	<ul style="list-style-type: none"> Make certain AC power cord is plugged into a live outlet Check to see if AC outlet is switch controlled Turn on Main Power
Remote does not function	<ul style="list-style-type: none"> Wrong deck selected Dead batteries Sensor blocked 	<ul style="list-style-type: none"> Press the CDP button to control the Play Deck; press the CDR button to control the Record Deck Replace both batteries Remove obstructions from front panel or connect a remote sensor to the Remote-In Jack
Disc does not erase	<ul style="list-style-type: none"> CD-R disc in use 	<ul style="list-style-type: none"> CD-R discs do not erase, only CD-RW discs may be erased
Recorded CD-R disc does not play in another CD player or DISC ERROR message appears in Play Deck	<ul style="list-style-type: none"> CD-R disc not finalized 	<ul style="list-style-type: none"> Finalize the CD-R disc in the CDR 20's Record Deck (see page 22)
Recording suddenly stops	<ul style="list-style-type: none"> Input source stopped or paused 	<ul style="list-style-type: none"> Recordings will stop when the input source is paused for more than 3 seconds for digital recordings and 10 seconds for analog recordings

ERROR MESSAGES

ERROR MESSAGE	EXPLANATION AND PROBABLE CAUSE	SOLUTION
CHECK DISC	<ul style="list-style-type: none"> A record-related button has been pressed when a Finalized disc is in the Record Deck 15 A record-related button has been pressed when a standard CD is in the Record Deck 15 	<ul style="list-style-type: none"> Unfinalize the disc to add tracks to a CD-RW disc Replace the disc with a blank CD-R or CD-RW disc Replace the disc with a blank CD-R or CD-RW disc
DATA DISC	<ul style="list-style-type: none"> A non-audio CD-ROM or a CD-Video disc has been placed in the machine 	<ul style="list-style-type: none"> Only CD Audio and DTS discs will play in the CDR 20; replace the disc
DISC ERROR	<ul style="list-style-type: none"> An Unfinalized disc has been placed in the Play Deck 3 A DVD disc has been placed in the unit 	<ul style="list-style-type: none"> Finalize the disc (see page 22) Replace the disc, the CDR 20 does not play or dub DVD discs
DISC FULL	<ul style="list-style-type: none"> There are only four seconds of record time remaining on the disc being recorded 	<ul style="list-style-type: none"> Use another blank CD-R or CD-RW disc Erase one or more tracks on a CD-RW disc
ERROR	<ul style="list-style-type: none"> The disc is not seated properly There is a problem with the disc 	<ul style="list-style-type: none"> Open the drawer and check to see that the disc is properly seated Try another disc
FAILED	<ul style="list-style-type: none"> A dub has not been completed properly 	<ul style="list-style-type: none"> Check the play disc Repeat the dub process
FULL	<ul style="list-style-type: none"> More than 99 tracks have been recorded 	<ul style="list-style-type: none"> The CDR 20 does not record more than 99 tracks on a disc
NO AUDIO	<ul style="list-style-type: none"> A record-related button has been pressed when a non-audio disc is in the Record Drawer 15 	<ul style="list-style-type: none"> Replace the disc with a blank CD-R or CD-RW Audio disc
SVC - 1	<ul style="list-style-type: none"> There is an internal problem with the CDR 20 	<ul style="list-style-type: none"> Contact an authorized Harman Kardon service depot

Technical Specifications

Signal Format

Playback Sampling Frequency	44.1kHz
D/A Conversion	96kHz, Multi-Bit Delta-Sigma Conversion
Oversampling	128 Times

Playback Specifications

Frequency Response	2Hz – 20,050Hz
Playback S/N	105dB
Playback Dynamic Range	105dB
Playback THD	0.005%/-88dB
Analog Audio Output	2V RMS, \pm 2dB
Digital-Coaxial Output	0.5Vpp/75 Ω
Headphone Output	1V RMS/32 Ω Load

Record Specifications

Digital Input Sample Rates	32kHz – 96kHz
Recording S/N: Analog	91dB
Recording S/N: Digital Dub Mode	Equal to Source
Recording S/N: Digital External Source	Source -10dB
Recording Dynamic Range	91dB
Recording THD	0.005%/-85dB
Analog Input Sensitivity	330mV RMS 47k Ω = 0dB
Digital Inputs (Direct Recording)	44.1kHz, \pm 100 ppm/min.

General

Power Requirement	100–240 VAC/50–60Hz
Power Consumption	28 Watts
Dimensions	
Width	17.3"/440mm
Height	4.4"/112mm
Depth	14.2"/363mm
Weight	10.5 lb/4.7kg

Depth measurement includes knobs, buttons and connection jacks.
Height measurement includes feet and chassis.
All features and specifications are subject to change without notice.

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