

CD-RW Drive

CRD-BP1500U

OWNER'S MANUAL

FCC Compliance Statement

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. Operation is subject to the following two conditions. (1) This device may not cause harmful interference. (2) This device must accept any interference received, including interference that may cause undesired operation. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Move the equipment away from receiver.
- Plug the equipment into an outlet and circuit different from that which powers the receiver.
- If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions.

CAUTION:

Use of controls or adjustments, or performance of procedures other than those specified herein may result in hazardous radiation exposure.

The equipment should not be adjusted or repaired by anyone except qualified service personnel.

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

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

LE PRÉSENT APPAREIL NUMÉRIQUE N'ÉMET PAS DE BRUITS RADIOÉLECTRIQUES DÉPASSANT LES LIMITES APPLICABLES AUX APPAREILS NUMÉRIQUES DE CLASSE B PRÉSCRITES DANS LE RÈGLEMENT SUR LE BROUILLAGE RADIOÉLECTRIQUE ÉDICTÉ PAR LE MINISTÈRE DES COMMUNICATIONS DU CANADA.

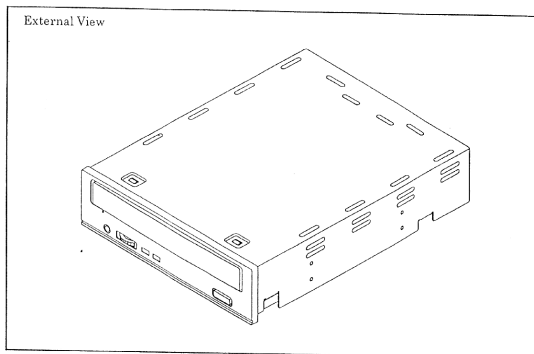
Document No. (1/3)	Document Name General Description	
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General Description

(1) Model Name: CRD-BP1500U

(CD-R drive with MAX $\times 40$ speed reading, $\times 24$ speed writing, and $\times 10$ speed rewriting)

(2) External View



(3) General Specifications

1) Characteristics

- * Half-height and built-in type
 - * Conforms to Orange Book Part 2, 3
 - * Equipped with the newly developed automatic strategy LSI with the data reliability enhanced.
 - * MAX $\times 40$ CAV speed reading, $\times 24$ speed writing (ZCLV), and $\times 10$ speed rewriting
 - * USB2.0 is employed to enable high speed data transmission.
 - * Automatic loading mechanism
 - * Emergency disc ejecting function
 - * Data verifying function
 - * Media condition check function
 - * CD-DA read function
 - * BURN-Proof Technology implemented
- "BURN-Proof" stands for Proof against Buffer Under Run error, not for proof against burning.

Document No. (2/3)	Document Name General Description	
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(4) Applications

Wide range of applications available, such as image data filing, management of CAD/CAM, drawing data and financial affairs, audio data storage and electronic publication.

(5) Main Specifications

Items	Specifications
Dimensions	148 (W) x 194.2 (D) x 42.3 (H) mm
Mass	950 g
Recording Form	Orange book part 2, 3 Fixed packet Disc-at-once Variable packet Track-at-once
Front Panel	Eject key, Emergency eject pinhole, LED (busy and write) Headphone jack, Volume
Eject	Automatic loading
Power Supply	DC 5 × (1 ± 10 %) V DC 12 × (1 ± 10 %) V

(6) Operational environment for the "write/rewrite" application software

Items	Specifications
Host Machine	IBM compatible PC (Pentium 166 MHz or more) (Note 1)
OS	MS-Windows 98SE/ME/2000 (Note 2)
Memory	MS-Windows 98SE/ME/2000: 64 MB required. 128 MB recommended.
Hard disc	Empty Storage Capacity: 100 MB or more Average seek time: 20 ms or less Transmission rate: 2 MB/s or more Do not use the HDD which calibrates thermally during operation.
Recommended Media	CD-R (×2 ~ ×24) :TAIYOYUDEN, MITSUI CHEMICAL, MITSUBISHI CHEMICAL, RICOH, RITEK, PRINCO CD-R (×2 ~ ×16) :TDK, HITACHI MAXELL, FUJI FILM, PIONEER VIDEO, KODAK CD-RW (×2 ~ ×10) :MITSUBISHI CHEMICAL, RICOH (Note 3) (Note 4)

(Note 1) If any problem occurs, negotiation is required to settle the matter.

(Note 2) (1) Install "Device Driver of USB 2.0" in OS. (A thing for the board of USB 2.0 which you chose.)

(2) Install USB 2.0 Storage Driver (TPPinst.exe).

(Note 3) We intend to add the proper media one by one in the near future.

(Note 4) Please refer to the latest information on the web: www.burn-proof.com.

Document No. (3/3)	Document Name General Description	
(7) Scope These delivery specifications are applied to the CD-R/RW drive "CRD-BP1500U" which is sold by SANYO Electric Co., Ltd. (8) Contents 1) Model No. CRD-BP1500U 2) Performance Write function onto CD-R/RW disc in combination with the write application software and CD-ROM read function, in combination with the CD-ROM application software (For further information, refer to the item, "Specifications"). 3) Applications Write onto and read of the CD-R/RW disc. Read of CD-ROM disc. 4) Dimensions Refer to the item "Dimensions and Dimensional Drawing". 5) Notes for handling Refer to the Manual and Notes for Handling. 6) Others a. The specifications of this product are the same as in the delivery specifications. If any fault or malfunction of the product occurs when it is used under any conditions except for our guaranteed conditions, our company has no responsibility for the claim. Service and the term of guarantee shall be described in the attached memorandum. b. For the legal regulations for this product, refer to the attached document. c. The specifications of this product are subject to change to enhance the performance. d. The change of notice is issued when the specification is changed only. e. If any doubt occurs regarding the contents of the specifications, negotiation is required to settle the matter.		

Document No.	Document Name	
(1/2)	Dimensions, External View and Names and Functions of Each Part	

1. Dimensions and External View

(1) External View

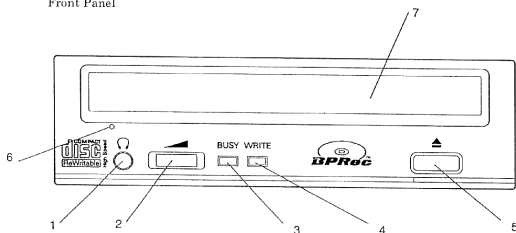
Refer to the "General Description".

(2) Dimensions and Dimensional Drawing

Refer to the attached document "Dimensions and Dimensional Drawing".

(3) Names and Functions of Each Part on the Front Panel

Front Panel

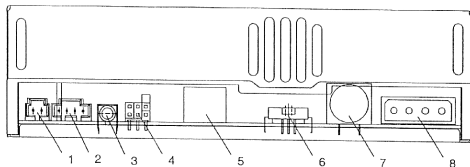


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|----------------------------|--|
| 1. Headphone Terminal | : The headphone with a stereo mini plug is connected through this terminal. |
| 2. Headphone Volume | : The volume of the headphone connected to the headphone terminal is adjusted using this volume dial. When the volume dial is turned right, the volume becomes louder. |
| 3. BUSY indicator | : Command executing. |
| ON | Reading disc and accessing condition |
| ON-AND-OFF | TOC reading condition & EJECT condition |
| OFF | Pause or Stop condition |
| 4. WRITE indicator | : This is ON when the data is written onto the disc. |
| 5. EJECT key | : The disc is ejected, using this key. This key is available even when the tray is moving. When the PRV command is transmitted from HOST or during writing, this key is not available. |
| 6. Emergency eject pinhole | : If the disc is not ejected when the key is pressed, because of power failure or run away of the software, this pinhole is used to take out the disc. |
| 7. Disc tray | : The disc is placed on this tray. |

Document No. (2/2)	Document Name Dimensions, External View and Names and Functions of Each Part	
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(4) Names and Functions of Each Part on the Rear Panel

Rear Panel



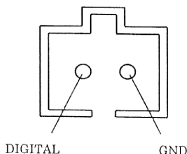
- 1.DIGITAL AUDIO Connector(for Internal use)
- 2.ANALOG AUDIO Connector(for Internal use)
- 3.Stereo Jack 3P(for External use)
- 4.Factory use only Pin
- 5.USB 2.0 Connector
- 6.Power Switch(When using DC Connector 5P.)
- 7.DC Connector 5P(for External use)
- 8.DC Connector 4P(for Internal use)

Document No. (1/3)	Document Name Terminal Description	
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1. DIGITAL AUDIO Connector

The audio digital signal output connector.

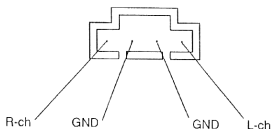
Connect the personal computer's audio internal cable here.



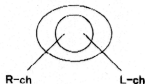
2. ANALOG AUDIO Terminals

The audio signal is output through these terminals. These terminals are used when the sound board applicable to these terminals, is attached to the personal computer.

Connect the personal computer's audio internal cable here.



3. Audio(Line out) connector

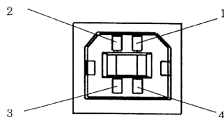


Connect the personal computer's audio external cable here.

Document No.	Document Name	
(2/3)	Terminal Description	

3. IDE Connector Terminals (USB2.0 CONNECTOR)

USB2.0 is connected to the host computer.

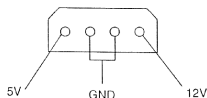


PIN NO.	SIGNAL NAME
1	VBUS
2	D -
3	D +
4	GND

4. DC Connector Terminals (DC INPUT) 4 P

The DC power supply cable is connected through these terminals.

(Connect the personal Computer's DC power cable here)



Document No.

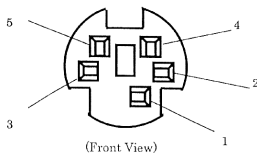
Document Name

(3/3)

Terminal Description

5. DC Connector Terminals (DC INPUT) 5 P

The DC power supply external cable is connected through these terminals.



PIN NO.	SIGNAL NAME
1	+12 V
2	GND
3	+5 V
4	GND
5	+5 V

Document No. (1/1)	Document Name Environmental Conditions	
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Environmental Conditions

Items	Environmental Conditions
Temperature	Operation : $5^{\circ}\text{C} < t_a < 45^{\circ}\text{C}$ Storage : $-30^{\circ}\text{C} < t_{\text{NG}} < 60^{\circ}\text{C}$
Humidity	Operation : (8 to 80) % (non-condensing) Storage : 90 % (40 °C, 48 h)
Mean-Time-Between-Failure (MTBF)	30000 POH DUTY 20 % (read operation) (Note 1)
Life	Tray loading : 20000 cycles Traverse mechanism : 1000000 seek
Vibration	Operation: Read 0.98 m/s^2 (0.1 G) [(10 to 500) Hz] Random Vibration Without operation (transportation): 800 cpm (13.3 Hz), 3 mm (1.06 G), Up/Down 20 min.
Impact	Drop Impact: 490 m/s^2 (50 G), 3 directions, 6 ms

(Note 1) POH : Power On Hour (live current time)

DUTY : Actual operation time

Document No.	Document Name	
(1/3)	Reliability	

1. Estimate Conditions

1) Standard test position

For the standard test position, the + side of the Z axis shall be in the upper direction, provided that the Z axis shall be the outgoing beam and the direction of the outgoing beam shall be + side.

2) Standard Estimate Environments

Temperature : $(22 \pm 2) ^\circ\text{C}$

Humidity : $(50 \pm 5) \% \text{ RH}$

However, when no doubt occurs regarding the judgment, the test may be performed under the following conditions.

Temperature : $(15 \text{ to } 30) ^\circ\text{C}$

Humidity : $(45 \text{ to } 85) \% \text{ RH}$

3) Disc to be estimated

Test Disc made by ALMEDIO Inc. ROM DISK, DA DISK, CD-R DISK (TY-74P),
CD-RW (RICOH, MITSUBISHI CHEMICAL)

However, when no doubt occurs regarding the judgment, TCD-784 made by ALMEDIO Inc. may be used.

4) Power Supply Voltage

Power supply : $\text{DC } 5 \times (1 \pm 10 \%) \text{ V}$

Power supply : $\text{DC } 12 \times (1 \pm 10 \%) \text{ V}$

2. Reliability

The results should conform to the criteria of each item after the test has been performed under the following conditions.

There shall be no crack, deformation or distortion from the external view of the product after the test.

Unless otherwise specified, the measurement conditions of this test for each item shall be subject to the above estimate conditions.

However, the temperature in this test shall be specified to the surrounding temperature of the drive unit, rather than the surrounding temperature of the set unit where this product is built-in.

Document No.	Document Name
(2/3)	Reliability

Test items	Test conditions	Criteria
1. Operating temperature test	Operation under low temperature: +5 °C Operation under high temperature: +45 °C Leave the product for 4 hours without operation in the environmental temperatures, as above. Turn on the power and leave the product for 10 minutes. Immediately after that, check the performance under the same environmental temperatures as above. However, there should be no dew condensation.	The performance should conform to the standards described in the Reliability Estimation Standard Table.
2. Practical operation temperature test	Operation under low temperature: +5 °C Operation under high temperature: +45 °C Leave the product for 4 hours without operation in the environmental temperatures, as above. Turn on the power of the product and leave the product for 10 minutes. Immediately after that, check the performance under the same environmental temperatures as above. However, there should be no dew condensation.	There should be no errors in the practical operation. When this product is built in the set unit, make sure that the temperature does not exceed the range described on the left.
3. Storage test under low temperature.	Temperature: $(-30 \pm 2) ^\circ\text{C}$ Leave the product for 24 hours without operation in the above environmental temperature range, and then leave it at normal temperature for 24 hours. After that, measure the characteristic change. However, there should be no dew condensation.	The characteristics should conform to the standards described in the Reliability Estimation Standards Table.
4. Storage test under high temperature	Temperature: $(60 \pm 2) ^\circ\text{C}$ Leave the product for 24 hours without operation in the above environmental temperature range, and then leave it at normal temperature for 24 hours. After that, measure the characteristic change. However, there should be no dew condensation.	The characteristics should conform to the standards described in the Reliability Estimation Standards Table.
5. Storage under high temperature and high humidity	Temperature and humidity: $(40 \pm 2) ^\circ\text{C}$, $(90 \pm 2) \% \text{ RH}$ Leave the product for 24 hours without operation in the above environmental temperature range, and then leave it at normal temperature for 24 hours. After that, measure the characteristic change. However, there should be no dew condensation.	The characteristics should conform to the standards described in the Reliability Estimation Standards Table.
6. Unit Vibration (without operation)	Amplitude: 800 cpm (13.3 Hz) 3 mm (1.06 G) The above amplitude is applied to the product for 20 minutes for Up/Down direction.	The characteristics should conform to the standards described in the Reliability Estimation Standards Table.
7. Unit Impact (without operation)	Impact: 490 m/s ² (50 G), 3 directions Impact time: 6 ms Measure the performance after applying the above impact for each direction.	The characteristics should conform to the standards described in the Reliability Estimation Standards Table.
8. Pick-up Slide Operation	Random Seek After 1000000 times operation, the performance is checked.	There should be no errors in the practical operation.
9. Jamming	When the product is built in the set unit, the level of electromagnetic wave which is emitted from the unit shall conform to the local radio wave standards. (When any problems occurs, the negotiation is required to support the counter measures).	

Document No.	Document Name	
(3/3)	Reliability	

The following table shows the reliability standards for the main parts (units) which are used in this product.

Test items	Test conditions	Criteria
10. Laser diode life	Check the recorded power after 1000 hours of operation at 60 °C. (except for breakage caused by static electricity)	The error rate should be 1 % or less.
11. Spindle motor life	Amplitude:800 cpm (13.3 Hz) 3 mm (1.06 G) The above amplitude is applied to the product for 20 minutes for Up/Down direction.	The initial value should be +35 % or less.
12. Feeder motor life	After the pick-up slide operation as described in item 8, measure the consumption current in the motor.	The values should conform to the minimum start-up volume (500 PPS Vc: 1.0 V or less) and pull-out torque [2000 PPS 6.86×10^{-4} N·m (7 gf·cm) or more].

11. Reliability Standards

The change in values after estimation under the reliability conditions, should conform to the values in the following table.

Items		Before Test	Change in Values after Test	Remarks
1/3 stroke mean access time	×40 CAV speed	0.27 s or less	0.35 s or less	Mean value measured after reciprocating operation for (0 to 20) min. (one way value)
Block error rate read	×4 CLV speed	250 errors or less	260 errors or less	Mean value per 1 second. Measured from the number of times of mean C1 error for 10 seconds. (Note 1) (Note 2)
	Standard speed	50 errors or less	75 errors or less	
Block error rate self-record reading	×4 CLV speed	150 errors or less	220 errors or less	Standard speed reading The recording strategy is set automatically: OPC TY-74P
	Standard speed	100 errors or less	150 errors or less	

(Note 1) Test Disc: A.BEX TCD-784 (There should be no scratches or dirt).

(Note 2) There should be no dirt on the lens.