

4 Channel Class-D Amplifier

Operating Instructions

GB

For customers in the United States:
The warranty for this product is included in this manual
(page 13).

Owner's Record

The model and serial numbers are located on the bottom of the unit.

Record the serial number in the space provided below.

Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. XM-S400D

Serial No. _____



* 4 5 8 1 3 7 3 1 1 * (2)

Warning

FOR THE CUSTOMERS IN THE USA. NOT APPLICABLE IN CANADA, INCLUDING IN THE PROVINCE OF QUEBEC.

POUR LES CLIENTS AUX ÉTATS-UNIS. NON APPLICABLE AU CANADA, Y COMPRIS LA PROVINCE DE QUÉBEC.

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

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

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Made in Thailand

Notice for customers: the following information is only applicable to equipment sold in countries applying EU Directives

Manufacturer: Sony Corporation, 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
For EU product compliance: Sony Deutschland GmbH, Hedelfinger Strasse 61, 70327 Stuttgart, Germany



Disposal of waste batteries and electrical and electronic equipment (applicable in the European Union and other European countries with separate collection systems)

This symbol on the product, the battery or on the packaging indicates that the product and the battery shall not be treated as household waste. On certain batteries this symbol might be used in combination with a chemical symbol. The chemical symbols for mercury (Hg) or lead (Pb) are added if the battery contains more than 0.0005% mercury or 0.004% lead.

By ensuring these products and batteries are disposed of correctly, you will help prevent potentially negative consequences for the environment and human health which could otherwise be caused by inappropriate waste handling. The recycling of the materials will help to conserve natural resources.

In case of products that for safety, performance or data integrity reasons require a permanent connection with an incorporated battery, this battery should be replaced by qualified service staff only.

To ensure that the battery and the electrical and electronic equipment will be treated properly, hand over these products at end-of-life to the applicable collection point for the recycling of electrical and electronic equipment.

For all other batteries, please view the section on how to remove the battery from the product safely. Hand the battery over to the applicable collection point for the recycling of waste batteries.

For more detailed information about recycling of this product or battery, please contact your local Civic Office, your household waste disposal service or the shop where you purchased the product or battery.



This symbol is intended to alert the user to the presence of a hot surface. The symbol applies to Europe models only.

If you have any questions or problems concerning your unit that are not covered in this manual, please consult your nearest Sony dealer.

Features

- Maximum power output of 100 W per channel (at 4 Ω).
- Built-in LP (low-pass) filter and HP (high-pass) filter.
- Protection circuit and indicator provided.
- Direct connection can be made with the speaker output of your car audio unit if it is not equipped with the line output (High level input connection).
- Hi-level Sensing Power On feature allows this unit to be activated without the need for a REMOTE connection.
- Class-D Technology* is supported.

*** Class-D Technology**

The Class-D Technology is a method to convert and amplify music signals with MOSFETs to high speed pulse signals. Furthermore, it features high efficiency and low heat generation.

Table of Contents

Warning	2
Features	3

Operation

Location and Function of Controls	4
---	---

Installation and Connections

Parts for Installation and Connections	5
Installation	5
Connections	6
Power Connections	6
Input Connections	7
Speaker Connections	9

Additional Information

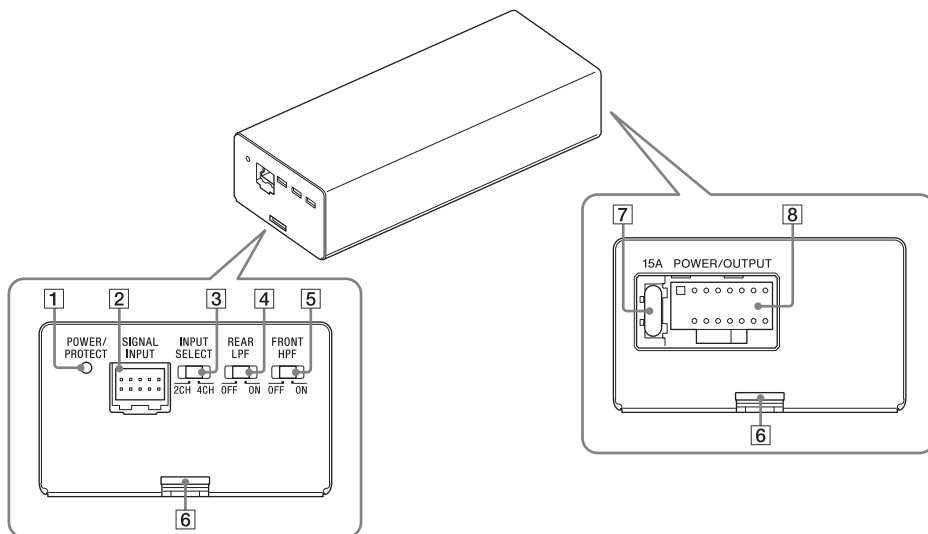
Precautions	10
Maintenance	10
Fuse Replacement	10
Specifications	11
Troubleshooting	12

For customers in the United States:

Important notice

The warranty for this product is included in this manual (page 13). Keep this manual for future use.

Location and Function of Controls



1 POWER/PROTECT indicator

Lights up in green during operation. If the protection circuit activates, the POWER/PROTECT indicator flashes. For details, see "Troubleshooting" (page 12).

2 SIGNAL INPUT connector

Can be connected with the supplied RCA input cord or high level input cord.

3 INPUT SELECT switch

Sets the input signal to "2CH" or "4CH."

4 REAR LPF (low-pass filter) switch

Sets the low-pass filter (LPF) to "ON" or "OFF."

5 FRONT HPF (high-pass filter) switch

Sets the high-pass filter (HPF) to "ON" or "OFF."

6 Slit for the supplied bracket

Insert the bracket and secure with the screw to mount the unit on the mounting board or flat surface.

7 Fuse holder (15A)

When replacing the fuse, be sure to use one with 15 A.

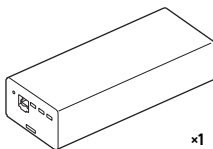
8 POWER/OUTPUT connector

Can be connected with the supplied power connection cable.

Installation and Connections

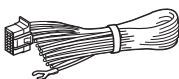
Parts for Installation and Connections

① Main unit



x1

② Power connection cable



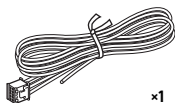
x1

③ RCA input cord



x1

④ High level input cord



x1

⑤ Bracket



x2

⑥ Bracket screw
ø 2.6 mm × 6 mm
(1/8 in × 1/4 in)



x2

⑦ Mounting screw
ø 4 mm × 20 mm
(3/16 in × 13/16 in)



x2

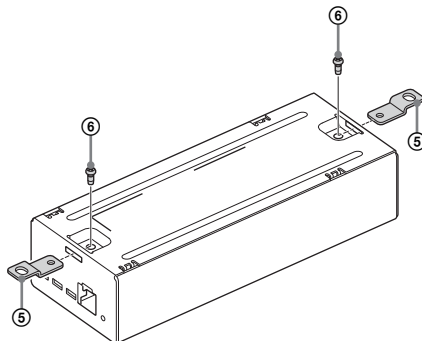
This parts list does not include all the package contents.

- The unit will not come into contact with a driver/passengers or materials in your car since the unit becomes hot during use.
- Do not install the unit under the floor carpet, where the heat dissipation from the unit will be considerably impaired.

Mounting the unit

Prepare a mounting board that is thicker than 20 mm (13/16 in) since the supplied mounting screws ⑦ are all 20 mm (13/16 in) long. The unit can also be mounted on the flat surface of your car without a mounting board.

- 1 Insert the supplied mounting brackets ⑤ into the slits of the unit and secure them with the supplied bracket screws ⑥.

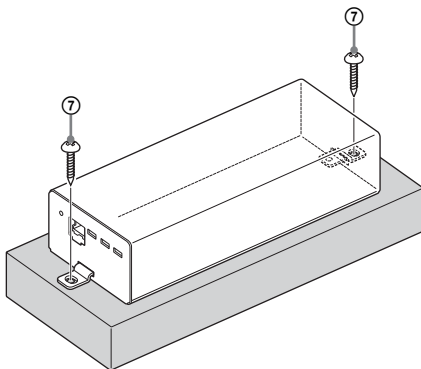


- 2 Place the unit on the mounting board and mark the two screw hole positions.
- 3 Drill a 3 mm (1/8 in) pilot hole at each mark on the mounting board.

Installation

- Mount the unit on a flat surface.
- Mount the unit where
 - The unit will not interfere with the normal movements of the driver.
 - The unit will not be exposed to direct sunlight or hot air from the heater.

- 4** Place the unit on the mounting board and secure it with the supplied mounting screws ⑦.

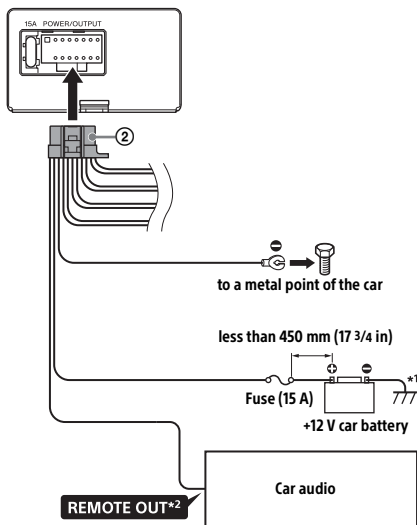


Connections

- Before making any connections, disconnect the ground (earth) terminal of the car battery to avoid short circuits.
 - If your car is equipped with a computer system for navigation or some other purpose, disconnecting the ground (earth) wire from the car battery may damage the computer memory. Leaving the ground (earth) wire connected and disconnecting the +12 V power supply wire until all the other wires have been connected may prevent short circuits.
 - Be sure to use speakers with an adequate power rating. If you use small capacity speakers, they may be damaged.
 - Do not connect the ⊖ terminal of the speaker system to the car chassis, and do not connect the ⊖ terminal of the right speaker with that of the left speaker.
 - Install the input and output cords away from the power supply wire. Running them close together may generate interference noise.
- ### Power Connections
- Connect the +12 V power supply wire only after all the other wires have been connected and the settings on this unit have been made.
 - Be sure to connect the ground (earth) wire of the unit securely to a metal point of the car. A loose connection may cause a malfunction of the amplifier.
 - Be sure to connect the remote control wire of the car audio unit to the remote input (REM) wire of the supplied power connection cable.
 - When using a car audio unit without a remote output for the amplifier, connect the remote input (REM) wire of the supplied power connection cable to the accessory power supply.
 - Use a power supply wire with a fuse (15 A) attached.
 - All power wires connected to the positive battery post should be fused within 450 mm (17 3/4 in) of the battery post, and before they pass through any metal.
 - Make sure that the car's battery wires connected to the car (ground (earth) to chassis) are of a wire gauge at least equal to that of the main power wire connected from the battery to the amplifier.
 - During full-power operation, a current of more than 15 A will run through the system. Therefore, make sure that the wires to be connected to the +12 V and GND wires of this unit are at least 14-Gauge (AWG-14) or have a sectional area of more than 2 mm² (3/32 in²).

Making power connections

Connect the supplied power connection cable to the POWER/OUTPUT connector on the unit.



*1 Ground (earth) to chassis.

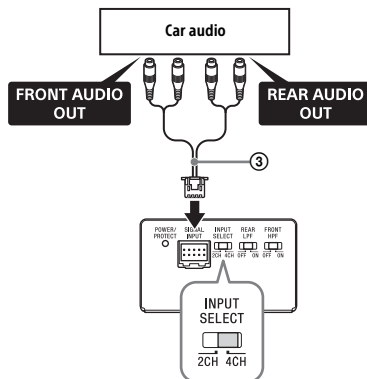
*2 If you have the factory original or some other car audio unit without a remote output for the amplifier, connect the remote input (REM) wire of the supplied power connection cable to the accessory power supply. With the high level input connection, the car audio unit can also be activated without need for a REMOTE connection. However, this function is not guaranteed for all car audio units.

Input Connections

Set the INPUT SELECT switch to "2CH" or "4CH" according to the input connection. Also, refer to the manual supplied with your car audio unit for further details.

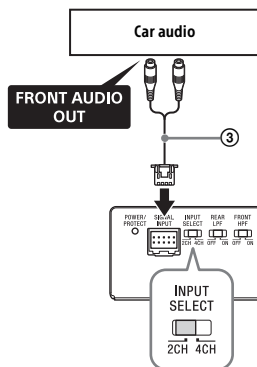
A Line input connection

Set the INPUT SELECT switch to "4CH" with the speaker connection **1** (page 9).



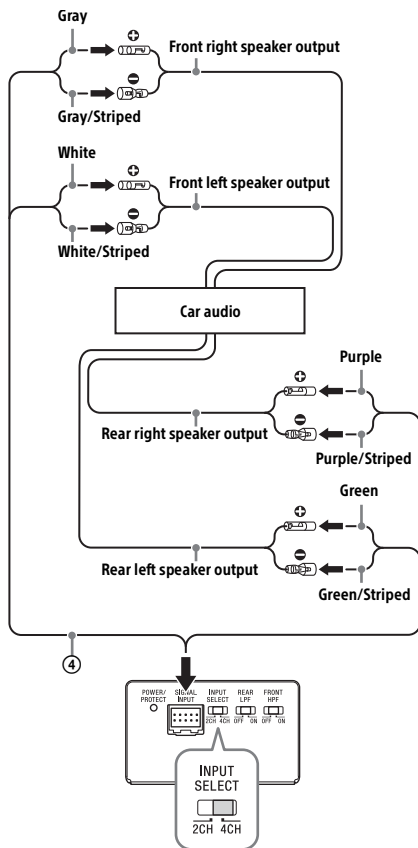
B Line input connection

Set the INPUT SELECT switch to "2CH" with the speaker connection **2** (page 9).



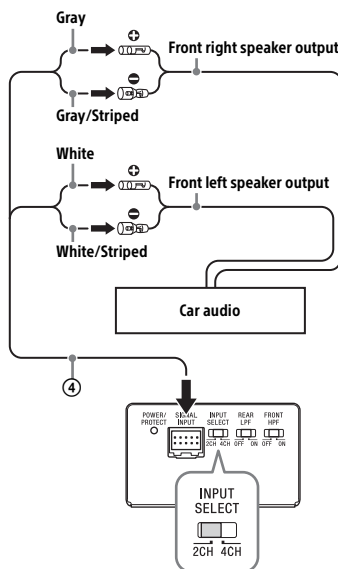
C High level input connection

Set the INPUT SELECT switch to "4CH" with the speaker connection **1** (page 9).



D High level input connection

Set the INPUT SELECT switch to "2CH" with the speaker connection **2** (page 9).

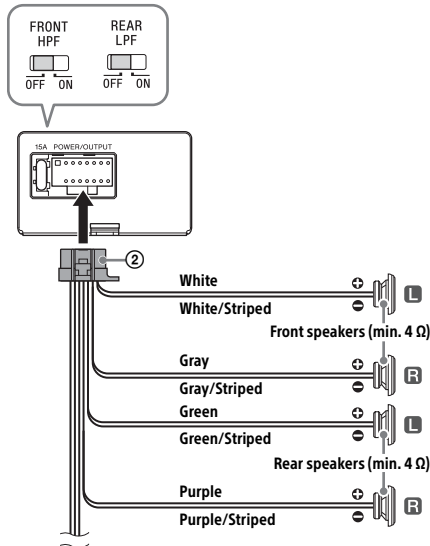


Speaker Connections

Set the REAR LPF switch and FRONT HPF switch to "ON" or "OFF" according to the speaker system. Also, refer to the manual supplied with your speakers for further details.

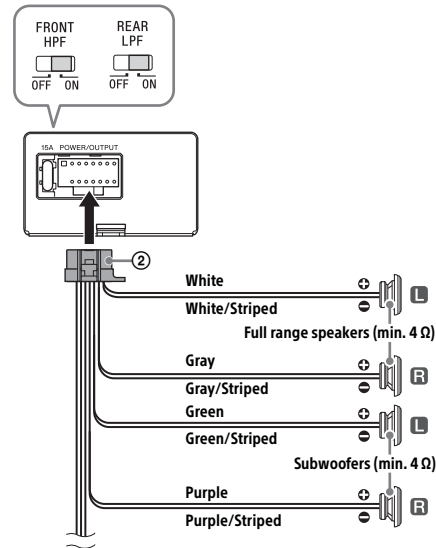
1 4-speaker system

Set with the input connection **A** (page 7) or **C** (page 8).



2 2-way system

Set with the input connection **B** (page 7) or **D** (page 8).



Note

In this system, the volume of the subwoofer will be controlled by the car audio unit fader control.

Additional Information

Precautions

- This unit is designed for negative ground (earth) 12 V DC operation only.
- Use speakers with an impedance of 4 Ω to 8 Ω .
- Do not connect any active speakers (with built-in amplifiers) to the unit. Doing so may damage the active speakers.
- Avoid installing the unit in areas subject to:
 - High temperatures such as from direct sunlight or hot air from the heater
 - Rain or moisture
 - Dust or dirt
 - Inclined surface
 - Direct contact with a driver/passengers.
- If your car is parked in direct sunlight and there is a considerable rise in temperature inside the car, allow the unit to cool down before use.
- When installing the unit horizontally, be sure not to cover the unit with the floor carpet, etc.
- If this unit is placed too close to the car audio unit or antenna (aerial), interference may occur. In this case, relocate this unit away from the car audio unit or antenna (aerial).
- If no power is being supplied to the car audio unit, check the connections.
- This unit employs a protection circuit* to protect the transistors and speakers if the amplifier malfunctions. Do not attempt to test the protection circuits by covering the unit or connecting improper loads.
- Do not use the unit on a weak battery as its optimum performance depends on a good power supply.
- For safety, keep your car audio unit volume moderate so that you can still hear other sounds.

* Protection circuit

This amplifier is provided with a protection circuit that operates in the following cases:

- When the unit overheats
- When a DC current is generated
- When the speaker terminals are short-circuited.

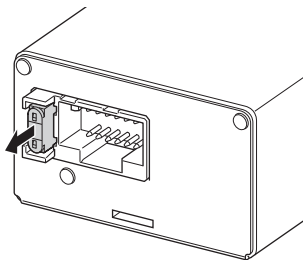
If a protection circuit is activated, the POWER/PROTECT indicator will flash. For details, see "Troubleshooting" (page 12).

If you have any questions or problems concerning your unit that are not covered in this manual, please consult your nearest Sony dealer.

Maintenance

Fuse Replacement

When replacing the fuse, be sure to use one matching the amperage stated above the fuse holder. If the fuse blows, check the power connection and replace the fuse. If the fuse blows again after replacement, there may be an internal malfunction. In such a case, consult your nearest Sony dealer.



Warning

Never use a fuse with an amperage rating exceeding the one supplied with the unit as this could damage the unit.

Specifications

FOR THE CUSTOMERS IN THE USA. NOT APPLICABLE IN CANADA, INCLUDING IN THE PROVINCE OF QUEBEC.

POUR LES CLIENTS AUX ÉTATS-UNIS. NON APPLICABLE AU CANADA, Y COMPRIS LA PROVINCE DE QUÉBEC.

AUDIO POWER SPECIFICATIONS



CEA2006 Standard

Power Output: 45 Watts RMS $\times$ 4 at 4 Ohms $<$ 1% THD+N

SN Ratio: 83 dBA

(reference: 1 Watt into 4 Ohms)

Circuit system

- OTL (output transformerless) circuit,
- Pulse power supply

Inputs

- RCA pin jacks,
- High level input connector

Input level

- 1 V (RCA pin jacks),
- 8 V (High level input)

Outputs

- Speaker terminals

Speaker impedance

- 4 Ω – 8 Ω

Maximum output

- 4 Speakers: 100 W $\times$ 4 (at 4 Ω)

Rated output

- (supply voltage at 14.4 V, 1 kHz, 1% THD)
- 4 Speakers: 45 W $\times$ 4 (at 4 Ω)

Frequency response

- 20 Hz – 20 kHz ($+0.5$ -3.0 dB)

Harmonic distortion

- 0.08% or less (at 1 kHz, 4 Ω)

Low-pass filter

- 120 Hz, 12 dB/oct

High-pass filter

- 120 Hz, 12 dB/oct

Power requirements

- 12 V DC car battery (negative ground (earth))

Power supply voltage

- 10.5 V – 16 V

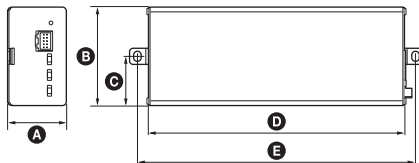
Current drain

At rated output: 15 A (4 Ω , 45 W $\times$ 4)

Remote input: 1 mA

Dimensions

Approx. 162.8 mm $\times$ 37.3 mm $\times$ 62.6 mm
(6 1/2 in $\times$ 1 1/2 in $\times$ 2 1/2 in) (w/h/d) not incl.
projecting parts and controls



A 37.3 mm (1 1/2 in)

B 62.6 mm (2 1/2 in)

C 31.3 mm (1 1/4 in)

D 162.8 mm (6 1/2 in)

E 176.8 mm (7 in)

Mass

Approx. 0.46 kg (1 1/4 lb) not incl. accessories

Package contents:

- Main unit (1)
- Parts for installation and connections (1 set)

Your dealer may not handle some of the above listed accessories. Please ask the dealer for detailed information.

Design and specifications are subject to change without notice.

Troubleshooting

The following checklist will assist in the correction of most problems which you may encounter with your unit. Before going through the checklist below, refer to the connection and operating procedures.

The POWER/PROTECT indicator does not light up.

- The fuse is blown.
 - Replace the fuse with a new one.
- The ground (earth) wire is not securely connected.
 - Fasten the ground (earth) wire securely to a metal point of the car.
- The voltage going into the remote input (REM) wire is too low.
 - Turn on the car audio unit if it is not turned on.
 - Use a relay if the system employs too many amplifiers.
- Check the battery voltage (10.5 V – 16 V).

The POWER/PROTECT indicator flashes quickly (once every 0.2 seconds) and the unit turns off automatically.

- The speaker outputs are short circuited.
 - Take out any media from the car audio unit and turn the connected equipment off, then determine the cause of the short circuits.
- The speaker cord and ground (earth) wire are not securely connected.
 - Take out any media from the car audio unit and turn the connected equipment off, then connect the speaker cord securely and fasten the ground (earth) wire to a metal point of the car.
- The unit has overheated.
 - Wait until the unit cools down.
 - Check whether the impedance of the connected speakers is lower than 4 Ω .

The POWER/PROTECT indicator flashes slowly (once every second) and sound becomes low.

- The unit has overheated and thermal protector is activated.
 - Turn the volume down.

The unit becomes abnormally hot.

- Use speakers with a suitable impedance of 4 Ω - 8 Ω .
- Make sure to place the unit in a well ventilated location.

Alternator noise is heard.

- The power connecting wires are installed too close to the RCA pin cords.
 - Keep the wires away from the cords.
- The ground (earth) wire is not securely connected.
 - Fasten the ground (earth) wire securely to a metal point of the car.

The filter switch is set to the wrong position.

- When connecting the subwoofer (2-way system connection), set the REAR LPF switch to "ON" (page 9).
- When connecting the full range speaker (2-way system connection), set the FRONT HPF switch to "ON" (page 9).
- When connecting the front speakers and the rear speakers (4-speaker system connection), set the FRONT HPF and REAR LPF switches to "OFF" (page 9).

If these solutions do not help improve the situation, consult your nearest Sony dealer.

SONY®

LIMITED WARRANTY

Car Audio

(U.S. Only)

Sony Electronics Inc. ("Sony") warrants this product against defects in material or workmanship for the time periods and as set forth below when purchased directly from Sony or a Sony Retailer. Pursuant to this Limited Warranty, Sony will, at its option, (i) repair the product using new or refurbished parts or (ii) replace the product with a new or refurbished product. For purposes of this Limited Warranty, "refurbished" means a product or part that has been returned to its original specifications. **In the event of a defect, these are your exclusive remedies.**

Labor: For a period of one (1) year from the original date of purchase of the product ("Labor Warranty"), Sony will, at its option, repair or replace with new or refurbished product, product determined to be defective. If Sony elects to replace the product after this Labor Warranty has expired but while the Parts Warranty below is still in effect, it will do so for the applicable labor charge.

Parts: For a period of one (1) year from the original date of purchase of product ("Parts Warranty"), Sony will supply new or refurbished replacement parts in exchange for parts determined to be defective.

This Limited Warranty covers only the hardware components packaged with the Product. It does not cover technical assistance for hardware or software usage and it does not cover any software products whether or not contained in the Product; any such software is provided "AS IS" unless expressly provided for in any enclosed software Limited Warranty. Please refer to the End User License Agreements included with the Product for your rights and obligations with respect to the software.

Instructions: To obtain warranty service, you must deliver the product, freight prepaid, in either its original packaging or packaging affording an equal degree of protection to the Sony authorized service facility specified. **It is your responsibility to backup any data, software or other materials you may have stored or preserved on your unit. It is likely that such data, software, or other materials will be lost or reformatted during service and Sony will not be responsible for any such damage or loss.** A dated purchase receipt from Sony or a Sony Retailer is required. For specific instructions on how to obtain warranty service for your product,

Visit Sony's Web Site:
www.sony.com/support

Or call the **Sony Customer Information Service Center**
1-800-222-SONY(7669)

For an accessory or part not available from your authorized dealer, call:

1-800-488-SONY (7669)

Repair / Replacement Warranty: This Limited Warranty shall apply to any repair, replacement part or replacement product for the remainder of the original Limited Warranty period or for ninety (90) days, whichever is longer. Any parts or product replaced under this Limited Warranty will become the property of Sony.

This Limited Warranty only covers product issues caused by defects in material or workmanship during ordinary consumer use; it does not cover product issues caused by any other reason, including but not limited to product issues due to commercial use, acts of God, misuse, limitations of technology, or modification of or to any part of the Sony product or product purchased from other than Sony or a Sony Retailer. To determine if a retailer is part of the Sony Retailer Network, please contact Sony's Customer Service Call Center or go to www.sony.com/support. This Limited Warranty does not cover Sony products sold AS IS or WITH ALL FAULTS or consumables (such as fuses or batteries). This Limited Warranty is invalid if the factory-applied serial number has been altered or removed from the product. This Limited Warranty is valid only in the United States.

LIMITATION ON DAMAGES: SONY SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ON THIS PRODUCT.

DURATION OF IMPLIED WARRANTIES: EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or allow limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. This Limited Warranty gives you specific legal rights and you may have other rights which vary from state to state.