

KENWOOD

XR-1S KAC-X1D

MONO DIGITAL POWER AMPLIFIER ▶ page 2-13

INSTRUCTION MANUAL

AMPLIFICATEUR MONO NUMÉRIQUE ▶ page 14-25

MODE D'EMPLOI

AMPLIFICADOR DE POTENCIA DIGITAL MONOFÓNICO ▶ página 26-36

MANUAL DE INSTRUCCIONES

Kenwood Corporation

Take the time to read through this instruction manual.

Familiarity with installation and operation procedures will help you obtain the best performance from your new power amplifier.

For your records

Record the serial number, found on the back of the unit, in the spaces designated on the warranty card, and in the space provided below. Refer to the model and serial numbers whenever you call upon your Kenwood dealer for information or service on the product.

Model XR-1S/KAC-X1D Serial number _____

US Residence Only

Register Online

Register your Kenwood product at
www.Kenwoodusa.com

Safety precautions

▲ WARNING

To prevent injury or fire, take the following precautions:

- Mounting and wiring this product requires skills and experience. For safety's sake, leave the mounting and wiring work to professionals.
- When extending the ignition, battery, or ground wires, make sure to use automotive-grade wires or other wires with the range of 14 mm² (AWG 6) to 21 mm² (AWG 4) to prevent wire deterioration and damage to the wire coating.
- To prevent a short circuit, never put or leave any metallic objects (such as coins or metal tools) inside the unit.
- If the unit starts to emit smoke or strange smells, turn off the power immediately and consult your Kenwood dealer.
- Do not touch the unit during use because the surface of the unit becomes hot and may cause burns if touched.

▲ CAUTION

To prevent damage to the machine, take the following precautions:

- Be sure the unit is connected to a 12V DC power supply with a negative ground connection.
- Do not open the top or bottom covers of the unit.
- Do not install the unit in a spot exposed to direct sunlight or excessive heat or humidity. Also avoid places with too much dust or the possibility of water splashing.
- When replacing a fuse, only use a new one with the prescribed rating. Using a fuse with the wrong rating may cause your unit to malfunction.
- To prevent a short circuit when replacing a fuse, first disconnect the wiring harness.

NOTE

- If you experience problems during installation, consult your Kenwood dealer.
- If the unit does not seem to be working right, consult your Kenwood dealer.

FCC WARNING

This equipment may generate or use radio frequency energy. Changes or modifications to this equipment may cause harmful interference unless the modifications are expressly approved in the instruction manual. The user could lose the authority to operate this equipment if an unauthorized change or modification is made.

FCC NOTE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment may cause harmful interference to radio communications, if it is not installed and used in accordance with the instructions. 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.

NOTE

This Class B digital apparatus complies with Canadian ICES-003.

CE Declaration of Conformity with regard to the EMC Directive 2004/108/EC

Manufacturer:

Kenwood Corporation
2967-3 Ishikawa-machi, Hachioji-shi, Tokyo,
192-8525 Japan

EU Representative's:

Kenwood Electronics Europe BV
Amsterdamseweg 37, 1422 AC UITHOORN,
The Netherlands

Information on Disposal of Old Electrical and Electronic Equipment (applicable for EU countries that have adopted separate waste collection systems)



Products with the symbol (crossed-out wheeled bin) cannot be disposed as household waste.

Old electrical and electronic equipment should be recycled at a facility capable of handling these items and their waste byproducts. Contact your local authority for details in locating a recycle facility nearest to you. Proper recycling and waste disposal will help conserve resources whilst preventing detrimental effects on our health and the environment.

This Product is not installed by the manufacturer of a vehicle on the production line, nor by the professional importer of a vehicle into an EU Member State.

Cleaning the unit

If the front panel gets dirty, turn off the power and wipe the panel with a dry silicon cloth or soft cloth.

▲ CAUTION

Do not wipe the panel with a hard cloth or a cloth dampened by volatile solvents such as paint thinner and alcohol. They can scratch the surface of the panel and/or cause the indicator letters to peel off.

To prevent battery rise

When the unit is used in the ACC ON position without turning the engine ON, it depletes the battery. Use it after starting the engine.

Protection function

The protection function is activated in the following situations:

This unit is equipped with a protection function for protecting this unit and your speakers from various accidents or problems that can occur.

When the protection function is triggered, the PROTECTION indicator lights and the amplifier stops operating.

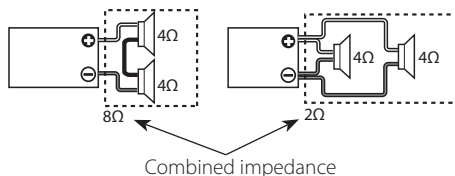
- When a speaker wire may be short-circuited.
- When a speaker output contacts ground.
- When the unit malfunctions and a DC signal is sent to the speaker output.

■ Wiring

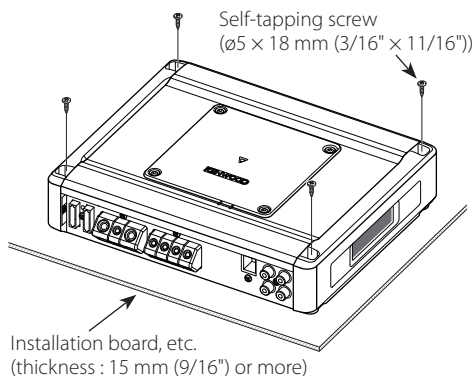
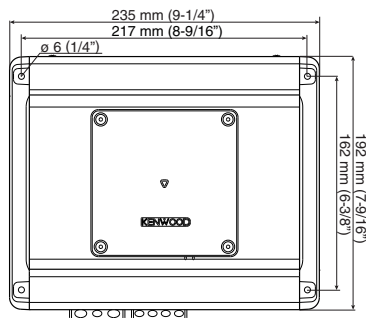
- Take the battery wire for this unit directly from the battery. If it's connected to the vehicle's wiring harness, it can cause blown fuses etc.
- If a buzzing noise is heard from the speakers when the engine is running, connect a line noise filter (optional) to each of the battery wire.
- Do not allow the wire to directly contact the edge of the iron plate by using Grommets.
- Connect the ground wire to a metal part of the car chassis that acts as an electrical ground passing electricity to the battery's negative \ominus terminal. Do not turn the power on if the ground wire is not connected.
- Be sure to install a protective fuse in the power cord near the battery. The protective fuse should be the same capacity as the unit's fuse capacity or somewhat larger.
- For the power cord and ground, use a vehicle type (fireproof) power wiring cord with a current capacity greater than the unit's fuse capacity. (Use a power wiring cord with the range of 14 mm² (AWG 6) to 21 mm² (AWG 4).
- When more than one power amplifier are going to be used, use a power supply wiring wire and protective fuse of greater current-handling capacity than the total maximum current drawn by each amplifier.

■ Speaker Selection





- The rated input power of the speakers that are going to be connected should be greater than the maximum output power (in Watts) of the amplifier. Use of speakers having input power ratings that are less than the output power of the amplifier will cause smoke to be emitted as well as damage.
- The impedance of the speakers that are going to be connected should be 2Ω or greater (for stereo connections), or 4Ω or greater (for bridged connections). When more than one set of speakers are going to be used, calculate the combined impedance of the speakers and then connect suitable speakers to the amplifier.



Installation



■ Accessories

Part name	External View	Number of Items
Self-tapping screws ($\varnothing 5 \times 18 \text{ mm}$ (3/16" \times 11/16"))		4
Hexagon Wrench (Large)		1
Hexagon Wrench (Small)		1
Terminal cover (Power terminal)		1

■ Installation procedure

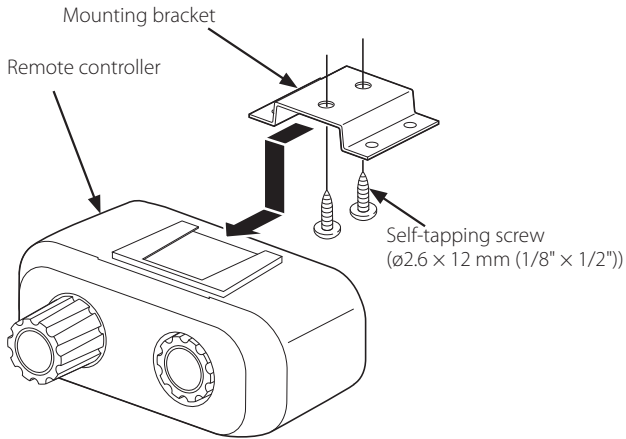
Since there are large variety of settings and connections possible according to applications, read the instruction manual well to select the proper setting and connection.

1. Remove the ignition key and disconnect the negative \ominus terminal of the battery to prevent short circuits.
2. Set the unit according to the intended usage.
3. Connect the input and output wires of the units.
4. Connect the speaker wires.
5. Connect the power wire, power control wire and grounding wire following this order.
6. Install the installation fittings in the unit.
7. Attach the unit.
8. Install the remote controller.
9. Connect the negative \ominus terminal of the battery.





▲ CAUTION

- Do not install in the below locations; (Unstable location, In a location that interferes with driving, In a location that gets wet, In a dusty location, In a place that gets hot, In a place that gets direct sunlight, In a location that gets hit by hot air)
- Do not install the unit under the carpet. Otherwise heat build-up occurs and the unit may be damaged.
- Install this unit in a location which allows heat to easily dissipate. Once installed, do not place any object on top of the unit.
- The surface temperature of the amplifier will become hot during use. Install the amplifier in a place where people, resins, and other substances that are sensitive to heat will not come into contact with it.
- This unit has cooling fan to decrease the internal temperature. Do not mount the unit in a place where the cooling fan and ducts of the unit are blocked. Blocking these openings will inhibit the cooling of the internal temperature and result in malfunction.
- When making a hole under a seat, inside the trunk, or somewhere else in the vehicle, check that there is nothing hazardous on the opposite side such as a gasoline tank, brake pipe, or wiring harness, and be careful not to cause scratches or other damage.
- Do not install near the dashboard, rear tray, or air bag safety parts.
- The installation to the vehicle should securely fasten the unit to a place in which it will not obstruct driving. If the unit comes off due to a shock and hits a person or safety part, it may cause injury or an accident.
- After installing the unit, check to make sure that electrical equipment such as the brake lamps, turn signal lamps and windshield wipers operate normally.

■ **Remote controller (Accessory of KAC-X1D, Optional accessory for XR-1S.)**



■ **Accessories**

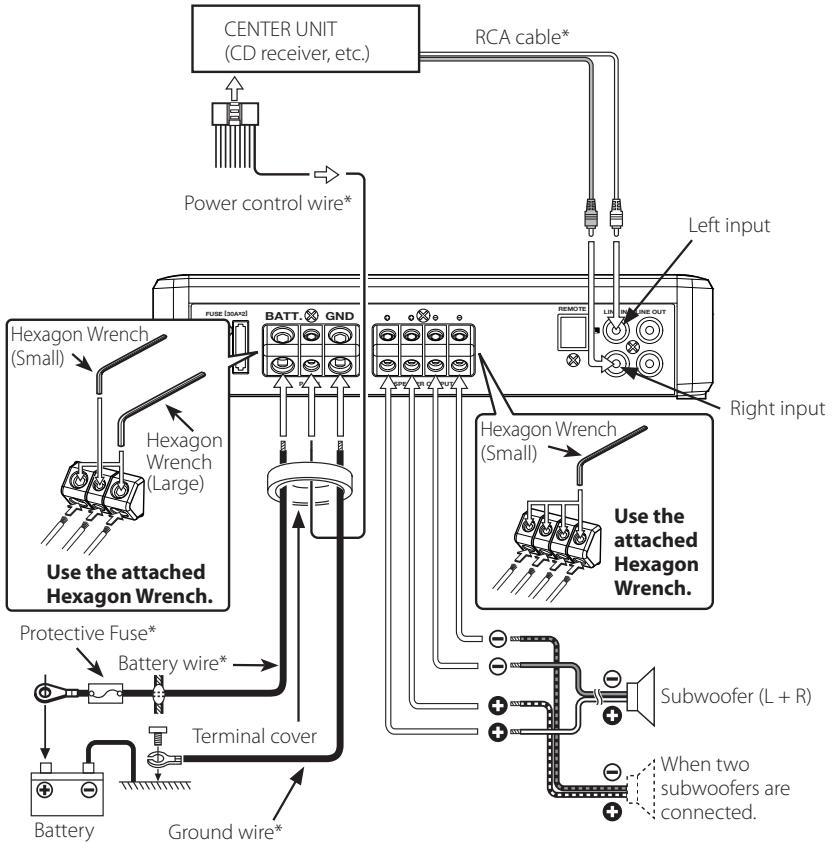
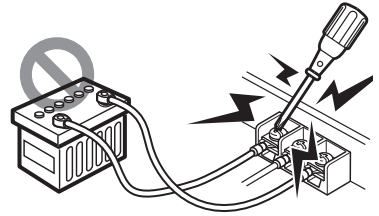
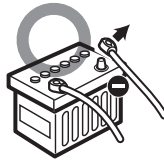
Part name	External View	Number of Items
Remote cable (6.0 m : 19.7 ft)		1
Remote controller		1
Mounting bracket		1
Self-tapping screws (ø2.6 x 12 mm (1/8" x 1/2"))		2

Connection

* Commercially available parts

⚠ WARNING

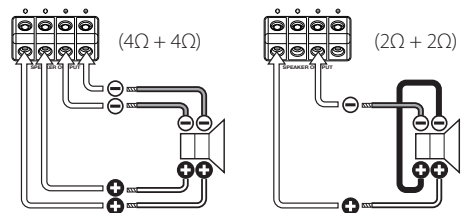
Remove the ignition key and disconnect the negative \ominus terminal of the battery to prevent short circuits.



⚠ WARNING

- To prevent fire caused by a short in the wiring, connect a fusible link or breaker nearby the battery's positive terminal.

Dual voice coil subwoofer



▲ CAUTION

- If sound is not output normally, immediately turn power off and check connections.
- Be sure to turn the power off before changing the setting of any switch.
- If the fuse blows, check wires for shorts, then replace the fuse with one of the same rating.
- Check that no unconnected wires or connectors are touching the car body. Do not remove caps from unconnected wires or connectors to prevent short circuits.
- Connect the speaker wires to appropriate speaker connectors separately. Sharing the negative wire of the speaker or grounding speaker wires to the metal body of the car can cause this unit to fail.
- After installation, check that the brake lamps, wipers, and wipers work properly.

■ About the Lead Terminals

1. Wire Thicknesses

You can use wires with the following thicknesses:

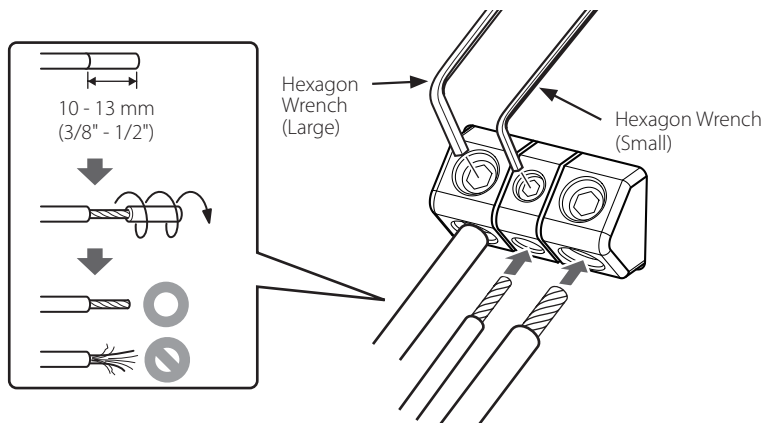
Battery wire and ground wire	AWG 4 – AWG 6
Speaker wire	AWG 8 – AWG 12

2. Strip the wire

Make a cut in the wire sheath (insulator made from vinyl, etc.) at the position 10-13 mm (3/8" - 1/2") away from the end of the wire, and then remove the unnecessary portion of the sheath by twisting it.

3. Install the wire

Loosen the screw using the supplied hexagon wrench. Insert the conductor of the wire in the terminal hole, and then tighten the screw.

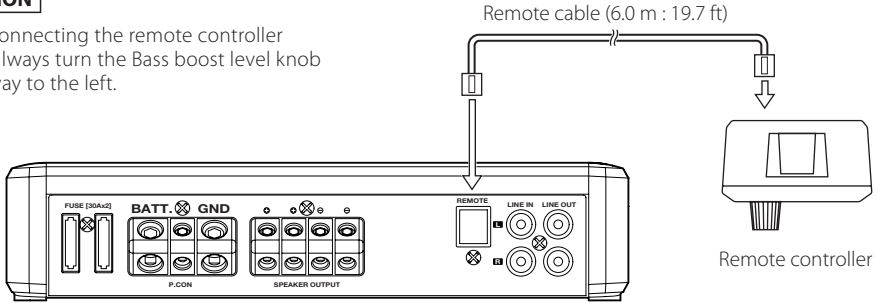


Connection

■ Remote cable connection (Accessory of KAC-X1D, Optional accessory for XR-15.)

⚠ CAUTION

- Before connecting the remote controller cables, always turn the Bass boost level knob all the way to the left.



■ Multi Amplifier with Remote cable connection (Accessory of KAC-X1D, Optional accessory for XR-1S.)

▲ CAUTION

- Before connecting the remote controller cables, always turn the Bass boost level knob all the way to the left.

You can control the Bass boost level of the second and subsequent Slave amplifiers simultaneously from the Master amplifier.

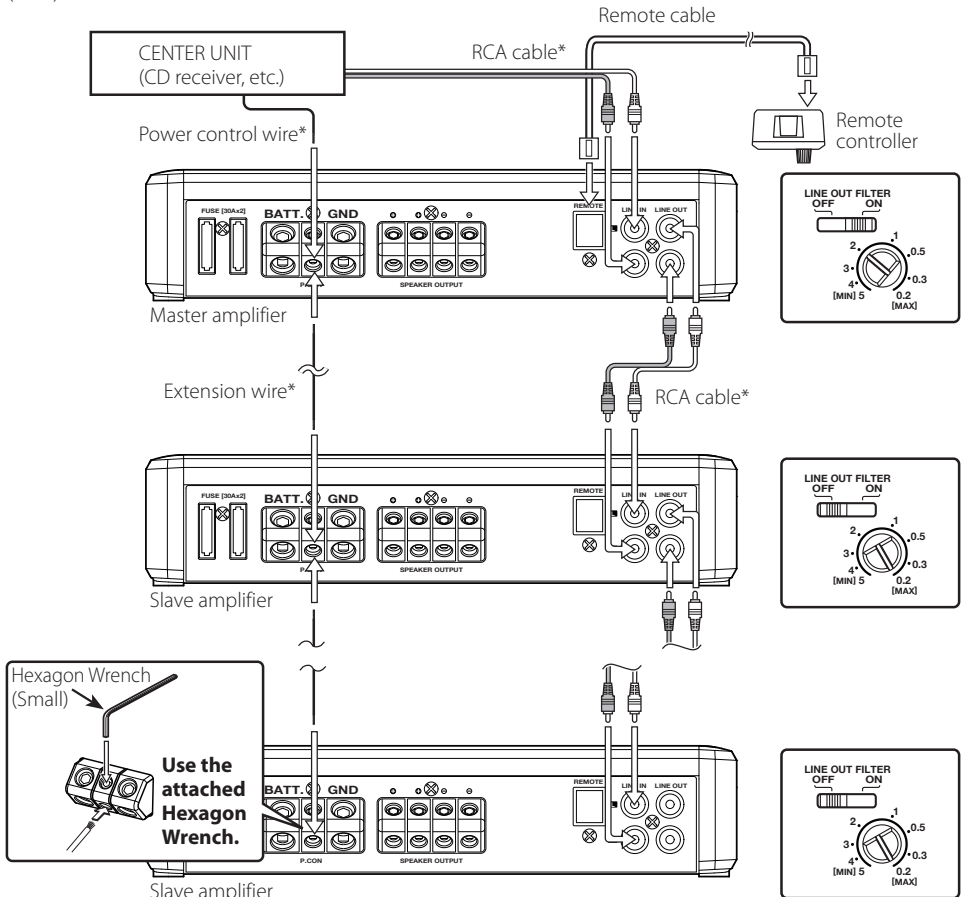
The volume level of each amplifier is determined by the setting of the Master amplifier (INPUT SENSITIVITY, boost level of the remote controller).

Setting the Master amplifier

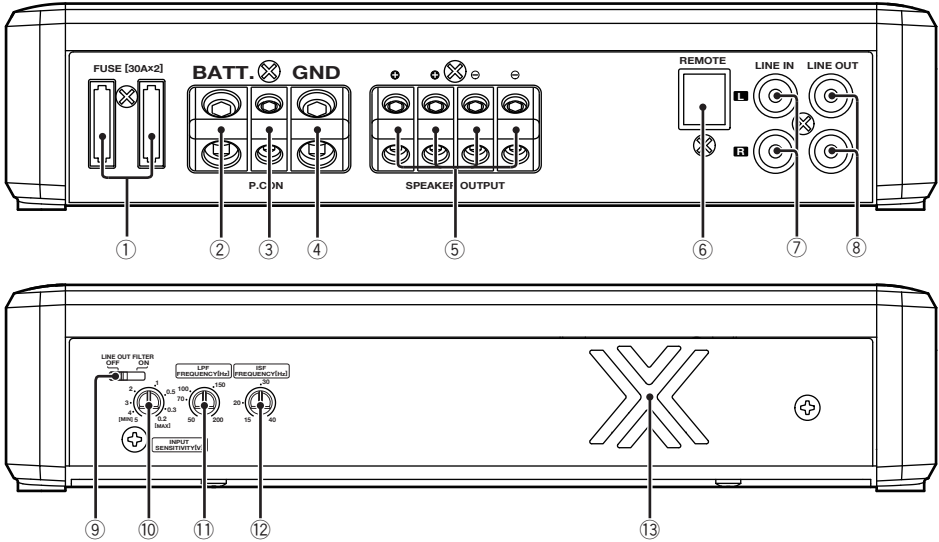
1. Adjust the INPUT SENSITIVITY to the output of the center unit to be connected.
2. Set the LPF frequency and ISF.
3. Turn the LINE OUT FILTER switch ON.

Setting the Slave amplifier

1. Turn the LINE OUT FILTER switch OFF.
 2. Adjust the INPUT SENSITIVITY.
- To adjust the Slave amplifier to the same volume as the Master amplifier, adjust the INPUT SENSITIVITY to 0.2 V (max.).



Controls



① Fuse (30 A × 2)

NOTE

If you can't find the specified capacity fuse at your store etc., consult your Kenwood dealer.

② Battery terminal

③ Power control terminal

Controls the unit ON/OFF.

NOTE

Controls the unit power. Be sure to connect it with all the systems.

④ Ground terminal

⑤ Speaker output terminals

As this unit accepts speakers with a minimum impedance of 2 ohm, connect speakers with 2-ohm or higher impedance to these terminals.

⑥ REMOTE terminal

Connects the Remote cable.

NOTE

Use the Remote cable of the accessory.

⑦ LINE IN terminal

⑧ LINE OUT terminal

The audio signal set with the LINE OUT FILTER switch will be output.

⑨ LINE OUT FILTER switch

Changing over the audio signal output to the LINE OUT terminal.

ON position:

The audio signal adjusted when setting LPF, INPUT SENSIVITY control and Bass boost is output to the LINE OUT terminal.

OFF position:

The audio signal input from the LINE IN terminal is output to the LINE OUT terminal (through output).

⚠ CAUTION

The volume of the audio output to the LINE OUT terminal is different in ON and OFF position. Remember this when changing the LINE OUT FILTER switch from ON to OFF.

⑩ INPUT SENSITIVITY control

Set this control according to the pre-output level of the center unit connected with this unit.

NOTE

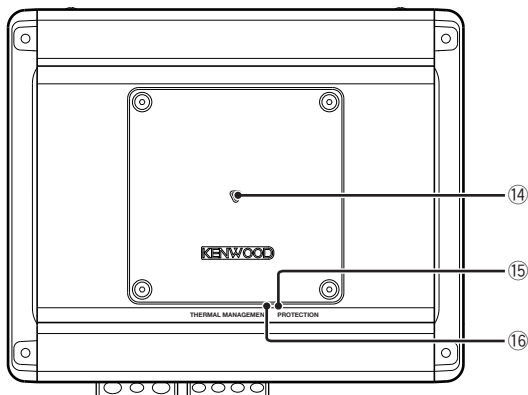
For the pre-output level, refer to the <Specifications> in the instruction manual of the center unit.

⑪ LPF(Low-Pass Filter) FREQUENCY control

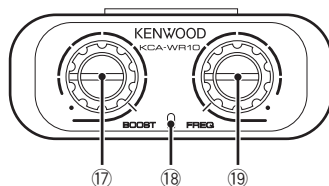
This control adjusts the frequency band output from this unit.

⑫ ISF (infrasonic filter) control

Ultralow frequencies that cannot be reproduced even by a subwoofer speaker do not become sound but become unnecessary oscillations,



Remote controller (Accessory of KAC-X1D, Optional accessory for XR-15.)



which affect the sound by causing distortion, etc. Setting this control cuts the frequencies below the respective frequency. This improves the reproduction performance of the speakers by eliminating unnecessary oscillations which will not become sound.

- ⑬ **Cooling fan**
- ⑭ **Power indicator**
When the power is turned on, the Power indicator lights.
- ⑮ **PROTECTION indicator**
Lights this indicator when the protection function is activated. (See page 3)
- ⑯ **THERMAL MANAGEMENT indicator**
Lights this indicator when the internal temperature is high.
- ⑰ **BOOST LEVEL (Bass boost level) control**
Sets the level by which the low frequency range should be boosted.
- ⑱ **Power indicator**
- ⑲ **FREQUENCY (Bass boost frequency) control**
Sets the center frequency around which the low frequency range should be boosted.

Troubleshooting Guide

What might appear to be a malfunction in your unit may just be the result of slight misoperation or miswiring. Before calling service, first check the following table for possible problems.

PROBLEM	POSSIBLE CAUSE	SOLUTION
No sound. (No sound from one side.) (Blown fuse.)	<ul style="list-style-type: none">• Input (or output) cables are disconnected.• Protection circuit may be activated.• Volume is too high.• The speaker cord is shorted.	<ul style="list-style-type: none">• Connect the input (or output) cables.• Check connections by referring to <Protection function>.• Replace the fuse and use lower volume.• After check the speaker cord and fixing the cause of the short, replace the fuse.
The output level is too small (or too large).	<ul style="list-style-type: none">• The input sensitivity adjusting control is not set to the correct position.	<ul style="list-style-type: none">• Adjust the control correctly referring to <Controls>.
The sound quality is bad. (The sound is distorted.)	<ul style="list-style-type: none">• The speakers wire are connected with wrong \oplus/\ominus polarity.• A speaker wire is pinched by a screw in the car body.• The switches may be set improperly.	<ul style="list-style-type: none">• Connect them properly checking the \oplus/\ominus of the terminals and wires well.• Connect the speaker wire again so that it is not pinched by anything.• Set switches properly by referring to <System examples>.
The Remote Controller does not function.	<ul style="list-style-type: none">• The Remote Cable is disconnected.	<ul style="list-style-type: none">• Connect the Remote Cable securely and correctly.

Specifications

Specifications subject to change without notice.

CEA-2006

RMS Watts per channel @ 4 ohms, 1 % THD+N 600 W x 1
 Signal to Noise Ratio (Reference: 1Watt into 4 ohms)..... 83 dBA



Audio Section

Max Power Output 1500 W
 Rated Power Output (+B = 14.4 V)
 (4 Ω) (20 Hz – 200 Hz, 1.0 % THD) 600 W x 1
 (4 Ω) (DIN45324 , +B = 14.4V)..... 600 W x 1
 (2 Ω) (100 Hz, 1.0 % THD)..... 700 W x 1
 Frequency Response (+0, –3 dB)..... 20 Hz – 200 Hz
 Sensitivity (rated output) (MAX.) 0.2 V
 (MIN.) 5.0 V
 Input Impedance..... 10 kΩ
 Signal to Noise Ratio..... 105 dB
 Low Pass Filter Frequency (-24 dB/oct.)..... 50 Hz – 200 Hz (variable)
 Infrasonic Filter Frequency (-24 dB/oct.)..... 15 Hz – 40 Hz (variable)
 Bass Boost Level..... 0 dB – +18 dB (variable)
 Bass Boost Frequency 40 Hz – 100 Hz (variable)

General

Operating Voltage..... 14.4 V (11 – 16 V allowable)
 Current Consumption 60 A
 Dimensions (W x H x D)..... 235 x 52 x 192 mm
 9-1/4 x 2-1/16 x 7-9/16 inch
 Weight..... 2.9 kg (6.3 lbs)

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