

KENWOOD

# KAC-645

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**INSTRUCTION MANUAL**

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**MODE D'EMPLOI**

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**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 KAC-645 Serial number \_\_\_\_\_

# Safety precautions

## ▲ WARNING

Take the following precautions to prevent fire and avoid personal injury :

- When extending the battery cable, or ground cable, use 3mm<sup>2</sup> (AWG12) or larger automotive grade cable to avoid cable deterioration or damage to the covering.
- Check that no metal objects (coins, tools, etc.) are left inside the unit to avoid short circuits.
- If you smell or see smoke, turn the power off 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

Take the following precautions to keep the unit in proper working order.

- Be sure the unit is connected to a 12V DC power supply with a negative ground connection.
- Do not open the top or bottom cover.
- Do not install the unit in places it is exposed to direct sunlight, high heat or humidity, water may splash over it, or dust exists.

## NOTE

- If you have difficulty in installing this unit in your vehicle, contact your Kenwood dealer.

### Cleaning the unit

- If the surface is dirty, wipe it clean with a silicon cloth or soft dry cloth with the power off.

## ▲ CAUTION

Do not use hard cloths or paint thinner, alcohol, or other volatile solvents. These may damage external surfaces or remove indicator characters.

### 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.

# Accessories

Part name	External View	Number of Items
Self-tapping screws ( $\phi 4 \times 16$ mm)		4

# Installation procedure

1. Remove the ignition key and disconnect the negative (-) terminal of the battery to prevent short circuits.
2. Connect the input and output cables of the units.
3. Connect the speaker cables.
4. Connect the ground cable and battery cable in the order listed.
5. Install the unit in the car.
6. Connect the negative (-) terminal of the battery.

## **▲ CAUTION**

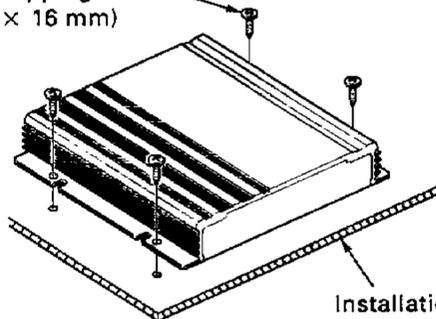
- If the fuse blows, check cables for shorts, then replace the fuse with one of the same rating.
- Check that no unconnected cables or connectors are touching the car body. Do not remove caps from unconnected cables or connectors to prevent short circuits.
- Connect the speaker cables to appropriate speaker connectors separately. Sharing the negative cable of the speaker or grounding speaker cables 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.

## ■ Installation

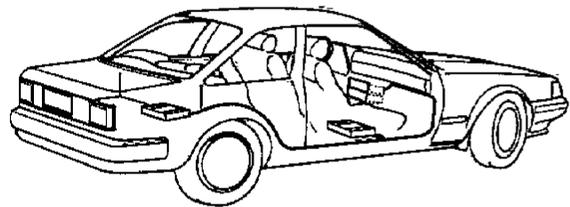
### **▲ CAUTION**

Do not install the unit under the carpet. Otherwise heat build-up occurs and the unit may be damaged.

Self-tapping screw  
( $\phi 4 \times 16$  mm)



Installation board, etc.  
(thickness : 15 mm or more)



- Since the power amplifier has no parts which require operation, it can be installed at a position away from the driver's seat without any hindrances.  
As generally accepted positions for its installation, places such as inside the boot, etc. can be considered.

### **▲ CAUTION**

- Install this unit in a location which allows heat to easily dissipate.  
Once installed, do not place any object on top of the unit.
- After installing the unit, check to make sure that electrical equipment such as the brake lamps, turn signal lamps and windshield wipers operate normally.
- Install the unit securely in a location that does not interfere with driving.

# Controls

This is a 4 channel amplifier including 2 stereo amplifiers in a body. One amplifier is referred to as amplifier A and the other is amplifier B. This unit is compatible with a large variety of systems by combining the switches and functions described in the following.

① **POWER CONTROL LEAD terminal**

② **LOW PASS FILTER switch**

When this switch is on, the low-pass filter takes effect on the line output.  
(The frequencies higher than 80 Hz are filtered.)

③ **OPERATION switch**

This switch allows selection of the amplification method of input signals.

- STEREO position  
The amplifier can be used as a stereo amplifier.
- L+R position  
The L+R (mono) sound is output.  
Set this position to bridge connection.

④ **HIGH PASS FILTER switch**

When this switch is on, only 80 Hz and higher frequencies are output through the speaker.

⑤ **POWER INDICATOR**

When the power is turned on, the Power indicator lights.

If the Power indicator does not light when the power is turned on, the protection function may be activated.

Check whether there is any indication of trouble.

⑥ **INPUT SENSITIVITY control**

Adjust this control according to the pre-out level of the center unit connected to this amp.

**NOTE**

Refer to "Specifications" on the center unit's instruction manual about the pre-out level.

Center unit preout level	Amplifier input sensitivity
300 mV	MAX (0.15 V)
800~1000 mV	0.3 V
1.5 V	0.5 V
2~4 V	1.0 V

⑦ **Amp A LINE IN terminal**

⑧ **Amp B LINE IN terminal**

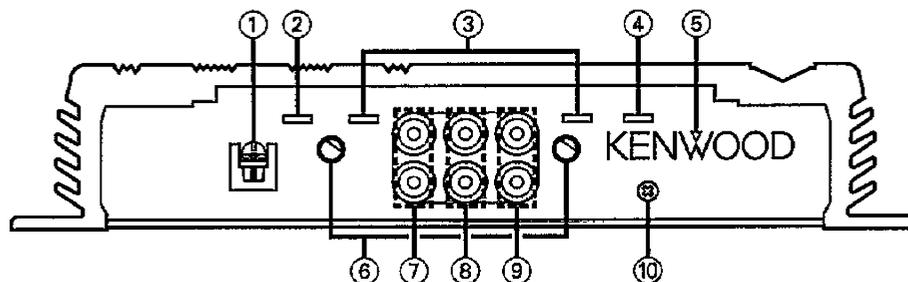
⑨ **LINE OUT terminal**

The signals input to Amp A and Amp B and mixed are output from this terminal.  
Only low frequencies or full range frequencies can be output by turning the LOW PASS FILTER ON/OFF.

**CAUTION**

The signal output from LINE OUT through the low-pass filter must not be input to the unit again. Otherwise, the unit may fail.

⑩ **RCA CABLE GROUND LEAD terminal**



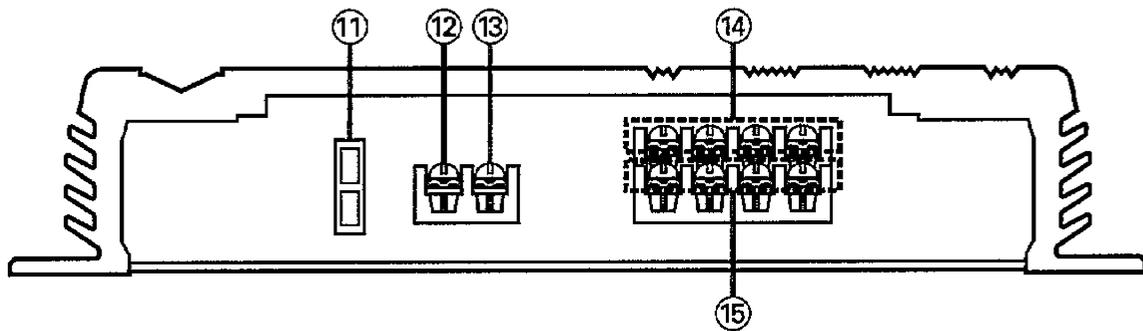
⑪ FUSE

⑫ Battery terminal

⑬ GROUND terminal

⑭ Amp A SPEAKER CABLE terminals

⑮ Amp B SPEAKER CABLE terminals

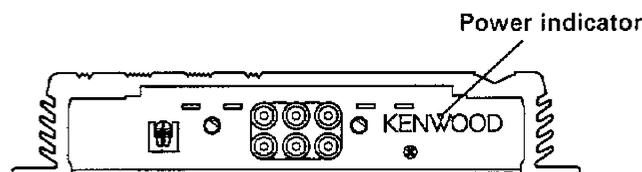


## ***Protection function***

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 Power indicator goes off and the amplifier stops operating.

### **The protection function activates in the following situations:**

- When a speaker output contacts ground.
- When the unit malfunctions and a DC signal is sent to the speaker output.
- When the temperature of internal parts exceeds 120°C (248°F).
- When a ground cable of the center unit (cassette receiver, CD receiver, etc.) or this unit is not connected to a metal part serving as an electrical ground passing electricity to the battery's negative (-) terminal.



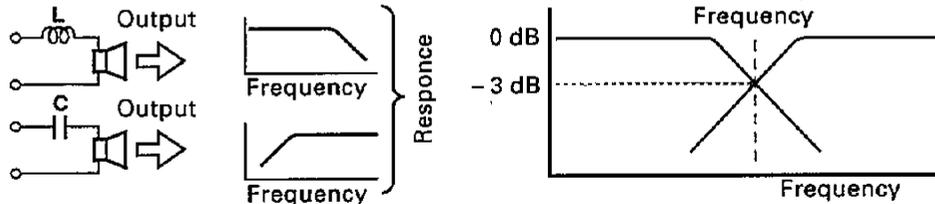
# Tri-mode

With the KAC-645, a subwoofer can be added easily to the speaker system by marking use of the properties of coils and capacitors. This mode of operation is called Tri-mode.

## Principle of Tri-mode

### Method of frequency band division using a coil and capacitor

...in case of 6dB/oct. slope



- Coil (L): Passes low frequencies and blocks high frequencies. (Low pass)
- Capacitor (C): Passes high frequencies and blocks low frequencies. (High pass)

### Your coil and capacitor

Use the following formula to identify the coil and capacitor you need in your system.

$$C = \frac{159000}{f_c \times R} \quad (\mu F) \quad L = \frac{159 \times R}{f_c} \quad (mH)$$

$f_c$  = Cut of Frequency (Hz)       $R$  = Speaker Impedance ( $\Omega$ )

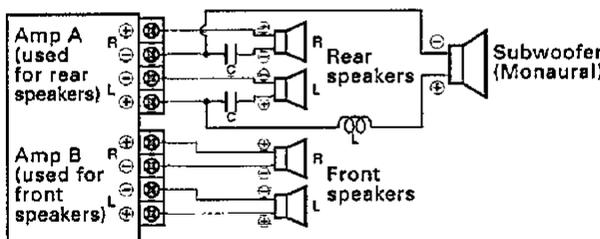
**Example:** When it is required to set a crossover frequency of 120 Hz using speakers with an impedance of 4 ohms.

Prepare commercially-available coil and capacitor with the closest ratings to the results calculated from the formula above. The capacitor rating should be as close as possible to 331.25 ( $\mu F$ ) and the coil rating should be as close as possible to 5.3 (mH).

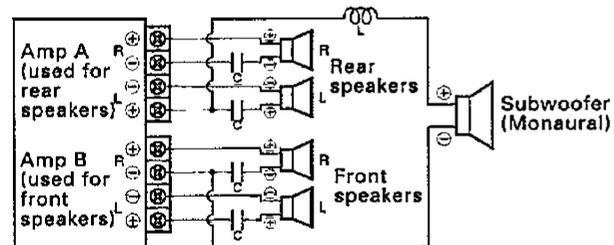
## System example

To use the Tri-mode configuration, set the OPERATION switch to the STEREO position.

### When a subwoofer is added to the rear speaker system



### When a subwoofer is added to the whole speaker system



- The subwoofer is not affected by the controls on the center unit.

## CAUTION

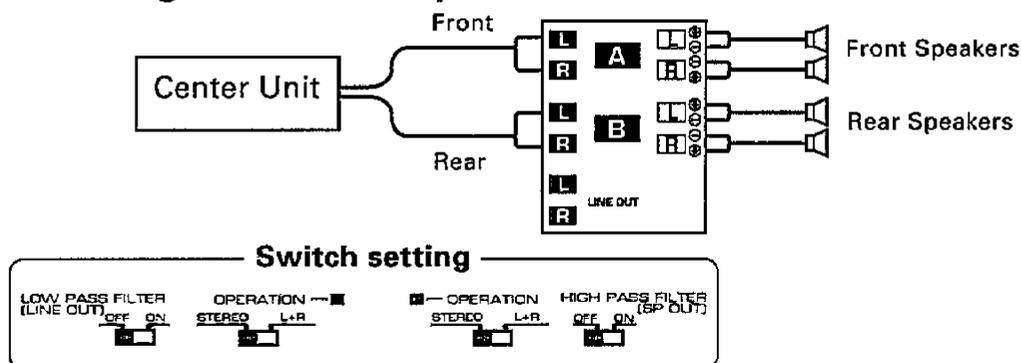
If you wish to bridge-connect a speaker, such as a subwoofer, as shown above, the speaker impedance must be no less than 4 ohms.

If a speaker is bridge-connected as shown, the impedance as seen from the amplifier unit is half the actual impedance. Therefore, if you use a speaker with an impedance of 2 ohms, since the impedance as seen from the amplifier unit is 1 ohm, it may result in a failure of the amplifier.

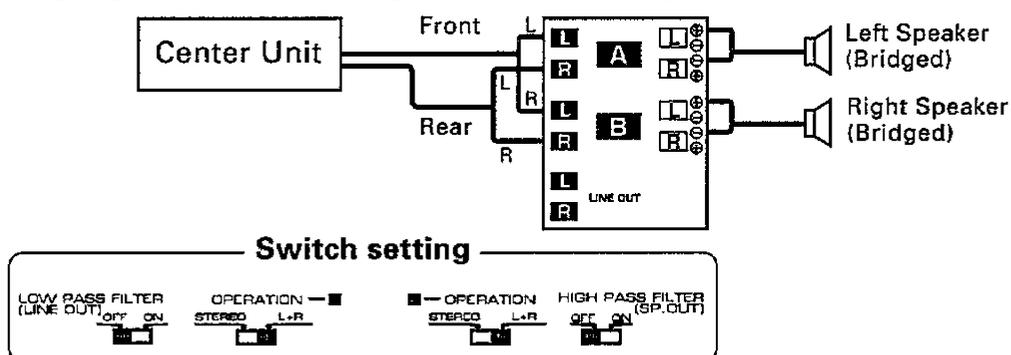
# System examples

By combining the switches and functions of the KAC-645, you can implement a wide range of audio system configurations.

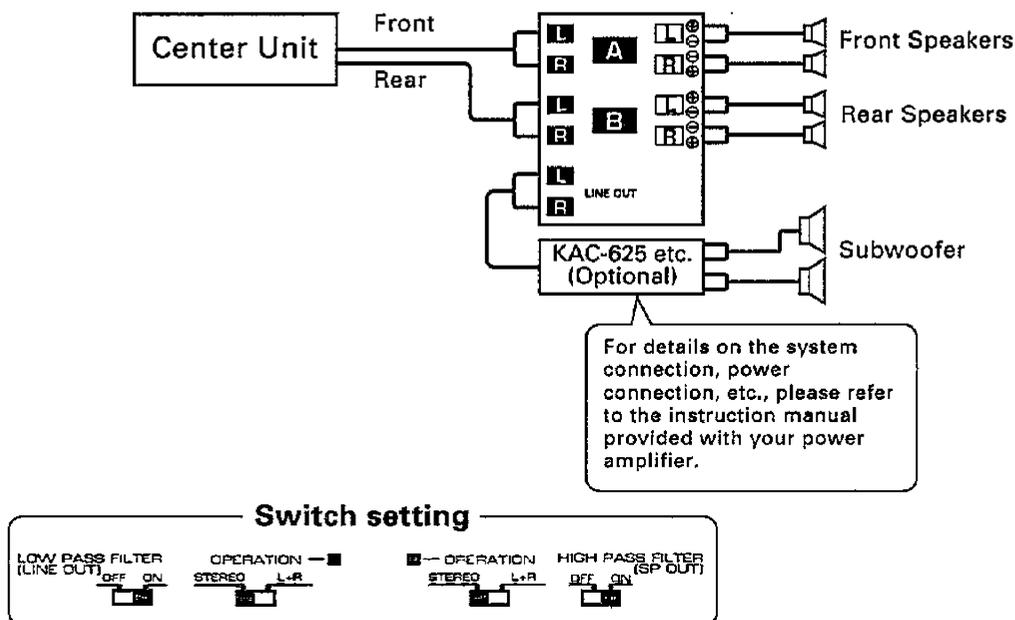
## ■ Full-range 4-channel system



## ■ High-power full-range 2-channel system

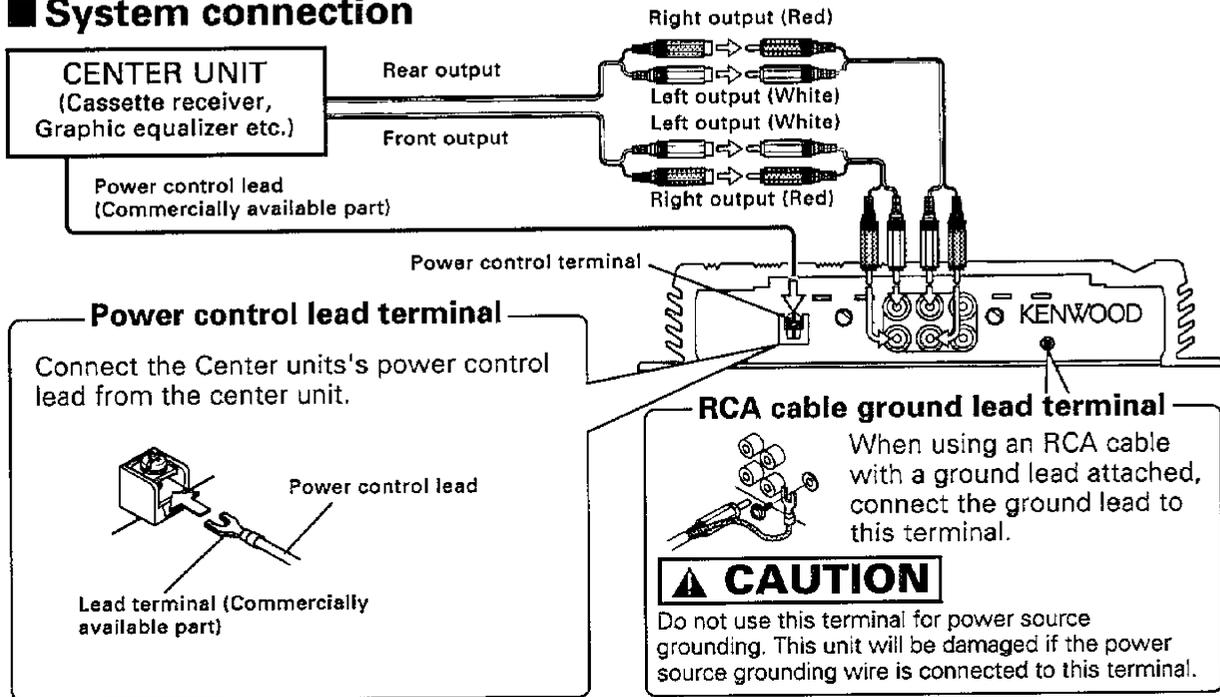


## ■ High-pass 4-channel + Subwoofer 2-channel system

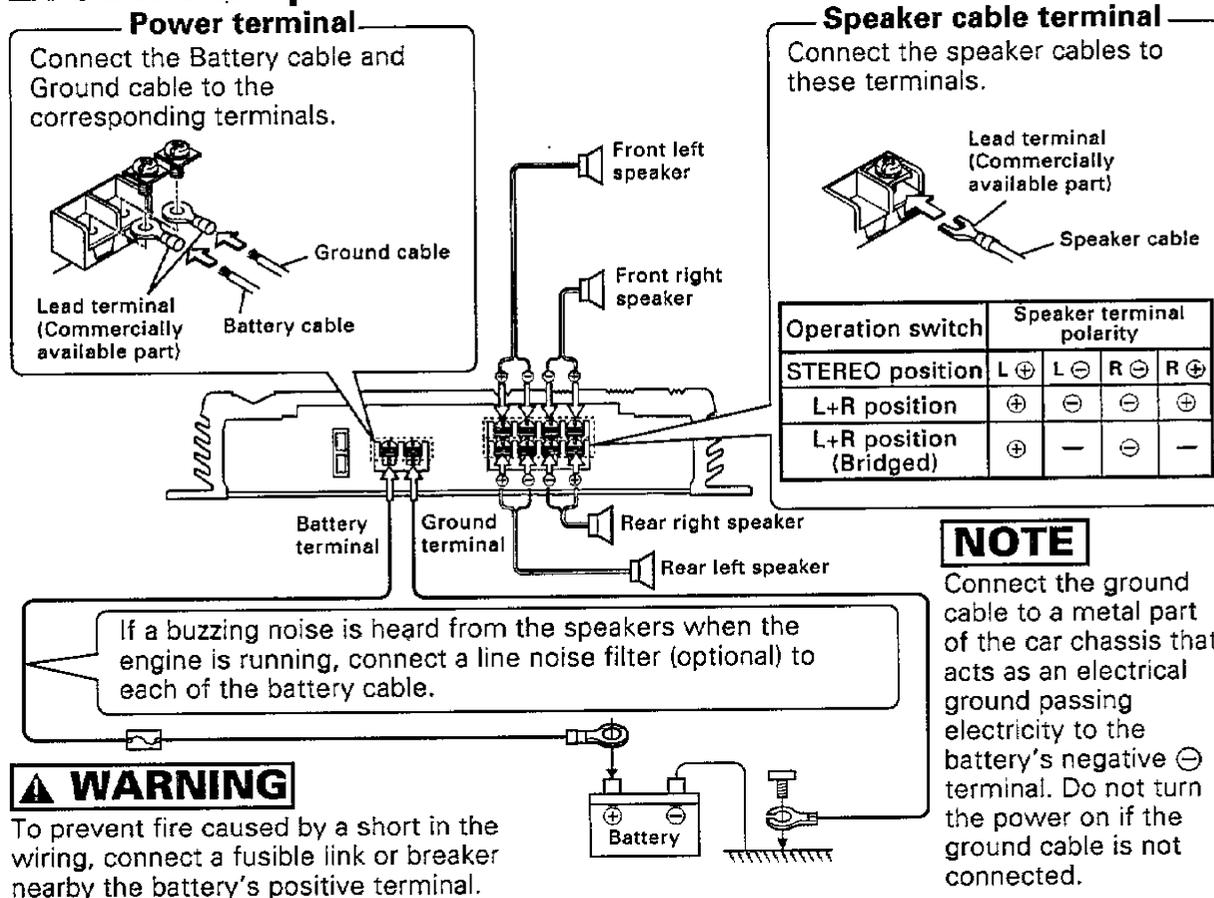


# Connection

## System connection



## Power and Speakers cable connection



# Troubleshooting guide

Often, what appears to be a malfunction is due to user error. Before calling for service, please consult the following table.

Symptom	Cause	Remedy
<b>No sound. (No sound from one side.)</b>	A speaker cable has become unconnected.	Connect the speaker cable again.
<b>The output level is too small (or too large).</b>	The input sensitivity adjusting control is not set to the correct position.	Adjust the control correctly referring to "Controls".
<b>The sound quality is bad. (The sound is distorted.)</b>	The speakers cable are connected with wrong $\oplus/\ominus$ polarity.	Connect them properly checking the $\oplus/\ominus$ of the terminals and cables well.
	A speaker cable is pinched by a screw in the car body.	Connect the speaker cable again so that it is not pinched by anything.

## Specifications

Specifications subject to change without notice.

### Audio Section

Max Power Output (4 $\Omega$ )	
4 Channel Mode .....	50 W $\times$ 4
3 Channel Mode .....	50 W $\times$ 2 + 140 W
2 Channel Mode .....	140 W $\times$ 2
Rated Power Output (4 $\Omega$ )	
4 Channel Mode .....	25 W $\times$ 4 (20 Hz ~ 20 kHz, less than 0.08 %THD)
3 Channel Mode .....	25 W $\times$ 2 (1 kHz, 0.08 %) + 70 W $\times$ 1 (1 kHz, 0.8 %)
2 Channel Mode .....	70 W $\times$ 2 (1 kHz, 0.8 % THD)
Rated Power Output (2 $\Omega$ )	
4 Channel Mode .....	35 W $\times$ 4 (1 kHz, 0.8 % THD)
Frequency Response .....	5 Hz ~ 50 kHz (-3 dB)
Signal to Noise Ratio .....	100 dB
Sensitivity (MAX) .....	0.15 V (rated output)
Sensitivity (MIN) .....	3.0 V (rated output)
Input Impedance .....	10 k $\Omega$
Damping Factor (100 Hz) .....	More than 100
Low Pass Filter .....	80 Hz (18 dB/oct.)
High Pass Filter .....	80 Hz (12 dB/oct.)

### General

Operating Voltage .....	14.4 V (11 ~ 16 V allowable)
Current Consumption (1 kHz, 10% THD) .....	20 A
Dimensions (W $\times$ H $\times$ D) .....	256 $\times$ 48 $\times$ 250 mm (10-1/16 $\times$ 1-7/8 $\times$ 9-13/16 in.)
Weight .....	2.1 kg (4.6 lb)