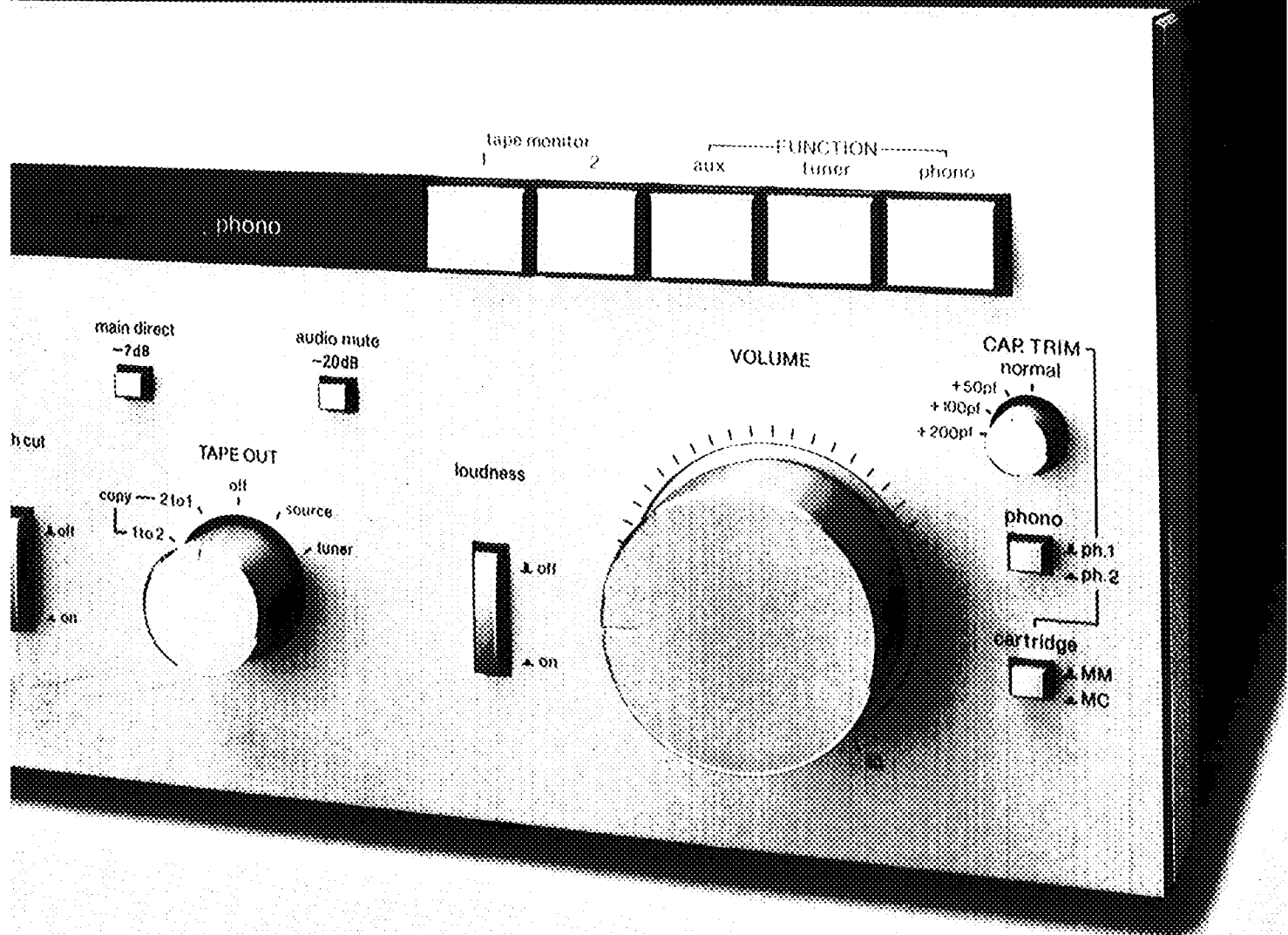


harman/kardon

HI-CURRENT CAPABILITY INTEGRATED AMPLIFIER

PM660

owner's manual



Your investment in a component high fidelity system indicates you have a more than average interest in music. The fact that your investment includes a Harman Kardon PM660 Hi-current Capability Integrated Amplifier shows us your appreciation of uncompromised reproduction of the music you enjoy. Throughout the design and manufacture of this unit, we made every effort to assure it will meet all your expectations. To ensure continuing high performance, read this manual carefully before you connect and operate your PM660.

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WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

Features

- Adoption of TAPE OUT selector and FUNCTION selector to enable listening to another source during air check or dubbing as well as recording and playback through equalizer or noise reduction system.
- 60A HICC (high instantaneous current capability) to enable ample driving against fluctuation in dynamic impedance of speakers for clear controlled sound reproduction.
- High-sensitivity amplifier especially designed for MC cartridge to enable use of low-impedance, low-sensitivity MC cartridge.
- Adoption of power output transistor with sufficient margin even during high power operation.
- AUDIO MUTING switch to enable temporary attenuation of the sound being reproduced.
- Adoption of MAIN DIRECT switch to input the signal from a program source directly to the power amplifier.
- Adoption of CAPACITANCE TRIM selector for selection of optimal load capacitance to maximize cartridge performance.
- SUBSONIC FILTER for elimination of sound distortion caused by extremely low frequency component because of wide-band design laying stress on sound quality.
- TONE DEFEAT switch to obtain flat frequency characteristic by single touch.
- WAIT indicator to show circuit instability after power on and to warn an abnormality in the signal path.
- Functional face layout allowing easy operation by mainly adopting push-button switches.

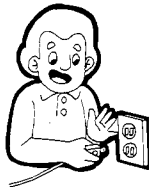
General Instructions

Always use at 120V AC

This unit is designed for use at 120V AC. Do not connect the unit to an outlet supplying a higher voltage to prevent fire.

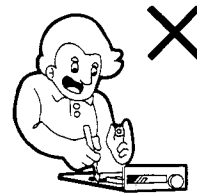
Handle the AC cord carefully

- Always hold the plug when disconnecting the AC cord from the outlet. Pulling at the cord may cause discontinuity.
- If the unit is not used for a prolonged period, disconnect the plug from the outlet.
- Do not place or drop a heavy material such as furniture on the cord. Otherwise the cord may be damaged to cause fire or shock hazard.



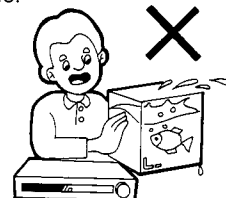
Do not open the cabinet

To prevent shock hazard or unexpected trouble, do not tamper with internal components for inspection or maintenance. Harman Kardon does not guarantee performance degradation resulting from any modification.



When water or a metal piece enters the unit

When water, a hair pin or wire accidentally enters the unit, immediately extract the AC plug from the outlet to prevent shock or trouble.



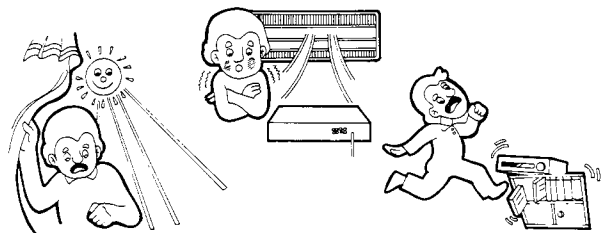
★ Always disconnect the plug from the outlet before making connections with other components.

Locations for Installation

Select a firm level base.

Avoid the following locations:

- Place exposed to excessive moisture
- Place exposed to direct sunlight or near a heat source
- Cold place such as near a cooling air outlet
- Dusty place
- Place exposed to excessive vibration
- Poorly ventilated place



When piling with other components, carefully plan so as to obtain good heat radiation from this unit. Use of a Harman Kardon audio rack is recommended.

Components and Their Functions

1 STEREO HEADPHONES JACK (headphones)

For connection of stereo headphones.
Output signal is always supplied to this jack.

2 SPEAKER SELECTORS (speakers 1, speakers 2)

For selection of speakers to be sounded.
2 speaker systems can be connected to this unit. When listening to speaker sound, depress the corresponding selector. To sound both speaker systems, depress both switches. Release the switch to listen with headphones only.

3 POWER SWITCH (POWER)

For power on and off.
When this switch is pressed after AC cord connection to an outlet, the "wait" indicator illuminates. In about 8 seconds, the "on" indicator illuminates.
Operate your PM660 after illumination of the "on" indicator.

9 DISPLAY PANEL

(on/wait/tape 1/tape 2/aux/tuner/phono)
The DISPLAY panel indicates the current status of the unit.

on, wait:

The "wait" indicator illuminates when the POWER switch is pressed.

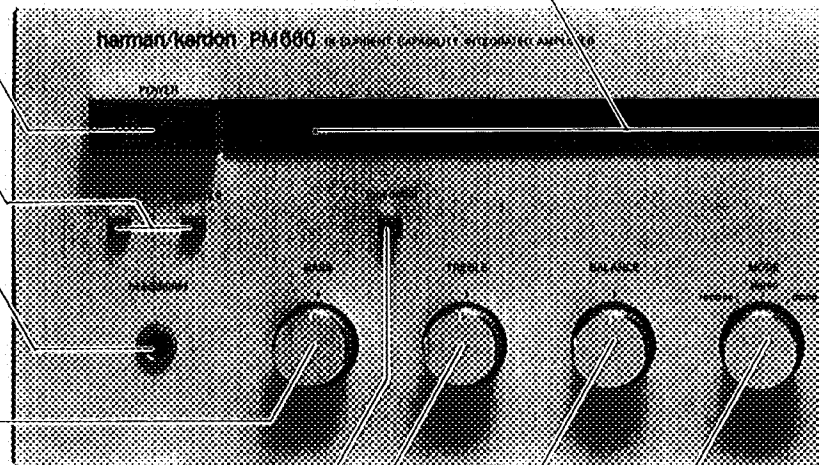
When the circuit is stabilized, the "wait" indicator goes off and the "on" indicator illuminates. In case of short-circuit at speaker terminals, it illuminates to indicate the abnormality.

tape 1, tape 2:

TAPE MONITOR switch indicators,

aux, tuner, phono:

Indicators for FUNCTION selectors.



4 BASS CONTROL KNOB (BASS)

For emphasis or attenuation of low-pitched tone. Turn it clockwise for emphasis, or counter-clockwise for attenuation.

5 TONE DEFEAT SWITCH (tone defeat)

For defeating tone control by TONE CONTROL knobs (BASS, TREBLE).

At the depressed position, flat frequency characteristic is obtained irrespective of TONE CONTROL knob positions.

6 TREBLE CONTROL KNOB (TREBLE)

For emphasis or attenuation of high-pitched tone. Turn it clockwise for emphasis, or counter-clockwise for attenuation.

7 BALANCE CONTROL KNOB (BALANCE)

For balance adjustment between left and right channels. Normally place it at the center position.

8 MODE SELECTOR (MODE)

MONO position :

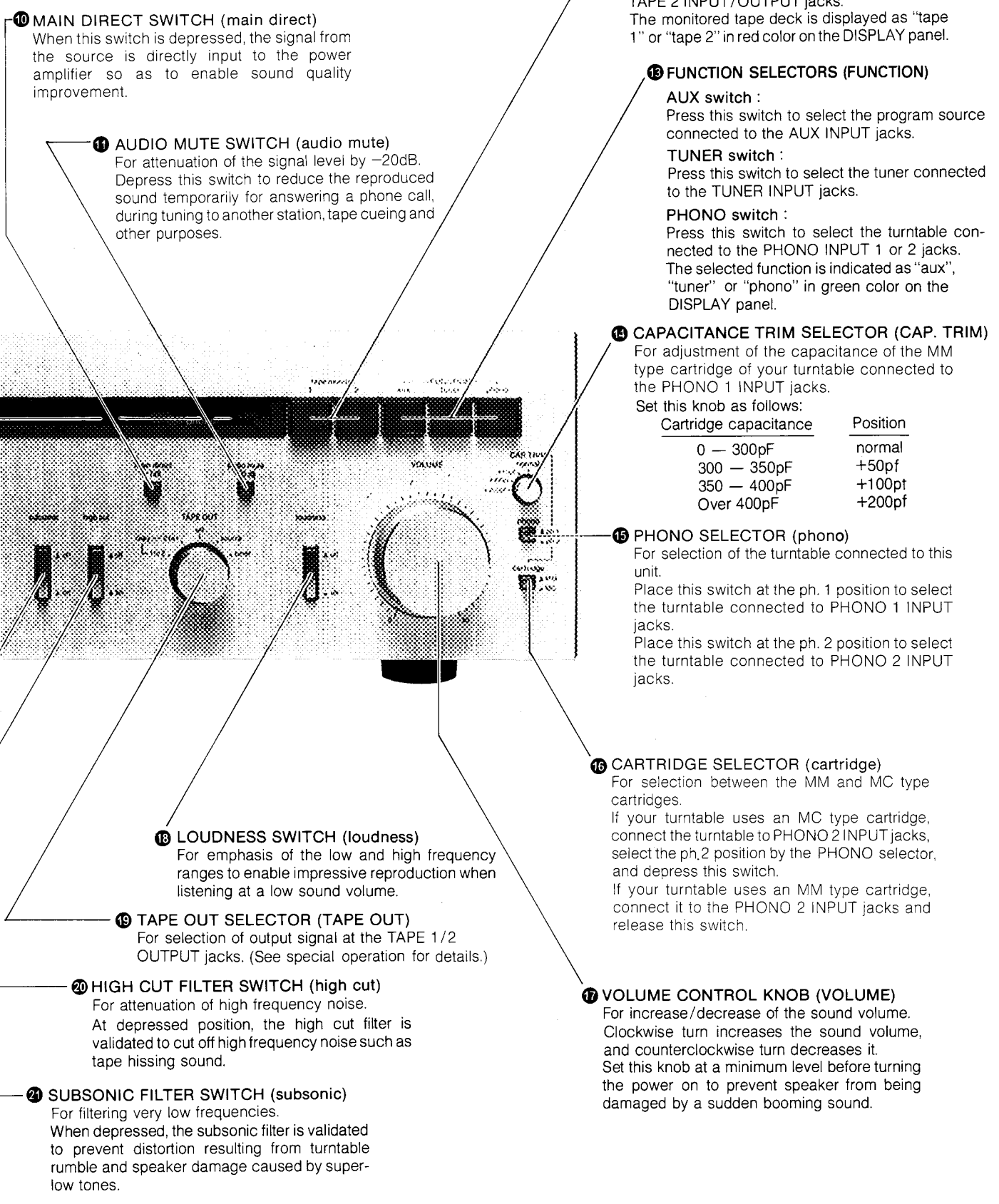
Select this position for a monaural source program.

STEREO position :

Select this position for stereo playback, reception or recording.

REVERSE position :

Select this position to reverse the right and left channel signals.



10 MAIN DIRECT SWITCH (main direct)
 When this switch is depressed, the signal from the source is directly input to the power amplifier so as to enable sound quality improvement.

11 AUDIO MUTE SWITCH (audio mute)
 For attenuation of the signal level by -20dB. Depress this switch to reduce the reproduced sound temporarily for answering a phone call, during tuning to another station, tape cueing and other purposes.

12 TAPE MONITOR SWITCHES (tape monitor 1, 2)
 For monitoring the equalizer or tape deck connected to the TAPE 1 INPUT/OUTPUT jacks or TAPE 2 INPUT/OUTPUT jacks. The monitored tape deck is displayed as "tape 1" or "tape 2" in red color on the DISPLAY panel.

13 FUNCTION SELECTORS (FUNCTION)
AUX switch :
 Press this switch to select the program source connected to the AUX INPUT jacks.
TUNER switch :
 Press this switch to select the tuner connected to the TUNER INPUT jacks.
PHONO switch :
 Press this switch to select the turntable connected to the PHONO INPUT 1 or 2 jacks. The selected function is indicated as "aux", "tuner" or "phono" in green color on the DISPLAY panel.

14 CAPACITANCE TRIM SELECTOR (CAP. TRIM)
 For adjustment of the capacitance of the MM type cartridge of your turntable connected to the PHONO 1 INPUT jacks.
 Set this knob as follows:

Cartridge capacitance	Position
0 — 300pF	normal
300 — 350pF	+50pf
350 — 400pF	+100pt
Over 400pF	+200pf

15 PHONO SELECTOR (phono)
 For selection of the turntable connected to this unit. Place this switch at the ph. 1 position to select the turntable connected to PHONO 1 INPUT jacks. Place this switch at the ph. 2 position to select the turntable connected to PHONO 2 INPUT jacks.

18 LOUDNESS SWITCH (loudness)
 For emphasis of the low and high frequency ranges to enable impressive reproduction when listening at a low sound volume.

19 TAPE OUT SELECTOR (TAPE OUT)
 For selection of output signal at the TAPE 1/2 OUTPUT jacks. (See special operation for details.)

16 CARTRIDGE SELECTOR (cartridge)
 For selection between the MM and MC type cartridges. If your turntable uses an MC type cartridge, connect the turntable to PHONO 2 INPUT jacks, select the ph.2 position by the PHONO selector, and depress this switch. If your turntable uses an MM type cartridge, connect it to the PHONO 1 INPUT jacks and release this switch.

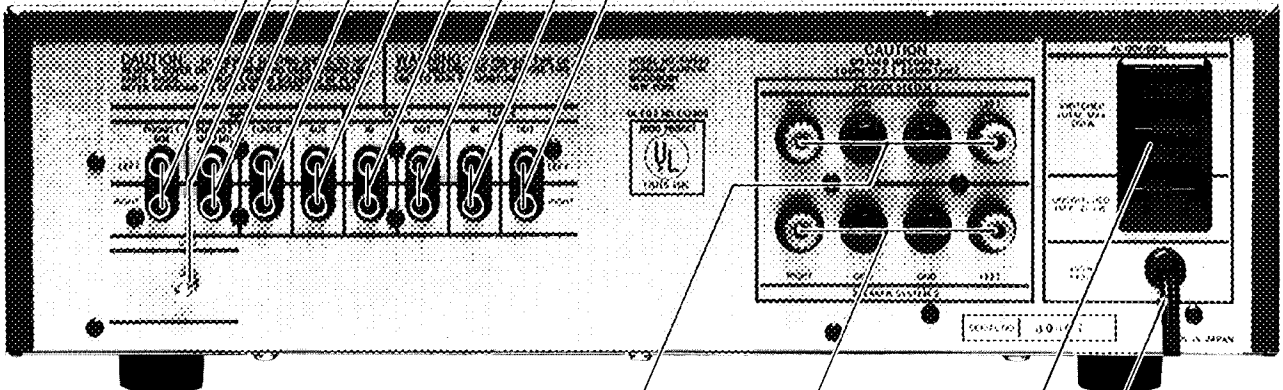
20 HIGH CUT FILTER SWITCH (high cut)
 For attenuation of high frequency noise. At depressed position, the high cut filter is validated to cut off high frequency noise such as tape hissing sound.

17 VOLUME CONTROL KNOB (VOLUME)
 For increase/decrease of the sound volume. Clockwise turn increases the sound volume, and counterclockwise turn decreases it. Set this knob at a minimum level before turning the power on to prevent speaker from being damaged by a sudden booming sound.

21 SUBSONIC FILTER SWITCH (subsonic)
 For filtering very low frequencies. When depressed, the subsonic filter is validated to prevent distortion resulting from turntable rumble and speaker damage caused by super-low tones.

Components and Their Functions (Rear Panel)

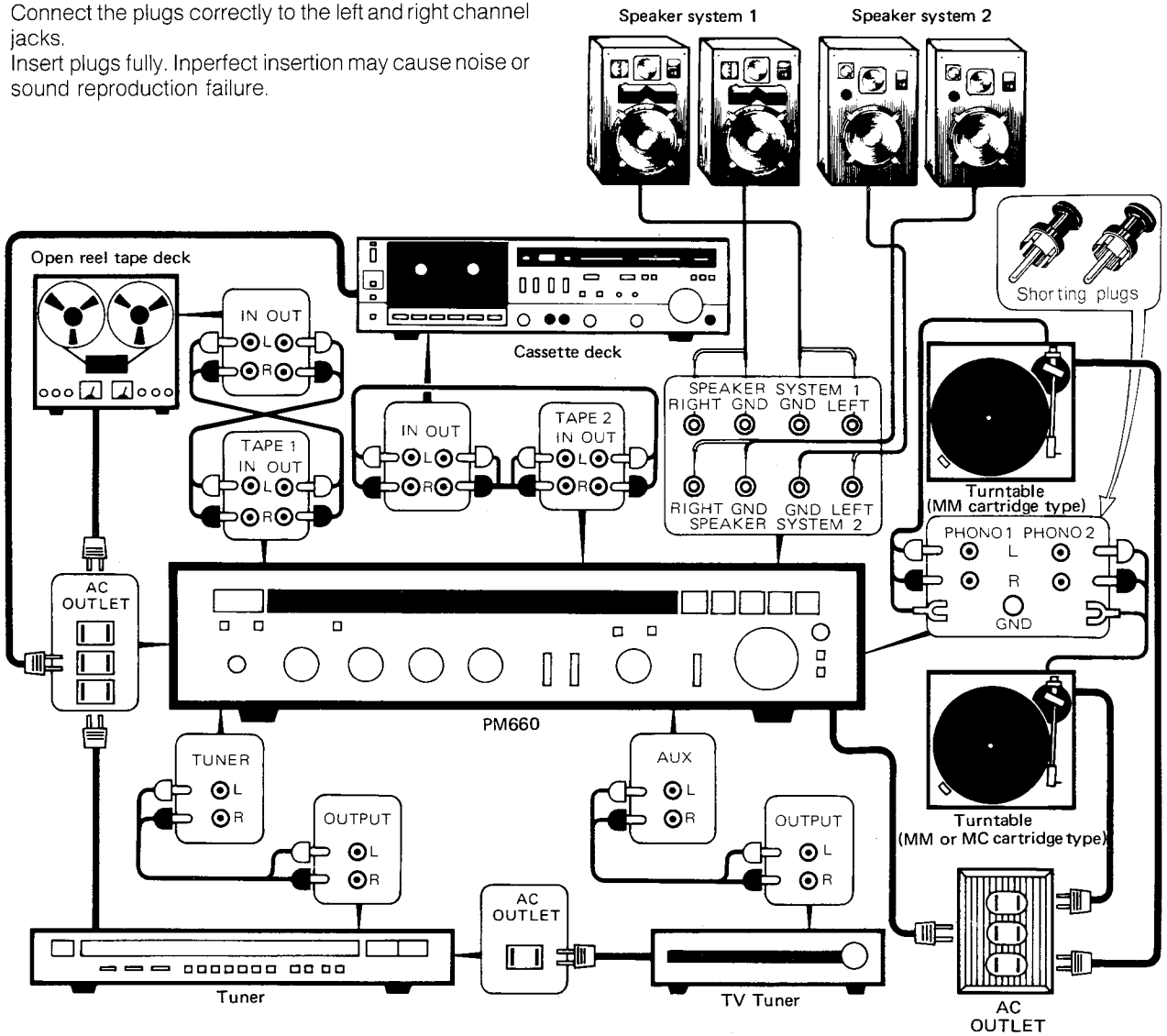
- 22 GROUND TERMINAL (GND)**
Connect the grounding cable from your turntable here.
- 23 PHONO 1 INPUT JACKS (INPUT PHONO 1 MM)**
Connect the output cables from your turntable using an MM type cartridge here.
Note: When using either PHONO1 or PHONO2 INPUT jacks, please insert the attached SHORTING PLUGS into the PHONO INPUT jacks not in use.
- 24 PHONO 2 INPUT JACKS (INPUT PHONO 2 MM/MC)**
Connect the output cables from your turntable using an MC type cartridge here. You can also connect a turntable using an MM type cartridge here.
- 25 TUNER INPUT JACKS (INPUT TUNER)**
Connect the output cables from your tuner here.
- 26 AUX INPUT JACKS (INPUT AUX)**
Connect the output cables from your TV tuner, etc. here.
- 27 TAPE 1 INPUT JACKS (TAPE 1 IN)**
Connect the output cables from your tape deck or equalizer here.
- 28 TAPE 1 OUTPUT JACKS (TAPE 1 OUT)**
Connect the input cables to your tape deck or equalizer here.
- 29 TAPE 2 INPUT JACKS (TAPE 2 IN)**
Connect the output cables from another tape deck here.
- 30 TAPE 2 OUTPUT JACKS (TAPE 2 OUT)**
Connect the input cables to another tape deck here.



- 31 SPEAKER SYSTEM 1 CONNECTORS (SPEAKER SYSTEM 1)**
Connect the cables for your speaker system here. Carefully connect speaker cables so as not to mistake left and right channels and polarities.
- 32 SPEAKER SYSTEM 2 CONNECTORS (SPEAKER SYSTEM 2)**
Connect the cables for the second speaker system here in the same way as explained for the first speaker system. When using one speaker system, it may be connected to either SPEAKER SYSTEM 1 connectors or SPEAKER SYSTEM 2 connectors.
- 33 AC CONVENIENCE OUTLETS**
SWITCHED :
Use these outlets to connect your turntable, tuner, cassette deck and/or other components. The power supply to the connected components is interlocked with power on/off of this unit. The total maximum capacity is 200W.
UNSWITCHED :
This outlet is always supplied with the power regardless of the position of the POWER switch of this unit. Interlocked on/off of the connected component is impossible. The maximum capacity is 200W.
- 34 AC CORD**
Connect this cord to a mains outlet. Be sure to turn the POWER switch off before connecting the AC cord.

Connections

- Always disconnect the AC cords connected to mains outlets before connections between components.
- Connect the plugs correctly to the left and right channel jacks.
- Insert plugs fully. Inperfect insertion may cause noise or sound reproduction failure.

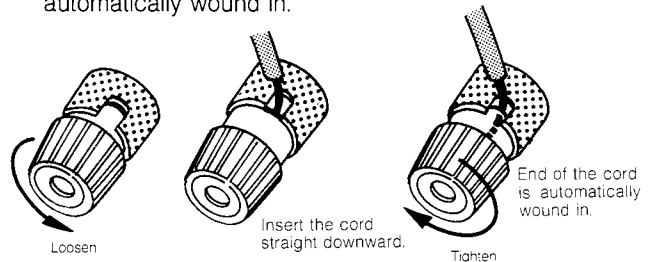


Speaker connection

When connecting speakers, carefully connect the cords so as not to mistake left and right channels and speaker polarities.

1. Use sufficiently thick cords (for example 20- to 30-strand cords) with small electric resistance. It is recommended to use color-coded cords for easy confirmation of polarities. Speaker cords shall be as short as possible, and the left and right channel cords shall have the same length.
2. Remove about half inch (12.5 mm) of insulation from the end of each speaker cord, and twist the strands of each conductor.

3. Loosen the speaker terminal knob. Insert the bare end of the cord straight downward. As the knob is turned clockwise for tightening, the bare end of the cord is automatically wound in.



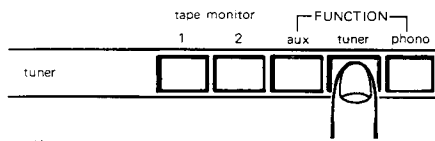
Caution

2 speaker systems can be connected to this unit. The minimum speaker impedance shall be 4Ω when only one speaker system is used, or 8Ω when two speaker systems are used.

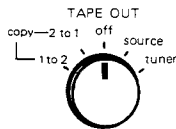
Operation Procedures

Listening to a tuner

1. Turn the VOLUME CONTROL knob to the minimum level and press the POWER switch.
The "wait" indicator illuminates in orange color. As the circuit is stabilized, the "on" indicator illuminates in red color.
2. Press the TUNER FUNCTION selector and check that the "tuner" indicator illuminates in green color.



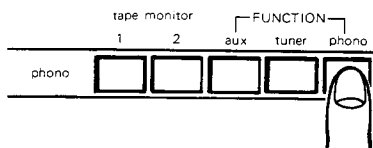
3. Be sure that the TAPE MONITOR 1 and 2 switches are off.
4. Place the TAPE OUT switch at its OFF position.



5. Depress the SPEAKER selector for the speakers to be sounded.
6. Tune the tuner to the desired station according to its owner's manual.
7. Place the MODE selector at its MONO or STEREO position according to the broadcasting program.
8. After perfect tuning, adjust the VOLUME, BASS, TREBLE and BALANCE CONTROL knobs to obtain the desired tone.

Listening to a turntable

1. Turn the VOLUME CONTROL knob to the minimum level and press the POWER switch.
2. Press the PHONO FUNCTION selector and check that the "phono" indicator illuminates in green color.

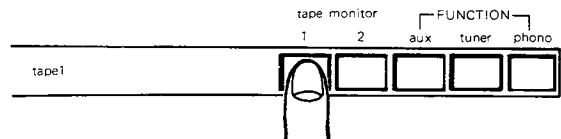


3. Be sure that the TAPE MONITOR 1 and 2 switches are off.
4. Place the TAPE OUT selector at its OFF position.
5. Depress the SPEAKER selector for the speakers to be sounded.
6. Place the MODE selector at its MONO or STEREO position according to the type of the record to be played.
7. Place the PHONO selector at its ph. 1 or ph. 2 position according to the PHONO INPUT jacks to which the turntable is connected.
8. Place the CARTRIDGE selector at the MM or MC position according to the type of the cartridge used in the turntable only when the PHONO selector is placed at the ph. 2 position.
9. Only when the PHONO selector is placed at the ph. 1 position, place the CAP. TRIM knob at the proper position according to the cartridge capacitance.
10. Start the turntable and lower the tonearm.

11. Gradually turn the VOLUME CONTROL knob to increase the sound volume to the desired level.
12. If the record is warped, depress the SUBSONIC FILTER switch.
13. Adjust the BASS, TREBLE and BALANCE CONTROL knobs to obtain the desired tone.

Tape playback

1. Turn the VOLUME CONTROL knob to the minimum level and press the POWER switch.
2. Press the TAPE MONITOR 1 or 2 switch corresponding to the TAPE INPUT jacks to which the playing tape deck is connected, and check that "tape 1" or "tape 2" indicator illuminates in red color.



3. Place the TAPE OUT switch at its OFF position.
4. Depress the SPEAKER selector for the speakers to be sounded.
5. Place the MODE selector at its MONO or STEREO position according to the type of the tape to be played back.
6. Mount a recorded tape on the selected tape deck and set the tape deck to playback mode according to the owner's manual of the tape deck.
7. Gradually turn the VOLUME CONTROL knob until the desired sound volume is obtained.
8. Adjust the BASS, TREBLE and BALANCE CONTROL knobs until the desired tone is obtained.
9. Depress the HIGH CUT FILTER switch to cut off tape hissing sound.

MAIN DIRECT switch

Press this switch to improve the sound quality by inputting the source signal directly to the power amplifier. Then, the tone control, balance control, subsonic filter, and high-cut filter circuits are cut off from the signal path. The sound quality will be improved as much as such characteristics as residual noise and distortion ratio are simplified so as to give pure sound reproduction.

When this switch is depressed, the sound volume is attenuated by 7 dB. Adjust the VOLUME CONTROL knob.

Channel reversing

When the MODE selector is set at its REVERSE position, the left and right channel signals are reversed to change the sound field.

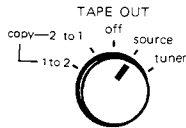
Select this position to test the possible cause of no sound reproduction in one channel.

When the positions of musical instruments in the reproduced sound are reverse of those printed on jacket, this position also enables correction without changing signal cable connections.

Tape recording

Recording from a music source (turntable, tuner or a component connected to AUX INPUT jacks) to a tape deck is possible.

1. Turn the VOLUME CONTROL knob to the minimum level and press the POWER switch.
2. Press the FUNCTION selector (AUX, TUNER or PHONO) for the desired source, and check that the corresponding indicator illuminates in green color.
3. Be sure that the TAPE MONITOR 1 and 2 switches are off.
4. Place the TAPE OUT selector at its SOURCE position.



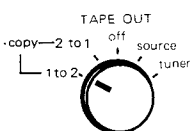
5. Place the MODE selector at its MONO or STEREO position according to the source program. The recording sound is not affected.
6. Depress the SPEAKER selector for the speakers to be sounded.
7. Gradually turn the VOLUME CONTROL knob clockwise until the source sound is heard.
8. Start recording at the destination tape deck according to its owner's manual.
9. Recording has started. To enjoy the source sound during recording, adjust the BASS, TREBLE and BALANCE controls as desired. These adjustments do not affect the recording sound.
10. To monitor the recording sound, press the TAPE MONITOR 1 or 2 switch corresponding to the TAPE OUTPUT jacks to which the tape deck is connected. In this state, the recording signals can be monitored through speakers.
11. While monitoring the sound, adjust the BASS, TREBLE and BALANCE controls as desired. These adjustments do not affect the recording sound.
12. To enjoy another source (turntable or auxiliary component) sound during air check (recording of a broadcasting program), place the TAPE OUT selector at its TUNER position and press the desired FUNCTION selector (PHONO or AUX).

Note: If two tape decks are connected to this unit, simultaneous recording of the same source at two tape decks is possible.

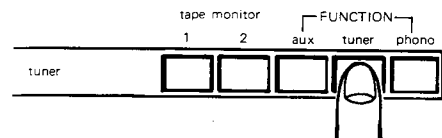
Tape copying (dubbing)

When two tape decks are connected to this unit, copying from one tape deck to another is possible in either direction.

1. Turn the VOLUME CONTROL knob to the minimum level and press the POWER switch.
2. For copying from the tape deck connected to the TAPE 1 INPUT/OUTPUT jacks to the tape deck connected to TAPE 2 INPUT/OUTPUT jacks, place the TAPE OUT selector at its COPY-1 TO 2 position. Place the same switch at its COPY-2 TO 1 position for copying in the reverse direction.



3. Set the source tape deck (the deck connected to the TAPE 1 INPUT/OUTPUT jacks when the TAPE OUT selector is at the COPY-1 TO 2 position, or the one connected to the TAPE 2 INPUT/OUTPUT jacks when the TAPE OUT selector is at the COPY-2 TO 1 position) to playback mode, and the other tape deck to recording mode.
4. Copying has started.
5. To monitor the copying status, first depress the SPEAKER selector for the speakers to be sounded. Then, place the MODE selector to the MONO or STEREO position according to the type of the tape being copied. This adjustment does not affect the dubbing sound.
6. When the TAPE MONITOR 1 switch is pressed, "tape 1" indicator on the DISPLAY panel illuminates, and the tape deck connected to the TAPE 1 INPUT/OUTPUT jacks is monitored. When the TAPE MONITOR 2 switch is pressed, "tape 2" indicator on the DISPLAY panel illuminates, and the tape deck connected to the TAPE 2 INPUT/OUTPUT jacks is monitored.
7. To enjoy the monitoring sound in this state, adjust the BASS, TREBLE and BALANCE controls as desired. These adjustments do not affect the copying sound.
8. To enjoy another source (turntable, tuner or auxiliary component), set both the TAPE MONITOR 1 and 2 switches off and press the FUNCTION selector (AUX, TUNER or PHONO) for the desired source.



Notes

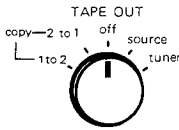
- Even when the POWER switch is turned on, no sound will be reproduced for a while. This is a period until circuit stabilization, and not a trouble. When the indicator is switched from "wait" to "on", operate this unit. It takes about 8 seconds until circuit stabilization.
- Keep the MAIN DIRECT switch released in normal operation. If the switch is depressed, the sound volume is attenuated by 7 dB, and the TONE CONTROLS, BALANCE CONTROL, MODE SELECTOR, SUBSONIC FILTER, and HIGH-CUT FILTER become ineffective.
- Carefully release the AUDIO MUTE switch from the on position so as to prevent sudden booming sound from speakers.
- When both the TAPE MONITOR 1 and 2 switches are pressed, both "tape 1" and "tape 2" are indicated on the display panel, but the sound of the tape deck connected to the TAPE 1 INPUT jacks is heard. When playing back a tape on the tape deck connected to the TAPE 2 INPUT jacks, be sure that "tape 1" indicator is off and press the TAPE MONITOR 2 switch.

Special Feature and Operation

TAPE OUT selector

The TAPE OUT selector is adopted for the following purposes:

- To prevent sound quality degradation resulting from instable circuit status caused by tape deck off status when listening to a tuner, turntable or an auxiliary component connected to the AUX INPUT jacks of this unit.
- To enable air check while listening to another source.
- To facilitate tape copying (dubbing).



The function of each position is as follows:

TUNER position

The tuner signals appear at TAPE 1/2 OUTPUT jacks irrespective of the selected function. This position enables listening to turntable or the source connected to the AUX INPUT jacks while recording a broadcasting program (air check).

SOURCE position

The signals of the source selected by the FUNCTION selector appear at the TAPE 1/2 OUTPUT jacks.

OFF position

During tape playback or listening to a program source selected by the FUNCTION selector, the output signals to the TAPE 1/2 OUTPUT jacks are cut off to prevent sound degradation.

COPY - 2 TO 1 position

Enables dubbing from the tape deck connected to TAPE 2 INPUT jacks to the deck connected to TAPE 1 OUTPUT jacks.

To monitor the source tape sound, press the TAPE MONITOR 2 switch. To monitor the sound being recorded, press the TAPE MONITOR 1 switch.

When the FUNCTION switch (AUX, TUNER or PHONO) is pressed with the TAPE MONITOR switches OFF, you can enjoy the selected source sound while copying the tape (dubbing).

COPY - 1 TO 2 position

Reverse of the above position.

Using audio equalizer or noise reduction system

In addition to tuners, turntables, and tape decks, this unit allows connection with an AUDIO EQUALIZER or NOISE REDUCTION SYSTEM to enable various combinations.

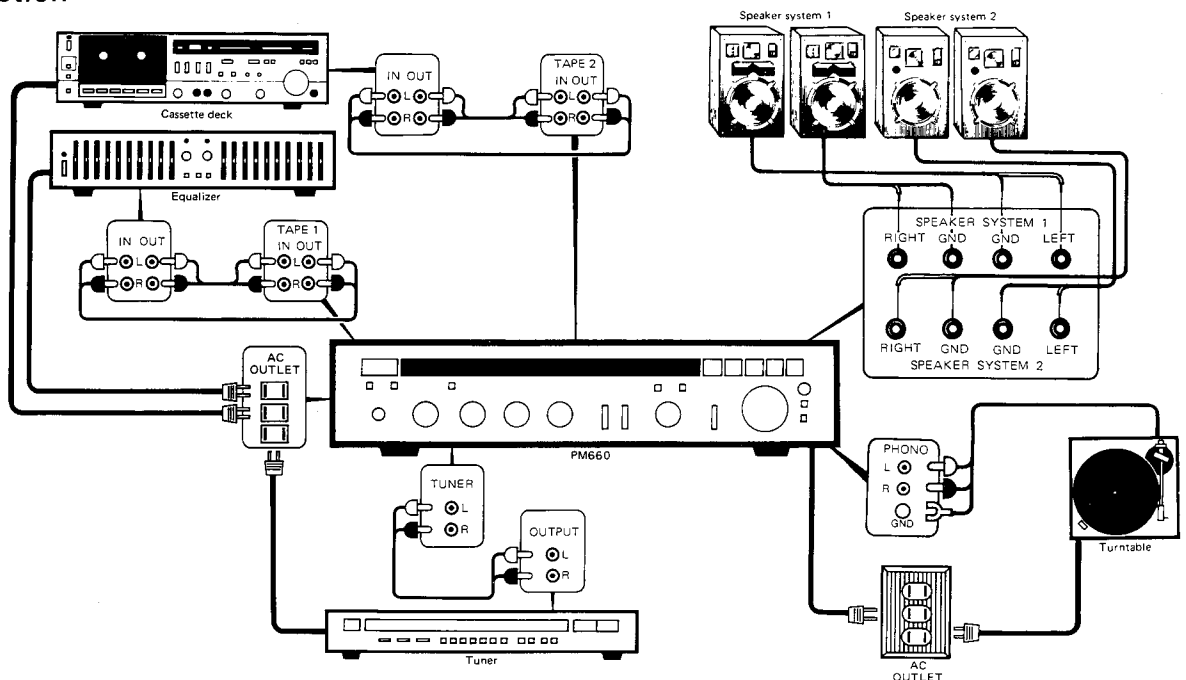
Use of an equalizer as an additional component of your system enables various tone controls such as flattening of the acoustic characteristic in the listening room, equalization to match the system, equalization to obtained desired sound and equalization for emphasis of the sound of a certain musical instrument.

Use of a noise reduction system will enable clear sound reproduction with minimal noise.

Please enjoy equalized sound according to the illustrations in the next page for use of an equalizer and operation instructions for the TAPE OUT selector, TAPE MONITOR switches and FUNCTION selectors.

To use a noise reduction system, connect it in the same way as and in place of the equalizer and operate it similarly as the equalizer.

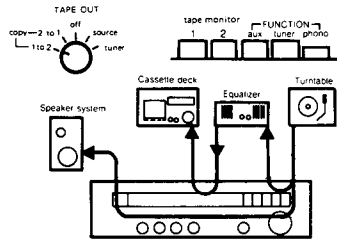
Connection



Operation

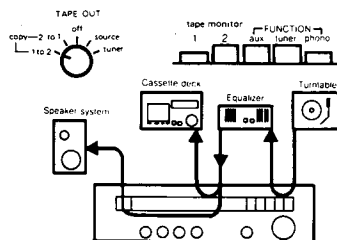
To listen to the sound of the source (turntable, tuner or auxiliary component) selected by the FUNCTION selector or to listen to the equalized sound by monitoring the equalizer or the tape deck while recording the equalized sound of the source to the tape deck connected to the TAPE 2 INPUT/OUTPUT jacks through the equalizer (or noise reduction system) connected to the TAPE 1 INPUT/OUTPUT jacks.

Setting 1



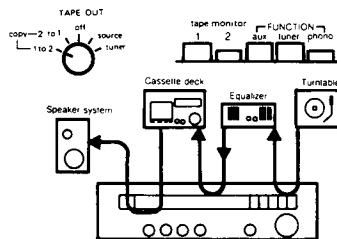
To listen to the original source sound while recording through the equalizer the sound of the source.

Setting 2



To monitor the equalized sound while recording through the equalizer the sound of the source.

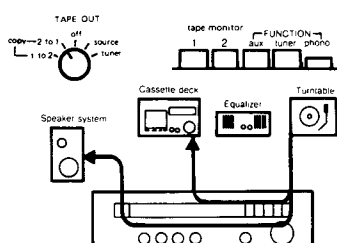
Setting 3



To monitor the equalized recorded sound while recording through the equalizer the sound of the source.

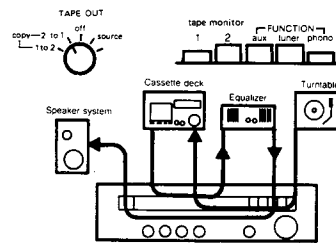
To listen to the sound of the source (turntable, tuner or auxiliary component) selected by the FUNCTION selector directly or by monitoring the recorded sound with or without equalization while recording the source sound directly to the tape deck connected to the TAPE 2 INPUT/OUTPUT jacks.

Setting 1



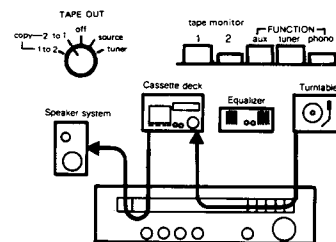
To listen to the source sound directly while recording the sound of the source directly without equalization.

Setting 2



To monitor the recorded sound through the equalizer while recording the sound of the source directly without equalization.

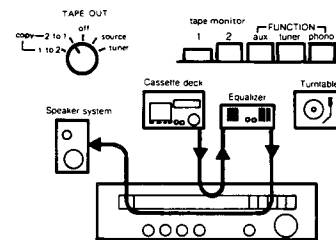
Setting 3



To monitor the recorded sound without equalization while recording the sound of the source directly without equalization.

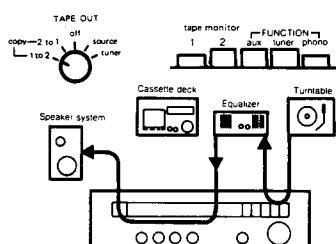
To listen to the equalized tape playback sound or equalized sound of the source selected by the FUNCTION selector.

Setting 1



To listen to the equalized sound of the tape played on the tape deck connected to the TAPE 2 INPUT/OUTPUT jacks.

Setting 2



To listen to the equalized sound of the source selected by the FUNCTION selector.

Note: When both the TAPE MONITOR 1 and 2 switches are on, the TAPE MONITOR 1 switch has the priority. It provides the same status as when only the TAPE MONITOR 1 switch is pressed.

Maintenance

When the unit gets dirty, wipe it with a soft dry cloth. If heavily contaminated, wipe it with a soft cloth soaked with mild soapy water and then wipe with a dry cloth. Never use alcohol, thinner, benzene or other volatile agent since the painting may be damaged.