SONY

INTEGRATED STEREO AMPLIFIER

TA-AX410

OPERATING INSTRUCTIONS

Before operating the unit, please read this manual thoroughly.
This manual should be retained for future reference.

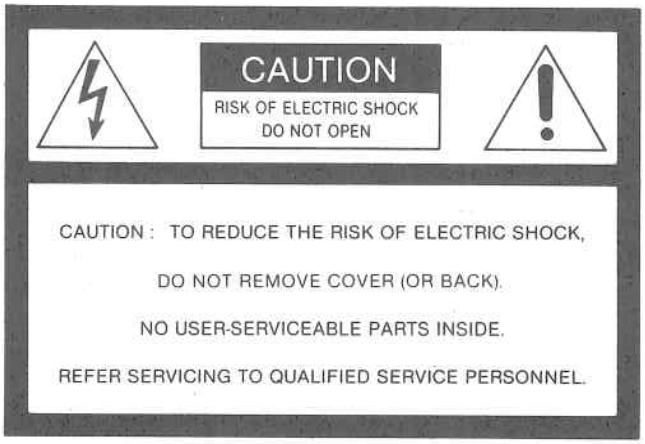
OWNER'S RECORD

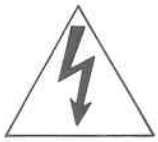
The model and serial numbers are located at the rear. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. TA-AX410 Serial No. _____

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.





This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and mainteance (servicing) instructions in the literature accompanying the appliance.

TABLE OF CONTENTS

FEATURES

The TA-AX410 integrated stereo amplifier incorporates a number of technical breakthroughs in circuit design to take full advantage of new digital sources such as the CD (compact disc), with a power output of 50 + 50 watts (20 Hz - 20 kHz, 0.008% THD).

MAJOR DESIGN ELEMENTS AND CIRCUIT FEATURES

ASP (Audio Signal Processor) IC in the preamplifier stage

The Audio Signal Processor IC developed by Sony can digitally control the tone, filter and volume settings. The ASP IC also permits electronic program source selection. Mechanical controls and switches have been practically eliminated from the front panel. In combination with a microcomputer and a non-volatile memory IC, the ASP IC offers greater flexibility — an Acoustic Function, an ability to store and recall two sets of tonal adjustments.

Legato linear power amplifier stage

The operation of the power amplifier stage is stable without any observable distortion up through the higher frequencies. We call this power amp "Legato Linear" because its switching distortion is very low and its output waveform smooth.

Simple, straight signal path layout

The ASP IC layout near the input and output terminals minimize wiring losses and allow low distortion operation.

Volume control using ASP IC
The volume can be adjusted with the slightest touch of the electronically driven volume control button. When the power is turned on, the volume is set to the minimum level and automatically increased to the previously set level.

CD (compact disc) inputs
Independent CD inputs are provided to connect a brand-new CD player to your stereo system.

Wireless remote control operation
Using the optional RM-S410 system remote controller, various operations—power on/off, program selection, muting on/off and timer operation—can be remotely controlled.

PRECAUTIONS

On safety
- Operate the unit only on 120 V ac, 60 Hz.
- Should any liquid or solid object fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time. To disconnect the cord, pull it out by grasping the plug. Never pull the cord itself.

On installation
- Do not install the unit in a location near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Good air circulation is essential to prevent internal heat build-up in the unit. Place the unit in a location with adequate air circulation. Do not place the unit on a soft surface, such as a rug that would block the ventilation holes on the bottom.
- Do not place anything on top of the cabinet. The top ventilation holes must be unobstructed for the proper operation of the unit and to prolong the life of its components.

On operation
- Before making program source connections, be sure to turn the power switch off and unplug the unit.
- When the unit is not used, turn the power off, to conserve energy and to extend the useful life of your unit.

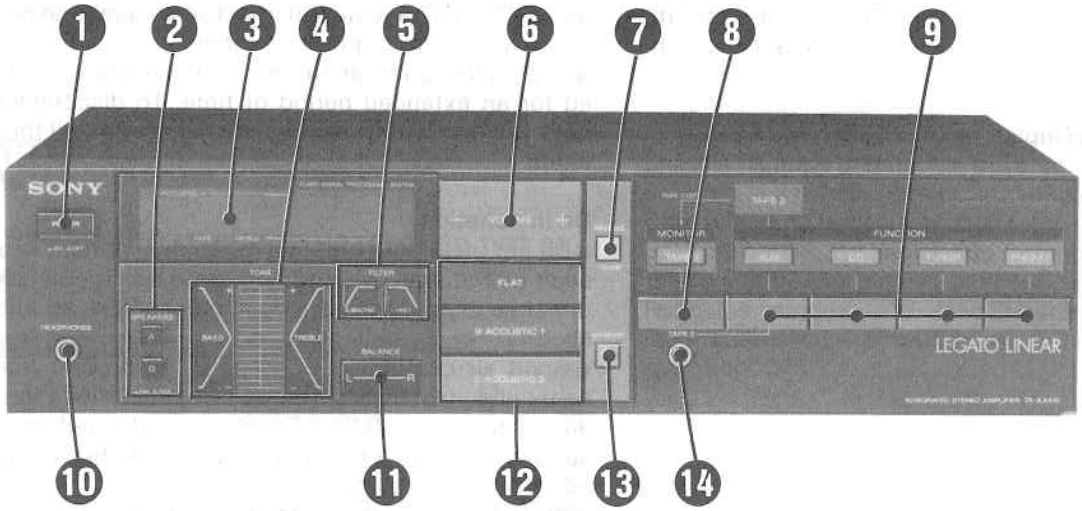
On cleaning the cabinet
Clean the cabinet, panel and controls with a soft cloth lightly moistened with mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.

On repacking
Do not throw away the carton and the packing material. It makes an ideal container to transport the unit in. When shipping the unit for repair work or to another location, repack it as illustrated on the carton box.

For the customers in the USA
For detailed safety precautions, see the leaflet "IMPORTANT SAFEGUARDS".

FUNCTION OF CONTROLS

Front panel



❶ POWER switch
Turns the operating power on or off.

❷ SPEAKERS select buttons
Select speaker system A or B, or both.

❸ Fluorescent display

❹ BASS and TREBLE TONE controls
Regulates the bass and treble response. Press its upper-end (+) to increase the response, and its lower-end (–) to decrease it.

❺ FILTER buttons
SUBSONIC: If subsonic noise components created by warped records, etc. are present, the audible range frequencies may be modulated and cause irritating intermodulation distortion. In this case, press this button to reduce unwanted noise components in the program source. The filter will cut off any input signals below 15 Hz at a 6 dB-per-octave rate. Press this button again to disengage it.
HIGH: If tape hiss or a beat is audible, press this button. Unwanted noise components will be reduced. When you press this button again, the filter is disengaged.

❻ VOLUME control
Regulates the overall sound level. Press its right-end (+) to increase the sound level, and its left-end (–) to decrease it.

❼ MUTING button
When the MUTING button is pressed, the MUTING indicator will light up and the overall listening sound level is reduced by 20 dB. When the button is disengaged by pressing it again, you can restore exactly the same listening level as before.
This feature is useful when you lower the tonearm onto the record or when you answer the telephone.

❽ MONITOR (TAPE 1) button
Press this button to listen to a tape deck connected to the TAPE RECORDER 1 inputs on the rear panel. The indicator will light up. Press the button again to disengage it when listening to other program sources.

❾ FUNCTION select buttons
Press one of these buttons to select a desired program source other than a taped program connected to the TAPE RECORDER 1 input. The indicator of the pressed button will light up.
PHONO: For record programs (connected to PHONO inputs)
TUNER: For broadcasting programs (connected to TUNER inputs)
CD: For compact disc programs (connected to CD inputs).
AUX: For auxiliary programs (connected to AUX inputs on the rear panel) or for taped programs (connected to the TAPE 2 input on the front panel).

❿ HEADPHONES jack
Accepts any low or high impedance stereo headphones. For headphone monitoring only, keep both SPEAKERS select buttons A and B released.

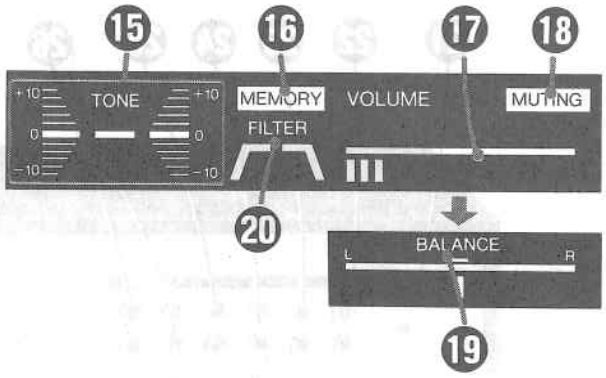
⓫ BALANCE control
Governs the amount of sound coming from each paired speaker to get optimum stereo effect.
Pressing the right-end (R) will decrease the left channel volume, and pressing the left-end (L) will decrease the right channel volume.

⓬ ACOUSTIC buttons
Press either ACOUSTIC 1 or 2 button just after pressing the MEMORY button to store the acoustic settings—tone and filters. Once set, you can recall these acoustic settings instantly. Use thé FLAT button to disengage the settings recalled by the acoustic function or the normal tonal settings. At the FLAT position, flat frequency response results.

⓭ MEMORY button
When this button is pressed, the MEMORY indicator will light up and the acoustic settings can be stored on either of the ACOUSTIC buttons.

⓮ TAPE 2 input jack (stereo phone jack)
This stereo phone jack allows you to quickly and easily connect a tape recorder for playback with the optional RK-81A connecting cord (stereo phone plug to two phono plugs).
The tape thus played back can be copied by the tape deck connected to the TAPE RECORDER 1 REC OUT outputs on the real panel.
The TAPE 2 input has priority over the AUX input on the rear panel.

Fluorescent display section



⓯ TONE indicator
A straight bar graph indicates a flat frequency response.
Bars move up and down, depending on the tone control settings, graphically showing the tone control characteristics.

⓰ MEMORY indicator
Lights up when you press the MEMORY button.

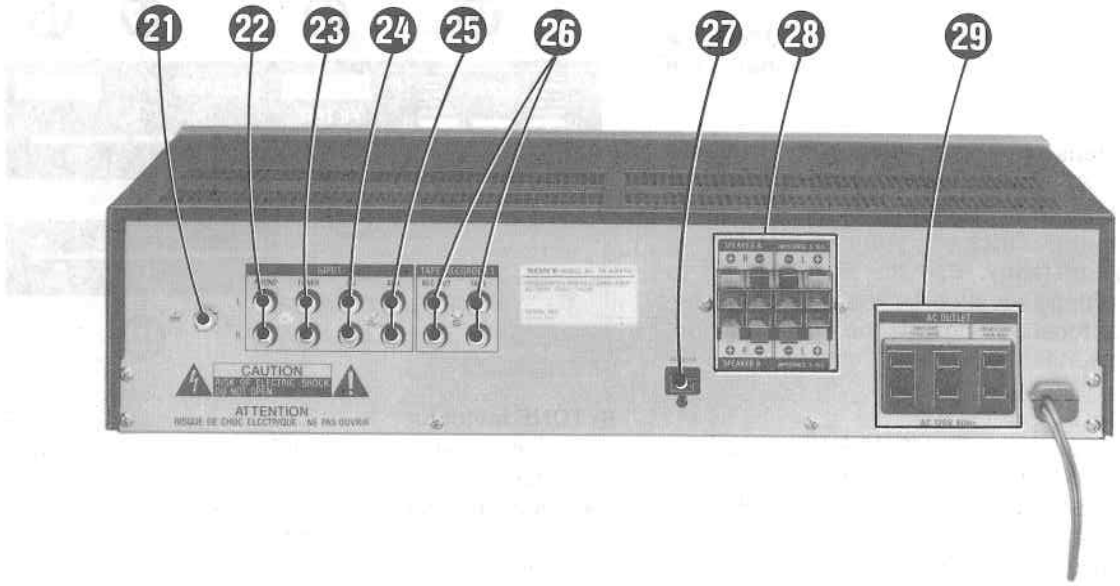
⓱ VOLUME indicator
The volume is displayed by the vertical bar graphs. The bars move toward the right as the volume increases.

⓲ MUTING indicator
Lights up when you press the MUTING button.

⓳ BALANCE indicator
When you press the BALANCE control, the VOLUME indicator disappears and BALANCE indicator appears. Parallel bars move between the L and the R when either side of the BALANCE control is pressed. A few seconds after you stop pressing the BALANCE control, the display automatically changes to the VOLUME indicator.

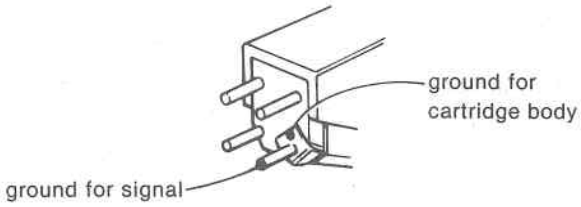
⓴ FILTER indicator
The settings of the SUBSONIC FILTER (left) button or the HIGH FILTER (right) button or both are graphically displayed.

Rear panel



㉑ Ground terminal
For a turntable system with a ground wire, be sure to connect it to this terminal to prevent hum. If hum still exists, it may be helpful to connect the ground terminal directly to earth via a ground rod.

Note
When a special MM cartridge with the ground to signal connected to the ground for cartridge body, is installed to a metal cartridge shell, the current will flow in a loop and cause hum noise. In this case, disconnect the turntable ground wire from the ⏚ terminal of the amplifier, or disconnect the ground for cartridge body from the ground for signal.



㉒ PHONO inputs (phono jack)
Accept the outputs of a turntable system with an MM (moving magnet) type cartridge.

㉓ TUNER inputs (phono jack)
Accept the outputs of a tuner.

㉔ CD (compact disc) inputs (phono jack)
Accept the outputs of a compact disc player.

㉕ AUX (auxiliary) inputs (phono jack)
Accept various input sources such a tape deck (for playback only), an additional tuner, etc.

㉖ TAPE RECORDER 1 inputs/outputs (phono jack)
The TAPE inputs accept the outputs of a tape deck for playing back tapes. The REC OUT (outputs) accept the inputs of a tape deck for tape recording.

Note: The AUX, CD, TUNER and TAPE RECORDER inputs are identical in sensitivity and input impedance.

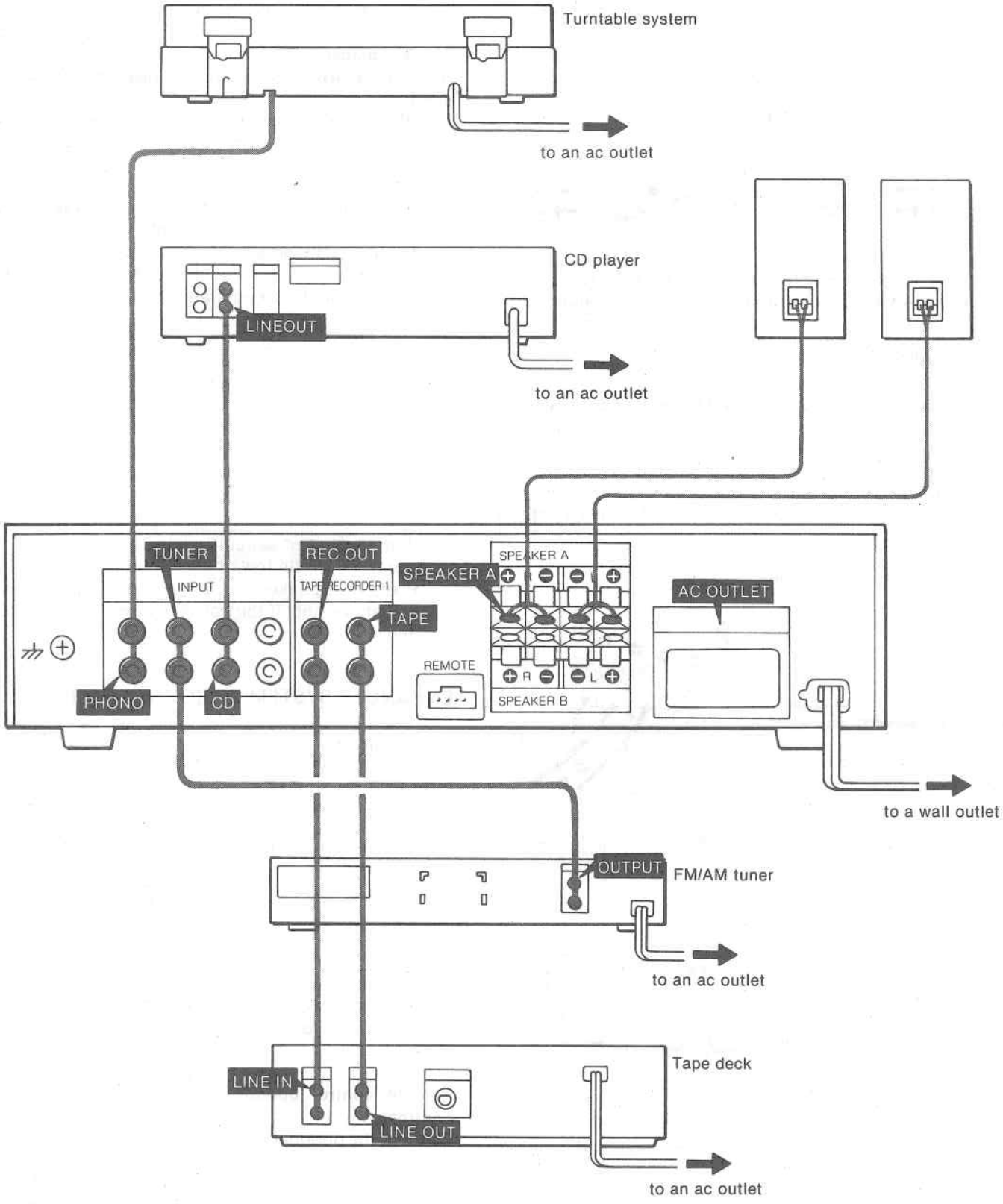
㉗ Remote control connector
For connecting the optional RM-S410 system remote controller.

㉘ SPEAKER A, B connectors
For connecting a speaker system or two pairs of speaker systems. System A and system B can be selected by means of the front panel SPEAKERS select buttons.

㉙ AC OUTLETs
These are used to power other audio components whose power consumption is less than the wattage indicated on the ac outlet.

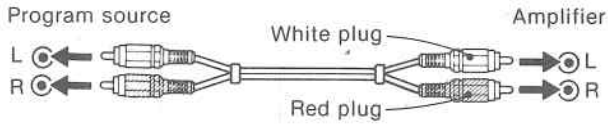
SYSTEM CONNECTIONS

For hooking up, see the connection diagram below.



CONNECTION NOTES

- The power cord should be connected last of all, first making sure that the POWER switch is turned off.
- When connecting program sources or tape recorders, note that the red jacks of the amplifier are for right-channel connections and the white jacks for left-channel connections.



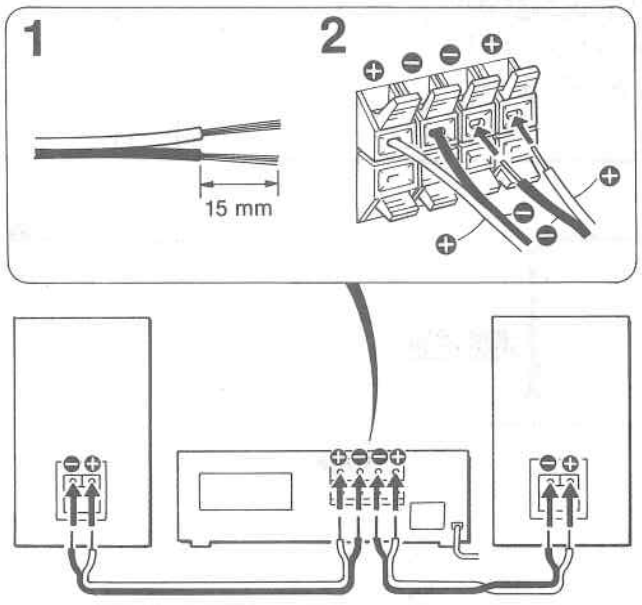
- The cable connectors should be fully inserted into the jacks. A loose connection may cause hum and noise.

SPEAKER CONNECTION

Speaker impedance and power handling capacity

This amplifier is designed to work best with speakers having nominal impedance from 8 to 16 ohms, and rated at 50 watts minimum RMS per channel with an 8-ohm load from 20 – 20,000 Hz. Be sure not to use speakers with impedance less than 8 ohms and to use adequate power handling capabilities.

Speaker cord connection



1 Strip the outer covering and twist the wires.
2 Keep the terminal button depressed and fully insert the wires into the slot, and then release the button. Pull on the speaker cord lightly to see if the connection is secure.

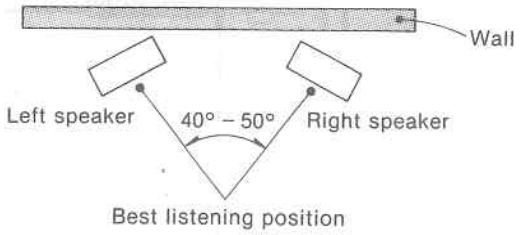
Generally speaker cords are coded with color, or mark, indicating the ⊕ ⊖ polarities. Remember the coding and prevent faulty connections.

Right speaker: to R SPEAKER terminals
Left speaker: to L SPEAKER terminals
⊕ code: for ⊕ connection
⊖ code: for ⊖ connection

Speaker placement

Here are a few suggestions on basic speaker placement.

— Place each speaker with its back 3 - 5 cm (1¼ - 2") from a hard wall in a similar acoustic environment.
— Set your speaker system up on a hard, flat floor or pedestals. Carpets, draperies and upholstered furniture will miminize the multiple reflections of high-frequency sound which reduce the stereo effect.
— Generally we recommend that the speaker/listener relationship be an equilateral triangle.



If the speaker separation is too wide, face the speakers a little towards each other.
— Place the speakers no higher than your ears when you are seated, if the speakers are to be positioned above the floor.

ENHANCED SYSTEM-UP CONNECTIONS

Second speaker system

Connect the second pair of speaker system to the SPEAKER B outputs.

Two speaker systems, A and B, can be selected individually or simultaneously by means of the front panel SPEAKERS select buttons. Note that the speaker system A and B are series connected. No sound will be heard if only one of the speaker systems is connected and the SPEAKERS select buttons A and B are depressed.

Second tape deck

Connect the second tape deck to the TAPE 2 input on the front panel for playing back tapes or for tape copying.

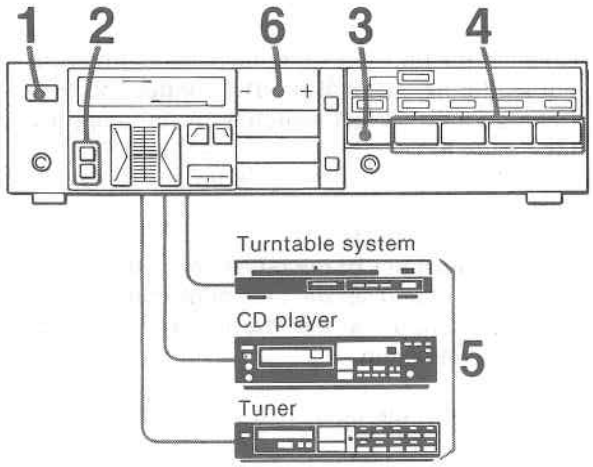
Remote control operation with an optional remote controller

Connect the optional RM-S410 system remote controller to the remote control connector. The various functions of the amplifier—power on/off, program selection, muting on/off and volume adjustment—can be remotely controlled. The RM-S410 also incorporates a timer, so that timer activated recording, or playback can be made.

AC OUTLETS

The SWITCHED outlets are controlled by the front panel POWER switch, whose total power consumption is 100 watts.
The UNSWITCHED outlet is not controlled by the POWER switch, whose power consumption is 100 watts. Do not connect any electrical home appliance such as an electric iron, fan, TV or other high-wattage equipment to these ac outlets.

TO LISTEN TO PROGRAM SOURCES

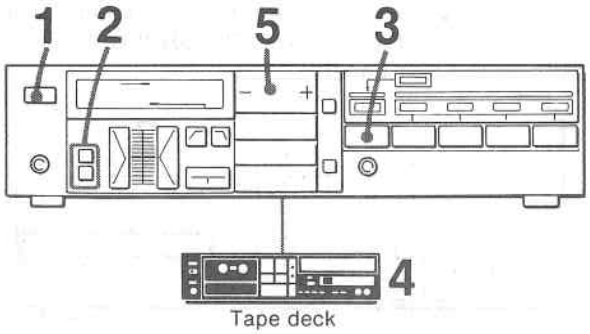


1 Depress the POWER switches of the amplifier and connected source equipment to ON.
2 Select the speaker system used with the SPEAKERS select buttons.
To drive speaker system A: depress A button.
To drive speaker system B: depress B button.
To drive both speaker systems: depress A and B buttons.
For headphone listening only: keep both buttons released.
3 If the TAPE 1 indicator lights up, press the TAPE 1 button to release it.
4 Press the appropriate function button.
For a record program, press PHONO.
For a CD program, press CD.
For a tuner program, press TUNER.
For an auxiliary source connected to the AUX inputs, press AUX.
5 Start the program.
6 Adjust the volume with the VOLUME control by pressing either end of the button.

When the power is turned on, the volume will be automatically reset to minimum, then will be up slowly to the previous setting.

The TAPE 1 button has priority over the function select buttons (PHONO, TUNER, CD and AUX) if they are pressed at the same time.

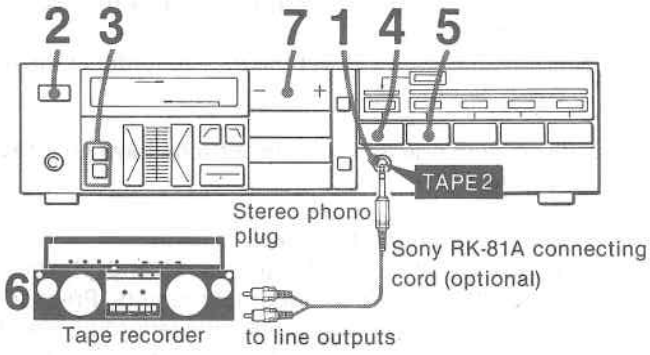
TO LISTEN TO A TAPED PROGRAM



1 Depress the POWER switches of the amplifier and the tape deck to ON.
2 Select the speaker system with the SPEAKERS select buttons.
3 Press the TAPE 1 button. The TAPE 1 indicator lights up.
4 Start playback.
5 Adjust the volume to your preference with the VOLUME control.

Connecting a tape recorder to the front panel tape 2 input

The front panel TAPE 2 jack can be temporarily used to play back a tape recorder, such as a radio cassette corder, without changing the rear panel connection.



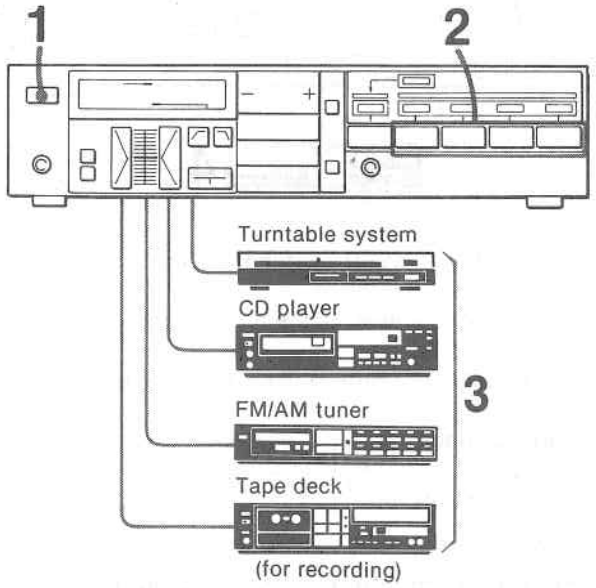
1 Connect the tape recorder (or tape deck) to the TAPE 2 input using the optional RK-81A connecting cord.
2 Depress the POWER switch of the amplifier and tape recorder (or tape deck) to ON.
3 Select the speaker system with the SPEAKERS select buttons.
4 If the TAPE 1 indicator lights up, press the TAPE 1 button to release it.
5 Press the AUX button.
6 Start playback.
7 Adjust the volume to your preference with the VOLUME control.

The front panel TAPE 2 connection has priority over the auxiliary program connected to the AUX inputs on the rear panel.

TAPE RECORDING AND TAPE COPY

TO RECORD

You can record any program source using a tape recorder connected to the TAPE RECORDER 1 REC OUT outputs on the rear panel.

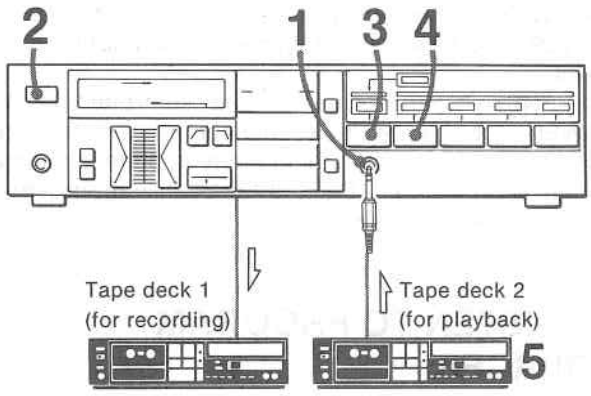


1 Depress the POWER switches of the amplifier and connected source equipment to ON.
2 Select the program to be recorded with the function select button.
If the TAPE 1 indicator lights up, press the TAPE 1 button to release it.
3 Start the program and set the tape recorder in the recording mode.

The filters, and tone and volume settings have no effect on recording.

Monitoring of a 3-head tape deck
If your tape deck has separate record and playback heads, you can monitor the recording results. Press the TAPE 1 button and you can monitor the recording result. Press the TAPE 1 button again and press the appropriate function select button ; the source sound will be heard. For tape monitoring, the tape deck should be connected to the TAPE RECORDER 1 TAPE inputs and REC OUT outputs. Be sure to keep the monitor switch of the tape recorder in the TAPE position.

TO COPY



1 Connect the tape deck for playback to the TAPE 2 input using the optional RK-81A connecting cord.
2 Depress the POWER switches of the amplifier and tape deck to ON.
3 If the TAPE 1 indicator lights up, press the TAPE 1 button to release it.
4 Press the AUX button.
5 Start the playback of the tape deck connected to the TAPE 2 input and set the tape deck connected to the REC OUT outputs at the rear in recording mode. Copying will begin.

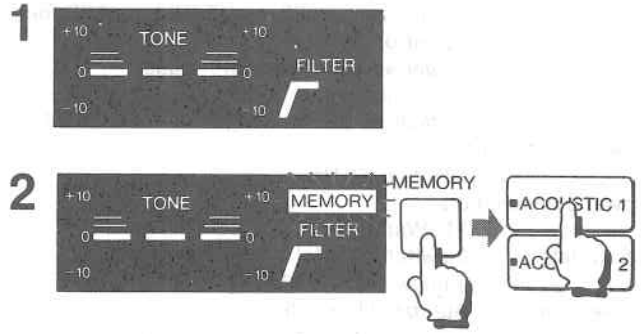
Tape copy from tape deck 1 to tape deck 2 cannot be made.

TO SET THE ACOUSTIC SETTINGS

—Acoustic Function—

This amplifier can store and recall the acoustic settings—tone control (BASS and TREBLE TONE), and filters (SUBSONIC and HIGH FILTER) used, thus instantly providing a choice of two different acoustic settings. These settings may be based upon the preferences of two individual users of the system, or the speaker system in use, or the type of music being listened to, etc.

1 Adjust the tonal quality to your preference.
2 Press the MEMORY button. The MEMORY indicator will come on, during which time, press either the ACOUSTIC 1 or 2 button.
Now one of the two acoustic settings is committed to memory.



Q. How can I check the acoustic setting?
A. Once the setting is set, press the FLAT button. All the acoustic settings are disengaged and a flat frequency response results. Then press the ACOUSTIC button which you committed to memory, so that the original settings will be recalled. Now compare the effect of the settings with the flat frequency response.

Q. How can I change temporarily a part of the acoustic settings?
A. Simply change the part of the acoustic setting you want.
You can recall the original settings later by pressing the ACOUSTIC 1 or 2 button.

Q. How can I change all the acoustic settings?
A. Simply set the new acoustic settings as you like and memorize them as described before.

Q. If I turn the amplifier off, are the acoustic settings cancelled?
A. No. This amplifier, with its non-volatile IC in the memory circuit, retains the contents of the memory even when the power is off, and recalls them whenever you want.

Note
But if the power is turned off within 1 second after changing any of the settings, the acoustic settings cannot be retained in the memory.

TROUBLE CHECKS

Should any problem persist after you have made these checks, consult your nearest Sony service facility. Before going through the check list below, first refer back to the connection and operating procedures.

No audio
- Check speaker and program source connections.
- Check the settings of the TAPE 1 button and function select buttons.
- Disconnect the tape deck connected to the front panel TAPE 2 input when listening to source equipment connected to the AUX inputs on the rear panel.
- Check the SPEAKERS selector setting.
- Turn up the volume.

No audio from one channel or unbalanced left and right volume
- Adjust the BALANCE control.
- Check the speaker and input connections of the inoperative channel.

Abrupt loss of sound from one or both of the speakers and volume indicator flickering*
- Turn off the amplifier and check the speaker terminals or speaker cord for a short.

Abrupt loss of sound from one or both of the speakers*
- Check for a connected audio component which might generate a dc content that affects the amplifier.

Lack of bass sound or obscure instrument position
- Check the speaker connection for proper phasing.

Severe hum or noise
- Keep the connecting cords away from transformers or motors and at least 3 meters (10 feet) from TV sets and fluorescent lights.
- If the TV set and audio components are too close together do not use both TV set and audio components at the same time. If both are used at the same time, separate the TV set from the audio components.
- Ground the turntable system.
- Disconnect the ground wire of the turntable from the ⏚ terminal when using a special designed MM cartridge. See page 6.
- Make secure connections.
- Wipe the plugs and jacks with a cloth lightly dampened with methanol.

* These symptoms may be caused when the protection circuits activate.

SPECIFICATIONS

AUDIO POWER SPECIFICATIONS

POWER OUTPUT AND TOTAL HARMONIC DISTORTION:

With 8 ohm loads, both channels driven, from 20 – 20,000 Hz; rated 50 watts per channel minimum RMS power, with no more than 0.008% total harmonic distortion from 250 milliwatts to rated output.

OTHER SPECIFICATIONS

Amplifier section

Power bandwidth (IHF)
5 Hz – 40 kHz (0.02% THD)

Dynamic headroom
1.8 dB ('78 IHF)

Harmonic distortion
Less than 0.008% at rated output

Intermodulation (IM) distortion
(60 Hz : 7 kHz = 4 : 1) Less than 0.008% at rated output

Frequency response
PHONO : RIAA equalization curve ±0.5 dB
TUNER, CD, AUX, TAPE 1,2 } 5 Hz – 100 kHz $^{+0}_{-3}$ dB

Residual noise Less than 50 μV (8 ohms, network A)
Damping factor 50 (8 ohms, 1 kHz)
Inputs

	Sensitivity	Impedance	Maximum input capability (1 kHz)	S/N (weighting network, input level)
PHONO	2.0 mV	50 kilohms	120 mV	75 dB 79 dB* (A, 2.0 mV)
TUNER CD AUX TAPE 1,2	150 mV	50 kilohms	—	100 dB 88 dB* (A, 150 mV)

* '78 IHF

Outputs
REC OUT 1
Voltage 150 mV
Impedance 4.7 kilohms
SPEAKER A, B
Accepts speakers of 8 – 16 ohms.
HEADPHONES
Accepts low and high impedance headphones.

Tone controls
BASS
±10 dB at 50 Hz (turnover freq. 250 Hz)
TREBLE
±10 dB at 15 kHz (turnover freq. 3 kHz)

Subsonic filter 6 dB/octave attenuation below 15 Hz
High filter 6 dB/octave attenuation above 9 kHz
Muting –20 dB

General

System
Preamplifier section : low-noise IC NF type equalizer amplifier ; NF-CR type ASP tone control
Power amplifier section : quasi-complementary SEPP OCL power amplifier with all stages direct coupled

Power requirements
120 V ac, 60 Hz

Power consumption
110 Watts

AC outlets
2 switched, total 100 W max.
1 unswitched, 100 W max.

Dimensions
Approx. 430 × 105 × 280 mm (w/h/d)
($17^{1}/_{8} \times 4^{1}/_{4} \times 11^{1}/_{8}$ inches)
including projecting parts and controls

Weight
Approx. 6.2 kg (13 lbs 11 oz) net
Approx. 7.7 kg (17 lbs) in shipping carton

Design and specifications subject to change without notice.

Sony Corporation Printed in Japan

3-773-893-21 (1)