SOLID STATE STEREO AMPLIFIER

SA-800

KUW

OPERATING INSTRUCTIONS

PIONEER®

Thank you for buying the quality stereo amplifier SA-800. To satisfy your today's stringent requirements, the SA-800 is especially designed for professional use in stereo sound reproduction, employing many features as described below. To get the most from the SA-800, read through the instructions.

FEATURES

QUASI-COMPLEMENTARY, DIRECT COUPLED OUTPUT AMPLIFIER

The power amplifier stage is a quasi-complementary design with direct coupling, i.e. without coupling capacitors between the individual stages. This results in a super-wide frequency response curve ranging from near-DC to well above the audible sound range. (For details, see the attached frequency response curve).
To maintain high output power with good stability, a positive-negative symmetrical power supply unit is employed. These design features make the SA-800 power amp stage one of the world's most advanced hi-fi amplifiers.

HIGH STABILITY EQUALIZER/HEAD AMPLIFIER

The equalizer/head amplifier consists of three direct coupled stages, possessing high gain and, therefore, a wide dynamic range. Emitter-to-emitter feedback results in high stability and extremely accurate equalizing characteristics.

FET-EQUIPPED CONTROL AMPLIFIER, SWITCH-TYPE TONE CONTROLS

The tone controls are not continuous but accurately dimensioned switch types, with each click-stop corresponding to a 3dB change.
The control amplifier operates with NFB (negative feedback), eliminating mid-level fluctuations during tone adjustments. What's more, a low-noise FET (field effect transistor) is employed in each of the first stages—the control amplifier has three stages—in order to eliminate impedance variations which would cause distortions. This design assures higher, more stable impedance than conventional transistor circuits, resulting in precise, as-calculated tone control function.

COMPLETE CHOICE OF PROGRAM SOURCES

The SA-800 is equipped with terminals for a full range of program sources including two turntables, a tuner, two tape decks, microphone plus two auxiliary sources such as a cartridge tape player or TV sound track.

EASY COMPARISON OF TURNTABLE CARTRIDGES

If two turntables (or two tonearms) are connected to the PHONO inputs 1 and 2, phono cartridges can be compared by simply flicking a switch. In addition, low-output moving coil cartridges can be used by plugging in a separately available phono input transformer (Pioneer model PP-402).

TAPE-TO-TAPE DUPLICATING

With two tape decks connected, duplicating and editing of recorded tapes becomes extremely easy.

FULL RANGE OF EXTRAS

The SA-800 incorporates a wide range of extra features which mark it as a truly advanced, versatile amplifier. These include a speaker selector which enables two sets of speakers to be used separately or together, a PRE & MAIN switch permitting independent use of the pre- and power amplifier sections in a multi-amp installation, an audio muting switch, a mode switch and a loudness switch.

ADVANCED OUTPUT PROTECTOR CIRCUIT

To safeguard against damage to speakers and output transistors caused by accidental short-circuiting of the speaker leads and every voltage drift, the SA-800 is equipped with a high-grade protector circuit. The protector, employing relays and transistors, detects dangerous DC potential at the speaker outputs and disconnects the output stage in the case of a short-circuit.

STYLISH DESIGN MATCHED WITH OTHER PIONEER HI-FI COMPONENTS

The SA-800 combines a modern control panel with luxurious cabinet styling in natural wood. Used together with other Pioneer hi-fi components, it presents an appearance of perfectly matched, "systemized" elegance.

ASSEMBLING A STEREO SYSTEM

The SA-800 is a stereo amplifier. It combines with a stereo speaker system, turntable, AM/FM stereo tuner, tape deck and microphone to create a high-performance stereo system.

COMBINING COMPONENTS

A wide range of Pioneer speaker systems, turntables, AM/FM stereo tuners, tape decks, electronic crossover networks and other stereo components are available. By choosing from this selection, you can construct a high-quality stereo system to suit your budget and taste.

A WORD ABOUT ROOM ACOUSTICS

The quality of reproduced sound varies according to the size and shape of the room, the materials of walls, floor and ceiling and the amount and arrangement of furniture. Too harsh or "bright" a sound usually results from too many hard reflecting surfaces, and/or too low a ceiling. This condition is improved by having ample carpet area or covering the wall (especially that facing the speakers) with a thick curtain.

On the other hand, too many absorbing surfaces will tend to "soak up" the sound, resulting in a certain "deadness." Furniture may be rearranged to provide irregular reflection of the sound. In any event, the true stereo effect is lost if the two speaker systems are placed too far apart. This may be corrected by angling them slightly toward each other or reducing the distance between them.

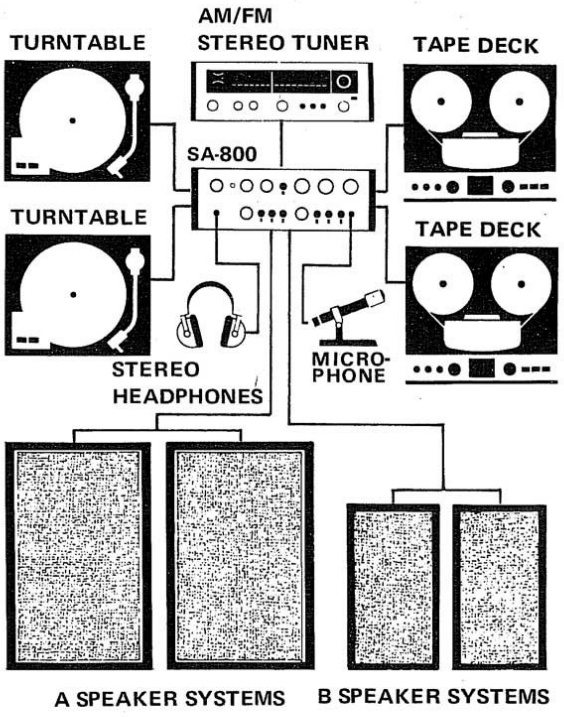


Fig. 1

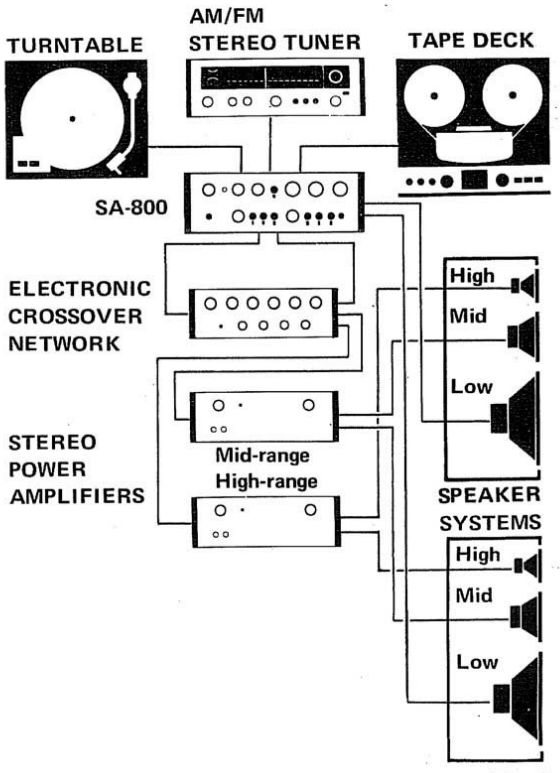


Fig. 2

INSTALLATION

Do not install the SA-800 in the following places:
- In the direct sunlight or near heating units.
- In damp, dusty places or where air circulation is poor.
- In vibration-prone, unstable places.

CONNECTION AND INSTALLATION OF SPEAKER SYSTEM

CONNECTION

- As shown in Fig. 3, connect the lead wires of the speaker system to the supplied speaker plugs. Be sure to observe the correct polarity and no short between ⊕ and ⊖.
- For the main set of speakers, use the A speaker terminals. Connect the right-channel speaker (the right-hand speaker when viewed from the front) to the terminal marked R, and the left-channel speaker to the terminal marked L.
- For the second set of speakers, use the B speaker terminals. Connect in the same way as for the main set.

NOTE: When using both sets of speakers simultaneously (with the SPEAKER switch set at A + B), make sure that the impedance of each set is at least 8Ω.

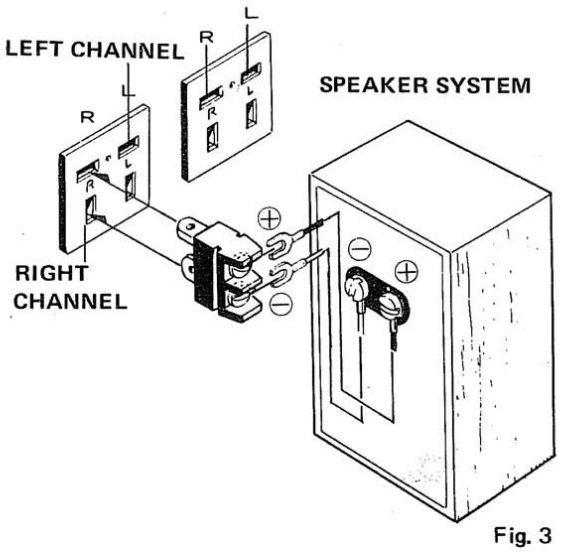


Fig. 3

INSTALLATION

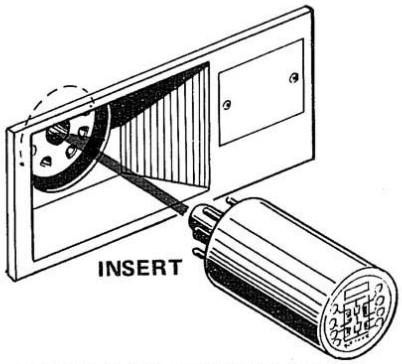
Optimum stereo effect is obtained when the listener is at the vertex of the regular triangle whose base is the line connecting the left and right speakers (approx. 3ft. to 8ft. apart). Wherever possible, install the speakers at the same height; if the difference in height is too great, stereo effect deteriorates.

CONNECTION OF TURNTABLE

Connect as follows, according to the type of cartridge used in your turntable:
- With a moving magnet (MM) cartridge, connect the output leads of the turntable to the PHONO 1 MAG terminals. The upper terminal is for the left channel, the lower terminal for the right channel.
- With a moving coil (MC) cartridge, connect the output leads of the turntable to the PHONO 2 terminals. Connect in the same way as for the PHONO 1 MAG terminals.

NOTES:
1. When using a turntable with an MC cartridge, be sure to insert the separately available PHONO INPUT transformer (Pioneer PP-402) into the socket at the upper left of the rear panel of the SA-800 (Fig. 4).
2. Set the PHONO 2 MM/MC switch on the front panel of the SA-800 to MC.
3. If the turntable output lead plugs do not fit the PHONO terminals, attach the pin plugs supplied.

- With a ceramic- or crystal-type turntable, connect to the PHONO 1 CER terminals.



PHONO INPUT TRANSFORMER (PIONEER PP-402)

Fig. 4

- When using two turntables with moving magnet cartridges, connect to PHONO 2 terminals and set the PHONO 2 MM/MC switch on the front panel to MM.

CONNECTION OF TUNER

- Connect the output leads of the tuner to the TUNER terminals. The upper terminal is for the left channel, the lower terminal for the right channel.
- When using two tuners, connect the second one to the AUX 1 or AUX 2 terminals.

CONNECTION OF TAPE DECK OR TAPE RECORDER

RECORDING

- Connect the recording input terminals (LINE INPUT) of the tape deck to the TAPE 1 REC terminals of the SA-800. The upper terminal is for the left channel, the lower terminal for the right channel. Use the connecting cord supplied with the tape deck.
- With a monophonic tape deck, connect to the CENTER CHANNEL terminal.

PLAYBACK

- Connect the playback output terminals (LINE OUTPUT or TAPE MONITOR) of the tape deck to the TAPE 1 MON terminals of the SA-800. Connection is the same as for recording.
- With a monophonic tape deck, connect to the upper terminal, and set MODE switch to MONO L position.

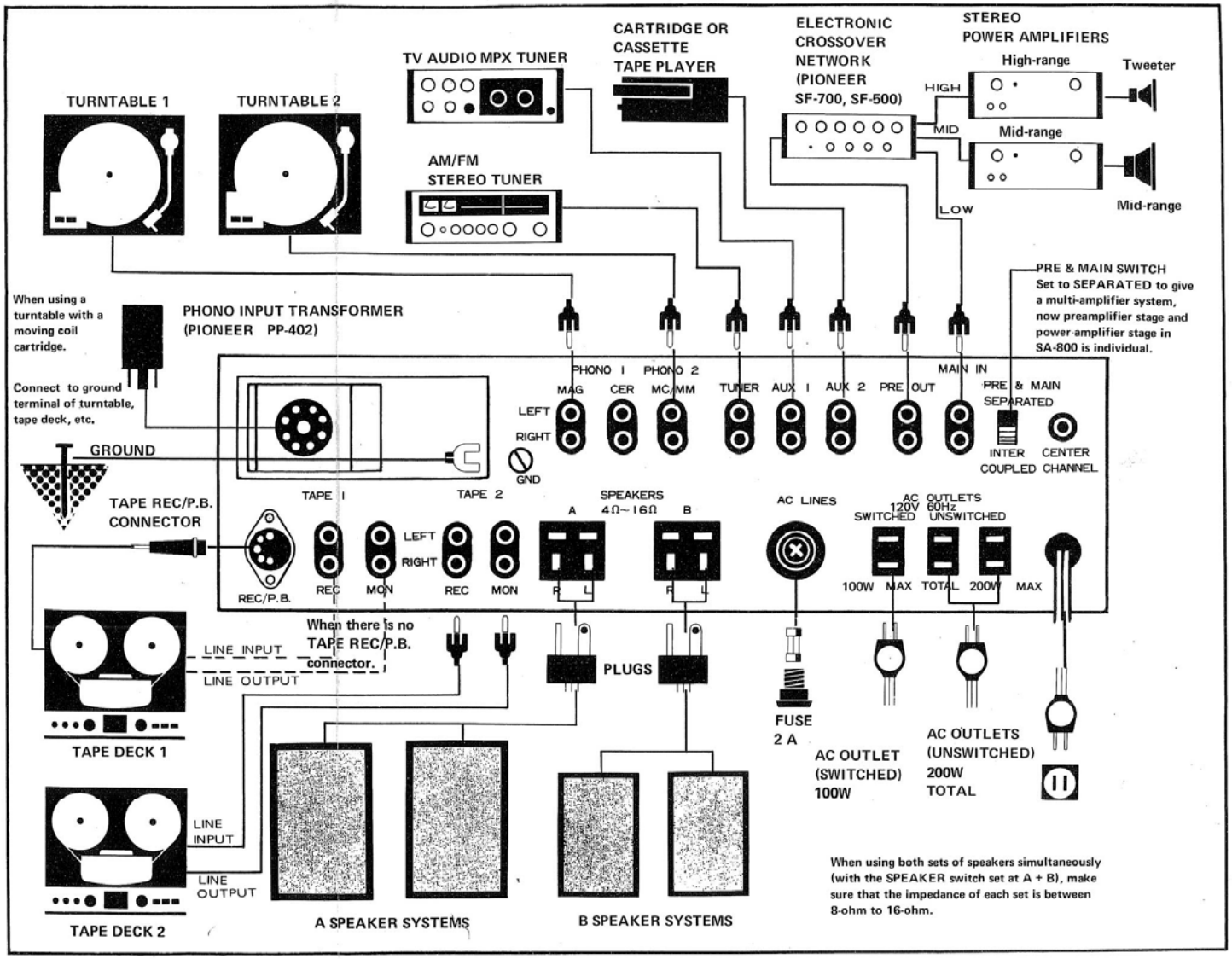
NOTES:
1. Where the tape deck is provided with a DIN type connector, connecting this to the REC/P.B. connector of the SA-800 by means of a separately available recording/playback cord (Pioneer PP-101) completes both connections.
2. When using two tape decks, connect the second to the TAPE 2 REC and TAPE 2 MON terminals. Connection is similar to that for the TAPE 1 terminals.
   There is no recording/playback connector for the TAPE 2 terminals.

- Connect the two tape decks as explained in the "RECORDING" and "PLAYBACK" sections just described.

CONNECTION OF CARTRIDGE TAPE PLAYER

- Connect the output leads to the AUX 1 or AUX 2 terminals.

CONNECTION DIAGRAM



FRONT PANEL FACILITIES

■ POWER SWITCH

Controls power to the unit. Setting it to ON will apply power to the unit.

■ SPEAKER SWITCH

Selects the speaker system to be used.

OFF ..... No sound comes from any speaker system. Useful when listening through headphones.

A ..... Sound comes through the speaker system connected to the A speaker terminals.

B ..... Sound comes through the speaker system connected to the B speaker terminals.

A + B .... Both A and B speaker systems are energized.

■ PHONES JACK

Use this to plug in stereo headphones. A full selection of high-performance headphones is available from Pioneer.

■ BASS CONTROLS

Operation is the same as for the TREBLE controls.

■ FILTER SWITCHES

LOW ..... Setting to ON will eliminate low frequency noises, such as record rumble, hum, or other interference. The switch is normally set to OFF, unless the filter is required.

HIGH ..... Setting to ON will eliminate high frequency noises, such as record scratch, hiss, static noise from fluorescent lamps, or other interference. The switch is normally set to OFF, unless the filter is required.

■ TREBLE CONTROLS

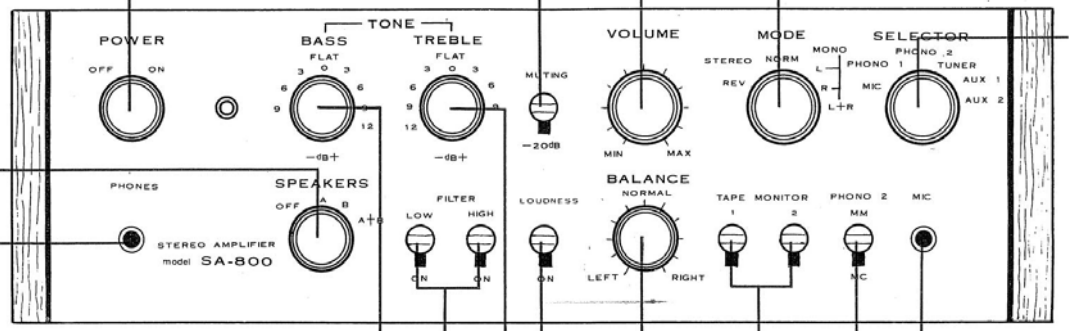
Turn them to the right (clockwise) from the FLAT position to boost the high tone, and turn them to the left (counterclockwise) to diminish it. The scale markings in dB (decibels) enable the listener to read the actual settings.

■ VOLUME CONTROL

To increase the volume, turn it to the right (clockwise).

■ MUTING SWITCH

Pressing this switch down to the −20dB position decreases the volume by 20dB instantly. Setting it to the OFF position restores the volume to normal.



■ LOUDNESS SWITCH

To listen to quieter sound, set this to the ON position. This emphasizes the low and high notes. For normal listening, set it to the OFF position.

■ BALANCE CONTROL

This control balances the volume of the left and right speaker systems. Where the volume from the right-hand speakers is too low, turn it to the right (clockwise). Where the volume from the left-hand speakers is too low, turn it to the left (counterclockwise).

■ PHONO 2 MM/MC SWITCH

Set this switch according to the type of cartridge used in the turntable connected to the PHONO 2 terminals.

MM ..... For a moving magnet (MM) cartridge.

MC ..... For a moving coil (MC) cartridge.

■ MODE SWITCH

This selects mode sound reproduction.

STEREO REV ..... Stereo with the left and right channels reversed.

STEREO NORM ... Normal stereo

MONO L ..... Input signals of the left channel through speakers.

MONO R ..... Input signals of the right channel through speakrs.

MONO L + R ..... Input signals of left and right channels are mixed and reproduced through both speakers. (Monophonic sound)

■ SELECTOR SWITCH

This selects the program source.

MIC ..... Microphone sound can be reproduced through the speakers or recorded on tape.

PHONO 1 ..... To use the turntable connected to the PHONO 1 terminals.

PHONO 2 ..... To use the turntable connected to the PHONO 2 terminals.

TUNER ..... To use a tuner connected to the TUNER terminals.

AUX 1 ..... To use a cassette or cartridge tape player or other program source connected to the AUX 1 terminals.

AUX 2 ..... To play TV sound track or another program source connected to the AUX 2 terminals.

■ MIC JACK

Connect the plug attached to the microphone lead to this jack. A high-impedance, dynamic-type microphone with a standard plug should be used. A selection of high-performance dynamic microphone is available from Pioneer.

■ TAPE MONITOR SWITCHES (1 and 2)

These switches are set to ON for test-listening of recording in progress or playback of recorded tapes with tape decks.

1 ..... This switch is set to ON for using a tape deck connected to TAPE 1 MON terminals and TAPE 1 REC terminals or TAPE REC/P.B. connector.

2. ..... This switch is set to ON for using a tape deck connected to TAPE 2 MON terminals and TAPE 2 REC terminals.

NOTE: For a normal playback function except for tape playback, leave these switches set to the upper position (OFF position). If the switches are set to ON, sound does not come out from speakers.

BEFORE SWITCHING ON THE POWER

Check the following:

1. VOLUME control is at MIN.
2. MODE switch is at STEREO NORM.
3. BASS, TREBLE controls are at FLAT.
4. BALANCE control is at NORMAL.
5. TAPE MONITOR switch is set at OFF except for tape playback.
6. PRE & MAIN switch on the rear panel is set at INTER-COUPLED.

PROTECTOR CIRCUIT

No sound is produced for about three seconds after the power is switched on. This is due to the action of the built-in protector circuit which protects transistors and speakers from damage in the event of breakdowns. Short circuits at the speaker terminals or extremely low-impedance speaker may result in sudden stopping of the sound or continuous clicking of the relays during playing. If this occurs, turn off the power and check the speaker connections.

PLAYING RECORDS

1. Set the SELECTOR switch to PHONO 1 or PHONO 2.

NOTES:
1. Set to PHONO 1 when using the turntable connected to the PHONO 1 terminals, and to PHONO 2 when using the turntable connected to the PHONO 2 terminals.
2. When setting to PHONO 2, set the PHONO 2 MM/MC switch to MM or MC according to the type of cartridge used in the turntable.

2. Start the turntable.
3. Adjust the volume and tone by means of the VOLUME, BASS and TREBLE controls.

LISTENING TO RADIO BROADCASTS

1. Set the SELECTOR switch to TUNER. If the tuner being used is connected to the AUX terminals, set to AUX.
2. Tune in the station.
3. Adjust the volume and tone as required.

USING A MICROPHONE

1. Connect the microphone to the MIC jack.
2. Set the SELECTOR switch to MIC.
3. Adjust the volume by slowly turning the VOLUME control to the right. The BASS and TREBLE controls should normally be set at FLAT.

NOTES:
1. Use a high-impedance, dynamic-type microphone fitted with a standard plug.
2. Howling may result if the VOLUME control is turned too high or if the microphone is close to the speakers.

USING A CARTRIDGE TAPE PLAYER

1. Set the SELECTOR switch to AUX 1 or AUX 2.
2. Start the cartridge tape player.
3. Adjust the volume and tone as required.

USING A TAPE DECK(S) OR TAPE RECORDER(S)

RECORDING

As shown in Fig. 5, live signal is always appearing at TAPE 1 and 2 REC terminals. Operate the SA-800 as described in "PLAYING RECORDS" and "LISTENING TO RADIO BROADCASTS."

NOTE: The VOLUME, BASS, TREBLE controls of the SA-800 cannot control the signal appearing at TAPE REC terminals. Control the recording level by the controls on the tape deck.

• TAPE MONITOR

When a three-head type tape deck (or two-head type) with monitor function is used, while recording, the recording condition can be monitored by switching the TAPE MONITOR switch on the front panel if the recording and playback connections are provided.

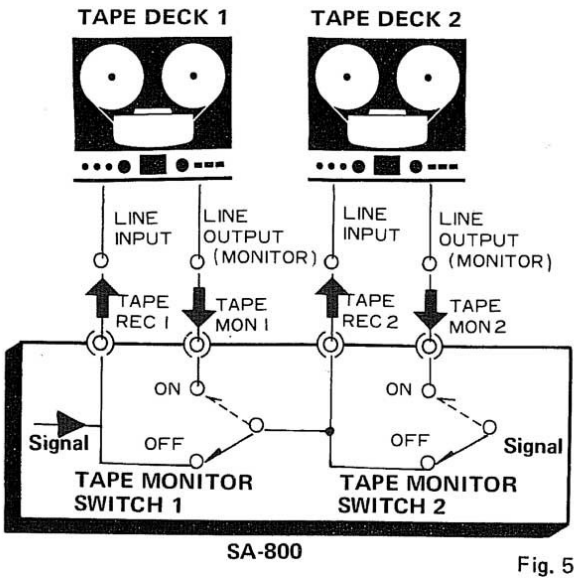


Fig. 5

PLAYBACK

With the TAPE MONITOR switch 1 or 2 set to ON, tape playback can be made. The volume and tone can be controlled by means of VOLUME, BASS and TREBLE controls of the SA-800. Note that the SELECTOR switch can be set at any position.

DUPLICATING OR EDITING OF RECORDED PROGRAMS

You can make your own "tape library" by duplicating or editing recorded programs, using two tape decks combined with the SA-800. For instance, you can record only what you like from all of the FM stereo programs recorded on tape.

1. Connect two tape decks as shown in Fig. 6.
2. Set the TAPE MON switch 1 to ON, and playback a recorded program by operating the tape deck connected to the TAPE 1 MON.
3. Record the playback in the way you want by operating the tape deck connected to the TAPE 2 REC and TAPE 2 MON. Setting the TAPE MONITOR switch 2 to ON allows you to monitor a recording in progress.

NOTES:
1. Make sure to set the TAPE MONITOR switch 1 to ON.
2. Using a PAUSE switch-provided tape deck for recording will facilitate duplicating or editing of programs recorded on tape.

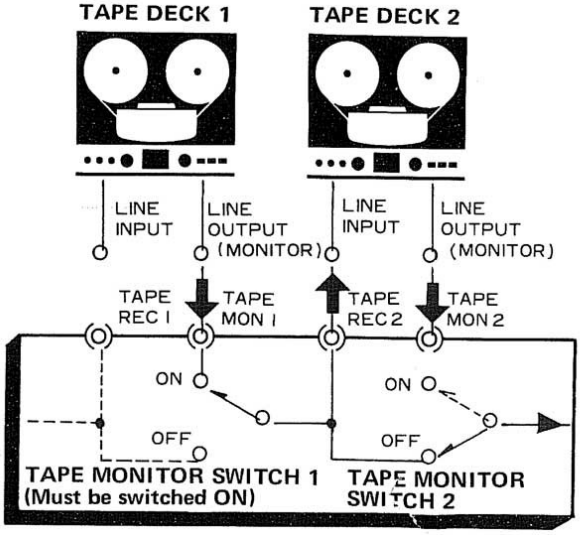


Fig. 6

ASSEMBLING A MULTI-AMPLIFIER SYSTEM

A 2-way or 3-way multi-amplifier system can be constructed by incorporating a separately available electronic crossover network and one or two power amplifiers (Fig. 7).

1. Set the PRE & MAIN switch on the rear panel of the SA-800 to SEPARATED.
2. Connect the input terminals of the electronic crossover network to the PRE OUT terminals of the SA-800.
3. Connect the LOW range output terminals of the electronic crossover network to the MAIN IN terminals of the SA-800.
4. Connect the MID range output terminals of the electronic crossover network to the input terminals of the power amplifier for mid-range, and the HIGH range output terminals to the input terminals of the power amplifier for high-range.

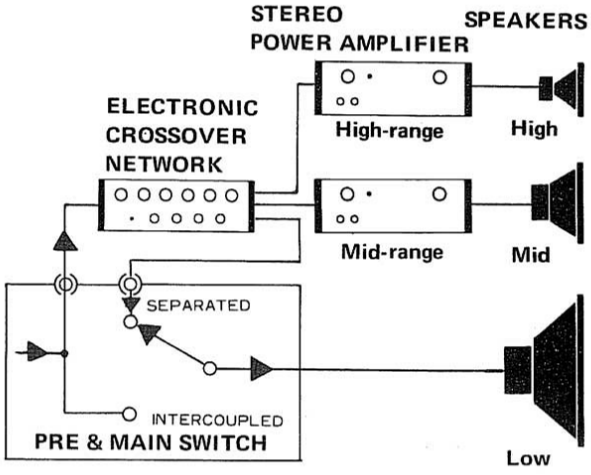


Fig. 7

NOTE: A fine selection of high-performance electronic crossover networks, power amplifiers and multi-amplifier speaker systems is available from Pioneer.

CONDITIONS FREQUENTLY MISTAKEN FOR MALFUNCTION

Noise: There are a variety of noises relating to the operation of a hi-fi unit. These are generally divided into two types; (1) the unit is faulty (a transistor or parts has deteriorated) and (2) an external source is adding to the unit.
When a hi-fi unit produces an unpleasant noise, it is often assumed that the unit is faulty, but statistical records indicate that the majority of noises produced in hi-fi acoustic units result from external sources of noise. Due to the inherent high sensitivity and the high fidelity in reproduction, the unit amplifies and reproduces extraneous noises, into definite output noise. If your stereo system produces a noise, check according to the following table and trace out the source of noise for the appropriate corrective action.

- **To locate the cause of troubles, follow the chart below. Check not only SA-800 but also the tuner and/or turntable of the system.**

	SYMPTOM	SUSPECTED SOURCE OF NOISE	DIAGNOSIS AND REMEDY
WHEN LISTENING TO BROADCAST	Continuous or intermittent noise like jjjj or zzzz.	• Static (lightning) • Fluorescent lamp, motor, or thermostat may be in use in house or in the vicinity of the house.	In many cases, it is very difficult to remove the source of noise. In order to make the radio input larger than the noise level, set up a good outdoor antenna and make a complete grounding.
	When a station is tuned in, hum is mixed in the program.	• Poor fluorescent lamp, motor, or electric heater may be in use in house or near the house.	Reversing the line plug may occasionally alleviate this noise problem. Usually it is very difficult to eliminate the noise.
	Static noise (in particular, when automobiles run close to the house).	• White noise generated from automobile engines. • High-frequency sewing machine or welding machine being used near your house.	In an area surrounded by hills or high buildings, the FM input signals are very weak. Thus the noise limiter in the circuit loses its function. Set up an FM outdoor antenna having many reflector elements.
	Reception of FM stereo program contains more noise than FM mono program.	• Note that the service area covered by an FM stereo broadcast is about 50% of that of a regular mono broadcast.	Increasing FM input signal may alleviate this problem. Use an exclusive FM outdoor antenna instead of the indoor T-type antenna.
WHEN PLAYING RECORDS	Hum or buzz. When switched to radio reception, the noise disappears.	• Poor connection of shielded wire (a) • Jack connection is loose. (b) • Line cord or fluorescent lamp is near the shielded wire. (c) • Poor grounding. (d) • HAM transmitting station or TV transmitting station is near your house. (e)	Correct the conditions stated in (a), (b), (c) or (d). In case of (e), report it to an official activity.
	Output tone quality is poor and mixed with noise. Treble is not clear.	• Stylus wears out. (a) • Record wears out. (b) • Dust adheres to stylus. (c) • Stylus is improperly mounted. (d) • Stylus pressure is not proper. (e) • The TREBLE level is too high.	Check (a) through (e) and correct the condition. Lower the TREBLE level.

WATCH FOR THE FOLLOWING CONDITIONS; THESE ARE ALSO APT TO BE MISTAKEN FOR MALFUNCITON.

	SYMPTOM	SUSPECTED SOURCE OF NOISE	DIAGNOSIS AND REMEDY
	Power is not turned on although the power switch is set to ON.	• Fuse blows. (a) • Line plug is loose. (b) • Protector circuit operates. (c)	Check (a) and (b) and correct the condition. Check speaker connection.
	In playing a record, increasing the volume causes howling.	• Distance between the turntable and the speakers is too short. • The place on which the turntable or speakers are set is unstable.	Change the distance or rearrange the installation increase of the unit and speakers. (Installing the turntable on a firm, solid stand may alleviate this problem.) Do not enhance the BASS sound level excessively.

SPECIFICATIONS

SEMICONDUCTORS

FETs	2
Transistors	35
Diodes	20

POWER AMPLIFIER SECTION

Music Power Output (IHF)	165 Watts (4Ω) 108 Watts (8Ω)
Continuous Power Output (each channel driven)	53W/53W (4Ω) 41W/41W (8Ω)
Continuous Power Output (both channel driven)	39W + 39W (4Ω) 34W + 34W (8Ω)
Power Output in the range of 20Hz to 20kHz (both channel driven)	26W + 26W (8Ω, Harmonic Distortion Less than 0.5%)
Harmonic Distortion	Less than 0.5% (Continuous power output)
Inter Modulation Distortion	Less than 0.5% (Continuous power output)
Power Bandwidth (IHF)	5Hz to 50kHz (8Ω, Harmonic Distortion Less than 0.5%)
Frequency Response	5Hz to 80kHz, ±1dB
Input Sensitivity/Impedance (1kHz, Continuous power output)	560mV/100kΩ
Speakers	4 to 16Ω
Damping Factor	More than 65 (8Ω, 1kHz)
Center Channel Output	500mV

PREAMPLIFIER SECTION

Output Voltage	3V (Rated output), 5V (Max.)
Harmonic Distortion	Less than 0.1%
Frequency Response	20Hz to 60kHz, ±1dB
Input Sensivitity/Impedance (1kHz, for rated output)	PHONO 1. MAG 3mV/50kΩ CER 56mV/100kΩ PHONO 2 MM 3mV/50kΩ MC 110μV/30Ω (with PHONO INPUT TRANSFORMER "PP-402") MIC 2.3mV/50kΩ TUNER 230mV/200kΩ AUX 1, 2 230mV/200kΩ TAPE MONITOR 1, 2 230mV/200kΩ
Recording Output	TAPE REC 1, 2 (Pin jack) 230mV TAPE REC (DIN connector) 35mV
BASS Control (3dB step)	−9dB, +12dB (100Hz)
TREBLE Control (3dB step)	−12dB, +9dB (10kHz)
LOW Filter	−3.5dB/60Hz (12dB/oct.)
HIGH Filter	−3dB/6kHz (12dB/oct.)
Equalization Curve	PHONO: RIAA
Loudness Contour	+11.5dB/100Hz, +6.5dB/10kHz with Volume Control set at −40dB position.
Muting	−20dB
Hum and Noise (IHF)	PHONO More than 80dB TUNER, AUX More than 100dB
Channel Separation (1kHz)	PHONO More than 50dB TUNER, AUX More than 55dB

MISCELLANEOUS

Power Requirements	120V, 60Hz	
Power Consumption	80W	
Dimensions (overall)	$16\frac{15}{16}$" /430mm (width) $5\frac{11}{16}$" /145mm (height) $13\frac{1}{4}$" /337mm (depth)	
Weight:	Without package	23 lb/10.3 kg
	With package	27 lb/12.3 kg

NOTE: Specification and the design subject to possible modification without notice due to improvements.

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PRINTED IN JAPAN
〈71D02Y01C〉
〈ARB-011-0〉