INTEGRATED STEREO AMPLIFIER

SA-8100

KCW
KUW
FVW

OPERATING INSTRUCTIONS

PIONEER®

Your new Pioneer stereo amplifier, model SA-8100, incorporates numerous breakthroughs in circuit design and will serve as the heart of a hi-fi stereo system to satisfy even the most discriminating demands. To make full use of this unit's many features, please study the following instructions carefully.

FEATURES

Balanced (+) And (–) Power Supply In All Amplifier Stages

Differential amplifier circuits are employed in the equalizer, tone control and power amplifier sections, and power supply to all amplification stages is of the balanced (+) and (–) type. This design gives stable DC potential balance – vital for speaker protection and unfluctuating performance – and prevents the generation of switching noises.

Constant-Current Circuit Solves Problem Of Conventional Transistor Amplifiers

All stages of the power amplifier are direct coupled, the output stage is a pure complementary OCL circuit. This is the revolutionary constant-current circuit keeps transistor characteristics stable regardless of input signal level. With its high-gain and generous application of negative feedback, this amplifier shows excellent transient characteristics and minimum distortion. Continuous rated IHF output power, with both channels driven, is 40W + 40W at 0.3% total harmonic distortion.

Phono Equalization Adheres Strictly To RIAA Curve

The use of strictly selected nichrome processed metal-film resistors and styrol capacitors in the NFB circuit enables the phono equalizer amp to operate within ±0.2dB of the standard RIAA curve, over the whole swing from 30 to 15,000 Hz. Records sound, in other words, exactly as the recording engineers intended them to sound. Furthermore, a relatively high supply voltage and large input handling ability result in a wide dynamic range.

Unique Twin Tone Controls For Flexible Adjustment Of Frequency Response

There are a total of four tone controls – two for the bass, two for the treble range. Working frequencies of the bass controls are 50Hz and 100Hz, those for the treble controls are 10kHz and 20kHz. Practically any desired frequency response curve can be obtained, to compensate for the particular characteristics of the phono cartridge, the room, or personal listening preferences. A "tone defeat" switch removed the tone controls from the circuit, providing flat response for measurement purposes, etc.

Presetting Of Volume Range

Where the full maximum volume is never needed – with speakers of insufficient power handling ability, for example – the maximum volume level can be pre-set at -15dB or -30dB. The volume control knob then covers the reduced range, permitting finer adjustments.

Perfect Electronic Protection Of Speakers, Output Transistors

Speakers are protected from accidental damage in three ways: by the accurate control of DC potential at the amp outputs; by the above-mentioned possibility to limit maximum power; and by an electronic protection circuit that shuts off the output circuit at the first sign of trouble such as a short-circuit in the speaker leads.

Auxiliary Controls And Circuits Give Great Flexibility

Preset level controls are provided for the phono 2 and aux 2 inputs. Two sets of tape inputs and outputs with corresponding monitor switches permit easy tape-to-tape duplicating. A two-position (8Hz, 30Hz) low filter and a 5kHz high filter are effective in controlling noise problems. Two pairs of speakers can be driven separately or at the same time. An audio muting switch reduces the listening volume instantly by 20dB. The loudness switch gives more natural-sounding frequency contours at low volume levels.

Elegant Styling Matches Technical Excellence

The functional layout of the control panel is as practical as it is beautiful. The natural walnut cabinet provides protection and adds decorator looks. Combination with other Pioneer hi-fi components will result in a music system of well-matched beauty in sound and appearance.

HOW TO ASSEMBLE A COMPONENT STEREO SYSTEM

The SA-8100 is an integrated stereo amplifier, meaning that it combines a preamplifier and power amplifier in one unit. For a stereo system, you will need at least one pair of speaker systems and one program source such as a turntable, a stereo tuner, or a tape deck. These should be of very high quality comparable to the SA-8100.
Fig. 1 shows a stereo system with all components that can be connected to the SA-8100.
The SA-8100 can also serve as the heart of a multi-amplifier system of the highest caliber, or of a 4-channel system as described on page 15.

HOW TO CHOOSE OTHER COMPONENTS

Pioneer manufactures a wide variety of all types of hi-fi components. These match your SA-8100 perfectly, in their technical aspects as well as in styling. In any event, observe the following hints when selecting other units for your stereo system.

Turntable

Shop for low wow & flutter rating, high signal-to-noise ratio, and wide frequency response of pick-up cartridge.

Tuner

Among tuner specifications, pay special attention to selectivity, signal-to-noise ratio, stereo channel separation, image rejection, AM suppression.

Tape deck (reel-to-reel or cassette)

Pay attention to wow & flutter, signal-to-noise ratio, frequency response. Among reel-to-reel decks, three-head models are preferable because of better recording control.

Speaker Systems

Speaker systems should have an impedance of 4 to 16 ohms, and frequency response curves without conspicuous dips and peaks. If at all possible, use identical speakers for the left and right channels.
According to their enclosures, speaker systems can be classified as "closed box" and "bass reflex" types. By the number of speaker units, they are grouped into "full range," "2-way," "3-way," etc. systems. There are floor-standing and bookshelf types, plus omnidirectional systems that can be placed anywhere. Maximum input power is also important, because the SA-8100 is a very powerful amplifier.

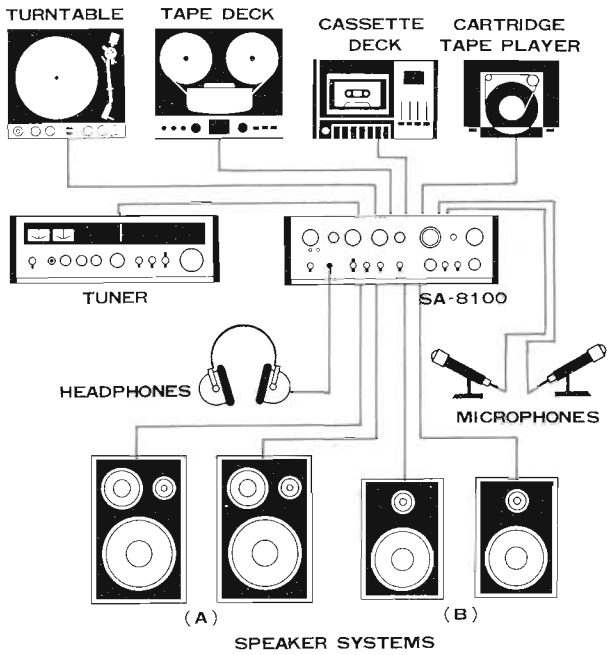


Fig. 1

PLACEMENT AND CONNECTIONS

WHERE TO PLACE THE SA-8100

When selecting a place for your SA-8100, avoid locations that are,

- near stoves or other heat sources,
- in direct sunlight,
- poorly ventilated, very moist or dusty,
- wobbly or slanted,
- near a storage place of alcohol or other easily inflammable chemicals.

CONNECTION OF SPEAKER SYSTEMS

The SA-8100 has two sets of speaker output terminals (A and B) and can accept two pairs of speaker systems When using only one pair of speakers, connect them to the A terminals as follows.

Use common two-pole lead wire, preferably with different colors for the two leads. Speaker wire is often supplied with the speakers.

Connect the speaker for the right channel (marked "R" in Fig. 2) to the speaker terminals marked "R" on the SA-8100.

Connect the left channel speaker ("L" in Fig. 2) to the speaker terminals marked "L" on the SA-8100.

Be sure to connect the plus (+) terminal (the upper terminal) on the SA-8100 to the (+) terminal on the speaker, and the minus (—) terminal (lower) on the SA-8100 to the (—) terminal on the speaker.

A second pair of speakers can be connected to the B terminals the same way.

For connection, remove about 10mm (1/3 inch) of insulation from the lead wires. If the wire core is stranded, twist it to prevent hair wires from sticking out. On the (+) side, push the red clamp-lever on the terminal up and insert the wire end into the hole, then release the lever — the wire will be clamped securely in the terminal. On the (-) side, push the black clamp-lever on the terminal down, insert the wire and release the lever.

Refer to Fig. 3.

PLACEMENT OF SPEAKER SYSTEMS

The listening room — its size, shape, materials of walls, floor and ceiling, draperies, furniture, etc. — have considerable influence upon the sound. Generally, placing the speakers in corners or with their backs against the wall will improve bass response. If the room sounds too "live," i.e. with strong reverberations of high-range sound, it can be improved by heavy curtains and draperies, upholstered furniture and other sound-absorbing material.

To obtain clear stereo channel separation, place the speakers sufficiently far apart. Your listening position and the two speakers should form an equal-sided triangle.

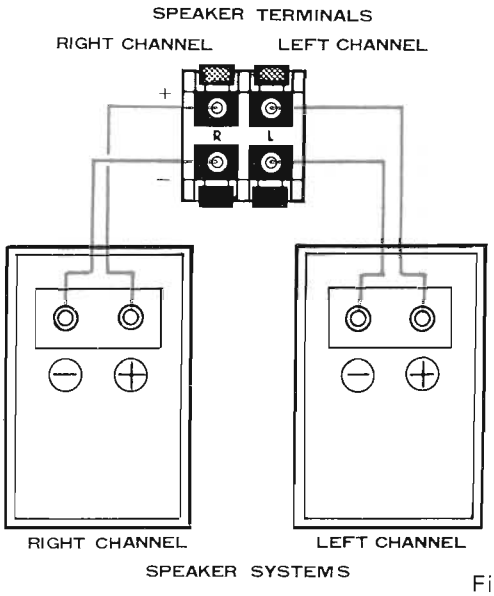


Fig. 2

NOTE:
If two pairs of speakers are to be used at the same time (A + B), each speaker must have an impedance of 8 ohms or more.

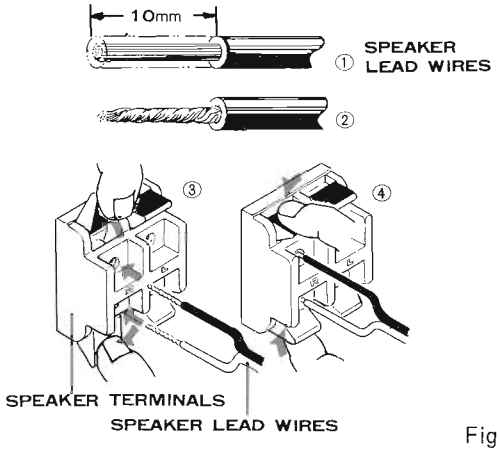


Fig. 3

CONNECTION OF TURNTABLE

Two stereo turntables with magnetic phono cartridges can be connected to the PHONO 1 and PNONO 2 inputs. With both phono inputs, the upper terminal is for the left channel output cable from the turntable, the lower terminal for the right channel output cable. The ground wire from the turntable should be connected to the GND terminal on the SA-8100.

Outputs from a second turntable — or a second tonearm on the same turntable — can be connected to the PHONO 2 inputs in the same manner. The inputs sensitivity of the PHONO 2 inputs can be adjusted within a range of 2.5mV ~5mV by turning the level control on the rear panel. Thus, different phono cartridges can be accommodated. Connect the "louder" of two phono cartridges to the PHONO 2 inputs, the one producing lower signal output to the PHONO 1 inputs. Then, by turning the level control the volume levels can be balanced.

NOTE:
A moving coil (MC) cartridge of low output voltage can be used only in combination with a separate booster transformer or head amplifier.

CONNECTION OF TUNER

The outputs of an AM/FM stereo tuner can be connected to the TUNER inputs with the supplied cable. Again, the upper terminal is for the left channel, the lower for the right channel.

A second tuner can be connected to the AUX 1 or AUX 2 inputs.

CONNECTION OF TAPE DECKS

Two tape decks can be connected to the SA-8100 for recording, playback, and tape-to-tape duplicating. The necessary connection cords are usually supplied with the tape deck.

Connections for recording

Connect the tape deck's LINE (or AUX or RADIO) inputs with the TAPE 1 REC outputs of the SA-8100. Upper terminal: left channel.

In the same way, a second tape deck can be connected to the TAPE 2 REC outputs.

Connections for playback and monitoring

Connect the tape deck's LINE (or MONITOR) outputs with the TAPE 1 MON inputs of the SA-8100. Upper terminals: left channel.

In the same way, a second tape deck can be connected to the TAPE 2 MON inputs.

Connection via REC/PB Connector

Please note that the REC/PB connector corresponds to the TAPE 2 REC and TAPE 2 MON terminals — the signal must be controlled with the TAPE MONITOR 2 switch on the front panel.

Also, in the case of a three-head tape deck, connection via a DIN-cable may sometimes cause crosstalk. With three-head tape decks, connection to the REC outputs and MON inputs via regular phono cables is preferable.

NOTE:
Instead of the recording and playback connections just described, the tape deck can be linked to the REC/PB connector of the SA-8100 if an identical connector is provided on the tape deck, too. The required DIN-cable is available at all hi-fi and radio stores. This single cable completes all playback and recording connections.
Be sure, the DIN-cable is for between tape deck to amplifier.

WHAT ARE THE AUX 1 AND AUX 2 INPUTS FOR?

These two pairs of inputs are provided to accommodate additional program sources such as an 8-track cartridge tape player, the sound track from a TV set, or a second tuner.

Input sensitivity of the AUX 2 inputs can be adjusted with the level control on the rear panel. Counterclockwise rotation of the level control reduces sensitivity, so that program sources with relatively high output voltage can be accommodated.

PURPOSE OF THE PRE OUT AND POWER IN JACKS

PREAMPLIFIER AND POWER AMPLIFIER CAN FUNCTION SEPARATELY

The preamplifier section of the SA-8100 can be used alone, and its output signal supplied to a separate high-powered amplifier to service large halls, theaters, etc. Or, another power amplifier can be compared with that of the SA-8100 by switching back and forth. Also, the signal from the PRE OUT outputs — which has passed through the tone controls, filters, etc. — can be recorded on tape.

For such applications, the SEPARATION switch on the rear panel must be moved to either of its lower two (SEPARATED) positions. These two positions are for turning the SUBSONIC filter in the power amplifier ON and OFF. For an explanation of the subsonic filter, see page 9, item LOW FILTER.

A MULTI-AMPLIFIER SYSTEM CAN BE ASSEMBLED

By adding an electronic crossover network (e.g. Pioneer model SF-700) and one or two additional power amplifiers, a high-grade multi-amplifier system can be built. The electronic crossover network divides the audible frequency spectrum into two (low, mid-high) or three (low, medium, high) ranges, and each is then augmented in a separate power amplifier and reproduced via special loudspeakers. Fig. 4 shows such a two-way multi-amplifier installation. Compared with conventional full-range amplification, it offers numerous advantages: Less or no intermodulation distortion in speakers and amplifiers; precise matching of crossover frequencies to speaker characteristics; individual level control of each band in each channel; greater overall power; elimination of conventional, passive crossover networks in the speaker systems, with their inherent problems.

In a two-way multi-amplifier system, connections are made as just described at the right.

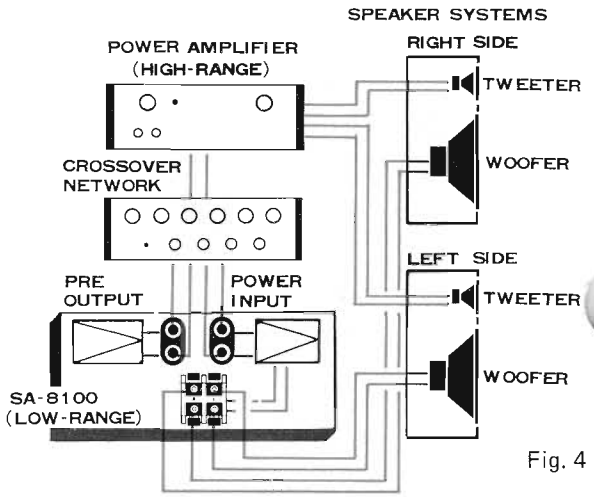
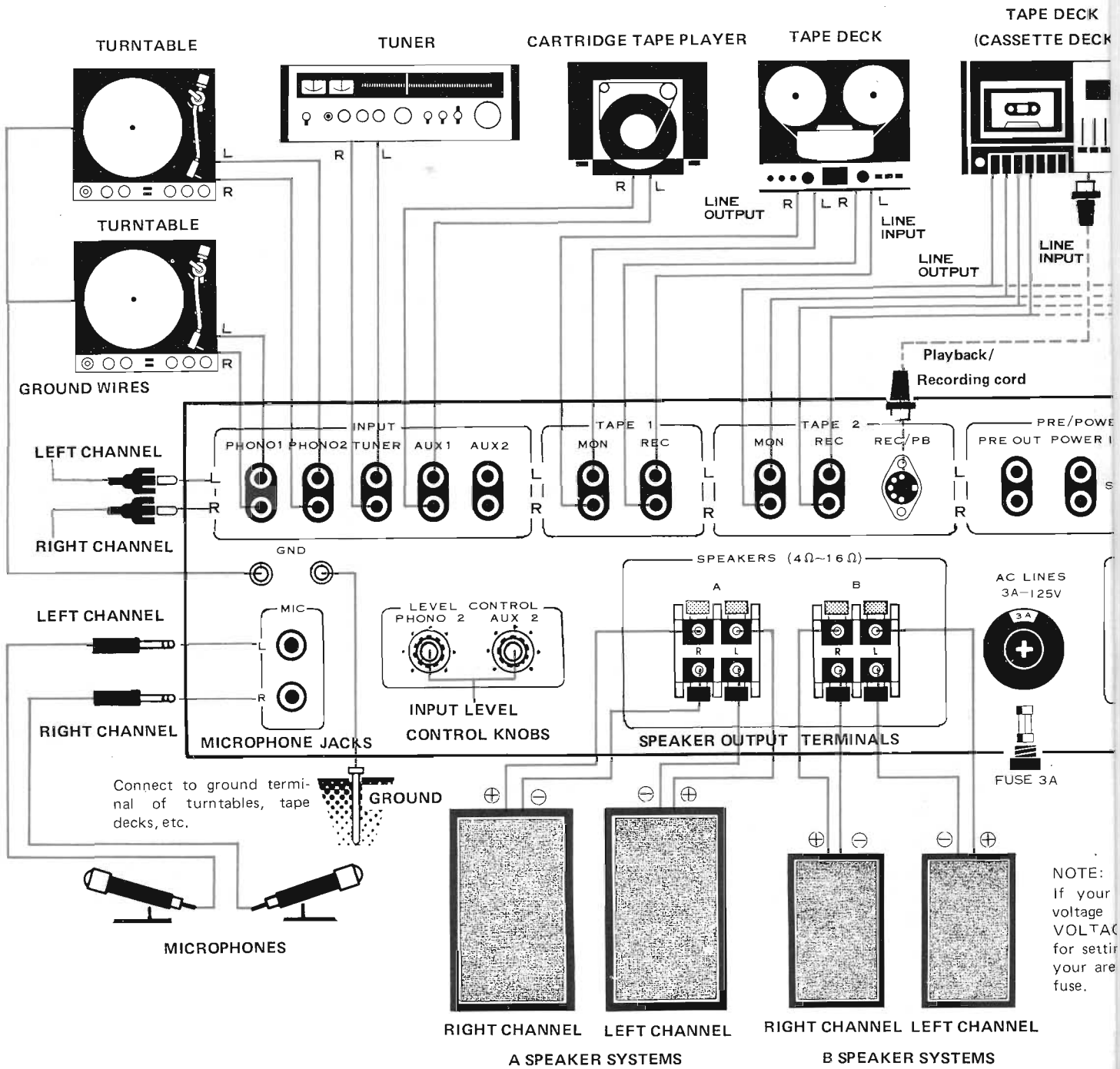


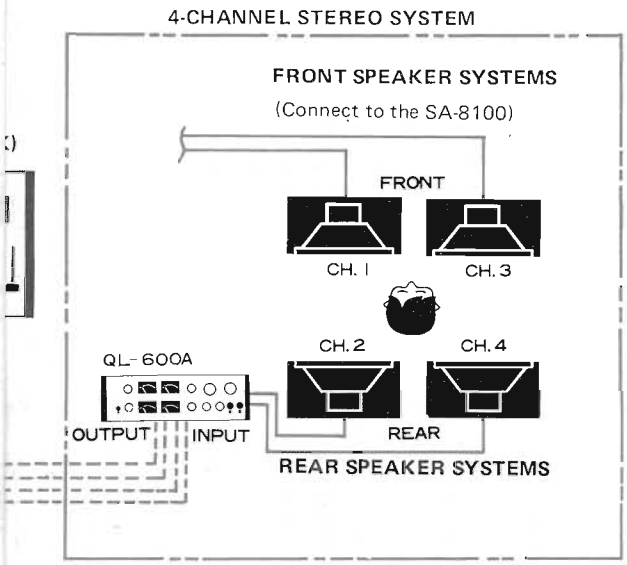
Fig. 4

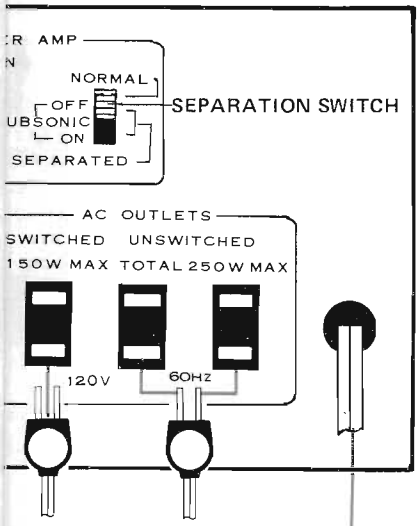
Connection

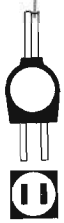
1. Connect PRE OUT jacks of SA-8100 to inputs of electronic crossover network.
2. Connect LOW range outputs of electronic crossover network to POWER IN jacks of SA-8100.
3. Connect MID-HIGH outputs of electronic crossover network to inputs of second power amplifier.
4. Connect woofers to speaker outputs of the SA-8100. Connect mid-high-range speakers to speaker outputs of second power amplifier.
5. Set separation switch on the SA-8100 to SEPARATED position.

CONNECTION DIAGRAM









SA-8100 is of the 5-line type, refer to the LINE GE AND FUSE on page 8 ng the proper line voltage in a and, then select a correct

LINE VOLTAGE AND FUSE

The SA-8100 is available in two models: one model operates only on 120V, and the other operates on one of the five line voltages; 110V, 120V, 130V, 220V and 240V. If your SA-8100 is the latter model, set the unit to the proper line voltage by following the procedure described below.

CHANGING LINE VOLTAGE SETTING AND FUSE

To remove the fuse, turn the fuse cap located on the line voltage selector in the direction of the arrow.
Then remove the fuse plug from the unit. Put the fuse plug back so that the proper line voltage marking can be seen through the cut in the edge of the plug. Whenever the position of the selector is changed, check the rating of the fuse. A 1.5A fuse is to be used for either 220V or 240V operation and a 3A fuse for 110V, 120V or 130V operation. If the rating of the fuse is correct, replace cap.

FUSE REPLACEMENT

When the fuse blows, remove the fuse cap and replace the fuse with a new one. See Fig. 5.

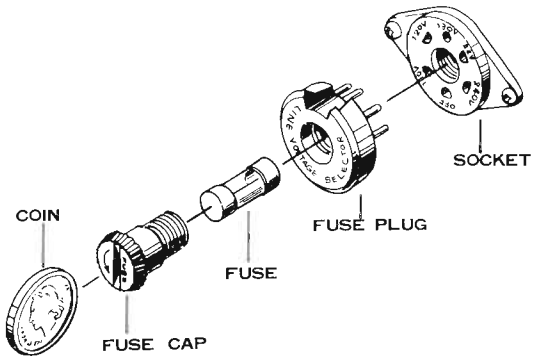


Fig. 5

FRONT PANEL FACILITIES

POWER SWITCH, PILOT LAMP

Turns the power to the unit ON and OFF. Also controls the AC outlet marked SWITCHED on the rear panel. The pilot lamp lights when the power is on.

SPEAKERS SWITCH

Selects the speaker system(s) to be driven.

A . . . . . Speaker systems connected to speaker outputs A operate.

B . . . . . Speaker systems connected to speaker outputs B operate.

A+B . . . Both speaker systems A and B operate.

OFF . . . All speakers off. Use this position when listening through headphones.

PROTECTION PILOT LAMP

When the built-in protector circuit operates to shut off the power to the speakers, this lamp will light. This happens when there's a short-circuit in the speaker leads, or when combined speaker impedance is below 2-ohm, causing overload.

NOTE:

The lamp will also light for 3 to 6 seconds after you turn on the power, and the speakers will remain silent. This is no indication of trouble. The protector circuit is so designed that it will keep the speakers muted for the first few seconds, because they might produce unpleasant noise while the amplifier is still warming up. Also refer to page 13, item "THE PROTECTOR CIRCUIT."

HEADPHONE JACK

Stereo headphones can be plugged into this jack. A wide variety of quality headphones is available from Pioneer.

LOW FILTER SWITCH

The low filter is used to eliminate low-frequency noise such as turntable rumble, etc.

SUBSONIC . . . Frequencies below 8Hz are attenuated by 12dB/octave. Although such subsonic frequencies are inaudible to the human ear, they can cause intermodulation distortions and even damage to the loudspeakers. It is advisable to leave the switch in this position at all times, even if no record rumble etc. is heard.

30Hz . . . . . Frequencies below 30Hz are attenuated by 12dB/octave. Use this position to eliminate record rumble and other low-frequency noise.

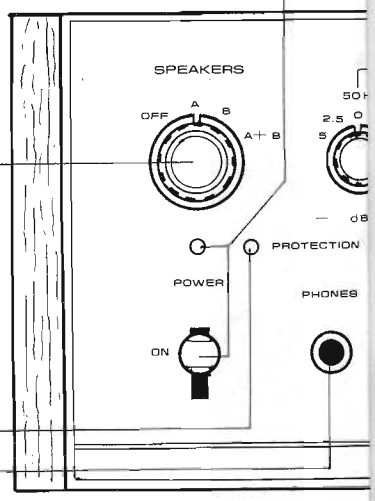
OFF . . . . . No attenuation of low and subsonic frequencies. Use this position for measurements, when the widest possible bass response is required.

BASS CONTROL

This pair of twin controls are for tone adjustments in the bass range.

100Hz knob . . . . Controls bass frequencies at and below 400Hz and also at 100Hz by up to ±10dB, in click-stops of 2.5dB.

50Hz knob . . . Re-controls frequency range below 80 Hz of tone quality being controlled by the 100Hz knob and also by up to ±5dB, in click-stops of 2.5dB.



TONE DEFEAT SWITCH

In position ON, the four bass and treble controls do not function – the amplifier produces flat frequency response. This is useful for frequency response measurements of phono cartridges, loudspeakers and the acoustic characteristics of the room.

HIGH FILTER SWITCH

In position 8kHz frequencies above 8kHz are attenuated by 12dB/oct. This helps eliminate noise from scratchy records, tape and FM hiss, etc.

TREBLE CONTROL

These twin controls are for tone adjustments in the high sound range.

10kHz knob . . . Controls high-frequencies at and above 2.5kHz and also at 10kHz by up to ±10dB in click-stops of 2.5dB.

20kHz knob . . . Re-controls frequency range above 12 kHz of tone quality being controlled by the 10kHz knob and also by up to ±5dB in click-stops of 2.5dB.

NOTE:

For a detailed description of the twin tone controls and how to use them, see item "THE TWIN TONE CONTROLS" on page 11. Flat frequency response can be obtained in either of two ways: by setting all four knobs at center position "0," or by setting the TONE DEFEAT switch to ON.

VOLUME CONTROL

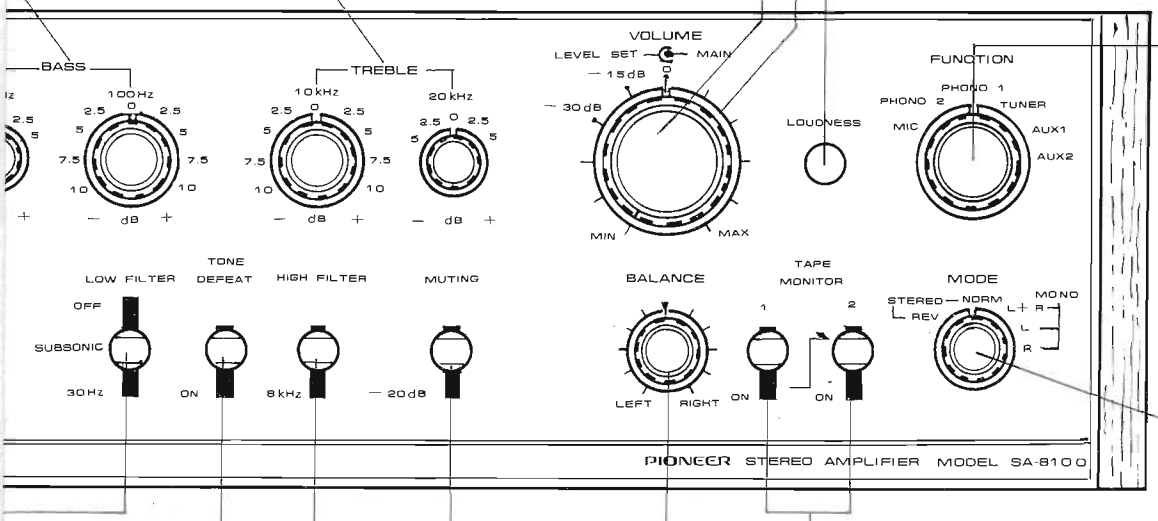
Controls the listening volume. Clockwise rotation increases the volume.

LEVEL SET CONTROL

The outer ring of the volume control serves to limit the output level of the SA-8100. This helps to protect speakers of small power handling ability, but also permits finer volume adjustments at low-to-medium listening levels.

-30dB . . . Output level reduced by 30dB.
-15dB . . . Output level reduced by 15dB.
0 . . . . . No reduction. Full output level available.

A detailed description of level presetting is given in item "THE LEVEL SET CONTROL" on page 11.



MUTING SWITCH

In position -20dB, the listening volume is instantly reduced by 20dB. Without having to turn the volume control, you can reduce the sound level.

BALANCE CONTROL

For balancing the relative sound volume of the left and right channel speakers. Clockwise rotation reduces the volume from the left speaker, counterclockwise rotation decreases the volume from the right speaker.

TAPE MONITOR SWITCHES 1, 2

Position ON of these switches is used only for tape playback and tape monitoring of a recording in progress. For all other listening modes (records, radio, etc.) these switches must remain OFF.

TAPE MONITOR 1 . . . Playback and monitoring with tape deck connected to TAPE 1 REC and TAPE 1 MON jacks.

TAPE MONITOR 2 . . . Playback and monitoring with tape deck connected to TAPE 2 REC and TAPE 2 MON jacks, or to the DIN-type REC/PB connector.

LOUDNESS SWITCH

Push this switch to obtain a more natural frequency contour at quiet listening levels. The human ear has different frequency response characteristics at high and low volume levels, and the loudness circuit automatically compensates for this deficiency by boosting the bass range when the volume is low.

The loudness circuit operates when the switch is pushed in. Function of the loudness circuit is linked to the VOLUME and LEVEL SET controls.

LEVEL SET at 0 . . . . . Loudness circuit functions at volume settings from MIN to about "11 o'clock."

LEVEL SET at -15dB . . . Loudness circuit functions at volume settings from MIN to about "1 o'clock."

LEVEL SET at -30dB . . . Loudness circuit functions at any position of the volume control.

FUNCTION SELECTOR

Selects the program source to be played.

PHONO 1 . . . Turntable connected to PHONO 1 inputs.

PHONO 2 . . . Turntable connected to PHONO 2 inputs.

TUNER . . . . Radio reception with tuner connected to TUNER inputs.

AUX 1 . . . . . Program source (cartridge tape player etc.) connected to AUX 1 inputs.

AUX 2 . . . . . Program source (TV sound, second tuner, etc.) connected to AUX 2 inputs.

MIC . . . . . Microphones connected to MIC inputs on rear panel.

MODE SWITCH

Selects stereophonic and monophonic listening modes.

STEREO NORM . . . Normal stereophonic reproduction.

STEREO REV . . . . Stereophonic reproduction with reversed channels: left input signal to right speaker, right input signal to left speaker.

MONO L+R . . . . . Monophonic reproduction. Mixed left-plus-right signal to both speakers.

MONO L . . . . . Left input signal to both speakers.

MONO R . . . . . Right input signal to both speakers.

THE TWIN TONE CONTROLS

Model SA-8100 has one pair of tone control knobs for the bass range, another pair for the treble range.

The larger BASS control knob permits bass response to be adjusted by ±10dB at 100Hz. After passing through this control circuit, the signal can be adjusted again at 50Hz, by ±5dB, with the smaller control knob.

Similarly, the larger TREBLE control knob adjusts treble response at 10kHz by ±10dB. The signal can be further adjusted at 20kHz by ±5dB. Fig.6 (A) shows the obtainable frequency response curves when both controls are used together. If the larger knobs are left at "0" and only the smaller knobs used, these function as tone controls with turnover frequencies at 80Hz and 12kHz, respectively. Conversely, if both small controls are left an "0" and only the large knobs used, these act as tone controls with turnover frequencies at 400Hz and 2.5kHz. Fig.6(B) illustrates these uses.

NOTE:

The numbers on the panel (50Hz, 100Hz, 10kHz and 20kHz denote the frequencies at which the tone controls will show maximum effectiveness, i.e. maximum boost or attenuation.)

"Turnover frequency," on the other hand, denotes the frequency at which the control will produce a boost or attenuation of 3dB.

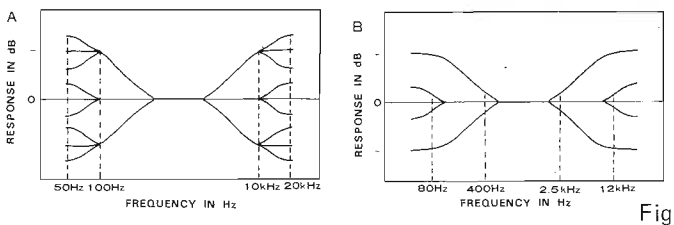


Fig. 6

THE LEVEL SET CONTROL

On model SA-8100, there is an outer ring around the volume control knob. With this LEVEL SET control, amplifier output can be reduced by 30dB or 15dB. This gives several advantages and new possibilities:

- When an amplifier as powerful as the SA-8100 is used for listening at quiet sound levels, the volume control has to be turned down almost to MIN, and fine adjustments within the soft range are difficult. If you reduce total amp power by 15 or 30dB with the level set control, the volume control will permit easier and finer adjustments in the remaining power range.
- Limiting of the power output also protects speakers, especially those of small input handling ability, from accidental damage that might occur when you turn up the volume to maximum by mistake. With small speakers, it is advisable to leave the LEVEL SET control at -15dB or -35dB at all times.

STEP-BY-STEP OPERATING INSTRUCTIONS

BEFORE OPERATION

. . . complete the following checks.

1. VOLUME control at MIN.
2. LEVEL SET control at 0.
3. MUTING switch at OFF (upper position).
4. Both TAPE MONITOR switches 1 and 2 at OFF (upper position).
5. SPEAKERS switch at correct position for speakers to be driven: A, B, or A+B.
6. MODE switch at STEREO NORM.
7. BALANCE and all BASS and TREBLE controls at center position.
8. TONE DEFEAT switch at OFF (upper position).

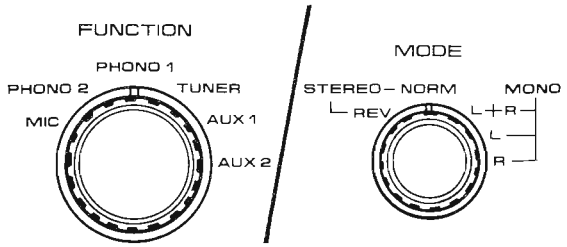


Fig. 7

RECORD PLAYING

1. If the turntable is connected to the PHONO 1 inputs, set the FUNCTION selector at PHONO 1. If the turntable is connected to the PHONO 2 inputs, use FUNCTION selector position PHONO 2.
2. Set the turntable in operation.
3. Use the VOLUME, BASS, TREBLE, BALANCE, etc. controls to obtain the desired listening volume and tonal quality.

RADIO RECEPTION

1. Set the FUNCTION selector at position TUNER.
2. Operate the tuner as usual.
3. Use the VOLUME, BASS, TREBLE, BALANCE, etc. controls to obtain the desired volume and tonal quality.

USE OF MICROPHONES

1. Two microphones can be plugged into the MIC L and MIC R jacks on the rear panel for stereophonic operation. When using only one microphone, plug it into either MIC jack.
2. Set the FUNCTION selector at position MIC.
3. With two microphones, leave the MODE switch at position STEREO NORM. When using only one microphone, however, turn the MODE switch to position MONO L or MONO R, depending on which MIC input jack you're using.
4. Turn the VOLUME control back to MIN, then turn it up little by little. At high volume settings and if the microphones are close to the speakers, howling (acoustic feedback) may occur.

USE OF AUXILIARY PROGRAM SOURCES

Auxiliary program sources such as an 8-track cartridge tape player, sound track from a TV set, or a second radio tuner may be connected to the AUX 1 or AUX 2 inputs.

1. Set the FUNCTION selector at position AUX 1 or AUX 2.
2. Operate the program source equipment as usual.
3. Use the VOLUME, BALANCE, BASS, TREBLE, etc. controls to obtain the desired volume level and tonal quality.

NOTES:

USEFUL HINTS FOR OPTIMUM OPERATION

1. *When two turntables (or two tonearms mounted on one turntable) are connected to the PHONO 1 and PHONO 2 inputs, one will probably sound a little louder than the other. This is due to different phono cartridge characteristics.*
   Connect the louder one to the PHONO 2 inputs, then turn down the PHONO 2 LEVEL control on the rear panel. Switching the FUNCTION selector alternately to PHONO 1 and PHONO 2, balance the turntable volume levels by adjusting the PHONO 2 LEVEL control. You can then conduct comparative listening tests with the two turntables without having to change the volume setting each time.
2. *Microphones should be dynamic types of high impedance (approx. 50kΩ) and equipped with standard 6φ plugs. A variety of high-grade microphones is available from Pioneer.*
3. *Be careful not to position the microphones close to the speakers and not to turn up the volume too high, as this may cause howling. It is also advisable to set the TONE DEFEAT switch at ON when using microphones.*
4. *If a program source is connected to the AUX 2 inputs, its sound volume can be balanced with that of other program sources (tuner, turntable) by adjusting the AUX 2 LEVEL control on the rear panel. Switch the FUNCTION selector alternately at AUX 2 and TUNER, for example and adjust the AUX 2 LEVEL control until about the same volume is obtained from both sources.*

LEVEL CONTROLS on the rear

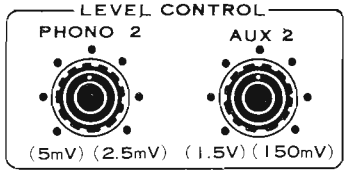


Fig. 8

THE PROTECTION CIRCUIT

When you turn on the SA-8100, the protector pilot lamp will light and the speakers will remain silent for the first 3 to 6 seconds. This is caused by the protector circuit which keeps the output amplifier off until all components have attained a state of completely stable operation. Otherwise, unpleasant noise and, in extreme cases, damage to transistors and speakers might occur in the first few seconds.

If the protector pilot lamp remains lit and the speakers silent after 6 seconds, turn off the power and check the speaker connections and lead wires for a possible short-circuit. If the protector lamp lights during play and you hear a repeated clicking of the built-in relay, also turn off the power and check the speaker connections. The trouble may also be caused by very low speaker impedance — note that, when two pairs of speaker systems (A + B) are used, each system must have an impedance of at least 8 ohms. The protector circuit resets itself automatically, so after you have repaired the trouble, the amplifier will resume normal operation.

TAPE RECORDING, PLAYBACK AND DUPLICATING

TAPE RECORDING

The signal being played over the amplifier is always present at the TAPE 1 REC and TAPE 2 REC outputs for recording on tape. Select the program source with the FUNCTION selector as usual.

You can also connect two tape decks (for example, one open reel model and one cassette deck) to the TAPE 1 and 2 REC outputs and record on both decks simultaneously. In this case, the TAPE MONITOR 1 switch should always be left at OFF (upper position) because some tape decks will not record when this switch is at ON.

Please note that the VOLUME, BASS, TREBLE, BALANCE controls and filters have no effect upon the signal at the TAPE REC outputs. The signal is recorded as it comes from the program source. Recording levels must be adjusted with the controls on the tape deck.

Monitoring of a recording in progress

If the tape deck is a three-head type or equipped with monitor circuits, a recording in progress can be monitored by setting the TAPE MONITOR switch 1 or 2 on the SA-8100 at position ON (Fig. 10).

As mentioned above, do not switch the TAPE MONITOR 1 switch to ON when recording on two tape decks at the same time. Leave the switch OFF.

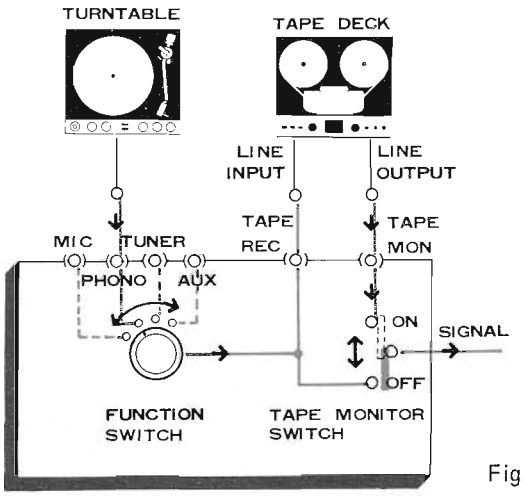


Fig. 9

TAPE PLAYBACK

Playback on a tape deck connected to the TAPE 1 MON inputs: Set TAPE MONITOR 1 switch to ON.

Playback on a tape deck connected to the TAPE 2 MON inputs: Set TAPE MONITOR 2 switch to ON.

During tape playback, VOLUME, BASS, TREBLE, BALANCE, etc. controls of the SA-8100 function as usual. The FUNCTION selector switch, however, is meaningless during tape playback (Fig. 10).

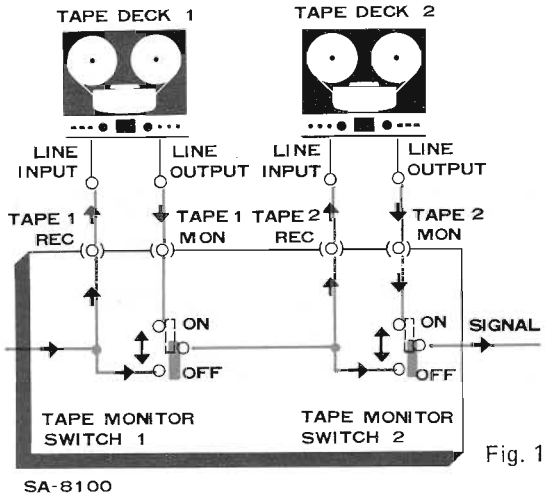


Fig. 10

TAPE DUPLICATING

With two tape decks, you can duplicate tape-to-tape, or edit recordings while re-recording. For example, you can first tape a complete FM stereo program, with announcements and commercials, and later re-record on another tape while cutting out unwanted portions. For duplicating, proceed as follows:

1. Connect two tape decks as shown in Fig. 11.
2. Set TAPE MONITOR 1 switch at ON. Put the recorded tape on tape deck 1. Set this deck in playback operation.
3. Put a blank tape on tape deck 2, set this deck in recording mode. Stop tape travel of deck 2 during unwanted passages.
4. The recording taking place on deck 2 can be monitored by setting the TAPE MONITOR 2 switch at ON from time to time.

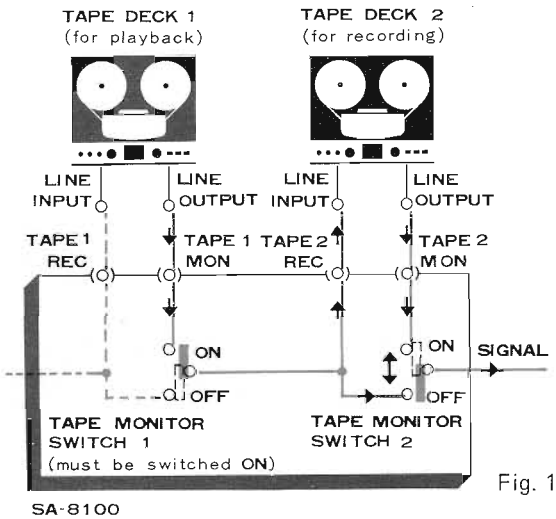


Fig. 11

HOW TO BUILD A 4-CHANNEL STEREO SYSTEM

Compared to 2-channel stereo reproduction, a 4-channel system offers numerous advantages. It can reproduce a life-like sound field including indirect and reverberated sound as heard in a concert hall. It can give distinct localization of sound sources at the front, sides and rear. It can create special effects such as "surround sound" and motion of sound sources in any desired direction. Where a 2-channel system will recreate only what takes place on the stage, a 4-channel system can re-build the total musical environment.
Such a 4-channel system can be built as shown in Fig. 12, by adding the Pioneer 4-channel decoder amplifier, model QL-600A, and another pair of speakers for the rear channels. Connections and operational details are explained in the operating instructions of model QL-600A.

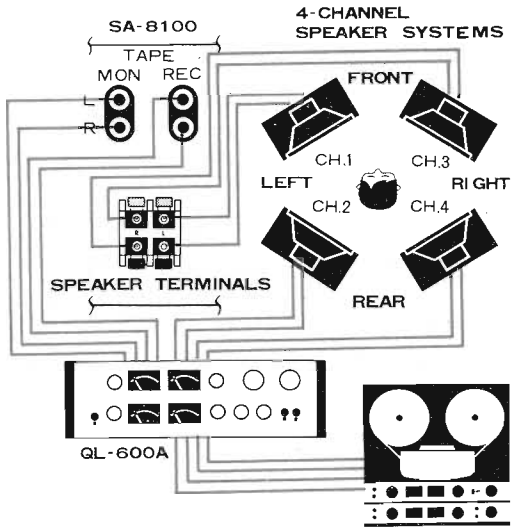


Fig. 12

CONDITIONS FREQUENTLY MISTAKEN FOR MALFUNCTION

In the case of a malfunction, please consult the following chart — the trouble is often caused by a mistake in operation. Also check the other components of your stereo system, because the malfunction may have occurred there.

	TROUBLE	PROBABLE CAUSE	REMEDY
RADIO RECEPTION	Intermittent high-pitched noise during FM reception.	Automobile ignition systems without noise suppression. High-frequency welding and plastic sealing equipment operating nearby.	Install high-gain special FM antenna. Direct antenna away from streets with heavy traffic. If noise persists, lodge complaint with radio communications authorities.
	More noise in FM stereo than in FM mono programs.	Reach of FM stereo broadcasts is only half that of mono broadcasts.	Install special FM antenna with high gain.
TURNTABLE OPERATION	Hum or buzzing noise present only when playing records.	a) Insufficient shielding of turntable output cables. b) System not grounded. c) TV transmitter nearby.	a) Replace turntable output cables with good shielded cables. b) Check ground connections motor-to-amplifier, tonearm-to-amplifier, amplifier-to-ground. c) Consult Pioneer dealer or service station.
	Turntable picks up ham radio transmissions.	Ham radio transmitter operating by.	Consult Pioneer dealer or service station, discuss matter with ham radio operator.
	Noisy, unclear treble sound from records.	a) Worn pickup stylus. b) Worn record. c) Dust on pickup stylus. d) Faulty mounting or connection of pick-up cartridge. e) Stylus tracking force too high or too low. f) TREBLE controls turned up too high.	Check points (a) thru (e). f) Turn down treble controls.
	Howling occurs when volume is turned up.	Turntable placed too close to speakers, or on unstable surface.	Remove turntable farther from speakers. Turn down BASS controls. Install shock-absorbing pads under turntable.

SPECIFICATIONS

Semiconductors

Transistors	49
Diodes	29

Power Amplifier Section

Circuitry	1st Stage Differential Amplifier, Direct Coupled Pure Complementary OCL
Continuous Power Output	
20Hz~20kHz (Both channels driven)	40W+40W (8Ω), 45W+45W (4Ω)
1kHz (Both channels driven)	44W+44W (8Ω), 50W+50W (4Ω)
1kHz (Each channel driven)	50W/50W (8Ω), 60W/60W (4Ω)
Harmonic Distortion	
(Continuous Power Output)	Less than 0.3%
(1W+1W Power Output)	Less than 0.05%
Intermodulation Distortion	
(Continuous Power Output)	Less than 0.3%
(1W+1W Power Output)	Less than 0.05%
Power Bandwidth (IHF, Both channels driven)	5Hz ~ 40kHz (H.D. 0.3%)
Frequency Response	7Hz ~ 80kHz $^{+0}_{-1}$ dB
Input Sensitivity/Impedance	
POWER AMP IN	500mV/50kΩ
Output, Speaker	A, B, A+B (4 ~ 16Ω)
Headphone	4 ~ 16Ω
Damping Factor (1kHz, 8Ω)	More than 60
Hum & Noise (IHF, Short-circuited, A Network)	More than 95dB
Residual Hum & Noise (8Ω, Pre & Power-amplifier)	Less than 1mV (0.13μW)
Subsonic Filter	8Hz (12dB/oct)

Preamplifier Section

Circuitry	
Equalizer-amplifier	1st Stage Differential Amplifier, 3-stage Direct Coupled NFB type
Control-amplifier	1st Stage Differential Amplifier 3-stage Direct Coupled NFB type
Input Sensitivity/Impedance	
PHONO 1	2.5mV/50kΩ
PHONO 2	2.5mV ~ 5mV/50kΩ
PHONO Overload Level (rms/p-p)	250mV/700mV
MIC	2.0mV/50kΩ
TUNER	150mV/100kΩ
AUX 1	150mV/100kΩ
AUX 2	150mV ~ 1.5V/50kΩ~100kΩ
TAPE MONITOR 1, 2	150mV/100kΩ
TAPE MONITOR 2 (DIN connector)	150mV/100kΩ
Output Level/Impedance	
TAPE REC 1, 2	150mV
TAPE REC 2 (DIN connector)	30mV/80kΩ
PRE AMP OUT	2V/5Ω
Harmonic Distortion (20Hz ~ 20kHz)	Less than 0.05%
Frequency Response	
PHONO (RIAA equalization)	30Hz ~ 15kHz ±0.2dB
MIC	10Hz ~ 10kHz $^{+0}_{-1}$ dB
TUNER, AUX, TAPE MON	10Hz ~ 70kHz $^{+0}_{-1}$ dB
Tone Control	
BASS Main Control	±10dB (100Hz)
BASS Sub Control	±5dB (50Hz)
TREBLE Main Control	±10dB (10kHz)
TREBLE Sub Control	±5dB (20kHz)
Filter	
SUBSONIC	8Hz (12dB/oct)
LOW	30Hz (12dB/oct)
HIGH	8kHz (12dB/oct)
Loudness Contour (Volume control set at –40dB position)	+10dB (100Hz)
Hum & Noise (IHF, Short-circuited A Network)	
PHONO	More than 80dB
MIC	More than 70dB
TUNER, AUX, TAPE MON	More than 90dB
Muting	–20dB
Level Set	0dB, –15dB, –30dB

Miscellaneous

Power Requirements	AC 120V 60Hz or AC 110V, 120V, 130V, 220V and 240V 50/60Hz. (Switchable)
Power Consumption (Max.)	270W
AC Outlets	Switched 1, Unswitched 2
Dimensions (overall)	430(W) x 138(H) x 341(D)mm 16-15/16(W) x 5-7/16(H) x 13-7/16(D)in.
Weight Without Package	12.1 kg (26 lb 10oz)
Weight With Package	14.1 kg (31 lb 1oz)

Furnished Parts

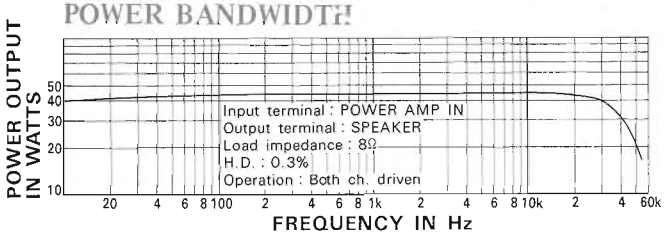
- Connection Cord with Pin Plugs 1
- Polishing Cloth 1
- Hex. Wrench 1
- Factory Tested Data 1
- Operating Instructions 1
- 5-voltage Model; Fuse 1.5A 1
  Fuses 3A 2

NOTE:

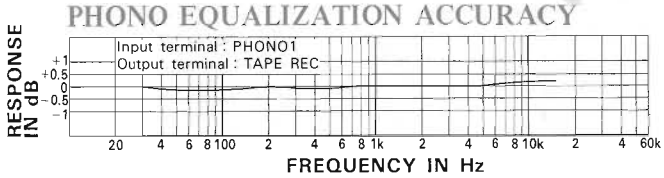
Specificatins and the design subject to possible modification without notice due to improvements.

AMPLIFIER CHARACTERISTICS

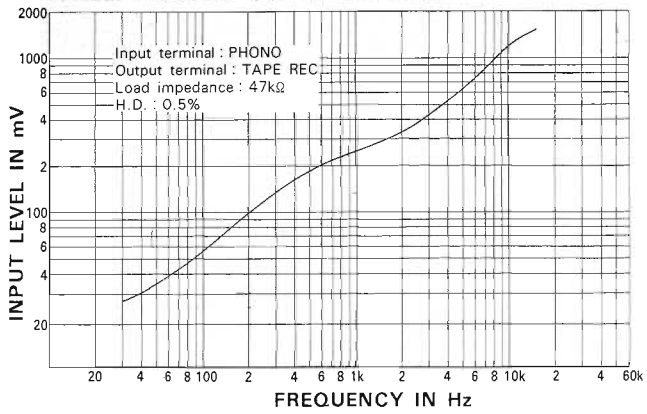
POWER BANDWIDTH



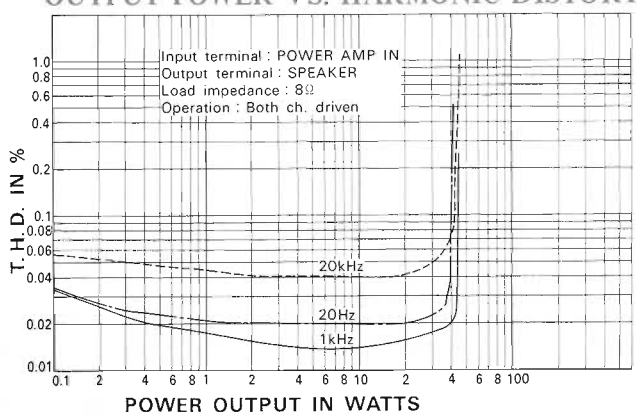
PHONO EQUALIZATION ACCURACY



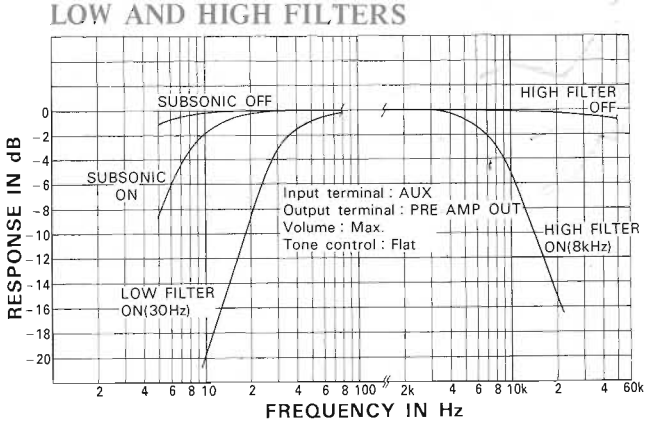
MAX. PHONO INPUT LEVEL



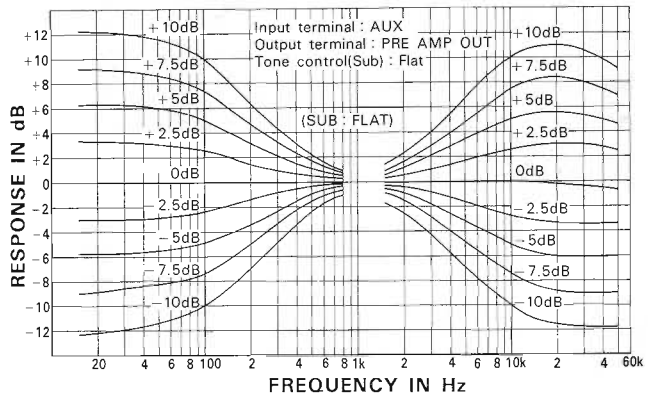
OUTPUT POWER VS. HARMONIC DISTORTION



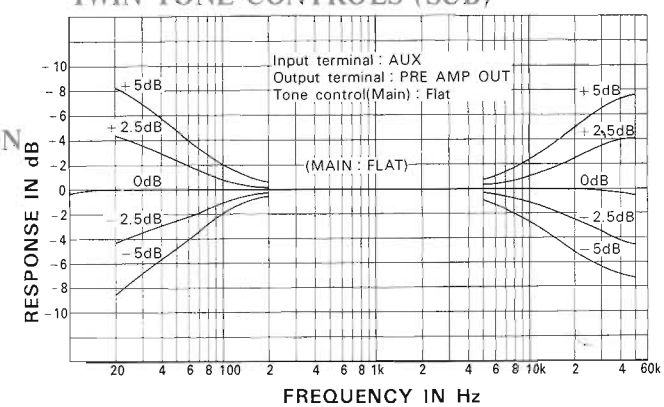
LOW AND HIGH FILTERS



TWIN TONE CONTROLS (MAIN)



TWIN TONE CONTROLS (SUB)



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