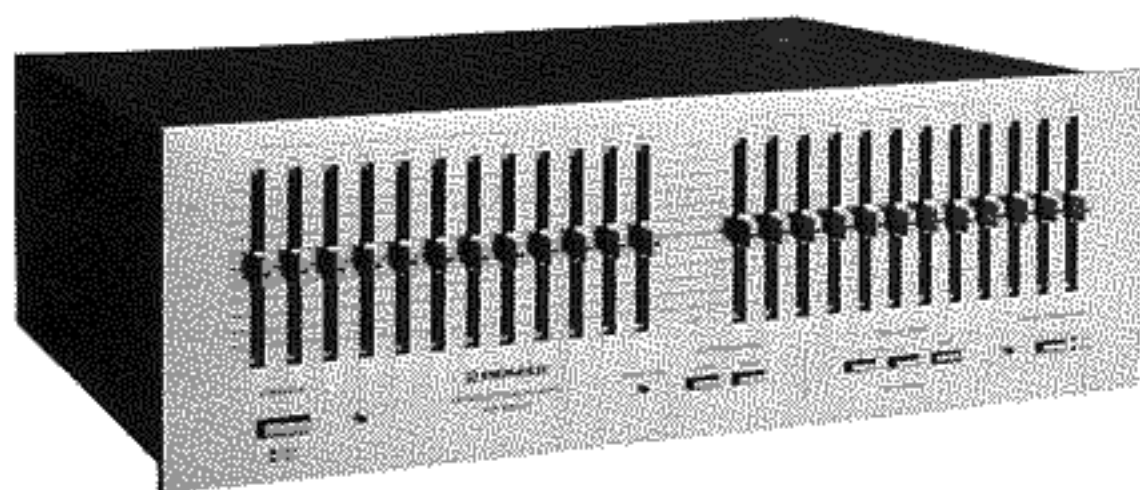


SG-9800

R, R/G
WE, WB

OPERATING INSTRUCTIONS



FEATURES

Op Amp Filter Circuits

Operational amplifier (Op Amp) integrated circuits make up the special active filter networks for each band. Performance is always stable, while the complete elimination of coils avoids aging variations due to temperature, humidity and other ambient conditions. The high dynamic range design provides low distortion over a wide band with respect to any input signal.

2 Channel 12 Elements Graphic Equalizer

The graphic equalizer divides the audio frequency spectrum into 12 segments from 16Hz to 32kHz, with each segment corresponding to an octave. Individual controls for each segment provide continuous adjustment (from -10dB to +10dB) and allow the sound to be contoured in order to compensate for equipment and speaker characteristics, listening room acoustics or personal preferences. Adjustments can also be performed during recording.

Effective Tape Monitor and Equalizer Switches

Tape jacks are included for connecting a stereo tape deck. In addition to input signal equalizing, simple switch selection can provide equalizing for a tape playback signal and recording of an equalized signal.

Easy-to-operate Panel Layout

Slide controls and push switches compose the operating panel. The styling is both functional and attractive, making this an excellent addition to a high performance audio system in combination with Pioneer audio components.

The specifications of this model differ according to the shipment destination.

- For U.K. (WB stamped on packing case): Power line voltage is 240 volts.
- For mainland Europe (WE stamped on packing case): Power line voltage is 220 volts.
- For destinations excluding above (R, R/G stamped on packing case): A 2-point (110V-120V/220V-240V) voltage selector switch is provided on the rear panel, and an AC convenience outlet is provided on the rear panel.

For the sake of convenience, the illustrations and explanations are based on the SG-9800/R, R/G.

Before turning on the power, please confirm the setting of the line **VOLTAGE SELECTOR** switch on the rear panel. If it is not set properly, change the setting of it according to the **LINE VOLTAGE SELECTOR SWITCH** on page 2.

IMPORTANT

To prevent electric shock, do not remove cover. No user serviceable parts inside, refer servicing to qualified service personnel.

Always disconnect all the equipment from the mains supply when disconnecting the signal leads. The power cord should be connected last, make sure that the power switch is off.

Unplug the set from the wall socket when it is not to be used for an extended period of time.

FOR USE IN UNITED KINGDOM

The wires in this mains lead are coloured in accordance with the following code:

Blue:	Neutral
Brown:	Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured marking identifying the terminals in your plug proceed as follows.

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

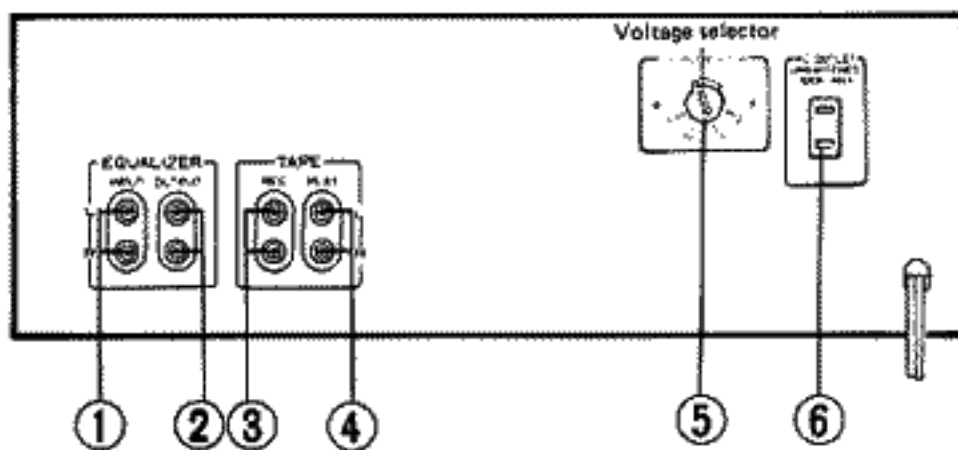
The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

CONTENTS

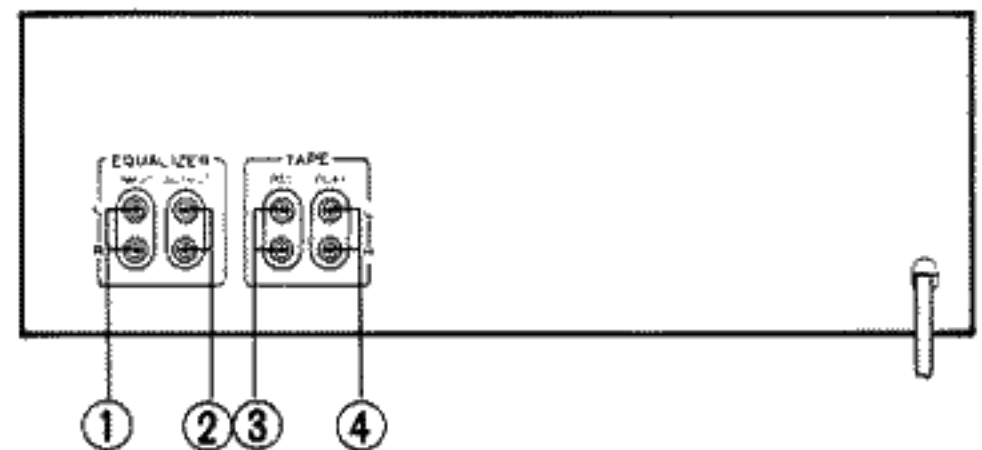
Features	1	Operation	6
Rear Panel Facilities	2	Effective Operation	8
Connections	3	Schematic Diagram	10
Front Panel Facilities	4	Specifications	12
Octave Control Operation	5	Installation Cautions	12
Before Operation	6		

REAR PANEL FACILITIES

This rear panel is the R, R/G models.



This rear panel is the WB, WE models.



① EQUALIZER INPUT JACKS

Connect these jacks to the TAPE REC jacks on the stereo amplifier or to the PREAMP OUT (OUTPUT) jacks on the preamplifier.

② EQUALIZER OUTPUT JACKS

Connect these jacks to the TAPE PLAY jacks on the stereo amplifier or to the POWER AMP IN (INPUT) jacks on the power amplifier.

NOTE:

The maximum rated input of the model SG-9800 is 7.5V. When it is being used between the PRE OUT jacks of the preamplifier and the MAIN IN jacks of the power amplifier, set this switch beforehand to -3dB or -6dB if the output level of the preamplifier will exceed 7.5V.

③ TAPE REC JACKS

Connect these to the INPUT (REC) jacks on the tape deck.

④ TAPE PLAY JACKS

Connect these to the OUTPUT (PLAY) jacks on the tape deck.

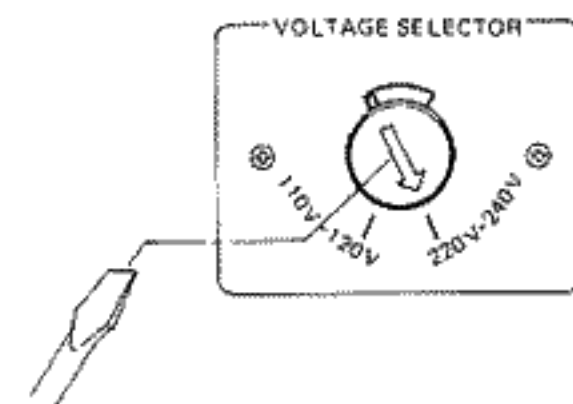
⑤ AC OUTLET (R, R/G models only)

This is an auxiliary power outlet. Connect the power plug of your tape deck or other stereo hi-fi component to this outlet. It is not coupled with the power switch on the model SG-9800 (UN-SWITCHED). The maximum power capacity is 100W and so do not connect electrical appliances with a power capacity exceeding this value.

⑥ LINE VOLTAGE SELECTOR SWITCH

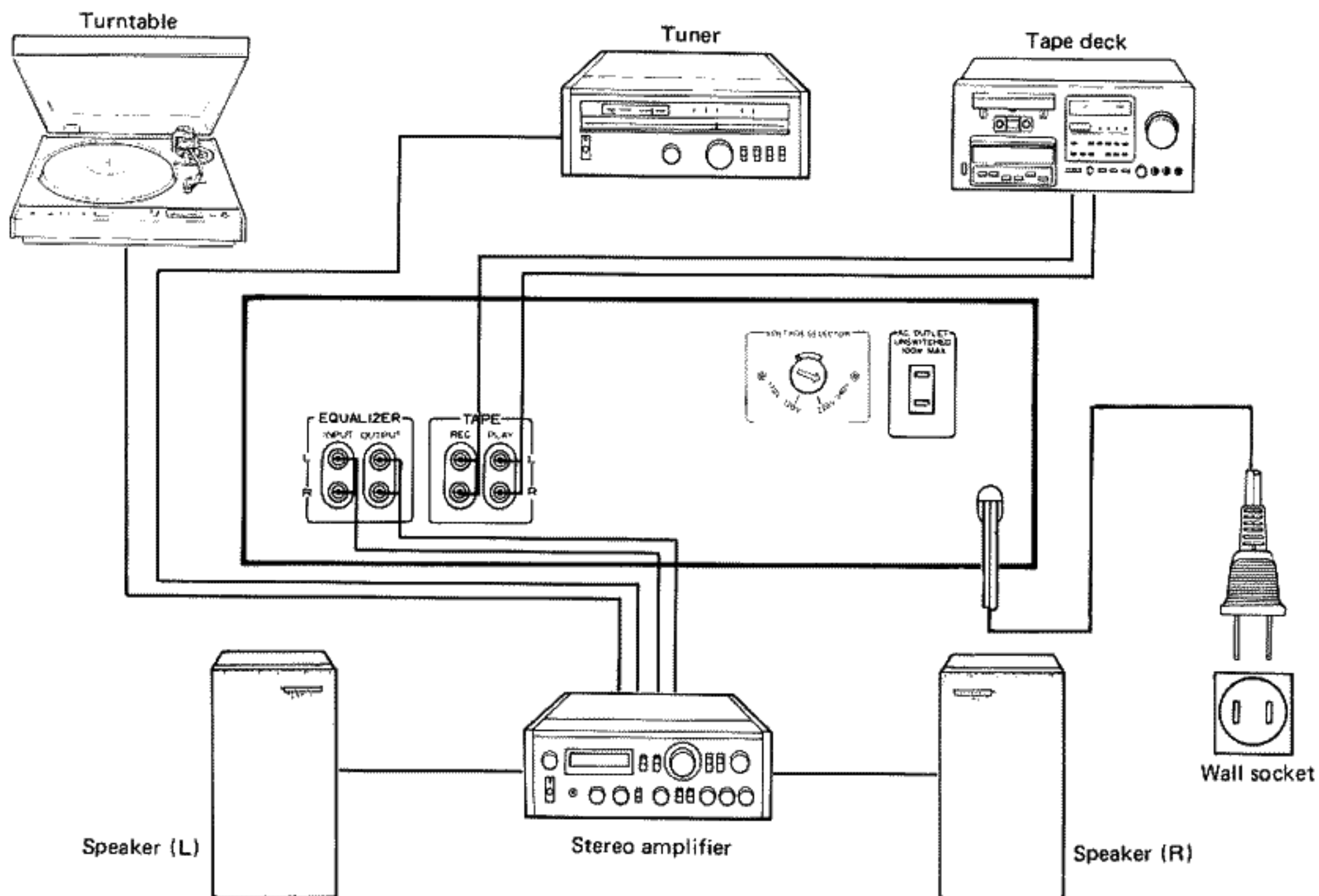
Check that the indication of the line voltage selector switch is same as your residence before plugging the power cord into the outlet. If it isn't or if you move to an area where the voltage requirements differ, change the switch setting as follows. Before adjusting, disconnect the power cord.

1. Prepare a medium size screwdriver.
2. Insert the screwdriver into the arrow on the voltage selector and adjust so that the tip of the arrow points to the voltage value of your area.



CONNECTIONS

This rear panel is based on the R, R/G models



CONNECTIONS TO STEREO AMPLIFIER

Use the accessory connecting cords to connect the EQUALIZER INPUT and OUTPUT jacks on the SG-9800 to the TAPE REC and TAPE PLAY jacks on a stereo amplifier (Fig. 1). Take care not to reverse L (left) and R (right) channels, and make sure connection securely.

TAPE DECK CONNECTIONS

SG-9800 is provided with recording output jacks and playback input jacks for adding equalization to the program source to be recorded or the playback signals.

Connections for recording

Connect the recording input jacks (INPUT) on the tape deck to the TAPE REC jacks on the SG-9800.

Connections for playback

Connect the playback output jacks (OUTPUT) on the tape deck to the TAPE PLAY jacks on the SG-9800.

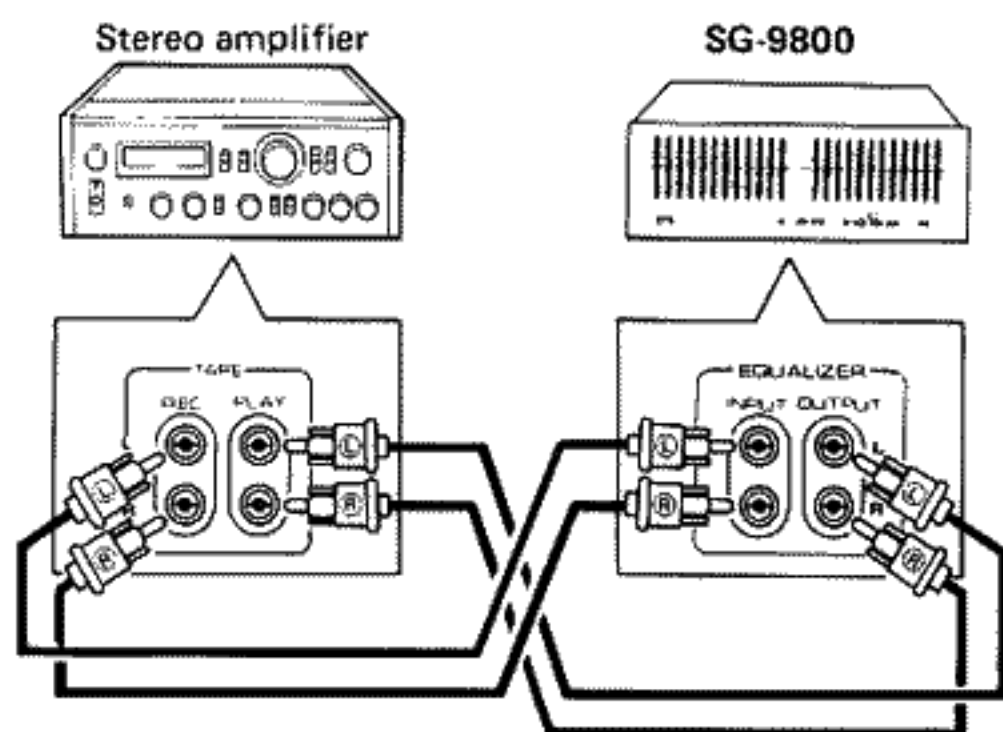


Fig. 1

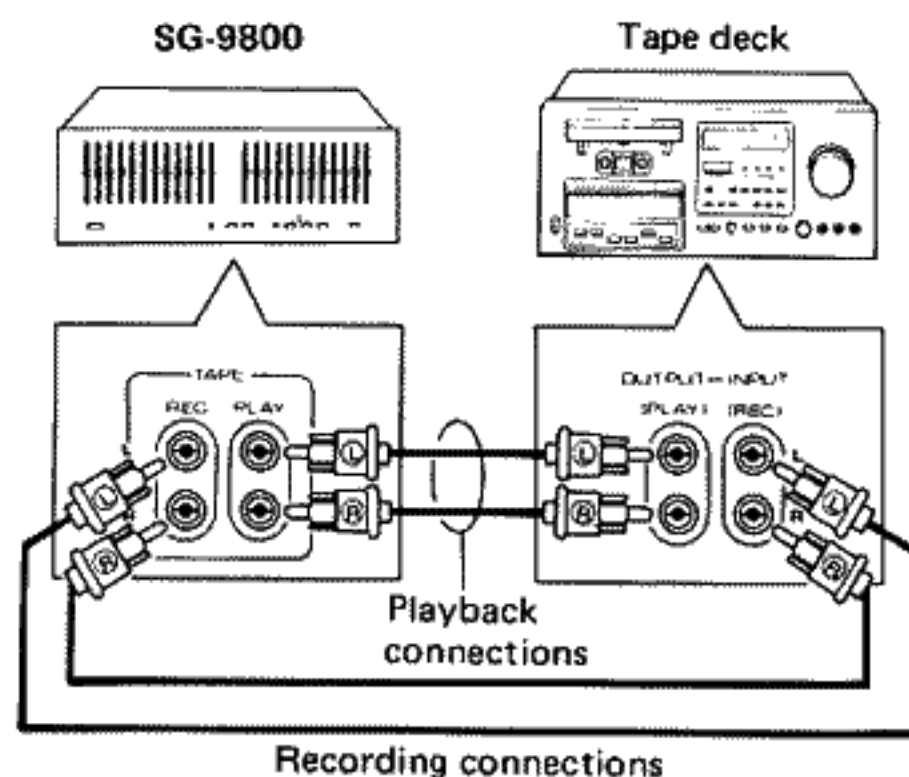
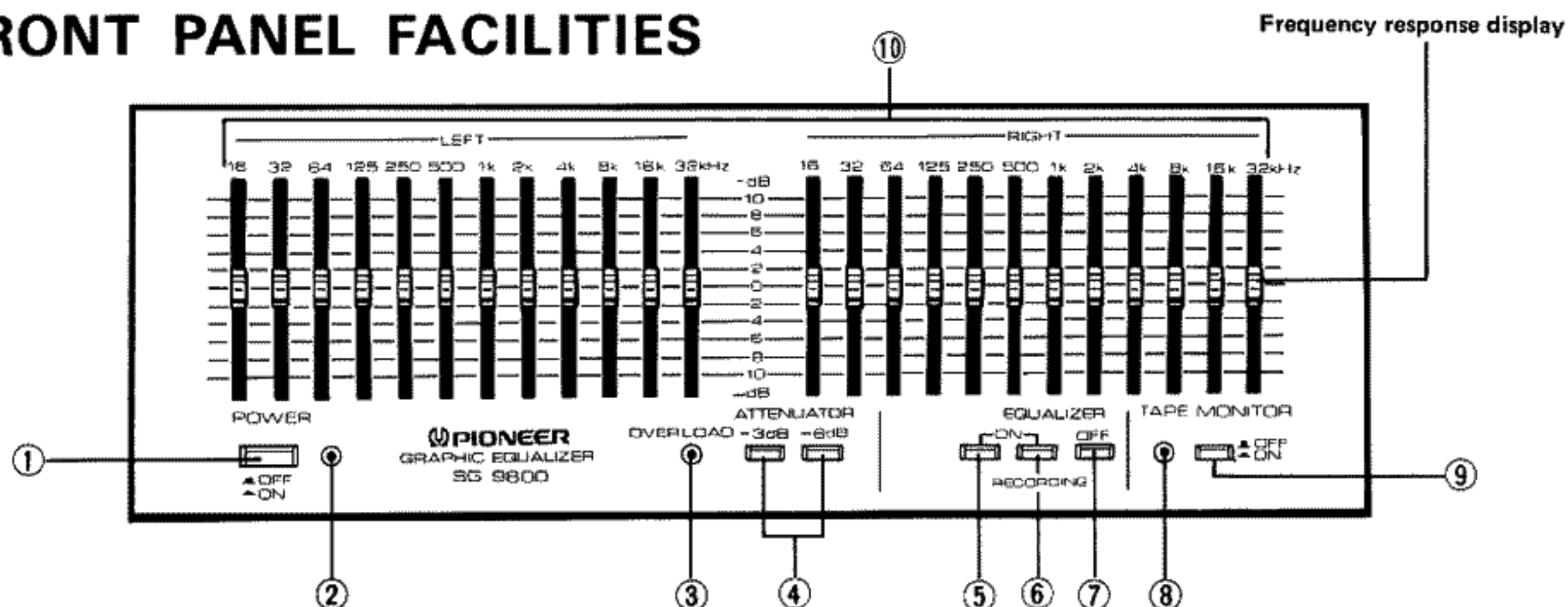


Fig. 2

FRONT PANEL FACILITIES



① POWER SWITCH

Power is supplied to the model SG-9800 when this switch is depressed. The power indicator comes on as soon as the power is supplied.

② POWER INDICATOR

This comes on as soon as the SG-9800's power switch is set to ON to indicate that power is being supplied.

③ OVERLOAD INDICATOR

This indicator comes on when the octave control is set too high and the peaks come in only part of the frequencies, or when a strong input signal is applied directly from the preamplifier. Adjust the attenuator switch and the octave control across a range where this indicator does not light up.

④ ATTENUATOR SWITCHES

These are used to attenuate the input signal before equalization. Under normal conditions, operate the octave control knob with the switches at the 0dB (released) position. When a program has a wide dynamic range or when the overload indicator comes on, depress either the -3dB or -6dB switch.

⑤ EQUALIZER ON SWITCH

Depress this switch to equalize the signals fed from the EQUALIZER INPUT jacks. The frequency response display will come on, and signals featuring an equalization only will be fed out from the model SG-9800's OUTPUT jacks.

⑥ EQUALIZER ON/RECORDING SWITCH

Depress this switch when recording a program source whose signals feature an equalization onto a tape in a deck connected to the model

SG-9800's TAPE jacks. This will allow signals with the equalizing sound to be made available from both the SG-9800's OUTPUT jacks and the TAPE REC jacks.

⑦ EQUALIZER OFF SWITCH

Depress this switch to cut off the equalization effect. This will allow signals without an equalizing sound to be made available from both the SG-9800's OUTPUT jacks and the TAPE REC jacks.

NOTE:

The equalizer on switch, the equalizer on recording switch and equalizer off switch are all coupled. When you depress one switch, make sure that all the others are released. Do not depress more than one switch at a time.

⑧ TAPE MONITOR INDICATOR

This come on when the tape monitor switch is depressed.

⑨ TAPE MONITOR SWITCH

Depress this switch to monitor the sound on the tape as it is being recorded or when playing back a tape using a tape deck connected to the SG-9800's TAPE jacks. (The tape monitor indicator comes on.)

⑩ OCTAVE CONTROLS

These controls provide continuous level variation of its indicated frequency from -10dB to +10dB. Each frequency segment becomes enhanced when its control is positioned above center (0) and attenuated when positioned below center. With all controls set to 0, the input signal is fed to the OUTPUT jacks unchanged. The frequency response display on the octave controls displays the level variation of the frequency response of the output signals.

OCTAVE CONTROL OPERATION

As shown in Fig. 1, each octave control allows adjustment only in a narrow band with the center frequency as indicated above the control. Adjust the controls according to conditions or personal preferences.

16Hz Control:

This control is used to control the frequency components lower than 16Hz. This makes it possible to suppress the noise components in the ultra-low frequency region which are caused by record warp, etc. and also to keep intermodulation distortion down to the bare minimum. The control also serves to protect your speakers from potentially harmful noise.

32Hz Control:

This can be used to compensate for an excessively strong low frequency output from the speaker system, or as a low cut filter to reduce motor rumble, record cutting noise and similar low frequency noise.

64Hz Control:

Increasing this control setting brings out the fascination of massive bass sounds such as produced by bass violins, drums and pipe organs. The sound is given an impression of solidness and imposing grandeur.

125Hz Control:

Enhancing this region imparts a fullness to the sound, while reducing the control setting provides a more transparent sound.

250Hz Control:

Clapping causes echo reflections in certain types of rooms, such as those adjacent to hallways. Reduce this control setting to eliminate these reflections.

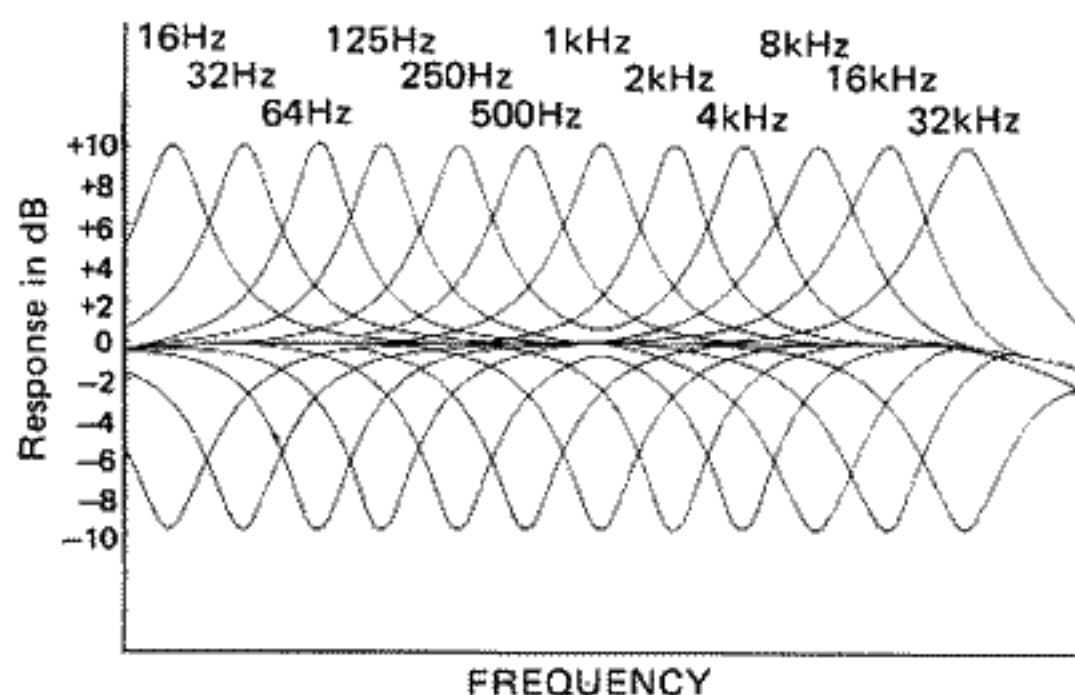


Fig. 1 Octave control variation curve

500Hz Control:

This region governs the strength of the sound. Increasing the control setting can add impact to the sound, while conversely, an excessively low setting can lend an impression of incompleteness.

1kHz Control:

Adjusting this control during vocal performances can either render the singer's voice more distinct or cause it to become nearly inaudible. Presence can be greatly varied by controlling the midrange sound frequency.

2kHz Control:

Sound in the 2kHz area provides the strongest stimulus to the human ear and also evokes a psychological response. If the sound has a hard, metallic impression, reduce this control.

4kHz Control:

When set too high, the sound can become irritatingly brassy and metallic. Setting the control for attenuation can result in a gentle, non-fatiguing sound for easy listening.

8kHz Control:

Increasing this control setting enhances the brilliance of music containing string and wind instruments. If a conventional type tone control is used to increase this band, undesirable effects may be imparted and the sound can be made unpleasant. The 8kHz frequency band delicately influences tone variations.

16kHz Control:

The 16kHz control can be used to extend subtle high frequencies. Sound presence becomes richer with instruments possessing narrow reverberations such as cymbals and the triangle.

32kHz Control:

This control is used to control the ultra-high frequencies which are beyond your range of hearing. It allows the peaks in the ultra-high frequency region, such as those from a MM cartridge, to be compensated for, and for smooth curves to be provided.

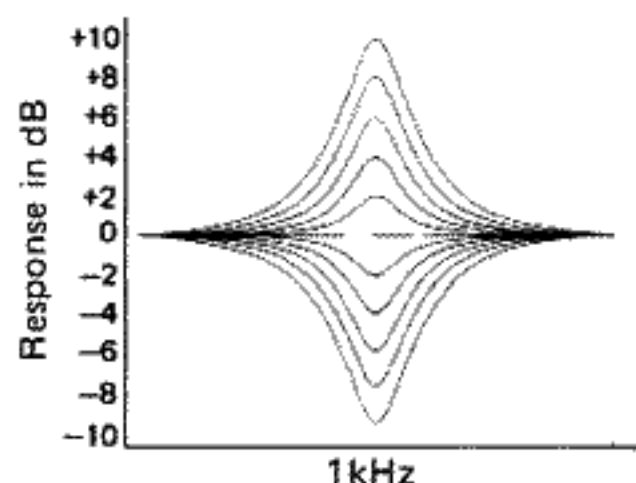


Fig. 2 1kHz Variation response

BEFORE OPERATION

It is suggested that the SG-9800 power cord be plugged into a switched convenience outlet of the stereo system. The POWER switch of the SG-9800 can then be left in the ON position and power to the unit supplied by operating the power switch of the stereo system.

- Set the TAPE MONITOR switch of the stereo system to ON.
- Set the LOUDNESS switch, TONE control switch and other filter switches of the stereo system to OFF.

OPERATION

EQUALIZING PROGRAM SOURCE (Fig. 3)

1. Adjust the VOLUME control of the stereo system as desired.
2. Set the TAPE MONITOR switch of the SG-9800 to OFF.
3. Set the EQUALIZER switch to ON.
4. Operate the octave controls to obtain equalization.
5. Readjust the VOLUME control of the stereo system.

In this mode, the unequalized program source will be recorded by a tape deck connected to the SG-9800 TAPE jacks and recording conditions cannot be monitored.

EQUALIZING TAPE PLAYBACK SIGNAL (Fig. 4)

1. Set the TAPE MONITOR switch SG-9800 to ON.
2. Set the EQUALIZER switch to ON.
3. Operate the tape deck and play the tape.
4. Adjust the VOLUME control of stereo system as desired.
5. Operate the octave controls to obtain equalization.
6. Readjust the VOLUME control of the stereo system.

When recording, the original sound of the program source is recorded without being modified at all. Recording conditions cannot be monitored at this time.

TAPE RECORDING EQUALIZED PROGRAM SOURCE WHILE MONITORING WITH SPEAKERS (Fig. 5)

1. Set the TAPE MONITOR switch of SG-9800 to ON.

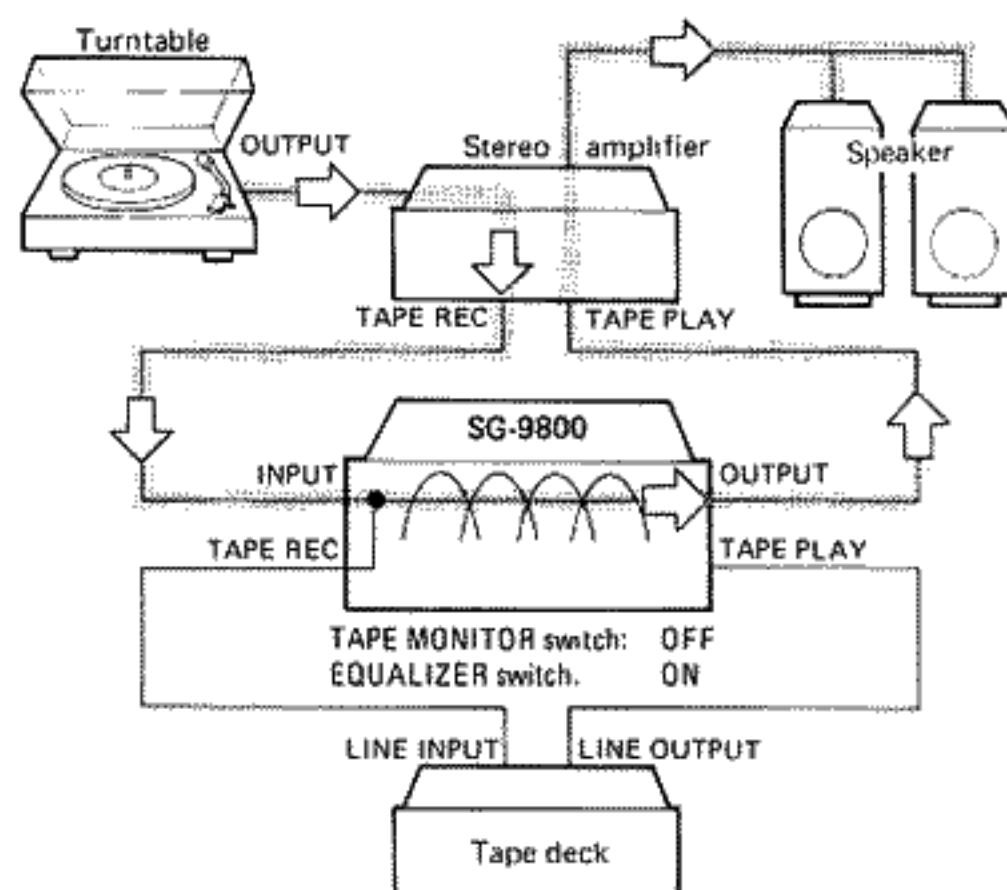


Fig. 3

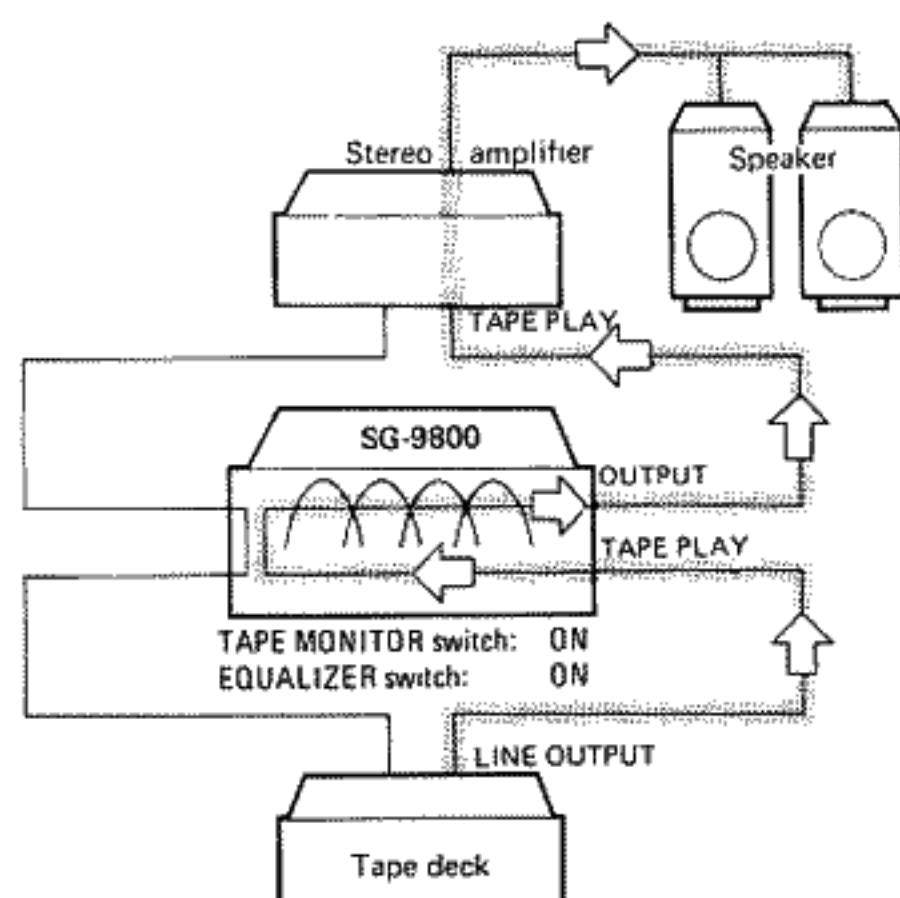


Fig. 4

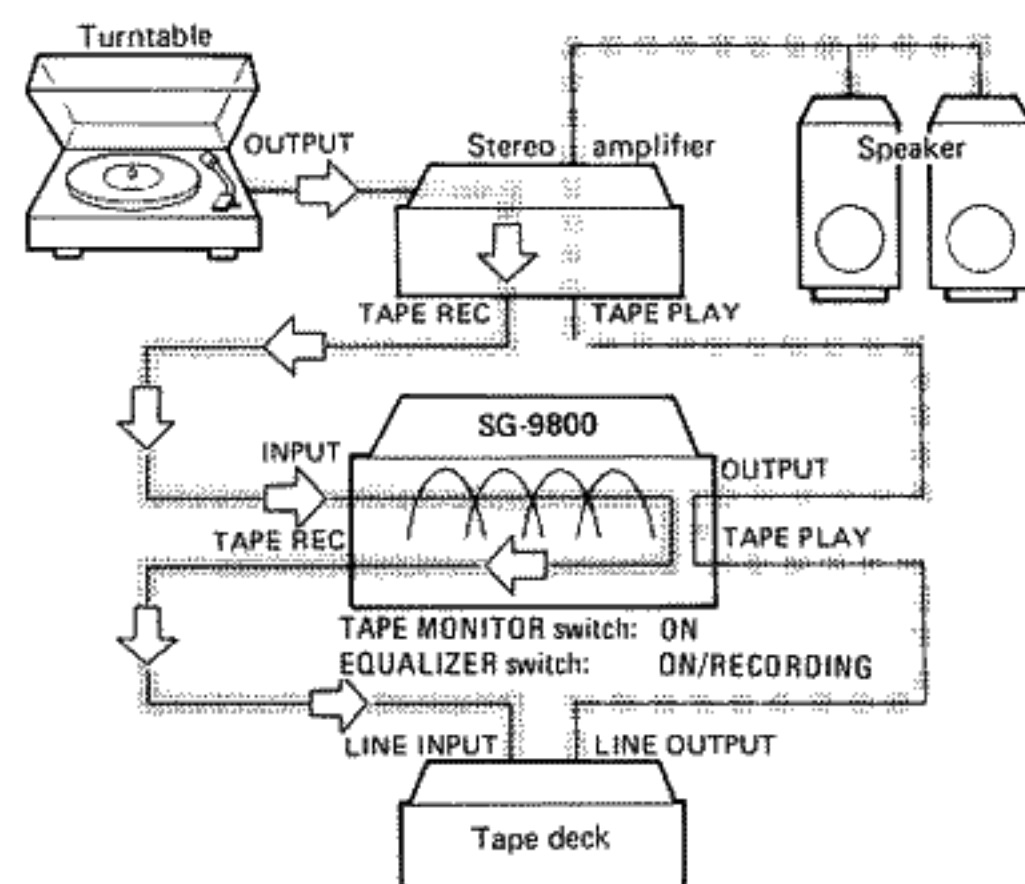


Fig. 5

2. Set the EQUALIZER switch to ON/RECORDING.
3. Operate the tape deck and set for recording standby.
4. Operate the octave controls to equalize the program source, then record. Perform equalizing while monitoring the recording conditions with the speakers.
- Note that due to the variation in human ear response according to volume (loudness response), the equalizing effect recorded on tape and the sound monitored from the speakers can differ.
- In this mode, the tape playback signal cannot be equalized.

EQUALIZING PROGRAM SOURCE WHILE SIMULTANEOUSLY LISTENING WITH SPEAKERS AND RECORDING ON TAPE (Fig. 6)

1. Set the TAPE MONITOR switch of SG-9800 to OFF.
2. Set the EQUALIZER switch to ON/RECORDING.
3. Adjust the VOLUME control of stereo system as desired.
4. Operate the tape deck and set for recording standby.
5. Operate the octave controls to perform equalization.
6. Readjust the VOLUME control of the stereo system and proceed with recording.

TAPE RECORDING OR PLAYBACK WITHOUT EQUALIZING THE PROGRAM SOURCE (Fig. 7)

1. Set the TAPE MONITOR switch of the SG-9800 to ON.
2. Set the EQUALIZER switch to OFF.
3. Operate the tape deck to record program source or play a tape.

When recording in this mode, recording conditions can be monitored through the speakers.

PLAYING PROGRAM SOURCE WITHOUT EQUALIZATION (Fig. 8)

1. Set the TAPE MONITOR switch of the SG-9800 to OFF.
2. Set the EQUALIZER switch to OFF.
3. Adjust the VOLUME and tone controls of the stereo system as desired.

In this mode, the program source can be recorded by a tape deck connected to the SG-9800 TAPE jacks, but recording cannot be monitored.

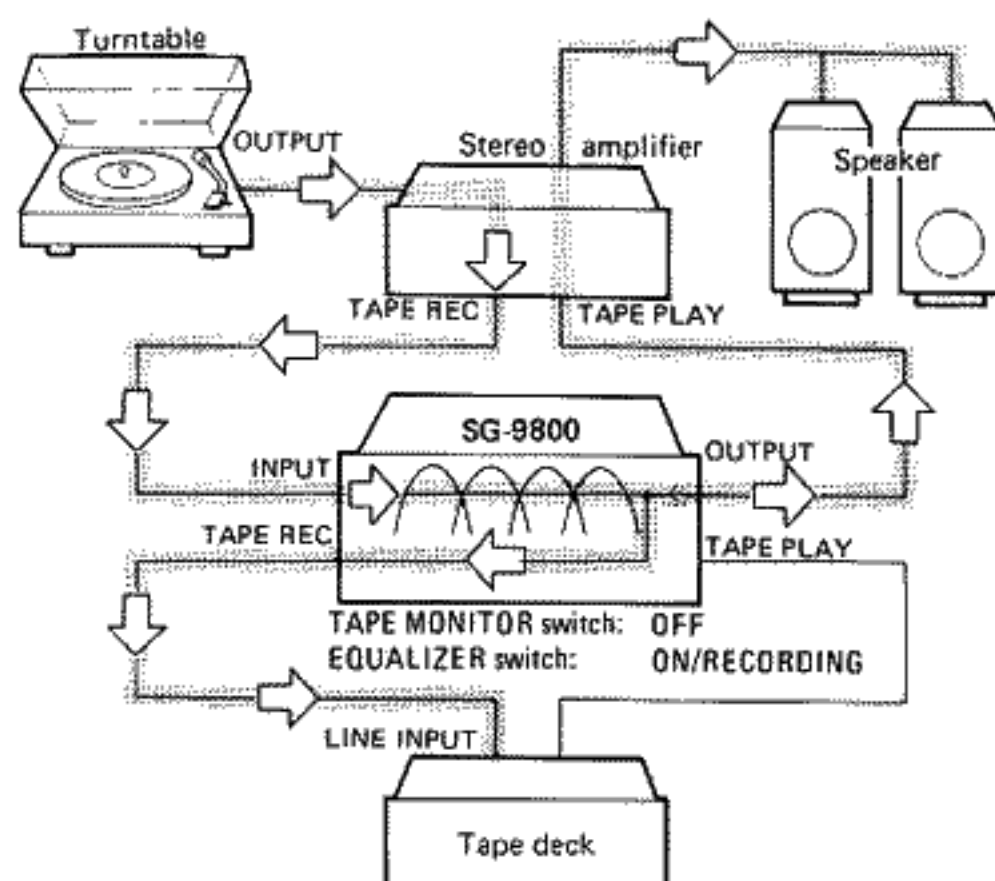


Fig. 6

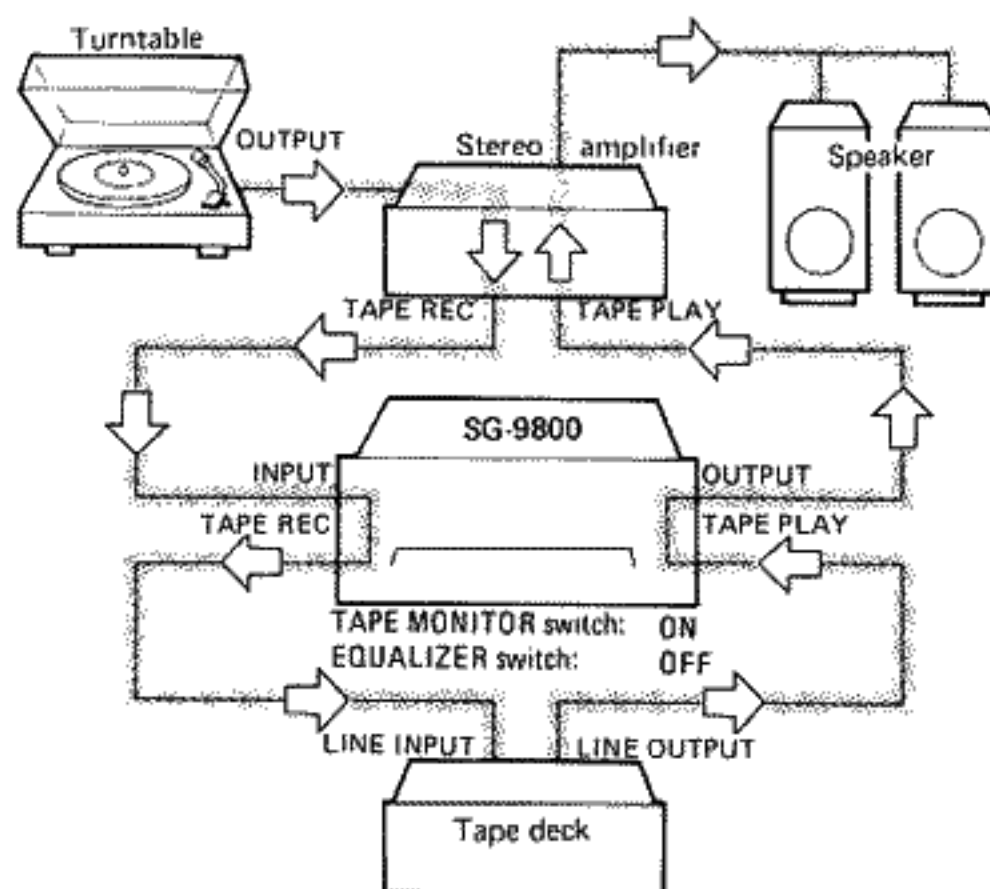


Fig. 7

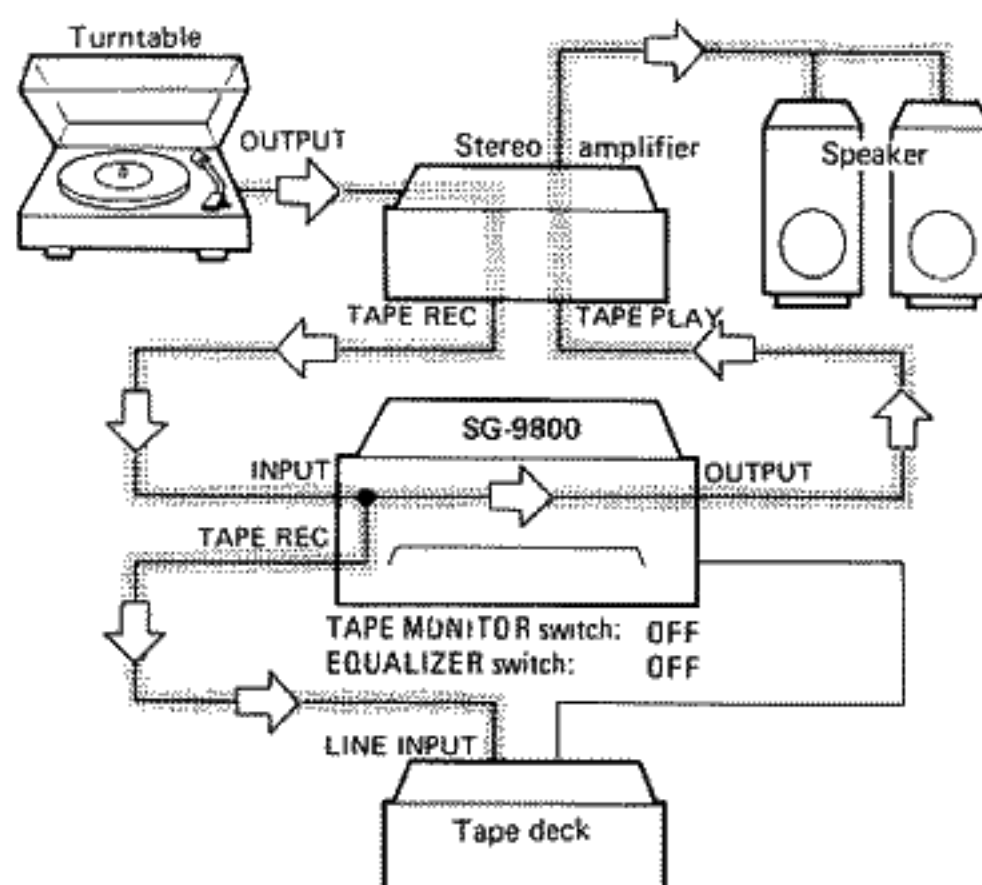


Fig. 8

NOTE:

When no equalization is performed, it will offer no problem to depress any control switch on the SG-9800 after setting its POWER switch to OFF.

EFFECTIVE OPERATION

The complex control functions of the SG-9800 are not limited merely to the equalization of a simple program source, but can also provide precise tone corrections for the playback equipment (turntable and tape deck), speakers and listening room. Musical program sources can also be modified to improve the sound of technically inferior recordings or to tailor them to suit your personal taste. Since the SG-9800 is a highly versatile audio component, the practical examples and hints described in the following paragraphs are provided as an aid to deriving maximum benefit from its capabilities.

Equalization of Playback Components (Various Components)

When referring to the frequency response of a typical cartridge, shown in Fig. 9, deviations can be noted in the low, middle and high frequency regions. Compensation using the tone controls of an ordinary amplifier still fails to suppress the undulations and peaks (Fig. 9) in the response curve; the SG-9800, however, permits an overall flat response to be obtained by providing independent fine adjustment for each band (Fig. 10).

In the field of tape recording, considerable differences in playback response can be observed according to the type of tape deck (open reel or cassette) and tape (standard, high performance, chrome, etc.). This does not present a serious problem in practice, since the tape decks are provided with the necessary equalization. However, full equalization for tape types plus maker differences can be considered quite difficult. An example of this is shown in Fig. 11. Tone improvement can be expected in this case by compensating for frequencies below 64Hz and above 4kHz.

Dynamic microphone response is exemplified in Fig. 12. Correction for low frequencies and above medium high frequencies is also effective in this case. Other important applications in connection with microphones include controlling the proximity effect (low frequency increase when microphone is used at close range) and howling (interference due to acoustic feedback at low and high frequencies) by cutting frequencies below 64Hz, plus correcting for microphone directionality during live recording by adjusting high frequencies (Figs. 11 and 12). While checking the frequency response during equalization is most typically performed by ear from the speakers, this is quite difficult to do without experience. It is therefore recommended to make adjustments by means of a special frequency response test record or tape and a voltmeter. Final minor adjustments can then be easily performed by ear.

Equalizing Musical Program Source

The sound quality of recorded music is often ascribed to

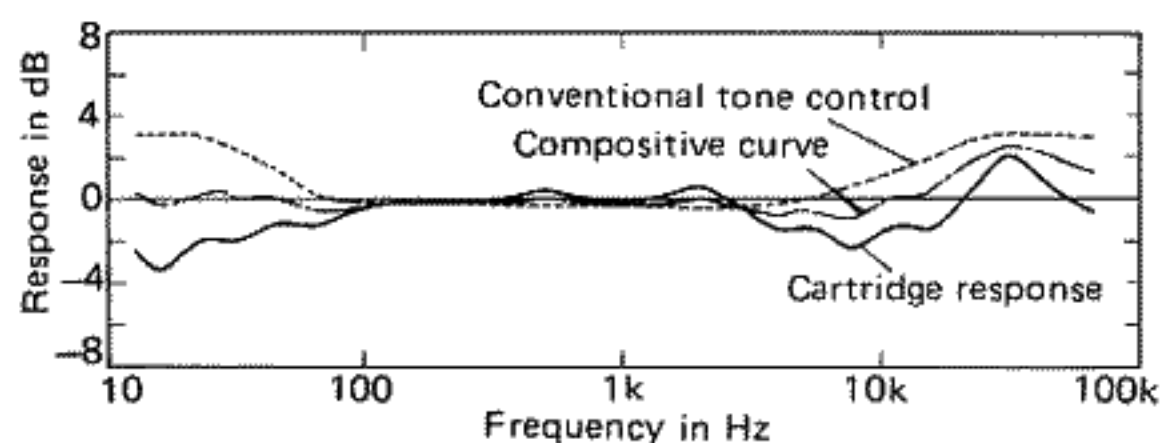


Fig. 9 MM cartridge high frequency compensation with conventional tone controls

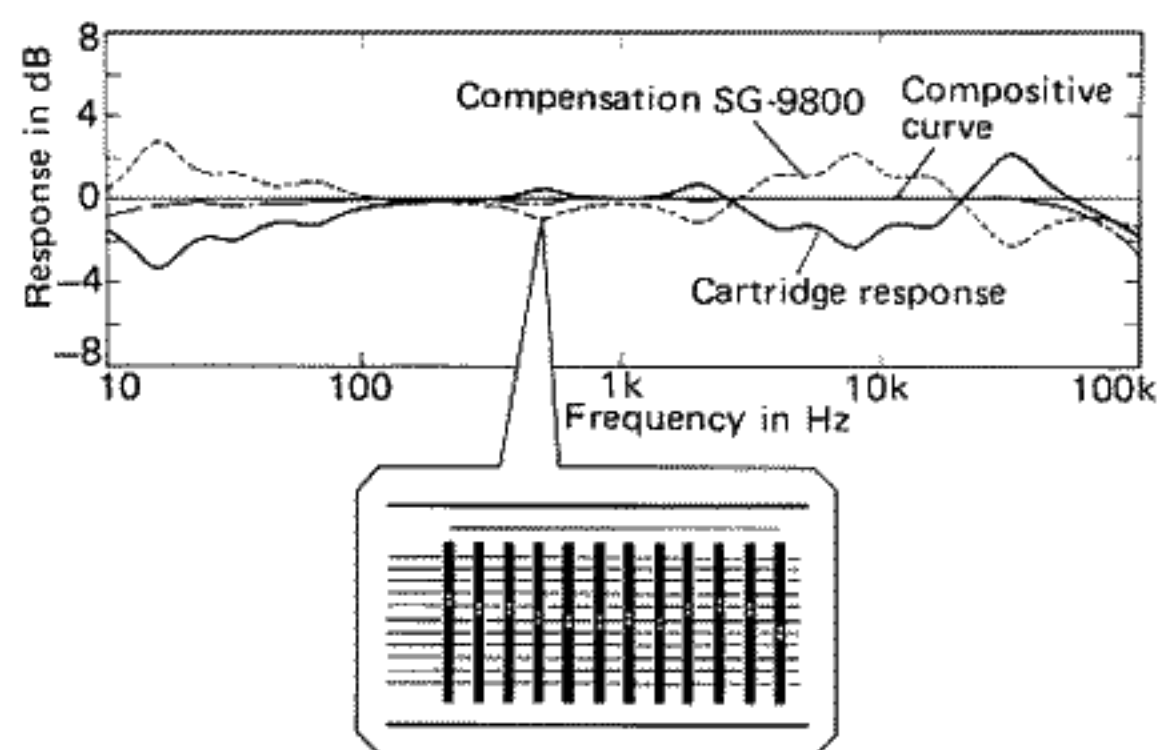


Fig. 10 MM cartridge high frequency compensation with SG-9800

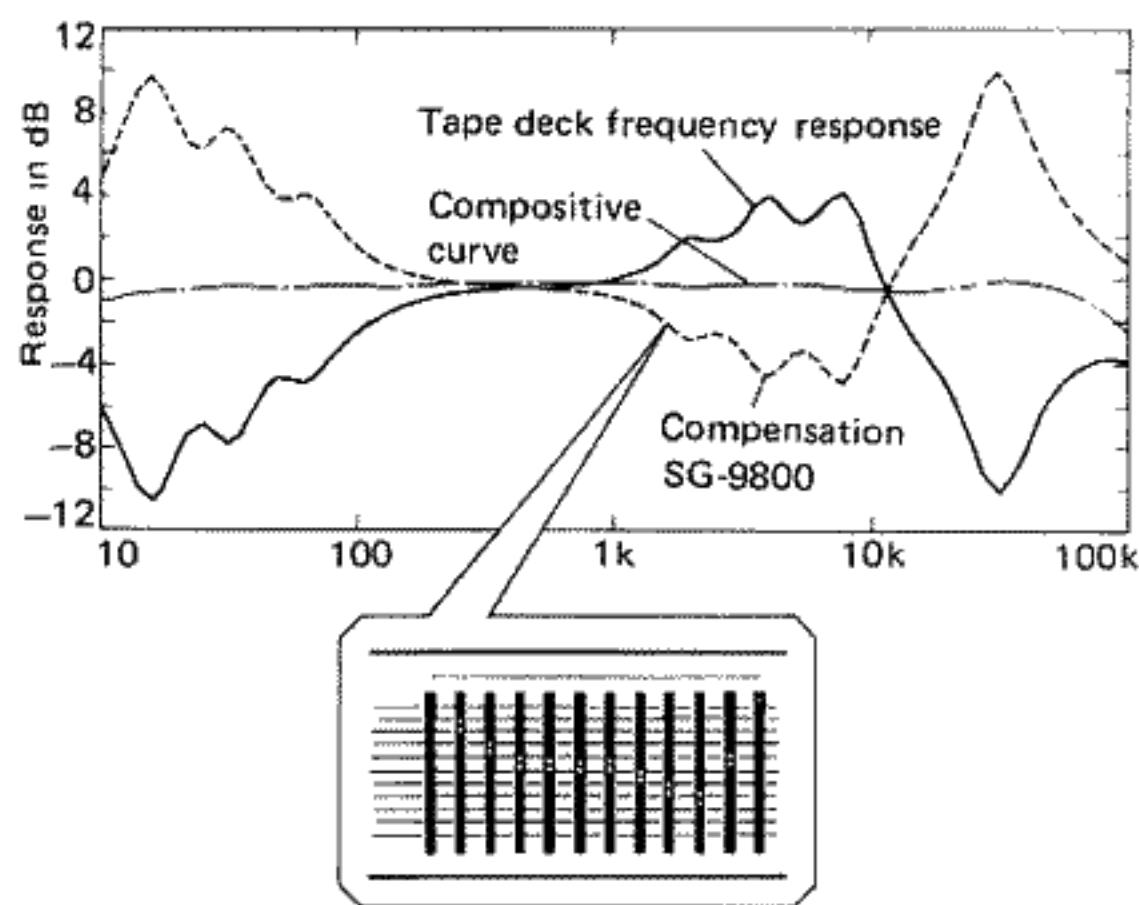


Fig. 11 Example of tape deck frequency response

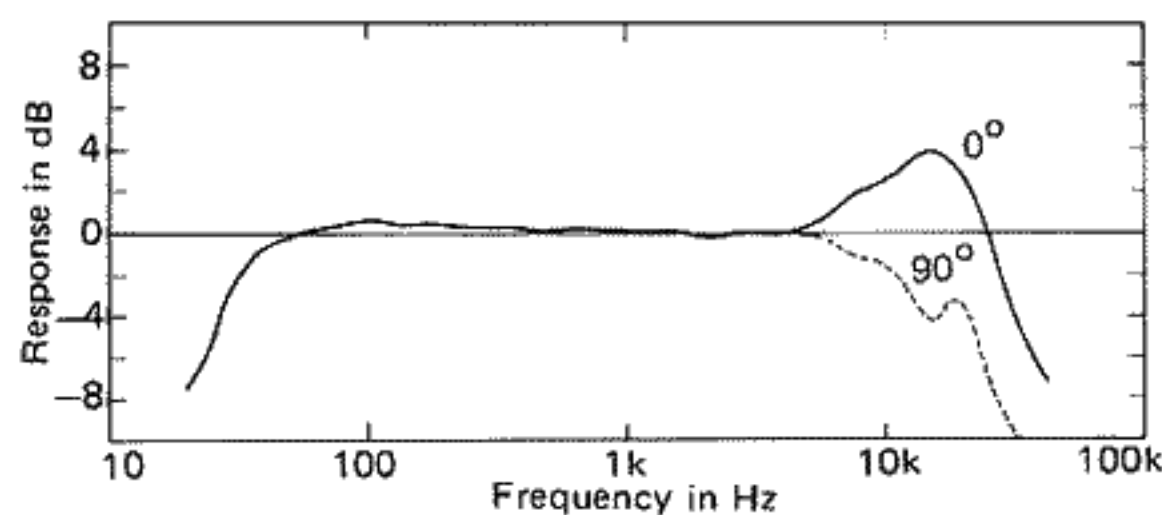


Fig. 12 Example of dynamic microphone response

the personal taste of the studio mixing engineer. To some extent this is true, since the mood of a recording can be varied by such effects as echoes and emphasis of particular instruments, factors which are controlled by the mixing engineer. The SG-9800 can equalize many of these effects at the time of reproduction and allow you to compose the sound according to your personal taste. To bring out the bass violins and drums, emphasize the frequencies below 250Hz, for vocalists increase the area from 500Hz ~ 2kHz, for strings 4kHz ~ 8kHz, and for cymbals above 8kHz. Control combinations are also important. For example, to emphasize low frequency bass violins, adjust not only the 250Hz control but also vary the positions of the high frequency controls. A brilliant and rich sound can then be produced. Left and right channel controls can also be adjusted according to musical instrument positioning a technique which may also enhance separation.

Compensation for Room Acoustics (Fig. 13)

Frequency characteristics of the listening room are subject to complex influences according to the listening position. Sound reflections are generally a problem in rooms surrounded by hard walls. High and low frequencies become enhanced, while an impression of inadequacy may be felt in the lower midrange. Spurious reflections are also high in such rooms and tend to disturb sound orientation (musical instrument positions).

In this type of situation, first improve the conditions as far as possible by such standard techniques as installing a thick carpet on the floor and draperies opposite the speaker systems, and by careful selection and arrangement of the furniture. After determining the listening position, the SG-9800 can then be used to adjust for optimum system performance. Changes in characteristics can be considerable according to the location.

The reverse effect can be noted in an excessively dead room (sound reflectivity too low) which can impart an inadequate impression to low and midrange frequencies. Equalization for high frequencies (including speaker response) then becomes necessary.

Recommended test instruments for evaluating room and speaker system acoustic characteristics consist of a low frequency oscillator, a microphone and flat amplifier whose characteristics are known, and a voltmeter (high sensitivity AC voltmeter). Employ these to construct a dB scale as shown in Fig. 14.

Since the SG-9800 controls are graduated in dB, equalization can easily be obtained by setting controls at values opposite of those obtained in the measurements. To check the efficacy of the tone adjustments (equalization), without disturbing the control settings, operate the EQUALIZER switch ON-OFF. A-B comparison can be heard directly.

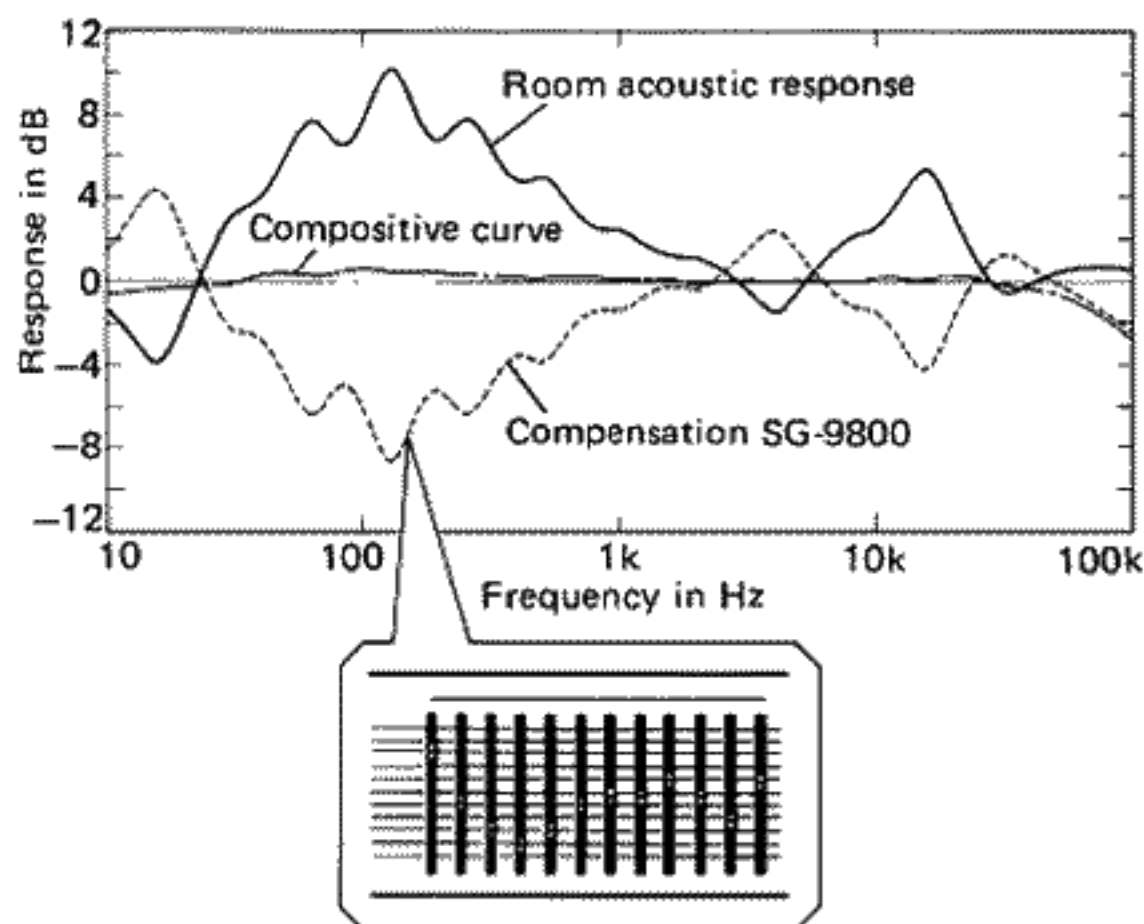


Fig. 13 Example of room acoustical response (transfer response)

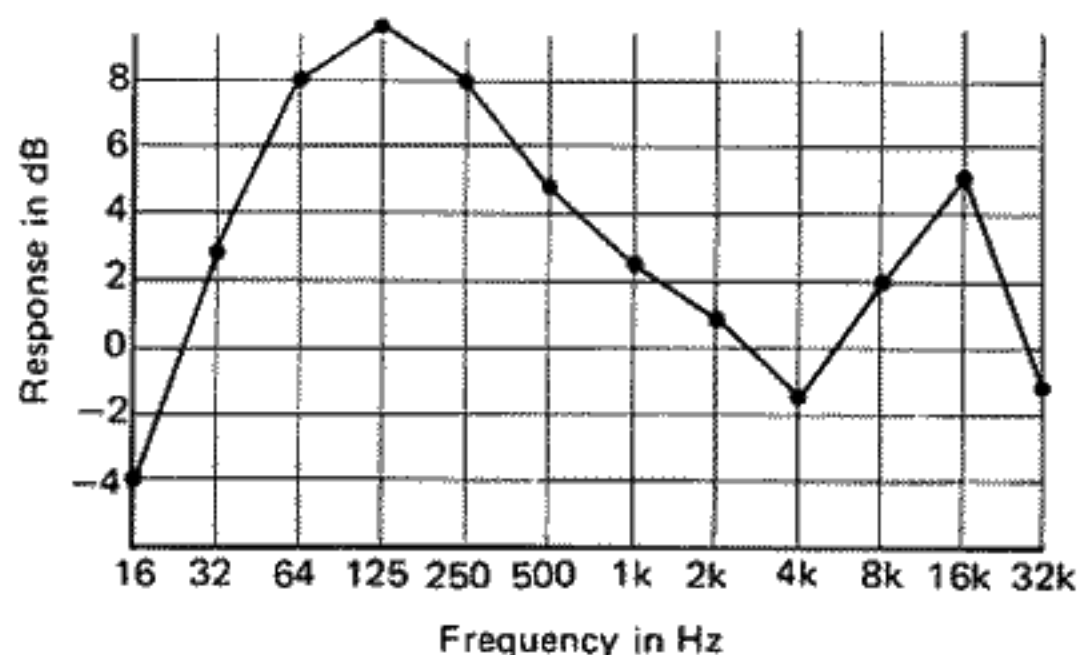


Fig. 14 Frequency line chart

SPECIFICATIONS

Semiconductors

ICs	27
FETs	2
Transistors	14
Diodes	19

Equalizer Section

Equalizer Range

(Individual channel adjust)	$\pm 10\text{dB}$
16Hz, 32Hz, 64Hz, 125Hz, 250Hz, 500Hz, 1kHz, 2kHz, 4kHz, 8kHz, 16kHz, 32kHz	

Total Harmonic Distortion

20Hz — 20kHz, All Control; Flat, Output: 1V	0.006%
10Hz — 30kHz, All Control; Flat, Output: 1V	0.02%
1kHz, All Control; Max., Output: 3V	0.01%
1kHz, All Control; Flat, Output: 2V	0.005%
1kHz, All Control; Min., Output: 1V	0.02%

Insertion Loss

0dB (Control; Flat)	
---------------------	--

Max. Output Voltage

(1kHz, THD.: 0.02%, RL 47k Ω)	7.5V
---------------------------------------	------

Frequency Response

5Hz — 100kHz	$\pm 0.3\text{dB}$
--------------	--------------------

Signal to Noise Ratio

(IHF, A Network, short circuited, 1V Output)	92dB
--	------

Input Impedance

50k Ω	
--------------	--

Output Impedance

600 Ω	
--------------	--

Miscellaneous

Power Requirements	WE, WB model; AC 220V-240V, 50/60Hz R, R/G model; AC 110V-120V/220V-240V (switchable), 50/60Hz
--------------------	--

Power Consumption	25W
-------------------	-----

Dimensions	420(W) x 150(H) x 355 (D)mm
------------	-----------------------------

16-1/2 x 5-7/8 x 14in	
-----------------------	--

Weight (without package)	7.1 kg, 15lb 8oz
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Furnished Parts

Connection Cord with Pin Plugs	2
--------------------------------	---

Operating Instructions	1
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NOTE:

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

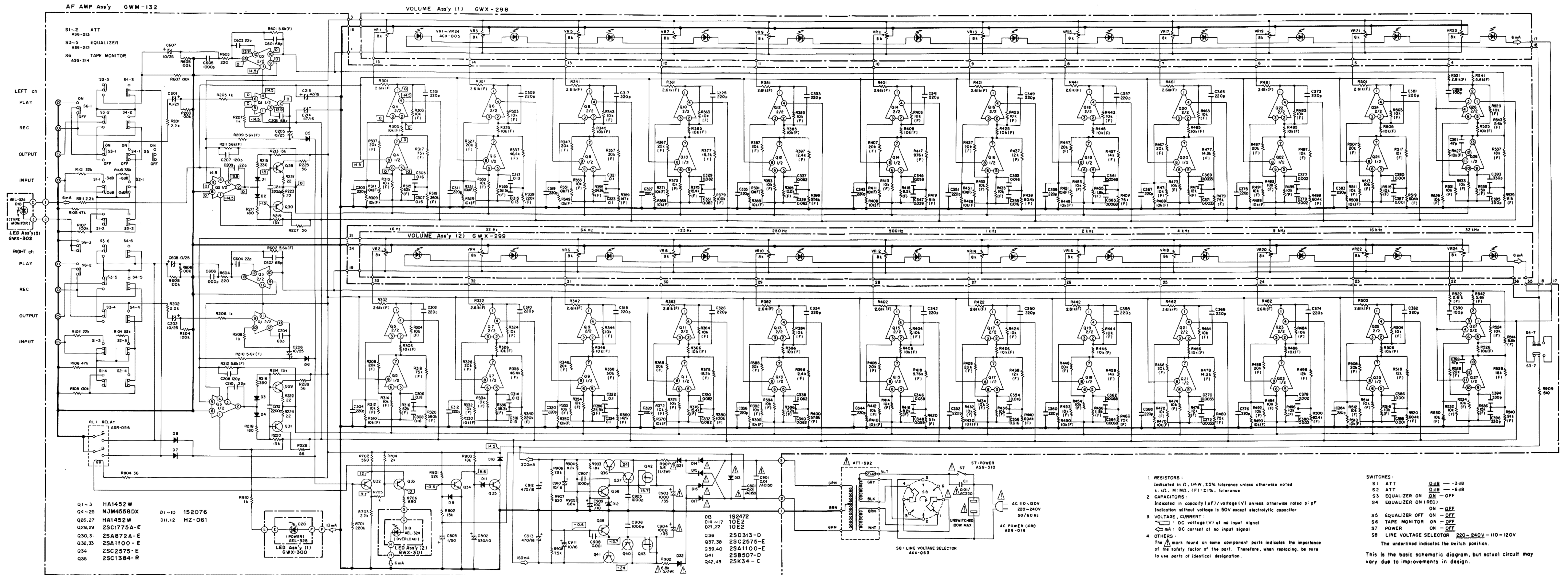
INSTALLATION CAUTIONS

To ensure the best sound quality and trouble-free operation, avoid setting up the graphic equalizer in any of the locations described below:

Locations liable to downgrade performance and result in breakdowns	Resulting trouble
1. Locations exposed to direct sunlight, or near heaters.	1. External heat causes the performance of the electronic parts to deteriorate, and operation becomes unstable.
2. Locations with poor ventilation, with high humidity or moisture contents, or dusty locations.	2. Cause of faulty contact in input-output terminals, and rust. High humidity and a high moisture content cause deterioration in insulation. There is also the danger of current leakage and heat generation in the circuit parts. Dust or grease in the rotating parts causes them to deteriorate.
3. Locations susceptible to vibration.	3. These locations affect the precision parts adversely.

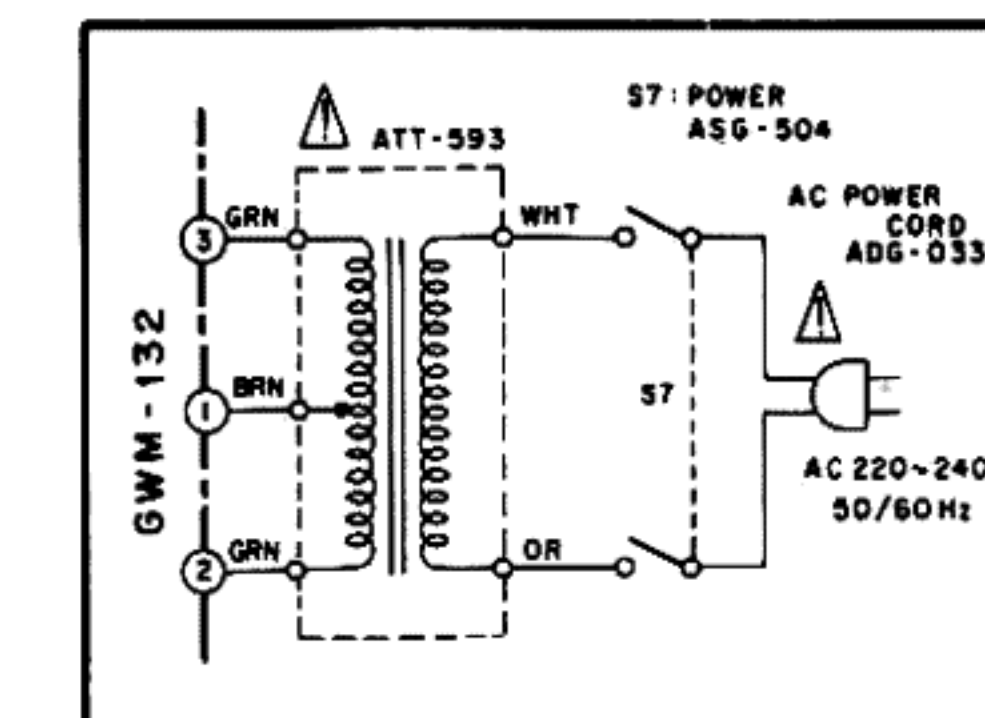
PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
U.S. PIONEER ELECTRONICS CORPORATION 85 Oxford Drive, Moonachie, New Jersey 07074, U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Luithagen-Haven 9, 2030 Antwerp, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

This schematic diagram is R, R/G models.



This schematic diagram is WE, WB models.

EUROPE MODEL ONLY (WE model)



UNITED KINGDOM MODEL
ONLY (WB model)

