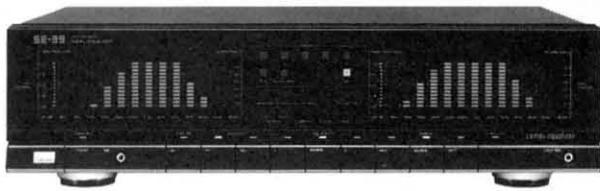


SE-99

OPERATING INSTRUCTIONS
MODE D'EMPLOI
MANUAL DE INSTRUCCIONES



SE-99: Precautions for Use

- * Do not connect a microphone other than the RE-99 remote control microphone (or EM-99 condenser microphone) to the MIC jack on the front panel of this unit. If you connect another microphone to this jack, noise will be emitted and a breakdown may occur. Also, automatic sound space compensation measurement and reverberation time measurement will not be possible.
- * The TAPE PLAY terminals at the back of the unit are provided with shorting pin plugs. These are for reducing noise when nothing is connected to the TAPE PLAY terminals. When you wish to connect a tape deck to the TAPE PLAY terminals, first remove these shorting pins. Do not insert these shorting pins into the TAPE REC or other terminals apart from the TAPE PLAY terminals because this may cut off all sound from the speakers.

SE-99: Précautions d'utilisation

- * Ne pas relier de microphone autre que le microphone commandable à distance RE-99 (ou le microphone à condensateur EM-99) à la prise MIC du panneau avant de l'appareil. Si l'on relie un autre microphone à cette prise, cela engendrera des parasites et on risque de provoquer une panne. De même, la mesure de la compensation automatique d'espace sonore et la mesure du temps de réverbération ne seraient pas possibles.
- * Les bornes TAPE PLAY qui se trouvent au dos de l'appareil sont dotées de fiches à broche court-circuitantes. Elles permettent de réduire les parasites lorsqu'on ne relie pas d'appareil à ces bornes. Pour relier un magnétophone aux bornes TAPE PLAY, retirer tout d'abord ces fiches court-circuitantes. Ne pas insérer ces fiches court-circuitantes dans les bornes TAPE REC ou toute borne autre que les bornes TAPE PLAY car ceci risquerait de couper le son des enceintes.

SE-99: Precauciones para su utilización

- * No conectar otro tipo de micrófono que no sea el micrófono de control remoto RE-99 (o el micrófono de electreto EM-99) en la toma MIC del panel delantero de este aparato. Si se conecta otro tipo de micrófono en esta toma, se emitirán ruidos y podría ocurrir una avería. Además, la medición automática de compensación de espacio de sonido y la medición del tiempo de reverberación no serán posibles.
- * Los terminales TAPE PLAY situados en la parte posterior del aparato disponen de clavijas cortocircuitadoras que reducen el ruido cuando no hay nada conectado en los terminales TAPE PLAY. Cuando se desee conectar una grabadora en los terminales TAPE PLAY, quitar primero estas clavijas cortocircuitadoras. No insertar estas clavijas cortocircuitadoras en los terminales TAPE REC, u otro tipo de terminales que no sean los terminales TAPE PLAY ya que de lo contrario, el sonido de los altavoces quedará cortado.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



Le symbole à flèche brisée dans un triangle équilatéral a pour but d'attirer l'attention de l'utilisateur sur la présence, à l'intérieur du coffret, d'une "tension dangereuse" non isolée qui est d'une importance suffisante pour constituer un risque de décharge électrique pour les êtres humains.



Le point d'exclamation dans un triangle équilatéral a pour but de signaler à l'utilisateur la présence d'explications importantes, relatives à l'exploitation et à l'entretien, dans le texte accompagnant l'appareil.



La iluminación parpadea con un símbolo de flecha, dentro de un triángulo equilátero, para avisar al usuario de la presencia de "tensión peligrosa" no aislada dentro de la caja del aparato de una magnitud suficiente para constituir peligro de descargas eléctricas para las personas.



El punto de exclamación de dentro del triángulo equilátero es para avisar al usuario de la presencia de instrucciones importantes de operación y mantenimiento (servicio) en los manuales que se sirven con el aparato.

ENGLISH

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WARNING: To prevent fire or shock hazard, do not expose this appliance to rain or moisture.

- The Model No. and Serial No. of your unit are shown on its back panel.

FRANÇAIS

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14~23

ATTENTION: Pour éviter les dangers d'électrocution ou d'incendie, ne pas exposer cet appareil à la pluie ou à l'humidité.

- Le numéro du modèle et le numéro de série de l'appareil sont inscrits sur son panneau arrière.

ESPAÑOL

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24~33

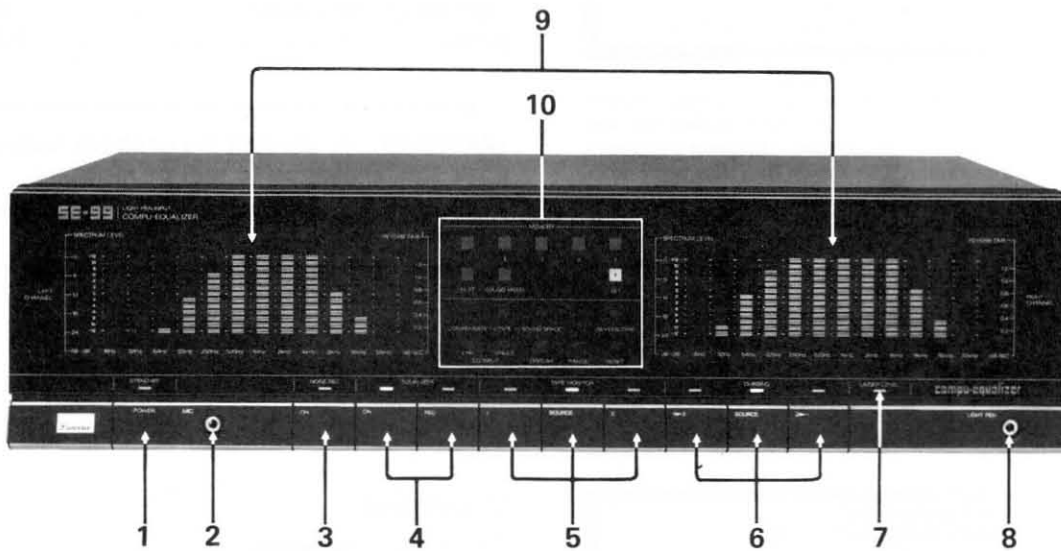
AVISO: Para evitar incendios y descargas eléctricas, no exponer este aparato a la lluvia ni a la humedad.

- El Nº de modelo y el Nº de serie de este aparato están impresos en el panel posterior.

Panel information (Turn to page 6 for details.)

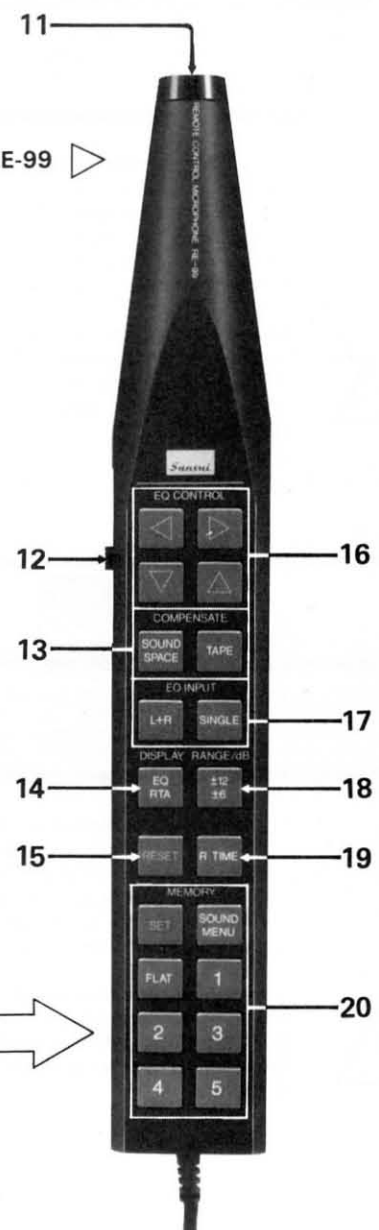
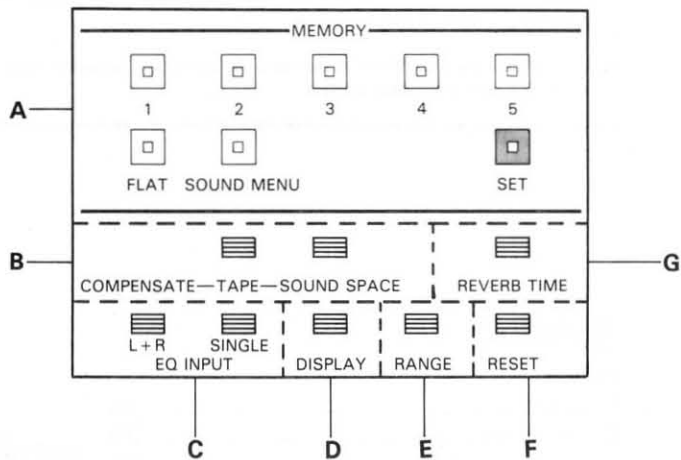
Indications sur le panneau (Se reporter à la page 16 pour de plus amples détails.)

Información del panel (Consultar la página 26 para más detalles.)



Indicators
Témoins
Indicadores

Remote control microphone RE-99
Microphone commandable à distance RE-99
Micrófono de control remoto RE-99



* The RE-99 remote control microphone is not provided with units sold in some areas. In such cases, the EM-99 condenser microphone is provided instead.

* Dans certaines régions, le microphone commandable à distance RE-99 n'est pas fourni avec l'appareil. Dans ce cas, c'est le microphone à condensateur EM-99 qui est fourni.

* El micrófono de control remoto RE-99 no se ha provisto con aparatos destinados a ciertos países. En tales casos, en su lugar se ha provisto el micrófono de electrero EM-99.

Thank you for purchasing this fine SANSUI product. Taking the time to read these operating instructions carefully before use will acquaint you fully with all its features and help ensure optimum performance.

* In order to simplify the explanation illustrations may sometimes differ from the originals.

Precautions

Power plug

When disconnecting the power cord from the power outlet, always take hold of the plug, and not the wire, and pull free. Never connect or disconnect the power plug with wet hands since you may receive an electric shock.

- * Remember to disconnect the power plug from the power outlet when you do not intend to use the unit for a prolonged period of time.

Do not remove the case and bottom panel

Any inspections or adjustments inside the unit may lead to malfunctions and electric shocks. Do not touch any of the inside parts. SANSUI's warranty is not effective if a deterioration in the unit's performance results from remodeling inside.

Installation precautions

Do not install the unit in any of the following locations since this may result in a deterioration in performance or malfunction:

- * Locations exposed to direct sunlight or near objects radiating heat such as heating appliances.
- * Locations exposed to moisture or humidity.
- * Locations with poor ventilation exposed to dust and dirt.
- * Locations which are unstable and not perfectly flat or which are susceptible to vibration.
- * On top of a high power output amplifier, audio components or any other product which radiates heat.

Do not wipe with thinners

Wipe the panels and case from time to time with a soft cloth. Using any kind of thinner, alcohol or volatile liquid will mar the surface, cause blotching on the exterior and erase the markings and should therefore be avoided.

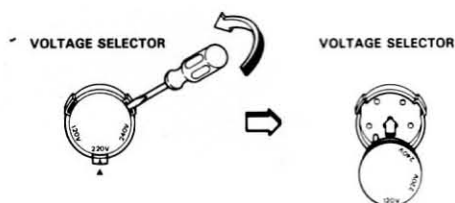
Do not use insecticide sprays in the vicinity.

Before connecting the power plug

Before connecting the power plug to an electrical outlet, check to be sure that the unit is set to the proper voltage for your area. If the voltage of the unit is improperly set, fire hazard or damage to the unit may result. If you find that the unit is not set to the proper voltage for your area, follow the instructions listed below:

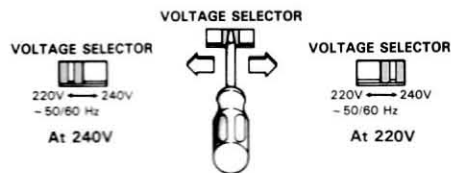
• Units with 120V/220V/240V VOLTAGE SELECTOR on the rear panel

These units are set at either 120V, 220V or 240V with the VOLTAGE SELECTOR. To change the voltage use a minus screwdriver to remove the plug, and reinsert it so that the mark (▲) matches the desired voltage.



• Units with 220V/240V VOLTAGE SELECTOR switch at rear panel

These units are set at either 220V or 240V with the VOLTAGE SELECTOR switch. To change the voltage, use a minus screwdriver or similar device to slide the switch.



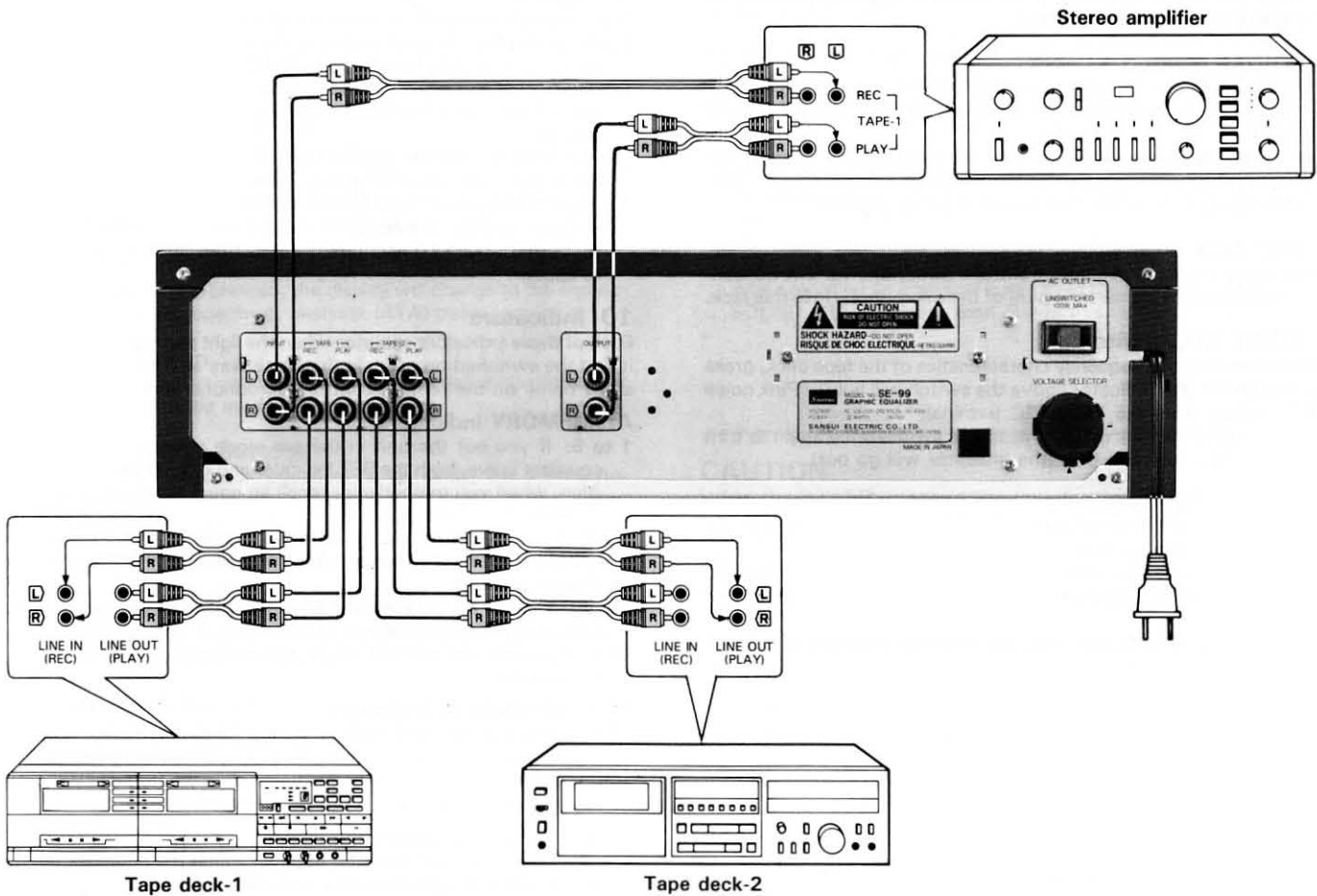
• On units not equipped with a voltage selector

Some units are not provided with a voltage selector due to laws and ordinances in the areas in which they are sold; these units have been preset to a specific voltage. If you wish to use the unit in an area with a differing voltage, consult your nearest SANSUI Service Station, or the dealer where you purchased the unit.

Connections

* Mains plug may vary to some extent depending on sales area, local laws and regulations.

ENGLISH



Connection precautions

- * When connecting, either disconnect the power plug from the power outlet or turn off the unit's power using the POWER switch.
- * Before connecting, read through the Operating Instructions of the other audio components which will be connected to this unit.
- * Check the left and right channels and connect properly (L to L and R to R).
- * Insert the plugs securely. Improper connection can lead to the generation of noise.

Amplifier or receiver connections

Connect the TAPE REC terminals on the amplifier or receiver to the INPUT terminals on the SE-99 and connect the TAPE PLAY terminals on the amplifier or receiver to the OUTPUT terminals on the SE-99.

Tape deck connections

Connect the TAPE REC terminals on the SE-99 to the LINE IN/REC terminals on the tape deck and the TAPE PLAY terminals on the SE-99 to the LINE OUT/PLAY terminals on the tape deck.

There are two sets of tape terminals on this unit. Connect the second tape deck to the TAPE-2 terminals.

AC OUTLET

This unit is provided with auxiliary AC outlet which are handy for connecting a tape deck to supply power to these units. It provides power continuously, regardless of whether the power switch is ON or OFF. The maximum capacity of this power outlet is 100W. Do not attempt to exceed this capacity as this is very dangerous. Before connecting equipment to it, verify the rated power consumption of the equipment.

NOTE: Depending on the laws and regulation enforced locally, models without AC outlet may be supplied to some areas. Also, depending on the sales area, the shape of the AC outlet and their capacity may differ.

Panel information

* Please read the following explanation while referring to the photographs on page 3.

* When the unit is switched on or a control switch is pressed, an electronic tone will be emitted.

1 POWER Switch

Power is supplied to the unit when this switch is depressed to ON. When released to the STAND-BY position, the main circuitry power is cut off.

* In the STAND-BY position, none of the functions will operate, but power is supplied to a part of the circuits. The STAND-BY indicator lights to indicate that power is being supplied.

2 MIC Jack

When using the RE-99 remote control microphone (or EM-99 condenser microphone), insert the plug of the microphone into this jack.

3 NOISE REC Switch

When measuring the frequency characteristics of the tape deck, press this switch ON (the indicator above the switch will light). Pink noise will be output from the TAPE REC terminal.

After recording the pink noise, press this switch once again to turn the NOISE REC function OFF (the indicator will go out).

4 EQUALIZER Switches

ON: Press this switch when applying frequency compensation to the sound being played back.

REC: Press this switch when applying frequency compensation to a source being recorded on a tape deck which is connected to this unit.

By pressing one of these switches, the indicator above the switch will light.

5 TAPE MONITOR Switches

1: Press this switch when playing back a tape in a tape deck connected to the TAPE-1 terminals.

SOURCE: Press this switch when reproducing signals (such as those from a record or broadcast) from the amplifier.

2: Press this switch when playing back a tape in a tape deck connected to the TAPE-2 terminals.

By pressing one of these switches, the indicator above the switch will light.

6 DUBBING Switches

1 ► 2: Press this switch when copying a tape from the tape deck connected to the TAPE-1 terminals onto a tape deck connected to the TAPE-2 terminals.

SOURCE: Press this switch for reproducing signals (such as those from a record or broadcast) from the amplifier.

It is possible to record with two tape decks connected to the TAPE terminals.

2 ► 1: Press this switch when copying a tape from the tape deck connected to the TAPE-2 terminals onto a tape deck connected to the TAPE-1 terminals.

By pressing one of these switches, the indicator above the switch will light.

7 UNDER LEVEL Indicator

This indicator will flash if the playback level of the pink noise is less than that necessary for measuring the frequency characteristics or reverberation time of your listening room.

8 LIGHT PEN Jack

When using a light pen, insert the plug of the light pen into this jack.

9 Display

This displays an equalizer curve or spectrum analyser curve.

Equalizer display: The set status of the equalizer curve is indicated using 12 frequency bands and a level range of ± 12 dB (or ± 6 dB).

Spectrum analyser display: The program source signals are divided into 12 frequency bands, and the signal level for each band is displayed.

The level display has a peak hold function which automatically holds the peak value for about 2 seconds.

* If you press one of the DISPLAY switch while using the spectrum analyser display, the equalizer display will automatically appear, then after about 10 seconds the spectrum analyser display will re-appear.

10 Indicators

Each of these indicators operates when the light pen is pressed against it and the switched pressed, in the same way as if the button of the same name on the remote control microphone was pressed.

A) MEMORY Indicators

1 to 5: If you put the unit in the set mode when memorizing the equalizer curve, both the SET indicator and this indicator will flash.

Also, when you memorize or recall an equalizer curve, one of indicators 1 to 5 will light.

FLAT: If you recall flat data which was obtained by measurement using the automatic sound space compensation function, this indicator will light.

SOUND MENU: If you recall an equalizer curve from the sound menu, both this indicator and one of indicators 1 to 5 will light.

SET: If you activate the SET mode, this indicator will flash for about 10 seconds.

B) COMPENSATE Indicators

TAPE: This indicator will flash while the frequency response is being measured during recording or playback on a tape deck.

SOUND SPACE: This indicator will flash while the frequency characteristics of the listening room are being measured.

C) EQ INPUT Indicators

L + R: While this indicator is lit, you can adjust the equalizer curves of the left and right channels simultaneously.

SINGLE: While this indicator is lit, you can adjust the equalizer curves of the left and right channels separately.

D) DISPLAY Indicator

This indicator will light for exactly one second when the display is switched to the equalizer mode or the spectrum analyser mode.

E) RANGE Indicator

This indicator will light when the level range of the equalizer display is set to ± 6 dB.

F) RESET Indicator

This indicator will light for exactly one second when the equalizer curve is reset.

G) REVERB TIME Indicator

This indicator will flash while the reverberation time is being measured. When measurement is completed, the indicator will stop flashing and glow steadily.

(Remote control microphone RE-99)

11 Microphone

12 ON/OFF Switch

This switch is used to turn the microphone ON/OFF. When using the microphone, set this switch to ON.

13 COMPENSATE Buttons

SOUND SPACE: Press this button when you wish to measure the frequency characteristics of the listening room.

TAPE: Press this button when you wish to measure the frequency characteristics during tape recording or playback.

14 DISPLAY Button

Each time this button is pressed, the display will change to the equalizer (EQ) mode or the spectrum analyser (RTA) mode.

15 RESET Button

Press this button when you wish to make an equalizer curve flat, or interrupt the automatic measuring function.

16 EQ CONTROL Buttons

When you wish to adjust an equalizer curve, select the desired frequency using the "◀" and "▶" buttons, then set the level using the "▼" and "▲" buttons.

17 EQ INPUT Buttons

When you wish to adjust the equalizer curves for the left and right channels simultaneously, press the L + R button.

When adjusting the equalizer curves for the left and right channels separately, press the SINGLE button.

18 RANGE/dB Button

Each time you press this button, the level range of the equalizer display will switch to ± 12 dB or ± 6 dB.

19 R. (Reverb) TIME Button

Press this button when you wish to measure the reverberation time.

20 MEMORY Buttons

SET: Press this button when you wish to memorize an equalizer curve.

SOUND MENU: Press this button and then one of buttons "1" to "5" when you wish to recall an equalizer curve from the sound menu.

FLAT: Press this button when you wish to recall flat data which was obtained by measurement using the automatic sound space compensation function.

1 to 5: Press one of these button to recall an equalizer curve from the user's memory.

When recalling an equalizer curve from the sound menu, press the SOUND MENU button, then press this button.

CAUTION

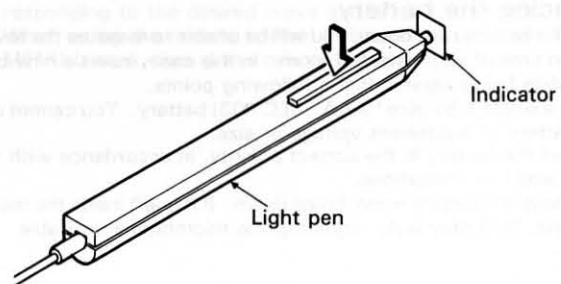
When the POWER switch of this unit is put in the STAND-BY position, the unit will stop functioning, however current will continue to flow through part of the circuit.

When power is being supplied, the STAND-BY indicator lights. When not used for a long period of time, remove the power plug from the AC outlet to cut off power.

Using the light pen

Insert the plug of the light pen into the LIGHT PEN jack, press the tip of the light pen against the indicator, then press the switch of the light pen. An electronic tone will be emitted and the indicator will light (or flash), and the mode corresponding to the indicator will be activated.

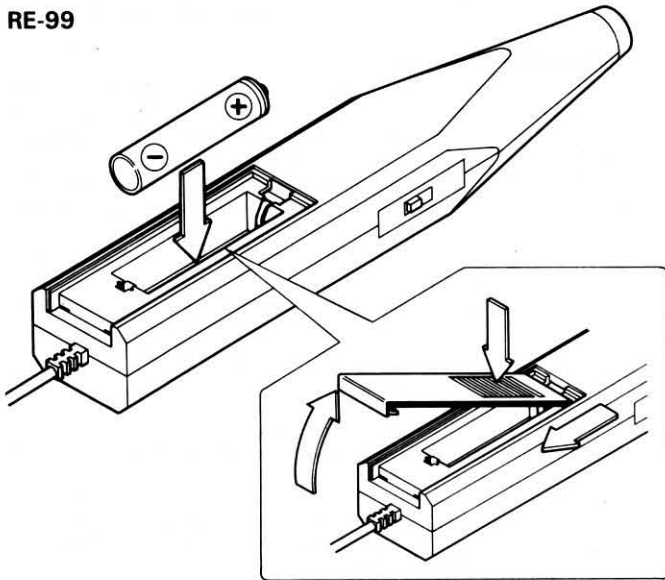
- * When using the light pen, press it against the indicator at right angles to it.
- * When not using the light pen, disconnect the plug from the LIGHT PEN jack. The display pattern will change.



Operating procedures

* This unit is provided with each an RE-99 remote control microphone or an EM-99 condenser microphone, depending upon the area in which the unit is sold.

RE-99



Inserting the battery

The condenser microphone will not operate unless the battery is inserted.

Refer to the illustration and insert the "AAA" (IEC R03) battery provided into the microphone according to the following procedure.

For RE-99 remote control microphone

1. Slide the battery holder cover at the back of the remote control microphone about 5 mm while pressing the grooved portion, then raise the cover from the rear and remove it.
2. Insert the single "AAA" (IEC R03) dry battery provided. When inserting the battery, refer to the diagram to ensure that you do not insert it in the reverse polarity.
3. Re-install the battery holder cover in the reverse sequence.

For EM-99 condenser microphone

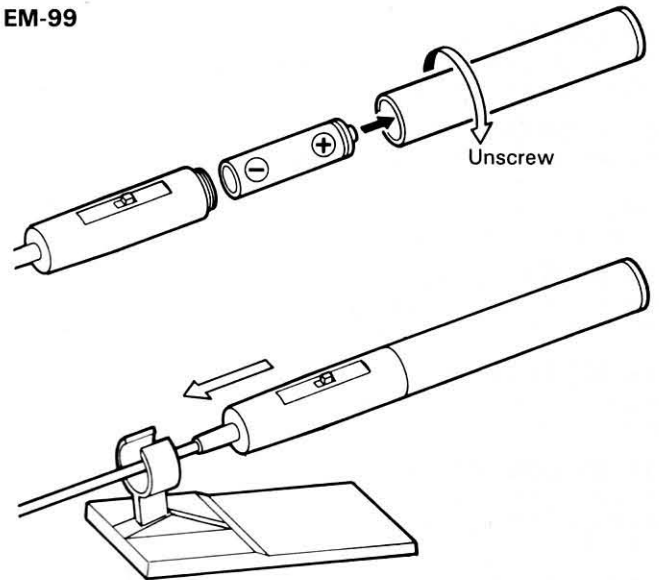
1. Rotate the microphone body clockwise as shown in the illustration, and remove it.
2. Insert the "AAA" (IEC R03) dry battery provided, taking care not to insert it in the reverse polarity. Insert the (+) side first.
3. Re-install the microphone body by rotating it counterclockwise.
4. Attach the microphone to the accessory microphone stand by sliding it into place from the side where the microphone cord is attached.

Replacing the battery

When the battery runs down, you will be unable to measure the reverberation time of your listening room. In this case, insert a new battery, while being careful of the following points.

- * Use a single 1.5V size "AAA" (IEC R03) battery. You cannot use a battery of a different voltage or size.
- * Insert the battery in the correct polarity, in accordance with the (+) and (-) indications.
- * Remove the battery when it runs down. If it is left inside the microphone, fluid may leak, rendering the microphone unusable.

EM-99



Method of adjusting equalizer curve

You can adjust an equalizer curve using either the light pen or the remote control microphone.

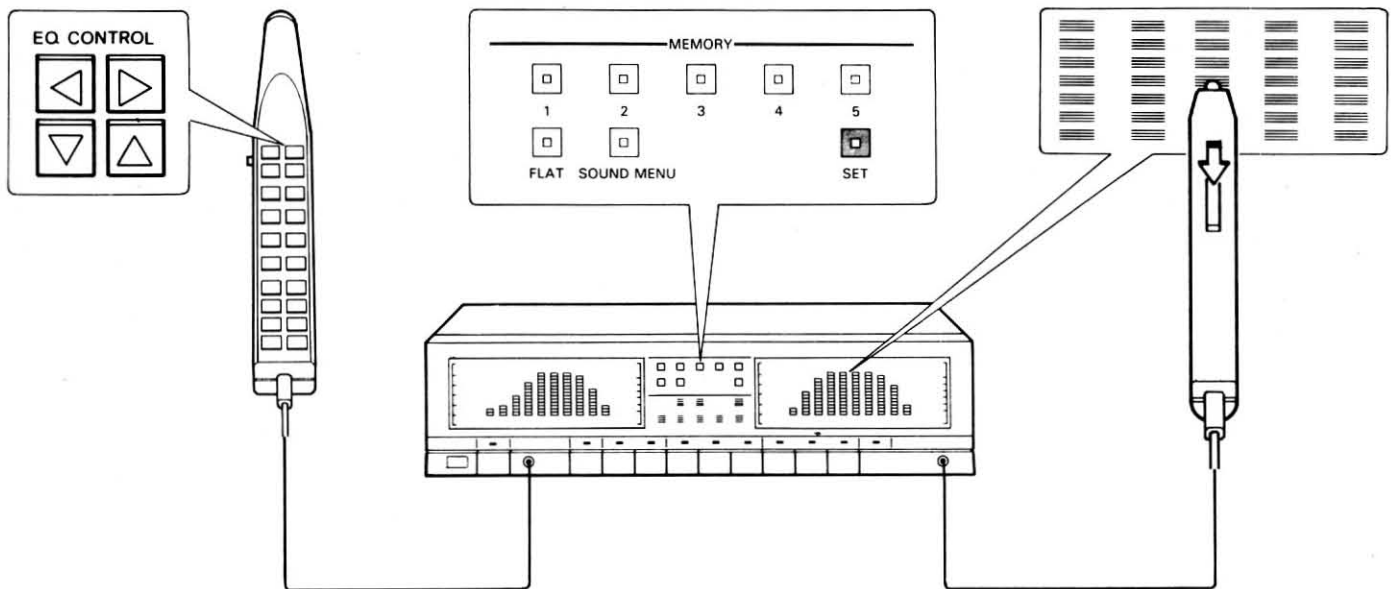
- * By setting the EQ INPUT mode to L + R (indicator will light), you can set the left and right channels simultaneously. By setting the mode to SINGLE (indicator will light), you can set each channel separately.

Adjustment using light pen

1. Insert the plug of the light pen into the LIGHT PEN jack.
2. When the display is set to the spectrum analyser mode, press the light pen against the DISPLAY indicator, then press the switch to activate the equalizer mode. The DISPLAY indicator will light for exactly one second.
3. Press the light pen against the L + R or SINGLE indicator of EQ INPUT, then press the switch to bring up the mode corresponding to the particular indicator.
4. Press the light pen against the bar corresponding to the desired frequency and level, then press the switch. The corresponding bar will light.

Adjustment using remote control microphone

1. Insert the plug of the remote control microphone into the MIC jack.
 2. Press the L + R or SINGLE button of EQ INPUT.
 3. Press one of the four EQ CONTROL buttons, the 16 Hz bar will flash (left channel).
 4. Each time you press the "◀" or "▶" button, the flashing of the bar will shift horizontally. When the end frequency flashes, the flashing indication will remain there. If you press the button continuously, the frequency will change continuously, however the bars will not flash. Each time you press the "▼" or "▲" button, the flashing bar will move down or up, and will stop when it reaches the level corresponding to the lower limit of upper limit. If you press the button continuously, the flashing bar will move continuously.
- * If you press the EQ CONTROL button when the display is in the spectrum analyser mode, the equalizer mode will automatically appear, and after adjustment is completed the spectrum analyser mode will reappear in about 10 seconds.
 - * The display can be switched between ± 6 dB (1 dB steps) and ± 12 dB (2 dB steps) either by pressing the light pen against the RANGE indicator and pressing the switch, or by pressing the RANGE/dB button of the remote control microphone.



User's memory

You can make and memorize up to five equalizer curves and recall any one of them by pressing a single button.

1. Set the desired equalizer curve in accordance with "Method of adjusting equalizer curve".
 2. Press the light pen against the SET indicator and press the switch, or press the SET button of the remote control microphone. The SET indicator and indicators 1 to 5 of MEMORY will flash for about 10 seconds.
 3. While the indicators are flashing, either press the light pen against indicator 1 and press the switch, or press button 1 of the remote control microphone. Indicator 1 will change from a flashing indication to a steady glow, and the equalizer curve will be memorized in circuit 1 of the user's memory. Repeat operations 1 to 3 and memorize the desired equalizer curves in circuits 2 to 5 of the user's memory.
 4. The memorized equalizer curves can be recalled simply by pressing the light pen against one of indicators 1 to 5 and pressing the switch, or by pressing one of remote control microphone buttons 1 to 5.
- * When you memorize a new equalizer curve in the memorized user's memory circuit, the previous equalizer curve will be erased.

Caution

The contents of the user's memory (and flat memory) will be retained when the POWER switch is pressed to turn off the unit. If, however, the power plug is pulled out from the power outlet, the memory will be erased.

Also, when the unit is switched on, the "last-one" memory which contains the various modes that were set before the unit was switched off will be erased.

Sound menu

SANSUI has provided this unit with five custom equalization curves called the "Sound menu".

The equalizer curves which are memorized in memory circuits 1 to 5 are as follows:

Memory 1: Pops sound

This curve is suitable for popular music. It produces bright stimulating sound with an American West Coast flavor.

Memory 2: Classic sound

This curve is suitable for enjoying classical music or relaxing music. It provides a soft sound.

Memory 3: Rock sound

This curve is designed for listening to rock music or disco music. It provides powerful, body shaking sound.

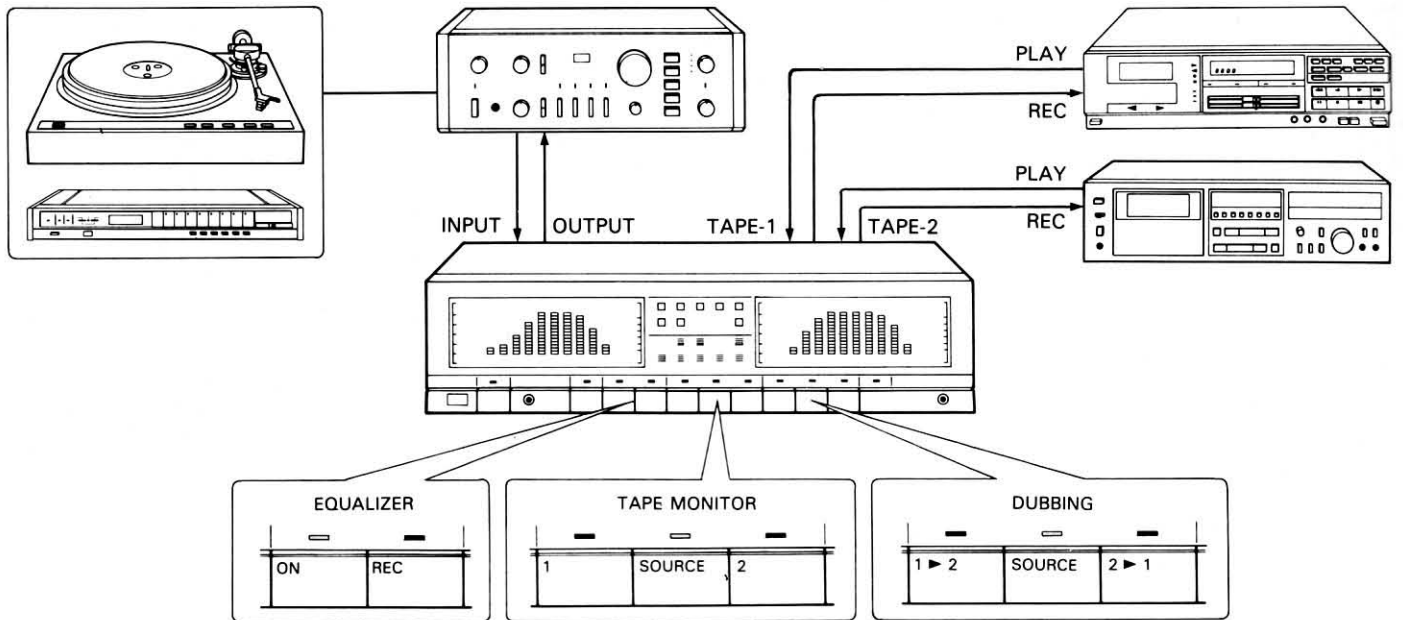
Memory 4: Mobile sound

This equalizer curve enables you to enjoy forceful sound reproduction from a relatively small speaker system such as that used in a car stereo system or portable cassette recorder.

Memory 5: Headphone sound

This equalizer curve enables you to enjoy superb music reproduction when using headphones.

- * To recall the sound menu, press the light pen against the SOUND MENU indicator and press the switch. The SOUND MENU indicator will light. Next, press the light pen against the number corresponding to the desired curve and press the switch. When using the remote control microphone, press the SOUND MENU button, then press one of buttons 1 to 5.



Before operating the unit

Set the controls of the amplifier to which the SE-99 is connected, as follows:

- * Set the tape monitor switch or input selector to "TAPE" to enable the unit to be used.
- * Set the tone controls and loudness switch, etc., to the flat positions.
- * Set the volume control to minimum.

Playing a program source with added equalizer effects

1. Depress the POWER switch and turn on the power.
2. Depress the EQUALIZER "ON" switch and the DUBBING "SOURCE" switch.
3. Select the program source which you wish to listen to.

When listening to a record or radio broadcast: Depress the TAPE MONITOR "SOURCE" switch, then select the program source using the input selector switch on the amplifier or the recording selector (if this function is provided on the amplifier).

When listening to a tape: Depress the TAPE MONITOR "1" or "2" switch in accordance with the connections of the tape deck being used.
4. Play the program source, and set the volume control to the desired level.
5. Set the desired equalizer curve in accordance with "Method of adjusting equalizer curve".

Alternatively, call up the memorized equalizer curve.

 - * To monitor the frequency distribution of the music when the display is set to the equalizer mode, press the light pen against the DISPLAY indicator and press the switch, or press the DISPLAY button on the remote control microphone to activate the spectrum analyser mode.
 - * To make an equalizer curve flat, press the light pen against the RESET indicator and press the switch, or press the RESET button on the remote control microphone.

Tape recording with added equalizer effects

1. Depress the POWER switch and turn on the power.
2. Depress the EQUALIZER "REC" switch and the TAPE MONITOR "SOURCE" switch.
3. Select the program source which you wish to record.

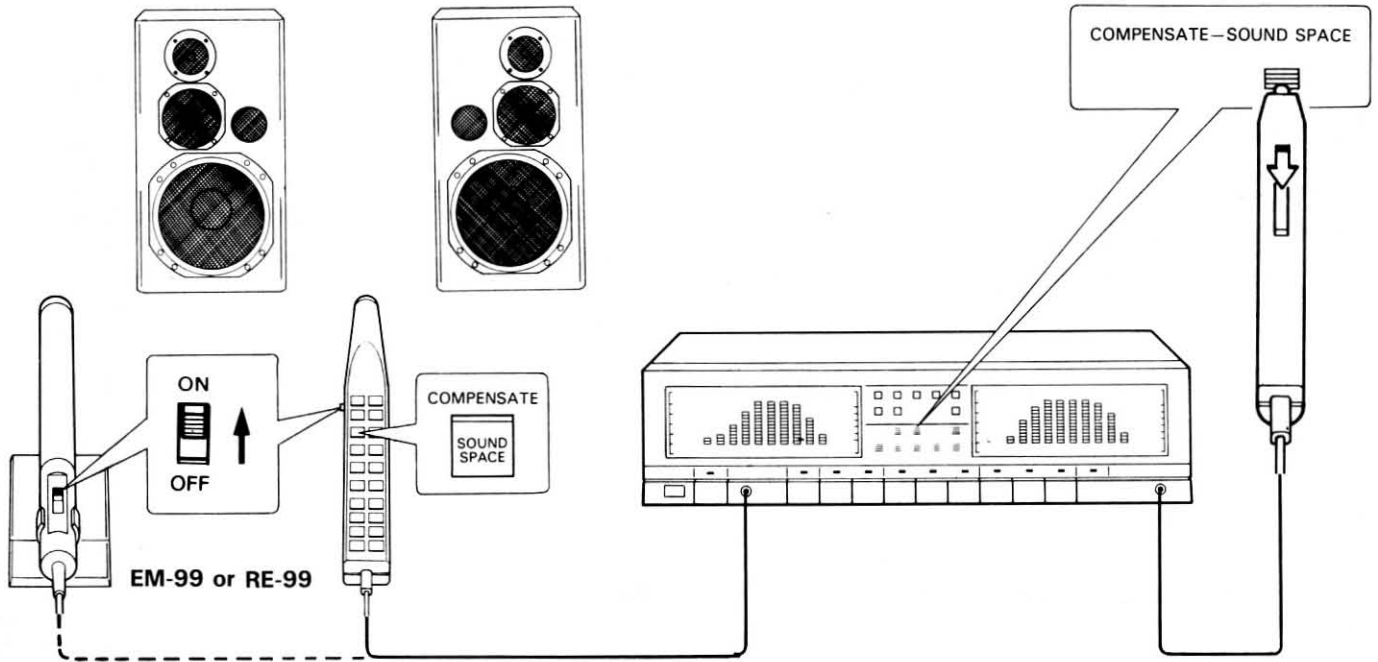
When recording a record or radio broadcast: Depress the DUBBING "SOURCE" switch, then select the program source using the input selector of the amplifier or the recording selector (if this function is provided on the amplifier).

When dubbing from tape deck-1 (playback) to tape deck-2 (recording): Depress the DUBBING "1 > 2" switch.

When dubbing from tape deck-2 (playback) to tape deck-1 (recording): Depress the DUBBING "2 > 1" switch.
4. Set the desired equalizer curve in accordance with "Method of adjusting equalizer curve".

Alternately, recall the memorized equalizer curve.

 - * When making a normal tape recording (without sound quality compensation), press the EQUALIZER "ON" switch.
 - * You can make your own original sound tapes for various occasions by using the "SOUND MENU" and recording them onto tape. It's a lot of fun when this function is used to the full.
 - * By using the measured data obtained using the automatic tape compensation function, you can make a recording with flat characteristics.

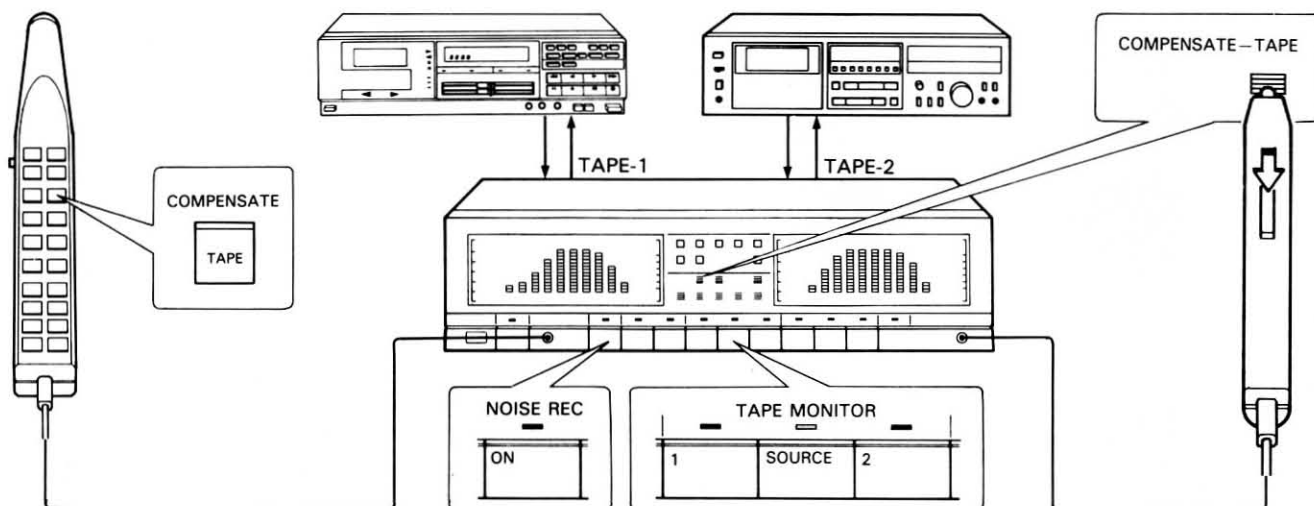


Automatic sound space compensation function

This function uses a computer to analyse the acoustic characteristics of your listening room including the frequency characteristics of your stereo system, and automatically creates an equalizer curve of the reverse characteristics, resulting in a flat frequency response. Measure the acoustic characteristics of your listening room as follows.

1. Insert the plug of the remote control microphone (or condenser microphone) into the MIC jack, and set the power switch to ON.
2. Set the microphone at the listening point so that it faces a point mid-way between the left and right speaker systems.
3. Set the volume control of the amplifier to the normal listening level.
4. Press the light pen against the COMPENSATE SOUND SPACE indicator and press the switch, or press the COMPENSATE SOUND SPACE button on the remote control microphone. The COMPENSATE SOUND SPACE indicator will flash.
5. The line input will be automatically cut off, and pink noise will be emitted first from the left speaker system. The level of the pink noise will be low at first, then gradually increase until it reaches the necessary level for measurement. At this point, the pink noise will be emitted five times in 0.4 second bursts at intervals of 0.5 seconds. Measure this pink noise using the microphone, and take the average of the measured values as the characteristics of your listening room.
 - * If the necessary level for measurement is not obtained even when the output level of the pink noise is maximum, the UNDER LEVEL indicator will flash, and an electronic tone will be emitted. In this case, increase the setting of the volume control on the amplifier.
6. Next, measurement of the right channel will take place in the same way.
7. The reverse characteristics of the averaged sound space frequency characteristics will be automatically memorized as flat data in the flat memory circuit, and the corresponding equalizer curve will be set. At this time, the FLAT indicator will light.

- * The memorized flat data can be recalled by pressing the light pen against the FLAT indicator and pressing the switch, or by pressing the FLAT button on the remote control microphone. When this is done, the FLAT indicator will light.
- * Do not perform sound space compensation at the lowest frequency of 16 Hz and the highest frequency of 32 kHz. Set these frequencies to 0 dB. This is because for a normal listening room and speaker system there is a danger of destroying the woofer and tweeter if an attempt is made to perform compensation at these frequencies.
- * If the deviation in level between each band is within 12 dB, set the flat data in 1 dB steps (± 6 dB), and if the deviation exceeds this value, set the flat data in 2 dB steps (± 12 dB). If the deviation exceeds 24 dB (± 12 dB), the FLAT indicator will flash for 10 seconds, indicating that the compensated frequency characteristics are not perfectly flat, however the set data will be memorized as flat data.
- * The flat data will be retained in the flat memory circuit until the next sound space measurement is performed.
- * To interrupt measurement, press the light pen against the RESET indicator and press the switch, or press the RESET button on the remote control microphone.
- * Remember always to set the power switch to OFF after having used the microphone.
- * **Note that if there is external noise or air conditioning noise, accurate data cannot be created. If the magnitude of the noise is large, measurement may sometimes be impossible.**



Automatic tape characteristic compensation function

The frequency characteristics obtained during recording and playback using a tape deck sometimes have marked peaks and troughs due to the frequency characteristics of the tape deck or the tape used. This unit can be used to analyse the peaks and troughs in the frequency characteristics and automatically set an equalizer curve having reverse characteristics, enabling flat frequency characteristics to be obtained.

1. Operate the tape deck and start recording.
 2. Press the NOISE REC switch ON (the indicator above the switch will light).
Pink noise will be output from the TAPE REC terminal, and after the lapse of the period which is necessary for measurement (approx. 10 seconds), an electronic tone will be emitted.
 3. When the electronic tone is emitted, stop recording on the tape deck, then press the NOISE REC switch OFF (indicator will go out).
 4. Press the 1 or 2 TAPE MONITOR switch ON (the indicator above the switch will light). Press the switch corresponding to the terminal to which the tape deck is connected.
 5. While playing back recorded pink noise, either press the light pen against the COMPENSATE-TAPE indicator and press the switch, or press the COMPENSATE-TAPE button on the remote control microphone. The COMPENSATE-TAPE indicator will flash. Next, set the reverse recording or playback characteristics as flat data using the same procedure as that used for automatic space sound compensation.
- * You can memorize flat data in the same way as data for a normal equalizing curve in the user's memory circuits (1 to 5).
 - * Because of the characteristics of the tape, 16 Hz and 32 kHz are set to 0 dB without applying compensation.
 - * If you change the tape deck or use a different type of tape, perform measurement again.
 - * In the following cases, the UNDER LEVEL indicator will flash and an electronic tone will be emitted.
 - If the COMPENSATE-TAPE mode is activated before pink noise is emitted. In this case, repeat step 5.
 - If the pink noise recording level is low.
 In this case, raise the recording level, and repeat steps 1 to 5.
 - * Note that if the NOISE REC switch is set to ON, the COMPENSATE TAPE mode cannot be activated.

Reverberation time measuring function

This unit is provided with a function which indicates reverberation time as real time for each frequency. This function allows you to obtain a near-optimum reverberation time by rearranging furniture and carpets, etc., in your listening room while repeating measurements. Measure the reverberation time using the following procedure.

1. Insert the plug of the remote control microphone (or condenser microphone) into the MIC jack, and set the power switch ON.
 2. Set the microphone at the listening point so that it faces a point mid-way between the left and right speaker systems.
 3. Set the volume control of the amplifier to the normal listening level.
 4. Press the light pen against the REVERB TIME indicator and press the switch, or press the R. TIME button on the remote control microphone. The REVERB TIME indicator will flash.
 5. The line input will be automatically cut off, and pink noise will be emitted from the speaker systems of both channels.
The level of the pink noise will be low at first, then gradually increase until it reaches the necessary level for measurement. Then, after a fixed interval, the level will be measured and the computer will calculate the interval necessary for the level to be attenuated by 60 dB.
This measurement will take place once for each frequency except 16 Hz and 32 kHz, that is, a total of 10 times, and during each measurement the reverberation time will be displayed in steps of 0.1 second on both channel displays.
 6. Upon completion of measurement, the REVERB TIME indicator will stop flashing and glow steadily.
- * If the necessary level for measurement is not obtained even when the output level of the pink noise is maximum, the UNDER LEVEL indicator will flash, and an electronic tone will be emitted.
 - * Like the data for a normal equalizer curve, this reverberation time data can be memorized in the user's memory circuits (1 to 5).
 - * To interrupt measurement, press the light pen against the RESET indicator and press the switch, or press the RESET button on the remote control microphone.
 - * Remember always to set the power switch to OFF after having used the microphone.
 - * **Note that if there is external noise or air conditioning noise, accurate data cannot be created.**
If the magnitude of the noise is large, measurement may sometimes be impossible.

Adjusting reverberation time

The reverberation time of the listening room is one of the major factors which influence the reproduced sound quality. If the reverberation time is too short, the sound will lack warmth, while if it is too long, the sound will be "muddy". The ideal reverberation time is between about 0.3 and 0.8 seconds, depending on the size of the room. Also, it should be the same for all frequencies.

Reverberation is caused by certain frequencies being absorbed and accentuated due to the dimensions and structure of the room when the sound from the speakers is attenuated while being reflected off the walls and ceiling. Consequently, the necessary countermeasures for reverberation will vary depending upon the condition of the listening room. Try improving the reverberation time while referring to the following.

A) High range

Generally, most audiophiles tend to aim for sound with clearly defined contours, and hence prefer a listening room having a short reverberation time. To this end, it is normal practice to use a large quantity of sound absorbing material in the room (curtains, carpet, etc.) In this case, there is no problem if all frequencies are absorbed uniformly, however in many cases only the high frequencies are absorbed, resulting in a dull sound.

In such a case, the reverberation time for the high frequencies can be extended by using curtains and carpet with short hairs, or by placing reflecting panels in front of the curtains in the rooms.

If the reverberation time in the high range is too long, the sound will not be adversely affected to any great degree. It can be improved, however, by using sound absorbing curtains, etc.

B) Middle range

If the reverberation time in the middle range is too short, the sound "penetration" will be degraded, and for the same output power the volume will tend to be low.

If the reverberation time is too short, objects in the room will often resonate in this range. In such a case, these objects must be found and removed. This can be done by removing objects of at least a certain size from the room one at a time, and repeating measurements.

Conversely, if the reverberation time in the middle range is too long, the sound will reverberate excessively. In this case, standing-waves may sometimes be set up. This can be overcome by placing a box of about one cubic meter containing sound absorbing material (glass wool, etc.) in each corner of the room.

C) Low range

The reverberation time in the low range is nearly always too long in the average listening room, and a satisfactory solution is rather difficult. To completely overcome this problem, it is necessary to modify the walls of the room. A simpler method which will provide some degree of improvement is to use larger quantities of sound absorbing materials than are necessary to shorten the reverberation time in the middle range.

Specifications

Input sensitivity and impedance (1 kHz)

INPUT, TAPE PLAY-1,2 150mV/47 kohms

Output level and impedance (1 kHz)

TAPE REC-1,2 150mV/1.5 kohms

OUTPUT 150mV/1.5 kohms

(Maximum output level: 5V into 47 kohms at 0.5% total harmonic distortion)

Total harmonic distortion (at 2V, 20 Hz to 20 kHz)

INPUT, TAPE PLAY-1,2 0.003%

Frequency response (at 0.5V, Equalizer curve flat)

INPUT, TAPE PLAY-1,2 10 Hz to 100 kHz,
+ 1.0 dB, -2.0 dB

Signal to noise ratio (Short-circuit, A-network)

INPUT, TAPE PLAY-1,2 120 dB

Equalizer frequency 16 Hz, 32 Hz, 64 Hz, 125 Hz,
250 Hz, 500 Hz, 1 kHz, 2 kHz,
4 kHz, 8 kHz, 16 kHz, 32 kHz

Level variation range ± 12 dB or ± 6 dB

Others

Power voltage 120V, 220V, 240V
(50/60 Hz)

For U.S.A. and Canada 120V (60 Hz)

Power consumption 25 watts

Dimensions 430 mm (16-15/16") (W)
119 mm (4-11/16") (H)
304 mm (11-15/16") (D)

Weight 5.3 kg (11.7 lbs) net
6.6 kg (14.6 lbs) packed

* Design and specifications subject to change without notice for improvements.

* Due to local laws and regulations, this unit sold in some areas are not equipped with variable voltage selectors.



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