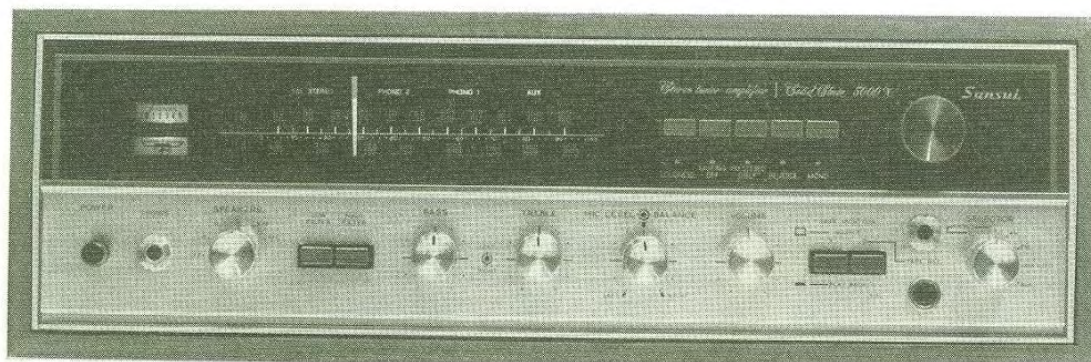


OPERATING INSTRUCTIONS

SOLID-STATE AM/FM STEREO TUNER AMPLIFIER

SANSUI 5000X



Sansui

SANSUI ELECTRIC CO., LTD.

Thank you for selecting the Sansui 5000X AM/FM Multiplex Stereo Tuner Amplifier. You have made an excellent choice, one that promises you years of rich stereo enjoyment.

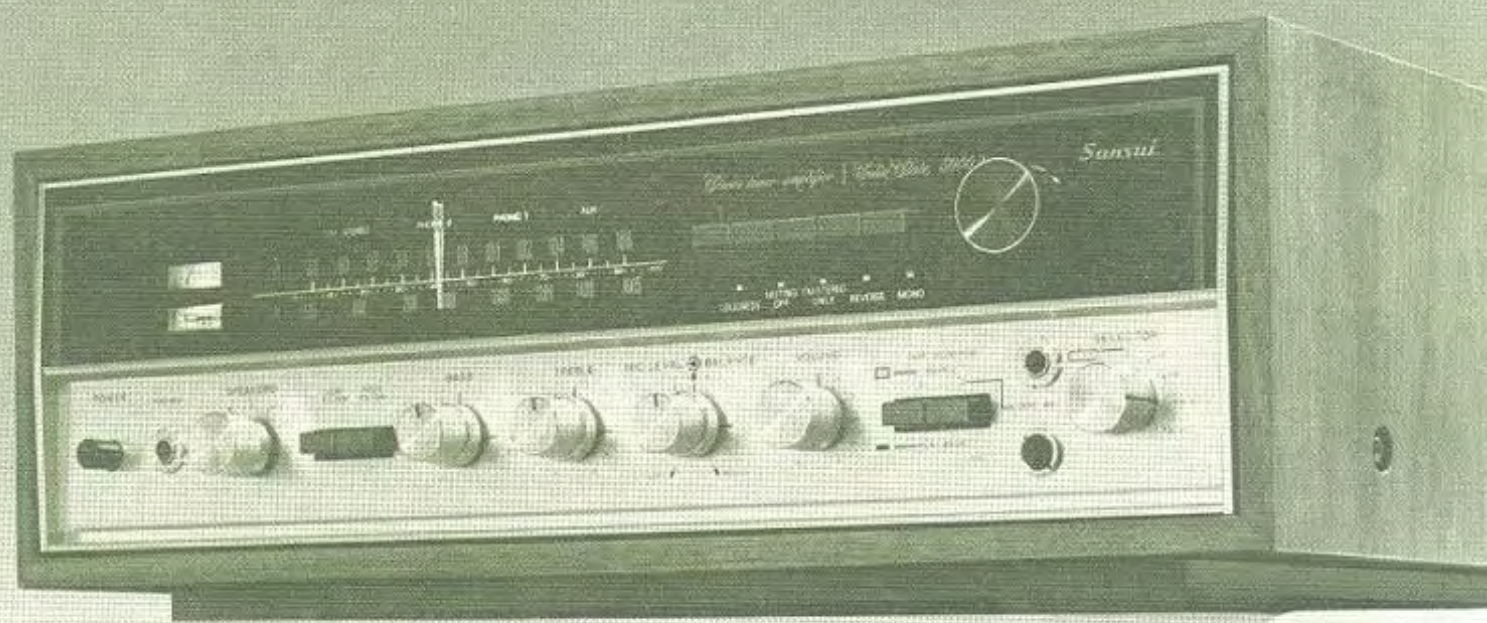
As the world's foremost audio-only specialist, Sansui has spared no effort in making the 5000X the most powerful, most versatile and most sophisticated receiver available at its price. With an unprecedented 200 watts in power, the latest FET and IC components, functional front panel design and an ability to handle up to two tape decks and three sets of speaker systems, the 5000X considerably advances the art of stereophonic reproduction.

Before leaving our factory, your new 5000X was tested, inspected and certified to be in perfect operating condition. It is now up to you to keep it that way.

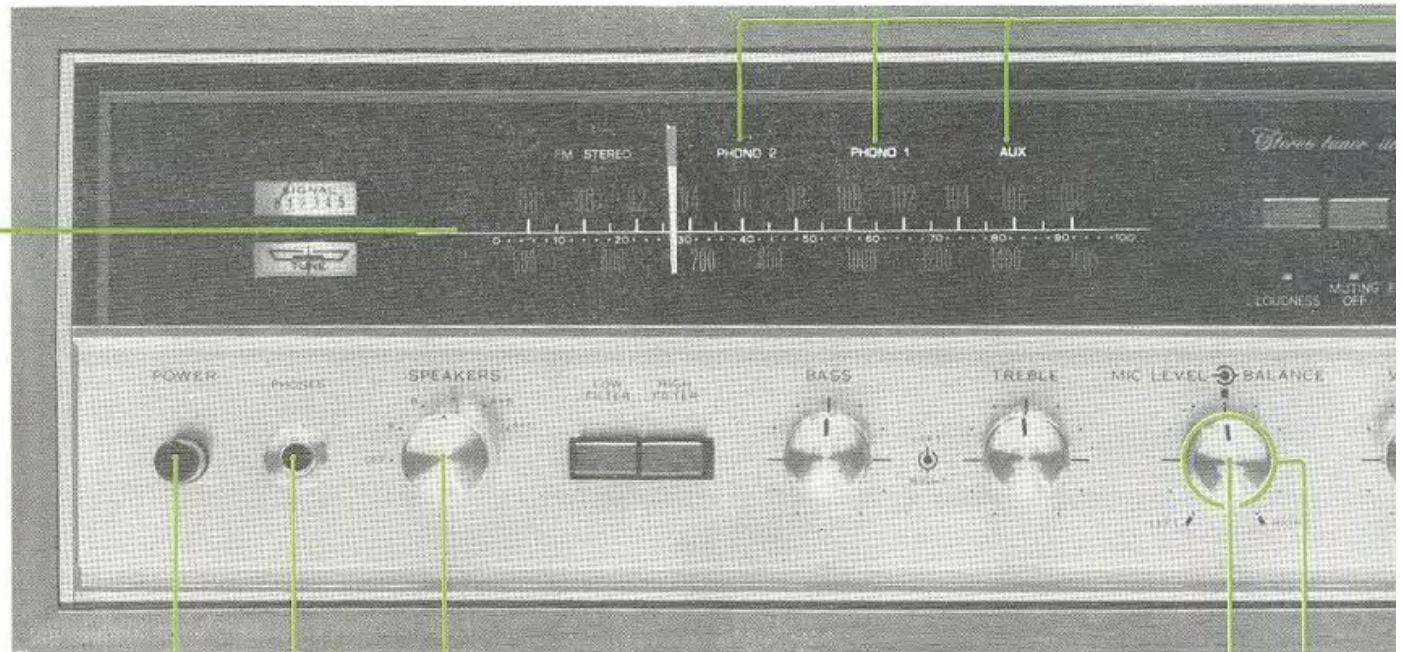
This manual has been prepared to guide you in installing and operating the receiver correctly. It contains some very helpful information on making antenna connections, using controls properly and operating components most effectively. Please read it carefully before operating the receiver and retain it for future reference.

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SWITCHES AND CONTROLS



Power Switch

Push this switch once to turn on the system; push it again to turn the system off. This switch also controls the power to one (SWITCHED) of the two AC outlets on the rear panel of the amplifier.

Headphones Jack

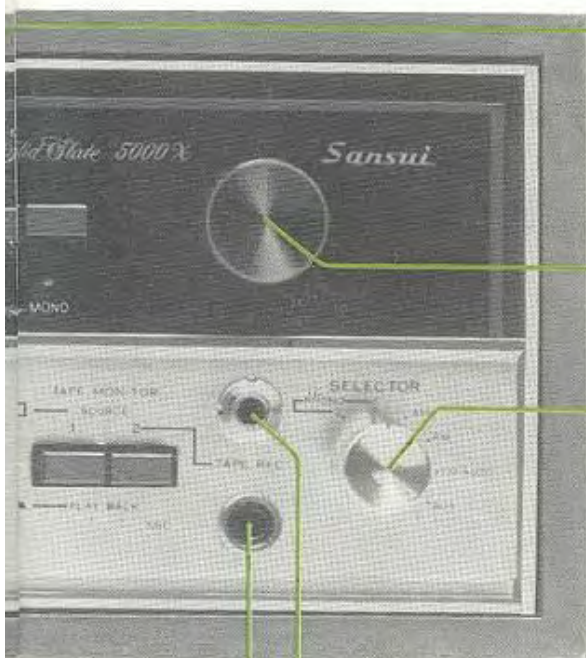
This jack accommodates headphones for monitoring or private listening. Before using for private listening, turn the SPEAKERS switch to its OFF position. Dynamic type stereo headphones are recommended for use with the 5000X.

Dial Scales

Light up whenever the SELECTOR switch is set to a radio receiving position—AM, FM or FM AUTO. The upper scale is for FM, the lower for AM.

Speakers Switch

A—Selects a pair of speaker systems connected to the SYSTEM A outputs on the rear panel.
B—Selects a pair of speaker systems connected to the SYSTEM B outputs.
C—Selects a pair of speaker systems connected to the SYSTEM C outputs.
A+B—Selects two sets of speaker systems connected to the SYSTEM A and B outputs.
A+C—Selects two sets of speaker systems connected to the SYSTEM A and C outputs.
OFF—Use this position to cut off sound from all speaker systems for private listening with headphones connected to the PHONES jack.



Function Indicators

According to the setting of the SELECTOR switch, one of the function indicators appears to indicate what function the 5000X is being programmed to perform. 'PHONO 1' is illuminated in blue, 'PHONO 2' in green and 'AUX' in red.

Tuning Knob

Use this knob to select any desired AM or FM station.

Selector Switch

PHONO 2—Turn this switch to this position to hear records being played on a record player connected to the PHONO 2 inputs on the rear panel.
PHONO 1—Use this position to hear records being played on a record player connected to the PHONO 1 inputs.

AM—Use this position for AM programs.

FM—Use this position for monophonic FM programs.

FM AUTO—Use this position for automatic stereo/mono switching.

AUX—Use this position to select any other program sources connected to the AUX inputs.

Volume Control

The VOLUME control adjusts the overall sound level of both channels. Turn it clockwise to increase volume, counterclockwise to decrease the volume.

Balance Control

The outer ring is used to adjust for equal sound level from both left and right channels when slight imperfections in program material, variations in speaker output and vagaries of room acoustics make this procedure necessary. Turning the control clockwise accents the right channel by reducing the left channel output.

Mic Level Control

The inner knob is used to control the sound level of the microphone connected to the MIC jack. It must be in the fully counterclockwise position when the microphone is not in use.

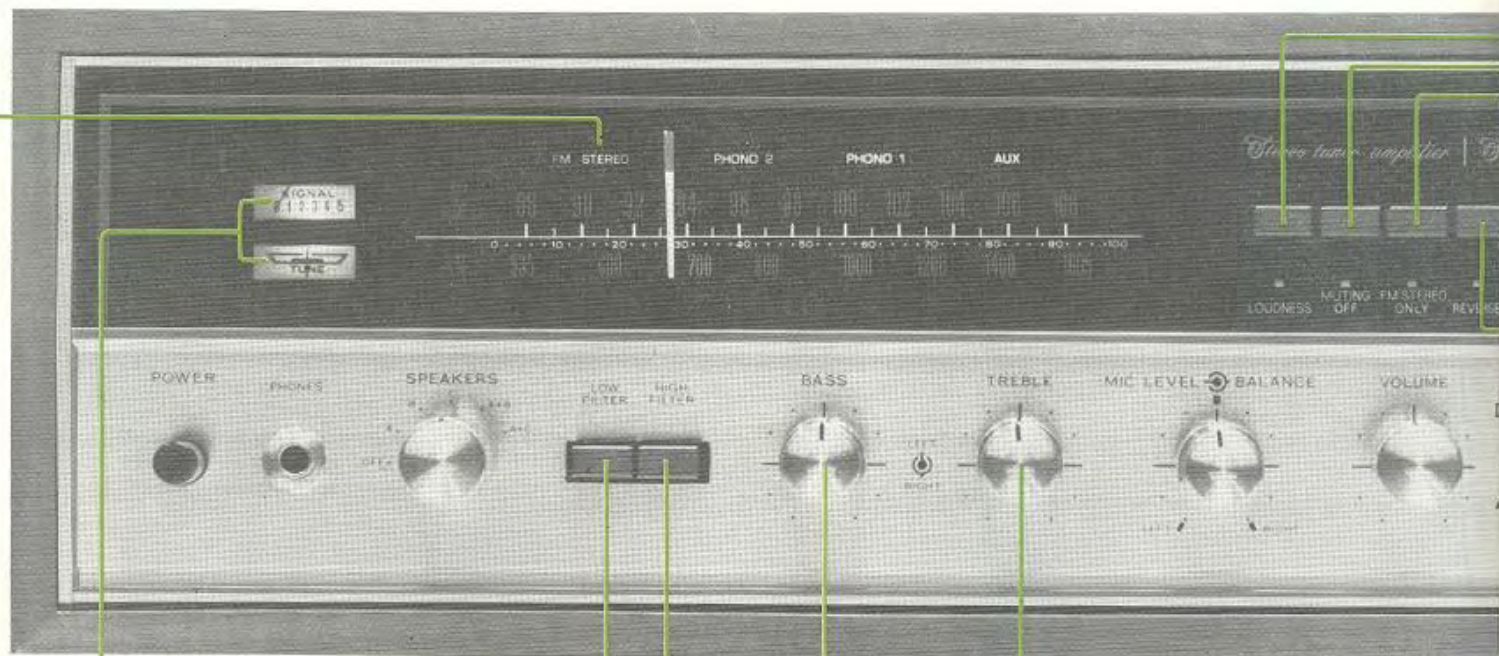
Tape Rec. Jack

This jack allows connection to a tape deck having a standard stereo phone plug for recording use only.

Mic Jack

This jack will accept any standard phone plug for microphone operation. It connects a mike to both right and left speakers selected by the SPEAKER switch. The proper settings of both MIC LEVEL and VOLUME controls allow the mike to be mixed with another program source selected by either SELECTOR or TAPE MONITOR switch. Note that the mike cannot be controlled by the controls and switches except the MIC LEVEL and that it cannot be recorded on tapes by tape decks.

SWITCHES AND CONTROLS



Tuning Meters

These meters aid in pinpointing stations. Use both to pinpoint FM stations; the upper signal meter only for best AM reception.

For FM stations: Turn the TUNING knob until the needle in upper meter swings as far to the right as possible. Then, watching the lower meter, turn the TUNING knob until the needle is perfectly centered.

For AM stations: Use only the upper meter and tune as for FM.

FM Stereo Indicator

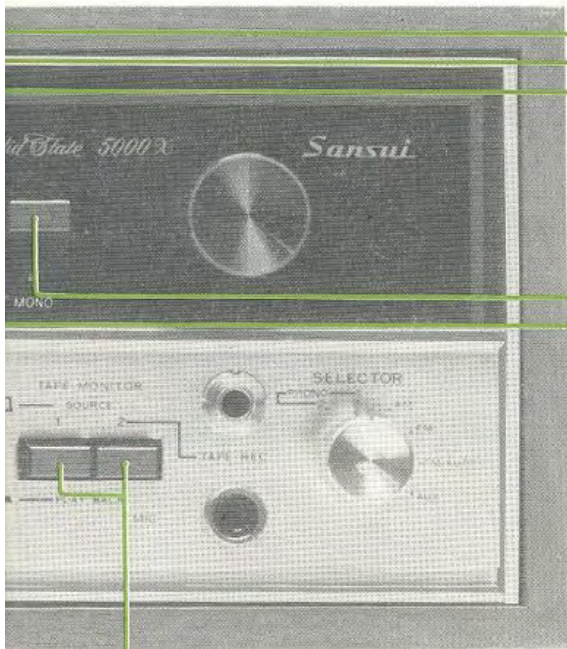
This indicator lights up red when the dial pointer crosses a station making an FM-MPX broadcast and receiver is properly set for stereo reception.

High Filter Switch

Use this switch to eliminate or reduce high-frequency noise such as surface noise from old or worn records, tape hiss and radio noise caused by interference from nearby electrical appliances.

Low Filter Switch

Use this switch to eliminate or reduce low-frequency disturbances such as turntable rumble. Use only when needed. At all other times, keep off.



Treble Control

Use this control to boost or cut high-end frequency response according to taste and listening conditions. To boost, turn it clockwise. To cut, turn it counterclockwise.

Designed as a friction-coupled, dualconcentric control, it is actually two controls in one. The outer ring controls treble loudness in the right channel; the inner knob controls treble loudness in the left channel. Both outer and inner controls can be used simultaneously or independently, as desired.

Bass Control

Use this control in the same way as the TREBLE control to boost or cut low-end response.

Loudness Switch

Use this switch to boost bass and treble response at low volume listening levels. Due to the sensitivity of human hearing, both bass and treble seem greatly reduced at low listening levels. This switch compensates for this apparent loss.

Muting Off Switch

When not in use, the MUTING OFF switch eliminates interstation tuning noise. If you want to receive a weak FM station, push it down to its off position.

FM Stereo Only Switch

Use this switch when only FM-MPX broadcasts are desired. It cuts out all monaural broadcasts.

Mono Switch

Use this switch for reproducing either monaural or stereo program sources monaurally. For AM or FM mono broadcasts, however, reproduction will be monaural even without the use of this switch.

Reverse Switch

Use this switch to reverse signals between left and right channels during stereo operations. Keep it off for regular stereo reproduction.

Tape Monitor Switches

The TAPE MONITOR switches are used to select between the tape monitor circuits 1 and 2. Detailed information on usage is given in the section entitled 'Operation', p. 13.

SPEAKER CONNECTIONS

Connecting the Main Set of Speaker Systems

Connect it to the speaker terminals marked SYSTEM A on the rear panel of the amplifier. The two outputs on the left accommodate the left speaker cables (as viewed from the listening area); the pair of outputs on the right, the right speaker leads. Be sure the polarities (+ and -) of the speakers and the amplifier match. To actually connect a speaker lead to a corresponding terminal, push the colored button down and hold with one hand, insert the end wires of the speaker cord into the hole with the other hand, and release the button. When the system has been properly connected, set the SPEAKERS switch on the front panel to the SYSTEM A position. It is then ready for operation.

Connecting Additional Stereo Speaker Systems

Following the same procedure indicated above, one or two more stereo speaker systems can be connected to the 5000X by utilizing the speaker terminals SYSTEM B and SYSTEM C respectively.

Each of the three sets of systems can be operated independently with the SPEAKERS switch on the front panel. In addition, speaker systems A and B can be operated simultaneously when the SPEAKERS switch is set to the 'A+B' position, and speaker systems A and C can be operated simultaneously when the SPEAKERS switch is set to the 'A+C' position.

If Speaker Polarities Are Not Properly Matched . . .

If the polarities (+ and -) of the speakers and the amplifier are not matched correctly, sound cancellation at some frequencies or in some listening position occurs. Particularly when listening to monaural reproduction, this condition is noticeable by an absence of sound at a point midway between right and left speakers. If this situation occurs, check the amplifier and speaker connections once more

and reverse the connections between the amplifier and either right or left speaker.

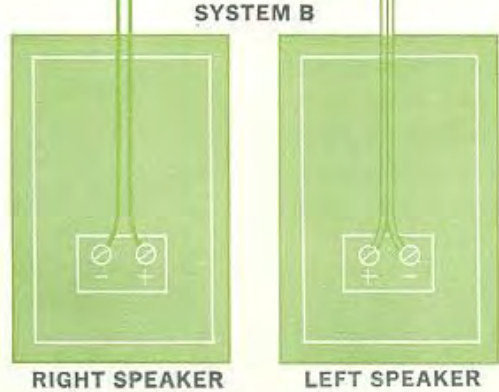
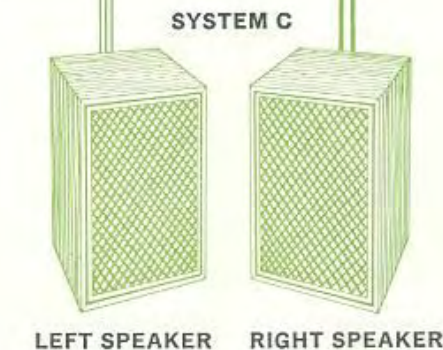
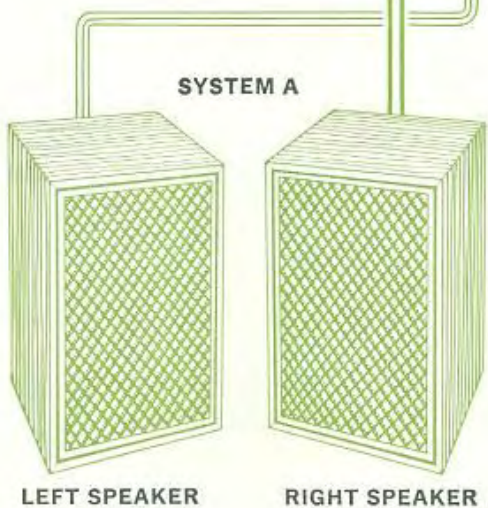
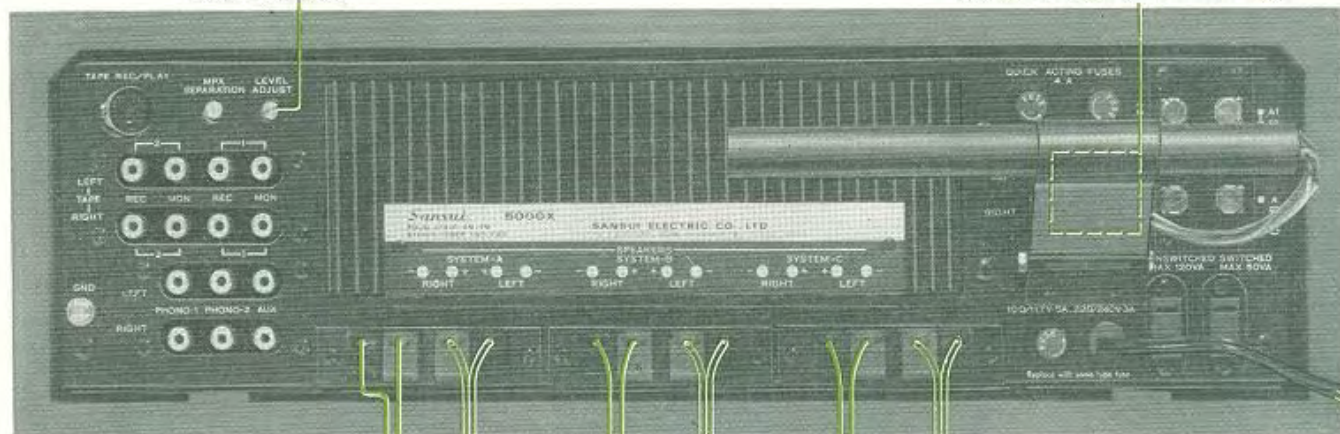
Speaker Impedance

If you want to use two sets of speaker systems at the same time with the SPEAKERS switch in its 'A+B' or 'A+C' position, their impedance must be 8 ohms each or more.

If you want to connect two or more speakers to one terminal in parallel, their combined impedance must be 4 ohms or more.

LEVEL ADJUST

CONNECTORS (SEE PAGE 18)



— LEFT CHANNEL
— RIGHT CHANNEL

OPERATIONS

RADIO RECEPTION

The quality of reception that can be expected from the 5000X is largely dependent on the correct positioning and use of antennas. The following procedures are recommended for noise-free reception.

FM Antenna

Where FM broadcasting stations are near and FM signals are strong, satisfactory FM reception can be obtained by using the folded dipole accompanying the amplifier. Connect the folded dipole to the antenna terminals marked FM-A1 and FM-A2 on the rear panel, then fully extend the dipole to a T form and fix it to a wall or ceiling where it allows the strongest reception.

If the 5000X is used in a thick-walled building or in an area remote from FM broadcasting stations, the indoor dipole antenna may be inadequate for strong signal reception. An outdoor antenna designed exclusively for FM reception should then be installed. FM antennas of the 300 ohm balanced type and 75 ohm unbalanced type can be used with the 5000X. Connect either antenna to the matching antenna terminals on the rear of the amplifier. The 300 ohm feeder wire should be connected to the FM antenna terminals A1 and A2 as in Fig. 2. If a 75 ohm coaxial cable is used, connect the conductor to the FM antenna terminal A, and the shielding wire to the terminal G as in Fig. 1.

Note: FM sensitivity cannot be raised simply by lengthening the antenna. Adjust the antenna's height and direction while actually listening to a broadcast for the best reception.

Built-in AM Ferrite Bar Antenna

This sensitive antenna, located on the rear panel of the amplifier, is usually adequate for strong AM reception. To use, pull it down and away from the back of the amplifier until it comes to a stop halfway between the top and the bottom of the amplifier. Then move it from up to down until best reception is obtained.

Outdoor AM Antenna

In ferroconcrete buildings or in areas remote from

the broadcasting station, the built-in ferrite bar antenna may be inadequate for strong AM reception. An outdoor antenna then becomes necessary. This can be accomplished by connecting the PVC wire accompanying the amplifier to the antenna terminal marked AM-A on the rear panel. Run this wire to an antenna that has been installed outdoors and away from the building. At the same time, the unit should be grounded. Position the outdoor antenna where reception is strongest while actually receiving a broadcast. And, for reasons of safety, be sure to attach a lightning arrester to the outdoor antenna.

Radio Reception

FM Programs

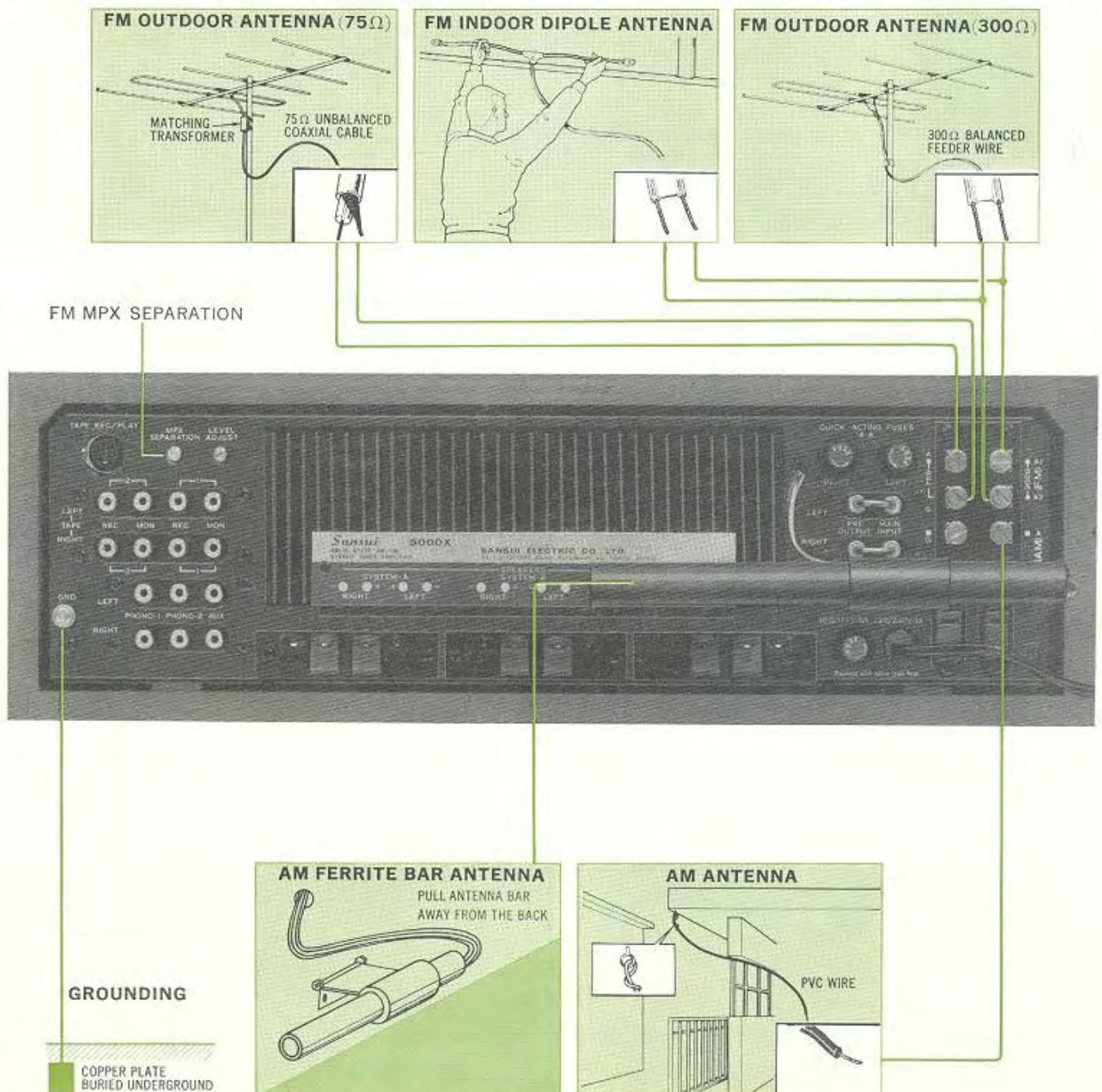
1. Set the SELECTOR switch to the FM or FM AUTO position, the former for only monaural broadcasts and the latter for automatic switching between monaural and stereo broadcasts. If too much noise or interference accompanies a stereo broadcast with the SELECTOR switch set at FM AUTO, turn the SELECTOR switch to the FM position and listen to the same broadcast monaurally.
2. Select the desired FM station on the FM band of the tuning dial with the TUNING knob. The station is properly pinpointed when the needle in the SIGNAL meter moves as far to the right as possible, and when the needle in the TUNE meter is centered. For all stereo broadcasts being received, the STEREO indicator will light up in red.
3. When a stereo broadcast is being received, use the BALANCE knob to control the balance of sound for both left and right channels. Use all other controls and switches according to taste and listening conditions.
4. To listen to FM-MPX stereo broadcasts exclusively, set the FM STEREO ONLY switch to its ON position. This automatically cuts out all FM monaural broadcasts and enables the operator to find stations broadcasting stereo programs more rapidly. When using this switch, be sure that all other pertinent switches are set for stereo reception.

AM Programs

1. Set the SELECTOR switch to the AM position.
2. Select the desired station on the AM band of the tuning dial with the TUNING knob. The station is properly tuned when the needle in the SIGNAL meter moves as far to the right as possible.

The lower TUNE meter does not operate for AM broadcasts and should be ignored.

3. Use all other controls and switches as required. During AM reception, the right and left speakers produce the same sounds whether the REVERSE and MONO switches are on or off.



OPERATIONS

— RECORD PLAYING

Record Player Connections

The following procedures are recommended for use with a player or turntable utilizing a magnetic cartridge with an output voltage between 2mV and 10mV:

1. Connect the left channel output of a stereo turntable to the LEFT channel (upper) PHONO 1 (or PHONO 2) input jack on the rear panel of the amplifier.
2. Connect the right channel output of the turntable to the RIGHT channel (lower) PHONO 1 (or PHONO 2) input jack.
3. If a monophonic player or turntable is used, it may be connected to either RIGHT or LEFT channel PHONO 1 (or PHONO 2) input jack.
4. Insert the power-cord plug of the player into the AC outlet marked SWITCHED on the rear of the amplifier. The power supply for the player will then be controlled by the POWER switch on the front panel of the amplifier.

Note: Although it is not recommended from a standpoint of tone quality, if a player with a crystal cartridge must be used, connect the output of the player to an input jack marked AUX on the rear of the amplifier.

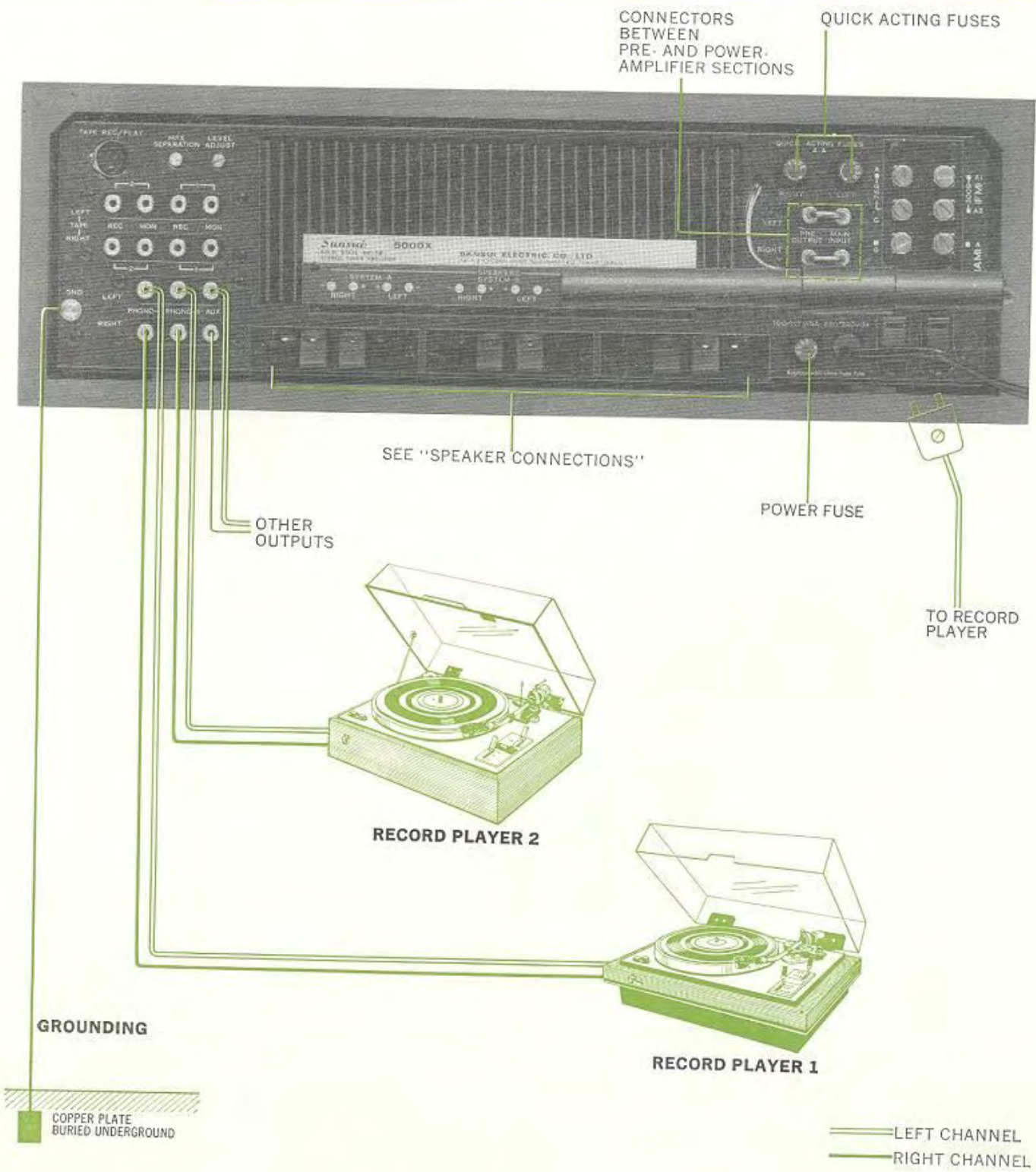
Record Player Operations

1. Set the SELECTOR switch to PHONO 1 or PHONO 2 depending on which input is being used.
2. If a monaural player is used, push the MONO switch on.
3. Turn on the player, and select the correct speed for the record(s) to be played.
4. Place the stylus on the record. When monophonic records are played on a stereo player, follow the same procedures as for stereophonic records for better results.
5. Adjust the BALANCE control to obtain equal sound from both right and left channels.
6. Use all other controls and switches according to your personal taste and listening conditions.

Humming and Howling

Care must be taken never to place a record player on or too near a speaker enclosure. Otherwise the vibration of the speaker enclosure is transmitted to the player and causes howling. It is best to keep these components completely separated, but if this is impossible, to place a thick cushion between them.

Humming is a phenomenon caused by incomplete or incorrect player-amplifier connections. If this occurs, check to make sure that all connections are complete and that the thickness of the connecting wire is sufficient.



CONNECTORS BETWEEN PRE- AND POWER-AMPLIFIER SECTIONS

QUICK ACTING FUSES

SEE "SPEAKER CONNECTIONS"

OTHER OUTPUTS

POWER FUSE

TO RECORD PLAYER

RECORD PLAYER 2

RECORD PLAYER 1

GROUNDING

COPPER PLATE BURIED UNDERGROUND

== LEFT CHANNEL
 — RIGHT CHANNEL

OPERATIONS

— TAPE PLAYBACK — TAPE RECORDING

Connecting Tape Decks

The 5000X incorporates two tape deck circuits: one leads to the TAPE 1 jacks and the DIN socket (marked TAPE REC/PLAY) on the rear panel and the other leads to the rear TAPE 2 jacks and the front TAPE REC jack.

If a tape deck has connecting cable fitted with 5-pin DIN plugs, connect it to the TAPE REC/PLAY socket on the rear panel. Tape decks having connecting cables with pin plugs should be connected to the TAPE 1 and/or 2 jacks on the rear as well. A tape deck with phone plugs should be connected to the TAPE REC jack on the front panel. This jack is an output terminal for recording use only. If you want to use this type of tape deck for playback through the 5000X, change the phone plug of its playback cord to the pin plug and connect it to the TAPE 2 MON jack on the rear panel. A monophonic tape deck can be connected to either right or left channel jack.

Operating the 5000X and Tape Deck or Decks

Check that the tape deck or decks are correctly connected to the 5000X and make the appropriate settings of controls on the tape deck or decks.

Recording

Turn the SELECTOR switch to the program source to be recorded. Note that voice or music through the microphone connected to the MIC jack cannot be recorded from the 5000X.

If the source material is a pre-recorded tape (tape-to-tape reprinting), connect the two tape decks as indicated below:

Playback deck → TAPE 1 MON jacks or DIN socket

Recording deck ← TAPE 2 REC jacks or front TAPE REC jack

In this case, the TAPE MONITOR 1 switch should be depressed (⏏) while the TAPE MONITOR 2 switch should not be used (⏏).

To monitor the quality of tape recordings made from

the 5000X with the original program during the recording process, use a three-head tape deck i.e. that with separate playback and recording heads. If the tape deck used as a monitor is connected to the TAPE 1 jacks or DIN socket, the TAPE MONITOR 1 switch should be depressed (⏏). If it is connected to the TAPE 2 jacks, the TAPE MONITOR 2 switch should be depressed (⏏).

Note:

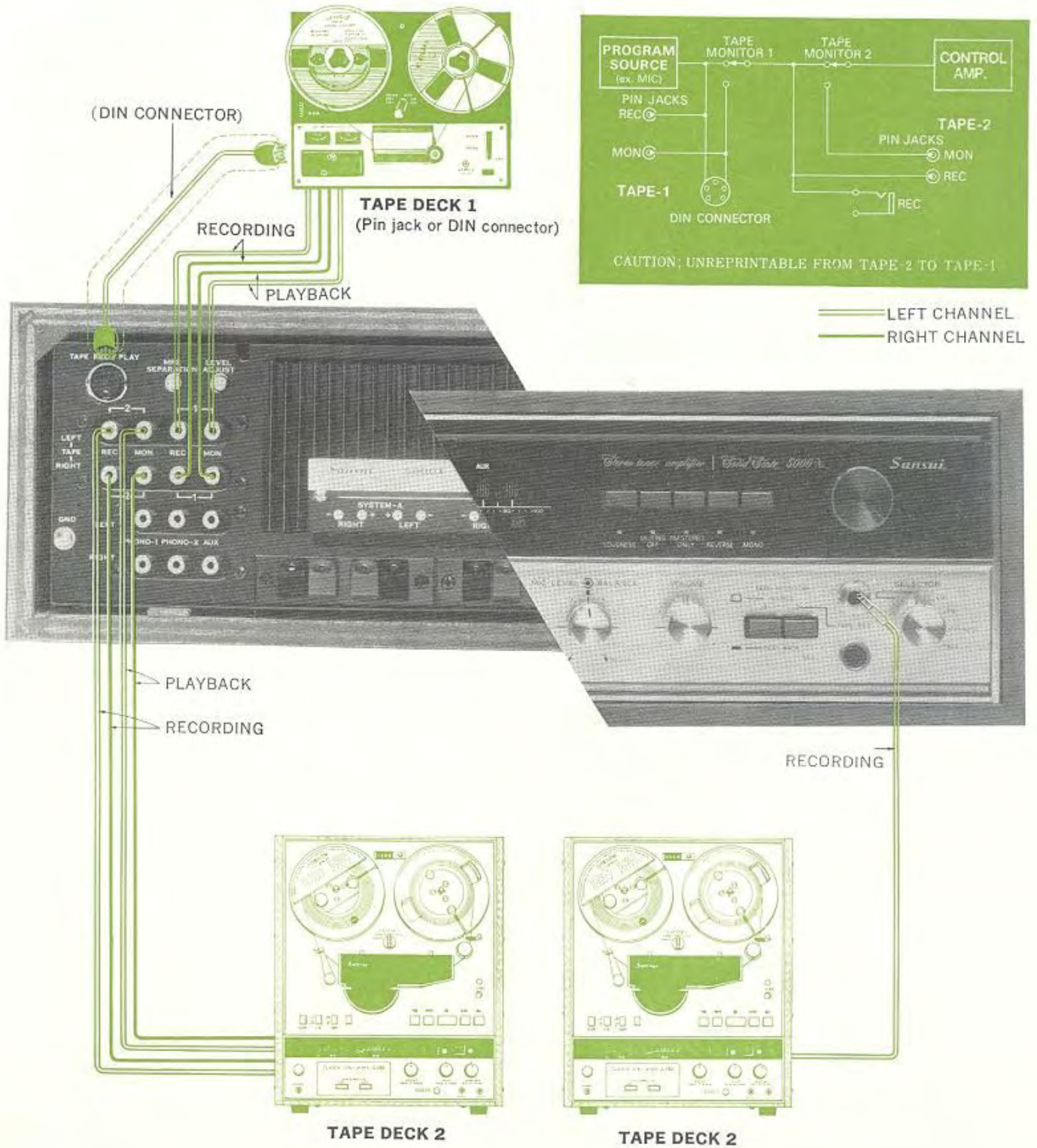
1. When the TAPE MONITOR switch is not depressed (⏏), the sound from the program source is not heard through the tape deck.
2. The recordings cannot be controlled by the controls and switches on the front panel of the 5000X. Only the sound from the speakers is controlled by them.
3. For better results, the recordings should be made not from microphones placed in front of the speakers but directly from the 5000X.

Playback

To play back through the 5000X, depress the TAPE MONITOR switch 1 or 2 depending on which circuit is being used. The playback is possible with the SELECTOR switch left in any position. The sound from the pre-recorded tape can be controlled by the 5000X. In addition, it is possible to blend it with the voice from the microphone connected to the MIC jack. For use with a monophonic tape deck, push the MONO switch to its ON position (⏏).

Recordings with Three Tape Decks

Three tape decks can be connected to record simultaneously from the 5000X. Connect each of them to the DIN socket (marked TAPE REC/PLAY), TAPE 1 REC jacks and TAPE 2 REC jacks or front TAPE REC jack. Both TAPE MONITOR 1 and 2 switches should be in their OFF position (⏏). To monitor, depress the TAPE MONITOR 2 switch only. Don't depress the TAPE MONITOR 1 switch during the recording process.



ELECTRONIC CROSSOVER SYSTEM

Pre- and Main-Amplifier Sections Separately Usable

The 5000X's preamplifier section and the main or power amplifier section can be used as separate units by simply removing connectors from the jacks marked PRE OUTPUT and MAIN INPUT on the rear panel. If you want to add another power amplifier to the 5000X, connect its inputs to the PRE OUTPUT jacks. For connection of an additional preamplifier, connect its outputs to the MAIN INPUT jacks. When the additional preamplifier is connected, only the SPEAKERS switch is usable on the front panel of the 5000X. Thus, tone and volume should be adjusted by means of corresponding controls on the additional preamplifier. When the additional power amplifier is connected, all the controls and switches on the front panel of the 5000X are usable.

Electronic Crossover System

The independent pre- and power-amplifier sections make the 5000X more versatile. One of their most exciting uses is for Electronic Crossover System. In this stereo system, the frequency separation is accomplished electronically between the preamplifier and the power amplifiers (in the conventional system, an LC crossover network is used between the amplifier and the speakers), and the tweeters, midranges and woofers are driven independently by their own power amplifiers. At the present time, this system is acknowledged as the best system for true high fidelity sound reproduction.

The features and advantages of the electronic crossover system are:

1. Speakers more freely selectable

Since the tweeters, midranges and woofers are driven by separate power amplifiers, they can be freely selected on the virtue of their tone quality alone, without regard to their efficiency and impedance characteristics.

2. Better filtering characteristic

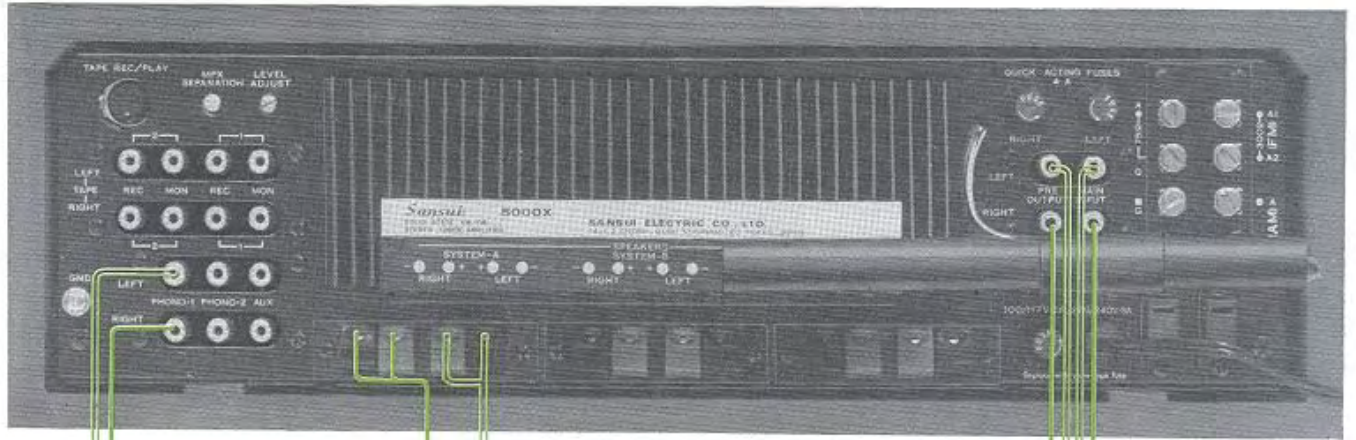
Designing a perfect LC crossover network is a highly complex job, and even the best network may fail to offer a perfect filtering characteristic. Also, as the impedance of a speaker varies with frequency, a network does not always divide the signals at the predetermined crossover points. In contrast, the electronic crossover system not only offers a much better filtering characteristic, but permits changing over the crossover frequencies and cutoff characteristics with great ease.

3. Damping factor not impaired

Amplifier's damping factor is not impaired, because there is no resistance between the amplifier and the speakers.

4. Power amplifiers used more effectively

Amplifiers best suited for each frequency band can be used. For example, an amplifier with a fairly big output is suited for driving the woofers, while amplifiers with better tone quality characteristics may be employed for driving the midranges and tweeters.



RECORD PLAYER

PRE-AMPLIFIER OUTPUTS
POWER AMPLIFIER INPUTS FOR WOOFER



ELECTRONIC CROSSOVER UNIT



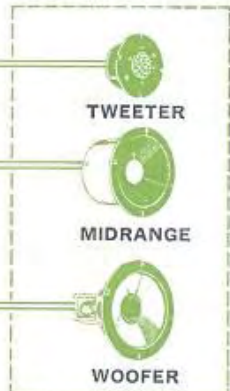
POWER AMPLIFIER FOR TWEETER



POWER AMPLIFIER FOR MIDRANGE



RIGHT SPEAKER



LEFT SPEAKER

— LEFT CHANNEL
— RIGHT CHANNEL

MAINTENANCE

How to Eliminate Radio Noise AM Reception

AM reception noise can often be eliminated by changing the position of the antenna. If you are located far from the broadcasting station, or in the mountains, a thick-walled building or a block of such buildings, radio waves will not be well received, resulting in unstable reception and increased noise. If reception is poor, connect a vinyl wire (supplied) to the AM antenna terminal and position it for best reception. If this does not reduce noise or improve sensitivity, erect an antenna outside the building and apart from the wall. This terminal is located behind the AM ferrite bar antenna on the back panel of 5000X. Some noises are peculiar to a certain broadcasting frequency or a certain time of day. These result from the nature of AM signals. In some cases the noise can be eliminated by grounding the amplifier or reversing the power-cord plug receptacle connections.

Note: If the antenna terminal marked A is touched with a finger, a hum may be heard. This is a natural phenomenon; the unit is not at fault.

FM Reception

Noise during FM reception can be generally attributed to either insufficient antenna input or interference from other electrical appliances.

Antenna input is insufficient when the antenna is not installed properly or when the station is far away. Extend and fix the attached antenna so that noise is minimized and the antenna input is at maximum. For better results, install an exclusive FM antenna in a position to receive signals most effectively.

If you use a T.V. antenna for the T.V. set and the FM unit with a splitter, make sure that the television reception is not affected. To prevent noise, avoid using a long antenna wire.

FM reception is affected considerably by the transmitting conditions of certain stations; usually their power and antenna efficiency. You may receive one station quite well and another poorly. To eliminate interstation tuning noise, release the MUTING OFF button.

Noise Common to FM and AM

In an area with many ferroconcrete buildings, noise may occur at a particular time of day. This noise is easily distinguished from that described above. To eliminate such noise, attach a noise arrester to the interfering electrical appliance or to the power source of the 5000X. When you are listening to an FM-MPX program, you may notice a noise not heard with monophonic FM broadcasts. The unit is not at fault, just push the HIGH FILTER switch to eliminate the noise. In some cases, you can also eliminate the noise by setting the TREBLE control to "flat" or lower.

Listening to FM-MPX Stereo Programs Monaurally

In areas remote from broadcasting stations, FM-MPX broadcasts may be accompanied by noise that is not noticeable with regular FM monaural broadcasts. This is because the stereo broadcast wave has a service area only half as long as the monaural wave. If the noise accompanying a stereo broadcast cannot be suppressed satisfactorily by using the HIGH FILTER or by adjusting the TREBLE control to a flatter level, set the SELECTOR switch to the FM position and listen to the same broadcast monaurally.

Output Level Adjust

The 5000X offers a full 200 watts in power output, often more than is needed for the average speaker system. To protect speakers from becoming damaged should the 5000X be operated at full power, this control limits the maximum volume of the amplifier. Turn the screw counterclockwise with a small screw driver to adjust the 5000X's output to the input level of the speaker system. The VOLUME control on the front panel then adjusts sound volume only within this range.



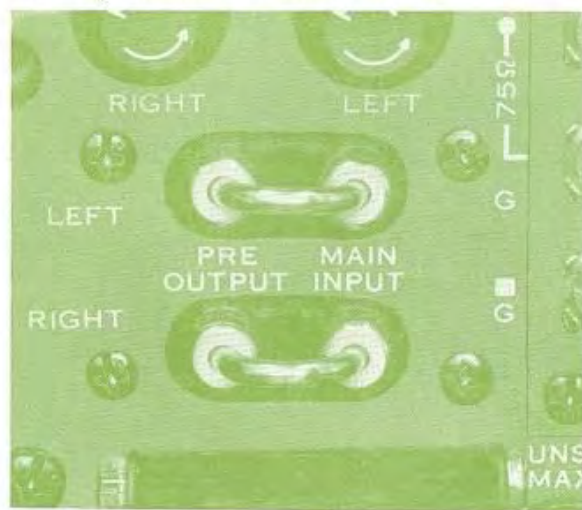
FM-MPX Separation

If the channel separation during FM-MPX stereo reception becomes inadequate or excessive, turn the screw marked MPX SEPARATION on the rear panel of the amplifier for natural proportions. Never attempt to turn it without reason as it has been properly adjusted prior to leaving our factory.

Connectors between Pre- and Main-amplifier Sections

Although the 5000X's preamplifier section and power amplifier section have been connected at the factory, you may use each section as a separate unit for the electronic crossover system, for instance, by simply removing the connectors from the jacks marked PRE OUTPUT and MAIN INPUT on the rear panel. If you want to connect another preamplifier and/or power amplifier to the 5000X, refer to the Section titled under ELECTRONIC CROSS-OVER SYSTEM (p. 15). The connectors must be in place unless the additional component or components will be connected to the 5000X.

Warning: Before connecting or disconnecting, be sure to push the POWER switch off.



Grounding

Connect one end of vinyl or enameled wire to the terminal screw marked GND at the rear of the amplifier, attach a copper plate to the other end, and bury it underground. Whenever an outdoor AM antenna is used, grounding becomes necessary. In all cases, grounding is desirable since it allows a better SN ratio to be obtained. To ground an entire audio system, connect the grounding wire of each component used to this terminal.



Quick-Acting Fuses

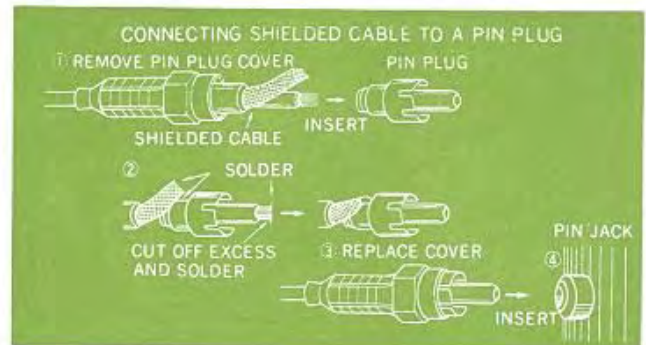
These fuses for right and left channels are also designed to protect the transistors by blowing instantly if shorting occurs between connections at a speaker system terminal. If, after the POWER switch is turned on and the function indicator lights up, nei-

ther channel operates or only one operates normally, it is either because one or both Quick-Acting fuses have blown. In this case, remove the 5000X's power supply cord from its outlet, screw out the fuse holders on the rear panel, and check to see if the fuses are blown. Replace them with identical 4A fuses after finding and eliminating the source of trouble that caused them to blow.



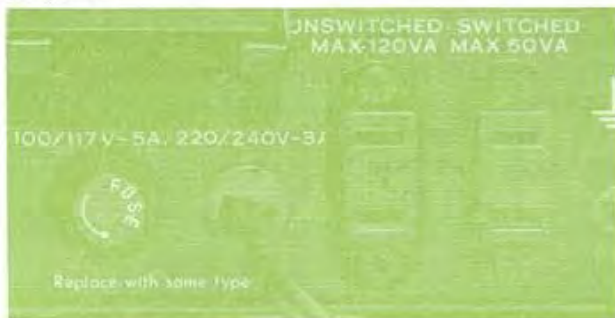
Wire Connections

When connecting decks, players or other components to the 5000X, be sure to use shielded wire. The use of an ordinary cord or vinyl wire may cause humming and buzzing. The length of the shielded wire used should be shorter than 5 feet. Be sure that all lead wires between the amplifier and components are properly connected. If the connections are loose or in touch with other parts, the amplifier will not function properly, may pickup noise, and even breakdown over a period of time. Also, be sure to read the manufacturer's instructions for any component before connecting it to the 5000X.



AC Outlets

Two AC outlets have been provided on the rear panel of the amplifier to serve as power supply sources for players or other components used with the 5000X. The left outlet (SWITCHED) is controlled by the POWER switch on the front panel of the amplifier.



Caution: The outlet marked SWITCHED has a maximum capacity of 50 VA and the other (marked UNSWITCHED) 120VA. Never use them beyond their rated capacities. The voltage supplied by the AC outlets is the same as the power supply voltage used.

Power Fuse

Should the amplifier fail to operate and the function indicator fail to light up when the POWER switch is turned on, the probable cause is either a power stoppage or a blown fuse. To check, remove the 5000X's power supply cord from its outlet, turn the fuse holder on the rear panel counterclockwise, and remove the fuse. If it is blown, replace it with a new glass-tubed fuse of the same capacity (100/117V—5A, 220/240V—3A) after determining and eliminating the trouble source that caused the fuse to blow. Using wire or a fuse of a different capacity as a stop-gap measure is dangerous and should be avoided.

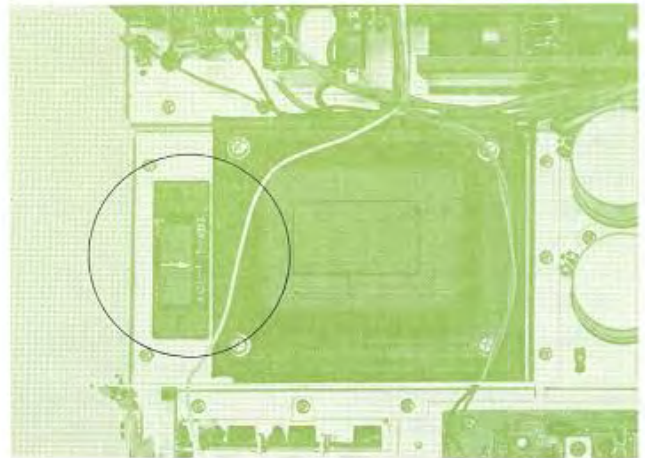
Should the Function Indicator Fail to Light

If one or more function indicators fail to light in the dial window when the FUNCTION Selector is switched to the appropriate position, it is most likely one or more indicator lamps behind the window

have burnt out. To replace, remove the wood case from the amplifier (see Service Manual).

Voltage Selecting Plug

This plug is located inside the wood case of the amplifier and has been set to the voltage of your area prior to shipment. If the amplifier is ever moved to an area with another voltage requirement, this plug must be changed to the proper voltage of the new area. To change, remove the wood case from the amplifier (see Service Manual), remove the plug from the voltage socket you have been using, and plug the arrow head into the appropriate voltage requirement of 100V, 117V, 220V and 240V.



Accessories

1. AM ANTENNA	1
2. FM ANTENNA	1
3. PIN-PLUGS	6
4. OPERATING INSTRUCTIONS	1
5. OPERATING SHEET	1
6. SERVICE MANUAL	1
7. POLISHING CLOTH.....	1
8. QUICK ACTING FUSES (4A)	2

SPECIFICATIONS / CHARACTERISTICS

POWER AMPLIFIER SECTION

POWER OUTPUT

MUSIC POWER (IHF):	200W at 4 ohms load 160W at 8 ohms load
CONTINUOUS POWER:	85/85W at 4 ohms load 60/60W at 8 ohms load
TOTAL HARMONIC DISTORTION:	less than 0.5% at rated output
INTERMODULATION DISTORTION (60Hz: 7,000Hz= 4 : 1 SMPTE method):	less than 0.8% at rated output
POWER BANDWIDTH (IHF):	15 to 30,000Hz
FREQUENCY RESPONSE: (at normal listening level)	10 to 50,000Hz ± 1 dB
CHANNEL SEPARATION: (at rated output, 1,000Hz)	better than 60dB
HUM AND NOISE (IHF):	better than 80dB
INPUT SENSITIVITY: (for rated output 1,000Hz)	0.8V

INPUT IMPEDANCE:	50k ohms
LOAD IMPEDANCE:	4 to 16 ohms
DAMPING FACTOR:	50 at 8 ohms load

PREAMPLIFIER SECTION

OUTPUT VOLTAGE

MAXIMUM OUTPUT VOLTAGE:	1.5V
RATED OUTPUT VOLTAGE:	0.8V
TOTAL HARMONIC DISTORTION:	less than 0.1% at rated output voltage
FREQUENCY RESPONSE: AUX	20 to 30,000Hz ± 1 dB
CHANNEL SEPARATION (at rated output 1,000Hz)	
PHONO-1 AND 2:	better than 40dB
AUX:	better than 45dB

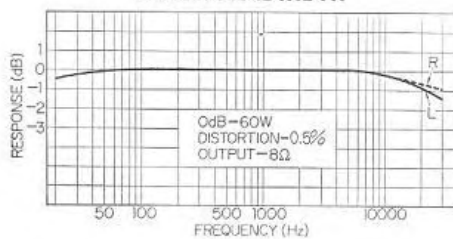
HUM AND NOISE (IHF)

PHONO-1 AND 2:	better than 70dB
AUX:	better than 75dB
INPUT SENSITIVITY (at rated output 1,000Hz)	
PHONO-1:	2.5mV (50k ohms)
PHONO-2:	2.5mV (50k ohms)
AUX:	150mV (100k ohms)
MIC:	3.0mV (10k ohms)
TAPE MON (pin):	150mV (100k ohms)
TAPE RECORDER (DIN):	150mV (100k ohms)
RECORDING OUTPUT (at rated input 1,000Hz)	
TAPE REC (pin):	200mV
TAPE RECORDER (DIN):	35mV
EQUALIZER PHONO:	RIAA NF type
MIC:	flat NF type
TONE CONTROLS	
BASS:	± 13 dB at 50Hz
TREBLE:	± 12 dB at 10,000Hz
LOUDNESS CONTROL:	+8dB at 50Hz, +3dB at 10,000Hz (volume control at -30dB)

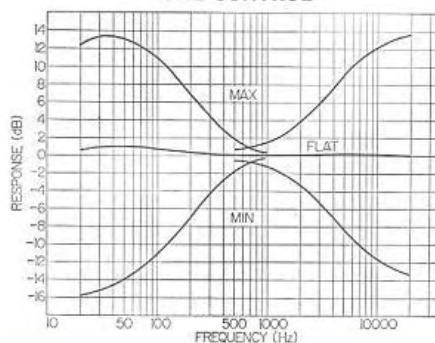
SWITCHES

SELECTOR:	PHONO-2, PHONO-1, AM, FM MONO, FM AUTO, AUX
TAPE MONITOR-1 AND 2:	SOURCE, PLAY BACK
MONO:	STEREO, MONO
REVERSE:	NORMAL, REVERSE
LOW FILTER:	-13dB at 50Hz
HIGH FILTER:	-13dB at 10,000Hz
SPEAKER SELECTOR:	OFF, SYSTEM-A, SYSTEM-B, SYSTEM-C, SYSTEM-A+B, SYSTEM-A+C

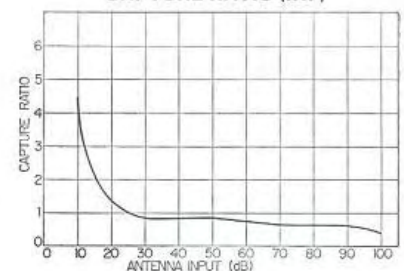
POWER BANDWIDTH



TONE CONTROL



CAPTURE RATIO (IHF)



CONTROL: LEVEL ADJUST (sub volume)
(rear panel)

TUNER SECTION

<FM>

TUNING RANGE: 88 to 108MHz
 SENSITIVITY (20dB quieting): 1.4 μ V
 (IHF): 1.8 μ V
 TOTAL HARMONIC DISTORTION: less than 0.8%
 SIGNAL TO NOISE RATIO: better than 65dB
 SELECTIVITY: better than 45dB
 CAPTURE RATIO (IHF): 1.5dB
 IMAGE FREQUENCY REJECTION: better than 90dB
 at 98MHz
 IF REJECTION: better than 100dB
 at 98MHz
 SPURIOUS RESPONSE REJECTION: better than 95dB
 at 98MHz
 FM STEREO SEPARATION: better than 35dB
 at 1,000Hz
 SPURIOUS RADIATION: less than 34dB
 ANTENNA INPUT IMPEDANCE: 300 ohms balanced,
 75 ohms unbalanced

<AM>

TUNING RANGE: 535 to 1605kHz
 SENSITIVITY (bar antenna): 250 μ V at 1,000kHz
 (IHF): 20 μ V (terminal)
 IMAGE FREQUENCY REJECTION: better than 80dB at 1,000kHz
 IF REJECTION: better than 90dB at 1,000kHz
 SELECTIVITY: better than 30dB at 1,000kHz

SWITCHES

FM MUTING OFF: ON, OFF
 FM STEREO ONLY: OFF, ON

SEMICONDUCTORS

Transistors: 52 FET: 3 IC: 4 Diodes: 31
 Zener Diodes: 3

POWER REQUIREMENTS

POWER VOLTAGE: 100, 117, 220, 240V 50/60Hz
 POWER CONSUMPTION: 375 VA

DIMENSIONS:

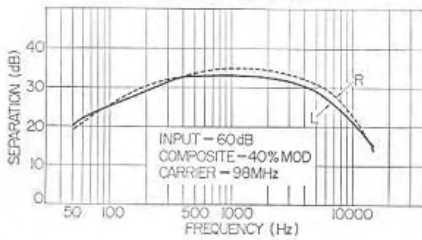
462mm(18 $\frac{3}{16}$ "W), 162mm(6 $\frac{3}{8}$ "H),
 338mm(13 $\frac{5}{16}$ "D)

WEIGHT:

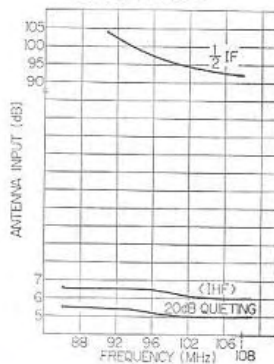
15.1 kg (33.3 lbs.)

* Manufacturer reserves right to change design and/or specifications without notice for purpose of improvement.

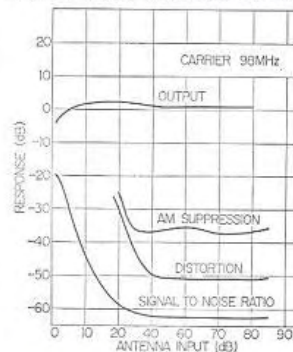
FM STEREO SEPARATION



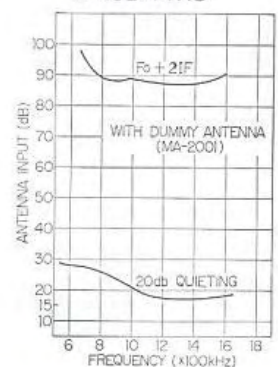
FM SENSITIVITY & IMAGE RATIO



FM SIGNAL TO NOISE RATIO, OUTPUT LEVEL VS ANTENNA INPUT, DISTORTION & AMPLITUDE MODULATION SUPPRESSION RATIO



AM SENSITIVITY & IMAGE RATIO





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