SOLID STATE INTEGRATED AMP.

OPERATION MANUAL

WE THANK YOU FOR YOUR CHOICE OF THE SQ507

HOW TO MAKE BEST USE OF THIS AMPLIFIER

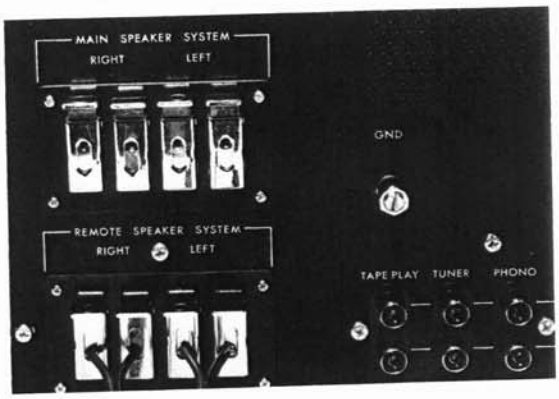
This operation manual has been prepared so that even an audio beginner can make the best use of this amplifier through perusal.
Upon unpacking, place the amplifier at a location where it is installed. In the following sections are detailed various connection procedures to make this amplifier a control center of the audio system. The procedures cover connection to speakers, a power point, a record player, a tuner, a tape deck, etc.

BASIC CONNECTIONS

The LUXMAN model SQ507 is a pre/main (integrated) amplifier. A stereo audio system can therefore be built by proper connections from input sources (record player, tuner, tape recorder, etc.) and to output loads (speakers, headphones, etc.). Above all connections to speakers and specified single phase AC power point are the most basic requirement.

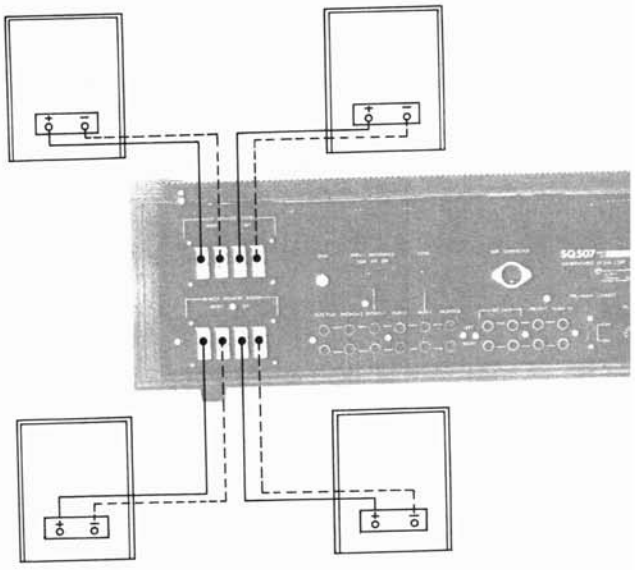
CONNECTION TO SPEAKERS

The right-hand side speaker (viewed from the listening position) to the RIGHT speaker terminals and the left-hand side speaker to the LEFT speaker terminals of the amplifier. The positive (+) terminals are provided with ° mark for identification. Correct phase matching (positive leads to positive terminals and negative leads to negative terminals) between the right and left speakers is very important. If mismatched, anti-phasing (phase between the right and left speakers is reversed) is caused and normal stereophonic reproduction may not be possible. Since the amplifier provides two sets of speaker terminals (Main, Remote), normally connect to the MAIN SPEAKER SYSTEM terminals which are located top of the other. In this case main speaker systems switch must be on. Unless otherwise listening with other speaker system (connected to the REMOTE SPEAKER SYSTEM terminals) or headphone is made, the above switch is normally selected at the ON position. Connection of the speaker leads to the speaker terminals of this amplifier is easy. First strip off the insulating shield of the lead at its tip for approximately 7mm (1/4"). Then lift the handle of the terminal and insert the lead tip into the terminal. Firm connection is automatically established by pressing down the handle. For disconnection, lift the handle while pulling out the lead. (See the photo illustration.)



CONNECTION TO POWER POINT

Before connecting the power cable of the amplifier to a suitable single phase AC power point, the volume control must be cut (turned to the extreme counterclockwise direction). Press the power switch to the ON position and the pilot light at the front control panel lights up to indicate the amplifier is in the operating condition.



PHONOGRAPH PLAYBACK

■ CONNECTION

This amplifier is provided with two phonograph input terminals (Phono-1, Phono-2) so that phonograph playback from two record players is possible without extra connection/disconnection practice. Since selection of these connectors can be made quickly by the INPUT SELECTOR, comparison of phono cartridges or selection of an optimum record player for a record to be played can be made very easily.

The record player mainly consists of a turntable giving a constant speed turning of the record, a pick-up or cartridge of which precision made stylus tracks along the sound groove to pick up recorded signals contained in such sound grooves to convert them into electric signals, a pick-up arm which supports the cartridge and gives optimum stylus pressure, etc. The record player is provided with two shielded leads for carrying the right and left phonograph signals to the input terminals of the amplifier. For easy connection, at the tips of these leads, pin connectors are provided.

Connect the pin connectors to the PHONO connector of this amplifier. An earth lead may be provided with the record player. This lead may be connected to the GND terminal of this amplifier. This practice is normally effective to reduce hum level, but in some cases hum level may be increased by this connection.

The record player is also provided with a power cord for its drive motor. This cord may be connected to the convenience AC outlet of the amplifier.

■ SIGNAL PATHS

Place the record on the turntable, switch on the phono motor switch, and set the stylus on the sound groove of the record. Phonograph signals are then fed to the amplifier.

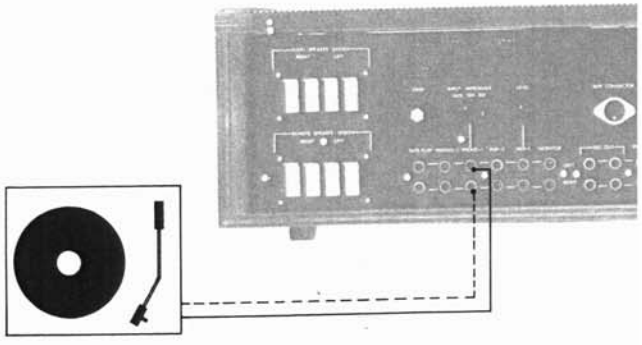
Reference to the block diagram indicates signals fed to the amplifier through the PHONO terminals are firstly carried to the equalizer stage. In this equalizer stage, input signals are equalized to the recording characteristics. Presently, RIAA equalization is the standard. Equalized signals are then sent to the input selector (function switch). If the input selector is not selected at the PHONO position, signals are blocked and playback is not possible. It is therefore very important that the INPUT SELECTOR IS PROPERLY SELECTED at the position of the matching program source. Signals then go through impedance conversion by the emitter-follower stage to completely shut out treble response deterioration possibly caused by extension cord or floating capacitance. Then signals are divided into two channels . . branch line to the REC. OUT. terminals and main line to the TAPE MONITOR SWITCH and finally to the playback speakers via various blocks as per the diagram. If the TAPE MONITOR SWITCH is on, signals are stopped at this control . . recording output signals are possible from the REC. OUT. terminals but sound playback from the speakers can not be made.

When recording of phonograph output on a tape recorder is desired, it can be made irrespective of the position of the TAPE MONITOR SWITCH. However, for playback of sound from the speakers or headphone, it is necessary that the TAPE MONITOR SWITCH is OFF. Signals after the tape monitor switch are sent to the speakers provided that the speaker systems switch is properly selected and the VOLUME CONTROL is adjusted for a desirable playback sound level.

A clockwise turn of the volume control knob causes to increase the sound volume. If completely turned counterclockwise, sound volume is cut off.

■ PLAYBACK

As a record placed on the turntable and the volume control knob turned clockwise from the cut position, playback can be made. Excepting for correct setting of the above essential controls, sound playback shall be made irrespective of positions of other control functions, such as the MODE SELECTOR, etc., for these controls are not related to the "sound reproduction" (satisfactory playback is another question). So, the essential practice for the sound playback is now completed. Sound level from the both speakers identical? If deviated, it can be corrected by the BALANCE CONTROL. For playback from a stereo record, it is necessary that the MODE SELECTOR is selected at the stereo normal (or stereo reverse . . if reversed stereo playback is desired or phonograph cartridge connection was reversely made). If this switch is selected at the other positions, stereophonic playback is not possible.



TAPE PLAYBACK

CONNECTION OF TAPE PLAY CONNECTOR

Almost all of presently marketed tape recorders or tape decks integrate audio amplifiers for tape playback. Also tape players designed for tape playback alone are marketed. Tape outputs from such tape recorders or players can be connected to the TAPE PLAY CONNECTOR for playback from speakers. Tape playback from the AUX terminals is also possible. All playback procedures are identical to that practised for phonograph playback.

CONNECTION OF TAPE MONITOR CONNECTOR

When the TAPE MONITOR CONNECTOR is used, the TAPE MONITOR SWITCH must be on. By this selection, controls prior to this TAPE MONITOR SWITCH such as INPUT SELECTOR, etc. are separated and isolated from the playback circuit. Input signals from other program sources supplied through the input terminals (PHONO, AUX-1, AUX-2) are available at the REC. OUT terminals irrespective of the position of the TAPE MONITOR SWITCH. This therefore permits simultaneous tape recording and playback.

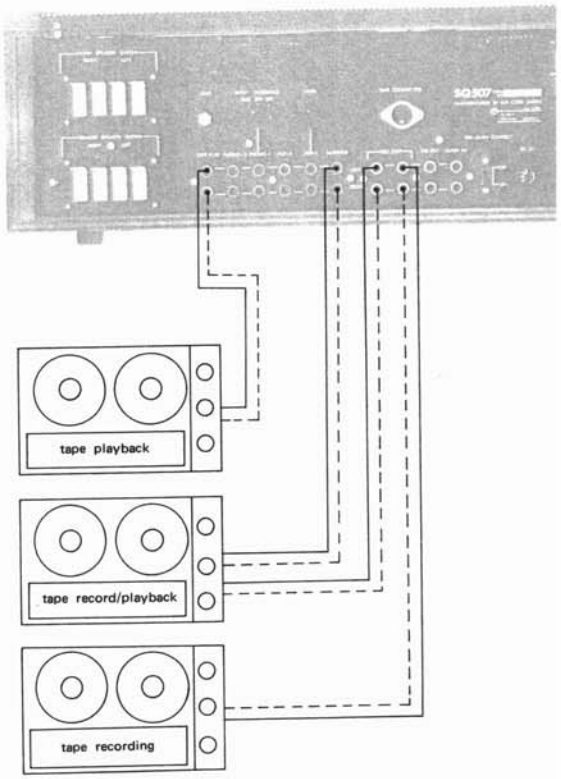
RECORDING ON TAPE

In playback of various program sources, identical output signals to that supplied to speakers are available at the REC. OUT CONNECTOR. By connection of such output signals from the REC. OUT CONNECTOR to the input terminals of a tape recorder, simultaneous recording/playback is possible. Since these recording output signals are taken out prior to the TAPE MONITOR SWITCH, various control functions provided after the said switch such as VOLUME CONTROL, TONE CONTROL, etc. are not effective on recording output signals.

Duplication of tape recording (reprinting) can be practised by using two tape recorders. Connect the tape recorder having good recording characteristics to the TAPE MONITOR CONNECTOR and the REC. OUT CONNECTOR of the amplifier and connect the other tape recorder outputs to the TAPE PLAY CONNECTOR. Set the INPUT SELECTOR at the tape recorder position.

TAPE PLAYBACK MONITORING

With the 3-head tape recorder, playback head and the playback amplifier are independently in circuit while recording is made and tape outputs can be taken out for playback from the speaker or headphone. For this, connect the tape recorder AUX terminals with the REC. OUT CONNECTOR of the amplifier, and the tape recorder LINE OUT terminals with the TAPE MONITOR CONNECTOR of the amplifier. Comparison between original sound and recorded sound can be readily practised by switching on and off the TAPE MONITOR SWITCH. Since playback monitoring is possible with the 3-head tape recorder, recording error can be completely eliminated.

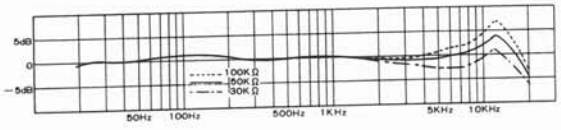


BASIC REQUIREMENTS FOR SOUND PLAYBACK

1. POWER: (Firm connection of the power cord to an adequate AC power point. The power switch is on.)
2. OUTPUT CONNECTION: (Firm and correct connection to output loads . . speakers, headphone, etc.)
3. INPUT CONNECTION: (Firm and correct connection from program source equipment.)
4. INPUT SELECTOR: (This control is properly selected at the position for the matching program source.)
5. TAPE MONITOR SWITCH: (Unless the TAPE MONITOR CONNECTOR is used, the switch must be OFF.)
6. VOLUME CONTROL: (The control knob is turned clockwise from the cut position until desired sound level is obtained.)
7. PRE-MAIN SEPARATOR SWITCH: (This switch is normally selected at the ON position. If accidentally selected at the OFF position, switch on the switch.)
8. SPEAKER SYSTEM SWITCHES: (For playback with the main speaker system, select the main switch.)
9. STEREO HEADPHONE: (If a headphone jack is inserted to the HEADPHONE CONNECTOR, speakers are silenced.)

INPUT IMPEDANCE SELECTOR

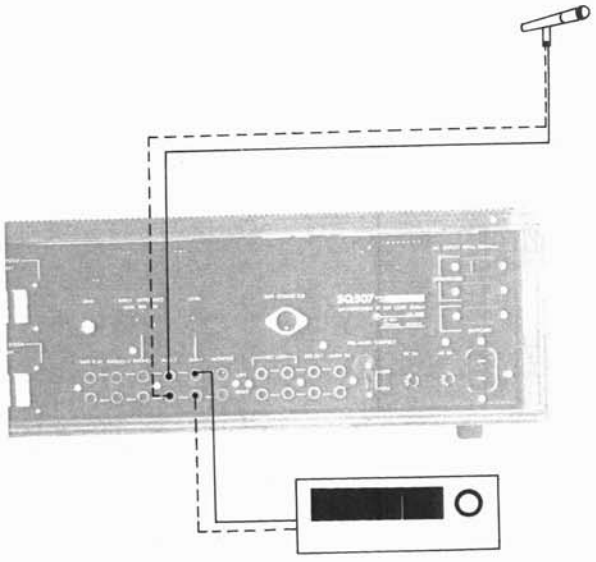
The PHONO-1 input connector is provided with a 3-step impedance selector (30, 50, 100 KΩ) on the rear panel. Excepting for a special low impedance type pick-up, almost all currently marketed pick-ups specify recommended load impedance as 30/100Kohms. It is furthermore an accepted fact that 50Kohm type pick-ups are predominent. It is known variation of the load impedance value effects to a greater extent frequency response. The chart given here clearly illustrates an example—with a low load impedance, treble output is cut while with a high load impedance a peak is caused in the treble range. Degree of such effect is not same with different pick-ups but generally a pick-up having a higher output impedance tends to be more delicately influenced. It is therefore necessary that selection of a proper input impedance is made by this control.



Note:

The above description generally applies to use with a magnetic type pick-up having an output of 0.5mv or more which is most commonly used. This amplifier accepts the following magnetic type pick-ups without any problem.

MM(moving magnet) type, IM(induced magnet) type, and MI(moving iron) type. However some models in the MC (moving magnet) type pick-up may have a very low output voltage needing insertion of an input transformer between the phonograph cartridge and the input connector for voltage step-up. For use with special photoelectric or electrostatic type pick-up, or any other special type, selection of a proper input connector in compliance with an instruction for such pick-up is essential. For use with a conventional piezo-electric (crystal or ceramic) type pick-up, excepting for a special type, the AUX connector must be used. However, since this type of pick-up normally requires some response compensation, it is not so commonly used.



PLAYBACK OF AM/FM BROADCASTING PROGRAMS

Playback of AM or FM broadcasting programs can be made by connecting the tuner output to the AUX-1 or AUX-2 CONNECTOR and by selecting the INPUT SELECTOR at the proper position. As shown in the block diagram, tuner input signals are directly sent to the INPUT SELECTOR bypassing the equalizer stage. In AM program playback, if modulation hum trouble is possible, it may be corrected by varying the distance between the tuner and the amplifier or angle of these component placement. Otherwise, provision of an outdoor antenna and earthing may be necessary. If this amplifier is connected to an FM MPX (stereo) tuner, the mode switch of this amplifier must always be set at the STEREO position.

PLAYBACK FROM MICROPHONE, ETC.

If playback from microphone is desired, microphone output can be connected to the AUX-1 or AUX-2 INPUT CONNECTOR. If a low impedance microphone is used, voltage step-up by using a 1 : 10 ratio step-up transformer is necessary. Besides the microphone playback, whenever playback of audio signals having flat frequency response characteristics is desired, use the AUX. INPUT CONNECTORS. The INPUT SELECTOR must be set at the auxiliary position.

LEVEL SET

The AUX-1 connector circuit is provided with a semi-fixed resistor to permit input level adjustment. When this control is turned completely clockwise, sensitivity of the AUX-1 connector becomes identical with that of the AUX-2. By turning counterclockwise, the AUX-1 connector can flexibly accept higher than 100mv output level signals.

CONNECTION OF DIN TAPE CONNECTORS

If a tape recorder is also provided with a DIN connector, connection of recording and playback connectors of the amplifier and the tape recorder can be made by a single cord having matching DIN pin connectors at its ends.

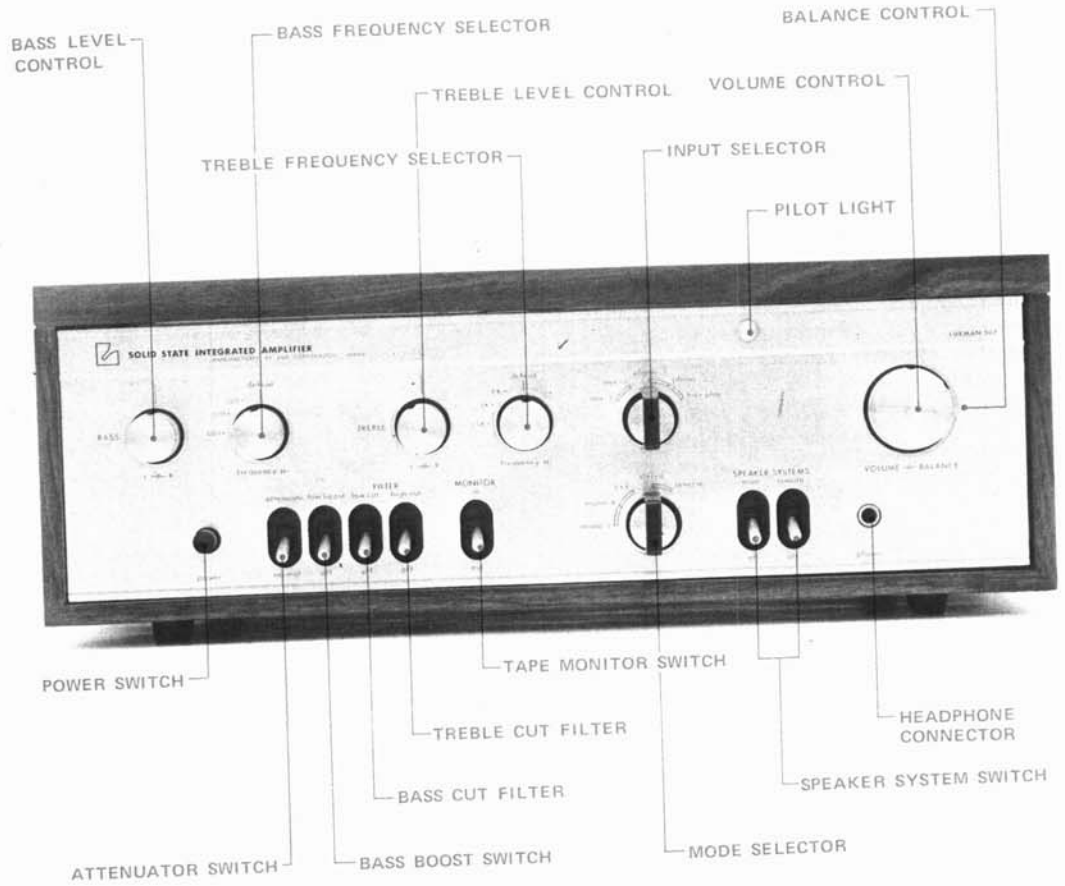
SIMULTANEOUS RECORDING ON TWO OR MORE TAPES

This amplifier is provided with two sets of REC. OUT CONNECTORS to permit simultaneous recording on two tape recorders. In other words, if so desired, recording on a casstte tape and an open reel tape can be made at one time. This facility is useful to provide double safety of recording, or for tape printing, etc. Use of the DIN CONNECTOR permits recording on 3 tape recorders. Output impedance at the recording output connector is sufficiently low so that mutual interference of parallel operation tape recorders is irreducibly minimum.

NOTE

When the DIN CONNECTOR is used, disconnect the MONITOR INPUT CONNECTOR or when the MONITOR INPUT CONNECTOR is used, disconnect the DIN CONNECTOR. This is because parallel connection of two tape recorder output circuits impairs recording characteristics to some extent.

CONTROLS RELATED TO SOUND PLAYBACK



Luxman 507

SPECIFICATIONS

PREAMPLIFIER

Frequency response: 20Hz -- 50,000Hz (less than −1dB)

Total harmonic distortion: less than 0.1% (1KHz 1V)

Residual noise: less than 100μV

Cross talk: (1KHz) more than 55dB (channel to channel)
more than 70dB (input connectors)

Equalizer: RIAA (3-stage direct coupling NF circuit)

Tone control: LUX type NF turnover frequency selection
TREBLE: 1.5KHz, 3KHz, 6KHz
BASS: 600Hz, 300Hz, 150Hz

Additional controls: BASS BOOST: 80Hz, −6dB/oct.
TREBLE CUT FILTER: 100Hz, −6dB/oct.
PRE/MAIN AMP. SEPARATOR SWITCH, TAPE MONITOR SWITCH & CONNECTOR

MAIN AMPLIFIER

Circuit: Semi complementary single ended push-pull output transformerless (SEPP OTL)

RMS power: 70W/70W (4 ohms), 60W/60W (8 ohms, 40W/40W (16 ohms)

Total harmonic distortion: less than 0.2% (60W, 8 ohms, 1KHz)

Frequency response: 10Hz ~ 50,000Hz (less than −1dB)

Input sensitivity: 800mv (60W, 8 ohms)

Input impedance: 50K ohms

Residual noise: less than 0.5mV

Damping factor: 70 (16 ohms, 1KHz), 35 (8 ohms, 1KHz)

Additional controls: ATTENUATOR SWITCH (−12dB)
MAIN/REMOTE SPEAKERS SWITCHES AND CONNECTORS
HEADPHONE CONNECTOR
AUTOMATIC RESETTING PROTECTIVE CIRCUIT

INPUT CONNECTORS	INPUT SENSITIVITIES	INPUT IMPEDANCE	MAX. PERMISSIBLE INPUT	S/N RATIO
PHONO−1	2mv	30K, 50K, 100KΩ	100mv	more than 60dB
PHONO−2	2mv	50KΩ	100mv	more than 60dB
AUX−1	more than 100mv	100KΩ	more than 5v	more than 70dB
AUX−2	100mv	200KΩ	5v	more than 70dB
TAPE PLAY	100mv	100KΩ	5v	more than 70dB
MONITOR	400mv	100KΩ		more than 70dB
TAPE CONNECTOR	400mv	100KΩ		more than 70dB

OUTPUT CONNECTORS	RATED OUTPUT	OUTPUT IMPEDANCE
REC OUT	100mv	less than 500Ω
TAPE CONNECTOR	50mv	75KΩ
PRE OUT	800mv	less than 100Ω

SEMI-CONDUCTORS, ETC.

TRANSISTORS: 2SD218(5), 2SC959(5), 2SA-606(2), 2SC369BL(3), 2SC-693Gu(14), 2SC694G(5), 2SC734Y(1)

DIODES: SD34(6), DS13(4)

VARISTERS: SV-03(2)

POWER CONSUMPTION: 170W (maximum output)

POWER REQUIREMENT: 100, 115, 220, 240V, AC single phase 50/60Hz

DIMENSIONS: 160mm (6-5/16")H x 450mm (17-3/4")W x 268mm (10-9/16")D

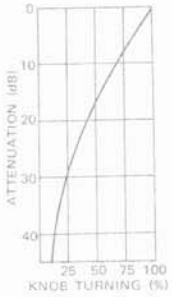
WEIGHT: 11Kg (24 1bs)

MODE SELECTOR

Since this is the stereo integrated amplifier, two independent amplification circuits are integrated. The MODE SELECTOR is placed inbetween these two amplification circuits.

knob position	connection input output	performance	use
STEREO NORMAL	R→R, L→L	normal stereo playback	for normal stereo playback
STEREO REVERSE	R→L, L→R	reversed stereo playback	when program source is reversly connected
MONO R	R→R, L→L	right input signals is reproduced from both right and left speakers	for monaural program source playback
MONO L	R→R, L→L	left input signal is reproduced from both right and left speakers	
MONO R+L	R→R, L→L	right and left input signals are integrated	for playback of monaural record with a stereo phono pick-up

VOLUME CONTROL



This amplifier uses JIS-A type variable resistors having the attenuation characteristic that attenuation is −17dB at the neutral point from the maximum output which is obtainable by turning the knob completely clockwise. In other words, amplification degree or gain of the amplifier is cut. Attenuation of −6dB causes voltage gain cut to 1/2, −20dB, 1/10 and −26dB, 1/20. This JIS-A type volume control provides proportionate relationship between knob turning and gain from the 1/4 point to the extreme right end. If the maximum output is possible without turning the knob to the extreme clockwise position (for example at 8 o'clock knob position), input level must be excessive. In such case, level adjustment must be made. Otherwise distortion at the front end may be possible. However, the input connectors of this amplifier possess an ample margin for verying input levels.

BALANCE CONTROL

When the BALANCE CONTROL is in the central position the gain of each channel shall be identical. A clockwise turn of this knob causes to cut the volume of the LH channel. When the volume of both channels is balanced, monaural phonograph playback sound through a stereo phono cartridge comes from the center of the right and left speakers. (In this case the MODE SELECTOR should be at the stereo position.) If input signals vary between two channels, establish the balance using this BALANCE CONTROL.

TONE CONTROL

The tone control consists of the BASS & TREBLE LEVEL CONTROLS and the BASS & TREBLE FREQUENCY SELECTORS.

The ultimate purpose of the audio system is high fidelity playback of the program source. However, every listener has his own taste of sound and playback conditions do not always match with recording conditions, and he must create his favorite sound by himself -- it is therefore important that the audio system provides such facility to permit flexible tone control for creation of best sound. This amplifier adopts the LUX's original NF tone control circuits which assure ideal playback sound quality adjustment.

TREBLE LEVEL CONTROLS
BASS LEVEL CONTROLS

A clockwise turn of these knobs boosts the treble or bass response and a counterclockwise turn, cut. At the neutral click stop position, response is flat. Treble and bass response curves shown in this manual show the responses at respective click stops of the control knobs.

TREBLE FREQUENCY SELECTORS
BASS FREQUENCY SELECTORS

Turn-over or roll off frequencies in treble or bass tone control circuit can be selected by these switches. If a mild response adjustment at the both treble and bass frequency ranges is desired, select 6KHz and 150Hz positions. At the DEFEAT position, response shall be flat irrespective of position of the TREBLE or BASS CONTROL knob.

TREBLE CUT SWITCH

When this control is selected, a filter circuit to cut the treble response above 5KHz with 6dB/oct attenuation characteristic comes into function. Useful to eliminate scratch noise, etc. Use of this switch can intensify the function of the TREBLE CONTROLS.

BASS CUT SWITCH

When this control is selected, a filter curcuit to cut the bass response below 100Hz with 6dB/oct attenuation characteristic comes to function. Useful for elimination of low frequency noise such as motor rumble. Use of this switch can intensify the function of the BASS CONTROLS.

BASS BOOST SWITCH

Selection of this control intensifies the bass response below 80Hz with a slope of 6dB/oct. Since this circuit is effective only to the extreme low end, it permits very flexible tone quality adjustment. For further details see characteristic charts and descriptions at the end of this manual.

ATTENUATOR SWITCH

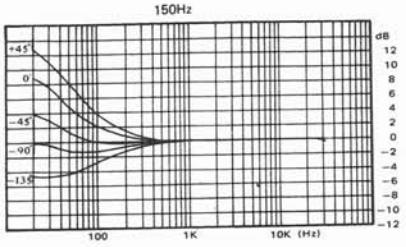
Lift this switch and an attenuator inserted at the input side of the main amplifier is operated to attenuate the gain by 12dB. This control is useful when playback at subdued volume level is desired. Residual noise is irreducibly minimum and an interlocking error which is frequently possible when the volume level is cut to near zero is also eliminated. Also useful as a momentary speaker silencing switch. Avoid using this switch for high volume level playback because distortion by clipping at the preamplifier stage is possible.

BASS CONTROL : TURNOVER FREQUENCY

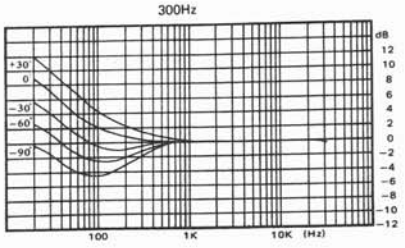
The charts given below show respective composite response curves in low frequency range when the BASS CONTROL is adjusted while the BASS BOOST SWITCH is ON.

(Angles shown in the vertical axis = 0° as the BASS CONTROL neutral position, + for clockwise (boost) and − for counter-clockwise (cut) turns.)

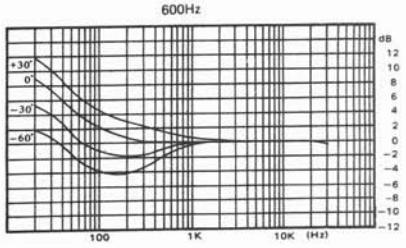
150Hz



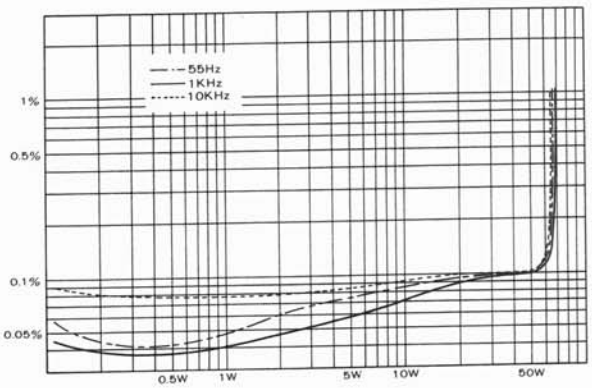
300Hz



600Hz

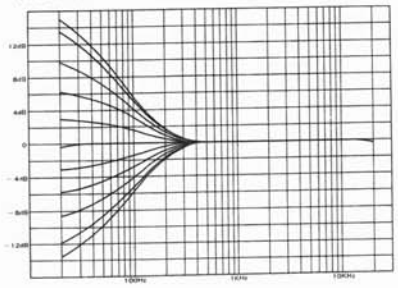


OUTPUT VS. THD (INPUT: MAIN-IN CONNECTOR)

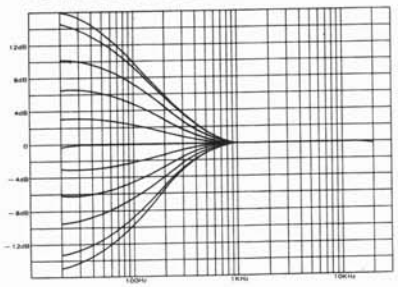


BASS LEVEL CONTROL

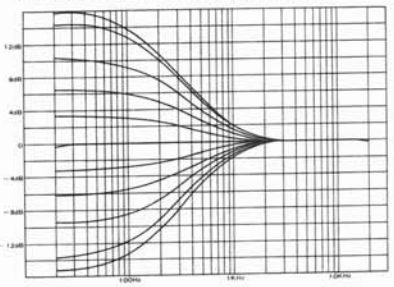
(TURNOVER FREQUENCY: 150Hz)



(TURNOVER FREQUENCY: 300Hz)

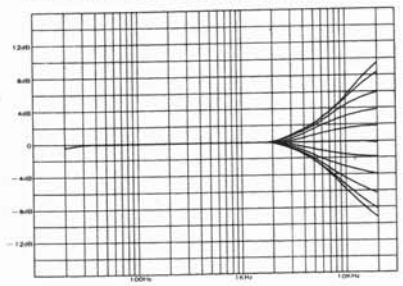


(TURNOVER FREQUENCY: 600Hz)

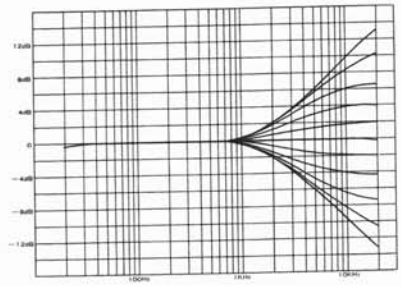


TREBLE LEVEL CONTROL

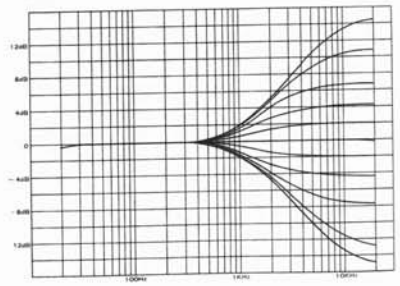
(TURNOVER FREQUENCY: 6KHz)



(TURNOVER FREQUENCY: 3KHz)

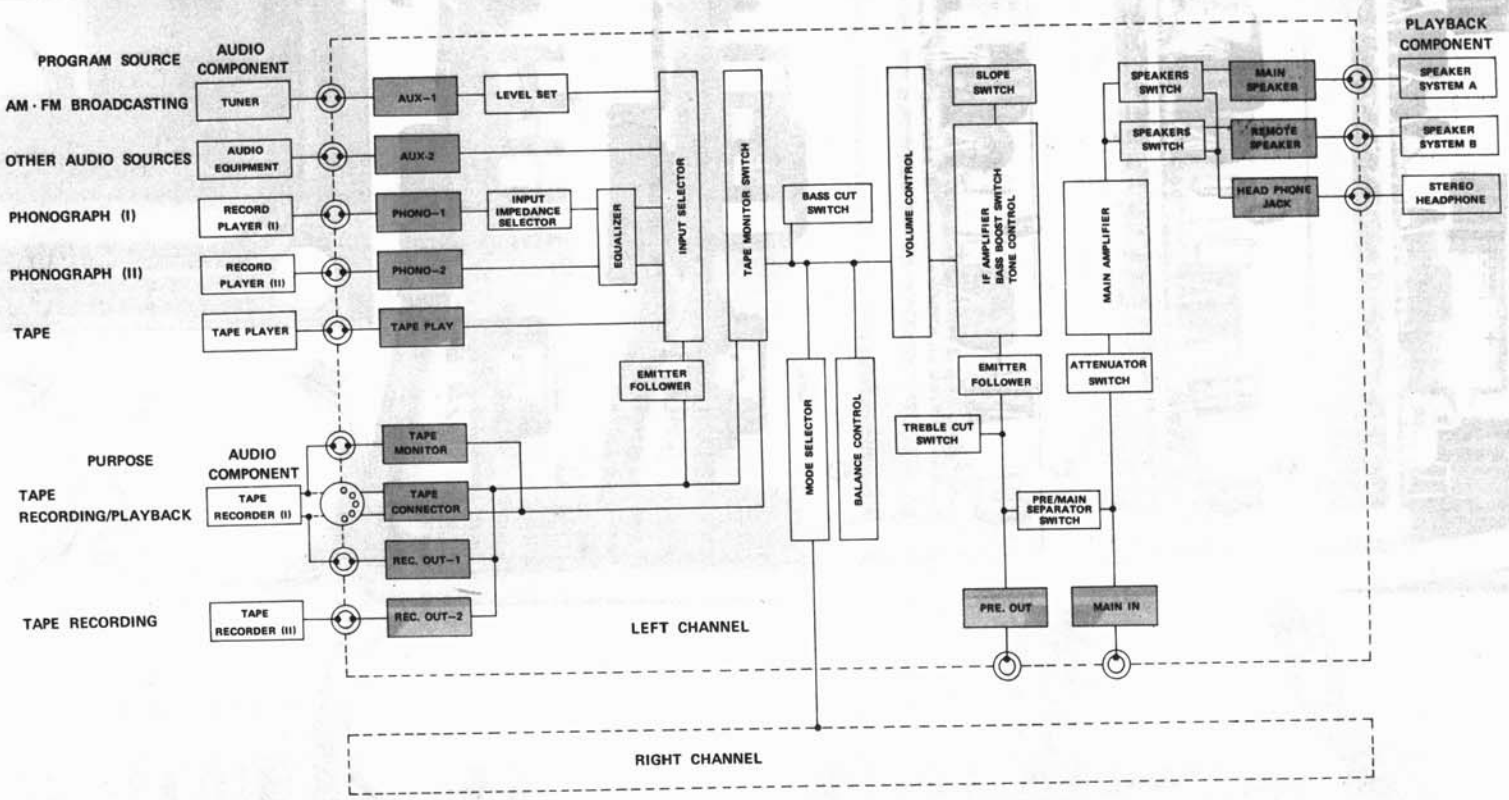


(TURNOVER FREQUENCY: 1.5KHz)



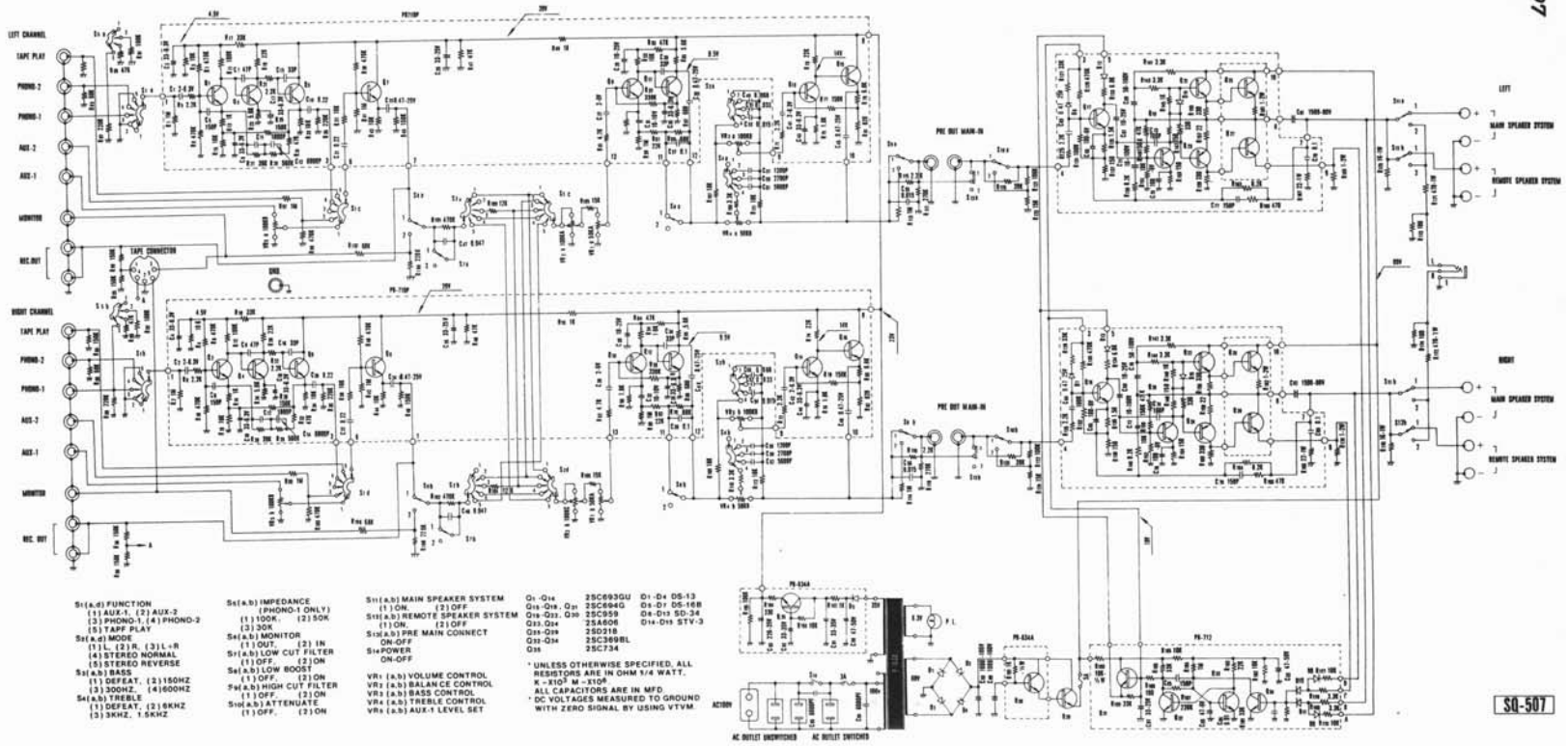
BLOCK DIAGRAM

Completion of speaker and power connections enables normal sound playback from the speakers when adequate signal sources are connected to the input terminals of this amplifier. The block diagram given on this page may be useful to explain the function of the amplifier.
Reference to the diagram clearly indicates the respective paths of input signals to the speakers through various controls--it may help visualize how unperceivably low level signal current of program sources can be selected, equalized, and amplifierd for driving of the speaker systems.
The following sections of this instruction are described in reference to this block diagram.



1. This block diagram mainly indicates terminal connections & signal paths in the left channel.
2. ▭ indicates description of respective terminals.
3. Emitter-follower is used as impedance converter in order to eliminate possible interferance from load equipment, connecting cable, etc.

CIRCUIT DIAGRAM



S1(a,d) FUNCTION
(1) AUX-1, (2) AUX-2
(3) PHONO-1, (4) PHONO-2
(5) TAPE PLAY
S2(a,d) MODE
(1) L, (2) R, (3) L+R
(4) STEREO NORMAL
(5) STEREO REVERSE
S3(a,b) BASS
(1) DEFEAT, (2) 150HZ
(3) 300HZ, (4) 600HZ
S4(a,b) TREBLE
(1) DEFEAT, (2) 6KHZ
(3) 3KHZ, 1.5KHZ

S5(a,b) IMPEDANCE (PHONO-1 ONLY)
(1) 100K, (2) 50K
(3) 30K
S6(a,b) MONITOR
(1) OUT, (2) IN
S7(a,b) LOW CUT FILTER
(1) OFF, (2) ON
S8(a,b) LOW BOOST
(1) OFF, (2) ON
S9(a,b) HIGH CUT FILTER
(1) OFF, (2) ON
S10(a,b) ATTENUATE
(1) OFF, (2) ON

S11(a,b) MAIN SPEAKER SYSTEM
(1) ON, (2) OFF
S12(a,b) REMOTE SPEAKER SYSTEM
(1) ON, (2) OFF
S13(a,b) PRE MAIN CONNECT
ON-OFF
S14 POWER
ON-OFF

VR1 (a,b) VOLUME CONTROL
VR2 (a,b) BALANCE CONTROL
VR3 (a,b) BASS CONTROL
VR4 (a,b) TREBLE CONTROL
VR5 (a,b) AUX-1 LEVEL SET

Q1 -Q14 2SC693GU
Q15-Q18, Q20 2SC694G
Q19-Q22, Q39 2SC959
Q23, Q24 2SA606
Q25-Q29 2SD316
Q30-Q34 2SC369BL
Q35 2SC734

D1-D4 DS-13
D5-D7 DS-16B
D8-D13 SD-34
D14-D15 STV-3

* UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE IN OHM 1/4 WATT, K=10³ M=10⁶.
ALL CAPACITORS ARE IN MFD.
* DC VOLTAGES MEASURED TO GROUND WITH ZERO SIGNAL BY USING VTVM.