



*Solid State Integrated Amplifier*  
**RA-311**  
 ROTEL®

## owner's manual

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## INTRODUCTION

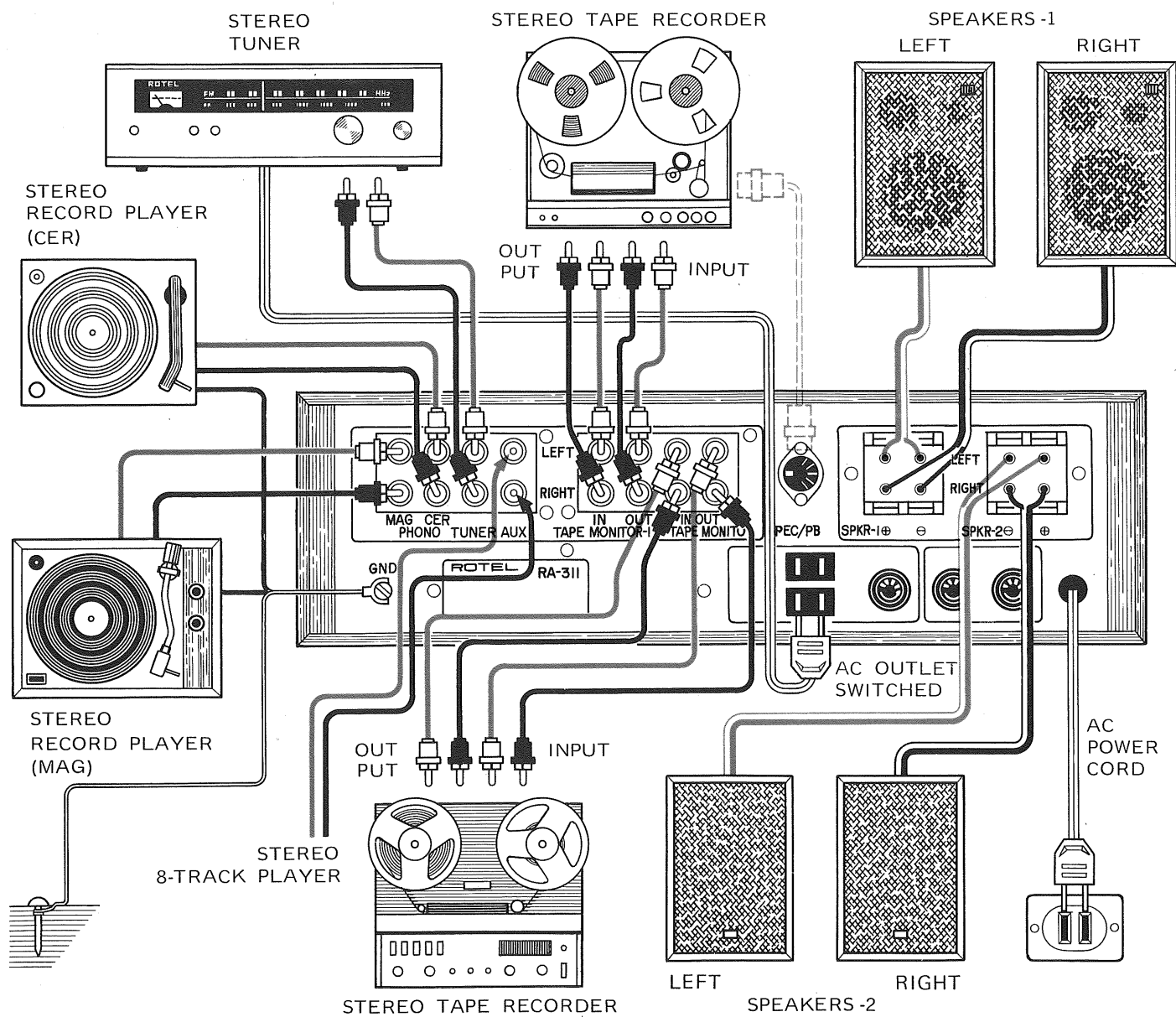
We would like to take this opportunity to thank you for purchasing our Stereo Amplifier. With the high quality design and workmanship that goes into making this equipment, you can be assured of its flawless performance for many years to come.

We have fitted every control and feature you could conceivably need. Designed for both versatility and ease of operation, this piece of equipment will add professional studio flexibility to your Hi-Fi sound center. The performance is exceptional; it will allow you to experience

true high fidelity as never before. Its full and natural stereophonic reproduction offers you musical entertainment approaching that of live performances. We sincerely hope you will treasure this professional equipment. In order to obtain the maximum use out of your unit, please read the following pages of this Operating Manual carefully.

Do not attempt to operate the unit until you have made all the necessary connections.

## REAR PANEL CONNECTIONS



## INSTALLATION

first making sure that speakers are connected properly and all the other necessary connections are made.

### SPEAKER CONNECTION

This unit is equipped with quick-connect jaw-snap terminals for connecting two sets of speakers. Connect your main pair of speakers to the terminals marked SPKR-1. Ensure that your right speaker is connected to the terminal marked  $\oplus$  and that the ground (-) terminal on the right speaker is connected to the terminal marked  $\ominus$  on the extreme left of the terminal block. Similarly, connect your left speaker between the adjacent SPKR-1 terminals marked  $\oplus$  and  $\ominus$ . If you wish to connect a second pair of speakers, connect them to SPKR-2 terminals in the manner described above.

**Caution:** Ensure that the speaker leads are fastened securely to the proper terminals, and that there are no stray strands which may cause shorting between terminals. If 2 sets of speakers are played simultaneously, the impedance of each unit should not be less than 8 ohms.

### Phasing:

When all connections have been made, and the unit is operating, a check on correct speaker phasing should be made. This is described in a later section.

### RECORD PLAYER CONNECTION

The shielded cables from your stereo record player should be terminated with RCA type phono plugs. To avoid loss in the high frequencies, the cables should not exceed 10 feet (3 m) in length.

Connect both leads from your record player to the LEFT and RIGHT PHONO input receptacles on the rear chassis. If your record player has a ground cable emerging besides two input cables, connect this ground cable to the ground terminal post marked GND on the rear chassis.

This amplifier has two sets of PHONO input receptacles to accommodate two record players. The MAG is suitable for record player with regular magnetic cartridge.

The CER is for record player with ceramic cartridge.

### TUNER CONNECTION

Connect the outputs of your stereo tuner to the LEFT and RIGHT TUNER input receptacles on the rear chassis with shielded cables. If you have another tuner, connect it to AUX receptacles.

### AUX CONNECTION

Your amplifier has two pairs of AUX input receptacles for use with high level program sources: tape recorder, tuner, cassette recorder, 8-track cartridge player, TV sound or a ceramic microphone. It should be noted that AUX is used only for the playback purpose, and for recording see

TAPE RECORDER CONNECTION below.

When connecting a stereo tape recorder, connect both output cables to the AUX LEFT and RIGHT input jacks on the rear chassis. For cassette or 8-track cartridge, similar procedure is followed. When connecting a monophonic equipment, connect the single output lead to either of the AUX LEFT or RIGHT input jack.

### TAPE RECORDER CONNECTION

Terminals are supplied for connecting two tape recorders (which incorporate playback preamplifier). Connect the right and left output cables of the tape recorders to the TAPE MONITOR terminals marked IN, and connect its right and left input cables to the TAPE MONITOR terminals marked OUT. If you have tape recorders with DIN-type plugs, connect it to the REC/PB DIN sockets.

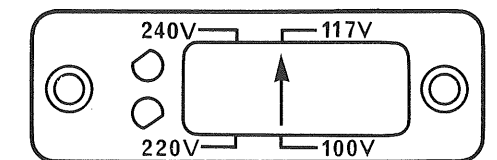
### AC OUTLETS

Your amplifier is equipped with two switched AC Outlet to provide power and switching control to whatever component you may wish to connect to the unit. However, the total load of equipments connected to the AC Outlets must not exceed 200 watts.

### VOLTAGE SELECTION

The amplifier is a variable voltage equipment that can run on 100V, 117V, 220V or 240V power supply. Your unit comes already preset at the proper voltage for use in your area; however, if you move to an area where the power supply voltage is different, the voltage setting can be manually changed. BE SURE THAT YOUR UNIT IS NOT CONNECTED TO THE POWER SOURCE BEFORE ATTEMPTING TO MAKE THIS CHANGE.

To change the voltage setting, remove the name plate on the rear panel and locate the VOLTAGE SELECTOR (see figure below). Pull up the Voltage Selector plug which has a white arrow on its top. Reinsert the Plug to the Selector Base so that the head of the arrow lines up with the pointer line of the voltage you desire.



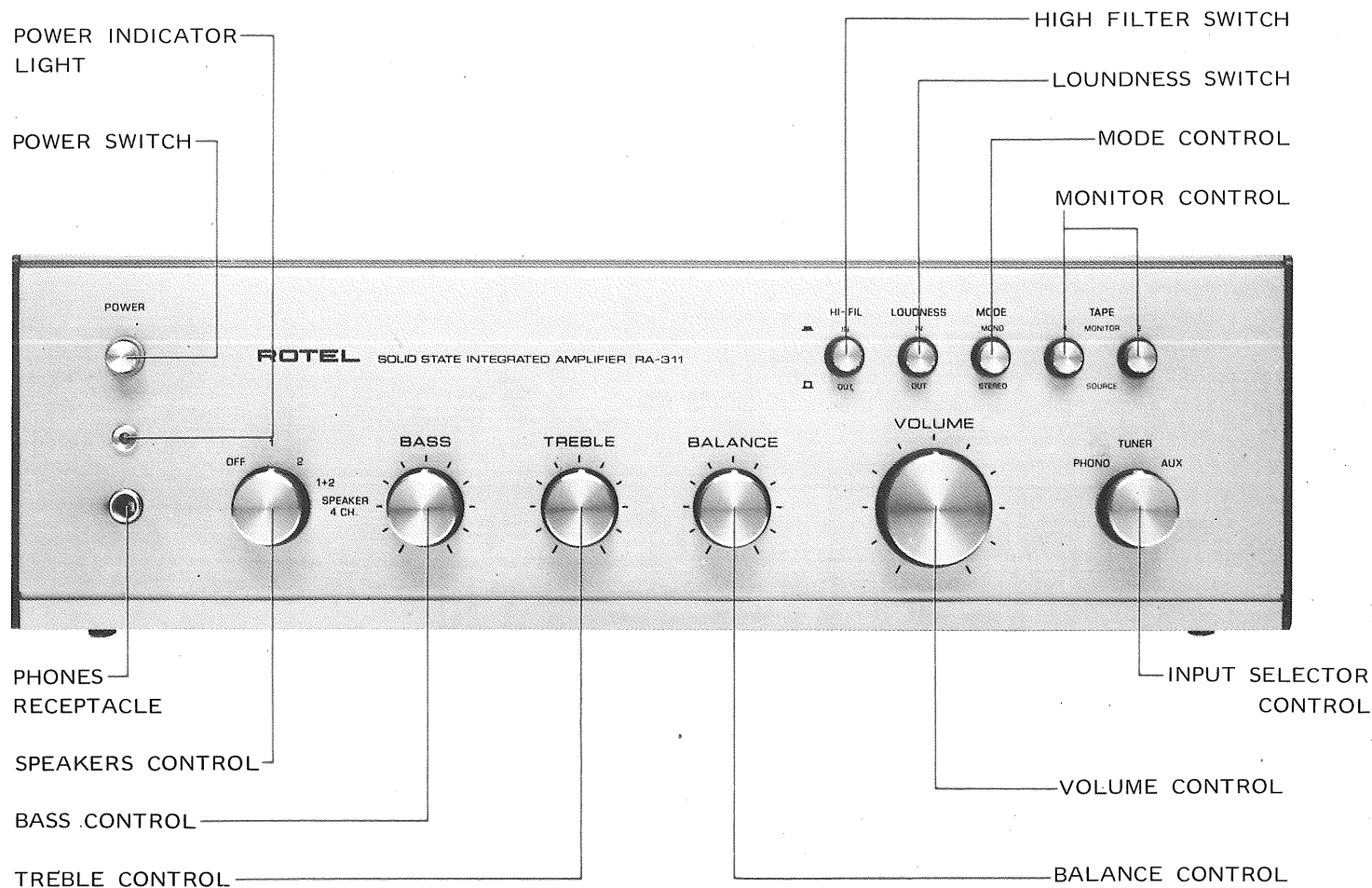
### CONNECTING TO POWER SUPPLY

Before connecting up ensure that the voltage selector is set correctly for your supply, and a suitable plug fitted. If you need to fit a plug, ensure live, neutral and (where appropriate) earth leads are connected to the proper terminals. Ensure the terminals are screwed down firmly, and no loose strands of wire are present.

The unit is protected with a 2 amp. fuse in the AC input

circuit. In addition, the DC circuits and the speaker circuits are protected by two 1.5 amp. fuses. When replacing a fuse, be sure to use a fuse of the same rating. DO NOT replace with a fuse of higher rating. Protection will be lost, and severe damage to the unit may result. If in any doubt about connecting to the power supply, consult a qualified electrician.

### FRONT PANEL CONTROLS



**VOLUME CONTROL:** regulates the sound level of any program material fed into the receiver. The control affects both channels equally, eliminating regular balancing. Rotate clockwise for increase in sound level.

**BALANCE CONTROL:** regulates the relative outputs from the two channels. Normally the balance control is adjusted to provide the effect of a mono signal coming from a point midway between the speakers. When balanced in this way, the maximum stereo effect will be achieved. Turn to right for increase in sound level from the right channel, and to left for the left channel.

**TREBLE CONTROL:** regulates high frequency sounds, as desired, to suit personal taste, speaker characteristics, etc. The center position gives normal (flat) frequency response. Turning to left increases the treble, and to right reduces the treble.

**BASS CONTROL:** regulates low frequency sounds, and operates in the same manner as the treble control.

**INPUT SELECTOR:** enables you to select the function you desire from PHONO, TUNER and AUX.

**SPEAKERS CONTROL:** allows you to select your speaker systems for activation. OFF to deactivate all speaker systems when such as listening to your headphones privately, 1 to activate your speaker systems connected to SPKR-1 terminals on the rear chassis; 2 to activate your systems connected to SPKR-2; 1+2 to activate both systems SPKR-1 and SPKR-2; SPKR 4CH to activate speaker matrix for simulated 4-channel sound using both SPKR-1 and SPKR-2.

**POWER PILOT LIGHT:** allows visual indication that power is activated.

*The push button switches used are all of the PUSH/PUSH type; that is push in to activate the circuit and push again to release or deactivate the circuit. In describing these switches we will consider the IN position to be "ON" and the OUT position to be "OFF"*

**POWER SWITCH:** performs the function as its name denotes. It supplies power to the receiver and to the switched AC outlets. When the switch is "ON", power pilot light will be illuminated.

**LOUDNESS SWITCH:** in "ON" position activates a circuit which boosts low and high sounds at low volume control settings. This compensates for the ears loss of sensitivity to bass and treble notes at low listening levels.

**HIGH FILTER:** allows you to reduce the high frequency response of your amplifier whenever you wish to reduce annoying record scratches, tape hiss, FM background noise, etc.

**TAPE SWITCHES:** allows you to playback, monitor, and dub two tape recorders. TAPE 1 switch is used with the tape recorder connected to the TAPE MONITOR-1 terminals on the rear panel and TAPE 2 switch is for the tape recorder connected to the TAPE MONITOR-2 terminals. If you have the tape recorder with DIN plug connected to the DIN socket on the rear panel, use TAPE 1 switch. Push in to "MONITOR" position to playback pre-recorded tapes, either TAPE 1 or TAPE 2 depending on which tape recorder you will be using. When dubbing or duplicating the tape recorder connected to TAPE 1 by the tape recorder connected to TAPE 2, push in TAPE 1 switch to "MONITOR". Set both switches to "SOURCE" positions whenever tape recorder is not being operated but other program material is being played.

If your tape recorders have separate playback heads, "MONITOR" positions also can be used as monitors during recording; setting to these positions will allow you to listen to program as actually being recorded. So, you can compare recording program playing ("SOURCE" position) with same program being actually recorded ("MONITOR" position).

**PHONES RECEPTACLE:** Simply plug in your headphone lead and switch off unwanted speakers for private listening.

## OPERATION

Having made all connections according to the preceding instructions and become familiar with the functions of the amplifier, you are ready to operate the equipment. Apply power by plugging into the power source and pushing "IN" the POWER button. Select the speakers you wish to use by turning "ON" either SPKR-1 or SPKR-2 switch, or both according to requirements.

### PRELIMINARY CHECKS:

1. If the dial light has failed to illuminate, remove and check the AC fuse.
2. If no sound is heard when all switches and controls are correctly positioned, remove and check the DC fuses (BE SURE POWER SOURCE IS DISCONNECTED). If a fuse or fuses are blown, check possible reasons for the blowout and replace the fuse.
3. The phasing of the speakers should be checked. If the two speakers are out of phase, the stereophonic effect will suffer. Check as follows:
  - a) Set the MODE switch to MONO.
  - b) Tune in a program with a distinct solo part (e.g. voice).
  - c) If the speakers are in phase (correct connection) the solo will appear to come from the center point between the speakers. If they are not in phase, the sound will appear to come from the two speakers separately.
  - d) If the phasing is wrong, reverse the ⊕ and ⊖ speaker connections.

### TUNER

Turn the input selector control to the TUNER position, and set the mode switch to STEREO or MONO depending upon the program selected. Use all other controls and switches according to taste and listening conditions. Set to the AUX if your tuner is connected to either receptacles. Note: Before operating your tuner, be sure to read the operating manual or information of the tuner.

### RECORD PLAYER

Turn the input selector control to PHONO. Set the mode control to STEREO or MONO depending upon the mode of the record disc selected.

If you have two record players connected to this receiver, the one you are operating will be heard through the speakers.

### PLAYBACK OF TAPE RECORDING

#### 1. When using AUX inputs

Turn the input selector control to the AUX position, and set the MODE to your choice.

#### 2. When using TAPE MONITOR inputs

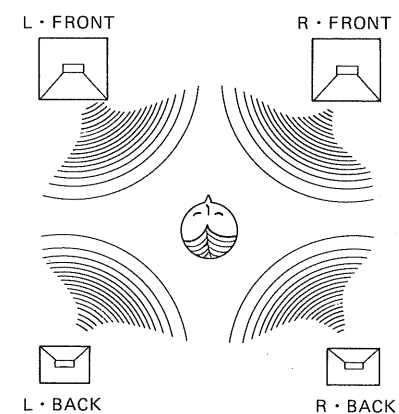
To listen to a playback of pre-recorded tape, push either TAPE switch depending on which tape recorder you wish to use. The setting of the input selector control is irrelevant in this case and may be left at any position.

### MAKING TAPE RECORDINGS

To make off-the-air recordings, turn the function selector control to TUNER or AUX depending on which your tuner is connected, and to record off records turn to PHONO. To record off the equipments such as cassette recorder or 8-track cartridge player connected to AUX terminals on the rear panel, turn the control to AUX. To record off (dubbing) the tape recorder connected to TAPE 1 by the tape recorder connected to TAPE 2, push in TAPE 1 switch to "MONITOR", and operate both recorders. Note you cannot dub the recorder connected to TAPE 2 by the one connected to TAPE 1; it can be done if you plug the output cables of tape recorder connected to TAPE 2 to AUX terminals on the rear panel. If your tape recorder is equipped with a separate playback head, turning TAPE 1 or TAPE 2 switch to "MONITOR" will cause the input source to be bypassed and will permit you to listen to the recording being made on the tape. When dubbing, only the tape recorder that is recording will be monitored; so pushing in TAPE 2 switch will let you monitor program being played by TAPE 1.

### SPEAKER MATRIX 4-CHANNEL

In general the Speaker 4-Channel switch on the rear chassis should be set at NORMAL position for individual stereophonic operation of main speaker system and remote speaker system (SPKR-1 and SPKR-2). However, if you wish to listen to stimulated 4-channel sound, set the switch to the SPKR 4CH position and use your remote pair of speakers as the rear speakers of 4-channel system. You will be certain to enjoy a "surround effect" of this stimulated 4-channel, placing the speakers as suggested below.



### WHERE TO PLACE

Since transistors are extremely susceptible to heat, the amplifier has been designed to diffuse heat through the top and rear of its case. Therefore, special consideration should be given to where it will be used before installing the system. It should not be operated in a place where it is exposed directly to the sun, near radiators or other heat-generating sources, and it should never be mounted in an air-tight cabinet. Finally nothing should be placed on top of it.

### GROUNDING

Connect one end of vinyl or enameled wire to the terminal screw marked GND on the rear of the amplifier, attach a copper plate to the other end, and bury it underground.

### HUM AND NOISE

In any high fidelity installation, hum may be caused by the interconnection of a record player, tuner and amplifier, as a result of the cables and different grounds. If hum is experienced with your amplifier, disconnect everything but the speakers from the unit. If hum persists, reverse the AC line cord. Plug in the record player and if hum appears, reverse the record player power plug and connect a single lead from the record player chassis to the ground post on the rear chassis. Connect your other devices in this manner.

**Caution:** Hum may also be induced by defective connecting cables or by running these cables too close to a strong AC field.

## SPECIFICATIONS

### Power Amplifier Section

#### Power Output:

Total Music Power (IHF)	100 watts at 4 ohms
Continuous Power (RMS)	24 watts/channel at 4 ohms
(both channels driven, THD less than 1%)	20 watts/channel at 8 ohms

Harmonic Distortion	less than 0.15% at 18w/ch RMS, 8 ohms and 1KHz
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Intermodulation Distortion	0.5% at 20w/ch
Frequency Response	15 to 70,000Hz, +0dB - 3dB at 8 ohm

Power Bandwidth (IHF)	20 to 50,000Hz at 8 ohms
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Damping Factor	35 at 8 ohms
Speaker Impedance	4 to 16 ohms

#### Hum and Noise:

PHONO 1, PHONO 2	65dB
TUNER, AUX1, AUX2, TAPE IN	75dB
Residual Noise	1.5mV

#### Input Sensitivity/Impedance:

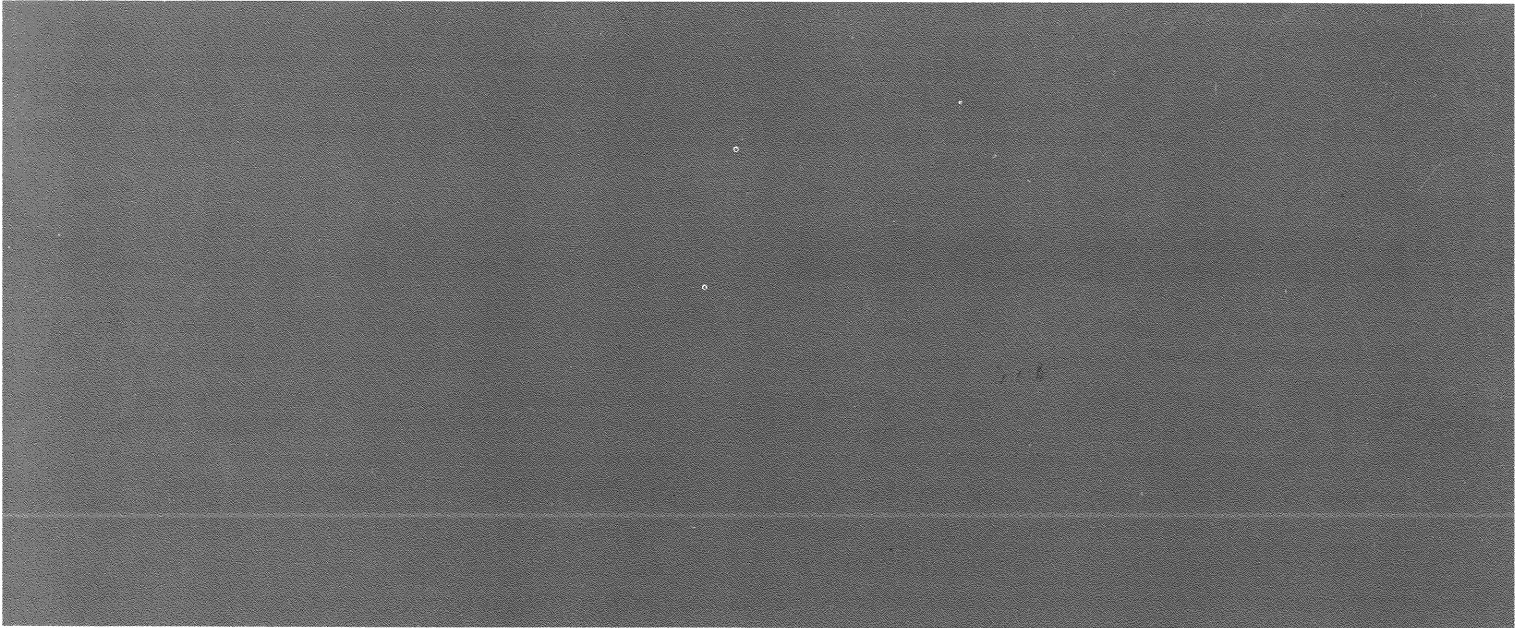
PHONO (MAG)	2.5mV/40K ohms
PHONO (CER)	140mV/94K ohms
TUNER, AUX1, AUX2, TAPE IN	170mV/46K ohms
TAPE MONITOR IN, DIN, 1 & 2	150mV/45K ohms
DIN OUT	30mV/80K ohms

Phono Equalizer	RIAA ±1dB
	50 to 15,000Hz
Phono Overload	100mV
Loudness Switch	+10dB at 50Hz, +4dB at 10,000Hz
High Filter	-10dB at 10KHz
Bass Control	±10dB at 50Hz
Treble Control	±10dB at 10,000Hz
Crosstalk	-45dB at 10kHz

### Miscellaneous

Power Requirements	100, 117, 220, 240V
	50/60Hz
Power Consumption	150 watts (maximum)

Note: features and specifications subject to changes for improvement without notice.



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