

INSTALLATION AND OPERATION MANUAL

STRATOPHONIC SERIES

MODEL SA2000

harman kardon

SOLID-STATE STEREOPHONIC AMPLIFIER

SPECIFICATIONS FOR SA2000 STRATOPHONIC AMPLIFIER

A. Amplifier

Music Power Output at 4 ohms	36 watts
Full Power Bandwidth	10-23 KC
Harmonic Distortion 20-20KC	less than 1.0%
Frequency Response ±1db	8-25 KC
Damping Factor	25:1
Square Wave Rise Time	5.0 us
Hum and Noise	90 db
Input Sensitivity Phono	2.5 mv
Aux.	200 mv
Tone Controls	+14 db, -10 db
Speaker Impedance	4-16 ohms
High Cut Filter	-6db at 10 KC
Low Cut Filter	-10 db at 50 cps

B. General

Input Receptacles:	
Magnetic Phono	2
Auxiliary	2
Tuner	2
Tape Amplifier	2
Output Receptacles	2
Tape Out	2

Introduction

YOUR NEW STRATOPHONIC AMPLIFIER

We know how anxious you are to try your new Stratophonic Amplifier. But a few extra moments of patience spent in carefully reading this instruction book will pay vast dividends in the ultimate enjoyment of your component.

It is customary, at this time, to congratulate you on the wise decision you have made in the purchase of your new Stratophonic Solid-State Amplifier. This, we most certainly do.

You should also know that it is the culmination of several years of intensive research in solid-state technology. Your Stratophonic Amplifier is *literally* born of space-age development.

Thus, you have invested in the finest stereophonic integrated amplifier available. It truly represents the state-of-the-art in its ability to reproduce life-like music. And, because of advanced solid-state reliability and construction, your new Stratophonic Amplifier will continue to provide the ultimate subtleties of every musical nuance.

But, this alone is not enough. Your new Stratophonic Amplifier has also been designed for maximum versatility. The simple movement of a switch or control makes you master of every program source — disc — mono and stereo, tape amplifier, and FM. And, Harman-Kardon designers have endeavored to make your Stratophonic Amplifier a major asset to home decor.

Now, go on to a new experience — Stratophonic Sound — *the experience of hearing music as you have never heard it before.*

KEEP THIS BOOK AVAILABLE AT ALL TIMES FOR IT CONTAINS
INDISPENSABLE TECHNICAL AND SERVICE INFORMATION.

General Information

UNPACKING

After unpacking the SA2000, inspect it carefully for signs of transit damage. The amplifier was subjected to numerous rigid quality control inspections and therefore should be in perfect operating condition. If damage is visible, notify your dealer at once. If the amplifier was shipped to you, notify the transportation company. Harman-Kardon will cooperate with you in such instances, but please note that only you can recover from the carrier for damages incurred during shipment.

WARRANTY POLICY

We urge you to fill in your warranty card and mail it to the factory without delay to protect your rights under warranty. The Harman-Kardon warranty is not valid unless we have your card on file.

WARRANTY

We warrant each SA2000 to be free from defects in material and workmanship under normal use and service, and in accordance with the conditions herein below set forth, for a period of 2 years from date of delivery to the original purchaser, and agree to replace or repair any part or parts, returned to us within said 2 years, with transportation prepaid and which our examination shall disclose to our satisfaction to have been thus defective. This warranty does not include free labor, nor is it applicable to any instrument which shall have been repaired or altered in any way so as in our judgment to affect its stability or reliability nor which has been subject to neglect, misuse, abuse, negligence or accident nor which has had the serial number altered, effaced, or removed. Neither shall this warranty apply to any instrument which has been connected otherwise than in accordance with instructions furnished by us.

This warranty is expressly in lieu of all other warranties, express or implied, and of all other obligations or liability on our part, and we neither assume nor authorize any representative or other person to assume for us any other liability in connection with the sale of this instrument.

SERVICE POLICY

Harman-Kardon has established a special consumer division to answer all questions pertinent to the installation and operation of your unit. Please feel free to write us at any time and we will endeavor to offer prompt and complete advice.

If your problem cannot be resolved through our combined efforts we may wish to refer you to one of our authorized warranty stations. The unit must be shipped via Railway Express, Prepaid to the station designated, accompanied by a brief note describing the exact nature of the difficulty. *Under no circumstances should the set be shipped directly to the factory without prior authorization.*

Installation Procedure

VENTILATION

Sufficient space must be allowed around the SA2000 to permit unrestricted air flow for maximum circulation. This will insure low operating temperatures which will result in extended component life.

The SA2000 chassis is constructed of aluminum which acts as a heat sink (a device which dissipates heat) for the output transistors. This area will become hot under normal use. This is normal and should not be cause for concern. Do not place books or other objects on the cage or in the immediate vicinity of the Amplifier.

When mounting your SA2000 into an equipment cabinet the following precautions must be observed.

1. Allow at least 3 inches above the top of the unit.
2. Allow at least 1 inch on each side of the chassis.
3. Cut the mounting shelf in accordance with the instructions on the mounting template.
4. Leave the back of your equipment cabinet open to insure proper ventilation.

POWER REQUIREMENTS

Connect the AC line cord to any outlet furnishing 117 volts, 50 or 60 cycle AC current. The voltage may vary between 105 and 125 volts. Two AC convenience outlets are located on the rear panel of the amplifier. These outlets are "switched" and are controlled by the on/off switch on the front panel. Any auxiliary equipment may be plugged into these outlets. The rating of this equipment should not exceed 300 watts.

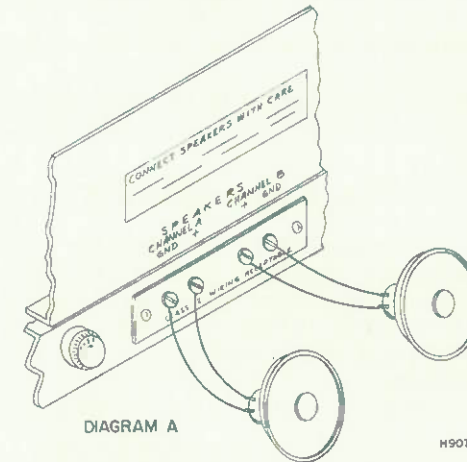
CONNECTING THE SPEAKERS FOR STEREO OPERATION

Your two speakers should be identical, if possible, to obtain optimum results. Experts agree that a perfectly matched system offers the best stereophonic reproduction. The speakers should be placed along the same wall approximately 8 to 10 feet apart depending upon room size and furniture placement. It may be necessary to experiment with speaker placement until best results are obtained.

Use any type of wire to connect your speakers to the SA2000. Lamp cord "zip cord" is excellent and may be easily dressed around the moulding for an inconspicuous and neat installation. Do not drive the staples or tacks through the center of the wire for this may short out the two sections and will decrease the overall volume or short out the speakers entirely. It is permissible to use approximately 50 feet of speaker connecting wire for each speaker without loss of volume. **CONNECT SPEAKERS WITH CARE. AVOID SHORTS—AMPLIFIER HAS BEEN DESIGNED TO PREVENT DAMAGE FROM ACCIDENTAL SHORTING; HOWEVER, REPETITIVE SHORTING CAN DAMAGE TRANSISTORS.**

1. Connect one length of lamp cord to the left speaker. (This is the speaker on your left as you face the speakers. This speaker will now be referred to as Channel A.)
2. Attach the other end of the lamp cord to the terminals marked CHAN A located on the rear of the SA2000.

CONNECT SPEAKERS WITH CARE — AVOID ACCIDENTAL SHORTS



3. Similarly connect another length of lamp cord to your right speaker. (This speaker will now be referred to as Channel B.)
4. Attach the other end of the lamp cord to the terminals marked CHAN B.
5. Your amplifier is now connected for stereo operation.

SPEAKER PHASING

When more than one speaker is used in any music reproducing system the speakers must be connected in a manner to work together rather than work out of phase. If one speaker is pushing air out while the other is moving in the opposite direction this will result in diminishing bass response. Checking for proper phase and correcting if necessary is quite simple.

1. Place a stereophonic recording on your record player.
2. Place the Function switch in the Phono Mono position for monophonic playback.
3. Play the record. The sound should emerge from approximately the center area between the two speakers.
4. While the record is playing place the Function switch in the Phono Stereo position.
5. The sound should now move across the wall of the room and should appear to come from both speakers as well as the center.
6. If your speakers are out of phase, the sound source will not pinpoint itself between the two speakers when the Function switch is in the Phono Mono position. Instead it will appear to come from both sides.

If the speakers are out of phase, turn off the amplifier and disconnect both leads from either the left or right speaker and reverse them. Your system will now be in phase.

This completes your speaker connections. The SA2000 is a solid state device which does not contain audio output transformers. It is therefore not necessary to match the impedance of your speakers to the amplifier. The SA2000 will perform perfectly with any speaker which has an impedance of 4, 8 or 16 ohms.

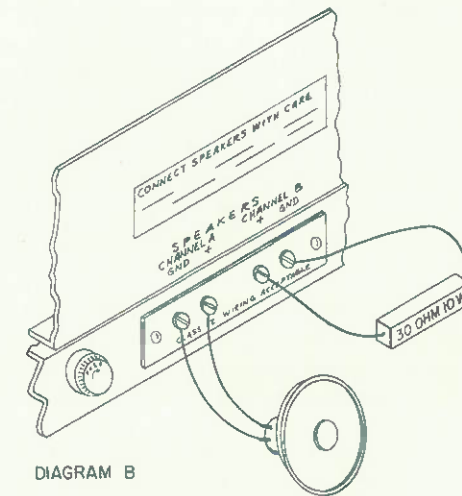
CONNECTING THE SPEAKERS FOR MONOPHONIC OPERATION

If the SA2000 is to be used monophonically and stereo is to be added at a later date, it is essential that both speaker output terminals are terminated into a proper load to prevent damage to the output stage of the amplifier. Refer to Diagram B for proper installation of the loading resistor.

At no time should the output terminals be paralleled for monophonic operation!

THIS IS THE ONLY CORRECT METHOD FOR CONNECTING ONE SPEAKER TO THE SA2000

CONNECT SPEAKERS WITH CARE — AVOID ACCIDENTAL SHORTS



STEREO HEADPHONE RECEPTACLE

The stereo headphone receptacle located on the front panel will accept any headphone with any impedance rating. The headphone receptacle is "on" at all times. If you wish to listen to the headphones alone, see the paragraph on "SPEAKER SWITCH".

CONNECTING A STEREO RECORD PLAYER — (MAGNETIC PICKUP)

Connect both leads from your record player to the CHAN A and CHAN B PHONO MAG input receptacles on the rear of the SA2000 chassis. If your record player has a special ground wire emerging with the two input leads, connect this ground wire to the ground terminal on the rear of the amplifier.

CONNECTING A MONOPHONIC RECORD PLAYER — (MAGNETIC PICKUP)

Connect the single lead from your monophonic record player to either the A or B PHONO MAG input receptacles on the rear of the SA2000 chassis.

CONNECTING A STEREO TAPE RECORDER

Since most stereo tape recorders include their own record and playback pre-amplifiers, it is not desirable to connect the output of the recorder into any low level input receptacles. This will result in overloading of the low level stage and cause distortion.

Connect the two tape recorder output leads to the CHAN A and CHAN B TAPE AMP receptacles on the rear panel of the amplifier. This will enable you to play back your stereo tapes.

To make a recording, connect the inputs of your recorder to the CHAN A and CHAN B TAPE OUT receptacles. This will enable you to make a stereophonic recording with the proper recording equalization as determined by your recorder, while simultaneously listening to the program material through your speaker system. The recording signals from the TAPE OUT receptacles are unaffected by the tone controls or volume setting of the SA2000 to insure an absolutely flat response.

CONNECTING A MONOPHONIC TAPE RECORDER

If a monophonic tape recorder is to be used with the SA2000 connect the recorder output to either the CHAN A or CHAN B TAPE AMP input receptacle located on the rear panel. This will enable you to play back your monophonic tapes.

If your recorder is stereo playback but records monophonically, connect the output as described in the previous section on connecting a stereo tape recorder. Connect the input for recording monophonically as described below.

Connect the input of your recorder to either the CHAN A or CHAN B TAPE OUT receptacle. This will enable you to record monophonically while simultaneously listening to the program through the amplifier and speakers.

TO MONITOR YOUR TAPES WHILE RECORDING

Connect the output of your tape recorder to the TAPE AMP receptacle on the rear of the amplifier chassis. Connect in accordance with the instructions

supplied by the recorder manufacturer. To monitor your tapes while recording throw the TAPE MONITOR switch to the "on" position. See paragraph on tape monitor switch.

Operation Procedure

Every control on this amplifier serves a specific useful function and is important for the proper operation of your stereo system. *It is important to note that under no circumstances should this amplifier be operated without either a speaker or resistive load across both the output terminals.*

ON/OFF SWITCH

The power switch is located on the volume control. In the full counter-clockwise position the receiver is off. Rotate the control clockwise to turn the receiver on.

VOLUME CONTROL

The VOLUME CONTROL on the SA2000 is essentially two controls in one, mechanically tied together, to be operated by one knob. The volume control varies both channels simultaneously and is used to adjust the volume level of program material fed into the stereo system. Its effect can be modified by the special Harman-Kardon CONTOUR switch.

BALANCE CONTROL

The nature of stereophonic reproduction is such that it requires two identical channels to attain the highest degree of faithfulness and spatial distribution. Any variation in the efficiency of one channel as compared to the other will disturb this relationship. As there may be slight differences between the two speakers, tape heads, cartridge coils, etc. the SA2000 includes a special control to balance one channel against the other. Sufficient range is covered by this control to permit rebalancing of the overall system even in extreme cases where unbalance exists.

It should be noted that the BALANCE control may be set anywhere within its range of adjustment to attain system balance.

BASS AND TREBLE CONTROLS

The BASS and TREBLE tone controls on the SA2000 provide the full range of tonal adjustment necessary for stereo high fidelity listening. The tone control range is considerable and can adequately adjust the low and high frequencies in accordance with your listening preference, speaker characteristics and room acoustics.

FUNCTION SELECTOR SWITCH

The FUNCTION SELECTOR switch selects the desired type of program source. The switch on the SA2000 has five switching positions.

1. PHONO MONO. This position selects your record player, (magnetic pickup) for monophonic playback and includes RIAA equalization.
2. PHONO STEREO. This position selects your record player, (magnetic pickup) for stereophonic playback and includes RIAA equalization.
3. TAPE AMP. This position selects your tape recorder, for playback when you are connected to the TAPE AMP receptacles on the rear of the amplifier.
4. TUNER. This position selects your FM tuner, when you are connected to the tuner receptacles on the rear of the amplifier.
5. AUX. This position selects any other high level equipment, such as an AM tuner or the output of your television set, which is connected to the AUX receptacles on the rear of the amplifier.

CONTOUR SWITCH

One of the limitations of human hearing is its tendency to lose sensitivity to the very low pitched sounds as the program sound level is reduced. It is this characteristic (known as the Fletcher-Munson effect) which causes one to play music programs at high listening levels in order to experience the full rich tone available from fine modern recordings.

The Harman-Kardon CONTOUR switch compensates for this effect; thereby eliminating high listening levels as a requisite for full enjoyment of reproduced music. For warm, full-bodied reproduction at low listening levels, throw the CONTOUR switch "IN". At high levels, the contour switch has no effect.

LOW CUT SWITCH

At times, record changers, turntables and even some FM stations produce an objectionable low frequency signal that is strong enough to be introduced into the playback system. This is known as rumble and can be cancelled out by the special low frequency cut off filter network included in this amplifier. Whenever rumble is present throw the LOW CUT switch "IN".

HIGH CUT SWITCH

In the event of objectionable high frequency scratch, throw the HIGH CUT switch located on the front panel "IN". This will roll off the higher frequencies and will clear up the program material considerably.

This switch may also be used when listening to FM reception. It may be useful when listening to a stereophonic FM broadcast which is slightly noisy. Throwing the HIGH CUT switch "IN" will eliminate the noise.

TAPE MONITOR SWITCH

If your tape recorder has a special monitoring feature throwing the tape monitor switch to the "in" position will enable you to listen to your tapes a second after they are recorded. When not in use, this switch must be in the "out" position. If your tape recorder does not have any monitoring feature, throwing this switch will result in zero output from your speaker system.

SPEAKER SWITCH

The speaker switch is used to defeat the speakers while you are listening to the stereo headphones. To defeat the speakers, throw the switch to the "off" position.

Special Technical Information

EQUALIZATION

In order to achieve good reproduction of the wide range of frequencies in music and to make necessary adjustments for the limitations of the recording technique, record manufacturers have found it necessary to modify the actual frequency response of the music while it is being recorded. Thus, to avoid over-cutting and consequent distortion, a measured and deliberate reduction is effected in low frequency response by selecting a "turnover frequency" and by recording attenuated response below that point. To assure optimum signal to noise at the high frequency end when the record is played at home, the highs are deliberately exaggerated during the recording process. A measured and deliberate boost is effected above a certain frequency. This combination of deliberate exaggeration at the low and high ends of the frequency response can be expressed in a recording curve. When the record is played a mirror image of that curve should be available so that the ideal "flat" response may be achieved.

The PHONO positions of the Function Selector automatically select the proper equalization that is required.

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 the SA2000, disconnect everything but the speakers from the amplifier. 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 of the amplifier chassis. Connect your other devices in this manner. CAUTION: Hum may be also induced by defective connecting cables or by running these cables too close to a strong AC field.

FUSES

The SA2000 is protected by a 2½ amp-3AG fuse. In the event of fuse failure replace ONLY with the same type used. Replacing with a fuse of a higher rating will not protect the instrument and may result in severe damage.

SERVICE

If this instrument should not perform properly during the first two years after date of purchase, contact the factory for instructions. The factory has many authorized warranty service stations in the United States, and for the station nearest you, please write our Customer Service Department, Harman Kardon, Inc. Plainview, Long Island, New York. Be sure to include the model and serial number of the unit. A brief description of your other components is often of help in answering your questions. DO NOT return this instrument to Harman Kardon without first receiving authorization.

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