

The Harman-Kardon Model 930

AM/FM/Stereo FM
Solid State Receiver

harman/kardon
THE MUSIC COMPANY

Instruction Manual

INTRODUCTION

With your purchase of the HARMAN-KARDON 930 receiver, you have entered a new era in high fidelity. The pages which follow describe the features and operation of the receiver. We urge that you read them carefully before proceeding to put the receiver into operation.

You now are the owner of an instrument unique in conception, design and manufacture. For example, the two separate power supplies of the 930 (one for each channel) guarantees flawless performance regardless of how much power the amplifiers are called on to deliver. Each channel has its own regulated voltages to permit a response to full RMS power output without being affected by the other channels. This closely regulated power supply results in cleaner and more transparent sound.

The 930 is also the proud heir of the HARMAN-KARDON trademark — ultra wideband frequency which reproduces sound beyond the limits of human hearing. This provides extra realism to the range you actually hear.

There are but examples of what is in store for you, your family and friends when you put the 930 to use.

Read this manual first . . . and then go on to enjoy many full years of genuine listening pleasure.

WARRANTY and SERVICE POLICY

POLICY

We warrant each unit to be free from defects in material and workmanship under normal use and service, and in accordance with the conditions set forth below. Should a defect occur within the period specified, and provided that the unit is returned to either HARMAN-KARDON or an authorized HARMAN-KARDON warranty station, transportation prepaid, and which our examination shall disclose to our satisfaction to be defective, we will, for a period of two (2) years from date of purchase, either replace or repair and install any defective parts of the stereo receiver free of charge.

EXCEPTIONS

This warranty does not include any obligation as to:

- a) repair or replacement of the accessory wooden enclosure due to damage incurred after initial delivery.
- b) transportation charges to and from the factory or an authorized warranty station.

REGISTRATION:

To obtain service under the terms of this policy, it is necessary for you to retain your ORIGINAL BILL of SALE. The enclosed registration card will NOT be considered proof of purchase.

In the event your equipment requires service during the warranty period, only presentation of your original bill of sale to either a factory-authorized repair agency or the factory, itself, will insure your rights under the policy, as outlined in this manual.

This warranty is not 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 or has been subject to neglect, misuse, abuse, negligence, or accident; or which has had the serial number altered, effaced or removed. Neither shall this warranty apply to any instrument which has been connected other than in accordance with instructions furnished by us.

SERVICE

HARMAN-KARDON has a special customer service division to answer all questions pertinent to the installation and operation of your unit. Please feel free to write to us at any time and we shall endeavor to offer prompt and complete advice.

If your problem cannot be resolved through our combined efforts, we may wish to refer you to a local authorized repair agency or we may prefer to authorize the return of your unit to the factory. In the event it must be returned, an authorization form and proper packing instructions will be forwarded to you. This authorization form, together with the warranty registration number, MUST BE RETURNED with your unit.

UNDER NO CIRCUMSTANCES SHOULD YOUR UNIT BE SHIPPED TO THE FACTORY WITHOUT PRIOR AUTHORIZATION.

This warranty is in lieu of all other warranties, expressed or implied, and of all other obligations or liabilities 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.

INSTALLATION PROCEDURE

VENTILATION

Although your new Receiver rarely develops high heat, it is still recommended that you leave the back of the cabinet open. If this is not possible, provide several large holes or slots as low down and as high up in the cabinet back as possible. As an alternative, holes may be provided in the sides, bottom or top of the cabinet. Remember that really effective ventilation requires provision for cool air to enter at the bottom and hot air to leave at the top. A minimum clearance of two (2) inches should be allowed on each side and in the rear, between the chassis and the cabinet, and three (3) inches are required above it.

Isolate any accessories which might interfere with ventilation. For example, do not drape plastic or rubber covered interconnecting cable over the equipment.

POWER REQUIREMENTS

Connect the AC line cord to any outlet furnishing 117 volts, 50/60 cycle AC current. The voltage may vary between 105 and 125 volts. Two auxiliary AC power outlets are provided on the rear panel of your receiver, one being alive at all times and the other being live only when the power switch is ON. Any accessory equipment (tape recorder, phonograph record player, etc.) may be connected to these receptacles and if connected to the SWITCHED receptacle, this equipment will be controlled by the ON/OFF POWER switch.

FUSING

A fuse is a safety device used to protect the receiver against possible damage due to overload, short circuits, and excess current. This receiver employs three fuses for protection. The AC fuse, labeled 3A-3AG is used to protect the entire system. The other two speaker fuses, also 3A-3AG, are used to prevent damage to the output stage of your receiver.

The output of your receiver has been designed to operate with a MAXIMUM of 3 amperes of current in each channel. Under certain conditions, it is possible to draw more than 3 amperes through the output stage which would, in turn, blow the speaker fuses. This could be caused by using multiple speaker systems where the total impedance falls below 4 ohms. Whenever you plan to operate more than two speakers simultaneously, make absolutely sure that their total load impedance WILL NOT fall below 4 ohms.

In the event of fuse failure, replace ONLY with the same fuse type used. NEVER replace with a fuse of a higher rating. To do so will NOT protect your receiver and could result in severe damage to it which will not be covered under the warranty policy.

SPEAKER PHASING

When more than one speaker is used in a music reproducing system, the speakers must be connected in a manner which will allow them to work together. Both left and right speakers must operate in perfect unison, moving back and forth together. If the speakers are moving in opposite directions, the result will be diminished bass response and decreased realism of sound. When this occurs, the speakers are said to be out of phase. Checking for proper phase and correcting, if required, is quite simple.

1. After connecting your speakers, place the stereo receiver in the L & R or monophonic mode of operation.

2. Play a record, tape, or FM broadcast which has a single speaking or singing voice, or a solo instrument.

3. The voice or instrument should appear to be coming from an area directly between the two speakers. If the speakers are out of phase, the sound will appear to be coming from the two individual speakers.

4. If you determine that the speakers are out of phase, simply disconnect the leads from only one of the speakers and reverse them. The system will then be in phase.

This completes your speaker connections. Your receiver 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 receiver. Your unit will perform perfectly with any speaker which has an impedance of 4, 8 or 16 ohms.

CONNECTING THE SPEAKERS FOR STEREO OPERATION (1 SYSTEM)

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 your receiver. Lamp cord "zip cord" is excellent and may be easily dressed around the molding 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 — THE RECEIVER HAS BEEN DESIGNED TO PREVENT DAMAGE FROM ACCIDENTAL SHORTING; HOWEVER, REPETITIVE SHORTING CAN DAMAGE TRANSISTORS.**

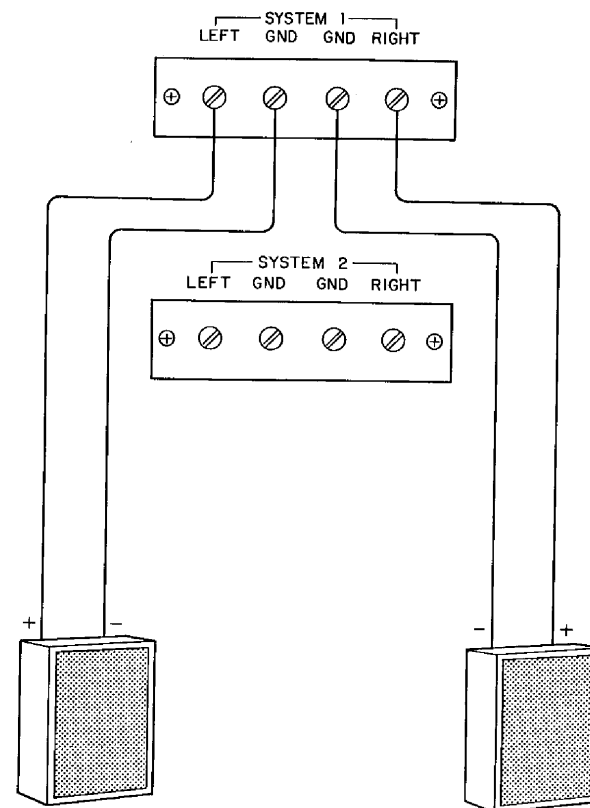
1. Connect one length of lamp cord to the left speaker. This is the speaker on your left as you face the speakers.

2. Attach the other end of the lamp cord to the terminals marked **SYSTEM 1 LEFT** located on the rear of the receiver.

3. Similarly connect another length of lamp cord to your right speaker.

4. Attach the other end of the lamp cord to the terminals marked **SYSTEM 1 RIGHT**.

5. Your receiver is now connected for stereo operation and is operative when the **SPKR-1** switch on the front panel is in the **ON** position.

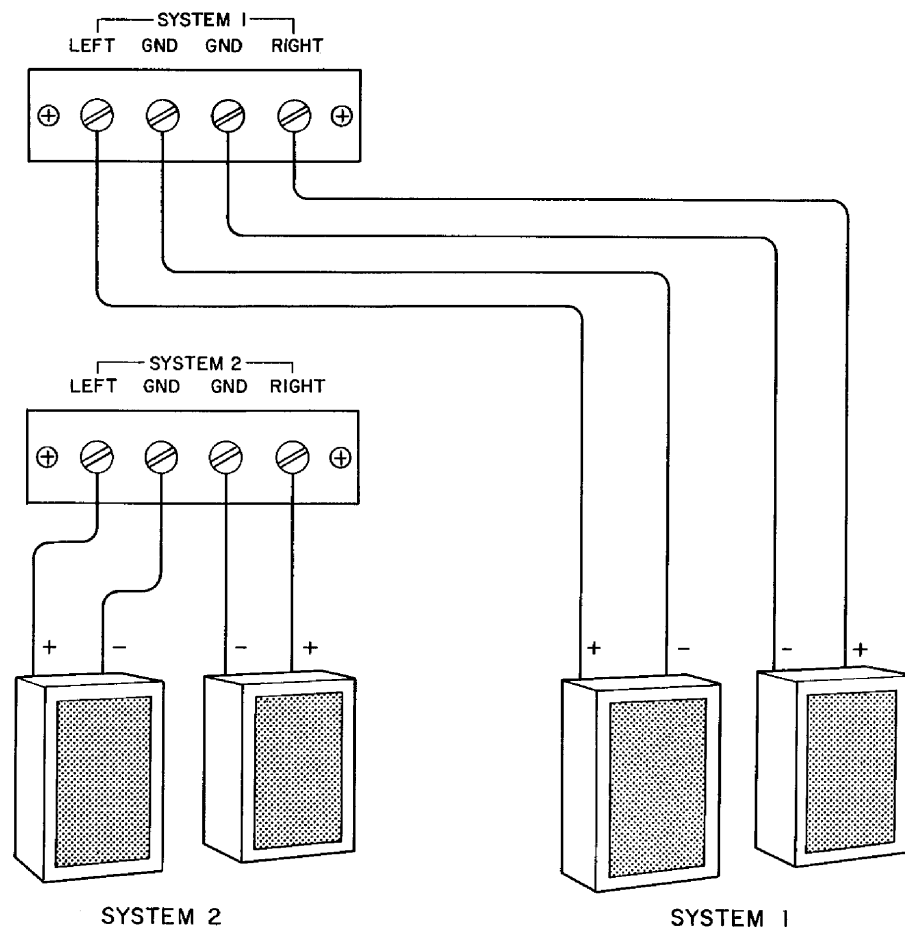


SYSTEM 1

CAUTION
CONNECT SPEAKERS WITH CARE—
AVOID ACCIDENTAL SHORTS

CONNECTING THE SPEAKERS FOR STEREO OPERATION (2 SYSTEMS)

1. Connect all four speakers for two system operation as shown in Diagram.
2. You may now select either system 1, or system 2 by the use of the speaker selector switch located on the left side of the front panel of your receiver.

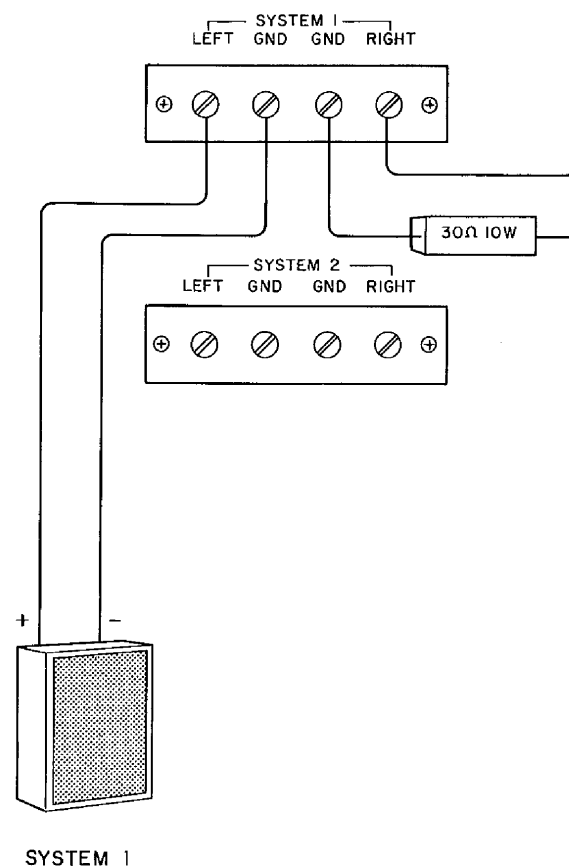


CAUTION
CONNECT SPEAKERS WITH CARE-
AVOID ACCIDENTAL SHORTS

CONNECTING THE SPEAKERS FOR MONOPHONIC OPERATION (1 SYSTEM)

If your receiver 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 receiver. Refer to Diagram or proper installation of the loading resistor.

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

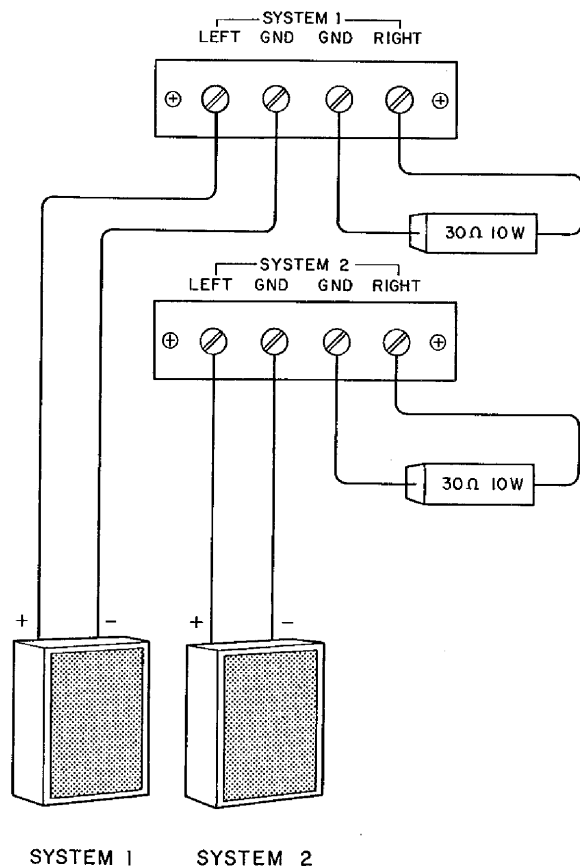


CAUTION
CONNECT SPEAKER WITH CARE-
AVOID ACCIDENTAL SHORTS

CONNECTING THE SPEAKERS FOR MONOPHONIC OPERATION (2 SYSTEMS)

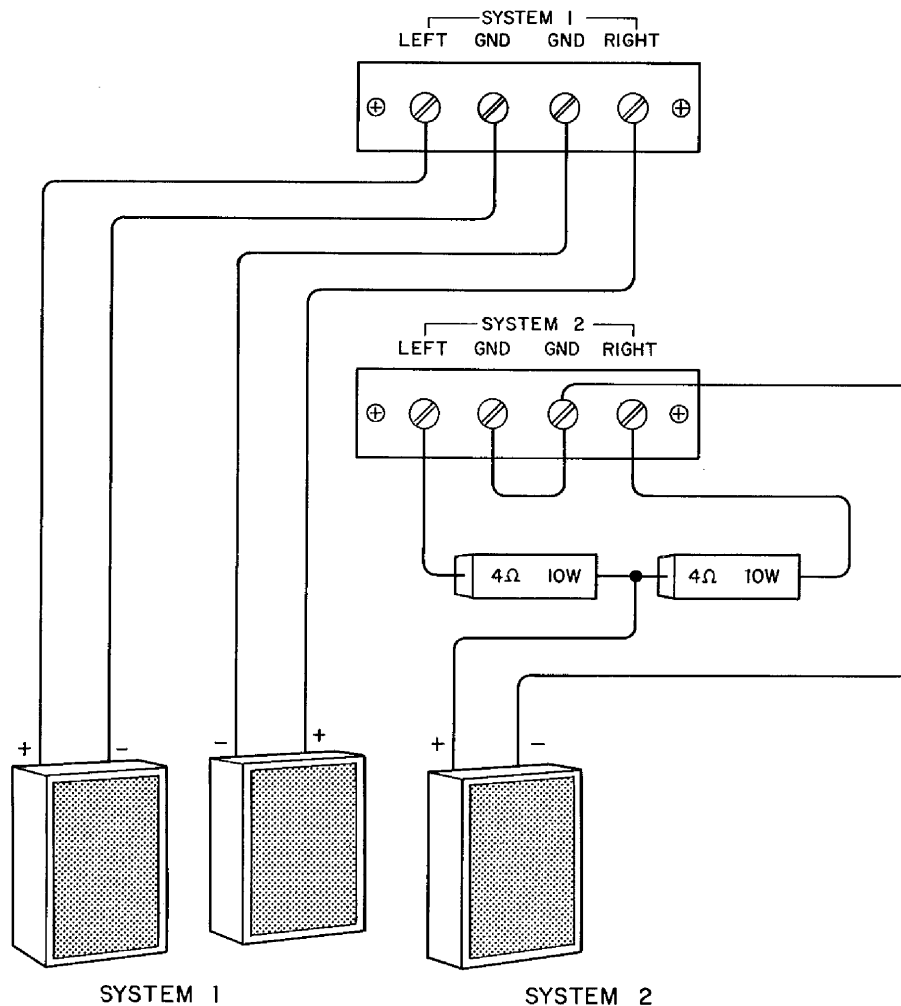
If your receiver is to be used monophonically and stereo is to be added at a later date, it is essential that both speaker output terminals are terminated into a proper load to prevent damage to the output stage of the receiver. Refer to Diagram for proper installation of the loading resistors.

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



CAUTION
CONNECT SPEAKERS WITH CARE—
AVOID ACCIDENTAL SHORTS

CONNECTING THE SPEAKER FOR STEREOPHONIC OPERATION (SYSTEM 1) AND MONOPHONIC OPERATION (SYSTEM 2)



CAUTION
CONNECT SPEAKERS WITH CARE—
AVOID ACCIDENTAL SHORTS

INPUT CONNECTIONS

CONNECTING the FM ANTENNA

The antenna input has been designed to accept either a 300 ohm balanced transmission line (300 ohm twin lead) or a 75 ohm unbalanced co-axial cable transmission line.

Due to the exceptionally high sensitivity of your receiver, a 48" wire is sufficient for all but the most difficult locations. When using the 48" antenna, connect one end of the 48" wire to either FM antenna terminal. Horizontal placement of the antenna will yield optimum reception. The antenna may be tacked to the back of the molding behind the equipment or to the shelf you use.

As FM signals are in the same broadcast frequency range as TV signals, they are affected by the same external conditions. Just as TV reception is improved, you can improve your FM reception with an external antenna. When using an external antenna, connect both leads of the antenna wire to the two 300 ohm FM antenna terminal posts on the rear of your receiver.

When using a 75 ohm Coaxial Cable connect between the 75 ohm and GND terminal, with the outer conductor or shield of the cable connected to the GND terminal.

CONNECTING THE AM ANTENNA

The AM loopstick fastened to the rear of your receiver comprises all the antenna usually required for normal signal areas. In more remote locations an additional outdoor antenna may be required. This should consist of a single wire, as long as is reasonably practical. It must be kept away from large metal objects, power lines or electrical machinery to insure reception without extraneous noise. Attach this length of wire to the AM terminal of the ANTENNA terminal strip.

PREAMP OUT AND AMP IN RECEPTACLES

These receptacles are intended for use with any necessary equipment designed to be installed between a preamplifier and power amplifier. This includes such equipment as electronic audio equalizers, reverberation units, and a new quadraphonic processor offered by Harman-Kardon. In order to make use of this facility, simply disconnect the two patch cords connected to these receptacles and follow the instructions supplied with the accessory equipment.

NOTE: When no accessory equipment is being used, the two patch cords MUST be installed in order to use your receiver.

PHONO 1 and PHONO 2

There are two sets of low level phono receptacles on the rear panel of your receiver. They are designed for use with any magnetic pickup with a nominal impedance of 42,000 to 52,000 ohms.

This special convenience permits you to connect a record changer and a manual turntable simultaneously, and to switch between them with the function selector located on the front panel. Since both low level inputs are identical and each has been compensated for the RIAA recording curve of today's modern recordings, either or both may be used.

When connecting a stereo record player (magnetic pickup) connect both leads to either the Phono 1 or Phono 2 LEFT and RIGHT input receptacles on the rear of the receiver chassis. When connecting a monophonic record player (magnetic pickup) connect the single lead to either the Phono 1 or Phono 2 LEFT or RIGHT input receptacle.

GROUND CONNECTION

Under certain conditions it may be necessary to provide a common "ground" between your receiver and your other associated equipment. This may be accomplished by using the GND terminal located on the rear panel of your receiver.

AUX INPUTS

Your receiver has two pair of AUX INPUT receptacles for use with high level program sources; ceramic or crystal pickup, reel-to-reel tape recorder, cassette tape recorder, TV or a second stereo tuner.

When connecting a stereo record player (ceramic pickup) connect both leads to either the AUX 1 or AUX 2 LEFT and RIGHT input receptacles on the rear of the receiver chassis. When connecting a monophonic record player (ceramic pickup) connect the single lead to either the AUX 1 or AUX 2 LEFT or RIGHT input receptacle.

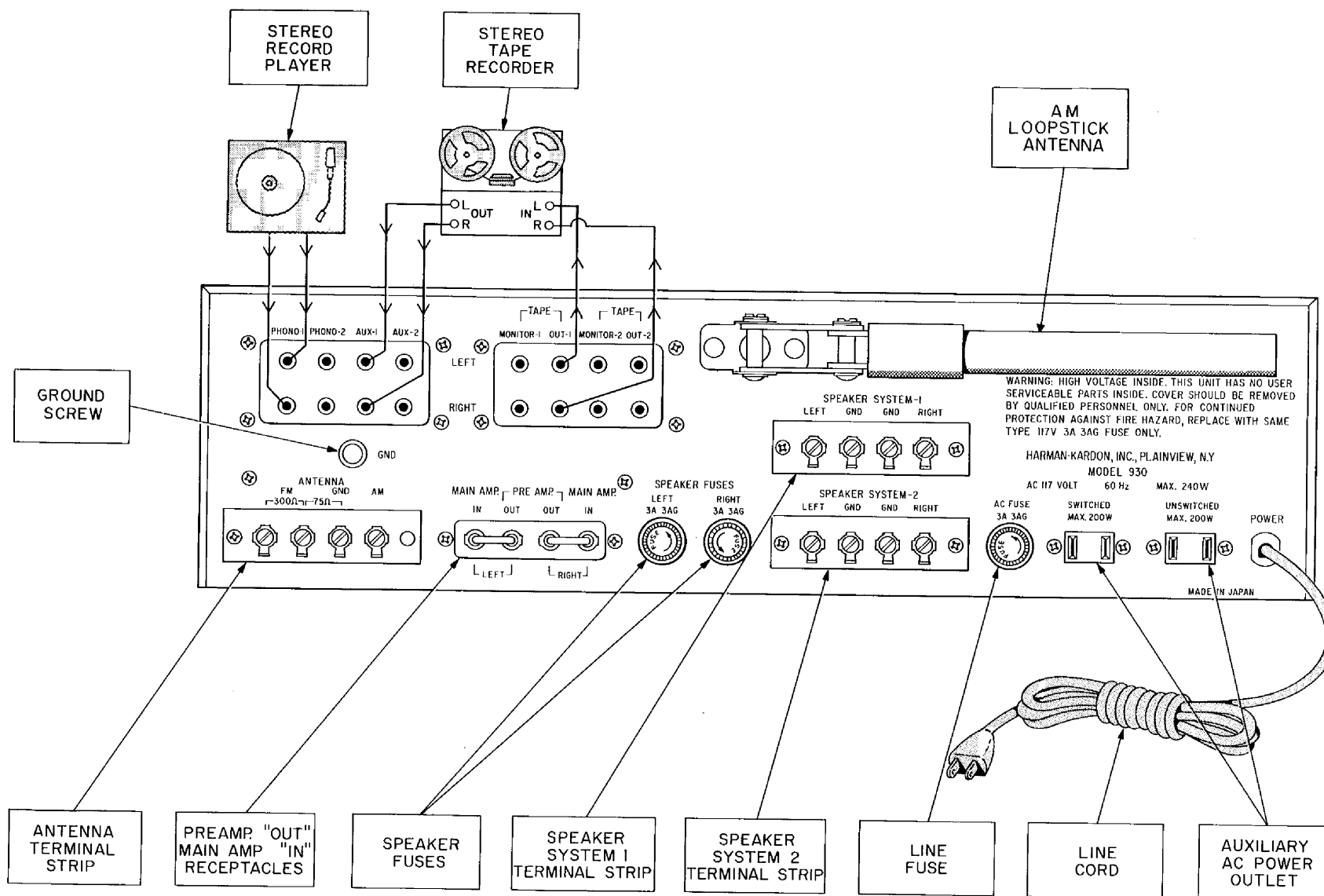
When connecting a stereo tape recorder connect both output cables to either the AUX 1 or AUX 2 LEFT and RIGHT input receptacles on the rear of the receiver chassis. When connecting a monophonic tape recorder connect the single output lead to either the AUX 1 or AUX 2 LEFT or RIGHT input receptacle.

In order to make a recording connect the input cable (if monophonic) or cables (if stereophonic) to either the TAPE OUT 1 or TAPE OUT 2 receptacles on the rear of the receiver chassis.

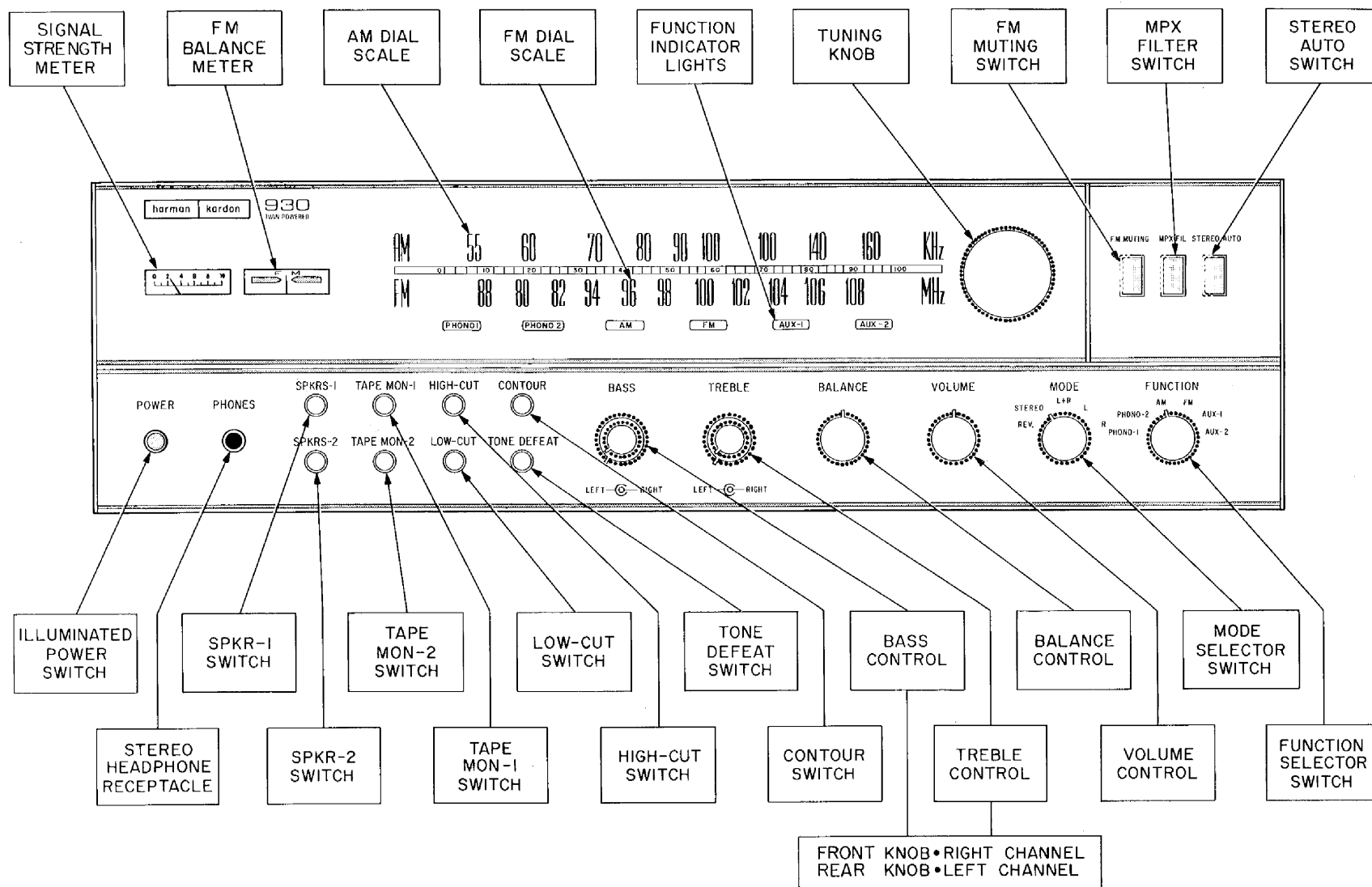
TAPE MONITOR 1 and TAPE MONITOR 2

There are two pair of tape monitor receptacles on the rear of your receiver. Either one or both pair of receptacles may be used to monitor your tapes as you make a recording, provided your tape recorder or recorders have separate record and playback heads. Connect the LEFT and RIGHT output cables of your tape recorder to the TAPE MONITOR 1 or 2 input receptacles. Complete operation is explained in detail in the paragraph TAPE MONITOR SWITCH.

MODEL 930 REAR PANEL DIAGRAM



MODEL 930 FRONT PANEL DIAGRAM



OPERATING PROCEDURE

Every control on this receiver serves a specific useful function and is important for the proper operation of your stereo system.

We recommend that you read the following section carefully so you may take full advantage of the performance capabilities of your receiver.

VOLUME CONTROL

The VOLUME control adjusts the signal level of any program material connected to your stereo receiver. It is a two section control which simultaneously adjusts both channels, and its close tracking specifications insure that the relative volume level of each channel will be identical.

BALANCE CONTROL

The nature of stereo 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. Since there may be slight differences between the two speakers, the tape heads, etc., your receiver includes a control to balance one channel against the other. Sufficient range is covered by this control to permit rebalancing of the overall system even in cases where major unbalance exists. This control may be set anywhere within its range to attain system balance. It does not necessarily have to be set in the exact vertical position.

When the BALANCE control is properly set, the apparent sound source will lie in a broad area between the two speakers. When the BALANCE control is rotated to the right the sound will move to the right and when the control is rotated to the left, the sound will move to the left.

BASS AND TREBLE CONTROLS

The BASS and TREBLE controls on your receiver 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.

You may adjust both the BASS and TREBLE for each channel simultaneously or individually. The outer knob adjusts the LEFT channel and the inner knob adjust the RIGHT channel. In order to adjust both channels turn either knob. In order to adjust one channel only simply hold one knob while adjusting the other.

MODE SWITCH

The MODE switch selects between stereophonic and monophonic operation depending upon the program source. The switch has five positions as follows:

- 1) REV To reverse left and right channels for your listening preference
- 2) STEREO Normal stereo operation
- 3) L & R Combined left plus right channels
- 4) L Left channel signal to L & R channel
- 5) R Right channel signal to L & R channel

FUNCTION SWITCH

The FUNCTION switch has six positions and is used to select the desired type of program source.

- 1) PHONO 1 (with RIAA equalization)
- 2) PHONO 2 (with RIAA equalization)
- 3) AM
- 4) FM
- 5) AUX 1
- 6) AUX 2

There are eleven remaining switches on the front panel of your receiver. The switches used are all of the PUSH/PUSH type; that is push in to activate the circuit and push again to release or de-activate the circuit. In describing these switches we will consider the "IN" position to be "ON" and the "OUT" position to be "OFF".

POWER SWITCH

The POWER switch performs the function as its name denotes. It supplies power to the receiver and to the switched AC convenience outlet. When the switch is ON, function indicator lights will be illuminated.

If the function switch is in either the AM or FM position, the dial scale and tuning meters will also be illuminated.

SPEAKER SYSTEM SELECTOR SWITCHES

Your receiver has been provided with two independent speaker selector switches.

If your receiver is connected with one set of speakers (1 system) as described in previous paragraph on speaker connections, the SPKR-1 switch must be in the "on" position. If you have 2 sets of speakers (2 systems) the SPKR-1 and SPKR-2 switches must both be in the "on" position for both systems to operate.

Should you desire to listen to stereo headphones alone, the speakers (either one or both systems) can be turned off at your discretion.

TAPE MONITOR SWITCHES 1 and 2

Your receiver is provided with two pairs of TAPE OUT receptacles to permit recording of program material being reproduced by your stereo system.

If your tape recorder is of the professional type and has a third head for "monitoring", it is possible to compare the recording with the original while it is being made. Simply push the appropriate TAPE MONITOR switch (depending on which TAPE MON receptacles you are using) to the IN position to listen to the recording after it has been made and back to the OUT position to listen to the program material you are recording.

If you have two professional recorders, each with a monitoring feature, you may monitor each one individually. However, if both TAPE MONITOR switches are IN, TAPE MONITOR 2 will take preference to prevent mixing of both channels.

HIGH CUT FILTER SWITCH

The HIGH CUT FILTER has been designed to reduce the high frequency response of your receiver. This will reduce annoying record scratch, tape hiss, FM background noise, etc.

LOW CUT FILTER SWITCH

At times, record changes, 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 receiver. Whenever rumble is present throw the LOW CUT switch "IN".

STONE DEFEAT SWITCH

This switch permits you to remove the tone controls from the circuit to provide an absolutely linear response. You may use this switch for instant comparison of program material with either an equalized or flat response.

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 to the IN position. At high levels, the CONTOUR switch has no effect.

FM MUTING SWITCH

The purpose of the muting circuit is to reduce audible noise when tuning from station to station. Since very weak signals may be muted at the same time, the front panel FM MUTING switch may be used to defeat the muting circuit on weak signals.

To reduce interstation noise, throw the MUTING switch "ON". To defeat the circuit, throw the switch "OFF".

MPX FILTER SWITCH

As FM multiplex reception requires greater signal strength at the antenna terminals than monophonic reception, transmissions from weak or distant stations will contain more noise than a monophonic signal of the same strength. This switch will eliminate noise accompanying these weak multiplex signals.

STEREO AUTO SWITCH

Under normal use for all FM broadcasts the function selector switch should be placed in the FM position and the stereo auto switch to the IN position.

Your receiver is equipped with a stereo sensing circuit which will automatically determine whether your unit is receiving monophonic or stereophonic broadcasts, and then automatically adjust the mode of operation.

If the station is transmitting stereo, your receiver will automatically switch on the multiplex section and you will hear the broadcast in full stereo. Should the station conclude broadcasting in stereo, your receiver will automatically switch back to monophonic reception.

Should you receive a weak stereo signal whose quality has been degraded by noise or poor signal conditions, and you wish to listen to this stereo broadcast monophonically, place the stereo auto switch in the OUT position.

STEREO INDICATOR

A stereo indicator is located directly behind the dial glass and operates in conjunction with the FM position of the Function switch and the Stereo Auto "IN" position. The indicator visually shows the reproduction of FM stereo through your receiver.

To tune for FM stereo proceed as follows:

1. Place the function selector switch in the FM position and the Stereo Auto switch IN.
2. Tune to the station of your choice using your tuning meter for precise and accurate tuning. Your stereo indicator will now show if you are tuned to a stereo program. If the indicator is off, the program you are listening to is being broadcast monophonically.

TUNING METERS

Your Receiver incorporates two D'Arsonval movement tuning meters for precise and accurate tuning.

The FM balance meter is designed to operate on a null or "zero" center principle. Therefore, the meter pointer should always be at the dead center position of your meter dial for optimum listening performance. To accomplish this, rotate your tuning knob slowly, in one direction towards the station of your choice. As you tune through the station you will notice the pointer swinging from the left or right past the zero center. THE CORRECT POINT for minimum distortion and optimum FM reception is when the pointer is resting at the "zero" center position.

The signal strength meter shows the level of the incoming signal. When used in the FM position you should operate in conjunction with the FM balance meter and tune for maximum indication on the signal strength meter as well as a "zero" null on the balance meter.

When used in the AM position you simply tune for maximum indication.

FUNCTION INDICATOR LIGHTS

The function indicator lights are located behind the dial glass and visually indicate the position of the function switch.

DIAL SCALE

The dial scale on your receiver is marked with three scales, namely, an FM frequency scale (88-108 mc), a logging scale (0-100), and an AM frequency scale.

Since most FM stations operate at frequencies which are not whole numbers (such as 96MC as compared to 96.3 MC). Ideally, each megacycle division on the frequency scale should be divided into 10 parts to enable the user to pinpoint the location of the station. This would require a dial scale which would be longer than the front panel.

The logging scale which is divided into 100 equal parts provides a means of finding your favorite station, once you have noted its position on the logging scale. For example, in New York City, WQXR operates at 96.3 MC. After locating this station through the use of the frequency scale (between 96 and 98 MC), you find that the pointer may fall on 42 on the logging scale. Make a note of this setting. For future tuning to WQXR simply set the pointer to 42 on the logging scale.

EQUALIZATION

In order to achieve good reproduction of the wide range of frequencies in music and to make necessary adjustment 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 overcutting and consequent distortion, a measured and deliberate reduction is effected in low frequency response by selecting a "turnover frequency" and 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 affected above a certain frequency. This combination of deliberate exaggeration at the low and high ends of the frequency spectrum 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 switch automatically introduces the proper equalization.

STEREO HEADPHONE RECEPTACLE

The stereo headphone receptacle located on the front panel will accept any stereo headphone with any impedance rating. The headphone receptacle is "on" at all times.

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 receiver, disconnect everything but the speakers from the receiver. 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 receiver 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.

SERVICE

If this instrument should not perform properly during the first two (2) years after date of purchase, contact the factory for instructions. The factory has many authorized warranty service stations in the United States. To aid us in selecting a service station convenient to you, it would be helpful if you would indicate which major city is closest to your home. Please write our Customer Service Department, Harman-Kardon, Incorporated, Plainview, New York 11803. 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.