



LAFAYETTE®

Model LR-100



(Stock No. 99-02214WX)

**50-WATT
SOLID-STATE
AM/FM
STEREO RECEIVER**



INSTALLATION AND OPERATING MANUAL

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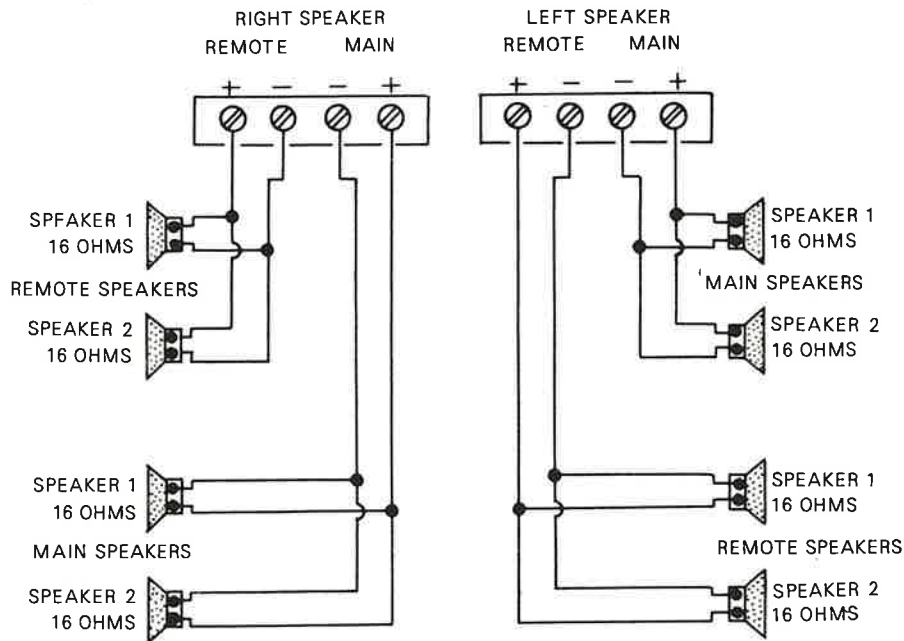
TECHNICAL SPECIFICATIONS

AMPLIFIER SECTION

POWER OUTPUT ± 1 db	50 watts at 4 ohms [both channels]; 40 watts IHF.
TOTAL HARMONIC DISTORTION	Under 1% at rated output, 0.1% at 1 watt.
FREQUENCY RESPONSE	20-20,000 Hz ± 1.5 db.
POWER BANDWIDTH	35-30,000 Hz.
HUM AND NOISE	High Level Inputs: -75 db [Aux]. Low Level Inputs: -60 db [Mag Phono].
INPUT SENSITIVITY [for rated output] ..	Phono-Mag: 2.3 mV; Phono-Cer: 80 mV; Aux: 250 mV.
MAXIMUM INPUT VOLTAGE	Aux: 4.5 V. Phono Mag: 42 mV. Phono-Cer: 1.4 V.
TONE CONTROL RANGE	Bass [50 Hz]: 10 db boost or cut. Treble [10 KHz]: 10 db boost or cut.
LOUDNESS SWITCH	50 Hz: +12 db; 10 KHz: +4 db.
HIGH FREQUENCY FILTER	10 KHz: -10 db.

FM SECTION

TUNING RANGE	88-108 MHz.
SENSITIVITY	2.5 μ V.
SELECTIVITY.....	40 db.
CAPTURE RATIO.....	5 db.
FM DISTORTION.....	0.7% [at 400 Hz 100% mod.] at 1 mV input
STEREO SEPARATION	35 db [at 400 Hz] at 1 mV input.
AM SUPPRESSION	40 db.
SIGNAL-TO-NOISE RATIO	60 db [100% mod].
SPURIOUS RESPONSE REJECTION	70 db.
INTERMEDIATE FREQUENCY	10.7 MHz.
ANTENNA	Built-in line cord antenna plus 300 ohms balanced input for external antenna.

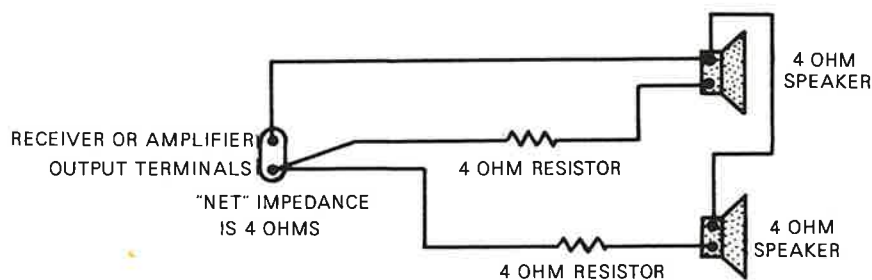


WIRING OF SPEAKERS LISTED IN COMBINATION "F" OF CHART

USING SERIES RESISTORS TO INCREASE NET IMPEDANCE

The use of a large wattage resistor in series with one lead to a speaker will effectively increase its impedance by the value of resistor chosen. For example, if a 4-ohm resistor were connected in series with a 4-ohm speaker, the total impedance of the speaker system would become 8-ohms (4 + 4).

This type of arrangement, when correctly carried out, will permit the use of an even wider range of speaker combinations. Unfortunately, each resistor added in series will introduce a substantial loss in power. In the example just given, half of the output power available would go to the 4-ohm speaker and half would be developed across the 4-ohm resistor. In effect, this means that twice as much power would be required for a given sound output: When two 4-ohm speakers are parallel and a series resistor is included in each line to avoid reducing the net impedance below 4 ohms (as shown in the following diagram), the available output power is developed across four elements in the system—two speakers and two resistors. If each speaker required 5 watts of power to produce adequate sound output, the amplifier or receiver would have to provide 20 watts—5 watts across each speaker and 5 watts across each resistor. The examples given are relatively simple ones and were chosen to more clearly illustrate some of the problems that may be encountered when series resistors are added. Therefore, before attempting to connect any speaker arrangement using series resistors, we strongly recommend that you consult a local high fidelity technician who will be able to determine the value of the resistors to be used, plus the necessary power rating required.



AM SECTION

TUNING RANGE.....	535-1605 KHz.
SENSITIVITY.....	20 μ V [ant terminal].
IMAGE REJECTION	50 db [at 1 MHz].
INTERMEDIATE FREQUENCY	455 KHz.
ANTENNA	Built-in adjustable ferrite loopstick plus provision for external antenna.
SELECTIVITY.....	35 db.
SIGNAL-TO-NOISE RATIO	45 db [400 Hz, 30% mod].

GENERAL

SOLID STATE DEVICES	33 Transistors, 25 Diodes and 2 Thermistors.
FUNCTIONS	FM Mono, Automatic FM Stereo, and AM reception. Inputs for stereo phono [ceramic and magnetic], Stereo Aux inputs.
OUTPUTS	Stereo tape recorder outputs [front and rear]; Main stereo speakers and Remote stereo speakers [4, 8 or 16 ohms]; Stereo headphones.
CONTROLS	Program Selector, Bass, Treble, Volume/Balance, Tuning, Speaker Mode, Loudness, Stereo-Mono switch, Hi-Filter.
POWER REQUIREMENTS	105-120 volts, 50/60 Hz AC.
DIMENSIONS.....	14 $\frac{1}{2}$ " W x 4 $\frac{1}{2}$ " H [including legs] x 10 $\frac{1}{2}$ " D [excluding rear projections and knobs].
NET WEIGHT	15 lbs.

BECAUSE ITS PRODUCTS ARE SUBJECT TO CONTINUOUS IMPROVEMENT, THE LAFAYETTE RADIO ELECTRONICS CORPORATION RESERVES THE RIGHT TO MAKE DESIGN CHANGES OR MODIFICATIONS AT ANY TIME WITHOUT INCURRING ANY OBLIGATION TO INCORPORATE THEM IN PRODUCTS PREVIOUSLY SOLD.

GENERAL DESCRIPTION

The Lafayette LR-100 is a deluxe stereophonic high fidelity music center. It combines a sensitive AM tuner, a fully automatic FM stereo multiplex tuner, stereo control-preamplifier, and a 50-watt stereo amplifier in one single, handsomely styled component. By simply adding loudspeakers, you can immediately enjoy individual AM and FM broadcasts, or the full-dimensional FM stereo broadcasts -- all reproduced with a quality that is unsurpassed.

The advanced all-transistor design of the receiver offers all the advantages expected from solid state circuitry -- instant operation, low current consumption, cool operation, low distortion and noise, and wide frequency response at full power. Stereo inputs have been provided for high-quality reproduction of programs from external sources such as record players, tape recorders, etc. Phonograph inputs are provided for record players equipped with magnetic or ceramic cartridges. These inputs offer proper loading and equalization for accurate reproduction. Tape recorder outputs let you record all stereo or monophonic programs reproduced through the receiver. A dual set of stereo outputs is provided for 4, 8 or 16 ohms loudspeakers -- one set for main stereo speakers, another set for remote stereo speakers.

A special protective circuit employing a fuse in each channel offers protection against the destruction of the output transistors due to internal malfunctions or to short-circuits in the speaker line.

A full range of front panel controls provides complete flexibility of operation and ensures the finest sound reproduction at all times regardless of variations in program sources or room acoustics. In order that you may benefit from the many operating and performance features designed into this receiver, we recommend that you carefully read all the instructions contained in this manual. Also, we suggest that you keep the manual close at hand and in a safe place so that you can refer to it when necessary.

INSTALLATION

The receiver may be used in any convenient location such as an equipment cabinet shelf, table or bookcase. Modern and attractive in appearance, the receiver lends itself to this type of installation.

The amount of heat generated by this receiver is extremely small compared to equivalent vacuum tube units. Even so, provision must be made for some ventilation in order to disperse the small amount of heat that is generated.

AC POWER

The receiver is designed to operate from a power source of 105-120 volts, 50/60 cycles AC. Do not attempt to use the receiver on any other power source or damage will result.

arrangement, however, no speakers may be connected to the "Remote" terminals. In combination F, the chart shows that a total of four 16-ohm speakers may be used on each channel—two 16-ohm speakers connected to the "Main" terminals on each channel and two 16-ohm speakers to the "Remote" terminals on each channel. An illustration of the wiring of speakers listed in combination F has been provided as an example.

PERMISSIBLE SPEAKER COMBINATIONS

The chart below shows the various combinations of speakers that may be connected to each channel of the receiver

		"MAIN" TERMINALS (Each Channel)	"REMOTE" TERMINALS (Each Channel)
Single Speaker Systems	A	1st Speaker: 4 ohms	None
	B	1st Speaker: 8 ohms	1st Speaker: 8 or 16 ohms
	C	1st Speaker: 16 ohms	1st Speaker: 8 or 16 ohms
Multiple Speaker Systems	D	1st Speaker: 8 ohms 2nd Speaker: 8 ohms	None
	E	1st Speaker: 8 ohms 2nd Speaker: 16 ohms	1st Speaker: 16 ohms 2nd Speaker: None
	F	1st Speaker: 16 ohms 2nd Speaker: 16 ohms	1st Speaker: 16 ohms 2nd Speaker: 16 ohms
	G	1st Speaker: 16 ohms 2nd Speaker: 16 ohms	1st Speaker: 8 ohms 2nd Speaker: None
	H	1st Speaker: 16 ohms 2nd Speaker: None	1st Speaker: 8 ohms 2nd Speaker: 16 ohms
	I	1st Speaker: 8 ohms 2nd Speaker: None	1st Speaker: 16 ohms 2nd Speaker: 16 ohms
	J	1st Speaker: 16 ohms 2nd Speaker: 16 ohms 3rd Speaker: 16 ohms	1st Speaker: 16 ohms 2nd Speaker: None 3rd Speaker: None
	K	1st Speaker: 8 ohms 2nd Speaker: 16 ohms 3rd Speaker: 16 ohms	None
	L	1st Speaker: 16 ohms 2nd Speaker: 16 ohms 3rd Speaker: 16 ohms 4th Speaker: 16 ohms	None

NOTE: Total of all speakers on any one channel (both "MAIN" and "REMOTE") never results in an impedance below 4 ohms.

USING MULTIPLE SPEAKER SYSTEMS

The connection of several speaker systems on each channel must be carried out with great care in order to avoid the possible destruction of the output transistors in solid-state equipment. Basically, you must ensure that the final impedance presented by all speakers (both main and remote) on each channel does not fall below 4 ohms. Speakers connected to both "Main" and "Remote" terminals must be taken into consideration because in the "Main + REM" position of the SPEAKER MODE switch, any speakers attached to these terminals are connected in parallel, causing a considerable reduction in total speaker impedance—possibly to a dangerously low figure (below 4 ohms). We therefore urge you to read the following section if you intend to connect remote speakers or if you plan to use more than one speaker (per channel) on the "main" outputs.

THE EFFECT OF MULTIPLE SPEAKERS ON IMPEDANCE

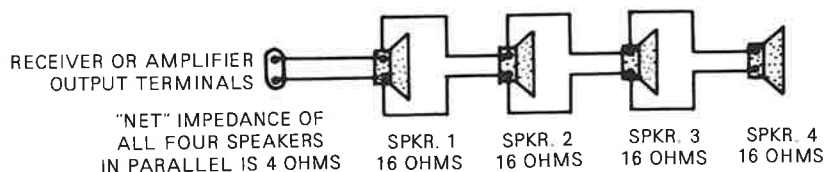
Most of the high fidelity speakers systems manufactured today are rated at either 8 or 16 ohms impedance, although there are several good ones rated at 4 ohms. When used singly, that is, one speaker on each channel, no special precautions need be taken. Each speaker, whether 4, 8 or 16 ohms impedance, is simply connected to the "Main" output terminals on each channel of the receiver. However, if you wish to add Remote speakers or connect more than one speaker to each "Main" channel, special precautions must be taken.

First, it must be understood that the recommended method of wiring multiple speakers in a high fidelity system is the parallel type of connection. This is illustrated in the following diagram. Series type connections may produce undesirable reactions in each speaker and should not therefore be used.

Unfortunately, the final or "net" impedance that results when speakers are connected in parallel is considerably lower than any one of the individual speaker impedances. And, as each additional speaker is added, the net impedance is further reduced. When each speaker in the group has the same impedance, it is relatively simple to calculate the net impedance of all the speakers combined. Divide the impedance of any speaker by the total number of speakers you intend to use (on each channel). For example, four 16 ohm speakers in parallel would be:

$$16 \text{ (ohms)} \div 4 \text{ (number of speakers)} = 4 \text{ ohms}$$

Thus, the actual impedance presented to the receiver is 4 ohms.



This method may be used to calculate the net impedance of any number of speakers in parallel, provided all speakers are of identical impedance. However, when the speakers have differing impedances, a more complex formula must be used.

To avoid the need for time-consuming calculations, we have provided a chart which shows many combinations of speakers that may safely be connected to your receiver. Note that the number and impedance of speakers that may be used applies to each channel. For example, in combination "D" two 8-ohm speakers may be attached to the "Main" terminals on each channel resulting in a total of four 8-ohm speakers for both channels. With this

TUNING METER
Shows when an AM or FM station is properly tuned in. Always tune for maximum deflection (to the right).

TUNING DIAL
Large, easy-to-read tuning dial for FM and AM, plus logging-scale.

AUTOMATIC FM STEREO INDICATOR
Lights up to indicate that the receiver has switched to stereo reception.

TUNING CONTROL
Used to tune to desired AM or FM stations.

SPEAKER MODE
Switches the receiver on and selects main stereo speakers only, main and remote, remote stereo speakers only, or Phones only.

TAPE OUT
Front panel receptacle provides a stereo output for recording purposes (rear panel also has jacks).

STEREO PHONES
Receptacle provided for use with stereo headphones (4, 8 or 16 ohms impedance).

HIGH FILTER
Used to reduce high frequency noise.

MONO-STEREO SWITCH
Determines the manner in which the amplifier section is operated—mono or stereo. Setting the switch to "Stereo" when the Selector is in the FM or MPX Filter position provides automatic FM stereo operation.

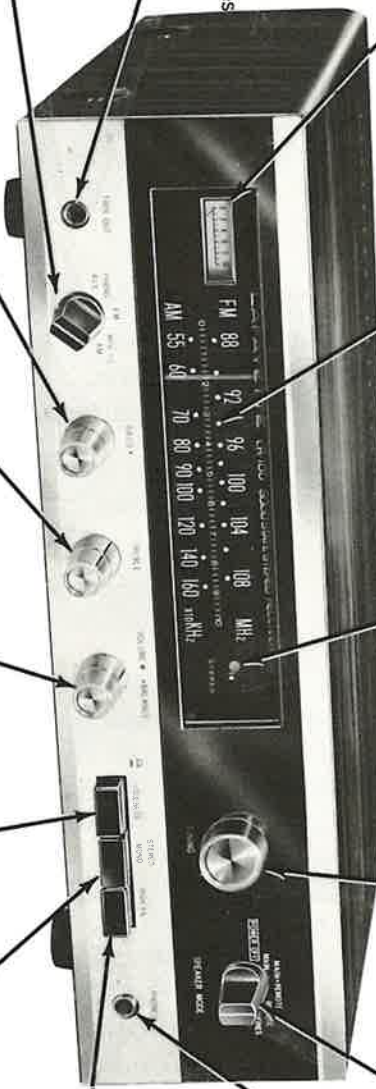
PROGRAM SELECTOR
Determines the mode of operation for the receiver—Aux, Phono, FM, MPX FIL, AM.

MASTER BASS CONTROL
Provides adjustment of the bass (low tones) for both channels.

MASTER TREBLE CONTROL
Provides adjustment of the treble (high tones) for both channels.

VOLUME/BALANCE CONTROLS
Dual controls provide adjustment of the volume for each channel—permits balancing.

LOUDNESS SWITCH
Increases the bass and treble tones—used to produce realistic reproduction at low listening levels.



CONVENIENCE OUTLETS

The convenience outlets are provided at the rear of the receiver. The unswitched [red] outlet should be used to supply AC power to equipment such as a record player or tape recorder. The switched [black] outlet is controlled by the power on-off switch on the receiver and should be used for equipment you wish to operate simultaneously with the receiver [a transistorized indoor FM antenna or booster, for example]. Note that both outlets are not protected by the AC fuse in the receiver.

GROUND CONNECTION

A ground screw at the receiver's rear [marked GND] provides for optional connection between the receiver and other Hi-Fi components that may be used in a system [such as a record player]. In many cases this connection aids in the reduction of hum.

AM ANTENNA

The ferrite loopstick built into the rear of the receiver assures adequate reception of all local AM stations. However, in fringe areas, high noise areas, or where surrounding metal objects interfere with normal reception, a 20-30 foot length of insulated antenna wire should be connected to the terminal designated A [See Fig. 1].

NOTE: The ferrite loopstick is mounted on a swivel bracket. For maximum signal pickup, the loopstick should be swung out -- away from the chassis -- and adjusted for best reception.

FM ANTENNA

The antenna is the single, most important factor in obtaining good, distortion-free FM reception. The finest, most sensitive receiver will not operate properly if it is fed with a poor FM signal. You should therefore give careful consideration to the selection of an antenna for your receiver if you want the best results -- particularly for FM stereo reception.

In areas reasonably close to the transmitter, the built-in FM antenna system will generally provide good results [See Fig. 1-A for internal FM connections]. In certain cases, however, it may be necessary to use a more directional indoor antenna system such as a simple folded dipole constructed of 300 ohm twin lead, or a "rabbit ears" antenna similar to the type sometimes used for TV reception. Indoor antennas of this type are fairly directional and should therefore be positioned for best reception of the desired stations. For the very best FM stereo reception, the use of an outdoor antenna is highly recommended. These are available in various types [See the Lafayette catalog]. For reception of stations scattered in many directions, a non-directional type of antenna may have to be used. If the desired stations lie mostly in one direction, a highly directional type will provide better results. When using a directional antenna, always orient it for best reception of the desired station. The correct position will be indicated by a maximum reading of the tuning meter on the receiver.

4. If the trouble was experienced during your initial operation of the system, check all interconnections for accuracy, and check that all plugs are firmly inserted. Make sure speakers are properly connected and that they are not at fault.
5. If you are having trouble on FM [little or no meter reading as you tune across the dial], check antenna connections. Check to make sure your program source is not at fault if you are using a record player or tape recorder.
6. Check any connecting audio cables themselves for an intermittent "open" or "shorted" condition.

IMPORTANT: When checking interconnecting cables, make sure Volume controls are at minimum or receiver is switched off.

RETURNING THE UNIT FOR SERVICE

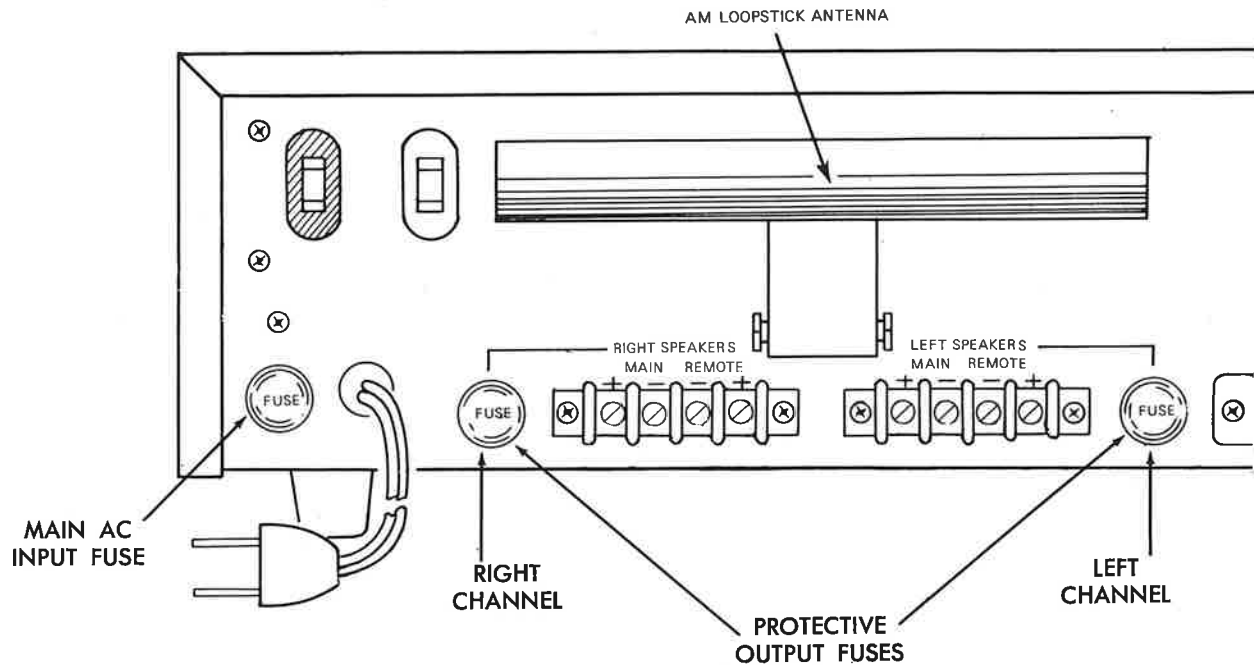
The receiver should require very little service except for occasional fuse replacement which may become necessary in some cases. For problems of a more serious nature, we recommend that you return the unit to the Lafayette store from which it was purchased.

If the unit is to be shipped to our main office for service, please read the instructions which follow.

SHIPPING INSTRUCTIONS

Pack the unit very carefully to avoid damage in transit, preferably in its original carton. If the original carton is not available, use a sturdy carton with at least 3 inches of shredded paper or excelsior around the unit. In the latter case, wrap the unit in paper first to avoid particles of packing material getting into it. Include with the unit a letter explaining exactly what difficulties you have encountered [remember to add an extra 6¢ postage and indicate on the outside of the carton that First Class Mail is enclosed]. Ship by prepaid express if possible and mark ELECTRONIC EQUIPMENT – FRAGILE. Clearly address the carton as follows:

SERVICE DIVISION
LAFAYETTE RADIO ELECTRONICS CORP.
111 JERICHO TURNPIKE
SYOSSET, L. I., N. Y. 11791



AC FUSE

The value of the AC fuse is $1\frac{1}{2}$ ampere standard 3AG. In the event of its failure, this fuse should be replaced with one of the same rating. Replacing it with a fuse of a higher rating may not protect the receiver and cause severe damage.

TROUBLE-SHOOTING GUIDE

If any trouble is encountered with your high fidelity system, we recommend that you do the following:

1. Make sure the receiver is plugged into the correct power source [105-120 volts, 50/60 cycles AC]. Check the dial and meter lamps on the receiver. If they are not lit, switch the unit off and check the main AC fuse at the rear of the unit. If the fuse has blown, obtain a replacement fuse of the same rating and insert it into the receiver must be suspected. **DO NOT ATTEMPT TO USE A FUSE OF A HIGHER RATING THAN THAT SPECIFIED.**
2. If the receiver appears to be operating on FM or AM [tuning meter is indicating reception of signals, but there is no sound output on one or both speakers], check the protective output fuse in each channel [See section titled "Protective Output Fuses"].
3. Check for possible error in control or switch settings. Make sure the Mono-Stereo and Program selector switches are correctly set to provide the type of operation you want. Check the SPEAKER MODE switch setting for proper selection of speakers.

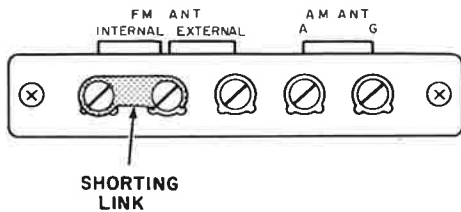


FIGURE 1-A.
INTERNAL FM ANTENNA CONNECTIONS

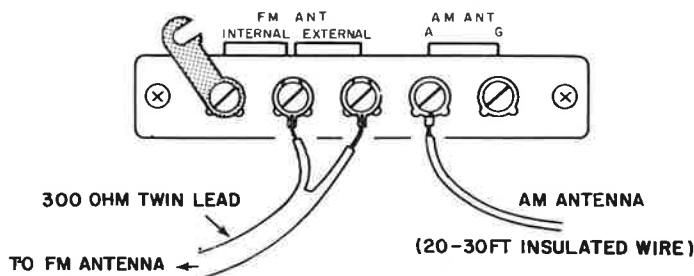


FIGURE 1-B.
EXTERNAL FM AND AM ANTENNA CONNECTIONS

If you presently use an outdoor TV antenna, it can sometimes be used to provide good reception of FM stations. Simply connect a 300 ohm twin lead between the stereo receiver and TV antenna lead-in, using a 2-set antenna coupler such as the LAFAYETTE TS-326 [Stock No. 99-40040]. You should remember, however, that some TV antennas are designed to attenuate signals in the FM band to minimize interference on TV from FM stations [the FM band is located between channel 6 and 7]. In such cases, it will be necessary to install a separate FM antenna [this may be installed on a lower part of the TV mast].

FM ANTENNA CONNECTIONS

There are two sets of FM antenna screw-terminals located at the rear of the receiver -- EXTERNAL and INTERNAL [the center terminal is common to both]. The 300 ohm twin lead from an external antenna should be connected to the "EXTERNAL" pair of terminals as shown in Figure 1-B. If you are located in an area which is extremely close to stations, it may not be necessary to use an external antenna. Connect the link [shorting bar] as shown in Figure 1-A and uncoil the AC cord to its full length.

This internal antenna will not be effective when the broadcasting station is distant or when the receiver is used in a ferroconcrete building or other electromagnetically shielded place.

CONNECTING ASSOCIATED EQUIPMENT

WARNING: Do not insert or remove connecting cables with the receiver switched on.

LOUDSPEAKERS

The interconnecting diagram illustrates how your main and remote speakers are connected to this receiver. For indoor installations, ordinary plastic-covered lamp cord [#18 gauge] should be used to connect the speakers to the receiver.

In order to ensure balanced tonal quality and output, it is recommended that identical speakers be connected to each channel of this receiver. Speakers not of the same impedance or model will produce sound differences between channels which may detract from the over-all stereo performance. If you intend to use more than one main speaker on each channel, or if you plan to use remote speakers in addition to the main speakers, we strongly recommend that you read the section at the end of the manual titled "Using Multiple Speakers Systems".

MAIN SPEAKER CONNECTIONS

Connect your "Main" left and right speaker systems to the "-" and "+" terminals marked "MAIN". If the speakers have coded terminals [for example, one terminal may have a red dot], try to maintain a consistency in the manner of connections -- in each case, connect the "red" speaker leads to the "+" receiver terminals as shown. This will ensure that your speakers are connected in phase. If the speaker leads are not coded, they may be connected without regard to polarity. Any out-of-phase condition which may result can be corrected as indicated later.

CAUTION: When connecting speaker leads to the receiver output terminals or to the speaker terminals, make sure that the strands of wire on each lead are securely held under each screw head. This will avoid the possibility of a loose strand accidentally touching an adjacent terminal and short-circuiting the speaker output, thereby causing one of the protective fuses to blow in the receiver. Also, if the speaker leads are secured anywhere by means of staples, make sure they do not pierce the actual wires and produce a short-circuit.

REMOTE SPEAKER CONNECTIONS

Remote speakers are connected in the same general manner as the main speakers, except that they are connected to the terminals marked "REMOTE".

CAUTION: If your "main" speakers are of 4 ohms impedance, do not connect remote speakers or damage may result. If main speakers are either 8 or 16 ohms, you may use either 8 or 16 ohms remote speakers safely, but not 4 ohms types. If you have not already done so, we urge you to read the section at the end of this manual entitled USING MULTIPLE SPEAKER SYSTEMS.

SPEAKER PLACEMENT

To realize optimum performance from your stereo system, it is important that the left and right channel speakers be placed at definite locations within the listening area. If the speakers are too closely spaced, the stereo effect will be severely limited. Except in a very small room, eight feet is considered minimum spacing between speakers for good stereo separation. In a two-channel system, good stereo listening begins a distance in front of the speakers equal to their separation, and continues for twice this distance. For example, if the speakers are placed 8 feet apart, the best listening area extends from 8 to 16 feet in front of the speakers.

A large spread between speakers is permissible if the listening area is moved back proportionately. Close listening to widely separated speakers creates a "hole in the center" which gives the impression of two distinctly separate sound sources rather than the desired sound dispersion. If speakers are substantially separated, it is generally best to "angle" the side speakers toward the center of the listening area.

PROTECTIVE OUTPUT FUSES

High fidelity amplifiers which employ transistors instead of vacuum-tubes offer many advantages. These include such features as instant warm-up, low current consumption, low heat, low distortion and noise, good transient response, and wider frequency response at full power. However, transistorized amplifiers cannot normally be subjected to the same electrical overloads or misuses that vacuum-tube units can survive, unless special circuit-protecting devices are incorporated. This has been done in the case of this receiver. A special fused circuit for each channel is included in the unit to guard against output transistor damage due to unintentional short-circuits at the speaker outputs. The electrical overload which would result from this condition will cause the protective fuse to blow automatically, and thus prevent serious damage. Blowing of a protective fuse on one or both channels [depending where the short-circuit occurs] will cause the sound output to go off permanently in that channel. IF THIS SYMPTOM IS OBSERVED, SWITCH THE RECEIVER OFF. Check your speaker connections very carefully, making sure you have not inadvertently created a short-circuit at the receiver outputs terminals or at the speakers themselves [if you have used staples anywhere to secure the speaker cables, check these points as well]. If the symptom is still present after checking, a fault in the receiver must be suspected and it should be serviced.

REPLACEMENT FUSES

The protective fuse used in each channel is a $1\frac{1}{2}$ amp standard 3AG fuse. Use only this type for replacement purposes. Do not, under any circumstances, use a fuse of a higher rating -- this may result in costly damage to receiver components. Replacement output fuses are available under Lafayette Stock No. 13-10143.

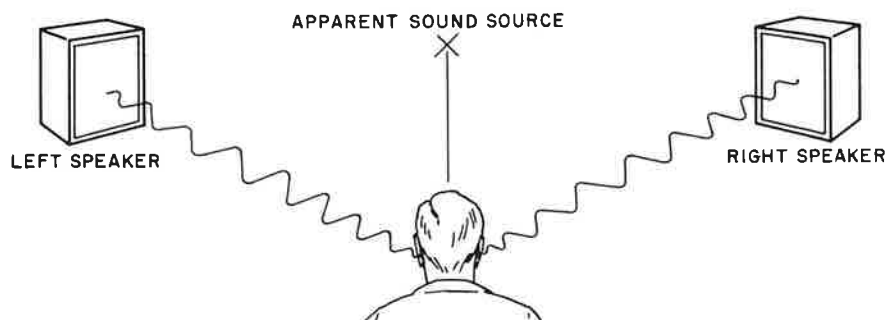


FIGURE 3.

2. Play any record or tune in any FM broadcast with a voice content [on FM, a news-cast or discussion is ideal]. Set the VOLUME/BALANCE controls to minimum. Set the BASS and TREBLE controls to the 12 o'clock position.
3. For this test, the speakers should be placed about 6 to 8 feet apart and facing inward slightly as shown in the diagram. You may require the help of another person to operate the controls while you position yourself midway between the speakers as shown.
4. Adjust VOLUME/BALANCE controls to slightly higher than normal listening level. Make sure that each control is set so that the output from each speaker is approximately the same. Listen carefully, and try to determine the area from which the voice appears to be coming. If the speakers are "in phase", the voice will seem to come from between the speakers.
5. Have someone reverse the connections at the rear of one speaker. Listen carefully to the sound output again as the wires are switched. Repeat this procedure a few times.

CAUTION: Use extreme care when reversing wires to the speaker terminals. If the wires are inadvertently shorted together, the amplifier output fuse in that channel may blow.

When you have the correct or "in-phase" connection you will notice that the sound seems to come from an area somewhere between the speakers. Adjustment of one of the VOLUME/BALANCE controls may be necessary to center the apparent sound source so that it seems to be located midway between the speakers. If the speakers are not in phase, however, the sound will not seem to come from any clearly defined area [unless there is a large difference in output between speakers], and you may have to reverse the speaker wires again.

When you have determined that the speakers are in phase, permanently connect the wires in the position that produced it.

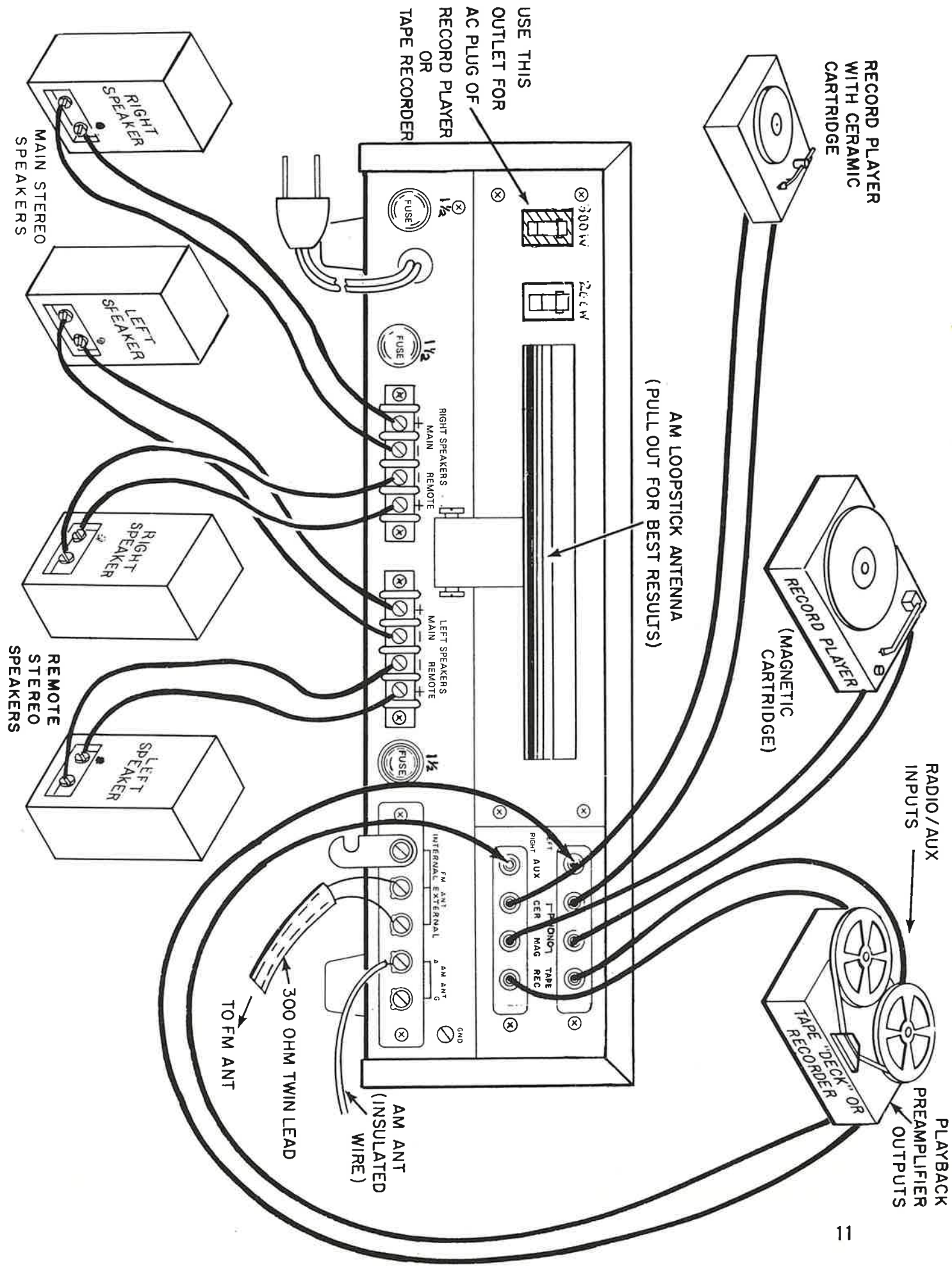


FIGURE 2 INTERCONNECTING DIAGRAM

STEREO HEADPHONES

The receiver is also designed for stereophonic headphone listening. Simply plug the headphones into the front panel receptacle marked "Stereo Phones" [the Speaker switch may be in any position]. If you wish to listen privately without the main or remote speakers being on, set the speaker switch to the PHONES position.

RECORD PLAYERS

The shielded audio cables from a record changer or turntable are normally terminated with RCA-type phono plugs. The phonograph input jacks on your receiver are designed to accept this type of plug. To avoid loss in the high frequency tones, the cables from the record player should not exceed 10 feet in length. If you are using a record player that is equipped with a ground wire, connect it to the screw at the rear of the receiver [marked GND].

RECORD PLAYERS WITH MAGNETIC CARTRIDGES

The two output cables from a stereo record changer or turntable equipped with a magnetic or variable reluctance cartridge should be connected to the left and right input jacks marked "MAG".

RECORD PLAYERS WITH CERAMIC CARTRIDGES

The two output cables from a stereo record changer or turntable equipped with a ceramic or crystal cartridge may be connected to the input jacks marked "CER". If the record player is equipped with a monophonic cartridge, connect the single output cable to the left or right input jack marked "CER".

NOTE: Some crystal cartridges may produce a high output voltage that requires connection to the AUX input jacks to avoid overloading.

TAPE RECORDERS

RECORDING

The two phono jacks at the rear marked "REC" offer a program output suitable for permanent connection to the Aux/Radio inputs on a stereo tape recorder. Any program being reproduced through the receiver will always be available at these jacks for recording FM Mono or Stereo programs, AM programs, or from a record player [or even from another tape recorder]. For convenience, a stereo output for recording purposes is also available on the front panel [Tape Out]. This receptacle is designed for a 3-conductor stereo phone plug.

NOTE: A special 6 ft. adapter cable, with a 3-conductor stereo phone plug at one end and two RCA phono plugs [L and R] at the other, is available under LAFAYETTE Stock No. 99-63364. This cable will permit connection from the tape output jack on the front panel of the receiver to the high level inputs on most LAFAYETTE tape recorders [or other makes equipped with RCA phono jacks].

and adjust tonal controls for desired reproduction. The sound you will hear from both speakers is monophonic. Now switch to "Stereo" and note the change that takes place. By switching between "Mono" and "Stereo", the added depth and spaciousness of stereophonic sound will soon become apparent.

INTERFERENCE ON FM

FM stereo broadcasts are more susceptible to noise pickup than regular FM monophonic broadcasts. Provision has therefore been made in the receiver to permit reduction of these noises by means of special high frequency filters.

However, before attempting to use any of these filters, remember the following:

- [a] Noise or distortion may be on the record or tape being played by the FM station.
- [b] Your antenna may not be properly oriented for best reception, or may be inadequate for good signal pickup from the desired station [See the section on FM antennas].
- [c] Nearby electrical signs, automobiles, etc., may sometimes cause annoying interference. These electrical disturbances are usually picked up by the antenna lead-in [if you are using a roof antenna], and can sometimes be reduced by using 300 ohm shielded cable.

REDUCING NOISE ON FM STEREO

1. If the noise is present when the Mono-Stereo button is in "Stereo" but disappears when set to "Mono", you should try the filter provided in the "MPX Fil" position of the program selector. This filter has negligible effect on the main program, but is helpful in reducing high frequency noise on FM stereo
2. If the noise is still present, set the HIGH FIL on. Although this filter will reduce the higher frequencies on the program material, any noise present will be significantly reduced.

SPEAKER PHASING

Correct phasing and balancing is important in a stereophonic system. If the speakers are out of phase, they will work in opposition to each other and there will be a noticeable loss in the low frequencies [bass]. If the speaker output levels are not equal, there will be an unnatural distribution of the musical program, resulting in a loss of the stereo effect. Correct balance and phase may be achieved using the method described below. It is based on the fact that if two speakers send out identical sound and you are equidistant from them, your ears will place the apparent source of sound between the two speakers, as indicated in Figure 3.

For this test, you may use either a record player or FM.

1. Set the program selector to the position which selects your program source. Set the MONO-STEREO switch to "Mono".

OPERATING THE RECEIVER

Before attempting to operate the receiver, make sure you have properly connected your loudspeakers and any other associated equipment you intend to use, such as a record player or tape recorder. For FM reception, you must have the internal or external antenna properly connected, as indicated previously.

THE AUTOMATIC FM STEREO SYSTEM

A special FM stereo sensing circuit in your receiver provides automatic switching to mono or stereo reception, depending on the broadcast. As soon as you tune to a stereo broadcast, the sensing circuit samples the signal and, if the stereo broadcast is being received with sufficient strength for good stereo reproduction, the circuit will automatically switch the receiver to stereo reception and light the FM stereo indicator on the tuning dial. If the stereo broadcast is weak, however, the sensing circuit will maintain the receiver in the monophonic mode and thus provide monophonic reception of the broadcast. This last feature is important. An inherent characteristic of the FM stereo multiplexing system is that a stronger signal is required for good FM stereo than for standard mono reception. A receiver attempting to reproduce stereo from a weak signal will provide poor results. However, the same stereo signal will provide highly improved reproduction with substantially reduced noise if the receiver is switched to monophonic reception. Thus, a circuit that will switch to stereo reception only when the stereo signal is received with adequate strength automatically selects the best mode of operation for the type of signal being received, and assures you of optimum sound reproduction at all times.

On occasion, the FM stereo indicator will light on a station which sounds as if it is broadcasting a monophonic program. This condition is usually encountered during an announcement or newscast, and can be explained as follows. Announcements or newscasts during a stereo program may actually be transmitted monophonically on both channels from the station, so that the sound heard from your left speaker will be identical to that heard from your right speaker [some stations transmit announcements on one channel only]. In such a case, your unit will produce an indication of stereo, even though the announcement or newscast is heard as a monophonic broadcast.

It should also be remembered that the musical program being transmitted from the station may have varying degrees of channel separation, depending on the musical selection which, most frequently, is reproduced from records. Since few record companies use the same stereo recording techniques, the amount of channel separation available will vary from one record to another. However, there is more to stereophonic sound than the mere division of musical instruments between the left and right channels. There is a subtle depth and spaciousness to the music with the sounds of various instruments distributed over a broad area. This particular characteristic will become more apparent if you make the following listening test. Set all controls for normal FM stereo operation, but place the Mono-Stereo button in the "Mono" position. Tune in a known stereo station

PLAYBACK

High level outputs that have already passed through a pre-amplifying stage in a tape "deck" or tape recorder should be connected to the "AUX" input jacks on the receiver. This will permit playback of tape using the receiver and attached speakers.

DESCRIPTION OF RECEIVER CONTROLS

We suggest you take the time to read this section carefully. A large number of controls and switches have been provided on this receiver to ensure complete flexibility of operation. A full understanding of each control and its functions will enable you to obtain maximum enjoyment from your complete system.

PUSH-BUTTON OPERATION

Three of the switches on this receiver are of the push-button type. To set any of these buttons to the "on" position, simply push the button to lock it into the depressed position. To release a button from the depressed position, push the button in momentarily and release. Note that the released [out] position represents "off" for all buttons except the "Stereo-Mono" button -- the released position is "Stereo", and the depressed position is "Mono", in this case.

PROGRAM SELECTOR SWITCH

This switch selects the program source. In detail, each position does the following:

- AUX Selects sources connected to the "AUX" input jacks.
- PHONO..... Selects sources connected to the "PHONO" input jacks [MAG or CER].
- FM Selects FM Mono or Stereo reception.
- MPX FIL..... In this position, a special high frequency filter is switched into the circuit to reduce any high frequency noise that may occur during FM stereo reception [See section titled "Interference on FM"].
- AM..... Selects AM reception.

STEREO-MONO PUSH-BUTTON

This switch determines the manner in which program sources [previously selected by the Program Selector switch] will be reproduced by the receiver.

- MONO..... A program source connected to left and right channel input jacks is mixed and reproduced through both channels and speakers. Also, a single program source connected to either the left or right input jack is automatic-

ally reproduced through both channels and is heard from both speakers.

NOTE: During FM operation, switching to "Mono" will disable the automatic stereo switching circuit of the receiver and provide only monophonic FM reception.

STEREO..... This provides stereophonic reproduction of any stereo programs source. This position will also provide automatic FM stereo operation when the program selector switch is in the FM or MPX FIL position.

FM STEREO INDICATOR LIGHT

The FM stereo light works in conjunction with the automatic FM stereo switching circuit in the receiver. When the light comes on, it indicates that the receiver has switched to FM stereo operation. When the light is out, it is an indication that the receiver has returned to FM mono operation. Note, however, that placing the STEREO-MONO switch in the "Mono" position will disable the automatic FM stereo switching circuit and extinguish the light, even on a stereo broadcast.

Any stereo station which produces an unsteady "flickering" light must be considered too weak or noisy for proper stereo reception [although it may be good enough for mono reception]. Tune only to those stations that produce a steady, uninterrupted light if you want best stereo reproduction [See "Automatic FM Stereo System"].

TUNING CONTROL

Tuning for either AM or FM is carried out with the same control. An electronic tuning meter on the receiver permits accurate tuning of all stations. Simply tune for highest meter reading. This is particularly important on FM -- poor tuning will result in noise and distortion. On FM stereo, poor tuning will also result in a loss of channel separation.

TUNING METER

An illuminated meter, arbitrarily calibrated from 1 to 10, permits accurate tuning of FM or AM stations. The meter also provides an indication of the relative strength with which the receiver is receiving various stations. One station may produce a reading of 6, another a reading of 10. This indicates that the signal arriving at the receiver input from one station is weaker than the other, even though both may have originated at transmitting stations having equal power. Factors causing one station to be received with less strength than another are numerous -- particularly on FM. These include: the distance of the station from your antenna, the terrain over which the signal must pass [intervening structures such as tall buildings, towers, etc. will affect reception], and the direction in which your FM antenna is "beamed". Your antenna [unless omnidirectional] must be oriented correctly for maximum "pick-up". Maximum signal pickup will be readily seen on the tuning meter. The meter can also be used to judge the efficiency of one antenna as compared to another, the better antenna producing a higher meter reading.

LOUDNESS PUSH-BUTTON

At low listening levels the human ear does not respond equally to all frequencies. When played at very low volume, a musical program will appear to exhibit a fairly great loss of the bass tones and a slight loss of the treble tones. In order to compensate for this peculiarity of the human ear, it becomes necessary to provide added volume at the low [bass] and high [treble] frequencies. This is accomplished by the LOUDNESS switch when "on". At low volume, it provides the required amount of bass and treble boost to enable the listener to hear the full range of frequencies with greater realism. The loudness circuit works in conjunction with the Volume/Balance controls so that at high volume control settings, the boosting action is automatically reduced.

HIGH FIL PUSH-BUTTON

This switch, when "on", will remove any of the high frequency noises [hiss and scratch] sometimes encountered in older records. When exceptionally noisy reception is encountered on AM or FM, this switch may be used to provide a reduction in the noise. Unless such noises are disturbing, however, this switch should be left in the "off" position to permit the full reproduction of the high frequencies.

SPEAKER MODE SWITCH

This switch turns the receiver on and also allows you to connect the sound output either to the main speakers in your principal listening area [Main], to two sets of speakers [Main + Rem], to remote speakers only [Remote], or to headphones only [Phones].

VOLUME/BALANCE CONTROL

These are concentric controls which permit individual adjustment of the volume for each channel. Generally, they should be set so that the indicator lines on the knobs are in the same position and turned together by grasping both knobs. However, if the speaker outputs are not equal in volume, adjustment of the small control should be made to equalized outputs. The rear knob [nearest the front panel] controls the left channel, and the small outer knob controls the right channel.

BASS CONTROL

This is a master tone control which permits the bass [low] tones of both channels to be adjusted simultaneously. When the indicator on the knob is set to the center or 12 o'clock position, response is normal [flat frequency response] and the amplifier section reproduces the bass frequencies normally. Clockwise rotation [from center] increases the bass tones, and counter-clockwise rotation decreases them.

TREBLE CONTROL

This control operates in the same way as the bass control except that it provides adjustment of the treble [high] tones.