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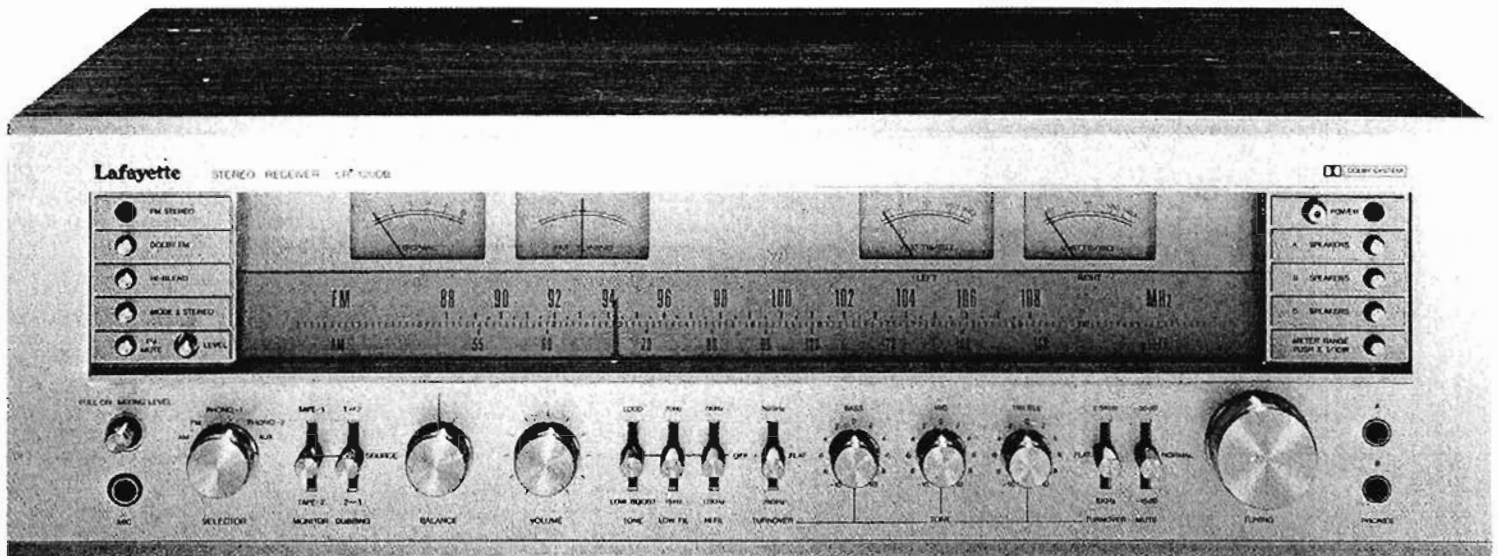
OPERATING & SERVICE MANUAL

**AM/FM  
STEREO  
RECEIVER**

**MODEL  
LR-120DB**

Lafayette

[No. 21-03109HW]



# Model LR-120DB

[ Stock No. 21-03109HW ]

## AM/FM STEREO RECEIVER



 AND "DOLBY" ARE TRADE MARKS OF DOLBY LABORATORIES

**WARNING**

To prevent fire or shock hazard, do not expose this appliance to rain or moisture.

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## GENERAL DESCRIPTION

The Lafayette LR-120DB is a highly sophisticated solid-state stereophonic high fidelity receiver that combines an AM tuner, a highly sensitive FM stereo tuner, and a high quality integrated stereo amplifier in one single, handsomely styled unit.

The receiver not only offers all the advantages expected from solid-state circuitry such as instant operation, low current consumption, and cool operation, but also provides extremely low distortion and noise, plus wide frequency response at its full rated power to ensure the finest sound reproduction.

Stereo inputs have been provided for reproduction from a wide variety of external program sources that you may wish to use — a record players, tape recorders, tape players, etc.

Some of the special features that have been incorporated in this receiver to ensure a high degree of performance and to provide complete flexibility of operation are as follows:

- \* 75 ohm and 300 ohm antenna inputs for FM.
- \* Sensitive dual-gate MOS FET in the FM RF section with 4-section variable capacitor.
- \* Two 2-element ceramic filters and 6-pole Linear Phase LC Block Filter used in the IF section for high selectivity.
- \* PLL [Phase Lock Loop] IC used in the FM stereo decoder section for optimum stereo performance with minimum distortion.
- \* A newly-developed IC functioning as an IF amplifier, a low-distortion Quadrature FM detector, a driver for the tuning meters, and as a sophisticated FM muting circuit which not only eliminates noise between stations on FM in the conventional manner, but also silences the receiver when not properly turned to a station.
- \* Dual Tuning Meters used — a conventional signal strength meter plus an FM center-tuning meter for precise tuning.
- \* Power Output Meters are provided for both channels to allow reading of average power with the aid of Meter Range Button.
- \* Built-in Dolby Noise reduction circuit for decoding Dolby FM broadcasts.
- \* Two sets of magnetic phono inputs accommodating a range of cartridge output levels from 2.5mV to 600mV (for rated power output).
- \* A single microphone input controlled by a mic on-off switch and level control for convenient mixing with other program sources.
- \* Two-position turnover frequency switches for Bass and Treble controls.
- \* Direct-coupled OCL power amplifier stages.
- \* Amplifier output stages protected by a dual system of relay and electronic overload protection circuitry.
- \* FM Mute Level Control — adjusts the FM muting level.
- \* Audio-Mute Switch — reduces receiver volume to one of two low levels (-15dB, -30dB).
- \* Quick-connect output terminals for up to three sets of stereo speakers.
- \* Antenna Attenuate Switch — Acts as a Local-Distance Switch.
- \* 2-position Low Frequency Filter Switch (15 or 70Hz).
- \* 2-position High Frequency Switch (7 or 12kHz).
- \* Dual Tape Monitoring facilities plus special dubbing switch to permit recording from one tape recorder onto another in either direction.

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 unit may be used in any convenient location such as an equipment cabinet shelf, table or bookcase. The amount of heat generated by this unit is small compared to vacuum-tube equipment. Even so, provision must be made for some ventilation in order to disperse the small amount of heat that is generated. Do not place books or objects on top of the unit so that the ventilation slots are obstructed. Do not place near radiators or other sources of heat.

### AC POWER

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

### CONVENIENCE OUTLETS

Two convenience outlets are provided at the rear of the receiver. The unswitched outlet should be used to supply AC power to equipment such as a record player and tape recorder. The switched 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 neither of these outlets is 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.

## ANTENNAS

### AM ANTENNA

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

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 ANTENNAS

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, you may be able to use an 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. 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 "SIGNAL" tuning meter on the receiver.

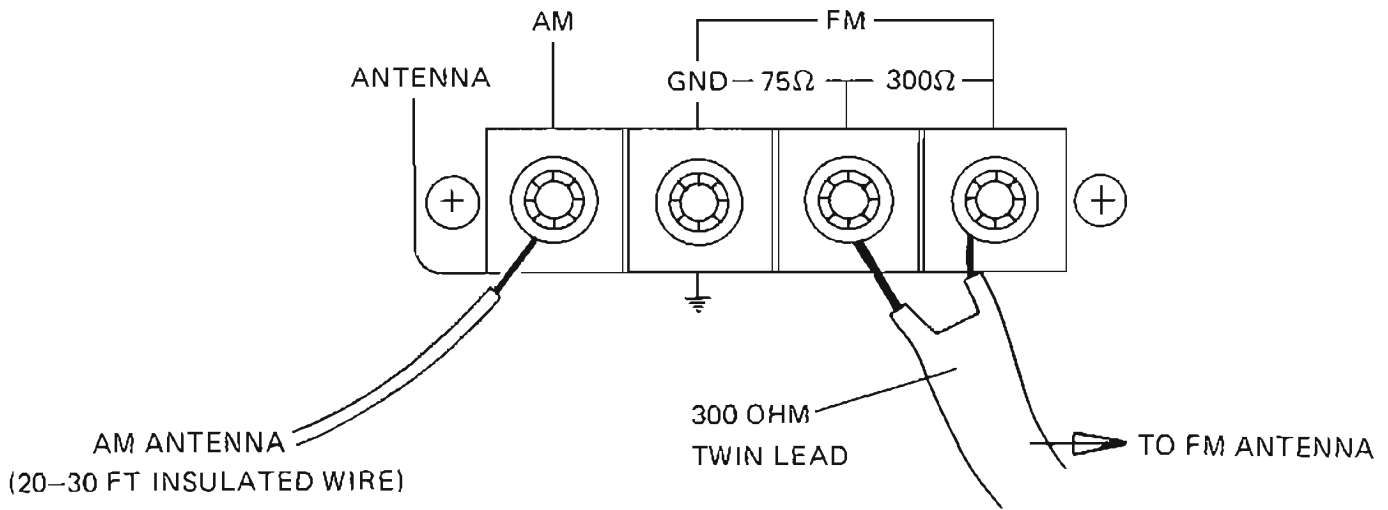
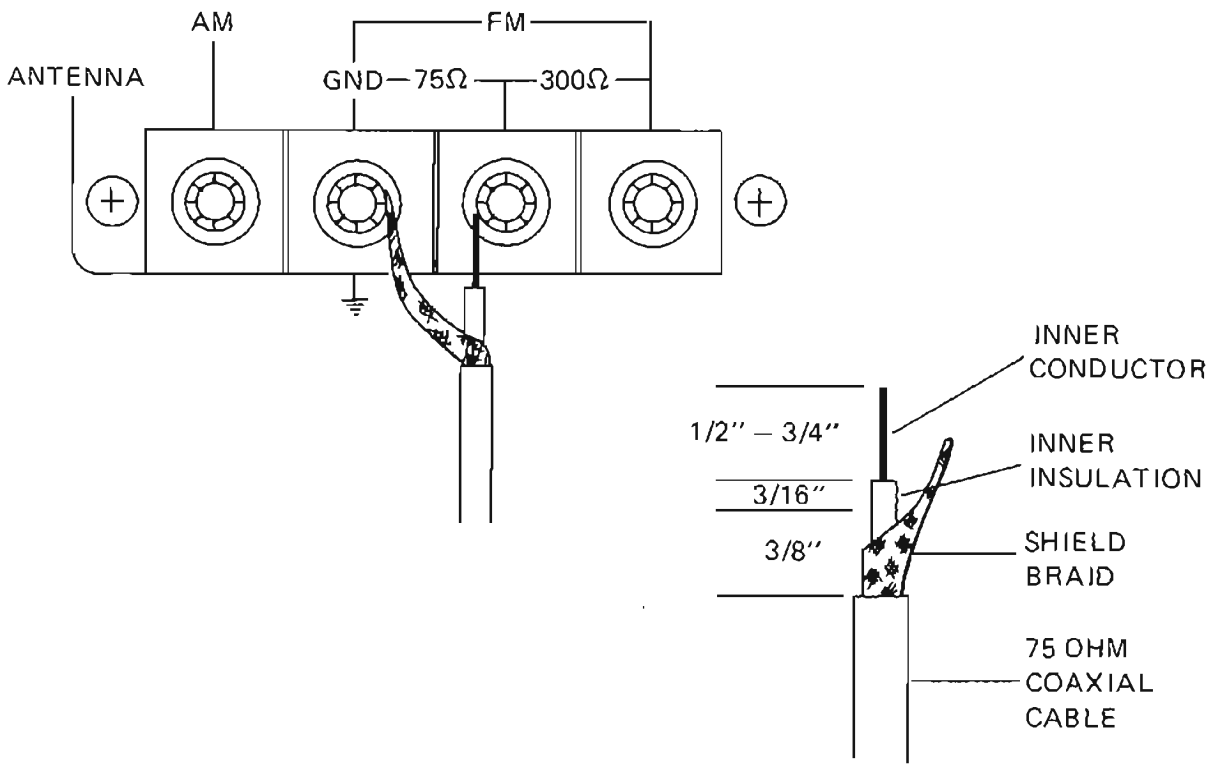


FIGURE 1-A.  
 AM EXTERNAL ANTENNA AND 300 OHM  
 FM EXTERNAL ANTENNA CONNECTIONS.



1. Remove approx 1-1/4" of outer insulation from cable.
2. Remove all but 3/8" of the shield braid, and twist.
3. Remove inner insulation, leaving 3/16" of the insulation exposed.  
 The center conductor should be approx 1/2" - 3/4" long.

FIGURE 1-B.  
 75 OHM FM CABLE CONNECTION.



If you presently use an outdoor TV antenna, it can sometimes be used to provide good reception of FM stations. Simply make a connection between the stereo receiver and TV antenna lead-in, using a 2-set antenna coupler [see Lafayette catalog]. 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 channels 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

### 300 Ohm Connection

When 300 ohm lead-in is used from the antenna, connection to the receiver should be made as shown in Figure 1-A [to the two terminals marked 300 $\Omega$ ].

### 75 Ohm Connection

In areas subject to electrical interference from vehicles, power lines, etc., the use of 75 ohm shielded cable as a lead-in to the receiver may result in a reduction of the interference. The use of 75 ohm shielded cable is also required in amplified distribution systems. The 75 ohm lead-in cable to the receiver is connected as shown in Figure 1-B. Prepare the end of the cable as shown. Wrap the inner conductor around the 75 $\Omega$  screw terminal and tighten the screw firmly. Then wrap the twisted shield braid around the GND screw in the same way.

**CAUTION:** Make sure that no strands of shield braid come into contact with the 75 $\Omega$  terminal since this will short out the antenna input signal.

Note that 75 ohm cable cannot be connected to the 300 ohm output of a booster amplifier, or a 300 ohm coupler or splitter. Nor can it be connected directly to a 300 ohm antenna, unless a 300 — 75 ohm matching transformer is used at the antenna. Antennas and booster amplifiers with 75 ohm outputs will present no problems, of course. If you intend to couple the 75 ohm cable to an existing 75 ohm feeder line, be sure to use a 75 ohm coupler [available from Lafayette].

## FM ANTENNA ATTENUATE SWITCH

This switch (located on the receiver rear panel) should generally be left in the "OUT" position for maximum sensitivity on FM. In very strong signal areas, certain FM stations may tend to cause overloading and produce distortion. Under these conditions, the switch should be set to the "IN" position to reduce the receiver sensitivity.

## CONNECTING YOUR ASSOCIATED EQUIPMENT

**WARNING: DO NOT ATTACH OR REMOVE CONNECTING CABLES WITH RECEIVER SWITCHED ON.**

### LOUDSPEAKERS

#### GENERAL

This stereo receiver is equipped with three sets of speaker output terminals, "A SPEAKERS", "B SPEAKERS" and "C SPEAKERS".

For conventional stereo operation in your main listening area, the left and right speakers [stereo speaker set "A" as shown in Figure 2] must be connected to the terminals marked "A SPEAKERS". If you wish to connect a second or third set of speakers in one or more locations, stereo speaker set "B" and stereo speaker set "C" must be connected to the applicable set of speaker terminals marked "B SPEAKERS" and "C SPEAKERS".

Selection of speakers is determined by depressing the appropriate Speaker Selector Button ("A SPEAKERS", "B SPEAKERS" or "C SPEAKERS"). Refer to the section titled "IMPEDANCE OF SPEAKERS USED" when connecting more than one set of speakers.

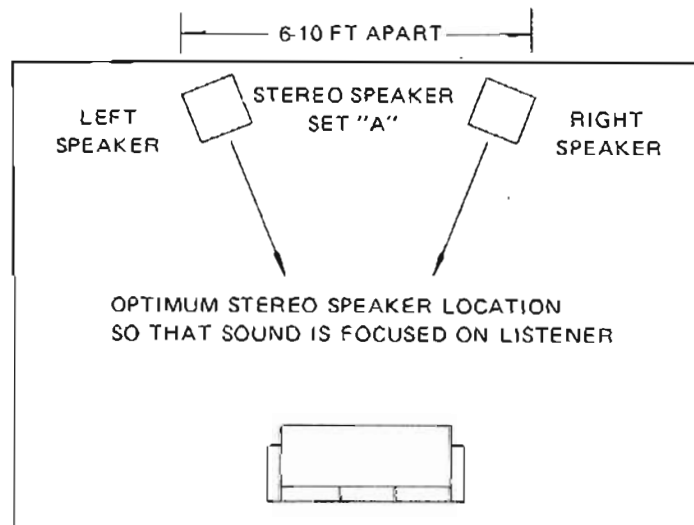


FIGURE 2. STEREO SPEAKER POSITIONING (MAIN LISTENING AREA)

#### SPEAKER CONNECTIONS

Figure 4 illustrates three sets of stereo speakers connected to the receiver. If you intend to use only one set of speakers for normal stereo, simply connect the two speakers to the Left and Right speaker terminals marked "A SPEAKERS".

We suggest you first position the speakers in their selected locations in the room before connecting them to the receiver. This will enable you to cut an adequate length of cable for the connection to each speaker (make each cable a few feet longer than necessary to permit changing of speaker locations slightly).

Check the cable for some sort of marking which distinguishes one conductor from another. In some cables, one wire is silver-colored, the other copper-colored. In other cases, the insulation over one wire may have a raised rib or line on it to differentiate this conductor from the adjacent one. By properly identifying the conductors at each end of a cable, you will be able to make sure that each terminal on a speaker is connected to the proper terminal on the receiver. This will ensure correct "phasing" of the speakers in the system.

Figure 3 shows the method used to connect the speaker leads to each set of terminals. To connect a lead, remove approximately 3/8" of insulation from its end and twist the bare strands of exposed wire together. Press the lever on the terminal down and insert the bared section of the lead into the opening, as shown. When the lever is released, the lead will be held securely. Be sure to observe correct polarity; the positive (+) terminal on the speaker must be connected to Red (+) receiver terminal and the negative (-) terminal on the speaker connected to the Black (-) receiver terminal in each case.

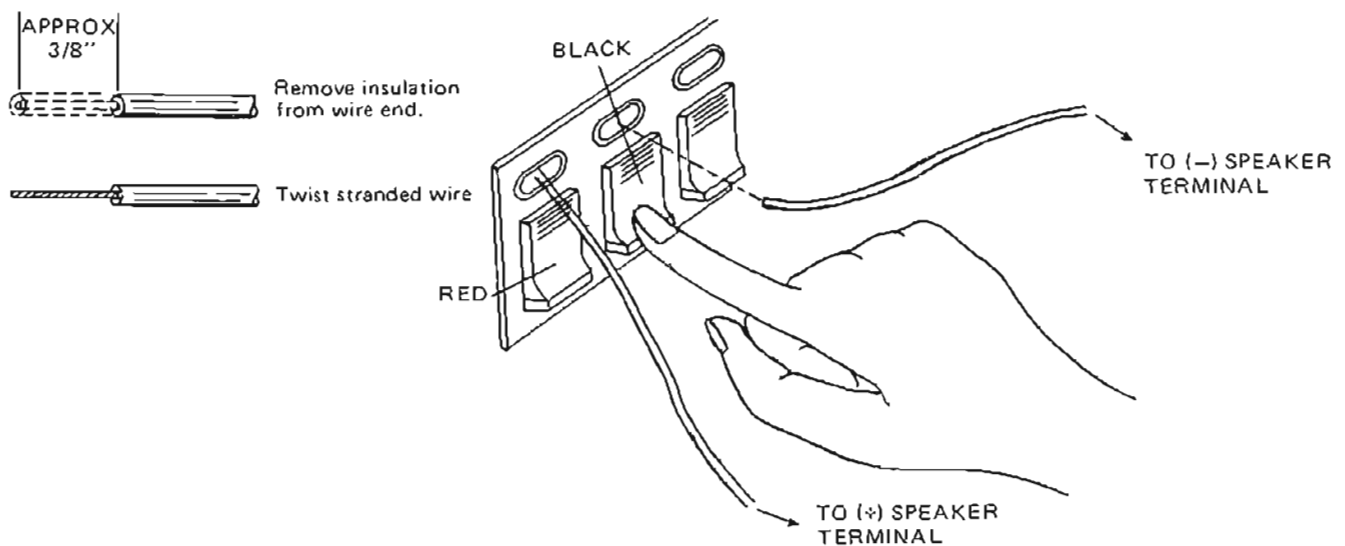


FIGURE 3. CONNECTING SPEAKER LEADS TO THE RECEIVER OUTPUT TERMINALS

A second set of stereo speakers [set "B"] can be used as extension speakers in a remote location. These should be connected to the Left and Right speaker terminals marked "B SPEAKERS".

A third set of stereo speakers [set "C"] may be used in another room. These speakers should be connected to the Left and Right speaker terminals marked "C SPEAKERS".

The following chart will be helpful in determining what gauge of speaker wire to use.

NOTE: The larger the number of the wire, the smaller its size. For example, 18 gauge is smaller than 16 gauge wire.

	MAXIMUM LENGTH OF WIRE FROM SOURCE	WIRE GAUGE
4 OHM SPEAKER	11 Feet	24
	30 Feet	20
	47 Feet	18
	75 Feet	16
	120 Feet	14
6 OHM SPEAKER	16 Feet	24
	35 Feet	20
	75 Feet	18
	110 Feet	16
	180 Feet	14
8 OHM SPEAKER	23 Feet	24
	60 Feet	20
	95 Feet	18
	150 Feet	16
	240 Feet	14
16 OHM SPEAKER	47 Feet	24
	118 Feet	20
	190 Feet	18
	300 Feet	16
	475 Feet	14

#### IMPEDANCE OF SPEAKERS USED

On this receiver it is possible to select two or three sets of speakers simultaneously. Special care must therefore be taken to ensure that the combined impedance of all speakers selected does not fall below 4 ohms (particularly at moderate or high volume levels), or the protective circuit in the receiver will be activated and automatically cut off the output to the speakers. No problem exists when only one set of speakers (left and right channel) are connected, provided they are each rated at 4 ohms or higher.

The table which follows shows the minimum speaker impedances that may be used when selecting one, two or three sets of speakers. In no case does the combined impedance fall below 4 ohms in the combinations shown.

TABLE 1

SPEAKERS SELECTED	MINIMUM SPEAKER IMPEDANCE
One Set Of Speakers Only	4, 6, 8 OR 16 Ohms
Two Sets Of Speakers Simultaneously	a) Two 8 Ohm Sets b) Two 16 Ohm Sets c) One 6 Ohm Set and One 16 Ohm Set
Three Sets Of Speakers Simultaneously	a) One 8 Ohm Set and Two 16 Ohm Sets b) Three 16 Ohm Sets

If you are using more than one set of speakers, and their impedance rating is lower than the minimum outlined in Table 1 (two sets of 6 ohm speakers, for example), you must either make certain that only one set of speakers is selected at a time, or wire the speakers in series to one set of terminals, as shown in Diagram A (this diagram illustrates three speakers wired in series).

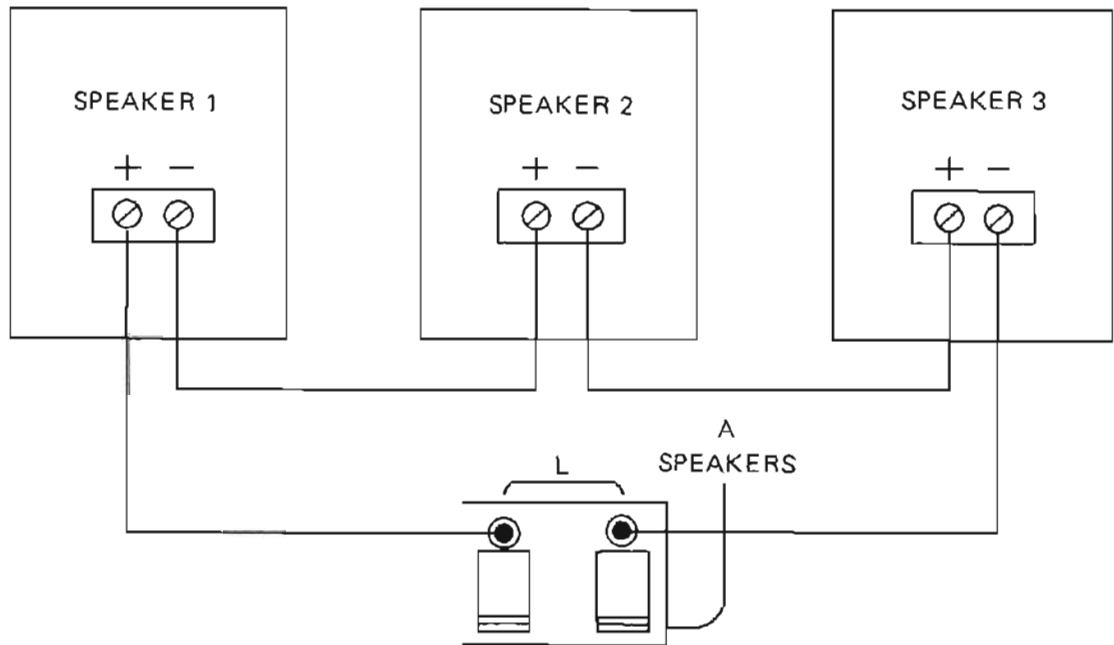


DIAGRAM A. CONNECTING SPEAKERS IN SERIES.

Connections to the left channel are illustrated—connect the right channel speakers using the same wiring method, but to the right channel output terminals on the receiver. Since all speakers are connected to the “A-SPEAKERS” terminals, the “A-SPEAKERS” Selector Button must be depressed. The “B-SPEAKERS” and “C-SPEAKERS” Selector Buttons must be in their released positions since their respective speaker output terminals are not being used. All speakers will be “on” and no individual speaker selection will be possible unless an external speaker selector switch is used which will select each speaker individually.

## STEREO HEADPHONES

The receiver is also designed for stereophonic headphone listening. Simply plug the headphones into one of the "PHONES" ["A" or "B"] front panel receptacles [the Speaker Selector Buttons may be in any position]. If you wish to listen privately without any of the speakers being on, release all Speaker Selector Buttons.

## CONNECTING A STEREO RECORD PLAYER

This receiver is equipped with two sets of phono inputs (PHONO 1 and PHONO 2) for use with record players whose pick-up arm is equipped with a magnetic cartridge (most players are so equipped). The two shielded audio cables from a record changer or turntable are normally terminated with RCA-type phono plugs. To ensure minimum "hum" and to avoid the possible pick-up of RF interference (plug possible loss in high frequency tones), the cables from the record player should be kept as short as possible (they should not exceed 10 feet in length). Figure 4 shows the manner in which record players are connected. If the record player has a ground wire, connect it to the GND terminal on the receiver. If this results in "hum", disconnect the ground wire.

If you are using only one record player, connect the left and right output cables from the record player to the left and right "PHONO 1" inputs. If you wish to use a second record player, connect its output cables to the "PHONO 2" inputs. Set the "Phono Input Sensitivity" switch (on the rear panel) to the "5mV" position initially (a procedure for determining the optimum position of this switch is provided in the section titled "Adjusting Phono Input Sensitivity On The Receiver").

To select either of the phono inputs, set the SELECTOR switch to the PHONO-1 or PHONO-2 position.

## STEREO TAPE RECORDER CONNECTIONS

### Connecting A Single Tape Recorder

A single stereo tape recorder [cassette, 8-track or open reel] should be connected to the "REC OUT-1" and the "MONITOR-1" jacks as shown in Figure 4, using shielded audio connecting cables. Note that the input of the recorder is connected to the "REC OUT-1" output jacks on the receiver, and that the output of the recorder is connected to the "MONITOR-1" input jacks on the receiver.

### Connecting Two Tape Recorders

Tape Recorder "1" must be connected to the "REC OUT-1" and "MONITOR-1" jacks on the receiver (as shown in Fig. 4).

Tape Recorder "2" is connected in the same manner, but to the "REC OUT-2" and "MONITOR-2" jacks on the receiver.



## CONNECTING AN 8 TRACK STEREO TAPE PLAYER

Using shielded audio cables terminated with RCA-type phono plugs at each end, connect one end of each cable to the Outputs on the stereo tape player. Connect the other end of each cable to the "AUX" (Left and Right) input jacks on the receiver.

### DESCRIPTION OF RECEIVER CONTROLS

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

**NOTE:** The BASS, MID and TREBLE controls all have a light "detent" action when rotated throughout their range. This serves two purposes. It will permit you to make a note of a specific setting for future reference, and will also reduce the possibility of accidental disturbance of the position of a control (even though the detent has a light action). The BALANCE control has only one detent, this being at the center position (12 o'clock).

#### SELECTION SWITCH

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

- AM ..... Selects AM reception.
- FM ..... Selects Automatic FM Stereo reception.
- PHONO-1 ..... Selects the outputs of a stereo record player connected to the "PHONO-1" inputs on the receiver.
- PHONO-2 ..... Selects the outputs of a stereo record player connected to the "PHONO-2" inputs on the receiver.
- AUX ..... Selects sources connected to the "AUX" input jacks.

#### MONITOR SWITCH

When this switch is in the SOURCE (center) position, the program selected by the SELECTOR switch will be reproduced through the receiver and heard through the speakers. When this switch is in the "TAPE-1" position, any stereo program source connected to the "MONITOR-1" inputs will be reproduced through the receiver, regardless of the SELECTOR switch selection. When this switch is in the "TAPE-2" position, any program source connected to the "MONITOR-2" input jacks is reproduced through the receiver and will be heard through the speakers, regardless of the SELECTOR switch selection (see "Stereo Tape Recorder Operation").

#### DUBBING SWITCH

The Dubbing switch is used only when you wish to duplicate a tape (two tape recorders must be connected). For example, if you want to copy the program on a tape on recorder "1" onto a blank tape on recorder "2", you would set the DUBBING switch to the "1-2" position, place recorder "1" in the play mode and recorder "2" in the record mode. To reverse this procedure (record the tape program on recorder "2" onto a blank tape on recorder "1") you would set the DUBBING switch to the "2-1" position, place recorder "2" in the play mode and recorder "1" in the record mode (see "Stereo Tape Recorder Operation" in a subsequent section).



## BALANCE CONTROL

This provides left to right balance of the volume. Initially, this should be set to its normal center (detent) position. Turn the control to the left of the center position to increase the volume of the left channel and turn it to the right to increase the volume of the right channel.

## VOLUME CONTROL

This permits adjustment of the volume for both left and right channels simultaneously.

## LOUDNESS / LOW BOOST SWITCH

When this switch is in the "LOUD" position, it will compensate for an apparent loss of bass and high treble tones at low volume settings. Such compensation is necessary because a natural peculiarity of the ear causes it to have a reduced sensitivity to low and high tones when music is played at low volume. The Loudness circuit will emphasize these tones and thus restore full body and brilliance to the music. In the "LOW BOOST" position, only the low frequencies below 70Hz are emphasized.

In either of these positions, the boosting action is at maximum when the VOLUME control is at a very low setting. As volume is increased, the boosting action is gradually reduced until the 12 o'clock position of the VOLUME control is reached, at which point the receiver will assume a normal tonal response.

## LOW FILTER SWITCH

A low frequency filter can be introduced at either of two frequencies — 15 Hz or 70 Hz (the center position is off). Generally, the use of the low filter is only required where low frequency rumble or vibration is encountered while using a record player. If your record player appears to be generating low frequency "rumble" through motor vibration, switch first to the 15 KHz position and then, if ineffective, switch to the 70 Hz position. The 70 Hz position will usually reduce any low frequency noise although it will have some effect on the program material. The 15 Hz position (which has little or no effect on program material) introduces filtering in the sub-sonic range and can be particularly useful when a record player is subjected to very low frequency vibration (from the speakers or some other source). However, if problems of this nature are not experienced, leave the switch in the off position.

## HIGH FILTER SWITCH

A high frequency filter can be introduced at either of two frequencies — 7 KHz or 12 KHz (the center position is off). High frequency filtering should only be used when high frequency noise in the program material is encountered. Such noises might be experienced when playing worn records which produce "scratching" noises, or with some tapes which might produce disturbing "hiss". Excessive high frequency noise on FM can also be reduced by means of this filter switch. When attempting to reduce high frequency noise, always start with the 12 KHz position (this position has least affect on program material). If this does not reduce the noise sufficiently, you should then go to the 7 KHz position. Since all high frequency filters have some effect on the high frequency response in the program material, they should not be used unless disturbing high frequency noises are present.

### **BASS TURNOVER SWITCH (250/500 Hz)**

This switch affects the action of the BASS control by changing the frequency below which the control will affect the tonal response. When the switch is in the 500 Hz position, Bass control adjustment will affect frequencies from 500 Hz down. When the switch is in the 250 Hz position, frequencies from 250 Hz down are affected. The 250 Hz position is recommended initially since this will move the Bass control action into the lower region of the audio spectrum where, generally, most change is desired. When the switch is in the FLAT position, a flat frequency response is obtained regardless of the position of the BASS control. For further information on the action of this switch, see "Bass and Treble Turnover Switch Action" in a subsequent section of this manual.

### **BASS CONTROL**

This control will allow you to increase or decrease the bass (low tones) in the sound output. When the indicator line on the control is in the center (0) position, the bass response of the receiver is normal. Clockwise rotation will increase the bass tones and counter-clockwise rotation will decrease them. See "Bass Turnover Switch" also.

### **MID CONTROL**

This control operates in the same general manner as the Bass and Treble controls, except that it provides adjustment of the midrange frequencies (middle tones). For normal midrange response, set the control to the "0" position.

### **TREBLE CONTROL**

This control operates in the same way as the Bass control, except that it provides adjustment of the treble (high) tones. See "Treble Turnover Switch" also.

### **TREBLE TURNOVER SWITCH (5/2.5 KHz)**

This switch affects the action of the TREBLE control by changing the frequency above which the control will affect tonal responses. When the switch is in the 2.5 KHz position, Treble control adjustment will affect frequencies from 2.5 KHz up. When the switch is in the 5 KHz, frequencies from 5 KHz up are affected. The 5 KHz position is recommended initially since this will move the Treble control action into the upper region of the audio spectrum where, frequently, most change is desired. When the switch is in the FLAT position a flat frequency response is obtained regardless of the position of the TREBLE control. For further information on the action of this switch, see "Bass and Treble Turnover Switch Action" in a subsequent section of this manual.

### **AUDIO-MUTE SWITCH**

This switch can be used during normal operation to automatically reduce the receiver volume to one of two low levels without disturbing the existing setting of the VOLUME control. Two positions are provided, "-15dB" and "-30dB" ("-30dB" provides greater volume reduction than "-15dB"). This feature will enable you to lower the volume temporarily when you find it necessary to momentarily interrupt your listening (to answer a phone, etc.).

### **TUNING CONTROL**

This control is used to tune in AM or FM stations. Use the 88 to 108 MHz scale on the tuning dial for FM stations, and the 55 (550 KHz) to 160 (1600 KHz) scale for AM stations.

## PHONE JACKS

Dual stereo phone jacks on the front panel are provided for private stereo headphone listening, when desired. Two sets of stereo headphones (4, 8 or 16 ohms impedance) may be connected to these jacks.

If you wish to listen privately without any speakers being on, place all speaker Selector Buttons in the "off" (released) positions.

## METER RANGE BUTTON

When this button is placed in the released position, the left and right Output Power Meters will indicate up to 240 watts. In the depressed position, the Output Power Meters will indicate up to 24 watts ( $240 \div 10$ ).

## SPEAKER SELECTOR BUTTONS

These buttons enable you to select one, two or three pairs of speakers independently or simultaneously.

**CAUTION:** Although this stereo receiver is designed to allow simultaneous driving of up to 3 sets of speakers, the total load impedance should not be less than 4 ohms (refer to section titled "Impedance Of Speakers Used").

"A SPEAKERS" Button . . . . . When this button is depressed, the sound output is connected to the two speakers attached to the "A SPEAKERS" output terminals.

"B SPEAKERS" Button . . . . . When this button is depressed, the sound output is connected to the set of speakers attached to the "B SPEAKERS" output terminals.

"C SPEAKERS" Button . . . . . When this button is depressed, the sound output is connected to the set of speakers attached to the "C SPEAKERS" output terminals.

## POWER BUTTON

This button switches on the receiver and lights the AC power indicator and tuning dial, indicating that the unit is ready for operation.

**IMPORTANT:** Before depressing the POWER button, always make sure that the volume controls have not inadvertently been set to an excessively high volume position, and that at least one set of speakers has been selected.

## AC POWER INDICATOR

This light will come on when the POWER button is depressed, indicating that AC power is applied to the receiver.

## OUTPUT POWER METERS

Illuminated left and right channel meters indicate the power level being produced by the receiver on each channel when operated into an 8 ohm load. The meter scales are calibrated in watts up to 240 and will indicate up to 240 watts providing the Meter Range Button is left in the released position. While the receiver is rated at 120 watts per channel, it should be noted that this is a continuous power rating (RMS) and that during music reproduction, peaks greatly in excess of this rating are likely to be produced by the receiver at high volume levels.

## FM TUNING METER

This is a special center-reading meter which is used for precise tuning to the center of an FM station to assure optimum FM reproduction. After the station is tuned in, finely adjust the tuning control for a center reading. Note that the pointer will swing toward the left or right of center if you are mistuned. If the meter pointer is over to the right, tune slightly toward the left on the main tuning dial if the meter pointer is over to the left, tune slightly toward the right on the main tuning dial.

## SIGNAL METER (AM and FM)

This meter is used for all tuning on AM, and for initial tuning on FM (the FM TUNING meter is used for final, more precise tuning on FM). Tune for a maximum reading on this meter on AM. The meter also indicates the relative strength with which various stations are received on AM or FM. For example, a station producing a reading of 5 is being received with greater strength than a station producing a reading of 3.

## FM STEREO INDICATOR

When you tune in an FM stereo station, the FM STEREO Indicator will light up, indicating that FM reception is stereophonic. When you are tuned to a monophonic FM station, the STEREO Indicator will not light.

Any stereo station which produces an unsteady "flickering" stereo indication must be considered too weak or noisy for proper stereo reception (although it may be good enough for mono reception).

Note that placing the MODE button in the depressed (MONO) position will disable the automatic FM stereo switching circuit and extinguish the light, even on a stereo broadcast.

## DOLBY FM BUTTON

When depressed, this button will switch in a DOLBY noise reduction circuit, which, when used with Dolby-encoded FM Broadcasts, will provide reception that is remarkably free of noise.

Since all Dolby FM broadcasts employ 25 micro-second pre-emphasis (instead of the conventional 75 micro-second pre-emphasis), automatic switching to 25 micro-second de-emphasis also takes place when the DOLBY FM switch is activated.

The Dolby circuit should not be used with any conventional stereo FM broadcast to provide a reduction in any noise present. It must be remembered that the Dolby circuit is primarily designed for use with specially processed broadcasts.

## HI BLEND BUTTON

When this button is depressed during FM Stereo reception, partial blending of both channels at the high frequencies occurs, reducing any high frequency noise that may be present (see section titled "Reducing Noise On FM Stereo").

## MODE BUTTON

This button determines the manner in which program sources will be reproduced by the receiver.

STEREO (released) . . . . . Provides stereophonic reproduction of any stereo program source. This position will also provide automatic FM stereo operation when the selector switch is in the FM position.

MONO (depressed) . . . . . 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 automatically reproduced through both channels and is heard from both speakers.

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

### FM-MUTE BUTTON

One of the normal characteristics of FM is the loud "rushing" noise heard between stations. The receiver incorporates a special muting circuit which may be used to eliminate this noise between stations on FM, so that when tuning over the dial each station will "break through" from a background of silence (See FM Mute Level Control). To activate the circuit, the "FM MUTE" button should be in the release position. For additional information, see "Operation of the FM Mute Circuit" in a subsequent section of this manual.

### FM MUTE LEVEL CONTROL

This control is used to adjust the FM Muting threshold. Initially set this control to the fully counter-clockwise position (see section titled "Adjusting The FM Muting Level"). This control becomes operational when the FM MUTE Button is in the released position.

### PULL ON MIXING LEVEL

This control is used to activate the MIC input jack and adjusts the microphone input level. Pull the knob outward and then rotate the control clockwise for the desired microphone input level.

### MIC INPUT JACK

This is a single input jack for a 600 to 10K ohm dynamic microphone. A microphone (with a 2-conductor phone plug) plugged into this jack will connect it to the left and right channels in the receiver (see section titled "Microphone Operation").

## OPERATING PROCEDURES

Before attempting to operate the system, we urge you to check the following:

1. Make sure that at least one set of stereo speakers have been connected to the output terminals on the receiver.
2. Make sure the receiver AC "POWER" button is in the released "OFF" position, and that you have properly connected any other associated equipment you intend to use, such as record players or tape recorders. For FM reception, you must have an external antenna properly connected, as indicated previously. Then connected the AC power cord to an electrical outlet supplying 105 — 120 volts, 50/60Hz AC.

Refer to the chart titled "Quick Guide To Operating Your Receiver" and set all operating controls and switches in the positions indicated for the particular type of operation desired.

When the AC "POWER" button is depressed, the AC power indicator light will come on, indicating that the unit is ready for operations. Select your program source (FM Phono, etc.) and adjust the VOLUME control for desired volume from all speakers.

**NOTE:** When the receiver is first switched on, there is an approximate 4 to 6 second delay before sound is heard from the speakers. The delay is due to the activation of one build-in overload safeguard circuit which consists of a combination of electronic and relay circuitry. However, if no sound is heard from one or both speakers after 9 or 10 seconds, switch the power OFF and see section titled "Power Overload Safeguard System".

## TUNING IN FM STEREO

To select an FM stereo broadcast, proceed as follows:

1. Depress the POWER button to switch the receiver on and set the Program Selector switch to the "FM" position.
2. Adjust the VOLUME control for a suitable listening level.
3. Tune across the FM dial observing the FM STEREO indicator light on the receiver. When it illuminates, you know that you are turned to a stereo broadcast.

## INTERFERENCE ON FM

FM stereo broadcasts are more susceptible to noise pickup than 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, or even by the FM station itself.
- [b] Your antenna may not be properly oriented for best reception, or may be inadequate for good signal pick up from the desired station (see 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 75 ohm shielded cable.

## REDUCING NOISE ON FM STEREO

If the noise is present when the MODE switch is in "STEREO" but disappears when set to "MONO", you should try the HI-BLEND FILTER. This filter has negligible effect on the main program, but is helpful in reducing high frequency noise on FM stereo.

## OPERATION OF THE ANTENNA ATTENUATOR

Since the front end of this receiver adopts dual gate MOS FETs, normally the attenuator should be left in the "OUT" position. But when the location is very close to a broadcast station, where problems occur, set the attenuator to the "IN" position. This prevents input overload to realize stable and undistorted reproduction.

## REDUCING NOISE ON FM STEREO

1. If the noise is present when the MODE Button is placed in the STEREO (released) position but disappears when button is set to the Mono (depressed) position, depress the HI BLEND Button. This introduces partial blending at the higher frequencies and provides a reduction in high frequency noise. This partial blending does not affect frequency response, and has virtually no audible effect on stereo separation.
2. If the noise is still present, set the HI FIL switch to the 12 KHz position. If this does not reduce the noise sufficiently, use the 7 KHz position. Although the use of this filter will affect the higher frequencies on the program material (the 12 KHz position will have the least effect), any noise present will be significantly reduced.

# Lafayette LR-120DB

## A QUICK GUIDE TO OPERATING YOUR STEREO RECEIVER

RECEIVER CONTROLS (BASIC SETTINGS)																				
FUNCTION	STATION TUNING	SELECTOR SWITCH	VOLUME CONTROL	BALANCE CONTROL	TREBLE CONTROL	MID CONTROL	BASS CONTROL	FILTER SWITCHES		HI-BLEND BUTTON	BASS TURNOVER SWITCH	TREBLE TURNOVER SWITCH	MODE BUTTON	DOLBY FM BUTTON	FM MUTE BUTTON	MUTE (AUDIO)	LOUD/LOW BOOST SWITCH	DUBBING SWITCH	MONITOR SWITCH	SPEAKER BUTTON
								LOW	HI											
FM STEREO	Use tuning control and 88-108 MHz scale.	FM	9 o'clock initially.	[12 o'clock] position.	"0" position.	"0" position.	"0" position.	OFF	OFF	OFF (released)	250 Hz	5 kHz	STEREO (released)	OFF (1) (released)	OFF (depressed)	NORMAL	OFF	SOURCE	SOURCE	"A" (2) Depressed
AM BROADCAST	Use tuning control and 530-1600 kHz scale.	AM	9 o'clock initially.	[12 o'clock] position.	"0" position.	"0" position.	"0" position.	OFF	OFF	OFF (released)	250 Hz	5 kHz	Not Used	Not Used	Not Used	NORMAL	OFF	SOURCE	SOURCE	"A" (2) Depressed
STEREO PHONO	Not Used.	Phono 1 or Phono 2 (3)	9 o'clock initially.	[12 o'clock] position.	"0" position.	"0" position.	"0" position.	OFF	OFF	OFF (released)	250 Hz	5 kHz	STEREO (released)	Not Used	Not Used	NORMAL	OFF	SOURCE	SOURCE	"A" (2) Depressed
STEREO TAPE PLAYBACK	Tape Recorder "1"	Not used (4)	9 o'clock initially.	[12 o'clock] position.	"0" position.	"0" position.	"0" position.	OFF	OFF	OFF (released)	250 Hz	5 kHz	STEREO (released)	Not Used	Not Used	NORMAL	OFF	SOURCE	TAPE-1 (4)	"A" (2) Depressed
	Tape Recorder "2"	Not used (5)	9 o'clock initially.	[12 o'clock] position.	"0" position.	"0" position.	"0" position.	OFF	OFF	OFF (released)	250 Hz	5 kHz	STEREO (released)	Not Used	Not Used	NORMAL	OFF	SOURCE	TAPE-2 (5)	"A" (2) Depressed
STEREO TAPE PLAYER		AUX (6)	9 o'clock initially.	[12 o'clock] position.	"0" position.	"0" position.	"0" position.	OFF	OFF	OFF (released)	250 Hz	5 kHz	STEREO (released)	Not Used	Not Used	NORMAL	OFF	SOURCE	SOURCE	"A" (2) Depressed

[1] If FM stereo broadcast is Dolby-encoded, switch DOLBY FM "on".

[2] Assuming stereo speakers in main listening area are connected to the "A" set of speaker terminals.

[3] Set Selector to position which selects desired record player; if a single record player is being used, it is usually connected to the Phono 1 inputs.

[4] Assuming the output of the tape recorder is connected to the "MONITOR 1" input jacks (SELECTOR is by-passed in the "TAPE-1" position of MONITOR switch)

[5] Assuming the output of the tape recorder is connected to the "MONITOR 2" input jacks (SELECTOR is by-passed in the "TAPE-2" position of MONITOR switch)

[6] Assuming the output of the tape player is connected to the AUX input jacks

## OPERATION OF THE FM MUTE CIRCUIT

This receiver incorporates an FM muting system with dual functions. One of its functions is to eliminate the background noise normally heard between FM stations. This form of FM muting is of the conventional type found in other receivers.

A second function of this FM muting circuit is that it will mute (silence) the receiver if you are not properly tuned to an FM station — even though the station may be an extremely strong one. This is graphically illustrated in Diagram B. Correct practice is to tune the FM station in so that the FM TUNING meter reads precisely at its mid-point. If the receiver is improperly tuned, causing the pointer to move outside the shaded area shown in Diagram B, muting will automatically occur and the receiver will be silenced. This action will take place even with the strongest signal. This unique form of “detune muting” is designed to guard against improper FM tuning.

NOTE: Rapid tuning across the dial will cause the receiver to remain in a state of continuous muting. When tuning across the dial (in search of an FM station offering music of your preference, for example), tune slowly to avoid this condition or switch Mute Off (depressed position).

This dual muting system is activated when the FM MUTE is in the released position, and defeated when the button is depressed. It should be noted that when the receiver is muted (silenced) and the FM mute button is depressed (to switch mute off), a slight delay will occur before the sound output returns. This is normal.

If receiver is detuned sufficiently to cause pointer to go outside the shaded area, muting will occur even though signal meter shows a high reading.

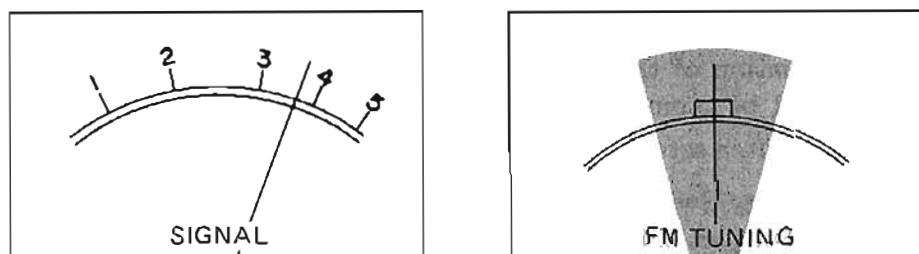


DIAGRAM B. "DETUNE MUTING" ACTION



### Adjusting the FM Muting Level

The LEVEL control adjacent to the FM MUTE button will allow you to adjust the level at which muting will take place. Even in the fully counter-clockwise position (minimum), sufficient muting is provided to eliminate background noise and very weak stations, while allowing most other stations to "break through" and be heard.

As the control is rotated clockwise, the muting level is progressively increased and progressively stronger stations are needed to overcome the muting action and be heard.

We suggest that you set the LEVEL control to minimum initially (fully counter-clockwise). If, at this setting, you find that FM increase the LEVEL control sufficiently to cause these particular stations to be silenced.

To defeat the muting circuit so that all stations can be heard (as well as background noise), simply place the FM MUTE button in the depressed position (Mute off).

## ADJUSTING PHONO INPUT SENSITIVITY ON THE RECEIVER

Provision has been made to accommodate the output from virtually any magnetic cartridge by equipping this receiver with a phono sensitivity switch. This 3-position switch is located on the rear panel of the receiver and is marked "INPUT SENS." (2.5—5—10mV).

**CAUTION:** Never set the phono sensitivity switch to the "2.5" (high gain) position when using a cartridge with a high output level. This may overload the input stages in the receiver, possibly resulting in distortion in the sound output.

The "10mV" position provides the least amount of gain and is therefore suitable with the higher output cartridges. The "5" position is designed to use with cartridges with average outputs.

The following procedure should be used to obtain a proper setting for the phono sensitivity switch.

1. Set up complete installation of the receiver (including speakers, FM antenna, AC power, etc.). A record player should be connected to the PHONO 1 inputs, as instructed previously, and the Phono Sensitivity switch set initially to "5".

**NOTE:** The Phono Sensitivity Switch setting will affect both sets of Phono inputs (Phono 1 and 2). If two record players are to be used with the receiver, identical or very similar cartridges (in terms of output level) should be used for each record player.

2. Set all controls for "FM Stereo" operation (see chart headed "Quick Guide to Operating the Receiver").
3. Tune in a strong FM station and set the VOLUME control to produce normal listening volume. Leave the volume control in this position.
4. Operate the record player, using a stereo record containing the same general type of music being broadcasted on the selected FM station.

5. Alternately, switch between the "Phono 1" and "FM" positions on the Program SELECTOR switch. Compare the output level from the speakers in each position. If the output levels are approximately equal, leave the switch in the "5" position. If the Phono output is lower in the "5" position, set the INPUT SENS switch to the "2.5" position; if the Phono output is higher in the "2.5" and "5" positions, try the "10mV" position. Remember, the object of this procedure is to find a phono sensitivity setting which will produce approximately the same level as is heard on FM (no distortion should be present either). Once the proper sensitivity position has been found, it will not be necessary to change it again unless the phono cartridge is changed.

NOTE: An exact matching of the volume on FM and Phono is not likely. Simply find the position which provides the closest match.

## STEREO TAPE RECORDER OPERATION

### RECORDING/PLAYBACK USING ONE TAPE RECORDER

To record a stereo program on a tape recorder connected to the REC OUT-1 and MONITOR-1 jacks [as shown in Figure 4], select the desired program source [FM, Phono, etc.]. The REC OUT-1 output jacks will automatically produce a recording output during reproduction of a program through the receiver and will provide the tape recorder connected to these jacks with a recording signal. If you wish, you may monitor the program information that is being recorded [provided the stereo tape recorder you are using has tape monitoring facilities, 3-head machine]

IMPORTANT: Make sure that the DUBBING switch is set to the SOURCE position during record. by simply setting the MONITOR switch on the receiver to the "Tape-1" position.

For playback from the tape recorder, set the MONITOR switch to the "Tape-1" position if you used the MONITOR-1 inputs on the receiver.

### SIMULTANEOUS RECORDING [TWO RECORDERS CONNECTED]

To record a stereo program on two stereo tape recorders simultaneously, select the desired stereo program source (FM, Phono, Etc.). Be sure the DUBBING switch is in the SOURCE position. The REC OUT-1 and the REC OUT-2 output jacks will automatically produce a stereo recording output during reproduction of a program through the receiver. If you wish, you may monitor tape recorder 1 or 2 (providing the tape recorders have tape monitoring facilities, 3-head machine) by setting the MONITOR switch on the receiver to the Tape-1 or Tape-2 position.

### DUBBING OR DUPLICATING (TWO RECORDERS CONNECTED)

To duplicate a tape presently on recorder "1" onto a tape on recorder "2", proceed as follows:

1. Make sure the inputs and outputs of tape recorders "1" and "2" are properly connected, as shown in Figure 4.
2. Set the DUBBING switch to the "1-2" position.

3. Playback the tape on tape recorder "1" and record it on tape recorder "2" (the output of recorder "1" is being fed to recorder "2").
4. The tape being recorded on tape recorder "2" may be monitored by setting the MONITOR Switch to the Tape-2 position.

NOTE: If you wish to monitor the output of tape deck "1", simply set the MONITOR switch to the Tape-1 position.

To reverse the recording procedure (duplicating a tape on recorder "2" onto a tape on recorder "1"), simply set the DUBBING switch to "2-1". The tape being recorded on recorder 1 may be monitored by placing the MONITOR switch in the Tape-1 position.

NOTE: If you wish to monitor the output of tape deck "2", simply set the MONITOR Switch to the Tape-2 position.

5. During either of the dubbing operations (1-2 or 2-1) just described, the MONITOR switch may be set to the SOURCE position to permit you to listen to any other selected program source (such as FM or Phono) without disturbing the dubbing operation.

### RECORDING ON ONE TAPE RECORDER WHILE PLAYING TAPE ON ANOTHER

It is possible to record an FM broadcast or record on one tape deck while simultaneously playing a second tape deck. With this type of operation, you will obviously not be able to monitor the program being recorded on one tape recorder and also listen to the tape playing on the second recorder. However, you can periodically monitor the program being recorded to check for possible problems by means of the MONITOR switch (if the recorder has monitoring facilities).

#### Recording On "2" Tape Deck While Playing Back Tape On "1" Tape Deck

1. Select the program you wish to record by means of the SELECTOR switch (Tuner, Phono, Etc.). Initially, set the MONITOR switch to the SOURCE position (DUBBING must always be off).
2. Place Recorder "2" in the record mode and adjust recording level in the normal manner.
3. When recording on machine "2" commences, set the MONITOR switch to the TAPE-1 position and place recorder "1" in the playback mode. You will now hear the tape being played on the "1" recorder while simultaneously recording the selected program source on recorder "2".

#### Recording On "1" Tape Deck While Playing Back Tape On "2" Tape Deck

1. Select the program you wish to record by means of the SELECTOR switch (Tuner, Phono, Etc.). Initially, set the MONITOR switch to the SOURCE position (DUBBING must always be off).
2. Place Recorder "1" in the record mode and adjust recording level in the normal manner.
3. When recording on machine "1" commences, set the MONITOR switch to the TAPE-2 position and place recorder "2" in the playback mode. You will now hear the tape being played on the "2" recorder while simultaneously recording the selected program on recorder "1".

## PLAYBACK (TWO RECORDERS CONNECTED)

For playback from either tape recorder, simply set the "MONITOR" switch to TAPE-1 for playback from tape recorder "1", or TAPE-2 for playback from tape recorder "2".

## 8-TRACK TAPE PLAYER OPERATION

For playback from an 8-track stereo tape player, set the SELECTOR switch to the "AUX" position in order to select the "AUX" inputs on the receiver (assuming the tape player has been connected to the "AUX" inputs).

## MICROPHONE OPERATION

This receiver has a "MIC" jack for connection of a microphone input to the left and right channels for mixing with any other program source. This allows you to sing-a-long with music from a program source or to make announcements, etc. The output of the microphone (mixed with any other program source), will be present at the REC-OUT jacks, and can therefore be recorded. Microphones used should have an impedance between 600 and 10 K ohms (dynamic type) for best results.

To activate the MIC input and to adjust the microphone input level, simply pull out and then rotate the PULL ON MIXING LEVEL control to the right (clockwise) to increase the microphone level and to the left (counter-clockwise) to decrease the microphone level.

NOTE: If the microphone is being used in the same area as the speakers, feedback (evidenced by a "howling" noise) may occur as the control is increased. If this should happen, reduce the setting of the control or depress a speaker button to activate a remote speaker only so that the microphone and the activated speakers are not in the same area.

## BASS AND TREBLE TURNOVER SWITCH ACTION

NOTE: When the Bass and Treble switches are set to the FLAT positions, the Bass and Treble controls are disabled, and the receiver will produce a normal (flat) tonal response regardless of the existing settings of the Bass and Treble controls.

### Bass Turnover Switch

In the 500 Hz position, frequencies from about 500 Hz begin to be affected by the Bass Control, with maximum rated boost or cut taking place at 100 Hz. In the 250 Hz position, frequencies from about 250 Hz begin to be affected, with maximum rated boost or cut taking place at 50 Hz. When the Bass control is in the flat (0) position, the turnover switch has no effect, of course. Since the 250 Hz position shifts the action of the Bass control into the lower region of the audio spectrum (where most change is generally desired), we recommend you use this position initially. However, some experimentation with the 500 Hz position should be undertaken to determine the position which provides the most desirable Bass control action with your complete system.

## Treble Turnover Switch

In the 2.5 KHz position, frequencies from about 2.5 KHz begin to be affected by the Treble control, with maximum rated boost or cut taking place at 10 KHz. In the 5 KHz position, frequencies from about 5 KHz begin to be affected, with maximum rated boost or cut taking place at 20 KHz. When the Treble control is in the flat (0) position, the turnover switch has no effect, of course. Since the 5 KHz position shifts the action of the Treble control into the higher region of the audio spectrum (where most changes is generally desired), we recommend you use this position initially. However, some experimentation with the 2.5 KHz position should be undertaken to determine the optimum position for your needs (as in the case of the Bass Turnover switch).

## SPEAKER PHASING

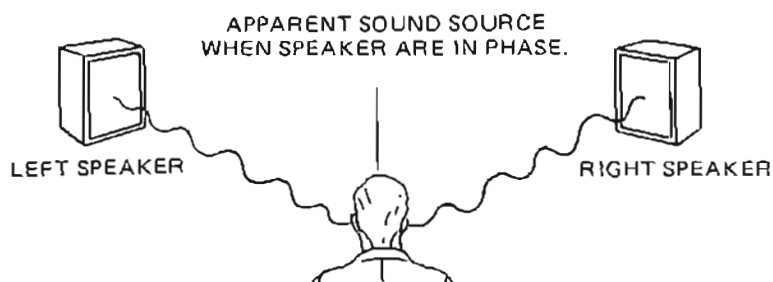
In order for any system to be effective, it is important that all speakers be operated in the proper phase (speakers are in phase if all speaker cones move in the same direction when an identical signal applied to them).

If all speakers used were equipped with coded terminals and if you made all connections correctly when wiring them to the unit (as indicated in the section dealing with speaker connections), you can assume that all speakers are in proper phase. However, if you have any doubts, you can use the following detailed procedure for checking the phase of all speakers in the system.

## PRELIMINARY SET-UP

Operate the receiver in the normal manner for Phono or Tuner, with the "A" SPEAKER button in the depressed position (if phasing the "A" set of speakers). Play any monophonic FM program (if using FM), preferably one with a voice content.

The listening tests that follow are based on the fact that when two speakers produce the same "in phase" sound, the sound will appear to come from between the speakers. If the sound is out-of-phase, the sound will not appear to come from any definite location and will be dispersed over an area across both speakers. When carrying out a listening test on any two speakers, they should be separated by a distance of approximately 6-10 feet and turned in at an angle to face the listener who should stand about 6-10 feet in front of them, as shown in the diagram.



For these listening tests, the help of another person may be required (to adjust the controls on the equipment, reverse wires at each speaker, etc.).

1. Position yourself midway between the left and right speakers as shown in the diagram.
2. Set the POWER button "on" (depressed). Adjust the VOLUME Control to a slightly higher than normal listening level. Also, set the "BALANCE" Control in the 12 o'clock position. Listen carefully, and try to determine the area from which the sound appears to be coming. If the speakers are "in phase", the sound will seem to come from between the speakers.

3. Have someone reverse the connections at the rear of the right 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 -- make sure the wires are not inadvertently shorted together.

When you have the correct or "in phase" connections, you will notice that the sound seems to come from an area somewhere between the speakers. If the speakers are not "in phase", however, the sound will not seem to come from any clearly defined area and will appear to be dispersed. When you have determined that the speakers are "in phase", permanently connect the right speaker wires in the positions that produced it.

## POWER OVERLOAD SAFEGUARD SYSTEM

This receiver is protected by a built-in safeguard system which consists of a combination of electronic and relay circuitry. This protects both transistors and speakers from damage by automatically disengaging the speakers the instant a dangerous power overload condition occurs.

When the receiver is first switched on, there is an approximate 4-6 second delay before sound is heard from the speakers. This is to prevent initial surge currents from possibly damaging the output transistors or speakers, and also to avoid any unpleasant "popping" noises from being heard. If no sound is heard from one or both speakers after a period of 9-10 seconds, set the POWER button to the "OFF" position and check all speakers connections and wiring for a possible short-circuit. Remember also that if two or more sets of speakers are selected simultaneously, there is a possibility that the total load impedance presented by the speakers may be less than 4 ohms, causing the relay to be activated (see "Impedance of Speakers Used" in a previous section of this manual).

Another indication of a dangerous power overload condition would be the sudden interruption of sound from one or both speakers during normal operation, or intermittent sound output accompanied by a continuous relay switching sound (clicking). Both of these symptoms may indicate a malfunction within the unit, but a check of the speaker connections or wiring should be made to make sure that a short or partial short has not suddenly occurred (for example, a wire connection may have become loose and shorted to an adjacent wire).

The overload protection circuit is self-resetting. Once the cause of the external power overload is located and the problem rectified, normal operation can be resumed.

## MAINTENANCE

**WARNING:** Do not attempt to remove the cover — there are no user servicable parts inside this receiver. Refer servicing only to a qualified personnel. [See "Returning The Unit For Service"].

## 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, 50/60Hz AC]. Check the dial and POWER indicator lights on the receiver. If they are not lit, switch the unit off — the AC fuse within the unit may have blown and a fault in the receiver must be suspected. **DO NOT ATTEMPT TO REPLACE THE INTERNAL AC FUSE YOURSELF.** This must be performed by a qualified technician.

**NOTE:** The receiver is equipped with a number of internal DC power fuses. Failure of one of these fuses may result in a complete loss of sound output or the failure of only one section in the receiver (AM and FM, for example), depending on the particular fuse that has blown. It should also be noted that the dial, meter and POWER indicator lights will remain lit even if one or more of the DC fuses fails.

**DO NOT ATTEMPT TO REPLACE ANY OF THESE FUSES YOURSELF.** They must be replaced by a qualified technician only.

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 speaker connections at the speaker[s] and on the receiver for the channel affected [refer to section titled "Power Overload Safeguard System"].
3. Check for possible error in control or switch settings. Make sure the Program "SELECTOR" switch is correctly set to provide the type of operation you want. Check the SPEAKER Buttons for proper selection of speakers. If volume is low, check the audio MUTE Switch — make sure it is in the NORMAL position.
4. If you are not selecting the "MONITOR" jacks on the receiver, make sure that the MONITOR switch is in the "SOURCE" position.
5. If the trouble is experienced with an external program source (phono, tape, etc.), check that all connecting plugs are firmly inserted. Check any connecting audio cables themselves for an intermittent "Open" or "Shorted" condition.

**IMPORTANT:** When checking interconnecting cables, make sure the Volume Control is at minimum or receiver is switched off.

6. If you are having trouble on FM (little or no meter reading as you tune across the dial), check antenna connections. Also check the ATTENUATE switch at the rear - - - it should be in the "OUT" position for maximum FM sensitivity.

## RETURNING THE UNIT FOR SERVICE

In the event that repair is necessary (either in or out of warranty), we recommend that you return the unit to the store from which it was purchased. In most cases, this will be your fastest and most efficient method of obtaining service.

If you wish to ship the unit to our main service center, 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 6 inches of crumpled newspaper or other packing material packed tightly around the unit to avoid any chance of damage in shipment. Be sure to use strong cord or tape around carton. If this unit is being returned under warranty, it must be accompanied by a copy of the original sales ticket or shipping document to establish date of purchase. Also, include with the unit a letter explaining what difficulties you have encountered (remember to add extra First Class 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.  
150 Engineers Road  
Hauppauge, L.I., N.Y. 11787



LR-120DB  
TECHNICAL SPECIFICATIONS

AMPLIFIER SECTION

POWER OUTPUT (Both channels driven)

120 Watts per channel, minimum RMS, at 8 ohms from 20Hz to 20kHz, with no more than 0.09% Total Harmonic Distortion.

POWER BANDWIDTH .....15Hz to 40kHz (-3dB)

FREQUENCY RESPONSE @1 Watt .....15Hz to 40kHz

HUM AND NOISE .....Aux: -90dB  
(IHF A weighted) Monitor "1" and "2": -90dB  
Mag Phono: -70dB

INPUT SENSITIVITY

(for rated output) .....Aux: 150mV  
Monitor "1" and "2": 150mV  
Mag Phono: 2.5mV/5mV/10mV  
Mic: 5mV/10k ohms

MAXIMUM INPUT VOLTAGE .....Aux: 15V  
Monitor "1" and "2": 15V  
Mag Phono: 150mV (2.5mV)  
300mV (5 mV)  
600mV (10 mV)  
Mic: 70mV (Mic Level at Max.)

BASS CONTROL .....250Hz Turnover: ±12dB at 50Hz  
500Hz Turnover: ±12dB at 100Hz

TREBLE CONTROL .....2.5kHz Turnover: ±10dB at 10kHz  
5kHz Turnover: ±10dB at 20kHz

MID CONTROL (6dB/octave) .....±6dB at 1kHz

LOW FREQUENCY FILTER (12dB/octave) ..15Hz (-3dB), 7Hz (-12dB)  
70Hz (-3dB), 35Hz (-12dB)

HIGH FREQUENCY FILTER (12dB/octave) ..7kHz (-3dB), 14kHz (-12dB)  
12kHz (-3dB), 24kHz (-12dB)

LOUDNESS .....50Hz: +12dB  
100Hz: +10dB  
10kHz: + 8dB

LOW BOOST .....50Hz: +12dB  
100Hz: +10dB

AUDIO MUTE .....-15dB, -30dB

TAPE OUTPUT LEVEL .....0.15V output at rated input sensitivity

FM SECTION

TUNING RANGE .....88 - 108MHz

IHF SENSITIVITY (Mono) .....1.8μV\*\*

USABLE SENSITIVITY .....10.3dBf (Mono), 17.2dBf (Stereo)

50dB QUIETING SENSITIVITY .....2.8μV(14.1dBf) (Mono)\*\*,  
38μV(36.8dBf) (Stereo)\*\*

SELECTIVITY (Alternate Channel) .....80dB\*\*

CAPTURE RATIO .....1.3dB\*

FM DISTORTION (at 1kHz) .....0.15% (Mono), 0.3% (Stereo)\*

STEREO SEPARATION .....45dB (at 100Hz and 1kHz)\*  
42dB (at 6kHz)\*  
35dB (at 10kHz)\*

FREQUENCY RESPONSE .....30 - 15,000Hz +0.5, -1.5dB\*

IF REJECTION	.85dB*
SIGNAL/NOISE RATIO	Without DOLBY 74dB (Mono), 70dB (Stereo)* With DOLBY 84dB (Mono), 80dB (Stereo)*
SPURIOUS REJECTION F + IF/2	.90dB**
IMAGE REJECTION	.80dB**
AM REJECTION	.55dB**
SUB-CARRIER PRODUCT REJECTION	.60dB*
FM-MUTE THRESHOLD (Adjustable)	.10 $\mu$ V—200 $\mu$ V**
DOLBY FM	De-emphasis: 25 $\mu$ S
TAPE OUTPUT LEVEL (@30% mod)	.330mV
ANTENNA	.75 ohms unbalanced and 300 ohms balanced input for external antenna.

\* At 98MHz, 65dBf signal input, 100% Mod.

\*\* At 98MHz.

### AM SECTION

TUNING RANGE	.535 — 1605 kHz
SENSITIVITY (IHF)	.20 $\mu$ V (ant terminal)**
IMAGE REJECTION	.75dB
SELECTIVITY (Alternate Channel)	.32dB**
SIGNAL/NOISE RATIO	.52dB*
TAPE OUTPUT LEVEL	.170mV*
ANTENNA	Built-in adjustable ferrite bar, plus provision for external antenna.

\* At 1MHz, 1mV input signal 30% Mod.

\*\* At 1MHz.

### GENERAL

SOLID STATE DEVICES	.7 IC's, 2 FET's, 65 Transistors, 31 Diodes
AC POWER REQUIREMENT	.105 — 120 volts, 50/60Hz AC.
POWER CONSUMPTION	.475 Watts both channels driven at rated power. (at 120V AC)
DIMENSIONS	.21-1/2"W x 7"H (including legs) x 17-5/8"D (including rear protrusions and knobs). 546mm(W) x 178mm(H) x 448mm(D)
NET WEIGHT	.41 lbs. 14oz./19Kgs.

## LR-1200B CIRCUIT DESCRIPTION

### [AUDIO SECTION]

#### Power Supply

The AC line is connected to the primary side of power transformer via a power switch. Four windings are provided for the secondary side i.e. (1) 12 volts AC for the dial lamps, muting circuits and power indicate L.E.D.; this is utilized for 3 pilot lamps, power indicate L.E.D. and further half wave rectified by D608 to obtain 13V DC for muting circuit. (2) 15 volts AC for tuner section; this 15V AC is half wave rectified by D110 to obtain 18V unsmooth DC, which is further regulated by transistor Q125 and zener diode D109 to realize 13V regulated DC against  $\pm 20\%$  AC line. (3) 45 volts AC for preamplifier (equalizer stage, intermediate stage, tone control and microphone amplifier stage); the 45V AC is half wave rectified by D603 to obtain 62V unsmooth DC, which is turned into low noise -45V regulated DC power supply by Q601, 602 and 603. (4) 49.5 volts x 2 AC for main amp; the 49.5V x 2 AC are rectified by D1001 and then led to large filtering capacitors C1008 and C1009 (10000uF x 2) to obtain dual supply +62V and -62V.

#### Preamplifier Section

The preamplifier consists of an equalizer, microphone amplifier, intermediate amplifier and a tone control. The equalizer adopts the Negative Feedback circuit using two silicon transistors 2SA836 (Q201) and 2SC1345 (Q202) per channel and is designed to provide precise equalization to the input signals. Input signals given through the AUX and TUNER section bypass the equalizer and are fed directly to the later stages of this amplifier.

Microphone amplifier uses basically the same circuit without equalization. Controls arranged after the equalizer stage are; REC. OUT connector, TAPE MONITOR SWITCH, TAPE DUBBING SWITCH, LOW-CUT FILTER, HIGH-CUT FILTER, MODE SWITCH, BALANCE CONTROL, VOLUME CONTROL and LOUDNESS, LOW-BOOST SWITCH. The intermediate amplifier consisting of Q401 and Q402 is a flat amplifier adopting 2-stage Negative Feedback circuit which is designed to boost the equalizer, microphone, tuner or AUX. This covers sufficiently the insertion loss by the tone control in the next stage and leads low impedance output to the tone control for its smooth function. The tone control adopts the NF circuit of Q404 and Q405. Any desired frequency response can be adjusted by the following controls: Variable resistor VR403(Bass), VR404(Middle) and VR405(Treble). Major components of the preamplifier are arranged on the printed circuit boards 215-340010 and 215-340030. (215-340010 for Equalizer and Mic. Amp, 215-340030 for Filters, Loudness, Flat Amp and Tone Control.)

#### Main Amplifier

The main amplifier is of full direct coupling, one stage differential amplification, pre-driving and fully complementary circuits. The power transistors Q509 2SD665(NPN) and Q510 2SB-645(PNP) (2 transistors per channel) are fitted over to the heat sink. All components are assembled to the printed circuit board 215-320010. The differential amplifier is consisted of Q501 and Q502, the pre-driving stage of Q504, and the driver transistors, Q507 and Q508. Besides the above transistors, capacitors, resistors and trimmer potentiometers are integrated in the circuit.

#### Muting & Protection Circuit (215-370010)

On pressing the power switch to ON, charging of C607 starts via R608 and VR603. When the base voltage of Q605 becomes 1.3V approximately 3 seconds later, the driver of RL601, namely Q604 and Q605 are turned ON to connect output of power amp with the speaker selector switch.

When the power switch is turned to be off, C607 is discharged via D610 and R609, and RL601 is led to "break" promptly. When some DC is detected at the output terminal due to abnormal operation of power amp section, Q607 or Q608 is turned ON, then C607 is discharged through D610 with the aid of Q608, thus RL601 is led to "break".

## {RF SECTION}

### AM Section

The RF signal reached to the ferrite rod antenna L401 is fed to PIN (2) of IC Q119 HA1197 which is exclusively developed for AM and realizes high sensitivity, low distortion characteristics. The IC is composed of 4 blocks; RF amp, Converter, IF amp, Meter amp and further the RF amp circuit is built in, which is superior in the Image Rejection or IF Rejection response. Thanks to the T105 Ceramic Filter, the Selectivity and the Frequency Characteristic is much improved.

And the excellent AGC effect made inside of the IC realized stable reception of lesser distortion or spurious interference even in the strong radio field area.

### FM Section

The FM section has been designed to realize superior characteristics for various spurious responses, or image ratio etc., by integrating, in a 4-gang tuning capacitor, the tuning circuit with a matching transformer for 75-ohm and 300-ohm, a MOS FET RF amplifier with an excellent noise figure, stable local oscillator and stable frequency converter. Further the whole section is housed in an excellent shield cover.

### IF Amplifier

The signal, converted to 10.7MHz IF frequency at the frontend, is connected to F101 ceramic filter to remove interfering signals, then amplified up to a certain level by Q102. The output is connected to F102 ceramic filter, where any further interfering signals are removed to obtain the necessary selectivity. F101 and F102 are of the linear phase type, therefore lesser distortion in stereophonic reception is realized. Low distortion characteristic is realized due to adoption of high performance IC BA401 (TA7060P) for Q102 and Q103, and 2-stage ceramic filter F101 and F102, and further 6-pole linear phase filter F103.

Then the signal is supplied to Q104 the quadrature IC, which has a 4-stage IF amplifier, and incorporates these circuits of FM detection, muting and signal strength.

But at the time of AM reception, noises are possible from this IC, therefore in this occasion this IC is designed not to operate by applying some voltage to PIN No 2. The quadrature detection system is adopted for the FM detection circuit, which operates in combination with the external circuit of T101, T102 and L102.

At PIN No 10, output of the muting circuit, the voltage will be 0V when signals are available, while approximately 5.4V will appear at no-signal time. By feeding the voltage to PIN No 17, the muting circuit can be operated. At PIN No 9, the voltage will appear according to the signal strength, which controls the signal strength meter. Q101 is an amp for AGC. The IF signal is rectified by D101 and D102, and the DC voltage is supplied as the AGC-bias of Q1 at the frontend to obtain stable reception even in the strong radio field area.

The detection output is available at the PIN No 16, where usually an output of about 350mV appears, which is supplied to Q105, the P.L.L. IC is used for the multiplex to obtain stereo reception. The 76kHz voltage control oscillator is incorporated in the P.L.L. IC, where the 76kHz signal is divided by 2 to make 38kHz for switching of the composite signal. The oscillation frequency is controlled to perfectly match with that of the 19kHz pilot signal of the composite signal, therefore deterioration of the separation etc. caused by the change of ambient conditions is eliminated. For the weak signal, the PIN No 10 is grounded by supplying the muting signal to the base of Q106 to set up monaural signal. The VCO output of 19kHz is available at PIN No 12 of this IC (No 30), which is controlled by VR105. The separation adjustment is easily done with VR106 by canceling the leak-signals of L- and R-ch. The spurious by VCO will be the interfering signal at the time of AM reception, therefore the oscillator is cancelled by supplying some voltage to PIN No 16.

The discriminated signals appear at PIN No 4 and PIN No 5, which is then connected to the audio amplifier via low-pass filter and de-emphasis circuit..

The final output of approximately 1V r.m.s. (400Hz, 100% modulation), is obtained with low output impedance from the audio amplifier composed of Q121 - Q124.

## LR-1200B ALIGNMENT PROCEDURE

The alignment procedure described in each chart may be performed independently, without affecting the others. Warm up the signal generators for at least 15 minutes to make certain if they are stabilized at their operating temperature particularly generators containing vacuum tubes. Consult the instruction manual supplied with the particular test instrument for specific information concerning connection and operation.

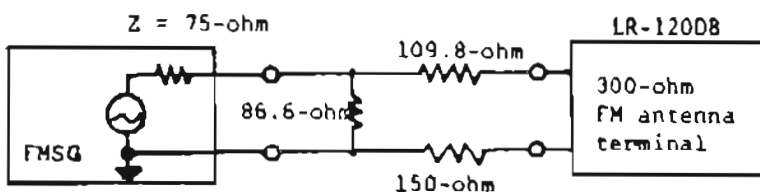
The test equipment listed here is intended only as a guide, but alternate instruments should be of similar quality. The following instruments are required for a complete alignment of the tuner.

### 1. Measurement Instruments and Tools

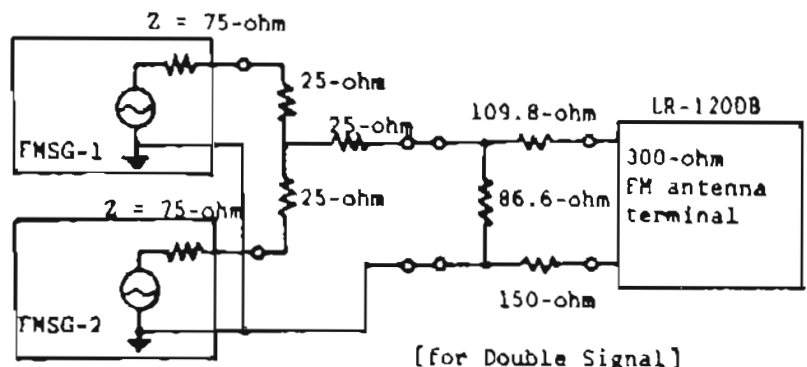
<u>Signal Source:</u>	1) FM signal generator (FMSG)	<u>Output Indicator:</u>	7) Oscilloscope (CRO)
	2) Sweep Generator (SWG)		8) Distortion Meter (IDM)
	3) AM Signal Generator (AMSG)		9) AC Voltmeter (ACVTVM)
	4) FM Stereo Modulator (MPXSG)		10) DC Voltmeter (DCVTVM)
	5) Audio Oscillator (AFO)		11) Hex-head Alignment Tool
	6) AM Standard Loop Antenna		12) Thin fiber shaft alignment tool

### 2. General Alignment Conditions

- 1) The normal test voltage is within  $\pm 1\%$  of what is indicated on the receiver, at 60Hz AC line frequency
- 2) Unless otherwise specified, the normal ambient temperature is  $15^{\circ}\text{C} - 25^{\circ}\text{C}$  and humidity 65 - 75%. But as far as correct judgement is ensured  $5 - 35^{\circ}\text{C}$ , 45 - 85% is allowable.
- 3) FM dummy antenna shall be as follows if not otherwise specified. The output voltage of the signal generator is  $1/4$  of the unloaded terminal voltage.



[for Single Signal]



[for Double Signal]

- 4) The AM standard loop antenna should be set above the ferrite loopstick antenna, when the axis should be at right angles to the plane made by the center to center interval of the two antennas must be 60cm (2-3/8").
- 5) The output level of the sweep generator is measured by the output of the attenuator regardless of its terminated impedance.
- 6) FM modulation 100% with  $\pm 75\text{kHz}$ .

TUNER SECTION ALIGNMENT PROCEDURE

[CAUTION]

1. FM alignment must be done after 5 minutes of the power switch "ON".
2. Low distortion SG or stereo signal generator is indispensable for the FM-mono, stereo alignment procedure.

<p>Preliminary Check</p>	<ol style="list-style-type: none"> <li>1. AC line voltage must be 120V.</li> <li>2. Fuses on 215-370010 must be the appointed one.</li> <li>3. Set the Input Selector Switch to the "AM" position.</li> <li>4. Set the Dial Pointer at the maximum-right position.</li> <li>5. Set all semi-fixed pots (6 pcs) to their center position.</li> </ol>
<p>AM Section Alignment</p>	<ol style="list-style-type: none"> <li>6. Push the Power Switch to "ON", and confirm if there is no trouble.</li> <li>7. Measure the voltage at the (+) side of power rectifying diode D110, which must be 18V ± 1V.</li> <li>8. Voltage at Pin No. 71 or No. 72 must be 13V ± 1V.</li> <li>9. Set the output of 455kHz Sweep Generator for AM at 40dB, and connect it to Pin No. 64. At the same time connect the line input of the SG to Pin No. 66.</li> <li>10. Adjust the Ceramic Filter T105 and T106, and the Detector IFT T107 to have symmetrical response.</li> <li>11. Set the loop antenna connected to AM-SG at the measuring position.</li> <li>12. Connect oscilloscope and milivoltmeter to the REC. OUT terminal.</li> <li>13. Obtain 400Hz 30% modulation on AM SG, and set the output attenuator at 80dB.</li> <li>14. Set both SG and the dial pointer at 600kHz.</li> <li>15. Adjust T104, Ferrite-core antenna and RF coil T103 to obtain maximum response on the signal meter or 400Hz sine-wave.</li> <li>16. Set SG and the Dial Pointer at 1400kHz.</li> <li>17. Adjust 3 trimmers on top of the variable capacitor (viewing from front, the RIGHT side is for OSC.) to obtain maximum response on the Signal Meter or 400Hz sine-wave. Repeat steps 15 - 18 for 2 or 3 times to obtain maximum sensitivity.</li> <li>18. Set SG and the Dial Pointer at 1000kHz, and at maximum output level (126dB), adjust VR108 to have 4.5 reading on the Signal Meter calibration.</li> <li>19. Check that all the specification items, sensitivity, output level, etc., are fulfilled.</li> </ol>

Note the following adjustment must be done at least 5 minutes after the power "ON"

FM Frontend  
&  
IF Section  
Alignment

20. Set the Input Selector Switch to the "FM" position, and the Dolby FM Switch to the "1N" position.
21. Connect millivoltmeter, distortion meter and synchroscope to the REC. OUT terminal.
22. Connect FM SG of 400Hz 100% modulated to the 300-ohm ANT. terminal through balun. In this case the attenuator of the SG must be minimum, and set VR102 to the extreme counter-clockwise direction.
23. Set SG and the dial pointer to 98MHz. Short-circuit Pin No. 36 and 37 on PB-1121.
24. Adjust the detection transformer T101 to obtain center indication of the center meter.
25. Set the SG output at 1mV, and adjust VR104 to have 1.0V output level at REC. OUT. Adjust detection trans T102 (both L & R ch) to realize minimum distortion (no more than 0.1%).
26. Set SG output at minimum, and turn the tuning knob to let the center meter stay at the center. Then set SG output at 1mV, and adjust detection trans T101 and T102 2 or 3 times to realize minimum distortion of the detection output.
27. Set SG and dial pointer at 108MHz, then obtain 1.5 - 1.8uV of SG output.
28. Adjust the trimmer on top of the Frontend (RF, ANT side) to obtain maximum indication of millivoltmeter.
29. Set SG and dial pointer at 98MHz, then obtain 1.5 - 1.8uV SG output.
30. Adjust IF core on the Frontend to obtain maximum indication of millivoltmeter.
31. Set SG output at 4.0uV.
32. Set the muting switch to "ON", and adjust VR102 to set muting point. In this case set it so that 400Hz detection output waveform can be stable against the level fluctuation and that stable output is feasible. After adjustment set the switch to "OFF".
33. Repeat step 26 and check distortion.  
Center: 0.15%      Limit: 0.25%
34. Set SG output at 1mV, and adjust VR103 to have 4.5 reading on the signal meter calibration.
35. Check that all the specification items such as sensitivity, output level, etc., are fulfilled.
36. Set FM stereo signal generator modulated at 1kHz, then set FM SG 100% modulated, and connect both equipments to the 300-ohm ANT. terminal through 300-ohm balun.
37. Connect distortion meter, millivoltmeter, oscilloscope or synchroscope to the REC. OUT terminal. Remove short circuit made between 36 and 37.
38. Set SG and the dial pointer at 98MHz, and fix the SG output at 1mV.



	39.	Connect Frequency Counter to Pin No. 30 and adjust VR106 to obtain 19KHz $\pm$ 0, -10KHz. Only this case, the pilot signal of the SG should be "OFF".
	40.	Modulate the L-ch of the stereo signal generator, and make note of the output by the millivoltmeter.
	41.	Adjust VR105 to obtain minimum movement of the L-ch millivoltmeter.
	42.	Measure the distortion and separation on both channels, which must fulfill the specification. Note that only in the case the distortion is critical against the spec., adjust the IF core in the Frontend within 1/3 turn.
	43.	Switch on and off the pilot signal, and confirm if the stereo indicator LED's light up in correspondance with the signal.
	44.	Confirm all specification items such as S/N ratio etc. are fulfilled. And make note of them.
FM Dolby Section Alignment	45.	Set the input selector switch at the "FM" position, and the FM dolby switch at the "DOLBY" position. At this time confirm if the Dolby indicator LED's light up.
	46.	Set SG and the dial pointer at 98MHz, and fix the SG output at 1mV.
	47.	Adjust VR801 on the Dolby printed circuit board PB-1055 to obtain 580mV output level at the L-ch REC. OUT terminal. At this step, stereo signal generator must be modulation L+R 50% and pilot signal 10%.
	48.	Same as the above. Adjust VR802 on PB-1055 to have 580mV output level at the REC. OUT terminal.
	49.	Set stereo signal generator at 100% modulation at 1KHz. Confirm the output level of L-ch and R-ch at REC. OUT terminal is 1.1V.

## SR-120FB AUDIO SECTION ALIGNMENT PROCEDURE

### [1] Idle Adjust

VR501a (L-ch) and VR501b (R-ch) on the printed circuit board 215-320010 are semifixed potentiometers for quiescent current adjustment of the power transistors.

First, connect a DC millivoltmeter between PIN No. 10a (No. 10b) and No. T.P. 1 (No. T.P. 2). [(+) for PIN No. 10a and No. 10b]

After one minute of POWER-ON, adjust VR501a and VR501b respectively to have 23mV reading on the meter.

### [2] Time Delay Muting Adjust (P.C.B. No. 215-370010)

Adjust VR603 to switch-on the relay after three seconds of POWER-ON.

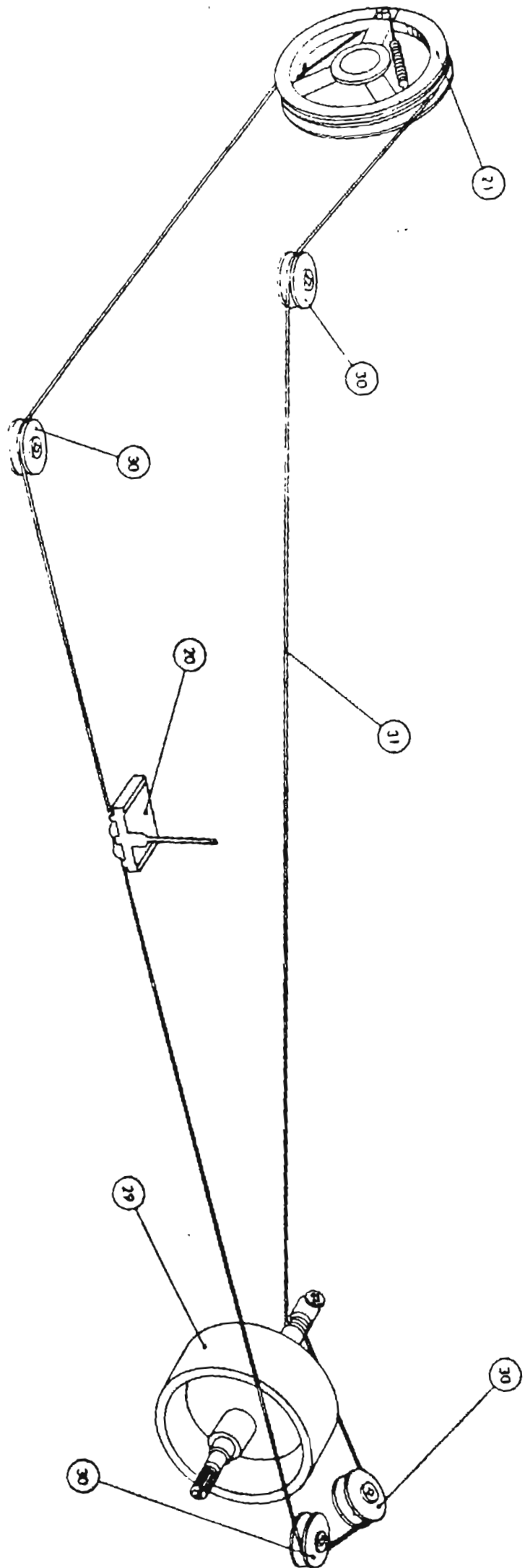
### [3] Power Meter Adjust

Connect the AUDIO OSC to the "AUX" Input Terminal. Connect 8 ohms dummy load to the Speaker Terminal for both channels and also connect the AC VTVM to the same terminal.

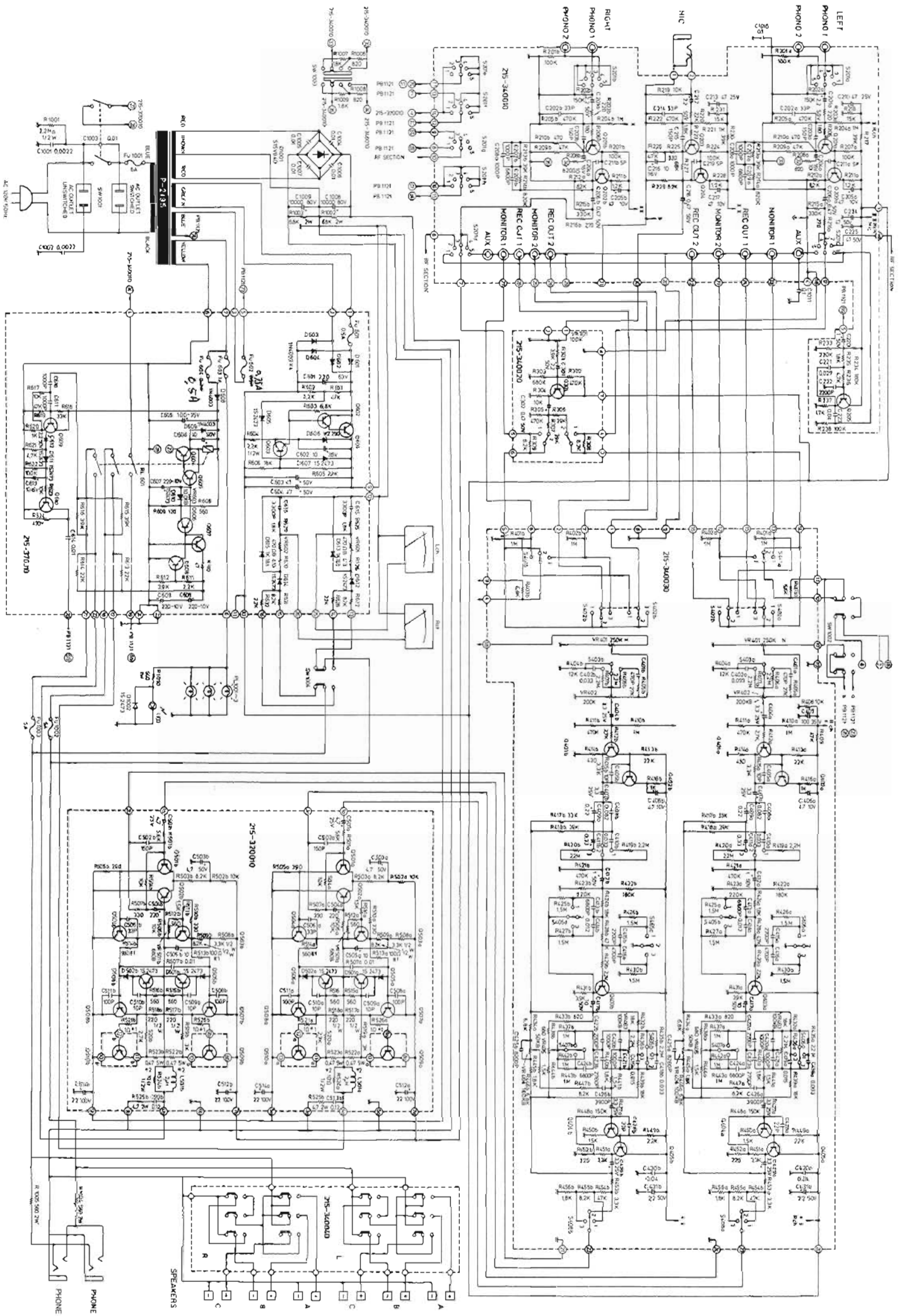
Select the "AUX" position of the Function Switch and set the Main Volume to the maximum. While the Tone Control Switches and the Balance Control should be set to the center of rotation.

Gradually increase the input signal level of the AUDIO OSC at 1kHz until the output signal of the AC VTVM becomes 31.0V.

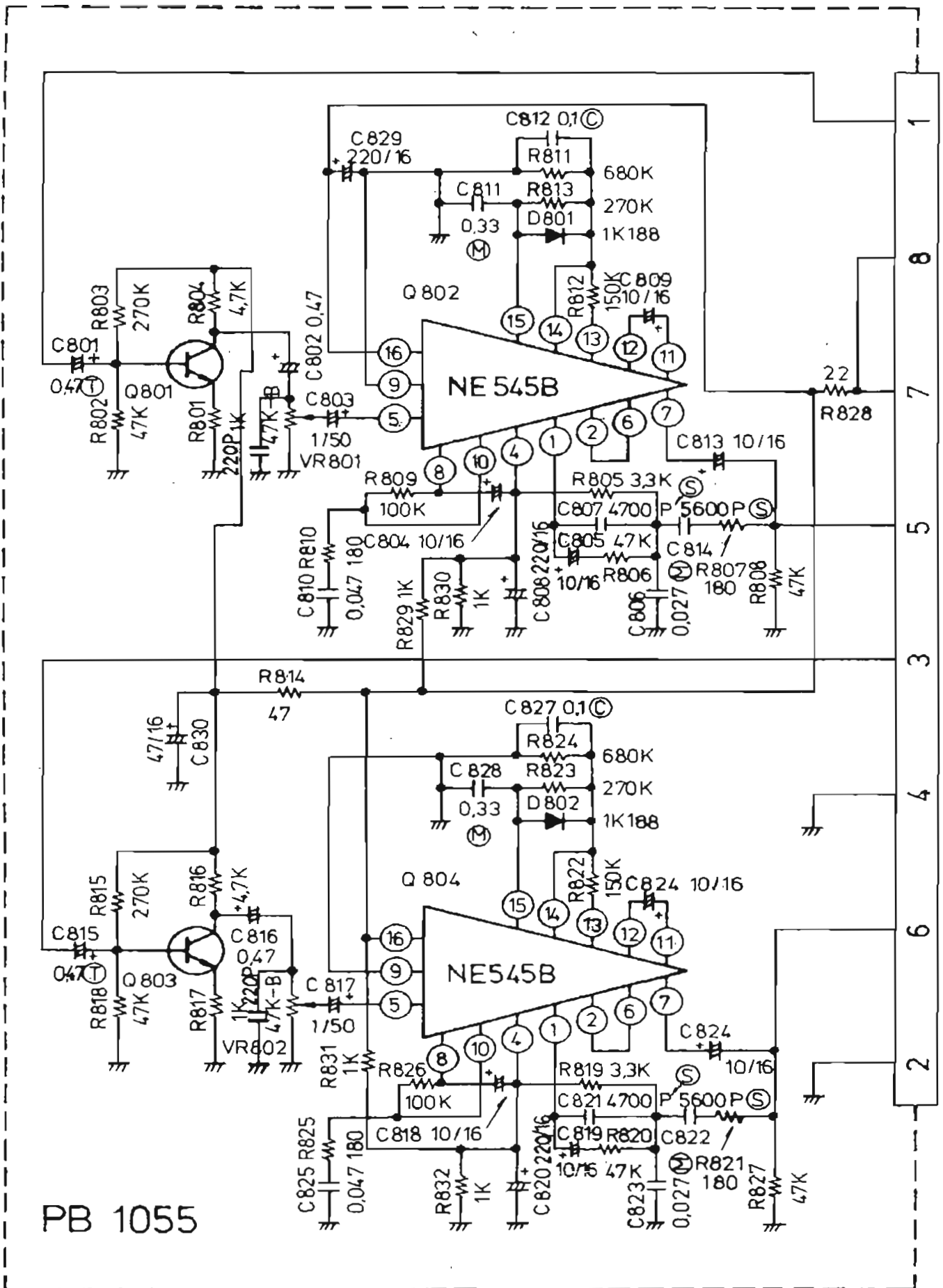
Adjust VR601 and VR602 respectively to have 120W reading on the POWER-METER.







AUDIO SECTION MODEL LR-1200B



PB 1055

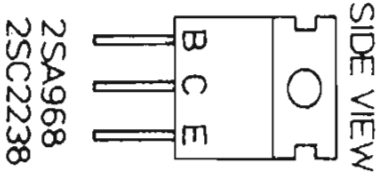
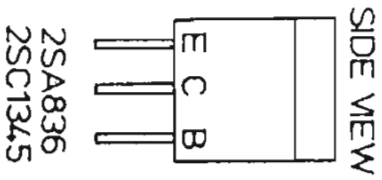
- Q801, 803 ----- 2SC1000
- Q802, 804 ----- NE 545B
- D801, 802 ----- 1K188

DOLBY UNIT

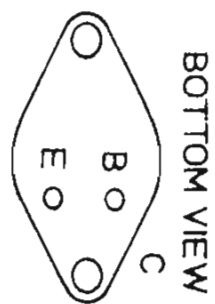
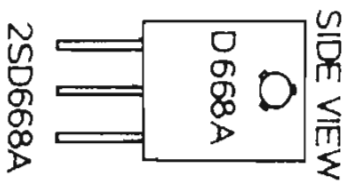
S201 : F-UNC11UN  
 S301 : MIC MIXING  
 S401 : MONITOR  
 S402 : DUBBING  
 S403 : LOUDNESS, LOW BOOST  
 S404 : LOW CUT  
 S405 : HIGH CUT  
 S406 : BASS TURNOVER  
 S407 : TREBLE TURNOVER  
 S408 : AUDIO ATTENUATE  
  
 VR401 : BALANCE  
 VR402 : VOLUME  
 VR403 : BASS  
 VR404 : MIDDLE  
 VR405 : TREBLE  
  
 SW1001 : POWER  
 SW1002 : MODE  
 SW1003 : PHONO INPUT SENS.  
 SW1004 : METER RANGE

Q201 : 2SA836E  
 Q202 : 2SC1345E  
 Q203 : 2SA836E  
 Q204 : 2SC1345E  
 Q205 : 2SA836E  
 Q301 : 2SA836E  
 Q401 : 2SA836E  
 Q402 : 2SC1345E  
 Q403 : 2SA836E  
 Q404 : 2SA836E  
 Q405 : 2SA836E  
  
 Q501 : 2SA942RAKK or 2SA872DA  
 Q502 : 2SA942RAKK or 2SA872DA  
 Q503 : 2SC1740  
 Q504 : 2SD668A  
 Q505 : 2SC1740  
 Q506 : 2SA826  
 Q507 : 2SC2238  
 Q508 : 2SA968  
 Q509 : 2SD665 or 2SD424  
 Q510 : 2SB645 or 2SB554  
  
 Q601 : 2SD382  
 Q602 : 2SA872  
 Q603 : 2SC1775  
 Q604 : 2SC1741  
 Q605 : 2SC1740  
 Q606 : 2SA826  
 Q607 : 2SC1740  
 Q608 : 2SC1740  
 Q609 : 2SC1345E  
 Q610 : 2SC1345E

\*1 : UNFLAMMABLE RESISTOR  
 \*2 : CEMENT RESISTOR

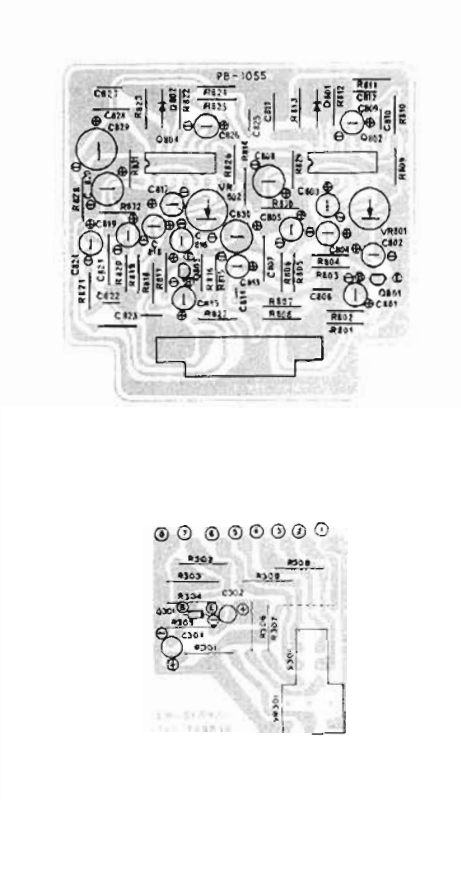
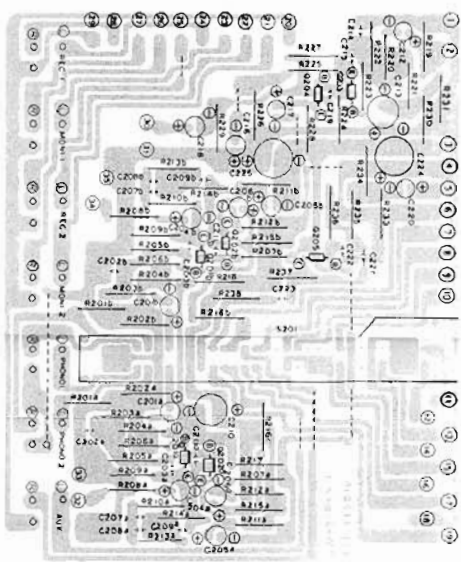
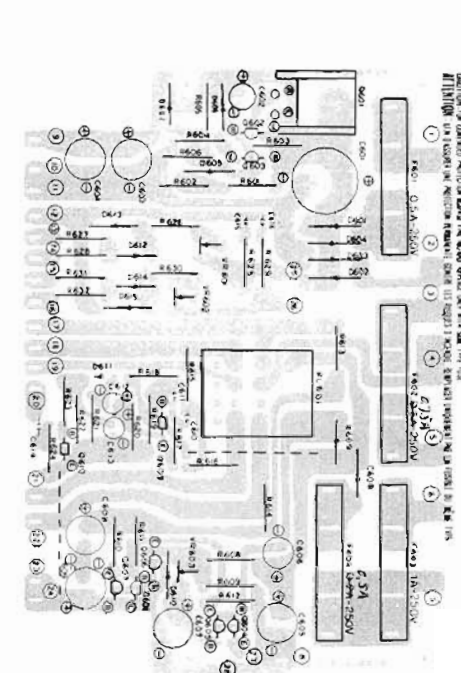
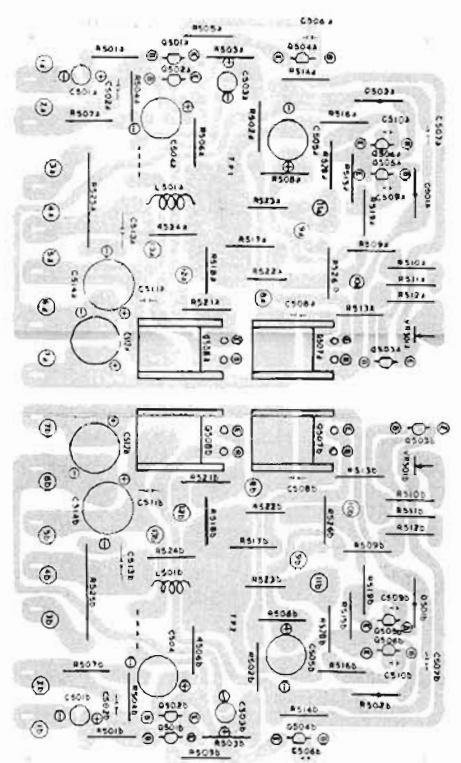
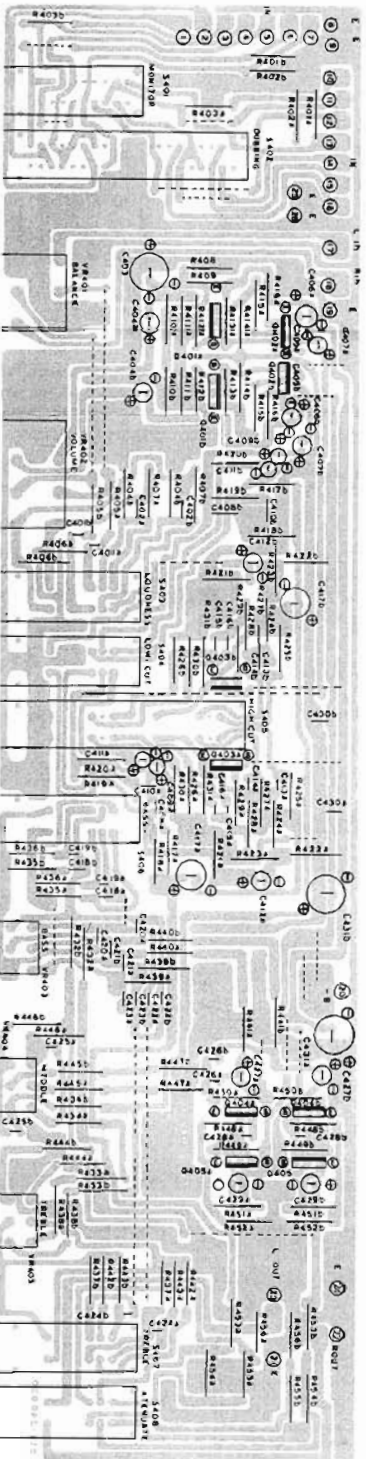
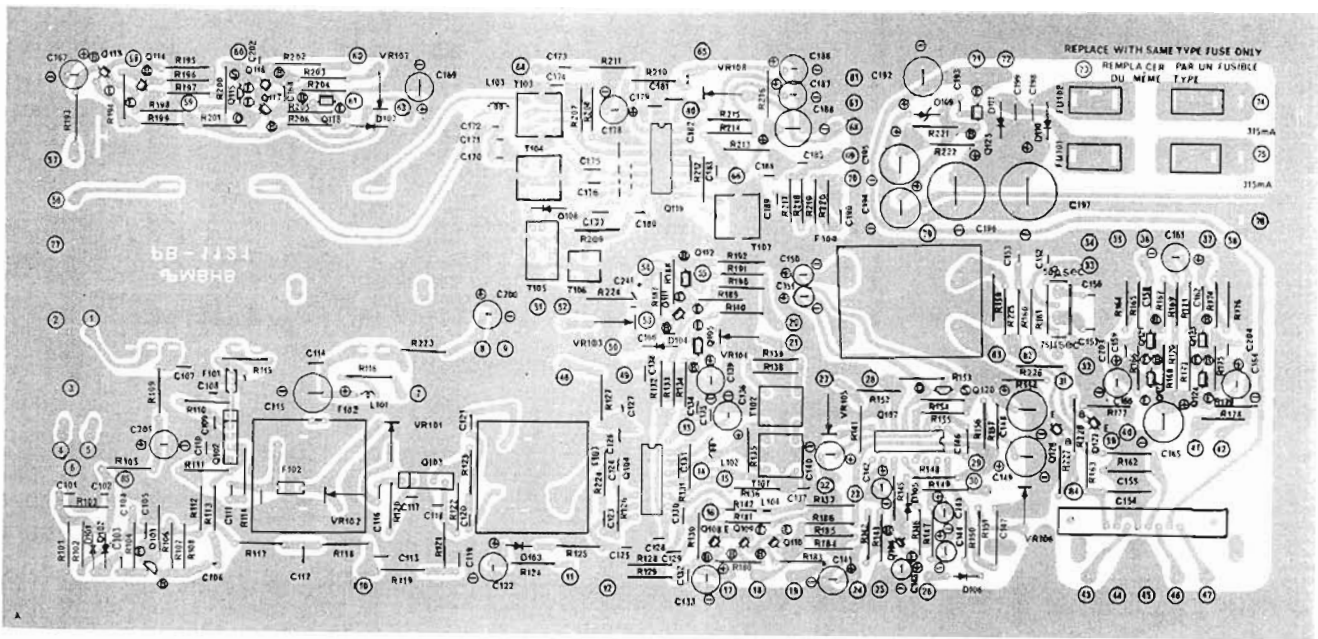


2SA872  
 2SA942  
 2SA826  
 2SC1740  
 2SC1741  
 2SC1775



2SD668A  
 2SB645  
 2SD665

SEMICONDUCTOR TERMINAL CONNECTION







# IMPORTANT

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Please observe the following precautions at all times when using your equipment. By so doing, you will be assured of long, trouble-free enjoyment of this unit.

1. Never expose this unit to direct sunlight or install it near sources of heat.
2. Never attempt to switch on the unit until you have made all necessary connections to loudspeakers and to any program source to be employed.
3. Always minimize Volume Control[s] before switching the unit on or when switching from one program source to another [from Phono to FM, for example].
4. Use Tone controls or Loudness switch with caution. Never set Bass to maximum or set Loudness switch "on" at high volume levels — this could result in serious damage to speakers. NEVER use full Bass and Loudness simultaneously.
5. If one of the speakers is inactive, switch off and trace the source of the trouble, usually caused by a short circuit in the speaker wires [check all terminals for wires that may be touching].
6. Never connect more than one speaker to each set of terminals. Refer to the instruction book for information on connecting remote or extension speakers.
7. Please study the instruction book carefully. It contains all the information you will need to correctly install and operate this unit. Only in this way can you be sure of the best possible performance from your complete system.

# Lafayette

LAFAYETTE RADIO ELECTRONICS CORPORATION

Printed in Japan