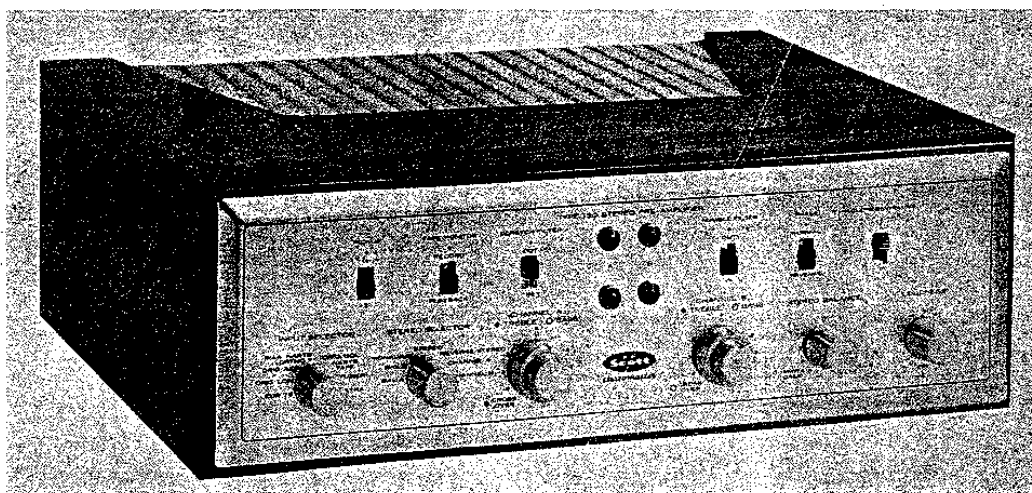


OPERATING MANUAL

Type 130

Stereo Preamplifier



111 POWDER MILL ROAD

MAYNARD, MASSACHUSETTS

Hermon Hosmer Scott, Inc.
111 Powder Mill Road
Maynard, Mass.

OPERATION MANUAL FOR THE TYPE 130 STEREOPHONIC PREAMPLIFIER

| | |
|----------------------------------|----|
| Specifications | 2 |
| Unpacking | 3 |
| Installation | 3 |
| Description of Controls | 7 |
| Operation | 11 |
| Installation of Pickups | A |
| Magnetic Level Control | B |
| Phasing the Loudspeakers | F |
| Hum Adjustment Potentiometer | F |
| Wiring Diagrams for Installation | G |

Hermon Hosmer Scott, Inc.
111 Powder Mill Road
Maynard, Mass.

OPERATION MANUAL FOR THE TYPE 130 STEREOPHONIC PREAMPLIFIER

| | |
|----------------------------------|----|
| Specifications | 2 |
| Unpacking | 3 |
| Installation | 3 |
| Description of Controls | 7 |
| Operation | 11 |
| Installation of Pickups | A |
| Magnetic Level Control | B |
| Phasing the Loudspeakers | F |
| Hum Adjustment Potentiometer | F |
| Wiring Diagrams for Installation | G |

Hermon Hosmer Scott, Inc.
111 Powder Mill Road
Maynard, Mass.

OPERATION MANUAL FOR THE TYPE 130 STEREOPHONIC PREAMPLIFIER

The H. H. Scott Type 130 Stereophonic Preamplifier is designed to provide all the facilities necessary for complete stereophonic sound systems. It contains many unique features found only in H. H. Scott components. It has five stereophonic channels including two low level magnetic inputs and three high level components inputs. The preamplifier has also two stereophonic output channels together with a center channel output which combines both stereophonic channels for operating a third center speaker to provide optimum stereophonic performance.

The 130 Stereo Preamplifier has the following characteristics:

| | |
|---|------------------------------|
| Maximum Voltage Output | 10 volts |
| Rated Voltage Output | 2.5 volts |
| Rated Voltage Output to Tape Recorder | 1.2 volts |
| Maximum Harmonic Distortion at rated output | 0.15% |
| Signal for Rated Output - NARTB TAPE at 1000 cps | 1.5 millivolts |
| Signal for Rated Output - RIAA equalization at 1,000 cps | 3.0 millivolts |
| Signal for Rated Output - Tuner and Extra | 0.1 volts |
| Hum and Noise - Tuner and Extra Inputs | 80 db below 2.5 volts |
| Hum and Noise - Low Level Inputs | Equiv. to 3 microvolts |
| Sharp Cutoff Rumble Filter | 12 db/octave below 20 cps |
| Rumble Filter | 12 db/octave below 50 cps |
| Scratch Filter | 12 db/octave above 8,000 cps |
| Treble Boost - 10,000 cps | 15 db \pm 2 db |
| Treble Cut - 10,000 cps | 15 db \pm 2 db |
| Bass Boost - 50 cps | 15 db \pm 2 db |
| Bass Cut - 50 cps | 15 db \pm 2 db |

(These characteristics are measured at a line voltage of 117 volts rms and a line frequency of 60 cycles per second. No significant changes of characteristics should be experienced for normal variations of line voltages or a line frequency of 50 cycles per second.)

| | |
|--|--------------------------|
| Input Impedance - Low Level Inputs | 47,000 ohms |
| Input Impedance - All High Level Inputs | 600,000 ohms |
| Minimum recommended load resistance on all outputs | 100,000 ohms |
| Maximum recommended cable capacitance on all outputs | 500 mmfids |
| Maximum recommended length of main output cables | 20 ft. |
| Range of line voltage and frequency | 105-125 volts, 50-60 cps |
| Power Consumption - 117 volts at 60 cps | 35 watts |

NOTE: THIS IS A TRANSFORMER OPERATED DEVICE. DO NOT ATTEMPT TO OPERATE ON DIRECT CURRENT.

UNPACKING

Carefully remove the preamplifier from its carton. Do not force any of the packing material or tube breakage may result.

If there is any damage to the preamplifier, report it to your dealer immediately. If your dealer shipped the amplifier to you, report the damage to the shipping company as soon as possible. Failure to report the damage immediately may void any claim against the shipping company. Remember that the warranty covers only defects due to faulty workmanship or components. Shipping damage is not covered in the warranty.

Make sure the following accessories have been included in the carton: Panel Mounting Template, Package of Mounting Hardware, Warranty Card, and Connecting Cable. Be sure to send the Warranty Card to H. H. Scott, Inc. so that your instrument may be registered in our warranty files.

INSTALLATION

1. Ventilation and Mounting

This preamplifier may be mounted in either horizontal or vertical positions. The preamplifier must never be mounted directly above the power amplifier where the convection current of air will heat the preamplifier. This heated air may shorten the life of the unit considerably. If mounted in an enclosed cabinet, have the back or one side open so that the heated air may escape. If mounted in an accessory cabinet, be sure the cabinet is kept one inch away from the wall and also be sure that the ventilation grille is not covered on top.

In order to make a panel mounting in a custom installation, apply the following procedure:

- A. Locate a supporting shelf in a cabinet at the height at which you wish the amplifier to be positioned, and mark the edge at which the upper surface of the supporting shelf meets the panel.
- B. Using this line as a guide, place the mounting template so that the lower edge of the cutout coincides with the line.
- C. Mark the size of the cutout and carefully cut the opening as indicated on the template.
- D. Slide the preamplifier in from the front so that it rests on a shelf. The front panel should completely cover the opening.
- E. Fasten the 130 to the cabinet using the method described on the mounting template.

NOTE: THE PREAMPLIFIER MUST BE SUPPORTED BY A SHELF. IT SHOULD NEVER BE SUPPORTED BY THE FRONT PANEL ALONE EITHER IN THE VERTICAL OR HORIZONTAL POSITIONS.

2. Electrical Connections

The two channels of all stereophonic magnetic, variable reluctance and moving coil pickups should be connected to either the "MAG 1" or "MAG 2" inputs at the rear of the preamplifier. Be sure not to cross-connect the magnetic inputs, that is do not connect to "MAG 1" Channel A and "MAG 2" Channel B, for instance. Be sure also to use both magnetic inputs, Channel A and B. The "MAG-LEVEL" control at the rear of the preamplifier must be set according to the type of phonograph cartridge used. Refer to Appendix I for information concerning the proper setting of this control and the precautions to be followed when installing phonograph pickups.

Monaural magnetic, variable reluctance and moving coil pickups are also connected to the "MAG 1" or "MAG 2" inputs. In order to drive both left and right speakers, however, the "STEREO SELECTOR" switch is positioned on the channel into which the cartridge is plugged.

Ceramic and crystal phonograph pickups that have a high voltage output and automatically compensate for the RIAA recording characteristic should be connected to one of the high level jacks such as the "TUNER", "EXTRA", or "PLAYBACK" jacks on the rear of the preamplifier. In order to make use of the cartridge, the "INPUT SELECTOR" switch is turned to the position of the jack to which the cartridge is connected. For example, if the cartridge is connected to the "EXTRA" jack, the "INPUT SELECTOR" switch must be turned to "EXTRA" to play records. Adjustment of the level control is necessary.

In the case of low level stereophonic cartridges and tape heads, it is desirable to twist the two shielded leads about each other to minimize hum pickup. It is also desirable not to ground the two outer shields of the conductors together at any point along their length. In the case of three terminal stereophonic cartridges, both shields will have to be grounded to the center connection of the cartridge, but in the case of four terminal stereophonic cartridges, it is desirable that the ground be made through the internal connections in the preamplifier which are automatically provided.

Certain ceramic cartridges will work when connected directly to the low level magnetic inputs. If you do not have sufficient flexibility of equalization with your ceramic cartridge when it is connected to the high level outputs, change the connection to the low level inputs. Most cartridges of this type so connected will work properly with the equalization controls.

NOTE: SHIELDED CABLE MUST BE USED ON ALL INPUT CONNECTIONS, AND THE SHIELD MUST BE CAREFULLY SOLDERED TO THE COLLAR OF THE PLUGS THAT ARE CONNECTED TO THE AMPLIFIER. IF ANY HUM DEVELOPS IN THE PHONOGRAPH PICKUP SYSTEM, SEE THE APPENDIX ON PICKUP INSTALLATION.

A. Connections for Tape Heads

Connect the two channels of stereo playback tape heads of a tape deck (having no tape preamplifier) to either of the two pair of jacks marked "MAG 1" or "MAG 2". The "PICKUP" selector switch should be placed on either "MAG 1" or "MAG 2" to playback from tape depending upon which connection on the back of the preamplifier is used. The "INPUT SELECTOR" switch is then turned to the "NARTB TAPE" position. The tape deck can then be heard through the amplifier.

When tape heads are used with our preamplifiers in this configuration, it is

necessary to adjust the tape level control. Please refer to the section on un-calibrated level controls for proper information concerning this matter. Another precaution must also be taken, the connecting cables from the tape heads must be no longer than 6 ft. in length or treble rolloff may result.

B. Connections for Stereophonic Tape Recorders Having Dual Preamplifiers:

The outputs from a stereophonic tape recorder having dual preamplifiers should be connected to the "PLAYBACK" inputs at the rear of the preamplifier. The tape recorder may then be heard through the amplifier when the "TAPE MONITOR" switch is placed in the "PLAYBACK" position. If it is desired to record with a tape recorder, connect the appropriate inputs of the tape recorder to the "TO RECORDER" outputs of the preamplifier. A signal will be available at these outputs for any type of program material used in the preamplifier.

If the tape recorder has a monitor output, the tape monitoring facilities of the 130 permit continuous comparison of the material being recorded with the program material coming into the preamplifier. Whenever the "TAPE MONITOR" switch is in the record position, the incoming signal is heard through the circuits of the preamplifier. When the "TAPE MONITOR" switch is in the playback position, the material picked off the playback heads of the tape recorder through the tape preamplifier is heard through the speakers. This feature enables one to maintain a check on the quality of tape recording produced while recording.

C. Output Connections for Stereophonic Sound:

Five output connections have been provided in the Type 130 Preamplifier. They are the "TO RECORDER" channels, the "OUTPUT" channels, and the "CENTER CHANNEL OUTPUT". The two "TO RECORDER" outputs have been described in the last paragraph. The two "OUTPUT" channels are connected to two power amplifiers which in turn are connected to the two loudspeaker systems. The "CHANNEL A" output should be connected through a power amplifier to the loudspeaker system on the left side as seen from the listener's position. The "CHANNEL B" output should be connected through a power amplifier to the loudspeaker system on the right.

The two stereophonic output channels together with the center channel should be connected to the 1.5 volt input of all H. H. Scott power amplifiers. The level controls of these power amplifiers should then be set in the manner described below.

(1) Choose a recording of high quality which has a good distribution of treble and bass sounds and is of fairly constant medium-loud volume. Orchestral music is best suited for this adjustment, and listening is best done with the loudspeaker and the listener in their normal placement.

(2) Set the record compensator controls for proper equalization of the record selected, turn the treble and bass controls to flat response.

(3) Set the Volume-Loudness Switch to Volume and turn up both level and loudness controls so that the music is quite loud. Balance the speaker system level controls provided. This should be done on high quality multiple speaker systems before programming. If speaker system has no balance controls, disregard this paragraph.

(4) Adjust the preamplifier level control to that position recommended by its manufacturer for use with your phonograph cartridge. If you do not know this position, consult the preamplifier manufacturer. Turn the loudness-volume switch to

loudness and set the power amplifier level control to mid-scale.

(5) Set the loudness control to 7 on the preamplifier and note the tonal balance of the music, that is to say its treble-bass relationships.

(6) Set the loudness control to 3 and note again the tonal balance. If there is no change in the balance and only a change in the volume, the level control is properly set. If there is too much bass the level control of the power amplifier is set too high; and if there is a lack of bass, the level control is set too low.

(7) Repeat steps D and E after resetting the level control until there is no change in tonal balance.

E. The "CENTER CHANNEL OUTPUT":

If desired, the "CENTER CHANNEL OUTPUT" should be connected to a third power amplifier and its speaker; this speaker being placed midway between the left and right stereophonic speakers. Should the preamplifier be used with only one speaker, this output should be used for proper mixing of the stereophonic signals for use with a single power amplifier and speaker. The center channel consists of the sum of one-half the signals of both channel A and channel B. This permits a continuous distribution of sound without the feeling of a "hole in the middle" effect heard occasionally in some stereophonic material. For best results, the level control of the center channel power amplifier should be adjusted so that the sound from the center speaker is just audible in the normal listening position while stereophonic program material is reproduced.

The "CENTER CHANNEL OUTPUT" can also be used if it is desired to mix program material such as a voice with music. This usage will require a microphone and preamplifier for one channel together with a suitable signal through the other channel.

F. Using the 130 as an Electronic Crossover:

If it is desired to use the preamplifier as an electronic crossover rather than as a stereophonic preamplifier, the "OUTPUT A" jack should be connected to the low frequency power amplifier and speaker. The "OUTPUT B" jack should be connected to the high frequency power amplifier and tweeter. The tone controls are then placed in the crossover position, and the stereo balance control is used to adjust the relative levels of the high frequency speaker to the low frequency speaker. The Channel A bass control and the Channel B treble control are then used to adjust the treble and bass of the entire system. The crossover frequency of the Type 130 Preamplifier is 800 cycles.

G. Power Connections:

The preamplifier may be plugged into any 110 to 120 volt 50 or 60 cycle AC source. Three accessory outlets are provided at the rear of the preamplifier to permit the control of other equipment from the power switch. No more than a total of 300 watts may be obtained from this outlet. To find the total wattage of the accessory equipment, just add the wattage consumed by each unit. For instance, a tuner of 65 watts, a turntable of 75 watts and a tape deck of 50 watts will give a total of 190 watts which may be controlled by the preamplifier. Three-way outlets may be used to increase the number of controlled power inputs.

DESCRIPTION OF CONTROLS

A. Input Selector Control:

The first five positions of this control ("EUROPEAN 78's" through "ORIG. COL") provide exact compensation for the most common recording curves. Certain technical characteristics of the recording process require that the bass frequencies be artificially reduced and the treble frequencies boosted by the recording engineers. For the original sound to be reproduced properly when a record is played back, just the opposite must be done in the amplifier through which the recording is played. Up to 1955, different manufacturers used different recording curves and the different positions of the "INPUT SELECTOR" control provide for this. Beginning in 1955, most companies standardized on the "RIAA-NARTB" curve, and for new recordings use this position. For records recorded prior to 1955, use the table below, or consult any of the leading high-fidelity magazines for proper settings. All 45-45 stereo recordings use the "RIAA-NARTB" recording characteristics.

33 and 45 rpm Recordings

| | | | |
|----------------|-----|-------------|------|
| Angel | AES | HMV | COL |
| Bach Guild | COL | London | LON |
| Capitol | AES | Mercury | AES |
| Cetra-Soria | COL | MGM | COL |
| Columbia | COL | Oiseau-Lyre | COL |
| Concert Hall | COL | Remington | RIAA |
| Cook | AES | Urania | COL |
| Decca | COL | Vanguard | COL |
| Esoteric | AES | Vox | COL |
| Good Time Jazz | AES | Westminster | COL |

78 rpm Recordings

| | | | |
|--------------------|------|----------------|------|
| Capitol | RIAA | MGM | RIAA |
| Columbia (USA) | RIAA | NAB | RIAA |
| Columbia (British) | EUR | Old US records | EUR |
| Decca | LON | RCA | RIAA |
| European records | EUR | Telefunken | EUR |
| HMV | EUR | VOX | EUR |
| London | LON | | |

Other stereo inputs to the 130 such as "TUNER" or "EXTRA" are also connected to the amplifier through the "INPUT SELECTOR" switch. For example, when the switch is set to "TUNER", the stereo tuner input jack at the rear of the amplifier will be connected to the circuit. The "PLAYBACK" jacks, however, on the rear of the preamplifier are not connected into the circuit by the "INPUT SELECTOR" switch. In order to make use of this input, you must manipulate the "TAPE MONITOR" switch.

B. Stereo Selector Switch:

The "STEREO SELECTOR" switch permits the preamplifier to be operated through seven different modes. This switch also changes the front panel light pattern that was incorporated into the Type 130 Preamplifier for the purpose of identifying the setting of this control at a distance. The seven modes are:

1. Balance A - This setting permits program material coming from both A and B channel inputs to drive the A channel power amplifier and speaker only. This position is necessary for balancing the loudspeakers. See the section on the stereo balancing control for details.
2. Balance B - This permits program material from both A and B channel inputs to drive the B channel speaker and power amplifier only. This position is necessary for balancing the loudspeakers. See the section on the stereo balancing control for details.
3. Monaural Records - This permits playback of monaural records with a stereo cartridge through both channels and speaker. This particular setting together with the phase control will permit playback of either laterally or vertically modulated records. Be sure to keep the "PHASE" switch in the "NORMAL" position for all normal (lateral) monaural records. The "PHASE" switch should be set to "REVERSE" for playing vertical recordings (mostly transcriptions) with a stereophonic pickup.
4. Stereo - This setting permits stereophonic program material to go through the preamplifier in such a manner that Channel A input is heard through the Channel A power amplifier and speaker and the Channel B input is heard through the Channel B power amplifier and speaker.
5. Reverse Stereo - This setting cross-connects the outputs so that Channel A is heard through the Channel B power amplifier and speaker and Channel B inputs are heard through the Channel A power amplifier and speaker.
6. Channel A - This setting permits monaural program material coming into Channel A to operate both Channel A and Channel B power amplifiers and speakers. It also permits the preamplifier to be operated as an electronic crossover for monaural program material on Channel A when the treble and bass controls are placed in their crossover position and the two power amplifiers drive a combined speaker system.
7. Channel B - This setting permits monaural program material coming into Channel B to operate both Channel A and B power amplifiers and speakers. It also permits the preamplifier to be operated as an electronic crossover for monaural program material on Channel B when the treble and bass controls are in their crossover position and the two power amplifiers drive a combined speaker system.

C. Treble and Bass Controls:

These are tone controls which allow accurate compensation for room acoustics, differences in speakers and pickups, and personal preferences. When set in the plus positions the bass and treble frequencies are boosted. When set in the minus positions, the bass and treble frequencies are attenuated. The controls should be adjusted until the music sounds best to you, for this is the most important factor in music listening.

These tone controls are provided for each channel in case the speakers for each channel are of different manufacture or the room placement causes two matched speakers to assume different sound properties.

These controls also have calibrated points for use when the preamplifier is used as an electronic crossover. In these calibrated positions, Channel A becomes the low frequency channel and Channel B becomes the high frequency channel.

D. The Stereo Balance Control:

This control is used in conjunction with the "BAL A" and "BAL B" positions of the "STEREO SELECTOR" switch. The "STEREO SELECTOR" switch is repeatedly moved from "BAL A" to "BAL B" and the "STEREO BALANCE" control and the tone controls should be adjusted so that the sound output from both speakers is identical. For this test, it is recommended that the center channel be inoperative.

The Stereo Balance Control adjusts the relative levels of output from the two stereophonic channels. If the control is in its extreme counter-clockwise position, output will be available from Channel A only, and if the control is in its extreme clockwise position, output will be available only from the channel B speaker. This control was provided to balance stereophonic sound from two dissimilar speakers. For two speakers of the same type, the control will normally be in the zero position provided that the gain of both power amplifiers are equal and that the stereophonic program material is properly balanced with respect to relative levels at the input. If one speaker sounds unduly loud, the control should be moved away from the channel that the speaker occupies and moved nearer the channel of the other speaker until the sound from both speakers is properly balanced. This control may have to be readjusted for different program material because of changed recording balance.

E. The Loudness Control and the Loudness Volume Switch:

The volume is adjusted with this control. When the "LOUDNESS-VOLUME" switch on the front panel is set to "LOUDNESS", special compensation is given to music. The need for this is explained as follows:

The human ear is insensitive to extremes of treble and bass frequencies at low volume levels. To compensate for this, the control progressively boosts the treble and bass frequency as the volume is turned lower. Therefore, the control maintains the proper balance of bass and treble with the middle ranges of reproduced music at all volume levels. This compensation may be removed by setting the "LOUDNESS-VOLUME" switch to "VOLUME".

F. The Pickup Selector Switch:

This switch permits selection of either of two magnetic cartridges or of one magnetic cartridge and one tape head. When the switch is placed on the control dot setting, the input labeled "MAG 1" is connected to the amplifier. The "MAG 2" position is connected when this switch is in the No. 2 position.

G. The Tape Monitor Switch:

This switch has two functions. First, when a tape recorder is used in conjunction with tape preamplifiers and the output is connected to the playback jacks in the rear of the 130, the "TAPE MONITOR" switch will select this input to play through the preamplifier outputs regardless of the setting of the "INPUT SELECTOR" switch. Second, if one has a three-head tape recorder with erase, record and playback heads together

with a tape preamplifier and monitor provisions, the tape can be monitored making recordings.

For playback from a tape deck used in conjunction with tape preamplifier whose outputs have been inserted in the "PLAYBACK" jacks, turn the "TAPE MONITOR" switch to "PLAYBACK" to hear the program material on the tape. This switch is independent of the "INPUT SELECTOR". Be sure that it is placed in the position to hear program material other than the tape deck.

In order to monitor from a tape deck and tape preamplifiers having monitor provisions, connect the monitor output of the tape recorder to the "PLAYBACK" jacks and the recorder input to the "TO RECORDER" jacks. When the "TAPE MONITOR" switch is in the "PLAYBACK" position, the actual material on the tape will be heard. If the switch is in the "RECORD" position, the material entering the input recorder will be heard. The volume levels of both positions of the switch can be matched by adjustment of the uncalibrated "PLAYBACK LEVEL" control located at the rear of the 130.

H. Rumble and Scratch Filters:

The "SCRATCH" and "RUMBLE" filters have been incorporated in the amplifier to reduce noise due to these causes. These are not only operative on the "TAPE MONITOR" inputs, they can be used also to reduce similar noises on the "TUNER", "FM", and "PLAYBACK" inputs. If the record has an undesirable amount of very low frequency noise, place the "RUMBLE FILTER" switch on the "IN" position to reduce the noise. If this condition is permanent, check for acoustic feedback from the speaker to the turntable as described in the section on installation of pickups in the case of a malfunction of the turntable. If a record is worn and exhibits scratch noise, has noticeable hiss, turn the "SCRATCH FILTER" to the "ON" position. These filters operate in all positions of the "INPUT SELECTOR" switch.

I. The Phase Switch:

The "PHASE" switch is provided so that the phase relationship of the stereo channels may be reversed. This feature permits both speakers to be driven in the same manner that their sound reinforces at low frequency rather than cancels. At low frequency sounds tend to disappear, reverse the phase switch. This reverses the leads of one speaker at the power amplifier. Occasionally it may be found necessary to put this control in the reverse position when the speakers have been improperly phased. See the appendix for directions concerning the phase switch.

J. The Front Panel Indicator Lights:

These lights are used in conjunction with the settings of the "STATUS" switch and permit you to identify the setting of this control at a considerable distance from the preamplifier. The light patterns are as follows:

Balance A



Stereo



Balance B



Reverse Stereo



Monaural



Channel A



Channel B

● = ON

○ = OFF

○ ○

○ ●

K. Uncalibrated Level Controls at the Rear of the Preamplifier:

These controls have been provided at the rear of the amplifier for the purpose of matching various levels of the program material. The controls should be adjusted so that the outputs for all program material match the sound intensity available from the calibrated magnetic level control. More precise adjustments of these controls can be achieved through the following procedure:

- (1) Use program material of high quality which has a good distribution of treble and bass sound and is of fairly constant medium-loud volume. Orchestral music is best suited for this adjustment and listening is best done at a point equally distant from both loudspeakers. (This point should be chosen as the normal listening position.)
- (2) Set the "INPUT SELECTOR" control for the proper input, and turn the treble and bass controls of both channels to equal tonal balance from both loudspeakers (flat response).
- (3) Set the "VOLUME-LOUDNESS" switch to "VOLUME" and turn up both level and loudness controls so that the music is quite loud. Balance the speaker system level controls (these will be located on the speaker) if provided. This should be done on high quality multiple speaker systems before proceeding. If the speaker system has no balance controls, disregard this paragraph.
- (4) Adjust the "MAG. LEVEL" control located on the rear of the preamplifier to the proper setting as shown in the appendix.
- (5) Set the "LOUDNESS" control to 7, turn the "LOUDNESS-VOLUME" switch to "LOUDNESS", and note the tonal balance of the music. That is to say, its treble-bass relationships.
- (6) Set the "LOUDNESS" control to 3 and note again the tonal balance. If there is no change in the balance and only a change in the volume, the level controls of the power amplifiers are properly set. If there is too much bass the level controls are set too high; and if there is a lack of bass, the level controls are set too low.
- (7) Repeat steps D and E after resetting the level controls until there is no change in tonal balance.
- (8) The uncalibrated "LEVEL" controls of the preamplifier should be set to produce equal volume in all positions of the "INPUT SELECTOR" or "TAPE MONITOR" controls.

OPERATION

Before attempting to operate the preamplifier, read the description of each control carefully and make sure all the proper connections have been made. The

preamplifier will suffer no damage due to incorrect control settings or connections, but it is entirely possible that it will not operate with certain settings or connections.

NOTE: IMPROPER SETTING OF THE "PICKUP", "TAPE MONITOR", "STEREO SELECTOR" AND INTERNAL LEVEL CONTROLS WILL PREVENT THE SIGNAL FROM GOING THROUGH THE AMPLIFIER. IF NO SIGNAL CAN BE HEARD, MAKE SURE THAT THE SWITCHES ARE CORRECTLY SET AND THE INTERNAL LEVEL CONTROLS ARE NOT TURNED TO THEIR EXTREME COUNTER-CLOCKWISE POSITION.

A. Operation with Stereo Program Material:

The preamplifier is turned on by rotating the "LOUDNESS" control clockwise. The "INPUT SELECTOR" switch is turned to the inputs from which the program material will come. In the case of the low level inputs, the "PICKUP" switch is turned to either one or two according to whether the input to be used will be "MAG 1" or "MAG 2". In the case of a tape recorder playing through dual tape preamplifiers, the "TAPE MONITOR" switch is turned to playback. Otherwise, it is imperative that this switch always be kept in the "RECORD" position.

The "STEREO SELECTOR" switch is then turned to the "BAL A" position, then moved back and forth between the "BAL A" and the "BAL B" positions, and the "STEREO BALANCE" control is adjusted until the loudness from both speakers is equalized. The "STEREO SELECTOR" switch is then turned to the "STEREO" position. If the very low bass notes seem attenuated, reverse the "PHASE" switch, and see if this improves the bass response. If the stereophonic sound is reversed (as in the case of the orchestral first violin being to the listener's right as he is facing the speakers), change the "STEREO SELECTOR" switch to the "REVERSE STEREO" position.

B. Operating the Preamplifier with Monaural Program Material Other Than Records:

Set the "INPUT SELECTOR" and "TAPE MONITOR" switches for the inputs from which the program material will come. Set the "STEREO SELECTOR" switch to either "CHANNEL A" or "CHANNEL B" positions according to the channel from which the monaural sound is coming. Adjust the "STEREO BALANCE" control for equal volume from both speakers, and make sure that the "PHASE" switch is in the normal position. Adjust the tone controls and loudness controls for comfortable listening.

C. Using the Preamplifier for Monaural Recordings With a Stereo Pickup:

Set the "INPUT SELECTOR" switch for the proper recording equalization. Set the "STEREO SELECTOR" switch to the "MONAURAL" position. Set the "PICKUP" switch for the proper low level input. Set the "TAPE MONITOR" switch to record. Set the "STEREO BALANCE" control for equal volume from both speakers. Set the "PHASE" switch to the "NORMAL" position. If this switch is not correctly positioned, the recordings will not sound. Finally, adjust the "SCRATCH FILTER", "RUMBLE FILTER", tone controls and "LOUDNESS" control for most comfortable listening.

D. Using the Center Channel Output:

This output is used in conjunction with a third power amplifier and speaker to provide a source of sound midway between the left and right stereophonic speakers. This arrangement permits a continuous panorama of sound in front of the listener. Plug the center channel output into the third power amplifier, and place its speaker

midway between the left and right stereophonic speakers; and in the case of H. H. Scott power amplifiers, set the level control to 60. The center channel is not absolutely necessary for a stereophonic effect, but it does provide the absolute ultimate in performance.

The center channel may also be used to combine both stereophonic channels into a properly balanced monaural channel. This feature permits the use of the Type 130 preamplifier as a monaural preamplifier with a single power amplifier and speaker system while one is preparing to purchase a second power amplifier and speaker. For single channel operation, connect this output with the power amplifier

E. Operation of the Type 130 Preamplifier as an Electronic Crossover:

The preamplifier may be used as an electronic crossover when operated with two separate power amplifiers and a separate high frequency and low frequency speaker, both speakers being housed in the same cabinet. The high frequency speaker is connected into the appropriate output of the B channel power amplifier and the low frequency speaker is connected to the appropriate output of the A channel power amplifier. The controls are set in the same manner as they would be for monaural program material except that the channel A treble control and the channel B bass control are put in the crossover position. The "STEREO BALANCE" control is then used to balance the relative speaker outputs and the "CHANNEL A" and "BASS" and the "CHANNEL B" "TREBLE" controls are used to adjust the tone.

NOTE: IMPROPER SETTING OF THE "PICKUP", "TAPE MONITOR", "STEREO SELECTOR" AND INTERNAL LEVEL CONTROLS WILL PREVENT THE SIGNAL FROM GOING THROUGH THE AMPLIFIER. IF NO SIGNAL CAN BE HEARD, MAKE SURE THAT THE SWITCHES ARE CORRECTLY SET AND THE INTERNAL LEVEL CONTROLS ARE NOT TURNED TO THEIR EXTREME COUNTER-CLOCKWISE POSITION.

APPENDIX1. INSTALLATION OF PICKUPS

The manufacturer's directions should be followed carefully in all cases. We are listing some precautions and suggestions here to aid the user when such instructions are absent or incomplete.

A. The cable lengths on phonograph cartridges should be kept as short as possible to minimize shunt capacity which may cause high frequency peaks or roll-off and also minimize hum and noise pickup. At the same time, low capacity shielded cable should be used to reduce shunt capacitance. It is usually not wise to extend the total length of cable from the phonograph pickup to the amplifier more than six feet.

B. There are several causes of hum and noise pickup. These can be isolated by the process outlined below.

- (1) SYMPTOM - Loud hum and no signal from the phonograph cable when plugged into the amplifier; no hum when the cable is removed from the amplifier.

This is usually due to a poor connection, broken solder joint, broken lead or frayed wire. Check the phonograph cable's and pickup's leads and connections.

- (2) SYMPTOM - Low hum or buzz with signal coming through the phonograph lead. This sound remains whether the turntable motor is on or off and is not modified by changing the position of the tone arm.

This occurs most frequently when the arm or the turntable metal parts and motor shield are not grounded to the phonograph cable shield. Care must be exercised to insure that these are not grounded through two distant points lest a ground loop induce more hum into the system. This symptom also may be caused by running the phonograph cables parallel to power lines. These should be kept as far from low level leads as possible; and if it is necessary for power lines to cross the low level leads, cross them at right angles. This symptom may also occur in stereophonic cartridges with a common ground terminal. If this is the case, insert the plug of one of the stereophonic cartridges in such a manner that its collar does not touch the collar connection on the preamplifier. It is also desirable to twist the two cables coming from a stereophonic cartridge about each other so that no hum is induced because of magnetic pickup.

- (3) SYMPTOM - Low hum or buzz present when the turntable is rotating and absent when it is turned off. Hum varies in intensity when the pickup is moved about the turntable. This is usually caused by magnetic pickup from the field of the turntable motor. It can be controlled by increasing the shielding of the motor. Different pickups have different magnetic pickup characteristics. In some cases, therefore, it is necessary to change the phonograph cartridge to a different type or make to improve upon the hum level.

- (4) SYMPTOM - Low hum or buzz present when the turntable is both on and off. Hum varies in intensity when the cartridge is moved about.

B

This may be caused by magnetic fields from power transformers. Changing the position of the amplifiers or tuners with respect to the phonograph solves this problem. Never mount an amplifier or tuner immediately above or below a turntable if it can be avoided.

C. It is a good idea to keep the phonograph and amplifier as far away from the speaker as feasible. In some cases, air-borne vibrations are fed back from the speaker to the phonograph cartridge with the result that squeals or howls occur when the amplifier "LOUDNESS" control is turned above a certain setting. Usually this is an indication that the turntable is too close to the speaker. The problem can be solved by moving the phonograph and amplifier away from the speaker and, in some cases, by enclosing them.

D. Often sound energy is propagated through walls or floors with the result that the very low bass is increased greatly or the phonograph system develops excessive rumble even though all the components of the system are performing properly by themselves. In order to prevent this, isolate the speaker and the phonograph from the floor by means of felt, foam rubber or plastic. This will stop low frequency vibrations from being transmitted from the loudspeaker to the record changer or turntable. If the loudspeaker system is a corner horn that utilizes the wall to direct sound energy, be careful of mounting the phonograph in wall brackets or built-in bookcases. The phonograph and preamplifier should be mounted on a wall opposite to one of the two walls proximate to the speaker in this case. Mounting the loudspeaker on the same shelf as the phonograph and preamplifier or in the same bookcase is not recommended.

2. THE MAGNETIC LEVEL CONTROL

The "MAG LEVEL" control, which is located at the rear of the preamplifier, has been incorporated into the 130 for two reasons: The first is to adjust the phonograph level for uniform response with other inputs, and the second is to achieve full dynamic capability without either clipping with full treble or bass boost and offer at the same time the most favorable signal-to-noise ratio. By adjusting all signal levels and achieving uniformity of response, we can maintain proper loudness compensation when using the "LOUDNESS" control in its normal settings and when the "VOLUME-LOUDNESS" switch is turned to the "LOUDNESS" position.

The correct setting of the "MAGNETIC LEVEL" control is found by either of two methods. The first method is the more accurate.

- A. Using the pickup chart which assigns exact values to most frequently encountered pickups. At the time of this publication we have been unable to obtain adequate data concerning stereophonic pickups. This data will be available in October of 1958.
- B. Using the sensitivity graph when the pickup output is known.

LEVEL SETTING CHART

| <u>TYPE</u> | <u>LEVEL</u> |
|-------------------------------|--------------|
| Audax Polyphase | 24 |
| SL C-60 (without transformer) | 77 |

| <u>TYPE</u> | <u>LEVEL</u> |
|---|-----------------|
| ESL Standard (without transformer) | Not recommended |
| ESL Standard (with 201 or 201M, 50 ohm output) | 89 |
| ESL Standard (with 201 or 201M, 200 ohm output) | 53 |
| ESL Standard (with 201F) | 53 |
| ESL Standard (with 301 or 301M) | 24 |
| ESL Standard (with 211) | Not recommended |
| ESL Professional (without transformer) | Not recommended |
| ESL Professional (with 201 or 201M, 50 ohm output) | 73 |
| ESL Professional (with 201 or 201M, 200 ohm output) | 35 |
| ESL Professional (with 201F) | 35 |
| ESL Professional (with 211) | Not recommended |
| ESL Professional (with 301 or 301M) | 18 |
| Fairchild 215 (without transformer) | Not recommended |
| Fairchild 215 (with 235 or 826) | 63 |
| Fairchild 220A (without transformer) | 100 |
| Fairchild 220A (with 235 or 826) | 38 |
| Fairchild 220B (without transformer) | 92 |
| Fairchild 220B (with 235 or 826) | 28 |
| Fairchild 225 (without transformer) | 92 |
| Ferranti (with FA-21) | 28 |
| General Electric RPX-040 | 34 |
| General Electric RPX-041 | 34 |
| General Electric RPX-046 | 49 |
| General Electric RPX-052 | 34 |
| General Electric VR-II | 41 |
| Grado (without transformer) | 100 |
| Miratwin MST-1 (33 RPM) | 21 |
| Miratwin MST-1 (78 RPM) | 24 |
| Miratwin MST-2 (33 RPM) | 21 |
| Miratwin MST-2 (78 RPM) | 24 |
| Norelco | 27 |
| Pickering 120 | 22 |
| Pickering 140 | 22 |
| Pickering 194 | 58 |
| Pickering 220 | 31 |
| Pickering 240 | 31 |
| Pickering 260 | 31 |
| Pickering 350 | 36 |
| Pickering 370 | 45 |
| Shure Dynetic M1 | 63 |
| Shure Dynetic M2 | 63 |
| Shure Dynetic M5 | 45 |

D

| <u>TYPE</u> | <u>LEVEL</u> |
|---------------------|--------------|
| Shure Dynetic M6 | 45 |
| Shure Dynetic M12 | 63 |
| Shure Dynetic M16 | 63 |
| Tannoy Variluctance | 53 |

LEVEL SETTINGS WHEN CARTRIDGE SENSITIVITY
IS GIVEN BY THE MANUFACTURER

The correct level setting of an amplifier may be found from the chart, Figure 1, if the sensitivity of a pickup is given by the manufacturer. These specifications are expressed in the form of a millivolt output for a given velocity at 1000 cycles per second. Usually the velocity is determined by a test record; but, since there has been no standard chosen, the data must be put through the following formula in order to translate it into the proper factor for use with the charts.

$$\frac{e}{v} \times 4.4 = e$$

e Millivolts at given velocity

e Millivolts at velocity of 4.4 centimeters/second

v Given velocity

EXAMPLES

Cartridge has 30 millivolts output at 10 centimeters/second

1. a. $\frac{30}{10} \times 4.4 = 13.2$

b. Level setting for 130 is 30

Cartridge has 1.5 millivolts/centimeter/second.

2. a. $\frac{1.5}{1} \times 4.4 = 6.6$

b. Level setting for 130 is 60

Ask the pickup manufacturer for the correct sensitivity if the cartridge is not listed in the preceding chart. Supplementary instructions for the stereophonic cartridges will be available in October, 1958.

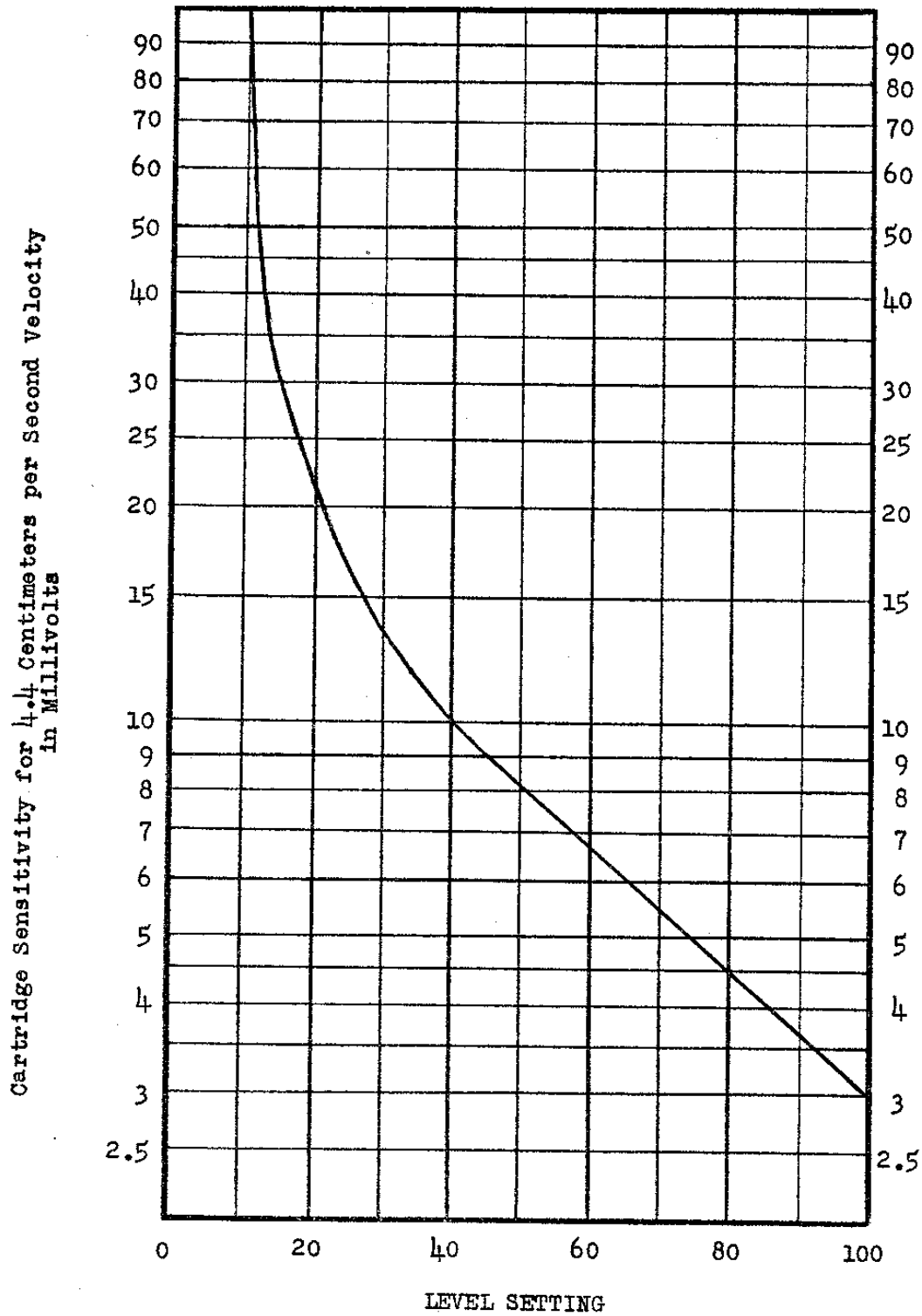


Figure 1 - Magnetic Level Settings

3. PHASING THE LOUDSPEAKERS

Proper phasing of both left and right loudspeakers are necessary in stereophonic installations in order that low frequency sounds are not cancelled out by speakers that are working in opposition to each other. When these speakers are out of phase, the very low notes are apt to be severely attenuated. Use the following procedure to make this adjustment:

- A. Put a monaural signal of very low frequency (between 30 and 70 cycles) into the preamplifier and set the "STEREO SELECTOR" switch to "CHANNEL A" or "CHANNEL B" according to the placement of the input, and set the "PHASE" switch to the "NORMAL" position.
- B. Adjust the two-speaker systems for equal output.
- C. Place your head exactly between both speaker systems and listen to the intensity of the sound.
- D. Change the "PHASE SWITCH" to the "REVERSED" position. Once again, place your head exactly between the two speakers and note the intensity of the sound. If the sound is more intense in the "NORMAL" position of the "PHASE" switch, the speakers are correctly phased. If, on the other hand, the sound is more intense when the "PHASE" switch is in the "REVERSED" position, the speakers are incorrectly phased. If the speakers are incorrectly phased, reverse the leads of one of the speakers and try again.
- E. This completes the phasing adjustment. Check this adjustment at various other frequencies to insure that it is correct.

4. HUM ADJUSTMENT POTENTIOMETER

The hum adjustment potentiometer is provided in the 130 for the purpose of reducing 60 cycle hum on the low level inputs. If the hum on these inputs is excessive, rotate this potentiometer until the hum is minimized. If the hum continues to be excessive, refer to the section on Installation of Phonograph Pickups in which methods of reducing hum are given.

Figure - 2

Typical Wiring of Inputs of Preamplifier

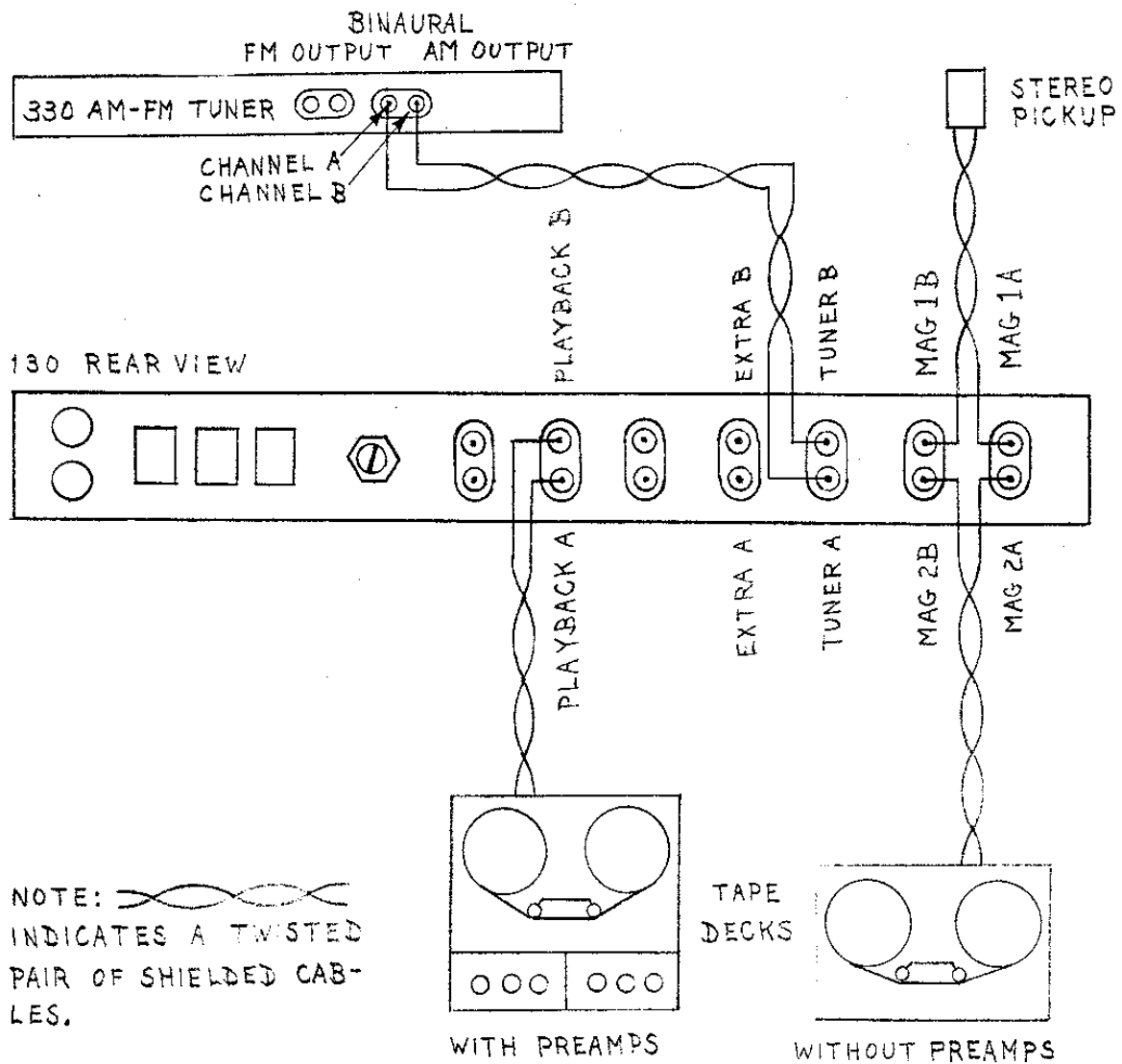
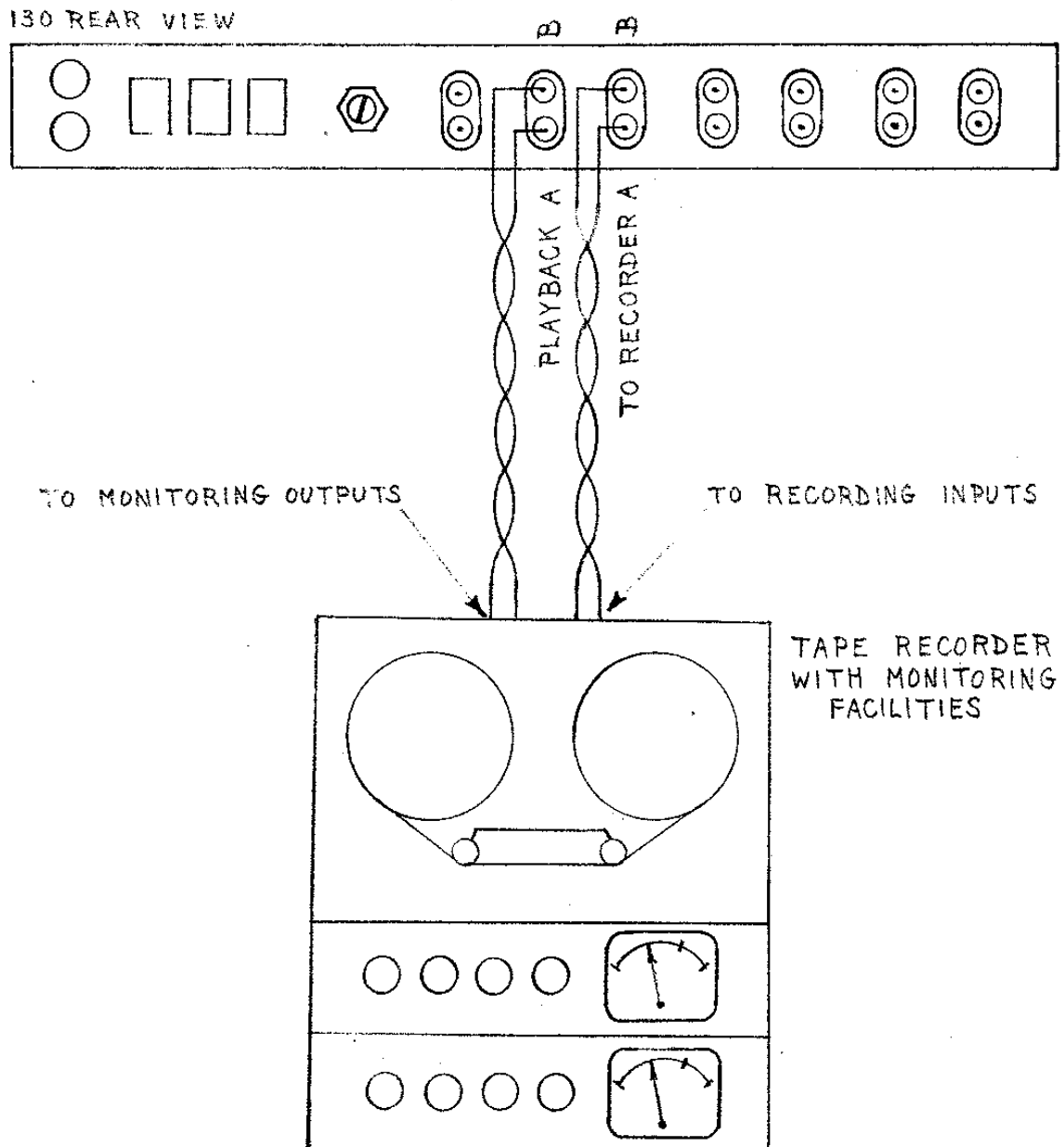


Figure - 3



Typical Wiring of Tape Recorder with Monitor Provisions

Figure - 4

Typical Wiring of Main Outputs (Stereophonic Operation)

NOTE: THE CENTER CHANNEL IS NOT NECESSARY FOR GOOD RESULTS

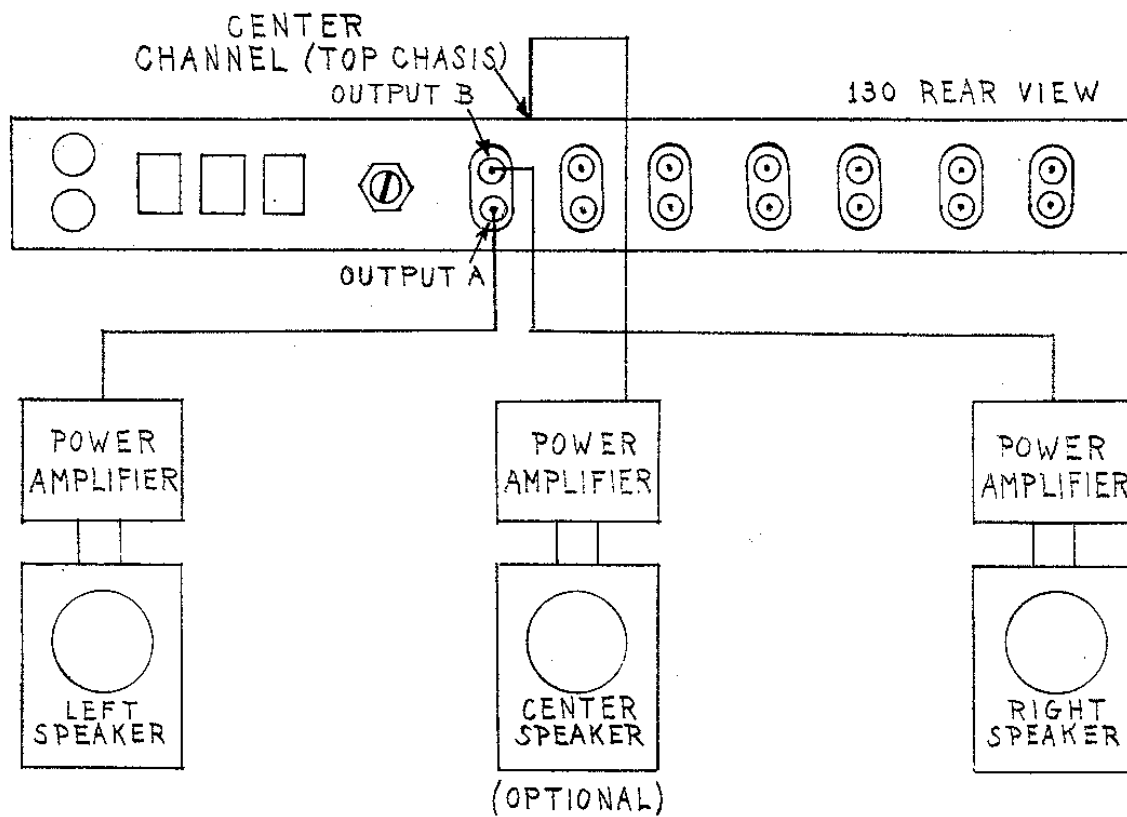
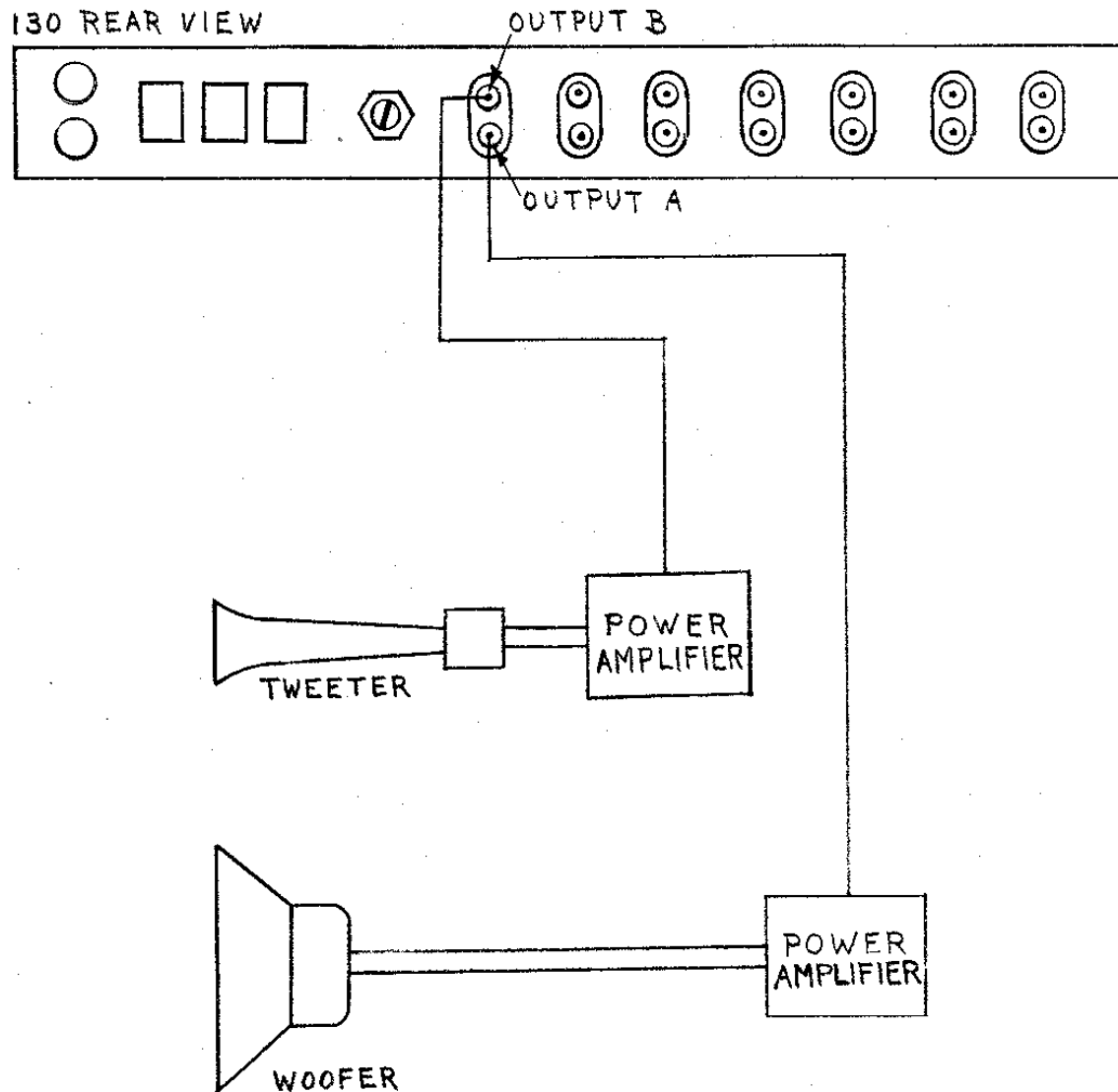


Figure - 5

Typical Wiring of Main Outputs (Crossover Operation)



NOTE: SET TONE CONTROLS TO THEIR CROSSOVER POSITIONS.

NOTE: CHOOSE A TWEETER AND WOOFER TO PERMIT A CROSSOVER OF 800 CPS. SOME VARIATION IS PERMISSIBLE.

IMPORTANT
SUPPLEMENTARY INSTALLATION INSTRUCTIONS

The Model 130 Stereo Preamplifier is a flexible, wide range instrument. It is the highest gain preamplifier available - giving an output of 2.5 volts with an input of only 3 millivolts. This high gain permits direct use of very low level pickup cartridges and tape heads.

The high gain of the 130 makes it absolutely necessary for the power amplifiers with which the unit is to be used to each have an input level control and that this input level control be correctly adjusted. Otherwise, poor tracking of the loudness control at low listening levels and hum and noise may result. The following procedure should be followed for correctly adjusting the power amplifier input level control:

First, it is necessary to adjust the MAG LEVEL control of the 130. Most magnetic stereo pickups have very low outputs, in the 3 to 4 millivolt range. This means that for these pickups, the 130 MAG LEVEL control must be set between 80 and 100. An exception at this time is the "Stereotwin 200" pickup, which requires a MAG LEVEL setting of 60.

After the MAG LEVEL control is correctly set, play a record with the 130 STEREO SELECTOR switch in the MONAURAL position. The input level control of each power amplifier should be adjusted so that normal living room listening volume is obtained with the LOUDNESS control of the 130 set to approximately 5. Fine adjustment of the power amplifier input level control can be made by listening successively at 130 preamplifier LOUDNESS control settings of 3 and 7 (LOUDNESS switch of the 130 should be at L) and listening for bass and treble response at each of the two settings. If there is an apparent increase in bass response at the 3 setting, the power amplifier controls are set too high and should be reduced until no apparent increase in bass response is noticeable.

