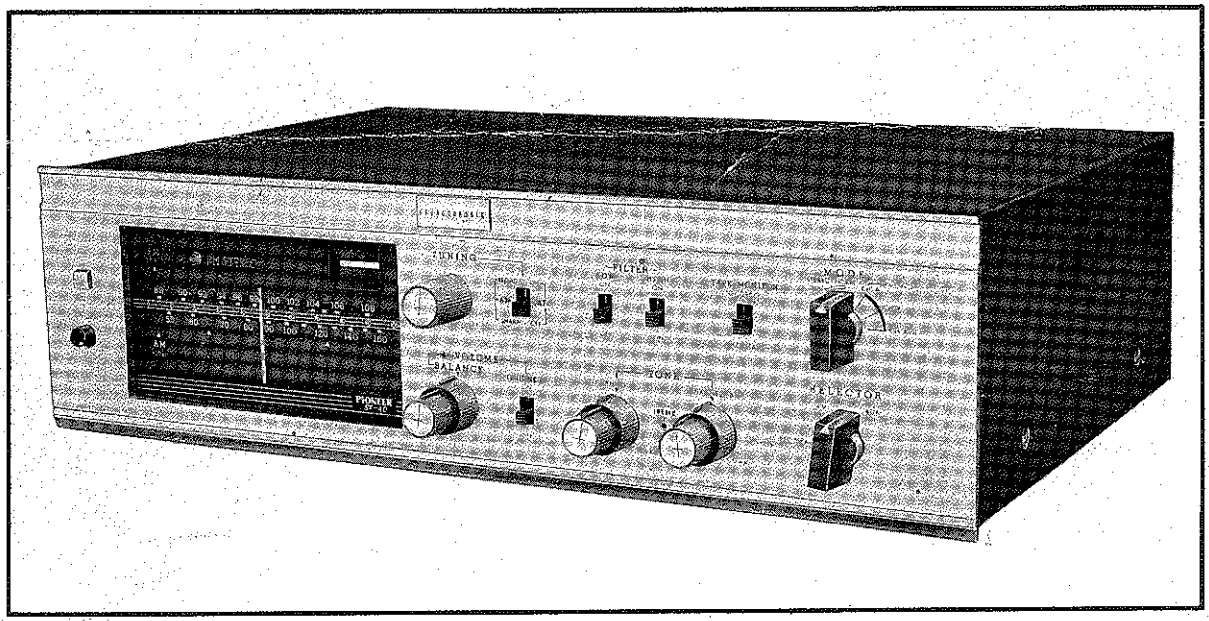
PIONEER®

AM/FM MULTIPLEX RECEIVER SX-40

THE SX-40 - ITS FEATURES

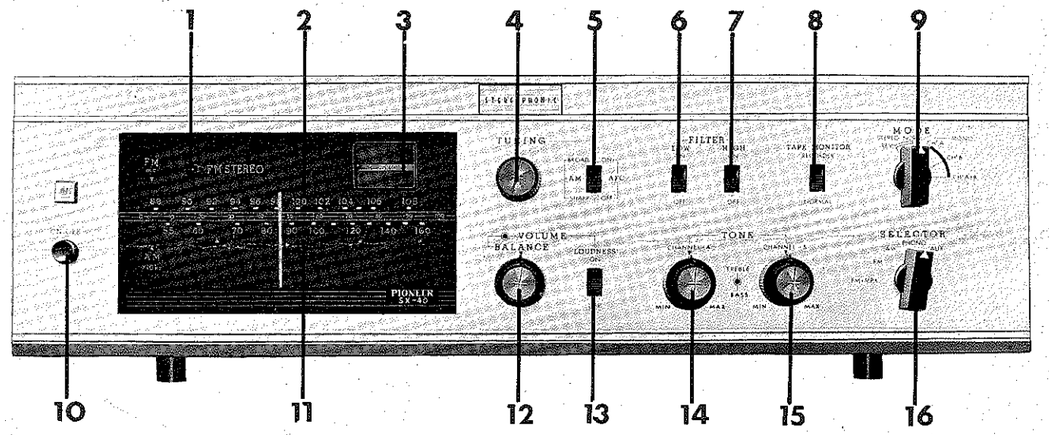
- Combines versatility in performance with simplicity in operation - its three tuner circuits provide reception of AM, FM, and FM stereo broadcasts; its efficient audio section is capable of handling virtually all types of external program inputs including disc and tape recordings; and its full range of supplementary circuits ensure optimum reproduction under all conditions and circumstances; yet its carefully planned placement of controls and well-designed circuitry enable simple and trouble-free operation.
- The tuner sections feature extremely high sensitivity, and outstanding channel separation in stereo reception; and the power output section provides 20 watts per channel, ample for the largest systems.
- The old adage against judging a book by its cover is torn asunder in the SX-40, for its superb overall performance is fully matched by its clean and functional external appearance, making it a handsome addition to any room, with its subdued yet rich and solid lines.

INSTRUCTION MANUAL



PIONEER ELECTRONIC CORPORATION

FUNCTIONS OF THE KNOBS AND SWITCHES ON THE FRONT PANEL



1. STEREO INDICATOR LIGHT

With the SELECTOR switch set to the FM MPX position, the stereo indicator light will go on when an FM station transmitting an FM stereo broadcast is tuned in. However, the stereo indicator light will not function when the SELECTOR switch is set to any position other than the FM MPX position.

2. DIAL SCALE - FM TUNER - THE POINTER

The pointer that is coupled to the TUNING control (4) indicates the frequencies for FM broadcasts on the upper section of the dial scale. The FM tuner has a tuning range of 88 to 108 megacycles.

3. TUNING INDICATOR

The tuning indicator is a 'magic eye' type indicator for the FM and AM tuners, and it serves to indicate the correct tuning point of broadcast transmissions as stations are tuned in by manipulating the TUNING control (4). The point where the shadowed portion of the indicator closes down to a minimum for that particular station is the tuning point. (If the shadowed portion does not close down very much, and there is a lot of static in the reception, this is an indication that the antenna input is inadequate. When using only the built-in ferrite loopstick antenna, try rotating the antenna for improved reception. When using the external lead antenna, extend the length of the lead wire.)

4. TUNING

This is the tuning control for the FM and AM tuners.

5. BROAD/SHARP/AFC SWITCH

In AM reception, this switch serves as an IF bandwidth selector. For quality broad bandwidth reception, it should be set to the BROAD position (which provides an IF bandwidth of ±9 kc.), while for maximum selectivity, it should be set to the SHARP position (which provides an IF bandwidth of ±3 kc.).

In FM reception, it serves as the AFC defeat switch. The station should first be tuned in with the switch set to the OFF position, and then the switch should be set to the ON position. This ensures stable reception over sustained periods of time without any station drift.

When a weak station on a channel adjacent to a much stronger station is being tuned in, the AFC switch should be turned to the "OFF" position to prevent the stronger station from pulling the tuning away from the desired weaker station.

6. FILTER - LOW

If there are marked 'rumble' noises emanating from the turntable drive in disc record playback, or if there is excessive noise in the low frequency ranges of the record itself, this switch should be set to the ON position. It provides 10 db of attenuation at 50 cps, for noise-free reception.

7. FILTER - HIGH

If in playback of disc records there is excessive crackling or hissing, this switch should be set to the ON position. It provides 15 db of attenuation at 10,000 cps, for enjoyable reproduction. Also, if there is excessive static in reception of radio broadcasts, setting this switch to the ON position will alleviate the noise to some extent.

8. TAPE MONITOR

This switch is of value when making recordings or playing back recordings using a tape recorder. Please refer to the paragraph on Using Tape Recorder With SX-40' for details on its function. When this function is not being used, this switch must always be set to the NORM position.

9. MODE

This is the selector switch that provides selection of modes of reproduction: stereophonic, monophonic or Channel A and Channel B.

STEREO REV provides reversing of the channels (when the left and right channel signals are to be fed to the opposite speakers);

STEREO NORM provides normal stereophonic reproduction;

MONO CH. A provides reproduction of signals of Channel A only;

MONO CH. B provides reproduction of signals of Channel B only;

MONO CH. A+B provides simultaneous reproduction of monophonic material over both channels.

10. POWER SWITCH

This is the AC power switch for the amplifier. It is a push-button type switch.

11. DIAL SCALE - AM TUNER

The pointer that is coupled to the TUNING control (4) indicates the frequencies for AM broadcasts on the lower section of the dial scale.

12. VOLUME - BALANCE

The outside control of the dual concentric knob is the volume control for the amplifier. It is a coupled control providing simultaneous control of both A and B channels.

The inside control of the dual knob is the balance control for the two channels. If the left channel is too low in volume level, this control should be turned counter clock-wise, while if the right channel is too low, then it should be turned clockwise, to achieve the correct balance.

13. LOUDNESS

One of the characteristics of the human ear is the fact that at low volume levels, its sensitivity deteriorates at high and low frequencies. The LOUDNESS control is a low and high frequency boosting control that is incorporated to compensate for this characteristic. When listening at low volume settings, this switch should be set to the ON position for full frequency range reproduction with depth and brilliance.

14, 15. TONE CONTROLS

The outside controls of the dual concentric knobs are the bass controls, and the inside controls are the treble controls. Control (14) is for Channel A, and Control (15) is for Channel B.

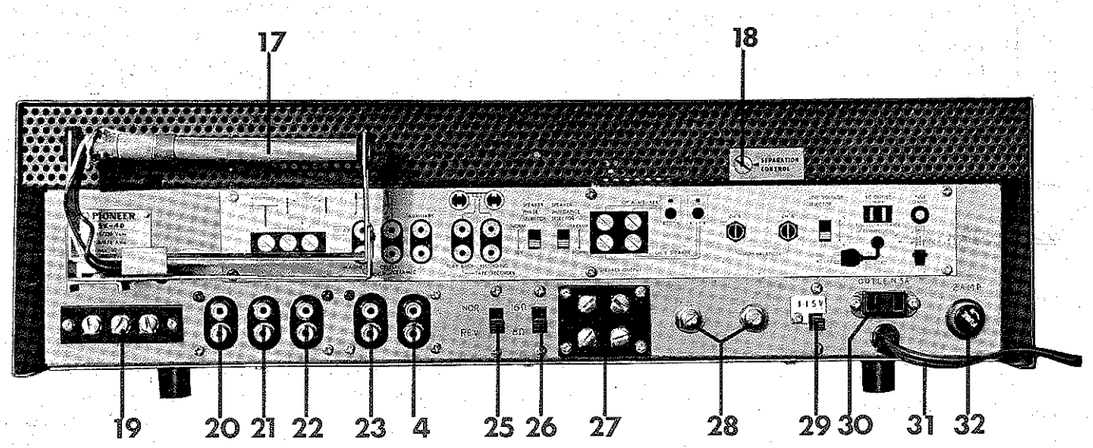
The bass controls each provide +14 db of boost to −13 db of attenuation at 50 cps, while the treble controls each provide +11 db of boost to −13 db of attenuation at 10,000 cps.

16. SELECTOR

This is the input selector switch of the SX-40. It provides selection of program source: disc records, or radio broadcasts, and its positions are:

FM MPX	For FM multiplex stereo
FM	For FM broadcast reception
AM	For AM broadcast reception
PHONO	For disc record playback
AUX	Auxiliary input circuit for external program sources.

TERMINALS AND SOCKETS ON REAR OF AMPLIFIER



17. FERRITE LOOPSTICK ANTENNA

This antenna is for AM reception only. It provides reception of local AM stations of strong signal strength without the use of an external antenna. This ferrite loopstick antenna has directional properties, so it should be moved around both on vertical and horizontal planes, and secured in the position providing optimum reception.

18. SEPARATION CONTROL

This control serves to adjust the separation of the two channels in FM multiplex stereo. The circuit has been fully adjusted prior to shipment from the factory, and so there should be no need for any further adjustments. Should the need arise for adjustment, however, first identify and establish the position it is in initially, and then turn it 90° to the left and right, to find the position of optimum separation. Nonetheless, this circuit is extremely delicate, and therefore, it should be adjusted wherever possible by a qualified service engineer using proper instruments.

19. ANTENNA TERMINAL STRIP

For optimum reception of both FM and AM radio broadcasts, proper aerials should be used. If proper reception cannot be obtained, or if there is so much static or other noise that hearing is severely impaired, the chances are that it can be attributed to inadequate antenna input.

Reading from the left, the first terminal is the FM antenna terminal. Each of the two leads from the antenna - whether it is the indoor antenna that is provided with your SX-40 or an outdoor FM antenna - should be connected to this and the ground terminals respectively. Sensitivity of FM reception varies according to the positioning of the antenna elements. When using the indoor antenna, the horizontal T-shaped elements should be spread out, and then rotated on a horizontal plane and fastened in place using adhesive tape to the wall or ceiling in that position.

In regions of weak signal strength, at long distances from stations, it is recommended that a proper outdoor FM antenna be put up.

20. MAGNETIC PICKUP INPUTS

The pickup cable plugs should be plugged into these input jacks when a magnetic pickup cartridge is being used. Magnetic pickups provide excellent reproduction, but they have extremely low outputs, and are exceptionally susceptible to hum induction and other external noise, so care should be taken in making the connections.

21. CRYSTAL-CERAMIC PICKUP INPUTS

When a crystal or ceramic pickup cartridge is being used, the pickup cable plugs should be plugged into these input jacks. Crystal or ceramic pickups have high outputs and are not as susceptible to hum induction as magnetic types, but still, the leads should not be extended too long as this may affect tonal quality and some hum may be picked up.

22. AUXILIARY

These are auxiliary inputs for use when connecting outputs from external tuners or other sources to the SX-40. The signals should have 300 millivolts or more of input strength.

23. TAPE PLAYBACK INPUTS

By connecting the LINE-OUT outputs of tape recorders to these inputs, high fidelity tape playback can be obtained.

24. TAPE RECORDING OUTPUTS

By connecting these outputs to the LINE INPUTS of a tape recorder, it is possible to make simultaneous recordings on tape of radio broadcasts or disc recordings.

25. SPEAKER PHASE SELECTOR

If the speakers have been connected to the wrong channel outputs, the connections can be reversed simply by moving this switch. The positions are:

NORMAL — For normal connections
REVERSE — Reverses channels

26. SPEAKER IMPEDANCE SELECTOR

This switch should be set to the position providing the proper impedance for the speakers being used, to either the 8 ohm or the 16 ohm position.

27. SPEAKER OUTPUTS

The two upper terminals are for Channel A, and the two lower terminals are for Channel B. The positive leads of the speakers should be connected to the righthand terminals, and the negative leads of the speakers should be connected to the lefthand terminals.

If the positive and negative leads are connected to the wrong terminals, reproduction of stereophonic signals will be very poor. In such cases, setting the SPEAKER PHASE SELECTOR switch (25) to the REVERSE position will remedy the error and provide proper reproduction.

The SPEAKER IMPEDANCE SELECTOR switch (26) should be set to either the 8 ohm or the 16 ohm position, depending upon the speakers' impedance values.

28. HUM BALANCE

This is a control that serves to keep hum down to a minimum. It is of course set to the optimum position of minimum hum before the amplifier leaves the factory, but even better results may be achieved if it is readjusted for minimum hum after the record player has been hooked up.

29. VOLTAGE SELECTOR

This is the AC power voltage selector. The SX-40 can operate off either 115 volts or 230 volts AC, by setting this switch to the appropriate voltage.

30. AC OUTLET

This outlet serves as a convenient source of AC power for a record player or a tape recorder. It should be noted that this power outlet is not controlled by the POWER SWITCH (10) of the amplifier, and remains 'live' even when the power switch is switched off.

31. AC CORD

This is the AC power cord for the power supply of the amplifier.

32. FUSE HOLDER

This contains the fuse inserted in the power circuit of the amplifier. Turning the cap of the fuse holder in the direction of the arrow will remove the cap and enable replacement of the fuse. The fuse is a standard two ampere fuse.

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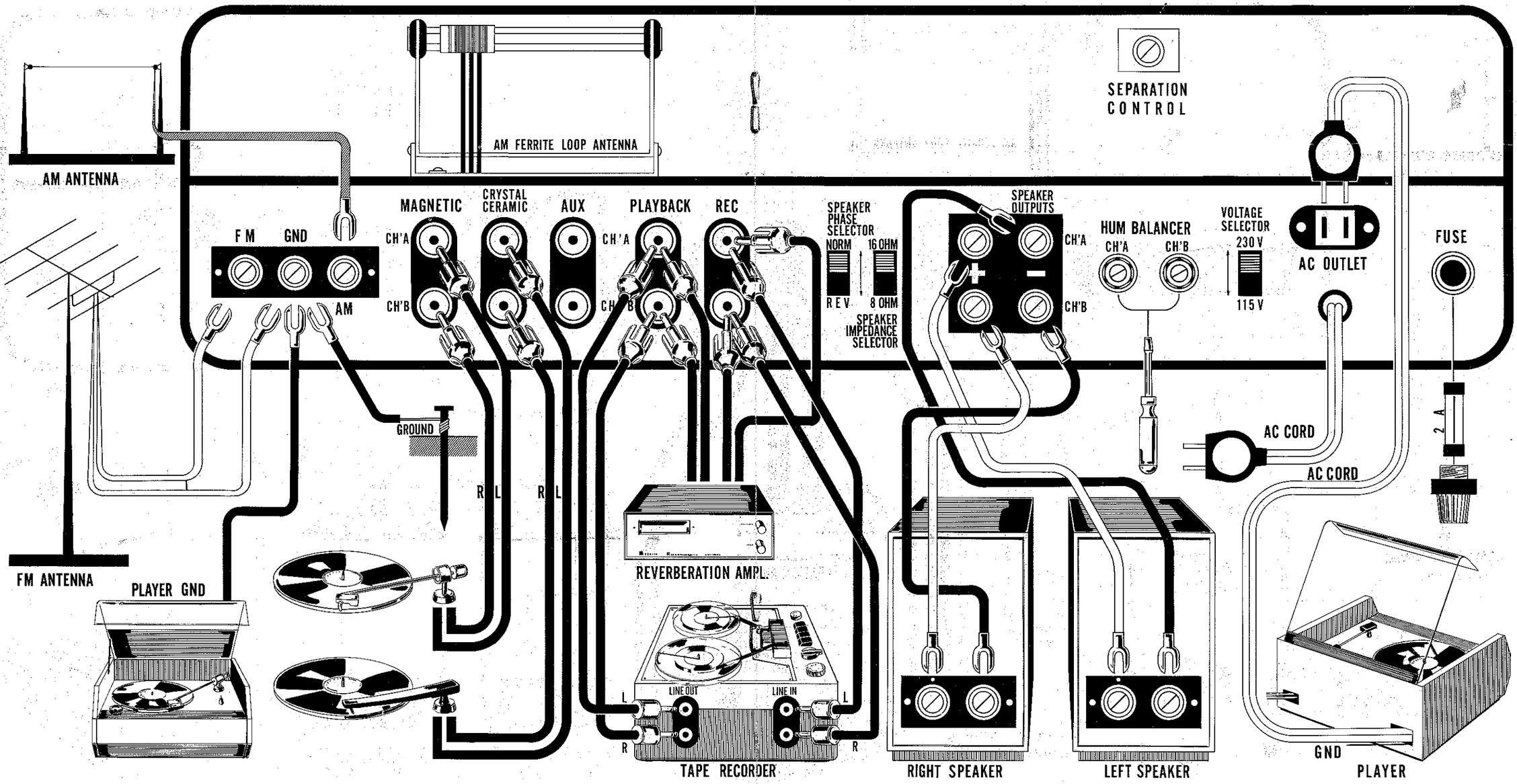
CONNECTING DIAGRAM



		POSITIONS OF CONTROLS ON FRONT PANEL					REAR CONNECTIONS FOR AMPLIFIER			NOTES	
		MODE (9)	SELECTOR (16)	BROAD-SHARP AFC SWITCH (5)	FILTERS (6, 7)	TAPE MONITOR (8)	MAG (20) CRYSTAL/CERAMIC (21)	REC (24) PLAYBACK (23)	AUX (22)		
FM RECEPTION	MONO	CH. A or CH. A+B	FM	AFC SWITCH OFF when tuning in station ON when station tuned in	ON or OFF	NORMAL				Use proper multiplex element FM antenna for reception of weak stations Stereo indicator light will go on when FM stereo station is tuned in with SELECTOR set to FM MPX position	All upper input and output jacks are for left channel (Channel A) and all lower input and output jacks are for right channel (Channel B)
	STEREO	NORMAL or REVERSE	FM MPX								
AM RECEPTION		MONO CH. A or CH. A+B	AM	BROAD except when excessive noise prevalent	ON or OFF	NORMAL				Use outdoor antenna for weak signals	
RECORD PLAYER	MONO	MONO CH. A, CH. B or CH. A+B	PHONO		ON or OFF	NORMAL	Pickup cable connected both MAGNETIC PICKUP JACKS (20) when using magnetic cartridge, and CRYSTAL/CERAMIC PICKUP JACKS (21) when using crystal or ceramic cartridge.			Input required for 20 watts output per channel is 2.3 mv. If record player has separate ground lead, connect it to the GROUND terminal	
	STEREO	NORMAL or REVERSE					Pickup cables connected to upper and lower MAGNETIC PICKUP JACKS (20) when using magnetic cartridge, and CRYSTAL/CERAMIC JACKS (21) when using crystal or ceramic cartridge.				
MAKING TAPE RECORDINGS		Set to position providing desired mode of operation		FM RECEPTION AFC - ON or OFF AM RECEPTION BROAD or SHARP	ON or OFF	When not monitoring RECORDER When monitoring NORMAL		Tape recorder LINE INPUTS are connected to RECORDING JACKS (24)		Filters, volume control, and tone controls do not function	
PLAYING BACK TAPE RECORDINGS	WHEN UTILIZING TAPE RECORDER LINE OUTPUT	Set to position providing desired mode of operation			ON or OFF	RECORDER		Tape recorder LINE OUTPUTS are connected to PLAYBACK JACKS (23)			
WHEN USING AUXILIARY INPUTS	MONO	MONO CH. A, CH. B or CH. A+B	AUX		ON or OFF	NORMAL			Signal is fed to CH. A or CH. B jack of AUX INPUT JACKS STRIP (22)		
	STEREO	NORMAL or REVERSE							Signals are fed to CH. A and CH. B jacks of AUX INPUT JACK STRIP (22)		

ASSEMBLING A SYSTEM

CONNECTING SPEAKER SYSTEMS

1. Speakers have positive and negative leads, and if these connections are reversed, the phases of the speakers will be reversed and signals will sound unnatural. Care should be taken therefore to see that the speaker systems are hooked up properly.

   Normally, the positive terminals of speakers either have a plus (+) symbol or a red or white coding mark.
2. The positive terminal of the lefthand speaker and the upper positive terminal of the SPEAKER OUTPUT terminal strip (27) should be hooked together. The negative terminal of the same speaker should then be connected to the upper negative terminal of the SPEAKER OUTPUT terminal strip (27).
3. The righthand speaker should also be hooked up in the same fashion, only to the two lower terminals of the SPEAKER OUTPUT terminal strip (27).

   Good quality heavy cables should be used for the speaker connections.

CONNECTING RECORD PLAYER

First of all, determine just where you plan to install the record player. The closer the amplifier and the record player are, the better, but at the same time, depending upon where they are located in relation to each other, there is the risk of the record player picking up hum from the power transformer of the amplifier, so this point should be borne in mind also. The power transformer of the SX-40 is on the lefthand side of the amplifier chassis, so the record player should, if possible, be placed on the righthand side of the amplifier.

WHEN USING MAGNETIC PICKUP

When using a record player equipped with a magnetic cartridge pickup, the shielded coaxial cable for the lefthand channel from the magnetic pickup should be connected to the upper phonograph input jack of the MAGNETIC PICKUP INPUTS (20) and the cable for the righthand channel connected to the lower phonograph input jack.

WHEN USING CRYSTAL OR CERAMIC PICKUP

When using a record player equipped with a crystal or ceramic cartridge pickup, the shielded coaxial cable for the lefthand channel from the pickup should be connected to the upper phonograph input jack of the CRYSTAL-CERAMIC PICKUP INPUTS (21), and the cable for the righthand channel connected to the lower phonograph input jack.

OPERATION OF SX-40

TO LISTEN TO RADIO BROADCASTS

AM BROADCASTS

AM broadcasts can be received with the MODE switch (9) set to any of the following positions: STEREO NORMAL, STEREO REVERSE, MONO CHANNEL A or A+B. Normally, it is recommended that the MODE switch be set to the MONO CHANNEL A position.

1. The SELECTOR switch (16) is set to the AM position.
2. The MODE switch (9) is set to the MONO CHANNEL A position.
3. The TUNING control (4) is then manipulated to tune in the desired station.
4. The point where the image of the 'magic eye' tuning indicator closes down to a minimum is the tuning point.

FM BROADCASTS

1. The SELECTOR switch (16) is set to the FM position.
2. The MODE switch (9) is set to the MONO CHANNEL A position.
3. The TUNING control (4) is then manipulated to tune in the desired station.

FM MULTIPLEX BROADCASTS

The SX-40 features a built-in FM multiplex adaptor circuit, and this circuit can be activated by operation of the front controls alone.

1. The SELECTOR switch (16) is set to the FM MPX position.
2. The MODE switch (9) is set to the STEREO NORM or REV positions.
3. The TUNING control (4) is then manipulated to tune in the desired station.

The effective range of FM multiplex transmissions as compared to the range of ordinary monaural FM transmissions is considerably smaller. Therefore, there may be times (or places) where it is possible to receive monaural transmissions with satisfactory results but not FM multiplex transmissions.

Unlike the reception of monaural transmissions, an extra high antenna input is required for good reception of FM multiplex transmissions. Without adequate input, overall results will be poor, with excessive noise and possibly distortion. Therefore, in regions of weak signal strength in FM multiplex reception, instead of using a simple indoor antenna, a proper outdoor FM antenna should be used for good reception.

SIMULTANEOUS RECORDING

1. Stereophonic Recording
   The upper and lower TAPE RECORDING OUTPUTS (24) should be connected by shielded coaxial cables to the tape recorder.
   Monophonic Recording
   The upper or the lower of the two TAPE RECORDING OUTPUTS (24) are connected by shielded coaxial cable to the input of the tape recorder.
2. The TAPE MONITOR switch (8) on the front panel is set to the NORMAL position.
3. The signals being reproduced by the amplifier are fed at all times to the TAPE RECORDING OUTPUTS (24), at a constant level regardless of the volume setting of the amplifier. Therefore, all recording adjustments should be made using the recorder controls.

PHONOGRAPH RECORD PLAYBACK

Reproduction of Stereophonic Long Playing Records

1. The SELECTOR switch (16) is set to the PHONO position.
2. The MODE switch (9) is set to the STEREO NORM position.

Reproduction of Monophonic Long Playing Records

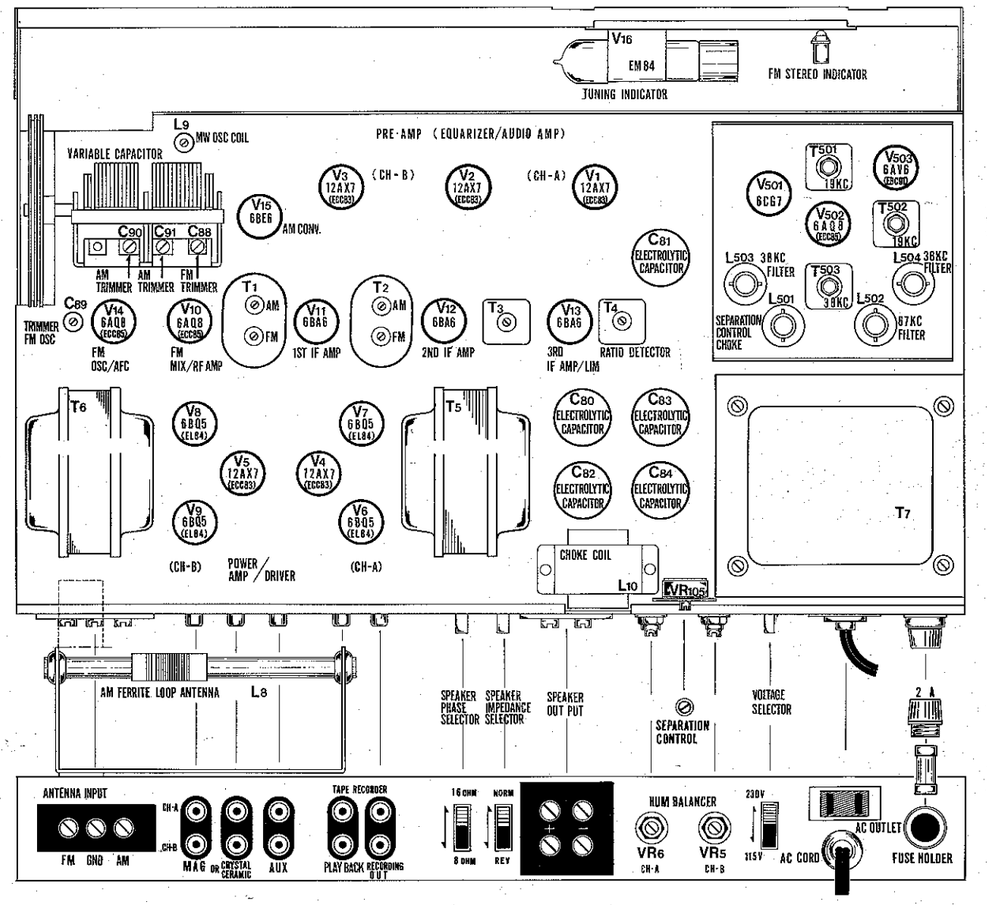
When using only the lefthand channel, the MODE switch (9) should be set to the MONO CHANNEL A position, while when using only the righthand speaker, it should be set to the MONO CHANNEL B position. When both speakers are to be used, it should be set to the MONO A+B position.

Using a tape recorder in conjunction with the SX-40, it is possible to record on tape radio broadcasts or disc records simultaneously while listening to these program sources, or enjoy high fidelity reproduction of tape recordings.

HIGH FIDELITY REPRODUCTION OF TAPE RECORDINGS

1. The output of the tape recorder is connected to the TAPE RECORDER PLAYBACK inputs (23) by shielded coaxial cable.
2. The TAPE MONITOR switch (8) is set to the RECORD position, and the volume control of the SX-40 then adjusted to an appropriate level.

LAYOUT OF COMPONENTS OF SX-40



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JM-05E01K

PRINTED IN JAPAN