SOLID STATE AM/FM STEREO RECEIVER

SX-828

FW
KCW
KUW
FVZW

OPERATING INSTRUCTIONS

PIONEER®

FEATURES

FET-EQUIPPED FM FRONT END

The MOS type FETs in the 2-stage FM RF amplifier result in excellent sensitivity, selectivity, signal-to-noise ratio and a remarkable freedom from cross-modulation distortion and spurious noise.

ADVANCED FM TUNER AND STEREO SEPARATION CIRCUITS

The FM IF stage is equipped with three ICs (integrated circuits) and an equal number of solid state ceramic filters for stable operation and maximum selectivity. The FM MPX decoder operates according to the highly accurate time switching principle and is provided with an integrated circuit. The 38kHz MPX switching frequency is sharply suppressed by an effective LC/RC complex filter circuit.

EFFECTIVE FM MUTING SWITCH

Unwanted, irritating inter-station noise on FM is eliminated by the FM MUTING switch. This circuit, equipped with an FET, also cuts out useless, too-weak FM station signals, leaving only strong stations in high-quality reception.

AM TUNER WITH SENSITIVE FERRITE ANTENNA

To provide high reception sensitivity on AM, too, a ferrite loopstick antenna and a tuned RF amplifier circuit are provided.

PRECISION-ENGINEERED OCL AMPLIFIER

The audio amplifier is characterized by its extremely wide frequency response, its great power bandwidth, its low distortion figures and superb signal-to-noise ratio. It is exclusively equipped with low-noise silicon transistors. All power amplification stages are directly coupled, the output stage is OCL and the power supply is a balanced positive-negative type. Loudspeakers and output transistors are protected against shortcircuits by a fully electronic sensing circuit with relay.

FULL CHOICE OF PROGRAM SOURCES

All standard program sources can be connected, including two turntables, two tape decks, and an auxiliary sound source as well as two microphones. Low-output MC-type phono cartridges can be used with the help of an optional Pioneer step-up transformer which can be plugged in.

TAPE-TO-TAPE DUPLICATING POSSIBLE

With the help of two (open reel or cassette) tape decks, copies of tapes can be made easily.

UP TO THREE PAIRS OF LOUDSPEAKERS

For easy comparison of speaker systems, or for main/remote speaker installations, up to three pairs of speakers can be connected and operated individually or A+B, A+C.

VERSATILE AUXILIARY CIRCUITS

These include click-stop tone controls, low and high filters for reducing noise, a loudness switch for more natural frequency response at low volume levels, a 5-position mode switch, a dimmer switch controlling the front panel illumination, and signal strength and tuning meters for easy tuning.

PRACTICAL AND AT THE SAME TIME ELEGANT DESIGN

With an exceptionally long and linear frequency dial for easy tuning. Easy, perfect tuning with signal strength meter and center zero meter. Slightly slanted front panel for easier dial reading. Plus the incomparable Pioneer elegance of harmoniously matched metal, black and natural wood.

LINE VOLTAGE AND FUSE

The SX-828 is available in two models: one model operates only on 120V, and the other does on one of the five line voltages, 110V, 120V, 130V, 220V and 240V. If your SX-828 is the latter model, set the unit to the proper line voltage by following the procedure described below.

CHANGING LINE VOLTAGE SETTING AND FUSE

To remove the fuse, turn the fuse cap located on the line voltage selector in the direction of the arrow.

Then remove the fuse plug from the unit. Put the fuse plug back so that the proper line voltage marking can be seen through the cut in the edge of the plug. Whenever the position of the selector is changed, check the rating of the fuse. A 1.5A fuse is to be used for either 220V or 240V operation and a 3A fuse for 110V, 120V or 130V operation. If the rating of the fuse is correct, replace cap.

FUSE REPLACEMENT

When the fuse blows, remove the fuse cap and replace the fuse with a new one. See Fig. 1.

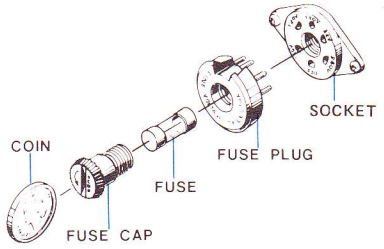


Fig. 1

ASSEMBLING A STEREO SYSTEM

- Model SX-828 is a Stereo Receiver, i.e. it combines an AM/FM stereo tuner, a preamplifier and a power amplifier in one unit. To obtain a complete stereo system, it can be combined with 2, 4 or even 6 speakers, 1 or 2 turntables, 1 or 2 tape decks, etc. See Fig. 2.
- By adding an electronic crossover network (Pioneer SF-500, SF-700, for example) and 1 or 2 additional power amplifiers, a 2-way or 3-way multi-amplifier system can be built. See Fig. 3.

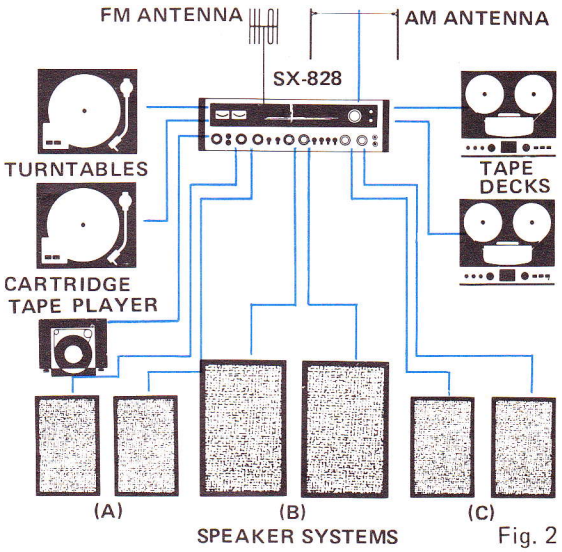


Fig. 2

INSTALLATION

Do not install the SX-828 in the following places:
- In direct sunlight or near heating units.
- In damp, dusty places or where air circulation is poor.
- In vibration-prone, unstable places.

Prepare a shelf or a stand durable enough for the large-size, weighty SX-828 to be placed upon.

A WORD ABOUT ROOM ACOUSTICS

The quality of reproduced sound varies according to the size and shape of the room, the materials of walls, floor and ceiling and the amount and arrangement or furniture. Too harsh or bright a sound usually results from too many hard reflecting surfaces, and/or too low a ceiling. This condition is improved by having an ample carpeted area or by covering the wall (especially that facing the speakers) with a thick curtain. On the other hand, too many absorbing surfaces will tend to "soak up" the sound, resulting in a certain "deadness." Furniture may be rearranged to provide irregular reflection of the sound. In any event, the true stereo effect is lost if the two speaker systems are placed too far apart. This may be corrected by angling them slightly toward each other or reducing the distance between them.

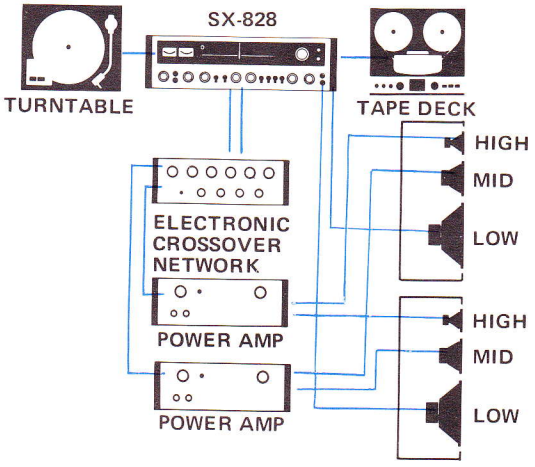


Fig. 3

SPEAKER CONNECTION AND INSTALLATION

- As shown in Fig. 4, connect the lead wires of the speaker system to the supplied speaker plugs. Be sure to observe the correct polarity and to cause no short circuit between ⊕ and ⊖.
- For the main set of speakers, use the A speaker sockets. Connect the right-channel speaker to the socket marked R, and the left channel speaker to the socket marked L.
- For the second (third) pair of speakers, use the B (C) speaker sockets. Connect in the same way as for the first pair.

NOTE: In order to use two pairs of speakers simultaneously (with the SPEAKER switch set to A+B or A+C), the impedance of each unit must be at least 8Ω.

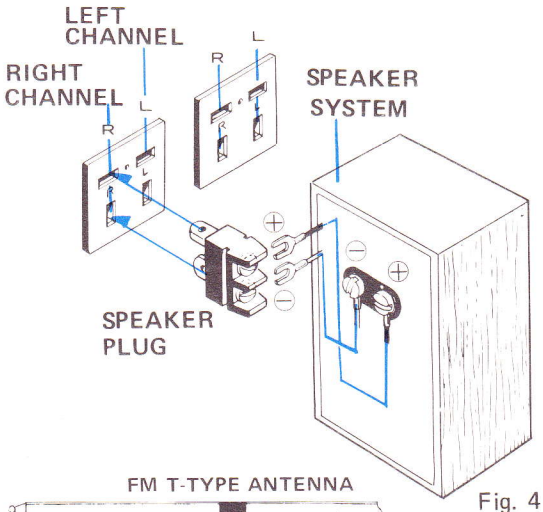


Fig. 4

INSTALLATION

Optimal stereo effect is obtained when the listener is at the vertex of a regular triangle whose base is the line connecting the left and right speakers (approx. 3ft. to 8ft. apart). Wherever possible, install the speakers at the same height; if the difference in height is too great, the stereo effect deteriorates.

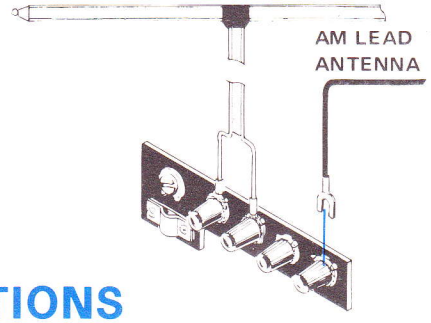


Fig. 5

ANTENNA AND GROUND CONNECTIONS

FM ANTENNA

FM broadcast signals are obstructed somewhat by mountains, buildings, and other obstacles. Therefore, even if a station is nearby, a high-gain antenna may be required. Select the antenna in accordance with the following rules:

- If the receiver is to be located in a wooden building and stations are nearby, use the T-type antenna which comes with the SX-828. As shown in Fig. 5, connect the feeder terminals of the antenna to the FM antenna terminals. Stretch out the antenna proper and secure it to the ceiling or a wall in such a manner that pickup is optimum, as determined by listening to the station to be received. Refer to FM RECEPTION on page 9.
- If orientation of the T-type antenna does not eliminate background noise, connect an FM outdoor antenna to the antenna terminals as shown in Fig. 6. Instead of a special FM antenna, a combination FM/TV antenna may be used.

NOTES:
- A variety of FM antennas are available. Consult your dealer.
- In locations adjacent to heavily traveled streets, around factories or near high-voltage power transmission lines, use of an FM antenna may not give the desired noise attenuation. In such cases, consult your dealer concering a coaxial cable feeder (75Ω) for the FM antenna. When using coaxial cable, make connections to the receiver as shown in Fig. 7.

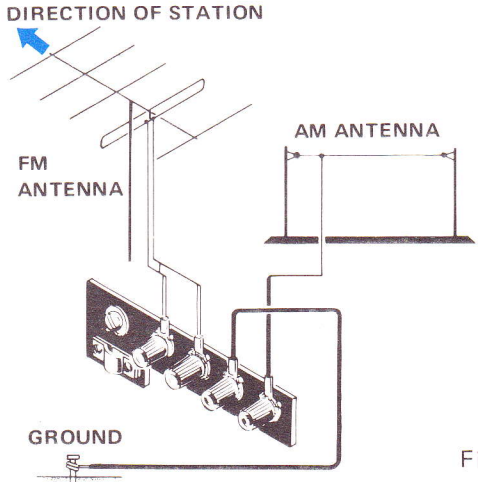
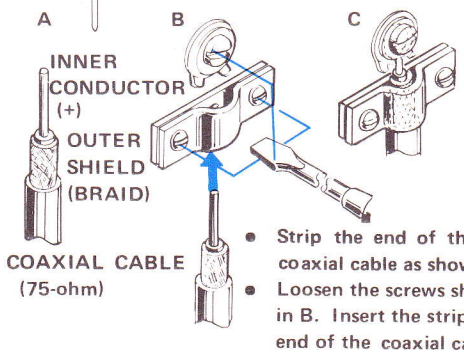


Fig. 6



- Strip the end of the coaxial cable as shown in A.
- Loosen the screws shown in B. Insert the stripped end of the coaxial cable.
- Tighten the screws.

Fig. 7

AM ANTENNA

- Refer to AM RECEPTION on page 9. With an AM station tuned in, position the ferrite antenna for optimum pickup. See Fig. 8.
- If the ferrite antenna does not give satisfying results, stretch out the AM lead antenna (vinyl-insulated wire) and connect it to the AM lead antenna terminal. See Fig. 5. Keep the other end of the antenna lead as high as possible.
- If the lead antenna does not give satisfactory results, erect an AM outdoor antenna and connect it as shown in Fig. 6. Special construction is not required: vinyl-insulated wire may be stretched between two masts or other supports.

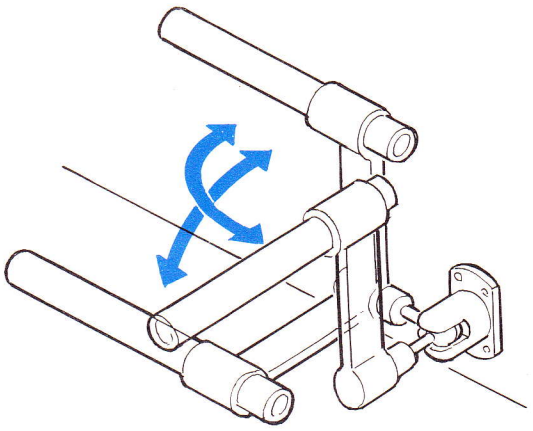


Fig. 8

GROUNDING

- A ground lead is not necessary for reception. Still, from the viewpoint of safety and elimination of noise, one should be used.

CONNECTION OF TURNTABLE

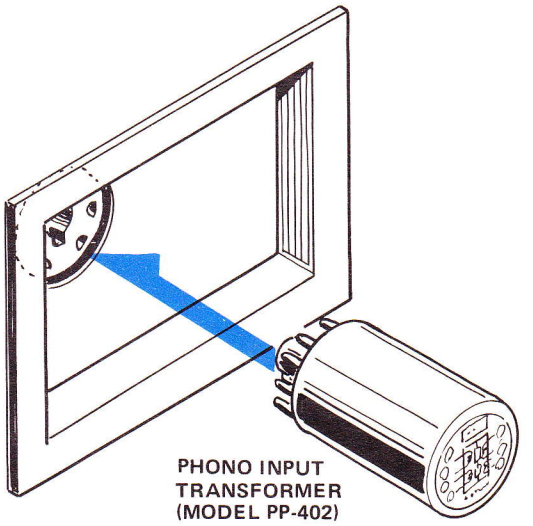
Connect as follows, according to the type of cartridge used in your turntable;

- With a moving magnet (MM) cartridge, connect the output leads of the turntable to the PHONO 1 MAG terminals. The upper terminal is for the left channel, the lower terminal for the right channel.
- With a moving coil (MC) cartridge, connect the output leads of the turntable to the PHONO 2 terminals. Connect in the same way as for the PHONO 1 MAG terminals.

NOTES:
- When using a turntable with an MC cartridge, be sure to insert a separately available PHONO INPUT transformer (Pioneer PP-402) into the socket at the right side panel of the SX-828 (Fig. 9).
- If the plugs of the output cord of the turntable do not fit into the PHONO input jack, replace them with pin plugs, separately available.

- With a ceramic or crystal-type cartridge , connect to the AUX terminals.

NOTE: In this case, set the SELECTOR switch to AUX to enjoy a record playing.



PHONO INPUT TRANSFORMER (MODEL PP-402)

Fig. 9

CONNECTION OF TAPE DECK

Three different types of tape deck are available on the market; open-reel type, cassette type and cartridge type. Any tape deck equipped with preamplifiers for recording and playback can be connected directly to the SX-828.

RECORDING

- Connect the recording input terminals (LINE INPUT) of the tape deck to the TAPE 1 REC jacks of the SX-828. The upper jack is for the left channel, the lower jack for the right channel. Use the connecting cords supplied with the tape deck.

PLAYBACK

- Connect the playback output terminals (LINE OUTPUT or TAPE MONITOR) of the tape deck to the TAPE 1 MON jacks of the SX-828.
- With a monophonic tape deck, plug in either the upper or lower jack and set the MODE switch to MONO (L, R, or L+R) position.

NOTES:
- If the tape deck is equipped with a DIN-type REC/P.B. socket, plug the separately available DIN-type REC/P.B. connector (Pioneer PP-101 etc.) into this socket. This completes both recording and playback connections.
- For using two tape decks, plug the second into the TAPE 2 REC and TAPE 2 MON jacks. Connection is the same as that for the TAPE 1 jacks.
- The TAPE 1 REC/P.B. socket is provided to plug a DIN-type REC/P.B. connector but the REC/P.B. socket for TAPE 2 is not provided on this unit.

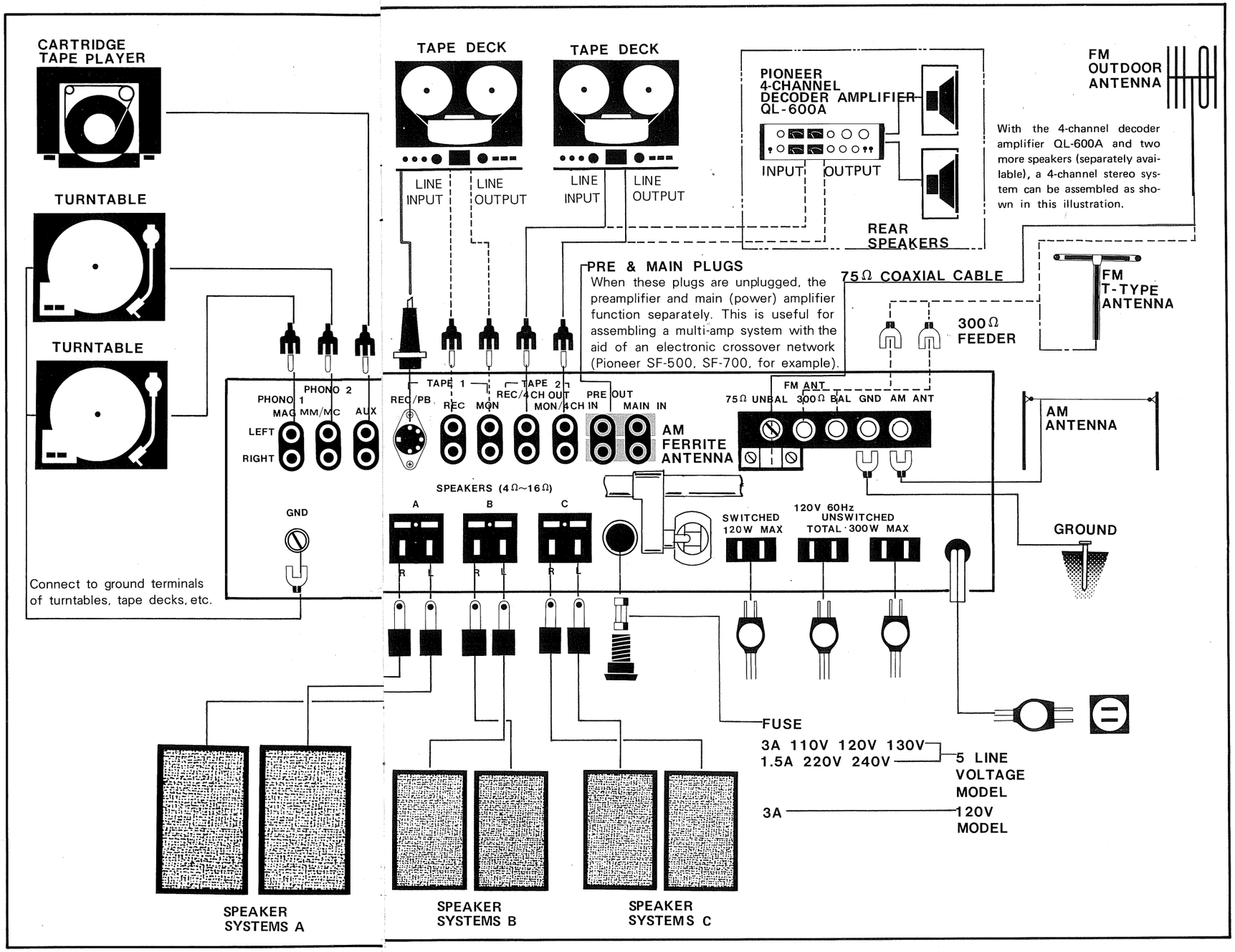
CONNECTION FOR DUPLICATING OR EDITING

- Connect two tape decks as explained in the RECORDING and PLAYBACK sections above.

AUX INPUT JACKS

These jacks are used for making connections with the output leads from a cartridge or cassette tape player, a turntable equipped with a ceramic or crystal phono cartridge, a television set, etc.

CONNECTION DIAGRAM



FRONT PANEL FACILITIES

SPEAKERS SWITCH

A combination of the power ON/OFF switch and the speaker system selector switch.

POWER OFF . . The equipment is off.
A . . . . . The speaker system plugged into the A speaker sockets is in operation.
SPKR OFF . . . All speaker systems off. Useful for listening through headphones.
B . . . . . The speaker system plugged into the B speaker sockets is in operation.
C . . . . . The speaker system plugged into the C speaker sockets is in operation.
A+B . . . . . Both speaker systems A and B are in operation.
A+C . . . . . Both speaker systems A and C are in operation.

PHONES JACKS (1, 2)

Use these to plug in stereo headpnones.
A full selection of high-performance headphones is available from Pioneer.

BASS & TREBLE CONTROL

Used for adjusting bass and treble.
Clockwise (Counterclockwise) rotation of these controls from the FLAT position will boost (diminish) tone. Also, only the left (right) channel can be adjusted by turning the front (rear) part of the knob while holding the other part in place.
Adjustment of both channels or only the left channel is made by click-stops. For normal listening, set to the FLAT position.

FILTER SWITCHES

LOW: Setting this switch to ON will eliminate low noise such as record rumble, hum, etc. Leave it at OFF unless the filter is required.
HIGH: Setting this switch to ON will eliminate high noise such as record scratch, tape hiss, static noise from fluorescent lamps, etc. Leave it at OFF unless the filter is required.

BALANCE CONTROL

Adjust the stereo balance. When the volume of the right channel speaker is smaller, turn the knob clockwise toward RIGHT; when left channel volume is smaller, turn the knob counterclockwise toward LEFT. For normal listening, set it to the NORM position.

VOLUME CONTROL

The volume increases when this knob is turned clockwise.

LOUDNESS SWITCH

When listening at low volume level, set this switch to ON. This emphasizes the extreme ends of the sound spectrum, giving a more natural sound contour.

AUDIO MUTING SWITCH

In position -20dB, the volume will be attenuated by 20dB.
For restoring the volume to its former level, set the switch to the OFF position.

SIGNAL METER

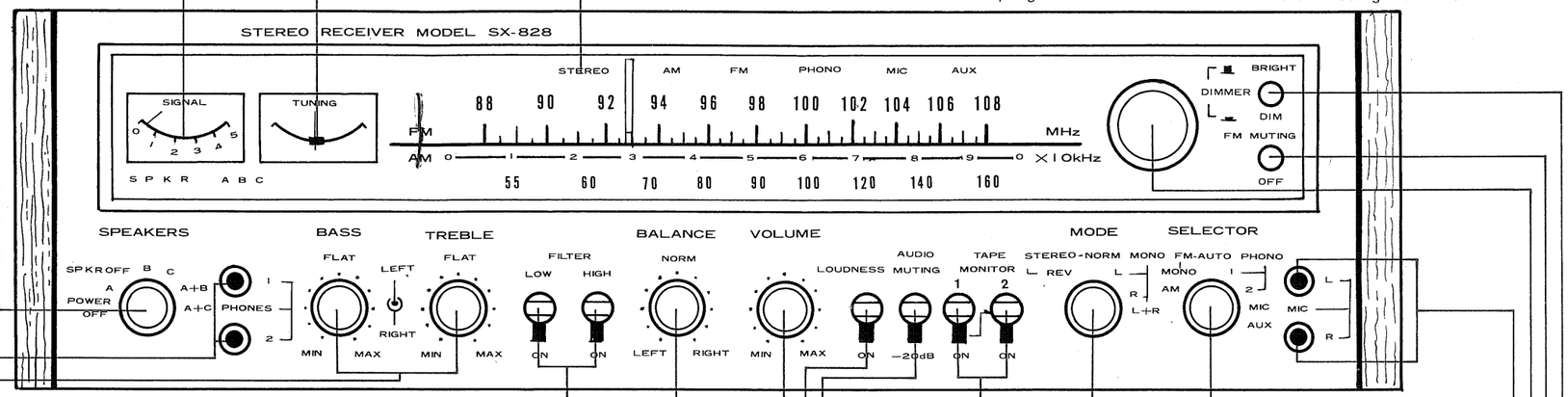
This meter indicates the optimum tuning point for AM and FM stations. Maximum deflection to the right indicates that the station has been properly tuned in.

FM TUNING METER

When tuning in an FM station, use this meter to make the tuning perfect. After the desired station has been properly tuned in with the SIGNAL METER, adjust the TUNING KNOB so that the needle comes to the center.

FM STEREO INDICATOR

This lamp lights when an FM stereo broadcast is being received.



TAPE MONITOR SWITCHES (1 and 2)

These switches are set to ON for monitoring of a recording in progress or playback of recorded tapes with tape decks.

1— This switch is set to ON for using a tape deck plugged into the TAPE 1 MON and TAPE 1 REC jacks or the TAPE 1 REC/P.B. socket.
2— This switch is set to ON for using a tape deck plugged into the TAPE 2 MON and TAPE 2 REC jacks.

NOTE: For phonograph records or broadcasts, leave these switches in OFF position. If either of these switches is set to ON, no sound will be heard.

MODE SWITCH

This selects the mode of reproducing sound.

STEREO REV — Stereo, with the input signals of the left and right channels reversed.
STEREO NORM — Normal stereo.
MONO L — Playing the input signals of only the left channel through the left and right speakers.
MONO R — Playing the input signals of only the right channel through the left and right speakers.
MONO L+R — Monophonic reproduction, mixing the input signals of the left and right channels.

NOTE: If the front panel inscriptions of your unit become dirty, clean them with volatile fluid (chemical thinner, pure alcohol, etc.). In this case, the letters on the front panel may be blotted. Wipe out them with a soft dry cloth, however they will still remain unerased.

MIC JACKS

Connect the microphone plugs to these jacks. Only high-impedance, dynamic microphones with standard plugs (6.4φ) should be used. A selection of high-performance dynamic microphone is available from Pioneer.

TUNING KNOB

Used to tune in the desired station.

NOTE: If the setscrews holding the TUNING KNOB should ever become loose, they can be tightened with the supplied L-shaped hexagonal wrench.

FM MUTING SWITCH

This switch is used to suppress noise between FM stations when tuning. When receiving weak stations, this switch should be kept OFF because it would suppress the desired station signal at the same time. Note that this switch is OFF when it is pushed in, and ON when released.

DIMMER SWITCH

The brightness of the front panel illumination is controllable by this switch. The front panel becomes dimmer when the switch is pushed in.

SELECTOR SWITCH

Choose the program source.

AM . . . . . AM reception.
FM MONO . . . . . FM monophonic reception only.
FM AUTO . . . . . FM reception with automatic switching for either stereo or monophonic programs.
PHONO 1 . . . . . For playing records on a turntable plugged into the PHONO 1 jacks.
PHONO 2 . . . . . Same as above, for PHONO 2 jacks.
MIC . . . . . Microphone sound can be reproduced.
AUX. . . . . For playing signals fed to the AUX jacks.

BEFORE SWITCHING THE POWER ON

Set the SPEAKERS switch to position A only after checking the following points:

1. VOLUME control is at MIN.
2. MODE switch is at STEREO NORM.
3. BASS, TREBLE controls are at FLAT.
4. BALANCE control is at NORM.
5. The AUDIO MUTING switch must be OFF (not depressed).
6. Both TAPE MONITOR switches must be OFF except for tape playback or monitoring.

PROTECTOR CIRCUIT

No sound is produced for about three seconds after the power is switched ON. This is due to the built-in protector circuit which protects transistors and speakers from damage in the event of breakdowns. Short circuits at the speaker terminals or extremely low speaker impedance may result in sudden cut-off of the sound or continuous clicking of the relays.
If this occurs, turn off the power and check the speaker connections.

FM RECEPTION

1. Set the SELECTOR switch to FM AUTO.
2. Set the FM MUTING switch to ON (not pushed).
   Keep the switch OFF if the station is weak.
3. While observing the meters, tune in the desired station by turning the TUNING knob. Best reception is attained when the needle of the SIGNAL meter deflects to the right, and the needle of the FM TUNING meter is at the center. When the station is broadcasting a stereo program, the FM stereo indicator lights, and model SX-828 operates automatically for stereo broadcast reception.
4. When the desired station has been tuned in, turn the VOLUME control gradually clockwise for the desired volume. Adjust the BASS and TREBLE controls as described.

NOTES:

- If fringe areas or where reception is noisy, turning the SELECTOR switch to FM MONO will usually reduce the noise. In this case, however, stereo broadcasts will be reproduced as monophonic.
- In some countries, model SX-828 is delivered with a selector switch for adjusting the FM de-emphasis to 50 to 75 μsec. If your unit is equipped with such a switch (in the cut-out in the right side panel), and if the sound seems to lack brilliance in the high range, move the de-emphasis switch to its other position.

AM RECEPTION

1. Set the SELECTOR switch to AM.
2. While observing the signal meter, tune in the desired station by turning the TUNING knob.
   Best reception is attained when the SIGNAL meter deflects to the right.
3. Adjust the VOLUME, BALANCE, BASS, and TRELBE controls for desired volume and tone.

NOTE:

If good reception cannot be attained by steps 1 through 3 described in AM RECEPTION, the antenna may be the cause. Refer to ANTENNA AND GROUND CONNECTIONS on page 3. When the station is very near, sound distortions may result from excessive field strength. If this occurs, shorten or remove the AM antenna.

RECORD PLAYING

1. Set the SELECTOR switch to PHONO 1 or PHONO 2.
2. Start the turntable.
3. Adjust the volume and tone with the VOLUME, BASS and TREBLE controls.

When using an MC-type cartridge, a PHONO INPUT transformer (Pioneer PP-401, separately available) must be plugged into the MC socket in the right side panel of the SX-828. See Fig. 9 on page 4.

NOTES:

- Set to PHONO 1 for using the turntable plugged into the PHONO 1 jacks, and to PHONO 2 for using the turntable plugged into the PHONO 2 jacks.
- PHONO 2 jacks accept either MM or MC type cartridges.

USING A TAPE DECK

RECORDING

As shown in Fig. 10, the signal being played is always present at the TAPE 1 REC and TAPE 2 REC jacks. Operate the SX-828 as explained in the sections RECORD PLAYING or FM and AM RECEPTION on page 9.

NOTE: The VOLUME, BASS and TREBLE controls on the SX-828 do not affect the signal at the TAPE 1 REC and TAPE 2 REC jacks. The recording level must be adjusted on the tape deck itself.

• TAPE MONITOR

If the tape deck is of the 3-head type or is equipped with a tape monitor circuit, the recording can be monitored by setting the TAPE MONITOR switches (1 or 2) to ON. Both recording and playback connections must be made.

PLAYBACK

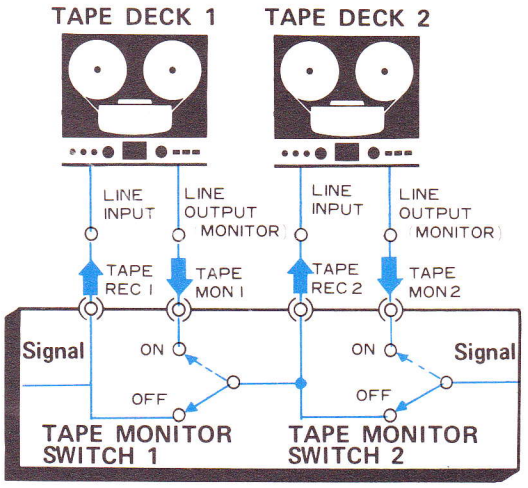
As shown in Fig. 10, setting the TAPE MONITOR switch 1 to ON permits playback of the tape on tape deck 1.
Volume and tone can be adjusted by the VOLUME, BASS and TREBLE controls. Playback is possible regardless of the SELECTOR switch position.

DUPLICATING OR EDITING TAPES

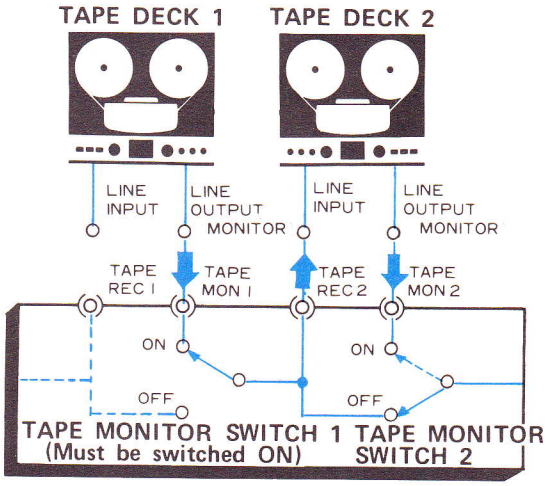
With the SX-828, it is possible to record, say, an FM stereo broadcast and then re-tape only the parts of the broadcast one wishes to keep onto another tape.

1. Connect two tape decks as shown in Fig. 11.
2. Turn the TAPE MONITOR switch 1 to ON.
3. Play back the recorded tape on tape deck 1 and record it onto tape deck 2.
4. The tape being recorded can be monitored by setting the TAPE MONITOR switch 2 to ON. TAPE MONITOR switch 2 in position OFF will produce the sound from tape deck 1.

NOTE: Duplicating and editing is easier if the recording tape deck is equipped with a PAUSE control.



SX-828 Fig. 10



SX-828 Fig. 11

USING MICROPHONE(S)

1. Plug the microphones into the MIC jacks.
2. Set the SELECTOR switch to MIC, and the MODE switch to STEREO NORM.
3. Adjust the volume by slowly turning the VOLUME control to the right.
   The BASS and TREBLE controls should normally be set at FLAT.

NOTES:
- Use only high-impedance, dynamic microphones fitted with standard plugs (6.4ϕ).
- Howling may occur if the VOLUME control is turned too high or if the microphone is too close to the speakers.
- One microphone can be used with its plug connected to either L or R jack, setting the MODE switch at MONO L or MONO R position respectively.

USING A CARTRIDGE TAPE PLAYER

1. Set the SELECTOR switch to AUX.
2. Start the cartridge tape player.
3. Adjust the volume and tone controls as required.

ASSEMBLING A MULTI-AMP SYSTEM

A 2-way or 3-way multi-amplifier system can be assembled by adding a separately available electronic crossover network (Pioneer SF-500, SF-700, for example) and one or two additional power amplifiers (Fig. 12).

1. Remove the PRE OUT/MAIN IN plugs on the rear panel of the SX-828 (Fig. 13).
2. Connect the input terminals of the electronic crossover network to the PRE-OUT jacks of the SX-828.
3. Connect the LOW range output terminals of the electronic crossover network to the MAIN IN jacks of the SX-828.
4. Connect the MID range output terminals of the electronic crossover network to the input terminals of the power amplifier for mid range, and the HIGH range output terminals to the input terminals of the power amplifier for high range.

NOTE: A fine selection of high-performance electronic crossover networks, power amplifiers and suitable multi-amp speaker systems are available from Pioneer.

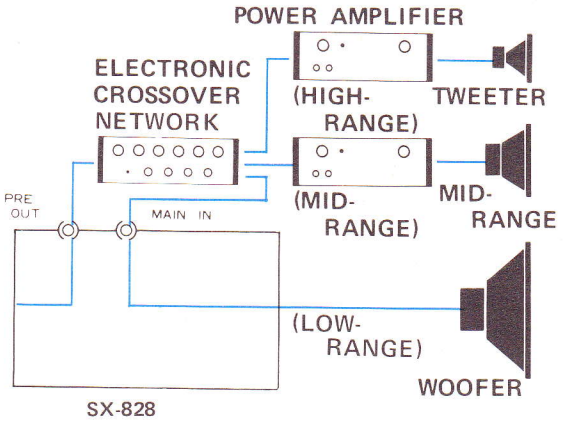


Fig. 12

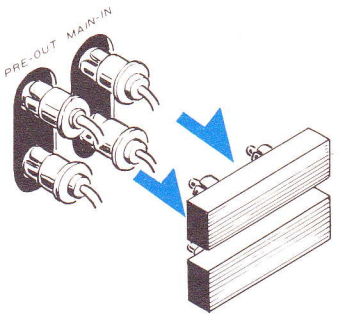


Fig. 13

4-CHANNEL STEREO SYSTEM

Conventional 2-channel stereo systems are designed so that instrumental and vocal music can be reproduced in stereo through left and right speakers placed in front of the listener. In contrast, the newly developed 4-channel stereo system features a high degree of reproduction of full dimensional sound including the atmosphere and applause in a concert hall in addition to stereo sound from singers and instruments. Consequently, you can get magnificently lifelike 4-channel sound far superior to that of 2-channel stereo.
The Pioneer 4-channel Decoder Amplifier, model QL-600A combined with your SX-828, and two additional speakers gives you 4-channel sound. See Fig. 14.

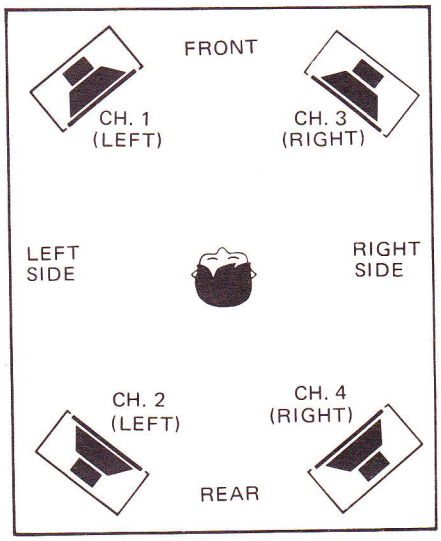


Fig. 14

HOW TO USE THE 4-CHANNEL DECODER AMPLIFIER QL-600A

To obtain 4-channel sound, combine the Pioneer QL-600A with your SX-828. The QL-600A has a matrix decoder circuit for converting a 2-channel stereo signal into a 4-channel stereo signal plus amplifiers for driving the two rear speaker systems. As shown in Fig. 15, the QL-600A can be plugged into the TAPE 2 REC and TAPE 2 MON jacks of your SX-828, giving you 4-channel sound of the REGULAR or SQ MATRIX type. With the MATRIX system, matrix recordings or FM stereo broadcasts are reproduced to perfection. What's more, with a 4-channel stereo tape deck (Pioneer QT-6600, for example) connected to the QL-600A as shown in Fig. 15, discrete 4-channel tapes can be reproduced.

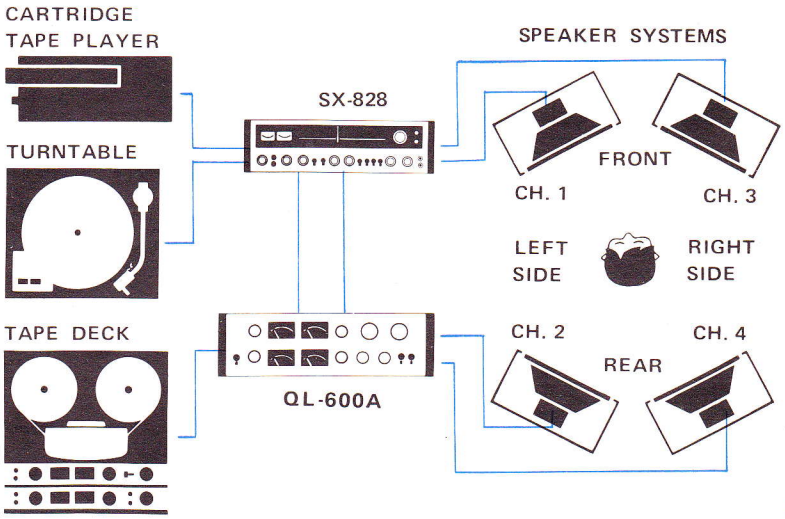


Fig. 15

FM TUNER TRACKING ALIGNMENT

Set is factory adjusted, no re-adjustments should normally be required. If re-adjustment is required, observe following steps.

Connections

Connect FM signal generator to FM antenna terminals. Connect V.T.V.M. to TAPE REC outputs. Adjust signal generator output level at 20dB, apply 400Hz 30% modulation.

Procedure

1. Turn tuning knob to extreme left and confirm that pointer is at scale end.
2. Set signal generator frequency at 87.4MHz. Adjust oscillator coil in figure to obtain maximum output reading on V.T.V.M.
3. Turn tuning knob to 106MHz, adjust signal generator for 106MHz. Adjust oscillator trimmer capacitor to obtain maximum output reading.
4. Adjust receiver and signal generator at 90MHz. Adjust RF and antenna coils core to obtain maximum output reading.
5. Return to 106MHz setting. Adjust RF and antenna trimmer capacitors to obtain maximum output reading.
6. Repeat steps 2 – 5 to optimum output alignment.

ABSTIMMUNG DES FM-EMPFANGSTEILS

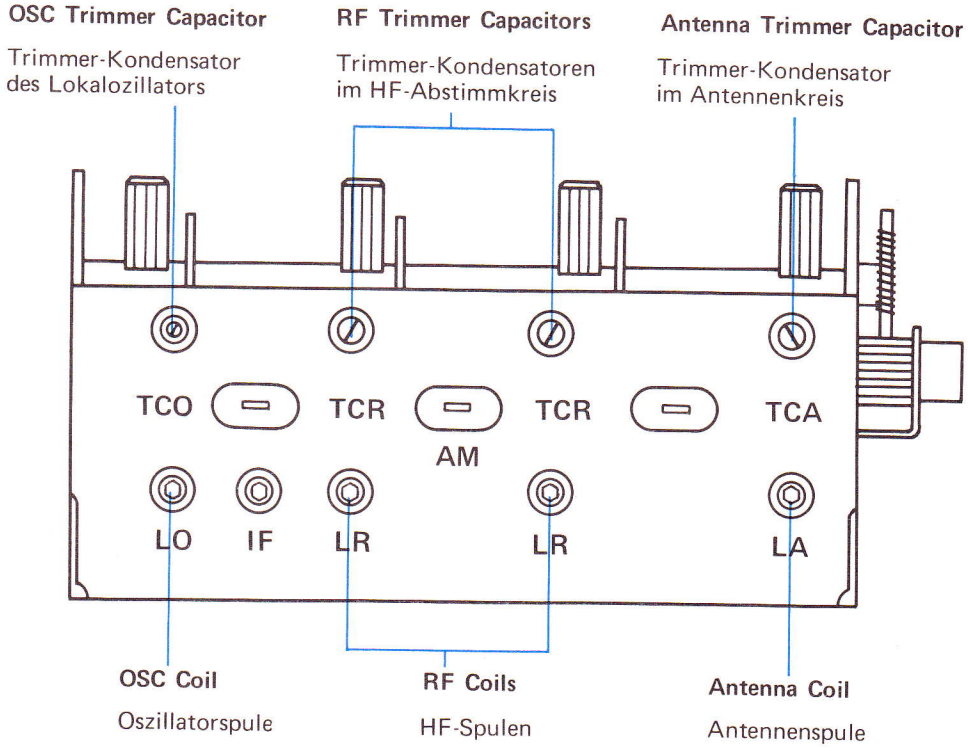
Nachjustierungen dürften normalerweise nocht erforderlich sein. Gegebenenfalls wie folgt vorgehen, um die FTZ-Bestimmungen zu erfüllen.

Anschlüsse

Testgenerator an UKW-Antennenanschlüsse, Röhrenvoltmesser an TAPE REC Ausgänge anschliessen. Testgenerator auf 20dB Ausgangspegel, 400Hz 30% Modulation einstellen.

Abgleichverfahren

1. Sendereinstellung auf extrem links drehen. Zeiger muss am Skalenende stehen.
2. Testgeneratorfrequenz auf 87.4MHz einstellen. Oszillatorspule in Abbildung so justieren, dass maximaler Ausgangspegel am Voltmesser abgelesen wird.
3. Sendereinstellung und Testgenerator auf 106MHz einstellen. Trimmer-Kondensator des Lokaloszillators wiederum auf maximalen Ausgangspegel einstellen.
4. Empfänger und Testgenerator auf 90MHz einstellen. Kerne der HF- und Antennenspulen auf maximalen Ausgangspegel abgleichen.
5. Wieder auf 106MHz übergehen. Trimmer-Kondensatoren im HF-Abstimmkreis und Antennenkreis auf maximalen Ausgangspegel justieren.
6. Schritte 2 – 5 wiederholen, bis bestmögliche Abstimmung erzielt ist.



CONDITIONS FREQUENTLY MISTAKEN FOR MALFUNCTION

Noise: There are a variety of noises relating to the operation of a hi-fi unit. These are generally divided into two types; (1) the unit is faulty (a transistor or part has deteriorated) and (2) an external source is adding to the unit.
When a hi-fi unit produces an unpleasant noise, it is often assumed that the unit is faulty, but statistical records indicate that the majority of noises produced in hi-fi acoustic units result from external sources of noise: Due to the inherent high sensitivity and the high fidelity in reproduction, the unit amplifies and reproduces extraneous noises, however small, into definite output noise. If your receiver produces a noise, check according to the following table and trace out the source of noise for the appropriate corrective action.

	SYMPTOM	SUSPECTED SOURCE OF NOISE	DIAGNOSIS AND REMEDY
WHEN LISTENING TO BROADCASTS	Continuous or intermittent noise like jjjjjj or zzzzzz.	• Static (lightning) • Fluorescent lamp, motor, or thermostat may be in use in house or in the vicinity of the house.	In many cases, it is very difficult to remove the source of noise. In order to make the radio input larger than the noise level, set up a good outdoor antenna and make a complete grounding.
	When a station is tuned in, hum is mixed in the program.	• Poor fluorescent lamp, motor, or electric heater may be in use in house or near the house.	Reversing the line plug may occasionally alleviate this noise problem. Usually it is very difficult to eliminate the noise.
	Hissing sound noise in AM (medium wave) reception.	• The frequency of an adjacent station is interfering with that of the station being tuned in (10kHz beat interference). • TV set is on in the same house with the receiver.	Impossible to remove such interference. If the cause of such noise is in the TV set, increase the distance between the TV set and receiver.
	Static noise (in particular, when automobiles run close to the house).	• White noise generated from automobile engines. • Radio frequency sewing machine or welding machine being used near your house.	In an area surrounded by hills or high buildings, the FM input signals are very weak. Thus the noise limiter in the circuit loses its function. Set up an FM outdoor antenna having many director elements.
	Reception of FM stereo program contains more noise than FM mono program.	• Note that the service area covered by an FM stereo broadcast is about 50% of that of a regular mono broadcast.	Increasing FM input signal may alleviate this problem. Use an exclusive FM outdoor antenna instead of the indoor T-type antenna.
WHEN PLAYING RECORDS	Hum or buzz. When switched to radio reception, the noise disappears.	• Poor connection of shielded wire (a). • Jack connection is loose.(b). • Line cord or fluorescent lamp is near the shielded wire. (c). • Poor grounding. (d). • Ham transmitting station or TV transmitting station is near your house. (e).	Correct the conditions stated in (a), (b), (c) or (d). In case of (e), report it to an official activity.
	Output tone quality is poor and mixed with noise. Treble is not clear.	• Stylus wears out. (a) • Record wears out. (b) • Dust adheres to stylus. (c) • Stylus is improperly mounted. (d) • Tracking force is not proper. (e) • The TREBLE level is too high.	Check (a) through (e) and correct the condition. Lower the TREBLE level.

WATCH FOR THE FOLLOWING CONDITIONS; THESE ARE ALSO APT TO BE MISTAKEN FOR MALFUNCTIONS.

	SYMPTOM	SUSPECTED SOURCE OF NOISE	DIAGNOSIS AND REMEDY
	Power is not turned on although the power switch is set to ON.	• Fuse blows. (a) • Line plug is loose. (b)	Check (a) and (b) and correct the condition.
	In playing a record, increasing the volume causes howling.	• Distance between the turntable and the speakers is too short. • The place on which the turntable or speakers are set is unstable.	Change the distance or rearrange the installation increase of the unit and speakers. (Installing the turntable on a firm, solid stand may alleviate this problem.) Do not enhance the BASS sound level excessively.

SPECIFICATIONS

SEMICONDUCTORS

FETs	6
ICs	4
Transistors	55
Diodes	36

POWER AMPLIFIER SECTION

Music Power Output (IHF)	270 W (4Ω), 180 W (8Ω)
Continuous Power Output (1kHz each channel driven)	95 W/95 W (4Ω), 70 W/70 W (8Ω)
Continuous Power Output (1kHz both channels driven)	75 W+75 W (4Ω), 60 W+60 W (8Ω)
Power Output in the range of 20Hz to 20kHz (both channels driven)	54 W + 54 W (8Ω, Harmonic Distortion less than 0.5%)
Harmonic Distortion	Less than 0.5% (Continuous power output) Less than 0.03% (8Ω, 35W/35W power output)
Intermodulation Distortion	Less than 0.5% (Continuous power output) Less than 0.03% (8Ω, 35W/35W power output)
Power Bandwidth (IHF)	10Hz to 60kHz (8Ω, Harmonic Distortion less than 0.5%)
Frequency Response	5Hz to 80kHz, ± 1 dB
Input Sensitivity/Impedance (1kHz, Continuous power output)	500mV/50kΩ
Speakers	4 to 16Ω
Damping Factor	40 (8Ω, 1kHz)

PREAMPLIFIER SECTION

Output Voltage	500mV (Rated output), 4V (Max.)	
Harmonic Distortion	Less than 0.1%	
Frequency Response	10Hz to 40kHz, ± 1 dB	
Input Sensitivity/Impedance (1kHz, for rated output)	PHONO 1 MAG	2.7mV/50kΩ
	PHONO 2 MM	2.7mV/50kΩ
	MC	115μV/30Ω
	(with PHONO INPUT transformer "PP-402")	
	MIC	2.6mV/50kΩ
	AUX	200mV/100kΩ
	TAPE MONITOR 1, 2	200mV/100kΩ
Recording Output	TAPE REC 1, 2 (Pin jack)	200mV
	TAPE REC (DIN connector)	35mV
BASS Control	−10 dB, +10 dB/100Hz	
TREBLE Control	−10 dB, +10 dB/10kHz	
LOW Filter	−3 dB/60Hz (−12 dB/oct.)	
HIGH Filter	−3 dB/6kHz (−12 dB/oct.)	
Equalization Curve	PHONO: RIAA S.T.D.	
Loudness Contour	+10 dB/100Hz, +6 dB/10kHz with Volume Control set at −40 dB position.	
Muting	−20 dB	
Hum and Noise (Short circuit, IHF network)	PHONO	More than 85 dB
	AUX	More than 95 dB

FM TUNER SECTION

Frequency Range	87.5MHz to 108MHz
Usable Sensitivity (IHF)	1.7μV
Capture Ratio (IHF)	1.5 dB
Selectivity (IHF)	More than 75 dB
Image Rejection	More than 95 dB (98MHz)
IF Rejection	More than 100 dB (90MHz)
Spurious Rejection	More than 100 dB (98MHz)
AM Suppression	50 dB
Signal-to-Noise Ratio	70 dB
Harmonic Distortion	Mono: Less than 0.2% (100% Mod.) Stereo: Less than 0.4% (100% Mod.)
Tuning Indicator	Signal strength type and Center tuning type
Muting	Switchable to ON-OFF
Stereo Separation	More than 40 dB (1kHz)
Sub Carrier Suppression	More than 50 dB
Antenna Input	Impedance 300Ω balanced and 75Ω unbalanced

AM TUNER SECTION

Frequency Range	525kHz to 1,605kHz
Usable Sensitivity (IHF)	10μV
Selectivity (IHF)	More than 35 dB
Image Rejection	More than 85 dB (1,000kHz)
IF Rejection	More than 80 dB
Signal-to-Noise Ratio	More than 50 dB
Antenna	Built-in ferrite loopstick antenna

MISCELLANEOUS

Power Requirements		120V 60Hz or 110V, 120V, 130V, 220V and 240V (Switchable) 50–60Hz
Power Consumption		370W (Max.)
AC Outlets		Switched 1, Unswitched 2
Dimensions (overall)		19-1/8 in./485 mm (width) 5-15/16 in./150 mm (height) 14-3/4 in./375 mm (depth)
Weight	Without package	32 lb 10oz/14.8 kg
	With package	39 lb 3oz/17.8 kg
Furnished Parts		FM T-type Antenna 1
		Fuse 1.5A, 3A (5-line voltage model) 1, 2
		Speaker Plug 6
		Hexagonal wrench 1
		Polishing cloth 1
		Operating instructions 1

NOTE: Specifications and the design subject to possible modification without notice due to improvements.

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