

STEREO CASSETTE RECEIVER

CX-7000

OPERATING INSTRUCTIONS

S
S/G
HG
YSA



CX-7000 are designed to operate 220V or 240V main, 110V, 120V, 220V, or 240V main and 240V main. Before turning on the power, please confirm the line voltage setting indicated on the rear of your unit corresponds to the supply voltage in your area; if not, change the setting as described in IMPORTANT-LINE VOLTAGE on page 2.

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IMPORTANT—LINE VOLTAGE

These operating instructions pertain to 220V — 240V selectable (HG) models, 110V — 120V — 220V — 240V selectable (S) models and 240V only (YSA) models. The LINE VOLTAGE SELECTOR switch has been set according to the local AC power line supply in the area of use. YSA models do not have the LINE VOLTAGE SELECTOR switch. Before operating your unit, be sure to confirm that this switch has been set properly. If it is necessary to change the switch setting, do so according to the steps below.

S MODELS (110V—120V—220V—240V)

1. Disconnect the AC mains cord.
2. Use the Phillips screwdriver to unscrew the fuse cap, then take out the fuse and SELECTOR plug (Fig. 1).
3. Reinstall the SELECTOR plug so that its cut-out section exposes the voltage indication of the SELECTOR socket which corresponds to your household AC power.
4. Refer to the table and install a replacement fuse (provided as accessory).
5. Insert fuse in fuse cap, then install cap to plug and tighten.

HG MODELS (220V—240V)

1. Disconnect the AC mains cord.
2. Use the Phillips screwdriver to loosen the mounting screw, then remove the SELECTOR plug (See Fig. 2).
3. Reinstall the SELECTOR plug with its cut-out section exposing the correct voltage indication.
4. Insert and tighten the mounting screw.

FOR YOUR SAFETY

1. Insert this plug only into effectively earthed three-pin plug-socket outlet.
2. If any doubt exists regarding the earthing, consult a qualified electrician.
3. Extension cords, if used, must be three-core correctly wired.

S model

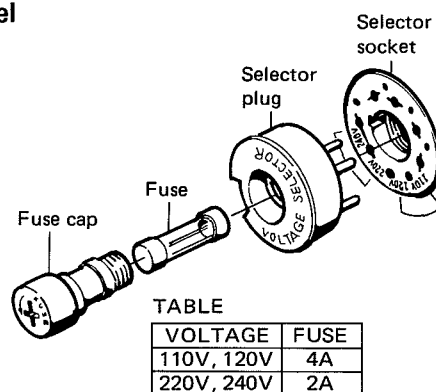


Fig. 1

HG model

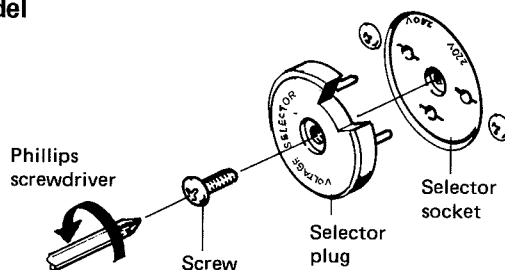


Fig. 2

FEATURES

The CX-7000 is stereo cassette receiver which combines an amplifier, tuner and cassette deck into one multi-functional package.

Receiver Section

- The amplifier delivers a power output of 25W (over 20 herz to 20,000 herz, both channels driven at 8 ohms with no more than 0.3% total harmonic distortion) which is quite enough to guarantee dynamic stereo listening enjoyment.
- The CX-7000 is equipped with two pairs of speaker terminals and speaker buttons to select the speakers. It also has a PHONES jack so that you can listen to program sources through stereo headphones.
- The built-in tuner allows you to enjoy both FM stereo and AM broadcasts. The rear panel has provision for PHONO jacks, to which you can connect a turntable, as well as AUX jacks for connecting a cartridge tape player, or a TV tuner. This means that you can enjoy just about any program source with a few simple connections. Another feature is the two MIC jacks (L, R) which you can use to connect microphones for record concert commentary or public address announcements.
- The FM tuner has circuitry which is composed of FETs (field effect transistors) and ICs (integrated circuits). These circuit parts improve distortion, the signal-to-noise ratio and other specifications and ensure stable and faithful FM listening pleasure.
The FM MPX section adopts a PLL (phase-locked loop) circuit made up of ICs for an improved channel separation. Furthermore, there is a canceller circuit which automatically cancels out 19kHz pilot signals and suppresses carrier leak. This means that the pilot signals have no effect when recording an FM broadcast onto a cassette tape and that the frequency response is excellent at the high end of the frequency spectrum.
- The AM tuner section integrates ICs into the circuitry and is equipped with a high-performance ferrite bar antenna. This is why you always listen to clear and stable AM broadcasts.
- Also featured are TAPE jacks (PLAY, REC, DIN connectors) as well as a TAPE switch. You can connect an openreel deck to the CX-7000 and play back and record tapes. You can also duplicate cassette tapes on the CX-7000. You can build up your own tape library.

Cassette Deck Section

- The cassette deck section incorporates a DC servo control motor which features superb stability for the best in tape run stability. It also employs an ultra-precision capstan, belt, large-size flywheel and a high precision take-up mechanism for a superior wow/flutter and stability. The cassette half insertion mechanism is of the vertical type for easy insertion and stable tape run.
- The deck section has a built-in Dolby noise reduction system which cuts down the level of tape hiss which is annoying to hear during tape playback so that it does not impair the sound quality of the program source (an improvement of about 10dB at the high-end of the frequency spectrum). This expands the dynamic range and makes for recording and playback with a high signal-to-noise ratio.
- There are bias and equalizer circuits as well as selector switches so that the capabilities of not only chrome tapes but also low-noise tapes and standard tapes can be displayed to the full. Chrome tapes are selected automatically thanks to the automatic bias detection mechanism.
- The direct operation levers can be selected to set the cassette deck immediately from one mode to another — like from playback or recording to fast forward or rewind, or from fast forward to playback. The levers are easy to operate and they adopt direct change mechanisms which do not harm the tapes in any way.
- There is a full auto-stop mechanism which is actuated automatically without bringing any load to bear on either the tape or the deck's mechanisms when the tape is fully wound in any mode (recording, playback, fast forward or rewind).
- **Cassette Section Applications**
 - Stereo and monophonic playback of music tapes (prerecorded tapes).
 - FM and AM broadcast, and disc recording.
 - Recording of the audio signals of a TV tuner which is connected to the AUX jacks.
 - Live stereo and monophonic recordings using microphones.

STEREO SYSTEM COMPOSITION

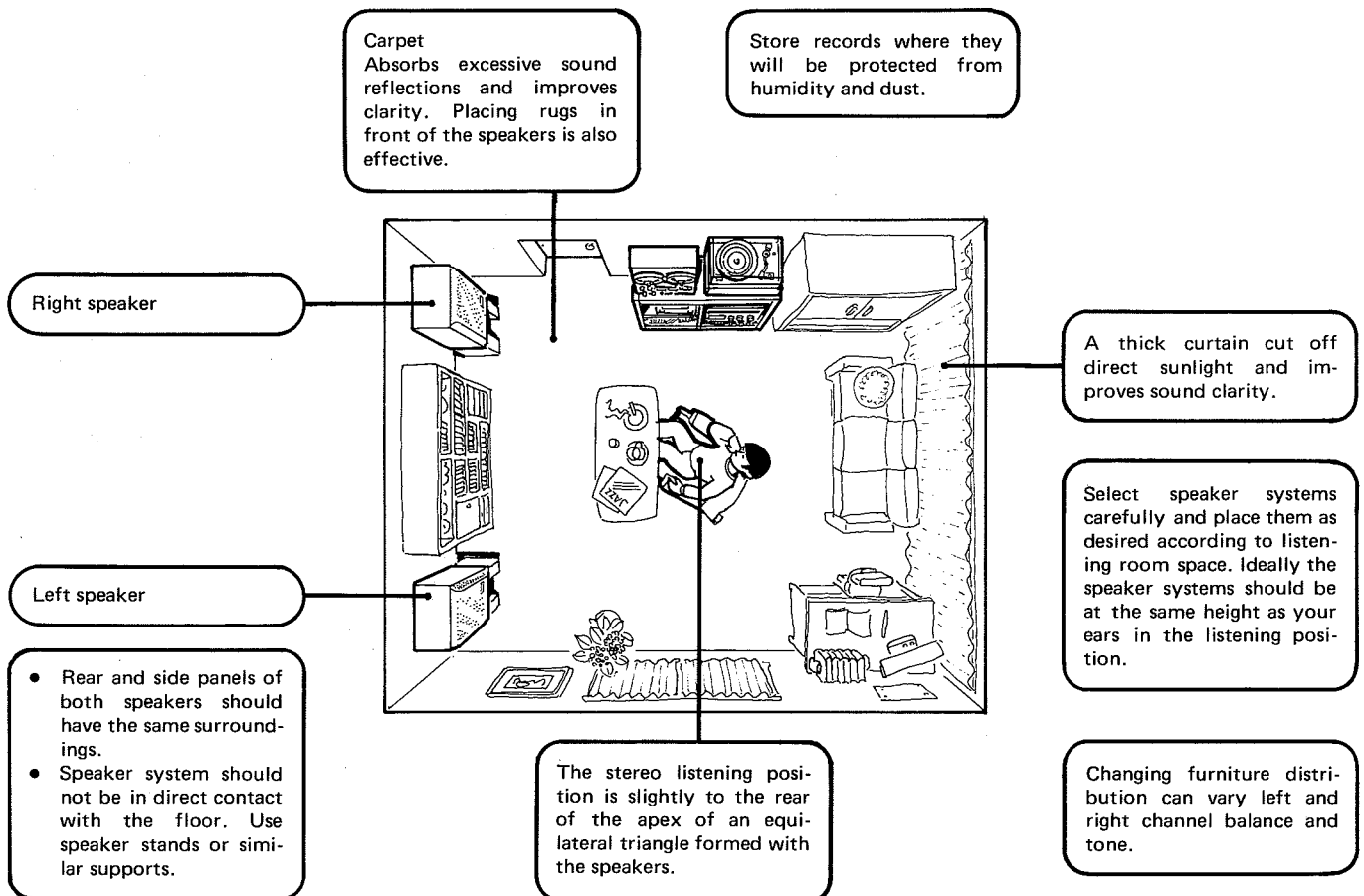


Fig. 3

INSTALLATION CAUTIONS

To ensure the best sound quality and trouble-free operation, avoid setting up the CX-7000 in any of the locations described below.

Location liable to downgrade performance and result in breakdowns	Resulting trouble
1. Locations exposed to direct sunlight, or near heaters.	1. External heat causes the performance of the circuit parts to deteriorate, and operation becomes unstable.
2. Locations with poor ventilation, or with high humidity or moisture contents, or dusty locations.	2. Cause of faulty contact in input/output terminals, and rust. High humidity and a high moisture content cause deterioration in insulation. There is also the danger of current leakage and heat generation in the circuit parts. Dust or grease in the rotating parts causes the parts to deteriorate.
3. Locations susceptible to vibration.	3. These locations affect the precision parts adversely.
4. Locations where there are thinners, benzine and other types of volatile liquids, insect sprays or any kind of inflammable objects at hand.	4. These help to corrode the front panel. In particular, the heads are precision-finished to micron dimensions. Chemicals may reduce their performance, so exercise all due care.
5. Locations where an AM radio or TV set is being used simultaneously.	5. Mutual interference can occur from the oscillator circuits used in these products.

CONNECTION DIAGRAM

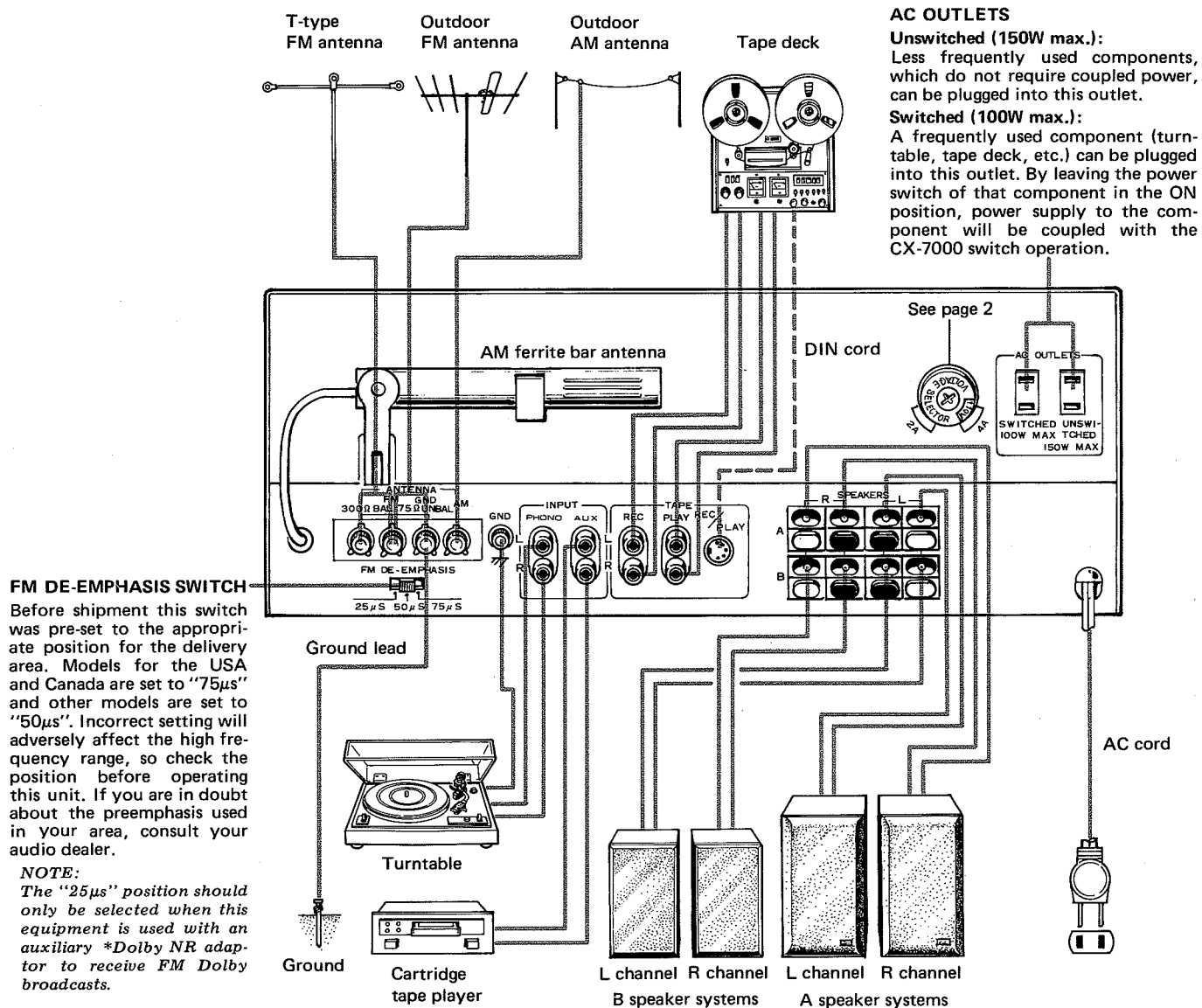


Fig. 4

HG model (220V, 240V)

YSA model (240V)

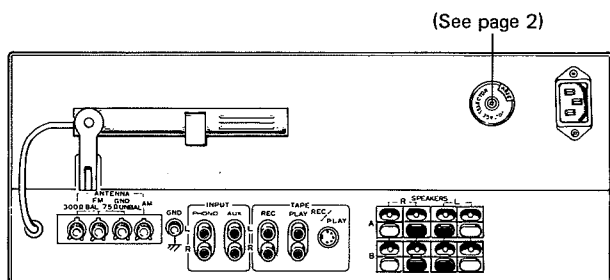


Fig. 5-A

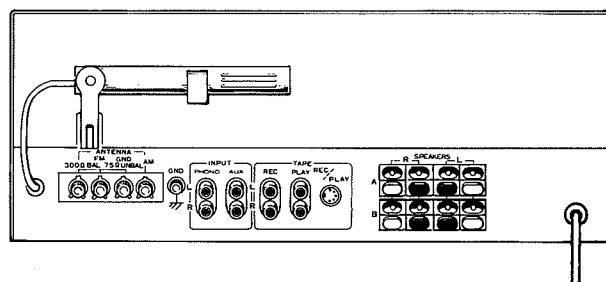


Fig. 5-B

ANTENNA AND GROUND CONNECTIONS

FM ANTENNA

FM signals are considerably weakened by mountains, tall buildings and metal-framed structures. Select the FM antenna carefully according to the ambient conditions and signal strength.

Outdoor FM Antennas

An outdoor FM antenna is recommended for an input signal which will allow the CX-7000 to display its performance to the full.

- While listening to an FM station (see FM Reception on Page 10), determine the antenna direction for optimum reception, then install it securely.
- According to type of antenna, employ a 75ohm coaxial cable or 300ohm feeder for connection.

75ohm coaxial cable: Recommended in locations where external noise is incurred due to street traffic, high voltage power lines or other conditions. Also employed if the distance between the antenna and CX-7000 is relatively great. Connect to the 75ohm UNBAL terminals as shown in Fig. 6.

300ohm feeder: This is suitable in locations where external noise is not a problem and if the distance between the antenna and the CX-7000 is short. Connect to the 300ohm BAL terminals as shown in Fig. 7.

NOTE:

Consult a reliable audio dealer regarding the FM antenna and 75ohm cable installation.

T Type Dipole FM Antenna

The accessory T type FM antenna can be employed in locations where FM signals are strong, such as those near transmitting stations or within wooden structures. As shown in Fig. 7, connect the T type FM antenna to the 300ohm BAL terminals. While listening to FM stations, open the antenna to a T shape, rotate it 180° to determine where the best reception is obtained, then attach it to a wall or ceiling.

AM ANTENNAS

While listening to AM stations (see AM Reception on Page 10), move the rear panel ferrite bar antenna and position it for best reception (Fig. 8).

- In cases when the bar antenna is insufficient for adequate reception, an indoor AM antenna can be made from a length (5 to 6 meters) of vinyl insulated wire. As shown in Fig. 9, connect one end of the wire to the AM antenna terminal and suspend the free end from a wall or ceiling as

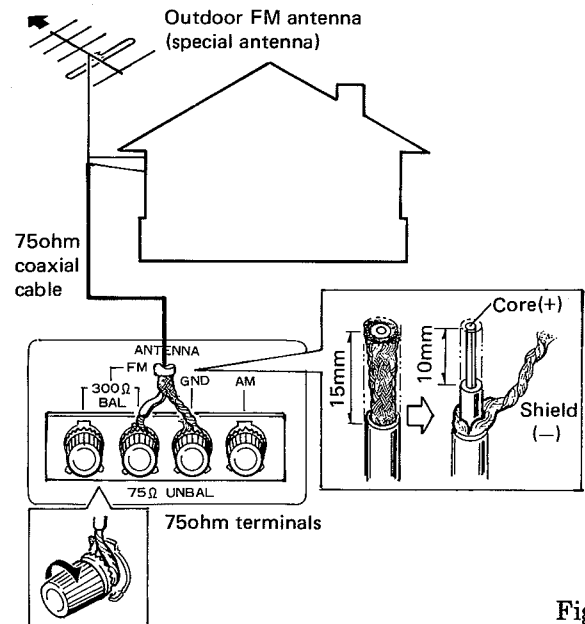


Fig. 6

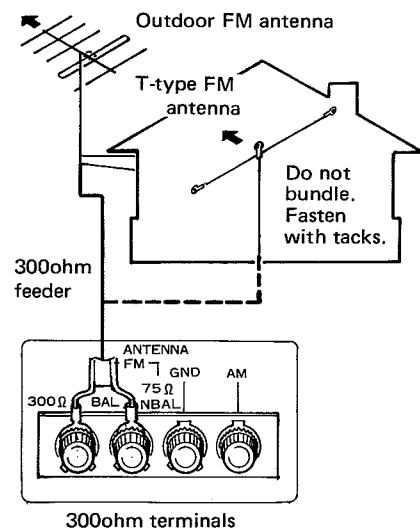


Fig. 7

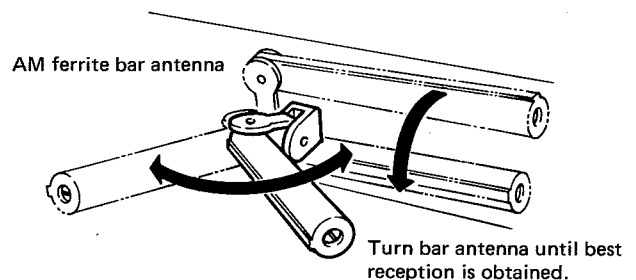


Fig. 8

high as possible.

- If reception is still not satisfactory with an indoor antenna, use vinyl insulated wire to erect an outdoor AM antenna between two supports as shown in Fig. 9.

GROUNDING

For safety and reduced noise, employ a ground as shown in Fig. 9 if possible. Connect the ground lead to the GND terminal of the CX-7000. Consult a qualified electrician regarding proper grounding techniques.

CONNECTIONS

SPEAKER SYSTEMS

Two sets of stereo speaker systems (A and B) can be connected to the CX-7000. Normally employ the SPEAKERS A terminals when connecting only one set of speaker systems.

NOTE:

If two sets of speaker systems are used simultaneously, the impedance of each speaker system must be 8 ohms or more. Malfunction can be incurred if a speaker of less than 8 ohms impedance is connected.

As shown in Fig. 4, connect the right channel speaker (as viewed from the listening position) to the R terminals and the left channel speaker to the L terminals. Observe the minus (-: black) and plus (+: red) polarities of SPEAKERS terminals and the terminals on the rear of speaker systems. Be sure to connect minus to minus and plus to plus.

Speaker Cord Connection

1. As shown in Fig. 10, strip about 10mm of the insulation from the end of the speaker cord. If the conductor is stranded, twist the strands together to prevent spreading.
2. Press down on the terminal button and insert the end of the cord into the opening.
3. Release the button and confirm that cord is firmly clamped in terminal.

TURNTABLE

Connect the output cord of a turntable equipped with a moving magnet (MM) type cartridge to the PHONO jacks. If the turntable is provided with a ground lead, connect this lead to the GND terminal on the rear of the CX-7000.

NOTE:

In addition to an MM type cartridge, an induced magnet (IM) type cartridge can be employed. In the case of a moving coil (MC) type cartridge, a special boosting transformer or head amplifier is required.

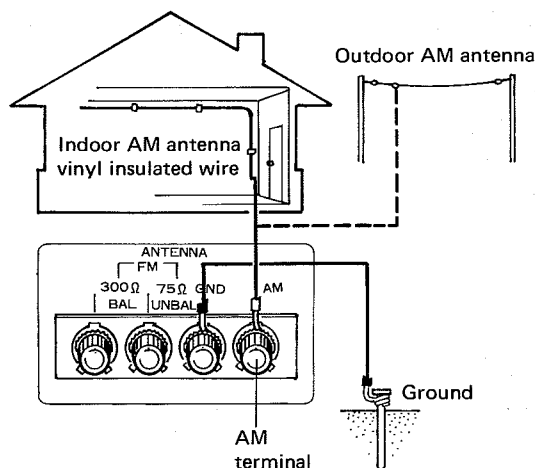


Fig. 9

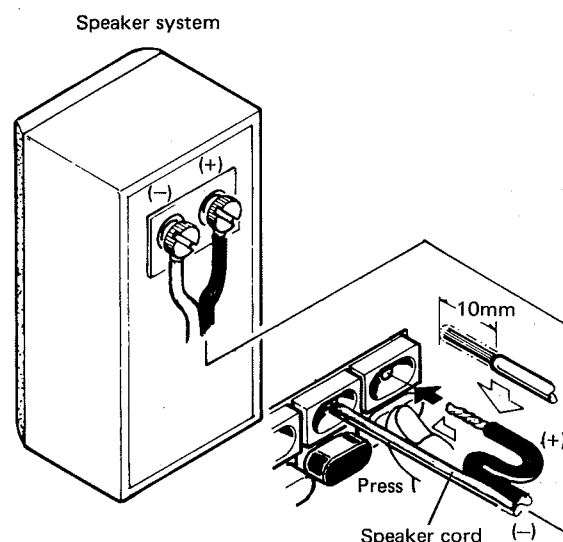


Fig. 10

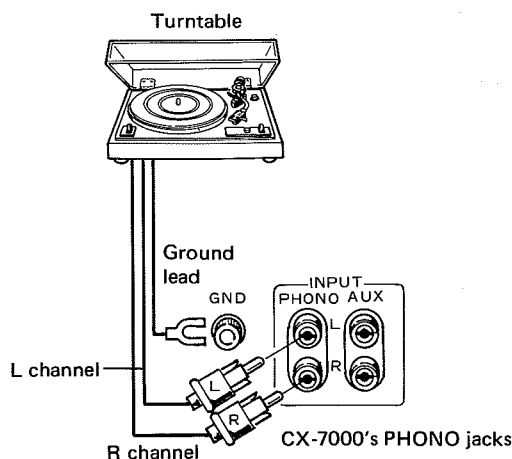


Fig. 11

FRONT PANEL FACILITIES (Receiver Section)

POWER BUTTON

Power is supplied to the CX-7000 when this button is pressed. Release it from its depressed setting to switch the power off.

SPEAKERS BUTTONS

Switch to select the speaker systems connected to the terminals on the rear panel. Sound from the corresponding speaker systems is heard when a button is depressed. Sound is cut off when these buttons are released.

A: Sound is obtained from the speakers connected to the A speaker terminals.

B: Sound is obtained from the speakers connected to the B speaker terminals.

If both buttons are depressed simultaneously, sound will be obtained from both A and B speaker systems.

When listening with headphones, release the SPEAKER buttons.

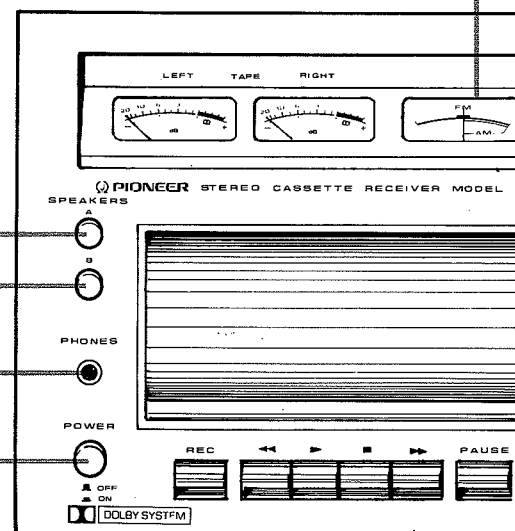
PHONES JACK

This is the output jack for stereo headphones. Use this jack to monitor the input signal when you are recording a tape on the tape deck or when you want to listen to a program through the stereo headphones.

AM/FM METER

This meter indicates the state of the broadcast reception. AM broadcast: Optimum reception is indicated when the pointer deflects to the far right.

FM broadcast: Optimum reception is indicated when the pointer stays firmly in the center of the black band.



MODE/FM MUTE BUTTON

This button performs two functions: it is used to cut out FM interstation noise as the muting switch, and also to switch between stereo and monophonic reproduction as a selector switch.

STEREO/MUTE ON: Set the button to this position for stereo reproduction and when the FUNCTION switch is set to FM AUTO, and it will cut out annoying FM interstation noise.

MONO/MUTE OFF: Set the button to this position for a monophonic performance whereby the signals of both the left and right channels are mixed, and when it is difficult to receive an FM station with the FUNCTION switch set to FM AUTO (i.e. when there is a lot of noise, or when the broadcasting signals are weak).

BASS, TREBLE KNOBS

Adjust the bass with the BASS knob and the treble with the TREBLE knob. The bass and treble are strengthened when the knobs are turned to the right and weakened when turned to the left.

The sound quality of the music source depends on how the sound is absorbed and reflected in the listening room and also on the characteristics of the speakers. You can use these knobs to compensate accordingly and adjust the sound to your preference.

VOLUME KNOB

Use this knob to adjust the volume of the speakers and headphone. You can increase the volume by turning this knob to the right.

STEREO INDICATOR

This lamp lights up when the FUNCTION switch is set to FM AUTO to indicate that an FM stereo broadcast is being received.

TUNING KNOB

Use this knob to tune in broadcasting stations. Turn this knob and tune while keeping a close watch on the deflection of the AM/FM meter pointer.

LOUDNESS BUTTON

When you want to listen to a program source at a low volume level (set the VOLUME knob until the center), press this button and the bass and treble will be accentuated.

The bass and treble characteristics fall off when you listen to a program source at a low volume level, compared to when you listen at a high volume level. The LOUDNESS button makes up for the deficiency of the human ear when you listen at low volume levels.

EXT TAPE BUTTON

Press this button (ON position) when playing back a tape using a tape deck which is connected to the TAPE jacks on the rear panel, or when monitoring the quality of an ongoing recording. Always keep this button at the OFF position (released) when not in use.

MIC JACKS

Plug your left channel microphone into the MIC L jack and your right channel mike into the MIC R jack.

NOTE:

Disconnect your microphones from the MIC jacks when you are not using them, otherwise you will not be able to listen to records.

FUNCTION SWITCH

Use this switch to select the program source.

AM: For AM broadcasts only.

FM AUTO: For stereo broadcasts. The reception of an FM monaural broadcast will automatically come through in monophonic.

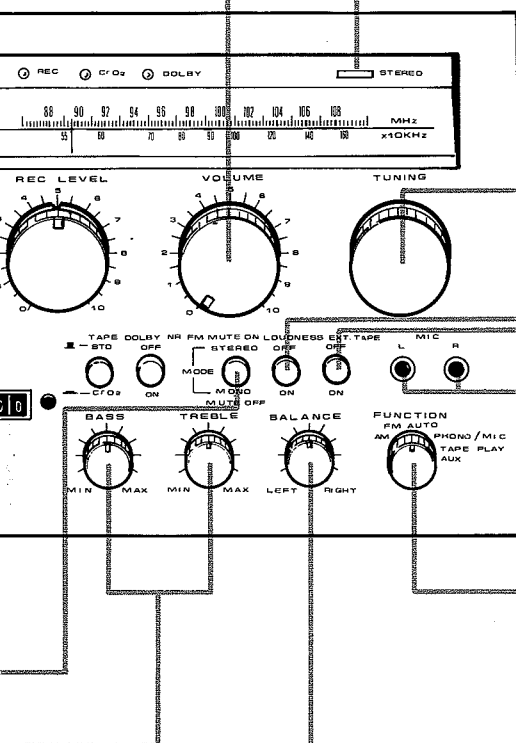
PHONO/MIC: Set to this position when playing a record on a turntable which is connected to the PHONO jacks or for a performance using microphones connected to the MIC jacks.

TAPE PLAY: For playing back a tape on the CX-7000's cassette deck.

AUX: For an auxiliary music source which is connected to the AUX jacks.

BALANCE KNOB

Use this knob to achieve a balance between the volume of the left and right channels. First, set the MODE/FM MUTE button to MONO, and adjust so that the sound appears to come from a position exactly between the two speakers. If the sound appears stronger on the right, for example, it means that the volume of the right channel is higher than that of the left channel. In this case, turn the knob to the left. Turn the knob to the right if the sound appears stronger on the left. After you have achieved a balance, return the MODE/FM MUTE button to STEREO.



BEFORE OPERATION

Before you switch on the power, set the knobs and buttons as follows:

- Select the **SPEAKER** buttons in accordance with the speakers connected to the **SPEAKER** terminals (A or B).
- Set the **MODE/FM MUTE** button to **STEREO**.
- Set the **EXT TAPE** button to **OFF**.
- Set the **BASS**, **TREBLE** and **BALANCE** knobs to the center position.
- Set the **VOLUME** knob to its leftmost position.
- Set the cassette tape operating levers to release position.
- Set the **LOUDNESS** button to **OFF**.

LISTENING TO BROADCASTS

FM RECEPTION

1. Set the **FUNCTION** switch to **FM AUTO**.
2. Turn the **TUNING** knob and select an FM station.

The pointer of the AM/FM meter deflects to the center of the scale with the **TUNING** knob, as shown in Fig. 12.

- Set the **MODE/FM MUTE** button to **MUTE OFF** when the broadcast signals are weak or when the reception is not satisfactory. The program is now heard in mono through both speakers.
 - The **FM STEREO** indicator lights up when an FM stereo broadcast is being received. It does not light up with monophonic broadcasts.
3. Adjust the volume with the **VOLUME** knob, and the tone with the **BASS** and **TREBLE** knobs to the preferred levels.

AM RECEPTION

1. Set the **FUNCTION** switch to **AM**.
2. Turn the **TUNING** knob and select an AM station.

As shown in Fig. 13, turn the **TUNING** knob so that the AM/FM meter pointer deflects to the far right.

3. Adjust the volume with the **VOLUME** knob, and the tone with the **BASS** and **TREBLE** knobs.

NOTE:

If you find that there is still a lot of noise and that the FM or AM program is not coming through loud and clear, read through the section on Antenna and Ground Connections' on page 6, and check the antenna connections.

LISTENING TO RECORDS

OPERATION

1. Set the **FUNCTION** switch to **PHONO/MIC**.
 2. Prepare the turntable for operation and start playing the record.
 3. Adjust the volume with the **VOLUME** knob, and the tone with the **BASS** and **TREBLE** knobs to the preferred levels.
- Do not leave the mike plugs in the **MIC** jacks.
 - Lift the stylus gently onto the record, and have either the **VOLUME** knob set to its leftmost position, or the **SPEAKER** buttons at the **OFF** position.
 - Do not cause the turntable to vibrate when a record is being played since this will make the stylus jump grooves or scratch the record.
 - Do not switch the power to the turntable off when the stylus is tracing grooves.
 - Placing the turntable close to the speakers may invite feedback howling and you will not be able to listen to the records at a high volume level. To safeguard against this, either make sure that the vibration from the speakers is not transmitted to the turntable or re-locate the turntable at a distance from the speakers.

FM stations: Meter pointer indicates center when FM station is absent. As the tuning knob is turned and a station approached, the meter pointer deflects toward the right or left. Then when the station is correctly tuned in, it returns to the center position.

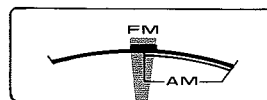


Fig. 12

AM stations: When selecting AM stations, carefully turn the **TUNING** knob for maximum deflection of the AM/FM meter pointer toward the right, as shown in the figure.

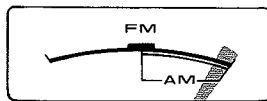


Fig. 13

USING THE AUX INPUT JACKS

You can use these jacks to connect an 8-track cartridge player, or tuner, or to connect the output of a tuner or tape deck tape playback (See Fig. 14).

OPERATION

1. Set the FUNCTION switch to AUX.
2. Prepare the component connected to the AUX jacks for operation.
3. Adjust the volume with the VOLUME knob, and the tone with the BASS and TREBLE knobs.

You can use the AUX jacks to duplicate a pre-recorded tape. As shown in Fig. 15, you can record songs and music broadcast in FM programs, which have been pre-recorded by a tape deck, on a tape in the CX-7000's cassette deck if you connect the LINE OUTPUT jacks of that tape deck to the AUX jacks. In addition, you can duplicate material from an open-reel tape deck onto the CX-7000 cassette tape.

1. Connect the tape deck as shown in Fig. 15;
2. Set the FUNCTION switch to AUX.
3. Play back the tape in the tape deck connected to the AUX jacks and record the material onto the tape in the CX-7000's cassette deck.

NOTE:

You cannot check the quality of the recording on the CX-7000, although you can monitor the playback sound at the playback end through the speakers or headphones.

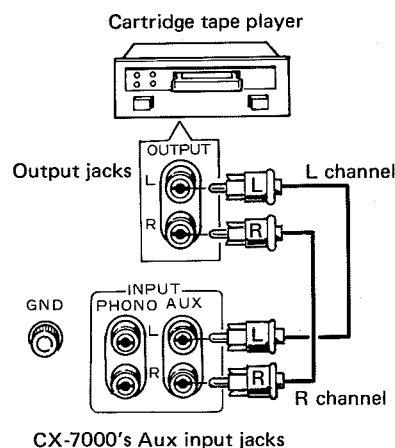


Fig. 14

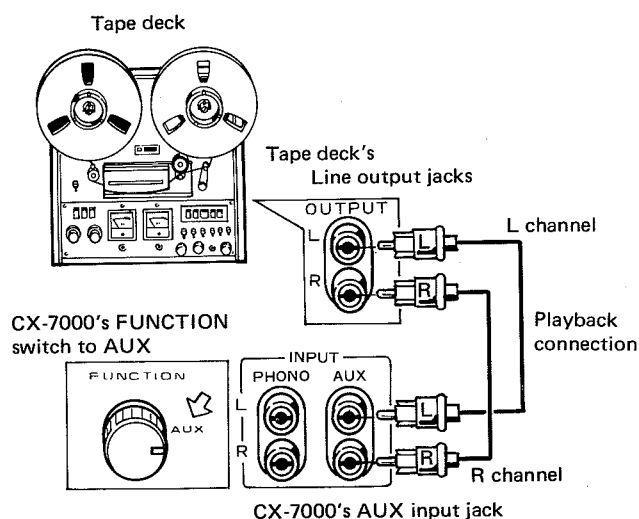


Fig. 15

FRONT PANEL FACILITIES (Cassette Deck Section)

REC LEVEL KNOBS

Use the knobs to adjust the level of the input signals from a program source you have selected with the FUNCTION switch (excluding TAPE PLAY).

The front knob is for the left channel and the back knob for the right channel. The two knobs can be adjusted independently. Turn the knobs while keeping an eye on the deflection of the TAPE level meter pointer.

TAPE LEVEL METERS (LEFT, RIGHT)

These two meters show the input level when you are recording a tape in the CX-7000's cassette deck and the output level when you are playing back a tape.

The level meters are not related to the VOLUME knob and so there will be no change in the deflection even if you turn this knob.

REC INDICATOR

This indicator lights up red to indicate that the tape deck is set to the recording mode when the PLAY and REC levers are depressed together.

NOTE:

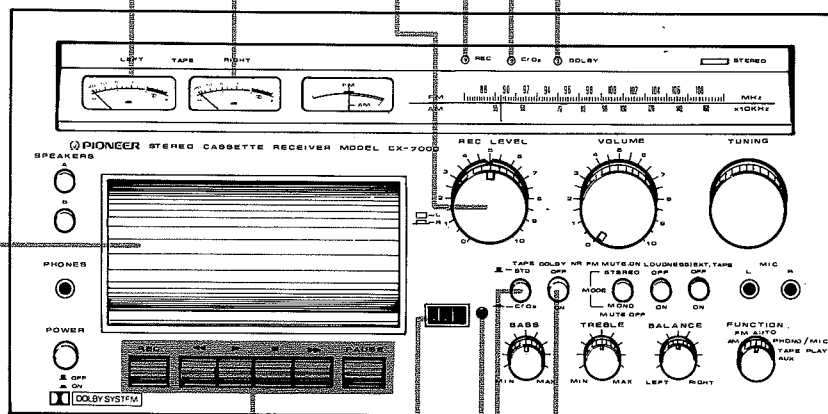
Always check that this indicator has lit up before starting to record.

CrO₂ INDICATOR

This lamp lights up when the TAPE selector is set to CrO₂ and it indicates that you are using a chrome tape.

DOLBY INDICATOR

When the DOLBY NR button is pressed, this indicator lights up to indicate that the tape deck is set for Dolby recording or Dolby playback.



DUST COVER

Keep the cassette dust cover closed unless you are inserting or ejecting a cassette since dust and dirt are liable to enter the cassette loading section. Open and close the cover by hand. For further details, refer to page 13.

FUNCTION LEVERS

- REC:** Press this lever and the PLAY lever together when you want to record.
- REW (◀):** Press this lever to rewind the tape (The tape will run from right to left).
- PLAY (▶):** Press this lever when playing back a tape. Press it together with the REC lever when recording (The tape will run from left to right).
- STOP (■):** When this lever is pressed during tape play, the other function levers are released and the tape is stopped.
- FF (▶▶):** Press this lever for fast forward (The tape will run from left to right).
- PAUSE:** Press this lever when you want to stop the tape temporarily during recording or playback. When this lever is released, the tape will start to run again. This lever does not work during FF and rewind.

TAPE SELECTOR BUTTON

Operate this button according to the type of tape you intend to use.

The settings are STD (released position) and CrO₂ (depressed position).

STD: Standard tapes, low-noise, and low-noise high-output tapes.

CrO₂: Chrome tapes and ferrichrome tapes.

If you want to use a chrome tape, choose one with chrome detection holes (see page 13). Do not use chrome tapes which are not provided with these special holes.

DOLBY NR BUTTON

Press this button (ON position) when you want to record using the Dolby noise reduction system built into the CX-7000 or when you want to play back a tape which has been recorded using the Dolby system.

COUNTER RESET BUTTON

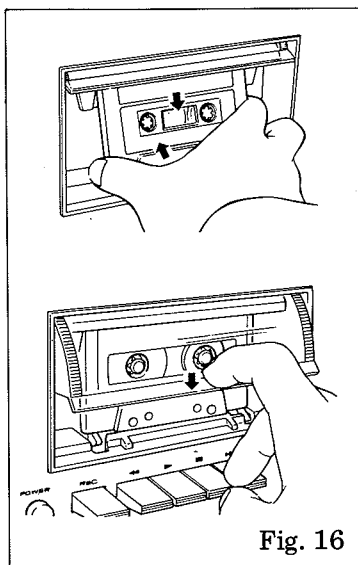
The tape counter will be set to '000' when this button is pressed.

TAPE COUNTER

This shows how far the tape has run.

BASIC OPERATION

TAPE INSERTION



Aligning the cassette tape with the guide, push upward and insert. When you want to remove the tape, pull it towards you.

Place your forefinger on the edge of the dust cover and pull towards you.

Fig. 16

TAPE RUN

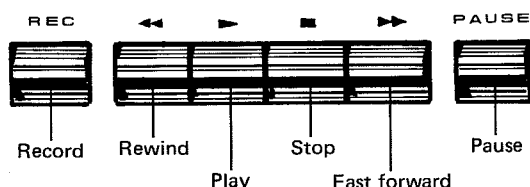


Fig. 17

Play and record

1. Check that the tape is on the left reel.
2. The tape runs from left to right when the PLAY lever (and the REC lever if recording) is depressed.

Stop

Press the STOP lever to stop the tape. This action also releases the other function levers.

Fast forward

1. Check that the tape is on the left-hand reel.
2. The tape runs from left to right at a high speed when the FF lever is depressed.

Rewind

1. Check that the tape is on the right-hand reel.
2. The tape runs from right to left at a high speed when the REW lever is depressed.

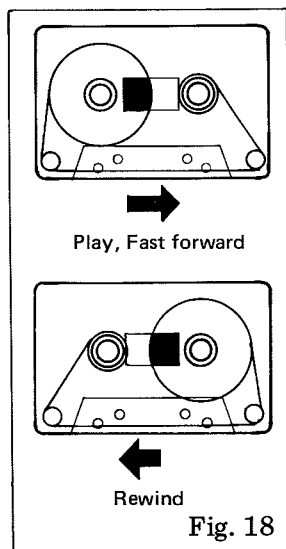


Fig. 18

NOTES:

- Do not press more than one lever at a time except when recording.
- You do not have to depress the STOP lever when selecting the next mode, since the levers feature a direct change mechanism.

PAUSE LEVER OPERATION

1. The tape can be stopped during recording or playback by pressing the PAUSE lever. The PLAY lever and the REC lever, if recording, are not released from their depressed positions.
2. If the PAUSE lever is released, the tape will begin to run again.

Convenient applications

- When setting the recording level.
- When cutting out unnecessary sections of a program source which you are recording and then continuing your recording.
- When you want to stop the sound temporarily during playback.

NOTES:

1. To stop the tape for a prolonged period of time, press the STOP lever.
2. When using a pre-recorded tape to re-record a program source, bear in mind that the pre-recorded sound will sometimes not be erased at the place on the tape where you set the deck to the PAUSE mode.

AUTO-STOP MECHANISM

The tape is automatically stopped and the operating levers released when the tape becomes completely wound onto one reel during each operating mode (record, playback, fast forward), even if the STOP lever is not depressed. It takes only a few seconds for this auto-stop operation.

CHROME TAPE DETECTOR

A chrome tape detecting mechanism is incorporated into this tape deck. When the employed chrome tape is equipped with chrome detection holes, as shown in Fig. 19, the bias is automatically switched for chrome tape specifications; however, equalization should be selected by setting the TAPE selector button. Be sure to use a chrome tape that is provided with these holes otherwise the automatic switching response will not be performed.

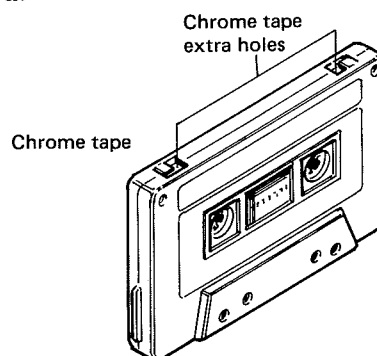


Fig. 19

CASSETTE TAPES

Cassette tapes are manufactured according to international standards governing their construction, and they are generally classified according to their tape performance and recording time.

Performance classifications

Table 1

Standard type	Low-noise type	High-performance type
• Standard tape • Dynamic tape	• Low-noise tape • Low-noise, high-output tape	• Chrome tape • Ferrichrome tape

NOTE:

You can set the tape selector button on the CX-7000 to the suitable positions for all of these tapes.

Recording time classifications

Table 2

Cassette tape designation	Recording time (minutes)	
	One side	Both sides
C-30	15	30
C-46	23	46
C-60	30	60
C-90	45	90
C-120	60	120

The size of the cassette tapes is the same but their playing (and recording) times differ according to the tape thickness (length). The C-60 and C-90 tapes are most commonly used. The C-120 tapes are not recommended because their mechanical and electrical specifications vary.

CHECK CASSETTE BEFORE USE

Slack or protruding tapes

If the tape protrudes from the cassette as shown in Fig. 20, or is slack the tape may run without passing through between the capstan and the pinch roller, and so may be damaged. Take up the slack by inserting a pencil through the reel hub and turning it as indicated in the figure.

Some tapes provide a tape stopper to prevent tape slack. Make sure that you remove the tape stopper before inserting the tape into the deck.

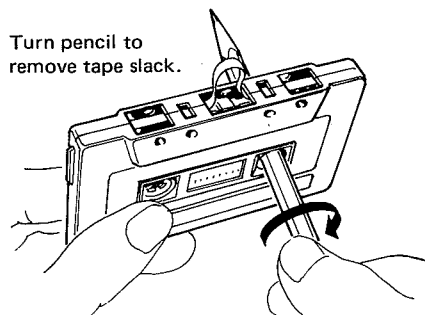


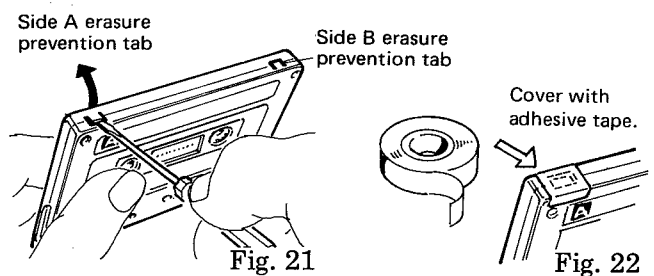
Fig. 20

Erase prevention tabs

Cassette tapes are provided with erase prevention tabs, as shown in Fig. 21, which act as a protection device to prevent the accidental erasure of a recording which you want to keep. If you remove the tabs, as shown in Fig. 21, with a screwdriver you will be able to prevent erasure if you accidentally set the CX-7000 to the recording mode by depressing the REC lever. To re-record, cover the tab opening with a double layer adhesive tape (Fig. 22).

NOTE:

Cassette tapes are provided with two tabs (A or 1 and B or 2) and so you can protect the recordings on both sides.



CHECKPOINTS WHEN HANDLING CASSETTES

Check tape before recording

Before recording, first run the tape through fast forward and rewind. This is to prevent jamming or running irregularities from affecting the recording.

Allow for the leader tape

A leader tape is provided (it cannot be recorded) at the beginning of each cassette tape. Allow about 5 seconds for it to clear the heads before starting recording.

Always keep in the case

Avoid leaving cassette tapes uncovered. The cassette case protects the tape from dirt and dust and safeguards it against tape unwind.

Do not use tape right after cleaning heads

Allow the heads to dry completely (2–3 minutes) after cleaning them with head cleaning fluid. Then insert the tape.

Tape storage

Always store your tapes in a location which is unaffected by dirt, dust, oil and magnetic fields.

Do not touch tapes

Do not allow your hands to come into direct contact with the tape surface, since this may cause drop-outs in the sound.

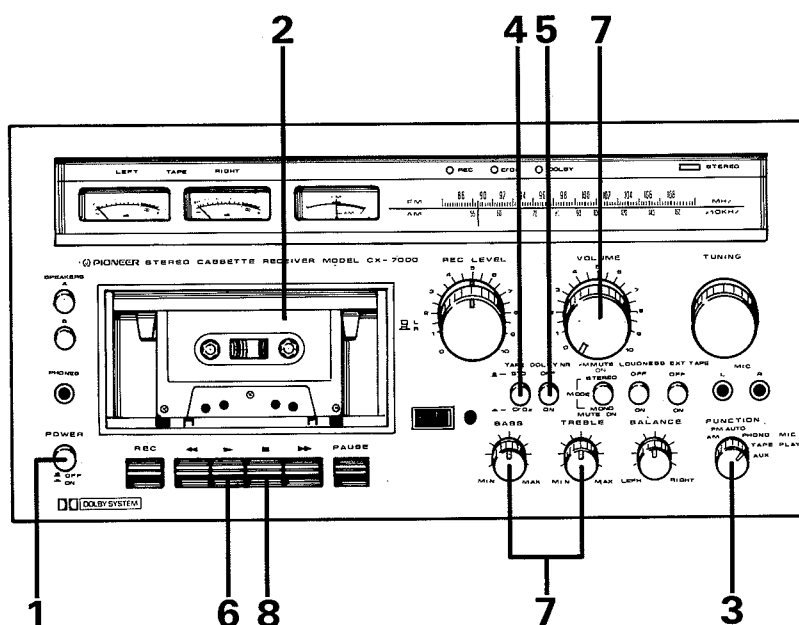
PLAYBACK

Before you switch on the power, set the knobs, buttons and tape counter as follows:

- Select the **SPEAKER** buttons in accordance with the speakers connected to the **SPEAKER** terminals (A or B).
- Release the **PAUSE** lever.
- Set the tape counter to '000.'

- Set the **MODE/FM MUTE** button to **STEREO**.
- Set the **EXT TAPE** button to **OFF**.
- Set the **BASS**, **TREBLE** and **BALANCE** knobs to the center position.

Follow the procedure below for playback in numerical order. The step numbers are illustrated in the figure.



1. Set the **POWER** button to **ON**.

2. Insert the cassette tape.

Check that the tape is wound on the left-hand reel.

3. Set the **FUNCTION** switch to **TAPE PLAY**.

4. Select the **TAPE** selector button.

Set the **TAPE** selector button in accordance with the type of tape you plan to play back.

STD: For standard tapes, low-noise tapes and low-noise high-output tapes.

CrO₂: For chrome tapes, ferrichrome tapes.

5. Select the **DOLBY NR** button.

Press this button (**ON** position) when playing back a Dolby-recorded tape.

6. Start playback.

Press the **PLAY** lever and the tape will start to run. Sound will be heard through the speakers.

7. Adjust the volume and tone.

Adjust the volume with the **VOLUME** knob, and the tone with the **BASS** and **TREBLE** knobs to the desired level.

8. Finish playback.

The CX-7000 automatically shuts down when the tape is wound onto the right-hand reel.

Press the **STOP** lever to stop the tape during playback.

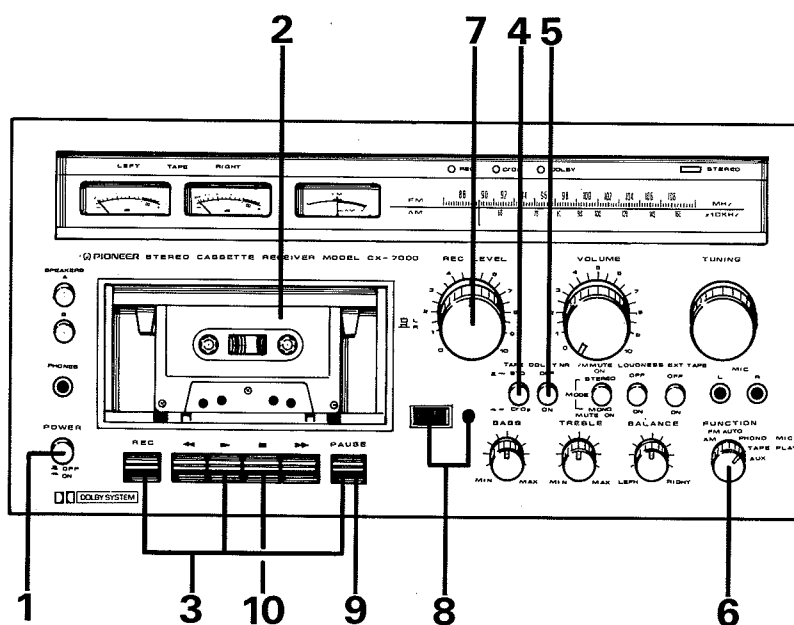
Press the **PAUSE** lever to stop the tape temporarily.

RECORDING

Before you switch on the power, set the knobs and buttons as follows:

- Turn the REC LEVEL knobs to their leftmost positions.
- Set the DOLBY NR button to OFF.
- Set the MODE/FM MUTE button to STEREO.
- Set the EXT TAPE button to OFF.
- Set the BASS, TREBLE and BALANCE knobs to the center position.
- Select the SPEAKER buttons in accordance with the speakers connected to the SPEAKER terminals. (A or B)
- Set the FUNCTION switch in accordance with the program source you are about to record.
- Set the VOLUME knob to your normal listening position.

Follow the procedure below for recording in numerical order. The step numbers are illustrated in the figure.



1. Set the POWER button to ON.

2. Insert your cassette tape.

Check that the tape is wound onto the left-hand reel.

3. Stand by for recording.

Press the PAUSE lever and set the cassette deck to the PAUSE mode. Then press the PLAY and REC levers together. The REC indicator will now light up to indicate that the deck is set to the recording mode.

4. Select the TAPE selector button.

Select the TAPE selector button in accordance with the type of tape you are using to record.

STD: For standard tapes, low-noise tapes and low-noise high-output tapes.

CrO₂: For chrome tapes, ferrichrome tapes.

5. Select the DOLBY NR button.

Press this button (ON position) for Dolby recording. Refer to page 18 for further details on Dolby Noise Reduction.

6. Set up and operate the program source.

Set up the program source (AM, FM broadcast, record, microphones) and check the quality of the playback through the speakers or headphones.

7. Set the recording level.

Adjust the REC LEVEL knobs so that the level meter pointers do not deflect past the 0dB marks. Refer to 'Setting the Recording Level' on page 17 for further details.

8. Press the tape counter button and set to '000.'

9. Start recording.

Release the PAUSE lever and the tape will start to run. Check the deflection of the level meter pointers, the operation of the tape counter and the tape run.

NOTE:

You cannot monitor the recording with the CX-7000.

10. Finish recording.

The CX-7000 automatically shuts down when the tape is wound onto the right-hand reel. If you want to stop the tape during recording, press the STOP lever. Press the PAUSE lever to stop the tape temporarily.

SETTING THE RECORDING LEVEL

Set the recording level controls so that the level meter pointers deflect across a $-3 \sim 0$ dB range when there are relatively high signal peaks in the program source that you are recording. The playback sound will be distorted if the level meter pointers deflect to the upper end of the scale during recording. Conversely, if the angle of deflection is too low, the Signal-to-Noise ratio will deteriorate and there will be a high level of audible noise during playback. The signal level varies from program source to program source, and so keep your eye on the pointers during recording.

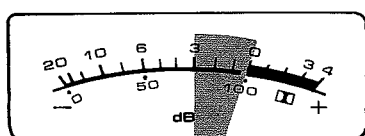


Fig. 23

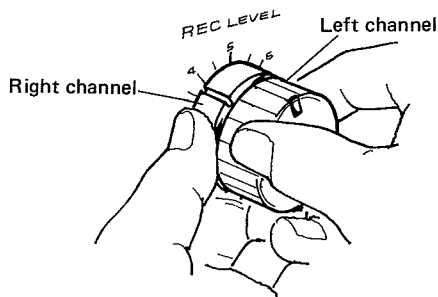


Fig. 24

Turning the controls adjusts both L and R channels at the same time. To adjust independently, hold the control you do not want to adjust and turn the control of the channel you wish to adjust.

FOLLOW-ON RECORDING

You can record a new program source onto a pre-recorded tape which is playing in the deck if you depress the PLAY and REC levers together. This procedure is particularly effective for tape editing.

NOTE:

Check that the tape's erasure prevention tabs have not been broken off. You cannot record a new program source if they have (Refer to page 14 and the section on 'Erasure Prevention Tabs').

ERASING RECORDED SOUND

- When you want to completely erase a program source which you have recorded, set the recording level knobs to their leftmost positions and then allow the tape to run with the tape deck set to the recording mode.
- If you re-record a new program source onto a pre-recorded tape, the previous recording will be erased automatically, and the new program source will be recorded.

USING THE MIC JACKS

You can use microphones to amplify the sound of a live performance or to record sound onto the cassette tape.

Use two microphones which are exactly the same for the left and right channels and plug them into the L and R MIC jacks (Fig. 25).

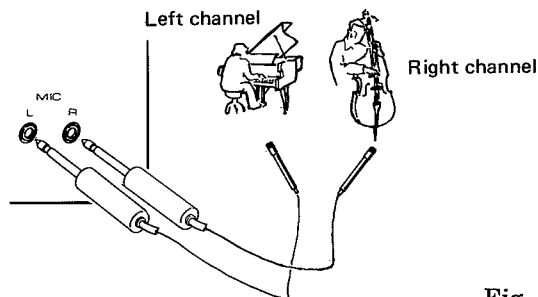


Fig. 25

BEFORE OPERATION

- Turn the VOLUME knob to its leftmost position.
- Set the BASS and TREBLE knobs to the center position.
- Use dynamic or electret microphones.
- Make sure that the connecting cord is no longer than 5m if you use high-impedance microphones (20 kilohms, or more).
- Howl is easily caused if the recorded sound is monitored through the speakers so try to use the microphones as far away from the speakers as possible.
- It is a good idea to use the headphones to monitor the recording.

Amplification

Set the FUNCTION switch to PHONO/MIC and turn the VOLUME knob slowly to the right and set at the optimum level.

Recording

Set the FUNCTION switch to PHONO/MIC and record (Refer to page 16 for the recording procedure).

NOTE:

When you are not using the microphones, always disconnect the plugs from the MIC jacks.

RECORDING PROGRAMS IN MONO

When recording with one microphone only, set the recording level knob of the channel (left or right) which you are not using to its leftmost position. Furthermore, if you set the MODE/FM MUTE button to MONO during playback, the sound can be heard through the left and right speakers.

USING THE DOLBY SYSTEM

The Dolby System is a method of reducing noise generated in the tape playback process. It is widely employed throughout the world.

Since the system is mainly concerned with noise produced by the tape itself, it cannot reduce noise in the program source which is being recorded on tape. This means that to derive the maximum benefit from the Dolby system you should avoid recording signals from records which have been played a lot and also from FM broadcasting stations containing a lot of noise. Instead, you should always try to choose signals with as little noise as possible.

PRINCIPLE

Magnetic tapes used for recording and playback on a tape recorder have a certain amount of inherent noise. The most audible is that in the midrange and treble, and this is called 'hiss'. This can be traced to the size of the magnetic particles in the tape. The hiss is reduced if these particles are small or if the tape is run quickly which in effect reduces the size of the particles. However, the low speed of the cassette places it at a disadvantage in this respect.

The CX-7000 features a B-type Dolby system which is designed to reduce this hiss. An A-type system is also available on the market and this reduces all kinds of noise (but it is employed in special professional equipment).

Although the noise reduction frequency band differs, both types of Dolby Systems are capable of providing an improvement of up to 10dB under optimum conditions.

The B-type noise reduction system works as follows. When the recording input signals fall below the reference level, the midrange and treble component levels in the signals are successively enhanced and then recorded. A tape recorded in this way is given exactly the reverse treatment during playback. The midrange and treble components below the reference level are successively attenuated and so when the tape is played back, the signals are returned to their original form. At the same time, the tape hiss which is the midrange and treble noise generated in the playback process is attenuated in proportion to the size of the signals — the smaller the signals, the greater the attenuation. This has the effect of reducing the noise.

SELECTING TAPES

Although there are some differences among standard tapes, LH tapes, chrome tapes and ferrichrome tapes, you can use just about any brand with the CX-7000. It is better to avoid using C-120 tapes which do not have any particular performance specifications and also LH tapes with a high sensitivity level.

NOTE:

In some cases and especially with high sensitivity tapes, Dolby recording and playback can produce deviations in the frequency response and this results in downgrading the sound quality rather than improving it.

RECORDING LEVEL

Adjusting the recording level involves basically the same operations as with non-Dolby recording. However, with wide dynamic range sources, such as live recordings with microphones whereby high-volume sounds are being recorded, it is a good idea to set the recording level a little lower than normal. The Dolby System works to suppress noise with low-volume sound and it reduces the level slightly with high-volume sound. This means that you do not have to worry about distortion when recording.

PLAYBACK

- When you play back pre-recorded Dolby music tapes sold on the market on your CX-7000, you will be surprised at the high quality of reproduction and the very low noise level.
- If the Dolby noise reduction system is not applied during both recording and playback, the original signals will lose their original characteristics. Playing back normally recorded tapes with the Dolby system on (noise decreases but treble unbalanced) and playing back Dolby recorded tapes with the Dolby system off (treble is accentuated slightly) are not illustrations of the correct application of the Dolby System.

USING THE TAPE JACKS

You can use the TAPE jacks on the rear panel of the CX-7000 to connect a tape deck (open-reel or cassette).

Use the connecting cords that come with the tape deck to connect the deck to the CX-7000. The upper jack is for the left channel and the lower jack for the right channel.

CONNECTION (Fig. 26)

Recording Connections: Connect the TAPE REC jacks to the recording input (LINE INPUT) jacks of the tape deck.

Playback Connections: Connect TAPE PLAY jacks to the playback output (LINE OUTPUT) jacks of the tape deck.

Using the REC/PLAY Connector: The tape deck is equipped with DIN recording/playback cords, which are sold separately, to connect the REC/PLAY connectors on the CX-7000 and the tape deck. There is no need for the accessory connecting cords since the same connections serve for both recording and playback.

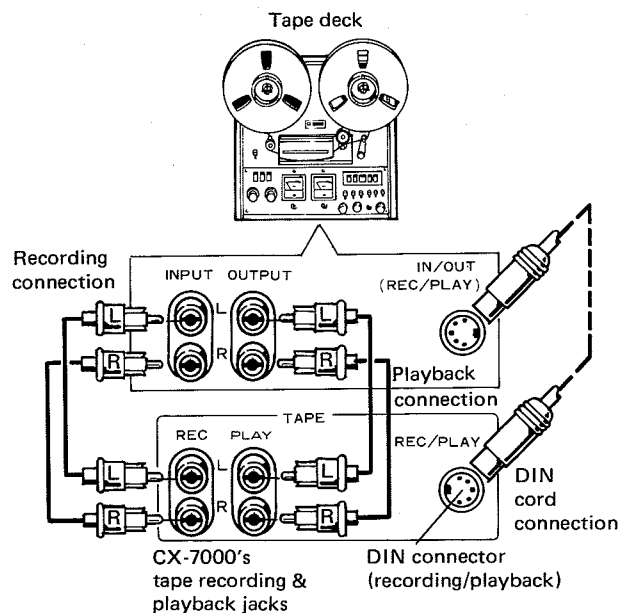


Fig. 26

OPERATION

Tape Playback

Steps for playback of a pre-recorded tape on the tape deck (Fig. 27).

1. Set the EXT TAPE button to ON.
2. Operate the tape deck and playback the tape.
3. Adjust the VOLUME, BASS and TREBLE knobs for the desired volume and tone.

Tape Recording

A program source (records, FM broadcasts, etc.) can be recorded with the tape deck (Fig. 28).

1. Set the FUNCTION switch to the source of the recording (AM, FM AUTO, PHONO, etc.).
2. Operate the program source.
3. Adjust the recording level knobs on the tape deck and proceed with recording.

NOTE:

If you set the FUNCTION switch to TAPE PLAY, you can duplicate recordings on the CX-7000's tape deck cassette onto the tape in the deck connected to the CX-7000. You can edit tapes, too.

Monitoring the Recording

If the tape deck is equipped with monitoring facilities (3 heads), the recording can be monitored from the speakers by pressing the EXT TAPE button. Both recording and playback connections must be completed in this case.

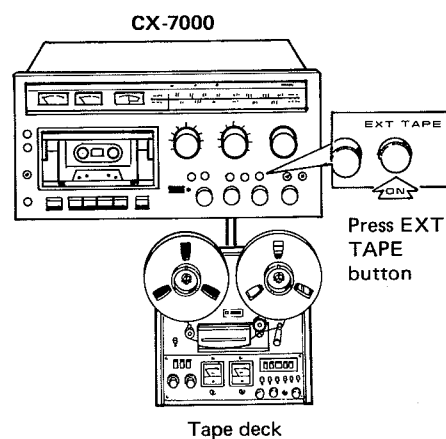


Fig. 27

NOTES:

1. Be sure to release the EXT TAPE button when not playing a tape.
2. Tape playback is not related to the FUNCTION switch.

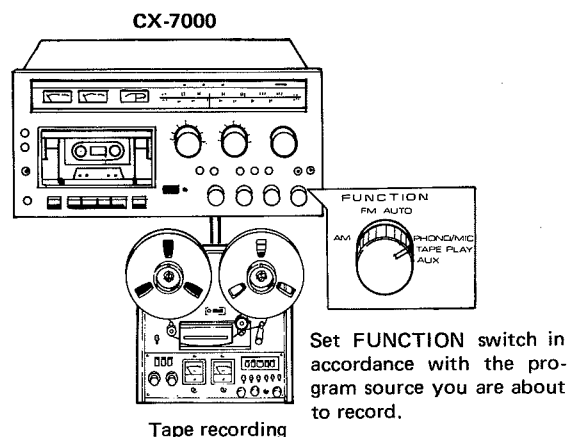


Fig. 28

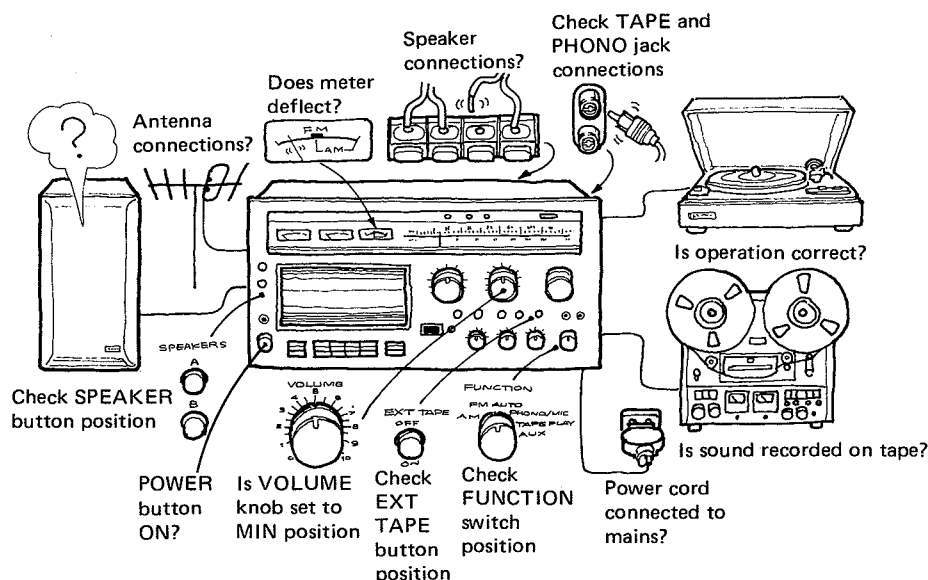
CONDITIONS FREQUENTLY MISTAKEN FOR MALFUNCTIONS

Although the first thought when operating difficulty occurs is that something is amiss with the equipment, in most cases careful inspection of connections and operating procedure will remedy

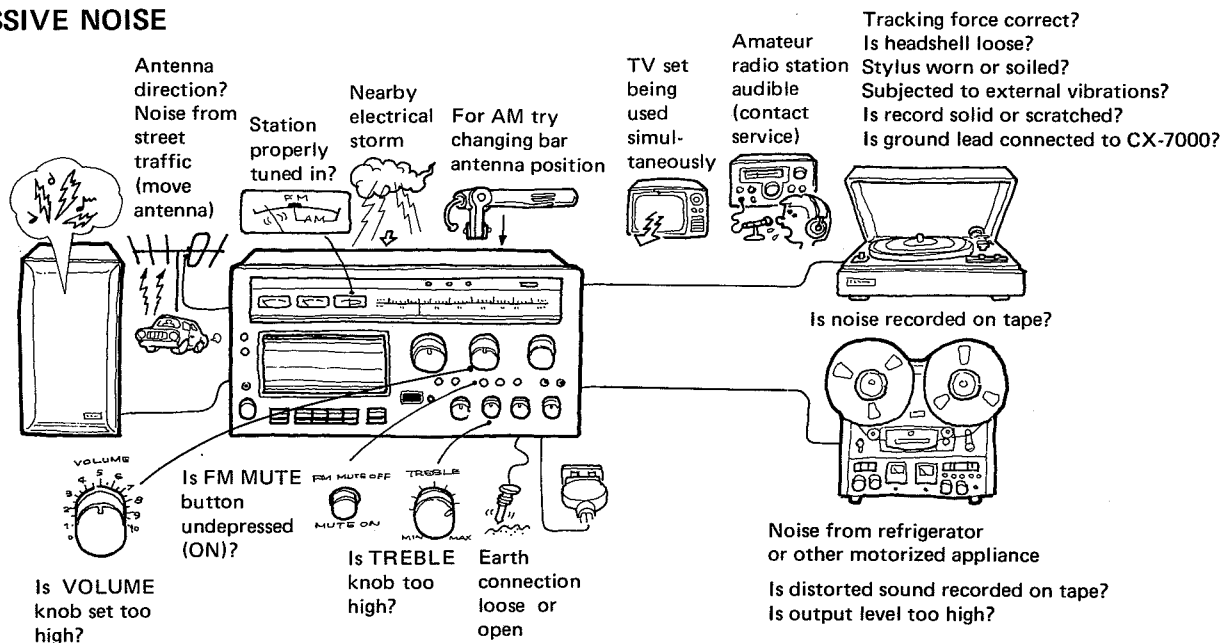
the problem. If trouble is encountered, check the equipment according to the following steps. If the problem cannot be corrected, contact the nearest Pioneer Authorized Service Center.

RECEIVER INSPECTION POINTS

NO SOUND

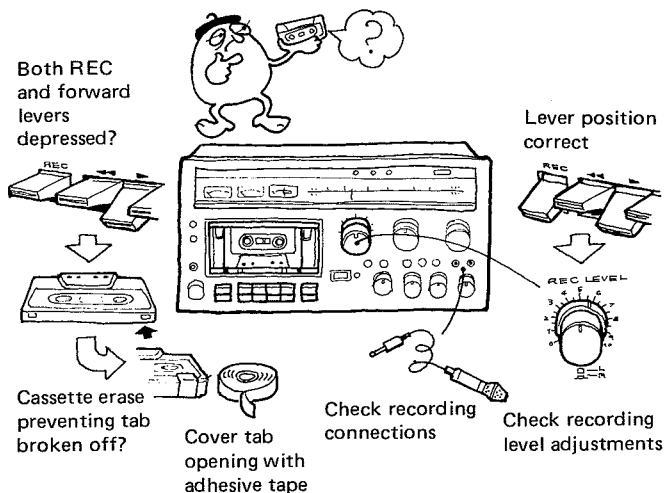


EXCESSIVE NOISE

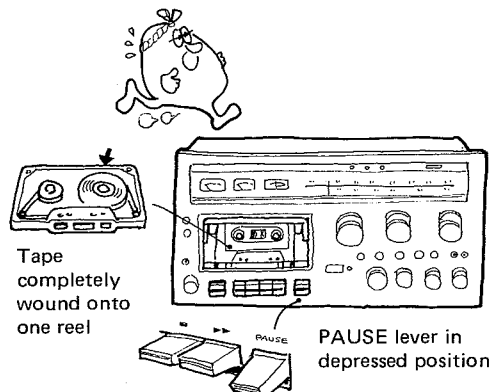


CASSETTE TAPE DECK INSPECTION POINTS

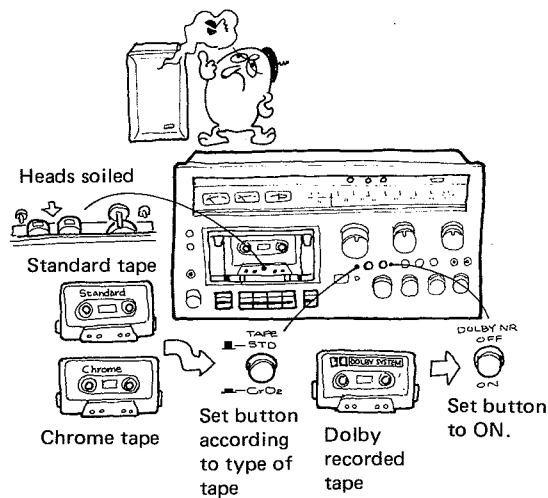
CANNOT RECORD



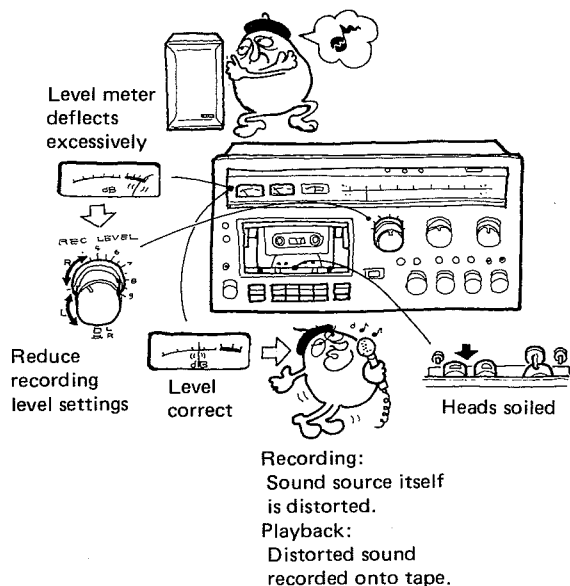
TAPE DOES NOT RUN



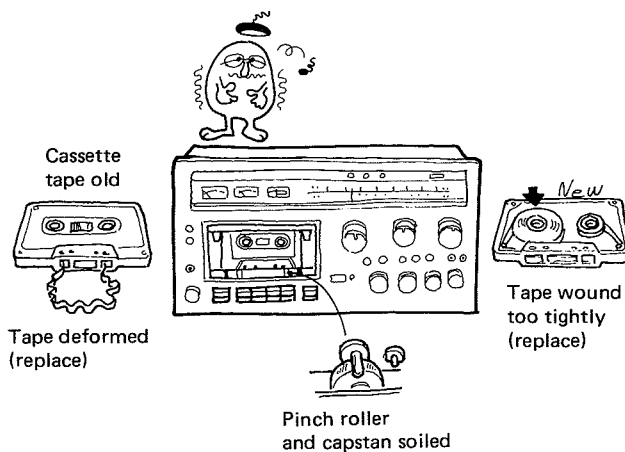
HIGH FREQUENCIES UNNATURAL



SOUND DISTORTED



SOUND UNSTEADY



SPECIFICATIONS

Semiconductors

FETs	3
ICs	4
Transistors	49
Diodes	39

Power Amplifier Section

Continuous Power Output of 25watts*per channel, min., at 8 ohms or 30watts per channel, at 4 ohms from 20 Hertz to 20,000 Hertz with no more than 0.3% total harmonic distortion.

Total Harmonic Distortion (20 Hertz to 20,000 Hertz, from AUX)	
Continuous Rated Power Output	No more than 0.3%
13 watts per channel power output,	
8 ohms	No more than 0.1%
1 watt per channel power output,	
8 ohms	No more than 0.1%
Intermodulation Distortion (50 Hertz : 7,000 Hertz = 4 : 1, from AUX)	
Continuous Rated Power Output	No more than 0.3%
13 watts per channel power output,	
8 ohms	No more than 0.1%
1 watt per channel power output,	
8 ohms	No more than 0.1%
Damping Factor	
(20Hz to 20,000Hz, 8 ohms)	40
Input Sensitivity/Impedance	
PHONO	2.5mV/50kilohms
MIC	7.0mV/50kilohms
AUX	150mV/30kilohms
TAPE PLAY	150mV/30kilohms
TAPE PLAY (DIN connector)	150mV/30kilohms
PHONO Overload Level (T.H.D. 0.1%)	150mV (1kHz)
Output Level/Impedance	
TAPE REC	150mV
TAPE REC (DIN connector)	30mV/80kilohms
SPEAKER	A, B, A+B
HEADPHONES	Low Impedance
Frequency Response	
PHONO (RIAA equalization)	30Hz to 15,000Hz ± 0.5 dB
AUX, TAPE PLAY	10Hz to 60,000Hz ± 0.5 dB
Tone Control	
BASS	± 9 dB (100Hz)
TREBLE	± 8 dB (10kHz)
Loudness Contour (Volume control set at -40dB position)	
	+6dB (100Hz), +3dB (10kHz)
Hum and Noise (IHF, short-circuited, A Network, rated power)	
PHONO	70dB
AUX, TAPE PLAY	90dB

FM Section

Usable Sensitivity	MONO	11.2dBf (2.0 μ V)
	STEREO	20.0dBf (5.5 μ V)
50dB Quieting Sensitivity	MONO	19.2dBf (5.0 μ V)
	STEREO	39.2dBf (50 μ V)
Signal to Noise Ratio at 65dBf	MONO	78dB
	STEREO	70dB
Distortion at 65dBf	100Hz	MONO 0.15%
		STEREO 0.3%
	1kHz	MONO 0.15%
		STEREO 0.3%
	6kHz	MONO 0.3%
		STEREO 0.4%
Frequency Response	30Hz to 15,000Hz	± 0.2 dB
Capture Ratio		1.0dB
Alternate Channel Selectivity		60dB
Spurious Response Ratio		75dB
Image Response Ratio		
	S, S/G, HG model	65dB
	YSA model	50dB
IF Response Ratio		90dB
AM Suppression Ratio		50dB
Muting Threshold		17.3dBf (4.0 μ V)
Stereo Separation	40dB (1kHz), 30dB (30Hz to 15kHz)	
Subcarrier Product Ratio		45dB
SCA Rejection Ratio		65dB
Antenna Input		300 ohms balanced
		75 ohms unbalanced

AM Section

Sensitivity (IHF, Ferrite antenna)	200 μ V/m
(IHF, Ext. antenna)	13 μ V
Selectivity	30dB
Signal to Noise Ratio	50dB
Image Response Ratio	40dB
IF Response Ratio	40dB
Antenna	Built-in Ferrite Loopstick Antenna

Cassette Tape Deck Section

Type	Compact cassette tape deck 2-channel stereo/mono
Motor	Electronically controlled DC motor (built-in generator)
Heads	"Permalloy Solid" record/playback head x 1 Ferrite erase head x 1
Fast Winding Time	Approx. 85 seconds (with C-60)
Wow and Flutter	No more than 0.08% (JIS), No more than $\pm 0.20\%$ (DIN)
Frequency Response	
Standard & LH tape	30Hz~14,000Hz (40Hz~13,000Hz ± 3 dB)
Chrome tape	30Hz~16,000Hz (40Hz~15,000Hz ± 3 dB)
Signal to Noise Ratio	Dolby OFF: more than 52dB Dolby ON: more than 62dB (over 5kHz, standard & LH tapes) Further improvement of 4.5dB when using chrome tape (over 5kHz)
Harmonic Distortion	No more than 1.7% (0dB)

Miscellaneous

Power Requirements

HG model	AC 220V, 240V (switchable) 50Hz
S, S/G model	AC 110V, 120V, 220V and 240V (switchable) 50/60Hz
YSA model	AC 240V 50/60Hz

Power Consumption

HG model	260 watts
S, S/G, YSA model	100 watts

Dimensions

430(W) x 220(H) x 357(D)mm

16-15/16(W) x 8-11/16(H) x 14-1/16(D) in

Weight

Without package	13.2kg (29 lb 2oz)
With package	14.8kg (32 lb 10oz)

Furnished Parts

FM T-type Antenna	1
Head cleaning kit	1
Fuses (S, S/G model only)	4A (for 110V, 120V) x 1 2A (for 220V, 240V) x 1
Operating Instructions	1

* Measured pursuant to Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifiers.

NOTE:

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

NOTES:

- Reference Tapes: Standard & LH: DIN 45513/BLATT6 or equiv.
: CrO₂: DIN 45513/BLATT7 (CrO₂) or equiv.
- Reference Recording Level: Meter 0dB indicating level (160 nwb/m magnetic level = Philips cassette reference level)
- Reference Signal: 333Hz
- Wow & Flutter: • JIS [3kHz, with acoustic compensation (weighted), rms value] • DIN [3150Hz, with acoustic compensation (weighted) PEAK value]; DIN 45507
- Frequency Response: • Measured at -20dB level, DOLBY OFF, level deviation is ± 6 dB without indication • DIN is DIN 45500
- Signal-to-Noise Ratio: • Measured at +4dB level (250nwb/m magnetic level = DIN 45513 specified reference level), IEC A curve with acoustic compensation (weighted) • DIN is DIN 45500
- Sensitivity: Input level (mV) required for reference recording level with input (REC) controls set to maximum.
- Maximum Allowable Input: While decreasing settings of input (REC) level controls and increasing level at input jacks, this is the maximum input level (mV) at the point where recording amplifier output waveform becomes clipped.
- Reference Output Level: Playback output level when meter indicates 0dB.

MAINTENANCE

Follow the maintenance instructions below to keep your tape deck working in tip-top condition.

CLEANING THE HEAD SECTION

The head section is composed of the heads, capstan, pinch roller (see Fig. 29), and with extended use these parts accumulate dust, dirt and grease easily. If this assembly gets dirty, the contact between the tape and the surfaces of the heads is impaired, and this downgrades the sound quality and the stereo balance, and also leads to unstable operation. To prevent this, clean the head section and the surrounding parts regularly with the accessory cleaning swab or with a soft cloth dipped in the accessory cleaning fluid.

- You will find that it is easier to clean the pinch roller if you depress the cassette detection pins and the PLAY lever, since this operation will cause the pinch roller to rotate.

DEMAGNETIZING THE HEAD

The recording head becomes magnetized when you use the tape deck for prolonged periods of time. This results in noise being generated and the treble dropping off during recording and playback. The recording head should therefore be regularly demagnetized with the head eraser, which is sold separately. For further details, refer to the head eraser's instructions booklet.

NOTE:

Do not hold screwdrivers, metal objects or magnets close to the tape heads.

CLEANING THE FRONT PANEL, DUST COVER

Wipe the front panel and the dust cover when dusty or greasy with a soft cloth containing a small amount of ordinary washing-up liquid. Then, wipe dry with a dry cloth. Never use volatile spirits like thinners, benzine or alcohol because they will damage the panel's finish.

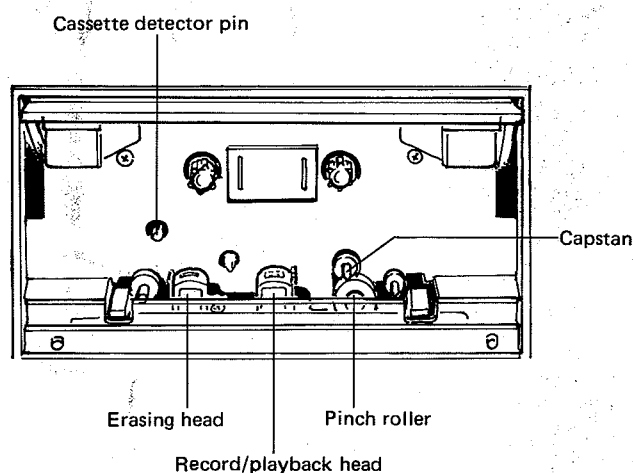


Fig. 29

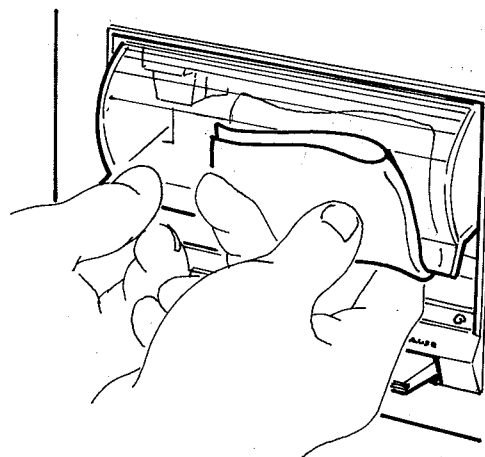


Fig. 30

Moisture forms in the operating sections of this model and the model's performance will be impaired if the model is brought from cool surroundings into a warm room or if the temperature of the room rises suddenly.

To prevent any performance impairment, let the model stand in its new surroundings for about an hour before switching it on, or ensure that the room temperature rises gradually.

PIONEER ELECTRONIC CORPORATION

4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan

U.S. PIONEER ELECTRONICS CORPORATION

85 Oxford Drive, Moonachie, New Jersey 07074, U.S.A.

PIONEER ELECTRONIC (EUROPE) N.V.

Luithagen-Haven 9, 2030 Antwerp, Belgium

PIONEER ELECTRONICS AUSTRALIA PTY. LTD.

178-184 Boundary Road, Braeside, Victoria 3195, Australia

Printed in Japan

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