



SANYO

DCA 401



SANYO STEREO PRE-MAIN AMPLIFIER OWNER'S MANUAL

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This High Fidelity Stereo Pre-Main Amplifier was developed and engineered by Sanyo to be a source of entertainment and listening pleasure for many years to come.

Before you install and start operating your unit, please read the instructions in this booklet carefully. This will prevent errors in operation and will assure faultless performance of your unit and maximum listening enjoyment.

CHARACTERISTICS

Direct-coupled pure complementary OCL circuit

The power amplifier section is a two-way differential input all-stage direct-coupled pure complimentary OCL circuit which incorporates in it silicon transistors for superior dependability. You can enjoy stereo music with a rich sound volume and good, stable quality over the entire sound range.

Pre-amplifier built with IC technology

The equalizer and tone amplifier sections are made with SANYO's superb IC technology. The monolithic integrated circuits built into them reduce to a technically possible minimum RIAA distortion, enabling record music performance that does not fail to satisfy the most discerning audiophile. The pre-amplifier also features a wide dynamic range and a very good S/N ratio.

Modern mechanical design

All circuitry is contained in a strong and attractively styled steel cabinet which is accentuated by a grip handle at each end. The DCA 401 pre-main amplifier is designed to match the FMT 401K AM/FM tuner (option) in appearance and in operation.

PREPARATION

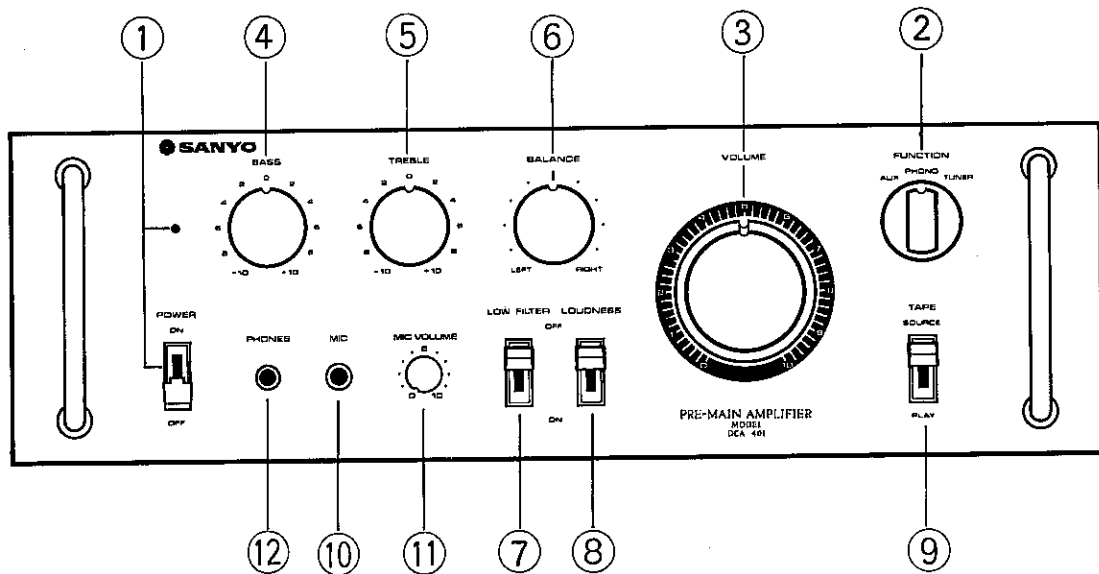
1. Unpack the unit. (Save carton and fillers for future use.)
2. Make all connections before inserting line cord into an AC wall outlet.
3. This model is already set for a fixed voltage level. If it is used in a different voltage area from that indicated on the power cord label, the setting should be changed. To alter the voltage, remove the cover of the AC selector and pull out voltage selector plug and insert it to the right position in the socket which corresponds to your local power. After this change has been made, remove the cover of the unit and be sure to make the following Power Fuse changes.
 - 2A . . . When your local power is 110V or 120V.
 - 1A . . . When your local power is 220V or 240V.In that case, refer this servicing to qualified service personnel.

WHERE TO PLACE THE UNIT

1. Select a well-ventilated place that is not exposed to direct sunlight.
2. Avoid humid or dusty locations.
3. The unit should not be placed near electric appliances that cause interference, such as motors, strong magnets, etc. Locations near electric heating systems should also be avoided.

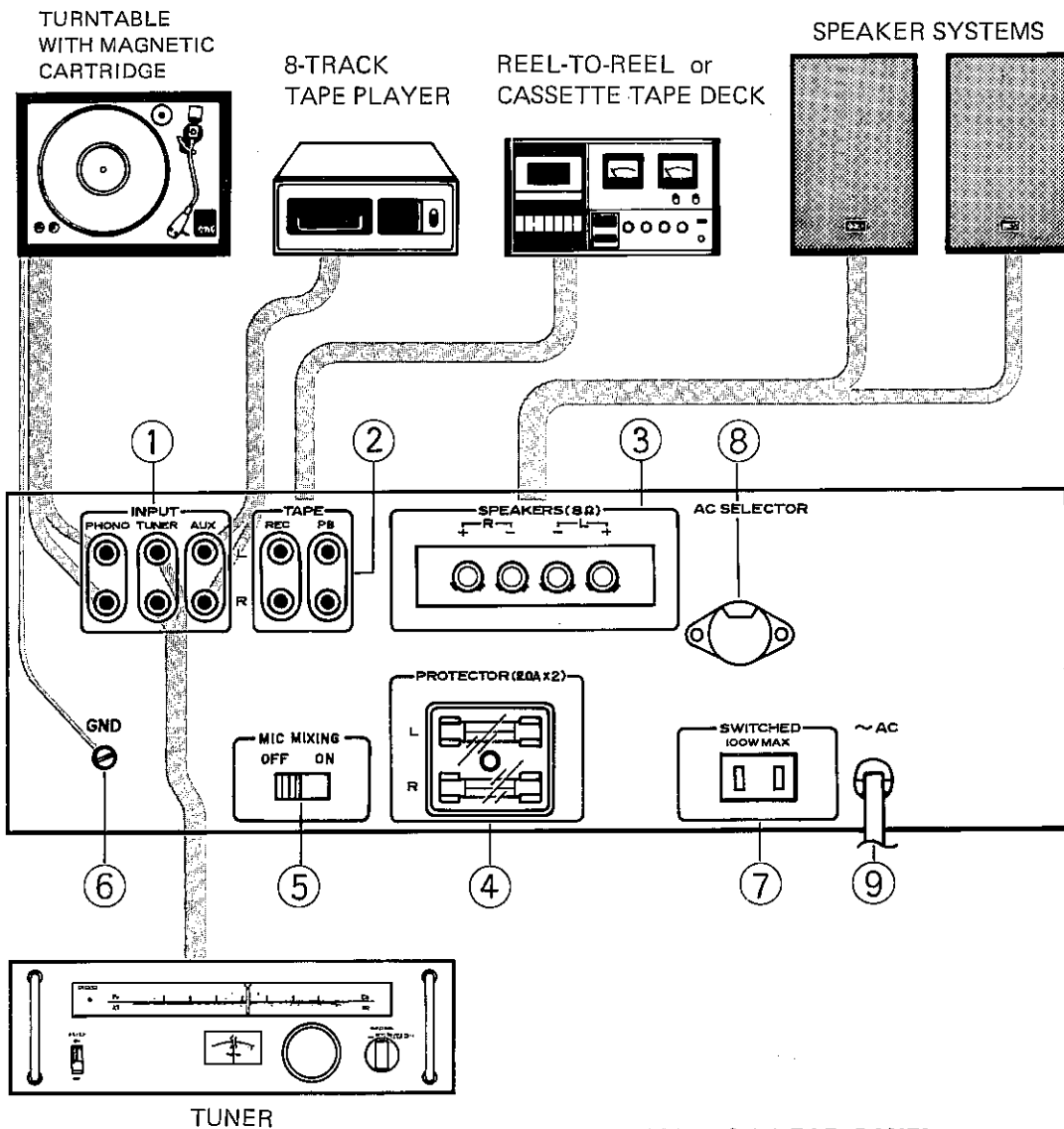
WHAT THE CONTROLS DO AND HOW TO USE THEM (Fig. 1)

1. **POWER switch**
Set this switch to ON, and power will be delivered to the amplifier and the RED power indicator will go on. Set it to OFF to turn off power.
NOTE:
Before turning the power switch on, set the volume to the minimum position.
2. **FUNCTION selector**
AUX. For using the AUX input terminals.
PHONO. For playing records on a record player connected to PHONO.
TUNER. For listening to AM or FM broadcasts.
(Connect your tuner to the unit's TUNER inputs.)
3. **VOLUME control**
Turn this control knob clockwise to increase, and counter-clockwise to decrease the sound volume.
4. **BASS control**
Turn this control knob clockwise to boost and counter-clockwise to attenuate the low-frequency range. When the control is at the center of its movement, standard tone quality sound is delivered through the speaker systems.
5. **TREBLE control**
Turn this control knob clockwise to boost and counter-clockwise to attenuate the high-frequency range. When the control is at the center of its movement, standard tone quality sound is delivered through the speaker systems.
6. **BALANCE control**
This control knob is provided for adjusting the volumes of sound delivered through the right and left speaker systems and balancing them. Turn the knob clockwise to increase the sound volume of the right channel and counter-clockwise to increase the sound volume of the left channel.
7. **LOW FILTER switch**
Set this switch to ON to eliminate noise problems in the subsonic range (humming, motor noise and vibration due to distortion of records).
8. **LOUDNESS switch**
Flip this switch to ON when the listening volume is low, and bass and treble will be emphasized automatically. Compensation for the tone quality is necessary because listening sensitivity for the high and low frequency ranges differs with the sound volume.
9. **TAPE switch**
Set the switch to PLAY for reproducing sound with the tape deck hooked to the TAPE jacks or for monitoring during recording operation. It should be set to SOURCE prior to playing records or listening to AM/FM broadcasts.
10. **MIC jack**
When using a microphone, insert into this jack.
11. **MIC VOLUME control**
When using a microphone, turn this knob clockwise to switch to ON and increase the microphone input level.
NOTE:
When using a microphone, keep it distant from speakers or cut output level to prevent feedback.
12. **PHONES (headphone) jack**
Connect the headphones (option) to this jack for personal listening, and sound will be delivered only through them.



VIEW OF FRONT PANEL

Fig. 1



VIEW OF REAR PANEL

Fig. 2

INPUT AND OUTPUT TERMINALS (Fig. 2)

1. INPUT

Terminals for the input of signals from the system turntable, tuner or other sound sources.

2. TAPE

To be used exclusively for making connections to a tape deck.

3. SPEAKERS

For making connections to the speaker systems.

4. PROTECTOR (2.0A)

These fuses provide protection to the amplifier. If a large current flows due to the shorting of speaker terminals, they burn out and prevent the destruction of transistors. Use replacement fuses of the same rating and install them after remedying the cause of trouble.

The upper one is for the left channel and the lower one for the right channel.

5. MIC MIXING

When recording simultaneously from either the built-in radio or phonograph and the microphone, or from the microphone and another sound source, set the MIC MIXING switch to ON, otherwise keep it to OFF position.

6. GND

The ground terminal for connecting the grounding wire from the turntable or from the earth.

7. SWITCHED

An AC power outlet interlocked with the main switch on this pre-main amplifier. With a rated power output of 100W, it is a convenient power source for the system tuner.

NOTE:

When your local power is 120V, use this AC OUTLET. Otherwise OUTLET cannot be used.

— Keep the OUTLET cover. —

8. AC SELECTOR

Refer to "PREPARATION".

9. AC

Connect the power cord of this amplifier to an AC household outlet.

MAKING CONNECTIONS

Read carefully the instructions given in this section prior to connecting a turntable, tuner, tape deck and speaker systems to the DCA 401 pre-main amplifier. Incorrect connections may result not only in faulty operation but in costly damage to system components.

Plug the power cord into an AC outlet only after making sure that all connections have been made correctly and that the POWER switch on the amplifier is set to the OFF position.

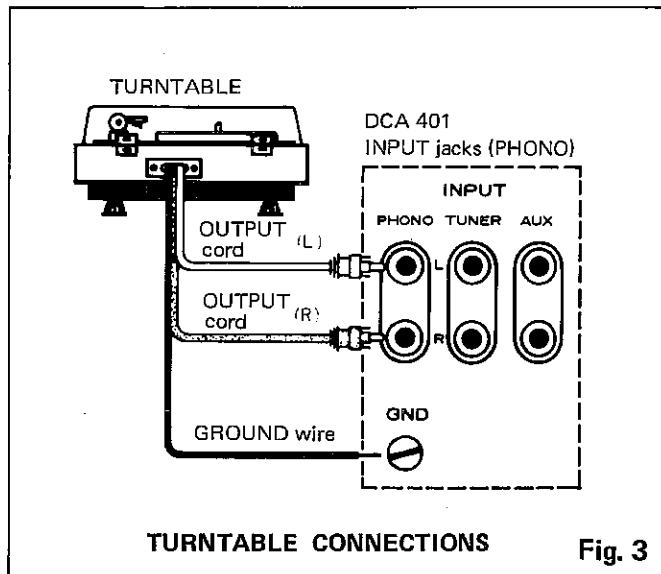
Connecting turntable (Fig. 3)

Connect the output cord of the system turntable to the INPUT jacks marked PHONO. The upper INPUT jack is for the (L) left channel and the lower one for the (R) right channel. The ground wire from the turntable should be connected to the GND terminal.

NOTE:

There are various types of tonearm cartridges for turntables, the MM type being most commonly used.

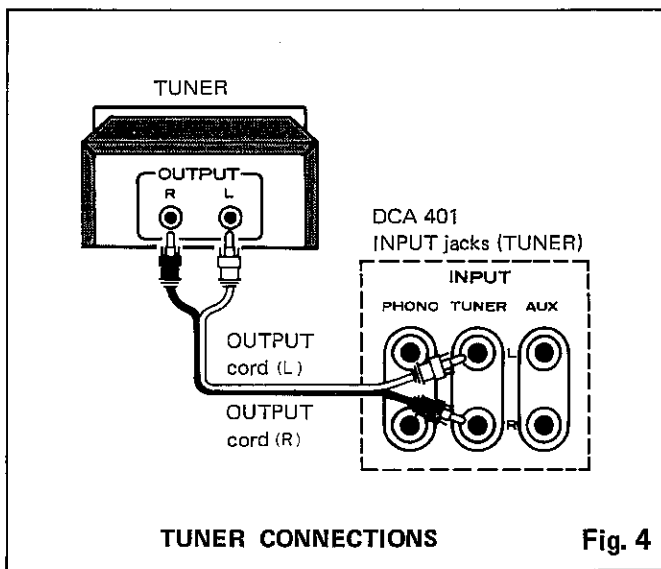
They may differ in output voltage and impedance, so careful study of the instruction manuals on the turntable and the cartridge to be adopted is recommended.



Connecting tuner (Fig. 4)

Connect the OUTPUT cord of the system tuner to the INPUT TUNER jacks, matching the L and R marks. We recommend that the tuner power cord be connected to the SWITCHED socket for interlocked switching control.

Leave the POWER switch on the tuner set to ON after plugging its power cord into this socket, and power will be switched on and off from the amplifier.



Connection to AUX jacks

The INPUT jacks marked AUX are spare terminals. They are used only when the pre-main amplifier is connected to an 8-track tape player, a second system tuner or a turntable equipped with a ceramic or crystal tonearm cartridge. When duplicating sound from one tape deck to another, connect to the AUX jacks the one being used for the playback of tape.

Connecting tape deck (Fig. 5)

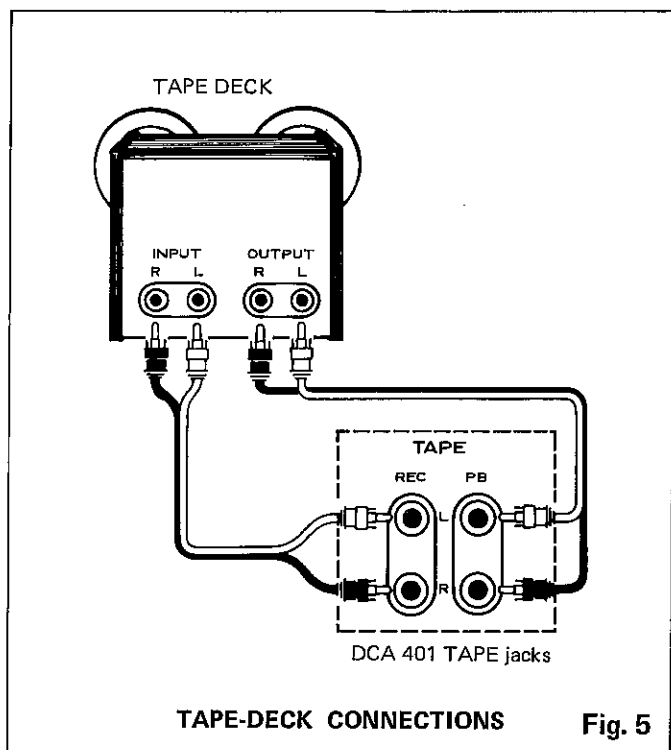
Connect the system tape deck to the pre-main amplifier at the TAPE jacks. Be sure to make correct connections, taking note of the REC, PB, R and L marks.

● REC jacks (recording terminals)

Make connections between these jacks and the INPUT jacks on the system tape deck to record signal from the pre-main amplifier.

● PB jacks (playback terminals)

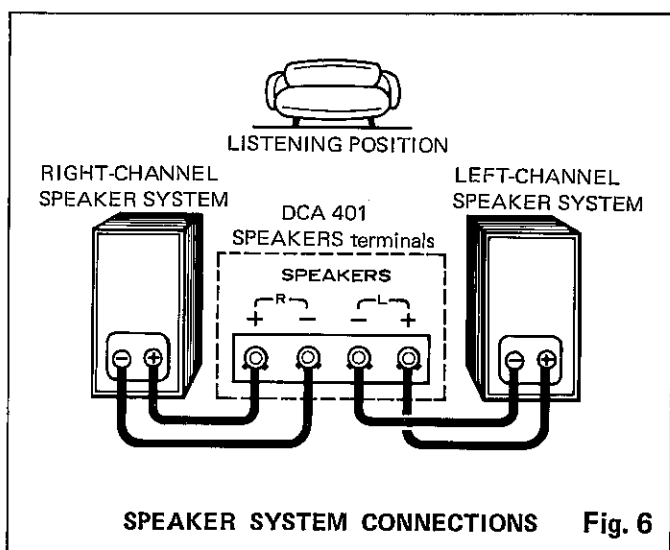
Connect these jacks to the OUTPUT terminals on the tape deck for playing tapes.



NOTE:
When disconnecting power and patch cords, hold them by the plugs. Do not pull on the cords. This precaution will prevent broken wires.

Connecting speaker systems (Fig. 6)

Connect to the terminals marked **SPEAKERS (R)** the speaker system installed to the right of the amplifier as seen from the listening position. Connect to **SPEAKERS (L)** the other speaker system.



The **SPEAKERS** terminals having positive polarity are marked (+) and those having negative polarity (-) for quick identification. These should be connected to the **INPUT** terminals having corresponding marks on the speaker systems. Wrong connections will result in a loss of low-range sound and unsatisfactory sound effect.

NOTES:

- (1) Be very careful not to touch the speaker cord conductors to each other or to the wrong terminals, when connecting speaker systems to the amplifier.
- (2) The speaker systems for the left and right channels should have identical performance characteristics and their impedance range should be 4 to 16 ohms.

Checking polarities of speaker systems

To check for the correct polarities of the right and left speaker systems, set the **FUNCION** switch on the front panel to **TUNER**, reproduce an AM or FM monaural program and turn the **BALANCE** knob to the left or to the right. See if the reproduced sound moves in agreement with the movement of the knob. The speaker systems are connected correctly to the amplifier if sound comes from the center of the two speaker systems when the **BALANCE** knob is in the center position. If sound spreads between the two, re-check the speaker cord connections.

PLAYING RECORD AND LISTENING TO RADIO PROGRAMS

Go through the following steps before switching on power. The strict observance of these steps is necessary to protect the speaker systems from damage and prevent possible trouble.

- (1) **TAPE** switch
Flip the switch to **SOURCE** before playing record or tuning in radio programs.
- (2) **VOLUME** control
Set this knob to 0.
- (3) **BALANCE** control
Set this knob to the center position.
- (4) **BASS** and **TREBLE** controls
Set these knobs to 0 (center positions).
- (5) **POWER** switch
Flip this switch to **ON** after going through the above steps.

Listening to records

1. Set the **FUNCION** switch to **PHONO**.
2. Play the record you want to listen to on the system turntable.
3. Adjust the **VOLUME**, **BASS** and **TREBLE** controls for the sound quality you like.

NOTE:

- (1) Be sure to set the **VOLUME** knob of this amplifier to 0 before placing the tonearm on the record being played. This precaution is necessary for the protection of the speaker systems from possible damage due to shock noise, should the tonearm be dropped accidentally onto the record.
- (2) When the sound volume is increased while a record is being played, howling may occur. This is caused by the feedback of sound between the turntable and the speaker systems and should not be mistaken for a mechanical trouble. To correct, place the speaker systems as far away from the system turntable as practicable. It is also advised that the speaker systems be placed on rigid individual shelves.

Listening to radio programs

1. Select **TUNER** by the **FUNCION** switch.
2. Tune in a radio station you want to listen to.
3. Adjust the **VOLUME**, **BASS** and **TREBLE** controls for the sound quality you like.

Listening to sound from unit hooked to AUX jacks

1. Set the **FUNCION** switch to **AUX**.
2. Operate the component connected to the **AUX** jacks.
3. Adjust the **VOLUME**, **BASS** and **TREBLE** controls for the sound quality you like.

Listening through headphones

Plug the headphone cord into the jack marked PHONES. Sound will then be delivered only through the headphones for quiet personal enjoyment. (No sound will come out of the speaker systems.)

NOTE:

Be sure to set the VOLUME knob to 0 before plugging or unplugging the headphones. This precaution is necessary to protect the speaker system and the headphones from shock noise.

Balancing sound volumes

The BALANCE control is provided on the front panel for adjusting the volumes of sound delivered from the right and left channel speaker systems. Reproduce an AM or FM monaural broadcast and adjust the BALANCE knob. A perfect balance is achieved between the two speaker systems when the sound seems to come from midway between them.

TAPE DECK OPERATION

With a tape deck connected to the pre-main amplifier's TAPE jacks, you can tape record music or FM radio broadcasts. You can also play back tape recordings.

Connect another tape deck to the AUX jacks, and sound can be duplicated to the other.

Recording sound

1. Flip the TAPE switch to SOURCE.
2. Select the sound source by the FUNCTION switch.
3. Tune in an FM program or play a record, adjusting the controls as instructed on the previous page.
4. Set the tape deck in the recording mode.

NOTE:

Signals to be recorded are kept at a constant level at the TAPE REC terminals irrespective of the VOLUME, BASS and TREBLE control settings. The level of sound being recorded is regulated by the LEVEL control on the system tape deck.

Monitoring sound during tape recording operation

When the tape deck being used for sound recording has three heads or a monitoring mechanism, you can monitor sound being recorded and compare it with source sound by flipping the TAPE switch. To monitor sound, do as follows:

- Set to MONITOR the tape monitor switch on the tape deck.
- The speaker systems connected to the amplifier deliver source sound when the TAPE switch is set to SOURCE.
- Flip the TAPE switch to PLAY, sound recorded on tape will be delivered through the speaker systems.

Playing tapes

1. Flip the TAPE switch to PLAY.
2. Operate the tape deck and play back a tape.
3. Adjust the VOLUME, BASS and TREBLE controls for the sound volume and quality you like to listen to.

NOTE:

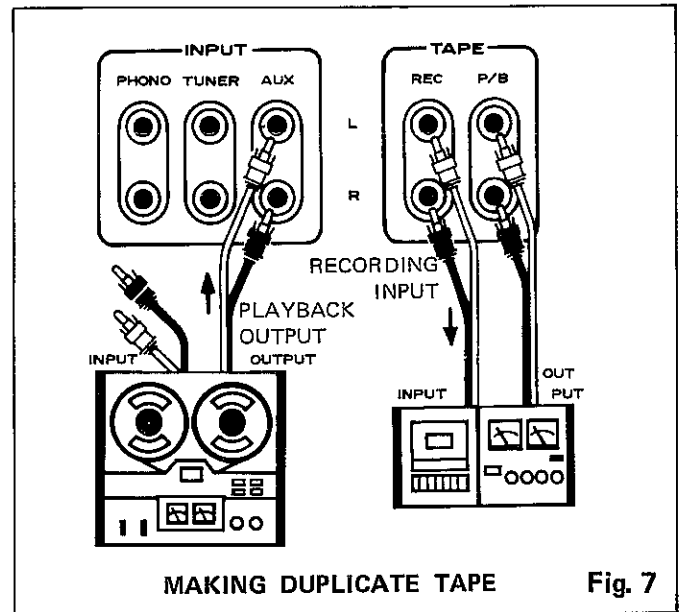
When the TAPE switch is set to PLAY, tape can be played back on the tape deck irrespective of the FUNCTION switch setting.

Producing duplicate tapes

Play back a recorded tape on the tape deck connected to the amplifier's AUX jacks (Fig. 7).

Record sound thus reproduced with the tape deck plugged to the TAPE jacks. Follow the previous instructions for sound recording and monitoring.

Illustrated in Fig. 7 is an example of duplicating sound from a reel-to-reel tape deck to a cassette tape deck.



HOW TO USE THE MICROPHONE EFFECTIVELY

By connecting a microphone, the amplifier-speaker system can be used as a public address system. It is also possible to mix microphone sound with a radio, record, or other programs.

1. Before connecting a microphone, turn down the MIC VOLUME.
2. Connect a microphone to the MIC input jack.
3. Turn the MIC VOLUME control clockwise to obtain the desired microphone sound level.

NOTE:

If "howling" (acoustic feedback) occurs, move the microphone far away from the loudspeakers, or turn the MIC VOLUME control down.

MIC MIXING RECORDING

1. Turn the MIC VOLUME control to obtain the desired microphone sound level.
2. Adjust proper controls (VOLUME, BASS, TREBLE, etc.) as desired.
3. Set the mic mixing switch to ON at the back of the set.
4. Set the tape recorder to the recording condition.

NOTE:

1. The mic mixing recording level is effected by controlling the VOLUME, BASS, or TREBLE controls.
2. The tape deck must be connected to the set on mic mixing recording.



SANYO ELECTRIC CO., LTD.

1316-4119-58900
Printed in Japan

CLEANING AND MISCELLANEOUS REMARKS

Cleaning

Wipe the front panel and other exterior surfaces of the pre-main amplifier clean with a soft, dry cloth. Stains should be removed by wiping its surfaces with a soft cloth immersed in water and synthetic detergent and wrung dry.

Never use solvent or alcohol. Do not spray insecticide liquid near the amplifier. Such chemicals may cause surface discoloration and cracking.

When handling power cord

- Do not handle the power cord with a wet hand.
- Do not pull on the power cord when disconnecting it from an AC outlet. Hold it at the plug.

Do not drop pieces of metal into the amplifier.

Needles, coins and other electrically conductive materials may cause trouble if they get into the amplifier unit.

Do not overload the SWITCHED socket.

Take power from the SWITCHED socket on the rear panel of this pre-main amplifier only for audio equipment such as a turntable, tuner or tape deck.

Never use it as a power outlet for such appliances as an electric iron or coffee maker with a rated power consumption of more than 100W. Refer to No.7 of "INPUT AND OUTPUT TERMINALS".

When changing connections

Be sure to turn off the POWER switch on this amplifier to OFF before attempting to change connections to the input terminals. This precaution is required to protect speaker systems, which may be damaged by a sudden increase in input.

Shock noise of POWER switch operation

When flipping the POWER switch on and off, a shock noise may be audible. This should not be regarded as an indication of trouble. It is recommended that you set the VOLUME control to 0 before switching on and off power, because this will minimize the shock.

Servicing

If the pre-main amplifier presents any sign of trouble, switch off power and unplug the power cord. Minor troubles can be remedied, following the trouble-shooting guide on the next page. Never attempt to disassemble or modify the amplifier. For repairs and servicing, bring it to a SANYO service center or a SANYO store.

ABOUT SANYO

Sanyo is one of the world's largest manufacturers of quality electronic equipment. Our products include television receivers, radios, high fidelity audio equipment, stereo equipment, automobile stereo equipment, and tape recorders.

SPECIFICATIONS (Nominal)

POWER AMPLIFIER SECTION

Continuous Power Output (at 8 ohms)	
Both Channel Driven at 1 kHz	20 + 20 W
Both Channel Driven at 40 to 20,000 Hz	20 + 20 W
Total Harmonic Distortion (at Rated Power)	0.5 %
Frequency Response (at AUX input ± 3 dB)	10 Hz - 35 kHz
Signal to Noise Ratio	
AUX	80 dB
PHONO	70 dB
TAPE	80 dB
MIC	70 dB
Damping Factor	40

PRE AMPLIFIER SECTION

Input Sensitivity/Impedance	
AUX	150 mV/80 ohms
TAPE	150 mV/80 ohms
PHONO	2.5 mV/50k ohms
MIC	3.5 mV/600 ohms
TAPE REC. Output Level	150 mV
Tone Control	
Bass (at 50 Hz)	± 11 dB
Treble (at 10 kHz)	± 10 dB
Loudness Control (at -30 dB position)	
at 100 Hz	+8 dB
at 10 kHz	+5 dB
Low Filter (at 40 Hz)	6 dB/oct.

GENERAL SECTION

Power Source (Switchable)	Voltage	AC: 110/120/220/240 V
	Frequency	50/60 Hz
Power Consumption		100 W
Dimensions (W)x(D)x(H)		400 x 305 x 127 mm
Weight		6.2 kg.

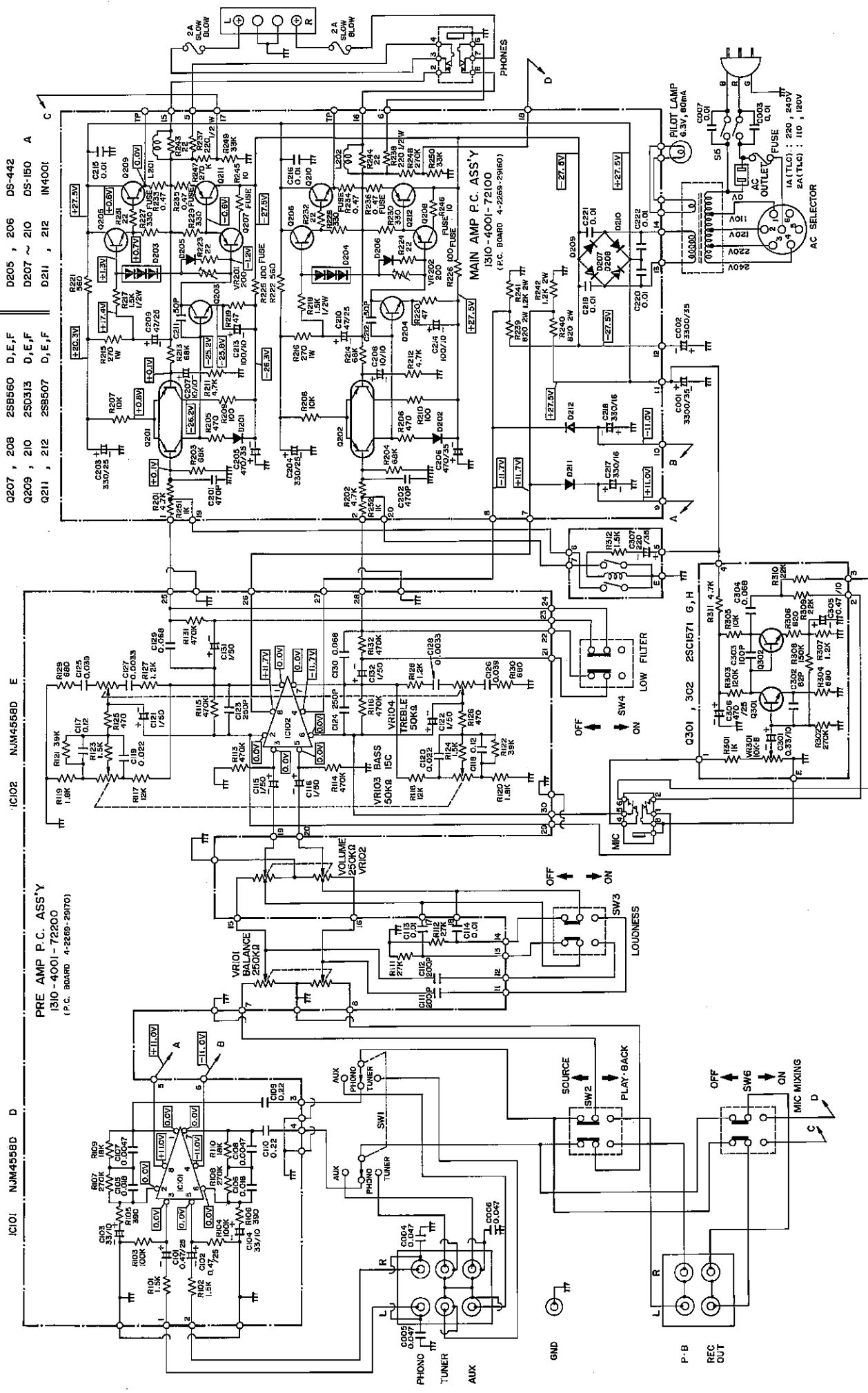
TROUBLES YOU CAN SHOOT

Check the DCA 401 pre-main amplifier in reference to the table below before having it serviced.

OPERATION	TROUBLE	CAUSE	CORRECTION
When listening to AM/FM broadcasts or records:	Lamps remain off and no sound is delivered when POWER switch is on.	Power cord is not plugged securely.	Plug cord into AC outlet.
	Lamps go on but no sound comes out.	Disconnected speaker cords.	Reconnect to SPEAKERS terminals.
		VOLUME control is set to 0.	Turn it clockwise.
		TAPE switch is set to PLAY.	Set it to SOURCE except when operating tape deck.
	Sound is delivered thru one speaker system.	Disconnected speaker cord.	Reconnect to SPEAKERS terminals.
		BALANCE control is at an extreme.	Set it to center.
Sound comes out but low-range response is not good.	Check for incorrect polarities.	Correct by changing connections.	
When playing records:	Speakers hum.	Turntable output cord is connected loosely.	Connect it securely.
		Ground wire of turntable isn't connected to GND.	Connect. (Under certain conditions, avoid making a connection.)
	Speakers howl.	Howling	Keep the speaker apart from the turntable.
	Rasping noise disturbs TREBLE range.	Worn or damaged stylus.	Replace stylus.
		Dust on record or stylus.	Clean.
TREBLE control is set too high.	Adjust it.		
When listening to AM programs:	Continuous or intermittent noise, particularly at night.	Noise interference from motor, fluorescent lamps, electrical equipment or lightning.	Install amp as far away from noise source or erect AM antenna. (Noise can't be eliminated completely.)
	Ham interference.	Amateur radio transmitter is near-by.	Consult with official amateur radio organization or Sanyo Service Station.
When listening to FM programs:	Continuous noise interference, particularly when receiving FM program in stereo.	Weak FM radio wave.	Erect outdoor FM antenna having 5 to 8 elements.
	Occasional loud noise.	Noise from automobile engine.	Erect outdoor FM antenna as far away from road traffic as possible.
	Stereo indicator lamp goes on and off.	Weak radio wave.	Erect outdoor FM antenna.

SCHEMATIC DIAGRAM

- Q201, 202 2SA798 F
- Q203 ~ 206 2SD438 D, E, F
- Q207, 208 2SB560 D, E, F
- Q209, 210 2SD313 D, E, F
- Q211, 212 2SB507 D, E, F
- DS-430
- STV-3H
- DS-442
- DS-150 A
- IN4001



IC101 NM4558D D
PRE AMP P.C. ASS'Y
 1310-4001-72100
 (P.C. BOARD 4-22669-29161)

IC102 NM4558D E

MAIN AMP P.C. ASS'Y
 1310-4001-72100
 (P.C. BOARD 4-22669-29161)

Q301, 302 2SC1671 G, H
LOW FILTER

SW2 SOURCE
 SW3 PLAY-BACK
 SW6 OFF
 ON
MIC MIXING

PHONES
 P-B
 REC
 OUT