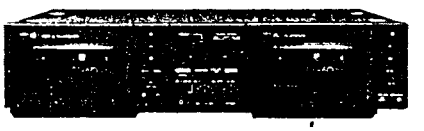
PIONEER®

Service Manual

CIRCUIT & MECHANISM DESCRIPTIONS REPAIR & ADJUSTMENTS



ORDER NO.
ARP-153-0

STEREO DOUBLE CASSETTE DECK

CT-05

MODEL CT-05 COMES IN FOUR VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
HE	220V and 240V (Switchable)	Europe model
HB	220V and 240V (Switchable)	United Kingdom model
D	120V, 220V and 240V (Switchable)	General export model
D/G	120V, 220V and 240V (Switchable)	U.S. military model

- This service manual is applicable to the HE, HB, D and D/G types.
- Ce manuel d'instruction se refère au mode de réglage, en fançais.
- Este manual de servicio trata del método de ajuste escrito en español.

Original

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS (USA) INC. 1925 E. Dominguez St., Long Beach, California 90810 U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

 Printed in Japan

12. ADJUSTMENTS

12.1 MECHANICAL ADJUSTMENTS

Prior to starting mechanical adjustments, clean the capstan, pinch roller, idler and belt with an alcohol moistened swab.

- For items not specified, adjust both decks A and B.

12.1.1 Pinch Roller Pressure Adjustment

1. Put the tape deck into playback mode without loading a cassette half.
2. Gently push against the pinch roller arm with a tension gauge (service part no. GGK-047) and separate the pinch roller slightly from the capstan. (See Fig. 12-1).
3. Then ease the pinch roller back onto the capstan, and read the value when the pinch roller starts to rotate. If the reading fails to lie between 200g and 350g, replace the pinch pressure spring (part no. RBH-893).

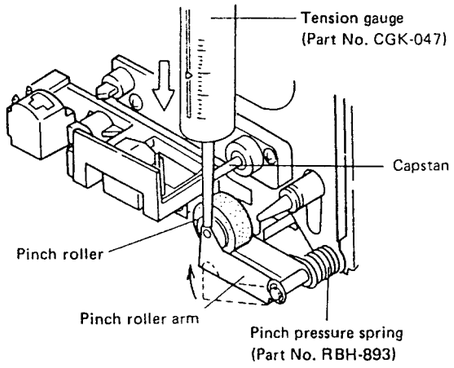


Fig. 12-1 Pinch roller pressure adjustment

12.1.2 Reel Base Torque Adjustment

Measure the reel base torque during playback, fast forward and rewind modes with a cassette type torque meter (service part no. GGK-056). The measured values should lie within the ranges listed below in Table 1. If the measured values lie outside these ranges, replace the supply reel assembly (part no. RXB-377), take-up reel assembly (part no. RXB-360) or the full drive arm assembly (part no. RXB-376).

Table 1

	TU reel base ass'y	Supply reel base ass'y
Playback mode	35 – 55g.cm	* 2 – 5g.cm
Farst forward mode	75 – 110g.cm	* 2 – 5g.cm
Rewind mode	* 2 – 5g.cm	75 – 110g.cm

NOTE:
** denotes back tension torque.*

12.1.3 Tape Speed Adjustment

- When adjusting tape speed on the deck A side, set the pinch control knob to the center click-stop position.

1. Connect a frequency counter to the PLAY terminals.
2. Play the 3kHz portion of the STD-301 test tape. At the beginning of the tape, the frequency should lie between 3000Hz and 3010 Hz, and may be adjusted by turning the variable resistor located in the capstan motor adjustment hole shown in Fig. 12-2. Turning clockwise increases tape speed, while turning counterclockwise decreases the speed.

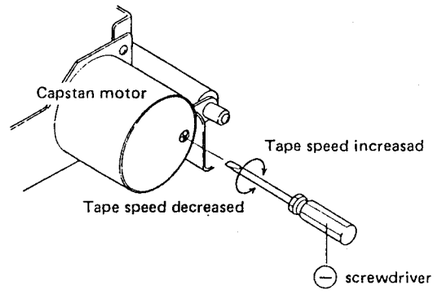


Fig. 12-2 Tape speed adjustment

12.1.4 REC Detector Switch Adjustment

- Perform this adjustment only on deck B

1. Prepare a cassette half with the erase prevention tabs intact, and one with the tabs broken off.
2. Adjust the record prevention lever (shown by the arrow in Fig. 12-3) by bending so that the lever switch is on when a half without tabs is loaded, and off when a half with tabs is loaded.

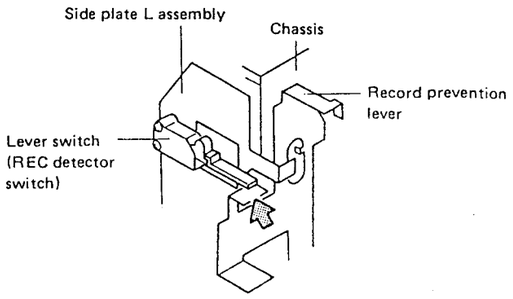


Fig. 12-3 REC detector switch adjustment

12.1.5 Detection Switch Adjustment

- For Deck A side

Insert the STD-601 test tape to turn the lever switch off. When the STD-604 test tape is inserted, the lever switch should be turned on. If the lever switch (for chrome tape detection) does not operate properly, gently bend the section indicated by the arrow so that it operates properly (see Fig. 12-4).

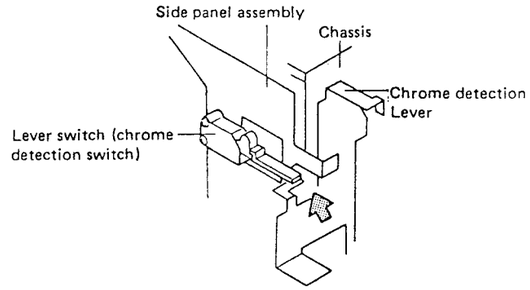


Fig. 12-4 Adjustment of chrome detection switch

- For Deck B side

When the STD-601 test tape is inserted, the slide switch should turn off and when the STD-604 test tape is inserted, the slide switch should turn on (see Fig. 12-5). If this switch does not operate properly, loosen screw ❶ in Fig. 12-5 and adjust the position of the detection panel as required.

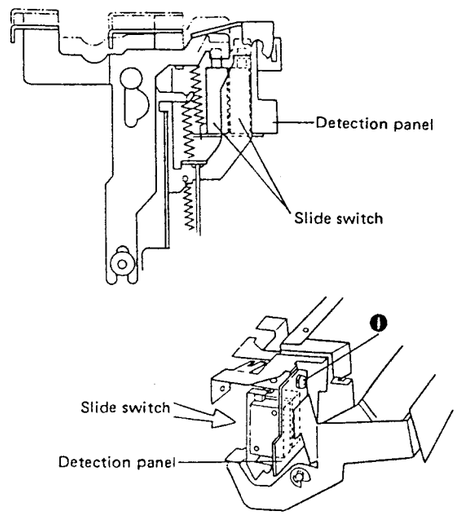


Fig. 12-5 Adjustment of detection assembly

12.1.6 FF Solenoid Adjustment

1. Put the deck into fast forward mode.
2. Loosen screw ❷ and adjust the mounting position of the FF solenoid (plunger solenoid F) so that the square hole in the full reel base assembly is flush against the boss of the full drive arm assembly. (See Fig. 12-6)

12.1.7 REW Solenoid Adjustment

1. Put the deck into rewind mode.
2. Loosen screw ❸ and adjust the mounting position of the REW solenoid (plunger solenoid R) so that the square hole in the full reel base assembly is flush against the boss of the full drive arm assembly. (See Fig. 12-6).

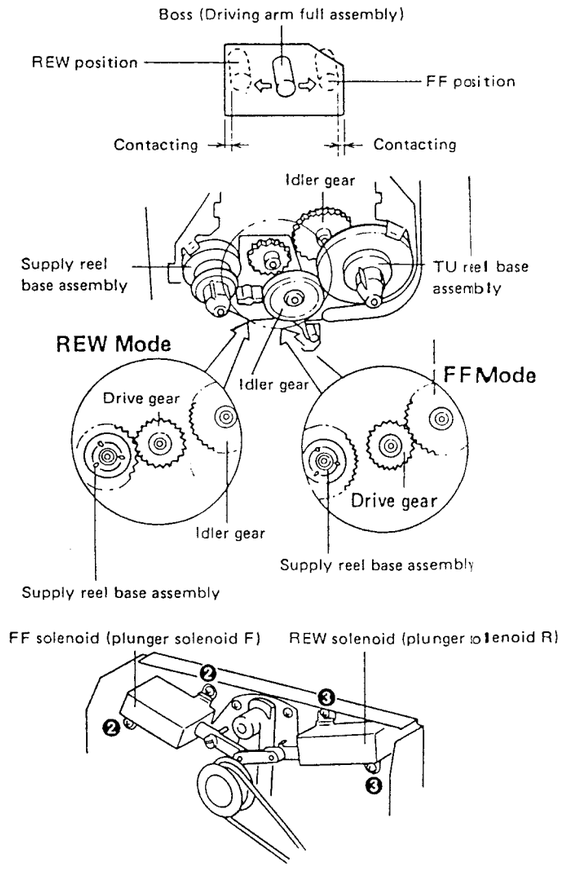


Fig. 12-6 FF and REW solenoid adjustment

12.2 ELECTRICAL ADJUSTMENTS

- Adjust Point

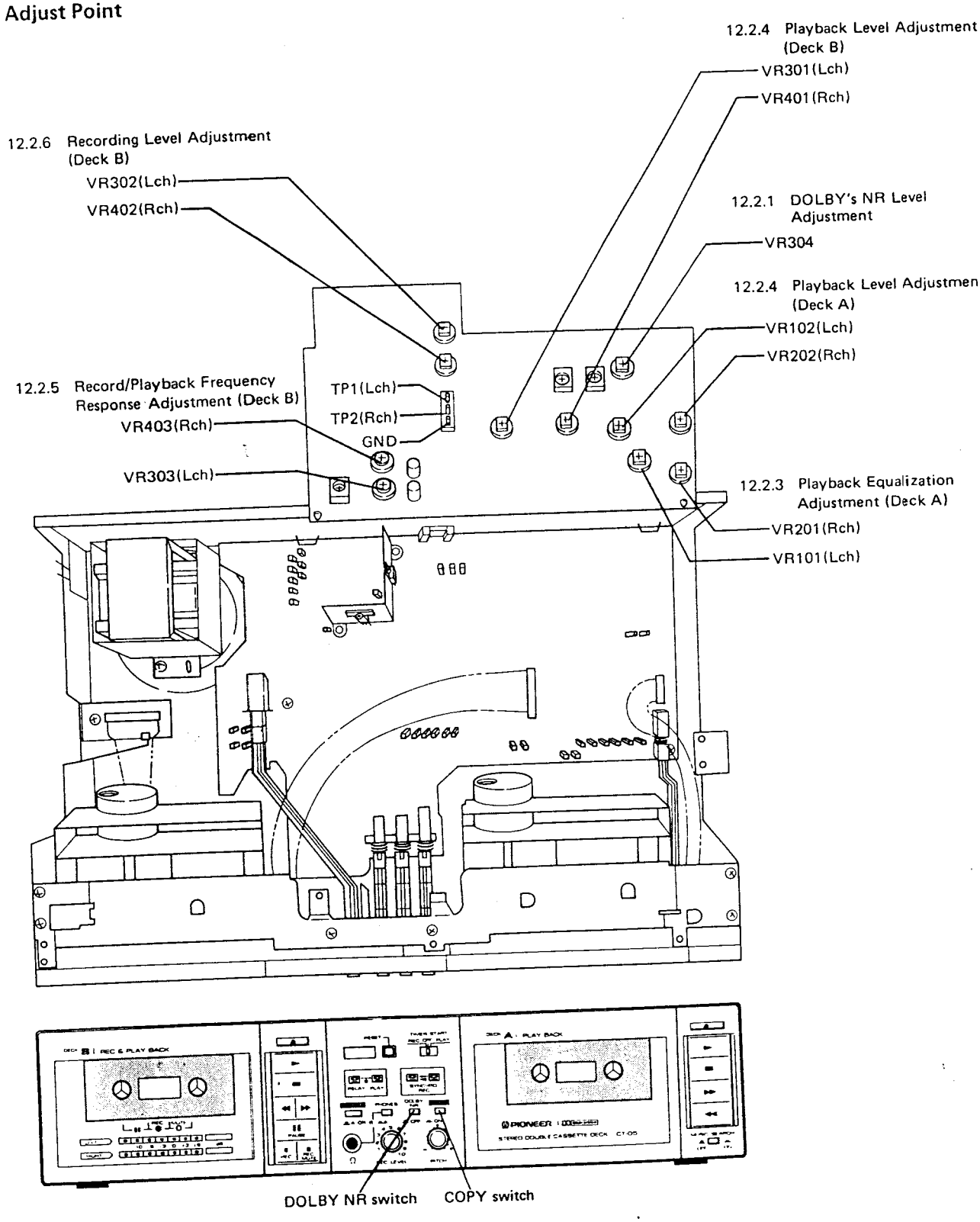


Fig. 12-7 Adjustment points

- Check the following points before starting any electrical adjustments.

1. All mechanical adjustments must be completed.
2. Clean the heads and demagnetize the erase head.
3. Level measurements are based on 0dBv = 1V. Connect a 50kΩ dummy resistor (47k~52kΩ) across the OUTPUT terminals.
4. Use the specified test tapes for each adjustment. Although test tapes have both A and B sides, use the side with the lable (side A).

   STD-341A : Playback adjustments
   STD-608A : NORMAL blank tape
   STD-603 : CrO_2 blank tape
   STD-604 : METAL blank tape

5. Prepare the following measuring equipment. AC millivoltmeter, audio oscillator, attenuator, and oscilloscope.
6. Unless otherwise specified, always adjust for both left and right channels.
7. Unless otherwise specified, adjust with the DOLBY NR switch in the OFF position.
8. Let the deck warm up for a few minutes before starting adjustments. Also leave the deck in playback and recording mode respectively for 3 to 5 minutes before starting playback and recording frequency response adjustments.
9. Proceed according to the specified adjustment sequence. Changing the sequence can prevent proper adjustments from being carried out, and subsequently result in loss of performance.

	ADJUSTMENT SEQUENCE	DECK A	DECK B
1	DOLBY NR level.	X	O
2	Head azimuth	O	O
3	Playback equalization	O	X
	Playback equalization check	X	O
4	Playback level	O	O
5	Level meter check	X	O
6	Record/playback frequency response	X	O
7	Recording level	X	O

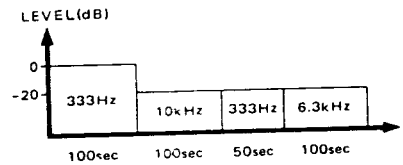


Fig. 12-8 STD-341A test tape

12.2.1 DOLBY NR Level Adjustment

Settings

AC mV meter ..... Connect to TP1 (L ch) and TP2 (R ch)
Input signal ..... 2kHz, -10dBv (316mV) to LINE INPUT
Tape selector ..... NORM
Mode ..... Record

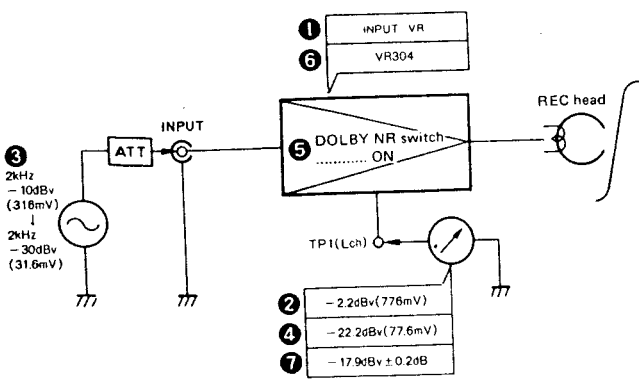


Fig. 12-9 DOLBY NR level adjustment

Procedure

1. Adjust the INPUT level control so that the AC mV meter reads -2.2dBv (776mV).
2. Drop the input signal level to -30dBv (31.6 mV) and confirm that the AC mV meter reads -22.2dBv (77.6mV).
3. Switch the DOLBY NR switch ON.
4. Adjust VR304 so that the AC mV meter reads -17.9dBv ±0.2dB (130mV ~ 124mV).

12.2.2 Head Azimuth Adjustment

Settings

AC mV meter ..... Connect to OUTPUT terminals
Test tape ..... STD-341A (10kHz, -20dB)
Tape selector ..... NORM
Mode ..... Playback

■ Deck A

VR102 and VR202 ...Turn clockwise to maximum position

■ Deck B

VR301, VR401 ..... Turn clockwise to maximum position

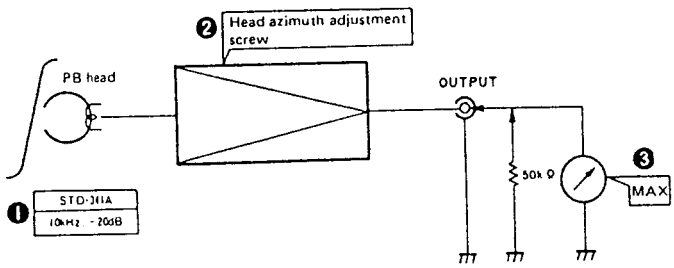


Fig. 12-10 Head azimuth adjustment

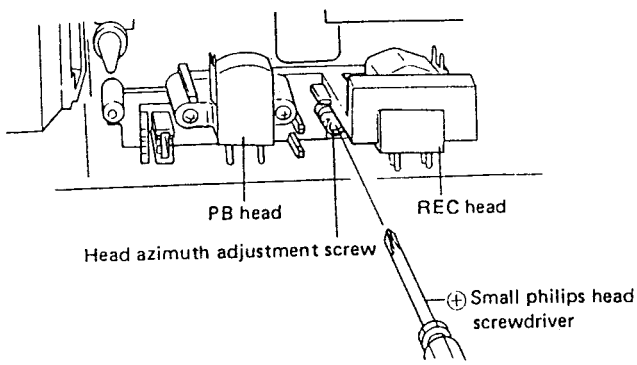


Fig. 12-11 Head azimuth adjustment

Procedure

1. Rotate the azimuth adjustment screw so that the AC mV meter reading goes as high as possible.
2. After completing the adjustment, be sure to lock the adjustment screw. (use screw tight green No. 300 to lock the screw — service part no. GYL-001.)

12.2.3 Playback Equalization Adjustment (Deck A) Check (Deck B)

Settings

AC mV meter ..... Connect to OUTPUT terminals
Test tape ..... STD-341A (333Hz, -20dB) (6.4kHz, -20dB)
Tape selector ..... NORM
Mode ..... Playback

■ Deck A

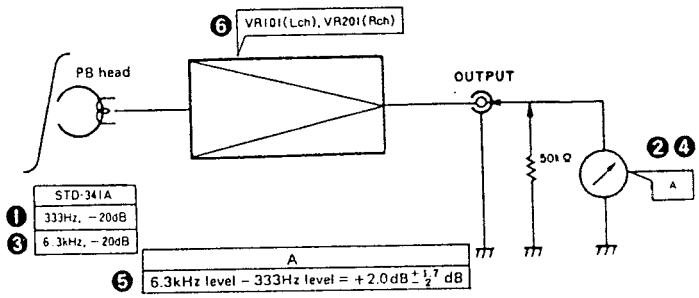


Fig. 12-12 Playback equalization adjustment

Procedure

1. Play the 333Hz, -20dB portion and record the AC mV meter reading.
2. Then play the 6.3kHz, -20dB portion, and check that the meter reading lies within +2.0 dB $^{+1.7}_{-2}$ dB of the reading obtained in step 1 above.
3. If the meter reading is not within the acceptable range of step 2, adjust VR101 (L ch) and VR201 (Rch) and then repeat this procedure from step 1.
4. Put the deck into the playback mode without loading a cassette half and switch the tape selector switch to check for any changes in the output noise level.

■ Deck B

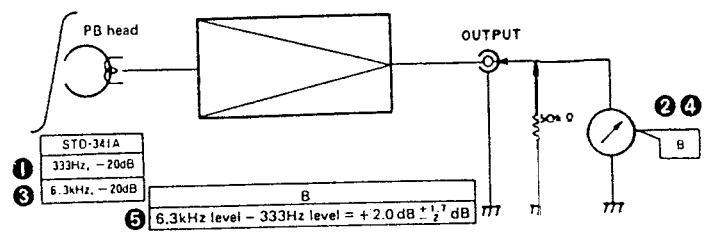


Fig. 12-13 Playback equalization check

Procedure

1. Play the 333Hz, -20dB portion andrecord the AC mV meter reading.
2. Then play the 6.3kHz, -20dB portion, and check that the meter reading lies within +2.0 dB $^{+1.7}_{-2}$ dB of the reading obtained in step 1 above.
3. Put the deck into the playback mode without loading a cassette half and switch the tape selector switch to check for any changes in the output noise level.

12.2.4 Playback Level Adjustment (Deck A and Deck B)

Since this adjustment determines the DOLBY NR level during playback, it should be performed precisely.

Settings

AC mV meter ..... Connect to TP1 (L ch) and TP2 (R ch)
Test tape STD-341A (333Hz, 0dB)
Tape selector ..... NORM
Mode ..... Playback

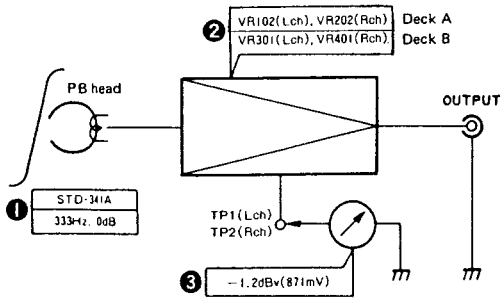


Fig. 12-14 Playback level adjustment

Procedure

Adjust VR102 (L ch) and VR202 (R ch) on deck A and VR301 (L ch) and VR401 on deck B so that the AC mV meter reads -1.2dBv (871mV).

12.2.5 Level Meter Check (Deck B)

Settings

AC mV meter ..... Connect to TP1 (L ch) and TP2 (R ch)
Input signal ..... 333Hz, -10dBv (316mV) to INPUT terminals
Mode ..... Record

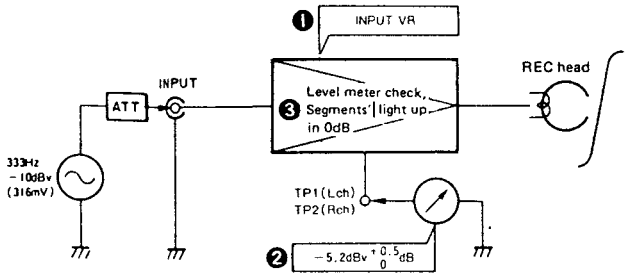


Fig. 12-15 Level meter check

Procedure

Adjust the input level control so that the AC mV meter reads -5.2dBv $^{+0.5}_{0}$dB and check that the level meter segments light up to indicate 0dB.

12.2.6 Record/Playback Frequency Response Adjustment (Deck B)

Settings

AC mV meter ..... Connect to OUTPUT terminals
Input signal ..... 333Hz, -30dBv (31.6mV) to LINE INPUT terminals
Test tape STD-608A (STD-603, STD-604)
Tape selector ..... NORM (CrO_2, METAL)
Mode ..... Record

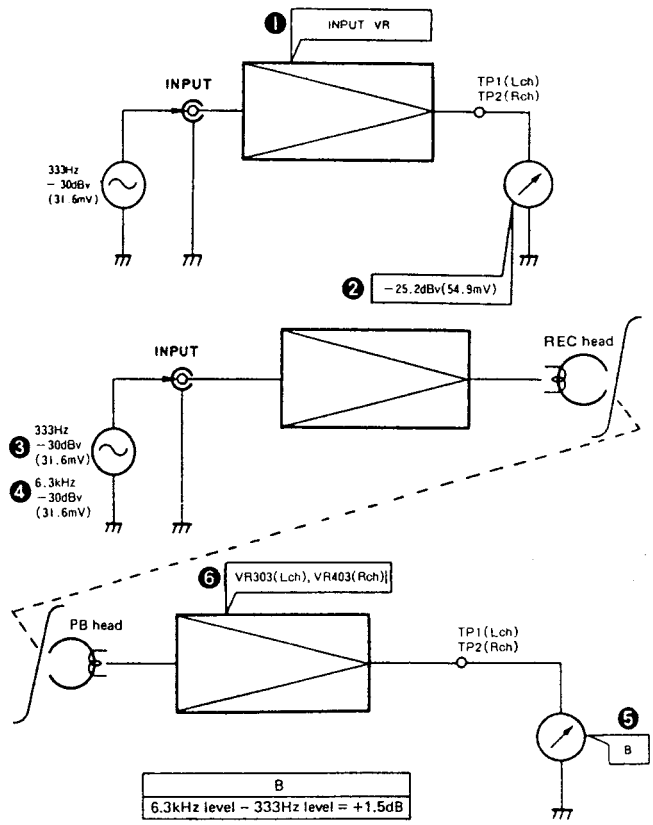


Fig. 12-16 Record/playback frequency response adjustment

Procedure

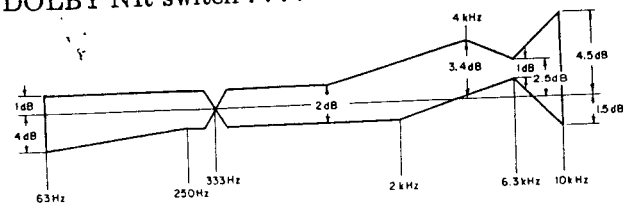
1. Adjust the INPUT level control so that the meter reads -25.2dBv (54.9mV).
2. Record the 333Hz, -30dBv and 6.3kHz, -30dBv signals, and adjust VR303 (L ch) and VR403 (R ch) so that the difference in the playback output signal level with the 333Hz level as the reference level is +1.5dB.
3. Change the tape selector and DOLBY NR switch positions (See Fig. 12-17), and check that the frequency response is satisfactory.

Playback Frequency Response

Due to "dege effect", compensate the right channel by - 0.5dB at 125Hz and - 1dB at 63Hz.

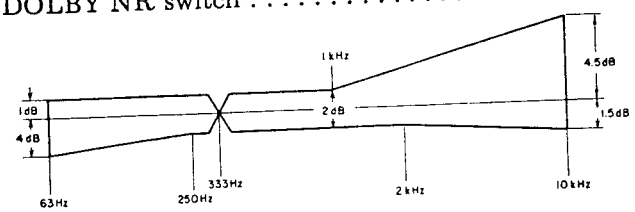
■ **Deck A**

Test tape STD-341A
DOLBY NR switch ..... OFF



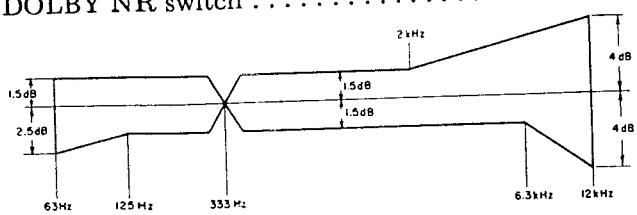
■ **Deck B**

Test tape STD-341A
DOLBY NR switch ..... OFF

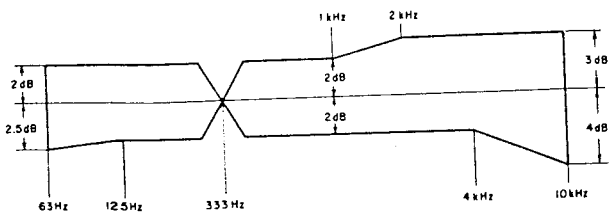


Overall Frequency Response

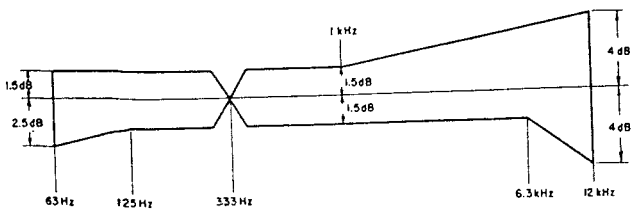
Test tape STD-608A
DOLBY NR switch ..... OFF



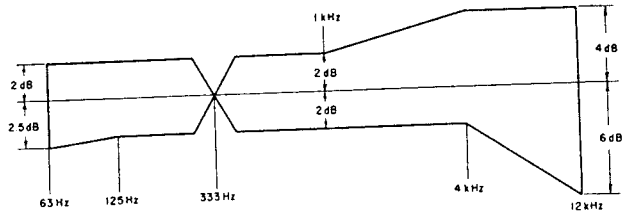
Test tape STD-608A
DOLBY NR switch ..... ON



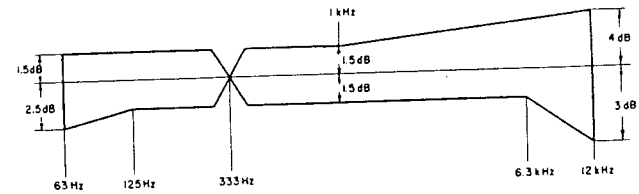
Test tape STD-603
DOLBY NR switch ..... OFF



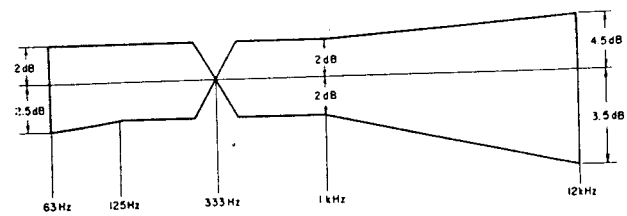
Test tape STD-603
DOLBY NR switch ..... ON



Test tape STD-604
DOLBY NR switch ..... OFF

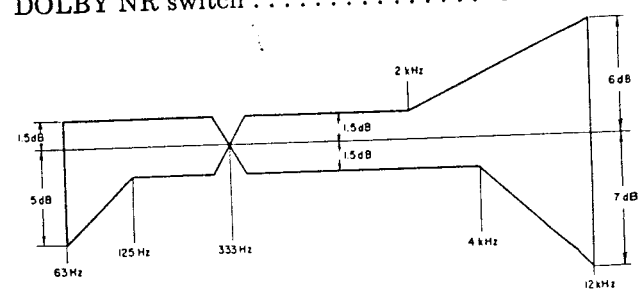


Test tape STD-604
DOLBY NR switch ..... ON



Overall Frequency Response at Copy Time

Deck A playback tape STD-341A
Test tape STD-608A
DOLBY NR switch ..... OFF



Test tape STD-608A
DOLBY NR switch ..... ON

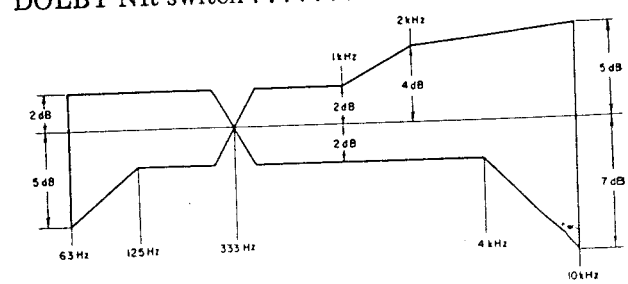
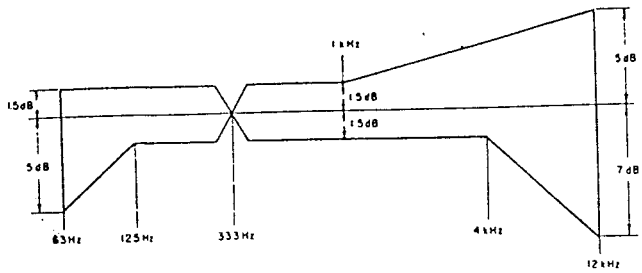
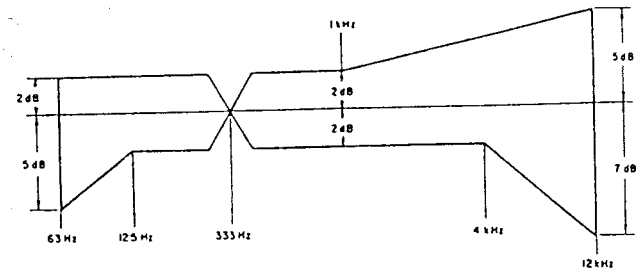


Fig. 12-17 Frequency response

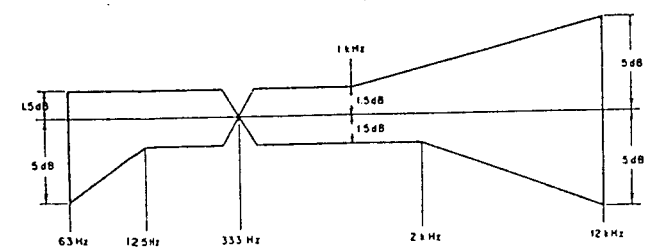
Test tape STD-603
DOLBY NR switch ..... OFF



Test tape STD-603
DOLBY NR switch ..... ON



Test tape STD-604
DOLBY NR switch ..... OFF



Test tape STD-604
DOLBY NR switch ..... ON

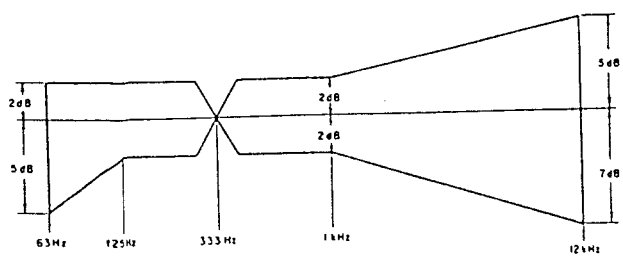


Fig. 12-18 Frequency response

12.2.7 Recording Level Adjustment (Deck B)

Settings

AC mV meter ..... Connect to TP1 (L ch) and TP2 (R ch)
Input signal ..... 333Hz, -10dBv (316mV) to LINE INPUT terminals
Test tape STD-608A (STD-603, STD-604)
Tape selector ..... NORM (CrO_2, METAL)
Mode ..... Record

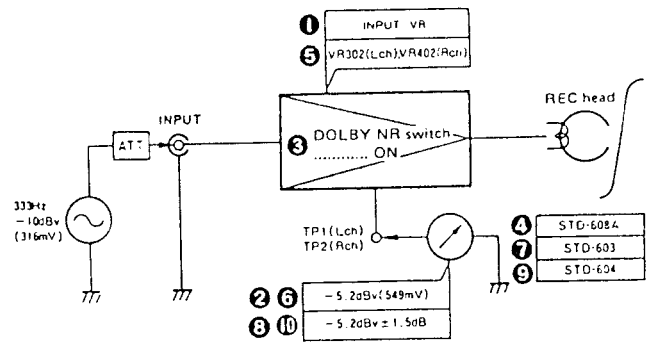


Fig. 12-19 Recording level adjustment

Procedure

1. Adjust the INPUT level control so that the meter reads -5.2dBv (549mV).
2. Switch the DOLBY NR switch ON.
3. Record the 333Hz, -10dBv signal on the STD-608A test tape. Then adjust VR302 (L ch) and VR402 (R ch) so that the meter reads -5.2dBv (549mV) when the recorded signal is played back.
4. Perform recording and playback as described in step 3 using the STD-603 test tape. The playback output level should lie within -5.2 dBv ±1.5dB (653mV ~ 462mV).
5. Perform recording and playback as deseribed in step 3 using the STD-604 test tape. The playback output level should lie within -5.2 dBv ±1.5dB (653mV ~ 462mV).