

Service Manual

Digital Compact Cassette Deck
RS-DC10

Supplement-1

Colour

(K)... Black Type

Please file and use this supplement manual together with the service manual for Model No. RS-DC10, Order No. AD9209339C1 (PP), AD9209340C8 (EB, EG, G).

Note: This supplement is intended to provide additional information or corrections to the existing service manual for Model No. RS-DC10. Be sure to update your service manual for future reference.

Area

Suffix for Model No.	Area	Colour
(PP)	U.S.A./Canada	(K)
(EB)	Great Britain	
(EG)	Germany, Italy and Europe	
(G)	Asia, Latin America, Middle Near East and Africa	

FOR USE OF ADJUSTMENT

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NOTE : Please put this Supplement-1 (AD9307210S0) in the place of Supplement (AD9212389C8).

Technics

CAUTION!

- 1 Connect a wrist strap (RFKZ0036) to the meter's ground terminal. Always wear a wrist strap when replacing the heads or inspecting or repairing a P.C.B. to prevent electrostatic breakdown.

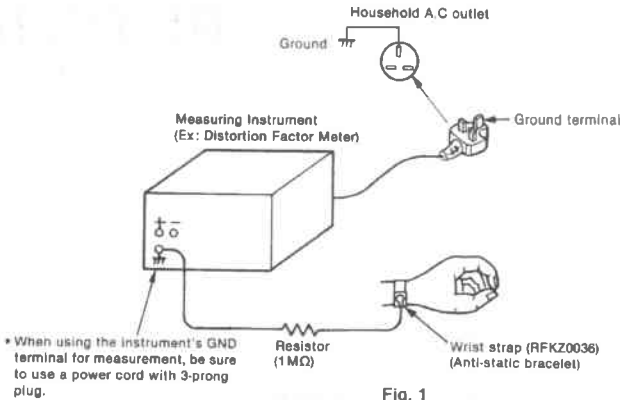


Fig. 1

- 2 When removing the head FPC from the READ/WRITE P.C.B., always attach a shorting clip to the FPC to prevent electrostatic breakdown.

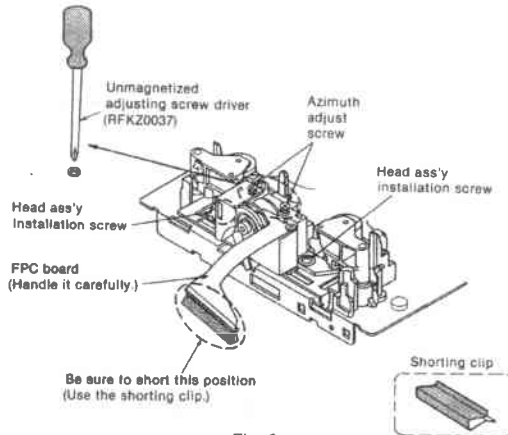


Fig. 2

- 3 Use the unmagnetized adjusting screw driver (RFKZ0037) for replacing the head and for AZTEC adjustment. (The head may be damaged by an external magnetic field.)

■ PREPARATION FOR ADJUSTMENTS

• How to use Extension cables (RFKZ0029, RFKZ0030, RFKZ0031) for Adjustment

Extension cable	P.C.B. to P.C.B.
RFKZ0029	Main P.C.B. ↔ Mechanism Block (JW02/05/08) (See Fig. 3)
RFKZ0030	PASC P.C.B. ↔ Read/Write P.C.B. (See Fig. 4)
RFKZ0031	Main P.C.B. ↔ PASC Digital P.C.B. (See Fig. 4)

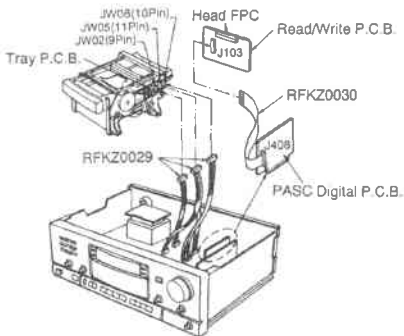


Fig. 3

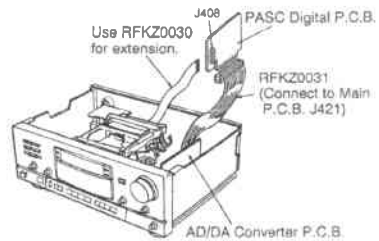


Fig. 4

• Necessary Test tapes for each adjustment

Part No.	Name	Use
QZZCAC	10kHz Test tape	AZTEC adjustment
QZZCRD	Mirror tape	
RFKZ0033	DCC Blank tape	Optimum DCC recording current adjustment
DCC-S1	DCC Characteristics tape	DCC playback level adjustment and Error Rate check
QZZCFM	ACC Test tape	Analog feedback adjustment
		Minimum analog output distortion adjustment
		Analog output frequency response characteristics adjustment
RFKZ0038	Dolby level tape	Dolby level adjustment
QZZCWAT	3kHz Test tape	Tape speed adjustment

• Necessary tools and measuring instruments

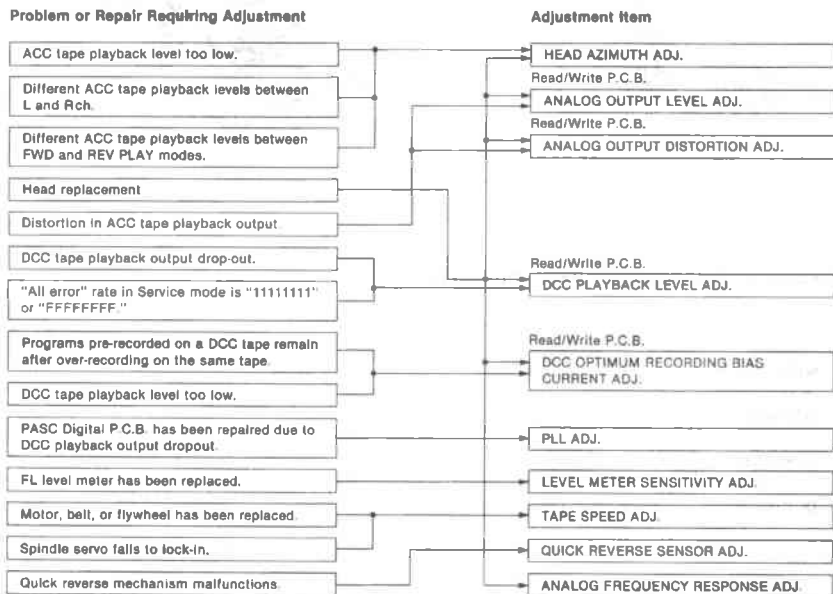
Tools

Unmagnetized adjusting screw driver (RFKZ0037)
 CD player (EX: SL-PS700, SL-PS900 etc.)

Measuring instruments

Oscilloscope (30MHz or Higher)
 Distortion Factor Meter
 Frequency Counter
 Electric Volt Meter (AC/DC)

■ EXAMPLES OF PROBLEMS WHICH REQUIRE ADJUSTMENT



■ WHAT YOU SHOULD KNOW BEFORE ADJUSTMENT

The DCC head block employs the AZTEC mechanism.

AZTEC plays an important role in stabilizing the running of the tape relative to the head.

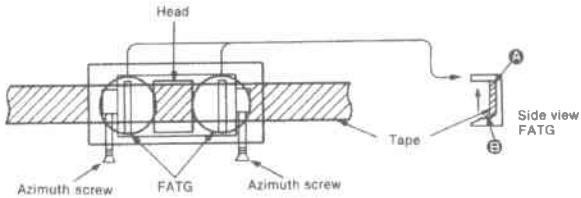


Fig. 1

The Fixed Azimuth Tape Guidance (FATG) has a different shape above and below the tape. The upper part **A** is the guiding surface for the tape's upper edge. The slanted area of the lower part **B** is structured so that the tape moves itself upwards. The tape usually runs along the upper guiding surface **A**.

When the head has been replaced, be sure to adjust the AZTEC.

① Head is too low relative to the tape hub.

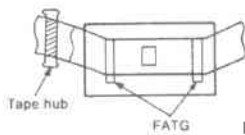
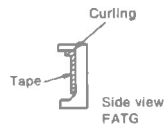


Fig. 2



② Head and tape hub are correctly aligned.

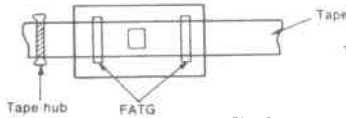


Fig. 3



③ Head is too high relative to the tape hub.

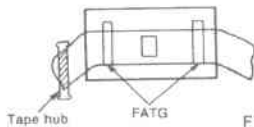


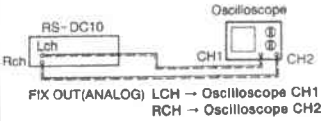
Fig. 4



* If condition **①** or **③** occurs, adjust the azimuth screws to obtain the correct position (as shown in **②**).

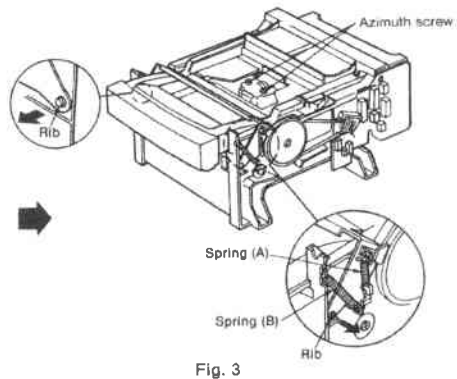
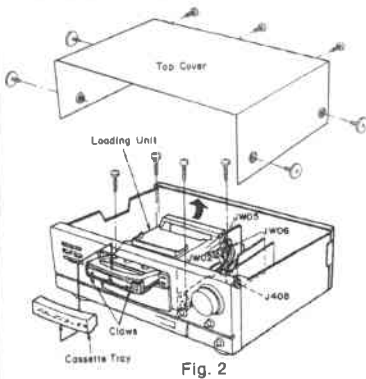
ADJUSTMENT

1. AZTEC ADJUSTMENT

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. Mirror tape (QZZCRD) 2. 10kHz Test tape (QZZCAC) 3. Unmagnetized adjusting screw driver (RFKZ0037) 4. Wrist strap (RFKZ0036)	1. Oscilloscope (30MHz or higher)	 <p>FIX OUT(ANALOG) LCH → Oscilloscope CH1 RCH → Oscilloscope CH2</p> <p>Fig. 1</p>

• Adjustment Steps

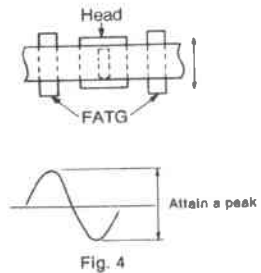
- (1) Trigger on CH1.
- (2) Remove the tape control lever from the tray mechanism.



• Rough Adjustment

STEP 1

1. Using the Mirror tape (QZZCRD):
Adjust the Azimuth screws so that the Mirror tape (QZZCRD) runs over the center of the head.
2. Not using the Mirror tape (QZZCRD):
While playing back the 10kHz Test tape (QZZCAC), adjust the Azimuth screws to attain a peak on one channel (RCH) only.

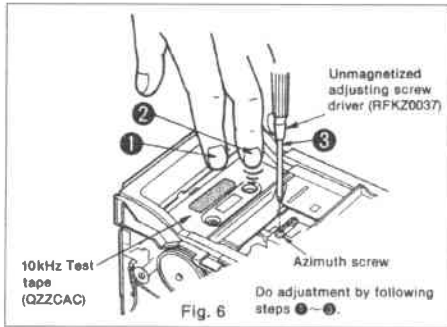


• Fine Adjustment

STEP 2 Forward side adjustment

To adjust in the forward direction, use the right side Azimuth screw.
Do not touch the left side Azimuth screw (Fig. 5).

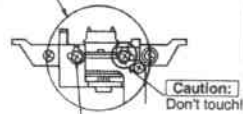
1. Run the 10kHz Test tape (QZZCAG) to its middle. Press a finger on the shaded area (⊗) and run the tape. (To keep the cassette from floating.)
2. While keeping your finger in the position given in Fig. 6. Press another finger on the head of the Supply reel cap, and turn the right side Azimuth screw to the right. (Control the range of movement to the left and right of the CH1 waveform.)



• Adjustment Points

Top view of the head block

Caution:
Keep magnetized objects away from this area.



Forward Play Azimuth screws

Fig. 5

Procedure	Reference figure
<p>① Stop the right side Azimuth screw at the point where only the CH2 waveform starts to move ●.</p>	<p>Side view AZTEC</p> <p>Fig. 7</p>
<p>② Turn the Azimuth screw to the left until the point where the waveform starts to move in the opposite direction ⊗.</p>	<p>Side view AZTEC</p> <p>Fig. 8</p>
<p>③ Turn the Azimuth screw to halfway between ⊗ and ●.</p>	<p>Side view AZTEC</p> <p>Fig. 9</p>

STEP 3 Method of verification

1. Connect the oscilloscope to the AZCHK terminal of the PASC DIGITAL P.C.B. (Fig. 11).
2. Playback the DCC Characteristics tape (DCC-S1).
If the pulse width shown is within $150\mu\text{s}$, the adjustment is good (Fig. 10).
3. Otherwise, re-adjust starting with **STEP 1** (Refer to page 7).

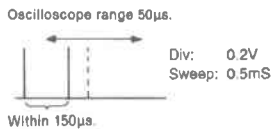


Fig. 10

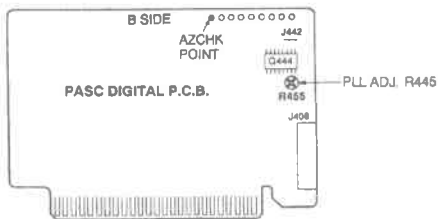


Fig. 11

STEP 4 Reverse side adjustment

To adjust in the reverse direction, use the left side Azimuth screw.
Do not touch the right side Azimuth screw (Fig. 12).

1. Reverse playback the 10kHz Test tape (QZZCAC).
(Control the tape with your finger.)
2. While reverse playing and keeping your finger pressed on the Supply reel cap (to apply a load), turn the left side Azimuth screw as was done for the forward side adjustment (Fig. 13).

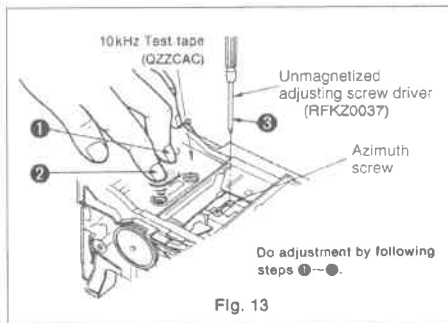


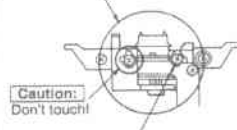
Fig. 13

3. The method of verification is also the same.

• Adjustment Points

Top view of the head block

Caution:
Keep magnetized objects away from this area.

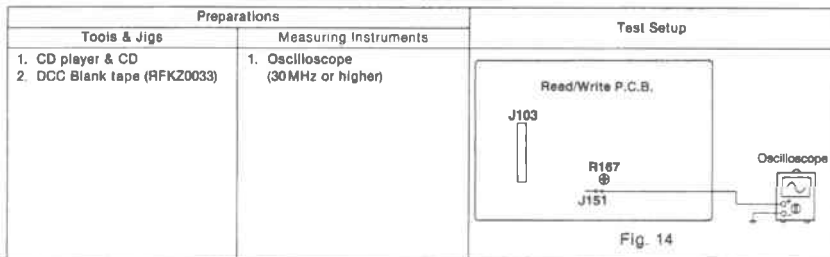


Reverse Play Azimuth screws

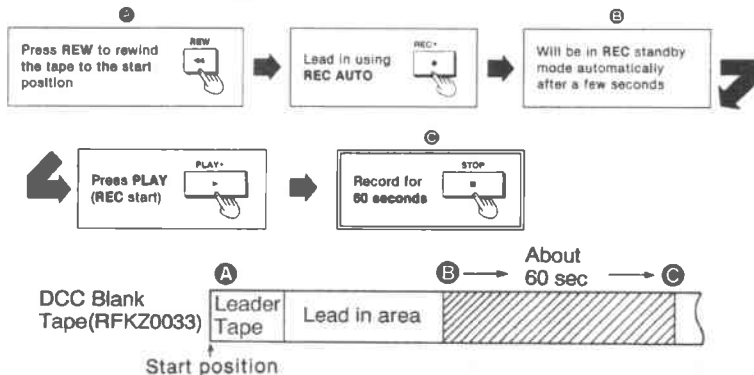
Fig. 12

2. OPTIMUM DCC RECORDING CURRENT ADJUSTMENT (READ/WRITE P.C.B.)

• Connect the CD player output terminal with the DCC recording terminal (either analog input, digital input, or optical input). Record the CD sound onto the DCC Blank tape (RFKZ0033). This recording gives A-time.



[How to do A-time recording]



• Adjustment Steps

- Put the unit in REC mode using an unrecorded section of the DCC Blank tape (RFKZ0033).
- Adjust potentiometer R167 to obtain the optimum voltage on the output level of J151.

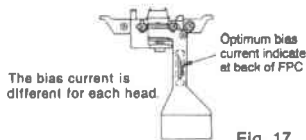
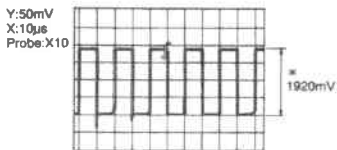
* How to find the optimum voltage

The bias current indicated on the back of the FPC of each head is found using the following formula:

$$V = I \times R151 (12\Omega)$$

Example:

When the bias current is 160mA:
 $V = 160\text{mA} \times 12\Omega = 1920\text{mV}$



(I) Method of Verification (Must be performed after adjustment.)

Overwrite with another music source part of the section that was recorded during preparation.

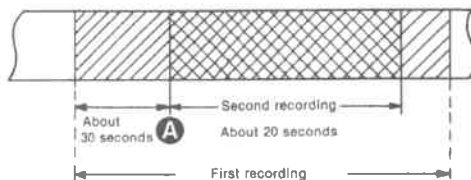
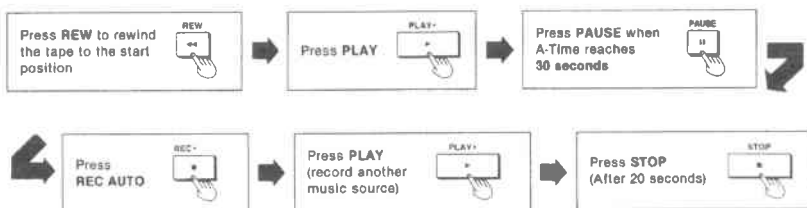


Fig. 18

[How to overwrite]**(II) Verification Items**

Rewind the tape and play it back, and check the following at the breaks between tracks.

1. Check that A-Time is played back.
(Fails if the recording current is low.)
2. Check the Error Rate
 - ① Stop after about 25 seconds from the tape start position.
 - ② Turn off the power so that "ALL · ERR · RATE" is displayed in the service mode, and play the tape again. (Refer to page 12)
 - ③ Confirm that "00 0000000" remains on the display, although the Error Rate is momentarily worse than this at A-Time (5 seconds after the initial 25 seconds).

(III) Viewing the "Error Rate"

(1) Setting the Error Rate mode

1. Turn the **POWER** off. While pressing both the **STOP** key and the **PLAY** key, turn the **POWER** on.
2. [SERVICE MODE] is displayed.

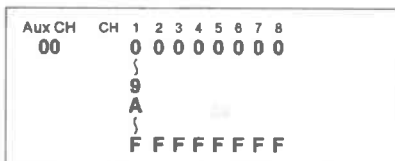


are scrolled in order.

Press the **COUNTER** key on the DCC seven times.
ALL · ERR · RATE is displayed.

Place a pre-recorded tape into the machine and press the **PLAY** key.

3. Ten characters (numbers or letters) will be displayed on the display section.
This display shows the Error Rate on each of 8 CH signal tracks and the AUX CH.
The signal drop-out condition for each channel is displayed using the hexadecimal digits 0-9, A-F.

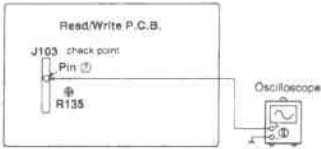
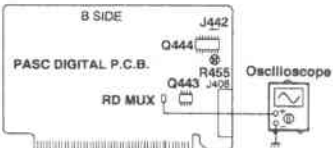


(2) Error Rate acceptability criteria

Display	Condition
"00000000" is constantly displayed for all tracks.	Normal (OK)
"01101000" is momentarily displayed for any one to three tracks (or more).	Normal (OK)
"11111111" is constantly displayed for one to three tracks (or more). Anything but "0" is displayed.	Error
"11111111" is constantly displayed for all tracks. Anything but "0" is displayed.	Error
"FFFFFFF" is constantly displayed for all tracks.	Error

3. DCC PLAYBACK LEVEL ADJUSTMENT (READ/WRITE P.C.B. or PASC DIGITAL P.C.B.)

- The purpose of this adjustment is to feed digital signals at the specified level from the DCC RF circuit to the PASC Digital circuit.

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. DCC Test tape (DCC-S1). 2. Screwdriver (-)	1. Oscilloscope (30MHz or higher)	(Ex. 1)  Fig. 19 (EX. 2)  Fig. 20

• Adjustment Steps

- Play forward the DCC Test tape (DCC-S1).
- Adjust potentiometer R135 so the voltage at J103-pin ① is $1.2Vp-p \pm 100mV$ (Fig. 19).
(or RD MUX on the B SIDE of the PASC DIGITAL P.C.B. will do (Fig. 20).)

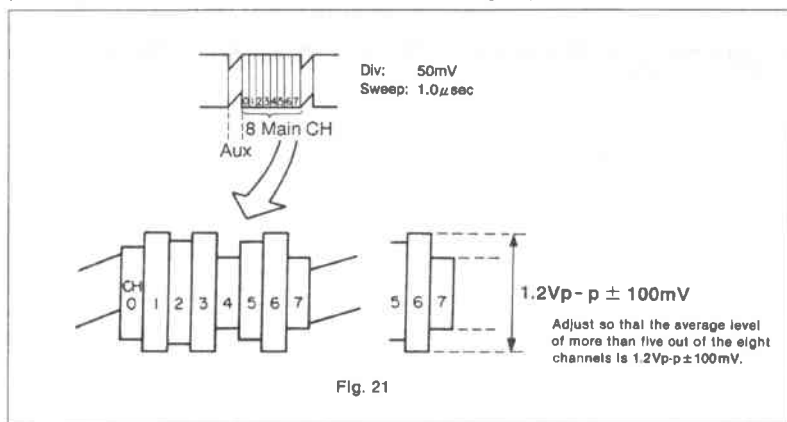


Fig. 21

4. ANALOG OUTPUT LEVEL ADJUSTMENT (READ/WRITE P.C.B.)

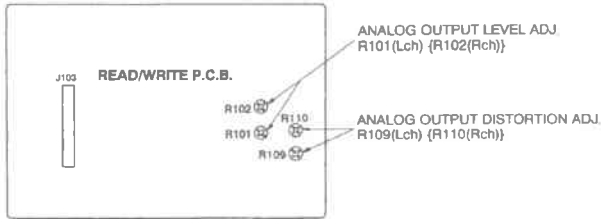


Fig. 22

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. ACC Test tape (QZZCFM) 2. Screwdriver (-)	1. Oscilloscope (30MHz or higher) 2. EVM (AC Range)	

• Adjustment Steps

- (1) Play forward the 315Hz, 0dB test tone on the ACC Test tape (QZZCFM).
- (2) Maximize output level with potentiometers R101 (Lch) and R102 (Rch)
- (3) Reduce output level by -10dB (optimum output level) from the maximum level again with R101 and R102.

5. CONFIRMATION OF ANALOG OUTPUT DISTORTION ADJUSTMENT (READ/WRITE P.C.B.)

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. ACC Test tape (QZZCFM) 2. Screwdriver (-)	1. Oscilloscope (30MHz or faster) 2. Distortion Factor Meter	

• Adjustment Steps

- (1) Play forward the 315Hz, 0dB test tone on the ACC Test tape (QZZCFM)
- (2) Check to make sure that THD is no greater than 1.5%.
- (3) If THD is grater than 1.5%, adjust the R109 (Lch) and R110 (Rch) until it is within 1.5%.

ADJUSTMENT POINTS (MAIN P.C.B.)

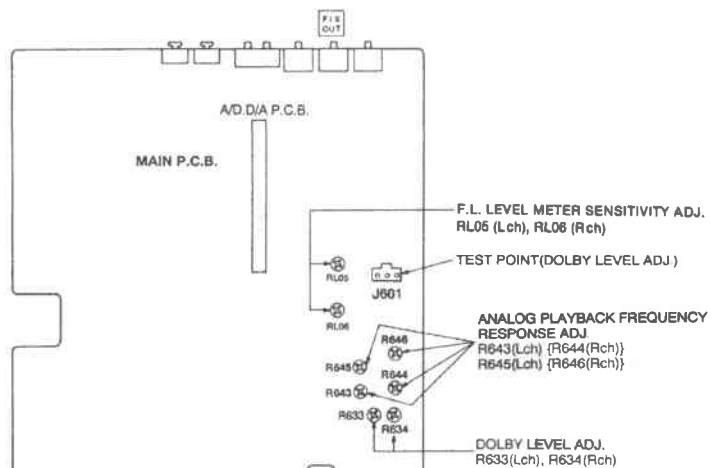


Fig. 25

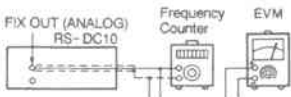
6. DOLBY LEVEL ADJUSTMENT (MAIN P.C.B.)

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. Dolby level tape (RFKZ0038)	1. EVM (AC Range)	

• Adjustment Steps

- (1) While playing back the Dolby level tape (RFKZ0038), adjust the voltage at test point J601 to 338mV using R633 (Lch) and R634 (Rch) (See Fig. 25).

7. ANALOG PLAYBACK FREQUENCY RESPONSE ADJUSTMENT (MAIN P.C.B.)

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. ACC Test tape (QZZCFM) 2. Screwdriver (-)	1. Frequency Counter 2. EVM (AC Range)	 <p>Fig. 27</p>

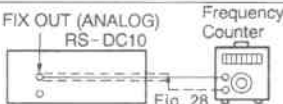
• Adjustment Steps

- Play the 1kHz and 63Hz test tones on the ACC Test tape (QZZCFM) and adjust potentiometers R645 (Lch) and R646 (Rch) until the FIXED OUT output level at 63Hz is within $0 \pm 0/-1$ dB from that at 1kHz.
- Play the 1kHz and 12.5kHz test tones on the ACC Test tape (QZZCFM) and adjust potentiometers R643 (Lch) and R644 (Rch) until the FIXED OUT output level at 12.5kHz is within $0 \pm 0/-1$ dB from that at 1kHz. (See Fig. 25)

Notes:

- During adjustment, monitor playback frequency with a Frequency Counter.
- Misalignment will affect the ACC Test tape (QZZCFM) playback frequency response.

8. TAPE SPEED ADJUSTMENT (TRAY P.C.B.)

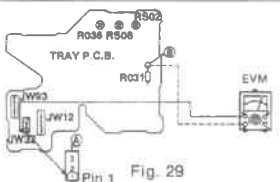
Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. ACC Test tape (QZZCWAT). 3kHz - 10dB 2. Screwdriver (-)	1. Frequency Counter	 <p>Fig. 28</p>

• Adjustment Steps

- Play forward the 3000Hz test tone on the ACC Test tape (QZZCWAT) and adjust the signal frequency at the FIXED OUT jack to $3000\text{Hz} \pm 10\text{Hz}$ with potentiometer RS02 (See Fig. 29).
- Play backward the 3000Hz test tone on the ACC Test tape (QZZCWAT) and adjust the signal frequency at the FIXED OUT jack to $3000\text{Hz} \pm 10\text{Hz}$ with potentiometer RS08 (See Fig. 29).

9. QUICK REVERSE SENSOR ADJUSTMENT (TRAY P.C.B.)

- The purpose of this adjustment is to set EOT sensor's sensitivity to the magnetic and leader portions of cassette tapes (quick reverse sensor).

Preparations		Test Setup
Tools & Jigs	Measuring Instruments	
1. ACC Blank tape (MAXELL UD-190) (commercially available) 2. Screwdriver (-)	1. EVM (DC Range)	 <p>Fig. 29</p>

• Adjustment Steps

- Play the leader tape portion of an ACC Blank tape (MAXELL UD-190) and adjust the potential difference between JW32 and R031 to 1V with potentiometer R036.