MEASUREMENT AND ADJUSTMENT METHODES

Measurement Condition

- Rec. level control; Maximum
- Timer switch; Off
- MPX filter switch: off
- Bias-adjustment VR: Center
- Rec. balance control; Center
- Rec. calibration adjustment; Center
- Dolby NR switch; Off
- Make sure heads are clean
- Make sure capstan and pressure roller are clean
- Judgeable room temperature 20±5°C (68±9°F)

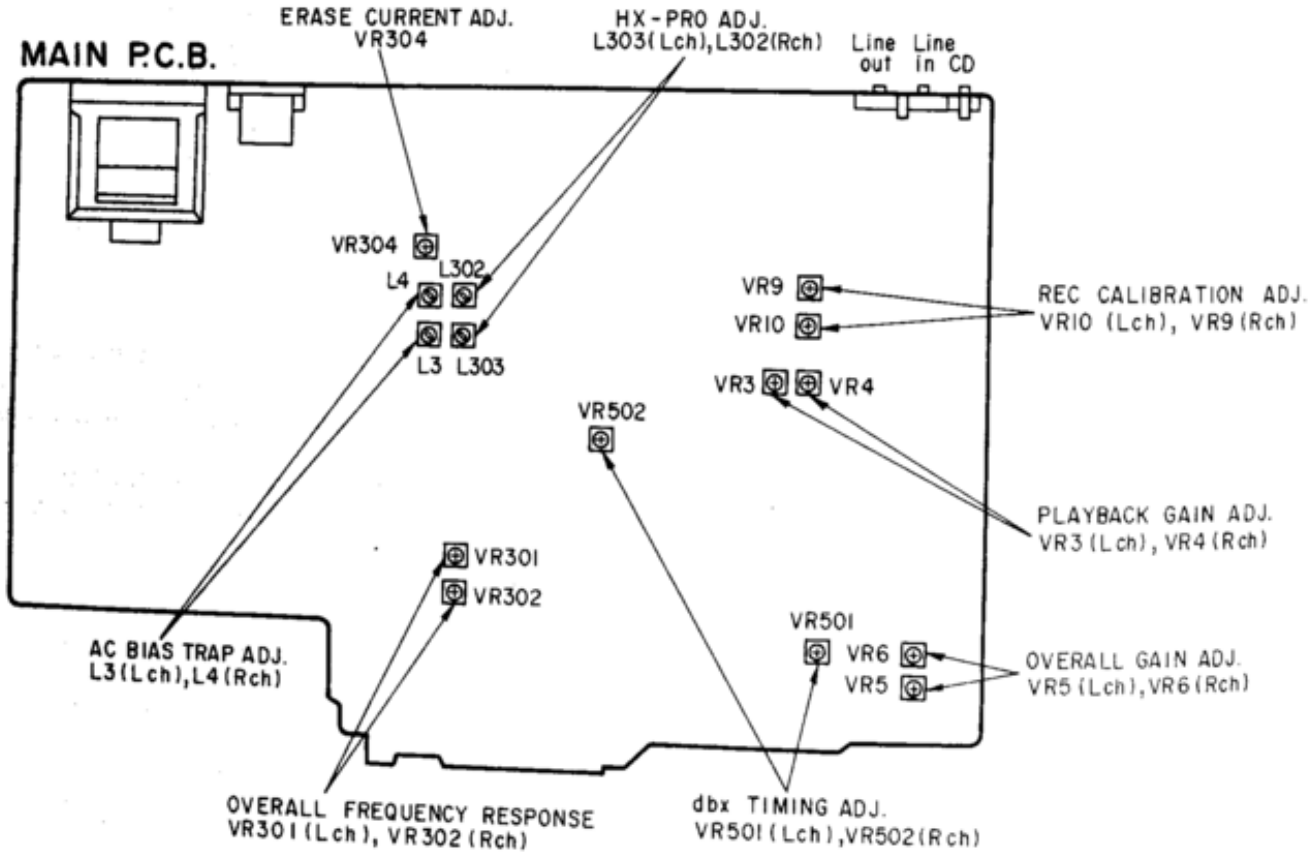
Measuring Instrument

- EVM (Electronic Voltmeter)
- Oscilloscope
- Digital frequency counter
- AF oscillator
- ATT (Attenuator)
- DC voltmeter
- Resistor (600Ω)

Test tape

- Head azimuth adjustment (8kHz, −20dB); QZZCFM
- Tape speed adjustment (3kHz, −10dB); QZZCWAT
- Playback frequency response (315Hz, 12.5kHz, 10kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz, 63Hz, −20dB); QZZCFM
- Playback gain adjustment (315Hz, 0dB); QZZCFM
- Overall frequency response, Overall gain adjustment
  Normal reference blank tape ; QZZCRA
  CrO_2 reference blank tape; QZZCRX
  Metal reference blank tape; QZZCRZ

• Adjustment Points



■ Replacing, Installing and Adjusting the Head

Adjustment Screws and Head Screws

1. Remove the head by removing the two head screws (see Fig. 1).
2. Install the head with the two head screws, holding the head facing in the direction of arrow 1 (toward the left) (see Fig. 1).
3. Install the head alignment gauge (QZZ0207) in the mechanism and set the unit to the play mode.
4. With the check bar, check if it comes in contact with the head. (See Figs. 2 and 3)

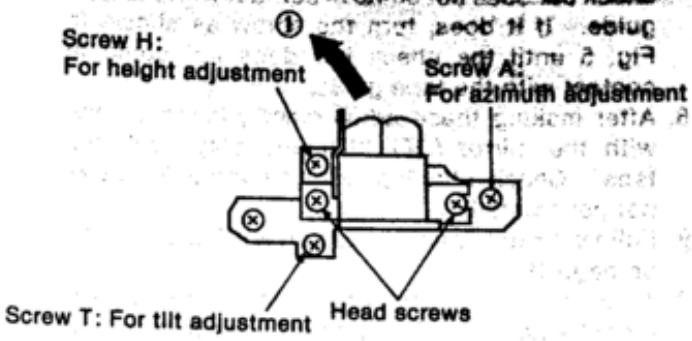


Fig. 1

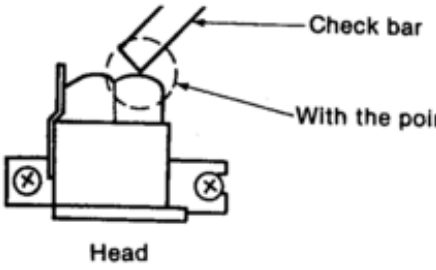


Fig. 2

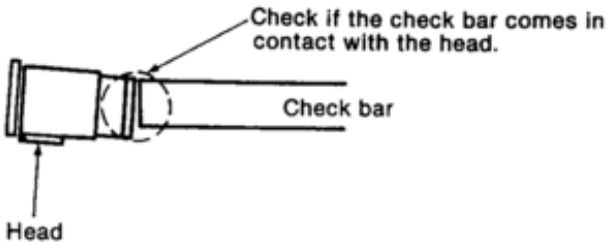


Fig. 3

∗ If the check bar and head do not come in contact, adjust the head with the "Tilt Adjustment Screw".

5. With the check bar, make sure that the check bar and tape guide do not come in contact, and visually check that the head is placed horizontally (azimuth aligned).

∗ If the check bar comes in contact with the tape guide, make adjustments as follows. (See Fig. 4.)

[If the check bar comes in contact with the top of the tape guide:]

Turn screw H (height adjustment screw) clockwise (as shown in Fig. 1) until the check bar does not come in contact with the tape guide. Then turn screw T (tilt adjustment screw) in the same way as screw H was turned. Finally, turn screw A (azimuth alignment screw) counterclockwise as many degrees as screws H and T were turned.

[If the check bar comes in contact with the bottom of the tape guide:]

Turn screw H (height adjustment screw) counterclockwise until the check bar does not come in contact with the tape guide. Then turn screw T (tilt adjustment screw) in the same way as screw H was turned. Finally, turn screw A (azimuth alignment screw) clockwise as many degrees as screws H and T were turned.

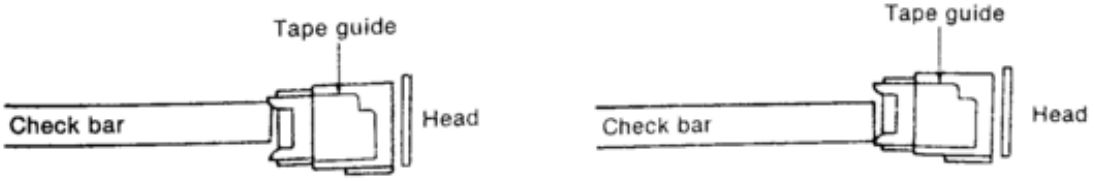


Fig. 4

6. With the check bar, make sure that the check bar does not come in contact with the tape guide on pinch arm S. If it does, make adjustment with a hex wrench (1.27mm) until the check bar does not come in contact with the pinch arm.

7. Then, with the check bar, make sure that the check bar does not come in contact with the tape guide. If it does, turn the screw as shown in Fig. 5 until the check bar does not come in contact with the tape guide.
8. After making these adjustments, insert a tape with the mirror (QZZCRD) and play back the tape. Check if the tape runs smoothly (i.e. does not get twisted).
9. Follow "Head Azimuth Adjustment" procedures on page 19.
10. After following the adjustment procedures, repeat steps 3 to 10 and check if trouble occurs (if it does, remedy it).

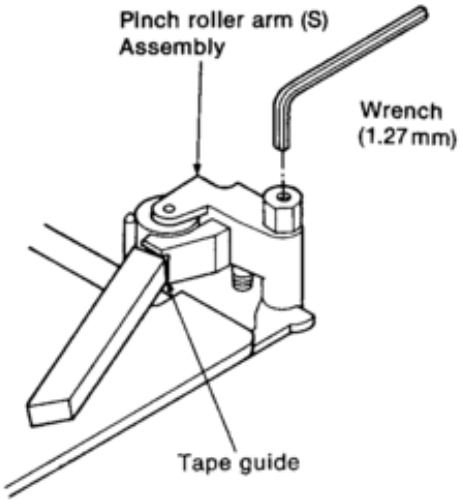


Fig. 5

■ Adjustment procedures when replacing "Pinch Arm S"

1. Install the head alignment gauge and set the play mode.
2. Adjust the height of the pinch arm with the check bar, using the height of tape guide on the head as reference.

■ If the already adjusted "Screw H (Height Adjustment Screw) and Screw T (Tilt Adjustment Screw)" are wrongly turned

- Install the head alignment gauge (QZZ0207), set the play mode, and turn screws H and T until the check bar does not come in contact with the tape guide on the head.
- Then, follows steps 1 to 10 in "Replacing, Installing and Adjusting the Head".

HEAD AZIMUTH ADJUSTMENT

1. Playback the azimuth adjusment portion (8 kHz, -20 dB) of the test tape (QZZCFM). Vary the azimuth adjusting screw until the outputs of the L-CH and R-CH are maximized and the lissajous waveform, as illustrated, approaches 0 degrees.

Note: If L-CH and R-CH are not maximized at the same point, adjust to the point where the levels of each channel are maximized and equal.

2. Perform the same adjustment in the play mode.
3. After the adjustment, apply screwlock to the azimuth adjusting screw.

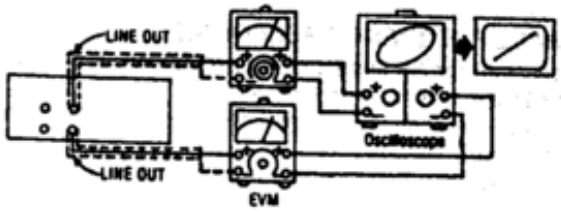


Fig. 6

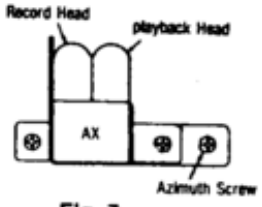


Fig. 7

PLAYBACK GAIN ADJUSTMENT

1. Playback the gain adjusted portion (315 Hz, 0 dB) of the test tape (QZZCFM).
2. Adjust **VR3** (L-CH) and **VR4** (R-CH) so that the output is within the standard value.

Standard value: 0.4V±0.5dB

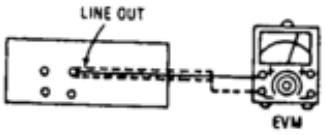


Fig. 8

PLAYBACK FREQUENCY RESPONSE

1. Playback the frequency response portion (315Hz, 12.5kHz~63Hz, −20dB) of the test tape (QZZCFM).
2. Assure that the frequency response is within the range shown in **Fig. 10** for both L-CH and R-CH.

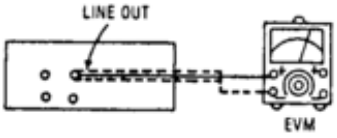


Fig. 9

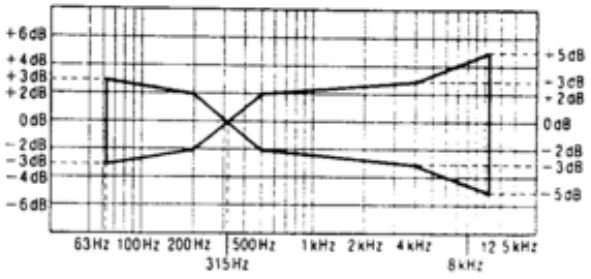


Fig. 10

AC BIAS TRAP ADJUSTMENT

1. Insert the Metal blank test tape (QZZCRZ) and set the unit to the Record mode.
2. Adjust **L3** (L-CH) [[**L4** (R-CH)]] so that the output voltage between **TP7** (**TP8**) and GND is less than the minimum value.

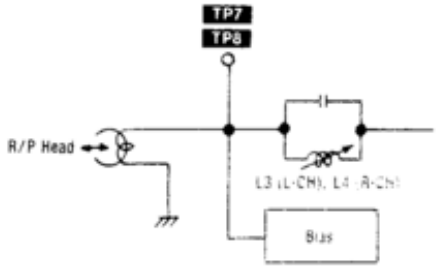


Fig. 11

OVERALL GAIN ADJUSTMENT

1. Insert the normal blank test tape (QZZCRA) and set the unit to the record pause mode.
2. Apply a reference input signal (1kHz, −24dB). Attenuate the output so that its level becomes 0.4V.
3. Record this input signal.
4. Playback the signal recorded in step 3 above, and assure that the output is within the standard value.
5. If it is not within the standard value, adjust **VR5** (L-CH) and **VR6** (R-CH).
6. Repeat the step 2~5 above until the output is within the standard value.

Standard value: 0.4V±0.5dB

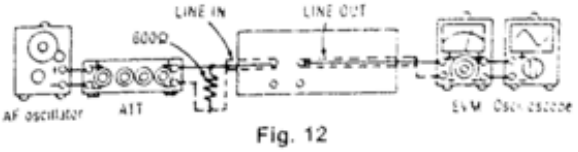


Fig. 12

OVERALL FREQUENCY RESPONSE

1. Insert the normal blank test tape (QZZCRA) and set the unit to the record pause mode.
2. Apply a reference input signal (1kHz, −24dB) through an attenuator.
3. Attenuate the signal by 20dB and adjust the frequency from 50Hz~10kHz.
4. Record the frequency sweep.
5. Playback the recorded signal and assure that it is within the range shown in **Fig. 14** in comparison to the reference frequency (1kHz).
6. If it is not within the standard range, adjust **VR301** (L-CH) and **VR302** (R-CH) so that the frequency level is within the standard range.
   - Level up in high frequency range .....Increase the bias current.
   - Level down in high frequency range ...Decrease the bias current.
7. Repeat steps 2~6 above using the CrO_2 tape (QZZCRX) and the metal tape (QZZCRZ) increasing the frequency range to 12.5kHz (50Hz~12.5kHz).
8. Assure that the level is within the range shown in **Fig. 15.**

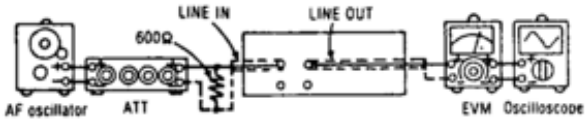


Fig. 13

Normal Overall frequency response chart (NR OUT)

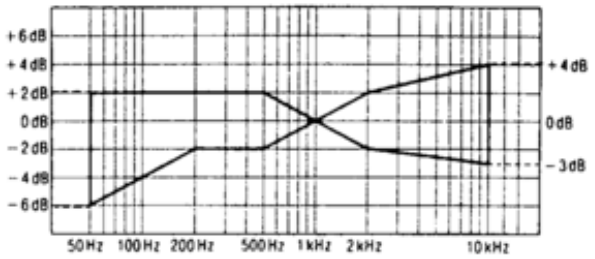


Fig. 14

CrO_2 Metal Overall frequency response chart (NR OUT)

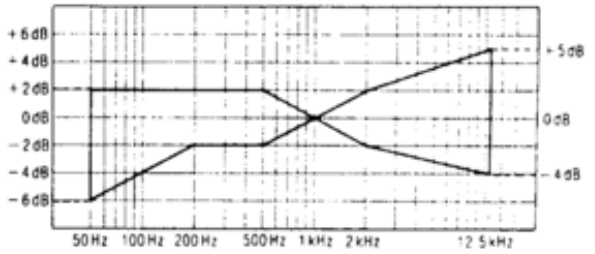


Fig. 15

ERASE CURRENT ADJUSTMENT

1. Insert the Metal blank test tape (QZZCRZ) and set the unit to the Record Pause mode.
2. Adjust **VR304** so that the output between **TP6** and GND is within the standard value.

Standard value: 190±5mA (Metal)...EVM Reading: 190±5mV

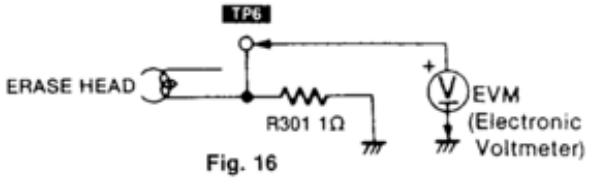


Fig. 16

dbx TIMING ADJUSTMENT

1. Shift the noise reduction switch to the dbx position.
2. Playback the gain adjustment portion (315 Hz, 0 dB) of the test tape (QZZCFM).
3. Connect a DC voltmeter across **TP1** (**TP4**) and **TP2** (**TP3**).
4. Adjust **VR501** (**VR502**) so that the output is within the standard value.

Standard value: DC18.4mV ± 0.5mV

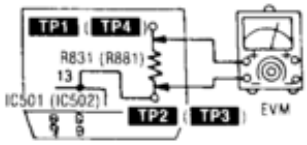


Fig. 17

HX-PRO ADJUSTMENT

1. Insert the Metal blank tape (QZZCRZ) and set the unit to the Record Pause mode.
2. Connect a DC voltmeter across **TP15** (L-CH) and GND, **TP16** (R-CH) and GND.
3. Adjust **L303** (L-CH) and **L302** (R-CH)so that the output is the minimum value.

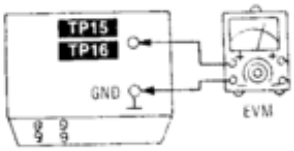


Fig. 18