Using Nakamichi Calibration Cassettes & Gauges

Note – This document is a work-in-progress

29 February 2020
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The calibration procedures below are very similar to the calibration procedure for all 3-head Nakamichi cassette decks with the exception of the auto azimuth alignment section.

Tape Speed Adjustment

(1) Remove the Top Cover.
(2) Connect a Frequency Counter to the Output Jacks.
(3) Load a 3 kHz Speed Wow/Flutter Tape (DA09006A) and play it back.
(4) Referring to Fig 4.3, adjust the Tape Speed Adjustment Volume VR407 on the Speed Cal. P.C.B. to obtain 3,000 Hz on the Frequency Counter.
CCW: Motor drives slower.
CW: Motor drives faster.

Record Head and Playback Head Tilt Adjustment

Note: On items. 4.3-4.9, please refer to Fig 4.4 flow chart.
Refers to Figs. 4.5 and 4.6.

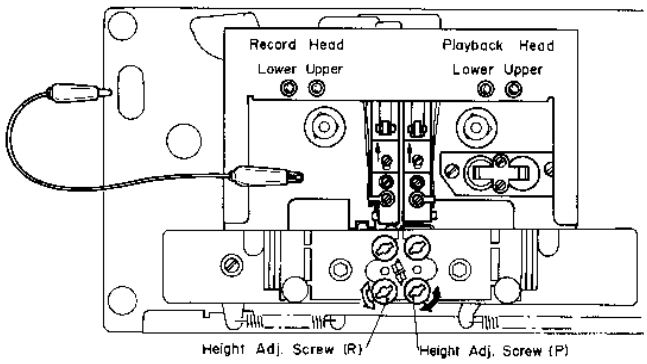


Fig. 4.5

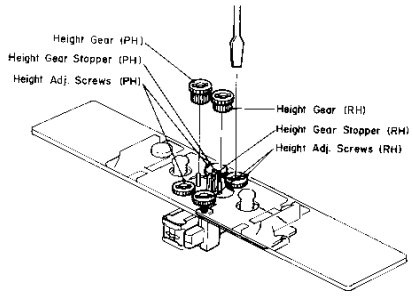


Fig. 4.6

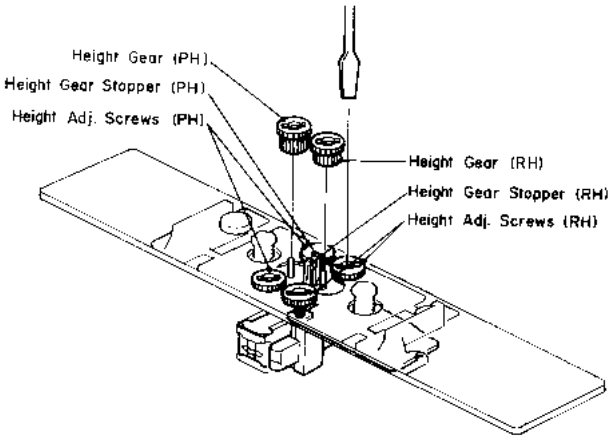


Fig. 4.6

(1) Load a Tilt Check Gauge M-9039 (DA09039A) in the N-660ZX.
(2) Clip the ground terminal of the Tilt Check Gauge with one end of the cord with clip, and the other end to the chassis of the N-660ZX.

(3) Remove both of the Height Gears.
(4) Set the N-660ZX in play mode. Check to insure whether the Beacons Playback Head "Upper" or "Lower" and Record Head "Upper" or "Lower" are illuminating. In order not to give damages onto the head surfaces, push both of slide knobs of the Gauge to the direction of arrow marks, then return it to the original place to be in contact with record head and playback head surfaces after play mode is securely locked.
(5) Check to insure freedom from contact between the Gauge and pad lifter.
(6) Beacon Playback Head "Lower" will light on when height adjustment scree (P) turned clockwise but Playback Head "Upper" when counterclockwise. Adjust so that both "Upper" and "Lower" will light on even when you move the slide knob to the direction of an arrow mark and then return it to the original place.
(7) Same procedures will apply to the Beacons Record Head "Upper" and "Lower", except for the height adjustment screw (R).
(8) Set the N-660ZX in stop mode and fit both of the serrated height gears. Then set the N-660ZX again in play mode and insure all of the 4 Beacons are illuminating. If not, (3) through (7) will have to be repeated till satisfactory results are obtained.

4.4 Head Base Stroke Adjustment in Play and Cue Modes

Note: Before you conduct this adjustment, adjust with a "Tilt Check Gauge" to insure freedom from tilt on the playback head and record head.
(1) Head Base Stroke Adjustment in Play Mode.
Refer to Fig. 4.7.

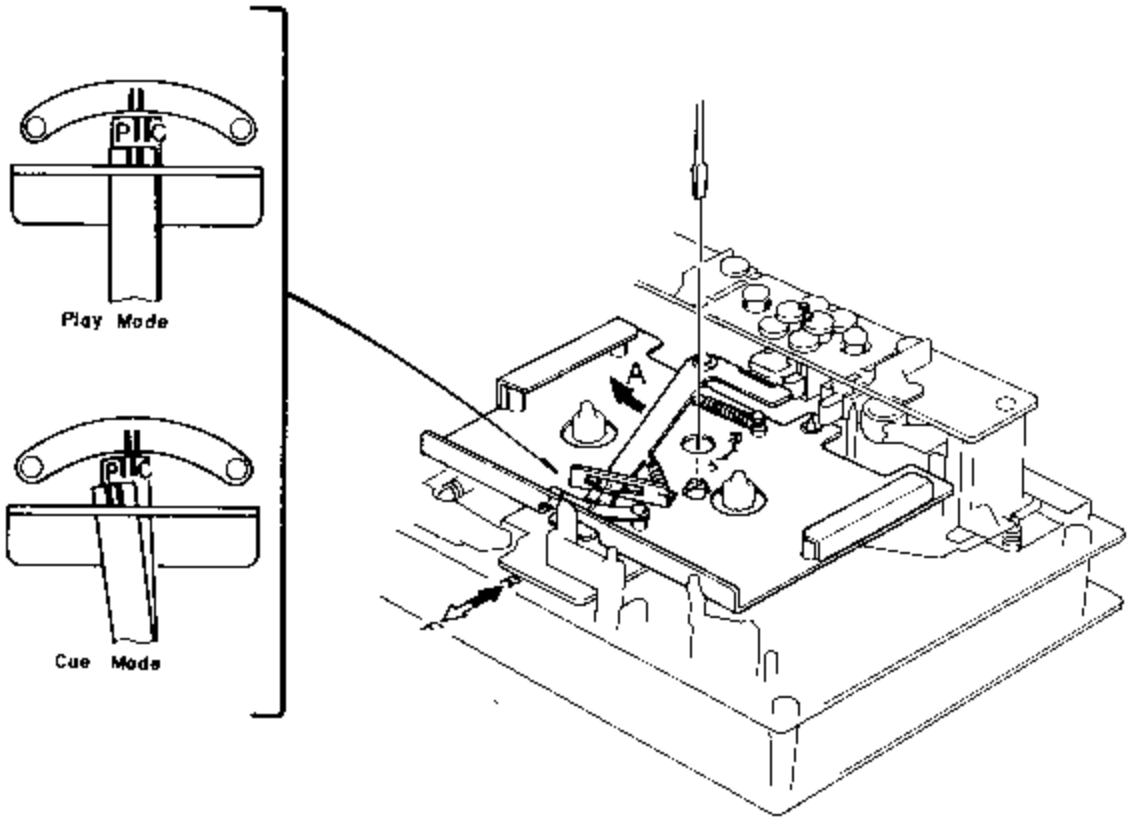


Fig. 4.7

(a) Load a Stroke Check Gauge M-9047 (DA09047A) in the N-660ZX.

(b) Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the N-660ZX in play mode. Then slowly release the Indicators and insure whether each of the Indicators is in contact with record and playback heads.

(c) Check to insure whether the "P" pointer on the Playback Head Indictor locates between the 2 lines on the Indicator Plate.

(d) If the playback head stroke is noted to be misaligned, adjustment can be made by moving the strobe adjuster assembly in the head base assembly (either forwardly or backwardly).

(e) Check to insure whether the "P" pointer on the Playback Head Indicator locates between the 2 lines on the Record Head Indicator, thus check can be made on record head stroke.

(f) If the record head stroke is noted to be misaligned, adjustment can be made with a Record Head Mounting Gauge M-9048 (DA09048A).

(2) Head Base Stroke Adjustment in Cue Mode

Refer to Fig. 4.8.

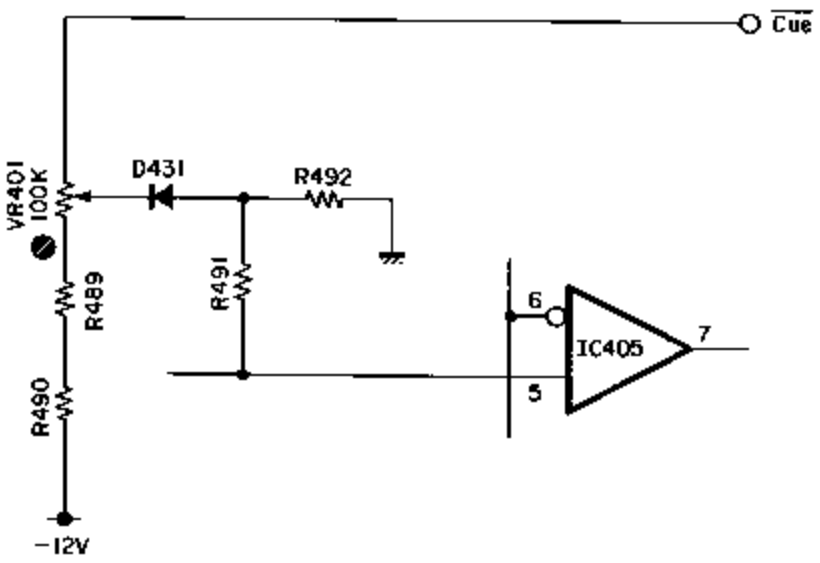


Fig. 4.8

(a) Load a Stroke Check Gauge M-9047 (DA09047A) in the N-660ZX.

(b) Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the N-660ZX in cue mode (F.F. and Pause).

Then slowly release the Indicators and insure whether each of the Indicators is in contact with record and playback heads.

(c) Check to insure whether the "C" pointer on the Playback Head Indicator locates between the 2 lines on the Indicator Plate.

(d) If the playback head stroke is noted to be misaligned, adjust VR401 on the Logic P.C.B. Ass'y til satisfactory results are obtained.

(e) After completion of the Head Base Stroke Adjustment, check to insure accuracy of the Head Base Stroke Adjustment in play mode.

If the above are inaccurate, items (1) and (2) will have to be repeated till satisfactory results are obtained.

4.5 Tape Guides Adjustment and Erase Head Stroke Adjustment

Remove Head Mount Base Ass'y referring to item 2.30.
Refer to Figs. 4.9 and 4.10.

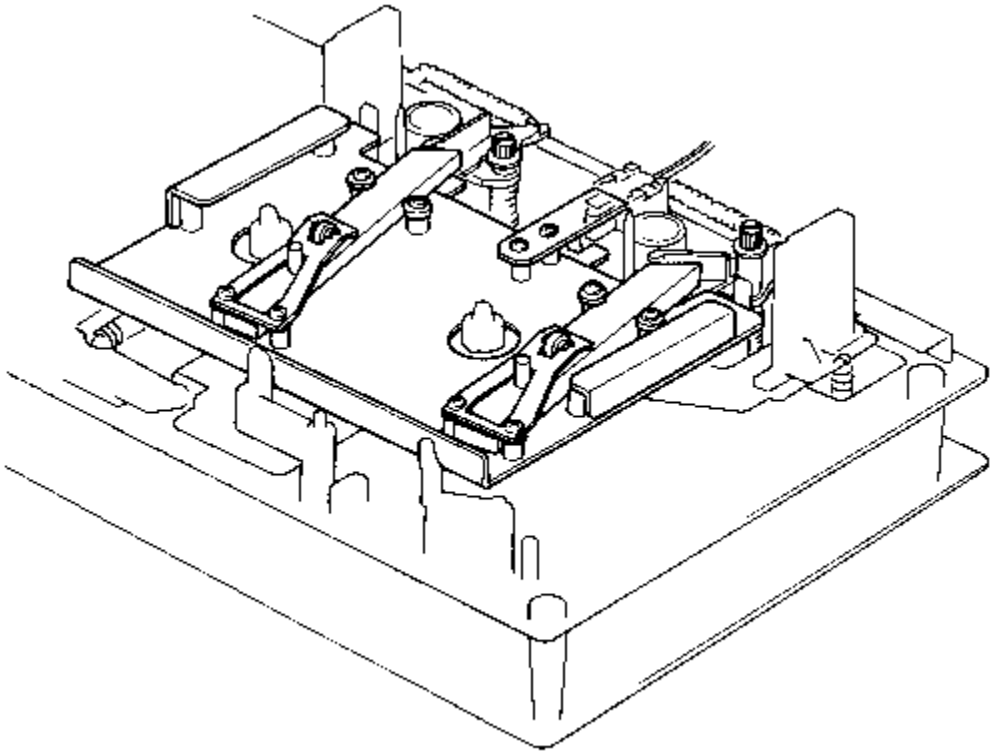


Fig. 4.9

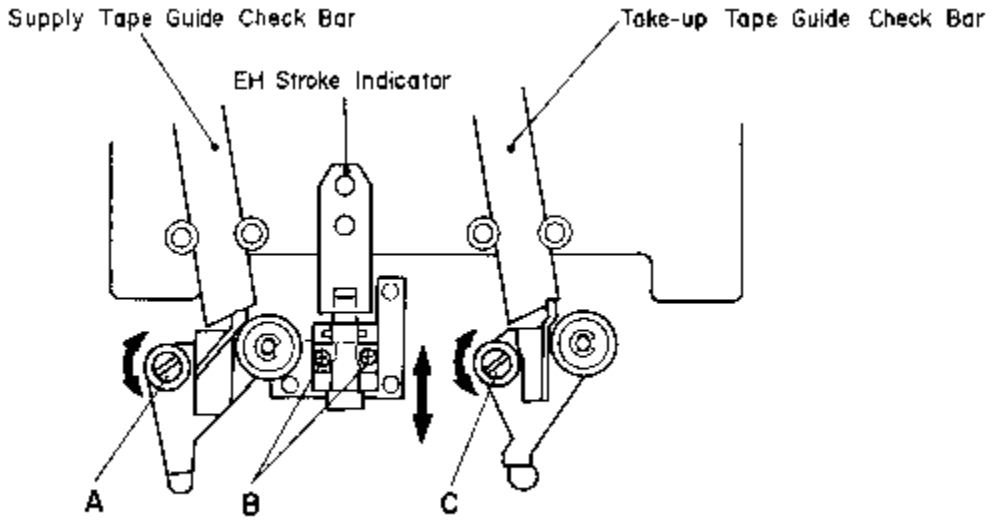


Fig. 4.10

(1) Supply Tape Guides Height Adjustment
   (a) Load an EH Stroke Check Gauge M-9042/M-9051 in the N-660ZX.
   (b) Set the N-660ZX in play mode.

(c) Slide the Supply Tape Guide Check Bar down against the supply tape guide, thus check can be made on supply tape guide height.

(d) If the supply tape guide is misaligned, the Supply Tape Check Bar will not come into the supply tape guide. If such is noted, turn to adjust the height adjustment nut A till the Supply Tape Guide Check Bar is accepted by the supply tape guide.

(e) If the above are insured, set the N-660ZX in pause mode, then in play mode to see whether adjustments are appropriately made. If not, (b) through (e) will have to be repeated till satisfactory results are obtained.

(2) Take-up Tape Guide Height Adjustment

(a) Load an EH Stroke Check Gauge M-9042/M-9051 in the N-660ZX.

(b) Set the N-660ZX in play mode.

(c) Slide the Take-up Tape Guide Check Bar down against the take-up tape guide, thus check can be made on take-up tape guide height.

(d) If the supply tape guide is misaligned, the Supply Tape Check Bar will not come into the supply tape guide. If such is noted, turn to adjust the height adjustment nut B till the Take-up Tape Guide Check Bar is accepted by the take-up tape guide.

(e) If the above are insured, set the N-660ZX in pause mode, then in play mode to see whether adjustments are appropriately made. If not, (b) through (e) will have to be repeated till satisfactory results are obtained.

(3) Erase Head Stroke Adjustment

(a) Load an EH Stroke Check Gauge M-9042/M-9051 in the N-660ZX.

(b) Set the N-660ZX in play mode, thus check can be made on erase head stroke through the EH Stroke Indicator.

(c) Check to insure whether the erase head surface is aligned with red line on the EH Stroke Indicator. If not, adjust the erase head and erase head plate.

(d) After completion of adjustment, 2 pcs. of screws shall be locked with lock tight paint.

Note:

EH Stroke Check Gauge N-9042 (DA0942A) should be used for the Models serial Nos. from A30701001 to A30702750, and EH Stroke Check Gauge M-9051 (DA09051A) is for Models bearing serial No. A30702751 and greater.

4.6 Erase Head Height and Tilt Adjustment

Refer to Figs. 4.11 and 4.12

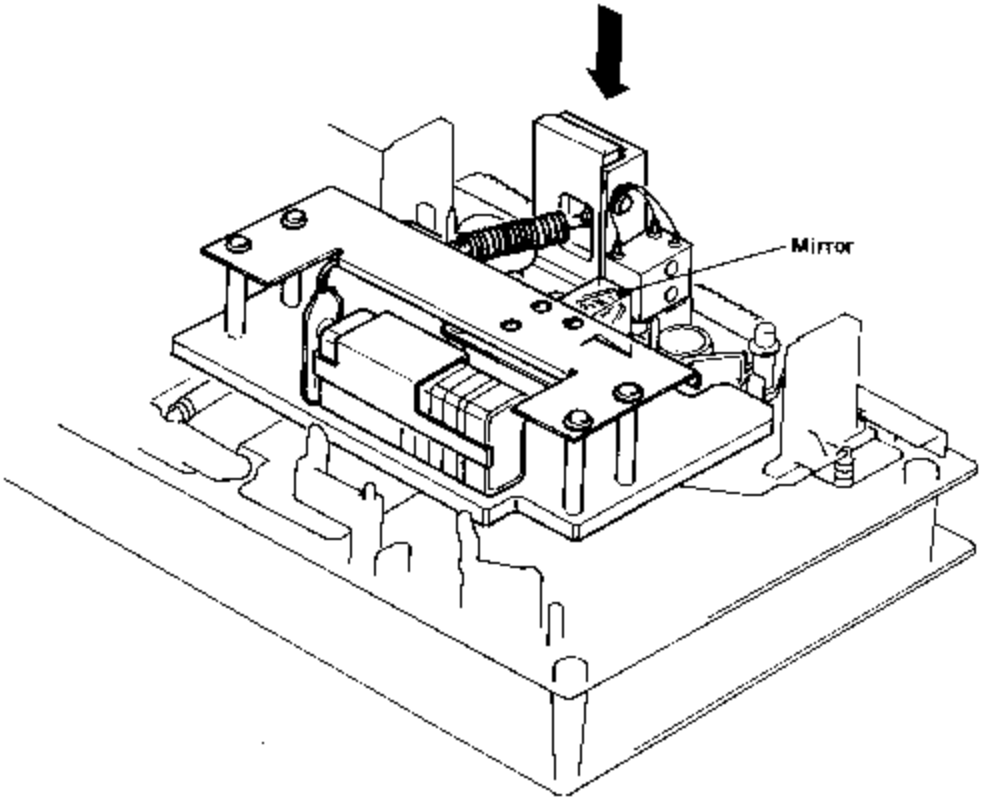


Fig. 4.11

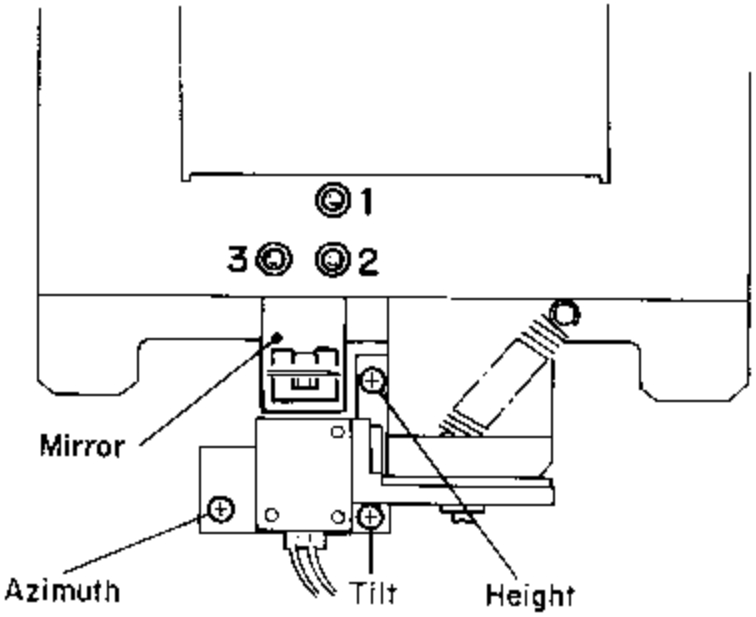


Fig. 4.12

(1) Remove Head Mount Base Ass'y referring to item 2.30.
(2) Load an EH Tilt Check Gauge M-9040 (DA0940A) in the N-660ZX.
(3) Set the N-660ZX in stop mode.
(4) Check to insure whether one of the 3 Beacons is illuminating. Look down the mirror as

shown by an arrow mark and slowly turn the Screw "Height" conterclocwise (or clockwise) so that the two horizontal lines on the mirror will become superimposed on the line (in different color) of the erase head, and check to insure whether Beacon "1" is illuminating.
(5) Turn Screw "Tilt" counterclockwise (or clockwise) to light Beacon "2". Excessive turning will cause the Beacon "1" to light off. Adjustments of Screw "Tilt" will therefore be conducted till both of the Beacons "1" and "2" illuminate.
(6) Turn Screw "Azimuth" counterclockwise (or clockwise) to light Beacon "3". Excessive turning will cause the Beacon "1" or "2" to light off, and therefore adjust with Screw "Azimuth" until all of the 3 Beacons "1", "2" and "3" illuminate.
(7) Check to insure whether the horizontal line on the mirror corresponds to that on the erase head. If not, (4) through (7) will have to be repeated till satisfactory results are obtained.
(8) After completion of adjustment, 3 pcs. of screws shall be locked with lock tight paint.
Note: before use of this gauge, check to insure freedom from dust or dirts, or overflow in the groove of the erase head surface.

4.7 Back Tension Adjustment

Note: This adjustment is required for the Models bearing serial Nos. A30704141 and greater.
Refer to Figs. 4.13 - 4.16.

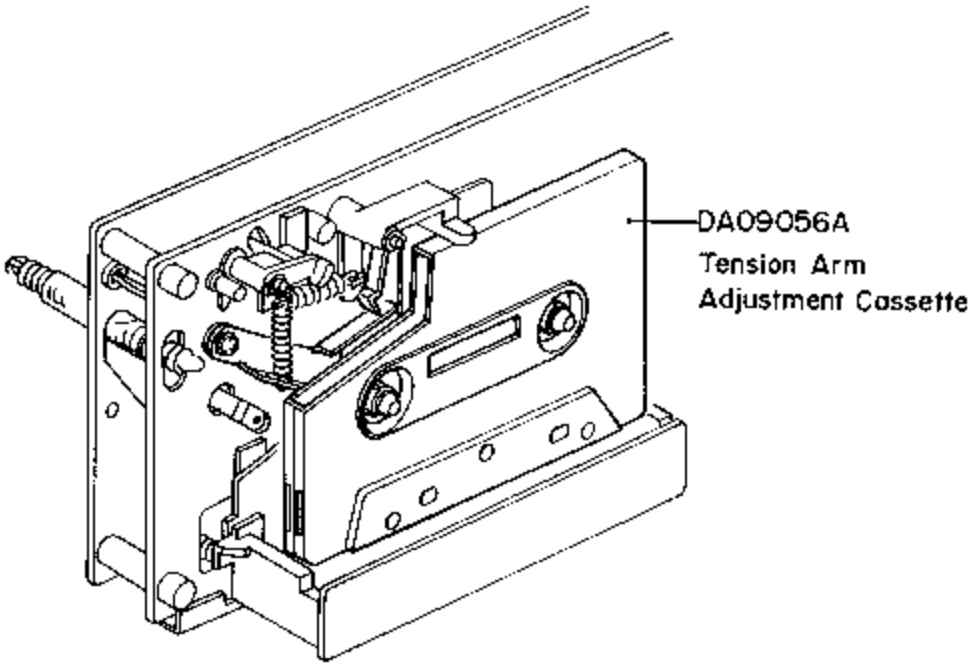


Fig. 4.13

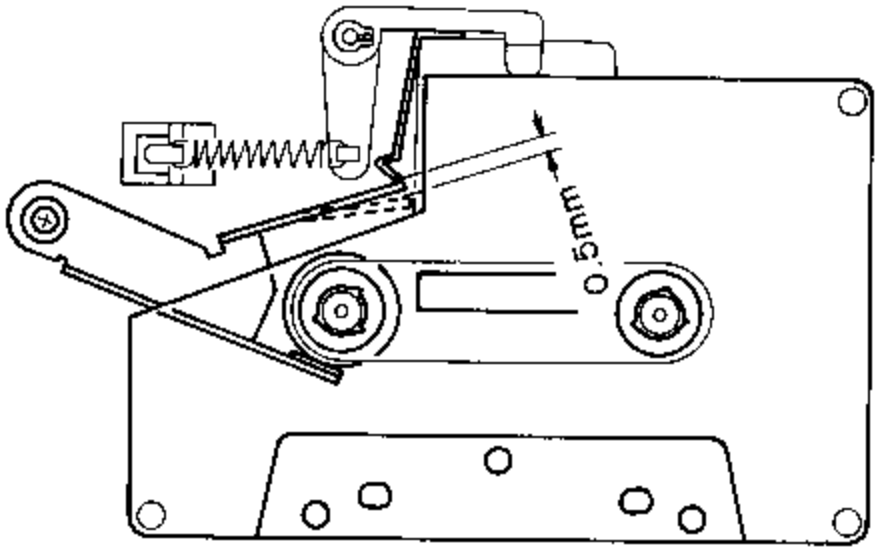


Fig. 4.14

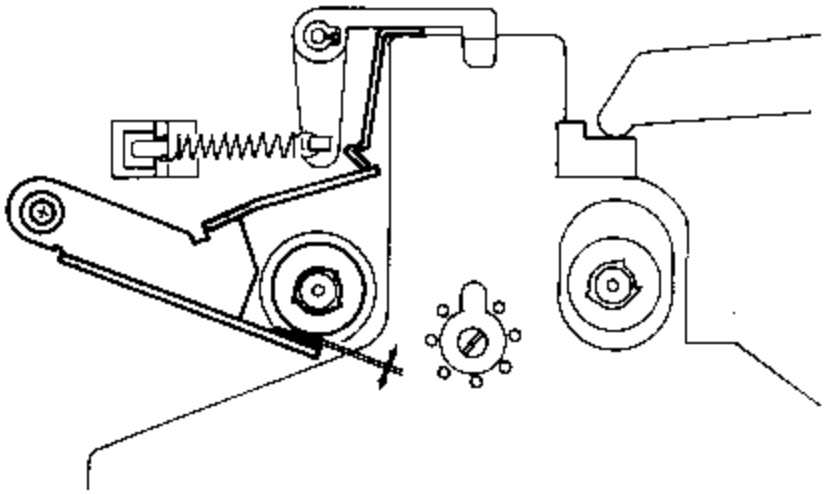


Fig. 4.15

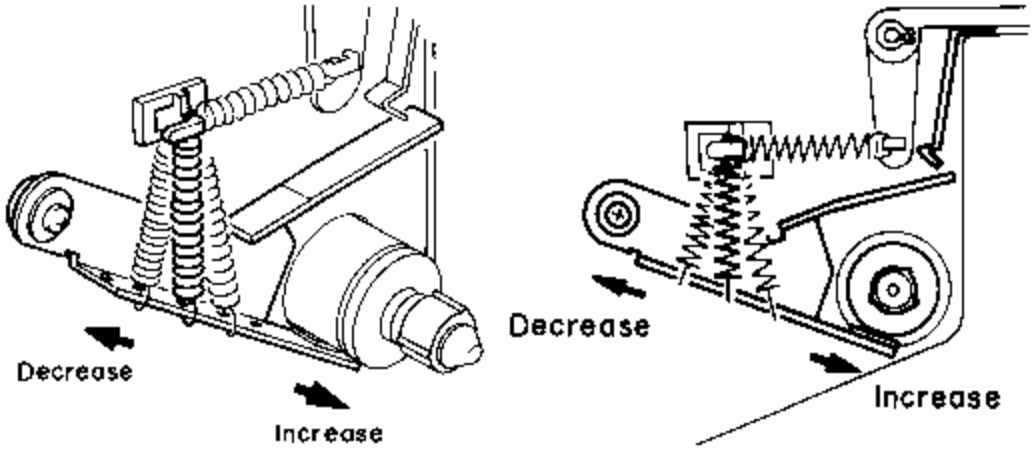


Fig. 4.16

(1) Load a Tension Arm Adjustment Cassette (DA09056A) referring to Fig. 4.13.
(2) Set the N-660ZX in play mode.
(3) Bend the Back Tension Arm with pliers so that the gap between the Cassette Holding Spring assembled with the Head Base Ass'y and the Back tension Arm becomes 0.5 mm as shown in Fig. 4.14. Do not bend the pointed end of the Back Tension Arm.
(4) Set the N-660ZX in stop mode, and remove the Tension Arm Adjustment Cassette (DA09056A), then set the N-660ZX in cue mode.

In cue mode, check to insure that the gap is found between the Supply Reel Hub B Ass'y and the Felt of Back Tension Ass'y as shown in Fig. 4.15.
(5) Load a Back Tension Gauge (DA09055A).
(6) Set the N-660ZX in play mode and read the torque value of Back Tension Gauge.

If the value is in a range of 6 g-cm to 10 g-cm, adjustment is not necessary. If not, change the installation point of the Back Tension Spring as shown in Fig. 4.16, and obtain the torque of 7 g-cm to 9 g-cm range.

4.8 Playback Head and Record Head Height Adjustment and Azimuth Alignment

(1) Playback Head Height Adjustment and Azimuth Alignment

Refer to Fig. 4.17.

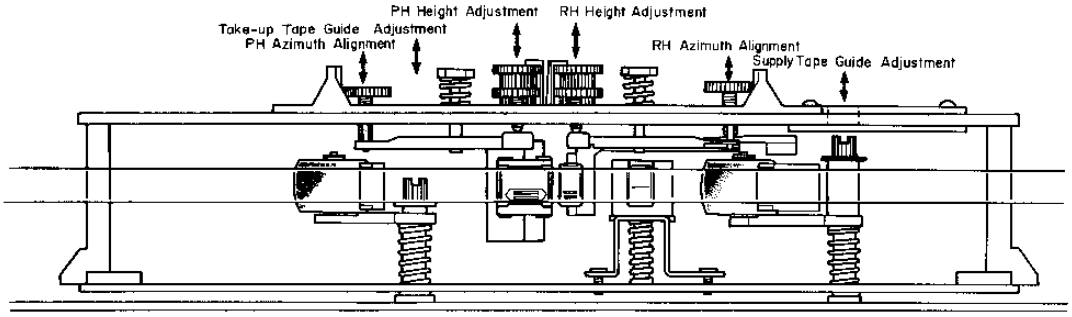


Fig. 4.17

(a) Connect a VTVM to the Output Jacks.

(b) Load a 1 kHz Track Alignment Tape (DA09007A), then set the N-660ZX in play mode.

(c) Turn the PH Height Gear until the outputs of both channels become minimum.

(d) Load a 15 kHz Azimuth Alignment Tape (DA09004A), then set the N-660ZX in play mode.

(e) Turn the PH Azimuth Alignment Screw until the outputs of both channels become maximum.

(f) Repeat above steps (b) through (e) one or two times to obtain optimum performance.

(2) Record Head Height Adjustment and Azimuth Alignment

Refer to Figs. 4.17 - 4.20.

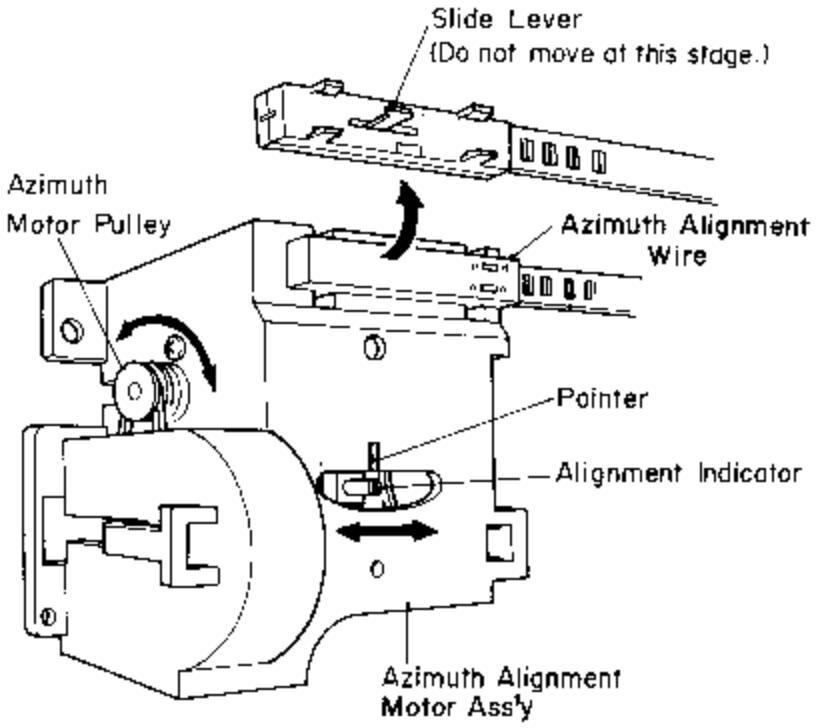


Fig. 4.18

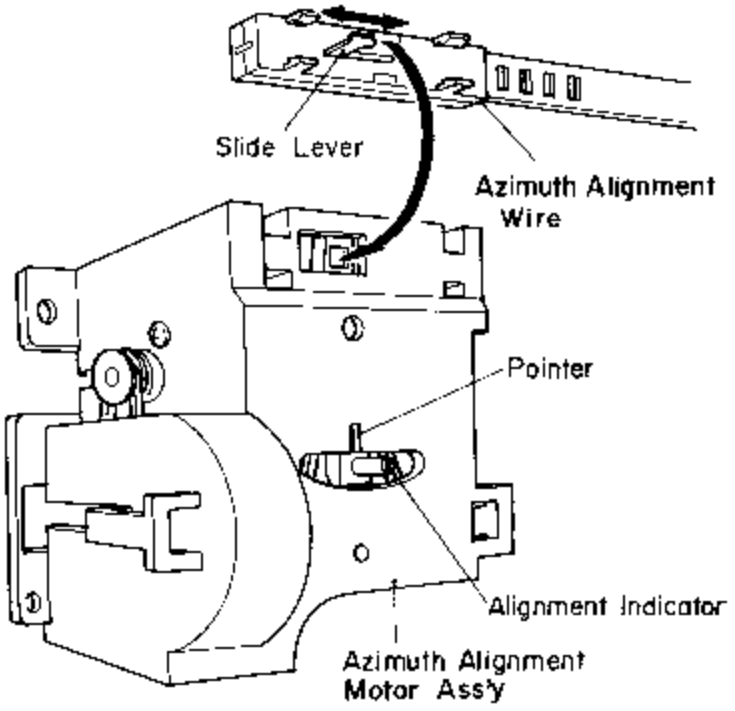


Fig. 4.19

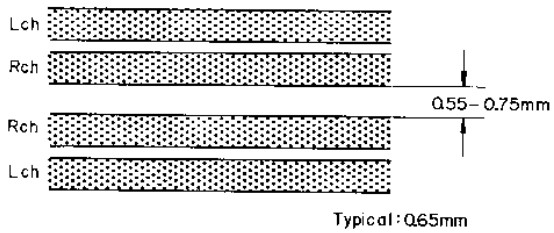


Fig. 4.20

(a) Set the N-660ZX in stop mode.

Turn the Azimuth Motor in the Azimuth Alignment Motor Ass'y by hand so that the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y as shown in Fig. 4.18.

Remove the Azimuth Alignment Wire be pulling out from the Azimuth Alignment Motor Ass'y. In this case, do not move the Slide Lever of the Azimuth Alignment Wire. Short both leads of capacitor C903 on the Auto Azimuth P.C.B. Ass'y with a jumper wire.

(b) Connect a VTVM to the Playback Eq. Amp. Outputs, terminals 29 (L ch) and 2 (R ch) on the Main P.C.B. Ass'y, or terminals 1 (L ch) and 2 (R ch) on the Auto Azimuth P.C.B. Ass'y.

(c) Load a Reference SX Tape (DA09025A). Set the Eq. Switch to the 70 uS position and Tape Switch to the SX position. Then set the N-660ZX in record and play mode.

(d) Set the Auto. A/Tone Switch to the Cal. position, then turn the RH Height Gear until the outputs of both channels become maximum.

(e) Feed in 15 kHz (-20 dB), then set the N-660ZX in record and play mode. turn the RH Azimuth Alignment Screw until the outputs of both channels become maximum.

(f) Repeat above steps (d) and (e) one or two times to obtain optimum performance.

(g) After completion of the above adjustments, perform the following electrical adjustments by using the same side of the tape as used in the above steps.

(1) Set the Auto. A/Tone Switch to the Cal. position, then set the N-660ZX in record and play mode.

(2) Adjust VR901 on the Auto Azimuth P.C.B. Ass'y so that the Azimuth Motor stops its rotation.

(h) Set the N-660ZX in stop mode.

Mount the Azimuth Alignment Wire on the Azimuth Alignment Motor Ass'y referring to Fig. 4.19. (Correct the position of the Slide Lever of the Azimuth Alignment Wire by sliding by hand, then insert the Slide Lever into the receptacle of the Azimuth Alignment P.C.B. Ass'y.

(i) After completion of the above adjustments, record 400 Hz tone to the same portion of both side A and side B of the tape.

(j) Immerse the recorded tape in magnetized developing solution. In turn, check to insure that the recording head tracks across the center are separated with a distance of 0.55 to 0.75 mm (typically 0.65 mm) as illustrated in Fig. 4.20.

Note: Liquid for tape magnetized development solution "MAGNA-SEE, SOUND CRAFT a product of CBS RECORD a division of Columbia Broadcasting System, Inc., Danbury, Conn. 06810 U.S.A., or equivalent".

After development, clean the tape otherwise pressure rollers and heads will become dirty.

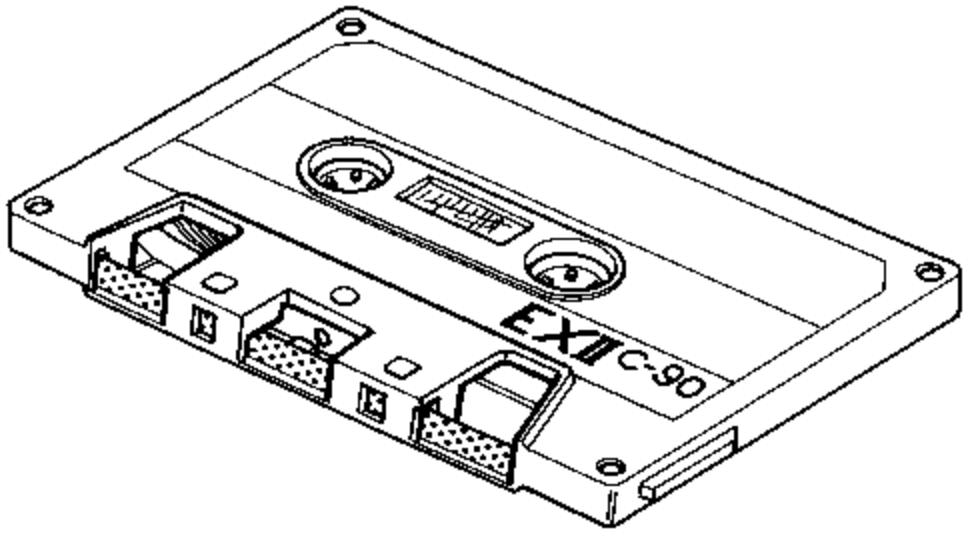


Fig. 4.23

4.10 Tape Travelling Adjustment

The adjustment shall be made with a modified version of the current type EX II C-90 as shown in Fig. 4.23 (error will be made if a current type Tape Travelling Cassette (DA09011A) should be used for this purpose).

While modifying an EXII C-90, the tape guides in the cassette housing shall be kept protected to avoid tilt.

Check shall be made in the following procedures:

(1) An EXII C-90 Tape thus modified shall be loaded onto the N-660ZX.

(2) Release the back-tension (rotate the Supply Reel and feed out some length of tape) and set the N-660ZX in play mode.

(3) In this juncture, check to insure whether the tape is free from waving or slippage from the tape guide.

(4) When the modified EXII C-90 is playing back, check to insure whether the tape is freedom from waving from head surface or at pressure rollers.

(5) If either of waving or slippage from the tape guide should be noted, adjustments of "4.3. Record Head and Playback Head Tilt Adjustment". "4.4. Head Base Stroke Adjustment", "4.5. Tape Guides Adjustment and Erase Head Stroke Adjustment", "4.6. Erase Head Height and Tilt Adjustment", "4.7. Back Tension Adjustment", "4.8. Playback Head and Record Head Height Adjustment and Azimuth Alignment", "4.9. Record Head Stroke Adjustment", etc. will be required.

As a case may be, the said waving or slippage may have been caused from defective Supply Pressure Roller Ass'y or Take-up Pressure Roller Ass'y without parallel contact with capstans. If such are noted, the Pressure Roller Assemblies will have to be replaced.

Further, excessively weak take-up torque or strong take-up torque may cause defective tape travelling.

The N-660ZX is intended to be an adjustment-free Model, however if the similar metters as above should be noted, please replace the Reel Hub Ass'y to obtain appropriate take-up torque.

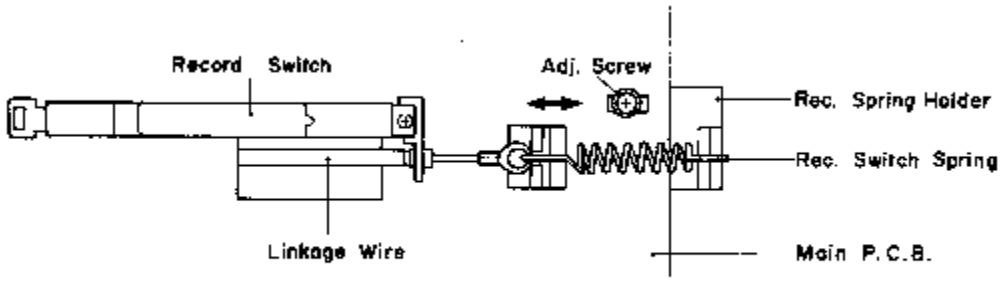


Fig. 4.24.1

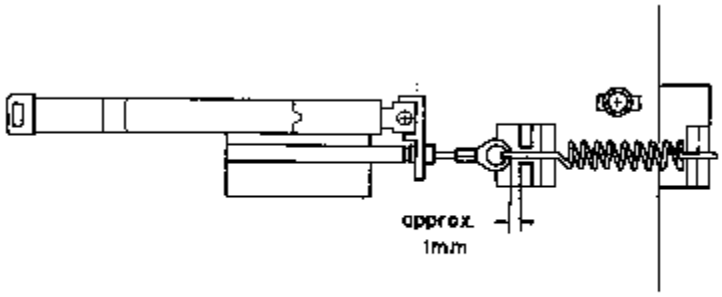


Fig. 4.24.2

4.11 Record Switch Linkage Adjustment

(1) Set the N-660ZX in stop mode.
(2) Loosen the screw of the Record Spring Holder, and shift the Record Spring Holder in order to remove the looseness of the Linkage Wire as shown in Fig. 4.24.1. Then tighten the screw for fixing the Record Switch Holder. (In this case, the Record Switch should be positioned at Play side. If in the Record position, it will be defective.)
(3) Set the N-660ZX in record and pause mode. Check to insure that the gap between the top of the wire and the Record Spring Holder is approximate. 1 mm as shown in Fig. 4.24.2.
(Check that the Record Switch is in Record position.)
(4) Upon completion of the above adjustments, apply a quanitity of lock light paint.

4.12 Flywheel Adjustment

(1) Refer to Fig. 4.25.

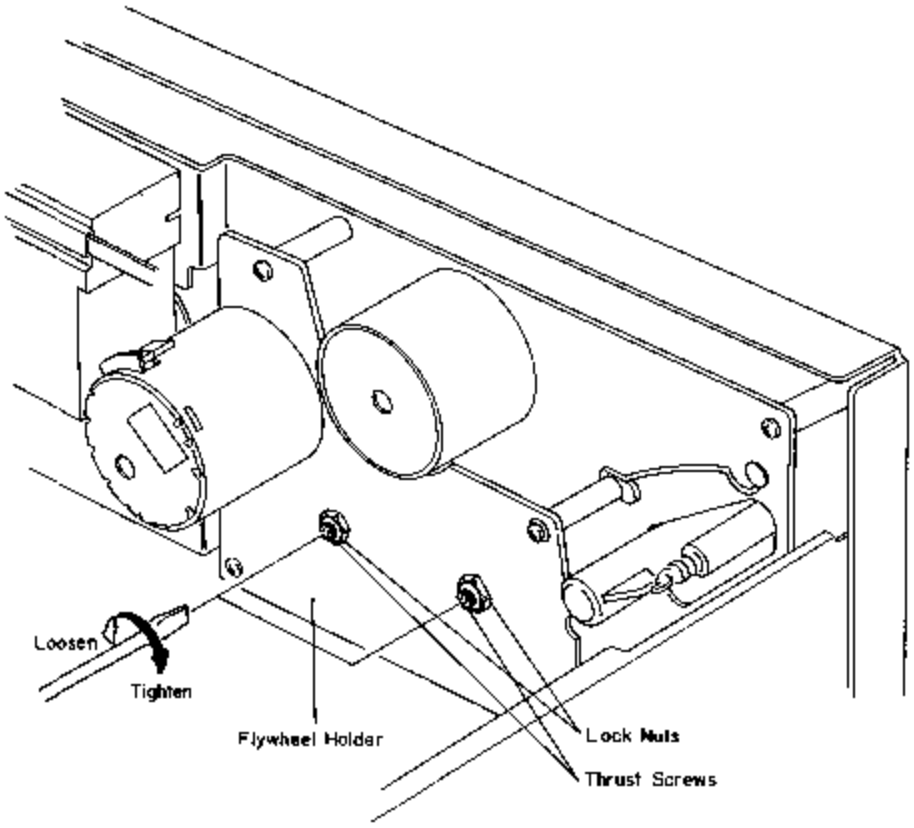


Fig. 4.25

Tighten the Thrust Screws until the gap between the Flywheel Assemblies and Thrust Screws becomes minimized when both of the Capstan Shafts are moved backwardly and forwardly (the Thrust Springs between the Capstan Flanges and Flywheel Thrust Caps are in a flat state).

Excessive tightening of the Thrust Screws however will give damages on the Flywheel Assemblies, to which careful attention is invited.

(2) Return the Thrust Screws by 1/2 turn.
(3) Fixing the Thrust Screw with a screwdriver, lock the Lock Nut.
(4) Apply a quantity of lock tight paint to the Thrust Screws.

4.13 Lubrication

N-660ZX is a lubrication-free cassette deck except when parts are replaced. Apply the following lubricant for each replaced part:

(1) LAUNA #100
  Capstan Shaft
  Pressure Roller Shaft
  Thrust Cap
(2) FLOIL GB-TS-1
  Reel Hub Shaft
  Thrust portion on the Capstan Shaft

FLOIL GB-TS-1, made by Kanto Chemicals Co., Ltd., Japan.

We suggest you use the above or equivalent type. If unavailable please contact Kanto

Chemicals Co., Ltd., 1-7 Kanda Suda-cho Chiyoda-ku, Tokyo 101 Japan.
(3) Silicon Oil #3000 CST
Air Damper Piston
Note: Excessive lubrication may cause defective damper action as the 0.2mm diameter hole at the end of the cylinder may be filled with oil.

Calibration procedure from the Nakamichi 660 ZX service manual

6 ELECTRICAL ADJUSTMENTS AND MEASUREMENTS

6.1 Adjustment and Measurement Instructions

Note: Electrical adjustments should be performed after mechanical adjustment is completed.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
1	Tape Speed	3 kHz Speed and Wow/Flutter Tape (DA09006A)	Frequency Counter to OUTPUT Jacks	Playback	Speed Cal. P.C.B. VR407	Adjust VR407 to obtain 3 kHz +/- 0.5%.
2	Tone Calibration	Test Tone 400 Hz	VTVM to TP101 (A) TP201 (B) on the Main P.C.B.	Record, Pause Auto. A/Tone SW - CAL	Switch P.C.B. VR301	1. Set the Auto. A/Tone Switch to CAL. Turn output level control fully clockwise (maximum position). 2. Darn I forgot step 2.
3	Meter Level	400 Hz (0 dB /-10 dB/ -20dB) to INPUT Jacks	VTVM to TP101(A), TP201(B) on the Main P.C.B.	Record, Pause Auto. A/Tone SW - CAL/OFF	Main P.C.B. VR102, VR202	1. Adjust VR102 (VR202) to obtain 0 dB on the level meters at 100 mV level on the VTVM. 2. Decrease input level by 10 dB/20 dB then short or

						open R149 (R249) to obtain minimum deviation for -10 dB/-20 dB on the level meters. (Perform at -10 dB and -20 dB.) 3. Again increase input level so that output will become 100 mV, then readjust VR102 (VR202) to obtain 0 dB on the level meters.
4	MPX Filter	19 kHz +/- 100 Hz to INPUT Jacks	VTVM to OUTPUT Jacks	Auto. A/Tone SW - OFF Dolby NR SW - OUT/MPX	Main P.C.B. L102, L202	1. Turn output level control fully clockwise (maximum position). 2. Adjust input lelve control to obtain 1 V on the VTVM. 3. Set the Dolby NR Switch to MPX position, then adjust L102 (L202) to obtain minimum reading on the VTVM (minimum reading will be less than -30 dB).

5	Playback Head Track Alignment	1 kHz Track Alignment Tape (DA09007A)	VTVM to OUTPUT Jacks	Playback Auto A./Tone SW - OFF Eq. SW - 70 us Dolby NR SW - OUT	Playback Head Height Adj. Screw	Adjust the Playback Head Height Adj. Screw to obtain minimum reading of both L and R channels on the VTVM. See "Playback Head Height Adjustment and Azimuth Alignment" in item 4.8.
6	Playback Head Azimuth Alignment	15 kHz Azimuth Tape (DA09004A)	VTVM to OUTPUT Jacks	Same as above	Playback Head Azimuth Alignment Screw	Adjust the Playback Head Azimuth Alignment Screw to obtain maximum reading on both L and R channels on the VTVM. See "Playback Head Height Adjustment and Azimuth Alignment" in item 4.8. Note: Repeat steps 5 and 6 one or two times to obtain optimum performance.
7	Playback Level	400 Hz Level Tape (DA09005A)	VTVM to TP101, TP201 on the Main P.C.B.	Same as above	Main P.C.B. VR101, VR201	Adjust VR101(VR201) to obtain 100 mV on the VTVM or 0dB on the level meters.

8	Playback Frequency Response Adjustment	400 Hz Level Tape (DA09005A) 10 kHz PB Frequency Response Tape (DA09003A) 15 kHz PB Frequency Response Tape (DA09002A) 20 kHz PB Frequency Response Tape (DA09001A)	VTVM to OUTPUT Jacks	Playback Auto A./Tone SW - OFF Eq. SW - 70 us Dolby NR SW - OUT	Main P.C.B. R132, R232 R133, R233	1. Load the 400 Hz level tape and play it back. Adjust the output level control to a certain level (for example 0 dB). 2. Load 10 kHz, 15 kHz and 20 kHz PB frequency response tapes and adjust the playback head azimuth to give maximum levels on the VTVM with each tape. Short R132 (R232) or R133 (R233) to obtain the following levels against 400 Hz level tape. Refer to Fig. 6.5. 10 kHz: -20 dB -1 dB to +2 dB 15 kHz: -20 dB -1 dB to +3 dB 20 kHz: -20 dB -1 dB to +4 dB 3. Conduct step 6 "Playback Head Azimuth Alignment".

						4. If above is not sufficient, refer to "Playback Frequency Response Adjustment" in item 6.2.
9	Bias Oscillation Frequency and Erase Current	Connect an additional 0.1 Ohms resistor in series to the Erase Head	VTVM and Frequency Counter across the additional 0.1 Ohm resistor	Record, Pause Tape SW - ZX Eq. SW - 70 us Dolby NR SW - OUT	Main P.C.B. T301 R304, R305	1. Adjust T301 to obtain 105 kHz on the frequency counter. 2. Check the erase current by the vtvm. Erase current will be in a range of 310 mA to 400 mA (typically approx. 350 mA). If erase current is not sufficient, increase it by shorting R304 or R305. 3. After completion of the erase current adjustment, recheck the bias oscillation frequency.
10	Record Amplifier Equalizer	23 kHz (-20 dB) to INPUT Jacks	VTVM to CN2-1, CN2-3 on the Main P.C.B.	Record, Pause Auto A./Tone SW - OFF Tape SW - ZX	Main P.C.B. L104, L204	1. Remove the bias-cut-jumper from the dip side of the Main P.C.B. 2. Adjust L104 (L204) to

				Eq. SW - 70 us Dolby NR SW - OUT		obtain peak reading at 23 kHz on the VTVM. 3. Re-solder the bias-cut-jumper.
11	Bias Trap (Record Amp.)	Remove input signals	Same as above	Same as above	Main P.C.B. L105, L205	Adjust L105 (L205) to obtain maximum reading on the VTVM
12	Bias Trap (Playback Amp.)	Remove input signals	VTVM to Playback Eq. Amp. Output; Terminals 29, 30 on the Main P.C.B. or Terminals 1, 2 on the Auto Azimuth P.C.B.	Same as above	Main P.C.B. L103, L203	Adjust L103 (L203) to obtain minimum reading on the VTVM

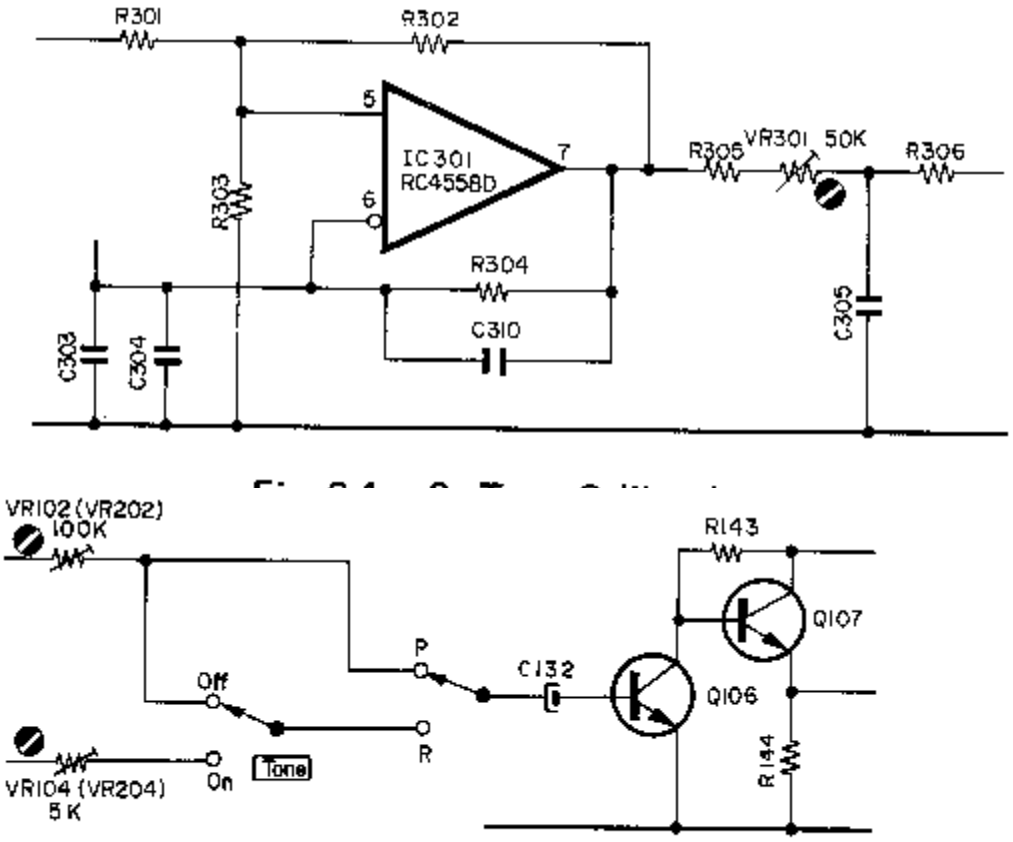


Fig. 6.2 3. Meter Level

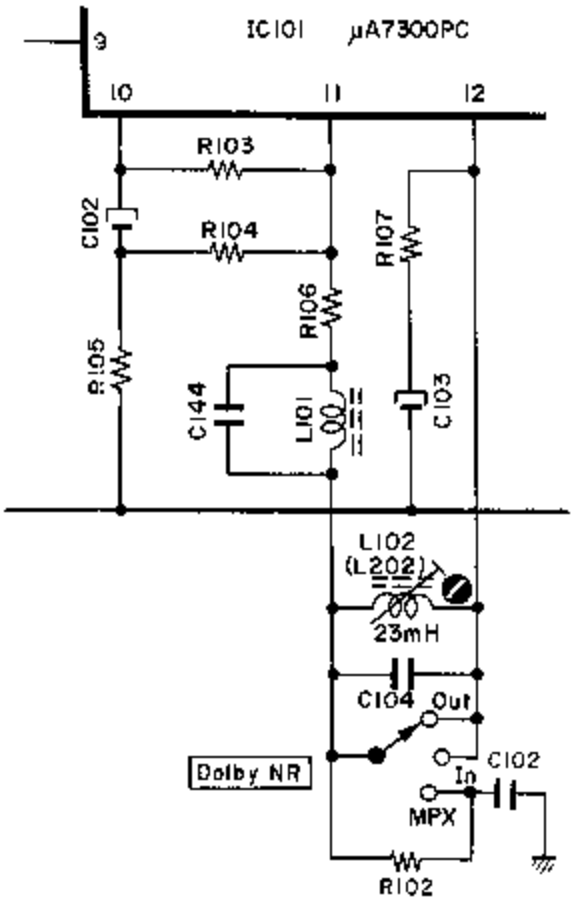


Fig. 6.3 4. MPX Filter

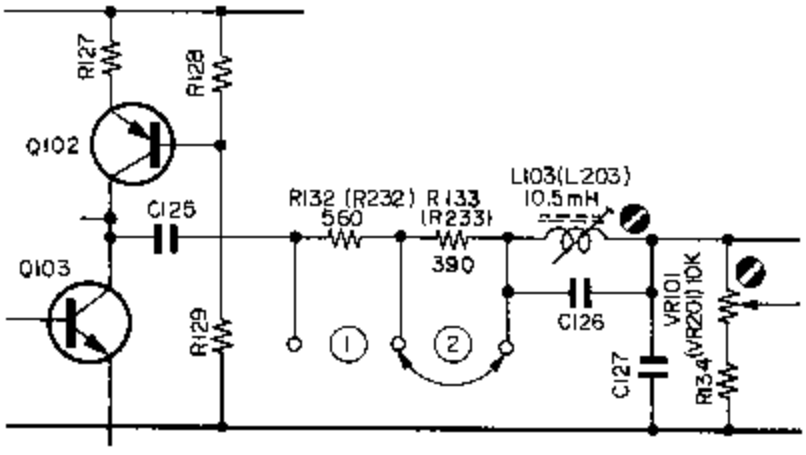


Fig. 6.4 7. Playback Level

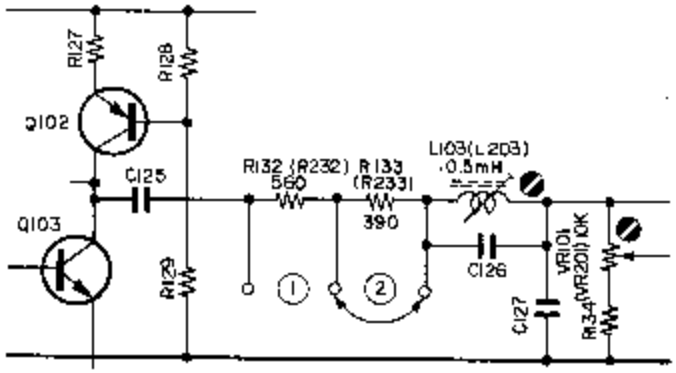


Fig. 6.5 8. Playback Frequency Response
12. Bias Trap (Playback Amp.)

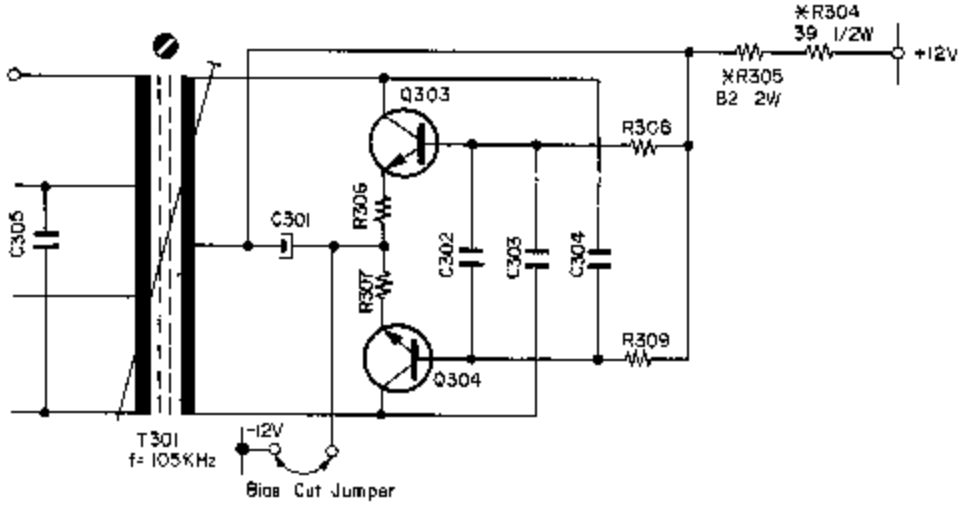


Fig. 6.6 9. Bias Oscillation Frequency and Erase Current

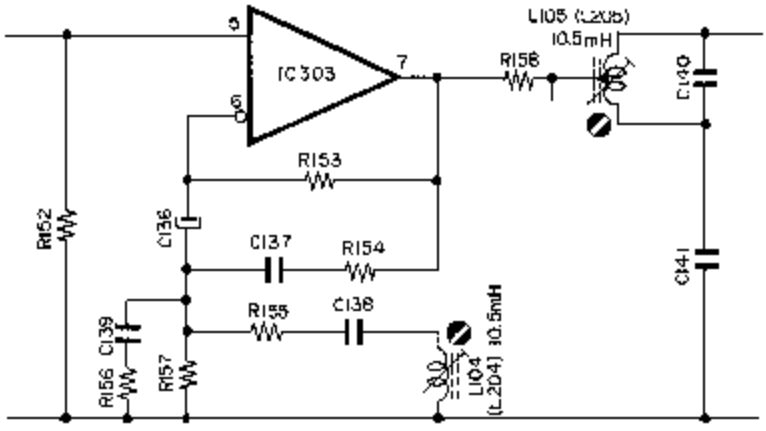


Fig. 6.7 10. Record Amp. Equalizer
11. Bias Trap (Record Amp.)

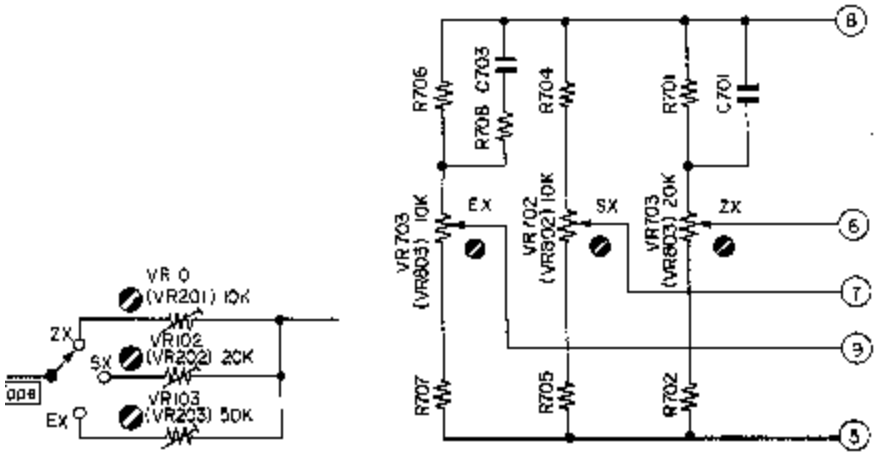


Fig. 6.8 13. Record Head Height and Azimuth

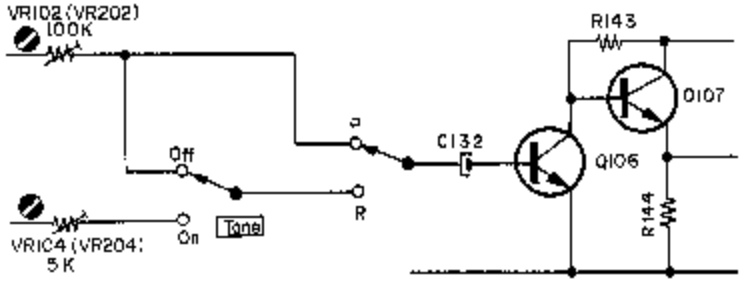


Fig. 6.9 13. Record Head Height and Azimuth

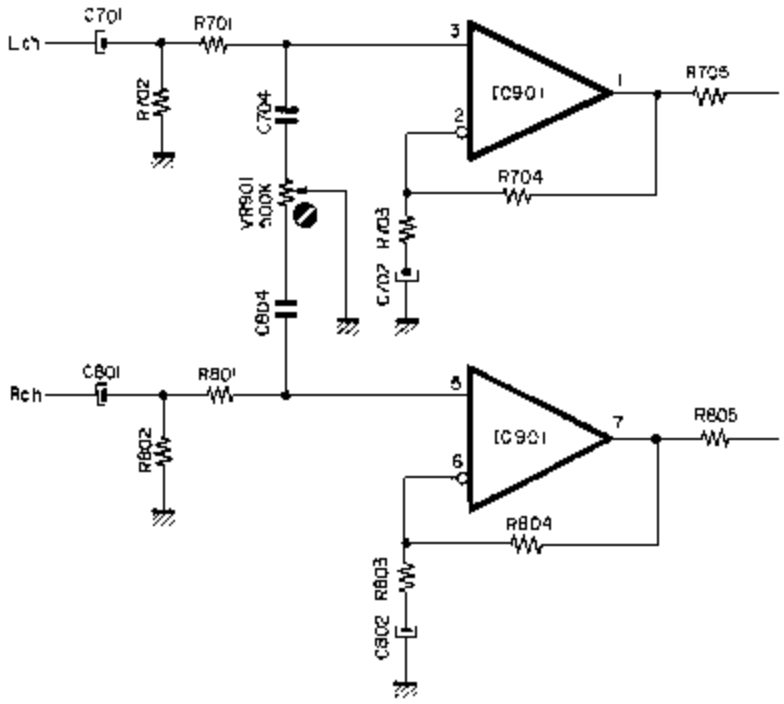
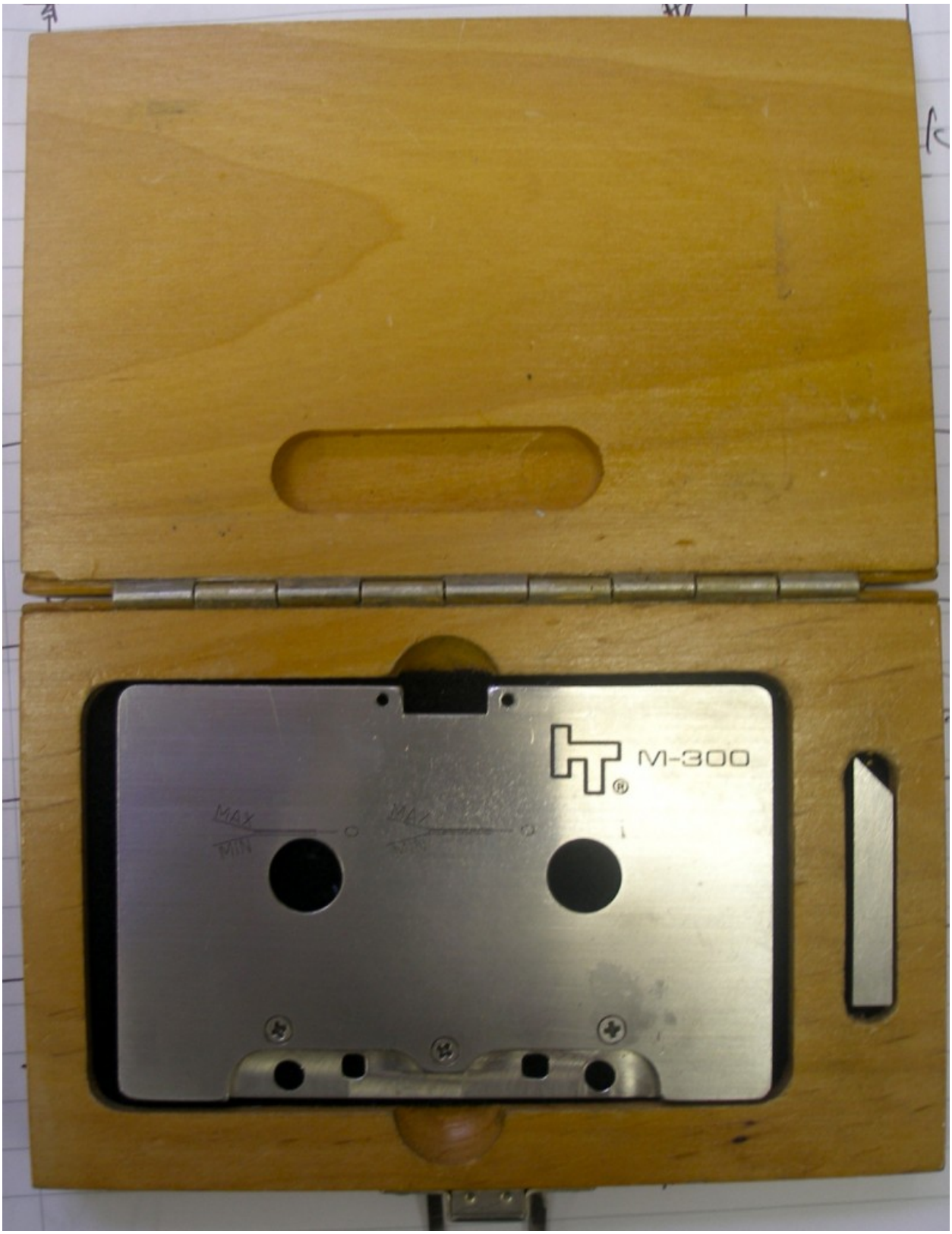


Fig. 6.10 13. Record Head Height and Azimuth


M-300
MAX
MIN
MAX


MIRROR CASSETTE
CO-012C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Verbatim M-300 Gauge

https://picclick.com/TEAC-Cassette-Torque-Meter-Test-Tape-MTT-8131-N-124081900083.html

https://picclick.com/ABEX-MIRROR-LEADER2-LINE-SCC-1882-Tape-Thinkness-018mm-254519008341.html

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