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## 1. GENERAL

### 1.1. Control Functions

Nakamichi 680ZX control functions are shown below:

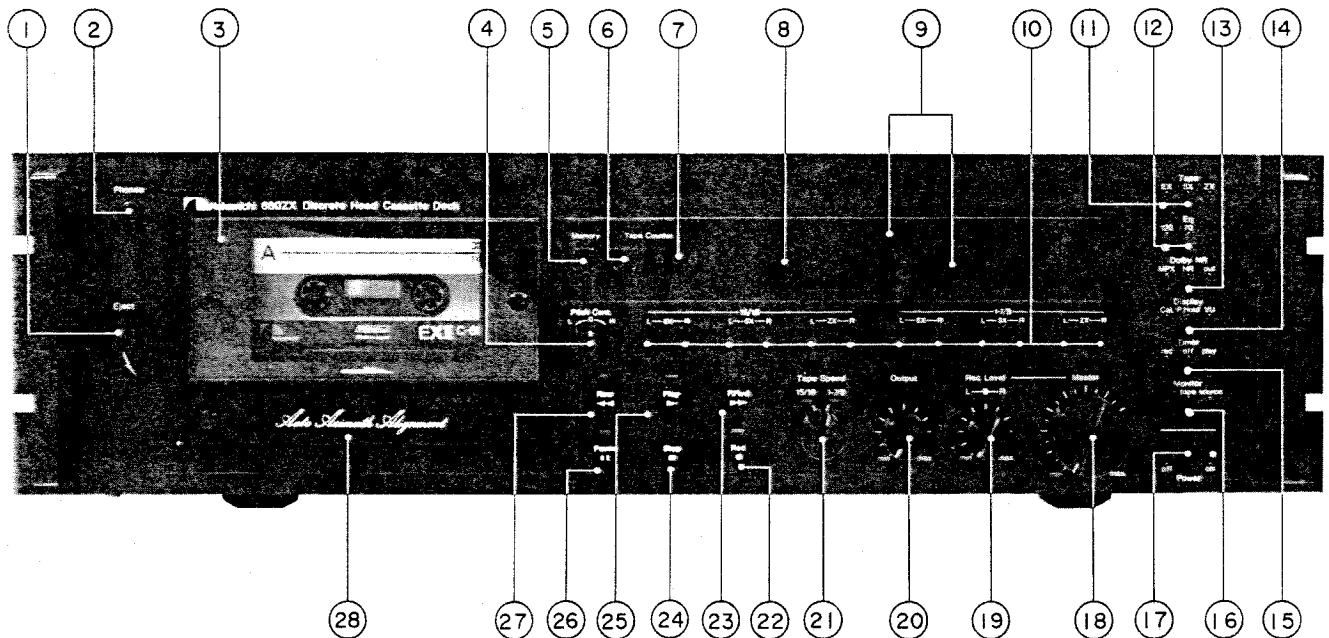


Fig. 1.1 Front View

- |  |                                  |
|--|----------------------------------|
| 1. Eject Lever                           | 15. Timer Switch                 |
| 2. Headphone Jack                        | 16. Monitor Switch               |
| 3. Cassette Holder (with see-thru cover) | 17. Power Switch                 |
| 4. Pitch Control                         | 18. Master Input Level Control   |
| 5. Tape Start Memory Switch              | 19. Input Level Controls         |
| 6. Counter Reset Button                  | 20. Output Level Control         |
| 7. Tape Counter                          | 21. Tape Speed Selector          |
| 8. RAMM Display                          | 22. Record Button                |
| 9. Fluorescent (FL) Level Indicators     | 23. Fast-Forward Button          |
| 10. Record Calibration Controls          | 24. Stop Button                  |
| 11. Tape Switch (EX/SX/ZX)               | 25. Play Button                  |
| 12. Eq. Switch (120 μs/70 μs)            | 26. Pause Button                 |
| 13. Dolby NR/MPX Filter Switch           | 27. Rewind Button                |
| 14. Display Switch                       | 28. Auto Azimuth Alignment Cover |

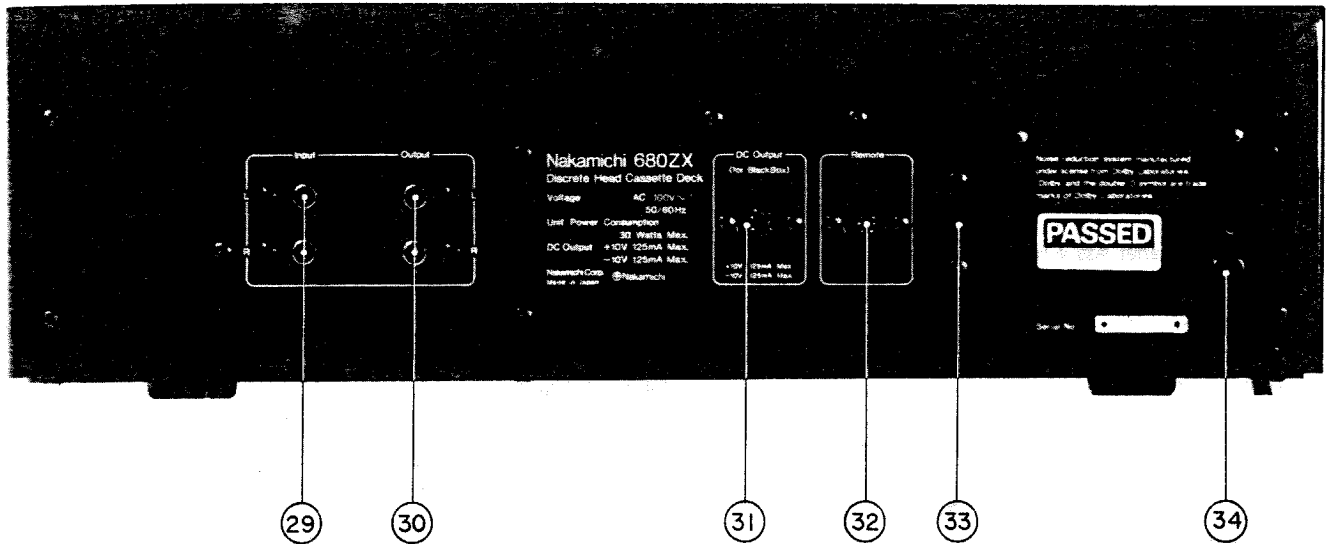


Fig. 1.2 Rear View

- |                    |                           |
|--------------------|---------------------------|
| 29. Input Jacks    | 32. Remote Control Socket |
| 30. Output Jacks   | 33. Voltage Selector      |
| 31. DC Output Jack | 34. Power Cord            |

### 1.2. Voltage Selector

Voltage selector is installed on the rear panel for other versions of the Nakamichi 680ZX. This voltage selector can select either 120 V or 220 – 240 V at customer's disposal.

## 2. REMOVAL PROCEDURES

### 2.1. Side Panel Ass'y

Refer to Fig. 2.1.

Remove F01 and F02, then disassemble F03 (Side Panel Ass'y)

### 2.2. Top Cover Ass'y

Refer to Fig. 2.1.

(1) Remove Side Panel Ass'y referring to item 2.1.

(2) Remove F04 and F05, then disassemble F06 (Top Cover Ass'y).

### 2.3. Bottom Cover Ass'y

Refer to Fig. 2.1.

Remove F07, then disassemble F08 (Bottom Cover Ass'y).

### 2.4. Cassette Case Cover Ass'y and Azimuth Alignment Cover Ass'y

Refer to Fig. 2.1.

(1) Turn fully counterclockwise two screws which are mounted on the Cassette Case Cover, then disassemble F09 (Cassette Case Cover Ass'y).

(2) Turn fully counterclockwise two screws which are mounted on the Front Panel Escutcheon Ass'y, then disassemble F10 (Azimuth Alignment Cover Ass'y).

### 2.5. Front Panel Ass'y

Refer to Fig. 2.2.

(1) Refer to Fig. 2.1. Remove Top Cover Ass'y and Bottom Cover Ass'y referring to items 2.2 and 2.3.

(2) Pull out F01 (Volume Knob A), F02 (Volume Knob L), F03 (Volume Knob R), F04 (Volume Knob B) and F05 (Pitch Control Knob).

(3) Remove F06, F07 and F08, then disassemble F09 (Front Panel Ass'y including 2 connectors).

### 2.6. Headphone Jack Ass'y

Refer to Fig. 2.2.

(1) Remove Front Panel Ass'y referring to item 2.5.

(2) Remove F10, then disassemble F11 (Headphone Jack Ass'y).

### 2.7. Mechanism Ass'y

Refer to Fig. 2.2.

(1) Remove Front Panel Ass'y referring to item 2.5.

(2) Remove F12, then disassemble F13 (Mechanism Ass'y including 7 connectors).

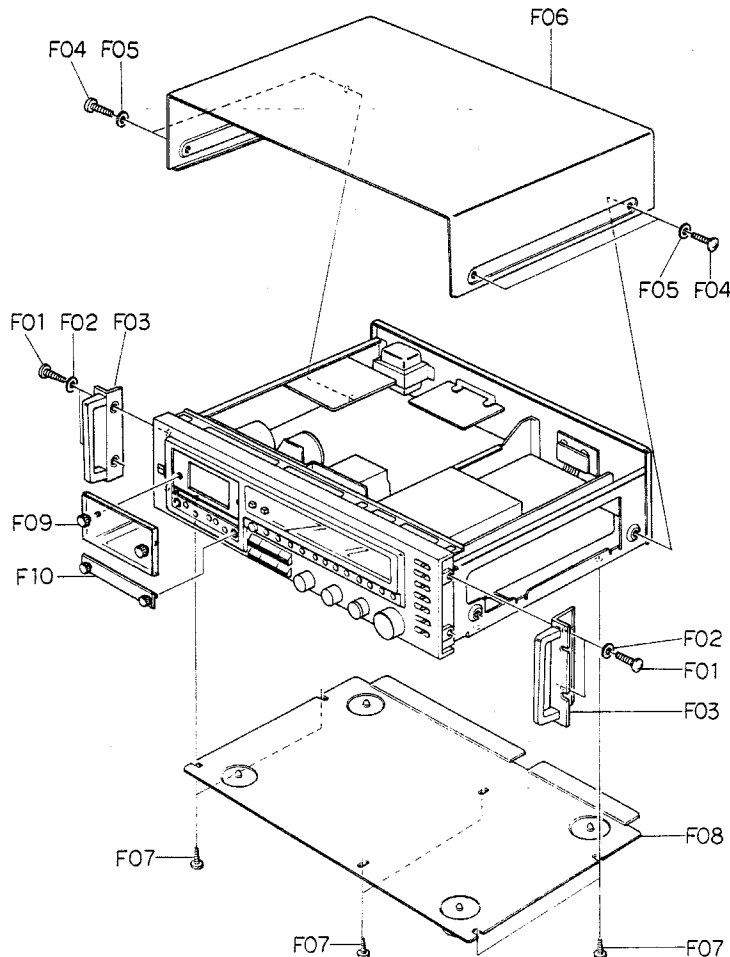


Fig. 2.1

**2.8. FL Indicator Ass'y**

Refer to Fig. 2.3.

- (1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.5.
- (2) Remove F01, then disassemble F02 (FL Indicator Ass'y including 3 connectors).

**2.9. Auto Azimuth P.C.B. Ass'y**

Refer to Fig. 2.3.

- (1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.5.
- (2) Remove one connector and the wires connected by wrapping.
- (3) Remove F03, then disassemble F04 (Auto Azimuth P.C.B. Ass'y)

**2.10. Logic P.C.B. Ass'y**

Refer to Fig. 2.3.

- (1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.5.
- (2) Remove 7 connectors and the wires connected by wrapping from F06 (Logic P.C.B. Ass'y).
- (3) Remove F05, then disassemble F06 (Logic P.C.B. Ass'y).

**2.11. Switch P.C.B. Ass'y**

Refer to Fig. 2.3.

- (1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.5.
- (2) Pull out F07 (Function Switch Knob Ass'y).
- (3) Remove the Flat Cables, connector and wires connected by wrapping from F10 (Switch P.C.B. Ass'y).
- (4) Remove F08 and F09, then disassemble F10 (Switch P.C.B. Ass'y).

**2.12. Main P.C.B. Ass'y**

Refer to Fig. 2.3.

- (1) Remove FL Indicator Ass'y and Switch P.C.B. Ass'y referring to items 2.8 and 2.11.
- (2) Remove the Flat Cables, 3 connectors and wires connected by wrapping from F12 (Main P.C.B. Ass'y).
- (3) Remove F11, then disassemble F12 (Main P.C.B. Ass'y).

**2.13. Volume P.C.B. Ass'y**

Refer to Fig. 2.3.

- (1) Remove FL Indicator Ass'y referring to item 2.8.
- (2) Remove F13 and the Flat Cable from F14 (Volume P.C.B. Ass'y). then disassemble F14 (Volume P.C.B. Ass'y).

**2.14. Record Cal. P.C.B. A Ass'y, Record Cal. P.C.B. B Ass'y and Lamp P.C.B. A Ass'y**

Refer to Fig. 2.3.

- (1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.5.
- (2) Remove F15, then disassemble F16 (Calibration Case Ass'y)
- (3) Remove F17, then disassemble F18 (Record Cal. P.C.B. A Ass'y).
- (4) Remove F19, then disassemble F20 (Record Cal. P.C.B. B Ass'y).
- (5) Remove F21, then disassemble F22 (Lamp P.C.B. A Ass'y).

**2.15. Power Switch**

Refer to Fig. 2.3.

- (1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.5.
- (2) Remove F23, then disassemble F24 (Power Switch Knob).
- (3) Remove F25, then disassemble F26 (Power Switch Holder Ass'y).
- (4) Remove F27, then disassemble F28 (Power Switch).

**2.16. Lamp P.C.B. B Ass'y and Lamp P.C.B. C Ass'y**

Refer to Fig. 2.3.

- (1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.5.
- (2) Remove F29, then disassemble F30 (Insulator) and F31 (Lamp P.C.B. B Ass'y).
- (3) Remove F32 (Lamp P.C.B. C Ass'y) by releasing the self-interlocking pin of the Reflector.

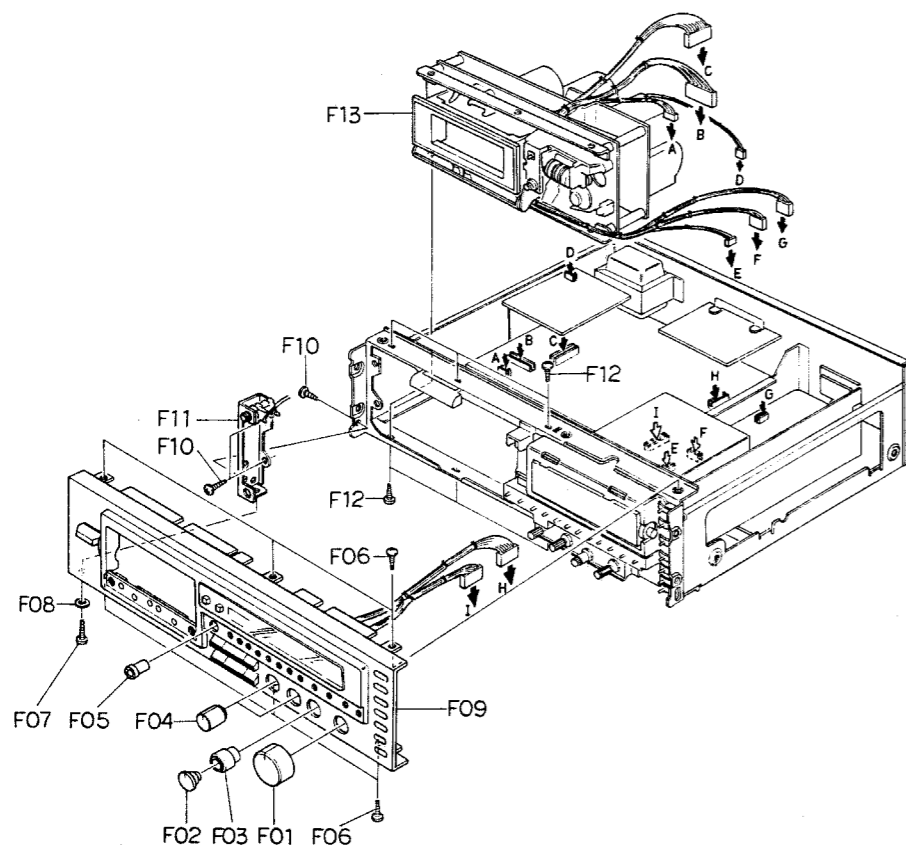


Fig. 2.2

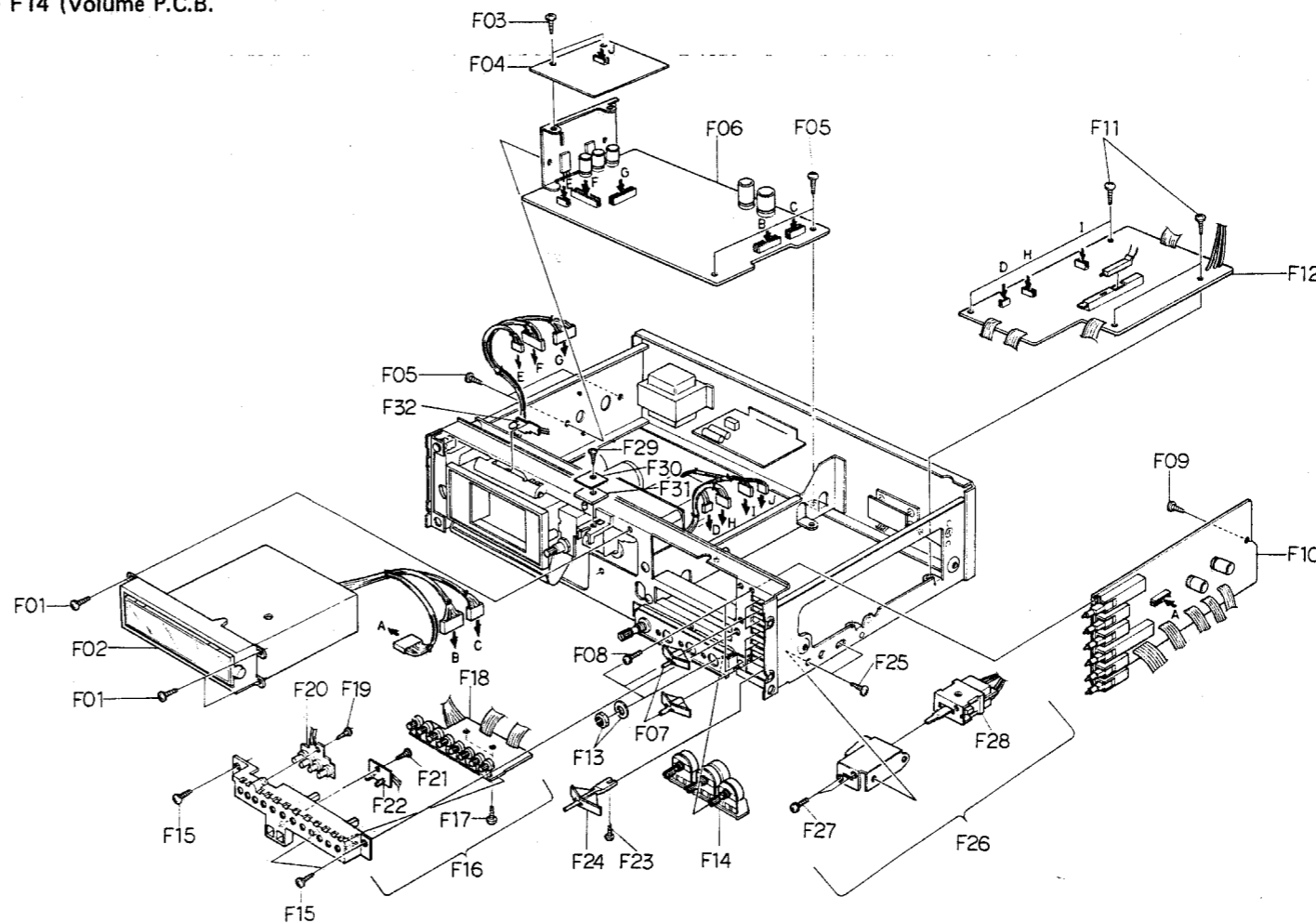


Fig. 2.3

**2.17. Control Switch P.C.B. Ass'y**

Refer to Fig. 2.4.

- (1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.5.
- (2) Remove F01, F02, F03 and F04, then disassemble F05 (Control Button Ass'y).
- (3) Remove F06, then disassemble F07 (Control Switch P.C.B. Ass'y).

**2.18. Indicator P.C.B. Ass'y**

Refer to Fig. 2.5.

- (1) Refer to Fig. 2.3. Remove FL Indicator Ass'y referring to item 2.8.
- (2) Remove F01, then disassemble F02 (Shield Cover).
- (3) Remove F03 (Indicator P.C.B. C Ass'y) by releasing the self-interlocking pin of the P.C.B. supporters.
- (4) Remove F04, then disassemble F05 (Indicator P.C.B. B Ass'y).
- (5) Remove F06 and F07, then disassemble F08 (FL Indicator Holder L), F09 (FL Indicator Holder R) and F10 (Indicator P.C.B. A Ass'y).

**2.19. Rear Panel Ass'y**

Refer to Fig. 2.6.

- (1) Refer to Fig. 2.1. Remove Top Cover Ass'y and Bottom Cover Ass'y referring to items 2.2 and 2.3.
- (2) Remove F01 and F02, then disassemble F03 (Rear Panel Ass'y).

**2.20. Power Transformer and Fuse P.C.B. Ass'y**

Refer to Fig. 2.6.

- (1) Refer to Fig. 2.1. Remove Top Cover Ass'y and Bottom Cover Ass'y referring to items 2.2 and 2.3.
- (2) Remove F04 and F05, then disassemble F06 (Power Transformer) and F07 (Transformer Plate).
- (3) Remove F08 and F09, then disassemble F10 (Fuse P.C.B. Ass'y).

**2.21. Cassette Case Ass'y and Cover Plate Ass'y**

Refer to Fig. 2.7.

- (1) Refer to Fig. 2.2. Remove Mechanism Ass'y referring to item 2.7.
- (2) Press the Eject Button to open the Cassette Case Ass'y.
- (3) Remove F01 and F02, then disassemble F03 (Cassette Case Holder L Ass'y) by releasing the self-interlocking pin of the Damper Lock Arm and F04 (Cassette Case Ass'y).
- (4) Remove F05, then disassemble F06 (Cover Plate Ass'y).

**2.22. Tape Counter Ass'y, Memory Switch and Pitch Control Volume**

Refer to Fig. 2.7.

- (1) Refer to Fig. 2.2. Remove Mechanism Ass'y referring to item 2.7.
- (2) Remove F07, then disassemble F08 (Tape Counter Ass'y).
- (3) Remove F09, then disassemble F10 (Pitch Control Holder Ass'y).
- (4) Remove F11, then disassemble F12 (Memory Switch).
- (5) Remove F13, then disassemble F14 (Pitch Control Volume).

**2.23. Capstan Motor Ass'y and Flywheel Ass'y**

Refer to Fig. 2.8.

- (1) Refer to Fig. 2.2. Remove Mechanism Ass'y referring to item 2.7.
- (2) Remove F01 and F02, then disassemble F03 (Flywheel Holder Ass'y) and F08 (Capstan Belt).
- (3) Remove F04, then disassemble F05 (Capstan Motor Ass'y).
- (4) Remove F06, then disassemble F07 (Speed Cal. P.C.B. Ass'y).
- (5) Remove F09 (Supply Flywheel Ass'y), then disassemble F10 (Take-up Flywheel Ass'y).
- (6) After removing both Flywheel Assemblies, disassemble F11 (Thrust Washer 3 mm), F12 (Thrust Washer 2.6 mm), F13 (Flange Thrust Cap) and F14 (Thrust Spring).

**2.24. Sub Mechanism Chassis Ass'y**

Refer to Fig. 2.9.

- (1) Remove Flywheel Holder Ass'y referring to item 2.23.
- (2) Remove F01 and F02, then disassemble F03 (Sub Mechanism Chassis Ass'y).

**2.25. Control Motor Ass'y and Reel Motor Ass'y**

Refer to Fig. 2.9.

- (1) Remove Sub Mechanism Chassis Ass'y referring to item 2.24.
- (2) Remove F04, then disassemble F05 (Control Motor Ass'y).
- (3) Remove F06, then disassemble F07 (Reel Motor Ass'y).

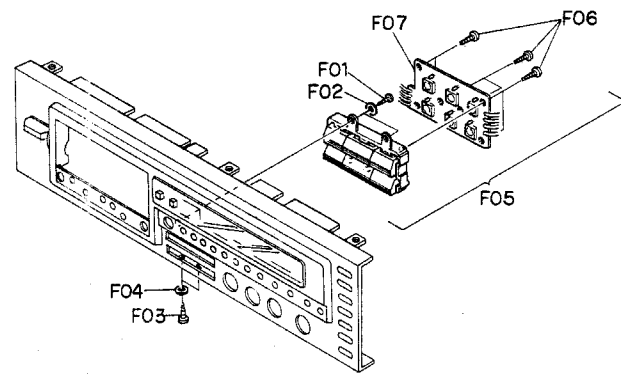


Fig. 2.4

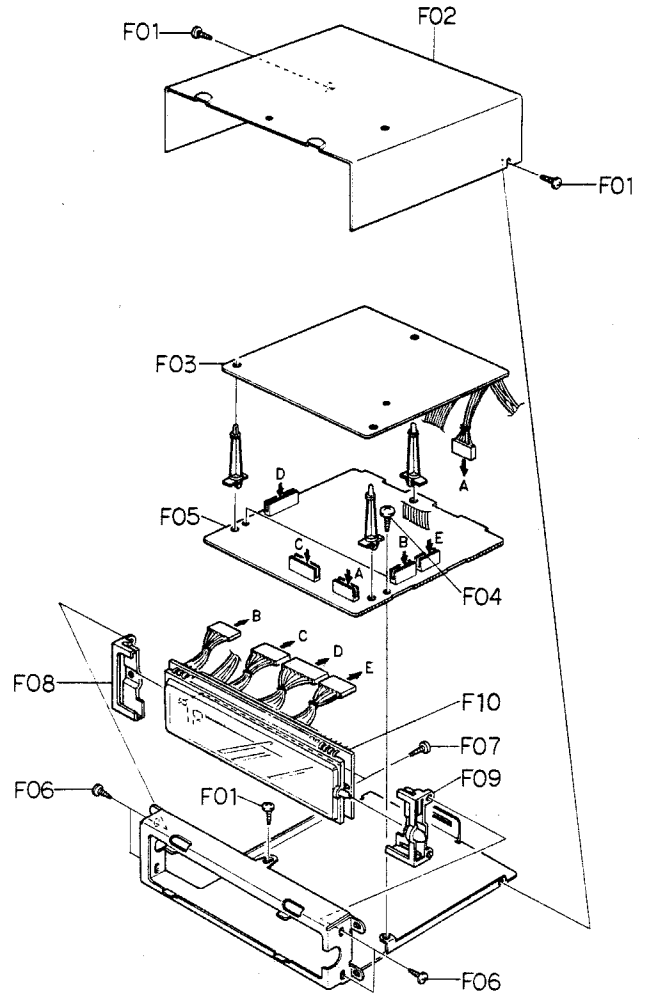


Fig. 2.5

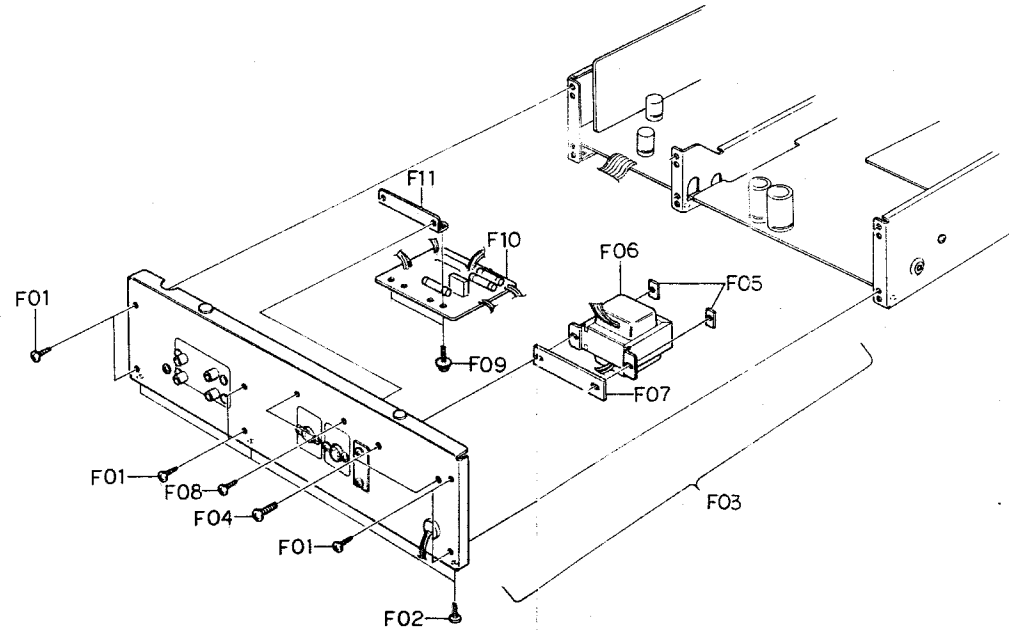


Fig. 2.6

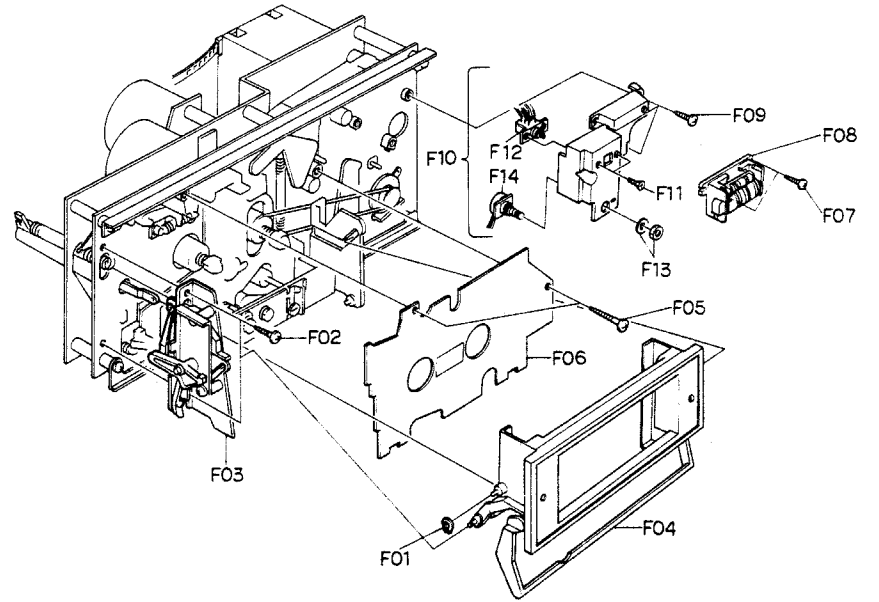


Fig. 2.7

### 2.26. Cam Control Volume

Refer to Fig. 2.9.

- (1) Remove Sub Mechanism Chassis Ass'y referring to item 2.24.
- (2) Remove F08, then disassemble F09 (Volume Coupler).
- (3) Remove F10, then disassemble F11 (Cam Control Volume).

### 2.27. Azimuth Motor Ass'y

Refer to Fig. 2.9.

- (1) Remove Sub Mechanism Chassis Ass'y referring to item 2.24.
- (2) Remove F12, then disassemble F13 (Azimuth Alignment Motor Ass'y).
- (3) Remove F14, then disassemble F15 (Azimuth Motor Ass'y) and F16 (Drive Pulley Ass'y).

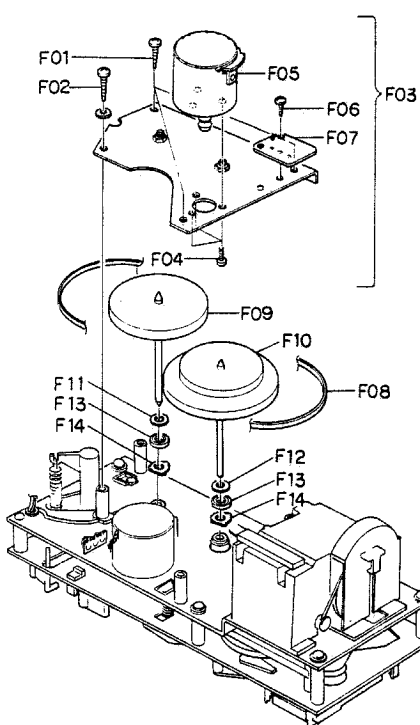


Fig. 2.8

### 2.28. Reel Hub Ass'y and Idler Ass'y

Refer to Fig. 2.9.

- (1) Remove Sub Mechanism Chassis Ass'y referring to item 2.24.
- (2) Remove F17 (Reel Hub Head), then disassemble F18 (Reel Hub B Ass'y), F19 (Reel Hub Take-up Ass'y), F20 (Reel Hub Supply Ass'y), F21 (Back Tension Ass'y) and F22 (Back Tension Spring).
- (3) Remove F23, then disassemble F24 (Idler Ass'y).

### 2.29. Cam Drive Gear and Control Cam

Refer to Fig. 2.9.

- (1) Remove Sub Mechanism Chassis Ass'y referring to item 2.24.
- (2) Remove F25, then disassemble F26 (Cam Drive Gear).
- (3) Remove F27, then disassemble F28 (Counter-Load Arm Ass'y).
- (4) Remove F29, then disassemble F30 (Control Cam).

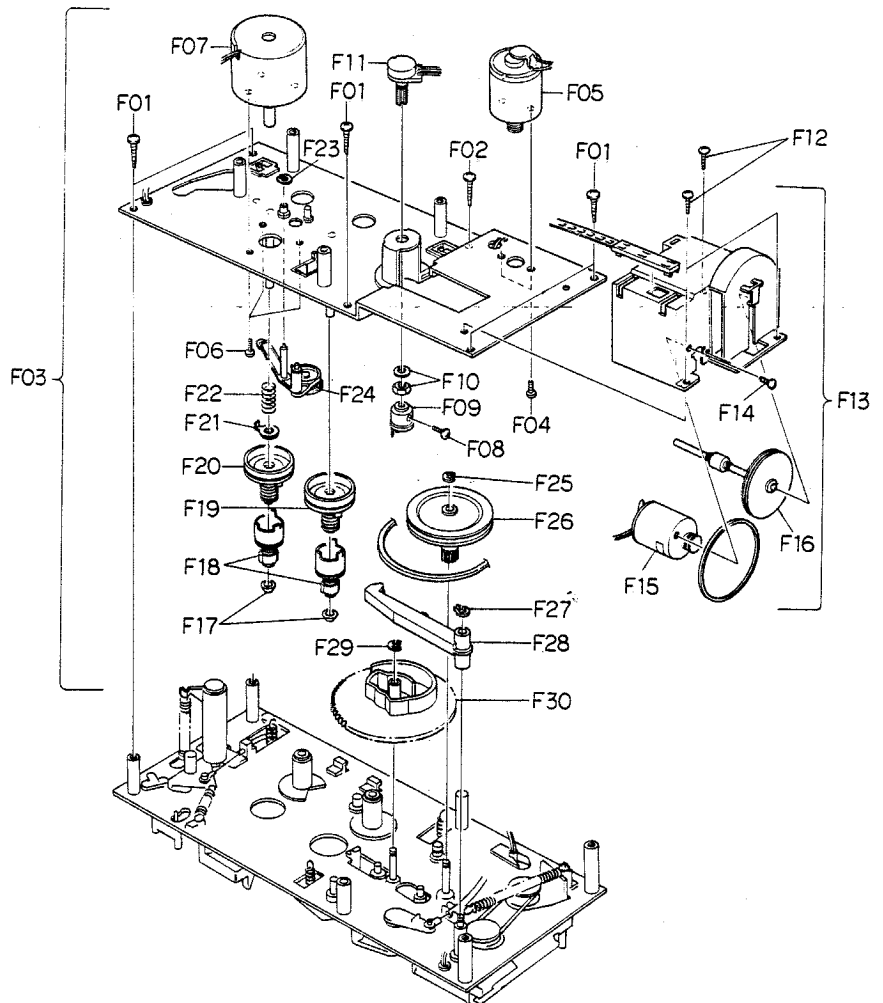


Fig. 2.9



**2.30. Head Mount Base Ass'y**

Refer to Fig. 2.10.

- (1) Refer to Fig. 2.7. Remove Cassette Case Ass'y referring to item 2.21.
- (2) Remove F01, then disassemble F02 (Head Mount Base Ass'y).

**2.31. Pressure Roller Ass'y and Erase Head**

Refer to Fig. 2.10.

- (1) Remove Head Mount Base Ass'y referring to item 2.30.
- (2) Remove F03, then disassemble F04 (Supply Pressure Roller Ass'y).
- (3) Remove F05, then disassemble F06 (Erase Head).
- (4) Remove F07, then disassemble F08 (Take-up Pressure Roller Ass'y).

**2.32. Playback Head Ass'y and Record Head Ass'y**

Refer to Fig. 2.10.

- (1) Remove Head Mount Base Ass'y referring to item 2.30.
- (2) Turn F09 by 90° by pushing it, then disassemble F10 (Playback Head Ass'y).
- (3) Turn F10 by 90° by pushing it, then disassemble F12 (Record Head Ass'y) and F13 (RH Azimuth Alignment Plate).

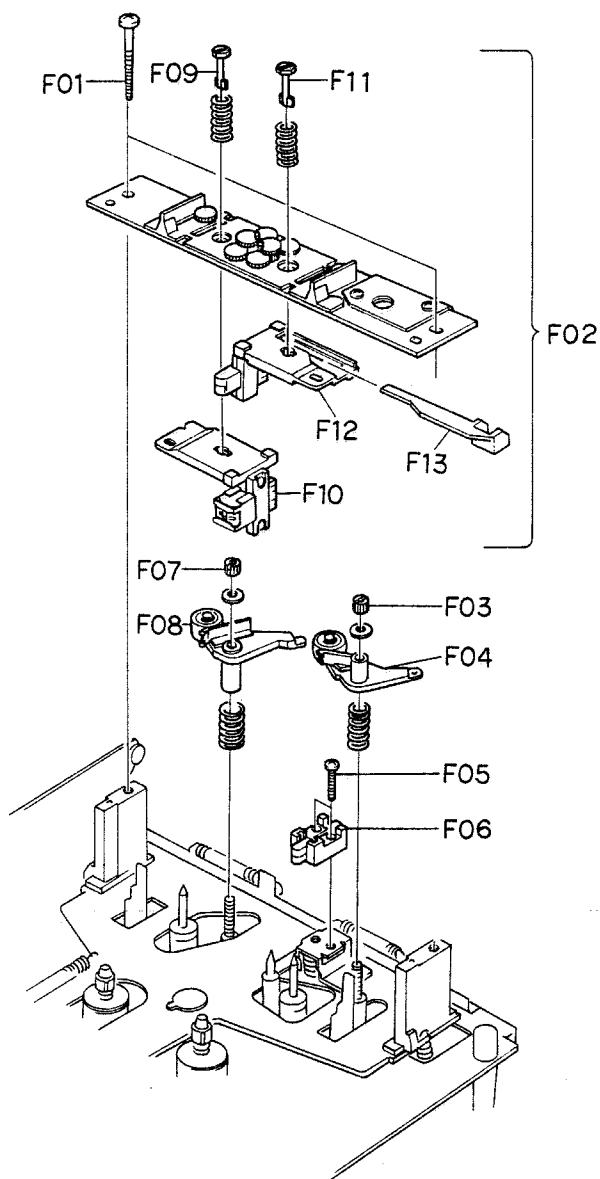


Fig. 2.10

### 3. MEASUREMENT INSTRUMENTS

- (1) Audio Generator (20 Hz — 200 kHz)
- (2) AC Millivolt Meter (with dB measures)
- (3) Oscilloscope (DC — 5 MHz)
- (4) Distortion Meter
- (5) Speed & Wow/Flutter Meter
- (6) Frequency Counter (DC — 1 MHz)
- (7) Ohm Meter
- (8) DC Volt Meter
- (9) AC Volt Meter
- (10) Torque Gauge (DA09013A)
- (11) 15 kHz Azimuth Tape (DA09004A)
- (12) 3 kHz Speed & Wow/Flutter Tape (DA09006A) for Standard Speed (1-7/8 ips)
- (13) 3 kHz Speed & Wow/Flutter Tape (DA09049A) for Half-Speed (15/16 ips)
- (14) 1 kHz Track Alignment Tape (DA09007A)
- (15) 400 Hz Level Tape (DA09005A)
- (16) 20 kHz PB Frequency Response Tape (DA09001A)
- (17) 15 kHz PB Frequency Response Tape (DA09002A)
- (18) 10 kHz PB Frequency Response Tape (DA09003A)
- (19) Reference EXII Tape (DA09021A)
- (20) Reference SX Tape (DA09025A)
- (21) Reference ZX Tape (DA09037A)
- (22) Tilt Check Gauge M-9039 (DA09039A)
- (23) EH Tilt Check Gauge M-9040 (DA09040A)
- (24) EH Stroke Check Gauge M-9042 (DA09042A)
- (25) EH Stroke Check Gauge M-9051 (DA09051A)
- (26) Stroke Check Gauge M-9047 (DA09047A)
- (27) Record Head Mounting Gauge M-9048 (DA09048A)
- (28) Back Tension Gauge (DA09055A)
- (29) Tension Arm Adjustment Cassette (DA09056A)
- (30) Audio Analyzer T-100  
(including Distortion, Wow/Flutter, Speed, Oscillator and dB meter)

Notes: 1. (10) — (30) are the products of Nakamichi Corporation.

2. EH Stroke Check Gauge M-9042 (DA09042A) should be used for the Models serial Nos. from A11601001 to A11603009, and EH Stroke Check Gauge M-9051 (DA09051A) is for the Models bearing serial Nos. A11603010 and greater.

3. Back Tension Gauge (DA09055A) and Tension Arm Adjustment Cassette (DA09056A) are used for the Models bearing serial Nos. A11606264 and greater.

## 4. MECHANICAL ADJUSTMENTS

### 4.1. Mechanism Control Cam Adjustment

Before adjustment, disassemble the Front Panel Ass'y, then remove the Cover Plate referring to items 2.5 and 2.21.

#### (1) Offset Adjustment of Control Motor Driver

- (a) Refer to Figs. 4.1 and 4.2.  
Adjust VR402 and VR403 on the Logic P.C.B. to locate approximately at the middle of the variable range. Then turn ON the Power Switch.  
VR402 (for Cam position stop)  
VR403 (for Cam position play)
- (b) Press the Stop Switch to set the N-680ZX in stop mode.  
Adjust VR402 (for stop) so that the "S" mark on the Cam corresponds to the pointer on the mechanism chassis.
- (c) Press the Play Switch to set the N-680ZX in playback mode.  
(Cam will rotate, and the position marked with "PY" comes to the pointer.) Adjust VR403 (for play) so that the "PY" mark on the Cam corresponds to the pointer.
- (d) Repeat above (b) and (c) 2 - 3 times so that the "S" and "PY" marks on the Cam correspond to the pointer accurately in stop and playback modes respectively.  
(This adjustment is required because the position adjusted by one volume will be slightly changed when the other volume is adjusted.)
- (e) Set the N-680ZX in FF, pause, or cue mode by pressing each switch (press FF and Pause Switches to set the N-680ZX in cue mode) and check to insure that the pointer is in a range of "F", "PS", or "CU" mark respectively.
- (f) If out of the range, precise adjustment for each position according to "(2) Offset Fine Adjustment of Control Motor Driver" will be required.

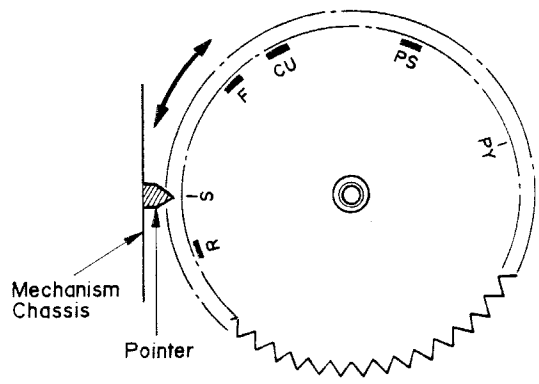


Fig. 4.1

#### (2) Offset Fine Adjustment of Control Motor Driver

Adjust only if a satisfactory result is not obtained in "(1) Offset Adjustment of Control Motor Driver". This adjustment is made by changing the value of the fixed resistors on the Logic P.C.B.

Note: The value of voltage is typical value.

#### (a) Observation Point of Reference Voltage

Observe the each voltage at the sliding contact of the Cam Control Volume VR405 (10 kΩ) in stop, fast (FF or REW), pause, record and playback modes.

#### (b) Reference Voltage

Reference voltage at the sliding contact of VR405 (Cam Control Volume) in each mode is as follows:

Mode	Reference Voltage (Typical Value)
Stop	3.0 V
Fast (FF/REW)	1.3 V
Pause	-2.8 V
Play	-5.4 V

} 1.7 V ± 0.25 V

} 2.6 V ± 0.4 V

#### (c) Resistors for Adjustment

Mode	Ref. No.	Typical Value
Stop	R461	9.1 kΩ (F)
Fast (FF/REW)	R462	4.32 kΩ (F)
Pause	R445	287 kΩ (F)
Play	R443	174 kΩ (F)

#### (d) Adjustment Procedures

- 1) Press the Stop Switch to set the N-680ZX in stop mode.  
Adjust the value of R461 to obtain 3.0 V (±0.6 V) at the sliding contact of VR405.  
Note: When R461 is adjusted, the reference voltage in fast (FF or REW) mode is changed. Therefore, re-check of the reference voltage in fast (FF or REW) mode is required. If the reference voltage is out of the range, re-adjustment of R462 according to next step 2) is necessary.

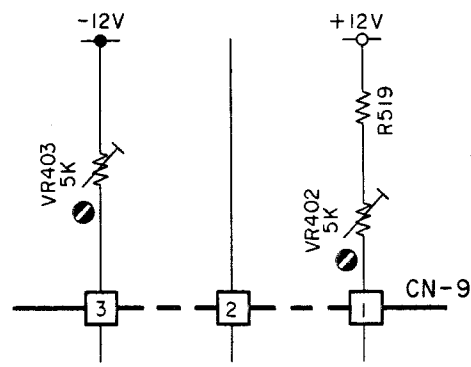


Fig. 4.2

- 2) Set the N-680ZX in FF mode, then adjust the value of R462 so that the voltage of VR405 will become lower by 1.7 V ( $\pm 0.25$  V) than in stop mode.

- 3) Press the Pause Switch to set the N-680ZX in pause mode.

Adjust the value of R445 to obtain  $-2.8$  V ( $+0.4$ ,  $-0.15$  V) at the sliding contact of VR405.

- 4) Set the N-680ZX in playback mode, then adjust the value of R443 so that the voltage of VR405 will become lower by 2.6 V ( $\pm 0.4$  V) than in pause mode.

### (3) Cam Timing Adjustment

- (a) Remove the wires from the Control Motor Terminals to set the motor open.

- (b) Without loading a cassette tape and with pressing the Record Protecting Switch with your finger tip, press the Record and Play Switches to set the N-680ZX in record mode.

- (c) Turn the Cam and bring the "PY" mark toward the pointer by hand. Reel Motor will rotate before the "PY" mark reaches the pointer. Adjust the value of R483 and R484 so that the voltage at sliding contact of VR405 becomes  $-3.6$  V ( $\pm 0.3$  V) when Reel Motor starts rotation.

- (d) Observe the mute signal at the Q418 collector.

Turn the Cam referring to above step (c) and check to insure that the voltage at the sliding contact of VR405 is  $-3.8$  V ( $\pm 0.3$  V) when mute is released (mute signal changes from H to L).

(This voltage is determined by the adjustment of R483 and R484 in above step (c).)

- (e) Observe the  $\overline{\text{Rec}}$  signal at the Q417 collector. Turn the Cam referring to above step (c) and adjust the value of R488 to obtain  $-2.1$  V ( $\pm 0.4$  V) at the sliding contact of VR405 when  $\overline{\text{Rec}}$  signal changes from H to L (bias oscillation will begin).

- (f) Upon completion of the above adjustment, re-connect wires to the motor terminals.

## 4.2. Tape Speed Adjustment

### (1) Standard Speed (1-7/8 ips)

- (a) Remove the Top Cover.  
 (b) Connect a Frequency Counter to Output Jack.  
 (c) Load a 3 kHz Speed Wow/Flutter Tape (DA09006A) and play it back.  
 (d) 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.

### (2) Half-Speed (15/16 ips)

- (a) Remove the Top Cover.  
 (b) Connect a Frequency Counter to Output Jack.  
 (c) Load a 3 kHz Speed Wow/Flutter Tape (DA09049A) and play it back.  
 (d) Referring to Fig. 4.3, adjust the Tape Speed Adjustment Volume VR408 on the Speed Cal. P.C.B. to obtain 3,000 Hz on the Frequency Counter.

CCW: Motor drives slowly.

CW: Motor drives fast.

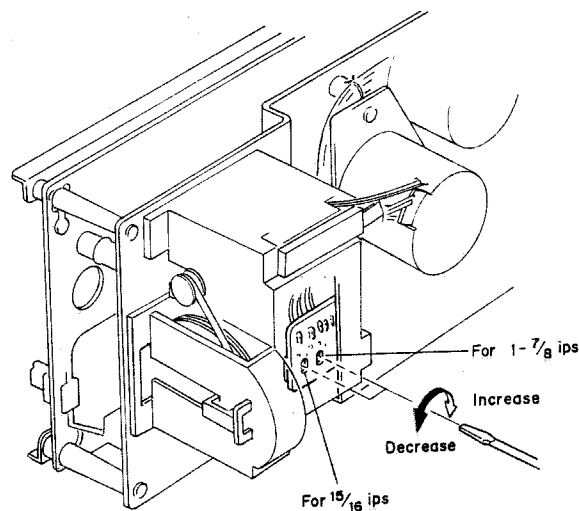


Fig. 4.3

### 4.3. Record Head and Playback Head Tilt Adjustment

Note: On items 4.3–4.9, please refer to Fig. 4.4 flow chart.

Refer to Figs. 4.5 and 4.6.

- (1) Load a Tilt Check Gauge M-9039 (DA09039A) in the N-680ZX.
- (2) Clip the grounding terminal of the Tilt Check Gauge with one end of the cord with clip, and the other end to the chassis of the N-680ZX.
- (3) Remove both of the Height Gears.
- (4) Set the N-680ZX 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 se-

curely 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 screw (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-680ZX in stop mode and fit both of the serrated height gears. Then set the N-680ZX 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.

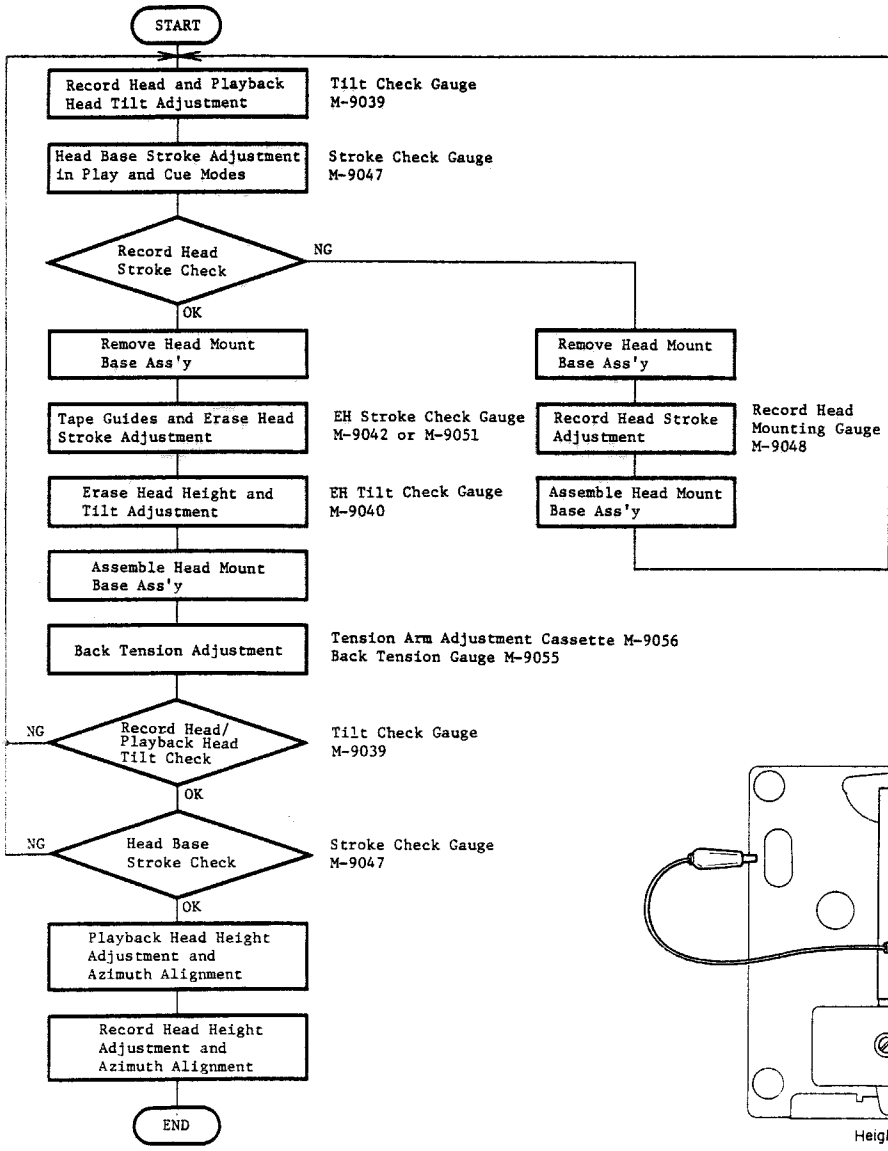


Fig. 4.4

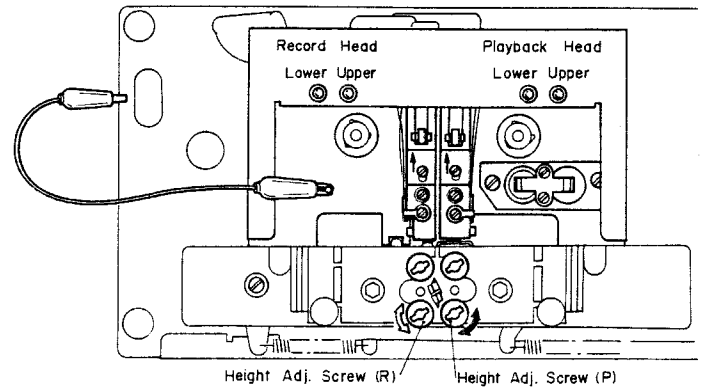


Fig. 4.5

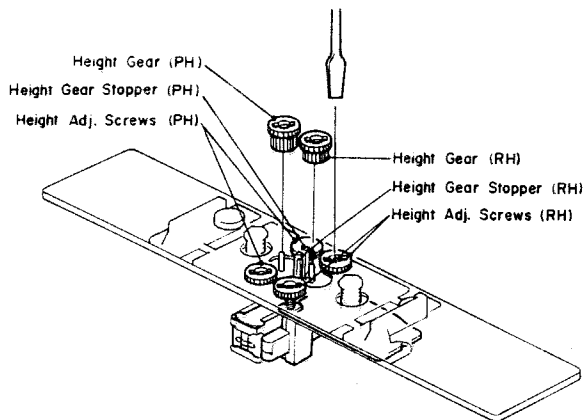


Fig. 4.6

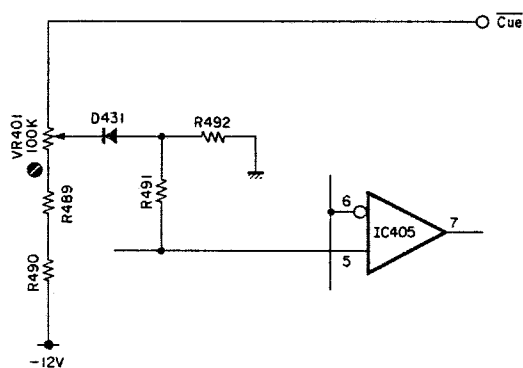


Fig. 4.8

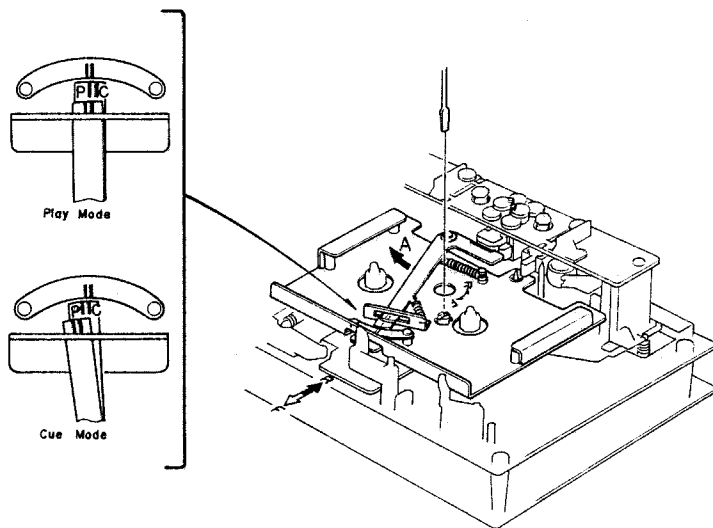


Fig. 4.7

#### 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.

- Load a Stroke Check Gauge M-9047 (DA09047A) in the N-680ZX.
- Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the N-680ZX in play mode. Then slowly release the Indicators and insure whether each of the Indicators is in contact with record and playback heads.
- Check to insure whether the "P" pointer on the Playback Head Indicator locates between the 2 lines on the Indicator Plate.
- If the playback head stroke is noted to be misaligned, adjustment can be made by moving the stroke adjuster assembled in the head base assembly (either forwardly or backwardly).
- 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.

- 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.

- Load a Stroke Check Gauge M-9047 (DA09047A) in the N-680ZX.
- Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the N-680ZX 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.
- Check to insure whether the "C" pointer on the Playback Head Indicator locates between the 2 lines on the Indicator Plate.
- If the playback head stroke is noted to be misaligned, adjust VR401 on the Logic P.C.B. Ass'y till satisfactory results are obtained.
- 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.

##### (1) Supply Tape Guide Height Adjustment

- (a) Load an EH Stroke Check Gauge M-9042/M-9051 in the N-680ZX.
- (b) Set the N-680ZX 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 Guide 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-680ZX 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-680ZX.
- (b) Set the N-680ZX 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 take-up tape guide is misaligned, the Take-up Tape Guide Check Bar will not come into the take-up 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-680ZX 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-680ZX.
- (b) Set the N-680ZX 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 stroke by loosening 2 screws that assembled 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 M-9042 (DA09042A) should be used for the Models serial Nos. from A11601001 to A11603009, and EH Stroke Check Gauge M-9051 (DA-09051A) is for the Models bearing serial No. A11603010 and greater.

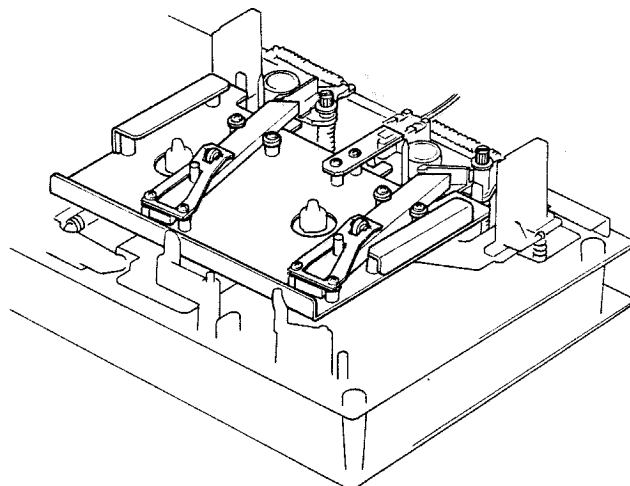


Fig. 4.9

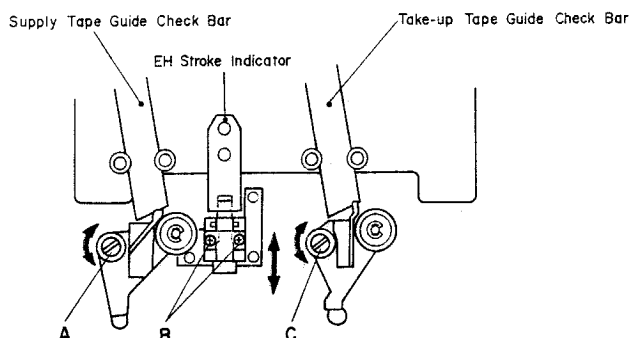


Fig. 4.10

#### 4.6. Erase Head Height and Tilt Adjustment

Refer to Figs. 4.11 and 4.12.

- (1) Remove Head Mount Base Ass'y referring to item 2.30.
- (2) Load an EH Tilt Check Gauge M-9040 (DA09040A) in the N-680ZX.
- (3) Set the N-680ZX 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" counterclockwise (or clockwise) so that the two horizontal lines on the mirror will become superposed 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 on 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 on Beacon "3". Excessive turning will cause either Beacon "1" or "2" to light off, and therefore adjust with Screw "Azimuth" until all of the 3 Beacons "1", "2" and "3" illuminate.

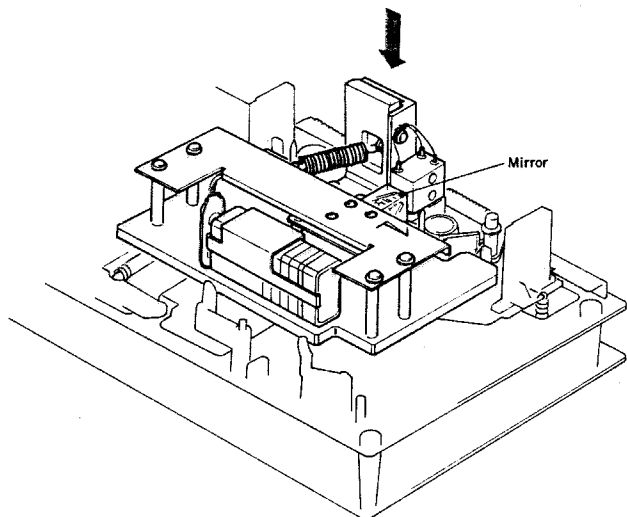


Fig. 4.11

- (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 dirt, or overflow in the groove of the erase head surface.

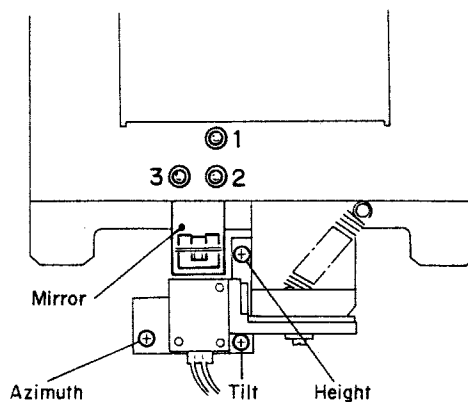


Fig. 4.12

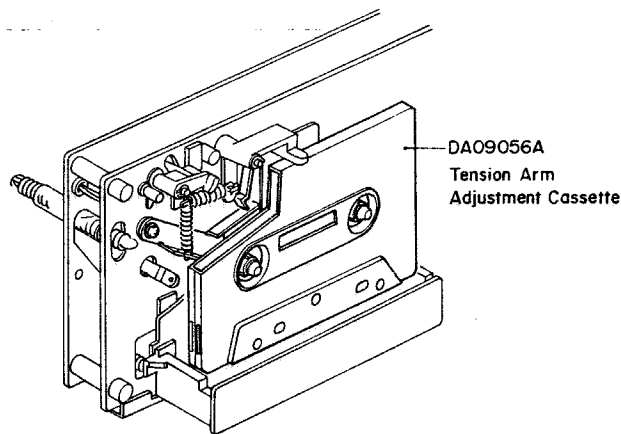


Fig. 4.13

#### 4.7. Back Tension Adjustment

Note: This adjustment is required for the Models bearing serial Nos. A11606264 and greater.

Refer to Figs. 4.13 – 4.16.

- (1) Load the Tension Arm Adjustment Cassette (DA 09056A) referring to Fig. 4.13.
- (2) Set the Cassette Deck 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.

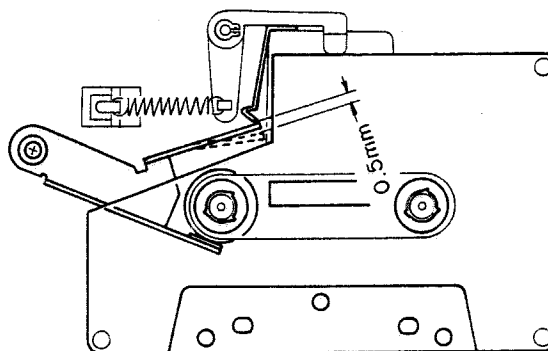


Fig. 4.14



- (4) Set the Cassette Deck in stop mode, and remove the Tension Arm Adjustment Cassette (DA09056A), then set the Cassette Deck 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 the Back Tension Gauge (DA09055A).
- (6) Set the Cassette Deck 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.

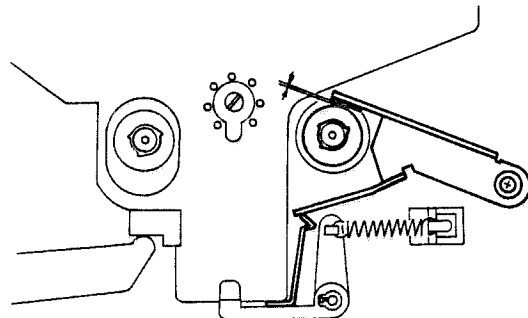


Fig. 4.15

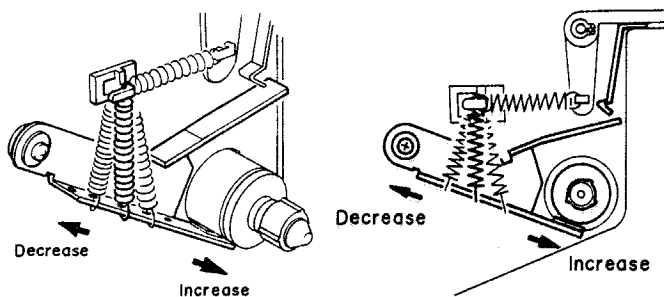


Fig. 4.16

**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.

- (a) Set the Monitor Switch to the Tape position, then connect a VTVM to the Output Jacks.
- (b) Load a 1 kHz Track Alignment Tape (DA09007A), then set the N-680ZX in play mode.
- (c) Turn the PH Height Gear until the outputs of both channels become minimum.
- (d) Load a 15 kHz Azimuth Tape (DA09004A), then set the N-680ZX 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.

- (a) Set the N-680ZX 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 by 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) Set the Monitor Switch to the Tape position, then connect a VTVM to the Output Jacks.
- (c) Load a Reference SX Tape (DA09025A). Set the Eq. Switch to the 70 μs position and the Tape Switch to the SX position. Then set the N-680ZX in record and play mode.
- (d) Set the Display 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-680ZX 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 first at standard tape speed, then at half tape speed.

Note: Use the same side of the same tape used in the above steps.

- (1) Standard Speed (1-7/8 ips):
  - a) Set the Monitor Switch to the Tape position and the Display Switch to the Cal. position, then set the N-680ZX in record and play mode.
  - b) Adjust VR404 on the Logic P.C.B. Ass'y so that the cursors are coincident with the rightmost edges of the main displays on the FL Level Indicators.
  - c) Adjust VR901 on the Auto Azimuth P.C.B. Ass'y so that the Azimuth Motor stops its rotation.

- (2) Half-Speed (15/16 ips):
- Set the Tape Selector to the 15/16 ips position.
  - Feed in 15 kHz (-20 dB), then set the N-680ZX in record and play mode. Turn the RH Azimuth Alignment Screw until the outputs of both channels become maximum.
  - Set the Monitor Switch to the Tape position and the Display Switch to the Cal. position, then set the N-680ZX in record and play mode.
  - Adjust VR405 on the Logic P.C.B. Ass'y so that the cursors are coincident with the rightmost edges of the main displays on the FL Level Indicators.
  - Adjust VR902 on the Auto Azimuth P.C.B. Ass'y so that the Azimuth Motor stops its rotation.
- (h) Set the N-680ZX 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 Motor Ass'y.)

Remove the shorting jumper wire from C903 on the Auto Azimuth P.C.B. Ass'y.

- After completion of the above adjustments, record 400 Hz tone to the same portion of both sides A and B of the tape.
- Immerse the recorded tape in a 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 RECORDS 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.

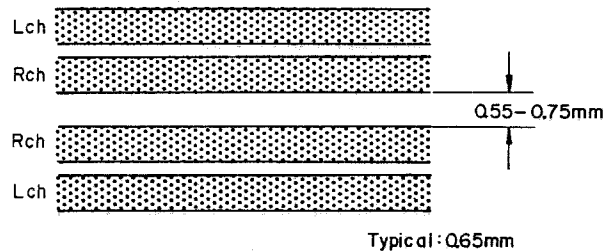


Fig. 4.20

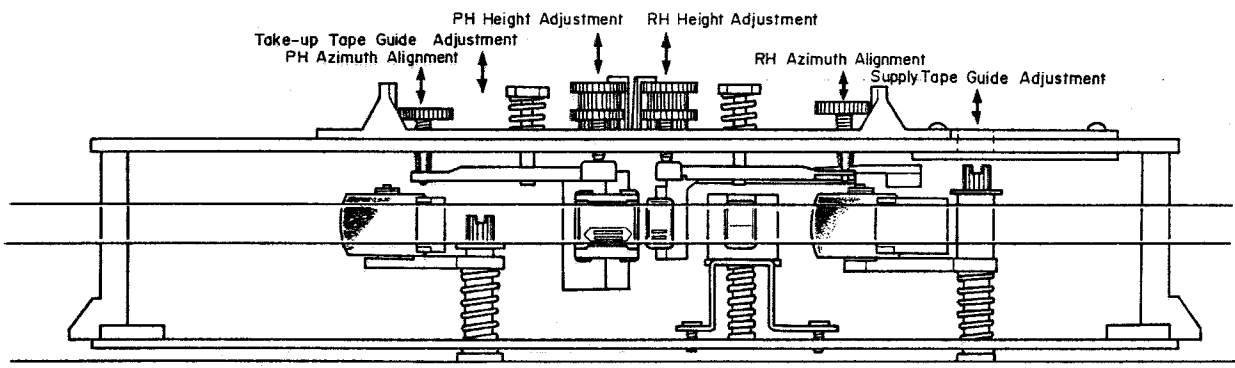


Fig. 4.17

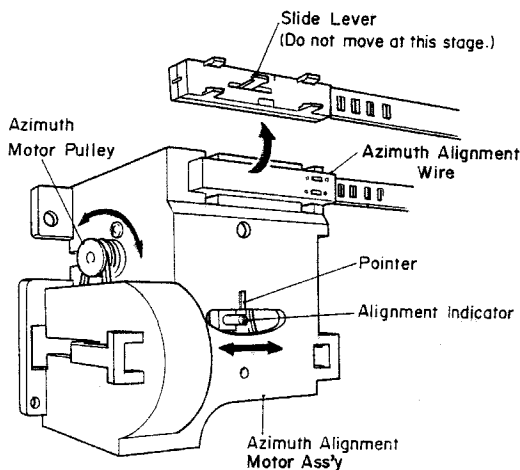


Fig. 4.18

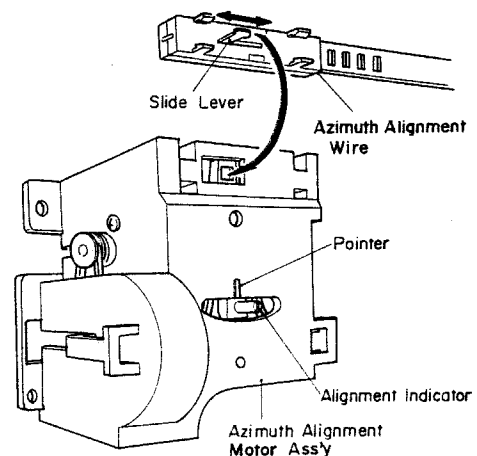


Fig. 4.19

**4.9. Record Head Stroke Adjustment**

Refer to Figs. 4.21 and 4.22.

Note: This adjustment will be required only to insure freedom from misalignment of the record head stroke in the record head stroke check mode.

- (1) Check the accuracy of the record head stroke.
- (2) Remove Head Mount Base Ass'y referring to item 2.30.
- (3) Remove the record head assembly.
- (4) Adjustment of Record Head Mounting Gauge M-9048 (DA09048A) .
  - (a) Mount the Block B onto the Mounting Gauge Plate.
  - (b) Loosen the 2 screws fixing the Block A.
  - (c) As shown in Fig. 4.21 hold the Gauges (3.05 mm and 0.1 mm thickness) between the Block A and Block B, fix the Block A with screws, pushing the Block A to the 2 guide pins.
- (5) Remove the Block B from the Mounting Gauge Plate.
- (6) As shown in Fig. 4.22, mount the R-8L record head assembly onto the Mounting Gauge Plate, then check the location of the R-8L record head surface. (If record head contacts to the Block C, loosen 2 pcs. of screws that assembled record head and R-8L record head assembly, then place the R-8L record head assembly onto the Plate.)
- (7) Remove the R-8L record head assembly from the Mounting Gauge Plate.

- (8) Readjustment of Record Head Mounting Gauge M-9048 (DA09048A)

- (a) Mount the Block B onto the Mounting Gauge Plate.
- (b) Loosen the 2 screws fixing the Block A.
- (c) As shown in Fig. 4.21 hold the Gauges (3.05 mm and either one of 0.05, 0.15, 0.2, 0.25, 0.3 or 0.35 mm thickness) between the Block A and Block B, fix the Block A with screw, pushing the Block A to the 2 guide pins.

- (9) Remove the Block B from the Mounting Gauge Plate.
- (10) Mount the R-8L record head assembly onto the Mounting Gauge Plate.
- (11) As shown in the Fig. 4.22, loosen the R-8L record head with 2 pcs. of screws onto the record head plate. As the location of the Block A is secured by the item (8)-(c), push the record head to the directions A and B, then tighten 2 pcs. of screws.
- (12) Check to insure freedom from gap between the Block C and record head surface, then tighten the 2 pcs. of screws on the record head plate with lock tight paint.
- (13) Assemble the record head assembly to the head mount base assembly.
- (14) Assemble the head mount base assembly to the mechanism assembly.
- (15) Check the record head stroke.

If the above are inaccurate, items (1) through (15) will have to be repeated till satisfactory results are obtained.

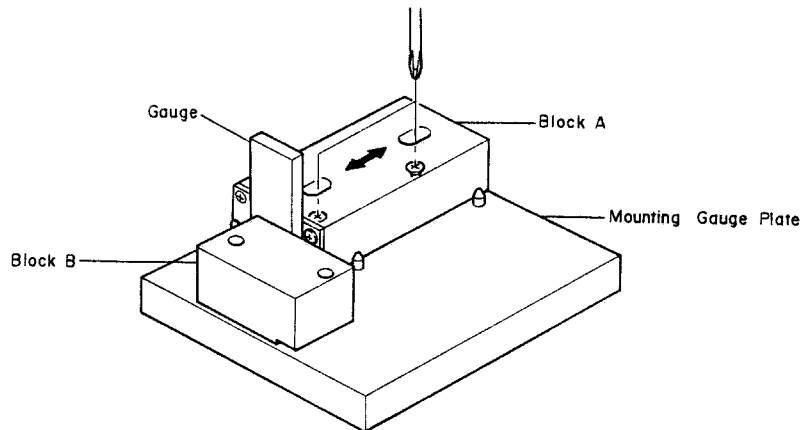
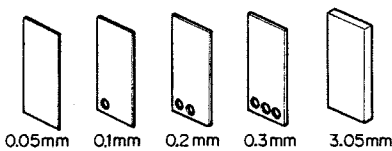


Fig. 4.21

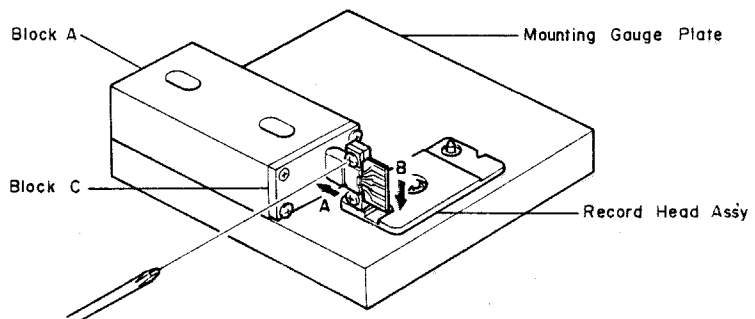


Fig. 4.22

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA04210A	Logic P.C.B. Ass'y	R413, 466	OB05509A	Carbon Resistor 33K ERD-25T J	C404	OB05582A	Mylar Capacitor 0.022μ 50V J	R544, 562	OB01857A	Carbon Resistor 1K ERD-25T J
	-- Logic --		476, 507			C407	OB00093A	Mylar Capacitor 0.1μ 50V	R547, 549	OB05671A	Carbon Resistor 2.2M ERD-25T J
			514, 607			C408	OB01405A	Electrolytic Capacitor 1μ 50V	R548	OB05615A	Carbon Resistor 22K ERD-25T J
			R414, 437	OB05615A	Carbon Resistor 22K ERD-25T J (9 pcs.)	C409	OB09166A	Mylar Capacitor 3300P 50V	R552, 553	OB05776A	Carbon Resistor 1M ERD-25T J
			451-456			C410	OB00610A	Mylar Capacitor 0.15μ 50V	558		
IC401, 402	OB06178A	IC μPD4011C	502			C411, 414	OB01676A	Mylar Capacitor 0.056μ 50V	R560	OB05625A	Carbon Resistor 220K ERD-25T J
403			R415, 488	OB09263A	Carbon Resistor 12K ERD-25T J	C412, 413	OB09324A	Electrolytic Capacitor 3.3μ 16V (LN)	R565, 566	OB05676A	Carbon Resistor 390K ERD-25T J
IC404	OB06143A	IC μPD4001C	R420, 471	OB09049A	Fail Safe Type Resistor				R582-588	OB09320A	Carbon Resistor 820K ERD-25T J (7 pcs.)
IC405	OB06124B	IC RC4558D	472			C415, 422	OB09223A	Electrolytic Capacitor 1μ 50V (LN)	R589	OB01684A	Carbon Resistor 470K ERD-25T J
IC406	OB06144A	IC μPD4066C	R426, 504	OB01682A	Carbon Resistor 6.8K ERD-25T J	C416	OB09173A	Electrolytic Capacitor 4.7μ 16V (LN)	C429, 430	OB09313A	Electrolytic Capacitor 100μ 50V
IC407	OB06192A	Regulator +12V μA7812	R427, 428	OB05776A	Carbon Resistor 1M ERD-25T J	C417	OB09277A	Ceramic Capacitor 10P 50V J	C431, 432	OB05652A	Mylar Capacitor 4700P 50V J
IC408	OB06193A	Regulator -12V μA7912	446, 515			C418, 420	OB05513A	Mylar Capacitor 0.033μ 50V	436		
Q401, 405	OB06100A	Transistor 2SC945 (A)	516			C419	OB01502A	Electrolytic Capacitor 330μ 16V	C434, 444	OB01405A	Electrolytic Capacitor 1μ 50V
406, 407			R431	OB05698A	Carbon Resistor 1.5K ERD-25T J	C423, 424	OB01406A	Electrolytic Capacitor 2200μ 16V	446		
408, 409			R432, 433	OB05671A	Carbon Resistor 2.2M ERD-25T J	425			C434	OB01863A	Electrolytic Capacitor 3.3μ 50V
410, 411			494, 498			C426	OB09374A	Electrolytic Capacitor 6800μ 25V	C435	OB05557A	Mylar Capacitor 0.015μ 50V J
412, 413			503, 509			C427	OB05654A	Electrolytic Capacitor 2200μ 25V	C437	OB09222A	Electrolytic Capacitor 0.47μ 16V (LN)
414, 417			R435	OB05784A	Carbon Resistor 560K ERD-25T J	C457	OB09286A	Ceramic Capacitor 470P 50V K	C438	OB09287A	Ceramic Capacitor 680P 50V K
419, 420			R438, 439	OB05625A	Carbon Resistor 220K ERD-25T J	CN5, 11	OB08645A	9P-T Post	C439	OB00610A	Mylar Capacitor 0.15μ 50V J
421, 422			491			CN6	OB08642A	6P-T Post	C440, 441	OB05583A	Mylar Capacitor 0.033μ 50V J
423, 429			R444	OB09367A	Metal Film Resistor	CN7	OB08643A	7P-T Post	C442, 443	OB09220A	Electrolytic Capacitor 0.22μ 50V (LN)
430, 435						CN8	OB08644A	8P-T Post			
447			R445	OB09366A	Metal Film Resistor 174K SN14K2E F	CN9	OB08653A	3P-T Post			
Q402, 403	OB06013A	Transistor 2SA733	R459, 464	OB01889A	Carbon Resistor 100K ERD-25T J	CN10	OB08655A	11P-T Post	C447	OB09285A	Ceramic Capacitor 330P 50V K
404, 415			493, 505						C459	OB09187A	Electrolytic Capacitor 1μ 50V (BP)
416, 418			510, 511						C461	OB01180A	Ceramic Capacitor 330P 100V
428, 433			523, 525								
Q424, 426	OB06020A	Transistor 2SC1096	R461	OB09328A	Metal Film Resistor 9.1K SN14K2E F	IC409	OB06127A	IC RC4559D			
Q425, 427	OB06012A	Transistor 2SA634	R463	OB09365A	Metal Film Resistor 4.32K SN14K2E F	IC410	OB06215A	IC TC4049BP			
Q432	OB06069A	Transistor 2SB564	R465	OB09340A	Metal Film Resistor 15K SN14K2E F	IC411	OB06143A	IC μPD4001C			
Q434	OB06066A	Transistor 2SD471	R467	OB05743A	Carbon Resistor 27K ERD-25T J	IC412	OB06214A	IC TC4071BP			
ZD403, 404	OB06231A	Zener Diode 11V	R468, 469	OB01856A	Carbon Resistor 8.2K ERD-25T J	IC413	OB06213A	IC TC4013BP	IC416	OB06216A	IC μPC4556C
D401-437	OB01909A	Silicon Diode 1S1555 (43 pcs.)	R470	OB05578A	Carbon Resistor 180 ERD-25T J	IC414	OB06212A	IC TC4510BP	Q448, 451	OB06100A	Transistor 2SC945 (L)
442-444			R473, 477	OB01681A	Carbon Resistor 3.3K ERD-25T J	IC415	OB06211A	IC TC5022BP	D468, 469	OB06181A	Silicon Diode 1SS53
471, 473			485			Q431	OB06060A	Transistor 2SA473	VR404, 405	OB09107A	Semi-fixed Volume 500K
476			R478, 487	OB01854A	Carbon Resistor 39K ERD-25T J	Q436	OB06070A	Transistor 2SC1636	R591, 593	OB01889A	Carbon Resistor 100K ERD-25T J
D438, 439	OB06109A	Silicon Diode GP08B	R479, 490	OB01888A	Carbon Resistor 10K ERD-25T J	Q437	OB06100A	Transistor 2SC945 (L)	601		
D470	OB06183A	Diode Bridge RB151	506, 521			Q438-446	OB06013A	Transistor 2SA733 (9 pcs.)	R592, 594	OB05625A	Carbon Resistor 220K ERD-25T J
VR401	OB03832A	Semi-fixed Volume 100K	R480, 499	OB05508A	Carbon Resistor 56K ERD-25T J	ZD401	OB06235A	Zener Diode 39V	609		
VR402, 403	OB03831A	Semi-fixed Volume 5K	R483, 484	OB01857A	Carbon Resistor 1K ERD-25T J	ZD402	OB06230A	Zener Diode 5V	R595, 596	OB05627A	Carbon Resistor 330K ERD-25T J
R401, 402	OB05627A	Carbon Resistor 330K ERD-25T J	508			D440, 441	OB06109A	Silicon Diode GP08B	610		
403, 404			R489	OB05640A	Carbon Resistor 180K ERD-25T J	D445-454	OB06181A	Silicon Diode 1SS53 (24 pcs.)	R597, 599	OB01888A	Carbon Resistor 10K ERD-25T J
405, 406			R492	OB05680A	Carbon Resistor 1.8M ERD-25T J	456-467			600		
407, 408			R495, 500	OB05692A	Carbon Resistor 68K ERD-25T J	474, 475			R598	OB01681A	Carbon Resistor 3.3K ERD-25T J
409, 410			501			R527	OB05675A	Carbon Resistor 3.9K ERD-25T J	C448, 449	OB01412A	Electrolytic Capacitor 10μ 16V
411, 412			R496	OB01887A	Carbon Resistor 5.6K ERD-25T J	R532, 534	OB01889A	Carbon Resistor 100K ERD-25T J (16 pcs.)	C450, 451	OB01802A	Mylar Capacitor 2200P 50V J
416, 417			R497	OB09320A	Carbon Resistor 820K ERD-25T J	546, 563			C452	OB09221A	Electrolytic Capacitor 1.5μ 50V (LN)
418, 419			R512	OB09381A	Fail Safe Type Resistor	465, 570					
421, 422						572-580					
423, 424			R518	OB09217A	Fail Safe Type Resistor	602					
425, 429											
430, 434			R519	OB05794A	Carbon Resistor 680 ERD-25T J	R533, 535	OB05509A	Carbon Resistor 33K ERD-25T J			
436, 440			R524	OB05621A	Carbon Resistor 120K ERD-25T J	543, 545					
441, 442			R526	OB05560A	Carbon Resistor 18K ERD-25T J	568, 569					
447, 448			R528, 530	OB09215A	Fail Safe Type Resistor	571					
449, 450						R536	OB05622A	Carbon Resistor 2.2K ERD-25T J			
457, 458			R529, 531	OB09321A	Fail Safe Type Resistor	R537	OB01679A	Carbon Resistor 100 ERD-25T J			
474, 475						R538	OB05621A	Carbon Resistor 120K ERD-25T J			
481, 482			R590	OB09216A	Fail Safe Type Resistor	R539	OB05623A	Carbon Resistor 1.2K ERD-25T J			
486, 513						R540, 550	OB05627A	Carbon Resistor 330K ERD-25T J			
517, 520						551, 554					
522			C401, 421	OB01412A	Electrolytic Capacitor 10μ 16V	555, 567					
			C402, 403	OB05556A	Mylar Capacitor 4700P 50V	608					
			405, 406			R541	OB05508A	Carbon Resistor 56K ERD-25T J			
						R542, 581	OB01888A	Carbon Resistor 10K ERD-25T J			

Schematic Ref. No.	Part No.	Description
F1, 2, 3	BA04095A	Fuse P.C.B. Ass'y (U.S.A. & Canada)
	0B07842A	Fuse P.C.B.
	0B08374A	Fuse 1A 250V
	0B08342A	Spark Killer (1 pce.)
	0M04075B	Fuse Caution A112 (1 pce.)
	0M04078B	Fuse Label 1A x 2 (1 pce.)
	0M03782A	Fuse Label 1A (1 pce.)
	0J03834B	Fuse P.C.B. Holder (1 pce.)
0E00606A	Screw M3x6 philips Pan Head (3A) (2 pcs.)	
0E00752A	Eyelet (6 pcs.)	
F1, 2, 3	BA04096A	Fuse P.C.B. Ass'y (Japan)
	0B07842A	Fuse P.C.B.
	0B08686A	Fuse 1A 250V
	0B08363A	Spark Killer (1 pce.)
	0M04078B	Fuse Label 1A x 2 (1 pce.)
	0M03782A	Fuse Label 1A (1 pce.)
	0J03834B	Fuse P.C.B. Holder (1 pce.)
	0E00606A	Screw M3 x 6 Philips Pan Head (3A) (2 pcs.)
0E00752A	Eyelet (6 pcs.)	
F1, 2, 3 F4, 5	BA04097B	Fuse P.C.B. Ass'y (Others)
	0B07842A	Fuse P.C.B.
	0B08263A	Fuse T 315mA 250V
	0B08347A	Fuse T 1A 250V
	0B08349A	Fuse Clip (10 pcs.)
	0B08240A	Spark Killer (1 pce.)
	0M04073A	Fuse Label 315mA (1 pce.)
	0M04131A	Fuse Label 1A x 2 (1 pce.)
	0M04074A	Fuse Label 315mA x 2 (1 pce.)
	0J03834B	Fuse P.C.B. Holder (1 pce.)
	0E00606A	Screw M3 x 6 Philips Pan Head (3A) (2 pcs.)
0E00752A	Eyelet (6 pcs.)	
F1 F2, 3 F4, 5	BA04098B	Fuse P.C.B. Ass'y (UK & Australia)
	0B07842A	Fuse P.C.B.
	0B08665A	Fuse T 160mA 250V
	0B08263A	Fuse T 315mA 250V
	0B08347A	Fuse T 1A 250V
	0B08349A	Fuse Clip (10 pcs.)
	0B08240A	Spark Killer (1 pce.)
	0M04066A	Fuse Label 160mA (1 pce.)
	0M04131A	Fuse Label 1A x 2 (1 pce.)
	0M04074A	Fuse Label 315mA x 2 (1 pce.)
	0J03834B	Fuse P.C.B. Holder (1 pce.)
0E00606A	Screw M3 x 6 Philips Pan Head (3A) (2 pcs.)	
0E00752A	Eyelet (6 pcs.)	
F1 F2, 3 F4, 5	BA04105B	Fuse P.C.B. Ass'y (220V Class 2)
	0B07842A	Fuse P.C.B.
	0B08665A	Fuse T 160mA 250V
	0B08263A	Fuse T 315mA 250V
	0B08347A	Fuse T 1A 250V
0B08349A	Fuse Clip (10 pcs.)	
0B08445A	Spark Killer (2 pcs.)	

Schematic Ref. No.	Part No.	Description
	0M04066A	Fuse Label 160mA (1 pce.)
	0M04131A	Fuse Label 1A x 2 (1 pce.)
	0M04074A	Fuse Label 315mA x 2 (1 pce.)
	0J03834B	Fuse P.C.B. Holder (1 pce.)
	0E00606A	Screw M3 x 6 Philips Pan Head (3A) (2 pcs.)
	0E00752A	Eyelet (6 pcs.)

7.6. Fuse P.C.B. Ass'y

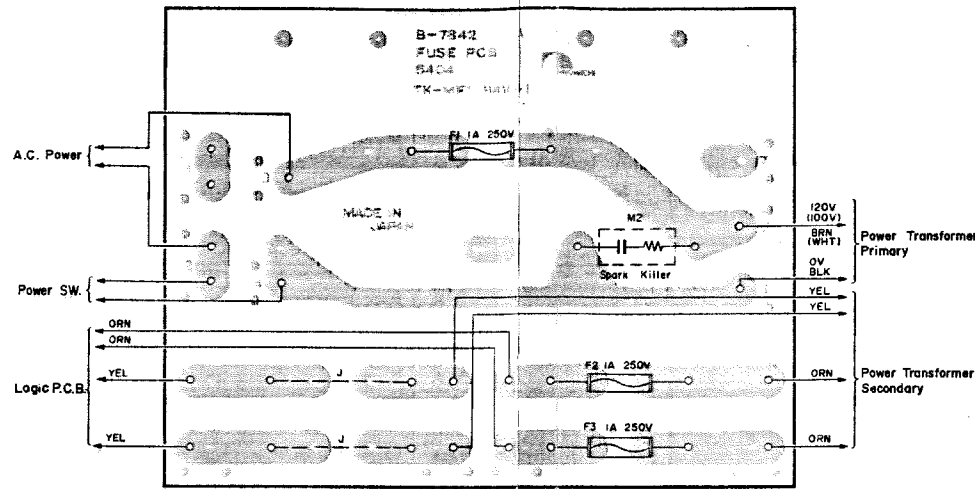


Fig. 7.6.1 U.S.A., Canada & Japan

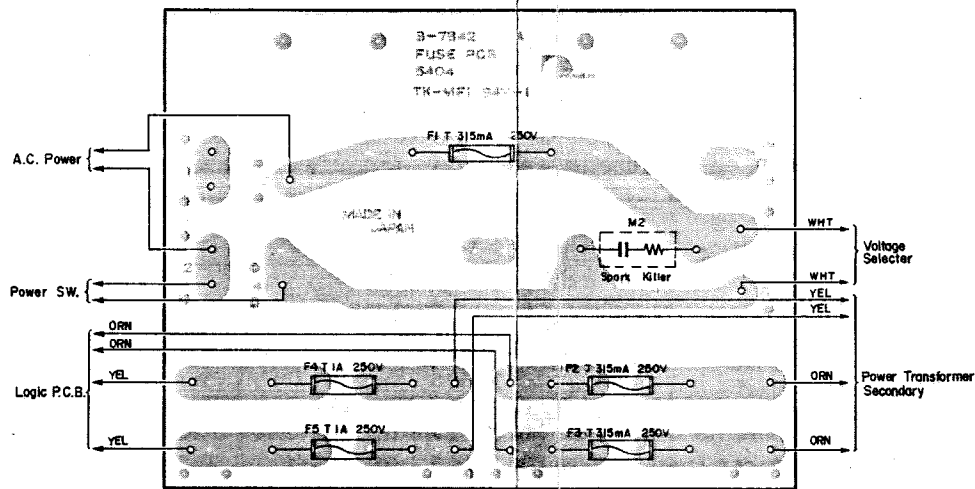


Fig. 7.6.2 Others

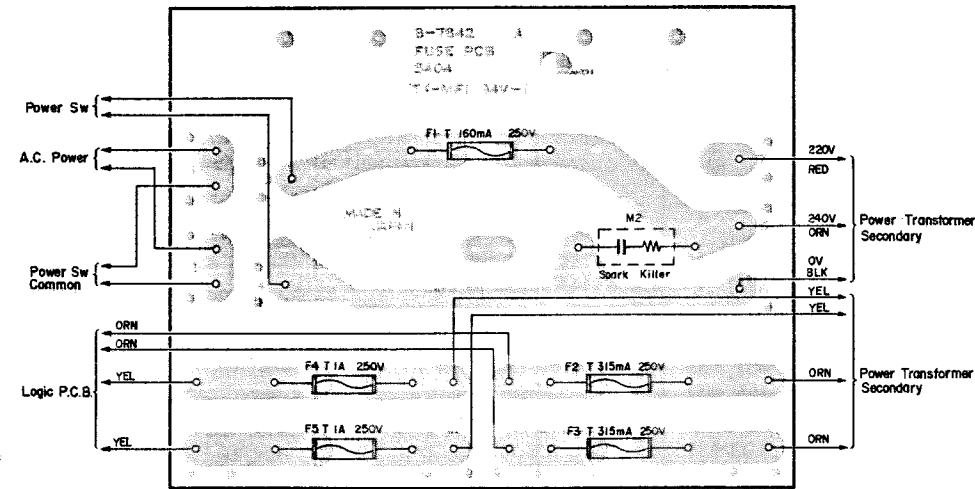


Fig. 7.6.3 UK & Australia

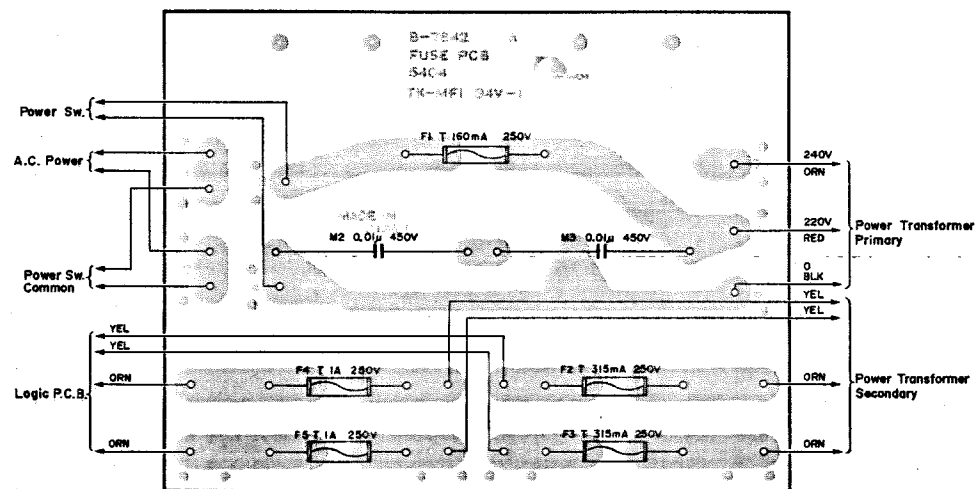


Fig. 7.6.4 220 V Class 2

7.7. Pin Jack P.C.B. Ass'y

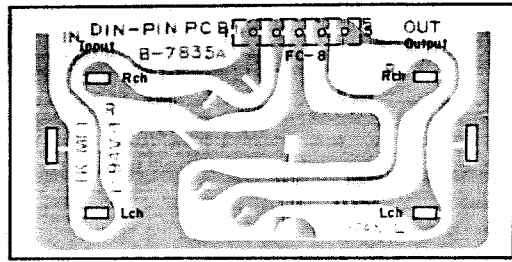


Fig. 7.7

7.8. Auto Shut-off P.C.B. Ass'y

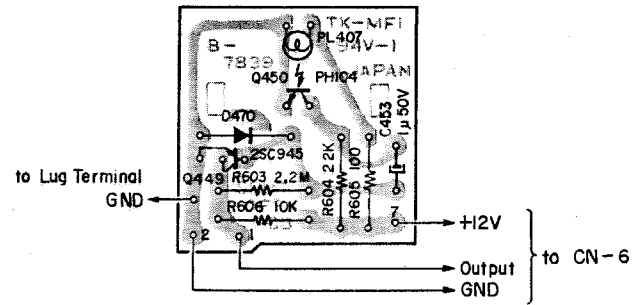


Fig. 7.8

Note: Diode is 1SS53 unless otherwise specified.

7.9. Volume P.C.B. Ass'y

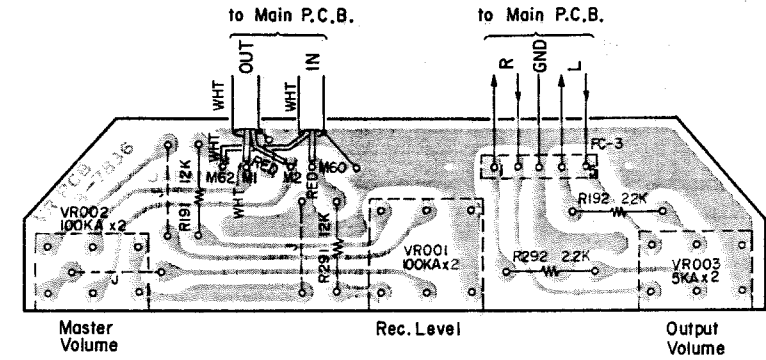


Fig. 7.9

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
FC8	BA04176A	Pin Jack P.C.B. Ass'y	D701,702	0B06181A	Silicon Diode 1SS53
	0B07835A	Pin Jack P.C.B.	801,802		
	0B05238A	5P Flat Cable 50mm	901,902		
	0B08709A	Jack Unit (1 pce.)	903,904		
	0E00037A	Earth Lug B-5 (1 pce.)	905,906		
Q449 Q450 D470 R603 R604 R605 R606 C453 PL407	BA04070A	Auto Shut-off P.C.B. Ass'y	VR901,902	0B09107A	Semi-fixed Volume 500K
	0B07839A	Auto Shut-off P.C.B.	R701,801	0B05625A	Carbon Resistor 220K ERD-25T J
	0B01872A	Transistor 2SC945 (L)	917,919		
	0B06228A	Photo Transistor PH104	R702,802	0B01889A	Carbon Resistor 100K ERD-25T J
	0B06181A	Silicon Diode 1SS53	929,930		
	0B05671A	Carbon Resistor 2.2M ERD-25T J	936,937		
	0B05615A	Carbon Resistor 22K ERD-25T J	R703,803	0B01888A	Carbon Resistor 10K ERD-25T J
	0B09215A	Fail Safe Type Resistor 100 RDF-25S J	913,922		
	0B01888A	Carbon Resistor 10K ERD-25T J	R704,804	0B05627A	Carbon Resistor 330K ERD-25T J
	0B01405A	Electrolytic Capacitor 1μ 50V	904,927		
	0B08552A	Lamp 12V 25mA	R705,706	0B05509A	Carbon Resistor 33K ERD-25T J
			805,806		
			905,906		
VR001 VR002 VR003 R191,291 R192,292 FC3	BA04069A	Volume P.C.B. Ass'y	907,909		
	0B07836A	Volume P.C.B.	910,925		
	0B07231A	Volume 100K (A)x2	R707,807	0B05671A	Carbon Resistor 2.2M ERD-25T J
	0B07279A	Volume 100K (A)x2	920,923		
	0B07259A	Volume 5K (A)x2	928		
	0B09263A	Carbon Resistor 12K ERD-25T J	R901,902	0B05776A	Carbon Resistor 1M ERD-25T J
	0B05622A	Carbon Resistor 2.2K ERD-25T J	903,918		
	0B05237A	5P Flat Cable 200mm	R908	0B01681A	Carbon Resistor 3.3K ERD-25T J
			R911,912	0B01887A	Carbon Resistor 5.6K ERD-25T J
			R914,916	0B05615A	Carbon Resistor 22K ERD-25T J
IC901,905 IC902 IC903 IC904 Q901,902 905,906 907,909 910,913 Q903 Q904 Q908	BA04208A	Azimuth P.C.B. Ass'y B	924,931		
	0B07872A	Azimuth P.C.B.	R915	0B09380A	Carbon Resistor 1.5M ERD-25T J
	0B06124B	IC RC4558D	R921	0B05692A	Carbon Resistor 68K ERD-25T J
	0B06216A	IC μPC4556C	R926	0B01682A	Carbon Resistor 6.8K ERD-25T J
	0B06213A	IC TC4013BP	R932	0B05626A	Carbon Resistor 150K ERD-25T J
	0B06244A	IC μPD4073C	R933	0B05641A	Carbon Resistor 47K ERD-25T J
	0B01872A	Transistor 2SC945(L)	C701,801	0B01405A	Electrolytic Capacitor 1μ 50V
			901,902		
			C702,802	0B01412A	Electrolytic Capacitor 10μ 16V
			C704,804	0B01802A	Mylar Capacitor 2200P 50V J
			C705,805	0B01676A	Mylar Capacitor 0.056μ 50V
			C903	0B01389A	Electrolytic Capacitor 4.7μ 16V
			C904	0B05772A	Tantalum Capacitor 0.22μ 35V
		CN10	0B08656A	2P-T Post	

7.10. Auto Azimuth P.C.B. Ass'y

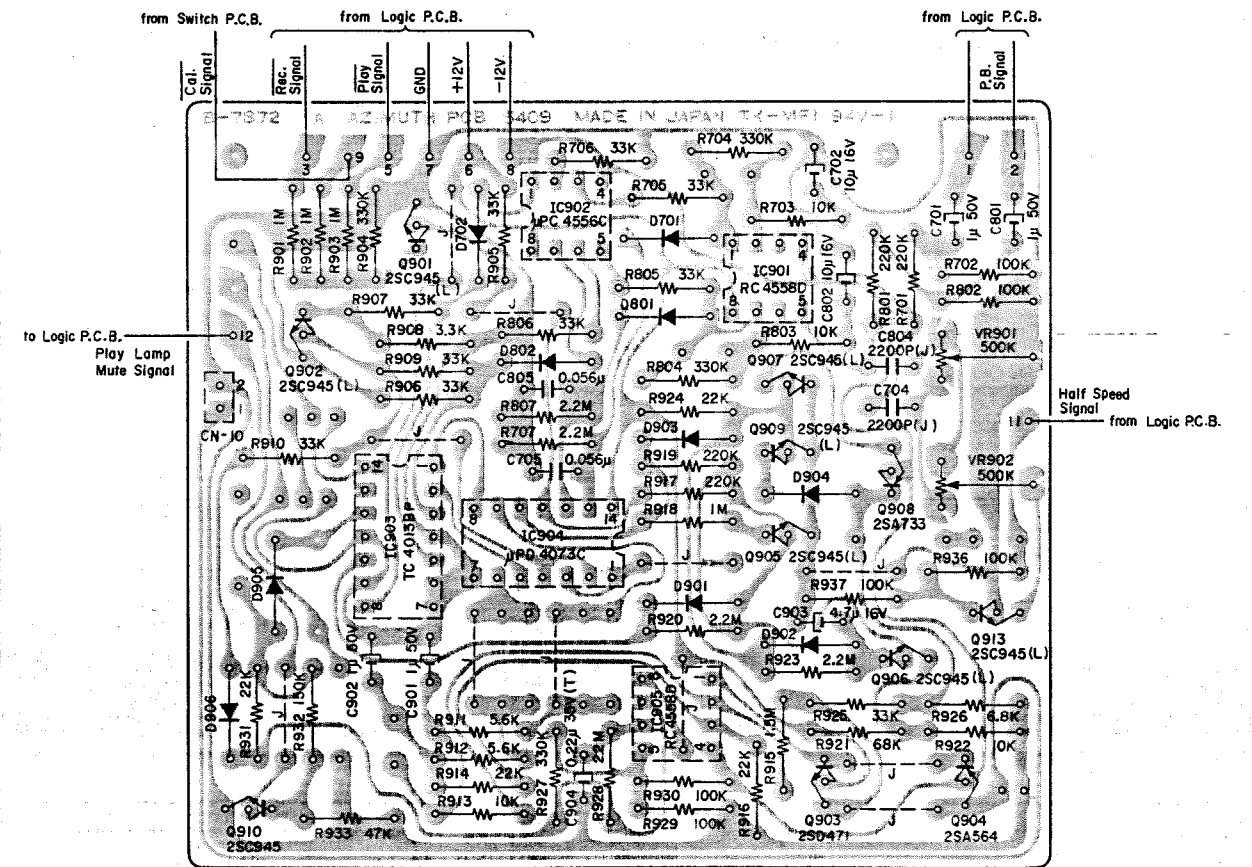


Fig. 7.10

7.11. Control Switch P.C.B. Ass'y

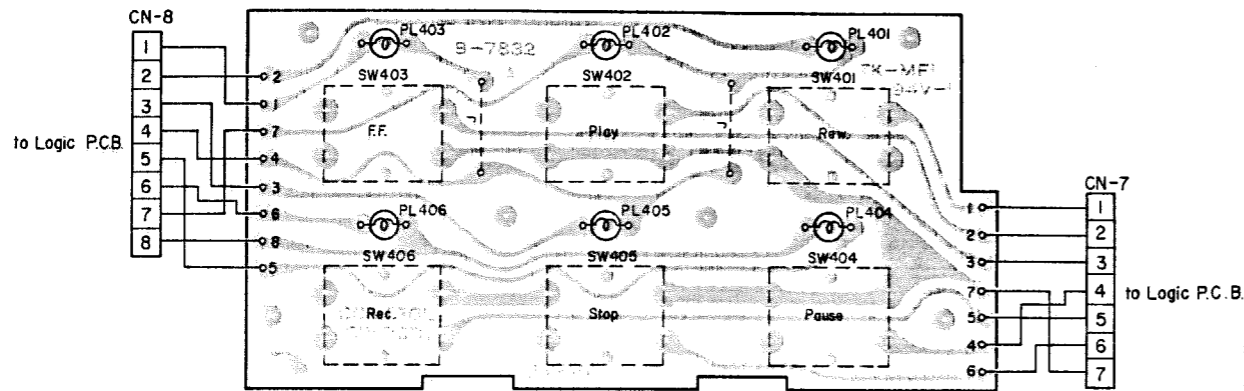


Fig. 7.11

7.12. Lamp P.C.B. A Ass'y

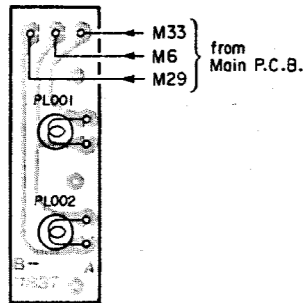


Fig. 7.12

7.13. Lamp P.C.B. B Ass'y

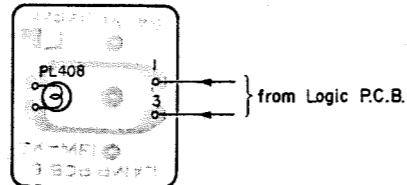


Fig. 7.13

7.14. Lamp P.C.B. C Ass'y

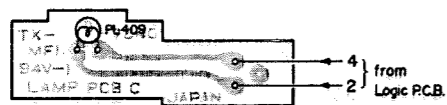


Fig. 7.14

7.15. Indicator P.C.B. A Ass'y

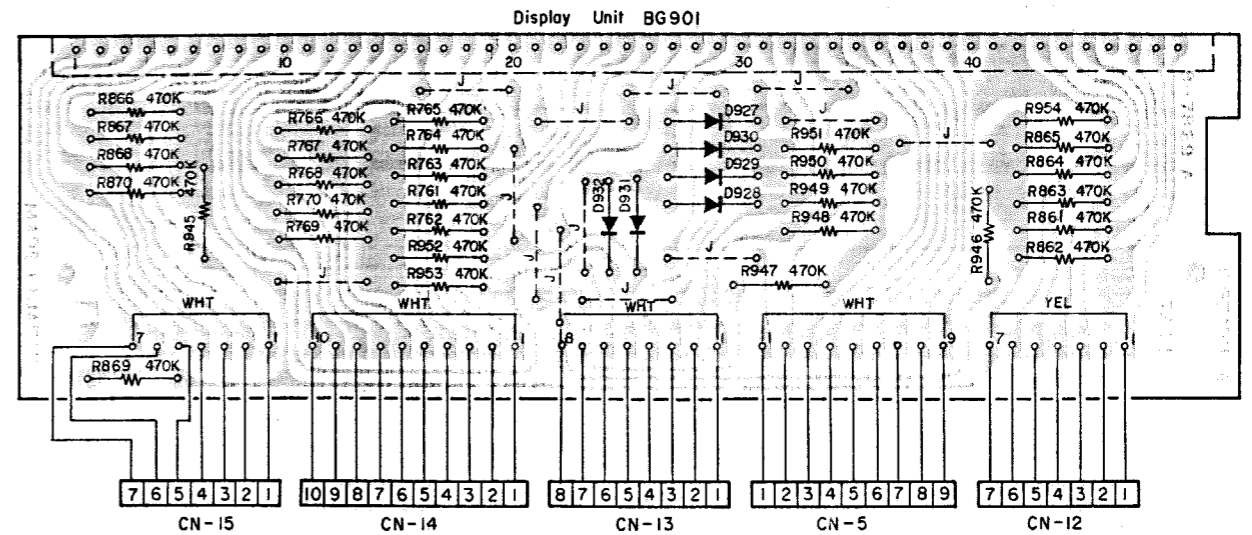


Fig. 7.15

Note: Diode is 1SS53 unless otherwise specified.

7.16. Indicator P.C.B. B Ass'y

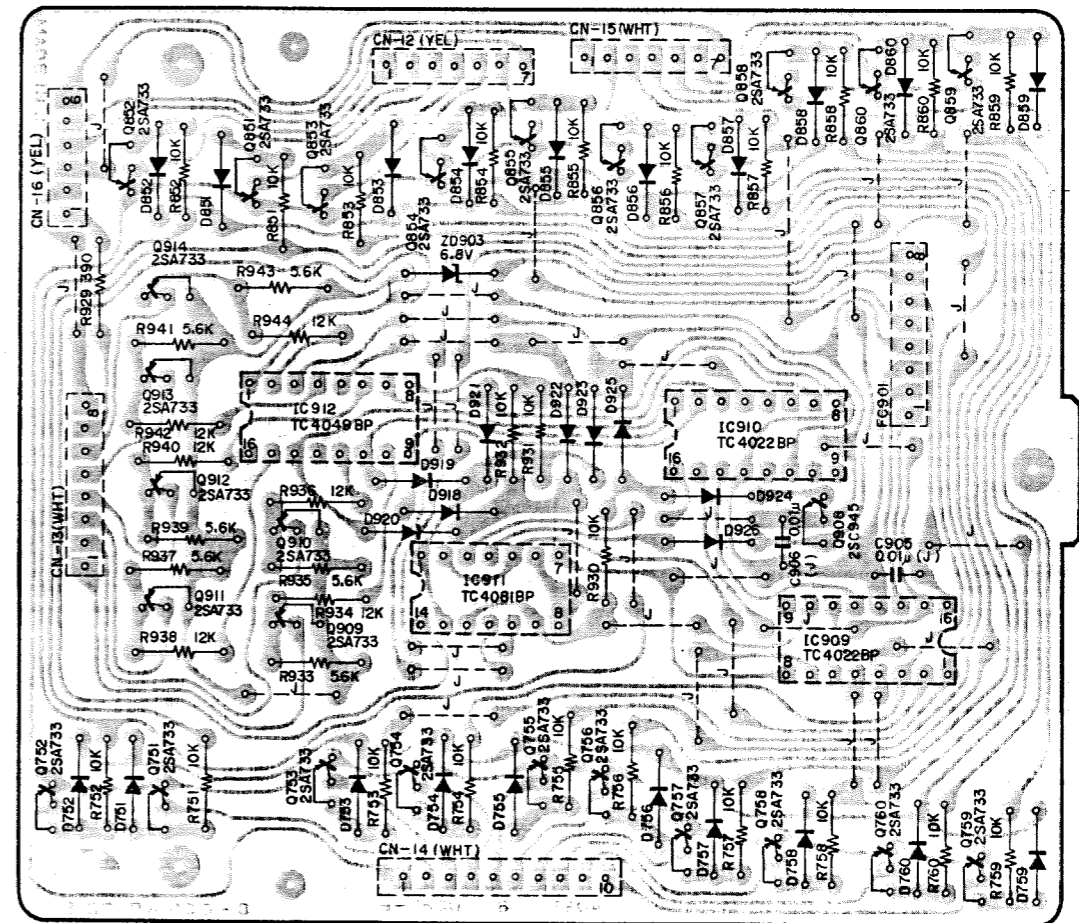


Fig. 7.16

Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA04071A	Control Switch P.C.B. Ass'y		BA04062A	Lamp P.C.B. B Ass'y
SW401-406	0B07832A	Control Switch P.C.B.	PL408	0B07838A	Lamp P.C.B. B
PL401-406	0B07219A	Semi-Switch		0B08586A	Lamp
CN7	0B08552A	Lamp	PL409	BA04063A	Lamp P.C.B. C Ass'y
CN8	0B08631B	7P-H Connector A Ass'y		0B07840A	Lamp P.C.B. C
	BA04072A	Lamp P.C.B. A Ass'y	0B08586A	Lamp	
PL001, 002	0B07837A	Lamp P.C.B. A			
	0B08552A	Lamp			12V 25mA

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	<b>BA04061A</b>	<b>Indicator P.C.B. A Ass'y</b>		<b>BA04066A</b>	<b>Indicator P.C.B. C Ass'y</b>
D927-932	0B07829A	Indicator P.C.B. A	IC901	0B07831B	Indicator P.C.B. C
R761-770	0B06181A	Silicon Diode 1SS53 (6 pcs.)	IC902	0B06144A	IC $\mu$ PD4066C
861-870	0B01684A	Carbon Resistor 470K ERD-25T J (30 pcs.)	IC903	0B06219A	IC TC4081BP
945-954			IC904	0B06215A	IC TC4049BP
BG901	0B08640A	Display Unit FIP50A13Y	IC905	0B06217A	IC RC4560D
CN5	0B08638A	9P-H Connector Ass'y	IC906	0B06224A	IC TC4023BP
CN12	0B08636A	7P-H Connector C Ass'y	IC907	0B06178A	IC $\mu$ PD4011C
CN13	0B08637A	8P-H Connector B Ass'y	IC908	0B06223A	IC TC4040BP
CN14	0B08639A	10P-H Connector Ass'y	Q901, 904	0B06216A	IC RC4556C
CN15	0B08635A	7P-H Connector B Ass'y	Q902, 903	0B06100A	Transistor 2SC945
	<b>BA04065A</b>	<b>Indicator P.C.B. B Ass'y</b>	Q905, 906	0B06013A	Transistor 2SA733
IC909, 910	0B07830B	Indicator P.C.B. B	907		
IC911	0B06218A	IC TC4022BP	ZD901	0B06230A	Zener Diode 5V
IC912	0B06219A	IC TC4081BP	ZD902	0B06233A	Zener Diode 10V
Q751-760	0B06215A	IC TC4049BP	D901-917	0B06181A	Silicon Diode 1SS53 (17 pcs.)
851-860	0B06013A	Transistor 2SA733 (26 pcs.)	VR901	0B07257A	Semi-fixed Volume 100K
909-914			R901, 907	0B01889A	Carbon Resistor 100K ERD-25T J
Q908	0B06100A	Transistor 2SC945	913, 914		
D751-760	0B06181A	Silicon Diode 1SS53 (29 pcs.)	915		
851-860			R902	0B05578A	Carbon Resistor 180 ERD-25T J
918-926			R903	0B01856A	Carbon Resistor 8.2K ERD-25T J
ZD903	0B06241A	Zener Diode 6.8V	R904	0B09299A	Metal Film Resistor 511K SN14K2E F
R751-760	0B01888A	Carbon Resistor 10K ERD-25T J (23 pcs.)	R905	0B09319A	Metal Film Resistor 36.5K SN14K2E F
851-860			R906	0B05509A	Carbon Resistor 33K ERD-25T J
930-932			R908, 916	0B01888A	Carbon Resistor 10K ERD-25T J
R929	0B05691A	Carbon Resistor 390 ERD-25T J	917, 920		
R933, 935	0B01887A	Carbon Resistor 5.6K ERD-25T J	921, 922		
937, 939			923, 924		
941, 943			R909	0B09300A	Metal Film Resistor 150K SN14K2E F
R934, 936	0B09263A	Carbon Resistor 12K ERD-25T J	R910	0B09298A	Metal Film Resistor 64.9K SN14K2E F
938, 940			R911, 912	0B05743A	Carbon Resistor 27K ERD-25T J
942, 944			919		
C905, 906	0B09290A	Ceramic Capacitor 0.01 $\mu$ 50V J	R918	0B05692A	Carbon Resistor 68K ERD-25T J
CN12, 15	0B08643A	7P-T Post	R925	0B01857A	Carbon Resistor 1K ERD-25T J
CN13	0B08644A	8P-T Post	R926	0B05698A	Carbon Resistor 1.5K ERD-25T J
CN14	0B08646A	10P-T Post	R927	0B01682A	Carbon Resistor 6.8K ERD-25T J
CN16	0B08642A	6P-T Post	R928	0B09263A	Carbon Resistor 12K ERD-25T J
FC901	0B05239A	8P Flat Cable 50mm	C901	0B09191A	PP Capacitor 4700P 100V G
			C902	0B09312A	PP Capacitor 0.01 $\mu$ 100V G
			C903	0B09322A	PP Capacitor 330P 100V G
			C904	0B09290A	Ceramic Capacitor 0.01 $\mu$ 50V J
			CN4	0B08633A	6P-H Connector B Ass'y
			CN6	0B08634A	6P-H Connector C Ass'y
			CN16	0B08632A	6P-H Connector A Ass'y

7.17. Indicator P.C.B. C Ass'y

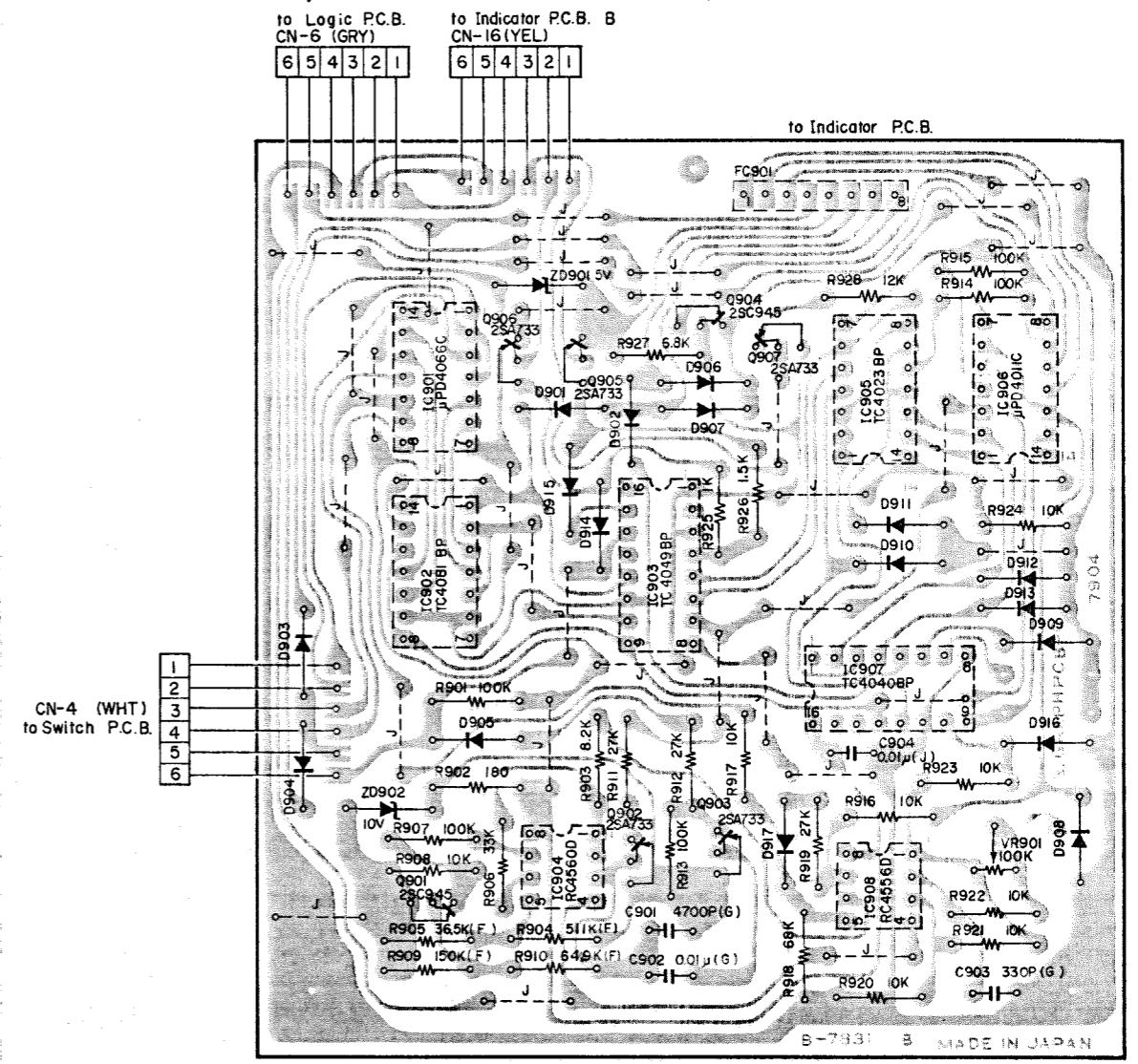


Fig. 7.17 Note: Diode is 1SS53 unless otherwise specified.



8. MECHANISM ASS'Y AND PARTS LIST

8.1. Synthesis

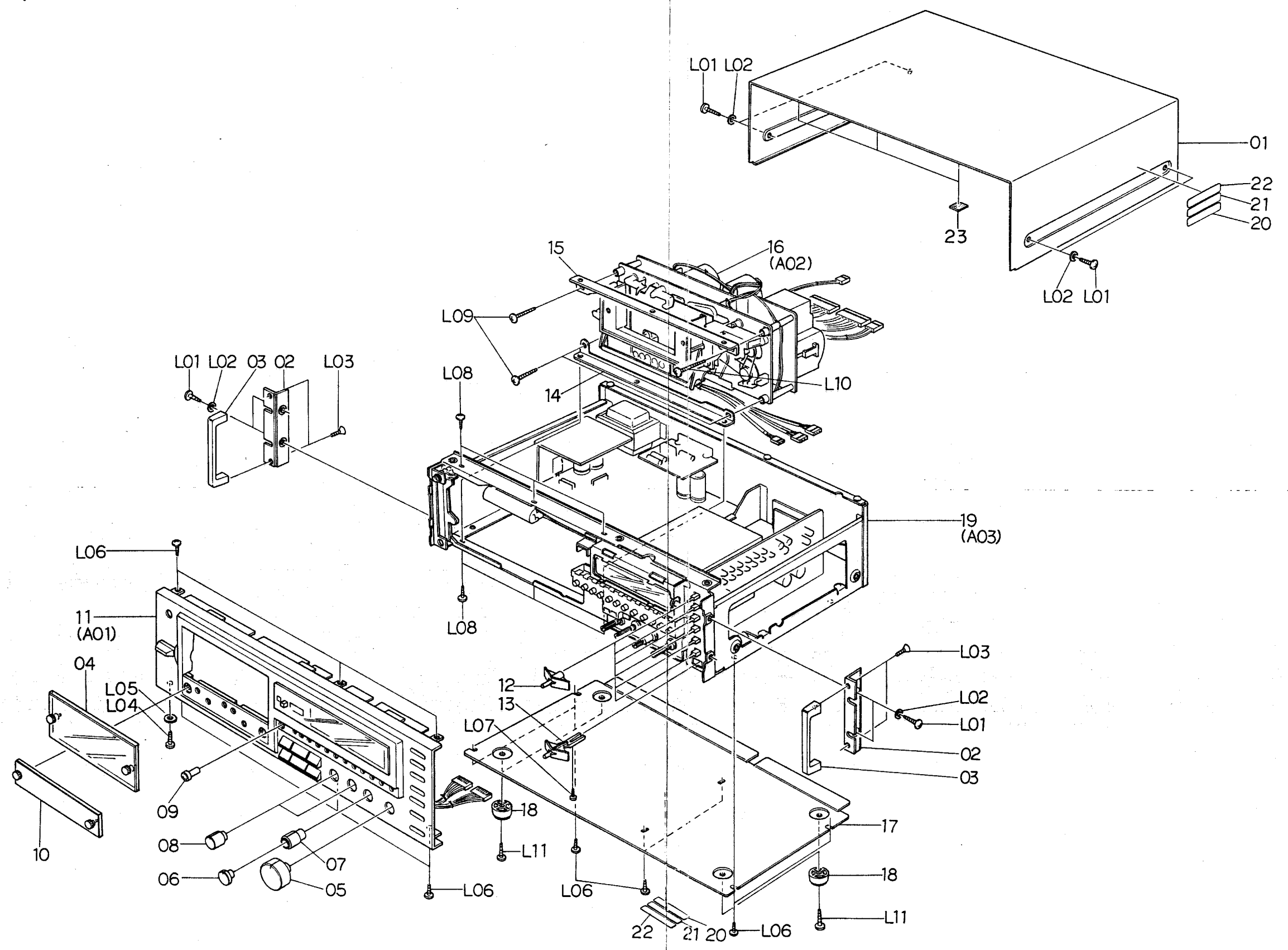


Fig. 8.1