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


Fig. 1.2 Rear View
29. Input Jacks
30. Output Jacks
31. DC Output Jack
32. Remote Control Socket
33. Voltage Selector
34. Power Cord

### 1.2. Voltage Selector

Voitage selector is installed on the rear panel for other versions of the Nakamichi 6802X.
This voltage selector can select either 120 V or $220-240 \mathrm{~V}$ 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'yl

### 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 FO5 (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 F 10 (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

### 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 FO5 (Control Button Ass'y)
(3) Remove F06, then disassemble $\mathrm{F07}$ (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 refer ring 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 F 10 (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).

## 220. 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 (Powe 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 (Cas sette Case Holder L Ass'y) by releasing the self-interlocking pin of the Damper Lock Arm and FO4 (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 FO5 (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 Moto Ass'y).
(3) Remove F06, then disassemble F07 (Reel Motor Ass'y).

Fig. 2.4



Fig. 2.5


Fig. 2.6


### 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).

### 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. 2.8


### 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 $90^{\circ}$ by pushing it, then disassemble F10 (Playback Head Ass'y).
(3) Turn F10 by $90^{\circ}$ 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 ( $20 \mathrm{~Hz}-200 \mathrm{kHz}$ )
(2) AC Millivolt Meter (with dB measures)
(3) Oscilloscope ( $\mathrm{DC}-5 \mathrm{MHz}$ )
(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 $Z \times$ 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 $N-680 Z X$ in cue mode) and check to insure that the pointer is in a range of " F ", " $P S^{\prime}$ ", 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 ( $10 \mathrm{k} \Omega$ ) 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:

| $\frac{\text { Mode }}{\text { Stop }}$ | Reference Voltage (Typical Value) |
| :--- | :--- |
| Fast (FF/REW) | $1.3 \mathrm{~V}-1.7 \mathrm{~V} \pm 0.25 \mathrm{~V}$ |
| Pause | $-2.8 \mathrm{~V} \square-2.6 \mathrm{~V} \pm 0.4 \mathrm{~V}$ |
| Play | $-5.4 \mathrm{~V}-$ |

(c) Resistors for Adjustment

| Mode | Ref. No. |  | Typical Value |
| :--- | :--- | ---: | ---: |
| Stop |  | $R 461$ |  |
| Fast (FF/REW) | $R 462$ |  | $4.32 \mathrm{k} \Omega(F)$ |
| Pause | $R 445$ |  | $287 \mathrm{k} \Omega(F)$ |
| Play | $R 443$ |  | $174 \mathrm{k} \Omega$ (F) |

(d) Adjustment Procedures

1) Press the Stop Switch to set the N-680ZX in stop mode.
Adjust the value of R461 to obtain $3.0 \mathrm{~V}( \pm 0.6 \mathrm{~V})$ 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 $1.7 \mathrm{~V}( \pm 0.25 \mathrm{~V})$ than in stop mode.
3) Press the Pause Switch to set the N-680ZX in pause mode.
Adjust the value of R445 to obtain $-2.8 \mathrm{~V}(+0.4$, -0.15 V ) at the sliding contact of VR405.
4) Set the $N$ - $680 Z X$ in playback mode, then adjust the value of R443 so that the voltage of VR405 will become lower by $2.6 \mathrm{~V}( \pm 0.4 \mathrm{~V})$ 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 $-3.6 \mathrm{~V}( \pm 0.3 \mathrm{~V})$ when Reel Motor starts rotation.
(d) Observe the mute signal at the 0418 collector. Turn the Cam referring to above step (c) and check to insure that the voltage at the sliding contact of VR405 is $-3.8 \mathrm{~V}( \pm 0.3 \mathrm{~V})$ 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 $\overline{R e c}$. signal at the 0417 collector. Turn the Cam referring to above step (c) and adjust the value of R488 to obtain $-2.1 \mathrm{~V}( \pm 0.4 \mathrm{~V})$ at the sliding contact of VR405 when 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 $3,000 \mathrm{~Hz}$ 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 $3,000 \mathrm{~Hz}$ on the Frequency Counter.

CCW: Motor drives slowly.
CW: Motor drives fast.


Fig. 4.3
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 $\mathrm{N}-680 \mathrm{ZX}$.
(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

### 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.
(a) Load a Stroke Check Gauge M-9047 (DA09047A) in the N -6802X.
(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 -680ZX 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 Indicator 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 stroke adjuster assembled 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.


Fig. 4.7
(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.
(a) Load a Stroke Check Gauge M-9047 (DA09047A) in the $\mathrm{N}-680 \mathrm{ZX}$.
(b) Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark " $A$ " with your finger tip and then set the $N-680 Z X$ 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 till 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.
(1) Supply Tape Guide Height Adjustment
(a) Load an EH Stroke Check Gauge M-9042/M-9051 in the N -6802X.
(b) Set the N -6802X 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 $\mathrm{N}-680 \mathrm{ZX}$ 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 $\mathrm{N}-6802 \mathrm{X}$.
b) Set the $N-680 Z X$ 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 takeup 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 $\mathrm{N}-680 \mathrm{ZX}$ 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 $N-6802 \mathrm{X}$.
(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 (DA09051A) 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 $\mathrm{N}-6802 \mathrm{X}$.
(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
. . . . -
(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 $6 \mathrm{~g}-\mathrm{cm}$ to $10 \mathrm{~g}-\mathrm{cm}$, 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 $7 \mathrm{~g}-\mathrm{cm}$ to $9 \mathrm{~g}-\mathrm{cm}$ 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.
(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 $\mathrm{N}-680 \mathrm{ZX}$ 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 $\mathrm{N}-680 \mathrm{ZX}$ 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.


Fig. 4.15


Fig. 4.16
(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 $70 \mu$ s position and the Tape Switch to the SX position. Then set the $N-680 Z X$ 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 $15 \mathrm{kHz}(-20 \mathrm{~dB})$, then set the $\mathrm{N}-680 \mathrm{ZX}$ 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 $\mathrm{N}-680 \mathrm{ZX}$ 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):
a) Set the Tape Selector to the $15 / 16 \mathrm{ips}$ position.
b) Feed in $15 \mathrm{kHz}(-20 \mathrm{~dB})$, then set the $\mathrm{N}-6802 \mathrm{X}$ in record and play mode. Turn the RH Azimuth Alignment Screw until the outputs of both channels become maximum.
c) 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.
d) 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.
e) 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.
(i) After completion of the above adjustments, record 400 Hz tone to the same portion of both sides $A$ and B of the tape.
(j) 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.


Typical:Q65mm
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 M9048 (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
4.10. Tape Travelling Adjustment

The adjustment shall be made with a modified version of the current type EXII 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 cassette housing shall be kell proteced to avoid tilt. in the following procedures:
(1) An EXII C-90 Tape thus modified shall be loaded anto the $N$-680ZX
(2) Release the back-tension (rotate the Supply Reel and feed out some length of tape) and set the N -680ZX 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 played 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 ension 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 takeup torque may cause defective tape travelling.
The N-680ZX is intended to be an adjustment-free Model, however if the similar matters as above should be noted, please replace the Reel Hub Ass'y to obtain appropriate take-up torque.


Fig. 4.23

## .11. Flywheel Holder Adjustment

(1) Refer to Fig. 4.24.

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.


### 4.12. Lubrication

N -680ZX 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.,
in Japan.
We suggest you use the above or equivalent type. If unavailable please contact Kanto Chemicals Co., Ltd., 2-7 Kanda Suda-cho Chiyoda-ku, Tokyo 101 Japan.
(3) Silicon Oil \#3000CST

Air Damper Piston
Note: Excessive lubrication may cause defective damper action as the $0.2 \phi$ hole at the end of the cylinder may be filled with oil.

## 5. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT



Fig. 5


Fig. 6.3 3. FL Indicator Level and Dynamic Range


Fig. 6.4 3. FL Indicator Level and Dynamic Range


Fig. 6.5 7. Playback Level
8. Playback Frequency Response ( $1.7 / 8 \mathrm{ips}$ )
6.1. Adjustment and Measurement Instructions

Note: Electrical adjustment 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 Tapes (DA09006A and DA09049A) | Frequency Counter to OUTPUT Jacks | Playback | Speed Cal. P.C.B. <br> VR407 <br> VR408 | 1. Standard Speed ( $1.7 / 8 \mathrm{ips}$ ): <br> Adjust VR407 to obtain $3 \mathrm{kHz} \pm 0.5 \%$. <br> 2. Half-Speed ( $15 / 16 \mathrm{ips}$ ): <br> Adjust VR408 to obtain $3 \mathrm{kHz} \pm 0.5 \%$. |
| 2 | Tone Calibration | Test Tone 400 Hz | VTVM to TP101, TP201 on the Main P.C.B. | Monitor SW - Source Display SW - CAL | Main P.C.B. <br> VR301 <br> Switch P.C.B. <br> VR161 | 1. Set the Display Switch to CAL. <br> Turn output level control fully clockwise (maximum position). <br> 2. Adjust VR301 to obtain $100 \mathrm{mV} \pm 0.2 \mathrm{~dB}$ on the VTVM at TP201 (output will be $1 \mathrm{~V}(0 \mathrm{~dB})$ ). <br> 3. Adjust VR161 to obtain the same level as Right channel on the VTVM at TP101. |
| 3 | FL Indicator Level and Dynamic Range | $400 \mathrm{~Hz}(0 \mathrm{~dB} /-20 \mathrm{~dB})$ to INPUT Jacks | Frequency Counter to IC907-10 pin on the indicator P.C.B. C and <br> VTVM to TP101, TP201 on the Main P.C.B. | Monitor SW - Source <br> Display SW - VU or P. Hold | Indicator P.C.B. C VR901 <br> Switch P.C.B. <br> VR701, VR801 | 1. Remove the FL Indicator Ass'y from the Front Chassis, then disassemble the FL Indicator Ass'y itself. <br> 2. Adjust VR901 to obtain 25.6 kHz clock oscillation frequency on the Frequency Counter. <br> 3. Assemble the FL Indicator Ass'y, then instail it to the Front Chassis. <br> 4. Adjust the input level control to obtain 100 mV at TP101 (TP201) on the VTVM. <br> 5. Adjust VR701 (VR801) so that the FL level indicator displays 0 dB . <br> 6. Decrease input signats by 20 dB to obtain 10 mV at TP101 (TP201) on the VTVM, then adjust VR901 so that the FL level indicator displays -20 dB . <br> 7. Repeat steps 4 through 6 till satisfactory results are obtained. |
| 4 | MPX Filter | $19 \mathrm{kHz} \pm 100 \mathrm{~Hz}$ to INPUT Jacks | VTVM to OUTPUT Jacks | Monitor SW - Source <br> Dispiay SW - VU or P. Hold <br> Dolby NR SW -- OUT/MPX | Switch P.C.B. <br> L162, L262 | 1. Turn output level control fully clockwise (maximum position). <br> 2. Adjust input level control to obtain 1 V on the VTVM. <br> 3. Set the Dolby NR Switch to MPX position, then adjust L162 (L262) 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 <br> Monitor SW - Tape <br> Display SW - VU or P. Hold <br> Eq. $S W-70 \mu \mathrm{~s}$ <br> Dolby NR SW - OUT <br> Tape Speed SW-1-7/8 ips | 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 | Playback <br> Monitor SW - Tape <br> Display SW - VU or P. Hold <br> Eq. SW $-70 \mu \mathrm{~s}$ <br> Dolby NR SW - OUT <br> Tape Speed SW - 1-7/8 ips | Playback Head <br> Azimuth Alignment <br> Screw | Adjust the Playback Head Azimuth Alignment Screw to obtain maximum reading of both $L$ and $R$ channels on the VTVM. See "Playback Head Height Adjustment and Azimuth Alignment" in item 4.8. <br> 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 | $\begin{aligned} & \text { Main P.C.B. } \\ & \text { VR101, VR201 } \end{aligned}$ | Adjust VR101 (VR201) to obtain 100 mV on the VTVM or 0 dB on the FL level indicators. |
| 8 | Playback Frequency Response Adjustment at Standard Speed (1-7/8 ips) | 400 Hz Level Tape <br> (DA09005A) <br> 10 kHz PB Frequency <br> Response Tape (DA09003A) <br> 15 kHz PB Frequency <br> Response Tape (DA09002A) <br> 20 kHz PB Frequency <br> Response Tape (DA09001A) | VTVM to OUTPUT Jacks | Playback <br> Monitor SW - Tape <br> Display SW - VU or P. Hold <br> Eq. $S W-70 \mu \mathrm{~s}$ <br> Dolby NR SW - OUT <br> Tape Speed SW - 1-7/8 ips | Main P.C.B. <br> R112, R212 | 1. Load the 400 Hz level tape and play it back. Adjust the output level control to a certain level (for example 0 dB ). <br> 2. Load the $10 \mathrm{kHz}, 15 \mathrm{kHz}$ and 20 kHz PB frequency response tapes and adjust the playback head azimuth to give maximum levels on the VTVM with each tape. <br> Short R112 (R212) to obtain the following levels against 400 Hz level tape. Refer to Fig. 6.5. $\begin{aligned} & 10 \mathrm{kHz}:-20 \mathrm{~dB}-1 \mathrm{~dB} \text { to }+2 \mathrm{~dB} \\ & 15 \mathrm{kHz}:-20 \mathrm{~dB}-1 \mathrm{~dB} \text { to }+3 \mathrm{~dB} \\ & 20 \mathrm{kHz}:-20 \mathrm{~dB}-1 \mathrm{~dB} \text { to }+4 \mathrm{~dB} \end{aligned}$ <br> 3. Conduct step 6 "Playback Head Azimuth Alignment". <br> 4. If above is not sufficient, refer to "Playback Frequency Response Adjustment" in item 6.2. |


| STEP | ITEM | SIGNAL SOURCE | OUTPUT CONNECTION | MODE | ADJUSTMENT | REMARKS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 9 | Playback Frequency Response Check at HalfSpeed (15/16 ips) | 400 Hz Level Tape <br> (DA09005A) <br> 10 kHz PB Frequency <br> Response Tape (DA09003A) <br> 15 kHz PB Frequency <br> Response Tape (DA09002A) <br> 20 kHz PB Frequency <br> Response Tape (DA09001A) | VTVM to OUTPUT Jacks | Playback <br> Monitor SW - Tape <br> Display SW - VU or P. Hold <br> Eq. SW - $120 \mu \mathrm{~s}$ <br> Dolby NR SW - OUT <br> Tape Speed SW - 15/16 ips |  | 1. Load the 400 Hz level tape and play it back. Adjust the output level control to a certain level (for example 0 dB ). <br> 2. Load the $10 \mathrm{kHz}, 15 \mathrm{kHz}$ and 20 kHz PB frequency response tapes and adjust the playback head azimuth to give maximum levels on the VTVM with each tape. <br> Check to insure the following levels against 400 Hz level tape. <br> Output frequency will become half as shown in () as the tape speed is half. $\begin{aligned} & 10 \mathrm{kHz}:(5 \mathrm{kHz})-22 \mathrm{~dB}-3 \mathrm{~dB} \text { to } 0 \mathrm{~dB} \\ & 15 \mathrm{kHz}:(7.5 \mathrm{kHz})-22 \mathrm{~dB}-3 \mathrm{~dB} \text { to }+1 \mathrm{~dB} \\ & 20 \mathrm{kHz}:(10 \mathrm{kHz})-22 \mathrm{~dB}-3 \mathrm{~dB} \text { to }+2 \mathrm{~dB} \end{aligned}$ <br> 3. Conduct step 6 "Playback Head Azimuth Alignment". |
| 10 | Bias Oscillation <br> Frequency and Erase Current | Connect an additional $0.1 \Omega$ resistor in series to the Erase Head | VTVM and Frequency Counter across the additional $0.1 \Omega$ resistor | Record, Pause <br> Monitor SW - Source <br> Tape SW - ZX <br> Eq. SW - $70 \mu \mathrm{~s}$ <br> Dolby NR SW - OUT | $\begin{aligned} & \text { Main P.C.B. } \\ & \text { T301 } \\ & \text { R331, R330 } \end{aligned}$ | 1. Adjust T301 to obtain 105 kHz on the frequency counter. <br> 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 ). <br> If erase current is not sufficient, increase it by shorting R331 or R330. <br> 3. After completion of the erase current adjustment, recheck the bias oscillation frequency. |
| 11 | Record Amplifier Equalizer | $23 \mathrm{kHz}(-20 \mathrm{~dB})$ to INPUT Jacks | VTVM to CN2-1, CN2-3 on the Main P.C.B. | Record, Pause <br> Monitor SW - Source <br> Display SW - VU or P. Hold <br> Tape SW-ZX <br> Eq. SW $-70 \mu \mathrm{~s}$ <br> Dolby NR SW - OUT <br> Tape Speed SW-1-7/8 ips | $\begin{aligned} & \text { Main P.C.B. } \\ & \text { L102, L202 } \end{aligned}$ | 1. Remove the bias-cut-jumper from the dip side of the Main P.C.B. <br> 2. Adjust L102 (L202) to obtain peak reading at 23 kHz on the VTVM. <br> 3. Re-solder the bias-cut-jumper. |
| 12 | Bias Trap <br> (Record Amp.) | Remove input signals | Same as above | Same as above | Main P.C.B. L103, L203 | Adjust L103 (L203) to obtain maximum reading on the VTVM. |
| 13 | Bias Trap <br> (Playback Amp.) | Remove input signals | VTVM to OUTPUT Jacks | Same as above | $\begin{aligned} & \text { Main P.C.B. } \\ & \text { L101, L201 } \end{aligned}$ | Adjust L101 (L201) to obtain minimum reading on the VTVM. |



Fig. 6.6


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


Fig. 6.8 13. Bias Trap (Playback Amp.)



Fig. 6.10 14. Record Head Height and Azimuth


Fig. 6.11 14. Record Head Height and Azimuth

14. Record Head Height and Azimuth


Fig. 6.13 14. Record Head Height and Azimuth

| STEP | ITEM | SIGNAL SOURCE | OUTPUT CONNECTION | MODE | ADJUSTMENT | REMARKS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 14 | Record Head Height Adjustment and <br> Azimuth Alignment | Test Tone 400 Hz or $12.5 \mathrm{kHz}(-20 \mathrm{~dB})$ to INPUT Jacks | VTVM to OUTPUT Jacks | Record, Playback <br> Monitor SW - Tape <br> Display SW - CAL/VU or P. Hold <br> Tape SW - SX <br> Eq. SW - $70 \mu \mathrm{~s}$ <br> Dolby NR SW - OUT <br> Tape Speed SW - $1.7 / 8 \mathrm{ips} /$ <br> 15/16 ips | Head Height: <br> Record Head Height Adj. Screw <br> Azimuth Alignment: <br> Record Head Azimuth Alignment <br> Standard Speed (1-7/8 ips): Rec. Cal. P.C.B. (Level) VR183, VR283 <br> Switch P.C.B. (Bias) VR166, VR266 <br> Logic P.C.B. <br> VR404 <br> Auto Azimuth P.C.B. VR901 <br> Half-Speed (15/16 ips): Rec. CaI. P.C.B. (Level) VR184, VR284 <br> Switch P.C.B. (Bias) VR163, VR263 <br> Logic P.C.B. VR405 <br> Auto Azimuth P.C.B. VR902 | 1. In stop mode, turn the Azimuth Motor 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.) <br> Short both leads of capacitor C903 on the Auto Azimuth P.C.B. Ass'v with a jumper wire. <br> 2. Record Head Height Adjustment: <br> a. Set the Display Switch to CAL. Record signals on the reference $S X$ tape (DA09025A), then play it back. <br> b. Adjust the Record Head Height Adj. Screw to obtain maximum readings of both channels on the VTVM. <br> 3. Record Head Azimuth Alignment: <br> Perform the following procedures for both standard and half tape speeds. <br> a. Set the Tape Speed Selector to 1-7/8/15/16. <br> b. Set the Display Switch to CAL. Record signals on the reference SX tape (DA09025A), then play it back. <br> c. Adjust Record Cal. VR183(VR283)/VR184(VR284) to the center position. <br> d. Adjust Bias VR166(VR266)/VR163(VR263) to obtain maximum reading on the VTVM. <br> e. Adjust Record Cal. VR183(VR283)/VR184(VR284) to obtain the same reading as the source monitor level on the FL level indicator. <br> f. Set the Display Switch to VU or P. Hold, then feed in $12.5 \mathrm{kHz}(-20$ $d B$ ). Record signals on the reference $S X$ tape (DA09025A), then play it back. <br> g. Adjust the Record Head Azimuth Alignment Screw to obtain maximum readings of both channels on the VTVM. <br> h. Adjust finely VR166(VR266)/VR163(VR263) to obtain the same reading as the source monitor level on the VTVM. <br> i. Repeat above substeps 2 and 3 one or two times to obtain optimum performance. <br> j. Set the Display Switch to CAL. Record signals on the reference $S X$ tape (DA09025A), then play it back. <br> k. Adjust VR404/VR405 so that the cursors are coincident with the rightmost edges of the main displays on the FL level indicators. <br> I. Adjust VR901/VR902 so that the Azimuth Motor stops its rotation. <br> 4. After completion of above steps, mount the Azimuth Alignment Wire on the Azimuth Alignment Motor Ass'y. <br> Remove the shorting jumper wire from C903 on the Auto Azimuth P.C.B. Ass'y. <br> 5. Check the Auto Azimuth Alignment function as follows for both standard and half tape speeds: <br> a. Set the Tape Speed Selector to 1-7/8/15/16. <br> b. Set the Display Switch to VU or P. Hold. <br> c. Load a reference tape, then depress the Record Button and Play Button simultaneousiy to start recording. <br> d. Change the Display Switch to the CAL. position and check to insure that the play lamp will keep flashing. <br> e. Set the Display Switch to VU or P. Hold, then feed in $12.5 \mathrm{kHz}(-20$ dB). Record signals on the reference SX tape (DA09025A), then play it back. <br> f. Check to insure that the playback level is the same as the source monitor level for both channels. <br> g. If above is insured, the Auto Azimuth Alignment function is accurate. |


| STEP | ITEM | SIGNAL SOURCE | OUTPUT CONNECTION | MODE | ADJUSTMENT | REMARKS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 15 | Record Head Azimuth Phase Adjustment | Test Tone 400 Hz and <br> $15 \mathrm{kHz}(-20 \mathrm{~dB})$ to INPUT Jacks | VTVM to OUTPUT Jacks | Record, Playback <br> Monitor SW - Tape <br> Dispiay SW - CAL/VU or P. Hold <br> Tape SW - ZX <br> Eq. SW - $70 \mu \mathrm{~s}$ <br> Dolby NR SW - OUT <br> Tape Speed SW - 1-7/8 ips/ <br> 15/16 ips | Standard Speed <br> (1.7/8 ips): <br> Rec. Cal, P.C.B. <br> (Level) <br> VR181, VR281 <br> Switch P.C.B. (Bias) <br> VR167, VR267 <br> Logic P.C.B. <br> VR404 <br> Half-Speed (15/16 ips): <br> Rec. Cal. P.C.B. <br> (Level) <br> VR182, VR282 <br> Switch P.C.B. (Bias) VR164, VR264 <br> Logic P.C.B. VR405 | 1. Step 14 " Record Head Azimuth Alignment" should be completely performed. <br> 2. Perform the following adjustment procedures first at standard tape speed, then at haif tape speed. <br> a. Set VR405 to the center position. <br> b. Set the Tape Speed Selector to 1-7/8/15/16. <br> c. Set the Display Switch to CAL. <br> d. Record signals on the reference ZX tape (DA09037A), then play it back. <br> e. Adjust Record Cal. VR181(VR281)/VR182(VR282) to the center position. <br> f. Adjust Bias VR167(VR267)/VR164(VR264) to obtain maximum reading on the VTVM. <br> g. Set the Display Switch to VU or P. Hold, then feed in $15 \mathrm{kHz}(-20 \mathrm{~dB})$. <br> h. Record signals on the reference ZX tape (DA09037A), then play it back. <br> i. Adjust Record Head Azimuth Alignment Screw to obtain maximum reading on the VTVM, while adjust Bias VR167(VR267)/VR164 (VR264) to obtain $-20 \mathrm{~dB} \pm 0 \mathrm{~dB}$ on the VTVM. <br> j. Set the Display Switch to CAL. <br> k. Adjust VR404/VR405 so that the azimuth cursors are coincident with the rightmost edges of the main displays on the FL level indicators. |
| 16 | Record Level Calibration <br> and <br> Recording Bias Current <br> Adjustment | Test Tone 400 Hz or $400 \mathrm{~Hz}(0 \mathrm{~dB})$ and $12.5 \mathrm{kHz} / 15 \mathrm{kHz}(-20 \mathrm{~dB})$ to INPUT Jacks | VTVM and Distortion Meter to OUTPUT Jacks | Standard Speed (1-7/8 ips: : <br> Record, Playback <br> Monitor SW - Tape <br> Display SW - CALIVU or P. Hold <br> Tape SW - ZX/SX/EX <br> Eq. $\mathrm{SW}-70 \mu \mathrm{~s}(\mathrm{ZX} / \mathrm{SX})$ <br> $120 \mu \mathrm{~s}$ (EX) <br> Dolby NR SW - OLT <br> Tape Speed SW - 1-7/8 ;ps <br> Half-Speed (15/16 ips): <br> Record, Playback <br> Monitor SW - Tape <br> Display SW - CAL/VU or P. Hold <br> Tape SW - ZX/SX/EX <br> Eq. SW - $120 \mu \mathrm{~s}$ <br> Dolby NR SW - OUT <br> Tape Speed SW - 15/16 ips | Standard Speed (1-7/8 ips): <br> Rec. Cal. P.C.b. (Level) <br> ZX: VR181, VR281 <br> SX: VR183, VR283 <br> EX: VR185, VR285 <br> Switch P.C.B. (Bias) <br> ZX: VR167, VR267 <br> SX: VR166, VR266 <br> EX: VR165, VR265 <br> Half-Speed (15/16 ips): Rec. Cal. P.C.B. (Level) <br> ZX: VR182, VR282 SX: VR184, VR284 EX: VR186, VR286 <br> Switch P.C.B. (Bias) ZX: VR164, VR264 EX: VR162, VR262 | For each tape to be used, perform the Auto Azimuth Alignment operation by depressing Record and Play Buttons simultaneously after setting the Display Switch to CAL. <br> To minimize the influence of interference between each VR, adjustment should be made in the order of ZX, SX and EX. In each tape position, adjust first the following steps at tape speed $1-7 / 8 \mathrm{ips}$, then perform at tape speed $15 / 16$ ips. After that re-check the performance at tape speeds $1-7 / 8$ ips and $15 / 16$ ips. If satisfactory results are not obtained, re-adjustment at tape speed 1-7/8 ips and $15 / 16$ ips will be required. After completion of adjustment for each tape, re-check the performance. <br> 1. Set the Tape Speed Switch to $1-7 / 8 / 15 / 16$. <br> 2. Set the Display Switch to CAL. <br> 3. Record signals on the reference $Z X$ tape (DA09037A), $S X$ tape (DA09025A), or EXII tape (DA09021A), then play it back. <br> 4. Adjust Record Cal. VR181(VR281)/VR182(VR282) (for ZX), VR183 (VR283)/VR184(VR284) (for SX), or VR185(VR285)/VR186(VR286) (for EXII) to the center position. <br> 5. Adjust Bias VR167(VR267)/VR164(VR264) (for ZX), VR166(VR266)/ VR163(VR263) (for SX), or VR165(VR265)/VR162(VR262) (for EXII) to obtain maximum reading on the VTVM. <br> 6. Set the Display Switch to VU or P. Hold, then feed in $15 \mathrm{kHz}(-20 \mathrm{~dB})$ (for ZX ), or $12.5 \mathrm{kHz}(-20 \mathrm{~dB})$ (for $S X$ and EXII) <br> 7. Adjust finely VR167(VR267)/VR164(VR264) (for ZX), VR166(VR266)/ VR163(VR263) (for SX), or VR165(VR265)/VR162(VR262) (for EXII) to obtain the same reading as source monitor level on the VTVM. <br> 8. Set the Display Switch to CAL. <br> 9. Adjust Record Cai. VR181(VR281)/VR182(VR282) (for ZX), VR183 (VR283)/VR184(VR284) (for SX), or VR185(VR285)/VR186(VR186) (for EXII) to obtain 0 dB on the FL level indicators. <br> 10. Repeat 6 through 9 as above two or three times to obtain optimum performance. <br> 11. Check whether the total harmonic distortion (T.H.D.) is less than $0.8 \%$ / $1.5 \%$ (for ZX ), or $1.0 \% / 2.0 \%$ (for SX and EXII). <br> Note: Typical bias current <br> $\begin{array}{ll}\text { ZX: } & \text { approx. } 3.4 \mathrm{~mA} \\ \text { SX: } & \text { approx. } 1.5 \mathrm{~mA} \\ \text { EXII: } & \text { approx. } 0.9 \mathrm{~mA}\end{array}$ |


| STEP | ITEM | SIGNAL SOURCE | OUTPUT CONNECTION | MODE | ADJUSTMENT | REMARKS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 17 | Overall <br> Frequency Response at Tape Speed 1-7/8 ips | $400 \mathrm{~Hz}(0 \mathrm{~dB})$ and 10 Hz to $22 \mathrm{kHz}(-20 \mathrm{~dB})$ to INPUT Jacks | VTVM and Distortion Meter to OUTPUT Jacks | Record, Playback <br> Monitor SW - Source/Tape <br> Display SW - VU or P. Hold <br> Tape SW - EX/SX/ZX <br> Eq. SW - $120 \mu \mathrm{~s}$ (EX) $70 \mu \mathrm{~s}(\mathrm{SX} / \mathrm{ZX})$ <br> Dolby NR SW - OUT <br> Tape Speed SW - 1-7/8 ips | $\begin{aligned} & \text { Main P.C.B. } \\ & \text { L102, L202 } \end{aligned}$ | For each tape to be used, perform the Auto Azimuth Alignment operation by depressing Record and Play Buttons simultaneously after setting the Display Switch to CAL. <br> 1. Set the Monitor Switch to Source. <br> 2. Feed in $400 \mathrm{~Hz}(0 \mathrm{~dB})$ and adjust input level controls to obtain 0 dB on the FL level indicators. <br> 3. Switch the Generator output level to -20 dB . <br> 4. Set the Monitor Switch to Tape, then record and play it back. <br> 5. Feed in 10 Hz to $22 \mathrm{kHz}(-20 \mathrm{~dB})$, and check to insure if the output levels are within $-20 \mathrm{~dB} \pm 3 \mathrm{~dB}$. <br> 6. If above is not sufficient, adjust L102 (L202) to obtain approx. -20 dB on the VTVM. <br> 7. Conduct step 16 "Record Level Caiibration and Recording Bias Current Adjustment". <br> 8. If above is not sufficient, precise re-adjustment of step 8 "Playback Frequency Response", replacement of Playback Head or Record Head, or check on item 4.10 "Tape Travelling Adjustment" will be required. |
| 18 | Overall <br> Frequency Response at Tape Speed 15/16 ips | $400 \mathrm{~Hz}(0 \mathrm{~dB})$ and 10 Hz <br> to $15 \mathrm{kHz}(-20 \mathrm{~dB})$ to <br> INPUT Jacks | Same as above | Record, Playback <br> Monitor SW - Source/Tape <br> Display SW - VU or P. Hold <br> Tape SW - EX/SX/ZX <br> Eq. SW-120 $\mu$ s (EX) <br> $70 \mu \mathrm{~s}(\mathrm{SX} / \mathrm{ZX})$ <br> Dolby NR SW - OUT <br> Tape Speed SW - 15/16 ips | $\begin{aligned} & \text { Main P.C.B. } \\ & \text { L102, L202 } \end{aligned}$ | For each tape to be used, perform the Auto Azimuth Alignment operation by depressing Record and Play Buttons simultaneously after setting the Display Switch to CAL. <br> 1. Set the Monitor Switch to Source. <br> 2. Feed in $400 \mathrm{~Hz}(0 \mathrm{~dB})$ and adjust input level controls to obtain 0 dB on the FL level indicators. <br> 3. Switch the Generator output level to -20 dB . <br> 4. Set the Monitor Switch to Tape, then record and play it back. <br> 5. Feed in 10 Hz to $15 \mathrm{kHz}(-20 \mathrm{~dB})$, and check to insure if the output levels are within $-20 \mathrm{~dB} \pm 3 \mathrm{~dB}$. <br> 6. If above is not sufficient, adjust L102 (L202) to obtain approx. -20 dB on the VTVM. <br> 7. Conduct step 16 "Record Level Calibration and Recording Bias Current Adjustment". <br> 8. If above is not sufficient, precise re-adjustment of step 8 "Playback Frequency Response"', replacement of Playback Head or Record Head, or check on item 4.10 "Tape Travelling Adjustment" will be required. |



| STEP | ITEM | SIGNAL SOURCE | OUTPUT CONNECTION | MODE | ADJUSTMENT | REMARKS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 19 | Crosstalk | 1 kHz to INPUT Jacks | 1 kHz Band Pass Filter, VTVM to OUTPUT Jacks | Record and Playback <br> Monitor SW - Tape <br> Display SW - VU or F. Hold <br> Tape SW - ZX <br> Eq. SW $-70 \mu \mathrm{~s}$ <br> Dolby NR SW - OUT <br> Tape Speed SW - 1-7,8 ips |  | 1. Erase the tape with bulk eraser. <br> 2. Adjust input level controls to obtain 0 dB on the FL level indicators, and record the signals on the reference tape. <br> 3. Turn the cassette tape the other way round and play it back. <br> 4. Measure the difference between 2 and 3 . |
| 20 | Channel Separation | 1 kHz to INPUT Jacks | Same as above | Same as above |  | 1. Erase the tape with bulk eraser. <br> 2. Adjust Lch (Rch) input level control to obtain 0 dB on the FL level indicators, and close Rch (Lch) input level control. <br> 3. Record and play it back, then measure the Rch (Lch) level. |
| 21 | Erasure | 1 kHz to INPUT Jacks | 1 kHz Band Pass Filter, VTVM to OUTPUT Jacks | Same as above |  | 1. Erase the tape with bulk eraser. <br> 2. Adjust input level controls to obtain 0 dB on the FL level indicators, and record the signals on the reference tape. <br> 3. Rewind the tape then close input level controls. <br> 4. Record and play it back, then measure the difference between 2 and 3 . |
| 22 | Signal to Noise Ratio | 400 Hz to INPUT Jacks | VTVM and Distortion Meter to OUTPUT Jacks | Record and Playback <br> Monitor SW - Tape <br> Display SW - VU or F. Hoid <br> Tape SW - ZX <br> Eq. $s W-70 \mu \mathrm{~s}$ <br> Dolby NR SW - MPX |  | 1. Feed in 400 Hz and record, and play it back. <br> 2. Adjust the input level controls to obtain $3 \%$ total harmonic distortion in playback mode. <br> 3. Close the input level controis then record. <br> 4. After rewound, play back and check the output level difference between 2 and 3. <br> Note: The filter of IHF-A curve shall be used in the measurements. |
| 23 | Total Harmonic Distortion | 400 Hz to INPUT Jacks | Distortion Meter to OUTPUT Jacks | Record and Playback <br> Monitor SW - Tape <br> Display SW - VU or P. Hold <br> Tape SW - EX/SX/ZX <br> Eq. $S W-120 \mu \mathrm{~s}$ (EX) $70 \mu \mathrm{~s}(S X: Z X)$ <br> Dolby NR SW - OUT <br> Tape Speed SW - $1.7 / 8 \mathrm{ips} /$ 15:16 ips | - ....- - | Tape Speed 1-7/8 ips: <br> 1. Adjust input level controls to obtain 0 dB on the FL level indicators. <br> 2. Record and play it back. <br> 3. Read the distortion meter and check to insure that the distortion is less than $0.8 \%$ for ZX tape and $1.0 \%$ for SX and EXII tapes. <br> Tape Speed 15/16 ips: <br> 1. Adjust input level controis to obtain 0 dB on the FL level indicators. <br> 2. Record and play it back. <br> 3. Read the distortion meter and check to insure that the distortion is less than $1.5 \%$ for ZX tape and $2.0 \%$ for SX and EXII tapes. |
| 24 | Wow/Flutter | 3 kHz Speed and Wow/Flutter Tapes (DA09006A and DA09049A) | Wow/Fiutter Meter to OUTPUT Jacks | Playback <br> Monitor SW - Tape <br> Display SW - VU or ?. Hold <br> Eq. SW $-70 \mu \mathrm{~s}$ <br> Tape Speed SW-1-7.8 / 15/16 ips |  | Play back and read the wow/flutter meter. |

6.2. Frequency Response Adjustment at Standard Speed (1-7/8 ips)
(1) Playback Frequency Response Adjustment at Standard Speed (1-7/8 ips)
ard Speed (1.7/8 ips)
Refer to Figs. $6.19-6.21$.
(a) Level Adjustment (for middle frequency response) This adjustment will be required when playback level is not sufficient at 10 kHz PB Frequency Response Tape (refer to step 8 in "6.1. Adjustment and Measurement Instructions.").
Playback equalization level can be varied by the modification of R108 (R208) and R109 (R209).
Following are the details for level modification:

| Approx. +1 dB | R109 | (R209): 3.0K |
| :---: | :---: | :---: |
|  | R108 | (R208): 4.3 K |
| 0 dB | R109 | (R209): 3.3 K |
|  | R108 | (R208): 4.7 K |
| Approx. -1 dB | .R109 | (R209): 3.6K |
|  | R108 | (R208): 5.1 K |

## (b) Peaking Adjustment (for high frequency response)

 This adjustment will be required when playback level is not sufficient at 20 kHz PB Frequency Response Tape (refer to step 8 in "6.1. Adjustment and Measurement Instructions").Peaking portion compensates the gap loss of the playback head.
Peaking level is varied by the short circuit of R112 (R212) as illustrated in Fig. 6.20.



Fig. 6.20 Playback Equalization Curve (1-7/8 ips)

(2) Record Current Frequency Response Adjustment at Standard Speed (1-7/8 ips)
Record eq. peaking is adjusted for compensating the overall frequency response when playback frequency response is completed.
Normally however, peaking frequency is pre-adjusted to approx. 23 kHz in record mode. See Fig. 6.22
(a) For ZX Tape

1) Feed in $400 \mathrm{~Hz}(0 \mathrm{~dB})$, then record and play it back. Adjust bias current by VR167 (VR267) on the Switch P.C.B. to obtain a $0.8 \%$ distortion.
2) Feed in 10 kHz and $400 \mathrm{~Hz}(-20 \mathrm{~dB})$ then record and play it back.
Check the difference of the levels between 10 kHz and 400 Hz , and mount an additional capacitor in parallel with the C179 (C279) on the Switch P.C.B. from the dip side of the printed circuit board depending upon the difference of the levels against 400 Hz . See Fig. 6.23.

|  | Add |  |
| :---: | :---: | :---: |
| 0 | 0 | Total |
| -1 dB | 380 pF |  |
| -2 dB | 680 pF | 1010 pF |
|  |  | 1360 pF |

3) Feed in $22 \mathrm{kHz}(-20 \mathrm{~dB})$ then record and play it back.
Adjust record peaking coil L102 (L202) to obtain flat overall frequency response.
(b) For SX Tape
4) Feed in 15 kHz and $400 \mathrm{~Hz}(-20 \mathrm{~dB})$, then record and play it back.
Adjust bias current by VR166 (VR266) on the Switch P.C.B. to obtain flat overall frequency response.
5) Feed in 22 kHz and $400 \mathrm{~Hz}(-20 \mathrm{~dB})$, then record and play it back.
And check to insure that the overall frequency response is flat.
(c) For EX Tape
6) Feed in 15 kHz and $400 \mathrm{~Hz}(-20 \mathrm{~dB})$, then record and play it back.
Adjust bias current by VR165 (VR265) on the Switch P.C.B. to obtain flat overall frequency response.
7) Feed in 22 kHz and $400 \mathrm{~Hz}(-20 \mathrm{~dB})$, then record and play it back.
And check to insure that the overall frequency response is flat.
6.3. Dolby NR Circuit Check

Dolby NR circuit incorporates a Dolby B-Type NR IC ( $\mu \mathrm{A} 7300 \mathrm{PC}$ ) which has no adjustment point.
Perform the following checks and make sure that the IC perates accurately ie accuracy of frequency respor through IC.
(1) Playback Dolby NR Circuit (IC101 (IC201) on the Main P.C.B.)
Signal Source: $\quad 5 \mathrm{kHz}$ to No. 9 pin of IC101 and IC201
Output Connection: VTVM to the test points TP101 and TP201 on the Main P.C.B.

Mode: Stop Monitor SW - Tape
Dolby NR SW - OUT/IN
(a) Connect a VTVM to TP101 (TP201) on the Main P.C.B.

Feed in 5 kHz to No. 9 of IC101 (IC201) and adjust the generator output control so that the VTVM may read 7.6 mV at each test point.
(b) Set the Dolby NR Switch to IN. Check to insure that the level at TP101 (TP201) is $3 \mathrm{mV} \pm 1.5 \mathrm{~dB}$.
(2) Record Dolby NR Circuit (IC161 (IC261) on the Switch P.C.B.)
Signal Source: $\quad 5 \mathrm{kHz}$ to INPUT Jacks
Output Connection: VTVM to the output side of C178 (C278) on the Switch P.C.B.

Mode:
Stop
Monitor SW - Source
(a) Connect a VTVM to TP101 (TP201) on the Main P.C.B.

Feed in 5 kHz and adjust the input level so that the VTVM may read $100 \mathrm{mV}(0 \mathrm{~dB})$ at each test point $F L$ level indicators will indicate 0 dB .
(b) Remove the VTVM from TP101 (TP201) and re connect it to the output side of C178 (C278). Check to insure that the VTVM indicates approx. 560 mV .
(c) Decrease the input level ( 0 dB ) by 20 dB or 30 dB . Check to insure that the level at output side of C178 (C278) corresponds to the following with Dolby NR Switch IN and OUT.

| Input Lovel | Copocior Output Lovel |  |  |
| :---: | :---: | :---: | :---: |
| (f=5 kHz) | Doby NR Out | Dolby NR IN | Difference befween in and OUT |
| -20 dB | -20 dB | -16.8 de $\pm 1.5 \mathrm{~dB}$ | $3.288 \pm 1.5 \mathrm{~dB}$ |
| -30 d8 | -30 d8 | $-21.8 \mathrm{~dB} \pm 1.5 \mathrm{~dB}$ | $8.2 \mathrm{~dB} \pm 1.588$ |

Note: Mounting diagram shows a dip side view of the printed circuit board.
7.1. Main P.C.B. Ass'y




Fig. 7.2
Note: Diode is 1SS53 unless otherwise specified.

7.4. Record Cal. P.C.B. B Ass'y




Fig. 7.5
Note: Diode is 1SS53 unless otherwise specified.

| Schematic Ref. No. | Part No. | Description |  | Schamatic Ref. No. | Part No. | Description |  |  | Schematic Ref. No. | Part No. | Description |  | $\begin{gathered} \text { Schematic } \\ \text { Ref. No. } \end{gathered}$ | Part No. | Description |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Logic P.C.B. Ass'y |  | R413, 466 | OB05509A | Carbon Resistor | 33K | ERD-25T J | C404 | OB05582A | Mylar Capacitor | 0.022 $\mu$ 50VJ | R544, 562 | 0801857A | Carbon Resistor | 1 K ERD-25TJ |
|  | BA04210A |  |  | 476,507 | 0B05615A |  |  |  | C407 | 0B00093A | Mylar Capacitor | 0.1 $\mu \mathrm{L}$ 5 V | R547, 549 | 0805671A | Carbon Resistor | 2.2M ERD-25T J |
|  |  |  |  | 514,607 |  | Carbon Resistor | 22K | ERD-25T J( 9 pcs.) | C408 | OB01405A | Electrolytic Capacito | tor $1 \mu$ 50V | R548 | 0805615A | Carbon Resistor | 22 K ERD-25T J |
|  | - Logic - |  |  | R414, 437 |  |  |  |  | C409 | OB09166A | Mylar Capacitor | 3300 P 50 V | R552, 553 | OB05776A | Carbon Resistor | 1 M ERD-25T J |
|  |  |  |  | 451-456 |  |  |  |  | C410 | OB00610A | Mylar Capacitor | 0.15 $\mu \mathrm{F} 0 \mathrm{~V}$ | 558 |  |  |  |
| IC401, 402 | 0806178A |  | $\mu \mathrm{PD} 4011 \mathrm{C}$ | 502 |  |  |  |  | C411,414 | OB01676A | Mylar Capacitor | $0.056 \mu \mathrm{~F} 0 \mathrm{~V}$ | R560 | 0B05625A | Carbon Resistor | 220K ERD-25TJ |
| 403 |  | IC |  | R415, 488 | 0809263A | Carbon Resistor 12 K ERD-25T J |  |  | C412,413 | OB09324A | Electrolytic Capacito | or 3.3 $\mu \mathrm{l}$ (6) | R565, 566 | 0B05676A | Carbon Resistor | 390 K ERD-25T J |
| IC404 | 0B06143A |  |  | R420, 471 | 0B09049A | Fail Safe Type Resistor |  |  |  |  | (LN) |  | R582-588 | 0809320A | Carbon Resistor | 820 K ERD-25TJ( 7 pcs.$)$ |
| IC405 | 0806124B | IC | RC4558D | 472 |  |  |  | ERD-14F J | C415, 422 | OB09223A | Electrolytic Capacitor $1 \mu \quad 50 V$ (LN) <br> Electrolytic Capacitor $4.7 \mu$ 16V (LN) |  |  |  |  |  |
| ${ }^{1} \mathrm{C} 406$ | 0806144A | IC ${ }^{\prime \prime}$ | $\mu \mathrm{PD} 4066 \mathrm{C}$ | R426, 504 | 0B01682A | Carbon Resistor | 6.8K | ERD-25T J | C416 | OB09173A |  |  | $\begin{aligned} & \text { R589 } \\ & \text { C429,430 } \end{aligned}$ | OB01684A | Carbon Resistor | 470K ERD-25TJ |
| IC407 | 0806192A | Regulator $+12 \mathrm{~V} \mu$ | $\mu \mathrm{A} 7812$ | R427, 428 | 0805776A | Carbon Resistor 1 | 1M | ERD-25TJ | C417 | 0809277A | Ceramic Capacitor 10P 50V J |  |  | 0809313A |  | or $100 \mu 50 \mathrm{~V}$ |
| IC408 | 0806193A | Regulator - $12 \mathrm{~V} \mu$ | $\mu$ - 7912 | 446, 515 |  |  |  |  | C418, 420 | 0805513A | Mylar Capacitor | $\begin{array}{ll}10 \mathrm{P} & 50 \mathrm{~V} \text { J } \\ 0.033 \mu & 50 \mathrm{~V}\end{array}$ | C431, 432 | OB05652A | Mylar Capacitor 4700 P 50 V J |  |
| -401, 405 | 0806100A | Transistor | 2SC945 (A) | 516 |  | Carbon Resistor 1 <br> Carbon Resistor 2 | $\begin{aligned} & 1.5 \mathrm{~K} \\ & 2.2 \mathrm{M} \end{aligned}$ |  | C 419 | OB01502A | Electrolytic Capacitor Electrolytic Capacitor | $\begin{array}{lll}\text { \% } 330 \mu & 16 \mathrm{~V} \\ \text { 2200 } & 16 \mathrm{~V}\end{array}$ | 436 | 0801405A | Electrolytic Capacitor $1 \mu .50 \mathrm{~V}$ |  |
| 406, 407 |  |  |  | R 431 | 0B05698A |  |  | ERD-25TJ | C423,424 | 0801406A |  |  |  |  |  |  |  |
| 408,409 |  |  |  | R432, 433 | 0B05671A |  |  | ERD-25TJ | 425 |  |  |  |  |  |  |  |
| 410,411 |  |  |  | 494, 498 |  |  |  |  | C426 | 0809374A | Electrolytic Capacitor | 6800ر 25 V | $\begin{array}{r} 446 \\ \mathrm{C} 434 \end{array}$ | OB01863A | Electrolytic Capacitor | or $3.3 \mu 50 \mathrm{~V}$ |
| 412,413 |  |  |  | 503, 509 |  |  |  |  | $\mathrm{C427}$ | 0805654A |  | Electrolytic Capacitor $2200 \mu 25 \mathrm{~V}$ |  |  | OB05557A | Mylar Capacitor Electrolytic Capacitor | $\begin{array}{ll}0.015 \mu & 50 \mathrm{VJ} \\ 0.47 \mu & 16 \mathrm{~V}\end{array}$ |
| 414,417 |  |  |  | R435 | 0805784A | Carbon Resistor | $\begin{aligned} & 560 \mathrm{~K} \\ & 220 \mathrm{~K} \end{aligned}$ | ERD-25TJ | C457 | 0809286A |  |  |  | C437 | 0809222A |  |  |
| 419,420 |  |  |  | R438, 439 | OB05625A | Carbon Resistor 22 |  |  | CN5, 11 | 0808645A | $\begin{aligned} & \text { Ceramic Capacitor } 470 \mathrm{P} 50 \mathrm{~V} \mathrm{~K} \\ & \text { 9P-T Post } \end{aligned}$ |  | Electrolytic Capacitor |  |  |  |  |
| 421,422 |  |  |  | 491 |  |  |  |  | CN6 | 0808642A | 9P-T Post <br> 6P-T Post |  | C438 |  |  |  |  |
| 423, 429 |  |  |  | R444 | 0B09367A | Metal Film Resistor |  |  | CN7 | 0808643A | 7P.T Po |  | $\begin{aligned} & \text { C439 } \\ & \text { C440, } 441 \end{aligned}$ | 0B09287A OB00610A | Ceramic Capacitor Mylar Capacitor | 680 P 50 V K $0.15 \mu$ 50 V J |  |
| 430,435 |  |  |  |  |  |  | 174K | SN14K2EF | CN8 | 0808644A | ${ }_{\text {8P-T Po }}$ |  |  | OB05583AOB09220A | Mylar Capacitor Electrolytic Capacito | $0.033 \mu 50 \mathrm{~V} \mathrm{~J}$ |  |
| 447 |  | Transistor |  | R445 | OB09366A | Metal Film Resistor | 287 K | SN14K2EF | CN9 | OB08653A | 3P-T Post |  | $\begin{aligned} & \mathrm{C} 440,441 \\ & \mathrm{C} 442,443 \end{aligned}$ |  |  | or $0.22 \mu 50 \mathrm{~V}$ |  |
| -402, 403 | OB06013A |  | 2SA733 | R459, 464 | OB01889A | Carbon Resistor 10 | 100K | ERD-25TJ | CN10 | 0808655A | 11P-T Post |  | C447 <br> C459 <br> C461 | OB09285A 0B09187A OB01180A | Ceramic Capacitor Electrolytic Capacitor Ceramic Capacitor | (LN) <br> 330P 50VK <br> $1 \mu 50 \mathrm{~V}$ (BP) <br> 330 P 100V |  |
| 404,415 |  |  |  | 493, 505 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 416, 418 |  |  |  | 510,511 |  |  |  |  |  | - RAMM - |  |  |  |  |  |  |  |  |  |
| 428,433 0424,426 |  |  |  | 523,525 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| O424,426 | 0806020A | Transistor 2 | ${ }^{2 S C 1096}$ | R461 | 0B09328A | Metal Film Resistor 9.1K SN14K2EF |  |  | IC409 | OB06127A | $\begin{array}{lll}\text { IC } & \text { RC4559D } \\ \text { IC } & \text { TC4049BP }\end{array}$ |  |  | 0B01180A | Ceramic Capacitor 330P 100V |  |  |
| 0425, 427 | 0806012A | Transistor 2 | 2 2SA634 | R463 | 0B09365A | Metal Film Resistor 4.32K SN14K2E F |  |  | IC410 | 0806215A |  |  |  | - Azimuth Datector - |  |  |  |
| 0432 | 0806069A | Transistor 2 | 2 28564 | R465 | 0B09340A | Metal Film Resistor 15K SN14K2EF |  |  | IC411 | 0806143 A | IC ${ }_{\text {IC }}$ |  |  |  |  |  |  |  |  |
| 0434 | 0806066A | Transistor 2 | 2 SD471 | R467 | 0B05743A | Carbon Resistor | 27K | ERD-25T J | IC412 | 0806214A | IC ..... TC4071BP |  | IC416 | OB06216A | IC $\quad \mu \mathrm{PC4556C}$ |  |  |
| 2D403, 404 | 0806231A | Zener Diode 1 | 11 V | R468, 469 | OB01856A | Carbon Resistor ${ }^{\text {c }}$ 8.2K ERD-25T J |  |  | IC413 | 0806213A | IC TC4013B |  | $\begin{aligned} & 0448,451 \\ & 0468,469 \end{aligned}$ | OB06100A |   2SC945 (L) <br> Transistor 2S  <br> Silicon Diode $15 S 53$  |  |  |
| D401-437 | 0801909A | Silicon Diode 151555 (43 pcs.) |  | R470 | 0B05578A | Carbon Resistor 180 ERD-25T J J <br> Carbon Resistor 3.3 K ERD-25T J J |  |  | IC414 | 0806212A | IC ! TC4510 |  |  | 0B06181A <br> OB09107A |  |  |  |  |
| 442-444 |  |  |  | R473,477 | 0B01681A |  |  |  | IC415 | 0806211A | $\begin{array}{\|ll\|}\text { IC } & \text { CC5022B } \\ \text { ITansistor } & \text { 2SA473 }\end{array}$ |  | $\begin{array}{\|l\|} \hline \text { D468, } 469 \\ \text { VR404, } 405 \end{array}$ |  | Silicon Diode 15553 <br> Semi-fixed Volume 500 K |  |  |
| 471,473 |  |  |  | 485 |  |  |  |  | 0431 | OB06060A |  |  | $\begin{array}{\|c\|} \text { R591, } 593 \\ 601 \end{array}$ | 0B09107A0B01889A | Semi-fixed Volume 500 K <br> Carbon Resistor 100 K ERD-25TJ J |  |  |
| 476 |  |  |  | R478, 487 | 0B01854A | Carbon Resistor | 39K | ERD-25T J | 0436 | OB06070A |  | $2 \mathrm{SC1636}$ |  |  |  |  |  |
| $\text { D438, } 439$ D470 | $\begin{array}{\|l\|} \hline 0806109 A \\ \text { OBO6183A } \end{array}$ | Silicon Diode Diode Bridge Semi-fixed Volume Semi-fixed Volume Carbon Resistor | GP08B <br> RB151 <br> 100K <br> 5K <br> 330K ERD-25T J | R479,490 506,521 | 0801888A | Carbon Resistor 10 | 10K | ERD-25TJ | ${ }^{0437}$ | OB06100A | Transistor $\quad 2 \mathrm{SC945}$ (L) |  | $\begin{gathered} \text { R592, } 594 \\ 609 \end{gathered}$ | 0B05625A | Carbon Resistor 220K ERD-25T J |  |  |
| VR401 | 0B03832A |  |  | R480, 499 | 0B05508A | bon |  |  | z 2401 | 0806235A | Transistor 2SA733 (9 pcs.) <br> Zener Diode 39V  <br> Zener Diode 5 V  |  | $\begin{gathered} 609 \\ \text { R595,596 } \\ 610 \end{gathered}$ | 0B05627A | Carbon Resistor 330 K ERD-25T J |  |  |
| VR402, 403 | 0B03831A |  |  | R483, 484 | 0801857A | Carbon Resistor 1 | 1 K | ERD-25TJ J | 2D402 | 0806230A |  |  |  |  |  |  |  |  |  |  |
| R401, 402 | 0805627A |  |  | 508 |  |  |  |  | D440,441 | O806109A | Zener Diode 5V <br> Silicon Diode GP08B <br> Silicon Dice 15553 |  | $\begin{aligned} & 610 \\ & \text { R597, } 599 \end{aligned}$ | OB01888A | Carbon Resistor 10K ERD-25T J |  |  |
| 403, 404 |  |  |  | R489 | OB05640A | Carbon Resistor 180 K ERD-25T J |  |  | $\begin{array}{\|r} \text { D445-454 } \\ 456-467 \end{array}$ | 0806181A | Silicon Diode $15553 \quad(24 \mathrm{pc}$ |  | $\begin{array}{r} 600 \\ \mathrm{R} 598 \end{array}$ | OB01681A |  |  |  |  |
| 405, 406 |  |  |  | R492 | OB05680A |  |  |  |  |  |  | Carbon Resistor 3.3 K ERD-25T J Electrolytic Capacitor $10 \mu \quad 16 \mathrm{~V}$ Mylar Capacitor 2200P 50V J <br> Electrolytic Capacitor $1.5 \mu 50 \mathrm{~V}$ (LN) |  |  |  |  |  |  |
| 407, 408 |  |  |  | R495, 500 | 0805692A | Carbon Resistor | 68K | ERD-25TJ |  |  | $\begin{array}{r}\text { 474,475 } \\ \hline\end{array}$ |  |  |  |  |  | C448, 449 | OB01412A |
| 409, 410 |  |  |  | 501 |  |  |  |  | R527 | 0805675A |  |  |  |  | C450,451 | 0801802A |  |
| 411,412 416,417 |  |  |  |  |  |  |  |  |  |  |  |  | C452 | 0B09221A |  |  |  |  |
| 416,417 418,419 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 421,422 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 423, 424 |  |  |  |  |  |  |  |  |  |  |  |  |  | 0807827E | Logic P.C.B. |  |  |
| 425, 429 |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.04030B | Heat Sink | (1 pce.) |  |
| 430, 434 |  |  |  |  |  |  |  |  |  |  |  |  |  | OEO0860A | BT Screw M3×6 Phili | lips Binding Head |  |
| 436, 440 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | (2 pcs.) |  |
| 441, 442 |  |  |  |  |  |  |  |  |  |  |  |  |  | 0E00896A | Screw M3x6 Philips | Binding Head |  |
| 447,448 449,450 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | (Black Chroma | nate) (2 pcs.) |  |
| 457, 458 |  |  |  |  |  |  |  |  |  |  |  |  |  | 0E00507A | Nut Hex. M3 | (2 pcs.) |  |
| 474,475 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 481, 482 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 486, 513 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 522 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |




Fig. 7.6.3 UK \& Australia


Fig. 7.6.4 220 V Class 2


Fig. 7.7
7.8. Auto Shut-off P.C.B. Ass'y


Fig. 7.8
Note: Diode is 1 SS 53 unless otherwise specified.
7.9. Volume P.C.B. Ass'y


Fig. 7.9



Fig. 7.10
7.11. Control Switch P.C.B. Ass'y


Fig. 7.11
7.12. Lamp P.C.B. A Ass'y

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


Fig. 7.13

Fig. 7.12
7.14. Lamp P.C.B. C Ass'y


Fig. 7.14

| Schematic Ref. No. | Part No. | Description | Schematic Ref. No. | Part No. | Description |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SW401-406 PL401-406 | BA04071A <br> 0807832A <br> 0B07219A <br> 0B08552A | Control Switch P.C.B. Ass'y <br> Control Switch P.C.B. <br> Semi-Switch <br> Lamp 12 V 25 mA <br> 7P-H Connector A Ass'y <br> 8P-H Connector A Ass'y | PL408 | BA04062A <br> 0B07838A 0808586A | Lamp P.C.B. B Ass'y <br> Lamp P.C.B. B Lamp |  |
| $\begin{array}{\|l\|l\|} \text { CN7 } \\ \text { CN8 } \end{array}$ | 0808631B OB08630B |  | PL409 | BA04063A <br> OB07840A 0B08586A | Lamp P.C.B. C Ass'y <br> Lamp P.C.B. C Lamp | 12 V 6.PmA |
| PL001, 002 | BA04072A <br> OB07837A 0B08552A | Lamp P.C.B. A Ass'y <br> Lamp P.C.B. A <br> Lamp <br> 12 V 25 mA |  |  |  |  |

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

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


Fig. 7.16
Note: Diode is 1 SS53 unless otherwise specified.

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


Fig. 7.17 Note: Diode is 1 SS53 unless otherwise specified.
8. MECHANISM ASS' $Y$ AND PARTS LIST
8.1. Synthesis


| Schematic Ref, No. | Part No. | Description | Q'v | Schematic Ref. No. | Part No. | Description | Q'ty |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | ```Synthesis Serial No.: A11606273 -``` |  |  |  | Synthesis <br> Serial Nos.: <br> A11606264 - A11606272 |  |
| 01 | OH03723D | Top Cover | 1 | 01 | OH03723D | Top Cover | 1 |
| 02 | OH03788B | Side Panel B | 2 | 02 | 0H03788B | Side Panel B | 2 |
| 03 | 0H03763B | Handle B | 2 | 03 | OH03763B | Handle B | 2 |
| 04 | HA03882A | Cassette Case Cover Ass'y | 1 | 04 | HA03882A | Cassette Case Cover Ass'y | 1 |
| 05 | OH03732B | Volume Knob A | 1 | 05 | OH03732B | Volume Knob A | 1 |
| (05) | OH03733A | Volume Knob Sleeve A | 1 | 105) | OH03733A | Volume Knob Sleeve A | 1 |
| 06 | OH03736B | Volume Knob L | 1 | 06 | OH03736B | Volume Knob L | 1 |
| (06) | OH03737A | Volume Knob Sleeve L | 1 | (06) | OH03737A | Volume Knob Sleeve L | 1 |
| 07 | OH03734B | Volume Knob R | 1 | 07 | 0H03734B | Volume Knob R | 1 |
| (07) | OH03735A | Volume Knob Sleeve R | 1 | (07) | OH03735A | Volume Knob Sleeve R | 1 |
| 08 | OH03738B | Volume Knob B | 2 | 08 | OH03738B | Volume Knob B | 2 |
| 1081 | OH03739A | Volume Knob Sleeve B | 2 | (08) | 0H03739A | Volume Knob Sleeve B | 2 |
| 09 | 0H03725A | Pitch Control Knob | 1 | 09 | 0H03725A | Pitch Control Knob | 1 |
| 10 | HA03981A | Azimuth Alignment Cover Ass'y | 1 | 10 | HA03981A | Azimuth Alignment Cover Ass'y | 1 |
| 11 | HA03979A | Front Panel Ass'y | 1 | 11 | HA03979A | Front Panel Ass'V | 1 |
| 12 | HA03838B | Function Switch Knob Ass'Y | 6 | 12 | HA03838B | Function Switch Knob Ass'y | 6 |
| 13 | 0H03741A | Power Switch Knob | 1 | 13 | 0H03741A | Power Switch Knob | 1 |
| 14 | 0.j04054B | Mechanism Holder B | 1 | 14 | 0.J04054B | Mechanism Holder B | 1 |
| 15 | 0J04053A | Mechanism Holder A | 1 | 15 | 0.j04053A | Mechanism Holder A | 1 |
| 16 | CA08228A | Mechanism Ass'y 6802X | 1 | 16 | CA08152C | Mechanism Ass'y 680ZX | 1 |
| 17 | 0H03757A | Bottom Cover | 1 | 17 | OH03857A | Bottom Cover | 1 |
| 18 | 0J03825A | Leg S | 4 | 18 | 0J03825A | Leg S | 4 |
| 19 | JA03669A | Chassis Ass'y IU.S.A. \& | 1 | 19 | JA03669A | Chassis Ass'y (U.S.A. \& Canada) | 1 |
|  |  | Canadal |  |  | JA03670A | Chassis Ass'y (Japan) | 1 |
|  | JA03670A | Chassis Ass'y (Japan) | 1 |  | JA03671A | Chassis Ass'y (220V Class 2) | 1 |
|  | JA03671A | Chassis Ass'y (220V Class 2) | 1 |  | JA03672A | Chassis Ass'y (Australia) | 1 |
|  | JA03672A | Chassis Ass'y (Australia) | 1 |  | JA03673A | Chassis Ass'y (UK) - | 1 |
|  | JA03673A | Chassis Ass'y (UK) | 1 |  | JA03674A | Chassis Ass'y (Others) | 1 |
|  | JA03674A | Chassis Ass'y (Others) | 1 | 20 | OM03799A | Caution Label G | 1 |
| 20 | 0M03799A | Caution Label $G$ | 1 | * 21 | OM03800A | Caution Label H (U.S.A. \& Canada) | 2 |
| * 21 | 0M03800A | Caution Label H (U.S.A. \& Canada) | 2 | * 22 | 0M03883A | Lamp Caution Label (U.S.A. \& Canada) | 2 |
| * 22 | OM03883A | Lamp Caution Label (U.S.A. \& | 2 | 23 | 0.J04080A | Top Cover Himelon | 4 |
|  |  | Canada) |  | L01 | 0E00915A | BT Screw M4x8 Philips Binding | 8 |
| 23 | 0, 040808 | Top Cover Himelon | 4 |  |  | Head (Black Chromate) |  |
| L01 | OE00915A | BT Screw M4x8 Philips Binding | 8 | L02 | OE00736A | Washer 4mm (Black Chromate) | 8 |
|  |  | Head (Black Chromate) |  | L03 | 0E00908A | Screw M4×6 Philips Countersunk | 4 |
| $L 02$ | 0E00736A | Washer 4mm (Black Chromate) | 8 | L04 | 0E00921A | BT Screw M3x8 Philips Binding | 1 |
| L03 | 0E00908A | Screw M4x6 Philips Countersunk | 4 | $L 05$ | 0E00677A | Head (Black Chromate) <br> Washer 3mm (Black Plastics) | 1 |
| L04 | OE00921A | BT Screw M3x8 Philips Binding Head (Black Chromate) | 1 | L06 | 0E00857A | BT Screw M3x6 Philips Binding Head | 12 |
| $L 05$ | 0E00677A | Washer 3mm (Black Plastics) | 1 | L07 | 0E00814A | ST Screw M $2 \times 4$ Philips Pan Head | 6 |
| L06 | 0E00857A | BT Screw M $3 \times 6$ Philips | 12 | L08 | 0E00920A | Screw M3x6 Philips Polywave | 1 |
|  |  | Binding Head |  | L09 | 0E00867A | BT Screw M $4 \times 15$ Philips | 3 |
| L07 | 0E00814A | ST Screw M2x4 Philips Pan Head | 6 | 110 | OE00878A | Binding Head <br> BT Screw M4×20 Philips | 1 |
| L08 | 0E00920A | Screw M3x6 Philips Polywave | 1 | L0 | O | Binding Head | 1 |
| L09 | 0E00867A | BT Screw M $4 \times 15$ Philips Binding Head | 3 | L11 | 0E00852A | BT Screw M4×12 Philips Binding Head | 4 |
| L10 | $\begin{aligned} & \text { OE00878A } \\ & \text { 0E00852A } \end{aligned}$ | BT Screw M4×20 Philips Binding Head | 1 |  |  | *: Depends on the versions. |  |
| L11 |  | BT Screw M $4 \times 12$ Philips Binding Head | 4 |  |  |  |  |
|  |  | *: Depends on the versions. |  |  |  |  |  |


| Schematic Ref. No. | Part No. | Description | Q'ty | Schematic Ref. No. | Part No. | Description | Q'ty |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Synthesis <br> Serial Nos.: <br> A11604671 - A11606263 |  |  |  | ```Synthesis Serial Nos.: A11601001 - A11604670``` |  |
| 01 | OH03723D | Top Cover | 1 | 01 | 0H03723D | Top Cover | 1 |
| 02 | 0H03788B | Side Panel B | 2 | 02 | OH037888 | Side Panel B | 2 |
| 03 | OH03763B | Handie B | 2 | 03 | OH03763B | Handle B | 2 |
| 04 | HA03882A | Cassette Case Cover Ass'y | 1 | 04 | HA03882A | Cassette Case Cover Ass'y | 1 |
| 05 | OH03732B | Volume Knob A | 1 | 05 | OH03732B | Volume Knob A | 1 |
| (05) | OH03733A | Volume Knob Sleeve A | 1 | (05) | OH03733A | Volume Knob Sleeve A | 1 |
| 06 | OH03736B | Volume Knob L | 1 | 06 | OH037368 | Volume Knob L | 1 |
| (06) | OH03737A | Volume Knob Sleeve L | 1 | (06) | OH03737A | Volume Knob Sleeve L | 1 |
| 07 | OH03734B | Volume Knob R | 1 | 07 | 0H03734B | Volume Knob R | 1 |
| (07) | OH03735A | Volume Knob Sleeve R | 1 | 107) | OH03735A | Volume Knob Sleeve R | 1 |
| 08 | OH037388 | Volume Knob B | 2 | 08 | OH037388 | Volume Knob B | 2 |
| (08) | OH03739A | Volume Knob Sleeve B | 2 | (08) | OH03739A | Volume Knob Sleeve 8 | 2 |
| 09 | OH03725A | Pitch Control Knob | 1 | 09 | 0H03725A | Pitch Control Knob | 1 |
| 10 | HA03981A | Azimuth Alignment Cover Ass'y | 1 | 10 | HA03981A | Azimuth Alignment Cover Ass'y | 1 |
| 11 | HA03979A | Front Panel Ass'v. | 1 | 11 | HA03979A | Front Panel Ass'y | 1 |
| 12 | HA038388 | Function Switch Knob Ass'y | 6 | 12 | HA03838B | Function Switch Knob Ass'y | 6 |
| 13 | 0H03741A | Power Switch Knob | 1 | 13 | OH03741A | Power Switch Knob | 1 |
| 14 | 0.J04054B | Mechanism Holder B | 1 | 14 | OJ04054B | Mechanism Holder B | 1 |
| 15 | 0J04053A | Mechanism Holder A | 1 | 15 | 0J04053A | Mechanism Holder A | 1 |
| 16 | CA08152B | Mechanism Ass'y 680ZX | 1 | 16 | CA08152A | Mechanism Ass'y 6807X | 1 |
| 17 | 0H03757A | Bottom Cover | 1 | 17 | 0H03757A | Bottom Cover | 1 |
| 18 | 0.J03825A | Leg S | 4 | 18 | 0J03825A | Leg S | 4 |
| 19 | JA03669A | Chassis Ass'y (U.S.A. \& Canada) | 1 | 19 | JA03669A | Chassis Ass'y (U.S.A. \& Canada) | 1 |
|  | JA03670A | Chassis Ass'y (Japan) | 1 |  | JA03670A | Chassis Ass'y (Japan) | 1 |
|  | JA03671A | Chassis Ass'y (220V Class 2) | 1 |  | JA03671A | Chassis Ass'y (220V Class 2) | 1 |
|  | JA03672A | Chassis Ass'y (Australia) | 1 |  | JA03672A | Chassis Ass'y (Australia) | 1 |
|  | JA03673A | Chassis Ass'y (UK) | 1 |  | JA03673A | Chassis Ass'y (UK) | 1 |
|  | JA03674A | Chassis Ass'y (Others) | 1 |  | JA03674A | Chassis Ass'y (Others) | 1 |
| 20 | OM03799A | Caution Label G | 1 | 20 | OM03799A | Caution Label G | 1 |
| *21 | OM03800A | Caution Label H(U.S.A. \& Canada) | 2 | *21 | OM03800A | Caution Label H(U.S.A. \& Canada) | 2 |
| *22 | OM03883A | Lamp Caution Label (U.S.A. \& Canada) | 2 | *22 | OM03883A | Lamp Caution Label (U.S.A. \& Canada) | 2 |
| 23 | 0.J04080A | Top Cover Himelon | 4 | 23 | 0J04080A | Top Cover Himelon | 4 |
| L01 | 0E00915A | BT Screw M4×8 Philips Binding Head (Black Chromate) | 8 | L01 | 0E00915A | BT Screw M4×8 Philips Binding Head (Black Chromate) | 8 |
| $L 02$ | OE00736A | Washer 4mm (Black Chromate) | 8 | L02 | 0E00736A | Washer 4 mm (Black Chromate) | 8 |
| L03 | 0E00908A | Screw M $4 \times 6$ Philips Countersunk | 4 | L03 | 0E00908A | Screw M $4 \times 6$ Philips Countersunk | 4 |
| L04 | 0E00921A | BT Screw M3x8 Philips Binding Head (Black Chromate) | 1 | L04 | 0E00921A | BT Screw M $3 \times 8$ Philips Binding Head (Black Chromate) | 1 |
| L05 | 0E00677A | Washer 3mm (Black Plastics) | 1 | L05 | 0E00677A | Washer 3mm (Black Plastics) | 1 |
| L06 | 0E00857A | BT Screw M3x6 Philips Binding Head | 12 | L06 | 0E00857A | BT Screw M3x6 Philips Binding Head | 12 |
| L07 | OE00814A | BT Screw M $2 \times 4$ Philips Pan Head | $6$ | L07 | 0E00814A | ST Screw M $2 \times 4$ Philips Pan | 6 |
| L08 | 0E00920A | Screw M3x6 Philips Polywave | 1 |  |  | Head |  |
| L09 | OE00867A | BT Screw M $4 \times 15$ Philips Binding | 3 | L08 | 0E00920A | Screw M3x6 Philips Polywave | $1$ |
|  |  | Head |  | L09 | 0E00867A | BT Screw M $4 \times 15$ Philips | $3$ |
| $L 10$ | 0E00878A | BT Screw M4×20 Philips Binding Head | 1 | $L 10$ | 0E00878A | Binding Head BT Screw M4×20 Philips | 1 |
| L11 | OE00852A | BT Screw M4×12 Philips Binding Head <br> *: Depends on the versions. | 4 | L11 | OE00852A | Binding Head <br> BT Screw M4×12 Philips <br> Binding Head <br> *: Depends on the versions. | 4 |

### 8.2. Front Panel Ass'y (A01)



Fig. 8.2

| Schematic Ref. No. | Part No. | Description | Q'ty |
| :---: | :---: | :---: | :---: |
| A01 | HA03979A | ```Front Panel Ass'y Serial No.: A11601001 -``` | 1 |
| 01 | OH03824A | Front Panel | 1 |
| 02 | OH03746A | Function Switch Escutcheon | 6 |
| 03 | OH03747C | Power Switch Escutcheon | 1 |
| 04 | HA03978B | Front Panel Escutcheon Ass'y | 1 |
| 05 | OH03744B | Green Lens | 7 |
| 06 | OH03745B | Orange Lens | 1 |
| 07 | OJ04060A | Light Intercepting Seal B | 1 |
| 08 | OJ04059B | Light Intercepting Seal A | 2 |
| 09 | HA03823A | Control Button Ass'y | 1 |
| 10 | OH03781A | Cushion | 3 |
| L01 | 0E00825A | BT Screw M2.6x8 Philips Binding Head | 2 |
| L02 | OE00912A | Washer FT25 | 2 |
| L03 | 0E00794A | BT Screw M2x5 Philips Pan Head | 2 |
| L04 | OE00117A | Washer 2mm | 2 |

### 8.3. Mechanism Ass'y 680ZX (A02)



Fig. 8.3

| Schematic Ref. No. | Part No. | Description | Q'ty | Schematic Ref. No. | Part No. | Description | O'ty |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A02 | CA08228A | Mechanism Ass'y 6802X Serial No.: <br> A11606273 - | 1 | A02 | CA08152B | ```Mechanism Ass'y 680ZX Serial Nos.: A11604671 - A11606263``` | 1 |
| 01 | CA08093A | Flywheel Holder Ass'y | 1 | 01 | CA08093A | Flywheel Holder Ass'y | 1 |
| 02 | 0C08096C | Capstan Belt | 1 | 02 | 0C08096C | Capstan Belt | 1 |
| 03 | CA08173A | Supply Flywheel Ass'y D | 1 | 03 | CA08173A | Supply Flywheel Ass'y D | 1 |
| 04 | CA08015A | Take-up Flywheel Ass'y | 1 | 04 | CA08015A | Take-up Flywheel Ass'y | 1 |
| 05 | OC08021B | Thrust Washer 3.1 mm | 1 | 05 | 0С08021B | Thrust Washer 3.1 mm | 1 |
| 06 | 0C08020B | Thrust Washer 2.6 mm | 1 | 06 | 0C08020B | Thrust Washer 2.6 mm | 1 |
| 07 | 0с08069C | Flange Thrust Cap | 2 | 07 | 0C08069C | Flange Thrust Cap | 2 |
| 08 | 0C08022B | Flange Thrust Spring | 2 | 08 | 0C08022B | Flange Thrust Spring | 2 |
| 09 | CA08235A | Sub Mechanism Chassis Ass'y | 1 | 09 | CA08146A | Sub Mechanism Chassis Ass'y | 1 |
| 10 | OC08099B | Control Motor Belt | 1 | 10 | 0C08099B | Control Motor Belt | 1 |
| 11 | DC08098B | Counter Belt B | 1 | 11 | 0C08098B | Counter Belt B | 1 |
| 12 | CA08208A | Main Mechanism Chassis Ass'y | 1 | 12 | CA08181A | Main Mechanism Chassis Ass'y | 1 |
| 13 | OB08650B | 9P-H Connector | 1 | 13 | 0B08650B | 9P-H Connector | 1 |
| 14 | 0808651D | 11P.H Connector | 1 | 14 | 0B08651D | 11P-H Connector | 1 |
| 15 | 0B08652C | 3P-H Connector | 1 | 15 | 0B08652C | 3P-H Connector | 1 |
| 16 | OB08515A | Insh-Lock | 15 | 16 | 0B08515A | Insh-Lock | 15 |
| 17 | OC08237A | Azimuth Alignment Wire | 1 | 17 | 0C08237A | Azimuth Alignment Wire | 1 |
| - | OM04159A | Mechanism Serial No. Seal | 1 | - | 0M04159A | Mechanism Serial No. Seal | 1 |
| L01 | 0E00834A | BT Screw M $3 \times 30$ Philips | 1 | L01 | 0E00834A | BT Screw M3×30 Philips Pan Head | 1 |
|  |  | Pan Head |  | L02 | 0E00178A | Washer 3 mm | 2 |
| L02 | OE00178A | Washer 3mm | 2 | L03 | 0E00833A | BT Screw M3x20 Philips Pan Head | 3 |
| L03 | 0E00833A | BT Screw M3x20 Philips | 3 | L04 | OE00835A | BT Screw M3x25 Philips Pan Head | $1$ |
|  |  | Pan Head |  | L05 | 0E00883A | BT Screw M3×18 Philips Pan Head | 5 |
|  |  | Head |  | A02 | CA08152A | Mechanism Ass'y 6802X | 1 |
| L05 | OE00883A | BT Screw M3×18 Philips Pan Head | 5 |  |  | Serial Nos.: A11601001 - A11604670 |  |
| A02 | CA08152C | Mechanism Ass'y 6802X | 1 | 01 | CA08093A | Flywheel Holder Ass'y | 1 |
|  |  | Serial Nos.: |  | 02 | 0C08096C | Capstan Belt | 1 |
|  |  | A11606264 - A11606272 |  | 03 | CA08014A | Supply Flywheel Ass'y | 1 |
|  |  |  |  | 04 | CA08015A | Take-up Flywheel Ass'y | 1 |
| 01 | CA08093A | Flywheel Holder Ass'y | 1 | 05 | 0C08021B | Thrust Washer 3.1 mm | 1 |
| 02 | 0C08096C | Capstan Belt | 1 | 06 | 0C08020B | Thrust Washer 2.6 mm | 1 |
| 03 | CA08173A | Supply Flywheel Ass'y D | 1 | 07 | 0С08069C | Flange Thrust Cap | 2 |
| 04 | CA08015A | Take-up Flywheel Ass'y | 1 | 08 | 0C08022B | Flange Thrust Spring | 2 |
| 05 | 0C08021B | Thrust Washer 3.1 mm | 1 | 09 | CA08146A | Sub Mechanism Chassis Ass'y | 1 |
| 06 | OC08020B | Thrust Washer 2.6 mm | 1 | 10 | 0C08099B | Control Motor Belt | 1 |
| 07 | 0C08069C | Flange Thrust Cap | 2 | 11 | 0С08098B | Counter Belt 8 | 1 |
| 08 | 0C08022B | Flange Thrust Spring | 2 | 12 | CA08161A | Main Mechanism Chassis Ass'y | 1 |
| 09 | CA08202A | Sub Mechanism Chassis Ass'y | 1 | 13 | OB08650B | 9P.H Connector | 1 |
| 10 | 0 C 08099 B | Control Motor Belt | 1 | 14 | 0808651D | 11P-H Connector | 1 |
| 11 | 0C08098B | Counter Belt B | 1 | 15 | 0B08652C | 2P-H Connector | 1 |
| 12 | CA08208A | Main Mechanism Chassis Ass'y | 1 | 16 | 0B08515A | Insh-Lock | 15 |
| 13 | OB08650B | 9P-H Connector | 1 | 17 | 0C08237A | Azimuth Alignment Wire | 1 |
| 14 | 0B08651D | 11P-H Connector | 1 | - | 0M04159A | Mechanism Serial No. Seal | 1 |
| 15 | 0B08652C | 3P-H Connector | 1 | L01 | 0E00834A | BT Screw M3x30 Philips Pan | 1 |
| 16 | 0B08515A | Insh-Lock | 15 |  |  | Head |  |
| 17 | 0C08237A | Azimuth Alignment Wire | 1 | L02 | OE00178A | Washer 3 mm | $2$ |
| - | 0M04159A | Mechanism Serial No. Seal | 1 | L03 | 0E00833A | BT Screw M3x20 Philips Pan | 3 |
| L01 | 0E00834A | BT Screw M3×30 Philips Pan Head | 1 | L04 | OE00835A | Head BT Screw M3×25 Philips Pan | 1 |
| L02 | OE00178A | Washer 3mm | 2 |  |  | Head |  |
| L03 | OE00833A | BT Screw M3x20 Philips Pan Head | 3 | L05 | 0E00883A | BT Screw M3x18 Philips Pan Head | 5 |
| L04 | 0E00835A | BT Screw M3x25 Philips Pan Head | 1 |  |  |  |  |
| L05 | 0E00883A | BT Screw M3×18 Philips Pan Head | 5 |  |  |  |  |


| Schematic Ref. No. | Part No. | Description | O'ty | Schematic Ref. No. | Part No. | Description | Q'ty |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A03 | JA03669A | Chassis Ass'y (U.S.A. \& Canada) | 1 | B01 | HA03978B | Front Panel Escutcheon Ass'y | 1 |
|  | JA03670A | Chassis Ass'y (Japan) | 1 |  |  | Serial No.: |  |
|  | JA03671A | Chassis Ass'y (220V Class 2) | 1 |  |  | A11601001 - |  |
|  | JA03672A | Chassis Ass'y (Australia) | 1 |  |  |  |  |
|  | JA03673A | Chassis Ass'y (UK) | 1 | 01 | HA03984C | Front Panel Escutcheon Sub Ass'y | 1 |
|  | JA03674A | Chassis Ass'y (Others) | 1 | 02 | OH03722B | Display Glass | 1 |
|  |  | Serial No.: |  | 03 | OH037438 | Counter Escutcheon | 1 |
|  |  | A11601001 - |  | 04 | OH03748A | FL Indicator Filter | 1 |
|  |  |  |  | 05 | OJ04050A | Counter Escutcheon Holder | 1 |
| 01 | JA03587A | FL. Indicator Ass'y | 1 | 06 | OH03749A | Memory Switch Knob | 1 |
| 02 | JA03675A | Calibration Case Ass'y | 1 | 07 | 0J04043A | Memory Switch Knob Spring | 1 |
| 03 | JA03589A | Volume Holder Ass'y | 1 | 08 | OH03753D | Counter Reset Knob Holder | 1 |
| 04 | JA03659A | Headphone Jack Ass'y | 1 | 09 | OH03750A | Counter Reset Knob | 1 |
| 05 | JA03600A | Reflector Ass'y | 1 | 10 | 0J04042A | Counter Reset Knob Spring | 1 |
| 06 | JA03602A | Counter Lamp Ass'y | 1 | 11 | OH03724F | Eject Lever | 1 |
| 07 | JA04034F | Front Chassis | 1 | 12 | OH03762A | Eject Lever Spring | 1 |
| 08 | BA04059B | Switch P.C.B. Ass'y | 1 | 13 | 0J04057B | Eject Lever Cushion | 1 |
| 09 | BA04058C | Main P.C.B. Ass'y | 1 | L01 | 0E00842A | Stopper Ring 2mm | 5 |
| 10 | BA04210A | Logic P.C.B. Ass'Y | 1 | L02 | OE00854A | BT Screw M2.6x4 Philips Pan Head | 2 |
| 11 | BA04208A | Auto Azimuth P.C.B. Ass'y | 1 | $L 03$ | 0E00890A | C-Ring 2mm | 1 |
| 12 | OJ04033C | Side Chassis Right | 1 | L04 | OE00837A | Stopper Ring 3mm | 1 |
| 13 | JA03592A | Power Switch Holder Ass'y (U.S.A., Canada \& Others) | - 1 | B02 | HA03823A | Control Button Ass'y | 1 |
|  | JA03595A | Power Switch Holder Ass'y (Japan) | 1 |  |  | Serial No.: |  |
|  | JA03594A | Power Switch Holder Ass'y (220V Class 2, Australia \& UK) | 1 |  |  | A11601001 - |  |
| 14 | 0.J04055B | Switch P.C.B. Holder | 1 | 01 | OH03726B | Control Button Stop | 1 |
| 15 | 0J04032C | Center Chassis | 1 | 02 | OH03727B | Control Button Play | 1 |
| 16 | OJ04031B | Side Chassis Left | 1 | 03 | OH03728B | Control Button F.F. | 1 |
| 17 | HA03972A | Rear Panel Ass'y (U.S.A. \& Canada) | 1 | 04 | OH03729B | Control Button Rewind | 1 |
|  | HA03973A | Rear Panel Ass'y (Japan) | 1 | 05 | OH03730B | Control Button Pause | 1 |
|  | HA03977A | Rear Panel Ass'y (220V Class 2) | 1 | 06 | OH03731B | Control Button Record | 1 |
|  | HA03976A | Rear Panel Ass'y (Australia) | 1 | 07 | OJ04044C | Control Button Holder | 1 |
|  | HA03975A | Rear Panel Ass'y (UK) | 1 | 08 | 0J04045B | Control Button Shaft | 2 |
|  | HA03974A | Rear Panel Ass'y (Others) | 1 | 09 | 0J04046A | Control Button Spring | 6 |
| 18 | OJ04062B | Insulator | 2 | 10 | 0J04052B | Spring Stopper | 6 |
| 19 | OB08515A | Insu-Lock | 23 | 11 | 0J04099A | Control Button Himelon | 2 |
| 20 | 0.04064A | Free Bushing 85mm | 1 | 12 | BA04071A | Control Switch P.C.B. Ass'y | 1 |
| *21 | OM03700A | Earth Mark Label | 1 | L01 | 0E00792A | BT Screw M2.6x6 Philips Pan Head | 6 |
| 22 | 0B08580A | Wire Holder 161 | 1 | L02 | 0J04061A | Washer FT20 | 8 |
| L01 | 0E00857A | BT Screw M3x6 Philips Binding Head | 38 | $\mathbf{C 0 1}$ | CA08093A | Flywheel Holder Ass'y | 1 |
| L02 | 0E00868A | BT Screw M3x8 Philips Binding Head | 2 |  |  | Serial No.: A11601001 - |  |
| L03 | 0E00859A | BT Screw M2.6x6 Philips Binding | 3 |  |  |  |  |
|  |  | Head |  | 01 | 0C080131 | Flywheel Holder | 1 |
| $L 04$ | 0E00622A | Screw M3x5 Philips Pan Head (2A) | 6 | 02 | 0C08213A | Capstan Motor | 1 |
| L05 | 0E00860A | BT Screw M3x6 Philips Binding | 6 | 03 | 0C08228B | Capstan Motor Pulley | $1$ |
|  |  | Head (Black Chromate) |  | 04 | - | Speed Cal. P.C.B. Ass'y | (1) |
| L06 | 0E00157A | Washer 3mm (Black Plastics) | 6 |  |  | lincorporated in the Capstan |  |
| ${ }^{\text {L L07 }}$ | 0E00521A | Screw M3x8 Philips Pan Head | 1 |  |  | Motor) |  |
| * 208 | OE00507A | Nut Hex. M3 | 1 | L01 | 0E00226A | Screw M2.6x4 Philips Pan Head | 3 |
| * L09 | OE00581A | Washer 3mm (Spring) | 1 | L02 | 0C08068C | Thrust Screw | 2 |
| *L10 | OE00037A | Earth Lug B-5 | 1 | L03 | 0C03857A | Lock Nut | 2 |
|  |  | *: Depends on the versions. |  | L04 | 0E00862A | BT Screw M3x6 Philips Pan Head | 1 |


8.5. Front Panel Escutcheon Ass'y (B01)


Fig. 8.5
8.6. Control Button Ass'y (B02)

8.7. Flywheel Holder Ass'y (C01)


Fig. 8.7
8.8. Sub Mechanism Chassis Ass'y (CO2) -


Fig. 8.8.1 Serial No.: A11606273 -


Fig. 8.8.2 Serial Nos.: A11606264-A11606272

| Schematic Ref. No. | Part No. | Description | O'ty | Schematic Ref. No. | Part No. | Description | Q'ty | Schematic Ref. No. | Part No. | Description | O'ty | Schematic Ref, No. | Part No. | Description | O'ty |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| c02 | CA08235A | Sub Mechanism Chassis Ass'y Serial No.: <br> A11606273 - | 1 | L05 | OE00226A | Screw M2.6x4 Philips <br> Pan Head <br> BT Screw M3x8 Philips | 5 3 | C02 | CA08202A | Sub Mechanism Chassis Ass'y Serial Nos.: <br> A11606264 - A11606272 | 1 | L04 L05 | OE00859A | BT Screw M2.6x6 Philips Binding Head Screw M2.6×4 Philips Pan | 1 5 |
| 01 | 0C08039B | Reel Hub Head | 2 | L07 | - | Pan Head Volume Nut | (1) | 01 | 0C08039B | Reel Hub Head | 2 | L06 | 0E00846A | Head <br> BT Screw M3×8 Philips Pan | 3 |
| 02 | CA08038C | Reel Hub B Ass'y | 2 | L08 | - | Volume Washer | (1) | 02 | CA08038B | Reel Hub B Ass'y | 1 |  |  | Head |  |
| 03 | CA08037A | Reel Hub Take-up Ass'y | 1 |  |  |  |  | 03 | CA08197A | Reei Hub B Ass'y | 1 | L07 | - | Volume Nut | (1) |
| 04 | CA08064A | Reel Hub Supply Ass'y | 1 |  |  |  |  | 04 | CA08037A | Reel Hub Take-up Ass'y | 1 | L08 | - | Volume Washer | (1) |
| 05 | CA08039A | Back Tension Ass'y | 1 |  |  |  |  | 05 | CA08064A | Reel Hub Supply Ass'y | 1 |  |  |  |  |
| 06 | 0c08178A | Back Tension Spring | 1 |  |  |  |  | 06 | CA08039A | Back Tension Ass'y | 1 |  |  | - |  |
| 07 | CA08193A | Idier Ass'y | 1 |  |  |  |  | 07 | 0C08178A | Back Tension Spring | 1 |  |  |  |  |
| 08 | CA08042A | Brake Ass'y | 2 |  |  |  |  | 08 | CA08040A | Idier Ass'y | 1 |  |  |  |  |
| 09 | OC08030C | Brake Drive Arm | 1 |  |  |  |  | 09 | 0C08127B | Idier Arm Spring | 1 |  |  |  |  |
| 10 11 | OC08129A | Brake Arm Spring | 1 |  |  |  |  | 10 | CA08042A | Brake Ass'y | 2 |  |  |  |  |
| 11 12 | OC08128A | Brake Drive Arm Spring Reel Motor Ass'y | 1 1 |  |  |  |  | 11 | 0C08030C | Brake Drive Arm | 1 |  |  |  |  |
| 12 13 | CA08117B | Reel Motor Ass'y Control Motor Ass'y | 1 |  |  |  |  | $\begin{aligned} & 12 \\ & 13 \end{aligned}$ | OC08129A | Brake Arm Spring | 1 |  |  |  |  |
| 14 | 0C08053B | Volume Coupler | 1 |  |  |  |  | 14 | CA08117B | Rrael Motor Ass'y | 1 |  |  |  |  |
| 15 | OB07240A | Volume Control 10k ${ }^{\text {(8) }}$ | 1 |  |  |  |  | 15 | CA08034A | Control Motor Ass'y | 1 |  |  |  |  |
| 16 | CA08148A | Azimuth Alignment Motor Ass'y | 1 |  |  |  |  | 16 | 0C08053B | Volume Coupler | 1 |  |  |  |  |
| 17 | CA08041A | Sub Chassis Ass'y | 1 |  |  |  |  | 17 | 0B07240A | Volume Control 10k ${ }^{\text {(B) }}$ | 1 |  |  |  |  |
| L01 | 0E00698A | E-Ring 2.5 mm |  |  |  |  |  | 18 | CA08148A | Azimuth Alignment Motor Ass'y | , |  |  |  |  |
| L02 | 0E00837A | Stopper Ring 3mm | 1 |  |  |  |  | 19 | CA08041A | Sub Chassis Ass'y | 1 |  |  |  |  |
| L03 | 0E00838A | Stopper Ring 4 mm BT Screw M2.6x6 Philips | 1 |  |  |  |  | L01 | 0E00842A | Stopper Ring 2 mm Stopper Ring 3 mm | 1 |  |  |  |  |
|  |  | Binding Head |  |  |  |  |  | L03 | 0E00838A | Stopper Ring 4mm | 1 |  |  |  |  |



Fig: 8.8.3 Serial Nos.: A11601001 - A11606263

| Schematic Ref. No. | Part No. | Description | $\mathbf{Q}^{\prime} \mathbf{t y}$ | Schematic Ref. No. | Part No. | Description | Q'ty |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| C02 | CA08146A | Sub Mechanism Chassis Ass'y Serial Nos.: | 1 | L04 | 0E00859A | BT Screw M2.6x6 Philips Binding Head | 1 |
|  |  | A11601001 - A11606263 |  | $L 05$ | OE00226A | Screw M2.6x4 Philips Pan Head | 5 |
|  |  |  |  | L06 | 0E00846A | BT Screw M3x8 Philips Pan Head | 3 |
| 01 | $0 \mathrm{C080398}$ | Reel Hub Head | 2 | L07 | - | Volume Nut | (1) |
| 02 | CA080388 | Reel Hub B Ass'y | 2 | L08 | - | Volume Washer | (1) |
| 03 | CA08037A | Reel Hub Take-up Ass'y | 1 |  |  |  |  |
| 04 | CA08064A | Reel Hub Supply Ass'y | 1 |  |  |  |  |
| 05 | CA08039A | Back Tension Ass'y | 1 |  |  |  |  |
| 06 | 0C08178A | Back Tension Spring | 1 |  |  |  |  |
| 07 | CA08040A | Idler Ass'y | 1 |  |  |  |  |
| 08 | 0C08127B | Idler Arm Spring | 1 |  |  |  |  |
| 09 | CA08042A | Brake Ass'y | 2 |  |  |  |  |
| 10 | OC08030C | Brake Drive Arm | 1 |  |  |  |  |
| 11 | 0C08129A | Brake Arm Spring | 1 |  |  |  |  |
| 12 | 0C08128A | Brake Drive Arm Spring | 1 |  |  |  |  |
| 13 | CA08117B | Reel Motor Ass'y | 1 |  |  |  |  |
| 14 | CA08034A | Control Motor Ass'y | 1 |  |  |  |  |
| 15 | 0C08053B | Volume Coupler | 1 |  |  |  |  |
| 16 | 0B07240A | Volume Control 10k $\Omega$ (B) | 1 |  |  |  |  |
| 17 | CA08148A | Azimuth Alignment Motor Ass'y | 1 |  |  |  |  |
| 18 | CA08041A | Sub Chassis Ass'V | 1 |  |  |  |  |
| L01 | 0E00842A | Stopper Ring 2mm | 1 |  |  |  |  |
| L02 | OE00837A | Stopper Ring 3mm | 2 |  |  | * |  |
| L03 | 0E00838A | Stopper Ring 4mm | 1 |  |  |  |  |


| Schematic Ref. No. | Part No. | Description | O'ty | Schematic Ref. No. | Part No. | Description | $a^{\prime}$ 'ty |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| C03 | CA08208A | Main Mechanism Chassis Ass'y Serial No.: <br> A1 1606264 - | 1 | L12 L13 | OE00846A | BT Screw M3x8 Philips <br> Pan Head <br> BT Screw M3x10 Philips Binding Head | 3 2 |
| 01 | CA08125A | Cassette Case Hoider L Ass'y | 1 | L14 | OE00895A | Earth Lug 3mm | 2 |
| 02 | 0C08151A | Lid Arm Spring Tube | 1 | L15 | 0E00859A | BT Screw M2.6x6 Philips | 1 |
| 03 | CA08022A | Cassette Case Holder R Ass'Y | 1 |  |  | Binding Head |  |
| 04 | CA08163A | Cassette Case Ass'y | 1 | L16 | 0C08255A | Washer 2.6 mm | 1 |
| 05 | 0C080191 | Cover Plate | 1 |  |  |  |  |
| 06 | 0M03977A | Cassette Viewer Label | 1 |  |  |  |  |
| 07 | CA08160A | Head Mount Base Ass'y | 1 |  |  |  |  |
| 08 | 0C08121A | Supply Pressure Roller Spring | 1 |  |  |  |  |
| 09 | CA08053B | Supply Pressure Roller Ass'v | 1 |  |  |  |  |
| 10 | 0C08122B | Supply Pressure Roller Thrust Spring | 1 |  |  |  |  |
| 11 | CA08079B | Take-up Pressure Roller Ass'y | 1 |  |  |  |  |
| 12 | 0С08183B | Take-up Pressure Roller Thrust Spring | 1 |  |  |  |  |
| 13 | CA08104A | Head Base Ass'y D | 1 |  |  |  |  |
| 14 | 0C08182A | Pressure Roller Drive Bar B | 1 |  |  |  |  |
| 15 | 0C08086B | Head Base Roller | 3 |  |  |  |  |
| 16 | 0C08050B | Record Sensor | 1 |  |  |  |  |
| 17 | 0C08051E | Cassette Hold Arm | 1 |  |  |  |  |
| 18 | 0C08120A | Cassette Hold Arm Spring | 1 |  |  |  |  |
| 19 | CA08027A | Head Base Drive Arm Ass'y | 1 |  |  |  |  |
| 20 | 0C08143C | Head Base Drive Arm Spring | 1 |  |  |  |  |
| 21 | CA08026A | Pressure Roller Drive Arm Ass'y | 1 |  |  |  |  |
| 22 | CA08099A | Auto Shut-off Ass'y | 1 |  |  |  |  |
| 23 | CA08098A | Counter Ass'y | 1 |  |  |  |  |
| 24 | CA08105A | Pitch Control Holder Ass'y | 1 |  |  |  |  |
| 25 | 0C08224A | Counter Belt | 1 |  |  | $\cdots$ |  |
| 26 | 0C08119A | Record Protector | 1 |  |  |  |  |
| 27 | 0C08194C | Damper Lock Arm | 1 |  |  |  |  |
| 28 | 0C08153A | Dampe Lock Arm Spring Tube | 1 |  |  |  |  |
| 29 | 0C08125A | Damper Lock Arm Spring | 1 |  |  |  |  |
| 30 | CA08030A | Pneumatic Damper Ass'y | 1 |  |  |  |  |
| 31 | CA08023A | Supply Capstan Flange Ass'y | 1 |  |  |  |  |
| 32 | CA08024A | Take-up Capstan Flange Ass'y | 1 |  |  |  |  |
| 33 | 0C08186A | Cam Drive Gear | 1 |  |  |  |  |
| 34 | OC08029H | Control Cam | 1 |  |  |  |  |
| 35 | 0C08152A | Counter-Load Arm Spring | 1 |  |  |  |  |
| 36 | 0C08117A | Counter-Load Arm Spring Tube | 1 |  |  |  |  |
| 37 | CA08028A | Counter-Load Arm Ass'y | 1 |  |  |  |  |
| 38 | CA08072A | Main Chassis Ass'y | 1 |  |  |  |  |
| 39 | OC08250A | Supply Pressure Roller Spring B | 1 |  |  |  |  |
| 40 | CA08196A | Back Tension Ass'y | 1 |  |  |  |  |
| 41 | 0C08254A | Back Tension Arm Collar | 1 |  |  |  |  |
| L01 | 0E00837A | Stopper Ring 3mm |  |  |  |  |  |
| L02 | OE00832A | BT Screw M3x14 Philips Pan Head | 2 |  |  |  |  |
| L03 | OE00834A | BT Screw M3x30 Philips Pan Head | 2 |  |  |  |  |
| L04 | 0E00831A | BT Screw M3x10 Philips Pan Head | 3 |  |  |  |  |
| L05 | 0E00254A | Washer 3.1 mm (Plastics) | 2 |  |  |  |  |
| L06 | 0E00222A | E-Ring 2 mm | 2 |  |  |  |  |
| L07 | OE00876A | BT Screw M2.6x8 Philips Pan Head | 11 |  |  |  |  |
| L08 | OC08060B | Height Adjustment Nut | 2 |  |  |  |  |
| L09 | OE00142A | Washer 2.6 mm | 2 |  |  |  |  |
| Lio | OE00879A | BT Screw M2×15 Philips Pan Head | 1 |  |  |  |  |
| L11 | 0E00838A | Stoppe Ring 4mm | 3 |  |  |  |  |



Fig, 8.9.1 Serial No.: A11606264 -


Fig. 8.9.2 Serial Nos.: A11604671 - A11606263

| Schematic Ref. No. | Part No. | Description | Q'ty |
| :---: | :---: | :---: | :---: |
| CO3 | CA08181A | Main Mechanism Chassis Ass'y Serial Nos.; <br> A11604671 - A11606263 | 1 |
| 01 | CA08125A | Cassette Case Holder L Ass'y | 1 |
| 02 | 0C08151A | Lid Arm Spring Tube | 1 |
| 03 | CA08022A | Cassette Case Holder R Ass'y | 1 |
| 04 | CA08163A | Cassette Case Ass'y | 1 |
| 05 | 0C080191 | Cover Plate | 1 |
| 06 | OM03977A | Cassette Viewer Label | 1 |
| 07 | CA08160A | Head Mount Base Ass'y | 1 |
| 08 | 0C08121A | Supply Pressure Roller Spring | 1 |
| 09 | CA08053B | Supply Pressure Roller Ass'y | 1 |
| 10 | OC08122B | Supply Pressure Roller Thrust Spring | 1 |
| 11 | CA08079B | Take-up Pressure Rotler Ass'y | 1 |
| 12 | OC08183B | Take-up Pressure Roller Thrust Spring | 1 |
| 13 | CA08104A | Head Base Ass'y D | 1 |
| 14 | 0C08182A | Pressure Roller Drive Bar B | 1 |
| 15 | 0C08086B | Head Base Roller | 3 |
| 16 | 0С080508 | Record Sensor | 1 |
| 17 | 0C08051E | Cassette Hold Arm | 1 |
| 18 | OC08120A | Cassette Hold Arm Spring | 1 |
| 19 | CA08027A | Head Base Drive Arm Ass'y | 1 |
| 20 | 0C08143C | Head Base Drive Arm Spring | 1 |
| 21 | CA08026A | Pressure Roller Drive Arm Ass'y | 1 |
| 22 | CA08099A | Auto Shut-off Ass'y | 1 |
| 23 | CA08098A | Counter Ass'y | 1 |
| 24 | CA08105A | Pitch Control Holder Ass'y | 1 |
| 25 | 0C08224A | Counter Belt | 1 |
| 26 | 0C08119A | Record Protector | 1 |
| 27 | 0C08194C | Damper Lock Arm | 1 |
| 28 | 0C08153A | Damper Lock Arm Spring Tube | 1 |
| 29 | 0C08125A | Damper Lock Arm Spring | 1 |
| 30 | CA08030A | Pneumatic Damper Ass'y | 1 |
| 31 | CA08023A | Supply Capstan Flange Ass'y | 1 |
| 32 | CA08024A | Take-up Capstan Flange Ass'y | 1 |
| 33 | 0C08186A | Cam Drive Gear | 1 |
| 34 | 0С08029H | Control Cam | 1 |
| 35 | 0C08152A | Counter-Load Arm Spring | 1 |
| 36 | 0C08117A | Counter-Load Arm Spring Tube | 1 |
| 37 | CA08028A | Counter-Load Arm Ass'y | 1 |
| 38 | CA08072A | Main Chassis Ass'y | 1 |
| 39 | 0C08250A | Supply Pressure Roller Spring B | 1 |
| L01 | 0E00837A | Stopper Ring 3mm | 7 |
| L02 | 0E00832A | BT Screw M3×14 Philips Pan Head | 2 |
| L03 | 0E00834A | BT Screw M3x30 Philips Pan Head | 2 |
| L04 | OE00831A | BT Screw M3×10 Philips Pan Head | 3 |
| $L 05$ | OE00254A | Washer 3.1 mm (Plastics) | 2 |
| L06 | OE00222A | E-Ring 2 mm | 2 |
| L07 | 0E00876A | BT Screw M2.6x8 Philips Pan Head | 11 |
| L08 | 0C08060B | Height Adjustment Nut | 2 |
| L09 | 0E00142A | Washer 2.6 mm | 2 |
| $L 10$ | OE00879A | BT Screw M2.6x8 Philips Pan Head | 1 |
| L11 | 0E00838A | Stopper Ring 4mm | 3 |
| L12 | 0E00846A | BT Screw M3x8 Philips Pan Head | 3 |
| L. 13 | 0E00865A | BT Screw M3x10 Philips Binding Head | 2 |
| L14 | 0E00895A | Earth Lug 3mm | 2 |


| Schematic Ref. No. | Part No. | Description | O'ty | Schematic Ref. No. | Part No. | Description | Q'ty |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| C03 | CA08161A | Main Mechanism Chassis Ass'y Serial Nos.: <br> A11603010 - A11604670 | 1 | co3 | CA08161A | Main Mechanism Chassis Ass'y Serial Nos.: <br> A11601001 - A1 1603009 | 1 |
| 01 | CA08125A | Cassette Case Holder L Ass'y | 1 | 01 | CA08125A | Cassette Case Hoider L Ass'y | 1 |
| 02 | 0C08151A | Lid Arm Spring Tube | 1 | 02 | 0C08151A | Lid Arm Spring Tube | 1 |
| 03 | CA08022A | Cassette Case Holder R Ass'y | 1 | 03 | CA08022A | Cassette Case Holder R Ass'V | 1 |
| 04 | CA08163A | Cassette Case Ass'y | 1 | 04 | CA08163A | Cassette Case Ass'y | 1 |
| 05 | 0C08019 | Cover Plate | 1 | 05 | 0C080191 | Cover Plate | 1 |
| 06 | OM03977A | Cassette Viewer Label | 1 | 06 | ом03977A | Cassette Viewer Label | 1 |
| 07 | CA08160A | Head Mount Base Ass'y | 1 | 07 | CA08160A | Head Mount Base Ass'y | 1 |
| 08 | OC08121A | Supply Pressure Roller Spring | 2 | 08 | 0C08121A | Supply Pressure Roller Spring | 2 |
| 09 | CA08053B | Supply Pressure Roller Ass'y | 1 | 09 | CA08053B | Supply Pressure Roller Ass'V | 1 |
| 10 | 0C08122B | Supply Pressure Roller Thrust Spring | 1 | 10 | 0C08122B | Supply Pressure Roller Thrust Spring | 1 |
| 11 | CA08079B | Take-up Pressure Roller Ass'y | 1 | 11 | CA08079A | Take-up Pressure Roiler Ass'y | 1 |
| 12 | 0C08183B | Take-up Pressure Roller Thrust Spring | 1 | 12 | 0C08183B | Take-up Pressure Roiler Thrust Spring | 1 |
| 13 | CA08104A | Head Base Ass'y D | 1 | 13 | CA08104A | Head Base Ass'y D | 1 |
| 14 | 0C08182A | Pressure Roller Drive Bar B | 1 | 14 | 0C08182A | Pressure Roller Drive Bar B | 1 |
| 15 | 0С08086B | Head Base Roiler | 3 | 15 | 0C08086B | Head Base Roller | 3 |
| 16 | OC08050B | Record Sensor | 1 | 16 | OC080508 | Record Sensor | 1 |
| 17 | 0C08051E | Cassette Hold Arm | 1 | 17 | 0C08051E | Cassette Hold Arm | 1 |
| 18 | 0C08120A | Cassette Hold Arm Spring | 1 | 18 | OC08120A | Cassette Hold Arm Spring | 1 |
| 19 | CA08027A | Head Base Drive Arm Ass'y | 1 | 19 | CA08027A | Head Base Drive Arm Ass'y | 1 |
| 20 | 0C08143C | Head Base Drive Arm Spring | 1 | 20 | 0C08143C | Head Base Drive Arm Spring | 1 |
| 21 | CA08026A | Pressure Roller Drive Arm Ass'y | 1 | 21 | CA08026A | Pressure Roller Drive Arm Ass'y | 1 |
| 22 | CA08099A | Auto Shut-off Ass'y | 1 | 22 | CA08099A | Auto Shut-off Ass'y | 1 |
| 23 | CA08098A | Counter Ass'y | 1 | 23 | CA08098A | Counter Ass'y | 1 |
| 24 | CA08105A | Pitch Control Holder Ass'y | 1 | 24 | CA08105A | Pitch Control Holder Ass'y | 1 |
| 25 | 0C08224A | Counter Belt | 1 | 25 | 0C08224A | Counter Belt | 1 |
| 26 | 0C08119A | Record Protector | 1 | 26 | 0C08119A | Record Protector | 1 |
| 27 | 0C08194C | Damper Lock Arm | 1 | 27 | 0C08194C | Damper Lock Arm | 1 |
| 28 | 0C08153A | Damper Lock Arm Spring Tube | 1 | 28 | 0C08153A | Damper Lock Arm Spring Tube | 1 |
| 29 | 0C08125A | Damper Lock Arm Spring | 1 | 29 | 0C08125A | Damper Lock Arm Spring | 1 |
| 30 | CA08030A | Pneumatic Damper Ass'y | 1 | 30 | CA08030A | Pneumatic Damper Ass'y | 1 |
| 31 | CA08023A | Supply Capstan Flange Ass'y | 1 | 31 | CA08023A | Supply Capstan Flange Ass'y | 1 |
| 32 | CA08024A | Take-up Capstan Flange Ass'y | 1 | 32 | CA08024A | Take-up Capstan Flange Ass'y | 1 |
| 33 | 0C08186A | Cam Drive Gear | 1 | 33 | 0C08186A | Cam Drive Gear | 1 |
| 34 | 0C08029H | Control Cam | 1 | 34 | 0С08029 ${ }^{\text {H }}$ | Control Cam | 1 |
| 35 | 0C08152A | Counter-Load Arm Spring | 1 | 35 | 0C08152A | Counter-Load Arm Spring | 1 |
| 36 | 0C08117A | Counter-Load Arm Spring Tube | 1 | 36 | 0C08117A | Counter-Load Arm Spring Tube | 1 |
| 37 | CA08028A | Counter-Load Arm Ass'y | 1 | 37 | CA08028A | Counter-Load Arm Ass'y | 1 |
| 38 | CA08072A | Main Chassis Ass'y | 1 | 38 | CA08072A | Main Chassis Ass'y | 1 |
| L01 | 0E00837A | Stopper Ring 3mm | 7 | L01 | 0E00837A | Stopper Ring 3mm | 7 |
| L02 | 0E00832A | BT Screw M $3 \times 14$ Philips Pan Head | 2 | L02 | 0E00832A | BT Screw M $3 \times 14$ Philips Pan Head | 2 |
| L03 | 0E00834A | BT Screw M3x30 Philips Pan Head | 2 | L03 | OE00834A | BT Screw M3x30 Philips Pan Head | 2 |
| L04 | 0E00831A | BT Screw M $3 \times 10$ Philips Pan Head | 3 | L04 | 0E00831A | BT Screw M3x10 Philips Pan Head | 3 |
| L05 | 0E00254A | Washer 3.1 mm (Plastics) | 2 | L05 | 0E00254A | Washer 3.1 mm (Plastics) | 2 |
| L06 | 0E00222A | E-Ring 2 mm | , | L06 | 0E00222A | E-Ring 2mm | 2 |
| L07 | 0E00876A | BT Screw M2.6x8 Philips Pan Head | 11 | L07 | 0E00876A | BT Screw M2.6x8 Philips Pan Head | 11 |
| L08 | 0C08060B | Height Adjustment Nut | 2 | L08 | 0C08060B | Height Adjustment Nut | 2 |
| L09 | 0E00142A | Washer 2.6 mm | 2 | L09 | OE00142A | Washer 2.6 mm | 2 |
| L10 | 0E00879A | BT Screw M2×15 Philips Pan Head | 1 | L10 | OE00879A | BT Screw M2×15 Philips Pan Head | 1 |
| L11 | 0E00838A | Stopper Ring 4mm | 3 | L11 | 0E00838A | Stopper Ring 4mm | 3 |
| L12 | 0E00846A | BT Screw M $3 \times 8$ Philips Pan Head | 3 | L12 | 0E00846A | BT Screw M $3 \times 8$ Philips Pan Head |  |
| L13 | 0E00865A | BT Screw M $3 \times 10$ Philips Binding Head | 2 | L13 | 0E00865A | BT Screw M $3 \times 10$ Philips Binding Head | 2 |
| L14 | 0E00895A | Earth Lug 3mm | 2 | L14 | OE00895A | Earth Lug 3mm | 2 |



Fig. 8.9.3 Serial Nos.: A11601001 - A11604670
8.10. FL Indicator Ass'y (D01)


Fig. 8.10
8.11. Calibration Case Ass'y (D02)


Fig. 8.11
8.12. Volume Holder Ass'y (D03)

8.13. Headphone Jack Ass'y (D04)
L01

Fig. 8.13
8.14. Reflector Ass'y (D05)


Fig. 8.14
8.15. Counter Lamp Ass'y (D06)


Fig. 8.15
8.16. Power Switch Holder Ass'y (D07)


| Schematic Ref. No. | Part No. | Description | O'ty | Schematic Raf. No. | Part No. | Description | Q'ty |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| D01 | JA03587A | FL Indicator Ass'y <br> Serial No.: A11601001 - | 1 | D07 | JA03592A | Power Switch Holder Ass'y (U.S.A. \& Canada) | 1 |
| 01 | 0,104037A |  | 1 |  | JA03595A | Power Switch Holder Ass'y (Japan) | 1 |
| 02 | BA04066A | Indicator P.C.B. C Ass'y | 1 |  |  | (Japan) |  |
| 03 | BA04066A |  | 1 |  | JA03594A | Power Switch Holder Ass'y | 1 |
| 04 | BA04065A | Indicator P.C.B. A Ass'y | 1 |  |  | (220V Class 2, UK, Australia \& |  |
| 05 | OJ04039A | FL Indicator Holder L | 1 |  |  | Serial No: A11601001 - |  |
| 06 | 0J04040A | FL Indicator Holder R | 1 |  |  | Serial No.: |  |
| 07 | 0J04036A | FL Indicator Hold Plate | 1 | 01 | 0J04038A | Power Switch Holder | 1 |
| 08 | 0J04058A | P.C.B. Supporter | 3 | 02 | 0J04056A | Power Switch Insulator | 1 |
| 09 | 0J04063A | Free Bushing 69mm | 1 | 03 | OB07280A | Power Switch (U.S.A. \& Canada) | 1 |
| L01 | 0E00859A | BT Screw M2.6×6 Philips Binding | 9 |  | OB07291A | Power Switch (Japan) | 1 |
|  |  | Head |  |  | 0B07292A | Power Switch | 1 |
| L02 | OE00857A | BT Screw M3x6 Philips Binding Head | 2 |  |  | (220V Class 2, UK, Australia \& Others) |  |
|  |  |  |  | L01 | 0E00622A | Screw M $3 \times 5$ Philips Pan Head (2A) | 2 |
| D02 | JA03675A | Calibration Case Ass'y <br> Serial No.: A11601001 - | 1 | L02 | OE00873A | 8T Screw M2.6×5 Philips Binding Head | 1 |
| 01 | BA04072A | Lamp P.C.B. A Ass'y | 1 |  |  | . |  |
| 02 | BA04067A | Record Cal. P.C.B. A Ass'y | 1 |  |  |  |  |
| 03 | BA04068A | Record Cal. P.C.B. B Ass'y | 1 |  |  | . |  |
| 04 | 0J04108A | Calibration Case | 1 |  |  |  |  |
| L01 | OE00792A | BT Screw M2.6×6 Philips Pan Head | 4 |  |  |  |  |
| D03 | JA03589A | Volume Holder Ass'y <br> Serial No.: A11601001 - | 1 |  |  |  |  |
| 01 | BA04069A | Volume P.C.B. Ass'Y | 1 |  |  |  |  |
| 02 | 0B07317A | Remote Switch | 1 |  |  |  |  |
| 03 | OJ04028D | Volume Holder | 1 |  |  |  |  |
| L01 | - | Volume Nut | (2) |  |  |  |  |
| $L 02$ | - | Volume Washer | (2) |  |  |  |  |
| L03 | - | Volume Nut | (1) |  |  |  |  |
| L04 | - | Volume Washer | (1) |  |  |  |  |
| L05 | - | Remote Switch Nut | (1) |  |  |  |  |
| L06 | - | Remote Switch Washer | (1) |  |  |  |  |
| D04 | JA03659A | Headphone Jack Ass'y <br> Serial No.: A11601001 - | 1 |  |  |  |  |
| 01 | 0J04101A | Headphone Jack Holder | 1 |  |  |  |  |
| 02 | 0808511 A | Headphone Jack | 1 |  |  |  |  |
| L01 | - | Headphone Jack Nut | (1) |  |  |  |  |
| L02 | - | Headphone Jack Washer | (1) |  |  |  |  |
| D05 | JA03600A | Reflector Ass'y <br> Serial No.: A11601001 - | 1 |  |  |  |  |
| 01 | 0H03754C | Reflector | 1 |  |  |  |  |
| 02 | BA04063A | Lamp P.C.B. C Ass'y | 1 |  |  |  |  |
| 03 | 0J04107A | Filter Cap | 1 |  | - |  |  |
| D06 | JA03602A | Counter Lamp Ass'y <br> Serial No.: A11601001 - | 1 |  |  |  |  |
| 01 | 0J04083A | Insulator | 1 |  |  |  |  |
| 02 | BA04062A | Lamp P.C.B. B Ass'y | 1 |  |  |  |  |
| 03 | 0.04107A | Filter Cap | 1 |  |  |  |  |
| 04 | 0.J04041A | Counter Lamp P.C.B. Holder | 1 |  |  |  |  |
| L01 | 0E00859A | BT Screw M2.6x6 Philips Binding Head | 1 |  |  |  |  |



8.18. Reel Motor Ass'y (E01)

8.20. Azimuth Alignment Motor Ass'y (E03)

8.22. Supply Pressure Roller Ass'y (F02)


Fig. 8.22
8.21. Head Mount Base Ass'y (F01)


Fig. 8.21


Fig. 8.23
8.24. Head Base Ass'y D (FO4)

8.25. Cassette Case Holder L Ass'y (F05)


Fig. 8.25
8.26. Cassette Case Holder R Ass'y (F06)

8.27. Auto Shut-off Ass'y (F07)

8.28. Pneumatic Damper Ass'y (F08)


Fig. 8.28
8.29. Pitch Control Holder Ass'y (F09)


Fig. 8.29
8.30

Azimuth Motor Ass'y (G01)

8.31. P-8L Playback Head Ass'y (H01)


Fig. 8.31
8.32. R-8L Record Head Ass'y (H02)



Fig. 8.32


## 9. OVERALL TIMING CHART

| Mode | PLAYBACK |  |  | RECORD |  |  |  |  | CUE |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Contral Button | Stop | Play | Stop | Rec | Rec/Play | Rec/Pause | Rec/Play | Stop | Stop | FFor Rew | Stop |
| Tape |  |  |  |  |  | 130 ms <br> 180 m |  |  |  |  |  |
| Output |  |  |  |  |  |  |  |  |  |  |  |
| Bias |  |  |  |  |  |  |  |  |  |  |  |

Fig. 9

## 10. EQ. AMP. FREQUENCY RESPONSE

10.1. Standard Speed (1-7/8 ips)
10.1.1. Playback Frequency Response


Fig. 10.1.1
10.1.2 Record Current Frequency Response

10.2 Half-Speed (15/16 ips)
10.21. Playback Frequency Respons

10.2.2. Record Current Frequency Response

11.1. Amplifier


Fig. 11.1
11.2. Mechanism Control



Fig. 12.1

Note: Table of wire colors
BLK - Black
BLU - Blue
GRN - Green
RED - Red
WHT - White
ORN - Orange
GRY - Gray
BRN - Brown
YEL - Yellow
VIO - Violet



Fig. 13.1





Fig. 13.3 Dolby NR IC $\mu$ A7300PC


Fig. 13.5 Operational Amp. IC
Fig. 13.4 Bilateral Switch C-MOS IC $\mu$ PD4066C


Fig. 13.6 Inverter C-MOS IC $\mu$ PD4049C



Fig. 13.7 NOR Gate C-MOSIIC $\mu$ PD4001C



Fig. 13.8 NAND Gate C-MOS IC $\mu$ PD4011C


Fig. 13.9 NAND Gate C-MOS IC $\mu$ PD4023C



Fig. 13.10 OR Gate C-MOS IC $\mu$ PD4071C


Fig. 13.11 AND Gate C-MOS IC $\mu$ PD4081C

## 14. SPECIFICATIONS



Fig. 13.12 AND Gate C-MOS IC $\mu$ PD4073C


Fig. 13.13 D.Type Flip-Flop C-MOS IC TC4013BP



Fig. 13.14 BCD Up/Down Counter C-MOS IC TC4510BP


Fig. 13.15 $B C D$ to 7-Segment Decorder/Driver C-MOS IC TC5022BP

$\begin{array}{ll}\text { Fig. } 13.16 & \text { 12-Stage Binary Counter } \\ & \text { C-MOS IC TC4040BP }\end{array}$ C-MOS IC TC4040BP

(TOP VIEW)

Fig. 13.17 Octal Counter/Driver C-MOS IC TC4022BP

## Standard Speed (1-7/8 ips

Frequency Response . .
... 10-22,000 $\mathrm{Hz} \pm 3$ dB ( 20 dB rec. level)
Better than 66 dB (IHF-A WTD RMS, ref. $400 \mathrm{~Hz}, 3 \%$ THD, w/Dolby NR, ZX tape, $70 \mu \mathrm{sec}$ EQ)
Total Harmonic Distortion . . . . . . Less than $0.8 \%$ at $400 \mathrm{~Hz}, 0 \mathrm{~dB}$ w/ZX tape Less than $1.0 \%$ at $400 \mathrm{~Hz}, 0 \mathrm{~dB}$ w/SX, EXII tapes
Wow-and-Flutter . . . . . . . . . . . . Less than 0.08\% WTD peak, 0.04\% WTD RMS
Erasure . . . . . . . . . . . . . . . . . . Better than 60 dB below saturation level at 1 kHz
Half-Speed ( $15 / 16$ ips)
Frequency Response .
Signal-to-Noise Ratio
$10-15,000 \mathrm{~Hz} \pm 3 \mathrm{~dB}$ ( -20 dB rec. level, $Z X$ tape) Better than 60 dB (IHF-A WTD RMS, ref. $400 \mathrm{~Hz}, 3 \%$ THD, w/Dolby NR, ZX tape, $120 \mu \mathrm{sec}$ EQ)
Total Harmonic Distortion . . . . . . Less than $1.5 \%$ at $400 \mathrm{~Hz}, 0 \mathrm{~dB} w / \mathrm{ZX}$ tape
Wow-and-Flutter . . . . . . . . . . . Less than 0.14\% WTD peak, 0.08\% WTD RMS
Erasure . . ................. . Better than 60 dB below saturation level at 1 kHz

| General |  |
| :---: | :---: |
| Separation | Better than 37 dB at $1 \mathrm{kHz}, 0 \mathrm{~dB}$ |
| Crosstalk | Better than 60 dB at $1 \mathrm{kHz}, 0 \mathrm{~dB}$ |
| Bias Frequency | 105 kHz |
| Input | $50 \mathrm{mV}, 50 \mathrm{k}$ ohms |
| Output | $1 \mathrm{~V}(400 \mathrm{~Hz}, 0 \mathrm{~dB}$, output control at max.) 2.2 k ohms |
| Headphone Output | 45 mW (at $400 \mathrm{~Hz}, 0 \mathrm{~dB}, 8$ ohms) |
| DC Output Jack | $\pm 10 \mathrm{~V}$ DC, 125 mA max. |
| Power Source | $100,120,120 / 220-240,220$ or $240 \mathrm{VAC} ; 50 / 60 \mathrm{~Hz}$ (according to country of sale) |
| Power Consumption | 30 W max. |
| Dimensions | $482(\mathrm{~W}) \times 143(\mathrm{H}) \times 340(\mathrm{D})$ millimeters $19(\mathrm{~W}) \times 5-5 / 8(\mathrm{H}) \times 13-3 / 8(\mathrm{D})$ inches |
| Approximate Weight | $\begin{aligned} & 9 \mathrm{~kg} . \\ & 19 \mathrm{lb} .13 \mathrm{oz} . \end{aligned}$ |

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