Nakamichi

# Service Manual

# Nakamichi 480

## 2 Head Cassette Deck

**1. General** . . . . 3
**2. Principle of Operation** . . . . 4
2. 1. Mechanisms . . . . 4
2.1.1. Headblock . . . . 4
2.1.2. Erase Head . . . . 5
2.1.3. Double Capstan Tape Drive . . . . 5
2.1.4. Mechanism Control Cam Operation . . . . 6
2. 2. Amp. Circuits . . . . 7
2.2.1. Playback Eq. Amp. Circuit . . . . 7
2.2.2. Record Eq. Amp. Circuit . . . . 9
2.2.3. Bias Osc. Circuit . . . . 9
2. 3. Mechanism Control Circuits . . . . 10
2.3.1. Outline . . . . 10
2.3.2. +12 V Power Source . . . . 11
2.3.3. $\overline{\text{Power-mute}}$ Signal . . . . 11
2.3.4. Auto Shut-off Circuit . . . . 11
2.3.5. Record Control Circuit . . . . 14
2.3.6. Mute Signal . . . . 14
2.3.7. Control Motor Drive Circuit . . . . 15
2.3.8. Reel Motor Governor . . . . 17
**3. Removal Procedures** . . . . **17**
3. 1. Cassette Case Cover Ass'y . . . . 17
3. 2. Top Cover Ass'y . . . . 17
3. 3. Bottom Cover Ass'y . . . . 17
3. 4. Front Panel Ass'y . . . . 17
3. 5. Headphone Jack Ass'y . . . . 18
3. 6. Mechanism Ass'y . . . . 18
3. 7. Meter Ass'y . . . . 18
3. 8. Lamp P.C.B. R Ass'y and Lamp P.C.B. L Ass'y . . . . 18
3. 9. Main P.C.B. Ass'y . . . . 19
3. 10. Control Switch Holder Ass'y . . . . 19
3. 11. Switch P.C.B. Ass'y . . . . 19
3. 12. Volume P.C.B. Ass'y and Control Switch P.C.B. Ass'y . . . . 19
3. 13. Rear Panel Ass'y, Power Transformer and Power Switch . . . . 19
3. 14. Cassette Case Ass'y and Cover Plate Ass'y . . . . 20
3. 15. Tape Counter Ass'y . . . . 20
3. 16. Capstan Motor Ass'y and Flywheel Ass'y . . . . 21
3. 17. Sub Mechanism Chassis Ass'y . . . . 21
3. 18. Control Motor Ass'y and Reel Motor Ass'y . . . . 21
3. 19. Cam Control Volume . . . . 21
3. 20. Reel Hub Ass'y and Idler Ass'y . . . . 21
3. 21. Cam Drive Gear and Control Cam . . . . 21
3. 22. Head Mount Base Ass'y . . . . 21
3. 23. Pressure Roller Ass'y and Erase Head . . . . 22
3. 24. Record/Playback Head Ass'y . . . . 22
**4. Measurement Instruments** . . . . **23**
**5. Mechanical Adjustments** . . . . **24**
5. 1. Mechanism Control Cam Adjustment . . . . 24
5. 2. Tape Speed Adjustment . . . . 25
5. 3. Record/Playback Head Tilt Adjustment . . . . 25
5. 4. Head Base Stroke Adjustment . . . . 26
5. 5. Tape Guides Adjustment and Erase Head Stroke Adjustment . . . . 27
5. 6. Erase Head Height and Tilt Adjustment . . . . 28
5. 7. Record/Playback Head Height Adjustment and Azimuth Alignment . . . . 28
5. 8. Tape Travelling Adjustment . . . . 29
5. 9. Record Switch Linkage Adjustment . . . . 29

5. 10. Flywheel Holder Adjustment . . . . . 30
5. 11. Eject Wire Adjustment . . . . . 30
5. 12. Lubrication . . . . . 30
**6. Parts Location for Electrical Adjustment . . . . . 31**
**7. Electrical Adjustments and Measurements . . . . . 32**
7. 1. Adjustment and Measurement Instructions . . . . . 32
7. 2. Playback Frequency Response Adjustment . . . . . 35
7. 3. Check on Dolby NR Circuit . . . . . 35
**8. Mounting Diagrams and Parts List . . . . . 36**
8. 1. Volume P.C.B. Ass'y . . . . . 36
8. 2. Control Switch P.C.B. Ass'y . . . . . 36
8. 3. Switch P.C.B. Ass'y . . . . . 36
8. 4. Control P.C.B. Ass'y . . . . . 36
8. 5. Auto Shut-off P.C.B. Ass'y . . . . . 36
8. 6. Lamp P.C.B. L Ass'y . . . . . 36
8. 7. Lamp P.C.B. R Ass'y . . . . . 36
8. 8. Main P.C.B. Ass'y . . . . . 37
**9. Mechanism Ass'y and Parts List . . . . . 41**
9. 1. Synthesis . . . . . 41
9. 2. Front Panel Ass'y (A01) . . . . . 41
9. 3. Synthesis Mechanism Ass'y (A02) . . . . . 41
9. 4. Meter Escutcheon Ass'y (B01) . . . . . 42
9. 5. Control Switch Holder Ass'y (B02) . . . . . 43
9. 6. Headphone Jack Ass'y (B03) . . . . . 43
9. 7. Mechanism Ass'y 480 (B04) . . . . . 44
9. 8. Chassis Ass'y (B05) . . . . . 45
9. 9. Flywheel Holder Ass'y (C01) . . . . . 45
9. 10. Sub Mechanism Chassis Ass'y (C02) . . . . . 46
9. 11. Main Mechanism Chassis Ass'y (C03) . . . . . 48
9. 12. Rear Panel Ass'y (D01) . . . . . 49
9. 13. Reel Motor Ass'y (E01) . . . . . 50
9. 14. Control Motor Ass'y (E02) . . . . . 50
9. 15. Head Mount Base Ass'y (F01) . . . . . 50
9. 16. Supply Pressure Roller Ass'y (F02) . . . . . 50
9. 17. Take-up Pressure Roller Ass'y (F03) . . . . . 50
9. 18. Head Base Ass'y C (F04) . . . . . 51
9. 19. Cassette Case Holder L Ass'y (F05) . . . . . 51
9. 20. Cassette Case Holder R Ass'y (F06) . . . . . 51
9. 21. Auto Shut-off Ass'y (F07) . . . . . 51
9. 22. Pneumatic Damper Ass'y (F08) . . . . . 51
9. 23. RP-9E Record/Playback Head Ass'y (G01) . . . . . 51
**10. Overall Timing Chart . . . . . 53**
**11. Eq. Amp. Frequency Response . . . . . 54**
11. 1. Playback Frequency Response . . . . . 54
11. 2. Record Current Frequency Response . . . . . 54
**12. Wiring Diagram . . . . . 55**
**13. Block Diagrams . . . . . 57**
13. 1. Amplifier . . . . . 57
13. 2. Mechanism Control . . . . . 58
**14. Schematic Diagrams . . . . . 59**
**15. Specifications . . . . . 62**

# 1. GENERAL

## 1.1. Control Functions

Nakamichi 480 control functions are shown below:

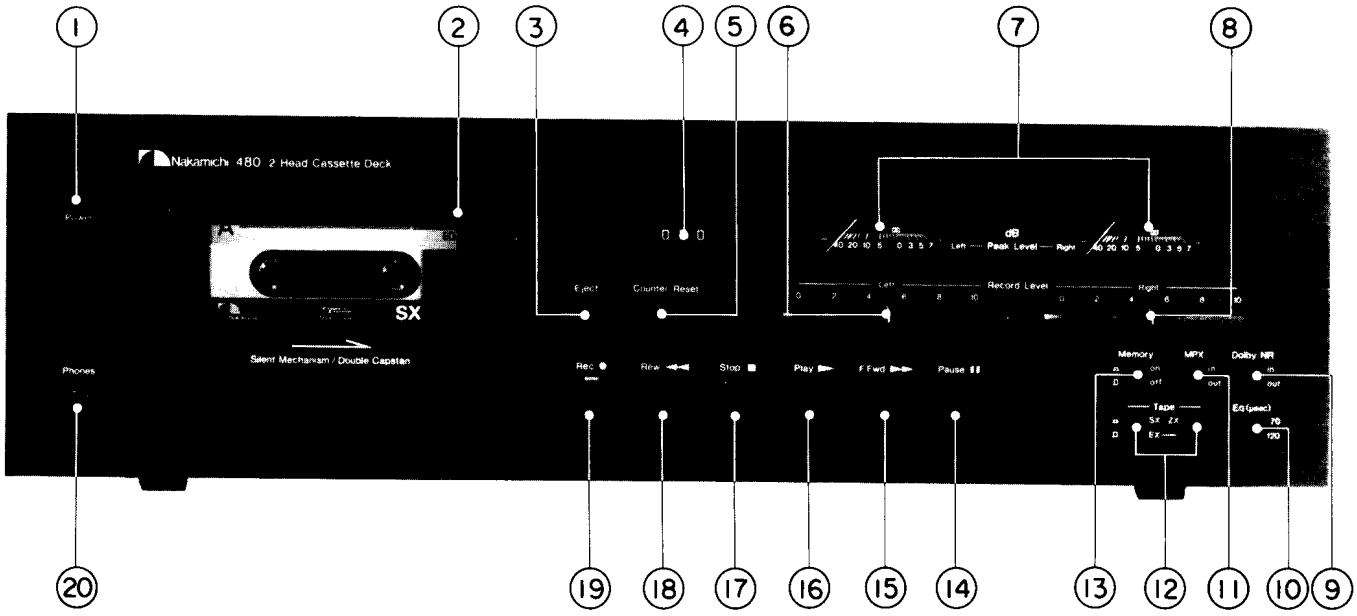



Fig. 1.1 Front View

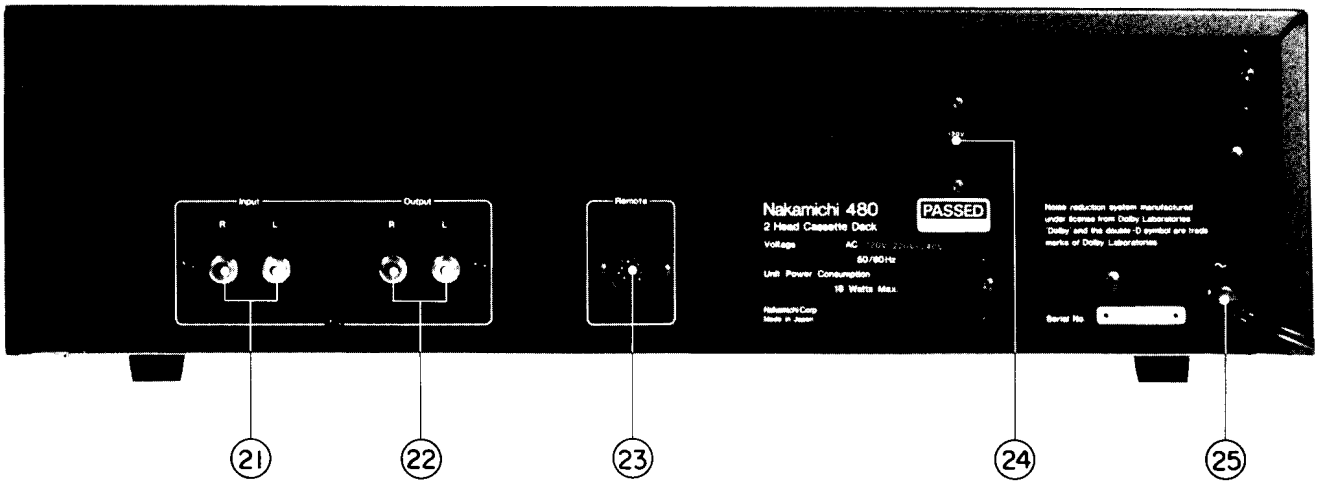



Fig. 1.2 Rear View

1. Power Switch
2. Cassette Lid
3. Eject Button
4. Tape Counter
5. Counter Reset Button
6. Input Level Control - Left Channel
7. Peak Level Meters
8. Input Level Control - Right Channel
9. Dolby NR Switch
10. Eq. Switch
11. MPX Filter Switch
12. Tape Selector Switches
13. Tape Memory Switch
14. Pause Button
15. Fast-Forward Button
16. Play Button
17. Stop Button
18. Rewind Button
19. Record Button
20. Headphone Jack
21. Input Jacks
22. Output Jacks
23. Remote Control Socket
24. Voltage Selector Switch
25. Power Cord

## 1.2. Voltage Selector

Voltage selector is installed on the rear panel for other versions of the Nakamichi 480.
This voltage selector can select either 120 V or 220 – 240 V at customer's disposal.

## 2. PRINCIPLE OF OPERATION

### 2.1. Mechanisms

#### 2.1.1. Headblock

Refer to Fig. 2.1.1 Headblock.

Nakamichi 480 Headblock provides more stabilized tape travel.

Accuracy of tape travel is one of the most essential factors for a device to optimize its performance. Inaccurate tape travel will therefore induce deterioration exemplified by the following:

(a) vibration will be given to tape travel, as a result of which flutter and modulation noise will become increased

(b) insufficient tape-to-head contact will result in level drops

(c) tape skew will become greater and frequency response will become decreased

Needless to say, constant tape travel must consist of smooth drive mechanism, as well as of the fact that tape, heads and tape guide are placed in the most appropriate positions.

N-480 Record/Playback Head is made small in size. Erase Head is located at the place where the Record Head is located in the N-700II/1000II.

Record/Playback Head is assembled on the Head Mount Base. Take-up Tape Guide and Supply Tape Guide are fixed to the Take-up and Supply Pressure Rollers respectively. Erase Head is placed on the Head Base. All these can be separately adjusted. Shape of the Heads and its location have been carefully studied to bring about smoother contact of tape with the Heads. Pad Lifter is affixed to the Record/Playback Head so as not to let Tape Pad touch the Head to give more stabilized tape travel, making it free from the influence of the Tape Pad within the Cassette Tape. Thus the trouble of changes in azimuth can now be avoided at changing of cassette tape, if only the Record Head azimuth is properly adjusted in advance.

**(1) Adjustment of Tape Guide Height**

Tape Guides for the N-480 are affixed to the Supply Pressure Roller Ass'y and Take-up Pressure Roller Ass'y. With springs in the studs of Main Mechanism Chassis Ass'y, the Supply Pressure Roller Ass'y and Take-up Pressure Roller Ass'y are tightly affixed with Tape Guide Adjustment Nuts. The Adjustment Nuts are placed on the springs, and therefore either by tightening or loosening, height adjustment of the Tape Guides will become possible.

**(2) Record/Playback Head Height Adjustment and Azimuth Alignment**

Azimuth and height of Record/Playback Head are independent from each other and adjustment may be done separately without affecting others. In order to adjust the tilt of Record/Playback Head backwards or frontwards, take off the Height Gear Stopper and take out the Height Gear and then turn the two Height Adjustment Screws. After completion of adjustment, place the Height Gear back and fix it with the Height Gear Stopper. After the tilt is adjusted in such a way as above, adjust the height by turning the Height Gear. Azimuth is aligned by turning the Azimuth Alignment Screw. This system has been carefully designed so as to minimize influence each other between azimuth alignment and height adjustment.

**(3) Erase Head Height and Tilt Adjustment**

Erase Head is affixed onto the Erase Head Plate which is assembled with the Head Base. It is installed with three screws. By turning these screws, its height, tilt of backward or frontward, and tilt of leftward or rightward can be adjusted separately, thus the best location of Erase Head can be obtained.

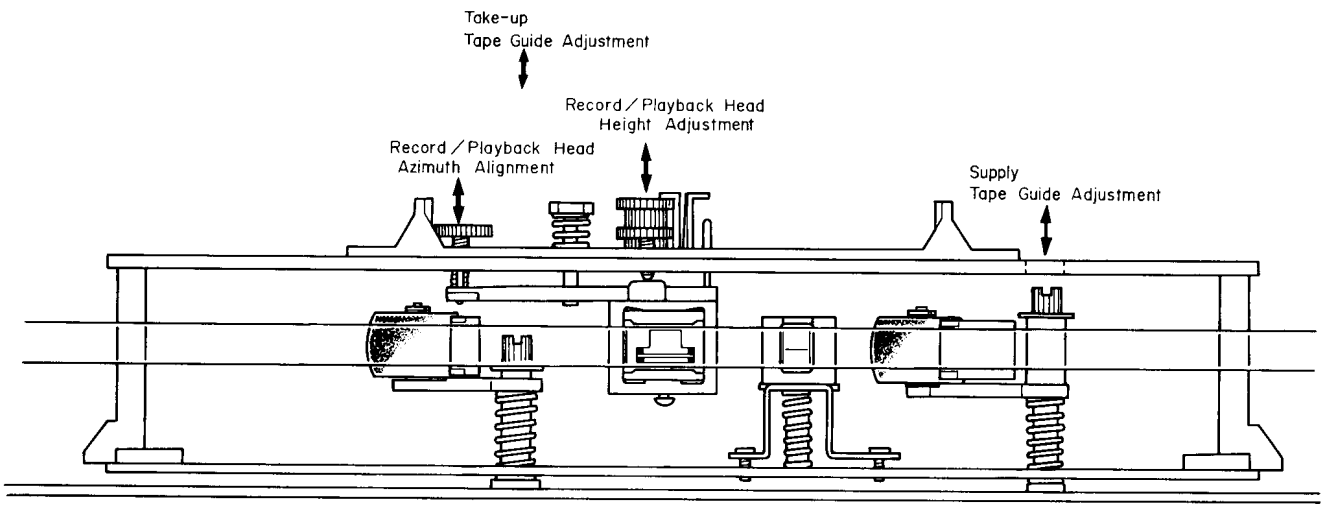



Fig. 2.1.1 Headblock

### 2.1.2. Erase Head

Fig. 2.1.2 shows the sectional view of the Erase Head. Fig. 2.1.3 shows the characteristics of erasing current and erasure.

It has the same characteristics with the previous type Direct-Flux Erase Head but been purposely developed to minimize the size further.

Conventional Erase Head had its inside core narrower than its outside core, while this Erase Head is equipped with an inside core wider than the outside core. This has resulted more power sufficient enough for erasing with small power consumption, approx. 0.5 W, though the head width is as small as 3 mm. The smaller the power consumption is, the smaller will be the heat generation, and this is of course another merit.

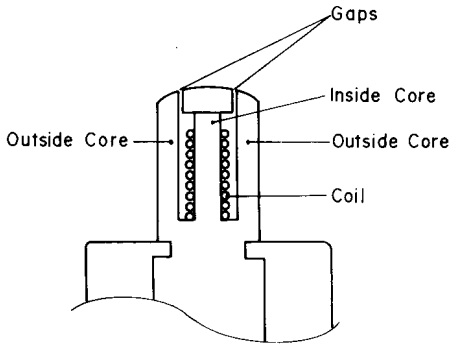



Fig. 2.1.2 Sectional View of Erase Head

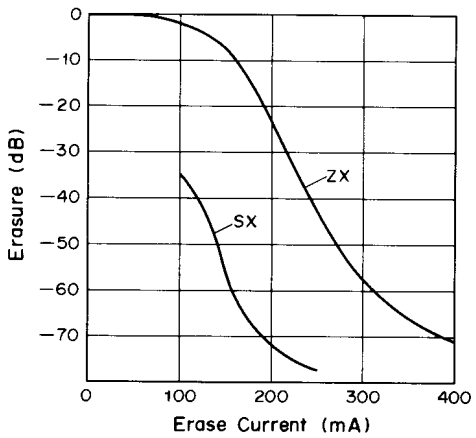



Fig. 2.1.3 Characteristics of Erasing Current and Erasure

### 2.1.3. Double Capstan Tape Drive

As shown in Fig. 2.1.4, the double capstan system consists of two capstan shafts (a) and (b) connected to the two flywheels which are driven by a capstan belt.

Against these capstans two pressure rollers (a) and (b) are engaged to run the tape with an adequate holdback tension created by the double capstan and pressure rollers. Since the diameter of capstan shaft (a) is smaller than that of capstan shaft (b), when two flywheels begin to turn as shown in the figure, capstan (a) runs slightly faster than capstan (b), which subsequently generates holdback tension.

As you note, if the diameters of the 2 capstans should be the same, the generation cycles of wow and flutter will become approximately the same, as a result of which defective portion will be doubly superposed and preferable portion vice versa. The N-480 employs 2 capstans, each having different diameter and rotations, thereby avoiding the aforesaid occurrence and stabilizing wow and flutter characteristics.

As the double capstan system always creates a constant and stable holdback tension between the two capstans, the condition of the tape between two capstans will not be affected by any external conditions such as irregular take-up and supply torques, irregular loading of cassette tape, undesirable mechanism vibration and etc., thus assuring the superior wow and flutter characteristics. The double capstan system provides a constant holdback tension on the tape and maintains the stable pressure onto the tape against the heads.

The only critical factor in the double capstan system is to be considered; the two capstans have to be positioned perfectly in parallel and to be precisely vertical against the head base, the pressure rollers have to be evenly pressed against the capstan shafts and the head surface must be positioned perfectly vertical to the tape surface. Otherwise, the running tape might become out of the tape guide resulting in irregular movement.

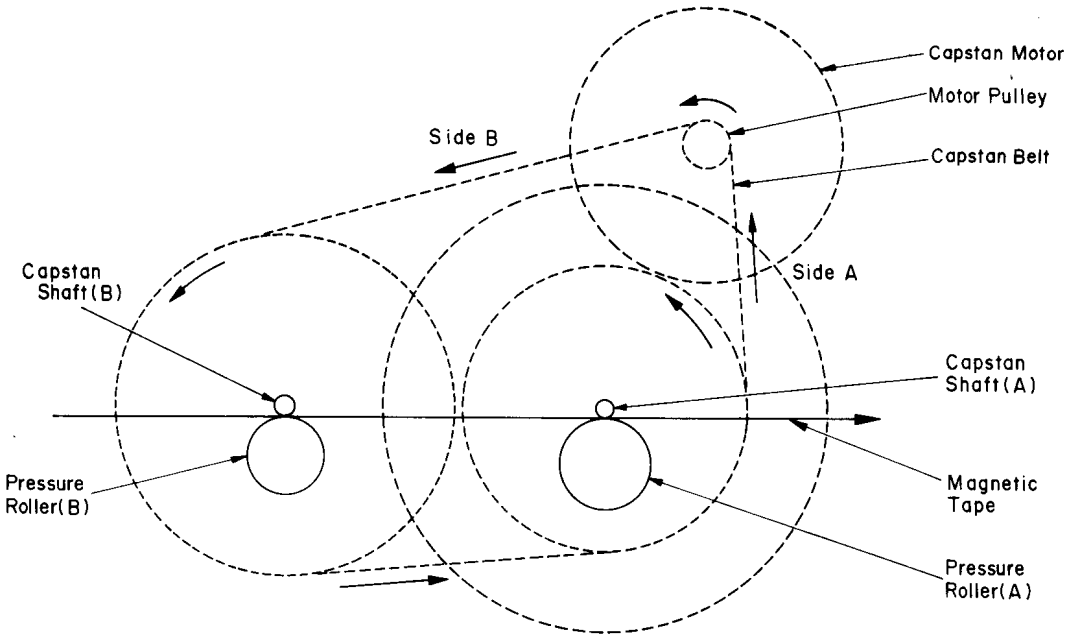



Fig. 2.1.4 Double Capstan Tape Drive

**2.1.4. Mechanism Control Cam Operation**

Refer to Fig. 2.1.5 Mechanism Control Cam timing chart. Function of N-480 Mechanism is done by Cam Control. Cam is driven by the Control Motor. The Motor operates so as to result zero in the difference of voltages between each voltage corresponding to mechanism function and each reference voltage which corresponds to each commands of the Control Switch. When the difference comes to zero, then it stops. In this way, each function is kept properly operated. For further details, please see the explanation on Logic Control. Here we explain principle of its mechanical functions.

Cam Control System works as follows: Cam Drive Gear is driven by Control Motor by means of Drive Belt. Cam Drive Gear is related to the cam with which each function may be mechanically set on.

**(1) Play Mode**

Press the Play Switch to make it Play mode. Then the Cam begins to move from Stop position to Play position and the Play mode will be set.

The Head Base which is linked to the Cam and which is normally pushed against the Stop position gets released and the Head Base will slowly come out for playing. To explain this function, first the Head Base is latched and the Reel Motor begins to turn. Then the Pressure Roller will be pushed and the Brake will be released. Now the tape begins to run. If you press the Pause Switch at this stage, it comes to Pause mode. Brake operates and the Pressure Roller moves away from the Capstan and the Reel Motor stops.

Play mode may be changed to Stop mode by pressing the Stop Switch, and latch of the Head Base being released. The Cassette Case cannot be opened because of the latched eject effect unless it is in Stop mode.

**(2) Record Mode**

By pressing the Record Switch and the Pause or Play Switch, it may be made to Record mode. The Cam at this moment moves from Stop position to Rec. position. At the same time, Rec. Trigger Mechanism is driven and the Record Switch on the Main P.C.B. is switched on to the Record side. Further, the Cam turns until it comes to the Pause or Play position. On the other hand, the Rec. Trigger Mechanism is released during this process. When the Cam is set in Rec./Pause or Rec./Play position, Record signals will be sent to Bias Oscillating Circuit from Logic Control Circuit to let the Bias to oscillate.

Press the Stop Switch and the Cam comes back to the Stop position. At the same time, it will set the Record Switch on the Main P.C.B. to the Play side.

**(3) F.F. or Rewind Mode**

By pressing the F.F. or Rewind Switch, it comes either to F.F. or Rewind mode. The only difference of these two modes is that one is to turn the Reel Motor reverse and the other to transmit the torque against the Reel Hub onto the take-up side or to the supply side. Brake is released at this stage and the Reel Motor begins to turn F.F. or Rewind.

**(4) Pause Mode**

Press the Pause Switch to make it to Pause mode. In changing it from Stop mode to Pause mode, the Brake is first released, then the Head Base is latched, and again the Brake works.

At this stage, the Reel Motor would not turn with the Pressure Roller being apart from the Capstan, and the tape would remain still.

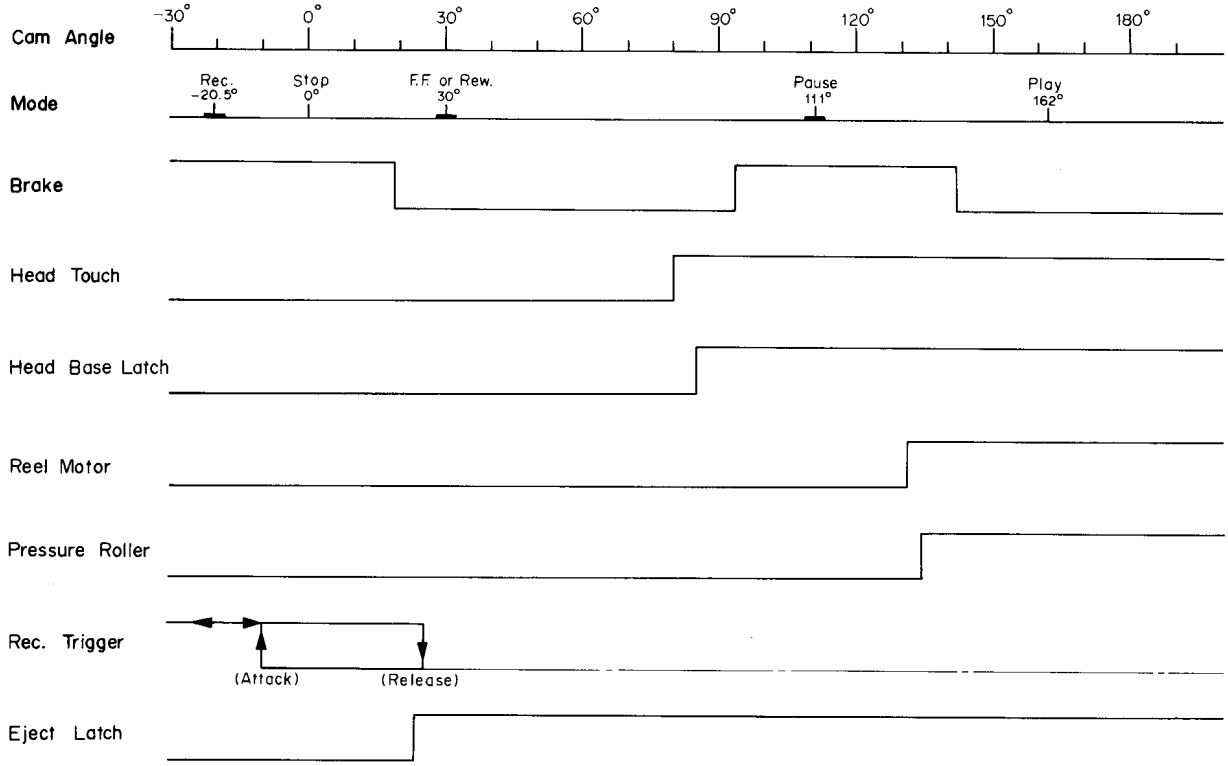



Fig. 2.1.5 Mechanism Control Cam Timing Chart

## 2.2. Amp. Circuits

### 2.2.1. Playback Eq. Amp. Circuit

Fig. 2.2.1 shows the playback equalizer circuit, and Fig. 2.2.2 shows the system diagram.

Fig. 2.2.3 shows the time constant of equalizer. The playback head is connected with circuit's input.

Amplifier (Q101 and Q102) is an equalizer amplifier and its time constant is illustrated in Fig. 2.2.3. R111, R112, L101, and C109 compose a peaking circuit. This circuit compensates the gap loss of the playback head so that high-frequency response will be improved.

Playback Eq. Amp. gain is adjusted by semi-fixed volume VR101 (VR201) to obtain 100 mV output level at TP101 (TP201) when 400 Hz Level Tape (DA09005A) is being played back. Equalizer Switch (70 μs/120 μs) is connected with Amp. The overall time constants in Playback Eq. Amp. are as follows:

Eq. SW – 70 μs
3180 μs (50 Hz) + 70 μs (2274 Hz)
Eq. SW – 120 μs
3180 μs (50 Hz) + 120 μs (1326 Hz)

Shown below is the table for the position of Tape Switch and Eq. Switch:

| Tape SW | Eq. SW | Tape |
|---|---|---|
| ZX | 70 μs | Nakamichi ZX |
| SX | 70 μs | Nakamichi SX, TDK SA, Maxell XL-II Scotch Master 70 μs |
| EX | 120 μs | Low-Noise High-Density (including EX, EXII, TDK AD, Maxell XL-I, Scotch Master 120 μs) |
| | 70 μs | Nakamichi EX, EXII |

It is specified in the IEC Standard that the time constant is 120 μs on tapes of ferric oxide, and 70 μs on tapes of CrO2.

However, in the case of Eq. Switch on the N-480, when time constant at playback is changed, at the same time time constant at record must also be changed.

Therefore, even though record and playback is made by the method other than the IEC Standard, no deterioration of frequency response or level difference will occur. (Any other method for instance, record and playback on ferric oxide tape with putting Tape Switch on EX and Eq. Switch on at 70 μs.)

When Nakamichi EX or EXII Tape is used at Tape Switch: EX, and Eq. Switch: 70 μs, S/N ratio will be improved by approximately 4 dB (WTD).

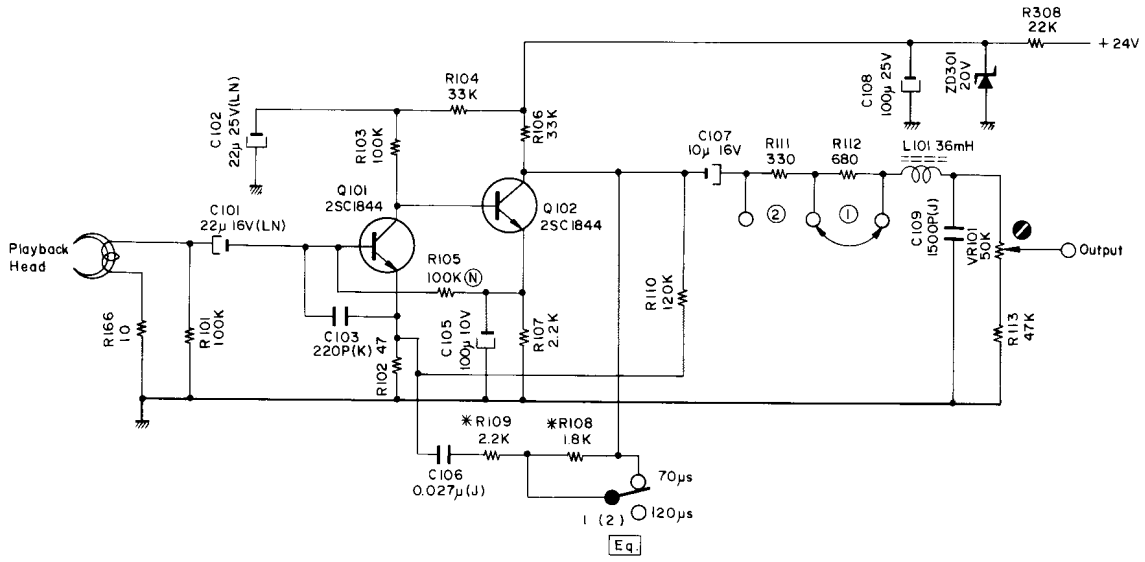



Fig. 2.2.1 Playback Eq. Circuit

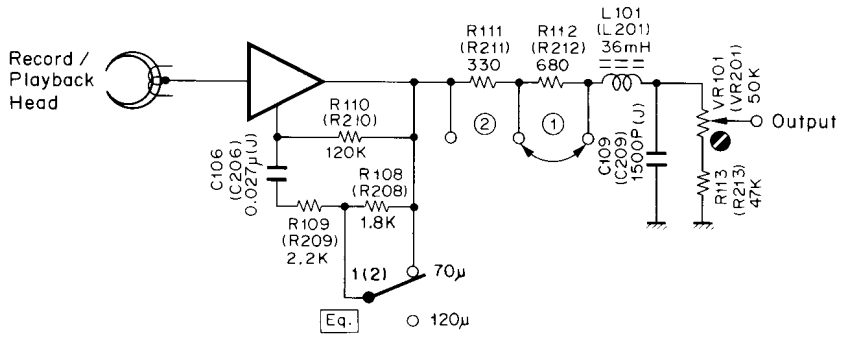



Fig. 2.2.2 System Diagram

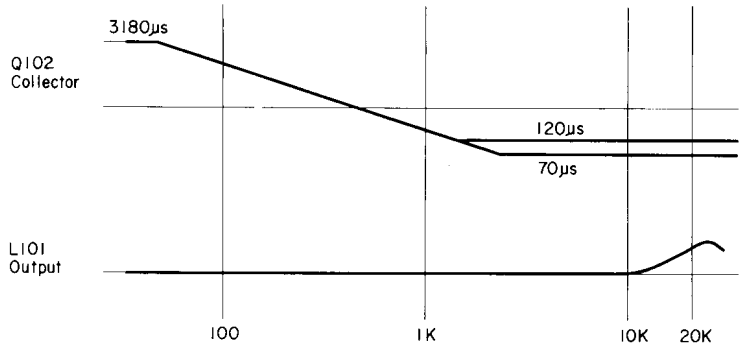



Fig. 2.2.3 Time Constant

### 2.2.2. Record Equalizer Amplifier Circuit

The record equalizer amplifier circuit consists of the Output Amp. incorporated in the Dolby NR IC and peripheral circuits as shown in Fig. 2.2.4.

VR102, VR103, and VR104 are the record calibration semi-fixed volumes for ZX, SX, and EX tapes. The output of the Output Amp. is given to these volumes, and the outputs from the volumes are fed back to the inverting input of the Output Amp. via amplifier Q103 and a time-constant changeover circuit.

By adjusting L104, compensation for the high frequency range is made by setting a resonance frequency at 21 kHz or neighborhood.

L105, C138 and C139 compose a recording bias trap circuit.

### 2.2.3. Bias Osc. Circuit

Fig. 2.2.5 shows a push-pull oscillator with an oscillation frequency of 105 kHz which is constructed by capacitors C302 and C303 coupling the collectors and bases of two transistors (Q301 and Q302).

This is used to provide recording bias and as an erase signal.

By pressing the Record and Pause, or Record and Play buttons, (Play + Pause)-Position signal conducted from the logic control circuit becomes H and Q303 turns to ON.

Therefore, +24 V is applied to the circuit and oscillation begins.

When the record mode is released, oscillator output is damped by the discharge of C304. This prevents magnetization of the head.

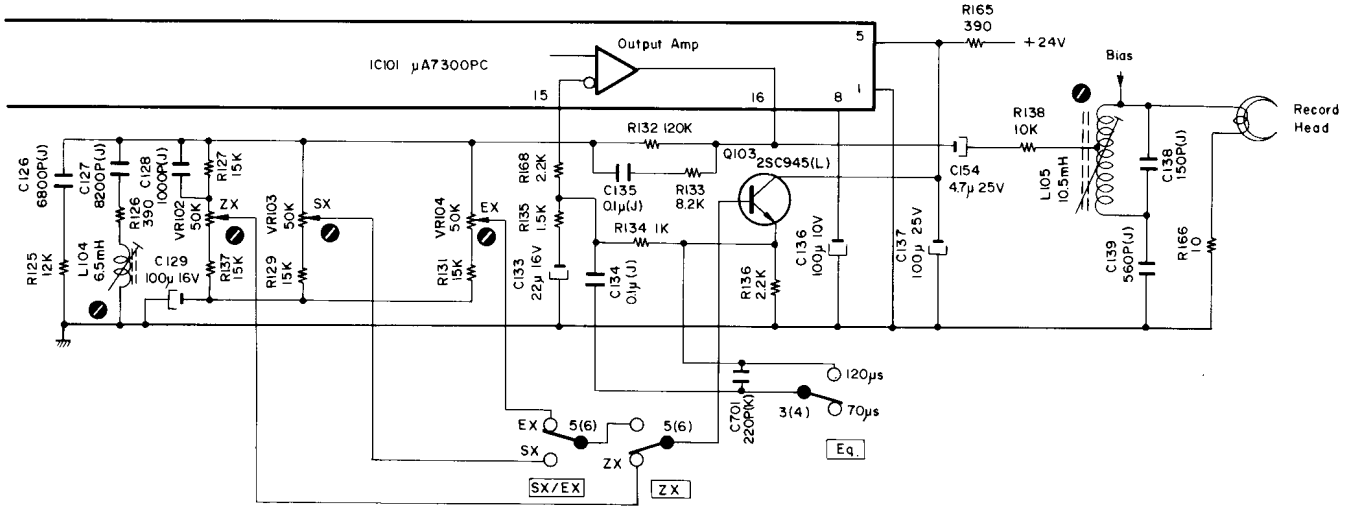



Fig. 2.2.4 Record Eq. Amp. Circuit

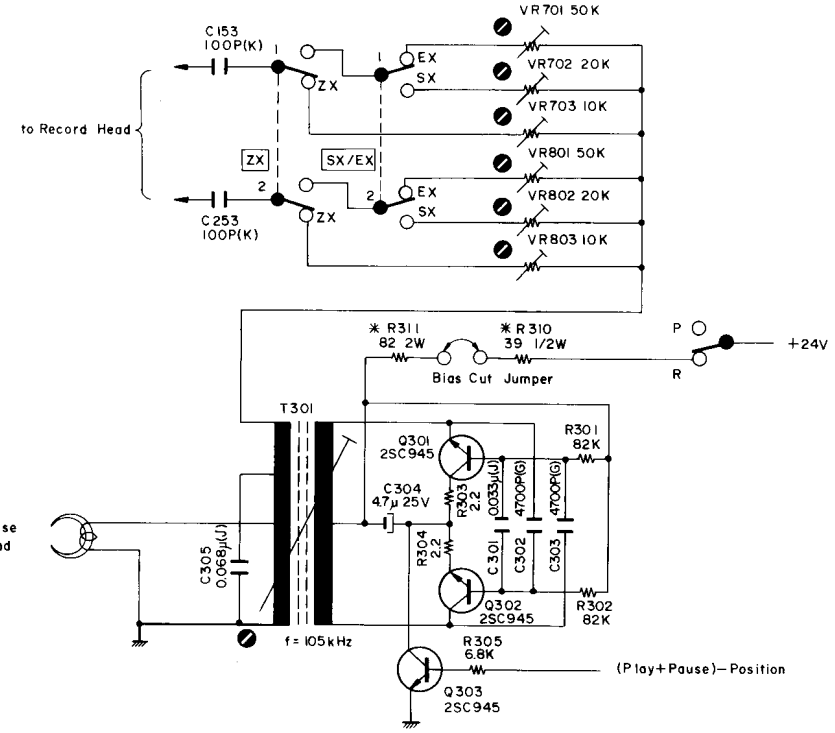



Fig. 2.2.5 Bias Osc. Circuit

## 2.3. Mechanism Control Circuits

### 2.3.1. Outline

**(1) Control Button Operation**

Record, Rewind, Stop, Play, and Fast-Forward Buttons consist of a 5-way switch and are interlocked each other. When one button is pressed, it is mechanically locked in the ON state and other buttons are mechanically released. Stop Button is of momentary type and acts to release other buttons mechanically. But it is not used to control circuits electrically. Pause Button is independent from others and is of push-on and push-off type. Note that if two or more buttons are pressed simultaneously, these buttons are locked in the ON state. Under the normal control button operation, only Record and Play Buttons are pressed simultaneously to set the N-480 in RECORD mode. In this case, both Record and Play Buttons are locked in the ON state and RECORD mode is set. The N-480 is designed so as not to occur erroneous operation even if two or more buttons are pressed simultaneously. Further, to prevent from abnormal tape tension, loosening of tape, etc., the N-480 changes its mode by passing through momentary STOP mode automatically, for example, when PLAYBACK mode is commanded while FF mode, or REW mode is commanded while FF mode.

**(2) Auto Shut-off Function**

Refer to Fig. 2.3.1 basic circuit diagram.

During FF, REW, or PLAY (PLAYBACK or RECORD) mode, auto shut-off will be activated when the tape comes to end, and FF, REW, or PLAY mode is changed to STOP mode.

Following explanation is made in regard to REW mode:

In the initial condition, Q428 is turned ON and +24 VS is applied to the emitter of Q402. When Rewind Button is pressed, it is locked in the ON state, as a result, Q402 is turned ON, the REW signal becomes H, and the N-480 is set in REW mode.

When tape-end comes, auto shut-off is activated and Q428 is turned OFF, as a result, +24 VS is shut-off, Q402 is cut off, and the REW signal becomes L. In this way, REW mode is changed to STOP mode. (Note that Rewind Button is still locked in the ON state.) When Play Button is pressed in this state, REW Button is released and Q428 is turned ON, as a result, +24 VS is applied again, Q418 is turned ON, the PLAY signal becomes H, and the N-480 is set in PLAY mode.

**(3) Unattended Recording or Playback**

Unattended recording or playback is carried out by the use of the lock mechanism of control button, therefore, no special circuit is required for this purpose.

If Record and Play Buttons are pressed, unattended recording can be carried out when the power is connected to the N-480. If only Play Button is pressed, playback will be carried out when the power is connected to the N-480.

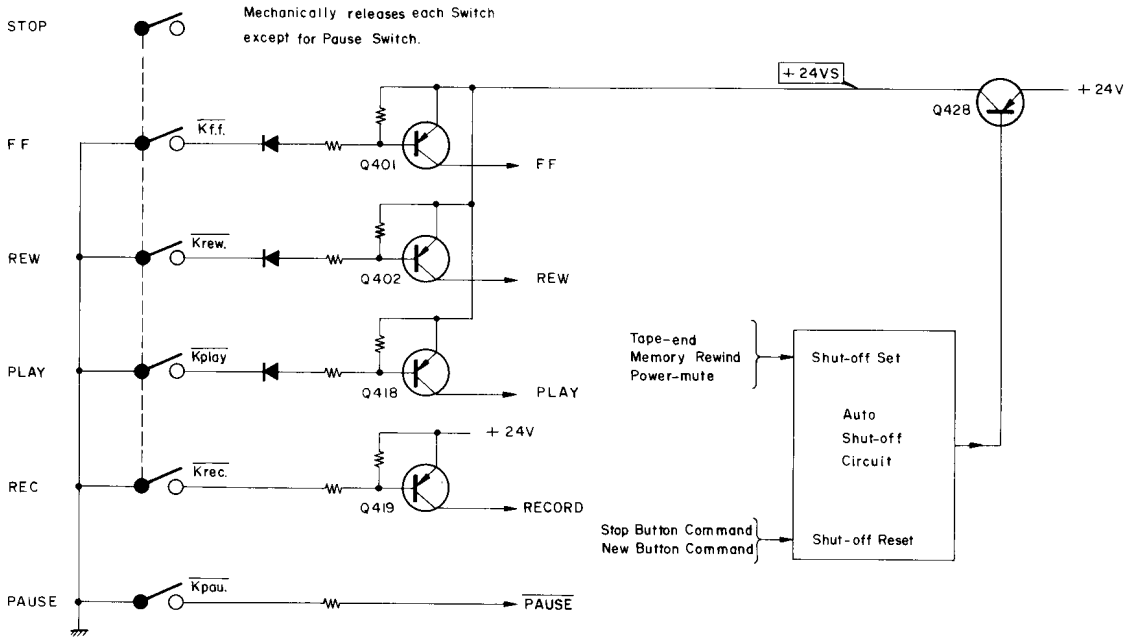



Fig. 2.3.1 Basic Auto Shut-off Circuit

### 2.3.2. +12 V Power Source

Refer to Fig. 2.3.2 circuit diagram. Only +24 V DC power supply is used in the N-480. The circuit acts to produce a +12 V power source from the +24 V DC power supply. Mechanism control is done by using thus produced +12 V.

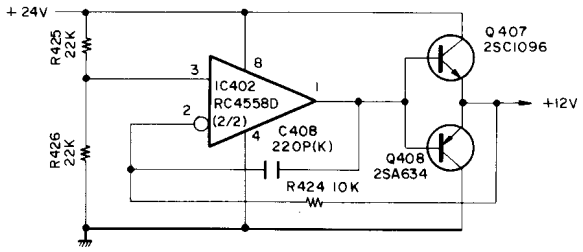



Fig. 2.3.2 +12 V Power Source Circuit

### 2.3.3. $\overline{\text{Power-mute}}$ Signal

Refer to Fig. 2.3.3 circuit diagram and Fig. 2.3.4 timing chart. $\overline{\text{Power-mute}}$ = L signal is produced pulse-likely when Power Switch is turned ON or OFF. This L pulse mutes the amp. circuit and also acts to shut off the shut-off circuit initially.

#### (1) Power Switch ON

Q433 is turned ON at every positive half cycle of the output from the secondary winding of the power transformer. When Q433 is turned ON, C416 is discharged, as a result, the voltage of C416 can not exceed the VBE of Q432, and Q432 is in the cutoff state.

Therefore, the $\overline{\text{Power-mute}}$ = L pulse is produced for a certain period of time when +24 V is built up after Power Switch is turned ON.

The $\overline{\text{Power-mute}}$ = L signal makes Q416 to turn ON, as a result, Mute signal becomes H and the amp. circuit is muted.

Meanwhile, the $\overline{\text{Power-mute}}$ = L pulse is applied to the shut-off circuit and shut-off is activated.

#### (2) Power Switch OFF

The output from the secondary winding of the power transformer ceases quickly, and Q433 is turned OFF. Consequently, the base current flows to Q432 through R481, Q432 is turned ON, and the $\overline{\text{Power-mute}}$ signal becomes L.

The $\overline{\text{Power-mute}}$ = L signal makes Q416 to turn ON, as a result, Mute signal becomes H and the amp. circuit is muted. At the same time, shut-off circuit is shut off by the $\overline{\text{Power-mute}}$ = L signal.

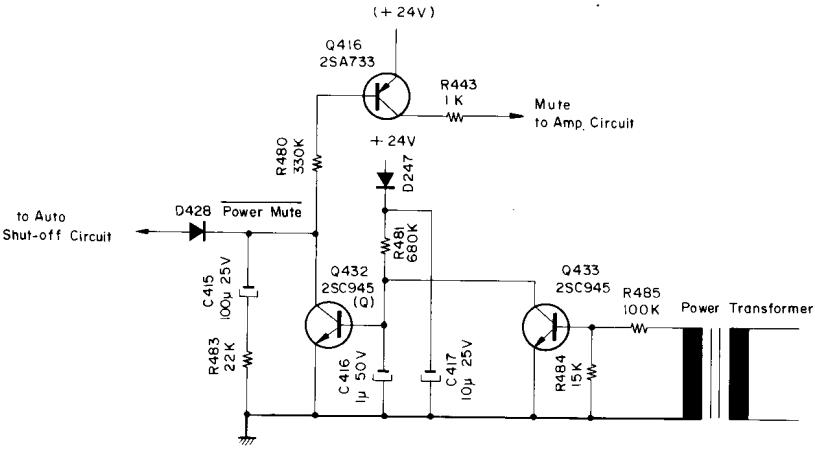



Fig. 2.3.3 Power-mute Circuit

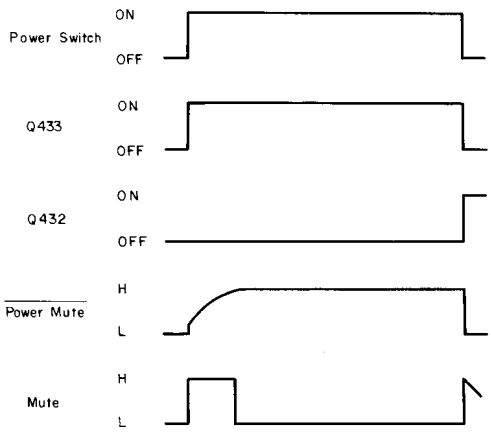



Fig. 2.3.4 Timing Chart

### 2.3.4. Auto Shut-off Circuit

Refer to Fig. 2.3.5 circuit diagram and Fig. 2.3.6 timing chart.

#### (1) Shut-off Sensor

Light from lamp PL407 is projected through holes in a disc rotating synchronously with the take-up reel, and the intermittent flashes coming through the disc are converted into electrical signals by a phototransistor Q450. These signals are amplified into square waves, and transmitted to the shut-off detecting circuit in the subsequent stage. When the tape-end comes, the take-up reel and the disc stops rotating, and no pulse is output from the sensor.

#### (2) Shut-off Detecting Circuit and Peripheral Circuits

Shut-off conditions are as follows:

- reached tape-end during PLAY (PLAYBACK or RECORD), FF, or REW mode
- mode is changed as follows:
  - from FF to REW mode, or vice versa
  - from FF to PLAY mode
  - from RECORD mode to FF or REW mode

  When the mode is changed, shut-off is momentarily activated and the mode is changed to STOP mode in a short period of time, and after this STOP mode is over, a new mode is set.
- $\overline{\text{Power-mute}}$ = L pulse is generated when Power Switch is turned ON or OFF
- memory rewind function is activated.

**(a) Reached tape-end during PLAY (PLAYBACK or RECORD), FF, or REW mode**

Explanation is made for PLAY mode as an example. For FF or REW mode, the shut-off function is the same as for PLAY mode.

As Play Button is locked ON mechanically, $\overline{Kplay}$ = L. Accordingly, R488 (100 kΩ) is grounded through Play Button and the voltage at the point A becomes approx. +23 V. Since the voltage at the point A is not lower than the emitter voltage of Q424, Q424 is turned OFF and Q426 is also turned OFF. (Q424 and Q426 will be turned ON when the voltage at the point A is further lowered as described in subsequent (b).)

Q425, Q427, Q430, R470 and C412 consist of a shut-off detecting circuit. During PLAY mode, the voltage at the point A is approx. +23 V, therefore, Q425 is turned ON and C412 (2.2 μF) is charged toward +24 V through R470.

Meanwhile, pulses from the shut-off sensor are applied to the base of Q427 through R489 and C418, and, at every H cycle of the sensor output pulse, Q427 is turned ON and C412 is discharged through Q427. When the tape-end is detected, pulses from the shut-off sensor are not transmitted and Q427 is turned OFF, resulting in C412 being charged continuously.

When the voltage of C412 exceeds the sum of the emitter voltage (approx. 5.5 V) and the VBE of Q430, Q430 is turned ON and the base current flows to Q429. Consequently, Q429 is turned ON, Q428 is cut off, +24 VS is shut-off, PLAY mode is changed to STOP mode, and play lamp goes out.

Q430, Q429, Q428, R476, R474, R456 and C420 consist of a Schmitt circuit which provides hysteresis characteristics for ON/OFF of Q430. Accordingly, Q430 will be turned ON or OFF without chattering for the input waveform with a large time constant developed across C412. If Pause Button is pressed during PLAY mode, tape stops and no pulse is transmitted from the shut-off sensor, but Q427 is kept ON since Q423 is turned ON during PLAY-PAUSE mode, therefore, no charge is made at C412 and shut-off is not activated.

When shut-off is made at the tape-end during PLAY mode, PLAY mode is changed to STOP mode.

If Stop Button is further pressed, Play Button will be released and the voltage at the point A returns to +24 V as R488 is released from grounding, as a result, Q425 is turned OFF and C412 is discharged quickly through D423 and R467 (10 kΩ). Accordingly, Q430 is turned OFF, Q429 is turned OFF, Q428 is turned ON, and +24 VS is again applied preparing for the next control button operation.

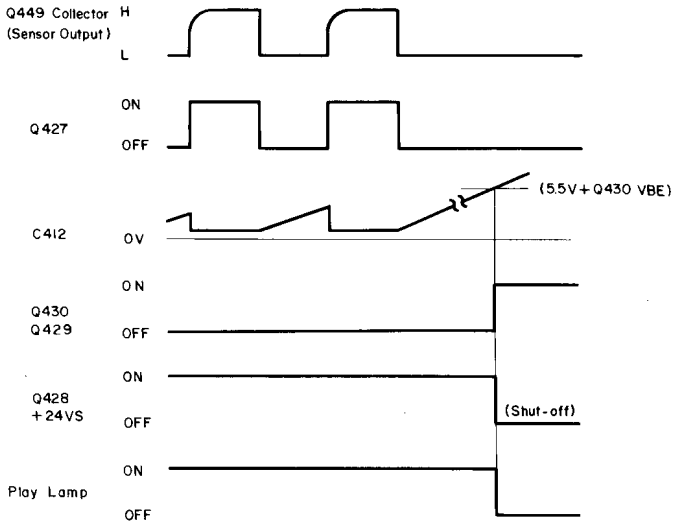



Fig. 2.3.6 Timing Chart

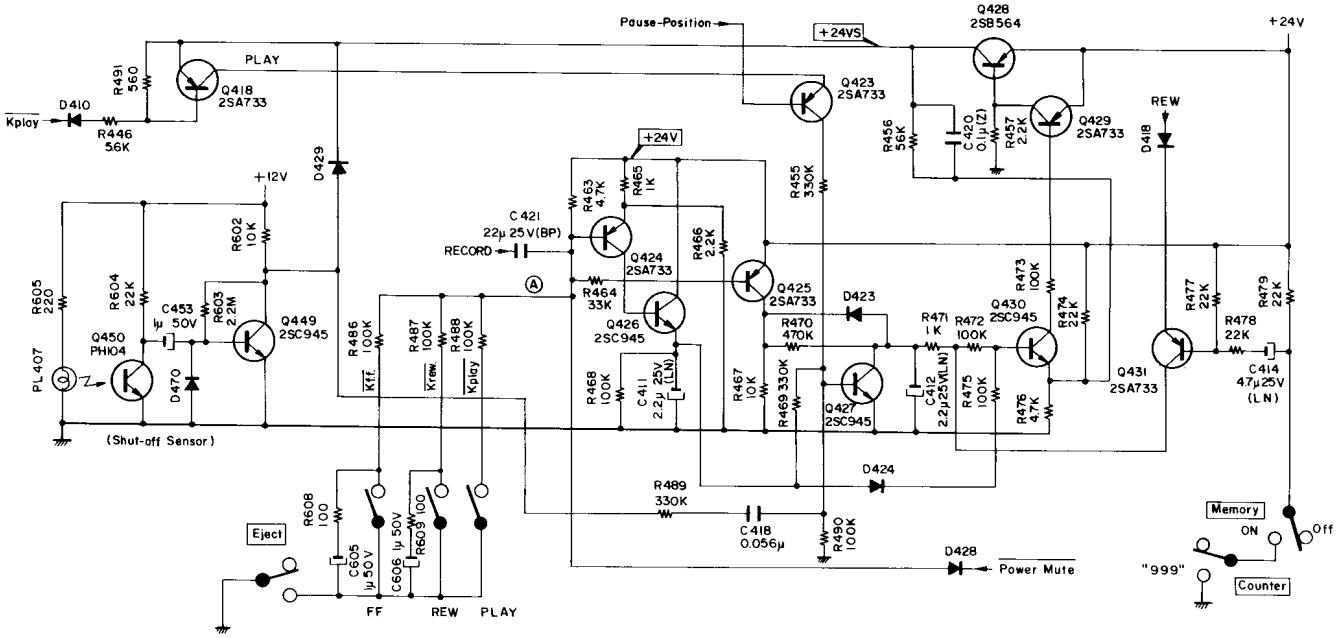



Fig. 2.3.5 Auto Shut-off Circuit

**(b) Mode is changed**

**1) From FF to REW mode, or vice versa, or from FF to PLAY mode**

Refer to Fig. 2.3.7 timing chart.

When mode is changed from FF to REW mode, or vice versa, or from FF to PLAY mode, momentary STOP mode is automatically taken in view of the response of the tape deck mechanism, and after this is over, a new mode is set.

The following explains in regard to the case when FF mode is changed to PLAY mode by pressing Play Button during FF mode:

During FF mode, R486 (100 kΩ) is grounded by the $\overline{\text{Kf.f.}}$ = L signal. When Play Button is pressed, it is locked ON and FF Button is released. Although FF Button is released, the $\overline{\text{Kf.f.}}$ signal is kept L for a short period of time because the delay circuit (C605 and R608) connected in parallel to FF Button acts to prolong the $\overline{\text{Kf.f.}}$ = L signal. In this period, the voltage at the point A becomes approx. +22 V from +23 V pulse-likely as R486 and R488 are grounded by the $\overline{\text{Kf.f.}}$ = L and $\overline{\text{Kplay}}$ = L signals respectively. Consequently, Q424 and Q426 are turned ON, and C411 is charged up to +24 V, but C411 will be discharged after this period is over. The base current to Q430 is supplied from C411 through D424 and R475, as a result, Q430 and Q429 are turned ON, Q428 is turned OFF, and +24 VS is shut off resulting in STOP mode. On the other hand, since the base current to Q427 is supplied from C411 through R469, R427 is turned ON until the discharge of C411 is completed. When the voltage of C411 is lowered than the emitter voltage (approx. 4.2 V) of Q430, Q430 and Q429 are cut off, Q428 is turned ON, and +24 VS is supplied, as a result, the PLAY signal becomes H (+24 VS) and PLAY mode is set.

**2) From RECORD mode to FF or REW mode**

When mode is changed from RECORD to FF or REW mode, momentary STOP mode is automatically taken in view of the tape deck mechanism, and after this is over, a new mode is set.

When Record Button is released by pressing either FF or REW Button, Q419 is turned from ON to OFF, therefore, a negative differentiated pulse is applied to the point A via C421 (22 μF).

This negative pulse acts to turn ON Q424 and Q426, as a result, C411 is charged up to +24 V. FF or REW mode is set after passing through a certain period of STOP mode in the same manner as above 1).

**(c) $\overline{\text{Power-mute}}$ = L**

The $\overline{\text{Power-mute}}$ = L pulse is generated when Power Switch is turned ON or OFF. During the $\overline{\text{Power-mute}}$ signal is L, the voltage at the point A becomes lower than the emitter voltage of Q424. Subsequently, Q424 and Q426 are turned ON, C411 is charged up to +24 V, and shut-off is activated in the same manner as above (b).

**(d) Memory Rewind**

During REW mode and with Memory Rewind Switch turned ON, C414 is grounded when the tape counter comes to "999", and Q431 is turned ON pulse-likely.

As a result, Q430 is turned ON, and shut-off is activated resulting in STOP mode.

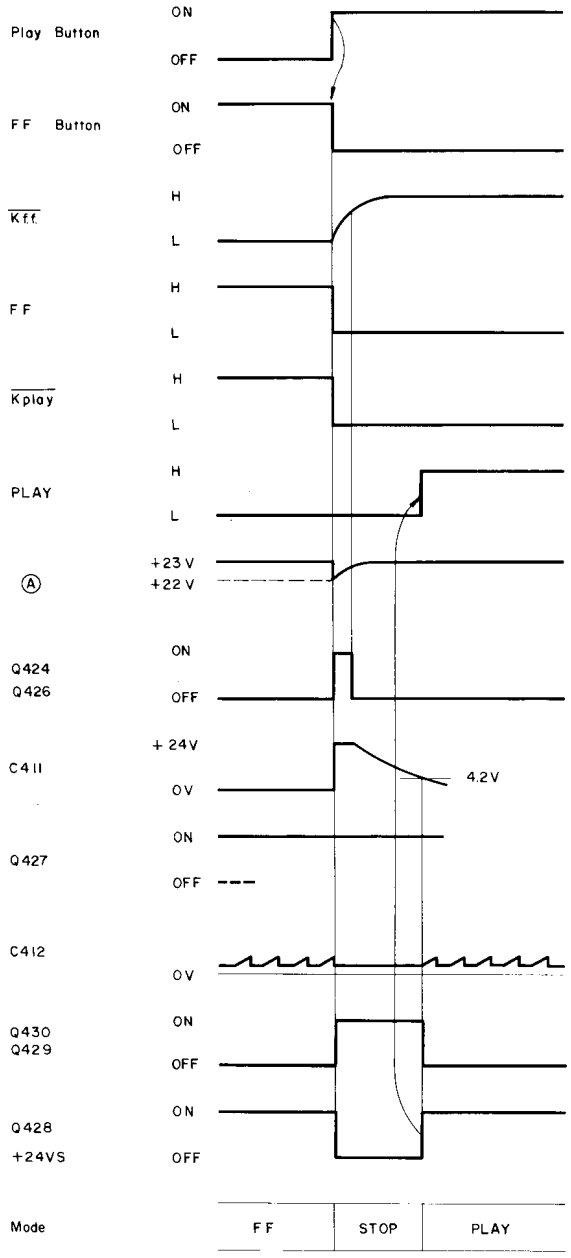



Fig. 2.3.7 Timing Chart

### 2.3.5. Record Control Circuit

Refer to Fig. 2.3.8 circuit diagram.

RECORD mode is set by pressing Record Button, then Play Button together. By pressing Record Button, the $\overline{\text{Krec.}}$ signal becomes L, Q419 is turned ON, Q421 is turned ON, and the record lamp is illuminating. Then, by pressing Play Button further, the $\overline{\text{Kplay}}$ signal becomes L, Q418 is turned ON, the PLAY signal becomes H (+24 VS), and Q420 is turned ON.

Accordingly, the base current flows to Q403 via C406 connected to the base of Q403, and Q403 is turned ON pulse-likely.

The output of Q403 is fed to the control motor drive circuit and acts to bring the cam to the record position.

When Q403 returns to OFF, the cam then moves to the play position and stays there, thus the mechanism is set to RECORD mode.

Record circuit is designed to protect from the erroneous setting of RECORD mode even if wrong record button operation is made.

Q422 is turned ON during FF or REW mode, or when the cam is set to the play or pause position, i.e., PLAY or PLAY/PAUSE mode. In this case, as D422 is grounded by Q422, Q421 is not turned ON and the record lamp is not lit even if Record Button is further pressed.

Further, the base of Q420 is grounded via D419 and Q422, consequently, Q420 and Q403 are not turned ON and no pulse is output from Q403 to the control motor drive circuit.

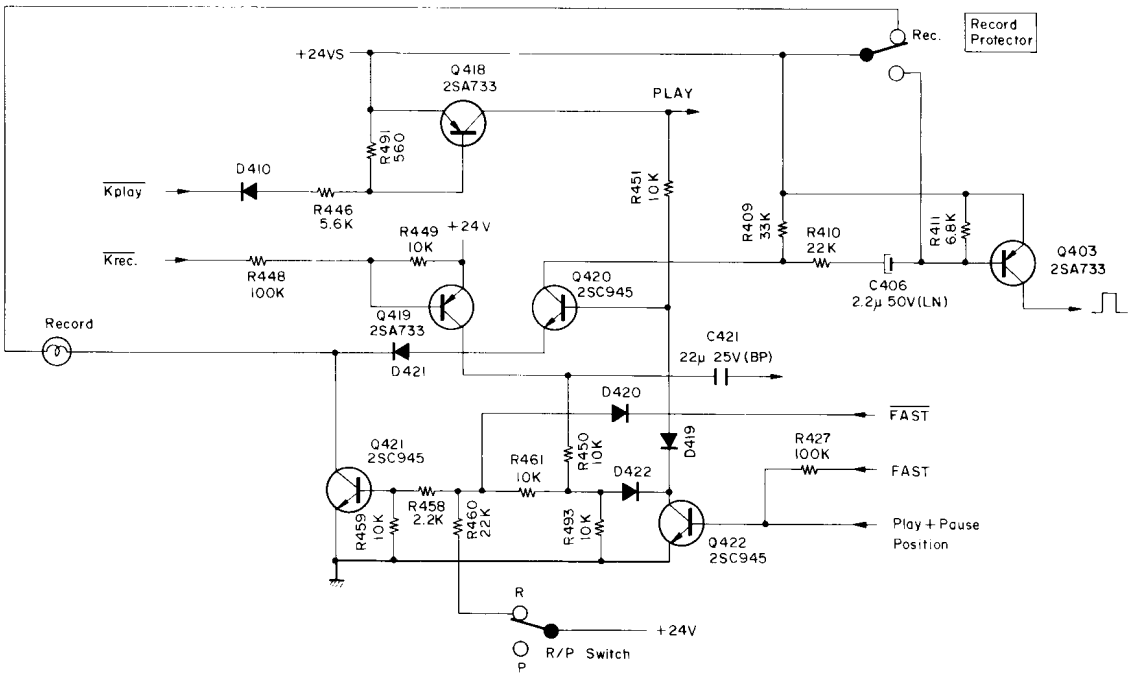



Fig. 2.3.8 Record Control Circuit

### 2.3.6. Mute Signal

Refer to Fig. 2.3.9 circuit diagram.

When Q416 is turned ON, the Mute = H signal is fed to the amp. circuit and the amp. circuit is muted.

The condition that the amplifier circuit is muted are (Mute = H):

Q416 ON = ((Q412 ON) + $\overline{\text{PLAY}}$)·(R/P Switch = Play) + Power-mute

Power-mute: When Power Switch is turned ON or OFF, $\overline{\text{Power-mute}}$ signal becomes L, i.e., Power-mute signal becomes H, and Q416 is turned ON.

Q412 ON : Cam is in the pause position.

Q412 OFF : Cam is in the play position (i.e., PLAYBACK or RECORD mode).

R/P Switch : When R/P Switch on the Main P.C.B. is in the record position, +24 V is applied, but when it is in the play position, no voltage is applied.

The modes in which the amplifier circuit is not muted are (Mute = L):

Q416 OFF = $\overline{\text{Q416 ON}}$

= $\overline{((\text{Q412 ON})\cdot\text{PLAY} + (\text{R/P Switch} = \text{Play}))\cdot\text{Power-mute}}$

= $\overline{((\text{Q412 OFF})\cdot\text{PLAY} + (\text{R/P Switch} = \text{Record}))\cdot\text{Power-mute}}$

i.e., PLAYBACK mode and RECORD mode.

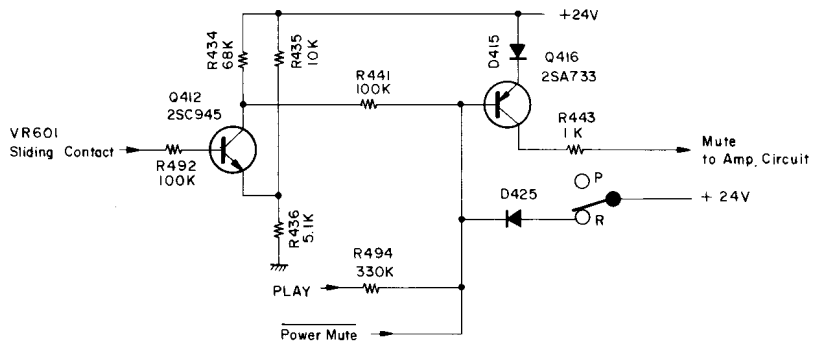



Fig. 2.3.9 Mute Signal Circuit

### 2.3.7. Control Motor Drive Circuit

Refer to Fig. 2.3.10 circuit diagram and Fig. 2.3.11 timing chart. The control motor is turned by varying amounts, according to which control button is set. This motor is connected to the mechanism control cam, and the mechanism is set to the mode indicated by this cam.

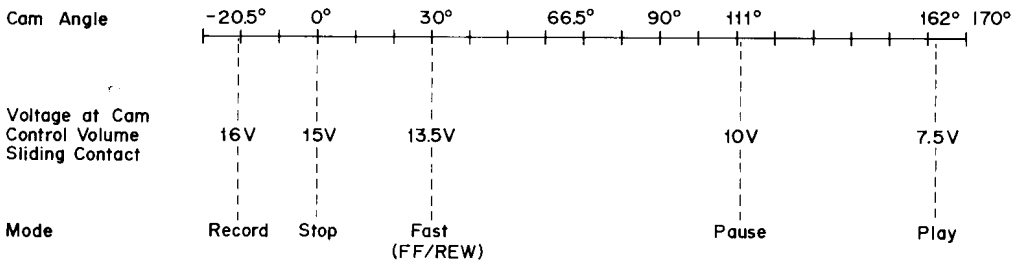
The motor is driven by the differential amplifier IC402 (1/2) and drivers Q405 and Q406. In the control motor stop condition, both voltages at pins No.5 (non-inverting input) and No.6 (inverting input) of IC402 (1/2) are equal and the difference of both inputs is zero. When a new mode is demanded, the balance of both inputs is broken, as a result, the control motor is driven until both inputs are balanced. The cam control variable resistor VR601 moves synchronously with the motor so that the voltage at the sliding contact of VR601 is changed.

When the voltage at the sliding contact of VR601 is changed and the input difference of the differential amplifier IC402 (1/2) becomes zero, the control motor stops.

The following table shows the relationship between cam position and the voltage at the sliding contact of the cam control variable resistor VR601, and the state of transistors in each mode.

| Position on Cam | Typical Voltage at Sliding Contact of Cam Control Volume |
|---|---|
| Record | 16V |
| Stop | 15V |
| FF/REW | 13.5V |
| Pause | 10V |
| Play | 7.5V |

| Mode | ON | | OFF | |
|---|---|---|---|---|
| Record | Q403, Q410 ⎍ | Q412 | Q404 | Q411 |
| Stop | | Q412 | Q403, Q404, Q410 | Q411 |
| FF/REW | Q404, Q410 | Q412 | Q403 | Q411 |
| Play·Pause | D417 ON | Q411, Q412 | Q403, Q404, Q410 | |
| Play | | Q411 | Q403, Q404, Q410 | Q412 |



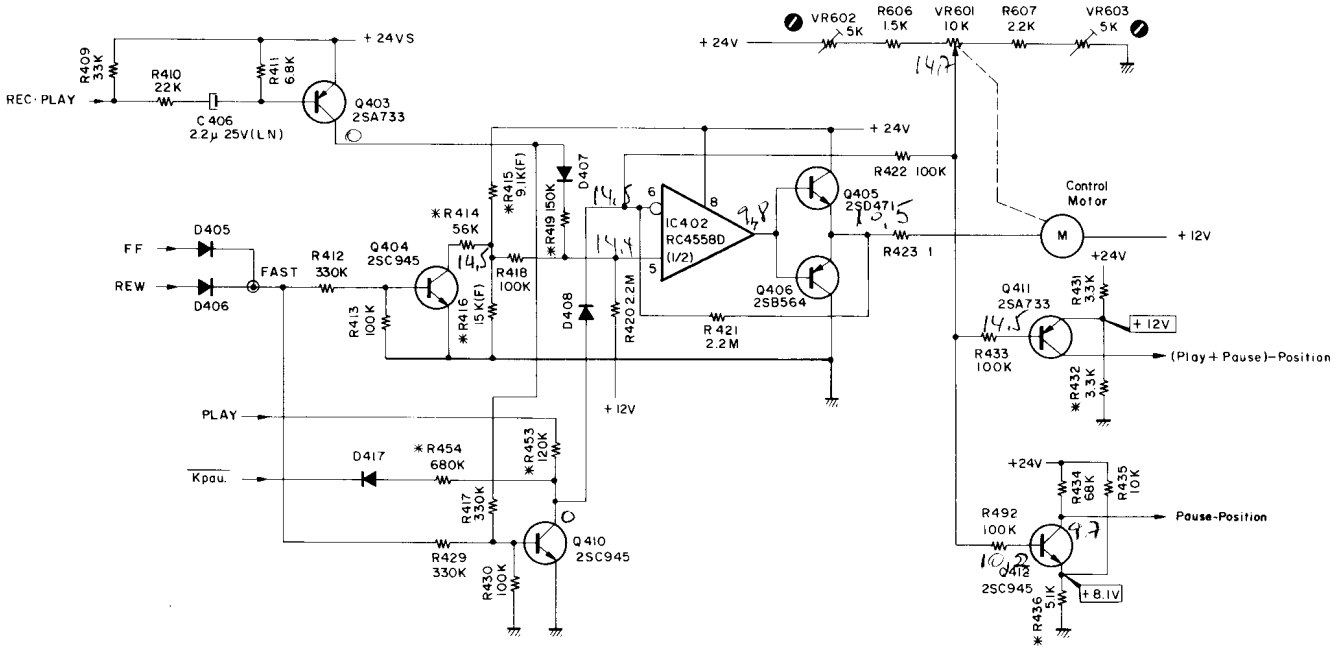



Fig. 2.3.10 Control Motor Drive Circuit

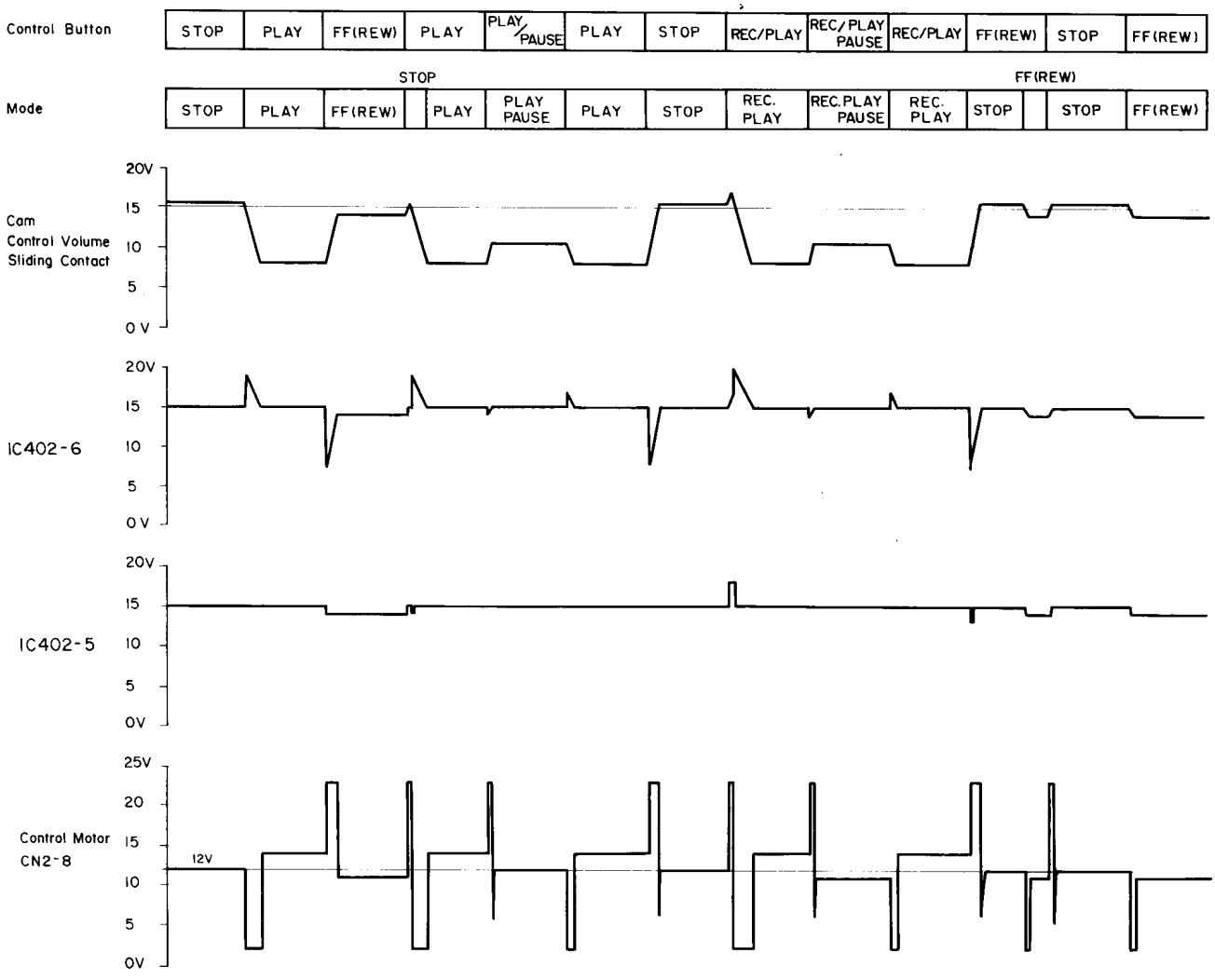



Fig. 2.3.11 Timing Chart

### 2.3.8. Reel Motor Governor

Refer to Fig. 2.3.12 circuit diagram.

One end of the reel motor is connected with +12 V and the other end is a terminal for controlling.

During FF mode, Q413 is turned ON and the reel motor is grounded. Accordingly, the reel motor turns in the direction of fast-forwarding. On the other hand, during REW mode, +24 V (REW = H) is applied to the reel motor and the reel motor turns in the direction of rewinding. During PLAY (PLAYBACK or RECORD) mode, Q412 is turned OFF and the Pause-position signal becomes H, as a result, Q417 is turned OFF and the reel motor is turned at a constant speed by the governor composed of Q414 and Q415.

During PLAY/PAUSE mode, Q412 is turned ON and the Pause-position signal becomes L, therefore, Q417 is turned ON, Q414 is biased in the reverse direction, and Q414 is cut off, thus the reel motor does not turn.

Take-up function at loading:

When a cassette tape is inserted and loaded, Eject Switch will become open. Consequently, the base current is applied to Q413 through C409, and Q413 is turned ON pulse-likely. During Q413 is turned ON, the reel motor turns in the direction of fast-forwarding and eliminates tape loosening of the cassette tape if any.

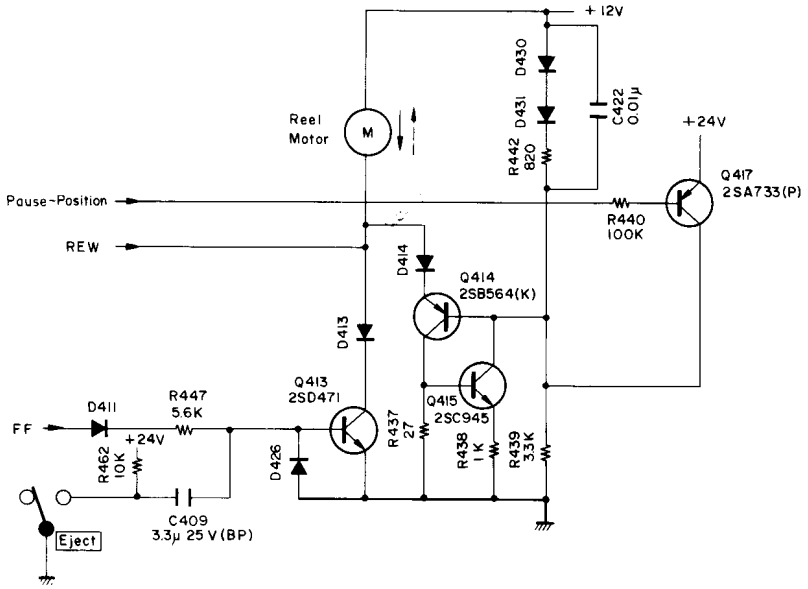



Fig. 2.3.12 Reel Motor Governor

## 3. REMOVAL PROCEDURES

### 3.1. Cassette Case Cover Ass'y

Refer to Fig. 3.1.

(1) Press the Eject Button to open the Cassette Case Ass'y.
(2) Pull out F01 (Cassette Case Cover Ass'y) upwardly.

### 3.2. Top Cover Ass'y

Refer to Fig. 3.1.

Remove F02 and F03, then disassemble F04 (Top Cover Ass'y).

### 3.3. Bottom Cover Ass'y

Refer to Fig. 3.1.

Remove F05, then disassemble F06 (Bottom Cover Ass'y).

### 3.4. Front Panel Ass'y

Refer to Fig. 3.2.

(1) Refer to Fig. 3.1. Remove Top Cover Ass'y and Bottom Cover Ass'y referring to items 3.2 and 3.3.
(2) Pull out F01 (Volume Knobs).
(3) Remove F02 (Power Switch Joint Bar) by releasing the self-interlocking pin of the Power Switch Joint Bar from Power Switch, and turn F02 (Power Switch Joint Bar) by 90° either clockwise or counterclockwise, then disassemble F02 (Power Switch Joint Bar) from the Power Switch Knob Ass'y.
(4) Remove F03, then disassemble F04 (Front Panel Ass'y).

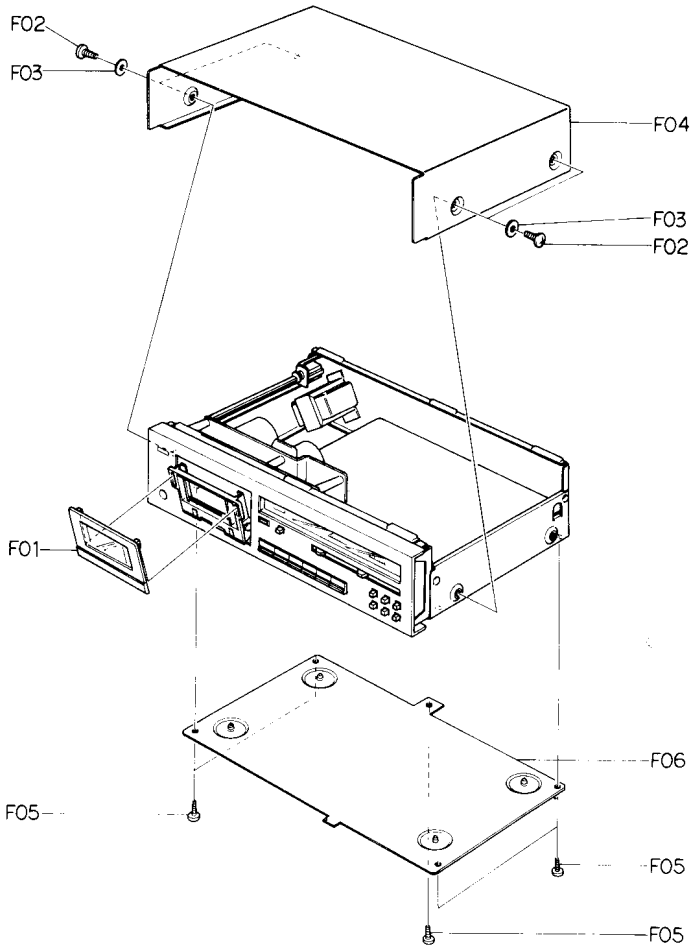



Fig. 3.1

### 3.5. Headphone Jack Ass'y

Refer to Fig. 3.2.

(1) Remove Front Panel Ass'y referring to item 3.4.
(2) Remove F05, then disassemble F06 (Headphone Jack Ass'y).

### 3.6. Mechanism Ass'y

Refer to Fig. 3.2.

(1) Remove Front Panel Ass'y referring to item 3.4.
(2) Remove F07 and F08, then disassemble F09 (Mechanism Ass'y including 4 connectors and a record switch linkage).

### 3.7. Meter Ass'y

Refer to Fig. 3.2.

(1) Remove Front Panel Ass'y referring to item 3.4.
(2) Remove F10 (Meter Ass'y) by releasing self-interlocking pins of the Meter Ass'y.

### 3.8. Lamp P.C.B. R Ass'y and Lamp P.C.B. L Ass'y

Refer to Fig. 3.2.

(1) Remove Meter Ass'y referring to item 3.7.
(2) Remove F11 (Lamp P.C.B. R Ass'y) and F12 (Lamp P.C.B. L Ass'y) by releasing the self-interlocking pins.

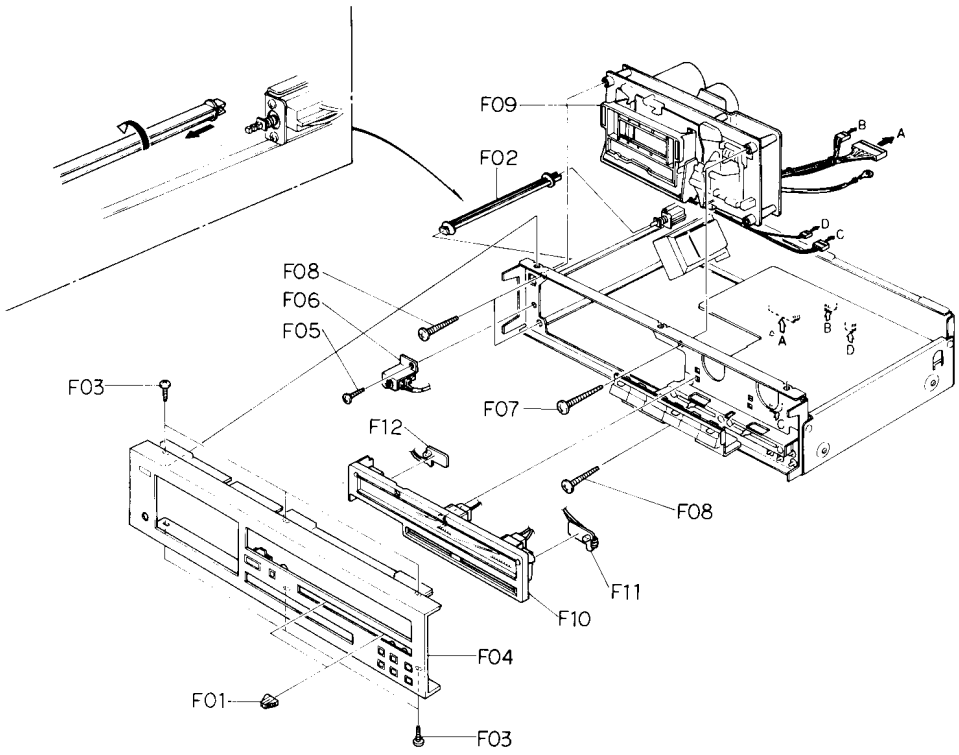



Fig. 3.2

### 3.9. Main P.C.B. Ass'y

Refer to Fig. 3.3.

(1) Refer to Fig. 3.2. Remove Front Panel Ass'y referring to item 3.4.
(2) Remove 4 connectors and the wires connected by wrapping from the F05 (Main P.C.B. Ass'y).
(3) Remove F01, F02, F03, F04 and the Record Switch Linkage from the Wire Holder assembled with Record Switch, then disassemble F05 (Main P.C.B. Ass'y).

### 3.10. Control Switch Holder Ass'y

Refer to Fig. 3.3.

(1) Refer to Fig. 3.2. Remove Meter Ass'y referring to item 3.7.
(2) Remove F06, then disassemble F07 (Control Switch Holder Ass'y).

### 3.11. Switch P.C.B. Ass'y

Refer to Fig. 3.3.

(1) Refer to Fig. 3.2. Remove Front Panel Ass'y referring to item 3.4.
(2) Remove F08, then disassemble F09 (Switch P.C.B. Ass'y).

### 3.12. Volume P.C.B. Ass'y and Control Switch P.C.B. Ass'y

Refer to Fig. 3.3.

(1) Remove Control Switch Holder Ass'y referring to item 3.10.
(2) Remove F10, then disassemble F11 (Volume P.C.B. Ass'y).
(3) Remove F12, then disassemble F13 (Control Button Spring).
(4) Remove F14 (Control Button Shaft), then disassemble F15 (Control Buttons).
(5) Remove F16, then disassemble F17 (Control Switch P.C.B. Ass'y).

### 3.13. Rear Panel Ass'y, Power Transformer and Power Switch

Refer to Fig. 3.4.

(1) Refer to Fig. 3.1. Remove Top Cover Ass'y and Bottom Cover Ass'y referring to items 3.2 and 3.3.
(2) Remove F01, F02 and F03, then disassemble F04 (Rear Panel Ass'y).
(3) Remove F05 and F06, then disassemble F07 (Power Transformer).
(4) Remove Power Switch Joint Bar by releasing the self-interlocking pin of the Power Switch Joint Bar from Power Switch and F08, then disassemble F09 (Power Switch Holder Ass'y).
(5) Remove F10, then disassemble F11 (Power Switch).

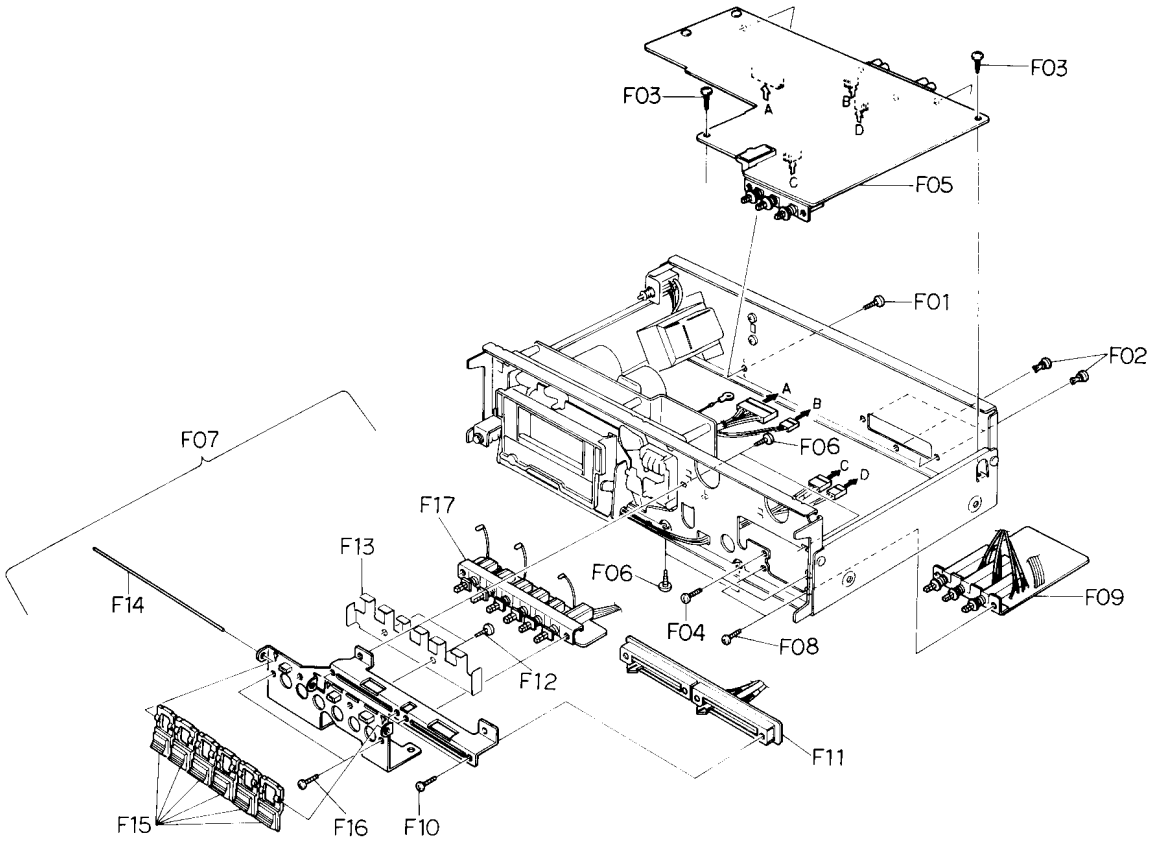



Fig. 3 3

### 3.14. Cassette Case Ass'y and Cover Plate Ass'y

Refer to Fig. 3.5.

(1) Refer to Fig. 3.2. Remove Mechanism Ass'y referring to item 3.6.
(2) Press the Eject Button to open the Cassette Case Ass'y.
(3) Remove F01, then disassemble the piston of the Pneumatic Damper Ass'y.
(4) Remove F02 and F03 (Cassette Case Holder L Ass'y), then disassemble F04 (Cassette Case Ass'y).
(5) Remove F05, then disassemble F06 (Cover Plate Ass'y).

### 3.15. Tape Counter Ass'y

Refer to Fig. 3.5.

(1) Refer to Fig. 3.2. Remove Meter Ass'y referring to item 3.7.
(2) Remove F07, then disassemble F08 (Tape Counter Ass'y).

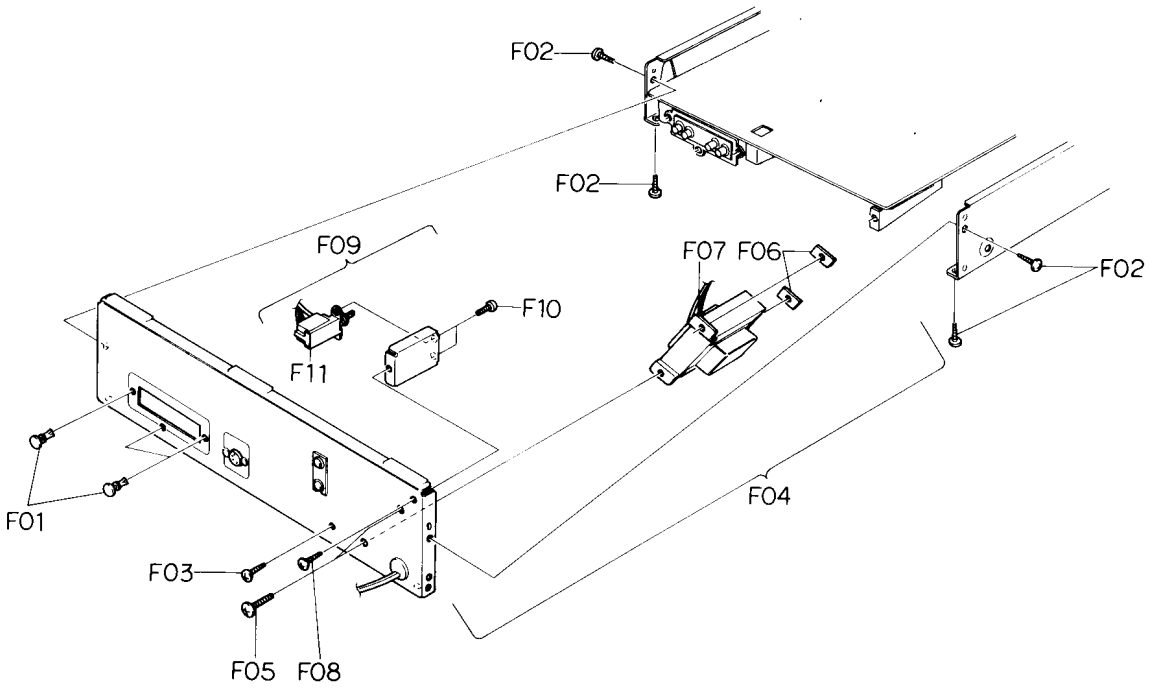



Fig. 3.4

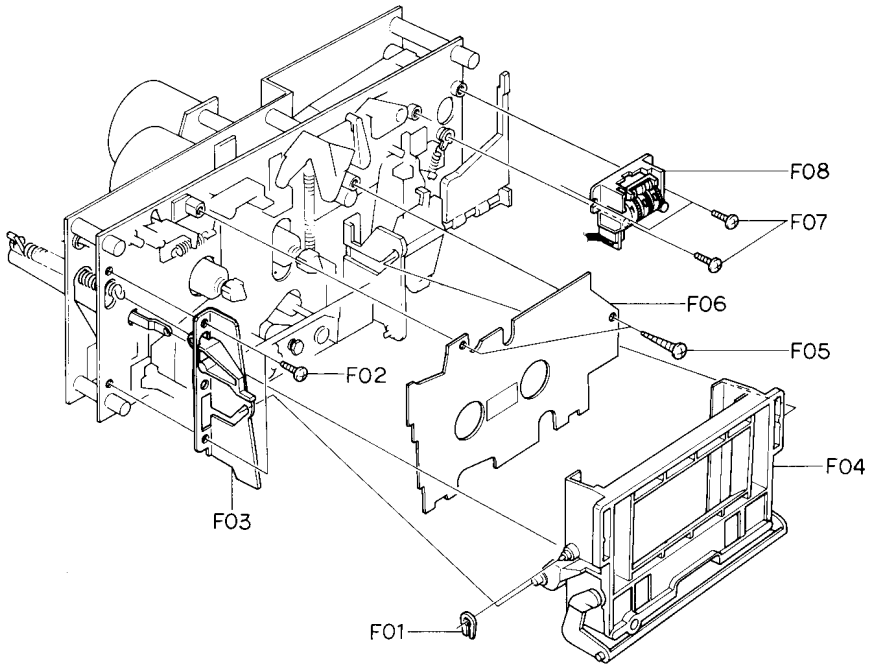



Fig. 3.5

### 3.16. Capstan Motor Ass'y and Flywheel Ass'y

Refer to Fig. 3.6.

(1) Refer to Fig. 3.2. Remove Mechanism Ass'y referring to item 3.6.
(2) Remove F01 and F02, then disassemble F03 (Flywheel Holder Ass'y) and F08 (Capstan Belt).
(3) Remove F04, then disassemble F05 (Capstan Motor Ass'y).
(4) Remove F06, then disassemble F07 (Control 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 Caps) and F14 (Thrust Springs).

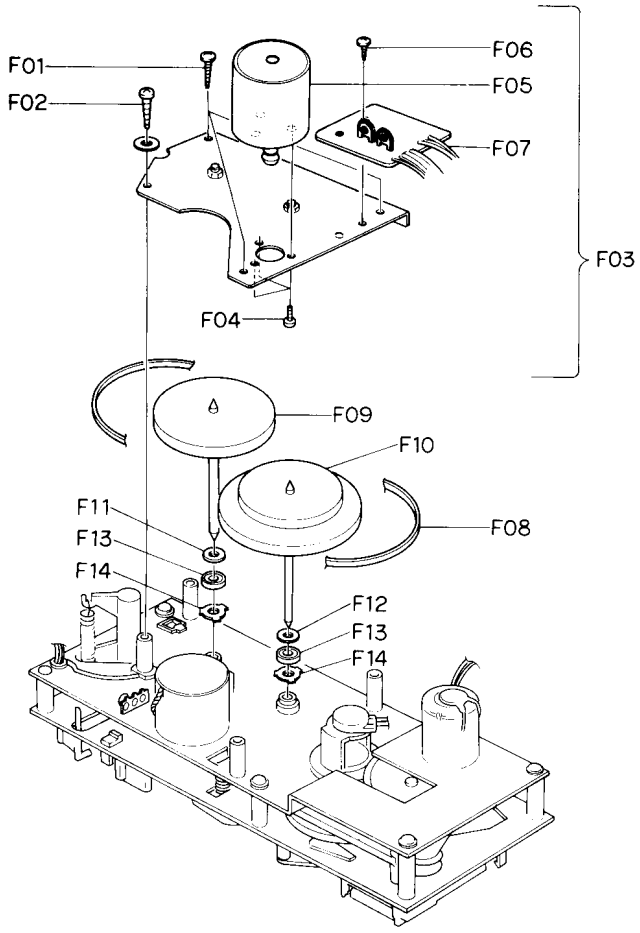



Fig. 3.6

### 3.17. Sub Mechanism Chassis Ass'y

Refer to Fig. 3.7.

(1) Refer to Fig. 3.6. Remove Flywheel Assemblies referring to item 3.16.
(2) Remove F01 and F02, then disassemble F03 (Sub Mechanism Chassis Ass'y).

### 3.18. Control Motor Ass'y and Reel Motor Ass'y

Refer to Fig. 3.7.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 3.17.
(2) Remove F04, then disassemble F05 (Control Motor Ass'y).
(3) Remove F06, then disassemble F07 (Reel Motor Ass'y).

### 3.19. Cam Control Volume

Refer to Fig. 3.7.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 3.17.
(2) Remove F08, then disassemble F09 (Volume Coupler).
(3) Remove F10, then disassemble F11 (Cam Control Volume).

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

Refer to Fig. 3.7.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 3.17.
(2) Remove F12 (Reel Hub Heads), then disassemble F13 (Reel Hub B Assemblies), F14 (Reel Hub Take-up Ass'y), F15 (Reel Hub Supply Ass'y), F16 (Back Tension Ass'y) and F17 (Back Tension Spring).
(3) Remove F18, then disassemble F19 (Idler Ass'y).

### 3.21. Cam Drive Gear and Control Cam

Refer to Fig. 3.7.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 3.17.
(2) Remove F20, then disassemble F21 (Cam Drive Gear).
(3) Remove F22, then disassemble F23 (Counter-Load Arm Ass'y).
(4) Remove F24, then disassemble F25 (Control Cam).

### 3.22. Head Mount Base Ass'y

Refer to Fig. 3.8.

(1) Refer to Fig. 3.5. Remove Cassette Case Ass'y referring to item 3.14.
(2) Remove F01, then disassemble F02 (Head Mount Base Ass'y).

### 3.23. Pressure Roller Ass'y and Erase Head

Refer to Fig. 3.8.

(1) Remove Head Mount Base Ass'y referring to item 3.22.
(2) Remove F03 and a washer, then disassemble F04 (Supply Pressure Roller Ass'y).
(3) Remove F05, then disassemble F06 (Erase Head).
(4) Remove F07 and a washer, then disassemble F08 (Take-up Pressure Roller Ass'y).

### 3.24. Record/Playback Head Ass'y

Refer to Fig. 3.8.

(1) Remove Head Mount Base Ass'y referring to item 3.22.
(2) Turn F09 by 90° by pushing it, then disassemble F10 (Record/Playback Head Ass'y).

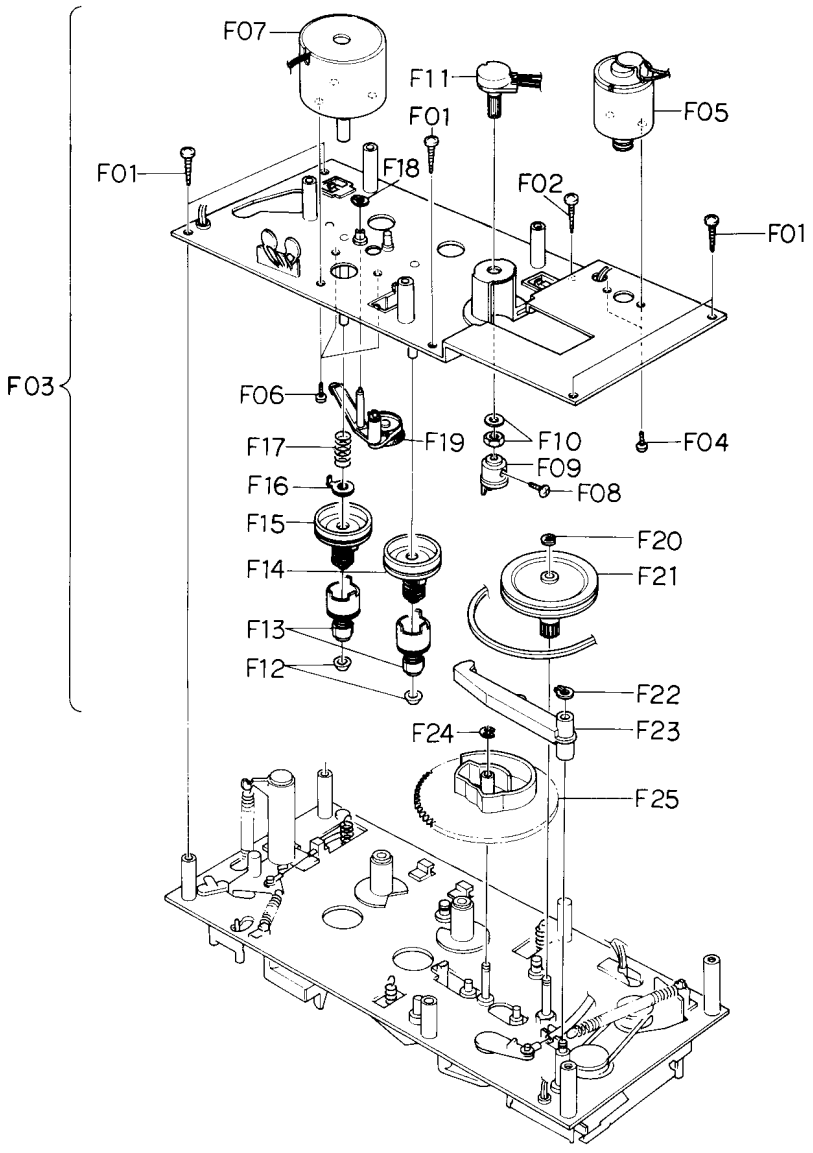



Fig. 3.7

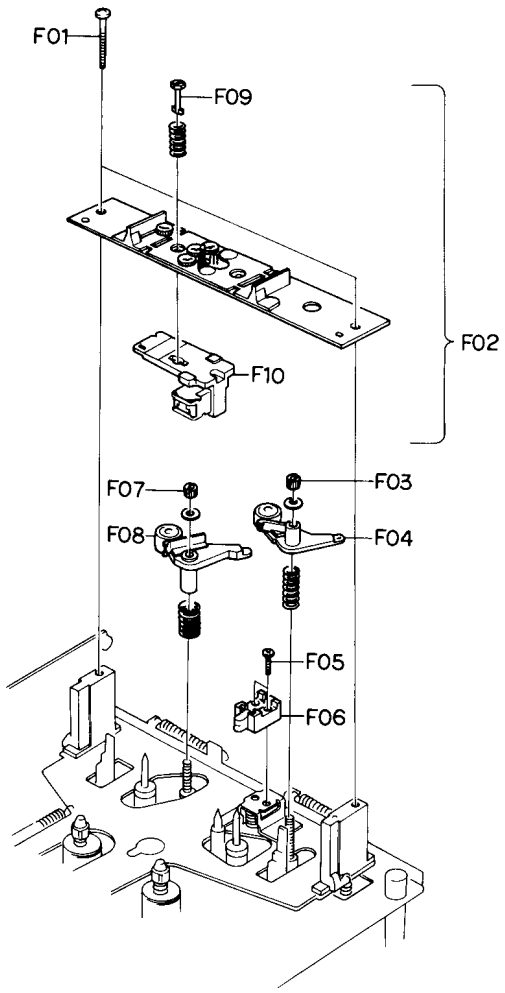



Fig. 3.8

## 4. MEASUREMENT INSTRUMENTS

(1) Audio Generator (20 Hz – 200 kHz)
(2) AC Millivolt Meter (with dB measures)
(3) Oscilloscope (DC – 5 MHz)
(4) Distortion Meter
(5) Speed & Wow/Flutter Meter
(6) Frequency Counter (DC – 1 MHz)
(7) Ohm Meter
(8) DC Volt Meter
(9) AC Volt Meter
(10) Torque Gauge (DA09013A)
(11) 15 kHz Azimuth Tape (DA09004A)
(12) 3 kHz Speed & Wow/Flutter Tape (DA09006A)
(13) 1 kHz Track Alignment Tape (DA09007A)
(14) 400 Hz Level Tape (DA09005A)
(15) 20 kHz PB Frequency Response Tape (DA09001A)
(16) 15 kHz PB Frequency Response Tape (DA09002A)
(17) 10 kHz PB Frequency Response Tape (DA09003A)
(18) Reference EXII Tape (DA09021A)
(19) Reference SX Tape (DA09025A)
(20) Reference ZX Tape (DA09037A)
(21) Tilt Check Gauge M-9036 (DA09036A)
(22) Stroke Check Gauge M-9038 (DA09038A)
(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) Audio Analyzer T-100
(including Distortion, Wow/Flutter, Speed, Oscillator and dB meter)

Notes: 1. (10) – (26) are the products of Nakamichi Corporation.
2. EH Stroke Check Gauge M-9042 (DA09042A) should be used for the Models from serial Nos. A304.501001 to A304.516073, and EH Stroke Check Gauge M-9051 (DA09051A) is for the Models bearing serial Nos. A304.516074 and greater.

# 5. MECHANICAL ADJUSTMENTS

## 5.1. Mechanism Control Cam Adjustment

Before Adjustment, disassemble the Front Panel Ass'y then remove the Cover Plate Ass'y, referring to items 3.4 and 3.14.

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

(a) Refer to Figs. 5.1 and 5.2.
Adjust VR602 and VR603 on the Control P.C.B. to locate approximately at the middle of the variable range. Then turn ON the Power Switch.
VR602 (for Cam position stop)
VR603 (for Cam position play)

(b) Press the Stop Switch to set the N-480 in stop mode. Adjust VR602 (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-480 in playback mode.
(Cam will rotate, and the position marked with "PY" comes to the pointer.) Adjust VR603 (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-480 in FF, pause, or record mode by pressing each switch and check to insure that the pointer is in a range of "F", "PS", or "R" 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.

**(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 Main P.C.B.

Note: The value of voltage is typical value.

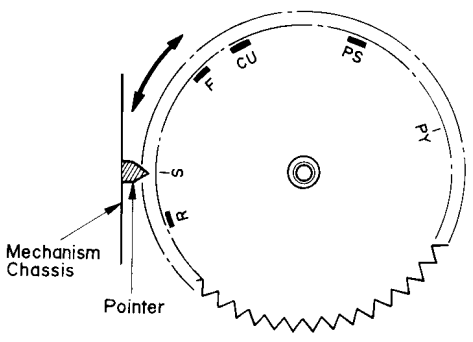



Fig. 5.1

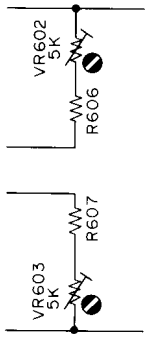



Fig. 5.2

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

Observe the each voltage at the sliding contact of the Cam Control Volume VR601 (10 kΩ) in stop, fast (FF or REW), pause, record and playback modes.

Note: When Record and Play Switches are pressed to set N-480 in record mode, the Cam is first set to the record position in a short period of time then stays at the play position.
Therefore to keep the Cam at the record position, following procedure is required:
Short the both leads of capacitor C406 (2.2 μF) on the Main P.C.B. with a jumper wire, then press the Record and Play Switches.

**(b) Reference Voltage**

Reference voltage at the sliding contact of VR601 (Cam Control Volume) in each mode is as follows:

| Mode | Reference Voltage (Typical Value) | |
|---|---|---|
| Record | 16 V | 1 V $^{+0.4\ V}_{-0.2\ V}$ |
| Stop | 15 V | |
| Fast (FF/REW) | 13.5 V | 1.5 V ± 0.25 V |
| Pause | 10 V | 2.5 V ± 0.4 V |
| Play | 7.5 V | |

**(c) Resistors for Adjustment**

| Mode | Ref. No. | Typical Value |
|---|---|---|
| Stop | R415, R416 | 9.1 kΩ(F),15 kΩ(F) |
| Fast (FF/REW) | R414 | 56 kΩ (F) |
| Pause | R454 | 680 kΩ |
| Play | R453 | 120 kΩ |
| Record | R419 | 150 kΩ |

**(d) Adjustment Procedures**

1) Press the Stop Switch to set the N-480 in stop mode. Adjust the value of R415 and R416 to obtain 15 V (±0.6 V) at the sliding contact of VR601.
Note: When R415 and R416 are 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 R414 according to next step 2) is necessary.

2) Set the N-480 in FF mode, then adjust the value of R414 so that the voltage of VR601 will become lower by 1.5 V (±0.25 V) than in stop mode.

3) Press the Pause Switch to set the N-480 in pause mode.
Adjust the value of R454 to obtain 10 V (+0.4, -0.15 V) at the sliding contact of VR601.

4) Set the N-480 in playback mode, then adjust the value of R453 so that the voltage of VR601 will be-

come lower by 2.5 V (±0.4 V) than in pause mode.

5) Short the both leads of capacitor C406 with a jumper wire.
   Set the N-480 in record mode, then adjust the value of R419 so that the voltage of VR601 will become higher by 1 V (+0.4, -0.2 V) than in stop mode.
   Note: Remove the short of C406 after completion of adjustment.

**(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-480 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 R436 so that the voltage at the sliding contact of VR601 becomes 9.7 V (±0.3 V) when Reel Motor starts rotation.

(d) Observe the mute signal at the Q416 collector.
   Turn the Cam referring to above step (c) and check to insure that the voltage at the sliding contact of VR601 is 9.5 V (±0.3 V) when mute is released (mute signal changes from H to L).
   (This voltage is determined by the adjustment of R436 in above step (c).)

(e) Observe the (Play + Pause)—Position signal at the Q411 collector.
   Turn the Cam referring to above step (c) and adjust the value of R432 to obtain 11.2 V (±0.4 V) at the sliding contact of VR601 when (Play + Pause)—Position signal changes from L to H (bias oscillation will begin).

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

**5.2. Tape Speed Adjustment**

(1) Remove the Top Cover.

(2) Connect a Frequency Counter to the Output Jack.

(3) Load a 3 kHz Speed Wow/Flutter Tape (DA09006A) and play it back.

(4) Referring to Fig. 5.3, adjust the Tape Speed Adjustment Volume (VR501) incorporated in the Capstan Motor to obtain 3,000 Hz on the Frequency Counter.
   CCW: Motor drives slowly.
   CW: Motor drives fast.

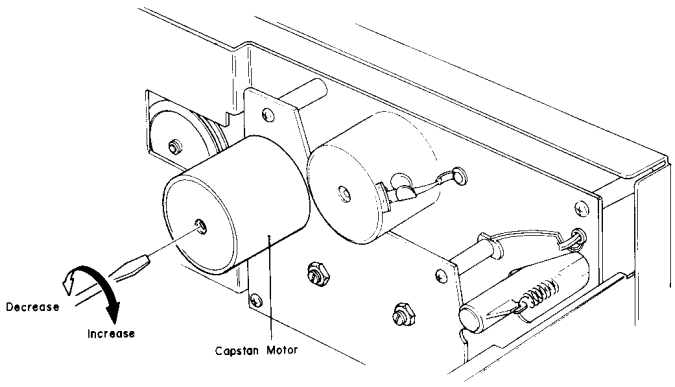



Fig. 5.3

**5.3. Record/Playback Head Tilt Adjustment**

On items 5.3 – 5.7, please refer to Fig. 5.4 flow chart.
Refer to Figs. 5.5 and 5.6.

(1) Load a Tilt Check Gauge M-9036 (DA09036A) in the N-480.

(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-480.

(3) Remove Height Gear.

(4) Set the N-480 in play mode. Check to insure whether the Beacon "Upper" or "Lower" is illuminating. In order not to give damages onto the record/playback head surface, push the slide knob of the gauge to the direction of an arrow mark, then return it to the original place to be in contact with record/playback head surface after play mode is securely locked.

(5) Check to insure freedom from contact between the gauge and pad lifter.

(6) Beacon "Lower" will light on when height adjustment screw turned clockwise but "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) Set the N-480 in stop mode and fit the serrated Height Gear. Then set the N-480 again in play mode and insure 2 Beacons "Upper" and "Lower" are illuminating.
   If not, (3) through (6) will have to be repeated till satisfactory results are obtained.

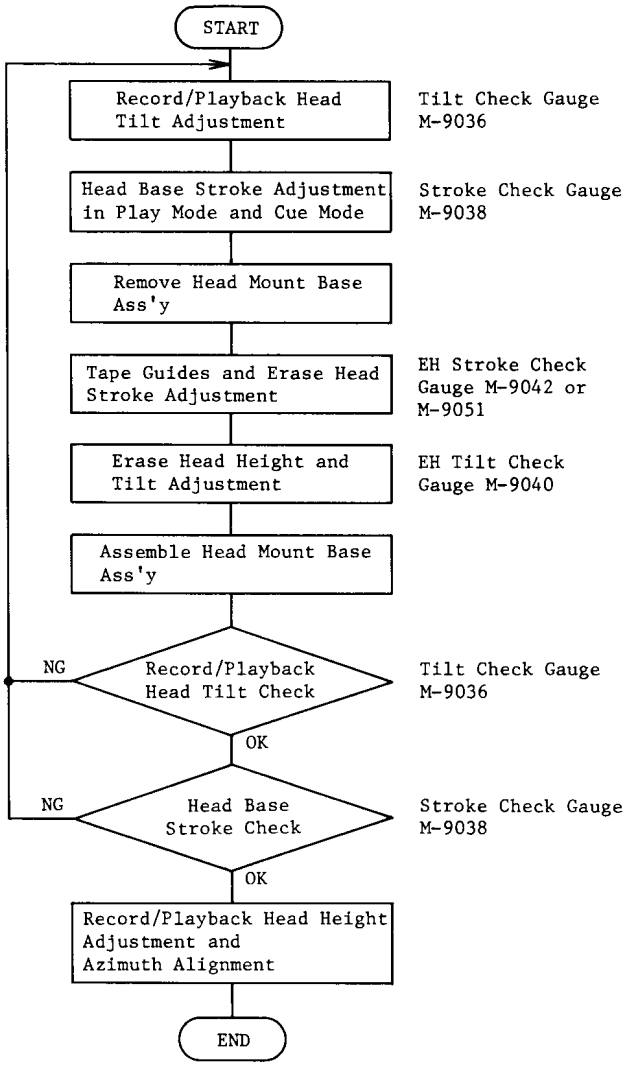



Fig. 5.4

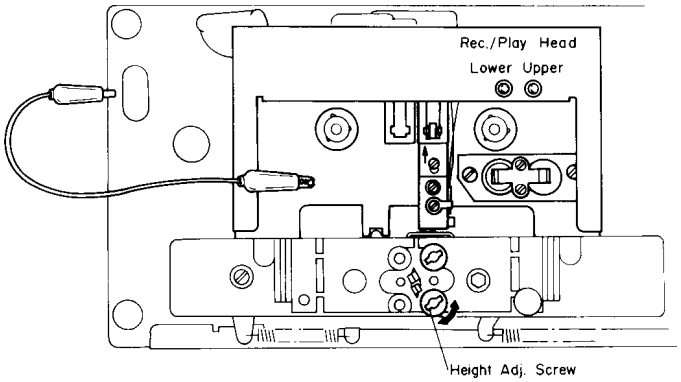



Fig. 5.5

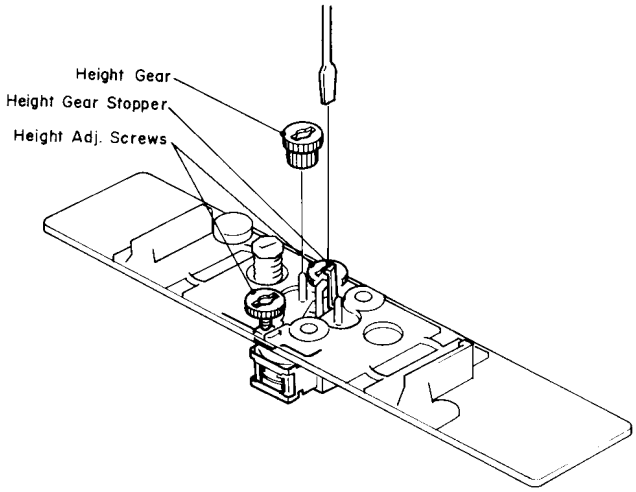



Fig. 5.6

### 5.4. Head Base Stroke Adjustment

Refer to Fig. 5.7.

Note: Before you conduct "Head Base Stroke Adjustment", adjust with a "Tilt Check Gauge" to insure freedom from tilt on the record/playback head.

(1) Load a Stroke Check Gauge M-9038 (DA09038A) in the N-480.

(2) Set the N-480 in play mode.

(3) Check to insure whether the "P" pointer on the Stroke Indicator locates between 2 lines as marked on the Stroke Check Plate.

(4) If the record/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).

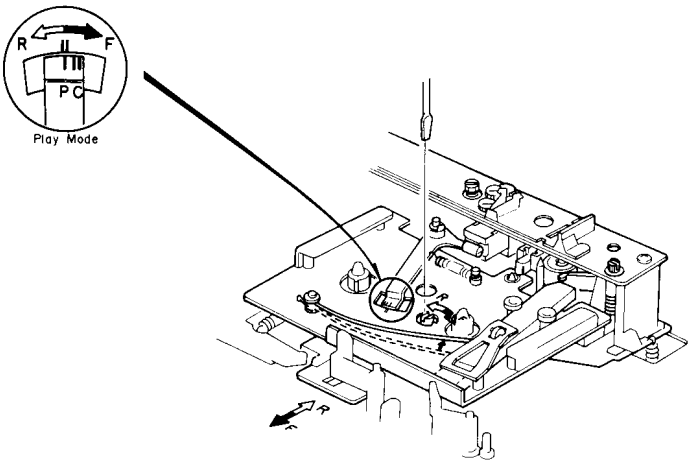



Fig. 5.7

### 5.5. Tape Guides Adjustment and Erase Head Stroke Adjustment

Remove Head Mount Base Ass'y. Refer to Figs. 5.8 and 5.9.

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

(a) Load an EH Stroke Check Gauge M-9042/M-9051 in the N-480.
(b) Set the N-480 in play mode.
(c) Slide the Supply Tape Guide Check Bar down against the supply tape guide, thus check can be made on supply tape guide height.
(d) If the supply tape guide is misaligned, the Supply Tape Guide Check Bar will not come into the supply tape guide. If such is noted, turn to adjust the height adjustment nut A till the Supply Tape Guide Check Bar is accepted by the supply tape guide.
(e) If the above are insured, set the N-480 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.

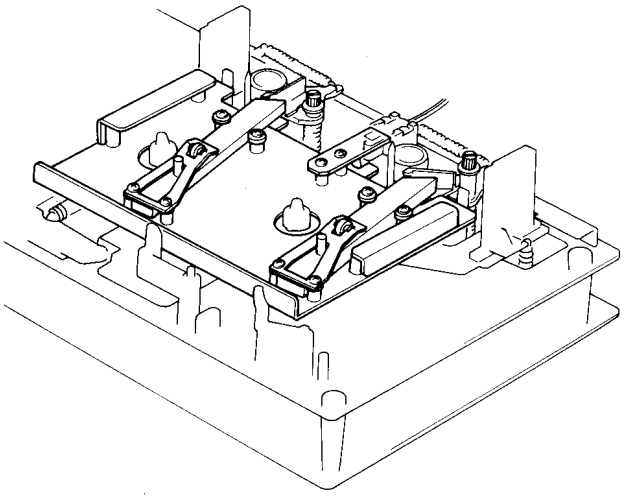


Fig. 5.8

**(2) Take-up Tape Guide Height Adjustment**

(a) Load an EH Stroke Check Gauge M-9042/M-9051 in the N-480.
(b) Set the N-480 in play mode.
(c) Slide the Take-up Tape Guide Check Bar down against the take-up tape guide, thus check can be made on take-up tape guide height.
(d) If the take-up tape guide is misaligned, the Take-up Tape Guide Check Bar will not come into the take-up tape guide. If such is noted, turn to adjust the height adjustment nut B till the Take-up Tape Guide Check Bar is accepted by the take-up tape guide.
(e) If the above are insured, set the N-480 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-480.
(b) Set the N-480 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 from Serial Nos. A304.501001 to A304.516073, and EH Stroke Check Gauge M-9051 (DA09051A) is for the Models bearing Serial Nos. A304.516074 and greater.

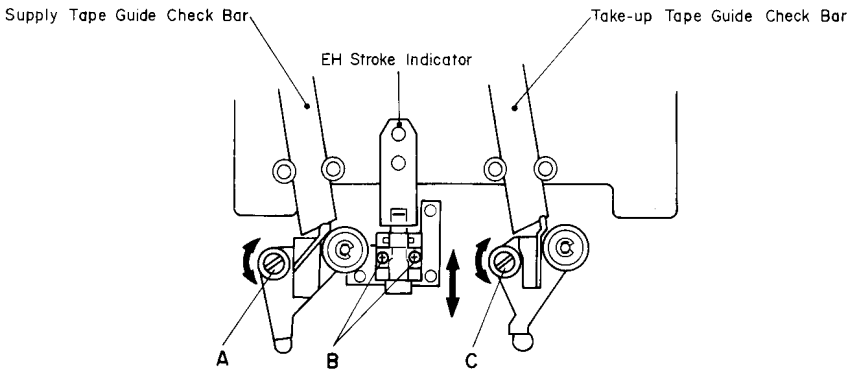



Fig. 5.9

### 5.6. Erase Head Height and Tilt Adjustment

Refer to Figs. 5.10 and 5.11.

(1) Remove Head Mount Base Ass'y.
(2) Load an EH Tilt Check Gauge M-9040 (DA09040A) in the N-480.
(3) Set the N-480 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 of 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.
(7) Check to insure whether the horizontal line on the mirror corresponds to that on the erase head. If not, (4) through (7) will have to be repeated till satisfactory results are obtained.
(8) After completion of adjustment, 3 pcs. of screws shall be locked with lock tight paint.

Note: Before use of this gauge, check to insure freedom from dust or dirts, or overflow in the groove of the erase head surface.

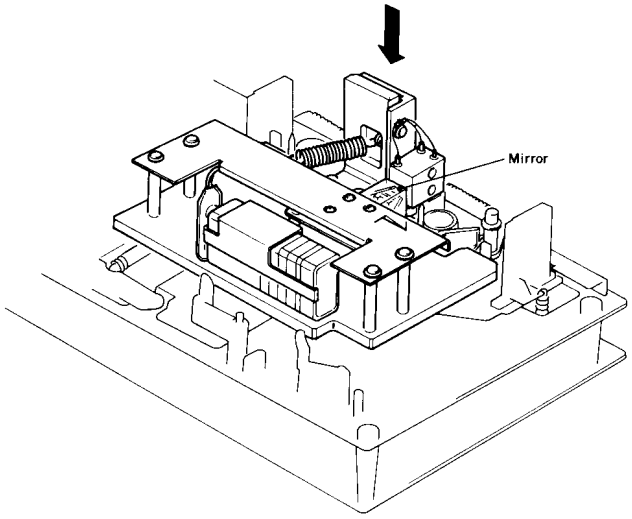



Fig. 5.10

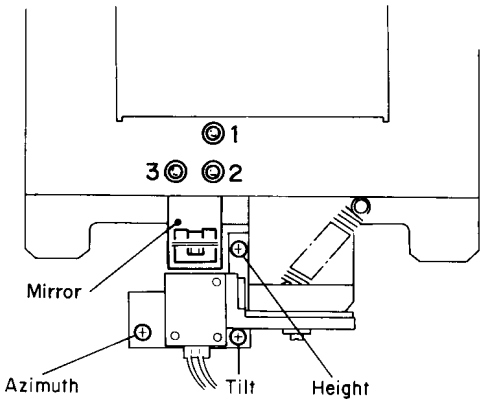



Fig. 5.11

### 5.7. Record/Playback Head Height Adjustment and Azimuth Alignment

Refer to Fig. 5.12.

(1) Connect a VTVM to the Output Jacks.
(2) Load a 1 kHz Track Alignment Tape (DA09007A) in the N-480.
(3) Set the N-480 in play mode.
(4) Turn the Height Gear until the output of both channels becomes minimum.
(5) Load a 15 kHz Azimuth Tape (DA09004A) in the N-480.
(6) Set the N-480 in play mode.
(7) Turn the Azimuth Alignment Screw until the output of both channels becomes maximum.
(8) Repeat (2) through (7) 1 – 2 times.

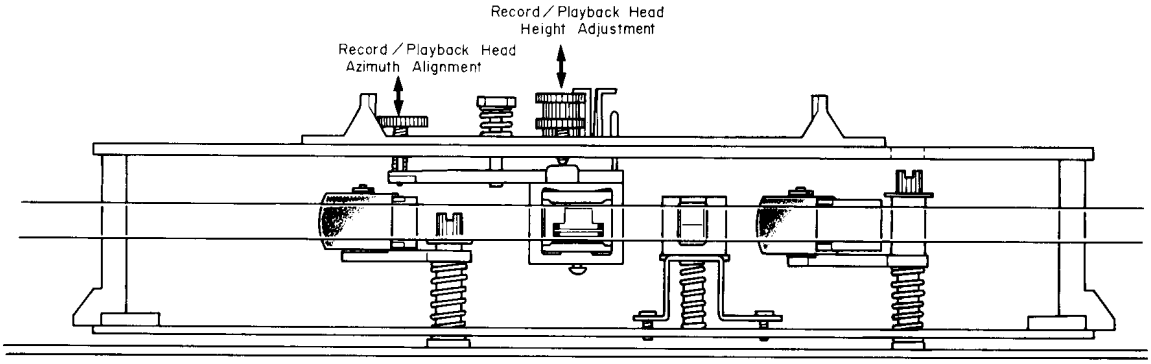



Fig. 5.12

### 5.8. Tape Travelling Adjustment

The adjustment shall be made with a modified version of the current type EXII C-90 tape as shown in the Fig. 5.13 (error will be made if a current type Tape Travelling Cassette (DA09011A) should be used for this purpose). While modifying an EXII C-90 tape, the tape guides in the cassette housing shall be kept protected to avoid tilt.

Check shall be made in the following procedures:

(1) An EXII C-90 tape thus modified shall be loaded onto the N-480.

(2) Release the back-tension (rotate the supply reel and feed out some length of tape) and set the N-480 in play mode.

(3) In this juncture, check to insure whether the tape is freedom from waving or slippage from the both of tape guides.

(4) When the modified EXII C-90 tape 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 guides should be noted, adjustments of "5.3. Record/Playback Head Tilt Adjustment", "5.4. Head Base Stroke Adjustment", "5.5. Tape Guides Adjustment and Erase Head Stroke Adjustment", "5.6. Erase Head Height and Tilt Adjustment", "5.7. Record/Playback Head Height Adjustment and Azimuth Alignment", etc. will be required.

As a case may be, the said waving or slippage may have been caused from defective Supply Pressure Roller Ass'y or Take-up Pressure Roller Ass'y without parallel contact with Capstans.

If such are noted, the Pressure Roller Assemblies will have to be replaced. Further, excessively weak take-up torque or strong take-up torque may cause defective tape travelling.

The N-480 is intended to be adjustment-free Model. However if the similar matters as above should be noted, please replace the Reel Hub Take-up Ass'y to obtain appropriate take-up torque.

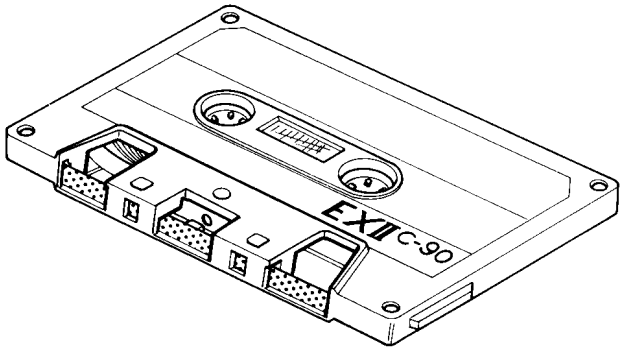



Fig. 5.13

### 5.9. Record Switch Linkage Adjustment

(1) Set the N-480 in stop mode.

(2) Loosen the screw of the Record Spring Holder, and shift the Record Spring Holder in order to remove the looseness of the Linkage Wire as shown in Fig. 5.14.1. Then tighten the screws for fixing the Record Spring Holder. (In this case, the Record Switch should be positioned at play side. If on the record position, it will be defective.)

(3) Set the N-480 in record and pause mode.
Check to insure that the gap between the top of the wire and the Record Spring Holder is approx. 1 mm as shown in Fig. 5.14.2.
(Check that the Record Switch is in record position.)

(4) Upon completion of the above adjustments, apply a quantity of lock tight paint.

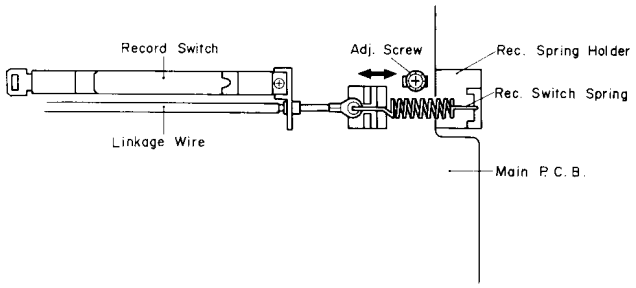



Fig. 5.14.1

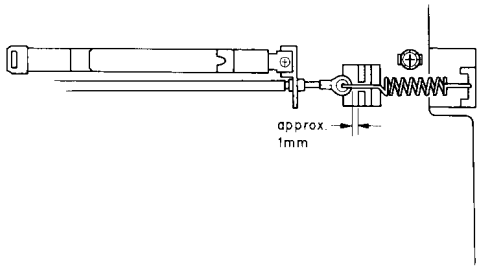



Fig. 5.14.2

### 5.10. Flywheel Holder Adjustment

(1) Refer to Fig. 5.15.
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 Screws with a screwdriver, lock the Lock Nut.
(4) Apply a quantity of lock tight paint to the Thrust Screws.

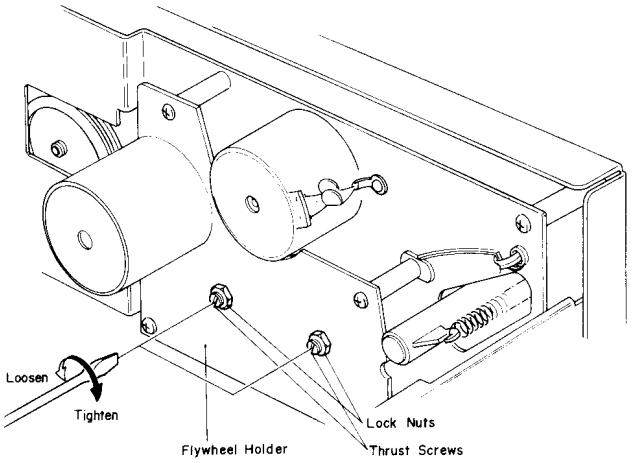



Fig. 5.15

### 5.11. Eject Wire Adjustment

(1) Referring to Fig. 5.16.1, insert a 1.5 mm spacer between the Eject Arm and Eject Stopper by turning the Eject Arm in the illustrated direction, then set the N-480 in playback mode.
(2) With pushing the Eject Arm by hand, loosen the screw and then pull the Eject Wire in the direction of the arrow until it stops as shown in Fig. 5.16.2.
(3) Tighten the screw, then apply a quantity of lock tight paint.

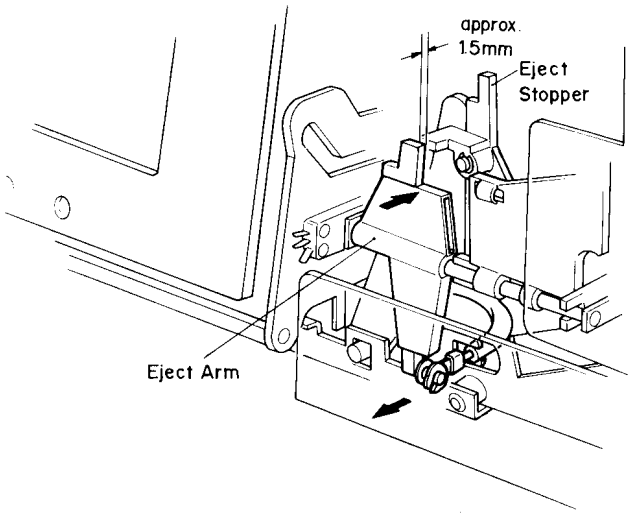



Fig. 5.16.1

### 5.12. Lubrication

N-480 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 #3000 CST
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.

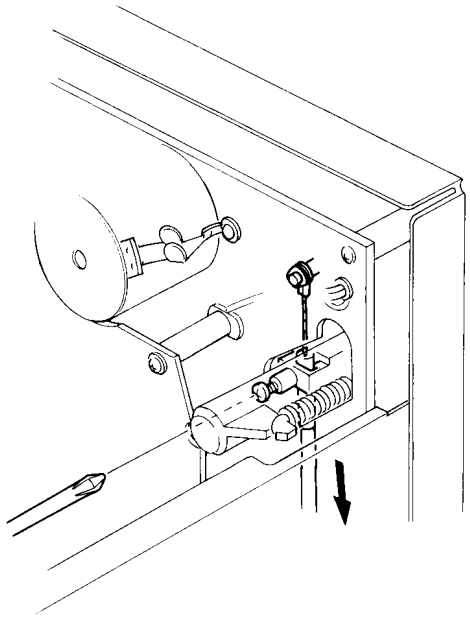
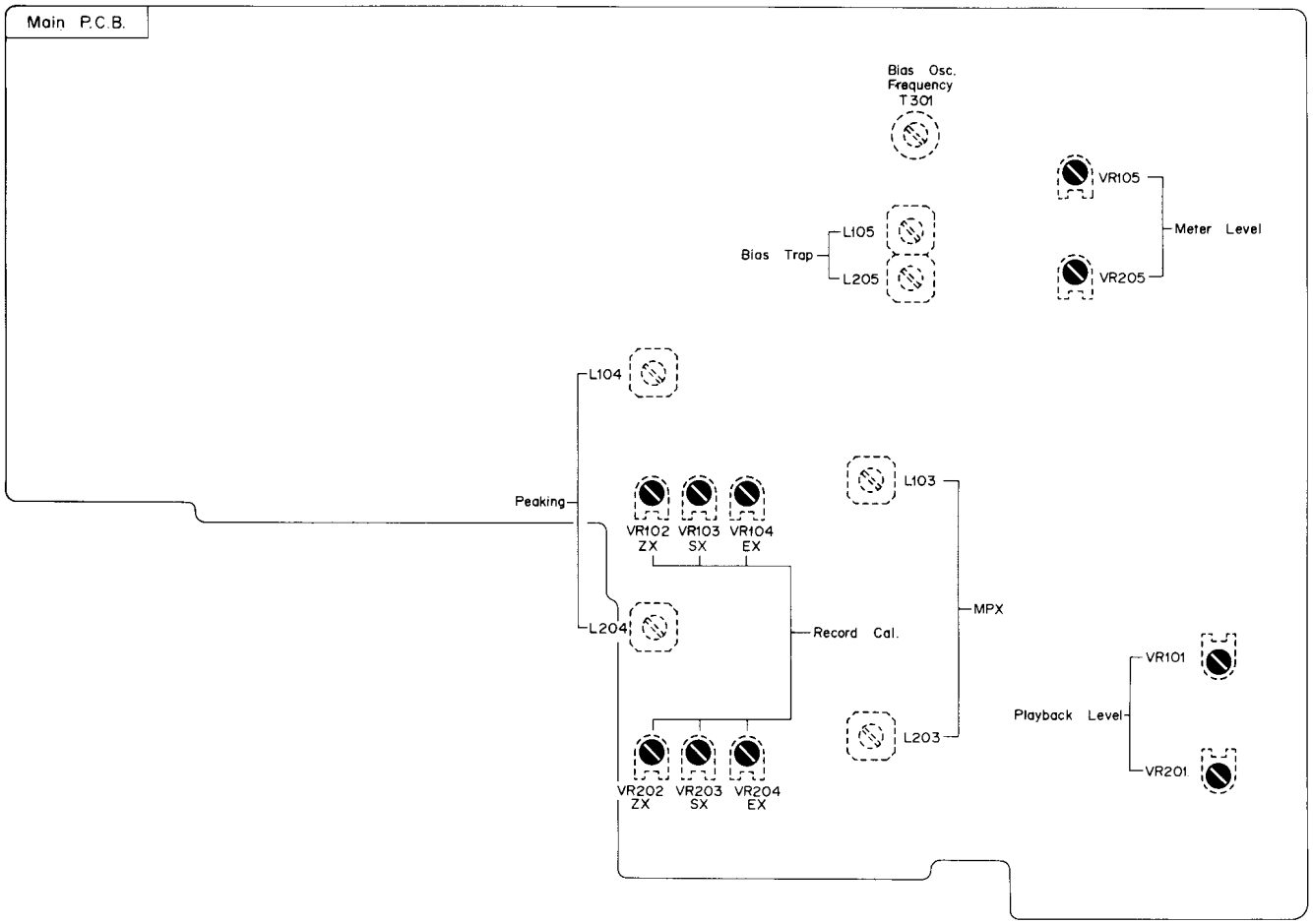
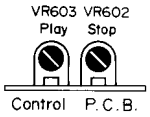


Fig. 5.16.2

## 6. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT



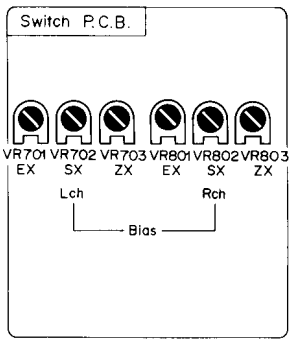




Fig. 6

## 7. ELECTRICAL ADJUSTMENTS AND MEASUREMENTS

### 7.1. 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 Tape (DA09006A) | Frequency Counter to OUTPUT Jacks | Playback<br>Eq. SW – 70 μs | Capstan Motor Governor P.C.B. VR501 | Adjust VR501 to obtain 3 kHz ± 0.5%.<br>(VR501 is incorporated in the capstan motor.) |
| 2 | Meter Level | 400 Hz to INPUT Jacks | VTVM to TP101, TP201 on the Main P.C.B. | Record, Pause | Main P.C.B. VR105, VR205 | 1. Set the input level controls to maximum.<br>2. Adjust the oscillator output to obtain 100 mV at TP101 (TP201), then adjust VR105 (VR205) to obtain 0 dB on the level meters. |
| 3 | MPX Filter | 19 kHz ± 100 Hz to INPUT Jacks | VTVM to OUTPUT Jacks | Record, Pause<br>MPX SW – OUT/IN | Main P.C.B. L103, L203 | 1. Adjust input level controls to obtain 600 mV on the VTVM.<br>2. Set the MPX Switch to IN position, then adjust L103 (L203) to obtain minimum reading on the VTVM (minimum reading will be less than –30 dB). |
| 4 | Record/Playback Head Track Alignment | 1 kHz Track Alignment Tape (DA09007A) | Same as above | Playback<br>MPX SW – OUT<br>Eq. SW – 70 μs<br>Dolby NR SW – OUT | Record/Playback Head Height Adjustment Screw | Adjust the Record/Playback Head Height Adj. Screw to obtain minimum reading of both L and R channels on the VTVM. See "Record/Playback Head Height Adjustment and Azimuth Alignment" in item 5.7. |
| 5 | Record/Playback Head Azimuth Alignment | 15 kHz Azimuth Tape (DA09004A) | Same as above | Same as above | Record / Playback Head Azimuth Alignment Screw | Adjust the Record/Playback Head Azimuth Alignment Screw to obtain maximum reading of both L and R channels on the VTVM. See "Record/Playback Head Height Adjustment and Azimuth Alignment" in item 5.7.<br>Note: Repeat steps 4 and 5 one or two times to obtain optimum performance. |
| 6 | Playback Level | 400 Hz Level Tape (DA09005A) | VTVM to TP101, TP201 | Same as above | Main P.C.B. VR101, VR201 | Adjust VR101 (VR201) to obtain 100 mV on the VTVM or 0 dB on the level meters. |
| 7 | Playback Frequency Response | 400 Hz Level Tape (DA09005A)<br>10 kHz PB Frequency Tape (DA09003A)<br>15 kHz PB Frequency Tape (DA09002A)<br>20 kHz PB Frequency Tape (DA09001A) | VTVM to OUTPUT Jacks | Same as above | Main P.C.B. R112, R212 | 1. Load the 400 Hz level tape and play it back.<br>2. Load the 10 kHz, 15 kHz and 20 kHz PB Frequency Response Tapes and adjust the record/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. 7.3.<br>10 kHz (–20 dB) –2 dB to + 2 dB<br>15 kHz (–20 dB) –2 dB to + 3 dB<br>20 kHz (–20 dB) –2 dB to + 4 dB<br>3. Conduct step 5 "Record/Playback Head Azimuth Alignment<br>4. If above is not sufficient, refer to "Playback Frequency Response Adjustment" in item 7.2. |

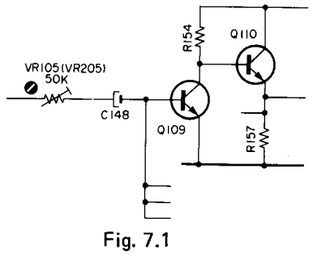



Fig. 7.1
2. Meter Level

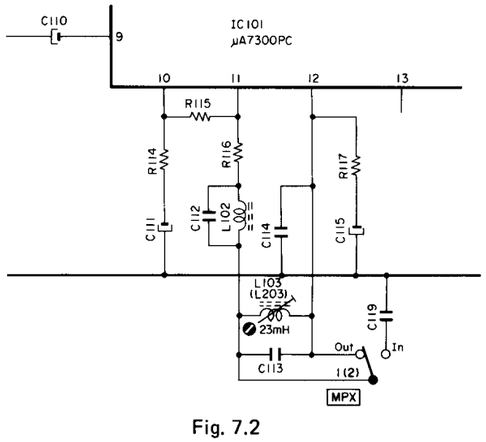



Fig. 7.2
3. MPX Filter

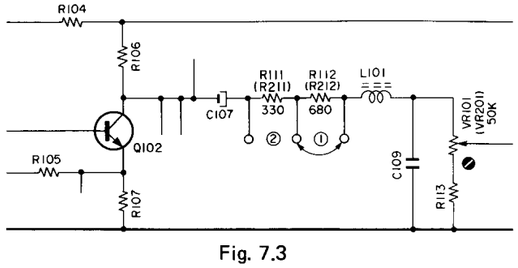



Fig. 7.3
6. Playback Level
7. Playback Frequency Response

| STEP | ITEM | SIGNAL SOURCE | OUTPUT CONNECTION | MODE | ADJUSTMENT | REMARKS |
|---|---|---|---|---|---|---|
| 8 | Bias Oscillation Frequency and Erase Current | External 0.1 Ω Resistor in series to Erase Head | VTVM and Frequency Counter across the 0.1 Ω Resistor | Record, Pause<br>ZX SW – IN<br>Eq. SW – 70 μs<br>Dolby NR SW – OUT<br>MPX SW – OUT | Main P.C.B.<br>T301<br>R310, R311 | 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). If erase current is not sufficient, increase it by shorting R310 or R311.<br>3. After completion of the erase current adjustment, re-check the bias oscillation frequency. |
| 9 | Record Amplifier Equalizer | 21 kHz (–20 dB) to INPUT Jacks | VTVM to TP102, TP202 | Same as above | Main P.C.B.<br>L104, L204 | 1. Remove the bias-cut-jumper from the dip side of the Main P.C.B.<br>2. Adjust L104 (L204) to obtain peak reading at 21 kHz on the VTVM.<br>3. Re-solder the bias-cut-jumper. |
| 10 | Bias Trap | Remove INPUT Signals | Same as above | Same as above | Main P.C.B.<br>L105, L205 | Adjust L105 (L205) to obtain maximum reading on the VTVM. |
| 11 | Record Level Calibration | 400 Hz to INPUT Jacks | VTVM to OUTPUT Jacks | Record and Playback<br>ZX SW – IN/OUT<br>SX/EX SW – SX/EX<br>Eq. SW – 120 μs (EX)<br>70 μs (SX/ZX)<br>Dolby NR SW – OUT<br>MPX SW – OUT | Main P.C.B.<br>VR102, VR202<br>VR103, VR203<br>VR104, VR204 | 1. Set the input level controls to obtain 0 dB on the level meters.<br>2. Record signals on the reference EXII (DA09021A), reference SX (DA09025A) or reference ZX (DA09037A), then play it back.<br>3. Repeating 2 as above, adjust VR104 (VR204) (for EXII), VR103 (VR203) (for SX) and VR102 (VR202) (for ZX) to obtain 0 dB on the level meters in playback mode. |
| 12 | Recording Bias Current and Overall Frequency Response | 400 Hz to INPUT Jacks<br>and<br>20 Hz to 18 kHz (–20 dB) to INPUT Jacks | VTVM and Distortion Meter to OUTPUT Jacks | Record and Playback<br>ZX SW – IN/OUT<br>SX/EX SW – SX/EX<br>Eq. SW – 120 μs (EX)<br>70 μs (SX/ZX)<br>Dolby NR SW – OUT<br>MPX SW – OUT | Switch P.C.B.<br>VR701, VR801<br>VR702, VR802<br>VR703, VR803 | 1. Feed in 400 Hz and adjust input level controls to obtain 0 dB on the level meters.<br>2. Record signals on the reference EXII tape (DA09021A), reference SX tape (DA09025A), or reference ZX tape (DA09037A).<br>3. Repeating 2 as above, play back the tape and adjust VR701 (VR801) (for EXII), VR702 (VR802) (for SX) or VR703 (VR803) (for ZX) to obtain maximum reading on the VTVM.<br>4. Conduct step 11 "Record Level Calibration".<br>5. Feed in 10 kHz (–20 dB) then record and play it back. Adjust VR104 (VR204) (for EXII), VR103 (VR203) (for SX) or VR102 (VR202) (for ZX) on the Main P.C.B. Ass'y to obtain approximately –20 dB on the VTVM. Feed in 18 kHz (–20 dB) then record and play it back. Adjust recording peaking coil L104 (L204) to obtain approximately –20 dB on the VTVM (refer to step 9 "Record Amplifier Equalizer").<br>6. Conduct step 11 "Record Level Calibration".<br>7. Feed in 400 Hz and adjust the input level controls to obtain 0 dB on the level meters, then record and play it back and check to insure whether the Total Harmonic Distortion (T.H.D.) is less than 1.0% for EXII, 1.2% for SX and 1.0% for ZX.<br>Feed in 20 Hz to 18 kHz (–20 dB) then record and play it back, and check to insure whether the output levels are within –20 dB ± 4 dB.<br>8. If T.H.D. exceeds 1.2%, the following adjustments are required:<br>a. Repeat 5 as above. Adjust bias calibration semi-fixed volumes and peaking coils to obtain –22 dB instead of –20 dB on the VTVM.<br>b. Perform step 11 "Record Level Calibration".<br>c. Repeat 7 as above.<br>d. If above is not sufficient, precise re-adjustment of step 7 "Playback Frequency Response", replacement of Record/Playback Head or check of item 5.8 "Tape Travelling Adjustment" will be required.<br>9. Conduct step 11 "Record Level Calibration". |

| STEP | ITEM | SIGNAL SOURCE | OUTPUT CONNECTION | MODE | ADJUSTMENT | REMARKS |
|---|---|---|---|---|---|---|
| 13 | Crosstalk | 1 kHz to INPUT Jacks | 1 kHz Band Pass Filter and VTVM to OUTPUT Jacks | Record and Playback<br>ZX SW – OUT<br>SX/EX SW – SX<br>Eq. SW – 70 μs<br>Dolby NR SW – OUT<br>MPX SW – IN | | 1. Erase the tape with bulk eraser.<br>2. Adjust the input level controls to obtain 0 dB on the level meters, and record the signals on the reference SX tape (DA09025A).<br>3. Turn the cassette tape the other way round and play it back.<br>4. Measure the difference between 2 and 3. |
| 14 | Channel Separation | 1 kHz to INPUT Jacks | Same as above | Same as above | | 1. Erase the tape with bulk eraser.<br>2. Adjust L ch (R ch) input level control to obtain 0 dB on the level meter, and close R ch (L ch) input level control.<br>3. Record and play it back, then meausre the R ch (L ch) level. |
| 15 | Erasure | 100 Hz to INPUT Jacks | 100 Hz Band Pass Filter and VTVM to OUTPUT Jacks | Record and Playback<br>ZX SW – IN<br>Eq. SW – 70 μs<br>Dolby NR SW – OUT<br>MPX SW – IN | | 1. Erase the tape with bulk eraser.<br>2. Adjust input level controls to obtain 0 dB on the level meters, and record the signals on the reference ZX tape (DA09037A).<br>3. Rewind the tape, close input level controls, and then record again.<br>4. Rewind the tape, play it back, and then measure the difference between 2 and 3. |
| 16 | Signal to Noise Ratio | 400 Hz to INPUT Jacks | IHF-A Curve Filter, Distortion Meter and VTVM to OUTPUT Jacks | Record and Playback<br>ZX SW – IN<br>Eq. SW – 70 μs<br>Dolby NR SW – IN<br>MPX SW – IN | | 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 controls 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 measurments. |
| 17 | Total Harmonic Distortion | 400 Hz to Input Jacks | Distortion Meter to OUTPUT Jacks | Record and Playback<br>ZX SW – IN/OUT<br>SX/EX SW – SX/EX<br>Eq. SW – 120 μs (EX)<br>70 μs (SX, ZX)<br>Dolby NR SW – OUT<br>MPX SW – IN | | 1. Adjust the input level controls to obtain 0 dB on the level meters.<br>2. Record and play it back.<br>3. Read the distortion meter and check to insure that the distortion is as follows:<br>EXII . . . . . 1.0% or less<br>SX . . . . . 1.2% or less<br>ZX . . . . . 1.0% or less |
| 18 | Wow/Flutter | 3 kHz Speed and Wow/Flutter Tape (DA09006A) | Wow/Flutter Meter to OUTPUT Jacks | Playback<br>Eq. SW – 70 μs | | Playback and read the wow/flutter meter. |

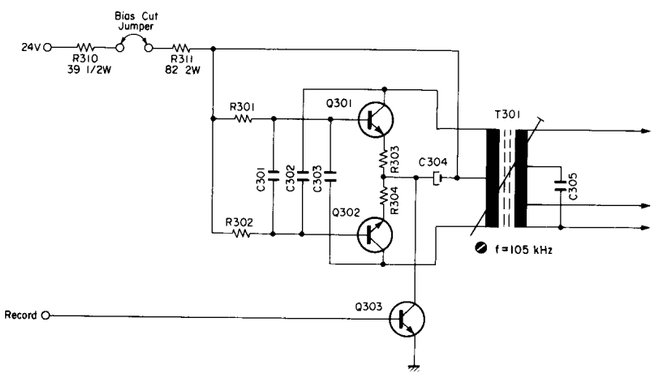



Fig. 7.4 8. Bias Oscillation Frequency and Erase Current

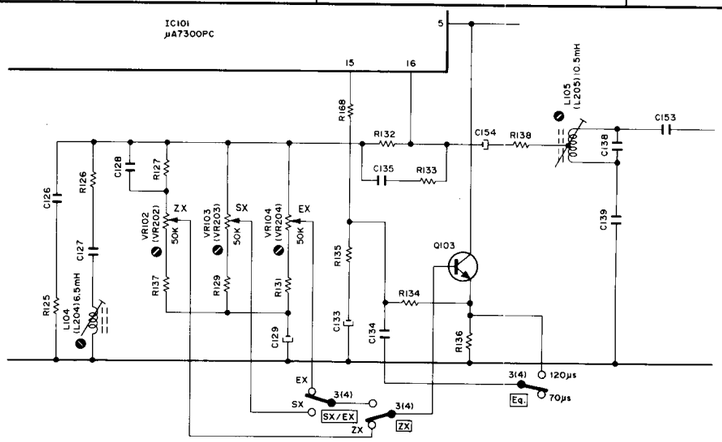



Fig. 7.5 9. Record Amplifier Equalizer
10. Bias Trap
11. Record Level Calibration

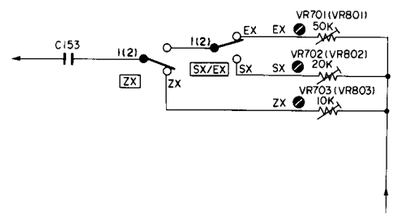



Fig. 7.6 12. Record Bias Current and Overall Frequency Response

### 7.2. Playback Frequency Response Adjustment

Fig. 7.7 shows the playback equalization curve for the N-480, and Fig. 7.8 is the circuit for adjustment.

**(1) 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 7 in "7.1. 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 . . . . . | R108 (R208): | 2 k |
| | R109 (R209): | 2.4 k |
| 0 dB . . . . . | R108 (R208): | 1.8 k |
| | R109 (R209): | 2.2 k |
| Approx. -1 dB . . . . . | R108 (R208): | 1.6 k |
| | R109 (R209): | 2 k |

**(2) 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 7 "7.1. 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) or R111 (R211) as illustrated in the figure.

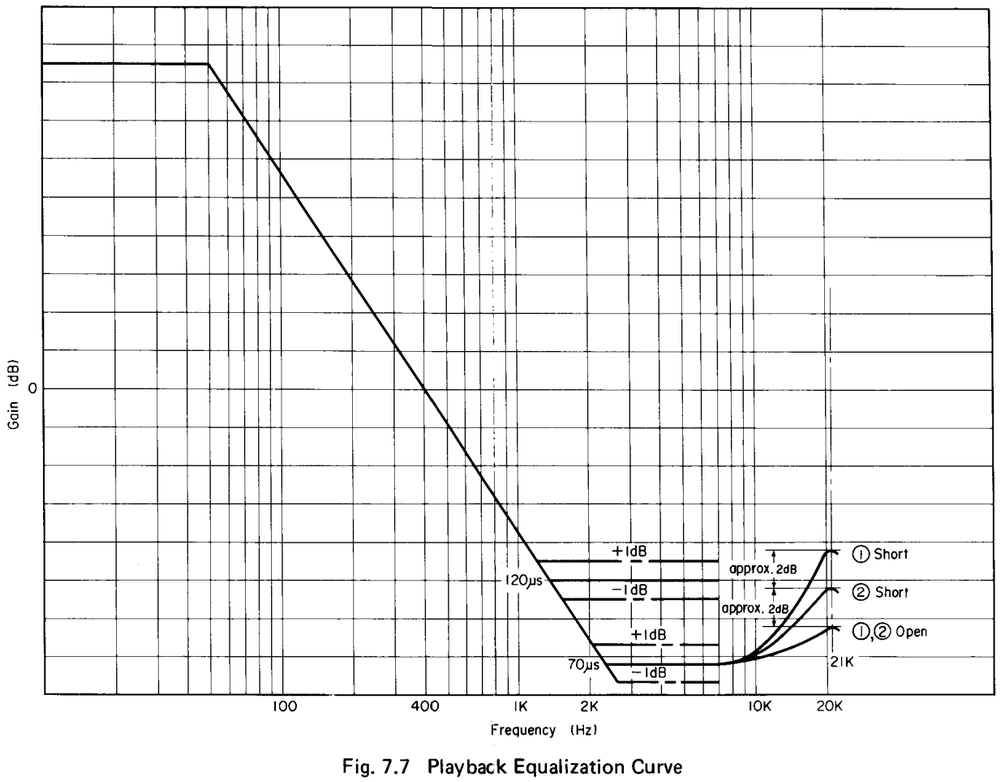



Fig. 7.7 Playback Equalization Curve

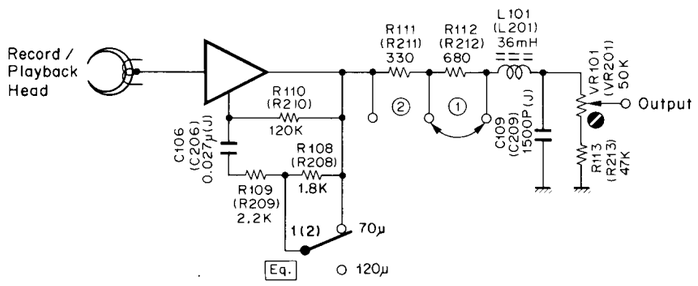



Fig. 7.8 Playback Amp.

### 7.3. Check on Dolby NR Circuit

Dolby NR Circuit incorporates a Dolby B-Type NR IC (μA7300PC) which has no adjustment point.

Perform the following checks and make sure that the IC operates accurately i.e., frequency response through IC is accurate.

| | |
|---|---|
| Signal Source: | 5 kHz to INPUT Jacks |
| Output Connection: | VTVM to the output side of C154 (C254) on the Main P.C.B. |
| Mode: | Record Pause<br>MPX SW – IN |

(1) Remove the Bias-cut Jumper from the dip side of the Main P.C.B.

(2) 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 mV (0 dB) at each Test Point. Pointer on the meter will indicate 0 dB.

(3) Remove the VTVM from TP101 (TP201) and reconnect it to the output side of C154 (C254).

(4) Decrease the input level (0 dB) by 20 dB or 30 dB. Check to insure that the level at output side of C154 (C254) corresponds to the following with the Dolby NR Switch IN and OUT.

(5) After completion of the adjustment, reconnect the Bias-cut Jumper.

| Input Level | Capacitor Output Level | | |
|---|---|---|---|
| (f=5 kHz) | Dolby NR OUT | Dolby NR IN | Difference between IN and OUT |
| −20 dB | −20 dB | −16.8 dB ± 1.5 dB | 3.2 dB ± 1.5 dB |
| −30 dB | −30 dB | −21.8 dB ± 1.5 dB | 8.2 dB ± 1.5 dB |

## 8. MOUNTING DIAGRAMS AND PARTS LIST

Note: Mounting diagram shows a dip side view of the printed circuit board.

### 8.1. Volume P.C.B. Ass'y

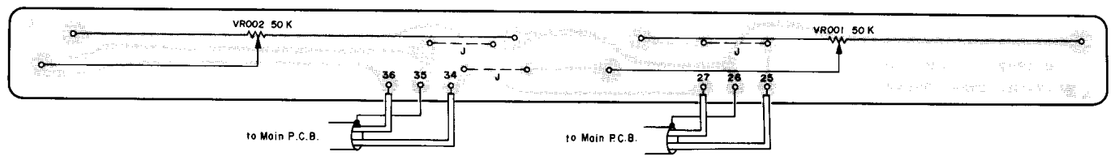



Fig. 8.1

### 8.2. Control Switch P.C.B. Ass'y

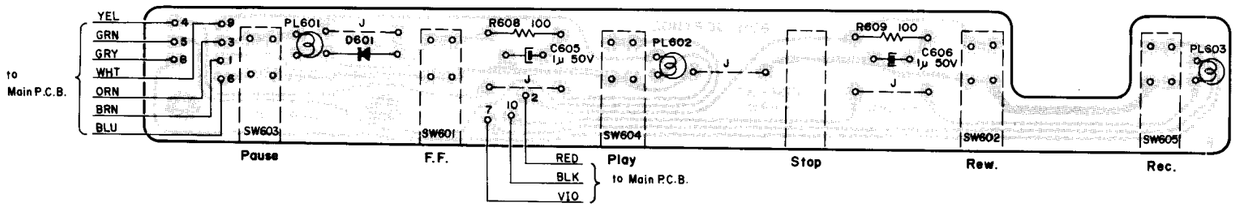
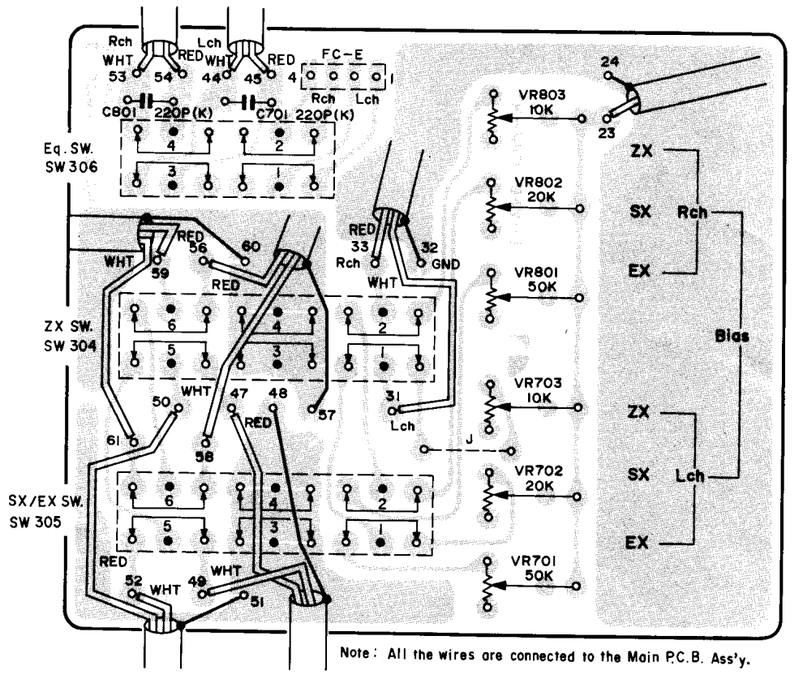



Fig. 8.2

Note: Diode is 1SS53 unless otherwise specified.

### 8.3. Switch P.C.B. Ass'y




Note: All the wires are connected to the Main P.C.B. Ass'y.

Fig. 8.3

### 8.4. Control P.C.B. Ass'y

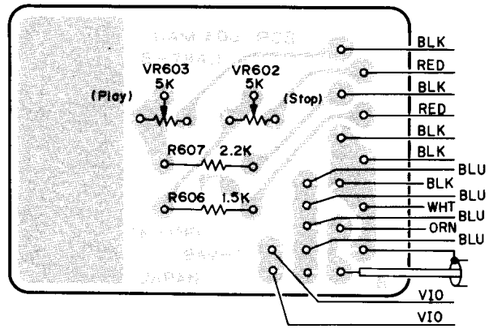



Fig. 8.4

### 8.5. Auto Shut-off P.C.B. Ass'y

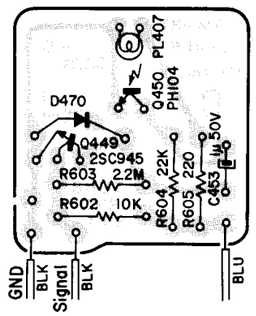



Fig. 8.5

Note: Diode is 1SS53 unless otherwise specified.

### 8.6. Lamp P.C.B. L Ass'y

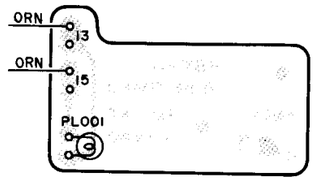



Fig. 8.6

### 8.7. Lamp P.C.B. R Ass'y

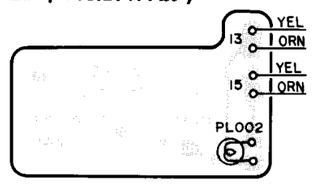
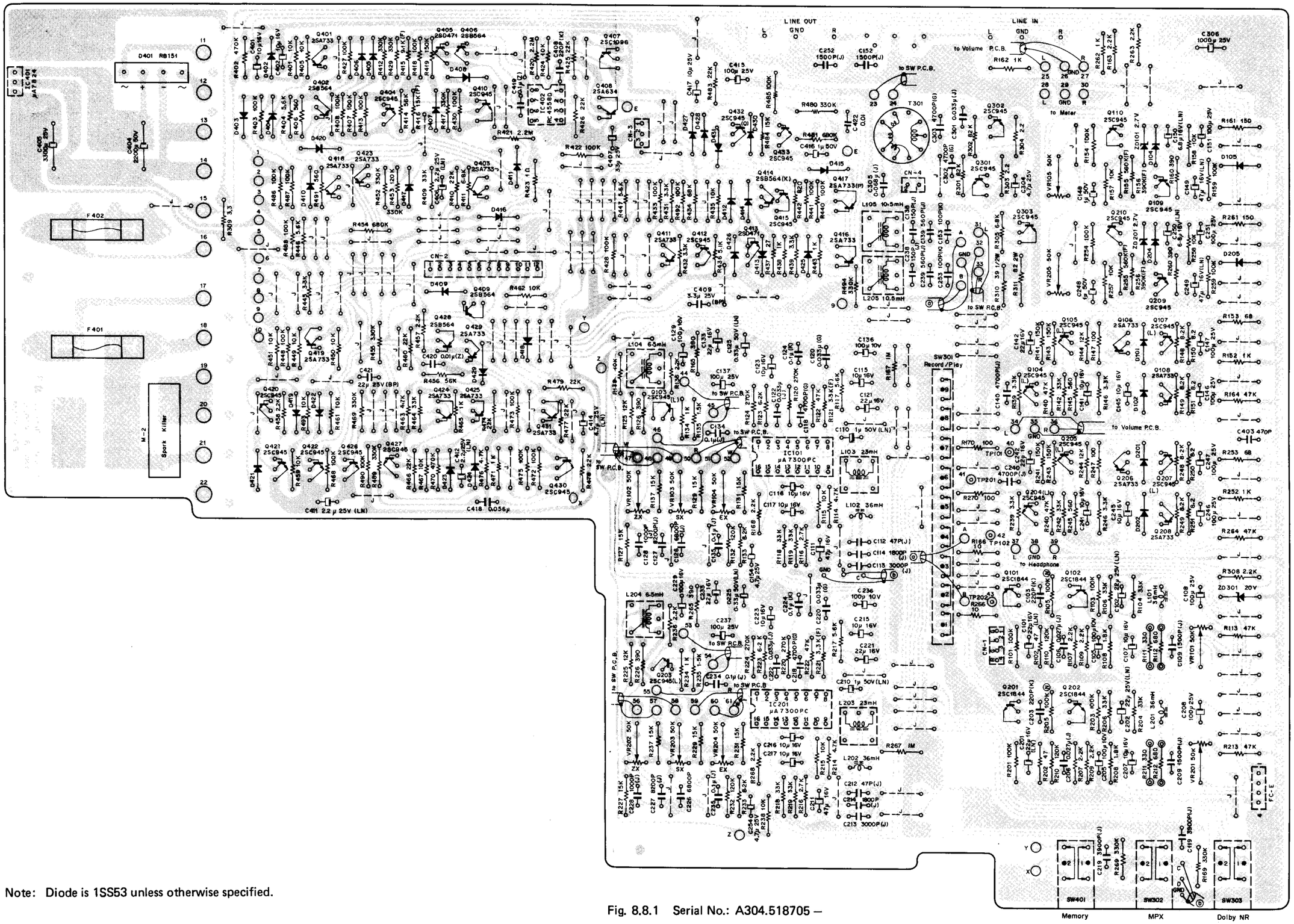



Fig. 8.7

| Schematic Ref. No. | Part No. | Description |
|---|---|---|
| | **BA04114A** | **Volume P.C.B. Ass'y** |
| | 0B07845B | Volume P.C.B. |
| VR001,002 | 0B07298A | Slide Volume 50K (A) |
| | **BA04126A** | **Control P.C.B. Ass'y** |
| | 0B07849B | Control P.C.B. |
| VR602,603 | 0B09059A | Semi-fixed Volume 5K |
| R606 | 0B05698A | Carbon Resistor 1.5K ERD-25T J |
| R607 | 0B05622A | Carbon Resistor 2.2K ERD-25T J |
| | **BA04127A** | **Switch P.C.B. Ass'y** |
| | 0B07846C | Switch P.C.B. |
| VR701,801 | 0B07237A | Semi-fixed Volume 50K |
| VR702,802 | 0B07261A | Semi-fixed Volume 20K |
| VR703,803 | 0B07236A | Semi-fixed Volume 10K |
| C701, 801 | 0B09283A | Ceramic Capacitor 220P 50V K |
| | 0B07302A | Push Switch 6-6-4 (1 pce.) |
| | **BA04113A** | **Control Switch P.C.B. Ass'y** |
| | 0B07848B | Control Switch P.C.B. |
| D601 | 0B06181A | Silicon Diode 1SS53 |
| R608, 609 | 0B01679A | Carbon Resistor 100 ERD-25T J |
| C605, 606 | 0B01405A | Electrolytic Capacitor 1μ 50V |
| PL601, 602 603 | 0B08673A | Lamp 24V 20mA |
| | 0B07297A | Control Switch (1 pce.) |

| Schematic Ref. No. | Part No. | Description |
|---|---|---|
| | **BA04128A** | **Auto Shut-off P.C.B. Ass'y** |
| | 0B07852B | Auto Shut-off P.C.B. |
| Q449 | 0B06100A | Transistor 2SC945 (A) |
| Q450 | 0B06228A | Photo Transistor PH104 |
| D470 | 0B06181A | Silicon Diode 1SS53 |
| R602 | 0B01888A | Carbon Resistor 10K ERD-25T J |
| R603 | 0B05671A | Carbon Resistor 2.2M ERD-25T J |
| R604 | 0B05615A | Carbon Resistor 22K ERD-25T J |
| R605 | 0B01933A | Carbon Resistor 220 ERD-25T J |
| C453 | 0B01405A | Electrolytic Capacitor 1μ 50V |
| PL407 | 0B08552A | Lamp 12V 25mA |
| | **BA04125A** | **Lamp P.C.B. L Ass'y** |
| | 0B07851B | Lamp P.C.B. L |
| PL001 | 0B08674A | Lamp 5V 200mA |
| | **BA04124A** | **Lamp P.C.B. R Ass'y** |
| | 0B07850B | Lamp P.C.B. R |
| PL002 | 0B08674A | Lamp 5V 200mA |

## 8.8. Main P.C.B. Ass'y




Note: Diode is 1SS53 unless otherwise specified.

Fig. 8.8.1 Serial No.: A304.518705 –

| Schematic Ref. No. | Part No. | Description |
|---|---|---|
| | **BA04130A** | **Main P.C.B. Ass'y (U.S.A. & Canada)** |
| | **BA04112A** | **Main P.C.B. Ass'y (Japan)** |
| | **BA04131A** | **Main P.C.B. Ass'y (220V Class 2)** |
| | **BA04132A** | **Main P.C.B. Ass'y (UK & Australia)** |
| | **BA04133A** | **Main P.C.B. Ass'y (Others)** |
| | | Serial No.: A304.518705 – |
| | | **– PB Eq. Amp. –** |
| Q101, 102 | 0B06119A | Transistor 2SC1844 |
| 201, 202 | | |
| ZD301 | 0B06239A | Zener Diode RD20EB |
| L101, 201 | 0B03919B | Inductor 36mH |
| VR101,201 | 0B07237A | Semi-fixed Volume 50K |
| R101, 103 | 0B01889A | Carbon Resistor 100K ERD-25T J |
| 201, 203 | | |
| R102, 202 | 0B01706A | Carbon Resistor 47 ERD-25T J |
| R104, 106 | 0B05509A | Carbon Resistor 33K ERD-25T J |
| 204, 206 | | |
| R105, 205 | 0B09330A | Carbon Resistor 100K ERD-25TS J (Noiseless) |
| R107, 109 | 0B05622A | Carbon Resistor 2.2K ERD-25T J |
| 207, 209 | | |
| 308 | | |
| R108, 208 | 0B05614A | Carbon Resistor 1.8K ERD-25T J |
| R110, 210 | 0B05621A | Carbon Resistor 120K ERD-25T J |
| R111, 211 | 0B05577A | Carbon Resistor 330 ERD-25T J |
| R112, 212 | 0B05794A | Carbon Resistor 680 ERD-25T J |
| R113, 213 | 0B05641A | Carbon Resistor 47K ERD-25T J |
| R166, 266 | 0B05936A | Carbon Resistor 10 ERD-25T J |
| C101, 201 | 0B09137A | Electrolytic Capacitor 22μ 16V (LN) |
| C102, 202 | 0B09376A | Electrolytic Capacitor 22μ 25V (LN) |
| C103, 203 | 0B09283A | Ceramic Capacitor 220P 50V K |
| C105, 205 | 0B05885A | Electrolytic Capacitor 100μ 10V |
| C106, 206 | 0B09045A | Mylar Capacitor 0.027μ 50V J |
| C107, 207 | 0B01412A | Electrolytic Capacitor 10μ 16V |
| C108, 208 | 0B01272A | Electrolytic Capacitor 100μ 25V |
| C109, 209 | 0B05653A | Mylar Capacitor 1500P 50V J |
| | | **– Dolby NR –** |
| IC101, 201 | 0B06175A | IC μA7300PC |
| L102, 202 | 0B03919B | Inductor 36mH |
| L103, 203 | 0B03563A | 19K Coil 23mH |
| R114, 214 | 0B01846A | Carbon Resistor 4.7K ERD-25T J |
| R115, 215 | 0B01888A | Carbon Resistor 10K ERD-25T J |
| R116, 216 | 0B05629A | Carbon Resistor 2.7K ERD-25T J |
| R117, 217 | 0B01887A | Carbon Resistor 5.6K ERD-25T J |
| R118, 119 | 0B05509A | Carbon Resistor 33K ERD-25T J |
| 218, 219 | | |
| R120, 124 | 0B05620A | Carbon Resistor 270K ERD-25T J |
| 220, 224 | | |
| R121, 221 | 0B09317A | Metal Film Resistor 3.3K SN14K2E F |
| R122, 222 | 0B05641A | Carbon Resistor 47K ERD-25T J |
| R123, 223 | 0B09271A | Carbon Resistor 6.2K ERD-25T J |
| R162, 262 | 0B01857A | Carbon Resistor 1K ERD-25T J |
| R165, 265 | 0B09383A | Fail Safe Type Resistor 390 RDF-25S J |
| R167, 267 | 0B05776A | Carbon Resistor 1M ERD-25T J |
| R169, 269 | 0B05627A | Carbon Resistor 330K ERD-25T J |
| C110, 210 | 0B09223A | Electrolytic Capacitor 1μ 50V (LN) |
| C111, 211 | 0B01403A | Electrolytic Capacitor 47μ 16V |
| C112, 212 | 0B09242A | Mica Capacitor 47P 50V J |
| C113, 213 | 0B09262A | PP Capacitor 3000P 50V J |

| Schematic Ref. No. | Part No. | Description |
|---|---|---|
| C114, 214 | 0B01913A | Mylar Capacitor 1800P 50V J |
| C115, 116 | 0B01412A | Electrolytic Capacitor 10μ 16V |
| 117, 123 | | |
| 215, 216 | | |
| 217, 223 | | |
| C118, 218 | 0B09191A | PP Capacitor 4700P 100V G |
| C119, 219 | 0B01804A | Mylar Capacitor 3900P 50V J |
| C120, 220 | 0B09240A | PP Capacitor 0.033μ 100V G |
| C121, 221 | 0B01862A | Electrolytic Capacitor 22μ 16V |
| C122, 222 | 0B05583A | Mylar Capacitor 0.033μ 50V J |
| C124, 224 | 0B01603A | Mylar Capacitor 0.1μ 50V K |
| C125, 225 | 0B09327A | Electrolytic Capacitor 0.33μ 50V (LN) |
| C136, 236 | 0B05885A | Electrolytic Capacitor 100μ 10V |
| C137, 237 | 0B01272A | Electrolytic Capacitor 100μ 25V |
| | | **– Rec. Amp. –** |
| Q103, 203 | 0B01872A | Transistor 2SC945 (L) |
| L104, 105 | 0B00068A | Trap Coil 10.5mH |
| 204, 205 | | |
| VR102,103 | 0B07237A | Semi-fixed Volume 50K |
| 104,202 | | |
| 203,204 | | |
| R127, 129 | 0B01683A | Carbon Resistor 15K ERD-25T J |
| 131, 137 | | |
| 227, 229 | | |
| 231, 237 | | |
| R125, 225 | 0B09263A | Carbon Resistor 12K ERD-25T J |
| R126, 226 | 0B05691A | Carbon Resistor 390 ERD-25T J |
| R132, 232 | 0B05621A | Carbon Resistor 120K ERD-25T J |
| R133, 233 | 0B01856A | Carbon Resistor 8.2K ERD-25T J |
| R134, 234 | 0B01857A | Carbon Resistor 1K ERD-25T J |
| R135, 235 | 0B05698A | Carbon Resistor 1.5K ERD-25T J |
| R136, 168 | 0B05622A | Carbon Resistor 2.2K ERD-25T J |
| 236, 268 | | |
| R138, 238 | 0B01888A | Carbon Resistor 10K ERD-25T J |
| C126, 226 | 0B05530A | Mylar Capacitor 6800P 50V J |
| C127, 227 | 0B05814A | Mylar Capacitor 8200P 50V J |
| C128, 228 | 0B05550A | Mylar Capacitor 1000P 50V J |
| C129, 229 | 0B01400A | Electrolytic Capacitor 100μ 16V |
| C133, 233 | 0B01862A | Electrolytic Capacitor 22μ 16V |
| C134, 135 | 0B01780A | Mylar Capacitor 0.1μ 50V J |
| 234, 235 | | |
| C138, 238 | 0B09246A | Mica Capacitor 150P 50V J |
| C139, 239 | 0B09323A | PP Capacitor 560P 100V J |
| C153, 253 | 0B09282A | Ceramic Capacitor 100P 50V K |
| C154, 254 | 0B01389A | Electrolytic Capacitor 4.7μ 25V |
| | | **– Line Amp. –** |
| Q104, 105 | 0B01872A | Transistor 2SC945 (L) |
| 107, 204 | | |
| 205, 207 | | |
| Q106, 108 | 0B06013A | Transistor 2SA733 |
| 206, 208 | | |
| D101, 102 | 0B06181A | Silicon Diode 1SS53 |
| 201, 202 | | |
| R139, 146 | 0B01681A | Carbon Resistor 3.3K ERD-25T J |
| 239, 246 | | |
| R140, 240 | 0B05641A | Carbon Resistor 47K ERD-25T J |
| R141, 143 | 0B05626A | Carbon Resistor 150K ERD-25T J |
| 241, 243 | | |
| R142, 242 | 0B05509A | Carbon Resistor 33K ERD-25T J |

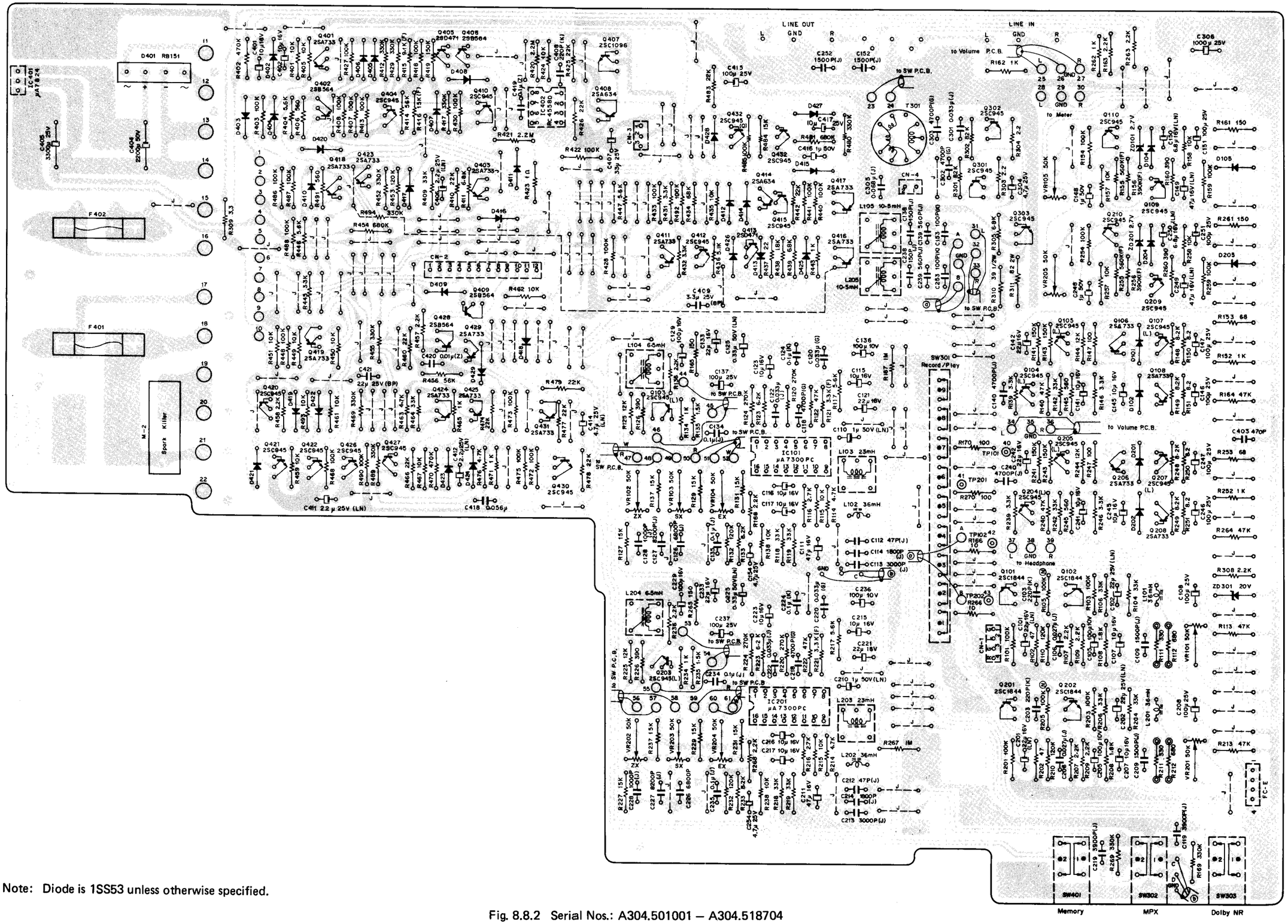
| Schematic Ref. No. | Part No. | Description |
|---|---|---|
| R144, 244 | 0B09263A | Carbon Resistor 12K ERD-25T J |
| R145, 245 | 0B05575A | Carbon Resistor 560 ERD-25T J |
| R147, 247 | 0B01679A | Carbon Resistor 100 ERD-25T J |
| R148, 149 | 0B01856A | Carbon Resistor 8.2K ERD-25T J |
| 248, 249 | | |
| R150, 151 | 0B09331A | Fail Safe Type Resistor 8.2 RDF-25S J |
| 250, 251 | | |
| R152, 252 | 0B01857A | Carbon Resistor 1K ERD-25T J |
| R153, 253 | 0B09306A | Fail Safe Type Resistor 68 RDF-25S J |
| R163, 263 | 0B05622A | Carbon Resistor 2.2K ERD-25T J |
| R164, 264 | 0B05641A | Carbon Resistor 47K ERD-25T J |
| R170, 270 | 0B01679A | Carbon Resistor 100 ERD-25T J |
| C140, 240 | 0B05652A | Mylar Capacitor 4700P 50V J |
| C141, 145 | 0B01412A | Electrolytic Capacitor 10μ 16V |
| 241, 245 | | |
| C142, 242 | 0B01862A | Electrolytic Capacitor 22μ 16V |
| C146, 147 | 0B01272A | Electrolytic Capacitor 100μ 25V |
| 246, 247 | | |
| C152, 252 | 0B05653A | Mylar Capacitor 1500P 50V J |
| | | **– Meter Amp. –** |
| Q109, 110 | 0B06100A | Transistor 2SC945 (A) |
| 209, 210 | | |
| ZD101,201 | 0B06191A | Zener Diode 2.7EB |
| D104, 105 | 0B06181A | Silicon Diode 1SS53 |
| 204, 205 | | |
| VR105,205 | 0B07237A | Semi-fixed Volume 50K |
| R154, 159 | 0B01889A | Carbon Resistor 100K ERD-25T J |
| 254, 259 | | |
| R155, 255 | 0B09318A | Metal Film Resistor 560K SN14K2E F |
| R156, 256 | 0B09338A | Metal Film Resistor 390K SN14K2E F |
| R157, 158 | 0B01888A | Carbon Resistor 10K ERD-25T J |
| 257, 258 | | |
| R160, 260 | 0B05691A | Carbon Resistor 390 ERD-25T J |
| R161, 261 | 0B09213A | Fail Safe Type Resistor 150 RDF-25S J |
| C148, 248 | 0B01405A | Electrolytic Capacitor 1μ 50V |
| C149, 249 | 0B09218A | Electrolytic Capacitor 47μ 16V (LN) |
| C150, 250 | 0B09219A | Electrolytic Capacitor 6.8μ 16V (LN) |
| C151, 251 | 0B01272A | Electrolytic Capacitor 100μ 25V |
| | | **– Bias Osc. –** |
| Q301, 302 | 0B06100A | Transistor 2SC945 (A) |
| 303 | | |
| T301 | 0B06613A | Osc. Coil |
| R301, 302 | 0B05668A | Carbon Resistor 82K ERD-25T J |
| R303, 304 | 0B09212A | Fail Safe Type Resistor 2.2 RDF-25S J |
| R305 | 0B01682A | Carbon Resistor 6.8K ERD-25T J |
| R310 | 0B09296A | Fail Safe Type Resistor 39 RSF-½B J |
| R311 | 0B09295A | Fail Safe Type Resistor 82 RSF-2B J |
| C301 | 0B05583A | Mylar Capacitor 0.033μ 50V J |
| C302, 303 | 0B09191A | PP Capacitor 4700P 100V G |
| C304 | 0B01402A | Electrolytic Capacitor 4.7μ 25V |
| C305 | 0B09254A | PP Capacitor 0.068μ 100V J |
| | | **– Logic –** |
| IC402 | 0B06124B | IC RC4558D |
| Q401, 403 | 0B06013A | Transistor 2SA733 |
| 411, 416 | | |
| 418, 419 | | |
| 423, 424 | | |

| Schematic Ref. No. | Part No. | Description |
|---|---|---|
| Q425, 429 | | |
| 431 | | |
| Q402, 406 | 0B06069A | Transistor 2SB564 |
| 409, 428 | | |
| Q404, 410 | 0B06100A | Transistor 2SC945 (A) |
| 412, 415 | | |
| 420, 421 | | |
| 422, 426 | | |
| 427, 430 | | |
| 433 | | |
| Q405, 413 | 0B06066A | Transistor 2SD471 |
| Q407 | 0B06020A | Transistor 2SC1096 |
| Q408 | 0B06012A | Transistor 2SA634 |
| Q414 | 0B06252A | Transistor 2SB564 (K) |
| Q417 | 0B06155A | Transistor 2SA733 (P) |
| Q432 | 0B06251A | Transistor 2SC945A (Q) |
| D403-431 | 0B06181A | Silicon Diode 1SS53 (29 pcs.) |
| R403, 407 | 0B01889A | Carbon Resistor 100K ERD-25T J |
| 408, 413 | | |
| 418, 422 | | |
| 427, 428 | | |
| 430, 433 | | |
| 440, 441 | | |
| 448, 468 | | |
| 472, 473 | | |
| 475, 485 | | |
| 486, 487 | | |
| 488, 490 | | |
| 492 | | |
| R404, 446 | 0B01887A | Carbon Resistor 5.6K ERD-25T J |
| 447 | | |
| R405, 424 | 0B01888A | Carbon Resistor 10K ERD-25T J |
| 435, 449 | | |
| 450, 451 | | |
| 459, 461 | | |
| 462, 467 | | |
| 493 | | |
| R406, 491 | 0B05575A | Carbon Resistor 560 ERD-25T J |
| R409, 464 | 0B05509A | Carbon Resistor 33K ERD-25T J |
| R410, 425 | 0B05615A | Carbon Resistor 22K ERD-25T J |
| 426, 460 | | |
| 466, 474 | | |
| 477, 478 | | |
| 479, 483 | | |
| R411 | 0B01682A | Carbon Resistor 6.8K ERD-25T J |
| R412, 417 | 0B05627A | Carbon Resistor 330K ERD-25T J |
| 429, 452 | | |
| 455, 469 | | |
| 480, 489 | | |
| 494 | | |
| R414, 456 | 0B05508A | Carbon Resistor 56K ERD-25T J |
| R415 | 0B09328A | Metal Film Resistor 9.1K SN14K2E F |
| R416 | 0B09340A | Metal Film Resistor 15K SN14K2E F |
| R419 | 0B05626A | Carbon Resistor 150K ERD-25T J |
| R420, 421 | 0B05671A | Carbon Resistor 2.2M ERD-25T J |
| R423 | 0B09214A | Fail Safe Type Resistor 1 RDF-25S J |
| R431, 432 | 0B01681A | Carbon Resistor 3.3K ERD-25T J |
| 439, 445 | | |
| R434 | 0B05692A | Carbon Resistor 68K ERD-25T J |
| R436 | 0B09314A | Carbon Resistor 5.1K ERD-25T J |
| R437 | 0B09384A | Fail Safe Type Resistor 27 ERD-14F J |
| R438, 443 | 0B01857A | Carbon Resistor 1K ERD-25T J |
| 465, 471 | | |

| Schematic Ref. No. | Part No. | Description |
|---|---|---|
| R442 | 0B01680A | Carbon Resistor 820 ERD-25T J |
| R453 | 0B05621A | Carbon Resistor 120K ERD-25T J |
| R454, 481 | 0B09335A | Carbon Resistor 680K ERD-25T J |
| R457, 458 | 0B05622A | Carbon Resistor 2.2K ERD-25T J |
| R463, 476 | 0B01846A | Carbon Resistor 4.7K ERD-25T J |
| R470 | 0B01684A | Carbon Resistor 470K ERD-25T J |
| R484 | 0B01683A | Carbon Resistor 15K ERD-25T J |
| C403 | 0B09286A | Ceramic Capacitor 470P 50V K |
| C406, 411 | 0B09332A | Electrolytic Capacitor 2.2μ 25V (LN) |
| 412 | | |
| C407 | 0B09251A | Electrolytic Capacitor 33μ 25V |
| C408 | 0B09283A | Ceramic Capacitor 220P 50V K |
| C409 | 0B09345A | Electrolytic Capacitor 3.3μ 25V (BP) |
| C414 | 0B09333A | Electrolytic Capacitor 4.7μ 25V (LN) |
| C415 | 0B01272A | Electrolytic Capacitor 100μ 25V |
| C416 | 0B01405A | Electrolytic Capacitor 1μ 50V |
| C417 | 0B01674A | Electrolytic Capacitor 10μ 25V |
| C418 | 0B01676A | Mylar Capacitor 0.056μ 50V |
| C419 | 0B09292A | Ceramic Capacitor 0.1μ 50V Z |
| C420, 422 | 0B09290A | Ceramic Capacitor 0.01μ 50V Z |
| C421 | 0B09368A | Electrolytic Capacitor 22μ 25V (BP) |
| | | **– Power Supply –** |
| IC401 | 0B06237A | Regulator +24V μA7824 |
| D401 | 0B06183A | Diode Bridge RB151 |
| D402 | 0B06181A | Silicon Diode 1SS53 |
| R309 | 0B09339A | Fail Safe Type Resistor 3.3 RSF-25S J |
| R401 | 0B01888A | Carbon Resistor 10K ERD-25T J |
| R402 | 0B01684A | Carbon Resistor 470K ERD-25T J |
| C306 | 0B01870A | Electrolytic Capacitor 1000μ 25V |
| C401, 402 | 0B01412A | Electrolytic Capacitor 10μ 16V |
| C404 | 0B09336A | Electrolytic Capacitor 2200μ 50V |
| C405 | 0B09373A | Electrolytic Capacitor 3300μ 25V |
| | | **– Missellaneous –** |
| | 0B07847H | Main P.C.B. |
| | 0B01857A | Carbon Resistor 1K ERD-25T J (2 pcs.) |
| F401 | 0B08686A | Fuse 1A 250V (Japan) |
| F401 | 0B08374A | Fuse 1A 250V (U.S.A., Canada & Others) |
| F401 | 0B08275A | Fuse T 125mA 250V (UK, Australia & 220V Class 2) |
| F402 | 0B08698A | Fuse 500mA 250V (U.S.A., Canada & Others) |
| F402 | 0B08697A | Fuse 500mA 250V (Japan) |
| F402 | 0B08457A | Fuse T 500mA 250V (UK, Australia & 220V Class 2) |
| M2 | 0B08363A | Spark Killer (Japan) |
| M2 | 0B08342A | Spark Killer (U.S.A. & Canada) |
| M2 | 0B08240U | Spark Killer (UK, Australia & Others) |
| M2, 3 | 0B08445A | Spark Killer (220V Class 2) |
| CN1 | 0B08654A | 4P-T Post |
| CN2 | 0B08681A | 12P-T Post |
| CN3 | 0B08653A | 3P-T Post |
| CN4 | 0B08656A | 2P-T Post |
| SW301 | 0B07239A | Record Switch |
| | 0B07303A | Push Switch (1 pce.) |
| | 0B08675A | Pin Jack (1 pce.) |
| | 0B08676A | Heat Sink (1 pce.) |

| Schematic Ref. No. | Part No. | Description |
|---|---|---|
| | 0B08680B | Heat Sink A (1 pce.) |
| | 0C08144C | Record Spring (1 pce.) |
| | 0B08569C | Record Wire Holder (1 pce.) |
| | 0B08570A | Record Spring Holder (1 pce.) |
| | 0B08573A | Wire Holder (1 pce.) |
| | 0B08349A | Fuse Clip (UK, Australia & 220V Class 2) (4 pcs.) |
| | 0M03782A | Fuse Label 1A 250V (U.S.A., Canada, Japan & Others) (1 pce.) |
| | 0M04100B | Fuse Label 500mA 250V (U.S.A., Canada, Japan & Others) (1 pce.) |
| | 0M04082B | Fuse Label T 125mA 250V (UK, Australia & 220V Class 2) (1 pce.) |
| | 0M04096B | Fuse Label T 500mA 250V (UK, Australia & 220V Class 2) (1 pce.) |
| | 0E00612A | Screw M3x6 Philips Pan Head (2A) (2 pcs.) |
| | 0E00788A | BT Screw M2x8 Philips Pan Head (1 pce.) |
| | 0E00831A | BT Screw M3x10 Philips Pan Head (1 pce.) |
| | 0E00857A | BT Screw M3x6 Philips Binding Head (2 pcs.) |
| | 0E00507A | Nut Hex. M3 (2 pcs.) |
| | 0E00117A | Washer 2mm (1 pce.) |
| | 0E00172A | Washer 3mm Toothed Lock (1 pce.) |

| Schematic Ref. No. | Part No. | Description |
|---|---|---|
| | BA04130A | Main P.C.B. Ass'y (U.S.A. & Canada) |
| | BA04112A | Main P.C.B. Ass'y (Japan) |
| | BA04131A | Main P.C.B. Ass'y (220V Class 2) |
| | BA04132A | Main P.C.B. Ass'y (UK & Australia) |
| | BA04133A | Main P.C.B. Ass'y (Others) |
| | | Serial Nos.: A304.501001 – A304.518704 |
| | – PB Eq. Amp. – | |
| Q101, 102 | 0B06119A | Transistor 2SC1844 |
| 201, 202 | | |
| ZD301 | 0B06239A | Zener Diode RD20EB |
| L101,201 | 0B03919B | Inductor 36mH |
| VR101,201 | 0B07237A | Semi-fixed Volume 50K |
| R101, 103 | 0B01889A | Carbon Resistor 100K ERD-25T J |
| 201, 203 | | |
| R102, 202 | 0B01706A | Carbon Resistor 47 ERD-25T J |
| R104, 106 | 0B05509A | Carbon Resistor 33K ERD-25T J |
| 204, 206 | | |
| R105, 205 | 0B09330A | Carbon Resistor (Noiseless) 100K ERD-25TS J |
| R107, 109 | 0B05622A | Carbon Resistor 2.2K ERD-25T J |
| 207, 209 | | |
| 308 | | |
| R108, 208 | 0B05614A | Carbon Resistor 1.8K ERD-25T J |
| R110, 210 | 0B05621A | Carbon Resistor 120K ERD-25T J |
| R111, 211 | 0B05577A | Carbon Resistor 330 ERD-25T J |
| R112, 212 | 0B05794A | Carbon Resistor 680 ERD-25T J |
| R113, 213 | 0B05641A | Carbon Resistor 47K ERD-25T J |
| R166, 266 | 0B05936A | Carbon Resistor 10 ERD-25T J |
| C101, 201 | 0B09137A | Electrolytic Capacitor 22μ 16V (LN) |
| C102, 202 | 0B09376A | Electrolytic Capacitor 22μ 25V (LN) |
| C103, 203 | 0B09283A | Ceramic Capacitor 220P 50V K |
| C105, 205 | 0B05885A | Electrolytic Capacitor 100μ 10V |
| C106, 206 | 0B09045A | Mylar Capacitor 0.027μ 50V J |
| C107, 207 | 0B01412A | Electrolytic Capacitor 10μ 16V |
| C108, 208 | 0B01272A | Electrolytic Capacitor 100μ 25V |
| C109, 209 | 0B05653A | Mylar Capacitor 1500P 50V J |
| | – Dolby NR – | |
| IC101, 201 | 0B06175A | IC μA7300PC |
| L102, 202 | 0B03919B | Inductor 36mH |
| L103, 203 | 0B03563A | 19K Coil 23mH |
| R114, 214 | 0B01846A | Carbon Resistor 4.7K ERD-25T J |
| R115, 215 | 0B01888A | Carbon Resistor 10K ERD-25T J |
| R116, 216 | 0B05629A | Carbon Resistor 2.7K ERD-25T J |
| R117, 217 | 0B01887A | Carbon Resistor 5.6K ERD-25T J |
| R118, 119 | 0B05509A | Carbon Resistor 33K ERD-25T J |
| 218, 219 | | |
| R120, 124 | 0B05620A | Carbon Resistor 270K ERD-25T J |
| 220, 224 | | |
| R121, 221 | 0B09317A | Metal Film Resistor 3.3K SN14K2E F |
| R122, 222 | 0B05641A | Carbon Resistor 47K ERD-25T J |
| R123, 223 | 0B09271A | Carbon Resistor 6.2K ERD-25T J |
| R162, 262 | 0B01857A | Carbon Resistor 1K ERD-25T J |
| R165, 265 | 0B09213A | Fail Safe Type Resistor 150 RDF-25S J |
| R167, 267 | 0B05776A | Carbon Resistor 1M ERD-25T J |
| R169, 269 | 0B05627A | Carbon Resistor 330K ERD-25T J |
| C110, 210 | 0B09223A | Electrolytic Capacitor 1μ 50V (LN) |
| C111, 211 | 0B01403A | Electrolytic Capacitor 47μ 16V |
| C112, 212 | 0B09242A | Mica Capacitor 47P 50V J |
| C113, 213 | 0B09262A | PP Capacitor 3000P 50V J |
| C114, 214 | 0B01913A | Mylar Capacitor 1800P 50V J |
| C115, 116 | 0B01412A | Electrolytic Capacitor 10μ 16V |
| 117, 123 | | |
| 215, 216 | | |
| 217, 223 | | |
| C118, 218 | 0B09191A | PP Capacitor 4700P 100V G |
| C119, 219 | 0B01804A | Mylar Capacitor 3900P 50V J |
| C120, 220 | 0B09240A | PP Capacitor 0.033μ 100V G |
| C121, 221 | 0B01862A | Electrolytic Capacitor 22μ 16V |
| C122, 222 | 0B05583A | Mylar Capacitor 0.033μ 50V J |
| C124, 224 | 0B01603A | Mylar Capacitor 0.1μ 50V K |
| C125, 225 | 0B09327A | Electrolytic Capacitor 0.33μ 50V (LN) |
| C136, 236 | 0B05885A | Electrolytic Capacitor 100μ 10V |
| C137, 237 | 0B01272A | Electrolytic Capacitor 100μ 25V |
| | – Rec. Amp. – | |
| Q103, 203 | 0B01872A | Transistor 2SC945 (L) |
| L104, 105 | 0B00068A | Trap Coil 10.5mH |
| 204, 205 | | |
| VR102,103 | 0B07237A | Semi-fixed Volume 50K |
| 104,202 | | |
| 203,204 | | |
| R127, 129 | 0B01683A | Carbon Resistor 15K ERD-25T J |
| 131, 137 | | |
| 227, 229 | | |
| 231, 237 | | |
| R125, 225 | 0B09263A | Carbon Resistor 12K ERD-25T J |
| R126, 226 | 0B05691A | Carbon Resistor 390 ERD-25T J |
| R132, 232 | 0B05621A | Carbon Resistor 120K ERD-25T J |
| R133, 233 | 0B01856A | Carbon Resistor 8.2K ERD-25T J |
| R134, 234 | 0B01857A | Carbon Resistor 1K ERD-25T J |
| R135, 235 | 0B05698A | Carbon Resistor 1.5K ERD-25T J |
| R136, 168 | 0B05622A | Carbon Resistor 2.2K ERD-25T J |
| 236, 268 | | |
| R138, 238 | 0B01888A | Carbon Resistor 10K ERD-25T J |
| C126, 226 | 0B05530A | Mylar Capacitor 6800P 50V J |
| C127, 227 | 0B05814A | Mylar Capacitor 8200P 50V J |
| C128, 228 | 0B05550A | Mylar Capacitor 1000P 50V J |
| C129, 229 | 0B01400A | Electrolytic Capacitor 100μ 16V |
| C133, 233 | 0B01862A | Electrolytic Capacitor 22μ 16V |
| C134, 135 | 0B01780A | Mylar Capacitor 0.1μ 50V J |
| 234, 235 | | |
| C138, 238 | 0B09246A | Mica Capacitor 150P 50V J |
| C139, 239 | 0B09323A | PP Capacitor 560P 100V J |
| C153, 253 | 0B09282A | Ceramic Capacitor 100P 50V K |
| C154, 254 | 0B01389A | Electrolytic Capacitor 4.7μ 25V |
| | – Line Amp. – | |
| Q104, 105 | 0B01872A | Transistor 2SC945 (L) |
| 107, 204 | | |
| 205, 207 | | |
| Q106, 108 | 0B06013A | Transistor 2SA733 |
| 206, 208 | | |
| D101, 102 | 0B06181A | Silicon Diode 1SS53 |
| 201, 202 | | |
| R139, 146 | 0B01681A | Carbon Resistor 3.3K ERD-25T J |
| 239, 246 | | |
| R140, 240 | 0B05641A | Carbon Resistor 47K ERD-25T J |
| R141, 143 | 0B05626A | Carbon Resistor 150K ERD-25T J |
| 241, 243 | | |
| R142, 242 | 0B05509A | Carbon Resistor 33K ERD-25T J |
| R144, 244 | 0B09263A | Carbon Resistor 12K ERD-25T J |
| R145, 245 | 0B05575A | Carbon Resistor 560 ERD-25T J |
| R147, 247 | 0B01679A | Carbon Resistor 100 ERD-25T J |
| R148, 149 | 0B01856A | Carbon Resistor 8.2K ERD-25T J |
| 248, 249 | | |
| R150, 151 | 0B09331A | Fail Safe Type Resistor 8.2 RDF-25S J |
| 250, 251 | | |
| R152, 252 | 0B01857A | Carbon Resistor 1K ERD-25T J |
| R153, 253 | 0B09306A | Fail Safe Type Resistor 68 RDF-25S J |
| R163, 263 | 0B05622A | Carbon Resistor 2.2K ERD-25T J |
| R164, 264 | 0B05641A | Carbon Resistor 47K ERD-25T J |
| R170, 270 | 0B01679A | Carbon Resistor 100 ERD-25T J |
| C140, 240 | 0B05652A | Mylar Capacitor 4700P 50V J |
| C141, 145 | 0B01412A | Electrolytic Capacitor 10μ 16V |
| 241, 245 | | |
| C142, 242 | 0B01862A | Electrolytic Capacitor 22μ 16V |
| C146, 147 | 0B01272A | Electrolytic Capacitor 100μ 25V |
| 246, 247 | | |
| C152, 252 | 0B05653A | Mylar Capacitor 1500P 50V J |
| | – Meter Amp. – | |
| Q109, 110 | 0B06100A | Transistor 2SC945 (A) |
| 209, 210 | | |
| ZD101,201 | 0B06191A | Zener Diode 2.7EB |
| D104, 150 | 0B06181A | Silicon Diode 1SS53 |
| 204, 205 | | |
| VR105, 205 | 0B07237A | Semi-fixed Volume 50K |
| R154, 159 | 0B01889A | Carbon Resistor 100K ERD-25T J |
| 254, 259 | | |
| R155, 255 | 0B09318A | Metal Film Resistor 560K SN14K2E F |
| R156, 256 | 0B09338A | Metal Film Resistor 390K SN14K2E F |
| R157, 158 | 0B01888A | Carbon Resistor 10K ERD-25T J |
| 257, 258 | | |
| R160, 260 | 0B05691A | Carbon Resistor 390 ERD-25T J |
| R161, 261 | 0B09213A | Fail Safe Type Resistor 150 RDF-25S J |
| C148, 248 | 0B01405A | Electrolytic Capacitor 1μ 50V |
| C149, 249 | 0B09218A | Electrolytic Capacitor 47μ 16V (LN) |
| C150, 250 | 0B09219A | Electrolytic Capacitor 6.8μ 16V (LN) |
| C151, 251 | 0B01272A | Electrolytic Capacitor 100μ 25V |
| | – Bias Osc. – | |
| Q301, 302 | 0B06100A | Transistor 2SC945 (A) |
| 303 | | |
| T301 | 0B06613A | Osc. Coil |
| R301, 302 | 0B05668A | Carbon Resistor 82K ERD-25T J |
| R303, 304 | 0B09212A | Fail Safe Type Resistor 2.2 RDF-25S J |
| R305 | 0B01682A | Carbon Resistor 6.8K ERD-25T J |
| R310 | 0B09296A | Fail Safe Type Resistor 39 RSF-1/2B J |
| R311 | 0B09295A | Fail Safe Type Resistor 82 RSF-2B J |
| C301 | 0B05583A | Mylar Capacitor 0.033μ 50V J |
| C302, 303 | 0B09191A | PP Capacitor 4700P 100V G |
| C304 | 0B01402A | Electrolytic Capacitor 4.7μ 25V |
| C305 | 0B09254A | PP Capacitor 0.068μ 100V J |
| | – Logic – | |
| IC402 | 0B06124B | IC RC4558D |
| Q401, 403 | 0B06013A | Transistor 2SA733 |
| 411, 416 | | |
| 417, 418 | | |
| 419, 423 | | |
| 424, 425 | | |
| 429, 431 | | |
| Q402, 406 | 0B06069A | Transistor 2SB564 |
| 409, 428 | | |
| Q404, 410 | 0B06100A | Transistor 2SC945 (A) |
| 412, 415 | | |
| 420, 421 | | |
| 422, 426 | | |
| 427, 430 | | |
| 433 | | |
| Q405, 413 | 0B06066A | Transistor 2SD471 |
| Q407 | 0B06020A | Transistor 2SC1096 |
| Q408, 414 | 0B06012A | Transistor 2SA634 |
| Q432 | 0B06251A | Transistor 2SC945A (Q) |
| D403-429 | 0B06181A | Silicon Diode 1SS53 (27 pcs.) |
| R403, 407 | 0B01889A | Carbon Resistor 100K ERD-25T J |
| 408, 413 | | |
| 418, 422 | | |
| 427, 428 | | |
| 430, 433 | | |
| 440, 441 | | |
| 448, 468 | | |
| 472, 473 | | |
| 475, 485 | | |
| 486, 487 | | |
| 488, 490 | | |
| 492 | | |
| R404, 446 | 0B01887A | Carbon Resistor 5.6K ERD-25T J |
| 447 | | |
| R405, 424 | 0B01888A | Carbon Resistor 10K ERD-25T J |
| 435, 449 | | |
| 450, 451 | | |
| 459, 461 | | |
| 462, 467 | | |
| 493 | | |
| R406, 491 | 0B05575A | Carbon Resistor 560 ERD-25T J |
| R409, 464 | 0B05509A | Carbon Resistor 33K ERD-25T J |
| R410, 425 | 0B05615A | Carbon Resistor 22K ERD-25T J |
| 426, 442 | | |
| 460, 466 | | |
| 474, 477 | | |
| 478, 479 | | |
| 483 | | |
| R411, 439 | 0B01682A | Carbon Resistor 6.8K ERD-25T J |
| R412, 417 | 0B05627A | Carbon Resistor 330K ERD-25T J |
| 429, 452 | | |
| 455, 469 | | |
| 480, 489 | | |
| 494 | | |
| R414, 456 | 0B05508A | Carbon Resistor 56K ERD-25T J |
| R415 | 0B09328A | Metal Film Resistor 9.1K SN14K2E F |
| R416 | 0B09340A | Metal Film Resistor 15K SN14K2E F |
| R419 | 0B05626A | Carbon Resistor 150K ERD-25T J |
| R420, 421 | 0B05671A | Carbon Resistor 2.2M ERD-25T J |
| R423 | 0B09214A | Fail Safe Type Resistor 1 RDF-25S J |
| R431, 432 | 0B01681A | Carbon Resistor 3.3K ERD-25T J |
| 445 | | |
| R434 | 0B05692A | Carbon Resistor 68K ERD-25T J |
| R436 | 0B09314A | Carbon Resistor 5.1K ERD-25T J |
| R437 | 0B09049A | Fail Safe Type Resistor 22 ERD-14F J |
| R438 | 0B05614A | Carbon Resistor 1.8K ERD-25T J |
| R443, 465 | 0B01857A | Carbon Resistor 1K ERD-25T J |
| 471 | | |
| R453 | 0B05621A | Carbon Resistor 120K ERD-25T J |
| R454, 481 | 0B09335A | Carbon Resistor 680K ERD-25T J |
| R457, 458 | 0B05622A | Carbon Resistor 2.2K ERD-25T J |
| R463, 476 | 0B01846A | Carbon Resistor 4.7K ERD-25T J |
| R470 | 0B01684A | Carbon Resistor 470K ERD-25T J |
| R484 | 0B01683A | Carbon Resistor 15K ERD-25T J |
| C403 | 0B09286A | Ceramic Capacitor 470P 50V K |
| C406, 411 | 0B09332A | Electrolytic Capacitor 2.2μ 25V (LN) |
| 412 | | |
| C407 | 0B09251A | Electrolytic Capacitor 33μ 25V |
| C408 | 0B09283A | Ceramic Capacitor 220P 50V K |
| C409 | 0B09345A | Electrolytic Capacitor 3.3μ 25V (BP) |
| C414 | 0B09333A | Electrolytic Capacitor 4.7μ 25V (LN) |
| C415 | 0B01272A | Electrolytic Capacitor 100μ 25V |
| C416 | 0B01405A | Electrolytic Capacitor 1μ 50V |
| C417 | 0B01674A | Electrolytic Capacitor 10μ 25V |
| C418 | 0B01676A | Mylar Capacitor 0.056μ 50V |
| C419 | 0B09292A | Ceramic Capacitor 0.1μ 50V Z |
| C420 | 0B09290A | Ceramic Capacitor 0.01μ 50V Z |
| C421 | 0B09368A | Electrolytic Capacitor 22μ 25V (BP) |
| | – Power Supply – | |
| IC401 | 0B06237A | Regulator +24V μA7824 |
| D401 | 0B06183A | Diode Bridge RB151 |
| D402 | 0B06181A | Silicon Diode 1SS53 |
| R309 | 0B09339A | Fail Safe Type Resistor 3.3 RSF-25S J |
| R401 | 0B01888A | Carbon Resistor 10K ERD-25T J |
| R402 | 0B01684A | Carbon Resistor 470K ERD-25T J |
| C306 | 0B01870A | Electrolytic Capacitor 1000μ 25V |
| C401, 402 | 0B01412A | Electrolytic Capacitor 10μ 16V |
| C404 | 0B09336A | Electrolytic Capacitor 2200μ 50V |
| C405 | 0B09373A | Electrolytic Capacitor 3300μ 25V |
| | – Miscellaneous – | |
| | 0B07847D | Main P.C.B. |
| | 0B01857A | Carbon Resistor 1K ERD-25T J (2 pcs.) |
| F401 | 0B08686A | Fuse 1A 250V (Japan) |
| F401 | 0B08374A | Fuse 1A 250V (U.S.A., Canada & Others) |
| F401 | 0B08275A | Fuse T 125mA 250V (UK, Australia & 220V Class 2) |
| F402 | 0B08698A | Fuse 500mA 250V (U.S.A., Canada & Others) |
| F402 | 0B08697A | Fuse 500mA 250V (Japan) |
| F402 | 0B08457A | Fuse T 500mA 250V (UK, Australia & 220V Class 2) |
| M2 | 0B08363A | Spark Killer (Japan) |
| M2 | 0B08342A | Spark Killer (U.S.A. & Canada) |
| M2 | 0B08240U | Spark Killer (UK, Australia & Others) |
| M2, 3 | 0B08445A | Spark Killer (220V Class 2) |
| CN1 | 0B08654A | 4P-T Post |
| CN2 | 0B08681A | 12P-T Post |
| CN3 | 0B08653A | 3P-T Post |
| CN4 | 0B08656A | 2P-T Post |
| SW301 | 0B07239A | Record Switch |
| | 0B07303A | Push Switch (1 pce.) |
| | 0B08675A | Pin Jack (1 pce.) |
| | 0B08676A | Heat Sink (1 pce.) |
| | 0B08680B | Heat Sink A (1 pce.) |
| | 0C08144C | Record Spring (1 pce.) |
| | 0B08569C | Record Wire Holder (1 pce.) |
| | 0B08570A | Record Spring Holder (1 pce.) |
| | 0B08573A | Wire Holder (1 pce.) |
| | 0B08349A | Fuse Clip (UK, Australia & 220V Class 2) (4 pcs.) |
| | 0M03782A | Fuse Label 1A 250V (U.S.A., Canada, Japan & Others) (1 pce.) |
| | 0M04100B | Fuse Label 500mA 250V (U.S.A., Canada, Japan & Others) (1 pce.) |
| | 0M04082B | Fuse Label T 125mA 250V (UK, Australia & 220V Class 2) (1 pce.) |
| | 0M04096B | Fuse Label T 500mA 250V (UK, Australia & 220V Class 2) (1 pce.) |
| | 0E00612A | Screw M3x6 Philips Pan Head (2A) (2 pcs.) |
| | 0E00788A | BT Screw M2x8 Philips Pan Head (1 pce.) |
| | 0E00831A | BT Screw M3x10 Philips Pan Head (1 pce.) |
| | 0E00857A | BT Screw M3x6 Philips Binding Head (2 pcs.) |
| | 0E00507A | Nut Hex. M3 (2 pcs.) |
| | 0E00117A | Washer 2mm (1 pce.) |
| | 0E00172A | Washer 3mm Toothed Lock (1 pce.) |




Note: Diode is 1SS53 unless otherwise specified.

Fig. 8.8.2 Serial Nos.: A304.501001 – A304.518704

# 9. MECHANISM ASS'Y AND PARTS LIST

## 9.1. Synthesis

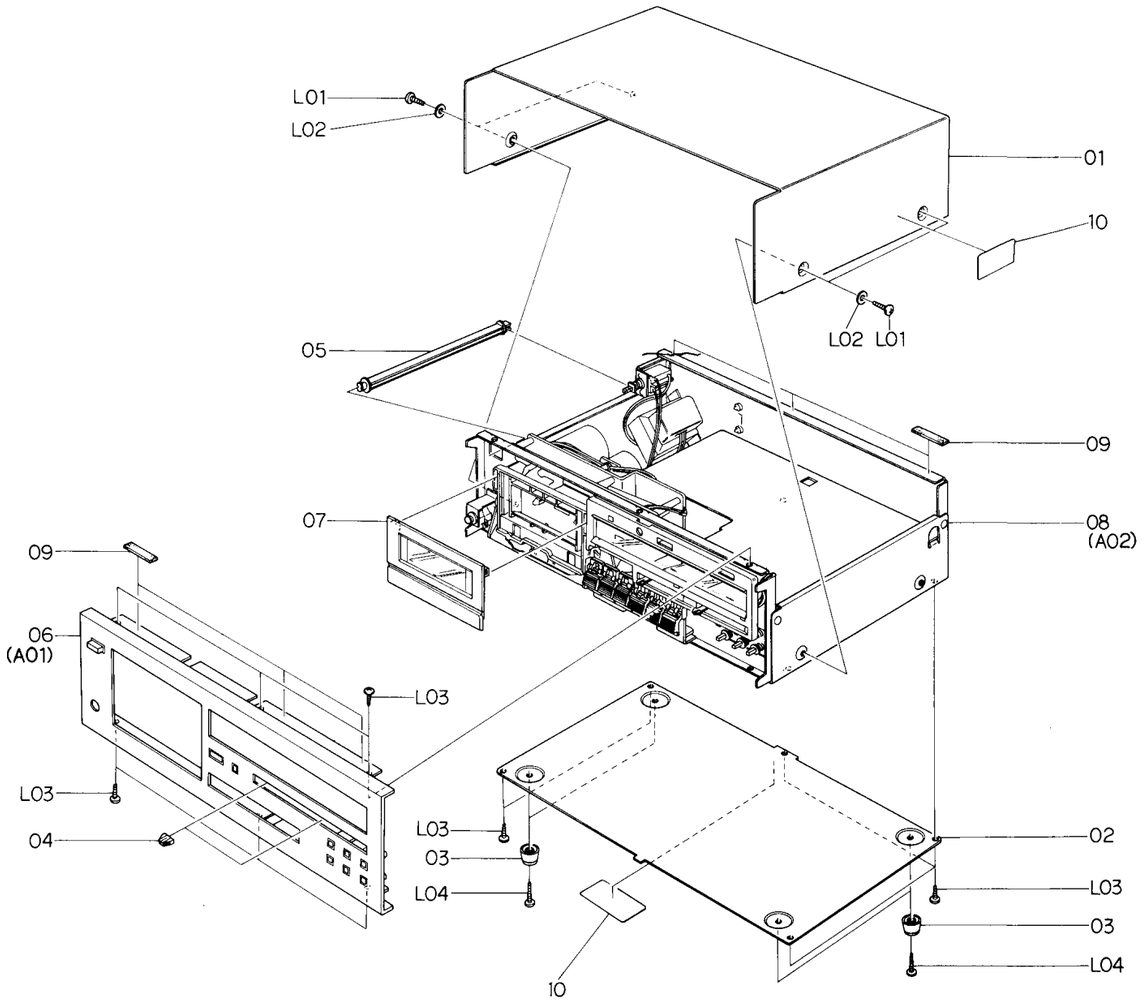



Fig. 9.1

| Schematic Ref. No. | Part No. | Description | Q'ty | Schematic Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|---|---|---|---|
| | | **Synthesis** | | | JA03631A | Synthesis Mechanism Ass'y (Australia) | 1 |
| 01 | 0H03768A | Top Cover Ass'y | 1 | | JA03632A | Synthesis Mechanism Ass'y (UK) | 1 |
| 02 | 0H03769B | Bottom Cover Ass'y | 1 | | JA03633A | Synthesis Mechanism Ass'y (Others) | 1 |
| 03 | 0J03564A | Leg T-H | 4 | | | | |
| 04 | 0H03794B | Volume Knob | 2 | 09 | 0H03781A | Cushion | 6 |
| 05 | 0J04066C | Power Switch Joint Bar | 1 | 10 | 0M04101A | Caution Label | 2 |
| 06 | HA03871A | Front Panel Ass'y | 1 | L01 | 0E00858A | BT Screw M4x6 Philips Binding Head (Black Chromate) | 4 |
| 07 | HA03872A | Cassette Case Cover Ass'y | 1 | | | | |
| 08 | JA03629A | Synthesis Mechanism Ass'y (U.S.A. & Canada) | 1 | L02 | 0E00736A | Washer 4mm (Black Chromate) | 4 |
| | | | | L03 | 0E00857A | BT Screw M3x6 Philips Binding Head | 11 |
| | JA03628A | Synthesis Mechanism Ass'y (Japan) | 1 | | | | |
| | | | | L04 | 0E00865A | BT Screw M3x10 Philips Binding Head | 4 |
| | JA03630A | Synthesis Mechanism Ass'y (220V Class 2) | 1 | | | | |

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

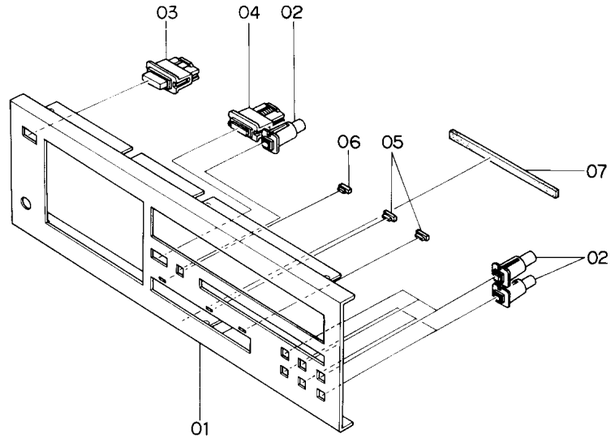



Fig. 9.2

## 9.3. Synthesis Mechanism Ass'y (A02)

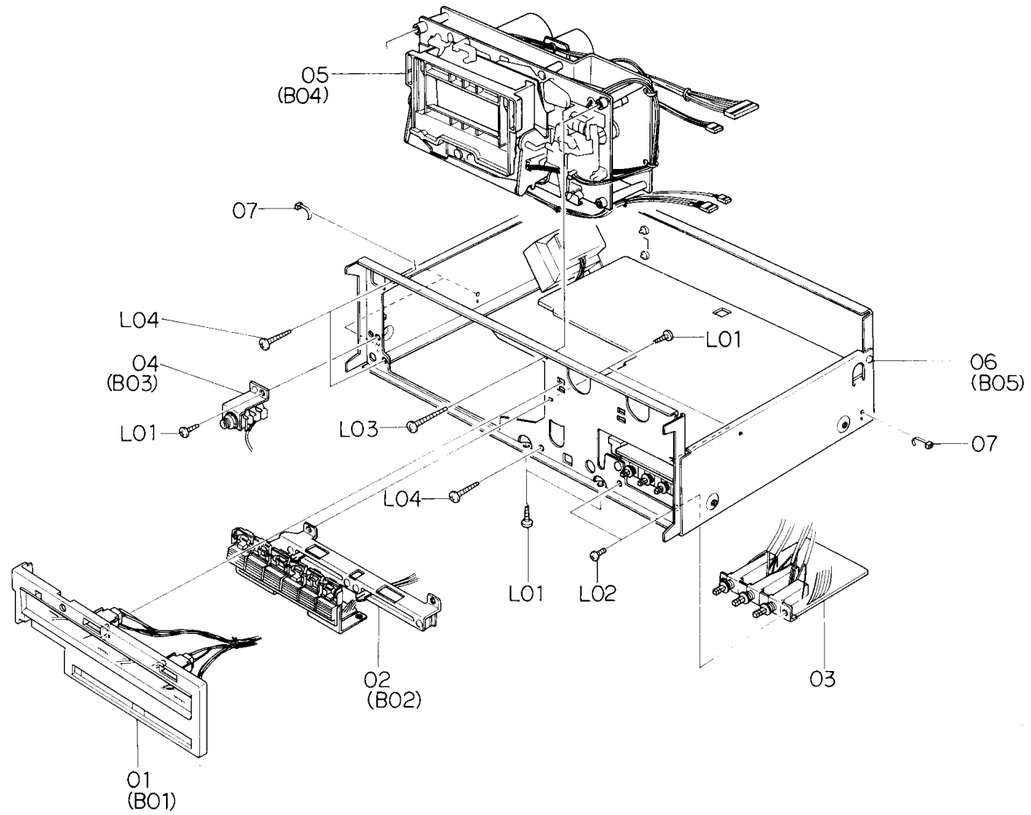



Fig. 9.3

## 9.4. Meter Escutcheon Ass'y (B01)

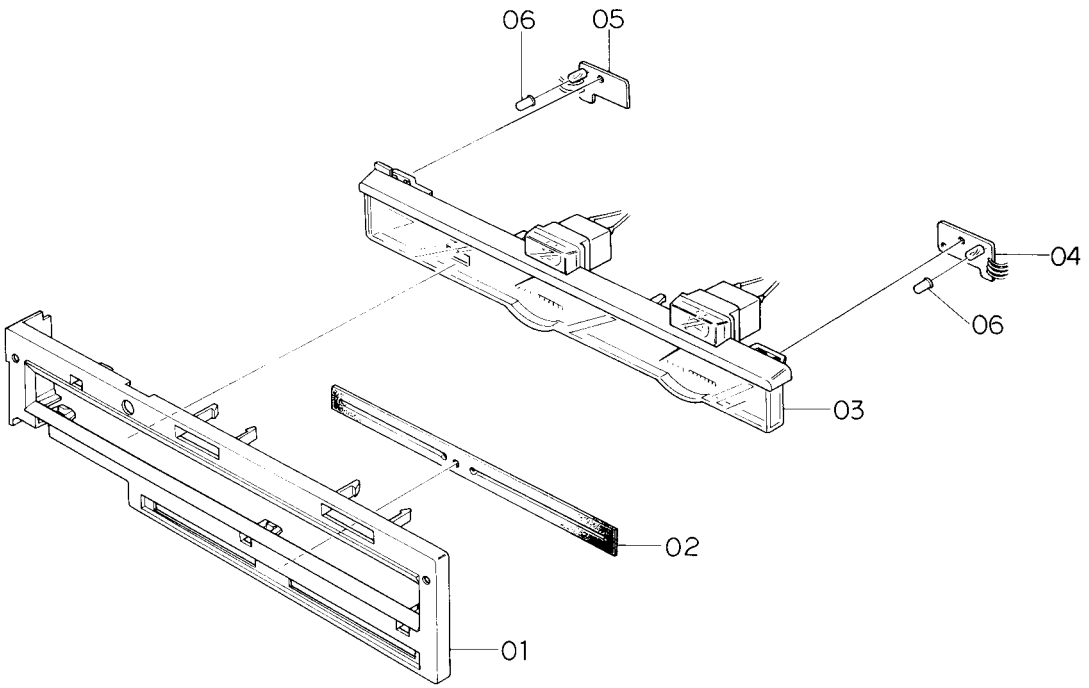



Fig. 9.4

| Schematic Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| **A01** | **HA03871A** | **Front Panel Ass'y** | **1** |
| 01 | 0H03795B | Front Panel | 1 |
| 02 | HA03873A | Push Button Ass'y C | 7 |
| 03 | HA03874A | Push Button Ass'y D | 1 |
| 04 | HA03875A | Eject Button Ass'y | 1 |
| 05 | 0H03744A | Green Lens | 2 |
| 06 | 0H03745A | Orange Lens | 1 |
| 07 | 0J04094A | Control Button Pad | 1 |
| – | 0J04081A | Adhesive Tape 55x6 | 5 |
| – | 0J04082A | Adhesive Tape 30x6 | 2 |
| **A02** | **JA03629A** | **Synthesis Mechanism Ass'y (U.S.A. & Canada)** | **1** |
| | **JA03628A** | **Synthesis Mechanism Ass'y (Japan)** | **1** |
| | **JA03630A** | **Synthesis Mechanism Ass'y (220V Class 2)** | **1** |
| | **JA03631A** | **Synthesis Mechanism Ass'y (Australia)** | **1** |
| | **JA03632A** | **Synthesis Mechanism Ass'y (UK)** | **1** |
| | **JA03633A** | **Synthesis Mechanism Ass'y (Others)** | **1** |
| 01 | HA03851A | Meter Escutcheon Ass'y | 1 |
| 02 | JA03627A | Control Switch Holder Ass'y | 1 |
| 03 | BA04127A | Switch P.C.B. Ass'y | 1 |
| 04 | JA03616A | Headphone Jack Ass'y | 1 |
| 05 | CA08112A | Mechanism Ass'y 480 | 1 |
| 06 | JA03611A | Chassis Ass'y (U.S.A. & Canada) | 1 |
| | JA03610A | Chassis Ass'y (Japan) | 1 |
| | JA03612A | Chassis Ass'y (220V Class 2) | 1 |
| | JA03613A | Chassis Ass'y (Australia) | 1 |
| | JA03614A | Chassis Ass'y (UK) | 1 |
| | JA03615A | Chassis Ass'y (Others) | 1 |
| 07 | 0B08515A | Insu-Lock | 18 |
| L01 | 0E00857A | BT Screw M3x6 Philips Binding Head | 5 |
| L02 | 0E00502A | Screw M3x5 Philips Pan Head | 2 |
| L03 | 0E00878A | BT Screw M4x20 Philips Binding Head | 1 |
| L04 | 0E00867A | BT Screw M4x15 Philips Binding Head | 3 |
| **B01** | **HA03851A** | **Meter Escutcheon Ass'y** | **1** |
| 01 | 0H03770B | Meter Escutcheon | 1 |
| 02 | 0H03786A | Volume Cover | 1 |
| 03 | BA04110B | Meter Ass'y | 1 |
| 04 | BA04124A | Lamp P.C.B. R Ass'y | 1 |
| 05 | BA04125A | Lamp P.C.B. L Ass'y | 1 |
| 06 | 0H03785A | Filter Cover | 2 |
| – | 0H03771B | Aluminum Seal | 1 |

### 9.5. Control Switch Holder Ass'y (B02)

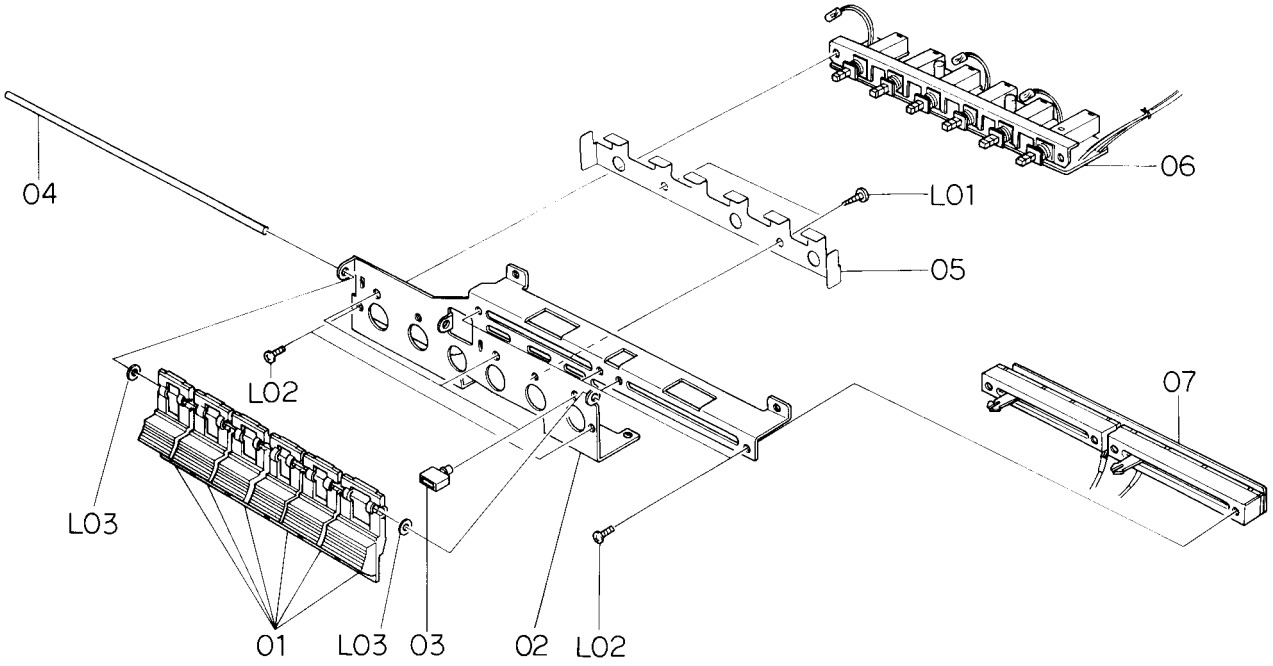



Fig. 9.5

### 9.6. Headphone Jack Ass'y (B03)

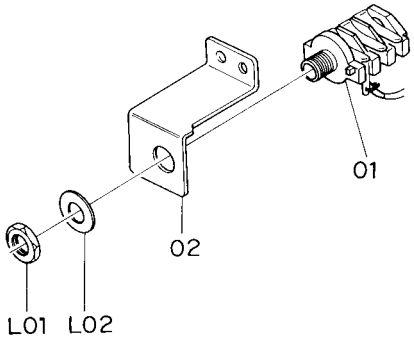



Fig. 9.6

| Schematic Ref. No. | Part No. | Description | Q'ty | Schematic Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|---|---|---|---|
| **B02** | **JA03627A** | **Control Switch Holder Ass'y** | **1** | **B03** | **JA03616A** | **Headphone Jack Ass'y** | **1** |
| 01 | 0H03793A | Control Button | 6 | 01 | 0B08511A | Headphone Jack | 1 |
| 02 | 0J04071C | Control Switch Holder | 1 | 02 | 0J04070A | Headphone Jack Holder | 1 |
| 03 | 0J04072B | Lamp Cover | 3 | L01 | – | Jack Nut | (1) |
| 04 | 0J04073A | Control Button Shaft | 1 | L02 | – | Jack Washer | (1) |
| 05 | 0J04074D | Control Button Spring | 1 | | | | |
| 06 | BA04113A | Control Switch P.C.B. Ass'y | 1 | | | | |
| 07 | BA04114A | Volume P.C.B. Ass'y | 1 | | | | |
| L01 | 0E00857A | BT Screw M3x6 Philips Binding Head | 2 | | | | |
| L02 | 0E00502A | Screw M3x5 Philips Pan Head | 6 | | | | |
| L03 | 0E00117A | Washer 2mm | 2 | | | | |

### 9.7. Mechanism Ass'y 480 (B04)

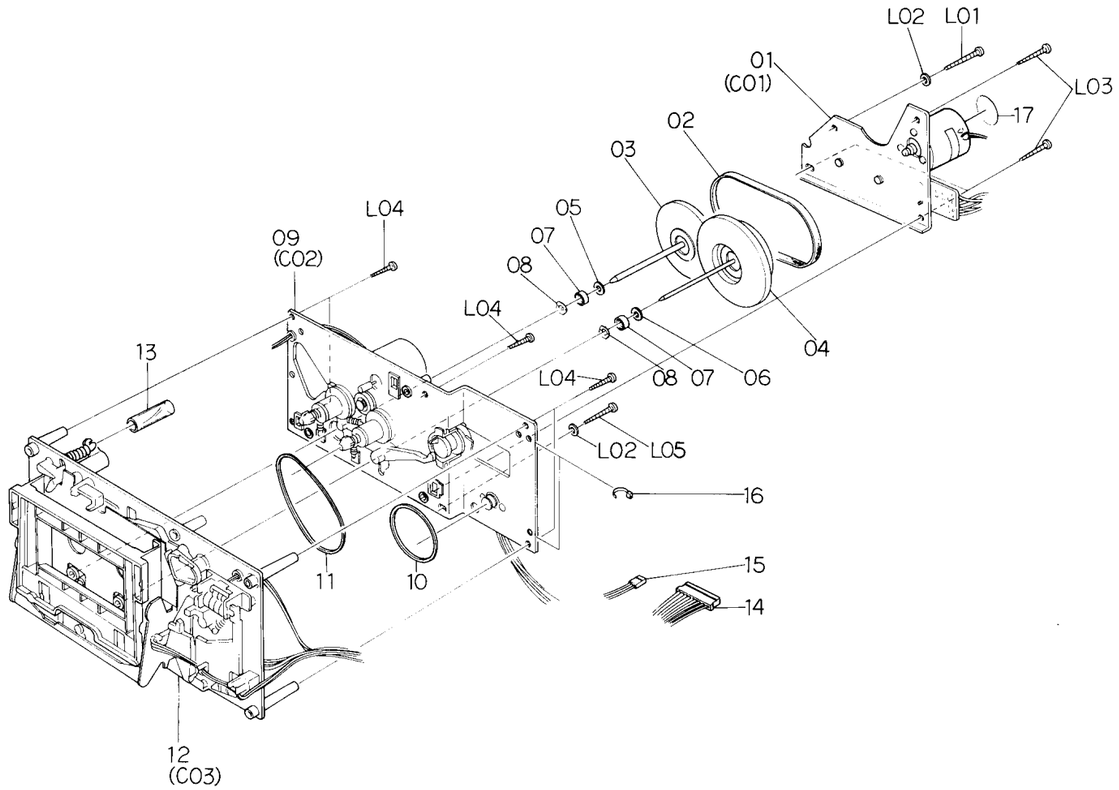



Fig. 9.7

| Schematic Ref. No. | Part No. | Description | Q'ty | Schematic Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|---|---|---|---|
| **B04** | **CA08112A** | **Mechanism Ass'y 480** | **1** | L03 | 0E00833A | BT Screw M3x20 Philips Pan Head | 3 |
| 01 | CA08109A | Flywheel Holder Ass'y | 1 | L04 | 0E00883A | BT Screw M3x18 Philips Pan Head | 5 |
| 02 | 0C08096C | Capstan Belt | 1 | | | | |
| 03 | CA08113A | Supply Flywheel B Ass'y | 1 | L05 | 0E00835A | BT Screw M3x25 Philips Pan Head | 1 |
| 04 | CA08107A | Take-up Flywheel B Ass'y | 1 | | | | |
| 05 | 0C08021B | Thrust Washer 3.1mm | 1 | | | | |
| 06 | 0C08020B | Thrust Washer 2.6mm | 1 | | | | |
| 07 | 0C08069C | Flange Thrust Cap | 2 | | | | |
| 08 | 0C08022B | Flange Thrust Spring | 2 | | | | |
| 09 | CA08108A | Sub Mechanism Chassis Ass'y | 1 | | | | |
| 10 | 0C08098B | Counter Belt B | 1 | | | | |
| 11 | 0C08099B | Control Motor Belt | 1 | | | | |
| 12 | CA08110A | Main Mechanism Chassis Ass'y | 1 | | | | |
| 13 | 0C08151A | Lid Arm Spring Tube | 1 | | | | |
| 14 | 0B08671B | 12P-H Connector | 1 | | | | |
| 15 | 0B08672B | 3P-H Connector | 1 | | | | |
| 16 | 0B08515A | Insu-Lock | 8 | | | | |
| 17 | 0M03902A | Motor Label 730 | 1 | | | | |
| L01 | 0E00834A | BT Screw M3x30 Philips Pan Head | 1 | | | | |
| L02 | 0E00178A | Washer 3mm | 2 | | | | |

### 9.8. Chassis Ass'y (B05)

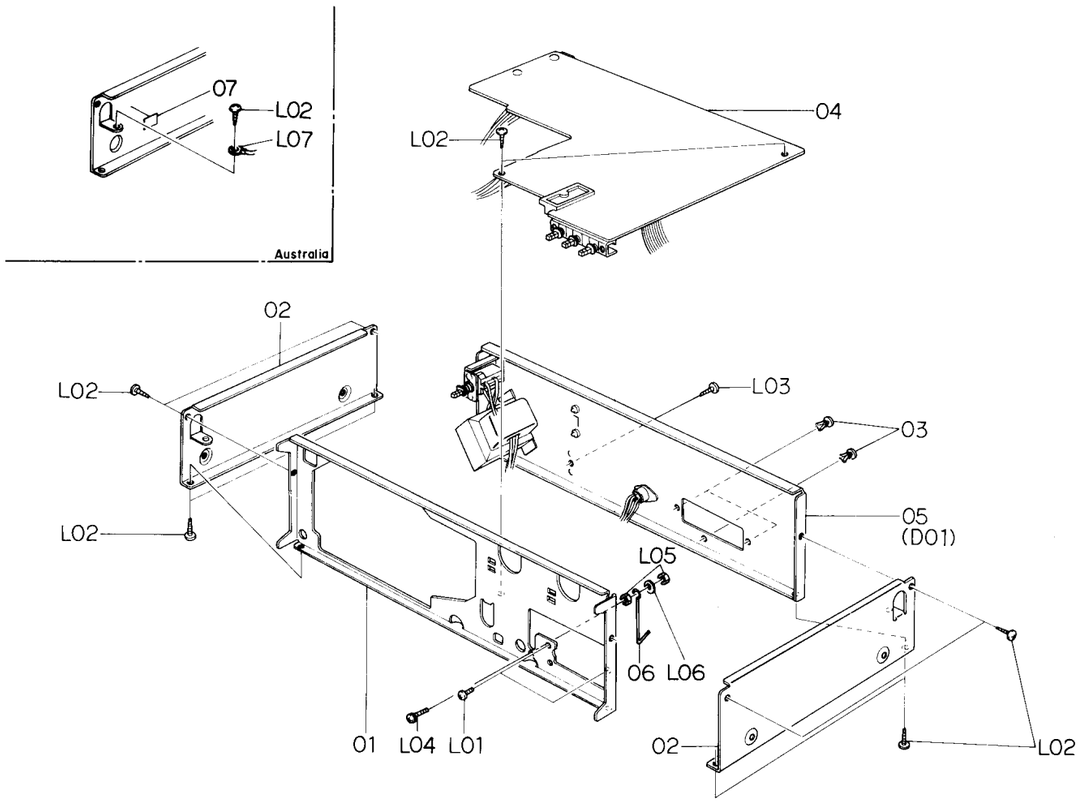



Fig. 9.8

### 9.9. Flywheel Holder Ass'y (C01)

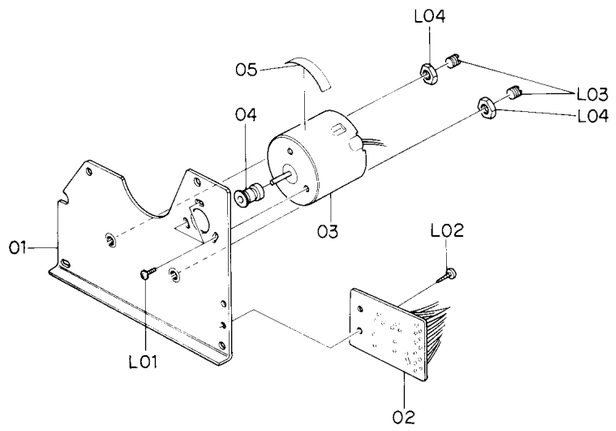



Fig. 9.9

| Schematic Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| **B05** | **JA03611A** | **Chassis Ass'y (U.S.A. & Canada)** | **1** |
| | **JA03610A** | **Chassis Ass'y (Japan)** | **1** |
| | **JA03612A** | **Chassis Ass'y (220V Class 2)** | **1** |
| | **JA03613A** | **Chassis Ass'y (Australia)** | **1** |
| | **JA03614A** | **Chassis Ass'y (UK)** | **1** |
| | **JA03615A** | **Chassis Ass'y (Others)** | **1** |
| | | Serial No.: A304.518705 – | |
| 01 | 0J04068B | Front Chassis | 1 |
| 02 | 0J04069B | Side Chassis | 2 |
| 03 | 0B08720A | Plastic Rivet | 3 |
| 04 | BA04130B | Main P.C.B. Ass'y (U.S.A. & Canada) | 1 |
| | BA04112B | Main P.C.B. Ass'y (Japan) | 1 |
| | BA04131B | Main P.C.B. Ass'y (220V Class 2) | 1 |
| | BA04132B | Main P.C.B. Ass'y (UK & Australia) | 1 |
| | BA04133B | Main P.C.B. Ass'y (Others) | 1 |
| 05 | HA03856A | Rear Panel Ass'y (U.S.A. & Canada) | 1 |
| | HA03855A | Rear Panel Ass'y (Japan) | 1 |
| | HA03857A | Rear Panel Ass'y (220V Class 2) | 1 |
| | HA03858A | Rear Panel Ass'y (Australia) | 1 |
| | HA03859A | Rear Panel Ass'y (UK) | 1 |
| | HA03860A | Rear Panel Ass'y (Others) | 1 |
| 06 | 0C08240A | Contact Wire | 1 |
| * 07 | 0M03700A | Earth Mark Label | 1 |
| L01 | 0E00502A | Screw M3x5 Philips Pan Head | 2 |
| *L02 | 0E00857A | BT Screw M3x6 Philips Binding Head | 11 |
| L03 | 0E00860A | BT Screw M3x6 Philips Binding Head (Black Chromate) | 1 |
| L04 | 0E00624A | Screw M3x10 Philips Pan Head (2A) | 1 |
| L05 | 0E00178A | Washer 3mm | 1 |
| L06 | 0E00507A | Nut Hex. M3 | 2 |
| *L07 | 0E00037A | Earth Lug B-5 | 1 |
| | | *: Depends on the versions. | |

| Schematic Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| | HA03855A | Rear Panel Ass'y (Japan) | 1 |
| | HA03857A | Rear Panel Ass'y (220V Class 2) | 1 |
| | HA03858A | Rear Panel Ass'y (Australia) | 1 |
| | HA03859A | Rear Panel Ass'y (UK) | 1 |
| | HA03860A | Rear Panel Ass'y (Others) | 1 |
| 06 | 0C08240A | Contact Wire | 1 |
| *07 | 0M03700A | Earth Mark Label | 1 |
| L01 | 0E00502A | Screw M3x5 Philips Pan Head | 2 |
| *L02 | 0E00857A | BT Screw M3x6 Philips Binding Head | 11 |
| L03 | 0E00860A | BT Screw M3x6 Philips Binding Head (Black Chromate) | 1 |
| L04 | 0E00624A | Screw M3x10 Philips Pan Head (2A) | 1 |
| L05 | 0E00178A | Washer 3mm | 1 |
| L06 | 0E00507A | Nut Hex. M3 | 2 |
| *L07 | 0E00037A | Earth Lug B-5 | 1 |
| | | *: Depends on the versions. | |
| **C01** | **CA08109A** | **Flywheel Holder Ass'y** | **1** |
| 01 | 0C08013I | Flywheel Holder | 1 |
| 02 | BA04126A | Control P.C.B. Ass'y | 1 |
| 03 | 0C08219A | Capstan Motor | 1 |
| 04 | 0C08212B | Capstan Motor Pulley | 1 |
| 05 | 0M04077A | Motor Seal | 1 |
| L01 | 0E00226A | Screw M2.6x4 Philips Pan Head | 3 |
| L02 | 0E00843A | BT Screw M3x5 Philips Pan Head | 1 |
| L03 | 0C08068C | Thrust Screw | 2 |
| L04 | 0C03857A | Lock Nut | 2 |

| Schematic Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| **B05** | **JA03611A** | **Chassis Ass'y (U.S.A. & Canada)** | **1** |
| | **JA03610A** | **Chassis Ass'y (Japan)** | **1** |
| | **JA03612A** | **Chassis Ass'y (220V Class 2)** | **1** |
| | **JA03613A** | **Chassis Ass'y (Australia)** | **1** |
| | **JA03614A** | **Chassis Ass'y (UK)** | **1** |
| | **JA03615A** | **Chassis Ass'y (Others)** | **1** |
| | | Serial Nos.: A304.501001 – A304.518704 | |
| 01 | 0J04068B | Front Chassis | 1 |
| 02 | 0J04069B | Side Chassis | 2 |
| 03 | 0B08539A | Plastic Rivet | 3 |
| 04 | BA04130A | Main P.C.B. Ass'y (U.S.A. & Canada) | 1 |
| | BA04112A | Main P.C.B. Ass'y (Japan) | 1 |
| | BA04131A | Main P.C.B. Ass'y (220V Class 2) | 1 |
| | BA04132A | Main P.C.B. Ass'y (UK & Australia) | 1 |
| | BA04133A | Main P.C.B. Ass'y (Others) | 1 |
| 05 | HA03856A | Rear Panel Ass'y (U.S.A. & Canada) | 1 |

## 9.10. Sub Mechanism Chassis Ass'y (C02)

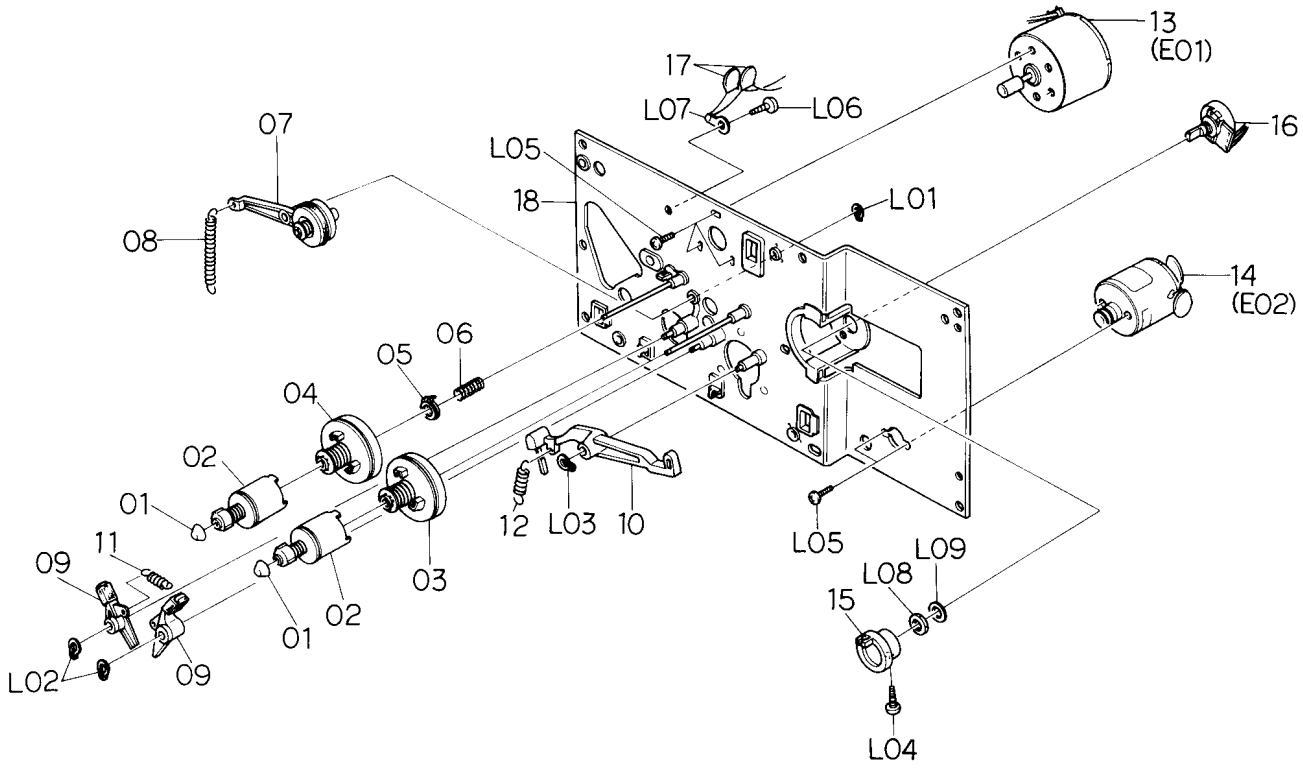



Fig. 9.10

| Schematic Ref. No. | Part No. | Description | Q'ty | Schematic Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|---|---|---|---|
| **C02** | **CA08108A** | **Sub Mechanism Chassis Ass'y** | **1** | L06 | 0E00843A | BT Screw M2.6x4 Philips Pan Head | 1 |
| 01 | 0C08039B | Reel Hub Head | 2 | L07 | 0E00037A | Earth Lug B-5 | 1 |
| 02 | CA08038B | Reel Hub B Ass'y | 2 | L08 | – | Volume Nut | (1) |
| 03 | CA08037A | Reel Hub Take-up Ass'y | 1 | L09 | – | Volume Washer | (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 Arm Ass'y | 2 | | | | |
| 10 | 0C08030C | Brake Drive Arm | 1 | | | | |
| 11 | 0C08029A | Brake Arm Spring | 1 | | | | |
| 12 | 0C08128A | Brake Drive Arm Spring | 1 | | | | |
| 13 | CA08117B | Reel Motor Ass'y | 1 | | | | |
| 14 | CA08124A | Control Motor Ass'y | 1 | | | | |
| 15 | 0C08053B | Volume Coupler | 1 | | | | |
| 16 | 0B07240A | Volume Control 10 KΩ (B) | 1 | | | | |
| 17 | 0B09091A | Ceramic Capacitor 0.01μ 50V | 2 | | | | |
| 18 | CA08041A | Sub Chassis Ass'y | 1 | | | | |
| L01 | 0E00842A | Stopper Ring 2mm | 1 | | | | |
| L02 | 0E00837A | Stopper Ring 3mm | 2 | | | | |
| L03 | 0E00838A | Stopper Ring 4mm | 1 | | | | |
| L04 | 0E00859A | BT Screw M2.6x6 Philips Binding Head | 1 | | | | |
| L05 | 0E00226A | Screw M2.6x4 Philips Pan Head | 5 | | | | |

| Schematic Ref. No. | Part No. | Description | Q'ty | Schematic Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|---|---|---|---|
| **C03** | **CA08110A** | **Main Mechanism Chassis Ass'y** | **1** | L08 | 0E00876A | BT Screw M2.6x8 Philips Pan Head | 11 |
| 01 | CA08141A | Cassette Case Holder L Ass'y | 1 | L09 | 0C08060B | Height Adjustment Nut | 2 |
| 02 | CA08022A | Cassette Case Holder R Ass'y | 1 | L10 | 0E00142A | Washer 2.6mm | 2 |
| 03 | CA08111A | Cassette Case Ass'y | 1 | L11 | 0E00879A | BT Screw M2x15 Philips Pan Head | 1 |
| 04 | 0C08019I | Cover Plate | 1 | | | | |
| 05 | 0M03977A | Cassette Viewer Label | 1 | L12 | 0E00838A | Stopper Ring 4mm | 3 |
| 06 | CA08120A | Head Mount Base Ass'y | 1 | L13 | 0E00846A | BT Screw M3x8 Philips Pan Head | 3 |
| 07 | 0C08121A | Supply Pressure Roller Spring | 2 | | | | |
| 08 | CA08053B | Supply Pressure Roller Ass'y | 1 | L14 | 0E00895A | Earth Lug 3mm | 2 |
| 09 | 0C08122B | Supply Pressure Roller Thrust Spring | 1 | | | | |
| 10 | CA08079B | Take-up Pressure Roller Ass'y | 1 | | | | |
| 11 | 0C08183B | Take-up Pressure Roller Thrust Spring | 1 | | | | |
| 12 | 0C08182A | Pressure Roller Drive Bar | 1 | | | | |
| 13 | CA08121A | Head Base Ass'y C | 1 | | | | |
| 14 | 0C08086B | Head Base Roller | 3 | | | | |
| 15 | 0C08050B | Record Sensor | 1 | | | | |
| 16 | 0C08051E | Cassette Hold Arm | 1 | | | | |
| 17 | 0C08120A | Cassette Hold Arm Spring | 1 | | | | |
| 18 | CA08027A | Head Base Drive Arm Ass'y | 1 | | | | |
| 19 | 0C08143C | Head Base Drive Arm Spring | 1 | | | | |
| 20 | CA08025A | Record Arm Ass'y | 1 | | | | |
| 21 | 0C08038D | Record Trigger | 1 | | | | |
| 22 | 0C08112A | Flip-Flop Spring | 1 | | | | |
| 23 | CA08026A | Pressure Roller Drive Arm Ass'y | 1 | | | | |
| 24 | 0C08071D | Counter Reset Arm | 1 | | | | |
| 25 | 0C08124B | Eject Linkage Wire | 1 | | | | |
| 26 | 0C08057D | Eject Arm | 1 | | | | |
| 27 | 0C08078B | Arm Shaft | 1 | | | | |
| 28 | CA08119A | Auto Shut-off Ass'y | 1 | | | | |
| 29 | CA08020A | Counter Ass'y | 1 | | | | |
| 30 | 0C08097B | Counter Belt A | 1 | | | | |
| 31 | 0C08067C | Eject Stopper | 1 | | | | |
| 32 | 0C08134C | Eject Stopper Spring | 1 | | | | |
| 33 | 0C08119A | Record Protector | 1 | | | | |
| 34 | 0C08194C | Damper Lock Arm | 1 | | | | |
| 35 | 0C08153A | Damper Arm Spring Tube | 1 | | | | |
| 36 | CA08030A | Pneumatic Damper Ass'y | 1 | | | | |
| 37 | CA08023A | Supply Capstan Flange Ass'y | 1 | | | | |
| 38 | CA08024A | Take-up Capstan Flange Ass'y | 1 | | | | |
| 39 | 0C08186A | Cam Drive Gear | 1 | | | | |
| 40 | 0C08029H | Control Cam | 1 | | | | |
| 41 | 0C08152A | Counter-Load Arm Spring Tube | 1 | | | | |
| 42 | 0C08117A | Counter-Load Arm Spring | 1 | | | | |
| 43 | CA08028A | Counter-Load Arm Ass'y | 1 | | | | |
| 44 | 0C08123B | Record Switch Linkage Wire | 1 | | | | |
| 45 | 0C08037E | Record Arm B | 1 | | | | |
| 46 | 0C08116A | Record Arm Spring | 2 | | | | |
| 47 | CA08072A | Main Chassis Ass'y | 1 | | | | |
| 48 | 0C08225A | Shield Plate | 1 | | | | |
| L01 | 0E00837A | Stopper Ring 3mm | 13 | | | | |
| L02 | 0E00832A | BT Screw M3x14 Philips Pan Head | 2 | | | | |
| L03 | 0E00834A | BT Screw M3x30 Philips Pan Head | 2 | | | | |
| L04 | 0E00831A | BT Screw M3x10 Philips Pan Head | 4 | | | | |
| L05 | 0E00254A | Washer 3.1mm Plastics | 2 | | | | |
| L06 | 0E00222A | E-Ring 2mm | 2 | | | | |
| L07 | 0E00839A | Stopper Ring 2.5mm | 2 | | | | |

### 9.11. Main Mechanism Chassis Ass'y (C03)

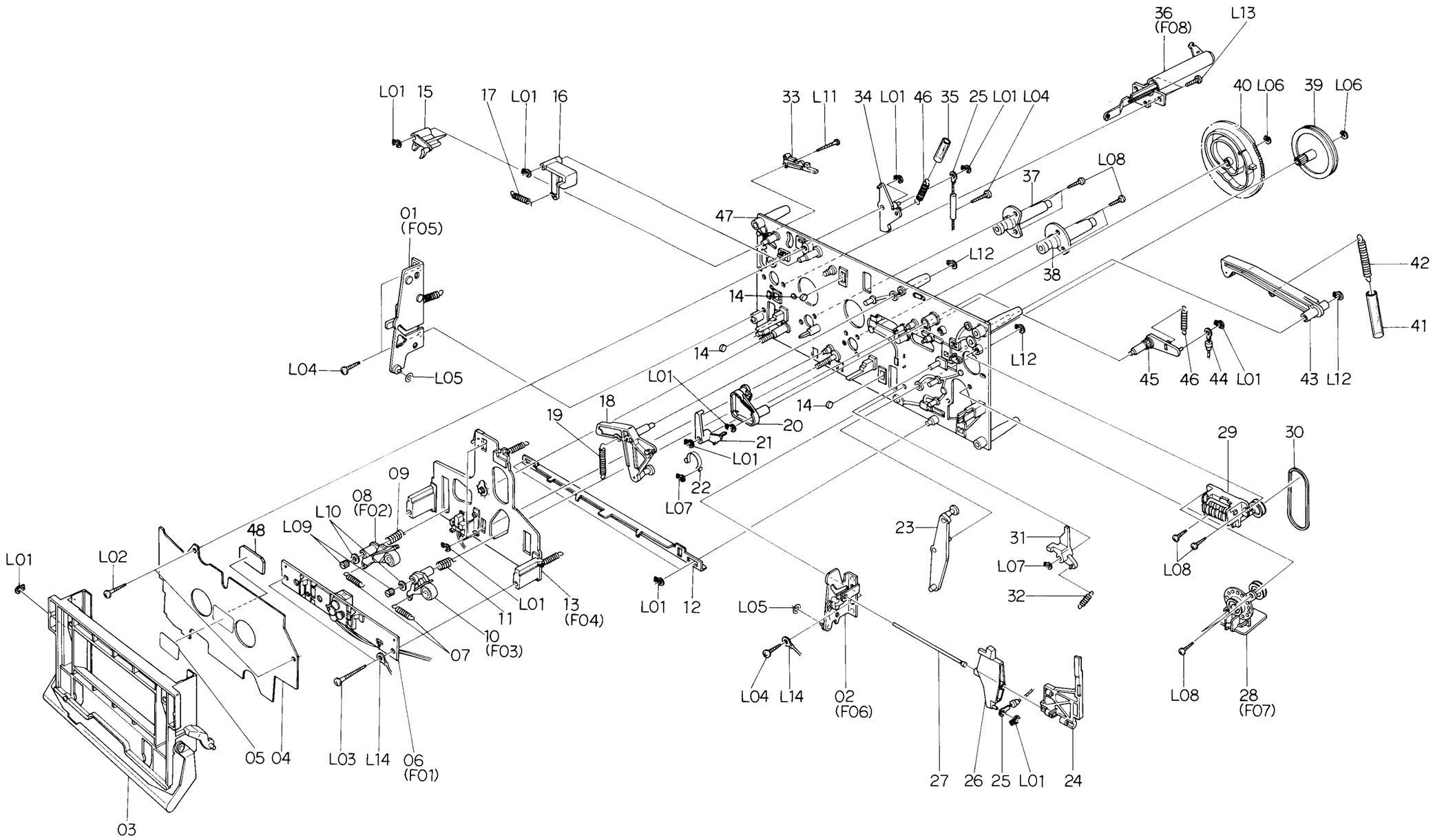
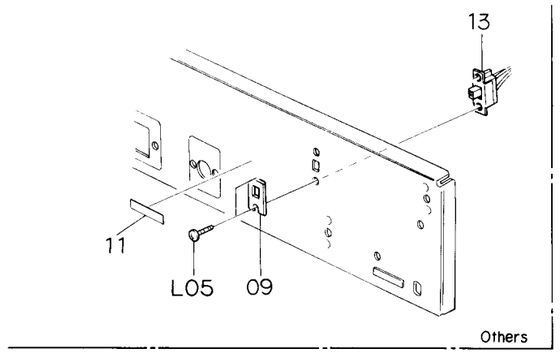



Fig. 9.11

### 9.12. Rear Panel Ass'y (D01)



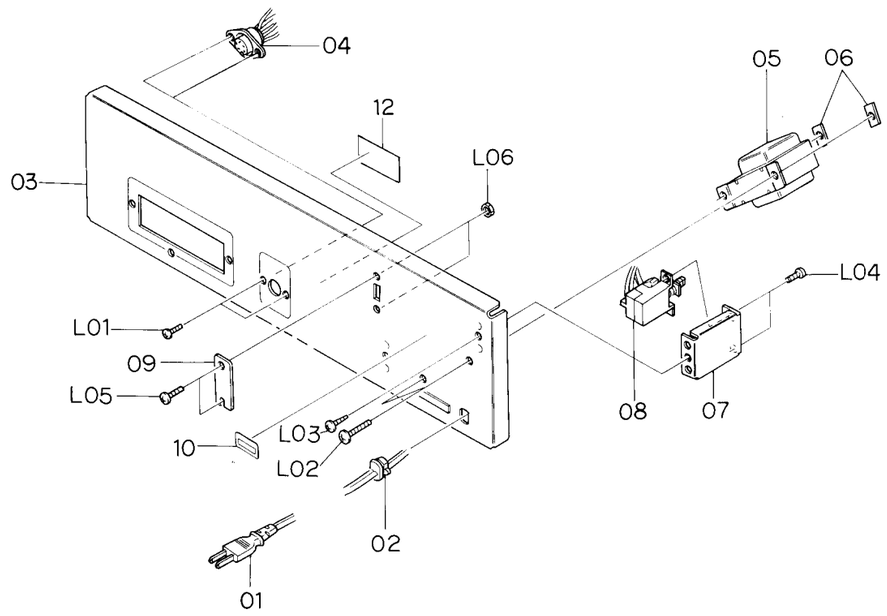




Fig. 9.12

| Schematic Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| **D01** | **HA03856A** | **Rear Panel Ass'y (U.S.A. & Canada)** | **1** |
| | **HA03855A** | **Rear Panel Ass'y (Japan)** | **1** |
| | **HA03857A** | **Rear Panel Ass'y (220V Class 2)** | **1** |
| | **HA03858A** | **Rear Panel Ass'y (Australia)** | **1** |
| | **HA03859A** | **Rear Panel Ass'y (UK)** | **1** |
| | **HA03860A** | **Rear Panel Ass'y (Others)** | **1** |
| 01 | 0B08533A | Power Cord (U.S.A., Canada & Others) | 1 |
| | 0B08219B | Power Cord (Japan) | 1 |
| | 0B08093U | Power Cord (220V Class 2) | 1 |
| | 0B08666A | Power Cord (Australia) | 1 |
| | 0B08348A | Power Cord (UK) | 1 |
| 02 | 0B08037U | Cord Bushing (U.S.A., Canada, Japan, 220V Class 2 & Others) | 1 |
| | 0B08719A | Cord Bushing (Australia) | 1 |
| | 0B08351A | Cord Bushing 4K-4 (UK) | 1 |
| 03 | 0H03779D | Rear Panel | 1 |
| 04 | 0B08687A | 6P DIN Socket | 1 |
| 05 | 0B06623A | Power Transformer (U.S.A. & Canada) | 1 |
| | 0B06622A | Power Transformer (Japan) | 1 |
| | 0B06624A | Power Transformer (220V Class 2, UK & Australia) | 1 |
| | 0B06625A | Power Transformer (Others) | 1 |
| 06 | 0C01162B | Bolt Receptacle Plate | 2 |
| 07 | 0J04076A | Power Switch Holder | 1 |
| 08 | 0B07299A | Power Switch (U.S.A. & Canada) | 1 |
| | 0B07301A | Power Switch (Japan) | 1 |
| | 0B07252A | Power Switch (220V Class 2, Australia, UK & Others) | 1 |
| 09 | 0J03663C | Switch Cover (U.S.A., Canada, Japan, 220V Class 2, UK & Australia) | 1 |
| | 0M03946A | Voltage Selector Lock Plate C (Others) | 1 |
| 10 | 0M03551B | Pass Label | 1 |
| 11 | 0M03794A | Voltage Label 100V (Japan) | 1 |
| | 0M03796A | Voltage Label 220V (220V Class 2) | 1 |
| | 0M03797A | Voltage Label 240V (UK & Australia) | 1 |
| | 0M03955A | Voltage Label 120V/220–240V (Others) | 1 |
| *12 | 0M04097B | Fuse Caution Label (U.S.A. & Canada) | 1 |
| 13 | 0B07092U | Voltage Selector (Others) | 1 |
| * – | 0M03844B | Power Cord Label (UK) | 1 |
| – | 0F01071A | Free-up Belt | 1 |
| * – | 0M04055A | SDNF Label (220V Class 2) | 1 |
| * – | 0M03865A | SEV Label (220V Class 2) | 1 |
| – | 0M04069B | Serial Number Plate | 1 |
| * – | 0M03798A | Nakamichi Label (Japan) | 1 |
| L01 | 0E00714A | Screw M2.6x6 Philips Binding Head (Bronze) | 2 |
| L02 | 0E00756A | Screw M4x8 Philips Binding Head (Bronze) | 2 |
| L03 | 0E00860A | BT Screw M3x6 Philips Binding Head (Black Chromate) | 1 |
| L04 | 0E00502A | Screw M3x5 Philips Pan Head | 2 |
| L05 | 0E00593A | Screw M3x6 Philips Binding Head (Bronze) | 2 |
| L06 | 0E00507A | Nut Hex. M3 | 2 |
| – | 0J03644A | Chobert Rivet | 2 |
| | | *: Depends on the versions. | |
| **E01** | **CA08117B** | **Reel Motor Ass'y** | **1** |
| 01 | 0C08218A | Reel Motor | 1 |
| 02 | 0C08063F | Reel Motor Pulley | 1 |
| **E02** | **CA08124A** | **Control Motor Ass'y** | **1** |
| 01 | 0C08137A | Control Motor | 1 |
| 02 | 0C08064A | Control Motor Pulley | 1 |
| 03 | 0B09292A | Ceramic Capacitor 0.1μ 50V | 2 |
| 04 | 0M03985A | Control Motor Label | 1 |
| 05 | 0M03988A | Motor Seal B | 1 |
| **F01** | **CA08120A** | **Head Mount Base Ass'y** | **1** |
| 01 | 0C08028C | Head Height Adjustment Gear | 1 |
| 02 | 0C08027E | Head Height Adjustment Screw | 2 |
| 03 | 0C08026D | Azimuth Alignment Screw | 1 |
| 04 | 0C08161B | Spring Stopper | 1 |
| 05 | 0C08131C | Head Plate Spring | 1 |
| 06 | CA08083C | Head Mount Base Sub Ass'y | 1 |
| 07 | CA08144A | RP-9E Record/Playback Head Ass'y | 1 |
| **F02** | **CA08053B** | **Supply Pressure Roller Ass'y** | **1** |
| 01 | 0C08164G | Pressure Roller | 1 |
| 02 | 0C08189B | Supply Tape Guide | 1 |
| 03 | CA08061A | Supply Pressure Roller Arm Ass'y | 1 |
| L01 | 0E00042A | E-Ring 1.5mm | 1 |
| L02 | 0C08024A | Washer 2mm | 2 |
| L03 | 0E00788A | BT Screw M2x8 Philips Pan Head | 1 |
| **F03** | **CA08079B** | **Take-up Pressure Roller Ass'y** Serial No.: A304.516074 – | **1** |
| 01 | 0C08164G | Pressure Roller | 1 |
| 02 | 0C08181C | Take-up Tape Guide | 1 |
| 03 | CA08073B | Take-up Pressure Roller Arm Ass'y | 1 |
| L01 | 0E00042A | E-Ring 1.5mm | 1 |
| L02 | 0C08024A | Washer 2mm | 2 |
| L03 | 0E00788A | BT Screw M2x8 Philips Pan Head | 1 |
| **F03** | **CA08079A** | **Take-up Pressure Roller Ass'y** Serial Nos.: A304.501001 – A304.516073 | **1** |
| 01 | 0C08164G | Pressure Roller | 1 |
| 02 | 0C08181B | Take-up Tape Guide | 1 |
| 03 | CA08073B | Take-up Pressure Roller Arm Ass'y | 1 |
| L01 | 0E00042A | E-Ring 1.5mm | 1 |
| L02 | 0C08024A | Washer 2mm | 2 |
| L03 | 0E00788A | BT Screw M2x8 Philips Pan Head | 1 |

### 9.13. Reel Motor Ass'y (E01)

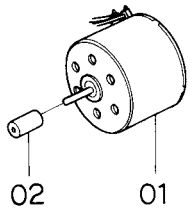



Fig. 9.13

### 9.14. Control Motor Ass'y (E02)

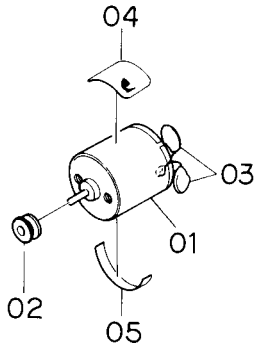



Fig. 9.14

### 9.15. Head Mount Base Ass'y (F01)

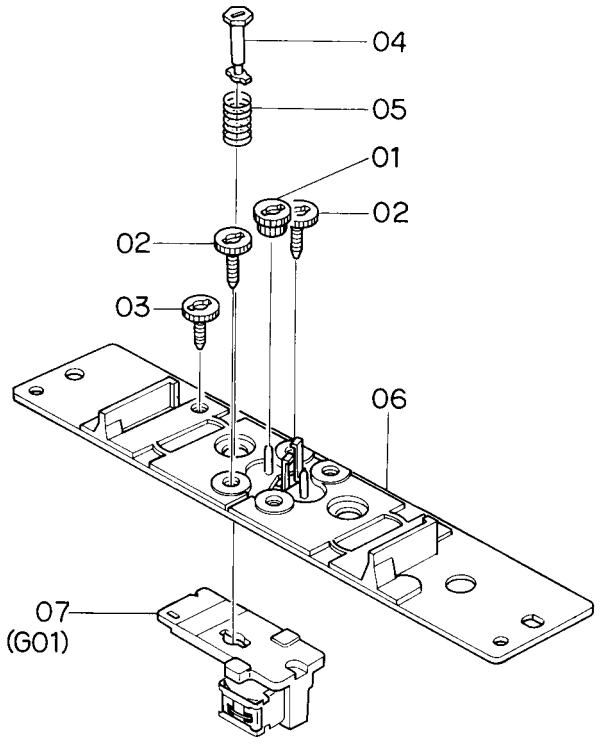



Fig. 9.15

### 9.16. Supply Pressure Roller Ass'y (F02)

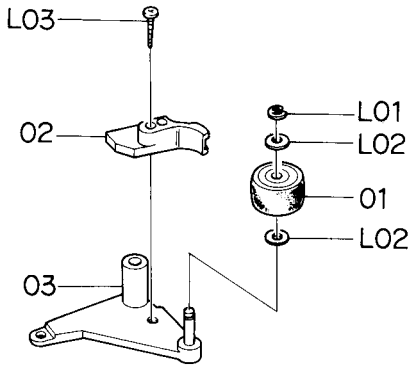



Fig. 9.16

### 9.17. Take-up Pressure Roller Ass'y (F03)

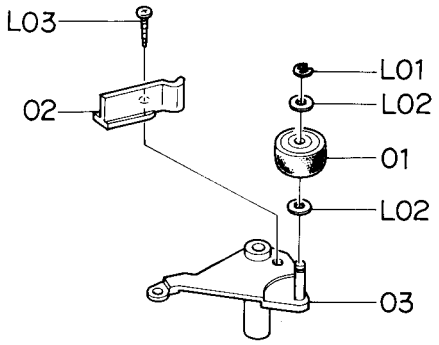



Fig. 9.17

### 9.18. Head Base Ass'y C (F04)

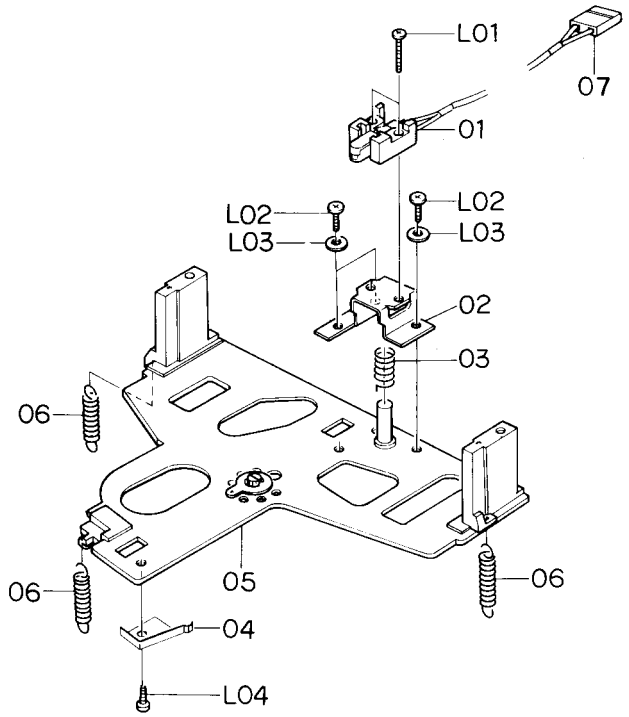



Fig. 9.18

### 9.19. Cassette Case Holder L Ass'y (F05)

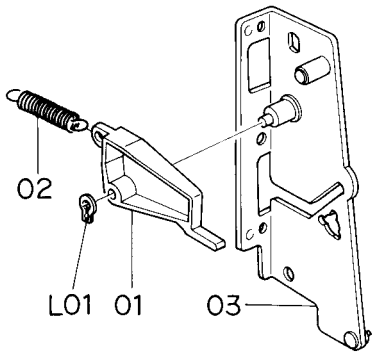



Fig. 9.19

### 9.20. Cassette Case Holder R Ass'y (F06)

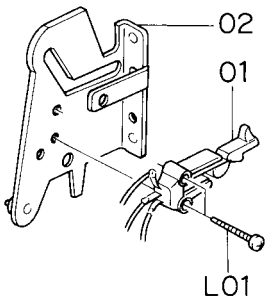



Fig. 9.20

### 9.21. Auto Shut-off Ass'y (F07)

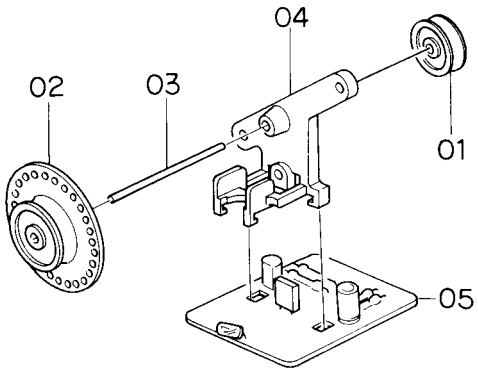



Fig. 9.21

### 9.22. Pneumatic Damper Ass'y (F08)

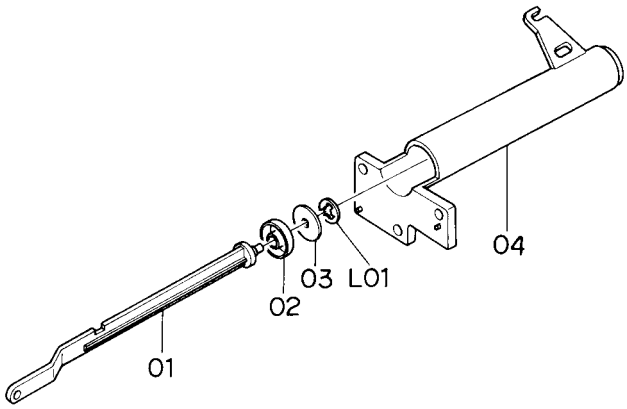



Fig. 9.22

### 9.23. RP-9E Record/Playback Head Ass'y (G01)

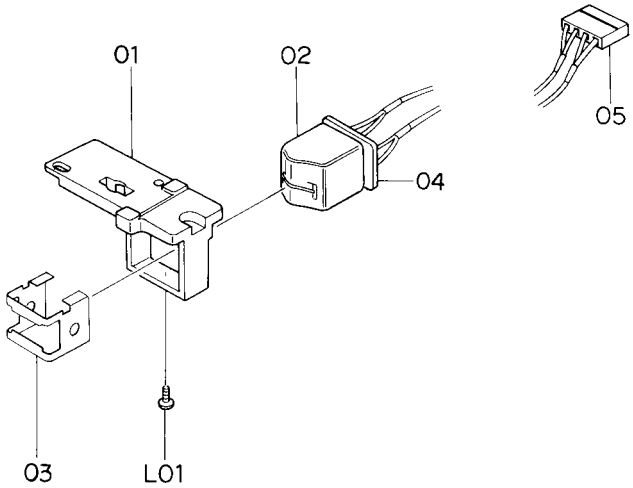



Fig. 9.23

| Schematic Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| **F04** | **CA08121A** | **Head Base Ass'y C** | **1** |
| 01 | GA02017A | E-8L Erase Head | 1 |
| 02 | 0C08158D | EH Hold Plate | 1 |
| 03 | 0C08166A | EH Hold Plate Spring | 1 |
| 04 | 0C08174C | Cassette Hold Spring | 1 |
| 05 | CA08003P | Head Base Ass'y | 1 |
| 06 | 0C08175A | Head Base L Spring | 3 |
| 07 | 0B08679D | 2P-H Connector | 1 |
| L01 | 0E00889A | Screw M1.7x8 Philips Pan Head | 2 |
| L02 | 0E00909A | Screw M2x6 Philips Pan Head | 3 |
| L03 | 0E00117A | Washer 2mm | 3 |
| L04 | 0E00853A | BT Screw M2x3 Philips Pan Head | 1 |
| **F05** | **CA08141A** | **Cassette Case Holder L Ass'y** | **1** |
| 01 | 0C08073C | Lid Arm A | 1 |
| 02 | 0C08114A | Lid Arm Spring | 1 |
| 03 | CA08090F | Cassette Case Holder L Sub Ass'y | 1 |
| L01 | 0E00837A | Stopper Ring 3mm | 1 |
| **F06** | **CA08022A** | **Cassette Case Holder R Ass'y** | **1** |
| 01 | 0C08133A | Eject Sensor | 1 |
| 02 | CA08044A | Cassette Case Holder R Sub Ass'y | 1 |
| L01 | 0E00840A | BT Screw M2x8 Philips Pan Head | 2 |
| **F07** | **CA08119A** | **Auto Shut-off Ass'y** | **1** |
| 01 | 0C08047A | Shut-off Pulley A | 1 |
| 02 | 0C08206B | Shut-off Pulley B | 1 |
| 03 | 0C08088B | Shut-off Pulley Shaft | 1 |
| 04 | 0C08207B | Shut-off Pulley Holder | 1 |
| 05 | BA04127A | Shut-off P.C.B. Ass'y | 1 |
| **F08** | **CA08030A** | **Pneumatic Damper Ass'y** | **1** |
| 01 | 0C08058C | Damper Piston | 1 |
| 02 | 0C08102B | Damper Ring | 1 |
| 03 | 0C08010C | Damper Plate | 1 |
| 04 | 0C08059D | Sylinder | 1 |
| L01 | 0E00874A | Stopper Ring CS 2mm | 1 |
| **G01** | **CA08144A** | **RP-9E Record/Playback Head Ass'y** | **1** |
| 01 | 0C08217A | Head Plate | 1 |
| 02 | 0G01294A | RP-9E Record/Playback Head | 1 |
| 03 | 0C08216B | Pad Lifter 9E | 1 |
| 04 | 0B07857A | Head Terminal P.C.B. | 1 |
| 05 | 0B08678C | 4P-H Connector | 1 |
| L01 | 0E00887A | Screw M1.7x4 Philips Pan Head | 1 |

## 10. OVERALL TIMING CHART

| Mode | PLAYBACK | | | RECORD | | | | |
|---|---|---|---|---|---|---|---|---|
| Control Button | Stop | Play | Stop | Rec | Rec/Play | Rec/Pause | Rec/Play | Stop |
| Tape | | 470ms 300ms | 120ms 180ms | | 840ms 740ms | 130ms 160ms | 220ms 120ms | 130ms 160ms |
| Output | | 300ms | | | 560ms | | | |
| Bias | | | | | 560ms | | | |

Fig. 10

# 11. EQ. AMP. FREQUENCY RESPONSE

## 11.1. Playback Frequency Response

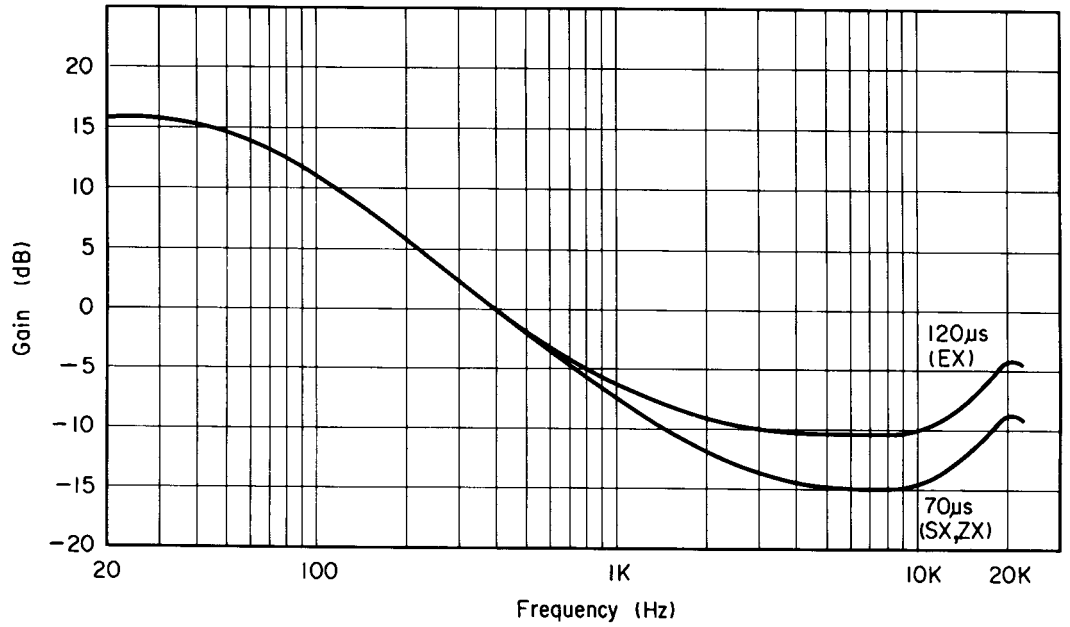



Fig. 11.1

## 11.2. Record Current Frequency Response

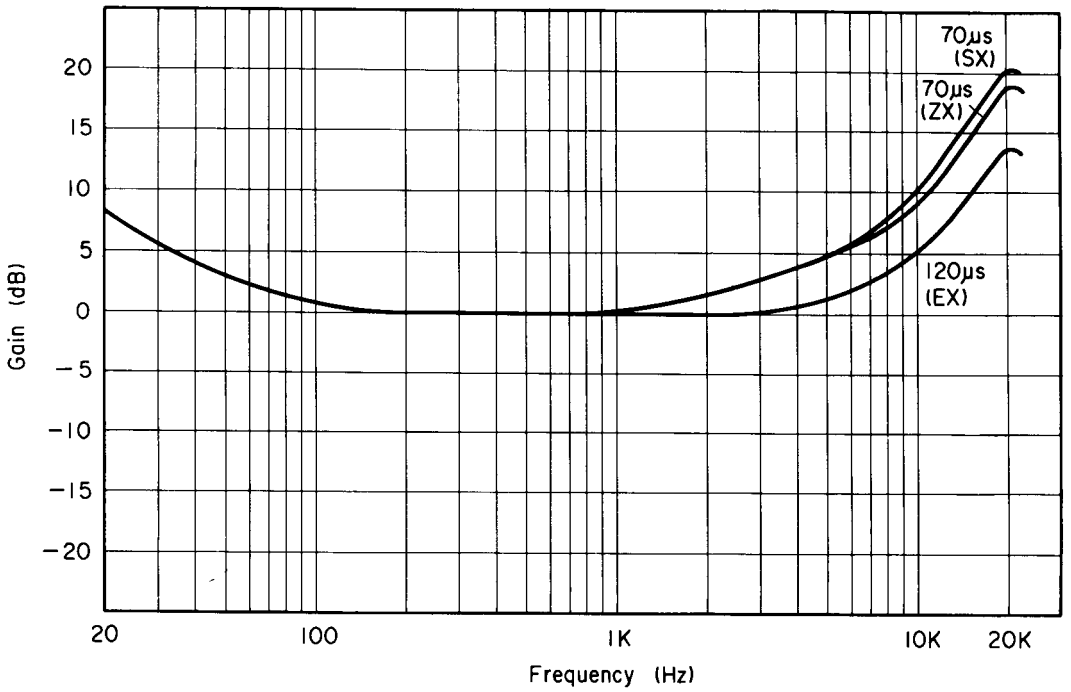



Fig. 11.2

## 12. WIRING DIAGRAM

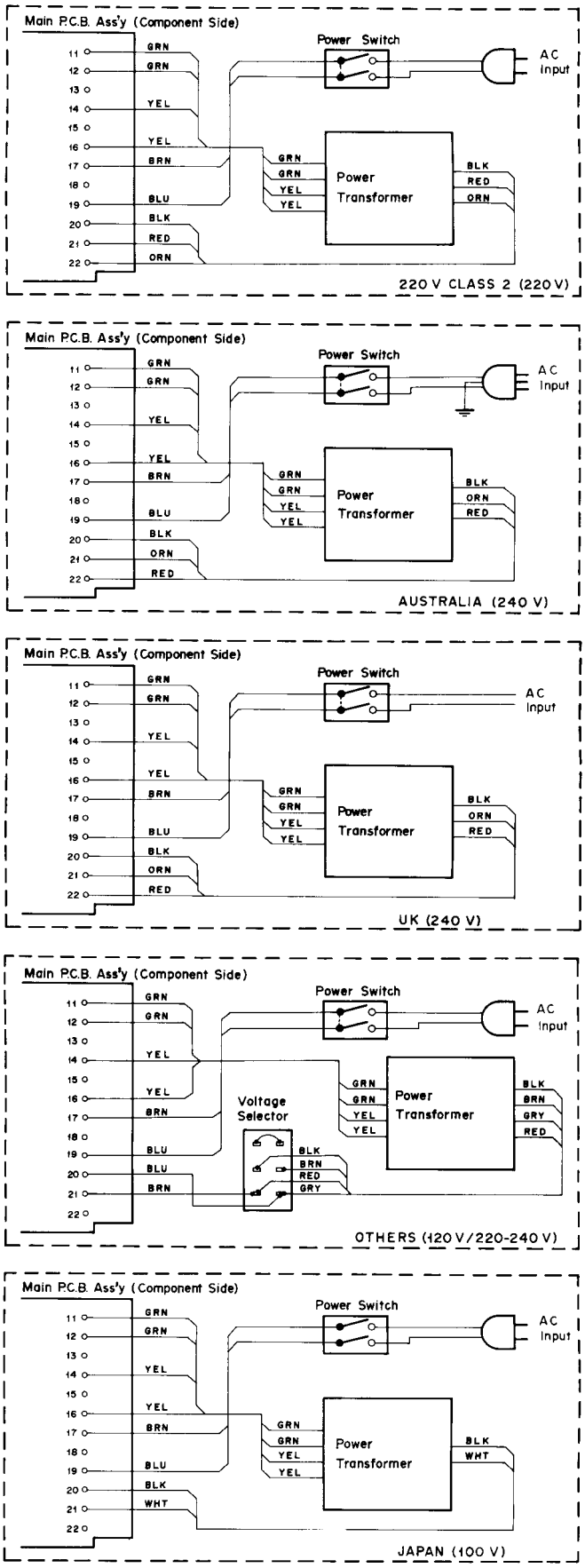



Fig. 12.1

Note: Table of colors

BLK – Black
BLU – Blue
ORN – Orange
GRY – Gray
GRN – Green
RED – Red
BRN – Brown
YEL – Yellow
WHT – White
VIO – Violet

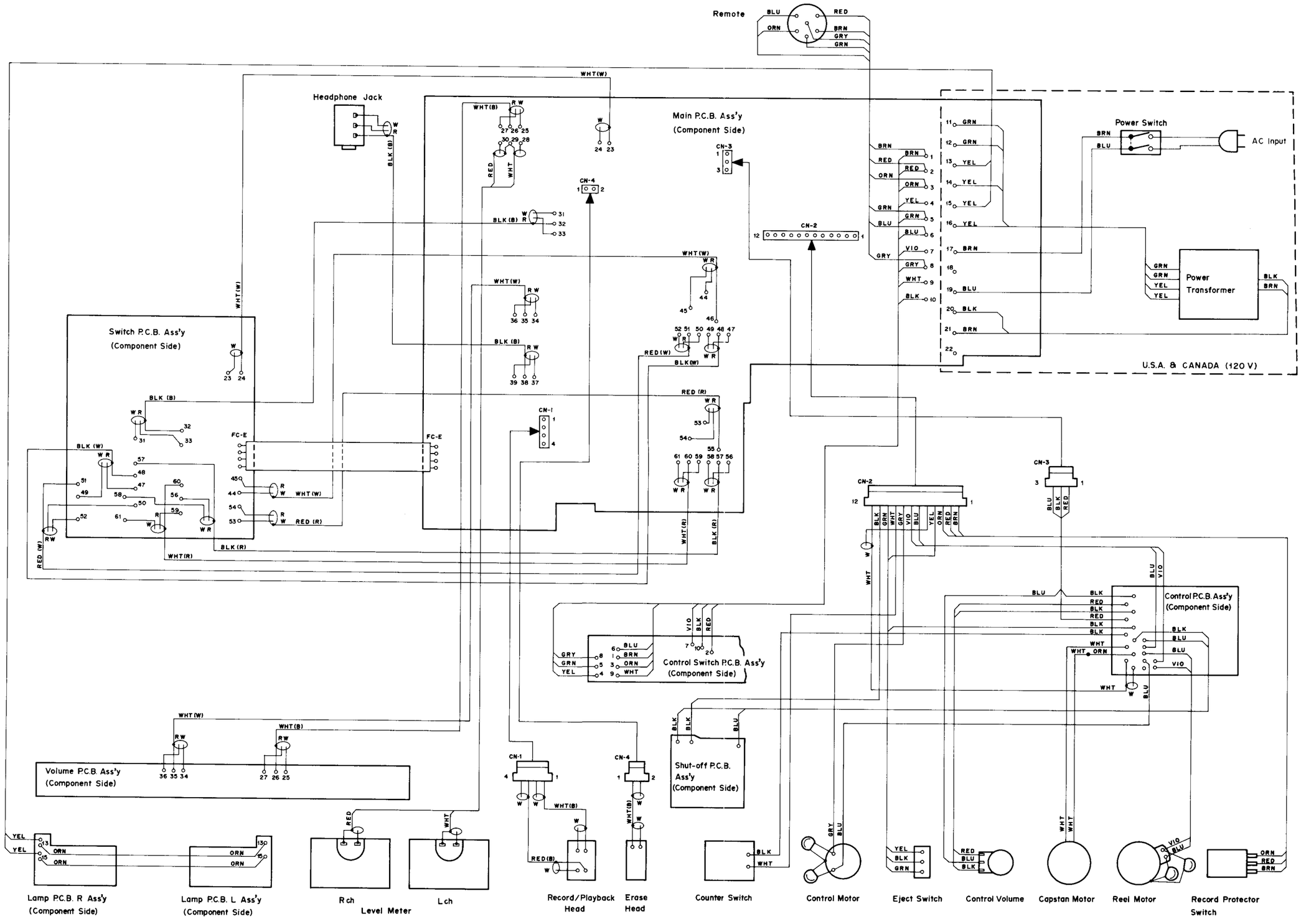

Remote
BLU
RED
ORN
BRN
GRY
GRN
Headphone Jack
WHT(W)
WHT(B)
BLK (B)
RED
WHT
Main P.C.B. Ass'y
(Component Side)
CN-3
CN-4
CN-2
CN-1
Power Switch
AC Input
Power Transformer
U.S.A. & CANADA (120 V)
Switch P.C.B. Ass'y
(Component Side)
BLK (W)
RED (W)
WHT(R)
BLK (R)
RED (R)
FC-E
Control Switch P.C.B. Ass'y
(Component Side)
Control P.C.B. Ass'y
(Component Side)
Volume P.C.B. Ass'y
(Component Side)
Shut-off P.C.B.
Ass'y
(Component Side)
Lamp P.C.B. R Ass'y
(Component Side)
Lamp P.C.B. L Ass'y
(Component Side)
Rch
Lch
Level Meter
Record/Playback
Head
Erase
Head
Counter Switch
Control Motor
Eject Switch
Control Volume
Capstan Motor
Reel Motor
Record Protector
Switch

Fig. 12.2

# 13. BLOCK DIAGRAMS

## 13.1. Amplifier

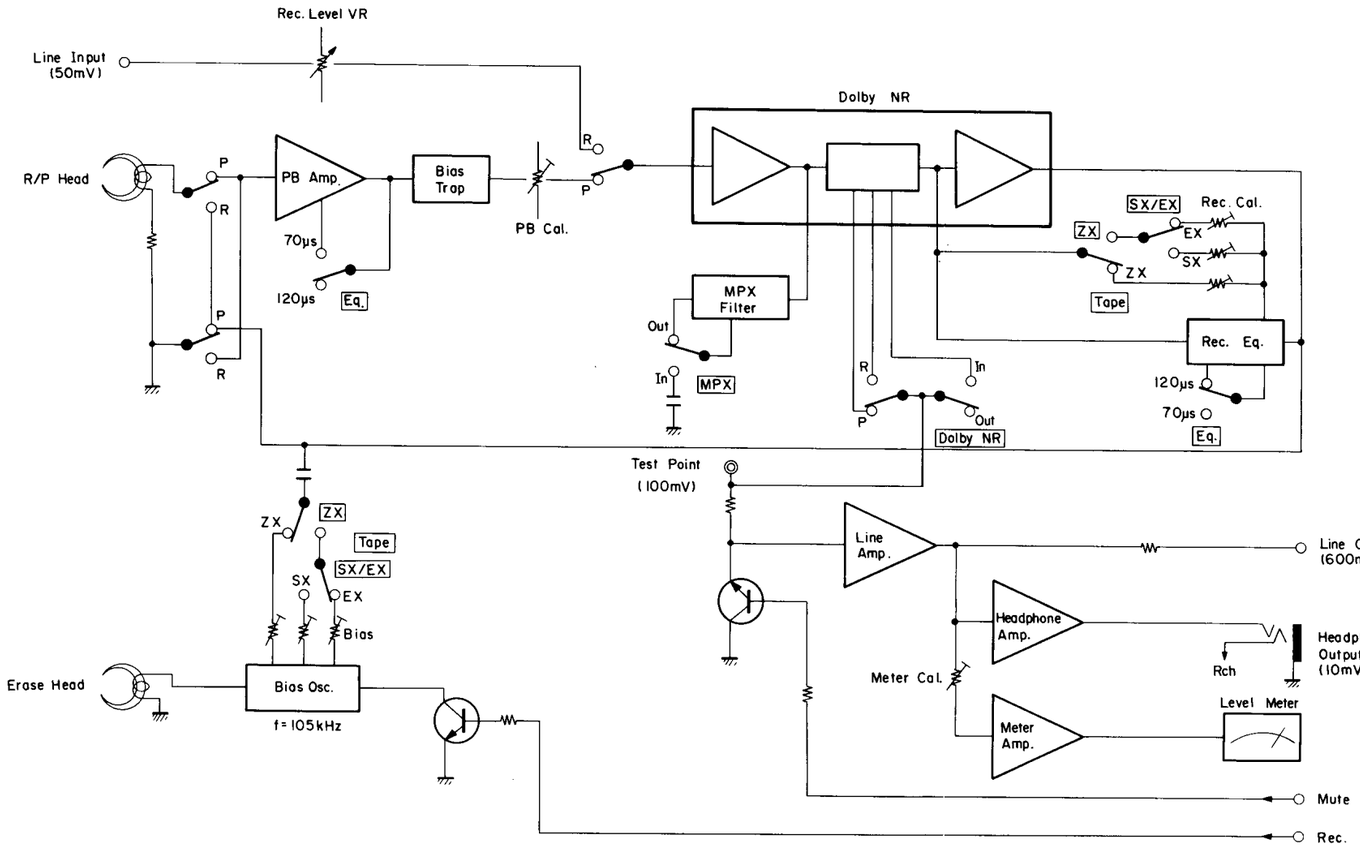



Fig. 13.1

## 13.2. Mechanism Control

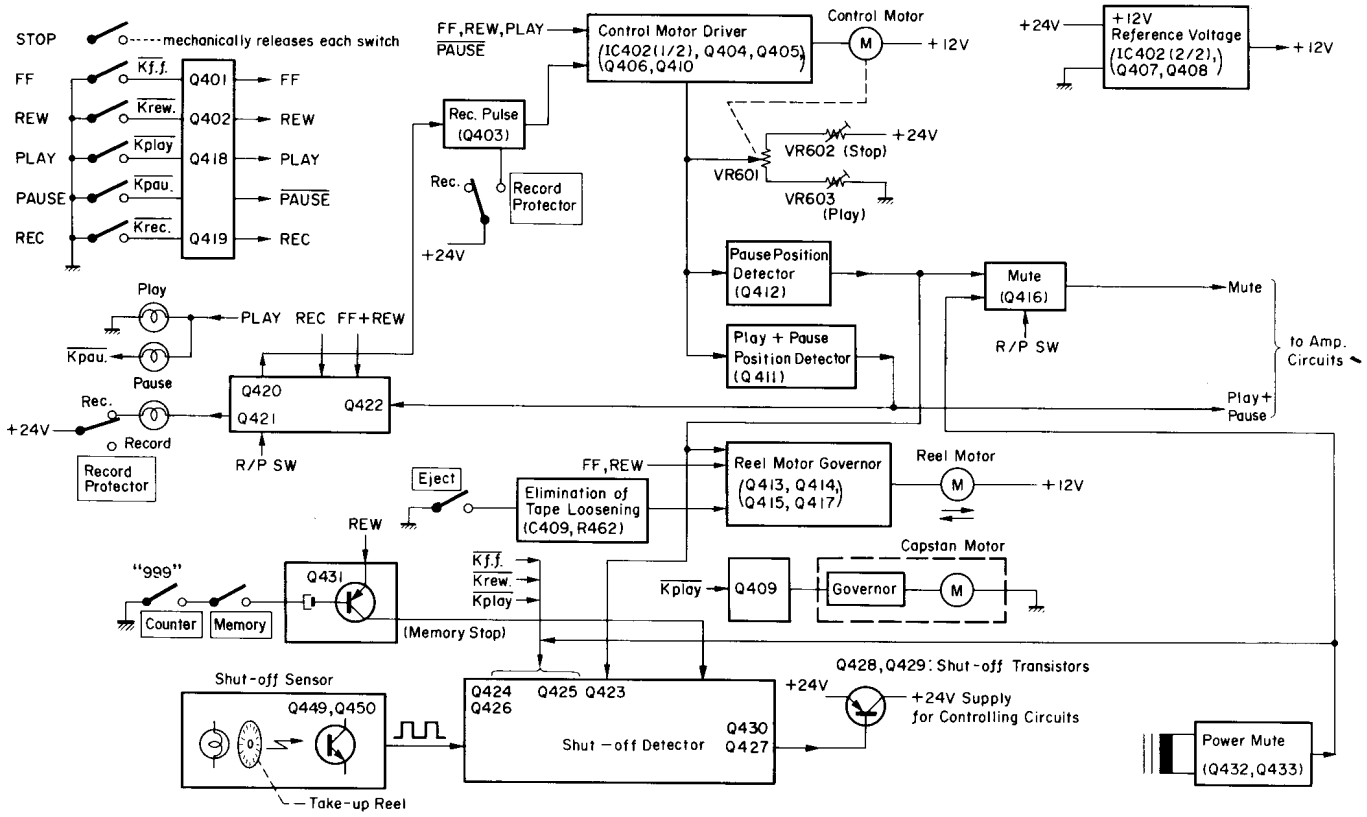



Fig. 13.2

## 14. SCHEMATIC DIAGRAMS

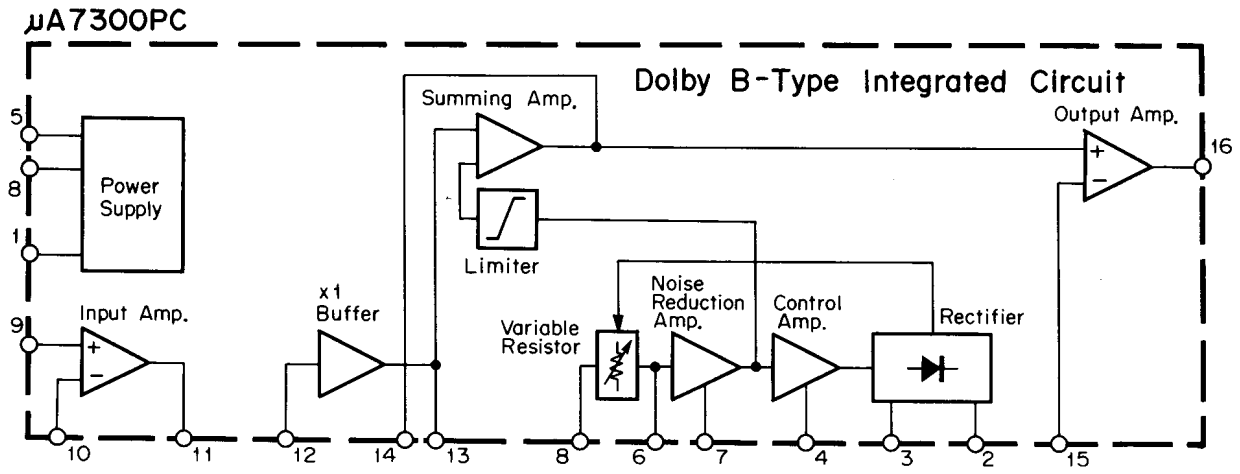



Fig. 14.1 Dolby NR IC μA7300PC

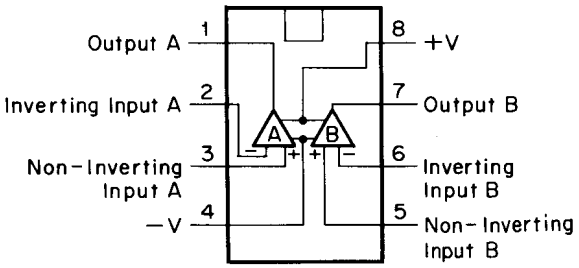
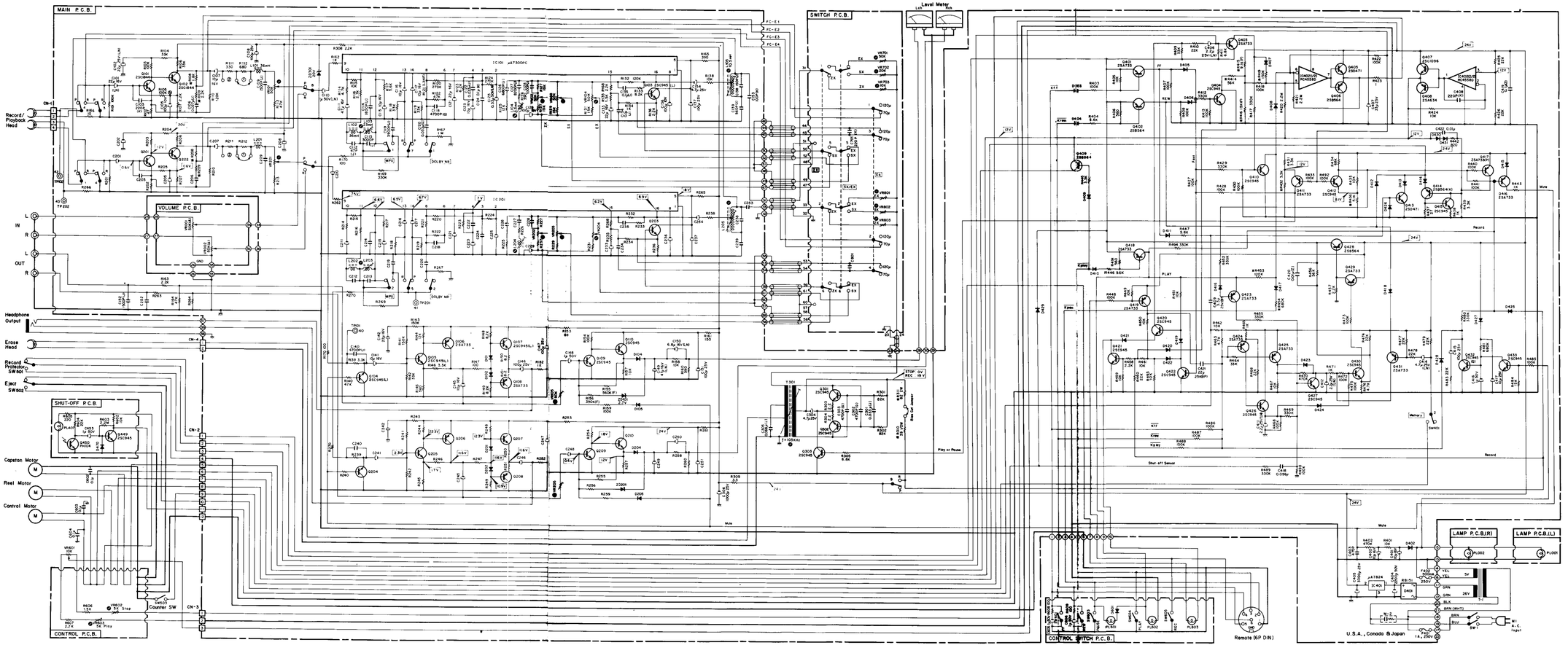
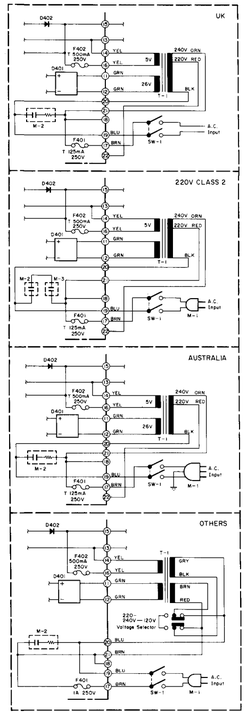



Fig. 14.2 Operational Amp. IC 4558

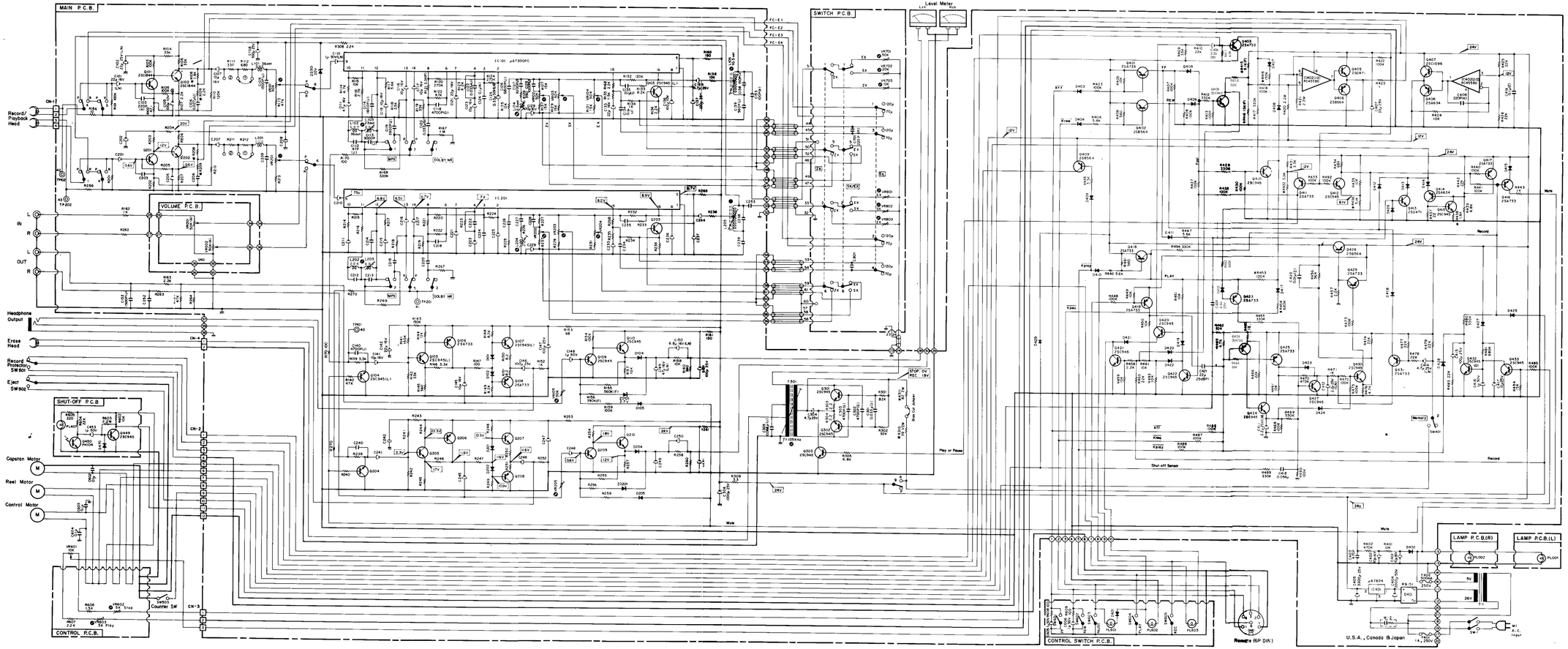


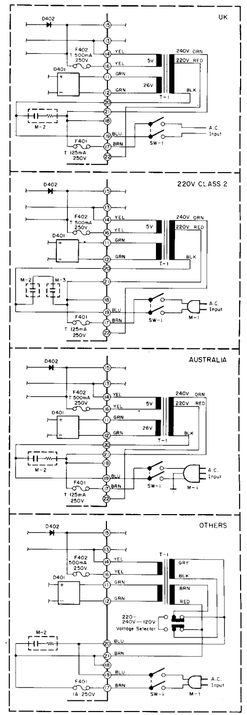




| Switch Chart | |
|---|---|
| Description | Schematic Ref. Number |
| Record / Play | SW301 |
| MPX | SW302 |
| Dolby NR | SW303 |
| ZX | SW304 |
| SX / EX | SW305 |
| Eq. | SW306 |
| Memory | SW401 |

Fig. 14.3.1 Serial No.: A304.518705 –

Notes: 1. Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.
2. Resistor and capacitor marked with * show typical value.




| Switch Chart | |
|---|---|
| Description | Schematic Ref. Number |
| Record / Play | SW301 |
| MPX | SW302 |
| Dolby NR | SW303 |
| ZX | SW304 |
| SX / EX | SW305 |
| Eq. | SW306 |
| Memory | SW401 |

Fig. 14.3.2 Serial Nos.: A304.501001 – A304.518704

Notes: 1. Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.
2. Resistor and capacitor marked with * show typical value.

## 15. SPECIFICATIONS

| | |
|---|---|
| Power Source | 100, 120, 120/220-240, 220 or 240 V; 50/60 Hz (according to country of sale) |
| Power Consumption | 23W Max. |
| Tape Speed | 1-7/8 ips. (4.8 cm/sec.) |
| Wow-and-Flutter | Less than 0.12% WTD Peak, 0.06% WTD rms |
| Frequency Response | 20-18,000 Hz ±4 dB (−20 dB Rec. Level) |
| Signal-to-Noise Ratio (Dolby NR In, 70 μs) | Better than 62 dB at 400 Hz, 3% THD, WTD rms |
| Total Harmonic Distortion | Less than 1.0% at 400 Hz, 0 dB (ZX, EXII Tapes)<br>Less than 1.2% at 400 Hz, 0 dB (SX Tape) |
| Erasure | Better than 60 dB below saturation level at 1 kHz |
| Separation | Better than 36 dB at 1 kHz, 0 dB |
| Crosstalk | Better than 60 dB at 1 kHz, 0 dB |
| Bias Frequency | 105 kHz |
| Input | 50 mV, 30 k ohms |
| Output Level | 600 mV (400 Hz, 0 dB) 2.2 k ohms |
| Headphone | 10 mW (400 Hz, 0 dB) 8 ohms |
| Dimensions | 450(W) x 135(H) x 289(D) m/m<br>17-23/32(W) x 5-5/16(H) x 11-3/8(D) inches |
| Approximate Weight | 6.4 kg, 14 lb 2 oz. |

- Specifications and appearance design are subject to change for further improvement without notice.
- Dolby NR under license from Dolby Laboratories.
- The word "Dolby" and the Double-D-Symbol are trademarks of Dolby Laboratories.

# Service Manual

# Nakamichi 480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