



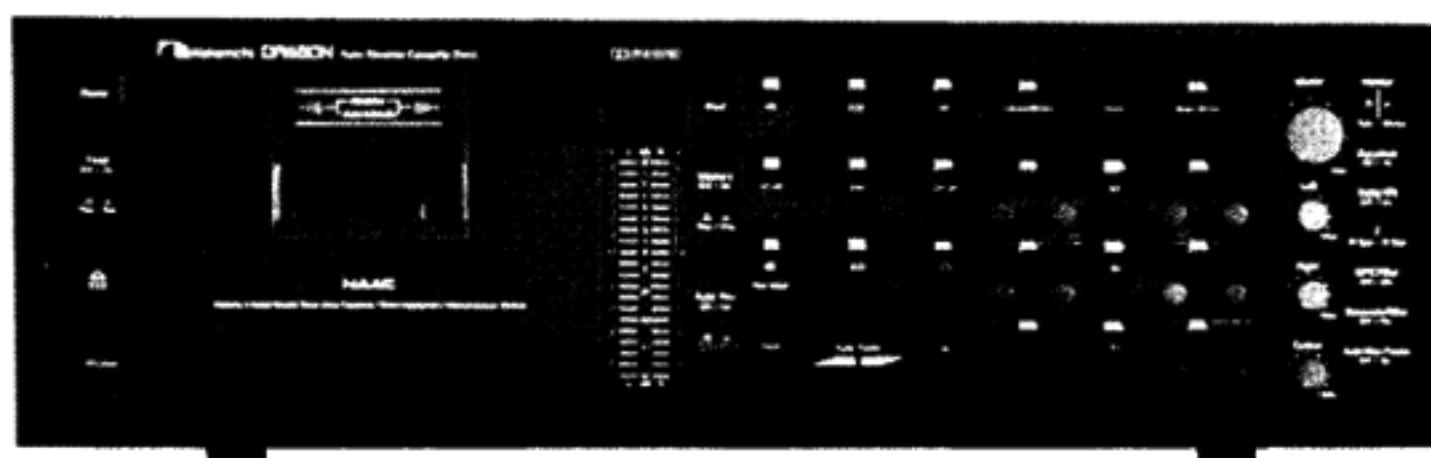
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# Service Manual

## Nakamichi DRAGON

Auto Reverse Cassette Deck



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## 1. GENERAL

### 1.1. Voltage Selector

Voltage selector is installed on the rear panel for Other version of the Nakamichi DRAGON. This voltage selector can select either 120 V or 220-240 V at customer's disposal.

### 1.2. Parts List for Carton and Packing

| Part No. | Description  | Q'ty |
|----------|--------------|------|
| 0F03685B | Inner Carton | 1    |
| 0F03686B | Outer Carton | 1    |
| 0F03629B | Packing      | 2    |

## 2. MECHANICAL ADJUSTMENTS

### 2.1. Mechanism Control Cam Adjustment

Before adjustment, remove the Front Panel Ass'y and the Cover Plate.

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

- Refer to Fig. 2.1.  
Adjust VR604 and VR603 on the Logic P.C.B. Ass'y to locate approximately at the middle of the variable range.  
Then turn ON the Power switch.  
VR604 (for Cam position stop)  
VR603 (for Cam position play)
- Press the Stop button to set the cassette deck in Stop mode. Adjust VR604 (for stop) so that the "S" mark on the Cam corresponds to the pointer on the mechanism chassis.
- Press the Play button to set the cassette deck 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.
- 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.)
- Set the cassette deck in F.F., Pause, or Cue mode by pressing each button.  
Check to insure that the pointer is in a range of "F", "PS", "CU" mark respectively.
- 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 Logic P.C.B. Ass'y.  
Note: The value of voltage is typical value.

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

Observe the each voltage at the sliding contact of the Cam Control Volume VR605 (10 k $\Omega$ ) in Stop, Fast (F.F. or Rew.), Pause and Playback modes.

##### (b) Reference Voltage

Reference voltage at the sliding contact of VR605 (Cam Control Volume) in each mode is as follows:

| Mode             | Reference Voltage (Typical Value) |
|------------------|-----------------------------------|
| Stop             | 0 V                               |
| Fast (F.F./Rew.) | -2.0 V                            |
| Pause            | -6.5 V                            |
| Play             | -9.1 V                            |

2.0 V  $\pm$  0.25 V  
2.6 V  $\pm$  0.4 V

##### (c) Resistors for Adjustment

| Mode             | Ref. No. | Typical Value       |
|------------------|----------|---------------------|
| Fast (F.F./Rew.) | R640     | 22 k $\Omega$       |
| Pause            | R643     | 76.8 k $\Omega$ (F) |
| Play             | R639     | 10 k $\Omega$       |

##### (d) Adjustment Procedures

- Set the cassette deck in Stop mode, then check to insure that the voltage at the sliding contact of VR605 is 0 V ( $\pm$ 0.3 V).
- Set the cassette deck in F.F. mode, then adjust the value of

R640 so that the voltage at the sliding contact of VR605 will become lower by 2.0 V ( $\pm$ 0.25 V) than in Stop mode.

- Press the Pause button to set the cassette deck in Pause mode. Adjust the value of R643 to obtain -6.5 V ( $\pm$ 0.4, -0.15 V) at the sliding contact of VR605.
- Set the cassette deck in Playback mode, then adjust the value of R639 so that the voltage at the sliding contact of VR605 will become lower by 2.6 V ( $\pm$ 0.4 V) than in Pause mode.

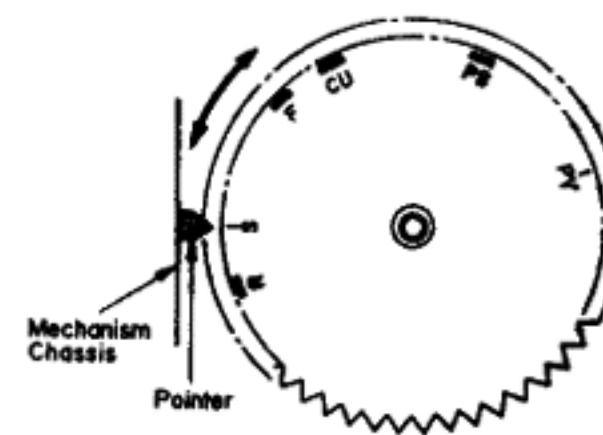


Fig. 2.1

### 2.2. Reel Motor Speed Adjustment in Play mode

- Connect a DC voltmeter to TP1 and GND on the Logic P.C.B. Ass'y.
- Without loading a cassette tape, set the cassette deck in Play mode.
- Adjust VR601 on the Logic P.C.B. Ass'y to obtain -4 V on the DC voltmeter.

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

Note: On items 2.3 — 2.9, refer to Fig. 2.2 flow chart. Refer to Figs. 2.3 and 2.4.

- Load a Tilt Check Gauge M-9039 (DA09039A) in the cassette deck.
- Clip the grounding terminal of the Tilt Check Gauge with one end of the cord with clip, and the chassis of the cassette deck with the other end.
- Remove both of the Height Gears.
- Set the cassette deck in Play mode. Check to insure whether the Beacons Playback Head "Upper" or "Lower" and Record Head "Upper" or "Lower" are illuminating. In order not to give damages onto the head surfaces, push both of slide knobs of the Gauge to the direction of arrow marks, then return them to the original place to be in contact with record head and playback head surfaces after Play mode is securely locked.
- Check to insure freedom from contact between the Gauge and pad lifter.
- Beacon Playback Head "Lower" will light on when height adjustment screw (P) turned clockwise but Playback Head "Upper" when counterclockwise. Adjust so that both "Upper" and "Lower" will light on even when you move the slide knob to the direction of an arrow mark and then return it to the original place.
- Same procedures will apply to the Beacons Record Head "Upper" and "Lower", except for the height adjustment screw (R).
- Set the cassette deck in Stop mode and fit both of the serrated Height Gears. Then set the cassette deck again in Play mode and insure all of the 4 Beacons are illuminating. If not, (3) through (7) will have to be repeated till satisfactory results are obtained.

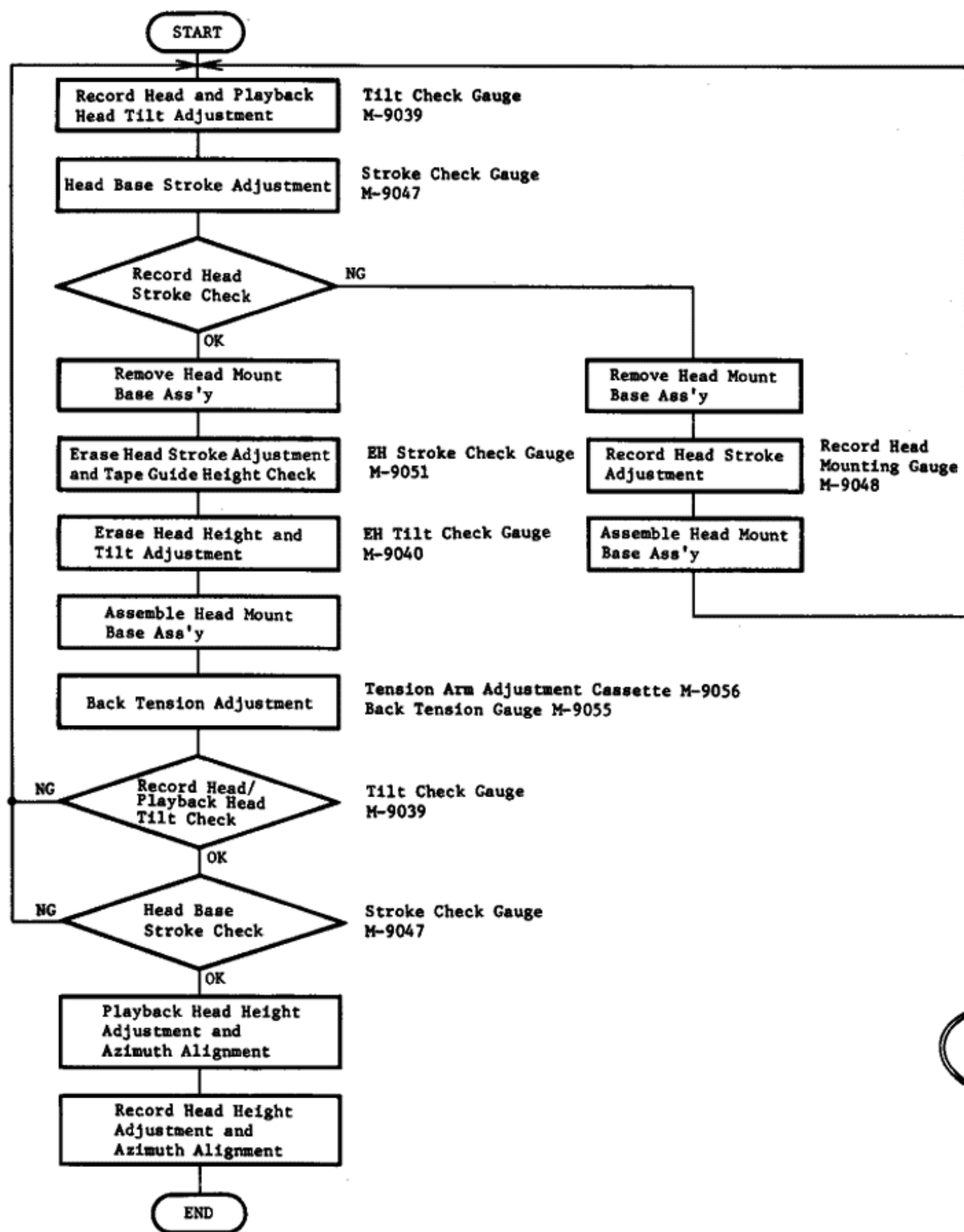


Fig. 2.2

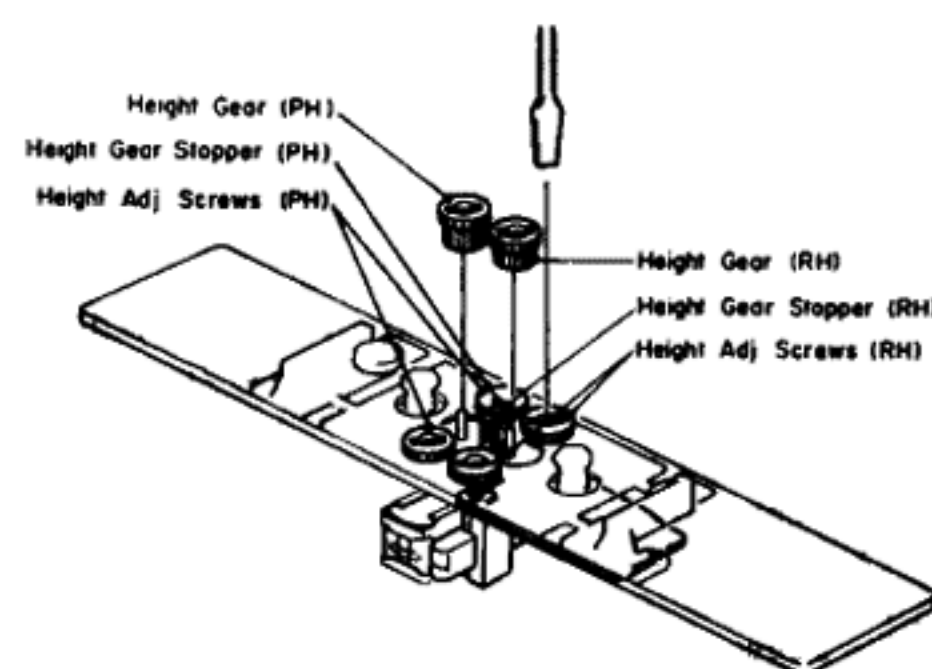


Fig. 2.3

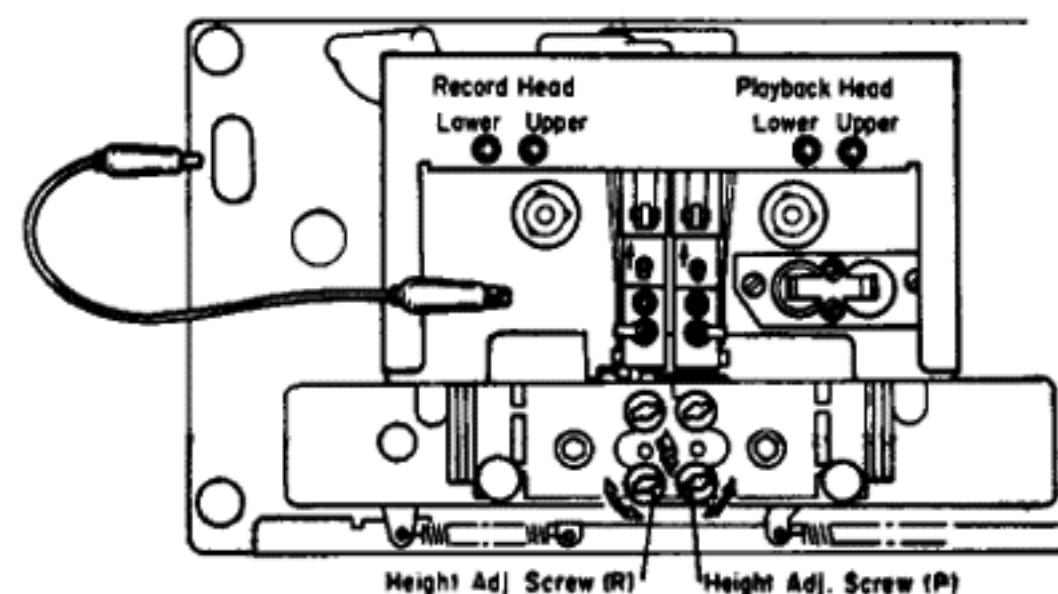


Fig. 2.4

#### 2.4. Head Base Stroke Adjustment

Refer to Fig. 2.5.

Note: Before you conduct this adjustment, adjust with a "Tilt Check Gauge" to insure freedom from tilt on the playback head and record head.

##### (1) Head Base Stroke Adjustment in Play Mode

- Load a Stroke Check Gauge M-9047 (DA09047B) in the cassette deck.
- Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the cassette deck in Play mode. Then slowly release the Indicators and insure whether each of the Indicators is in contact with record and playback heads.
- Check to insure whether the "P" pointer on the Playback Head Indicator locates between the 2 lines on the Indicator Plate.
- If the playback head stroke is noted to be misaligned, adjustment can be made by moving the stroke adjuster assembled in the head base assembly (either forwardly or backwardly).
- Check to insure whether the "P" pointer on the Playback Head Indicator locates between the 2 lines on the Record Head Indicator, thus check can be made on record head stroke.

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

##### (2) Head Base Stroke Adjustment in Cue Mode

- Load a Stroke Check Gauge M-9047 (DA09047B) in the cassette deck.
- Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the cassette deck in Cue mode. Then slowly release the Indicators and insure whether each of the Indicators is in contact with record and playback heads.
- Check to insure whether the "C" pointer on the Playback Head Indicator locates between the 2 lines on the Indicator Plate.
- If the playback head stroke is noted to be misaligned, adjust VR602 on the Logic P.C.B. Ass'y till satisfactory results are obtained.
- After completion of the Head Base Stroke Adjustment, check to insure accuracy of the Head Base Stroke Adjustment in Play mode. If the above are inaccurate, items (1) and (2) will have to be repeated till satisfactory results are obtained.

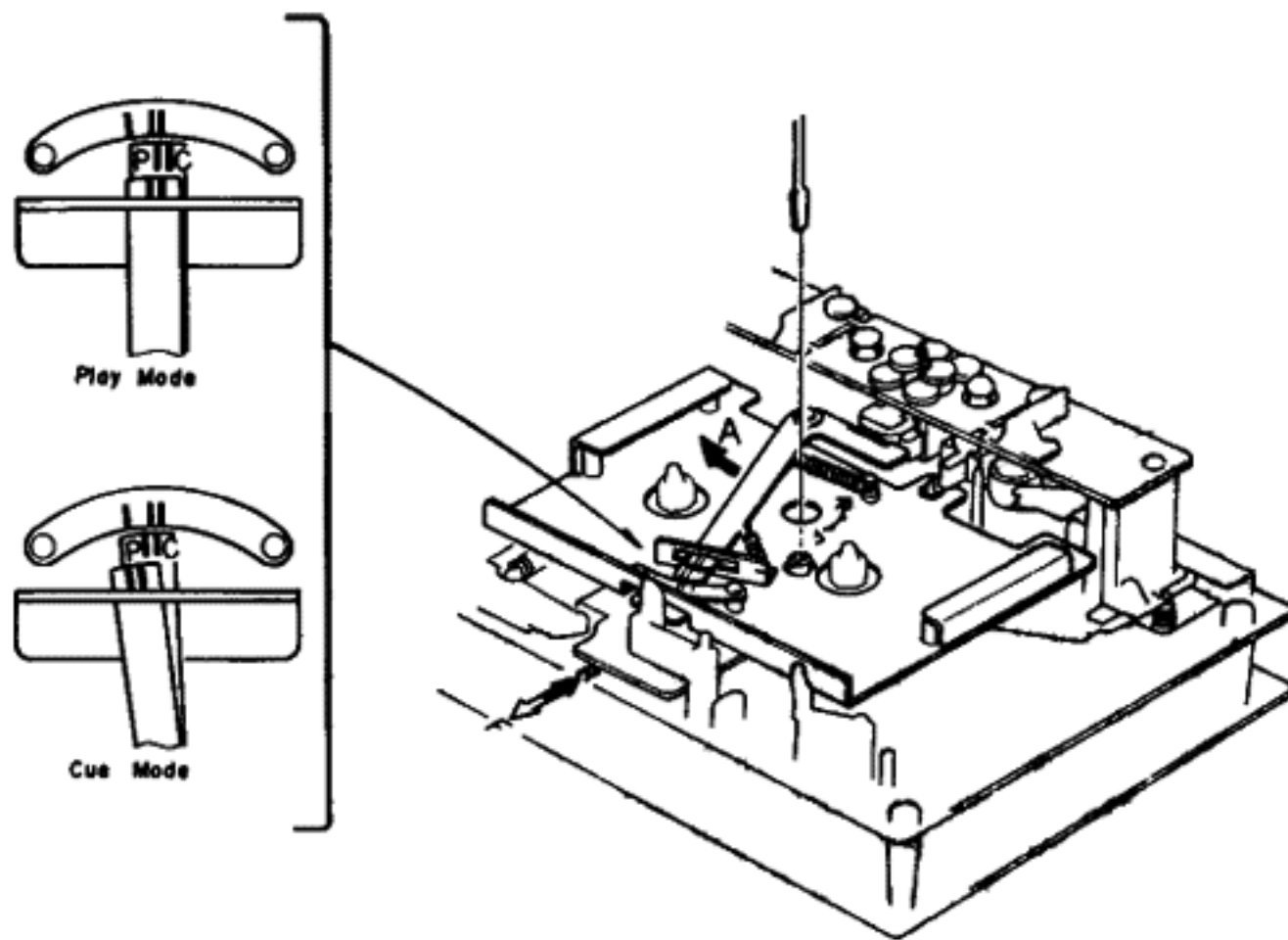


Fig. 2.5

**2.5. Erase Head Stroke Adjustment and Tape Guide Height Check**  
Remove the Head Mount Base Ass'y.  
Refer to Figs. 2.6 and 2.7.

- (1) **Erase Head Stroke Adjustment**
  - (a) Load an EH Stroke Check Gauge M-9051 (DA09051A) in the cassette deck.
  - (b) Set the cassette deck 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 A that assemble erase head and erase head plate.
  - (d) After completion of adjustment, 2 pcs. of screws shall be locked with lock tight paint.
- (2) **Supply Tape Guide Height Check**
  - (a) Load an EH Stroke Check Gauge M-9051 (DA09051A) in the cassette deck.
  - (b) Set the cassette deck in Play mode.
  - (c) Slide the Supply Tape Guide Check Bar down against the supply tape guide, and check to insure that the Supply Tape Guide Check Bar is accepted by the supply tape guide.
- (3) **Take-up Tape Guide Height Check**
  - (a) Load an EH Stroke Check Gauge M-9051 (DA09051A) in the cassette deck.
  - (b) Set the cassette deck in Play mode.
  - (c) Slide the Take-up Tape Guide Check Bar down against the take-up tape guide, and check to insure that the Take-up Tape Guide Check Bar is accepted by the take-up tape guide.

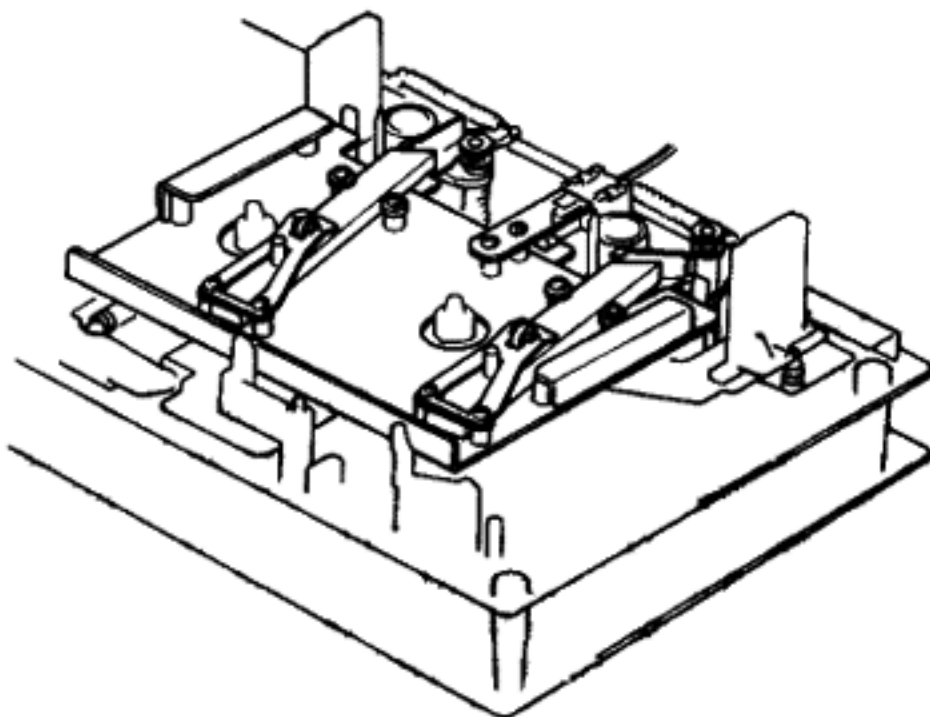


Fig. 2.6

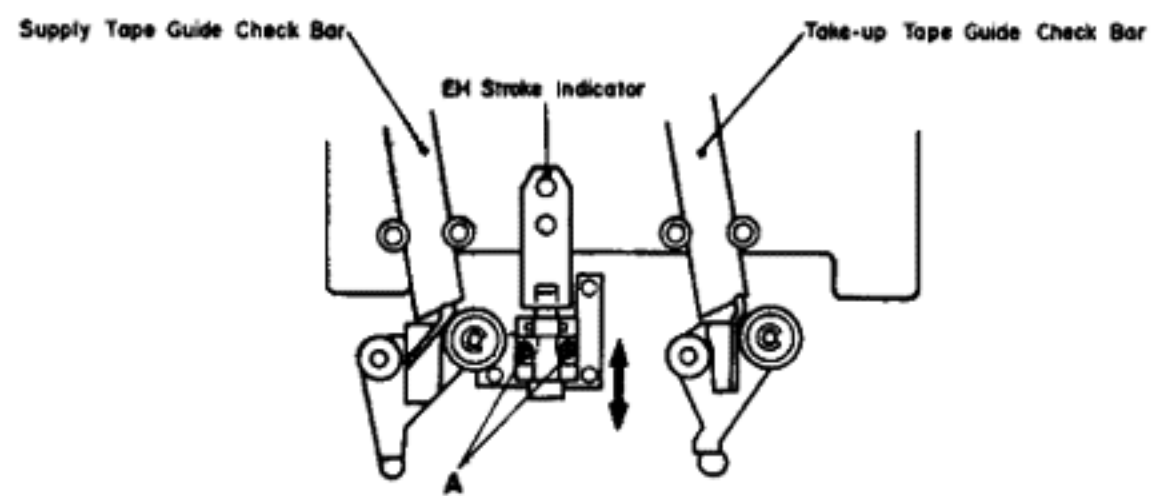


Fig. 2.7

**2.6. Erase Head Height and Tilt Adjustment**  
Refer to Figs. 2.8 and 2.9.

- (1) Remove Head Mount Base Ass'y.
- (2) Load an EH Tilt Check Gauge M-9040 (DA09040A) in the cassette deck.
- (3) Set the cassette deck in Stop mode.
- (4) Check to insure whether one of the 3 Beacons is illuminating. Look down the mirror as shown by an arrow mark and slowly turn the Screw "Height" counterclockwise (or clockwise) so that the two horizontal lines on the mirror will become superposed on the line (in different color) of the erase head, and check to insure whether Beacon "1" is illuminating.
- (5) Turn Screw "Tilt" counterclockwise (or clockwise) to light on Beacon "2". Excessive turning will cause the Beacon "1" to light off. Adjustments of Screw "Tilt" will therefore be conducted till both of the Beacons "1" and "2" illuminate.
- (6) Turn Screw "Azimuth" counterclockwise (or clockwise) to light on Beacon "3". Excessive turning will cause either Beacon "1" or "2" to light off, and therefore adjust 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 dirt, or overflow in the groove of the erase head surface.

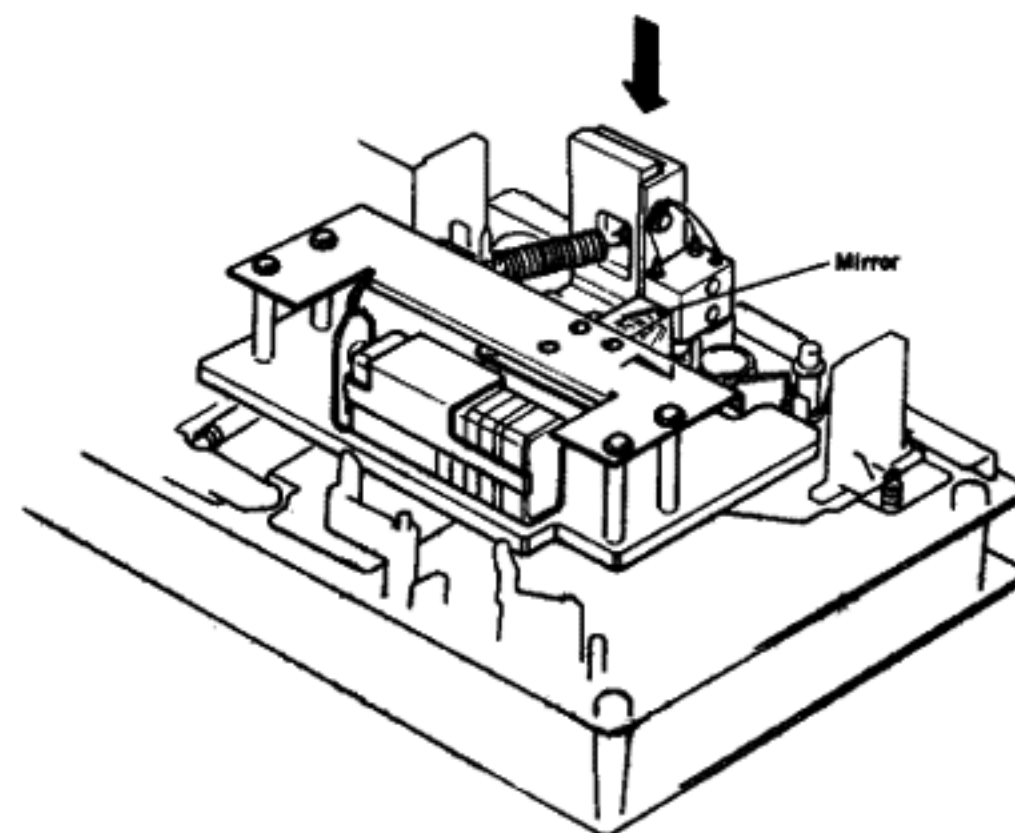


Fig. 2.8

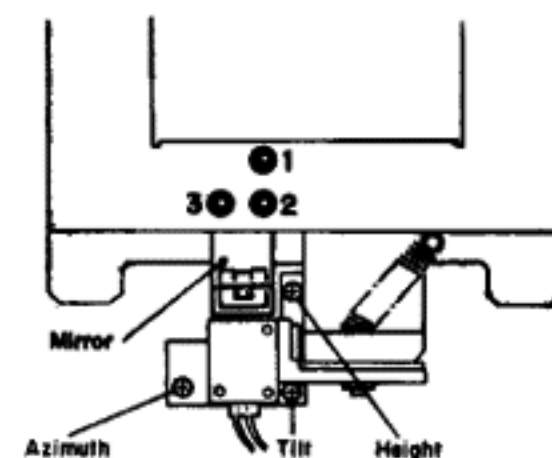


Fig. 2.9

## 2.7. Back Tension Adjustment

Refer to Figs. 2.10 — 2.13.

- (1) Load a Tension Arm Adjustment Cassette (DA09056A) in the cassette deck referring to Fig. 2.10.
- (2) Set the cassette deck in Play mode.
- (3) Bend the Back Tension Arm with pliers so that the gap between the Cassette Holding Spring assembled on the Head Base Ass'y and the Back Tension Arm becomes 0.5 mm as shown in Fig. 2.11. Do not bend the top of the Back Tension Arm.
- (4) Set the cassette deck in Stop mode, and remove the Tension Arm Adjustment Cassette (DA09056A), then set the cassette deck in Cue mode.  
In Cue mode, check to insure that the gap is found between the Supply Reel Hub B Ass'y and the Felt of Back Tension Ass'y as shown in Fig. 2.12.
- (5) Load the Back Tension Gauge (DA09055A) in the cassette deck.
- (6) Set the cassette deck in Play mode and read the torque value of Back Tension Gauge.  
If the value is in a range of 6 g-cm to 10 g-cm, adjustment is not necessary. If not, change the installation point of the Back Tension Spring as shown in Fig. 2.13, and obtain the torque of 7 g-cm to 9 g-cm range.

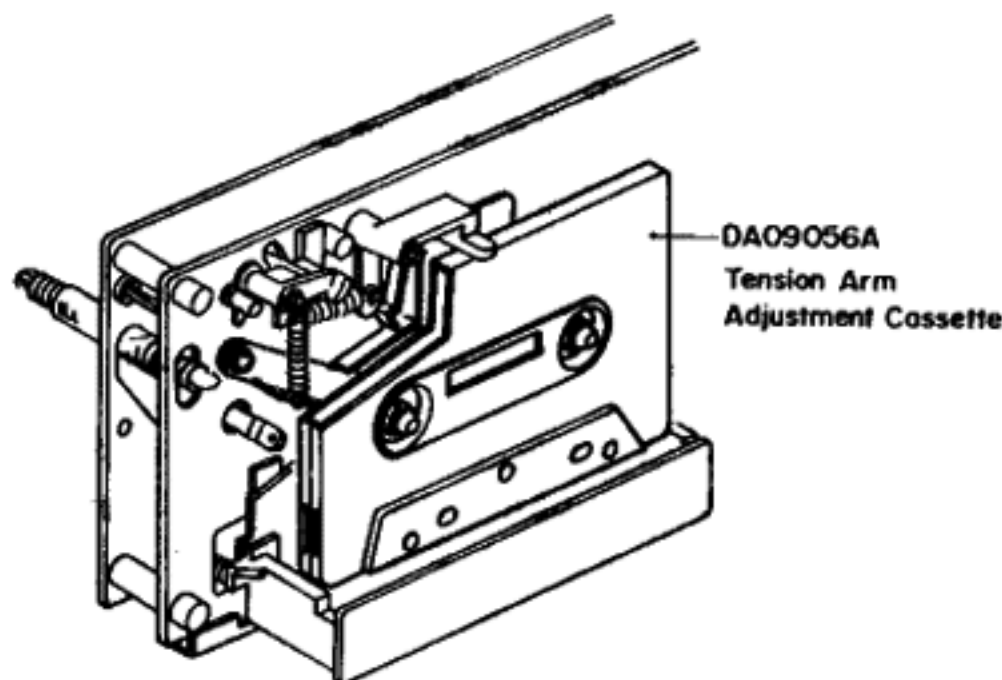


Fig. 2.10

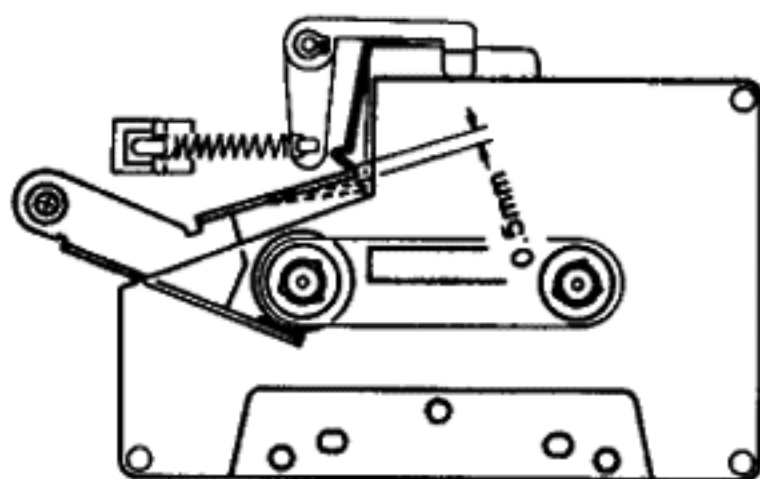


Fig. 2.11

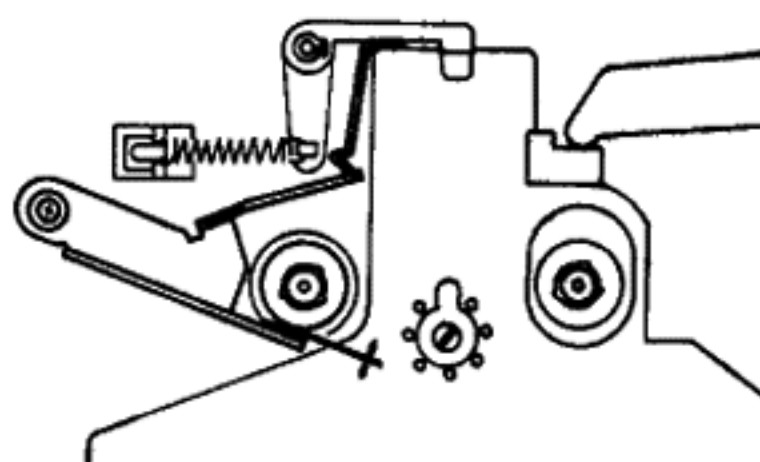


Fig. 2.12

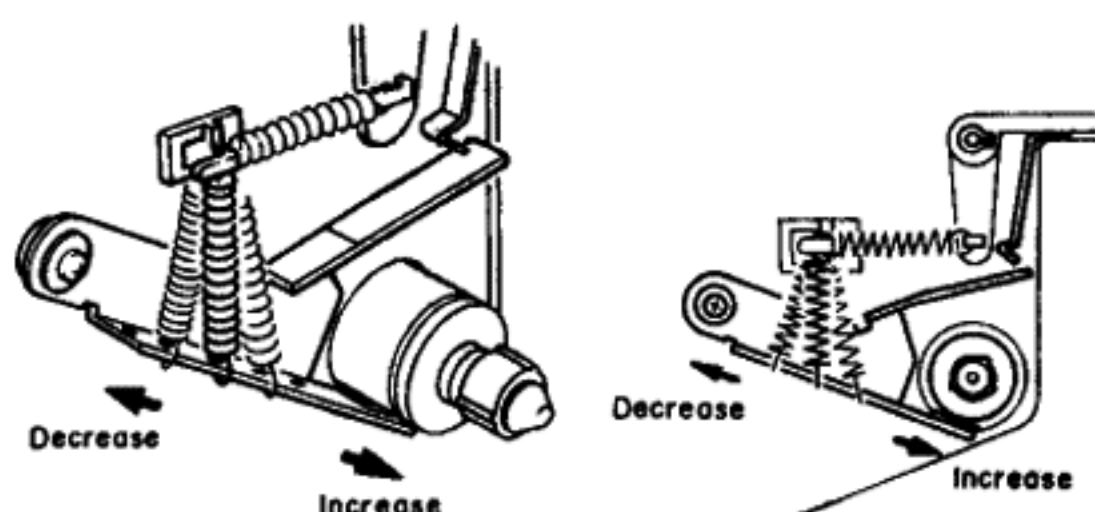


Fig. 2.13

## 2.8. Playback Head and Record Head Height Adjustment and Azimuth Alignment

Refer to Figs. 2.14 and 2.15. Perform the following adjustments successively.

- (1) **Playback Head Height Adjustment**
  - (a) Set the Monitor switch to Tape, Tape Selector button to ZX and Eq. switch to 70  $\mu$ s.
  - (b) Connect a VTVM to Output Jacks.
  - (c) Load a 1 kHz Track Alignment Tape (DA09007B) and set the cassette deck in Forward-Play mode.
  - (d) Turn the PH Height Gear until the outputs of both channels become minimum on the VTVM.
- (2) **Azimuth Reference Position Adjustment**
  - (a) With the Cassette Holder open, press the Forward-Play button.  
Adjust VR824 on the Auto Azimuth P.C.B. Ass'y so that the Alignment Indicator coincides with the Pointer in the Azimuth Alignment Motor Ass'y. Refer to Fig. 2.15.
  - (b) With the Cassette Holder open, press the Reverse-Play button.  
Adjust VR823 on the Auto Azimuth P.C.B. Ass'y so that the Alignment Indicator coincides with the Pointer in the Azimuth Alignment Motor Ass'y.
- (3) **Playback Head Azimuth Alignment**
  - (a) Disconnect the Azimuth Motor by pulling out the connector CN-5 of the Auto Azimuth P.C.B. Ass'y.
  - (b) Load a 15 kHz Azimuth Alignment Tape (DA09004B) and set the cassette deck in Forward-Play mode.
  - (c) Turn the PH Azimuth Alignment screw until the outputs of both channels become maximum on the VTVM.
- (4) **Phase Adjustment and Record Head Height Adjustment and Azimuth Alignment**
  - (a) Connect a DC millivoltmeter to pin 1 of CN-5 on the Auto Azimuth P.C.B. Ass'y (CN-5 is removed).
  - (b) Load a 15 kHz Azimuth Alignment Tape (DA09004B) and set the cassette deck in Forward-Play mode.  
Adjust the VR701 on the Main P.C.B. Ass'y to obtain 0 V on the DC millivoltmeter. (Adjustment should be carried out within approx. 10 seconds.)
  - (c) Turn the Azimuth Alignment Tape upside down and set the cassette deck in Reverse-Play mode.  
Adjust VR702 on the Main P.C.B. Ass'y to obtain 0 V on the DC millivoltmeter within approx. 10 seconds.
  - (d) Load a Reference ZX Tape (DA09037B) and set the cassette deck in Rec./Forward-Play mode.
  - (e) Press the Level Calibration button to oscillate 400 Hz (0 dB) and turn the RH Height Gear until the outputs of both channels become maximum on the VTVM.
  - (f) Press the Bias Calibration button to oscillate 15 kHz (-20 dB) and turn the RH Azimuth Alignment Screw until the outputs of both channels become maximum on the VTVM.
  - (g) Feed in 5 kHz (-20 dB) from an external generator. Set the cassette deck in Rec./Forward-Play mode and adjust VR822 on the Auto Azimuth P.C.B. Ass'y to obtain the closest value to 0 V on the DC millivoltmeter at pin 1 of CN-5. (Adjustment should be done within approx. 10 seconds.)
  - (h) Mount CN-5 on the original place.
  - (i) Load a 15 kHz Azimuth Alignment Tape (DA09004B) and set the cassette deck in Forward-Play mode. Note the Indicator swing from the Pointer.  
Turn the Azimuth Alignment Tape upside down, set the cassette deck in Reverse-Play mode and note the Indicator swing from the Pointer. (Indicator will move in the opposite direction as above.)  
Adjust the PH Azimuth Alignment Screw so that the Pointer swings evenly in Forward-Play and Reverse-Play modes.
  - (j) Load a 15 kHz Azimuth Alignment Tape (DA09004B) and set the cassette deck in Forward-Play mode.  
Pull out CN-5 of the Auto Azimuth P.C.B. Ass'y after the Direction Indicator has been finished flashing.
  - (k) Press the Bias Calibration button to oscillate 15 kHz (-20 dB) and turn the RH Azimuth Alignment Screw until the outputs of both channels become maximum on the VTVM.
  - (l) Mount CN-5 on the original place.

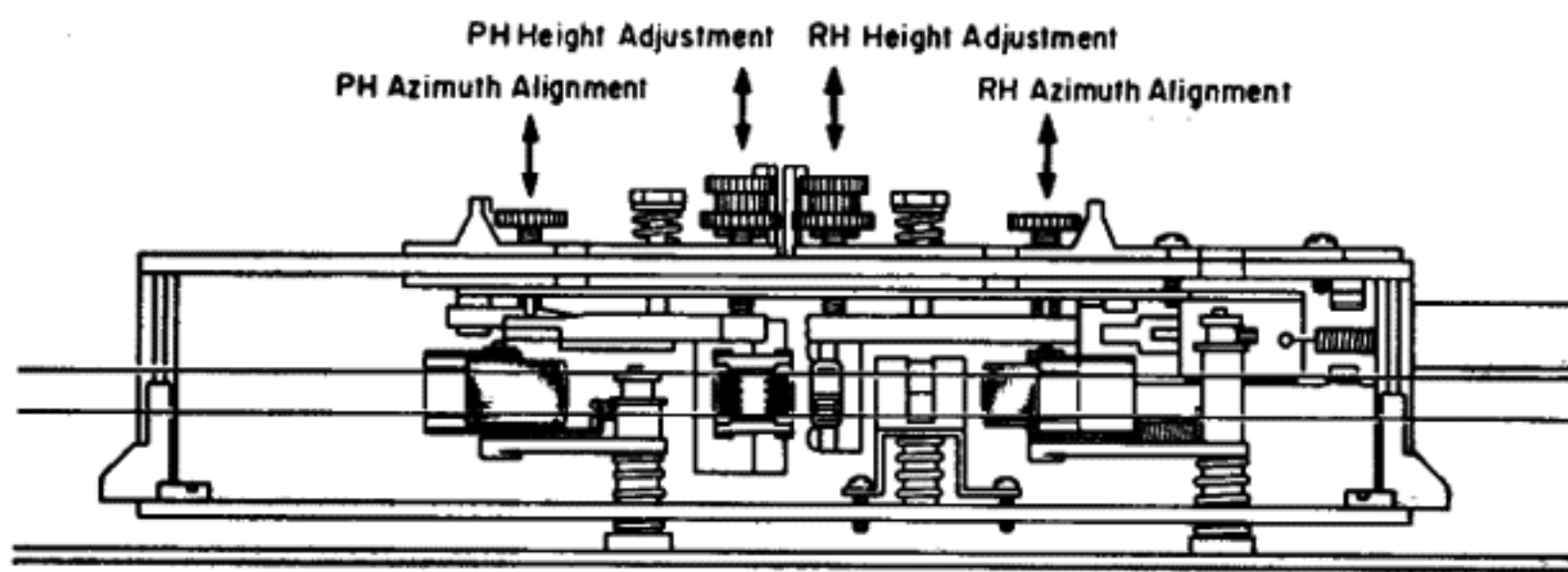


Fig. 2.14

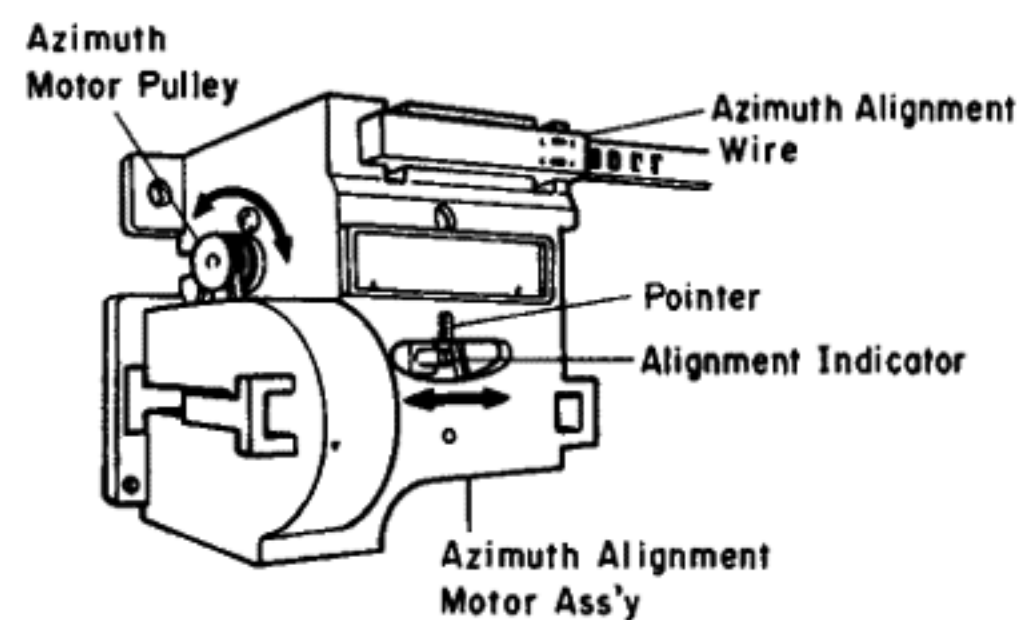


Fig. 2.15

## 2.9. Record Head Stroke Adjustment

Refer to Figs. 2.16 and 2.17.

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

- (1) Check the accuracy of the record head stroke.
- (2) Remove Head Mount Base Ass'y.
- (3) Remove the record head assembly.
- (4) Adjustment of Record Head Mounting Gauge M-9048 (DA0-9048A)
  - (a) Mount the Block B onto the Mounting Gauge Plate.
  - (b) Loosen the 2 screws fixing the Block A.
  - (c) As shown in Fig. 2.16, hold the Gauges (3.05 mm and 0.1 mm thickness) between the Block A and Block B, and fix the Block A with screws, pushing the Block A to the 2 guide pins.
- (5) Remove the Block B from the Mounting Gauge Plate.
- (6) As shown in Fig. 2.17, mount the R-8L record head assembly onto the Mounting Gauge Plate, then check the location of the R-8L record head surface. (If record head touches the Block C, loosen 2 pcs. of screws that assemble record head and record head plate, then place the R-8L record head assembly onto the Plate.)
- (7) Remove the R-8L record head assembly from the Mounting Gauge Plate.
- (8) Readjustment of Record Head Mounting Gauge M-9048 (DA09048A)
  - (a) Mount the Block B onto the Mounting Gauge Plate.
  - (b) Loosen the 2 screws fixing the Block A.
  - (c) As shown in Fig. 2.16, hold the Gauges (3.05 mm and either one of 0.05, 0.15, 0.2, 0.25, 0.3 or 0.35 mm thickness) between the Block A and Block B, and fix the Block A with screws, pushing the Block A to the 2 guide pins.
- (9) Remove the Block B from the Mounting Gauge Plate.
- (10) Mount the R-8L record head assembly onto the Mounting Gauge Plate.
- (11) As shown in Fig. 2.17, loosen 2 pcs. of screws that assemble record head and record head plate.
 

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

If the above are inaccurate, items (1) through (16) will have to be repeated till satisfactory results are obtained.

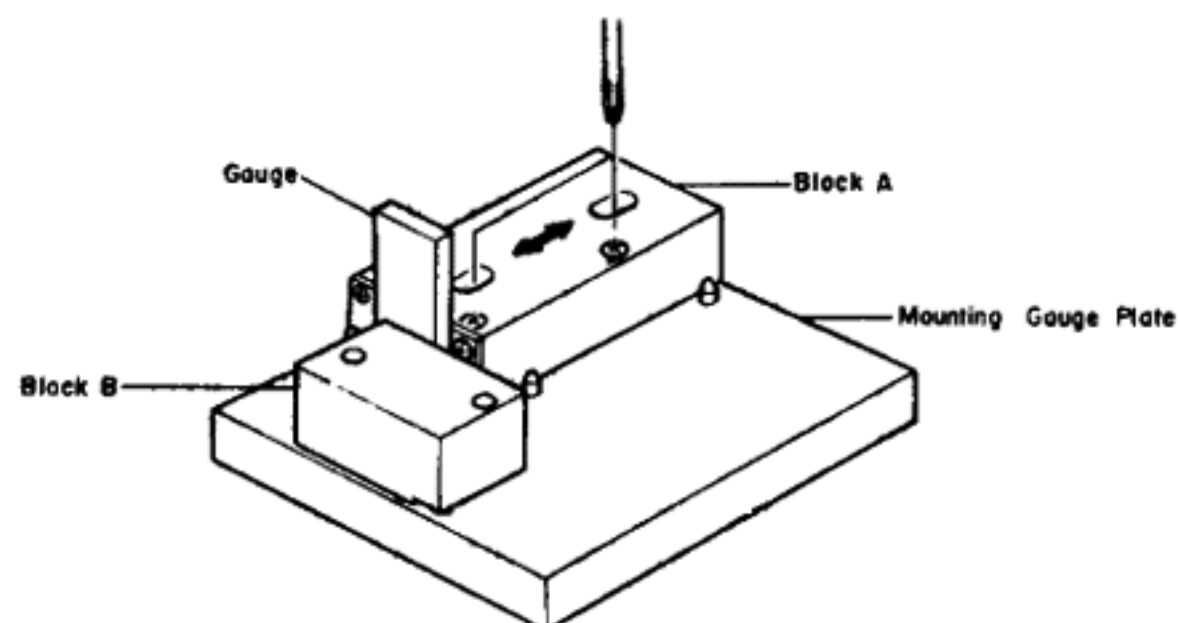
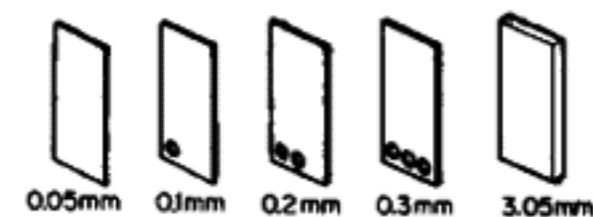


Fig. 2.16

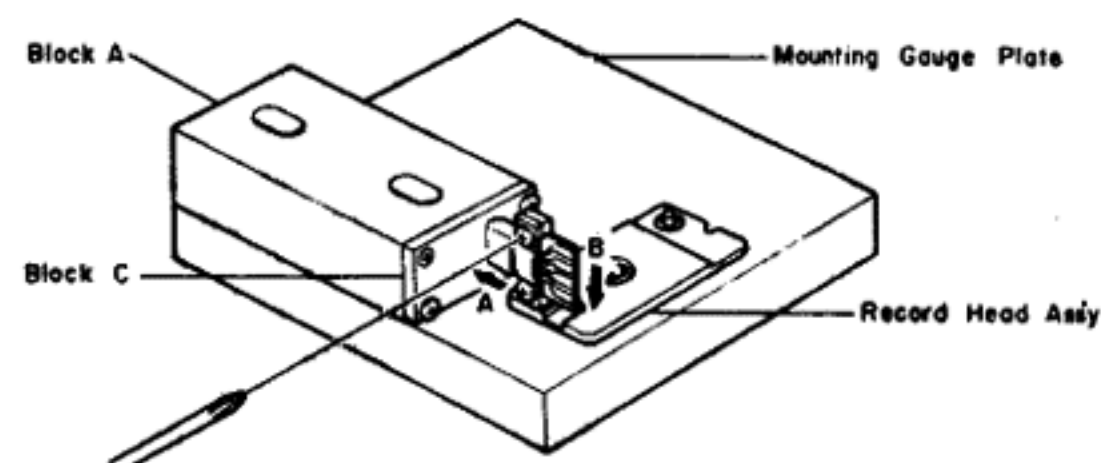


Fig. 2.17

### 2.10. Tape Travelling Adjustment

The adjustment shall be made with a modified version of the current type EXII C-90 as shown in Fig. 2.18 (error will be made if a current type Tape Travelling Cassette (DA09011A) should be used for this purpose).

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

Check shall be made in the following procedures.

- (1) An EXII C-90 tape thus modified shall be loaded onto the cassette deck.
- (2) Release the back-tension (rotate the Supply Reel and feed out some length of tape) and set the cassette deck in Play mode.
- (3) In this juncture, check to insure whether the tape is free from waving or slippage from the tape guide.
- (4) When the modified EXII C-90 is played back, check to insure whether the tape is freedom from waving from head surface or at pressure rollers.
- (5) If either of waving or slippage from the tape guide should be noted, adjustments of items 2.3 to 2.9, 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 cassette deck is intended to be an adjustment-free model, however if the similar matters as above should be noted, please replace the Reel Hub Ass'y to obtain appropriate take-up torque.

### 2.11. Flywheel Ass'y Height Adjustment

Refer to Fig. 2.19.

- (1) Adjust both Thrust Screws so that the gaps between the Motor Coil Assemblies and the Flywheel Assemblies become approx. 0.7 mm.
- (2) Connect a synchroscope to CN501-1 (take-up side) and CN502-1 (supply side) on the Motor Control P.C.B. Ass'y. Set the synchroscope to AC input.
- (3) Check to insure that the peak-to-peak levels of both waveforms are greater than 20 mV.
- (4) Apply a quantity of lock tight paint to the Thrust Screws.

Note: Mount washers on the Flywheel Ass'y as follows if Flywheel Ass'y is replaced.

- (a) Turn the Thrust Screw so that the gap between the Motor Coil Ass'y and the Flywheel Ass'y becomes approx. 1 mm.
- (b) From the front side of the cassette deck, first insert a Washer 3.1 mm FT into the capstan shaft of supply side (Washer 2.6 mm FT for take-up side), then insert a Washer 3 mm (Washer 2.5 mm) into the shaft and press it until the Washer 3.1 mm FT (Washer 2.6 mm FT) contacts with the flange sufficiently. Refer to Fig. 5.5.
- (c) Perform the "Flywheel Ass'y Height Adjustment" in item 2.11.

### 2.12. Lubrication

This 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 that 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. 2.18

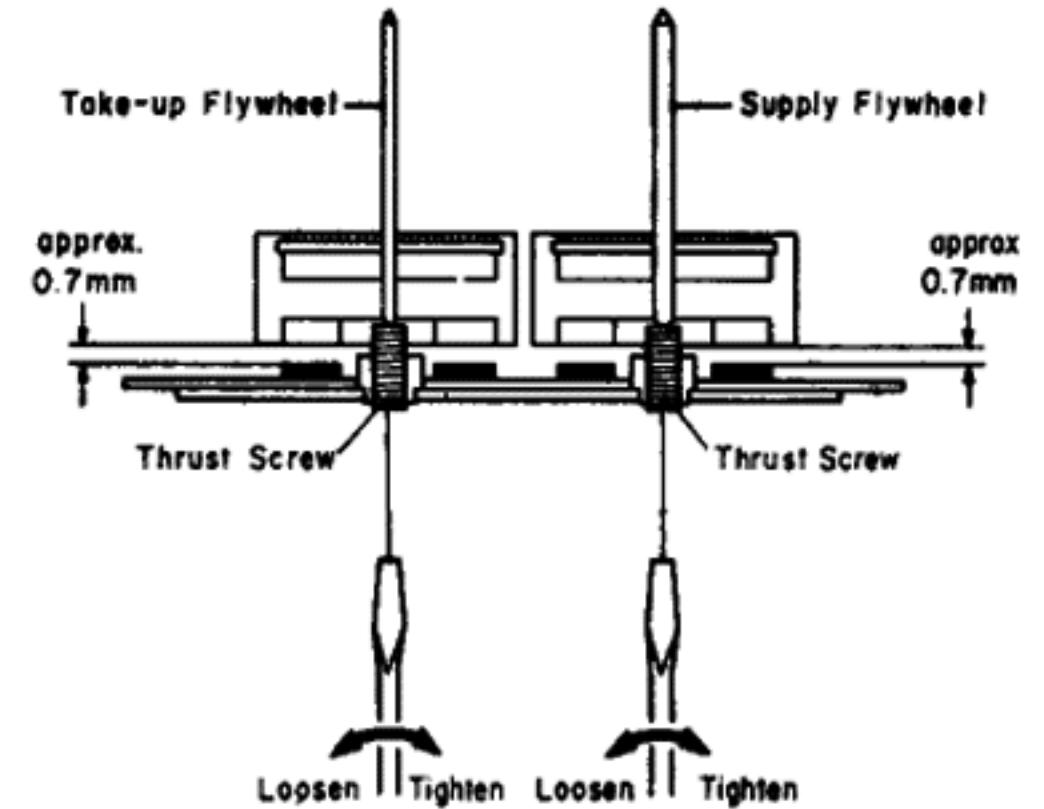


Fig. 2.19



#### 4. ELECTRICAL ADJUSTMENTS AND MEASUREMENTS

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

##### 4.1. Adjustment and Measurement Instructions

| STEP | ITEM                                                                  | SIGNAL SOURCE                                                                                                                       | OUTPUT CONNECTION                                                                  | MODE                                                                                                                                             | ADJUSTMENT                                                                                                                                                                                                                                                                                      | REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Tone Level Calibration                                                | Tone 400 Hz and 15 kHz                                                                                                              | VTVM to TP101, TP201 on Main P.C.B. and Output Jacks                               | Tone — 400 Hz/15 kHz<br>Monitor SW — Source                                                                                                      | Auto Azimuth P.C.B.<br>VR721 (400 Hz)<br>VR722 (15 kHz)<br><br>Main P.C.B.<br>VR301 (400 Hz Balance)                                                                                                                                                                                            | <ol style="list-style-type: none"> <li>1. Press the Level Calibration button to oscillate 400 Hz.</li> <li>2. Adjust VR721 to obtain 350 mV on the VTVM at TP101 (L ch).</li> <li>3. Adjust VR301 to obtain the same level as L ch at TP201.</li> <li>4. Measure the reading on the VTVM at the Output Jacks.</li> <li>5. Press the Bias Calibration button to oscillate 15 kHz.</li> <li>6. Adjust VR722 to obtain 20 dB lower level than in 4 on the VTVM at the Output Jacks.</li> <li>7. Press the Calibration Reset button to stop the tone oscillation.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2    | Meter Level Calibration                                               | 400 Hz to Input Jacks and Tone 400 Hz and 15 kHz                                                                                    | VTVM to TP101, TP201 on Main P.C.B.                                                | Tone — OFF/400 Hz/15 kHz<br>Monitor SW — Source                                                                                                  | Auto Azimuth P.C.B.<br>VR701, VR801<br>VR702, VR802<br>VR703, VR803<br><br>VR721 (400 Hz)<br>VR722 (15 kHz)                                                                                                                                                                                     | <ol style="list-style-type: none"> <li>1. Feed in 400 Hz, then adjust the Input level controls to obtain 350 mV —0.9 dB on the VTVM.</li> <li>2. Adjust VR701 (VR801) so that the 0 dB segment of the level meter starts illuminating.</li> <li>3. Press the Level Calibration button to oscillate 400 Hz, then adjust VR721 to obtain 350 mV —0.25 dB on the VTVM.</li> <li>4. Adjust VR702 (VR802) so that the 0 dB segment of the level meter starts illuminating.</li> <li>5. Press the Bias Calibration button to oscillate 15 kHz, then adjust VR722 to obtain 35 mV —0.25 dB on the VTVM.</li> <li>6. Adjust VR703 (VR803) so that the 0 dB segment of the level meter starts illuminating.</li> <li>7. Press the Calibration Reset button.</li> <li>8. Re-adjust the tone level according to step 1 "Tone Level Calibration".</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 3    | MPX Filter Adjustment                                                 | 19 kHz $\pm$ 100 Hz to Input Jacks                                                                                                  | VTVM to Output Jacks                                                               | Monitor SW — Source<br>Dolby NR SW — OFF<br>MPX SW — ON                                                                                          | Main P.C.B.<br>L102, L202                                                                                                                                                                                                                                                                       | <ol style="list-style-type: none"> <li>1. Turn the Output level control fully clockwise (maximum position).</li> <li>2. Adjust the Input Level controls to obtain 1 V on the VTVM.</li> <li>3. Set the MPX Filter switch to ON, then adjust L102 (L202) to obtain the minimum reading on the VTVM (the minimum reading will be less than —30 dB).</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4    | Playback Head and Record Head Height Adjustment and Azimuth Alignment | 1 kHz Track Alignment Tape (DA09007B)<br><br>15 kHz Azimuth Tape (DA09004B)<br><br>5 kHz (—20 dB) to Input Jacks<br><br>Tone 15 kHz | VTVM to Output Jacks and DC Millivoltmeter to pin 1 of CN-5 on Auto Azimuth P.C.B. | Playback (Fwd./Rev.)<br>Record, Playback (Fwd.)<br>Monitor SW — Tape<br>Tape SW — ZX<br>Eq. SW — 70 $\mu$ s<br>Dolby NR SW — OFF<br>MPX SW — OFF | PH Height Gear<br>PH Azimuth Alignment Screw<br><br>RH Height Gear<br>RH Azimuth Alignment Screw<br><br>Auto Azimuth P.C.B.<br>(Fwd. Azimuth Ref.)<br>VR824 (Rev. Azimuth Ref.)<br>VR823 (5 kHz Phase)<br>VR822<br><br>Main P.C.B.<br>(15 kHz Fwd. Phase)<br>VR701 (15 kHz Rev. Phase)<br>VR702 | Perform the following adjustments successively. <ol style="list-style-type: none"> <li>1. Playback Head Height Adjustment               <ol style="list-style-type: none"> <li>a. Load a 1 kHz track alignment tape (DA09007B) and forward-play it back.</li> <li>b. Adjust the PH Height Gear to obtain minimum readings of both channels on the VTVM.</li> </ol> </li> <li>2. Azimuth Reference Position Adjustment               <ol style="list-style-type: none"> <li>a. With the Cassette Holder open, press the Forward-Play button. Adjust VR824 on the Auto Azimuth P.C.B. Ass'y so that the Alignment Indicator coincides with the Pointer in the Azimuth Alignment Motor Ass'y. Refer to Fig. 2.15.</li> <li>b. With the Cassette Holder open, press the Reverse-Play button. Adjust VR823 on the Auto Azimuth P.C.B. Ass'y so that the Alignment Indicator coincides with the Pointer in the Azimuth Alignment Motor Ass'y.</li> </ol> </li> <li>3. Playback Head Azimuth Alignment               <ol style="list-style-type: none"> <li>a. Disconnect the Azimuth Motor by pulling out the connector CN-5 of the Auto Azimuth P.C.B. Ass'y.</li> <li>b. Load a 15 kHz azimuth tape (DA09004B) and forward-play it back.</li> <li>c. Adjust the PH Azimuth Alignment Screw to obtain maximum readings of both channels on the VTVM.</li> </ol> </li> <li>4. Phase Adjustment and Record Head Height Adjustment and Azimuth Alignment               <ol style="list-style-type: none"> <li>a. Disconnect CN-5 of the Auto Azimuth P.C.B. Ass'y.</li> <li>b. Load a 15 kHz azimuth tape (DA09004B) and forward-play it back. Adjust VR701 on the Main P.C.B. Ass'y to obtain 0 V on the DC millivoltmeter. (Adjustment should be carried out within approx. 10 seconds.)</li> </ol> </li> </ol> (to be continued) |

| STEP          | ITEM                                                    | SIGNAL SOURCE                                                                                                                                                                | OUTPUT CONNECTION                                                                              | MODE                                                                                                                  | ADJUSTMENT                                                                              | REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4 (continued) |                                                         |                                                                                                                                                                              |                                                                                                |                                                                                                                       |                                                                                         | <p>c. Turn the azimuth tape upside down and reverse-play it back. Adjust VR702 on the Main P.C.B. Ass'y to obtain 0 V on the DC millivoltmeter within approx. 10 seconds.</p> <p>d. Load a reference ZX tape (DA09037B) and record/forward-play it back.</p> <p>e. Press the Level Calibration button to oscillate 400 Hz (0 dB) and adjust the RH Height Gear to obtain maximum readings of both channels on the VTVM.</p> <p>f. Press the Bias Calibration button to oscillate 15 kHz (-20 dB) and adjust the RH Azimuth Alignment Screw to obtain maximum readings of both channels on the VTVM.</p> <p>g. Feed in 5 kHz (-20 dB) from an external generator and record/forward-play it back. Adjust VR822 on the Auto Azimuth P.C.B. Ass'y to obtain the closest value to 0 V on the DC millivoltmeter. (Adjustment should be done within approx. 10 seconds.)</p> <p>h. Mount CN-5 on the original place.</p> <p>i. Load a 15 kHz azimuth tape (DA09004B) and forward-play it back. Note the Indicator swing from the Pointer. Turn the azimuth tape upside down, reverse-play it back and note the Indicator swing from the Pointer. (Indicator will move in the opposite direction as above.) Adjust the PH Azimuth Alignment Screw so that the Pointer swings evenly in Forward-Play and Reverse-Play modes.</p> <p>j. Load a 15 kHz azimuth tape (DA09004B) and forward-play it back. Pull out CN-5 of the Auto Azimuth P.C.B. Ass'y after the Direction Indicator has been finished flashing.</p> <p>k. Press the Bias Calibration button to oscillate 15 kHz (-20 dB) and adjust the RH Azimuth Alignment Screw to obtain maximum readings of both channels on the VTVM.</p> <p>l. Mount CN-5 on the original place.</p> |
| 5             | Playback Level Calibration                              | 400 Hz Level Tape (DA09005B)                                                                                                                                                 | VTVM to TP101, TP201 on Main P.C.B.                                                            | Playback (Fwd./Rev.)<br>Monitor SW — Tape<br>Eq. SW — 70 $\mu$ s<br>Dolby NR SW — OFF<br>MPX SW — OFF                 | Main P.C.B.<br>VR501, VR601 (Fwd.)<br>VR502, VR602 (Rev.)                               | <p>1. Load a 400 Hz level tape and forward-play it back.</p> <p>2. Adjust VR501 (VR601) to obtain 350 mV on the VTVM.</p> <p>3. Turn the tape upside down and reverse-play it back.</p> <p>4. Adjust VR502 (VR602) to obtain 350 mV on the VTVM.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 6             | Playback Frequency Response Adjustment                  | 400 Hz Level Tape (DA09005B)<br>10 kHz PB Frequency Response Tape (DA09003B)<br>15 kHz PB Frequency Response Tape (DA09002B)<br>20 kHz PB Frequency Response Tape (DA09001B) | VTVM to Output Jacks                                                                           | Playback (Fwd./Rev.)<br>Monitor SW — Tape<br>Tape SW — SX<br>Eq. SW — 70 $\mu$ s<br>Dolby NR SW — OFF<br>MPX SW — OFF | Main P.C.B.<br>(Fwd.)<br>R507, R607<br>R508, R608<br>(Rev.)<br>R517, R617<br>R518, R618 | <p>1. Load a 400 Hz level tape and forward-play it back. Adjust the Output level control to a certain level (0 dB for example).</p> <p>2. Load 10 kHz, 15 kHz and 20 kHz PB frequency response tapes and forward-play them back. Short R507 (R607) or R508 (R608) to obtain the following levels against the level for the 400 Hz level tape.<br/>10 kHz: -20 dB -1 dB to +2 dB<br/>15 kHz: -20 dB -1 dB to +3 dB<br/>20 kHz: -20 dB -1 dB to +4 dB</p> <p>3. Turn the tape upside down and reverse-play them back. Short R517 (R617) or R518 (R618) to obtain the levels which suffice the range specified in above 2.</p> <p>4. Refer to the "Playback Frequency Response Adjustment" in item 4.2 for the detailed description.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 7             | Bias Oscillation Frequency and Erase Current Adjustment |                                                                                                                                                                              | VTVM across the additional 0.1 $\Omega$ resistor and Frequency Counter to CN1-1 on Main P.C.B. | Record, Pause<br>Monitor SW — Source<br>Tape SW — ZX<br>Eq. SW — 70 $\mu$ s<br>Dolby NR SW — OFF<br>MPX SW — OFF      | Main P.C.B.<br>T301<br>R313, R314                                                       | <p>1. Connect an additional 0.1 <math>\Omega</math> resistor in series to the Erase Head, then connect a VTVM across it.</p> <p>2. Adjust T301 to obtain 105 kHz on the frequency counter.</p> <p>3. 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 R313 or R314.</p> <p>4. After completion of the erase current adjustment, re-check the bias oscillation frequency.</p> <p>5. Remove the additional 0.1 <math>\Omega</math> resistor.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| STEP | ITEM                                                           | SIGNAL SOURCE                                                    | OUTPUT CONNECTION                                                                                                 | MODE                                                                                                                                                                                                | ADJUSTMENT                                                                                                                                                                     | REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------|----------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8    | Record Amplifier Equalizer Adjustment                          | 23 kHz (-20 dB) to Input Jacks                                   | VTVM to TP102, TP202 on Main P.C.B.                                                                               | Record, Pause<br>Monitor SW — Source<br>Tape SW — ZX<br>Eq. SW — 70 $\mu$ s<br>Dolby NR SW — OFF<br>MPX SW — OFF                                                                                    | Main P.C.B.<br>L503, L603                                                                                                                                                      | 1. Remove the bias-cut jumper from the dip side of the Main P.C.B. Ass'y.<br>2. Adjust L503 (L603) to obtain approx. +16 dB at 23 kHz on the VTVM.<br>3. Re-solder the bias-cut jumper.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 9    | Bias Trap Adjustment (Record Amp.)                             | Remove input signals                                             | VTVM to TP103, TP203 on Main P.C.B.                                                                               | Same as above                                                                                                                                                                                       | Main P.C.B.<br>L504, L604                                                                                                                                                      | Adjust L504 (L604) to obtain minimum reading on the VTVM.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 10   | Bias Trap Adjustment (Playback Amp.)                           | Remove input signals                                             | VTVM to IC502-3, IC602-3 (Fwd. Playback Amp.), IC502-1, IC602-1 (Rev. Playback Amp.) and AM39 (Sub Playback Amp.) | Same as above                                                                                                                                                                                       | Main P.C.B.<br>L501, L502<br>L601, L602<br>L701                                                                                                                                | 1. Adjust L501 (L601) to obtain minimum reading on the VTVM at IC502-3 (IC602-3).<br>2. Adjust L502 (L602) to obtain minimum reading on the VTVM at IC502-1 (IC602-1).<br>3. Adjust L701 to obtain minimum reading on the VTVM at terminal AM39.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 11   | Record Level Calibration and Recording Bias Current Adjustment | Tone 400 Hz and 15 kHz and 10 kHz/20 kHz (-20 dB) to Input Jacks | VTVM and Distortion Meter to Output Jacks                                                                         | Record, Playback (Fwd.)<br>Tone — 400 Hz/15 kHz<br>Monitor SW — Tape<br>Tape SW — ZX/SX<br>EX<br>Eq. SW — 70 $\mu$ s (ZX/SX)<br>120 $\mu$ s (EX)<br>Dolby NR SW — C-Type/B-Type/OFF<br>MPX SW — OFF | Control P.C.B. (Level)<br>ZX:<br>VR101, VR201<br>SX:<br>VR102, VR202<br>EX:<br>VR103, VR203<br><br>(Bias)<br>ZX:<br>VR106, VR206<br>SX:<br>VR105, VR205<br>EX:<br>VR104, VR204 | Adjustment should be made in the order of ZX, SX and EX.<br><br>1. Set the Dolby NR switch to C-Type.<br>2. Load a reference ZX tape (DA09037B), reference SX tape (DA09025B) and reference EXII tape (DA09066B).<br>3. Adjust the Sensitivity controls VR101 (VR201) for ZX, VR102 (VR202) for SX and VR103 (VR203) for EXII to maximum position.<br>4. Adjust the Bias controls VR106 (VR206) for ZX, VR105 (VR205) for SX and VR104 (VR204) for EXII to maximum position.<br>5. Press the Record and Fwd. Play buttons, then press the Level Calibration button to oscillate 400 Hz.<br>6. Adjust the Sensitivity controls VR101 (VR201), VR102 (VR202) and VR103 (VR203) to obtain 0 dB on the level meters.<br>7. Press the Bias Calibration button to oscillate 15 kHz.<br>8. Adjust the Bias controls VR106 (VR206), VR105 (VR205) and VR104 (VR204) to obtain 0 dB on the level meters.<br>9. Repeat 5 to 8 as above two or three times to obtain optimum performance.<br>10. Set the Dolby NR switch to B-Type/OFF.<br>11. Feed in 10 kHz (-20 dB) and 20 kHz (-20 dB), then record and forward-play them back.<br>Check to insure that the levels are within -20 dB $\pm$ 2 dB against the levels in Dolby NR C-Type.<br>12. Check to insure whether the total harmonic distortion is less than 0.8% for ZX tape and 1.0% for SX and EXII tapes. |
| 12   | Overall Frequency Response Adjustment                          | 400 Hz (0 dB) and 20 Hz to 20 kHz (-20 dB) to Input Jacks        | VTVM to Output Jacks                                                                                              | Record, Playback (Fwd.)<br>Monitor SW — Source/Tape<br>Tape SW — ZX/SX/EX<br>Eq. SW — 70 $\mu$ s (ZX/SX)<br>120 $\mu$ s (EX)<br>Dolby NR SW — OFF<br>MPX SW — OFF                                   | Main P.C.B.<br>L503, L603                                                                                                                                                      | 1. Set the Monitor switch to Source.<br>2. Feed in 400 Hz (0 dB) and adjust the Input level controls to obtain 0 dB on the level meters.<br>3. Switch the Generator output level to -20 dB.<br>4. Set the Monitor switch to Tape, then record and forward-play it back.<br>5. Feed in 20 Hz to 20 kHz (-20 dB), and check to insure whether the output levels are within -20 dB $\pm$ 3 dB.<br>6. If above is not sufficient, adjust L503 (L603) to obtain approx. -20 dB on the VTVM at 20 kHz.<br>7. Conduct step 11 "Record Level Calibration and Recording Bias Current Adjustment".<br>8. If above is not sufficient further, precise re-adjustment of step 6 "Playback Frequency Response", replacement of Playback Head or Record Head, check on item 2.10 "Tape Travelling Adjustment" or frequency response adjustment according to item 4.2 will be required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 13   | Crosstalk Measurement                                          | 1 kHz to Input Jacks                                             | 1 kHz Band Pass Filter and VTVM to Output Jacks                                                                   | Record and Playback (Fwd.)<br>Monitor SW — Tape<br>Tape SW — ZX<br>Eq. SW — 70 $\mu$ s<br>Dolby NR SW — OFF                                                                                         |                                                                                                                                                                                | 1. Erase a reference ZX tape with a bulk eraser.<br>2. Load the reference tape and adjust the Input level controls to obtain 0 dB on the level meters.<br>3. Record input signals on the tape with pressing the Record and Fwd. Play buttons.<br>4. Press the Stop button, then reverse-play it back with pressing Rev. Play button.<br>5. Measure the difference between 3 and 4.<br>(to be continued)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| STEP           | ITEM                                  | SIGNAL SOURCE                               | OUTPUT CONNECTION                               | MODE                                                                                                                                             | ADJUSTMENT | REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------|---------------------------------------|---------------------------------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13 (continued) |                                       |                                             |                                                 |                                                                                                                                                  |            | 6. Record input signals on the tape but not on the portion used as above.<br>7. Turn the tape the other way round and forward-play it back.<br>8. Measure the output level difference between 6 and 7.                                                                                                                                                                                                                        |
| 14             | Channel Separation Measurement        | 1 kHz to Input Jacks                        | 1 kHz Band Pass Filter and VTVM to Output Jacks | Record and Playback (Fwd.)<br>Monitor SW — Tape<br>Tape SW — ZX<br>Eq. SW — 70 $\mu$ s<br>Dolby NR SW — OFF                                      |            | 1. Erase a reference ZX tape with a bulk eraser.<br>2. Load the reference tape and adjust the L ch (R ch) Input level control to obtain 0 dB on the level meter.<br>3. Close the R ch (L ch) Input level control. Record and forward-play the input signals and measure the R ch (L ch) level on the VTVM.<br>4. Turn the tape the other way round and reverse-play it back.<br>5. Measure the R ch (L ch) level on the VTVM. |
| 15             | Signal to Noise Ratio Measurement     | 400 Hz to Input Jacks                       | VTVM and Distortion Meter to Output Jacks       | Record and Playback (Fwd.)<br>Monitor SW — Tape<br>Tape SW — ZX<br>Eq. SW — 70 $\mu$ s<br>Dolby NR SW — B-Type/C-Type                            |            | 1. Feed in 400 Hz and record and forward-play it back.<br>2. Adjust the Input level controls to obtain a 3% total harmonic distortion in Playback mode.<br>3. Close the Input level controls, then record again.<br>After rewind, forward-play back and check the output level difference between 3 and 4.<br>Note: The filter of IHF-A curve shall be used in the measurements.                                              |
| 16             | Total Harmonic Distortion Measurement | 400 Hz to Input Jacks                       | Distortion Meter to Output Jacks                | Record and Playback (Fwd.)<br>Monitor SW — Tape<br>Tape SW — ZX/SX/EX<br>Eq. SW — 70 $\mu$ s<br>(ZX/SX)<br>120 $\mu$ s (EX)<br>Dolby NR SW — OFF |            | 1. Adjust the Input level controls to obtain 0 dB on the level meters.<br>2. Record and forward-play it back.<br>3. Read the distortion meter and check to insure that the distortion is less than 0.8% for ZX tape and 1.0% for SX and EXII tapes.                                                                                                                                                                           |
| 17             | Wow/Flutter & Speed Measurement       | 3 kHz Speed and Wow/Flutter Tape (DA09006C) | Wow/Flutter Meter to Output Jacks               | Playback<br>Monitor SW — Tape<br>Eq. SW — 70 $\mu$ s                                                                                             |            | Forward-play back and read the wow/flutter meter.                                                                                                                                                                                                                                                                                                                                                                             |

#### 4.2. Frequency Response Adjustment

##### (1) Playback Frequency Response Adjustment

Refer to Figs. 4.2.1 and 4.2.2.

Peaking adjustment will be required if playback level is not sufficient when 20 kHz PB frequency response tape is played back as referred to step 6 in 4.1 "Adjustment and Measurement Instructions".

The adjustment will compensate the gap loss of the playback head.

Peaking level is varied by the short circuit of the following resistors in the playback amp. circuit of the Main P.C.B. Ass'y.

Forward Playback Amp.:

R507, R607 (220 ohms) or R508, R608 (470 ohms)

Reverse Playback Amp.:

R517, R617 (220 ohms) or R518, R618 (470 ohms)

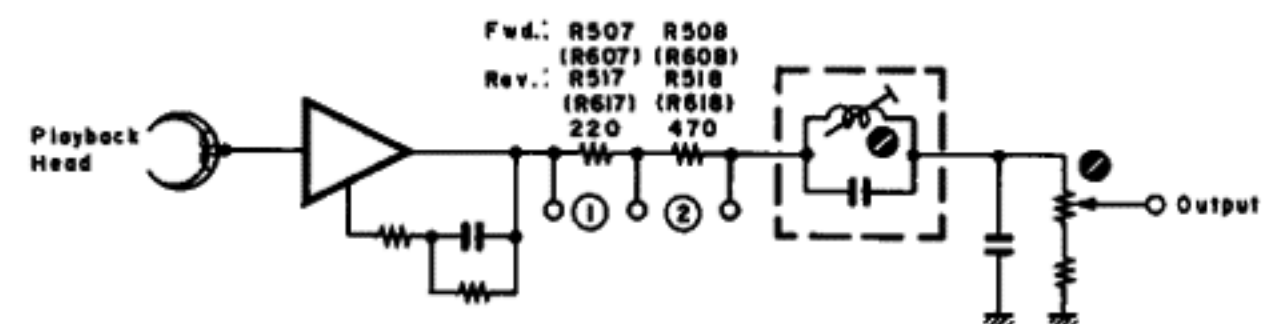


Fig. 4.2.1

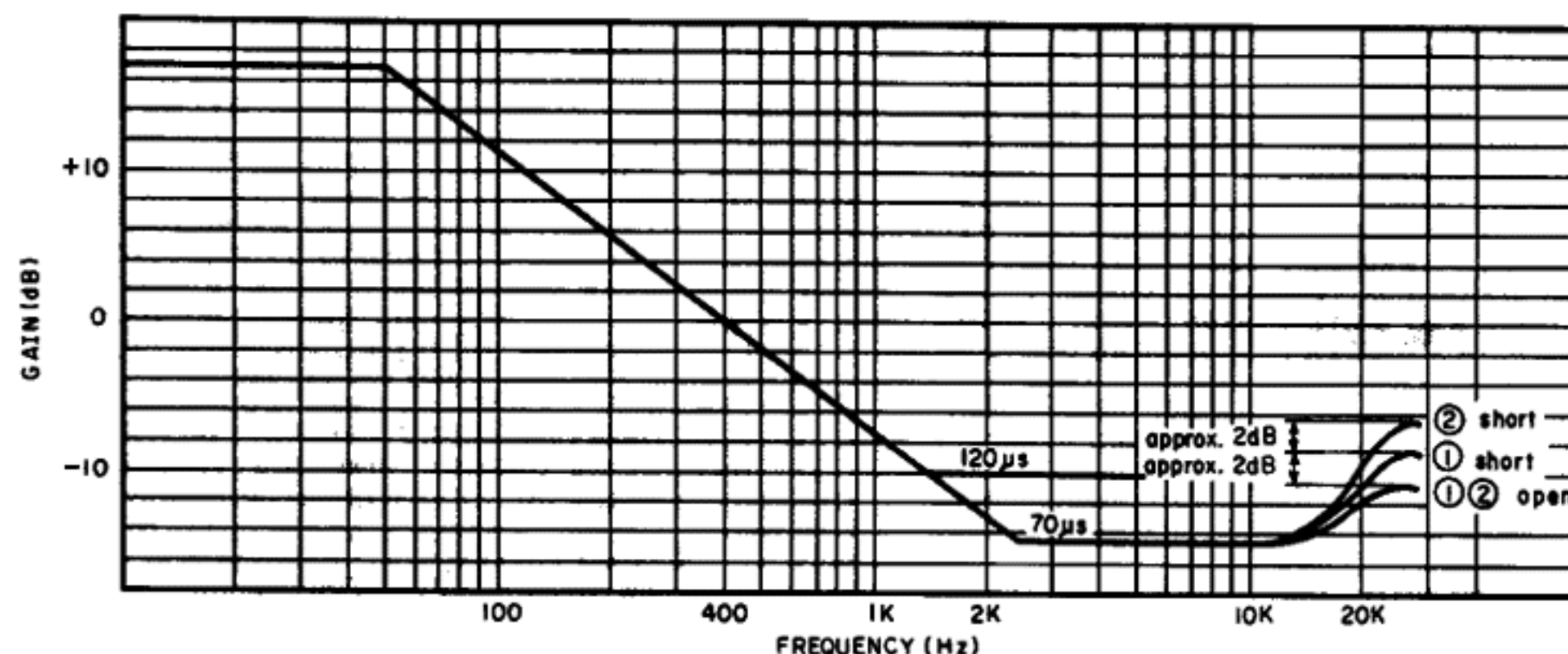


Fig. 4.2.2

## (2) Record Current Frequency Response Adjustment

Record eq. peaking is adjusted for compensating the overall frequency response when playback frequency response is completed.

Normally however peaking frequency is pre-adjusted to approx. 23 kHz in Record mode. Refer to Fig. 4.2.3.

### (a) For ZX Tape

- 1) Feed in 400 Hz (0 dB), then record and play it back. Adjust bias current by VR106 (VR206) on the Control P.C.B. Ass'y to obtain 0.8% distortion.
- 2) Feed in 10 kHz and 400 Hz (-20 dB), then record and play them back.  
Check the difference of the levels between 10 kHz and 400 Hz, and mount an additional capacitor in parallel with C126 (C226) on the Main P.C.B. Ass'y from the dip side of the printed circuit board depending upon the difference of the levels against 400 Hz. Refer to Fig. 4.2.4.

| Level Difference | Addition | Total   |
|------------------|----------|---------|
| 0 dB             | 0        | 820 pF  |
| -1 dB            | 220 pF   | 1040 pF |

- 3) Feed in 22 kHz (-20 dB), then record and play it back. Adjust record peaking coil L503 (L603) on the Main P.C.B. Ass'y to obtain flat overall frequency response.

### (b) For SX Tape

- 1) Feed in 15 kHz and 400 Hz (-20 dB), then record and play them back.  
Adjust bias current by VR105 (VR205) on the Control P.C.B. Ass'y to obtain flat overall frequency response.
- 2) Feed in 20 kHz and 400 Hz (-20 dB), then record and play them back.  
And check to insure that the overall frequency response is flat.

### (c) For EXII Tape

- 1) Feed in 15 kHz and 400 Hz (-20 dB), then record and play them back.  
Adjust bias current by VR104 (VR204) on the Control P.C.B. Ass'y to obtain flat overall frequency response.
- 2) Feed in 20 kHz and 400 Hz (-20 dB), then record and play them back.  
And check to insure that the overall frequency response is flat.

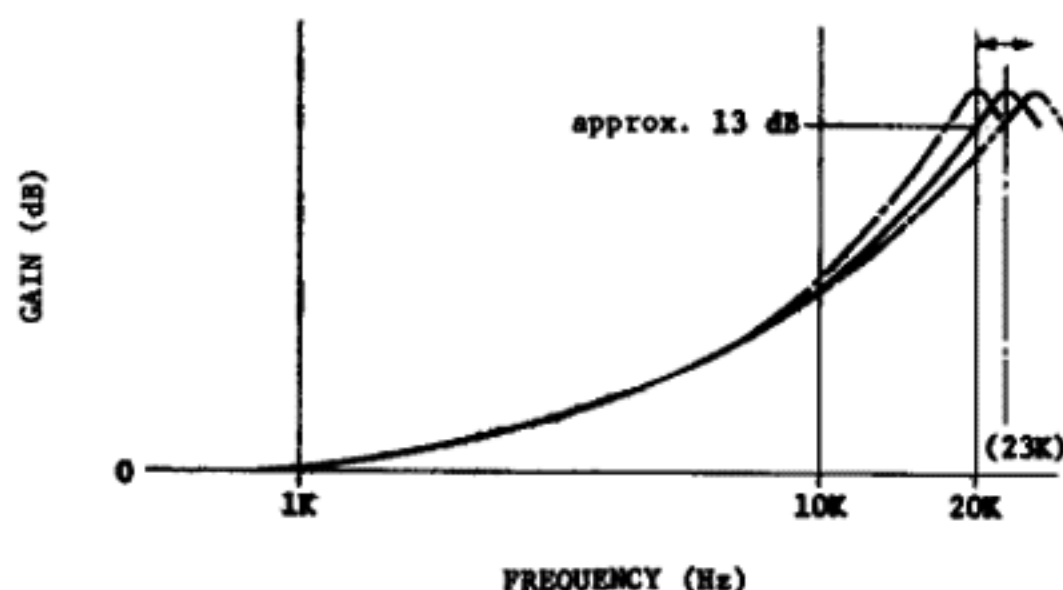


Fig. 4.2.3

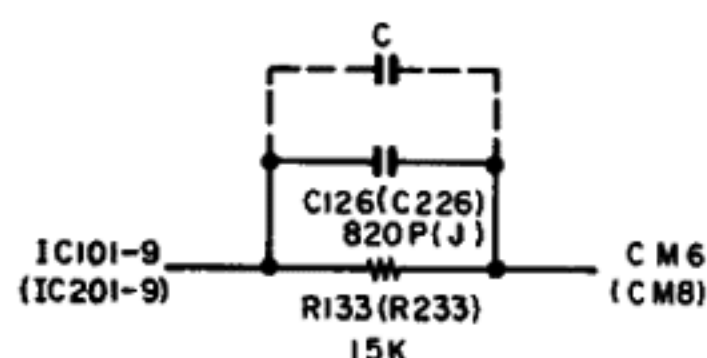


Fig. 4.2.4

## 4.3. Dolby NR Circuit Check

Dolby NR circuit incorporates Dolby NR ICs which have no adjustment point.

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

### 4.3.1. Dolby NR B-Type Circuit Check

#### (1) Playback Dolby NR Circuit

Signal Source: 1.4 kHz to negative side of C131 (C231) on Main P.C.B.  
Output Connection: VTVM to TP101 (TP201) on Main P.C.B.  
Mode: Stop  
Monitor SW — Tape  
Dolby NR SW — B-Type/OFF

- Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.
- Set the Dolby NR switch to B-Type.  
Feed in 1.4 kHz and adjust the generator output control to obtain 35 mV on the VTVM.
- Set the Dolby NR switch to OFF.  
Check to insure that the reading is +3.2 dB  $\pm$  1.5 dB on the VTVM.

#### (2) Record Dolby NR Circuit

Signal Source: 1.4 kHz to Input Jacks  
Output Connection: VTVM to TP101 (TP201) and CM6 (CM8) on Main P.C.B.  
Mode: Stop  
Monitor SW — Source  
Dolby NR SW — B-Type/OFF

- Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.
- Feed in 1.4 kHz and adjust the Input Level controls to obtain 35 mV/11.1 mV on the VTVM.
- Remove the VTVM from TP101 (TP201) and reconnect it to CM6 (CM8) on the Main P.C.B. Ass'y.
- Check to insure that the reading at CM6 (CM8) corresponds to the following with Dolby NR switch OFF and B-Type.

| Input Level at TP101, TP201 | Level at CM6, CM8 |                      |
|-----------------------------|-------------------|----------------------|
|                             | Dolby NR OFF      | Dolby NR B-Type      |
| 35 mV                       | 0 dB              | +3.2 dB $\pm$ 1.5 dB |
| 11.1 mV                     | 0 dB              | +8.2 dB $\pm$ 1.5 dB |

### 4.3.2. Dolby NR C-Type Circuit Check

#### (1) Playback Dolby NR Circuit

Signal Source: 1.4 kHz to negative side of C131 (C231) on Main P.C.B.  
Output Connection: VTVM to TP101 (TP201) on Main P.C.B.  
Mode: Stop  
Monitor SW — Tape  
Dolby NR SW — C-Type/OFF

- Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.
- Set the Dolby NR switch to C-Type.  
Feed in 1.4 kHz and adjust the generator output control to obtain 35 mV on the VTVM.
- Set the Dolby NR switch to OFF.  
Check to insure that the reading is +6.5 dB  $\pm$  1.5 dB on the VTVM.

#### (2) Record Dolby NR Circuit

Signal Source: 1.4 kHz to Input Jacks  
Output Connection: VTVM to TP101 (TP201) and CM6 (CM8) on Main P.C.B.  
Mode: Stop  
Monitor SW — Source  
Dolby NR SW — C-Type/OFF

- Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.
- Feed in 1.4 kHz and adjust the Input Level controls to obtain 35 mV/11.1 mV on the VTVM.
- Remove the VTVM from TP101 (TP201) and reconnect it to CM6 (CM8) on the Main P.C.B. Ass'y.
- Check to insure that the reading at CM6 (CM8) corresponds to the following with Dolby NR switch OFF and C-Type.

| Input Level at TP101, TP201 | Level at CM6, CM8 |                       |
|-----------------------------|-------------------|-----------------------|
|                             | Dolby NR OFF      | Dolby NR C-Type       |
| 35 mV                       | 0 dB              | +6.5 dB $\pm$ 1.5 dB  |
| 11.1 mV                     | 0 dB              | +11.4 dB $\pm$ 1.5 dB |

## 5. MECHANISM ASS'Y AND PARTS LIST

### 5.1. Synthesis

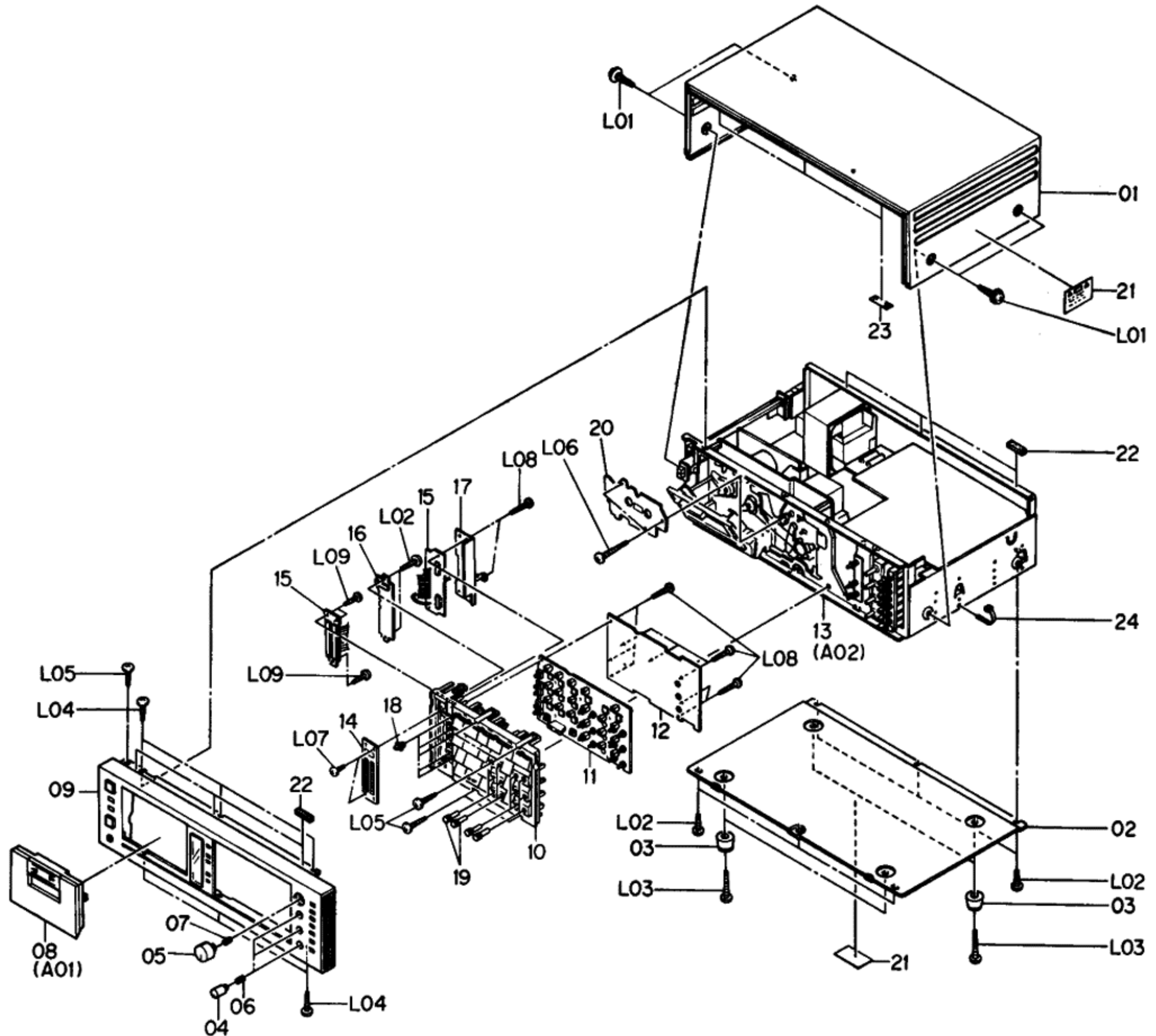


Fig. 5.1

| Schematic Ref. No. | Part No. | Description                     | Q'ty | Schematic Ref. No. | Part No. | Description                       | Q'ty |
|--------------------|----------|---------------------------------|------|--------------------|----------|-----------------------------------|------|
|                    | HA04393A | Synthesis (Japan)               | 1    | 14                 | 0H04198A | Meter Cover                       | 1    |
|                    | HA04392A | Synthesis (U.S.A. & Canada)     | 1    | 15                 | BA04893A | Indicator P.C.B. Ass'y            | 1    |
|                    | HA04396A | Synthesis (220V Class 2)        | 1    | 16                 | BA04894A | Counter P.C.B. Ass'y              | 1    |
|                    | HA04391A | Synthesis (UK)                  | 1    | 17                 | 0J04698B | Shield Plate                      | 1    |
|                    | HA04395A | Synthesis (Australia)           | 1    | 18                 | 0H04180A | Function Button                   | 5    |
|                    | HA04394A | Synthesis (Others)              | 1    | 19                 | 0H04204A | Calibration Volume Knob           | 12   |
|                    |          | Serial No.: A80101001 -         |      | 20                 | HA04422A | Cover Plate                       | 1    |
| 01                 | 0H04010A | Top Cover                       | 1    | 21                 | 0M04377A | Caution Label (U.S.A. & Canada)   | 2    |
| 02                 | 0J04652A | Bottom Cover                    | 1    | 22                 | 0J04550A | Top Cover Cushion                 | 6    |
| 03                 | 0J03564A | Leg T-H                         | 4    | 23                 | 0J04080A | Top Cover Himelon                 | 3    |
| 04                 | 0H04203A | Volume Knob                     | 3    | 24                 | 0B08515A | Insu-Lock                         | 1    |
| 05                 | 0H04202A | Master Volume Knob              | 1    | L01                | 0E03032A | BT 4x8 @ Pan (Washer Faced)       | 4    |
| 06                 | 0H03737A | Volume Knob Base                | 3    | L02                | 0E00857A | BT 3x6 @ Binding                  | 8    |
| 07                 | 0H03739A | Master Volume Knob Base         | 1    | L03                | 0E00865A | BT 3x10 @ Binding                 | 4    |
| 08                 | HA04401A | Cassette Lid Ass'y              | 1    | L04                | 0E00921A | BT 3x8 @ Binding (Black Chromate) | 6    |
| 09                 | HA04398A | Front Panel Ass'y               | 1    | L05                | 0E00868A | BT 3x8 @ Binding                  | 3    |
| 10                 | HA04399A | Front Panel Escutcheon Ass'y    | 1    | L06                | 0E00950A | BT 3x14 @ Pan (Black Chromate)    | 2    |
| 11                 | BA04892A | Control P.C.B. Ass'y            | 1    | L07                | 0E00869A | BT 2.6x4 @ Binding                | 2    |
| 12                 | 0J04707A | Insulator                       | 1    | L08                | 0E00954A | BT 2.6x8 @ Binding                | 10   |
| 13                 | JA03971A | Chassis Ass'y (Japan)           | 1    | L09                | 0E00859A | BT 2.6x6 @ Binding                | 3    |
|                    | JA03970A | Chassis Ass'y (U.S.A. & Canada) | 1    |                    |          |                                   |      |
|                    | JA03974A | Chassis Ass'y (220V Class 2)    | 1    |                    |          |                                   |      |
|                    | JA03969A | Chassis Ass'y (UK)              | 1    |                    |          |                                   |      |
|                    | JA03973A | Chassis Ass'y (Australia)       | 1    |                    |          |                                   |      |
|                    | JA03972A | Chassis Ass'y (Others)          | 1    |                    |          |                                   |      |

## 5.2. Cassette Lid Ass'y (A01)

## 5.3. Chassis Ass'y (A02)

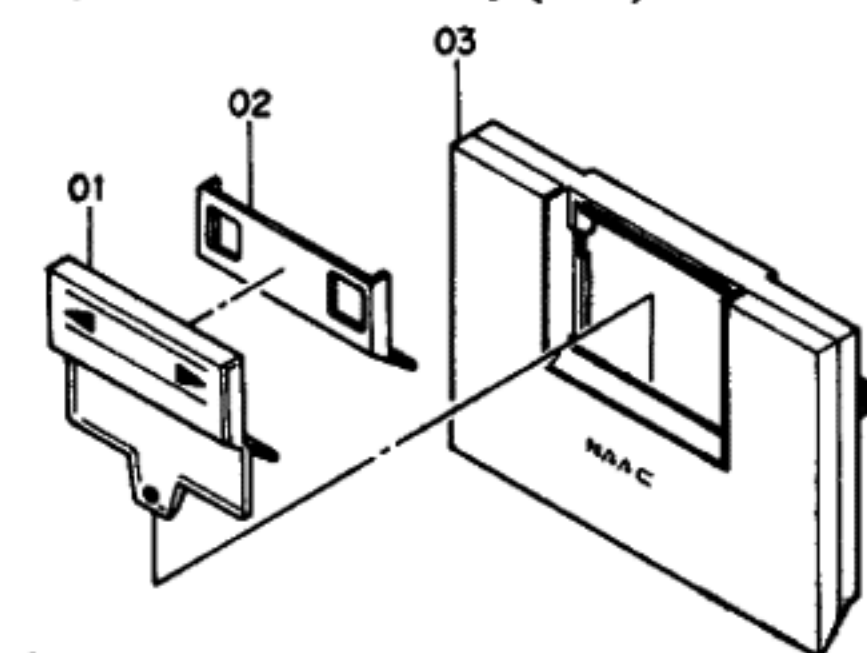


Fig. 5.2

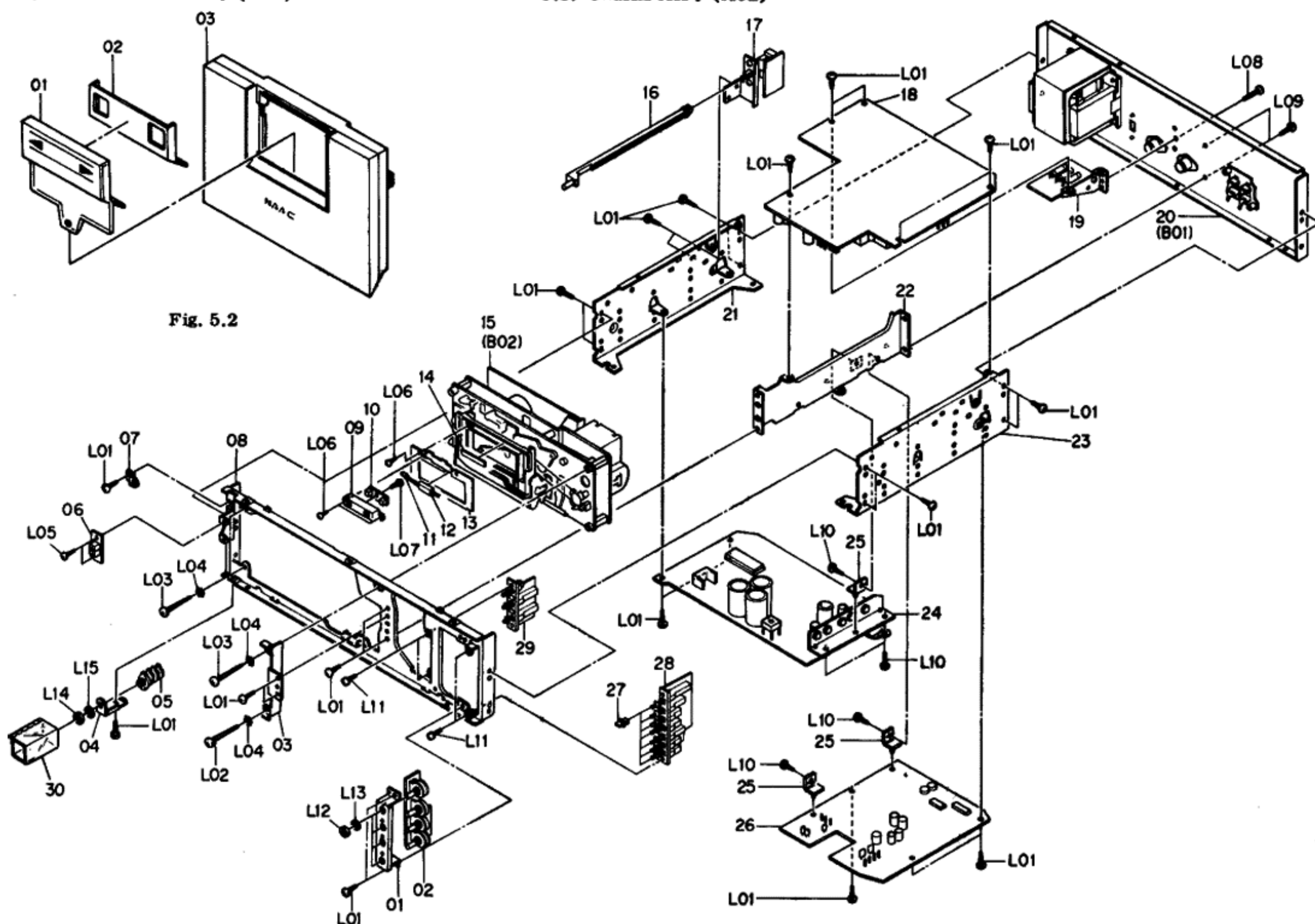


Fig. 5.3

| Schematic Ref. No. | Part No. | Description                                                            | Qty | Schematic Ref. No. | Part No. | Description                                         | Qty |
|--------------------|----------|------------------------------------------------------------------------|-----|--------------------|----------|-----------------------------------------------------|-----|
| A01                | HA04401A | Cassette Lid Ass'y<br>Serial No.: A80101001 -                          | 1   | 18                 | BA04870A | Main P.C.B. Ass'y                                   | 1   |
| 01                 | OH04189A | Lid Cover                                                              | 1   | 19                 | BA04899A | Fuse P.C.B. Ass'y<br>(U.S.A., Canada & Others)      | 1   |
| 02                 | OH04187A | Indicator Reflector                                                    | 1   |                    | BA04900A | Fuse P.C.B. Ass'y (UK, 220V<br>Class 2 & Australia) | 1   |
| 03                 | HA04414A | Cassette Lid Sub Ass'y                                                 | 1   |                    | BA04898A | Fuse P.C.B. Ass'y (Japan)                           | 1   |
| A02                | JA03969A | Chassis Ass'y (UK)                                                     | 1   | 20                 | HA04403A | Rear Panel Ass'y (UK)                               | 1   |
|                    | JA03970A | Chassis Ass'y (U.S.A. & Canada)                                        | 1   |                    | HA04408A | Rear Panel Ass'y<br>(U.S.A. & Canada)               | 1   |
|                    | JA03971A | Chassis Ass'y (Japan)                                                  | 1   |                    | HA04404A | Rear Panel Ass'y (Japan)                            | 1   |
|                    | JA03972A | Chassis Ass'y (Others)                                                 | 1   |                    | HA04405A | Rear Panel Ass'y (Others)                           | 1   |
|                    | JA03973A | Chassis Ass'y (Australia)                                              | 1   |                    | HA04406A | Rear Panel Ass'y (Australia)                        | 1   |
|                    | JA03974A | Chassis Ass'y (220V Class 2)<br>Serial No.: A80101001 -                | 1   |                    | HA04407A | Rear Panel Ass'y (220V Class 2)                     | 1   |
| 01                 | OJ04643A | Volume Holder                                                          | 1   | 21                 | OJ04650A | Side Chassis L                                      | 1   |
| 02                 | BA04890A | Volume P.C.B. Ass'y                                                    | 1   | 22                 | OJ04649A | Center Chassis                                      | 1   |
| 03                 | OJ04135A | Mechanism Bracket                                                      | 1   | 23                 | OJ04651A | Side Chassis R                                      | 1   |
| 04                 | OJ04644A | Headphone Jack Holder                                                  | 1   | 24                 | BA04886A | Logic P.C.B. Ass'y                                  | 1   |
| 05                 | OB08511A | Headphone Jack                                                         | 1   | 25                 | OB08771A | Hinge                                               | 1   |
| 06                 | BA04897A | Timer Switch P.C.B. Ass'y                                              | 1   | 26                 | BA04879A | Auto Azimuth P.C.B. Ass'y                           | 1   |
| 07                 | OJ04645A | Power Switch Bar Holder                                                | 1   | 27                 | OH04179A | Function Button A                                   | 7   |
| 08                 | OJ04648A | Front Chassis                                                          | 1   | 28                 | BA04889A | Switch P.C.B. Ass'y                                 | 1   |
| 09                 | OH04186A | Indicator Cover                                                        | 1   | 29                 | BA04891A | Tape Select P.C.B. Ass'y                            | 1   |
| 10                 | BA04895A | Direction P.C.B. Ass'y                                                 | 1   | 30                 | OJ04516A | Headphone Jack Cover                                | 1   |
| 11                 | OB02228B | Lamp 14V 50mA                                                          | 1   | L01                | OE00857A | BT 3x6 @ Binding (Chromate)                         | 31  |
| 12                 | OJ04506C | Lamp Holder                                                            | 1   | L02                | OE00924A | BT 4x16 @ Binding (Chromate)                        | 1   |
| 13                 | OJ04637A | Cassette Case Plate                                                    | 1   | L03                | OE00944A | BT 4x15 @ Binding<br>(Black Chromate)               | 3   |
| 14                 | BA04896A | Connector P.C.B. Ass'y                                                 | 1   | L04                | OE00078A | Washer 4mm Toothed Lock                             | 4   |
| 15                 | CA08445A | Mechanism Ass'y                                                        | 1   | L05                | OE03022A | BT 2x4 @ Binding<br>(Black Chromate)                | 2   |
| 16                 | OJ04604B | Power Switch Bar                                                       | 1   | L06                | OE00869A | BT 2x4 @ Binding (Chromate)                         | 1   |
| 17                 | BA04947A | Power Switch P.C.B. Ass'y<br>(U.S.A. & Canada)                         | 1   | L07                | OE00873A | BT 2.6x5 @ Binding (Chromate)                       | 1   |
|                    | BA04948A | Power Switch P.C.B. Ass'y (UK,<br>220V Class 2, Australia &<br>Others) | 1   | L08                | OE00921A | BT 3x8 @ Binding<br>(Black Chromate)                | 1   |
|                    | BA04946A | Power Switch P.C.B. Ass'y (Japan)                                      | 1   | L09                | OE00860A | BT 3x6 @ Binding<br>(Black Chromate)                | 2   |
|                    |          |                                                                        |     | L10                | OE00612A | M3x6 @ Pan                                          | 3   |

#### 5.4. Rear Panel Ass'y (B01)

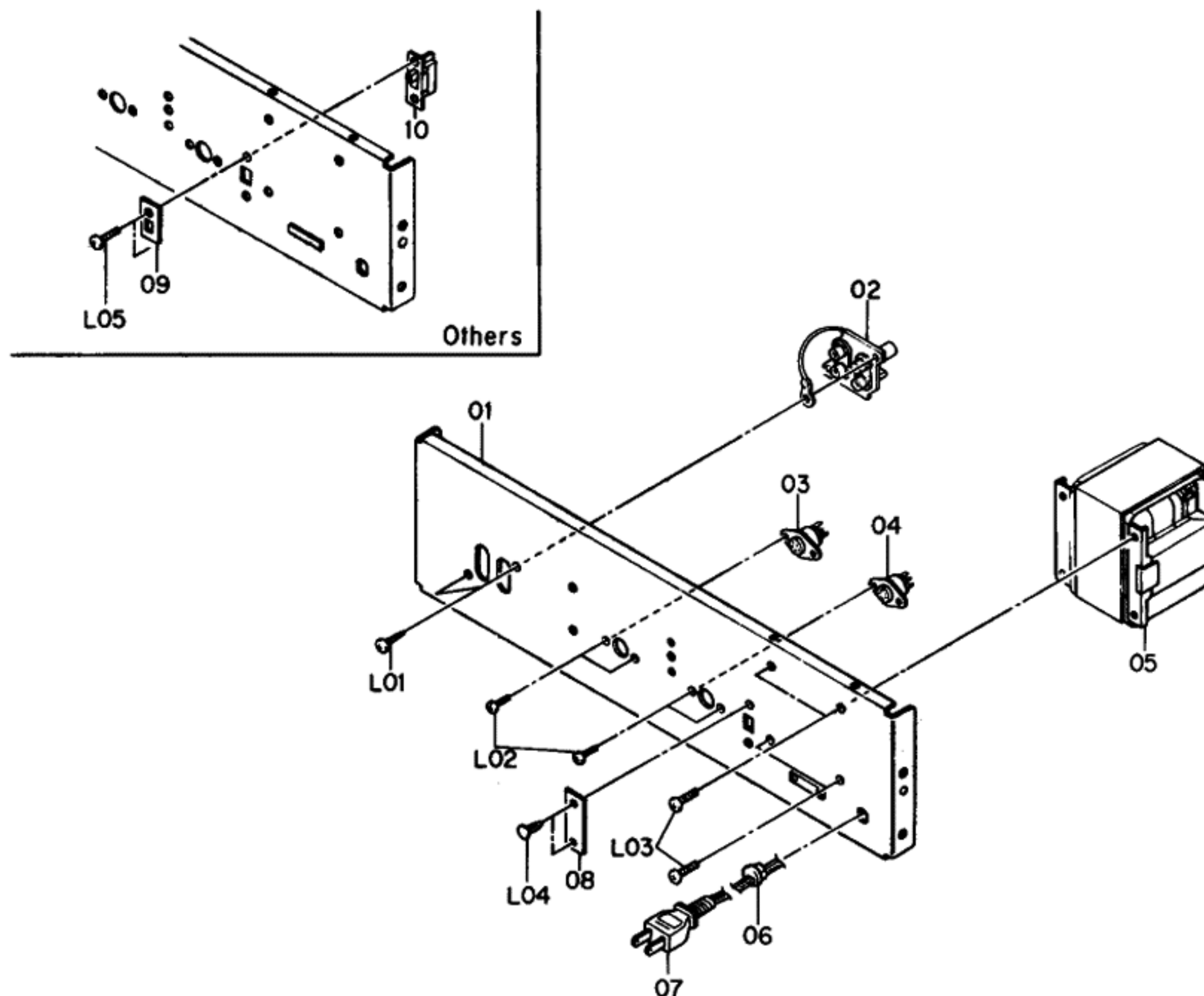


Fig. 5.4

| Schematic Ref. No. | Part No. | Description                                                              | Q'ty | Schematic Ref. No. | Part No. | Description                                                         | Q'ty |
|--------------------|----------|--------------------------------------------------------------------------|------|--------------------|----------|---------------------------------------------------------------------|------|
| B01                | HA04408A | Rear Panel Ass'y (U.S.A. & Canada)                                       | 1    | L03                | 0E00953A | M4x10 ⊕ Binding (Black Chromate)                                    | 4    |
|                    | HA04404A | Rear Panel Ass'y (Japan)                                                 | 1    | L04                | 0B08583A | Plastic Rivet (U.S.A., Canada, Japan, 220V Class 2, UK & Australia) | 2    |
|                    | HA04405A | Rear Panel Ass'y (Others)                                                | 1    | L05                | 0E00594A | M3x8 ⊕ Binding (Bronze) (Others)                                    | 2    |
|                    | HA04403A | Rear Panel Ass'y (UK)                                                    | 1    |                    |          |                                                                     |      |
|                    | HA04407A | Rear Panel Ass'y (220V Class 2)                                          | 1    |                    |          |                                                                     |      |
|                    | HA04406A | Rear Panel Ass'y (Australia) Serial No.: A80101001 -                     | 1    |                    |          |                                                                     |      |
| 01                 | 0H04205A | Rear Panel                                                               | 1    |                    |          |                                                                     |      |
| 02                 | BA04945A | Pin Jack P.C.B. Ass'y                                                    | 1    |                    |          |                                                                     |      |
| 03                 | BA04944A | 4P DIN Socket Ass'y                                                      | 1    |                    |          |                                                                     |      |
| 04                 | BA04949A | 8P DIN Socket Ass'y                                                      | 1    |                    |          |                                                                     |      |
| 05                 | 0B06639B | Power Transformer (U.S.A. & Canada)                                      | 1    |                    |          |                                                                     |      |
|                    | 0B06640B | Power Transformer (Japan)                                                | 1    |                    |          |                                                                     |      |
|                    | 0B06637B | Power Transformer (Others)                                               | 1    |                    |          |                                                                     |      |
|                    | 0B06638B | Power Transformer (UK, Australia & 220V Class 2)                         | 1    |                    |          |                                                                     |      |
| 06                 | 0B08037U | Cord Bushing C (U.S.A., Canada, Japan, 220V Class 2, Australia & Others) | 1    |                    |          |                                                                     |      |
|                    | 0B08351A | Cord Bushing 4K-4 (UK)                                                   | 1    |                    |          |                                                                     |      |
| 07                 | 0B08533A | Power Cord (U.S.A. & Canada)                                             | 1    |                    |          |                                                                     |      |
|                    | 0B08219B | Power Cord (Japan)                                                       | 1    |                    |          |                                                                     |      |
|                    | 0B08348A | Power Cord (UK)                                                          | 1    |                    |          |                                                                     |      |
|                    | 0B08093U | Power Cord (220V Class 2)                                                | 1    |                    |          |                                                                     |      |
|                    | 0B05241A | Power Cord (Australia)                                                   | 1    |                    |          |                                                                     |      |
| 08                 | 0J04601B | Switch Cover (U.S.A., Canada, Japan, 220V Class 2, UK & Australia)       | 1    |                    |          |                                                                     |      |
| 09                 | 0M03946A | Voltage Selector Lock Plate C (Others)                                   | 1    |                    |          |                                                                     |      |
| 10                 | 0B07092U | Voltage Selector (Others)                                                | 1    |                    |          |                                                                     |      |
| L01                | 0E00921A | BT 3x8 ⊕ Binding (Black Chromate)                                        | 2    |                    |          |                                                                     |      |
| L02                | 0E00714A | M2.6x6 ⊕ Binding (Bronze)                                                | 4    |                    |          |                                                                     |      |

5.5. Mechanism Ass'y (B02)

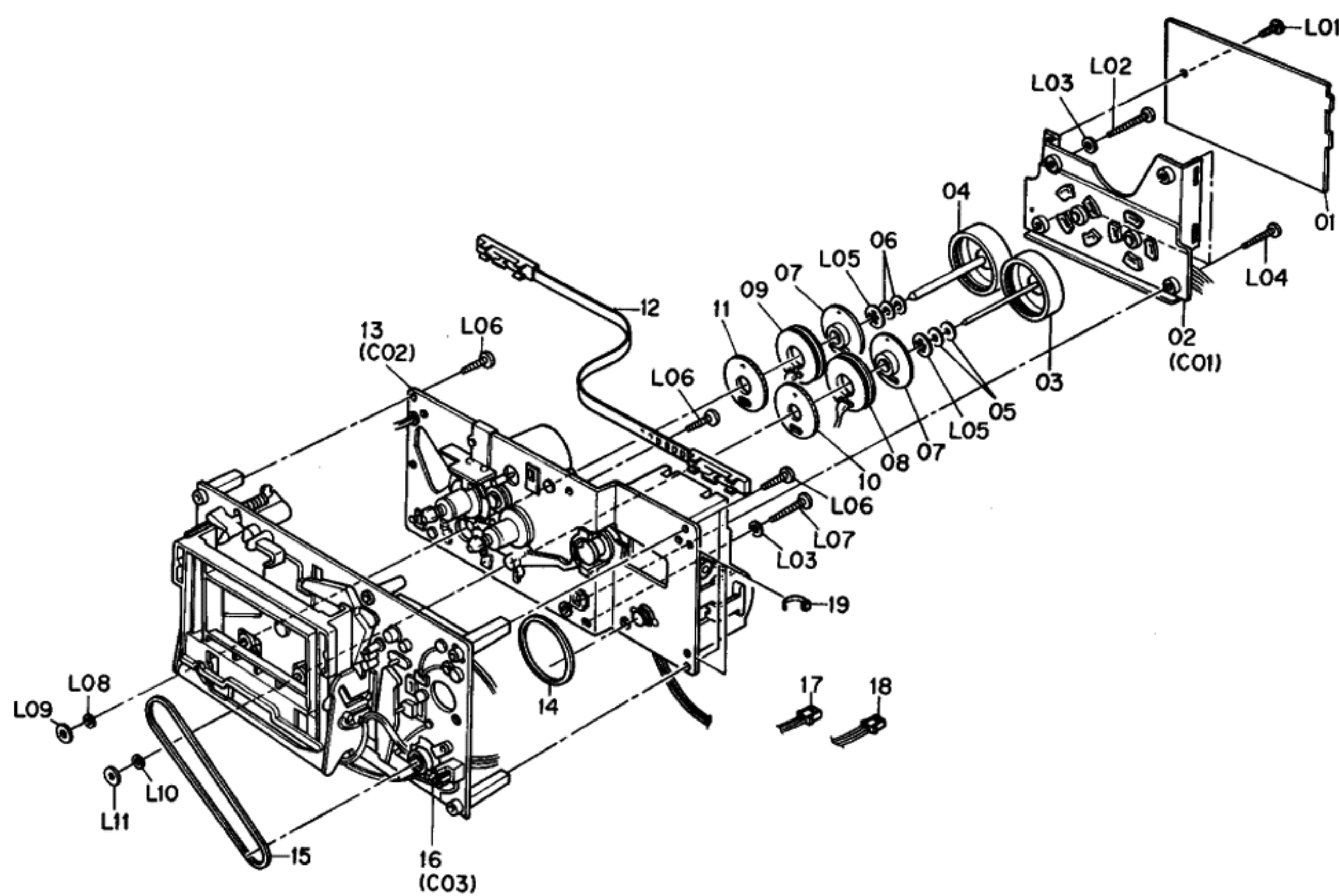


Fig. 5.5

5.6. Flywheel Holder Ass'y (C01)

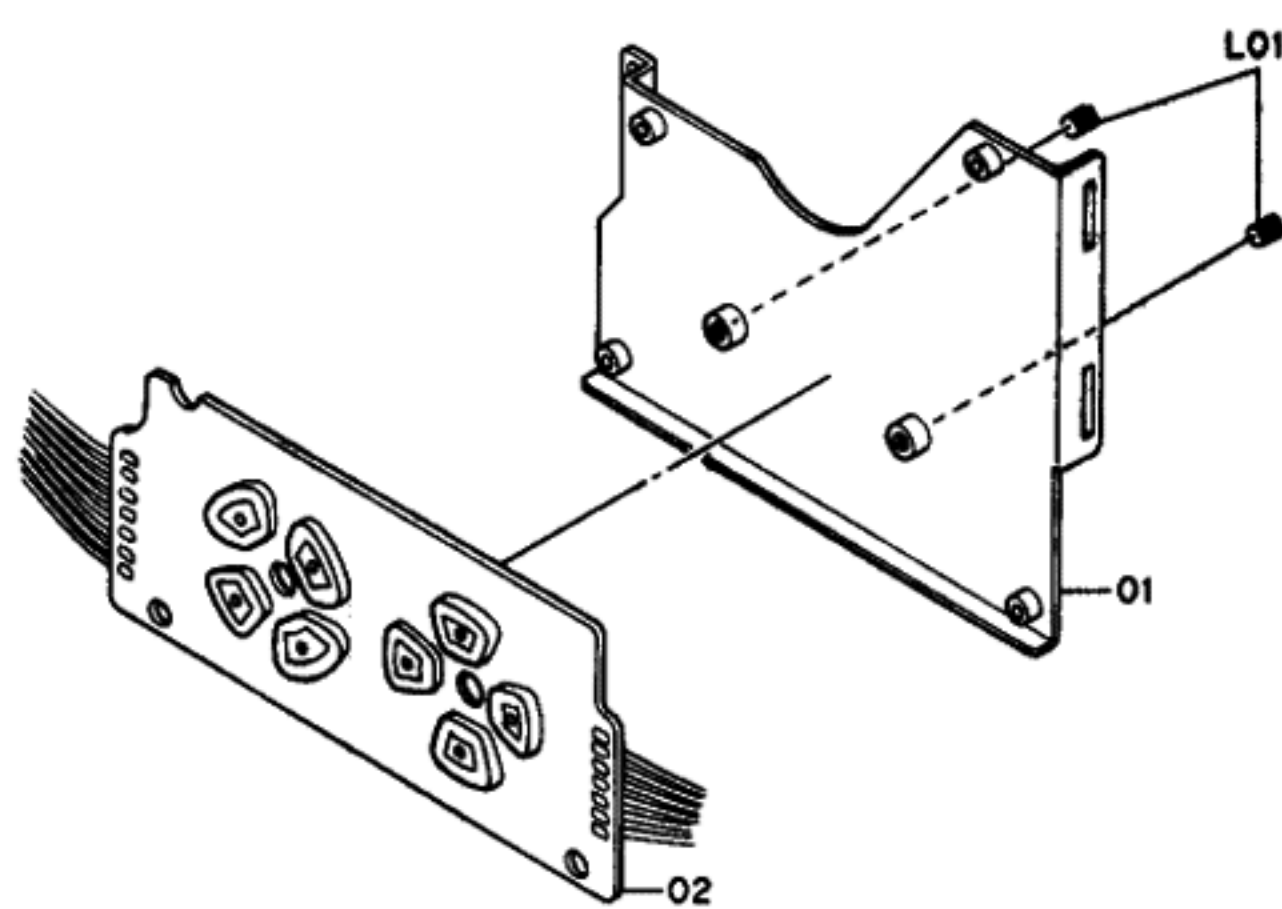


Fig. 5.6

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

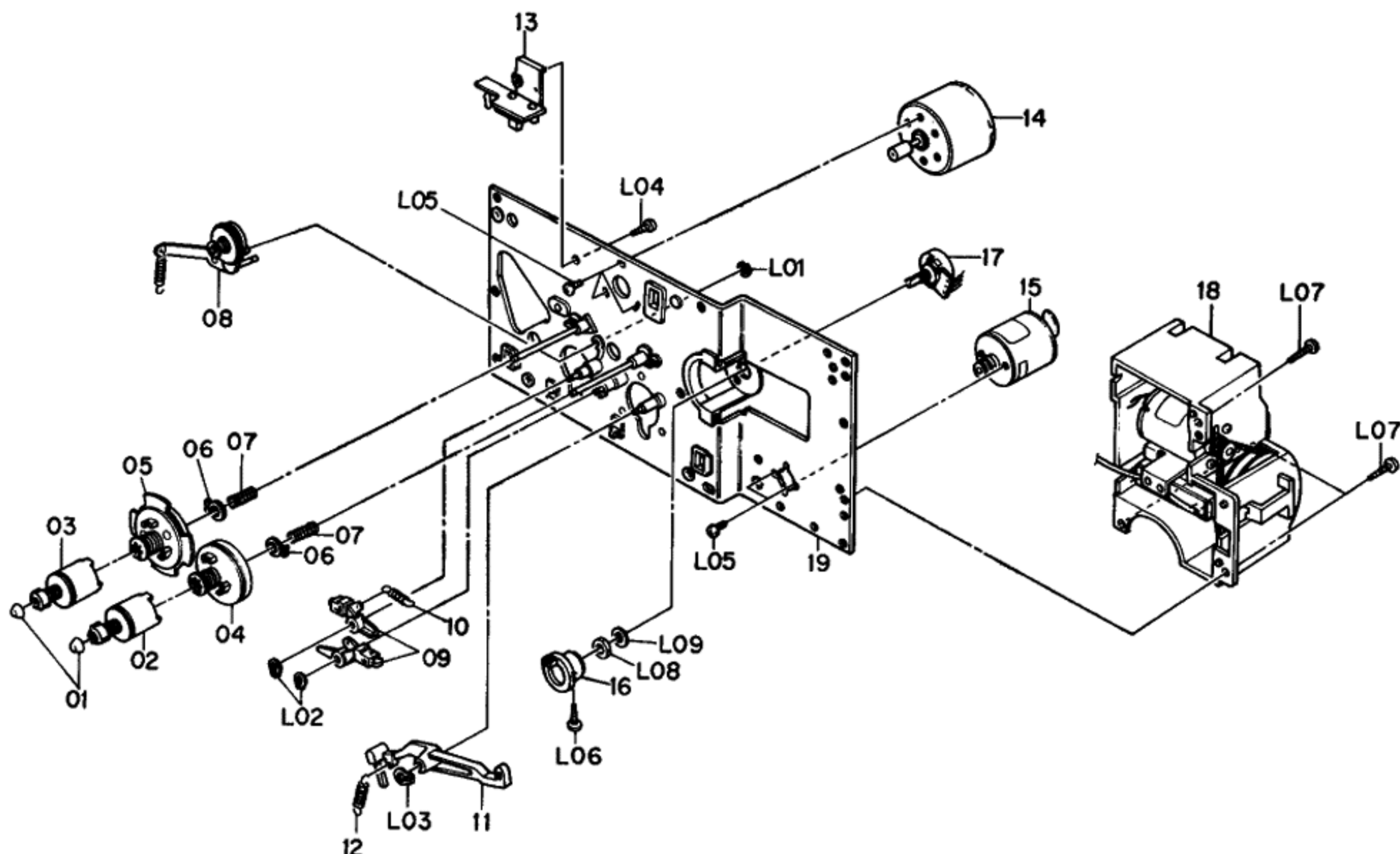


Fig. 5.7

| Schematic Ref. No. | Part No. | Description                                      | Q'ty | Schematic Ref. No. | Part No. | Description                                            | Q'ty |
|--------------------|----------|--------------------------------------------------|------|--------------------|----------|--------------------------------------------------------|------|
| B02                | CA08445A | Mechanism Ass'y<br>Serial No.: A80101001 -       | 1    | C02                | CA08444A | Sub Mechanism Chassis Ass'y<br>Serial No.: A80101001 - | 1    |
| 01                 | BA04941A | Motor Control P.C.B. Ass'y                       | 1    | 01                 | OC08039B | Reel Hub Head                                          | 2    |
| 02                 | CA08422A | Flywheel Holder Ass'y                            | 1    | 02                 | CA08038B | Reel Hub B Pulley Ass'y                                | 1    |
| 03                 | CA08433A | Take-up Flywheel Sub Ass'y                       | 1    | 03                 | CA08397A | Reel Hub S Pulley Ass'y                                | 1    |
| 04                 | CA08434A | Supply Flywheel Sub Ass'y                        | 1    | 04                 | CA08037A | Reel Hub Take-up Ass'y                                 | 1    |
| 05                 | OC08020B | Thrust Washer 2.6mm                              | 1    | 05                 | CA08452A | Reel Hub Supply Ass'y                                  | 1    |
| 06                 | OC08021B | Thrust Washer 3.1mm                              | 2    | 06                 | CA08039A | Back Tension Ass'y                                     | 2    |
| 07                 | OC08333A | Sensor Plate                                     | 2    | 07                 | OC08269A | Back Tension Spring C                                  | 2    |
| 08                 | CA08391A | Sensor Coil Take-up Sub Ass'y                    | 1    | 08                 | CA08193A | Idler Ass'y                                            | 1    |
| 09                 | CA08454A | Sensor Coil Supply Sub Ass'y                     | 1    | 09                 | CA08042A | Brake Ass'y                                            | 2    |
| 10                 | CA08483A | Sensor Gear Take-up Ass'y                        | 1    | 10                 | OC08129B | Brake Arm Spring                                       | 1    |
| 11                 | CA08485A | Sensor Gear Supply Ass'y                         | 1    | 11                 | OC08030C | Brake Drive Arm                                        | 1    |
| 12                 | OC08237A | Azimuth Wire                                     | 1    | 12                 | OC08128A | Brake Drive Arm Spring                                 | 1    |
| 13                 | CA08444A | Sub Mechanism Chassis Ass'y                      | 1    | 13                 | BA04943A | Counter Pulse Generator P.C.B.<br>Ass'y                | 1    |
| 14                 | OC08099B | Cam Motor Belt                                   | 1    | 14                 | CA08242A | Reel Motor Ass'y                                       | 1    |
| 15                 | OC08098B | Counter Belt B                                   | 1    | 15                 | CA08034A | Control Motor Ass'y                                    | 1    |
| 16                 | CA08443A | Main Mechanism Chassis Ass'y                     | 1    | 16                 | OC08053B | Volume Coupler                                         | 1    |
| 17                 | OB02333B | 3P-H Connector (Blue with Shield)                | 1    | 17                 | OB07240A | Volume Control 10K (B)                                 | 1    |
| 18                 | OB08672A | 3P-H Connector                                   | 1    | 18                 | CA08453A | Playback Head Azimuth<br>Alignment Motor Ass'y         | 1    |
| 19                 | OB08515A | Insu-Lock                                        | 1    | 19                 | CA08194A | Sub Chassis Ass'y B                                    | 1    |
| L01                | OE00857A | BT 3x6 @ Pan                                     | 1    | L01                | OE00698A | E-Ring 2.5mm                                           | 1    |
| L02                | OE00834A | BT 3x30 @ Pan                                    | 1    | L02                | OE00837A | Stopper Ring 3mm                                       | 2    |
| L03                | OE00178A | Washer 3.3x8x0.5                                 | 2    | L03                | OE00838A | Stopper Ring 4mm                                       | 1    |
| L04                | OE00833A | BT 3x20 @ Pan                                    | 3    | L04                | OE00859A | BT 2.6x6 @ Binding                                     | 1    |
| L05                | OE03023A | Stopper Ring 8mm                                 | 2    | L05                | OE00226A | M2.6x4 @ Pan                                           | 5    |
| L06                | OE00883A | BT 3x18 @ Pan                                    | 5    | L06                | OE00792A | BT2.6x6 @ Pan                                          | 1    |
| L07                | OE00835A | BT 3x25 @ Pan                                    | 1    | L07                | OE00846A | BT 3x8 @ Pan                                           | 3    |
| L08                | OC08347A | Washer 3.1mm FT                                  | 1    | L08                | —        | Volume Nut                                             | (1)  |
| L09                | OC08345A | Capstan Washer 3mm                               | 1    | L09                | —        | Volume Washer                                          | (1)  |
| L10                | OC08348A | Washer 2.6mm FT                                  | 1    |                    |          |                                                        |      |
| L11                | OC08346A | Capstan Washer 2.5mm                             | 1    |                    |          |                                                        |      |
| C01                | CA08422A | Flywheel Holder Ass'y<br>Serial No.: A80101001 - | 1    |                    |          |                                                        |      |
| 01                 | CA08382B | Flywheel Holder Sub Ass'y                        | 1    |                    |          |                                                        |      |
| 02                 | BA04942A | Motor P.C.B. Ass'y                               | 1    |                    |          |                                                        |      |
| L01                | OC08068C | Thrust Screw                                     | 2    |                    |          |                                                        |      |

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

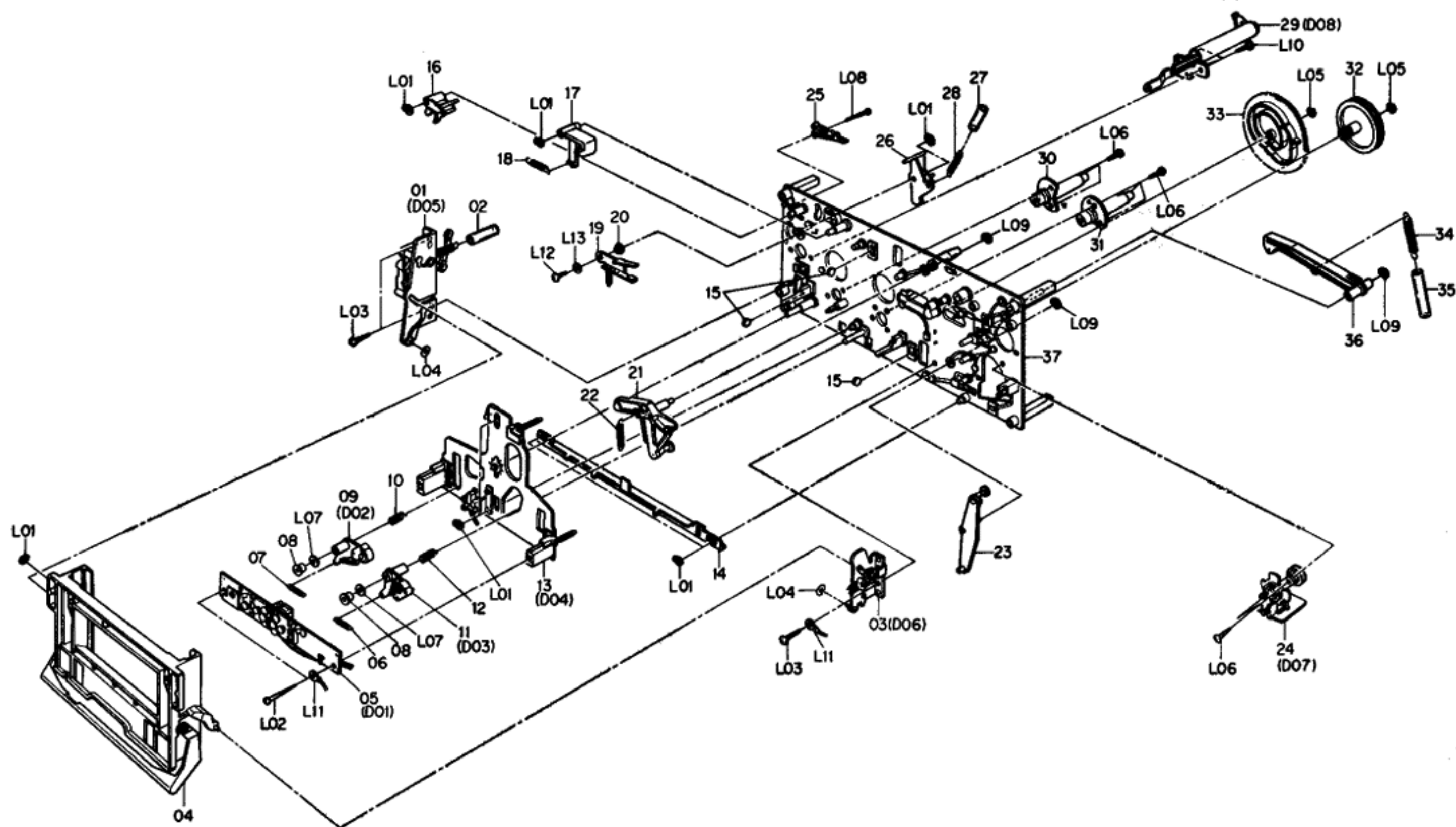


Fig. 5.8

| Schematic Ref. No. | Part No. | Description                                             | Q'ty | Schematic Ref. No. | Part No. | Description        | Q'ty |
|--------------------|----------|---------------------------------------------------------|------|--------------------|----------|--------------------|------|
| C03                | CA08443A | Main Mechanism Chassis Ass'y<br>Serial No.: A80101001 - | 1    | 36                 | CA08028A | Counter-Load Arm   | 1    |
| 01                 | CA08350A | Cassette Case Holder L Ass'y                            | 1    | 37                 | CA08347A | Main Chassis Ass'y | 1    |
| 02                 | OC08152A | Lid Arm Spring Tube                                     | 1    | L01                | OE00837A | Stopper Ring 3mm   | 9    |
| 03                 | CA08455A | Cassette Case Holder R Ass'y                            | 1    | L02                | OE00834A | BT 3x30 @ Pan      | 2    |
| 04                 | CA08451A | Cassette Case Ass'y                                     | 1    | L03                | OE00831A | BT 3x10 @ Pan      | 3    |
| 05                 | CA08438A | Head Mount Base Ass'y                                   | 1    | L04                | OE00254A | Washer 3.1mm       | 2    |
| 06                 | OC08250A | Take-up Roller Arm Spring                               | 1    | L05                | OE00222A | E-Ring 2mm         | 2    |
| 07                 | OC08121A | Supply Roller Arm Spring                                | 1    | L06                | OE00876A | BT 2.6x8 @ Pan     | 8    |
| 08                 | OC08313A | Pressure Roller Arm Bushing                             | 2    | L07                | OE00178A | Washer 3mm         | 2    |
| 09                 | CA08437A | Supply Pressure Roller Arm Ass'y                        | 1    | L08                | OE00879A | BT 2x15 @ Pan      | 1    |
| 10                 | OC08122C | Supply Pressure Roller Thrust Spring                    | 1    | L09                | OE00838A | Stopper Ring 4mm   | 3    |
| 11                 | CA08436A | Take-up Pressure Roller Arm Ass'y                       | 1    | L10                | OE00846A | BT 3x8 @ Pan       | 3    |
| 12                 | OC08183B | Take-up Pressure Roller Thrust Spring                   | 1    | L11                | OE00895A | Earth Lug 3mm      | 2    |
| 13                 | CA08339A | Head Base Ass'y                                         | 1    | L12                | OE00859A | BT 2.6x6 @ Binding | 1    |
| 14                 | OC08368A | Pressure Roller Drive Bar D                             | 1    | L13                | OC08255A | Washer 2.6mm       | 1    |
| 15                 | OC08086B | Head Base Roller                                        | 3    |                    |          |                    |      |
| 16                 | OC08050B | Record Sensor Arm                                       | 1    |                    |          |                    |      |
| 17                 | OC08051E | Cassette Hold Arm                                       | 1    |                    |          |                    |      |
| 18                 | OC08120A | Cassette Hold Arm Spring                                | 1    |                    |          |                    |      |
| 19                 | OC08371A | Back Tension Arm Ass'y                                  | 1    |                    |          |                    |      |
| 20                 | OC08254A | Back Tension Arm Collar                                 | 1    |                    |          |                    |      |
| 21                 | OC08027A | Head Base Drive Arm Ass'y                               | 1    |                    |          |                    |      |
| 22                 | OC08143C | Head Base Drive Arm Spring                              | 1    |                    |          |                    |      |
| 23                 | CA08026A | Pressure Roller Drive Arm Ass'y                         | 1    |                    |          |                    |      |
| 24                 | CA08441A | Auto Shut-off Ass'y                                     | 1    |                    |          |                    |      |
| 25                 | OC08119A | Record Protector                                        | 1    |                    |          |                    |      |
| 26                 | OC08194C | Damper Lock Arm                                         | 1    |                    |          |                    |      |
| 27                 | OC08153A | Damper Lock Arm Spring Tube                             | 1    |                    |          |                    |      |
| 28                 | OC08116A | Record Arm Spring                                       | 1    |                    |          |                    |      |
| 29                 | CA08030A | Pneumatic Damper Ass'y                                  | 1    |                    |          |                    |      |
| 30                 | CA08404B | Supply DD Flange Ass'y                                  | 1    |                    |          |                    |      |
| 31                 | CA08457A | Take-up DD Flange Ass'y                                 | 1    |                    |          |                    |      |
| 32                 | CA08186A | Cam Drive Gear                                          | 1    |                    |          |                    |      |
| 33                 | OC08029H | Control Cam                                             | 1    |                    |          |                    |      |
| 34                 | OC08117A | Counter-Load Arm Spring                                 | 1    |                    |          |                    |      |
| 35                 | OC08152A | Counter-Load Arm Spring Tube                            | 1    |                    |          |                    |      |

### 5.9. Head Mount Base Ass'y (D01)

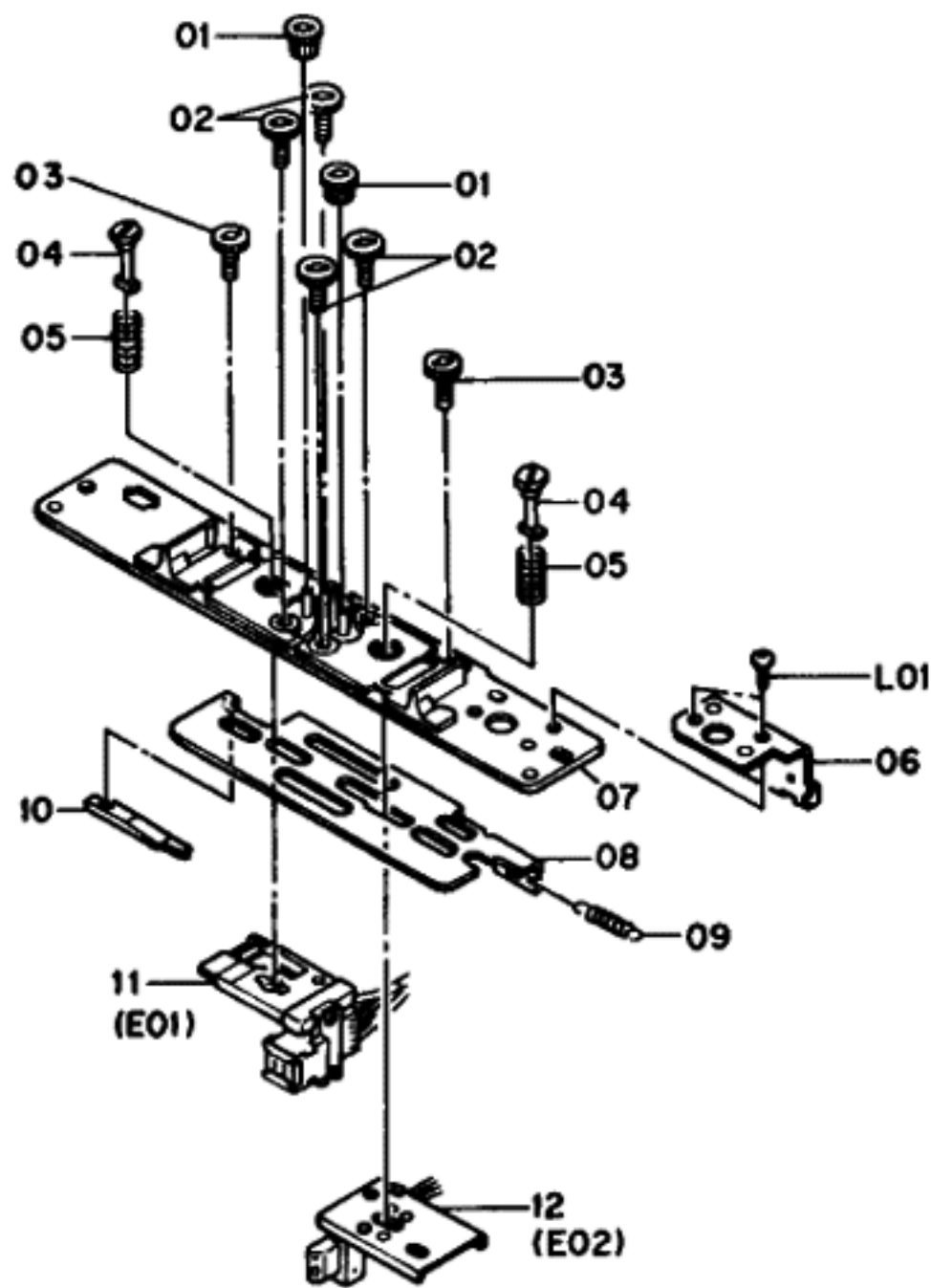


Fig. 5.9

### 5.10. Supply Pressure Roller Ass'y (D02)

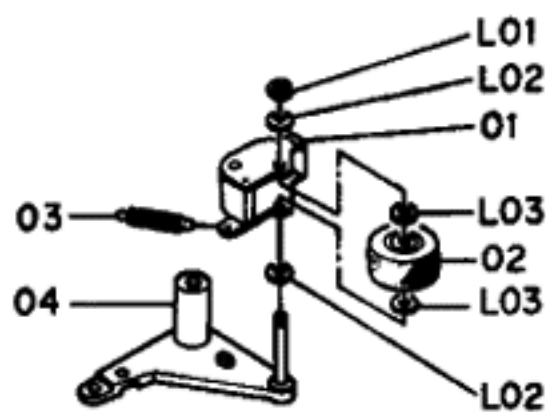


Fig. 5.10

### 5.11. Take-up Pressure Roller Ass'y (D03)

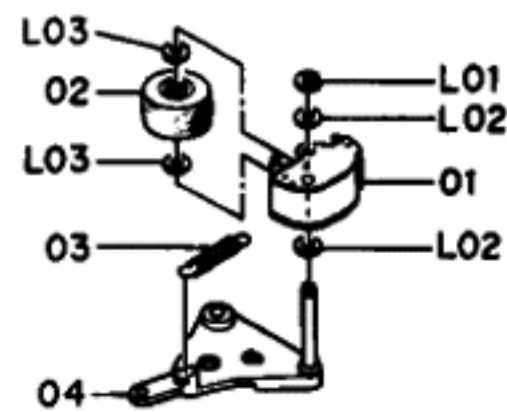


Fig. 5.11

### 5.12. Head Base Ass'y (D04)

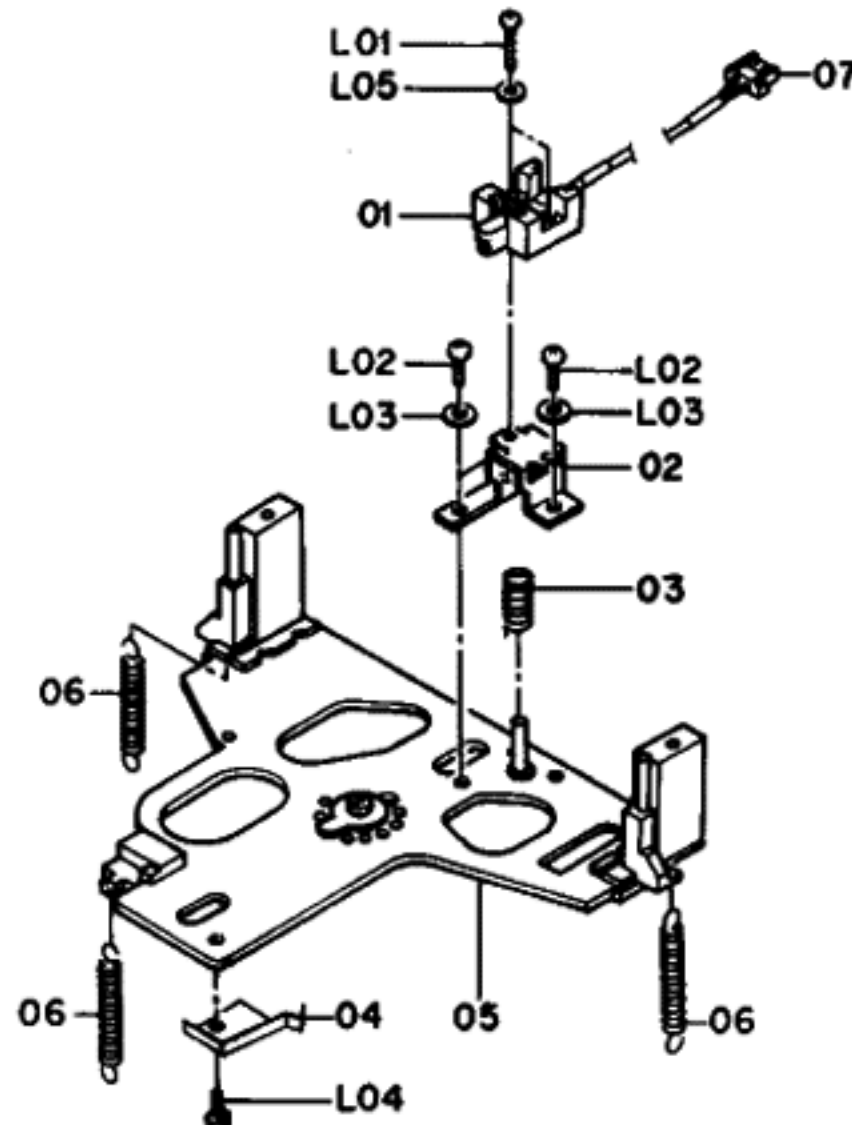


Fig. 5.12

### 5.13. Cassette Case Holder L Ass'y (D05)

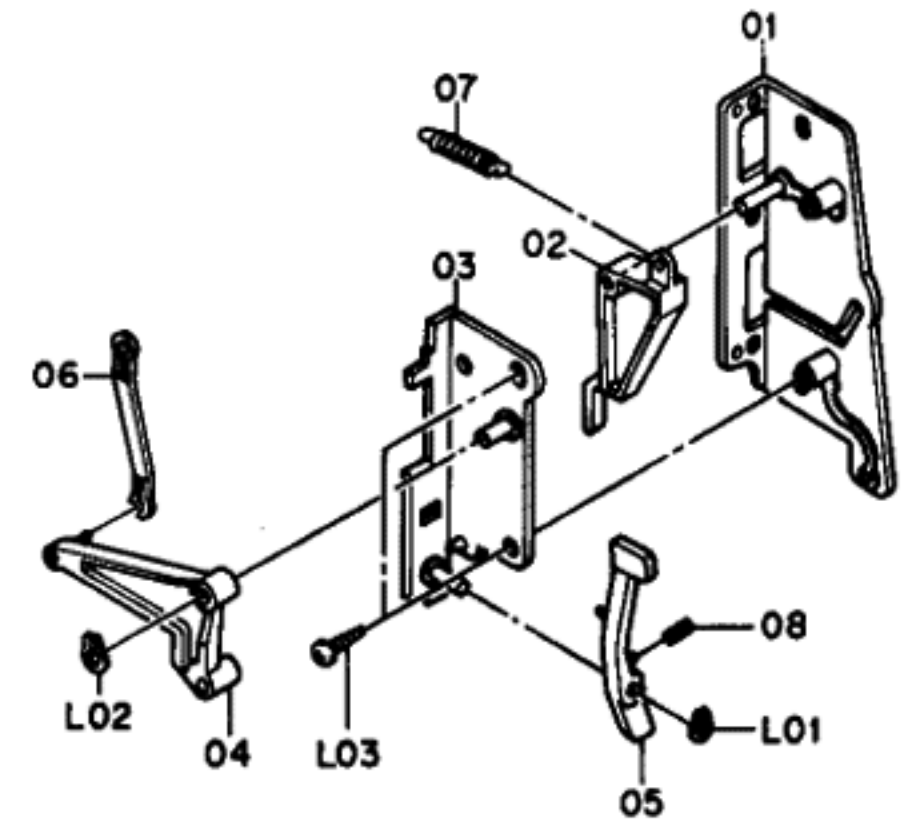


Fig. 5.13

| Schematic Ref. No. | Part No. | Description                                                  | Q'ty | Schematic Ref. No. | Part No. | Description                                             | Q'ty |
|--------------------|----------|--------------------------------------------------------------|------|--------------------|----------|---------------------------------------------------------|------|
| D01                | CA08438A | Head Mount Base Ass'y<br>Serial No.: A80101001 -             | 1    | L01                | 0E00042A | E-Ring 1.5mm                                            | 1    |
| 01                 | OC08028C | Head Height Adjustment Screw                                 | 2    | L02                | OC08024A | Washer 2mm 0.25T                                        | 2    |
| 02                 | OC08027F | Head Height Adjustment Gear                                  | 4    | L03                | OC08365A | Washer 2mm 0.13T                                        | 2    |
| 03                 | OC08026D | Azimuth Alignment Screw                                      | 2    | D04                | CA08339A | Head Base Ass'y<br>Serial No.: A80101001 -              | 1    |
| 04                 | OC08161B | Spring Stopper                                               | 2    | 01                 | GA02103A | EOK Erase Head                                          | 1    |
| 05                 | OC08187B | Head Plate Spring                                            | 2    | 02                 | OC08158D | Erase Head Hold Plate                                   | 1    |
| 06                 | OC08315A | Azimuth Alignment Wire Hold Plate                            | 1    | 03                 | OC08166A | Erase Head Hold Plate Spring                            | 1    |
| 07                 | CA08083D | Head Mount Base Sub Ass'y                                    | 1    | 04                 | OC08174D | Cassette Hold Spring                                    | 1    |
| 08                 | OC08352A | AP Drive Plate                                               | 1    | 05                 | CA08003R | Head Base Ass'y                                         | 1    |
| 09                 | OC08362A | TG Spring                                                    | 1    | 06                 | OC08175A | Head Base L Spring                                      | 3    |
| 10                 | OC08351A | PH Azimuth Plate                                             | 1    | 07                 | OB08944A | 2P-H Connector                                          | 1    |
| 11                 | CA08439A | PA-1L Playback Head Ass'y                                    | 1    | L01                | 0E00951A | M1.7x7 @ Pan (Black Chromate)                           | 2    |
| 12                 | CA08440A | R-8L Record Head Ass'y                                       | 1    | L02                | 0E00909A | M2x6 @ Pan                                              | 3    |
| L01                | 0E00917A | BT 2.6x5 @ Pan                                               | 2    | L03                | 0E00117A | Washer 2mm                                              | 3    |
| D02                | CA08437A | Supply Pressure Roller Arm Ass'y<br>Serial No.: A80101001 -  | 1    | L04                | 0E00853A | BT 2x3 @ Pan                                            | 1    |
| 01                 | CA08403A | Supply Tape Guide                                            | 1    | L05                | 0E00952A | Washer 1.7mm                                            | 2    |
| 02                 | OC08357A | Pressure Roller                                              | 1    | D05                | CA08350A | Cassette Case Holder L Ass'y<br>Serial No.: A80101001 - | 1    |
| 03                 | OC08495A | Supply Guide Spring                                          | 1    | 01                 | CA08326B | Cassette Case Holder L Sub Ass'y                        | 1    |
| 04                 | CA08401A | Supply Roller Arm Ass'y                                      | 1    | 02                 | OC08073C | Lid Arm A                                               | 1    |
| L01                | 0E00042A | E-Ring 1.5mm                                                 | 1    | 03                 | OC08306A | Eject Arm Holder                                        | 1    |
| L02                | OC08024A | Washer 2mm 0.25T                                             | 2    | 04                 | OC08307A | Eject Arm A                                             | 1    |
| L03                | OC08365A | Washer 2mm 0.13T                                             | 2    | 05                 | OC08197C | Eject Arm B                                             | 1    |
| D03                | CA08436A | Take-up Pressure Roller Arm Ass'y<br>Serial No.: A80101001 - | 1    | 06                 | OC08199B | Eject Arm Joint                                         | 1    |
| 01                 | CA08402A | Take-up Tape Guide                                           | 1    | 07                 | OC08114A | Lid Arm Spring                                          | 1    |
| 02                 | OC08357A | Pressure Roller                                              | 1    | 08                 | OC08211C | Eject Arm Spring                                        | 1    |
| 03                 | OC08362A | Take-up Guide Spring                                         | 1    | L01                | 0E00837A | Stopper Ring 3mm                                        | 1    |
| 04                 | CA08400A | Take-up Roller Arm Sub Ass'y                                 | 1    | L02                | 0E00838A | Stopper Ring 4mm                                        | 1    |
|                    |          |                                                              |      | L03                | 0E00865A | BT 3x10 @ Binding                                       | 2    |

#### 5.14. Cassette Case Holder R Ass'y (D06)

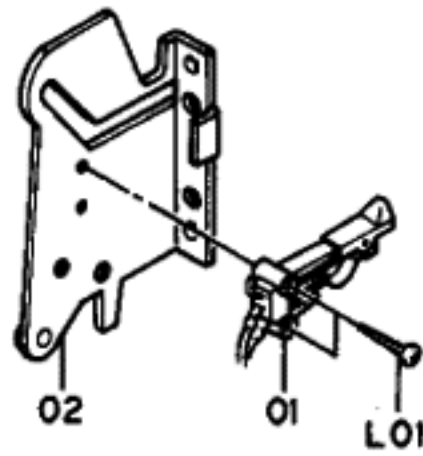


Fig. 5.14

#### 5.15. Auto Shut-off Ass'y (D07)

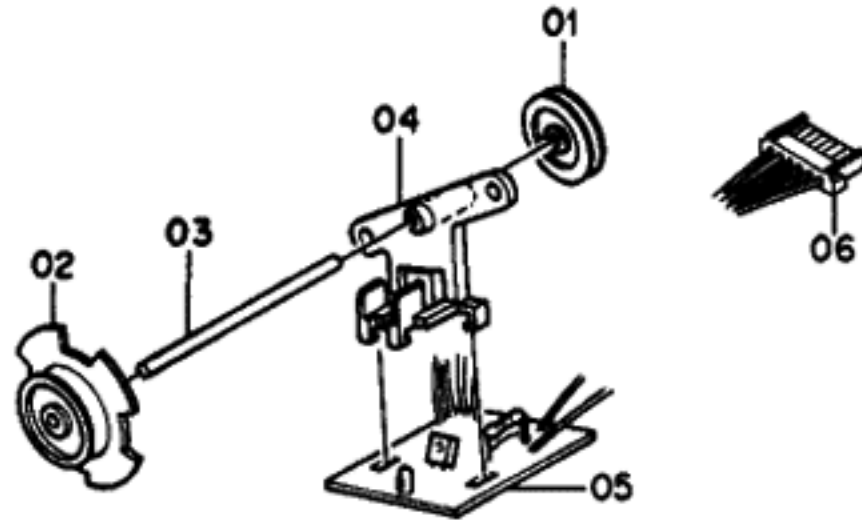


Fig. 5.15

#### 5.16. Pneumatic Damper Ass'y (D08)

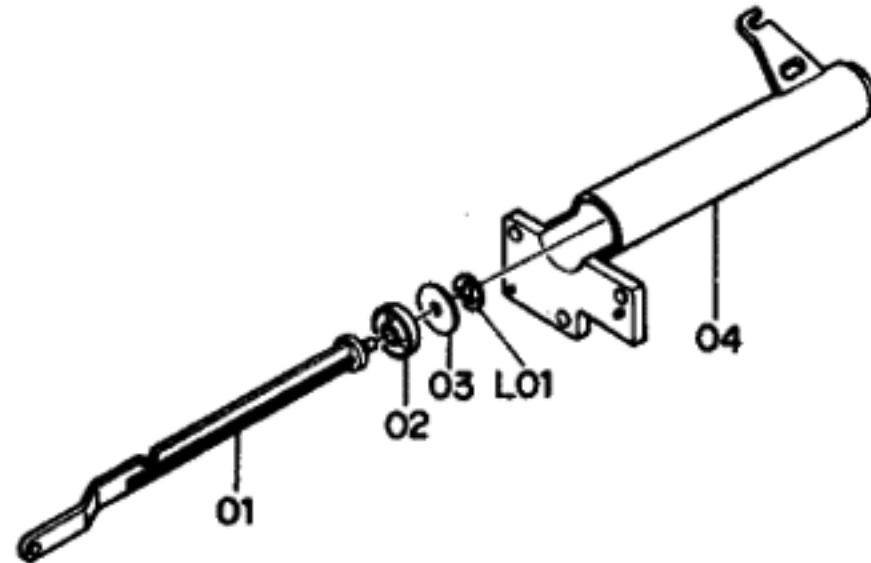


Fig. 5.16

#### 5.17. PA-1L Playback Head Ass'y (E01)

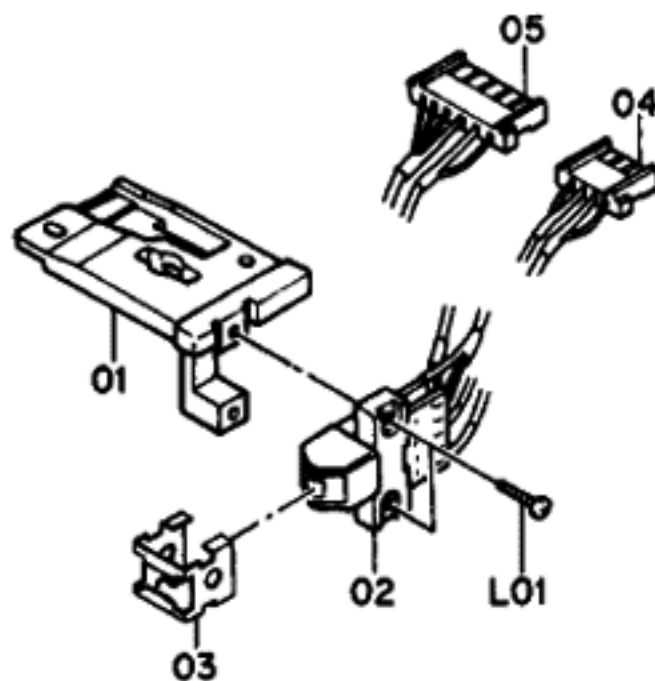


Fig. 5.17

#### 5.18. R-8L Record Head Ass'y (E02)

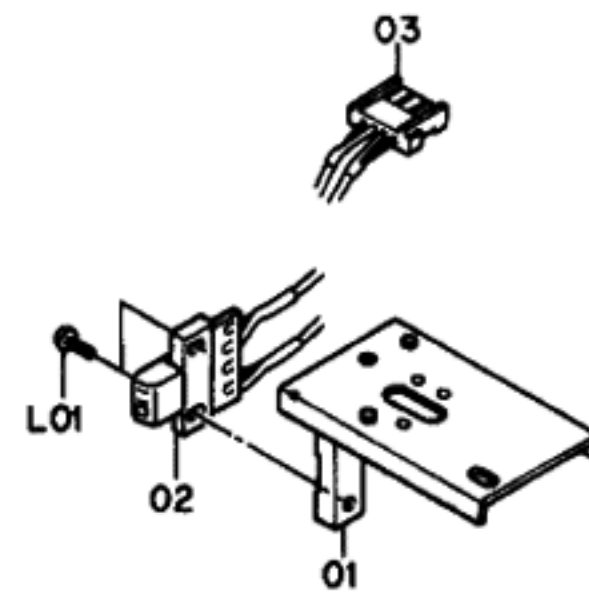


Fig. 5.18

| Schematic Ref. No. | Part No.        | Description                                                    | Q'ty     |
|--------------------|-----------------|----------------------------------------------------------------|----------|
| <b>D06</b>         | <b>CA08455A</b> | <b>Cassette Case Holder R Ass'y</b><br>Serial No.: A80101001 - | <b>1</b> |
| 01                 | 0C08133A        | Eject Sensor                                                   | 1        |
| 02                 | CA08427A        | Cassette Case Holder R Sub Ass'y                               | 1        |
| L01                | 0E00840A        | BT 2x8 @ Pan                                                   | 1        |
| <b>D07</b>         | <b>CA08441A</b> | <b>Auto Shut-off Ass'y</b><br>Serial No.: A80101001 -          | <b>1</b> |
| 01                 | 0C08047A        | Shut-off Pulley A                                              | 1        |
| 02                 | 0C08309B        | Shut-off Pulley B                                              | 1        |
| 03                 | 0C08088B        | Shut-off Pulley Shaft                                          | 1        |
| 04                 | 0C08207B        | Shut-off Pulley Holder                                         | 1        |
| 05                 | BA04852A        | Shut-off P.C.B. Ass'y                                          | 1        |
| 06                 | 0B02339B        | 6P-H Connector                                                 | 1        |
| <b>D08</b>         | <b>CA08030A</b> | <b>Pneumatic Damper Ass'y</b><br>Serial No.: A80101001 -       | <b>1</b> |
| 01                 | 0C08058C        | Damper Piston                                                  | 1        |
| 02                 | 0C08102C        | Damper Ring                                                    | 1        |
| 03                 | 0C08010C        | Damper Plate                                                   | 1        |
| 04                 | 0C08059D        | Sylinder                                                       | 1        |
| L01                | 0E00874A        | Stopper Ring CS 2mm                                            | 1        |
| <b>E01</b>         | <b>CA08439A</b> | <b>PA-1L Playback Head Ass'y</b><br>Serial No.: A80101001 -    | <b>1</b> |
| 01                 | 0C08350B        | Playback Head Plate                                            | 1        |
| 02                 | GA02162A        | PA-1L Playback Head                                            | 1        |
| 03                 | 0C08349C        | Tape Protector                                                 | 1        |
| 04                 | 0B02341B        | 4P-H Connector                                                 | 1        |
| 05                 | 0B02342B        | 6P-H Connector                                                 | 1        |
| L01                | 0E00886A        | M1.7x6.5 @ Pan                                                 | 1        |
| <b>E02</b>         | <b>CA08440A</b> | <b>R-8L Record Head Ass'y</b><br>Serial No.: A80101001 -       | <b>1</b> |
| 01                 | CA08308A        | Record Head                                                    | 1        |
| 02                 | GA01050A        | R-8L Record Head                                               | 1        |
| 03                 | 0B02340B        | 4P-H Connector                                                 | 1        |
| L01                | 0E00887A        | M1.7x4 @ Pan                                                   | 2        |

## 6. MOUNTING DIAGRAMS AND PARTS LIST

- Notes: 1. Mounting diagram shows a dip side view of the printed circuit board.  
 2. Diode is 1SS53, 1S1555, or 1SS176 unless otherwise specified.  
 3. Following transistors are interchangeable with each other.  
 a. 2SA733, 2SA608SP, 2SA1048, 2SA1175  
 b. 2SC945, 2SC536SP, 2SC2458, 2SC2785  
 4. Abbreviation for part name:  
 TR — Transistor, SiD — Silicon Diode, GD — Germanium Diode, ZD — Zener Diode  
 RK — Carbon Resistor, RM — Metal Film Resistor, RF — Fail Safe Type Resistor, RC — Cement Resistor,  
 RW — Wire Wound Resistor  
 CE — Electrolytic Capacitor, CM — Mylar Capacitor, CC — Ceramic Capacitor, CP — PP Capacitor,  
 CT — Tantalum Capacitor, CF — Film Capacitor, C — Mica Capacitor

6.1. Power Switch P.C.B. Ass'y

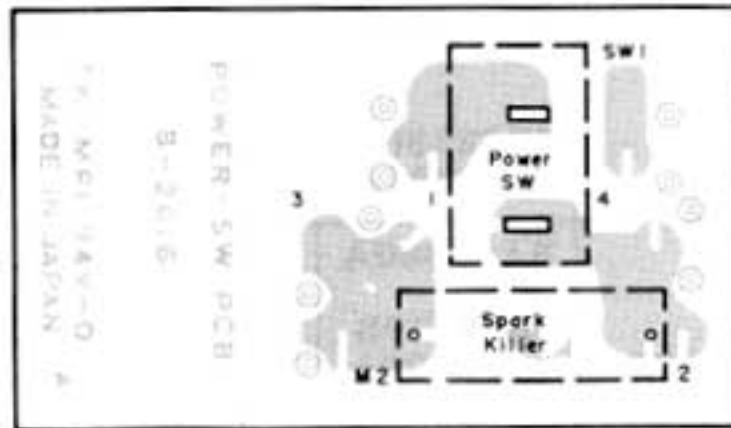


Fig. 6.1

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

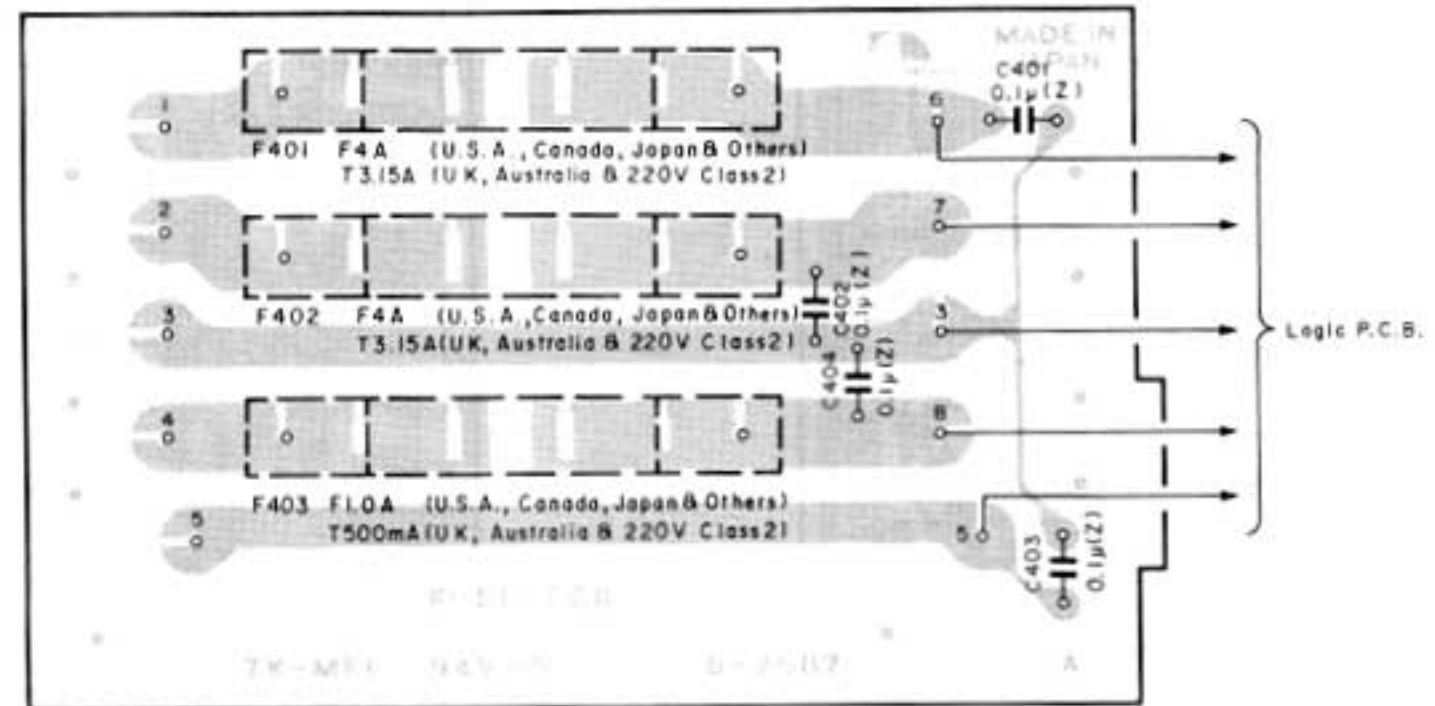


Fig. 6.2

6.3. Shut-off P.C.B. Ass'y

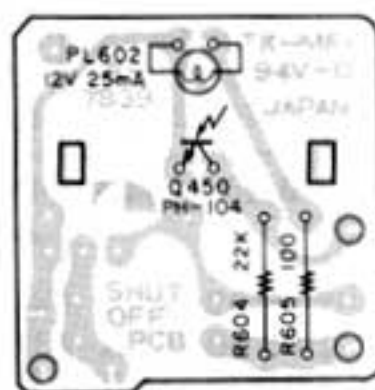


Fig. 6.3

6.4. Counter Pulse Generator P.C.B. Ass'y

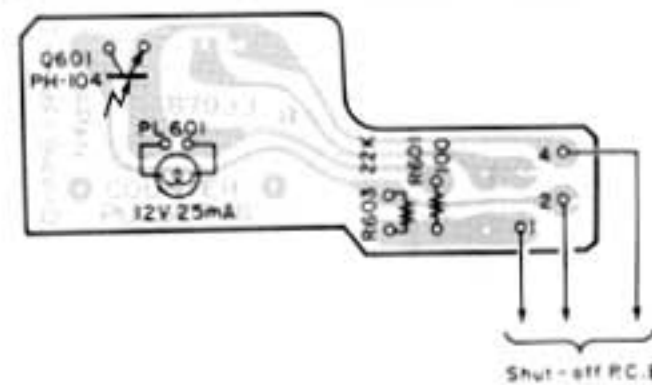


Fig. 6.4

| Schematic Ref. No. | Part No. | Description                                                      | Schematic Ref. No. | Part No. | Description                                          | Schematic Ref. No. | Part No. | Description                                               |
|--------------------|----------|------------------------------------------------------------------|--------------------|----------|------------------------------------------------------|--------------------|----------|-----------------------------------------------------------|
| SW1                | BA04947A | Power Switch P.C.B. Ass'y (U.S.A. & Canada)                      | F401,402           | BA04899A | Fuse P.C.B. Ass'y (U.S.A., Canada & Others)          | Q450               | OM04432A | Fuse Label 4A 125V x 2 (U.S.A., Canada & Others) (1)      |
|                    | BA04946A | Power Switch P.C.B. Ass'y (Japan)                                |                    | BA04898A | Fuse P.C.B. Ass'y (Japan)                            |                    | OM04441A | Fuse Label 4A 250V x 2 (Japan) (1)                        |
|                    | BA04948A | Power Switch P.C.B. Ass'y (UK, Australia, 220V Class 2 & Others) |                    | BA04900A | Fuse P.C.B. Ass'y (UK, Australia & 220V Class 2)     |                    | OM03936B | Fuse Label T3.15A 250V (UK, Australia & 220V Class 2) (1) |
|                    | OB02616A | Power Switch P.C.B.                                              |                    | OB02587A | Fuse P.C.B. CC 0.1μ 50V Z                            |                    | OB08349A | Fuse Clip (UK, Australia & 220V Class 2) (6)              |
|                    | OB07407A | Power Switch (U.S.A. & Canada)                                   |                    | OB07929A |                                                      | Q450               | BA04852A | Shut-off P.C.B. Ass'y                                     |
|                    | OB07406A | Power Switch (Japan)                                             |                    | OB90002A | Fuse F4A 125V (U.S.A., Canada & Others)              |                    | OB07839B | Shut-off P.C.B. Photo TR PH104                            |
|                    | OB07408A | Power Switch (UK, Australia, 220V Class 2 & Others)              |                    | OB90001A | Fuse F4A 250V (Japan)                                |                    | OB06228A | Photo TR PH104                                            |
|                    | OB08342A | Spark Killer (U.S.A. & Canada)                                   |                    | OB08281A | Fuse T3.15A 250V (UK, Australia & 220V Class 2)      |                    | OB05615A | RK 22K 1/4W J                                             |
|                    | OB08363A | Spark Killer (Japan)                                             |                    | OB08374A | Fuse F1A 250V (U.S.A., Canada & Others)              |                    | OB09215A | RF 100 1/4W J                                             |
|                    | OB08955A | Spark Killer (UK, Australia, 220V Class 2 & Others)              |                    | OB08686A | Fuse F1A 250V (Japan)                                |                    | OB08552A | Lamp 12V 25mA                                             |
| M2                 | OE00622A | M3x5 ⊕ Pan (2A) (2)                                              | F403               | OB08457A | Fuse T500mA 250V (UK, Australia & 220V Class 2)      | Q601               | BA04943A | Counter Pulse Generator P.C.B. Ass'y                      |
|                    | OE00752A | Eyelet 2x3 (2)                                                   |                    | OM04190A | Fuse Label 1A 250V (U.S.A., Canada & Japan) (1)      |                    | OB07933B | Counter Pulse Generator P.C.B. Photo TR PH104             |
|                    | OJ04646A | Power Switch Holder (1)                                          |                    | OM04096C | Fuse Label T500mA (UK, Australia & 220V Class 2) (1) |                    | OB06228A | Photo TR PH104                                            |
| M2                 |          |                                                                  |                    |          |                                                      |                    | OB09215A | RF 100 1/4W J                                             |
|                    |          |                                                                  |                    |          |                                                      |                    | OB05661A | RK 22K 1/4W JV                                            |
|                    |          |                                                                  |                    |          |                                                      |                    | OB08552A | Lamp 12V 25mA                                             |
|                    |          |                                                                  |                    |          |                                                      | PL601              | OC08281B | P.C.B. Holder (1)                                         |
|                    |          |                                                                  |                    |          |                                                      |                    | OE00792A | BT 2.6x6 ⊕ Pan (Chromate) (2)                             |

### 6.5. Direction P.C.B. Ass'y

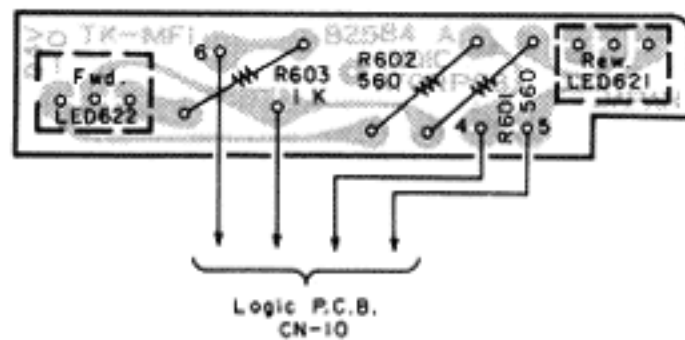


Fig. 6.5

### 6.6. Timer Switch P.C.B. Ass'y

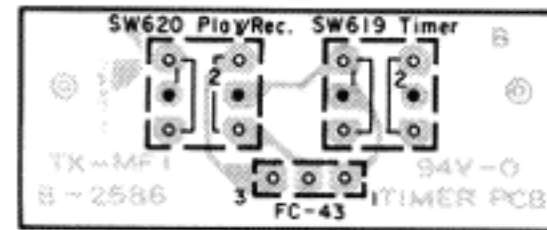


Fig. 6.6

### 6.7. Tape Select P.C.B. Ass'y

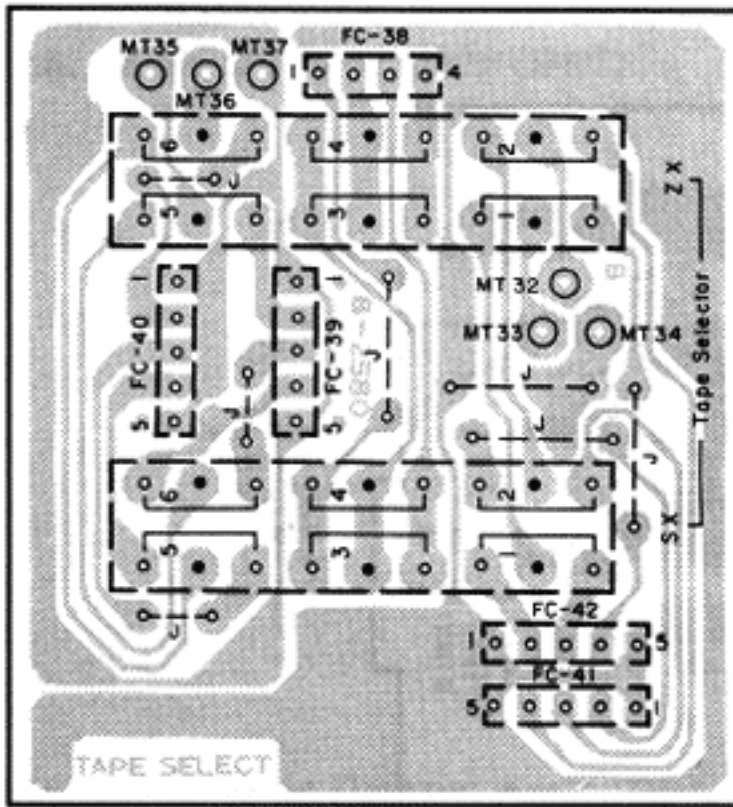


Fig. 6.7

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

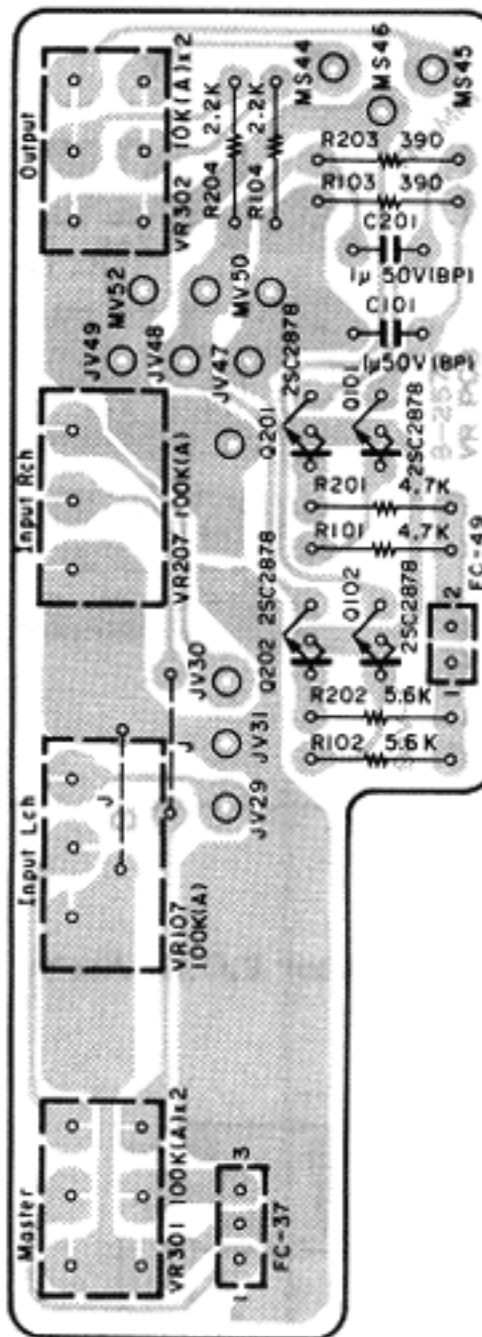


Fig. 6.8

### 6.9. Counter P.C.B. Ass'y

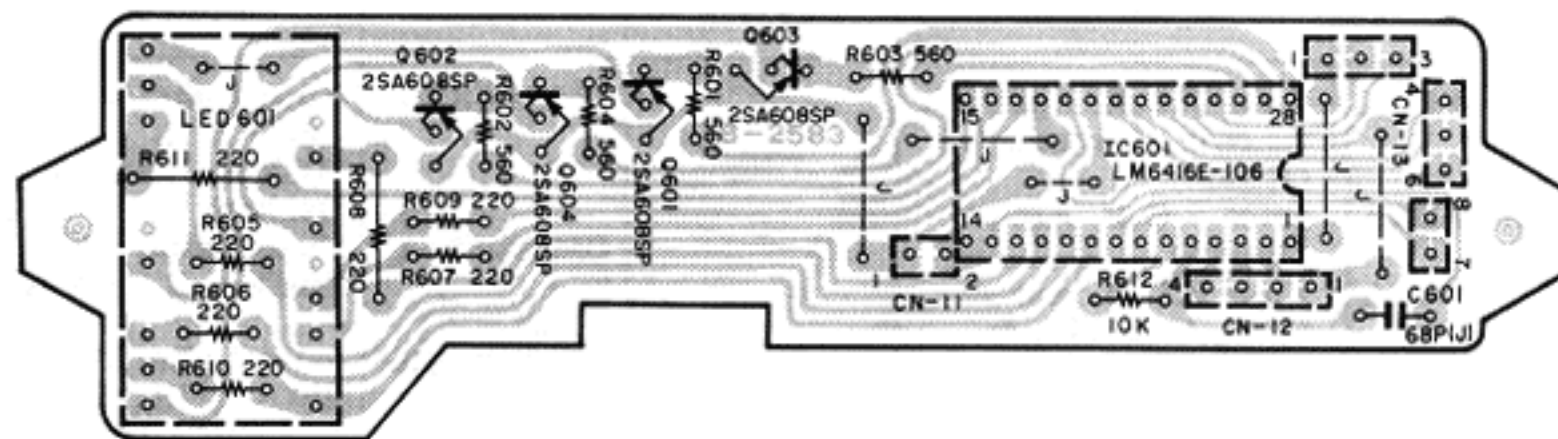
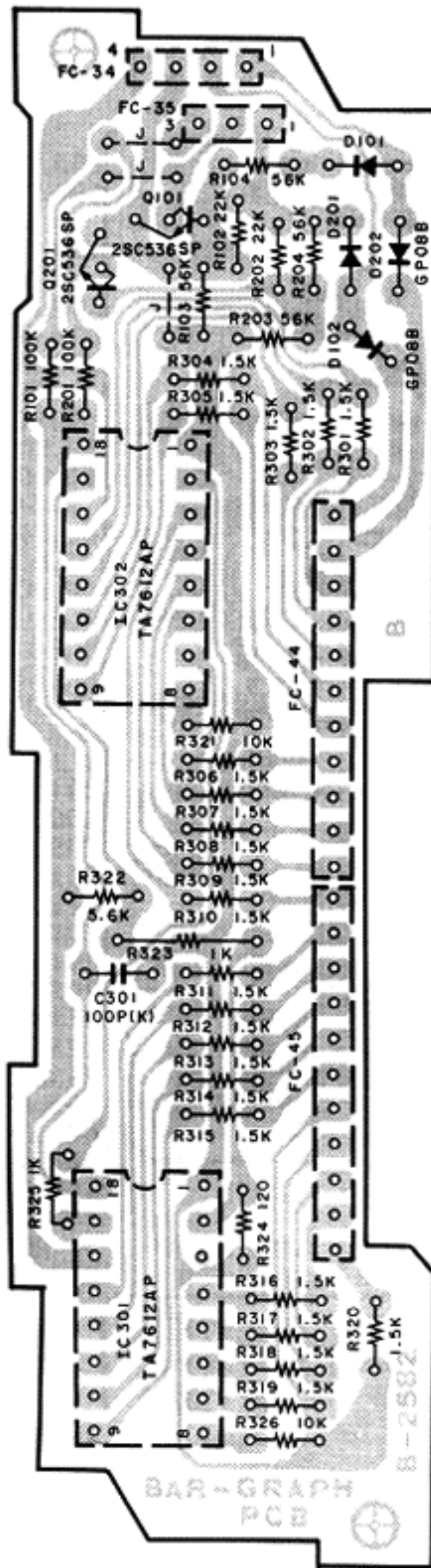


Fig. 6.9

| Schematic Ref. No.                                                                                                                                                                                | Part No.                                                                                                                                                                                                                                                             | Description                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                   | BA04895A                                                                                                                                                                                                                                                             | Direction P.C.B. Ass'y                                                                                                                                                                                                                                                                                                                                                              |
| LED621<br>622                                                                                                                                                                                     | OB02584A<br>OB06448A                                                                                                                                                                                                                                                 | Direction P.C.B. LED (RED + GRN)                                                                                                                                                                                                                                                                                                                                                    |
| R601,602<br>R603                                                                                                                                                                                  | OB05575A<br>OB01857A                                                                                                                                                                                                                                                 | RK 560 1/4W J<br>RK 1K 1/4W J                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                   | BA04897A                                                                                                                                                                                                                                                             | Timer Switch P.C.B. Ass'y                                                                                                                                                                                                                                                                                                                                                           |
| SW619,620                                                                                                                                                                                         | OB02586B<br>OB07464A                                                                                                                                                                                                                                                 | Timer Switch P.C.B. Push Switch                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                   | BA04891A                                                                                                                                                                                                                                                             | Tape Select P.C.B. Ass'y                                                                                                                                                                                                                                                                                                                                                            |
| SW618                                                                                                                                                                                             | OB02580B<br>OB07461A                                                                                                                                                                                                                                                 | Tape Select P.C.B. Push Switch                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                   | BA04890A                                                                                                                                                                                                                                                             | Volume P.C.B. Ass'y                                                                                                                                                                                                                                                                                                                                                                 |
| Q101,102<br>201,202<br>VR107,207<br>VR301<br>VR302<br>R101,201<br>R102,202<br>R103,203<br>R104,204<br>C101,201<br>FC37                                                                            | OB02579B<br>OBT6299A<br>OB07202A<br>OB07203A<br>OB07204A<br>OBT1846A<br>OBT1887A<br>OBT5691A<br>OBT5622A<br>OBT9187A<br>OB82037A<br>OM04252A                                                                                                                         | Volume P.C.B. TR 2SC2878<br>VR 100K (A)<br>VR 100K (A)x2<br>VR 10K (A)x2<br>RK 4.7K 1/4W J<br>RK 5.6K 1/4W J<br>RK 390 1/4W J<br>RK 2.2K 1/4W J<br>CE 1μ 50V (BP)<br>3P Flat Cable<br>Label CN-37 (1)                                                                                                                                                                               |
|                                                                                                                                                                                                   | BA04894A                                                                                                                                                                                                                                                             | Counter P.C.B. Ass'y                                                                                                                                                                                                                                                                                                                                                                |
| IC601<br>Q601,602<br>603,604<br>LED601<br>R601,602<br>603,604<br>R605,606<br>607,609<br>610<br>R608,611<br>R612<br>C601<br>CN11<br>CN12<br>CN13                                                   | OB02583A<br>OB06368A<br>OB06319A<br>OB06442A<br>OBT9671A<br>OBT9661A<br>OBT1933A<br>OBT9701A<br>OBT9393A<br>OB02344A<br>OB02345B<br>OB02346A                                                                                                                         | Counter P.C.B. IC LM6416E-106<br>TR 2SA608SP<br>Counter LED<br>RK 560 1/6W J<br>RK 220 1/6W J<br>RK 220 1/4W J<br>RK 10K 1/6W J<br>CC 68P 50V J<br>2P-H Connector<br>4P-H Connector<br>8P-H Connector                                                                                                                                                                               |
|                                                                                                                                                                                                   | BA04893A                                                                                                                                                                                                                                                             | Indicator P.C.B. Ass'y                                                                                                                                                                                                                                                                                                                                                              |
| IC301,302<br>Q101,201<br>LED303<br>D101,201<br>D102,202<br>R101,201<br>R102,202<br>R103,104<br>203,204<br>R301-320<br>R321,326<br>R322<br>R323<br>R324<br>R325<br>C301<br>FC34<br>FC35<br>FC44,45 | OB02582B<br>OB06369A<br>OB06401A<br>OB06441A<br>OBT6398A<br>OB06109A<br>OBT9725A<br>OBT9709A<br>OBT9719A<br>OBT9681A<br>OBT9701A<br>OBT9695A<br>OBT1857A<br>OBT9655A<br>OBT9677A<br>OBT9282A<br>OB05360B<br>OB05352B<br>OB05374C<br>OM04250A<br>OM04251A<br>OE00130A | Indicator P.C.B. IC TA7612AP<br>TR 2SC536SP<br>Indicator LED<br>SID 1SS176<br>SID GP08B<br>RK 100K 1/6W J<br>RK 22K 1/6W J<br>RK 56K 1/6W J<br>RK 1.5K 1/6W J<br>RK 10K 1/6W J<br>RK 5.6K 1/6W J<br>RK 1K 1/4W J<br>RK 120 1/6W J<br>RK 1K 1/6W J<br>CC 100P 50V K<br>4P Flat Cable<br>3P Flat Cable<br>11P Flat Cable<br>Label CN-34 (1)<br>Label CN-35 (1)<br>Earth Lug 2.6mm (1) |

#### 6.10. Indicator P.C.B. Ass'y



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

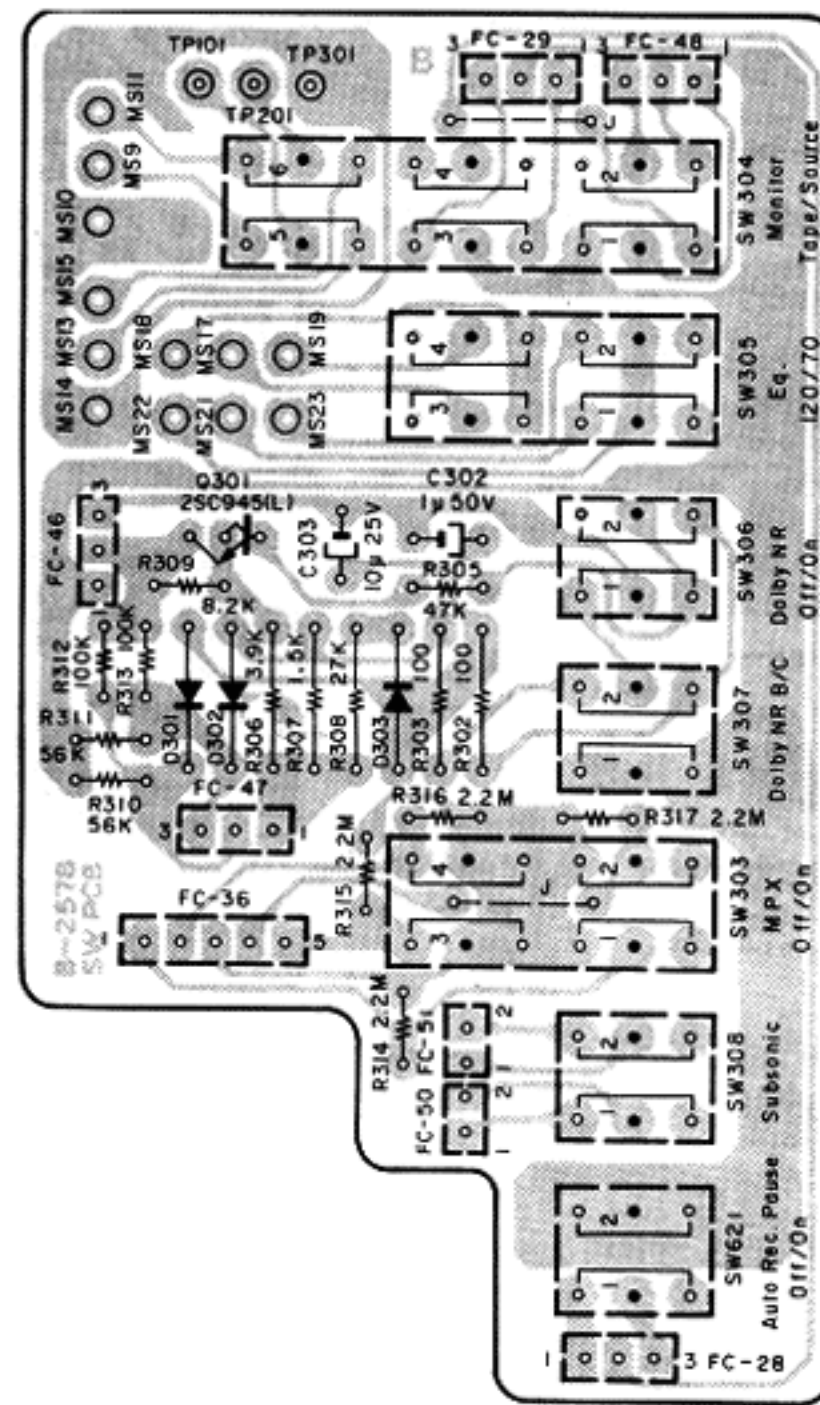
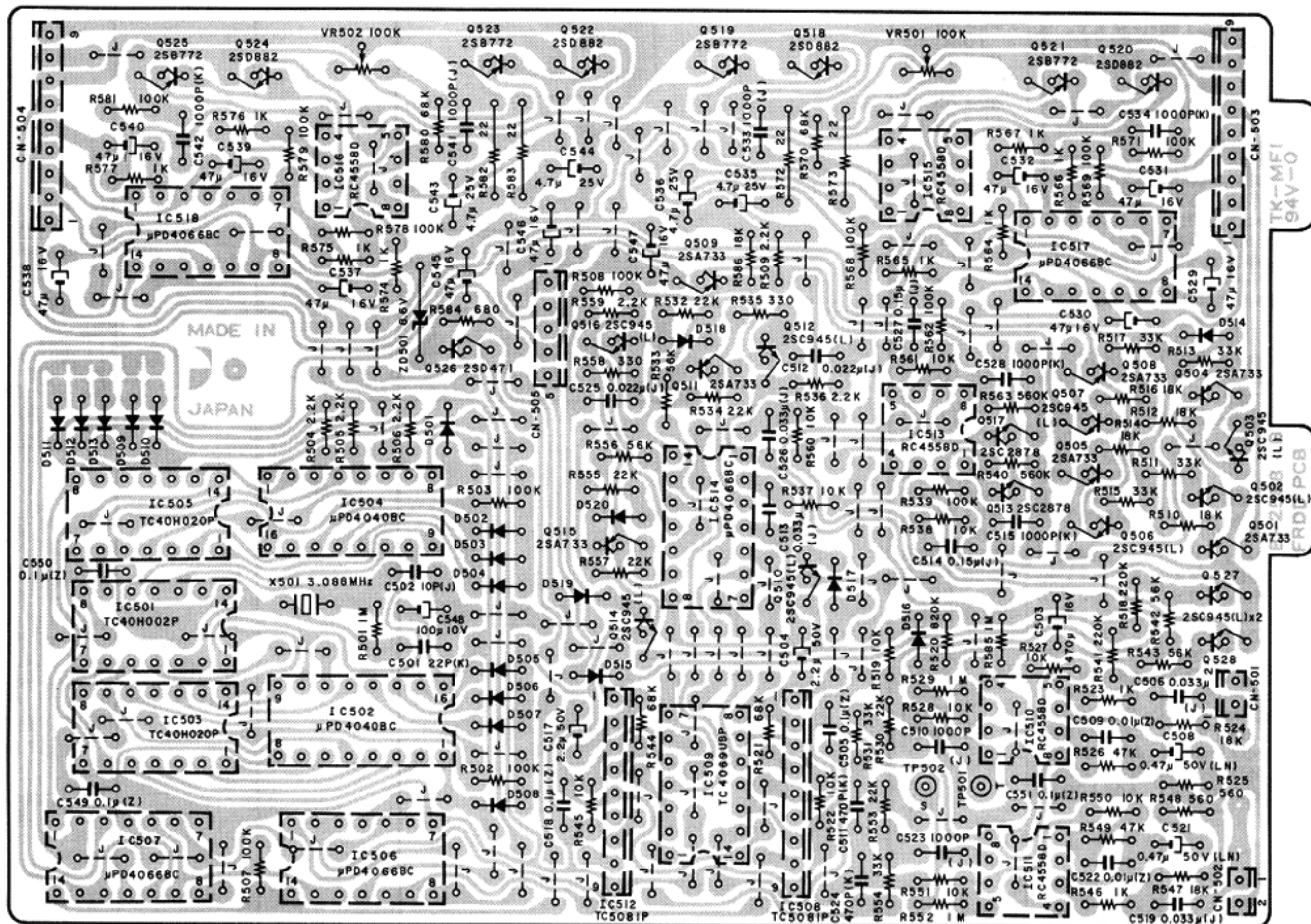


Fig. 6.11

| Schematic<br>Ref. No. | Part No. | Description         |
|-----------------------|----------|---------------------|
|                       | BA04889A | Switch P.C.B. Ass'y |
| Q301                  | 0B02578B | Switch P.C.B.       |
| D301,302              | 0BT1872A | TR 2SC945L (P,Q)    |
| 303                   | 0BT6181A | SiD 1SS53           |
| R302,303              | 0BT9653A | RK 100 1/6W J       |
| R305                  | 0BT9717A | RK 47K 1/6W J       |
| R306                  | 0BT5675A | RK 3.9K 1/4W J      |
| R307                  | 0BT5505A | RK 1.5K 1/4W J      |
| R308                  | 0BT5743A | RK 27K 1/4W J       |
| R309                  | 0BT9699A | RK 8.2K 1/6W J      |
| R310,311              | 0BT9719A | RK 56K 1/6W J       |
| R312,313              | 0BT9725A | RK 100K 1/6W J      |
| R314,315              | 0BT5671A | RK 2.2M 1/4W J      |
| 316,317               |          |                     |
| C302                  | 0BT1405A | CE 1 $\mu$ 50V      |
| C303                  | 0BT1674A | CE 10 $\mu$ 25V     |
| FC28                  | 0B82035A | 3P Flat Cable       |
| FC29                  | 0B82034A | 3P Flat Cable       |
| FC36                  | 0B82036A | 5P Flat Cable       |
| FC50                  | 0B05331B | 2P Flat Cable       |
| FC51                  | 0B82001B | 2P Flat Cable       |
|                       | 0B07460A | Push Switch (1)     |
|                       | 0M04240A | Label CN-28 (1)     |
|                       | 0M04438A | Label CN-29 (1)     |
|                       | 0M04440A | Label CN-36 (1)     |

### 6.13. Motor Control P.C.B. Ass'y



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| Schematic Ref. No. | Part No. | Description                     | Schematic Ref. No. | Part No. | Description                | Schematic Ref. No. | Part No. | Description       |
|--------------------|----------|---------------------------------|--------------------|----------|----------------------------|--------------------|----------|-------------------|
|                    | BA04892A | Control P.C.B. Ass'y            |                    | BA04941A | Motor Control P.C.B. Ass'y | C508,521           | OBT9222A | CE 0.47μ 50V (LN) |
| Q601,605           | OB02581B | Control P.C.B.                  |                    |          |                            | C509,522           | OBT9290A | CC 0.01μ 50V Z    |
| Q602,603           | OBT6013A | TR 2SA733 (P,Q)                 |                    | OB02588B | Motor Control P.C.B.       | C510,523           | OBT9844A | CF 1000P 50V J    |
| 604                | OBT1872A | TR 2SC945L (P,Q)                | IC501              | OB06423A | IC TC40H002P               | 533,541            |          |                   |
| D601,602           | OBT6181A | SiD 1SS53                       | IC502,504          | OB06223A | IC μPD4040BC               | C511,524           | OBT9286A | CC 470P 50V K     |
| 604                |          |                                 | IC503,505          | OB06424A | IC TC40H020P               | C512,525           | OBT9848A | CF 0.022μ 50V J   |
| D603,605           | OBT6398A | SiD 1SS176                      | IC506,507          | OB06144A | IC μPD4066BC               | C514,527           | OBT5914A | CM 0.15μ 50V J    |
| 606,607            |          |                                 | 514,517            |          |                            | C515,528           | OBT9288A | CC 1000P 50V K    |
| 608,609            |          |                                 | 518                |          |                            | 534,542            |          |                   |
| 610                |          |                                 | IC508,512          | OB06297A | IC TC5081P                 | C529,530           | OBT1403A | CE 47μ 16V        |
| LED301             | OB06445A | LED ORN TLO-123 (15)            | IC509              | OB06270A | IC TC4069UBP               | 531,532            |          |                   |
| 302,607            |          |                                 | IC510,511          | OB06124B | IC RC4558D                 | 537,538            |          |                   |
| 609-620            |          |                                 | 513,515            |          |                            | 539,540            |          |                   |
| LED601             | OB06446A | LED GRN TLP-163                 | 516                |          |                            | 545,546            |          |                   |
| 602,603            |          |                                 | Q501,504           | OBT6013A | TR 2SA733 (P,Q)            | 547                |          |                   |
| 604,605            |          |                                 | 505,508            |          |                            | C535,536           | OBT1402A | CE 4.7μ 25V       |
| 606,608            |          |                                 | 509,511            |          |                            | 543,544            |          |                   |
| VR101,102          | OB07404A | Semi-fixed VR 10K               | 515                |          |                            | C548               | OBT5885A | CE 100μ 10V       |
| 106,201            |          |                                 | Q502,503           | OBT1872A | TR 2SC945L (P,Q)           | CN501              | OBT2280A | 2P-T Post         |
| 202,206            |          |                                 | 506,507            |          |                            | CN502              | OBT8656A | 2P-T Post         |
| VR103,105          | OB07277A | Semi-fixed VR 22K               | 510,512            |          |                            | CN503,504          | OBT8645A | 9P-T Post         |
| 203,205            |          |                                 | 514,516            |          |                            | CN505              | OBT8724A | 5P-T Post         |
| VR104,204          | OB07260A | Semi-fixed VR 50K               | 527,528            |          |                            |                    | OE00507A | Nut Hex. M3 (8)   |
| R103,105           | OBT9693A | RK 4.7K 1/6W J                  | Q513,517           | OBT6299A | TR 2SC2878                 |                    | OE00521A | M3x8 ⊕ Pan (8)    |
| 107,203            |          |                                 | Q518,520           | OB06316A | TR 2SD882 (P,Q)            |                    | OJ04485A | Heat Sink B (4)   |
| 205,207            |          |                                 | 522,524            |          |                            |                    |          |                   |
| R104,112           | OBT9699A | RK 8.2K 1/6W J                  | Q519,521           | OB06303A | TR 2SB772 (P,Q)            |                    |          |                   |
| 204,212            |          |                                 | 523,525            |          |                            |                    |          |                   |
| R106,206           | OBT9695A | RK 5.6K 1/6W J                  | Q526               | OB06066A | TR 2SD471 (L,M)            |                    |          |                   |
| R108,109           | OBT9701A | RK 10K 1/6W J                   | ZD501              | OBT6426A | ZD 8.6V XZ086              |                    |          |                   |
| 208,209            |          |                                 | D501-520           | OBT6398A | SiD 1SS176                 |                    |          |                   |
| R110,210           | OBT1679A | RK 100 1/4W J                   | X501               | OB02324A | Xtal 3.088MHz              |                    |          |                   |
| R111,211           | OBT9697A | RK 6.8K 1/6W J                  | VR501,502          | OB09060A | Semi-fixed VR 100K         |                    |          |                   |
| R115,215           | OBT9685A | RK 2.2K 1/6W J                  | R501,529           | OBT9749A | RK 1M 1/6W J               |                    |          |                   |
| R601,602           | OBT5575A | RK 560 1/4W J                   | 552,585            |          |                            |                    |          |                   |
| 603,605            |          |                                 | R502,503           | OBT9725A | RK 100K 1/6W J             |                    |          |                   |
| 608,610            |          |                                 | 507,508            |          |                            |                    |          |                   |
| 612,613            |          |                                 | 539,562            |          |                            |                    |          |                   |
| 617                |          |                                 | 568,569            |          |                            |                    |          |                   |
| R604               | OBT5578A | RK 180 1/4W J                   | 571,578            |          |                            |                    |          |                   |
| R606,607           | OBT5743A | RK 27K 1/4W J                   | 579,581            | OBT9685A | RK 2.2K 1/6W J             |                    |          |                   |
| 611                |          |                                 | R504,505           |          |                            |                    |          |                   |
| R609               | OBT1857A | RK 1K 1/4W J                    | 506,509            |          |                            |                    |          |                   |
| R614               | OBT9709A | RK 22K 1/6W J                   | 536,559            | OBT9707A | RK 18K 1/6W J              |                    |          |                   |
| R615               | OBT9711A | RK 27K 1/6W J                   | R510,512           |          |                            |                    |          |                   |
| R616               | OBT9713A | RK 33K 1/6W J                   | 514,516            |          |                            |                    |          |                   |
| C103,203           | OBT9852A | CF 4700P 50V J                  | 524,547            |          |                            |                    |          |                   |
| C104,204           | OBT9854A | CF 6800P 50V J                  | 586                |          |                            |                    |          |                   |
| C601               | OBT1862A | CE 22μ 16V                      | R511,513           | OBT9713A | RK 33K 1/6W J              |                    |          |                   |
| SW301,302          | OBT7396A | Double Action Switch            | 515,517            |          |                            |                    |          |                   |
|                    |          |                                 | 531,554            | OBT9733A | RK 220K 1/6W J             |                    |          |                   |
| SW601-612          | OB07459A | Switch                          | R518,541           | OBT9701A | RK 10K 1/6W J              |                    |          |                   |
| SW613,614          | OB07462A | Push Switch                     | R519,522           |          |                            |                    |          |                   |
| 616,617            |          |                                 | 527,528            |          |                            |                    |          |                   |
| SW615              | OB07463A | Push Switch                     | 537,538            |          |                            |                    |          |                   |
| FC14,15            | OB05361B | 4P Flat Cable                   | 545,550            |          |                            |                    |          |                   |
| FC16               | OB05371B | 5P Flat Cable                   | 551,560            |          |                            |                    |          |                   |
| FC17               | OB05372B | 10P Flat Cable                  | 561                |          |                            |                    |          |                   |
| FC18               | OB82038A | 10P Flat Cable                  | R520               | OBT9747A | RK 820K 1/6W J             |                    |          |                   |
| FC19               | OB05360B | 4P Flat Cable                   | R521,544           | OBT9721A | RK 68K 1/6W J              |                    |          |                   |
| FC20               | OB05370B | 5P Flat Cable                   | 570,580            |          |                            |                    |          |                   |
| FC21               | OB05346B | 3P Flat Cable                   | R523,546           | OBT9677A | RK 1K 1/6W J               |                    |          |                   |
| FC38               | OB05354B | 4P Flat Cable                   | 564,565            |          |                            |                    |          |                   |
| FC39,40            | OB05365B | 5P Flat Cable                   | 566,567            |          |                            |                    |          |                   |
| FC41,42            | OB05368B | 5P Flat Cable                   | 574,575            |          |                            |                    |          |                   |
|                    | OE00857A | BT 3x6 ⊕ Binding (Chromate) (1) | 576,577            |          |                            |                    |          |                   |
|                    | OJ04653A | Lens House (20)                 | R525,548           | OBT9671A | RK 560 1/6W J              |                    |          |                   |
|                    | OJ04654A | Fader House (1)                 | R526,549           | OBT9717A | RK 47K 1/6W J              |                    |          |                   |
|                    | OM04231A | Label CN-14 (1)                 | R530,532           | OBT9709A | RK 22K 1/6W J              |                    |          |                   |
|                    | OM04222A | Label CN-15 (1)                 | 534,553            |          |                            |                    |          |                   |
|                    | OM04223A | Label CN-16 (1)                 | 555,557            |          |                            |                    |          |                   |
|                    | OM04224A | Label CN-17 (1)                 | R533,542           | OBT9719A | RK 56K 1/6W J              |                    |          |                   |
|                    | OM04330A | Label CN-18 (1)                 | 543,556            |          |                            |                    |          |                   |
|                    | OM04225A | Label CN-19 (1)                 | R535,558           | OBT9665A | RK 330 1/6W J              |                    |          |                   |
|                    | OM04226A | Label CN-20 (1)                 | R540,563           | OBT9743A | RK 560K 1/6W J             |                    |          |                   |
|                    | OM04232A | Label CN-21 (1)                 | R572,573           | OB09049A | RF 22 1/4W J               |                    |          |                   |
|                    |          |                                 | 582,583            |          |                            |                    |          |                   |
|                    |          |                                 | R584               | OBT9673A | RK 680 1/6W J              |                    |          |                   |
|                    |          |                                 | C501               | OBT9279A | CC 22P 50V K               |                    |          |                   |
|                    |          |                                 | C502               | OBT9277A | CC 10P 50V J               |                    |          |                   |
|                    |          |                                 | C503               | OBT1392A | CE 470μ 16V                |                    |          |                   |
|                    |          |                                 | C504,517           | OBT9372A | CE 2.2μ 50V                |                    |          |                   |
|                    |          |                                 | C505,518           | OBT9292A | CC 0.1μ 50V Z              |                    |          |                   |
|                    |          |                                 | 549,550            |          |                            |                    |          |                   |
|                    |          |                                 | 551                |          |                            |                    |          |                   |
|                    |          |                                 | C506,513           | OBT5583A | CM 0.033μ 50V J            |                    |          |                   |
|                    |          |                                 | 519,526            |          |                            |                    |          |                   |

| Schematic Ref. No. | Part No.      | Description        | Schematic Ref. No. | Part No. | Description        | Schematic Ref. No. | Part No.          | Description                     |
|--------------------|---------------|--------------------|--------------------|----------|--------------------|--------------------|-------------------|---------------------------------|
|                    | BA04886A      | Logic P.C.B. Ass'y | D602-611           | 0BT6398A | SiD 1SS176 (27)    | R706               | 0BT9711A          | RK 27K 1/6W J                   |
|                    | — DC Supply — |                    | 614-619            |          |                    | R712,713           | 0BT5509A          | RK 33K 1/4W J                   |
|                    |               |                    | 623,624            |          |                    | R717               | 0BT1683A          | RK 15K 1/4W J                   |
|                    |               |                    | 626-633            |          |                    | R731               | 0B09217A          | RF 5.6 1/4W J                   |
| IC401              | 0B06124B      | IC JRC4558D        | 640                | 0B08908A | Xtal KBR400BT      | C601,602           | 0BT9283A          | CC 220P 50V K                   |
| Q403,404           | 0BT1872A      | TR 2SC945L (P,Q)   | X601               | 0B02307A | Xtal KBR800H       | C603,604           | 0BT1405A          | CE 1μ 50V                       |
| 409,414            |               |                    | X602               | 0B07258A | Semi-fixed VR 220K | 630                |                   |                                 |
| 415                | 0BT6013A      | TR 2SA733 (P,Q)    | VR601              | 0B07257A | Semi-fixed VR 100K | C606,615           | 0BT1402A          | CE 4.7μ 25V                     |
| Q407,408           |               |                    | VR602              | 0B07329A | Semi-fixed VR 2K   | 618                |                   |                                 |
| 411                | 0BT6322A      | TR 2SC2002 (K,L)   | VR603              | 0B07256A | Semi-fixed VR 10K  | C607               | 0BT9852A          | CF 4700P 50V J                  |
| Q410,412           | 0BT1426A      | TR 2SA562 (O,Y)    | VR604              | 0BT9725A | RK 100K 1/6W J     | C608,609           | 0BT9282A          | CC 100P 50V K                   |
| Q416               | 0BT6058A      | ZD 5.1V YZ051      | R601,607           |          |                    | C612,613           | 0BT1412A          | CE 10μ 16V                      |
| ZD401              | 0BT6384A      | ZD 5.5V XZ055      | 608,611            |          |                    | C614               | 0BT9276A          | CC 5P 50V J                     |
| ZD402              | 0B06283A      | Diode Bridge DBA30 | 612,613            |          |                    | C616               | 0BT1502A          | CE 330μ 16V                     |
| D401               | 0B06109A      | SiD GP08B          | 614,615            |          |                    | C617               | 0BT9327A          | CE 0.33μ 50V (LN)               |
| D402,403           | 0B06282A      | Diode Bridge DBA10 | 627,632            |          |                    | C619               | 0BT9865A          | CF 0.056μ 50V J                 |
| D404               | 0BT6398A      | SiD 1SS176         | 649,667            |          |                    | C620               | 0BT9370A          | CC 33P 50V J                    |
| D405,406           | 0BT6181A      | SiD 1SS53          | 672,693            |          |                    | CN7                | 0B02347A          | 3P-T Post BLU                   |
| D407               | 0BT1857A      | RK 1K 1/4W J       | 694,696            |          |                    | CN8                | 0B08653A          | 3P-T Post                       |
| R401,426           | 0BT1679A      | RK 100 1/4W J      | 703,704            |          |                    | CN9                | 0B02286A          | 6P-T Post BLU                   |
| R402               | 0BT1846A      | RK 4.7K 1/4W J     | 709,710            |          |                    | CN10               | 0B08642A          | 6P-T Post                       |
| R403               | 0BT1888A      | RK 10K 1/4W J      | 720,721            |          |                    | CN11               | 0B08656A          | 2P-T Post                       |
| R404               | 0BT5671A      | RK 2.2M 1/4W J     | 722,726            |          |                    | CN12               | 0B08654A          | 4P-T Post                       |
| R405,415           | 0BT9528A      | RM 13.7K 1/4W F    | 727,734            |          |                    | CN13               | 0B08644A          | 8P-T Post                       |
| R406               | 0BT9203A      | RM 10K 1/4W F      | R603,651           | 0BT5622A | RK 2.2K 1/4W J     |                    | 0B08964A          | TR Mica TO-126(2)               |
| R407               | 0BT1887A      | RK 5.6K 1/4W J     | R604,609           | 0BT9749A | RK 1M 1/6W J       |                    | 0E00507A          | Nut Hex. M3 (2)                 |
| R408               | 0BT5794A      | RK 680 1/4W J      | 610,708            |          |                    |                    | (Chromate)        |                                 |
| R409               | 0BT9504A      | RM 11K 1/4W F      | 736                |          |                    |                    | 0E00510A          | M3x8 ⊕ Pan (2A) (2)             |
| R410,417           | 0BT9677A      | RK 1K 1/6W J       | R605,616           | 0BT9701A | RK 10K 1/6W J      |                    | QJ04485A          | Heat Sink B (1)                 |
| R411               | 0BT9653A      | RK 100 1/6W J      | 617,629            |          |                    |                    | — Miscellaneous — |                                 |
| R412               | 0BT9693A      | RK 4.7K 1/6W J     | 639,659            |          |                    |                    |                   |                                 |
| R413,431           | 0BT9701A      | RK 10K 1/6W J      | 661,662            |          |                    |                    |                   |                                 |
| R414               | 0BT9695A      | RK 5.6K 1/6W J     | 676,681            |          |                    |                    |                   |                                 |
| R416,420           |               |                    | 682,683            |          |                    |                    |                   |                                 |
| 421                |               |                    | 689,695            |          |                    |                    |                   |                                 |
| R418,425           | 0BT9725A      | RK 100K 1/6W J     | 699,711            |          |                    | Q401,402           | 0B02577B          | Logic P.C.B.                    |
| 427                |               |                    | 729,730            |          |                    | 413                | 0B06255A          | TR 2SD880 (Y)                   |
| R419               | 0BT9707A      | RK 18K 1/6W J      | 733,735            |          |                    | Q405,406           | 0B06256A          | TR 2SB834 (Y,GR)                |
| R422               | 0BT9667A      | RK 390 1/6W J      | 738                |          |                    |                    | 0B08601A          | TR Mica TO-220(5)               |
| R423,434           | 0BT9737A      | RK 330K 1/6W J     | R606,634           | 0BT1888A | RK 10K 1/4W J      |                    | 0B08602A          | TR Bushing TO-220 (5)           |
| R424               | 0BT9729A      | RK 150K 1/6W J     | 673,690            |          |                    |                    |                   |                                 |
| R428               | 0BT9713A      | RK 33K 1/6W J      | 724,728            |          |                    |                    | 0E00507A          | Nut Hex. M3 (5)                 |
| R429               | 0BT9719A      | RK 56K 1/6W J      | R618,697           | 0BT9707A | RK 18K 1/6W J      |                    | (Chromate)        |                                 |
| R430               | 0BT5622A      | RK 2.2K 1/4W J     | 698                |          |                    |                    | 0E00608A          | M3x10 ⊕ Pan (3A) (5)            |
| R432,433           | 0B09243A      | RF 4.7 1/2W J      | R619,637           | 0BT9713A | RK 33K 1/6W J      |                    | (Chromate)        |                                 |
| C401               | 0B40037A      | CE 10000μ 25V      | 638,642            |          |                    |                    | QJ04647B          | Heat Sink (1)                   |
| C402               | 0B09374A      | CE 6800μ 25V       | 666,671            |          |                    |                    | 0B02349A          | 4P-JP Connector                 |
| C403,407           | 0BT1272A      | CE 100μ 25V        | 691                |          |                    | CN14,15            |                   |                                 |
| C404,408           | 0BT9276A      | CC 5P 50V J        | R620               | 0BT9717A | RK 47K 1/6W J      | 34                 |                   |                                 |
| C405               | 0B09798A      | CE 6800μ 16V       | R621               | 0BT9712A | RK 30K 1/6W J      | CN16               | 0B02350A          | 5P-JP Connector                 |
| C406               | 0B09799A      | CE 4700μ 25V       | R622               | 0BT9716A | RK 43K 1/6W J      | CN17,18            | 0B02355A          | 10P-JP Connector                |
| C409,411           | 0B01397A      | CE 1000μ 16V       | R623,644           | 0BT9703A | RK 12K 1/6W J      | CN26,27            | 0B02348A          | 3P-JP Connector                 |
| C410               | 0BT9218A      | CE 47μ 16V (LN)    | R624,645           | 0BT9723A | RK 82K 1/6W J      | 28,29              |                   |                                 |
| C412               | 0B01406A      | CE 2200μ 16V       | R625,668           | 0BT9727A | RK 120K 1/6W J     | FC22               | 0B82033A          | 2P Flat Cable                   |
| C413               | 0BT1405A      | CE 1μ 50V          | R626,628           | 0BT9737A | RK 330K 1/6W J     | FC23               | 0B05337B          | 2P Flat Cable                   |
| C414               | 0BT9873A      | CF 0.27μ 50V J     | 633,652            |          |                    | FC24               | 0B05351B          | 3P Flat Cable                   |
|                    |               |                    | 665,670            |          |                    | FC25               | 0B05345B          | 3P Flat Cable                   |
|                    |               |                    | 674,678            |          |                    | FC43               | 0B05352B          | 3P Flat Cable                   |
|                    |               |                    | 679,680            |          |                    |                    | 0B02343B          | 5P-H Connector (1)              |
|                    |               |                    | 718,719            |          |                    |                    | 0B08515A          | Insu-Lock (8)                   |
|                    |               |                    | 725,732            |          |                    |                    | 0B90005A          | Insu-Lock (1)                   |
| IC601              | 0B06324A      | IC LM6402A-052     | R630               | 0BT5620A | RK 270K 1/4W J     |                    | 0E00037A          | Earth Lug B-5 (1)               |
| IC602              | 0B06392A      | IC LM6416E-149     | R631               | 0BT5627A | RK 330K 1/4W J     |                    | 0E00857A          | BT 3x6 ⊕ Binding (Chromate) (3) |
| IC603              | 0B06124B      | IC JRC4558D        | R635               | 0BT9699A | RK 8.2K 1/6W J     |                    | OM04331A          | Label CN-22 (1)                 |
| IC604              | 0B06317A      | IC μPD4030BC       | R636,732           | 0BT9689A | RK 3.3K 1/6W J     |                    | OM04332A          | Label CN-23 (1)                 |
| IC605              | 0B06214A      | IC μPD4071BC       | R640,653           | 0BT9709A | RK 22K 1/6W J      |                    | OM04236A          | Label CN-24 (1)                 |
| Q601,606           | 0BT6013A      | TR 2SA733 (P,Q)    | R641               | 0BT9731A | RK 180K 1/6W J     |                    | OM04237A          | Label CN-25 (1)                 |
| 607,611            |               |                    | R643               | 0B22444Y | RM 76.8K 1/4W F    |                    |                   |                                 |
| 612,613            |               |                    | R646               | 0B22457Y | RM 100K 1/4W F     |                    |                   |                                 |
| 614,621            |               |                    | R647               | 0BT9305A | RM 100K 1/4W F     |                    |                   |                                 |
| 626,627            |               |                    | R648,654           | 0BT5671A | RK 2.2M 1/4W J     |                    |                   |                                 |
| 629,630            |               |                    | 737                |          |                    |                    |                   |                                 |
| 631,633            |               |                    | R650               | 0BT9472A | RM 220K 1/4W F     |                    |                   |                                 |
| 635                |               |                    | R655,656           | 0BT9315A | RM 332K 1/4W F     |                    |                   |                                 |
| Q602,603           | 0BT1872A      | TR 2SC945L (P,Q)   | R657               | 0B22420A | RM 47.5K 1/4W F    |                    |                   |                                 |
| 604,605            |               |                    | R658               | 0B22475Y | RM 150K 1/4W F     |                    |                   |                                 |
| 608,617            |               |                    | R663               | 0BT5621A | RK 120K 1/4W J     |                    |                   |                                 |
| 618,619            |               |                    | R664               | 0BT5626A | RK 150K 1/4W J     |                    |                   |                                 |
| 622,623            |               |                    | R669               | 0BT9729A | RK 150K 1/6W J     |                    |                   |                                 |
| 628,632            |               |                    | R677,684           | 0BT1889A | RK 100K 1/4W J     |                    |                   |                                 |
| 634,636            |               |                    | 685,686            |          |                    |                    |                   |                                 |
| Q609               | 0B06316A      | TR 2SD882 (P,Q)    | 688,705            |          |                    |                    |                   |                                 |
| Q610               | 0B06303A      | TR 2SB772 (P,Q)    | 714,715            |          |                    |                    |                   |                                 |
| Q615               | 0B06066A      | TR 2SD471 (L,M)    | 716,723            |          |                    |                    |                   |                                 |
| Q616               | 0B06069A      | TR 2SB564 (L,M)    | R687               | 0BT9695A | RK 5.6K 1/6W J     |                    |                   |                                 |
| Q624,625           | 0BT6372A      | TR 2SA953 (K,L)    | R692               | 0BT9677A | RK 1K 1/6W J       |                    |                   |                                 |
| D601,612           | 0BT6181A      | SiD 1SS53          | R700               | 0BT9733A | RK 220K 1/6W J     |                    |                   |                                 |
| 613,620            |               |                    | R701,702           | 0BT9719A | RK 56K 1/6W J      |                    |                   |                                 |
| 621,622            |               |                    | 707                |          |                    |                    |                   |                                 |
| 625                |               |                    |                    |          |                    |                    |                   |                                 |

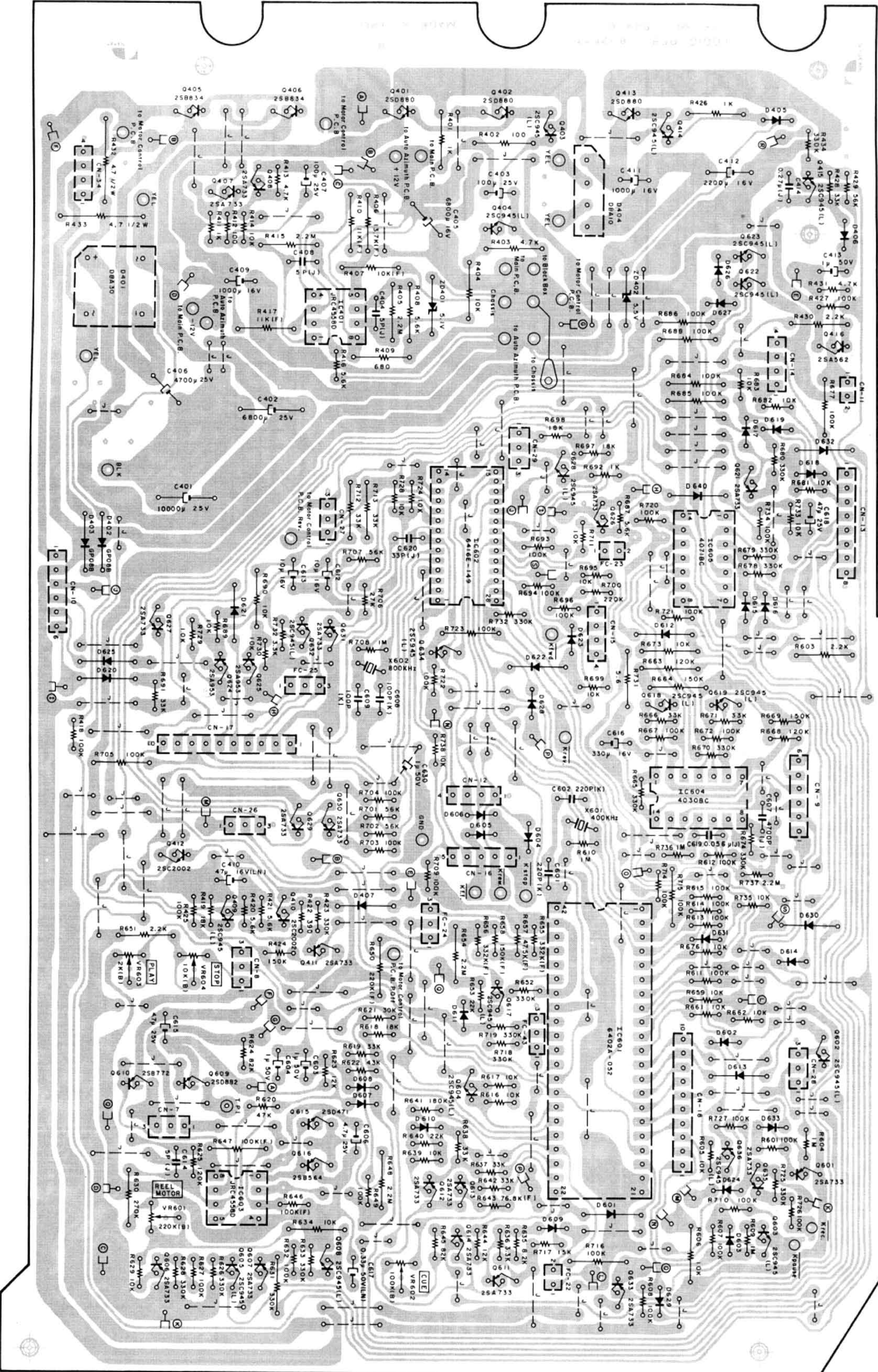


Fig. 6.14.1 Serial No.: A80102201 -



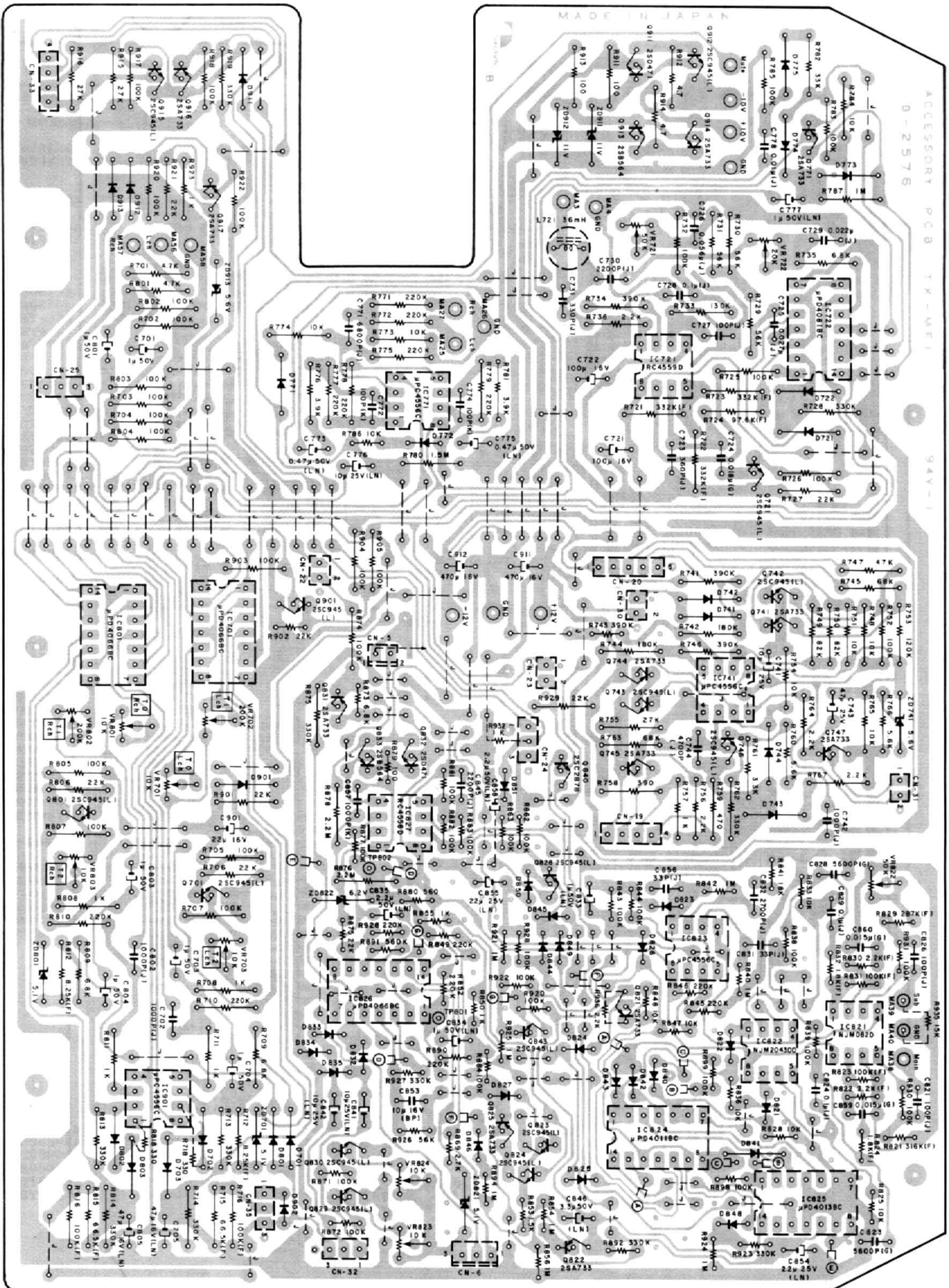


Fig. 6.15.1 Serial No.: A80102201



| Schematic Ref. No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Part No.                                                                                                                                                                                                                                                                                                                                                                                                                             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Schematic Ref. No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Part No.                                                                                                                                                                                                                                 | Description                                                                                                                                                                                                                                                                                                                                              | Schematic Ref. No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Part No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>BA04870A</b>                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Main P.C.B. Assy</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | C517,617<br>C518,618<br>C519,619<br>CN2                                                                                                                                                                                                                                                                                                                                                                                                                                                       | OBT9410A<br>OBT9322A<br>OBT9286A<br>OB02281A                                                                                                                                                                                             | CP 2200P 100V G<br>CP 330P 100V J<br>CC 470P 50V K<br>4P-T Post                                                                                                                                                                                                                                                                                          | D102,202<br>L101,201<br>R101,201<br>R102,202<br>R103,203<br>R104,204<br>R106,206<br>R107,207<br>R108,120<br>R109,110<br>R111,211<br>R112,212<br>R114,214<br>R115,215<br>R116,216<br>R117,125<br>R118,218<br>R119,219<br>R121,221<br>R123,223<br>R124,224<br>R126,130<br>R127,129<br>R131,132<br>R133,233<br>R134,234<br>R135,235<br>R136,236<br>C101,115<br>C103,203<br>C104,105<br>C106,206<br>C108,208<br>C109,209<br>C110,114<br>C111,211<br>C112,212<br>C116,216<br>C117,217<br>C118,122<br>C119,121<br>C120,220<br>C123,223<br>C124,125<br>C126,226<br>C127,227<br>C128,228                                                                                                                                                                                                                      | OBT6398A<br>OB06676A<br>OBT1889A<br>OBT1857A<br>OBT5622A<br>OBT5743A<br>OBT1681A<br>OBT9677A<br>OBT9701A<br><br>OBT9502A<br><br>OBT9197A<br>OBT9766A<br>OBT1888A<br>OB22305Y<br>OB22351Y<br>OBT9717A<br><br>OBT9673A<br>OBT9683A<br>OB22443Y<br>OBT9737A<br>OBT5668A<br>OBT5627A<br><br>OBT5676A<br><br>OB09162A<br><br>OBT9705A<br>OB22326Y<br>OB22545A<br>OBT9735A<br>OBT9814A<br><br>OBT9409A<br>OBT9857A<br><br>OBT9863A<br>OBT9240A<br>OBT9852A<br>OBT1412A<br><br>OBT9861A<br>OBT9191A<br>OBT9864A<br>OBT9866A<br>OBT9862A<br><br>OBT9868A<br><br>OBT9870A<br>OBT9872A<br>OBT5885A<br><br>OBT9783A<br>OBT9856A<br>OB09302A | SID 1SS176<br>Inductor 36mH G<br>RK 100K 1/4W J<br>RK 1K 1/4W J<br>RK 2.2K 1/4W J<br>RK 27K 1/4W J<br>RK 3.3K 1/4W J<br>RK 1K 1/6W J<br>RK 10K 1/6W J<br><br>RM 1M 1/4W F<br><br>RM 820K 1/4W F<br>RM 2.2M 1/4W F<br>RK 10K 1/4W J<br>RM 4.7K 1/4W F<br>RM 12K 1/4W F<br>RK 47K 1/6W J<br><br>RK 680 1/6W J<br>RK 1.8K 1/6W J<br>RM 75K 1/4W F<br>RK 330K 1/6W J<br>RK 82K 1/4W J<br>RK 330K 1/4W J<br><br>RK 390K 1/4W J<br><br>RF 82 1/4W J<br><br>RK 15K 1/6W J<br>RM 6.98K 1/4W F<br>RM 10M 1/4W F<br>RK 270K 1/6W J<br>CE 1μ 50V (LN)<br><br>CP 1800P 100V G<br>CF 0.012μ 50V J<br><br>CF 0.039μ 50V J<br>CP 0.033μ 100V G<br>CF 4700P 50V J<br>CE 10μ 16V<br><br>CF 0.027μ 50V J<br>CP 4700P 100V G<br>CF 0.047μ 50V J<br>CF 0.068μ 50V J<br>CF 0.033μ 50V J<br><br>CF 0.1μ 50V J<br><br>CF 0.15μ 50V J<br>CF 0.22μ 50V J<br>CE 100μ 10V<br><br>CP 820P 100V J<br>CF 0.01μ 50V J<br>C 100P 50V J |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | — PB Eq. Amp. —                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | — Bias Osc. —                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| IC301,501<br>601<br>IC502,602<br>IC701<br>Q501,502<br>601,602<br>701,702<br>ZD301<br>L501,502<br>601,602<br>701<br>VR501,502<br>601,602<br>VR701,702<br>R306<br>R307<br>R308<br>R341,342<br>R501,511<br>601,611<br>701,707<br>R502,512<br>602,612<br>702,708<br>R503,513<br>603,613<br>703,709<br>R504,514<br>604,614<br>704,710<br>R505,515<br>605,615<br>705,711<br>R506,516<br>606,616<br>706,712<br>R507,517<br>607,617<br>R508,518<br>608,618<br>R509,519<br>609,619<br>R715,716<br>C304<br>C305<br>C325,326<br>C501,504<br>601,604<br>701,703<br>C502,505<br>602,605<br>702,704<br>C503,506<br>603,606<br>705<br>CN3<br>CN4 | OB11005A<br><br>OB06144A<br>OB06443A<br>OB06376A<br><br>OBT6418A<br>OB06717A<br><br>OB07256A<br><br>OB32002A<br>OBT5622A<br>OBT9701A<br>OBT1857A<br>OBT9737A<br>OBT9725A<br><br>OB22296Y<br><br>OB22104Y<br><br>OB09785A<br><br>OB22512Y<br><br>OB22353Y<br><br>OBT9661A<br><br>OBT9669A<br><br>OBT1682A<br><br>OBT9653A<br>OBT1412A<br>OBT1400A<br>OBT9291A<br>OBT9933A<br><br>OBT9312A<br><br>OBT9851A<br><br>OBL8654A<br>OBL8642A | IC NJM072DE<br><br>IC μPD4066BC<br>IC NJM082D<br>FET 2SK170 (GR)<br><br>ZD 8.2V RD8.2JB2<br>Trap Unit<br><br>Semi-fixed VR 10K<br><br>Semi-fixed VR 2K<br>RK 2.2K 1/4W J<br>RK 10K 1/6W J<br>RK 1K 1/4W J<br>RK 330K 1/6W J<br>RK 100K 1/6W J<br><br>RM 3.92K 1/4W F<br><br>RM 80.6 1/4W F<br><br>RK 4.7M 1/4W J<br><br>RM 316K 1/4W F<br><br>RM 12.4K 1/4W F<br><br>RK 220 1/6W J<br><br>RK 470 1/6W J<br><br>RK 6.8K 1/4W J<br><br>RK 100 1/6W J<br>CE 10μ 16V<br>CE 100μ 16V<br>CC 0.022μ 50V Z<br>CE 2.2μ 50V (LN)<br><br>CP 0.01μ 100V G<br><br>CF 3900P 50V J<br><br>4P-T Post<br>6P-T Post | Q302<br>Q303<br>T301<br>R311<br>R312<br>R313,314<br>R315<br>R316<br>R317<br>R318<br>R343<br>C311<br>C312<br>C321<br>CN1<br><br>Q121,122<br>123,221<br>222,223<br>301<br>L102,202<br>VR301<br>R181,281<br>R182,282<br>R183,283<br>303<br>R184,284<br>R185,285<br>301,302<br>R186,286<br>R187,287<br>R188,288<br>R189,289<br>R190,290<br>R191<br>R291<br>R304<br>R305<br>C161,261<br>C162,262<br>C163,263<br>C164,264<br>C165,265<br>C166,266<br>C167,267<br>C301,302<br>C303<br>C320<br>Cds301 | — Line Input —                                                                                                                                                                                                                           | OBT1872A<br><br>OB06690A<br>OB07257A<br>OBT9733A<br>OBT9653A<br>OBT9725A<br><br>OBT9705A<br>OBT9677A<br><br>OBT9687A<br>OBT9698A<br>OBT5622A<br>OBT9701A<br>OBT5743A<br>OBT5692A<br>OBT5621A<br>OBT9709A<br>OBT9697A<br>OBT9814A<br>OB09247A<br>OBT9932A<br>OBT9849A<br>OBT9845A<br>OBT9288A<br>OBT9270A<br>OBT1400A<br>OBT9850A<br>OBT9290A<br>OB06325B | TR 2SA733 (P,Q)<br>TR 2SA562TM (Y)<br>Bias Osc. Unit<br>RK 10K 1/4W J<br>RK 68K 1/4W J<br>RF 10 1/2W J<br>RK 560 1/4W J<br>RK 3.3K 1/4W J<br>RK 18K 1/4W J<br>RK 10K 1/6W J<br>RK 220 1/6W J<br>CP 0.022μ 100V J<br>CE 100μ 16V<br>CF 1000P 50V J<br>2P-T Post<br><br>TR 2SC945L (P,Q)<br><br>L-C Block<br>Semi-fixed VR 100K<br>RK 220K 1/6W J<br>RK 100 1/6W J<br>RK 100K 1/6W J<br><br>RK 15K 1/6W J<br>RK 1K 1/6W J<br><br>RK 2.7K 1/6W J<br>RK 7.5K 1/6W J<br>RK 2.2K 1/4W J<br>RK 10K 1/6W J<br>RK 27K 1/4W J<br>RK 68K 1/4W J<br>RK 120K 1/4W J<br>RK 22K 1/6W J<br>RK 6.8K 1/6W J<br>CE 1μ 50V (LN)<br>C 220P 50V J<br>CE 22μ 16V (LN)<br>CF 2700P 50V J<br>CF 1200P 50V J<br>CC 1000P 50V K<br>CP 470P 100V J<br>CE 100μ 16V<br>CF 3300P 50V J<br>CC 0.01μ 50V Z<br>Photocoupler<br>MCD7214F |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | — Rec. Eq. Amp. —                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | — Line Amp. —                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| IC302<br>Q503,504<br>603,604<br>L503,603<br>L504,604<br>R521,529<br>621,629<br>R522,622<br>R523,526<br>623,626<br>R524,624<br>R527,627<br>R528,628<br>R530,630<br>R531,631<br>R532,632<br>R533,633<br>R534,634<br>C327,328<br>C511,611<br>C512,520<br>612,620<br>C513,613<br>C514,614<br>C515,615<br>C516,616                                                                                                                                                                                                                                                                                                                     | OB06387A<br>OBT6299A<br><br>OB00068A<br>OB06705A<br>OBT9705A<br><br>OBT5560A<br>OBT9731A<br><br>OBT9653A<br>OB22410Y<br>OB22296Y<br>OBT9673A<br>OB22247Y<br>OBT1888A<br>OBT5936A<br>OBT9749A<br>OBT1405A<br>OBT9862A<br>OBT9814A<br><br>OBT9815A<br>OBT9867A<br>OBT9854A<br>OBT9850A                                                                                                                                                 | IC NJM2043DD<br>TR 2SC2878<br><br>Trap Coil 10.5mH<br>Trap Coil 1.05mH<br>RK 15K 1/6W J<br><br>RK 18K 1/4W J<br>RK 180K 1/6W J<br><br>RK 100 1/6W J<br>RM 39.2K 1/4W F<br>RM 3.92K 1/4W F<br>RK 680 1/6W J<br>RM 1.5K 1/4W F<br>RK 10K 1/4W J<br>RK 10 1/4W J<br>RK 1M 1/4W J<br>CE 1μ 50V<br>CF 0.033μ 50V J<br>CE 1μ 50V (LN)<br><br>CE 47μ 6.3V (LN)<br>CF 0.082μ 50V J<br>CF 6800P 50V J<br>CF 3300P 50V J                                                                                                                                                                                    | IC303<br>Q505,605<br>D121,221<br>L504,604<br>R541,543<br>641,643<br>R542,546<br>642,646<br>R544,644<br>R545,645<br>R547,647<br>R548,648<br>C521,621<br>C522,622<br>C523,623<br><br>IC101,201<br>IC102,202<br>Q101,102<br>103,104<br>105,201<br>202,203<br>204,205<br>ZD101,102<br>201,202<br>D101,103<br>201,203                                                                                                                                                                              | OB11004A<br>OBT1872A<br>OBT6398A<br>OB06676A<br>OBT5625A<br><br>OBT1857A<br><br>OBT9535A<br>OBT9900A<br>OBT9701A<br>OBT9749A<br>OBT9814A<br>OBT9815A<br>OBT9847A<br><br>OB06382A<br>OB06457A<br>OBT1872A<br><br>OBT6232A<br><br>OBT6181A | IC NJM2041DD<br>TR 2SC945L (P,Q)<br>SID 1SS176<br>Inductor 36mH G<br>RK 220K 1/4W J<br><br>RK 1K 1/4W J<br><br>RM 9.76K 1/4W F<br>RM 4.99K 1/4W F<br>RK 10K 1/6W J<br>RK 1M 1/6W J<br>CE 1μ 50V (LN)<br>CE 47μ 6.3V (LN)<br>CF 1800P 50V J<br><br>IC NE652<br>IC NJM072DD<br>TR 2SC945L (P,Q)<br><br>ZD 9.1V RD9.1EB2<br><br>SID 1SS53                   | IC103,203<br>IC104,204<br>Q111-114<br>211-214<br>ZD106,107<br>206,207<br>D111,211<br>D112,212<br>R141,144<br>241,244<br>R142,242<br>R143,243<br>R145,245<br>R146,246<br><br>R147,247<br>R148,248<br>R149,249<br>R150,250<br>R151,251<br>R152,161<br>165,252<br>261,265<br>R153,253                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | OB06382A<br>OB06457A<br>OBT1872A<br><br>OBT6232A<br><br>OBT6181A<br>OBT6398A<br>OBT1889A<br><br>OBT1857A<br>OBT9588A<br>OBT5615A<br>OB22221Y<br><br>OBT1888A<br>OB22305Y<br>OBT9796A<br>OBT9717A<br>OB22230Y<br>OBT5627A<br><br>OB22443Y                                                                                                                                                                                                                                                                                                                                                                                         | IC NE562<br>IC NJM072DD<br>TR 2SC945L (P,Q)<br>(8)<br>ZD 9.1V RD9.1EB2<br><br>SID 1SS53<br>SID 1SS176<br>RK 100K 1/4W J<br><br>RK 1K 1/4W J<br>RK 2.4K 1/4W J<br>RK 22K 1/4W J<br>RM 845 1/4W F<br><br>RK 10K 1/4W J<br>RM 4.7K 1/4W F<br>RM 12K 1/4W F<br>RK 47K 1/6W J<br>RM 1.02K 1/4W F<br>RK 330K 1/4W J<br><br>RM 75K 1/4W F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Schematic Ref. No.  | Part No. | Description      |
|---------------------|----------|------------------|
| R155,255            | OBT9685A | RK 2.2K 1/6W J   |
| R156,256            | OBT9713A | RK 33K 1/6W J    |
| R157,257            | OBT9693A | RK 4.7K 1/6W J   |
| R158,258            | OBT9701A | RK 10K 1/6W J    |
| R159,163            | OBT5641A | RK 47K 1/4W J    |
| 259,263             |          |                  |
| R160,260            | OBT5668A | RK 82K 1/4W J    |
| R162,164            | OBT5676A | RK 390K 1/4W J   |
| 262,264             |          |                  |
| R166,167            | OB09162A | RF 82 1/4W J     |
| 266,267             |          |                  |
| R168,268            | OBT9749A | RK 1M 1/6W J     |
| C131,231            | OBT9933A | CE 2.2μ 50V (LN) |
| C133,233            | OBT9852A | CF 4700P 50V J   |
| C134,234            | OBT9240A | CP 0.033μ 100V G |
| C135,140            | OBT1412A | CE 10μ 16V       |
| 235,240             |          |                  |
| 329                 |          |                  |
| C136,144            | OBT9866A | CF 0.068μ 50V J  |
| 236,244             |          |                  |
| C137,237            | OBT9814A | CE 1μ 50V (LN)   |
| C139,239            | OB09191A | CP 4700P 100V G  |
| C141,241            | OBT9286A | CC 470P 50V K    |
| C142,242            | OBT9856A | CF 0.01μ 50V J   |
| C143,243            | OBT9864A | CF 0.047μ 50V J  |
| C145,149            | OBT9862A | CF 0.033μ 50V J  |
| 245,249             |          |                  |
| C146,148            | OBT9868A | CF 0.1μ 50V J    |
| 246,248             |          |                  |
| C147,247            | OBT9870A | CF 0.15μ 50V J   |
| C150,250            | OBT9872A | CF 0.22μ 50V J   |
| C151,152            | OBT5885A | CE 100μ 10V      |
| 251,252             |          |                  |
| C153,253            | OB09302A | C 100P 50V J     |
| C154,254            | OBT9262A | CP 3000P 100V J  |
| C310                | OBT1405A | CE 1μ 50V        |
| — Logic Interface — |          |                  |
| Q304,307            | OBT1872A | TR 2SC945L (P,Q) |
| 308                 |          |                  |
| Q305,306            | OBT6013A | TR 2SA733 (P,Q)  |
| D301,302            | OBT6181A | SiD 1SS53        |
| 304,305             |          |                  |
| 313,314             |          |                  |
| D303,311            | OBT6398A | SiD 1SS176       |
| 312                 |          |                  |
| R318,320            | OBT1889A | RK 100K 1/4W J   |
| 322,326             |          |                  |
| R319                | OBT5509A | RK 33K 1/4W J    |
| R321,331            | OBT5641A | RK 47K 1/4W J    |
| 332                 |          |                  |
| R323                | OBT1888A | RK 10K 1/4W J    |
| R324                | OBT5743A | RK 27K 1/4W J    |
| R325                | OBT1857A | RK 1K 1/4W J     |
| R327                | OBT9717A | RK 47K 1/6W J    |
| R328                | OBT5575A | RK 560 1/4W J    |
| R333,334            | OBT9749A | RK 1M 1/6W J     |
| C313,314            | OB01406A | CE 2200μ 16V     |
| C322,323            | OBT9292A | CC 0.1μ 50V Z    |
| 324                 |          |                  |
| — Headphone Amp. —  |          |                  |
| IC304               | OB06217A | IC NJM4560D      |
| Q506,606            | OB06066A | TR 2SD471 (L,M)  |
| Q507,607            | OB06069A | TR 2SB564 (L,M)  |
| R551,651            | OBT9653A | RK 100 1/6W J    |
| R552,553            | OBT1889A | RK 100K 1/4W J   |
| 652,653             |          |                  |
| R554,654            | OBT9645A | RK 47 1/6W J     |
| R555,655            | OB09331A | RF 8.2 1/4W J    |
| C531,631            | OBT9277A | CC 10P 50V J     |
| C315,316            | OBT1405A | CE 1μ 50V        |
| — Miscellaneous —   |          |                  |
| CN21,37             | OB02575B | Main P.C.B.      |
| CN36                | OB02348A | 3P-JP Connector  |
| FC21                | OB02350A | 5P-JP Connector  |
| FC30                | OB05343B | 3P Flat Cable    |
| FC31                | OB05334B | 2P Flat Cable    |
| FC32,47             | OB82032A | 2P Flat Cable    |
| FC33                | OB05342B | 3P Flat Cable    |
| FC37                | OB05356B | 4P Flat Cable    |
| FC46                | OB05341B | 3P Flat Cable    |
| FC48                | OB05344B | 3P Flat Cable    |
| FC49                | OB05347B | 3P Flat Cable    |
|                     | OB05335B | 2P Flat Cable    |
|                     | OB08515A | Insu-Lock (5)    |

| Schematic Ref. No. | Part No. | Description                     |
|--------------------|----------|---------------------------------|
|                    | OB08676B | Heat Sink A304 (1)              |
|                    | OM04238A | Label CN-26 (1)                 |
|                    | OM04239A | Label CN-27 (1)                 |
|                    | OM04439A | Label CN-30 (1)                 |
|                    | OM04247A | Label CN-31 (1)                 |
|                    | OM04248A | Label CN-32 (1)                 |
|                    | OM04249A | Label CN-33 (1)                 |
|                    | OE00612A | M3x6 ⊕ Pan (2A) (2)             |
|                    | OE00857A | BT 3x6 ⊕ Binding (Chromate) (2) |
|                    | OJ03834C | Fuse P.C.B. Holder (1)          |

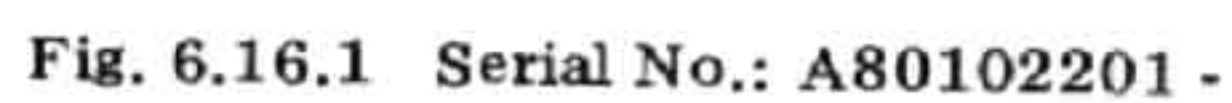


Fig. 6.16.1 Serial No.: A80102201 -

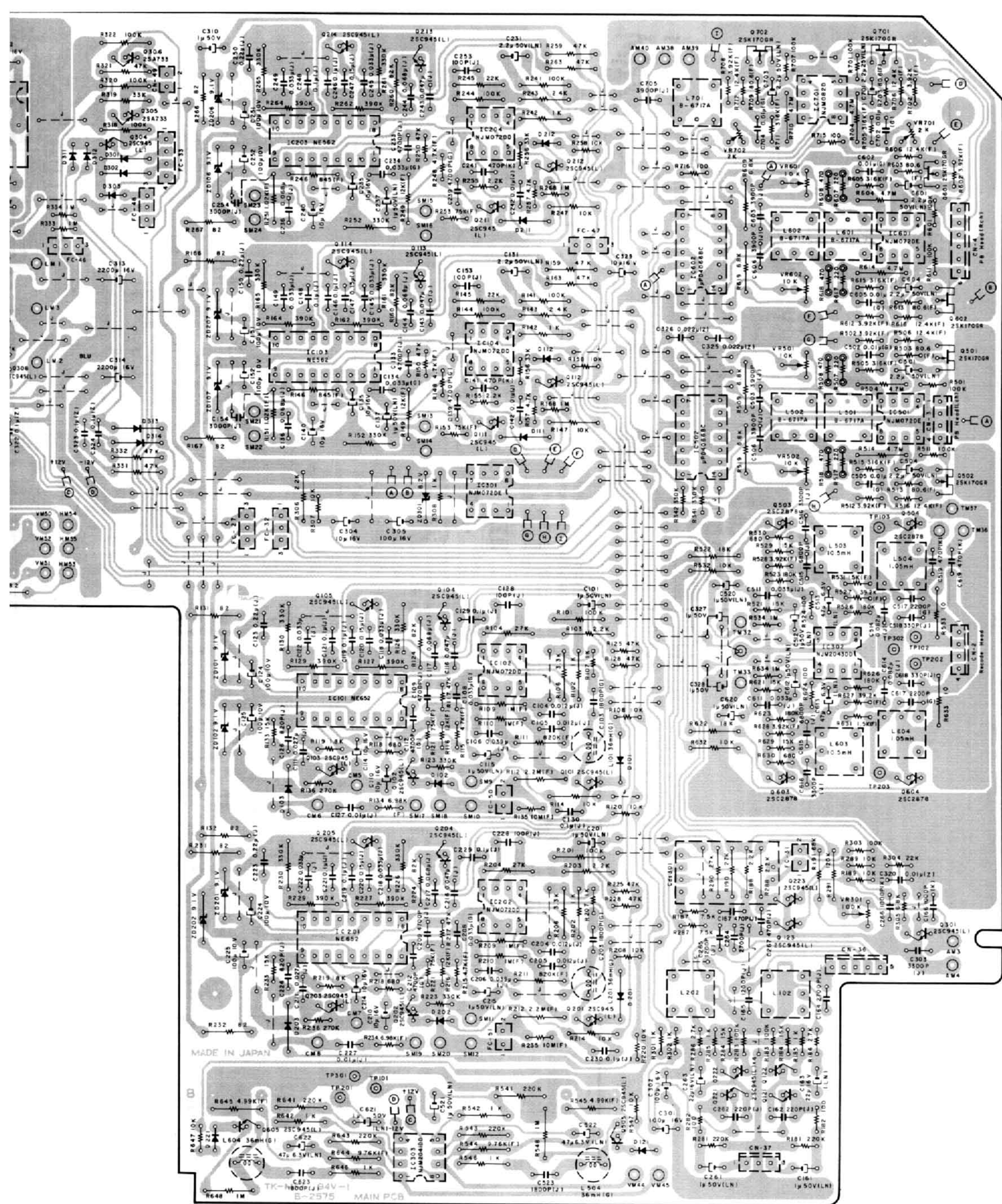
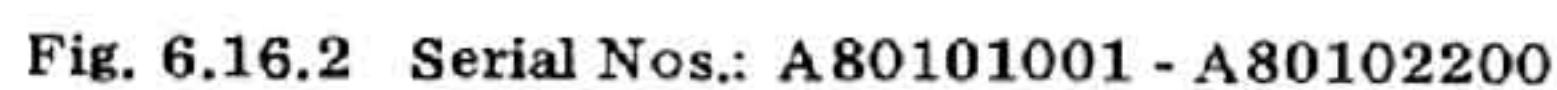


Fig. 6.16.1 Serial No.: A80102201 -



**Fig. 6.16.2 Serial Nos.: A80101001 - A80102200**

## 7. SCHEMATIC DIAGRAMS

### 7.1. Attention to Servicemen

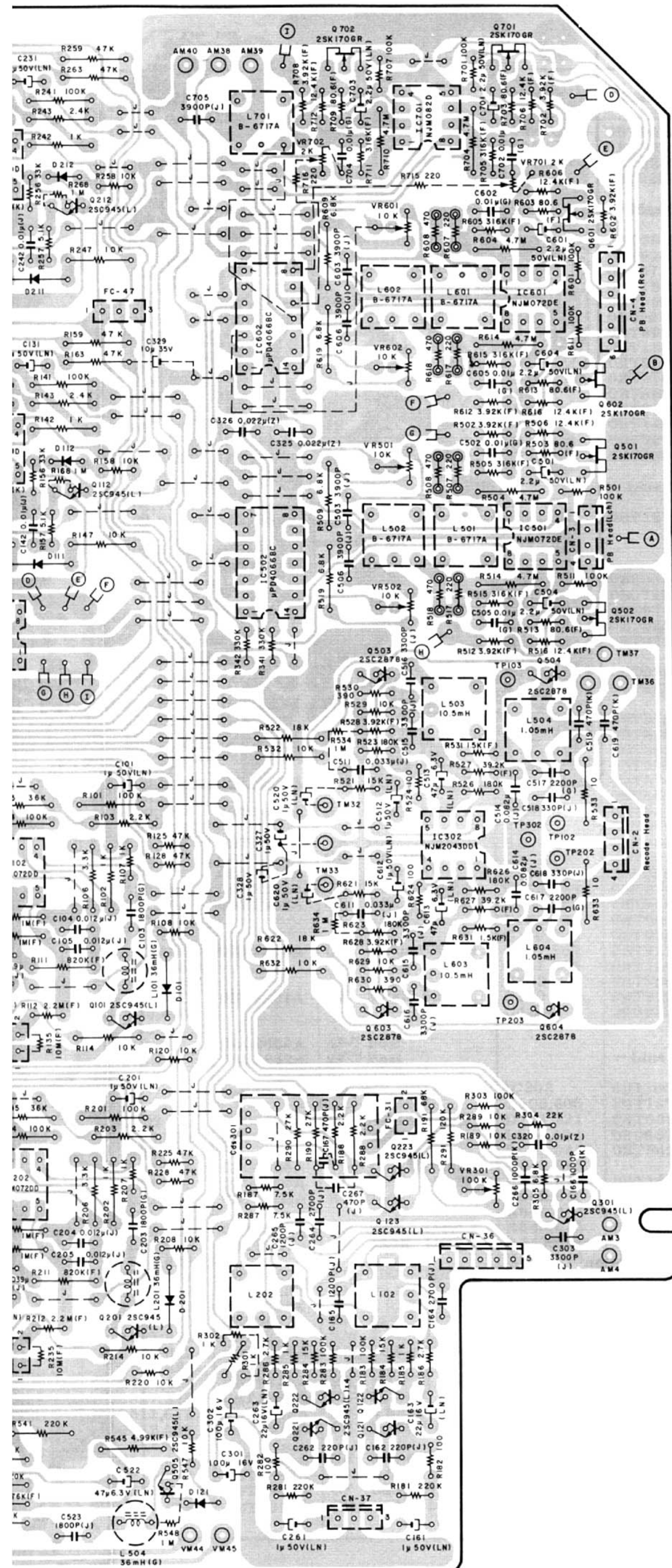
#### (1) Parts Replacement

Following parts shall be replaced with the specified ones. Refer to the parts list.

- (a) Power Supply Circuit  
Power Cord  
Power Transformer: T1
- (b) Power Switch P.C.B. Ass'y  
Power Switch: SW1  
Spark Killer: M2
- (c) Fuse P.C.B. Ass'y  
Fuses: F01, 02, 03
- (d) Logic P.C.B. Ass'y  
Power Transistors: Q401, 402, 405, 406, 410, 412, 413, 416, 609, 610, 615, 616  
Diode Bridges: D401, 404  
Fail Safe Type Resistors: R432, 433, 731
- (e) Main P.C.B. Ass'y  
Power Transistors: Q303, 506, 606  
Fail Safe Type Resistors: R131, 132, 166, 167, 231, 232, 266, 267, 313, 314, 555, 655
- (f) Auto Azimuth P.C.B. Ass'y  
Power Transistors: Q832, 833, 911, 913  
Fail Safe Type Resistors: R911, 912, 913, 914
- (g) Motor Control P.C.B. Ass'y  
Power Transistors: Q518, 519, 520, 521, 522, 523, 524, 525, 526  
Fail Safe Type Resistors: R572, 573, 582, 583
- (h) Shut-off P.C.B. Ass'y  
Fail Safe Type Resistor: R605  
Lamp: PL602
- (i) Counter Pulse Generator P.C.B. Ass'y  
Fail Safe Type Resistor: R601  
Lamp: PL601

#### (2) Insulation Check

Before returning the repaired Nakamichi DRAGON to a customer, check to insure that the exposed parts are accurately insulated from the AC line by measuring the leakage current or the insulation resistance between them.



2. IC Block Diagrams

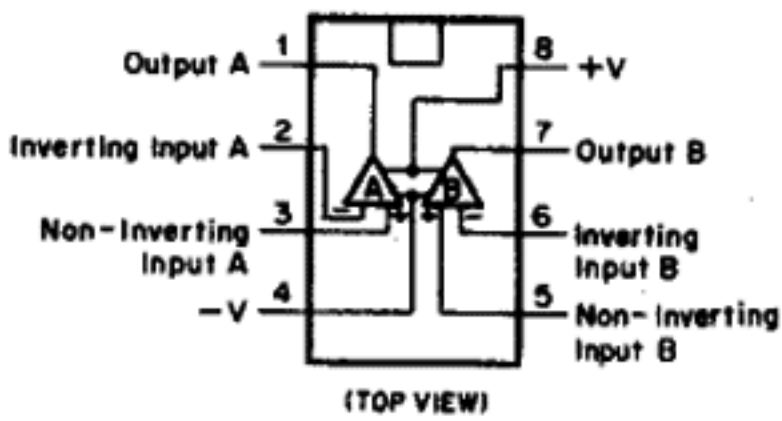


Fig. 7.2.1 Operational Amp. IC 4558D, 4559D, 4560D, 4556C, 2041DD, 2043DD, 082D, 072D

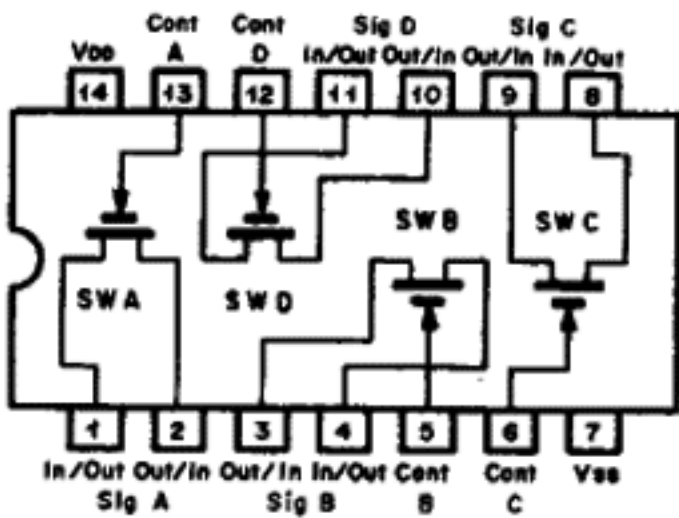


Fig. 7.2.2 Bilateral Switch C-MOS IC μPD4066BC

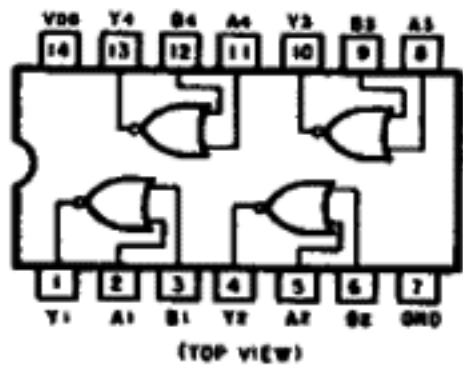


Fig. 7.2.3 NOR Gate C²-MOS IC TC40H002P

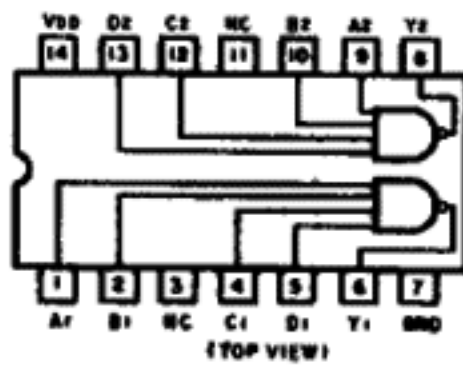


Fig. 7.2.4 NAND Gate C²-MOS IC TC40H020P

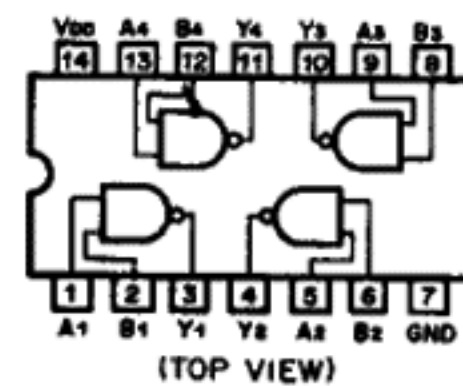


Fig. 7.2.5 NAND Gate C-MOS IC μPD4011BC

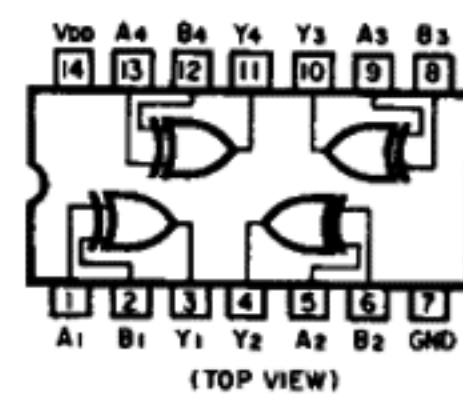


Fig. 7.2.6 Exclusive OR Gate C-MOS IC μPD4030BC

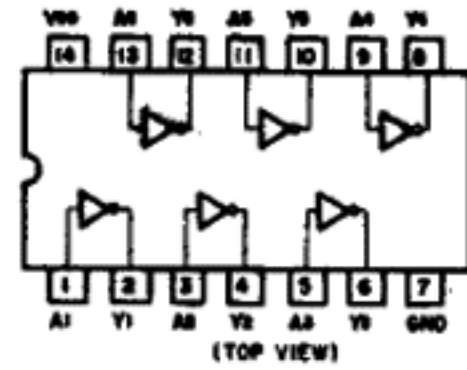


Fig. 7.2.7 Inverter C-MOS IC TC4069UBP

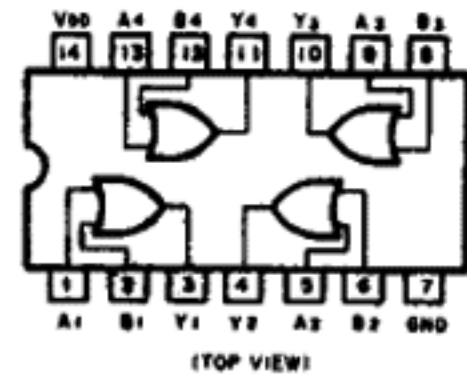


Fig. 7.2.8 OR Gate C-MOS IC μPD4071BC

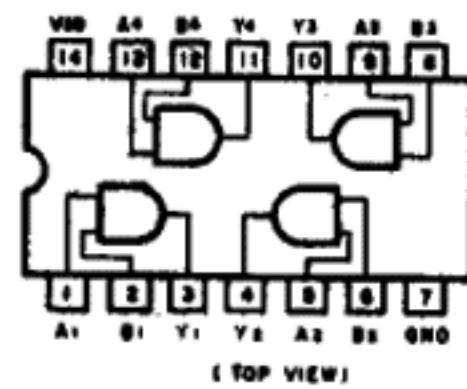


Fig. 7.2.9 AND Gate C-MOS IC μPD4081BC

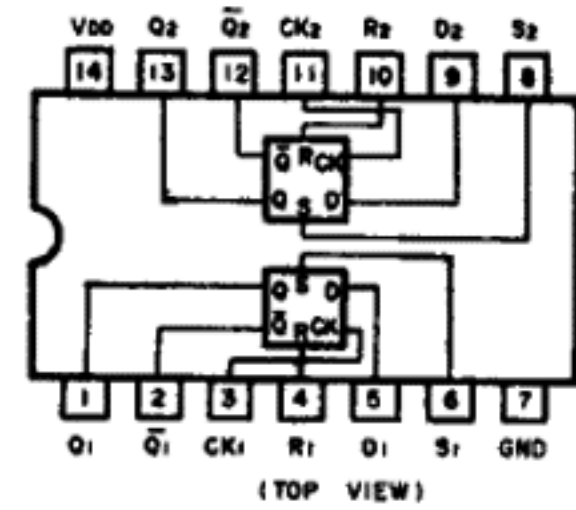


Fig. 7.2.10 D-Type Flip-Flop C-MOS IC μPD4013BC

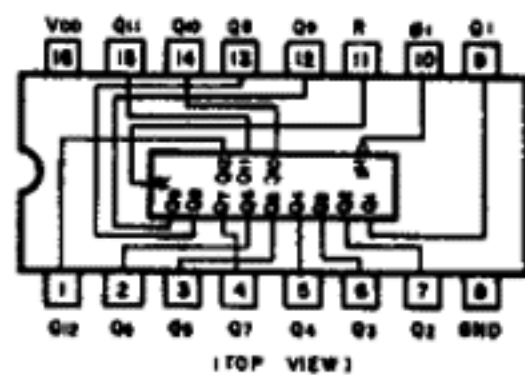


Fig. 7.2.11 Decoder C-MOS IC μPD4040BC

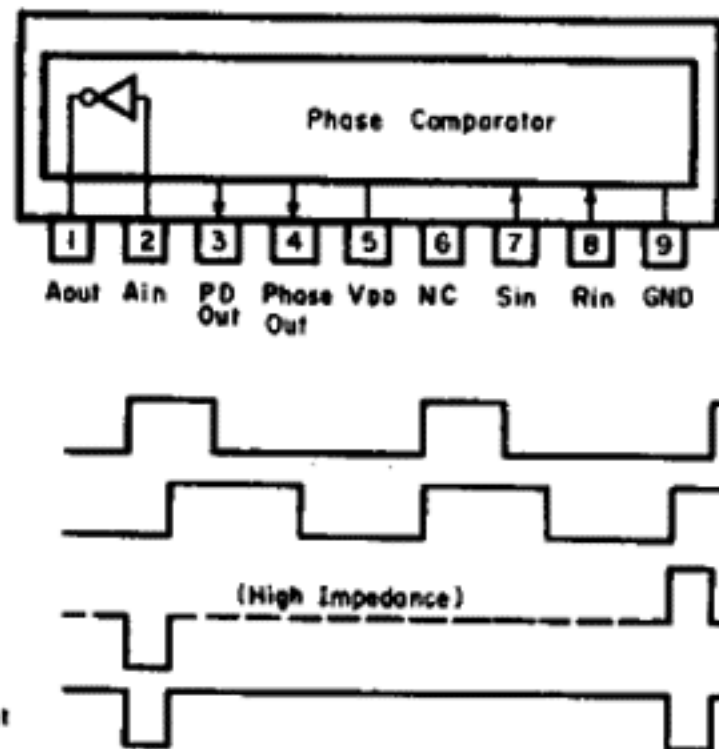


Fig. 7.2.12 Phase Comparator TC5081P

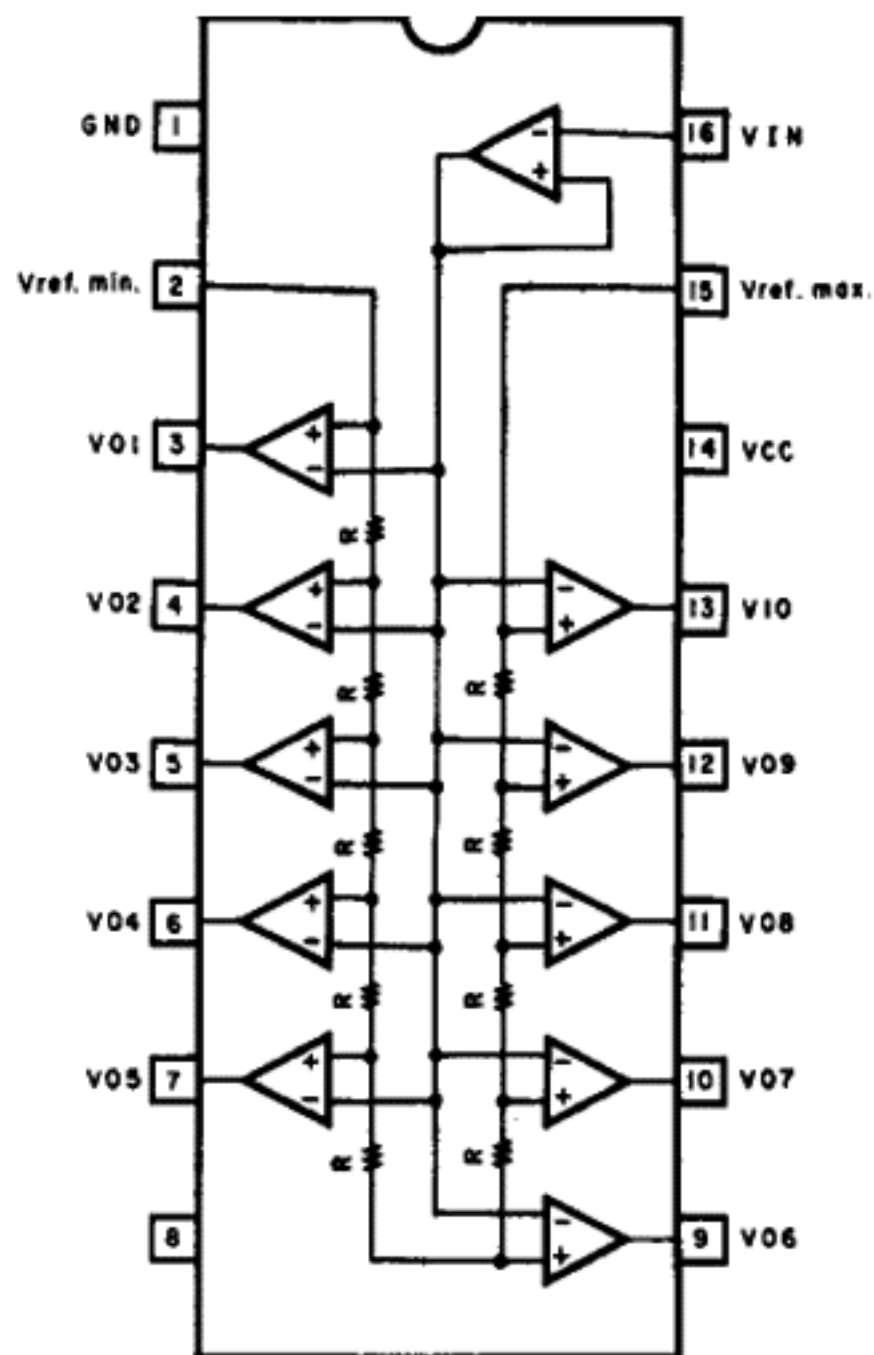


Fig. 7.2.13 Level Meter Driver TA7612AP

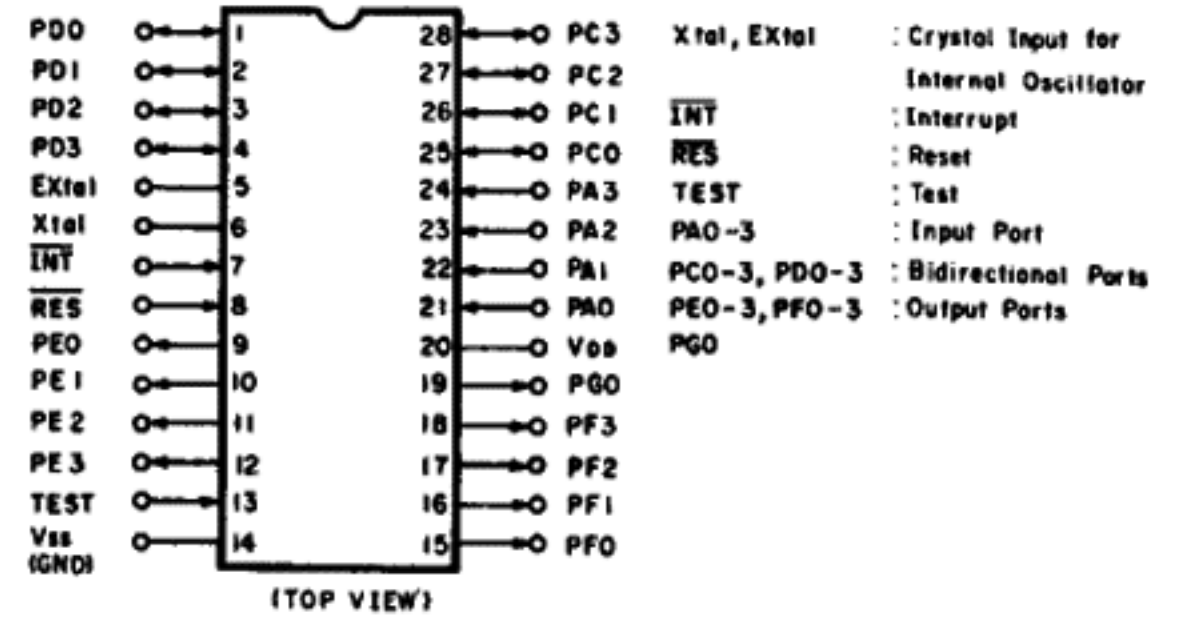
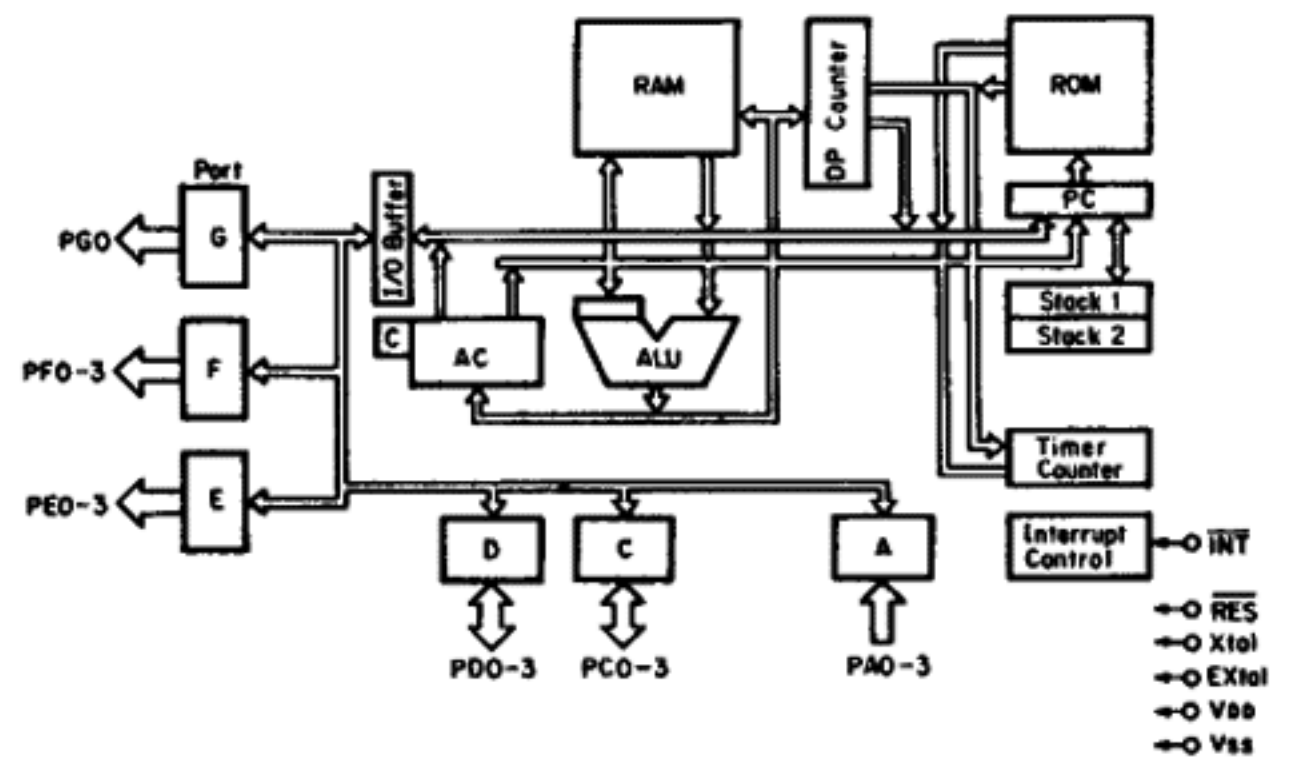


Fig. 7.2.15 4-Bit Micro-processor LM6416E

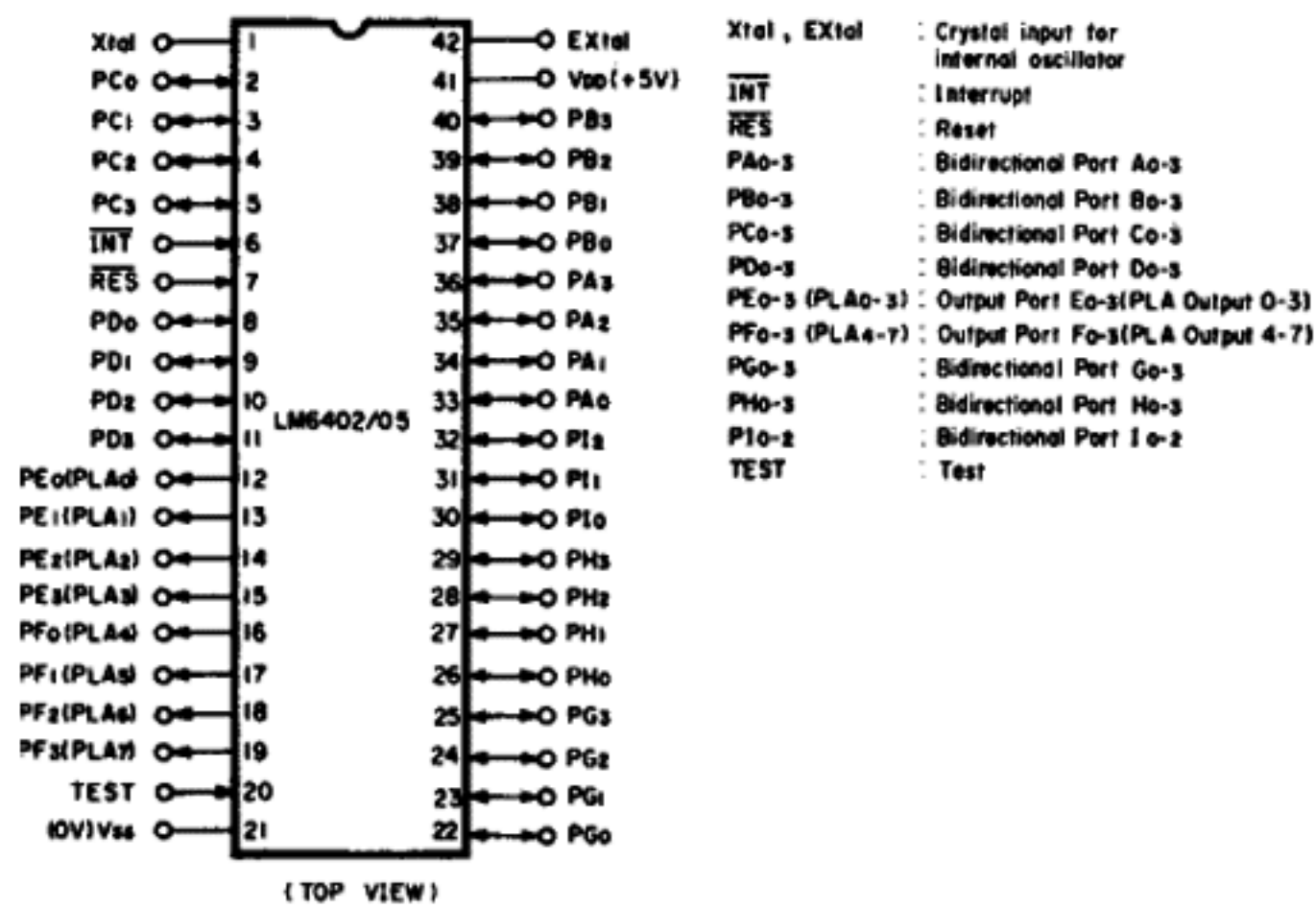
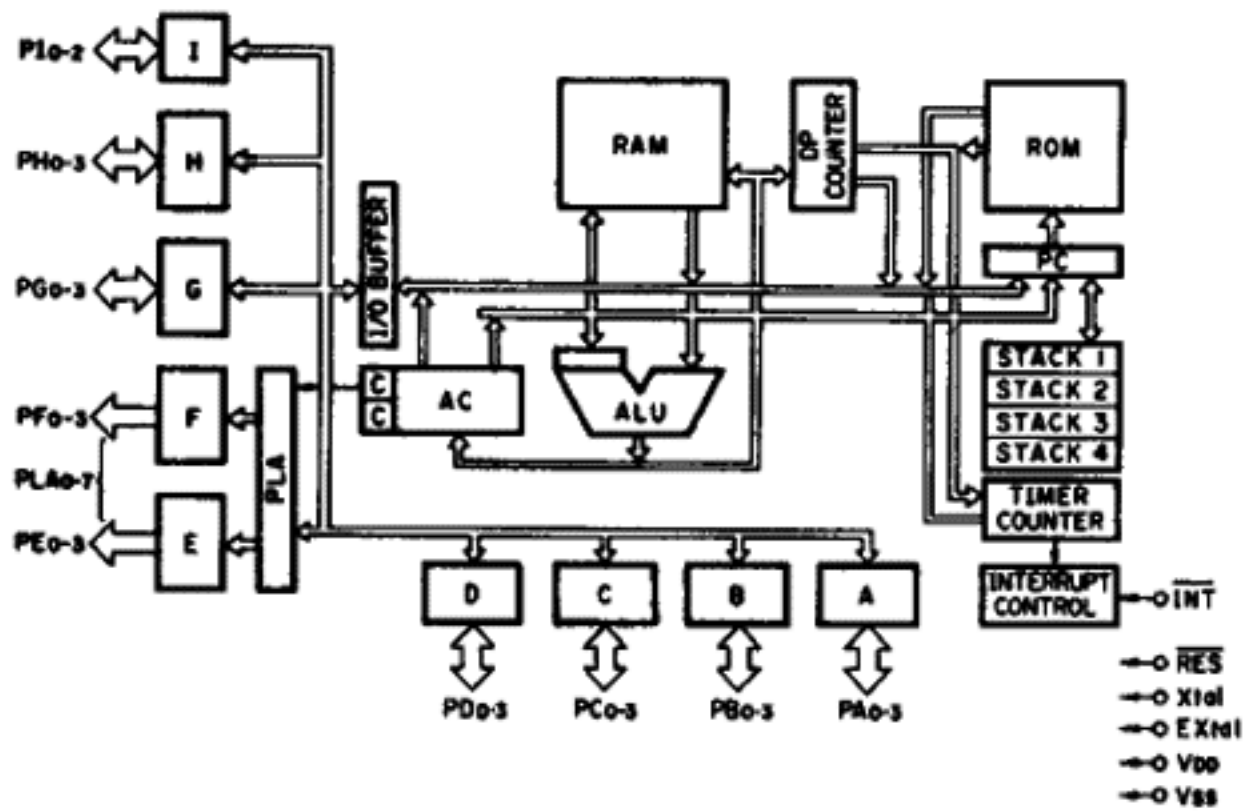
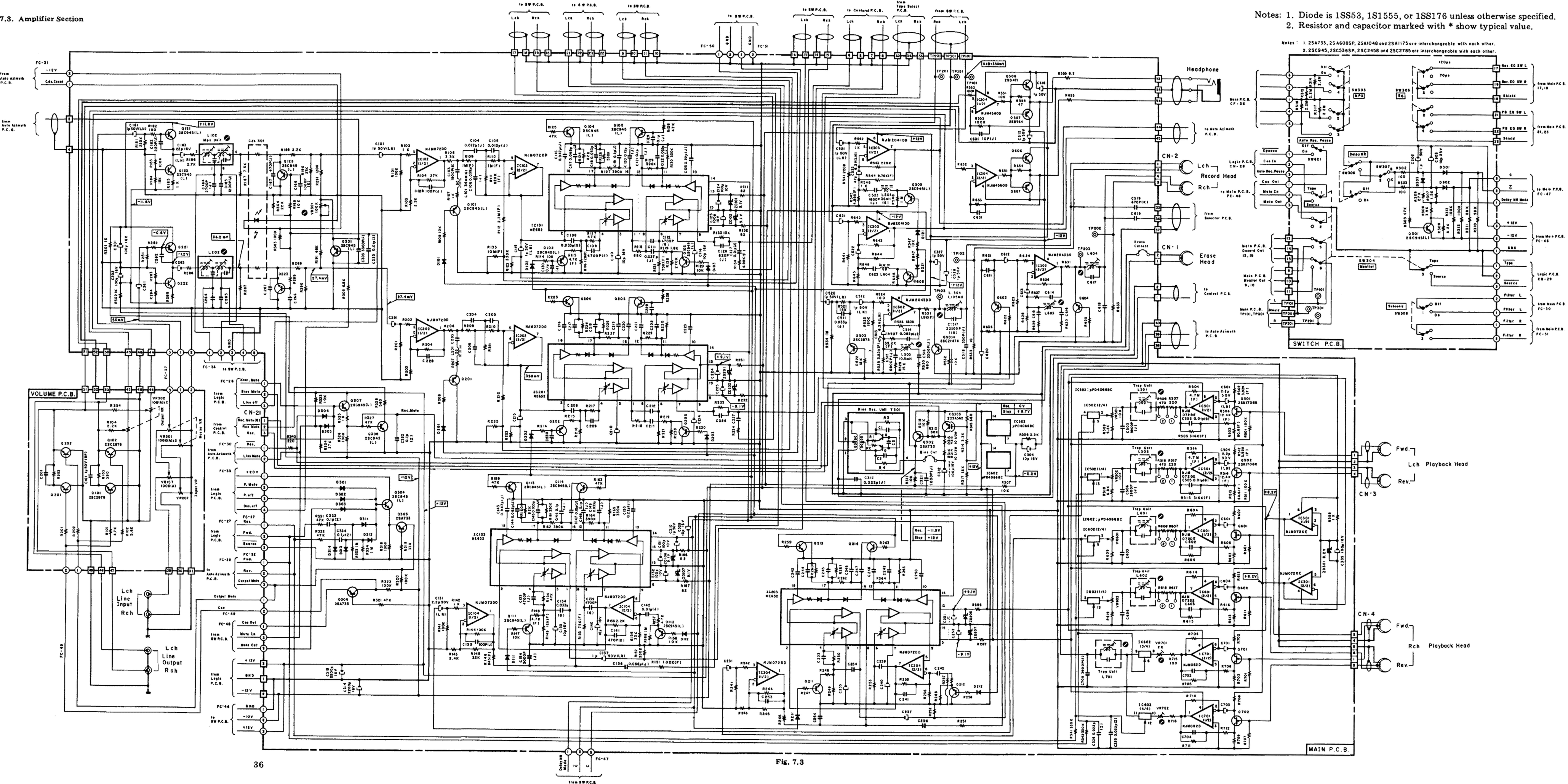


Fig. 7.2.14 4-Bit Micro-processor LM6402A



Notes: 1. Diode is 1SS53, 1S1555, or 1SS176 unless otherwise specified.  
2. Resistor and capacitor marked with \* show typical value.

Notes: 1. 25A733, 25A6085P, 25A1048 and 25A1175 are interchangeable with each other.  
2. 25C945, 25C5365P, 25C2458 and 25C2785 are interchangeable with each other.

Fig. 7.3