


# ONKYO SERVICE MANUAL

## COMPACT DISC PLAYER MODEL DX-100

|          |                      |
|----------|----------------------|
| UDN, UD  | 120V AC, 60Hz        |
| UGV, UG  | 220V AC, 50Hz        |
| UW       | 120/220V AC, 50/60Hz |
| UQA, UQB | 240V AC, 50Hz        |

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

### SPECIFICATIONS

|                            |   |
|----------------------------|---|
| Type:                      | Compact Disc player with optical pickup |
| Quantization:              | 16 bit linear                           |
| Channels:                  | 2 (Stereo)                              |
| Frequency response:        | 5Hz – 20kHz $\pm$ 0.5dB                 |
| Dynamic range:             | Over 96dB                               |
| Total harmonic distortion: | 0.003% (1kHz)                           |
| Channel separation:        | Over 90dB                               |
| Wow and flutter:           | Unmeasurable                            |
| Output:                    | 2.0 volts                               |
| Pickup:                    | Semiconductor laser type                |
| Track location:            | By track and index number               |
| Power consumption:         | 16 watts                                |
| Dimensions:                | 330(W) x 85(H) x 312(D) mm              |
| Weight:                    | 5.0kg                                   |
| Accessories:               | Connection cables                       |

Specifications are subject to change without notice.



## LASER PICK-UP REMOVAL

1. Remove the disc tray and pick-up cover. (See Figure 21)
2. Remove four screws (A) of mecha. chassis (B) .
3. Remove two screws (C) of guide rack assembly (D) .
4. Short-circuit the P.C. Board using short plug, then remove connector and leads. (Refer to CAUTIONS ON REPLACEMENT OF PICK-UP.)
5. Remove outside spring (E) .
6. Remove two screws (F) , and the laser pick-up (G) will be removed.

*BEWARE OF THE SPRINGS  
UNDER MECHA CHASSIS:  
THEY JUMP VERY FAST*

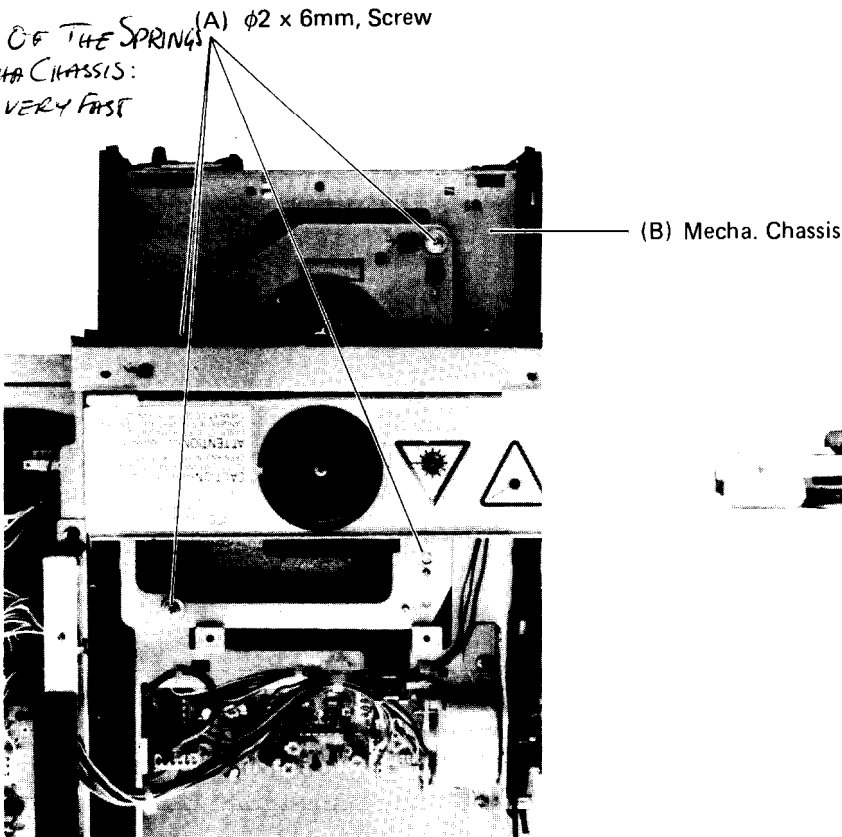
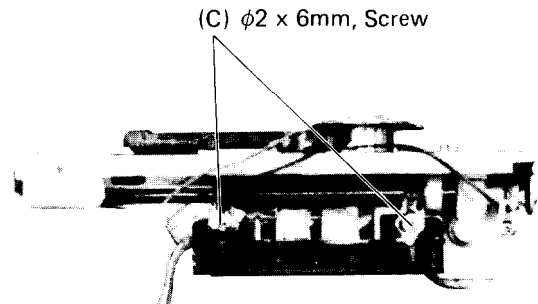
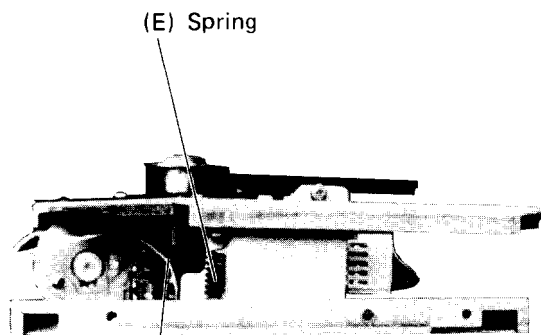


Figure 21



Guide Rack Assembly

Figure 22



(G) Laser Pick-up

Figure 23

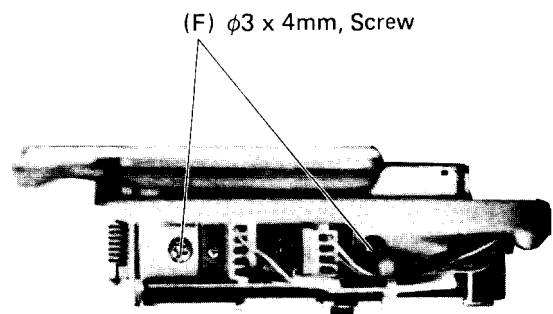
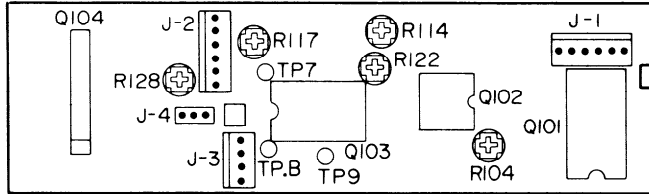


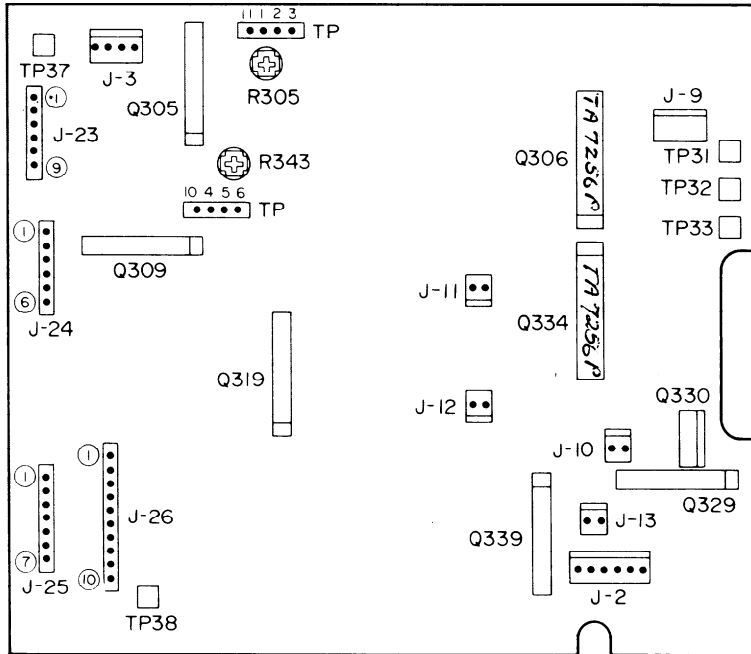
Figure 24

# ADJUSTMENT PROCEDURES

## Head ampli. P.C. Board



## Servo P.C. Board



## Main P.C. Board

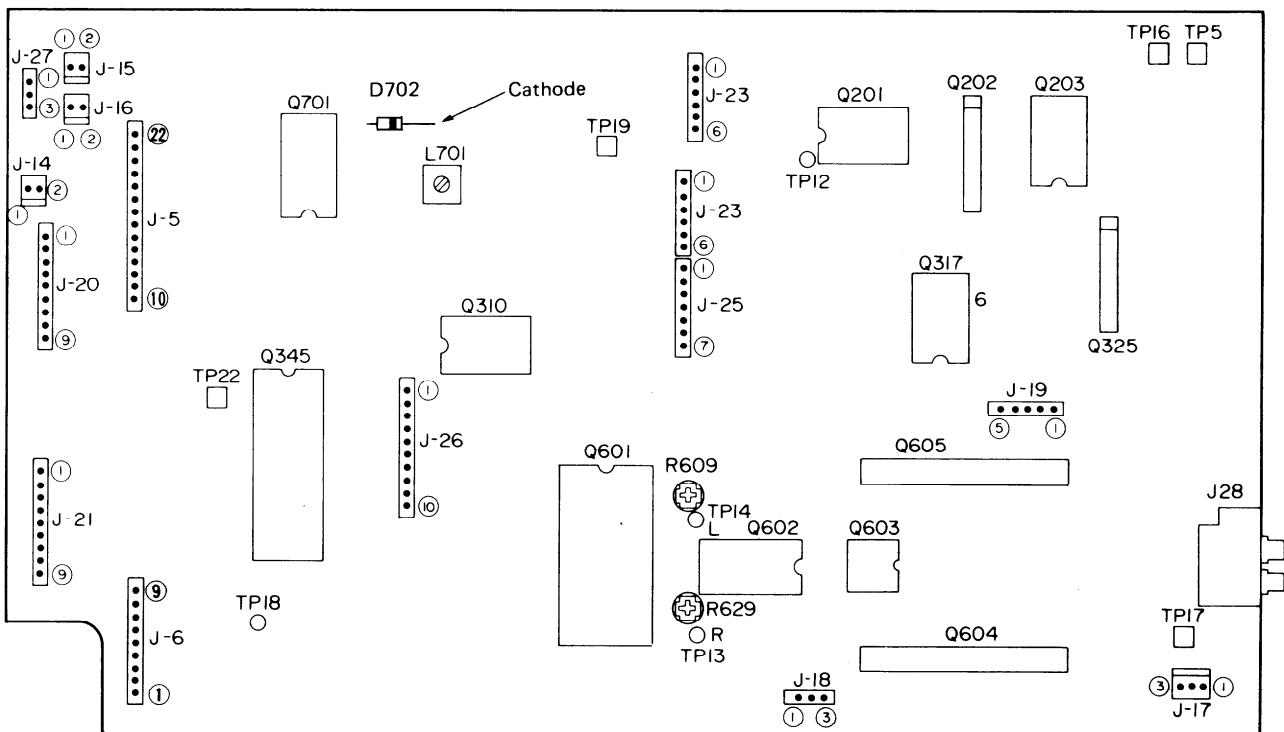


Figure 25

## Instruments Required

- |                                  |                           |                                   |
|----------------------------------|---------------------------|-----------------------------------|
| 1. Laser Power Meter             | 4. Tester                 | 7. Test Disc A (YEDS7)            |
| 2. Oscilloscope                  | 5. AC Millivoltmeter      | 8. Attachment Jig                 |
| 3. PU Alignment Jig (for DX-100) | 6. Regulated Power Supply | 9. Clamper (Exploded view No. 58) |

## Adjustment Procedure in Pick-up Replacement

| Step | Measurement Item                                      | Measurement Reference Value           | Disc       | Operation Button | Test Point                              | Adjustment Point                                  | Test/Setup            | Note  |
|------|---|---------------------------------------|------------|------------------|---|---|-----------------------|---|
| 1    | Laser Power Adjustment                                | Light output<br>$250\mu W \pm 5\mu W$ | Not loaded | Power ON         | Pick-up lens                            | R128  | Figure 26, 27         | J-2, J-9, J-10<br>J-11<br>S103, 104                             |
| 2    | PU Position (Height) Adjustment                       | DC 0V<br>$\pm 50mV$                   | TYPE A     | PLAY             | Q101 Pin (15), (16)<br>Attachment TP, A | R104<br>R117<br>pick-up lower side (A), (B), (C). | Figure 28, 29, 30, 31 | J-2, J-3, J-9,<br>J-10, 11<br>S103, S104                        |
| 3    | PU Tangential Direction Adjustment (Angle Adjustment) | AC milivoltmeter Max.                 | TYPE A     | PLAY             | TE, B                                   | Pick-up lower side (C).                           | Figure 32, 33, 34     | Keep unit under the same condition as for Step 2 just finished. |
| 4    | PU Radial Direction Adjustment (Angle Adjustment)     | AC milivoltmeter Max.                 | TYPE A     | PLAY             | TE, B                                   | Pick-up lower side (A).                           | Figure 32, 33, 34     | Same as above   |
| 5    | Repeat steps 2 via 4.                                 |                                       |            |                  |   |   |                       |   |
| 6    | DC Balance Adjustment                                 | Tracking error<br>0V center           | TYPE A     | PLAY             | TE, B                                   | R117 (↻)<br>R114                                  | Figure 35, 36, 37, 38 | Same as above   |
| 7    | Tracking Error Balance Adjustment                     | DC offset value<br>0V center          | TYPE A     | PLAY             | TE, B<br>Attachment TP, B, C            | R117  | Figure 39, 40, 41     | Same as above   |
| 8    | AC Balance Adjustment                                 | Tracking waveform<br>0V center        | TYPE A     | PLAY             | TE, B<br>Attachment TP, B, C            | R122  | Figure 39, 40, 41     | Same as above   |
| 9    | Focus Balance Adjustment                              | Jitter meter<br>Min.                  | TYPE A     | PLAY             | TP12,<br>Q317<br>Pin (6)                | R104  | Figure 42, 43, 44     | J11   |

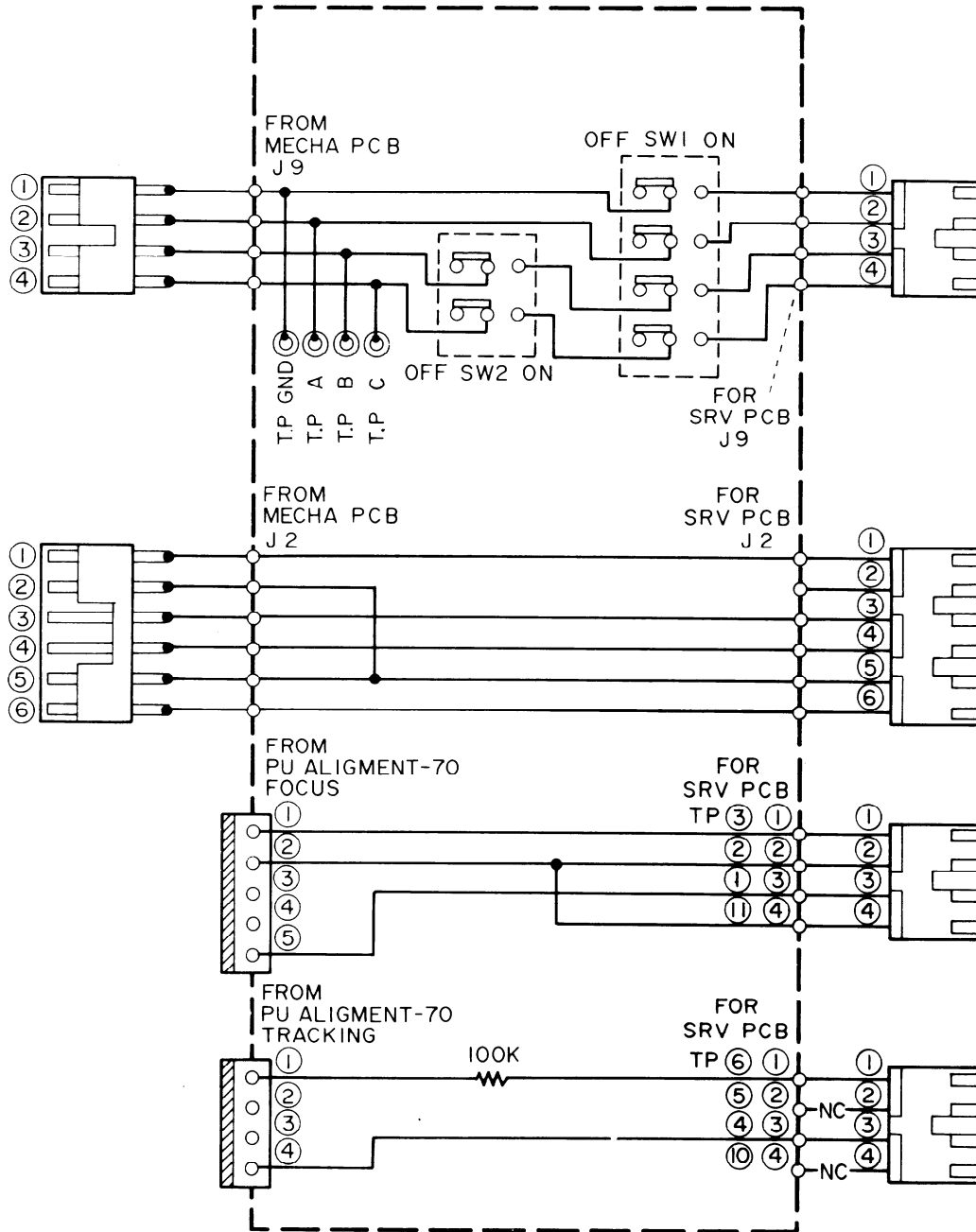
## Servo Circuit Adjustment

| Step | Measurement Item         | Measurement Reference Value | Disc   | Operation Button | Test Point                      | Adjustment Point | Test/Setup        | Note   |
|------|--------------------------|-----------------------------|--------|------------------|---------------------------------|------------------|-------------------|--------|
| 1    | Focus Gain Adjustment    | AC 28mV<br>$\pm 2mV$ RMS    | TYPE A | PLAY             | Servo P.C. Board TP-11, 1, 2, 3 | R305             | Figure 45, 47, 48 | 1kHz   |
| 2    | Tracking Gain Adjustment | AC 44mV<br>$\pm 4mV$ RMS    | TYPE A | PLAY             | Servo P.C. Board TP-10, 4, 5, 6 | R343             | Figure 46, 49, 50 | 1.5kHz |

Analog Circuit Adjustment

| Step | Measurement Item     | Measurement Reference Value | Disc   | Operation Button | Test Point                              | Adjustment Point     | Test/Setup | Note |
|------|----------------------|-----------------------------|--------|------------------|---|----------------------|------------|------|
| 1    | DC Offset Adjustment | DC 0V<br>±10mV              | TYPE A | PAUSE            | Main P.C. Board<br>TP13 (R)<br>TP15 (L) | R629 (R)<br>R609 (L) | Figure 51  |      |

ATTACHMENT JIG



## LASER POWER ADJUSTMENT

The laser diode and its S/N will be deteriorated if the light power output of the laser diode has been not adjusted within the specified limit of ( $250\mu\text{W} \pm 5\mu\text{W}$ ). Accordingly, the light power output adjustment must always be made when the pick-up was replaced.

The height and angle adjustments for the pick-up can be made easily during replacement of the pick-up as long as the hex-adjustment screws (A), (B), & (C) are not rotated. (See Figure 30)

### Adjustment Procedure

1. Turn power of unit OFF.

Disconnect connector J-9 on servo P.C. Board.

2. Connect connector J-9 on attachment jig to J-9 on servo P.C. Board. Set SW1 on attachment jig to OFF and SW2 to OFF.

Connect connector J-9 disconnected to terminal J-9 on attachment.

3. Disconnect J-2 of servo P.C. Board, connect J-2 on attachment to J-2 on servo P.C. Board, and connect connector J-2 terminal disconnected to J-2 on attachment.
4. Set 2-gang leaf switches S103 and S104 of mechanism assembly to ON.
5. Disconnect 2P connector J-10 (tray motor) and J-11 (feed motor) on servo P.C. Board.
6. Open tray by pulling it strongly with your hand (by exerting force of approx. 2.8kg).
7. Turn R128 10k ohm semi-fixed resistor clockwise fully. (Power MIN)
8. Set power supply switch to ON.

Apply laser power meter sensor to laser pick-up lens and slowly turn R128 of Head ampli. P.C. Board counter-clockwise so that the laser power meter indicates  $250\mu\text{W} \pm 5\mu\text{W}$ .

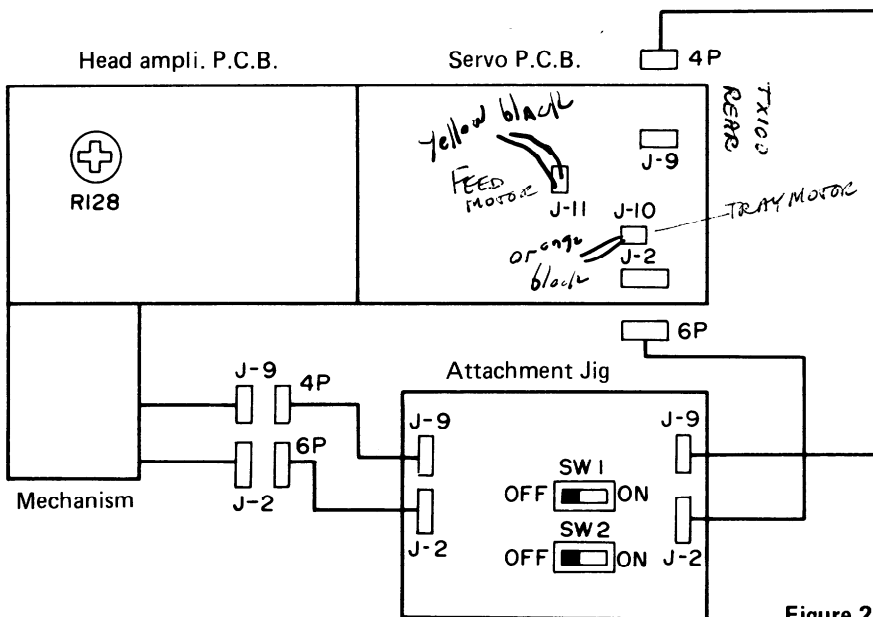


Figure 26

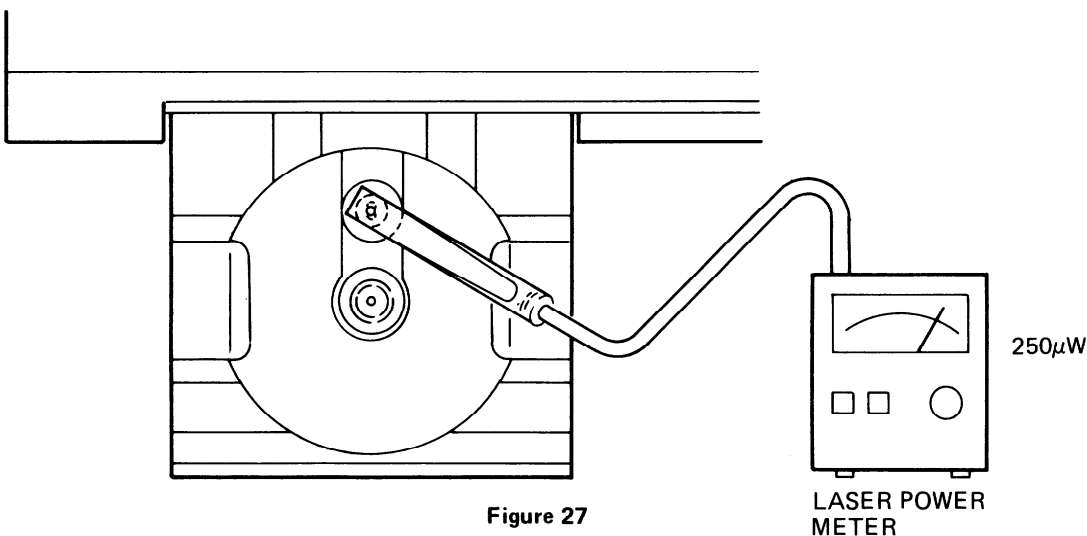
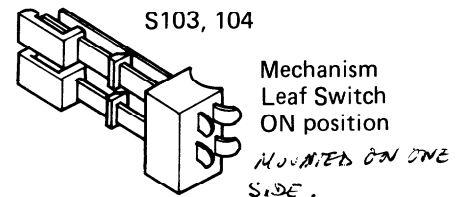
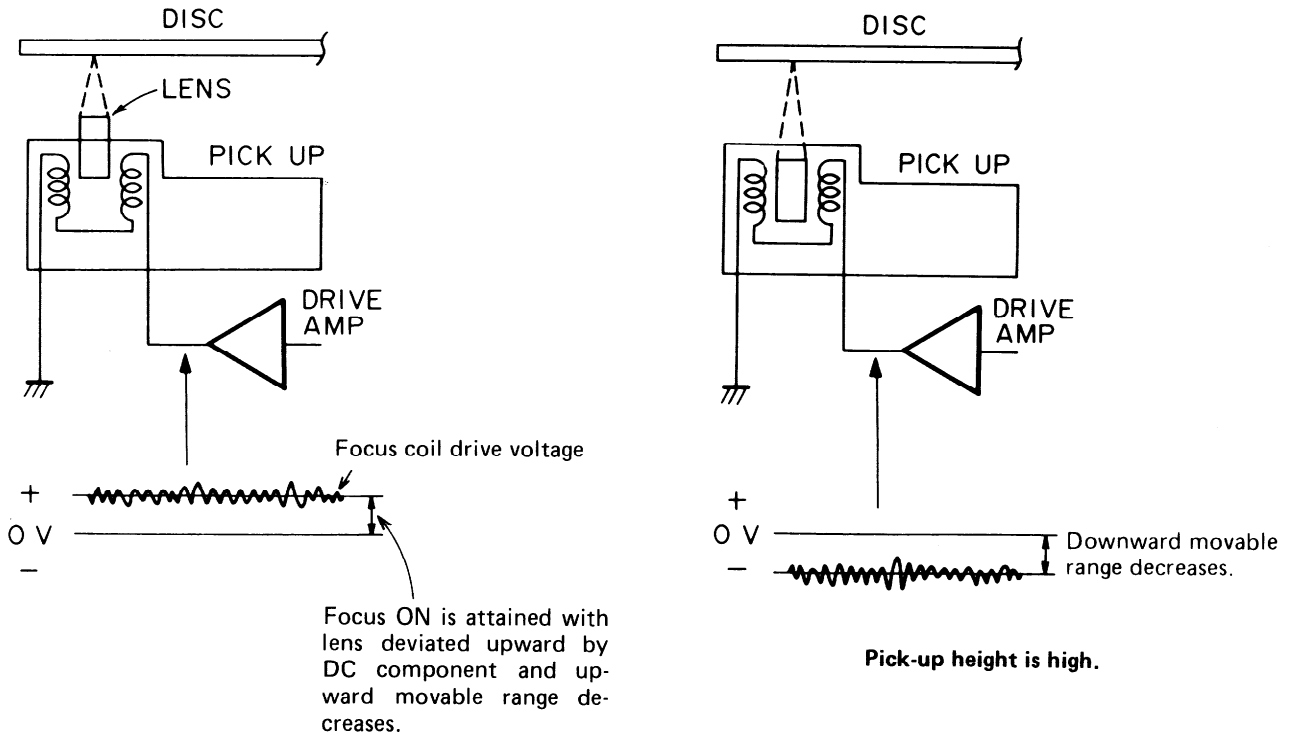


Figure 27

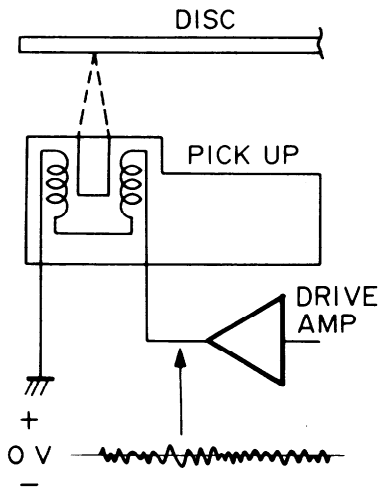
### PICK-UP HEIGHT ADJUSTMENT

Pick-up's movable range in focus direction can be maximized by adjusting the DC voltage (offset voltage) applied to focus coil to 0V when the focus servo is actuated.



Pick-up height is low.

Figure 28



Pick-up height can be adjusted by moving pick-up or downward direction while observing focus coil drive voltage.

Pick-up height is suitable.

Figure 29

**Adjustment Procedure**

1. Turn power of unit OFF.
2. Connect connector J-9 on attachment jig to J-9 on servo P.C. Board. Set attachment switches SW1 and SW2 to ON. Connect connector J-9 disconnected to J-9 terminal on attachment.
3. Disconnect J-2 on servo P.C. Board, connect J-2 on attachment to J-2 on servo P.C. Board, and connect connector J-2 terminal disconnected to J-2 on attachment.
4. Set 2-gang leaf switches S103 (close switch) and S104 (power supply for laser diode) of mechanism assembly to ON.
5. Disconnect (2P) connector J-10 (tray motor) on servo P.C. Board.
6. Disconnect (4P) connector J-3 (SIGNAL) on servo P.C. Board.
7. Connect circuit tester (Ohm meter) to pin (15) and (16) of Q101, TA7731P on head ampli. P.C. Board and adjust R104 22K ohm semi-fixed resistor so that the tester indicates 10K ohm  $\pm 0.5K$  ohm. (Focus balance coarse adjustment) After the coarse adjustment connect 4P connector J-3 to J-3 on servo P.C. Board.
8. Turn R117 10K ohm semi-fixed resistor counterclockwise (↺) fully.
9. Open tray.
10. Put TEST DISC YEDS-7 (TYPE 3) on DISC motor and hold it with clumper. (The clumper of mechanism assembly will be removed by removing only one screw.)
11. Connect oscilloscope to test point TP. A (focus coil) terminal on the attachment. (DC range 0.1V/DIV.)
12. Turn power of unit on and set unit to PLAY mode.
13. Disconnect (2P) connector J-11 (Feed motor) on servo P.C. Board.
14. Adjust pick-up adjusting hex screw with a hex wrench so that display on the scope deflects up and down with center or 0V while observing the scope display.

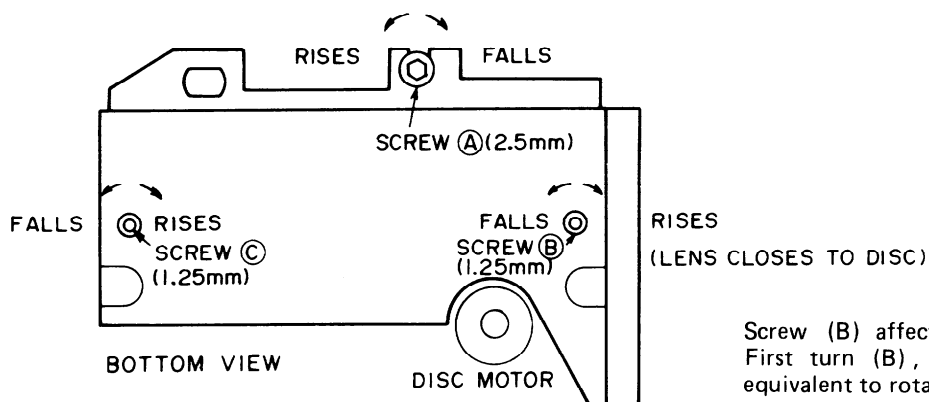


Figure 30

15. Keep power of unit ON for angle adjustment to be proceeded in the next item.



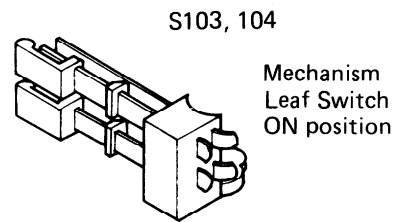
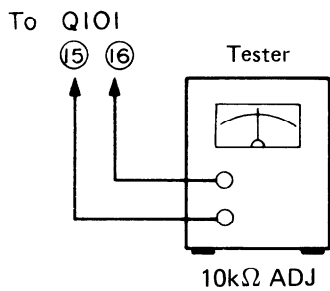
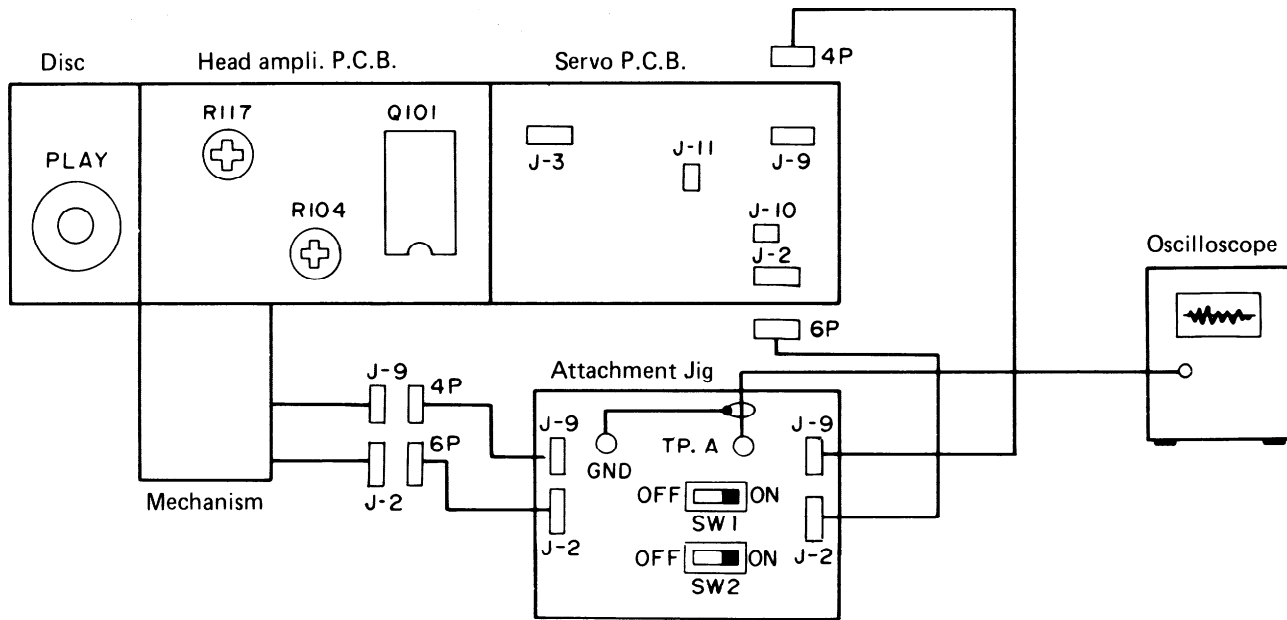


Figure 31

**PICK-UP ANGLE ADJUSTMENT**

Angle deviation of the pick-up can be divided into tangential direction and radial direction.

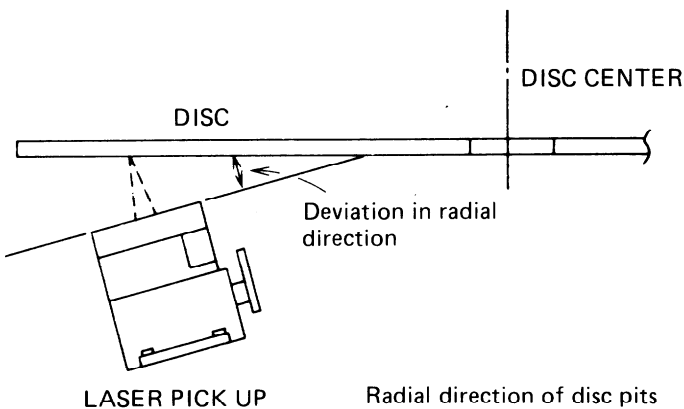


Figure 32

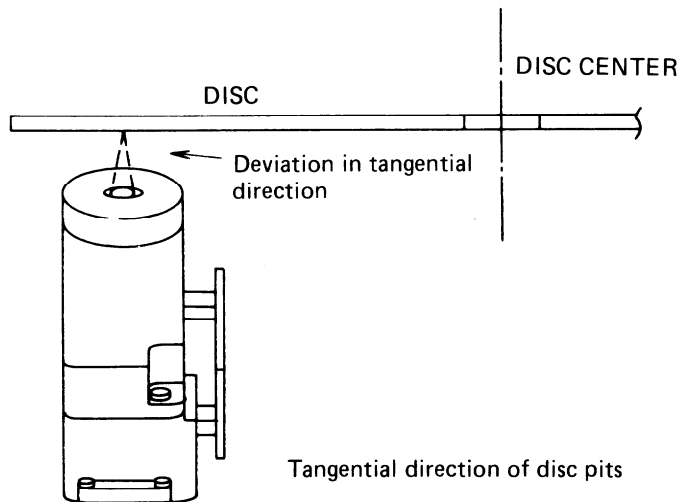


Figure 33

Since the angle deviation in both direction prevents a laser beam to fall at a right angle to a disc pit, random light reflection, etc. will be caused and normal reflection light cannot be obtained. Thus, angle adjustments for both tangential and radial directions will be needed. In this unit, outputs from the 4-division photo diodes are utilized to make adjustment for the optimum angle.

The angle deviation, scratches, dust, etc. give considerable affection on anti-vibration performance, so sufficient case should be given in the adjustments. After completion of the adjustments, the adjusting screws must be mechanically fixed securely, by using such as screw lock, etc.

**Adjustment Procedure (Tangential Direction)**

Keep unit under the same condition as for pick-up height adjustment just finished.

1. Set attachment switches SW1 to ON and SW2 to OFF. (Set tracking servo to OFF.)
2. Connect AC voltmeter between test point TE. B terminal on head ampli. P.C. Board and ground. (Range 0.3V)
3. Connect oscilloscope to test point TE. B terminal on head ampli. P.C. Board. Adjustment will be performed easily, if it is done while observing scope display.
4. Turn adjusting screws until AC voltmeter reads MAX output. (Adjusting screw (C) is the most critical for tangential direction adjustment.)

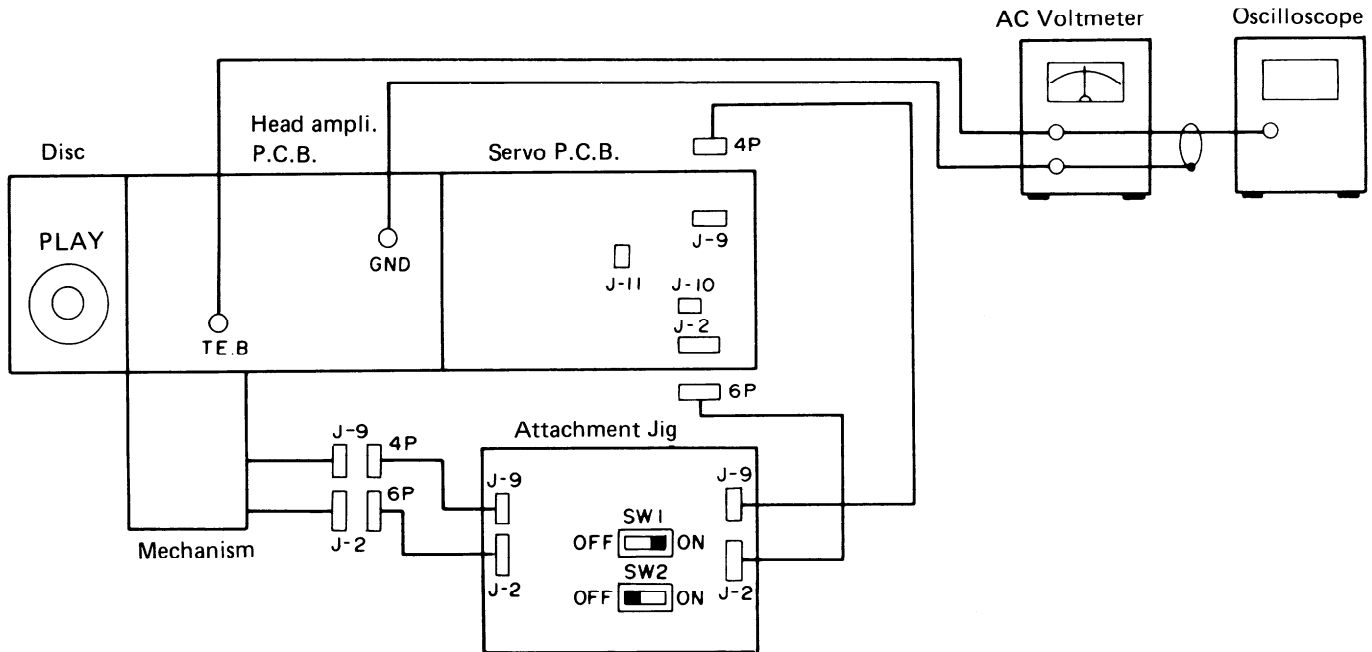


Figure 34

**Adjustment Procedure (Radial Direction)**

1. Turn adjusting screws so that AC voltmeter indicates a peak in the same way as for the tangential direction adjustment. (Adjusting screw (A) is the most critical for radial direction adjustment.)

Since angle adjustment may upset the pick-up height adjustment, always recheck pick-up height after the angle adjustment. And if the height adjustment is performed again, recheck angle adjustment again.

Namely, repeat height adjustment and angle adjustment 2 – 3 times, thus fine adjustment will be accomplished. Keep the unit under the same condition for next DC balance adjustment.

## TRACKING ERROR DC BALANCE ADJUSTMENT

If the angle adjustment has been completed, photo diode outputs may develop different output due to parameter variations of 4-division photo diodes, and optional system, etc. Accordingly, DC balance adjustment will be made in considering offset values of the head amplifiers Q101 (TA7731P) and Q103 (TA75902P).

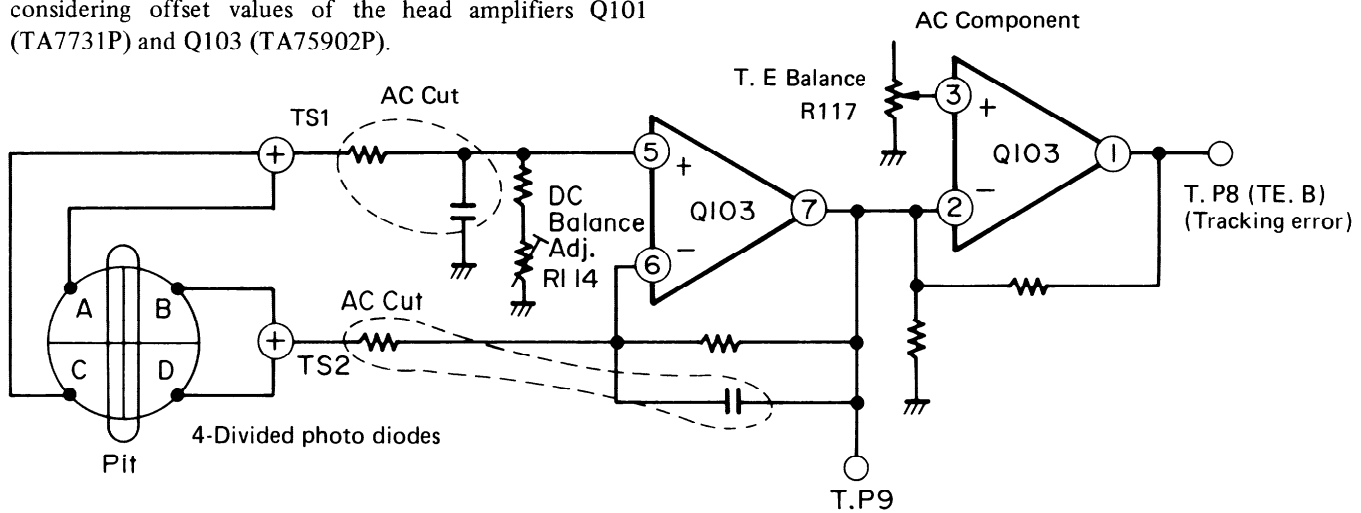


Figure 35

Difference of DC components will be developed at test point TE. B terminal on mechanism P.C. Board by adjusting tracking error balance to minimum (or by making input pin (3) of Q103 to GND level).

Adjusting DC balance adjusting resistor R114 on mechanism P.C. Board develops tracking error signal without offset at TE. B terminal on mechanism P.C. Board.

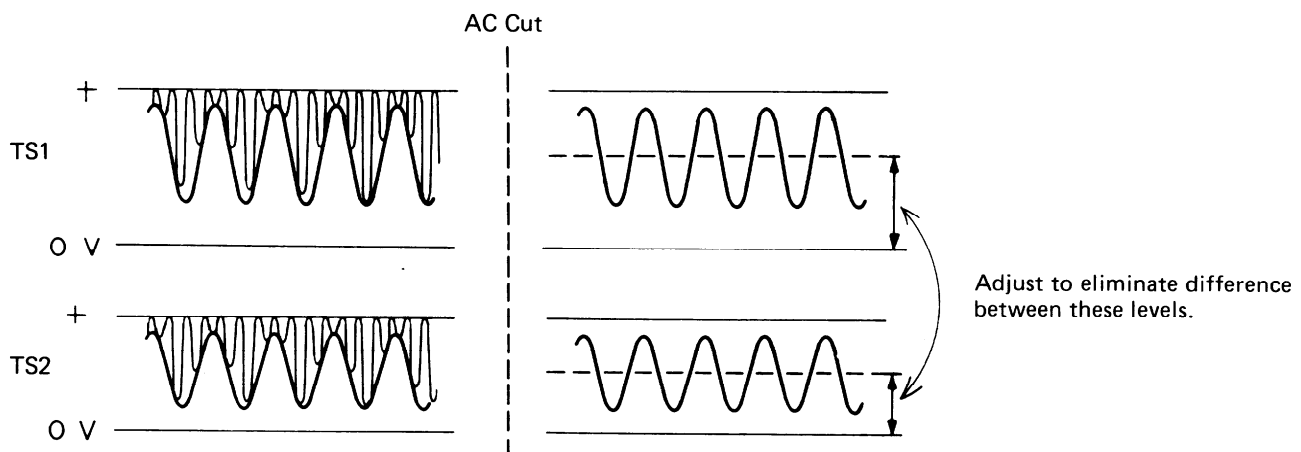


Figure 36

With DC balance adjustment upset tracking coil is always being biased by the DC voltage and this may cause difference in moving distance in horizontal direction. This also prevents normal reflection light beam from falling at 4-division photo diodes.

## PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

### WARNING!!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 30cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

### Laser Diode Properties

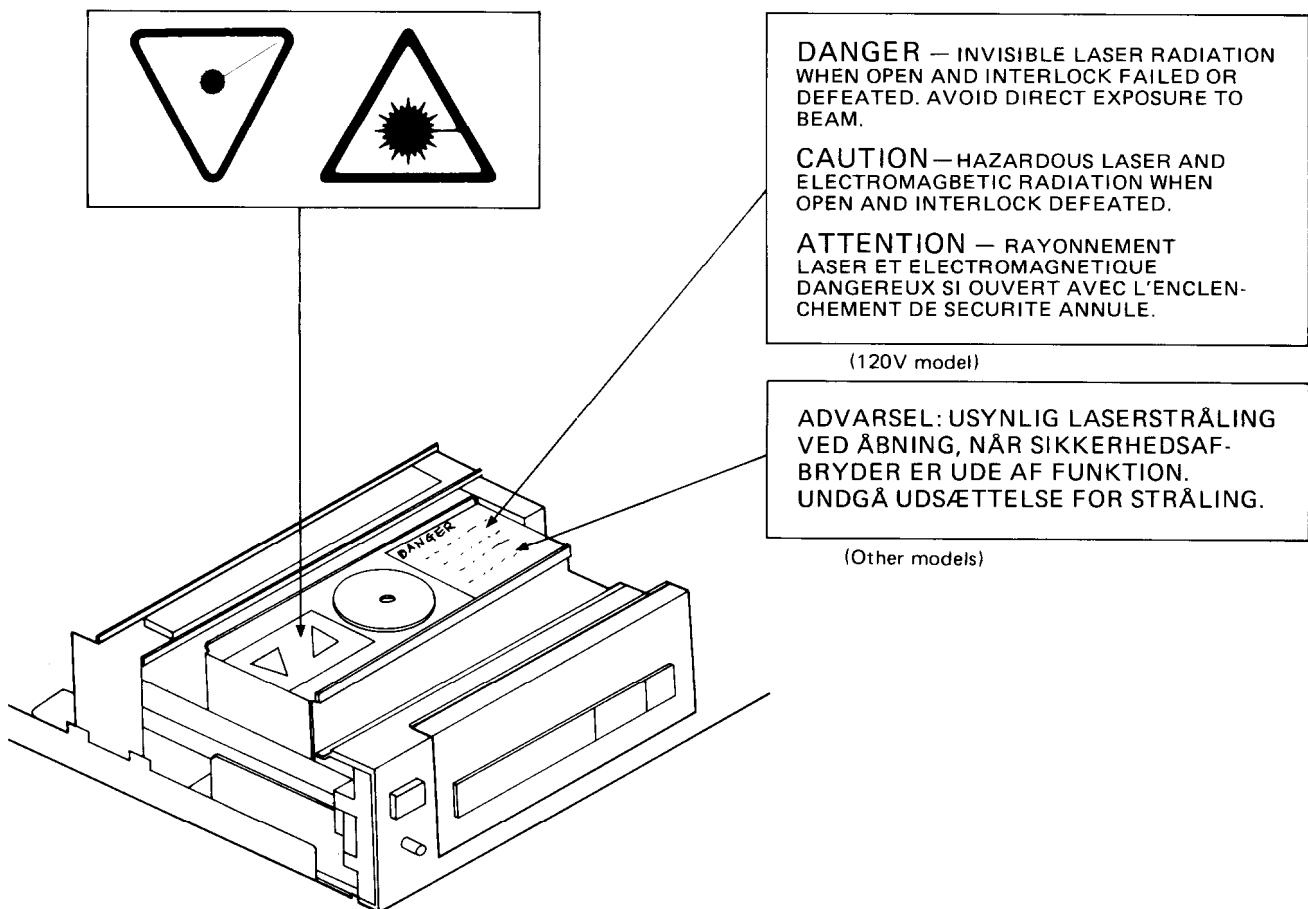
- Material: GaAs
- Wavelength: 780nm
- Emission Duration: continuous
- Laser output: max. 0.3mW\*

\*This output is the value measured at a distance about 1.8mm from the objective lens surface on the Optical Pick-up Block.

## LASER WARNING LABELS

The labels shown below are affixed.

### 1. Warning labels



**Adjustment Procedure**

Keep unit under the same condition as for pick-up angle adjustment just finished.

1. Turn R117 10K ohm semi-fixed resistor on head ampli. P.C. Board ~~clockwise fully (MIN).~~
2. Connect oscilloscope to TE. B terminal on head ampli. P.C. Board. (DC range 0.1V/DIV.)

3. While observing scope display, adjust semi-fixed resistor R114, 47K ohm on head ampli. P.C. Board so that tracking error waveform deflects around 0V center.

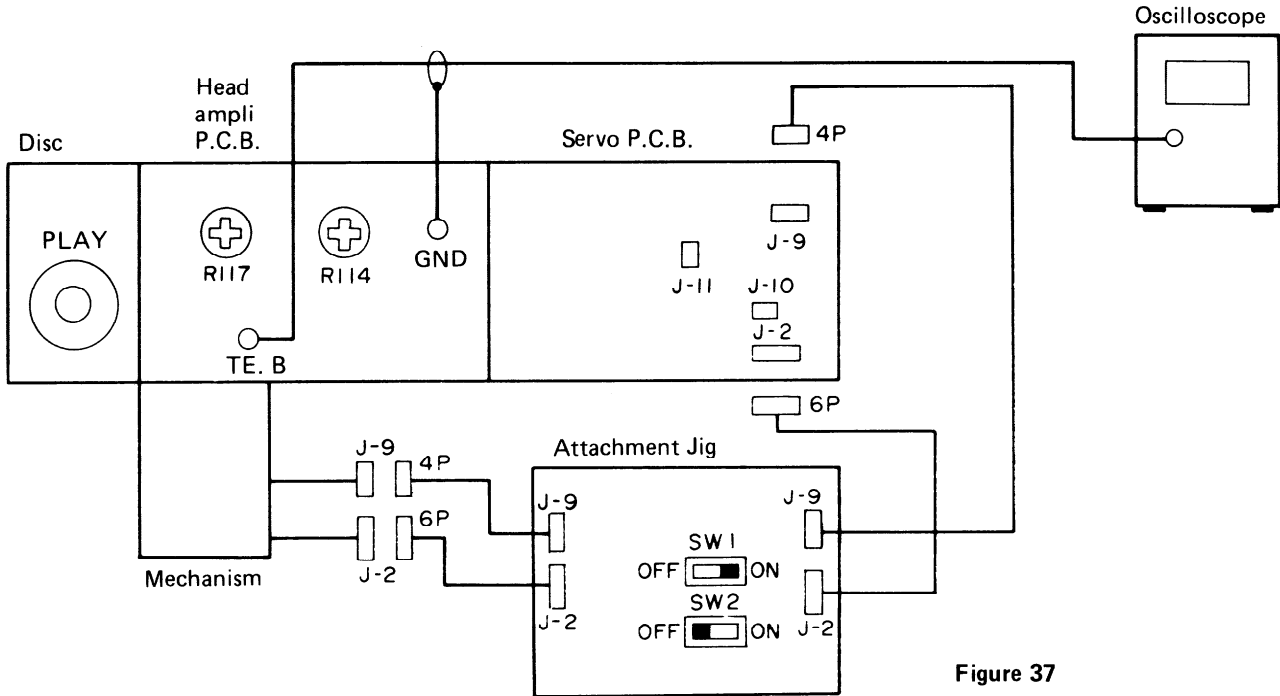


Figure 37

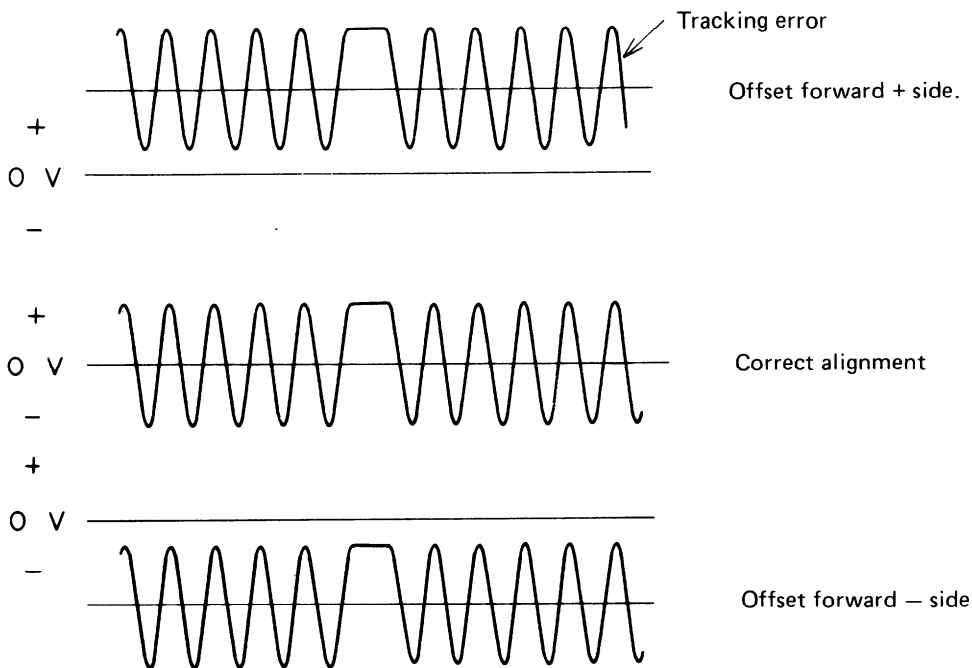


Figure 38

4. Keep unit under the same condition as above to proceed tracking error balance adjustment next.

## TRACKING ERROR BALANCE ADJUSTMENT, AC BALANCE ADJUSTMENT

If pick-up lens is forced to move in searching operation, relative geographical deviation against 4-division photo diodes will be caused and this develops offset voltage in the tracking error signal.

The offset voltage offset operation of the tracking coil, thus making searching operation to a desired track be difficult.

Tracking error balance adjustment is to prevent this offset voltage from developing in tracking error signal even if the tracking coil is moved forcibly.

This adjustment is performed by forcibly moving the pick-up lens with 1.0V DC applied to tracking coil. DC component and AC component (peak) of the photo diodes developed when lens is moved are utilized in this adjustment.

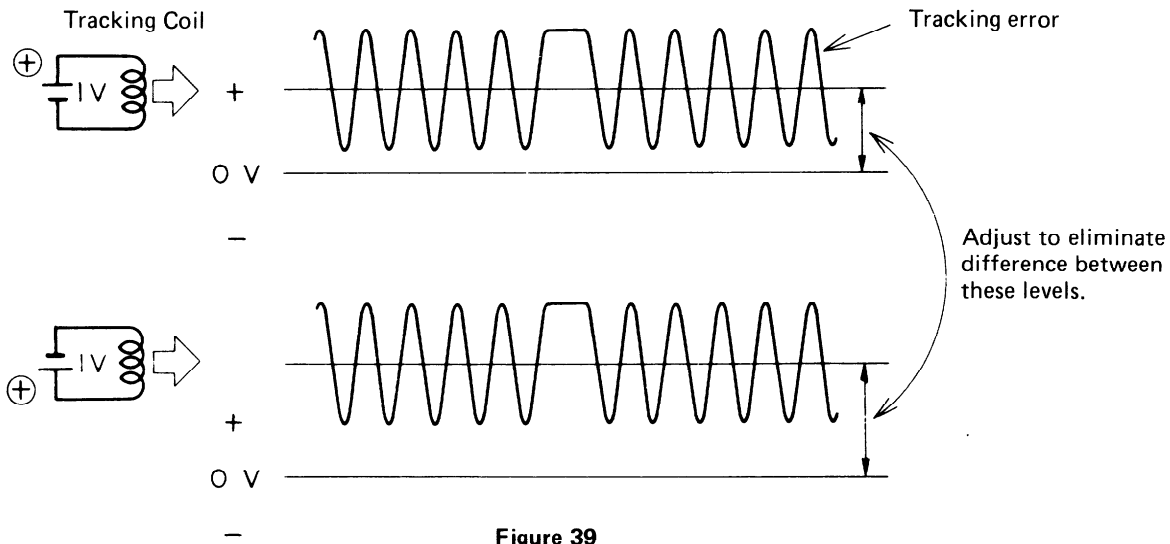


Figure 39

Adjust so that DC offset levels become a same level as shown above. To eliminate DC offsets perform AC balance adjustment.

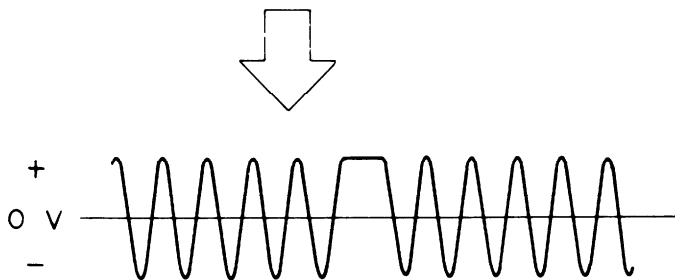


Figure 40

### Adjustment Procedure

Keep unit under condition just finished tracking error DC balance adjustment.

Use voltage regulator power supply jig.

1. Apply +1.0V voltage from TP. B terminal of the power supply jig to the test point of attachment, and connect TP. C terminal to GND.
2. Connect oscilloscope to test point TE. B terminal on head ampli. P.C. Board. (DC ranged 0.2V/DIV.)
3. Observe scope display and note DC offset value.
4. Apply +1V voltage from TP. C terminal of the power supply jig to test point of attachment, and connect TP. B terminal to GND. (Reversed in step 1 above.)
5. Observe scope display and adjust semi-fixed resistor R117, 10K ohm until the same offset value as that obtained in step 3 is obtained.
6. Repeat steps 1 and 4 and make sure there is no offset difference.
7. Adjust semi-fixed resistor R122, 47K ohm on head ampli. P.C. Board until no offset is developed in tracking error signals.
8. Remove +1.0V from voltage regulator power supply jig.

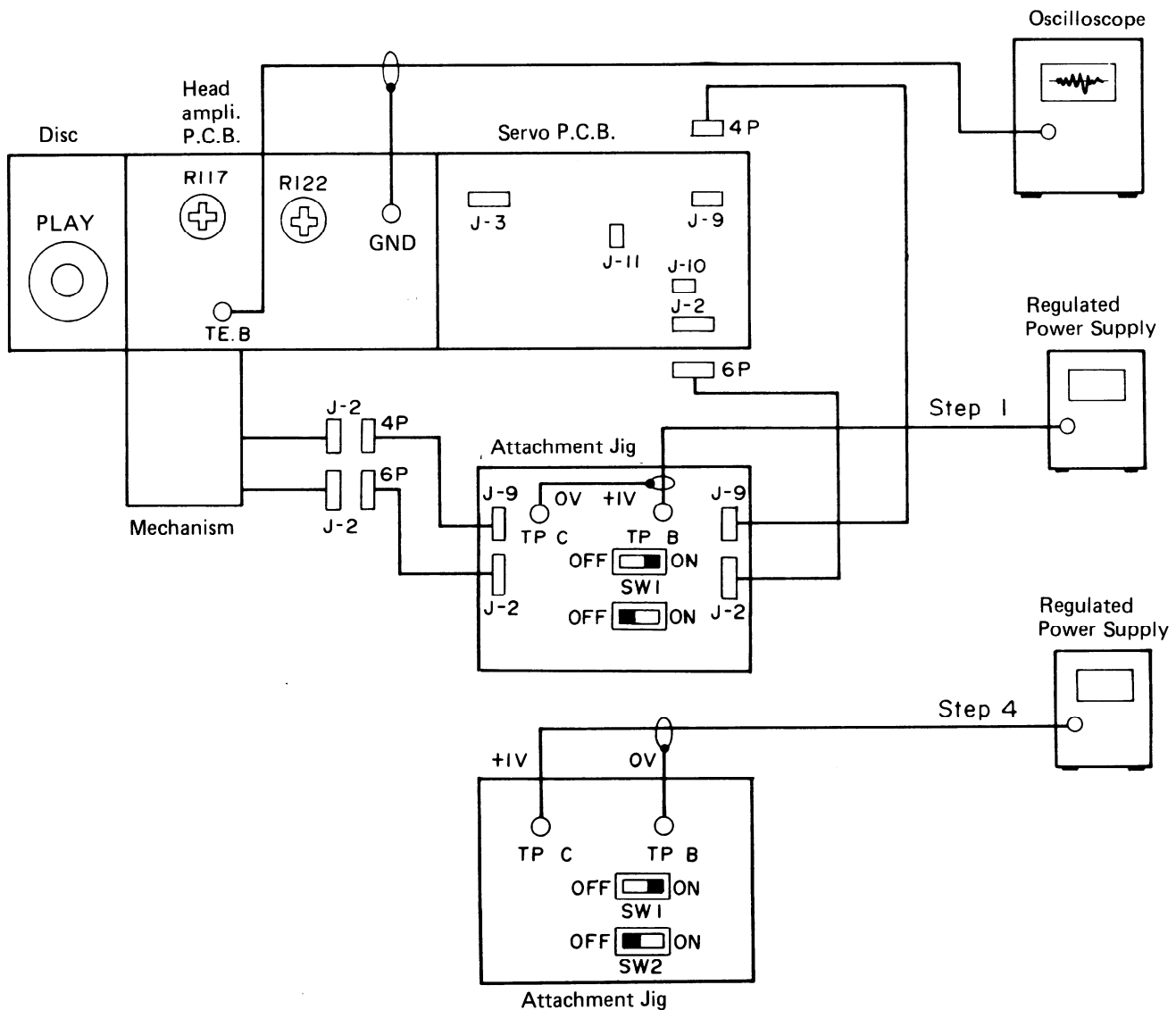


Figure 41

9. Keep unit under the same condition. (Power supply of unit may be turned OFF.)

## FOCUS BALANCE ADJUSTMENT

Next, proceed focus direction adjustment.

In the step 7 of pick-up height adjustment, resistance between pins (15) and (16) of Q101 (TA7731P) has been adjusted to 10K ohm  $\pm 0.5$  ohm.

This adjustment stands for that coarse adjustment for focus direction has been made indirectly. However, with this coarse adjustment, deviation in Q101, addition amplifier, cannot be cancelled.

The purpose of the focus balance adjustment is to focus a beam completely by precisely adjusting critical deviation in focus direction.

Try to upset the focus balance while observing R.F signal (eye pattern), and the R.F signal will be disturbed, thus you can see condition of out of focus.

However correct adjustment point may be different, depending upon person making the adjustment, as long as the adjustment is performed by observing the scope display.

To prevent this, only the coarse adjustment is performed by observing the waveform, and the fine adjustment is carried out by first converting R.F. signal into EFM signal and then by adjusting jitter amount of 3T components for minimum.

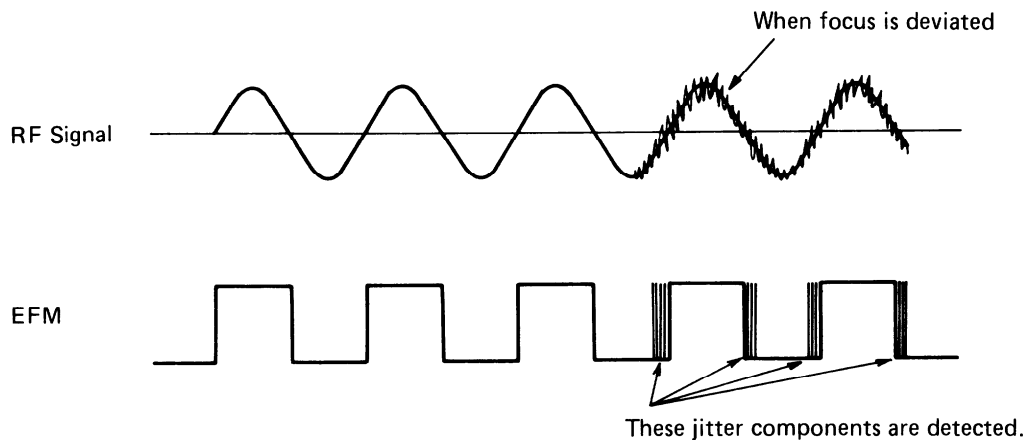


Figure 42

The jitter detector is incorporated in jig of PU-ALIGNMENT-70.



### Adjustment Procedure

Keep unit under the same condition as for tracking error balance adjustment and AC balance adjustment just performed above.

1. Set attachment switches SW1 and SW2 to ON.
2. Connect 2P connector J-11 (Feed motor) on servo P.C. Board.
3. Connect JITTER IN on the rear of PU-ALIGNMENT-70 to Q317 (TC40H004P) pin (6) (or to EFM2 on flat package P.C. Board).
4. Turn power of PU-ALIGNMENT-70 ON and set unit to PLAY. Play Track No. 1 (YEDS-7)

5. Connect oscilloscope to test point TP12 (RF signal) terminal on main P.C. Board (lower P.C. Board). (AC range 0.1V/DIV. 0.5 $\mu$ Sec/DIV.)
6. Adjust R104, 22K ohm semi-fixed resistor by turning it so that the clearest waveform is obtained.
7. Adjust R104 slightly so that JITTER meter of PU-ALIGNMENT-70 indicates minimum reading.

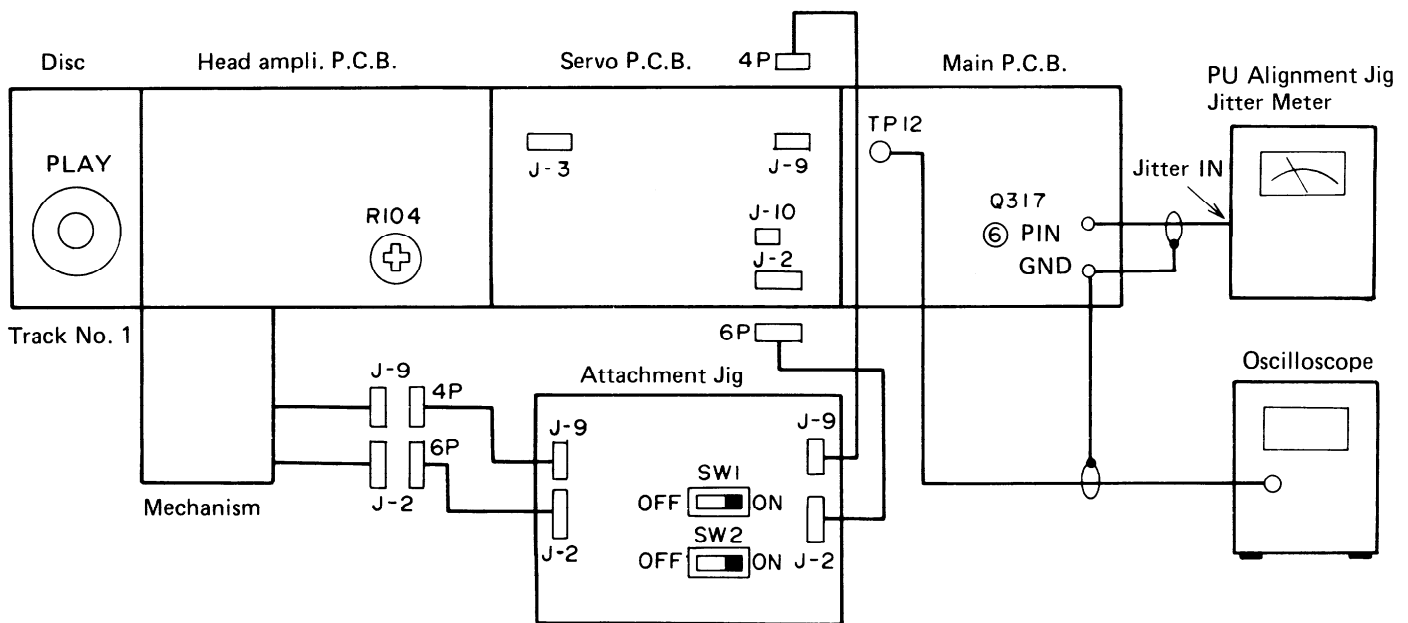


Figure 43

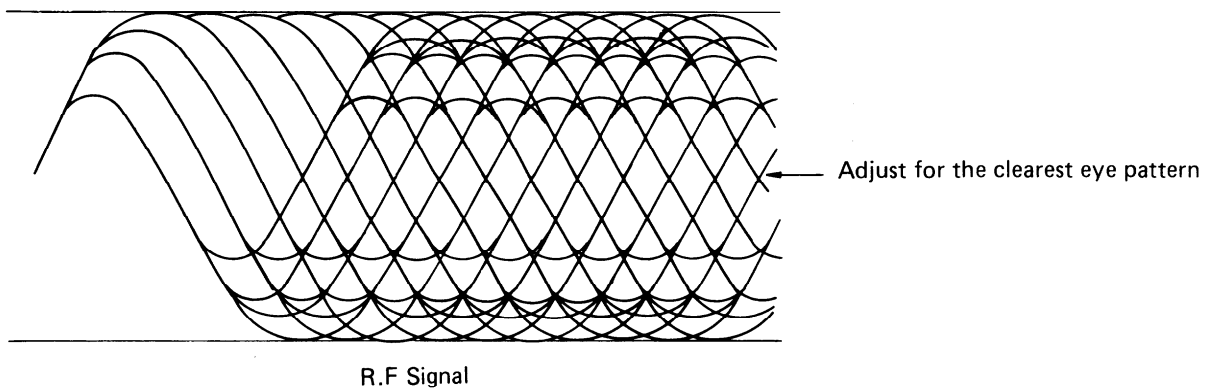


Figure 44

8. After adjustment is completed, set unit to original condition. (Connect all connectors normally.)  
Turn power of unit OFF.

### FOCUS SERVO GAIN AND TRACKING SERVO GAIN ADJUSTMENTS

Servo gain adjustment is performed to suppress undesirable deflections of lens due to external disturbances. Included in the external disturbances are scratches on disc surface, dusts, vibration, shock, etc. If the gain adjustment has been not made properly, the performance becomes critical

against the external disturbances such as scratches and vibration. The gain adjustments are carried out with 1kHz for focus servo system and 1.5kHz for tracking servo system.

The characteristics are as follows:

Focus system

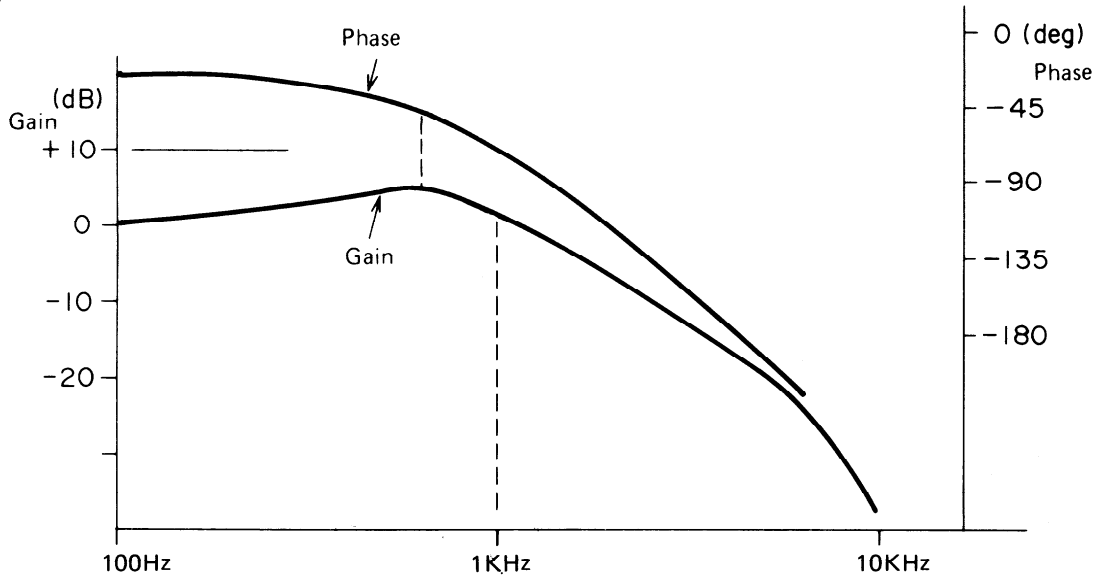


Figure 45

Tracking system

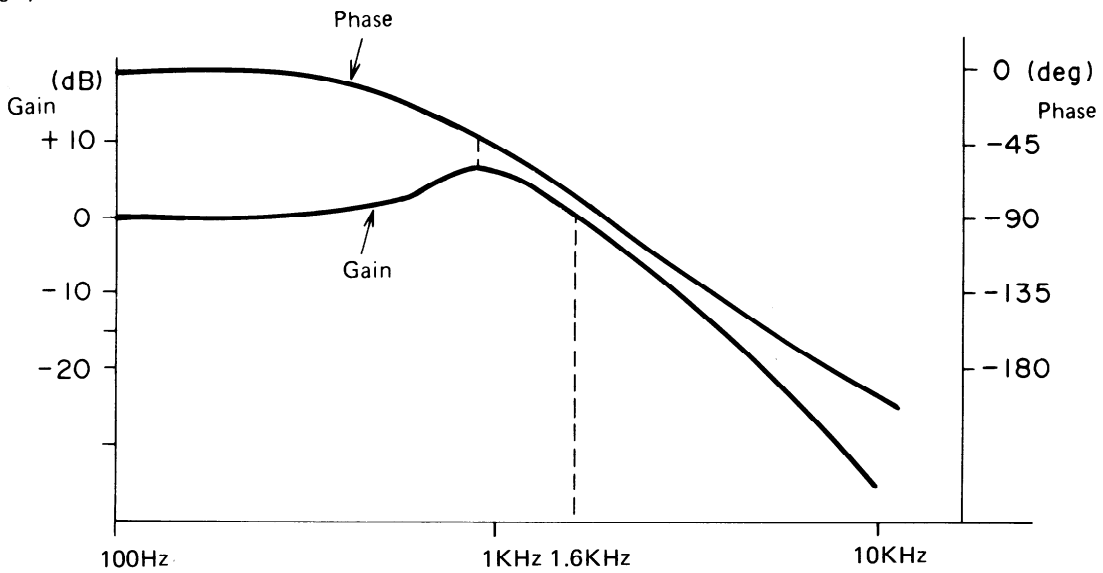
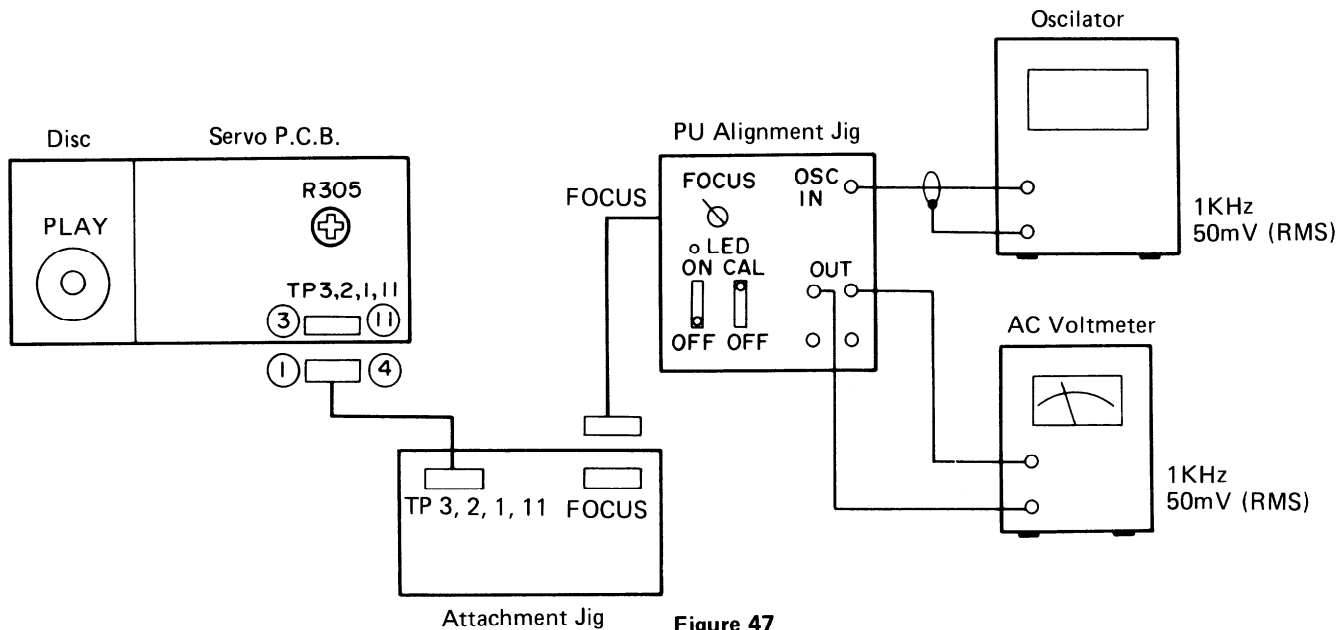


Figure 46

**Adjustment Procedure (Focus Gain)**

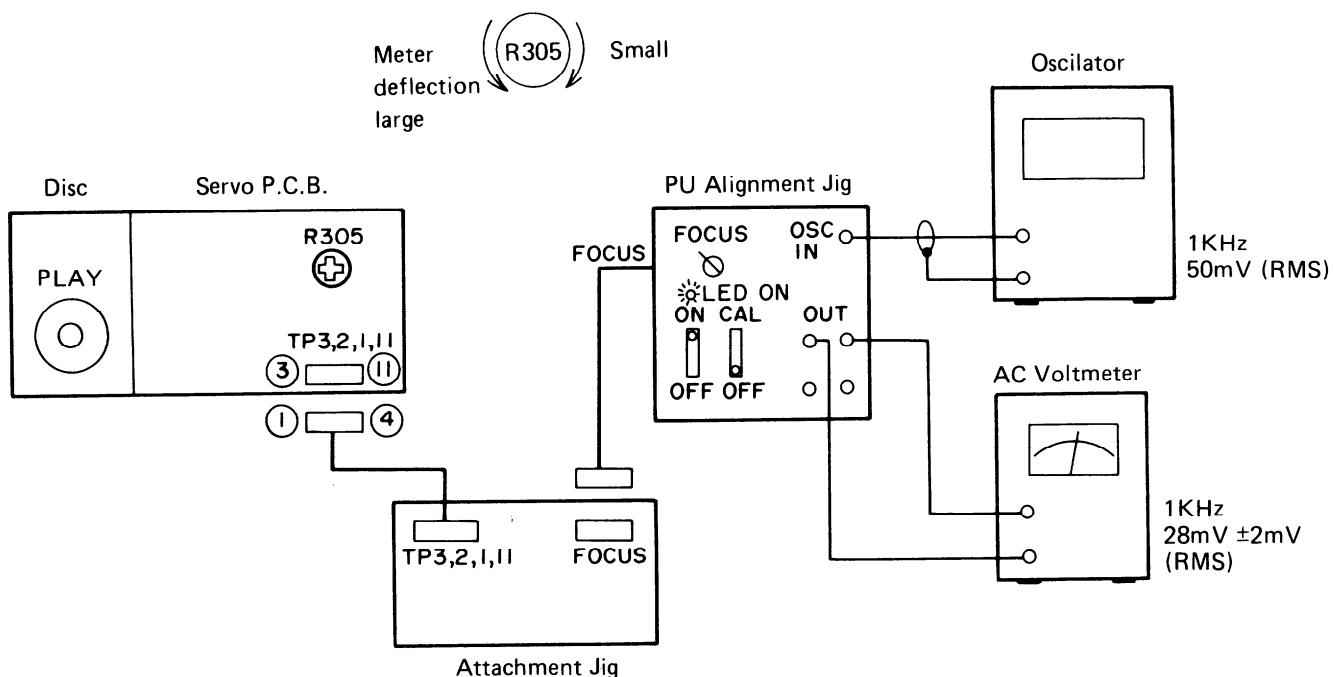
1. Turn power of unit to OFF.
2. Connect connector focus on attachment to FOCUS on the rear side of PU-ALIGNMENT-70. Connect focus connector on attachment to test point terminals TP (11), (1), (2), and (3) on servo P.C. Board.

3. Connect oscillator (1kHz 50mV (RMS)) to OSC IN on front panel of PU-ALIGNMENT-70.
4. Connect AC voltmeter between OUT and GND terminals on the front panel of PU-ALIGNMENT.
5. Set front panel switches of PU-ALIGNMENT as shown below.



6. Turn power of PU-ALIGNMENT-70 and unit ON and set unit to PLAY mode. (Play YEDS-7 TRACK No.1.)
7. Adjust level of oscillator so that AC voltmeter indicates 50mV reading. (Vary frequency to find a frequency that gives maximum reading and the frequency.)

8. Set front panel switch of PU-ALIGNMENT as shown below.
9. Adjust R305, 10K ohm semi-fixed resistor on servo P.C. Board so that AC voltmeter indicates  $28\text{mV} \pm 2\text{mV}$ .



10. Keep the above connection.

**Adjustment Procedure (Tracking Gain)**

1. Turn power of unit OFF.
2. Connect TRACKING on the rear side of PU-ALIGNMENT-70 to tracking terminal on attachment. Connect tracking connector on attachment to test point terminals

3. Set switches on PU-ALIGNMENT front panel as shown below.  
(Keep FOCUS connected.)

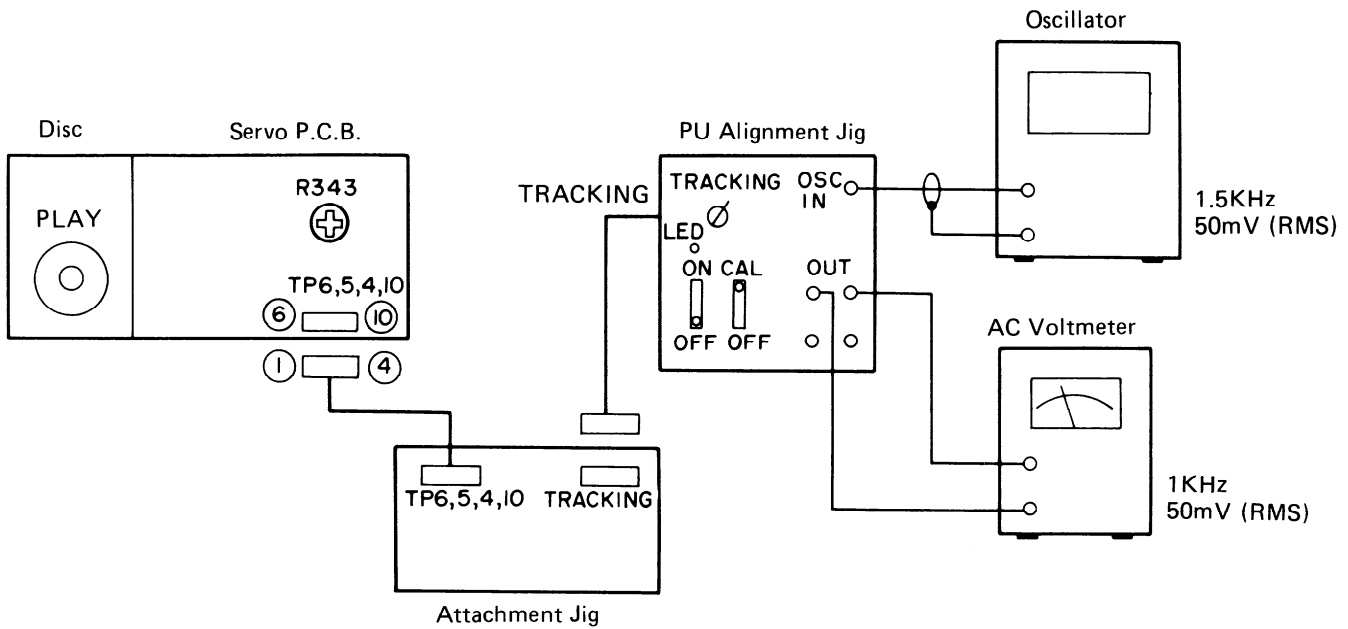


Figure 49

4. Set the unit to PLAY mode (and play both YEDS-7, TRACK No. 1).
5. Adjust oscillator output so that AC voltmeter indicates 50mV. (Vary 1.5kHz frequency and use the frequency that gives a peak.)

6. Set switches on PU-ALIGNMENT front panel as shown below.
7. Adjust semi-fixed resistor R343, 10K ohm until AC voltmeter indicates 44mV ±4mV.

Meter deflection  Large  
small

Be careful because of rotational direction reversed against focus gain.

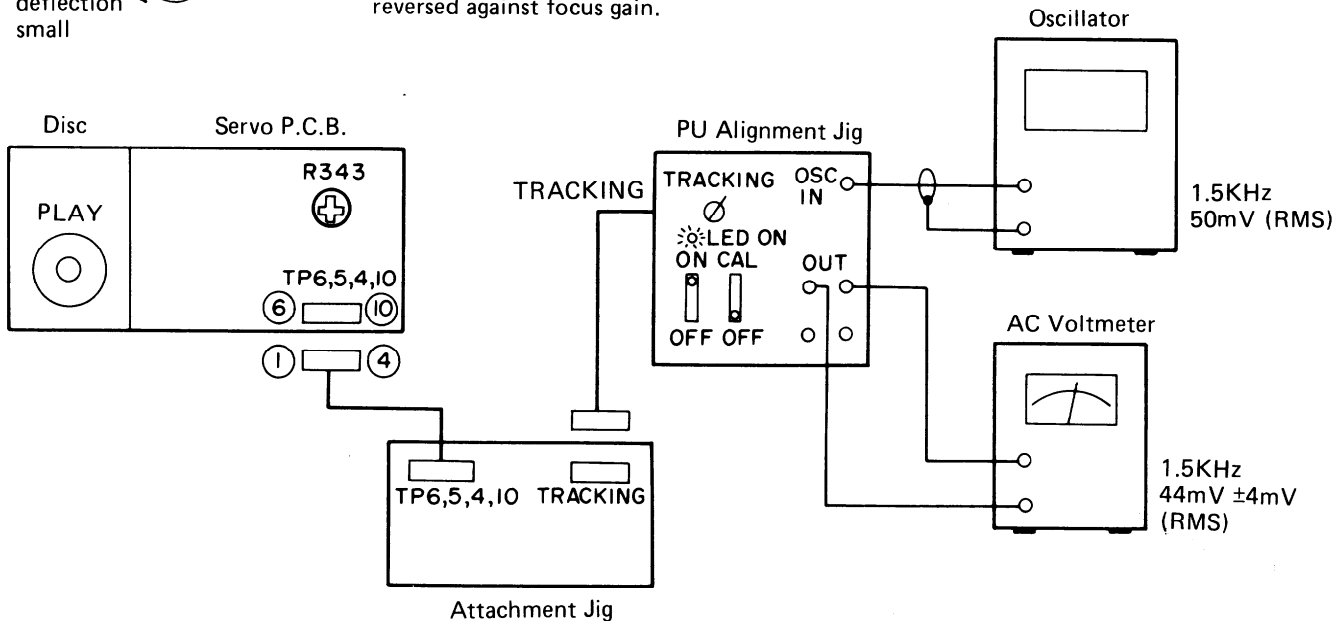


Figure 50

8. All adjustments, which should be made when pick-up was replaced, have been completed.

## ANALOG CIRCUIT ADJUSTMENT

### 1. DC offset adjustment

- 1) Load a test disc and set the unit to PAUSE mode.
- 2) Connect test point TP. 13 (R) and TP. 14 (L) to oscilloscope.
- 3) Adjust the semi-fixed resistors R629 (R) and R609 (L) until  $0V \pm 10mV$  DC is obtained on scope display.

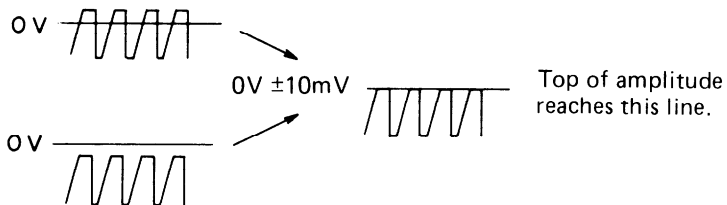
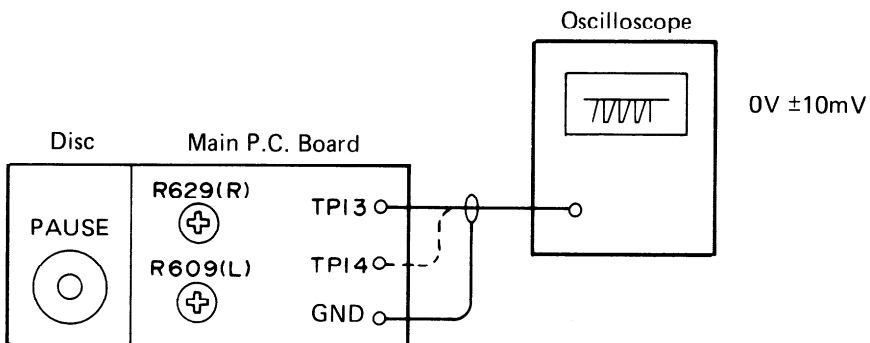
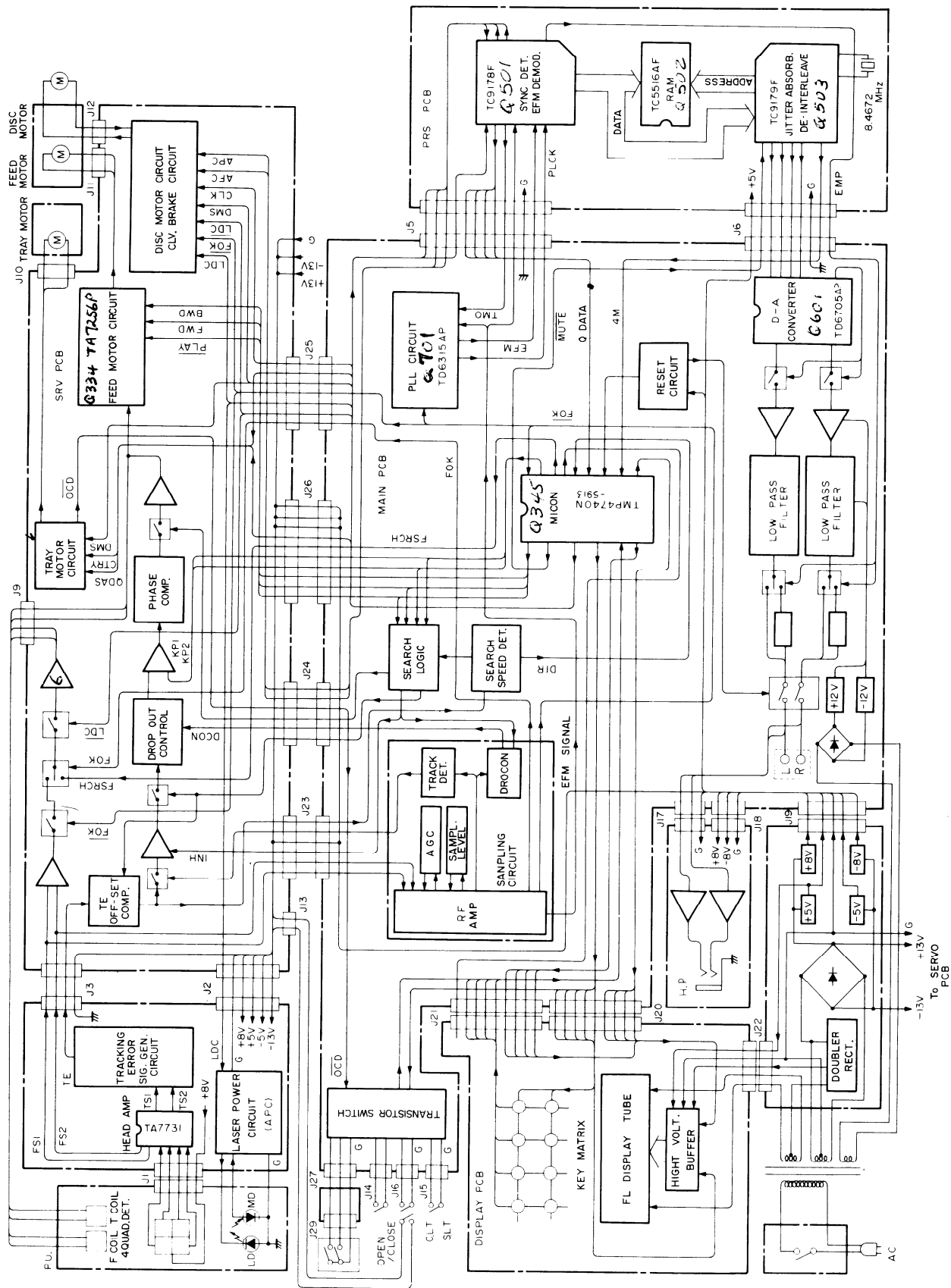


Figure 51

## PLL CIRCUIT ADJUSTMENT

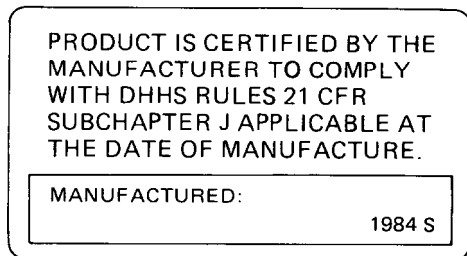
- Connect the DC voltmeter to the cathode of diode D702.  
 Load a test disc and play the test disc.  
 Adjust the coil L701 until DC voltmeter reads  $4.7 \pm 0.2V$ .

BLOCK DIAGRAM



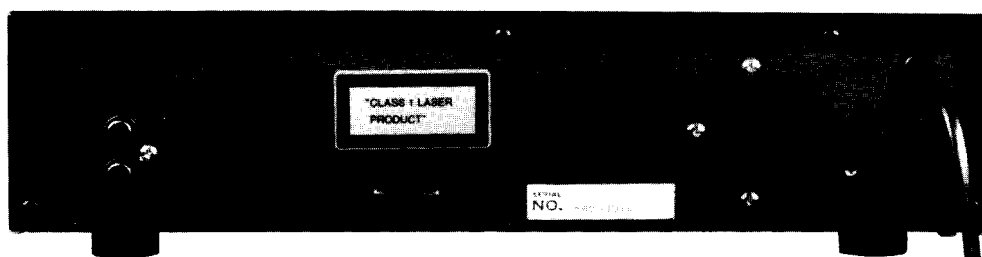
## 2. Certification label (UD model only)

This label is located on the back panel.

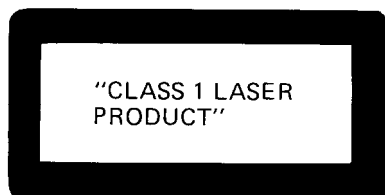


## 3. Class 1 label (UG/UW model only)

This label is located on the back panel.

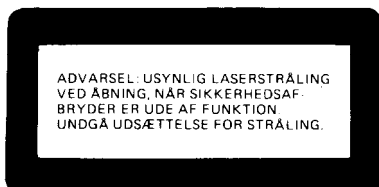


### ADVARSEL



Denne mærkning er anbragt på apparatets højre side og indikerer, at apparatet arbejder med laserstråler af klasse 1, hvilket betyder, at der anvendes laserstråler af svageste klasse, og at man ikke på apparatets yderside kan blive udsat for utilladelig kraftig stråling.

**APPARATET BØR KUN ÅBNES AF FAGFOLK MED SÆRLIGT KENDSKAB TIL APPARATER MED LASERSTRÅLER!**



Indvendigt i apparatet er anbragt den her gengivne advarselmærkning, som advarer imod at foretage sådanne indgreb i apparatet, at man kan komme til at udsætte sig for laserstråling.





## PARTS LIST

| REF. NO. | PART NO.  | DESCRIPTION              | REF. NO. | PART NO. | DESCRIPTION |
|----------|-----------|--------------------------|----------|----------|-------------|
| 301      | 27210496  | Front panel ass'y        |          |          |             |
| 302      | 27210499  | Tray panel ass'y         |          |          |             |
| 303      | 28400194  | Tray mold                |          |          |             |
| 304      | 27180255  | Spring, ground           |          |          |             |
| 305      | 28320954  | Knob, Power              |          |          |             |
| 306      | 28321685  | Knob, Open/Close         |          |          |             |
| 307      | 28321686  | Knob, Search             |          |          |             |
| 308      | 28321688  | Knob, Timer              |          |          |             |
| 309      | 28321695  | Knob, Display            |          |          |             |
| 310      | 28321696  | Knob, Memory             |          |          |             |
| 311      | 28321698  | Knob, Headphone          |          |          |             |
| 312      |           | Holder, pc board         |          |          |             |
| 313      |           | Holder, fluorescent tube |          |          |             |
| 314      | 28184239  | Top cover                |          |          |             |
| 315      | 27100054  | Chassis (D)              |          |          |             |
|          | 27100055  | Chassis (G)              |          |          |             |
|          | 27100056  | Chassis (W)              |          |          |             |
|          | 27100057  | Chassis (QA/QB)          |          |          |             |
| 316      | 28400195  | Leg                      |          |          |             |
| 317      | 27300722  | SR-4N-4, Strainrelief    |          |          |             |
| 318      |           | Lod                      |          |          |             |
| 319      | 27273032  | Joint                    |          |          |             |
| 320      |           | Case                     |          |          |             |
| 321      |           | Cover                    |          |          |             |
| 322      |           | Insulator                |          |          |             |
| 323      |           | Washer, transistor       |          |          |             |
| 324      |           | Bracket, holding, knob   |          |          |             |
| 325      | 29360714  | Label                    |          |          |             |
| 326      | 29360715  | Label, Danger            |          |          |             |
| 327      |           | Bracket, panel           |          |          |             |
| 328      |           | 3x8 (Red), Tapping screw |          |          |             |
| 329      |           | M12, Nut                 |          |          |             |
| 330      | 880009    | Rivert                   |          |          |             |
| 331      |           | 3x8, Tapping screw       |          |          |             |
| 332      | 82512606  | 2.6x6, Binding screw     |          |          |             |
| 333      |           | 3x6 (Red), Screw         |          |          |             |
| 334      |           | 2.6x8 (Red), Screw       |          |          |             |
| 335      |           | 3x4, Binding screw       |          |          |             |
| 336      |           | 3x6, Binding screw       |          |          |             |
| 337      |           | 3x6 (Red), Tapping screw |          |          |             |
| 338      | 838330082 | 3x8 (Cr), Tapping screw  |          |          |             |
| 339      | 801316    | 3x8 (BL), Tapping screw  |          |          |             |
| 340      |           | 3x8, Screw               |          |          |             |
| 341      |           | 3x10, Flat head screw    |          |          |             |
| 342      |           | 3x10 (BL), Tapping screw |          |          |             |
| 343      | 801313    | Screw, special           |          |          |             |
| 344      |           | 3x6, Tapping screw       |          |          |             |
| 345      | 28321689  | Knob, Play               |          |          |             |
| 346      | 28321690  | Knob, Pause/Stop         |          |          |             |
| 347      | 28321693  | Knob, Down               |          |          |             |
| 348      | 28321694  | Knob, Up                 |          |          |             |
| 349      | 28321691  | Knob, FR                 |          |          |             |
| 350      | 28321692  | Knob, FF                 |          |          |             |
| 351      |           | Bracket ass'y            |          |          |             |
| 352      |           | Radiator                 |          |          |             |
| 353      |           | Holder, transistor       |          |          |             |
| 354      |           | Radiator                 |          |          |             |
| 355      |           | Holder                   |          |          |             |
| 356      |           | Shield plate             |          |          |             |
| 357      |           | Cushion                  |          |          |             |
| 359      |           | Bracket, headphone       |          |          |             |
| 371      |           | Bracket, ass'y           |          |          |             |
| 372      | 22906545  | Label, caution, screw    |          |          |             |
| 374      |           | Label, Class 1           |          |          |             |
|          |           | Label, Class 1 (QB)      |          |          |             |

(D) : 120V model  
(G) : 220V model  
(W) : Universal model  
(QA) : Australian model  
(QB) : England model

| REF. NO. | PART NO.  | DESCRIPTION                                    |
|----------|-----------|--|
| EP01     | 253112    | △ AS-UC-4 #18, Power supply cord (D)           |
|          | 253083-1  | △ AS-CEE, Power supply cord (G/W)              |
|          | 253118    | △ AS-SAA, Power supply cord (QA)               |
|          | 728320    | △ Power supply cord (QB)                       |
| J28      | 25045160  | Output terminal                                |
| N801     | 212025    | Fluorescent indicator tube                     |
| S951     | 25035435  | △ NPS-111-L399P, Power switch                  |
| T901     | 230834    | △ NPT-847D, Power transformer (D)              |
|          | 230832    | △ NPT-847G, Power transformer (G)              |
|          | 230836    | △ NPT-847DG, Power transformer (W)             |
|          | 230835    | △ NPT-847QA, Power transformer (QA)            |
|          | 230833    | △ NPT-847QB, Power transformer (QB)            |
| U1       | 10208503  | NAMAIN-2103, Main circuit pc board ass'y       |
| U2       | 10208505  | NASER-2105, Servo circuit pc board ass'y (D)   |
|          | 10214505A | NASER-2105a, Servo circuit pc board ass'y (G)  |
|          | 10210505B | NASER-2105b, Servo circuit pc board ass'y (W)  |
|          | 10213505C | NASER-2105c, Servo circuit pc board ass'y (QA) |
|          | 10215505D | NASER-2105d, Servo circuit pc board ass'y (QB) |
| U3       | 10208504  | NAPRO-2104, Processor pc board ass'y           |
| U4       | 10208506  | NADIS-2106, Display pc board ass'y             |
| U5       | 10208507  | NATRAY-2107, Tray pc board ass'y               |
| U6       |           | Power supply pc board ass'y                    |
| U7       |           | Power switch pc board ass'y                    |
| U8       |           | Terminal pc board ass'y                        |
| U9       |           | Headphone terminal pc board ass'y              |
| U10      |           | Timer switch pc board ass'y                    |
| U11      |           | Sub display pc board ass'y                     |
| Z1       | 24506668  | Mechanism ass'y                                |

**NOTE:** THE COMPONENTS IDENTIFIED BY MARK △ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

## MECHANISM EXPLODED VIEW

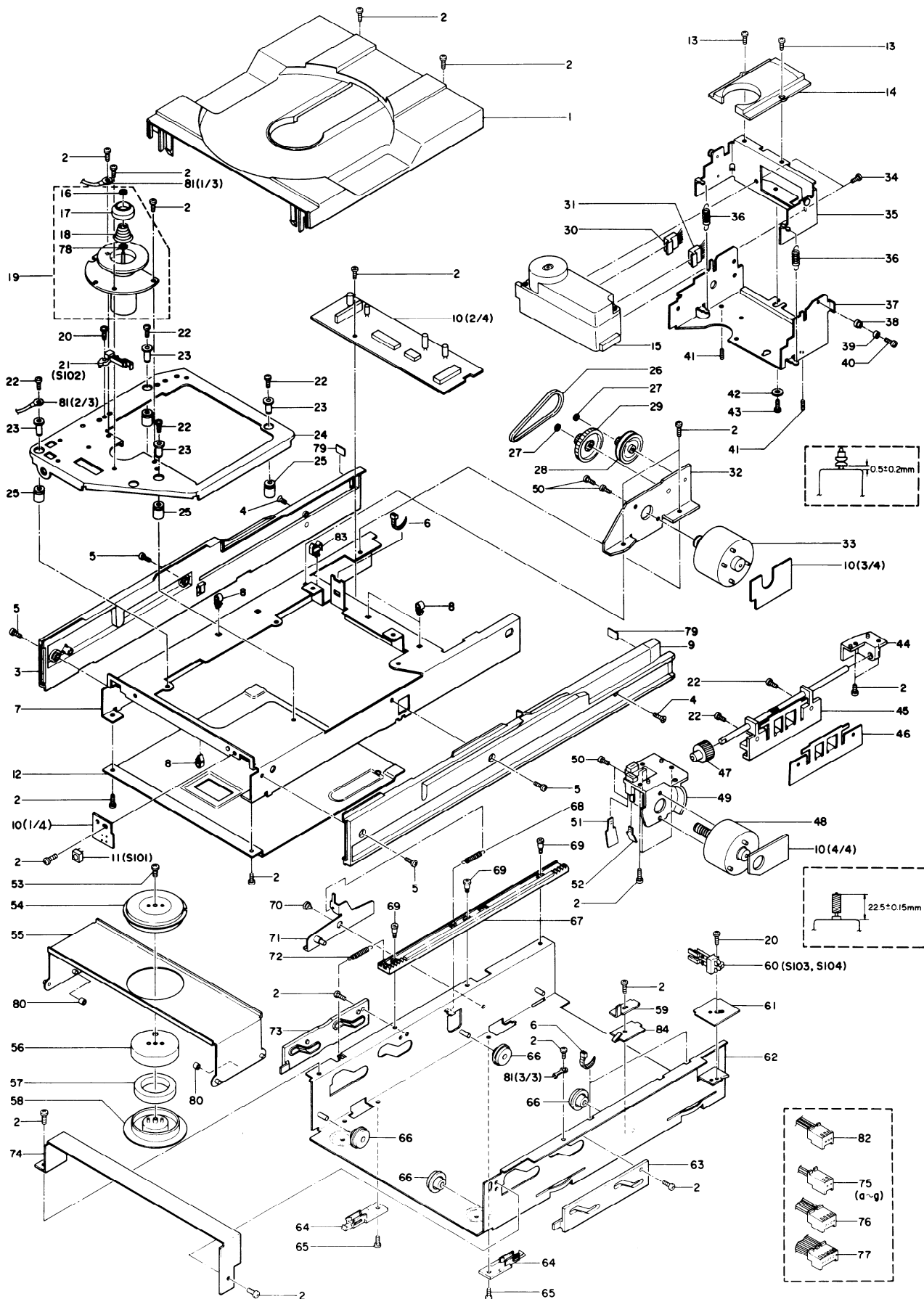


Figure 53

**NOTE:** The parts excluded in the parts list are not stocked since they are seldom required for routine service.

## PARTS LIST

| REF. NO. | PART NO.  | DESCRIPTION              |
|----------|-----------|--------------------------|
| 1        | 28400192  | Disc tray                |
| 2        | 82512606  | 2.6×6mm, Binding screw   |
| 3        | 27300703  | Slide rail, left         |
| 4        | 82212606  | 2.6×6mm, Flat head screw |
| 5        | 82542610  | 2.6×10mm, Binding screw  |
| 9        | 27300704  | Slide rail, right        |
| 11       | 25035291  | Key switch (S101)        |
| 13       | 82542004  | 2×4mm, Binding screw     |
| 14       | 28400193  | Pick-up cover            |
| 15       | 27300588A | OPH-32, Laser pick-up    |
| 19       | 27300705  | Disc motor ass'y         |
| 20       | 82112006  | 2×6mm, Pan head screw    |
| 21       | 25065244  | Leafswitch (S102)        |
| 22       |           | 2.6×12mm, Binding screw  |
| 23       | 27270134  | Spacer                   |
| 25       | 28140548  | Cushion                  |
| 26       | 27300706  | Drive belt               |
| 27       | 870115    | φ2.1mm, Washer           |
| 28       | 27300707  | Drive gear A             |
| 29       | 27300708  | Drive gear B             |
| 33       | 27300709  | Loading motor ass'y      |
| 34       |           | 3×4mm, Binding screw     |
| 36       | 27180219  | Spring                   |
| 38       | 27180220  | Bushing                  |
| 39       | 27300710  | Roller                   |
| 40       | 801314    | 2×8mm, Screw             |
| 41       | 801309    | 2.6×6mm, Screw           |
| 42       |           | 3mm, Washer              |
| 43       | 801310    | 3×10mm, Special screw    |
| 44       | 27300712  | Thrust holder            |
| 45       | 27300713  | Guide rack ass'y         |
| 46       | 27180221  | Spring plate             |
| 47       | 27300714  | Gear WH                  |
| 48       | 27300715  | Pick-up motor ass'y      |
| 49       | 27190297  | Motor mount              |
| 50       |           | 2.6×4mm, Binding screw   |
| 51       | 27180222  | Spring plate             |
| 52       | 27180223  | Spring plate             |
| 53       | 837120042 | 2×4mm, Binding screw     |
| 54       | 27300716  | Clamper plate            |
| 56       | 27300717  | Clamper yoke             |
| 57       | 28181013  | Clamper magnet           |
| 58       | 27300718  | Clamper                  |
| 60       | 25065245  | Leafswitch (S103/S104)   |
| 64       | 27300719  | Rail plate               |
| 65       |           | 2.6×3mm, Binding screw   |
| 66       | 27267351  | Guide roller             |
| 67       | 27300720  | Slide lack               |
| 68       | 27180224  | Spring                   |
| 69       | 801311    | Lack screw               |
| 70       | 801312    | 2.6×13mm, Special screw  |
| 72       | 27180226  | Spring                   |
| 79       | 28140549  | Stopper cushion          |
| 80       | 27300721  | Roller lifter            |

# PRINTED CIRCUIT BOARD-PARTS LIST

## MAIN CIRCUIT PC BOARD (NAMAIN-2103)

| CIRCUIT NO.        | PART NO.  | DESCRIPTION                                 |
|--------------------|-----------|---|
| <b>ICs</b>         |           |   |
| Q201               | 222755    | TC74HCU004P or TC40H004P                    |
| Q202               | 222648    | TA75458S                                    |
| Q203               | 222818    | TA75902P                                    |
| Q310, Q317         | 222755    | TC74HCU004P or TC40H004P                    |
| Q326               | 222829    | TA75393S                                    |
| Q344               | 222832    | PST518                                      |
| Q345               | 222831    | TMP4740N-5913                               |
| Q352               | 222780123 | TA78L012AP                                  |
| Q353               | 222790123 | NJM79L12A                                   |
| Q601               | 222828    | TA6705AP                                    |
| Q602               | 222717    | $\mu$ PD4053BC                              |
| Q603               | 222758    | NJM0720-D                                   |
| Q604, Q605         | 222833    | AFL89GP                                     |
| Q608               | 222755    | TC74HCU004P or TC40H004P                    |
| Q701               | 222827    | TD6315AP                                    |
| <b>Transistors</b> |           |   |
| Q204               | 2212186   | 2SK170 (BL)                                 |
| Q205, Q206         | 2211255   | 2SC1815 (GR)                                |
| Q324, Q327         | 2211255   | 2SC1815 (GR)                                |
| Q328, Q341         | 2211255   | 2SC1815 (GR)                                |
| Q342               | 2211255   | 2SC1815 (GR)                                |
| Q314, Q343         | 2211455   | 2SA1015 (GR)                                |
| Q346-Q351          | 2211455   | 2SA1015 (GR)                                |
| Q606, Q607         | 2212375   | 2SK30ATM (GR)                               |
| Q702               | 2211723   | 2SC1923 (O)                                 |
| <b>Diodes</b>      |           |   |
| D201-D204          | 223155 or | 1SS138 or                                   |
| D305-D312          |           | 1SS176                                      |
| D325, D326         | 223155 or | 1SS138 or                                   |
| D601, D602         |           | 1SS176                                      |
| D702               |           |   |
| D327               | 223885    | $\Delta$ 1B4B41                             |
| D603               | 223105    | 1S1555                                      |
| D701               | 223161    | 1SV147                                      |
| <b>Coil</b>        |           |   |
| L701               | 233330    | NFO-3034                                    |
| <b>Filter</b>      |           |   |
| Z601               | 3010090   | Z1383K                                      |
| <b>Capacitors</b>  |           |   |
| C201               | 352741009 | 10 $\mu$ F, 16V, Elect.                     |
| C202               | 352780109 | 1 $\mu$ F, 50V, Elect.                      |
| C212               | 352982296 | 0.22 $\mu$ F, 50V, Non-polar elect.         |
| C216               | 352734709 | 47 $\mu$ F, 10V, Elect.                     |
| C346, C708         | 352731019 | 100 $\mu$ F, 10V, Elect.                    |
| C347               | 352783399 | 0.33 $\mu$ F, 50V, Elect.                   |
| C348               | 352743309 | 33 $\mu$ F, 16V, Elect.                     |
| C355, C356         | 352751029 | 1,000 $\mu$ F, 25V, Elect.                  |
| C605, C606         | 3000047   | 1,200pF $\pm$ 5%, 125V, Styrol, copper foil |
| C609, C610         | 352743319 | 330 $\mu$ F, 16V, Elect.                    |
| C612, C616         | 372122724 | 2,700pF $\pm$ 5%, 50V, Styrol               |
| C613, C617         | 372121224 | 1,200pF $\pm$ 5%, 50V, Styrol               |
| C619, C620         | 352941006 | 10 $\mu$ F, 16V, Non-polar elect.           |
| C622, C623         | 352734719 | 470 $\mu$ F, 10V, Elect.                    |
| C624, C626         | 352734709 | 47 $\mu$ F, 10V, Elect.                     |
| C711, C712         | 351731019 | 100 $\mu$ F, 10V, Elect.                    |
| <b>Resistors</b>   |           |   |
| R219               | 4000096   | 9.5k $\Omega$ , 1/4W, Metal film            |
| R220               | 4000097   | 10k $\Omega$ , 1/4W, Metal film             |
| R384, R709         | 4000095   | 8.2k $\Omega$ , 1/4W, Metal film            |

| CIRCUIT NO.  | PART NO.    | DESCRIPTION                             |
|--------------|-------------|---|
| R457         | 49121562405 | 5.6k $\Omega$ $\times$ 5, 1/8W, Network |
| R466         | 49121563404 | 56k $\Omega$ $\times$ 4, 1/8W, Network  |
| R467, R468   | 49121273404 | 27k $\Omega$ $\times$ 4, 1/8W, Network  |
| R609, R629   | 5210013     | N06HR10KBDM, Semi-fixed                 |
| R619, R626   | 431511065   | 10M $\Omega$ , 1/2W, Solid              |
| R706         | 4000094     | 3.3k $\Omega$ , 1/4W, Metal film        |
| <b>Relay</b> |             |   |
| L601         | 25065243    |   |

## SUB DISPLAY PC BOARD

| CIRCUIT NO. | PART NO.  | DESCRIPTION              |
|-------------|-----------|--------------------------|
| Q804        | 222840131 | TC4013BP, IC             |
| Q803        | 2211255   | 2SC1815 (GR), Transistor |
| D808-D810   | 223155    | 1SS138 or 1SS176, Diode  |

## HEAD AMPLIFIER PC BOARD (NAPRI-2102)

| CIRCUIT NO.       | PART NO.  | DESCRIPTION                         |
|-------------------|-----------|-------------------------------------|
| <b>ICs</b>        |           |                                     |
| Q101              | 222819    | TA7731P                             |
| Q102              | 222735    | NJM072D or NJM082D                  |
| Q103              | 222818    | TA75902P                            |
| Q104              | 222648    | TA75458S                            |
| <b>Transistor</b> |           |                                     |
| Q105              | 2212464   | 2SA966 (Y)                          |
| <b>Capacitors</b> |           |                                     |
| C102, C105        | 352734709 | 47 $\mu$ F, 10V, Elect.             |
| C108, C109        | 352734709 | 47 $\mu$ F, 10V, Elect.             |
| C114              | 352781009 | 10 $\mu$ F, 50V, Elect.             |
| C115              | 352731019 | 100 $\mu$ F, 10V, Elect.            |
| <b>Resistors</b>  |           |                                     |
| R104              | 5210015   | N06HR22KBDM, Semi-fixed             |
| R114, R122        | 5210017   | N06HR47KBDM, Semi-fixed             |
| R117, R128        | 5210013   | N06HR10KBDM, Semi-fixed             |
| R136              | 441621014 | 100 $\Omega$ , 1W, Metal oxide film |

## PROCESSOR PC BOARD (NAPRO-2104)

| CIRCUIT NO.  | PART NO. | DESCRIPTION  |
|--------------|----------|--------------|
| <b>ICs</b>   |          |              |
| Q501         | 222820   | TC9178F (BL) |
| Q502         | 222822   | TC5516AF     |
| Q503         | 222821   | TC9179F (BL) |
| <b>X'tal</b> |          |              |
| Z501         | 3010089  | 8.5MHz       |

## SERVO CIRCUIT PC BOARD (NASER-2015)

| CIRCUIT NO.        | PART NO. | DESCRIPTION   |
|--------------------|----------|---------------|
| <b>ICs</b>         |          |               |
| Q301, Q309         | 222648   | TA75458S      |
| Q319, Q339         | 222648   | TA75458S      |
| Q329               | 222826   | TA7354P       |
| Q306, Q334         | 222825   | TA7256P       |
| <b>Transistors</b> |          |               |
| Q308               | 2212526  | 2SK363 (V)    |
| Q311, Q313         | 2212375  | 2SK30ATM (GR) |
| Q325, Q338         | 2212375  | 2SK30ATM (GR) |
| Q340               | 2212375  | 2SK30ATM (GR) |
| Q307, Q312         | 2211255  | 2SC1815 (GR)  |

| CIRCUIT NO.  | PART NO.  | DESCRIPTION                           |
|--|-----------|---------------------------------------|
| Q322, Q331<br>Q332   | 2211255   | 2SC1815 (GR)                          |
| Q302, Q304<br>Q305, Q315<br>Q318, Q321<br>Q333, Q335<br>Q336, Q337<br>Q354, Q355<br>Q316, Q320<br>Q323 | 2212286   | 2SC2878 (B)                           |
| Q330   | 2211455   | 2SA1015 (GR)                          |
|  | 2201074   | 2SD880 (Y)                            |
| <b>Diodes</b>  |           |                                       |
| D315   | 224175    | 05Z8.2Y                               |
| D317   | 224139    | 05Z2.7Y                               |
| D318, D319   | 224151    | 05Z3.9Y                               |
| D320, D321   | 224157    | 05Z4.7Y                               |
| D323   | 224153    | 05Z4.3Y                               |
| D301-D304<br>D314, D316<br>D322, D324<br>D328-D330   | 223155    | 1SS138 or<br>1SS176                   |
| <b>Capacitors</b>  |           |                                       |
| C307   | 352984796 | 0.47 $\mu$ F, 50V, Non-polar Elect.   |
| C317, C338   | 352941006 | 10 $\mu$ F, 16V, Non-polar Elect.     |
| C311, C344<br>C345   | 352980106 | 1 $\mu$ F, 50V, Non-polar Elect.      |
| C334, C339<br>C305   | 352983396 | 0.33 $\mu$ F, 50V, Non-polar Elect.   |
| C309, C321   | 352781009 | 10 $\mu$ F, 50V, Elect.               |
| C336, C343<br>C310   | 352752209 | 22 $\mu$ F, 25V, Elect.               |
| C322, C328<br>C333   | 352754709 | 47 $\mu$ F, 25V, Elect.               |
|  | 352780109 | 1 $\mu$ F, 50V, Elect.                |
|  | 352780109 | 1 $\mu$ F, 50V, Elect.                |
|  | 352780479 | 4.7 $\mu$ F, 50V, Elect.              |
| <b>Resistors</b>   |           |                                       |
| R406   | 4000098   | 220 $\Omega$ , 1/4W, Fuse             |
| R376   | 441520104 | 1 $\Omega$ , 1/2W, Metal oxide film   |
| R413   | 441520334 | 3.3 $\Omega$ , 1/2W, Metal oxide film |
| R446   | 441721004 | 10 $\Omega$ , 2W, Metal oxide film    |
| R305, R343   | 5210013   | N06HR10KBDM, Semi-fixed               |

### POWER SUPPLY CIRCUIT PC BOARD

| CIRCUIT NO.        | PART NO.  | DESCRIPTION                   |
|--------------------|-----------|-------------------------------|
| <b>ICs</b>         |           |                               |
| Q901               | 222780080 | TA78008AP                     |
| Q902               | 222790080 | $\mu$ PC7908H                 |
| Q903               | 222780050 | TA78005AP                     |
| Q904               | 222790050 | $\mu$ PC7905H                 |
| <b>Diodes</b>      |           |                               |
| D901               | 223884    | $\triangle$ 1B2Z1 (T)         |
| D902               | 223883    | $\triangle$ 1B2C1 (T)         |
| D903, D904<br>D905 | 223155    | 1SS138 or 1SS176              |
|                    | 224208    | 05Z24Y                        |
| <b>Capacitors</b>  |           |                               |
| C901, C902         | 3500079   | 0.01 $\mu$ Fx2, 250V, Ceramic |
| C903, C904         | 352743329 | 3,300 $\mu$ F, 16V, Elect.    |
| C905, C906         | 352734709 | 47 $\mu$ F, 10V, Elect.       |
| C909, C910         | 352734709 | 47 $\mu$ F, 10V, Elect.       |
| C913               | 352751019 | 100 $\mu$ F, 25V, Elect.      |
| C914               | 352780479 | 4.7 $\mu$ F, 50V, Elect.      |
| <b>Resistors</b>   |           |                               |
| R903, R904         | 4000093   | 1 $\Omega$ , 1/2W, Fuse       |

### DISPLAY PC BOARD (NADIS-2106)

| CIRCUIT NO. | PART NO.    | DESCRIPTION                                |
|-------------|-------------|--|
| Q801, Q802  | 222824      | TC5066BP, ICs                              |
| D801-D806   | 223155      | 1SS138 or 1SS176, Diodes                   |
| N801        | 212025      | FL-TUBE-Z84, Fluorescent<br>indicator tube |
| R803, R805  | 49121563405 | 56k $\Omega$ x5, 1/8W, Network resistors   |
| R804        | 49121563404 | 56k $\Omega$ x4, 1/8W, Network resistor    |

### HEADPHONE AMPLIFIER PC BOARD

| CIRCUIT NO. | PART NO.  | DESCRIPTION                        |
|-------------|-----------|------------------------------------|
| Q851        | 222823    | TA75557S, IC                       |
| C851, C852  | 352780109 | 10 $\mu$ F, 50V, Elect.            |
| R851        | 5104151   | N09RGP50KA15, Variable<br>resistor |

### TRAY PC BOARD (NATRAY-2107)

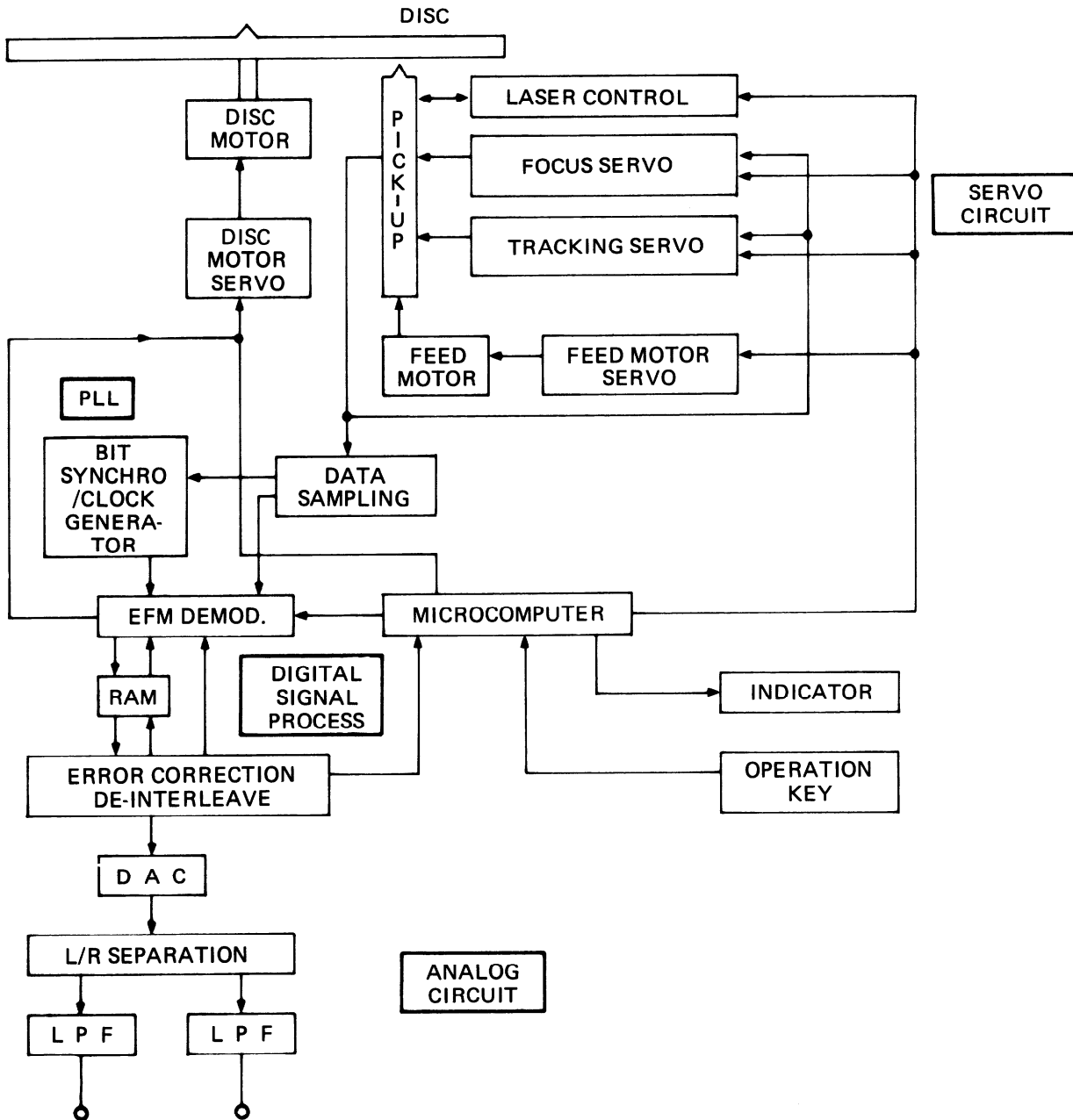
| CIRCUIT NO. | PART NO. | DESCRIPTION               |
|-------------|----------|---------------------------|
| D807        | 225162   | TLS143, LED               |
| S101        | 25035291 | NPS-111-S257, Push switch |

### POWER SWITCH CIRCUIT PC BOARD

| CIRCUIT NO. | PART NO. | DESCRIPTION   |
|-------------|----------|---|
| S951        | 25035435 | $\triangle$ NPS-111-L399P, Power switch                     |
| C951        | 3500077  | $\triangle$ 4,700pF, AC 400V, Capacitor<br>IS (G/W/Q)       |
|             | 3500065A | $\triangle$ 0.01 $\mu$ F, AC 125V/400V,<br>Capacitor IS (D) |

**NOTES:** THE COMPONENTS IDENTIFIED BY MARK  
 $\triangle$  ARE CRITICAL FOR RISK OF FIRE AND  
ELECTRIC SHOCK. REPLACE ONLY WITH  
PARTS NUMBER SPECIFIED.

# SYSTEM VIEW



This system can be divided into three parts: a servo circuit, which controls the pick-up and motor; a digital circuit, which processes signals read from discs; and an analog circuit, which processes sound signals.

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## PRECAUTIONS

### 1. The Pickup Attachment Screw

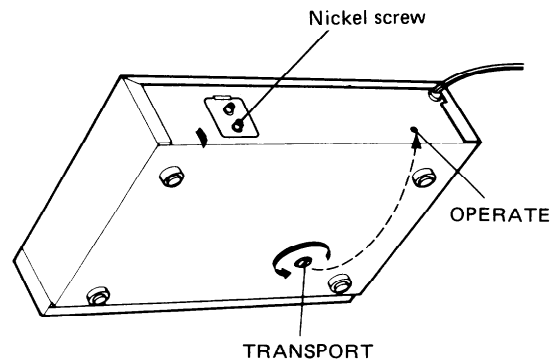
There is a pickup shipping screw on the bottom of the cabinet. Before playing a disc for the first time, this screw must be removed using a blade (-) screwdriver or coin. If the power is turned on with this screw attached, the unit will not operate properly. Save the screw by affixing it in the storage hole on the rear panel as it should be reattached if the player is ever moved or shipped.

**Note:** To transport, turn the power OFF with the disc tray open. Push the tray gently by hand, then tighten the screw by turning it clockwise.

### 2. Safety-check out (U.S.A. model)

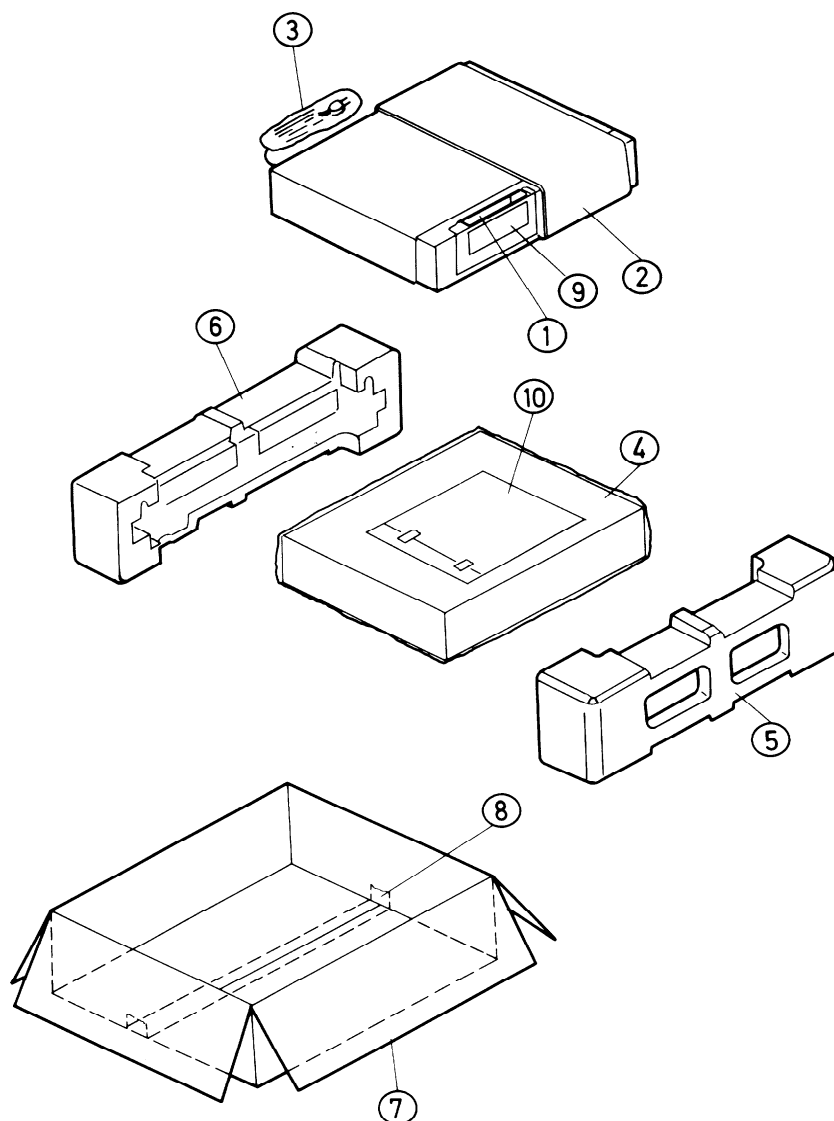
After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Connect the insulating-resistance tester between the plug of power supply cable and nickel screw on the back panel.  
Specifications: more than 10Mohm at 500V.



(Fig. 1)

# PACKING VIEW



| REF. NO. | PART NO. | DESCRIPTION                       |
|----------|----------|-----------------------------------|
| 1        |          | 50x140mm, Protection sheet        |
| 2        |          | 186x810mm, Protection sheet       |
| 3        | 29100056 | Poly = vinyl bag, power cord      |
| 4        | 29100074 | Poly = vinyl bag                  |
| 5        | 29090924 | Pad, front                        |
| 6        | 29090925 | Pad, back                         |
| 7        | 29050988 | Master carton box                 |
| 8        | 260013   | Tape                              |
| 9        | 29360715 | Label, caution, screw             |
| 10       |          | Accessory bag ass'y               |
|          | 29340809 | Instruction manual (120V model)   |
|          | 29340810 | Instruction manual (Other models) |
|          | 2010104  | Connection cord                   |
|          | 29100006 | 250x350mm, Poly = vinyl bag       |



## CAUTIONS ON REPLACEMENT OF PICK-UP

1. When removing the laser pick-up, temporarily connect (solder) the terminals to which red and black leads have been connected to protect the laser pick-up from damage which would be caused during removal work of the pick-up.
2. Disconnect the connector and leads after completion of soldering. Do not touch the terminals on the pick-up by your hand.
3. When mounting a new laser pick-up, first connect the connector and leads and then remove short-circuit spring on the P.C. Board (Refer to Fig. 4 and 5).

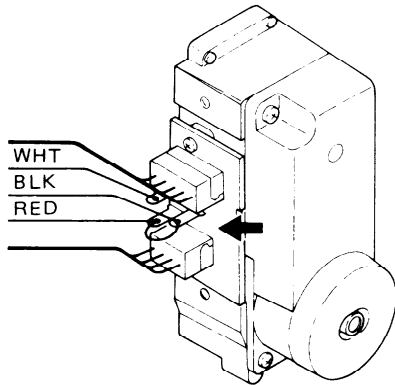


Figure 2

Solder or short-circuit these two terminals before disconnecting the connector leads.

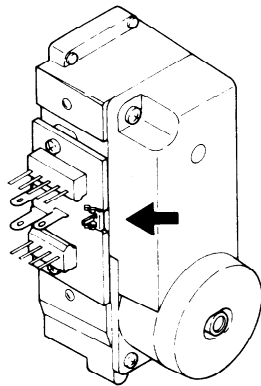


Figure 4

Shorting spring (to short-circuit the terminals)

### RANKS OF PICK-UP

The pickups are divided into two rank groups, B and C, and one of ranks is indicated on a label put on a side of the pickup as shown. When a new pickup having the same rank as one of the pickup to be replaced is replaced, no additional resistor replacement is required. However, when the pickup has a different rank, one resistor must be changed as tabulated below, depending on the rank of the pickup to be replaced.

| Symbol No. | R129        | R130          |
|------------|-------------|---------------|
| Rank       |             |               |
| B          | Use 18k ohm | Remove        |
| C          | Remove      | Use 6.8 k ohm |

When mounting the laser pick-up, the terminals (red and black) of which were soldered in the step 1. leftward, first connect the connector and leads before unsoldering the terminals (red and black). (Refer to Fig. 5)

- \* Use a soldering iron grounded (or iron less leakage).
  - \* Cover the working bench with a conductive mat which is also grounded.
  - Before proceeding job, always touch the conductive mat or ground lead with your both hand to discharge electric charges developed on your body.
4. The necessary distance between laser pick-up and the viewer's eye is only 2mm.

*viewer's eye*  
*disc*

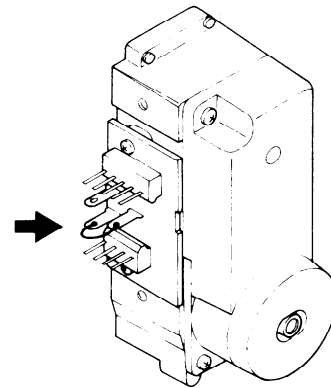


Figure 3

The terminals short-circuited.

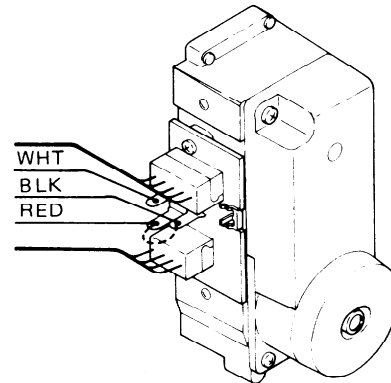


Figure 5

Remove the shorting spring after connection of the connector and leads have been completed.  
Shorting spring

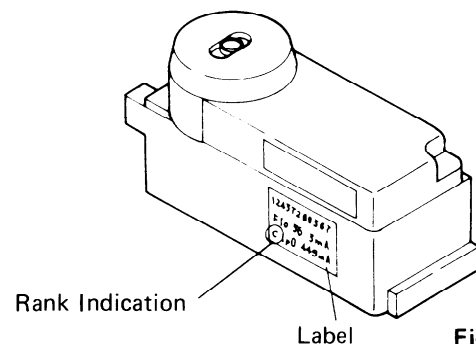


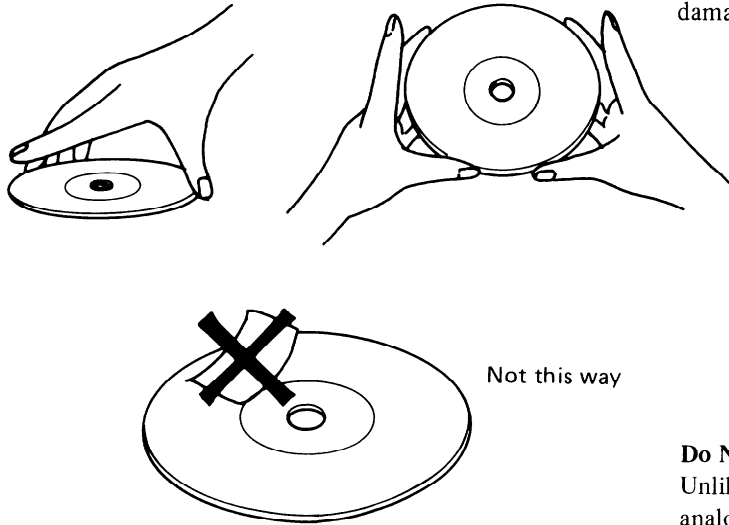
Figure 6

## NOTES ON COMPACT DISC

### • Holding Compact Discs

Hold Compact Discs by the edges so that you do not touch the surface of disc. Remember that the side of the disc with the "rainbow" reflection is the side containing the audio information.

Do not attach tape or paper to the label side of the disc and always be careful not to leave fingerprints on the side that is played.



### • Storing Compact Discs

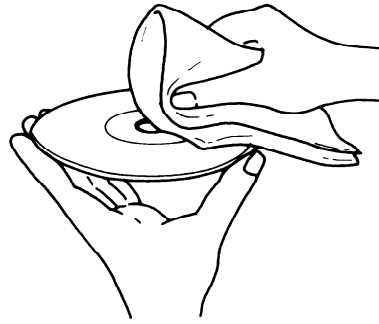
Store Compact Discs in a location protected from direct sunlight, high heat and humidity and extremely high and low temperatures. Discs should never be left in the trunk or interior of an automobile in the sun since the temperature can become very high in such a closed environment.

Always store Compact Discs in the holders in which they were sold. Never leave a disc in the player's disc holder for a long period of time.

### • Cleaning Compact Discs

Before playing a disc wipe off the playing surface with a soft cloth to remove dust and other soil. Wipe the surface in straight lines from the center of the disc outward, not in a circular motion as you would with a phonograph record.

Do not use benzene, chemical cleansers or phonograph record cleaning solutions to clean Compact Discs. Also avoid static electricity prevention solutions since they can damage the surface of Compact Discs.



### Do Not Set Volume Too High.

Unlike phonograph records, cassette tapes and other analog audio sources, Compact Discs have no background or surface noise (scratches, clicks, etc.).

Therefore, you can not adjust the volume level by listening to the "lead-in noise" as you would with a phonograph record, for example. Be careful not to set the volume control on your amplifier or receiver too high before the music on a disc begins since a high setting could damage your speaker system.

### Problems Caused by Dew

Dew can form inside a Compact player when it is brought from a cold environment into a warm room, when a room is rapidly heated and if a player is left in a humid environment.

This dew can prevent the laser pickup from reading the data contained in the pits in the disc surface. If the player does not operate properly because of dew, remove the disc and leave the player's power switch on for about one hour to remove all moisture.

## 11. DISASSEMBLY INSTRUCTIONS

### ■ TOP COVER REMOVAL

1. Remove two screws (A) & (B) on both sides and four screws (C) on back side, and the top cover will be removed. (See Figure 7, 8 and 9).

(A)  $\phi 3 \times 8\text{mm}$  Tapping Screw

Figure 7

(B)  $\phi 3 \times 8\text{mm}$  Tapping Screw

Figure 8

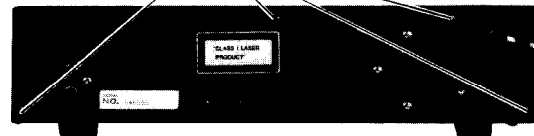
(C)  $\phi 3 \times 8\text{mm}$  Tapping Screw

Figure 9

### ■ TRAY PANEL REMOVAL

1. Remove top cover.
2. Mechanism assembly comes out (open) by pulling mechanism assembly gear in direction (D) shown by arrow while pressing the gear with your finger. (See Figure 10)
3. Remove tray panel by pushing hook (E) or Tray mold securing tray panel. (See Figure 11)

VERY EASY TO TAKE OUT "MECHANISM BOTTOM BOARD"  
SEE FIG. 19

(E) Hook

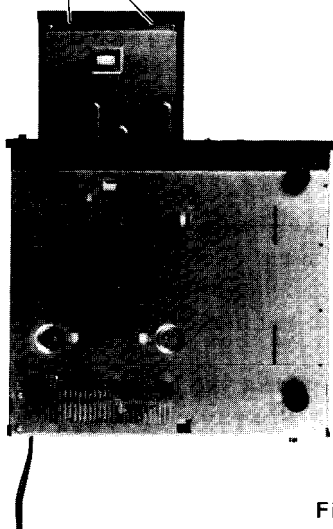


Figure 11

(D)

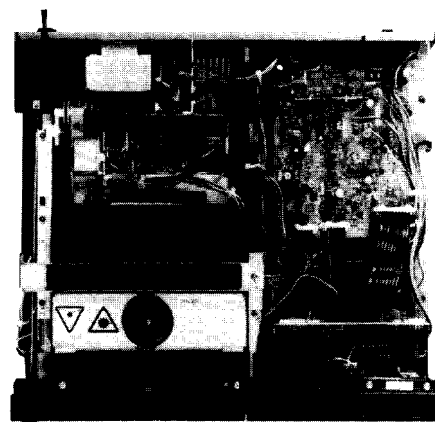


Figure 10

GROUND  
COPPER  
BAR SPRING

(F)  $\phi 3 \times 10\text{mm}$ , Screw

Figure 12

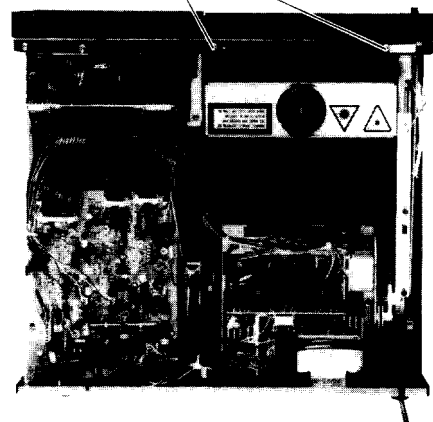
(G)  $\phi 3 \times 6\text{mm}$ , Tapping Screw

Figure 13

### ■ TRAY MOLD REMOVAL (PIECE OF PLASTIC IN FRONT OF TRAY, BUT BEHIND TRAY PANEL)

1. Remove top cover and tray panel.
2. Remove two screws (F) securing tray mold, and the tray mold will be removed. (See Figure 12)

### ■ FRONT PANEL ASSEMBLY REMOVAL

1. Remove top cover, tray panel, and tray mold.
2. Remove six screws (G), (H) & (I) securing front panel, and the front panel assembly will be removed. (Pay attention to connector leads and joint of power supply switch.) (See Figure 13, 14 and 15)

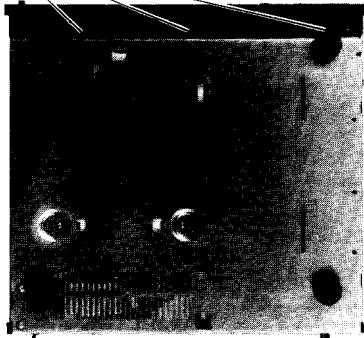
(H)  $\phi 3 \times 6\text{mm}$ , Tapping Screw

Figure 14

#### ■ MECHANISM ASSEMBLY REMOVAL

1. Remove front panel assembly.
2. Move mechanism assembly forward. (Open it.)
3. Remove two screws (J) securing mechanism assembly, and the mechanism assembly will be removed. (See Figure 16)

#### ■ DISC TRAY REMOVAL

1. Remove tray panel and tray mold.
2. Remove two screws (K) securing disc tray. (See Figure 17)
3. Move mechanism assembly forward. (Open it.)
4. Lift disc tray up with hool (L) pushed, the disc tray will be removed. (See Figure 18)

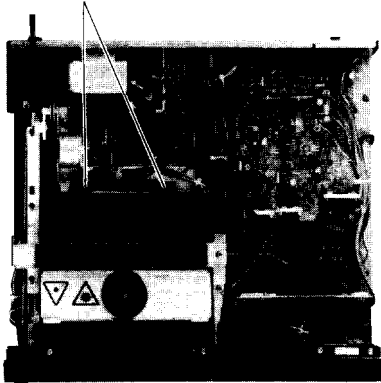
(K)  $\phi 2.6 \times 6\text{mm}$ , Screw

Figure 17

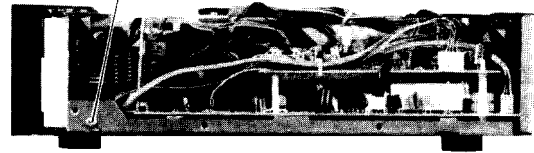
(I)  $\phi 3 \times 6\text{mm}$ , Tapping Screw

Figure 15

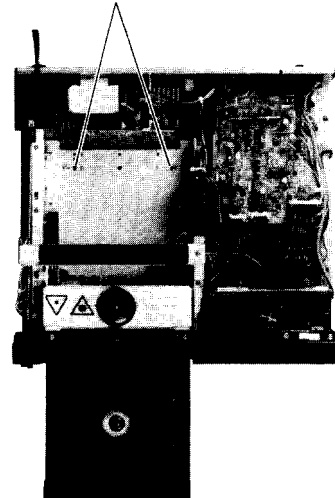
(J)  $\phi 3 \times 4\text{mm}$ , Screw

Figure 16

Hook

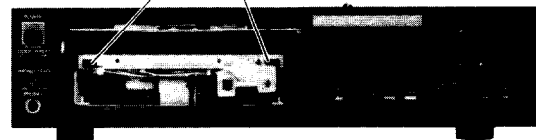


Figure 18

#### ■ MECHANISM BOTTOM BOARD REMOVAL

1. Move mechanism assembly forward. (Open it.)
2. Remove two screws (M) securing bottom board, and the mechanism bottom board will be removed. (See Figure 19)

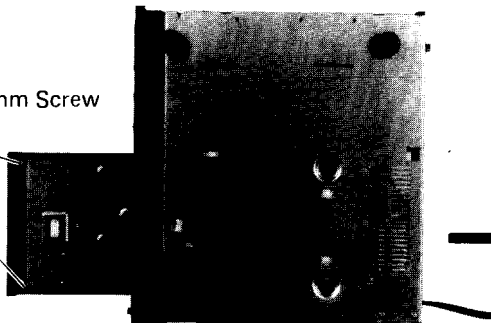
(M)  $\phi 2.6 \times 6\text{mm}$  Screw

Figure 19

Removing of bottom board

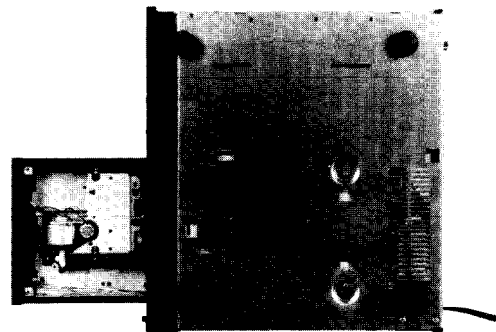


Figure 20