

## 7. ADJUSTMENTS

The adjustments for this unit are given below. Adjustments must be made in the order in which they are listed.

### ● Adjustments and check items

1. Focus lock and spindle lock check
2. Automatic adjustment check of the tracking balance
3. Grating adjustment
4. RF level adjustment
5. LD (Laser Diode) power check
6. Tangential adjustment
7. Radial adjustment
8. 2SB adjustment

### ● Measuring equipment

1. Dual trace oscilloscope
2. Optical power meter
3. Test disc (YEDS-7), 8 cm disc
4. Other regular measuring equipment

### ● About the test mode

#### How to activate and release the test mode

- ① To activate the test mode, turn ON the power switch (S470) with the test mode jumper short-circuited.
- ② The test mode is released by turning the power switch OFF.

The functions of the keys in the test mode are outlined in Table 7-1.

### ● Adjustment VR and their names

VR1 : Laser power

MAIN BOARD Assembly

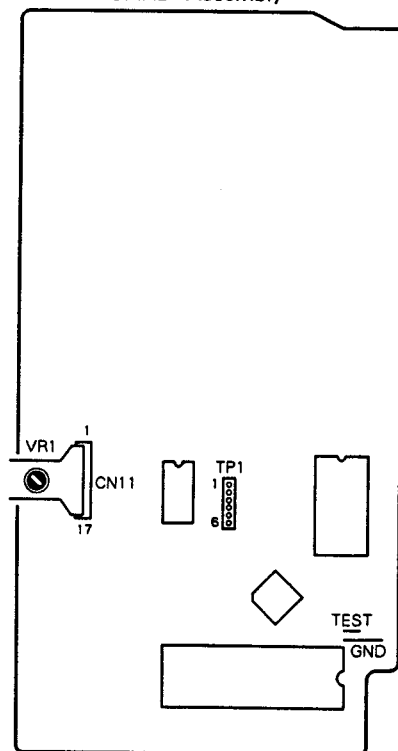


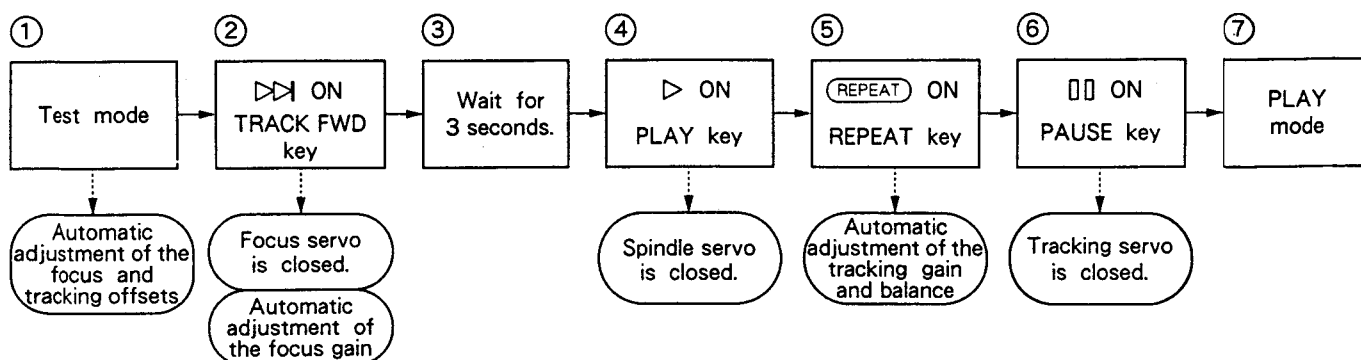
Fig. 7-1 Adjusting point

In the test mode, the servos must be closed and opened individually. Consequently, the servos must each be closed in the proper sequence (serial sequence) in order to put the machine into the play mode. Note also that the machine will not enter the play mode when the PAUSE (||) key is pressed.

For example, in order to change from the stop to the play mode, the function keys must be pressed in the following order.

\*1: The MANUAL SEARCH and REPEAT keys are not available on the panel. Use the remote control unit for these key operations. For other keys (PLAY, TRACK, PAUSE, etc.), both the panel and the remote control unit can be used.

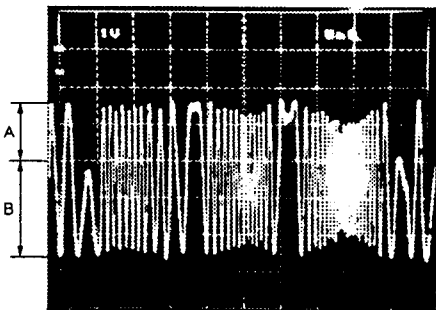
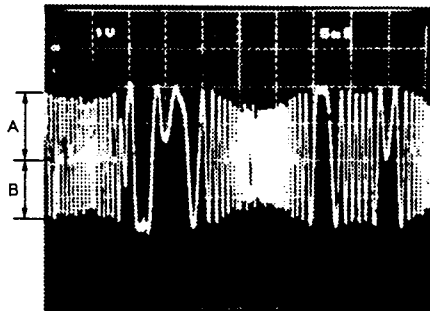
\*2: Servos in test mode are controlled in serial sequence. Note that no command is accepted in this model as long as the focus servo is not closed while the spindle is rotated in conventional models only by pressing the PLAY button.



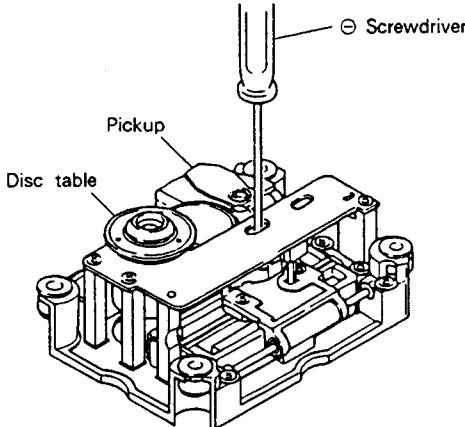
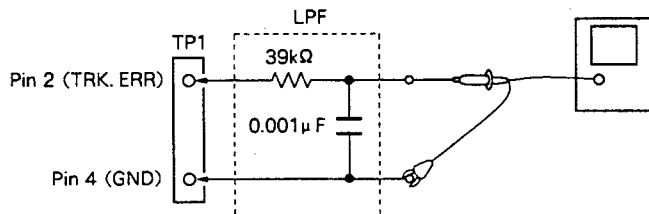
### • Key Functions in Test Mode

| Symbol | Key name          | Function in test mode                                       | Description                                                                                                                                                                                                                      |
|--------|-------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ▶▶     | TRACK FWD         | Focus servo close<br>Automatic adjustment of the focus gain | After illuminating the laser diode, slightly kicking the disc and moving up/down the focus actuator to adjust the focus gain, the focus servo is closed.                                                                         |
| ▶      | PLAY              | Spindle servo close                                         | Closes the servo in the rough servo mode after kicking the spindle motor.                                                                                                                                                        |
| REPEAT | REPEAT            | Automatic adjustment of the tracking gain and balance       | The tracking gain and balance are automatically adjusted using the error waveform in the tracking open loop condition.                                                                                                           |
|        | PAUSE             | Tracking servo close/open                                   | Acts as a toggle: closes the tracking servo and activates play mode when pressed (provided the focus and spindle servos are closed), at which time the PAUSE indicator illuminates; opens the tracking servo when pressed again. |
| ◀◀     | MANUAL SEARCH REV | Carriage reverse (moves inward)                             | Moves carriage quickly (3cm/s) toward innermost track. Be careful not to move too far as there is no safety device to stop the carriage.                                                                                         |
| ▶▶     | MANUAL SEARCH FWD | Carriage forward (moves outward)                            | Moves carriage quickly (3cm/s) toward outermost track. Be careful not to move too far as there is no safety device to stop the carriage.                                                                                         |
| □      | STOP              | Stop                                                        | Stops all servos and returns system to its initial state.                                                                                                                                                                        |
| △      | OPEN/CLOSE        | Disc tray open/close                                        | Opens and closes the disc tray. However, pickup does not return to rest on OPEN, and it remains stationary on CLOSE.                                                                                                             |

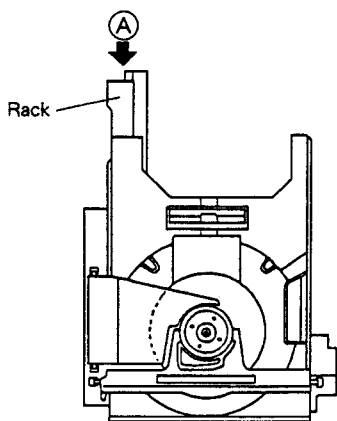
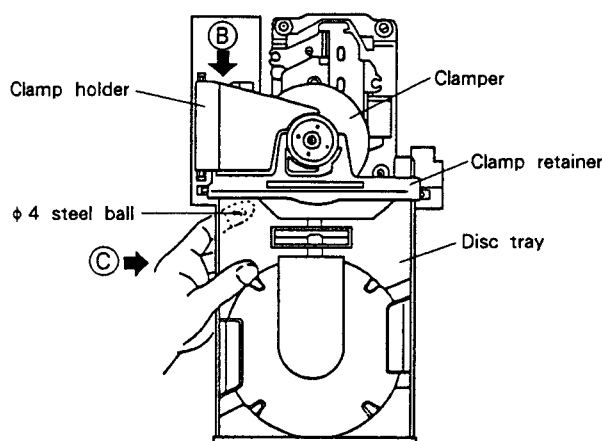
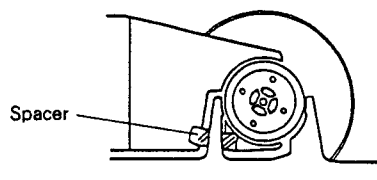
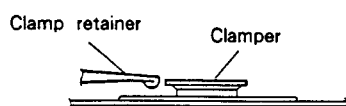
Table 7-1

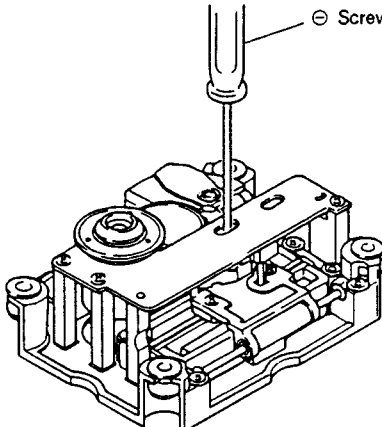
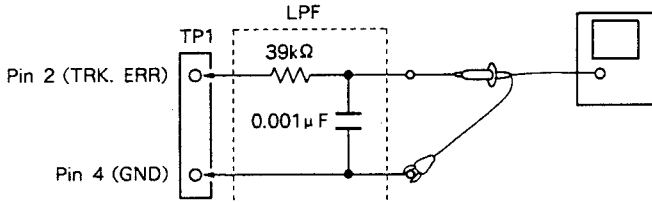
| Step No.                                                                                                                                                                                                                                                                                                                          | Oscilloscope Setting                               |              | Test Points                 | Adjusting Points | Check items/ Adjustment specifications                   | Adjustment procedure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--------------|-----------------------------|------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                   | V                                                  | H            |                             |                  |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 1                                                                                                                                                                                                                                                                                                                                 | Focus lock and spindle lock check                  |              |                             |                  |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                   | 0.5V/div                                           | 100msec /div | TP1<br>Pin 1<br>(RF output) |                  | RF signal is output.<br><br>Forward (clockwise) rotation | <ul style="list-style-type: none"><li>● Set the test disc.</li><li>● Put unit in the test mode. (※)</li><li>● Press the MANUAL SEARCH FWD (▷▷) key to move the pickup to the center of the disc.</li></ul> Note: Be sure to perform this operation. <ul style="list-style-type: none"><li>● Observe the output of TP1 pin 1 (RF output) on the oscilloscope. Confirm that the RF signal is output after the TRACK FWD (▷▷) key is pressed.</li><li>● Press the PLAY (▷) key and confirm that the disc rotates at constant speed (approx. 300 rpm) near center of disc in the forward (clockwise) direction ; disc may not run away or rotate counterclockwise.</li></ul>                                                                                                                                                                                                       |
| 2                                                                                                                                                                                                                                                                                                                                 | Automatic adjustment check of the tracking balance |              |                             |                  |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                   | 0.5V /div                                          | 5msec /div   | TP1<br>Pin 2<br>(TRK. ERR)  |                  | TRK. ERR                                                 | <ul style="list-style-type: none"><li>● Set the test disc.</li><li>● Put unit in the test mode. (※)</li><li>● While observing pin 2 of TP1 or TRK. ERR (tracking error) on an oscilloscope, adjust the DC offset to set the voltage to center on the oscilloscope.</li><li>● Press the MANUAL SEARCH FWD (▷▷) key to position the carriage near the center of the disc.</li><li>● Press the TRACK FWD (▷▷) and PLAY (▷) keys sequentially to cause the disc to rotate.</li><li>● Press the REPEAT key and check that the DC component in the tracking error is gone (A=B).</li></ul> Note :<br>In normal mode, this adjustment is performed at an appropriate timing after the spindle kick. Therefore, a disc that is drastically off center may not result in A=B upon confirmation in test mode. In this case, press the REPEAT key again and check if the DC level varies. |
| <div><div><p>A ≠ B</p><p>Photo. 7-1 DC elements mixed in signal</p></div><div>➔</div><div><p>A = B</p><p>Photo. 7-2 DC elements eliminated</p></div></div> |                                                    |              |                             |                  |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

※ : See page 30.

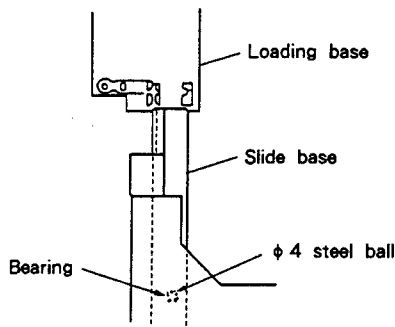
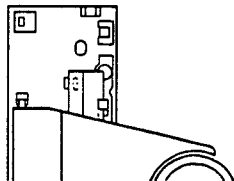
| Step No. | Oscilloscope Setting                                                                                          |             | Test Points                | Adjusting Points                                         | Check items/ Adjustment specifications | Adjustment procedure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------|---------------------------------------------------------------------------------------------------------------|-------------|----------------------------|----------------------------------------------------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | V                                                                                                             | H           |                            |                                                          |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 3        | Grating Adjustment (1) (When an 8 cm disc is used.)                                                           |             |                            |                                                          |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|          | <div><p>Fig. 7-2</p></div>   |             |                            |                                                          |                                        | <p>Note : This adjustment can be made by using an 8 cm disc, having pits within the diameter range of 75 mm.</p> <ul style="list-style-type: none"><li>● Put unit in the test mode. (※)</li><li>● Press the MANUAL SEARCH FWD (▶▶) key to move the pickup to the center of the disc, so that the grating adjustment screw of the pickup can be viewed through the oval hole (one of the oval holes which is near to the spindle motor) on the base plate of the servo mechanism.</li><li>● As shown in Fig. 7-2, insert a (slotted) ⊖ screwdriver from the top of the mechanism and check that the grating adjusting screw can be rotated.</li><li>● Mount the test disc.</li><li>● Press the TRACK FWD (▶▶), PLAY (▶) and REPEAT keys in sequence to close the focus servo and spindle servo (do not turn on the tracking servo).</li><li>● Insert a 4 kHz-cutoff low pass filter between the oscilloscope and TP1 pins 2 (TRK. ERR) and 4 (GND) as shown in Fig. 7-3 and observe the waveform of TP1 pin 2 (tracking error) on the oscilloscope.</li></ul> |
|          | 0.5V / div                                                                                                    | 5msec / div | TP1<br>Pin 2<br>(TRK. ERR) | Grating adjustment screw<br><br>Grating adjustment screw | Null point<br><br>Maximum amplitude    | <ul style="list-style-type: none"><li>● Insert a ⊖ screwdriver into the grating hole, turn and find the null point (see Photo 7-3).</li><li>● Next, slowly turn the ⊖ screwdriver COUNTERCLOCKWISE from the null point and adjust until the waveform (tracking error signal) reaches maximum amplitude (see Photo 7-4).</li></ul> <p>Note: Avoid applying pressure to the ⊖ screwdriver while adjusting the screw. Doing so causes the pickup to move inward, making adjustment more difficult.</p> <ul style="list-style-type: none"><li>● Lastly, make sure that there is no major fluctuation in the p-p voltage of the tracking error signal (do not insert the cutoff 4 kHz low-pass filter) when the pickup is moved to the inner and outer periphery. If there is a difference of more than ±10% again turn the grating adjustment screw and adjust the tracking error signal to maximum.</li></ul>                                                                                                                                                   |
|          | <div><p>Fig. 7-3</p></div> |             |                            |                                                          |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

※ See page 30.

| Step No.                                                                                                           | Oscilloscope Setting                                     |   | Test Points                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Adjusting Points | Check items/ Adjustment specifications | Adjustment procedure |
|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------------------|----------------------|
|                                                                                                                    | V                                                        | H |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                                        |                      |
| 3'                                                                                                                 | Grating adjustment (2) (When no 8 cm disc is available.) |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                                        |                      |
| <div></div> <div>Fig. 7-4</div>   |                                                          |   | <p>This adjustment is made if no 8 cm disc is available and the grating adjustment (1) cannot be effectuated. Remove the disc tray to perform this adjustment.</p> <p>● Removal of the disc tray</p> <ol style="list-style-type: none"><li>1. Press the rear edge of the rack, (*1) marked ① in Fig. 7-4, while pulling the disc tray out to the position where it catches, illustrated in Fig. 7-5.</li><li>(*1) When the rear edge of rack ① is pressed, first the disc clamp is released. If you continue pressing after it has been released completely, the disc tray is ejected.</li><li>2. While pulling the clamp holder ② (see Fig. 7-5) upward with the right hand, hold the tray as indicated by ③ in the left hand and pull it outward. Take care not to allow the <math>\phi 4</math> steel ball to fall (we recommend holding the ball in place with the left index finger while extracting the tray.)</li></ol> |                  |                                        |                      |
| <div></div> <div>Fig. 7-5</div>  |                                                          |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                                        |                      |
| <div></div> <div>Fig. 7-6</div> |                                                          |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                                        |                      |
| <div></div> <div>Fig. 7-7</div> |                                                          |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                                        |                      |

| Step No. | Oscilloscope Setting |           | Test Points                | Adjusting Points                                             | Check items/ Adjustment specifications | Adjustment procedure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------|----------------------|-----------|----------------------------|--------------------------------------------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | V                    | H         |                            |                                                              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|          |                      |           |                            |                                                              |                                        |  <p>Fig. 7-8</p>  <p>Fig. 7-9</p> <ul style="list-style-type: none"> <li>● Put unit in the test mode. (※)</li> <li>● Press the MANUAL SEARCH FWD (▶▶) key to move the pickup to the center of the disc, so that the grating adjustment screw of the pickup can be viewed through the oval hole (one of the oval holes which is near to the spindle motor) on the base plate of the servo mechanism.</li> <li>● As shown in Fig. 7-8, insert a (slotted) ⊖ screwdriver from the top of the mechanism and check that the grating adjusting screw can be rotated.</li> <li>● Mount the test disc; be sure to insert a 3-5 mm spacer (if no spacer is available, use a hex wrench) between the clamp holder and clamp retainer, as shown in Fig. 7-6.</li> <li>● Confirm that the clammer and the clamp retainer are not contacting one another (Fig. 7-7).</li> <li>● Press the TRACK FWD (▶▶), PLAY (▶) and REPEAT keys sequentially to close the focus and spindle servos (do not close the tracking servo).</li> <li>● Insert a 4 kHz-cutoff low pass filter between the oscilloscope and TP1 pins 2 (TRK.ERR) and 4 (GND) as shown in Fig. 7-9 and observe the waveform of TP1 pin 2 (tracking error) on the oscilloscope.</li> </ul> |
|          | 0.5V/div             | 5msec/div | TP1<br>Pin 2<br>(TRK. ERR) | Grating<br>adjusting screw<br><br>Grating<br>adjusting screw | Null point<br><br>Maximum<br>amplitude | <ul style="list-style-type: none"> <li>● Turn the grating adjusting screw with the ⊖ screwdriver to find the null point (see Photo 7-3.).</li> <li>● Next, slowly turn the ⊖ screwdriver COUNTERCLOCKWISE and adjust to the point where the waveform (tracking error signal) first achieves its maximum amplitude (see Photo 7-4).</li> </ul> <p>Note: Avoid applying pressure to the ⊖ screwdriver while adjusting the screw. Doing so causes the pickup to move inward, making adjustment more difficult.</p> <ul style="list-style-type: none"> <li>● Lastly, remove the low pass filter and confirm that the tracking error signal (do not insert the cutoff 4 kHz low-pass filter) p-p voltage does not greatly vary when the pickup is moved to the inner-most and outer-most tracks of the disc.</li> <li>● If the levels diverge by ±10% or more, re-adjust the maximum error amplitude point by turn the grating adjusting screw.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

※ : see page 30.

| Step No.                                                                                                                                                                                   | Oscilloscope Setting |   | Test Points | Adjusting Points | Check items/ Adjustment specifications | Adjustment procedure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---|-------------|------------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                            | V                    | H |             |                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <div></div> <div></div> |                      |   |             |                  |                                        | <p>Re-mount the disc tray according to the following procedure when the grating adjustment is complete.</p> <ol style="list-style-type: none"><li>1. Remove the disc and the spacer.</li><li>2. While lifting the clamp holder [marked ⑤ in Fig. 7-5] with the right hand, hold the tray in the left hand as indicated by ③ and slide the slide base into the hard resin fittings on the loading base as shown in Fig. 7-10 to re-insert the disc tray.<br/>At this time, be sure to hold the steel ball in place with the index finger of the left hand. Also, be careful that the front panel is not damaged by the slide base and bearing of the steel ball's bearing (in the slide base) coming into contact with the panel.</li><li>3. Insert the slide base so that it fits into the two hard resin fittings at the rear of the loading base (see Fig. 7-11).</li><li>4. Insert the tray tightly.</li></ol> |

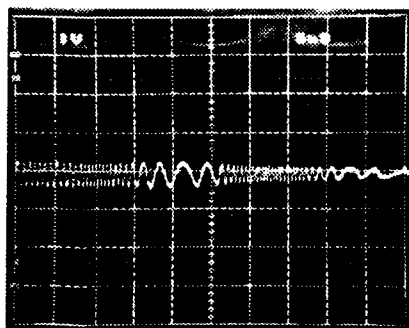


Photo. 7-3  
Null point

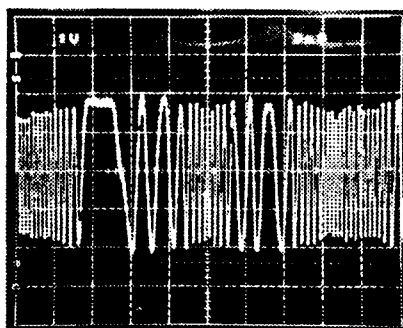


Photo. 7-4  
Maximum amplitude

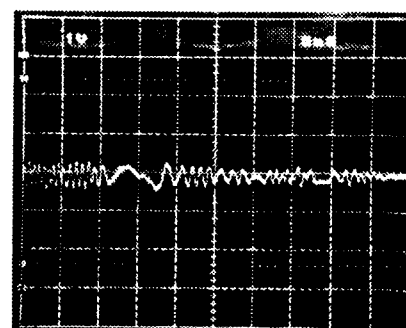
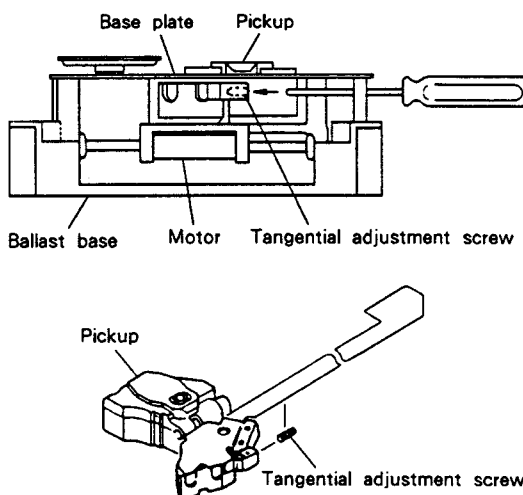


Photo. 7-5  
This is not the null-point waveform.

| Step No.                       | Oscilloscope Setting                                                                |   | Test Points                 | Adjusting Points     | Check items/ Adjustment specifications | Adjustment procedure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------|-------------------------------------------------------------------------------------|---|-----------------------------|----------------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                | V                                                                                   | H |                             |                      |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 4 RF level adjustment          |                                                                                     |   |                             |                      |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                |                                                                                     |   | TP1<br>Pin 1<br>(RF OUTPUT) | VR1<br>(Laser power) | 1.5Vp-p $\pm 0.2V$<br>-0.1V            | <ul style="list-style-type: none"><li>● Put unit in the test mode. (※)</li><li>● Connect the oscilloscope to TP1 pin 1 (RF output), play the test disc, and measure the P-P voltage of the RF waveform.</li><li>● Adjust VR1 (Laser power) so that the voltage is 1.5Vp-p <math>\pm 0.2V</math><br/>-0.1V.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5 LD (laser diode) power check |                                                                                     |   |                             |                      |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                |                                                                                     |   |                             | VR1                  | Less than 0.13mW                       | <ul style="list-style-type: none"><li>● Put unit in the test mode. (※)</li><li>● Press the TRACK FWD (▶▶) key to turn ON the laser diode (LD).</li><li>● Place the sensor of the optical power meter directly above the objective lens and confirm that the LD power is less than 0.13mW.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 6 Tangential adjustment        |                                                                                     |   |                             |                      |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                |  |   |                             |                      |                                        | <ul style="list-style-type: none"><li>● Put unit in the test mode. (※)</li><li>● Open the tray and load the test disc.</li><li>● Press the MANUAL SEARCH FWD (▶▶) key to position the pickup near the center of the disc.</li><li>● Insert a hex wrench into the tangential adjustment screw section from the rear of the mechanism.</li><li>● Close the tray.</li></ul> <p>Note: Do not use an L-shaped hex wrench. Use one such as shown to the left. Using an L-shaped hex wrench can cause the tray to come loose (see page 34 3'. Grating adjustment (2)).</p> <ul style="list-style-type: none"><li>● Press the TRACK FWD (▶▶), PLAY (▶), REPEAT and PAUSE (⏏) keys sequentially to close the all servos (PAUSE indicator will illuminate).</li></ul> |

※ : see page 30.



| Step No. | Oscilloscope Setting |              | Test Points               | Adjusting Points            | Check items/ Adjustment specifications | Adjustment procedure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------|----------------------|--------------|---------------------------|-----------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | V                    | H            |                           |                             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|          |                      | 200nsec /div | TP1<br>Pin 1<br>RF output | Tangential adjustment screw | Sharpest possible eye pattern          | <ul style="list-style-type: none"><li>● Observe TP1 pin 1 (RF output) on the oscilloscope and adjust the tangential adjustment screw to achieve the sharpest possible eye pattern.</li><li>● The point to which the adjusting screw should be set lies about halfway between the points at which the eye pattern becomes most blurred when the screw is rotated clockwise and counterclockwise. When the whole waveform becomes clear, concentrate on sharpening the fine lines forming the diamond at the center of the eye pattern (see Photo 7-7). Adjust until the fine lines on all four sides of the diamond are both sharply defined and dense.</li></ul> <p>Note: Use a hex wrench to raise the pickup somewhat while making this adjustment.</p> |

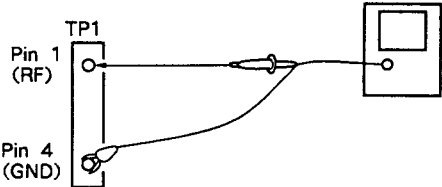


Fig. 7-13

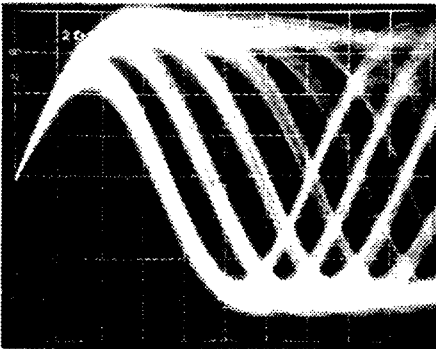


Photo. 7-6

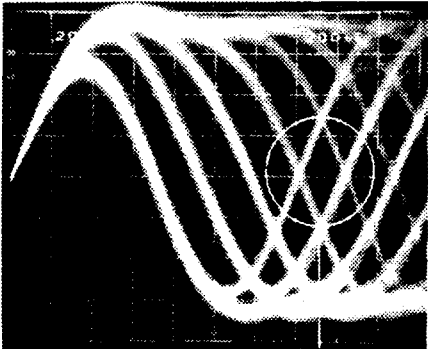


Photo. 7-7

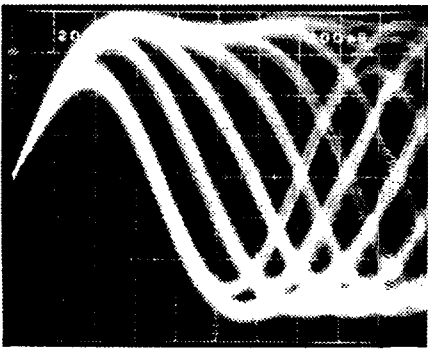
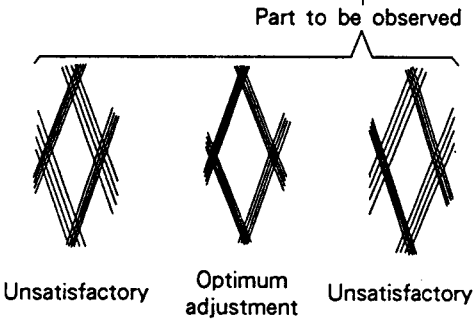


Photo. 7-8



| Step No. | Oscilloscope Setting |   | Test Points                 | Adjusting Points              | Check items/ Adjustment specifications | Adjustment procedure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------|----------------------|---|-----------------------------|-------------------------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | V                    | H |                             |                               |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 7        | Radial adjustment    |   |                             |                               |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|          |                      |   | TP1<br>Pin 1<br>(RF output) | Radial<br>adjustment<br>screw | Sharpest possible<br>eye pattern       | <p>Remove the disc tray before beginning this adjustment.</p> <p>Note: Refer to page 34 "3. Grating adjustment (2)" for the removal of the disc tray.</p> <ul style="list-style-type: none"><li>● Load the test disc.</li><li>● Put unit in the test mode. (※)</li><li>● Press the MANUAL SEARCH FWD (▷▷) key to move the pickup to the center of the disc, so that tangential adjustment screw can be viewed from the top (refer to Fig. 7-12).</li><li>● Press the TRACK FWD (▷◁), PLAY (▷), REPEAT and PAUSE (⏸) keys sequentially to close all servos(PAUSE indicator will illuminate).</li><li>● Observe TP1 pin 1 (RF output) on the oscilloscope and adjust the radial adjustment screw to achieve the sharpest possible eye pattern. (Fig. 7-14)</li><li>● When the whole waveform becomes clear, concentrate on sharpening the fine lines forming the diamond at the center of the eye pattern. Adjust until the fine lines on all four sides of the diamond are both sharply defined and dense, as shown in Photo 7-7.</li><li>● Perform the tangential adjustment and the radial adjustment twice or more alternately.</li></ul> |

The diagram shows a top-down view of the disc tray assembly. A radial adjustment screw is located on the left side, and a tangential adjustment screw is located on the right side. A dashed line indicates the position of the disc tray. A label 'D' is visible at the bottom right of the assembly.

Fig. 7-14

The diagram shows a top-down view of the disc tray assembly. A radial adjustment screw is located on the left side, and a tangential adjustment screw is located on the right side. A dashed line indicates the position of the disc tray. A label 'D' is visible at the bottom right of the assembly.

Fig. 7-15

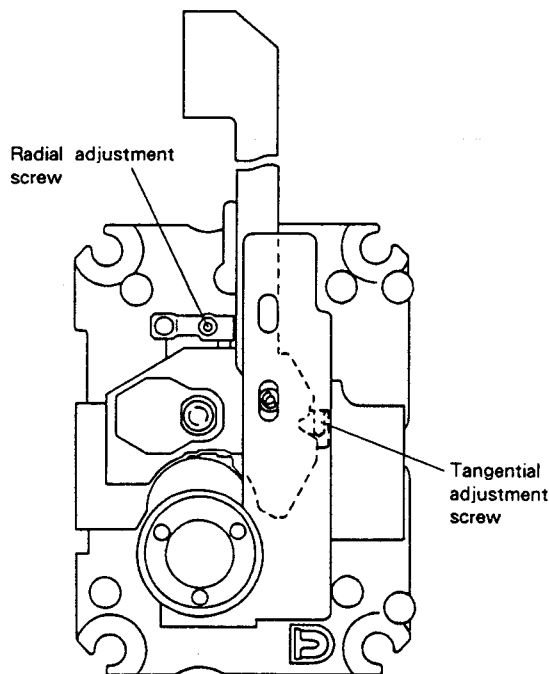


Fig. 7-14

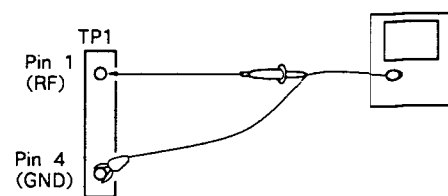


Fig. 7-15

※: See page 30.

| Step No. | Oscilloscope Setting           |   | Test Points | Adjusting Points | Check items/ Adjustment specifications | Adjustment procedure                                                                                                                                                                                                                                                                                                                        |
|----------|--------------------------------|---|-------------|------------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | V                              | H |             |                  |                                        |                                                                                                                                                                                                                                                                                                                                             |
| 8        | D/A converter (2SB) adjustment |   |             |                  |                                        |                                                                                                                                                                                                                                                                                                                                             |
|          |                                |   |             |                  |                                        | <ul style="list-style-type: none"><li>● When replacing the D/A converter<br/>For IC730 : Remove R730 through R733.<br/>For IC731 : Remove R740 through R743.<br/>(In this case, no adjustment is performed for 2SB. However, the initial condition of the performance of the D/A converter is resumed by removing the resistors.)</li></ul> |

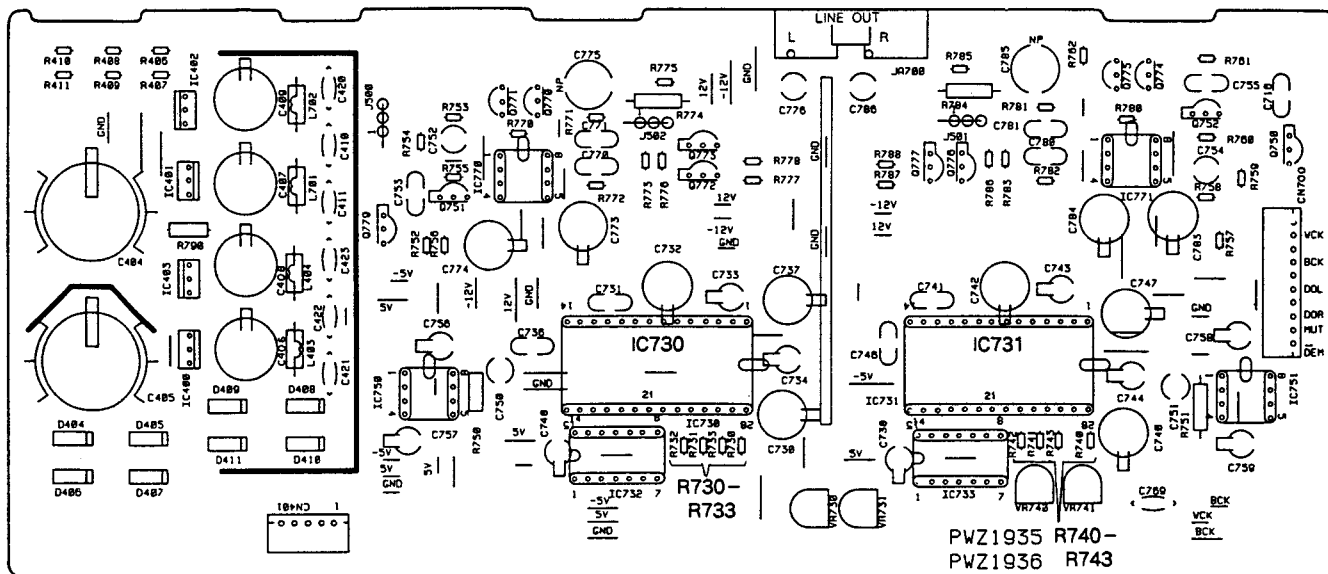


Fig. 7-16 AUDIO BOARD Assembly