

8. ELECTRICAL PARTS LIST

NOTES :

- Parts without part number cannot be supplied.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 Ω	56×10 ¹	561	RD1/4PS	561J
47k Ω	47×10 ³	473	RD1/4PS	473J
0.5 Ω	0R5		RN2H	0R5K
1 Ω	010		RS1P	010K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω	562×10 ¹	5621	RN1/4SR	5621F
---------	---------------------	------	---------	-------

Miscellaneous Parts

P. C. BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.	Mark	Symbol & Description	Part No.
⚠⊙	Main board assembly	PWZ1565	Q6	DTA124ES	
⊙	Control board assembly	PWZ1571	Q12, Q19	DTC124ES	
⚠	Transformer board assembly		Q1, Q3	2SA1399	
	Switch board assembly		Q7	2SA933S	
	Headphone board assembly		Q5, Q8, Q9, Q16, Q17, Q21	2SC1740S	

OTHERS

Mark	Symbol & Description	Part No.
⚠	Strain relief	CM-22C
⚠	AC Power cord	PDG1015
⚠	Power transformer	PTT1091
	Semiconductive ceramic capacitor	CGDYX104M25
	S101 Slide switch (INSIDE)	PSH1003
	Spindle motor assembly (with oil)	PYY1109
	Motor (CARRIAGE, LOADING)	PXM1002
	Pick-up assembly	PWY1009
	Motor assembly (CARRIAGE)	PYY1025
	Motor assembly (LOADING)	PYY1089

⚠⊙ Main Board Assembly (PWZ1565)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC1	CXA1081S
	IC2	CXA1082BS
	IC3	CXD1130QZ
⚠	IC30, IC31	ICP-N10
	IC5	LC7881-B
	IC4	LH5116-15
	IC10	M51955AL
	IC24, IC25, IC26	M5218P
	IC13	NJM78L06A
⚠	IC11	NJM7805FA
	IC14	NJM79L06A
⚠	IC12	NJM7905FA
	IC6	PD4184
	IC28	SM5807FP
⚠	IC17, IC18	TA8410K (V15)

Mark	Symbol & Description	Part No.
	C48	CEAS3R3M50
	C7, C12, C15, C18, C20, C23, C26, C36, C38, C41, C50, C52-C54, C56, C57, C59, C60, C65, C66, C69, C70, C89, C90, C97, C98	CEAS330M16
	C34	CEAS4R7M50
	C19, C106, C107	CEAS471M10
	C86, C91, C143, C167	CKCYF103Z50
	C131-C133	CKCYF473Z50
	C75, C76	CQMA102J50
	C30, C51	CQMA102K50
	C14, C17, C46, C61	CQMA103K50
	C31, C32, C35, C39	CQMA104K50
	C77, C78	CQMA152J50
	C29	CQMA272J50
	C13	CQMA332J50
	C11, C21, C28, C37	CQMA333K50
	C1, C27, C47, C73, C74	CQMA472J50
	C67, C68	CQMA683J50
	C121, C122	CQSA102J50

RESISTORS

Mark	Symbol & Description	Part No.
	R30	RN 1/6 PQ3601F
	VR2 Semi-fixed resistors (10k)	VRTB6VS103
	VR3-VR7 Semi-fixed resistors (22k)	VRTB6VS223
	VR8 Semi-fixed resistors (1k)	VRTS6VS102
	Other resistors	RD 1/6 PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	JA1 Terminal 2P (LIN OUT L/R)	PKB1009
	JA3, JA4 Mini jack (CONTROL IN/OUT)	RKN1004
	X3 Crystal resonator	PSS-012
	X1 Ceramic resonator	VSS1014

⊙ Control Board Assembly (PWZ1571)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	D201-D208	1SS254

SWITCHES

Mark	Symbol & Description	Part No.
	S201-S229 Tact switch (OPEN/CLOSE DISC I, OPEN/CLOSE DISC II, ◀, ▶, ◀▶, ▶▶, ▶◀, ▶▶, TIME, REPEAT, AUTO EJECT, PGM, RANDOM PLAY, DISC I, DISC II, ■, ≥20, +10, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, EDIT)	PSG1003

OTHERS

Mark	Symbol & Description	Part No.
	V201 Fluorescent indicator tube Remote sensor unit	PEL1026 GP1U50X

⚠ Transformer Board Assembly

SWITCH

Mark	Symbol & Description	Part No.
⚠	S301 Push switch (POWER)	PSA-009

CAPACITORS

Mark	Symbol & Description	Part No.
⚠	C312-C314, C317 C301 (0.01 μ F/AC400V)	CKPYX103N25 RCG-009

Switch Board Assembly

SWITCHES

Mark	Symbol & Description	Part No.
	S601-S603 Push switch (U, S, L)	PSH1008

Headphone Board Assembly

CAPACITORS

Mark	Symbol & Description	Part No.
	C503, C504 C505	CKCYF102Z50 CKCYF103Z50

RESISTORS

Mark	Symbol & Description	Part No.
	VR501 Variable resistor (LEVEL)	PCS1003
	R501, R502	RD 1/6 PM470J

OTHER

Mark	Symbol & Description	Part No.
	JA501 Jack (PHONES)	RKN1001

9. ADJUSTMENT

The adjustment must be performed in the OPEN/CLC during test

• Adjustment

1. Tracki
2. RF lev
3. LD (L
4. Focus
5. Grating
6. Tracki
7. Tanger
8. Focus
9. Tracki
10. VCO f
11. Confir

• Measure

1. Dual tr
2. Laser f
3. Test di
4. Loop g
5. Signal
6. Freque
7. Other

Adjustment

Mark	Symbol & Description	Part No.
	C48 C7, C12, C15, C18, C20, C23, C26, C36, C38, C41, C50, C52– C54, C56, C57, C59, C60, C65, C66, C69, C70, C89, C90, C97, C98 C34 C19, C106, C107 C86, C91, C143, C167	CEAS3R3M50 CEAS330M16 CEAS4R7M50 CEAS471M10 CKCYF103Z50
	C131–C133 C75, C76 C30, C51 C14, C17, C46, C61 C31, C32, C35, C39	CKCYF473Z50 CQMA102J50 CQMA102K50 CQMA103K50 CQMA104K50
	C77, C78 C29 C13 C11, C21, C28, C37 C1, C27, C47, C73, C74	CQMA152J50 CQMA272J50 CQMA332J50 CQMA333K50 CQMA472J50
	C67, C68 C121, C122	CQMA683J50 CQSA102J50

RESISTORS

Mark	Symbol & Description	Part No.
	R30 VR2 Semi-fixed resistors (10k) VR3–VR7 Semi-fixed resistors (22k) VR8 Semi-fixed resistors (1k) Other resistors	RN ¼PQ3601F VRTB6VS103 VRTB6VS223 VRTS6VS102 RD ¼PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	JA1 Terminal 2P (LIN OUT L/R) JA3, JA4 Mini jack (CONTROL IN/OUT) X3 Crystal resonator X1 Ceramic resonator	PKB1009 RKN1004 PSS–012 VSS1014

Control Board Assembly (PWZ1571)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	D201–D208	1SS254

SWITCHES

Mark	Symbol & Description	Part No.
	S201–S229 Tact switch (OPEN/CLOSE DISC I, OPEN/ CLOSE DISC II, ◀, ▶, ▶▶, ▶▶▶, ▶▶▶▶, ▶▶▶▶▶, TIME, REPEAT, AUTO EJECT, PGM, RANDOM PLAY, DISC I, DISC II, ■, ≥20, +10, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, EDIT)	PSG1003

OTHERS

Mark	Symbol & Description	Part No.
	V201 Fluorescent indicator tube Remote sensor unit	PEL1026 GP1U50X

Transformer Board Assembly

SWITCH

Mark	Symbol & Description	Part No.
△	S301 Push switch (POWER)	PSA–009

CAPACITORS

Mark	Symbol & Description	Part No.
	C312–C314, C317 △ C301 (0.01 μ F/AC400V)	CKPYX103N25 RCG–009

Switch Board Assembly

SWITCHES

Mark	Symbol & Description	Part No.
	S601–S603 Push switch (U, S, L)	PSH1008

Headphone Board Assembly

CAPACITORS

Mark	Symbol & Description	Part No.
	C503, C504 C505	CKCYF102Z50 CKCYF103Z50

RESISTORS

Mark	Symbol & Description	Part No.
	VR501 Variable resistor (LEVEL) R501, R502	PCS1003 RD ¼PM470J

OTHER

Mark	Symbol & Description	Part No.
	JA501 Jack (PHONES)	RKN1001

9. ADJUSTMENTS

The adjustment items for this unit are shown below. Adjustments must be made in the order in which they are listed. As OPEN/CLOSE operation for disc tray 2 cannot be performed during test mode, use tray 1 for adjustments.

Adjustment and check items

- Tracking offset, focus offset and RF offset adjustments
- RF level adjustment
- LD (Laser Diode) power check
- Focus lock and spindle lock check
- Grating adjustment
- Tracking adjustment
- Tangential adjustment
- Focus gain adjustment
- Tracking gain adjustment
- VCO free-run frequency adjustment
- Confirmation of S character (focus error)

Measuring Equipment

- Dual trace oscilloscope
- Laser power meter
- Test disc (YEDS–7)
- Loop gain adjustment filter
- Signal generator
- Frequency counter
- Other general tools

Adjustment points

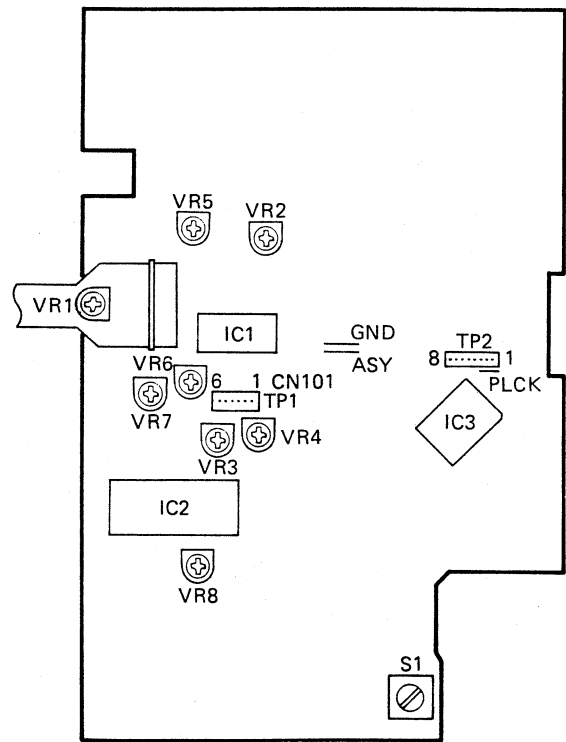


Fig. 9–1.

Test Mode

Test mode setting and cancellation procedures

- To set the test mode, turn ON the power switch (S301) while holding the test mode switch (S1) down.
- The test mode is cancelled by turning the power switch OFF.

The functions of the keys in the test mode are outlined in Table 9–1.

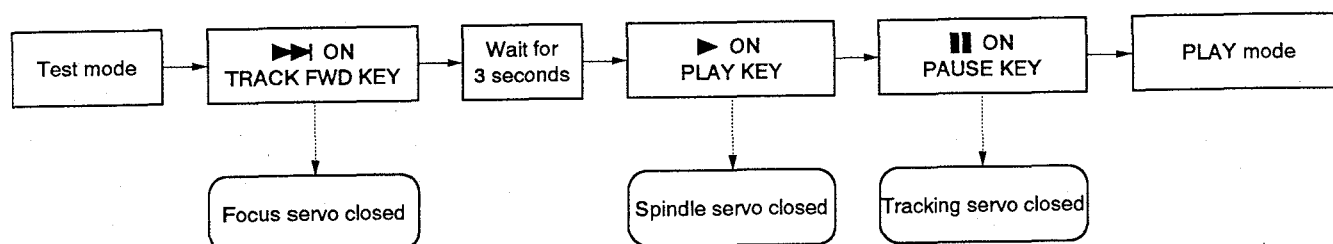
Adjustment VRs (Variable Resistors) and Names

- VR1: Laser power
VR2: RF offset (RF. OFS)
VR3: Focus gain (FCS. GAN)
VR4: Tracking gain (TRK. GAN)
VR5: Tracking balance (TRK. BAL)
VR6: Focus offset (FCS.OFS)
VR7: Tracking offset (TRK. OFS)
VR8: VCO free-run adjustment (VCO. ADJ)

In the test mode, the servos are closed and opened individually. Consequently, the servos must each be closed one at a time (in serial sequence) in order to set the unit to normal PLAY mode. Note also that during test mode the unit will not enter the PLAY mode when the PAUSE (||) key is pressed alone.

Example: Switching from STOP to PLAY mode.

* In the test mode, the servos must be operated in serial sequence.

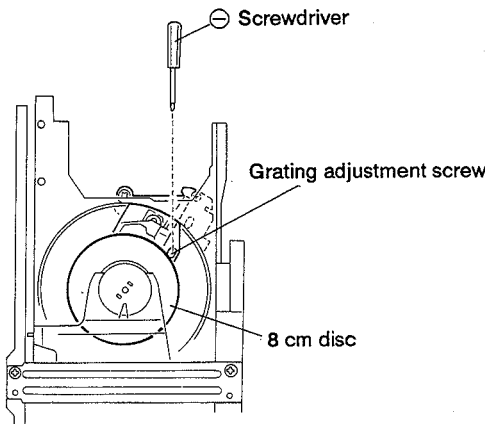
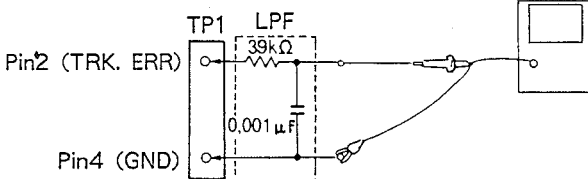


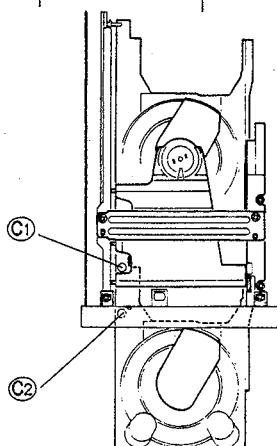
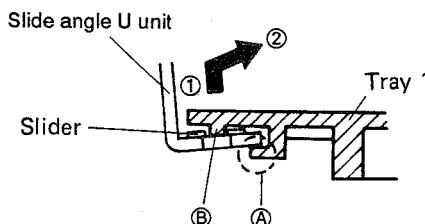
• Key Functions in the Test Mode

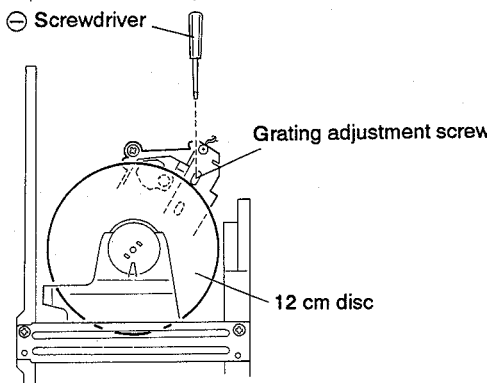
Symbol	Key name	Function during test mode	Description
▶▶	TRACK FWD	Focus servo close	Turns ON the laser diode, and raises/lowers the focusing actuator to close the focus servo. After closing disc tray 1, the tray is moved to PLAY position.
▶	PLAY	Spindle servo close	Closes the servo in the CLV-A mode after starting the spindle motor.
	PAUSE	Tracking servo close/open	Performs toggle operation: closes the tracking servo and sets to 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 reversal (inward movement)	Moves carriage rapidly (3 cm/s) toward the center. Because there is no safety mechanism for stopping the carriage, release the key when the carriage reaches the innermost track.
▶▶	MANUAL SEARCH FWD	Carriage advance (outward movement)	Moves carriage rapidly (3 cm/s) toward the outer edge. Because there is no safety mechanism for stopping the carriage, release the key when the carriage reaches the outermost track.
■	STOP	Stop	Stops all servos and returns system to its initial state.
▲	OPEN/CLOSE Disc I	(Disc tray) open/close	Opens and closes the disc tray. However, pickup does not return to rest when opening, and remains stationary when closing the tray.

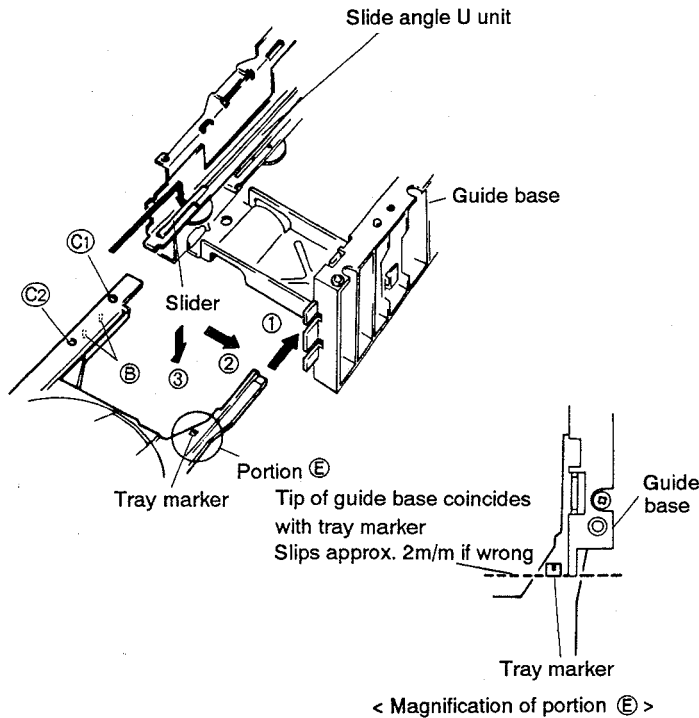
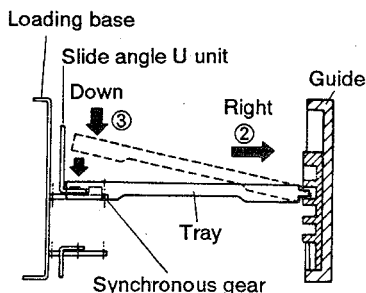
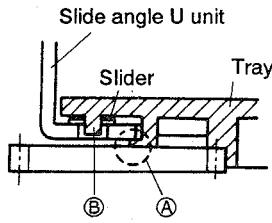
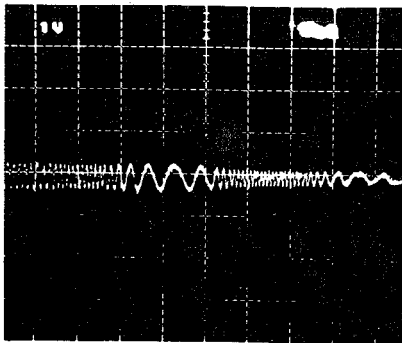
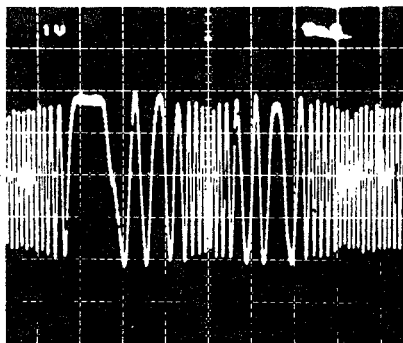
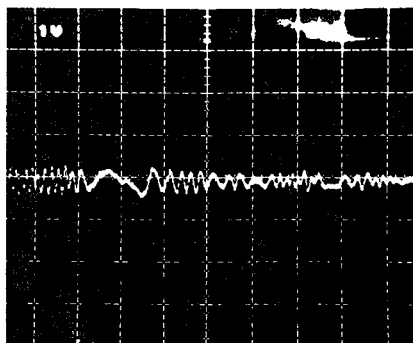
Table 9-1.

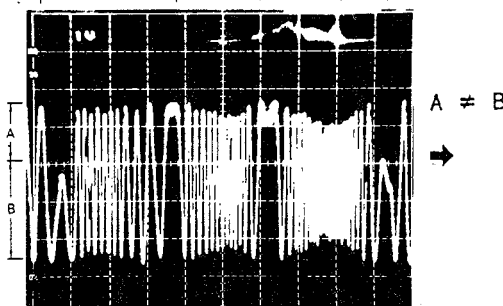
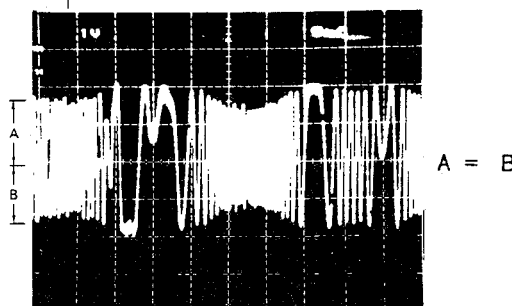
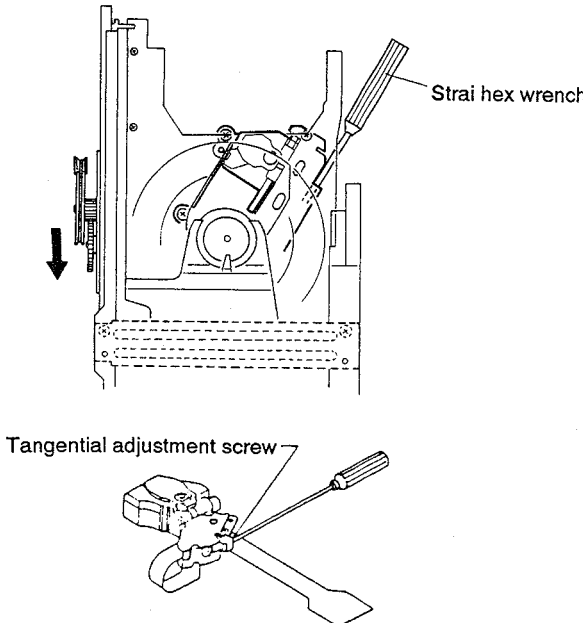
Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
1	TRACKING OFFSET, FOCUS OFFSET, RF OFFSET ADJUSTMENT					
			TP1 Pin 2 (TRK. ERR) TP1 Pin 6 (FCS. ERR) TP1 Pin 1 (RF output)	VR5 (TRK. BAL) VR7 (TRK. OFS) VR6 (FCS. OFS) VR2 (RF. OFS)	Tracking offset 45° 0V ± 50 mV Focus offset 0V ± 50 mV RF offset 100 mV ± 50 mV	<ul style="list-style-type: none">Set to test mode (see page 30).Turn VR5 TRK. BAL (tracking balance) counterclockwise about 45° from center position.Adjust VR7 TRK.OFS (tracking offset) so that the TRK. ERR (tracking error) voltage at TP1 Pin 2 becomes 0V ± 50 mV.Adjust VR6 FCS.OFS (focus offset) so that the FCS.ERR (focus error) voltage at TP1 Pin 6 becomes 0V ± 50 mV.Adjust VR2 RF.OFS (RF offset) so that the RF output voltage at TP1 Pin 1 becomes 100 mV ± 50 mV. <p>Note: After performing tracking offset adjustment, be sure to perform "6. TRACKING BALANCE ADJUSTMENT."</p>
2	RF LEVEL ADJUSTMENT					
			TP1 Pin 1 (RF output)	VR1 (laser power)	1.5V +0.2V -0V.	<ul style="list-style-type: none">Set to test mode (see page 30).Play the test disc, connect the oscilloscope to TP1 Pin 1 (RF output), and measure the P-P voltage of the RF waveform.Adjust so that the voltage becomes 1.5V +0.2V -0V.
3	LD (LASER DIODE) POWER CHECK					
					Less than 0.13 mW	<ul style="list-style-type: none">Set to test mode (see page 30).Press the TRACK FWD (▶▶) key to turn ON the LD (laser diode).Place the sensor of the laser power meter directly above the objective lens and confirm that the output power of the LD does not exceed 0.13 mW.

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
4	FOCUS LOCK AND SPINDLE LOCK CHECK					
	V 0.5V/div	H 100 msec /div	TP1 Pin 1 (RF output)		RF output exists Normal (clockwise) rotation	<ul style="list-style-type: none">• Set test disc.• Set to test mode (see page 30).• Press the MANUAL SEARCH FWD (▶▶) key to move the pickup close to the center of the disc.• Observe the output of TP1 Pin 1 (RF output) on the oscilloscope. Confirm that the RF signal is output after pressing the TRACK FWD (▶▶)key.• Press the PLAY (▶) key and confirm that the disc rotates at constant speed (approx. 30 rpm near center of disc) in the normal (clockwise) direction; make sure that the disc does not rotate too fast or counter-clockwise.
5	GRATING ADJUSTMENT (1) (using an 8 cm disc)					
					<p>Note: This adjustment can only be performed using a 8 cm disc having pits over a diameter of 75 mm.</p> <ul style="list-style-type: none">• Set to test mode (see page 30).• Set the 8 cm disc. Shift the pickup to the outermost track so that it is positioned over pits and the pickup grating adjustment hole is visible from the hole in the servo mechanism (see Fig. 9-2.).• Press the TRACK FWD (▶▶) and PLAY (▶) keys in sequence to close the focus servo and spindle servo (do not close the tracking servo).• Observe the waveform output of TP1 Pin 2 TRK.ERR (tracking error) on the oscilloscope, inserting a 4 kHz low-pass filter (see Fig. 9-3.).	
						
	Fig. 9-3.					

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
	0.5V/div	5 msec/div	TP1 Pin 2 (TRK. ERR)	Grating Grating	Null Point Maximum amplitude	<ul style="list-style-type: none">Insert ⊖ screwdriver into the grating adjustment hole, and turn to find the null point (see Photo 9-1.).Next, slowly turn ⊖ screwdriver in counterclockwise direction from the null point and adjust until the waveform (tracking error signal) reaches maximum amplitude (see Photo 9-2.). <p>Note: Use caution since inserting ⊖ screwdriver forcefully will cause the pickup unit to float upward.</p> <ul style="list-style-type: none">Finally, confirm 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 shifted to the innermost track and when the pickup is shifted to the outermost track. If there is a difference of more than ± 10%, re-adjust by turning the grating adjustment screw to the maximum amplitude point of the tracking error signal.
5	GRATING ADJUSTMENT (2) (without 8 cm disc)					
	 <p>Fig. 9-4.</p>  <p>Fig. 9-5.</p>					<p>Perform this adjustment when an 8 cm disc is not available and Grating adjustment (1) cannot be performed. Remove the tray 1 before performing this adjustment.</p> <ul style="list-style-type: none">Removal of tray 1<ol style="list-style-type: none">Set tray 1 to OPEN position.Remove screws $\textcircled{C1}$, $\textcircled{C2}$ holding tray 1 in Fig. 9-4.Move tray 1 in the direction of arrow in Fig. 9-5, and as detaching projection \textcircled{B} of tray 1, free slide angle U unit from hook \textcircled{A} of tray 1.Pull out tray 1 as raising its side of slide angle U unit slightly.

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
			<div></div> <p>Fig. 9-6.</p>			<p>Note: This adjustment can only be performed using a disc having pits up to a diameter 115 mm. The test disc (YEDS-7) cannot be used.</p> <ul style="list-style-type: none">• Set to test mode (see page 30).• Set a disc. Shift the pickup to the outermost track so that it is positioned over pits and the pickup grating adjustment hole is visible from the hole in the servo mechanism (see Fig. 9-6.).• Press the TRACK FWD (▶▶) and PLAY (▶) keys in sequence to close the focus servo and spindle servo (do not close the tracking servo).• Observe the waveform output of TP1 Pin 2 TRK. ERR (tracking error) on the oscilloscope, inserting a 4 kHz low-pass filter (see Fig. 9-7.).
	0.5V/div	5 msec/div	TP1 Pin 2 (TRK. ERR)	Grating Grating	Null Point Maximum amplitude	<ul style="list-style-type: none">• Insert ⊖ screwdriver into the grating adjustment hole, and turn to find the null point (see Photo 9-1.).• Next, slowly turn ⊖ screwdriver in counterclockwise direction from the null point and adjust until the waveform (tracking error signal) reaches maximum amplitude (see Photo 9-2.). <p>Note: Use caution since inserting ⊖ screwdriver forcefully will cause the pickup unit to float upward.</p> <ul style="list-style-type: none">• Finally, confirm 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 shifted to the innermost track and when the pickup is shifted to the outermost track. If there is a difference of more than $\pm 10\%$, re-adjust by turning the grating adjustment screw to the maximum amplitude point of the tracking error signal.

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
	<div></div> <p>Fig. 9-8.</p> <div></div> <p>Fig. 9-9.</p> <div></div> <p>Fig. 9-10.</p>				<p>After completing adjustments, attach tray 1 in the following process. Remove front panel previously as it disturbs attachment of tray 1.</p> <ol style="list-style-type: none">1. Set slide angle U unit to the foremost position (where opening of tray 1 is completed).2. Set slider to the foremost position as shown in Fig. 9-8.3. As shown by dotted line in Fig. 9-9 , insert tray 1 aslant to the position that mounting holes of slider and tray 1 coincide (make sure that slider does not move backward).4. Down tray 1 as pulling it to the right (toward guide). Do it as holding slider from below with finger.5. Adjust position of tray 1 so that hook (A) and projection (B) are properly fixed as shown in Fig. 9-10. Also do it so that to engage synchronous gear with gear of tray 1.6. Make sure that mounting holes of slider are being positioned in the center of tray 1's screw holes, and tighten screws in order of (C1, C2).7. After completing attachment of tray 1, with tray 1's complete-open state, make sure that mutual position shown in the portion (E)'s enlarged illustration is being satisfied. If it does not, the adjustment must be made again from the beginning.	
<div></div> <p>Photo 9-1. Null point waveform</p> <div></div> <p>Photo 9-2. Maximum amplitude</p> <div></div> <p>Photo 9-3. Waveform off Null Point</p>						

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
6	TRACKING BALANCE ADJUSTMENT					
	0.5V/div	5 msec/div	TP1 Pin 2 (TRK. ERR)	VR5 (TRK. BAL)		<ul style="list-style-type: none">• Set the test disc.• Set to test mode (see page 30).• Press the MANUAL SEARCH FWD (▶▶) key to position the carriage near the center of the disc.• Press the TRACK FWD (▶▶) key and then the PLAY (▶) key to cause the disc to rotate.• Observe the waveform output by TP1 Pin 2 TRK.ERR (tracking error) on the oscilloscope and adjust VR5 TRK. BAL (tracking balance) so that the DC component disappears from the tracking error signal.
						
	Photo 9-4. With DC component					Photo 9-5. Without DC component
7	TANGENTIAL ADJUSTMENT					
						<ul style="list-style-type: none">• Set to test mode (see page 30).• Open tray 1 and set the disc.• Close tray 1.• Press the MANUAL SEARCH FWD (▶▶) key to position the pickup at the outermost track.• Rotate gear-pulley by hand in the direction indicated by the arrow and move tray 2 up so that the tangential adjustment screw section becomes visible.• Insert a hexagonal wrench into the tangential adjustment screw section from the right-aslant in the rear of mechanism.• Press the MANUAL SEARCH REV (◀◀) key to position the pickup somewhere at the middle of the tracks.• Press the TRACK FWD (▶▶) key, PLAY (▶) key, and PAUSE (■) key in that order to close all the servos (the pause indicator will illuminate).
	Fig. 9-11.					

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
		200 ns/div	TP1 Pin 1 (RF output)	Tangential adjustment screw	Sharpest possible eye pattern	<ul style="list-style-type: none"> Observe the waveform output by TP1 Pin 1 (RF output) on the oscilloscope and adjust the tangential adjustment screw to achieve the sharpest possible eye pattern. The correct adjustment point is halfway between the two points where the eye pattern becomes blurred when rotating the tangential adjustment screw clockwise and then counterclockwise. When the whole waveform becomes clear, concentrate on sharpening the fine lines forming the diamond shape at the center of the eye pattern (see Photo 9-6.). Adjust until the diamond shape consists of single thin lines.

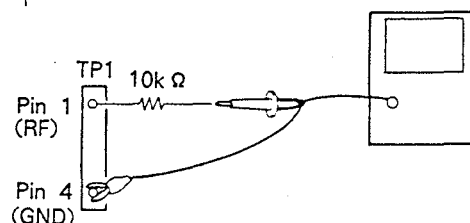
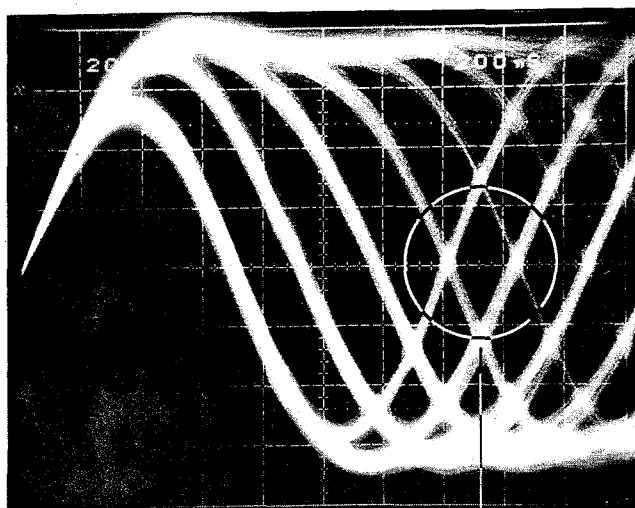


Fig. 9-12.

Note: Use a hexagonal wrench to keep the pickup in raised position while performing this adjustment.



Part to be observed

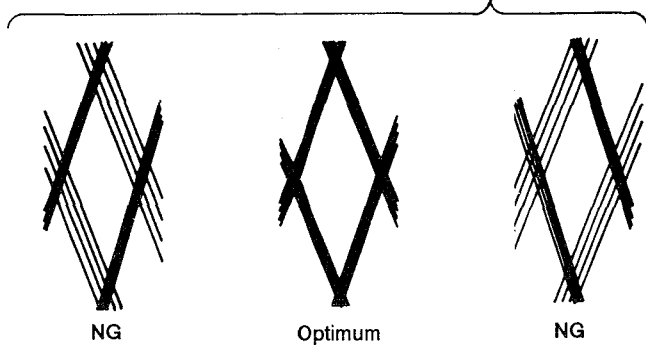


Photo 9-6.

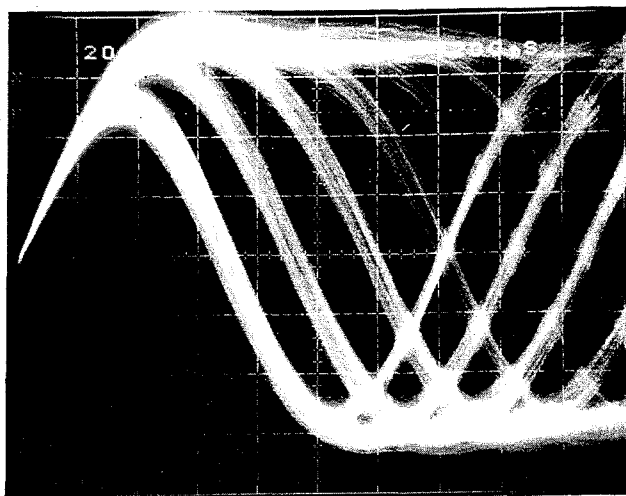


Photo 9-7.

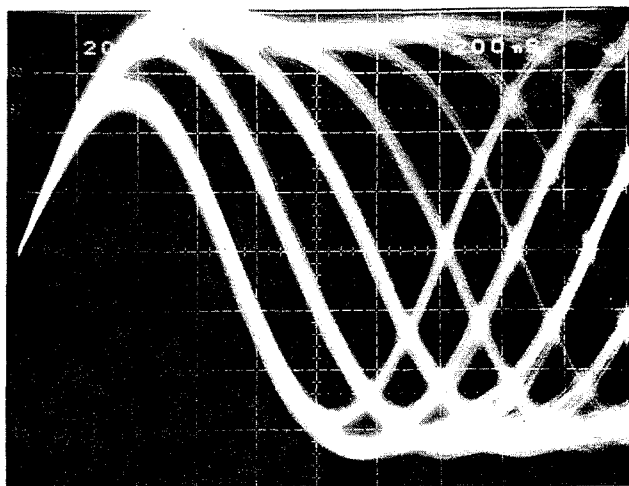


Photo 9-8.

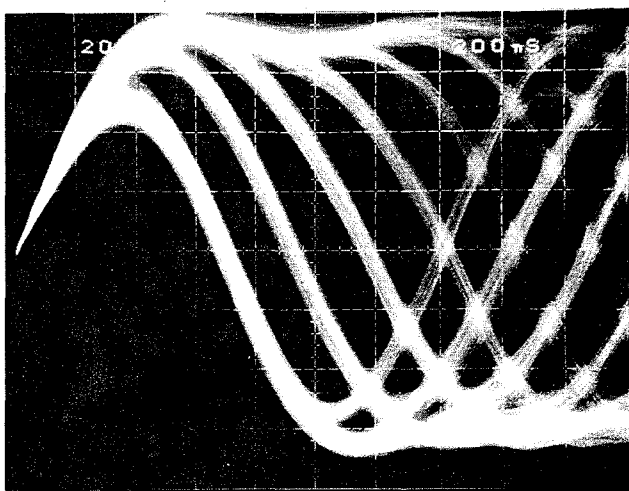
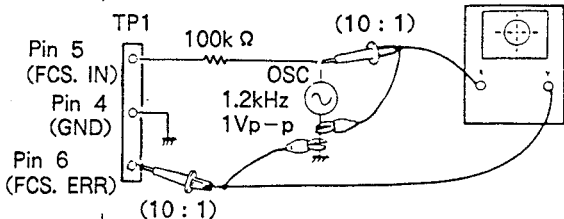
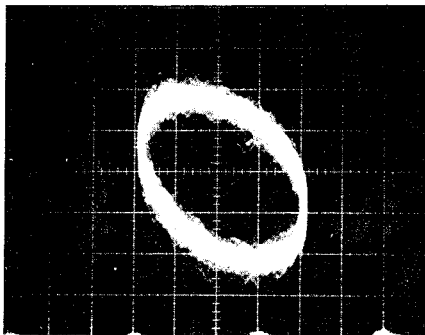
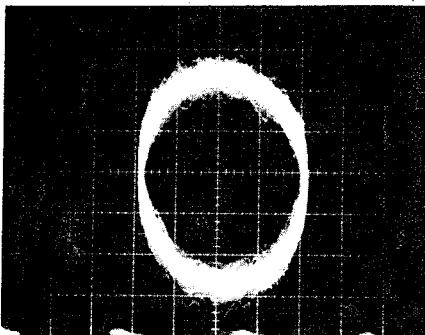
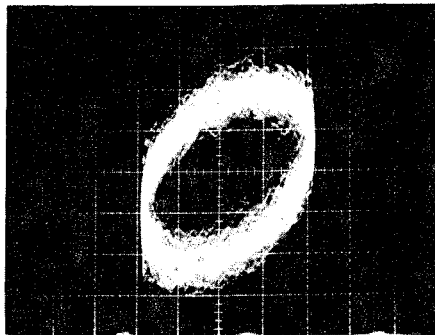
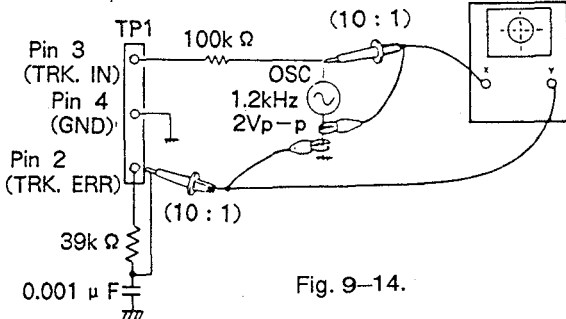
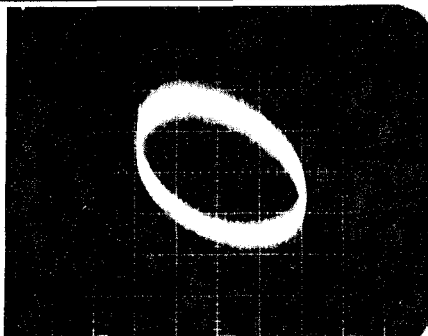
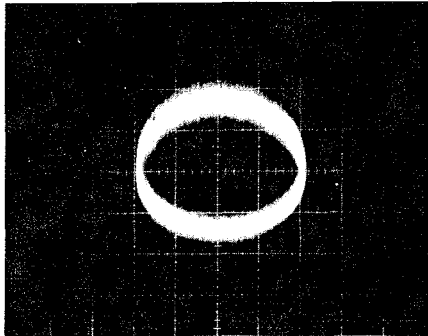
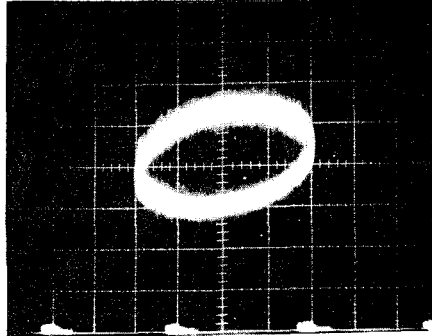


Photo 9-9.

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V.	H.				
8	FOCUS GAIN ADJUSTMENT					
	CH1 (X) , CH2 (Y) 20 mV/div, 5 mV/div (probe: 10:1)	X-axis TP1 Pin 5 (FCS. IN) Y-axis TP1 Pin 6 (FCS. ERR)	VR3 (FCS. GAN)	Phase difference of 90°	<ul style="list-style-type: none">• With the oscillator power turned OFF, connect the oscilloscope and oscillator as shown in Fig. 9-13.• Set to normal PLAY mode.• Turn ON the power of the oscillator and set it to output a 1.2 kHz 1 Vp-p signal. <p>Note: Some oscillators discharge a DC voltage when power is turned on. In that case it is recommended to connect the oscillator after it has been turned on.</p> <ul style="list-style-type: none">• Adjust VR3 FCS.GAN (focus gain) so that the Lissajous figures form a horizontal circle on the oscilloscope (phase difference of 90°).	<div></div> <p>Fig. 9-13.</p>
<div><div><p>High gain Photo 9-10.</p></div><div><p>Optimum gain Photo 9-11.</p></div><div><p>Low gain Photo 9-12.</p></div></div>						

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
9	TRACKING GAIN ADJUSTMENT					
	CH1 (X) , CH2 (Y) 50 mV/div, 5 mV/div (probe: 10:1)		X-axis TP1 Pin 3 (TRK. IN) Y-axis TP1 Pin 2 (TRK. OUT)	VR4 (TRK. GAN)	Phase difference of 90°	<ul style="list-style-type: none">With the oscillator power turned OFF, connect the oscilloscope and oscillator as shown in Fig. 9-14.Set to normal PLAY mode.Turn ON the power of the oscillator and set it to output a 1.2 kHz 2 Vp-p signal. <p>Note: Some oscillators discharge a DC voltage when power is turned on. In that case it is recommended to connect the oscillator after it has been turned on.</p> <ul style="list-style-type: none">Adjust VR4 TRK. GAN (tracking gain) so that the Lissajous figures form a horizontal circle on the oscilloscope (phase difference of 90°). <div></div> <p>Fig. 9-14.</p>
<div><p>High gain Photo 9-13.</p></div> <div><p>Optimum gain Photo 9-14.</p></div> <div><p>Low gain Photo 9-15.</p></div>						

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
10	VCO FREE-RUN FREQUENCY ADJUSTMENT					
			TP2 Pin 2 (PLCK)	VR8 (VCO. ADJ)	4.275 ± 0.025 MHz	<ul style="list-style-type: none">• Set to test mode (see page 30).• Short-circuit the ASY and GND jumpers with ⊖ screwdriver or similar tool (see Fig. 9-1.).• Connect a frequency counter capable of measuring frequencies of 10 MHz and above to the PLCK jumper.• Adjust VR8 VCO. ADJ (VCO free-run adjustment) so that the frequency counter reading becomes 4.275 ± 0.025 MHz.
11	CONFIRMATION OF S CHARACTER (FOCUS ERROR)					
			TP1 Pin 6 (FCS. ERR)			<ul style="list-style-type: none">• Set to test mode (see page 30).• Short-circuit TP1 Pin 5 FCS. IN (focus in) and Pin 4 GND.• Observe the waveform output by TP1 Pin 6 FCS. ERR (focus error) when pressing the TRACK FWD (▶▶) key.