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Service Manual

ORDER NO.
ARP2064

ADJUSTMENTS FOR CLD PLAYERS

- This service manual explains CLD players adjustment methods.
- Typical model covered by this service manual is :

Model CLD-1080 (CLD-110)

- For details on items other than adjustment methods, see the service manual of each manual.

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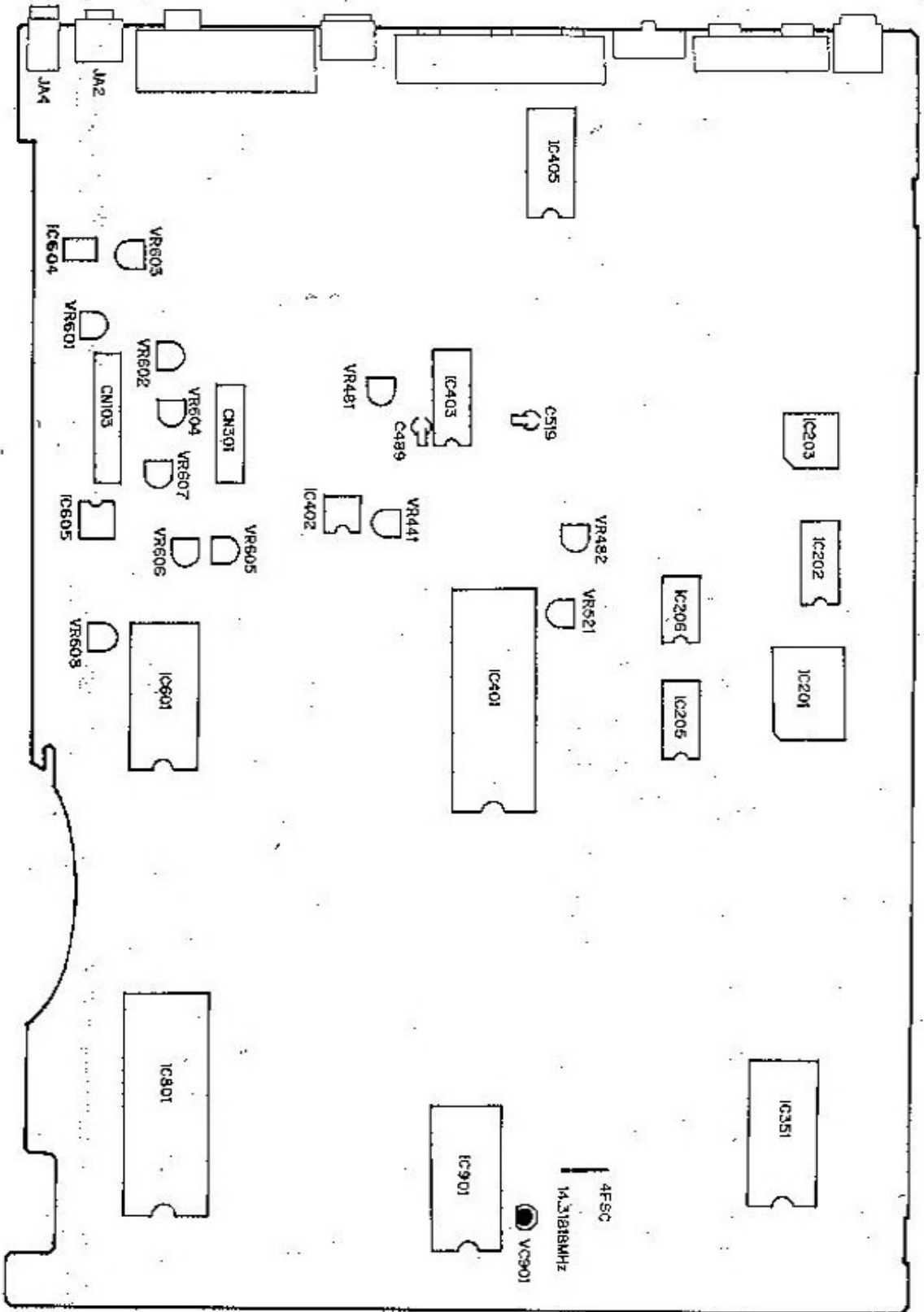
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1. MOTHER BOARD ASSEMBLY ADJUSTMENT ABSTRACT

ADJUSTMENT	P	Adjusting points	Measurement equipment connecting points	Player condition	Adjusting Specification
1 Tilt Sensor Adjustment	10	VR608	None	Power off	Marking of Tilt sensor Red: Right Clear: Center Blue: left
2 Coarse Adjustment of Grating and TRK Balance Adjustment	13	Grating/VR602	CN301-9(TRK ERR)	• Test mode #15000 still TRK servo loop open	• Tilt point → TRK error MAX • Adjust VR602 so that the TRK error waveform amplitude's positive and negative level become equal
3 Slider Shaft Horizontal Adjustment	12	Player SKIP key	CN301-3(FCS RTN)	• Test mode Tilt servo loop off TRK servo loop open #5200 still	• Use the SKIP key to adjust to DV
4 Pickup Inclination Adjustment / FCS Error Balance Adjustment	13	Pickup Ass'y TAN/TRK inclination adjustment screw VR605 VR606	CN301-2(RF) CN301-6(TRK ERR)	• Test mode #2701 still TRK servo loop close/open Tilt servo loop off	• TRK waveform's amplitude MAX (Pickup TAN / TRK adjustment screw) • TRK error MAX (VR605) RF MAX (VR606)
5 Tilt Sensor Inclination / Tilt Balance Adjustment	14	Tilt sensor inclination adjustment screw VR607(TILT BAL)	TV monitor Test mode screen	• Test mode #1020/#115 still TRK servo loop close Tilt servo loop off	• Set VR607 to the center • Adjust the adjustment screw so that the tilt error display code is 8, 7, or 8 • Adjust VR607 so that the tilt error display becomes 7
6 Inspection and Adjustment of Spindle Motor Centering	15	Spindle motor centering adjustment lever	CH1: CN301-9(TRK ERR) CH2: CN301-8(TRK SUM)	• Test mode #25000/#1 still TRK servo loop open Tilt servo loop on	• Adjust the centering adjustment screw so that the resurge waveforms of #1 and #25000 are the same
7 Fine Adjustment of Grating and TRK Balance Adjustment	16	Grating/VR602	CH1: CN301-9(TRK ERR) CH2: CN301-8(TRK SUM)	• Test mode TRK servo loop open Tilt servo loop on	• Minimize the Y direction of the resurge waveform • Level of the X direction of the resurge waveforms are equal
8 FCS Servo Loop Gain Adjustment	17	VR604	CH1: CN301-6(FCS IN) CH2: CN301-5(FCS TRIL)	• Test mode #15000 still TRK servo loop close Tilt servo loop on	• Adjust VR604 so that the resurge waveform is symmetric with respect to the X and Y axes
9 TRK Servo Loop Gain Adjustment	18	VR603	CH1: CN301-10(TLK IN) CH2: CN301-9(TRK ERR)	• Test mode #15000 still TRK servo loop close Tilt servo loop on	• Adjust VR603 so that the resurge waveform is symmetric with respect to the X and Y axes
10 RF Gain Adjustment	19	VR601	CH1: CN301-2(RF)	#15000 still	• Adjust VR601 so that the RF level becomes 300±50mV
11 14.31818MHz	20	VC001	JP(14.31818)	STOP	• Adjust VC001 so that the frequency becomes 14.31818 MHz
12 VCO Central Frequency Adjustment	21	VR481	CH1: C489 lead wire CH2: C519 lead wire	#5100 still	• The center of CH1's video signal jitter is delayed by 71µs with CH2's video signal
13 Output Video Level Adjustment	23	VR482	Video terminal	#10000 still	• Adjust the VR482 so that the voltage between the sync tip and the white peak becomes 1V ±5%
14 IIR Delay Video Level Adjustment	23	VR441	IC401 pin 42 IC401 pin 40	#3800 still	• The IIR delay video level becomes the same as the main line video level.
15 Color Tint Error Signal Level Adjustment	24	VR521	TV monitor	#6000 still	• Color irregularity on the magenta screen is minimized

MOTHER BOARD ASSEMBLY
ADJUSTMENT POINTS

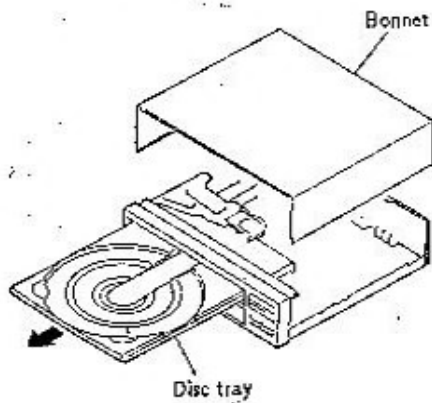


2. TEST MODE

2. 1 Test Mode

The player has a test mode function which allows the user to check the player's status on the TV screen by executing the respective key operation.

Also, since the TRK servo opens and closes easily, the test mode is especially useful for mechanical adjustments.

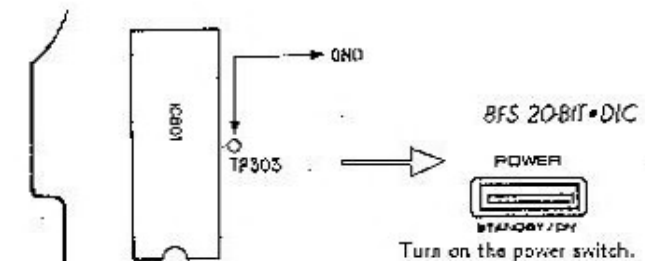


Remove the bonnet and the disc tray.

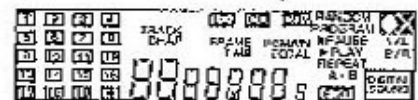
2. 2 Test Mode Initiation

[Procedure]

1. Remove the bonnet and the disc tray.
2. Connect the TP303 mother board Ass'y to GND (ground).
3. Turn on the power switch.
4. Check if all the items on the FL tube are ON.
5. Disconnect the TEST TP.



Connect TP303 to ground.



While in the test mode, all items on the FL tube will light.

2. 3 Test Mode Cancellation

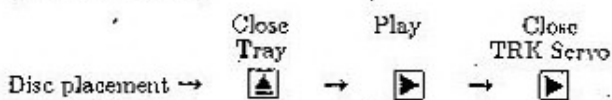
Turn off the power switch.

2. 4 Player Operation in the Test Mode

Operate the player by selecting a test mode function with the keys on the player or on the remote control unit.

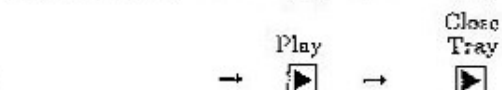
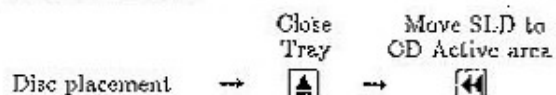
[Sample Key Operation]

<LD Mode> Disc playback (Normal playback)
(In the test mode)

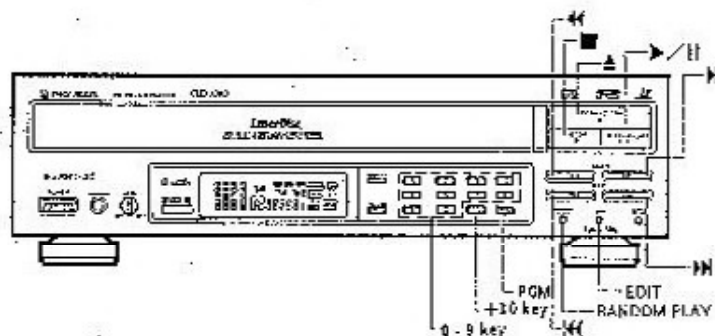


Note: In the test mode, disc playback will start with the TRK servo open.

<CD Mode> Disc playback (Normal playback)
(In the test mode)

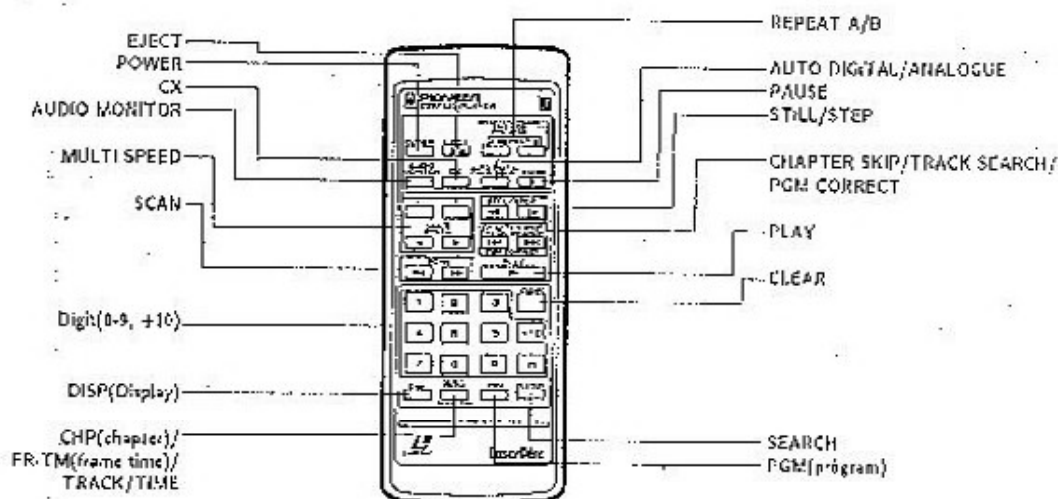


Note: In the test mode, disc playback will start with the TRK servo open.

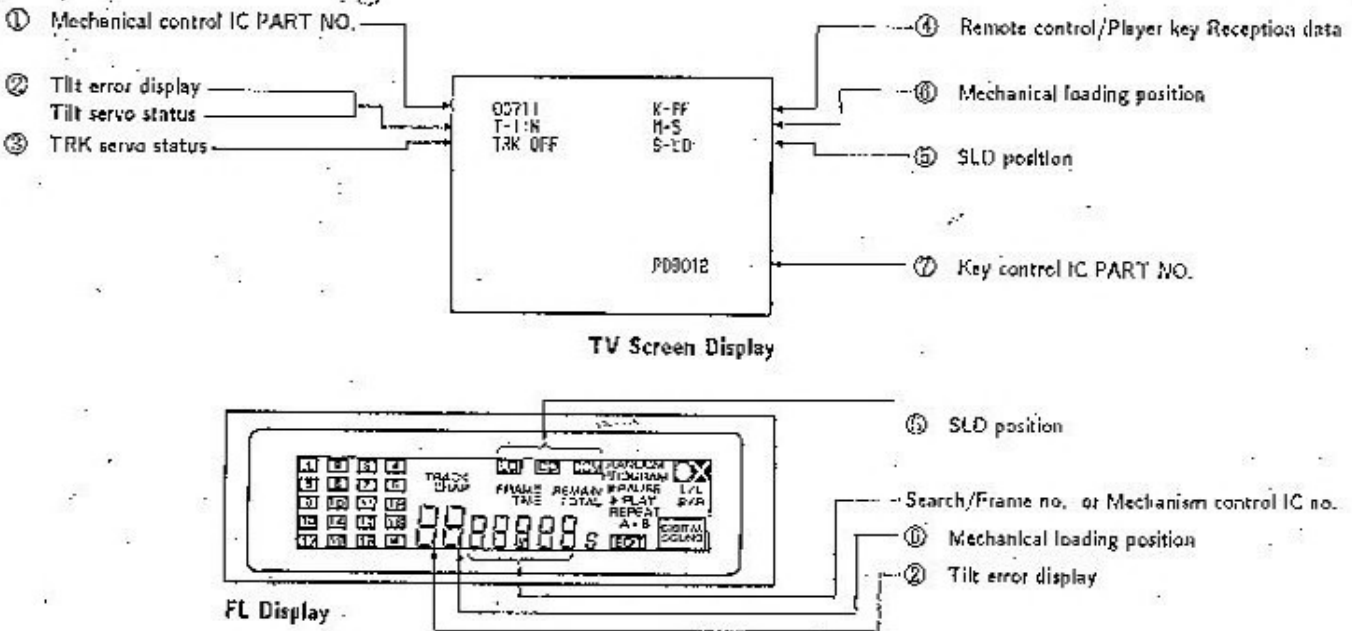


Function	Player Status	Key Operation	Remarks
Open Tray	Stop mode.	▲	
Close Tray	Tray open.	▲	
Stop	Play mode.	■	
Play	Disc placement and tray closed.	▶	<ul style="list-style-type: none"> Starts up with the TRK servo open. Starts up with tilt neutral. The disc type (LD/CD/CDV) is determined when playback starts at the SLDH position during startup.
TRK Servo Open/Close	Play mode.	▶	Each time the PLAY button (▶) is pressed, the TRK servo will open or close.
Still	Play mode. TRK servo closed.	▯ (Remote control unit key)	Each time the STILL button (▯) is pressed, the player will switch between the PLAY and STILL modes.
SLDH REV SCAN	Play mode.	◀◀	<ul style="list-style-type: none"> Press and hold down the key. With the TRK servo open, the pickup can be damaged if the SLD moves further inward than the read-in area on the disc. Do not allow the SLD to move further inward than the read-in area.
SLDR FWD SCAN	Play mode.	▶▶	<ul style="list-style-type: none"> Press and hold down the key. With the TRK servo open, the pickup can be damaged if the SLD moves further outward than the read-out area on the disc. Do not allow the SLD to move further outward than the read-out area.
TILT Neutral	Power switch ON.	EDIT	
TILT Servo On	Play mode.	RANDOM PLAY	
TILT Minus TILT Servo OFF	Play mode.	◀◀	Press and hold down the key.
TILT Plus TILT Servo OFF	Play mode.	▶▶	Press and hold down the key.
Screen Display ON/OFF	Power switch ON.	PGM Key	
Frame Search	Play mode.	+10 Key ↓ 0-9 Key ↓ ▶	<ul style="list-style-type: none"> In the PLAY mode, press the +10 key. (The player will standby for the frame no. entry.) Use the numeric keys to enter the frame no. Then press the player's PLAY key to search. After the search is completed, the player will return to the operation mode before the search was performed.
LOAD Motor Rotation Clockwise Counterclockwise	Tray open.	↻	

Table. Operation in test mode.

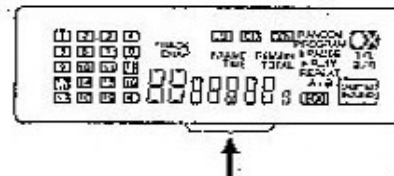


2. 5 TV Screen and FL Tube Displays in the Test Mode



Note: The numbers in the figures above correspond to the numbered descriptions that follow.

- ① The mechanical control IC (mother board Ass'y IC801) part no. will be displayed.
PD0071A → 0071A



- ② Tilt servo status/Tilt error display

TV screen display

T-○:○○

Tilt servo status: N.....Tilt neutral
ON..... Tilt servo ON
OFF ... Tilt servo OFF

Tilt error display: 0 Tilt --
 ↓
 Tilt neutral
 F Tilt +

- ③ TRK Servo Status

TV screen display

TRK-○○○

ON TRK servo closed
OFF ... TRK servo open

④ Remote Control/Player Key Reception Data

TV screen display

K-00

See table below

CODE	FUNCTION	CODE	FUNCTION	CODE	FUNCTION	CODE	FUNCTION	CODE	FUNCTION	CODE	FUNCTION
00	0	10	F-SCAN	20		30	(10)	40	{CHAPT}	50	R-STEP
01	1	11	R-SCAN	21		31	(11)	41	{FRAME}	51	
02	2	12		22		32	(12)	42	CHP/FRM	52	F-SKIP
03	3	13	CHP/FRM	23		33	(13)	43	SEARCH	53	R-SKIP
04	4	14		24		34	(14)	44	DISPLAY	54	F-STEP
05	5	15		25		35	(15)	45	CLEAR	55	R-MULTI
06	6	16	STP/OPN	26		36	OPN/CLS	46	SPEED -	56	
07	7	17	PLAY	27		37	STOP	47	SPEED +	57	
08	8	18	PAUSE	28		38	PLY/PAS	48	REP-A	58	F-MULTI
09	9	19		29		39	EDIT	49	{2/RCH}	59	
0A		1A	{POWON}	2A		3A	INTRO	4A	{STEREO}	5A	
0B		1B	{POWOFF}	2B		3B	RANDOM	4B	{1/LCH}	5B	
0C	DGT/ANL	1C	POWER	2C		3C		4C	PROGRAM	5C	
0D		1D		2D		3D		4D		5D	
0E	CX	1E	AUD.MON	2E		3E		4E		5E	{TEST}
0F	TV/LDP	1F	+10	2F		3F		4F		5F	{ESC}

⑤ SLD Position

TV screen display

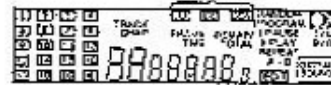
S-000

CD CD active area

GDV ... GDV active area

LD LD active area

FL Display



⑥ Mechanical Loading Position

TV screen display

M-0

0 ... Tray open

1 ... Loading

2 ... Standing by

3 ... Clamped

4 ... Tilt minus

5 ... Tilt neutral

6 ... Tilt plus

7 ... Tilt rinit

FL Display



3. ADJUSTMENTS

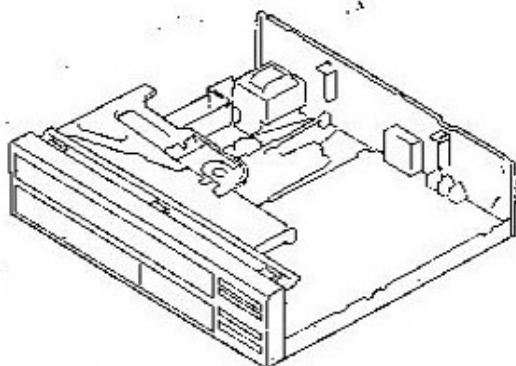
3. 1 Required Instruments

- Small blade screwdriver (7-cm shaft)
- Small Phillips screwdriver (15-cm shaft)
- Low-pass filter (47 K + 1 μ F/BP)
- Dual trace oscilloscope (with delay)
- AF oscillator
- Frequency counter
- Test disc (GGV1003)
- 8-inch LDD disc
- CDV disc
- Short clip
- TV monitor
- Resistor (100 K, 330 K)
- Capacitor (0.01 μ F)
- Remote control unit

3. 2 Adjustment Preparation and Notes

1. Player preparation

Before doing the adjustment, remove the bonnet and the disc tray. Then place the player horizontally on a flat surface.



2. Disc Insertion

Insert the disc from the rear of the player. Place it securely on the turntable. When the PLAY key is pressed, the clumper will go down and secure the disc. Playback will then begin.

3. Use all the oscilloscope's probes at 10 : 1.

4. Only the mother board needs to be adjusted.

Unless noted otherwise, all adjustment items and measuring instrument connections will be for the parts in the mother board.

5. Required adjustment for replacement of major parts.

Adjustments	Replacements				
	Pickup	Actuator	Pre-pickup	Spindle motor	Tilt sensor
1. Tilt sensor adjustment	⊙				⊙
2. Coarse grating adjustment /TRK balance adjustment	⊙	⊙	⊙		
3. Slider shaft horizontal adjustment	⊙	⊙	⊙	○	⊙
4. Pickup inclination adjustment	⊙	⊙	⊙	○	○
5. Tilt sensor inclination/ Tilt balance adjustment	⊙	⊙	⊙	○	⊙
6. Spindle motor shaft centering and adjustment	⊙	⊙	⊙	⊙	
7. Fine grating adjustment/ TRK balance adjustment	⊙	⊙	⊙		
8. FCS servo loop gain adjustment	⊙	⊙	⊙		
9. TRKG servo loop gain adjustment	⊙	⊙	⊙		
10. RF gain adjustment	⊙	⊙	⊙		

Note: Adjustments indicated by a ○ are made only when there is crosstalk.

3. 3 MECHANICAL ADJUSTMENTS

1. TILT SENSOR ADJUSTMENT

[Mechanical Adjustment]

- Purpose : Adjustment of the tilt servo's gain according to the tilt sensor's sensitivity rank.
- Symptom when incorrectly adjusted : Increased tilt servo hunting and increased crosstalk.

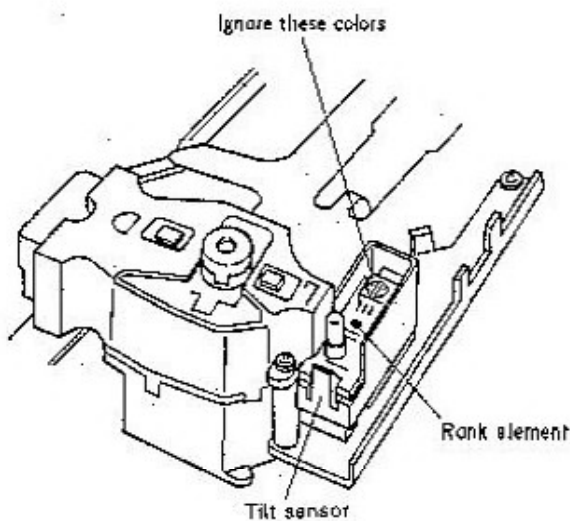
Measurement equipment & jigs	Adjusting points
● Blade screwdriver	● VR608

Adjusting procedure

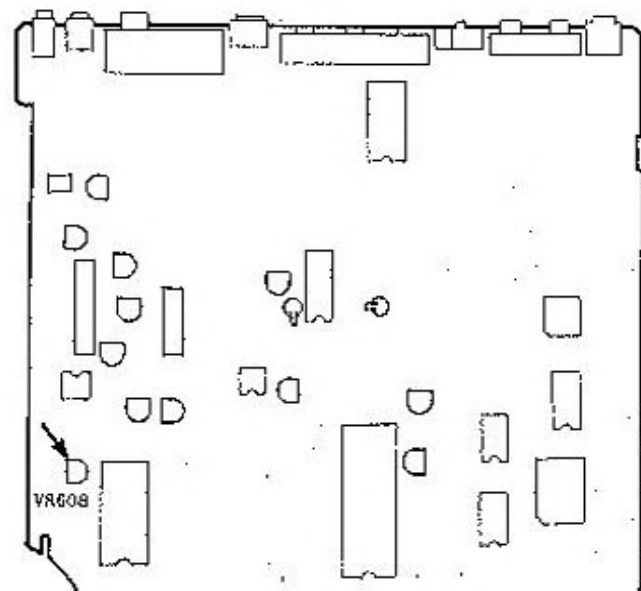
1. Use a blade screwdriver to adjust the angle of VR608 on the mother board Ass'y according to the rank indicator's color.

Rank	Color	VR Angle
A	Red	Clockwise all the way
B	Clear	Mechanical center
C	Blue	Counterclockwise all the way

Adjustment diagram



MOTHER BOARD ASSEMBLY



2. COARSE ADJUSTMENT OF GRATING AND TRK BALANCE ADJUSTMENT

[Mechanical Adjustment]

- Purpose: Adjustment of the grating angle to enable disc playback and track playback.
- Symptom when incorrectly adjusted: The disc cannot be played back. Track skipping occurs.

Measurement equipment & jigs	Measurement equipment connecting points	Player condition	Adjusting points
<ul style="list-style-type: none"> • Blade screwdriver • Oscilloscope • Test disc (GGV1003) • TV monitor 	<ul style="list-style-type: none"> • Oscilloscope Between CN301-9 (TRK ERR) and GND. 	<ul style="list-style-type: none"> • Test mode • Disc playback • TRK servo open • Tilt servo OFF 	<ul style="list-style-type: none"> • Pickup Ass'y grating • VR602 (TRK BAL)

Adjusting procedure

[Coarse grating adjustment]

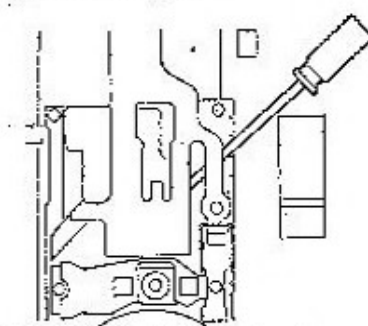
1. Insert the test disc and press the PLAY key.
2. Search for frame #15000 or thereabouts.
3. Open the TRK servo.
4. Connect CN301-9 to the oscilloscope and observe the waveform.
5. Slide the tip of a small blade screwdriver through the guide and insert it horizontally into the grating adjustment hole. Look for the null point. (See Fig. 1 and Photo 1.)
6. Turn the screwdriver counterclockwise until the TRK waveform's amplitude reaches the first maximum from the null point. (See Photo 2.)

[TRK balance adjustment]

1. Adjust VR602 so that the TRK error waveform amplitude's positive and negative level become equal. (See Photo 3.)
2. Close the TRK servo and check if the image on the TV screen is normal.

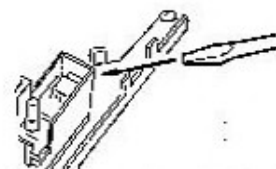
Note: Set the oscilloscope's time axis range to the maximum and watch the TRK error waveform. The compressed waveform will then appear. This will make the adjustment easier.

Adjustment diagram

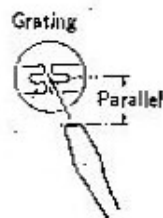


(Top view)

Screwdriver inserting direction

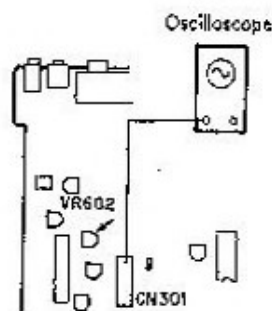


Insert the screwdriver to the slot horizontally for the base.



Grating

Parallel



Oscilloscope

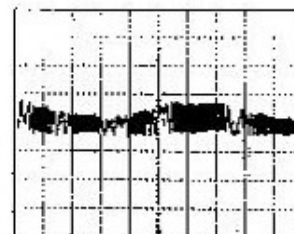
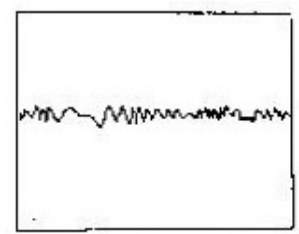


Photo 1 Null Point



This is not the null point.

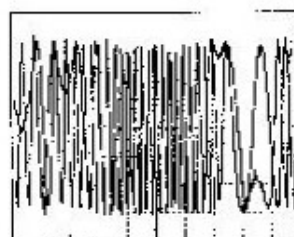
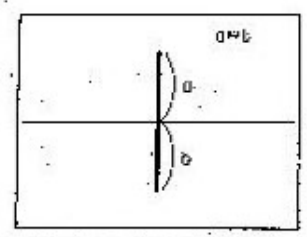


Photo 2 Maximum TRK error.



(Maximum time axis range.)

Photo 3 The positive and negative levels are equal.

3. SLIDER SHAFT HORIZONTAL ADJUSTMENT

[Mechanical Adjustment]

- Purpose: Setting the slider shaft horizontally to enable the pickup to move over the disc horizontally.
- Symptom when incorrectly adjusted: With a warped disc, the FCS servo does not function at the inner or outer periphery.

Measurement equipment & jigs	Measurement equipment connecting points	Player condition	Adjusting points
<ul style="list-style-type: none"> • Oscilloscope • Low-pass filter (47K 1μF) • Test disc (GGV1003) 	<ul style="list-style-type: none"> • Between CN301-3 (FCS RTN) and GND. 	<ul style="list-style-type: none"> • Test mode • #5200 still • TRK servo open • Tilt servo OFF 	<ul style="list-style-type: none"> • Player SKIP key (During test mode)

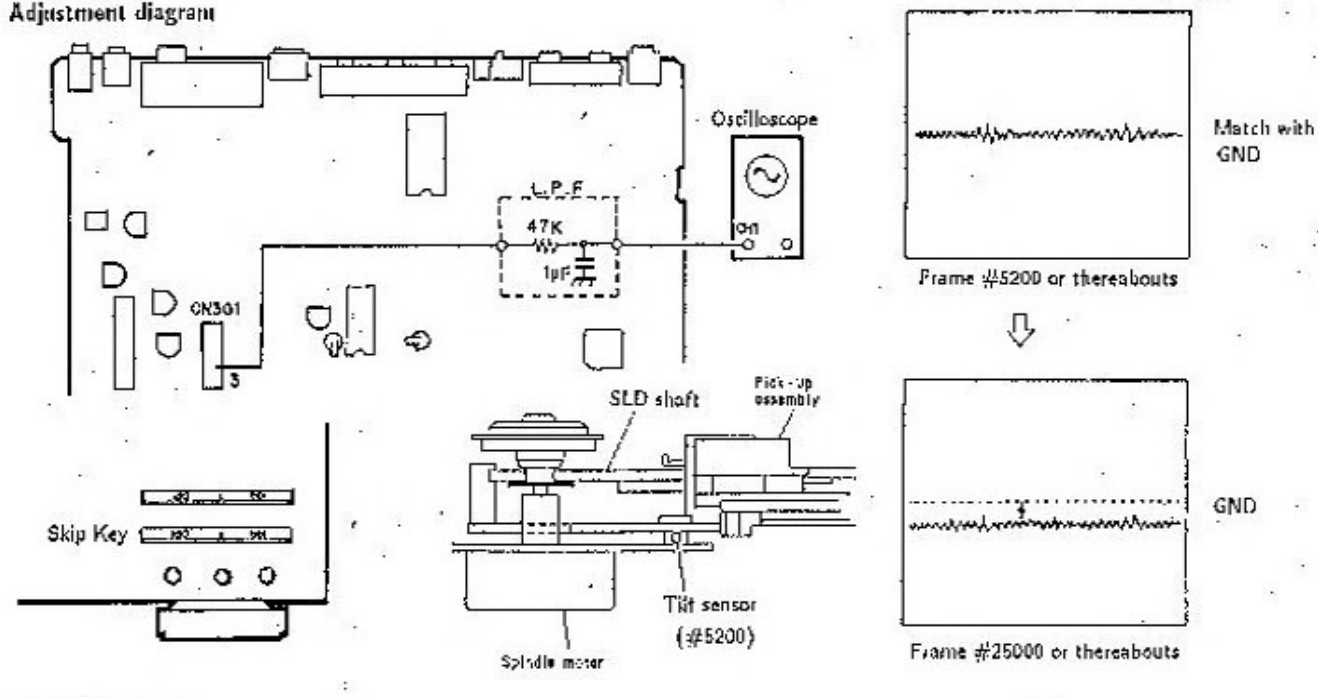
Adjusting procedure

1. Use the SCAN key to send the slider to frame #5200 or thereabouts (tilt fulcrum) on the test disc. Open the TRK servo.
2. Connect CN301-3 to the oscilloscope through L.P.F. and match the center of the waveform with the oscilloscope's GND.
3. Search for frame #25000 and use the SKIP key to adjust the center of the waveform to 0V.

Note: Regarding the test mode, see page 6.

Note: This adjustment is critical in that it will affect the adjustments following.

Adjustment diagram



4. PICKUP INCLINATION ADJUSTMENT/FCS ERROR BALANCE ADJUSTMENT

[Mechanical Adjustment]

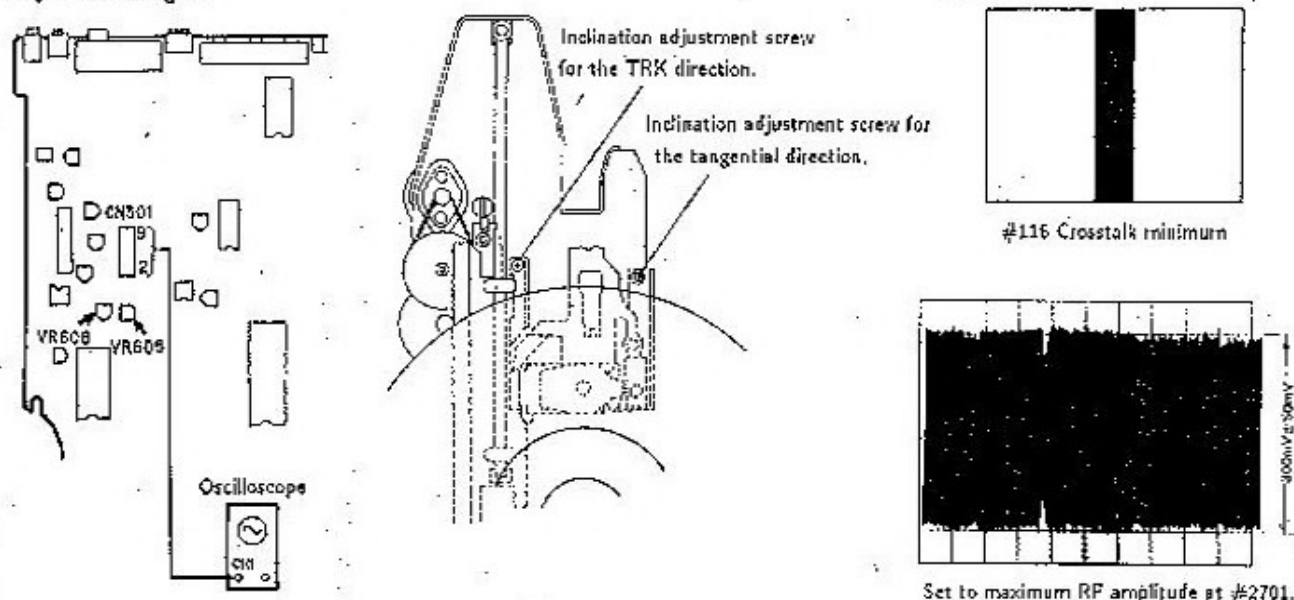
- Purpose: Adjustment of the pickup inclination to direct the laser beam vertically with respect to the disc.
- Symptom when incorrectly adjusted: There is crosstalk.

Measurement equipment & jigs	Measurement equipment connecting points	Player condition	Adjusting points
<ul style="list-style-type: none"> ● Test disc (GGV1003) ● Oscilloscope ● TV monitor 	<ul style="list-style-type: none"> ● Oscilloscope CN301-2 (RF) ● TV monitor ● Player's video output terminal. 	<ul style="list-style-type: none"> ● Test mode <ul style="list-style-type: none"> • #2701 still (Black screen) • TRK servo closed • Tilt servo OFF 	<ul style="list-style-type: none"> ● Pickup Ass'y TRK/Tangential direction Inclination adjustment screw ● VR605 (TE BEST) ● VR606 (CT BEST)

Adjusting procedure

1. Connect CN301-2 to the oscilloscope.
2. Search for #2701 and look at the RF waveform.
3. Adjust the pickup's TRK/tangential direction inclination adjustment screw to maximize the waveform's amplitude.
4. Look at the TV screen and make sure there is no crosstalk.
Note: If there is crosstalk on the TV screen even when the RF level is at the maximum, do next steps as follows.
5. Connect CN301-9 to the oscilloscope.
6. Open the TRK servo loop and adjust VR606 to maximize the TRK waveform's amplitude.
Note: With the TRK servo closed, set it to still. Then adjust the jump pulse to the maximum level.
7. Close the TRK servo loop.
8. Connect CN301-2 to the oscilloscope.
9. Adjust VR606 to maximize the RF waveform's amplitude.
10. Watch #115 on the TV monitor and make sure there is no crosstalk.
Note: If there is noticeable crosstalk, watch #115 on the TV monitor and adjust VR606 until the crosstalk is eliminated.

Adjustment diagram



5. TILT SENSOR INCLINATION/TILT BALANCE ADJUSTMENT

[Mechanical Adjustment]

● Purpose: Adjustment of the tilt sensor's inclination to direct the tilt sensor's LED vertically with respect to the disc. Also, compensation for the sensitivity difference between the two sensors.

● Symptom when incorrectly adjusted: There is crosstalk.

Measurement equipment & jigs	Measurement equipment connecting points	Player condition	Adjusting points
<ul style="list-style-type: none"> ● TV monitor ● Test disc (GGV1003) ● Small Phillips screwdriver 	<ul style="list-style-type: none"> ● TV monitor ● Player's video output terminal 	<ul style="list-style-type: none"> ● Test mode <ul style="list-style-type: none"> • #16200 still • TRK servo closed • Tilt servo OFF 	<ul style="list-style-type: none"> ● Tilt sensor inclination adjustment screw ● VR607 (TILT BAL)

Adjusting procedure

1. Search for frame #16200 on the test disc.
2. Set VR607 to the mechanical center.
3. Adjust the tilt sensor inclination adjustment screw so that the tilt error display code is 0, 7, or 8 on the TV monitor or PL tube.

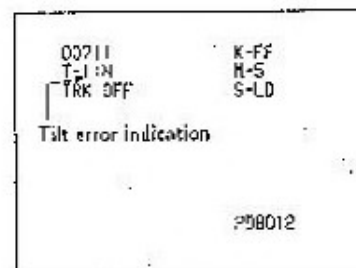
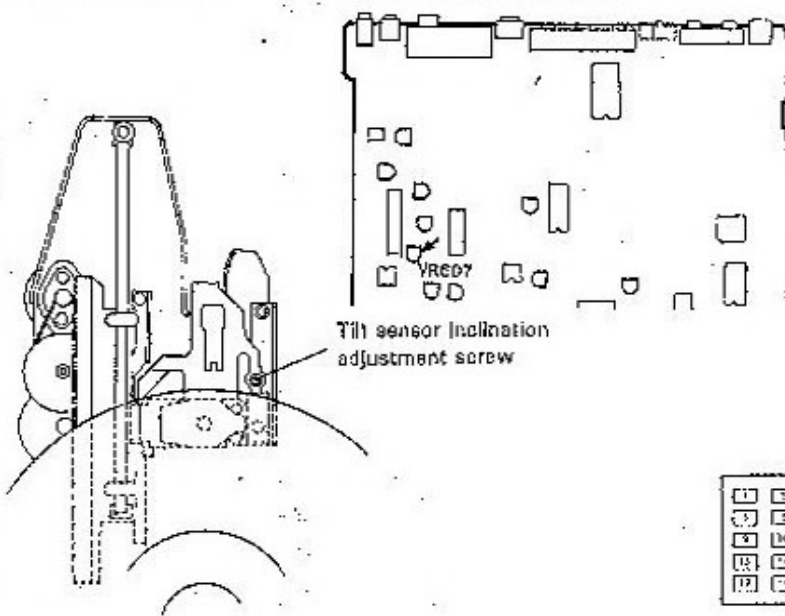
Note: Turn the tilt sensor inclination adjustment screw clockwise more than 1/4 turn from the best point. Then turn the screw counterclockwise 1/4 turn to complete the adjustment.

4. Search for frame #115.
5. Adjust VR607 so that the tilt error display becomes 7.

Note: Regarding the test mode, see page 4.

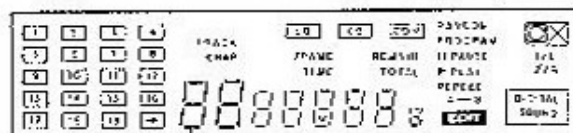
Adjustment diagram

MOTHER BOARD ASSEMBLY



TV screen display

Note: This display indicates the 4th error display's location. Other displays may differ slightly from the actual.



Tilt error display

6. INSPECTION AND ADJUSTMENT OF SPINDLE MOTOR CENTERING

[Mechanical Adjustment]

● Purpose: Adjustment of the mechanical Ass'y position to set the spindle motor over the center of the laser beam path when the pickup Ass'y moves toward the inner or outer periphery of the disc.

● Symptom when incorrectly adjusted: There is track skipping and the search time is long.

Measurement equipment & jigs	Measurement equipment connecting points	Player condition	Adjusting points
<ul style="list-style-type: none"> ● Oscilloscope ● Test disc (GGV1003) ● Blade screwdriver ● L.P.F. (0.01μF, 1K) (0.027μF) 	<ul style="list-style-type: none"> ● Oscilloscope CH1: CN301-9 (TRK PRR) CH2: CN301-8 (TRK SUM) 	<ul style="list-style-type: none"> ● Test mode ● #25000 still ● #1 still ● TRK servo open ● TILT servo ON 	<ul style="list-style-type: none"> ● Spindle motor centering adjustment lever

Adjusting procedure

1. Set the oscilloscope to the X-Y mode and connect CN 301-9 and CN301-8 to CH 1 (X input) and CH 2 (Y input) respectively.
2. Search for frame #25000 on the test disc and look at the resurge waveform.
3. Search for frame #1 and check if the bulge of the resurge waveform is the same as that of frame #25000's resurge waveform.

Note: If the bulge of the resurge waveform in step 3 differs for the inner and outer peripheries, do steps 4 to 6 as follows.

4. Search for frames #25000 and #1 alternately. Adjust the spindle motor centering adjustment screw so that the resurge waveforms match.

5. Change to a compact disc and playback the inner periphery. Check if the resurge waveform is the same as the one shown in Photo 1.

6. If the compact disc's inner periphery resurge waveform differs from the one shown in Photo 3, repeat steps 4 to 5.

Adjustment diagram

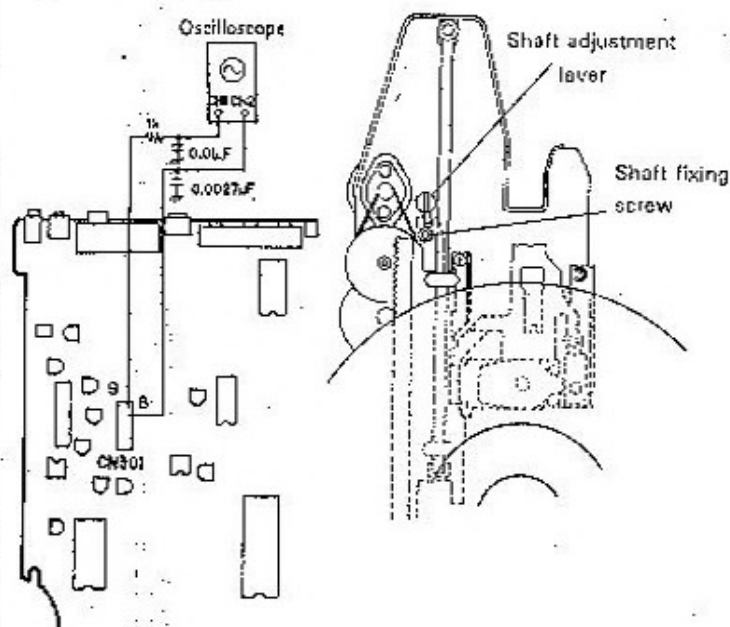


Photo 1 Frame #25000 resurge



Photo 2 Frame #1 resurge



Photo 3 CD inner periphery resurge waveform.

X-Y mode
CH1: 50mV/div
CH2: 5mV/div AC

7. FINE ADJUSTMENT OF GRATING AND TRK BALANCE ADJUSTMENT

[Mechanical Adjustment]

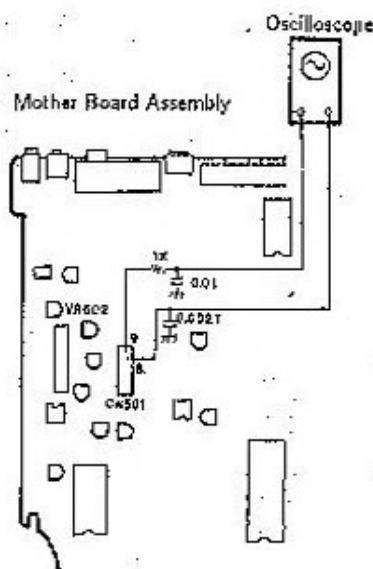
- Purpose: Fine adjustment of the grating to direct the two TRK servo laser beams at the disc at the optimum position over the track.
- Symptom when incorrectly adjusted: There is track skipping.

Measurement equipment & jigs	Measurement equipment connecting points	Player condition	Adjusting points
<ul style="list-style-type: none"> • Oscilloscope • Test disc (GGV1003) • Blade screwdriver • L.P.F. (0.01μF, 1K) (0.0027μP) 	<ul style="list-style-type: none"> • Oscilloscope CH1 (X): Between TRK error (CN301-9) and GND. CH2 (Y): TRK sum (CN301-8) 	<ul style="list-style-type: none"> • Test mode • PLAY mode • TRK servo loop open • TILT servo ON 	<ul style="list-style-type: none"> • Grating screw on the mechanical Ass'y • VR802

Adjusting procedure

1. Playback the disc at frame #3000 (inner periphery) or thereabouts.
2. Set the oscilloscope to the X-Y mode, and connect CN 301-9 (TRK error) and CN301-8 (TRK sum) to the X input and the Y input respectively. Then look at the resurge waveform.
3. Insert the blade screwdriver tip into the grating adjustment hole. Adjust the grating to minimize the Y direction of the resurge waveform. (Refer to adjustment diagram on page 11.)
4. Check if a equals b for the resurge waveform. If a is not equal to b, adjust VR802 (TRK balance).
5. Close the TRK servo loop and check if the image on the TV screen is normal.

Adjustment diagram

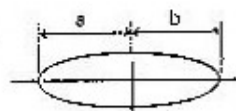


- Oscilloscope range:

CH1(X): 50mV/div

CH2(Y): 5mV/div

Set the probe to mu1 only for Y.



Frame #2000
Resurge waveform
Y direction minimum, a=b.

8. FCS SERVO LOOP GAIN ADJUSTMENT

[Mechanical Adjustment]

- Purpose : Setting the FCS servo's loop gain to the optimum setting.
- Symptom when incorrectly adjusted : Playability is poor.

Measurement equipment & jigs	Measurement equipment connecting points	Player condition	Adjusting points
<ul style="list-style-type: none"> ● Oscilloscope ● Test disc (GGV1003) ● AF oscillator (1.7 kHz/10 Vp-p) ● Resistor (47 k ohm) 	<ul style="list-style-type: none"> ● Oscilloscope ● CH 1(X) : Between FCS IN (CN301-6) and GND. ● CH 2(Y) : FCS error (CN301-5) 	<ul style="list-style-type: none"> ● Test mode ● STILL mode ● TRK servo loop close ● TILT servo ON 	<ul style="list-style-type: none"> ● VR004

Adjusting procedure:

1. Search for frame #15000 on the test disc.
2. Connect CN301-5 and CN301-6 as shown below.
3. Set the oscilloscope to the X-Y mode and look at the resurge waveform.
4. Adjust VR004 so that the resurge waveform is symmetric with respect to the X and Y axes. (See Photos 1 and 2.)

Adjustment diagram

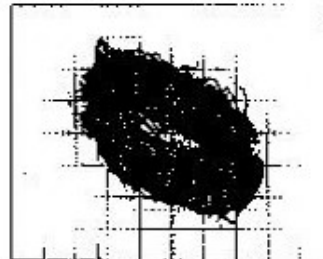


Photo 1 Inadequate adjustment.

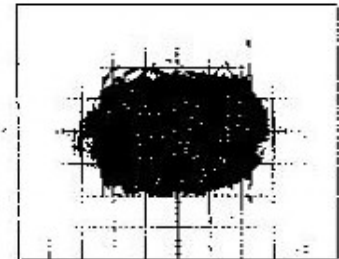
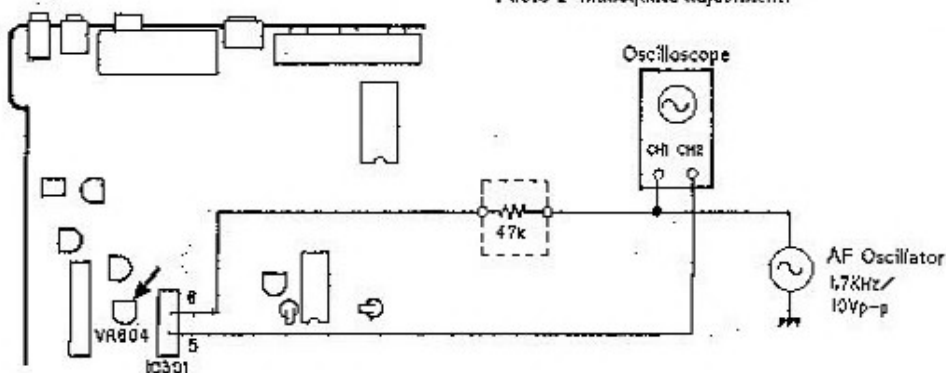


Photo 2 After adjustment.

Mother Board Assembly



9. TRK SERVO LOOP GAIN ADJUSTMENT

[Mechanical Adjustment]

- Purpose: Optimum setting of the TRK servo's loop gain.
- Symptom when incorrectly adjusted: Playability is poor.

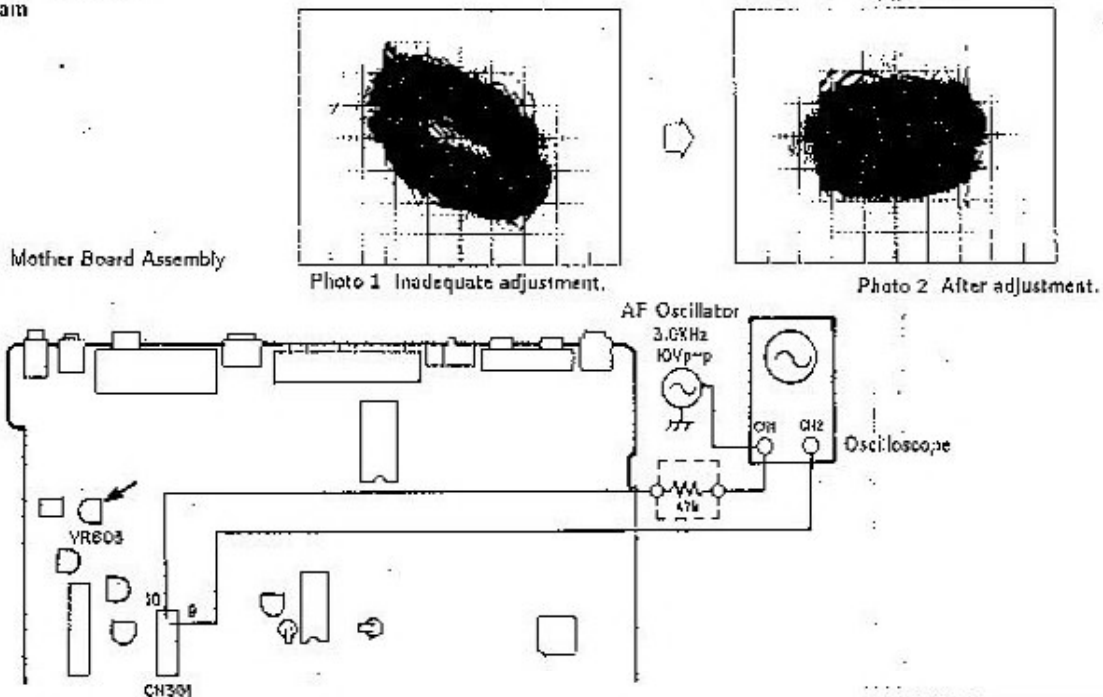
Measurement equipment & jigs	Measurement equipment connecting points	Player condition	Adjusting points
<ul style="list-style-type: none"> • Oscilloscope • Test disc (GGV1003) • AF oscillator (3.0kHz/10 V_{p-p}) • Resistor(47kΩ) 	<ul style="list-style-type: none"> • Oscilloscope • CH 1(X): CN301-10 (TRK IN) • CH 2(Y): CN301-9 (TRK-ERR) 	<ul style="list-style-type: none"> • Test mode • Still at frame #15000 (Black screen) • TRK servo closed. • Tilt servo ON 	<ul style="list-style-type: none"> • VR603

Adjusting procedure

1. Search for frame #15000 on the test disc.
2. Connect CN301-10(TRK IN) and CN301-9(TRK ERR) as shown in the diagram below.
3. Set the oscilloscope to the X-Y mode and watch the resurge waveform.
4. Adjust VR603 to make the resurge waveform symmetrical with respect to the X and Y axes.(See Photos 1 and 2.)

Note: If the adjustment cannot be made, either set the 47k Ω resistor to 33k Ω or increase the oscillator's output.

Adjustment diagram



10. RF GAIN ADJUSTMENT

[Mechanical Adjustment]

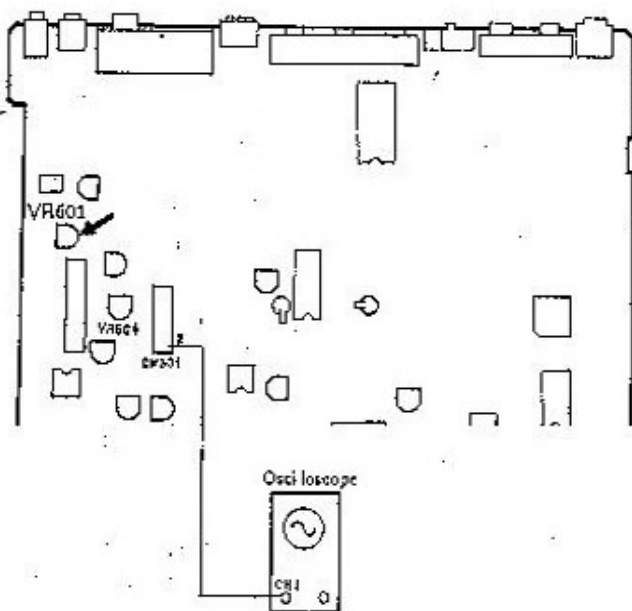
- Purpose : Optimization of the RF signal's amplitude.
- Symptom when incorrectly adjusted : There is prominent dropout. Scan and search operations are unstable.

Measurement equipment & jigs	Measurement equipment connecting points	Player condition	Adjusting points
<ul style="list-style-type: none"> • Oscilloscope • Test disc (GGV1003) 	<ul style="list-style-type: none"> • Oscilloscope CH 1 : Between RF (CN301-2) and GND. 	<ul style="list-style-type: none"> • Test mode <ul style="list-style-type: none"> • STILL mode • TRK servo loop close • TILT servo ON 	<ul style="list-style-type: none"> • VR601

Adjusting procedure

1. Search for frame #15000 on the test disc.
2. Connect CN301-2 (RF) to the oscilloscope and look at the RF signal.
3. Adjust VR601 so that the RF signal's amplitude becomes 300mV \pm 50mV. (See Photo 1.)

Adjustment diagram



Oscilloscope range AC
5mV/div
2mS/div

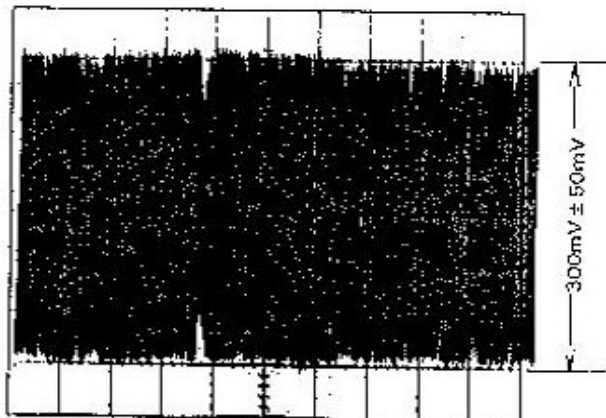


Photo 1