

COMPACT DISC PLAYER

CDX-2020/1120/CD-5050

SERVICE MANUAL

IMPORTANT NOTICE

This manual has been provided for the use of authorized Yamaha Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically Yamaha Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components and failure of the product to perform as specified. For these reasons, we advise all Yamaha product owners that all service required should be performed by an authorized Yamaha Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of Yamaha are continually striving to improve Yamaha products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

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■ TO SERVICE PERSONNEL

1. Critical Components Information.

Components having special characteristics are marked and must be replaced with parts having specifications equal to those originally installed.

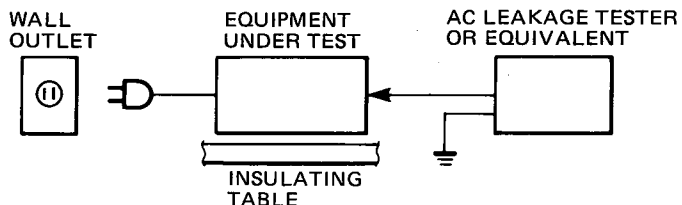
2. Leakage Current Measurement (For 120V Model Only).

When service has been completed, it is imperative that you verify that all exposed conductive surfaces are properly insulated from supply circuits.

- Meter impedance should be equivalent to 1500 ohm shunted by 0.15 μ F.
- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.

• POLARIZATION (U, C models)

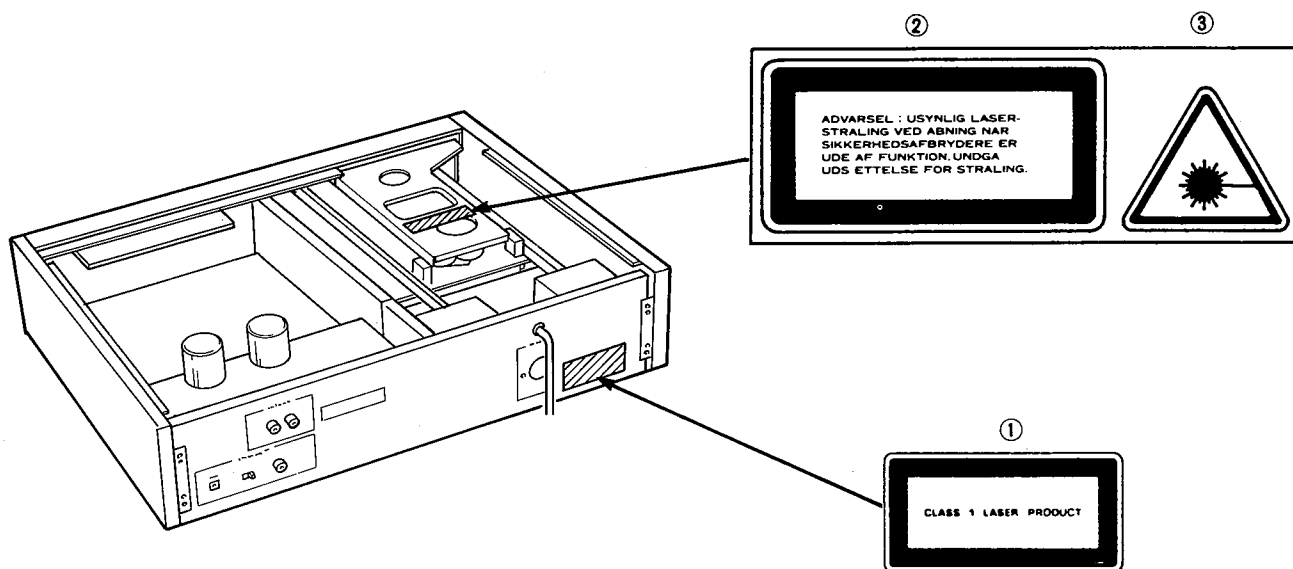
This CD player product is equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature.



CAUTION-USE OF CONTROLS, ADJUSTMENTS, OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN, MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

THE COMPACT DISC PLAYER SHOULD NOT BE ADJUSTED OR REPAIRED BY ANYONE EXCEPT PROPERLY QUALIFIED SERVICE PERSONNEL.

G, B models



English

- ① THIS LABEL IS ATTACHED AT THE PLACE ILLUSTRATED TO INFORM THAT THE APPARATUS CONTAINS A LASER COMPONENT.
- ② THIS LABEL IS ATTACHED IN THE POSITION SHOWN IN THE ILLUSTRATION TO WARN THAT ANY FURTHER PROCEDURE WILL BRING THE USER INTO EXPOSURE WITH THE LASER BEAM.
- ③ THE RADIATION WARNING LABEL IS PLACED INSIDE THE UNIT AS SHOWN IN THE ILLUSTRATION, TO WARN AGAINST FURTHER MEASURES ON THE UNIT. THE EQUIPMENT CONTAINS A LASER COMPONENT RADIATING LASER RAYS EXCEEDING THE LIMIT OF CLASS 1 LASER PRODUCTS.

CAUTION—USE OF CONTROLS, ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN, MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

Swedish

- ① PÅSKRIFTEN SITTE PÅ APPARATEM SOM VISAS SOM EN UPPMANING OM ATT APPARATEN OMFATTAR EN INBYGGD LASERKOMPONENT.
- ② TEXTSKYLTEN FÖR LASERN ÄR PLACERAD PÅ APPARATEN SOM EN UPPMANING OM ATT APPARATEN INNEHÅLLER EN LASERKOMPONENT.
- ③ VARNINGSSKYLTEN FÖR STRÅLNING HAR PLACERATS I APPARATEN, SOM BILDEN VISAR, SOM EN VARNING OM YTTERLIGARE INGREPP I APPARATEN. MATERIELEN INNEHÅLLER EN LASERKOMPONENT SOM AVGER LASERSTRÅLNING ÖVERSTIGANDE GRÄNSEN FÖR LASERKLASS 1.

VARNING—INGREPP I APPARATEN BÖR ENDAST FÖRETAS AV FACKMAN MED KUNSKAP OM ATT RISK FÖRELIGGER FÖR RADIOAKTIV STRÅLNING.

Danish

- ① DETTE MÆRKAT ER ANBRAGT SOM VIST I ILLUSTRATIONEN FOR AT ADVARE BRUGEREN OM AT APPARATET INDEHOLDER EN LASERKOMPONENT.
- ② DETTE MÆRKAT OM LASEREN ER ANBRAGT PÅ APPARATET SOM EN OPLYSNING OM AT APPARATET INDEHOLDER ET LASERKOMPONENT.
- ③ ADVARSELSKILTET OM STRÅLING ER PLACERET INDEN I APPARATET, SOM VIST I ILLUSTRATIONEN, SOM EN ADVARSEL OM YDERLIGERE INDGREB I APPARATET. APPARATET INDEHOLDER ET LASERKOMPONENT SOM AVGIVER LASESTRÅLING DER OVERSTIGER GÆNSEVERDIEN FOR LASERKLASSE 1.
- ③ ADVARSEL! INDGREB BØR KUN FORETAGES AF EN FAGMAND DA DER ER RISIKO FOR RADIOAKTIV STRÅLING.

Finnish

"VAROITUS! LAITE SISÄLTÄÄ LASERDIODIN, JOKA LÄHETTÄÄ (NÄKYMÄTÖNTÄ) SILMILLE VAARALLISTA LASERSÄTEILYÄ."

INTERLOCK OPERATION

The Digital Compact Disc Player reads the disc signals by laser beam detection. The human body must directly exposed to the laser beam. Human eyes are especially not be damaged by the laser beam. This unit is therefore equipped with an interlock to prevent unnecessary laser output.

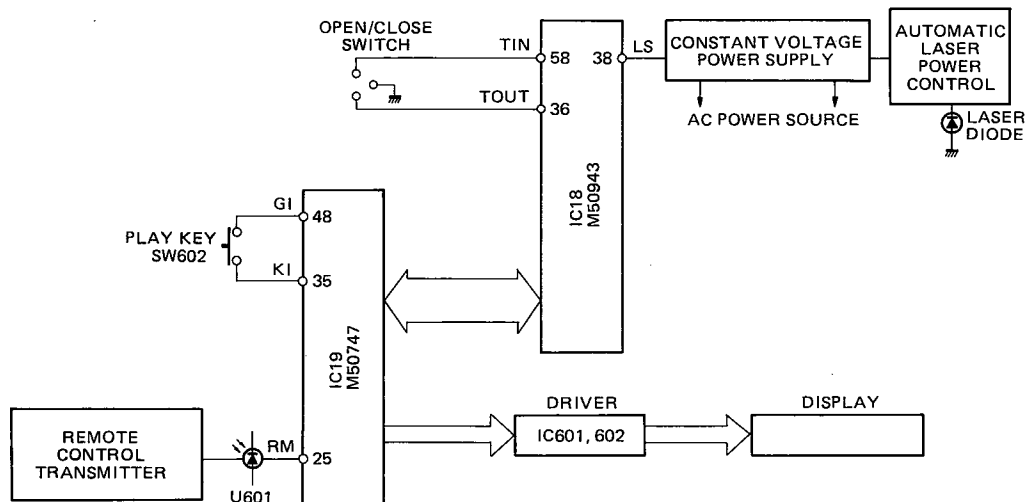
Laser output is controlled by the injection or cutoff of the constant voltage source to the laser diode at Pin 38 (LS) of IC18 (M50943), and also by Automatic Laser Power Control Circuit. When Pin 38 is in "H" (High) level, the laser emits the beam. When Pin 38 is in "L" (Low) level, the laser does not emit the beam.

Pin 38 is set in "H" level when the unit is loaded with a disc and reads the index signals or when the unit is set in the play mode. When the unit reads the index signals and the following two conditions are met, the laser emits the beam.

- 1) When the Loading Limit Switch is set in "CL" side. (The disc tray is closed.)
- 2) When the pickup is located at the area of minimum internal circumference.

After the above conditions are met and the index signals have been read, the laser emits the beam when the following two conditions are met.

- 1) When the PLAY key (SW602) or that of Remote Control Transmitter is pressed.
- 2) When the  display is ON.

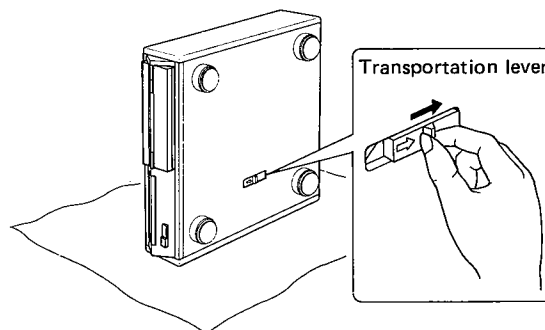


DISENGAGING THE TRANSPORTATION LEVER

In order to protect the internal laser pickup from the vibration and shocks which occur during transportation, it is held in place with a transportation lever located on the bottom of the unit. Be sure to disengage the transportation lever before making any connection.

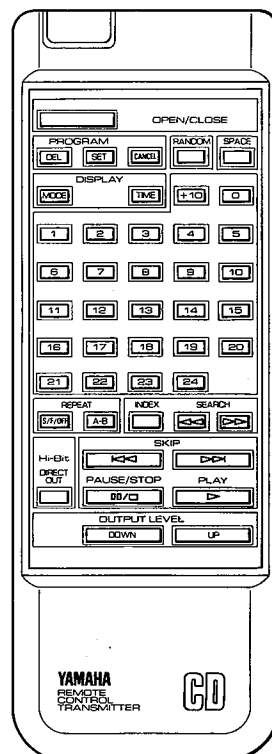
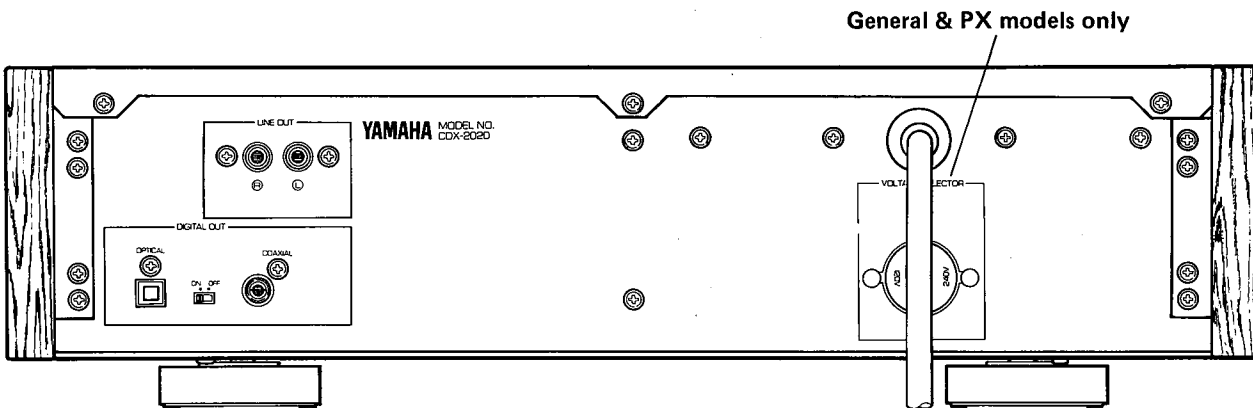
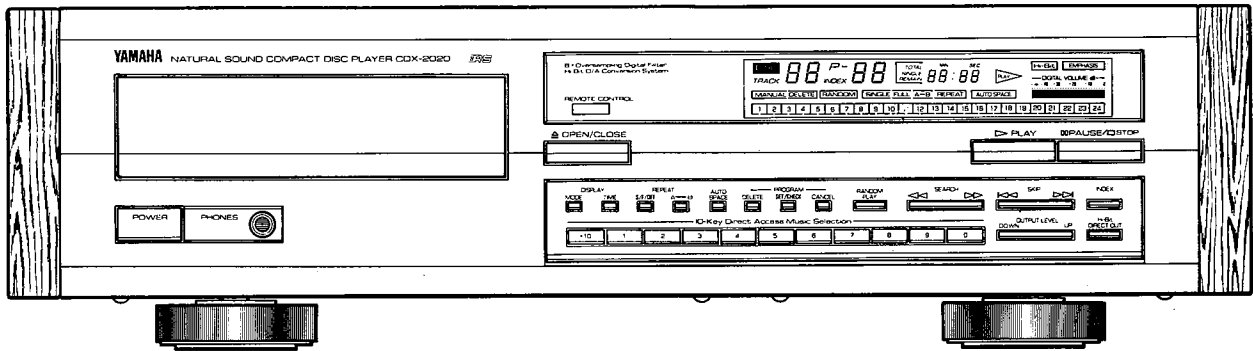
1. As shown in the figure, spread out a soft cloth or other protective material, and gently stand the unit on its side, taking care not to scratch the finish.
2. Slide the lever in the direction of the arrow.

To move the lever, be sure to stand the unit on its side. Do not place it with the front panel facing up (rear panel terminals down).



- * If the transportation lever has not been moved in the direction of the arrow, the unit will not play.
- * Before transporting the unit, slide the lever in the opposite direction of the arrow, after confirming that a disc is not loaded in the tray.

FRONT & REAR PANELS



AUDIO SECTION

INTERNAL SYSTEM

GENERAL

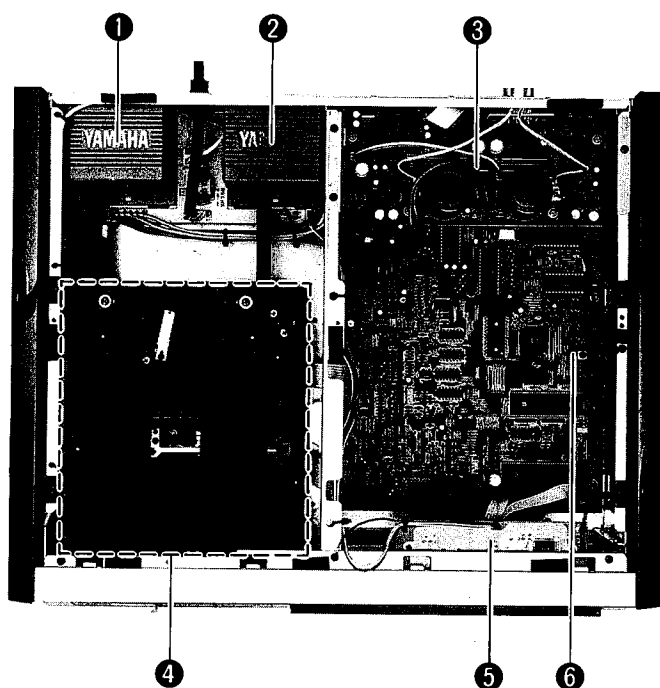
Power Requirements

Power Consumption	25W
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Dimensions (W x H x D)

CDX-2020 : 473 x 132 x 392 mm
(18-9/16" x 5-3/16" x 15-7/16")
CDX-1120/CD-5050 : 435 x 130 x 392 mm
(17-1/8" x 5-1/8" x 15-7/16")

INTERNAL VIEW



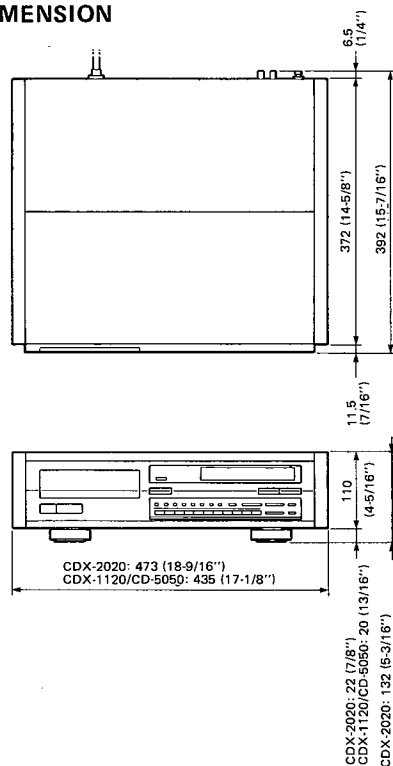
- ① POWER TRANSFORMER (DIGITAL)
- ② POWER TRANSFORMER (ANALOG)
- ③ AUDIO CIRCUIT BOARD (1)
- ④ DM-2L UNIT
- ⑤ OPERATION CIRCUIT BOARD (1)
- ⑥ MAIN CIRCUIT BOARD

Weight	CDX-2020 : 15.8 kg (34 lbs. 13 oz)
	CDX-1120/CD-5050 : 12 kg (26 lbs. 6 oz)
Accessories	Pin plug cord
	Remote control transmitter
	Batteries (size "AA", R06)

**Specifications are subject to change without notice.*

<i>U</i>	<i>U.S.A model</i>	<i>G</i>	<i>European model</i>
<i>C</i>	<i>Canadian model</i>	<i>R</i>	<i>General model</i>
<i>B</i>	<i>British model</i>	<i>P</i>	<i>PX model</i>
<i>A</i>	<i>Australian model</i>		

- **DIMENSION**



DISASSEMBLY PROCEDURES

(Remove parts in numbered order)

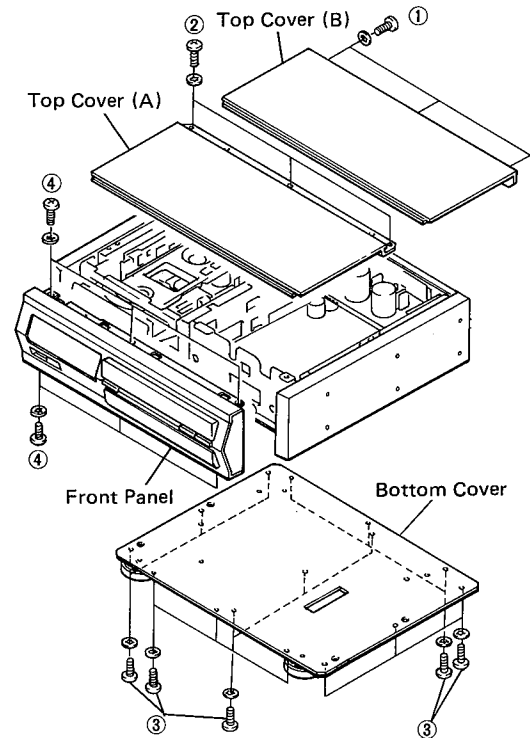
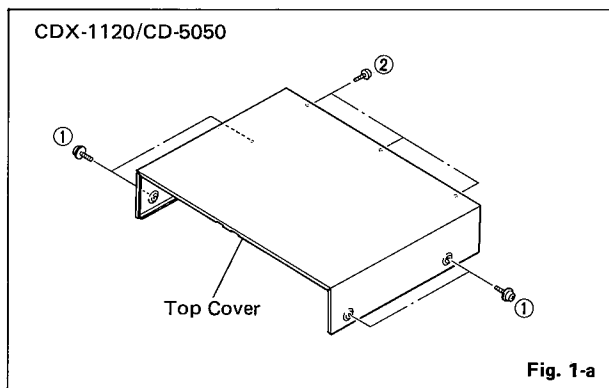
1. Removal of Top Cover

CDX-2020

- Remove 3 screws (①) in Fig. 1 and then remove the Top Cover (B).
- Remove 3 screws (②) in Fig. 1 and then remove the Top Cover (A).

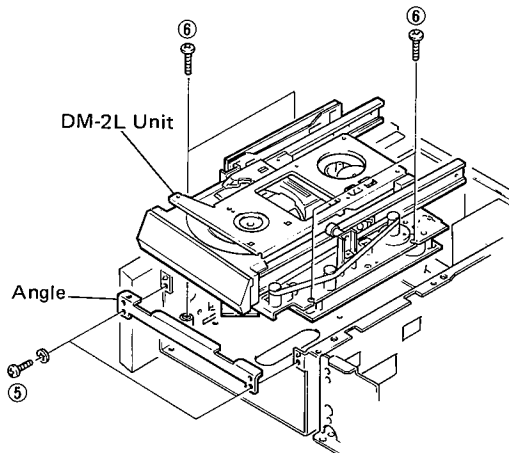
CDX-1120-CD-5050

- Remove 4 screws (①) and 3 screws (②) in Fig. 1-a and then remove the Top Cover.
- Removal of Bottom Cover**
 - Remove 15 screws (③) in Fig. 1.
 - Removal of Front Panel**
 - Remove 6 screws (④) in Fig. 1.



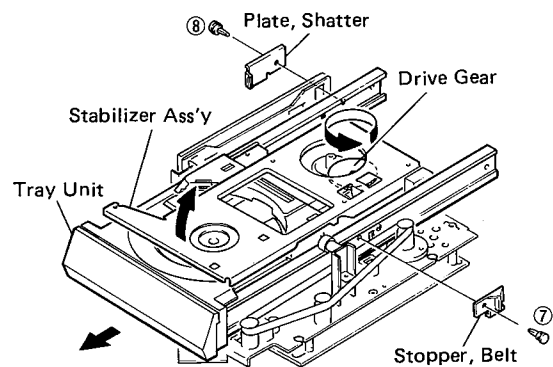
4. Removal of DM-2L Unit

- Remove 2 screws (⑤) in Fig. 2 and then remove the angle.
- Remove 4 screws (⑥) in Fig. 2, and lift the DM-2L Unit gradually.



5. Removal of Tray Unit

- Rotate the Drive Gear, and the Stabilizer Ass'y is pushed up.
- Remove plastic rivet (⑦) in Fig. 3 and then remove the Stopper, Belt.
- Remove plastic rivet (⑧) in Fig. 3 and then remove the Plate, Shatter.
- Take out the Tray Unit.



ADJUSTMENTS

Necessary items

Measuring instruments

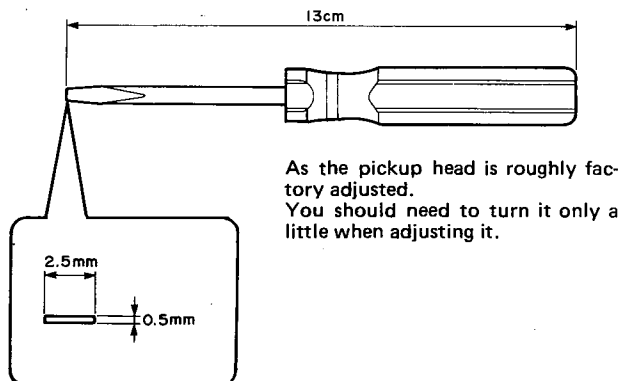
- Oscilloscope : x 2
(At least one shall have a bandwidth of 50 MHz or more)
- Audio frequency oscillator (A.F. OSC): x 1
[LEADER LPM-8000 (P/No. TX915140) or equivalent]
- AC voltmeter (ACVM) : x 2
(One dual channel or two single channel meters)
- DC voltmeter (DCVM) : x 1
- Frequency counter (FC) : x 1

Jigs

- Test disc : x 1
(YEDS-18 P/No. TX911730,
or YEDS-7 P/No. TX911320)
- Filter (P/No. TX913120) : x 1 (See Fig. A)
- Shorting cord : x 1 (Step 3)

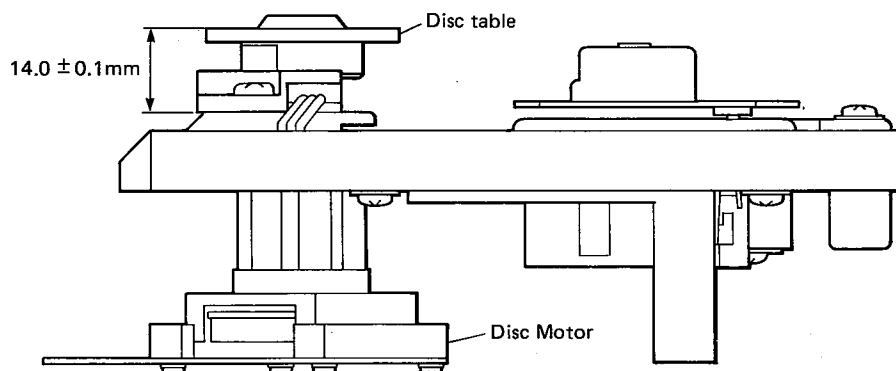
Tools

- ⊕ Screwdriver : x 1
(For Pre-Set Potentiometer adjustment)
- Core screwdriver : x 1 (Step 3)
- ⊖ Special Screwdriver : x 1 (Step 4)
(For Diffraction Grating adjustment)



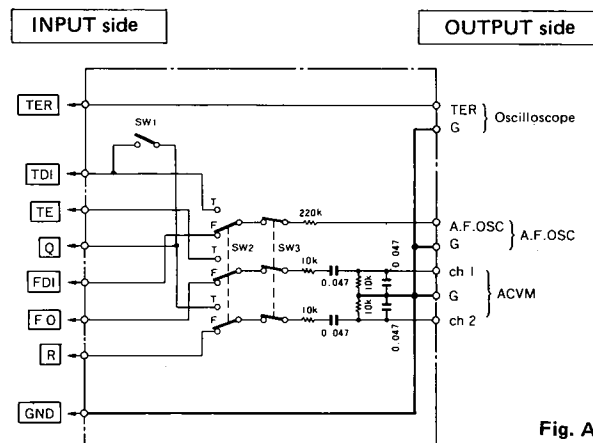
Confirmation of disc table height

- a. Check that the disc table height is as specified below.



Adjustment jig (with internal filter)

Connect the filter in Fig. A before measurement.

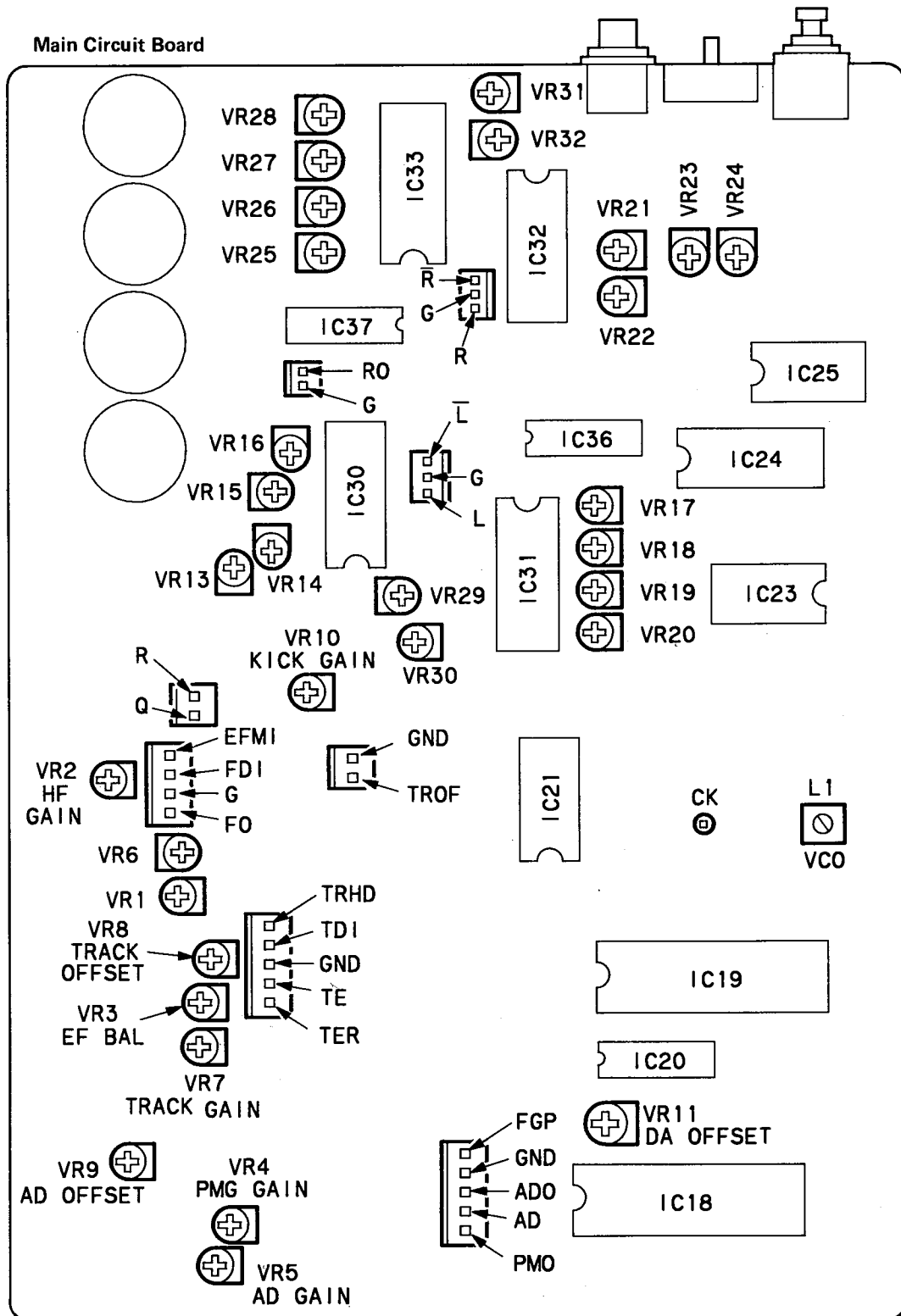


- SW1: For diffraction grating and EF balance adjustments
- SW2: FOCUS gain and TRACKING gain switching
- SW3: Filter ON/OFF switch

Precautions or Special Notes

1. Measure the output level at the output terminal of the AF oscillator.
2. The unit should always be in a horizontal position while performing adjustments.

●TEST POINTS



★ BEFORE ADJUSTMENTS

① Setting to TEST MODE

On the power switch while pressing the CANCEL key.

● Description of TEST MODE keys

OPEN/CLOSE : Focus start

PLAY : Play

STOP : Stop, Focus OFF

⏮ : -10 Kick

⏭ : +10 Kick

⏪ : -1 Kick

⏩ : +1 Kick

REPEAT : Feed forward

A ↔ B : Feed return

"2" : Tracking servo OFF
(Fixed toward inner circumference at the feed center)

"0" : DAC output for feed

"1" : DAC output for feed

"9" : TEST MODE converted into NORMAL MODE

② Adjustments

Carry out following adjustments in numbered order.

1. Confirmation of laser output
2. Confirmation of focus actuator operation
3. Adjustment of VCO
4. Adjustment of diffraction grating
5. Adjustment of jitter and focus offset
6. Adjustment of EF balance
7. Adjustment of HF level
8. Adjustment of focus gain
9. Adjustment of tracking gain
10. Adjustment of tracking offset
11. Confirmation of jitter
12. Adjustment of kick gain
13. Confirmation of search mode
14. Adjustment of AD offset
15. Adjustment of DA offset
16. Adjustment of PM gain
17. Adjustment of AD gain
18. Confirmation of FG pulse
19. Adjustment of DAC distortion
20. Adjustment of DAC offset

Confirmation of Laser Output (Step 1)

- ① Do not load the test disc.
- ② Remove the tray unit.
- ③ Apply the laser power meter's sensor to the pick-up head as shown in Fig. B.
- ④ Set to the TEST MODE.
- ⑤ Press OPEN/CLOSE key. (Focus search mode)
- ⑥ Measure the laser output during the 5 seconds of FOCUS search mode.

Rating: Laser output = 0.1mW to 0.5mW

(WAVE → Diode
RANGE → 0.3mW or 1mW)

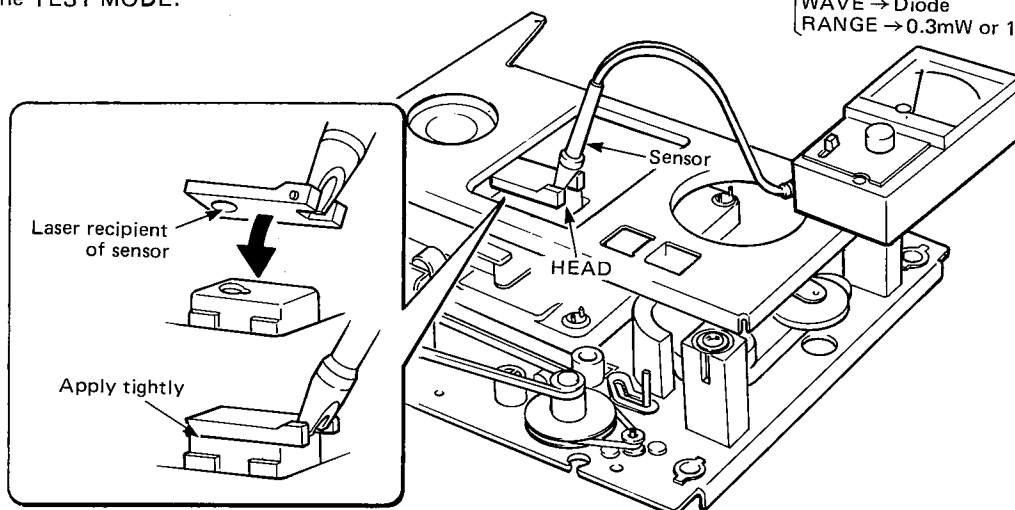


Fig. B

Precautions in handling PICKUP HEAD

- (1) When connecting the pickup head, be sure to ground with soldering iron.
- (2) Since laser light is near-infrared, visual confirmation is difficult. While light is emitted, for safety make sure your eyes are at least 30 cm (12 inches) away from the objective lens.
- (3) Do not disassemble it.
- (4) Do not drop or apply shock to it.
- (5) Do not leave it under high temperature or humidity.
- (6) Do not touch the objective lens. Should there be dust on the lens, clean using a blower for cameras.

Confirmation of Focus Actuator Operation (Step 2)

Oscilloscope (1) setting

- DC coupling
- 1V/div range (Vertical)
(0.1V/div when 10:1 probe is used)
- 0.5 sec/div or 1 msec/div time (Horizontal)

- ① Do not load the test disc.
- ② Connect the oscilloscope (1) to [R] terminal.
- ③ Set to the TEST MODE.
- ④ Press OPEN/CLOSE key. (Focus search mode)
- ⑤ Confirm that the waveform is as shown in Fig. C.
- ⑥ Confirm that the pickup head's objective lens moves smoothly from the lowest point to the highest point.

Adjustment of VCO (Step 3)

- ① Connect the shorting cord and frequency counter as shown in Fig. D. (Short-circuit between EFMI and GND).
- * Be sure to use the probe (10:1 for oscilloscope) for input to the frequency counter.
- ② Do not load the test disc.
- ③ The POWER switch is turned ON.
- ④ Wait for longer than a minute after the POWER switch is turned ON and while observing the frequency counter indication, adjust L1 core so that it satisfies the rating.

Rating: $F_{VCO} = 4.3218 \text{ MHz} \pm 0.025 \text{ MHz}$

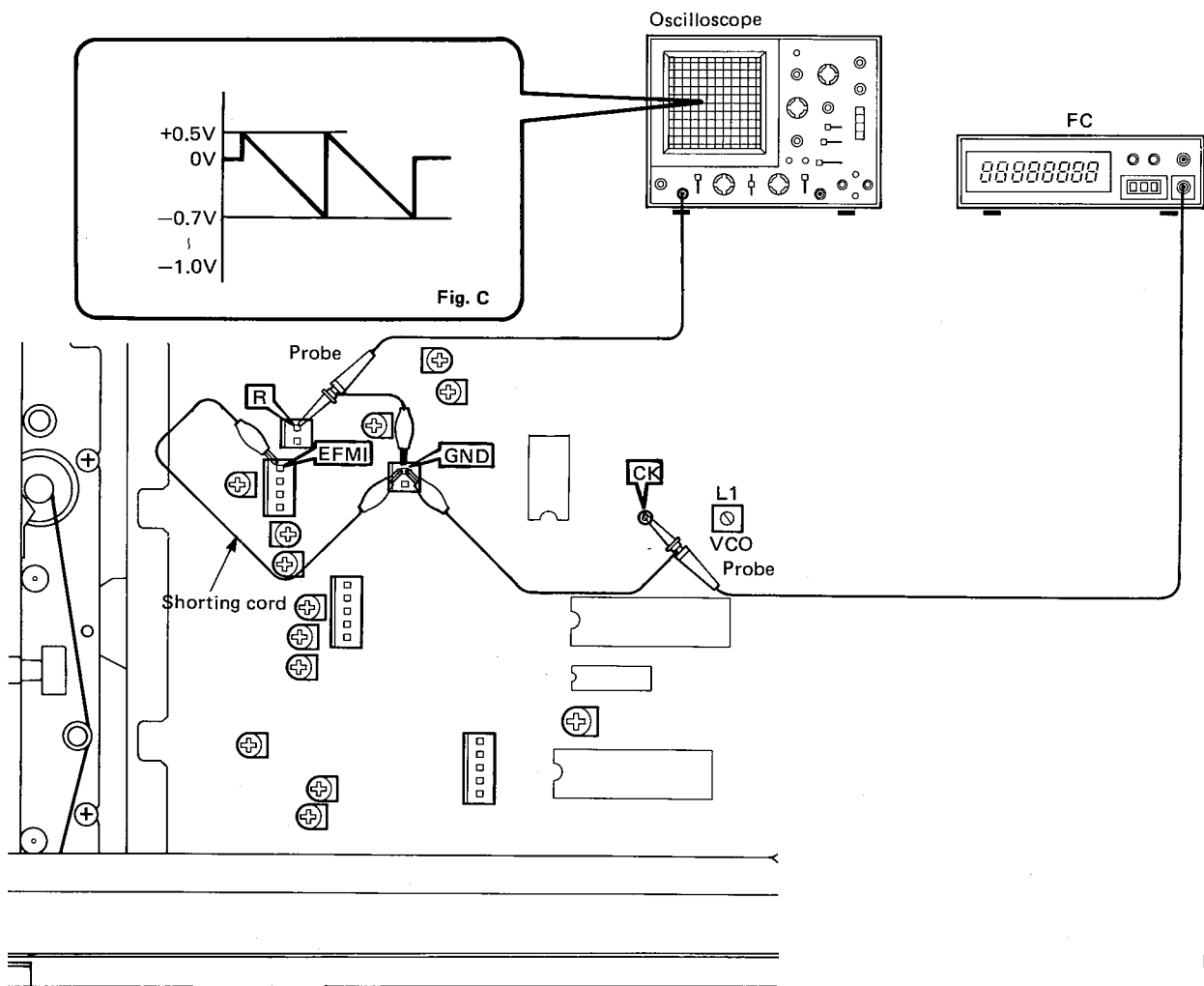
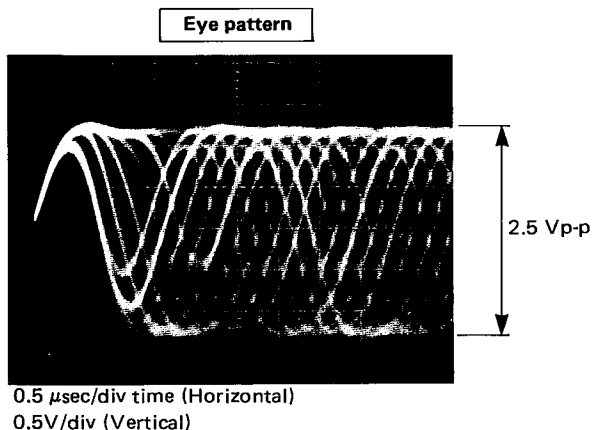
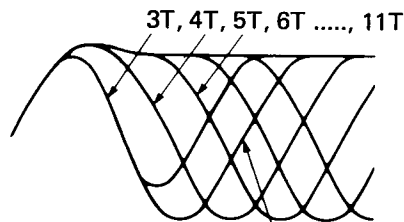


Fig. D

Oscilloscope (2)



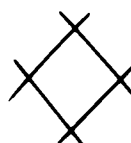
Waveforms 3T – 11T.



This portion is referred to as the eye pattern.

The abnormal eye pattern has less distinct lines and smaller amplitude than that of a good waveform.

Good waveform



Abnormal waveform



Adjust so that a good waveform is obtained.

Adjustment of Diffraction Grating (Step 4)

- * After replacing the head with a new service part, check E_{TER} .
If check result is $E_{TER} \geq 200\text{mVp-p}$, adjustment is NOT necessary.
- * This adjustment requires use of 2 oscilloscopes.

Oscilloscope (1) setting conditions

- DC coupling
- 0.1V/div range (Vertical)
(10mV/div when 10:1 probe is used)
- 20 msec/div time (Horizontal)

Oscilloscope (2) setting conditions

- AC coupling
- 0.5V/div range (Vertical)
(50 mV/div when 10:1 probe is used)
- 0.2 ~ 0.5 μ sec/div time (Horizontal)

- * Oscilloscope (2), should have frequency response of 50 MHz or greater.

- ① Connect the filter and measuring instruments as shown in Fig. E.
 - 1) Connect the oscilloscope (1) to **TER** terminal.
 - 2) Connect the oscilloscope (2) to **EFMI** terminal.
- ② Load the test disc.
- ③ Set to the TEST MODE.
- ④ Press the OPEN/CLOSE key.
- ⑤ Wait for 2 seconds before pressing the PLAY key.
- ⑥ Press the "2" key. (TRACKING SERVO $\rightarrow$ OFF)
- ⑦ Observe the waveform on the oscilloscope (1).

- ⑧ Using the slotted screwdriver (See P. 7) adjust diffraction grating for maximum signal amplitude TER at oscilloscope (1).

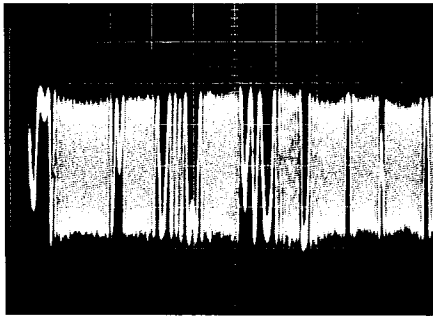
Rating: $E_{TER} \geq 200\text{ mVp-p}$

- * When disc has stopped rotating, go back to ④ again and make adjustment.
- * Adjust at the inner circumference of the disc.
- ⑨ Press the "9" key. (TRACKING SERVO ON)
- ⑩ Confirm that the **EFMI** signal (eye-pattern) appears on the oscilloscope (2).
 - * Set to the point where **TER** signal amplitude is maximum and **EFMI** signal waveform can be observed finely and clearly.

Oscilloscope (1)

Correct

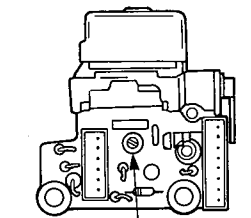
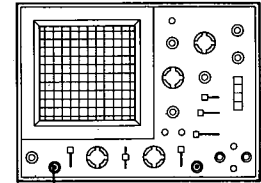
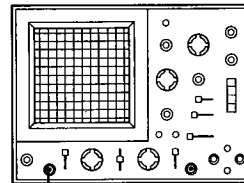
"DC 0V" ▶



TER signal amplitude in this state is 400mVp-p.

Oscilloscope (2)

Oscilloscope (1)



Diffraction Grating Screw

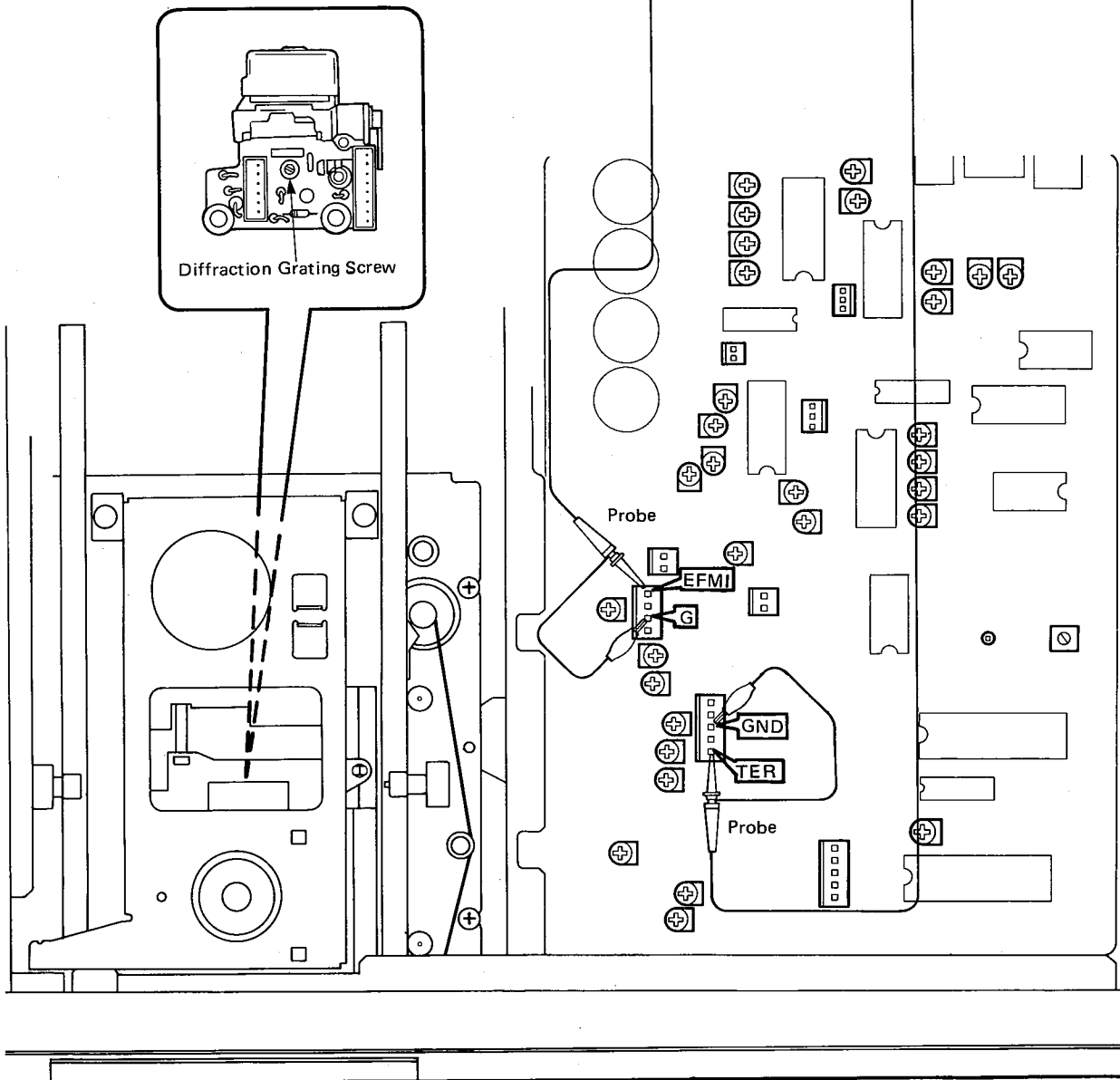


Fig. E

Adjustment of Jitter and Focus Offset (Step 5)

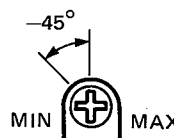
Oscilloscope (2) Settings

- AC coupling
- 0.5 V/div range (Vertical)
(50 mV/div when 10:1 probe is used)
- 0.2 ~ 0.5 μ sec/div time (Horizontal)

- ① Remove the tray unit.
 - ② Connect the oscilloscope (2) to **EFMI** terminal.
 - ③ Load the test disc.
 - ④ The POWER switch is turned ON.
 - ⑤ Press the PLAY key.
 - ⑥ Adjust the head base tilting screw so that the **EFMI** signal (eye-pattern) becomes distinct and clear.
- * Adjust at the center of the disc.

- ⑦ Adjust VR1 so that the **EFMI** signal (eye-pattern) becomes clear.

- * Be sure to adjust at the center of the disc.
- * Adjust VR1 within the $+0^\circ$ to -45° range.



If the best adjusted position is not available within 0° to -45° , turn VR1 back to the center position and turn it toward MIN again to obtain the best possible EFMI signal within that range.

- ⑧ After adjustment, check to make sure that there is nothing abnormal in FOCUS search operation.

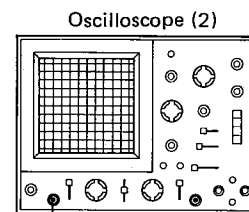
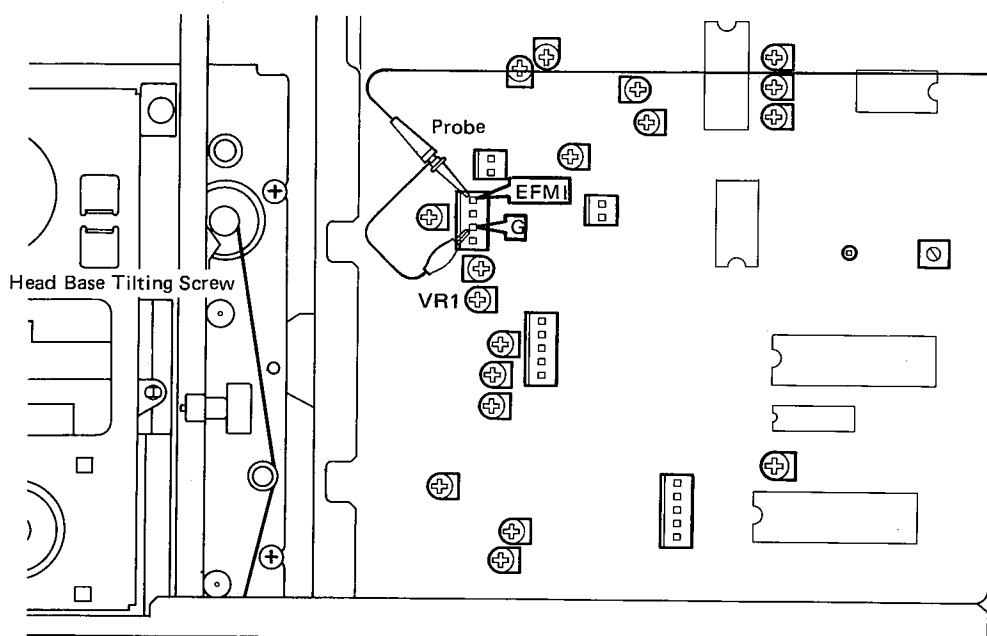
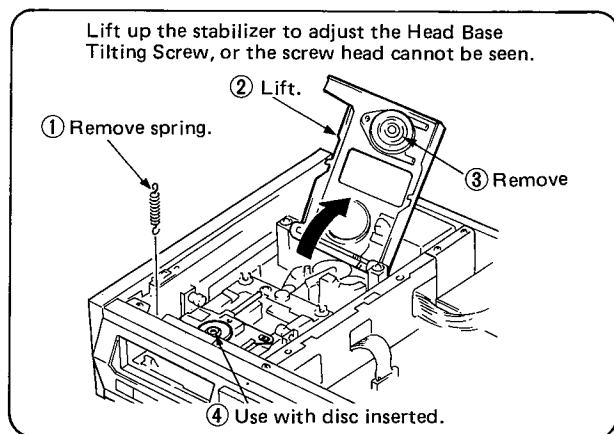


Fig. F

Adjustment of EF Balance (Step 6)

Oscilloscope (1) settings

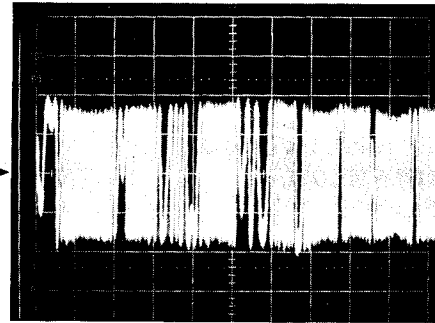
- DC coupling
- 0.1 V/div range (Vertical)
(10 mV/div when 10:1 probe is used)
- 20 msec/div time (Horizontal)

- ① Connect an oscilloscope (1) to the **TER** terminal.
- ② Load the test disc.
- ③ Set to the TEST MODE.
- ④ Press the OPEN/CLOSE key.
- ⑤ Press the PLAY key.
- ⑥ Press the "2" key. (TRACKING SERVO → OFF)
- ⑦ Observe the waveform on the oscilloscope (1).
- ⑧ Adjust VR3 so that the amplitude of the **TER** signal becomes equal above and below DC 0V position.
* Adjust at the inner circumference of the disc.

Correct

Rating DC offset → Less than $\pm 10\text{mV}$.

"DC0V"



Same amplitude.

This shows DC 0V state.

$E_{p-p} \geq 200\text{mV}$

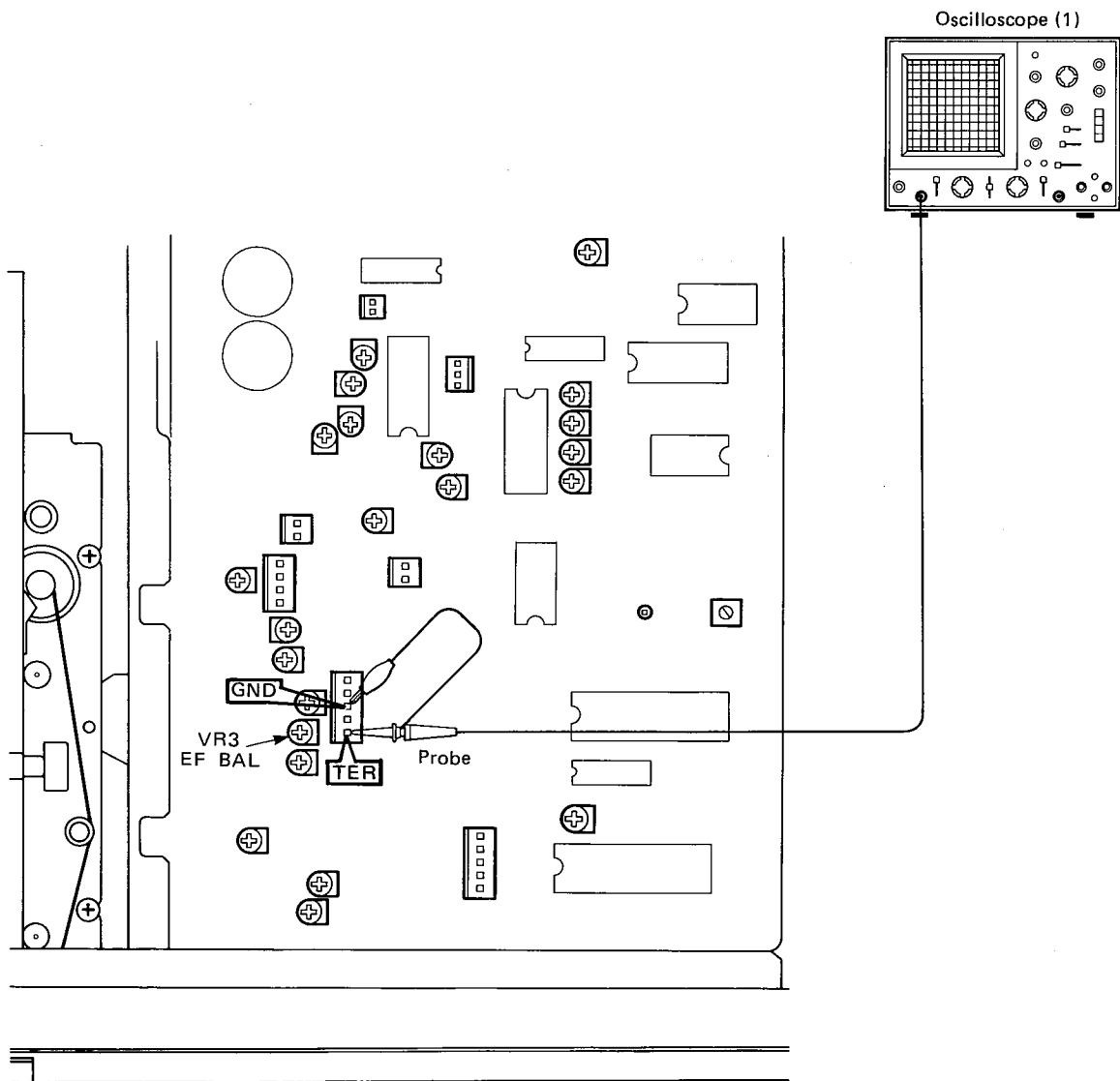


Fig. G

Adjustment of HF Level (Step 7)

Oscilloscope (2) setting

- AC coupling
- 0.5 V/div range (Vertical)
(50 mV/div when 10:1 probe is used)
- 0.2 ~ 0.5 μ sec/div time (Horizontal)

- ① Connect the oscilloscope (2) to the **EFMI** terminal.
 - ② Load the test disc.
 - ③ The POWER switch is turned ON.
 - ④ Press the OPEN/CLOSE key.
 - ⑤ Press the PLAY key.
 - ⑥ Adjust VR2 so that the **EFMI** level becomes 2.5 Vp-p.
- * Adjust at the center of the disc.

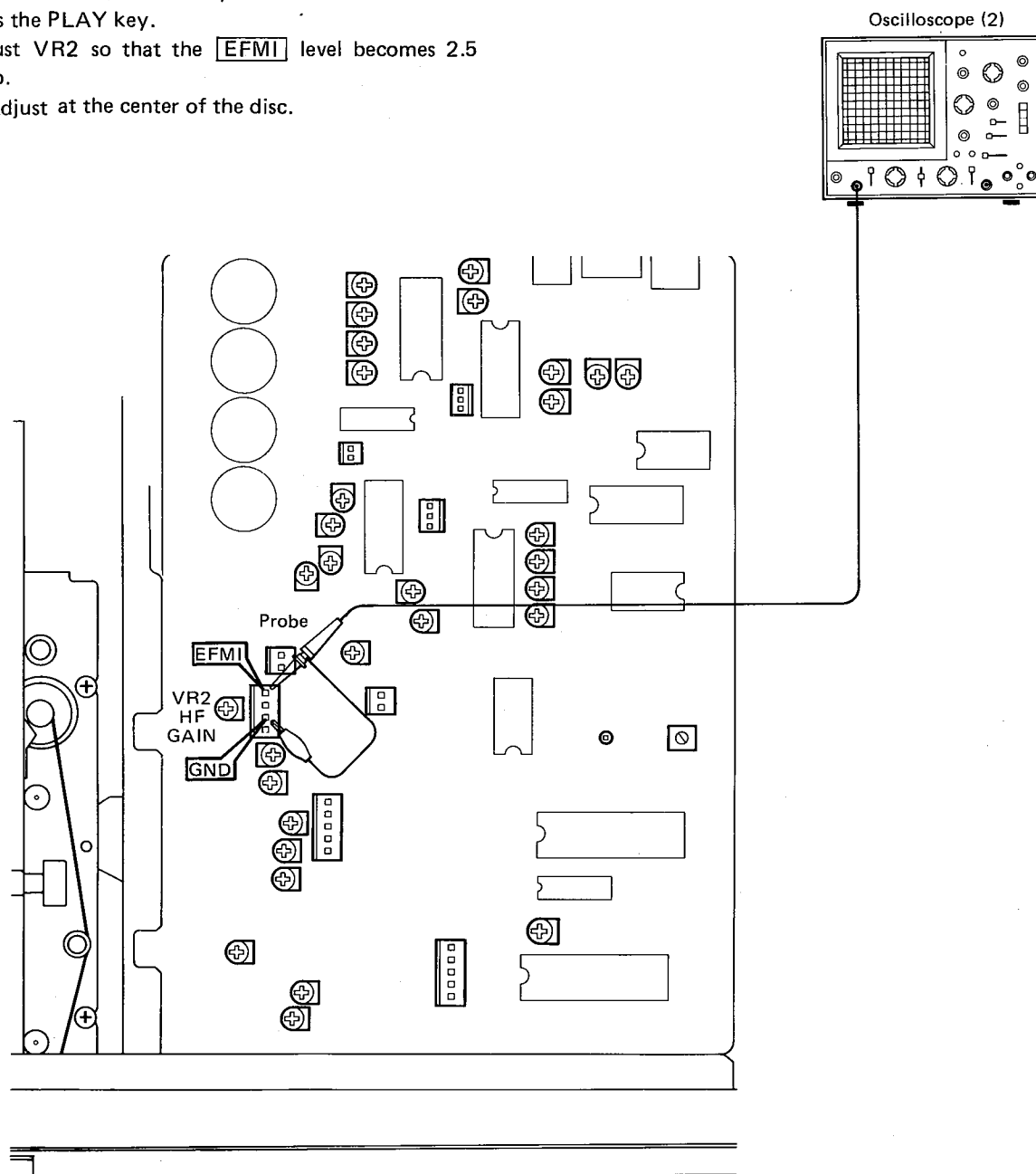


Fig. H

Adjustment of Focus Gain (Step 8)

* This adjustment requires two single channel AC voltmeters or one dual channel AC voltmeter.

- ① Connect the filter and measuring instruments as shown in Fig. 1.
Apply an 800 Hz, 4.5 Vrms signal from the AF oscillator to the **[FDI]** terminal via the resistor (220 k Ω).
- ② Set SW3 in the filter to OFF.
- ③ Set SW2 in the filter to F (FOCUS).
- ④ Load the test disc.
- ⑤ The POWER switch is turned ON.
- ⑥ Press the PLAY key.
- ⑦ Set SW3 to ON.

- ⑧ Read the indications of the AC voltmeters (CH1: E_{FO} , CH2: E_R).
- ⑨ Adjust VR6 so that AC voltmeter indications satisfy the rating.

Rating: $E_{FO} - E_R = -5 \text{ dB}$

0 dBV = 1V

Reference $E_{FO} = -26 \text{ dBV (50 mV)}$
 $E_R = -21 \text{ dBV (89 mV)}$

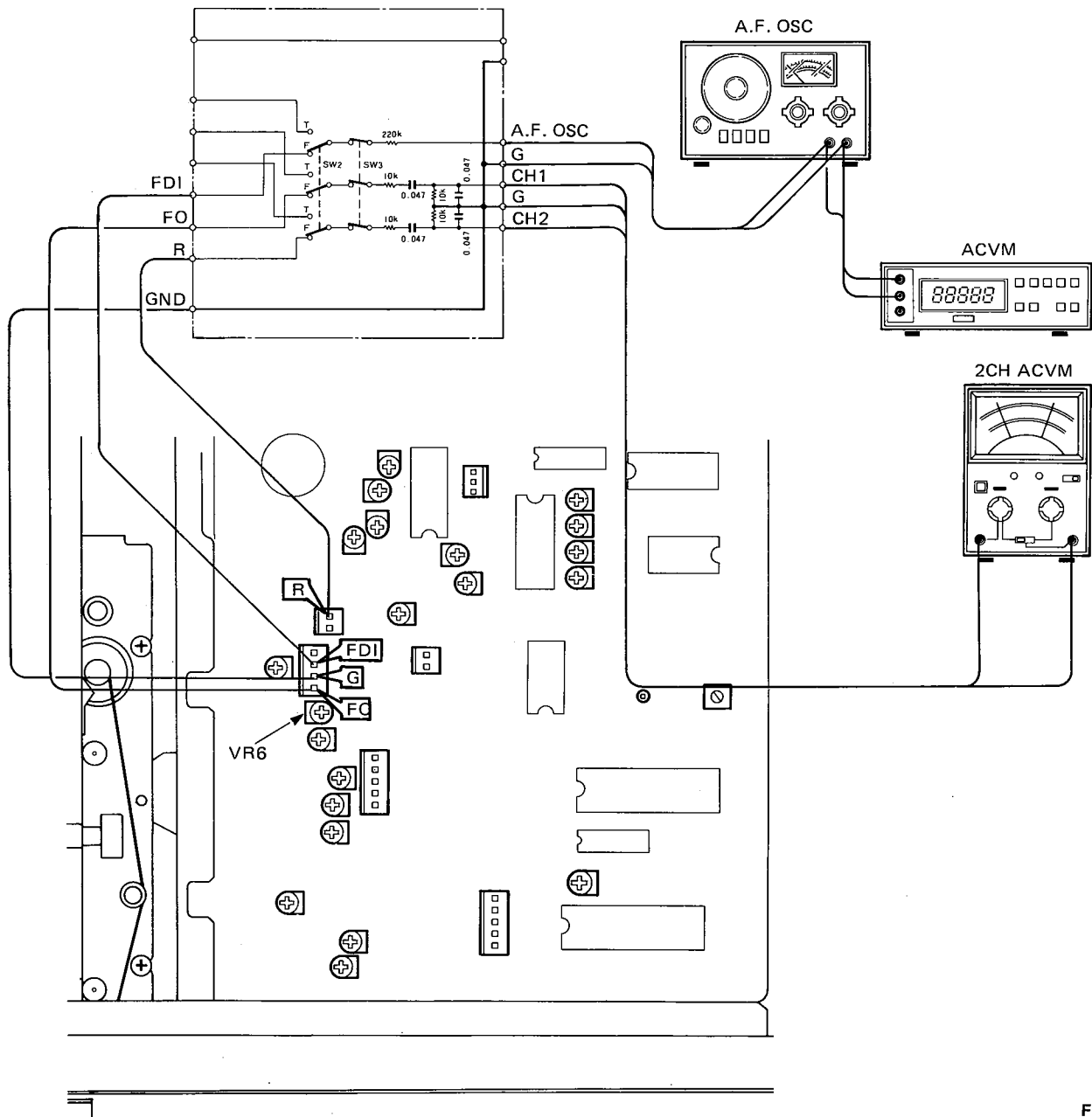


Fig. 1

Adjustment of Tracking Gain (Step 9)

* This adjustment requires two single channel AC voltmeters or one dual channel AC voltmeter.

- ① Connect the filter and measuring instruments as shown in Fig. J.
Apply an 800 Hz, 100 mVrms signal from the AF oscillator to the **TDI** terminal via the resistor (220 k Ω).
- ② Set SW3 in the filter to OFF.
- ③ Set SW2 in the filter to T (TRACKING).
- ④ Load the test disc.
- ⑤ The POWER switch is turned ON.
- ⑥ Press the PLAY key.

- ⑦ Set SW3 to ON.
- ⑧ Read the indications of the AC voltmeters (CH1: E_{TE} , CH2: E_Q).
- ⑨ Adjust VR7 so that AC voltmeter indications satisfy the rating.

Rating: $E_{TE} - E_Q = 20 \text{ dB}$

0 dBV = 1V

Reference $E_{TE} = -10 \text{ dBV}$ (316 mV)

$E_Q = -30 \text{ dBV}$ (32 mV)

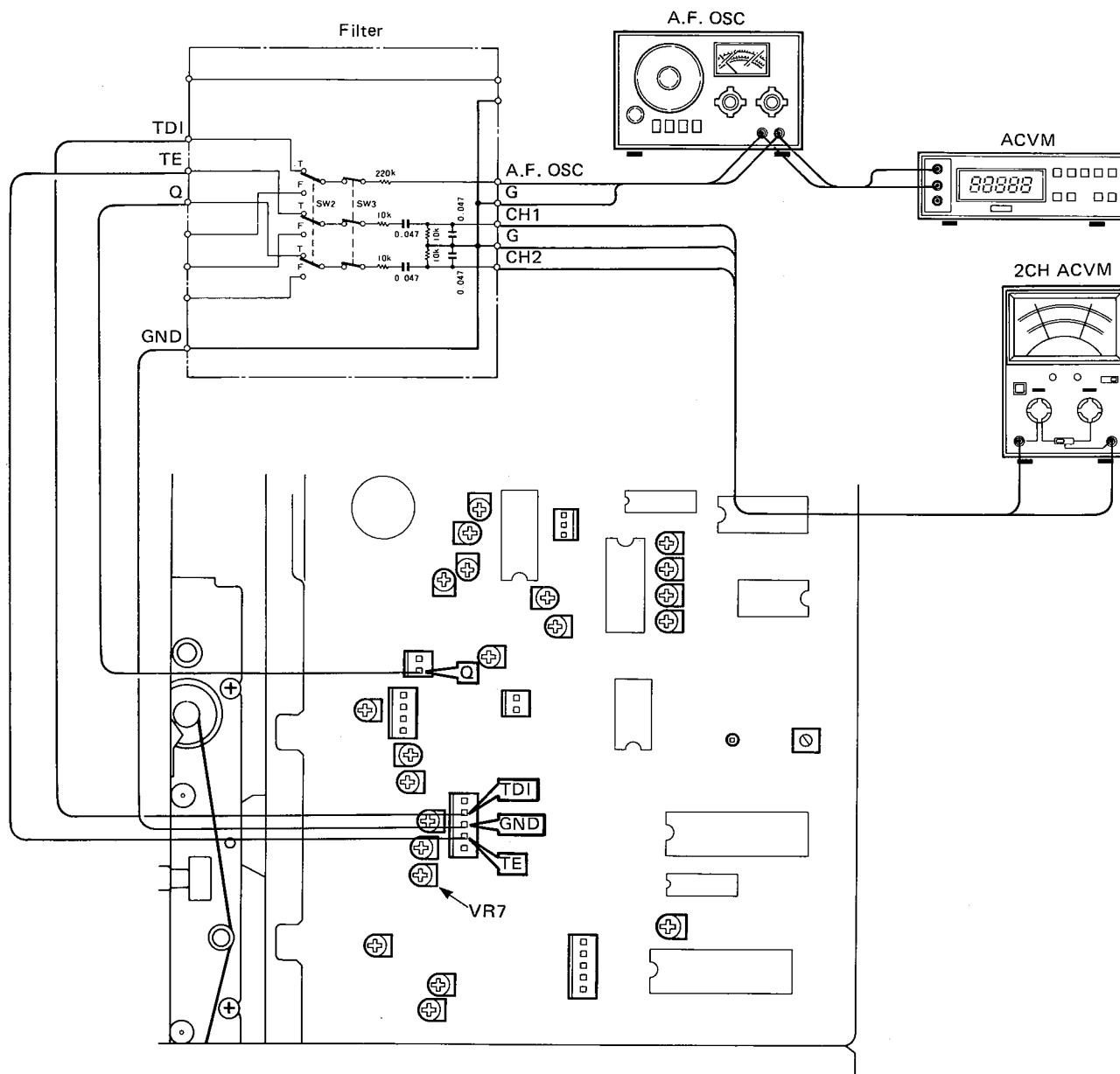


Fig. J

Adjustment of Tracking Offset (Step 10)

- ① Connect the DC voltmeter to the **Q** terminal.
- ② Short between the **TROF** and ground.
- ③ The POWER switch is turned ON.
- ④ Press the STOP key.
- ⑤ Adjust VR8 so that the DC voltmeters indication satisfies the rating.

Rating: $E_Q = 0V \pm 25\text{ mV}$

Confirmation of Jitter (Step 11)

- ① Confirm the jitter rating as in ⑥ of Step 5.
- ② When the tilting screw has been readjusted, go back to Step 5 and carry out adjustments all over from there.

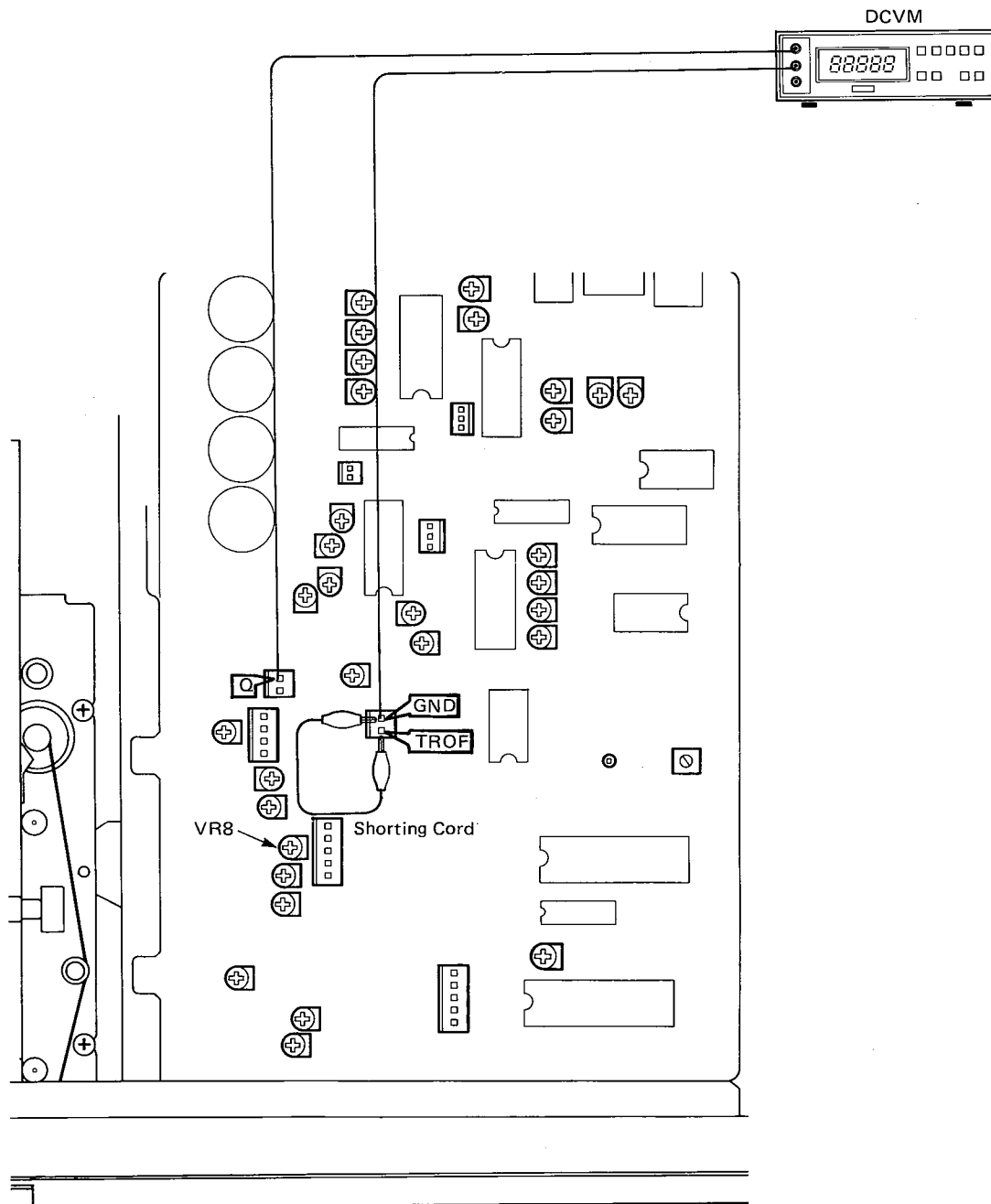


Fig. K

Adjustment of Kick Gain (Step 12)

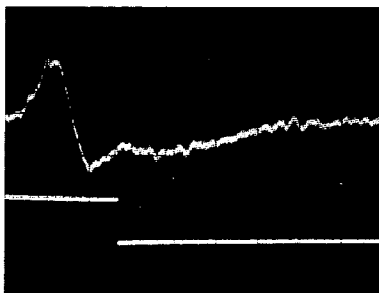
Oscilloscope (1) (2-ch oscilloscope) settings

- DC coupling
- CH1 → **TER** terminal: 0.1 V/div (Vertical)
(10 mV/div when 10:1 probe is used)
- CH2 → **TRHD** terminal: 5 V/div (Vertical)
(0.5 V/div when 10:1 probe is used)
- TRIGGER MODE: 2 CH
- 0.2 msec/div time (Horizontal)

- ① Connect the filter and measuring instruments as shown in Fig. L.
- ② Load the test disc.

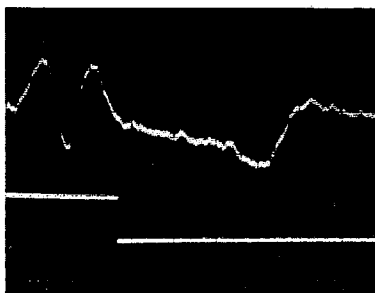
- ③ The POWER switch is turned ON.
- ④ Press the PLAY key.
- ⑤ Press the FF mode key (**▶▶**) for 3 seconds and check the waveform.
- ⑥ Adjust VR10 so that the **TER** signal cycle becomes 1.5 ± 0.5 while the **TRHD** signal level is high.
* Adjust at the inner circumference of the disc.
- ⑦ Confirm that in the Reverse mode, the **TER** signal cycle satisfies the rating given in 3 but in the reverse phase.

Incorrect



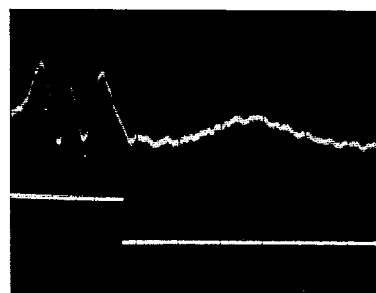
This shows about 0.9 cycle which is incorrect.

Correct



This shows about 1.7 cycle which is within specification.

Incorrect



This shows about 2.5 cycle which is incorrect.

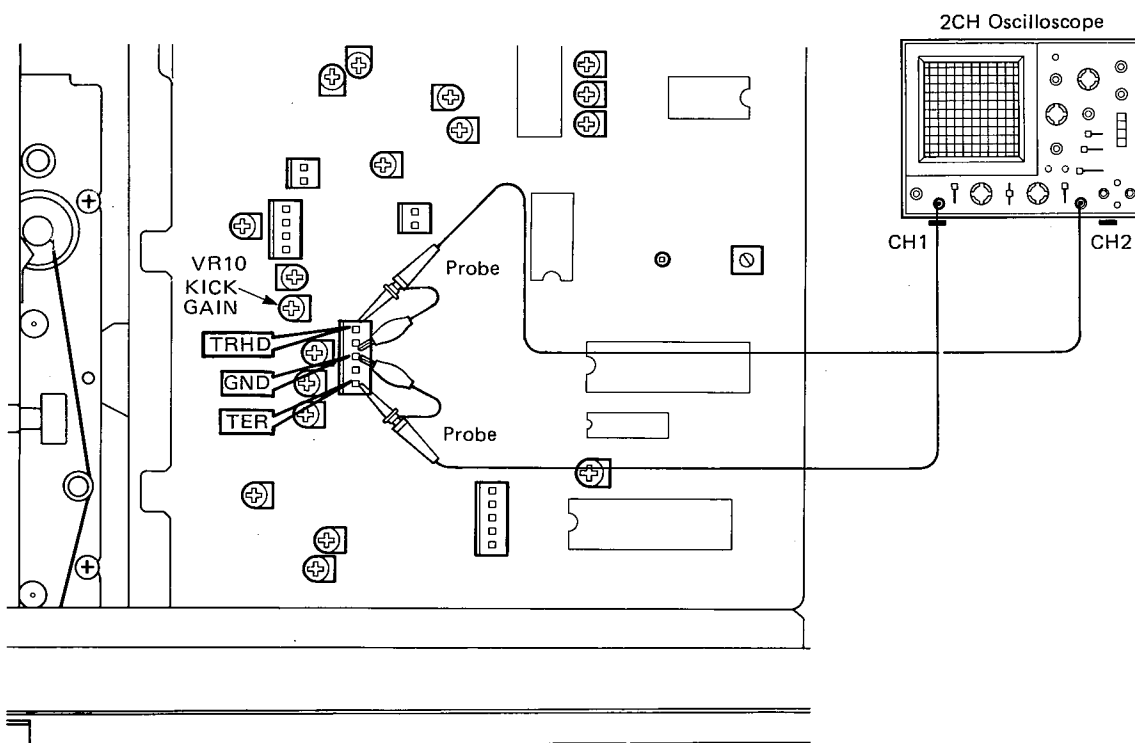


Fig. L

Confirmation of Search Mode (Step 13)

- ① Load the test disc.
- ② Press the PLAY key.
- ③ Press the Fast Forward mode key (▶▶) and confirm that the displayed time advances smoothly.
- ④ The displayed time should advance accurately and smoothly in both Fast Forward (▶▶) and Reverse (◀◀) modes.

Adjustment of AD Offset (Step 14)

- ① Connect the DC voltmeter to the PMO terminal.
- ② Load the test disc.
- ③ Set to the TEST MODE.
- ④ Press the STOP key.
- ⑤ Press the "1" key.
- ⑥ Force the head fully to the outer edge by pushing it with finger and fix it there.
- ⑦ Adjust VR9 so that the specified rating is obtained.

Rating: $E = 0V \begin{smallmatrix} +0 \\ -100 \end{smallmatrix} mV$

Adjustment of DA Offset (Step 15)

- ① Connect the DC voltmeter to AD terminal.
- ② Load the test disc.
- ③ Set to the TEST MODE.
- ④ Press the STOP key.
- ⑤ Press the "1" key.
- ⑥ Force the head fully to the outer edge by pushing it with finger and fix it there.
- ⑦ Adjust VR11 so that the specified rating is obtained.

Rating: $E = 0V \begin{smallmatrix} +0 \\ -10 \end{smallmatrix} mV$

- ⑧ In the same way as in step 14, confirm the AD offset. If "SEC" on display is less than FB (for example FB, FC, FD, FE, FF, is OK), perform the adjustment as described in step 14 again.

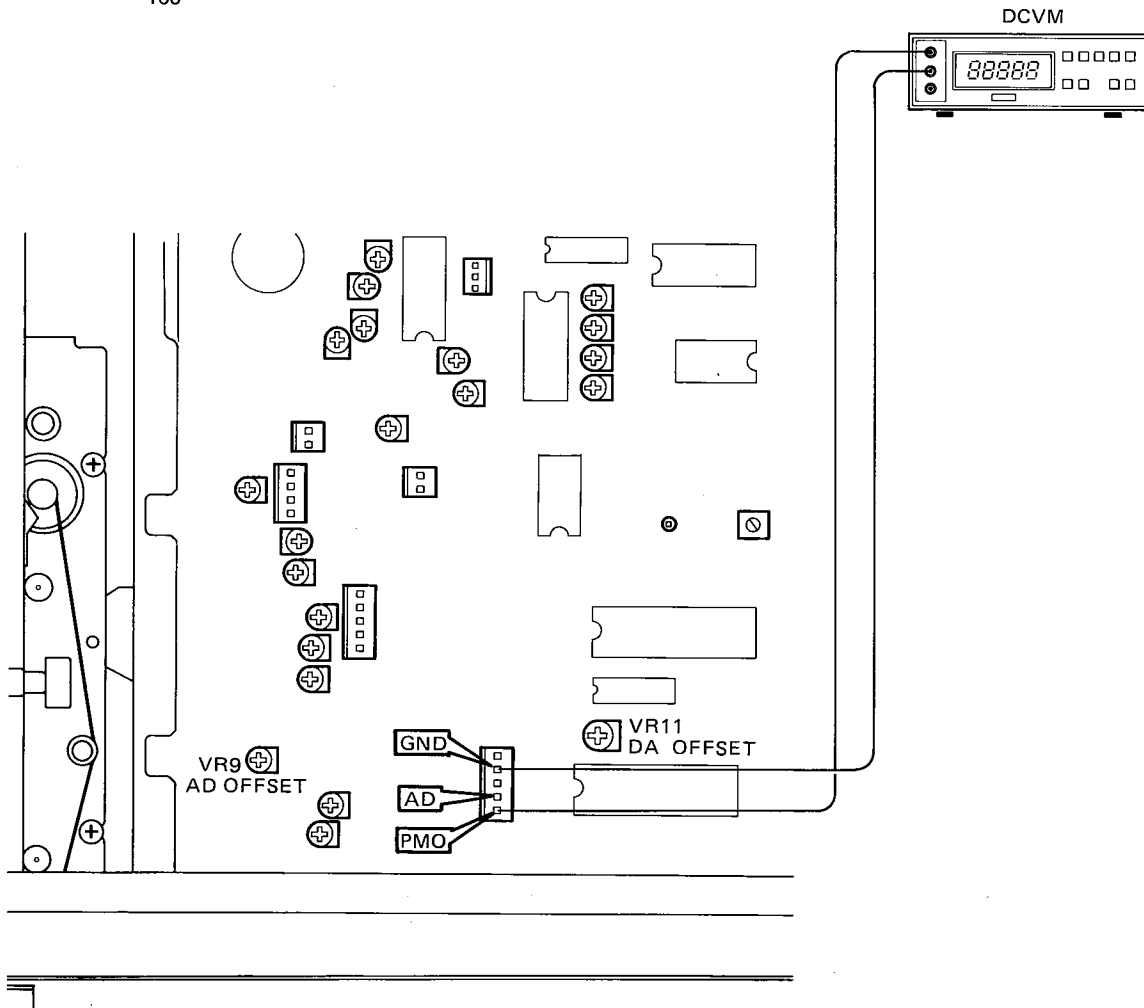


Fig. M

Adjustment of PM Gain (Step 16)

- ① Connect the DC voltmeter to the **ADO** terminal.
- ② Load the test disc.
- ③ Set to the TEST MODE.
- ④ Press the STOP key.
- ⑤ Press the "0" key.
- ⑥ Force the head fully to the inner edge by pushing it with finger and fix it there.
- ⑦ Adjust VR4 so that the specified rating is obtained.

Rating: $E = 0V \pm 100 \text{ mV}$

Adjustment of AD Gain (Step 17)

- ① Load the test disc.
- ② Set to the TEST MODE.
- ③ Carry out ④ to ⑥ of Step 16.
- ④ Adjust VR5 to the position where the "SEC" of the display changes from 01 to 00.

Confirmation of FG pulse (Step 18)

- ① Connect the oscilloscope and frequency counter to the **FGP** terminal.
- ② Load the test disc.
- ③ Set to the TEST MODE.
- ④ Press the OPEN/CLOSE key.
- ⑤ Press the PLAY key.
- ⑥ Check to ensure that the pulse (square wave) is generated. (varies depending on disc position)

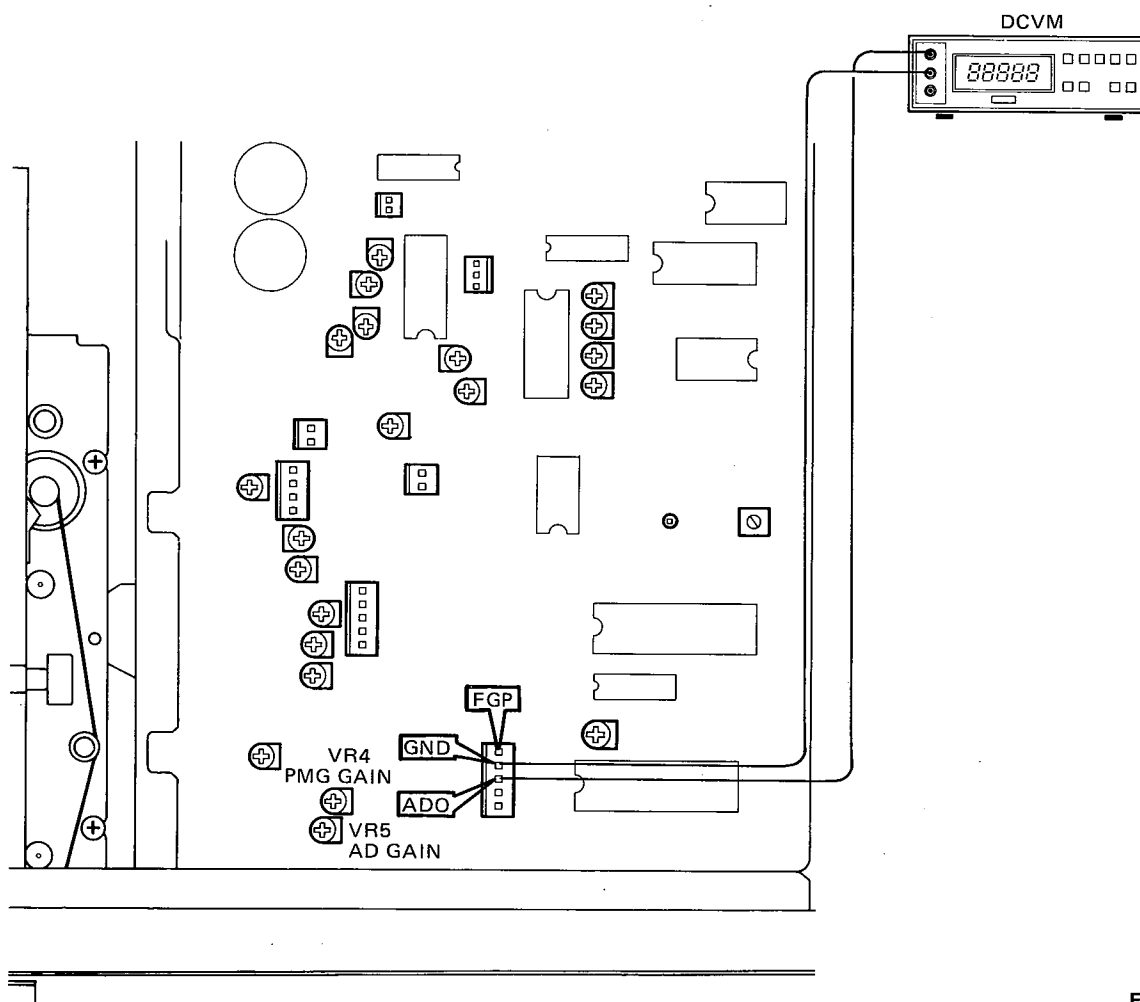
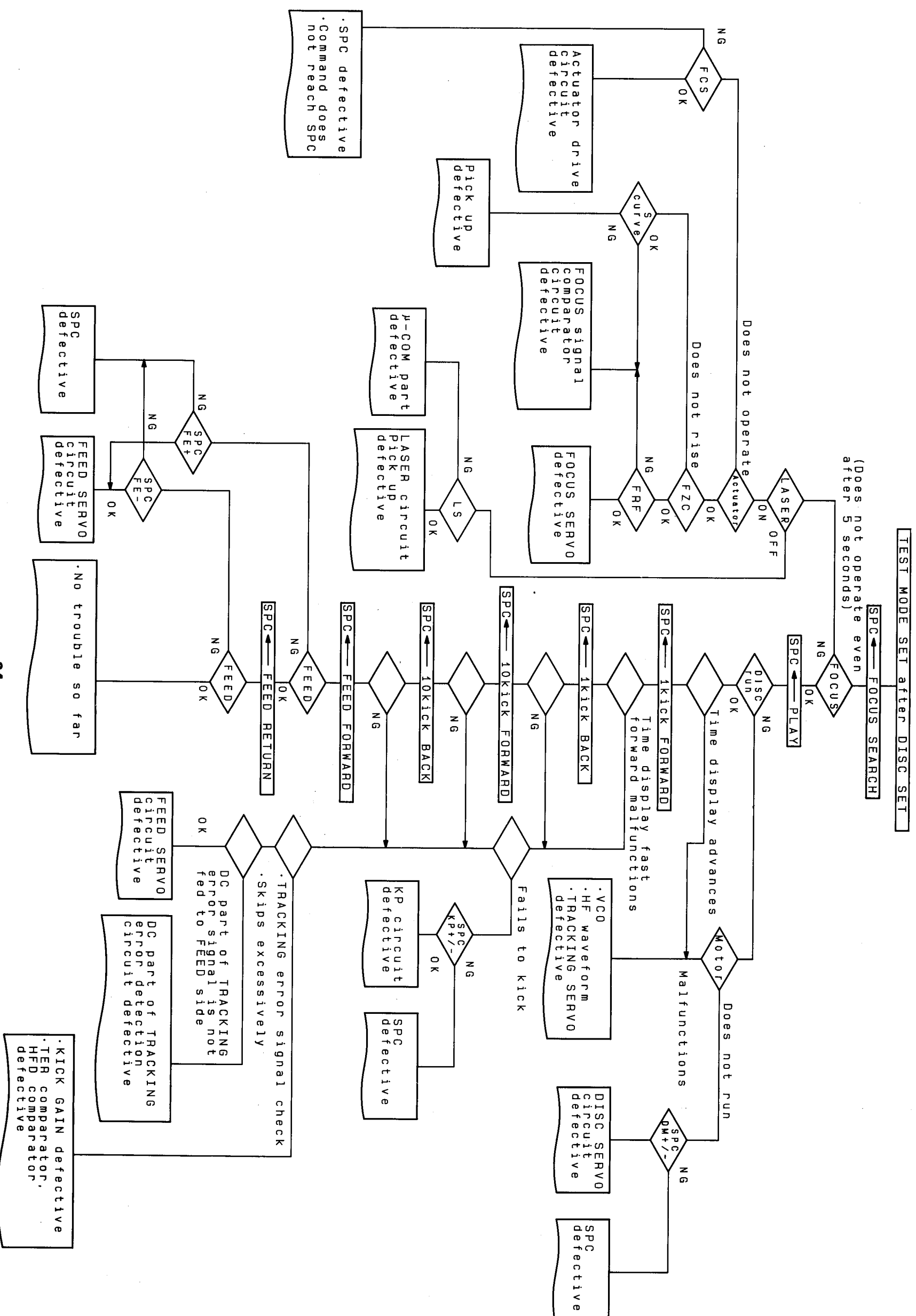
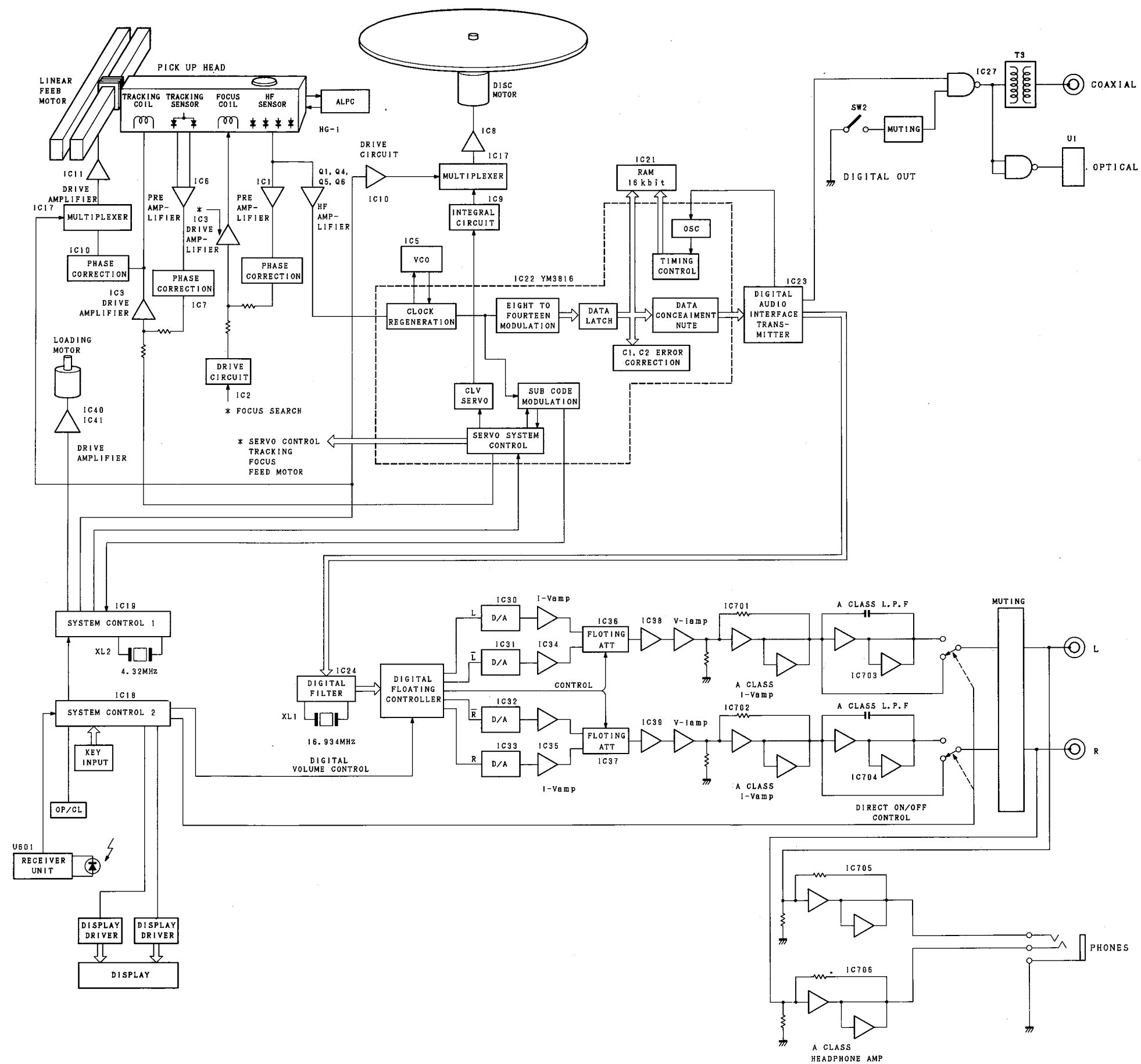


Fig. N

- Example of how to use TEST MODE for diagnosing a cause when LEAD IN or PLAY fails
- * SPC→X represents that COMMAND X is transferred to SPC by pressing the key corresponding to SPC COMMAND X.



■ BLOCK DIAGRAM



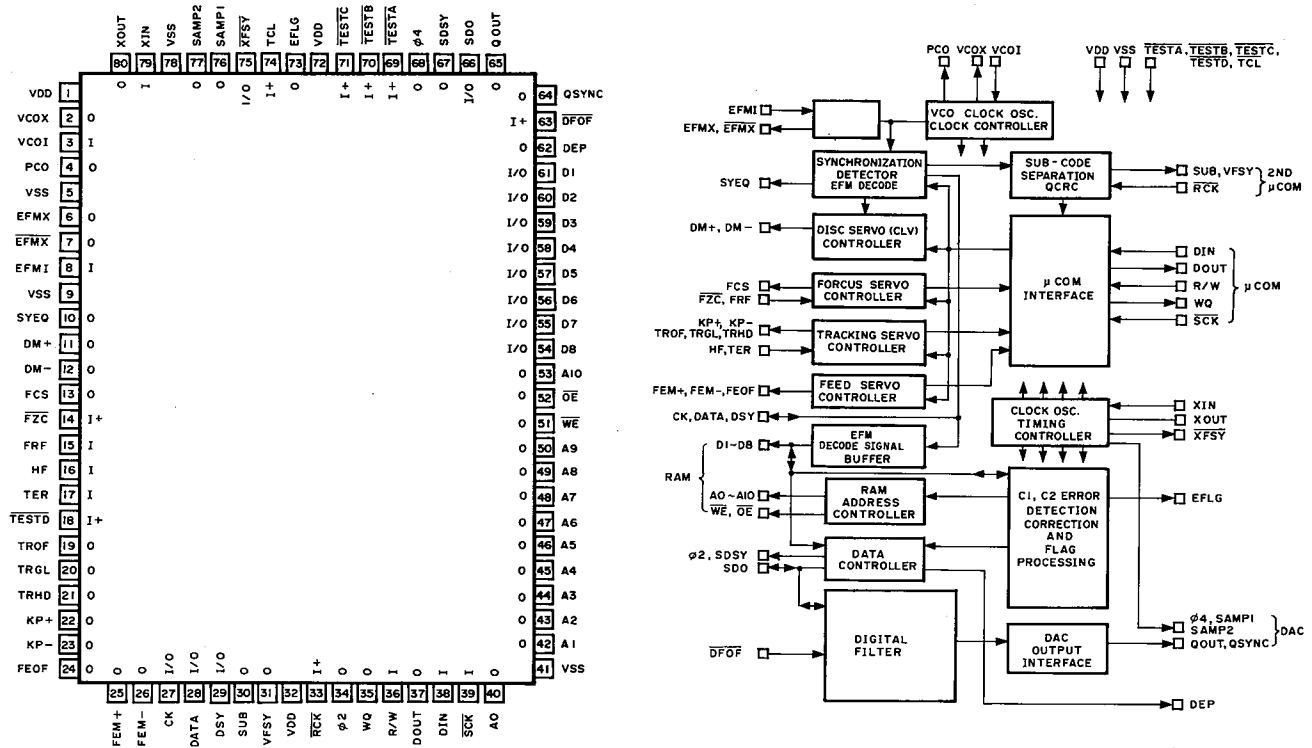
IC DATA

IC22: YM3616

Signal Processor & Controller

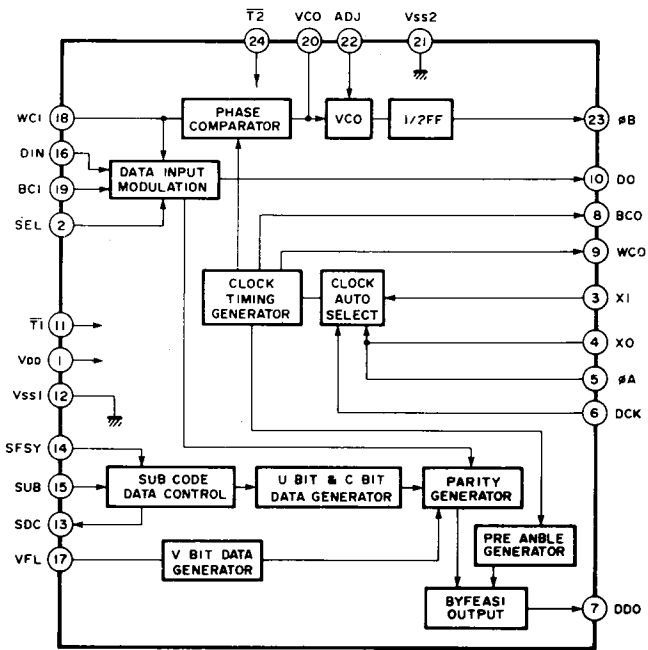
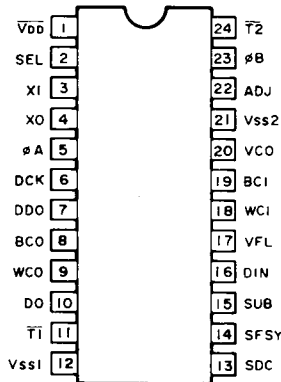
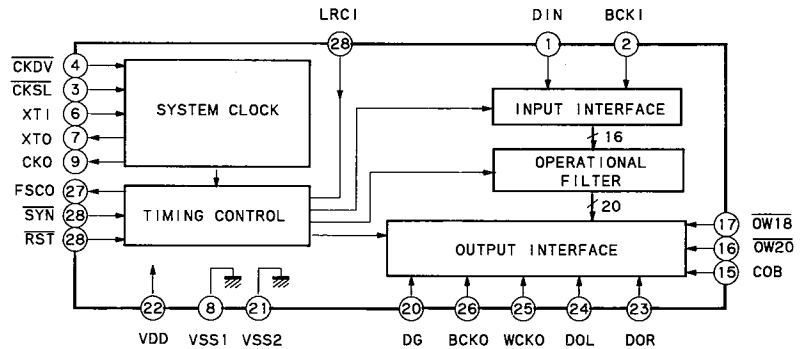
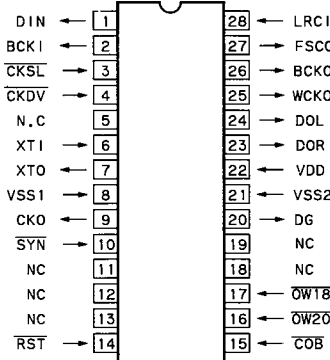
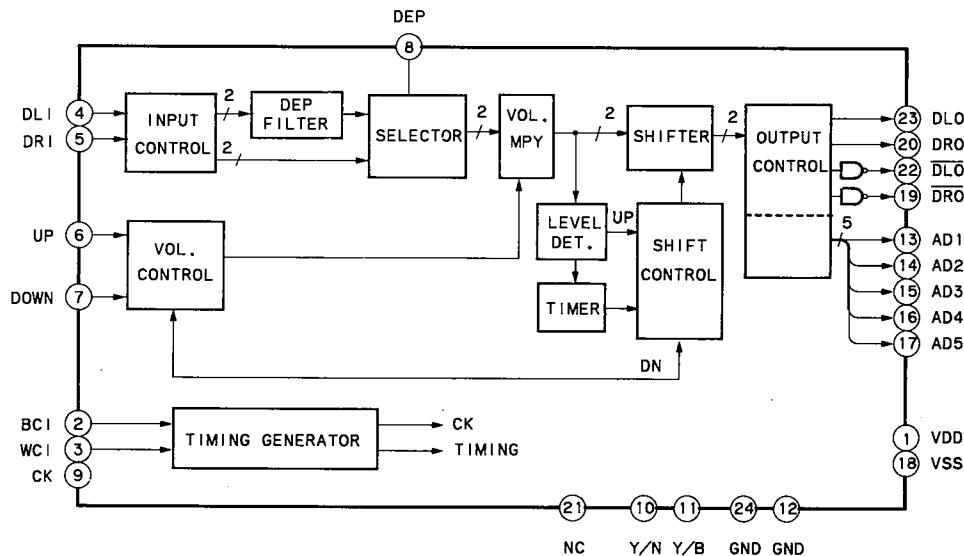
YM3616 is a CMOS LSI for signal processing and servo control of the compact disc player.

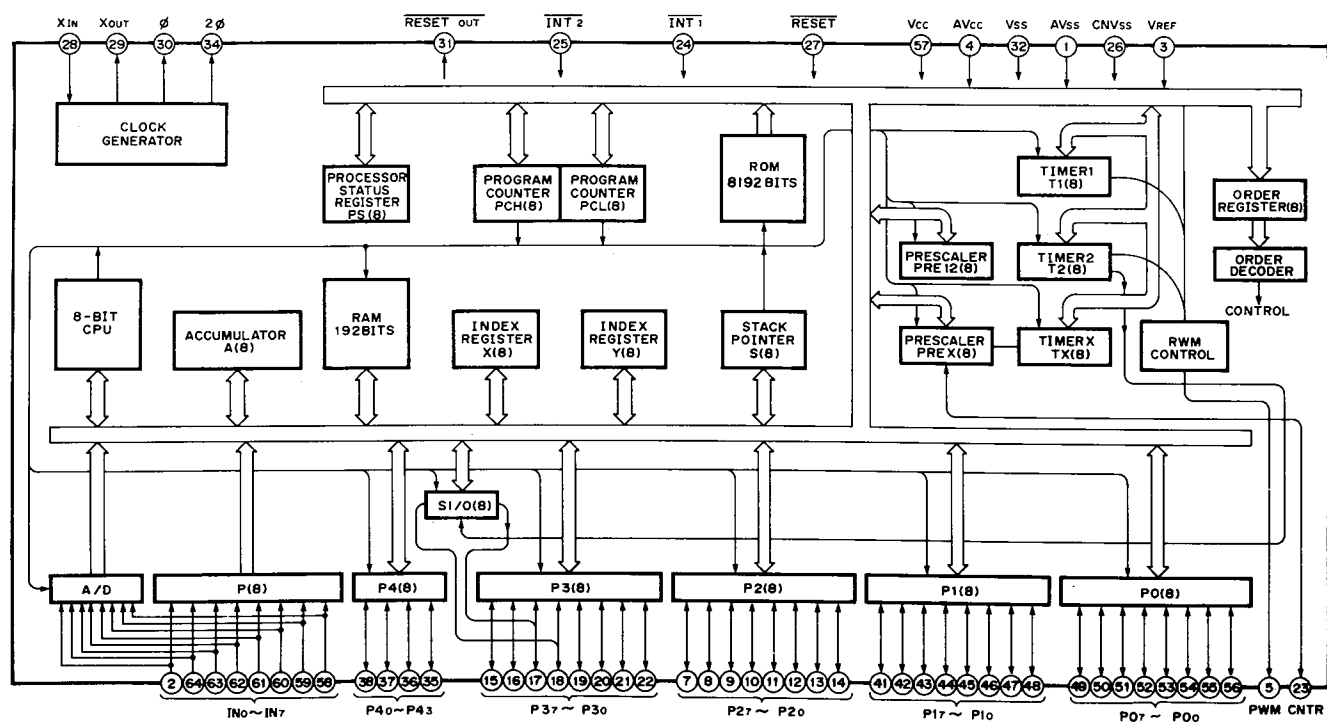
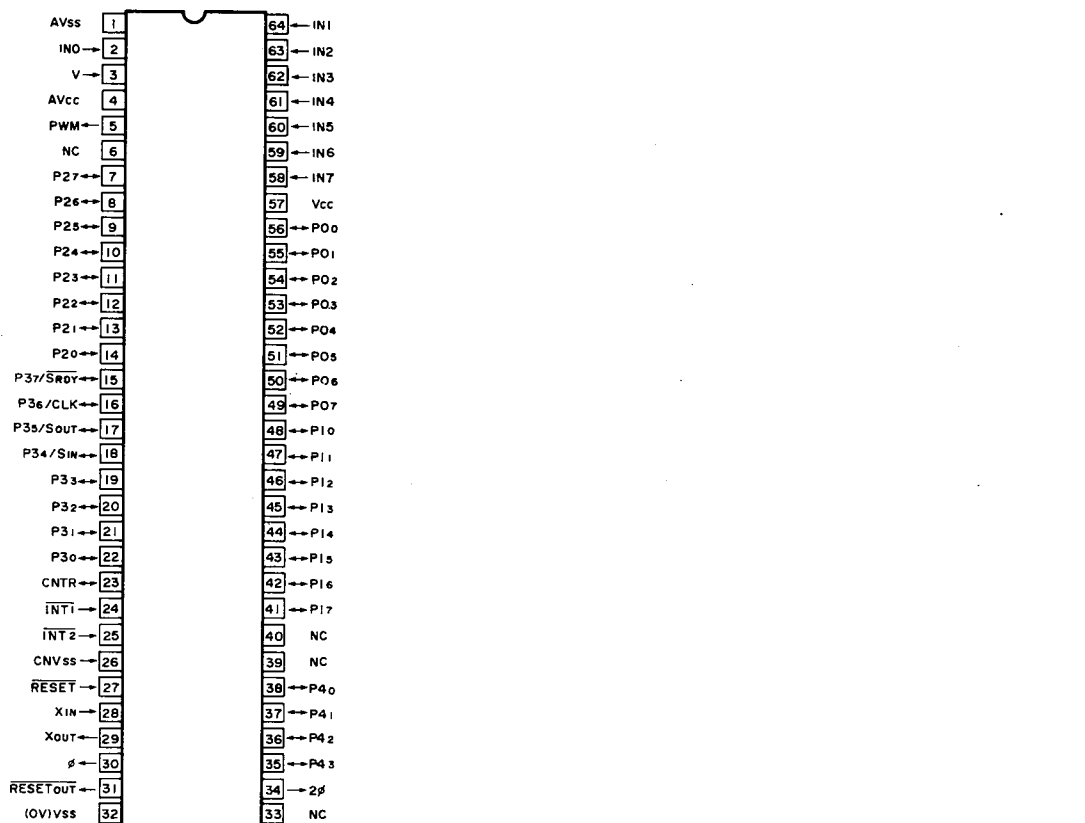
It executes such signal processing as demodulation of the EFM signal from the optical pick-up, detection and correction of the erroneous signal and digital filtering which helps to improve the sound quality, as well as such intelligent servo controlling as focus, disc, tracking and feeding.



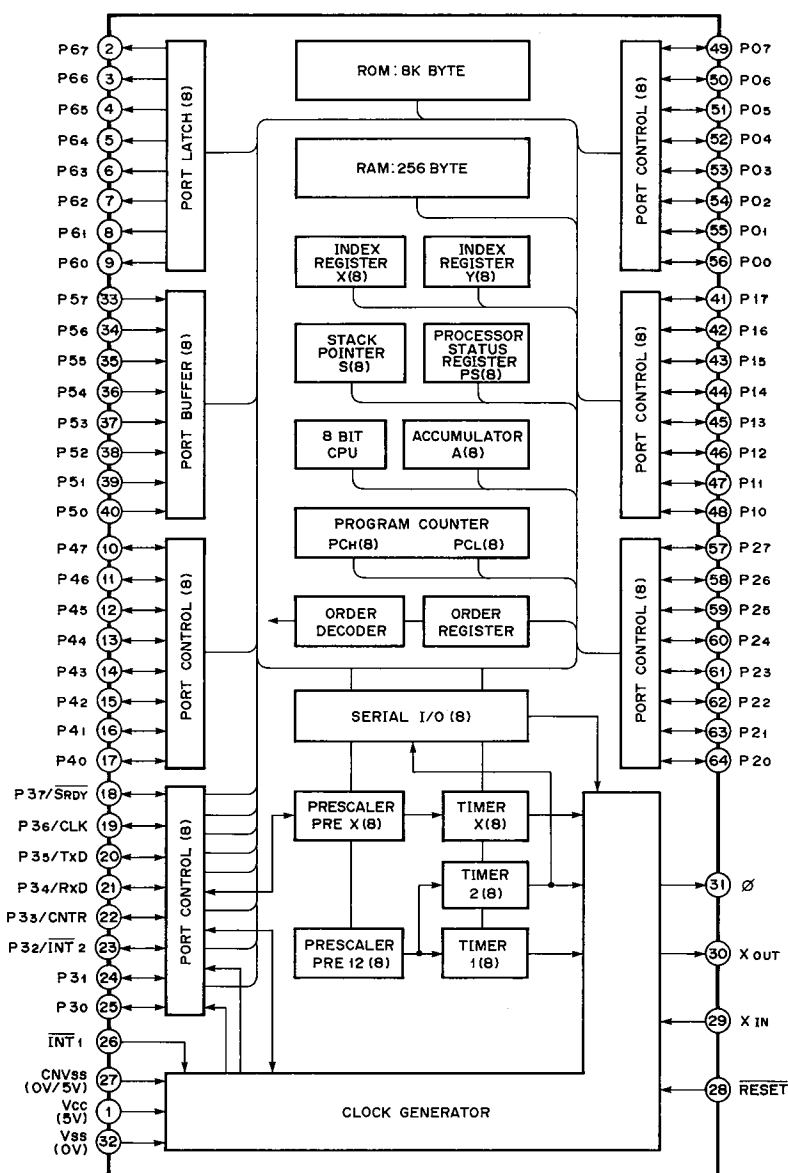
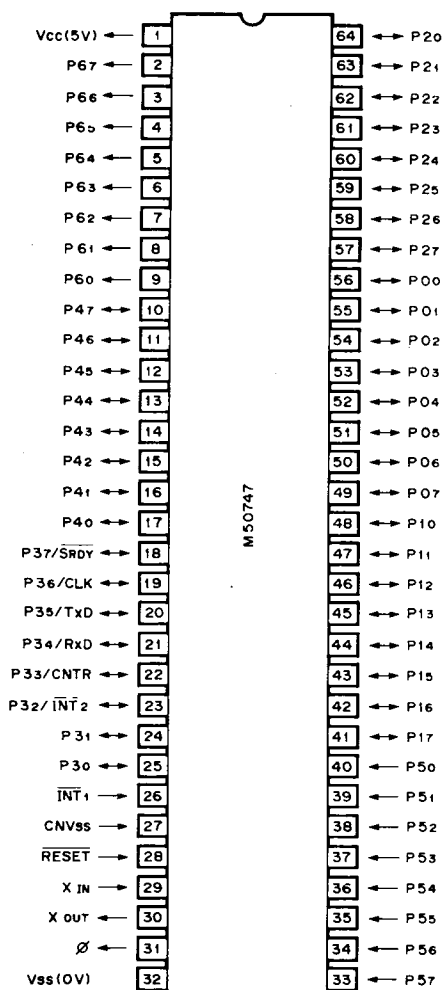
Pin No.	Pin Name	I/O	Function
1	VDD		Power Supply
2	VCOX	O	Clock Playback Circuit 4PCO
3	VCOI	I	
4	PCO	O	
5	VSS		GND
6	EFMX	O	EFM Signal External Circuit
7	EFMX	O	
8	EFMI	I	
9	VSS		GND
10	SYEQ	O	Synchronized Uniform Signal
11	N.C.		Not Use
12	DM	O	Disc Servo { LOW (0V): FORWARD OPEN (2.5V): STOP HIGH (5V): REVERSE
13	FCS	O	Focus Servo System Input
14	FZC	I	
15	FRF	I	
16	HF	I	Tracking Servo System Input
17	TER	I	
19	TRGF	O	
20	TRGL	O	
21	TRHD	O	
22	KP	O	
			{ LOW (0V): REW OPEN (2.5V): STOP HIGH (5V): FF

Pin No.	Pin Name	I/O	Function
23	CK		EFM Demodulated Signal Check Output (4.3218MHz, clock)
24	FEOF	O	
25	FEM+	O	Feed Servo System
26	FEM-	O	
23	CK	I/O	EFM Demodulated Signal Check Output (4.3218MHz clock)
27	DATA	I/O	
28	DSY	I/O	Sub-code Output
29	SUB	O	
30	VFSY	O	
31	RCK	I	Power Supply
32	VDD		
33	NC	I	Not Use
34	$\phi 4$		4.3218 MHz Clock
35	WQ	O	Q Code Output System
37	DOUT	O	
36	R/W	I	
39	SCK	I	
38	DIN	I	Q code Output Data I/O Control Signal Clock for Data I/O Data I/O from μ COM } μ COM Command
41	VSS		
40	A0	O	RAM Connections
42	A1	O	
43	A2	O	
44	A3	O	
45	A4	O	
46	A5	O	
47	A6	O	
48	A7	O	
49	A8	O	
50	A9	O	
51	WE	O	
52	OE	O	
53	A10	O	
54	D8	I O	
55	D7	I O	
56	D6	I O	
57	D5	I O	
58	D4	I O	
59	D3	I O	
60	D2	I O	
61	D1	I O	
62	DEP	O	Deemphasis Signal
63	DTFLG	O	Data Error Signal
66	SDO	O	Digital Data Output LSB first/MSB first
67	SDSY	O	
68	$\phi 2$	O	2.1659MHz Clock
69	L/M	I	
71	TESTC	I	SB first (H)/MSB first (L) Switch for SDO
64	NC	O	Test Terminal
65	SDSYMD	O	Not Use
76	SAMPR	O	BB Word Clock for DAC
77	SAMPL	O	
34	$\phi 4$	O	Digrich Signal
18	TESTD	I	
70	TESTB	I	4.3218MHz Clock
74	TCL	I	
72	VDD		Power Supply
73	EFLG	O	C1, C2 Error Correction Check Signal
75	XFSY	I/O	Synchronized Clock Signal
78	VSS		GND
79	XIN	I	Clock Oscillation
80	XOUT	O	

IC23: YM3613B**Digital Audio Interface Transmitter (DIT)****IC24: SM5813****Digital Filter****IC25: YM6055C****FDP**

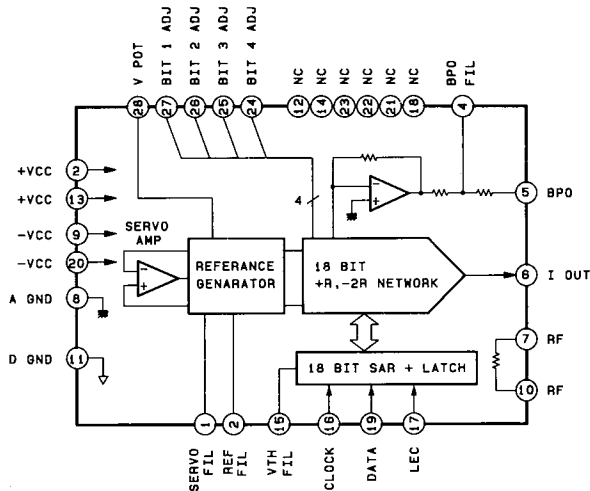
IC18: M50943-401SP
 8 bit μ -COM


Pin No.	Pin Name	I/O	Function
1	Vss		GND
2	AD	I	AD (PM detect)
3			} +5V
4			
5			} N.C.
6			
7		O	} 8 bit D/A Converter (Feed motor drive data)
8		O	
9		O	
10		O	
11		O	
12		O	
13		O	
14		O	
15	FGP	I	DM FG pulse detect
16	CLK	I	} SPC Interface
17	SO	O	
18	SI	I	
19	RW	O	
20	WQ	I	
21	DMC	O	DM Servo select
22	FMC	O	FM Servo select
23	TCK	I	Track count
24			} GND
25			
26	CNVss		
27	RES	I	RESET
28	XIN	I	} Clock (4.32 MHz)
29	XOUT	O	
30			} N.C.
31			
32	Vss		GND
33			} N.C.
34			
35	TRGH	O	Tracking Servo Gain Control
36	TO	I	TRAY OUT SW
37	PLY	O	PLAY
38	LS	O	LASER ON/OFF
39			} N.C.
40			
41	FI	I	FLAPPER IN SW
42	FO	I	FLAPPER OUT SW
43	DCLK	I	DISPLAY DATA CLK
44	DS	I	} DISPLAY DATA START
45	D3	I	
46	D2	I	
47	D1	I	
48	D0	I	
49	DM-	O	} Disc motor control
50	DM+	O	
51	KP-	O	} Kick gain control
52	KP+	O	
53	FP-	O	} Flapper control
54	FP+	O	
55	TY-	O	} Tray motor control
56	TY+	O	
57	Vcc		+5V
58	TI	I	TRAY IN SW
59	Ki 5	I	} KEY input
60	Ki 4	I	
61	Ki 3	I	
62	Ki 2	I	
63	Ki 1	I	
64	Ki 0	I	

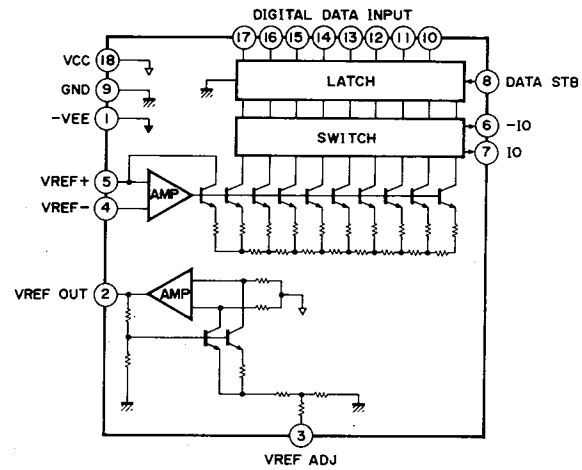
IC19: M50747-164SP or M50747E-401SP
 8 bit μ -COM


Pin No.	Pin Name	I/O	Function
1	Vcc		+5V
2	KO 5	O	KEY output line
3	KO 4	O	
4	KO 3	O	
5	KO 2	O	
6	KO 1	O	
7	KO 0	O	
8			N.C.
9			
10			
11			
12			
13			
14	UP	O	VOLUME control UP DOWN
15	DN	O	
16	LPF	O	Filter ON/OFF
17	INH	O	LCD Display drive interface
18			
19	CLK	O	
20	DATA	O	
21			
22	CLK	O	
23	CE 1	O	Remote Control
24	CE 2	O	
25		I	GND
26	REMO	I	
27	CNV _{ss}		Reset
28	RES	I	Clock
29	XI	I	N.C.
30			
31			GND
32	VS		
33	K3	I	KEY input line
34	K2	I	
35	K1	I	
36	K0	I	
37			N.C.
38			
39			
40			
41	G9	O	KEY scan output
42	G7	O	
43	G6	O	
44	G5	O	
45	G4	O	
46	G3	O	
47	G2	O	
48	G1	O	
49			N.C.
50			
51			
52			
53			
54			
55			
56			
57	Di 3	O	DISPLAY DATA START
58	Di 2	O	
59	Di 1	O	
60	Di 0	O	
61	DIS	O	
62	DCLK	O	DISPLAY DATA CLK
63	DEP	I	Deemphasis
64	BAK	I	Backup detect

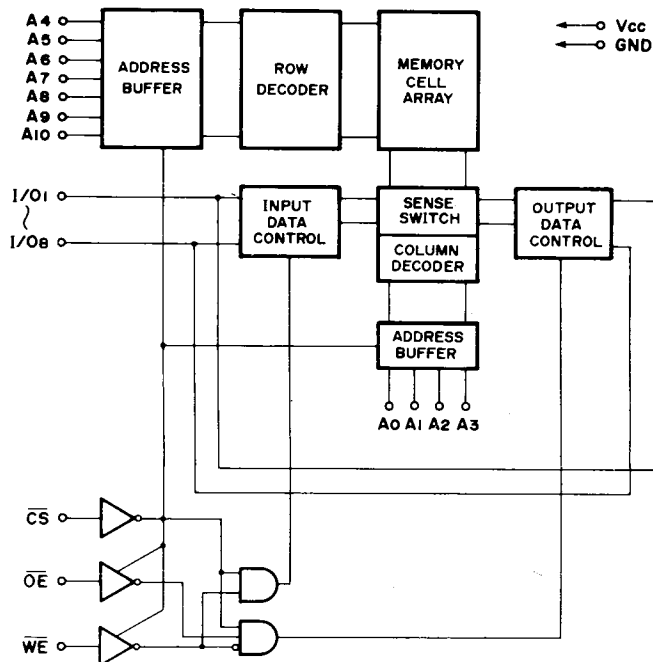
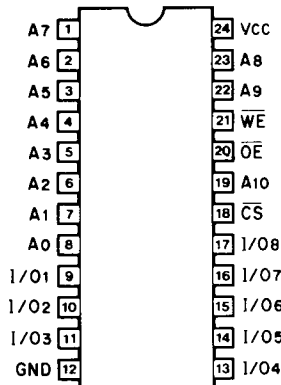
IC30 ~ 33: PCM58PJ
18 bit D/A Converter



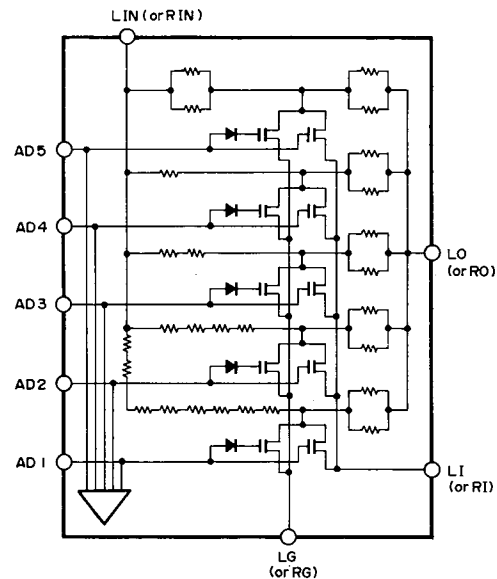
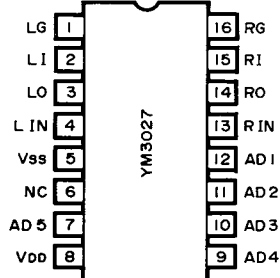
IC20: BA9201
8 bit D/A Converter



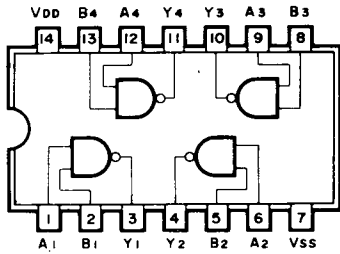
IC21: CJK5816PS or LC3517B-15
2048 – Word x 8 bit Static RAM



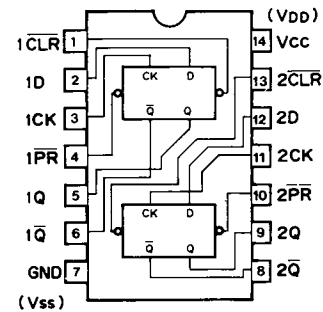
IC36, 37: YM3027
Floating Sample Hold



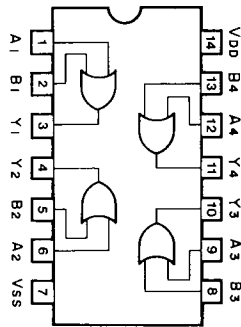
IC15: TC4011BP
IC27: TC74HC00P
 Quad 2-Input NAND Gate



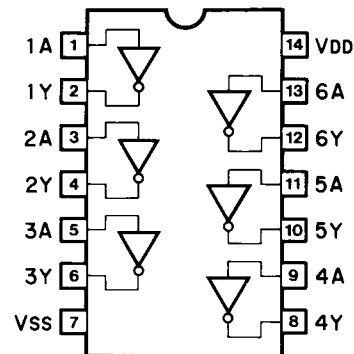
IC14, 29: TC74HC74P
 Dual D-Type Flip-Flop



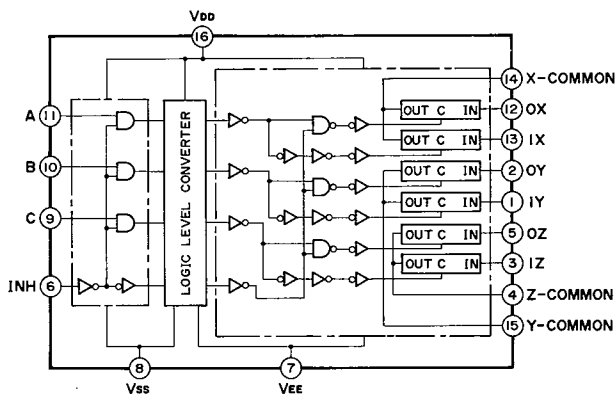
IC16: TC4071BP
 Quadruple 2-Input OR Gate



IC13: TC4069UBP
 Hex Inverter



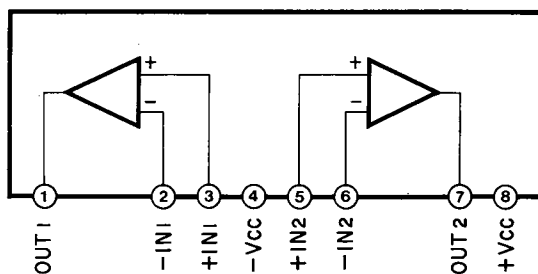
IC17: TC4053BP or NJM4053BD
 Triple 2 channel Multiplexer/Demultiplexer



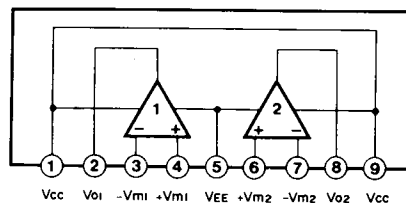
CONTROL INPUTS				"ON" CHANNEL
INHIBIT (Pin 6)	C (Pin 9)	B (Pin 10)	A (Pin 11)	OX (Pin 12), OY (Pin 2), OZ (Pin 5) 1X (Pin 13), 1Y (Pin 1), 1Z (Pin 3)
L	L	L	L	0X, 0Y, 0Z
L	L	L	H	1X, 0Y, 0Z
L	L	H	L	0X, 1Y, 0Z
L	L	H	H	1X, 1Y, 0Z
L	H	L	L	0X, 0Y, 1Z
L	H	L	H	1X, 0Y, 1Z
L	H	H	L	0X, 1Y, 1Z
L	H	H	H	1X, 1Y, 1Z
H	*	*	*	NOTE

* Don't Care

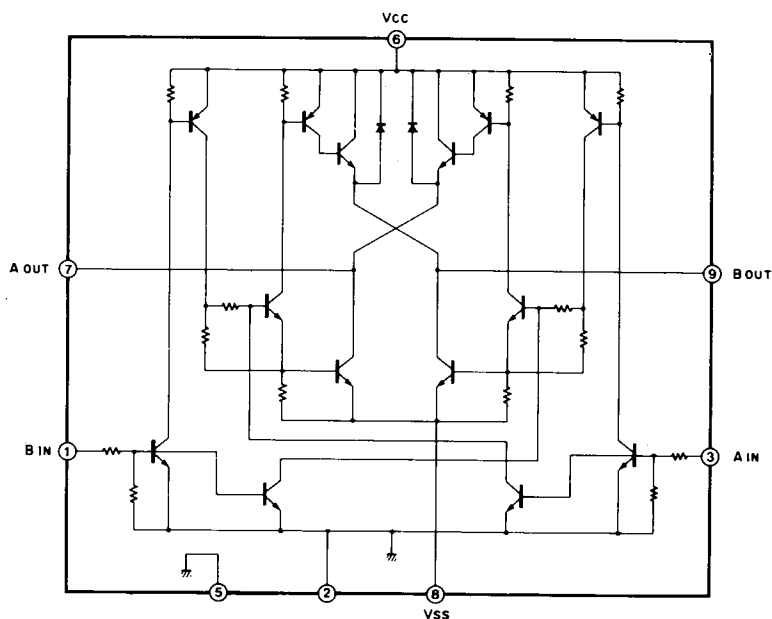
IC6: M5238L
IC705, 706: M5218L
Dual Ope-Amp



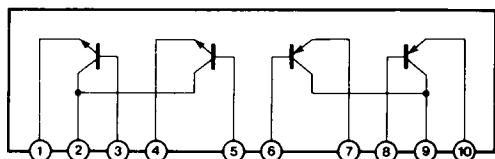
IC1, 2, 7 ~ 12: NJM4558S, BA715 or AN6551
IC4, 5: NJM2043S
IC34, 35, 38, 39, 701 ~ 704: NJM5532S
Dual Ope-Amp



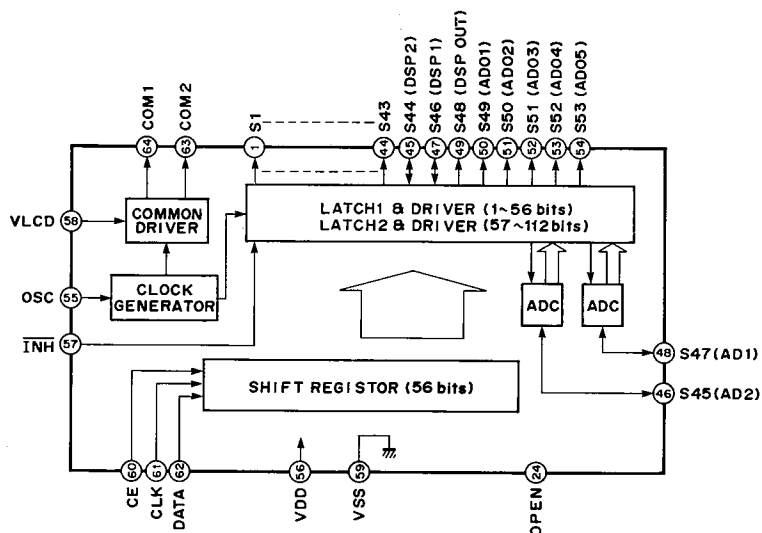
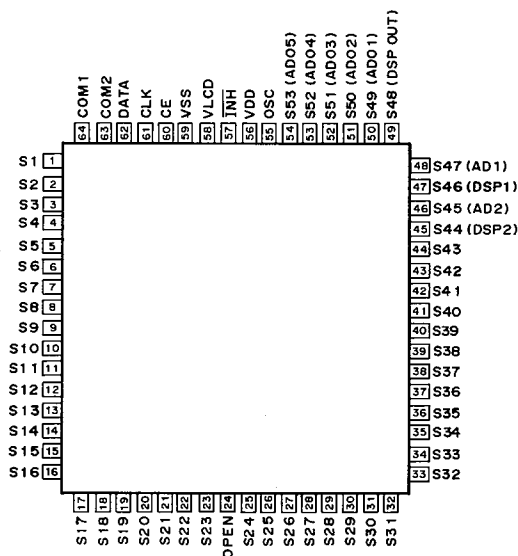
IC40, 41: BA6218
Motor Driver



IC3: STA451C
Transistor Array

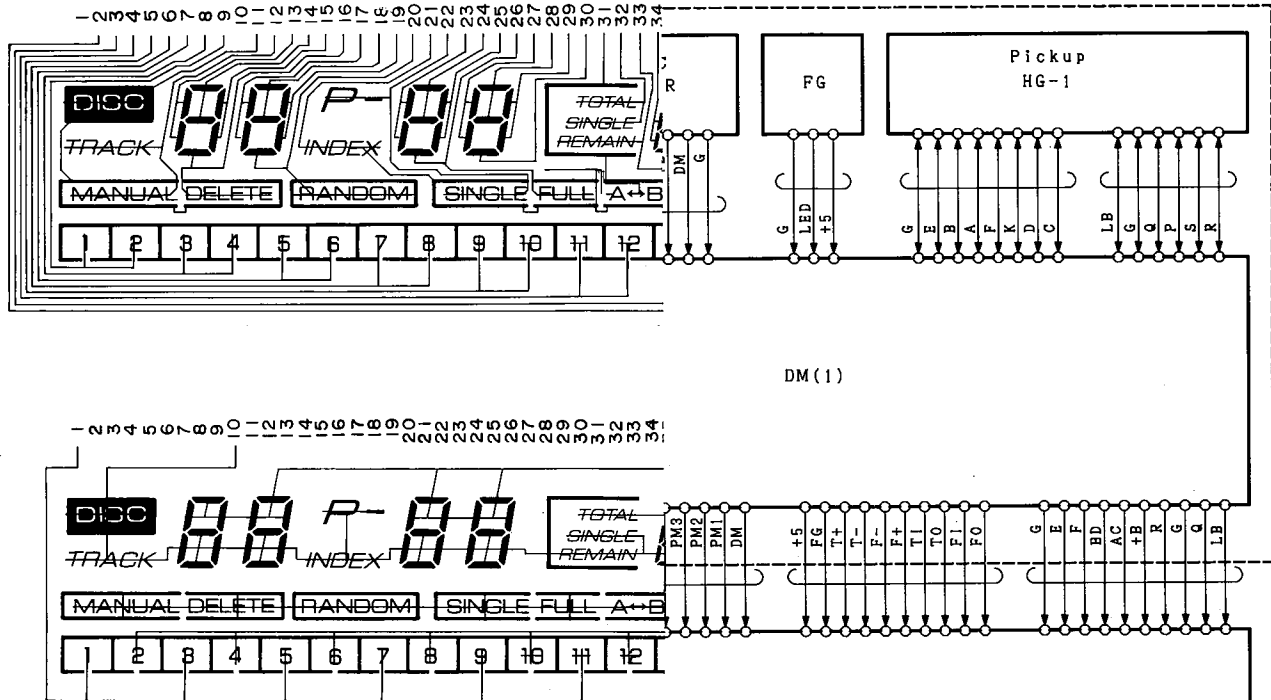


IC601, 602: LC7582
LCD Driver



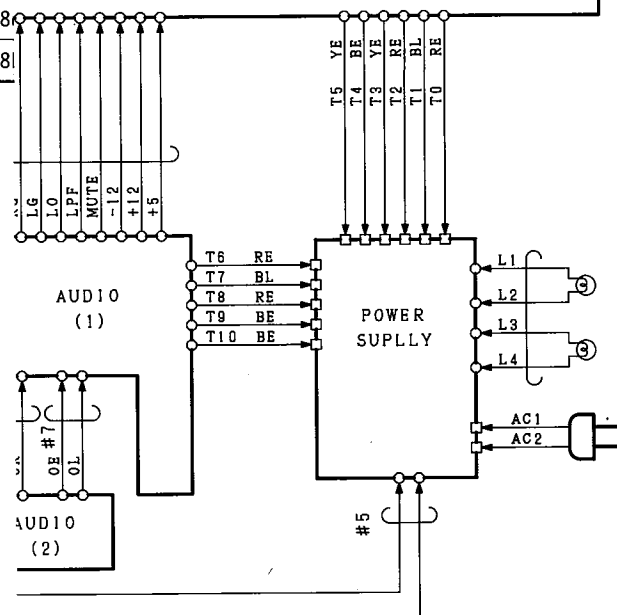
LCD DATA

M

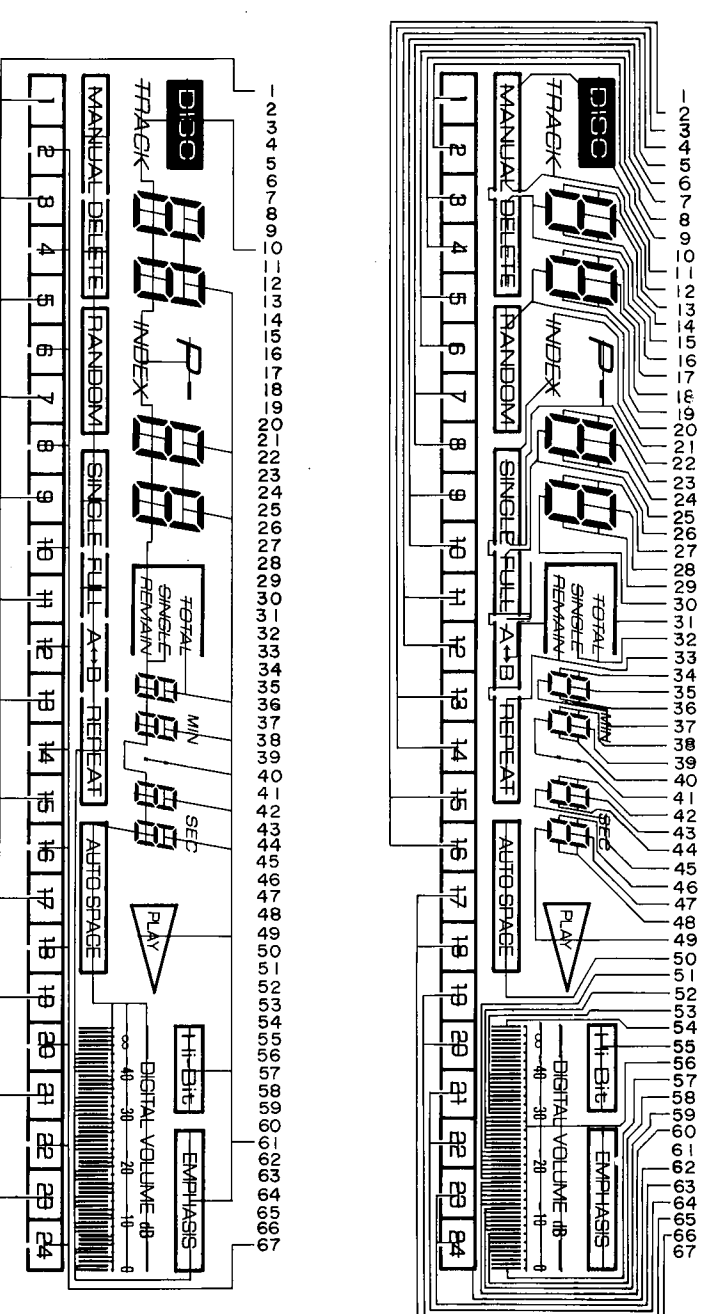


NO.	1	2	3	4	5	6	7	8	9	62	63	64	6
COM1	COM	15	13	11	9	7	5	3	1	—	23	21	1
COM2	—	16	14	12	10	8	6	4	2	*4	24	22	2
NO.	10	11	12	13	14	15	16	17	18	19	20	21	2
COM3	COM	DISC	TRACK	1e	1g	1c	1d	2e	2g	2c	2d	INDEX	P
COM4	—	*1	MANUAL	1f	1a	1b	DELETE	2f	2a	2b	RAM DOM	*2	SING
NO.	36	37	38	39	40	41	42	43	44	45	46	47	4
COM3	5c	5d	6e	6g	6c	6d	7e	7g	7c	7d	8e	8g	8
COM4	5b	MIN	6f	6a	6b	COL	7f	7a	7b	SEC	8f	8a	8

- *1: ☐ (MANUAL,DELETE)
 *2: ☐ (SINGLE,FULL,A↔B,REPEAT)
 *3: — DIGITAL VOLUME dB —,∞……………0
 *4: ☐ (1……………24)



■ LCD DATA

[illegible]

*1: ☐ (MANUAL,DELETE)

*2: ☐ (SINGLE,FULL,A $\leftrightarrow$ B,REPEAT)

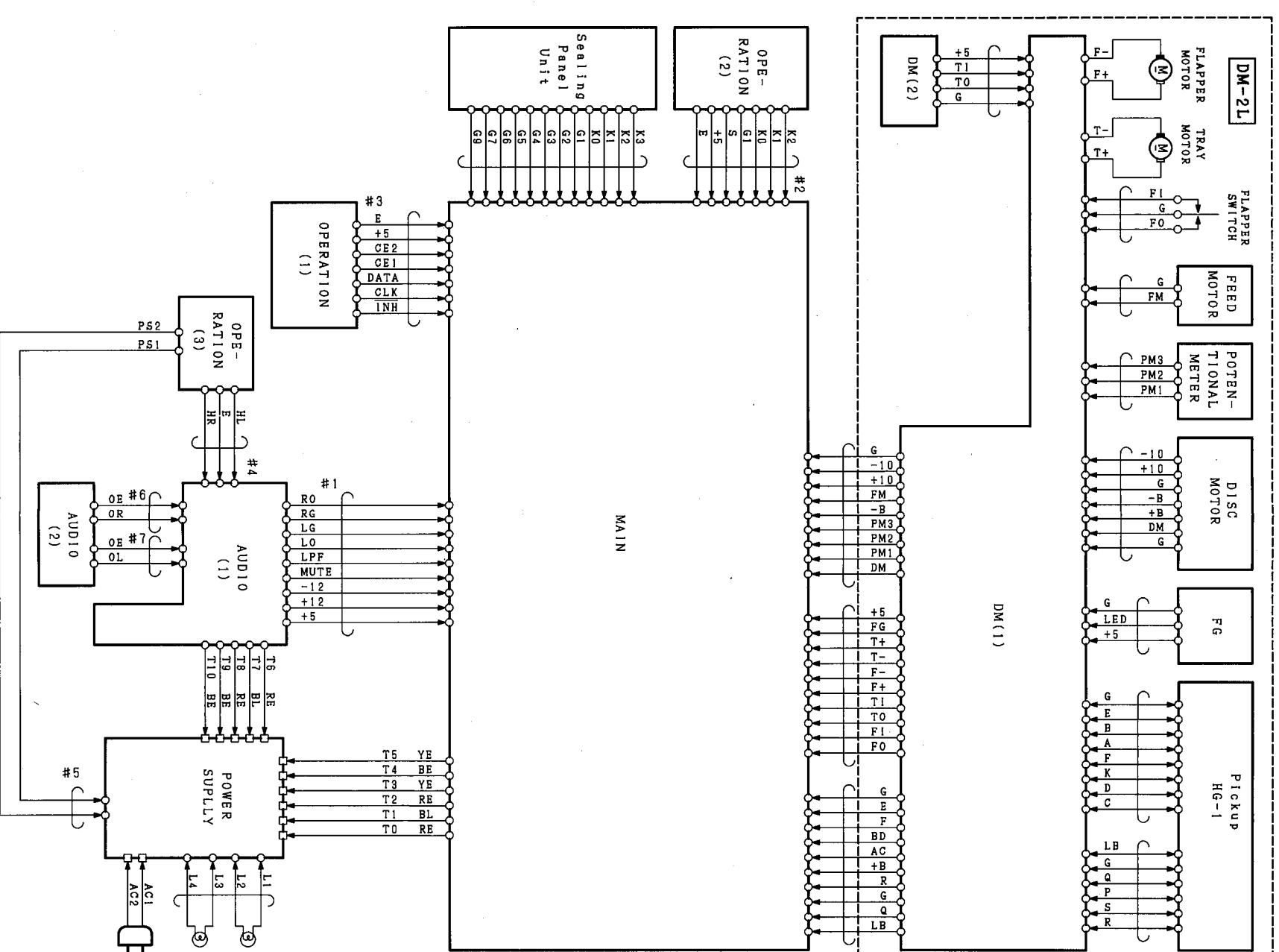
*3:— DIGITAL VOLUME dB ———,∞.....0

*4:

--	--	--	--	--	--	--	--

 (1.....24)

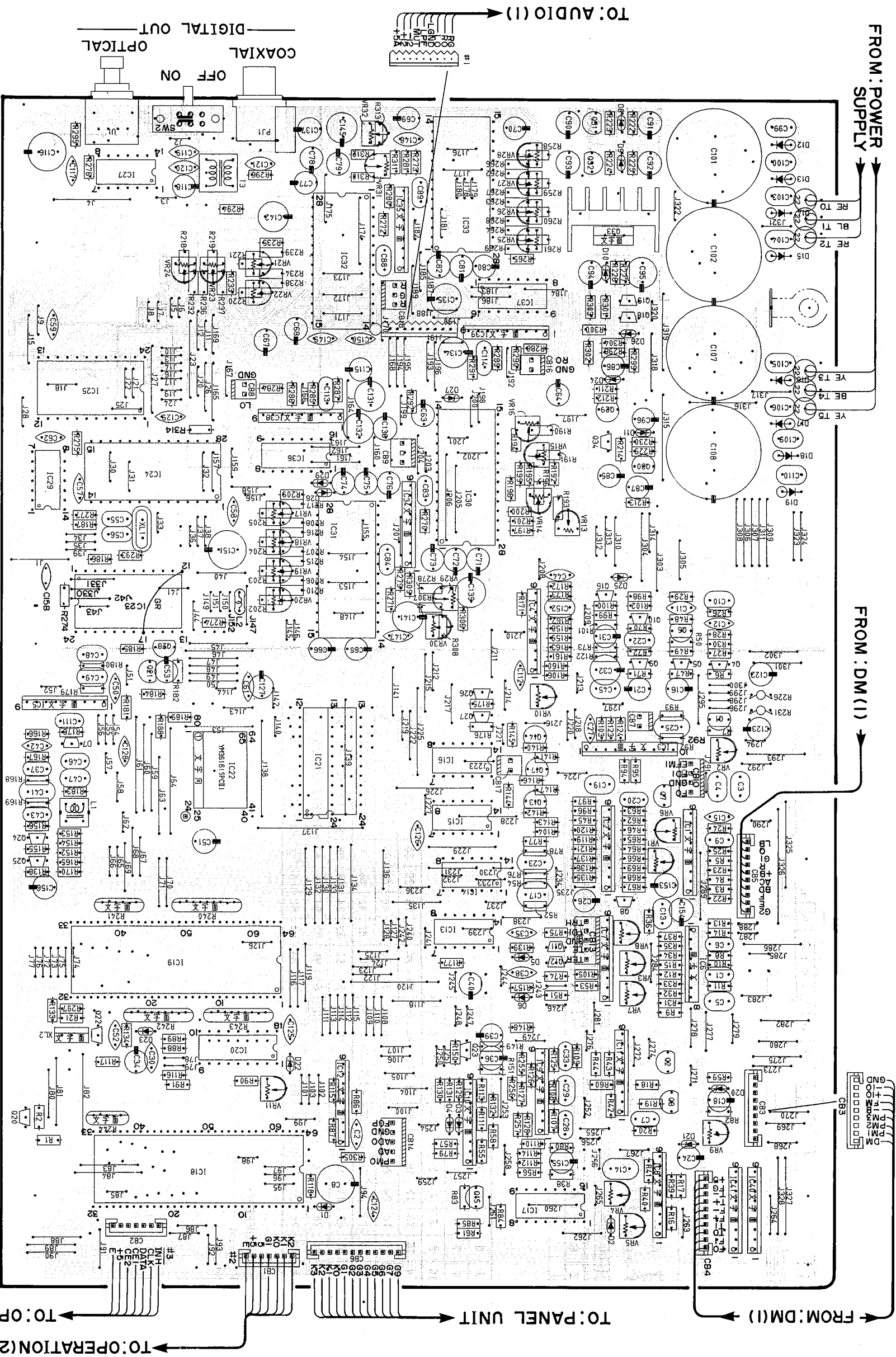
■ INTERCONNECT WIRING DIAGRAM



PRINTED CIRCUIT BOARD (Foil side)

(Note) 文字面 : Component side

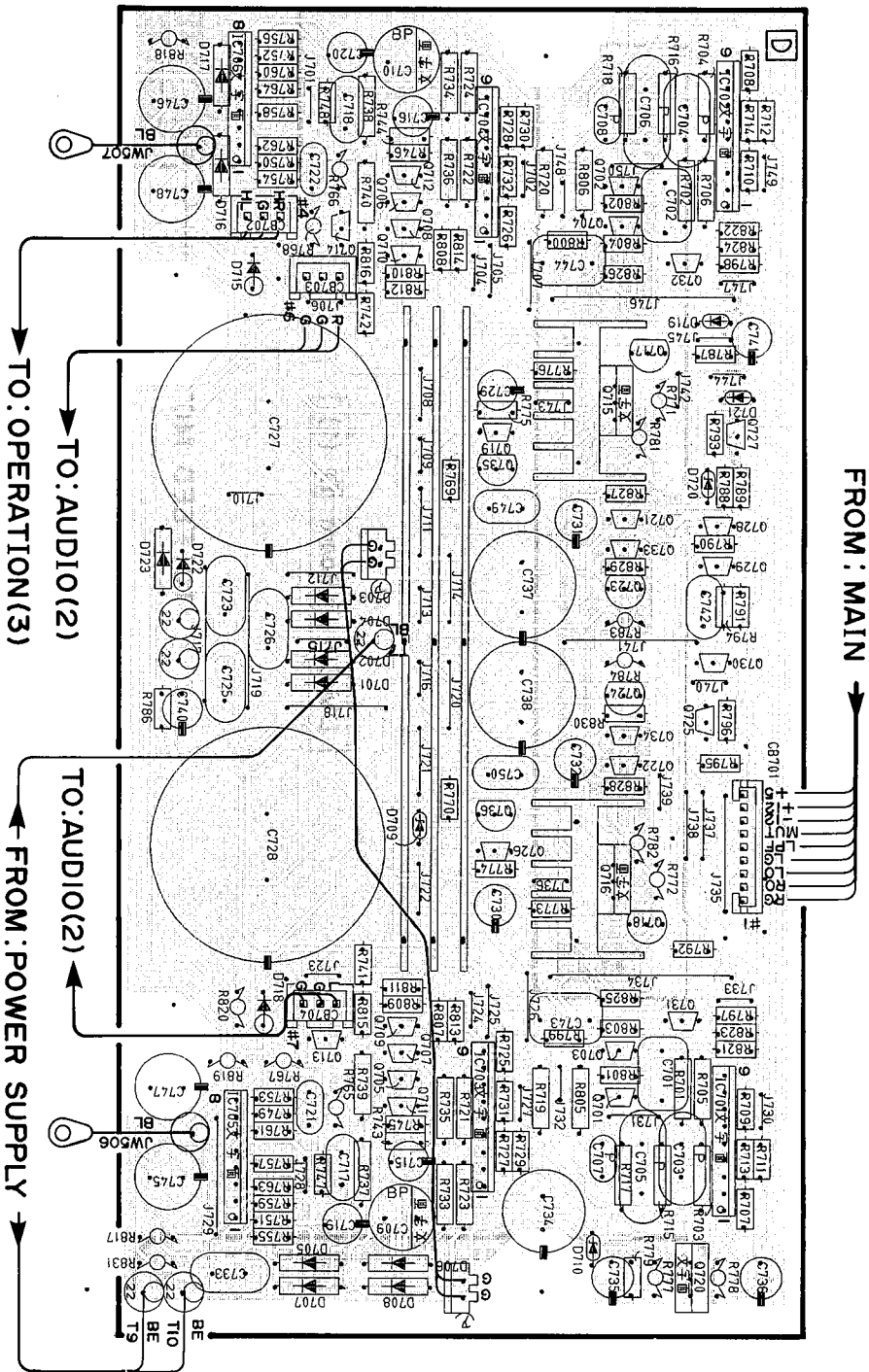
Main Circuit Board



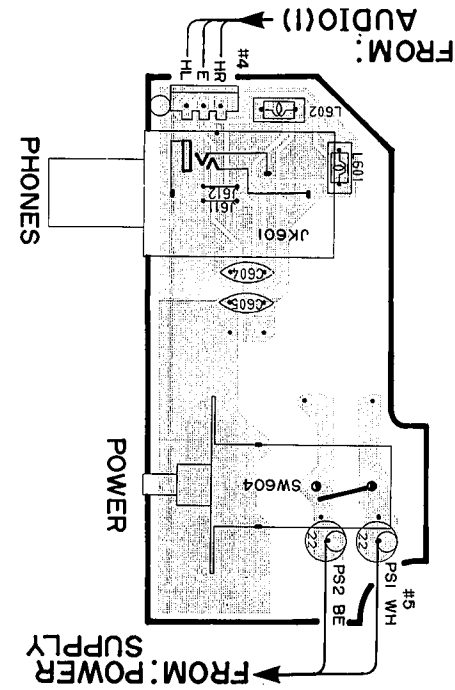
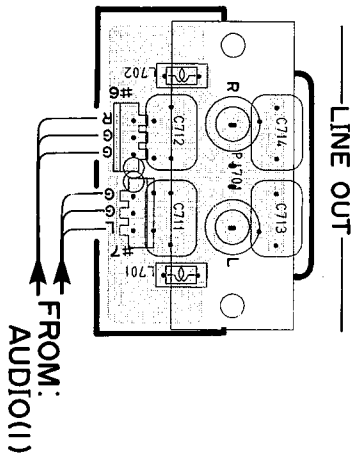
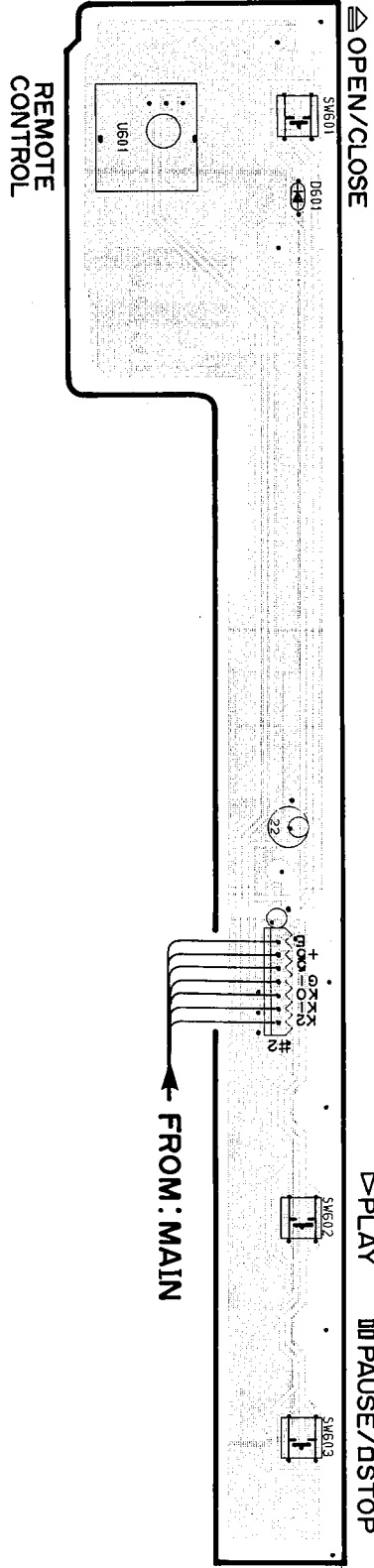
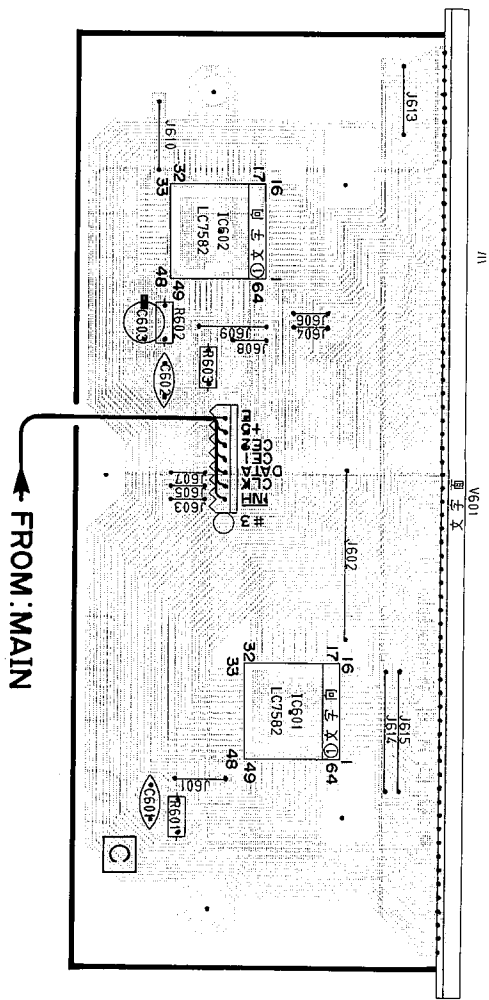
PRINTED CIRCUIT BOARD (Foil side)

Note) 文字面 : Component side

Audio Circuit Board D (1)



Operation Circuit Board C (1)

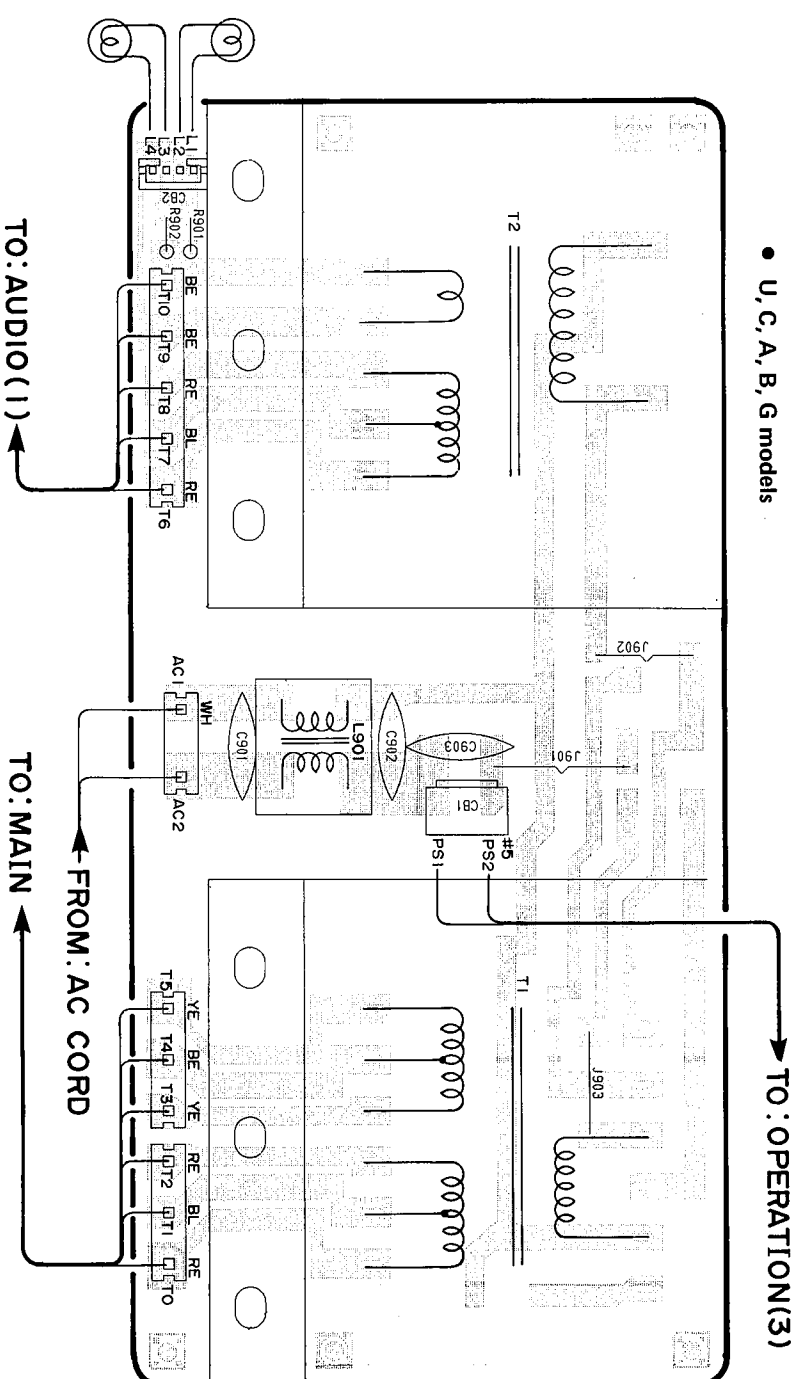


PRINTED CIRCUIT BOARD (Foil side)

Note) 文字面 : Component side

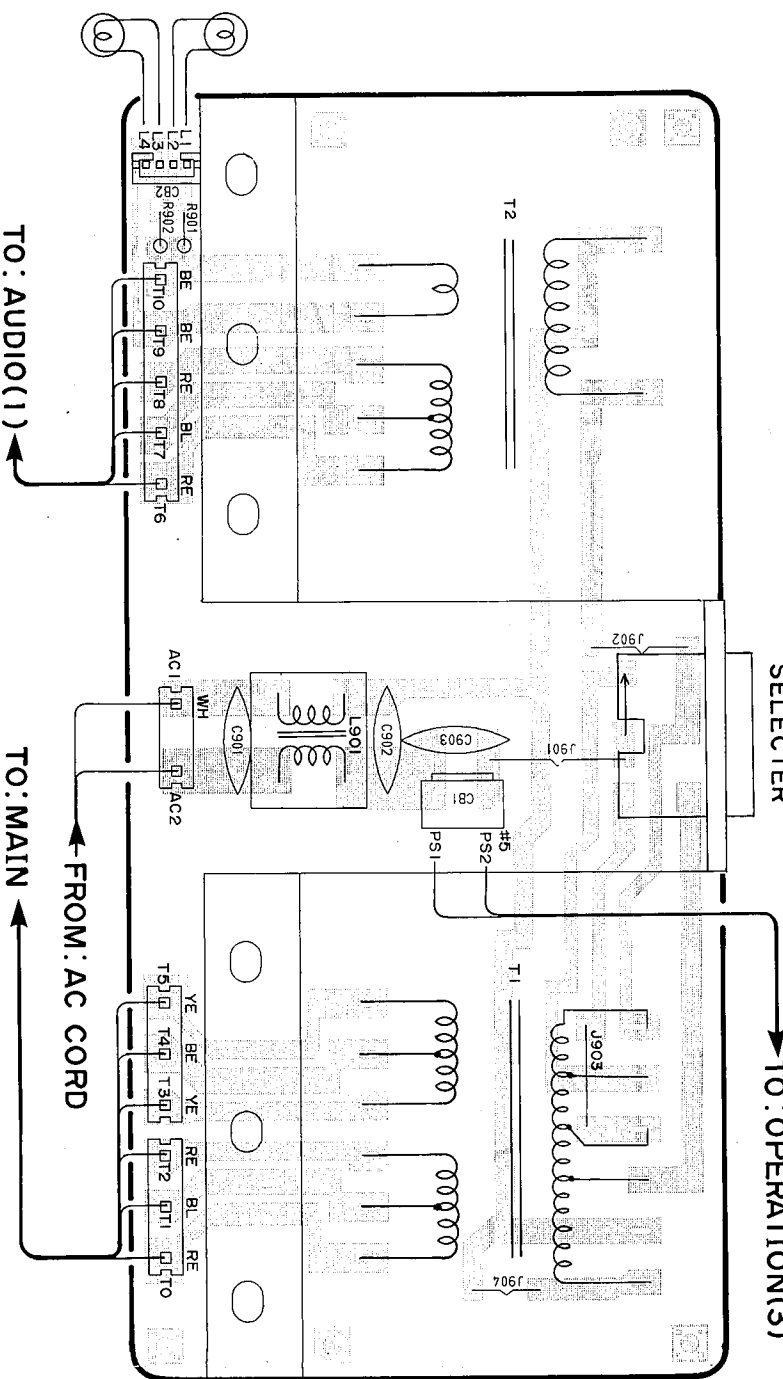
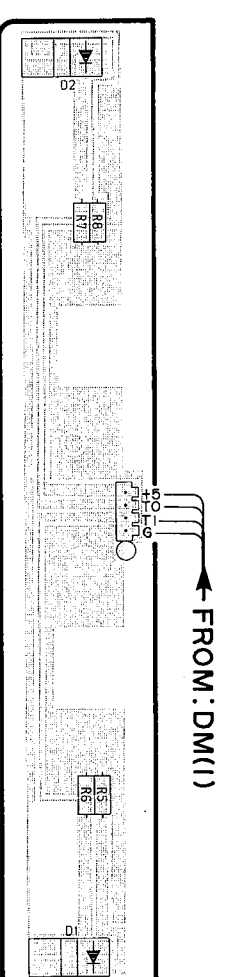
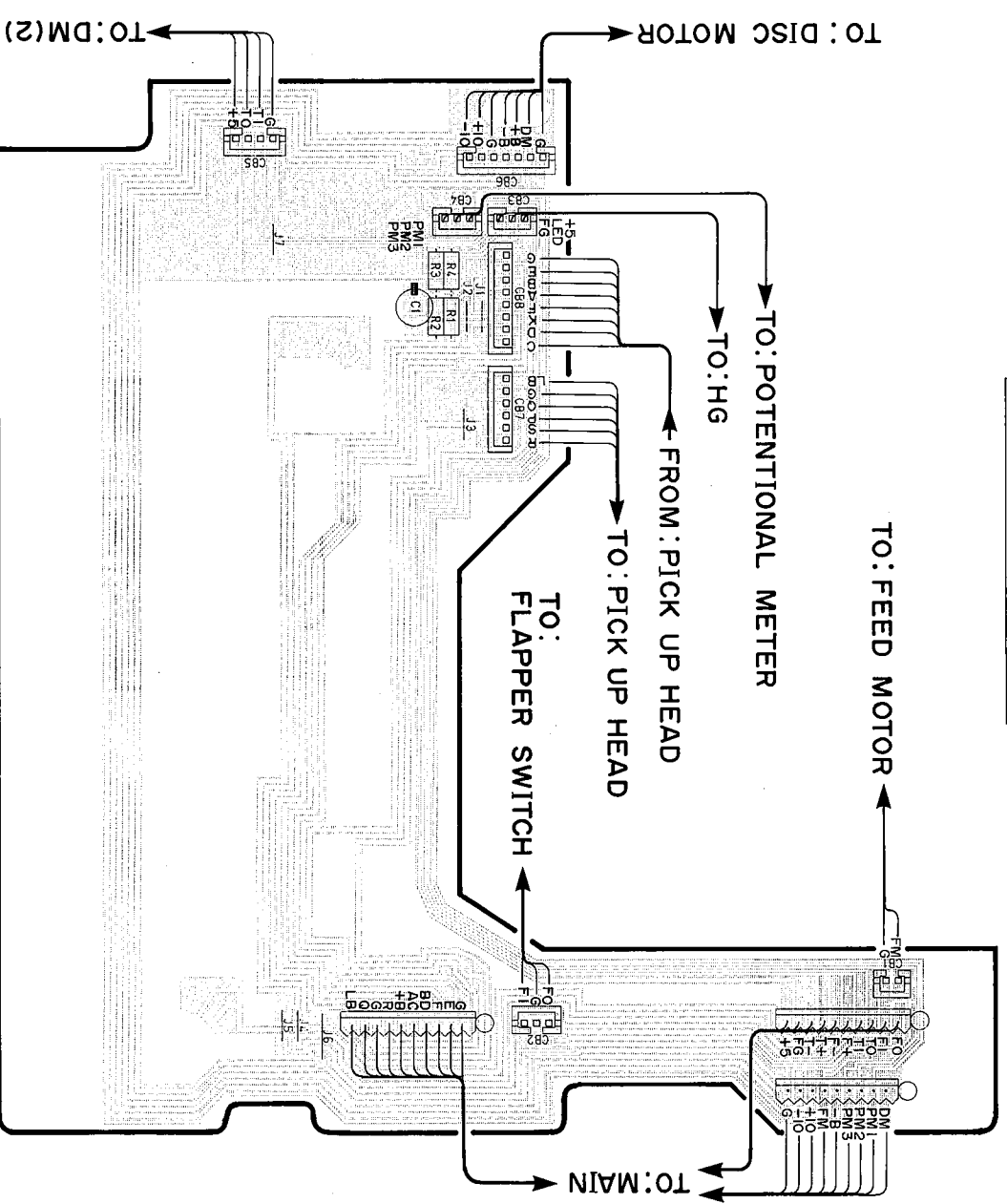
Power Supply Circuit Board **B**

- **U, C, A, B, G models**



- **R, P models**

VOLTAGE
SELECTER

DM Circuit Board **D** (2)DM Circuit Board ☒ (1)

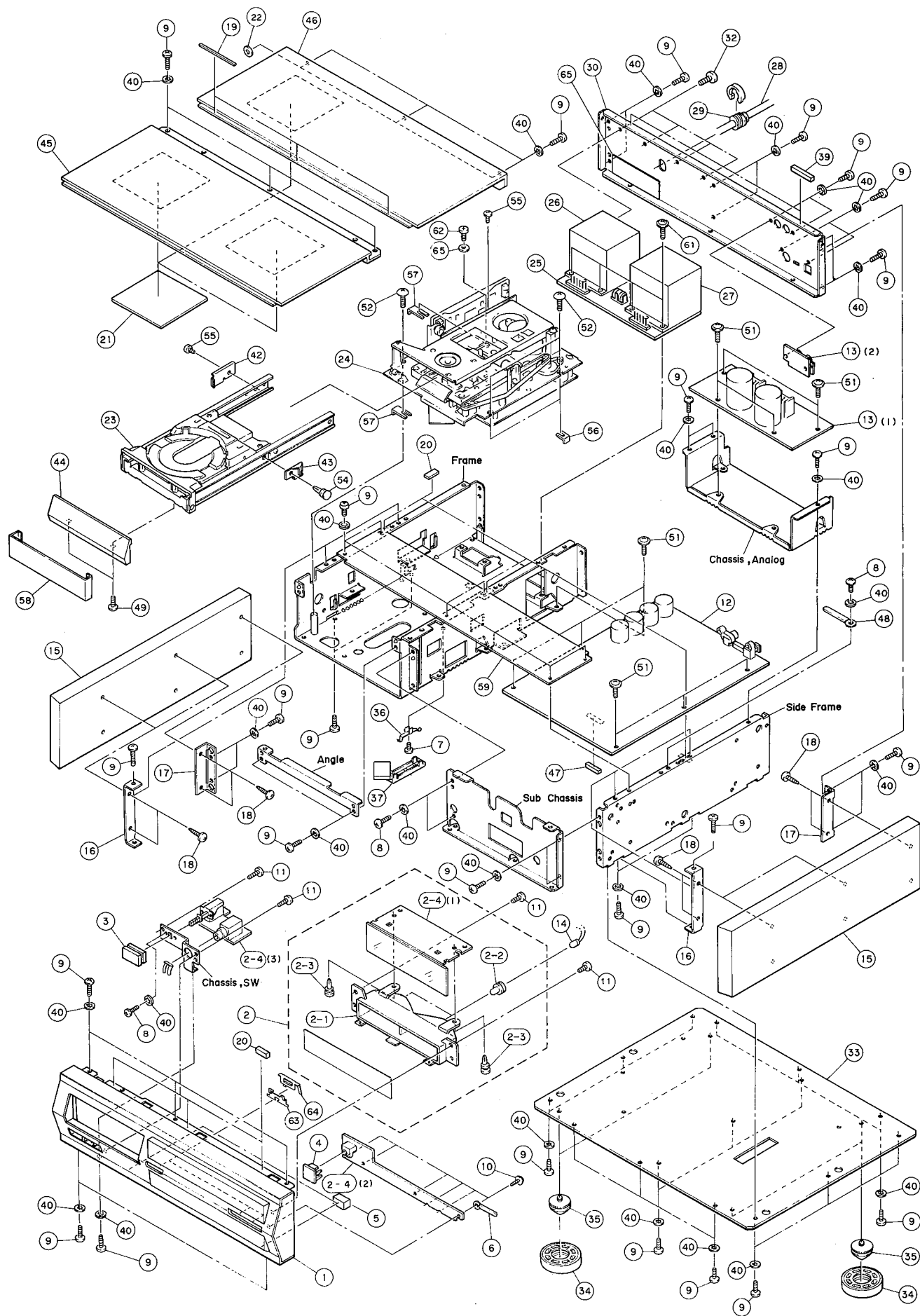
Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※	VG 48 26 00	Audio Circuit Board	オーディオシート		J		
※	VG 48 27 00	//	//		U,C,R,A,B,G,P		
	FA 15 41 00	Mylar Cap.	0.01 μ F 50V	マイラーコン	C742		
※	VH 17 75 00	Polypropylene Film Cap.	0.024 μ F 100V	ポリプロコン	C703,704		
	UT 46 43 90	//	0.039 μ F 100V	//	C705,706		
※	VH 17 74 00	//	3000pF 100V	//	C707,708		
	UJ 13 71 00	Electrolytic Cap.	10 μ F 16V	ケミコン	C741		
	UJ 16 64 70	//	4.7 μ F 50V	//	C740		
	UJ 14 71 00	//	10 μ F 25V	//	C715,716,719,720,729		
	UJ 13 74 70	//	47 μ F 16V	//	C730		
	UK 34 72 20	//	22 μ F 25V	B P コ ン	C709,710		
	UT 45 23 30	Polypropylene Film Cap.	330pF 100V	ポリプロコン	C717,718		
	UT 45 31 00	//	1000pF 100V	//	C747,750		
	UT 45 41 00	//	0.01 μ F 100V	//	C723,725,726,733		
	UT 45 21 50	//	150pF 100V	//	C711~714		
	VG 89 27 00	//	39pF 100V	//	C743,744		
	UT 45 24 70	//	470pF 100V	//	C701,702		
	FU 35 12 20	Mica Cap.	22pF 500V	マイカコン	C721,722		
	UJ 13 47 47	Electrolytic Cap.	47 μ F 16V	ケミコン	C731,732,735,736		
	UJ 13 84 70	//	470 μ F 16V	//	C745~748		
	UJ 13 91 00	//	1000 μ F 16V	//	C734		
	Ui 99 83 30	//	330 μ F 100V	//	C737,738		
※	VH 17 77 00	//	3300 μ F 63V	ブロックケミコン	C727,728		
	VD 47 37 00	SB Coil	60 μ H	S B コ イ ル	L701,702		
	HV 45 32 20	Flame Proof Carbon Resistor	2.2 Ω 1/4W	不燃化カーボン抵抗	R778		
	HV 45 31 00	//	1 Ω 1/4W	//	R831		
	HV 45 34 70	//	4.7 Ω 1/4W	//	R817~820		
	HV 45 38 20	//	8.2 Ω 1/4W	//	R781,782		
	HV 45 41 80	//	18 Ω 1/4W	//	R772		
	HV 45 43 90	//	39 Ω 1/4W	//	R771		
	HV 45 46 80	//	68 Ω 1/4W	//	R767,768		
	HV 45 48 20	//	82 Ω 1/4W	//	R765,766		
	HV 45 52 20	//	220 Ω 1/4W	//	R783,784		
	HV 45 54 70	//	470 Ω 1/4W	//	R777		
	iA 09 34 10	Transistor	2SA934	トランジスタ	Q724		
	VC 46 67 00	//	2SA1534A(Q,R,S)	//	//	Inter-changeable	
	iB 05 44 00	//	2SB544	//	//		
	iB 05 44 00	//	2SB544	//	Q718		
	iA 09 33 00	//	2SA933S(Q,R)	//	Q721,726,728,729,731~733	Inter-changeable	
	iA 11 15 10	//	2SA1115(E,F)	//	//		
	iX 60 31 70	//	2SA1310(R,S,T)	//	//		
	iC 17 40 00	//	2SC1740S(S,R)	//	Q722,725,727,734	Inter-changeable	
	iC 20 63 20	//	2SC2603(E,F)	//	//		
	iX 60 31 80	//	2SC3312(R,S,T)	//	//		
	iX 60 31 80	//	2SC3312(R,S,T)	//	Q719		
	iD 04 00 00	//	2SD400	//	Q717	Inter-changeable	
	iC 20 60 00	//	2SC2060	//	//		
	VC 46 68 00	//	2SC3940A(Q,R,S)	//	//		
	iD 04 00 00	//	2SD400	//	Q723		
	VC 61 40 00	//	2SB1274(Q,R,S)	//	Q715		

※New Parts (新規部品) NR

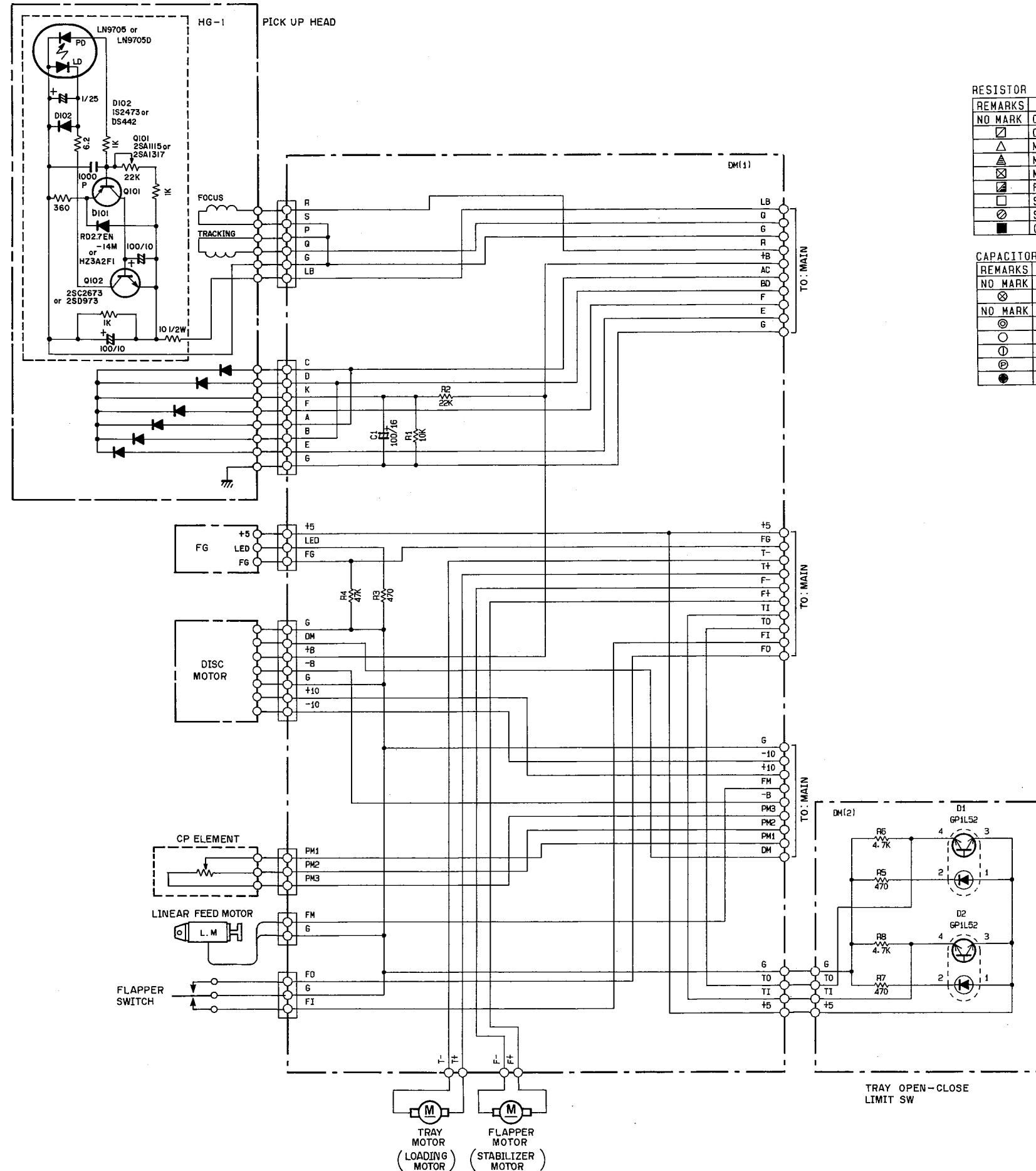
※New Parts (新規部品) NR

※New Parts (新規部品) NR

EXPLODED VIEW (CDX-2020)



SCHEMATIC DIAGRAM



RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (1/6W)
□	CARBON FILM RESISTOR (1/4W)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
▤	FIRE PROOF CARBON FILM RESISTOR
□	SEMENT MOLDED RESISTOR
⊗	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

CAPACITOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
⊗	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
⊙	POLYESTER FILM CAPACITOR
○	POLYSTYRENE FILM CAPACITOR
①	MICA CAPACITOR
⊕	POLYPROPYLENE FILM CAPACITOR
●	SEMICONDUCTIVE CERAMIC CAPACITOR

NOTICE

(J)..... Japanese model
 (U)..... U.S.A model
 (C)..... Canadian model
 (A)..... Australian model
 (G)..... European model
 (B)..... British model
 (R)..... General model
 (P)..... RP model

* All voltages are measured with a 10MΩ/DC electric volt meter.
 * Components having special characteristics are marked **△** and must be replaced with parts having specifications equal to those originally installed.
 * Schematic diagram is subject to change without notice.

PARTS LIST

ELECTRICAL PARTS

WARNING
Components having special characteristics are marked  and must be replaced with parts having specifications equal to those originally installed.
Carbon resistors (1/6W or 1/4W) are not included in the ELECTRICAL PARTS list. For the parts No. of the carbon resistors, refer to P.68.

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※	VG 48 23 00	Main Circuit Board		メ イ ン シ ー ト		J	
※	VG 48 25 00	//		//		U,C,R,A,B,G,P	
	FG 21 11 00	Ceramic Cap.	10pF 50V	セ ラ コ ン C44			
	FG 21 11 00	//	10pF 50V	// C158		U,C,R,A,B,G,P	
	FG 21 12 20	//	22pF 50V	// C27,50			
	FG 21 13 30	//	33pF 50V	// C42			
	FG 21 15 60	//	56pF 50V	// C35,38,112			
	FG 21 21 00	//	100pF 50V	// C2,57			
	FG 21 21 50	//	150pF 50V	// C15			
	FG 21 22 20	//	220pF 50V	// C11			
	FG 11 25 60	//	560pF 50V	// C119~121			
	FG 21 26 80	//	680pF 50V	// C12			
	FG 24 41 00	//	0.01μF 50V	// C124~126,128,129,147~150			
	FZ 00 41 30	Semiconductive Ceramic Cap.	0.1μF 25V	半 導 体 セ ラ コ ン C30,52,58,59,61,62,117			
	FZ 00 41 30	//	0.1μF 25V	// C157		J	
	FC 44 41 00	Mylar Cap.	0.01μF 50V	マ イ ラ ー コ ン C99,100,103~106,109,110			
	FA 15 31 00	//	1000pF 50V	// C111			
	FA 15 31 20	//	1200pF 50V	// C1,6			
	FA 15 31 80	//	1800pF 50V	// C7			
	FA 15 32 20	//	2200pF 50V	// C33			
	FA 15 33 90	//	3900pF 50V	// C37			
	FA 15 34 70	//	4700pF 50V	// C152			
	FA 15 36 80	//	6800pF 50V	// C9			
	FA 15 41 00	//	0.01μF 50V	// C46			
	FA 15 41 80	//	0.018μF 50V	// C43			
	FA 15 42 20	//	0.022μF 50V	// C28			
	FA 15 43 30	//	0.033μF 50V	// C20			
	FA 15 44 70	//	0.047μF 50V	// C10,47~49			
	FA 15 51 00	//	0.1μF 50V	// C3~5,19,29,45			
	FA 15 51 20	//	0.12μF 50V	// C13,22			
	FA 15 51 50	//	0.15μF 50V	// C14			
	FA 15 52 40	//	0.24μF 50V	// C41			
	FA 15 53 90	//	0.39μF 50V	// C23,25			
	FA 15 58 20	//	0.82μF 50V	// C17			
	UT 45 22 20	Polypropylene Film Cap.	220pF 100V	ポ リ プ ロ コ ン C83,84,88,89,113,114			
	FU 35 12 70	Mica Cap.	27pF 500V	マ イ カ コ ン C55,56			
	UJ 11 81 00	Electrolytic Cap.	100μF 6.3V	ケ ミ コ ン C51,156			
	UJ 11 82 20	//	220μF 6.3V	// C36			
	UJ 11 84 70	//	470μF 6.3V	// C32			
	UJ 11 91 00	//	1000μF 6.3V	// C116,151			
	UJ 12 81 00	//	100μF 10V	// C26,85,127			
	UJ 12 82 20	//	220μF 10V	// C94~96			
	UJ 13 73 30	//	33μF 16V	// C18,24,53,86,87			
	UJ 13 74 70	//	47μF 16V	// C21,155			
	UJ 13 81 00	//	100μF 16V	// C90~93,115,122,123,153,154			
	UJ 14 64 70	//	4.7μF 25V	// C16			
	UJ 16 61 00	//	1μF 50V	// C31,34,40			
	UJ 16 62 20	//	2.2μF 50V	// C39			
	UJ 46 63 30	//	3.3μF 50V	// C63~82			
	UJ 12 81 00	//	100μF 10V	// C136,137			
	UJ 29 71 00	//	10μF 100V	// C131,132,134,135,139,141,142,145			
※	VG 75 09 00	//	4700μF 16V	ブ ロ ッ ク ケ ミ コ ン C107,108			
※	VG 75 10 00	//	3300μF 25V	// C101,102			

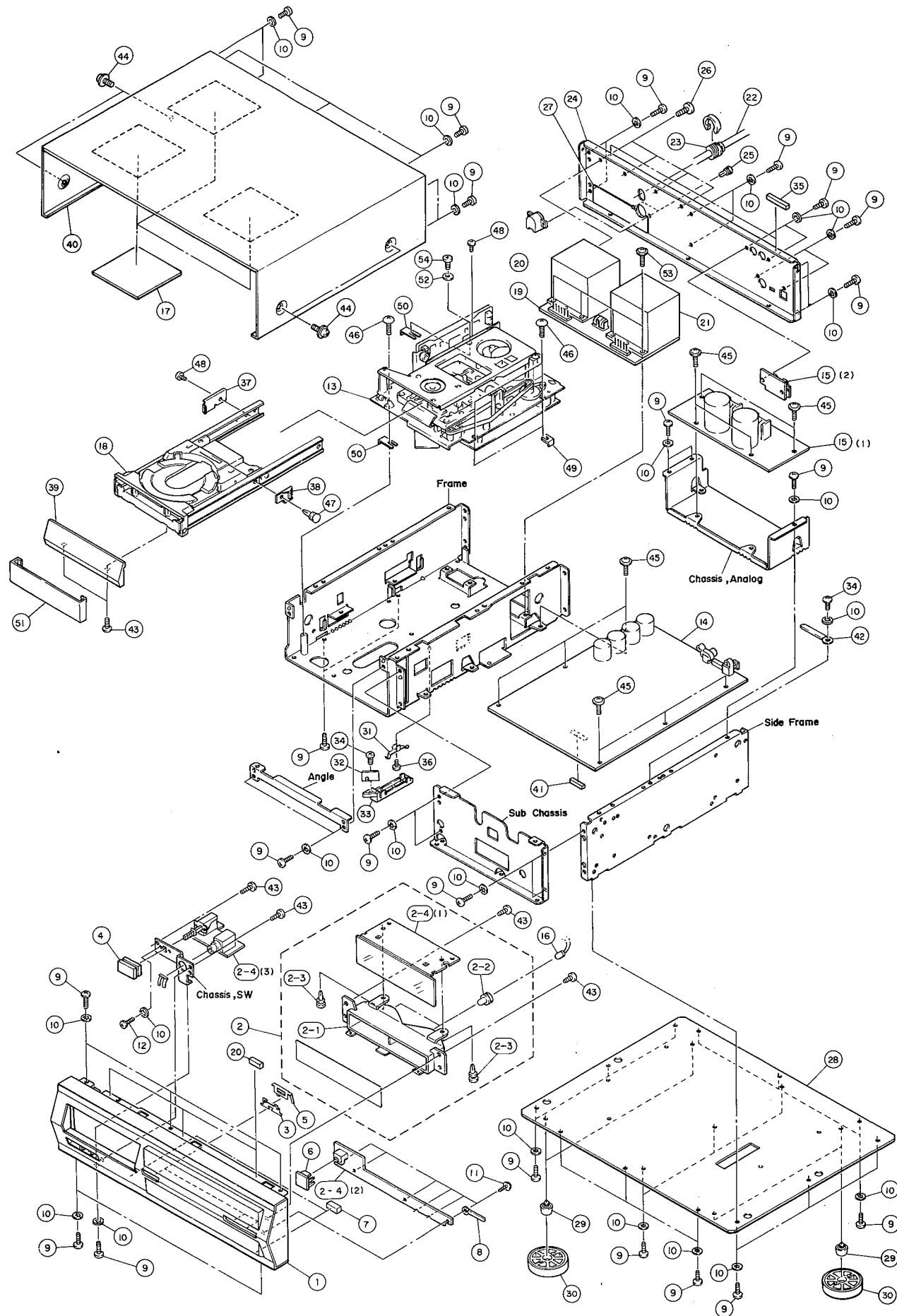
※New Parts (新規部品) NR

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
	VB 17 01 00	Electrolytic Cap.	4700μF 5.5V	バ ッ ク ア ッ プ ケ ミ コ ン C8			
	GE 90 20 00	OSC Coil	3.3μH	発 振 コ イ ル L1			
	VE 79 55 00	Ferrite Bead	B-01-RTF	フ ェ ラ イ ト ビ ー ズ L2		U,C,R,A,B,G,R	
	VC 54 82 00	Pulse Trans		パ ル ス ト ラ ン ス T3			
	VE 59 47 00	Metal Film Resistor	2.2kΩ 1/6W	金 属 被 膜 抵 抗 R165,170			
	VE 59 48 00	//	22kΩ 1/6W	// R152,154			
	HV 45 34 70	Flame Proof Carbon Resistor	4.7Ω 1/4W	不 燃 化 カ ー ボ ン 抵 抗 R226,231			△
※	VG 73 41 00	Resistor Array	10kΩ×4	抵 抗 ア レ イ R244			
※	VG 73 42 00	//	10kΩ×5	// R241			
	VE 11 14 00	//	10kΩ×8	// R240,242,243			
	VB 86 10 00	Pre-Set Potentiometer	B470Ω	半 固 定 抵 抗 VR11			
	VB 86 14 00	//	B4.7kΩ	// VR5,9			
	VB 86 15 00	//	B10kΩ	// VR2,8			
	VB 86 18 00	//	B47kΩ	// VR3			
	VC 61 25 00	//	B68kΩ	// VR1			
	VB 86 19 00	//	B100kΩ	// VR4,6,7,13~32			
	VB 86 23 00	//	B1MΩ	// VR10			
	iA 09 33 00	Transistor	2SA933S(Q,R)	ト ラ ン ジ ス タ Q8,20,26,34	Inter-changeable		
	iA 11 15 10	//	2SA1115(E,F)	//			
	iX 60 31 70	//	2SA1310(R,S,T)	//			
	iA 09 34 10	//	2SA934	// Q3,30,32	Inter-changeable		△
	iB 05 44 00	//	2SB544	//			△
	iC 17 40 00	//	2SC1740S(S,R)	// Q4,5,9~12,16,18,19,22~25,27	Inter-changeable		
	iC 26 03 10	//	2SC2603(E,F)	//			
	iX 60 31 80	//	2SC3312(R,S,T)	//			
	iC 20 60 00	//	2SC2060	// Q2,29,31	Inter-changeable		△
	iD 04 00 00	//	2SD400	//			△
	iC 05 35 40	//	2SC535(A,B,C)	// Q1,6	Inter-changeable		
	iC 19 23 00	//	2SC1923	//			
	iX 60 42 00	//	2SC2878(A,B)	// Q7,13~15,17,21,28	Inter-changeable		
	iC 33 27 00	//	2SC3327	//			
	VC 50 21 00	//	2SD1915	//			
	iC 19 83 00	//	2SC1983	// Q33			△
	iF 00 34 50	Diode	1SS133	ダ イ オ ー ド D1~6,23,25,28,29			
	iH 00 14 30	//	1SR35-100AT	// D12~19			△
	VG 43 62 00	Zener Diode	MTZJ3.6A	ツ ェ ナ ー ダイ オ ー ド D21			
※	VG 43 73 00	//	MTZJ5.1A	// D27			
※	VG 43 77 00	//	MTZJ5.6B	// D10,11,26			
※	VG 43 86 00	//	MTZJ7.5B	// D22,24			
※	VG 43 93 00	//	MTZJ9.1C	// D20			
※	VG 44 05 00	//	MTZJ13B	// D8,9			
	iF 00 49 10	Varactor Diode	1SV55	F M バ ラ ク タ ー ダイ オ ー ド D7	Inter-changeable		
	iF 00 49 20	//	SVC211	//			
	XB 24 80 01	IC	M5238L	I C IC6			
	iG 08 02 00	//	NJM2043S	// IC4,5			
	XA 42 60 01	//	NJM5532S	// IC34,35,38,39			

※New Parts (新規部品) NR

※New Parts (新規部品) NR

EXPLODED VIEW (CDX-1120/CD-5050)



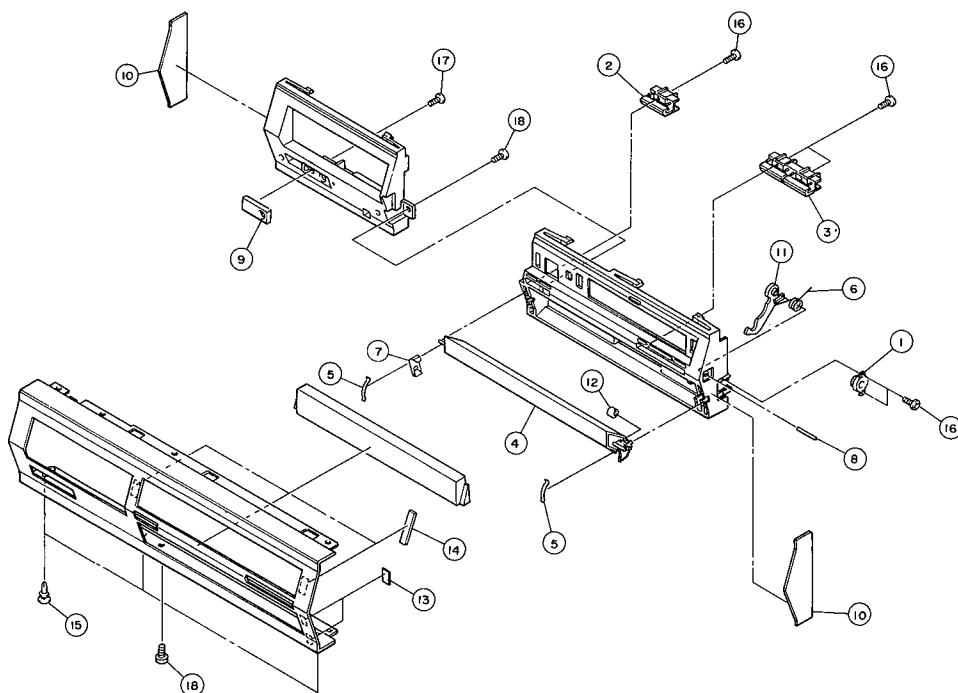
MECHANISM PARTS (CDX-1120/CD-5050)

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※ 1	VG : 47 : 97 : 00	Front Panel Ass'y	フロントパネル Ass'y	Titan CDX-1120		U,C,G,P	
※ //	VG : 47 : 99 : 00	//	//	// CDX-5050		R,A,B	
※ //	VG : 48 : 01 : 00	//	//	Black CDX-1120		U,C,G,P	
※ //	VG : 48 : 03 : 00	//	//	// CD-5050		R,A,B	
※ 2	VG : 48 : 04 : 00	LCD Unit	L C D ユ ニ ッ ト	Titan			
※ //	VG : 48 : 06 : 00	//	//	Black			
※ 2-1	VG : 06 : 39 : 00	Reflector	リ フ レ ク タ ー				
2-2	VF : 44 : 45 : 00	Lamp Cap	ラン プ キ ャ ッ プ				
2-3	CB : 06 : 88 : 80	Plastic Rivet	プラスチックリベット				
※ 2-4	VG : 48 : 29 : 00	Operation Circuit Board	オペレーションシート	Titan			
※ //	VG : 48 : 30 : 00	//	//	Black			
※ 3	VG : 90 : 47 : 00	Holder, Button	ホルダー / ボタン				
4	VG : 88 : 88 : 00	Button Ass'y	ボ タ ン Ass'y	Titan POWER			
※ //	VG : 88 : 87 : 00	//	//	Black //			
※ 5	VG : 90 : 46 : 00	Spring, Button	スプリング / ボタン				
6	VD : 94 : 08 : 00	Lens	レ ン ズ				
※ 7	VH : 08 : 63 : 00	Spacer	ス ペ ー サ / 線 材				
8	CB : 09 : 58 : 80	Wire Stopper	束 線 止 め				
9	Ei : 33 : 00 : 86	Binding Head Tapping Screw	3×8 FCRM3-BI バインドタッピングネジ	PACK			
10	EV : 41 : 30 : 36	Toothed Lock Washer	φ3 FCRM3-BI 歯 付 座 金	PACK			
11	EX : 60 : 08 : 40	BW Head Tapping Screw	2×6(φ5.5) FCRM3-BI B Wヘッドタッピングネジ				
12	ED : 33 : 00 : 60	Binding Head Screw	3×6 FCRM3-BI バ イ ン ド 小 ネ ジ	PACK			
※ 13	VG : 15 : 15 : 00	Disc Mechanism Ass'y	DM-2L D M - 2 L 総 組 立				
※ 14	VG : 48 : 25 : 00	Main Circuit Board	メ イ ン シ ー ト				
※ 15	VG : 48 : 27 : 00	Audio Circuit Board	オーディオシート				
※ 16	VG : 94 : 67 : 00	Lamp Ass'y	8V 150mA×2 ラ ン プ Ass'y				
17	VF : 22 : 26 : 00	Damper	ダ ン パ ー		MX-55		
※ 18	VG : 15 : 17 : 00	Tray Unit	ト レ イ ユ ニ ッ ト				
※ 19	VG : 76 : 51 : 00	Power Supply Circuit Board	電 源 シ ー ト			U,C,A,B,G	
※ //	VG : 76 : 52 : 00	//	//			R,P	
※ 20	XF : 71 : 9A : 00	Power Transformer	電 源 ト ラ ン ス	DIGITAL		U,C	△
※ //	XF : 72 : 0A : 00	//	//	//		R,P	△
※ //	XF : 72 : 1A : 00	//	//	//		A,B	△
※ //	XF : 72 : 2A : 00	//	//	//		G	△
※ 21	XF : 72 : 4A : 00	//	//	AUDIO		U,C	△
※ //	XF : 72 : 5A : 00	//	//	//		R,A,B,P	△
※ //	XF : 72 : 6A : 00	//	//	//		G	△
22	MG : 00 : 22 : 20	Power Cord	10A 125V 電 源 コ ー ド			U,C	△
※ //	MG : 00 : 16 : 30	//	6A 250V //			R,P	△
※ //	MG : 00 : 23 : 10	//	7.5A 250V //			A	△
※ //	MG : 00 : 23 : 30	//	300/300V //			B	△
※ //	MG : 00 : 23 : 20	//	2.5A 250V //			G	△
23	CB : 62 : 01 : 90	Cord Stopper	CM-22B コ ー ド ス ト ッ パ ー			R,A,B,G,P	
※ //	CB : 62 : 02 : 00	//	CM-22C //			U,C	
※ 24	VG : 66 : 57 : 00	Rear Panel	リ ア パ ネ ル			U	
※ //	VG : 66 : 58 : 00	//	//			C	
※ //	VG : 66 : 59 : 00	//	//			R	
※ //	VG : 66 : 60 : 00	//	//			A,B	
※ //	VG : 66 : 61 : 00	//	//			G	
※ //	VG : 66 : 66 : 00	//	//			P	
25	CB : 60 : 92 : 60	Plastic Rivet	プラスチックリベット			R	
26	Ei : 34 : 00 : 86	Binding Head Tapping Screw	4×8 FCRM3-BI バインドタッピングネジ	PACK			
※ 27	VH : 70 : 05 : 00	Sheet, Shield	シ ー ト / シ ー ル ド			A,B,G	

※New Parts (新規部品) NR

※New Parts (新規部品) NR

1 ■ EXPLODED VIEW (Front Panel Ass'y)

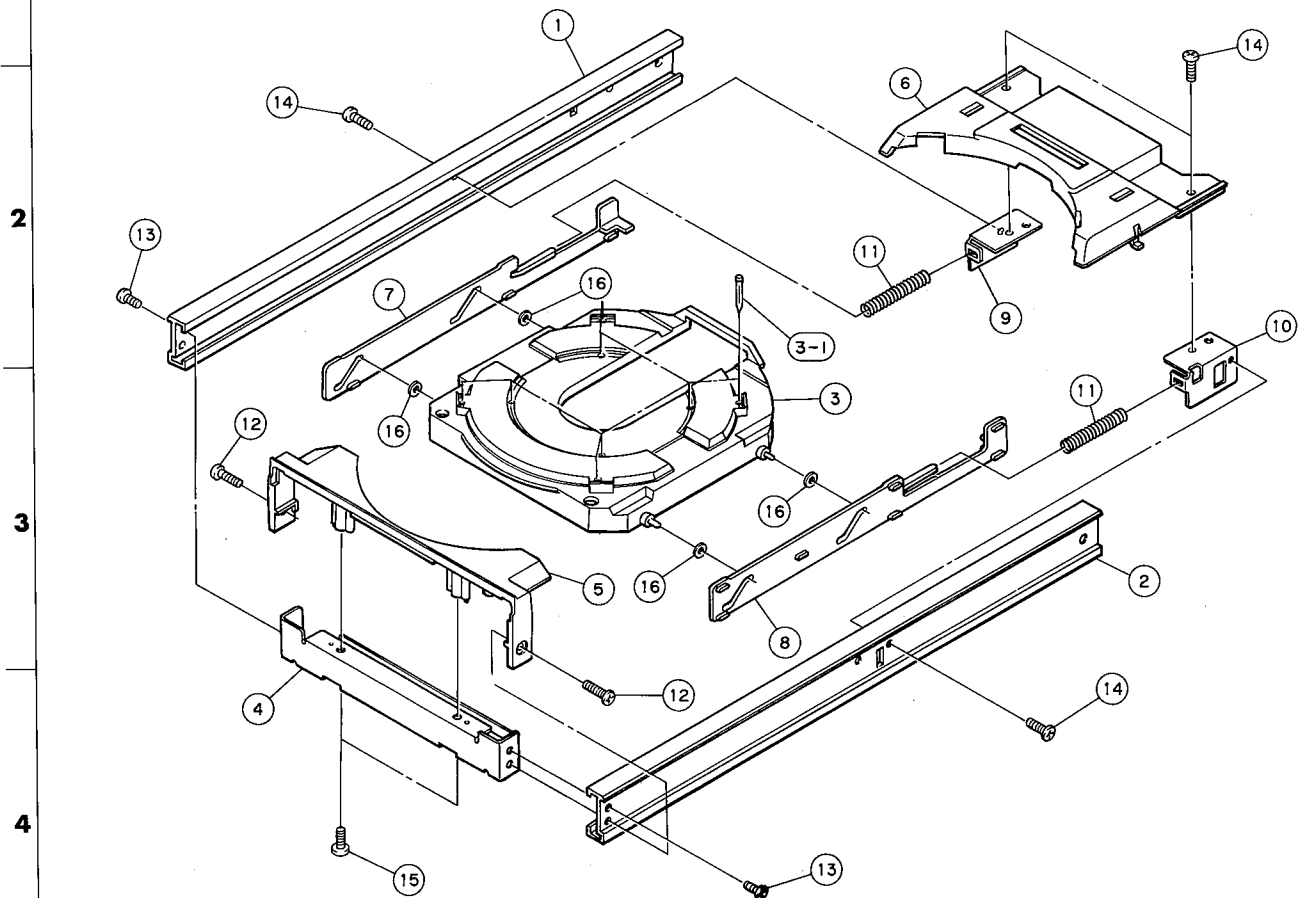


2 ■ PARTS LIST

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※	VG 06 52 00	Front Panel Ass'y	フ ロ ン ト パ ネ ル Ass'y	Titan CDX-2020			
※	VG 47 97 00	//	//	// CDX-1120			
※	VG 47 99 00	//	//	// CD-5050			
※	VG 48 01 00	//	//	Black CDX-1120			
※	VG 48 03 00	//	//	// CD-5050			
※	1 VG 06 48 00	Damper	ダ ン パ ー				
※	2 VG 06 42 00	Button Ass'y	ボ タ ン Ass'y	Black OPEN/CLOSE			
※	// VG 06 43 00	//	//	Titan //			
※	3 VG 06 44 00	//	//	Black PLAY, PAUSE/STOP			
※	// VG 06 45 00	//	//	Titan //			
※	4 VG 06 49 00	Sealing Ass'y	シ ー リ ン グ Ass'y	Black			
※	// VG 06 51 00	//	//	Titan			
※	5 VG 05 95 00	Spring, Sealing	スプリング/シーリング				
※	6 VG 05 96 00	Spring, Lever	スプリング/レバー				
※	7 VG 90 98 00	Spring, Shaft	スプリング/シャフト				
8	AA 63 14 60	Pin	φ2×14.5 ピ ン				
※	9 VG 06 25 00	Panel, HP	H P パ ネ ル	Black			
※	// VG 06 27 00	//	//	Titan			
※	10 VG 06 31 00	Panel, Side	パ ネ ル サ イ ド	Black			
※	// VG 06 33 00	//	//	Titan			
※	11 VG 06 34 00	Lever	ク リ ッ ク レ バ ー				
※	12 VG 06 04 00	Roller	ロ ー ラ ー				
※	13 VG 71 53 00	Cushion, Sealing B	クッション/シーリングB				
※	14 VG 71 58 00	Cushion, Window	クッション/ウィンドウ				
15	CB 60 32 40	Plastic Rivet	プラスチックリベット				
16	EJ 32 00 66	Pan Head Tapping Screw	2×6 FCRM3-BI ナベタッピングネジ	PACK			
17	ED 33 00 66	Binding Head Screw	3×6 FCRM3-BI バ イ ン ド 小 ネ ジ	PACK			
18	Ei 33 00 86	Binding Head Tapping Screw	3×8 FCRM3-BI バ イ ン ド タ ッ ピ ン グ ネ ジ	PACK			

※New Parts (新規部品) NR

1 ■EXPLODED VIEW (Tray Unit)

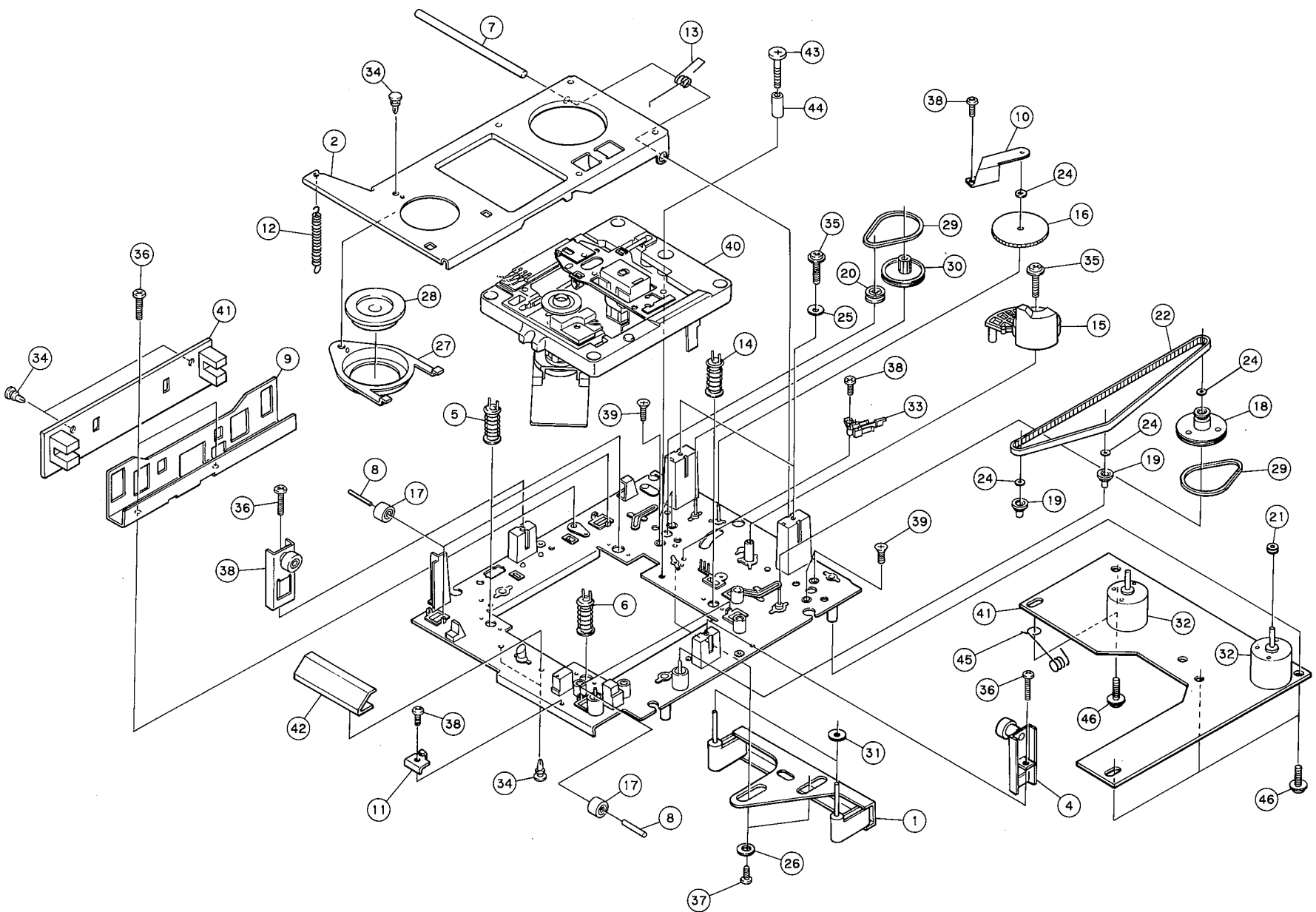


■PARTS LIST

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※	VG 15 17 00	Tray Unit	トレイユニット				
※	1	VG 15 21 00	Frame, L	フ レ ー ム L			
※	2	VG 15 22 00	// , R	// R			
※	3	VH 49 80 00	Tray, Disc Ass'y	トレイ / ディスク Ass'y			
※	3-1	VE 04 16 00	Pad, Disc	パッド / ディスク			
※	4	VG 21 88 00	Support, Tray	サ ポ ー ト / トレイ			
※	5	CB 65 70 90	Cover A, Tray	カバ ー A / トレイ	DM-IX		
※	6	CB 65 71 00	Cover B, Tray	カバ ー B / トレイ	//		
※	7	VG 15 23 00	Lifter, L	リ フ タ ー L			
※	8	VG 15 24 00	// , R	// R			
※	9	VG 21 91 00	Holder L, Cover	ホルダー L / カバー			
※	10	VG 21 92 00	Holder R, Cover	ホルダー R / カバー			
※	11	AA 63 11 60	Spring, COM	スプリング / C O M	DM-IX		
	12	ED 32 60 86	Binding Head Screw	2.6×8 ZMC2-BI バ イ ン ド 小 ネ ジ	PACK		
	13	ED 32 60 46	//	2.6×4 ZMC2-BI //	PACK		
	14	Ei 32 60 66	Binding Head Tapping Screw	2.6×6 FCRM3-BI バ イ ン ド タ ッ ピ ン グ ネ ジ	PACK		
	15	Ei 32 60 86	//	2.6×8 FCRM3-BI //	PACK		
	16	EV 90 02 30	Washer	φ2 t=0.5 ポ リ ス ラ イ ダ ー ワ ッ シ ー			

※New Parts (新規部品) NR

EXPLODED VIEW (DM-2L)

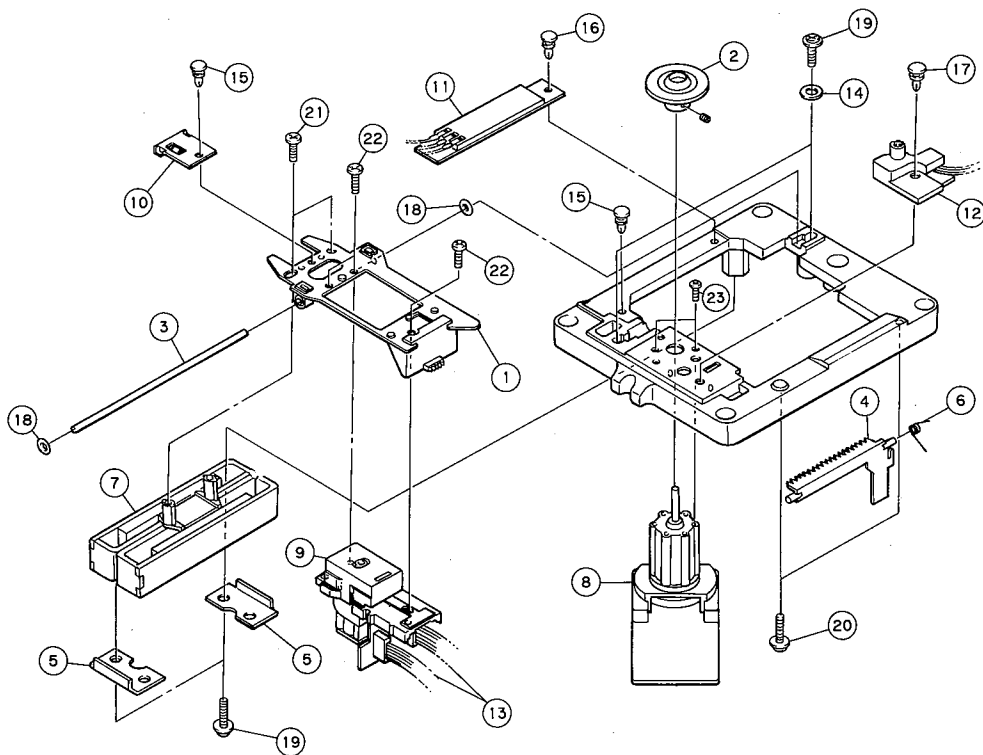


Note) ϕ : Diameter

[illegible]

※New Parts (新規部品) NR

1 ■EXPLODED VIEW (Disc Mechanism)



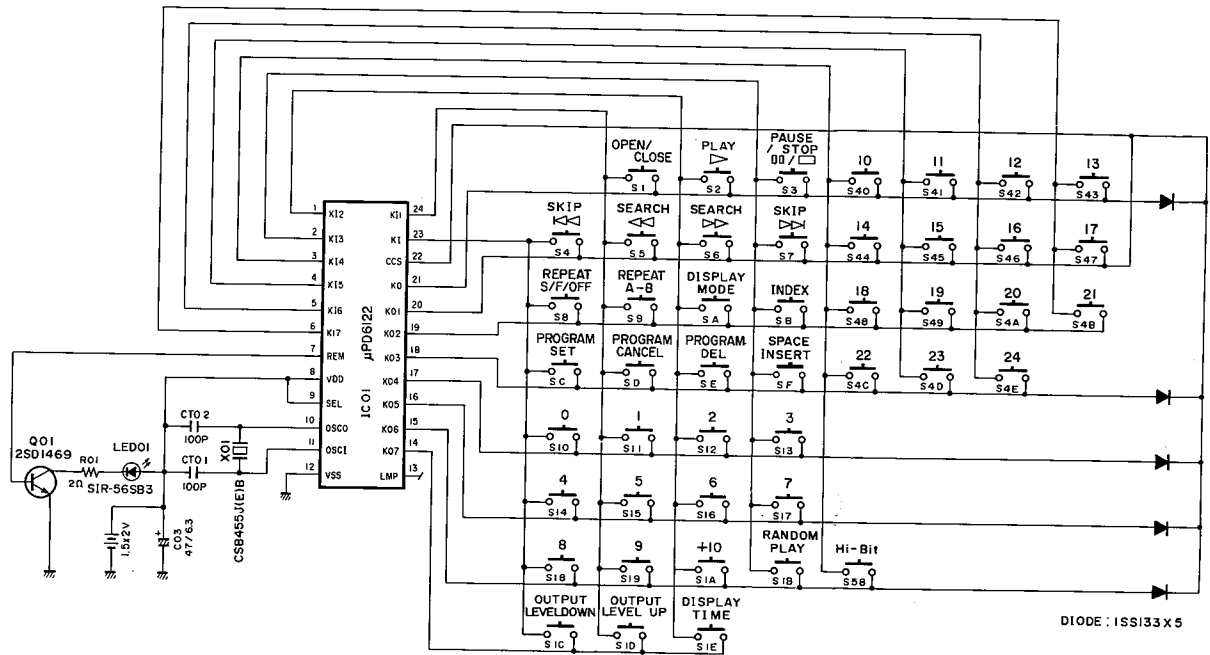
3 ■PARTS LIST

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※	VG 15 16 00	Disc Mechanism Unit	ディスクメカユニット				
I	NB 63 72 80	PU Base Ass'y	P U ベ ー ス Ass'y		DM-IX		
※	2 VG 21 84 00	Disc Table Ass'y	ディスクテーブル Ass'y				
3	AA 63 11 50	Shaft $\phi 4 \times 100$	シャフト		DM-IX		
4	CB 65 56 00	Lever, Lock	レバー / ロック		//		
※	5 VH 14 97 00	Washer, Magnet	マグネットワッシャ				
6	AA 63 17 40	Spring, TOR	スプリング / T O R		DM-IX		
7	VB 81 76 00	Liner Motor TDS-LOC-02	リニアモータ		//		
※	8 VG 38 10 00	Disc Motor SD04CB	ディスクモーター				
9	VE 72 03 00	Optical Pick Up Head HG-I	光ピックアップヘッド				
10	VC 47 45 00	CP Brush	C P ブ ラ シ		DM-IX		
※	11 VG 21 93 00	CP Element Ass'y	C P エレメント Ass'y				
12	NA 09 26 90	FG Circuit Board	F G シ ー ト		DM-IX		
※	13 VG 75 08 00	Connector Ass'y	コネクタ Ass'y				
14	CB 66 09 80	Washer	ワッシャ				
15	CB 09 96 00	Plastic Rivet	プラスチックリベット				
16	CB 60 88 10	//	//				
17	CB 03 27 50	//	//				
18	EX 60 05 10	O Ring $\phi 3.8$	O リン グ				
19	EK 33 00 10	BW Head Tapping Screw $3 \times 12(\phi 10)$ FCRM3-BI	B W ヘッドタッピングネジ				
20	EK 33 00 30	// $3 \times 10(\phi 8)$ FCRM3-BI	//				
21	Ei 32 60 86	Binding Head Tapping Screw 2.6×8 FCRM3-BI	バインドタッピングネジ	PACK			
22	ED 32 60 66	Binding Head Screw 2.6×6 ZMC2-BI	バインド小ネジ	PACK			
23	ED 32 00 66	// 2×6 ZMC2-BI	//	PACK			

※New Parts (新規部品) NR

REMOTE CONTROL TRANSMITTER

■ SCHEMATIC DIAGRAM



FUNCTION	DATA CODE	FUNCTION	DATA CODE	FUNCTION	DATA CODE
OPEN/CLOSE	01	2	12	14	44
PLAY	02	3	13	15	45
PAUSE/STOP	03	4	14	16	46
SKIP $\lll$	04	5	15	17	47
SEARCH $\lll$	05	6	16	18	48
SEARCH $\ggg$	06	7	17	19	49
SKIP $\ggg$	07	8	18	20	4A
REPEAT S/F/OFF	08	9	19	21	4B
REPEAT A-B	09	+10	1A	22	4C
DISPLAY TIME	0A	RANDOM PLAY	1B	23	4D
INDEX	0B	OUTPUT LEVEL DOWN	1C	24	4E
PROGRAM MANUAL	0C	OUTPUT LEVEL UP	1D	Hi-Bit	58
PROGRAM CANCEL	0D	DISPLAY MODE	1E		
PROGRAM DELETE	0E	10	40		
SPACE INSERT	0F	11	41		
0	10	12	42		
1	11	13	43		

CUSTOM CODE

79

■ PARTS LIST

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※	VG 82 32 00	Remote Control Transmitter	リモートコントロールトランスミッター	Titan			
※	VG 82 31 00	//	//	Black			
	CX 60 19 50	Battery Case	電池 蓋	Titan			
	CX 60 19 60	//	//	Black			
		Dry Cell	AA, R06	単 3 乾 電池			

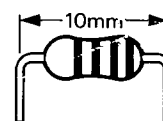
※New Parts (新規部品) NR

Parts List for Carbon Resistors

Value	1/4W Type Part No.	1/6W Type Part No.	Value	1/4W Type Part No.	1/6W Type Part No.
1.0 Ω	HJ353100	HF853100	12K Ω	HJ357120	HF857120
1.8 "	HJ353180	※	15 "	HJ357150	HF857150
2.2 "	HJ353220	HF853220	18 "	HJ357180	HF857180
3.3 "	HJ353330	HF853330	22 "	HJ357220	HF857220
4.7 "	HJ353470	HF853470	27 "	HJ357270	HF857270
5.6 "	HJ353560	HF853560	33 "	HJ357330	HF857330
10 "	HJ354100	HF854100	39 "	HJ357390	HF857390
15 "	HJ354150	HF854150	47 "	HJ357470	HF857470
22 "	HJ354220	HF854220	56 "	HJ357560	HF857560
27 "	HJ354270	HF854270	68 "	HJ357680	HF857680
33 "	HJ354330	HF854330	82 "	HJ357820	HF857820
39 "	HJ354390	HF854390	91 "	HJ357910	HF857910
47 "	HJ354470	HF854470	100 "	HJ358100	HF858100
56 "	HJ354560	HF854560	120 "	HJ358120	HF858120
68 "	HJ354680	HF854680	150 "	HJ358150	HF858150
82 "	HJ354820	HF854820	180 "	HJ358180	HF858180
100 "	HJ355100	HF855100	220 "	HJ358220	HF858220
110 "	HJ355110	HF855110	270 "	HJ358270	HF858270
120 "	HJ355120	HF855120	330 "	HJ358330	HF858330
150 "	HJ355150	HF855150	390 "	HJ358390	HF858390
160 "	HJ355160	※	470 "	HJ358470	HF858470
180 "	HJ355180	HF855180	560 "	HJ358560	HF858560
220 "	HJ355220	HF855220	680 "	HJ358680	HF858680
270 "	HJ355270	HF855270	820 "	HJ358820	HF858820
330 "	HJ355330	HF855330	1.0M Ω	HJ359100	HF859100
390 "	HJ355390	HF855390	1.2 "	HJ359120	※
470 "	HJ355470	HF855470	1.5 "	HJ359150	HF859150
510 "	※	HF855510	1.8 "	HJ359180	HF859180
560 "	HJ355560	HF855560	2.2 "	HJ359220	HF859220
680 "	HJ355680	HF855680	3.3 "	HJ359330	HF859330
820 "	HJ355820	HF855820	3.9 "	HJ359390	※
910 "	HJ355910	HF855910	4.7 "	HJ359470	HF859470
1.0K Ω	HJ356100	HF856100			
1.2 "	HJ356120	HF856120			
1.5 "	HJ356150	HF856150			
1.8 "	HJ356180	HF856180			
2.0 "	HJ356200	HF856200			
2.2 "	HJ356220	HF856220			
2.4 "	HJ356240	HF856240			
2.7 "	HJ356270	HF856270			
3.0 "	HJ356300	HF856300			
3.3 "	HJ356330	HF856330			
3.6 "	HJ356360	HF856360			
3.9 "	HJ356390	HF856390			
4.7 "	HJ356470	HF856470			
5.1 "	HJ356510	HF856510			
5.6 "	HJ356560	HF856560			
6.8 "	HJ356680	HF856680			
8.2 "	HJ356820	HF856820			
9.1 "	HJ356910	HF856910			
10 "	HJ357100	HF857100			

1/4W Type

HJ35○○○○



1/6W Type

HF85○○○○

