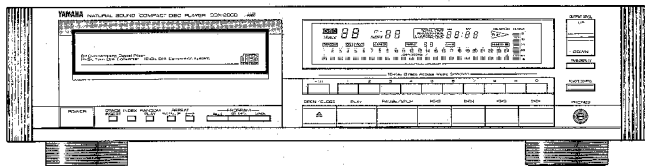


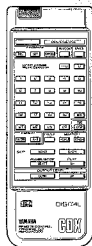
COMPACT DISC PLAYER

CDX-2000

SERVICE MANUAL



● RS-CDX2000



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 bus in the unit (heavy gauge black wires connect to this buss).

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

■ CONTENTS

TO SERVICE PERSONNEL	1/2
INTERLOCK OPERATION	3
SPECIFICATIONS	3
REAR PANELS	4
BLOCK DIAGRAM	5
PROTECTION LEVER FOR TRANSPORTATION	6
INTERNAL VIEW	6
DISASSEMBLY PROCEDURES	7
CHIP COMPONENT DESCRIPTION	8/9

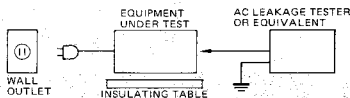
ADJUSTMENTS	10 ~ 26
LSI DATA	27 ~ 33
IC BLOCK	34 ~ 37
FL DISPLAY DATA	38
WIRING	39
PRINTED CIRCUIT BOARD	40 ~ 45
SCHEMATIC DIAGRAM	46 ~ 50
PARTS LIST	51 ~ 67
TEST MODE	68 ~ 70

■ 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.

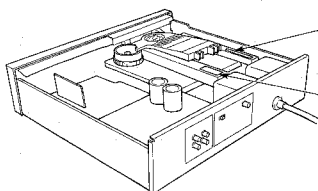
■ POLARIZATION (U, C models only)

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.



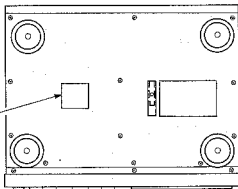
U.S.A. model

DANGER—Invisible laser radiation when open and interlock failed or defeated.
AVOID DIRECT EXPOSURE TO BEAM. (CA06537-1)

Canadian model

CAUTION—HAZARDOUS LASER AND ELECTROMAGNETIC RADIATION WHEN OPEN AND INTERLOCK DEFEATED.
ATTENTION—RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT AVEC L'ENCLÈCHEMENT DE SÉCURITÉ ANULÉ. (CA06537-1)

BOTTOM SIDE



THIS PRODUCT COMPLIES WITH OHHS RULES 21 CFR SUBCHAPTER J APPLICABLE AT DATE OF MANUFACTURE.

MANUFACTURED BY
YAMAHA CORPORATION.
10-1 NAKAZAWA-CHO.
HAMAMATSU-SHI.
SHIZUOKA-KEN, JAPAN

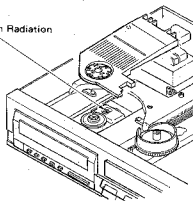
MANUFACTURED:



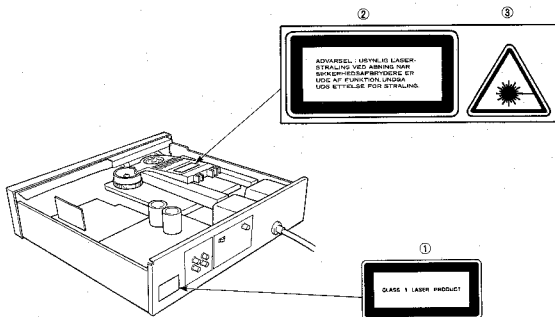
LASER BEAM RADIATION SPOT

Laser Diode Properties
Material: Ga-Al-As
Wavelength: 755 — 805 nm (25°C)
Laser Output: Continuous Wave max. 5 mW

Laser Beam Radiation



W, 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 WARNING LABEL INFORMING OF RADIATION 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 LASER PRODUCTS OF CLASS 1.

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

VARNING—INGREPP I APPARATEN BÖR ENDAST FÖRETAGAS 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 LASERSTRÅLING DER OVERSTIGER GÆNSEVERDIEN FOR LASERKLASSE 1.

ADVARSEL! INDGREB BØR KUN FORETAGES AF EN FAGMAND DA DER ER RISIKO FOR RADIOAKTIV STRÅLING.

Finnish

- ③ "VAROITUS! LAITE SISÄLTÄÄ LASERIODIN, JOKA LÄHETTÄÄ (NÄKYMÄTÖNTÄ) SILMILLE VAARALLISTA LASERSÄTEILYÄ."

■ INTERLOCK OPERATION

The Digital Compact Disc Player reads the disc signals by laser beam detection. It must be avoided for the human body to be directly exposed to the laser beam. Human eyes are especially badly affected 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 IC805 (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.

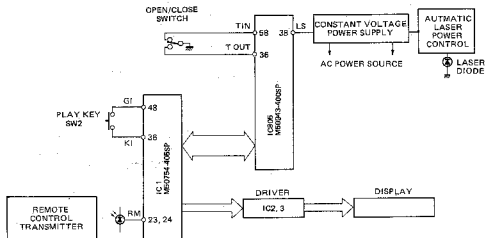
Pin 38 is set in "H" level when the unit is loaded with the disc and it reads the index signals or when the unit is set in the play mode after that. When the unit reads the index signals and the

following two conditions are met, the laser emits the beam.

- 1) When the Open/Close Switch is set in "TIN" side. (The disc tray is closed.)
- 2) The pickup is located at the area of the 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 (SW2) or that of Remote Control Transmitter is pressed.
- 2) when the **PLAY** display is ON.



■ SPECIFICATIONS

■ AUDIO SECTION

Frequency Response	2Hz - 20kHz ± 0.3 dB
Harmonic Distortion + Noise	0.002% (1kHz)
S/N Ratio	118dB (EIAJ)
Dynamic Range	100dB (EIAJ)
Wow & Flutter	Unmeasurable
Output Voltage	2V (EIAJ)
Output Impedance	47 Ω
Headphone Output	3V/150 Ω

■ INTERNAL SYSTEMS

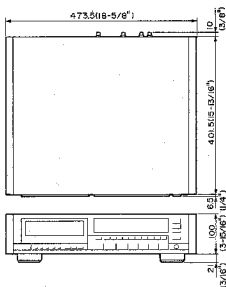
Optical Pick-up	3 beam laser
Error Correction System	CIRC
D/A Conversion	18 bit floating (L, R twin)
Filter	High bit digital filter and 5th order new active filter

■ GENERAL

Power Requirements	
U.S.A. and Canadian models	120V AC, 60Hz
European, Australian and U.K. models	220 - 240V AC, 50Hz
General model	110 - 120/220 - 240V AC, 50/60Hz
Power Consumption	
30W	
Dimensions (W x H x D)	
473.5 x 121 x 418 mm (18-5/8" x 4-3/4" x 16-7/16")	
Weight	
16.0 kg (35 lbs 4 oz)	
Accessories	
Pin plug cord: X2	
Remote control transmitter (RS-CDX1110)	
Dry Cell: X2 (Size "AA", "R06")	

*Specification subject to change without notice.

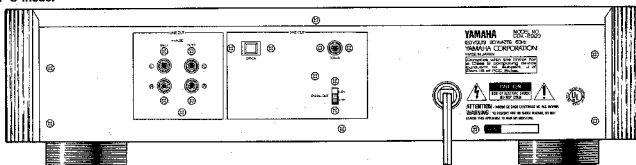
(U) U.S.A. model (B) U.K. model
(W) European model (A) Australian model
(C) Canadian model (R) General model



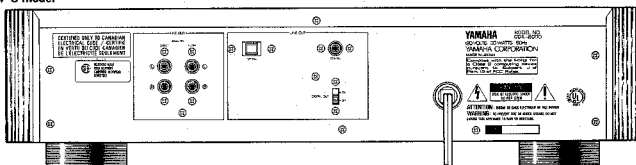
Unit : mm (inch)

REAR PANELS

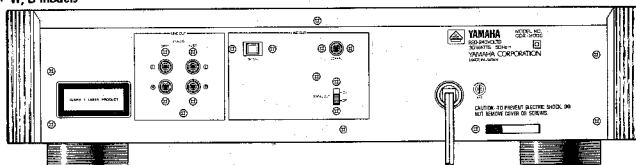
▼ U model



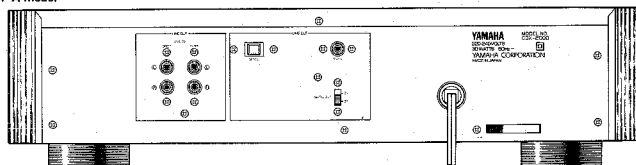
▼ C model



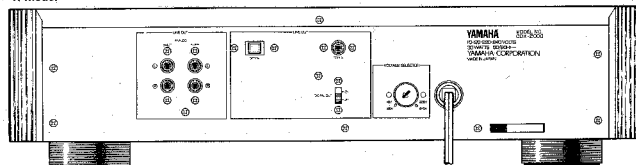
▼ W, B models



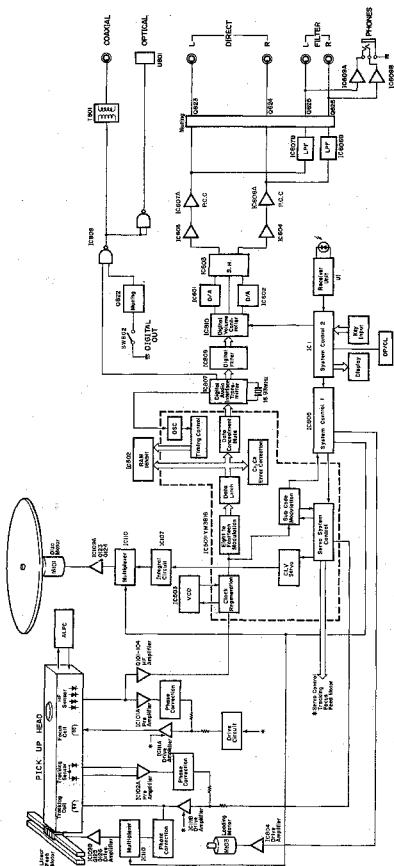
▼ A model



▼ R model



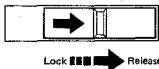
■ BLOCK DIAGRAM



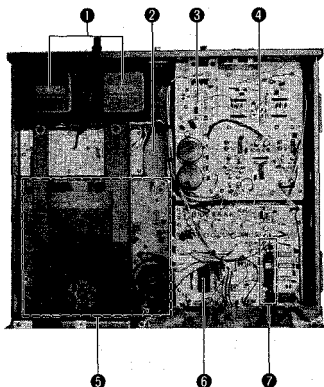
■ PROTECTION LEVER FOR TRANSPORTATION

When transporting the unit, take out the disc and lock the pick-up head by moving the lever in the opposite direction of the arrow while lifting the rear panel side.

*Unless the pick-up head has been locked in place, it may not operate properly even when it is released. It may also fail to operate properly even when the front panel side is lifted with the lever released. In such case, turn OFF the power once and then turn it ON again.



■ INTERNAL VIEW



- ① POWER TRANSFORMER
- ② DIGITAL CIRCUIT BOARD (2)
- ③ MAIN CIRCUIT BOARD (2)
- ④ MAIN CIRCUIT BOARD (1)
- ⑤ DISC MECHANISM UNIT
- ⑥ 8 bit μ -COM: M50943-401SP
- ⑦ SPC CIRCUIT BOARD

DISASSEMBLY PROCEDURES

1. Removal of Top Cover

Remove 5 screws (①) in Fig. 1, and then slide the Top Cover to back side.

2. Removal of Bottom Cover

Remove 12 screws (②) in Fig. 1.

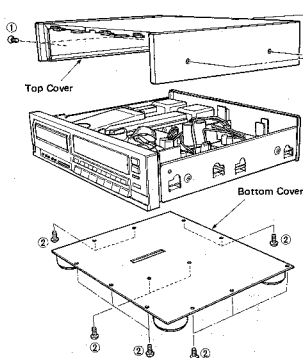


Fig. 1

5. Removal of Flapper

Push the hook fixing the flapper in Fig. 5, and remove the flapper. (Remove the spring, too.)

*Make sure not to forget the spring when reinstalling it.

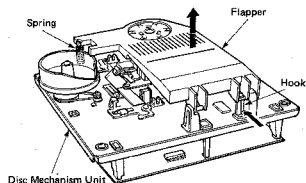


Fig. 5

3. Removal of Disc Tray Ass'y

a. Lift the flapper and pull out the disc tray ass'y in Fig. 2.

b. Push the hook on the DM unit with a slotted screwdriver or the like inserted into the tray hole in Fig. 3, and the disc tray ass'y can be removed.

4. Removal of Disc Mechanism Unit

Remove 4 screws (③) in Fig. 4, and lift the Disc Mechanism Unit gradually.

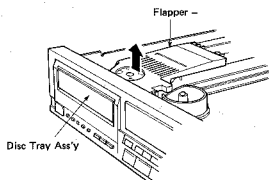


Fig. 2

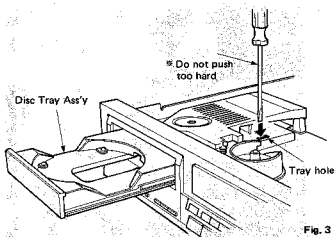


Fig. 3

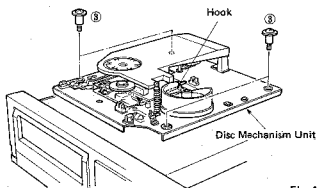


Fig. 4

■ CHIP COMPONENTS DESCRIPTION

1. KIND OF CHIP DEVICE

We have five kinds of chip devices:

- Thick film chip resistor
- Multi-layer ceramic chip capacitor
- Mini-mould (Chip) transistor
- Mini-mould (Chip) diode
- Mini-mould (Chip) IC

2. IDENTIFICATION OF FOUR KINDS OF CHIP DEVICES

Since four kinds of chip devices have similar shape and size, it is quite difficult to identify them at a glance, but basically, following identification is available:

a. Resistor/Jumper resistor

All chip resistors have a 3 digit indication of the value of resistance.

For example, "472" stands for 4.7k ohms and "000" stands for the jumper resistor.

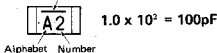
$$47 \times 10^2 = 4700\Omega$$

$$= 4.7k\Omega$$

b. Ceramic capacitor

Some chip capacitors have a 2 digit indication of the value of capacitance. For example, "A2" stands for 100pF. Some chip capacitors have no indication.

(Example) Special mark



• Contents of indication

Alphabet The numerical value of electrostatic capacity.

Number The value of the multiplier.

Special mark Temperature characteristic.

• Electrostatic capacity

(Alphabet)

Alphabet	A	B	C	D	E	F	G	H	J	K	L	M
Numerical value	1.0	1.1	1.2	1.3	1.5	1.6	1.8	2.0	2.2	2.4	2.7	3.0

Alphabet	N	P	O	R	S	T	U	V	W	X	Y	Z
Numerical value	3.3	3.6	3.9	4.3	4.7	5.1	5.6	6.2	6.8	7.5	8.2	9.1

Alphabet	a	b	c	d	e	f	m	n	t	y
Numerical value	2.5	3.5	4.0	4.5	5.0	6.8	7.8	8.0	9.0	

(Number)

Number	0	1	2	3	4	5	6	7	8	9
figures value	10^0	10^1	10^2	10^3	10^4	10^5	10^6	10^7	10^8	10^9

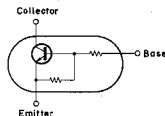
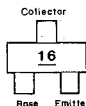
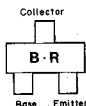
c. Transistor

The transistors can be identified by their identification codes of 2 to 4 alphabet letters assigned to each of them. Given below is a cross reference table of identification codes and transistors.

Use it to identify each transistor from its code.

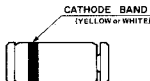
Indication	Parts No.	Description	HFE rank
FQ	1A103700	Transistor 2SA1037	Q-rank
FR	"	"	R-rank
FS	"	"	S-rank
AQ	1B070900	" 2SB709	Q-rank
AR	"	"	R-rank
AS	"	"	S-rank
BQ	1C241200	" 2SC2412	Q-rank
BR	"	"	R-rank
BS	"	"	S-rank
YQ	1D060100	" 2SD601	Q-rank
YR	"	"	R-rank
YS	"	"	S-rank

Ex. Transistor: 2SC2412(R) Ex. Digital Transistor DTA144EK

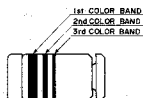


d. Diode and Zener Diode

Each diode has a yellow or white band (cathode band) on its cathode side as shown below.



The zener diode has three color bands as shown below.



The 1st and 2nd color bands indicate the model as a number is assigned to each color as listed in Table 1. Referring to Table 1, read the code number by converting the colors of bands into the corresponding numbers and then find the model code in Table 2. The number in the model code indicates the zener voltage. The 3rd color band on the zener diode indicates the subdivision of the zener voltage.

COLOR	1st color band 1st number in code	2nd color band 2nd number in code	3rd color band Zener voltage Subdivision
Black	0	0	—
Brown	1	1	—
Red	2	2	—
Orange	3	3	—
Yellow	4	4	A
Green	5	5	B
Blue	6	6	C
Purple	7	7	—
Gray	8	8	—
White	9	9	D

RLZ Series Zener Code No. and Model Code Cross Reference Table

Zener Code No.	Model Code
07	RLZ3.6
08	RLZ3.9
09	RLZ4.3
10	RLZ4.7
11	RLZ5.1
12	RLZ5.6
13	RLZ6.2
14	RLZ6.8
15	RLZ7.5
16	RLZ8.2
17	RLZ9.1
18	RLZ10
19	RLZ11
20	RLZ12
21	RLZ13
22	RLZ15
23	RLZ16
24	RLZ18
25	RLZ20
26	RLZ22
27	RLZ24
28	RLZ27
29	RLZ30
30	RLZ33
31	RLZ36
32	RLZ39

Table 2

As explained above you can identify chip devices tentatively, but actual identification should be made by referring to the parts layout drawing in the service manual.

3. SPECIAL NOTICE FOR HANDLING CHIP DEVICES

Chip devices are not heatproof and shockproof. Use caution when handling them.

a. For shock

Chip devices are made of ceramic or plastic moulding, please do not subject them to direct shock.

- Set chip device flat onto printed circuit board.
- Do not apply unnecessary stress to the chip device. When soldering two terminals of chip device, soldering is done one by one. Sometimes, when one terminal is soldered, the other unsoldered terminal is slightly lift. In such case, do not try to push down the lifted terminal using the tip of the soldering iron. In such a case, you may crack the chip device or may break the terminals.

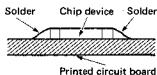
b. For heat

Do not apply high temperature to chip devices for long periods. Soldering should be done quickly.

c. Soldering

- Chip devices can not withstand rapid heating or cooling. Do not heat the chip itself, heat the terminals of chip devices.
- Solder quickly, excessive soldering time will cause damage to chip device.

- Try to reduce amount of solder when soldering. Amount of solder will effect the strength of the chip bending against the printed circuit board. Refer to amount of solder as shown below.



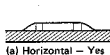
d. Soldering iron

When soldering chip devices, use the right soldering iron.

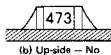
- Soldering iron
Power of soldering iron should be less than 30 watts.
Diameter of iron chip should be about 2 mm.
- Temperature of iron tip.
Temperature of soldering iron tip should be less than 536°F. (280°C.)

e. Mounting chip device onto printed circuit board

- Set chip devices as close as possible onto the surface of printed circuit board.
Do not apply unnecessary pressure to chip devices in order to make it close to the surface of printed circuit board.
Try to keep distance between chip device and surface of printed circuit board less than 0.5mm.
- Do not connect (solder) wire or terminal of other parts to terminal of chip device.
- Do not mount chip devices incorrectly, such as (b), (c) and (d).



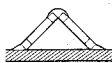
(a) Horizontal — Yes



(b) Up-side — No



(c) Vertical — No

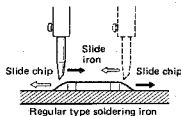


(d) Combination — No

f. Removal of defective device for repair

When removing chip devices with a forked tip iron, heat the chip device with the fork tip and slide.

When you are going to remove chip devices using regular tip iron, heat two terminals of chip device repeatedly about 2 or 3 times and slide the chip device. Slide chip device only in the direction specified as shown below.



ADJUSTMENTS

Necessary items

Measuring instruments

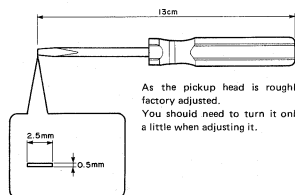
- Oscilloscope : x 2
 (At least one shall have a bandwidth of 50 MHz or more)
 Audio frequency oscillator (A.F. OSC) : x 1
 Laser power meter : x 1
 [LEADER LPM-8000 (P/No. TX915140) or equivalent]
 AC voltmeter (ACVM) : x 2
 (One dual channel or two single channel meters)
 DC voltmeter (DCVM) : x 1
 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 and 11)
 DM unit adjusting tool (P/No. TX911740) : x 1

Tools

- ⊕ Screwdriver : x 1
 (For Pre-Set Potentiometer adjustment)
 Core screwdriver : x 1 (Step 3)
 ⊖ Special Screwdriver : x 1 (Step 5)
 (For Diffraction Grating adjustment)



Adjustment jig (with internal filter)

Connect the filter in Fig. A before measurement.

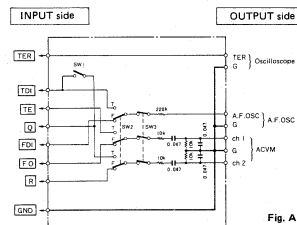
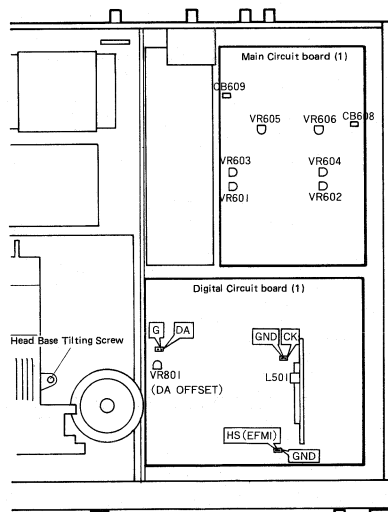


Fig. A

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

Test point (1)



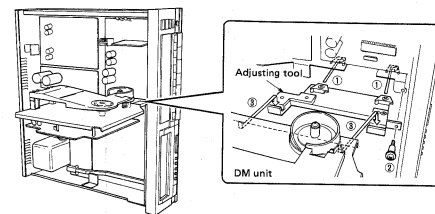
Shown with disc tray Assy removed

Precautions or Special Notes

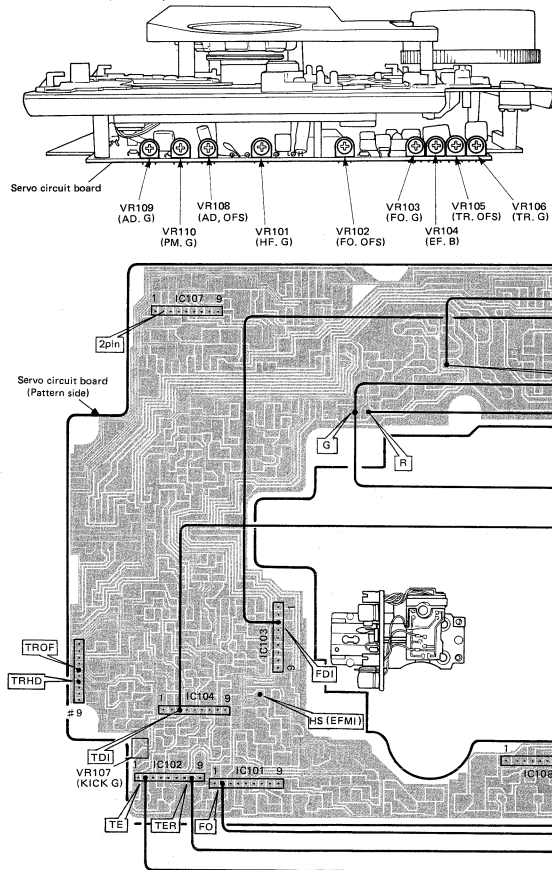
1. Measure the output level at the output terminal of the AF oscillator.
2. The unit should always be in a horizontal position while performing adjustments.
3. Solder the servo circuit board-to-filter wires to facilitate adjustments.

Installation of Adjusting Tool

- DM unit adjusting tool: P/No. TX911740
- a. With the unit placed vertically as shown, fit the adjusting tool into the cuts in the frame (where the digital circuit board (1) is installed) as indicated with (1) in the figure.
 - b. Fasten the frame and the adjusting tool as shown with the screw (2) used to fix the DM unit.
 - c. Fit the DM unit chassis into the grooves of the adjusting tool as indicated with (3) in the figure.



- Adjustment wiring diagram/test points (2)
(Before adjustment, solder input leads of filter to facilitate.)

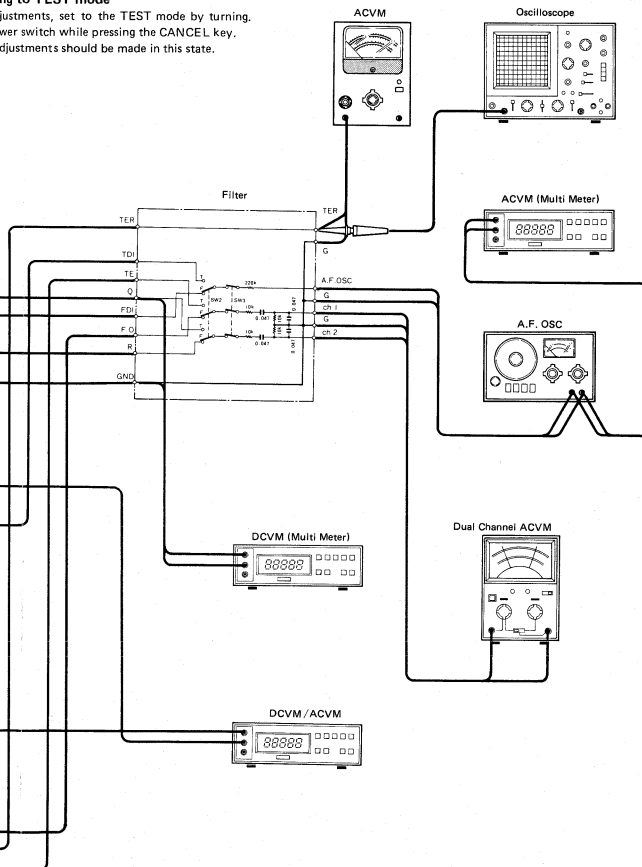


★ BEFORE ADJUSTMENTS

1 Setting to TEST mode

Before adjustments, set to the TEST mode by turning.
On the power switch while pressing the CANCEL key.

- * Some adjustments should be made in this state.



● Discription 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

② Adjustments

Carry out following adjustments in the order as numbered.

1. Confirmation of laser output
2. Confirmation of focus actuator operation
3. Adjustment of VCO
4. Adjustment of jitter
5. Adjustment of diffraction grating
6. Adjustment of focus offset
7. Adjustment of EF balance
8. Adjustment of HF level
9. Adjustment of focus gain
10. Adjustment of tracking gain
11. Adjustment of tracking offset
12. Confirmation of jitter

13. Adjustment of kick gain
14. Confirmation of search mode
15. Adjustment of AD offset
16. Adjustment of DAC offset (digital circuit board)
17. Adjustment of PM gain
18. Adjustment of AD gain
19. Adjustment of DAC offset (main circuit board)
20. Adjustment of output offset
21. Adjustment of DAC distortion

Confirmation of Laser Output (Step 1)

- ① Do not load the disc.
- ② Remove the disc tray.
- ③ Remove the flapper.
- ④ Set to the TEST mode.
- ⑤ Apply the laser power meter's sensor to the pick-up head as shown in Fig. B.

- ⑥ Measure the laser output during the 5 seconds.

Rating: Laser output = 0.1mW to 0.5mW

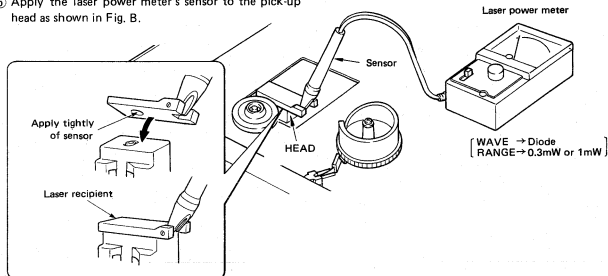


Fig. B

Precautions in handling pick-up head

- (1) No soldering necessary for unit.
- (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 dirt 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 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 pick-up head's objective lens moves smoothly from the lowest point to the highest point.

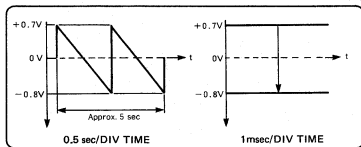
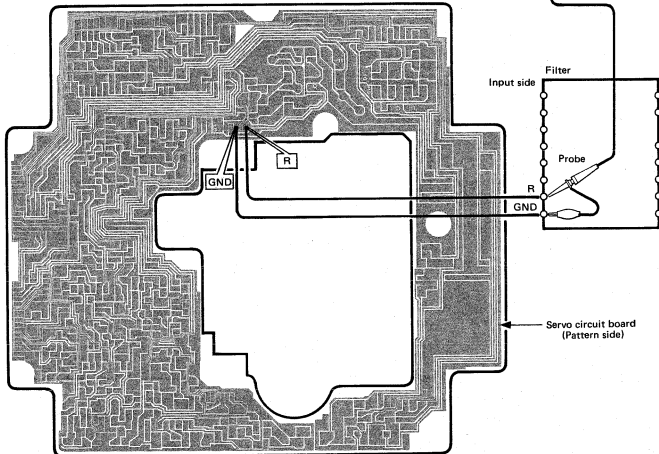


Fig. C



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 disc.
- ③ Set to the STOP mode.

- ④ Wait for longer than a minute after the POWER switch is turned ON and while observing the frequency counter indication, adjust L501 core so that it satisfies the rating.
Rating: $F_{VCO} = 4.3218 \text{ MHz} \pm 10 \text{ kHz}$

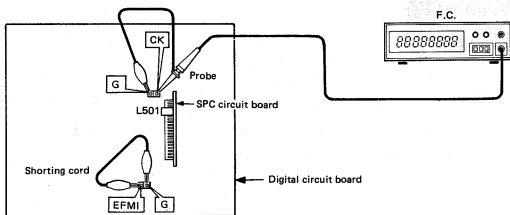


Fig. D

Adjustment of Jitter (Step 4)

Oscilloscope (2) Settings

- AC coupling
- 0.5 V/div range (Vertical)
(50 mV/div when 10:1 probe is used)
- 0.2 ~ 0.5 $\mu\text{sec/div}$ time (Horizontal)

- ① Remove the disc tray.
- ② Connect the oscilloscope (2) to [EFMI] terminal.
- ③ Load the specified disc YEDS-18.
- 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.

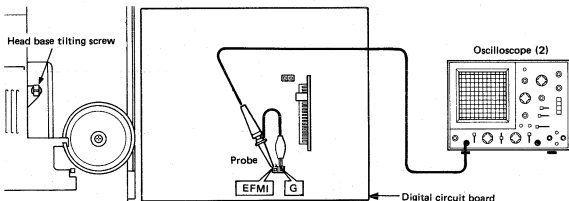
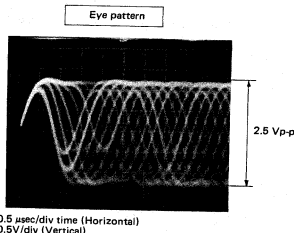


Fig. E

Oscilloscope (2)

CDX-2000



Adjustment of Diffraction Grating (Step 5)

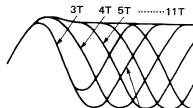
* This adjustment requires use of 2 oscilloscopes.

Oscilloscope (1) setting conditions

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

- ① Connect the filter and measuring instruments as shown in Fig. F.
- 1) Connect the oscilloscope (1) to [TER] terminal.
- 2) Connect the oscilloscope (2) to [EFMI] terminal.
- ② Load the test disc. (YEDS-18 or YEDS-7)
- ③ The POWER switch is turned ON.
- ④ Press the PLAY key.
- ⑤ Set SW1 in the filter to ON.
(Short-circuit between [TDI] terminal and [Q] terminal. (TRACKING SERVO $\rightarrow$ OFF))
- ⑥ Observe the waveform on the oscilloscope (1).

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 the good waveform.

Good waveform

Abnormal waveform



Adjust so that the good waveform is obtained.

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 50MHz or greater.

- ⑦ Using the screwdriver (See P. 10), adjust the diffraction grating screw so that the [TER] signal amplitude becomes maximum and satisfies the rating.
Rating: E TER $\geq$ 150mVp-p
 - * When the disc has stopped rotating, press PLAY key again and make adjustment.
 - * Adjust at the inner circumference of the disc.
- ⑧ Set SW1 in the filter to OFF.
(TRACKING SERVO $\rightarrow$ ON)
- ⑨ 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)

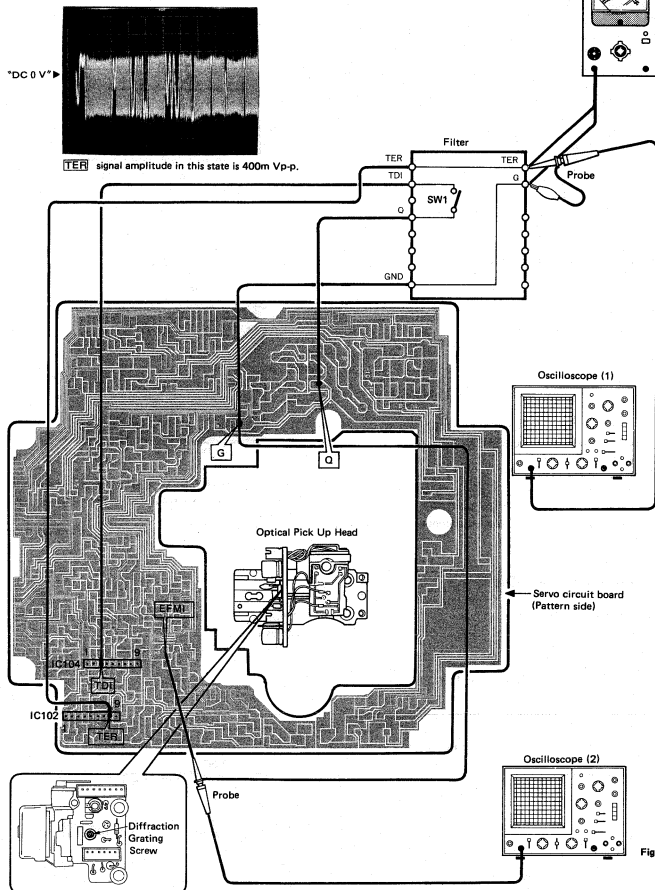


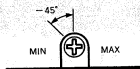
Fig. P

Adjustment of Focus Offset (Step 6)

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)

- Connect an oscilloscope (2) to the **[EFMI]** terminal.
- Load the test disc. (YEDS-18 or YEDS-7)
- The POWER switch is turned ON.
- Press the PLAY key.
- Adjust VR102 (FO, OFS) so that the **[EFMI]** signal (eye pattern) becomes clear.
 - * Be sure to adjust at the center of the disc.
 - * Adjust VR102 within the $\pm 45^\circ$ range.



- If the best adjusted position is not available within 0° to -45° , turn VR102 back to the center position and turn it toward MIN again to obtain the best possible EFMI signal within that range.
- After adjustment, check to make sure that there is nothing abnormal in FOCUS search operation.

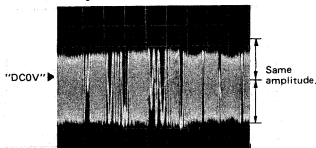
Adjustment of EF Balance (Step 7)

Oscilloscope (1) settings

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

- Connect the filter and measuring instruments as in Step 5.
- Load the test disc. (YEDS-18 or YEDS-7)
- The POWER switch is turned ON.
- Press the PLAY key.
- Set SW1 in the filter to ON.
 - Short-circuit between **[TDI]** terminal and **[Q]** terminal (TRACKING SERVO $\rightarrow$ OFF)
- Observe the waveform on the oscilloscope (1).

Good

Rating DC offset $\rightarrow$ Less than ± 10 mV.

This shows DC 0V state.

- Adjust VR104 (EF B) so that the amplitude of the **[TER]** signal becomes equal above and below the DC 0V position.
 - * Adjust at the inner circumference of the disc.

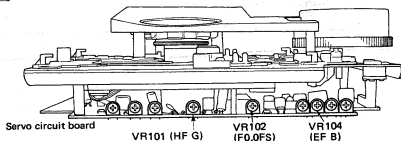
Adjustment of HF Level (Step 8)

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)

- Connect the oscilloscope (2) to the **[EFMI]** terminal as in Step 5.
- Load the test disc. (YEDS-18 or YEDS-7)
- The POWER switch is turned ON.
- Press the PLAY key.

- Adjust VR101 (HF G) so that the **[EFMI]** level becomes 2.5 Vp-p.
 - * Adjust at the center of the disc.



Adjustment of Focus 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. G.
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. (YEDS-18 or YEDS-7)
- ⑤ The POWER switch is turned ON.
- ⑥ Press the PLAY key.

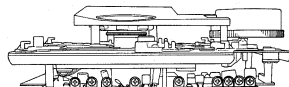
⑦ Set SW3 to ON.

⑧ Read the indications of the AC voltmeters (CH1: E_{FO} , CH2: E_R).

⑨ Adjust VR103 (FO G) so that AC voltmeter indications satisfy the rating.

Rating: $E_{FO} - E_R = -5\text{dB}$ $0\text{dBV} = 1\text{V}$

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



VR103 (FO G)

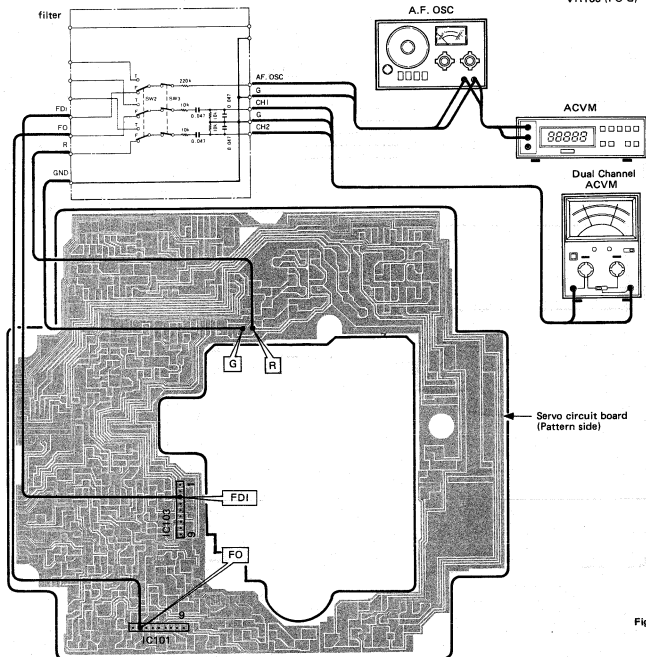
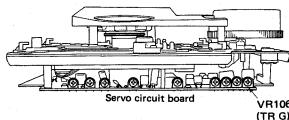


Fig. G

Adjustment of Tracking Gain (Step 10)

* 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. H.
- 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. (YEDS-18 or YEDS-7)
- 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: ETE, CH2: EQ).

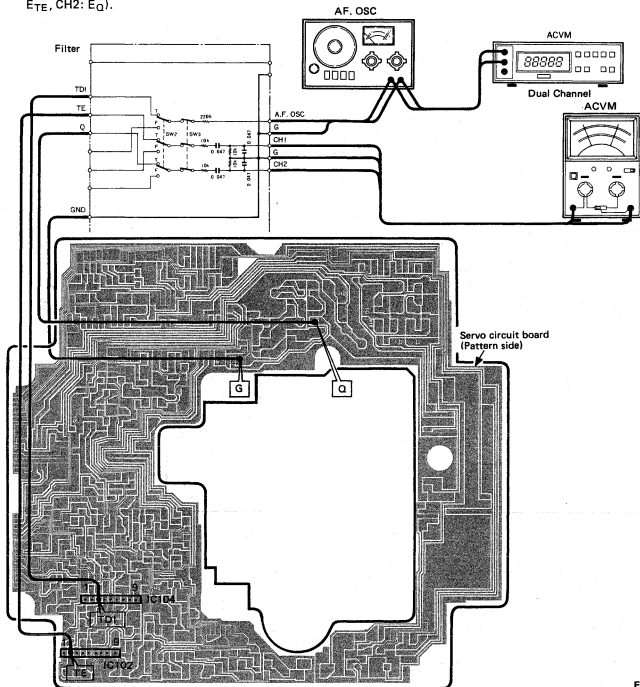


- ⑨ Adjust VR106 (TR G) so that AC voltmeter indications satisfy the rating.

Rating: ETE - EQ = 20dB 0dBV = 1V

Reference ETE = -10 dBV (316mV)

EQ = -30 dBV (32mV)



Adjustment of Tracking Offset (Step 11)

- ① Connect the DC voltmeter to the **Q** terminal.
- ② Short between the **TROF** (base of Q116) and ground.
- ③ The POWER switch is turned ON.
- ④ Press the STOP key.
- ⑤ Adjust VR105 (TR OFS) so that the DC voltmeter indication satisfies the rating.
Rating: $E_Q = 0V \pm 25mV$

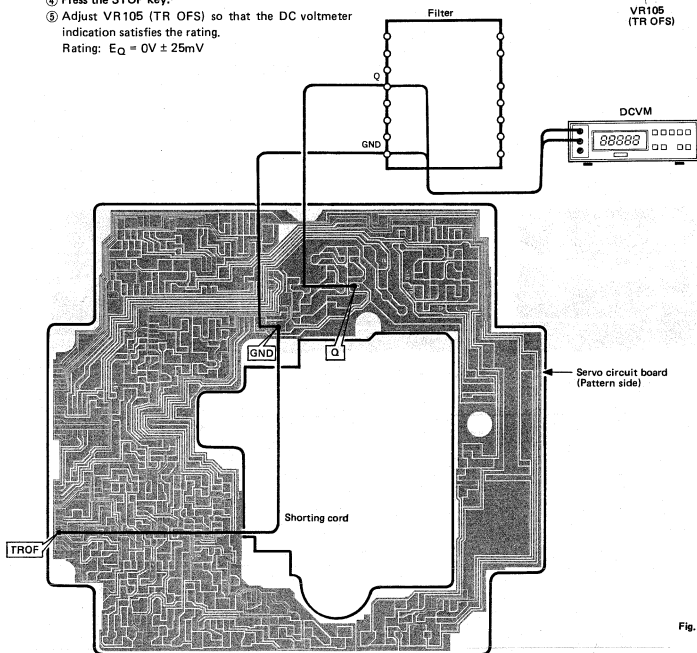


Fig. 1

Confirmation of Jitter (Step 12)

- ① Confirm the jitter rating as in ⑥ of Step 4.
- ② When the tilting screw has been readjusted, go back to Step 4 and carry out adjustments all over from there.

- 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)

- ⑤ Press the FF mode key () for 3 seconds and check the waveform.
- ⑥ Adjust VR107 (KICK G) 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.



Confirmation of Search Mode (Step 14)

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

Adjustment of AD Offset (Step 15)

- ① Connect the DC voltmeter to the 8 pin of IC108.
- ② Set to the Test mode.
- ③ Press the REPEAT key.
- ④ Press the "1" key.
- ⑤ Force the head fully to the outer edge by pushing it with finger and fix it there.
- ⑥ Adjust VR108 (AD OFS) so that the specified rating is obtained.

Rating: $E = 0V^{+0}_{-100} \text{ mV}$

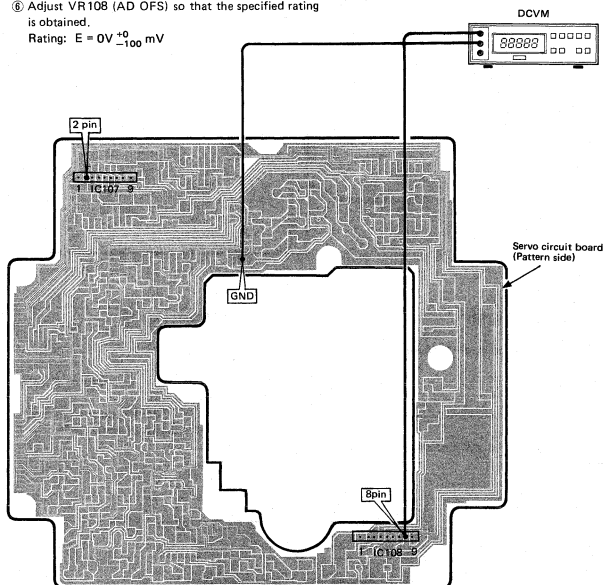
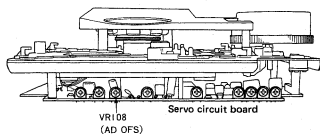


Fig. K

Adjustment of DA Offset (Step 16)

- ① Do not load the disc.
- ② Connect the DC voltmeter to [DA] terminal.
- ③ Set to the TEST mode.
- ④ Press the REPEAT 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 VR801 (DA OFS) so that the specified Rating: $E = 0V \pm 0_{-10}^{+0} \text{ mV}$
- ⑧ In the same way as in step 15, 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 15 again.

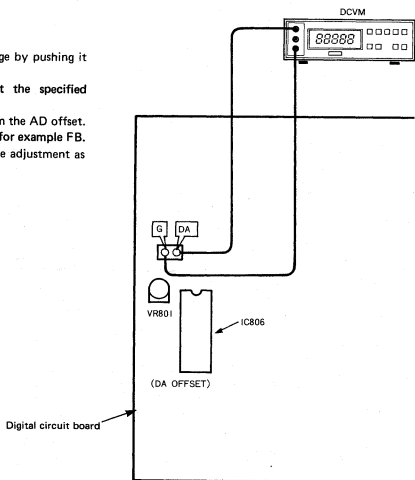


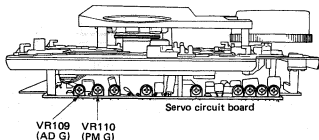
Fig. L

Adjustment of PM Gain (Step 17)

- ① Connect the DC voltmeter to the 2 pin of IC107 as shown in Fig. K.
- ② Set to the TEST mode.
- ③ Press the "0" key.
- ④ Force the head fully to the inner edge by pushing it with finger and fix it there.
- ⑤ Adjust VR110 (PM G) so that the specified rating is obtained.
Rating: $E = 0 \pm 100\text{mV}$

Adjustment of AD Gain (Step 18)

- ① Set to the TEST mode.
- ② Press the "0" key.
- ③ Force the head fully to the inner edge by pushing it with finger and fix it there.
- ④ Adjust VR109 (AD G) to the position where the "SEC" of the display changes from 01 to 00.



Adjustment of DAC Offset (Step 19)

- ① Connect the DC voltmeter to the 9 pin of IC601 and 8 pin of IC605 (L ch).
- ② Connect the DC voltmeter to the 9 pin of IC602 and 8 pin of IC604 (R ch).
- ③ In the STOP mode, adjust VR603 (L ch) and VR604 (R ch) so that the specified rating is obtained.
Rating: $E = 0 \pm 1\text{mV}$

Adjustment of Output Offset (Step 20)

- ① Connect the voltmeter to the output terminal of IC606 (R ch) and IC607 (L ch) respectively. (Test pin available: CB609 for L ch and CB608 for R ch)
- ② Load the disc.
- ③ Maximize the OUTPUT LEVEL by OUTPUT LEVEL UP key.
- ④ In the STOP mode, adjust VR605 (L ch) and VR606 (R ch) so that the specified rating is obtained.
Rating: $0\text{V} \pm 1\text{mV}$

Adjustment of DAC Distortion (Step 21)

- ① Connect the distortion meter to the LINE OUT terminal.
- ② Load the disc.
- ③ Press the PLAY key.
- ④ Maximum the OUTPUT LEVEL by OUTPUT LEVEL UP key.
- ⑤ Adjust VR601 (L ch) and VR602 (R ch) so that the distortion of 1kHz, 0dB output becomes minimum (less than 0.003%).

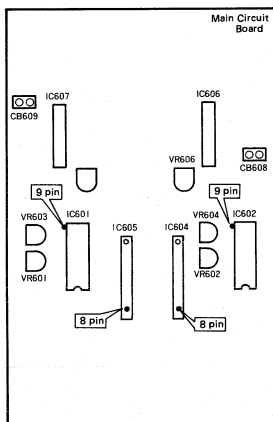


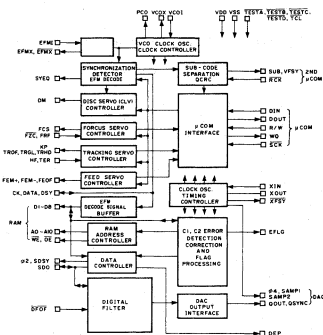
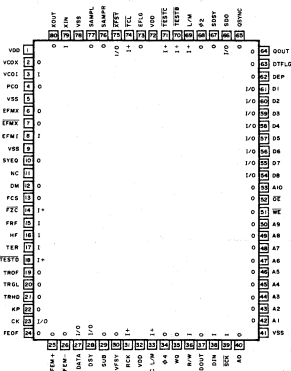
Fig. M

LSI DATA

IC501: YM3816 Signal Processor & Controller for Compact Disc Player (SPC)

YM3816 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.



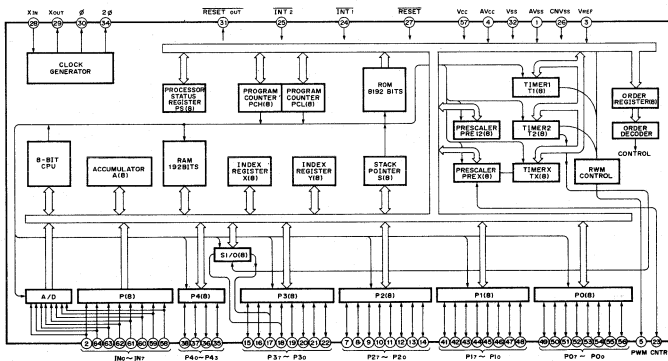
Pin No.	Pin Name	I/O	Function
1	VDD	O	Power Supply
2	VCOX	O	Clock Playback Circuit 4PCO
3	VCOI	I	
4	PCO	O	GND
5	VSS		
6	EFMX	O	EFM Signal External Circuit
7	EFMX	O	
8	EFMI	I	GND
9	VSS		
10	SYEQ	O	Synchronized Uniform Signal
11	N.C.		Not Use
12	DM	O	Disc Servo { LOW (0V): FORWARD OPEN (2.5V): STOP HIGH (5V): REVERSE
13	FCS	O	Focus Servo System Input
14	FZC	I	
15	FRF	I	Tracking Servo System Input
16	HF	I	
17	TER	I	Tracking Servo System Input
19	TRQF	O	
20	TRGL	O	Tracking Servo System Input
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	FE0F	O	
25	FEM+	O	Feed Servo System
26	FEM-	O	
23	CK	I/O	
27	DATA	I/O	EFM Demodulated Signal Check Output (4.3218MHz clock)
28	DSY	I/O	
29	SUB	O	
30	VFSY	O	Sub-code Output
31	RCK	I	
32	VDD		Power Supply
33	NC	I	Not Use
34	$\phi 4$		4.3218 MHz Clock
35	WQ	O	
37	DOUT	O	
36	R/W	I	Q Code Output System
39	SCK	I	
38	DIN	I	
41	VSS		Data Output to μ COM Data I/O Control Signal Clock for Data I/O Data I/O from μ COM
40	A0	O	
42	A1	O	
43	A2	O	Q code Output μ COM Command
44	A3	O	
45	A4	O	
46	A5	O	
47	A6	O	
48	A7	O	
49	A8	O	
50	A9	O	
51	WE	O	RAM Connections
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	SB first (H)/MSB first (L) Switch for SDO
71	TESTC	I	Test Terminal
64	NC	O	Not Use
65	SDSYM	O	BB Word Clock for DAC
76	SAMPR	O	DAC Interface
77	SAMPL	O	
34	$\phi 4$	O	Degitch Signal
18	TESTD	I	4.3218MHz Clock
70	TESTB	I	
74	TCL	I	Test Terminal
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	
80	XOUT	O	Clock Oscillation

IC805: M50943-401SP (8 bit μ -COM)

CDX-2000

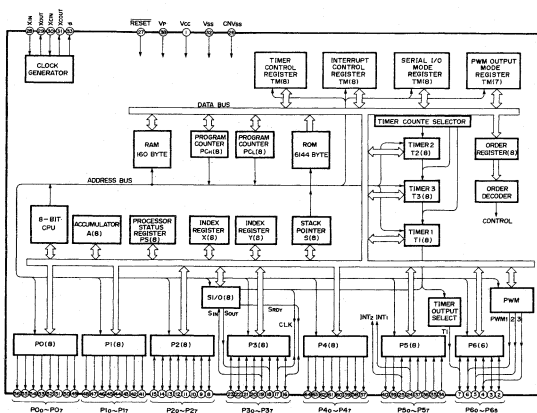
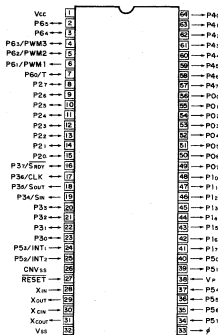
AVSS	1	64	--IN1
IND	2	63	--IN2
V	3	62	--IN3
AVCC	4	61	--IN4
PWM	5	60	--IN5
NC	6	59	--IN6
P2T	7	58	--IN7
P2s	8	57	Vcc
P2s	9	56	--P0
P2s	10	55	--P01
P2s	11	54	--P02
P2s	12	53	--P03
P2s	13	52	--P04
P2s	14	51	--P05
P3T/SW	15	50	--P06
P3s/CLK	16	49	--P07
P3s/SW	17	48	--P10
P34/SW	18	47	--P11
P3s	19	46	--P12
P3s	20	45	--P13
P3s	21	44	--P14
P3s	22	43	--P15
CNTR	23	42	--P16
INT1	24	41	--P17
INT1	25	40	NC
CNVSS	26	39	NC
RESET	27	38	--P40
Xin	28	37	--P41
Xout	29	36	--P42
S	30	35	--P43
RESETINT	31	34	--ZF
IOVSS	32	33	NC



Pin No.	Pin Name	I/O	Function
1	AV _{SS}	—	A/D GND
2	INO	I	A/D
3	V	—	A/D V _{ref} 5V
4	AV _{CC}	—	A/D V _{CC} 5V
5	PWM	O	—
6	NC	—	—
7	P2 ₇	I/O	Linear Motor Drive
8	P2 ₆		
9	P2 ₅		
10	P2 ₄		
11	P2 ₃		
12	P2 ₂		
13	P2 ₁		
14	P2 ₀	I/O	DM FG Pulse
15	P3 ₇ /SRDY		
16	P3 ₆ /CLK		
17	P3 ₅ /SOUT		
18	P3 ₄ /SIN		
19	P3 ₃		
20	P3 ₂		
21	P3 ₁	I	DM Servo select
22	P3 ₀		
23	CNTR		
24	INT ₁		
25	INT ₂		
26	CNV _{SS}		
27	RESET		
28	XIN	O	Clock Input
29	XOUT		
30	φ		
31	RESETOUT		
32	(OV)V _{SS}		
33	NC		
34	2 φ		
35	P4 ₃	I/O	TRACK Servo Gain Control
36	P4 ₂		
37	P4 ₁		
38	P4 ₀		
39	NC	—	—
40	NC	—	—
41	PI ₇	I/O	FLAPPER IN SW Input
42	PI ₆		
43	PI ₅		
44	PI ₄		
45	PI ₃		
46	PI ₂		
47	PI ₁		
48	PI ₀	I/O	DISPLAY DATA START Signal output
49	PO ₇		
50	PO ₆		
51	PO ₅		
52	PO ₄		
53	PO ₃		
54	PO ₂		
55	PO ₁	—	FLAPPER OUT SW Input
56	PO ₀		
57	V _{CC}		
58	IN ₇		
59	IN ₆		
60	IN ₅		
61	IN ₄	I	KEY Input
62	IN ₃		
63	IN ₂		
64	IN ₁		

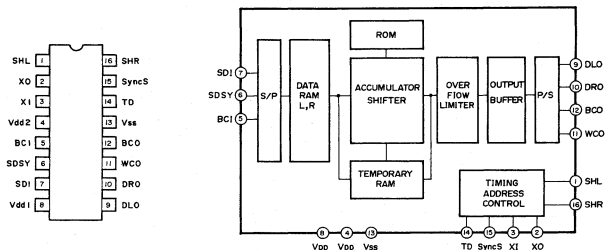
IC1: M50754-405SP (8 bit μ -COM)

CDX-2000



Pin No.	Pin Name	I/O	Function	
1	V _{cc}		V _{cc}	
2	P _{6f}	I/O	U T } DISPLAY SEGMENT	
3	P _{6g}			
4	P _{6h} /PWM3			
5	P _{6i} /PWM2	O	VOLUME UP	
6	P _{6j} /PWM1		VOLUME DOWN	
7	P _{6k} /T		S V } DISPLAY SEGMENT	
8	P ₂₇	I/O	} DISPLAY DATA INPUT	
9	P ₂₆			
10	P ₂₅			
11	P ₂₄			
12	P ₂₃			
13	P ₂₂			DISPLAY DATA START Signal output
14	P ₂₁			DISPLAY DATA CLK Signal output
15	P ₂₀		DISPLAY SEGMENT (K,W)	
16	P ₃₇ /SRDY		POWER OFF detect	
17	P ₃₆ /CLK	O	} KEY CODE OUTPUT	
18	P ₃₅ /SOUT			
19	P ₃₄ /SIN			
20	P ₃₃	I/O	} REMOCON INPUT	
21	P ₃₂			
22	P ₃₁			DISPLAY MODE BACKUP ON/OFF
23	P ₃₀	I	} REMOCON INPUT	
24	P ₅₃ /INT ₁			
25	P ₅₃ /INT ₂			
26	CNV _{ss}		GND	
27	RESET	I	RESET	
28	X ₁ N	O	CLOCK INPUT	
29	X ₀ UT	I		
30	X _C IN	I		
31	X _C OUT	O		
32	X _{ss}		GND	
33	φ	O		
34	P ₅₇	I	K3 K2 K1 K0 } KEY INPUT	
35	P ₅₆			
36	P ₅₅			
37	P ₅₄	O	FL DRIVE -30V : VP	
38	V _p		DISPLAY SEGMENT : R	
39	P ₅₁			
40	P ₅₀	O	G8 G9 G7 G6 G5 } DIGIT SIGNAL	
41	P ₁₇			
42	P ₁₆			
43	P ₁₅			
44	P ₁₄			
45	P ₁₃			
46	P ₁₂			
47	P ₁₁			
48	P ₁₀			
49	PO ₇		Q P } DISPLAY SEGMENT	
50	PO ₆			
51	PO ₅	O	O N M L J I H G F E D C B A } DISPLAY SEGMENT	
52	PO ₄			
53	PO ₃			
54	PO ₂			
55	PO ₁			
56	PO ₀			
57	P ₄₇			
58	P ₄₆			
59	P ₄₅			
60	P ₄₄			
61	P ₄₃			
62	P ₄₂			
63	P ₄₁			
64	P ₄₀			

IC809: YM3414 (16 bit over sampling digital filter)



Pin Name	Pin No.	I/O	Description of function
SHL	1	O	At 1DAC (TD = 'L') : Deglitcher signal of Lch (when four-fold) At 2DAC (TD = 'H') : Deglitcher signal of L/Rch (when eight-fold)
X 0	2	O	Generates quarts oscillation between X1 and X0.
X 1	3	I	16.934MHz (Direct input into X1 from the external source is also possible.)
Vdd 2	4		+5V power source for quarts oscillation and deglitcher signal
BCI	5	I	Input terminal for bit clock of input data
SDSY	6	I	Clock to indicate L/Rch distinction of input data and input timing
SDI	7	I	Data input terminal
Vdd 1	8		+5V power source for digital signal system
DLO	9	O	At 1DAC (TD = 'L') : L and R ch data output terminal (when four-fold) At 2DAC (TD = 'H') : L ch data output terminal (when eight-fold)
DRO	10	O	R ch data output terminal
WCO	12	O	Word clock of output data DLO, DRO
BCO	12	O	Bit clock of output data
Vss	13		GND terminal
TD	14	I	1DAC/2DAC select terminal 1DAC (four-fold) = 'L' 2DAC (eight-fold) = 'H'
Sync S	15	I	Synchronous signal to absorb jitter in unsynchronous input (Syncs = 'H' : fully synchronous input = 'L' : SDSY prohibited)
SHR	16	O	R ch deglitcher signal at 1DAC

■ IC BLOCK

IC101, 103, 105, 107 ~ 109: AN6551, NJM4558S, TA7558S or BA715

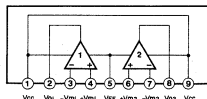
IC102: NJM4560S

IC106: NJM4558S

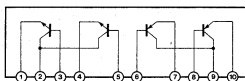
IC604 ~ 607: NJM5532S

IC609: NJM4556S

(Dual Ope-Amp)

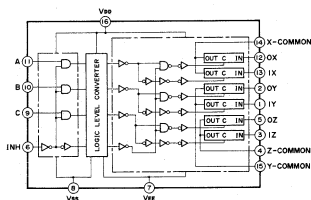


IC111: STA451C (Transistor Array)



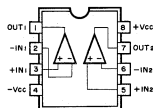
IC110: TC4053BP, μ PD4053, HD14053 or MN4053BP

(Triple-2 channel Multiplexer/Demultiplexer)



IC503: NJM2043M (T1) or AN6558S

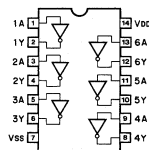
(Dual Ope-Amp)



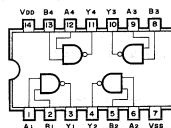
IC603: TC74HC04P or MC74HC04N

IC803: TC4069B

(Hex Inverter)



IC808: TC74HC00P
(Quad 2 Input NAND)

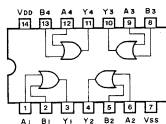


CONTROL INPUTS				"ON" CHANNEL	
INHIBIT (Pin 6)	C (Pin 8)	B (Pin 10)	A (Pin 11)	0X (Pin 12), 0Y (Pin 2), 0Z (Pin 5) 1X (Pin 13), 1Y (Pin 1), 1Z (Pin 3)	0X, 0Y, 0Z 1X, 0Y, 0Z 0X, 1Y, 0Z 1X, 1Y, 0Z 0X, 0Y, 1Z 1X, 0Y, 1Z 0X, 1Y, 1Z 1X, 1Y, 1Z
L	L	L	L	0X, 0Y, 0Z	0X, 0Y, 0Z
L	L	L	H	1X, 0Y, 0Z	1X, 0Y, 0Z
L	L	H	L	0X, 1Y, 0Z	0X, 1Y, 0Z
L	L	H	H	1X, 1Y, 0Z	1X, 1Y, 0Z
L	H	L	L	0X, 0Y, 1Z	0X, 0Y, 1Z
L	H	L	H	1X, 0Y, 1Z	1X, 0Y, 1Z
L	H	H	L	0X, 1Y, 1Z	0X, 1Y, 1Z
L	H	H	H	1X, 1Y, 1Z	1X, 1Y, 1Z
H	*	*	*	NOTE	

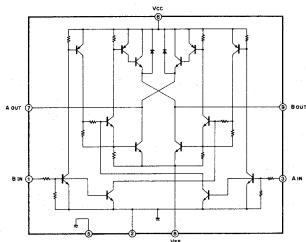
* Don't Care

IC801: TC4071BP

(Quadruple 2-Input OR Gate)

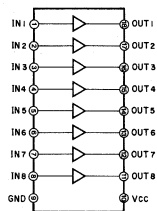
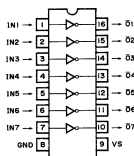


IC804: BA6218 (Motor Driver)

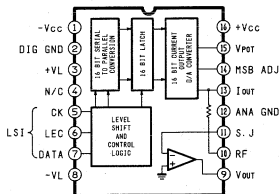


IC3: M54564P (LED Driver)

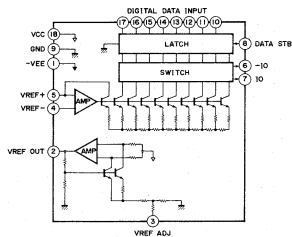
IC2: M54580P (LED Driver)



IC601, 602: PCM56P-K (D/A Converter)

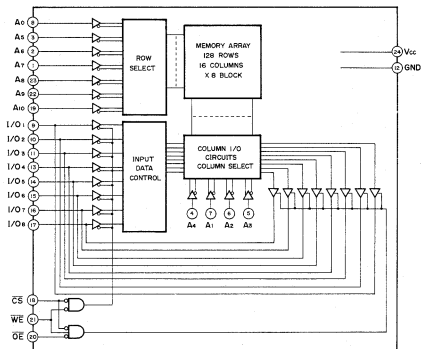
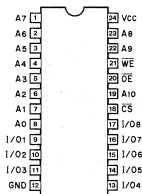


IC806: BA9201 (8 bit D/A Converter)

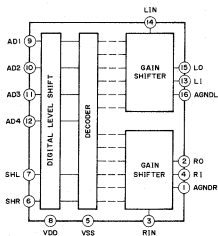
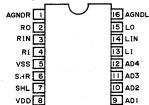


IC502: MSM5128-20GS, HM6116FP-4 or CXK5816M

(RAM)

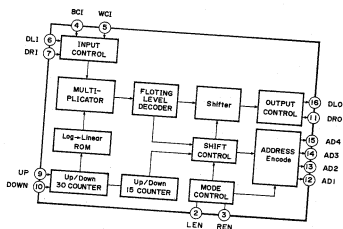


IC603: YM3023 (Gain Shifter)

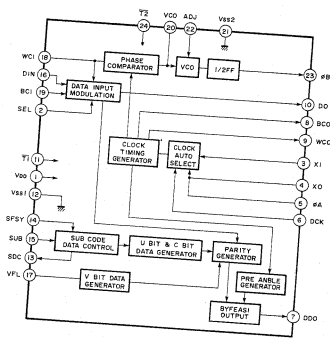
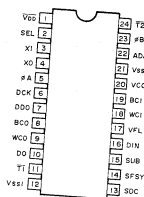


0007-Y95

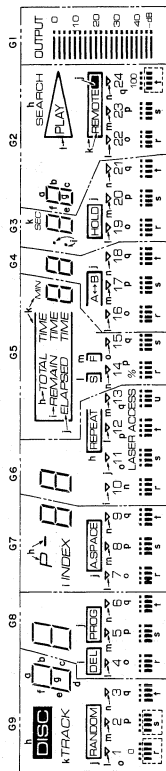
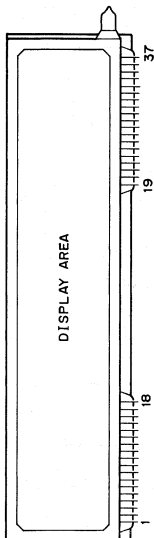
Pinout diagram for the 8255 PPI chip. The chip is shown as a rectangle with pins numbered 1 through 20. Pins 1-8 are on the left, and pins 16-9 are on the right. Pin 16 is DLO, 15 is AD4, 14 is AD3, 13 is AD2, 12 is AD1, 11 is DRO, 10 is DOWN, and 9 is UP. Pins 1-8 are VSS, LEN, REN, BCI, WCI, DLI, ORI, and VDD respectively.



(Digital Audio Interface Transmitter)



■ FL DISPLAY DATA



Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Assignment	F	F	Pk	Ph	Pl	Fm	Pn	Po	Pp	Pq	Pv	Pr	Ps	G9	G8	Pt	G7	G6	G5	G4
Pin No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37			
Assignment	G3	Pu	G2	Pj	Gi	Pk	Pd	Pc	Pl	Pw	Pe	Pg	Pi	Pb	Pa	F	F			

[illegible]

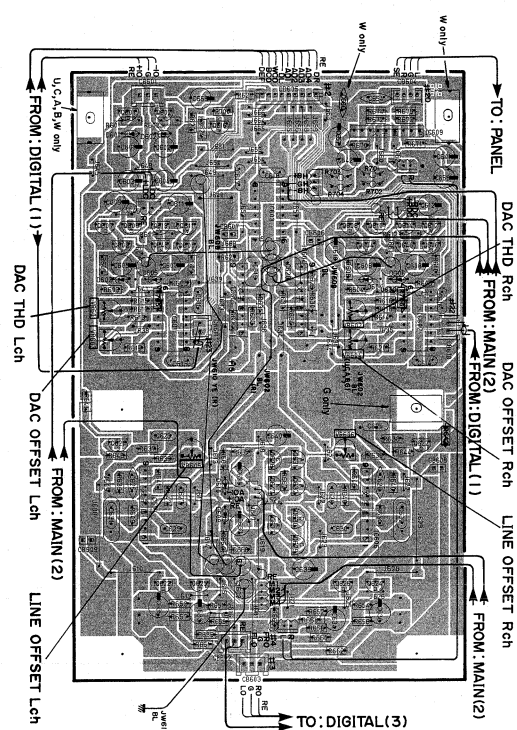
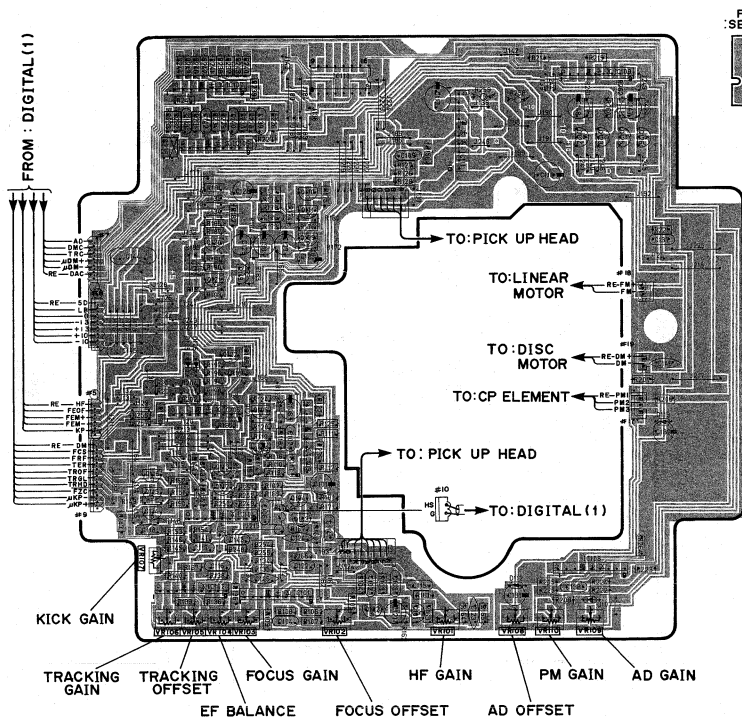
PRINTED CIRCUIT BOARD(Pattern side)

Note) 文字面 : Component side

Servo Circuit Board

FG Circuit Board

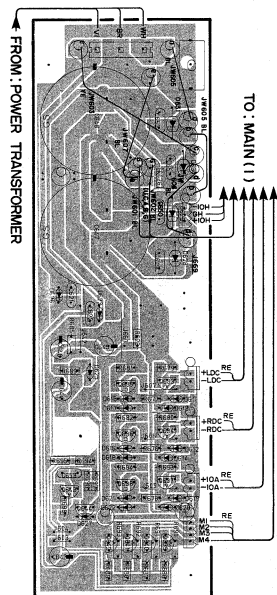
Main Circuit Board (1)



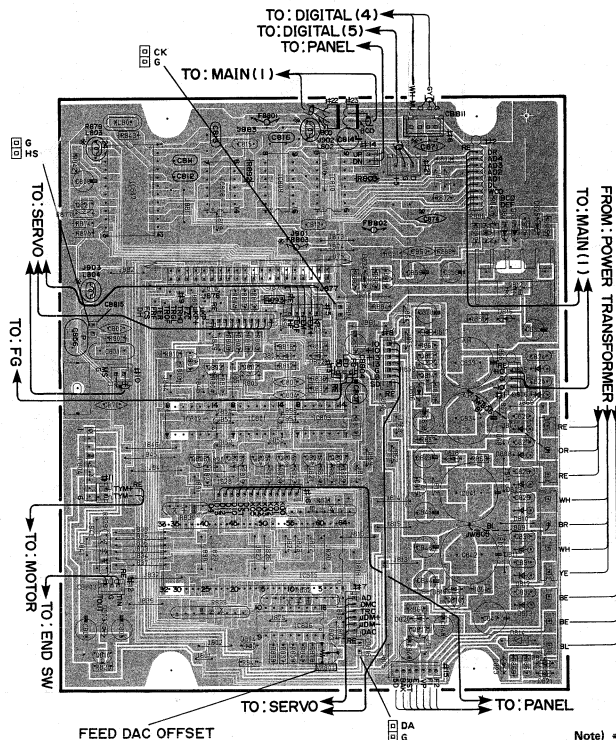
■ PRINTED CIRCUIT BOARD(Pattern side)

Note) 文字面 : Component side

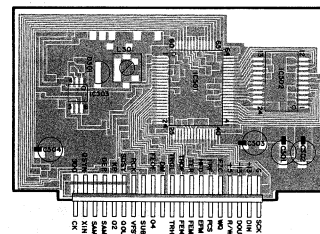
Main Circuit Board (2)



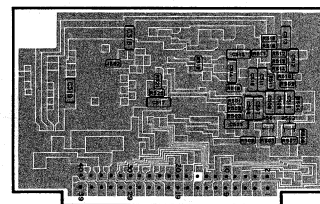
Digital Circuit Board (1)



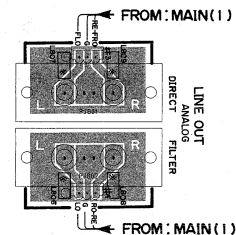
SPC Circuit Board Parts



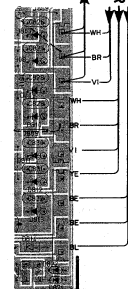
SPC Circuit Board ... Chip



Digital Circuit Board (3)



FROM: POWER TRANSFORMER
TO: MAIN (2)



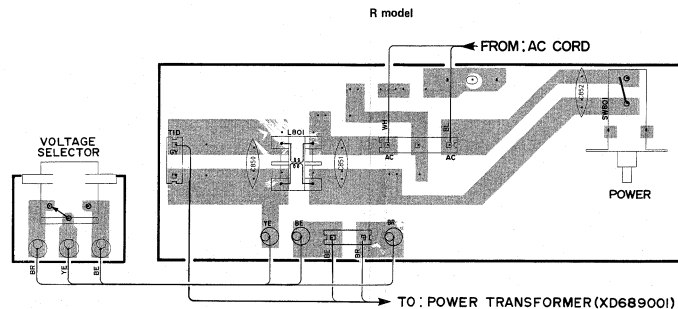
R model

Note) * marked

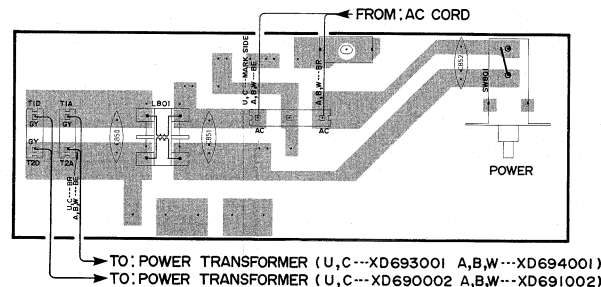
	R, U, C, A, B	W
CB74	OPEN	100P
FB903	SHORT	8-01-RTF
LB02, 804	SHORT	3.3μH
LB03	470	3.3μH
LB06~809	SHORT	60μH

1
2
3
4
5
6

Digital Circuit Board (2)



U, A, W, C, B models

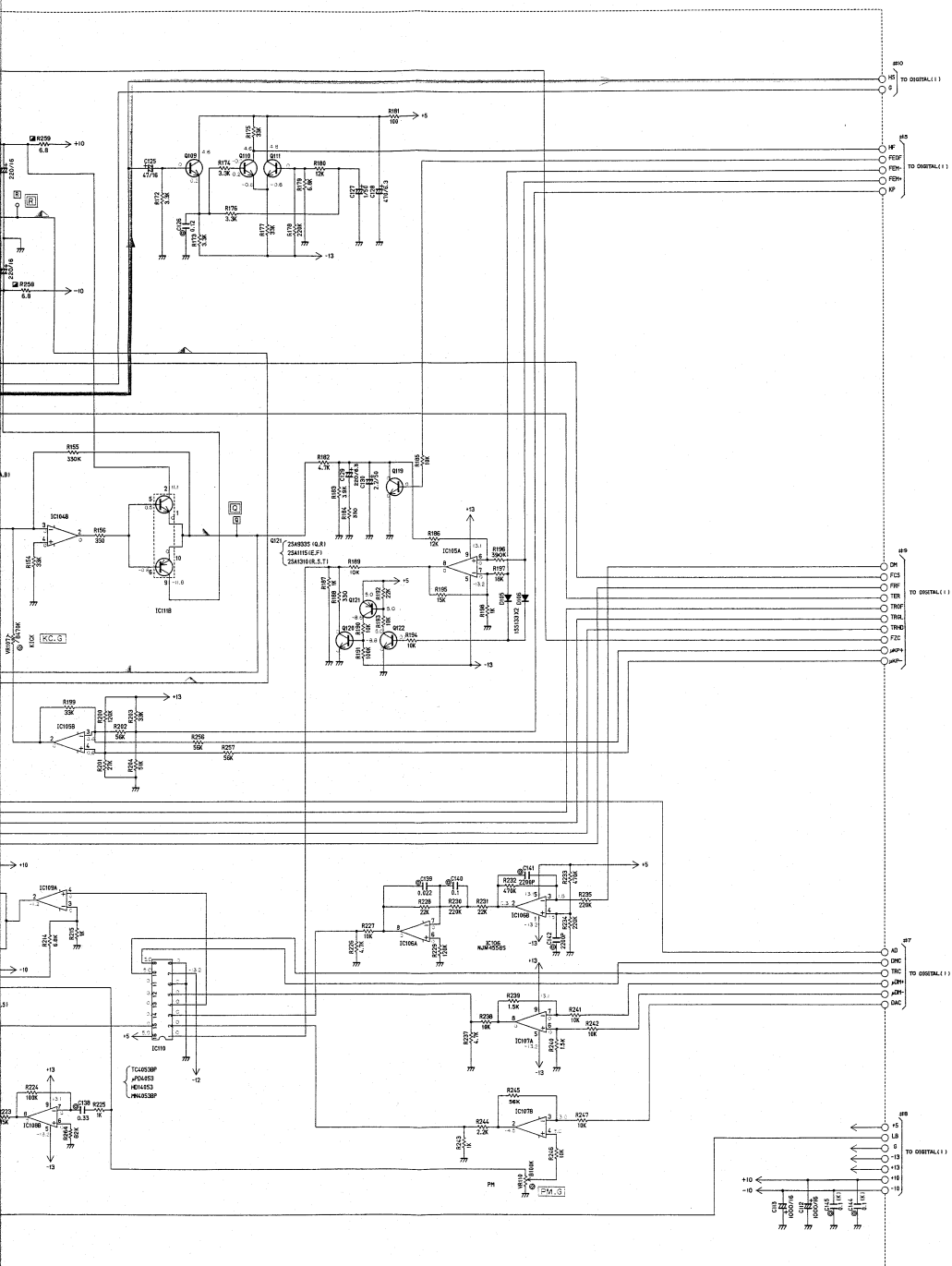


→ TO: POWER TRANSFORMER (U,C---XD693001 A,B,W---XD694001)
→ TO: POWER TRANSFORMER (U,C---XD690002 A,B,W---XD691002)



* Schematic diagram is subject to change without notice.

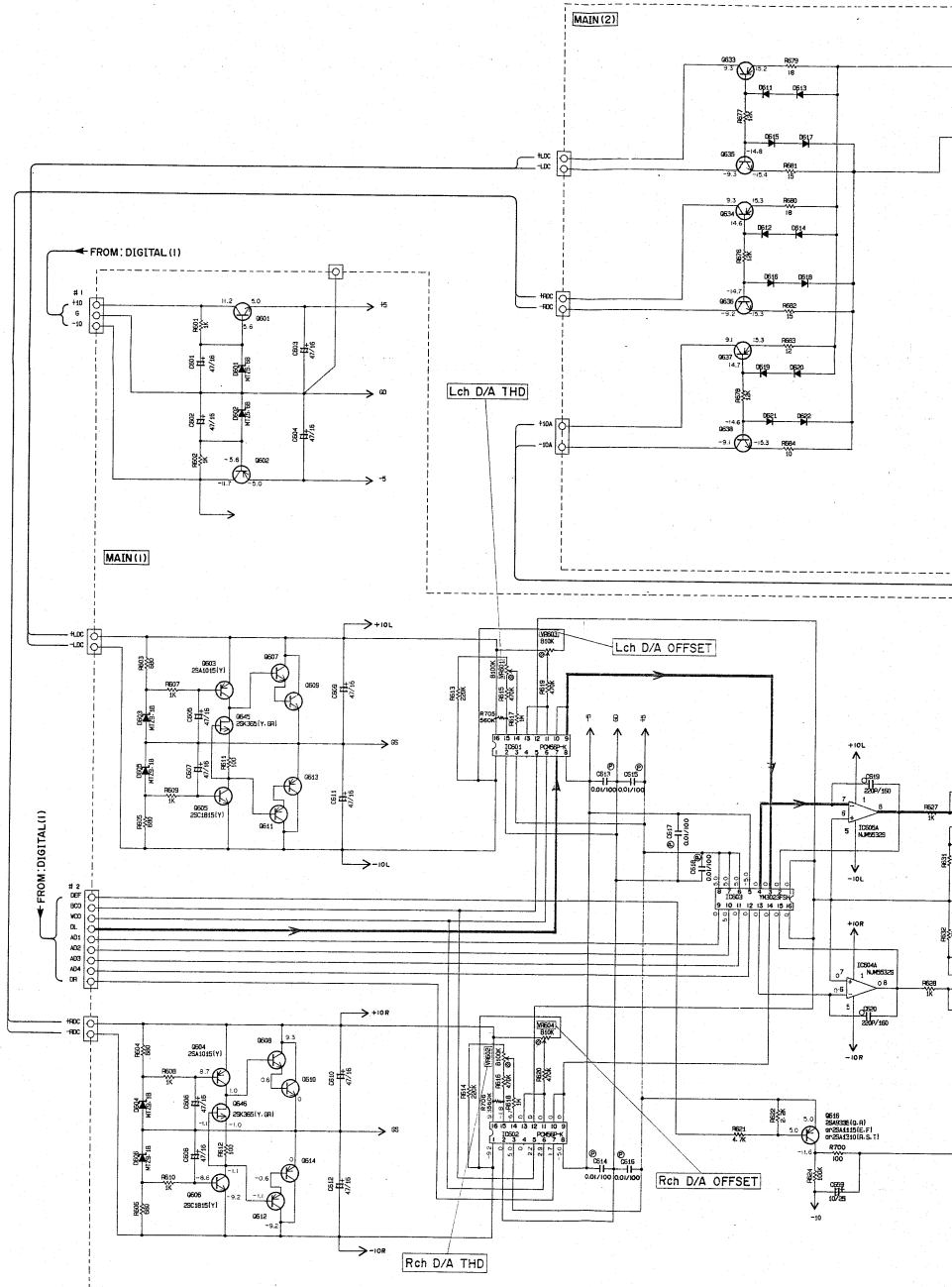
- FROM:MAIN (1)

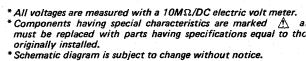


Signal Flow
 ➔ DISC SIGNAL
 ➔ FOCUS SERVO
 ➔ TRACKING SERVO

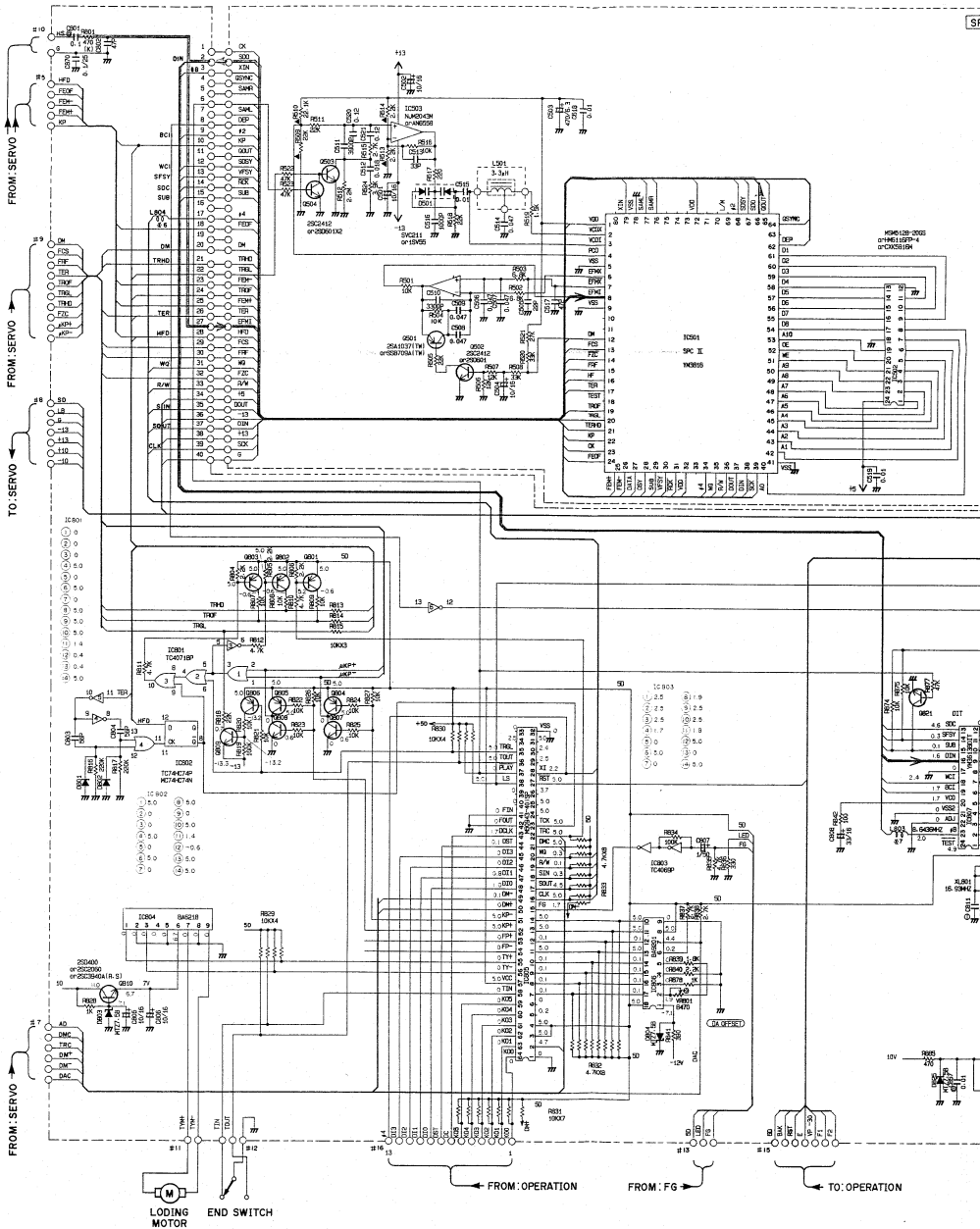
* All voltages are measured with a 10M Ω /DC electric volt meter.
 * Components having special characteristics are marked Δ and must be replaced with parts having specifications equal to those originally installed.
 * Schematic diagram is subject to change without notice.

■ SCHEMATIC DIAGRAM (3/4) Main



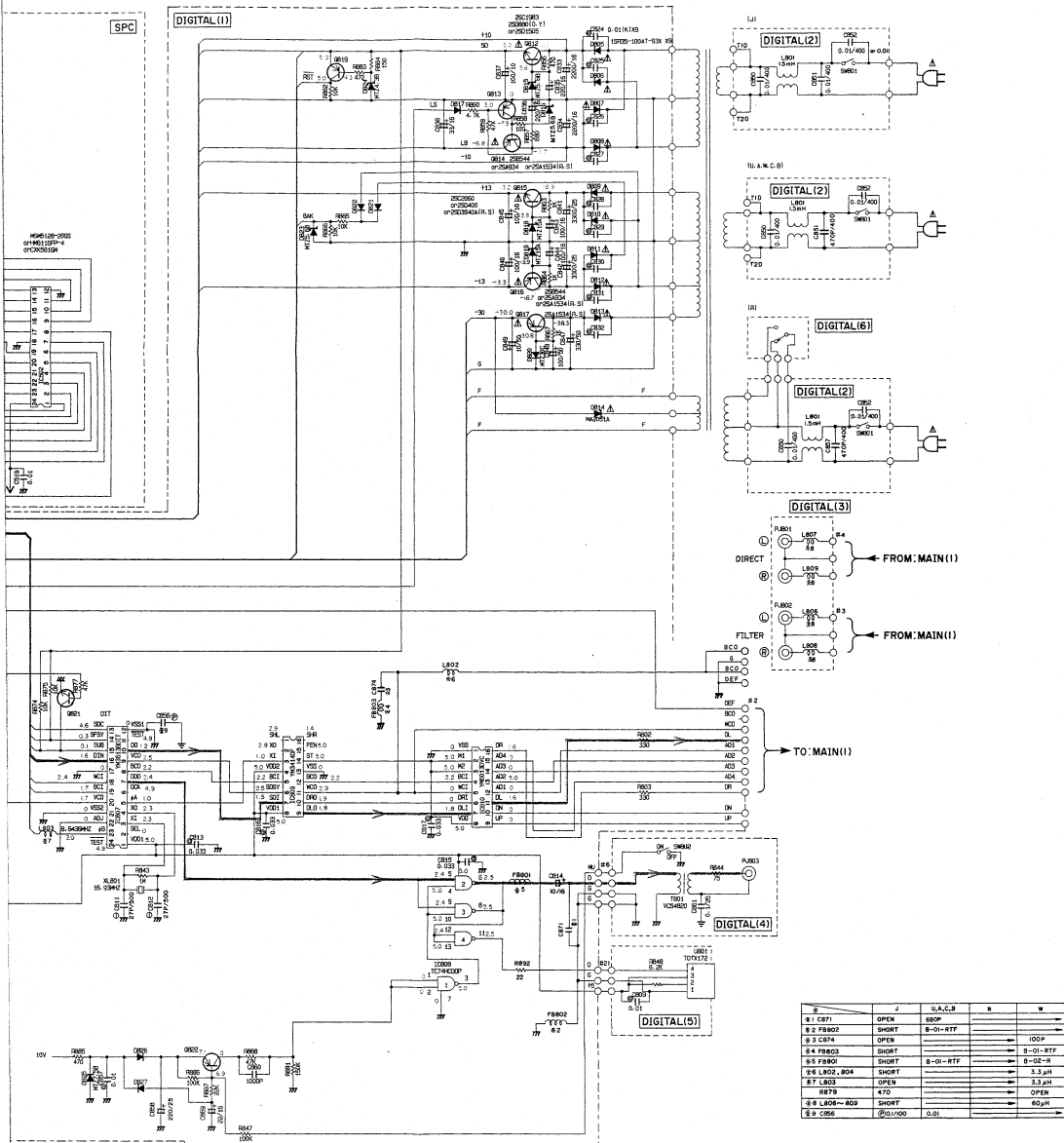


SCHEMATIC DIAGRAM (4/4) Digital



PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICs.

2SC2878 (A, B) 2SC3227 2SD1015 2SC3235 2SC1823 (R, O, Y) 2SA3534 2SB444 2SA1534A (R, S) 2SC3933S (O, R) 2BA1115 (E, F) 2BA1210 (R, S, T) 2SC2060 2SD4000	2SC3940A (R, S) 2SC1740S (S, R) 2SC2803 (E, F) 2SC3312 (R, S, T) 2SA1015 (Y) 2SC1815 (Y)	2SC1983 2SD800 (O, Y) 2SD1505	1SR35-100AT-93X 1S8133 MTZ15A MTZ4.3B MTZ30C MA2051A V11J MTZ5.1A MTZ5.6B	NJM5532S NJM4556S AN6551 NJM4568S TA7598S BA715 NJM4560S	NJM2043M (T1) AN6558S	TC74HC00P MCT4HC74N TC74HC40AP TC4071BP TC4069P	M54504P BA9201	YM3613B YM3023
2SK365 (Y, GR)	2SA1037 (TW) 2SB709A (TW) 2SC2412 2SD601	1SV55 5VC211	BA9218	STA451C	M54509P TC4063BP HD14053 YM30414 YM6013 PCM56P-K	μPD4053 MN4053BP	MM512B-20GS HM6116FP-4 CXK5816M	ME6043-40SP M50754-40SP



REMARKS	1	2	U.A.C.B	3	W
1. CEF1	OPEN	SSOP			
2. FBK02	SHORT	B-DI-RTF			
3. CEF4	OPEN				100P
4. FBK03	SHORT				B-DI-RTF
5. FBK01	SHORT	B-DI-RTF			B-DI-RTF
6. LB02, R04					3.3μH
7. LB03	OPEN				3.3μH
8. RTF9	470				OPEN
9. LB06~R09	SHORT				60μH
10. CEF6	0.01	0.01			

NOTICE

- (U, A, K, C, B) notes:
- (U) U.S.A. notes
- (A) Canadian notes
- (K) Australian notes
- (C) British notes
- (B) General notes

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

PARTS LIST

■WARNING

Components having special characteristics are marked Δ 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 resistor, refer to the last page.

CDX-2000

■ ELECTRICAL PARTS

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
	NA:09:73:90	Digital Circuit Board	デジタ ル シー ト	CDX-1110		U,C,A,B	
	NA:09:74:00	"	"	"		W	
	NA:09:74:10	"	"	"		R	
FC:44:41:00	Mylar Cap.	0.01 μ F 50V	マイ ラー コ ン	C824~832			
FU:35:12:70	Mica Cap.	27pF 500V	マ イ カ コ ン	C811,812			
FG:21:15:60	Ceramic Cap.	56pF 50V	セ ラ コ ン	C803,804			
FG:21:14:70	"	47pF 50V	"	C802			
FG:21:21:00	"	100pF 50V	"	C874		W	
FG:21:31:00	"	1000pF 50V	"	C860			
VD:79:92:00	"	220pF 400V	"	C862,863			
VD:79:93:00	"	470pF 400V	"	C864,865			
FG:21:26:80	"	680pF 50V	"	C871			
VD:79:93:00	"	470pF 400V	"	C851			
VE:17:92:00	"	0.01 μ F 400V	"	C850,852			
FG:24:41:00	"	0.01 μ F 50V	"	C856			
FA:15:41:00	Mylar Cap.	0.01 μ F 50V	マ イ ラー コ ン	C809,857			
FA:15:43:30	"	0.033 μ F 50V	"	C813,815~817			
FZ:00:49:40	"	0.1 μ F 50V	"	C801			
FZ:00:41:30	Semiconductive Ceramic Cap.	0.1 μ F 25V	半 導 体 セ ラ コ ン	C861,870			
VE:70:90:00	Electrolytic Cap.	3300 μ F 25V	ケ ミ コ ン	C841,842			
UJ:13:92:20	"	2200 μ F 16V	"	C833,834			
UJ:12:81:00	"	100 μ F 10V	"	C837			
UJ:13:71:00	"	10 μ F 16V	"	C805,806,814			
UJ:13:72:20	"	22 μ F 16V	"	C859			
UJ:13:73:30	"	33 μ F 16V	"	C808,838			
UJ:13:81:00	"	100 μ F 16V	"	C843~846			
UJ:13:82:20	"	220 μ F 16V	"	C835,836			
UJ:16:61:00	"	1 μ F 50V	"	C807			
UJ:16:71:00	"	10 μ F 50V	"	C849			
UJ:16:81:00	"	100 μ F 50V	"	C848			
UJ:46:83:30	"	330 μ F 50V	"	C847			
UJ:14:82:20	"	220 μ F 25V	"	C858			
VC:54:82:00	Coil		バ ル ス ト ラ ン ス	T801			
VA:77:84:00	Line Filter	1.5mH	ライン フィ ル ター	L801			
VD:47:37:00	SB Coil	60 μ H	S B コ イ ル	L806~809		W	
VE:92:52:00	Inductor	3.3 μ H	イ ン ダ ク タ	L802~804		W	
VE:92:56:00	Ferrite Bead	B-02-R	フェ ラ イ ト ビーズ	FB801		W	
VE:79:55:00	"	B-01-RTF	"	"		U,C,R,A,B	
VE:79:55:00	"	B-01-RTF	"	FB802			
VE:79:55:00	"	B-01-RTF	"	FB803		W	
HZ:00:47:40	Resistor Array	4.7k Ω $\times$ 8	抵 抗 ア レ イ	R832,833			
HZ:00:45:30	"	10k Ω $\times$ 4	"	R829,830			
HZ:00:28:70	"	10k Ω $\times$ 4	"	"			
HZ:00:45:40	"	10k Ω $\times$ 7	"	R831			
VS:86:10:00	Pre-Set Potentiometer	B470Q	半 固 定 抵 抗	VR801			
IF:00:34:50	Diode	ISS133	ダ イ オード	D801,802,817,821,822,826,827			

■New Parts (新規部品) NR

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
IF 00 84 80	Diode	1SR35-100A	ダイオード	D805~813			
IF 00 64 60	Zener Diode	MTZ5.6B	ツェナーダイオード	D815, 823			
IF 00 64 70	//	MTZ7.5B	//	D803, 804, 825			
IF 00 63 10	//	MTZ15A	//	D818, 819			
IF 01 06 30	//	MTZ4.3B	//	D824			
IF 00 91 70	//	MTZ30C	//	D820			
VC 68 63 00	//	MA2051A	//	D814			
IF 00 62 90	//	MTZ5.6B	//	D816			
IA 09 34 00	Transistor	2SA934	トランジスタ	Q814, 816			
IB 05 44 00	//	2SB544(E, F)	//	//	Inter-changeable		
VC 46 67 00	//	2SA1534A(R, S)	//	//			
VC 46 67 00	//	2SA1534A(R, S)	//	Q817			
IA 09 33 00	//	2SA933S(Q, R)	//	Q801~806, 813, 819, 822	Inter-changeable		
IA 11 15 10	//	2SA1115(E, F)	//	//			
IX 60 31 70	//	2SA1310(R, S, T)	//	//			
IC 20 60 00	//	2SC2060	//	Q810, 815	Inter-changeable		
ID 04 00 10	//	2SD400	//	//			
IC 17 40 70	//	2SC1740S(R, S)	//	Q807~809, 821	Inter-changeable		
IC 26 03 10	//	2SC2603(E, F)	//	//			
IX 60 31 80	//	2SC3312(R, S, T)	//	//			
IC 19 83 00	//	2SC1983	//	Q812	Inter-changeable		
ID 08 80 00	//	2SD880	//	//			
ID 15 05 00	//	2SD1505	//	//			
IG 00 14 40	IC	TC4071BP	I C	IC801			
IG 00 17 20	//	TC4069P	//	IC803			
IG 15 35 00	//	BA6218	//	IC804			
XB 98 00 01	//	BA9201	//	IC806			
XD 57 00 02	//	M50943-401SP	//	IC805			
IR 00 00 00	//	TC74HC00P	//	IC808			
IR 00 74 00	//	TC74HC74P	//	IC802			
XC 85 30 01	//	YM3613B	//	IC807			
XD 71 10 01	//	YM6013	//	IC810			
XD 71 20 01	//	YM3414	//	IC809			
VC 39 88 00	Quartz Crystal Unit	I6.93MHz	水晶振動子	XL801			
VC 09 79 00	Switch	ESB82102V-F	パワースイッチ	SW801	Inter-changeable		
VC 40 97 00	//	ESB82101V-F	//	//			
KA 40 09 40	//	SSB-022	スライドスイッチ	SW802			
VD 02 85 00	Pin Jack	1P	ピンジャック	PJ803			
VE 94 23 00	//	2P	//	PJ801, 802			
VD 98 21 00	Optical Module	TOTX172	光伝送モジュール	U801			
LB 20 13 90	Base Pin	TEB2P-SHF i-Type	N H ベースピン	CB814~816			
VD 00 45 00	//	2P i-Type	P H ベースピン	CB802			
VD 00 46 00	//	3P i-Type	//	CB803, 804			
VD 00 48 00	//	5P i-Type	//	CB805			
VD 00 49 00	//	6P i-Type	//	CB806			
VD 00 50 00	//	7P i-Type	//	CB807			

*New Parts (新規部品) NR

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
VD	00:53:00	Base Pin	10P i-Type	P H ベースピン	CB808		
LB	91:80:20	//	2P i-Type	X H ベースピン	CB809		
LB	91:80:30	//	3P i-Type	//	CB810		
LB	91:80:40	//	4P i-Type	//	CB811		
VC	48:80:00	Connector	2P	U P コネクター	CB801		
VC	48:85:00	//	7P	//	CB812		
VC	48:91:00	//	13P	//	CB813		
LA	00:21:40	Lapping Terminal	2P P=10 i-Type	i 型ラッピング端子板			
LA	00:23:20	//	3P P=7.5 i-Type	//		U,C,A,B,W	
LA	00:25:70	//	3P P=7.5 i-Type	//		R	
LA	00:23:30	//	4P P=7.5 i-Type	//			
LA	00:21:50	//	3P P=10 i-Type	//			
LA	00:58:10	Voltage Selector		電 圧 切 換 器		R	
BA	09:29:70	Heat Sink		放 熱 器			
BB	06:95:10	Land Metal Fitting		ラ ン ド 金 具			
VD	17:17:00	Washer		ワ ッ シ ャ			
ED	33:00:86	Binding Head Screw	3×8 FCRM3-BI	バ イ ン ド 小 ネ ジ	PACK		
NA	09:25:71	SPC Circuit Board		S P C シ ー ト		CDX-1100	
VE	85:42:00	Ferrite Core	ESD-R-25DB	フ ェ ラ イ ト コ ア			W

※New Parts (新規部品) NR

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
NA	09:60:20	Main Circuit Board	メ イ ン シ ー ト			U, C, A, B	
NA	09:80:70	"	"			W	
NA	09:79:00	"	"			R	
FF	09:22:20	Polystyrene Film Cap.	220pF 160V 銅ハクスチコン	C619, 620			
F0	21:14:70	Ceramic Cap.	47pF 50V セ ラ コ ン	C625, 626			
F2	00:41:30	Semiconductive Ceramic Cap.	0.1μF 25V 半 導 体 セ ラ コ ン	C654			
F2	00:41:30	"	0.1μF 25V //	C660		W	
UA	25:26:80	Mylar Cap.	680pF 50V マ イ ラ ー コ ン	C629, 630			
FA	15:41:00	"	0.01μF 50V //	C621, 622			
FA	15:36:80	"	6800pF 50V //	C627, 628			
FA	15:43:30	"	0.033μF 50V //	C623, 624			
FA	15:42:00	"	0.02μF 50V //	C631, 632			
UJ	14:64:70	Electrolytic Cap.	4.7μF 25V ケ ミ コ ン	C641, 642			
UJ	13:74:70	"	47μF 16V //	C601~612, 637~640			
UJ	14:71:00	"	10μF 25V //	C646, 659			
UJ	14:72:20	"	22μF 25V //	C644			
UJ	14:81:00	"	100μF 25V //	C657, 658			
UJ	14:82:20	"	220μF 25V //	C643, 645			
VD	03:24:00	"	3300μF 35V //	C647, 648			
UJ	13:74:70	"	47μF 16V //	C605~612			
VE	70:88:00	"	47μF 16V //	C633~636			
UT	45:31:50	Polypropylene Film Cap.	1500pF 100V ポ リ プ ロ コ ン	C653			
UT	45:41:00	"	0.01μF 100V //	C613~618, 649~652			
HV	45:53:30	Flame Proof Carbon Resistor	330Ω 1/4W 不 燃 化 カ ー ボ ン 抵 抗	R701~704			
VB	86:15:00	Pre-Set Potentiometer	810kΩ 半 固 定 抵 抗	VR603~606			
VB	86:19:00	"	8100kΩ //	VR601, 602			
IA	09:33:00	Transistor	2SA933S(Q,R)	ト ラ ン ジ ス タ Q616, 639~643	Inter-changeable		
IA	11:15:10	"	2SA1115(E,F)	"			
IX	60:31:70	"	2SA1310(R,S,T)	"			
IA	09:34:00	"	2SA934	"	Inter-changeable		
IB	05:44:10	"	2SB544	"			
VC	46:67:00	"	2SA1534A(R,S)	"			
IA	10:15:21	"	2SA1015(Y)	"	Inter-changeable		
IC	17:40:70	"	2SC1740S(S,R)	"			
IC	26:03:10	"	2SC2603(E,F)	"			
IX	60:31:80	"	2SC3312(R,S,T)	"	Inter-changeable		
IC	18:15:20	"	2SC1815(Y)	"			
IC	20:60:00	"	2SC2060	"			
ID	04:00:10	"	2SD400	"	Inter-changeable		
IX	60:42:00	"	2SC2878(A,B)	"			
IC	33:27:00	"	2SC3327	"			
VE	38:51:00	FET	2SK365(Y)	F E T Q645~647			
IF	00:34:50	Diode	1SS133	ダ イ オ ー ド D611~623, 625, 626			
IF	00:96:20	"	V11J	"		U, C, A, B, R	
VF	64:42:00	"	V11J	"		W	
IF	00:88:10	Zener Diode	MTZ3.6B	ツ ェ ナ ー ダイ オ ー ド D627			
IF	00:64:60	"	MTZ5.6B	"			
IF	01:08:60	"	MTZ9.1B	"			

*New Parts (新規部品) NR

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
IG	07 : 74 : 00	IC	NJM4556S	I C	IC609		
XA	42 : 60 : 01	//	NJM5532S	//	IC604~607		
XB	70 : 30 : 01	//	YM3023	//	IC603		
XB	63 : 80 : 01	//	PCM56P-K	//	IC601, 602		
LB	91 : 80 : 30	Base Pin	3P i-Type	X H ベースピン	CB601~603		
LB	91 : 80 : 20	//	2P i-Type	//	CB610, 611		
VC	48 : 82 : 00	Connector	4P	U P コネクター	CB604		
VD	00 : 52 : 00	Base Pin	9P i-Type	P H ベースピン	CB605		
LB	20 : 13 : 90	//	TEB2P-SHF i-Type	N H ベースピン	CB606~609		
LA	00 : 23 : 20	Lapping Terminal	3P P=7.5 i-Type	i型ラッピング端子板			
BB	06 : 95 : 10	Land Metal Fitting		ランド金具			
NX	60 : 04 : 20	Operation Circuit Board		オペレーションシート		CDX-1100	
KX	60 : 04 : 10	Switch		M T スイッチ	SW1~29	JPM1010-0401	
IX	60 : 89 : 60	Receiver	HC-102	受 光 器	REC	E-AA0354-001	
HJ	35 : 81 : 00	Carbon Resistor	100k Ω 1/4W	カーボン抵抗	R1~4	Z-W08AA-104DJ	
HJ	35 : 72 : 20	//	22k Ω 1/4W	//	R5~12	Z-W08AA-223DJ	
HJ	35 : 51 : 00	//	100 Ω 1/4W	//	R14	Z-W08AA-101DJ	
HJ	35 : 51 : 00	//	100 Ω 1/4W	//	R0	Z-W08AA-101DJ	R
HJ	35 : 64 : 70	//	4.7k Ω 1/4W	//	R13	Z-W08AA-472DJ	
IF	00 : 34 : 20	Diode	IS1588	ダイオード	D1~9	Z-T0300-1588	
IF	00 : 14 : 30	//	ISR35-100A	//	D10	Z-T0802-10100	
XC	48 : 90 : 03	IC	MS0754-405SP	I C	IC1	Z-Y0160-00038	
IX	60 : 89 : 30	//	MS4580P	//	IC2	Z-20192-54580	
IX	60 : 89 : 40	//	MS4564P	//	IC3	Z-Y0160-00036	
FG	24 : 41 : 00	Ceramic Cap.	0.01 μ F 50V	セラコン	C1	Z-Y27AC4708MW	
UW	91 : 94 : 70	Electrolytic Cap.	4700 μ F 6.3V	ケミコン	C2	Z-Y302R1035MX	
UJ	11 : 74 : 70	//	47 μ F 6.3V	//	C3	Z-Y27AP472BAA	
UR	32 : 73 : 30	//	33 μ F 10V	//	C4	Z-V04AC330CMC	
FG	21 : 22 : 20	Ceramic Cap.	220pF 50V	セラコン	C5~12	Z-Y302R221JNB	
IX	60 : 89 : 50	Display Unit	CP5296GR	蛍光表示管	FL	E-FL020-001	
NX	60 : 10 : 00	Jack Circuit Board		ジャックシート			
LX	60 : 08 : 20	Jack		ジャック	JK	LGR4512-0201R	
FG	24 : 51 : 00	Ceramic Cap	0.1 μ F 50V	セラコン	C13~15		
BD	55 : 00 : 50	Ferrite Core	ESD-R-12C	フェライトコア			

※New Parts (新規部品) NR

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
	NA 09 73 00	Servo Circuit Board	サーボシート				
FG 21 21 50		Ceramic Cap.	150pF 50V セラコン	C105			
FG 21 24 70		//	470pF 50V //	C124			
FG 21 26 80		//	680pF 50V //	C123			
FG 24 41 00		//	0.01μF 50V //	C146			
FA 15 54 70		Mylar Cap.	0.47μF 50V マイラーコン	C117			
FA 15 31 00		//	1000pF 50V //	C114, 115			
FA 15 31 80		//	1800pF 50V //	C137			
FA 15 32 20		//	2200pF 50V //	C141, 142			
FA 15 36 80		//	6800pF 50V //	C104			
FA 15 43 30		//	0.033μF 50V //	C107			
FA 15 42 20		//	0.022μF 50V //	C139			
FA 15 51 00		//	0.1μF 50V //	C102, 103, 106, 140			
FA 15 56 80		//	0.68μF 50V //	C143			
FA 15 51 20		//	0.12μF 50V //	C116, 126			
FA 15 46 80		//	0.68μF 50V //	C122			
FA 15 53 30		//	0.33μF 50V //	C138			
FA 15 53 90		//	0.39μF 50V //	C109			
FA 15 52 20		//	0.22μF 50V //	C118			
FZ 00 49 40		//	0.1μF 50V 銅リードマイラーコン	C144, 145			
UH 13 91 00		Electrolytic Cap.	1000μF 16V ケミコン	C112, 113			
UJ 11 84 70		//	470μF 6.3V //	C128			
UJ 11 82 20		//	220μF 6.3V //	C129			
UJ 12 81 00		//	100μF 10V //	C101, 108			
UJ 13 73 30		//	33μF 16V //	C131, 132			
UJ 13 74 70		//	47μF 16V //	C125			
UJ 13 82 20		//	220μF 16V //	C147, 148			
UJ 14 64 70		//	4.7μF 25V //	C121			
UJ 16 61 00		//	1μF 50V //	C127			
UJ 16 62 20		//	2.2μF 50V //	C130			
HV 45 36 80		Flame Proof Carbon Resistor	6.8Ω 1/4W 不燃化カーボン抵抗	R258, 259			
VB 85 97 00		Pre-Set Potentiometer	B4.7kΩ 半固定抵抗	VR108, 109			
VB 85 98 00		//	B10kΩ //	VR101, 105			
VB 86 01 00		//	B47kΩ //	VR104			
VB 86 02 00		//	B100kΩ //	VR106			
VB 86 02 00		//	B100kΩ //	VR110			
VB 86 05 00		//	B470kΩ //	VR107			
VC 68 58 00		//	B68kΩ //	VR102			
VB 86 01 00		//	B47kΩ //	VR103			
iA 09 33 70		Transistor	2SA933S(Q,R) トランジスタ	Q106, 121			
iA 11 15 10		//	2SA1115(E,F) //	//	Inter-changeable		
iX 60 31 70		//	2SA1310(R,S,T) //	//			
iA 09 34 00		//	2SA934 //	Q124, 126	Inter-changeable		
iB 05 44 10		//	2SB544 //	//			
iC 17 40 70		//	2SC1740S(S,R) //	Q102, 104, 109~113, 119, 120, 122	Inter-changeable		
iC 26 03 10		//	2SC2603(E,F) //	//			
iX 60 31 80		//	2SC3312(R,S,T) //	//			
iX 60 42 00		//	2SC2878(A,B) //	Q105, 114~116	Inter-changeable		
iC 33 27 00		//	2SC3327 //	//			

*New Parts (新規部品) NR

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ラング
IC 20 60 00	Transistor	Z5C2060	ト ラ ン ジ ス タ	Q123,125	Inter-changeable		
ID 04 00 10	"	Z5D400	"	"			
IC 05 35 00	"	Z5C535	"	Q101,103			
IC 19 23 00	"	Z5C1923(R,O,Y)	"	"			
IF 00 88 00	Zener Diode	MT23_6A	ツェナーダイオード	D112	Inter-changeable		
IF 01 08 70	"	MT29_IC	"	D113			
IF 00 34 50	Diode	ISS133	ダ イ オード	D105~107			
IG 07 68 00	IC	NJM4558S	I	C IC106	Inter-changeable		
IG 03 47 00	"	AN6551	"	IC101,102~105,107~109			
IG 07 68 00	"	NJM4558S	"	"			
IG 13 22 00	"	BA715	"	"			
IG 12 18 00	"	NJM4560S	"	IC102	Inter-changeable		
IG 11 94 00	"	STA451C	"	IC111			
IG 05 51 00	"	TC4053BP	"	IC110			
IG 10 59 00	"	μPD4053	"	"			
VB 21 89 00	Base Pin	2P	i-Type P H ベースピン				
VB 21 90 00	"	3P	i-Type				
VB 85 85 00	"	6P	L-Type				
VB 85 87 00	"	8P	L-Type				

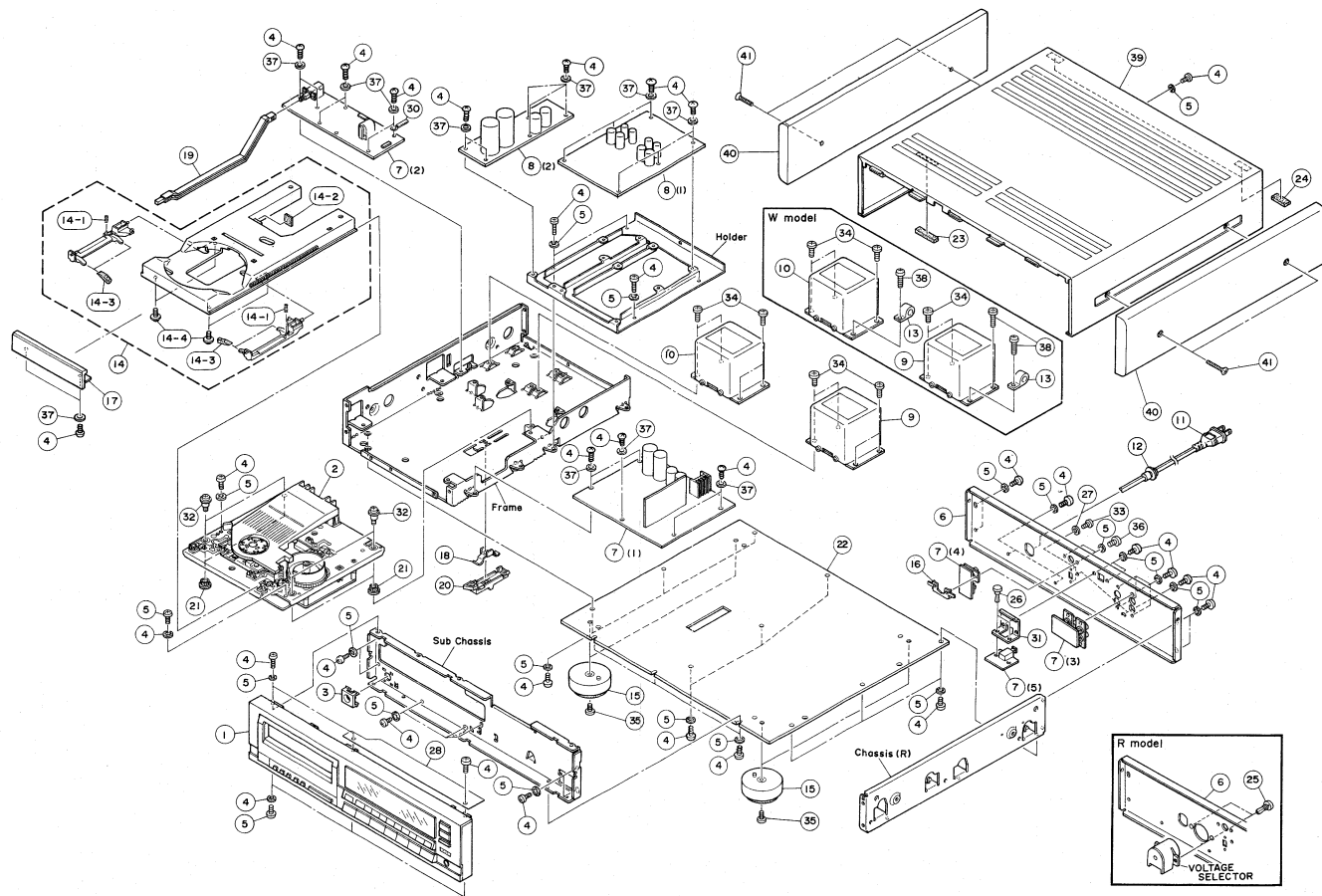
※New Parts (新規部品) NR

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ラング
NA 09 25 71		SPC Circuit Board		S P C シー ト			
UD 11 33 30	Chip Ceramic Cap.	3300pF 50V	チップセラコン	C510,513			
UD 11 41 00	"	0.01μF 50V	"	C515,518,519			
UD 11 44 70	"	0.047μF 50V	"	C506~509,514			
VB 37 18 00	"	22pF 50V	"	C505			
VB 37 26 00	"	47pF 50V	"	C517			
VB 37 38 00	"	220pF 50V	"	C512			
VB 37 42 00	"	470pF 50V	"	C511			
VB 37 46 00	"	1000pF 50V	"	C516			
UJ 11 84 70	Electrolytic Cap.	470μF 6.3V	ケ ミ コ ン	C503			
UJ 13 71 00	"	10μF 16V	"	C501,502,504			
GE 90 20 00	OSC Coil	3.3μH	発 振 コ イ ル	L501			
VB 36 97 00	Chip Jumper		チップジャンパー	J501			
VB 35 88 00	Chip Resistor	220Ω 1/8W	チ ッ プ 抵 抗	R517			
VB 36 08 00	"	1.5kΩ 1/8W	"	R519			
VB 36 12 00	"	2.2kΩ 1/8W	"	R511			
VB 36 16 00	"	3.3kΩ 1/8W	"	R512			
VB 36 21 00	"	4.7kΩ 1/8W	"	R515			
VB 36 25 00	"	6.8kΩ 1/8W	"	R502,503			
VB 36 29 00	"	10kΩ 1/8W	"	R501			
VB 36 31 00	"	12kΩ 1/8W	"	R506,507			
VB 36 37 00	"	22kΩ 1/8W	"	R505,518			
VB 36 39 00	"	27kΩ 1/8W	"	R521			
VC 31 66 00	Chip Metal Film Resistor	22.1kΩ 1/8W	チップ金属膜抵抗	R509,510,513,514			
VB 36 41 00	Chip Resistor	33kΩ 1/8W	チ ッ プ 抵 抗	R508,520			
VB 36 53 00	"	100kΩ 1/8W	"	R516			
VB 40 27 00	"	1MΩ 1/8W	"	R504			
IA 10 37 00	Chip Transistor	2SA1037	チップトランジスタ	Q501	Inter-changeable		
IB 07 09 10	"	2SB709A	"	"			
IC 24 12 00	"	2SC2412VB	"	"			
ID 06 01 00	"	2SD601	"	"			
IF 00 49 10	Varactor Diode	1SV55	F M/バラクタダイオード	D501	Inter-changeable		
IF 00 49 20	"	SVC211	"	"			
IG 15 75 00	IC	HM6116FP-4	I	C IC502			
IG 15 71 10	"	NJM2043M(T1)	"	IC503			
XB 69 80 01	"	YM3816(SPCI)	"	IC501			
VB 97 27 00	Connector	40pin	コ ネ ク ター				

※New Parts (新規部品) NR

CDX-2000

■ EXPLODED VIEW



MECHANISM PARTS

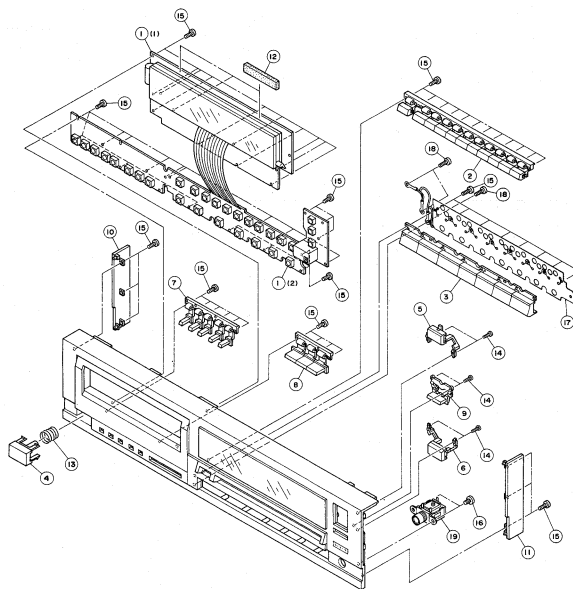
Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
1	VF 77 75 00	Panel Unit	パネルユニット			U,C	
2	VF 82 79 00	//	//			R	
3	VF 82 80 00	//	//			A,B,W	
4	VE 83 07 00	Disc Mechanism Unit	DM-2000L	D M ユ ニ ッ ト			
5	CB 66 09 60	Guide, Button	ボ タ ン ガ イ ド		CDX-1100		
6	EI 33 00 86	Binding Head Tapping Screw	3×8 FCRM3-BI	バインドタッピングネジ	PACK		
7	EV 41 30 36	Toothed Lock Washer	φ3 FCRM3-BI	内 歯 付 座 金	PACK		
8	VF 82 82 00	Rear Panel	リ ャ パ ネ ル			R	
9	VF 77 73 00	//	//			U	
10	VF 82 83 00	//	//			B,W	
11	VF 84 32 00	//	//			A	
12	VF 83 58 00	//	//			C	
13	NA 09 73 90	Digital Circuit Board	デ ジ タ ル シ ー ト		CDX-1110	U,C,A,B	
14	NA 09 74 00	//	//			W	
15	NA 09 74 10	//	//			R	
16	NA 09 60 20	Main Circuit Board	メ イ ン シ ー ト			U,C,A,B	
17	NA 09 80 70	//	//			W	
18	NA 09 79 00	//	//			R	
19	XD 69 00 03	Power Transformer	電 源 ト ラ ン ス			U,C	
20	XD 69 10 02	//	//			A,B,W	
21	XD 69 30 01	//	//			U,C	
22	XD 68 90 01	//	//			R	
23	XD 69 40 01	//	//			A,B,W	
24	MG 00 22 20	Power Cord	10A 125V	電 源 コ ー ド		U,C	
25	MG 00 16 30	//	6A 250V	//		R	
26	MG 00 23 10	//	7.5A 250V	//		A	
27	MG 00 23 30	//	300/300V	//		B	
28	MG 00 23 20	//	2.5A 250V	//		W	
29	CB 62 01 90	Cord Stopper	CM-22B	コ ー ド ス ト ッ パ ー		R,A,B,W	
30	CB 62 02 00	//	CM-22C			U,C	
31	VE 85 42 00	Ferrite Core	ESD-R-25DB	フ ェ ラ イ ト コ ア		W	
32	VC 53 20 00	Tray Ass'y		ト レ イ A s s ' y	CDX-1100		
33	VC 54 63 00	Spring		ス プ リ ン グ			
34	CB 65 60 20	Disc Pad		デ ィ ス ク パ ッ ド			
35	CB 62 79 60	Cushion Rubber		ク ャ シ ョ ン ゴ ム			
36	EX 60 02 40	BW Head Tapping Screw	3×8(φ10) FCRM-BI	B W ヘ ッ ド タ ッ ピ ン グ ネ ジ			
37	VC 53 25 00	Isolator		アイ ソ レ ー タ ー	CDX-1100		
38	VC 55 27 00	Washer		ワ ッ シ ャ ー	CDX-1100		
39	VE 20 76 00	Plate		プ レ ー ト			
40	BB 07 14 00	Spring		ス プ リ ン グ	CDX-1100		
41	CB 66 12 10	Rod		ロ ッ ド	CDX-1100		
42	CB 66 10 10	Knob		ノ ブ	CDX-1100		
43	CB 65 70 60	Damper		ダ ン パ ー	CDX-5000		
44	AA 63 15 70	Bottom Cover		ボ ト ム カ バ ー			
45	VD 83 23 00	Damper, Top D		ダ ン パ ー / ト ッ プ D	CDX-1100		
46	VD 60 83 00	Damper, Top C		ダ ン パ ー / ト ッ プ C	CDX-1100		
47	CB 60 92 60	Plastic Rivet	φ3×6.5	プ ラ ス チ ッ ク リ ベ ッ ト	CDX-1100	R	
48	CB 06 88 80	//		//			
49	EV 41 32 66	Toothed Lock Washer	φ2.6 FCRM3-BI	内 歯 付 座 金	PACK		
50	VE 79 78 00	Plate, Shield		シ ー ル ド プ レ ー ト			
51	VD 41 53 00	//		//			
52	VD 39 92 00	Wire Stopper		束 線 止 め			
53	VE 45 56 00	Support, OPT		サ ポ ー ト / O P T			

※New Parts (新規部品) NR

333

※New Parts (新規部品) NF

EXPLODED VIEW (Panel Unit)

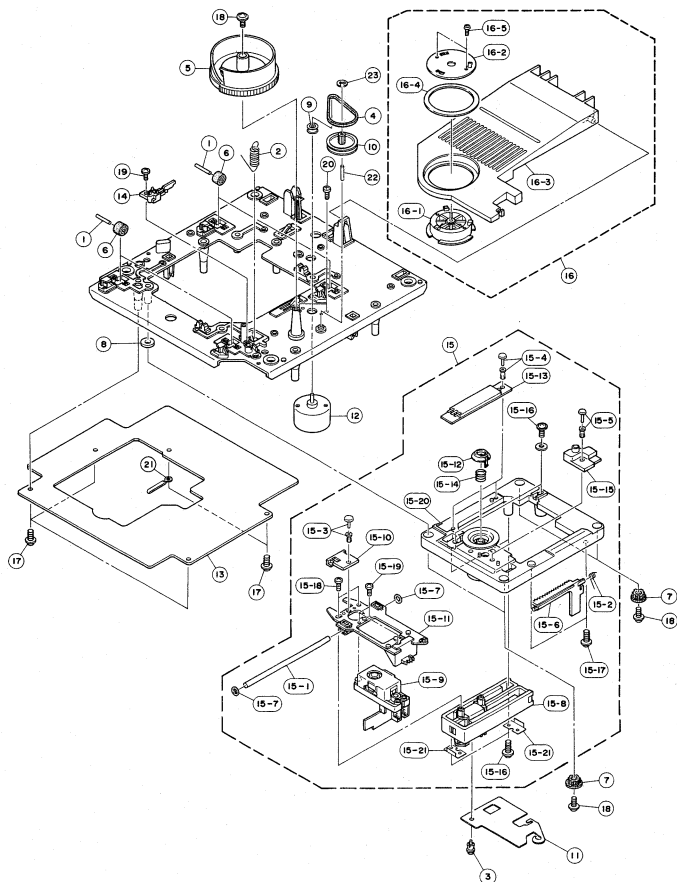


MECHANISM PARTS (Panel Unit)

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
* VF:77:75:00	Panel Unit		パネルユニット			U,C	
* VF:82:79:00	"		"			R	
* VF:82:80:00	"		"			A,W,B	
1	NX:60:04:20	Operation Circuit Board	オペレーションシート				
2	BX:60:05:30	Key Top Set A	キートップセット A				
3	BX:60:05:40	" B	" B				
4	BX:60:05:50	" C	" C	POWER			
5	BX:60:05:60	" D	" D	UP			
6	BX:60:05:70	" D	" D	DOWN			
7	BX:60:05:80	Key Top A	キートップ A				
8	BX:60:05:90	" B	" B				
9	BX:60:06:00	" C	" C				
10	CX:60:06:60	Cover A	カバー A				
11	CX:60:06:70	" B	" B				
12	CX:60:06:80	Cushion	クッション				
13	AX:60:02:30	Spring	コイルスプリング				
14	EX:60:05:30	Pan Head Tapping Screw	1.7×5 ZMC2-Y ナベタッピングネジ				
15	EJ:02:00:66	"	2×6 ZMC2-Y "	PACK			
16	EJ:03:00:66	"	3×6 ZMC2-Y "	PACK			
17	BX:60:06:10	Shield Plate	シールド板				
18	EJ:02:00:66	Pan Head Tapping Screw	2×6 ZMC2-Y ナベタッピングネジ	PACK			
19	NX:60:10:00	Jack Circuit Board	ジャックシート				

*New Parts (新増部品) NR

■EXPLODED VIEW(Disc Mechanism Unit)



■MECHANISM PARTS(Disc Mechanism Unit)

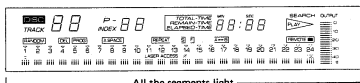
Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
	VE 83:07:00	Disc Mechanism Unit	DM-2200L	D ム ニ ュ ー ト			
1	AA 63:14:60	Pin	φ2×14.6	ピ ン	DM-IX		
2	VC 54:67:00	Spring(TE)		スプリング (T E)	DM-2200		
3	CB 09:96:00	Plastic Rivet		プラスチックリベット			
4	CB 63:78:30	V-Belt		V ベ ル ト			
5	CB 65:61:30	Loading Cam		ローディングカム	DM-2200		
6	CB 65:67:40	Roller		ロ ー ラ ー	DM-IX		
7	CB 65:70:60	Damper		ダ ン パ ー	DM-IX		
8	CB 65:71:80	//		ビックダンパー	DM-2200		
9	CB 65:85:10	P.Pulley		P プ ー リ ー	DM-X5		
10	CB 65:85:20	Idle Pulley		アイドルプーリー	DM-X5		
11	VE 78:46:00	Guide Wire		線 材 ガ イ ド A			
12	VC 40:61:00	Motor		モ ー タ ー	DM-IX		
13	NA 09:73:00	Servo Circuit Board		サーボシート			
14	KA 90:63:70	Switch	MSW-1485	エンドスイッチ	DM-IX		
15	VE 83:08:00	Disc Mechanism		ディスクメカユニット			
15-1	AA 63:11:50	Shaft	φ4×100	シャフト	DM-IX		
15-2	AA 63:17:40	Spring(TO)		ス プ リ ン グ	DM-IX		
15-3	CB 09:96:00	Plastic Rivet	φ3.5×4.5	プラスチックリベット			
15-4	CB 60:88:10	//	φ3.5×5.5	//			
15-5	CB 03:27:50	//	φ3.5×7	//			
15-6	CB 65:56:00	Lever		レ バ ー	DM-IX		
15-7	VD 39:56:00	Ring		オ リ ン グ	DM-IX		
15-8	VB 81:76:00	Linear Motor	TDS-L0C-02	リニアモーター	DM-IX		
15-9	VE 72:03:00	Optical Pick Up Head	HG-1	光ピックアップヘッド			
15-10	VC 47:45:00	CP Brush		C P ブ ラ シ	DM-IX		
15-11	NB 63:72:80	PU Base Ass'y		P リ ベ ース Ass'y	DM-IX		
15-12	VE 20:68:00	Disc Table, Inner		ディスクテーブル/インナー			
15-13	VC 54:34:00	CP Element Ass'y		C P エレメント Ass'y	DM-2200		
15-14	VE 25:33:00	Spring		スプリング/ディスクプーリー			
15-15	VC 56:74:00	FG Circuit Board Ass'y		F G シ ー ト Ass'y	DM-2200		
15-16	EK 33:00:10	BW Head Tapping Screw	3×12 FORM3-BI	B W ヘッドタッピングネジ			
15-17	EK 33:00:30	//	3×10 FORM3-BI	//			
15-18	EI 32:60:86	Binding Head Tapping Screw	2.6×8 FORM3-BI	バインドタッピングネジ	PACK		
15-19	ED 32:60:66	Binding Head Screw	2.6×6 FORM3-BI	バインド小ネジ	PACK		
15-20	VE 96:07:00	Sub Disc Mechanism Ass'y		サブディスクメカ Ass'y	With DISC Motor		
15-21	VD 83:17:00	Washer		マグネットワッシャー			
15-22	CB 66:09:80	//		ワ ッ シ ャ			
16	VE 20:66:00	Flapper Ass'y		フ ラ ッ パ ー Ass'y			
16-1	VE 20:71:00	Stabilizer, Magnet		スタビライザー/マグネット			
16-2	VE 20:72:00	Stabilizer, Metal		スタビライザー/金属			
16-3	CB 65:61:10	Flapper		フ ラ ッ パ ー			
16-4	VC 54:65:00	Damper, Rubber		ダンパーゴム B			
16-5	ED 02:00:46	Binding Head Screw	2×4 ZMC2-Y	バインド小ネジ	PACK		
17	EK 33:00:30	BW Head Tapping Screw	3×10 FORM3-BI	B W ヘッドタッピングネジ			
18	EX 60:02:40	//	3×8 FORM3-BI	//			
19	EI 32:61:06	Binding Head Tapping Screw	2.6×10 FORM3-BI	バインドタッピングネジ	PACK		
20	ED 32:60:36	Binding Head Screw	2.6×3 FORM3-BI	バインド小ネジ	PACK		
21	VC 38:02:00	Stopper Wire		束 縛 止 め	CDX-5000		
22	AA 62:79:70	Shaft		シャフト G			
23	EV 50:11:56	E-Ring	φ1.5 FNM3-3G	E リ ン グ	PACK		
CB	06:92:50	Binding Tie	BK-1	インシュロックタイ			

*New Parts (新規部品) NR

■TEST MODE

Turn the power ON while pressing **CANCEL** key.

All the segments light and remain ON till **CANCEL** key is released. When it is turned OFF, the operation mode is set to TEST MODE.



In TEST MODE, each key corresponds to each SPC COMMAND as listed below.

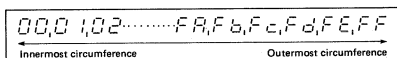
KEY	SPC COMMAND	Other
OPEN/CLOSE	FOCUS SEARCH	LASER ON
PLAY	PLAY	LASER ON
PAUSE/STOP	STOP	LASER OFF
⏮	10 kick BACK	LASER ON
⏪	1 kick BACK	LASER ON
⏩	1 kick FORWARD	LASER ON
⏭	10 kick FORWARD	LASER ON
REPEAT	FEED FORWARD	LASER ON
A↔B	FEED RETURN	LASER ON

Also, pressing certain keys causes conditions to change as follows, regardless SPC COMMAND.

KEY	CONDITION
"0"	DAC input for FEED CONTROL = 00
"1"	DAC input for FEED CONTROL = FF
"2"	FEED CONTROL to μ -COM side, TRACKING SERVO OFF
"9"	TEST MODE converted into NORMAL MODE

NOTE) When any key other than "2" key is turned ON, FEED CONTROL is set to SPC side.

When the key "0" or "1" is pressed in the TEST mode, 00 (or FF) appears in the "88" part of the indicator and it means the feed position.



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			

