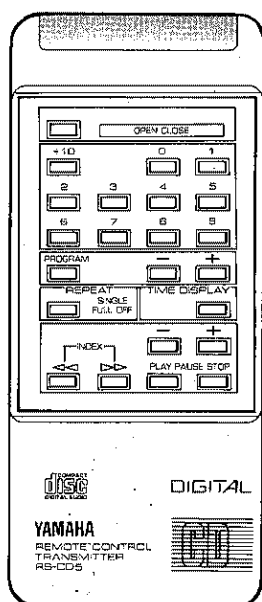


COMPACT DISC PLAYER

CDX-500/CD-30

SERVICE MANUAL

• RS-CD5



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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SINCE 1887



YAMAHA

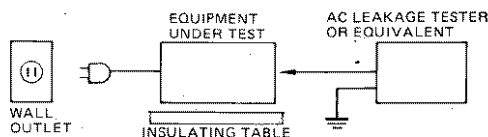
NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN

3.25K-913 © Printed in Japan '86.12

CDX-500/CD-30

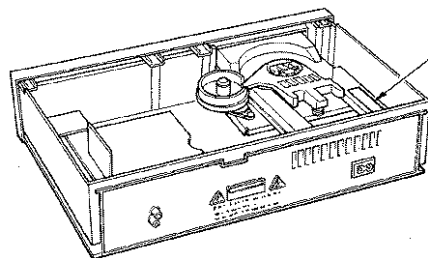
TO SERVICE PERSONNEL

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



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. (CAUTIONS 7-1)

Canadian model

CAUTION—HAZARDOUS LASER AND ELECTROMAGNETIC RADIATION WHEN OPEN AND INTERLOCK DEFEATED. ATTENTION—RADIATION LASER ET ELECTROMAGNETIQUE DANGEREUSE QUAND OUVERT AVEC L'ENGAGEMENT DE SECURITE ANNULE. (CAUTIONS 7-1)

U.S.A. model

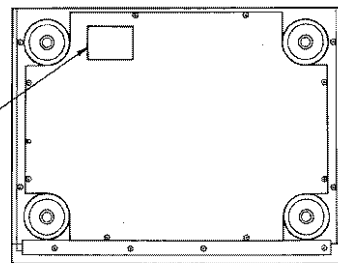
THIS PRODUCT COMPLIES WITH DHS RULES 21 CFR SUBCHAPTER J APPLICABLE AT DATE OF MANUFACTURE.

MANUFACTURED BY
NIPPON GAKKI CO., LTD.
10-1 NAKAZAWA-CHO.
HAMAMATSU-SHI.
SHIZUOKA-KEN, JAPAN

MANUFACTURED:

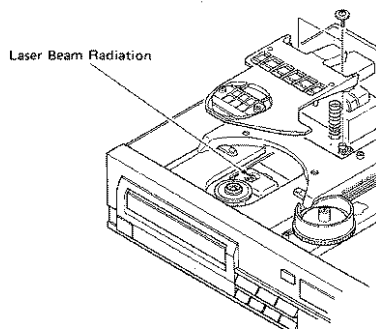


BOTTOM SIDE

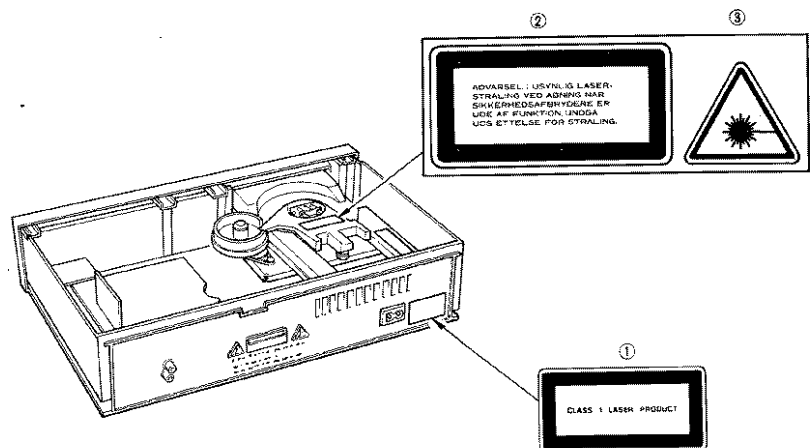


LASER BEAM RADIATION SPOT

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



European model



English

- THIS LABEL IS ATTACHED AT THE PLACE ILLUSTRATED TO INFORM THAT THE APPARATUS CONTAINS A LASER COMPONENT.
- 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.

- 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

- PÅSKRIFTEN SITTER PÅ APPARATEM SOM VISAS SOM EN UPPMANING OM ATT APPARATEN OMFATTAR EN INBYGGD LASERKOMPONENT.
 - TEXTSKYLTEN FÖR LASERN ÄR PLACERAD PÅ APPARATEN SOM EN UPPMANING OM ATT APPARATEN INNEHÅLLER EN LASERKOMPONENT.
 - VARNINGSSKYLTEN FÖR STRÅLNING HAR PLACERATS I APPARATEN, SOM BILDEN VISAR, SOM EN VARNING OM YTTERLIGARE INGREPP I APPARATEN. MATERIELEN INNEHÅLLER EN LASERKOMPONENT SOM AVGER LASER-STRÅLNING ÖVERSTIGANDE GRÄNSEN FÖR LASERKLASS 1.
- VARNING—INGREPP I APPARATEN BÖR ENDAST FÖRETAS AV FACKMAN MED KUNSKAP OM ATT RISK FÖRELIGGER FÖR RADIOAKTIV ÅSTRÅLNING.

Danish

- DETTE MÆRKAT ER ANBRAGT SOM VIST I ILLUSTRATIONEN FOR AT ADVARE BRUGEREN OM AT APPARATET INDEHOLDER EN LASERKOMPONENT.
 - DETTE MÆRKAT OM LASEREN ER ANBRAGT PÅ APPARATET SOM EN OPLYSNING OM AT APPARATET INDEHOLDER ET LASERKOMPONENT.
 - ADVARSELSKILTET OM STRÅLING ER PLACERET INDENI APPARATET, SOM VIST I ILLUSTRATIONEN, SOM EN ADVARSEL OM YDERLIGERE INDGEB I APPARATET. APPARATET INDEHOLDER ET LASERKOMPONENT SOM AVGIVER LASESTRÅLING DER OVERSTIGER GÆNSEVERDIEN FOR LASERKLASSE 1.
- ADVARSEL! INDGEB BÖR KUN FÖRETAGES 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, 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 the unnecessary laser output.

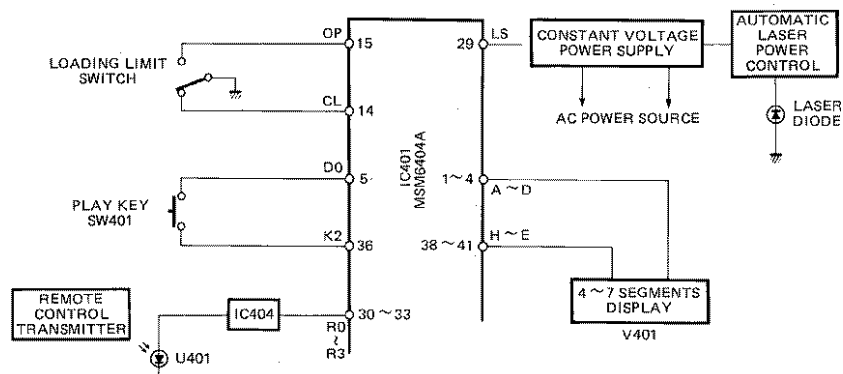
Laser output is controlled by the injection or cutoff of the constant voltage source to the laser diode at Pin 29 (LS) of IC401 (MSM6404A), and also by Automatic Laser Power Control Circuit. When Pin 29 is in "H" (High) level, the laser emits the beam. When Pin 29 is in "L" (Low) level, the laser does not emit beam.

Pin 29 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 Loading Limit Switch is set in "CL" side. (The disc tray is closed.)
- 2) The pickup is located at the area of minimum internal circumference.

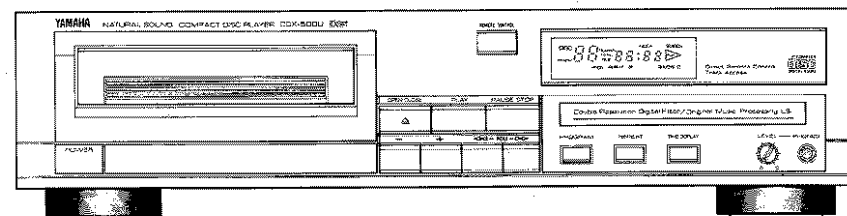
After the above conditions are met and the index signals have been read, the laser emits the beam when the following two conditions are met.

- 1) when the PLAY key (SW401 or that of Remote Control Transmitter) is pressed.
- 2) when the **PLAY** display is ON.

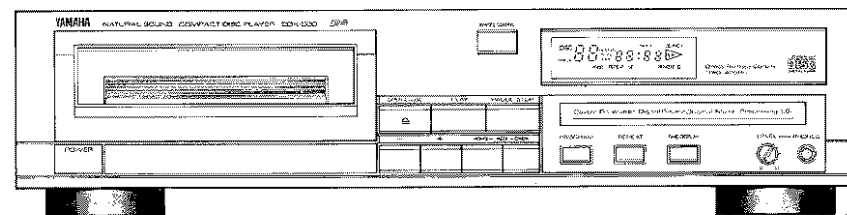


FRONT PANELS

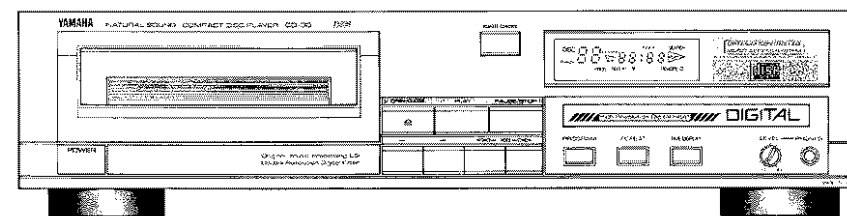
• CDX-500U



• CDX-500



• CD-30



SPECIFICATIONS

Format Compact disc digital audio system

AUDIO SECTION

Frequency Response	5Hz to 20kHz +0.5dB, -1.0dB
Harmonic Distortion + Noise	0.004% (1kHz)
S/N Ratio	100dB
Dynamic Range	95dB
Wow & Flutter	Unmeasurable
Channel Separation	Better than 85dB (1kHz)
Output Voltage	2V rms
Output Impedance	2 k-ohms
Headphone Output	150mV/8 ohms

INTERNAL SYSTEMS

Optical Pick-up	3-beam laser
Error Correction System	CIRC
D/A Conversion	16-bit linear
Filter	Digital filter and 3rd order active filter

GENERAL

Power Requirements

U.S.A. & Canadian models	120V, 60Hz
Australian & British models	240V, 50Hz
European model	240V, 50Hz
Other model	110 ~ 130/220 ~ 240V, 50/60Hz

Power Consumption

20W

Dimensions (W x H x D)

435 x 107 x 335 mm (17-1/8" x 4-3/16" x 13-3/16")

4.6 kg (10 lbs. 2 oz.)

Weight

Accessories

Pin plug cord
Power cord
Remote control transmitter (RS-CD5)
Batteries (size "AA", R06)

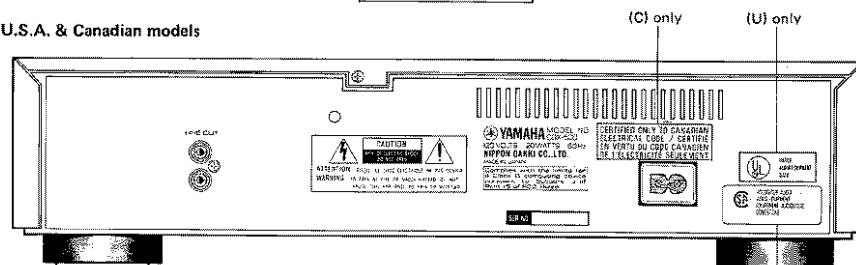
Specifications subject to change without notice.

(U) U.S.A. model (A) Australian model
(C) Canadian model (G) European model
(B) British model (R) Other model

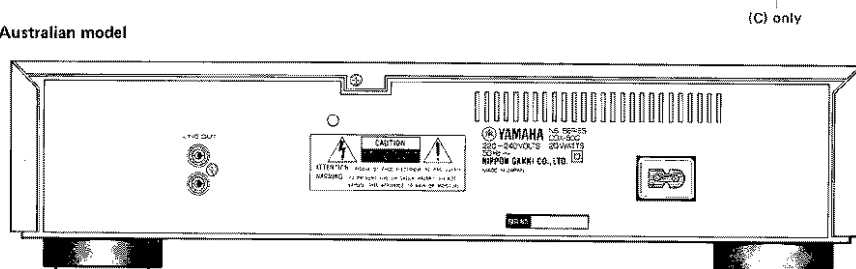
REAR PANELS

CDX-500/CDX-500U

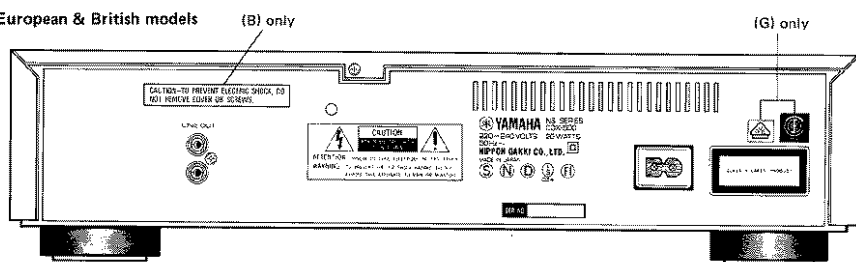
▼ U.S.A. & Canadian models



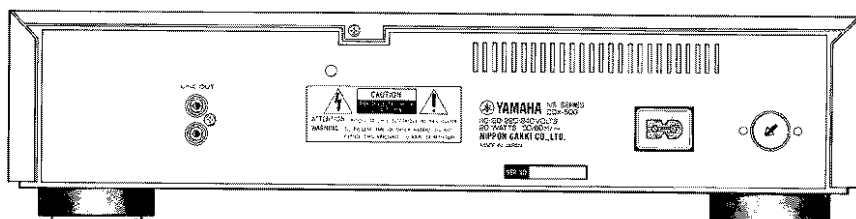
▼ Australian model



▼ European & British models

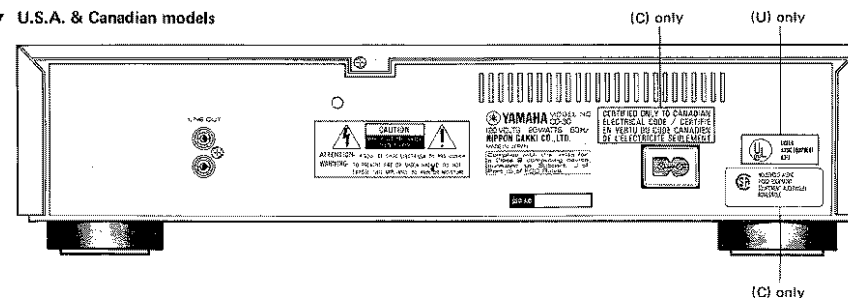


▼ Other model

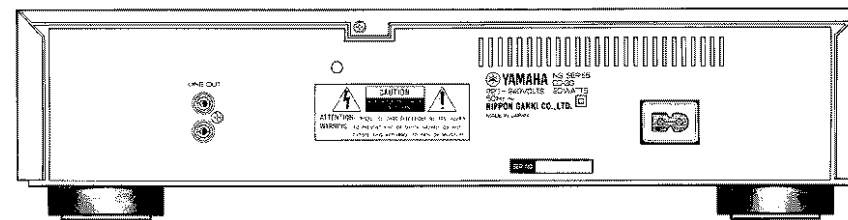


CD-30

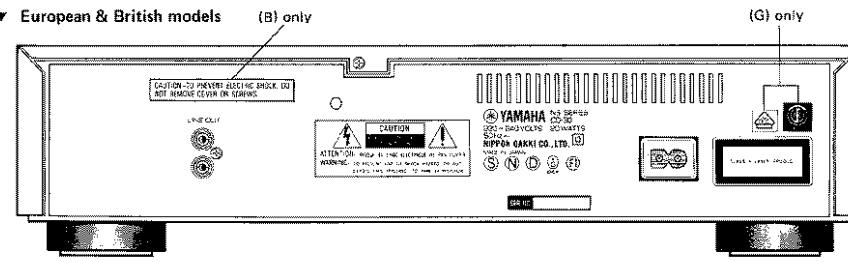
▼ U.S.A. & Canadian models



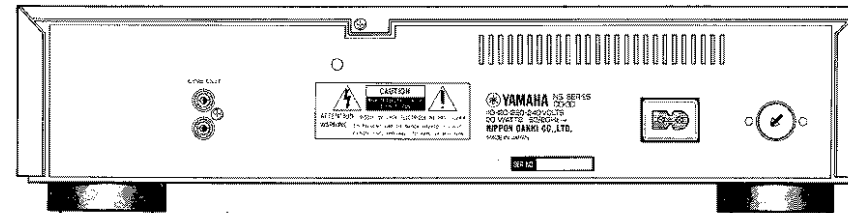
▼ Australian model



▼ European & British models



▼ Other model



4. Removal of Disc Tray Ass'y

- a. Lift Flapper as shown in Fig. 2, and pull Disc Tray Ass'y forward. Then pull off Disc Tray Ass'y by pressing the hook (A) in Fig. 3. Now, the jitter can be adjusted.

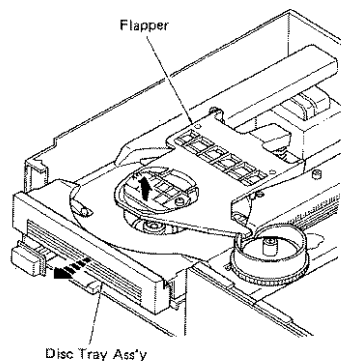


Fig. 2

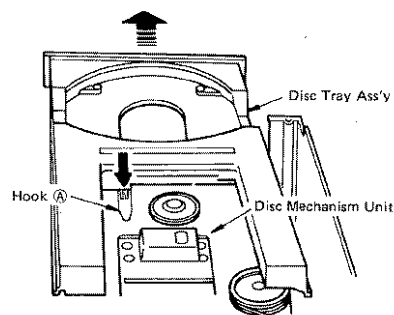


Fig. 3

5. Removal of Disc Mechanism Unit

- a. Remove 2 screws (4) in Fig. 4.

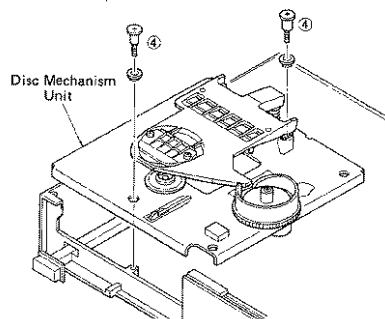


Fig. 4

6. Removal of Flapper

- a. Remove 2 screws (5) fixing Flapper in Fig. 5 and then remove the Flapper.

7. Removal of Cam

- a. Remove screw (6) in Fig. 5 and then pull up the Cam.

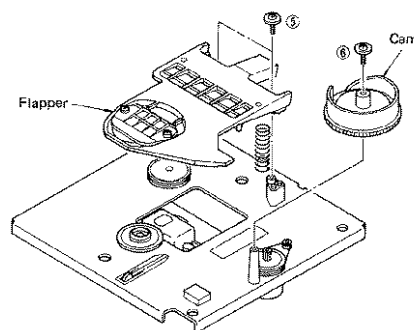


Fig. 5

■ 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

$$\begin{array}{|c|c|} \hline \text{A} & 2 \\ \hline \end{array} \quad 1.0 \times 10^2 = 100\text{pF}$$

Alphabet Number

• 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	1.8	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	d	e	f	m	n	t	v
Numerical value	2.5	3.5	4.0	4.5	5.0	6.6	7.6	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

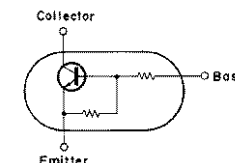
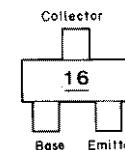
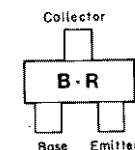
c. Transistor

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.

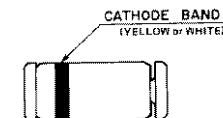
Indication	Parts No.	Description	HFE rank
FQ	1A103700	Transistor 2SA1037K	Q-rank
FR	"	"	R-rank
FS	"	"	S-rank
BQ	1C241200	" 2SC2412	Q-rank
BR	"	"	R-rank
BS	"	"	S-rank
DAQY	VB494100	" 2SD1664	R-rank
ID-R	ID132800	" 2SD1328	R-rank
ID-S	"	"	S-rank
ID-T	"	"	T-rank
13	VC123900	Digital Transistor DTA143EK	
16	VC124000	Digital Transistor DTA144EK	
26	VC124100	Digital Transistor DTC144EK	

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

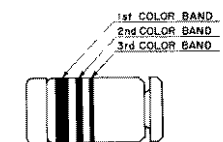


d. Diode and Zener Diode

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

Table 1 10

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	BLZ36
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.

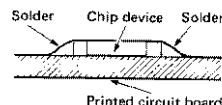


Fig.6

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).

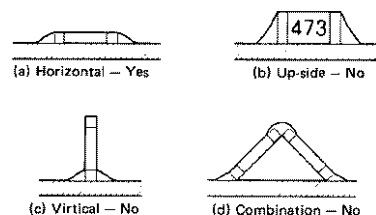


Fig.7

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.

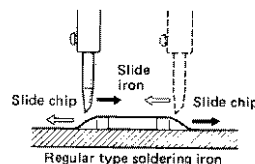


Fig.8

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 (See Fig. A) : x 1
- Shorting cord : x 1 (Step 3)

Tools

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

• Precautions or Special Notes

- Measure the output level at the output terminal of the AF oscillator.
- When disc tray has been removed from the mechanism, make sure the position of the loading cam and the leaf switch are correct.
- The unit should always be in a horizontal position while performing adjustments.

• Adjustment jig (with internal filter)

Connect the filter in Fig. A before measurement.

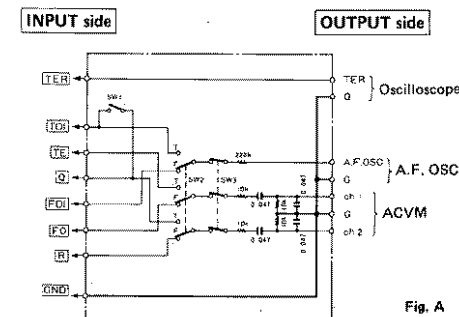
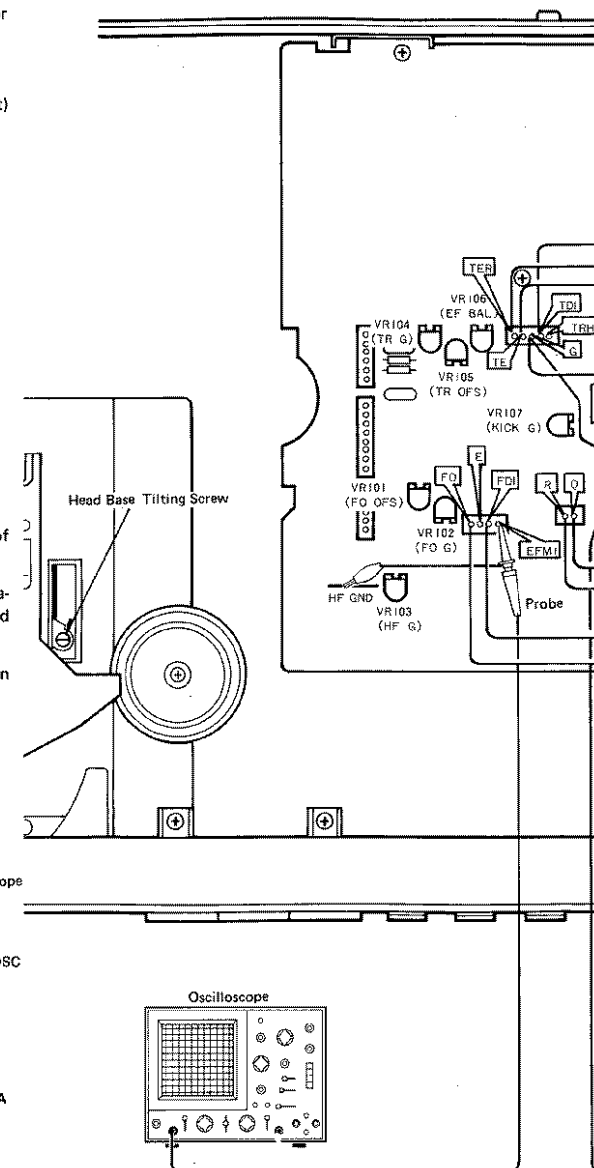


Fig. A

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

• Test Point



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 (See Fig. A) : x 1
Shorting cord : x 1 (Step 3)

Tools

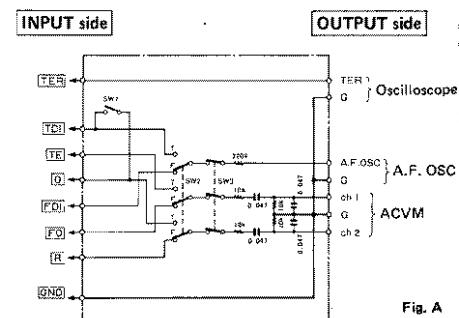
- ⊕ Screwdriver : x 1
(For-Pre-Set Potentiometer adjustment)
Core screwdriver : x 1 (Step 3)
⊖ Screwdriver : x 1

Precautions or Special Notes

1. Measure the output level at the output terminal of the AF oscillator.
2. When disc tray has been removed from the mechanism, make sure the position of the loading cam and the leaf switch are correct.
3. The unit should always be in a horizontal position while performing adjustments.

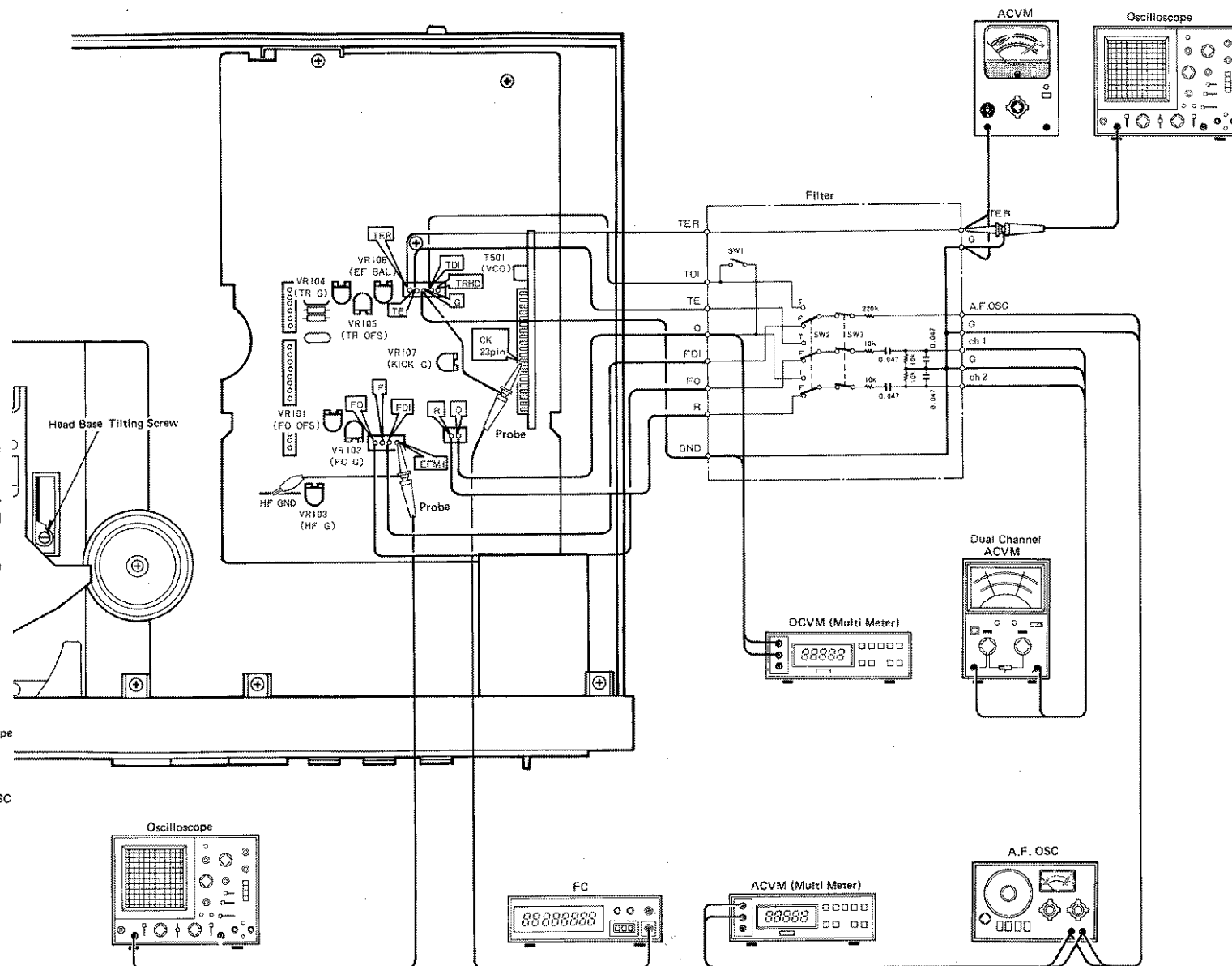
Adjustment jig (with internal filter)

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

Test Point



★ Carry out following adjustments in order as numbered.

Step 1. Confirmation of Laser Output.

Step 2. Confirmation of Focus Actuator Operation.

Step 3. Adjustment of VCO.

Step 4. Adjustment of Jitter and Focus Offset.

Step 5. Adjustment of Diffraction Grating

Step 6. Adjustment of EF Balance.

Step 7. Adjustment of HF Level.

Step 8. Adjustment of Focus Gain.

Step 9. Adjustment of Tracking Gain.

Step 10. Adjustment of Tracking Offset.

Step 11. Confirmation of Jitter.

Step 12. Adjustment of Kick Gain.

Step 13. Confirmation of Search Operation.

Confirmation of Laser Output (Step 1)

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

⑤ Press POWER key. (POWER ON)

⑥ Measure the laser output during the 5 seconds of FOCUS search mode.

Rating: Laser output = 0.1 mW to 0.5 mW

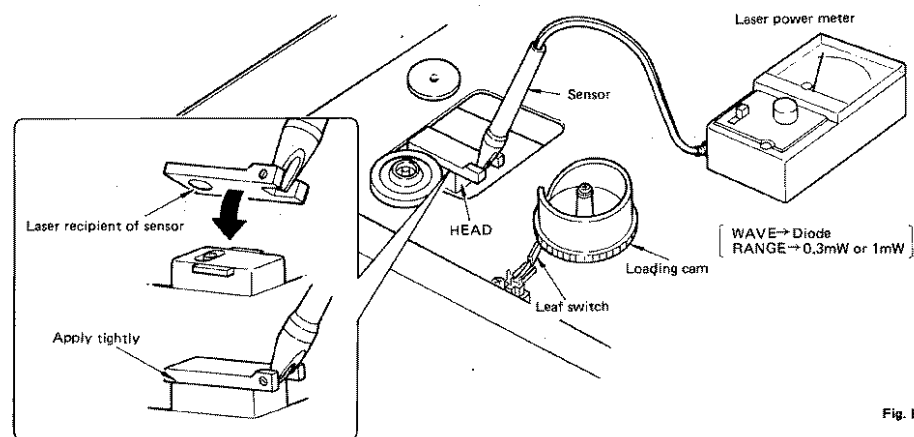


Fig. B

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 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 a disc.

② Connect the oscilloscope (1) to **R** and **GND** terminals on the input side of the filter.

③ Press POWER key. (POWER ON)

④ After confirming that loading cam position is correct press OPEN/CLOSE key for CLOSE operation.

⑤ During 5 seconds of FOCUS search, confirm that the waveform is as shown in Fig. C.

⑥ Confirm that the pick-up head's objective lens moves smoothly between the lowest and highest points.

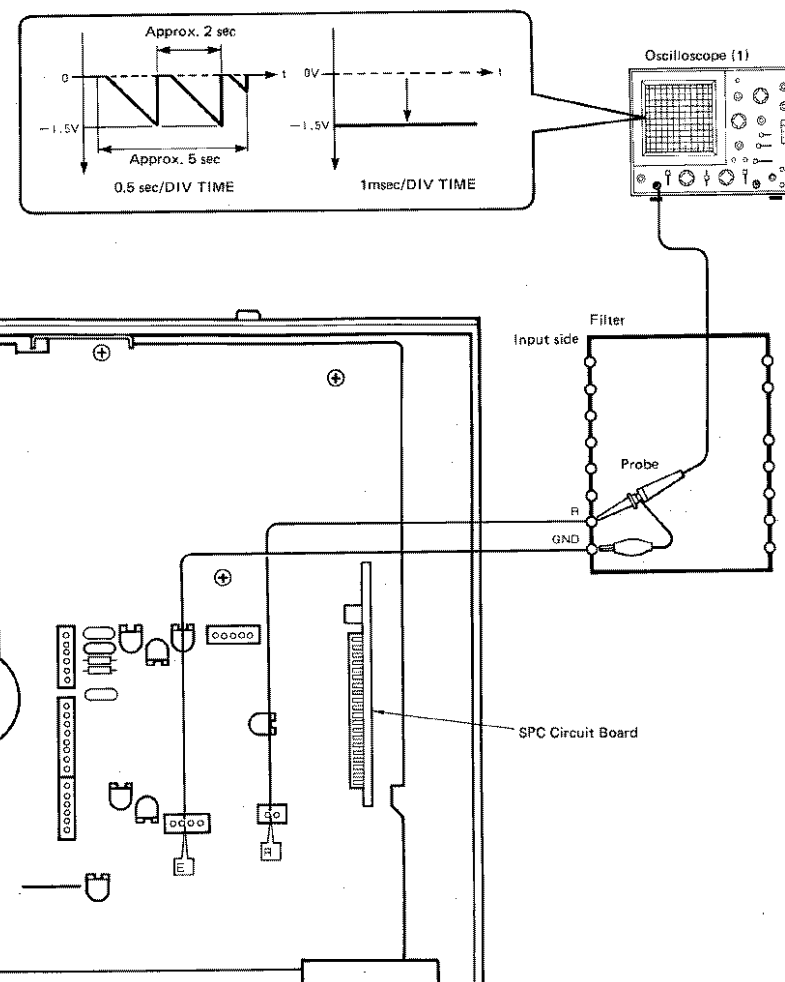


Fig. C

Adjustment of VCO (Step 3)

- ① Connect the shorting cord and measuring instruments, as shown in Fig. D.
- ② Do not load a disc.
- ③ Press POWER key. (POWER ON)

- ④ While observing the frequency counter indication (F_{VCO}), adjust T501 so that it satisfies the rating.

Rating: $F_{VCO} = 4.3218 \text{ MHz} \pm 10 \text{ kHz}$

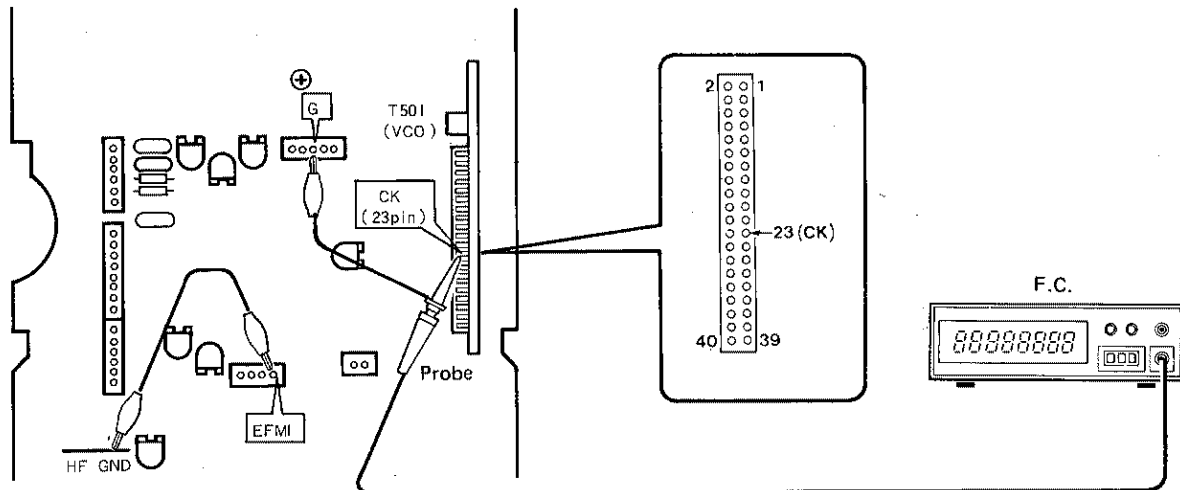


Fig. D

Adjustment of Jitter and Focus Offset (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 oscilloscope (2) to EFMI terminal, as shown in Fig. E.
- ③ Press POWER key. (POWER ON)
- ④ Load the specified disc (35DH5 or Philips test disc).
- ⑤ Confirm that the loading cam position is correct and press OPEN/CLOSE key for CLOSE operation.

- ⑥ Press PLAY key.

- ⑦ Adjust the head base tilting screw so that the EFMI signal (eye-pattern) waveform is distinct and clear.
* Adjust at the center of the disc.

- ⑧ Adjust VR101 (FOCUS OFFSET) so that the EFMI (eye-pattern) signal waveform is distinct and clear.
* Adjust at the center of the disc.

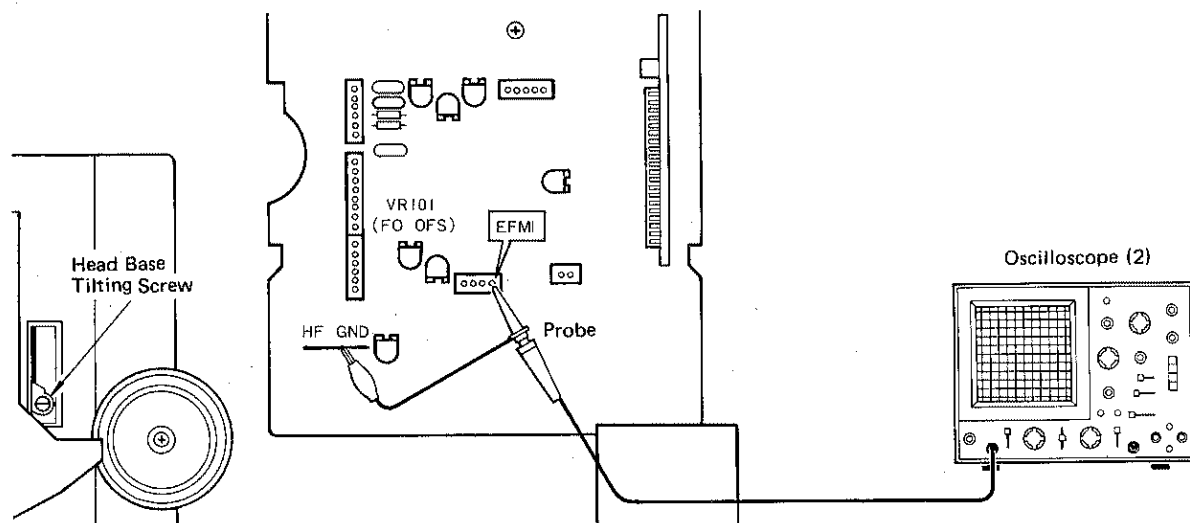
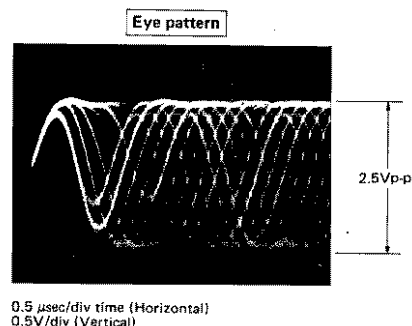


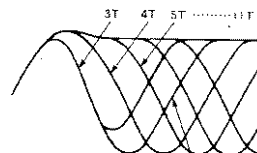
Fig. E

Oscilloscope (2)



3T, 4T, 5T, 6T, ..., 11T

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.

Adjustment of Diffraction Grating (Step 5)

* This adjustment requires use of 2 oscilloscopes.

* Power should not be turned OFF during steps ② through ⑨

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 μsec/div time (Horizontal)

Oscilloscope (1)

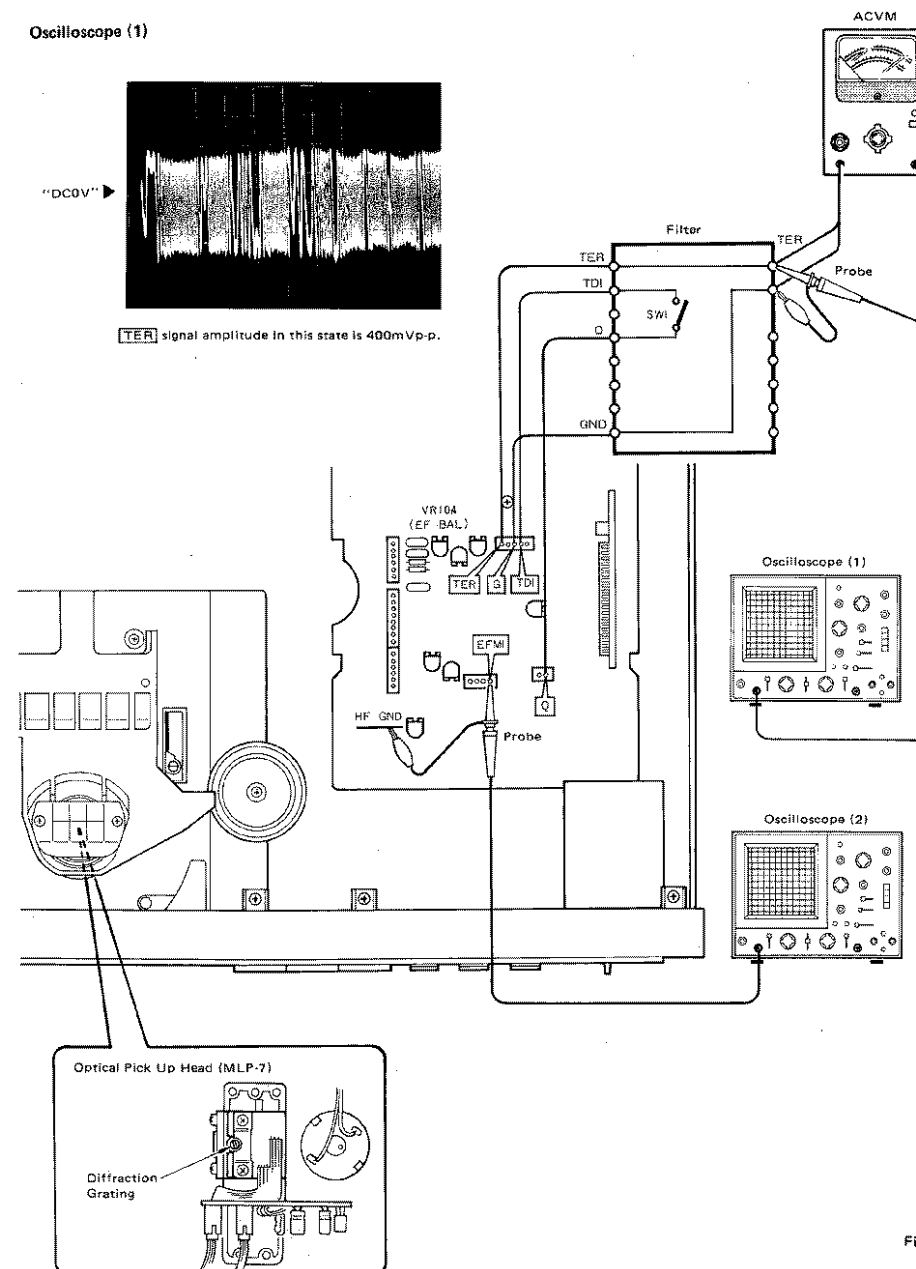
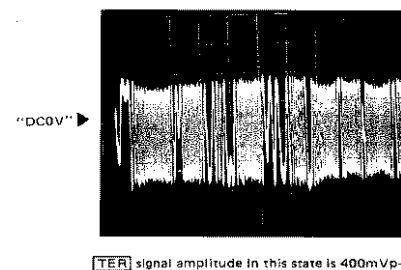
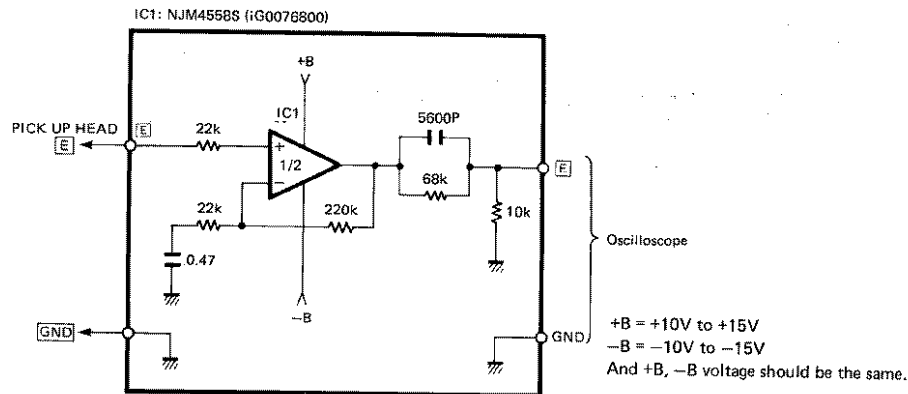


Fig. F

SUPPLEMENT

For adjustment by Lissajous's figure use the following adjustment instrument (buffer amplifier).

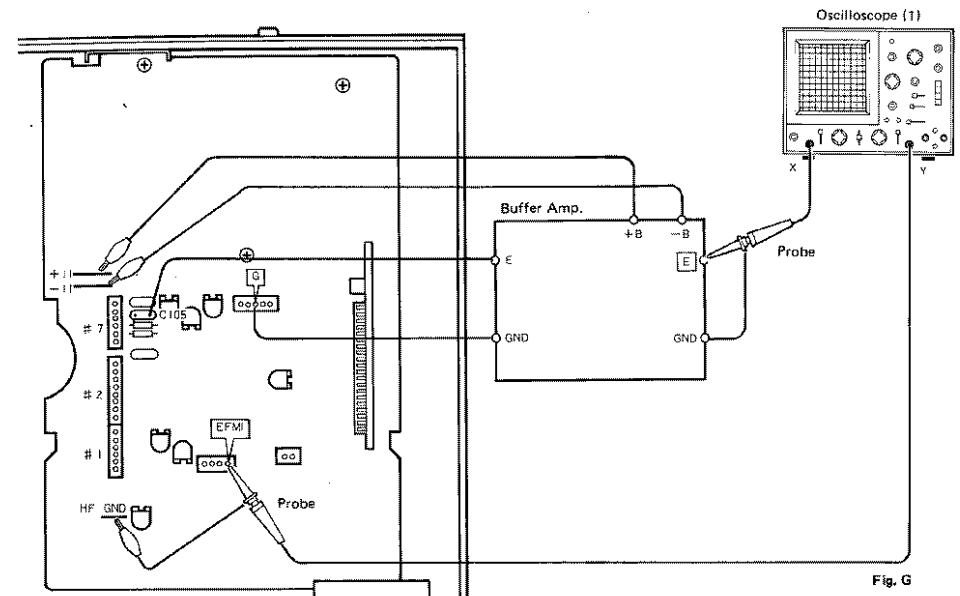
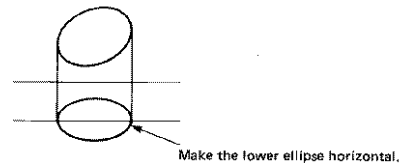
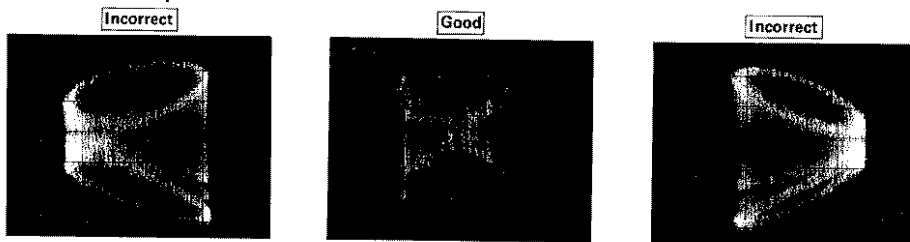


* The buffer amplifier is used only for this adjustment.
Don't leave it connected in other adjustments.

Oscilloscope (1) settings

- DC coupling
- X input → **E** signal: 50mV/div
(5mV/div when 10:1 probe is used)
- Y input → **EFMI** signal: 500mV/div
(50mV/div is when 10:1 probe is used)
- MODE → X-Y

- ① Connect the adjusting instrument and measuring instrument.
- ② Apply **E** signal and **EFMI** signal to the X, Y inputs of the oscilloscope respectively.
- ③ Set the mode to X-Y and observe Lissajous's figure. Make the lower ellipse horizontal.



Adjustment of EF Balance (Step 6)

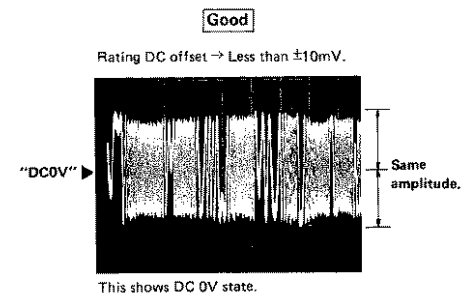
* Power should not be turned OFF during steps ② through ⑦

Oscilloscope (1) settings

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

- ① Connect the filter and measuring instruments as in Step 5.
- ② Press POWER key. (POWER ON)
- ③ Load Philips test disc. (Have lead-in data read.)
- ④ Press PLAY key then Pause.
- ⑤ Set SW1 in the filter to ON.
(Short **TD1** terminal to **Q** terminal: TRACKING SERVO is OPEN)
- ⑥ Observe the waveform on oscilloscope (1).
- ⑦ Adjust VR104 (EF BALANCE) so that the amplitude of **TER** signal becomes equal above and below DC 0V position.

* Adjust at the inner circumference of the disc.



This shows DC 0V state.

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)

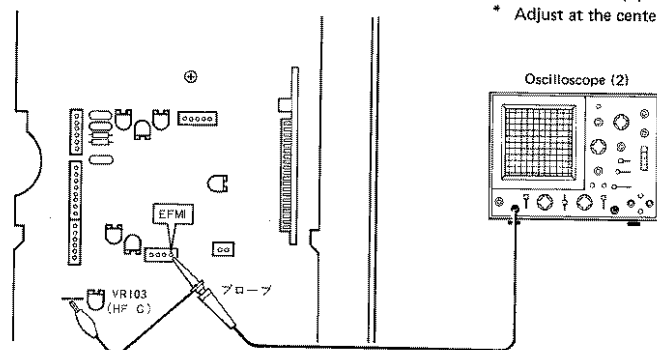


Fig. H

Adjustment of Focus Gain (Step 8)

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

- ① Connect the filter and measuring instruments, as shown in Fig. I.

Apply an 800 Hz, 4.5 Vrms signal from the AF oscillator to [FDI] terminal via the resistor (220 kilohms) in the filter.

- ② Set SW3 to OFF.
- ③ Set SW2 to F (FOCUS).
- ④ Press POWER key. (POWER ON)
- ⑤ Load Philips test disc.
- ⑥ Press PLAY key.
- ⑦ Set SW3 to ON.

- ⑧ Read the indications of the AC voltmeters (CH1: E_{FO} , CH2: E_R), adjust VR102 (FOCUS GAIN) so that they satisfy the rating.

Rating: $E_{FO} - E_R = 10\text{dB}$

Example [0dBV = 1V]
 $E_{FO} = -16\text{dBV}$ (160mV)
 $E_R = -26\text{dBV}$ (50mV)

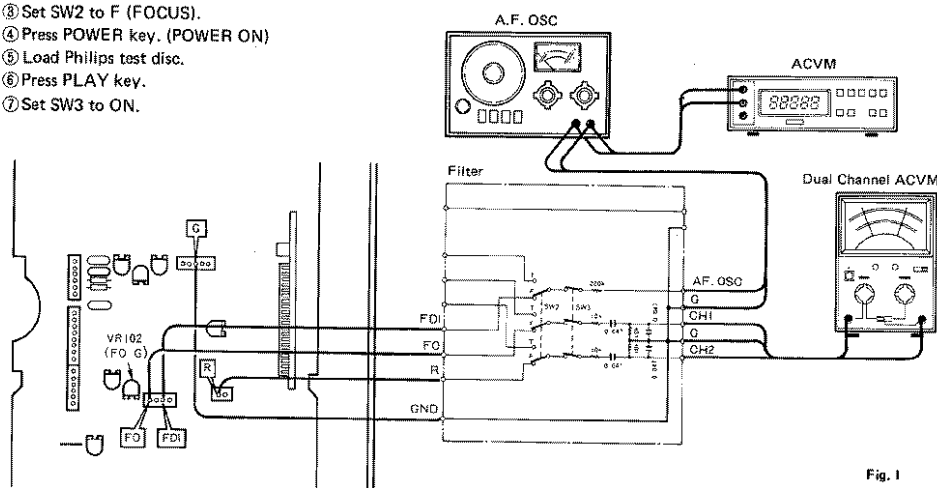


Fig. I

Adjustment of Tracking Gain (Step 9)

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

- ① Connect the filter and measuring instruments, as shown in Fig. J.

Apply a 800 Hz, 100 mVrms signal from the AF oscillator to [TDI] terminal via the resistor (220 kilohms) in the filter.

- ② Set SW3 to OFF.
- ③ Set SW2 to T (TRACKING).
- ④ Press POWER key. (POWER ON)
- ⑤ Load Philips test disc.
- ⑥ Press PLAY key.

- ⑦ Set SW3 to ON.

- ⑧ While observing the indications of the AC voltmeters (CH1: E_{TE} , CH2: E_Q), adjust VR106 (TRACKING GAIN) so that they satisfy the rating.

Rating: $E_{TE} - E_Q = 13\text{dB}$

Example [0dBV = 1V]
 $E_Q = -30\text{dBV}$ (30mV)
 $E_{TE} = -17\text{dBV}$ (140mV)

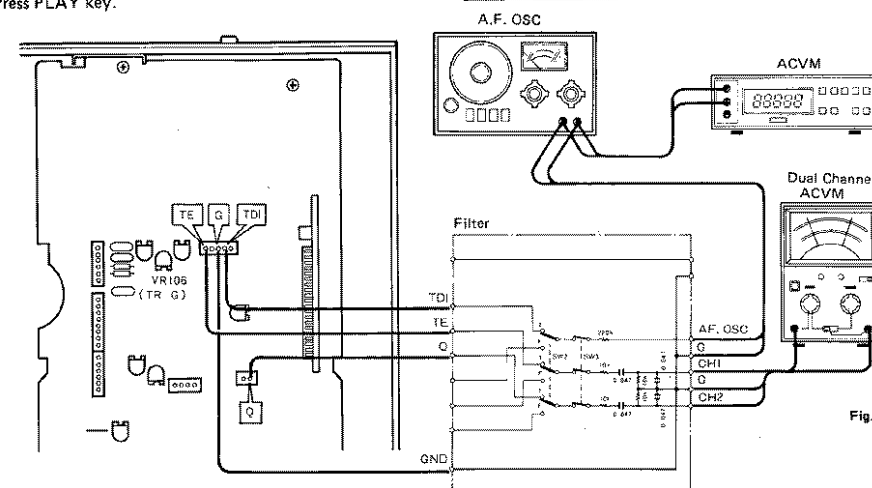


Fig. J

Adjustment of Tracking Offset (Step 10)

- ① Connect a DC voltmeter to [Q] and [GND] terminals on the Input side of the filter.

- ② Press POWER key. (POWER ON)

- ③ Press STOP key. (STOP mode: Display "0:00")

- ④ While observing the indication (E_Q) of the DC voltmeter, adjust VR105 (TRACKING GAIN) so that it satisfies the rating.

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

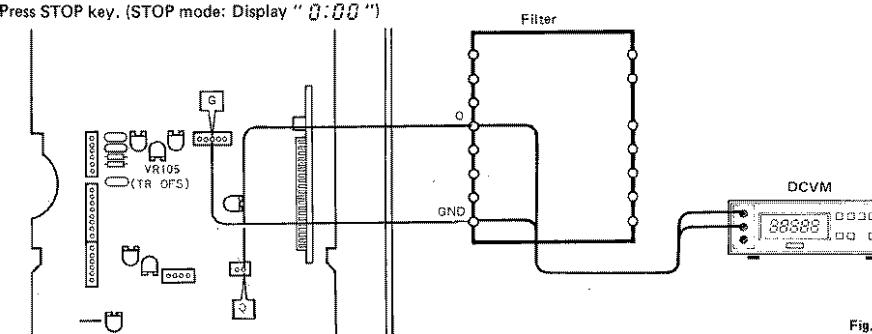


Fig. K

Confirmation of Jitter (Step 11)

- ① Confirm jitter rating as in ⑦ of Step 4.
- ② When jitter rating is improper, go back to step 4 and also carry out adjustments in steps 5 to 10 again.

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 Press POWER key. (POWER ON)
- ③ Load Philips test disc.
- ④ Press PLAY key.
- ⑤ Observe waveform while pressing Fast Forward mode key (▶▶) for 3 seconds.
- ⑥ Adjust VR107 (KICK GAIN) so that the **TER** signal cycle is 1.5 ± 0.5 when **TRHD** signal level is High.
* Adjust at the inner circumference of the disc.
- ⑦ Press Reverse mode key (◀◀) for 3 seconds and confirm that **TER** signal cycle is within the above specification but in reverse phase.

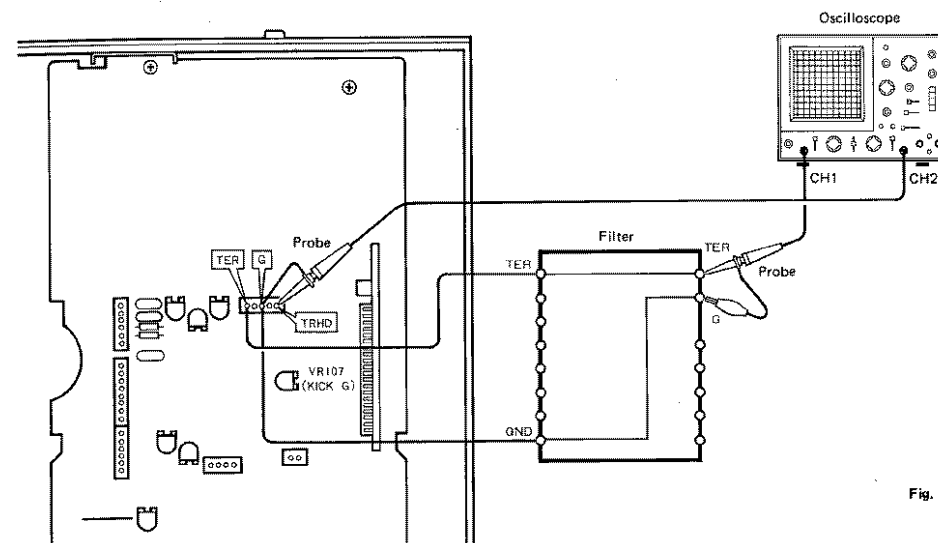
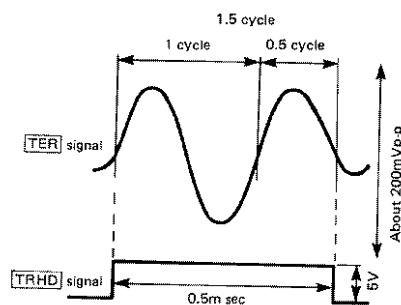


Fig. L

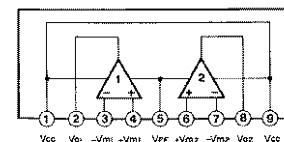
Confirmation of Search (◀◀, ▶▶) Operation (Step 13)

- ① Load Philips test disc and press PLAY key.
- ② Press Fast Forward mode key (▶▶) and confirm that the displayed time (ELAPSED TIME) advances smoothly.
- ③ Press Reverse mode key (◀◀) and confirm as in step ②.

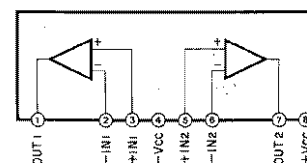
IC BLOCK

IC101, 103 ~ 106, 110: AN6551, NJM4558S, TA75558S or BA715

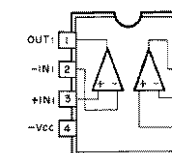
IC102: NJM2043S
IC405: NJM4556S
(Dual Ope-amp)



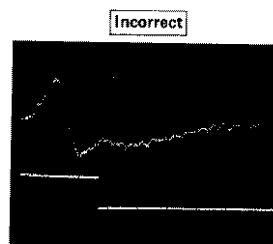
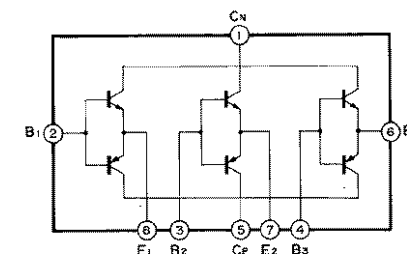
IC109: M5238L (Dual Ope-amp)



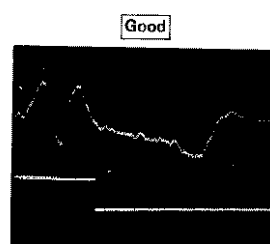
IC502: NJM2043M (T1) or AN6558S (Dual Ope-amp)



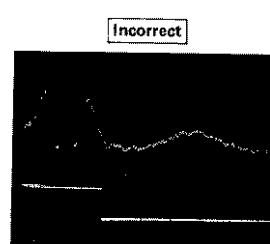
IC111: STA341M (Transistor Array)



This shows about 0.9 cycle which is incorrect



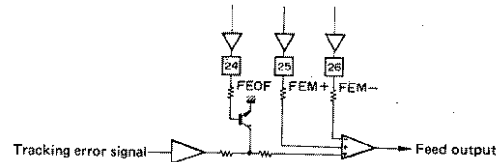
This shows about 1.7 cycle which is within specification.



This shows about 2.5 cycle which is incorrect

11. Feed Servo System 24 FEOF, 25 FEM+, 26 FEM-

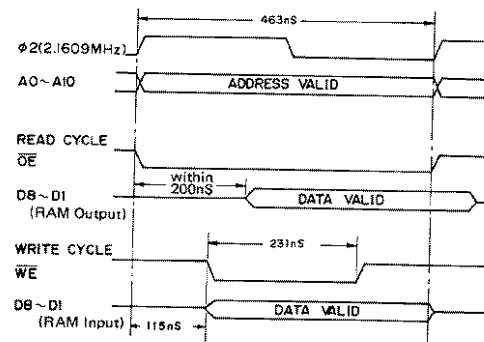
FEM + and FEM - signals are output as high-speed feed signals. To cut off the feed servo during this time, an FEOF signal is output.



Command	0, 2, 3	1 - 0	1-½	4, 5, 6		
FEOF	Low	Low	Low	Low	High	High
FEM+	Low	Low	Low	Low	High	High
FEM-	Low	Low	Low	Low	High	High
Pattern (repetition rotations vary with search mode time difference)				(time units in milliseconds)	34.8	34.8
Command search mode				7-0, 1, 2 7-4, 5, 6	7-3	7-7

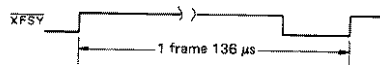
12. RAM Connections 40A0 ~ 50A9, 51 WE, 52 OE, 53 A10, 54D8 ~ 61D1

All are connected to the RAM and comprise the address, input control signals, and data signals. SPC is outputting when WE = "L" and inputting when WE = "H".



13. Crystal Clock Synchronizing Signal 75 XFSY

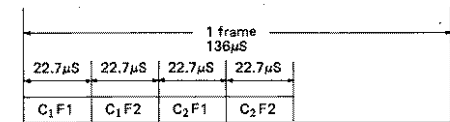
7.35 KHz frame synchronization signal.



14. C1, C2 Error Correction Check Test Signal 73 EFLG

This is the C1, C2 error correction circuit test terminal.

C1/C2	F2	F1
No error	0	0
Single-error correction	0	1
Double-error correction	1	0
Correction impossible	1	1



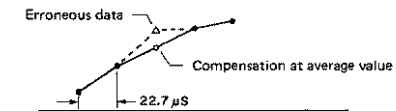
15. DATA Control Circuit and Serial Signal Output 68 φ2, 66 SDO, 67 SDSY, 69 L/M

71 TESTC

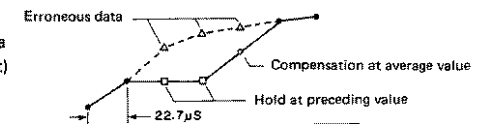
φ2 denotes 2.1609 MHz crystal clock.

SDO uses φ2 Bit Rate DAC serial output signals; left channel 24 Bit, right channel 25 Bit, LSB first. L/M and TESTC are normally conducted on "H" and the SDO on output; on L/M = TESTC = "L" with the same format, input is available to the digital filter. SDSY is the synchronizing signal. SDO is "H" for the left channel and "L" for the right channel.

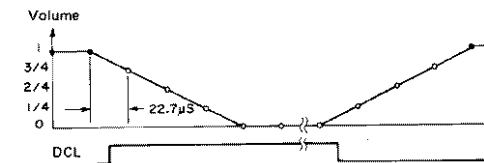
For discrete erroneous data
(left and right channels independent)



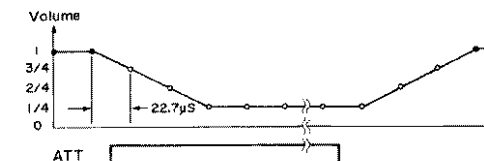
For continuous erroneous data
(left and right channels independent)



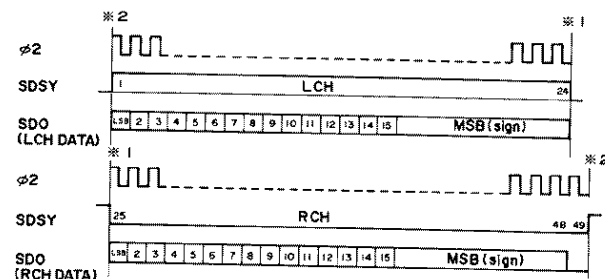
DCL (volume 0 command)
(left and right channels in tandem)



Change in ATT (Volume 1/4 Command)
(left and right channels in tandem)



Serial Output Signal Format



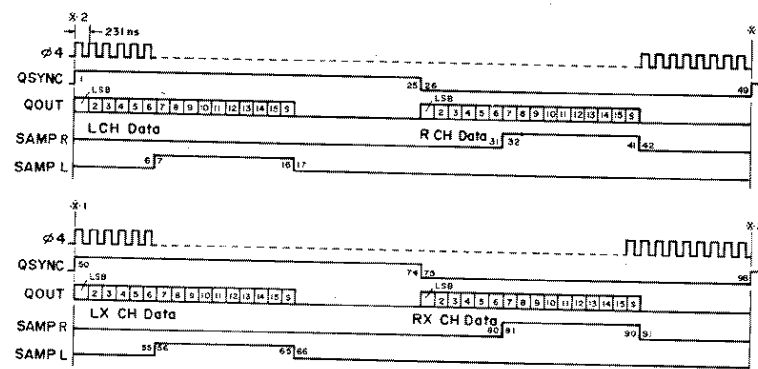
16. DAC Interface 64 QOUT, 65 QSYNC, 76 SAMP R, 77 SAMP L, 34 phi 4, 33 DAC L/M

The DAC serial output signal QOUT is 16 bit serial data synchronized to a 4.3218 MHz (phi 4) build-up and output by a 2's Comp format. (Refer to the diagram. The LX channel and RX channel show data that has been compensated by means of digital filtering.)

When the DAC L/M terminal is open, the data rate is 88.2 kHz (44.1 kHz plus or minus 20 kHz band suppression) for L ch and LX ch as well as for R ch and RX ch.

When DAC L/M terminal "L", LX = L, RX = R; offfootivo data rate is 44.1 kHz.

QSYNC is the output synchronizing signal and denotes the L and LX output period when "L" and R and RX output period when "H" SAMP R and SAMP L are the L and R channel sampling signals.



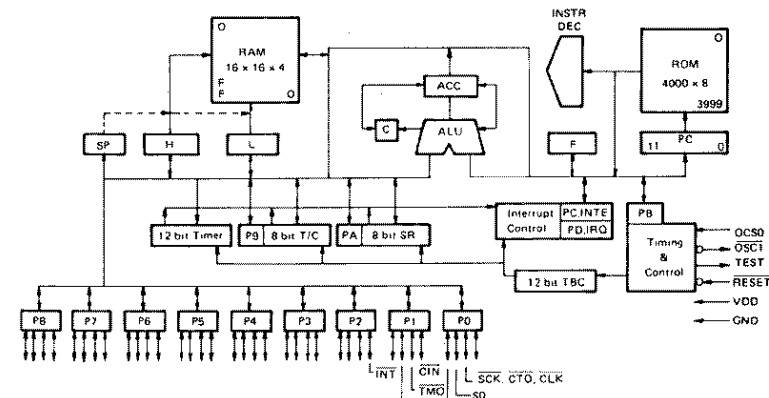
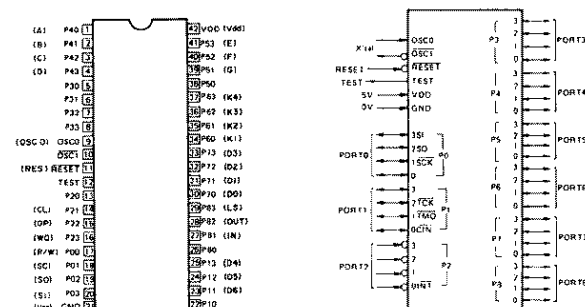
17. Deemphasis Signal 62DEP

Deemphasis is necessary when the frequency characteristics control signal is "H".

18. Test Terminals 70 TEST B, 71 TEST C, TEST D, 74 TCL

These comprise the several test terminals and normally read "H" with PULL-UP resistance. They need not be connected.

IC401: MSM6404A-168RS 4 bit Microcomputer



PIN FUNCTIONS

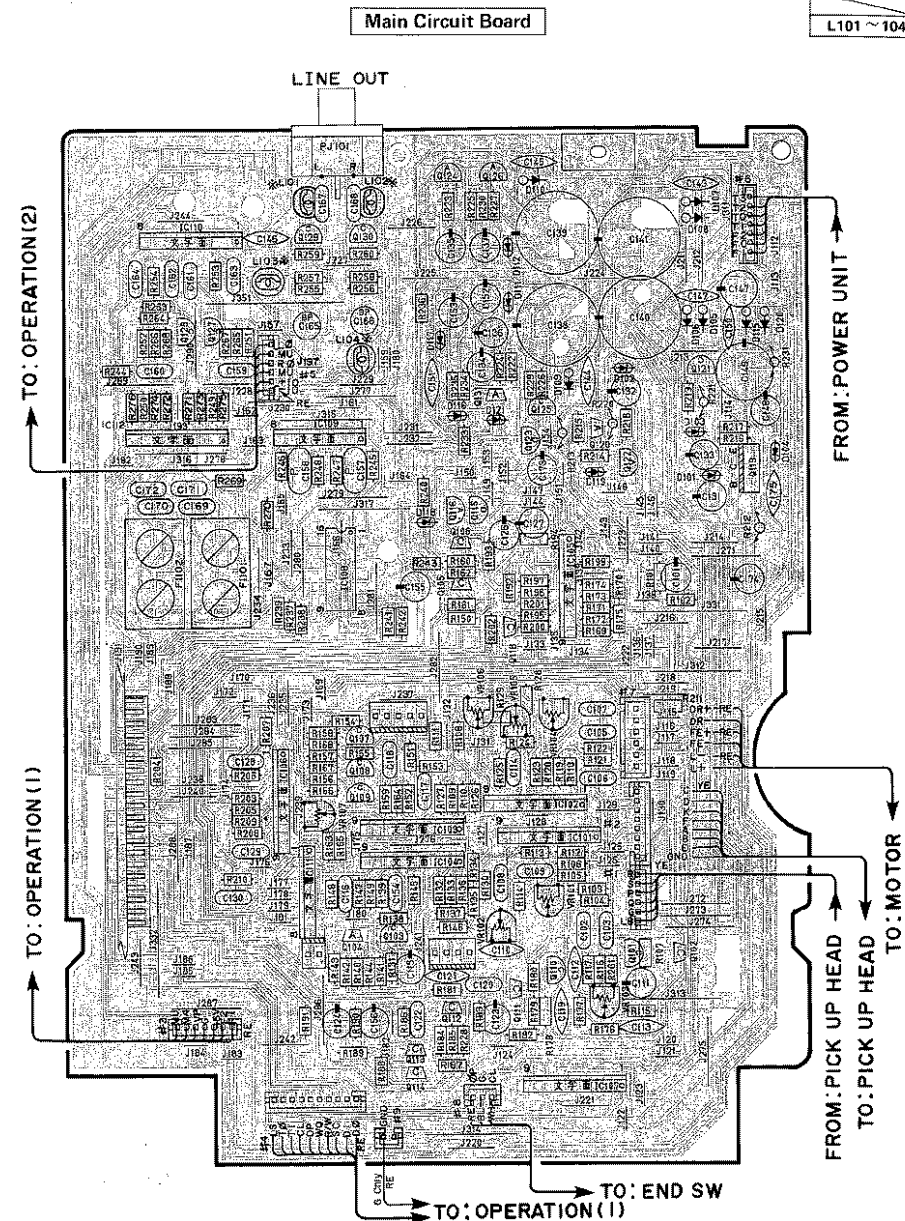
Pin No.	Pin Name	I/O	Function
1	P40 A	O	Display unit segment output
2	P41 B	O	
3	P42 C	O	
4	P43 D	O	
5	P30 D0	O	Display unit digit output
6	P31 D1	O	
7	P32 D2	O	
8	P33 D3	O	
9	OSC ₀		ϕ Input
10	OSC ₁		NC
11	Reset		Reset puls
12	TEST		NC
13	P20		NC
14	P21 IN	I	"L" at Tray close
15	P22 OUT	I	"L" at Tray open
16	P23 WQ	I	Transmits data with SPC IC
17	P00 R/W	O	
18	P01 SCK	O	
19	P02 Ss	O	
20	P03 SI	I	GND
21	GND		
22	P10 R4	I	
23	P11 J	O	
24	P12 D5	O	Remote Control input
25	P13 D4	O	Display unit segment output
26	P80 I	O	Display unit digit output
27	P81 Tray In	O	Display unit segment output
28	P82 Tray Out	O	Tray Loading output
29	P83 Laser	O	Optical pick up head power supply control. "H" at laser emits the beam
30	P70 R0	I	Remote control input
31	P71 R1	I	
32	P72 R2	I	
33	P73 R3	I	
34	P60 K1	I	Key scan input
35	P61 K2	I	
36	P62 K3	I	
37	P63 PLAY	O	
38	P50 H	O	Play control output "L" at playing
39	P51 G	O	Display unit segment output
40	P52 F	O	
41	P53 E	O	
42	VDD	O	
			+5V Power supply

PRINTED CIRCUIT BOARD (Pattern side)

Note) 文字面 : Component side

Note) * marke

L101 ~ 104



■ PRINTED CIRCUIT BOARD (Pattern side)

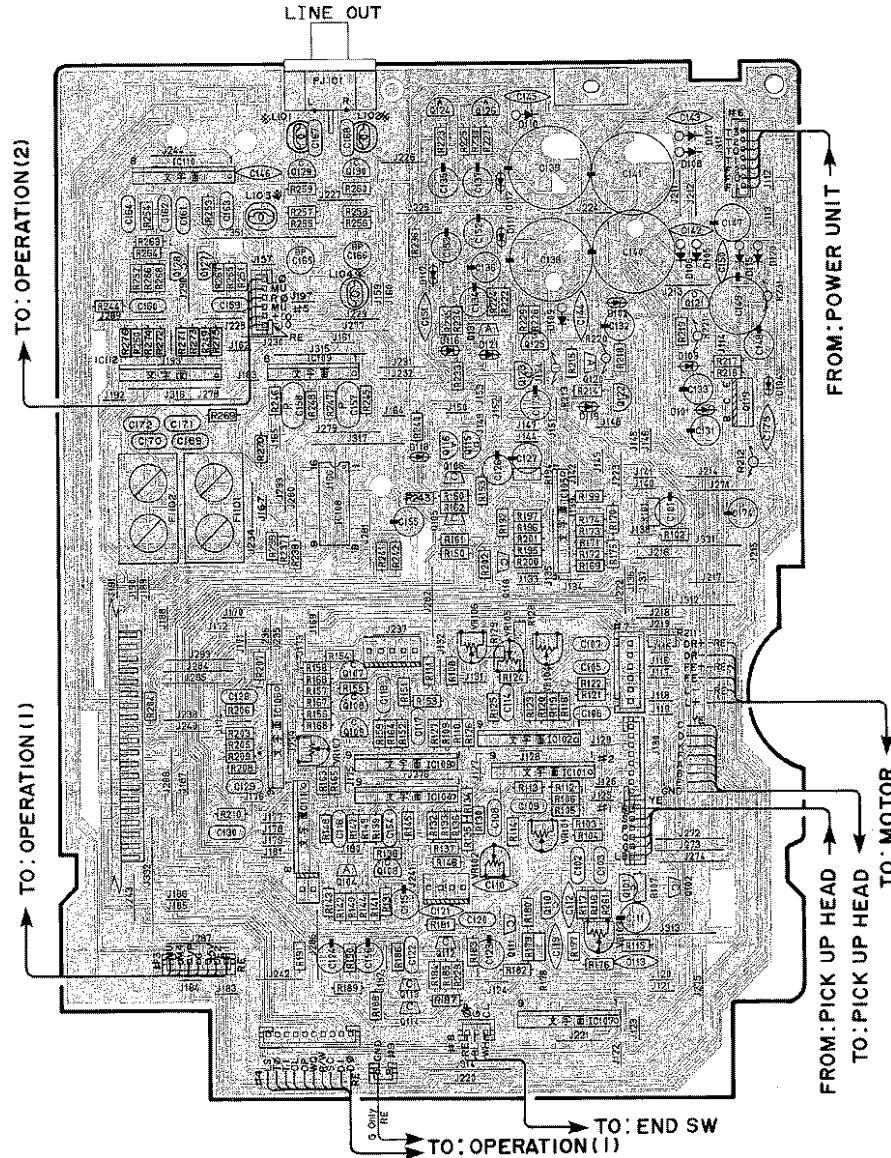
Note) 文字面 : Component side

Note) * marked

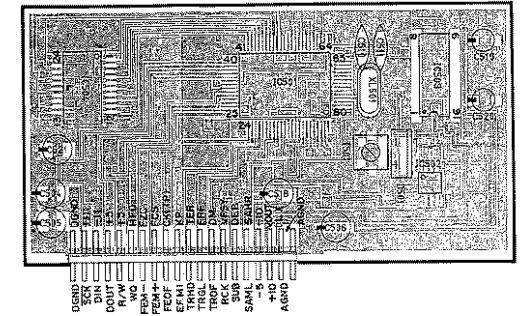
Main Circuit Board

	R, U, A, C, B	G
L101 ~ 104	SHORT	20μH

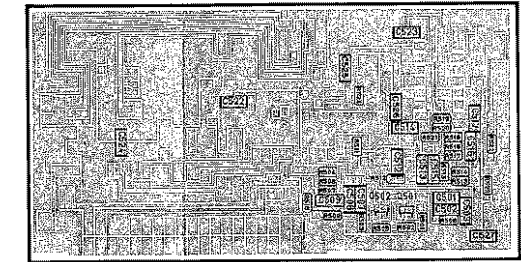
SPC Circuit Board



(Parts side)



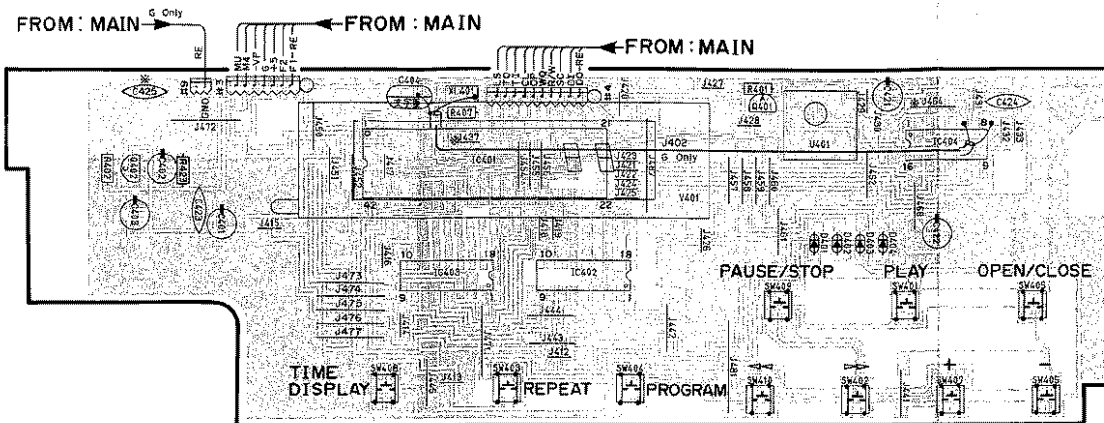
(Chip side)



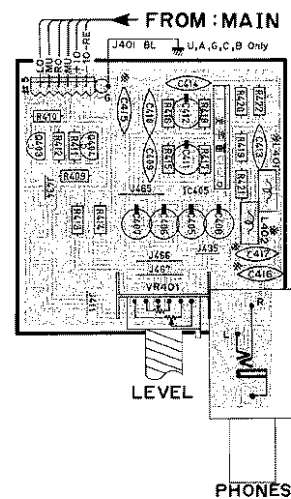
1
2
3
4
5
6

Note) 文字面 : Component side

Operation Circuit Board (1)



Operation Circuit Board (2)



Note) * marked

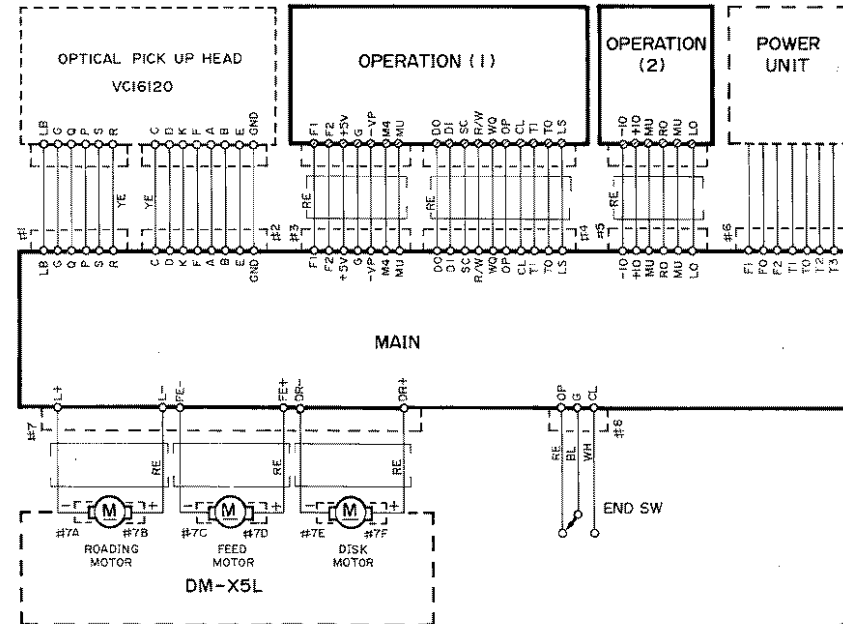
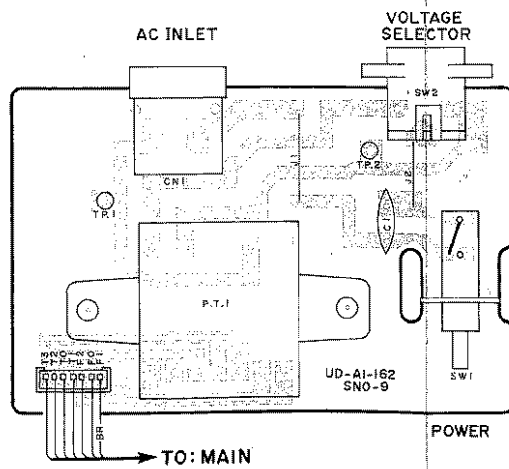
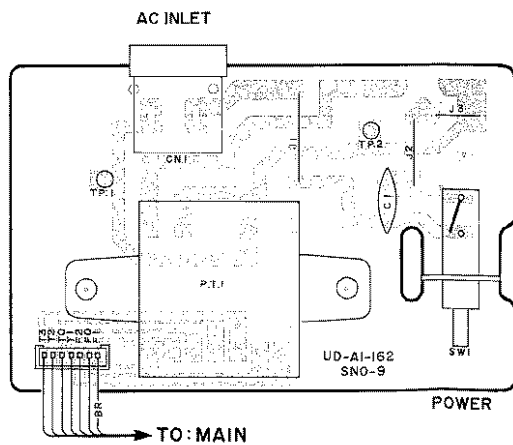
	R	U, A, C, B	G
C416, 417	OPEN	0.01	→
C415, 425	OPEN	→	0.01
L401, 402	SHORT	→	20μH
J437	SHORT	→	OPEN
J464	SHORT	→	OPEN

■ WIRING

Power Circuit Board

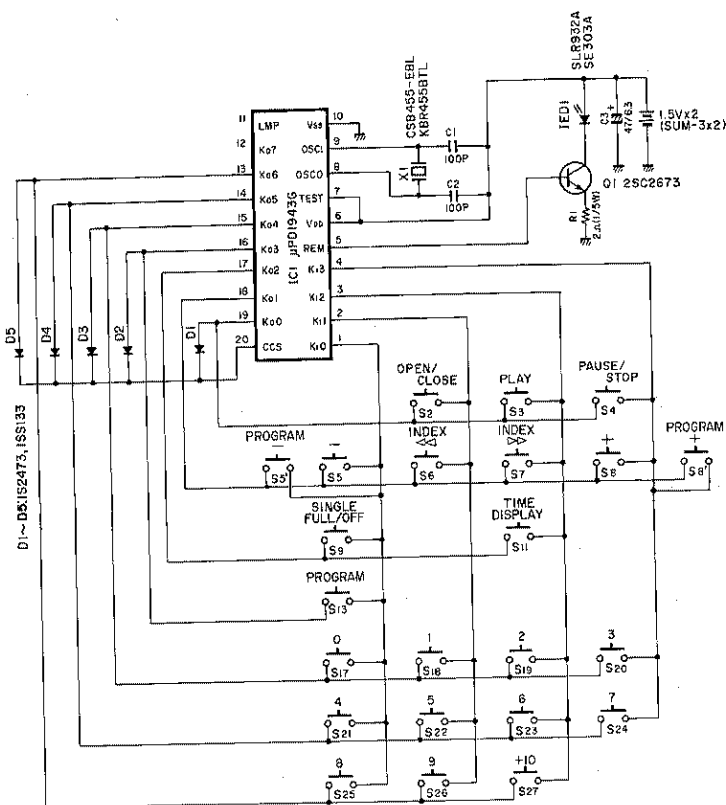
- U, C, A, G, B models

- R model



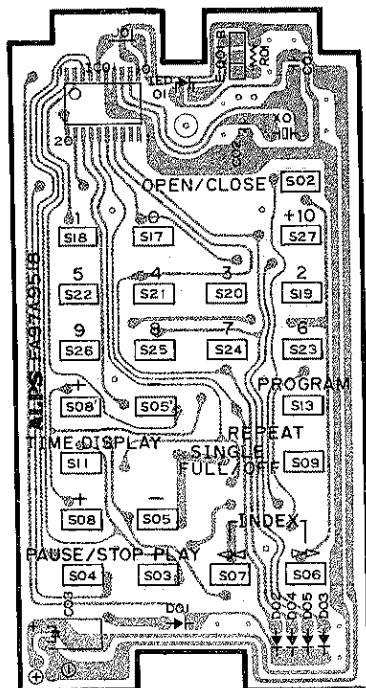
RS-CD5 REMOTE CONTROL TRANSMITTER

■ SCHEMATIC DIAGRAM

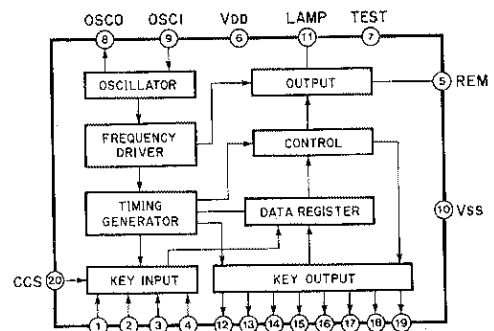
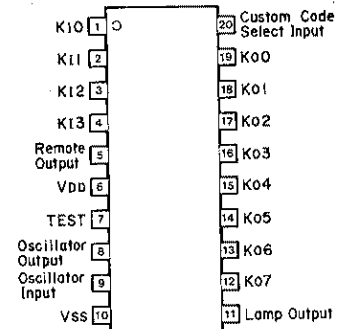


FUNCTION	DATE CODE							HEX CODE
	0	1	2	3	4	5	6	
OPEN/CLOSE	1	0	0	0	0	0	0	01
PLAY	0	1	0	0	0	0	0	02
PAUSE/STOP	1	1	0	0	0	0	0	03
-	0	0	1	0	0	0	0	04
◀ INDEX	1	0	1	0	0	0	0	05
▶ INDEX	0	1	1	0	0	0	0	06
+	1	1	1	0	0	0	0	07
SINGLE FULL/OFF	0	0	0	1	0	0	0	08
TIME DISPLAY	0	1	0	1	0	0	0	0A
PROGRAM	0	0	1	1	0	0	0	0C
0	0	0	0	0	1	0	0	10
1	1	0	0	0	1	0	0	11
2	0	1	0	0	1	0	0	12
3	1	1	0	0	1	0	0	13
4	0	0	1	0	1	0	0	14
5	1	0	1	0	1	0	0	15
6	0	1	1	0	1	0	0	16
7	1	1	1	0	1	0	0	17
8	0	0	0	1	1	0	0	18
9	1	0	0	1	1	0	0	19
+10	0	1	0	1	1	0	0	1A
PROGRAM -	0	0	1	0	0	0	0	04
PROGRAM +	1	1	1	0	0	0	0	07
CASTAM CODE	1	0	0	1	1	1	0	79

■ PRINTED CIRCUIT BOARD



• IC1: μPD1943G



PARTS LIST

ELECTRICAL PARTS

■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 p. 51.

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※	NA 09:23:30	Main Circuit Board	メイン シート			J	
※	NA 09:23:40	"	"			R,U,A,C,B	
※	NA 09:36:40	"	"			G	
	FC 36:46:80	Mylar Cap.	0.068 μ F 50V	マイラーコン C159,160			
	FC 44:31:50	"	1500pF 50V	" C167,168			
	FC 44:41:00	"	0.01 μ F 50V	" C142, 146, 150,151		J	
	FG 24:41:00	Ceramic Cap.	0.01 μ F 50V	セラコン "		R,U,A,G,C,B	
	FG 21:14:70	"	47pF 50V	" C121			
	FG 21:21:00	"	100pF 50V	" C110			
	FG 21:24:70	"	470pF 50V	" C119			
	FG 21:28:20	"	820pF 50V	" C112			
	FG 24:41:00	"	0.01 μ F 50V	" C175			
	FG 44:44:70	"	0.047 μ F 50V	" C113			
	UA 25:31:50	Mylar Cap.	1500pF 50V	マイラーコン C105,106			
	UA 25:32:20	"	2200pF 50V	" C128			
	FA 15:32:40	"	2400pF 50V	" C161,162			
	FA 15:36:80	"	6800pF 50V	" C109			
	FA 15:41:20	"	0.012 μ F 50V	" C163,164			
	FA 15:43:30	"	0.033 μ F 50V	" C154			
	UA 25:44:70	"	0.047 μ F 50V	" C130			
	UA 25:46:80	"	0.068 μ F 50V	" C129			
	UA 25:51:00	"	0.1 μ F 50V	" C102,103,107, 108,117,120			
	UA 55:51:20	"	0.12 μ F 50V	" C114,122			
	UA 55:51:80	"	0.18 μ F 50V	" C118			
	FA 15:53:30	"	0.33 μ F 50V	" C118			
	UK 14:64:70	Electrolytic Cap.	4.7 μ F 25V	B P コン C165,166		R,U,A,G,C,B	
	FV 34:64:70	"	4.7 μ F 25V	" "		J	
	UJ 11:84:70	"	470 μ F 6.3V	ケミコン C156			
	UJ 12:81:00	"	100 μ F 10V	" C101,115,127			
	UJ 13:82:20	"	220 μ F 10V	" C152			
	UJ 13:73:30	"	33 μ F 16V	" C136,137			
	UJ 13:74:70	"	47 μ F 16V	" C123			
	UJ 13:82:20	"	220 μ F 16V	" C131, 138,173, 174			
	UJ 14:64:70	"	4.7 μ F 25V	" C111			
	UJ 15:71:00	"	10 μ F 35V	" C148			
	UJ 15:81:00	"	100 μ F 35V	" C142			
	UJ 16:61:00	"	1 μ F 50V	" C124			
	UJ 16:62:20	"	2.2 μ F 50V	" C126			
	UJ 16:71:00	"	10 μ F 50V	" C153			
	UJ 91:91:00	"	1000 μ F 6.3V	" C155			
	UJ 15:84:70	"	470 μ F 35V	" C149			
	UT 45:26:80	Polypropylene Film Cap.	680pF 100V	ポリプロコン C157,158			
	UJ 13:92:20	Electrolytic Cap.	2200 μ F 16V	ケミコン C140,141		R,U,A,G,C,B	
	UW 83:92:20	"	2200 μ F 16V	" "		J	
	UW 94:91:00	"	1000 μ F 25V	" C138,139		R,U,A,G,C,B	
	UW 84:91:00	"	1000 μ F 25V	" "		R,U,A,G,C,B	
	UW 84:91:00	"	1000 μ F 25V	" "		J	
	UT 45:32:20	Polypropylene Film Cap.	2200pF 100V	ポリプロコン C171,172		R,U,A,G,C,B	
	UT 65:33:30	"	3300pF 100V	" C169,170		R,U,A,G,C,B	
※	VB 97:11:00	Coil	20 μ H	インダクタンス L101~104			

※New Parts (新規部品)

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
	HT 79:00:20	Pre-Set Potentiometer	B10k Ω	半 固 定 抵 抗 VR103			
	VA 78:80:00	"	B10k Ω	" "			
	VB 86:16:00	"	B10k Ω	" VR105			
	VB 86:18:00	"	B47k Ω	" VR104,106			
	VB 86:22:00	"	B470k Ω	" VR107			
	VC 61:25:00	"	B68k Ω	" VR101			
	VC 61:26:00	"	B150k Ω	" VR102			
	HV 45:34:70	Flame Proof Carbon Resistor	4.7 Ω 1/4W	不 燃 化 カ ー ボ ン 抵 抗 R212,213			
	HV 45:54:70	"	470 Ω 1/4W	" R221			
	HV 45:56:80	"	680 Ω 1/4W	" R220			
	HV 45:58:20	"	820 Ω 1/4W	" R231			
	IA 09:33:00	Transistor	2SA933S(Q,R)	ト ラ ン ジ ス ト Q104,120,131			
	IA 11:15:10	"	2SA1115(E,F)	" "			
	IX 60:31:70	"	2SA1310(R,S,T)	" "			
	IA 09:34:00	"	2SA934	" Q116,122,124,126			
	IB 05:44:10	"	2SB544	" "			
	IC 05:35:00	"	2SC535(A,B,C)	" Q101,110			
	IC 17:40:00	"	2SC1740S(S,R)	" Q122,126,108,111~112,118			
	IC 26:03:10	"	2SC2603(E,F)	" "			
	IX 60:31:80	"	2SC3312(R,S,T)	" "			
	IC 19:83:00	"	2SC1983	" Q119			
	IC 20:60:00	"	2SC2060	" Q115,121,123,125			
	ID 04:00:00	"	2SD400	" "			
	IX 60:42:00	"	2SC2878(A,B)	" Q103,107~109			
	IX 60:42:00	"	2SC2878(A,B)	" Q129,130			
	IC 33:27:00	"	2SC3327	" "			
	IX 60:42:00	"	2SC2878(A,B)	" Q127,128			
	IC 30:68:00	"	2SC3068	" "			
	IC 33:27:00	"	2SC3327	" "			
	IF 00:34:50	Diode	1SS133	ダ イ オ ー ド D116,119,121			
	IX 60:41:10	Zener Diode	MTZ5.6B	ツェナーダイオード D101,104,118			
	IF 00:64:70	"	MTZ7.5B	" D103			
	IF 00:88:80	"	MTZ13A	" D111,112			
	IF 00:89:10	"	MTZ6.8B	" D117			
	IF 01:08:20	"	MTZ8.2A	" D102			
	IF 00:84:80	"	1SR35-100A	ダ イ オ ー ド D105~110,115,120			
	IG 03:47:00	IC	AN6551	I C IC112		R,U,A,G,C,B	
	IG 07:68:00	"	NJM4558S	" "		R,U,A,G,C,B	
	IG 13:22:00	"	BA715	" "		R,U,A,G,C,B	
	IG 03:47:00	"	AN6551	" IC101,103~106			
	IG 07:68:00	"	NJM4558S	" "			
	IG 13:22:00	"	BA715	" "			
	IG 08:02:00	"	NJM2043S	" IC102			
	IG 05:51:00	"	TC4053BP	" IC108			
	IG 05:46:00	"	HD14053BP	" "			
	IG 15:35:00	"	BA6218	" IC107			
	VC 16:07:00	"	STA341M	" IC111			
	XB 24:80:01	"	M5238L	" IC109			
	XB 41:90:01	"	M5216L	" IC110		J	

※New Parts (新規部品)

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
IG 03:47:00	IC	AN6551	I C	IC110		RUAGCB	
IG 07:68:00	"	NJM4558S	"	"		RUAGCB	
IG 13:22:00	"	BA715	"	"		RUAGCB	
LB 20:23:40	Pin Jack	2P	ピンジャック	PJ101			
VC 34:76:00	Filter, LC	FZP217X	L C フィルター	F101,102		RUAGCB	
NA 09:18:80	SPC Circuit Board		S P C シート		CD-X5		
BB 06:95:10	Ground Plate		ランド金具				
CB 66:00:30	Clip		ワイヤークリップ				
LB 91:80:60	Base Pin	6P i-Type	X H ベースピン				
VD 00:46:00	"	3P i-Type	P H ベースピン				
VD 00:45:00	"	2P i-Type	"		G		
VD 00:49:00	"	6P i-Type	"				
VD 00:51:00	"	8P i-Type	"				
VD 00:53:00	"	10P i-type	"				
VD 00:50:00	"	7P i-Type	"				
LB 20:13:90	"	TEB2P-SHF	2.5ピッチベースピン				
LB 40:05:70	"	TEB4P-SHF	"				
LB 50:02:50	"	TEB5P-SHF	"				
NA 09:29:00	Operation Circuit Board		オペレーションシート	Black		U.A.C.B	
NA 09:29:10	"	"	"	Silver		U.A.C.B	
NA 09:23:50	"	"	"	Black		J.R	
NA 09:28:50	"	"	"	Silver		J.R	
NA 09:36:60	"	"	"	Black		G	
NA 09:36:70	"	"	"	Silver		G	
FG 21:14:70	Ceramic Cap.	47 μ F 50V	セラコン	C413,414			
FG 21:22:20	"	220pF 50V	"	C409,410			
FG 24:41:00	"	0.01 μ F 50V	"	C416,417		U.A.G.C.B	
FG 24:41:00	"	0.01 μ F 50V	"	C423,424			
FG 24:41:00	"	0.01 μ F 50V	"	C418,428		G	
FZ 00:76:10	Capacitor Network	CSC300K	コンデンサネットワーク	C404			
UJ 11:74:70	Electrolytic Cap	47 μ F 6.3V	ケミコン	C411,412			
UJ 13:71:00	"	10 μ F 15V	"	C405~408			
UJ 16:62:20	"	2.2 μ F 50V	"	C402			
UJ 16:71:00	"	10 μ F 50V	"	C401			
UJ 16:72:20	"	22 μ F 50V	"	C403			
UJ 13:73:30	"	33 μ F 15V	"	C421,422			
GG 00:07:30	Ceramic Resonator	4.19MHz	セラミック共振子	XL401			
VB 97:11:00	Coil	20 μ H	インダクタンス	L401,402		G	
VC 50:93:00	Potentiometer	50KA $\times$ 2	ロータリーボリューム	VR401			
IA 09:33:00	Transistor	2SA933S(Q,R)	トランジスタ	Q401			
IA 11:15:10	"	2SA1115(E,F)	"	"			
IX 60:31:70	"	2SA1310(R,S,T)	"	"			
IX 60:42:00	"	2SC2878(A,B)	"	Q402~404			
IC 30:68:00	"	2SC3068	"	"			
IC 33:27:00	"	2SC3327	"	"			

※New Parts (新規部品)

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
IF 00:34:50	Diode	1SS133	ダイオード	D401~404			
KA 90:83:80	Switch	EVQ-QRB-04M	ライトタッチスイッチ	SW401~410			
XB 67:10:01	IC	LU59516	I C	IC404			
IG 07:74:00	"	NJM4556S	"	IC405			
XB 68:00:01	"	MSM6404A-168	"	IC401			
XB 67:90:01	"	MSL915RS	"	IC402,403			
LB 30:24:30	Phone Jack	BL	ホーンジャック	JK401 Black			
LB 30:24:20	"	GY	"	JK401 Silver			
VB 96:96:00	Receive Unit	GP1U001	受光ユニット	U401			
VC 11:17:00	Display Unit	G-BT-912K	蛍光表示管	V401			
AA 83:14:30	Support, FL		サポートFL				
CB 65:08:30	Sheet, Felter		シートフィルター				
NA 09:18:00	Power Unit		電源ユニット			J	
NA 09:18:10	"	"	"			R	
NA 09:18:20	"	"	"			U,C	
NA 09:18:30	"	"	"			A,B	
NA 09:36:30	"	"	"			G	
XB 81:20:01	Power Transformer		電源トランス	PT-1		J	
XB 81:30:01	"	"	"	"		R	
XB 81:40:01	"	"	"	"		U,C	
XB 81:50:01	"	"	"	"		A,G,B	
VC 09:79:00	Power Switch		パワースイッチ	SW1			
LA 00:58:10	Voltage Selector		電圧切換スイッチ	SW2		R	
VA 98:55:00	Ceramic Cap.	0.01 μ F	セラコン	C1		J	
FI 41:41:00	"	0.01 μ F	"	"		RUAGCB	
VC 09:80:00	AC Inlet		はめ込みプラグ受	CN1			

※New Parts (新規部品)

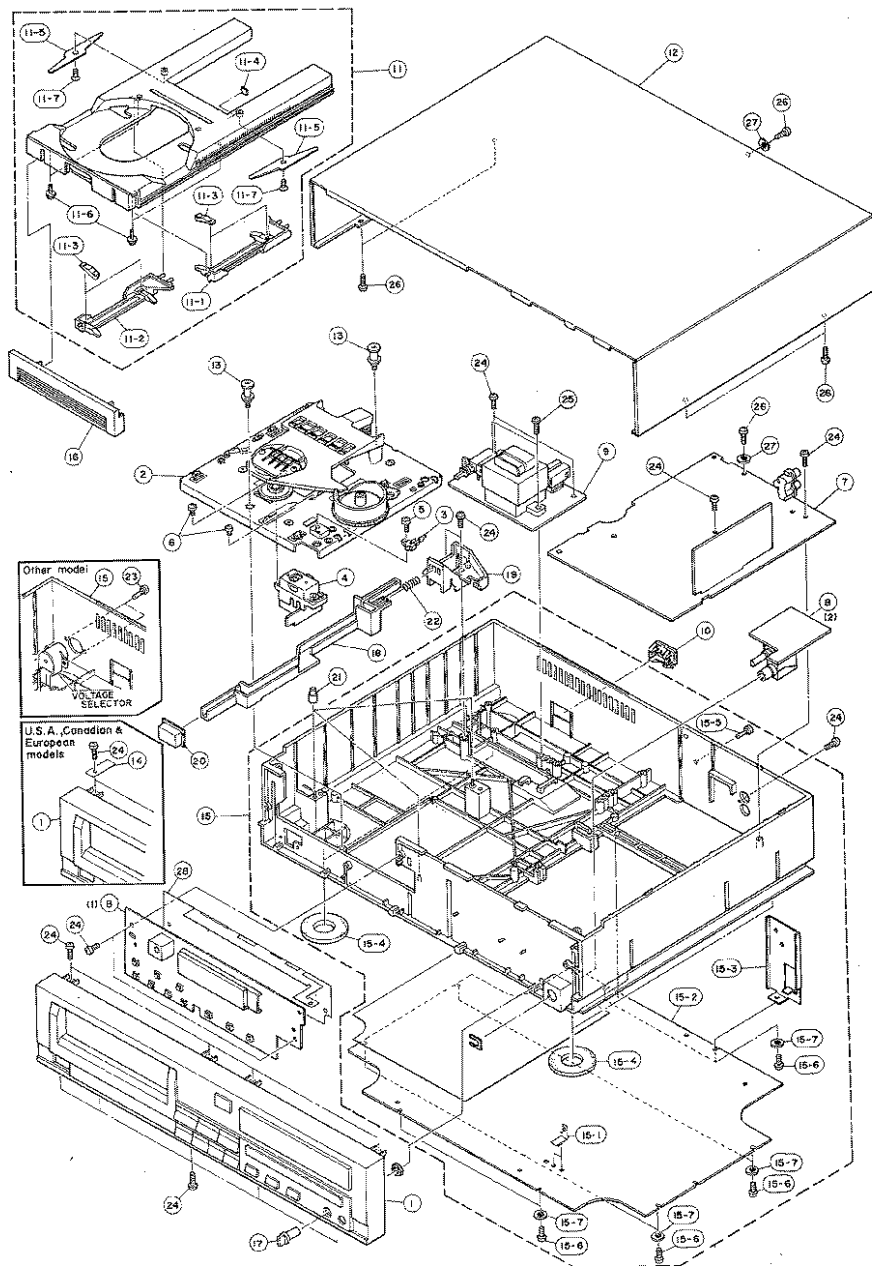
Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
	IF 00 34 50	Diode	1SS133	ダイオード D401~404			
	KA 90 83 80	Switch	EVQ-QRB-04M	ライトタッチスイッチ SW401~410			
*	XB 67 10 01	IC	1U59516	I C IC404			
	IG 07 74 00	"	NJM4556S	" IC405			
*	XB 68 00 01	"	MSM6404A-168	" IC401			
+	XB 67 90 01	"	MSL915RS	" IC402,403			
	LB 30 24 30	Phone Jack	BL	ホーンジャック JK401 Black			
	LB 30 24 20	"	GY	" JK401 Silver			
*	VB 96 96 00	Receive Unit	GP1U001	受光ユニット U401			
*	VC 11 17 00	Display Unit	6-BT-91ZK	蛍光表示管 V401			
	AA 63 14 30	Support,FL		サポートFL			
	CB 65 08 30	Sheet, Felter		シートフィルター			
	NA 09 18 00	Power Unit		電源ユニット		J	
*	NA 09 18 10	"		"		R	
*	NA 09 18 20	"		"		U,C	
*	NA 09 18 30	"		"		A,B	
*	NA 09 36 30	"		"		G	
*	XB 81 20 01	Power Transformer		電源トランス PT-1		J	△
*	XB 81 30 01	"		"		R	△
*	XB 81 40 01	"		"		U,C	△
*	XB 81 50 01	"		"		A,G,B	△
	VC 09 79 00	Power Switch		パワースイッチ SW1			△
	LA 00 58 10	Voltage Selector		電圧切換スイッチ SW2		R	△
	VA 98 55 00	Ceramic Cap.	0.01 μ F	セラコン C1		J	△
	Fi 41 41 00	"	0.01 μ F	"		R,U,A G,C,B	△
	VC 09 30 00	AC Inlet		はめ込みプラグ受 CN1			△

* New Parts (新規部品)

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
*	NA 09 18 80	SPC Circuit Board		S P C シート			
	FG 21 12 70	Ceramic Cap.	27pF 50V	セラコン C510,511			
	UD 11 41 00	Chip Ceramic Cap.	0.01 μ F 50V	チップセラコン C514			
	UD 11 42 20	"	0.022 μ F 50V	" C522~527			
	UD 11 44 70	"	0.047 μ F 50V	" C501,502,507,508,512			
	UD 11 33 30	"	3300pF 50V	" C503,517			
	UJ 11 94 70	Electrolytic Cap.	470 μ F 6.3V	ケミコン C518,521			
	UJ 13 71 00	"	10 μ F 16V	" C504~506			
	UJ 13 84 70	"	470 μ F 16V	" C519,520			
	FG 21 12 20	Ceramic Cap.	22pF 50V	セラコン C509			
	FG 21 22 20	"	220pF 50V	" C516			
	FG 21 24 70	"	470pF 50V	" C515			
	FG 21 31 00	"	1000pF 50V	" C513			
	GE 90 20 00	OSC Coil	3.3 μ H	発振コイル T501			
	VB 35 88 00	Chip Resistor	220 Ω 1/8W	チップ抵抗 R521~523			
	VB 36 08 00	"	1.5k Ω 1/8W	" R511			
	VB 36 12 00	"	2.2k Ω 1/8W	" R515			
	VB 36 16 00	"	3.3k Ω 1/8W	" R516			
	VB 36 21 00	"	4.7k Ω 1/8W	" R519			
	VB 36 25 00	"	6.8k Ω 1/8W	" R507,508			
	VB 36 29 00	"	10k Ω 1/8W	" R504			
	VB 36 31 00	"	12k Ω 1/8W	" R501,502			
	VB 36 37 00	"	22k Ω 1/8W	" R505,512			
	VB 36 39 00	"	27k Ω 1/8W	" R509			
	VB 36 41 00	"	33k Ω 1/8W	" R503,510			
	VB 36 53 00	"	100k Ω 1/8W	" R520			
	VB 40 27 00	"	1M Ω 1/8W	" R506,524			
	VC 31 66 00	Metal Film Resistor	22.1k Ω 1/8W	金属皮膜抵抗 R513,514,517,518			
	iA 10 37 00	Chip Transistor	2SA1037	チップトランジスタ Q502	Inter- changeable		
	iB 07 09 10	"	2SB709A	"	"		
	iC 24 12 00	"	2SC2412	" Q501	Inter- changeable		
	iD 06 01 00	"	2SD601	"	"		
	iF 00 49 10	Varactor Diode	1SV55	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 IC504			
	iG 15 71 10	"	NJM2043M(T1)	" IC502			
*	XB 63 70 01	"	PCM56P	" IC503			
*	XB 69 90 01	"	YM3817	" IC501			
	QU 00 58 00	Quartz Crystal Unit	8.64MHz	水晶振動子 XL501			
*	VB 97 27 00	Connector	40pin	コネクタ			

* New Parts (新規部品)

EXPLODED VIEW



MECHANISM PARTS

Note) φ : Diameter

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※ 1	NB 63 98 30	Panel Unit	パネルユニット	Black	CDX-500	J,R,A,G,B	
※ 2	NB 64 03 70	"	"	Silver	"	J,R,A,G,B	
※ 3	NB 64 06 10	"	"	Black	CDX-500	U,C	
※ 4	NB 64 06 20	"	"	Silver	"	U,C	
※ 5	NB 63 98 90	"	"	"	CD-30		
2	NB 63 77 20	Disc Mechanism Unit	DM-X5	DM ユニッ	CD-X5		
3	KA 90 63 70	Switch	MSW-1485	エンドスイッチ			
4	VC 16 12 00	Optical Pick Up Head	MLP-7	光ピックアップヘッド	CD-X5		
5	Ei 02 61 06	Binding Head Tapping Screw	2.6x10 ZMC2-Y	バインドタッピングネジ	PACK		
6	EO 32 60 46	Binding Head Screw	2.6x4 ZMC2-BI	バインド小ネジ	PACK		
※ 7	NA 09 23 30	Main Circuit Board	メインシート	"		J	
※ 8	NA 09 23 40	"	"	"		R,U,A,C,B	
※ 9	NA 09 36 40	"	"	"		G	
※ 10	NA 09 29 00	Operation Circuit Board	オペレーションシート	Black		U,A,C,B	
※ 11	NA 09 29 10	"	"	Silver		U,A,C,B	
※ 12	NA 09 23 50	"	"	Black		J,R	
※ 13	NA 09 28 50	"	"	Silver		J,R	
※ 14	NA 09 36 60	"	"	Black		G	
※ 15	NA 09 36 70	"	"	Silver		G	
9	NA 09 18 00	Power Unit	電源ユニット	"		J	
※ 16	NA 09 18 10	"	"	"		R	
※ 17	NA 09 18 20	"	"	"		U,C	
※ 18	NA 09 18 30	"	"	"		A,B	
※ 19	NA 09 36 30	"	"	"		G	
10	VC 09 81 00	Cover, AC Inlet	ACインレットカバー	"	CD-X5	J,U,C	
※ 11	VC 09 82 00	"	"	"	"	R,A,G,B	
11	NB 63 77 00	Tray Ass'y	トレイ Ass'y	"	"		
11-1	CB 65 60 10	Lifter(R)	リフター (R)	"	"		
11-2	CB 65 60 00	" (L)	" (L)	"	"		
11-3	CB 65 60 20	Disc Pad	ディスクパッド	"	"		
11-4	CB 62 79 60	Cushion Rubber	クッションゴム	"	"		
11-5	AA 63 08 30	Spring, Lifter	スプリングリフター	"	"		
11-6	EX 60 02 40	BW Head Tapping Screw	3x8(φ10) FCRM3-BI	BWヘッドタッピングネジ	"		
11-7	EO 33 00 86	Flat Head Tapping Screw	3x8 FCRM3-BI	皿タッピングネジ	PACK		
※ 12	AA 63 12 00	Top Cover	トップカバー	Black			
※ 13	VC 51 68 00	"	"	Silver			
13	NB 63 83 90	Special Screw Ass'y	段付ネジ Ass'y	"	CD-X5		
14	BB 07 11 70	Ground Plate	アースプレート	"	"		
※ 15	NB 63 98 50	Main Chassis Ass'y	メインシャーシ Ass'y	"		R	
※ 16	NB 63 98 60	"	"	"		J,U,A, G,C,B	
15-1	VC 81 47 00	Terminal Plate	ターミナルプレート	"		U,G,C	
※ 15-2	VC 93 60 00	Bottom Cover	ボトムカバー	"			
※ 15-3	AA 63 12 30	Ground Plate	アース金具	"			
※ 15-4	VC 96 54 00	Pad	パッド	"			
15-5	CB 06 88 80	Plastic Rivet	プラスチックリベット	"			
15-6	Ei 33 01 06	Binding Head Tapping Screw	3x10 ZMC2-BI	バインドタッピングネジ	PACK		
15-7	EV 42 30 36	Toothed Lock Washer	φ3 ZMC2-BI	歯付座金	PACK		
※ 16	VC 51 69 00	Lid	リッド	Silver			
※ 17	CB 65 88 50	"	"	Black			
※ 18	CB 65 91 00	Knob, VR	ツマミ	Black			
※ 19	VC 51 70 00	"	"	Silver			
※ 20	CB 65 91 40	Rod, SW	ロッド	"			
※ 21	CB 65 91 50	Holder, SW	ホルダー	"			

※New Parts (新規部品) NR

MECHANISM PARTS

(Note) φ: Diameter

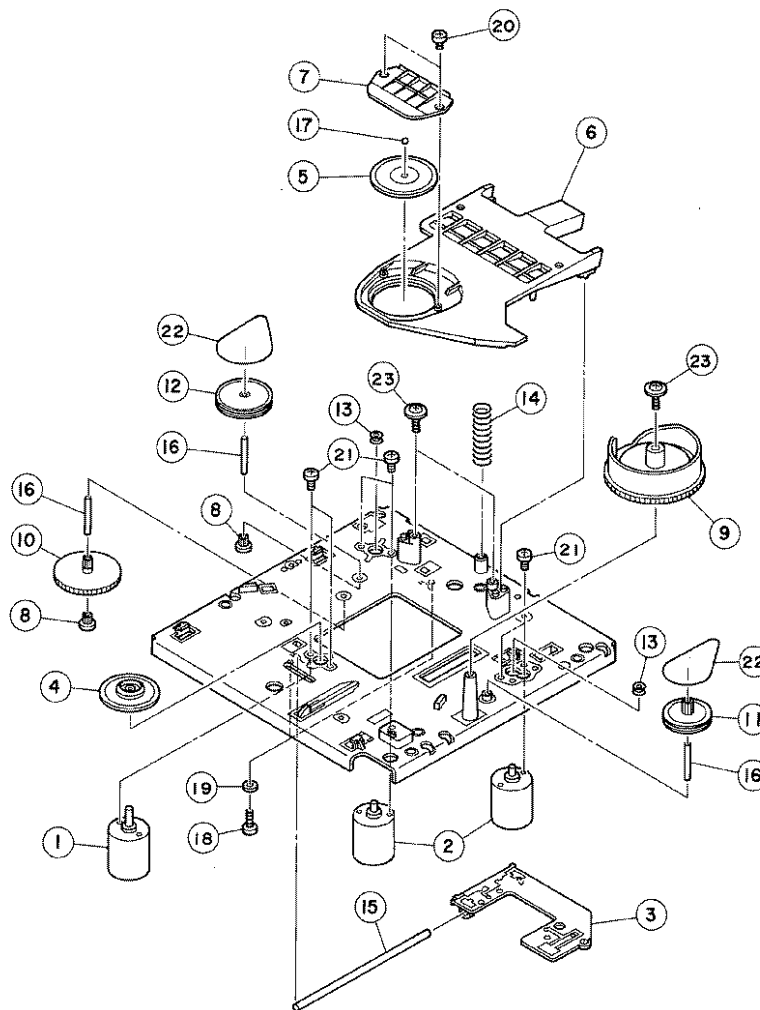
Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※ 1	NB 63 98 30	Panel Unit	パネルユニット	Black	CDX-500	J,R,A,G,B	
※ 2	NB 64 03 70	"	"	Silver	"	J,R,A,G,B	
※ 3	NB 64 06 10	"	"	Black	CDX-500	U,C	
※ 4	NB 64 06 20	"	"	Silver	"	U,C	
※ 5	NB 63 98 90	"	"	"	CD-30		
2	NB 63 77 20	Disc Mechanism Unit	DM-X5	DM ユニッ ト	CD-X5		
3	KA 90 63 70	Switch	MSW-1485	エンドスイッチ			
4	VC 16 12 00	Optical Pick Up Head	MLP-7	光ピックアップヘッド	CD-X5		
5	EI 02 61 06	Binding Head Tapping Screw	2.6x10 ZMC2-Y	バインドタッピングネジ	PACK		
6	ED 32 60 46	Binding Head Screw	2.6x4 ZMC2-BI	バインド小ネジ	PACK		
※ 7	NA 09 23 30	Main Circuit Board		メインシールド		J	
※ 8	NA 09 23 40	"		"		R,U,A,C,B	
※ 9	NA 09 36 40	"		"		G	
※ 10	NA 09 29 00	Operation Circuit Board		オペレーションシート	Black	U,A,C,B	
※ 11	NA 09 29 10	"		"	Silver	U,A,C,B	
※ 12	NA 09 23 50	"		"	Black	J,R	
※ 13	NA 09 28 50	"		"	Silver	J,R	
※ 14	NA 09 36 60	"		"	Black	G	
※ 15	NA 09 36 70	"		"	Silver	G	
9	NA 09 18 00	Power Unit		電源ユニット		J	
※ 16	NA 09 18 10	"		"		R	
※ 17	NA 09 18 20	"		"		U,C	
※ 18	NA 09 18 30	"		"		A,B	
※ 19	NA 09 36 30	"		"		G	
10	VC 09 81 00	Cover, AC Inlet		ACインレットカバー	CD-X5	J,U,C	
※ 20	VC 09 82 00	"		"	"	R,A,G,B	
11	NB 63 77 00	Tray Ass'y		トレイ Ass'y	"		
11-1	CB 65 80 10	Lifter(R)		リフター (R)			
11-2	CB 65 60 00	" (L)		" (L)			
11-3	CB 65 60 20	Disc Pad		ディスクパッド			
11-4	CB 62 79 80	Cushion Rubber		クッションゴム			
11-5	AA 63 08 30	Spring, Lifter		スプリングリフター			
11-6	EX 60 02 40	BW Head Tapping Screw	3x8(φ10) FCRM3-BI	BWヘッドタッピングネジ			
11-7	EO 33 00 86	Flat Head Tapping Screw	3x8 FCRM3-BI	皿タッピングネジ	PACK		
※ 12	AA 63 12 00	Top Cover		トップカバー	Black		
※ 13	VC 51 68 00	"		"	Silver		
13	NB 63 83 90	Spacial Screw Ass'y		段付ネジ Ass'y	CD-X5		
14	BB 07 11 70	Ground Plate		アースプレート	"		
15	NB 63 98 60	Main Chassis Ass'y		メインシャーシ Ass'y		R	
※ 16	NB 63 98 80	"		"		J,U,A,G,C,B	
15-1	VC 81 47 00	Terminal Plate		ターミナルプレート		U,G,C	
15-2	VC 93 60 00	Bottom Cover		ボトムカバー			
15-3	AA 63 12 30	Ground Plate		アース金具			
15-4	VC 96 54 00	Pad		パッド			
15-5	CB 06 88 80	Plastic Rivet		プラスチックリベット			
15-6	EI 33 01 06	Binding Head Tapping Screw	3x10 ZMC2-BI	バインドタッピングネジ	PACK		
15-7	EV 42 30 36	Toothed Lock Washer	φ3 ZMC2-BI	歯付座金	PACK		
※ 16	VC 51 69 00	Lid		リッド	Silver		
※ 17	CB 65 88 50	"		"	Black		
※ 18	CB 65 91 00	Knob, VR		ツマミ	Black		
※ 19	VC 51 70 00	"		"	Silver		
18	CB 65 91 40	Rod, SW		ロッド			
19	CB 65 91 50	Holder, SW		ホルダー			

※ New Parts (新規部品) NR

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※ 20	CB 65 91 60	Button, PW	ボ タ ン	Black	CDX-500/ CDX-500U		
※ 21	VC 51 71 00	"	"	Silver	"		
※ 22	VC 58 97 00	"	"	"	CD-30		
21	CB 65 75 10	Damper	ダンパー				
22	VB 95 81 00	Spring	スプリング		CLV-1		
23	CB 65 77 50	Plastic Rivet	プラスチックリベット			R	
24	EI 33 01 06	Binding Head Tapping Screw	3x10 ZMC2-BI	バインドタッピングネジ	PACK		
25	EI 34 01 46	"	4x14 FCRM3-BI	"	PACK		
26	EI 33 01 26	"	3x12 ZMC2-BI	"	PACK		
27	EV 42 30 36	Toothed Lock Washer	φ3 ZMC2-BI	歯付座金	PACK		
※ 28	VC 96 52 00	Shield Plate	シールドプレート			J,R,U,A,C,B	
		Accessories	付属品				
	MI 08 87 90	Pin Plug Cord	出力コード				
	VC 14 22 00	Power Cord	3A	電源コード	Inter-changeable	CD-X5	J
	VC 14 23 00	"	7A	"	"	"	J
	VC 14 25 00	"	1A	"	"	"	R
	VC 14 30 00	"	2.5A	"	Inter-changeable	"	A
	VC 14 31 00	"	2.5A	"	"	"	A
	VC 14 32 00	"	1A	"	Inter-changeable	"	G
	VC 14 33 00	"	1A	"	"	"	G
	VC 14 34 00	"	2.5A	"	Inter-changeable	"	B
	VC 79 40 00	"	2.5A	"	"	"	B
	VC 42 11 00	"	SPT-1	"	"	"	U,C
※	VC 57 29 00	Remote Control Transmitter	RS-CD5	リモートコントロールトランスミッター	Black		
※	VC 57 30 00	"	"	"	Silver		
		Dry Cell	SUM-3	単 3 乾 電 池			

※ New Parts (新規部品)

■ EXPLODED VIEW(Disc Mechanism Unit)

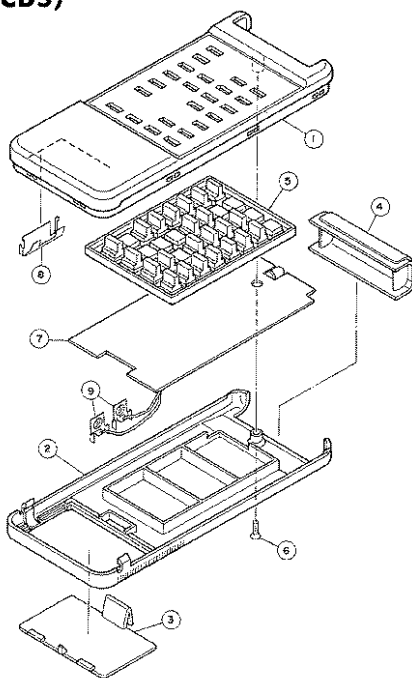


■ MECHANISM PARTS(Disc Mechanism Unit)

Ref. No.	Part No.	Description	部品名	Remarks	Common Model	Markets	ランク
* NB 63:77:20		Disc Mechanism Unit	DM-X5	D M ユ ニ ッ ト 1			
1	JC 00:12:60	Motor, Disc		ディスクモーター 2			
* 2	JC 00:13:00	Motor, Loading		ローディングモーター 3			
* 3	NB 62:99:80	S.L. Outsert		S L アウトサート 2			
4	NB 62:99:70	Turntable Unit		ターンテーブルユニット 2			
5	CB 64:24:00	Stabilizer		スタビライザ 2			
* 6	CB 65:55:20	Flapper		フラッパー 2			
* 7	CB 65:55:40	Thrust Bearing		スラストベアリング 2			
* 8	CB 65:55:50	Pinion Gear		ピニオンギヤ 2			
* 9	CB 65:55:60	Loading Cam		ローディングカム 2			
* 10	CB 65:55:80	Drive Gear		ドライブギヤ 2			
* 11	CB 65:85:20	Idle Pulley		アイドルプーリ			
* 12	CB 65:85:30	C. Pulley		C プーリ			
* 13	CB 65:85:10	P. Pulley		P プーリ			
14	AA 62:43:50	Spring		フラップスプリング 2			
15	AA 61:93:20	Shaft(L)		シャフト (L)			
16	AA 61:93:30	Shaft(S)		〃 (S)			
17	EZ 00:19:80	Steel Ball	φ 2.5	スチールボール			
18	EI 33:00:86	Binding Head Tapping Screw	3x8 FCRM3-BI	バインドタッピングネジ	PACK		
19	EV 20:30:36	Plain Washer	φ 3 FCRM3-BI	平 座 金	PACK		
20	EI 32:60:56	Binding Head Tapping Screw	2.5x5 FCRM3-BI	バインドタッピングネジ	PACK		
21	ED 32:00:56	Binding Head Screw	2x5 ZMC2-BI	バインド小ネジ	PACK		
22	CB 63:78:30	V-Belt		V ベルト			
23	EK 33:00:10	BW Head Tapping Screw	3x12 FCRM3-BI	BWヘッドタッピングネジ			

*New Parts (新規部品)

EXPLODED VIEW(RS-CD5)

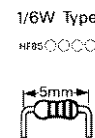
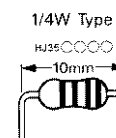


Ref. No.	Part No.	Description	部品名	Remarks	Common Model	Markets	ラック
※	VC 57 29 00	Remote Control Transmitter	RS-CD5	リモートコントロールトランスミッター	Black		
※	VC 57 30 00	"	"	"	Silver		
※	1 CX 60 03 20	Case(A) Ass'y	ケース (A) Ass'y	Black			
※	" CX 60 03 30	"	"	Silver			
※	2 XX 67 16 20	Case(B)	ケース (B)	Black			
※	" XX 67 17 10	"	"	Silver			
※	3 XX 67 16 30	Case(C)	ケース (C)	Black			
※	" XX 67 17 20	"	"	Silver			
※	4 XX 67 16 40	Filter	フィルター	Black			
※	5 CX 60 03 40	Rubber Contact	ゴム接点	Black			
※	" CX 60 03 50	"	"	Silver			
※	6 XX 67 16 60	Flat Head Screw	皿小ネジ	Black			
※	" XX 67 17 50	"	"	Silver			
※	7 CX 60 03 60	P.C.Board Ass'y	プリント基板 Ass'y				
※	8 XX 67 16 80	Dry Cell Terminal	電池電極板 A				
※	CX 60 03 60	P.C.Board Ass'y	プリント基板 Ass'y				
※	IX 60 16 00	IC	μPD1943G	I C	IC1		
※	QX 60 00 40	Ceramic Resonator	KBR-4558BTL	セラミック共振子	X1		
※	FG 21 21 00	Ceramic Cap.	100pF 50V	セラコン	C1.2		
※	UJ 11 74 70	Electrolytic Cap.	47μF 6.3V	ケミコン	C3		
※	IC 26 73 00	Transistor	2SC2673	トランジスタ	Q1		
※	HX 60 14 00	Carbon Resistor	2Ω 1/4W	カーボン抵抗	R1		
※	IX 60 36 00	IED	SLR-932A	I E D	IED1		
※	IF 00 06 70	Diode	1S2473	ダイオード	D1~5		
※	9 XX 67 16 90	Dry Cell Terminal	電池電極板 B				

※New parts (新規部品)

Parts List for Carbon Resistor

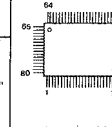
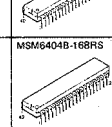
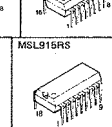
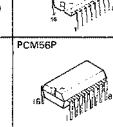
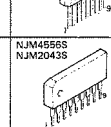
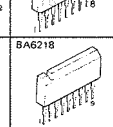
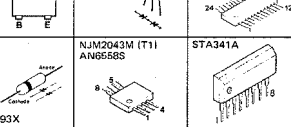
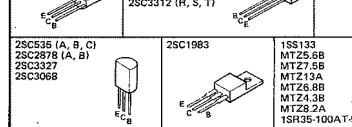
Value	1/4W Type Part No.	1/6W Type Part No.	Value	1/4W Type Part No.	1/6W Type Part No.
1.0 Ω	HJ353100	※	12K Ω	HJ357120	HF857120
1.8 "	HJ353180	※	15 "	HJ357150	HF857150
2.2 "	HJ353220	HF853220	18 "	HJ357180	HF857180
3.3 "	HJ353330	HF853330	22 "	HJ357220	HF857220
4.7 "	HJ353470	HF853470	27 "	HJ357270	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	※
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			

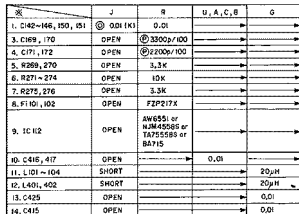


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2SA934 2SB544 2SC2060 2SD400	2SA933S (Q, R) 2SA1115 (E, F) 2SA1310 (R, S, T) 2SC1740S (S, R) 2SC2603 (E, F)	2SA10 2SB70 2SC24 2SD60
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- * All voltages are measured with a 10M Ω /DC electric volt meter.
- * 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.