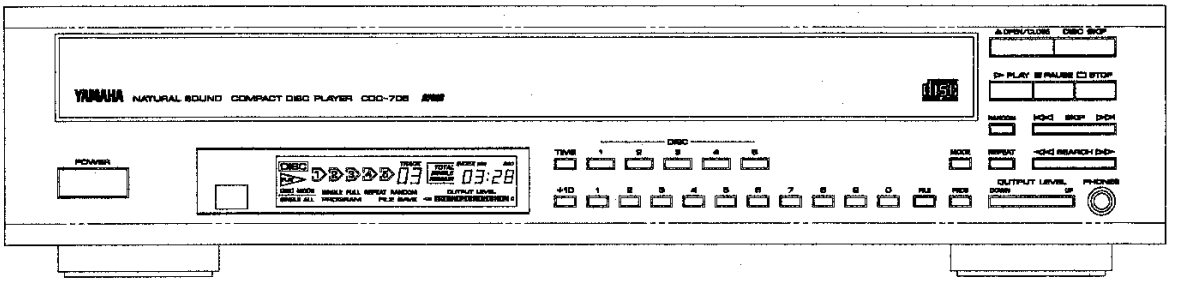
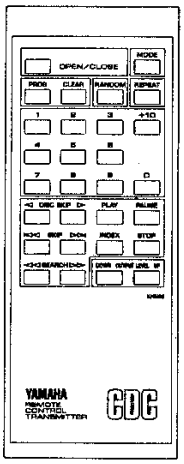
COMPACT DISC PLAYER

CDC-705

SERVICE MANUAL





IMPORTANT NOTICE

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

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components, and failure of the product to perform as specified. For these reasons, we advise all YAMAHA product owners that any 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 reseach, 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 part replacement. Recheck all work before you apply power to the unit.

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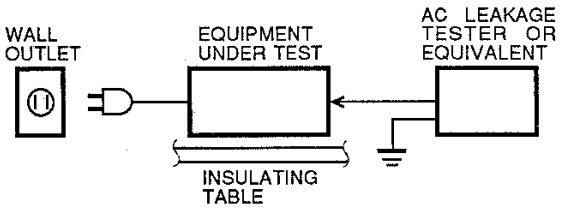
100332

YAMAHA
YAMAHA CORPORATION
P.O.Box 1, Hamamatsu, Japan
3.2k-814 Printed in Japan. '90.8

■ 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 Models Only).
   When service has been completed, it is imperative to verify that all exposed conductive surfaces are properly insulated from supply circuits.

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



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

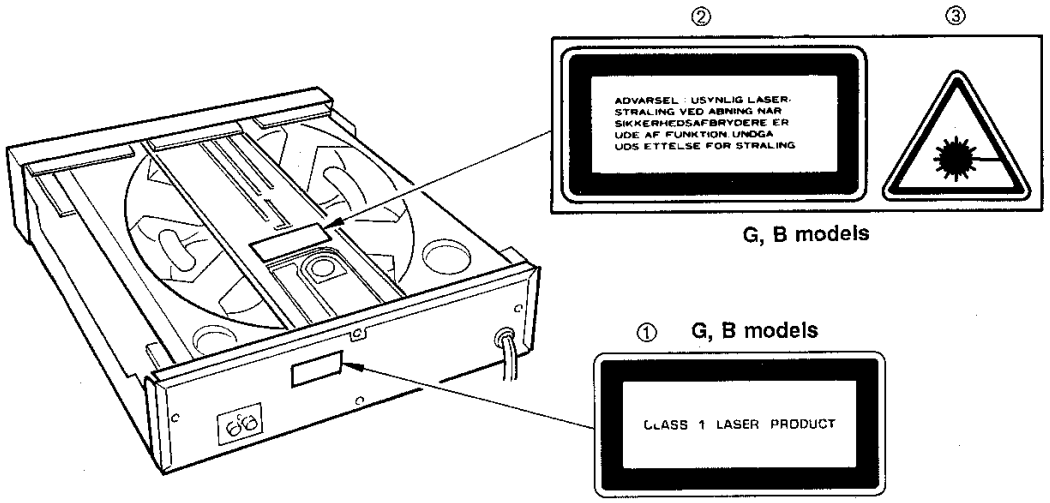
CAUTION: USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

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

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to carefully follow the instructions below when servicing .

1. Laser Diode Properties
   - Material : GaAlAs
   - Wavelength : 780 nm
   - Emission Duration : Continuous
   - Laser Output : max. 44.6 μW*
     * This output is the value measured at a distance of about 200 mm from the objective lens surface on the Optical Pick-up Block.
2. When servicing, do not take the Optical Pick-up Block apart, and do not adjust the APC circuit. If there is a breakdown in the APC circuit (including the laser diode), replace the entire Optical Pick-up Block (including the APC board).
3. When checking the laser diode emission, keep your eyes more than 30cm away from the objective lens.



English

① THIS LABEL (SEE POSITION SHOWN IN THE ILLUSTRATION) INFORMS THE USER THAT THE APPARATUS CONTAINS A LASER COMPONENT.

② THIS LABEL (SEE POSITION SHOWN IN THE ILLUSTRATION) WARNS THAT ANY FURTHER PROCEDURE WILL BRING THE USER INTO EXPROSURE WITH THE LASER BEAM.

③ THE RADIATION WARNING LABEL IS PLACED INSIDE THE UNIT AS SHOWN IN THE ILLUSTRATION, TO WARN AGAINST FURTHER MEASURES ON THE UNIT. THE EQUIPMENT CONTAINS A LASER COMPONENT RADIATING LASER RAYS EXCEEDING THE LIMIT OF CLASS 1 LASER PRODUCTS.

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

Swedish

① PÅSKRIFTEN SITTER PÅ APPARATEM SOM VISAS SOM EN UPPMANING OM ATT APPARATEN OMFATTAR EN INBYGGD LASERKOMPONENT.

② TEXTSKYLTEN FÖR LASERN ÄR PLACERAD PÅ APPARATEN SOM EN UPPMANING OM ATT APPARATEN INNEHÅLLER EN LASERKOMPONENT.

③ VARNINGSSKYLTEN FÖR STRÅLNING HAR PLACERATS I APPARATEN, SOM BILDEN VISAR, SOM EN VARNING OM YTTERLIGARE INGREPP I APPARATEN. MATERIELEN INNEHÅLLER EN LASERKOMPONENT SOM AVGER LASERSTRÅLNING ÖVERSTIGANDE GRÄNSEN FÖR LASERKLASS 1.

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

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 INDENI APPARATET, SOM VIST I ILLUSTRATIONEN, SOM EN ADVARSEL OM YDERLIGERE INDGREB I APPARATET. APPARATET INDEHOLDER ET LASERKOMPONENT SOM AVGIVER LASESTRÄLING DER OVERSTIGER GÆNSEVERDIEN FOR LASERKLASSE 1.

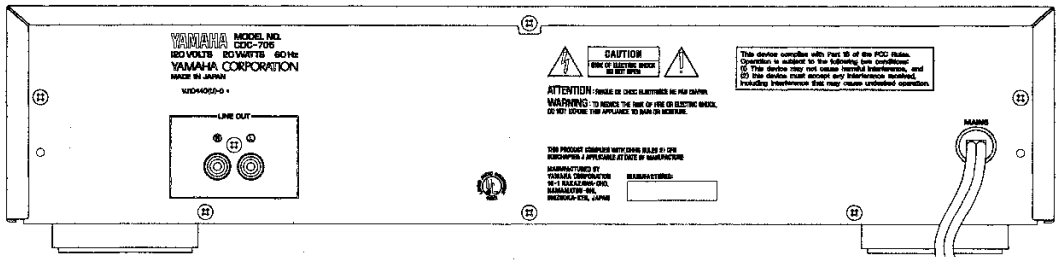
ADVARSEL! INDGREB BØR KUN FORETAGES AF EN FAGMAND DA DER ER RISIKO FOR RADIOAKTIV STRÅLING.

Finnish

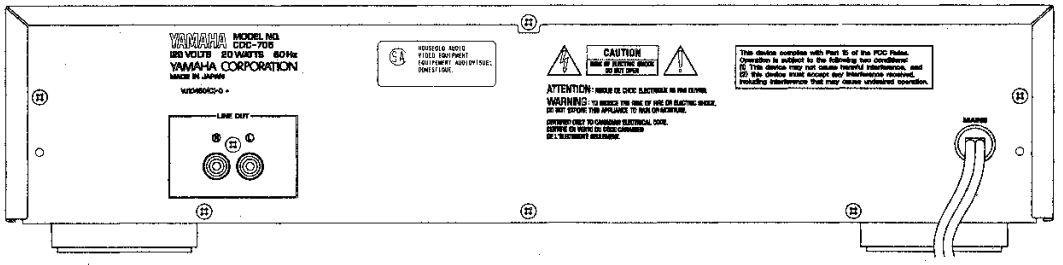
③ "VAROITUS! LAITE SISÄLTÄÄ LASERDIODIN, JOKA LÄHETTÄÄ (NÄKYMÄTÖNTÄ) SILMILLE VAARALLISTA LASERSÄTEILYÄ:"

■ REAR PANELS

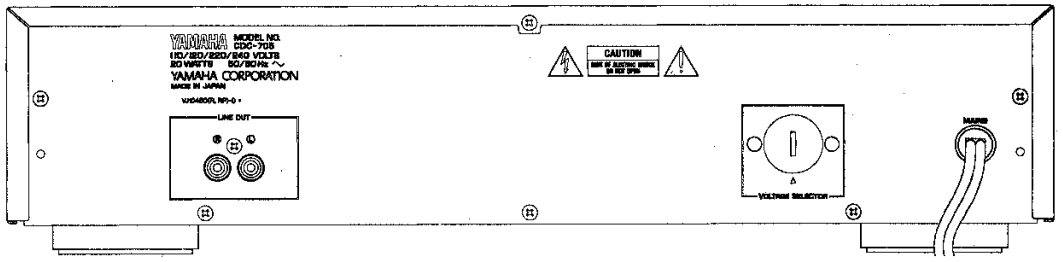
▼ USA model



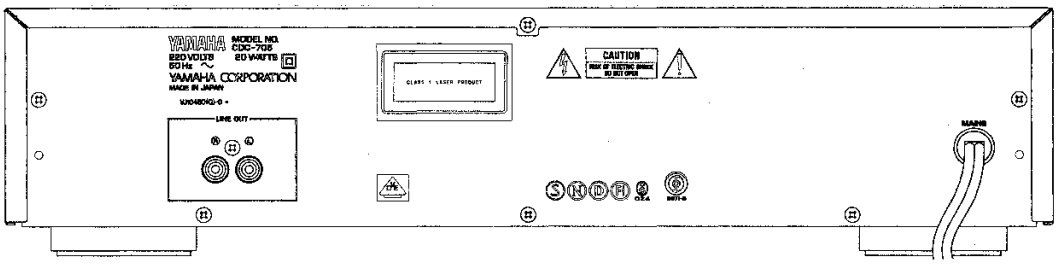
▼ Canadian model



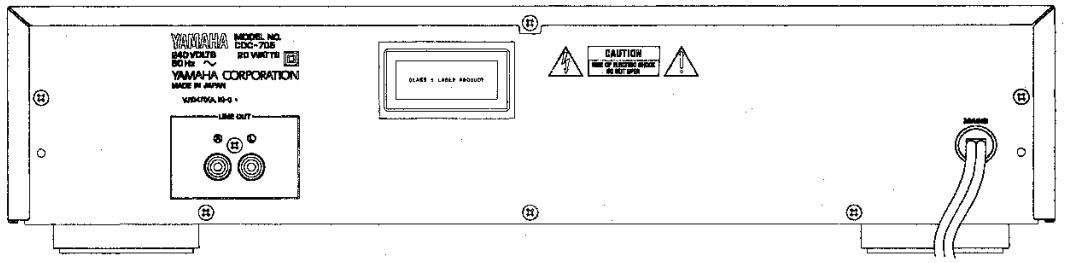
▼ General model



▼ European model



▼ Australian & British models



■ SPECIFICATIONS

■ AUDIO SECTION

Frequency Response	20Hz~20kHz±0.5dB
De-Emphasis Equalization	±0.5dB
Harmonic Distortion+Noise	Less than 0.0035%, (1kHz)
S/N Ratio	105dB
Dynamic Range	More than 95dB
Wow & Flutter	Unmeasurable
Channel Separation	More than 85dB, (1kHz)
Output Voltage	2.0±0.5V
Headphone Output (-20dB)	200±40mV/150Ω

■ INTERNAL SYSTEM

Optical Pick-up	3-beam laser
Error Correction System	CIRC
D/A Conversion	1-bit 4-DAC system
Filter	Hi bit-3rd order noise shaping Digital Filter

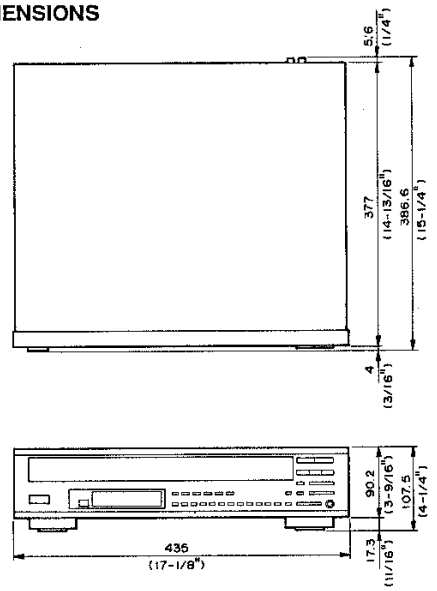
■ GENERAL

Power Requirements	
U, C models	120V AC 60Hz
G, B models	220-240V AC 50Hz
A model	240V AC 50Hz
R model	110-120/220-240V AC 50/60Hz
Power Consumption	20W
Dimensions (W x H x D)	435 x 107.5 x 386.6 mm (17-1/8" x 4-1/4" x 15-1/4")
Weight	6.2kg (13 lbs 10 oz)
Accessories	Pin plug cord
	Remote control transmitter
	Dry-cell: x2 (Size "AAA", R03)

** Specifications subject to change without notice.*

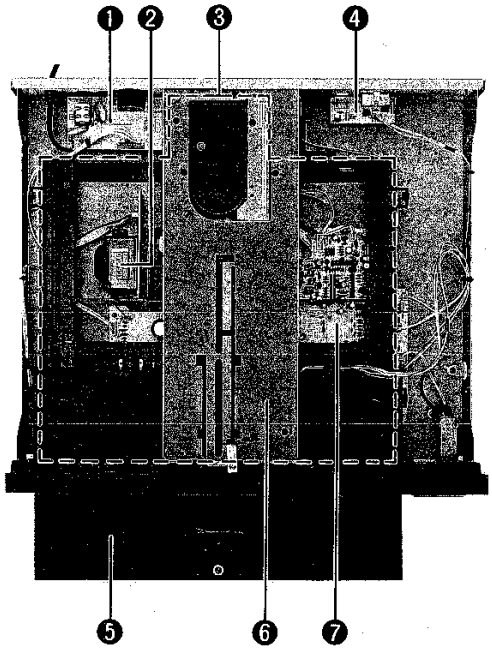
U ..... USA model
C ..... Canadian model
B ..... British model
A ..... Australian model
G ..... European model
R ..... General model

● **DIMENSIONS**



Unit : mm (inch)

■ INTERNAL VIEW



❶ POWER SUPPLY CIRCUIT BOARD (1) (R model only)
❷ POWER TRANSFORMER
❸ CM-90 UNIT
❹ MAIN CIRCUIT BOARD (4)
❺ TRAY ASS'Y
❻ SHUTTER ASS'Y
❼ MAIN CIRCUIT BOARD (1)

■ DISASSEMBLY PROCEDURES

(Remove parts in the order as numbered.)

Precaution for disassembly : Note that use of any screws other them specified ones may cause a radio wave interruption which will prevent the unit from maintaining its performance.

1. Removal of Top Cover

a. Remove 4 screws (①) and also 1 screw (②) as shown in Fig. 1.

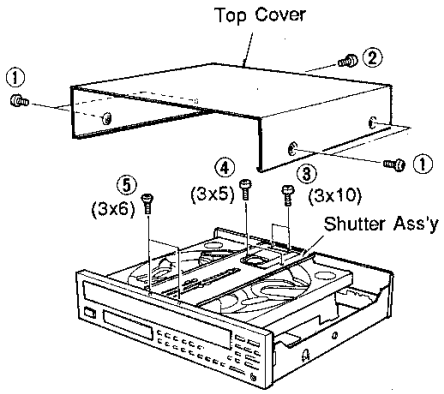
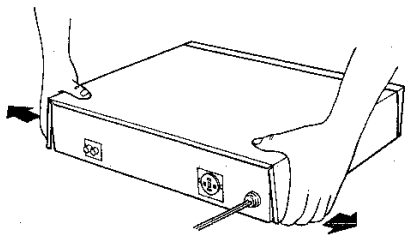


Fig. 1

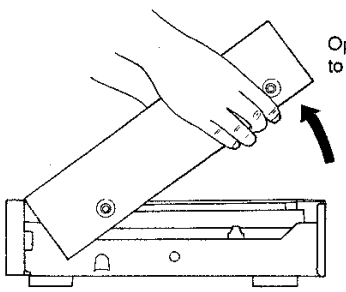
b. Pull the bottom edges of the Top Cover till they get disengaged as shown in Fig. 2. (About 5 mm at both sides)



Pull toward outside till the bottom edges are disengaged. (by about 5 mm at both sides)

Fig. 2

c. Keep lifting up the Top Cover till it opens about 45° as shown in Fig. 3.



Open the Top Cover to about 45°.

Fig. 3

d. Pull off the Top Cover diagonally as shown in Fig. 4.
* When pulling off the Top Cover, be careful not to allow the plastic rivet fixing the front panel to come off.

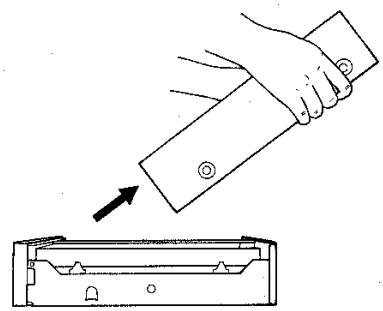


Fig. 4

2. Installation of Top Cover.

a. Fit the hooks of the Top Cover (at its front) between the front panel and sub-panel as shown in Fig. 5.

b. Pull the bottom edges of the Top Cover toward outside with both hands and lower it as shown in Fig. 5.

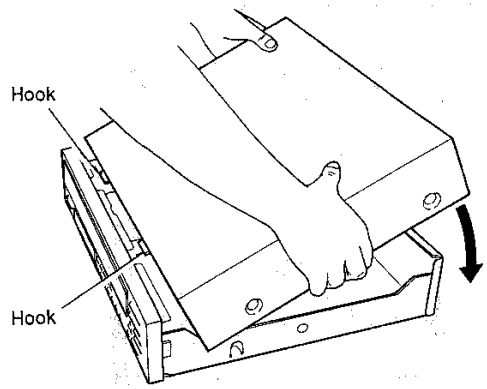
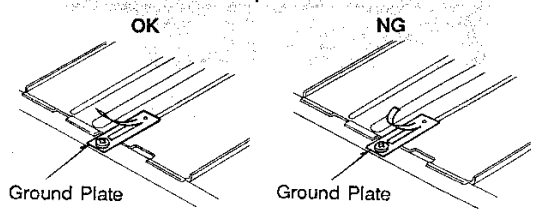


Fig. 5

Note

When installing the Top Cover, make sure the Ground Plate fixed to the front panel with screws in close contact with the Top Cover.



3. Removal of Shutter Ass'y

a. Remove 4 screws (③ , ④) and also 2 screws (⑤) as shown Fig. 1.

4. Removal of Tray Ass'y

a. Turn the stopper/tray pin (⑥) counterclockwise by 90° degrees to pull it out as shown in Fig. 6.
b. Remove a plastic rivet (⑦) and then remove the Support.
c. Slowly remove the Tray Ass'y as shown in Fig. 6.

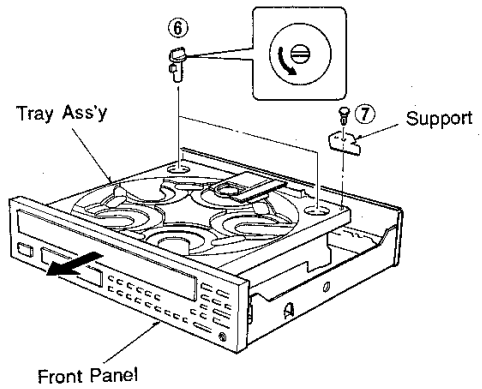


Fig. 6

5. Removal of CM-90 Unit

a. Remove 4 screws (⑧) as shown in Fig. 7.
b. Take out the CM-90 Unit out slowly as shown in Fig. 7.

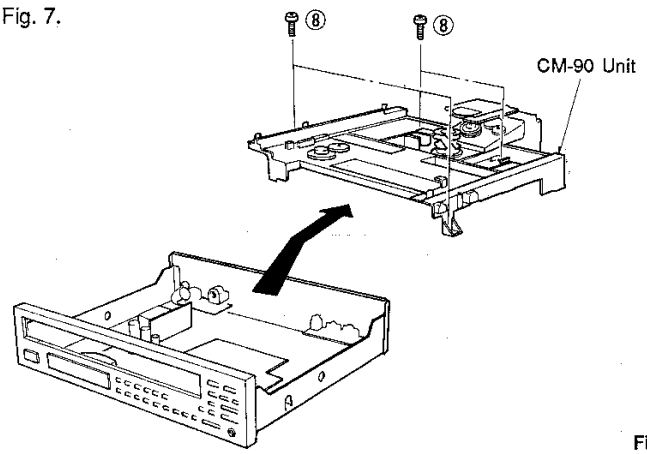


Fig. 7

6. Removal of Front Panel

a. Remove 5 screws , (⑨, ⑩) and also 1 screw (⑪) as shown in Fig. 8.
b. Take off the Front Panel Unit slowly as shown in Fig. 8.

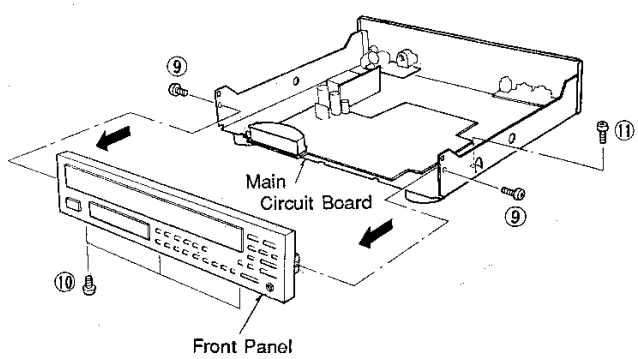


Fig. 8

Check and Parts Replacement of Main Circuit Board (1)

1. Turn OFF the POWER switch.
2. Remove the Top Cover
3. Remove the Shutter Ass'y.
4. Remove the Tray Ass'y.
5. Set to TEST mode.
   (See page 13 for TEST mode explanation)
6. Press the "0" key. (DISC Clumper up)
7. Turn OFF the POWER switch.
8. Remove the CM-90 Unit.
9. Remove connectors CB6, 7, 8 and 9 (Fig. 9) from the Main Circuit Board and also remove 5 binding ties from both sides of the Chassis.
10. Place the CM-90 Unit upright and fix it with gummed tape. (Fig. 10) Also, remove the connector as necessary.
11. Connect the following connectors which are the minimum requirements to the Main Circuit Board.
    1) CB2
    2) CB1
    3) CB7, CB9
    4) CB13, CB14
    5) CB3, CB4, CB5

    Note : That CB3 and CB4 are both the same 8 pins.
    CB3 : Blue
    CB4 : Red
12. Now the Main Circuit Board is ready for checking. When it is necessary to check the back side (foil side) of the main Circuit Board, remove 4 PCB Supports and place it upright as shown in Fig. 11.
13. To make adjustment, install the Main Circuit Board to the PCB support and place the CM-90 Unit as shown in Fig. 12.

● Connector Diagram

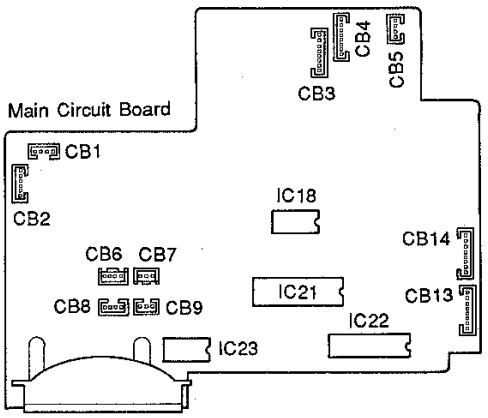


Fig.9

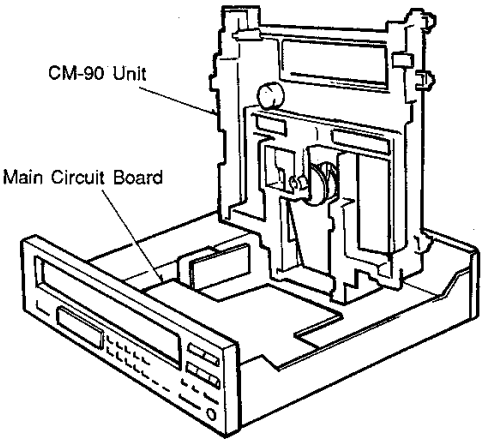


Fig.10

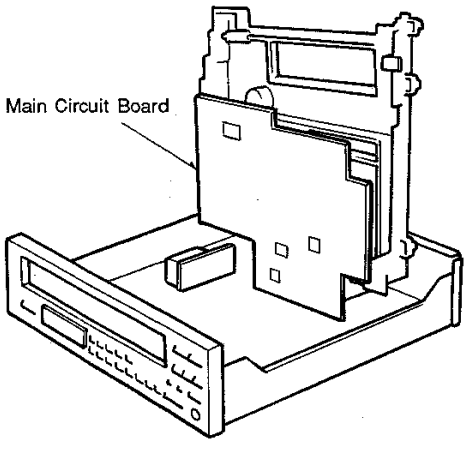


Fig.11

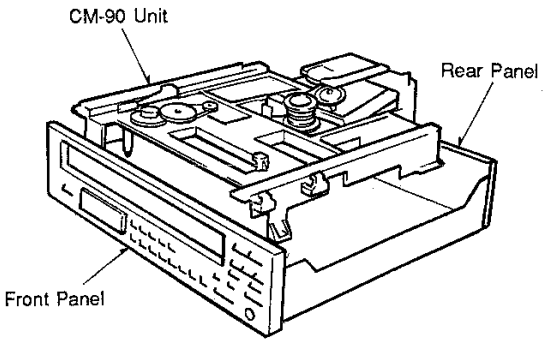
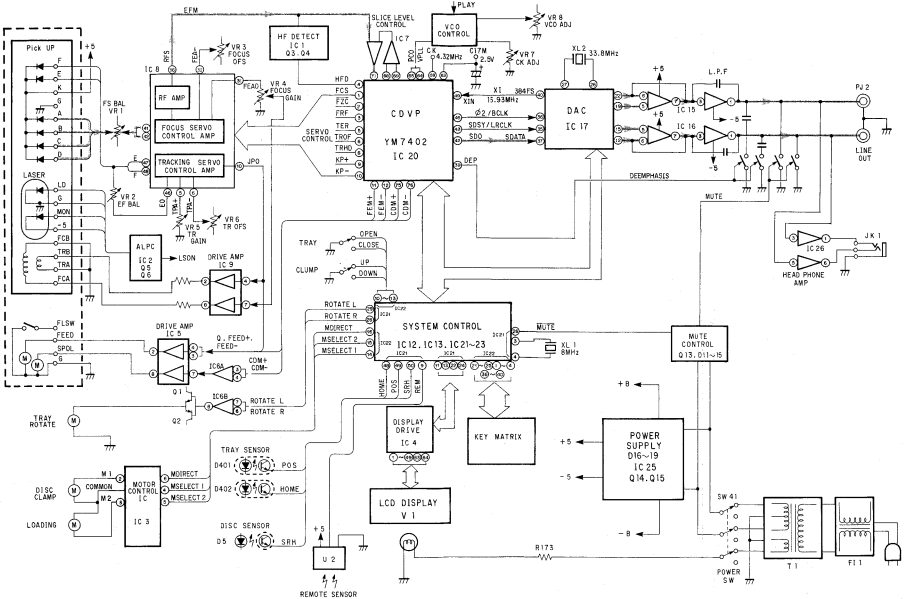


Fig. 12

■ BLOCK DIAGRAM



■ ADJUSTMENTS

• Note

1) Removal of the Top Cover only is not enough for repair or adjustment. The Shutter and Tray Ass'y also must be removed.
(Refer to Steps 3 and 4 of DISASSEMBLY PROCEDURES for its removal.)

2) Before adjustment, be sure to perform the necessary work at each test point including clipping or soldering test-lead wires.

• Necessary Equipment

Measuring Instruments

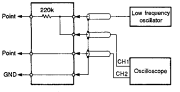
Oscilloscope (Bandwidth of 50MHz or more)	: x 1
AC voltmeter (ACVM)	: x 1
DC voltmeter (DCVM)	: x 1
Frequency counter (FC)	: x 1
Low frequency oscillator	: x 1

Test disc
SONY YEDS-18 (P/No. TX911730),
A-BEX TCD-782 or PHILIPS 5 : x 1

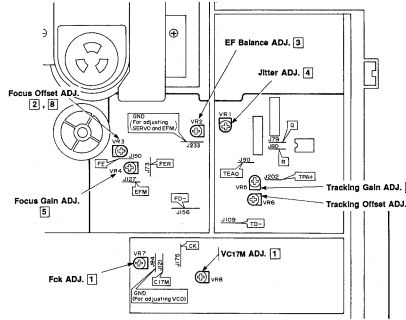
Tools
Screwdriver : x 1
(For Pre-set Potentiometer adjustment)

• Junction Circuit

Used for focus gain and tracking gain adjustment.



• TEST POINTS



• Before Adjustment

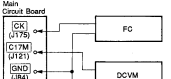
Starting TEST Mode

While pressing both the "4" and "7" keys, turn ON the power switch. Take fingers off both keys, and all the display segments will light for about 1 second and the operation mode is then set to TEST mode. (See page 13 for TEST mode explanation)

★ Carry out following adjustments in order as numbered.

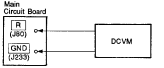
1. **VCO free-run adjustment**
2. **Focus offset adjustment**
3. **EF balance adjustment**
4. **Jitter adjustment**
5. **Focus gain adjustment**
6. **Tracking gain adjustment**
7. **Tracking offset adjustment**
8. **Focus offset adjustment**

1 VCO free-run adjustment



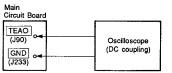
① Set to TEST mode.
② Press the "2" key .
③ Measure the voltage at the C17M terminal and adjust VR8 so that the specified voltage is obtained.
VC17M = 2.5V±100mV, –50mV (DC)
④ Connect a frequency counter to the CK terminal.
* Be sure to use a probe (10:1 type for oscilloscope) for frequency counter input.
⑤ Adjust VR7 so that the specified frequency is obtained.
FCK = 4.3218MHz±0.02MHz
⑥ Repeat ④ and ⑤ until no further improvement is noticed.

2 Focus offset adjustment



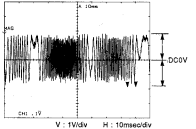
① Set to TEST mode.
② Press the "2" key .
③ Measure the voltage at the R terminal and adjust VR3 so that the specified voltage is obtained.
VR = 0V±100mV (DC)

3 EF balance adjustment

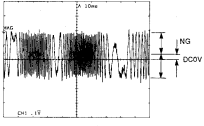


① Load a test disc.
② Set to TEST mode.
③ Press the ⏮⏮ key.
④ Press the "3" key .
⑤ Connect an oscilloscope to the TEAO terminal.
* Be sure to use a probe. (10 : 1 type)
⑥ Adjust VR2 so that the amplitude becomes equal on both sides (upper and lower) of DC 0V in the waveform at the TEAO terminal.
Rating : DC offset → 0V±50mV

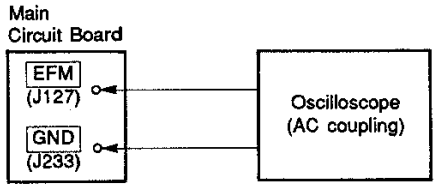
OK



NG

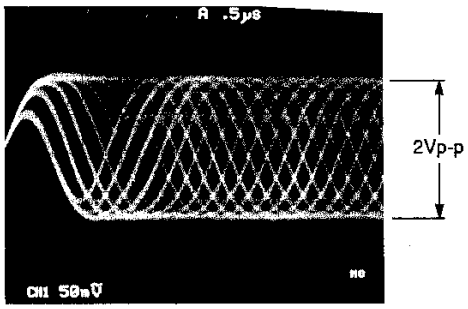


4 Jitter adjustment



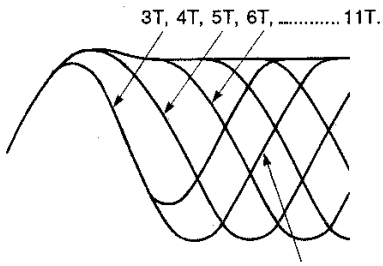
① Load the test disc.
② Set to TEST mode.
③ Press the "4" key .
④ Play track 1 (0:00~0:30).
⑤ Adjust VR1 so that a clear EFM signal (eye pattern) is obtained at the EFM terminal.
*Set VR1 at the center unless there is any change.

Eye pattern



V : 0.5V/div H : 0.5µsec/div

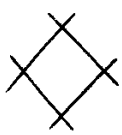
Waveforms 3T—11T.



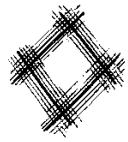
This portation is referred to as the eye pattern.

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

Good waveform

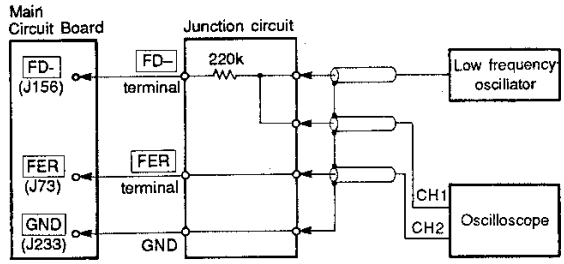


Abnormal waveform



5 Focus gain adjustment

① Connect an oscilloscope and a low frequency oscillator to the FD– terminal and the FER terminal as shown below.



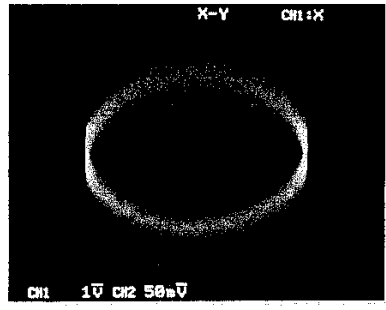
② Load the test disc.
③ Set to TEST mode.
④ Press the "4" key .
⑤ Apply a 2.0Vrms sine wave from the low frequency oscillator to the FD– terminal through a 220kΩ resistance as follows : *

*

Test disc	Frequency
YEDS-18	600Hz
TCD-782	600Hz
Philips 5	630Hz

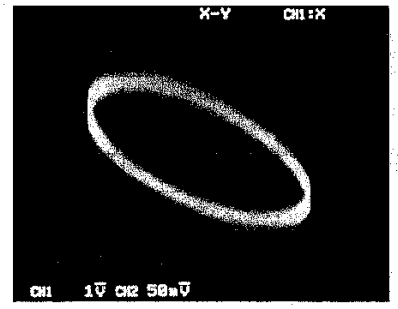
⑥ Adjust VR4 so that the phase difference between the FD– terminal and the FER terminal is 90°.

OK



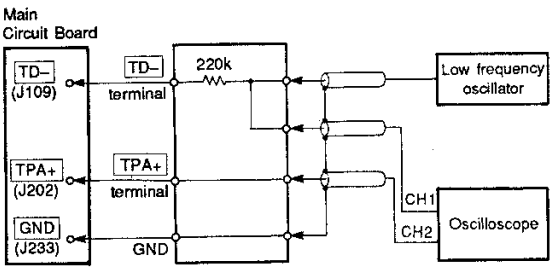
90°

NG



6 Tracking gain adjustment

① Connect an oscilloscope and a low frequency oscillator to the [TD–] terminal and the [TPA+] terminal as shown below.



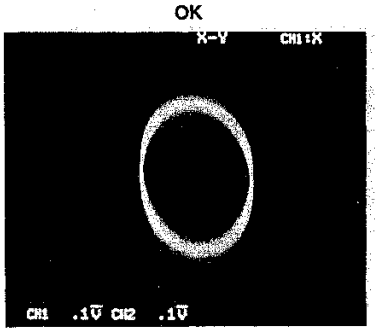
② Load the test disc.
③ Set to TEST mode.
④ Press the "4" key .
⑤ Apply a 100mVrms sine wave from the low frequency oscillator to the [TD–] terminal through a 220kΩ resistance as follows : *

*

Test disc	Frequency
YEDS-18	650Hz
TCD-782	750Hz
Philips 5	700Hz

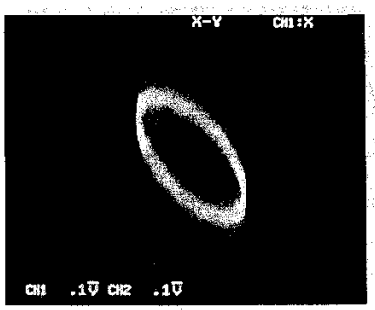
⑥ Adjust VR5 so that the phase difference between the [TD–] terminal and the [TPA+] terminal is 90°.

OK

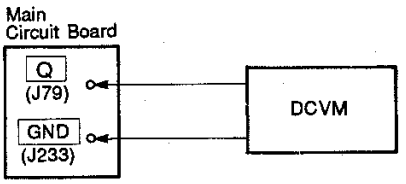


90°

NG

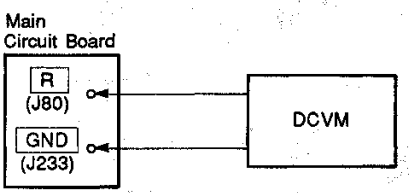


7 Tracking offset adjustment



① Set to TEST mode.
② Press the "5" key .
③ Measure the voltage at the [Q] terminal and adjust VR6 so that the specified voltage is obtained.
VQ = 0V±50mV (DC)

8 Focus offset adjustment



① Set to TEST mode.
② Press the "5" key .
③ Measure the voltage at the [R] terminal and adjust VR3 so that the specified voltage is obtained.
VR = 0V±100mV (DC)

Note : To cancel the TEST mode, switch the power OFF.

■ TEST MODE

● **Starting TEST mode**
While pressing both the "4" and "7" keys, turn ON the POWER switch.

Take fingers off both keys, and all the display segments will light for about 1 second and the operation mode is then set to TEST mode.

● **TEST mode key descriptions**

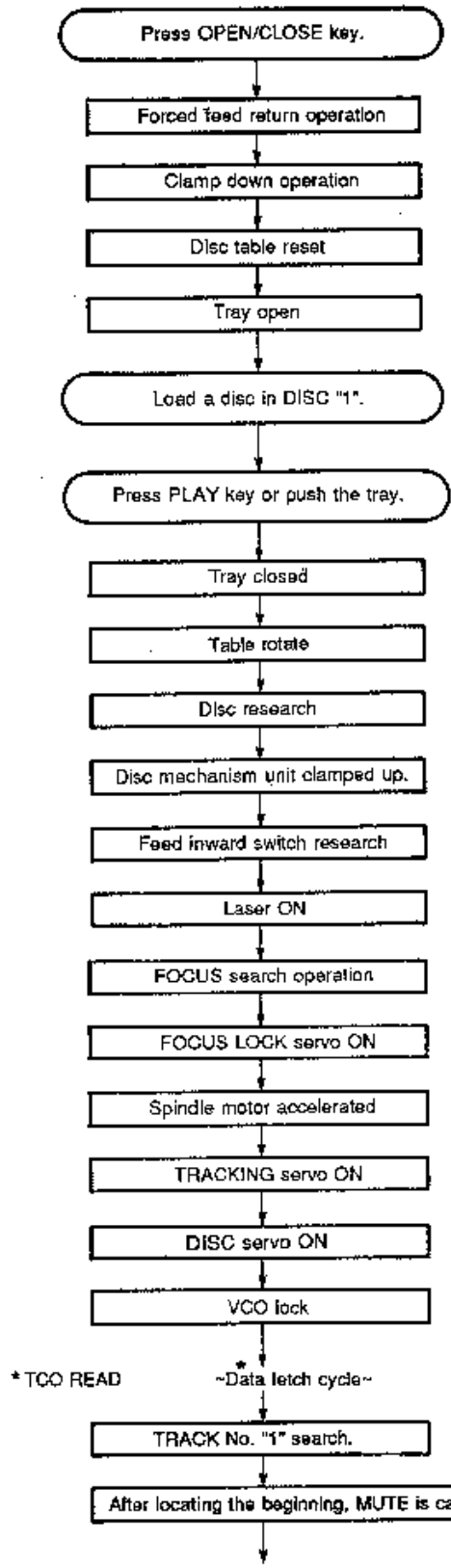
KEY	DESCRIPTION
OPEN/CLOSE	Tray OPEN/CLOSE operation is executed according to the conditions of SW401 (Loading limit switch). Operation (open or close) remains unchanged unless the condition of SW401 is changed.
DISC SKIP	The disc skip operation is executed once. (Clockwise) (Effective only when the tray is open or the clamper is lowered all way down.)
PLAY	• If focus servo is applied, VCO is drawn in and operation mode is set to PLAY mode. (A play command is sent to CDVP.) Regardless of the above state, a MUTE signal is output to cancel MUTE. • Tracking servo ON, Tracking gain "L".
PAUSE	Focus search is executed once. Focus lock effective if a disc is loaded.
STOP	For stopping whatever is set by any command within TEST mode. (motor, laser, etc.)
RANDOM	Tracking ON, Tracking gain "H".
⏮	Forced feed return is executed. Press the PLAY or STOP key for cancellation. When returned to the innermost position, FLSW = " L" is detected and operation is automatically stopped.
⏭	Outward forced feed is executed. Press the PLAY or STOP key for cancellation.
◀◀	Inward 10 track kick is executed. Press the PLAY or STOP key for cancellation.
▶▶	Outward 10 track kick is executed. Press the PLAY or STOP key for cancellation.
REPEAT	Tracking OFF.
MODE	Turntable starts to turn and its speed increases.
PROG	Turntable speed decreases to a stop.
OUTPUT LEVEL DOWN/UP	Output level increases / decreases.
TIME	For testing LCD lighting. ┌→(1, 2, 3.....9, 10) → (All ON) → (OFF)
DISC 1	VCO gain switched. High gain
DISC 2	VCO gain switched. Low gain
DISC 3	Analog mute OFF.
DISC 4	Analog mute ON.
DISC 5	150 track kick output continuously.
+10	Laser ON.
1	Return to product mode. Neither tray nor table operates.
2	For adjusting VCO, and focus offset.
3	For adjusting EF balance.
4	For adjusting tracking gain, focus gain, and focus.
5	For adjusting tracking offset, and confirming focus offset.
6	"PLAY" mode for checking circuit board.
7	Turntable spins counterclockwise. Press the STOP key for cancellation. Note : When the TEST mode has been cancelled, the table position is not set accurately. Therefore, be sure to execute DISC SKIP once before cancellation. (When operating the table, first confirm that the Disc Clamper is lowered.)
8	Turntable spins clockwise. Press the STOP key for cancellation. As described in 7 above, it is necessary to note operation conditions before cancellation.
9	Disc clamper lowered.
0	Disc clamper raised.
FILE	RAM TEST mode for checking circuit board. OK : MUTE = "L", NG : MUTE = "H"

Operation	Open	Close
	H	H
Open	H	L
Close	L	H

● μ-COM operation for each key

	LS	FCS	TROF	TRGL	PLAY	MUTE	FEOF	REMARKS
STOP	L	L	H		L		H	
PAUSE	H	H	H		L		H	Follow the focus search chart.
PLAY	—	—	L	H	H	H	L	
RANDOM	—	—	L	L	—	—	L	
REPEAT	—	—	H	—	—	—	—	
⏮	—	—					H	FE-
⏭	—	—					H	FE+
◀◀				L				KP-
▶▶				L				KP+
MODE								DM+
PROG								DM-
TIME	H							
DISC 1								
DISC 2								
DISC 3					L			
DISC 4					H			
DISC 5				L				KP+

■ STANDARD OPERATION CHART



: "OPEN" appears in the TIME indicator.

: FEM– = "H" is output until detection of LIMIT switch.

: Proceeds to next step after detection of CLAMP switch (SW402).

: Stop after detection of loading switch(SW401)

: "DISC" "1" flashes, PLAY indicator lights.

: Proceeds to next step after detection of LOADING switch (SW401).

: If FL SW = "L", proceed to next step.

: Detection of DISC sensor, "DISC" from flashing to lighting.

: Proceeds to next step after detection of CLAMP switch (SW402)

: If FL SW = "L", proceed to next step.

: LS = "H" (LD=2V)

: FCS = "L"→"H"

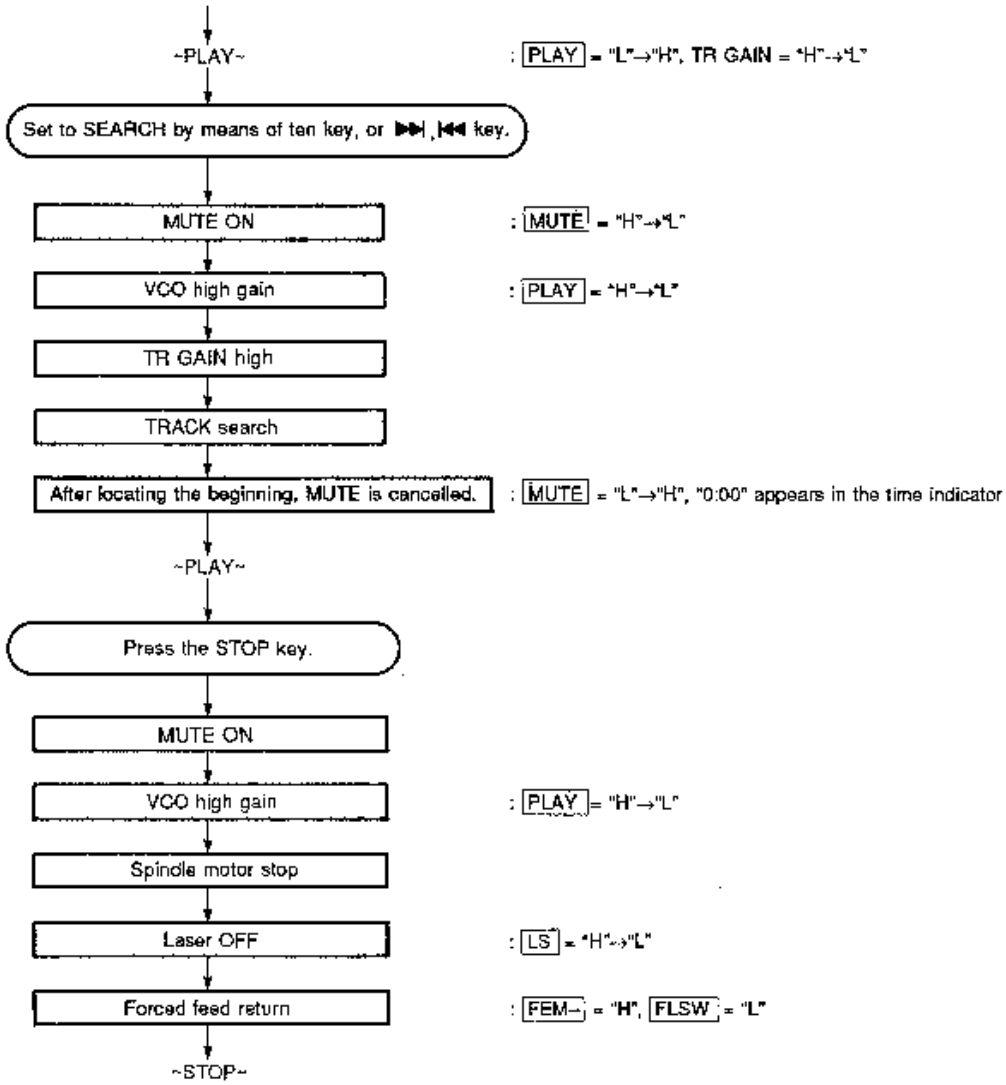
: FCS = "H"→"L"

: DM+ = "L"→"H" (Pulse output)

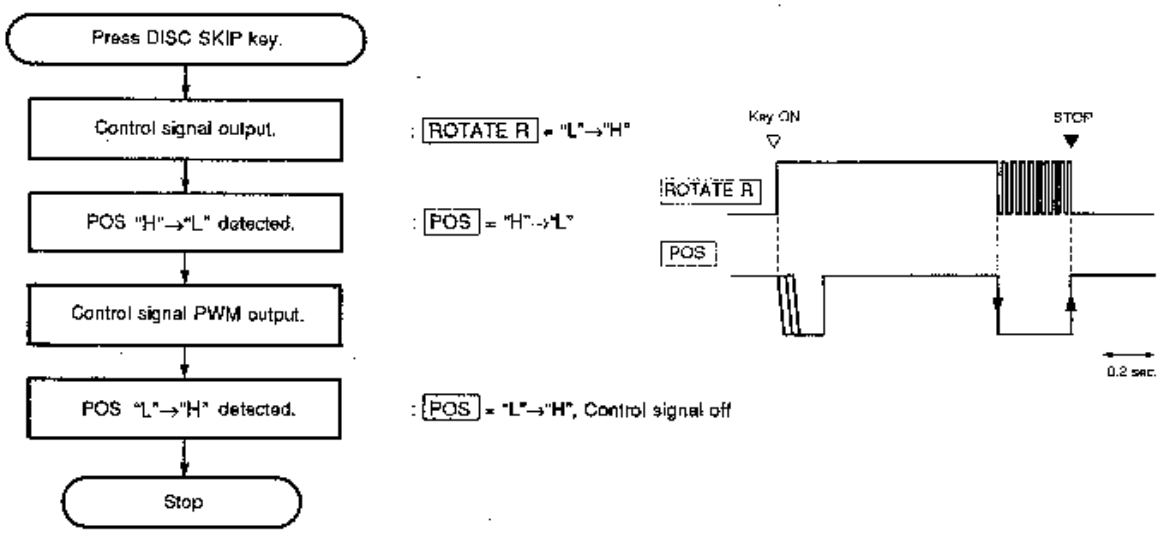
: TROF = "L"→"H"

: SYEQ = "H"

: MUTE = "L"→"H", "0:00" appears in the time indicator



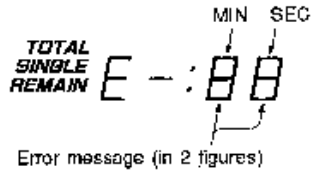
• Tray Operation



■ ERROR MESSAGES

If operation has stopped due to some fault, error messages can be used to investigate the fault.

- **How to get an error message displayed**
  With the unit stopped as it is, press the STOP key of the remote controller while pressing the STOP key on the main unit, and an error message will be displayed in the time display segment as shown below.



Error message (in 2 figures)

- **Error message and meaning**

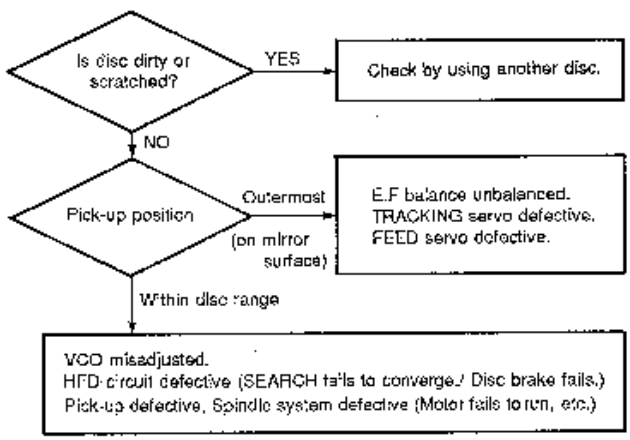
Error message		Meaning
X	0	No data reading executed after search.
X	1	Data reading failed in the midst of operation.
7	3	No data reading executed at start.
X	4	Tray closed but SW401 CLOSE SW failed to turn ON.
X	5	Tray opened but SW401 OPEN SW failed to turn OFF.
X	6	No table rotation.
X	7	Inward feed SW failed to turn ON.
X	8	Focus dropped and could not be restored even when retried.
X	9	Clamp lowered but SW402 DOWN SW failed to turn ON.
X	A	Clamp raised but SW402 UP SW failed to turn ON.

Note : "X" represents one of the states below.

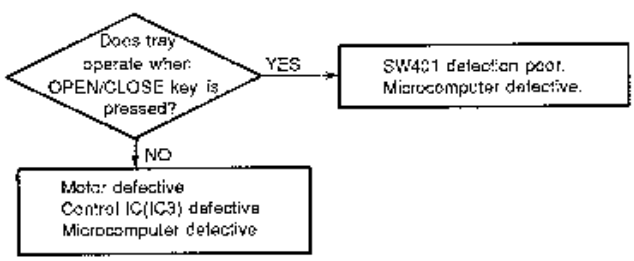
0 ..... PLAY
3 ..... SCAN
4 ..... PAUSE
5 ..... SEARCH
7 ..... START
8 ..... STOP
9 ..... DISC SEARCH
A ..... EJECT
C ..... NO DISC

1) Error Code Troubleshooting

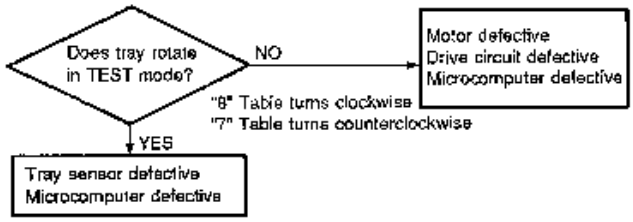
Error code [X0], [X1], [73] ..... Data cannot be read.



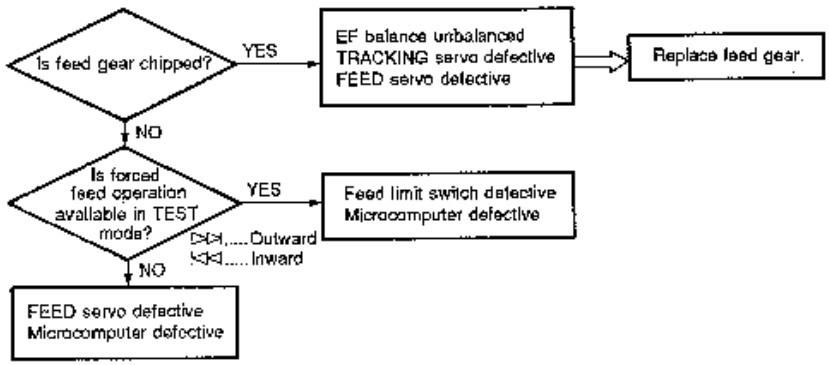
Error codes [X4], [X5] ..... Poor tray loading operation.



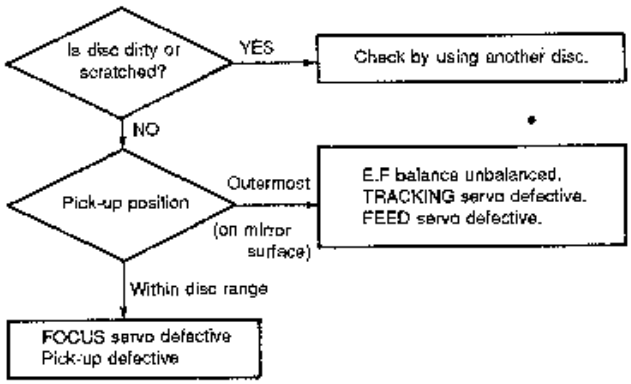
Error code **X5** ..... Poor table rotation.



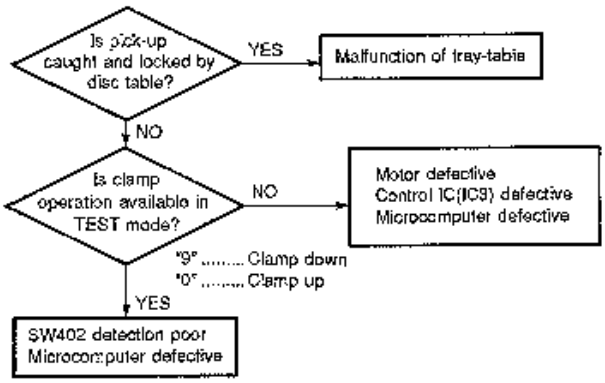
Error code **X7** ..... FEED operation defective. (Limit switch falls)



Error code **X8** ..... Focus drops.

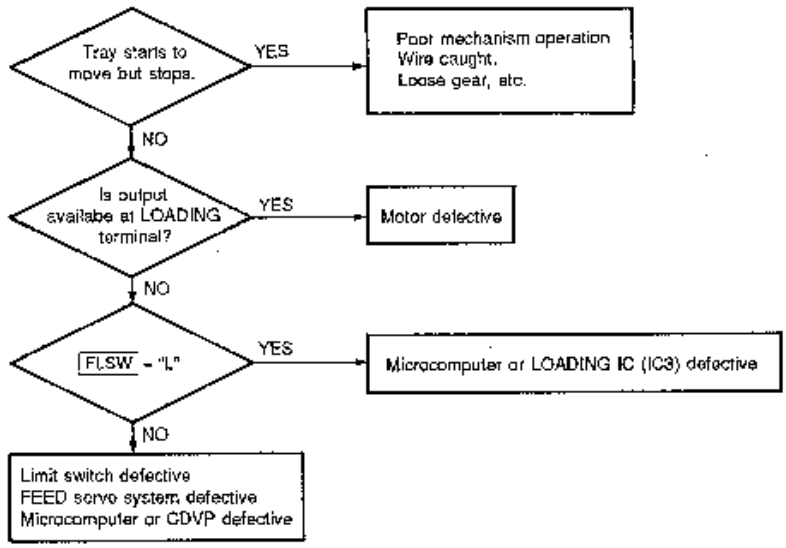


Error code [X9] , [XA] ..... Poor Clamp operation.

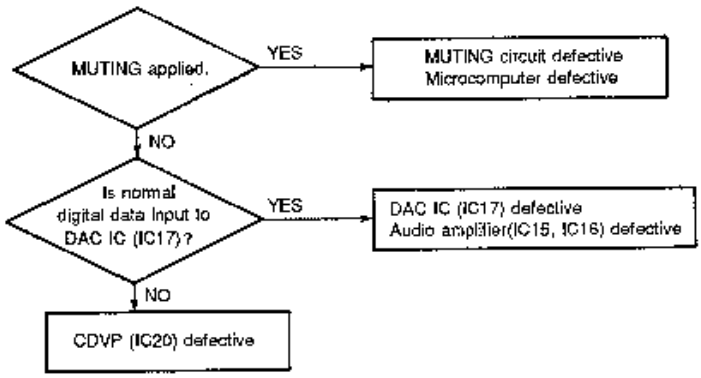


2) Troubleshooting from System Malfunctions

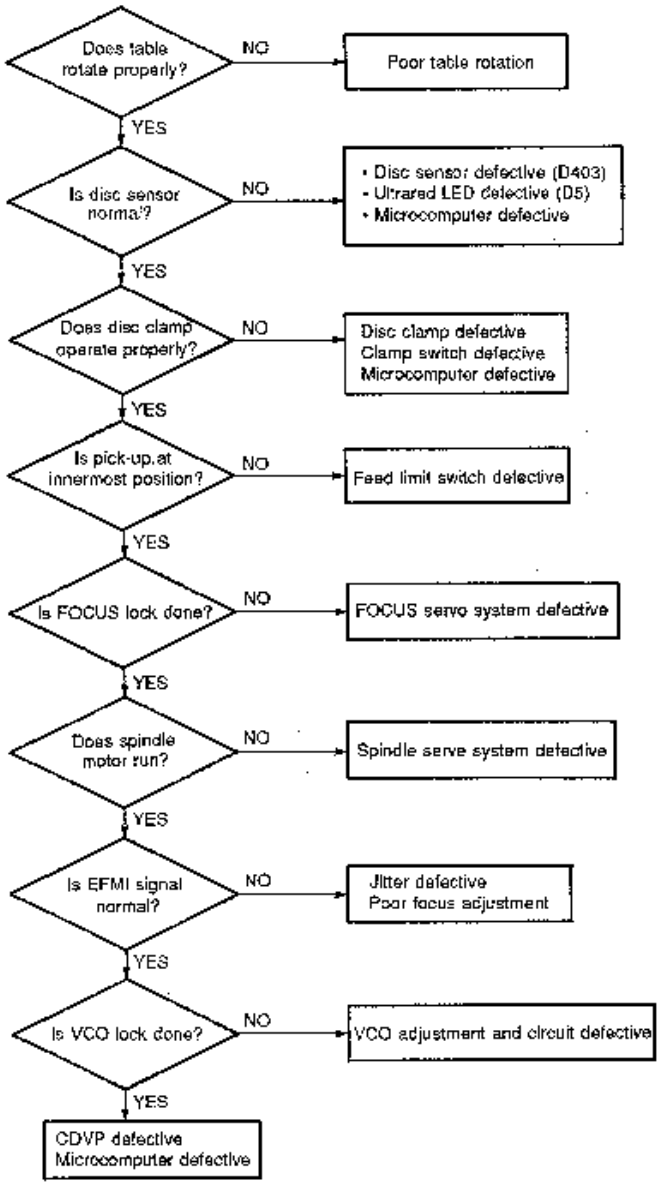
a) Tray fails to come out/go in.



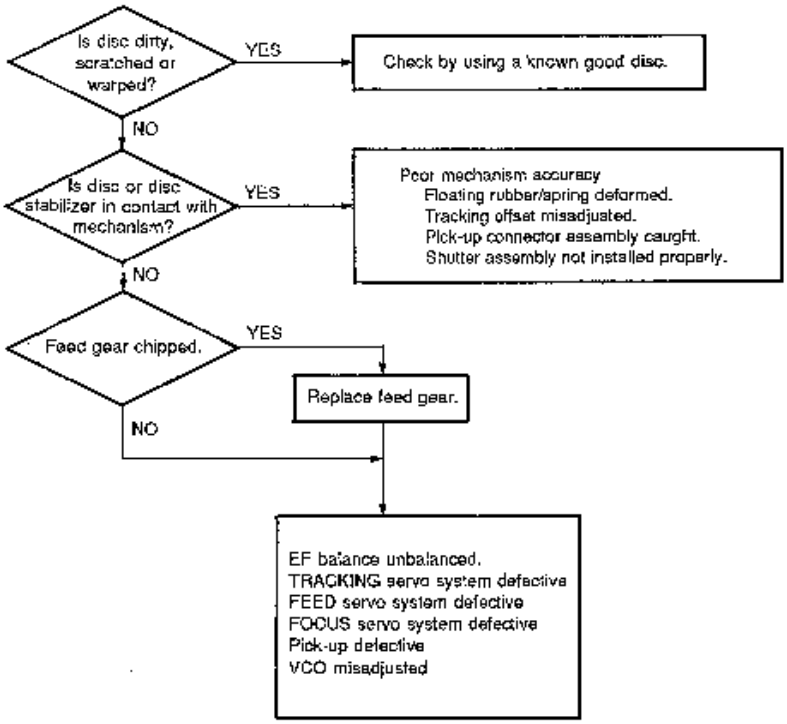
b) No sound generated, Sound cut during play. (but time display advances properly)



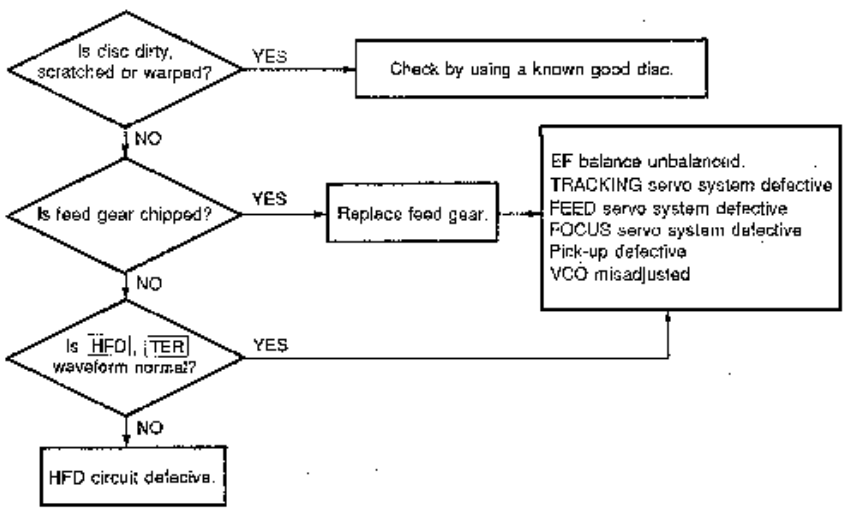
c) Operates as if no disc loaded. (although loaded)



d) Sound skips. (Time display fails to advance properly)

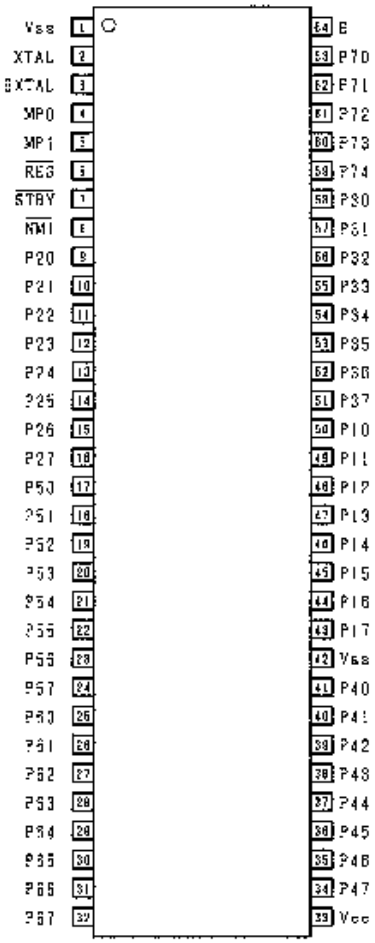


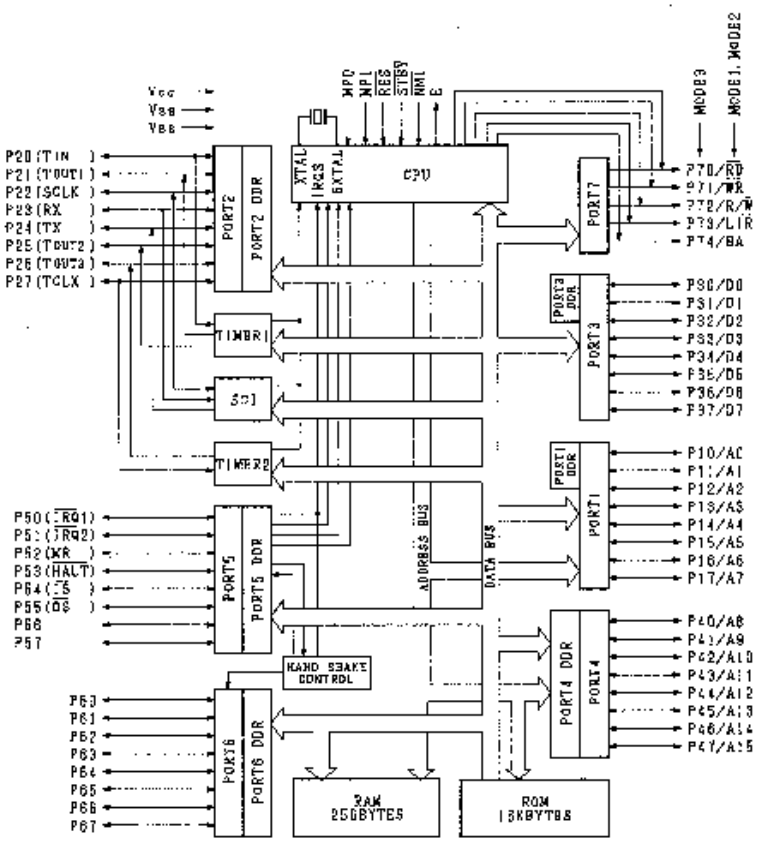
e) No search provided. (Sound skipped after search)



■ IC DATA

IC21 : HD63B01Y (XH778BO)
8 bit μ-COM





Pin No.	Pin Name	I / O	Active	Function
1	VSS			GND
2	XTAL			XTAL
3	E XTAL			External clock. (8MHz)
4	MP0	I	H	Sets μ-COM mode for built-in ROM and external RAM.
5	MP1	I	H	
6	RESET	I		Option starts at ⌐→ and stops at →⌐. (POWER ON → H)
7	STBY	I	H	Unused.
8	NMI	I	H	
9	REM	I		Input from remote control signal.
10	R/W	O		Serial data of YM7402, MN6474 and LC7582.
11	SCK	O		
12	SI	I		
13	SO	O		
14	WQ	I		
15	BUSY	I		BUSY signal input from YM7402.
16	TER	I		TER (Track count signal) input.

Pin No.	Pin Name	I / O	Active	Function
17	CHECK			Unused.
18	ST REQO			
19	ST DATA			
20	HALT		H	
21	ST CK			
22	INH	I	L	LCD Display driver. LCD goes off at "L".
23	FL SW	I	L	Feed inward detect switch. Switch ON at "L".
24	LCD	O	H	LCD Display driver (LC7582) chip select.
25	PLAY	O	H	VCO gain L at "H" (during play). VCO gain H at "L". (other than during play)
26	MUTE	O	L	Sound output mute at "L".
27	LCD			LC7582 chip select.
28	ROTATE R	O	H	Table rotate R. (Clockwise)
29	ROTATE L	O	H	Table rotate L. (Counterclockwise)
30	DEQ			YM6104 chip select.
31	MASH	O	H	MN6474 chip select.
32	CDVP	O	L	YM7402 chip select.
33	VDD			+5V
34	OPEN	O		A15
35	CLOSE	O		A14
36	DISC DOWN	O		A13
37	DISC UP	O		A12
38	LS ON	O		A11
39	M DIRECT	O		A10
40	M SELECT 2	O		A9
41	M SELECT 1	O		A8
42				GND — Address output to 82C55 and LC3517BL-15.
43	K4	O		A7
44	K3	O		A6
45	K2	O		A5
46	K1	O		A4
47	K0	O		A3
48	HOME	O		A2
49	POS	O		A1
50	DISC SNS	O		A0
51	D7	O		Data output to 82C55 and LC3517BL-15.
52	D6	O		
53	D5	O		
54	D4	O		
55	D3	O		
56	D2	O		
57	D1	O		
58	D0	O		
59				N. C.
60				
61				
62	WR			Write timing signal to 82C55 and LC3517BL-15.
63	RD			Read timing signal to 82C55 and LC3517BL-15.
64	E			N. C.

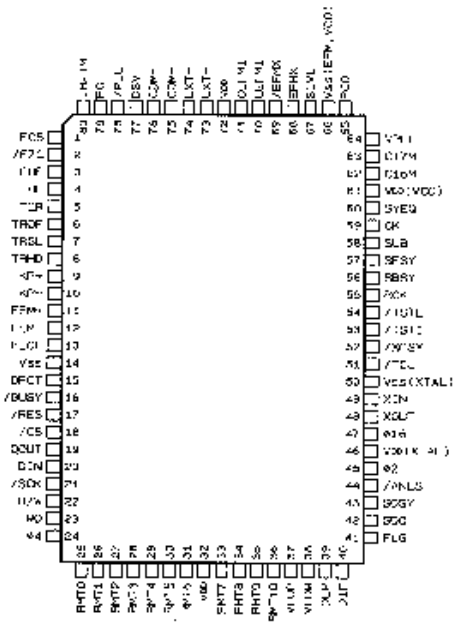
IC22 : MSM82C55A-2RS, M5M82C55AP-2 or μPD71055C
Programmable Peripheral Interface

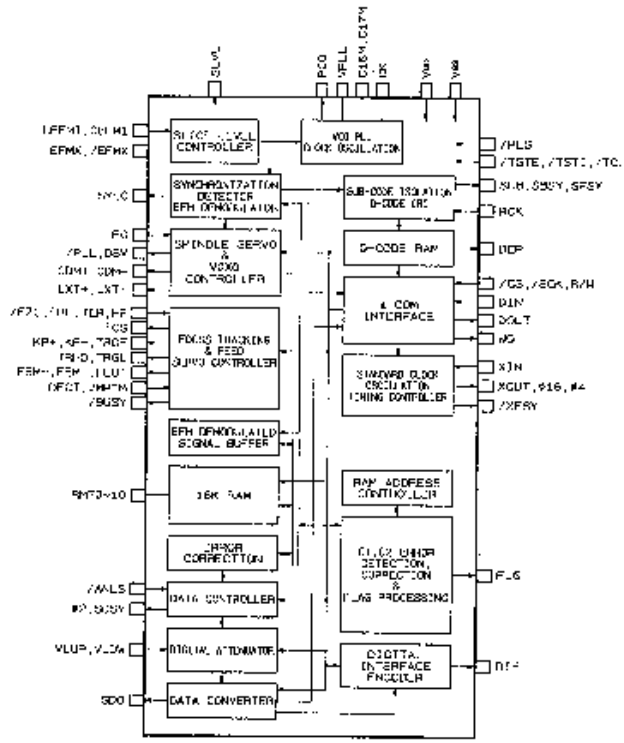
Pin No.	Pin Name	I/O	Active	Function
1	KD3	O		Key digit signal.
2	KD2	O		
3	KD1	O		
4	KD0	O		
5	RD	I		Read timing signal from μ-COM.
6	CS1	I	L	Chip select "L" when selected from μ-COM.
7				GND
8	A1	I		Port address at input/output from μ-COM.
9	A0	I		
10	OPEN	I	L	Tray open limit switch, ON at "L".
11	CLOSE	I	L	Tray close limit switch, ON at "L".
12	DISC DOWN	I	L	PU unit down limit switch, ON at "L".
13	DISC UP	I	L	PU unit up limit switch, ON at "L".
14	M SELECT 1	O		Clamp and Tray motor control. (**Table 1**)
15	M SELECT 2	O		
16	M DIRECT	O		
17	LS ON	O	H	Laser diode light at "H".
18	DISC SNS	O		Detection of disc existence/nonexistence.
19	TRAY POS	I		Sensor to detect each table stop position : 1, 2, 3, 4 or 5.
20	TRAY HOME	I		Sensor to detect table home position.
21	K0	I		Key matrix input.
22	K1	I		
23	K2	I		
24	K3	I		
25	K4	I		
26	VDD			+5V
27	D7	I		Data from μ-COM.
28	D6	I		
29	D5	I		
30	D4	I		
31	D3	I		
32	D2	I		
33	D1	I		
34	D0	I		
35	RESET	I		For resetting at power ON.
36	WR	I		Write timing from μ-COM.
37	KD7	O		Key digit output.
38	KD6	O		
39	KD5	O		
40	KD4	O		

Table 1

	M DIRECT	M SELECT 2	M SELECT 1
Tray Out	I	I	O
Tray In	O	I	O
PU unit Up	I	O	I
PU unit Down	O	O	I

IC20 : YM7402
Signal Processor & Controller for Compact Disc Player





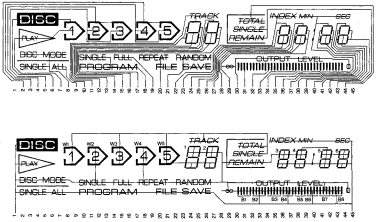
Pin No.	Pin Name	I / O	Function	
1	FCS	O	Focus search signal output	Focus servo
2	FZC	I	Focus zero cross signal input	
3	FRF	I	Focus reflection signal input	
4	HF	I	RF signal input	Tracking servo
5	TER	I	Tracking error signal input	
6	TROF	O	Tracking servo OFF signal output	
7	TRGL	O	TRGL signal output	
8	TRHD	O	Tracking hold signal output	
9	KP+	O	Outward kick pulse output	
10	KP-	O	Inward kick pulse output	
11	FEM+	O	Outward feed pulse output	Feed servo
12	FEM-	O	Inward feed pulse output	
13	FEOF	O	Feed servo OFF signal output	
14	Vss		GND	
15	DFCT	I	For setting track count synchronous mode	
16	BUSY	O	Sequence control output (H : End of track count)	
17	RES	I	System reset input	
18	CS	I	Chip select input from μ-COM	
19	D OUT	O	Serial data output to μ-COM	
20	D IN	I	Serial data input from μ-COM	
21	SCK	I	Clock input for input/output of serial data with μ-COM	
22	R/W	I	Control signal input for data input/output with μ-COM	
23	WQ	O	Request signal output for data output to μ-COM	
24	Ø4	O	System clock output (4.2336MHz)	

(Continneed on page 27)

Pin No.	Pin Name	I / O	Function
25	RMT0		For testing internal RAM
26	RMT1		
27	RMT2		
28	RMT3		
29	RMT4		
30	RMT5		
31	RMT6		
32	VDD		+5V
33	RMT7		For testing internal RAM
34	RMT8		
35	RMT9		
36	RMT10		
37	VL UP	I	Volume up input — Digital attenuator
38	VL DW	I	Volume down input — Digital attenuator
39	DEP	O	Deemphasis control signal output — Audio data output
40	DIF	O	Data output for digital interface — Audio data output
41	FLG	O	Flag output to correct error in SDO output data — Audio data output
42	SDO	O	Serial data output — Audio data output
43	SDSY	O	Synchronous signal output (44.1kHz) of SDO output data — Audio data output
44	ANLS	I	Analog sound serial data input — Audio data output
45	Ø2	O	System lock output (2.1168MHz) — Audio data output
46	VDD		XTAL system +5V
47	Ø16	O	System lock output
48	X OUT	O	For connecting quartz oscillator (16.9344MHz)
49	X IN	I	For connecting quartz oscillator (16.9344MHz)
50	Vss		XTAL system GND
51	TCL	I	Test signal input
52	XFSY	O	Frame synchronous signal output (7.35kHz)
53	TSTI		Test mode input — For testing
54	TSTE		Test mode control signal input — For testing
55	RCK	I	Clock input for reading sub-code — Sub-code output
56	SBSY	O	Sub-code block synchronization output — Sub-code output
57	SFSY	O	Sub-code frame signal output — Sub-code output
58	SUB	O	Sub-code serial output (P~W) — Sub-code output
59	CK	O	VCO system clock output (4.3218MHz)
60	SYEQ	O	Synchronous coincidence monitor (H : EFM pattern and internal counter are synchronized.)
61	VDD		VCO system +5V
62	C16M	I/O	For VCO control
63	C17M	I/O	For VCO adjusted voltage
64	VPLL		For VCO power supply
65	PCO	O	Clock reproduction system phase error output
66	Vss		EFM, VCO system GND
67	SLVL	O	Slice level output
68	EFMX	O	Signal output after limiting amplitude of EFM signal input (normal phase)
69	EFMX	O	Signal output after limiting amplitude of EFM signal output (reverse phase)
70	LEFMI	I	LD mode EFM signal input
71	CEFMI	I	CD mode EFM signal input
72	VDD		+5V
73	LXT+	O	VCXO frequency up signal output (only in LD mode)
74	LXT-	O	VCXO frequency down signal output (only in LD mode)
75	CDM+	O	Disc motor acceleration signal output (only in CD mode)
76	CDM-	O	Disc motor deceleration signal output (only in CD mode)
77	DSV	O	For system expansion
78	PLL	O	PLL operation monitor (L : Spindle control is PLL operated.)
79	FG	I	FG signal input
80	JMPTM	I	Trigger input to start sequence control

■ DISPLAY DATA

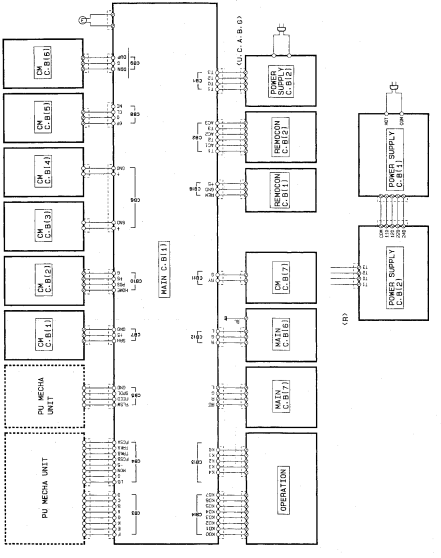
VC1 : LCD8122B1JP



	COM 1	COM 2		COM 1	COM 2		COM 1	COM 2
1	COM	—	16	2g	2d	31	B1	B2
2	W4	W5	17	2b	2c	32	B3	B4
3	4	5	18	SINGLE	PROGRAM	33	B5	B6
4	W2	W3	19	FULL	—	34	B7	B8
5	2	3	20	REPEAT	FILE	35	5a	2)
6	DISC	W1	21	RANDOM	SAVE	36	5f	5e
7	PLAY	1	22	3a	INDEX	37	5g	5d
8	DISC MODE	SINGLE	23	3f	3e	38	5b	5c
9	—	ALL	24	3g	3d	39	6a	—
10	1a	TRACK	25	3b	3c	40	6f	6e
11	1f	1e	26	4a	—	41	6g	6d
12	1g	1d	27	4f	4e	42	6b	6c
13	1b	1c	28	4g	4d	43	REMAIN	SINGLE
14	2a	—	29	4b	4c	44		TOTAL
15	2f	2a	30	1)	—	45	—	COM

1) : – ∞ OUTPUT LEVEL 0
2) : MIN. SEC. COLON

■ INTERCONNECT WIRING DIAGRAM



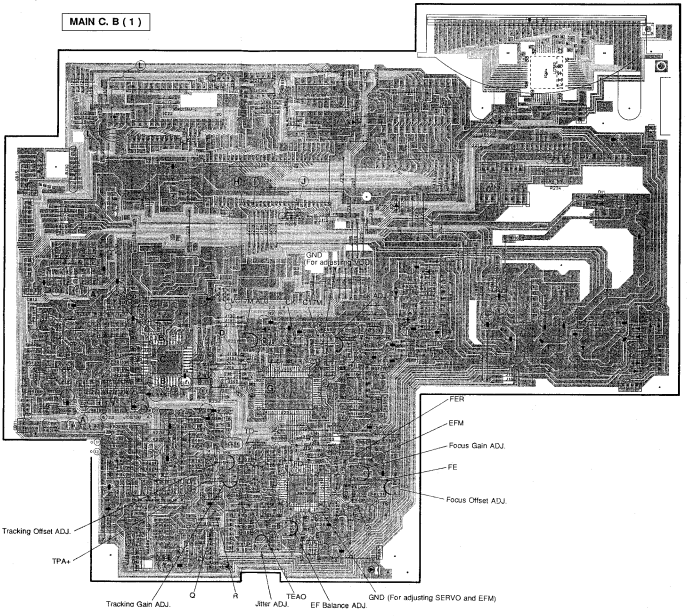
■ PRINTED CIRCUIT BOARD (Parts side)

Note) 文字面 : Component side

Ⓐ to Ⓛ : WAVEFORM OF TEST POINT (See page 38)

: The voltages are IC8 (LA9200NM)
: The voltages are IC17 (MN6474)
: The voltages are IC20 (YM7402)

MAIN C. B (1)

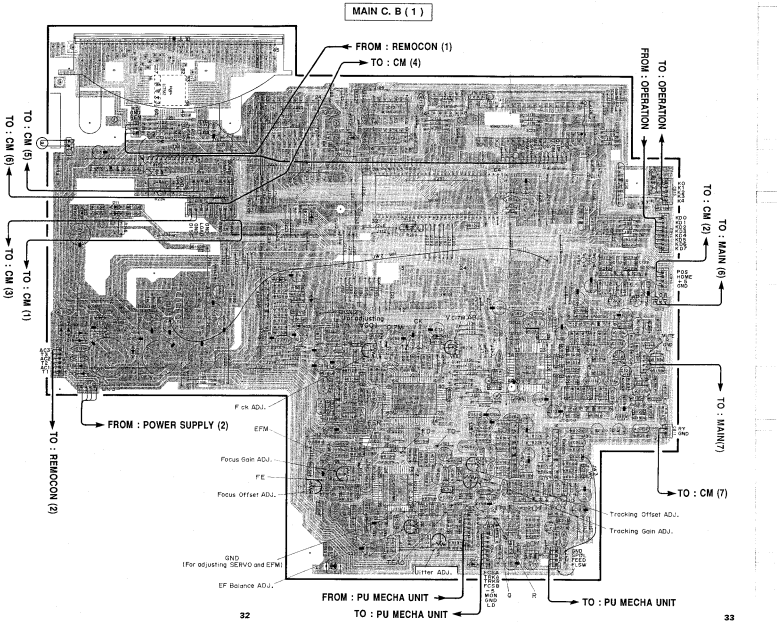


■ PRINTED CIRCUIT BOARD (Foil side)

Note) 文字面 : Component side

● Semiconductor Location

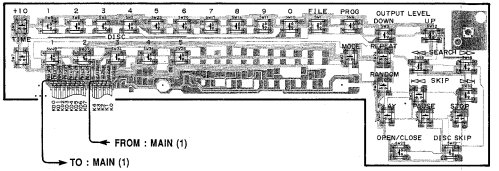
Ref.No	Location
D 1	D3
D 2	E3
D 3	E4
D 4	F6
D 5	E6
D 8	F4
D 9	E2
D10	C4
D11	D3
D12	D2
D13	C4
D14	C4
D15	C2
D16	C4
D17	C4
D18	C4
D19	C4
D20	E3
D21	C4
IC 1	D3
IC 2	F5
IC 3	C2
IC 4	C2
IC 5	F5
IC 6	F5
IC 7	E4
IC 8	E5
IC 9	F5
IC10	F2
IC12	E2
IC13	E2
IC15	E4
IC16	E4
IC17	F4
IC20	E4
IC21	F3
IC22	F2
IC23	D2
IC25	D3
IC26	D2
Q 1	E4
Q 2	E4
Q 3	E3
Q 4	E4
Q 5	F5
Q 6	F5
Q 7	E5
Q 8	F4
Q10	E4
Q11	F4
Q12	E2
Q13	C3
Q14	D3
Q15	C3
Q16	C4
Q18	E4
Q22	E4
Q24	E4
Q25	E4
Q26	E4
VR 1	F5
VR 2	E5
VR 3	E5
VR 4	E5
VR 5	F5
VR 6	F5
VR 7	E4
VR 8	F4



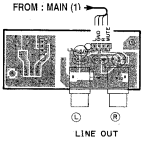
■ PRINTED CIRCUIT BOARD (Foil side)

Note) 文字面 : Component side

OPERATION C. B

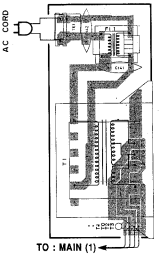


MAIN C. B (7)



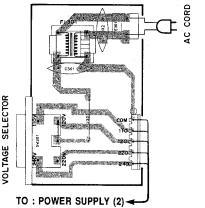
POWER SUPPLY C. B (2)

.....U, C, A, B, G models



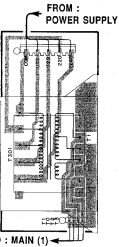
POWER SUPPLY C. B (1)

.....R model only



POWER SUPPLY C. B (2)

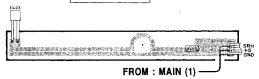
.....R model only



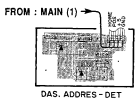
■ PRINTED CIRCUIT BOARD (Foil side)

Note) 文字面 : Component side

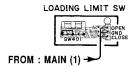
CM C. B (1)



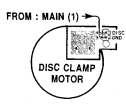
CM C. B (2)



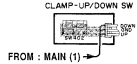
CM C. B (5)



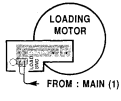
CM C. B (3)



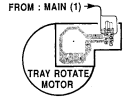
CM C. B (6)



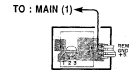
CM C. B (4)



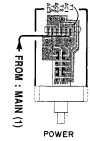
CM C. B (7)



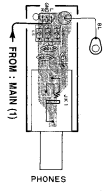
REMOCON C. B (1)



REMOCON C. B (2)



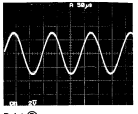
MAIN C. B (6)



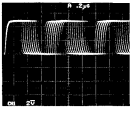
■ WAVEFORM OF TEST POINT

• The waveform are measured by TEST mode at PLAY

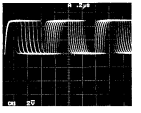
Point Ⓐ
(Pin 2 of IC15 or Pin 2 of IC16)
V : 2V/div H : 50μsec/div



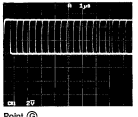
Point Ⓑ
(Pin 12 of IC17 or Pin 22 of IC17)
V : 2V/div H : 0.2μsec/div



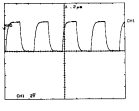
Point Ⓒ
(Pin 15 of IC17 or Pin 19 of IC17)
V : 2V/div H : 0.2μsec/div



Point Ⓓ
(Pin 42 of IC20)
V : 2V/div H : 1μsec/div



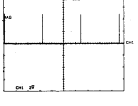
Point Ⓔ
(Pin 45 of IC20)
V : 2V/div H : 0.2μsec/div



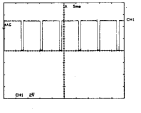
Point Ⓕ
(Pin 11 of IC21)
V : 2V/div H : 5msec/div

Point Ⓖ
(Pin 13 of IC21)
V : 2V/div H : 5msec/div

Point Ⓗ
(Pin 24 of IC21)
V : 2V/div H : 5msec/div

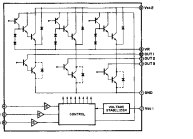


Point Ⓘ
(Pin 1 to 4 of IC22 or Pin 37 to 40 of IC22)

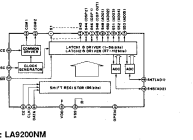


■ IC BLOCK

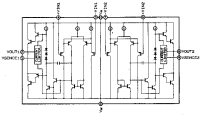
IC3 : AN6662 or M54649L
Motor Control



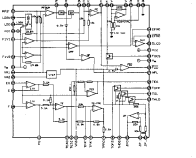
IC4 : LC7582
LCD Driver



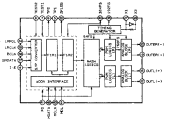
IC5, 9 : LA6510
Dual Power Operational Amp



IC8 : LA9200NM
RF Amp & Servo Controller

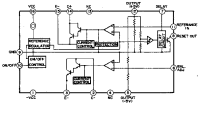


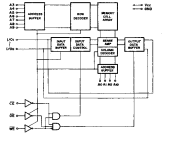
IC17 : MN6474
D/A Converter with Digital Filter



IC23 : LC3517BL-15
2048-Word x 8 bit Static RAM

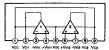
IC25 : M5290P
Constant-Voltage Tracking Suppply with Reset



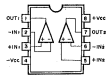


■ SCHEMATIC DIAGRAM

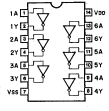
IC1, 6 : NJM4558S
IC7 : NJM2043S
IC15, 16 : μPC4570HA
Dual Ope-amp



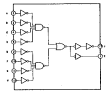
IC2 : μPC358C or BA10358
Dual Ope-amp



IC10 : MC74HCU04N,
μPD74HCU04C,
TC74HCU04P or
BU74HCU04
Hex Inverters

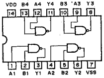


IC12 : MC74HC4078N,
TC74HC4078AP or
μPD74HC4078C
8-Input NOR/OR Gate

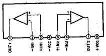


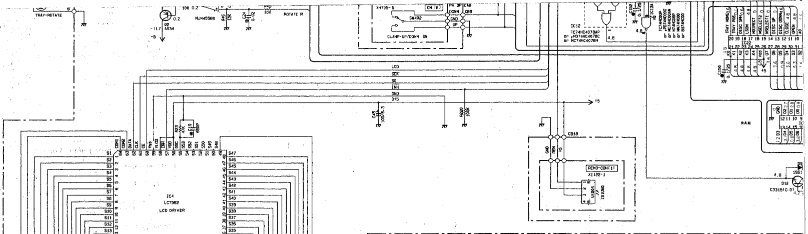
IC13 : TC74HC00P,
μPD74HC00C,
MC74HC00AN,
M74HC00P.

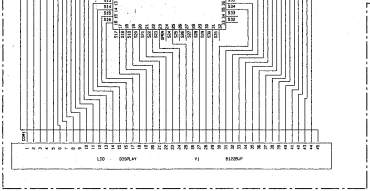
IC13 : TC74HC00P,
µPD74HC00C,
MC74HC00AN,
M74HC00P,
MN74HC00 or
BU74HC00
Quad 2 Input NAND



IC26 : M5218L,
BA15218N or
M5218AL
Dual Ope-amp







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

RESISTOR

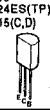
REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (1/6W)
◪	CARBON FILM RESISTOR (1/4W)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
◩	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊘	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

CAPACITOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITO
⊗	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
◉	AXIAL READ CERAMIC CAP
◎	POLYESTEL FILM CAPACIT
○	POLYSTYRENE FILM CAPA
ⓘ	MICA CAPACITOR
ⓟ	POLYPROPYLENE FILM CA
●	SEMICONDUCTIVE CERAMIC

PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICS.

2SA933S(Q, R), 2SA1115(E, F), 2SA1309A(Q, R, S), 2SA934, 2SB731, 2SB1013, 2SC1740S(R, S), 2SD1915(S, T), 2SD1815(Q, R), 2SD400, DTA124ES(TP), 2SC3315(C,D)



2SB1357T114(E, F)

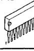
1SS133, 1SR139-100T32, MTZJ5.1B, MTZJ6.2A

M5218L, BA15218N, M5218AL

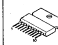
µPC358C, BA10358

NJM4558S, NJM2043S, µPC4570HA

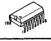
AN6662, M54649L



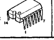
LA6510



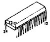
M5290P



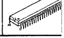
TC74HC00P, µPD74HC00C, MC74HC00AN, M74HC00P, MN74HC00, BU74HC00, MC74HCU04N, µPD74HCU04C, TC74HCU04P, BU74HCU04, MC74HC4078N, TC74HC4078AP, µPD74HC4078C

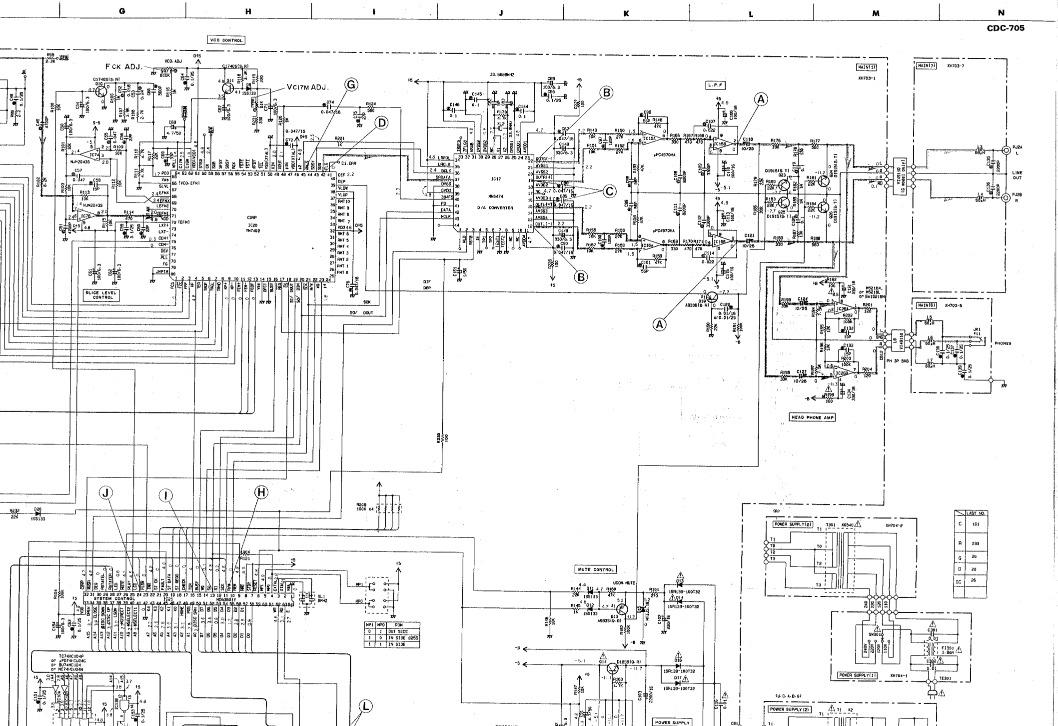


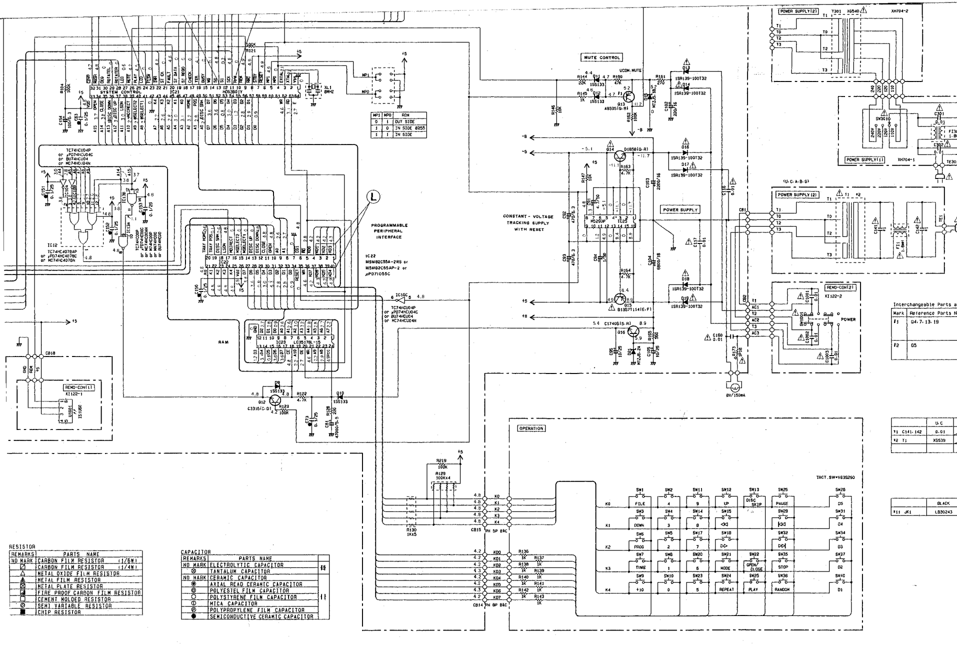
LC3517BL-15



MSM82C55A-2RS, M5M82C55AP-2, µPD71055C




G H I J K L M N
VCO CONTROL
F CK ADJ.
VC17M ADJ.
VCO ADJ
SLICE LEVEL CONTROL
CDVP
IC20
YM7402
33.8688MHZ
IC17
MN6474
D/A CONVERTER
L.P.F
µPC4570HA
MAIN(1) XH703-1
MAIN(7) XH703-7
MAIN(6) XH703-6
LINE OUT
PHONES
HEAD PHONE AMP
MUTE CONTROL
SYSTEM CONTROL
IC21
HD63801Y
XL1 8MHZ
POWER SUPPLY(2) XH704-2
POWER SUPPLY(1) XH704-1
POWER SUPPLY
LAST NO.
C 161
R 239
Q 25
D 20
IC 26



C	161
R	233
Q	26
D	20
IC	26

Interchangeable Parts at Manufacture-Stage

Mark	Reference Parts Number	Parts Name
#1	Q4, 7, 13, 19	2SA933S(Q·R) 2SA1115(E·F) 2SA1309A(Q·R·S)
#2	Q5	2AB731 2SB1013

	U·C	R	A·B	G
*1 C141, 142	0.01		0.01/400	
*2 T1	XG539		XG733	XG734

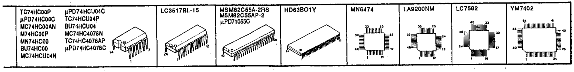
	BLACK	TITAN
*11 JK1	LB30243	LB30242

RESISTOR

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

CAPACITOR

REMARKS	PARTS NAME	
NO MARK	ELECTROLYTIC CAPACITOR	⌗
⊗	TANTALUM CAPACITOR	
NO MARK	CERAMIC CAPACITOR	⊣⊢
◉	AXIAL READ CERAMIC CAPACITOR	
◎	POLYESTEL FILM CAPACITOR	
○	POLYSTYRENE FILM CAPACITOR	
⦶	MICA CAPACITOR	
Ⓟ	POLYPROPYLENE FILM CAPACITOR	
●	SEMICONDUCTIVE CERAMIC CAPACITOR	

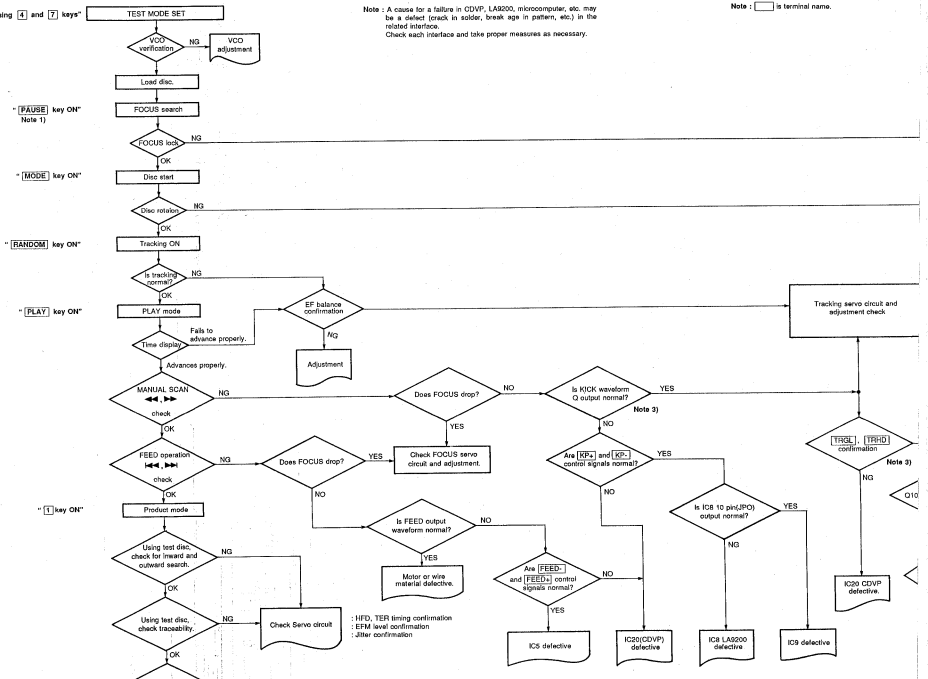


Ⓐ to Ⓛ : **WAVEFORM OF TEST POINT (See page 38)**

* The voltages are measured by TEST mode at PLAY.

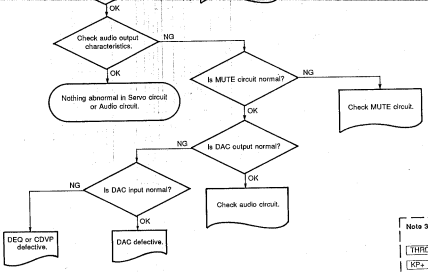
* *All voltage are measured with a 10MΩ/DC electric volt meter.*
* *Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.*
* *Schematic diagram is subject to change without notice.*

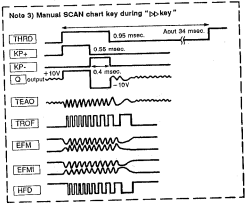
■ OPERATING CONFIRMATION TROUBLE SHOOTING

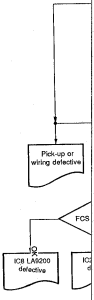


Note : A cause for a failure in CDVP, LA9200, microcomputer, etc. may be a defect (crack in solder, break age in pattern, etc.) in the related interface.
Check each interface and take proper measures as necessary.

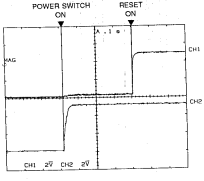
Note : [ ] is terminal name.



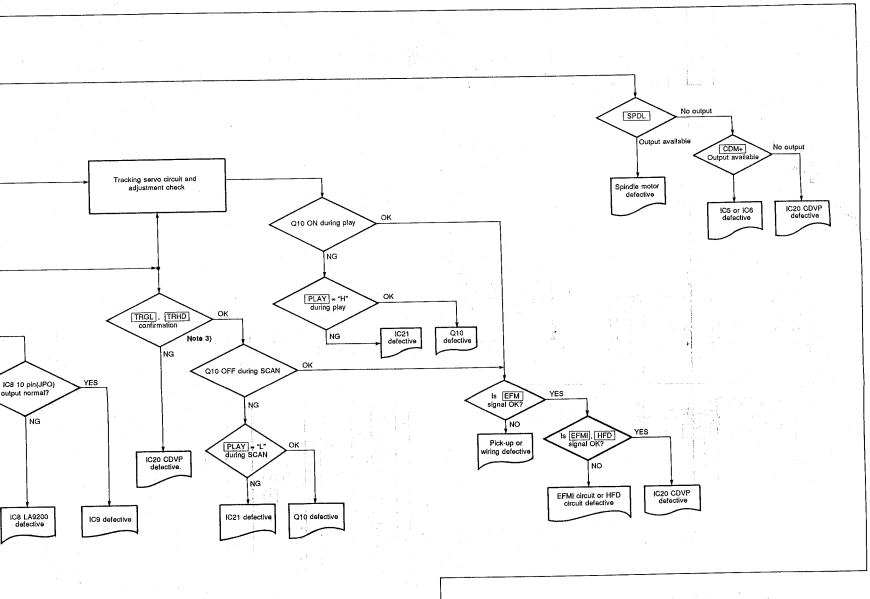


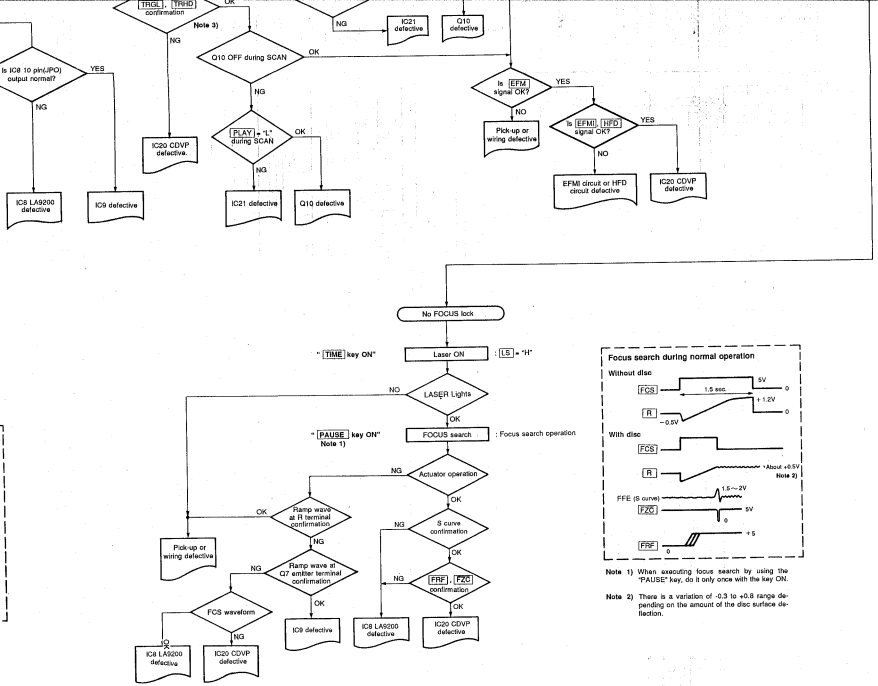


- **Reset waveform of μ-COM (IC21) when POWER switch is on.**
  CH1 : Pin 8 (RESET) of IC21
  CH2 : Pin 33 (VDD) of IC21



Note : [ ] is terminal name.





Note 1) When executing focus search by using the "PAUSE" key, do it only once with the key ON.

Note 2) There is a variation of -0.3 to +0.8 range depending on the amount of the disc surface deflection.

PARTS LIST

■ ELECTRICAL PARTS

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

● Carbon resistors (1/6W or 1/4W) are not included in the ELECTRICAL PARTS List. For the parts No. of the carbon resistors, refer to P. 52.

Ref. NO.	PART NO.	Description			部品名	Remarks	Markets	ランク
*	NXB08520	MAIN CIRCUIT BOARD			メインシート	BL		
*	NXB08530	MAIN CIRCUIT BOARD			メインシート	E		
	UA253100	MYLAR FILM CAP	1000pF	50V	マイラーコン	C27		
	UA253220	MYLAR FILM CAP	2200pF	50V	マイラーコン	C135,136		
	UA253330	MYLAR FILM CAP	3300pF	50V	マイラーコン	C109,112		
	UA253470	MYLAR FILM CAP	4700pF	50V	マイラーコン	C49,51		
	UA253820	MYLAR FILM CAP	8200pF	50V	マイラーコン	C108,111		
	UA254100	MYLAR FILM CAP	0.01uF	50V	マイラーコン	C5,32		
	FA154180	MYLAR FILM CAP	0.018uF	50V	マイラーコン	C52		
	UA254200	MYLAR FILM CAP	0.02uF	50V	マイラーコン	C9,24		
	UA254220	MYLAR FILM CAP	0.022uF	50V	マイラーコン	C107,114		
	UA254470	MYLAR FILM CAP	0.047uF	50V	マイラーコン	C55,57		
	UA254510	MYLAR FILM CAP	0.051uF	50V	マイラーコン	C47		
	UA254910	MYLAR FILM CAP	0.091uF	50V	マイラーコン	C36		
	UA255100	MYLAR FILM CAP	0.1uF	50V	マイラーコン	C1,110,120		
	FA155120	MYLAR FILM CAP	0.12uF	50V	マイラーコン	C22		
	UA255220	MYLAR FILM CAP	0.22uF	50V	マイラーコン	C40		
	FA155240	MYLAR FILM CAP	0.24uF	50V	マイラーコン	C53		
	FA155390	MYLAR FILM CAP	0.39uF	50V	マイラーコン	C42		
	UT452100	POLYPROPYLENE FILM CAP	100pF	100V	PPコン	C12		
	FK554100	CERAMIC CAP	0.01uF	50V	セラコン	C116,117,160		⚠
	VD030600	SEMI-CONDUCTIVE CERAMIC CAP	0.1uF	25V	半導体セラコン	C10,23,43,48,59,63,64, 73,86,137~139, 150~153,159		
	VG276200	CERAMIC CAP	15pF	50V	円筒セラコン	C58,132,133		
	VG276600	CERAMIC CAP	22pF	50V	円筒セラコン	C14,31,56,90		
	VG276800	CERAMIC CAP	27pF	50V	円筒セラコン	C75		
	VG277000	CERAMIC CAP	33pF	50V	円筒セラコン	C33,69		
	VG277200	CERAMIC CAP	39pF	50V	円筒セラコン	C25,26		
	VG277500	CERAMIC CAP	56pF	50V	円筒セラコン	C99,98,99,101		
	VJ309500	CERAMIC CAP	120pF	50V	円筒セラコン	C97,100		
	VG278600	CERAMIC CAP	330pF	50V	円筒セラコン	C16,17		
	VF466900	CERAMIC CAP	470pF	50V	円筒セラコン	C35		
	VG278800	CERAMIC CAP	560pF	50V	円筒セラコン	C66		
	VG278900	CERAMIC CAP	680pF	50V	円筒セラコン	C10,34		
	VF467000	CERAMIC CAP	1000pF	50V	円筒セラコン	C39,40		
	VF467300	CERAMIC CAP	0.01uF	16V	円筒セラコン	C21,122		
*	VJ599000	CERAMIC CAP	0.047uF	16V	円筒セラコン	C13,15,72,74,76,87~90		
*	VJ599100	CERAMIC CAP	0.1uF	50V	円筒セラコン	C144~146		
	VA760200	CERAMIC CAP	5pF	50V	セラコン	C82,83		
	UH218100	ELECTROLYTIC CAP	100uF	6.3V	ケミコン	C3,7,8,29,30,45,50,54, 81,82,87,71,85,154,158		
	VG286400	ELECTROLYTIC CAP	330uF	6.3V	ケミコン	C148,149		
	UJ118470	ELECTROLYTIC CAP	470uF	6.3V	ケミコン	C92,93		
	UA837220	ELECTROLYTIC CAP	22uF	16V	ケミコン	C38		
	VG287800	ELECTROLYTIC CAP	330uF	16V	ケミコン	C131,134		
	VG287600	ELECTROLYTIC CAP	100uF	16V	ケミコン	C18,20,106,110,113,115 ,155~157		
	UA838220	ELECTROLYTIC CAP	220uF	16V	ケミコン	C102		
	UA147100	ELECTROLYTIC CAP	10uF	25V	ケミコン	C4,41,95,105		

※New Parts (新規部品)　　ランク：Japan only

Ref. NO.	PART NO.	Description		部品名	Remarks	Markets	ランク
	UK166100	ELECTROLYTIC CAP	1uF 50V	ケミコン	C44,94,161		
	UJ666470	ELECTROLYTIC CAP	4.7uF 50V	ケミコン	C88,91		
	VG288100	ELECTROLYTIC CAP	2200uF 16V	ケミコン	C103		
	VJ578400	ELECTROLYTIC CAP	6800uF 16V	ケミコン	C104		
	VG779300	ELECTROLYTIC CAP	10uF 25V	BPケミコン	C11,118,121,124,127		
	UK156330	ELECTROLYTIC CAP	3.3uF 50V	BPケミコン	C28		
	UK156470	ELECTROLYTIC CAP	4.7uF 50V	BPケミコン	C37,140		
	VJ271200	ELECTROLYTIC CAP	47000uF 5.5V	バックアップケミコン	C81		
	VB100209	COIL	10uH BLO806KA	固定コイル	L1		
	VD473700	COIL	80uH SBT-0460T	コイル	L5~7		
	VJ491100	FERRITE CORE	BP53RB190120B0M	フェライトコア	L8		
	RV453220	FLAME PROOF CARBON RESISTOR	2.2Ω 1/4W	不燃化カーボン抵抗	R35,41,74,83		⚠
	RV454220	FLAME PROOF CARBON RESISTOR	22Ω 1/4W	不燃化カーボン抵抗	R31,234		
	RV455100	FLAME PROOF CARBON RESISTOR	100Ω 1/4W	不燃化カーボン抵抗	R192,199		⚠
	RL314180	METAL OXIDE RESISTOR	18Ω 1W	酸化金属被膜抵抗	R173		⚠
	VJ835400	FUSABLE RESISTOR	1.5Ω 1/8W	ヒューズ抵抗	R225,226		⚠
	VH721500	RESISTOR ARRAY	100KΩx4 RYL54J104	抵抗アレイ	R105,120,209		
	VJ394600	RESISTOR ARRAY	1KΩx5	抵抗アレイ	R130		
	XB247001	IC	uPC4570HA	IC	IC15,16		
	XF947A00	IC	LA6510	IC	IC5,9		
*	XG937A00	IC	BA10358	IC	IC2		
	XD201001	IC	M5290P	IC	IC25		
	XG839A00	IC	LA9200HM	IC	IC8		
	XB452001	IC	AN6652	IC	IC3		
*	XH692A00	IC	MM6474	IC	IC17		
	XB417001	IC	LC7582	IC	IC4		
*	XH778C00	IC	MD63B01Y	IC	IC21		
	1R000000	IC	TC74HC00P	IC	IC13		
	1G142220	IC	uPD74HCB04C	IC	IC10		
	1R407800	IC	TC74HC4078AP	IC	IC12		
	XB920001	IC	MSM82C55A-2RS	IC	IC22		
	XB859A00	IC	LC3517BL-15	IC	IC23		
	XG491A00	IC	YM7402	IC	IC20		
	1G076800	IC	NJM4558S	IC	IC1,6		
	1G080200	IC	NJM2043S	IC	IC7		
	XG938A00	IC	BA15218N	IC	IC26		
*	VJ295400	LCD	8122BJP	LCD表示器	V1		
	LB302430	PHONES JACK		ホーンジャック	JK1 (BL)		
	LB302420	PHONES JACK		ホーンジャック	JK1 (T)		
	VD004500	BASE PIN	PH 2P TE	ベースピン	CB11		
	VD004600	BASE PIN	PH 3P TE	ベースピン	CB9,12,18		
	VD004700	BASE PIN	PH 4P TE	ベースピン	CB1,5,8,10		
	VD004800	BASE PIN	PH 5P TE	ベースピン	CB15		
	VD004900	BASE PIN	PH 6P TE	ベースピン	CB2		
	VD005100	BASE PIN	PH 8P TE	ベースピン	CB3,4,14		
	LB918030	BASE PIN	XH 3P TE	ベースツキポスト	CB7		
	LB918040	BASE PIN	XH 4P TE	ベースツキポスト	CB6		
	VJ528800	QUARTZ CRYSTAL UNIT	33.8688MHz	水晶振動子	XL2		
	VE222400	CERAMIC RESONATOR	8MHz EFO-EC800	セラミック発振子	XL1		
	VR861100	PRE-SET POTENTIOMETER	B1KΩ	半固定VR	VR8		

*New Parts (新規部品)

ランク : Japan only

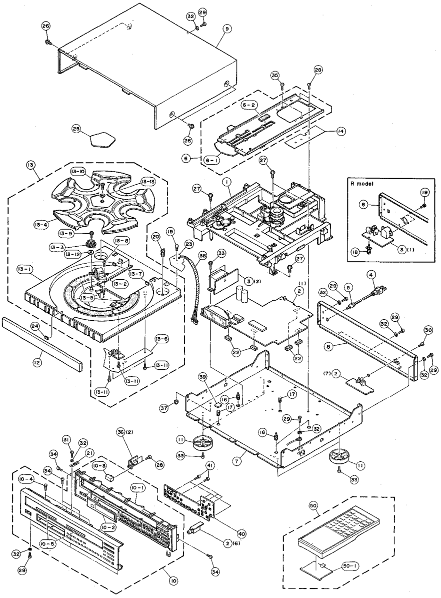
	Ref. NO.	PART NO.	Description		部品名	Remarks	Markets	ランク	
		VB861500	PRE-SET POTENTIOMETER	B10KΩ	半固定ＶＲ	VR1,4,7			
		VB861800	PRE-SET POTENTIOMETER	B47Ω	半固定ＶＲ	VR3,6			
		VC612500	PRE-SET POTENTIOMETER	B68KΩ	半固定ＶＲ	VR5			
		VB862000	PRE-SET POTENTIOMETER	B220KΩ	半固定ＶＲ	VR2			
		iA093370	TRANSISTOR	2SA933S Q,R	トランジスタ	Q4,7,13,19			
		iA093400	TRANSISTOR	2SA934	トランジスタ	Q2			
		VH555500	TRANSISTOR	2SB1357 E,F	トランジスタ	Q15			⚠
*		Vi915200	TRANSISTOR	2SB1013	トランジスタ	Q5			
		iC174070	TRANSISTOR	2SC1740S R,S	トランジスタ	Q3,8,10,11,16			
		VC529400	TRANSISTOR	2SC3315 C,D	トランジスタ	Q12			
		VC502100	TRANSISTOR	2SD1915 S,T	トランジスタ	Q23～26			
		VE613400	TRANSISTOR	2SD1858 Q,R	トランジスタ	Q14			⚠
		iD040000	TRANSISTOR	2SD400	トランジスタ	Q1			
		VH257100	DIGITAL TRANSISTOR	DTA124ES	デジトラ	Q6			
		iF004600	DIODE	1SS133	ダイオード	D1～4,8～12,20			
		VH770800	DIODE	1SR139-100T32	ダイオード	D13,14,16～19			⚠
		VG437400	ZENER DIODE	MTZJ5.1B	ツェナーダイオード	D15			
		VG437900	ZENER DIODE	MTZJ6.2A	ツェナーダイオード	D21			
		VG700100	LED	SIR-56SB3H	発光ダイオード	D5			
*		VJ295300	LAMP ASS'y	150mA 8V	ランプＡＳＳＹ				
		VB966900	PIN	IMSA-6024	スタイルピン				
*		VJ829800	FERRITE,MAIN ASS'y		メインフェライトＡＳＳＹ		G		
		VA119100	HEAT SINK		ヒートシンク				
		VG335800	REFLECTOR		リフレクター				
		VH041200	SHEET/DIFFUSION		シート／ディフュージョン				
		CB605620	PLASTIC RIVET		プラリベット				
		VF444500	LAMP CAP	AG-4015	ランプキャップ				

※New Parts（新規部品）　　ランク：Japan only

	Ref. NO.	PART NO.	Description		部品名	Remarks	Markets	ランク	
*		NX608580	OPERATION CIRCUIT BOARD		オペレーションシート				
		VE327300	PUSH SWITCH	KHH-MA901	タクトＳＷ	SW1～15,17,18,20～26,28,29,31,32,34,35,37,38,40			
		VG279400	CERAMIC CAP	2200pF 16V	円筒セラコン	C135,136			
		VG669100	COIL	68mH LHL06TB680K	コイル	L3,4			
		VE484600	PIN JACK	2P	ピンジャック	PJ2			
*		NX608540	POWER CIRCUIT BOARD		電源シート		UC		
*		VJ278000	POWER CIRCUIT BOARD		電源シート		R		
*		NX608550	POWER CIRCUIT BOARD		電源シート		AB		
*		NX608560	POWER CIRCUIT BOARD		電源シート		G		
		Fi384100	CERAMIC CAP	0.01uF 400V	規格認定コン	C141,142	UC		⚠
		Fi384100	CERAMIC CAP	0.01uF 400V	規格認定コン	C301,302	R		⚠
		VE179200	CERAMIC CAP	0.01uF 400V	規格認定コン	C141,142	ABG		⚠
		XG539A00	POWER TRANSFORMER		電源トランス	T1	UC		⚠
		XG540A00	POWER TRANSFORMER		電源トランス	T301	R		⚠
		XG733A00	POWER TRANSFORMER		電源トランス	T1	AB		⚠
		XG734A00	POWER TRANSFORMER		電源トランス	T1	G		⚠
		VE800700	LINE FILTER	1.8mH ELF18D290V	ラインフィルタ	Fi1	UCABG		⚠
		VE800700	LINE FILTER	1.8mH ELF18D290V	ラインフィルタ	Fi301	R		⚠
		VG388100	VOLTAGE SELECTOR	HXW0244	電圧切替器	SW301	R		⚠
		LA002140	LAPPING TERMINAL	2P i-TYPE P=10	ラッピング端子	TE1	UC		
		VE225700	BASE PIN	2P P=7.5	ベースポスト	TE301	R		
		VE225700	BASE PIN	2P P=7.5	ベースポスト	TE1	ABG		
		CB644670	CAP,CAPACITOR		コンデンサーカバー		ABG		
*		VJ793000	REMOTE CONTROL CIRCUIT BOARD		リモコンシート				
		Fi554100	CERAMIC CAP	0.01uF 50V	セラコン	C1001～1003			⚠
		Vi272700	PUSH SWITCH		プッシュＳＷ	SW1001 POWER			⚠
		VF926500	LIGHT DETECTING MODULE	GP1U501X	リモコン受光ユニット	U1001			
*		VJ279100	CN CIRCUIT BOARD		ＣＭシート				
		Vi294000	SWITCH,LEVER	SSCF21	レバーＳＷ	SW401,402			
*		VJ544400	PHOTO INTERRUPTER	RPI-2572	フォトインタラプタ	D401,402			
*		VJ544100	PHOTO TRANSISTOR	RPM-22DB106	フォトトランジスタ	D403			

※New Parts（新規部品）　　ランク：Japan only

■ EXPLODED VIEW



■ MECHANICAL PARTS Note) Ø : Diameter

	Ref. NO.	PART NO.	Description		部 品 名	Remarks	Markets	ランク	
*	1	VJ354300	DISC CHANGER MECHA. UNIT	CN-90	チェンジャーメカユニット				
*	2	NX608520	MAIN CIRCUIT BOARD		メインシート	BL			
*	2	NX608530	MAIN CIRCUIT BOARD		メインシート	T			
*	3	NX608540	POWER CIRCUIT BOARD		電源シート		UC		
*	3	VJ278000	POWER CIRCUIT BOARD		電源シート		R		
*	3	NX608550	POWER CIRCUIT BOARD		電源シート		AB		
*	3	NX608560	POWER CIRCUIT BOARD		電源シート		G		
	4	MG002220	POWER CORD	10A 125V	電源コード		UC		⚠
	4	VE222900	POWER CORD ASS'y		パワーコードＡＳＳＹ		R		⚠
	4	VE042900	POWER CORD ASS'y		パワーコードＡＳＳＹ		A		⚠
	4	VE043100	POWER CORD ASS'y		パワーコードＡＳＳＹ		B		⚠
	4	VE043400	POWER CORD ASS'y		パワーコードＡＳＳＹ		G		⚠
	5	CB620200	CORD STOPPER	CN-22C	コードストッパー		UC		
	5	CB620190	CORD STOPPER	CN-22B	コードストッパー		RABG		
*	6	VJ365700	SHUTTER ASS'y		シャッターＡＳＳＹ				
*	6-1	VJ105700	PLATE/SHUTTER		プレート／シャッター				
*	6-2	VJ967300	DAMPER/SHUTTER		ダンパー／シャッター				
*	7	VJ080300	MAIN CHASSIS		シャーシ／メイン				
*	8	VJ104400	REAR PANEL		リヤパネル		U		
*	8	VJ104500	REAR PANEL		リヤパネル		C		
*	8	VJ104600	REAR PANEL		リヤパネル		R		
*	8	VJ104700	REAR PANEL		リヤパネル		AB		
*	8	VJ104800	REAR PANEL		リヤパネル		G		
*	9	VJ060100	TOP COVER		トップカバー	BL			
*	9	VJ060200	TOP COVER		トップカバー	T			
*	10	VK431700	FRONT PANEL ASS'y		フロントパネルＡＳＳＹ	BL			
*	10	VK431800	FRONT PANEL ASS'y		フロントパネルＡＳＳＹ	T			
*	10-1	VJ079900	SUB PANEL		フロントパネル／サブ	BL			
*	10-1	VJ079800	SUB PANEL		フロントパネル／サブ	T			
*	10-2	VJ080100	WINDOW		ウインドウ	BL			
*	10-2	VJ080000	WINDOW		ウインドウ	T			
	10-3	VH841900	BUTTON		ボタン	BL POWER			
	10-3	VH842000	BUTTON		ボタン	T POWER			
	10-4	CB609260	PLASTIC RIVET		プラリベット				
*	10-5	VJ589600	SHEET		シート				
	11	VF639400	LEG ASS'y		レッグＡＳＳＹ	BL			
	11	Vi031600	LEG ASS'y		レッグＡＳＳＹ	T			
*	12	VJ129800	LID		リッド	BL			
*	12	VJ129900	LID		リッド	T			
*	13	VJ354600	TRAY ASS'y		トレイＡＳＳＹ	BL			
*	13	VJ354700	TRAY ASS'y		トレイＡＳＳＹ	T			
*	13- 1	Vi238300	TRAY		トレイ	BL			
*	13- 1	Vi572200	TRAY		トレイ	T			
*	13- 2	VJ354800	MOTOR ASS'y		ロータリーモータＡＳＳＹ				
*	13- 3	Vi238800	GEAR	WW	ギヤー				
*	13- 4	Vi238400	ROTARY TABLE		ロータリーテーブル	BL			
*	13- 4	Vi572300	ROTARY TABLE		ロータリーテーブル	T			
*	13- 5	VK324300	SPACER		スペーサ／トレイ２				
*	13- 6	Vi898600	COVER		カバー／トレイ				
*	13- 7	VJ613900	CUSHION		クッション／シャッター				

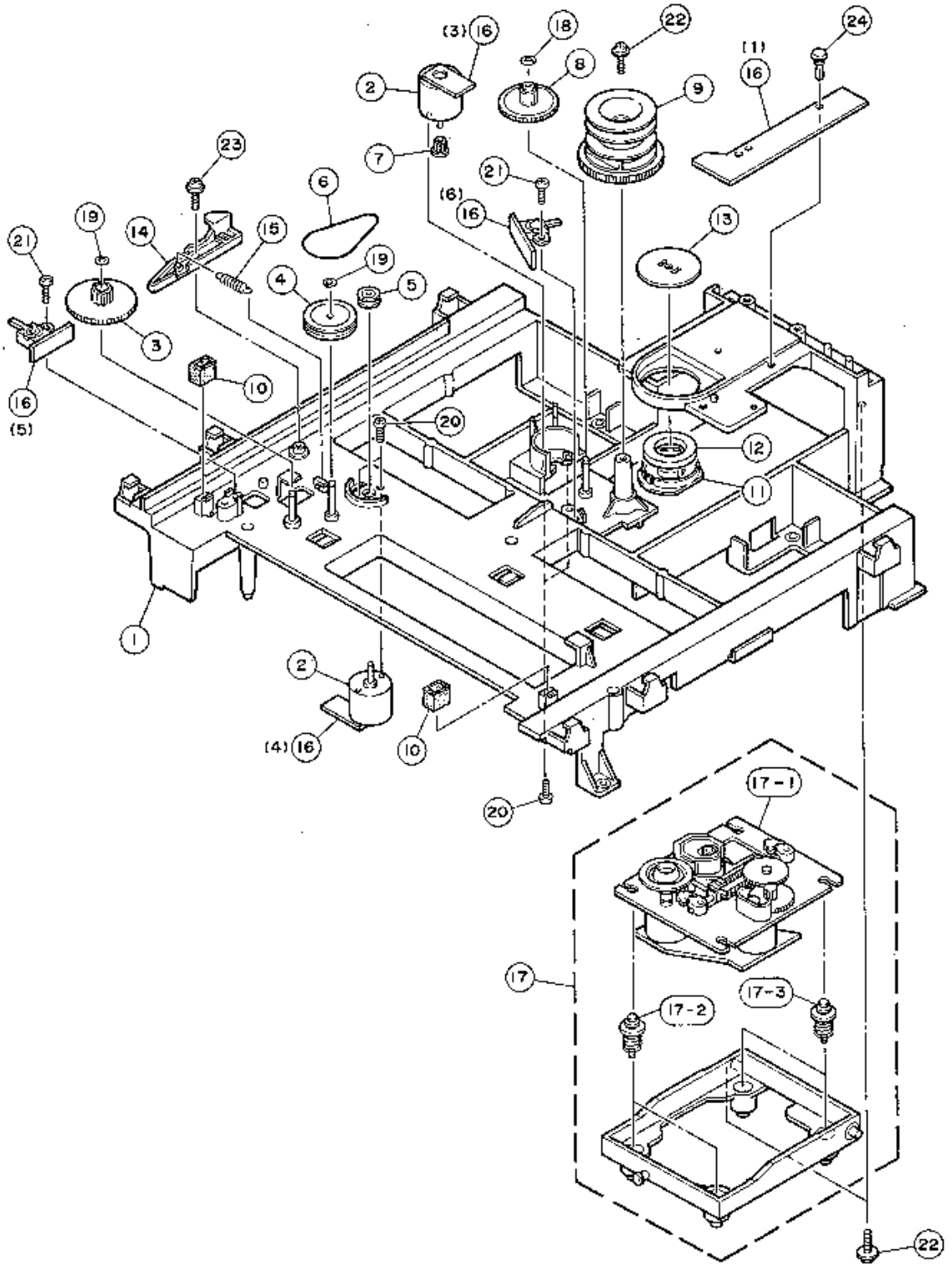
※New Parts（新規部品）　　ランク：Japan only

Ref. NO.	PART NO.	Description			部品名	Remarks	Markets	ランク
13- 8	EX601590	BIND HEAD P-TITE SCREW	2.6x8	FCRM3-BL	バインドPタイトネジ			
13- 9	EX601600	BW HEAD P-TITE SCREW	2.6x10	FCRM3-BL	BWヘッドタッピングネジ			
13-10	EC330140	FLAT HEAD P-TITE SCREW	3x14	ZMC2-BL	BWヘッドタッピングネジ			
13-11	EI328066	BIND HEAD P-TITE SCREW	2.6x6	FCRM3-BL	バインドタッピングネジ	PACK		
13-12	VK390800	SPACER			スペーサー／ギア2			
13-13	XY500070	FLAT WASHER	4x10x0.8	FCRM3-BL	平座金ミガキマル			
* 14	VJ716700	COVER			カバー			
16	CB803730	P.C.B SUPPORT			基板サポート			
* 17	VJ313700	P.C.B SUPPORT			基板サポート			
* 18	VJ354200	P.C.B SUPPORT			基板サポート		K	
19	CA609280	PLASTIC RIVET			プラリベット			
20	VG414400	STOPPER			ストッパー／トレイ			
21	BB071170	GROUND PLATE			アースプレート			
* 22	VJ588500	SHEET			シート／ダンパー			
* 23	VK210300	SUPPORT			サポート／線材2			
* 24	VJ613900	CUSHION			クッション／シャッター			
* 25	VJ105900	PLATE			プレート	BL		
* 25	VJ163000	PLATE			プレート	T		
26	EK365040	BW HEAD SCREW	4x8-10	FCRM3-BL	BWヘッド小ネジ	BL		
26	EX601050	BW HEAD SCREW	4x8-10	FCM3-BL	BWヘッド小ネジ	T		
27	EK305200	BW HEAD SCREW	4x10	FCRM3-BL	BWヘッド小ネジ			
28	EK093030	BIND HEAD P-TITE SCREW	3x10	ZMC2-Y	バインドPタイトネジ			
29	EI330066	BIND HEAD TAPPING SCREW	3x6	FCRM3-BL	バインドBタイトネジ	PACK		
30	EM335030	BIND HEAD BONDING TAP. SCREW	3x10	FCRM3-BL	ボンディングPタイトネジ			
31	ED330066	BIND HEAD SCREW	3x6	FCRM3-BL	バインド小ネジ			
32	EV413036	TOOTH LOCKED WASHER	M3	FCRM3-BL	歯付座金	PACK		
33	EK336010	BW HEAD TAPPING SCREW	3x8-8	FCRM3-BL	BWヘッドBタイトネジ			
34	EM030066	FLAT HEAD SCREW	3x6	ZMC2-Y	皿小ネジ			
35	EI030066	BIND HEAD TAPPING SCREW	3x5	ZMC2-Y	バインドタッピングネジ	PACK		
* 36	VJ793000	REMOTE CONTROL CIRCUIT BOARD			リモコンシート			
37	EX001560	HEXAGONAL BLIND NUT	M4	FCRM3-BL	六角袋ナット			
* 38	VK219400	COVER			カバー／線材			
* 39	VK341100	SPACER			スペーサー／コルク			
* 40	VJ281200	OPERATION CIRCUIT BOARD			オペレーションシート			
41	EI020066	BIND HEAD TAPPING SCREW	2x6	FCRM3-BL	バインドタッピングネジ	PACK		
	CB069250	BINDING TIE	BK-1		束線止め			
		ACCESSORIES			付属品			
* 50	VJ154200	REMOTE CONTROL TRANSMITTER			リモコントランスミッター			
50-1	CX611300	LID			電池蓋		KPW1-812-1	
	VG718700	PIN PLUG CORD		0.8m	ピンプラグコード			
		DRY CELL	R03,UM-4		マンガン電池			

※New Parts (新規部品)

ランク：Japan only

■ EXPLODED VIEW (CM-90)



■ MECHANICAL PARTS (CM-90) Note) Ø : Diameter

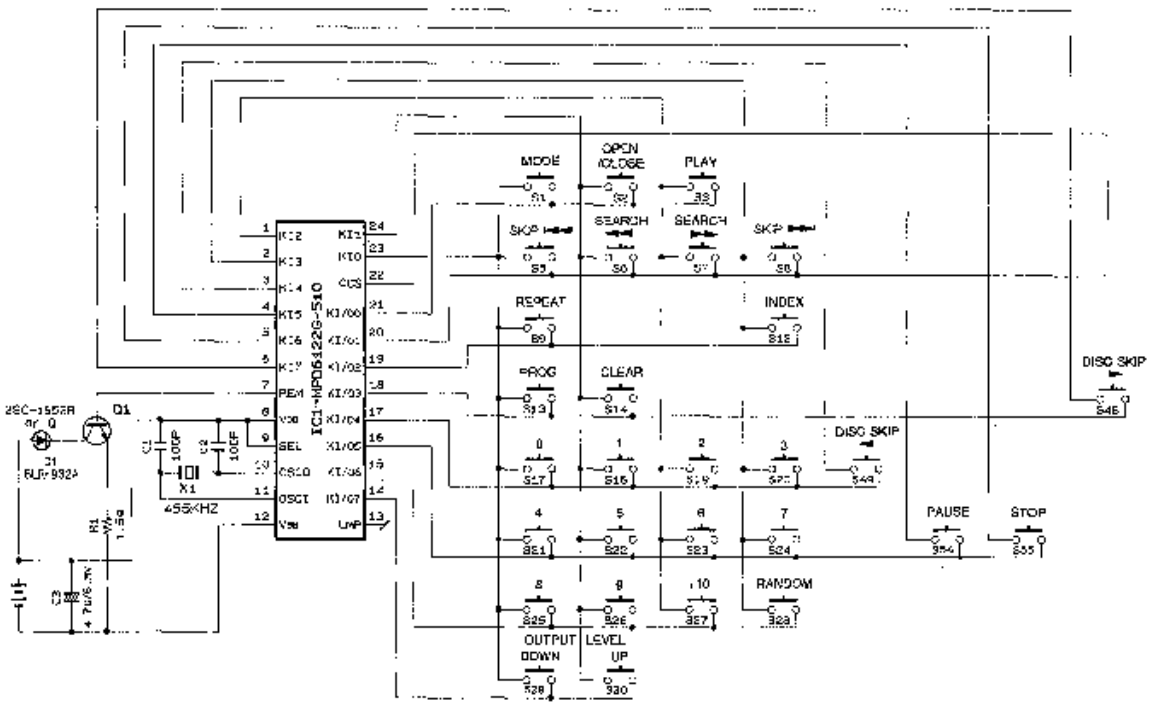
	Ref. NO.	PART NO.	Description		部品名	Remarks	Markets	ランク
*		VJ354300	DISC CHANGER MECHA. UNIT	CM-90	チェンジャーメカユニット			
*	1	VI238200	CHASSIS		シャーシ／CM			
	2	VK415000	MOTOR	MCV4B07	モーター／ディスクS			
*	3	VJ613000	GEAR		ギヤLO／CM			
*	4	VJ612900	GEAR,PULLEY		ギヤプーリー LO／CM			
	5	VG254500	PULLEY		プーリー／S			
	6	VB520600	BELT V		Vベルト			
*	7	VJ598300	GEAR		ギヤ／プーリー			
*	8	VJ784200	GEAR		ギヤ／ドライブ710			
*	9	VI238700	CAM		カム／CM			
*	10	VJ354100	DAMPER		ダンパー／トレイ			
*	13	VJ106000	STABILIZER		スタビライザ／CM			
	12	VI493400	MAGNET		マグネット			
*	13	VJ106100	PLATE		プレート／スタビライザー			
*	14	VJ106200	LEVER		レバー／トレイ			
*	15	VJ528700	SPRING		スプリング／レバー			
*	16	VJ279100	CM CIRCUIT BOARD		CMシート			
*	17	VJ354500	PICK UP UNIT ASS'y		PUユニットASSY			
*	17-1	VJ388100	PU MECHA. UNIT	XSM-210A RH	PUメカユニット			
*	17-2	HX808460	DAMPER ASS'y A		ダンパーASSY A			
*	17-3	HX808470	DAMPER ASS'y B		ダンパーASSY B			
	18	CB662020	STOP RING		止メワ			
	19	VI907700	WASHER	2.2x5x0.25	カットワッシャー			
	20	ED320050	BIND HEAD SCREW	2x5 ZMC2-BL	バインド小ネジ	PACK		
*	21	EXD015A0	BIND HEAD P-TITE SCREW	2.6x8 FCRM3-BL	バインドPタイトネジ			
	22	EK33D010	BW HEAD TAPPING SCREW	3x12 FCM3-BL	BWヘッドタッピングネジ			
	23	EX036050	BW HEAD P-TITE SCREW	2.6x10 ZMC2-Y	BWヘッドタップネジ			
	24	CB068880	PLASTIC RIVET		プラリベット			
		CB069250	BIND TIE		束線止め			

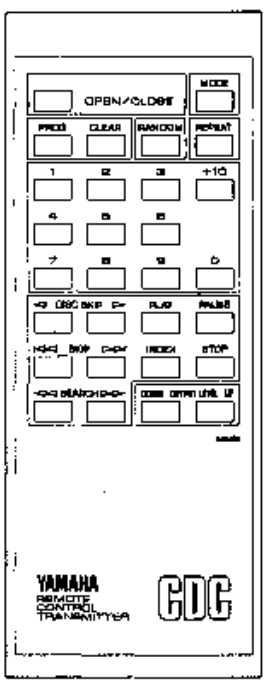
※New Parts (新規部品)　　ランク：Japan only

CDC-705

REMOTE CONTROL TRANSMITTER

■ SCHEMATIC DIAGRAM





CUSTOM CODE

C0 C1 C2 C3 C4 C5 C6 C7
1 0 0 1 1 1 1 0

KEY No.	DATA CODE D0	D1	D2	D3	D4	D5	D6	D7	FUNCTION
1	0	0	0	0	0	0	0	0	MODE
2	1	0	0	0	0	0	0	0	OPEN/CLOSE
3	0	1	0	0	0	0	0	0	PLAY
5	0	0	1	0	0	0	0	0	SKIP ⏮
6	1	0	1	0	0	0	0	0	SEARCH ◀◀
7	0	1	1	0	0	0	0	0	SEARCH ▶▶
8	1	1	1	0	0	0	0	0	SKIP ⏭
9	0	0	0	1	0	0	0	0	REPEAT
12	1	1	0	1	0	0	0	0	INDEX
13	0	0	1	1	0	0	0	0	PROG
14	1	0	1	1	0	0	0	0	CLEAR
17	0	0	0	0	1	0	0	0	0
18	1	0	0	0	1	0	0	0	1
19	0	1	0	0	1	0	0	0	2
20	1	1	0	0	1	0	0	0	3
21	0	0	1	0	1	0	0	0	4
22	1	0	1	0	1	0	0	0	5
23	0	1	1	0	1	0	0	0	6
24	1	1	1	0	1	0	0	0	7
25	0	0	0	1	1	0	0	0	8
26	1	0	0	1	1	0	0	0	9
27	0	1	0	1	1	0	0	0	+10
28	1	1	0	1	1	0	0	0	RANDOM
29	0	0	1	1	1	0	0	0	OUTPUT LEVEL DOWN
30	1	0	1	1	1	0	0	0	OUTPUT LEVEL UP
46	1	1	1	1	0	0	1	0	DISC SKIP ▶
49	0	0	0	0	1	0	1	0	DISC SKIP ◀
54	1	0	1	0	1	0	1	0	PAUSE
55	0	1	1	0	1	0	1	0	STOP

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	HJ35 3100	HF85 3100	12 KΩ	HJ35 7120	HF85 7120
1.8 Ω	HJ35 3180	*	15 KΩ	HJ35 7150	HF85 7150
2.2 Ω	HJ35 3220	HF85 3220	18 KΩ	HJ35 7180	HF85 7180
3.3 Ω	HJ35 3330	HF85 3330	22 KΩ	HJ35 7220	HF85 7220
4.7 Ω	HJ35 3470	HF85 3470	27 KΩ	HJ35 7270	HF85 7270
5.6 Ω	HJ35 3560	HF85 3560	33 KΩ	HJ35 7330	HF85 7330
10 Ω	HJ35 4100	HF85 4100	39 KΩ	HJ35 7390	HF85 7390
15 Ω	HJ35 4150	HF85 4150	47 KΩ	HJ35 7470	HF85 7470
22 Ω	HJ35 4220	HF85 4220	56 KΩ	HJ35 7560	HF85 7560
27 Ω	HJ35 4270	HF85 4270	68 KΩ	HJ35 7680	HF85 7680
33 Ω	HJ35 4330	HF85 4330	82 KΩ	HJ35 7820	HF85 7820
39 Ω	HJ35 4390	HF85 4390	91 KΩ	HJ35 7910	HF85 7910
47 Ω	HJ35 4470	HF85 4470	100 KΩ	HJ35 8100	HF85 8100
56 Ω	HJ35 4560	HF85 4560	120 KΩ	HJ35 8120	HF85 8120
68 Ω	HJ35 4680	HF85 4680	150 KΩ	HJ35 8150	HF85 8150
82 Ω	HJ35 4820	HF85 4820	180 KΩ	HJ35 8180	HF85 8180
100 Ω	HJ35 5100	HF85 5100	220 KΩ	HJ35 8220	HF85 8220
110 Ω	HJ35 5110	HF85 5110	270 KΩ	HJ35 8270	HF85 8270
120 Ω	HJ35 5120	HF85 5120	330 KΩ	HJ35 8330	HF85 8330
150 Ω	HJ35 5150	HF85 5150	390 KΩ	HJ35 8390	HF85 8390
160 Ω	HJ35 5160	*	470 KΩ	HJ35 8470	HF85 8470
180 Ω	HJ35 5180	HF85 5180	560 KΩ	HJ35 8560	HF85 8560
220 Ω	HJ35 5220	HF85 5220	680 KΩ	HJ35 8680	HF85 8680
270 Ω	HJ35 5270	HF85 5270	820 KΩ	HJ35 8820	HF85 8820
330 Ω	HJ35 5330	HF85 5330	1.0 MΩ	HJ35 9100	HF85 9100
390 Ω	HJ35 5390	HF85 5390	1.2 MΩ	HJ35 9120	*
470 Ω	HJ35 5470	HF85 5470	1.5 MΩ	HJ35 9150	HF85 9150
510 Ω	*	HF85 5510	1.8 MΩ	HJ35 9180	HF85 9180
560 Ω	HJ35 5560	HF85 5560	2.2 MΩ	HJ35 9220	HF85 9220
680 Ω	HJ35 5680	HF85 5680	3.3 MΩ	HJ35 9330	HF85 9330
820 Ω	HJ35 5820	HF85 5820	3.9 MΩ	HJ35 9390	*
910 Ω	HJ35 5910	HF85 5910	4.7 MΩ	HJ35 9470	HF85 9470
1.0 KΩ	HJ35 6100	HF85 6100			
1.2 KΩ	HJ35 6120	HF85 6120			
1.5 KΩ	HJ35 6150	HF85 6150			
1.8 KΩ	HJ35 6180	HF85 6180			
2.0 KΩ	HJ35 6200	HF85 6200			
2.2 KΩ	HJ35 6220	HF85 6220			
2.4 KΩ	HJ35 6240	HF85 6240			
2.7 KΩ	HJ35 6270	HF85 6270			
3.0 KΩ	HJ35 6300	HF85 6300			
3.3 KΩ	HJ35 6330	HF85 6330			
3.6 KΩ	HJ35 6360	HF85 6360			
3.9 KΩ	HJ35 6390	HF85 6390			
4.7 KΩ	HJ35 6470	HF85 6470			
5.1 KΩ	HJ35 6510	HF85 6510			
5.6 KΩ	HJ35 6560	HF85 6560			
6.8 KΩ	HJ35 6680	HF85 6680			
8.2 KΩ	HJ35 6820	HF85 6820			
9.1 KΩ	HJ35 6910	HF85 6910			
10 KΩ	HJ35 7100	HF85 7100