

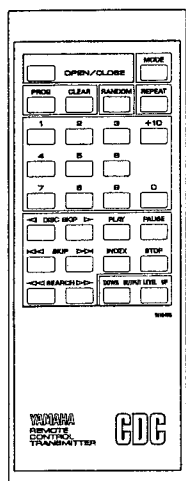
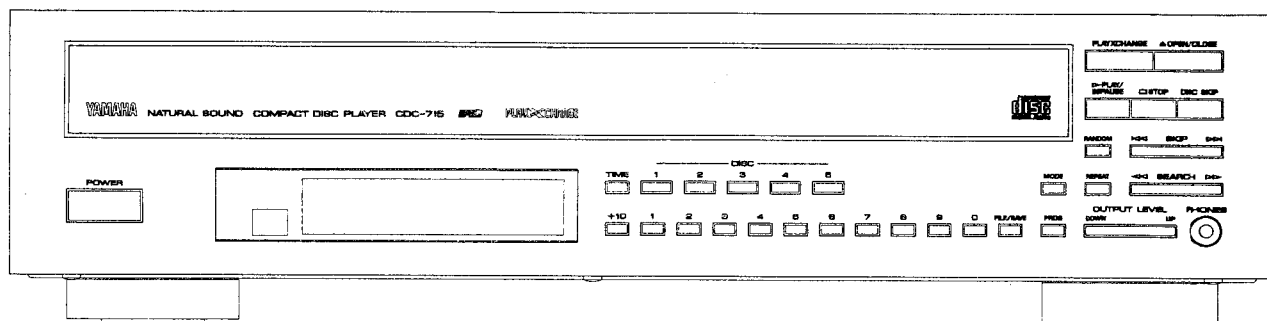


COMPACT DISC PLAYER

CDC-715

SERVICE MANUAL

CDC-715



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 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 part replacement. Recheck all work before you apply power to the unit.

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YAMAHA

YAMAHA CORPORATION
P.O. Box 1, Hamamatsu, Japan

3.0K-853 Printed in Japan '91.7

■ TO SERVICE PERSONNEL

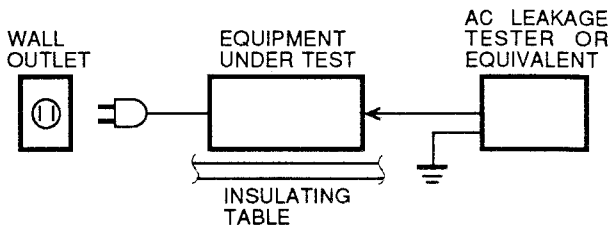
1. Critical Components Information.

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 0.15 μ F.
- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.



● POLARIZATION (U, C models)

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

CAUTION: USE OF CONTROLS 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 μ W*

* 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 30 cm away from the objective lens.

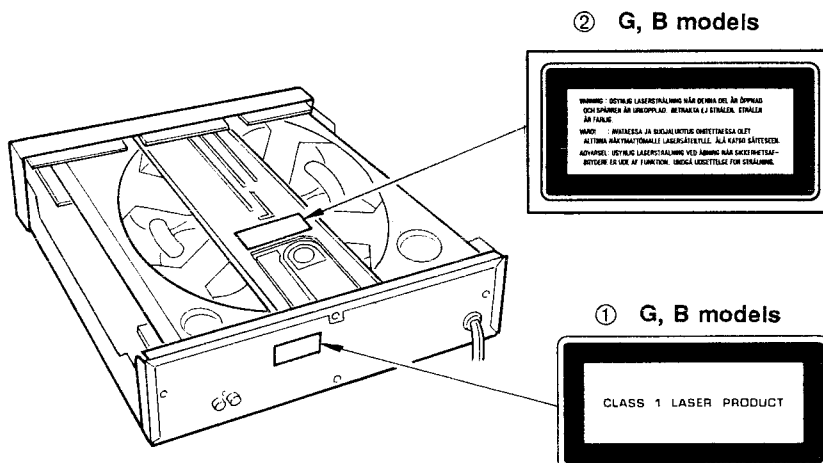
WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and/or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.



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 EXPOSURE WITH THE LASER BEAM.

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

Swedish

- ① DENNA MÄRKNING (SE FIGUR) UPPLYSER OM ATT DET I APPARATEN INGÅR EN LASERKOMPONENT AV TYP KLASS 1.
- ② VARNINGSMÄRKNING (SE FIGUR) FÖR STRÅLNING. INGREPP I APPARATEN BÖR ENDAST FÖRETAGAS AV FACKMAN MED KÄNNEDOM OM LASER. APPARATEN INNEHÅLLER EN LASERKOMPONENT SOM AVGER STRÅLNING ÖVERSTIGANDE GRÄNSEN FÖR LASERKLASS 1.

VARNING : INGREPP I APPARATEN BÖR ENDAST FÖRETAGAS AV FACKMAN MED KUNSKAP OM ATT RISK FÖRE LIGGER FÖR RADIOAKTIV STRÅLNING.

VARNING : OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR
ÖPPNAD : BETRAKTA EJ STRÅLEN.

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.

ADVARSEL : INDGREG BOR KUN FORETAGES AF EN FAGMAND DA DER ER RISIKO FOR RADIOAKTIV STRÅLING.

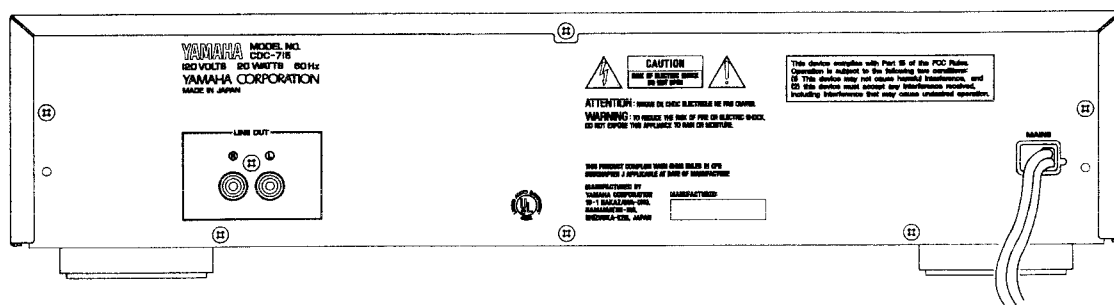
ADVARSEL : USYNLIG LASERSTRÅLING VED ÅBNING.
UNDGÅ UDSETELSE FOR STRÅLING.

Finnish

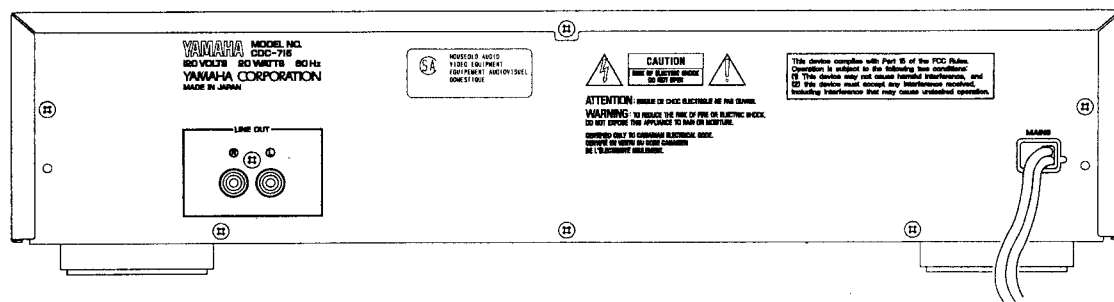
VAROI :
AVATTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

REAR PANELS

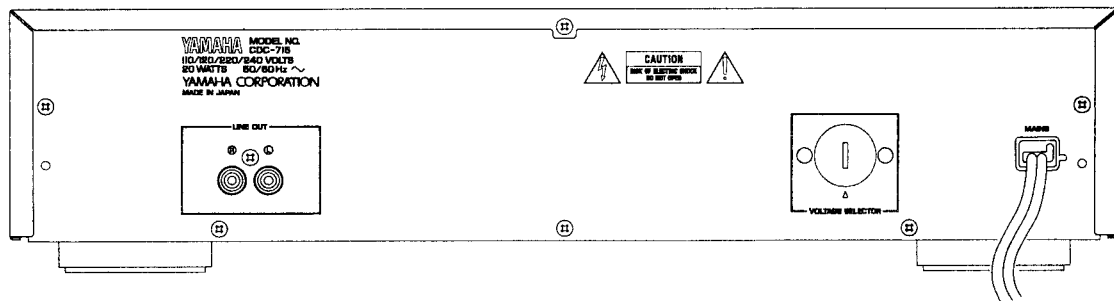
USA model



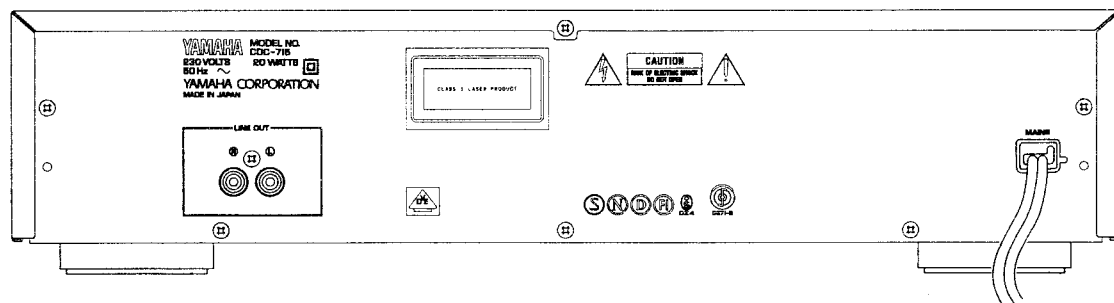
Canadian model



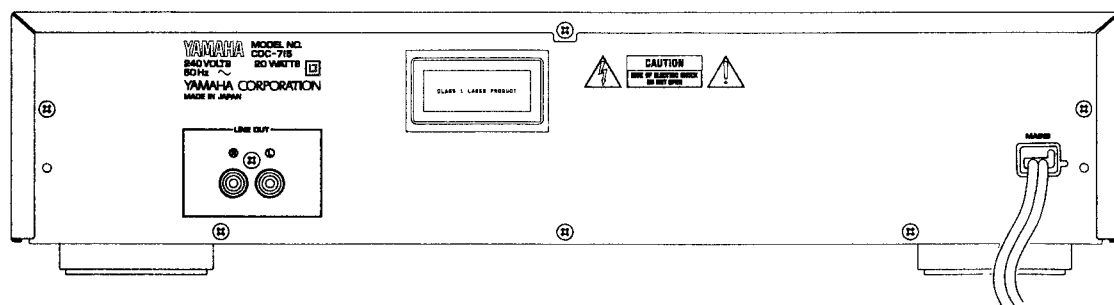
General model



European model



Australian & British models



■ SPECIFICATIONS

■ AUDIO SECTION

Frequency Response	2Hz~20kHz±0.5dB
De-Emphasis Equalization	±0.5dB
Harmonic Distortion+Noise	Less than 0.003%, (1kHz)
S/N Ratio	108dB
Dynamic Range	98dB
Wow & Flutter	Unmeasurable
Output Voltage	2.0±0.3V
Headphone Output (-20dB)	200mV ±40mV/150Ω

■ INTERNAL SYSTEM

Optical Pick-up	3-beam laser
Error Correction System	CIRC
D/A Conversion	1-bit 4-DAC system
Filter	8fs 18bit noise shaping Digital Filter

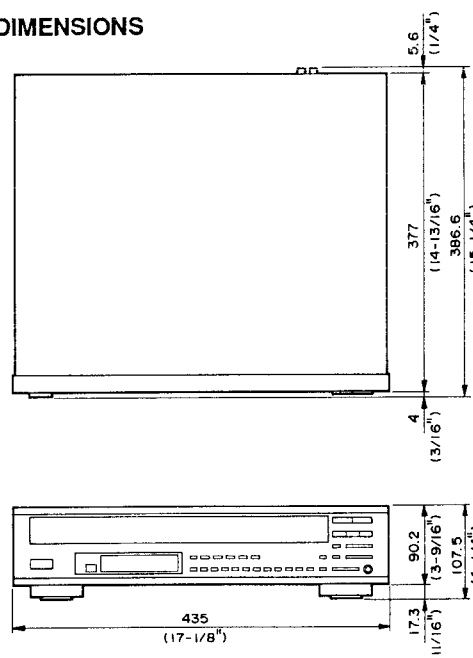
■ GENERAL

Power Requirements	
U, C models	120V AC 60Hz
A, B models	240V AC 50Hz
G model	230V 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.

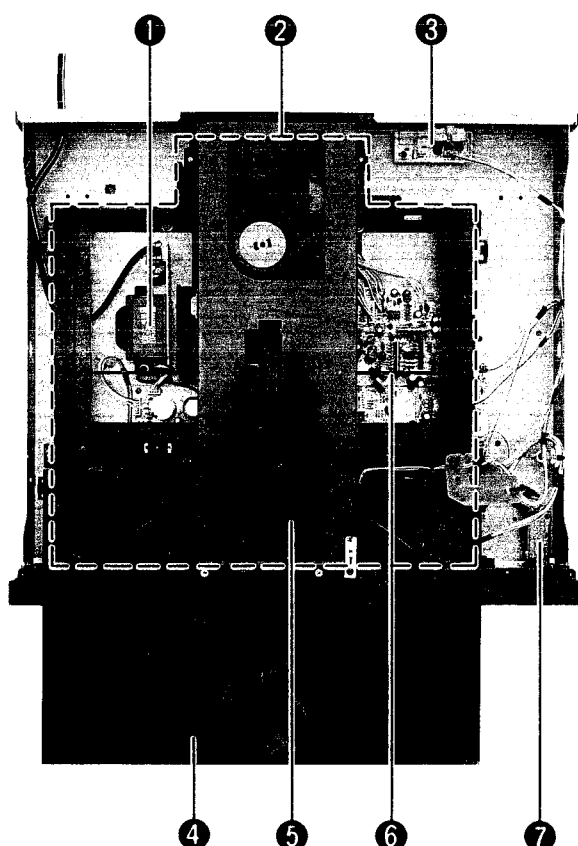
U USA model
 C Canadian model
 A Australian model
 B British model
 G European model
 R General model

● DIMENSIONS



Unit : mm (inch)

■ INTERNAL VIEW



- ① POWER TRANSFORMER
- ② CM-90XE UNIT
- ③ MAIN CIRCUIT BOARD (6)
- ④ TRAY ASS'Y
- ⑤ SHUTTER ASS'Y
- ⑥ MAIN CIRCUIT BOARD (1)
- ⑦ OPERATION CIRCUIT BOARD (4)

■ DISASSEMBLY PROCEDURES

(Remove parts in the order as numbered.)

Precaution for disassembly : Note that use of any screws other than 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.

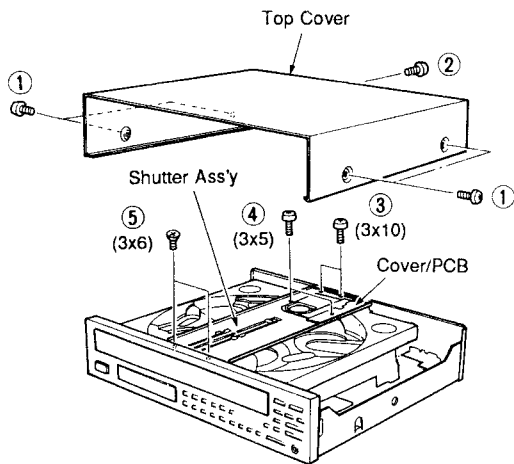
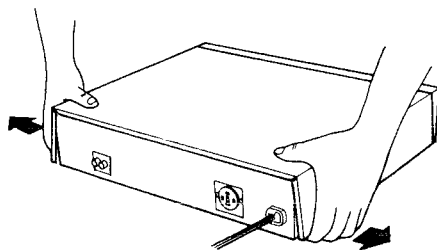


Fig. 1

- 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.

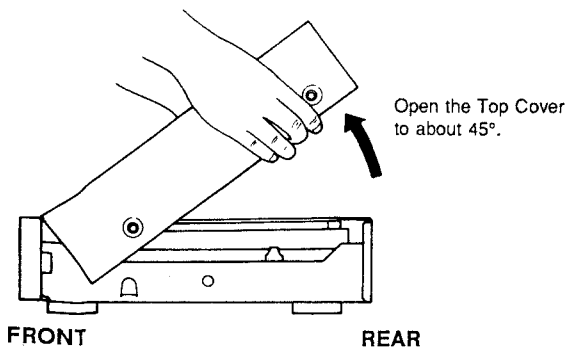


Fig. 3

- 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.

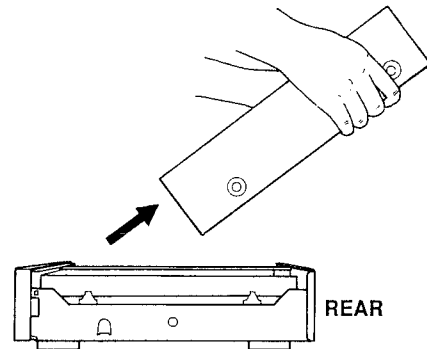


Fig. 4

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.

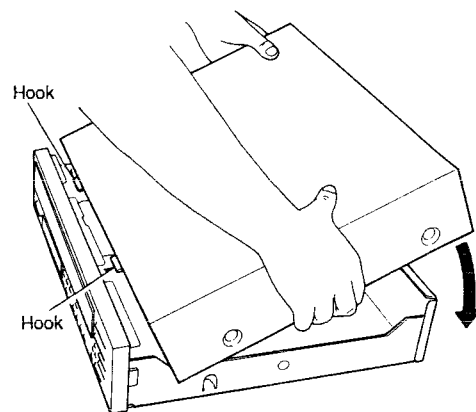
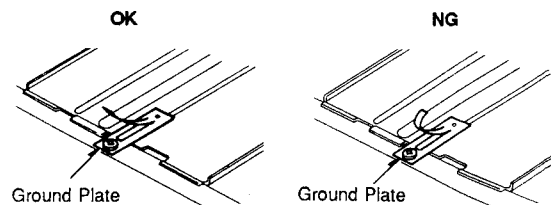


Fig. 5

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.

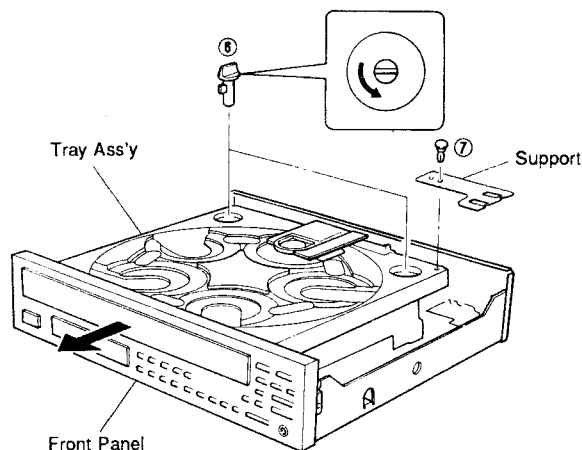


Fig. 6

5. Removal of CM-90XE Unit

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

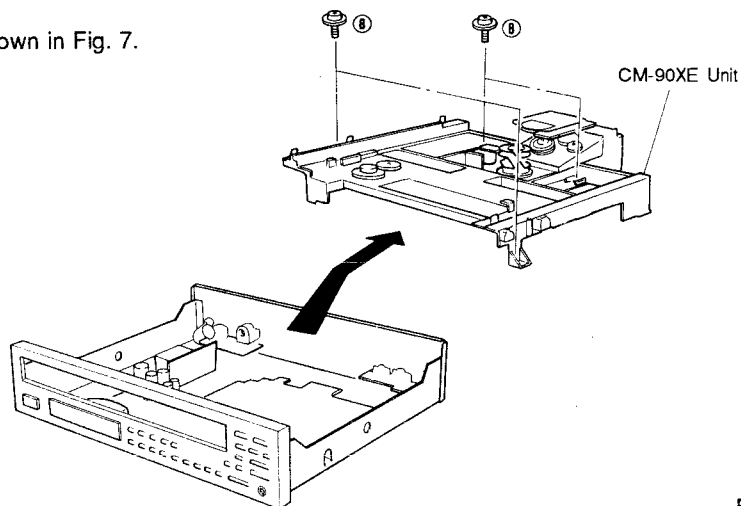


Fig. 7

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.

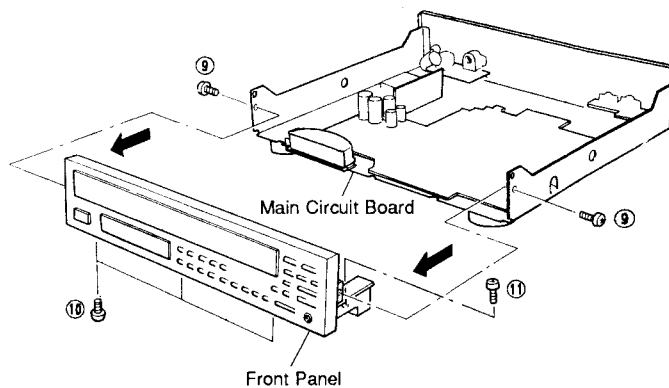


Fig. 8

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 14 for TEST mode explanation)
6. Press the "0" key. (DISC Clamper up)
7. Turn OFF the POWER switch.
8. Remove connectors CB1 to 4, 9 and 10 (Fig. 9) from the Main Circuit Board.
9. Remove the CM-90XE Unit.
10. Place the CM-90XE Unit upright and fix it with gummed tape. (Fig. 10)

11. Connect the following connectors which are the minimum requirements to the Main Circuit Board.

- 1) CB14
- 2) CB13
- 3) CB1, CB2, CB3
- 4) CB10

Note : CB1 and CB2 are both 8 pin.

CB1 : White
CB2 : 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 2 PCB Supports and 1 screw, and then 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-90XE Unit as shown in Fig. 12.

● Connector Diagram

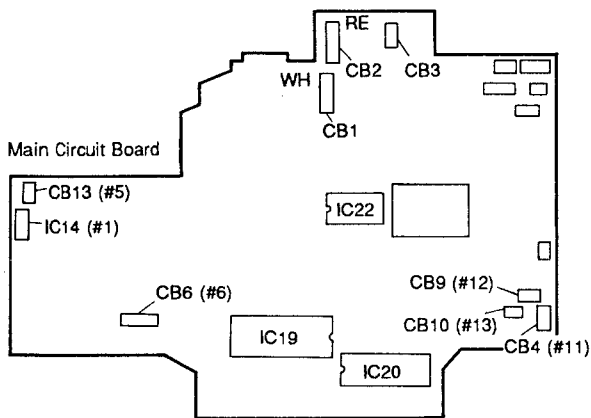


Fig.9

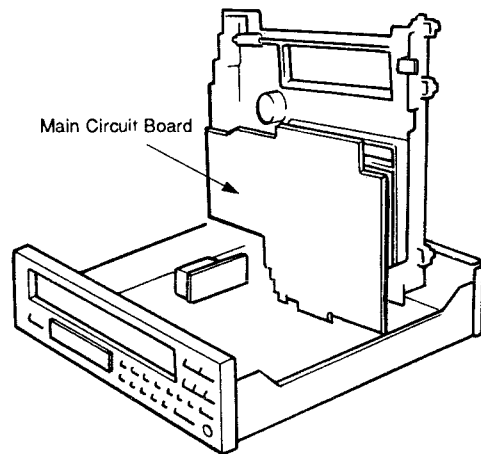


Fig.11

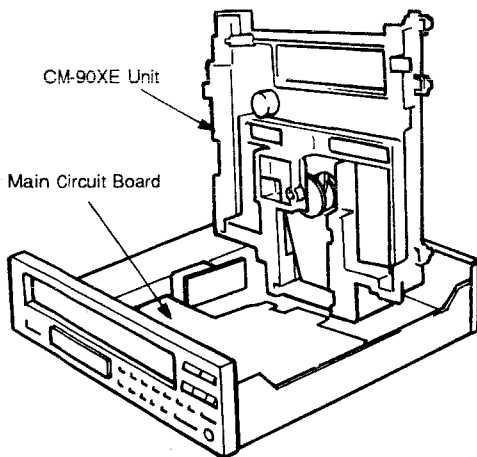


Fig.10

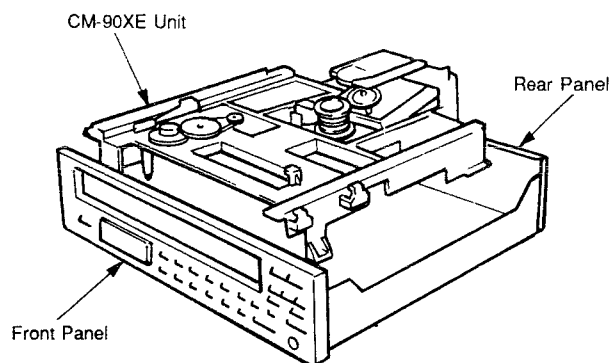
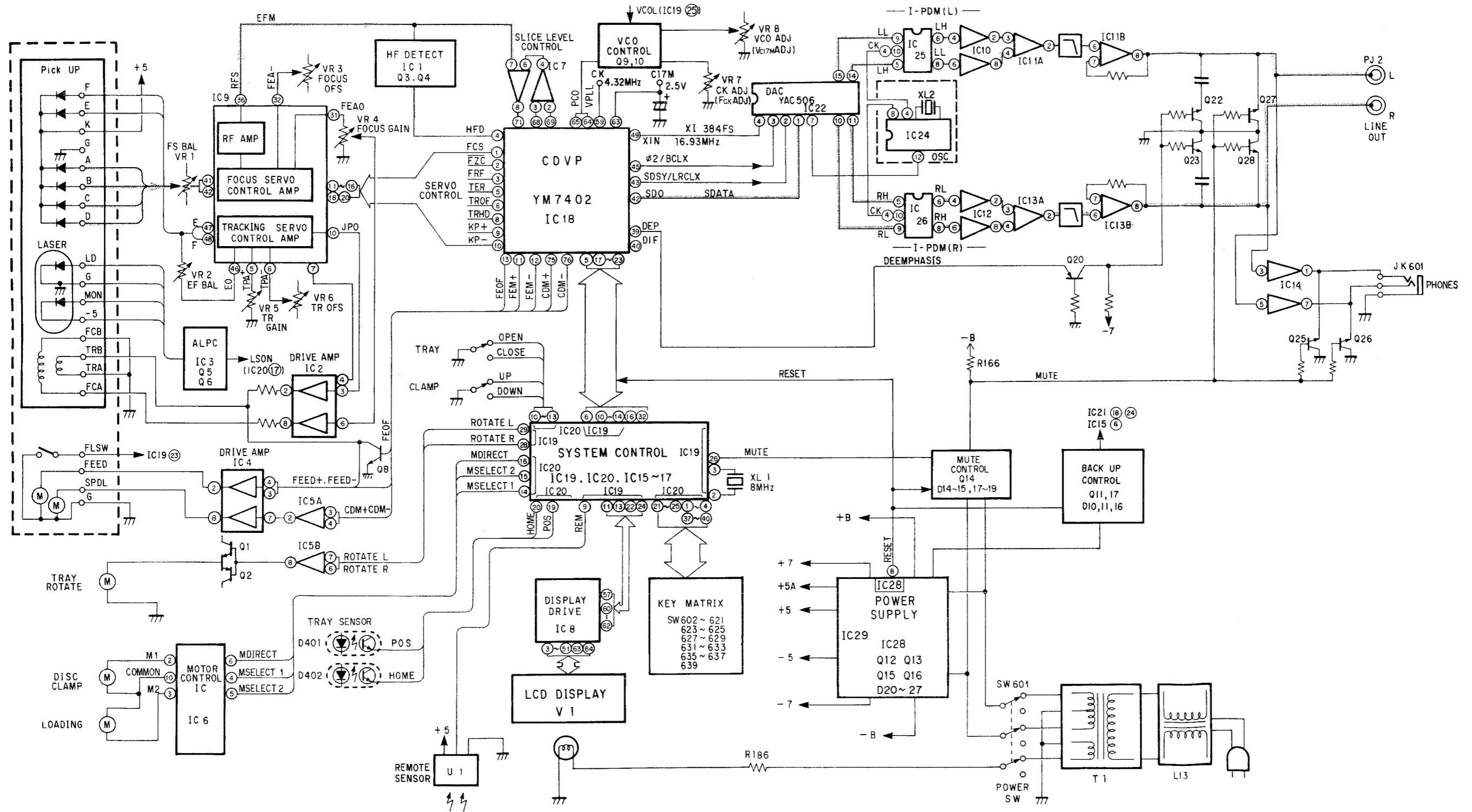


Fig. 12

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

Test disc

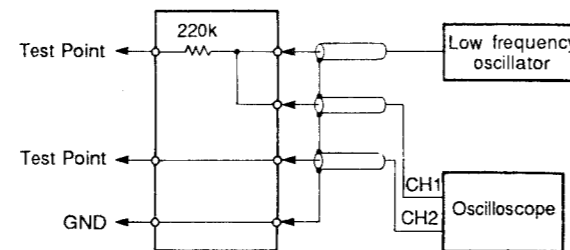
SONY YEDS-18 (P/No. TX911730),
A-BEX TCD-782 or PHILIPS 5 : x 1

Tools

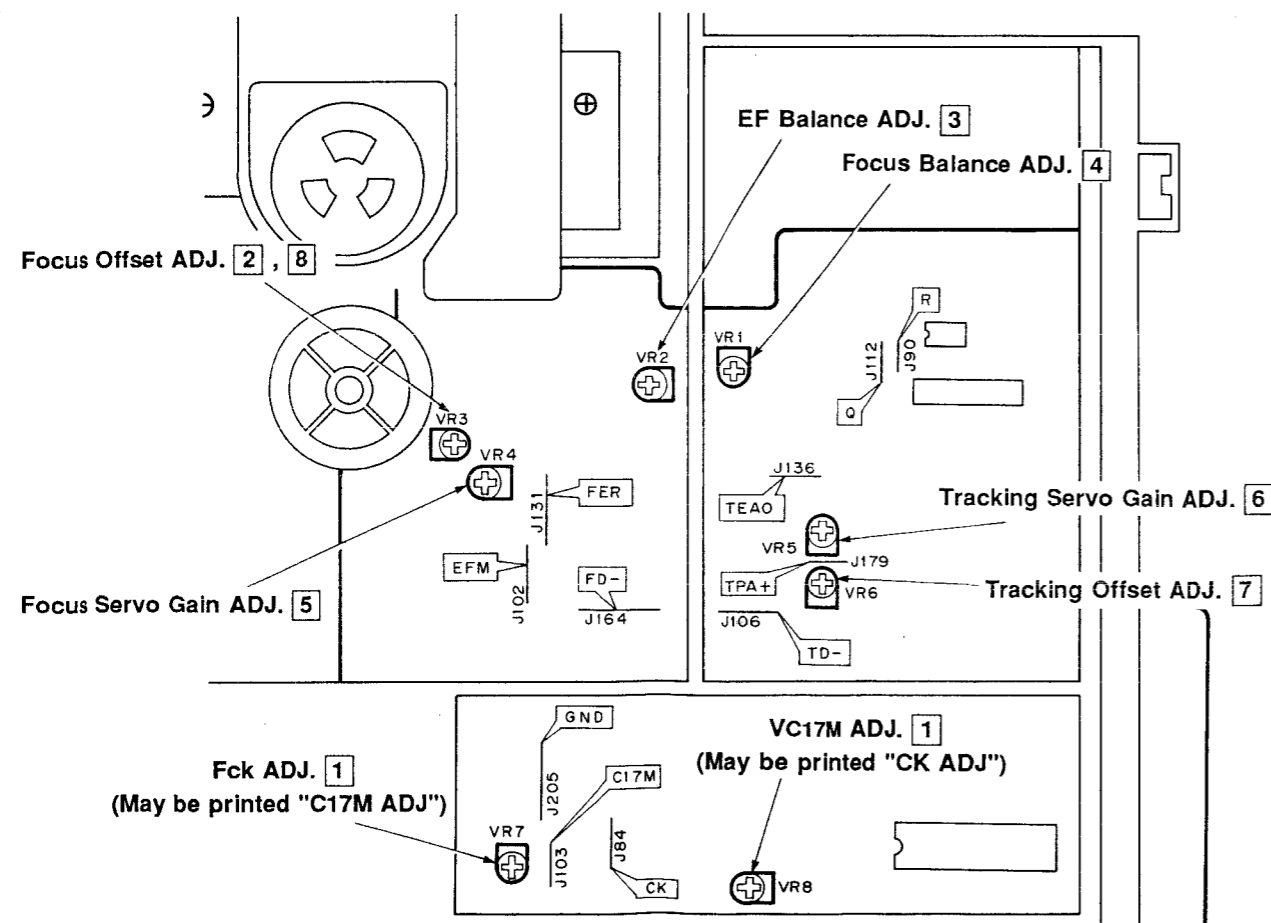
Screwdriver : x 1
(For Pre-set Potentiometer adjustment)

● Junction Circuit

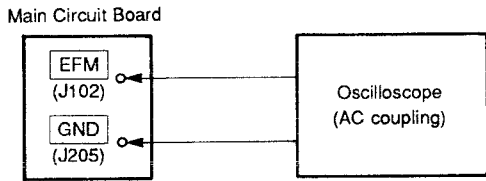
Used for focus gain and tracking gain adjustment.



● TEST POINTS

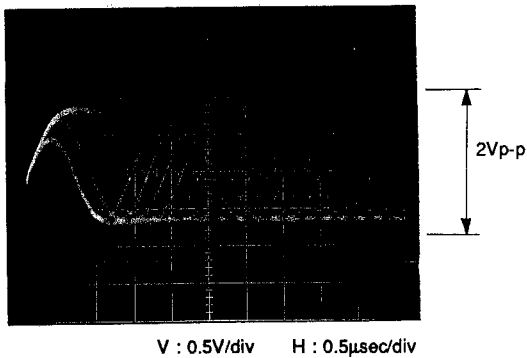


4 Focus balance (Jitter) adjustment

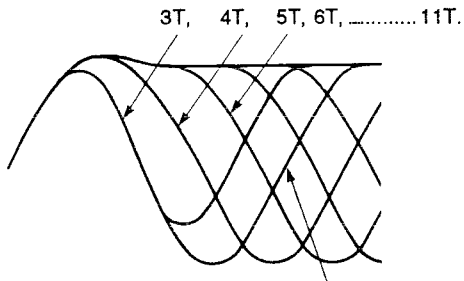


- ① Set to TEST mode.
 - ② Load the test disc.
 - ③ Press the "4" key .
 - ④ Play track 1 (0:00~0:30).
 - ⑤ Adjust VR1 so that a clear EFM signal (eye pattern) is obtained at the **EFM** terminal.
- *Set VR1 at the center unless there is any change.

Eye pattern



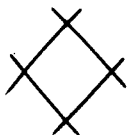
Waveforms 3T—11T.



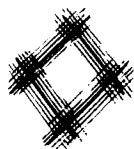
This portation is referred to as the eye pattern.

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

Good waveform

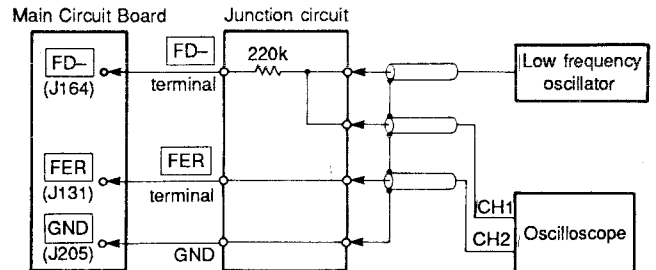


Abnormal waveform



5 Focus Servo gain adjustment

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

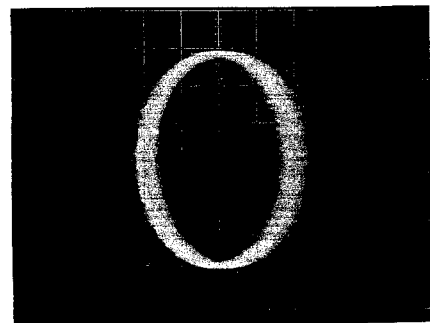


- ② Set to TEST mode.
- ③ Load the test disc.
- ④ Press the "4" key .
- ⑤ Apply a 2.0Vrms sine wave from the low frequency oscillator to the **FD-** terminal through a 220kΩ resistance as follows : *

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

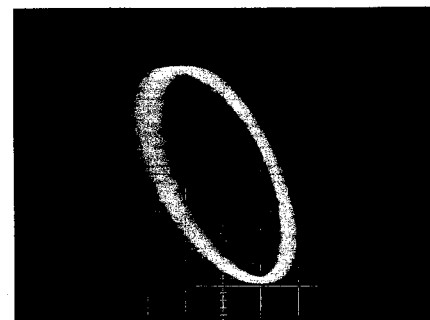
- ⑥ Adjust VR4 so that the phase difference between the **FD-** terminal and the **FER** terminal is 90°.

OK



90°

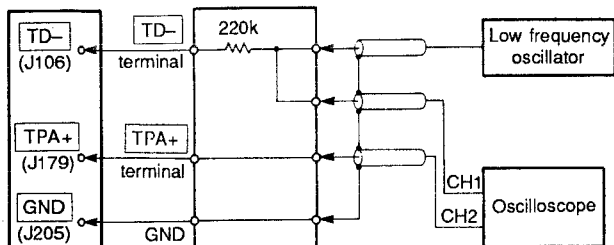
NG



6 Tracking Servo gain adjustment

- ① Connect an oscilloscope and a low frequency oscillator to the **TD-** terminal and the **TPA+** terminal as shown below.

Main Circuit Board

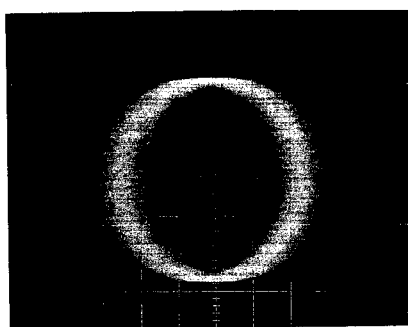


- ② Set to TEST mode.
- ③ Load the test disc.
- ④ Press the "4" key .
- ⑤ Apply a 100mVrms sine wave from the low frequency oscillator to the **TD-** terminal through a 220kΩ resistance as follows : *

Test disc	Frequency
YEDS-18	890Hz
TCD-782	780Hz
Philips 5	780Hz

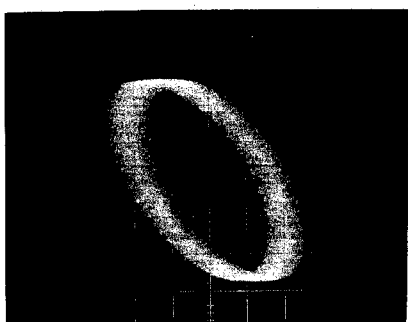
- ⑥ Adjust VR5 so that the phase difference between the **TD-** terminal and the **TPA+** terminal is 90°.

OK



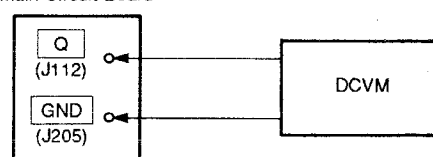
90°

NG



7 Tracking offset adjustment

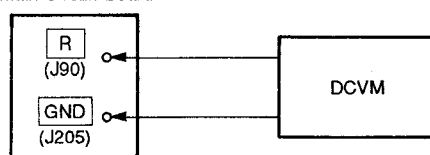
Main Circuit Board



- 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.
 $V_Q = 0V \pm 50mV \text{ DC}$

8 Focus offset adjustment

Main Circuit Board



- 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.
 $V_R = 0V \pm 100mV \text{ DC}$

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

■ TEST MODE

● Starting TEST mode

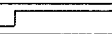
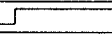
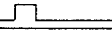
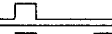
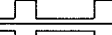
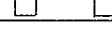
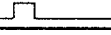
While pressing both the "4" and "7" keys, turn ON the POWER switch.

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.

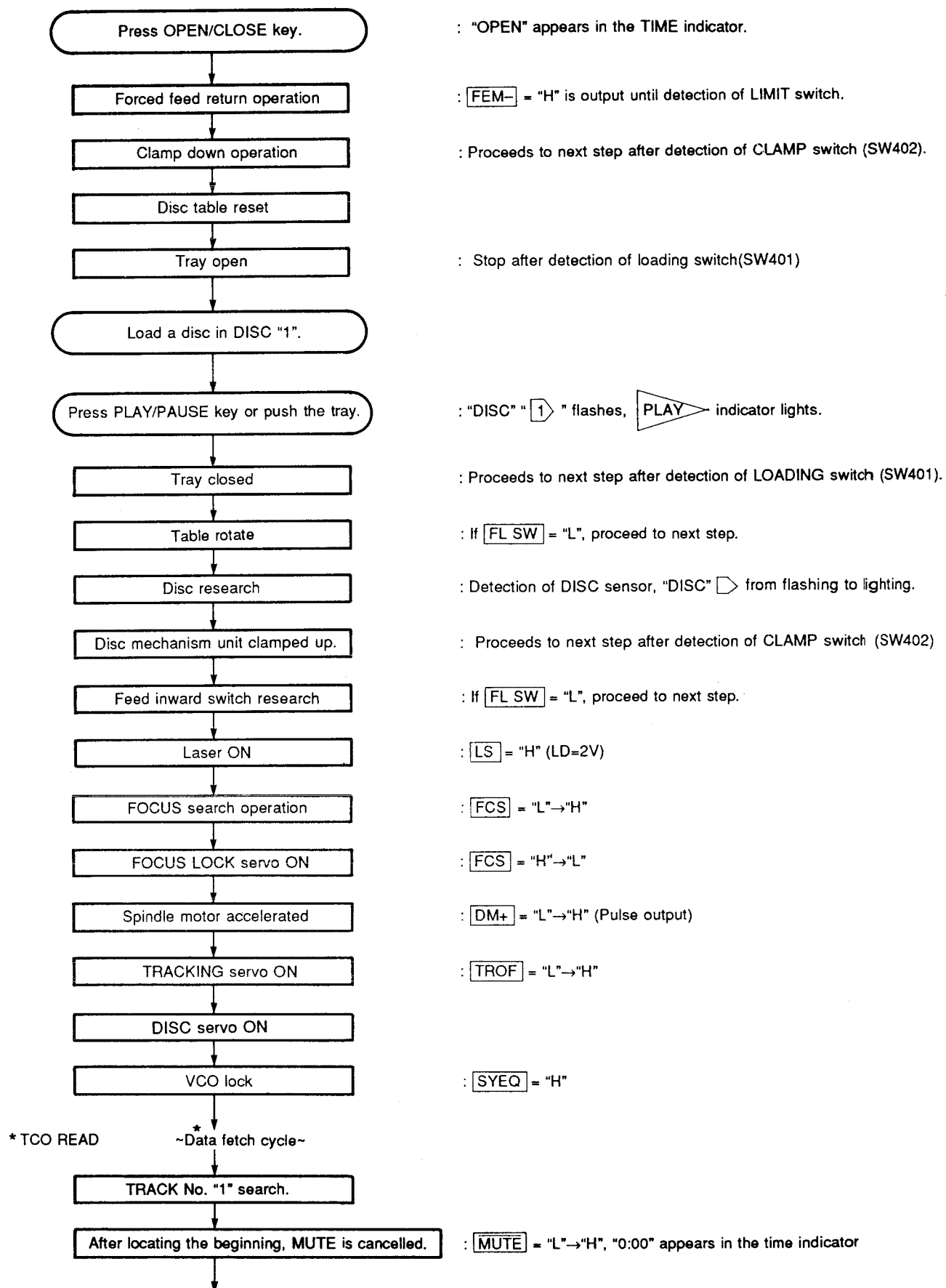
● TEST mode key descriptions

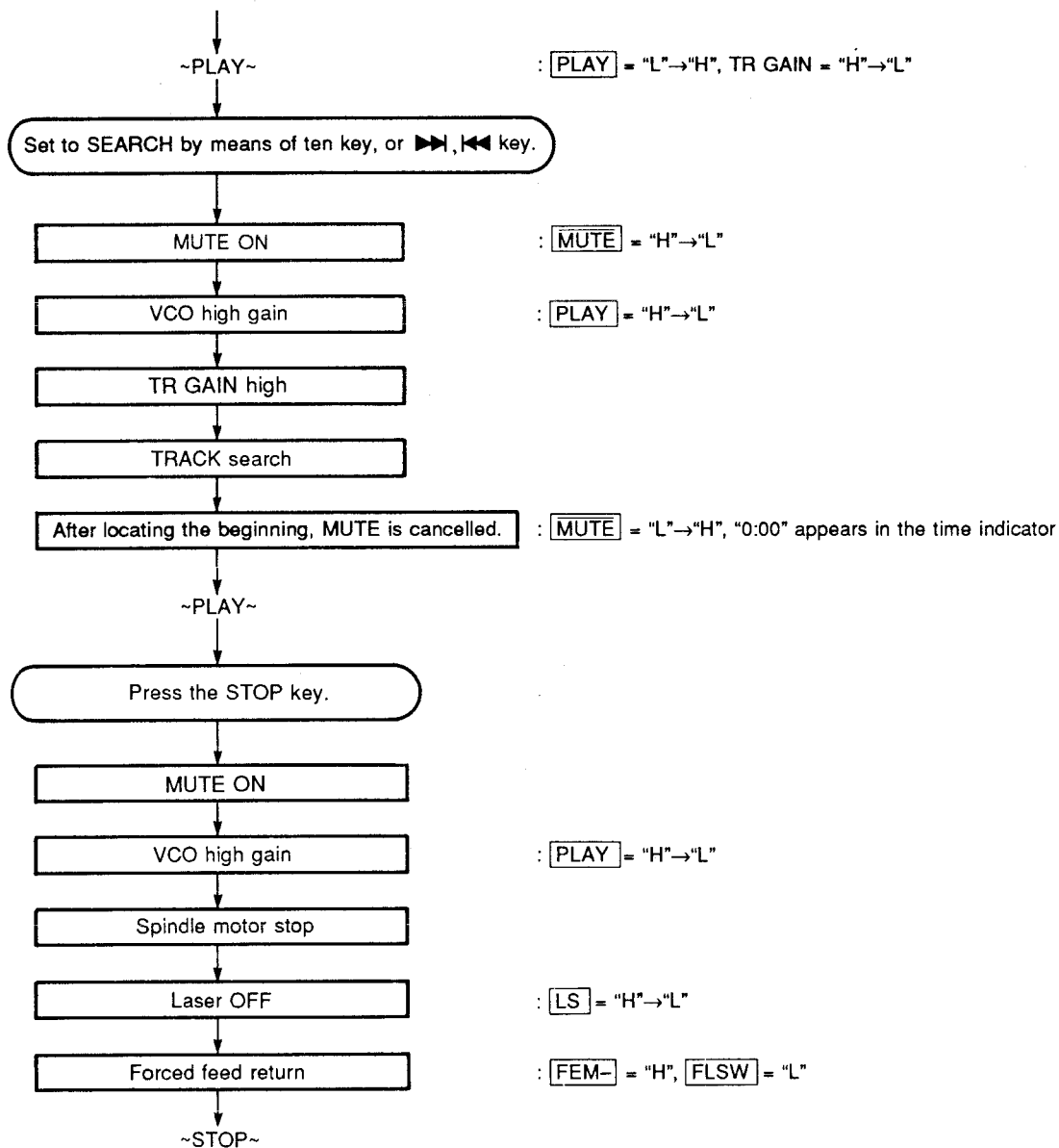
KEY	DESCRIPTION												
OPEN/CLOSE	Tray OPEN/CLOSE operation is executed according to the conditions of SW401 (Loading limit switch). <table><tr><td>Operation</td><td>Open</td><td>Close</td></tr><tr><td></td><td>H</td><td>H</td></tr><tr><td>Open</td><td>H</td><td>L</td></tr><tr><td>Close</td><td>L</td><td>H</td></tr></table> Operation (open or close) remains unchanged unless the condition of SW401 is changed.	Operation	Open	Close		H	H	Open	H	L	Close	L	H
Operation	Open	Close											
	H	H											
Open	H	L											
Close	L	H											
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/PAUSE	● 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".												
PLAY/XCHANGE	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	Spindle motor starts to turn and its speed increases.												
PROG	Spindle motor 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/SAVE	RAM TEST mode for checking circuit board. OK : MUTE = "L", NG : MUTE = "H"												

● μ -COM operation for each key

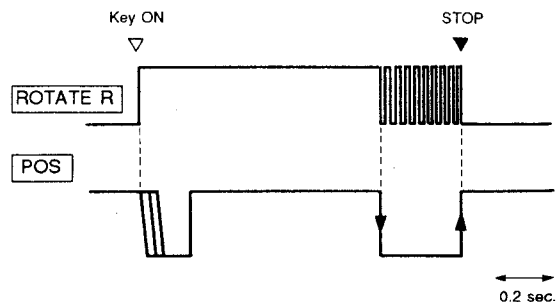
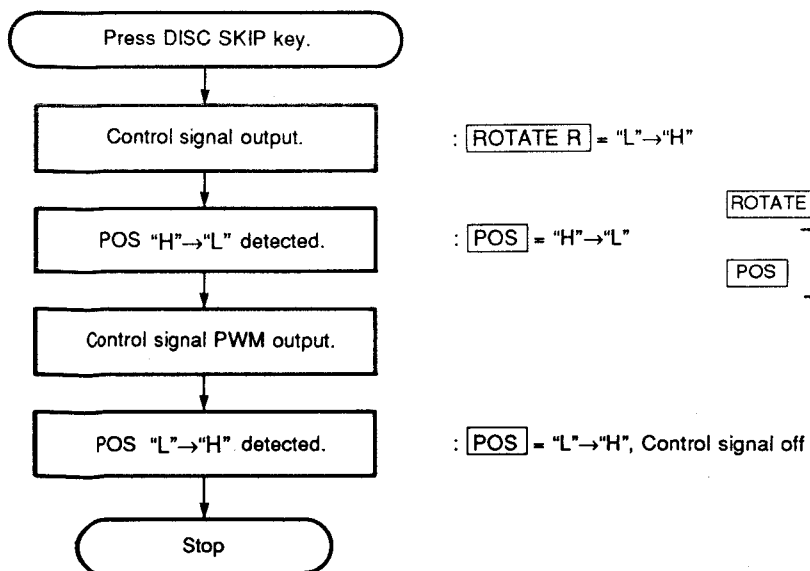
	LS	FCS	TROF	TRGL	PLAY	MUTE	FEOF	REMARKS
STOP	L	L	H		L		H	
PLAY/XCHANGE	H		H		L		H	Follow the focus search chart.
PLAY/PAUSE	—	—	L	H	H	H	L	
RANDOM	—	—	L	—	—	—	L	
REPEAT	—	—	H	—	—	—	—	
⏮	—	—					H	FE- 
⏭	—	—					H	FE+ 
⏪				L				KP- 
⏩				L				KP+ 
MODE								DM+ 
PROG								DM- 
TIME	H							
DISC 1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

■ STANDARD OPERATION CHART





● Tray Operation

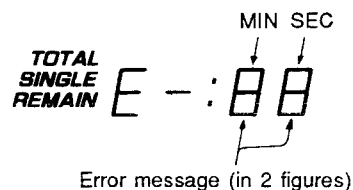


■ ERROR MESSAGES

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 and meaning

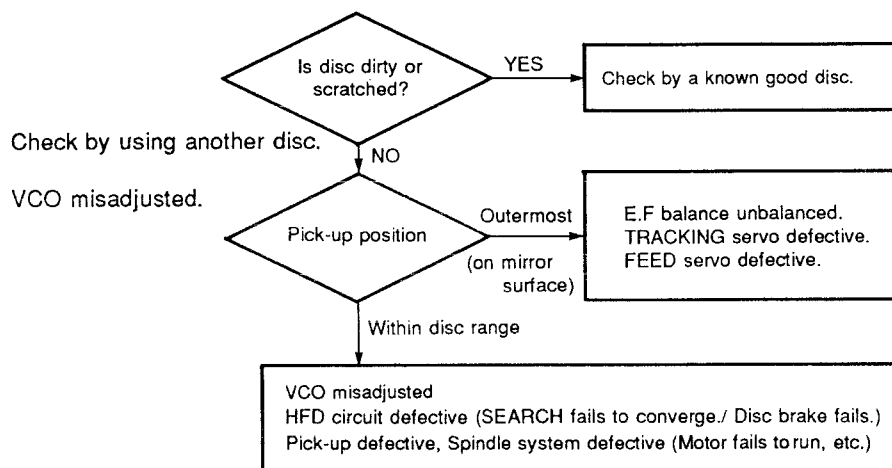
Error message	Meaning
X 0	No data reading executed after search.
X 1	Data reading failed in the midst of operation.
7 3	No data reading executed at start.
X 4	Tray closed but SW401 CLOSE SW failed to turn ON.
X 5	Tray opened but SW401 OPEN SW failed to turn OFF.
X 6	No disc table rotation.
X 7	Inward 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.

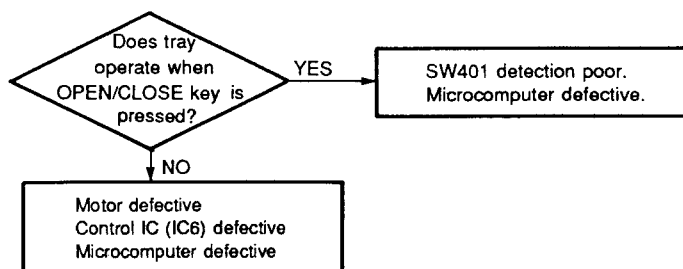
0 PLAY
 3 SCAN
 4 PAUSE
 5 SEARCH
 7 START
 8 STOP
 9 DISC SEARCH
 A EJECT
 C NO DISC

1) Error Code Troubleshooting

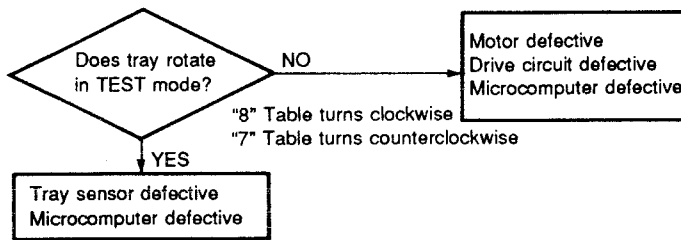
Error code **X0** , **X1** , **73** Data cannot be read.



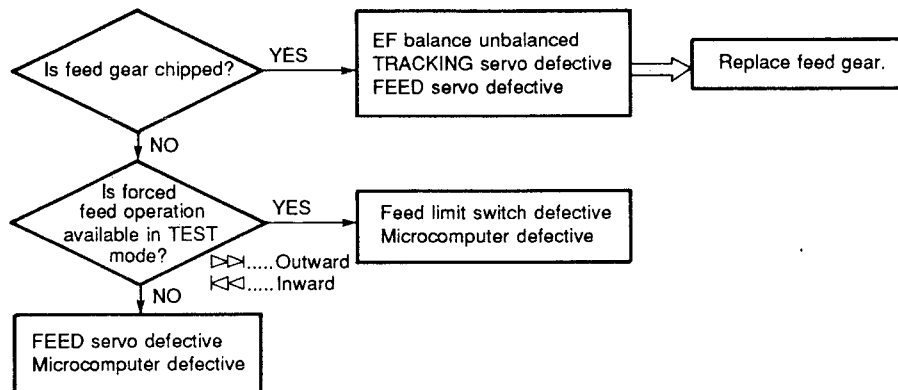
Error codes **X4** , **X5** Poor tray loading operation



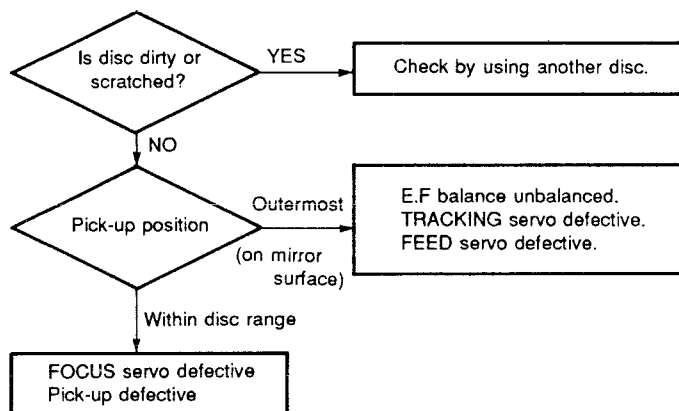
Error code **X6** Poor table rotation.



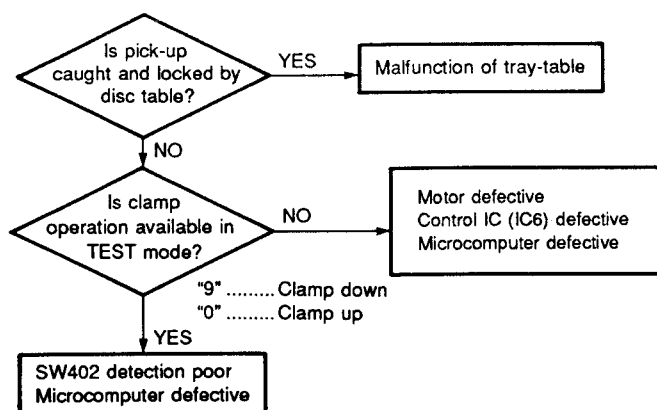
Error code **X7** FEED operation defective (Limit switch fails)



Error code **X8** Focus drops.

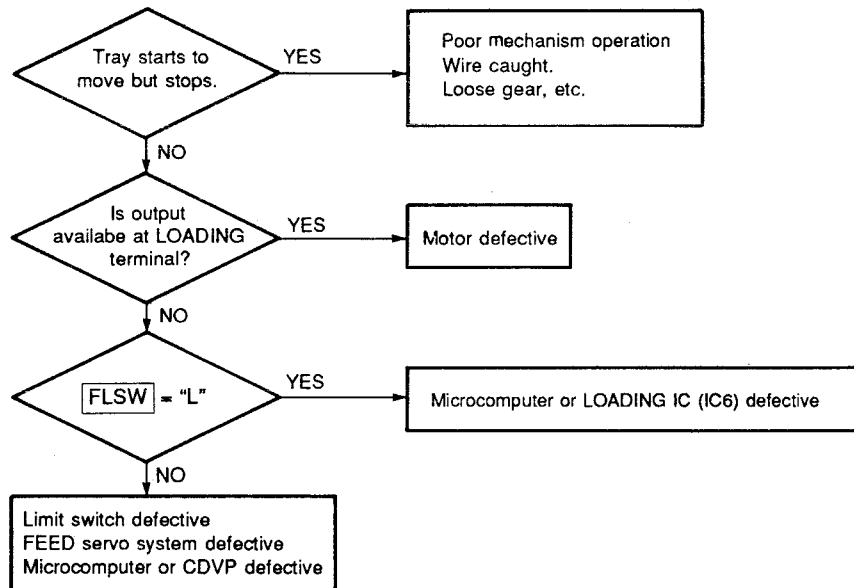


Error code **X9** , **XA** Poor Clamp operation

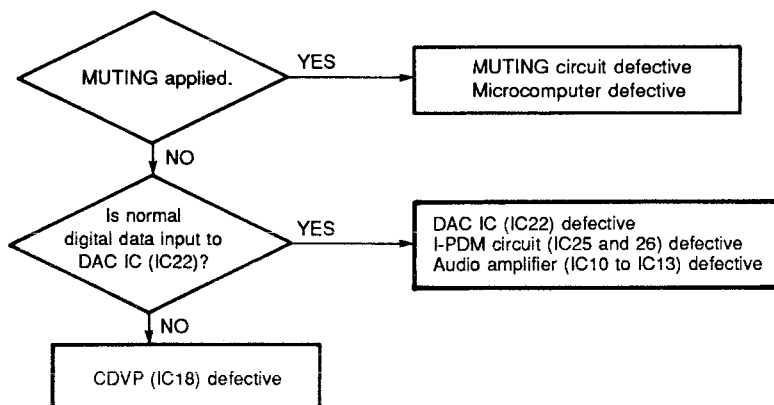


2) Troubleshooting from System Malfunctions

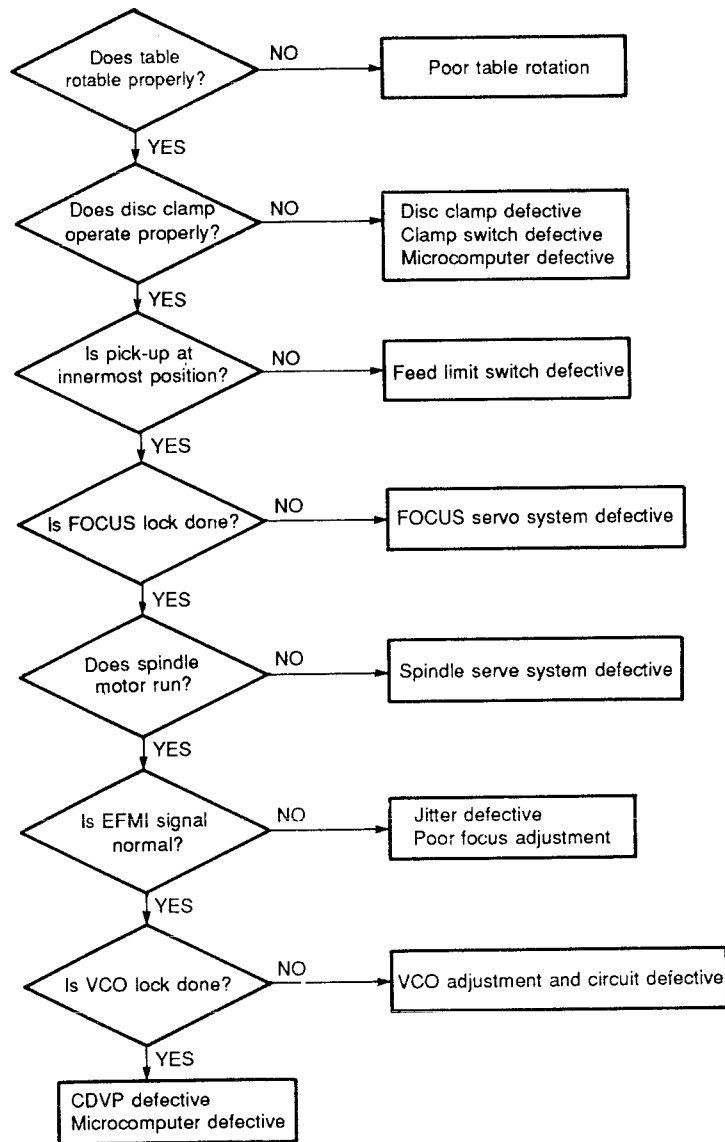
a) Tray fails to come out/go in.



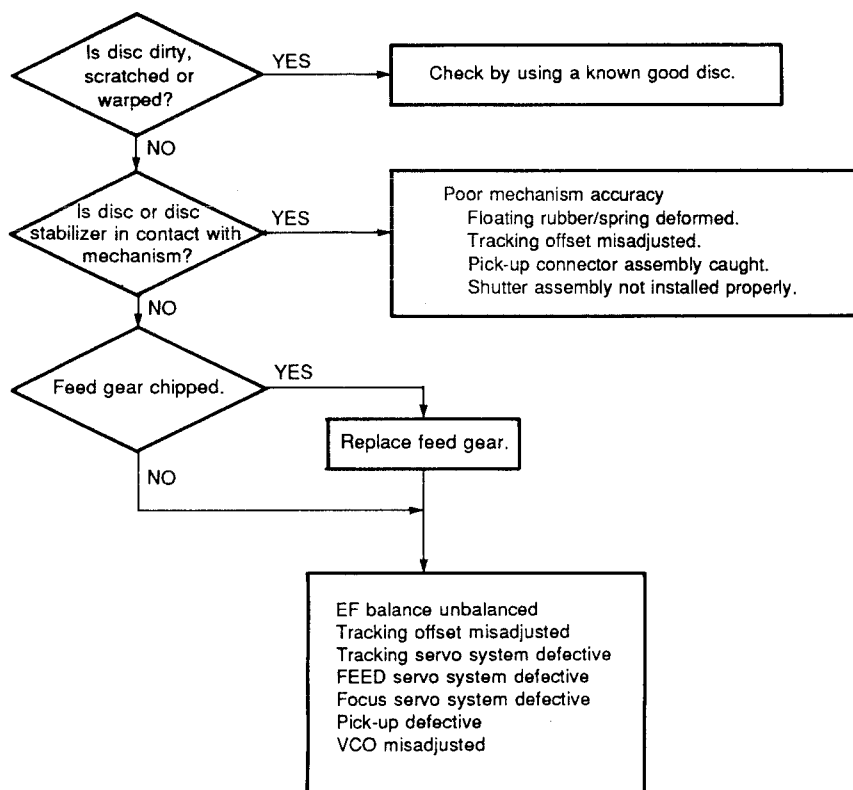
b) No sound generated, Sound cut during play (but time display advances properly.)



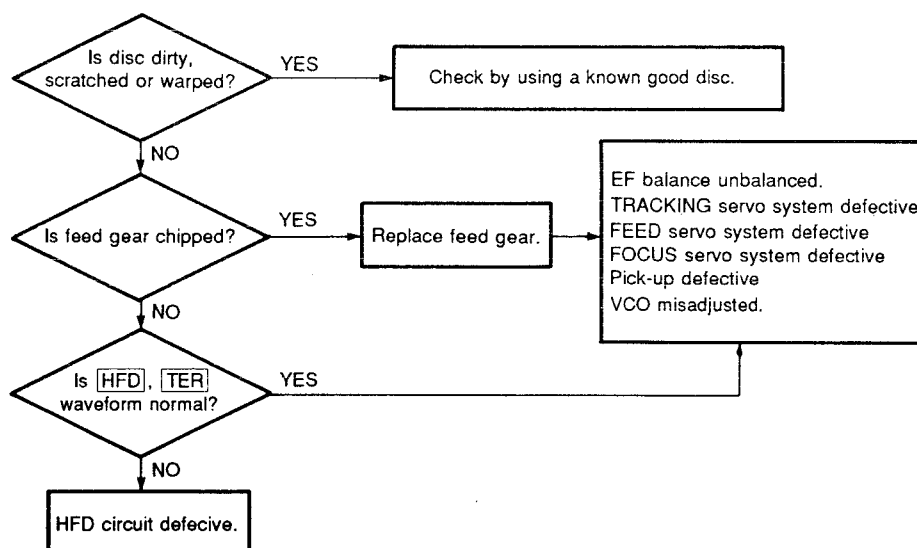
c) Operates as if no disc loaded (although loaded)



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



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



2400



■ PRINTED CIRCUIT BOARD (Parts side)

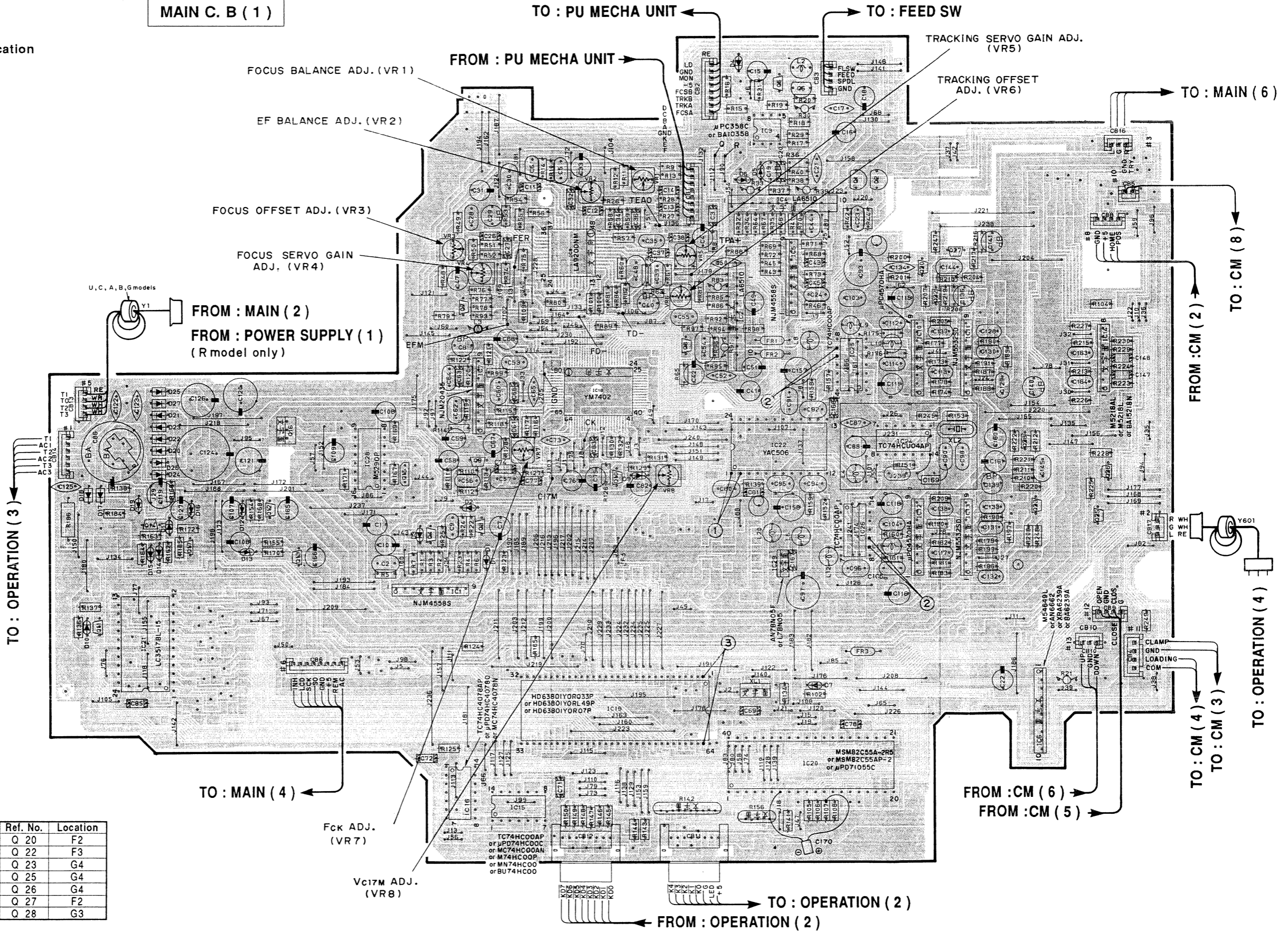
① to ③ : WAVEFORM OF TEST POINT (See page 40)

MAIN C. B (1)

● Semiconductor Location

Ref. No.	Location
D 1	D4
D 2	D4
D 3	D4
D 4	E1
D 5	E2
D 6	E2
D 7	F5
D 9	E4
D 10	B4
D 11	B4
D 12	C4
D 13	C4
D 14	B4
D 15	B4
D 16	B4
D 17	B4
D 18	B4
D 19	B4
D 20	B3
D 21	B3
D 22	B3
D 23	B3
D 24	B4
D 25	B3
D 26	B3
D 27	B3
IC 1	C4
IC 2	E3
IC 3	E2
IC 4	E2
IC 5	E3
IC 6	G5
IC 7	D3
IC 9	D2
IC 10	F3
IC 11	F3
IC 12	F4
IC 13	F4
IC 14	G3
IC 15	D5
IC 16	D5
IC 18	D3
IC 19	D5
IC 20	E5
IC 21	B4
IC 22	E3
IC 23	E4
IC 24	F3
IC 25	F3
IC 26	F4
IC 28	C3
IC 29	E4
Q 1	F2
Q 2	F2
Q 3	D4
Q 4	D4
Q 5	E2
Q 6	E2
Q 7	D3
Q 8	E3
Q 9	D3
Q 10	E4
Q 11	B4
Q 12	C4
Q 13	C4
Q 14	B4
Q 15	C4
Q 16	C3
Q 17	B4
Q 20	F2
Q 22	F3
Q 23	G4
Q 25	G4
Q 26	G4
Q 27	F2
Q 28	G3

Ref. No.	Location
Q 20	F2
Q 22	F3
Q 23	G4
Q 25	G4
Q 26	G4
Q 27	F2
Q 28	G3

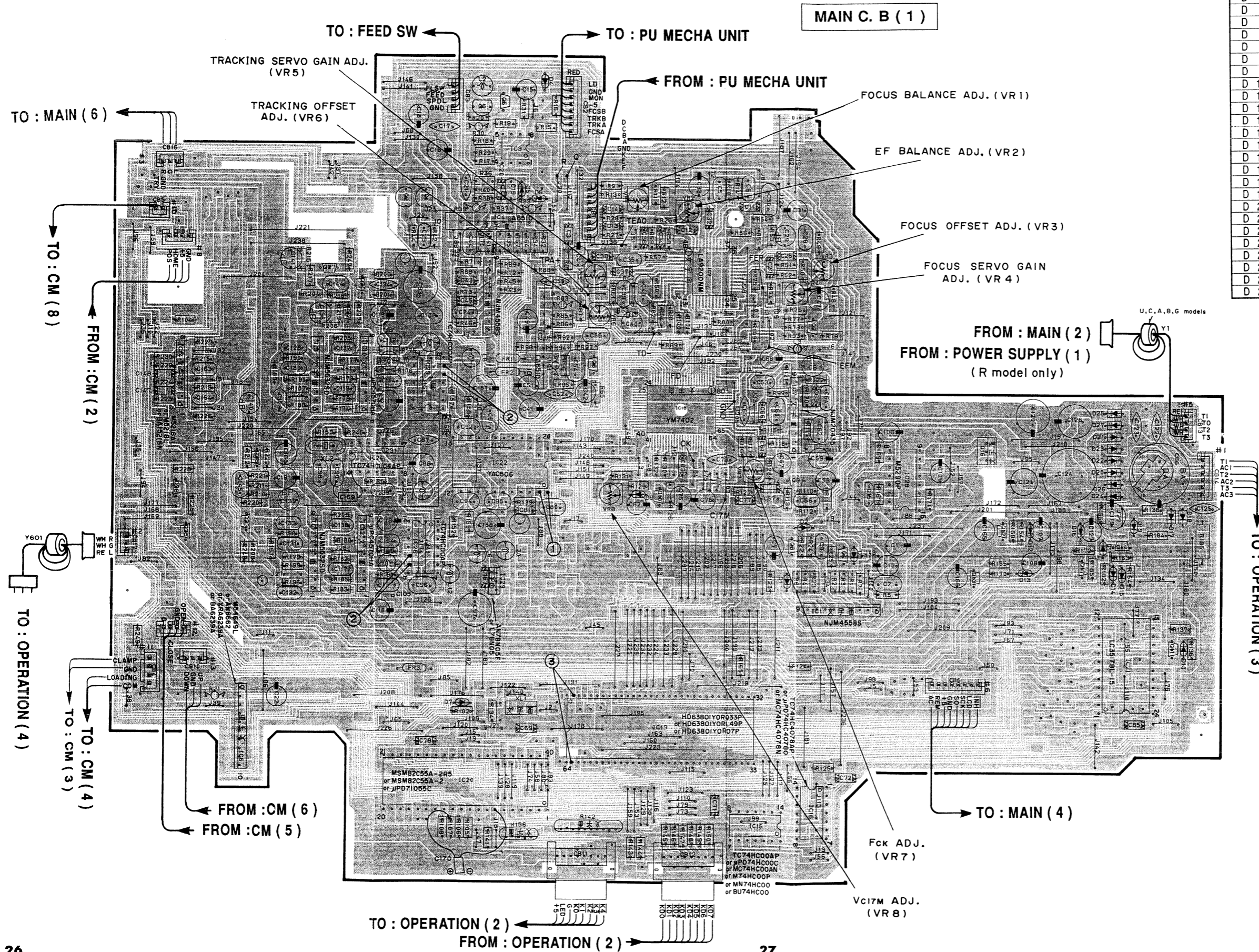


■ PRINTED CIRCUIT BOARD (Foil side)

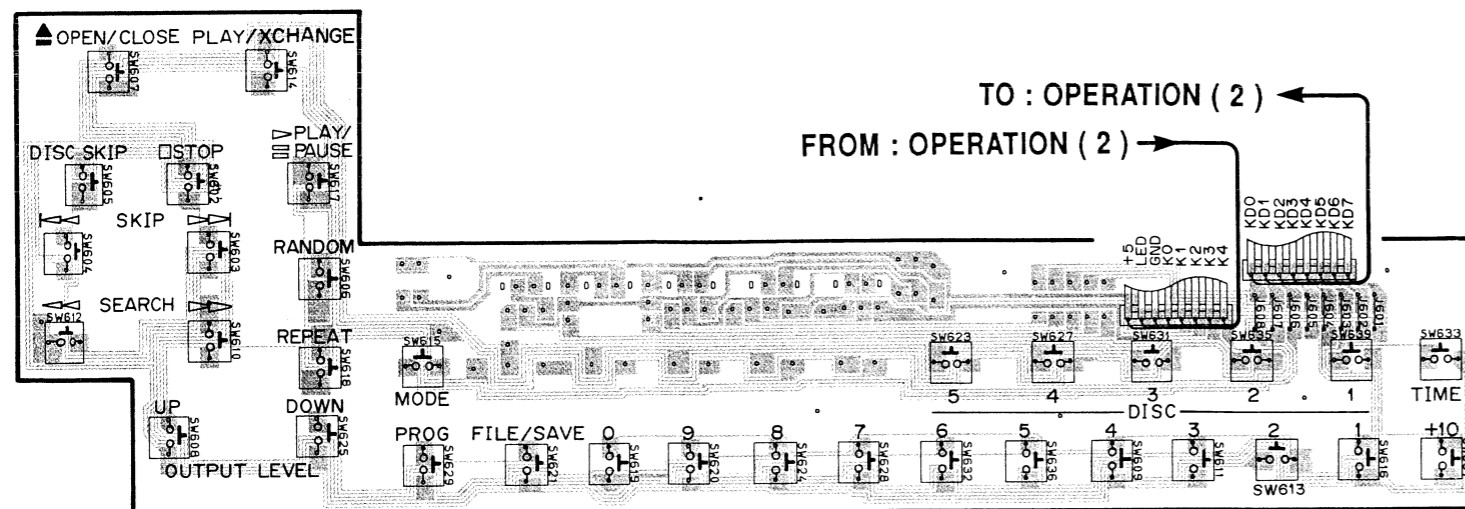
① to ③ : WAVEFORM OF TEST POINT (See page 40)

● Semiconductor Location

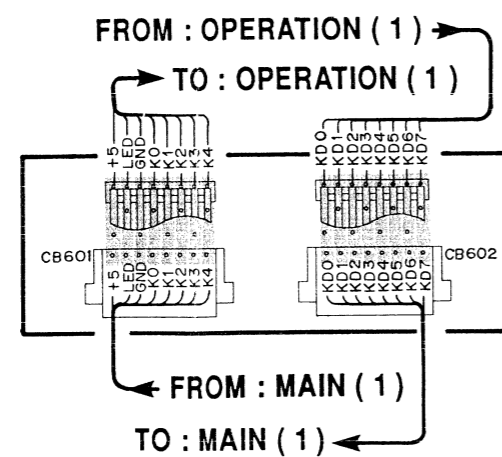
Ref. No.	Location	Ref. No.	Location
D 1	E4	IC 1	E4
D 2	E4	IC 2	C3
D 3	E4	IC 3	C2
D 4	C1	IC 4	C2
D 5	C2	IC 5	C2
D 6	C2	IC 6	B5
D 7	C5	IC 7	E3
D 9	D4	IC 9	D2
D 10	G4	IC 10	C3
D 11	F4	IC 11	B3
D 12	F4	IC 12	C4
D 13	F4	IC 13	B4
D 14	F4	IC 14	B3
D 15	F4	IC 15	E5
D 16	F4	IC 16	E5
D 17	G4	IC 18	D3
D 18	G4	IC 19	D5
D 19	G4	IC 20	C5
D 20	F3	IC 21	F4
D 21	F3	IC 22	C3
D 22	F3	IC 23	D4
D 23	F3	IC 24	C3
D 24	F4	IC 25	C3
D 25	F3	IC 26	C4
D 26	F3	IC 28	E3
D 27	F3	IC 29	C4
Q 1	C2	Q 1	C2
Q 2	C2	Q 2	C2
Q 3	E4	Q 3	E4
Q 4	E4	Q 4	E4
Q 5	C1	Q 5	C1
Q 6	C2	Q 6	C2
Q 7	E3	Q 7	E3
Q 8	D3	Q 8	D3
Q 9	E3	Q 9	E3
Q 10	D4	Q 10	D4
Q 11	G4	Q 11	G4
Q 12	F4	Q 12	F4
Q 13	F4	Q 13	F4
Q 14	F4	Q 14	F4
Q 15	E4	Q 15	E4
Q 16	F3	Q 16	F3
Q 17	F4	Q 17	F4
Q 20	C2	Q 20	C2
Q 22	B3	Q 22	B3
Q 23	B4	Q 23	B4
Q 25	B4	Q 25	B4
Q 26	B3	Q 26	B3
Q 27	B2	Q 27	B2
Q 28	B3	Q 28	B3



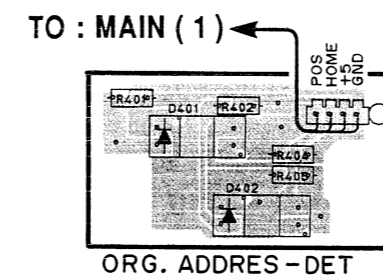
OPERATION C. B (1)



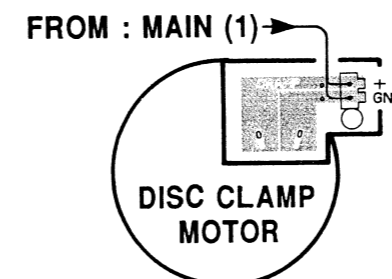
OPERATION C. B (2)



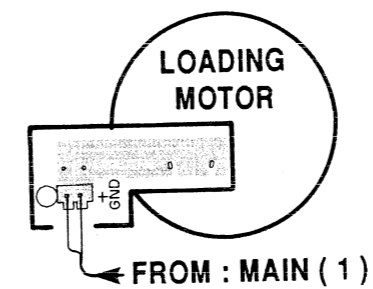
CM C. B (2)



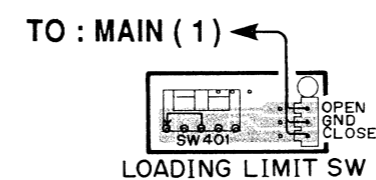
CM C. B (3)



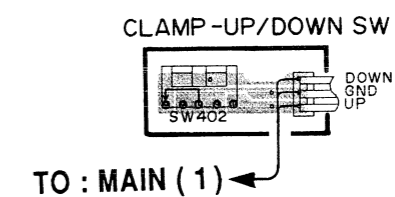
CM C. B (4)



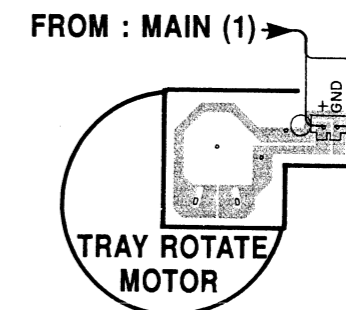
CM C. B (5)



CM C. B (6)

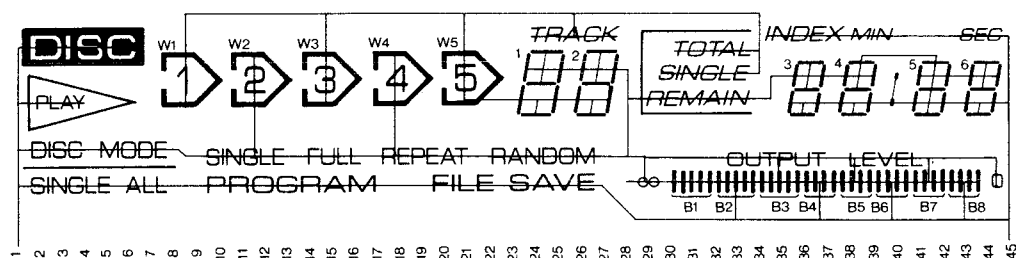
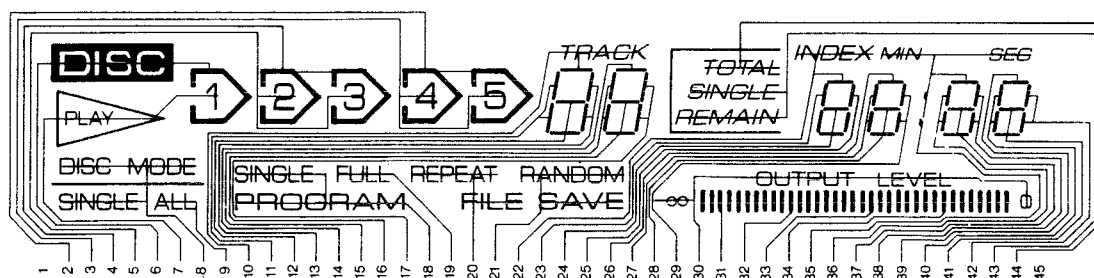


CM C. B (8)



■ DISPLAY DATA

V1 : 8122BJP



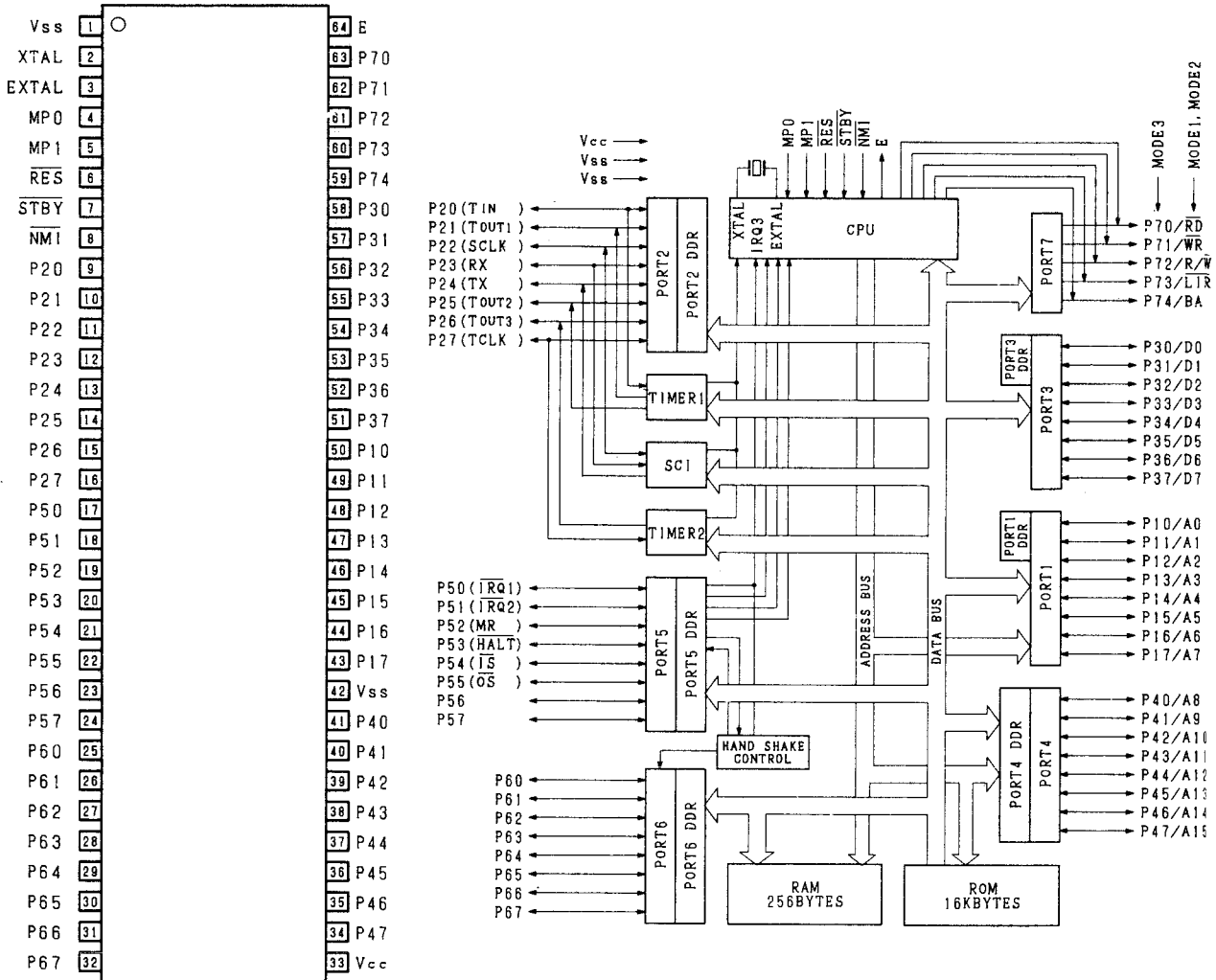
	COM 1	COM 2		COM 1	COM 2		COM 1	COM 2
1	COM	—	16	2g	2d	31	B1	B2
2	W4	W5	17	2b	2c	32	B3	B4
3	4	5	18	SINGLE	PROGRAM	33	B5	B6
4	W2	W3	19	FULL	—	34	B7	B8
5	2	3	20	REPEAT	FILE	35	5a	2)
6	DISC	W1	21	RANDOM	SAVE	36	5f	5e
7	PLAY	1	22	3a	INDEX	37	5g	5d
8	DISC MODE	SINGLE	23	3f	3e	38	5b	5c
9	—	ALL	24	3g	3d	39	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	2e	30	1)	—	45	—	COM

1) $-\infty$ OUTPUT LEVEL 0

2) MIN. SEC. COL

IC DATA

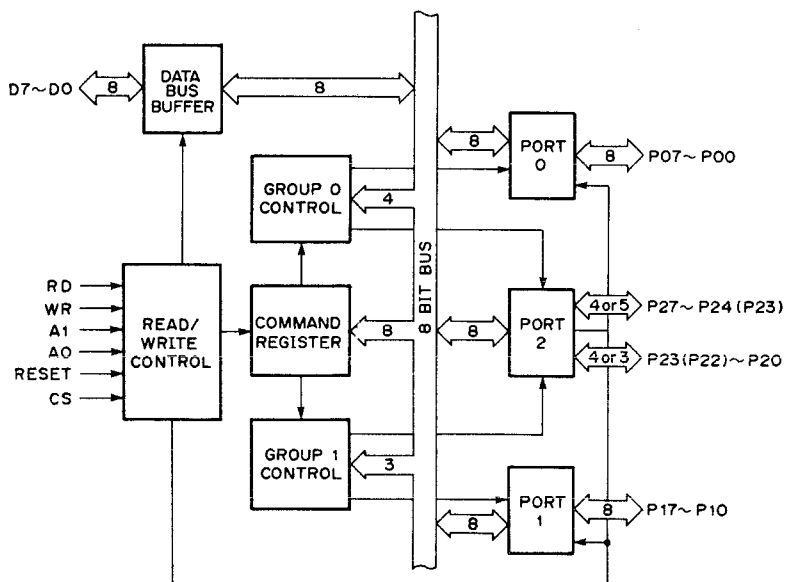
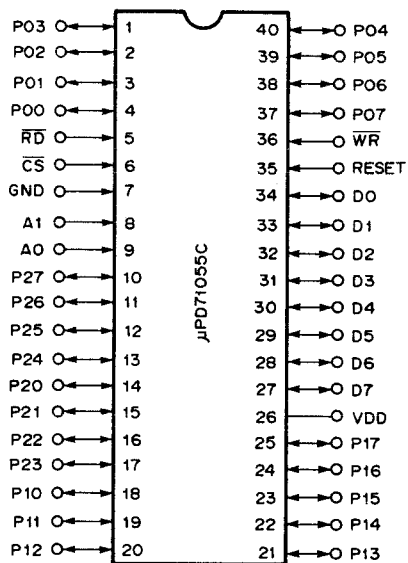
IC19 : HD63BOIY
8 bit μ -COM



Pin No.	Pin Name	I/O	Active	Function
1	VSS			GND
2	XTAL			XTAL
3	E XTAL			External clock (8MHz).
4	MP1	I	H	Sets μ -COM mode for built-in ROM and external RAM.
5	MP0	I	L	
6	RESET	I		Option starts at $\text{---}\rightarrow$ and stops at $\text{---}\rightarrow$ (POWER ON \rightarrow H)
7	STBY	I	H	Unused.
8	NMI	I	H	
9	REM	I		Input from remote control signal.

Pin No.	Pin Name	I/O	Active	Function
10	R/W	O		Serial data of YM7402 and LC7582.
11	SCK	O		
12	SI	I		
13	SO	O		
14	WQ	I		
15	GAIN	O		Gain control. (Unused)
16	TER	I		TER (Track count signal) input.
17	VLDN	O		Digital volume control down for CDVP (YM7402).
18	EXT R/W	I/O		2nd output, 20ms synchronous when RELAY PLAY connected. (Unused)
19	EXT DATA	I/O		Data input/output when RELAY PLAY connected. (Unused)
20	VLUP		H	Digital volume control up for CDVP (YM7402).
21	EXT CK	I/O		Clock input/output when RELAY PLAY connected. (Unused)
22	INH	I	L	LCD Display driver.
23	FL SW	I	L	Feed inward detect switch, Switch ON at "L".
24	LCD	O	H	LCD Display driver (LC7582) chip select.
25	VCOLOR	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	LED	O		DEQ LED control.
28	TBL-R	O	H	Table rotate R (Clockwise).
29	TBL-L	O	H	Table rotate L (Counterclockwise).
30	DEQ			YM6104 chip select. (Unused)
31	D/A cont	I		Digital/Analog select.
32	CDVP	O	L	YM7402 chip select.
33	VDD			+5V
34	A15	O		Address output to 82C55 and LC3517BL-15.
35	A14	O		
36	A13	O		
37	A12	O		
38	A11	O		
39	A10	O		
40	A9	O		
41	A8	O		
42				
43	A7	O		
44	A6	O		
45	A5	O		
46	A4	O		
47	A3	O		
48	A2	O		
49	A1	O		
50	A0	O		
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			2MHz cycle pulse(used as clock when data is transmitted to DEQ). (Unused)

IC20 : MSM82C55A-2RS, M5M82C55AP-2 or μ PD71055C
Programmable Peripheral Interface



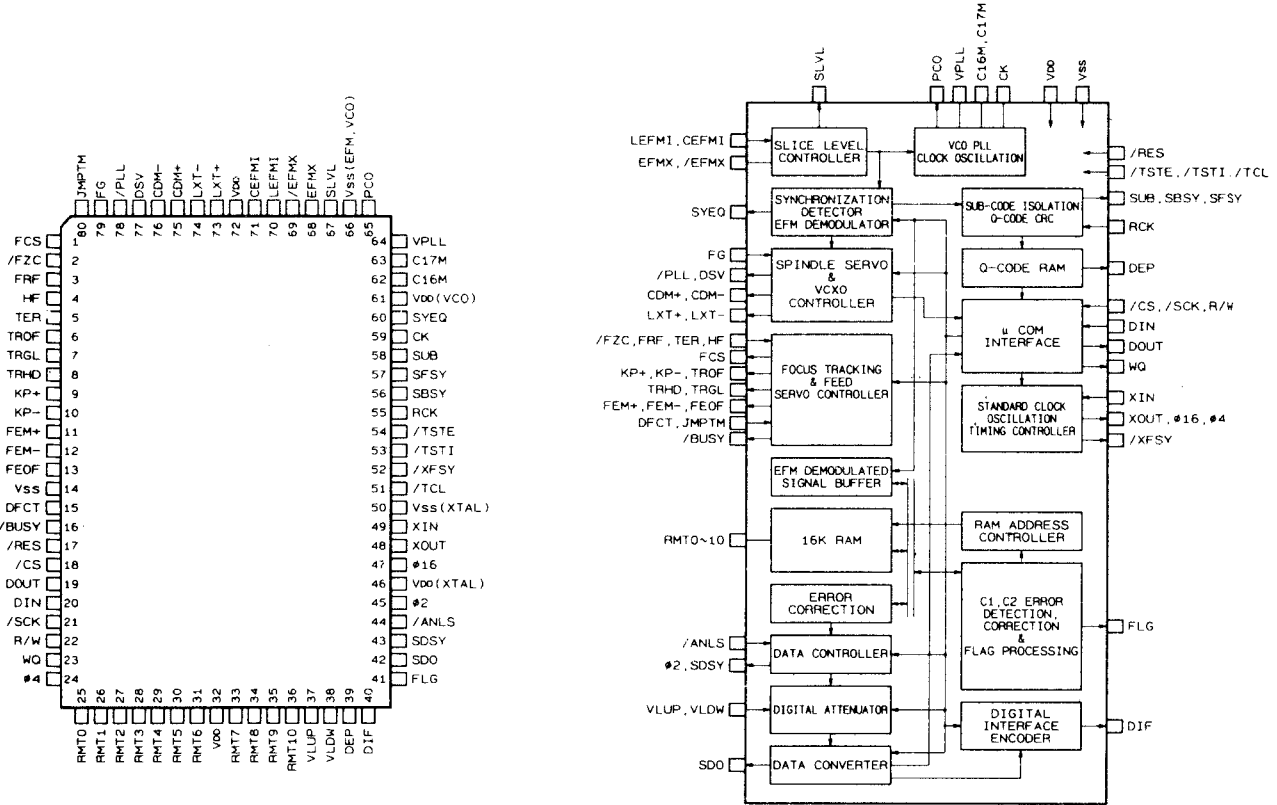
Pin No.	Pin Name	I/O	Active	Function
1	KD3	O		Key digit signal.
2	KD2	O		
3	KD1	O		
4	KD0	O		
5	RD	I		Read timing signal from μ -COM.
6	CS1	I	L	Chip select "L" when selected from μ -COM.
7				GND
8	AI	I		Port address at input/output from μ -COM.
9	AO	I		
10	OPEN SW	I	L	Tray open limit switch, ON at "L".
11	CLOSE SW	I	L	Tray close limit switch, ON at "L".
12	CRMP DOWN	I	L	PU unit down limit switch, ON at "L".
13	CRMP 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 SRH	O		Detection of disc existence/nonexistence.
19	TBL POS	I		Sensor to detect each table stop position : 1, 2, 3, 4 or 5.
20	TBL 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

IC18 : YM7402

Signal Processor & Controller for Compact Disc Player



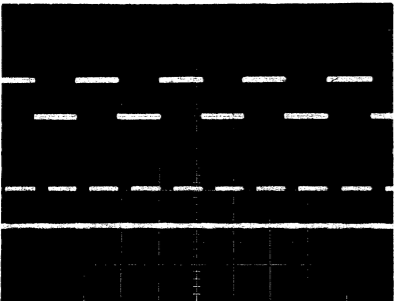
Pin No.	Pin Name	I / O	Function	
1	FCS	O	Focus search signal output	Focus servo
2	FZC	I	Focus zero cross signal input	
3	FRF	I	Focus reflection signal input	
4	HF	I	HF signal input	Tracking servo
5	TER	I	Tracking error signal input	
6	TROF	O	Tracking servo OFF signal output	
7	TRGL	O	TRGL signal output	
8	TRHD	O	Tracking hold signal output	
9	KP+	O	Outward kick pulse output	Feed servo
10	KP-	O	Inward kick pulse output	
11	FEM+	O	Outward feed pulse output	
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	$\emptyset 4$	O	System clock output (4.2336MHz)	

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
38	VL DW	I	Volume down input
39	DEP	O	Deemphasis control signal output
40	DIF	O	Data output for digital interface
41	FLG	O	Flag output to correct error in SDO output data
42	SDO	O	Serial data output
43	SDSY	O	Synchronous signal output (44.1kHz) of SDO output data
44	ANLS	I	Analog sound serial data input
45	Ø2	O	System lock output (2.1168MHz)
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	
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
54	TSTE		Test mode control signal input
55	RCK	I	Clock input for reading sub-code
56	SBSY	O	Sub-code block synchronization output
57	SFSY	O	Sub-code frame signal output
58	SUB	O	Sub-code serial output (P~W)
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 FFM 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

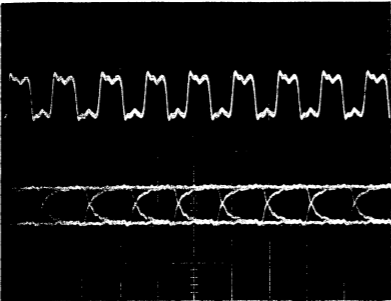
WAVEFORM OF TEST POINT

The waveform are measured by TEST mode at PLAY

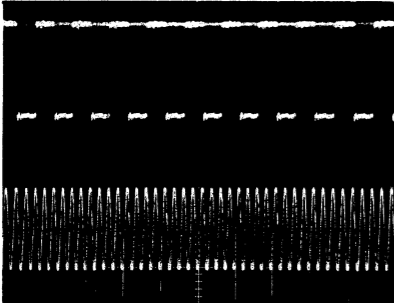
Point ① : SDSY, SDI
(CH1 : Pin2 of IC22, CH2 : Pin1 of IC22)
V : 0.5V/div H : 10μsec/div
DC range 10 : 1 probe (Trigger CH1)



Point ②
(CH1 : Pin10 of IC25 or Pin10 of IC26,
CH2 : Pin9 of IC25 or Pin9 of IC26)
V : 0.5V/div H : 50nsec/div
DC range 10 : 1 probe (Trigger CH1)

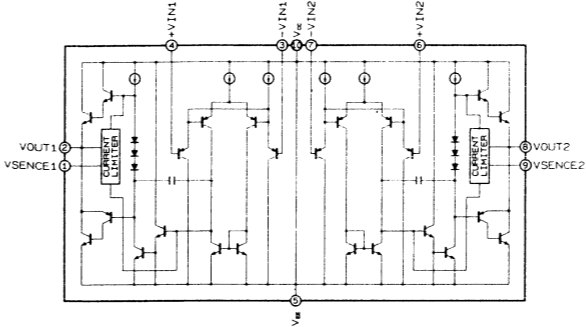


Point ③ : RD, XTAL
(CH1 : Pin63 of IC19, CH2 : Pin2 of IC19)
V : 0.2V/div H : 0.5μsec/div
DC range 10 : 1 probe (Trigger CH1)

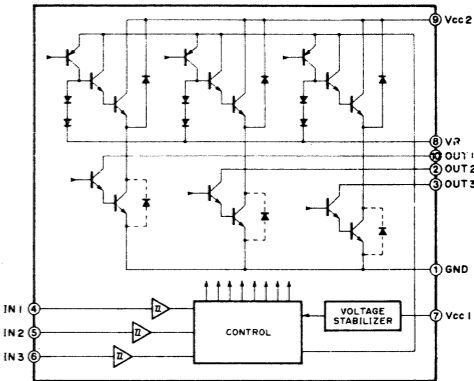


IC BLOCK

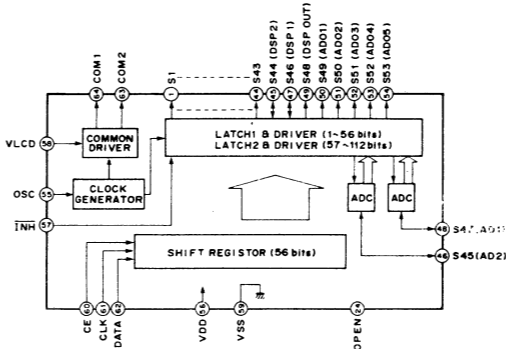
IC2, 4 : LA6510
Dual Power Operational Amp



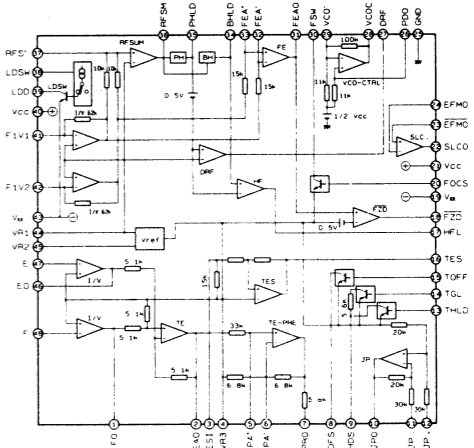
IC6 : AN6662, M54649L,
XRA6239A or BA6239A
Motor Control



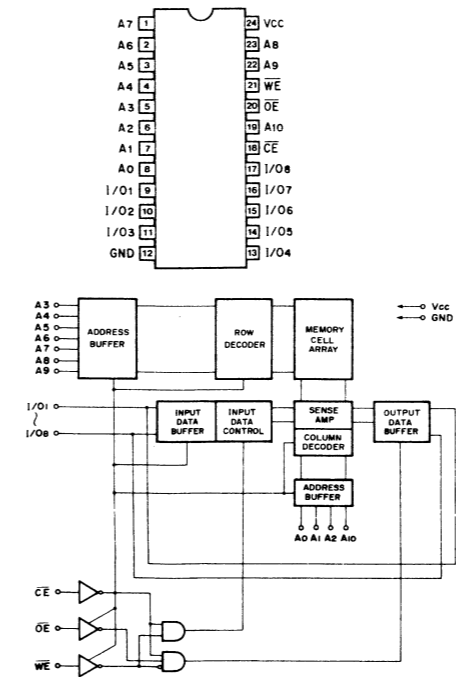
IC8 : LC7582
LCD Driver



IC9 : LA9200NM
RF Amp & Servo Controller



IC21 : LC3517BL-15
2048-Word x 8 bit Static RAM



PARTS LIST

■ WARNING

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

CDC-715

■ ELECTRICAL PARTS

- 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 55.

Ref. NO.	PART NO.	Description	部 品 名	Remarks	Markets	ランク
	VL490000	MAIN CIRCUIT BOARD	メインシート		UC	
	VL490100	MAIN CIRCUIT BOARD	メインシート		R	
	VL490200	MAIN CIRCUIT BOARD	メインシート		AB	
	FA153100	MYLAR FILM CAP	1000pF 50V	マイラーコン	C28,163,164	
	FA153220	MYLAR FILM CAP	2200pF 50V	マイラーコン	C113,117,154,155	
	FA153470	MYLAR FILM CAP	4700pF 50V	マイラーコン	C53,64	
	FA153750	MYLAR FILM CAP	7500pF 50V	マイラーコン	C128,133	
	FA153820	MYLAR FILM CAP	8200pF 50V	マイラーコン	C129,132	
	FA154100	MYLAR FILM CAP	0.01uF 50V	マイラーコン	C5,6,9,35,104,105,112,114	
	FA154180	MYLAR FILM CAP	0.018uF 50V	マイラーコン	C56,137,138	
	FA154200	MYLAR FILM CAP	0.02uF 50V	マイラーコン	C23,24	
	FA154470	MYLAR FILM CAP	0.047uF 50V	マイラーコン	C60,62,80	
	FA154510	MYLAR FILM CAP	0.051uF 50V	マイラーコン	C55	
	FA154910	MYLAR FILM CAP	0.091uF 50V	マイラーコン	C39	
	FA155100	MYLAR FILM CAP	0.1uF 50V	マイラーコン	C2,91,92,94-96,103,144,145	
	FA155120	MYLAR FILM CAP	0.12uF 50V	マイラーコン	C44	
	FA155220	MYLAR FILM CAP	0.22uF 50V	マイラーコン	C54	
	FA155240	MYLAR FILM CAP	0.24uF 50V	マイラーコン	C57	
	FA155390	MYLAR FILM CAP	0.39uF 50V	マイラーコン	C48	
	UT452100	POLYPROPYLENE FILM CAP	100pF 100V	P P コン	C30	
	UT453220	POLYPROPYLENE FILM CAP	2200pF 100V	P P コン	C130,131	
	VG276200	CERAMIC CAP	15pF 50V	円筒セラコン	C63,147,148	
	VG276600	CERAMIC CAP	22pF 50V	円筒セラコン	C12,34,61,66	
	VG276800	CERAMIC CAP	27pF 50V	円筒セラコン	C81	
	VG277000	CERAMIC CAP	33pF 50V	円筒セラコン	C36,77	
	VG277200	CERAMIC CAP	39pF 50V	円筒セラコン	C26,27	
	VG278600	CERAMIC CAP	330pF 50V	円筒セラコン	C13,14	
	VF466900	CERAMIC CAP	470pF 50V	円筒セラコン	C38	
	VG278800	CERAMIC CAP	560pF 50V	円筒セラコン	C74	
	VG278900	CERAMIC CAP	680pF 50V	円筒セラコン	C25,37	
	VF467000	CERAMIC CAP	1000pF 50V	円筒セラコン	C43,45	
	VF467300	CERAMIC CAP	0.01uF 16V	円筒セラコン	C20	
	VJ599000	CERAMIC CAP	0.047uF 16V	円筒セラコン	C3,11,32,69,71,72,78,	
	VJ599100	CERAMIC CAP	0.1uF 50V	円筒セラコン	83,85,159	
	FI384100	CERAMIC CAP	0.01uF 400V	規格認定コン	C167,168	UC
	VE179200	CERAMIC CAP	0.01uF 400V	規格認定コン	C142,143	AB
	UJ818100	ELECTROLYTIC CAP	100uF 6.3V	ケミコン	C142,143	
					C1,4,10,15,31,33,46,58	
	UJ818470	ELECTROLYTIC CAP	470uF 6.3V	ケミコン	.59,67,68,75,82	
	UJ719100	ELECTROLYTIC CAP	1000uF 6.3V	ケミコン	C88,157,158	
	UJ828470	ELECTROLYTIC CAP	470uF 10V	ケミコン	C93,97	
	UJ737330	ELECTROLYTIC CAP	33uF 16V	ケミコン	C165-167	
					C42	
	UJ738100	ELECTROLYTIC CAP	100uF 16V	ケミコン	C16,18,22,49,51,111,	
					115,116,118,160,161	
	UJ738220	ELECTROLYTIC CAP	220uF 16V	ケミコン	C119	
	UJ838330	ELECTROLYTIC CAP	330uF 16V	ケミコン	C121	
	UJ838470	ELECTROLYTIC CAP	470uF 16V	ケミコン	C120	

* : New Parts (新規部品)

ランク : Japan only

Ref. NO.	PART NO.	Description	部 品 名	Remarks	Markets	ランク
	UJ747100	ELECTROLYTIC CAP	10uF 25V	ケミコン	C7,47,107,108,127	
	UJ766100	ELECTROLYTIC CAP	1uF 50V	ケミコン	C109,170	
	UJ766220	ELECTROLYTIC CAP	2.2uF 50V	ケミコン	C41	
	UJ866470	ELECTROLYTIC CAP	4.7uF 50V	ケミコン	C76,106	
	VG288000	ELECTROLYTIC CAP	1000uF 16V	ケミコン	C126	
	VG288200	ELECTROLYTIC CAP	3300uF 16V	ケミコン	C124	
	FU451390	MICA CAP	39pF 500V	マイカコン	C00,98	
	UK137220	ELECTROLYTIC CAP	22uF 16V	B P ケミコン	C136,139-141	
	UK147100	ELECTROLYTIC CAP	10uF 25V	B P ケミコン	C8	
	UK166330	ELECTROLYTIC CAP	3.3uF 50V	B P ケミコン	C29	
	UK166470	ELECTROLYTIC CAP	4.7uF 50V	B P ケミコン	C19,40	
	VG930900	SEMI-CONDUCTIVE CERAMIC CAP	0.1uF 25V	半導体セラコン	C17,21,50,52,65,73,87,122,123,125,134	
	VI271200	ELECTROLYTIC CAP	47000uF 5.5V	バックアップケミコン	C86	
	XG539A00	POWER TRANSFORMER		電源トランス	T1	UC
	XG733A00	POWER TRANSFORMER		電源トランス	T1	AB
	VB056900	COIL	220uH	コイル	L4,6-12	
	VB100200	COIL	10uH EL0606RA	固定コイル	L2	
	VG609100	COIL	68uH LHL06TB680K	コイル	L3,15,16	
	VE800700	LINE FILTER	1.8mH ELF18D290V	ラインフィルター	L13	UCAB
	HV453220	FLAME PROOF CARBON RESISTOR	2.2Ω 1/4W	不燃化カーボン抵抗	R33,39,83,91	
	HV454220	FLAME PROOF CARBON RESISTOR	22Ω 1/4W	不燃化カーボン抵抗	R21,30	
	HL314180	METAL OXIDE RESISTOR	18Ω 1W	酸化金属被膜抵抗	R186	
	VJ394800	RESISTOR ARRAY	1KΩx5	抵抗アレイ	R142	
	VH721500	RESISTOR ARRAY	100KΩx4	抵抗アレイ	R156	
	VI835400	FUSABLE RESISTOR	1.5Ω 1/6W	ヒューズ抵抗	FR1-3	
	XF947A00	IC	LA6510	I C	IC2,4	
	XG938A00	IC	BA15218N	I C	IC14	
	IG076800	IC	NJM4558S	I C	IC1,5	
	IG080200	IC	NJM2043S	I C	IC7	
	XB247301	IC	uPC4570HA	I C	IC10-13	
	XG937A00	IC	BA10358	I C	IC3	
	XA507A00	IC	AN78N05	I C	IC29	
	XD201A00	IC	M5290P	I C	IC28	
	XB462001	IC	AN6662	I C	IC6	
	XG839A00	IC	LA9200NM	I C	IC9	
	IR000000	IC	TC74HC00AP	I C	IC15,25,26	
	XH759A00	IC	MC74HC4078N	I C	IC16	
	XG384A00	IC	M5M82C55AP-2	I C	IC20	
	XJ457A00	IC	HD63B01Y	I C	IC19	
	IG142200	IC	TC74HC04AP	I C	IC24	
	XE839A00	IC	LC3517BL-15	I C	IC21	
	XB417A00	IC	LC7582	I C	IC8	
	XG491A00	IC	YM7402	I C	IC18	
	XJ638A00	IC	YAC506-D	I C	IC22	
	VJ295400	LCD	8122BJP	L C D 表示器	V1	
	VE989900	LIGHT DETECTING MODULE	GP1U521Y	リモコン受光ユニット	U1	
	VE484600	PIN JACK	2P	ピンジャック	PJ2	
	VD004500	BASE PIN	PH i-TYPE 2P TE	ベースピン	CB5	
	VD004600	BASE PIN	PH i-TYPE 3P TE	ベースピン	CB10,16,17	

※ : New Parts (新規部品)

ランク : Japan only

Ref. NO.	PART NO.	Description	部 品 名	Remarks	Markets	ランク
	VD004700	BASE PIN	PH i-TYPE 4P TE	ベースピン	CB3,8,9,13	
	VD004900	BASE PIN	PH i-TYPE 6P TE	ベースピン	CB14	
	VD005100	BASE PIN	PH i-TYPE 8P TE	ベースピン	CB1,6	
	VK506300	BASE PIN	PH (RED) 8P TE	ベースピン	CB2	
	LB918040	BASE PIN	XH 4P TE	ベース付ポスト	CB4	
	VG879900	BASE PIN	VH 2P TE	ベースピン	CB20	UCAB
	VK880500	CONNECTOR	53114 8P SE	B & B コネクター	CB11,12	
	VJ719800	CRYSTAL RESONATOR	16.9344MHz	水晶振動子	XL2	
	VE222400	CERAMIC RESONATOR	8MHz	セラミック発振子	XL1	
	VJ693000	PRE-SET POTENTIOMETER	B1K Ω	半固定V R	VR8	
	VJ693600	PRE-SET POTENTIOMETER	B10K Ω	半固定V R	VR4,7	
	VJ694000	PRE-SET POTENTIOMETER	B47K Ω	半固定V R	VR3,6	
	VJ693800	PRE-SET POTENTIOMETER	B22K Ω	半固定V R	VR5	
	VJ694200	PRE-SET POTENTIOMETER	B100K Ω	半固定V R	VR1	
	VJ694400	PRE-SET POTENTIOMETER	B220K Ω	半固定V R	VR2	
	IA093320	TRANSISTOR	2SA933S Q,R	トランジスタ	Q4,7,12,14,20	
	IA093410	TRANSISTOR	2SA934 P,Q,R	トランジスタ	Q2	
	VH555500	TRANSISTOR	2SB1357 E,F	トランジスタ	Q16	
	VI915200	TRANSISTOR	2SB1013	トランジスタ	Q6	
	IC174020	TRANSISTOR	2SC1740S R,S	トランジスタ	Q3,8-10,13,17	
	VC529400	TRANSISTOR	2SC3315 C,D	トランジスタ	Q11	
	ID040040	TRANSISTOR	2SD400 E,F	トランジスタ	Q1	
	VE613400	TRANSISTOR	2SD1858 Q,R	トランジスタ	Q15	
	VK432900	TRANSISTOR	2SD1915(F) ST	トランジスタ	Q22,23,25-28	
	VH257100	DIGITAL TRANSISTOR	DTA124ES	デジトラ	Q5	
	IF004600	DIODE	1SS133	ダイオード	D1-4,7,9-11,14,15	
	VH770800	DIODE	1SR139-100 T-32	ダイオード	D17,18,20-27	
	VG435600	ZENER DIODE	MTZJ2.7A	ツェナーダイオード	D5,6	
	VG437400	ZENER DIODE	MTZJ5.1B	ツェナーダイオード	D19	
	VG437900	ZENER DIODE	MTZJ6.2A	ツェナーダイオード	D16	
	VG438700	ZENER DIODE	MTZJ7.5C	ツェナーダイオード	D13	
	VG439000	ZENER DIODE	MTZJ8.2C	ツェナーダイオード	D12	
	VL258500	FERRITE ASS'y		メインフェライトASSY		UCAB
	VH966900	PIN	1MSA-6024	スタイルピン		
	VJ295300	LAMP ASS'y	150mA 8V	ランプASSY		
	VA119100	HEAT SINK		ヒートシンク		
	VG335800	REFLECTOR		リフレクター		
	VH041200	SHEET/DEFFUSION		シートディフュージョン		
	CB605620	PLASTIC RIVET	NO.1057	プラスチックリベット		
	VF444500	LAMP CAP	AG-4015	ランプキャップ		
	VK503200	GROUND PLATE	TR	アースプレート		UCAB
	VI448100	SHIELD CASE	LPF	シールドケース		

※ : New Parts (新規部品)

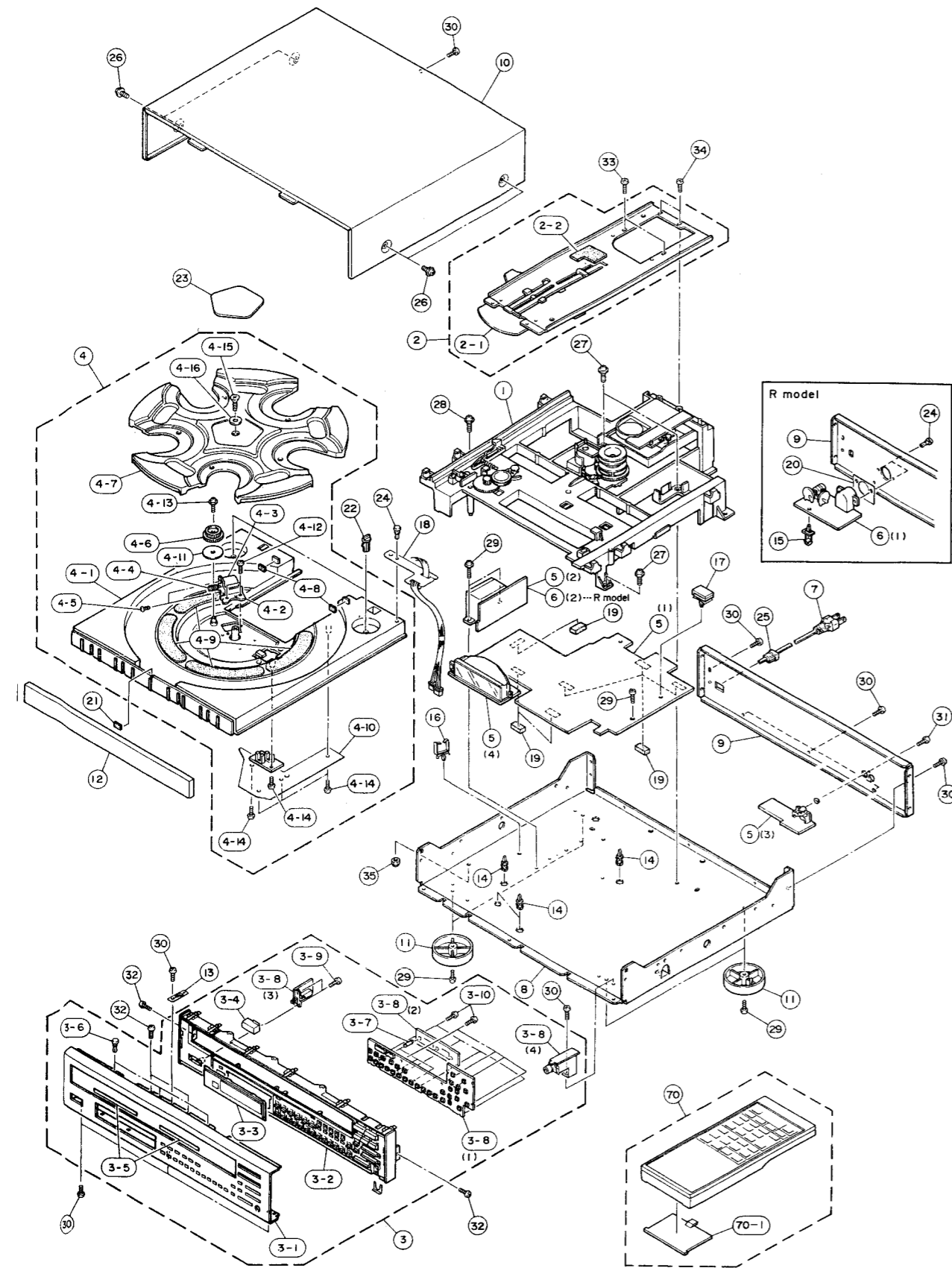
ランク : Japan only

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※: 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	VL488700	DISC CHANGER MECHA.	CH-90XE	ディスクチェンジャーメカ		
2	VJ365700	SHUTTER ASS'y		シャッターASSY		
2-1	VJ105700	PLATE/SHUTTER		プレート/シャッター		
2-2	VJ967300	DAMPER/SHUTTER		ダンパー/シャッター		
3-1	VL004000	FRONT PANEL		フロントパネル	BL	
3-1	VL004100	FRONT PANEL		フロントパネル	T	
3-2	VJ079800	SUB PANEL		フロントパネル/サブ	T	
3-2	VJ079900	SUB PANEL		フロントパネル/サブ	BL	
3-3	VL003700	WINDOW PANEL		ウインドウ		
3-4	VH841900	BUTTON	POWER	ボタン	BL	
3-4	VH842000	BUTTON	POWER	ボタン	T	
3-5	VJ589600	SHEET		シート		
3-6	CB609260	PLASTIC RIVET	NO.6206	プラスチックリベット		
3-7	VL178000	SUPPORT, P.C.B	NO.2V70	PCBサポート		
3-8	VL489600	OPERATION CIRCUIT BOARD		オペレーションシート	BL	
3-8	VL489700	OPERATION CIRCUIT BOARD		オペレーションシート	T	
3-9	EX601360	BIND HEAD P-TITE SCREW	3x10 FCRM3-BL	バインドPタイトネジ		
3-10	EI320066	BIND HEAD P-TITE SCREW	2x6 FCRM3-BL	バインドPタイトネジ		
4-1	VI238300	TRAY		トレイ/CM	BL	
4-1	VI572200	TRAY		トレイ/CM	T	
4-2	VL130500	BRACKET, MOTOR		モーターブラケット3		
4-3	VL138500	MOTOR	DC FF-130SH-11340	モーター		
4-4	VF956900	GEAR/WO		ギア/WO		
4-5	ED320036	BIND HEAD SCREW	2x3 FCRM3-BL	バインド小ネジ		
4-6	VI238800	GEAR	WW	ギヤ		
4-7	VI238400	TABLE		ロータリーテーブル	BL	
4-7	VI572300	TABLE		ロータリーテーブル	T	
4-8	VJ613900	CUSHION		クッション/シャッター		
4-9	VK428200	SPACER/TRAY 3		スペーサ/トレイ3		
4-10	VI898600	COVER		カバー/トレイ		
4-11	VK390800	SPACER		スペーサー/ギヤ2		
4-12	EX601590	BIND HEAD P-TITE SCREW	2.6x8 FCRM3-BL	バインドPタイトネジ		
4-13	EX601600	BW HEAD P-TITE SCREW	2.6x10 FCRM3-BL	BWヘッドPタイトネジ		
4-14	EI326066	BIND HEAD TAPPING SCREW	2.6x6 ZMC2-BL	バインドタッピングネジ		
4-15	EQ330146	FLAT HEAD P-TITE SCREW	3x14 ZMC2-BL	皿タッピングネジ		
4-16	ET500076	FLAT WASHER	4x10-0.8 FCRM3-BL	平座金ミガキマル		
5	VL490000	MAIN CIRCUIT BOARD		メインシート		UC
5	VL490100	MAIN CIRCUIT BOARD		メインシート		R
5	VL490200	MAIN CIRCUIT BOARD		メインシート		AB
6	VJ278000	POWER CIRCUIT BOARD		電源シート		R
7	VL012900	POWER CORD ASS'y		パワーコードASSY		UC
7	VE222900	POWER CORD ASS'y		パワーコードASSY		R
7	VL238400	POWER CORD ASS'y		パワーコードASSY		A
7	VL238600	POWER CORD ASS'y		パワーコードASSY		B
8	VJ060300	CHASSIS		シャーシ/メイン		
9	VL003200	REAR PANEL		リヤパネル		U
9	VL003300	REAR PANEL		リヤパネル		C
9	VL003400	REAR PANEL		リヤパネル		R
9	VL003500	REAR PANEL		リヤパネル		AB
10	VJ060100	TOP COVER		トップカバー	BL	

* : New Parts (新規部品)

ランク : Japan only

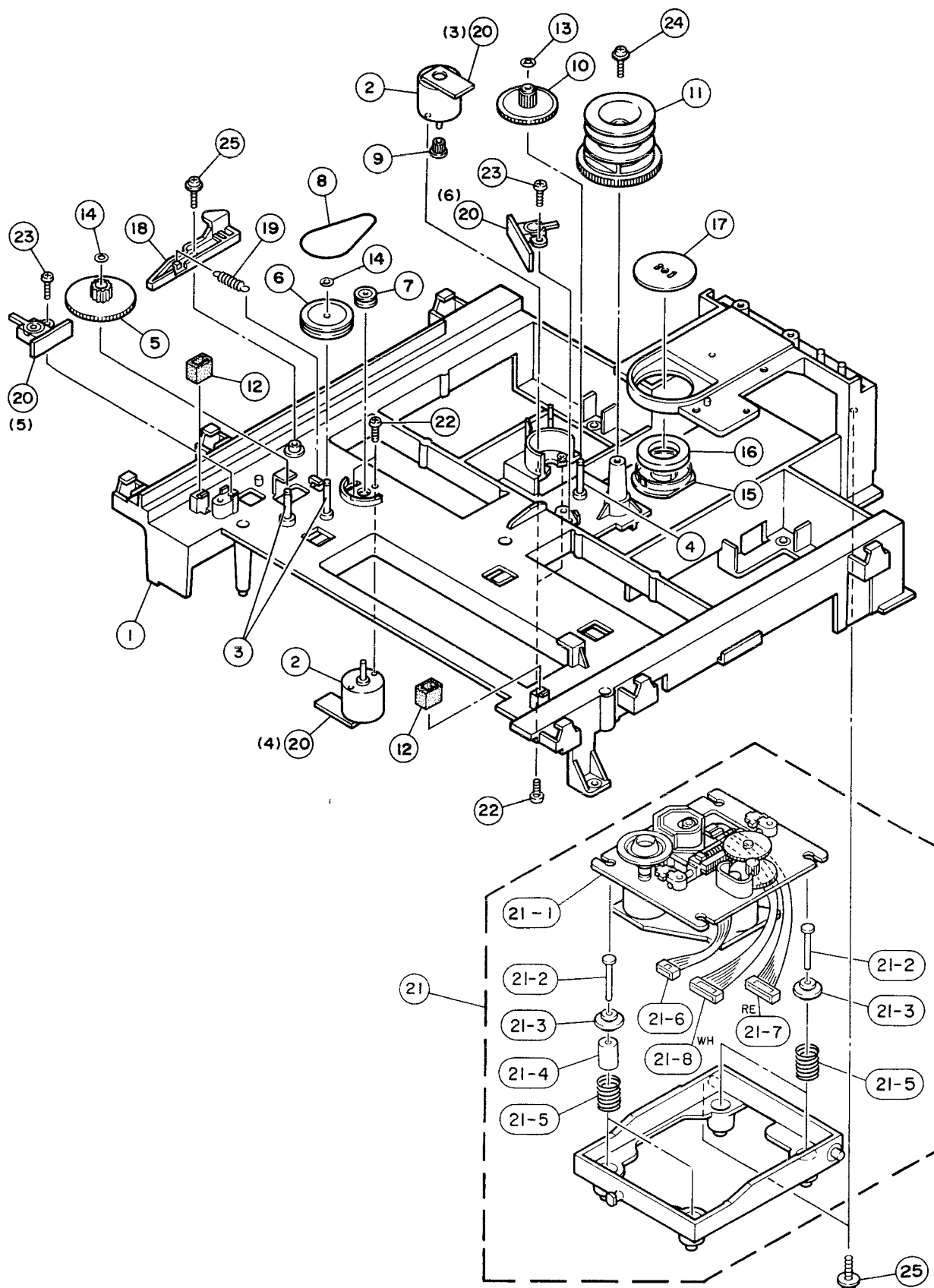


Ref. NO.	PART NO.	Description	部 品 名		Remarks	Markets	ランク
10	VJ060200	TOP COVER		トップカバー	T		
11	VIG15300	LEG		レッグ			
12	VL023100	LID		リッド	BL		
12	VL023200	LID		リッド	T		
13	BB071170	GROUND PLATE		アースプレート			
14	CB603730	P.C.B SUPPORT		基板サポート			
15	VJ354200	P.C.B SUPPORT		基板サポート		R	
16	VK632900	BINDING TIE		束線止め			
17	CB092990	BINDING TIE	NO.245	束線止め			
18	VK653300	SUPPORT		サポート/線材3			
19	VL242300	SHEET, DAMPER 2		シート/ダンパー2			
20	VK477700	ISOLATION SHEET		シート/絶縁		R	
21	VJ613900	CUSHION, SHUTTER		クッション/シャッター			
22	VG414400	STOPPER		ストッパー/トレイ			
23	VJ105900	PLATE, TABLE		プレート/テーブル	BL		
23	VJ106300	PLATE, TABLE		プレート/テーブル	T		
24	CB609260	PLASTIC RIVET	NO.6206	プラスチックリベット			
25	VD778200	CORD STOPPER		コードストッパー		UC	
25	VD375900	CORD STOPPER		コードストッパー		RAB	
26	EK365090	BW HEAD SCREW	4x8 ZMC2-BL	BWヘッドSタイトネジ	BL		
26	EX601150	BW HEAD S-TITE SCREW	4x8-10 FNM3-BL	BWヘッドSタイトネジ	T		
27	EK365090	BW HEAD SCREW	4x8 ZMC2-BL	BWヘッドSタイトネジ			
28	EK365200	BW HEAD SCREW	4x10-10 FCRM3-BL	BWヘッドSタイトネジ			
29	EK930010	BW HEAD TAPPING SCREW	3x8-8 FCRM3-BL	BWヘッドBタイトネジ			
30	VE190700	BIND HEAD BONDING TAP. SCREW	3x6 FCRM3-BL	ボンディングBタイトネジ			
31	EN335030	BIND HEAD BONDING TAP. SCREW	3x10 FCRM3-BL	ボンディングPタイトネジ			
32	E0030066	FLAT HEAD SCREW	3x6 ZMC2-Y	皿Sタイトネジ			
33	E1330056	BIND HEAD B-TITE SCREW	3x5 FCRM3-BL	バインドBタイトネジ			
34	EX601360	BIND HEAD P-TITE SCREW	3x10 FCRM3-BL	バインドPタイトネジ			
35	EX601580	HEXAGONAL BLIND NUT	φ4 FCRM3-BL	六角袋ナット			
	CB069250	BINDING TIE	BK-1	束線止め			
		ACCESSORIES		付属品			
70	VJ154200	REMOTE CONTROL TRANSMITTER		リモコンランスミッター			
70-1	CX611300	LID		電池蓋			
	VG718700	PIN PLUG CORD	1.0m	ピンピンコード			
		DRY CELL	SUH-4,AAA	マンガン電池			

※ : New Parts (新規部品)

ランク : Japan only

■ EXPLODED VIEW (CM-90XE)



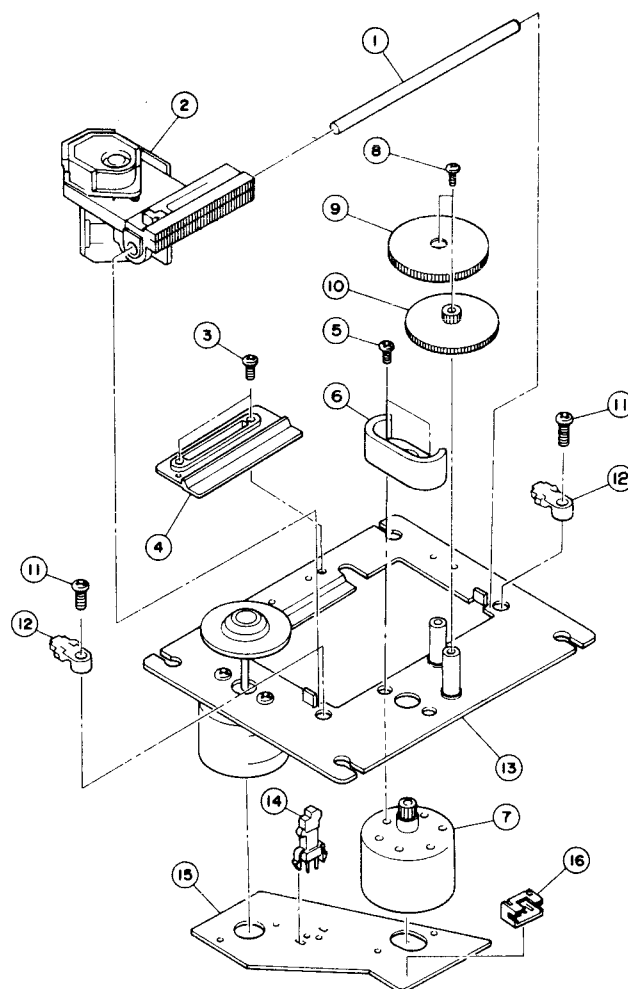
MECHANICAL PARTS (CM-90XE) Note) Ø : Diameter

Ref. NO.	PART NO.	Description	部 品 名	Remarks	Markets	ランク
	VL488700	DISC CHANGER MECHA.	CM-90XE	ディスクチェンジャーメカ		
1	VI238200	CHASSIS		シャーシ/CM		
2	VE415000	MOTOR	FEED	モーター		
3	VI239100	PIN	φ3	ピン		
4	VJ143700	PIN		ピン		
5	VJ613000	GEAR		ギヤLO/CM		
6	VJ612900	GEAR, PULLEY		ギヤプーリー LO/CM		
7	VG254500	PULLEY		プーリー/S		
8	VB820600	V BELT		Vベルト		
9	VJ598300	GEAR, PULLEY		ギヤ/プーリー		
10	VJ784200	GEAR		ギヤ/ドライブ710		
11	VI238700	CAM		カム/CM		
12	VJ354100	DAMPER		ダンパー/トレイ		
13	CB662020	STOPPER RING		止め輪		
14	VI907700	WASHER	2.2x5xt0.25	カットワッシャー		
15	VJ106000	STABILIZER		スタビライザ/CM		
16	VI493400	MAGNET		マグネット		
17	VJ106100	PLATE		プレート/スタビライザー		
18	VJ106200	LEVER		レバー/トレイ		
19	VJ528700	SPRING		スプリング/レバー		
20	VL494800	CM CIRCUIT BOARD		CMシート		
21	VJ354500	PICK UP ASS'y		PUユニットASSY		
21-1	VJ388100	PU MECHA. UNIT	KSM-210AFM	PUメカユニット		
21-2	VJ143700	PIN		ピン		
21-3	VJ635200	DAMPER		ダンパー/ブッシュ		
21-4	VJ635300	CUSHION		クッション/ダンパー		
21-5	VJ635400	SPRING		スプリング/フロント		
21-6	VJ676700	PH CONNECTOR ASS'y	4P L=130mm	PHコネクターASSY		
21-7	VJ676800	PH CONNECTOR ASS'y	8P RED L=200mm	PHコネクターASSY		
21-8	VM467100	PH CONNECTOR ASS'y	8P WHITE L=190mm	PHコネクターASSY		
22	ED320056	BIND HEAD SCREW	2x5 ZMC2-BL	バインド小ネジ		
23	EX601590	BIND HEAD P-TITE SCREW	2.6x8 FCRM3-BL	バインドPタイトネジ		
24	EK035030	BW HEAD TAPPING SCREW	3x12 ZMC2-Y	BWヘッドタッピングネジ		
25	EX601600	BW HEAD P-TITE SCREW	2.6x10 FCRM3-BL	BWヘッドPタイトネジ		

* : New Parts (新規部品)

ランク : Japan only

■ EXPLODED VIEW (KSM-210AFM)



Ref. NO.	PART NO.	Description	部 品 名	Remarks	Markets	ランク
	VJ388100	PU MECHA. UNIT	P.Uメカユニット			
1	BX601580	SLIDE SHAFT	スライド軸		4-9104310	04
2	PX600431	LASER PICK UP	レーザーピックアップ		8-8481271	18
3	AX607540	SPECIAL SCREW	特殊タッピングネジ		2-6413860	01
4	CX610940	SLIDE HOLDER	スライドホルダー		2-64144302	02
5	EA020046	PAN HEAD SCREW	ナベ小ネジ	PACK		01
6	CX610950	GEAR COVER	ギアカバー		2-6414340	02
7	JX600550	SLED MOTOR ASS'y	スレッドモーターASSY		X-2641358	09
8	AX607550	SPECIAL SCREW	特殊頭ネジ		3-3038093	02
9	CX610960	GEAR A	歯車A		2-64140402	02
10	CX610970	GEAR B	歯車B		2-64140305	02
11	AX607560	SPECIAL SCREW	特殊ネジ		2-6414470	01
12	CX610980	SHAFT CLAMP	シャフトクランプ		2-64144802	02
13	JX600560	SPINDLE MOTOR ASS'y	スピンドルモーターASSY		X-2641356	14
14	KX602370	LEAF SWITCH	リーフスイッチ		1-5720531	03
15	LX603470	MOTOR CIRCUIT BOARD	モータ基板		1-6282631	05
16	LX603480	CONNECTOR PIN	コネクタピン		1-5647201	02

*: New Parts (新規部品)

ランク : Japan only

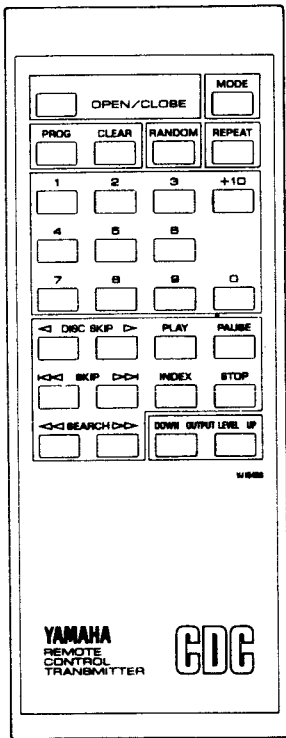
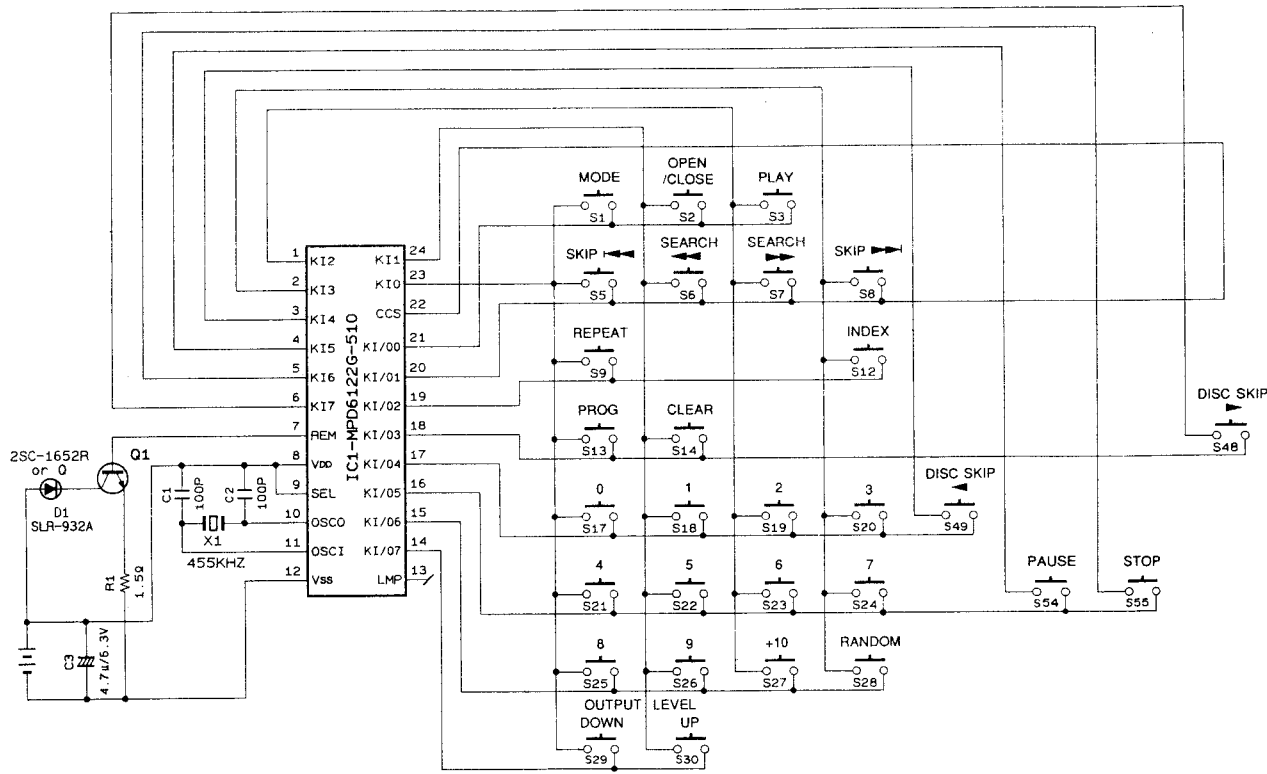
REMOTE CONTROL TRANSMITTER

■ SCHEMATIC DIAGRAM

1

2

3



CUSTOM CODE

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

KEY No.	DATA CODE								FUNCTION
	D0	D1	D2	D3	D4	D5	D6	D7	
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
48	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 K Ω	HJ35 7120	HF85 7120
1.8 Ω	HJ35 3180	*	15 K Ω	HJ35 7150	HF85 7150
2.2 Ω	HJ35 3220	HF85 3220	18 K Ω	HJ35 7180	HF85 7180
3.3 Ω	HJ35 3330	HF85 3330	22 K Ω	HJ35 7220	HF85 7220
4.7 Ω	HJ35 3470	HF85 3470	27 K Ω	HJ35 7270	HF85 7270
5.6 Ω	HJ35 3560	HF85 3560	33 K Ω	HJ35 7330	HF85 7330
10 Ω	HJ35 4100	HF85 4100	39 K Ω	HJ35 7390	HF85 7390
15 Ω	HJ35 4150	HF85 4150	47 K Ω	HJ35 7470	HF85 7470
22 Ω	HJ35 4220	HF85 4220	56 K Ω	HJ35 7560	HF85 7560
27 Ω	HJ35 4270	HF85 4270	68 K Ω	HJ35 7680	HF85 7680
33 Ω	HJ35 4330	HF85 4330	82 K Ω	HJ35 7820	HF85 7820
39 Ω	HJ35 4390	HF85 4390	91 K Ω	HJ35 7910	HF85 7910
47 Ω	HJ35 4470	HF85 4470	100 K Ω	HJ35 8100	HF85 8100
56 Ω	HJ35 4560	HF85 4560	120 K Ω	HJ35 8120	HF85 8120
68 Ω	HJ35 4680	HF85 4680	150 K Ω	HJ35 8150	HF85 8150
82 Ω	HJ35 4820	HF85 4820	180 K Ω	HJ35 8180	HF85 8180
100 Ω	HJ35 5100	HF85 5100	220 K Ω	HJ35 8220	HF85 8220
110 Ω	HJ35 5110	HF85 5110	270 K Ω	HJ35 8270	HF85 8270
120 Ω	HJ35 5120	HF85 5120	330 K Ω	HJ35 8330	HF85 8330
150 Ω	HJ35 5150	HF85 5150	390 K Ω	HJ35 8390	HF85 8390
160 Ω	HJ35 5160	*	470 K Ω	HJ35 8470	HF85 8470
180 Ω	HJ35 5180	HF85 5180	560 K Ω	HJ35 8560	HF85 8560
220 Ω	HJ35 5220	HF85 5220	680 K Ω	HJ35 8680	HF85 8680
270 Ω	HJ35 5270	HF85 5270	820 K Ω	HJ35 8820	HF85 8820
330 Ω	HJ35 5330	HF85 5330	1.0 M Ω	HJ35 9100	HF85 9100
390 Ω	HJ35 5390	HF85 5390	1.2 M Ω	HJ35 9120	*
470 Ω	HJ35 5470	HF85 5470	1.5 M Ω	HJ35 9150	HF85 9150
510 Ω	*	HF85 5510	1.8 M Ω	HJ35 9180	HF85 9180
560 Ω	HJ35 5560	HF85 5560	2.2 M Ω	HJ35 9220	HF85 9220
680 Ω	HJ35 5680	HF85 5680	3.3 M Ω	HJ35 9330	HF85 9330
820 Ω	HJ35 5820	HF85 5820	3.9 M Ω	HJ35 9390	*
910 Ω	HJ35 5910	HF85 5910	4.7 M Ω	HJ35 9470	HF85 9470
1.0 K Ω	HJ35 6100	HF85 6100			
1.2 K Ω	HJ35 6120	HF85 6120			
1.5 K Ω	HJ35 6150	HF85 6150			
1.8 K Ω	HJ35 6180	HF85 6180			
2.0 K Ω	HJ35 6200	HF85 6200			
2.2 K Ω	HJ35 6220	HF85 6220			
2.4 K Ω	HJ35 6240	HF85 6240			
2.7 K Ω	HJ35 6270	HF85 6270			
3.0 K Ω	HJ35 6300	HF85 6300			
3.3 K Ω	HJ35 6330	HF85 6330			
3.6 K Ω	HJ35 6360	HF85 6360			
3.9 K Ω	HJ35 6390	HF85 6390			
4.7 K Ω	HJ35 6470	HF85 6470			
5.1 K Ω	HJ35 6510	HF85 6510			
5.6 K Ω	HJ35 6560	HF85 6560			
6.8 K Ω	HJ35 6680	HF85 6680			
8.2 K Ω	HJ35 6820	HF85 6820			
9.1 K Ω	HJ35 6910	HF85 6910			
10 K Ω	HJ35 7100	HF85 7100			

1/4W Type

HJ35 ○○○○

10mm

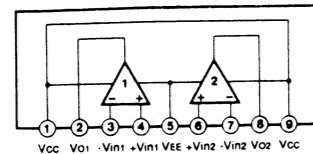
1/6W Type

HF85 ○○○○

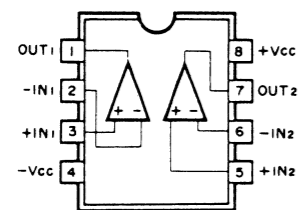
5mm

SCHEMATIC DIAGRAM

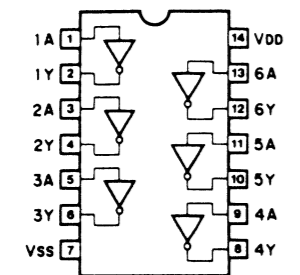
IC1, 5 : NJM4558S
IC7 : NJM2043S
IC10~13 : μ PC4570HA
Dual OP-Amp



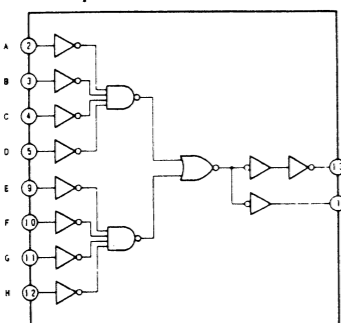
IC3 : μ PC358C or BA10358
Dual OP-Amp



IC24 : TC74HC04AP
Hex Inverters



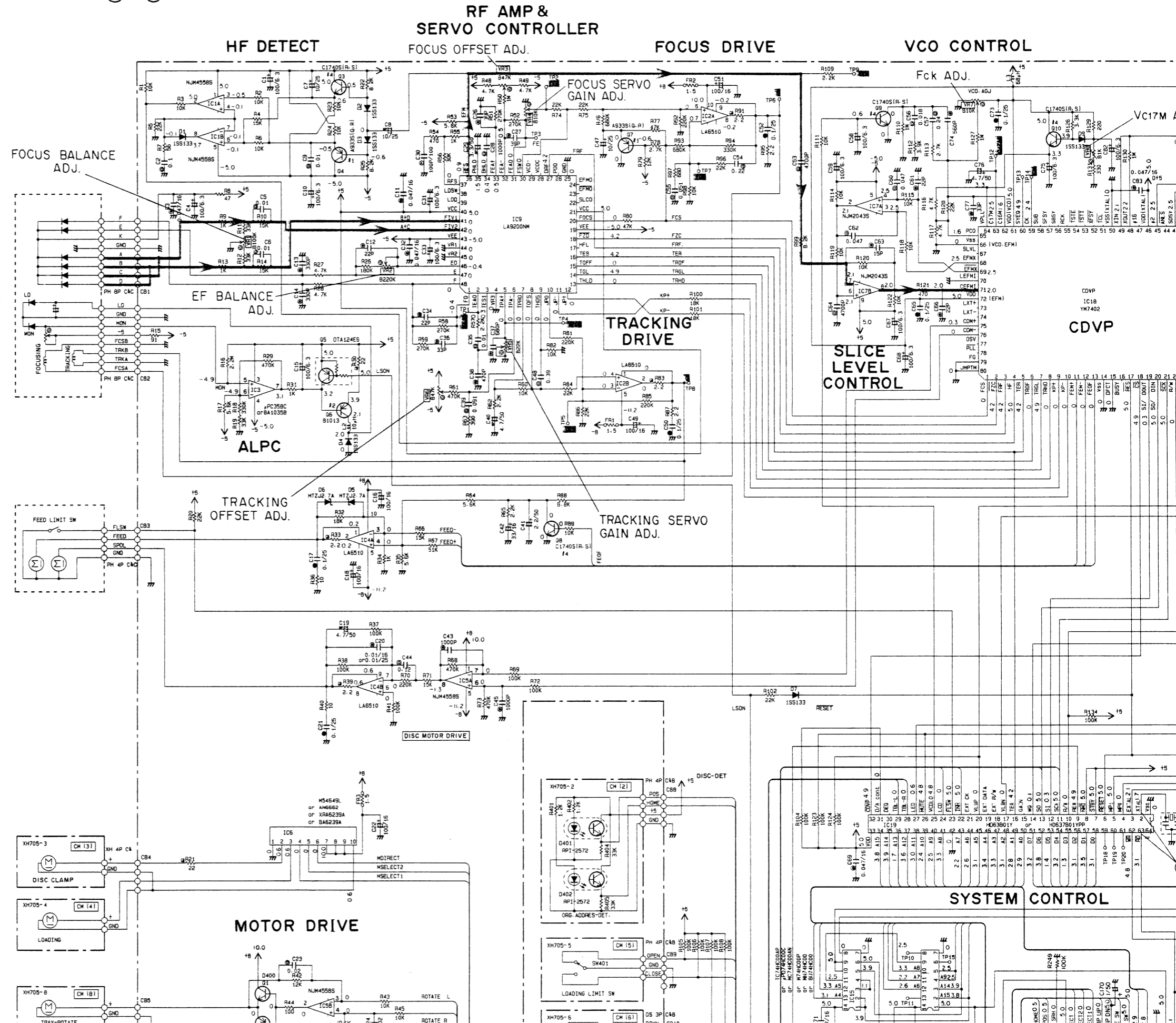
IC16 : MC74HC4078N,
TC74HC4078AP or
 μ PD74HC4078C
8-Input NOR/OR Gate

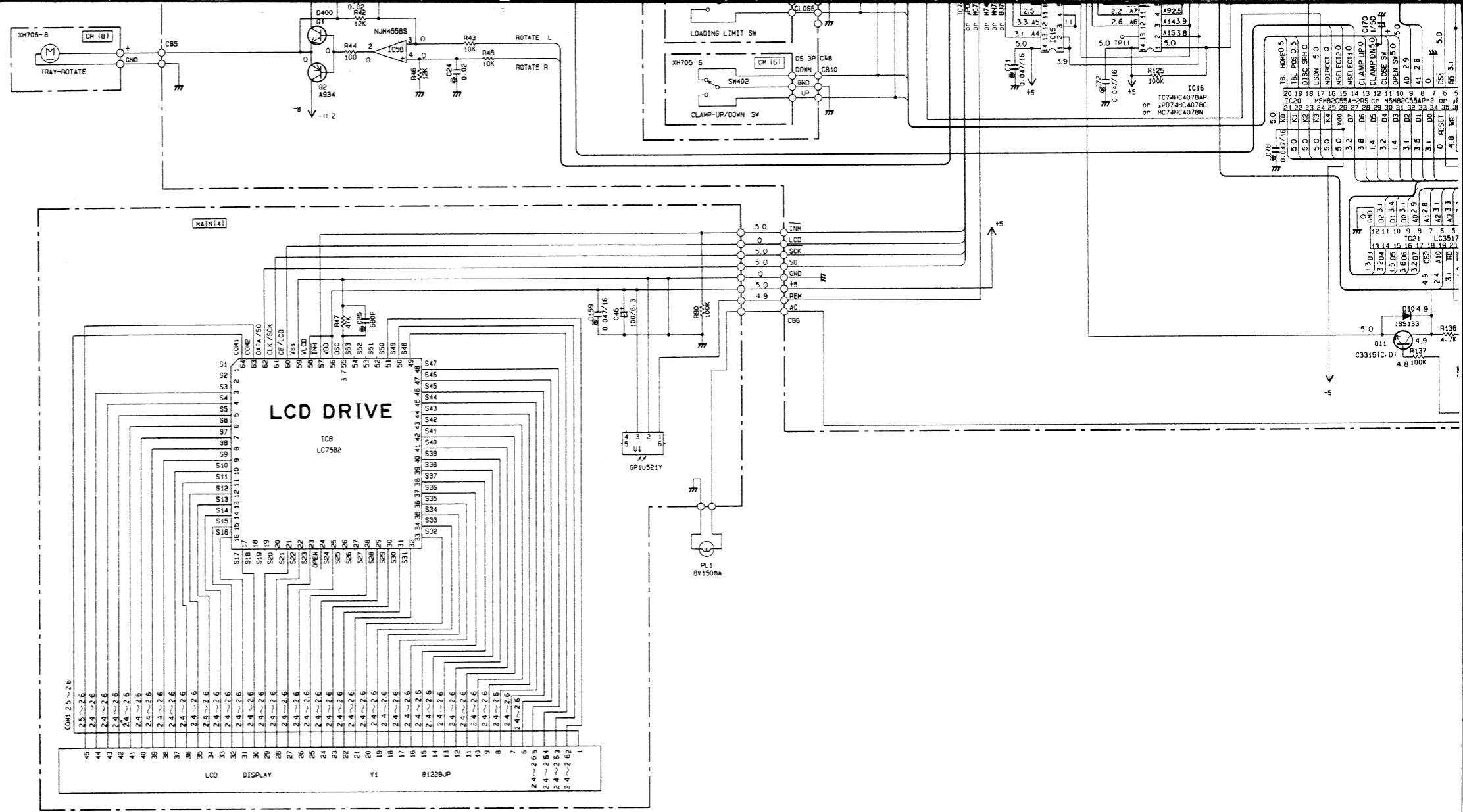
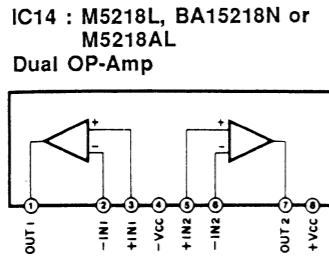
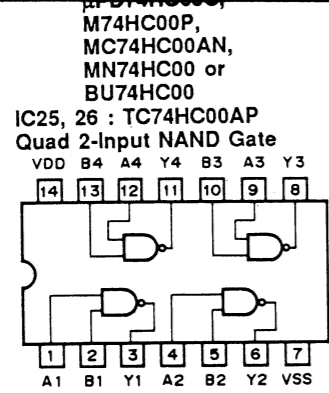


IC15 : TC74HC00AP,
 μ PD74HC00C,
M74HC00P,
MC74HC00AN,
MN74HC00 or
BU74HC00

① to ③ : WAVEFORM OF TEST POINT (See page 40)

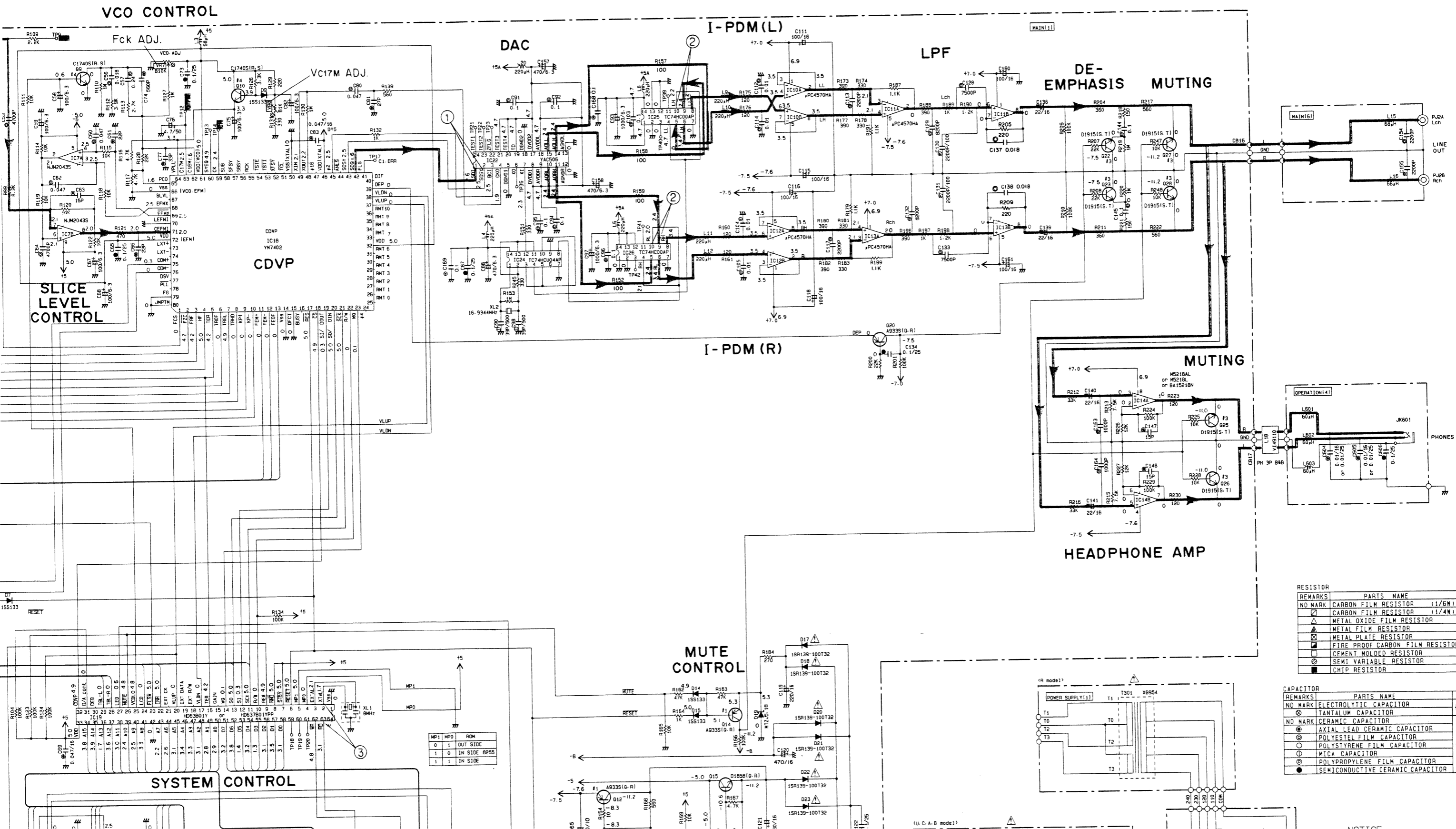
* The voltages are measured by TEST mode at PLAY.

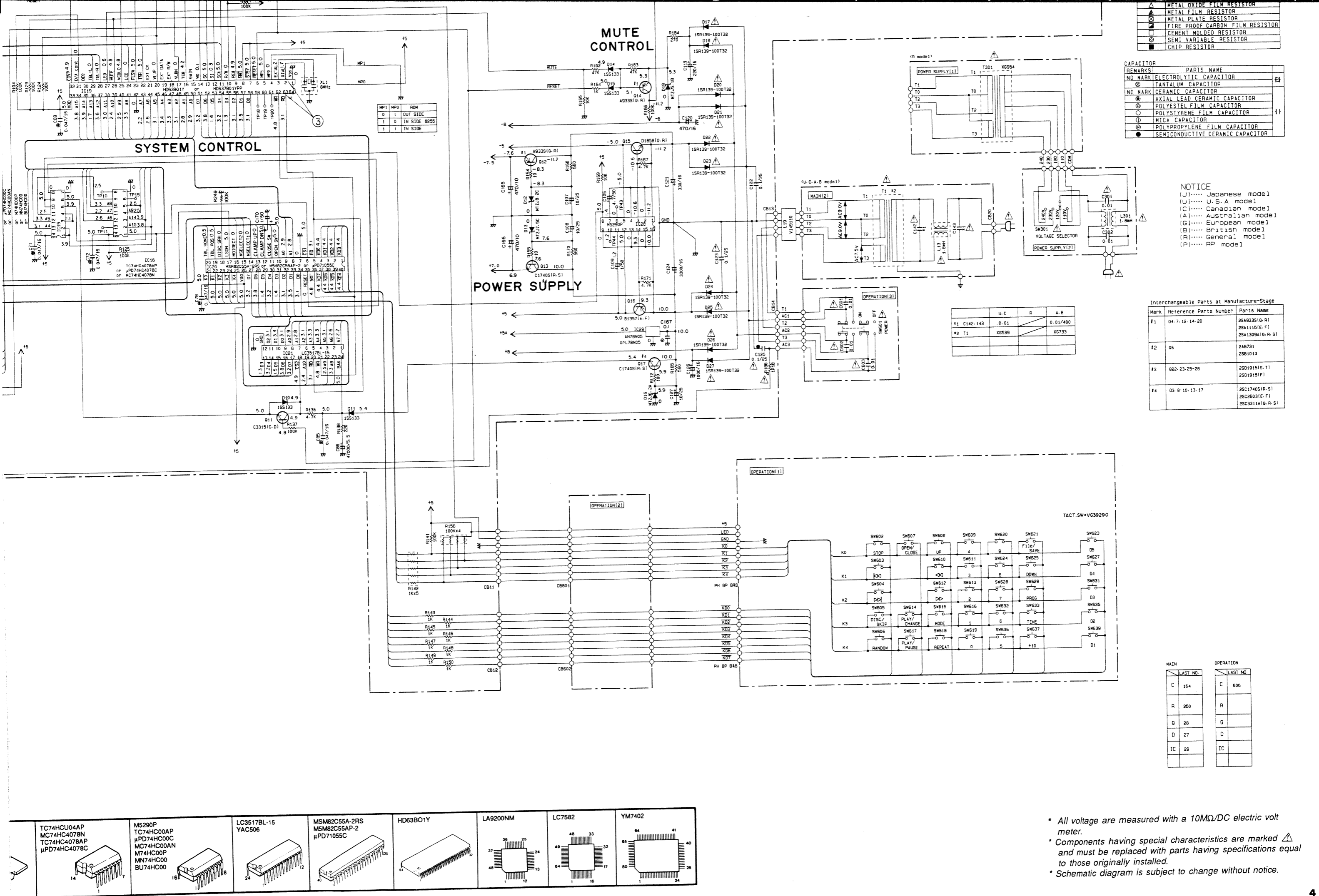




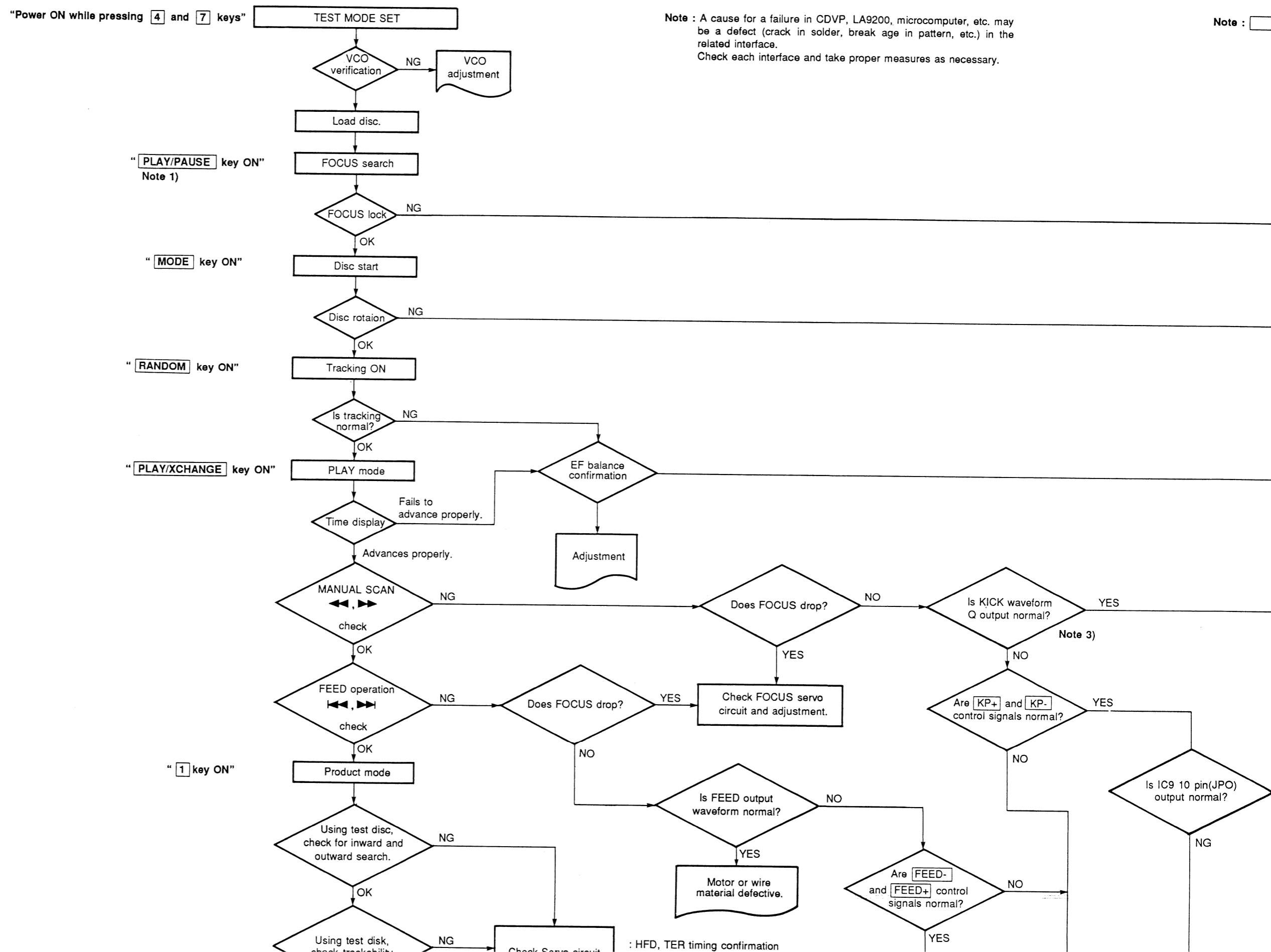
PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICs.

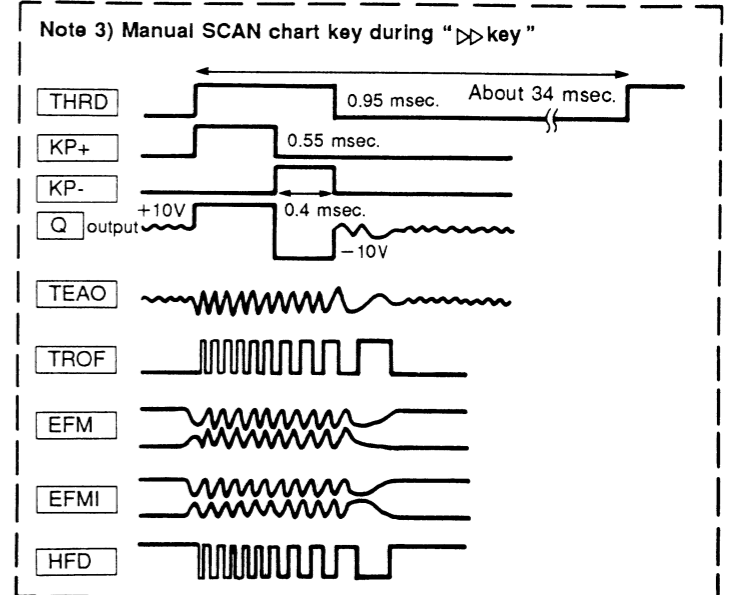
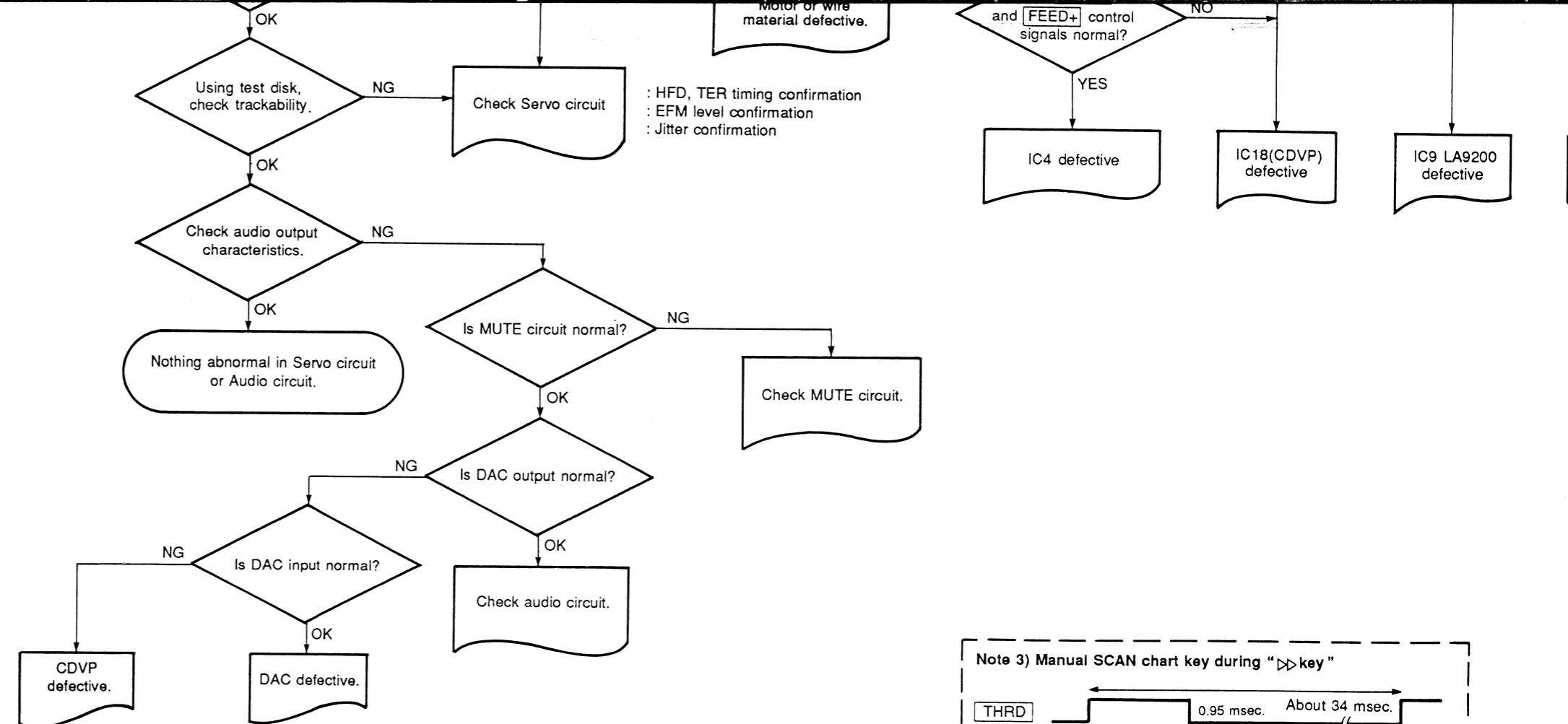
2SA933S(Q, R) 2SA1115(E, F) 2SA1309A(Q, R, S) 2SA934 2SB731 2SB1013 2SC1740S(R, S) 2SC2603(E, F) 2SC3311A(Q, R, S) 2SD1915(F)	2SC3315(C, D) 2SD1915(S, T) 2SD1815(Q, R) 2SD400 DTA124ES	2SB1357(E, F)	AN78N05 L78N05	1SS133 1SR139-100T32 MTZJ5.1B MTZJ6.2A MTZJ7.5C MTZJ8.2C MTZJ2.7A	M5218L BA15218N M5218AL	μPC358C BA10358	NJM4558S NJM2043S μPC4570HA NJM5532SD	AN6662 M54649L XRA6239A BA6239A	LA6510	TC74HC004AP MC74HC4078N TC74HC4078AP μPD74HC4078C	M5290P TC74HC00AP μPD74HC00C MC74HC00AN MN74HC00P MN74HC00 BU74HC00	LC3517BL-15 YAC506	MSI M5P μPC
--	---	---------------	-------------------	---	-------------------------------	--------------------	--	--	--------	--	---	-----------------------	-------------------



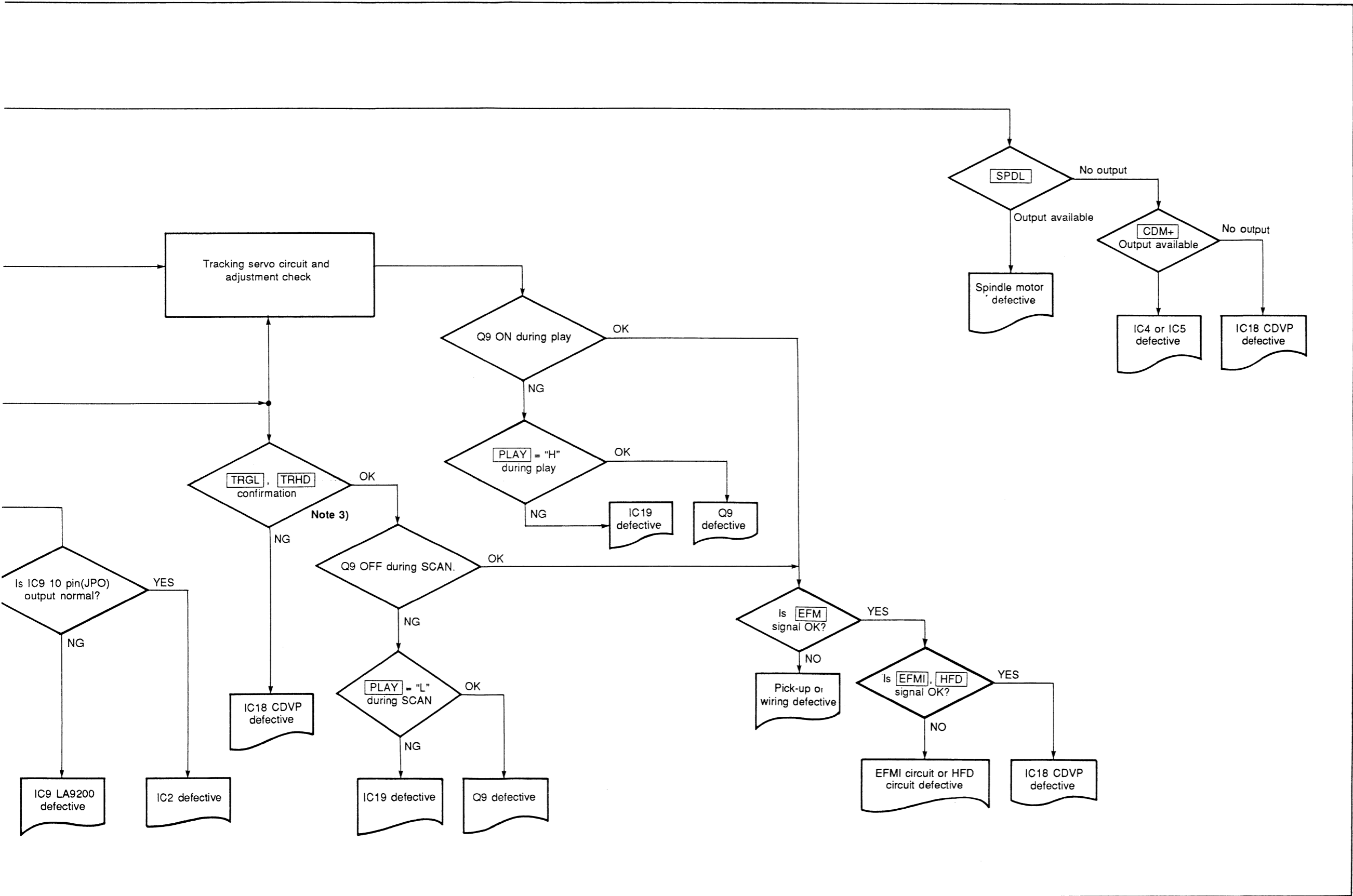


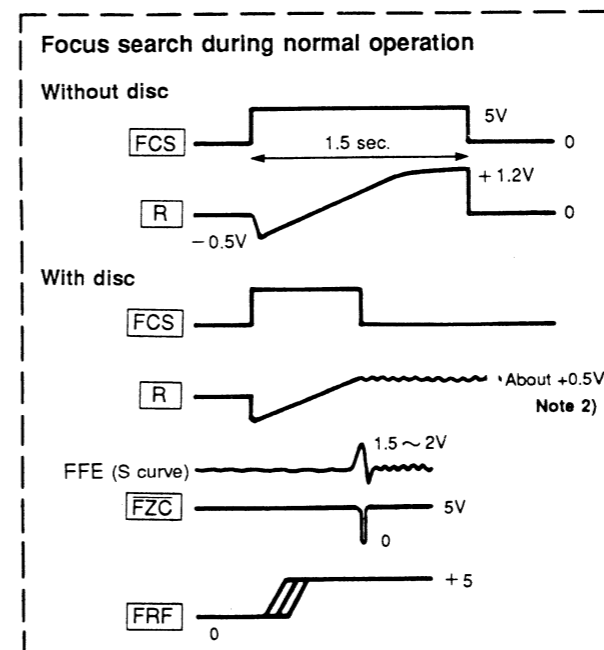
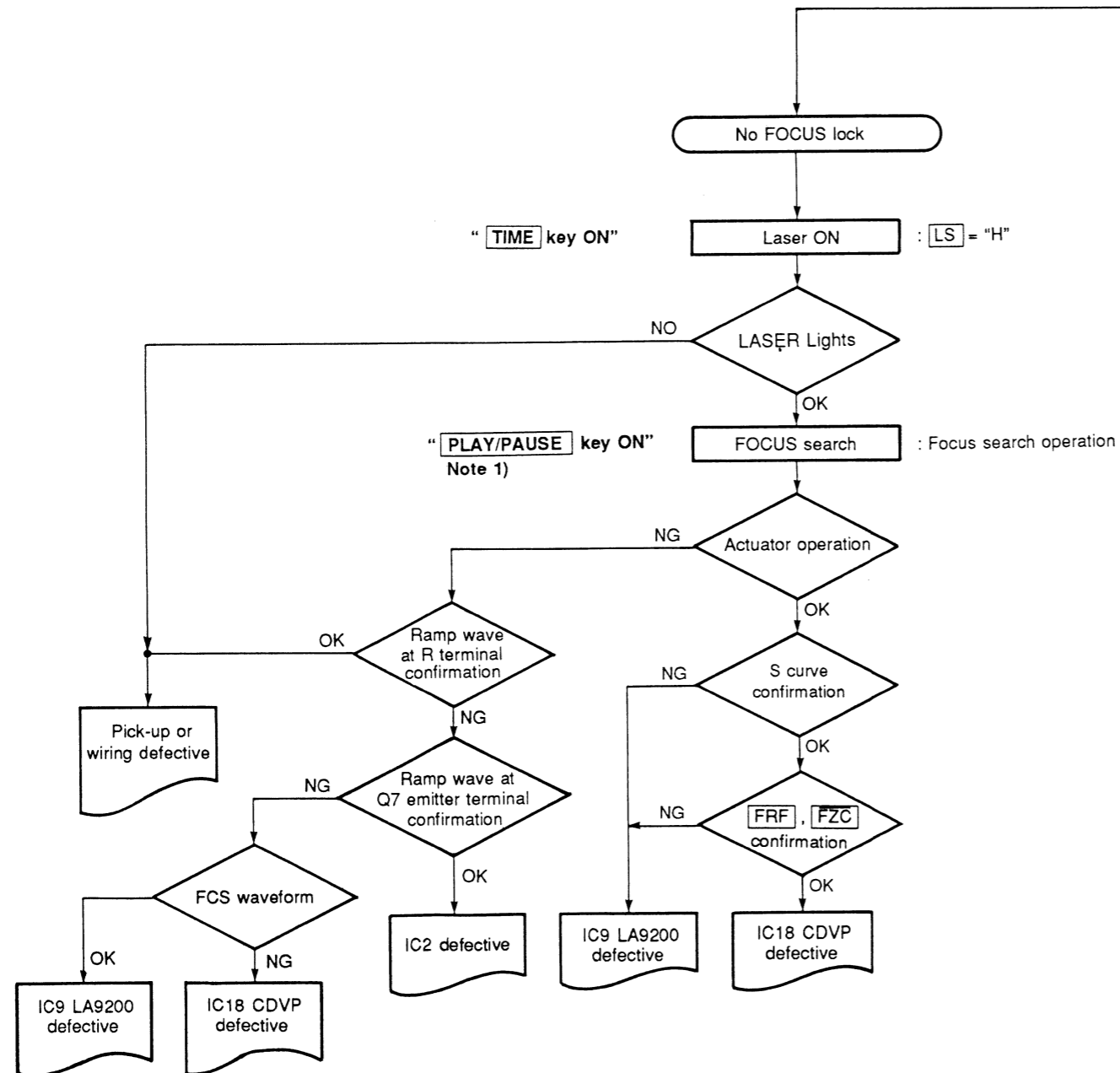
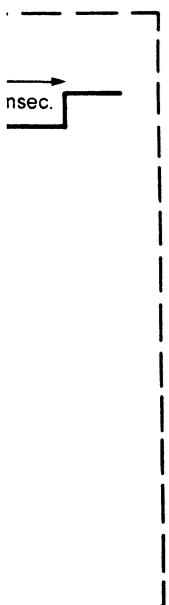
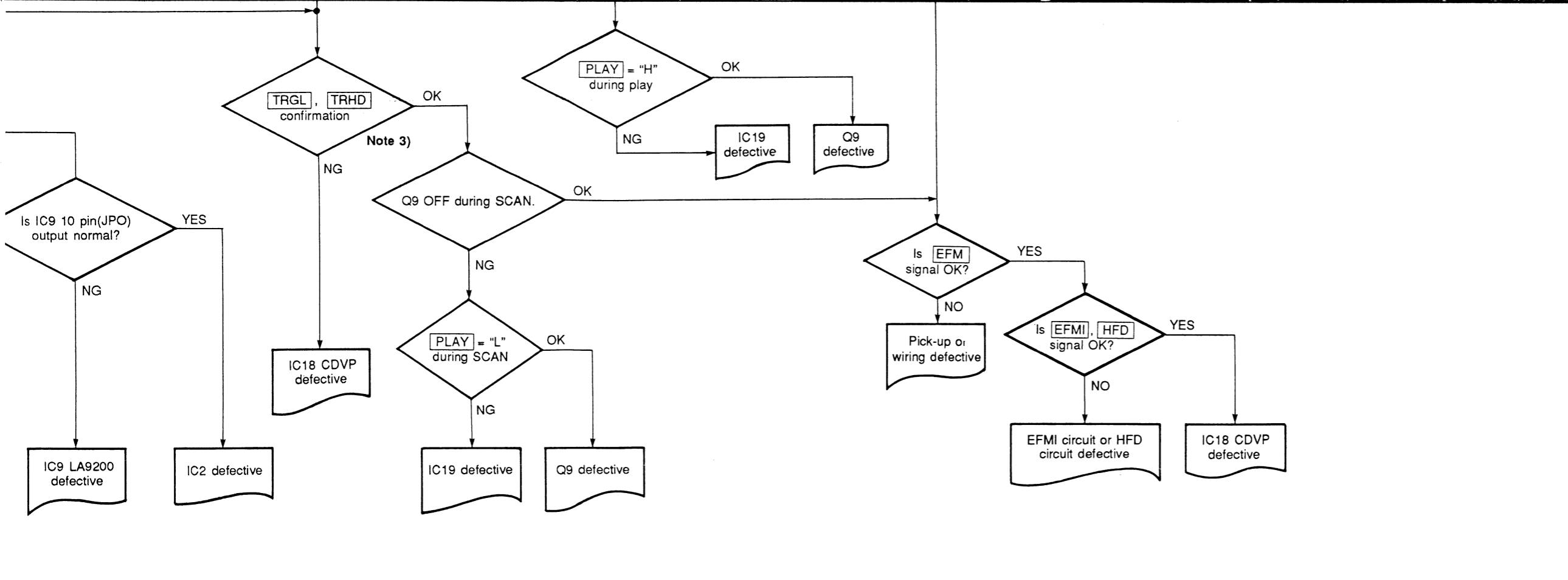
■ OPERATING CONFIRMATION TROUBLESHOOTING





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.