

CDP-M18/M19/M39

SERVICE MANUAL

*AEP Model
UK Model*

Discard CDP-M18 Service Manual
(No. 9-955-526-11) previously issued.
This Service Manual contains it.

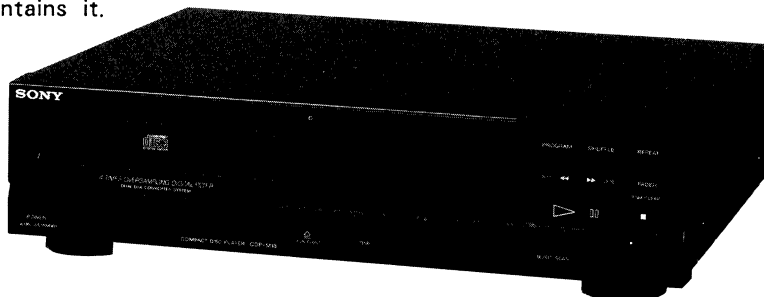


Photo : CDP-M18

Model Name Using Similar Mechanism	CDP-190/390
CD Mechanism Name	CDM14A-5K
Base Unit Name	BU-5K

SPECIFICATIONS

Compact disc player

Frequency response	2 Hz - 20 kHz $\pm 1\frac{1}{2}$ dB
Signal to noise ratio	More than 93 dB
Dynamic range	More than 90 dB
Harmonic distortion	Less than 0.05%
Channel separation	More than 90 dB

Outputs

LINE OUT (phono jacks) CDP-M19/M39 :	Output level 2 V (at 50 kilohms) Load impedance over 10 kilohms
PHONES (stereo phone jack)	Output level max. 10 mW Load impedance 32 ohms

General

Power requirements	AEP model : 220 V AC (or 240 V AC adjustable by Sony personnel), 50/60 Hz UK model : 240 V AC (or 220 V AC adjustable by Sony personnel), 50/60 Hz
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Power consumption	10 W
Dimensions (approx. , including projections)	355 x 95 x 305 mm (w/h/d) (14 x 3 $\frac{3}{4}$ x 11 $\frac{7}{8}$ inches)
Weight (approx.)	2.8 kg (6 lbs 3 oz)

Remote commander RM-D90 (CDP-M39)

Remote control system	Infrared control
Power requirements	3 V DC with two R6 (size AA) batteries
Dimensions	Approx. 43 x 20 x 175 mm (w/h/d) (1 $\frac{3}{4}$ x $\frac{13}{16}$ x 7 inches)
Weight	Approx. 105 g (3.7 oz) Including batteries

Design and specifications subject to change without notice.

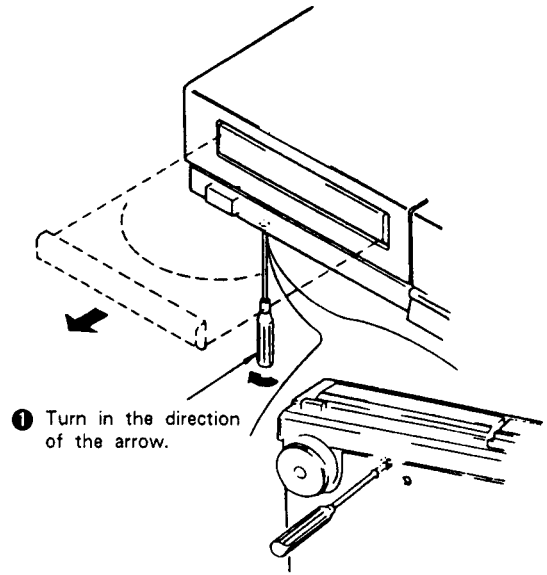


COMPACT DISC PLAYER
SONY®

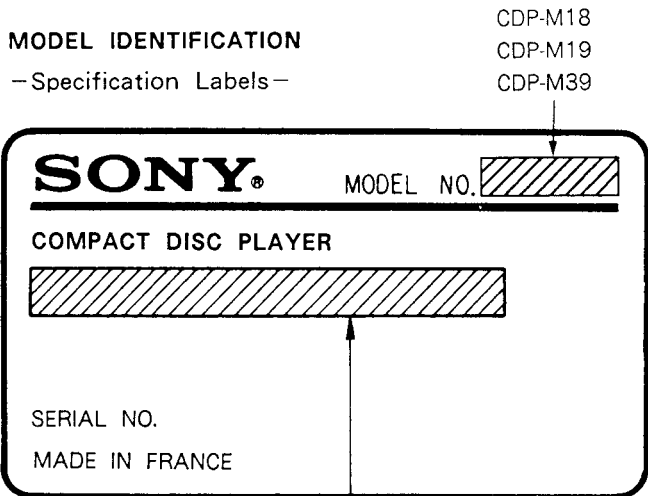
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HOW TO OPEN THE DISC TRAY WHEN POWER SWITCH TURNS OFF



Caution : When you work, keep the set horizontal.



AEP model : AC 220V~50/60Hz
UK model : AC 240V~50/60Hz

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body. During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts. The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe more than 25 cm away from the objective lens.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK OR DOTTED LINE WITH MARK ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

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

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

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. During service, 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 laser diode), replace the entire Optical Pick-up Block (including APC board).

BESKYTTELSE AF ØJNE MOD LASERSTRÅLING UNDER SERVICE

I dette apparat anvendes laserlys. Derfor skal nedenstående instruktioner nøje følges under service.

Følg iverigt instruktionerne i servicemanualen.

ADVARSEL!!

Under service må øjnene ikke komme nær objektiv-linsen på den optiske pick-up enhed. I tilfælde af at det er nødvendigt at kontrollere udsendelsen af laserlys, skal det ske i en afstand af mere end 25 cm fra den optiske pick-up.

1. Laser-dioe data

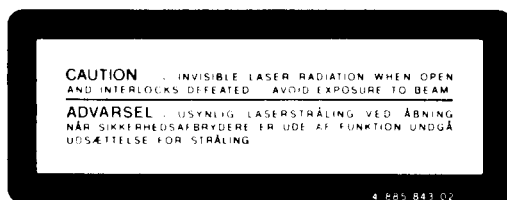
- Materiale: GaAlAs
- Bølgelængde: 780 nm
- Udstraling: Kontinuerlig
- Laseroutput: Max. 0,4 mW*
- * Målt i 1,6 mm afstand fra overfladen af objektiv-linsen på den optiske pick-up enhed.
- Klassifikation: Klasse IIIb.

2. Adskil aldrig den optiske pick-up enhed under service, og juster ikke APC kredsløbet (Automatic Power Control). Hvis APC kredsløbet (incl. laserdioden) bryder ned, skal hele den optiske pick-up enhed (incl. APC printkortet) udskiftes.

LASER ADVARSEL MÆRKNING

Følgende mærkning findes indvendig i apparatet:

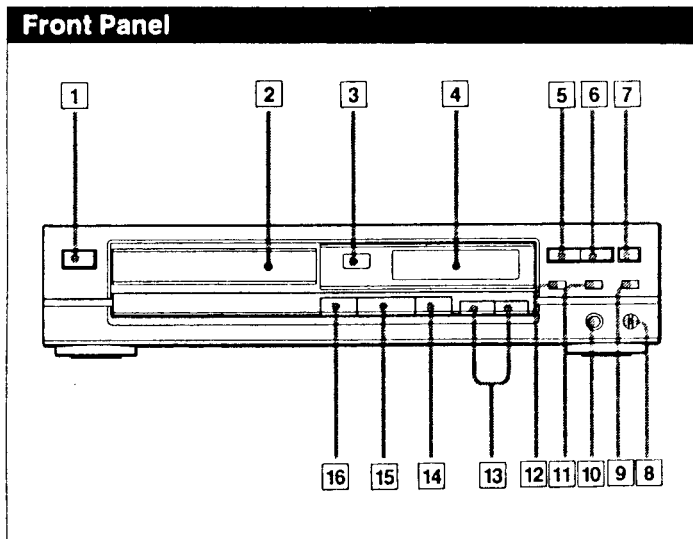
1. Advarsel Mærkning



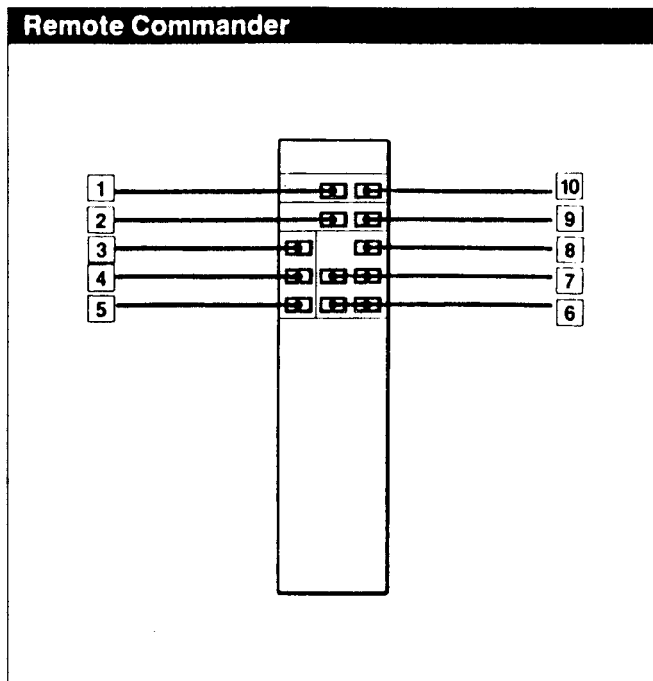
VAROITUS: Laite sisältää, laserdiodin, joka lähettää (näkyvätöntä) silmille vaarallista lasersäteilyä.

SECTION 1 GENERAL

1-1. LOCATION AND FUNCTION OF CONTROLS



- 1 POWER switch
- 2 Disc tray
- 3 Remote sensor
- 4 Display window
- 5 PROGRAM button
- 6 SHUFFLE button
- 7 REPEAT button
- 8 (headphone) LEVEL control (CDP-M19/M39)
- 9 MUSIC SCAN button
- 10 PHONES jack (CDP-M19/M39)
- 11 FADER button
- 12 TIME button
- 13 <<<<<<>>>> (AMS*/RMS**)/<<<<>>>> (manual search) buttons
- 14 ■ (stop)/PGM (program) CLEAR button
- 15 ▶|| (play/pause) button
- 16 ▲ (open/close) button



- 1 PGM (program) button
- 2 TIME button
- 3 ▶ (play) button
- 4 || (pause) button
- 5 ■ (stop) button
- 6 <<<<>>>> (manual search) buttons
- 7 <<<<>>>> (AMS*) buttons
- 8 FADER button
- 9 REPEAT button
- 10 SHUFFLE button

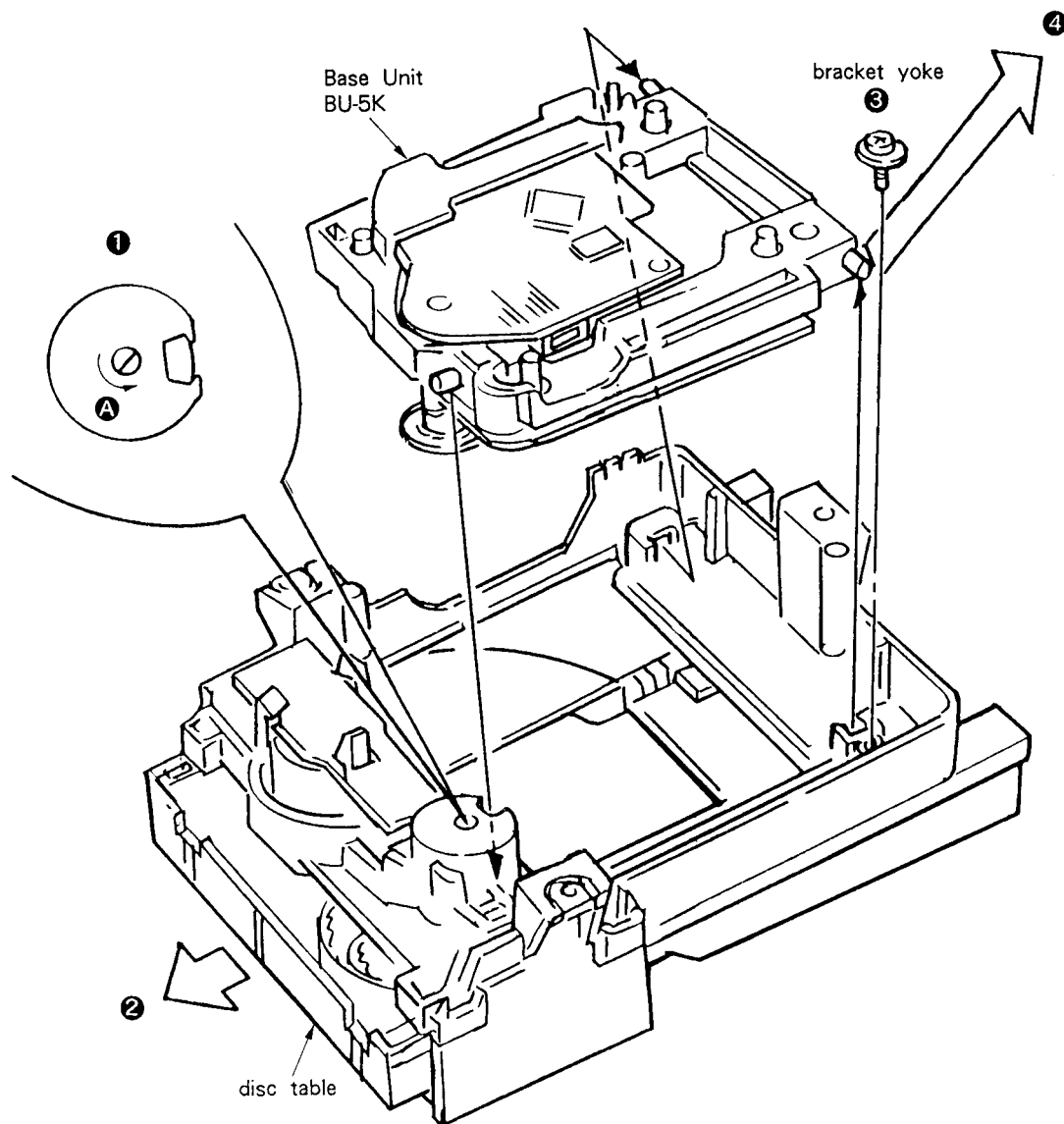
* AMS is an abbreviation of Automatic Music Sensor.
 ** RMS is the abbreviation of Random Music Sensor.

SECTION 2

DISSASSEMBLY OF BASE UNIT

Note: Follow the disassembly procedure in the numerical order given.

1. Remove CD mechanism from the set and turn over.
2. Turn the cam in the Arrow **A** direction by the **⊖** driver.
3. Take out disc table.
4. Remove bracket yoke.
5. Remove BU-5K in the Arrow **4** direction.

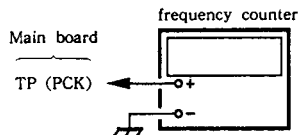


SECTION 3

ELECTRICAL ADJUSTMENTS

1. Perform adjustments in the order given.
2. Use YEDS-18 (Part No : 3-702-101-1) disc unless otherwise indicated.
3. Use the oscilloscope with more than 10 MΩ impedance.

RF PLL Frequency Adjustment / Lock Frequency Check Procedure :

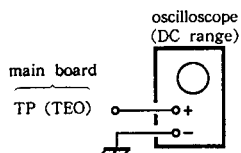


1. Connect test point TP (ASY) to ground with lead wire.
2. Turn POWER switch on.
3. Connect the frequency counter to test point TP (PCK).
4. Adjust RV201 so that the reading on frequency counter is 4,3218 MHz ± 30 KHz.
.....(RF PLL frequency adjustment)
5. Remove lead wire connecting TP (ASY) to ground.
6. Set disc (YEDS-18) and press ▷ PLAY button.
7. Confirm that the reading on frequency counter is 4,3218 MHz.
.....(Lock frequency check)
8. Turn POWER switch off.

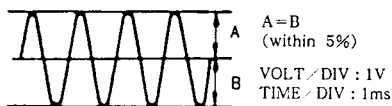
E-F Balance Adjustment

This adjustment should be made when replacing TOP (T-type Optical Pick-up).

Procedure :



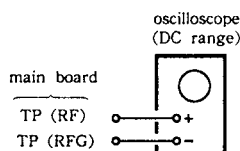
1. Connect test point TP (ADJ) and TP (TES) to ground with lead wire.
2. Connect oscilloscope to test point TP (TEO).
3. Set disc (YEDS-18) and turn POWER switch on.
4. Adjust RV101 so that the traverse waveform is symmetrical above and below.
5. Turn POWER switch off.
6. After adjustment, remove the lead wire connected in step 1.



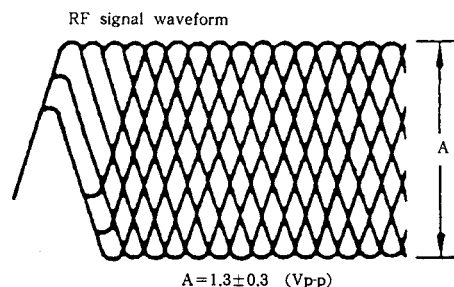
Focus Bias Adjustment

This adjustment should be made when replacing TOP (T-type Optical Pick-up).

Procedure :



1. Connect oscilloscope to test point TP (RF) and test point TP (RFG).
2. Set disc (YEDS-18) and turn POWER switch on.
3. Adjust RV102 for an optimum waveform eye pattern or so that the peak is maximum. Optimum eye pattern means that shape "◇" can be clearly distinguished at the center of the waveform.
4. Turn POWER switch off.



REFERENCE

Focus / Tracking Gain Adjustments

A frequency response analyzer is necessary in order to perform this adjustment exactly.

However, this gain has a margin, so even if it is slightly off, there is no problem. Therefore, do not perform this adjustment.

Focus / tracking gain determines the pick-up follow up (vertical and horizontal) relative to mechanical noise and shock when the 2-axis device operate.

However, as these reciprocate, the adjustment is at the point where both are satisfied.

- When gain is raised, the noise when the 2-axis device operates increases.
- When gain is lowered, mechanical shock and skipping occurs more easily.
- When gain adjustment is off, the symptoms below appear.

Symptoms	Gain	Focus	Tracking
• The time until music starts becomes longer for ■ STOP → ▷ PLAY or automatic selection, (⏮ ⏭ buttons pressed.) (Normally takes about 1 seconds.)		low	low or high
• Music does not start and disc continues to rotate for ■ STOP → ▷ PLAY or automatic selection, (⏮ ⏭ buttons pressed.)		—	low
• Sound is interrupted during PLAY or time counter display stops progressing.		—	low
• More noise during 2-axis device operation.		high	high

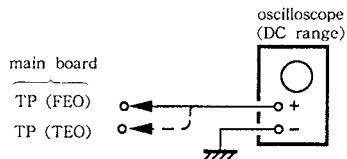
The following is a simple adjustment method.

-Primary Adjustment-

Note : Since exact adjustment cannot be performed, remember the positions of the controls before performing the adjustment.

If the position after the primary adjustment are only a little different, return the controls to the original position.

Procedure :



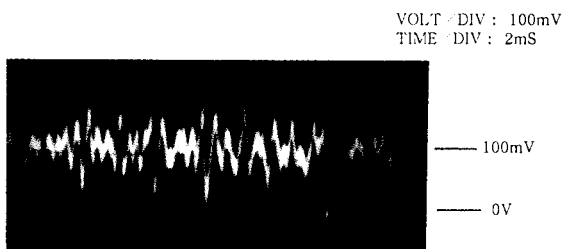
1. Keep the set horizontal.

(If the set is not horizontal, this adjustment cannot be performed due to the gravity against the 2-axis device.)

2. Set disc (YEDS-18) and turn POWER switch on.

3. Connect oscilloscope to main amp board TP (FEO).

4. Adjust RV103 so that the waveform is as shown in the figure below. (focus gain adjustment)



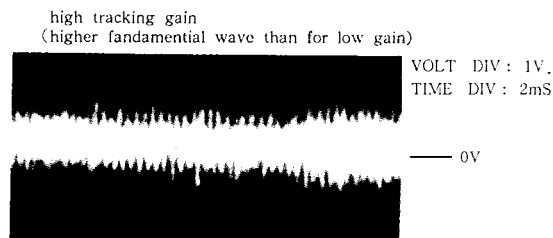
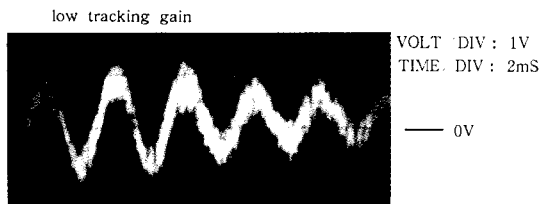
5. Connect oscilloscope to main board TP (TEO).

6. Adjust RV104 so that the waveform is as shown in the figure below. (tracking gain adjustment)

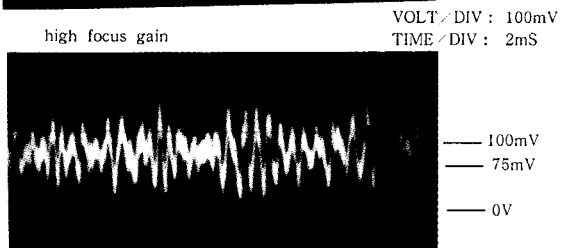
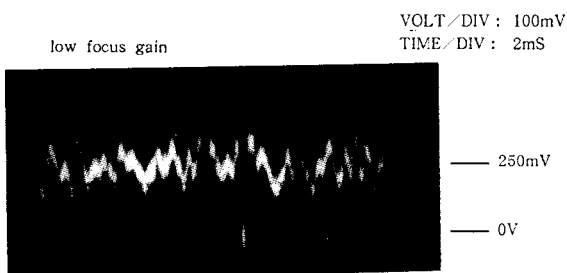
7. Turn POWER switch off.



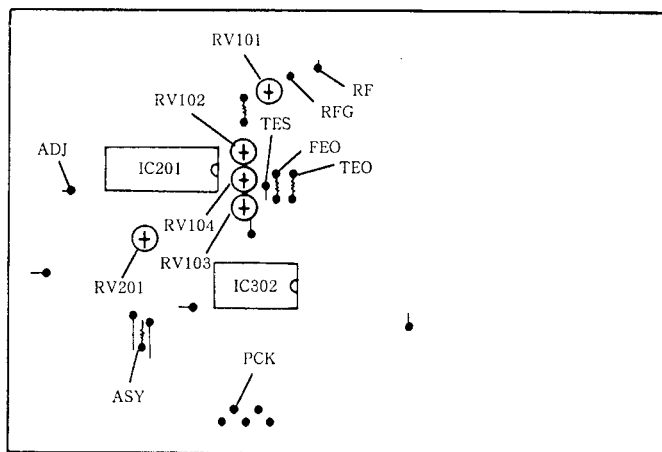
• Incorrect Examples (fundamental wave appears)



• Incorrect Examples (DC level changes more than on adjusted waveform)



Adjustment Location : main board -component side-



SECTION 4
DIAGRAMS

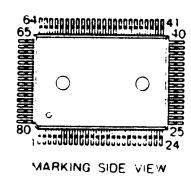
4-1. PRINTED WIRING BOARDS

• SEMICONDUCTOR LOCATION

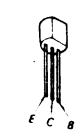
Ref. No	Location	Ref. No.	Location
IC001	E-17	D001	G-17
IC101	F-16	D002	G-17
IC201	E-14	D003	G-17
IC202	F-13	D004	G-17
IC203	F-12	D005	C-18
IC301	B-15	D007	D-17
IC302	C-15	D008	C-18
IC303	B-17	D401	C-17
IC304	B-16	D402	C-17
IC401	B-18	D501	B-6
IC402	A-19	D502	B-6
IC501	B-5	D503	B-6
IC721	B-10	D504	B-6
		D505	B-6
		D506	B-7
Q001	C-17	D507	B-7
Q101	G-15	D508	B-7
Q201	C-13	D509	B-7
Q202	C-13	D509	B-7
Q401	C-19	D510	B-7
Q402	B-17		
Q403	B-20		
Q404	B-20		
Q405	A-19		
Q453	B-19		
Q454	B-20		
Q455	A-19		

• SEMICONDUCTOR LEAD LAYOUTS

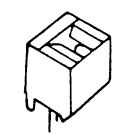
CXD1125Q
PD75308GF



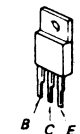
2SB1068K



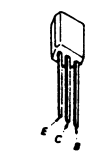
GP1U52XB



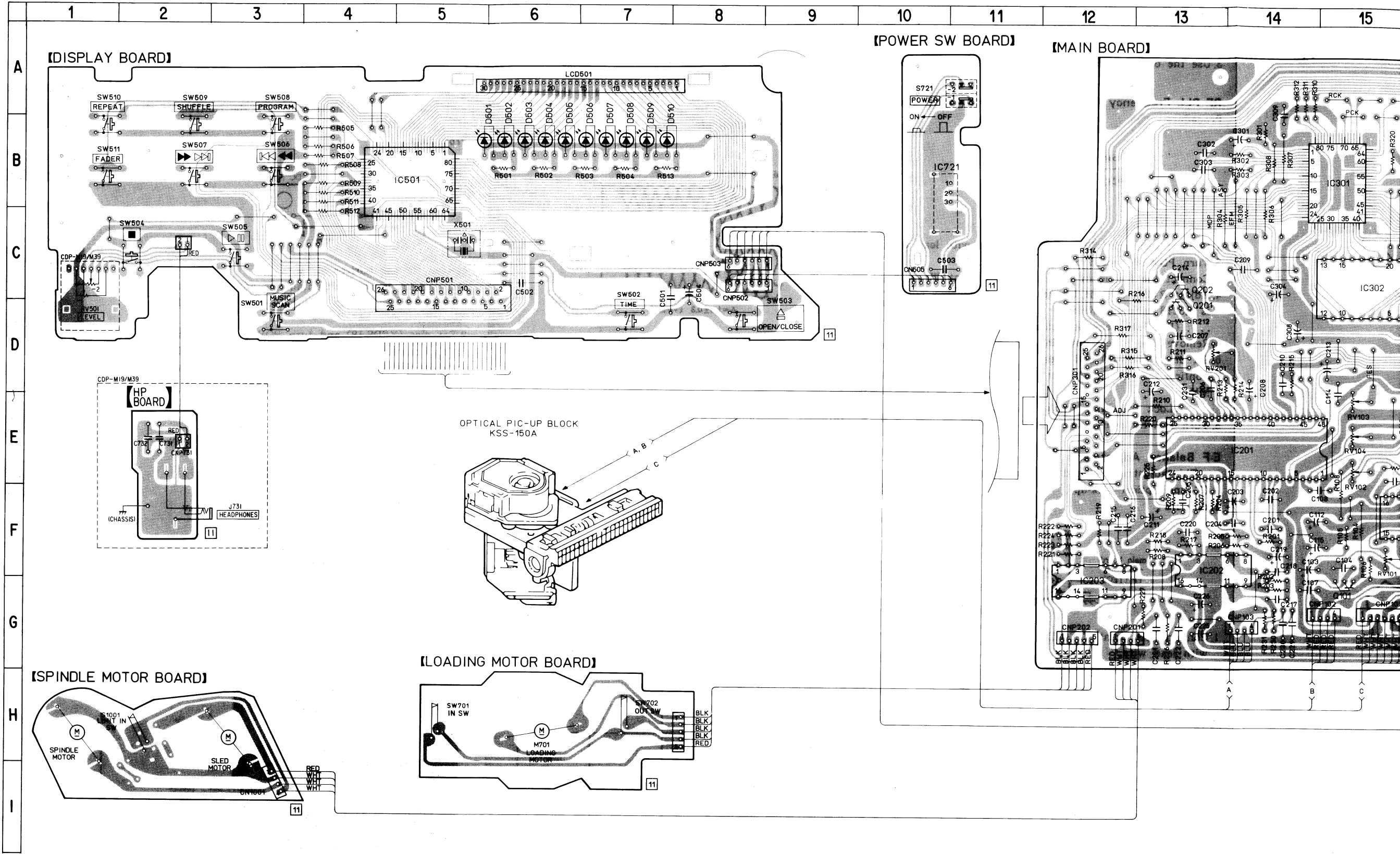
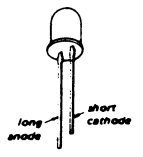
2SB1187



DTC114ES
DTC143ES
DTC144ES
2SA1348

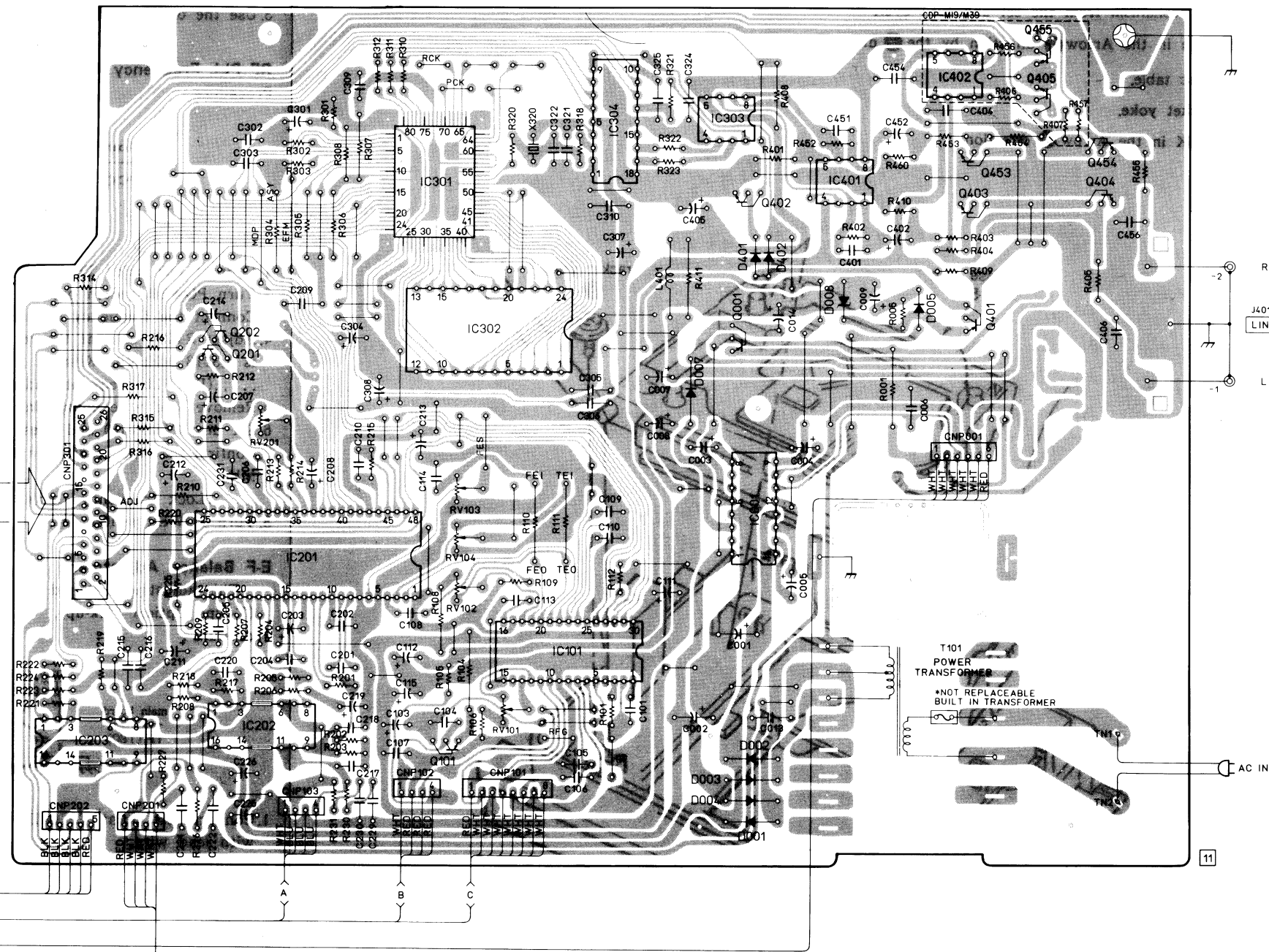
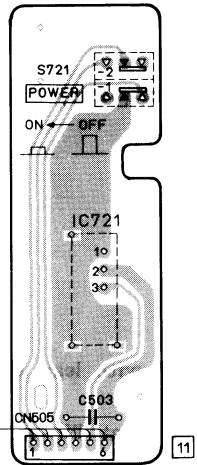
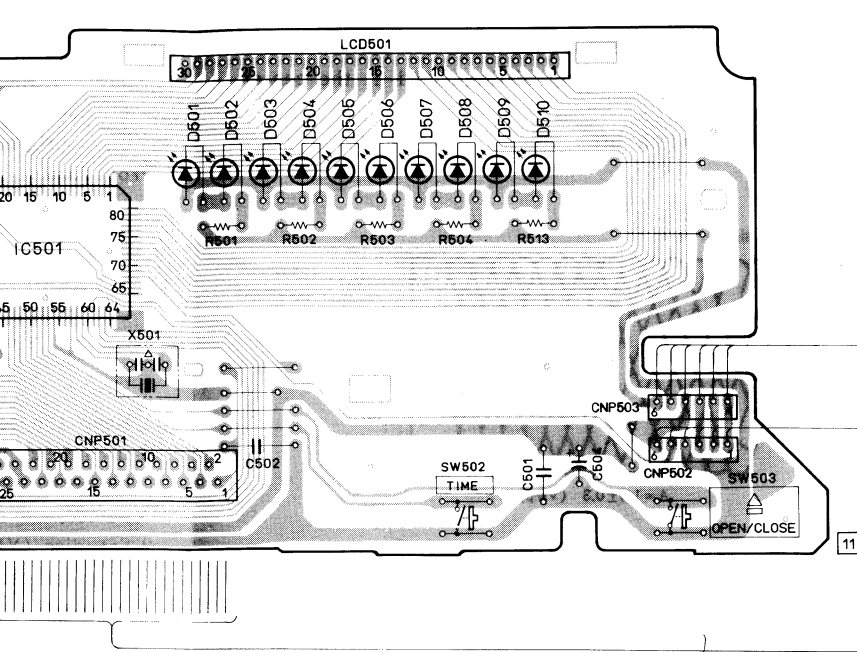


SEL3B10D

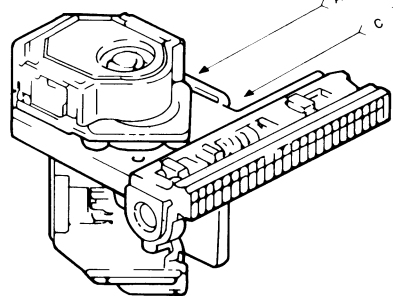


Note:
• : parts extracted from the component side.

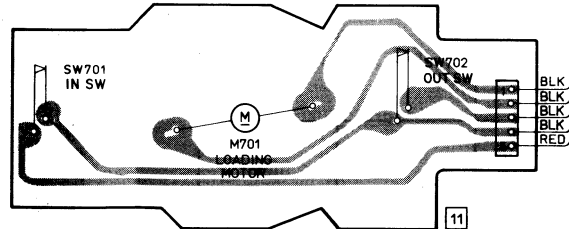
【POWER SW BOARD】 【MAIN BOARD】



OPTICAL PIC-UP BLOCK KSS-150A



【LOADING MOTOR BOARD】



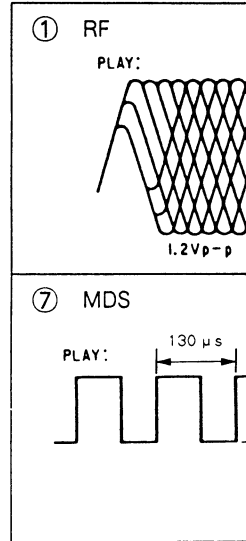
Note :

- All capacitors are in μF unless otherwise noted. pF : μF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
- Δ : internal component.
- **B+** : B+ Line
- **B-** : B- Line
- \square : adjustment for repair.

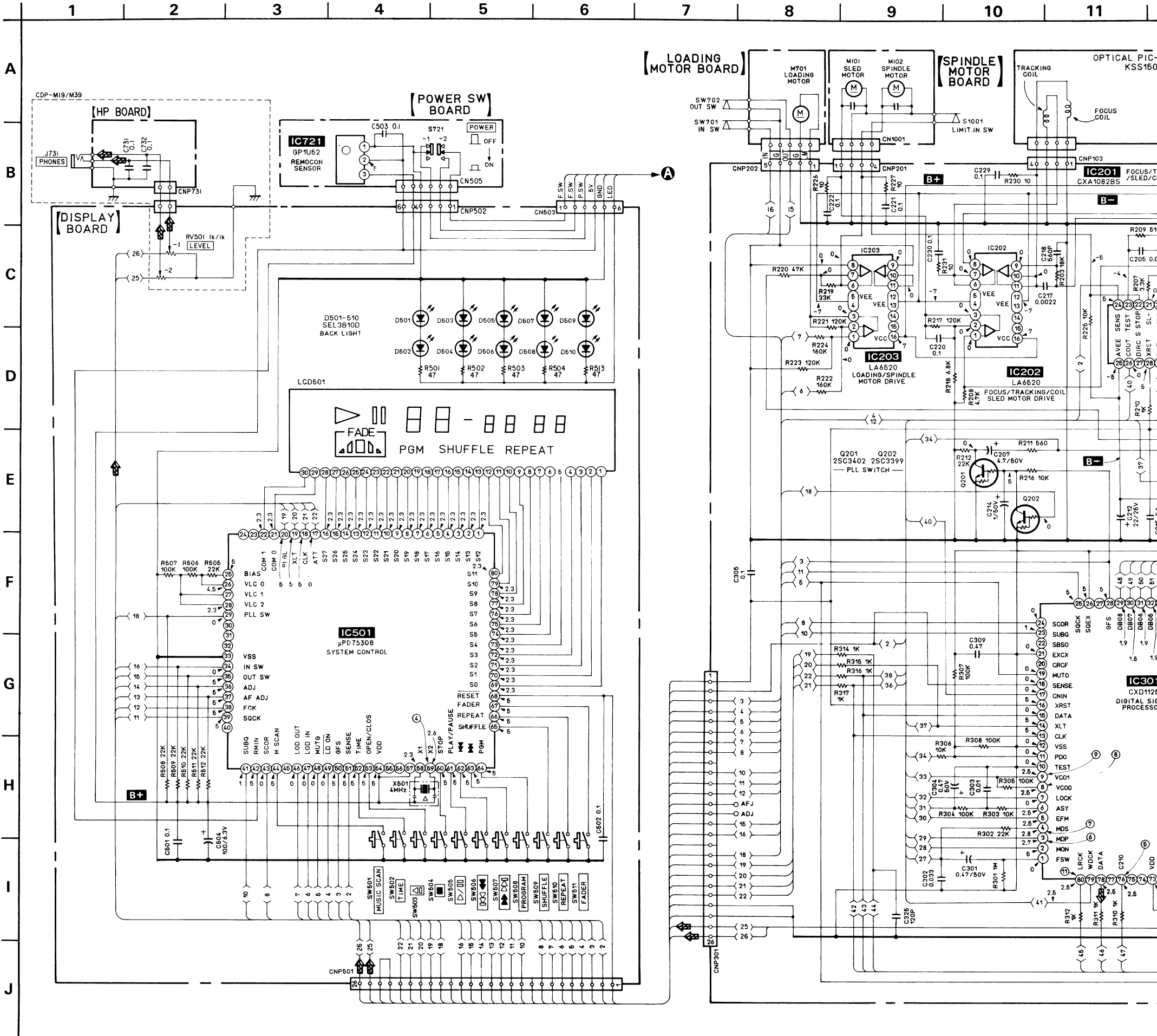
Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

- Voltage and waveforms are dc with respect to ground under no-signal conditions.
- no mark : PLAY
- Voltages are taken with a VOM (input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path. \Rightarrow : CD

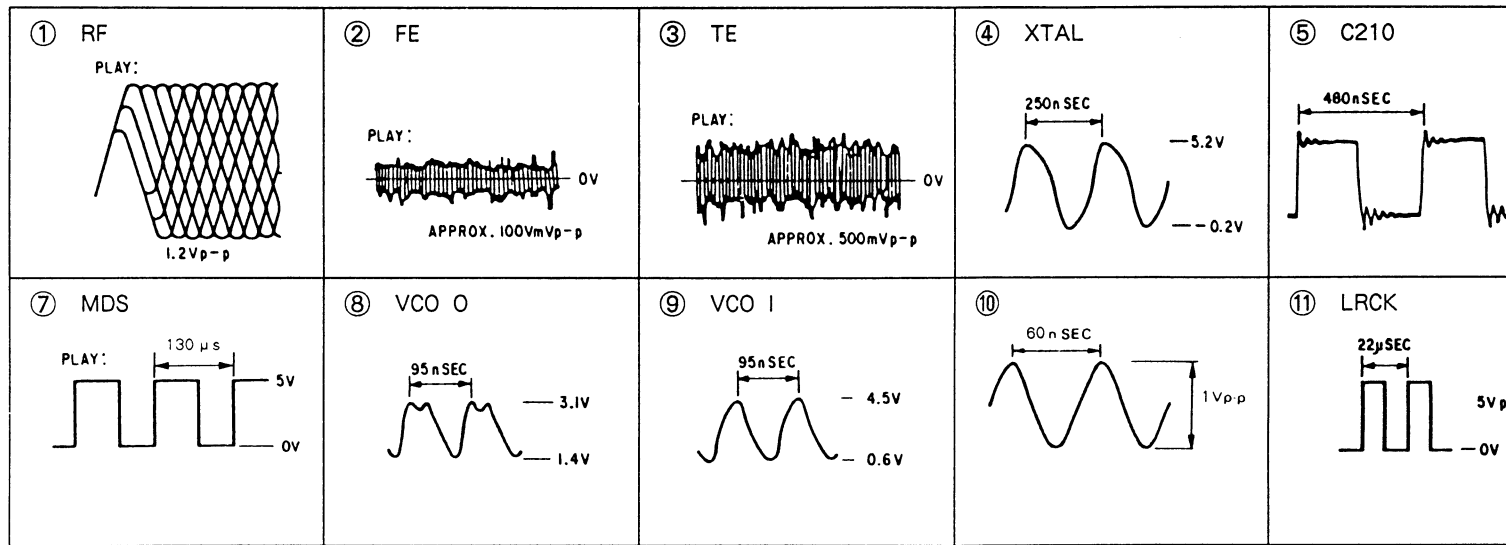
● WAVEFORM



4-2. SCHEMATIC DIAGRAM

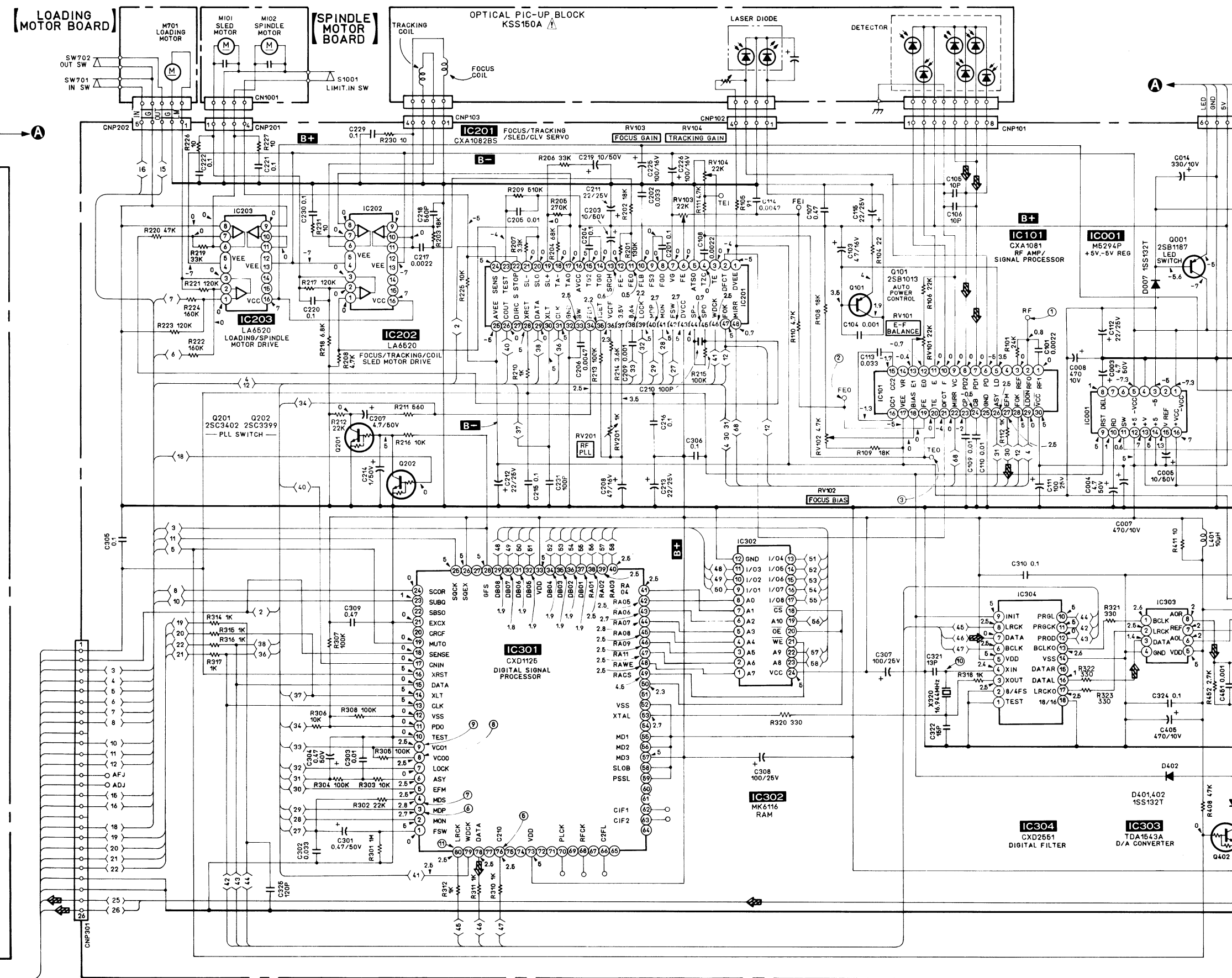


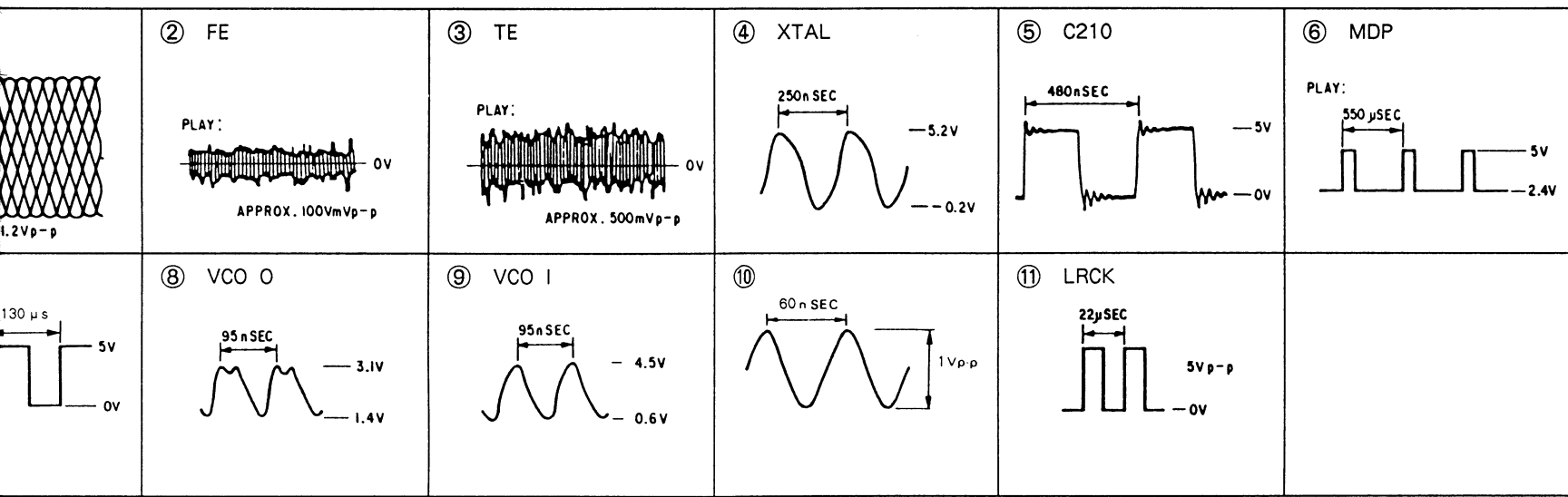
● WAVEFORM



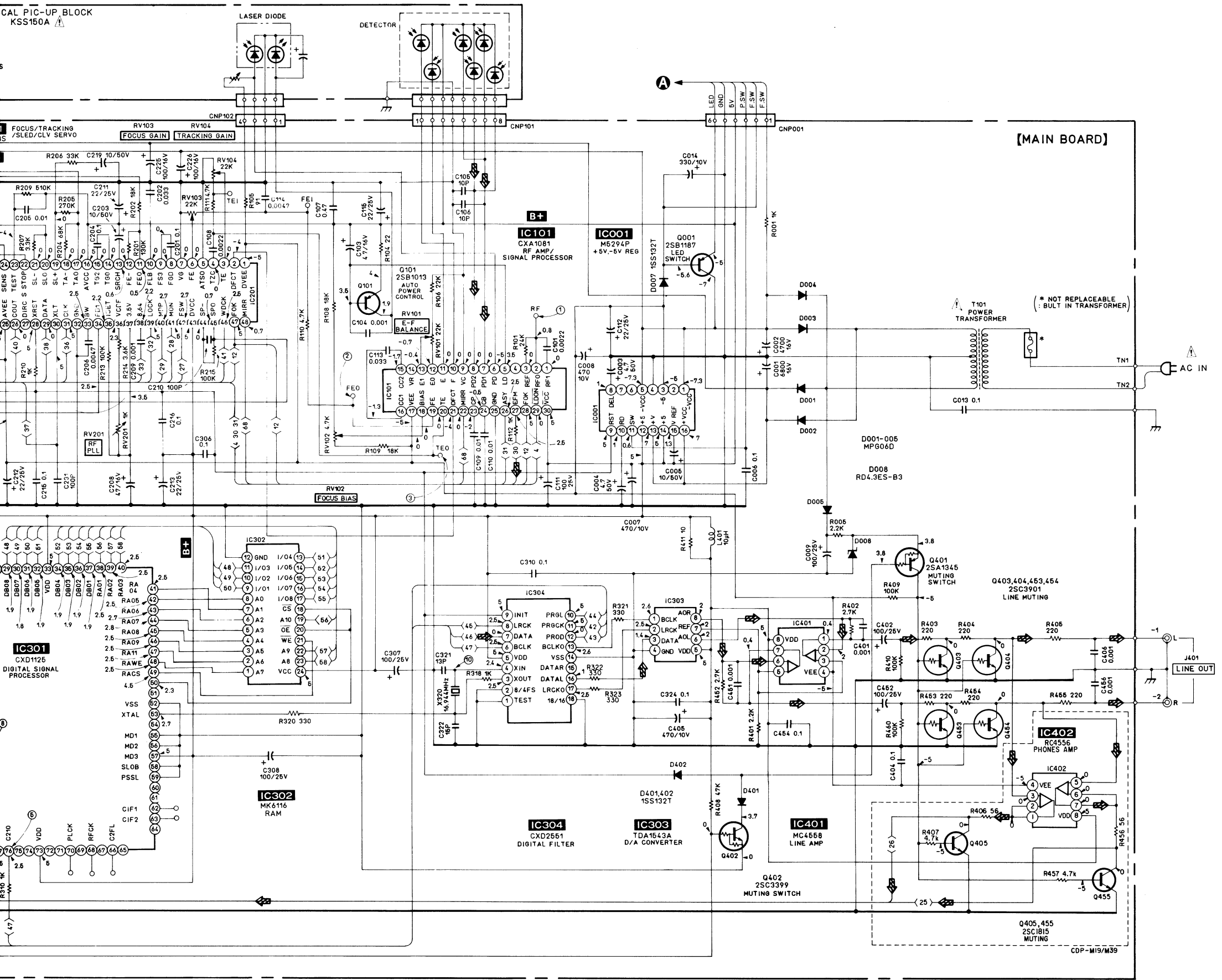
Waveforms are dc with respect to ground signal conditions.
 PLAY
 are taken with a VOM (input impedance 10MΩ).
 Variations may be noted due to normal produc-
 ces.
 are taken with an oscilloscope.
 Variations may be noted due to normal produc-
 ces.
 Numbers refer to waveforms.

7 8 9 10 11 12 13 14 15 16 17 18



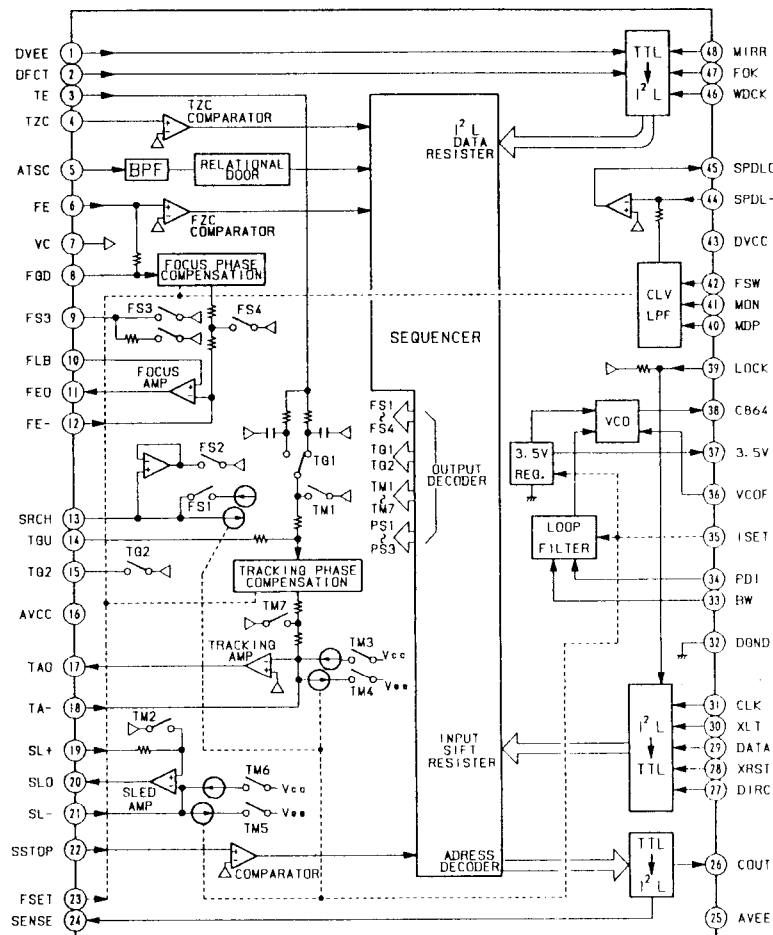


12 13 14 15 16 17 18 19 20 21 22

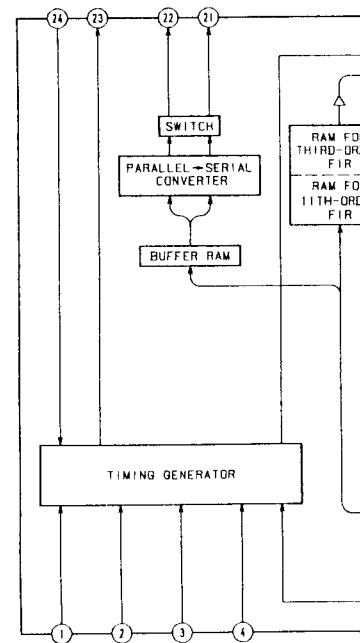


4-3. IC BLOCK DIAGRAM

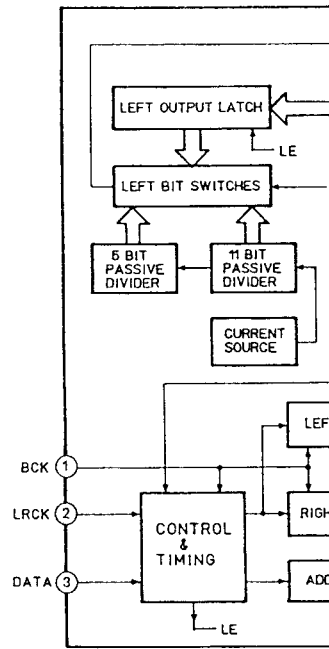
CXA1082BS



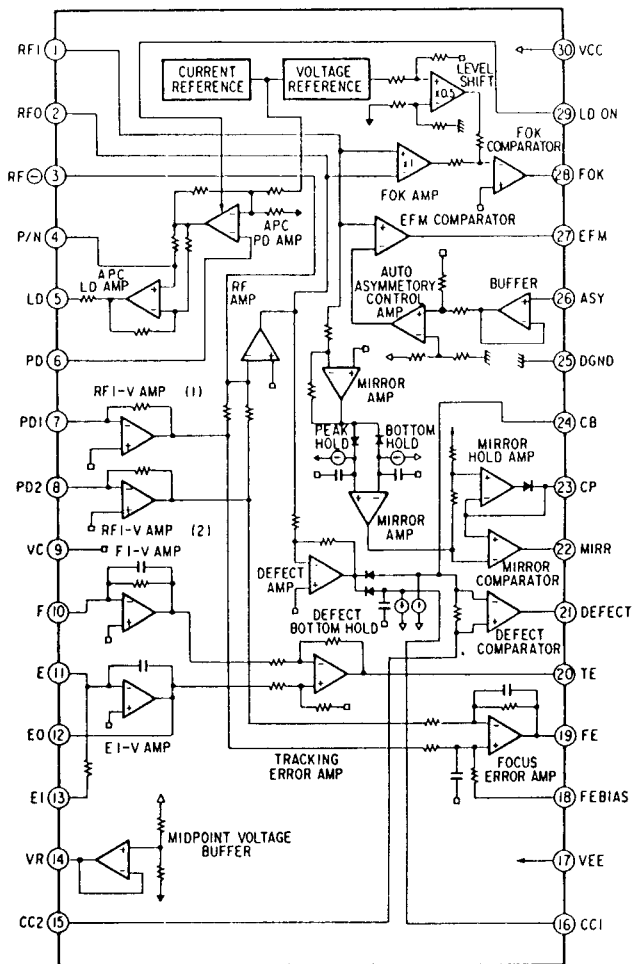
CXD2551P



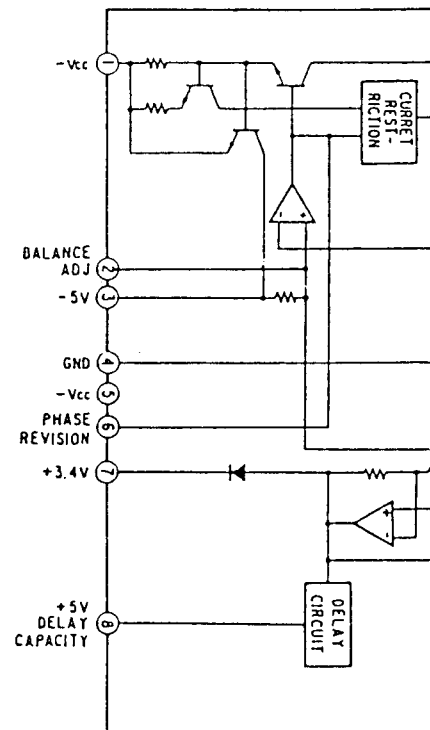
TDA1543



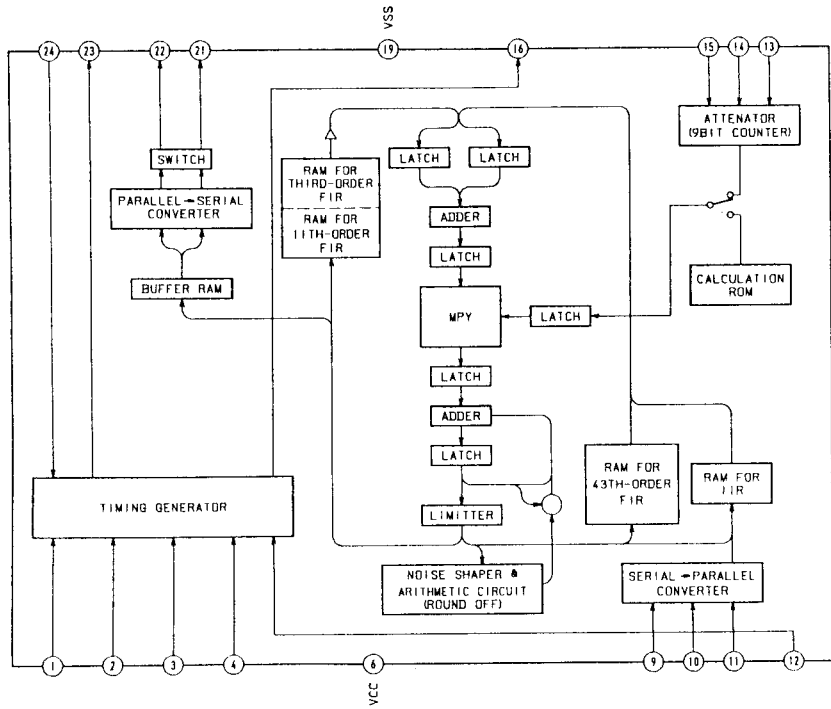
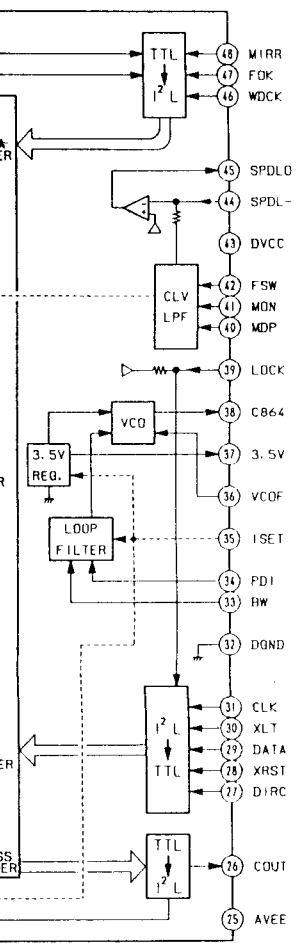
CXA1081S



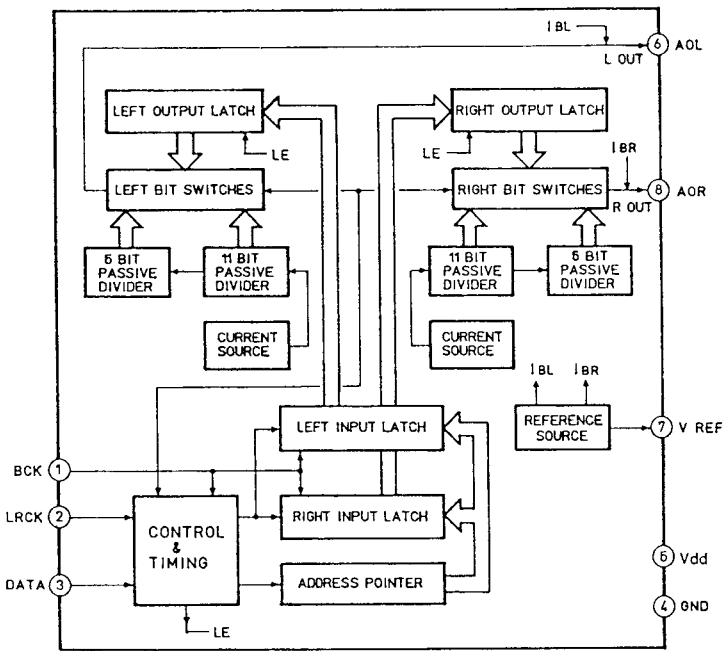
M5294P



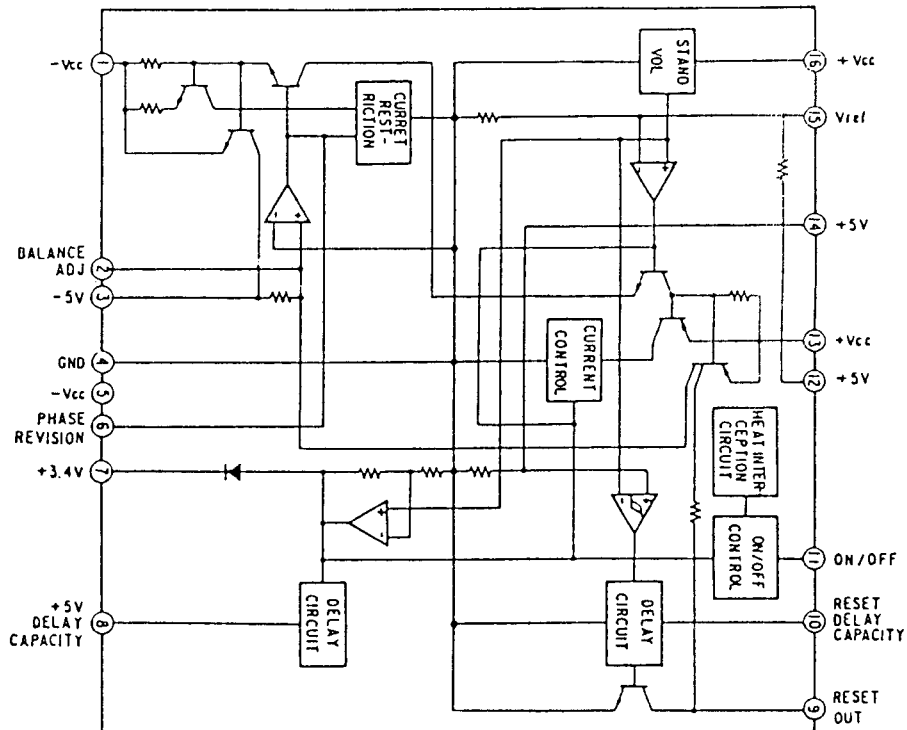
CXD2551P



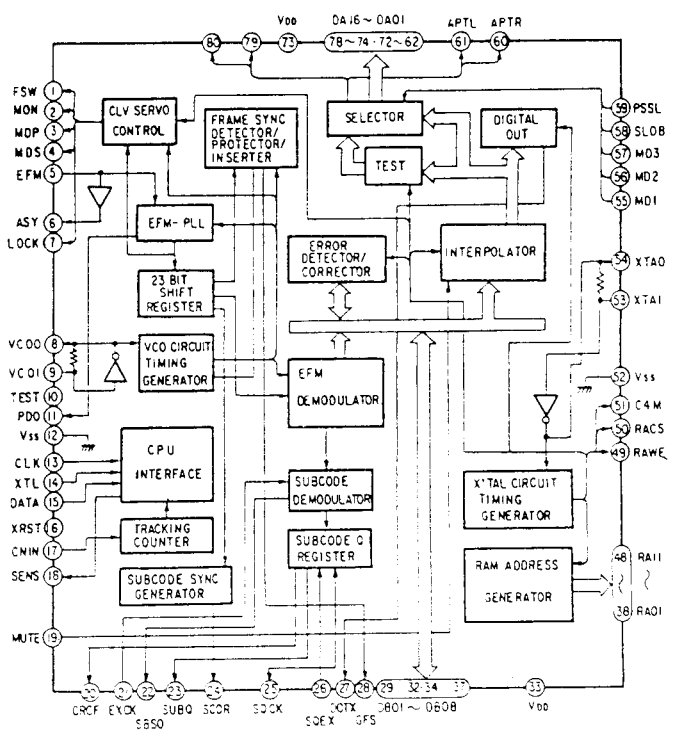
TDA1543



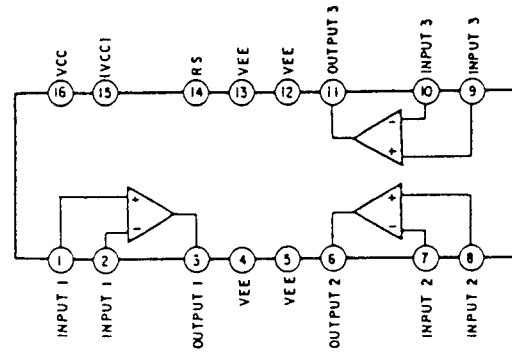
M5294P



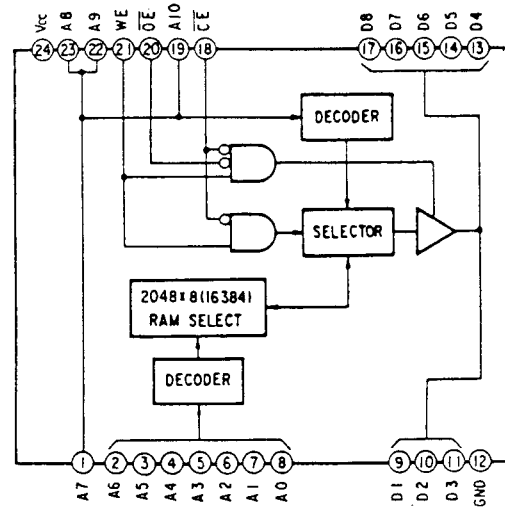
CXD1125Q



LA6520



MK6116-15



SECTION 5 EXPLODED VIEWS

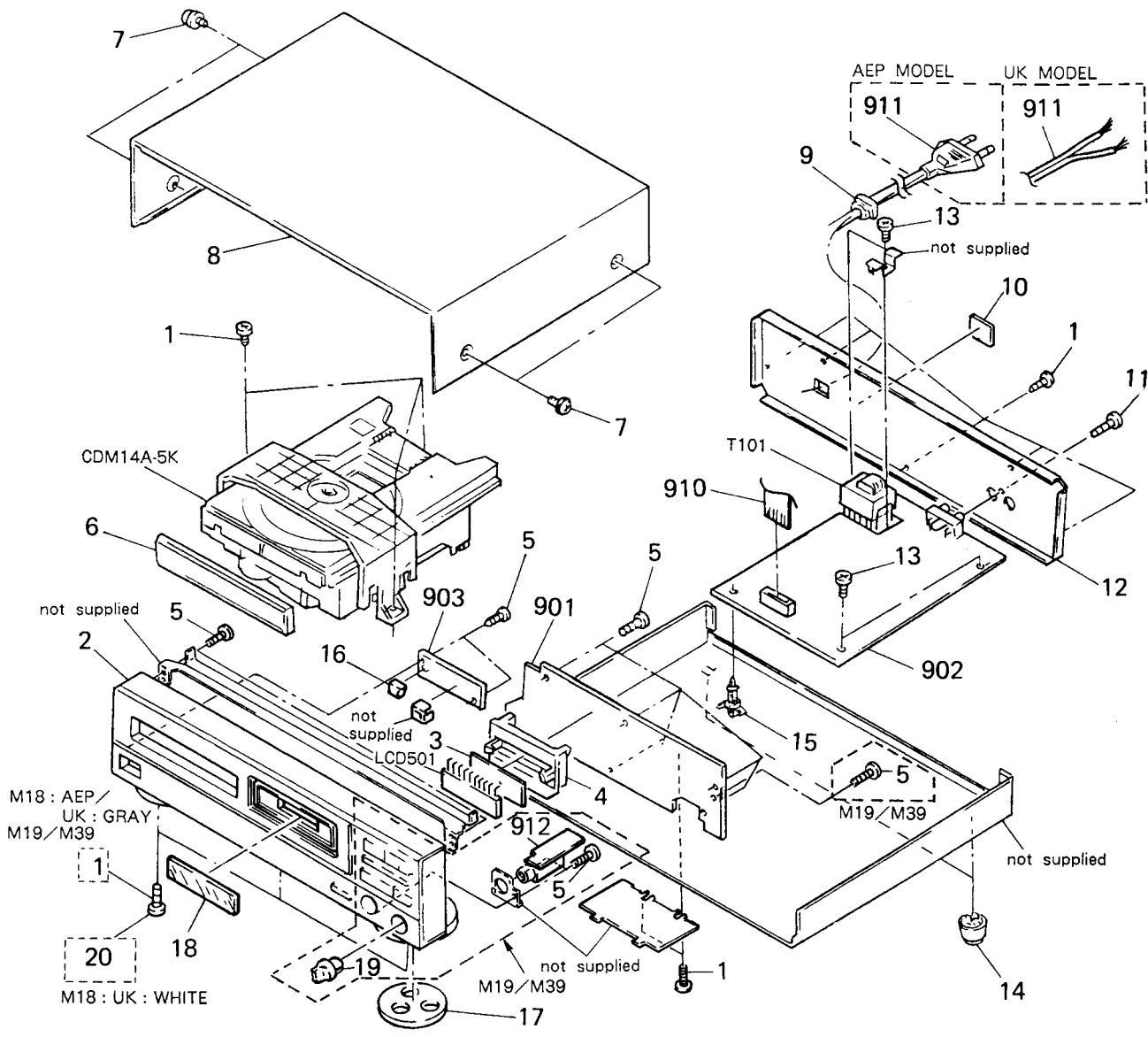
NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts
Example:
(RED) ... KNOB, BALANCE (WHITE)
↑ Cabinet's Color ↑ Parts Color

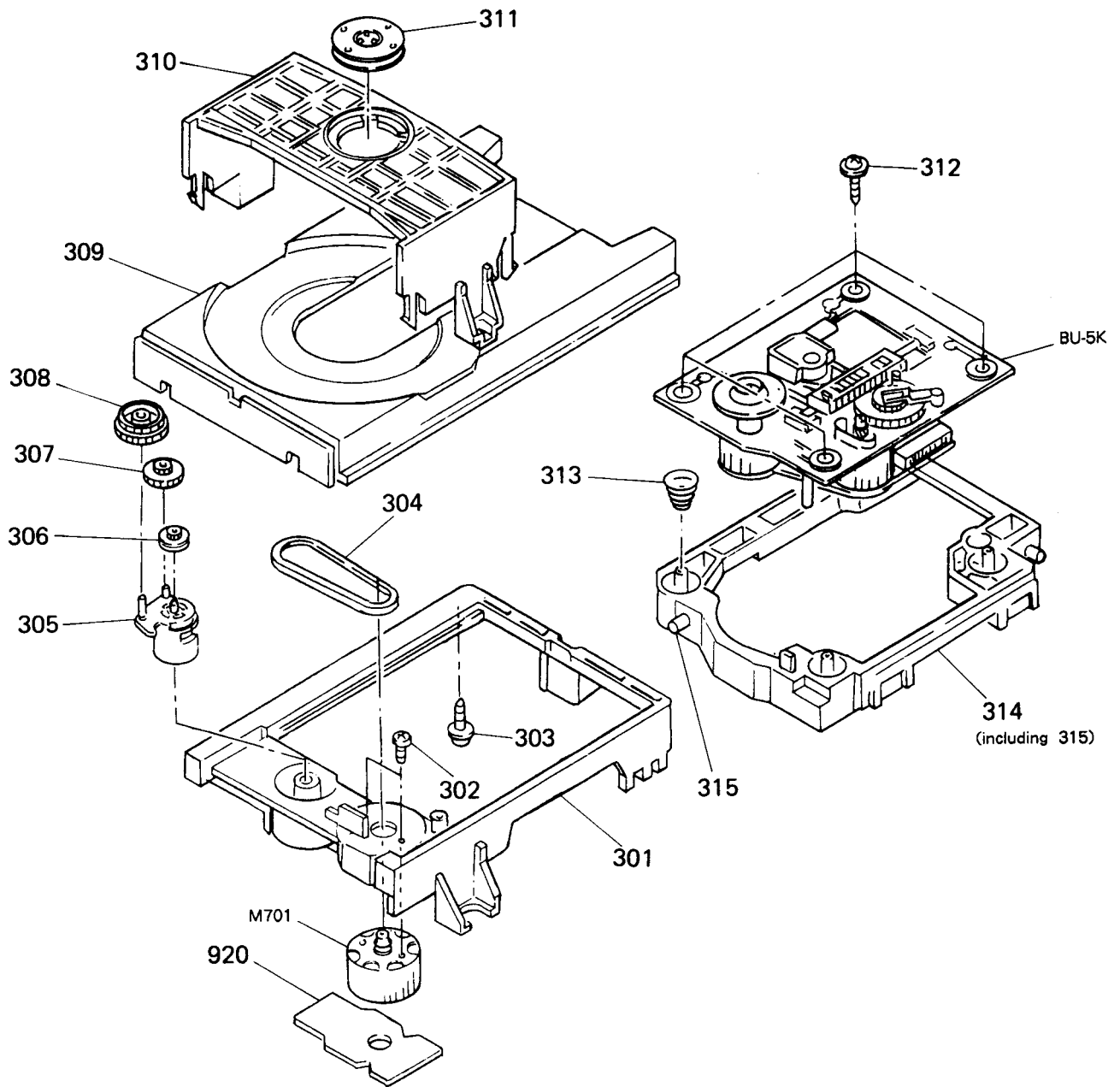
The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

(1) CHASSIS SECTION



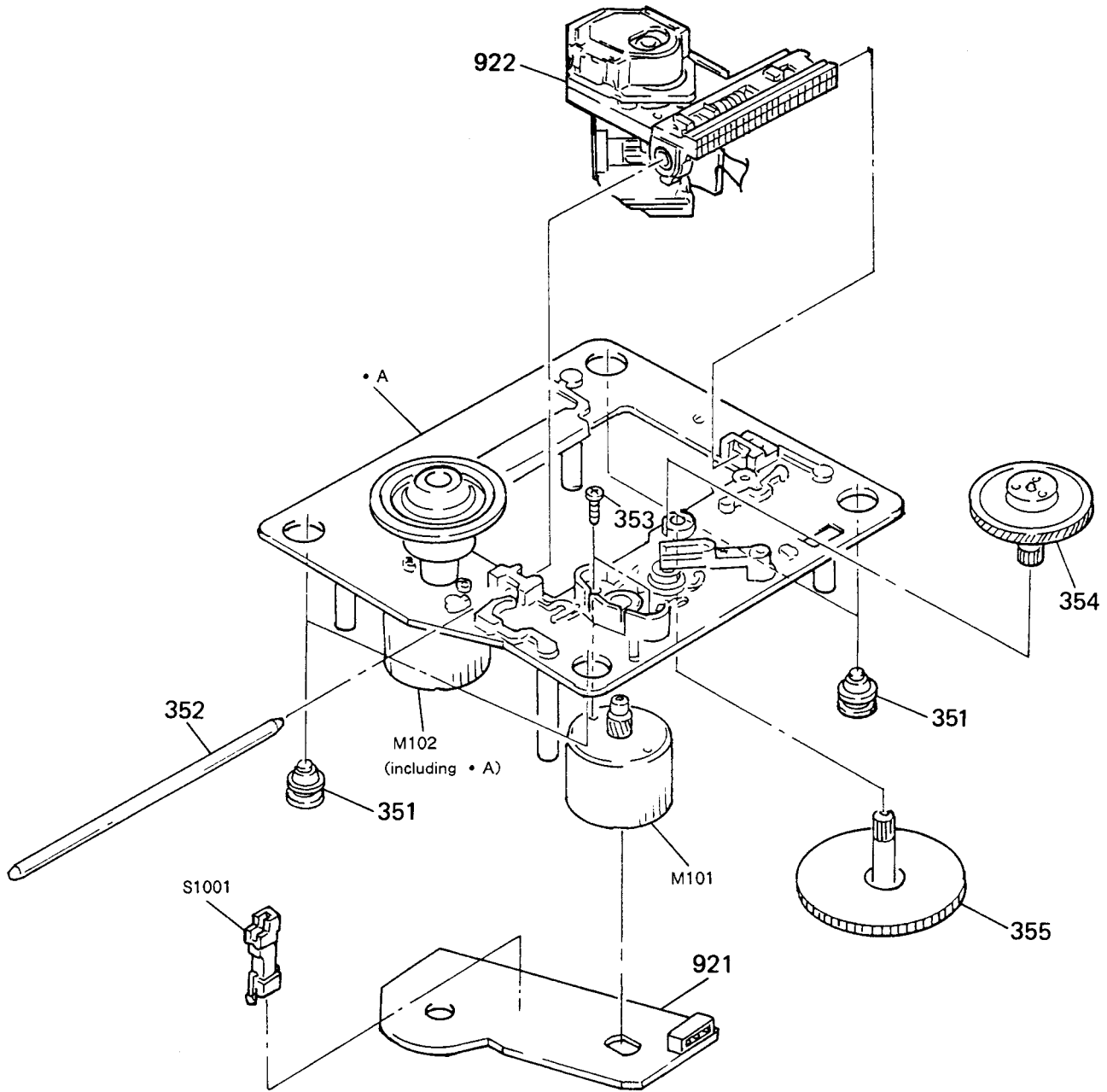
No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
1	7-685-872-09	SCREW +BVTT 3X8 (S)		12	*4-927-346-01	PANEL, BACK	
2	X-4917-582-2	(M18:AEP,UK)...PANEL ASSY, FRONT(GRAY)		14	4-933-601-01	FOOT	
	X-4917-584-1	(M39).....PANEL ASSY, FRONT		15	*4-924-098-31	HOLDER, PC BOARD	
	X-4917-585-1	(M19:AEP,UK)...PANEL ASSY, FRONT(BLACK)					
	X-4917-586-1	(M19:AEP).....PANEL ASSY, FRONT(GRAY)		16	4-927-341-01	(M18:AEP,UK/M19/M39)	
	X-4917-587-1	(M18:UK).....PANEL ASSY, FRONT(WHITE)				...BUTTON (POWER)(GRAY)	
3	*4-933-136-01	ILLUMINATOR			4-927-341-11	(M18:UK).....BUTTON (POWER)(WHITE)	
4	*4-933-121-01	HOLDER (LCD)		17	4-921-906-01	FELT	
5	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S		18	4-927-351-01	(M18:AEP,UK/M19/M39)	
						...PLATE, INDICATION (GRAY)	
6	4-927-339-02	(M39).....PANEL, LOADING			4-927-351-11	(M18:UK)....PLATE, INDICATION (WHITE)	
	4-927-339-12	(M19:AEP,UK)...PANEL, LOADING(BLACK)		19	4-933-116-11	(M19/M39)...KNOB (C,TYPE), LOV	
	4-927-339-21	(M18:AEP,UK)...PANEL, LOADING(GRAY)		20	7-685-872-01	(M18:UK)...SCREW +BVTT 3X8 (S)(WHITE)	
	4-927-339-31	(M19:AEP).....PANEL, LOADING(GRAY)		901	*1-632-162-11	PC BOARD, DISPLAY	
	4-927-339-41	(M18:UK).....PANEL, LOADING(WHITE)					
7	3-704-366-31	(M18:AEP,UK/M19/M39)...SCREW (CASE)		902	*A-4617-202-A	(M19/M39)...MOUNTED PCB, MAIN	
		(M3X6)(GRAY)			*A-4617-233-A	(M18).....MOUNTED PCB, MAIN	
	3-704-366-41	(M18:UK)...SCREW (CASE)(M3X6)(WHITE)		903	*1-632-163-11	PC BOARD, POWER SW	
8	4-919-376-51	(M19:AEP,UK/M39).....CASE (BLACK)		910	1-575-043-11	WIRE, PARALLEL (26 CORE)	
	4-919-376-61	(M18:AEP,UK/M19:AEP)...CASE (GRAY)					
	4-919-376-71	(M18:UK).....CASE (WHITE)		911	△1-574-127-11	(M18:AEP/M19:AEP/M39)...CORD, POWER	
9	*3-703-244-00	BUSHING (2104), CORD			△1-574-390-11	(M18:UK/M19:UK).....CORD, POWER	
10	*4-927-352-01	(M18:AEP)..LABEL, MODEL NUMBER(AE.ALSACE)		912	*1-632-164-11	(M19/M39)...PC BOARD, HEADPHONE	
11	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S		LCD501	1-808-794-41	DISPLAY PANEL, LIQUID CRYSTAL	
				T101	△1-449-823-11	TRANSFORMER, POWER	



(2) CD MECHANISM SECTION (CDM14A-5K)




No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
301	4-933-111-01	CHASSIS (MD)		310	4-933-110-01	HOLDER (MG)	
302	7-621-775-10	SCREW +B 2.6X4		311	A-4675-347-A	MG ASSY	
303	*4-917-583-21	BRACKET, YOKE		312	4-933-134-01	SCREW (+PTPWH M2.6X6)	
304	4-927-649-01	BELT		313	4-917-541-01	SPRING (B)	
305	4-933-109-01	CAM		314	4-933-129-01	HOLDER (BU)	
306	4-927-651-01	PULLEY (S)		315	4-933-108-01	SHAFT (CAM)	
307	4-927-628-01	GEAR (C)		920	*1-632-169-11	PC BOARD, LOADING MOTOR	
308	4-933-107-01	GEAR (PL)		M701	A-4608-362-A	MOTOR (L) ASSY	
309	4-933-112-01	TABLE, DISK					

(3) OPTICAL PICK-UP BLOCK (BU-5K)



Note: The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
351	4-933-126-01	INSULATOR (A)		921	*1-632-460-11	PC BOARD, SL/SP MOTOR	
352	4-917-565-01	SHAFT, SLED		922	 8-848-062-01	DEVICE, OPTICAL KSS-150A (H)	
353	7-621-255-15	SCREW +P 2X3		M101	X-4917-504-1	ASSY, MOTOR (SLED)	
354	4-917-567-01	GEAR (M)		M102	X-4917-523-1	ASSY, MOTOR (SPINDLE)	
355	4-917-564-01	GEAR (P), FLATNESS		S1001	1-570-822-11	SWITCH, LEAF (LIMIT IN SW)	

SECTION 6 ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:MF: μ F, PF: μ F.**RESISTORS**

- All resistors are in ohms.
- F: nonflammable

COILS

- MMH: mH, UH: μ H

SEMICONDUCTORSIn each case, U: μ , for example:UA...: μ A..., UPA...: μ PA...,
UPC...: μ PC, UPD...: μ PD...

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description			
901	*1-632-162-11	PC BOARD, DISPLAY	C210	1-162-282-31	CERAMIC	100PF	10%	50V
902	*A-4617-202-A	(M19/M39)...MOUNTED PCB, MAIN	C211	1-126-233-11	ELECT	22MF	20%	25V
	*A-4617-233-A	(M18).....MOUNTED PCB, MAIN	C212	1-126-233-11	ELECT	22MF	20%	25V
903	*1-632-163-11	PC BOARD, POWER SW	C213	1-126-233-11	ELECT	22MF	20%	25V
910	1-575-043-11	WIRE, PARALLEL (26 CORE)	C214	1-124-499-11	ELECT	1MF	20%	50V
911	Δ 1-574-127-11	(M18:AEP/M19:AEP/M39)...CORD, POWER	C215	1-164-159-11	CERAMIC	0.1MF		50V
	Δ 1-574-390-11	(M18:UK/M19:UK).....CORD, POWER	C216	1-164-159-11	CERAMIC	0.1MF		50V
912	*1-632-164-11	(M19/M39)...PC BOARD, HEADPHONE	C217	1-161-375-00	CERAMIC	0.0022MF	20%	16V
920	*1-632-169-11	PC BOARD, LOADING MOTOR	C218	1-162-291-31	CERAMIC	560PF	10%	50V
922	Δ 8-848-062-01	DEVICE, OPTICAL KSS-150A (H)	C219	1-123-875-11	ELECT	10MF	20%	50V
C001	1-126-017-11	ELECT	C220	1-136-165-00	FILM	0.1MF	5%	50V
C002	1-124-898-11	ELECT	C221	1-164-159-11	CERAMIC	0.1MF		50V
C003	1-124-927-11	ELECT	C222	1-164-159-11	CERAMIC	0.1MF		50V
C004	1-124-927-11	ELECT	C225	1-126-101-11	ELECT	100MF	20%	16V
C005	1-123-875-11	ELECT	C226	1-126-101-11	ELECT	100MF	20%	16V
C006	1-164-159-11	CERAMIC	C229	1-164-159-11	CERAMIC	0.1MF		50V
C007	1-124-472-11	ELECT	C230	1-164-159-11	CERAMIC	0.1MF		50V
C008	1-124-472-11	ELECT	C231	1-162-282-31	CERAMIC	100PF	10%	50V
C009	1-124-478-11	ELECT	C301	1-124-902-00	ELECT	0.47MF	20%	50V
C013	1-164-159-11	CERAMIC	C302	1-106-379-12	MYLAR	0.033MF	5%	100V
C014	1-124-604-00	ELECT	C303	1-161-379-00	CERAMIC	0.01MF	20%	16V
C101	1-106-351-00	MYLAR	C304	1-124-902-00	ELECT	0.47MF	20%	50V
C103	1-124-477-11	ELECT	C305	1-164-159-11	CERAMIC	0.1MF		50V
C104	1-162-294-31	CERAMIC	C306	1-164-159-11	CERAMIC	0.1MF		50V
C105	1-162-199-31	CERAMIC	C307	1-124-478-11	ELECT	100MF	20%	25V
C106	1-162-199-31	CERAMIC	C308	1-124-478-11	ELECT	100MF	20%	25V
C107	1-136-173-00	FILM	C309	1-136-173-00	FILM	0.47MF	5%	50V
C108	1-161-375-00	CERAMIC	C310	1-164-159-11	CERAMIC	0.1MF		50V
C109	1-106-367-00	MYLAR	C321	1-162-202-31	CERAMIC	13PF	5%	50V
C110	1-106-367-00	MYLAR	C322	1-162-203-31	CERAMIC	15PF	5%	50V
C111	1-124-478-11	ELECT	C324	1-164-159-11	CERAMIC	0.1MF		50V
C112	1-126-233-11	ELECT	C325	1-162-283-31	CERAMIC	120PF	10%	50V
C113	1-106-379-12	MYLAR	C401	1-162-294-31	CERAMIC	0.001MF	10%	50V
C114	1-161-377-00	CERAMIC	C402	1-124-478-11	ELECT	100MF	20%	25V
C115	1-126-233-11	ELECT	C404	1-164-159-11	CERAMIC	0.1MF		50V
C201	1-136-165-00	FILM	C405	1-124-472-11	ELECT	470MF	20%	10V
C202	1-106-379-12	MYLAR	C406	1-162-294-31	CERAMIC	0.001MF	10%	50V
C203	1-123-875-11	ELECT	C451	1-162-294-31	CERAMIC	0.001MF	10%	50V
C204	1-136-165-00	FILM	C452	1-124-478-11	ELECT	100MF	20%	25V
C205	1-161-379-00	CERAMIC	C454	1-164-159-11	CERAMIC	0.1MF		50V
C206	1-161-377-00	CERAMIC	C456	1-162-294-31	CERAMIC	0.001MF	10%	50V
C207	1-124-927-11	ELECT	C501	1-164-159-11	CERAMIC	0.1MF		50V
C208	1-124-477-11	ELECT	C502	1-164-159-11	CERAMIC	0.1MF		50V
C209	1-162-294-31	CERAMIC	C503	1-164-159-11	CERAMIC	0.1MF		50V
			C504	1-126-177-11	ELECT	100MF	20%	6.3V

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
C731	1-164-159-11	(M19/M39)...CERAMIC 0.1MF	Q202	8-729-900-89	TRANSISTOR DTC144ES
C732	1-164-159-11	(M19/M39)...CERAMIC 0.1MF	Q401	8-729-806-10	TRANSISTOR 2SA1348
CN505	*1-568-944-11	PIN, CONNECTOR 6P	Q402	8-729-900-89	TRANSISTOR DTC144ES
CNP001*	1-568-955-11	PIN, CONNECTOR 6P	Q403	8-729-900-74	TRANSISTOR DTC143TS
CNP101*	1-564-710-11	PIN, CONNECTOR (SMALL TYPE) 8P	Q404	8-729-900-74	TRANSISTOR DTC143TS
CNP102*	1-564-706-31	PIN, CONNECTOR (SMALL TYPE) 4P	Q405	8-729-281-52	(M19/M39)...TRANSISTOR 2SC1815Y
CNP103*	1-564-706-31	PIN, CONNECTOR (SMALL TYPE) 4P	Q453	8-729-900-74	TRANSISTOR DTC143TS
CNP201*	1-568-953-11	PIN, CONNECTOR 4P	Q454	8-729-900-74	TRANSISTOR DTC143TS
CNP202*	1-568-954-11	PIN, CONNECTOR 5P	Q455	8-729-281-52	(M19/M39)...TRANSISTOR 2SC1815Y
CNP301*	1-568-931-11	SOCKET, CONNECTOR 26P	R001	1-249-417-11	CARBON 1K 5% 1/4W
CNP501*	1-568-931-11	SOCKET, CONNECTOR 26P	R005	1-249-421-11	CARBON 2.2K 5% 1/4W
CNP731*	1-568-940-11	(M19/M39)...PIN, CONNECTOR 2P	R101	1-247-864-11	CARBON 24K 5% 1/4W
D001	8-719-950-59	DIODE MPG06D-6052	R104	1-249-397-11	CARBON 22 5% 1/4W
D002	8-719-950-59	DIODE MPG06D-6052	R105	1-247-806-11	CARBON 91 5% 1/4W
D003	8-719-950-59	DIODE MPG06D-6052	R106	1-249-433-11	CARBON 22K 5% 1/4W
D004	8-719-950-59	DIODE MPG06D-6052	R108	1-249-432-11	CARBON 18K 5% 1/4W
D005	8-719-950-59	DIODE MPG06D-6052	R109	1-249-432-11	CARBON 18K 5% 1/4W
D007	8-719-107-94	DIODE 1SS202-1	R110	1-249-425-11	CARBON 4.7K 5% 1/4W
D008	8-719-301-51	DIODE S-15H	R111	1-249-425-11	CARBON 4.7K 5% 1/4W
D401	8-719-107-94	DIODE 1SS202-1	R112	1-249-417-11	CARBON 1K 5% 1/4W
D402	8-719-107-94	DIODE 1SS202-1	R201	1-247-882-11	CARBON 130K 5% 1/4W
D501	8-719-312-63	LED SEL3B10D	R202	1-249-432-11	CARBON 18K 5% 1/4W
D502	8-719-312-63	LED SEL3B10D	R203	1-249-432-11	CARBON 18K 5% 1/4W
D503	8-719-312-63	LED SEL3B10D	R204	1-249-439-11	CARBON 68K 5% 1/4W
D504	8-719-312-63	LED SEL3B10D	R205	1-247-889-00	CARBON 270K 5% 1/4W
D505	8-719-312-63	LED SEL3B10D	R206	1-249-435-11	CARBON 33K 5% 1/4W
D506	8-719-312-63	LED SEL3B10D	R207	1-249-423-11	CARBON 3.3K 5% 1/4W
D507	8-719-312-63	LED SEL3B10D	R208	1-249-425-11	CARBON 4.7K 5% 1/4W
D508	8-719-312-63	LED SEL3B10D	R209	1-247-896-11	CARBON 510K 5% 1/4W
D509	8-719-312-63	LED SEL3B10D	R210	1-249-417-11	CARBON 1K 5% 1/4W
D510	8-719-312-63	LED SEL3B10D	R211	1-249-414-11	CARBON 560 5% 1/4W
IC001	8-759-631-40	IC M5294P	R212	1-249-433-11	CARBON 22K 5% 1/4W
IC101	8-752-034-00	IC CXA1081S	R213	1-249-441-11	CARBON 100K 5% 1/4W
IC201	8-752-032-30	IC CXA1082BS	R214	1-247-844-11	METAL 3.6K 5% 1/4W
IC202	8-759-805-18	IC LA6520	R215	1-249-441-11	CARBON 100K 5% 1/4W
IC203	8-759-805-18	IC LA6520	R216	1-249-429-11	CARBON 10K 5% 1/4W
IC301	8-752-334-00	IC CXD1125Q	R217	1-247-881-00	CARBON 120K 5% 1/4W
IC302	8-759-994-30	IC MK6116-15	R218	1-249-427-11	CARBON 6.8K 5% 1/4W
IC303	8-759-990-13	IC TDA1543A-S1	R219	1-249-435-11	CARBON 33K 5% 1/4W
IC304	8-752-334-06	IC CXD2551P	R220	1-249-437-11	CARBON 47K 5% 1/4W
IC401	8-759-995-08	IC MC4558	R221	1-247-881-00	CARBON 120K 5% 1/4W
IC402	8-759-981-85	(M19/M39)...IC RC4556D	R222	1-247-884-11	CARBON 160K 5% 1/4W
IC501	8-759-149-81	IC UPD75308GF-536-3B9	R223	1-247-881-00	CARBON 120K 5% 1/4W
IC721	8-749-920-83	IC GPIU52XB	R224	1-247-884-11	CARBON 160K 5% 1/4W
J401	1-566-921-11	JACK, PIN 2P (LINE OUT)	R225	1-249-429-11	CARBON 10K 5% 1/4W
J731	1-568-519-51	(M19/M39)...JACK, LARGE TYPE (PHONES)	R226	1-249-393-11	CARBON 10 5% 1/4W
L401	1-410-509-11	INDUCTOR 10UH	R227	1-249-393-11	CARBON 10 5% 1/4W
LCD501	1-808-794-41	DISPLAY PANEL, LIQUID CRYSTAL	R230	1-249-393-11	CARBON 10 5% 1/4W
M101	X-4917-504-1	ASSY, MOTOR (SLED)	R231	1-249-393-11	CARBON 10 5% 1/4W
M102	X-4917-523-1	ASSY, MOTOR (SPINDLE)	R301	1-247-903-00	CARBON 1M 5% 1/4W
M701	A-4608-362-A	MOTOR (L) ASSY	R302	1-249-433-11	CARBON 22K 5% 1/4W
Q001	8-729-920-91	TRANSISTOR 2SB1187-F	R303	1-249-429-11	CARBON 10K 5% 1/4W
Q101	8-729-116-57	TRANSISTOR 2SB1068K	R304	1-249-441-11	CARBON 100K 5% 1/4W
Q201	8-729-900-80	TRANSISTOR DTC114ES	R305	1-249-441-11	CARBON 100K 5% 1/4W
			R306	1-249-429-11	CARBON 10K 5% 1/4W
			R307	1-249-441-11	METAL 100K 5% 1/4W
			R308	1-249-441-11	METAL 100K 5% 1/4W

Ref.No.	Part No.	Description				
R310	1-249-417-11	CARBON	1K	5%	1/4W	
R311	1-249-417-11	CARBON	1K	5%	1/4W	
R312	1-249-417-11	CARBON	1K	5%	1/4W	
R314	1-249-417-11	CARBON	1K	5%	1/4W	
R315	1-249-417-11	CARBON	1K	5%	1/4W	
R316	1-249-417-11	CARBON	1K	5%	1/4W	
R317	1-249-417-11	CARBON	1K	5%	1/4W	
R318	1-249-417-11	CARBON	1K	5%	1/4W	
R320	1-249-411-11	CARBON	330	5%	1/4W	
R321	1-249-411-11	CARBON	330	5%	1/4W	
R322	1-249-411-11	CARBON	330	5%	1/4W	
R323	1-249-411-11	CARBON	330	5%	1/4W	
R401	1-249-421-11	CARBON	2.2K	5%	1/4W	
R402	1-249-422-11	CARBON	2.7K	5%	1/4W	
R403	1-249-109-11	CARBON	220	5%	1/4W	
R404	1-249-409-11	CARBON	220	5%	1/4W	
R405	1-249-409-11	CARBON	220	5%	1/4W	
R406	1-249-402-11	(M19/M39)...CARBON	56	5%	1/4W	
R407	1-249-425-11	(M19/M39)...CARBON	4.7K	5%	1/4W	
R408	1-249-437-11	CARBON	47K	5%	1/4W	
R409	1-249-441-11	CARBON	100K	5%	1/4W	
R410	1-249-441-11	CARBON	100K	5%	1/4W	
R411	1-249-393-11	CARBON	10	5%	1/4W	
R452	1-249-422-11	CARBON	2.7K	5%	1/4W	
R453	1-249-409-11	CARBON	220	5%	1/4W	
R454	1-249-409-11	CARBON	220	5%	1/4W	
R455	1-249-409-11	CARBON	220	5%	1/4W	
R456	1-249-402-11	(M19/M39)...CARBON	56	5%	1/4W	
R457	1-249-425-11	(M19/M39)...CARBON	4.7K	5%	1/4W	
R460	1-249-441-11	CARBON	100K	5%	1/4W	
R501	1-249-401-11	CARBON	47	5%	1/4W	
R502	1-249-401-11	CARBON	47	5%	1/4W	
R503	1-249-401-11	CARBON	47	5%	1/4W	
R504	1-249-401-11	CARBON	47	5%	1/4W	
R505	1-249-433-11	CARBON	22K	5%	1/4W	
R506	1-249-441-11	CARBON	100K	5%	1/4W	
R507	1-249-441-11	CARBON	100K	5%	1/4W	
R508	1-249-433-11	CARBON	22K	5%	1/4W	
R509	1-249-433-11	CARBON	22K	5%	1/4W	
R510	1-249-433-11	CARBON	22K	5%	1/4W	
R511	1-249-433-11	CARBON	22K	5%	1/4W	
R512	1-249-433-11	CARBON	22K	5%	1/4W	
R513	1-249-401-11	CARBON	47	5%	1/4W	

Ref.No.	Part No.	Description
RV101	1-228-995-00	RES, ADJ, METAL GLAZE 22K(E-F BALANCE)
RV102	1-228-993-00	RES, ADJ, METAL GLAZE 4.7K(FOCUS BIAS)
RV103	1-228-995-00	RES, ADJ, METAL GLAZE 22K(FOCUS GAIN)
RV104	1-228-995-00	RES, ADJ, METAL GLAZE 22K (TRACKING GAIN)
RV201	1-228-990-00	RES, ADJ, METAL GLAZE 1K (RF PLL)
RV501	1-238-748-11	(M19/M39)...RES, VAR, CARBON 1K/1K (LEVEL)
S721	1-571-305-11	SWITCH, PUSH (1 KEY)(POWER)
SW501	1-554-303-21	SWITCH, KEY BOARD (MUSIC SCAN)
SW502	1-554-303-21	SWITCH, KEY BOARD (TIME)
SW503	1-554-303-21	SWITCH, KEY BOARD (OPEN/CLOSE)
SW504	1-554-303-21	SWITCH, KEY BOARD (□)
SW505	1-554-303-21	SWITCH, KEY BOARD (▶▶)
SW506	1-554-303-21	SWITCH, KEY BOARD (◀◀)
SW507	1-554-303-21	SWITCH, KEY BOARD (▶▶▶▶)
SW508	1-554-303-21	SWITCH, KEY BOARD (PROGRAM)
SW509	1-554-303-21	SWITCH, KEY BOARD (SHUFFLE)
SW510	1-554-303-21	SWITCH, KEY BOARD (REPEAT)
SW511	1-554-303-21	SWITCH, KEY BOARD (FADER)
SW701	1-572-086-11	SWITCH, LEAF (IN SW)
SW702	1-572-086-11	SWITCH, LEAF (OUT SW)
T101	▲1-449-823-11	TRANSFORMER, POWER
TN1	*1-535-771-11	TERMINAL
TN2	*1-535-771-11	TERMINAL
X320	1-577-328-21	VIBRATOR, CRYSTAL (16.9MHz)
X501	1-567-775-11	VIBRATOR, CERAMIC (4.2MHz)

ACCESSORY & PACKING MATERIAL

1-465-282-11	(M39)...REMOTE COMMANDER (RM-D9D)
1-559-533-11	CORD, CONNECTION
3-750-716-52	(M19/M39).....MANUAL, INSTRUCTION
3-750-716-62	(M19:AEP/M39)...MANUAL, INSTRUCTION
*4-927-354-01	(M18)...INDIVIDUAL CARTON
*4-927-354-11	(M19)...INDIVIDUAL CARTON
*4-927-354-21	(M39)...INDIVIDUAL CARTON
*4-927-355-01	CUSHION

Note: The components identified by mark ▲ or dotted line with mark ▲ are critical for safety. Replace only with part number specified.