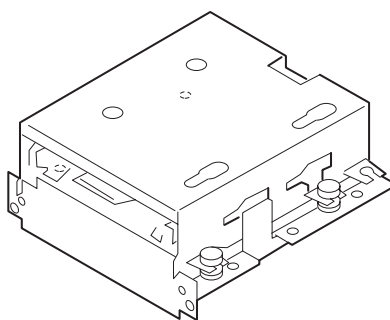




SERVICE MANUAL

MD MECHANISM

BASIC MD MECHANISM :KMS-260B

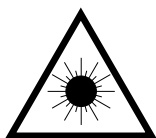
TYPE
A
YA
B
YB

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

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

WARNING!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION. BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 30cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.



- Caution: Invisible laser radiation when open and interlocks defeated avoid exposure to beam.
- Advarsel: Usynlig laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

VAROITUS!

Laiteen Käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylitävälle näkymättömälle lasersäteilylle.

VARNING!

Om apparaten används på annat sätt än vad som specificeras i denna bruksanvisning, kan användaren utsättas för osynlig laserstråling, som överskrider gränsen för laserklass 1.

CAUTION

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

ATTENTION

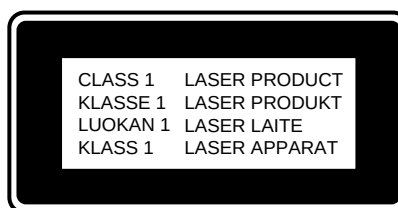
L'utilisation de commandes, réglages ou procédures autres que ceux spécifiés peut entraîner une dangereuse exposition aux radiations.

ADVARSEL!

Usynlig laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

This Compact Disc player is classified as a CLASS 1 LASER product.

The CLASS 1 LASER PRODUCT label is located on the rear exterior.

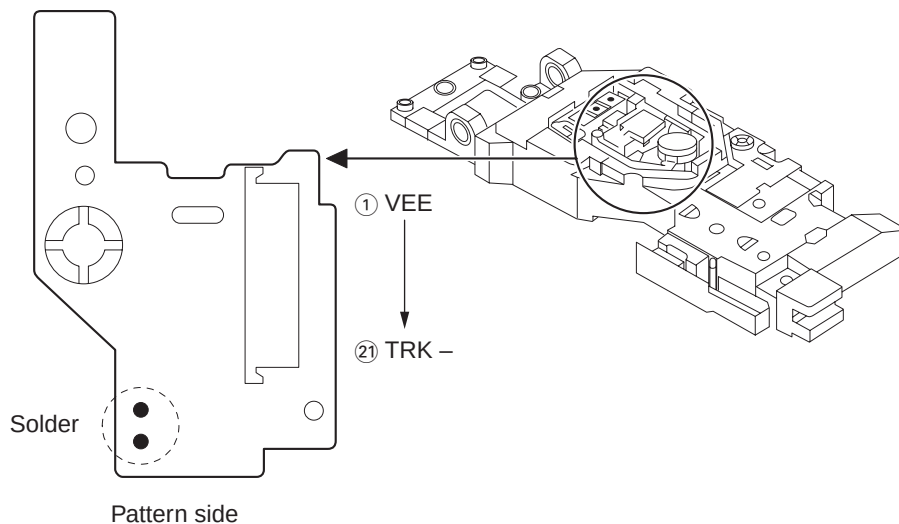


Precaution to replace Optical block (KMS-260B)

Body or clothes electrostatic potential could ruin laser diode in the optical block. Be sure ground body and workbench, and use care the clothes do not touch the diode.

- 1) After the connection, remove solder shown in the right figure.

MD PICKUP Assy P.C.B.



ELECTRICAL MAIN PARTS LIST

DESCRIPTIONで判断できない物は "REFERENCE NAME LIST" を参照してください。
If can't understand for Description please kindly refer to "REFERENCE NAME LIST".

REF. NO	PART NO.	KANRI NO.	DESCRIPTION	REF. NO	PART NO.	KANRI NO.	DESCRIPTION
IC				C219	87-016-296-080		C-CAP, TN 22-4SV(A)
	87-A20-707-010		C-IC, CXA2523AR	C220	87-010-662-080		C-CAP, E 22-6.3
	87-A20-708-010		C-IC, CXD2652AR	C221	87-010-831-080		C-CAP, U, 0.1-16F
	87-A20-709-040		C-IC, BD7910FV	C222	87-016-444-080		C-CAP, TN 47-10 F95E
	8A-ZG4-601-010		C-IC, CXP81952M-552R	C223	87-010-831-080		C-CAP, U, 0.1-16F
	87-A21-451-040		C-IC, MSM51V4400D-70	C224	87-A10-685-080		C-CAP, S 470P-100 J CH
	87-A20-755-080		C-IC, AK93C45AF	C225	87-010-831-080		C-CAP, U, 0.1-16F
	87-A20-710-040		C-IC, S-8110AMP	C226	87-010-831-080		C-CAP, U, 0.1-16F
	87-A20-711-040		C-IC, BA5970FP	C227	87-012-274-080		CHIP CAP, U 1000P-50B
	87-A21-110-040		C-IC, AK4519VF	C228	87-012-274-080		CHIP CAP, U 1000P-50B
	87-017-853-040		IC, NJM2100V	C229	87-012-274-080		CHIP CAP, U 1000P-50B
	87-A21-340-040		C-IC, LA5638H	C232	87-012-274-080		CHIP CAP, U 1000P-50B
TRANSISTOR				C233	87-012-274-080		CHIP CAP, U 1000P-50B
	87-026-423-080		C-TR RN2305	C236	87-010-831-080		C-CAP, U, 0.1-16F
	89-115-884-080		CHIP-TRANSISTER 2SA1588Y	C300	87-010-831-080		C-CAP, U, 0.1-16F
	89-341-164-080		CHIP-TRANSISTOR, 2SC4116 Y	C301	87-010-831-080		C-CAP, U, 0.1-16F
	87-026-412-080		C-TR RN1305	C302	87-010-831-080		C-CAP, U, 0.1-16F
DIODE				C305	87-016-462-080		C-CAP, S 1-16 F
	87-001-166-080		DIODE, 1SS301	C307	87-010-831-080		C-CAP, U, 0.1-16F
	87-A40-412-040		C-DIODE, SB05-05CP	C308	87-010-831-080		C-CAP, U, 0.1-16F
MD C.B				C311	87-010-662-080		C-CAP, E 22-6.3
	C100	87-016-296-080	C-CAP, TN 22-4SV(A)	C312	87-012-195-080		C-CAP, U 100P-50CH
	C101	87-016-296-080	C-CAP, TN 22-4SV(A)	C321	87-012-274-080		CHIP CAP, U 1000P-50B
	C102	87-012-286-080	CAP, U 0.01-25	C322	87-012-274-080		CHIP CAP, U 1000P-50B
	C103	87-010-787-080	CAP, U 0.022-25	C323	87-012-274-080		CHIP CAP, U 1000P-50B
	C104	87-010-662-080	C-CAP, E 22-6.3	C324	87-012-274-080		CHIP CAP, U 1000P-50B
	C105	87-010-831-080	C-CAP, U, 0.1-16F	C325	87-012-274-080		CHIP CAP, U 1000P-50B
	C106	87-016-462-080	C-CAP, S 1-16 F	C400	87-010-831-080		C-CAP, U, 0.1-16F
	C107	87-012-195-080	C-CAP, U 100P-50CH	C401	87-010-831-080		C-CAP, U, 0.1-16F
	C108	87-012-274-080	CHIP CAP, U 1000P-50B	C402	87-010-831-080		C-CAP, U, 0.1-16F
	C109	87-A11-033-080	C-CAP, TN 47U-4	C403	87-010-831-080		C-CAP, U, 0.1-16F
	C111	87-016-296-080	C-CAP, TN 22-4SV(A)	C404	87-010-831-080		C-CAP, U, 0.1-16F
	C112	87-012-286-080	CAP, U 0.01-25	C405	87-010-661-080		C-CAP, E 10-16
	C113	87-012-284-080	CAP, U 6800P-50	C406	87-010-779-080		C-CAP, E 100-6.3
	C114	87-010-828-080	CHIP CAPACITOR, U 0.033-25F	C407	87-012-197-080		C-CAP, U 150P-50 CH
	C115	87-A10-369-080	C-CAP, S 0.47-16 K B	C408	87-012-197-080		C-CAP, U 150P-50 CH
	C116	87-012-282-080	CAP, U 4700P-50	C411	87-012-271-080		CAP, U 560P-50
	C117	87-016-462-080	C-CAP, S 1-16 F	C412	87-012-271-080		CAP, U 560P-50
	C118	87-012-282-080	CAP, U 4700P-50	C413	87-012-197-080		C-CAP, U 150P-50 CH
	C119	87-016-491-080	C-CAP, S 0.22-16 FZ	C414	87-012-197-080		C-CAP, U 150P-50 CH
	C120	87-010-787-080	CAP, U 0.022-25	C415	87-012-286-080		CAP, U 0.01-25
	C121	87-012-286-080	CAP, U 0.01-25	C416	87-012-286-080		CAP, U 0.01-25
	C122	87-010-829-080	CAP, U 0.047-16	C417	87-012-268-080		C-CAP, U 330P-50 B
	C123	87-012-286-080	CAP, U 0.01-25	C418	87-012-268-080		C-CAP, U 330P-50 B
	C124	87-010-662-080	C-CAP, E 22-6.3	C423	87-012-286-080		CAP, U 0.01-25
	C125	87-010-662-080	C-CAP, E 22-6.3	C424	87-012-286-080		CAP, U 0.01-25
	C126	87-010-831-080	C-CAP, U, 0.1-16F	C429	87-012-286-080		CAP, U 0.01-25
	C201	87-010-831-080	C-CAP, U, 0.1-16F	C430	87-012-286-080		CAP, U 0.01-25
	C202	87-010-831-080	C-CAP, U, 0.1-16F	C431	87-010-779-080		C-CAP, E 100-6.3
	C203	87-010-785-080	C-CAP, U0.015-25BK	C431	87-010-779-080		C-CAP, E 100-6.3
	C204	87-016-461-080	C-CAP, S 0.47-16F	C434	87-010-831-080		C-CAP, U, 0.1-16F
	C205	87-010-831-080	C-CAP, U, 0.1-16F	C501	87-010-831-080		C-CAP, U, 0.1-16F
	C206	87-012-270-080	CAP, U 470P-50	C502	87-010-831-080		C-CAP, U, 0.1-16F
	C207	87-016-461-080	C-CAP, S 0.47-16F	C503	87-010-662-080		C-CAP, E 22-6.3
	C208	87-012-286-080	CAP, U 0.01-25	C504	87-010-831-080		C-CAP, U, 0.1-16F
	C209	87-010-831-080	C-CAP, U, 0.1-16F	C505	87-010-662-080		C-CAP, E 22-6.3
	C210	87-012-172-080	CAPACITOR CHIP U 10P CH	C506	87-010-831-080		C-CAP, U, 0.1-16F
	C211	87-012-172-080	CAPACITOR CHIP U 10P CH	C507	87-010-661-080		C-CAP, E 10-16
	C212	87-012-195-080	C-CAP, U 100P-50CH	C508	87-010-831-080		C-CAP, U, 0.1-16F
	C213	87-010-662-080	C-CAP, E 22-6.3	C509	87-010-662-080		C-CAP, E 22-6.3
	C214	87-012-274-080	CHIP CAP, U 1000P-50B	C510	87-010-831-080		C-CAP, U, 0.1-16F
	C217	87-012-188-080	C-CAP, U 47P-50 CH	C511	87-010-661-080		C-CAP, E 10-16
	C218	87-012-172-080	CAPACITOR CHIP U 10P CH	C513	87-010-661-080		C-CAP, E 10-16
				C514	87-010-661-080		C-CAP, E 10-16
				C515	87-012-337-080		C-CAP, U 56P-50 CH
				C516	87-012-337-080		C-CAP, U 56P-50 CH
				C517	87-012-278-080		C-CAP, U 2200P-50 B
				C518	87-012-278-080		C-CAP, U 2200P-50 B
				C519	87-010-831-080		C-CAP, U, 0.1-16F
				C520	87-010-661-080		C-CAP, E 10-16

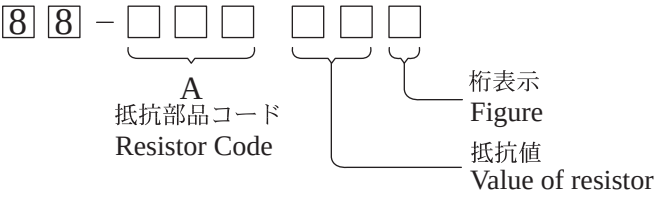
REF. NO	PART NO.	KANRI NO.	DESCRIPTION	REF. NO	PART NO.	KANRI NO.	DESCRIPTION
C521	87-010-831-080		C-CAP,U,0.1-16F	L616	87-A50-163-080		C-COIL,ZBFS5101-PT
C522	87-010-661-080		C-CAP,E 10-16	R423	87-025-564-080		C-RES,U M/F 47K D
C523	87-010-662-080		C-CAP,E 22-6.3	R424	87-025-564-080		C-RES,U M/F 47K D
C524	87-010-662-080		C-CAP,E 22-6.3	R425	87-022-583-080		C-RES,U M/F 12K D
C525	87-012-274-080		CHIP CAP,U 1000P-50B	R426	87-022-583-080		C-RES,U M/F 12K D
C526	87-012-274-080		CHIP CAP,U 1000P-50B	X200	87-A70-105-080		C-VIB,XTAL 22.5792MHZ SMD-49
C527	87-010-661-080		C-CAP,E 10-16	X301	87-A70-100-080		C-VIB,CER 12.0MHZ PBRC-BR-A
C528	87-010-661-080		C-CAP,E 10-16				
C530	87-010-831-080		C-CAP,U,0.1-16F				
C531	87-010-831-080		C-CAP,U,0.1-16F				
C600	87-010-662-080		C-CAP,E 22-6.3				
C601	87-010-779-080		C-CAP,E 100-6.3				
C602	87-010-779-080		C-CAP,E 100-6.3				
C603	87-010-662-080		C-CAP,E 22-6.3				
C604	87-010-779-080		C-CAP,E 100-6.3				
C607	87-010-831-080		C-CAP,U,0.1-16F				
C608	87-010-831-080		C-CAP,U,0.1-16F				
CN100	87-A60-537-080		C-CONN,21P H CFP55				
CN201	87-A60-467-080		C-CONN,4P V FMN-BMTR				
CN300	87-A60-518-080		C-CONN,8P H 6232				
CN400	87-A60-027-080		C-CONN,8P H WHT				
CN401	87-A60-062-010		CONN,05P V 9604S-05C				
CN600	87-A60-519-080		C-CONN,14P H 6232				
FB501	87-A90-828-080		C-F-BEAD, BK1608LM182				
L100	87-A50-117-080		C-COIL,10UHLQH3C				
L101	87-A50-012-080		C-COIL,100UH LQH3C				
L102	87-A50-117-080		C-COIL,10UHLQH3C				
L103	87-A50-117-080		C-COIL,10UHLQH3C				
L201	87-A50-117-080		C-COIL,10UHLQH3C				
L202	87-A50-117-080		C-COIL,10UHLQH3C				
L203	87-A50-116-080		C-COIL,4.7UHLQH3C				
L301	87-A50-117-080		C-COIL,10UHLQH3C				
L501	87-A50-116-080		C-COIL,4.7UHLQH3C				
L502	87-A50-116-080		C-COIL,4.7UHLQH3C				
L503	87-A50-116-080		C-COIL,4.7UHLQH3C				
L504	87-005-774-080		C-COIL,4BLH				
L505	87-005-774-080		C-COIL,4BLH				
L611	87-A50-163-080		C-COIL,ZBFS5101-PT				
L612	87-005-512-080		C-COIL,BLM21A05				
L613	87-005-512-080		C-COIL,BLM21A05				
L614	87-A50-163-080		C-COIL,ZBFS5101-PT				
L615	87-A90-034-080		C-FLTR,EMI BLM41P750				

- Regarding connectors, they are not stocked as they are not the initial order items.
The connectors are available after they are supplied from connector manufacturers upon the order is received.

○チップ抵抗部品コード／CHIP RESISTOR PART CODE

チップ抵抗部品コードの成り立ち

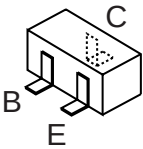
Chip Resistor Part Coding



チップ抵抗
Chip resistor

容量 Wattage	種類 Type	許容誤差 Tolerance	記号 Symbol	寸法／Dimensions (mm)				抵抗コード : A Resistor Code : A
				外形／Form	L	W	t	
1/16W	1005	± 5%	CJ		1.0	0.5	0.35	104
1/16W	1608	± 5%	CJ		1.6	0.8	0.45	108
1/10W	2125	± 5%	CJ		2	1.25	0.45	118
1/8W	3216	± 5%	CJ		3.2	1.6	0.55	128

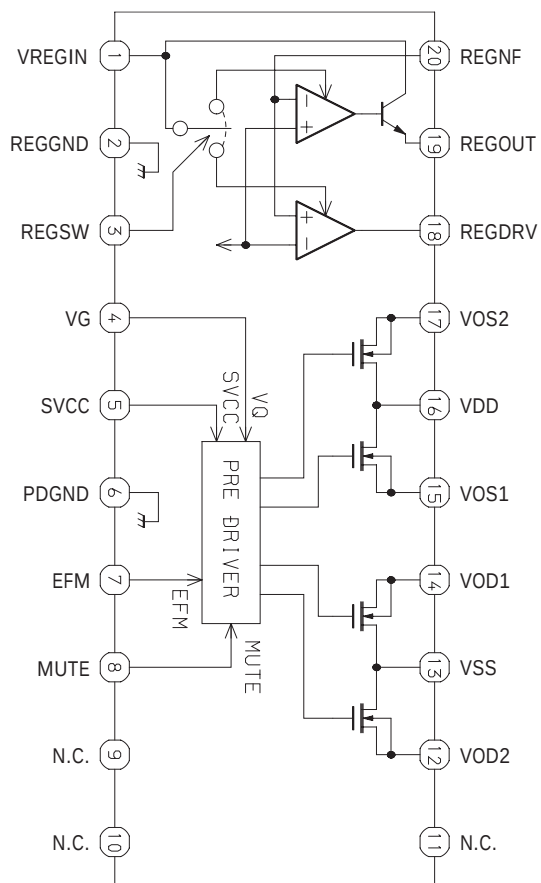
TRANSISTOR ILLUSTRATION



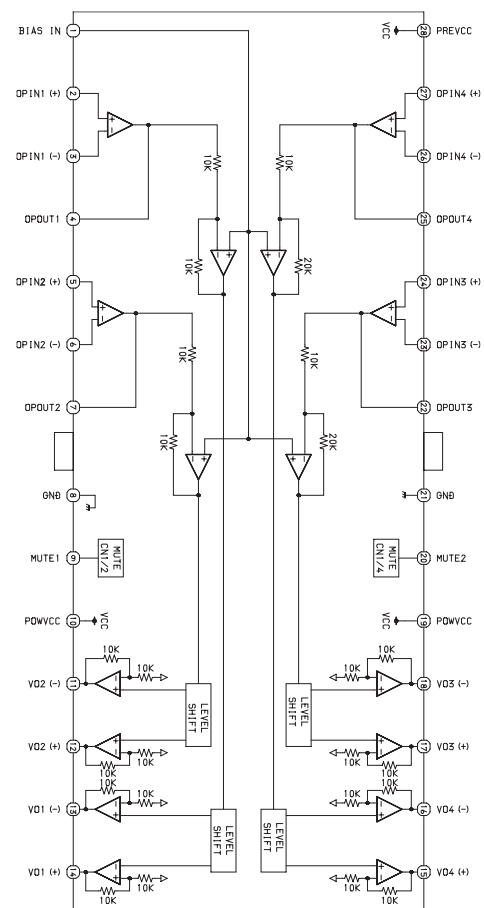
2SA1588
2SC4116
RN1305
RN2305

IC BLOCK DIAGRAM

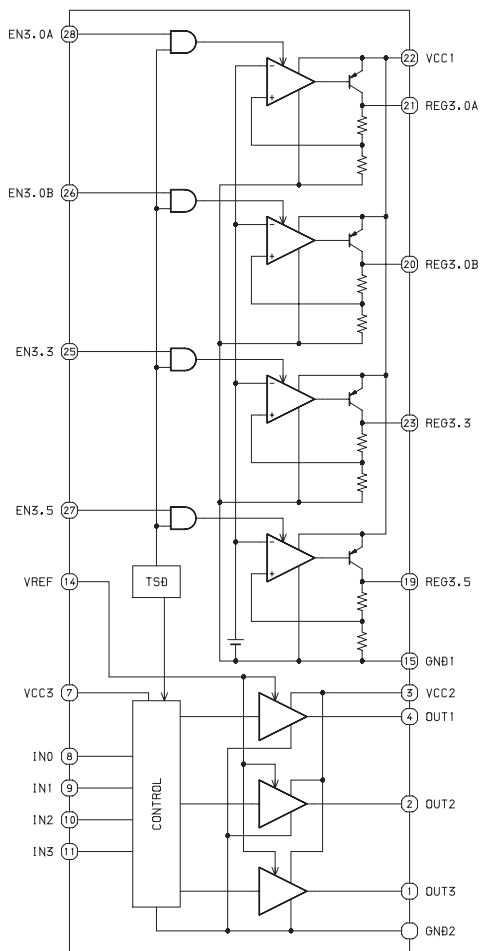
IC, BD7910FV



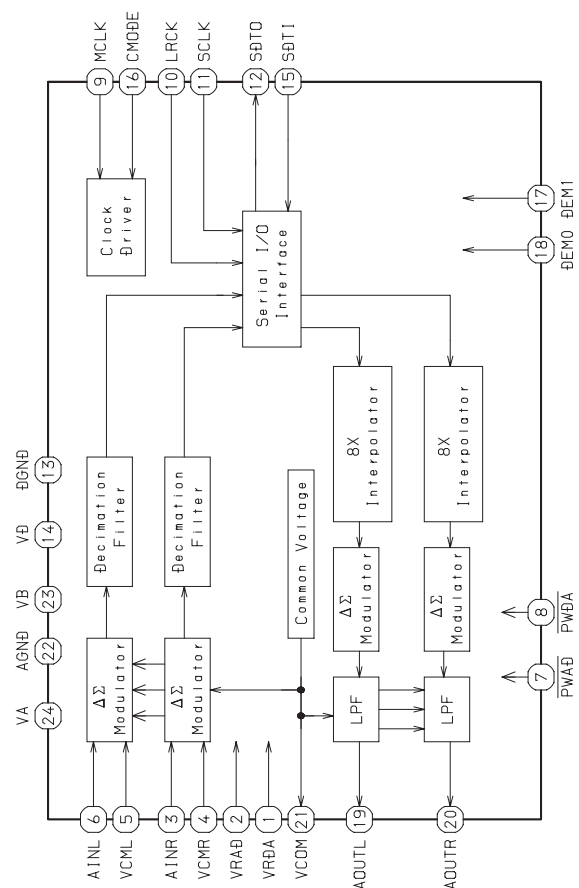
IC, BA5970FP



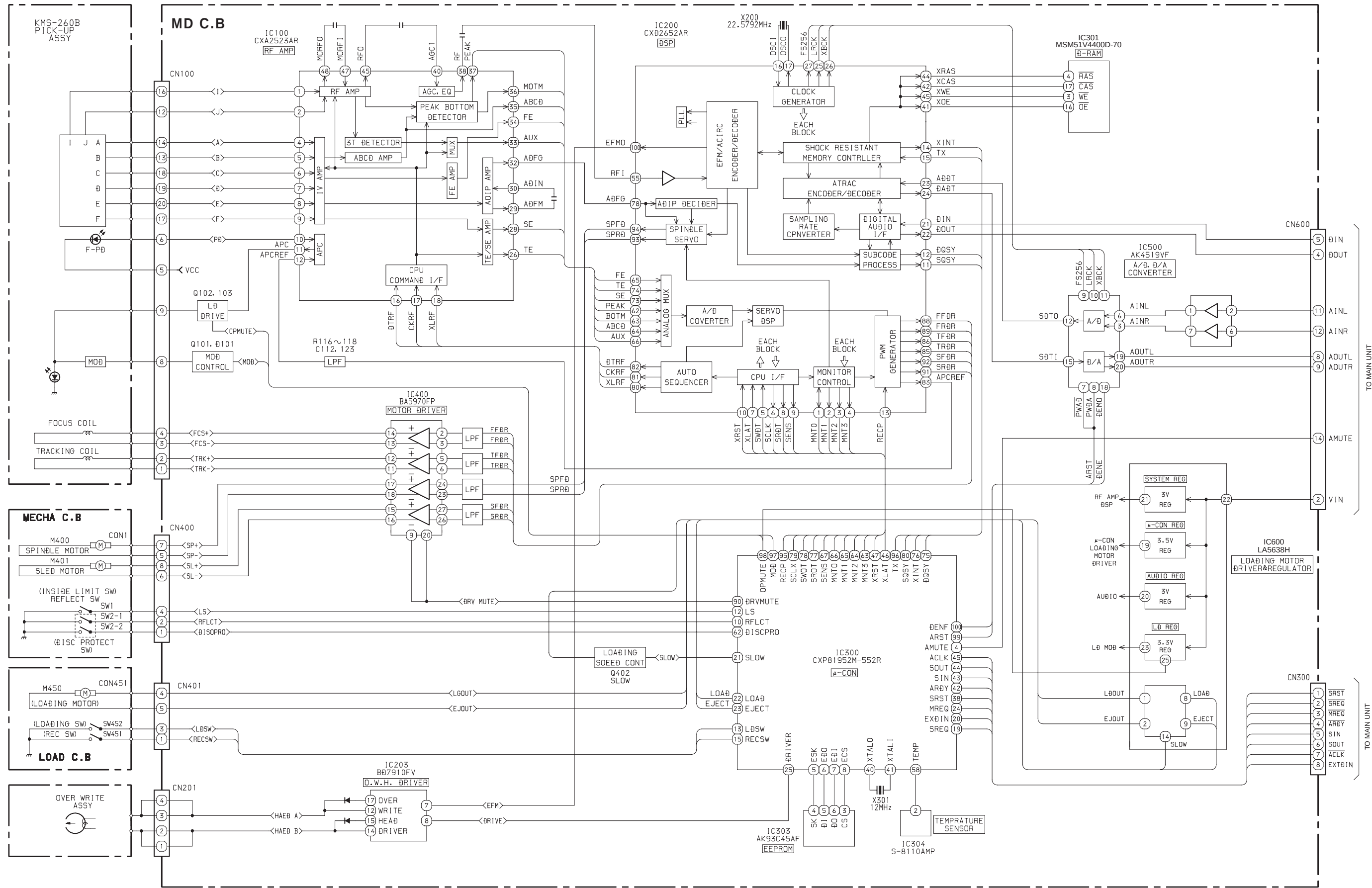
IC, LA5638H

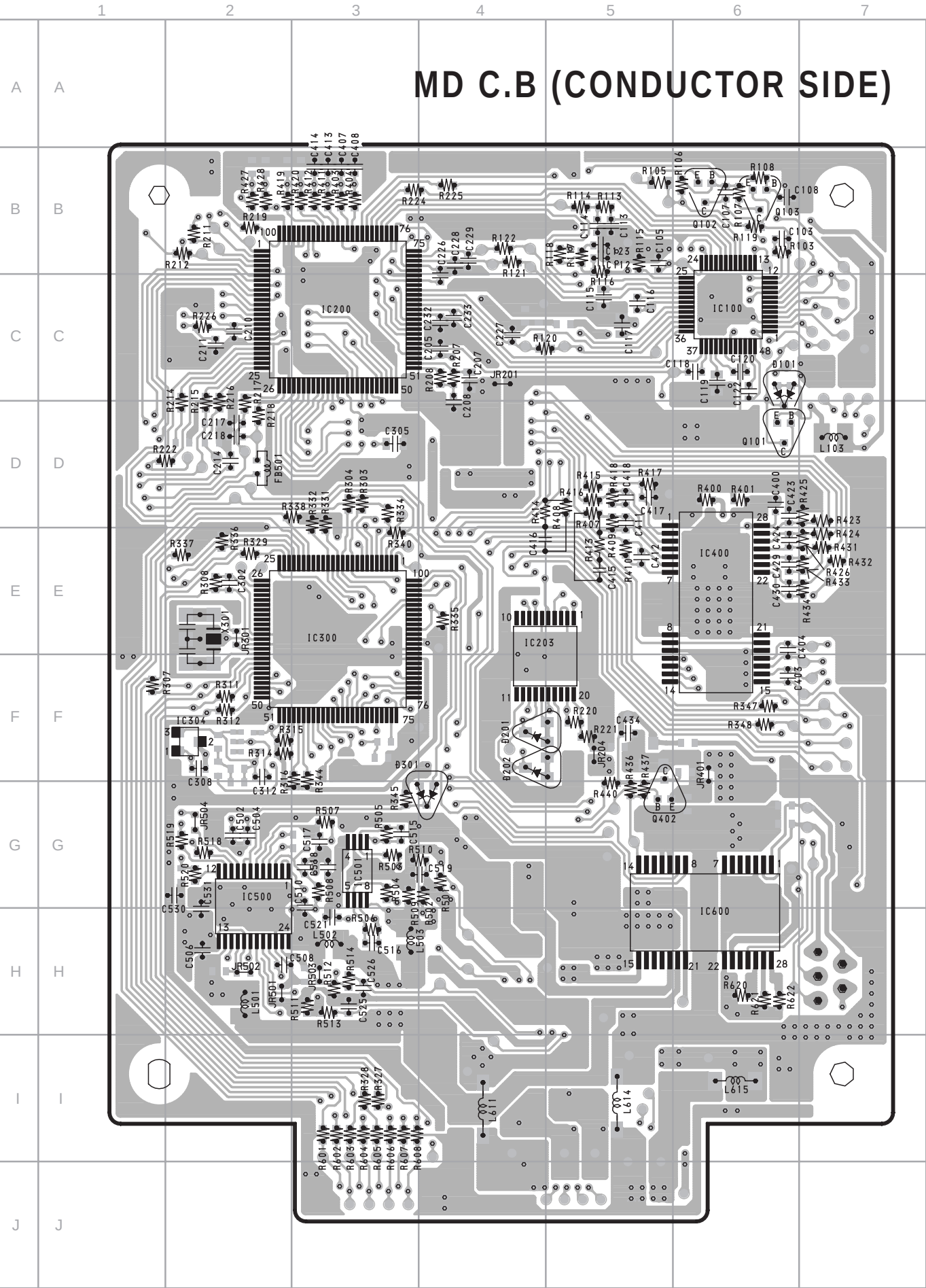
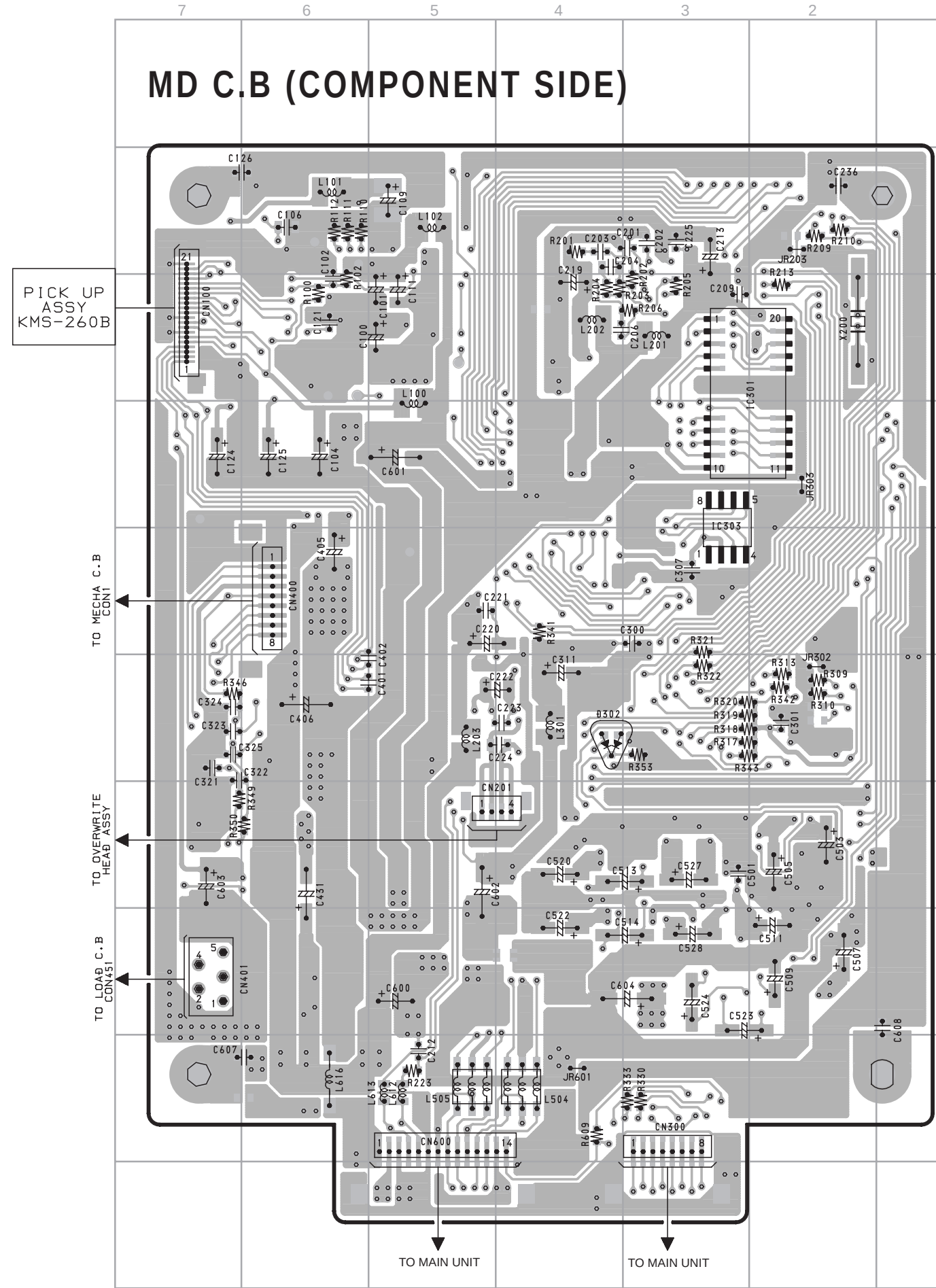


IC, AK4519VF

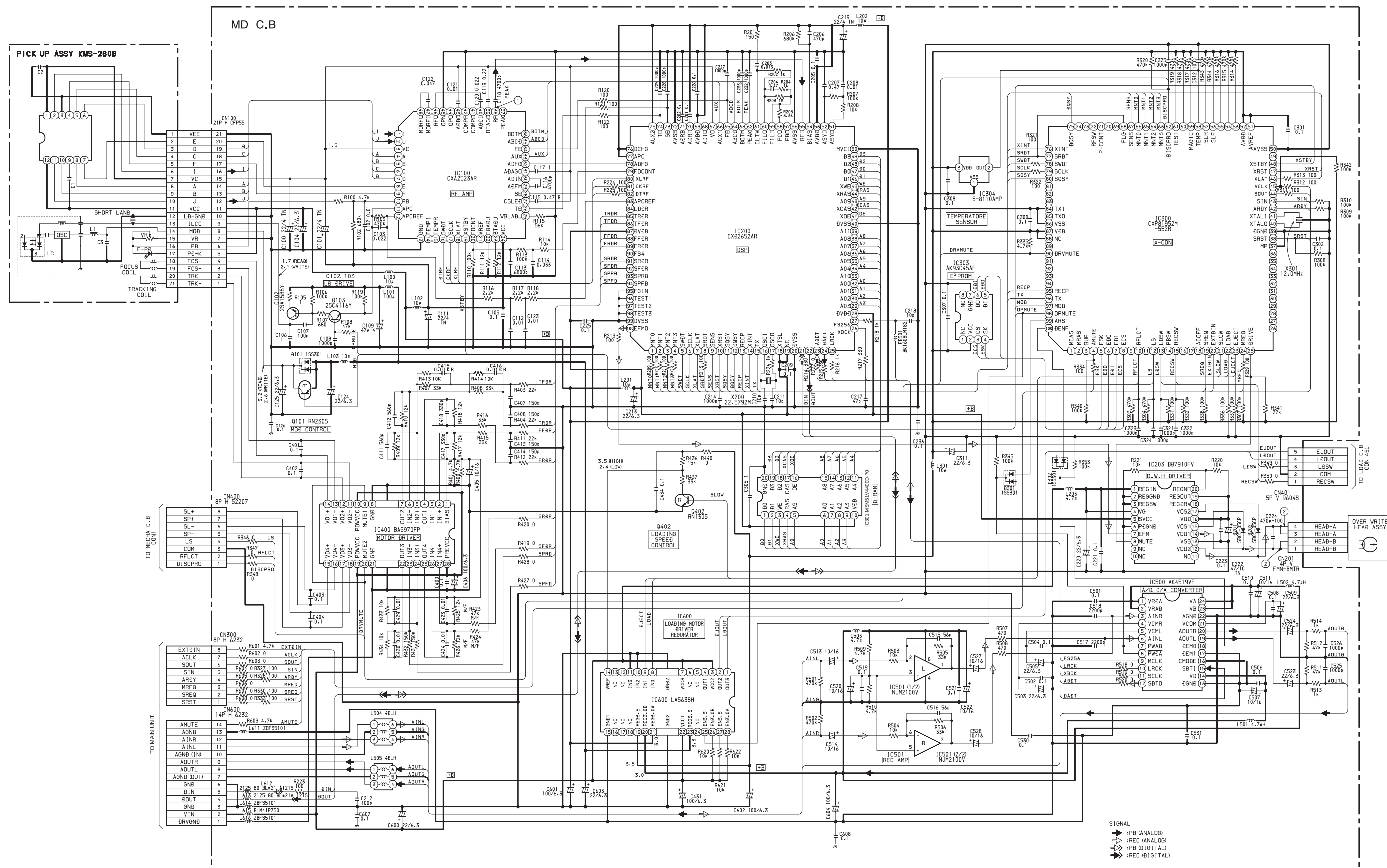


BLOCK DIAGRAM

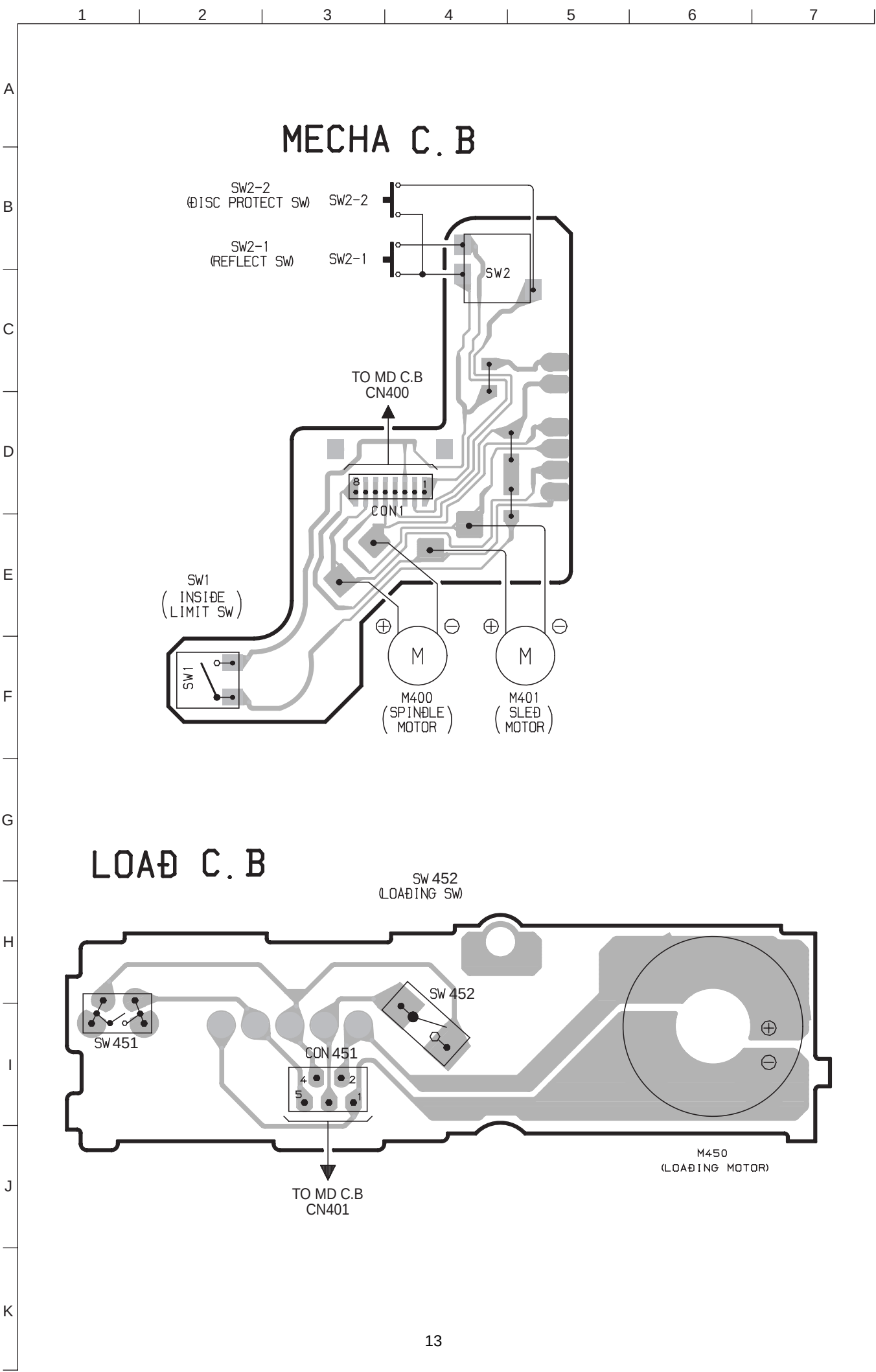




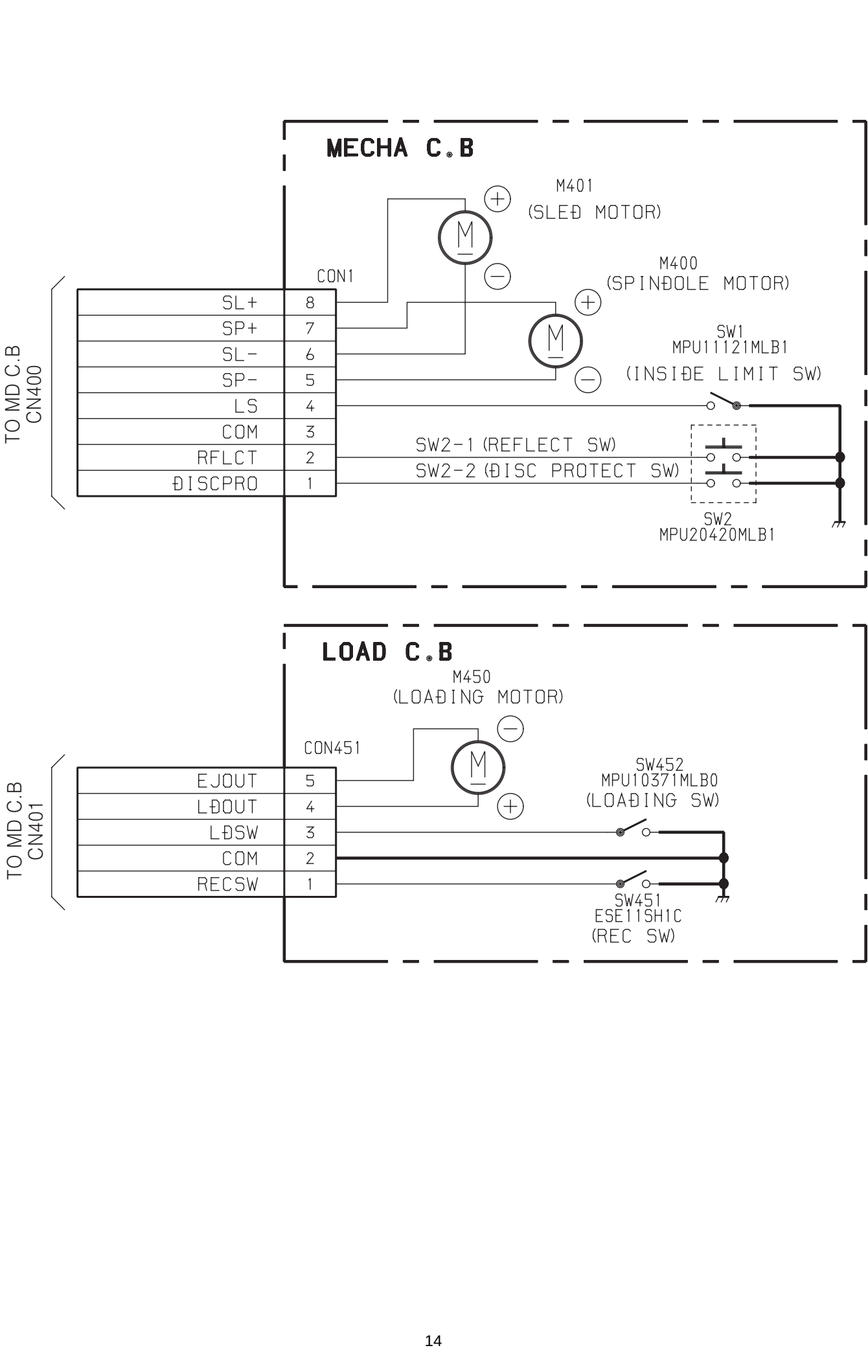
SCHEMATIC DIAGRAM-1 (MD)



WIRING-2 (MECHA/LOAD)



SCHEMATIC DIAGRAM-2 (MECHA/LOAD)



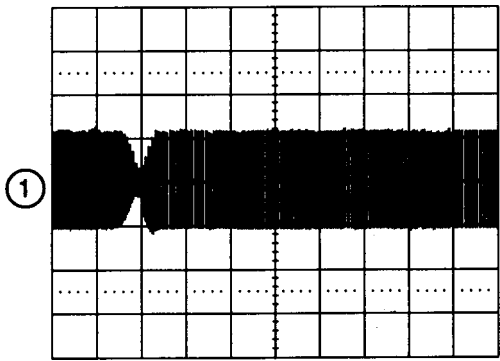
WAVE FORM

①

IC100 Pin ③⑧ (RF)

VOLT/DIV: 0.5V

TIME/DIV: 1mS

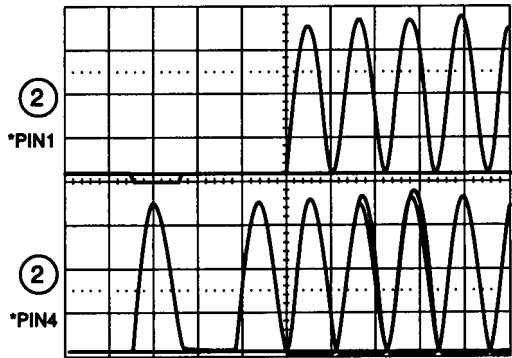


②

CN201 Pin ① (HEAD-B)
CN201 Pin ④ (HEAD-A)

VOLT/DIV: 10V

TIME/DIV: 0.2μS



TEST MODE

1. Starting up the MD Test Mode

While pressing the MD function button, insert the AC plug into the outlet.

- Notes: 1) Mechanical abnormalities are ignored while the test mode is starting up.
If any abnormality occurs, disconnect the plug immediately.
- 2) During test mode operation, playback and recording are normally not possible.

2. Checking the MD Test Mode

Indication

About five seconds later after the test mode starts, characters as shown in the below figure appear on the screen and the test mode becomes usable.



3. Canceling the MD Test Mode

- 1) Press the MD EJECT button to eject the disk.
 - 2) Disconnect the AC plug.
- * If the MD test mode is canceled by procedures other than the above, the unit sometimes run incorrectly.
If this happens, disconnect the AC plug.

4. Switching to the Servo Standby Mode

After starting up the test mode, press the STOP key to switch to the servo standby mode. (Indication: ALL SV OFF)

Change from this mode to each mode.

When the STOP key is pressed in each mode, the display returns to "ALL SV OFF".



5. Notes during Test Mode Operation

If the test mode starts up, the touch sensor of the operation panel does not run.

Operate in the following ways.

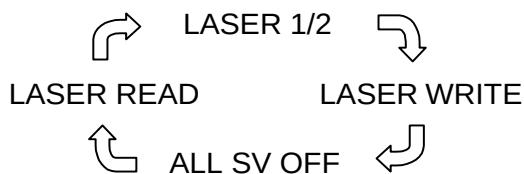
- 1) Use the remote controller.
- 2) Rotate the pulley that is visible from the hole of the CD board by hand to rotate the operation panel.

6. Checking the Sled Feed Operation

- 1) Press the F.SKIP button in the "ALL SV OFF" state to move the lens and pickup to the outer circumference. Then "T.SLED FWD" is displayed.
- 2) Press the B.SKIP button in the "ALL SV OFF" state to move the lens and pickup to the inner circumference. Then "T.SLED RVS" is displayed. Set the INSIDE LIMIT switch to ON to light the frame of graphic equalizer "JAZZ" of the display.

7. Checking the Laser Power

- 1) Every time the MD EDIT button is pressed in the "ALL SV OFF" state, the display is switched as shown below.
- 2) After checking, press the STOP button to return the display to "ALL SV OFF".



8. Checking the Loading Mechanism and OWH

to check the operations of the loading mechanism and OWH, follow the procedure given below.

Every time the CD → MD REC button or MD EJECT button is pressed in the "ALL SV OFF" state, the OWH moves up or down.

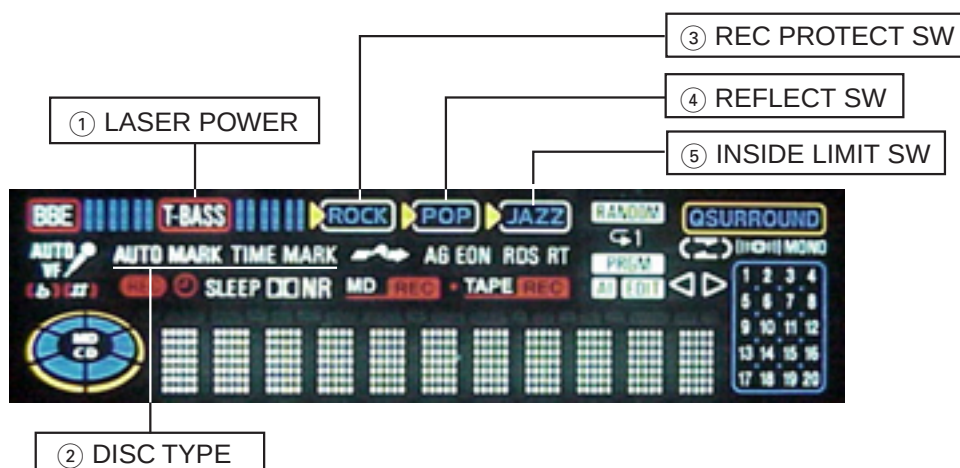
CD → MD REC button OWH DOWN

MD EJECT OWH UP/Unloading

9. About Indication

The state of circuit, selected disk or switch can be checked on the display.

	Function	Indication	pict indication	When pict lights	When pict glights off
①	Laser power	LA READ-1/2-WRITET	T-BASS	Displayed using the three-step level meter	
②	Disk type	SELECT GRV	TIME MARK	MO disk (for recording and playback)	
		SELSCT PIT	AUTO MARK	PIT disk (for playback)	
③	REC PROTECT SW	—	ROCK frame	REC is possible.	REC protection
④	REFLECT SW	—	POP frame	PIT disk	MO disc
⑤	INSIDE LIMIT SW	—	JAZZ frame	Switch ON (innermost circumference)	Switch OFF



10. Checking the Servo Operation

10-1. Checking the Focus Search and Spindle Kick 1 (checking the S-curve)

- 1) When the RANDOM/REPEAT button of the remote controller is pressed in the "ALL SV OFF" state, the focus search operation and spindle kick are performed at the same time. Then "FOCUS CHECK" is displayed.
These operations are repeated regardless of whether a disk is installed. Therefore, the S-curve can be checked with the disk installed.
- 2) After checking, press the STOP button to return the display to "ALL SV OFF".

10-2. Checking the Focus Search and Spindle Kick 2

- 1) When the PLAY button is pressed in the "ALL SV OFF" state without any disk, the search operation and spindle kick are performed at the same time. Then "FOCUS SRCH" is displayed.
- 2) After checking, press the STOP button to return the display to "ALL SV OFF".

10-3. Checking the Focus Servo

- 1) Insert a disk.
- 2) Press the MD MODE button and set the servo mode according to the inserted disk as shown below.
 - MO disk: "SELECT GRV" appears and "TIMEMARK" lights.
 - PIT disk: "SELECT PIT" appears and "AUTOMARK" lights.
- 3) Press the PLAY button.
If the focus servo is normal, "FOCUS SRCH" appears and "FOCUS ON!" appears.
- 4) After checking, press the STOP button to return the display to "ALL SV OFF".

10-4. Checking the All Servo ON

- 1) When the ENTER button is pressed during focus servo off, the tracking sled servo is turned on and all servos run.
If the servos are all normal, "ALL SV ON" is displayed.
- 2) After checking, press the STOP button to return the display to "ALL SV OFF".

ELECTRIC ADJUSTMENT

All the MD blocks are adjusted and checked in the test mode.
If “No Adjust” is displayed, perform the adjustments of 1 to 3.

1. Temperature Compensation Adjustment

- * Normally, do not perform the temperature compensation adjustment.
If the adjustment value is extensively different, perform the adjustment as given below in a suitable environment for measuring the correct temperature near the unit.
- Test point: Check the test point on the display.
- Tool: Thermometer
- 1) After the MD test mode starts up, press the STOP button to display “ALL SV OFF”.
- 2) Press the DISPLAY button to display “TEMP = \$**”.
- 3) Press the PAUSE button to display “T + **C: + 00”.
- 4) Put the thermometer near the MD mechanism to measure the room temperature.
- 5) Check the value of the thermometer and press the B.SKIP button and F.SKIP button to adjust until the value is the same as ** on the display. Then press the ENTER button to store the value.
- 6) After adjustment, press the STOP button to return the display to “ALL SV OFF”.
If “No Adjust” appears, perform 1) to 3) and press the ENTER button without changing the adjustment value with the B/F.SKIP buttons.

2. Laser Power Adjustment

- Test point: Check the test point on the display./Pickup laser output
- Tool: Laser power meter (meters that can measure up to 10 mW)

2-1. Playback Laser Power Adjustment

- 1) Press the MD EDIT button in the “ALL SV OFF” state to change the display to “LASER READ”.
- 2) Press the PAUSE button once to display “LASER = \$**”.
- 3) Set it to “LASER = \$11” using the B.SKIP and F.SKIP buttons, and press the ENTER button.
- 4) Measure the pickup laser output using the laser power meter and adjust it using the B.SKIP button and F.SKIP button so that it is around 0.68 mW.
- 5) After adjustment, press the STOP button to change the display to “ALL SV OFF”.

2-2. Recording Laser Power Adjustment

- 1) Press the MD EDIT button three times in the “ALL SV OFF” state to change the display to “LASER WRITE”.
- 2) Press the PAUSE button once to display “LASER = \$**”.
- 3) Set it to “LASER = \$9F” using the B.SKIP and F.SKIP buttons, and press the ENTER button.
- 4) Measure the pickup laser output using the laser power meter and adjust it so that it is around 0.68 mW.
- 5) After adjustment, press the STOP button to change the display to “ALL SV OFF”.

Note: If the laser output exceeds 7.0 mW, the pickup may be damaged.

3. Automatic Sequence Adjustment (EFB/IVR/FOCUS AGC/TRACKING AGC adjustment)

- Test point: Check the test point on the display.
- Test disk: MDW-74, TGYS-1 or equivalent

3-1. Adjusting the MO Disk

- 1) Load the MDW-74.
- 2) Press the MD MODE button to display “SELECT GRV”.
- 3) Press the MD function button to display “AUTO ADJ”. After adjustment, “DONE” is displayed. (If the adjustment failed, “FAILED” appears.)
- 4) Then, press the STOP button to return the display to “ALL SV OFF”.

3-2. IVR, EFB, Focus/ Tracking/ Sled Gain Check of MO Disk

- 1) Move the pickup to the center of the disk using the B.SKIP button and F.SKIP button.
- 2) Press the PLAY button to display “FOCUS ON!”.
- 3) Press the ENTER button to display “ALL SV ON”.
- 4) Press the STOP button and press the DISPLAY button twice.

Confirm that the values of “IV\$**EF\$◇◇” are within the range shown below. (hexadecimal)

IV\$ “**” 03 to 07
EF\$ “◇◇” 09 to 12



- 5) Press the DISPLAY once again.

Confirm that the values of “Gf**t##s△△” are within the range shown below. (hexadecimal)

f “**” 20 to 40
t “##” 15 to 35
s “△△” 15 to 35



- 6) After adjustment, press the STOP button to return the display to “ALL SV OFF”.

3-3. Adjusting the PIT Disk

- 1) Load the TGYS-1.
- 2) Press the MD MODE button to display “SELECT PIT”.
- 3) Press the MD function button to display “AUTO ADJ”. After adjustment, “DONE” is displayed. (If the adjustment failed, “FAILED” appears.)
- 4) Then, press the STOP button to return the display to “ALL SV OFF”.

3-4. IVR, EFB, Focus/ Tracking/ Sled Gain Check of PIT Disk

- 1) Move the pickup to the center of the disk using the B.SKIP button and F.SKIP button.
- 2) Press the PLAY button to display “FOCUS ON!”.
- 3) Press the ENTER button to display “ALL SV ON”.
- 4) Press the STOP button and press the DISPLAY button twice.

Confirm that the values of “IV\$**EF\$◇◇” are within the range shown below. (hexadecimal)

IV\$ “**” 13 to 19
EF\$ “◇◇” 09 to 12



- 5) Press the DISPLAY once again.

Confirm that the values of “Gf**t##s△△” are within the range shown below. (hexadecimal)

f “**” 2A to 45
t “##” 15 to 40
s “△△” 15 to 40



- 6) After adjustment, press the STOP button to return the display to “ALL SV OFF”.

4. Playback Error Rate Check (PIT disk)

- Test point: Check the test point on the display.
 - Test disk: TSYS-1 or equivalent
- 1) Load the TGYS-1.
 - 2) Move the pickup to the center of the disk using the B.SKIP button and F.SKIP button.
 - 3) Press the MD MODE button to display “SELECT PIT”.
 - 4) Press the PLAY button to display “FOCUS ON!”.
 - 5) Press the ENTER button to display “ALL SV ON”.
 - 6) Press the DISPLAY button once to confirm that the address indication is stable and count starts.
 - 7) Press the DISPLAY button once again to display the playback error rate.
Confirm that the numbers of “Er****:**** ” (underlined portion) is “Er0030” or lower.
 - 8) After checking, press the STOP button to return the display to “ALL SV OFF”.

5. Record/Playback Error Rate Check (MO disk)

- Test point: Check the test point on the display.
 - Test disk: MDW-74
- 1) Load the MDW-74.
 - 2) Move the pickup to the center of the disk using the B.SKIP button and F.SKIP button.
 - 3) Press the CD function button. Recording starts automatically in cluster 600.
 - 4) After recording for about 15 seconds, press the STOP button.
 - 5) Press the AUX/D-IN function button to move the pickup to around 600 cluster and enter the “ALL SV ON” state (the display is in the state of the address indication), and press the DISPLAY button in or after cluster 600.
Then confirm that the values of “Er****:**** ” (underlined portion) is “Er0030” or lower.
 - 6) After adjustment, press the STOP button to return the display to “ALL SV OFF”.

5. UTCO (User TOC) Deleting Procedure

If “UTC0 ERROR” or other message is displayed when inserting recorded disk and the UTCO needs to be deleted, follow this procedure.

- 1) Insert the disk whose UTOC is to be deleted.
- 2) Use the B.SKIP button and F.SKIP button to move the pickup to the center of the disk.
- 3) Press the MD MODE button to display “SELECT GRV”.
- 4) Press the MD REC button to display “REC Analog”
- 5) Press the PLAY button to display “FOCUS ON!”.
- 6) Press the ENTER button to display “ALL SV ON”.
- 7) Press the TAPE REC/REC MUTE button to display “UTOC ERASE”.
- 8) After deleting the UTOC, the display automatically returns to “ALL SV OFF”.

7. Initializing Procedure of EEP-ROM

Follow the procedure given below to set the adjustment value of EEP-ROM to the default value (reference value).

- 1) While pressing the CD OPEN/CLOSE button, press the MD EDIT button of the unit.
 - 2) After turning on the power again, confirm that “NO Adjust” is displayed.
- * Even in the “NO Adjust” state, the MD can be operated.



IC DESCRIPTION

IC, CXA2523AR

Pin No.	Pin Name	I/O	Description
1	I	I	Input “I” RF signal converted to I-V.
2	J	I	Input “J” RF signal converted to I-V.
3	VC	O	Output voltage for VCC/2.
4	A	I	Input current for main beam servo signal A.
5	B	I	Input current for main beam servo signal B.
6	C	I	Input current for main beam servo signal C.
7	D	I	Input current for main beam servo signal D.
8	E	I	Input current for side beam servo signal E.
9	F	I	Input current for side beam servo signal F.
10	PD	I	Input beam spectrum monitor signal.
11	APC	O	Output laser APC.
12	APCREF	I	Input reference voltage for laser power setting.
13	GND	—	GND.
14	TEMPI	I	Not used.
15	TEMPR	I	
16	SWDT	I	Input micro-processor serial interface data.
17	SCLK	I	Input micro-processor serial interface shift clock.
18	XLAT	I	Input micro-processor serial interface latch. “L”: Latch.
19	XSTBY	I	Standby setting pin. “H”: Normal mode, “L”: Standby.
20	FOCNT	I	Internal current setting pin.
21	VREF	O	Not used.
22	EQADJ	I/O	EQ central frequency setting pin.
23	3TADJ	I/O	BPF3T central frequency setting pin.
24	VCC	—	Power supply pin.
25	WBLADJ	I/O	BPF22 central frequency setting pin.
26	TE	O	Output tracking error signal.
27	CSLED	—	LPF capacitor connection pin for SLED error signal.
28	SE	O	Output SLED error signal.
29	ADFM	O	Output ADIP FM signal.
30	ADIN	I	Input ADIP signal comparator.
31	ADAGC	—	ADIPAGC capacitor connection pin.
32	ADFG	O	Output ADIP2 binary data signal.
33	AUX	O	I3 output temperature signal. Switched by serial command.
34	FE	O	Output focus error signal.
35	ABCD	O	Output beam spectrum signal for main beam servo detector.
36	BOTM	O	Output bottom hold signal for RF/ABCD.
37	PEAK	O	Output peak hold signal for RF/ABCD.
38	RF	O	RF equalizer output pin.
39	RFAGC	—	RFAGC capacitor connection pin.
40	AGCI	I	RFAGC input pin.
41	COMPO	O	Not used.

Pin No.	Pin Name	I/O	Description
42	COMPP	I	User comparator non-inverted input pin.
43	ADDC	I/O	Capacitor connection pin for ADIP amplifier on return circuit.
44	OPO	O	Not used.
45	OPN	I	Non-inverted input pin for user operational amplifier.
46	RFO	O	RF amplifier output pin. Check point for eye pattern.
47	MORFI	I	Input pin where Groove RF signal is AC coupled.
48	MORFO	O	Output pin for Groove RF signal.

IC, CXD2652AR

Pin No.	Pin Name	I/O	Description
1	MNT0	O	Monitor output terminal.
2	MNT1	O	
3	MNT2	O	
4	MNT3	O	
5	SWDT	I	Microprocessor serial interface data input.
6	SCLK	I	Microprocessor serial interface shift clock input.
7	XLAT	I	Microprocessor serial interface latch input. Latched at falling down edge.
8	SRDT	O	Microprocessor serial interface data output.
9	SENS	O	The terminal which outputs internal status in accordance with the address of the microprocessor serial interface.
10	XRST	I	Reset input. L: reset.
11	SQSY	O	Disc sub code Q sync/ADIP sync output.
12	DQSY	O	Subcode Q sync output of U-bit CD or MD format when the DIGITAL IN source is CD or MD.
13	RECP	I	Laser power selection input. H: Recording power, L: Playback power.
14	XINT	O	Interrupt request output terminal. L is output when interrupt status is generated.
15	TX	I	Record data output enable signal input terminal. H: enable.
16	OSCI	I	Crystal oscillator circuit input terminal.
17	OSCO	O	Crystal oscillator circuit output terminal. (Inverted output of OSCI).
18	XTSL	I	OSCI terminal input frequency selection. H: 512 Fs (22.5792 MHz), L: 1024 Fs (45.1584 MHz).
19	NC	—	Not connected.
20	DVSS	—	Digital GND.
21	DIN	I	Digital audio interface signal input.
22	DOUT	O	Digital audio interface signal output.
23	ADDT	I	Analog recording signal input terminal. (External A/D converter output is connected to this terminal).
24	DADT	O	RECORD monitor output/decode audio data output.
25	LRCK	O	LRCK (44.1 kHz) output terminal to external audio block.
26	XBCK	O	Bit clock output (2.8224 kHz) output terminal to external audio block.
27	FS256	O	256 Fs output. (11.2896 MHz).
28	DVDD	—	Digital power supply.
29	A03	O	Address output to external DRAM.
30	A02	O	
31	A01	O	
32	A00	O	
33	A10	O	Not used.
34	A04	O	Address output to external DRAM.
35	A05	O	
36	A06	O	
37	A07	O	

Pin No.	Pin Name	I/O	Description
38	A08	O	Address output to external DRAM.
39	A11	O	Not used.
40	DVSS	—	Digital GND.
41	XOE	O	External DRAM output enable.
42	XCAS	O	$\overline{\text{CAS}}$ output to external DRAM.
43	A09	O	Address output to external DRAM.
44	XRAS	O	$\overline{\text{RAS}}$ output to external DRAM.
45	XWE	O	Write enable for external DRAM.
46	D1	I/O	Data bus for external DRAM.
47	D0	I/O	
48	D2	I/O	
49	D3	I/O	
50	MVCI	I	External VCO (784 fs) clock input.
51	ASYO	O	Playback EFM full swing output. (L: VSS, H: VDD).
52	ASYI	I	Playback EFM comparator slice voltage input.
53	AVDD	—	Analog GND.
54	BIAS	I	Playback EFM comparator bias current input.
55	RFI	I	Playback EFM RF signal input.
56	AVSS	—	Analog power supply.
57	PDO	O	Not used.
58	PCO	O	Phase comparison output to the master PLL of playback digital PLL and to the recording EFM PLL.
59	FILI	I	Filter input to the master PLL of playback digital PLL and to the recording EFM PLL.
60	FILO	O	Filter output to the master PLL of playback digital PLL and to the recording EFM PLL.
61	CLTV	I	Internal VCO control voltage of the master PLL of playback digital PLL and of the recording EFM PLL.
62	PEAK	I	Optical light volume's peak hold signal input.
63	BOTM	I	Optical light volume's bottom hold signal input.
64	ABCD	I	Optical light volume signal input.
65	FE	I	Focus error signal input.
66	AUX1	I	Auxiliary input 1.
67	VC	I	Center terminal voltage input.
68	ADIO	O	Not used.
69	AVDD	—	Analog power supply.
70	ADRT	I	Voltage input of the upper limit of the A/D converter operation range.
71	ADRB	I	Voltage input of the lower limit of the A/D converter operation range.
72	AVSS	—	Analog GND.
73	SE	I	Sled error signal input.
74	TE	I	Tracking error signal input.
75	AUX2	I	Auxiliary input 2.

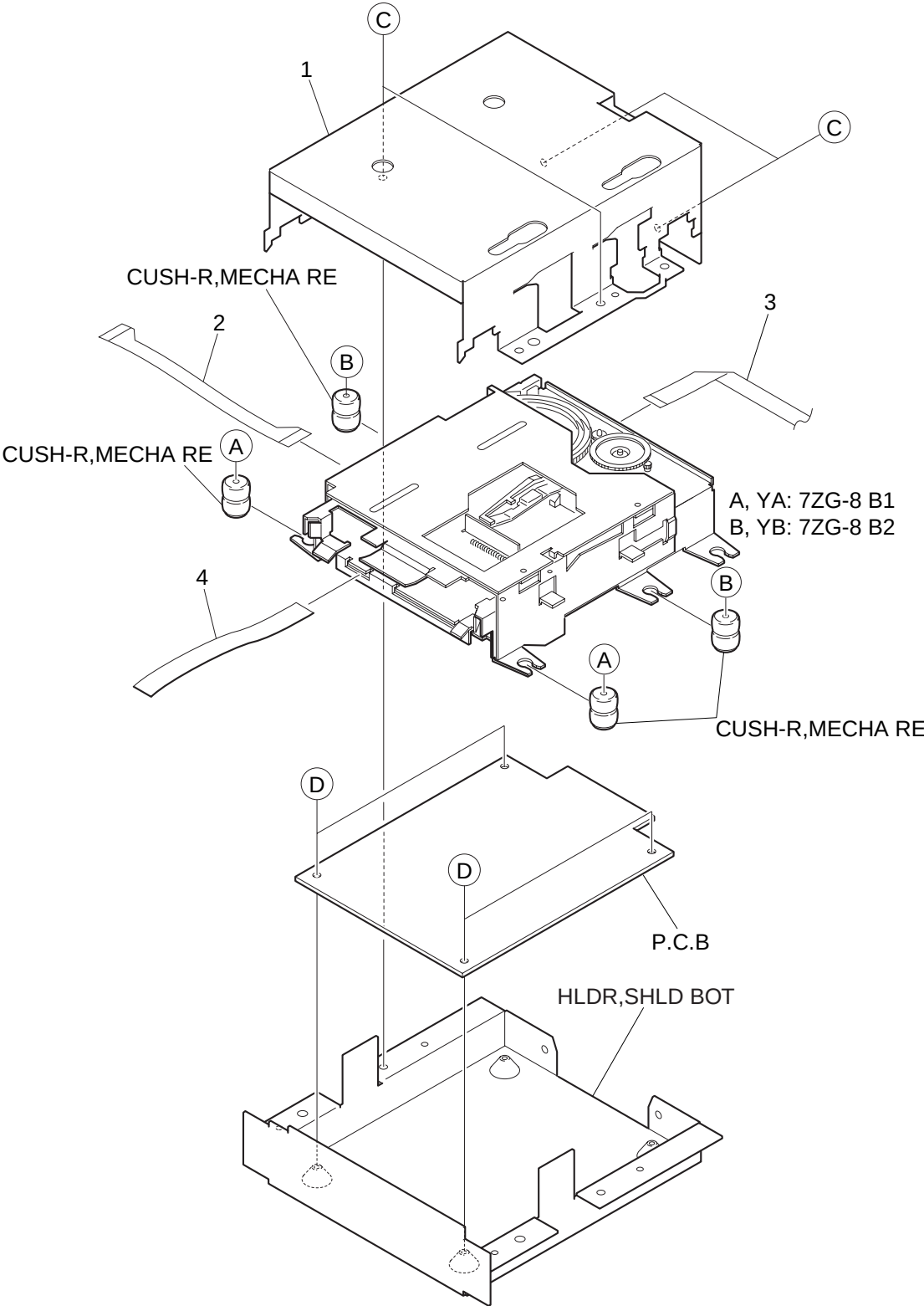
Pin No.	Pin Name	I/O	Description
76	DCHG	I	Connected to the low impedance power supply.
77	APC	I	Error signal input to the laser digital APC.
78	ADFG	I	ADIP2 binary-converted FM signal (22.05±1 kHz) input.
79	F0CNT	O	Current source setting output terminal to CXA2523.
80	XLRF	O	Latch output for CXA2523 control. Latched at rise-up.
81	CKRF	O	Shift clock output for CXA2523 control.
82	DTRF	O	Data output for CXA2523 control.
83	APCREF	O	Reference PWM output to laser APC.
84	LDDR	O	Not used.
85	TRDR	O	Tracking servo drive PWM output. (-).
86	TFDR	O	Tracking servo drive PWM output. (+).
87	DVDD	—	Digital power supply.
88	FFDR	O	Focus servo drive PWM output. (+).
89	FRDR	O	Focus servo drive PWM output. (-).
90	FS4	O	Not used.
91	SRDR	O	Sled servo drive PWM output. (-).
92	SFDR	O	Sled servo drive PWM output. (+).
93	SPRD	O	Spindle servo drive PWM output. (PWM (-) or negative polarity).
94	SPFD	O	Spindle servo drive PWM output. (PWM (+) or PWM absolute value).
95	FGIN	I	FG input to spindle CAV servo.
96	TEST1	I	Test pin. Connected to GND.
97	TEST2	I	
98	TEST3	I	
99	DVSS	—	Digital GND.
100	EFMO	O	Low signal during playback. EFM (encode data) output: during recording.

IC, CXP81952M-552R

Pin No.	Pin Name	I/O	Description
1	MCAS	—	Not used.
2	MRAS	—	
3	BUP	—	
4	AMUTE	O	Audio mute signal output.
5	ESK	O	Serial clock output for EEPROM interface.
6	EDO	O	Serial data output for EEPROM interface.
7	EDI	I	Serial data input for EEPROM interface.
8	ECS	O	EEPROM chip select signal output.
9	NC	—	Not used.
10	RFLCT	I	Input from disc reflectance detection switch.
11	NC	—	Not used.
12	LS	I	Input signal from pickup inner circumference detect switch.
13	LDSW	I	Input signal from loading mechanism EJECT position detect switch.
14	PBSW	—	Not used.
15	RECSW	I	Input signal from loading mechanism REC position detect switch.
16	NC	—	Not used.
17	NC	—	
18	ACOFF	—	
19	SREQ	I	System control send request input signal for system control interface.
20	EXTDIN	O	External DIGITAL-IN permission output signal.
21	SLOW	O	Speed control signal output to loading mechanism.
22	LOAD	O	Movement direction control signal output-1 to loading mechanism.
23	EJECT	O	Movement direction control signal output-2 to loading mechanism.
24	MREQ	O	MD controller send request output signal for system control interface.
25	DRIVE	O	EFM driver ON/OFF output signal.
26	NC	—	Not used.
27	NC	—	
28	NC	—	
29	NC	—	
30	NC	—	
31	NC	—	
32	NC	—	
33	NC	—	
34	NC	—	
35	NC	—	
36	NC	—	
37	MP	—	Connected to VSS.
38	SRST	I	MD controller reset signal input.
39	DGND	—	Connected to VSS.
40	XTALO	O	External crystal connection terminal-1 for system clock oscillation.
41	XTALI	I	External crystal connection terminal-2 for system clock oscillation.

Pin No.	Pin Name	I/O	Description
42	ARDY	I	READY input signal for system control interface.
43	SIN	I	Serial data input for system control interface.
44	SOUT	O	Serial data output for system control interface.
45	ACLK	O	Serial clock output for system control interface.
46	XLAT	O	Latch signal output for CXD2652 interface.
47	XRST	O	CXD2652 reset signal output.
48	XSTBY	O	CXA2523 standby signal output.
49	NC	O	Not used.
50	AVSS	—	Connected to VSS.
51	AVREF	—	Connected to VDD.
52	AVDD	—	
53	NC	I	
54	NC	I	
55	NC	I	
56	SLF	I	
57	SLR	I	
58	TEMP	I	Connected to VSS.
59	MAGIC	I	Connected to VDD.
60	NC	I	
61	TEST	I	
62	DISCPRO	I	Disc write protection switch input.
63	MNT3	I	CXD2652 monitor signal input-1.
64	MNT2	I	CXD2652 monitor signal input-2.
65	MNT1	I	CXD2652 monitor signal input-3.
66	MNT0	I	CXD2652 monitor signal input-4.
67	SENS	I	CXD2652 SENS signal input.
68	FLG	O	Monitoring signal of flag contained in SRDT of CXD2652 interface.
69	NC	O	Not used.
70	NC	O	
71	P-CONT	O	
72	RFSW	O	
73	NC	O	
74	NC	O	
75	DQSY	I	DIGITAL-IN SUB-Q sync input.
76	XINT	I	CXD2652 status sync input.
77	SRDT	I	Serial data input for CXD2652 interface.
78	SWDT	O	Serial data output for CXD2652 interface.
79	SCLK	O	Serial clock output for CXD2652 interface.
80	SQSY	I	SUB-Q, ADIP sync input.
81	NC	—	Not used.
82	NC	—	

Pin No.	Pin Name	I/O	Description
83	NC	—	Not used.
84	TXI	I	Connected to VSS.
85	TXO	O	Open.
86	VSS	—	Connected to VSS.
87	VDD	—	Connected to VDD.
88	NC	—	
89	NC	—	Not used.
90	DRVMUTE	O	BA5970FP mute signal output.
91	NC	—	Not used.
92	NC	—	
93	NC	—	
94	NC	—	
95	RECP	O	Laser power select signal output.
96	TX	O	Record data output enable signal output.
97	MOD	O	High frequency superimpose circuit ON/OFF signal output.
98	OPMUTE	O	Laser mute signal output.
99	ARST	O	AK4512 reset signal output.
100	DENF	O	De-emphasis ON/OFF signal output.

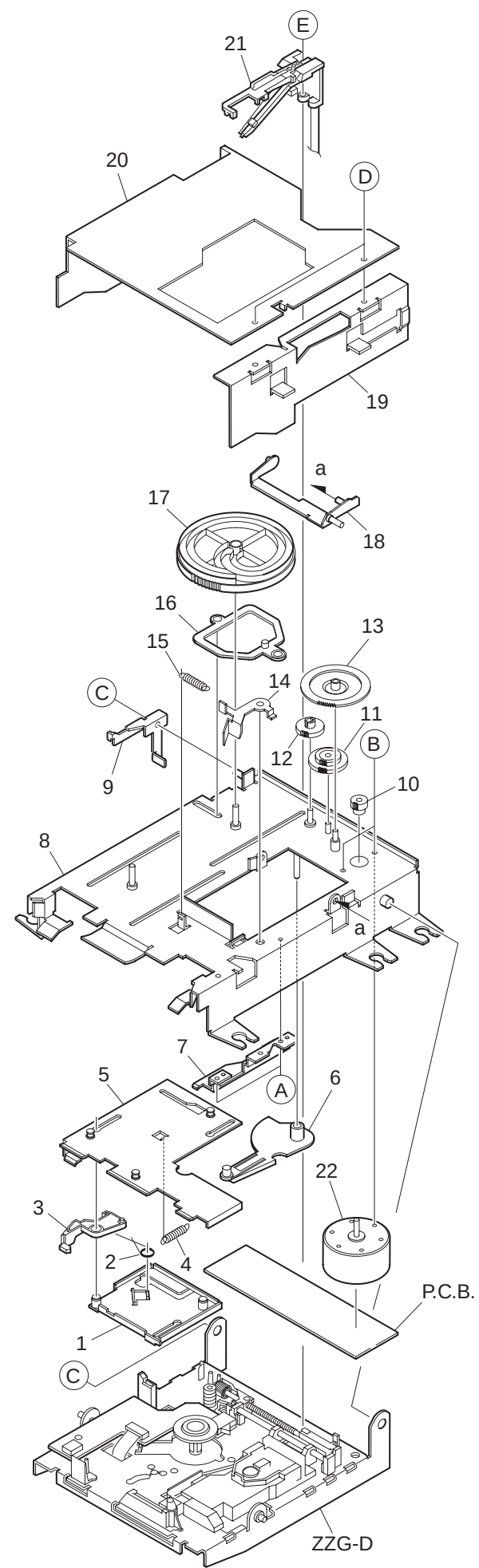


MECHANISM PARTS LIST 1/1

DESCRIPTIONで判断できない物は "REFERENCE NAME LIST" を参照してください。
If can't understand for Description please kindly refer to "REFERENCE NAME LIST".

REF. NO	PART NO.	KANRI NO.	DESCRIPTION	REF. NO	PART NO.	KANRI NO.	DESCRIPTION
1	87-ZG9-202-210		HLDR,SHLD TOP				
2	8A-ZG4-611-010		PWB,FLEX 21P AZG-4				
3	87-ZG9-604-010		FF-CABLE, 5P 1.25 100MM				
4	87-ZG9-603-010		FF-CABLE,8P 1.0 120MM				
A	87-ZG9-209-010		S-SCREW,MD TF				
B	87-ZG9-208-010		S-SCREW,MD T				
C	87-067-020-010		SCREW, VTT+3-4				
D	87-067-421-010		VTT+2-4				

MECHANISM EXPLODED VIEW 1/1 (7ZG8)

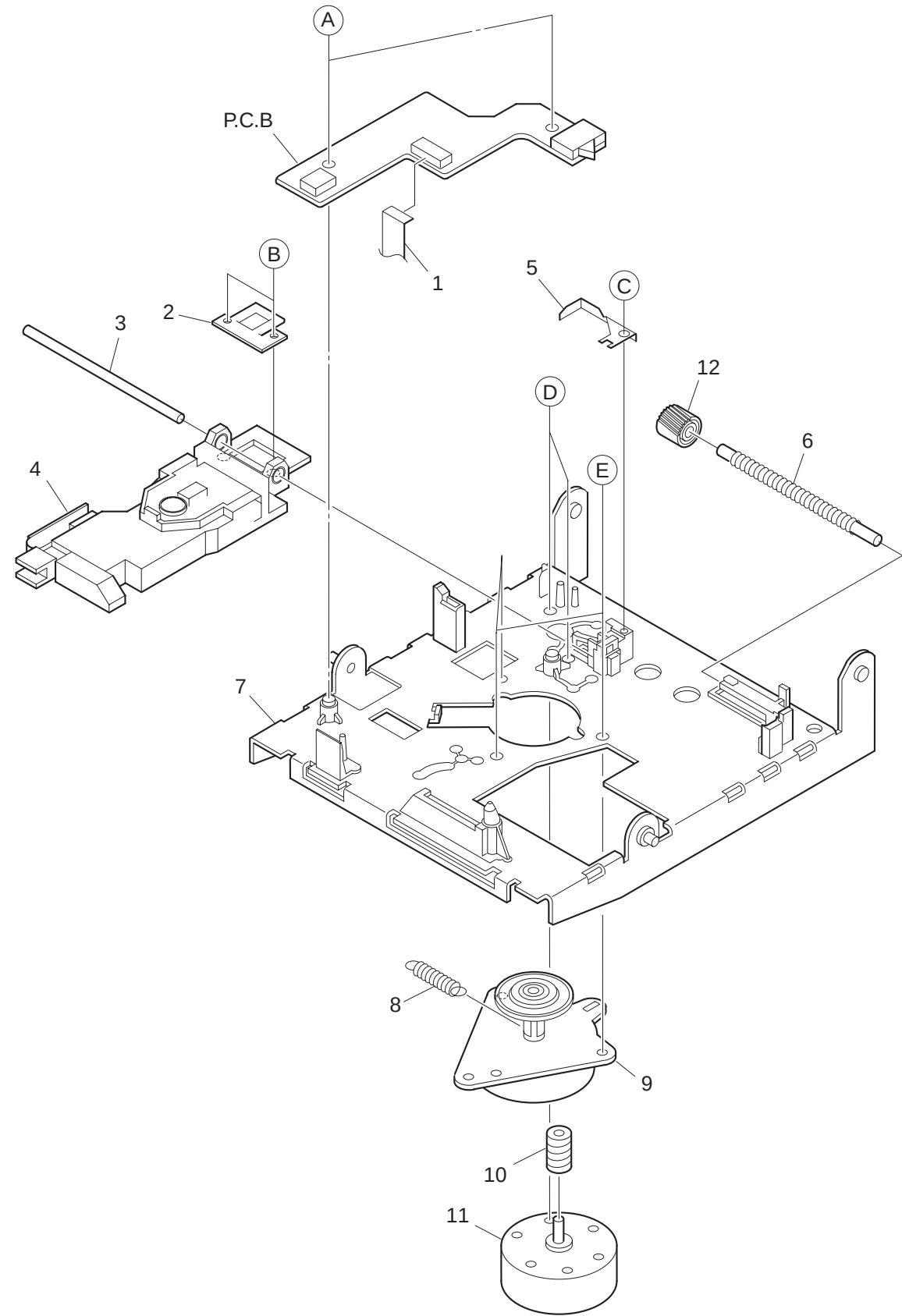


MECHANISM PARTS LIST 1/1 (7ZG8)

DESCRIPTIONで判断できない物は "REFERENCE NAME LIST" を参照してください。
If can't understand for Description please kindly refer to "REFERENCE NAME LIST".

REF. NO	PART NO.	KANRI NO.	DESCRIPTION	REF. NO	PART NO.	KANRI NO.	DESCRIPTION
1	87-ZG8-220-210		PLATE ASSY, LATCH	20	87-ZG8-209-310		PLATE ASSY, SLIDE L
2	87-ZG8-259-110		SPR-T, LATCH	21	87-A90-605-210		HEAD, OWH RF325-74A<B2>
3	87-ZG8-230-210		LEVER, LATCH(*)	21	87-A91-539-010		HEAD, OWH RM-21E<B1>
4	87-ZG8-224-110		SPR-E, LATCH	22	87-A90-672-010		MOT, M25E-4
5	87-ZG8-214-210		HLDR ASSY, CARTRIGE	A	87-B10-129-010		VTT+1.7-3.5 W/O MFZN2-C
6	87-ZG8-233-310		LEVER, SW H(*)	B	87-B10-128-010		V+1.7-2 W/O MFZN2-C
7	87-ZG8-255-210		PLATE, CARTRIGE	C	87-B10-130-010		W-P, 1.23-3.1-0.25 SLIT
8	87-ZG8-277-010		CHAS ASSY, MAIN B	D	87-B10-185-010		VTT+2-3
9	87-ZG8-256-110		LEVER, SW S2	E	87-B10-286-010		VW+1.7-5 W/O MFZN2C
10	87-ZG8-242-010		GEAR, MOT	F	87-067-315-010		PW 3.1-7-0.5
11	87-ZG8-253-010		GEAR, REDUCTION S3				
12	87-ZG8-246-010		GEAR, IDLER 2				
13	87-ZG8-252-010		GEAR, REDUCTION L3				
14	87-ZG8-231-110		LEVER, SHUTTER				
15	87-ZG8-232-110		SPR-E, SHUTTER				
16	87-ZG8-225-310		LEVER ASSY, CAM				
17	87-ZG8-239-110		CAM, LOAD(*)				
18	87-ZG8-257-210		LEVER ASSY, REC<B2>				
18	87-ZG8-272-110		LEVER, ASSY REC2<B1>				
19	87-ZG8-213-310		PLATE, SLIDE R				

MECHANISM EXPLODED VIEW 1/1 (ZZG-D)



MECHANISM PARTS LIST 1/1 (ZZG-D)

DESCRIPTIONで判断できない物は "REFERENCE NAME LIST" を参照してください。
If can't understand for Description please kindly refer to "REFERENCE NAME LIST".

REF. NO	PART NO.	KANRI NO.	DESCRIPTION	REF. NO	PART NO.	KANRI NO.	DESCRIPTION
1	87-ZG9-603-010		FF-CABLE, 8P 1.0 120MM	11	87-A91-490-010		MOT, BCD3B04
2	87-ZG3-216-010		SPR-P, RACK	12	8Z-ZGD-206-010		GEAR, LEAD
3	87-ZG3-211-010		SHAFT, GUIDE	A	87-341-035-210		SCREW, UT1+2-6
4	87-A91-444-010		PICKUP, KMS-260B	B	87-067-393-010		SCREW +1.4-1.4
5	8Z-ZGD-207-010		SPR-P, LEAD	C	8Z-ZGD-211-010		S-SCREW, VBT+1.7-5
6	8Z-ZGD-208-010		SHAFT, LEAD	D	87-263-523-310		SCREW, V+1.7-2
7	8Z-ZGD-201-010		CHAS ASSY, MECHA	E	8Z-ZGD-210-010		S-SCREW, +2-2.5
8	8Z-ZGD-209-010		SPR-E, SPINDLE				
9	87-A91-489-010		MOT, BCD3B93				
10	8Z-ZGD-205-010		GEAR, MOT				

REFERENCE NAME LIST

ELECTRICAL SECTION

DESCRIPTION	REFERENCE NAME
ANT	ANTENNAS
C-	CHIP
C-CAP	CAP, CHIP
C-CAP TN	CAP, CHIP TANTALUM
C-COIL	COIL, CHIP
C-DI	DIODE, CHIP
C-DIODE	DIODE, CHIP
C-FET	FET, CHIP
C-FOTR	FILTER, CHIP
C-JACK	JACK, CHIP
C-LED	LED, CHIP
C-RES	RES, CHIP
C-SFR	SFR, CHIP
C-SLIDE SW	SLIDE SWITCH, CHIP
C-SW	SWITCH, CHIP
C-TR	TRANSISTOR, CHIP
C-VR	VOLUME, CHIP
C-ZENER	ZENER, CHIP
CAP, CER	CAP, CERA-SOL
CAP, E	CAP, ELECT
CAP, M/F	CAP, FILM
CAP, TC	CAP, CERA-SOL
CAP, TC-U	CAP, CERA-SOL SS
CAP, TN	CAP, TANTALUM
CERA FIL	FILTER, CERAMIC
CF	FILTER, CERAMIC
DL	DELAY LINE
E/CAP	CAP, ELECT
FILT	FILTER
FLTR	FILTER
FUSE RES	RES, FUSE
MOT	MOTOR
P-DIODE	PHOTO DIODE
P-SNSR	PHOTO SENSER
P-TR	PHOTO TRANSISTOR
POLY VARI	VARIABLE CAPACITOR
PPCAP	CAP, PP
PT	POWER TRANSFORMER
PTR, RES	PTR, MELF
RC	REMOTE CONTROLLER
RES NF	RES, NON-FLAMMABLE
RESO	RESONATOR
SHLD	SHIELD
SOL	SOLENOID
SPKR	SPEAKER
SW, LVR	SWITCH, LEVER
SW, RTRY	SWITCH, ROTARY
SW, SL	SWITCH, SLIDE
TC CAP	CAP, CERA-SOL
THMS	THERMISTOR
TR	TRANSISTOR
TRIMMER	CAP, TRIMMER
TUN-CAP	VARIABLE CAPACITOR
VIB, CER	RESONATOR, CERAMIC
VIB, XTAL	RESONATOR, CRYSTAL
VR	VOLUME
ZENER	DIODE, ZENER

MECHANICAL SECTION

DESCRIPTION	REFERENCE NAME
ADHESHIVE	SHEET ADHESHIVE
AZ	AZIMUTH
BAR-ANT	BAR-ANTENNA
BAT	BATTERY
BATT	BATTERY
BRG	BEARING
BTN	BUTTON
CAB	CABINET
CASS	CASSETTE
CHAS	CHASSIS
CLR	COLLAR
CONT	CONTROL
CRSR	CURSOR
CU	CUSHION
CUSH	CUSHION
DIR	DIRECTION
DUBB	DUBBING
FL	FRONT LOADING
FLY-WHL	FLYWHEEL
FR	FRONT
FUN	FUNCTION
G-CU	G-CUSHION
HDL	HANDOL
HIMERON	CLOTH
HINGE, BAT	HINGE, BATTERY
HLDR	HOLDER
HT-SINK	HEAT SINK
IB	INSTRUCTION BOOKLET
IDLE	IDLER
IND, L-R	INDICATOR, L-R
KEY, CONT	KEY, CONTROL
KEY, PRGM	KEY, PROGRAM
KNOB, SL	KNOB, SLIDE
LBL	LABEL
LID, BATT	LID, BATTERY
LID, CASS	LID, CASSETTE
LVR	LEVER
P-SP	P-SPRING
PANEL, CONT	PANEL, CONTROL
PANEL, FR	PANEL, FRONT
PRGM	PROGRAM
PULLY, LOAD MO	PULLY, LOAD MOTOR
RBN	RIBBON
S-	SPECIAL
SEG	SEGMENT
SH	SHEET
SHLD-SH	SHIELD-SHEET
SL	SLIDE
SP	SPRING
SP-SCREW	SPECIAL-SCREW
SPACER, BAT	SPACER, BATTERY
SPR	SPRING
SPR-P	P-SPRING
SPR-PC-PUSH	P-SPRING, C-PUSH
T-SP	T-SPRING
TERM	TERMINAL
TRIG	TRIGGER
TUN	TUNING
VOL	VOLUME
W	WASHER
WHL	WHEEL
WORM-WHL	WORM-WHEEL