

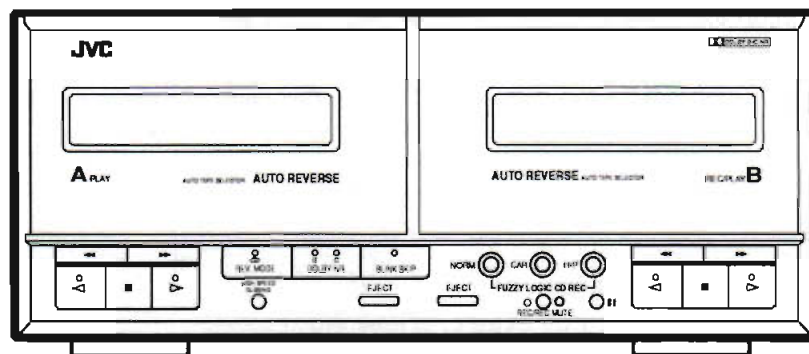
JVC

SERVICE MANUAL

COMPACT COMPONENT SYSTEM

CA-MX77TN/DX-MX77TN

(Unit No. TD-MX77TN)



- * For instruction manual, please refer to the CA-MX77TN (S.M.NO.20311) or DX-MX77TN (S.M.NO.20312).
- * AX-MX77TN is needed (for power supply etc.) when servicing.

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Safety Precautions

1. The design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Services should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the product should not be made. Any design alterations of the product should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacture of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the Parts List of Service Manual. Electrical components having such features are identified by shading on the schematics and by (Δ) on the Parts List in the Service Manual. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement parts shown in the Parts List of Service Manual may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been returned to normal, after re-assembling.
5. Leakage current check (Electrical shock hazard testing)
After re-assembling the product, always perform an isolation check on the exposed metal parts of the product (antenna terminals, knobs, metal cabinet, screw heads, headphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.
Do not use a line isolation transformer during this check.

- Plug the AC line cord directly into the AC outlet. Using a "Leakage Current Tester", measure the leakage current from each exposed metal parts of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground. Any leakage current must not exceed 0.5mA AC (r.m.s.).

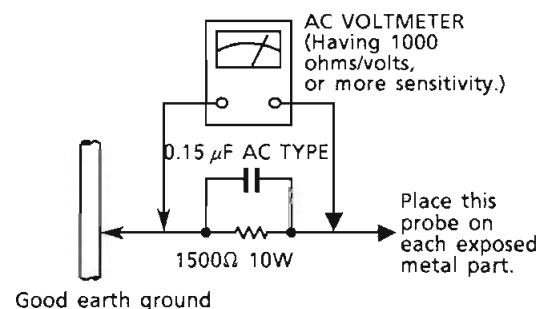
- Alternate check method

Plug the AC line cord directly into the AC outlet. Use an AC voltmeter having, 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1,500 Ω 10 W resistor paralleled by a 0.15 μ F AC-type capacitor between an exposed metal part and a known good earth ground.

Measure the AC voltage across the resistor with the AC voltmeter.

Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor.

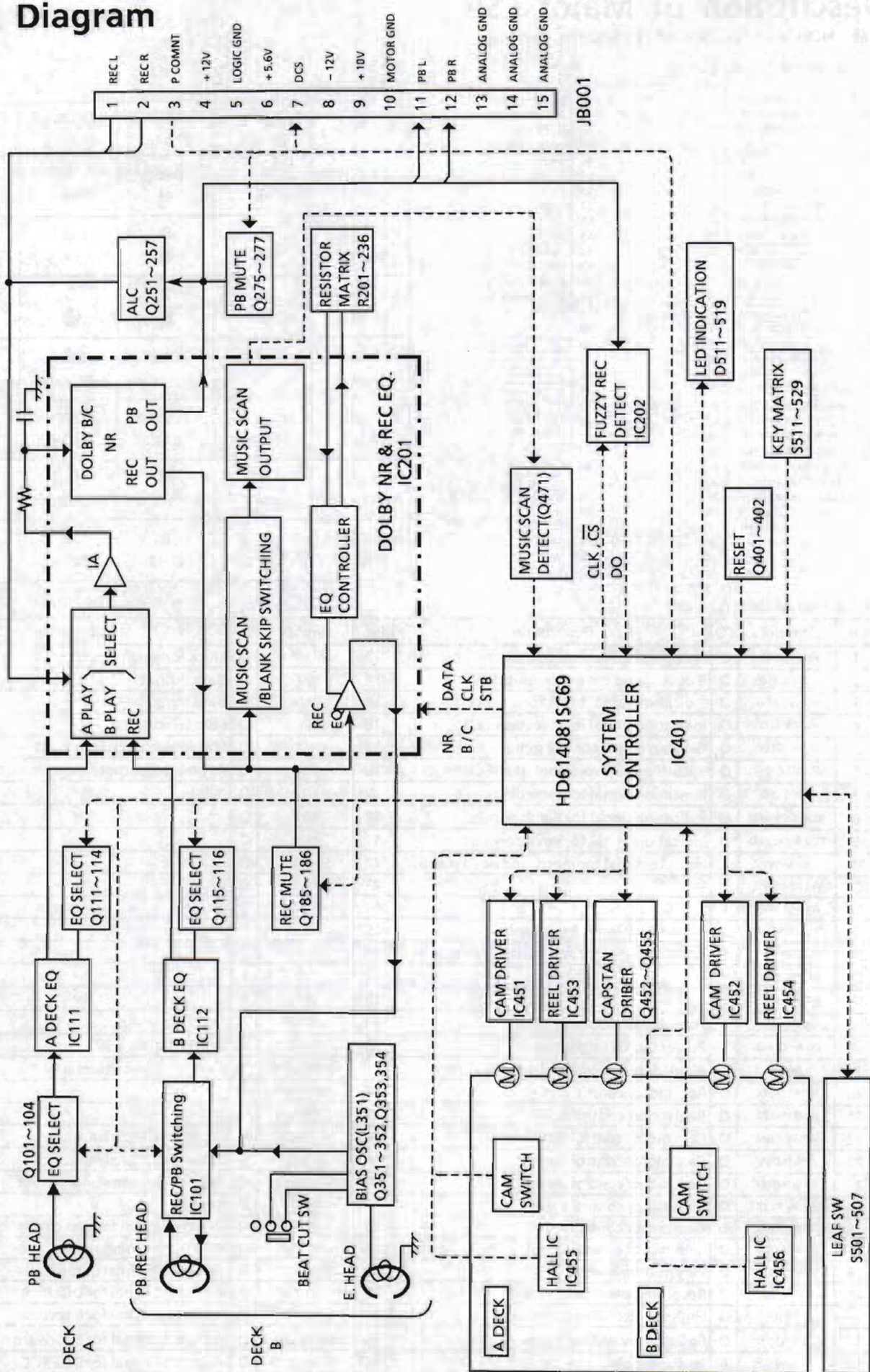
Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75 V AC (r.m.s.). This corresponds to 0.5 mA AC (r.m.s.).



Warning

1. This equipment has been designed and manufactured to meet international safety standards.
2. It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
3. Repairs must be made in accordance with the relevant safety standards.
4. It is essential that safety critical components are replaced by approved parts.
5. If mains voltage selector is provided, check setting for local voltage.

Block Diagram



Description of Major LSIs

■ HD614081SC69(IC401) : System controller

1. Terminal Layout

A SPEED UP	1	64	DOLBY C LED
B SPEED UP	2	63	B FWD LED
A FWD LED	3	62	B REV LED
A REV LED	4	61	DOLBY B LED
CAP MOTOR	5	60	NR OFF/ON
REC	6	59	NR B/C
REC LED	7	58	BIAS
BLANK SKIP LED	8	57	GND
REV. MODE LED	9	56	REC MUTE
A CAM SW-2	10	55	DCS IN
A CAM SW-1	11	54	DCS OUT
A CA SW-0	12	53	GND
A PULSE IN	13	52	4.19MHzOSC IN
B CAM SW-2	14	51	4.19MHzOSC IN
B CAM SW-1	15	50	TO VCC
B CAM SW-0	16	49	RESET IN
B PULSE IN	17	48	KEY&SW IN-4
POWER OFF IN	18	47	KEY&SW IN-3
MSI	19	46	KEY&SW IN-2
A FWD REEL MOTOR	20	45	KEY&SW IN-1
A REV REEL MOTOR	21	44	KEY OUT-7
A REV CAM MOTOR	22	43	KEY OUT-6
A FWD CAM MOTOR	23	42	KEY OUT-5
B FWD REEL MOTOR	24	41	KEY OUT-4
B REV REEL MOTOR	25	40	KEY OUT-3
B REV CAM MOTOR	26	39	KEY OUT-2
B FWD CAM MOTOR	27	38	KEY OUT-1
O MUTE	28	37	STB
METAL	29	36	CS
DUB	30	35	DATA
BEQ	31	34	DO
+5V	32	33	CLK

2. Key Matrix

	KEY&SW-1 (Pin45)	KEY&SW-2 (Pin46)	KEY&SW-3 (Pin47)	KEY&SW-4 (Pin48)
KEY OUT 1 (Pin38)	A ◀	A ◀◀	A ▶▶	A ▶
KEY OUT 2 (Pin39)	B ◀	B ◀◀	B ▶▶	B ▶
KEY OUT 3 (Pin40)	A ■	B ■	B ●	B ▬
KEY OUT 4 (Pin41)	A▶▶B	DOLBY	REV. MODE	BLANK SKIP
KEY OUT 5 (Pin42)	FUZZY NOR	FUZZY CAR	FUZZY PHONE	—
KEY OUT 6 (Pin43)	B PACK	REV REC	FWD REC	A PACK
KEY OUT 7 (Pin44)	—	B CrO2	B METAL	—

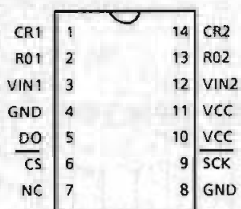
3. Terminal Description

Pin	Symbol	I/O	Description	Pin	Symbol	I/O	Description
1	A SPEED UP	O	A deck speed control output	33	CLK	O	Clock for data transfer
2	B SPEED UP	O	B deck speed control output	34	DO	O	Data output
3	A FWD LED	O	Indication signal for A forward LED	35	DATA	O	Data input
4	A REV LED	O	Indication signal for A reverse LED	36	CS	O	Chip select signal
5	CAP MOTOR	O	Capstan motor control signal	37	STB	O	Strobe signal output
6	REC	O	Recording control signal (H : REC)	38	KO 1	O	Key matrix output
7	B REC LED	O	Indication signal for recording	39	KO 2	O	◊
8	BLA. SKIP LED	O	Indication signal for Blank skip	40	KO 3	O	◊
9	REV.MOD.LED	O	Indication signal for Reverse mode	41	KO 4	O	◊
10	A CAM SW 2	I	Input terminal for mech. and head status	42	KO 5	O	◊
11	A CAM SW 1	I	◊	43	KO 6	O	◊
12	A CAM SW 0	I	◊	44	KO 7	O	◊
13	A PULSE IN	I	Pulse signal input from Reel	45	KI 1	O	Key matrix input
14	B CAM SW 2	I	Input terminal for mech. and head status	46	KI 2	I	◊
15	B CAM SW 1	I	◊	47	KI 3	I	◊
16	B CAM SW 0	I	◊	48	KI 4	I	◊
17	B PULSE	I	Pulse signal input from Reel	49	RESET	I	Reset signal input
18	POW. OFF IN	I	Power ON/OFF signal input	50	TO VCC	I	Connected to +5V
19	MS IN	I	Blank detect terminal for music scan	51	4.19MHzOSC	I/O	Clock oscillation terminal
20	AFWD REEL	O	Reel motor control signal	52	4.19MHzOSC	I/O	◊
21	A REV REEL	O	Reel motor control signal	53	GND	--	Ground
22	A REV CAM	O	Cam motor control signal	54	DCS OUT	O	Compulink signal output
23	AFWD CAM	O	Cam motor control signal	55	DCS IN	I	Compulink signal input
24	BFWD REEL	O	Reel motor control signal	56	REC. MUTE	O	Recording mute signal output
25	B REV REEL	O	Reel motor control signal	57	GND	O	Ground
26	B REV CAM	O	Cam motor control signal	58	BIAS	O	ON / OFF signal for bias circuit
27	BFWD CAM	O	Cam motor control signal	59	NR B/C	O	NR B / C switching signal
28	OMUTE	O	Play muting control	60	NR OFF/ON	O	NR ON/OFF signal output
29	METAL	O	Recording bias control for METAL tape	61	DOLBY B LED	O	Indication signal for DOLBY B
30	DUB	O	High speed dubbing control	62	B REV LED	O	Indication signal for B reverse
31	BEQ	O	Equalizer switching signal	63	B FWD LED	O	Indication signal for B forward
32	+5V	--	Power supply	64	DOLBY C LED	O	Indication signal for DOLBY C

Internal Block Diagram of Other ICs

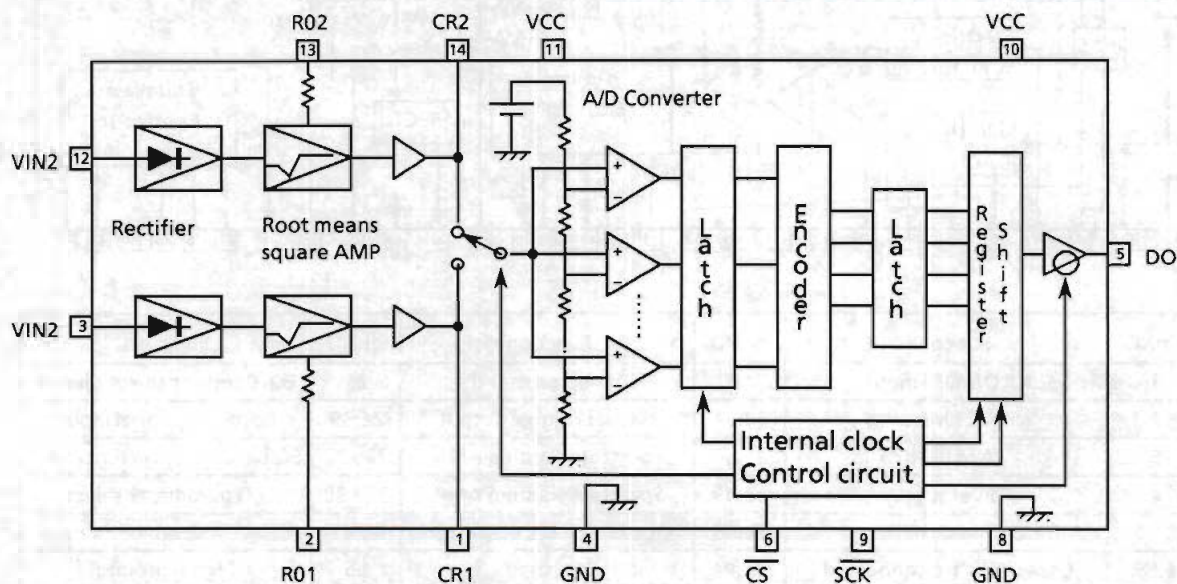
■ M62302P(IC202) : A/D converter for AV level

1. Terminal Layout

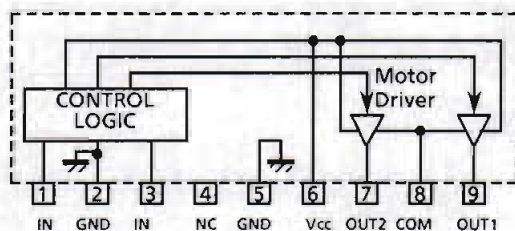


2. Terminal Description

Pin No.	Symbol	I/O	Description
1	CR1		This is a terminal to determine the response of the output.
14	CR2		
2	R01	--	This is a terminal to determine the response of the output.
13	R02	--	
3	VIN1	--	Analog signal input terminal
12	VIN2	--	
4	GND	--	Ground
8			
5	DO	O	Digital output terminal
6	$\overline{\text{CS}}$	I	Chip select terminal DO terminal is enable when this terminal is "L".
9	$\overline{\text{SCK}}$	I	Clock signal input The accuracy of the A/D conversion depends on this clock speed.
10	VCC	-	+ 5V
11			



■ BA6218 (IC451,452,453,454) : A,B REEL / CAM DRIVE IC



● Function Table

3pin (IN)	1pin (IN)	7pin (OUT)	9pin (OUT)
H	L	L	H
L	H	H	L
H	H	L	L
L	L	OPEN	OPEN

Input level H : more than 2.0V
L : less than 0.8V

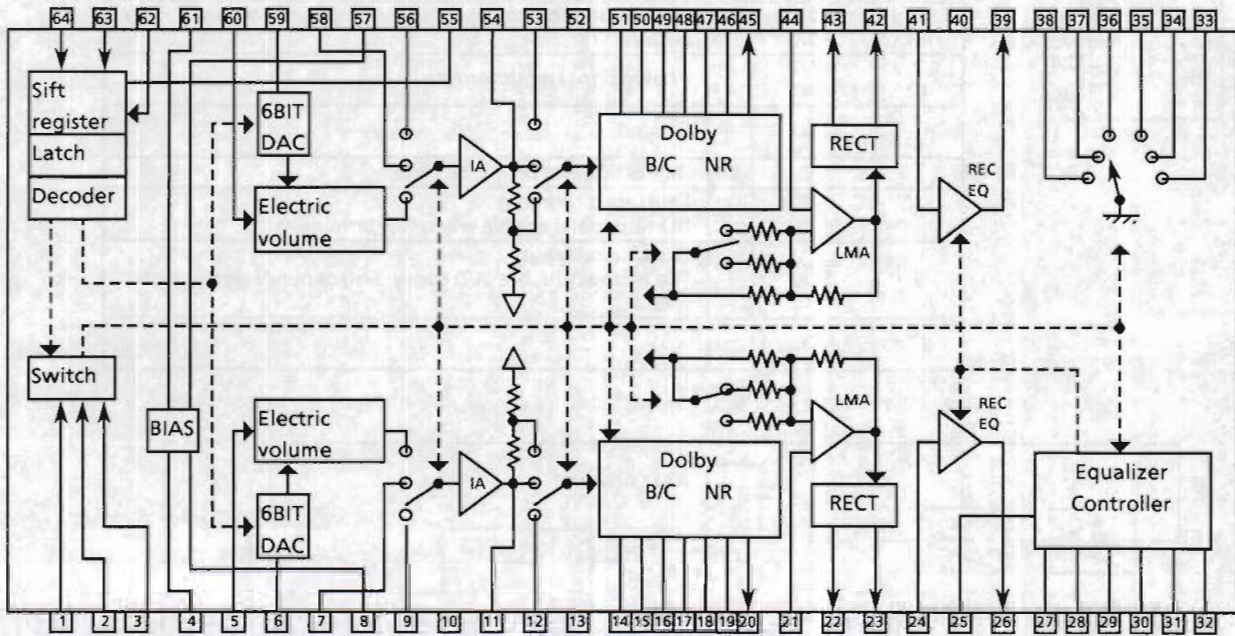
■ HA12155NT (IC201) : Signal processor

Function

REC Equalizer
Dolby B/C
Electric Volume
Level meter

Description

- 1) REC level automatic control
- 2) The signal which is not decoded is output from REC OUT during Playback.
- 3) Standard/high speed, Normal/CrO2/METAL switching
- 4) NR-ON/OFF,Dolby B/C,switching



PinNO	Function	PinNO	Function	PinNO	Function
1	NR ON/OFF input	10	Connected to +5V	25	EQ Constant current input
2	NR B/C switching	14,51	Playback signal output	26,39	Recording signal input
3	Not used	15,50	Spectram slanting AMP	27~32	EQ parameter current input
4	Power supply	16,49	Spectram slanting AMP	33~38	EQ parameter select
5,60	Recording signal Input	20,45	Output for REC equalizer	40,61	Ground
6,59	Capacitors are connected	21,44	Not used	55	Digital ground
7,58	Deck A playback signal input	22,43	Conected to capacitor	57	Current input for Dolby NR
8	Not used	23,42	Music scan output	62	Strobe signal input
9,56	Deck B playback signal input	24,41	Equalizer input	63	Clock input
11,12,13 54,53,52	Not used	17,18,19 48,47,46	Not used	64	Data input

Disassembly Procedures

■ Top cover removal

1. Remove the screws fastening both sides of the Top cover and rear side.
2. Remove the Top cover spreading both sides and lifting the rear up.

■ Front panel block removal

1. Remove the Top cover.
2. Disconnect the connectors P101, P102, J401, J402, J403.
3. Remove the screw on the bottom.
4. Release the 3 hooks and remove the front panel block.

■ Cassette mechanism block removal

1. Remove the front panel block.
2. Disconnect the connectors J408, J409.
3. Remove the 8 blue colored screws ③ ④ fixing the mechanism.
4. Push the cassette button and remove the cassette mechanism block.

Note The cassette mechanism is grounded through the bottom cover, so when checking the operations with the bottom cover removed (especially when checking the signal system), be sure to ground the chassis by using an alligator clip or other suitable gadget. Also, this mechanism is designed for pack sensing, remember that it can not be operated without any tape.

■ Cassette holder removal

1. Remove the cassette mechanism from the front panel block.
2. Remove the dampers.
3. Remove the holder spring from the holder bracket.
4. Remove the cassette holder from the holder bracket.

■ System controller PCB removal

1. Remove the front panel block.
2. Remove the screw ⑤ and remove the PCB.

■ Cassette lid removal

1. Open the doors and slide them in the direction of the arrows.

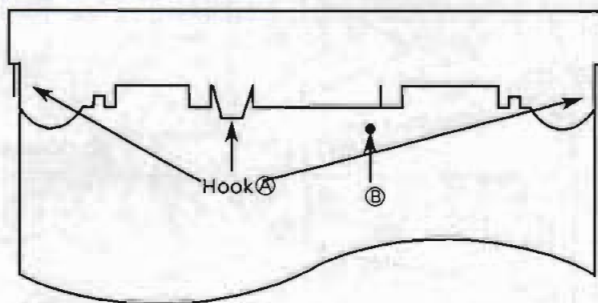


Figure 1 Bottom view of the front panel

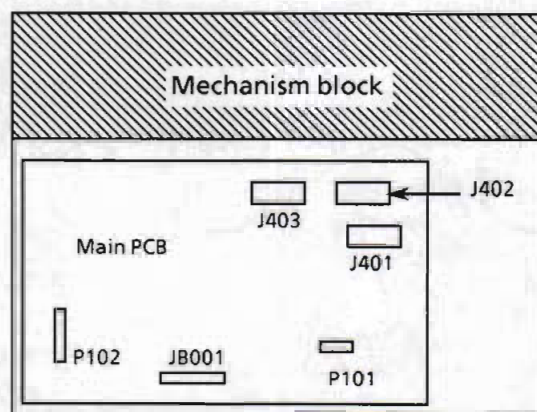


Figure 2 Top view

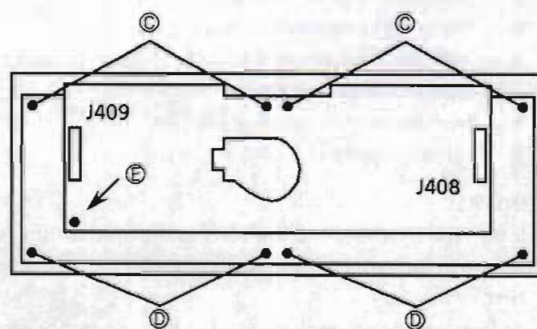


Figure 3 Rear view of the front panel block

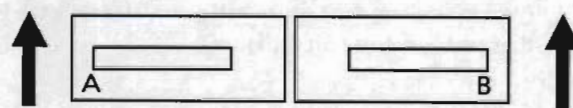


Figure 4 Cassette lids

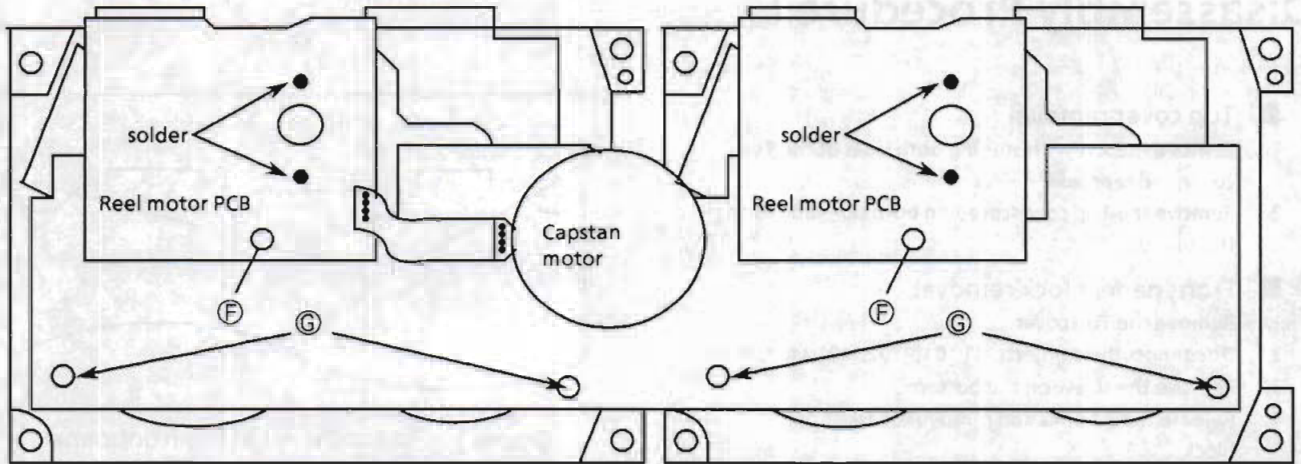


Figure 5 Rear view of the cassette mechanism

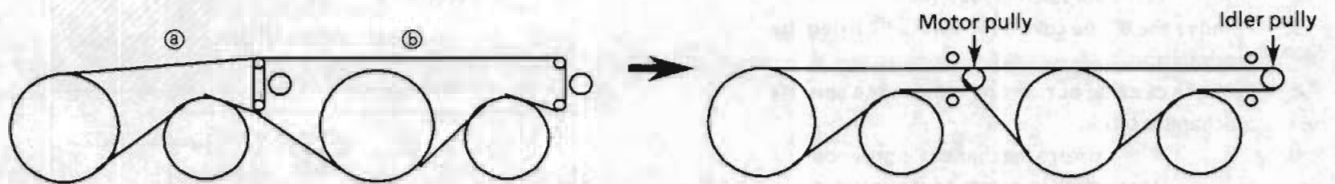


Figure 6 How to put the belts

■ Flywheel removal

1. Remove the mechanism block.
2. Remove the system controller PCB.
3. Remove the reel motor PCBs.
4. Remove the 4 screws fixing the bracket on which capstan motor is installed.
5. Remove the bracket and the belts.
5. Release the flywheel from the washer.

INSTALL

Install the flywheel and the belts to the mechanism as shown in figure 6. (When putting the belts, put the belt ② first.)

At last, install the bracket with the capstan motor and put the belts on the pulleys.

■ CAM switch PCB removal

1. Remove the flywheels.
2. Release the hook fixing the PCB and remove the PCB. (When installing the CAM switch gears, assemble the PCB so that part ④ meets part ①. figure7)

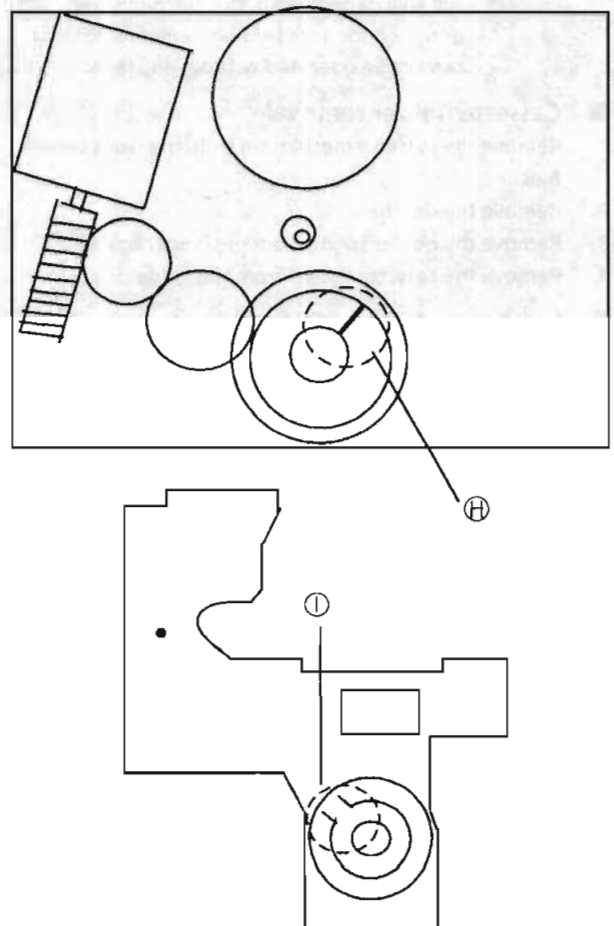
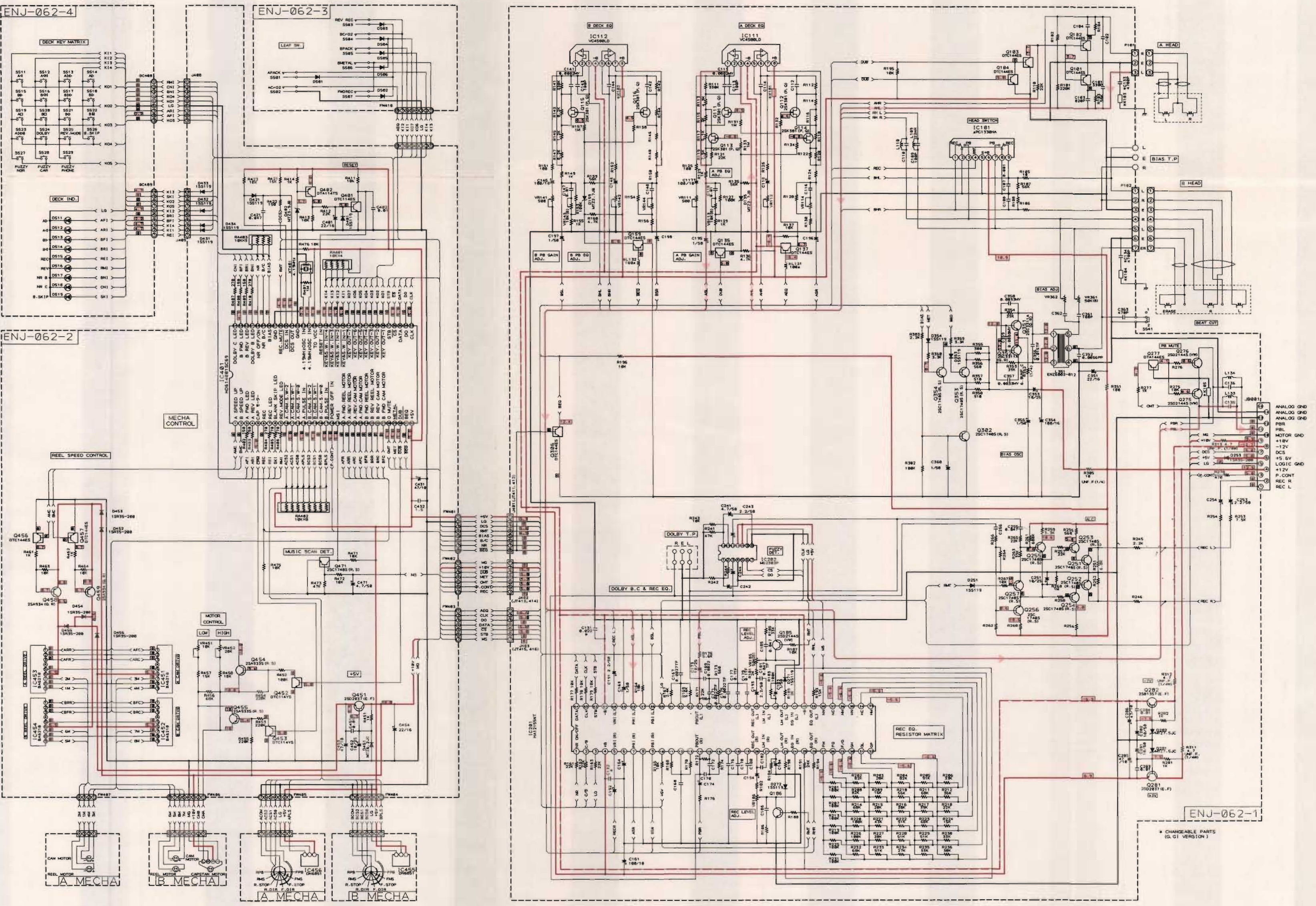


Figure 7 Gear position

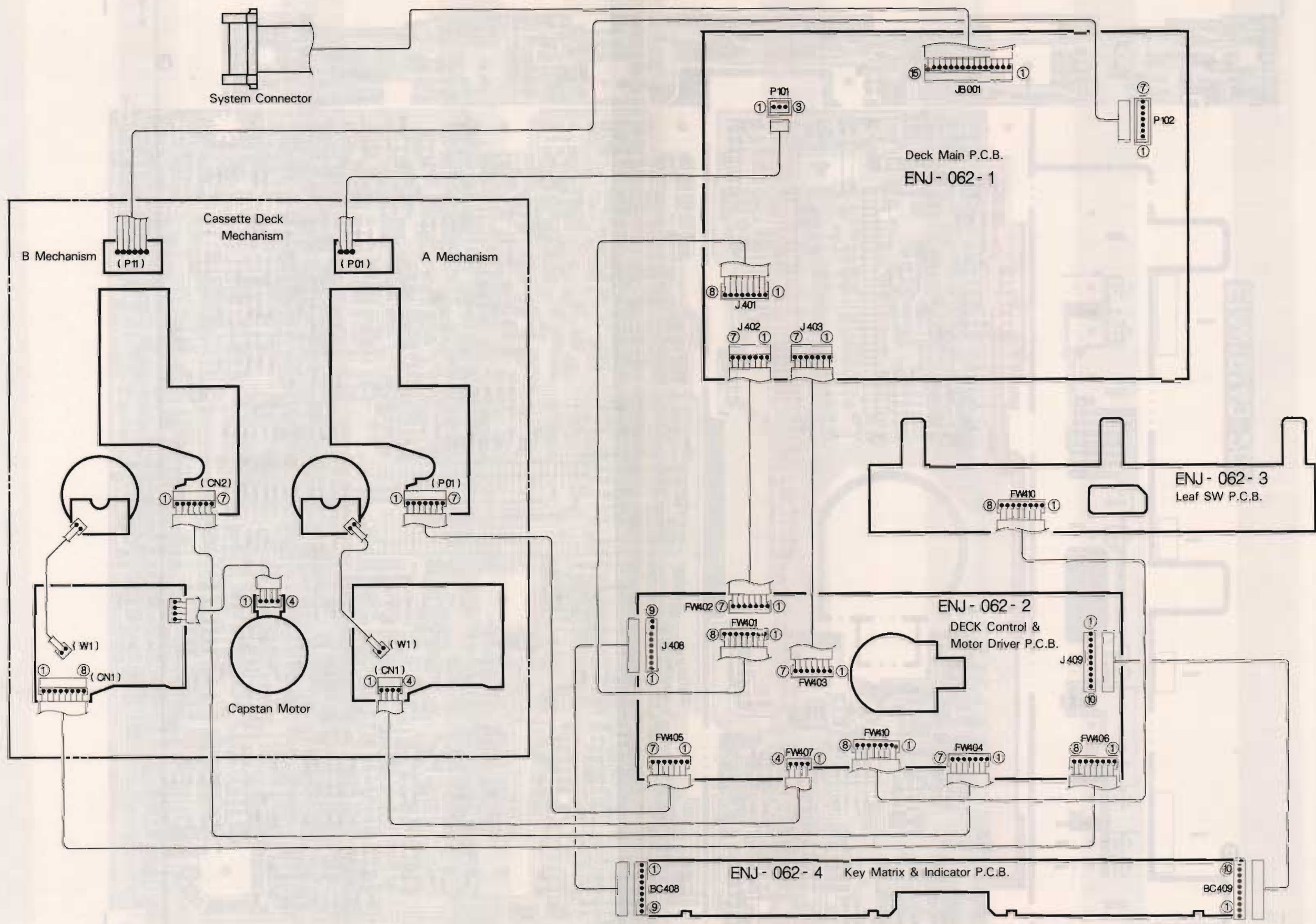
Schematic Diagram

Cassette Deck Section

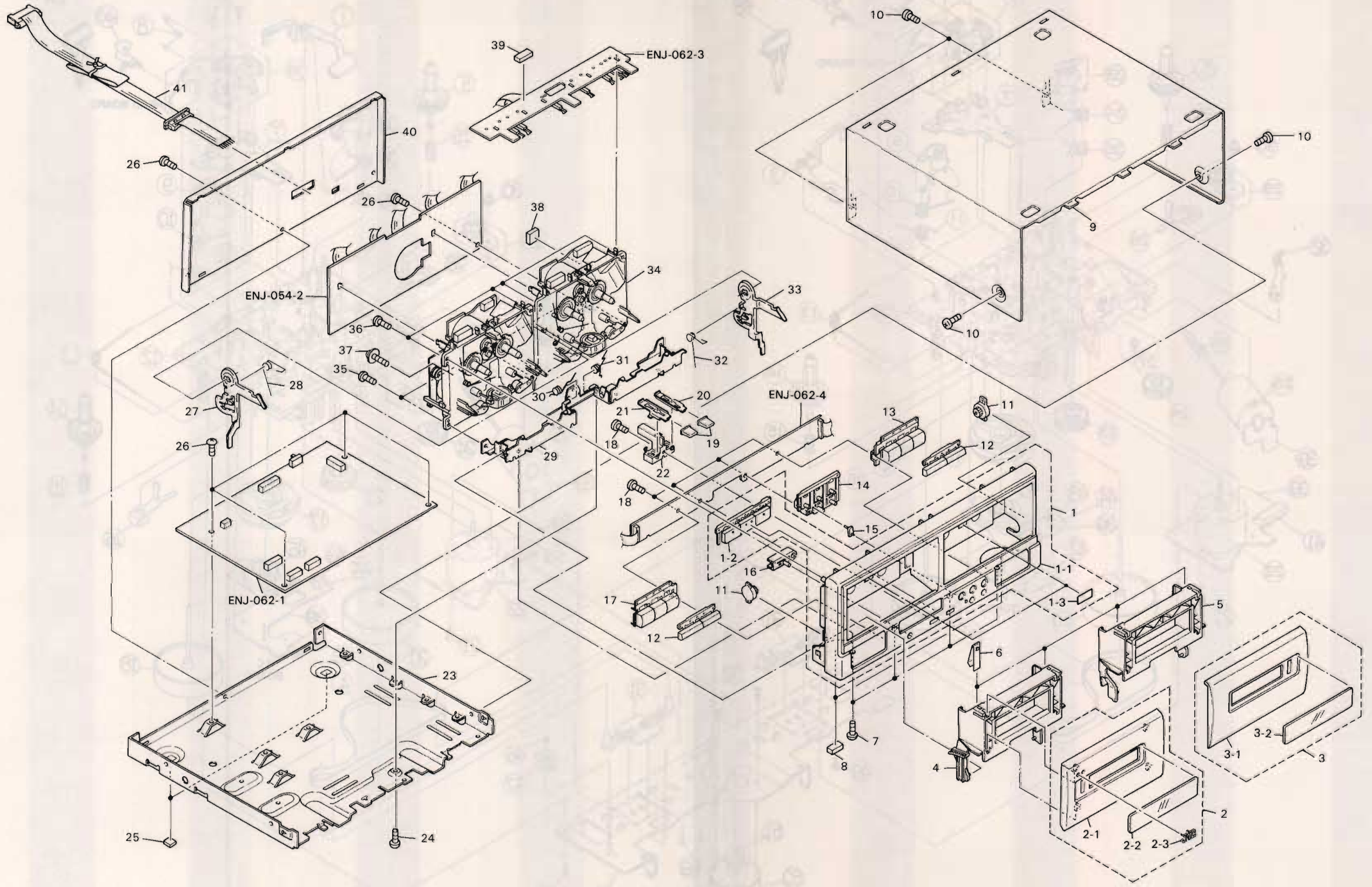


- Notes:**
1. Shows DC voltage to the chassis with no signal input.
 2. indicates +B power supply.
 3. indicates -B power supply.
 4. indicates signal path.
 5. When replacing the parts in the shaded are () and those marked with Δ, be sure to use the designated parts to ensure safety.
 6. This is the standard circuit diagram. The design and contents are subject to change without notice.

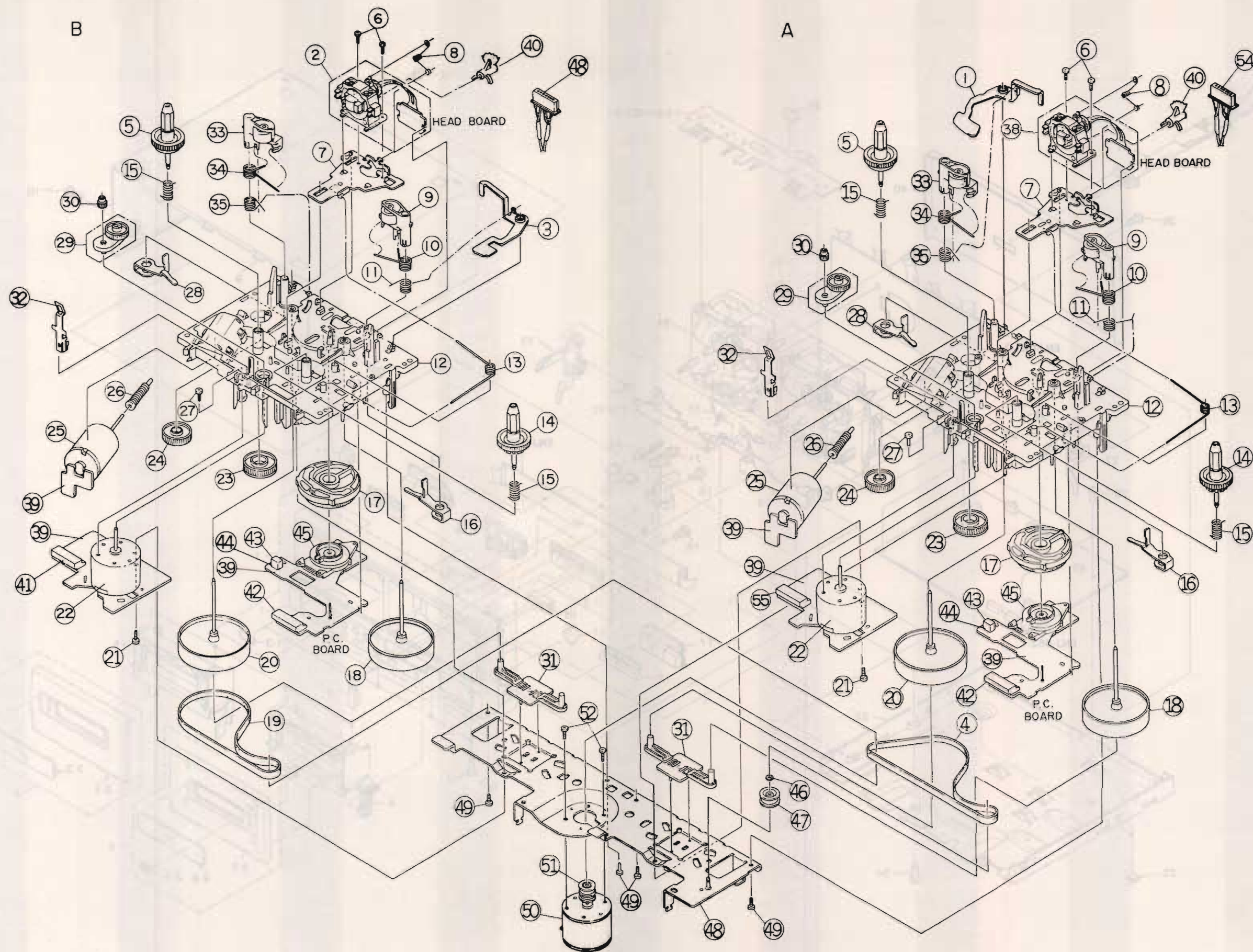
Connection Diagram



■ Exploded View



Cassette Mechanism Ass'y and Parts List



PARTS LIST

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Printed Circuit Board Ass'y and Parts List	2-8
■ ENJ-062 □ Cassette Deck PC Board Ass'y	2-8

General Exploded View and Parts List

■ Parts List

△	Item	Part Number	Part Name	Q'ty	Description	Areas
	1	EFP-TDMX77TNE(S)	Front Panel Ass'y	1		
	1-1	E102463-004	Front Panel	1		
	1-2	E2027166-002	Push Button Ass'y	1	Dolby	
	1-3	E69777-003	Reflector	1		
	2	E207198-002SA	Cassette Lid Ass'y	1	A	
	2-1	E207198-002	Cassette Lid	1	A	
	2-2	E307596-001	Cassette Window	1	A	
	2-3	E406971-001	JVC Mark	1	A	
	3	E307200-005SA	Cassette Lid Ass'y	1	B	
	3-1	E207200-005	Cassette Lid	1	B	
	3-2	E307596-001	Cassette Window	1	B	
	4	E207154-002	Cassette Holder	1	A	
	5	E207155-002	Cassette Holder	1	B	
	6	E406713-001	Cassette Spring	4		
	7	SBST3006M	Screw	4		
	8	E406855-003	Spacer	2		
	9	E207178-004	Metal Cover	1		
	10	SDSG3008M	Screw	6		
	11	E304434-002	Damper Ass'y	2		
	12	E207156-001	Push Button	2	FF / REW	
	13	E207163-001	Push Button Ass'y	1	B-Play	
	14	E207167-002	Push Button	1	Rec	
	15	E406673-001	Indicator	1	Rec	
	16	E307679-002	Push Button	1		
	17	E207160-001	Push Button Ass'y	1	A-Play	
	18	SDSF2608Z	Screw	5		
	19	E406667-003	Push Button	2	Eject	
	20	E406668-004	Push Plate	1	Eject(B)	
	21	E406668-003	Push Plate	1	Eject(A)	
	22	E307598-002	Eject Guide	1		
	23	E102462-001	Chassis Base	1		
	24	SBST3006Z	Screw	1		
	25	E406855-005	Spacer	2		
	26	SBSG3008CC	Screw	6		
	27	E307599-002	Eject Lever	1	A	
	28	E406669-001	Eject Spring	1	A	
	29	E207153-002	Holder Bracket	1		
	30	E406671-001	Holder Spring	1	A	
	31	E406672-001	Holder Spring	1	B	
	32	E406670-001	Eject Spring	1	B	
	33	E307600-002	Eject Lever	1	B	
	34		Cassette Mechanism Ass'y	1	See page 2-5	
	35	SBST3008C	Screw	4		
	36	SBSF3010C	Screw	4		
	37	E65923-001	Screw	1		
	38	EXO014008R60S13	Spacer	1		
	39	EXO020008R40S13	Spacer	1		
	40	E207151-005	Rear Panel	1		U, A
		E207151-006	Rear Panel	1		EN, EF, G, GI
		E207151-007	Rear Panel	1		BS
	41	EWP907-003	Plug Cord Ass'y	1		
	—	E61029-009	Number Label	1		

△: Safety Parts

The Marks Designated Areas

A.....Australia
 G.....Germany
 GI.....Italy
 BS.....the U.K.

EN.....Scandinavia
 EF.....Continental Europe
 U.....Universal Type
 No mark indicates all areas.

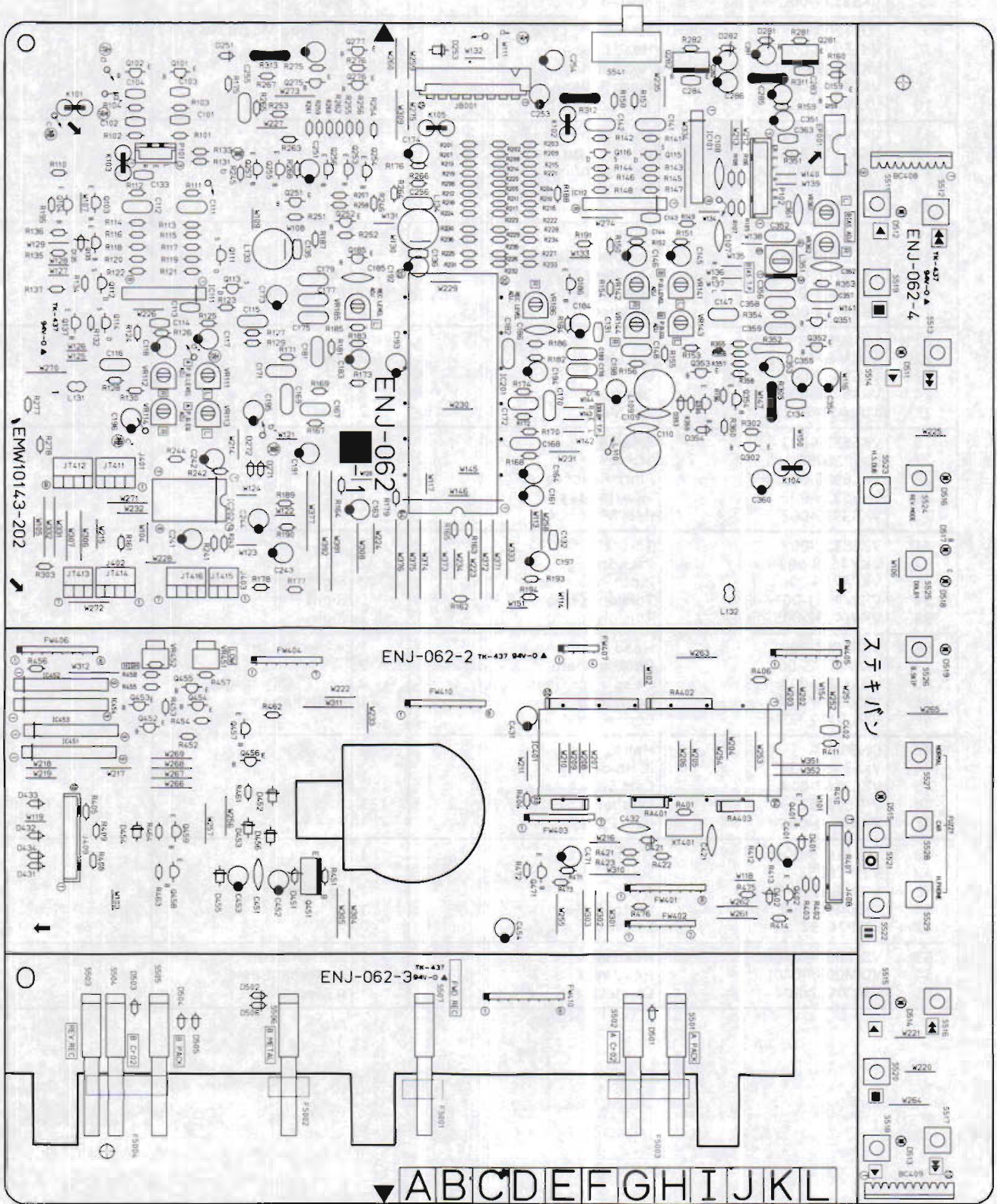
■ Cassette Mechanism Parts List

Item	Part Number	Part Name	Q'ty	Description	Areas
1	VKL6954-007	Eject Safety Lever	1	A Mechanism	
2	VKS3551-00B	Head Mount Ass'y	1	B Mechanism	
3	VKL6943-005	Eject Safety Lever	1	B Mechanism	
4	VKB3001-050	Capstan Belt	1	A Mechanism	
5	VKS5321-00D	Reel Ass'y	2	Right	
6	SDST2004Z	Screw	4	for Head Mount Ass'y	
7	VKL6942-00E	Head Base Ass'y	2		
8	VKW4994-001	Head Spring	2		
9	VKP4221-00C	Pinch Roller Ass'y	2	Left	
10	VKW4982-001	Torsion Spring	2	Left	
11	VKW4933-005	Torsion Spring	2	Left	
12	VKS1112-30E	Chassis Base Ass'y	2		
13	VKW4930-002	Return Spring	2		
14	VKS3480-005	Reel Ass'y	2	Left	
15	VKW4928-003	B.T Spring	4	for Reel Ass'y	
16	VKL6940-002	Pinch Roller Lever	2	Left	
17	VKS2209-005	Controller Cam	2		
18	VKF3186-00C	Flywheel Ass'y	2	Left	
19	VKB3001-048	Capstan Belt	1	B Mechanism	
20	VKF3184-00C	Flywheel Ass'y	2	Right	
21	SDSF2608Z	Screw	2		
22	MMN-6F4RA3B	D.C Motor	2	Reel	
23	VKS5331-002	Gear (6)	2		
24	VKS5330-004	Gear (5)	2		
25	MXN-13FB12F	D.C Motor	2	Cam	
26	VKS5329-002	Gear (4)	2		
27	SDSP2605Z	Screw	2		
28	VKL6939-002	Pinch Roller Lever	2	Right	
29	VKS5325-00F	FR Arm Ass'y	2		
30	VKS5328-002	Reel Motor Gear	2		
31	VKS5327-003	Thrust Plate	2		
32	VKY4628-002	Pack Spring	2		
33	VKP4219-00C	Pinch Roller Ass'y	2	Right	
34	VKW4981-001	Torsion Spring	2	Right	
35	VKW4932-005	Torsion Spring	2	Right	
38	VKS3550-00B	Head Mount Ass'y	1	A Mechanism	
39	VMW2345-001	Printed Board	2		
40	VKS3485-002	Head Block Gear	2		
41	VMC0107-R08	Connector	1	B Mechanism	
42	VMC0107-R07	Connector	2		
43	DN6851A	Hall IC	2		
44	VKS3487-002	IC Holder	2		
45	VKS3587-00A	Cam Switch Ass'y	2		
46	WDL163525-4	Washer	1		
47	VKR4631-002	Idler Pulley	1		
48	VKM3419-00E	FM Bracket	1		
49	SDSF2605Z	Screw	4		
50	MMI-6H2LWSK	Motor	1	Capstan	
51	VKR4632-002	Motor Pulley	1		
52	SPSP2603Z	Screw	2		
53	VDM007P-040I	Head Wire	1	B Mechanism	
54	VDM003P-040I	Head Wire	1	A Mechanism	
55	VMC0107-R04	Connector	1	A Mechanism	

Printed Circuit Board Ass'y and Parts List

■ ENJ-062 □ Cassette Deck PC Board Ass'y

Note : ENJ-062 □ varies according to the areas employed. See note (1) when placing an order.



Note (1)

PC Board Ass'y	Designated Areas
ENJ-062 A	Australia, the U.K., Continental Europe, Scandinavia, Universal Type
ENJ-062 B	Germany, Italy

Transistors

ITEM	PART NUMBER	DESCRIPTION	AREA
Q101	DTC144ES	SILICON ROHM	
Q102	DTC144ES	SILICON ROHM	
Q103	DTC144ES	SILICON ROHM	
Q104	DTC144ES	SILICON ROHM	
Q111	2SK301(P,Q)	F.E.T MATSUSHITA	
Q112	2SK301(P,Q)	F.E.T MATSUSHITA	
Q113	2SK301(P,Q)	F.E.T MATSUSHITA	
Q114	2SK301(P,Q)	F.E.T MATSUSHITA	
Q115	2SK301(P,Q)	F.E.T MATSUSHITA	
Q116	2SK301(P,Q)	F.E.T MATSUSHITA	
Q135	DTC144ES	SILICON ROHM	
Q137	DTC144ES	SILICON ROHM	
Q159	DTC144ES	SILICON ROHM	
Q185	2SD2144S(VW)	SILICON ROHM	
Q186	2SD2144S(VW)	SILICON ROHM	
Q251	2SC1740S(R,S)	SILICON ROHM	
Q252	2SC1740S(R,S)	SILICON ROHM	
Q253	2SC1740S(R,S)	SILICON ROHM	
Q254	2SC1740S(R,S)	SILICON ROHM	
Q255	2SC1740S(R,S)	SILICON ROHM	
Q256	2SC1740S(R,S)	SILICON ROHM	
Q257	2SC1740S(R,S)	SILICON ROHM	
Q275	2SD2144S(VW)	SILICON ROHM	
Q276	2SD2144S(VW)	SILICON ROHM	
Q277	DTA144ES	SILICON ROHM	
Q281	2SD2037(E,F)	SILICON ROHM	
Q282	2SB1357(E,F)	SILICON ROHM	
Q302	2SC1740S(R,S)	SILICON ROHM	
Q306	DTC144ES	SILICON ROHM	
Q351	2SC3311A(Q,R)	SILICON MATSUSHITA	
Q352	2SC3311A(Q,R)	SILICON MATSUSHITA	
Q353	2SC1740S(R,S)	SILICON ROHM	
Q354	2SC1740S(R,S)	SILICON ROHM	
Q401	DTC114ES	SILICON ROHM	
Q402	DTA114TS	SILICON ROHM	
Q451	2SD2037(E,F)	SILICON ROHM	
Q452	DTC114YS	SILICON ROHM	
Q453	DTC114YS	SILICON ROHM	
Q454	2SA933S(R,S)	SILICON ROHM	
Q455	2SA933S(R,S)	SILICON ROHM	
Q456	DTC144ES	SILICON ROHM	
Q457	DTC144ES	SILICON ROHM	
Q458	2SA934(Q,R)	SILICON ROHM	
Q459	2SA934(Q,R)	SILICON ROHM	
Q471	2SC1740S(R,S)	SILICON ROHM	

△ : SAFETY PARTS

I.C.s

ITEM	PART NUMBER	DESCRIPTION	AREA
IC101	UPC1330HA	I.C. NEC	
IC111	VC4580LD	I.L. DAINICHI	
IC112	VC4580LD	I.L. DAINICHI	
IC201	HA1215NT	I.C. HITACHI	
IC202	M62302P	I.C. MITSUBISHI	
IC401	HD614081SC69	I.C. HITACHI	
IC451	BA6218	I.C. ROHM	
IC452	BA6218	I.C. ROHM	
IC453	BA6218	I.C. ROHM	
IC454	BA6218	I.C. ROHM	

△ : SAFETY PARTS

Diodes

ITEM	PART NUMBER	DESCRIPTION	AREA
D135	MT22.7JB	ZENER ROHM	
D159	MT22.7JB	ZENER ROHM	
D251	1SS119	SILICON HITACHI	
D253	1SR35-200A	SILICON ROHM	
D271	1SS119	SILICON HITACHI	

Diodes

ITEM	PART NUMBER	DESCRIPTION	AREA
D272	1SS119	SILICON HITACHI	
D281	MT27.5JC	ZENER ROHM	
D282	MT27.5JC	ZENER ROHM	
D353	1SS119	SILICON HITACHI	
D354	1SS119	SILICON HITACHI	
D401	1SS119	SILICON HITACHI	
D402	MT23.9JB	ZENER ROHM	
D421	1SS119	SILICON HITACHI	
D431	1SS119	SILICON HITACHI	
D432	1SS119	SILICON HITACHI	
D433	1SS119	SILICON HITACHI	
D434	1SS119	SILICON HITACHI	
D451	MT26.2JC	ZENER ROHM	
D452	1SR35-200A	SILICON ROHM	
D453	1SR35-200A	SILICON ROHM	
D454	1SR35-200A	SILICON ROHM	
D455	1SR35-200A	SILICON ROHM	
D456	1SR35-200A	SILICON ROHM	
D501	1SS119	SILICON HITACHI	
D502	1SS119	SILICON HITACHI	
D503	1SS119	SILICON HITACHI	
D504	1SS119	SILICON HITACHI	
D505	1SS119	SILICON HITACHI	
D506	1SS119	SILICON HITACHI	
D511	SLR-34MC3F	L.E.D. ROHM	
D512	SLR-34MC3F	L.E.D. ROHM	
D513	SLR-34MC3F	L.E.D. ROHM	
D514	SLR-34MC3F	L.E.D. ROHM	
D515	SLR-34VC3F	L.E.D. ROHM	
D516	SLR-34VC3F	L.E.D. ROHM	
D517	SLR-34VC3F	L.E.D. ROHM	
D518	SLR-34VC3F	L.E.D. ROHM	
D519	SLR-34VC3F	L.E.D. ROHM	

△ : SAFETY PARTS

Capacitors

ITEM	PART NUMBER	DESCRIPTION	AREA
C101	QCBB1HK-331	330PF 50V CERAMIC	
C102	QCBB1HK-331	330PF 50V CERAMIC	
C103	QCGB1HK-821	820PF 50V CERAMIC	
C104	QCGB1HK-821	820PF 50V CERAMIC	
C107	QCY21HK-102	1000PF 50V CERAMIC	
C108	QCY21HK-102	1000PF 50V CERAMIC	
C109	QCS21HJ-101	100PF 50V CERAMIC	
C110	QCS21HJ-101	100PF 50V CERAMIC	
C111	QFLB1HJ-822	8200PF 50V MYLAR	
C112	QFLB1HJ-822	8200PF 50V MYLAR	
C113	QCBB1HK-101	100PF 50V CERAMIC	
C114	QCBB1HK-101	100PF 50V CERAMIC	
C115	QFVB1HJ-103	0.01MF 50V T.FILM	
C116	QFVB1HJ-103	0.01MF 50V T.FILM	
C117	QETB1AM-107	100MF 10V ELECTRO	
C118	QETB1AM-107	100MF 10V ELECTRO	
C131	QCHB1EZ-223	0.022MF 25V CERAMIC	B
C132	QCHB1EZ-223	0.022MF 25V CERAMIC	B
C133	QCXB1CM-472	4700PF 16V CERAMIC	B
C134	QCXB1CM-472	4700PF 16V CERAMIC	B
C135	QCBB1HK-101	100PF 50V CERAMIC	B
C136	QCBB1HK-101	100PF 50V CERAMIC	B
C141	QFLB1HJ-822	8200PF 50V MYLAR	
C142	QFLB1HJ-822	8200PF 50V MYLAR	
C143	QCBB1HK-101	100PF 50V CERAMIC	
C144	QCBB1HK-101	100PF 50V CERAMIC	
C145	QETB1AM-107	100MF 10V ELECTRO	
C146	QETB1AM-107	100MF 10V ELECTRO	
C147	QFVB1HJ-103	0.01MF 50V T.FILM	
C148	QFVB1HJ-103	0.01MF 50V T.FILM	
C161	QETB1AM-107	100MF 10V ELECTRO	
C163	QETB1HM-105	1MF 50V ELECTRO	
C164	QETB1HM-105	1MF 50V ELECTRO	
C167	QFLB1HJ-272	2700PF 50V MYLAR	
C168	QFLB1HJ-272	2700PF 50V MYLAR	
C169	QFLB1HJ-222	2200PF 50V MYLAR	
C170	QFLB1HJ-222	2200PF 50V MYLAR	
C171	QFLB1HJ-222	2200PF 50V MYLAR	
C172	QFLB1HJ-222	2200PF 50V MYLAR	
C173	QETB1EM-106	10MF 25V ELECTRO	
C174	QETB1EM-106	10MF 25V ELECTRO	
C175	QFLB1HJ-222	2200PF 50V MYLAR	
C176	QFLB1HJ-222	2200PF 50V MYLAR	
C177	QFVB1HJ-104N	0.1MF 50V T.FILM	
C178	QFVB1HJ-104N	0.1MF 50V T.FILM	
C179	QFVB1HJ-104N	0.1MF 50V T.FILM	
C180	QFVB1HJ-104N	0.1MF 50V T.FILM	
C181	QFVB1HJ-473	0.047MF 50V T.FILM	
C182	QFVB1HJ-473	0.047MF 50V T.FILM	
C183	QETB1HM-105	1MF 50V ELECTRO	
C184	QETB1HM-105	1MF 50V ELECTRO	
C185	QCF21HP-473	0.047MF 50V CERAMIC	
C186	QCF21HP-473	0.047MF 50V CERAMIC	
C191	QETB1HM-225	2.2MF 50V ELECTRO	
C192	QETB1HM-225	2.2MF 50V ELECTRO	

△ : SAFETY PARTS

Capacitors

Δ ITEM	PART NUMBER	DESCRIPTION			AREA
C193	QETB1HM-225	2.2MF	50V	ELECTRO	
C194	QETB1HM-225	2.2MF	50V	ELECTRO	
C195	QETB1HM-105	1MF	50V	ELECTRO	
C196	QETB1HM-105	1MF	50V	ELECTRO	
C197	QETB1HM-105	1MF	50V	ELECTRO	
C198	QETB1HM-105	1MF	50V	ELECTRO	
C241	QETB1HM-475	4.7MF	50V	ELECTRO	
C242	QETB1HM-475	4.7MF	50V	ELECTRO	
C243	QETB1HM-225	2.2MF	50V	ELECTRO	
C244	QETB1HM-225	2.2MF	50V	ELECTRO	
C251	QETB1EM-106	10MF	25V	ELECTRO	
C253	QETB1HM-225	2.2MF	50V	ELECTRO	
C254	QETB1HM-225	2.2MF	50V	ELECTRO	
C255	QFV81HJ-473	0.047MF	50V	T.FILM	
C256	QFV81HJ-473	0.047MF	50V	T.FILM	
C281	QETB1HM-106	10MF	50V	ELECTRO	
C282	QETB1HM-106	10MF	50V	ELECTRO	
C283	QCVB1CM-103	0.01MF	16V	CERAMIC	
C284	QCVB1CM-103	0.01MF	16V	CERAMIC	
C285	QETB1AM-476	47MF	10V	ELECTRO	
C286	QETB1AM-476	47MF	10V	ELECTRO	
C351	QETB1CM-226	22MF	16V	ELECTRO	
C352	QFP81HG-562	5600PF	50V	POLY	
C353	QETB1EM-106	10MF	25V	ELECTRO	
C354	QETB1CM-107	100MF	16V	ELECTRO	
C355	QETB1HM-105	1MF	50V	ELECTRO	
C356	QFV81HJ-153	0.015MF	50V	T.FILM	
C357	QFLB1HJ-332	3300PF	50V	MYLAR	
C358	QFLB1HJ-332	3300PF	50V	MYLAR	
C359	QFLB1HJ-682	6800PF	50V	MYLAR	
C360	QETB1HM-105	1MF	50V	ELECTRO	
C361	QCS21HJ-101	100PF	50V	CERAMIC	
C362	QCS21HJ-101	100PF	50V	CERAMIC	
C363	QCB1HK-471	470PF	50V	CERAMIC	
C401	QETB1CM-226	22MF	16V	ELECTRO	
C402	QCVB1CM-103	0.01MF	16V	CERAMIC	
C421	QCF21HP-473	0.047MF	50V	CERAMIC	
C431	QETB1AM-476	47MF	10V	ELECTRO	
C432	QCZ0205-155	1.5MF	25V	CERAMIC	
C451	QCF21HP-103	0.01MF	50V	CERAMIC	
C452	QETB1EM-106	10MF	25V	ELECTRO	
C453	QETB1AM-476	47MF	10V	ELECTRO	
C454	QETB1CM-226	22MF	16V	ELECTRO	
C471	QETB1HM-475	4.7MF	50V	ELECTRO	

Δ : SAFETY PARTS

Resistors

Δ ITEM	PART NUMBER	DESCRIPTION			AREA
R150	QRD167J-102	1K	1/6W	CARBON	
R151	QRD167J-101	100	1/6W	CARBON	
R152	QRD167J-101	100	1/6W	CARBON	
R153	QRD167J-104	100K	1/6W	CARBON	
R154	QRD167J-104	100K	1/6W	CARBON	
R155	QRD167J-102	1K	1/6W	CARBON	
R156	QRD167J-102	1K	1/6W	CARBON	
R157	QRD167J-105	1M	1/6W	CARBON	
R158	QRD167J-105	1M	1/6W	CARBON	
R159	QRD167J-563	56K	1/6W	CARBON	
R160	QRD167J-472	4.7K	1/6W	CARBON	
R161	QRD167J-223	22K	1/6W	CARBON	
R162	QRD167J-223	22K	1/6W	CARBON	
R163	QRD167J-223	22K	1/6W	CARBON	
R164	QRD167J-183	18K	1/6W	CARBON	
R165	QRD167J-103	10K	1/6W	CARBON	
R167	QRD167J-242	2.4K	1/6W	CARBON	
R168	QRD167J-242	2.4K	1/6W	CARBON	
R169	QRD167J-562	5.6K	1/6W	CARBON	
R170	QRD167J-562	5.6K	1/6W	CARBON	
R171	QRD167J-223	22K	1/6W	CARBON	
R172	QRD167J-223	22K	1/6W	CARBON	
R173	QRD167J-561	560	1/6W	CARBON	
R174	QRD167J-561	560	1/6W	CARBON	
R175	QRD167J-562	5.6K	1/6W	CARBON	
R176	QRD167J-562	5.6K	1/6W	CARBON	
R177	QRD167J-103	10K	1/6W	CARBON	
R178	QRD167J-103	10K	1/6W	CARBON	
R179	QRD167J-103	10K	1/6W	CARBON	
R181	QRD167J-202	2K	1/6W	CARBON	
R182	QRD167J-202	2K	1/6W	CARBON	
R183	QRD167J-104	100K	1/6W	CARBON	
R184	QRD167J-104	100K	1/6W	CARBON	
R185	QRD167J-333	33K	1/6W	CARBON	
R186	QRD167J-333	33K	1/6W	CARBON	
R187	QRD167J-103	10K	1/6W	CARBON	
R188	QRD167J-103	10K	1/6W	CARBON	
R189	QRD167J-202	2K	1/6W	CARBON	
R190	QRD167J-202	2K	1/6W	CARBON	
R191	QRD167J-243	24K	1/6W	CARBON	
R193	QRD167J-153	15K	1/6W	CARBON	
R194	QRD167J-153	15K	1/6W	CARBON	
R195	QRD167J-103	10K	1/6W	CARBON	
R196	QRD167J-103	10K	1/6W	CARBON	
R201	QRD167J-104	100K	1/6W	CARBON	
R202	QRD167J-823	82K	1/6W	CARBON	
R203	QRD167J-203	20K	1/6W	CARBON	
R204	QRD167J-823	82K	1/6W	CARBON	
R205	QRD167J-913	91K	1/6W	CARBON	
R206	QRD167J-333	33K	1/6W	CARBON	
R207	QRD167J-104	100K	1/6W	CARBON	
R208	QRD167J-823	82K	1/6W	CARBON	
R209	QRD167J-163	16K	1/6W	CARBON	
R210	QRD167J-563	56K	1/6W	CARBON	
R211	QRD167J-683	68K	1/6W	CARBON	
R212	QRD167J-363	36K	1/6W	CARBON	
R213	QRD167J-104	100K	1/6W	CARBON	
R214	QRD167J-683	68K	1/6W	CARBON	
R215	QRD167J-203	20K	1/6W	CARBON	
R216	QRD167J-303	30K	1/6W	CARBON	
R217	QRD167J-393	39K	1/6W	CARBON	
R218	QRD167J-223	22K	1/6W	CARBON	
R219	QRD167J-104	100K	1/6W	CARBON	
R220	QRD167J-104	100K	1/6W	CARBON	
R221	QRD167J-433	43K	1/6W	CARBON	
R222	QRD167J-913	91K	1/6W	CARBON	
R223	QRD167J-683	68K	1/6W	CARBON	
R224	QRD167J-153	15K	1/6W	CARBON	
R225	QRD167J-104	100K	1/6W	CARBON	
R226	QRD167J-104	100K	1/6W	CARBON	
R227	QRD167J-303	30K	1/6W	CARBON	
R228	QRD167J-513	51K	1/6W	CARBON	
R229	QRD167J-513	51K	1/6W	CARBON	
R230	QRD167J-333	33K	1/6W	CARBON	
R231	QRD167J-104	100K	1/6W	CARBON	
R232	QRD167J-683	68K	1/6W	CARBON	
R233	QRD167J-513	51K	1/6W	CARBON	
R234	QRD167J-273	27K	1/6W	CARBON	
R235	QRD167J-333	33K	1/6W	CARBON	
R236	QRD167J-303	30K	1/6W	CARBON	
R241	QRD167J-473	47K	1/6W	CARBON	
R242	QRD167J-473	47K	1/6W	CARBON	
R243	QRD167J-103	10K	1/6W	CARBON	
R244	QRD167J-103	10K	1/6W	CARBON	
R245	QRD167J-222	2.2K	1/6W	CARBON	
R246	QRD167J-222	2.2K	1/6W	CARBON	
R251	QRD167J-682	6.8K	1/6W	CARBON	
R252	QRD167J-682	6.8K	1/6W	CARBON	
R253	QRD167J-752	7.5K	1/6W	CARBON	
R254	QRD167J-752	7.5K	1/6W	CARBON	
R255	QRD167J-561	560	1/6W	CARBON	
R256	QRD167J-561	560	1/6W	CARBON	
R257	QRD167J-223	22K	1/6W	CARBON	
R258	QRD167J-223	22K	1/6W	CARBON	
R259	QRD167J-332	3.3K	1/6W	CARBON	

Resistors

Δ ITEM	PART NUMBER	DESCRIPTION			AREA
R101	QRD167J-224	220K	1/6W	CARBON	
R102	QRD167J-224	220K	1/6W	CARBON	
R103	QRD167J-563	56K	1/6W	CARBON	
R104	QRD167J-563	56K	1/6W	CARBON	
R105	QRD167J-100	10	1/6W	CARBON	
R106	QRD167J-100	10	1/6W	CARBON	
R107	QRD167J-563	56K	1/6W	CARBON	
R108	QRD167J-563	56K	1/6W	CARBON	
R110	QRD167J-223	22K	1/6W	CARBON	
R111	QRD167J-334	330K	1/6W	CARBON	
R112	QRD167J-334	330K	1/6W	CARBON	
R113	QRD167J-432	4.3K	1/6W	CARBON	
R114	QRD167J-432	4.3K	1/6W	CARBON	
R115	QRD167J-302	3K	1/6W	CARBON	
R116	QRD167J-302	3K	1/6W	CARBON	
R117	QRD167J-512	5.1K	1/6W	CARBON	
R118	QRD167J-512	5.1K	1/6W	CARBON	
R119	QRD167J-752	7.5K	1/6W	CARBON	
R120	QRD167J-752	7.5K	1/6W	CARBON	
R121	QRD167J-223	22K	1/6W	CARBON	
R122	QRD167J-223	22K	1/6W	CARBON	
R123	QRD167J-102	1K	1/6W	CARBON	
R124	QRD167J-102	1K	1/6W	CARBON	
R125	QRD167J-101	100	1/6W	CARBON	
R126	QRD167J-101	100	1/6W	CARBON	
R127	QRD167J-104	100K	1/6W	CARBON	
R128	QRD167J-104	100K	1/6W	CARBON	
R129	QRD167J-102	1K	1/6W	CARBON	
R130	QRD167J-102	1K	1/6W	CARBON	
R131	QRD167J-205	1M	1/6W	CARBON	
R132	QRD167J-205	1M	1/6W	CARBON	
R133	QRD167J-105	1M	1/6W	CARBON	
R134	QRD167J-105	1M	1/6W	CARBON	
R135	QRD167J-563	56K	1/6W	CARBON	
R136	QRD167J-472	4.7K	1/6W	CARBON	
R137	QRD167J-103	10K	1/6W	CARBON	
R141	QRD167J-334	330K	1/6W	CARBON	
R142	QRD167J-334	330K	1/6W	CARBON	
R143	QRD167J-822	8.2K	1/6W	CARBON	
R144	QRD167J-822	8.2K	1/6W	CARBON	
R145	QRD167J-122	1.2K	1/6W	CARBON	
R146	QRD167J-122	1.2K	1/6W	CARBON	
R147	QRD167J-822	8.2K	1/6W	CARBON	
R148	QRD167J-822	8.2K	1/6W	CARBON	
R149	QRD167J-102	1K	1/6W	CARBON	

Resistors

Δ	ITEM	PART NUMBER	DESCRIPTION	AREA
	R260	QRD167J-332	3.3K 1/6W CARBON	
	R261	QRD167J-684	680K 1/6W CARBON	
	R262	QRD167J-684	680K 1/6W CARBON	
	R263	QRD167J-393	39K 1/6W CARBON	
	R264	QRD167J-393	39K 1/6W CARBON	
	R265	QRD167J-223	22K 1/6W CARBON	
	R266	QRD167J-223	22K 1/6W CARBON	
	R267	QRD167J-103	10K 1/6W CARBON	
	R268	QRD167J-105	1M 1/6W CARBON	
	R275	QRD167J-103	10K 1/6W CARBON	
	R276	QRD167J-103	10K 1/6W CARBON	
	R277	QRD167J-102	1K 1/6W CARBON	
	R278	QRD167J-471	470 1/6W CARBON	
	R281	QRD167J-102	1K 1/6W CARBON	
	R282	QRD167J-102	1K 1/6W CARBON	
	R302	QRD167J-104	100K 1/6W CARBON	
	R303	QRD167J-222	2.2K 1/6W CARBON	
Δ	R305	QRZ0077-100	10 1/4W FUSIBLE	
Δ	R311	QRZ0077-4R7	4.7 1/4W FUSIBLE	
Δ	R312	QRZ0077-4R7	4.7 1/4W FUSIBLE	
Δ	R313	QRZ0077-4R7	4.7 1/4W FUSIBLE	
Δ	R351	QRD167J-181	180 1/6W CARBON	
Δ	R352	QRD14CJ-6R8S	6.8 1/4W UNF. CARBON	
	R353	QRD167J-393	39K 1/6W CARBON	
	R354	QRD167J-393	39K 1/6W CARBON	
	R355	QRD167J-301	300 1/6W CARBON	
	R356	QRD167J-561	560 1/6W CARBON	
	R357	QRD167J-511	510 1/6W CARBON	
	R358	QRD167J-911	910 1/6W CARBON	
	R359	QRD167J-332	3.3K 1/6W CARBON	
	R360	QRD167J-332	3.3K 1/6W CARBON	
	R401	QRD167J-105	1M 1/6W CARBON	
	R402	QRD167J-151	150 1/6W CARBON	
	R403	QRD167J-151	150 1/6W CARBON	
	R404	QRD167J-271	270 1/6W CARBON	
	R405	QRD167J-271	270 1/6W CARBON	
	R406	QRD167J-271	270 1/6W CARBON	
	R407	QRD167J-271	270 1/6W CARBON	
	R408	QRD167J-151	150 1/6W CARBON	
	R409	QRD167J-151	150 1/6W CARBON	
	R410	QRD167J-271	270 1/6W CARBON	
	R411	QRD167J-103	10K 1/6W CARBON	
	R412	QRD167J-223	22K 1/6W CARBON	
	R413	QRD167J-103	10K 1/6W CARBON	
	R414	QRD167J-102	1K 1/6W CARBON	
	R421	QRD167J-153	15K 1/6W CARBON	
	R422	QRD167J-151	150 1/6W CARBON	
	R423	QRD167J-103	10K 1/6W CARBON	
	R451	QRD167J-102	1K 1/6W CARBON	
	R452	QRD167J-184	180K 1/6W CARBON	
	R453	QRD167J-224	220K 1/6W CARBON	
	R454	QRD167J-224	220K 1/6W CARBON	
	R455	QRD167J-224	220K 1/6W CARBON	
	R456	QRD167J-683	68K 1/6W CARBON	
	R457	QRD167J-153	15K 1/6W CARBON	
	R458	QRD167J-183	18K 1/6W CARBON	
	R461	QRD167J-102	1K 1/6W CARBON	
	R462	QRD167J-102	1K 1/6W CARBON	
	R463	QRD167J-103	10K 1/6W CARBON	
	R464	QRD167J-103	10K 1/6W CARBON	
	R471	QRD167J-103	10K 1/6W CARBON	
	R472	QRD167J-103	10K 1/6W CARBON	
	R473	QRD167J-473	47K 1/6W CARBON	
	R475	QRD167J-103	10K 1/6W CARBON	
	R476	QRD167J-103	10K 1/6W CARBON	
	RA401	QRB049J-103	10K 1/10W R. NETWORK	
	RA402	QRB089J-103	10K 1/10W R. NETWORK	
	RA403	QRB049J-103	10K 1/10W R. NETWORK	
	VR111	QVPA601-501A	500 VARIABLE	
	VR112	QVPA601-501A	500 VARIABLE	
	VR113	QVPA601-103A	10K VARIABLE	
	VR114	QVPA601-103A	10K VARIABLE	
	VR141	QVPA601-501A	500 VARIABLE	
	VR142	QVPA601-501A	500 VARIABLE	
	VR143	QVPA601-103A	10K VARIABLE	
	VR144	QVPA601-103A	10K VARIABLE	
	VR185	QVPA601-503A	50K VARIABLE	
	VR186	QVPA601-503A	50K VARIABLE	
	VR361	QVPA601-503A	50K VARIABLE	
	VR362	QVPA601-503A	50K VARIABLE	
	VR451	QVPA603-103A	10K VARIABLE	
	VR452	QVPA603-203A	20K VARIABLE	

Δ : SAFETY PARTS

Others

Δ	ITEM	PART NUMBER	DESCRIPTION	AREA
		EMW10143-202	CIRCUIT BOARD	
	J408	EMV5142-909	PLUG ASSY(9PIN)	
	J409	EMV5142-910	PLUG ASSY(10PIN)	
	K101	ENZ8101-007	INDUCTOR	B
	K102	ENZ8101-007	INDUCTOR	B
	K103	ENZ8101-007	INDUCTOR	B
	K104	ENZ8101-007	INDUCTOR	B
	K105	ENZ8101-007	INDUCTOR	B
	L109	EQL2126-223	INDUCTOR	
	L110	EQL2126-223	INDUCTOR	
	L131	EQL4004-101	INDUCTOR	B
	L132	EQL4004-101	INDUCTOR	B
	L133	EQL2106-223	INDUCTOR	B
	L134	EQL2106-223	INDUCTOR	B
	L351	ENZ6002-012	OSCILLATOR COIL	
	P101	QMV5011-003K	PLUG ASSY(3PIN)	
	P102	QMV5011-007K	PLUG ASSY(7PIN)	
	S501	ESB1100-007	LEAF SWITCH(A PACK)	
	S502	ESB1100-007	LEAF SWITCH(A CrO ₂)	
	S503	ESB1100-007	LEAF SWITCH(REV REC)	
	S504	ESB1100-007	LEAF SWITCH(B CrO ₂)	
	S505	ESB1100-007	LEAF SWITCH(B PACK)	
	S506	ESB1100-007	LEAF SWITCH(B METAL)	
	S507	ESB1100-007	LEAF SWITCH(FWD REC)	
	S511	ESPO001-018	TACT SWITCH(A REV PLAY)	
	S512	ESPO001-018	TACT SWITCH(A REW)	
	S513	ESPO001-018	TACT SWITCH(A F. FWD)	
	S514	ESPO001-018	TACT SWITCH(A FWD PLAY)	
	S515	ESPO001-018	TACT SWITCH(B REV PLAY)	
	S516	ESPO001-018	TACT SWITCH(B REW)	
	S517	ESPO001-018	TACT SWITCH(B F. FWD)	
	S518	ESPO001-018	TACT SWITCH(B FWD PLAY)	
	S519	ESPO001-018	TACT SWITCH(A STOP)	
	S520	ESPO001-018	TACT SWITCH(B STOP)	
	S521	ESPO001-018	TACT SWITCH(B REC)	
	S522	ESPO001-018	TACT SWITCH(B PAUSE)	
	S523	ESPO001-018	TACT SWITCH(DUBBING)	
	S524	ESPO001-018	TACT SWITCH(DOLBY)	
	S525	ESPO001-018	TACT SWITCH(REV MODE)	
	S526	ESPO001-018	TACT SWITCH(B SKIP)	
	S527	ESPO001-018	TACT SWITCH(FUZZY NOR)	
	S528	ESPO001-018	TACT SWITCH(FUZZY CAR)	
	S529	ESPO001-018	TACT SWITCH(FUZZY PHONE)	
	S541	QSS6A12-E01	SLIDE SWITCH(BEAT CUT)	
	BC408	EWS329-A916	SOCKET WIRE(9PIN)	
	BC409	EWS32A-A916	SOCKET WIRE(10PIN)	
	EP001	E70859-001	EARTH PLATE	
	FW401	EWR38B-16LST	FLAT WIRE(8PIA)	
	FW402	EWR37B-10LST	FLAT WIRE(7PIN)	
	FW403	EWR37B-10LST	FLAT WIRE(7PIN)	
	FW404	EWR37B-10LST	FLAT WIRE(7PIN)	
	FW405	EWR37B-10LST	FLAT WIRE(7PIN)	
	FW406	EWR38B-08LST	FLAT WIRE(8PIN)	
	FW407	EWR34B-08LST	FLAT WIRE(4PIN)	
	FW410	EWR38B-16SST	FLAT WIRE(8PIN)	
	JB001	EMV7141-015	CONNECTOR(15PIN)	
	JT411	EMV7122-004	CONNECTOR(4PIN)	
	JT412	EMV7122-004	CONNECTOR(4PIN)	
	JT413	EMV7122-103	CONNECTOR(3PIN)	
	JT414	EMV7122-004	CONNECTOR(4PIN)	
	JT415	EMV7122-103	CONNECTOR(3PIN)	
	JT416	EMV7122-004	CONNECTOR(4PIN)	
	XT401	ECX0004-194KM	RESONATOR	

Δ : SAFETY PARTS

— MEMO —

— MEMO —

— MEMO —

Head assembly

1. Remove the cassette mechanism.
2. Unsolder the flexible wire on the relay PCB, and remove the 2 screws fixing the head assembly (Figure 10).

Notice for installing the head assembly

The direction of the head for forward or reverse mode is switched by the cam gear.

The point of the rib for the head assembly installation differs with the head direction. Figure 8 shows the relation of the gears.

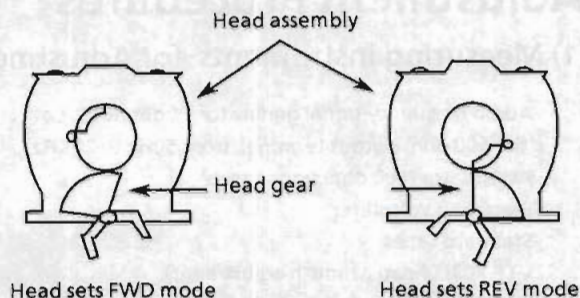


Figure 8 Bottom view of the head assembly

Pinch roller arm assembly removal (FWD / REV)

1. Release the pinch roller return spring from the hook (Figure 10).
2. Remove the hook fixing the pinch roller assembly, and remove the pinch roller assembly (Figure 9).

Reel motor PCB removal

1. Remove the mechanism block.
2. Remove the system controller PCB.
3. Remove the screw fixing the reel motor PCB (Figure 5).
4. Unsolder the reel motor.
5. Remove the PCB.

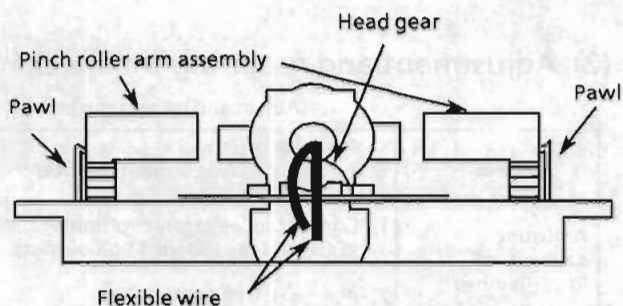


Figure 9 Bottom view of the cassette mechanism

Reel motor removal

1. Remove the mechanism block.
2. Remove the reel motor PCB.
3. Remove the FR arm assembly (Figure 10).
4. Remove the screws ① fixing the motor.
5. Release the pawl fixing the motor and remove the motor.

Capstan motor removal

1. Remove the mechanism block.
2. Remove the system controller PCB.
3. Remove the reel motor PCB.
4. Remove the 4 screws ② fixing the bracket (Figure 5).
5. Release the pawl fixing the bracket and remove the capstan motor with the bracket.
6. Remove the 2 screws fixing the motor on the bracket and remove the motor from the bracket.

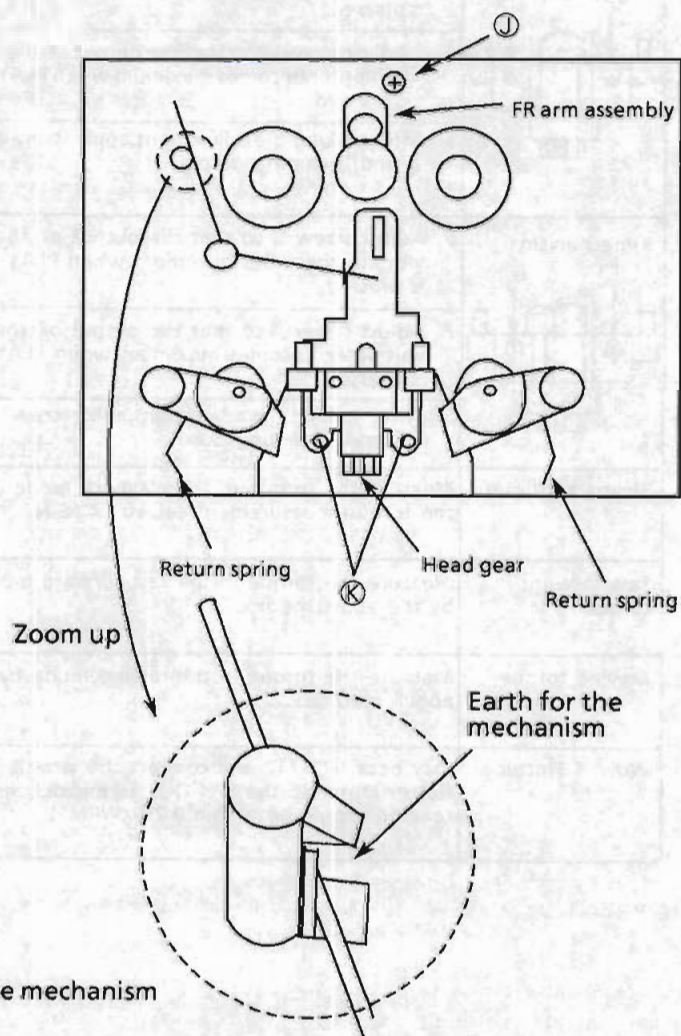


Figure 10 Front view of the cassette mechanism

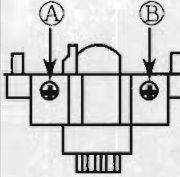
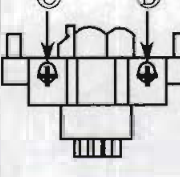
Adjustment Procedures

(1) Measuring instruments for Adjustment

1. Audio frequency signal generator (0dbs output at the 600 ohm output terminal from 50Hz to 20KHz)
2. Attenuator (600 ohm impedance)
3. Electronic voltmeter
4. Standard tapes
VTT-703L(head azimuth adjustment)
VTT-712 (tape speed , wow & flutter)
VTT-724 (Reference level)
5. Recording standard tapes
TS-8 (Normal) , TS-10 (CrO2) , TS-11 (Metal)
6. 600-ohm resistor for attenuator matching
7. Wow & Flutter meter with frequency counter
8. Distortion meter with band-pass filter
9. Torque gauge : CTG-N (cassette type)
10. C-120 tape (for checking the tape running)

(2) Adjustment and repairing the mechanism

(Adjust and inspect the mechanism before adjusting the electronic circuit)

Item	Adjustment Method	Standard value	Remarks
Adjusting azimuth of Rec/Play head	<ol style="list-style-type: none"> 1. Connect an electronic voltmeter to the VCR/DAT REC terminal. (about 1 volt output) 2. Play back VTT-703L 		1) When the specified characteristic cannot be obtained because of head wear, cut wire, excessive magnetization, etc., replace the head and adjust the head azimuth. Also, perform the adjustment of the playback level, recording bias current, recording level, etc.
A mechanism 	<ol style="list-style-type: none"> 3. Adjust screw ① so that the output of the voltmeter becomes maximum when PLAY (▶) is pressed. 	Maximum	2) When there is the difference of more than 3 ~ 4 dB between left and right output levels, replace the head to avoid complaints.
	<ol style="list-style-type: none"> 4. Adjust screw ② so that the output of the voltmeter becomes maximum when PLAY (◀) is pressed. 	Maximum	
	<ol style="list-style-type: none"> 5. After making the adjustment, apply screw lock to prevent screws ① and ② coming loose . 		
B mechanism 	<ol style="list-style-type: none"> 6. Adjust screw ③ so that the output of the vltmeter becomes maximum when PLAY (▶) is pressed. 	Maximum	
	<ol style="list-style-type: none"> 7. Adjust screw ④ so that the output of the voltmeter becomes maximum when PLAY (◀) is pressed. 	Maximum	
	<ol style="list-style-type: none"> 8. After making the adjustment, apply screw lock to prevent screws ③ and ④ coming loose . 		
Playback torque	Measure the torque in the playback mode using the torque measurement cassette CTG-N.	26 ~ 67 g-cm	When the standard torque cannot be obtained, replace the FR arm assembly or motor.
Fast forward torque	Measure the torque in the fast forward mode by the above method.	80 ~ 200 g-cm	When the standard torque cannot be obtained, replace the FR arm assembly or motor.
Rewind torque	Measure the torque in the rewind mode by the above method.	80 ~ 200 g-cm	When the standard torque cannot be obtained, replace the FR arm assembly or motor.
Wow & Flutter	Play back VTT-712 and connect the wow & flutter meter to the SPK OUT terminals , its reading should be within 0.2% (WRMS).	Less than 0.2%	As a complaint may occur if the wow & flutter fluctuates by 0.1% even though it is allowed in the standard, repairing is required.

(3) Electrical Circuit Adjustments

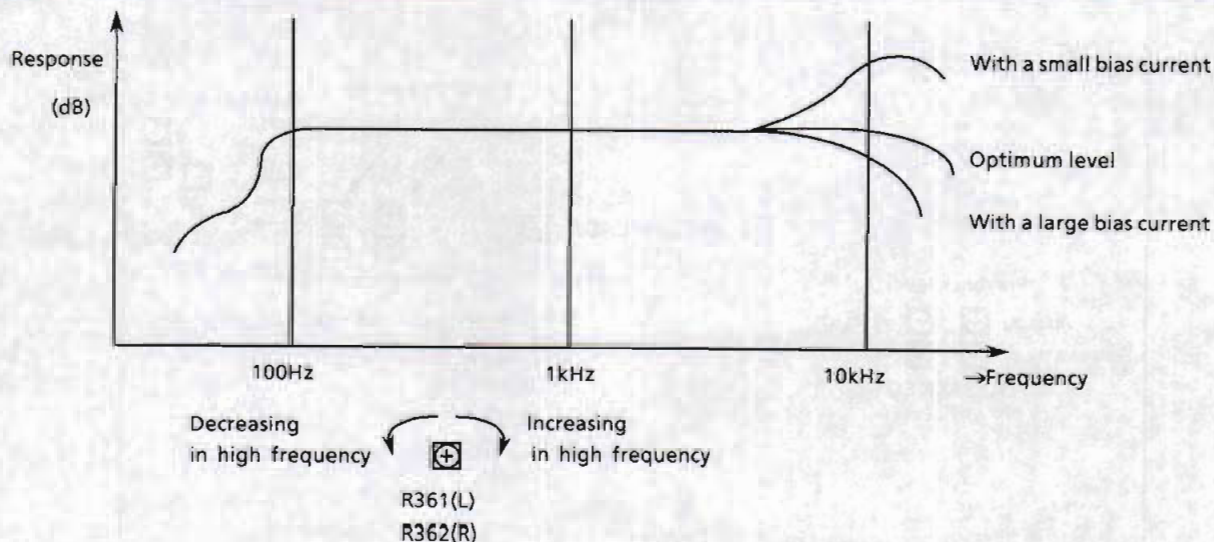
Make the following adjustments after adjusting the head azimuth.

In principle, the adjustments should be made in the following sequence.

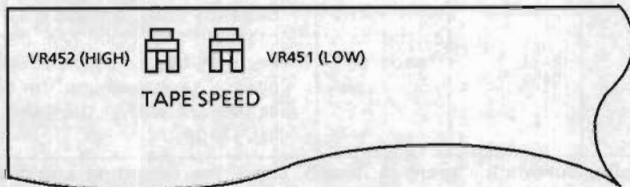
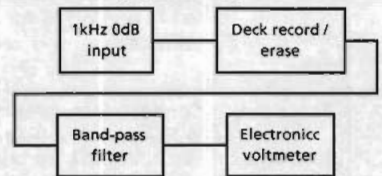
Set the NR switch to OFF and the BEAT CUT switch to "1".

Adjustments marked with an asterisk (*) should always be made after the head is replaced.

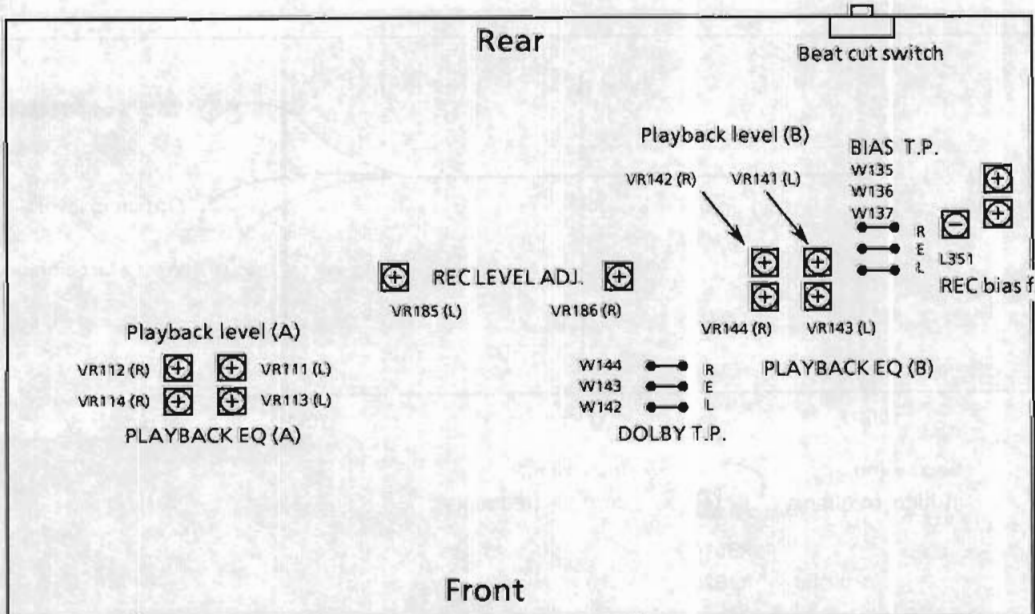
Item	Adjustment Method	Adjustment Location	Standard Value	Remarks
Motor speed	1. Play back VTT-712 and connect a frequency counter to the VCR/DAT terminals.	Semi-fixed resistor on the main PC Board		Connect a wow & flutter meter with a built-in frequency counter to the VCR/DAT REC terminal.
	2. Normal-speed adjustment Play back deck B and adjust the semi-fixed resistor VR451.	VR451	3,000 ± 10 Hz	Adjust the normal speed first, and perform the high speed adjustment.
	3. High-speed adjustment Play back deck A with high speed and adjust the semi-fixed resistor VR452.	VR452	6000 ± 10Hz	
* 1 Playback level	Play back VTT-724 (1 kHz) and connect an electronic voltmeter between W142 and W143 for left, or W144 and W143 for right. And then, adjust the semi-fixed resistors.	A deck (L) VR111 (R) VR112 B deck (L) VR141 (R) VR142	400mV	
* 2 Recording bias frequency	Connect a frequency counter between W137 (L), W135(R) and W136(E), and recording to a metal tape.	L351	100 ± 5 kHz	
* 3 Recording frequency response	Supply 63.5Hz / 1kHz / 12.5kHz, 14mV signals to VCR/DAT terminal. Record them with the NR switch off. While playing back, adjust VR361 and VR 362 so that the variation of output of 63.5Hz / 12.5kHz to the output of 1kHz satisfies the standard value.	(L)VR361 (R)VR362	0 ± 3 dB for 63Hz and 12.5kHz with 1 kHz as the standard.	1) The recording and playback frequencies of a cassette deck are adjusted by adjusting the bias. This is because the frequency response depends more on the bias current than with an open-reel deck. 2) Perform the adjustment with normal tape and confirm that the values are within the range for CrO ₂ tape.
Note: After completing the recording level adjustment in item 5, check the recording and playback frequencies with the NR switch on. Fine adjust again if the value is 0 ± 4 dB or more at 1 kHz and 10 kHz.				



Item	Adjustment Method	Adjustment Location	Standard Value	Remarks
* 4 Recording and Playback Sensitivity	1. Input a 1kHz (140mV) to VCR/DAT terminal and record it with a normal tape. 2. Connect an electric voltmeter between W142 and 143 for left, or W144 and 143 for right. And then, adjust the semi;fixed resistors when playing back.	(L) VR185 (R) VR186	400mV	Adjust with normal tape and make sure that the left / right level difference is 1.0dB or less
* 5 Recording/ playback distortion	1) Input a 1 kHz (140mV) to VCR / DAT terminals and record it. 2) Play it back and check the out-put with a distortion meter to make sure it is the rated value.		less than 2%	Perform after the bias current and recording level adjustments.
6 Recording/ playback S/N ratio	1) Input a 1 kHz (140mV) to VCR / DAT terminals and record it. While recording, remove the input and record without a signal. 2) Play back and use an electronic voltmeter to compare the 0 dB recording output and the out-put of the recording without a signal to make sure this is the rated value.		more than 40 dB	
7 Erase ratio check	1) Input a 1 kHz (500mV) to VCR / DAT terminals and record it. 2) Rewind and erase part of the recorded section. 3) Compare the outputs of the recorded and erased sections using an electronic voltmeter.		more than 55 dB	Connect a 1 kHz band-pass filter between the deck and electronic Voltmeter When making the adjustment.
8 Auto-stop check	When playing back and recording, make sure to operate AUTO STOP.			



← System controller PCB (ENJ-O62-2)



MEMO

MEMO

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JVC

VICTOR COMPANY OF JAPAN, LIMITED
AV ACCESSORY DIVISION, YAMATO PLANT, 1644, SHIMOTSURUMA, YAMATO-SHI, KANAGAWA-KEN, 242, JAPAN