

# Service Manual

Compact Disc Player

Compact Disc Player  
**SL-PG480A**



Colour

(K) : Black



## Areas

Suffix for Model No.	Area	Colour
(E)	Europe	(K)
(EB)	Britain	
(EG)	Germany and Italy	

## RAE1100Z MECHANISM SERIES

**SPECIFICATIONS \ ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ**  
**OPERATION CHECK AND MAIN COMPONENT REPLACEMENT**  
**PROCEDURES \ ПРОВЕРКА РАБОТОСПОСОБНОСТИ И МЕТОДИКА ЗАМЕНЫ**  
**ОСНОВНЫХ КОМПОНЕНТОВ**  
**AUTOMATIC ADJUSTMENT RESULTS DISPLAY FUNCTION \ ФУНКЦИЯ**  
**ОТОБРАЖЕНИЯ РЕЗУЛЬТАТОВ АВТОМАТИЧЕСКОЙ РЕГУЛИРОВКИ**  
**SCHEMATIC DIAGRAMS \ ПРИНЦИПИАЛЬНЫЕ СХЕМЫ**  
**WIRING CONNECTION DIAGRAM \ СХЕМА СОЕДИНЕНИЯ**  
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**LOADING UNIT PARTS LOCATION \ РАСПОЛОЖЕНИЕ ЧАСТЕЙ ЗАГРУЗОЧНОГО**  
**МЕХАНИЗМА**  
**PACKAGING \ УПАКОВКА**

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**Technics**

# Specifications

## ■ Audio

No. of channels	2 (left and right, stereo)
Frequency response	2 – 20,000 Hz, $\pm$ 1 dB
Output voltage	2 V (at 0 dB)
Dynamic range	92 dB
S/N	100 dB
Harmonic distortion	0.005% (1 kHz, 0 dB)
Total harmonic distortion	0.007% (1 kHz, 0 dB)
Wow and flutter	Below measurable limit
DA converter	MASH (1 bit)
Output impedance	1 k $\Omega$
Load impedance	More than 10 k $\Omega$

## ■ Pickup

Wavelength	780 nm
Laser Power	No hazardous radiation is emitted (with safety protection)

## ■ General

Power consumption	13 W
Power supply	AC 50/60 Hz, 230 – 240 V
Dimensions (W $\times$ H $\times$ D)	430 $\times$ 92 $\times$ 283 mm
Weight	3.1 kg

### Note:

Specifications are subject to change without notice.  
Weight and dimensions are approximate.

### For United Kingdom only:

This apparatus was produced to BS 800.

\*

- MASH is a trademark of NTT.

## Operation Check and Main Component Replacement Procedures

**Warning:** This product uses a laser diode. Refer to caution statements on page 2.

**ACHTUNG:** • Die lasereinheit nicht zerlegen.

• Die lasereinheit darf nur gegen eine vom hersteller speziferte einheit ausgetauscht werden.

**“ATTENTION SERVICER”** Some chassis components may have sharp edges. Be careful when disassembling and servicing.

### NOTE

1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
3. Select items from the following index when checks or replacement are required.
4. Illustrated screws are equivalent to actual size.
5. Refer the parts No. on the page of “Main Component Replacement Procedures”, if necessary.

### • Contents

#### • Checking Procedure for each P.C.B.

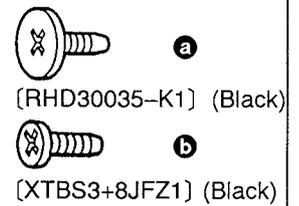
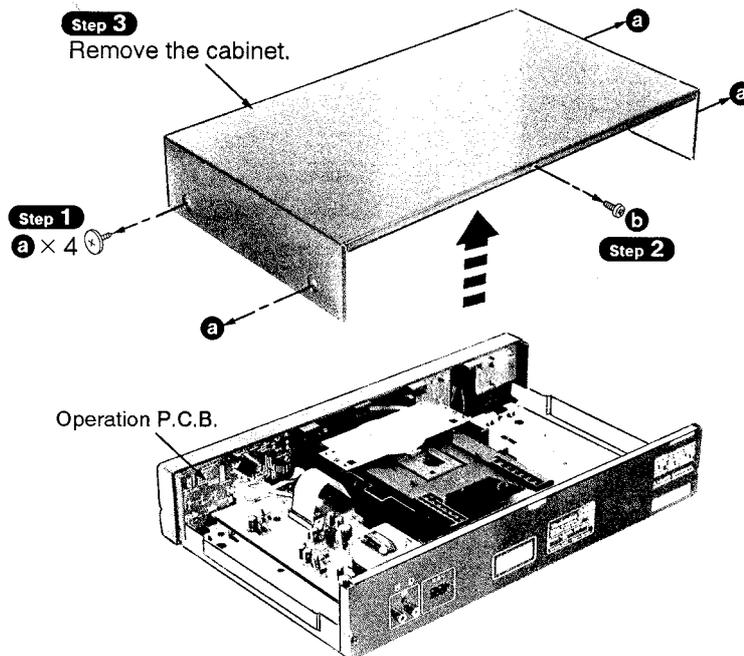
- |   |       |           |
|---|-------|-----------|
| 1. Checking for the main P.C.B. and operation P.C.B.. | ..... | Page 7,8. |
| 2. Checking for the servo P.C.B..                     | ..... | 9.        |

#### • Main Component Replacement Procedures

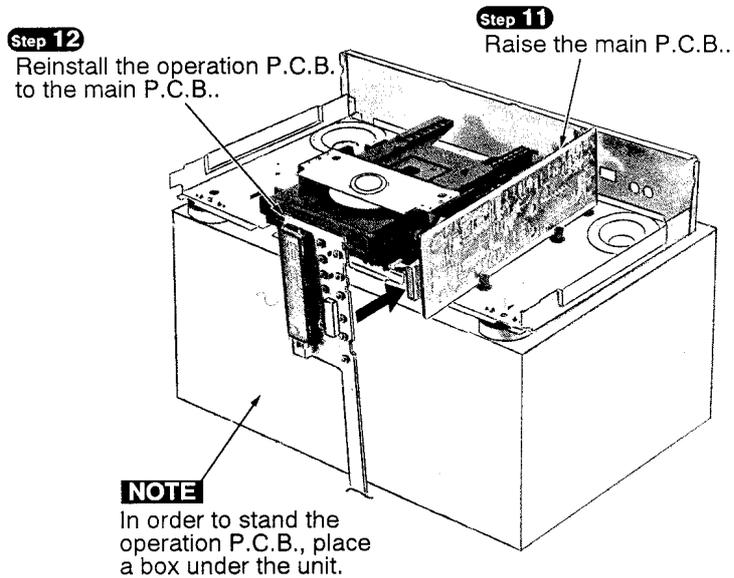
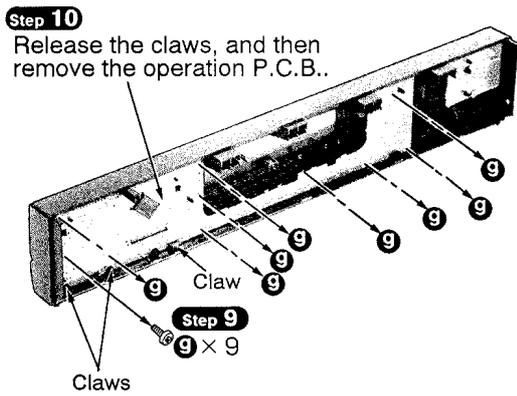
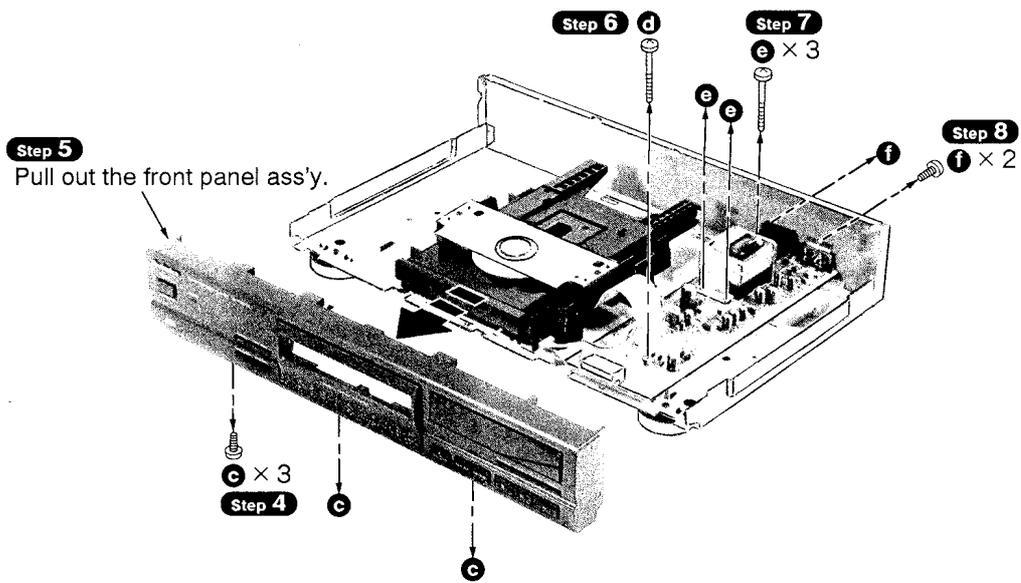
- |  |       |        |
|--|-------|--------|
| 1. Replacement for the traverse unit ass'y.            | ..... | 10~12. |
| 2. Replacement for the loading belt and loading motor. | ..... | 13.    |

## Checking Procedure for each P.C.B.

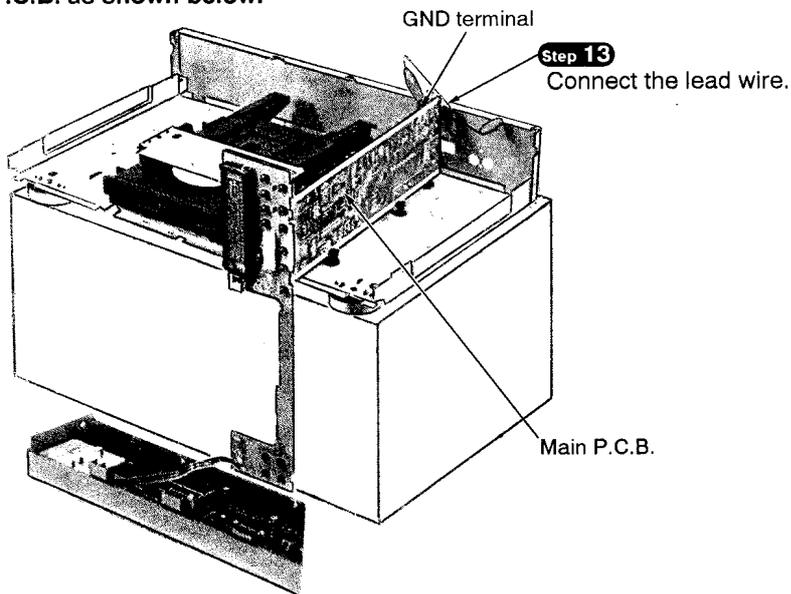
### 1. Checking for the main P.C.B. and operation P.C.B.



• Check the operation P.C.B. in this condition.

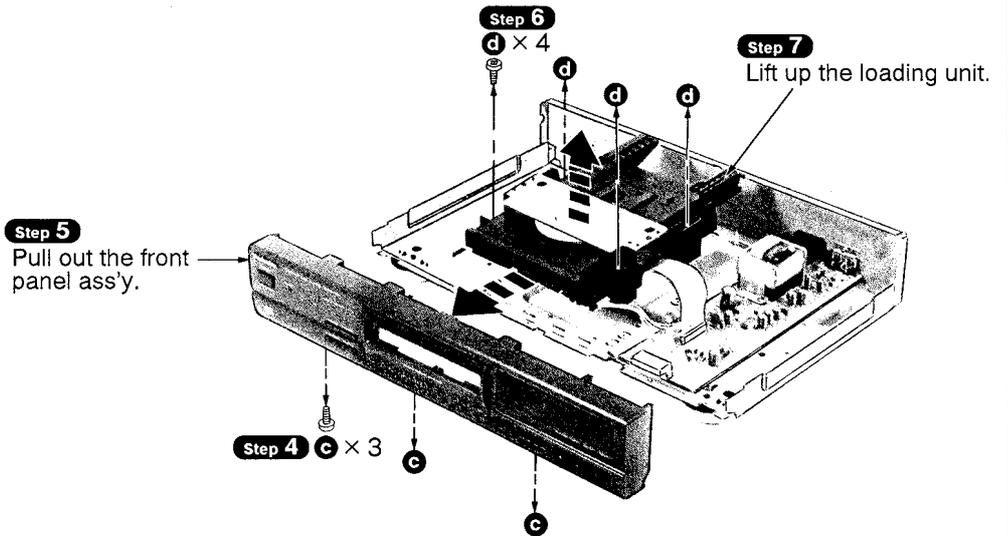
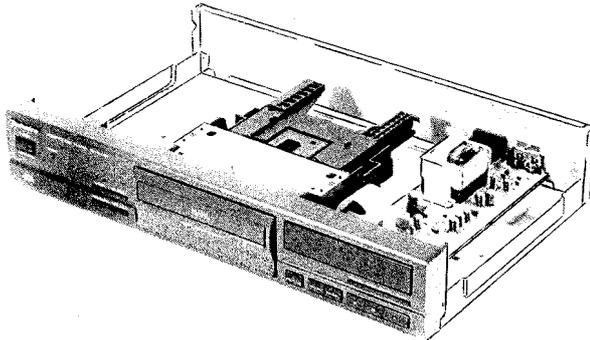
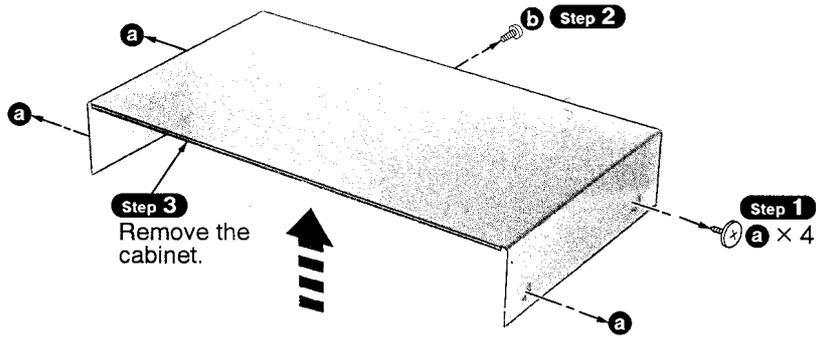


• Check the main P.C.B. as shown below.

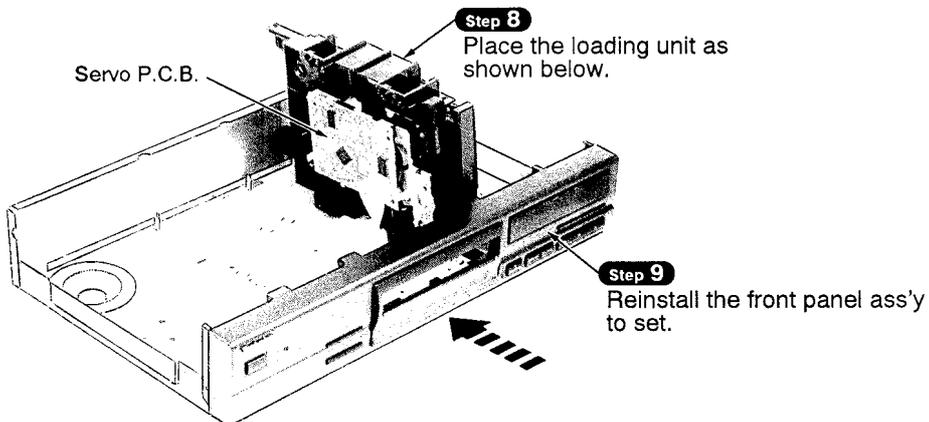


- c  
[XTB3+10JFZ] (Black)
- d  
[XTBR3+20JFZ] (Black)
- e  
[RHD30053]
- f  
[XTBS3+8JFZ1] (Black)
- g  
[RHD26021]

2. Checking for the servo P.C.B.



• Check the servo P.C.B. as shown below.



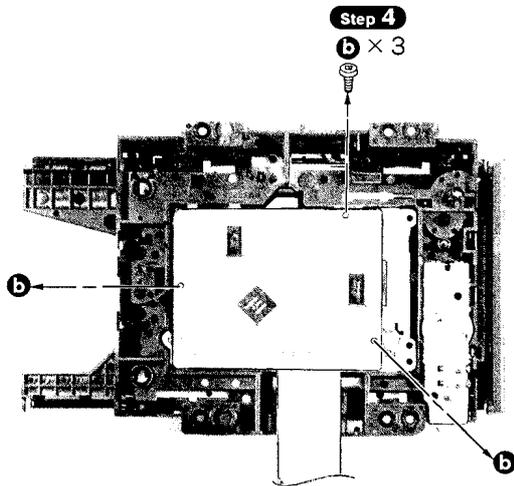
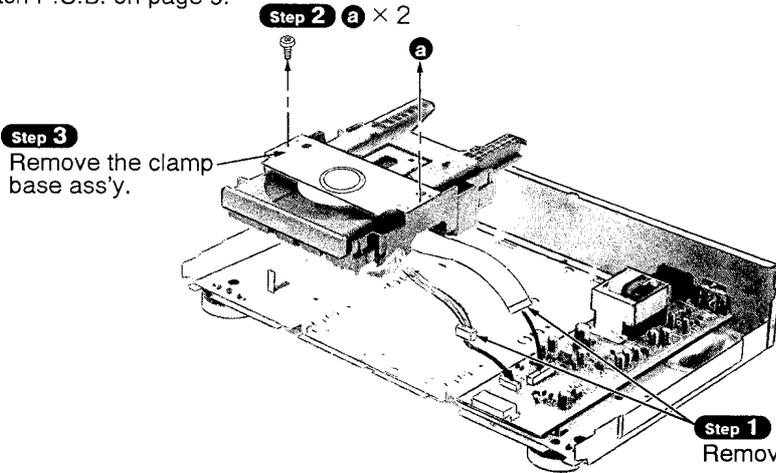
	<b>a</b>
[RHD30035-K1] (Black)	
	<b>b</b>
[XTBS3+8JFZ1] (Black)	
	<b>c</b>
[XTB3+10JFZ] (Black)	
	<b>d</b>
[XTB3+8JFZ] (Black)	

## ■ Main Component Replacement Procedures

### 1. Replacement for the traverse unit ass'y

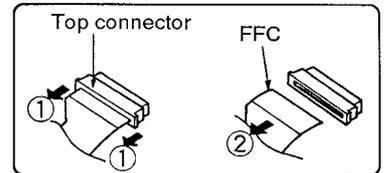
• Follow the **Step 1** ~ **Step 7** of item 2 in checking procedure for each P.C.B. on page 9.

- a**  
[XTB3+8JFZ] (Black)
- b**  
[XTBS26+8J]



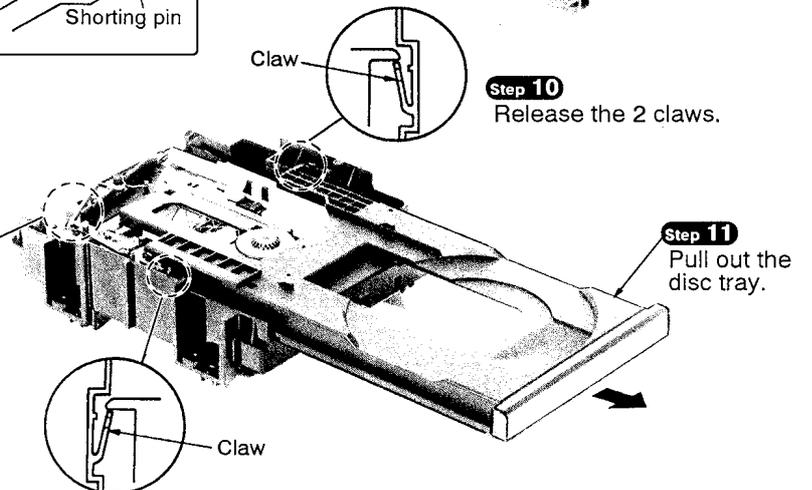
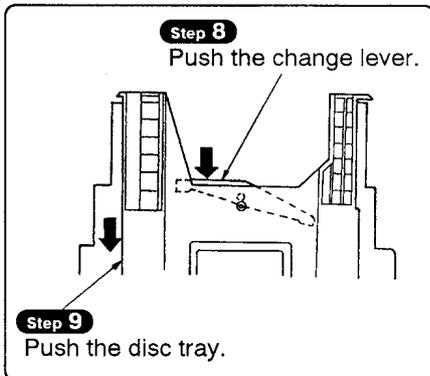
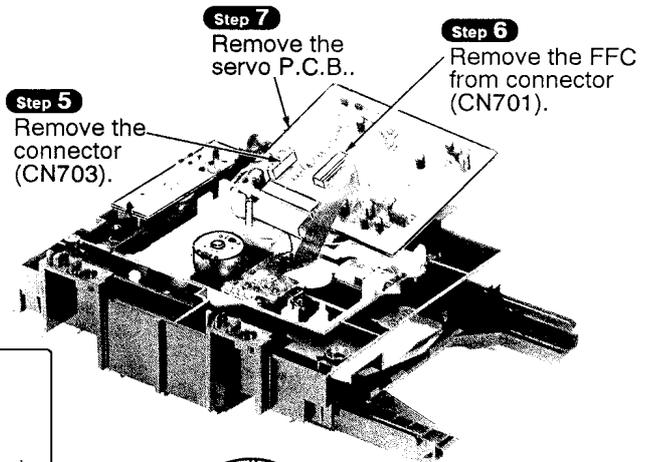
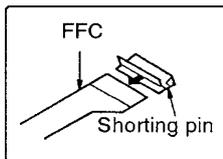
#### ■ Removal of the FFC

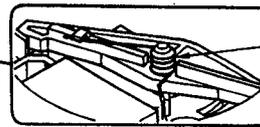
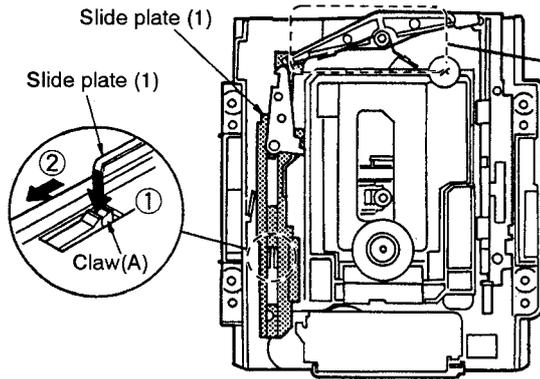
• Push the top of the connector in the direction of arrow ①, and then pull out the FFC in the direction of arrow ②.



#### NOTE

Insert a shorting pin into the traverse unit FFC. (Refer to Handling Precautions for Traverse Deck on page 2.)





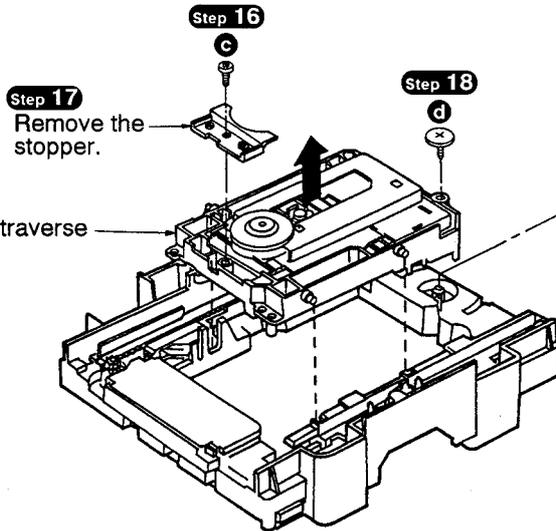
**Step 12**  
Remove the spring.

**NOTE**

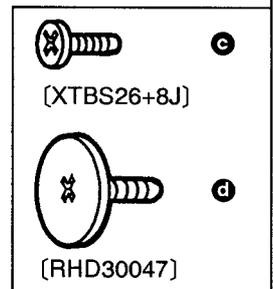
Be careful not to damage the claw (A) because the claw (A) is breakable.

**Step 13**

Push the claw (A) in the direction of arrow ①, and then move the side plate (1) in the direction of arrow ②.

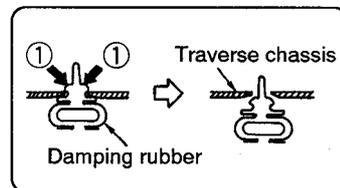


**Step 14**  
Remove the change lever.



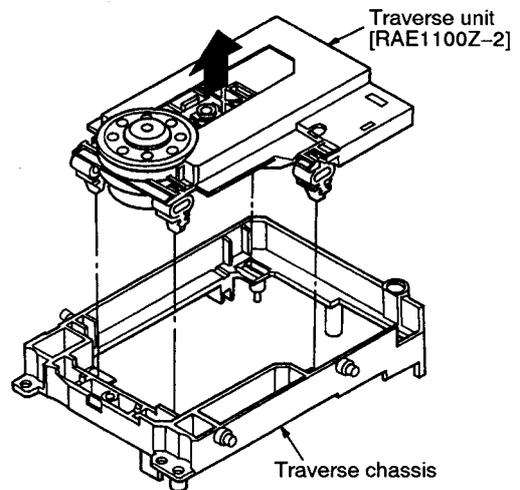
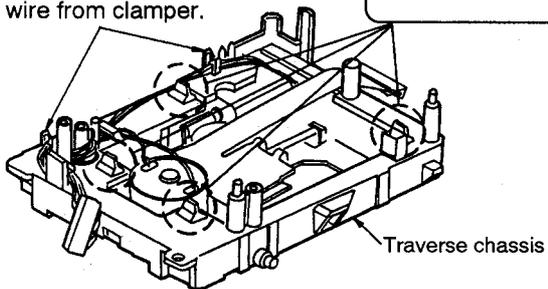
**Step 20**

Remove the damping rubber from traverse chassis.



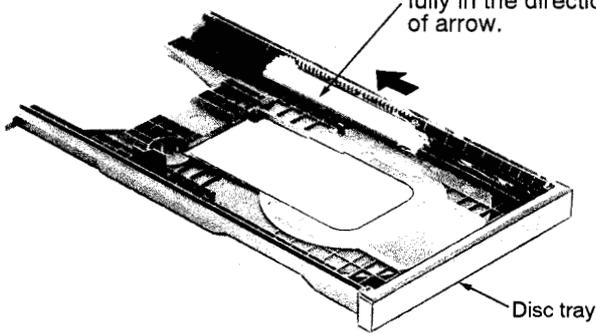
**Step 19**

Remove the lead wire from clamber.

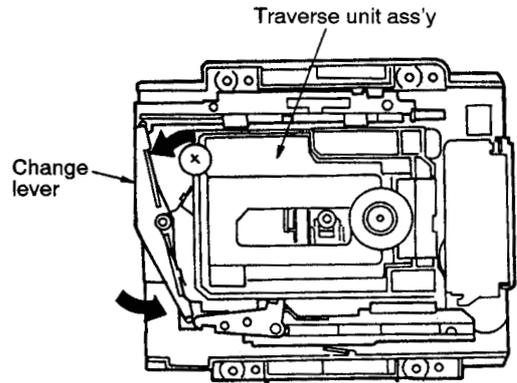


**Installation of the disc tray after replacement**

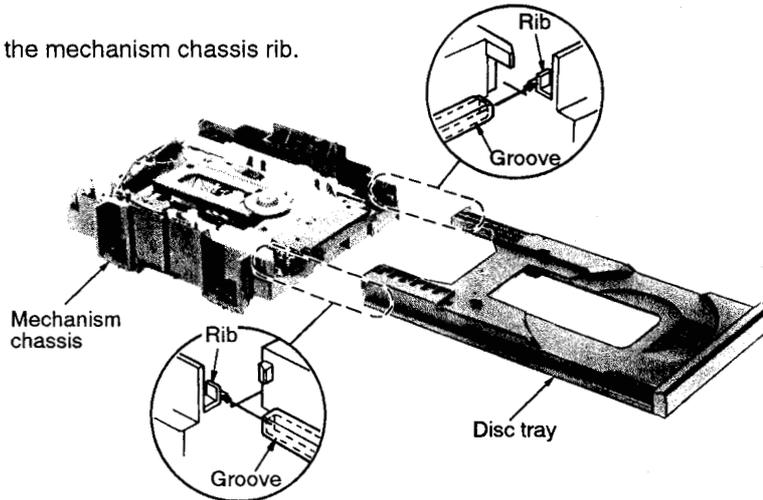
**Step 1**  
Slide the drive rack fully in the direction of arrow.



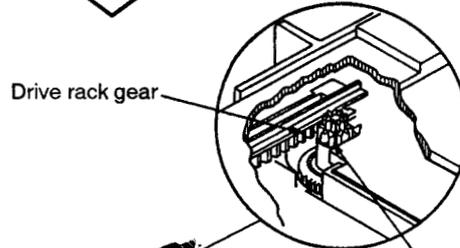
**Step 2**  
Slide the change lever, and then leave the traverse unit ass'y falling.



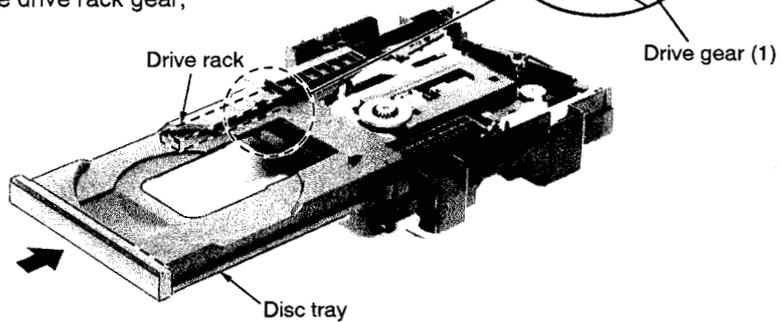
**Step 3**  
Align the disc tray groove with the mechanism chassis rib.



**Step 4**  
Slide the disc tray in the direction of arrow. Then, put the drive rack manually so that the drive gear (1) engages with the drive rack gear.

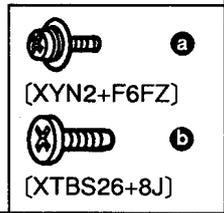
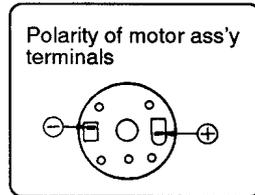
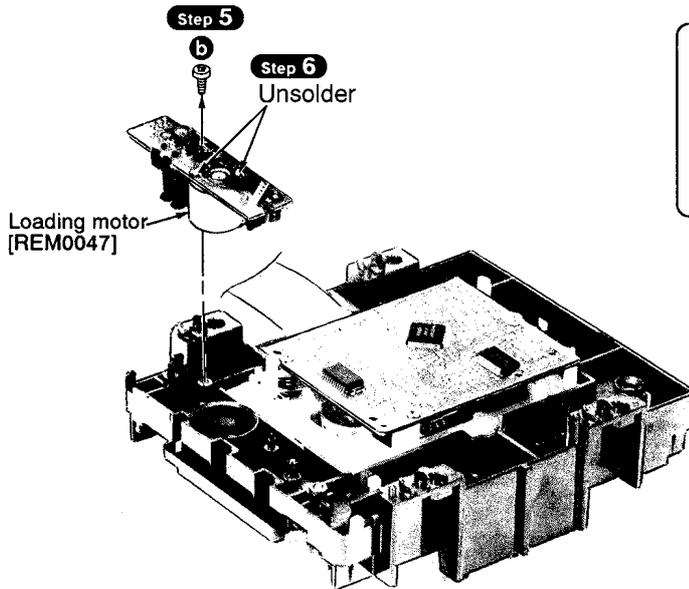
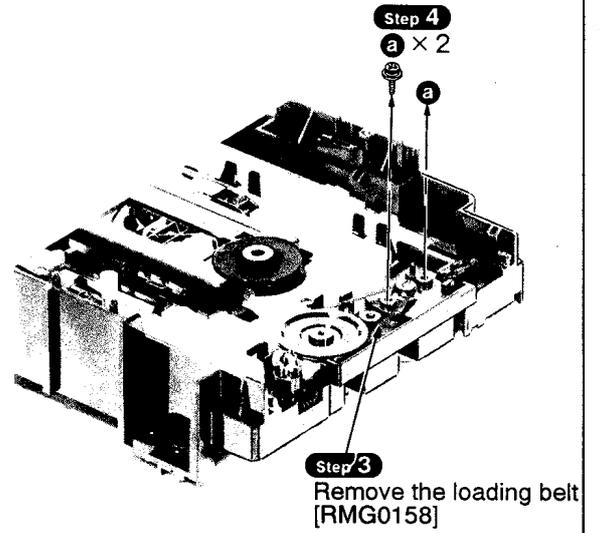
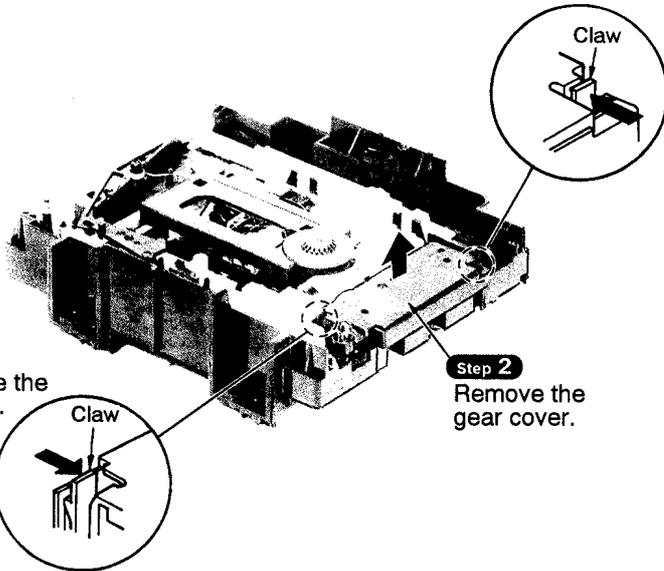


**Step 5**  
After the drive gear (1) engaged with the drive rack gear, slide the disc tray.



**2. Replacement for the loading belt and loading motor**

- Follow the **Step 1** ~ **Step 7** of item 2 in checking procedure for each P.C.B. on page 9.
- Follow the **Step 1** ~ **Step 11** of item 1 in main component replacement procedures on page 10.



## Automatic Adjustment Results Display Function (Self-Check Function)

This unit has a function that uses the FL display board to indicate the results of automatic adjustment of the servo-circuit (tracking, focus, offset, etc.) as error codes. The error code display indicates the location of failures from automatic adjustment circuit.

The following procedure displays the error codes from the self-diagnostic function.

### Procedure for displaying automatic adjustment codes

1. Plug in the power cord and wait for the STANDBY LED to flash, indicating the unit is in standby status.
2. Turn on the power supply switch while pressing the STOP (■), PAUSE (▣) and PLAY (▶) buttons at the same time.
3. The "F E C." code is displayed 2 or 3 seconds later to indicate the automatic adjustment results mode.
4. Push the OPEN/CLOSE button to open the disc tray and then load the test disc (SZZP1054C).
5. Push the OPEN/CLOSE button again to close the disc tray.
6. After automatic adjustment, the code display indicates the location of failures in the servo circuit.

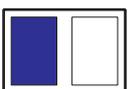
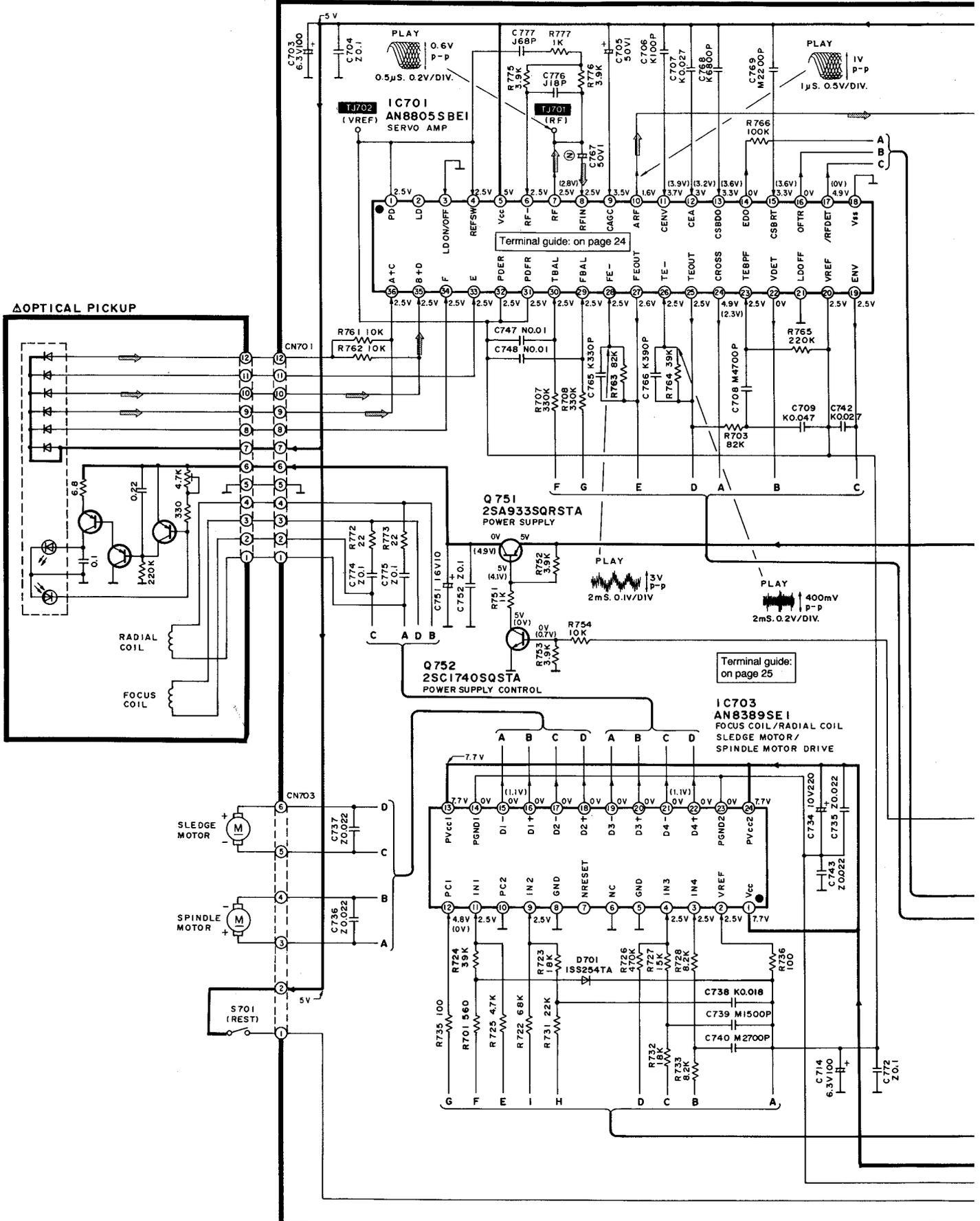
### Troubleshooting using the automatic adjustment code

#### Notes:

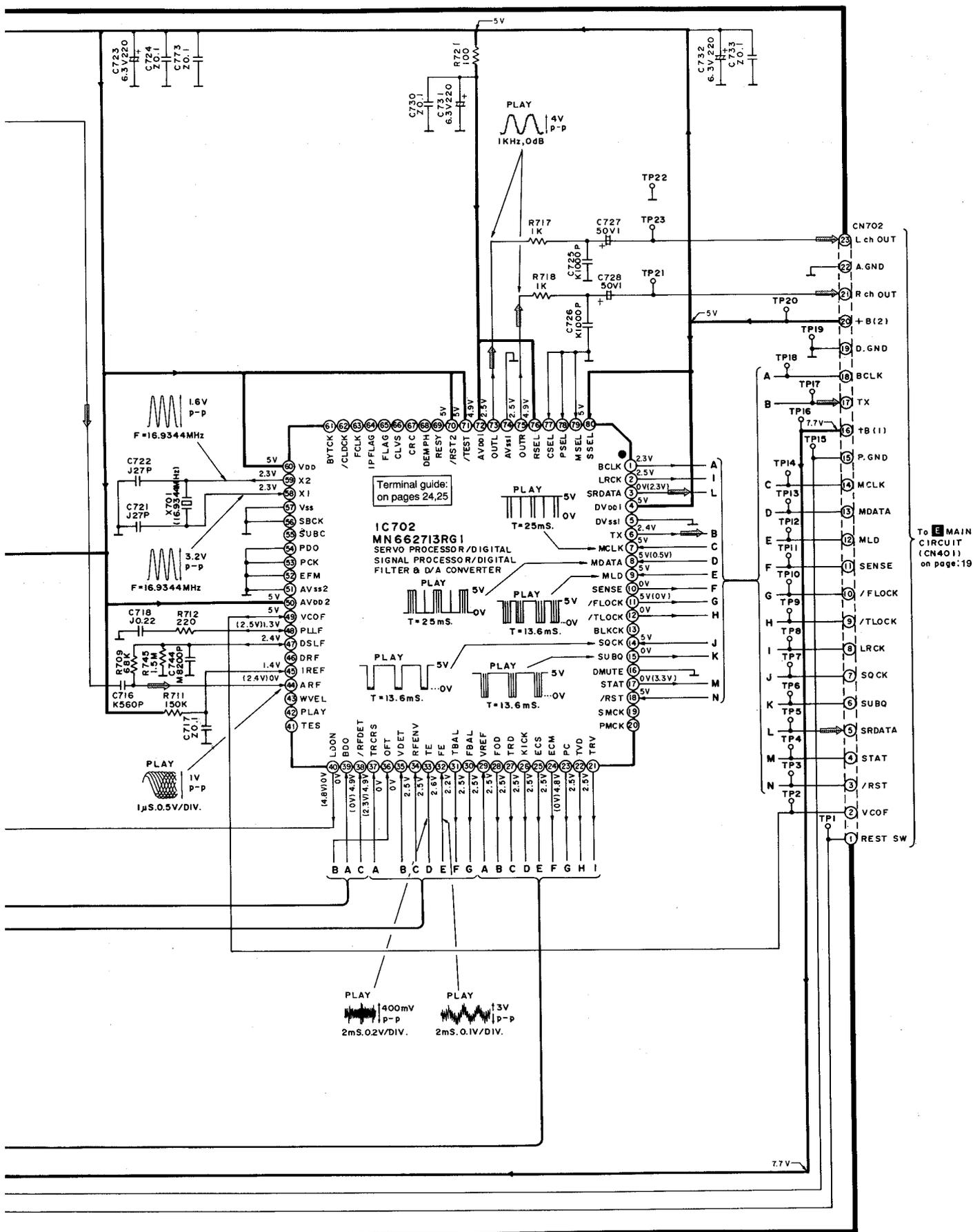
1. If "E-00" or "E-20" is displayed as an error code, this means no error was found.
  2. Check the disc and laser-detector lens for damage, contamination or stains.
- Take out the test disc and turn off the power, which terminates the automatic adjustment results mode.

FL error code display	Symptom	Probable cause	Signal to check		Normal voltage and waveform values	
			Location	Signal name	PLAY	STOP
E-01	Focus and tracking offset adjustments not completed in specified time period.	① Clocks X1 and X2, power supply VDD, and reset (/RST), all on IC702. ② MDATA, MCLK, MLD, and SENSE signals to/from mechanism controller.	IC702 ⑧ pin	MDATA		5.0 V
			IC702 ⑦ pin	MCLK		5.0 V
			IC702 ⑨ pin	MLD		0 V
			IC702 ⑩ pin	SENSE	0 V	0 V
			IC702 ⑱ pin	/RST	5.0 V	5.0 V
			IC702 ⑤⑧ pin	X1		
IC702 ⑤⑨ pin	X2					
E-03 E-05 E-07 E-09 E-0B E-0D E-0F	Disc play unstable	① Scratches or contaminants on disc surface ② Focus and Tracking servo circuits (check waveforms, voltages, and part values.) ③ Spindle driver circuit ④ Optical pickup	IC702 ⑩② pin	F E		2.6 V
IC702 ⑩③ pin			T E		2.5 V	
IC702 ⑩⑧ pin			FOD	2.5 V	2.5 V	
IC702 ⑩⑦ pin			TRD	2.5 V	2.5 V	
IC702 ⑩⑥ pin			KICK	2.5 V	2.5 V	
IC702 ⑩① pin			/FLOCK	0 V	5.0 V	
IC702 ⑩⑨ pin			/RF DET	0 V	4.9 V	
TJ701			R F		2.5 V	
IC702 ⑩⑦ pin			STAT	3.3 V	0 V	
E-04 E-06 E-0C E-0E	Best "eye" (PD balance) adjustment not completed in specified time period.	① Scratches or contaminants on disc surface ② Focus servo circuit (check waveforms, voltages, and part values.) ③ Optical pickup	IC702 ⑩⑩ pin	FBAL	2.5 V ± 1.25 V	2.5 V ± 1.25 V
TJ701			R F		2.5 V	
IC702 ⑩② pin			F E		2.6 V	
IC702 ⑩⑥ pin			O F T	0 V	0 V	
IC702 ⑩② pin			/TLOCK	0 V	0 V	
E-08 E-0A	Focus or Tracking gain adjustment not completed in specified time period.	① Scratches or contaminants on disc surface ② Focus and Tracking servo circuit (check waveforms, voltages, and part values.) ③ Optical pickup	IC702 ⑩② pin	F E		2.6 V
IC702 ⑩③ pin			T E		2.5 V	
IC702 ⑩⑥ pin			O F T	0 V	0 V	
IC702 ⑩② pin			/TLOCK	0 V	0 V	

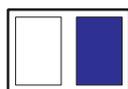
**A** SERVO CIRCUIT (P.C.Board : on page 20)



→ : Positive voltage line    - - - - - : Negative voltage line    ⇨ : CD signal Line

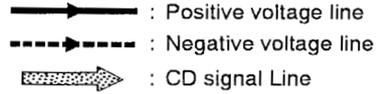
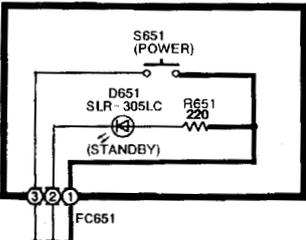


To **E** MAIN CIRCUIT (CN401) on page:19

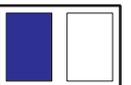
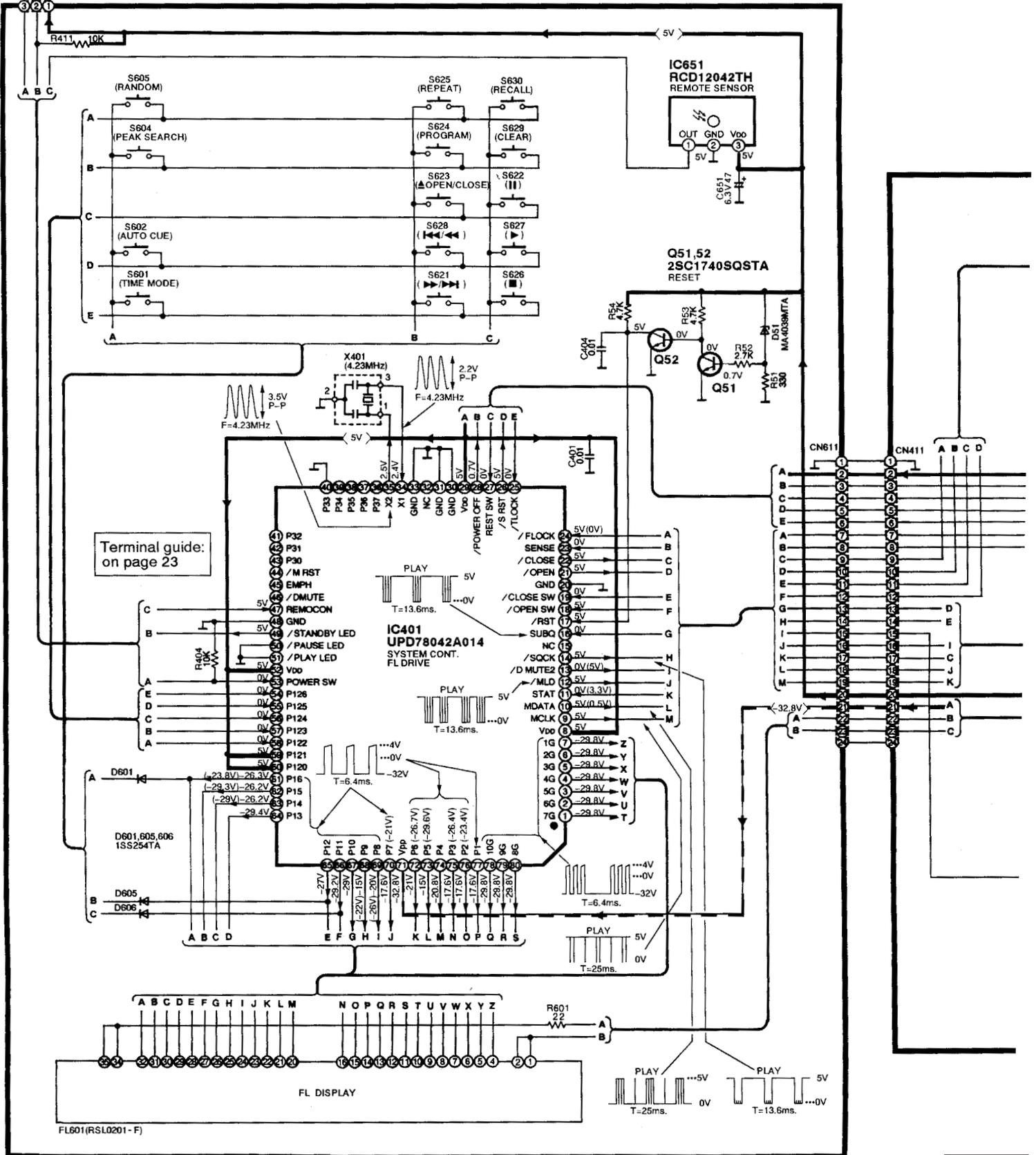


**L-PG480A**

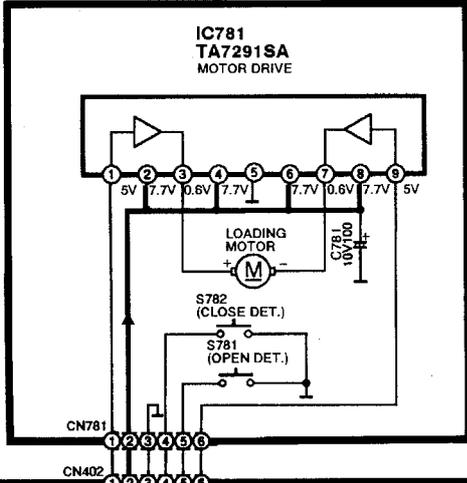
**B POWER SWITCH CIRCUIT**  
(P.C.Board: on page 20)



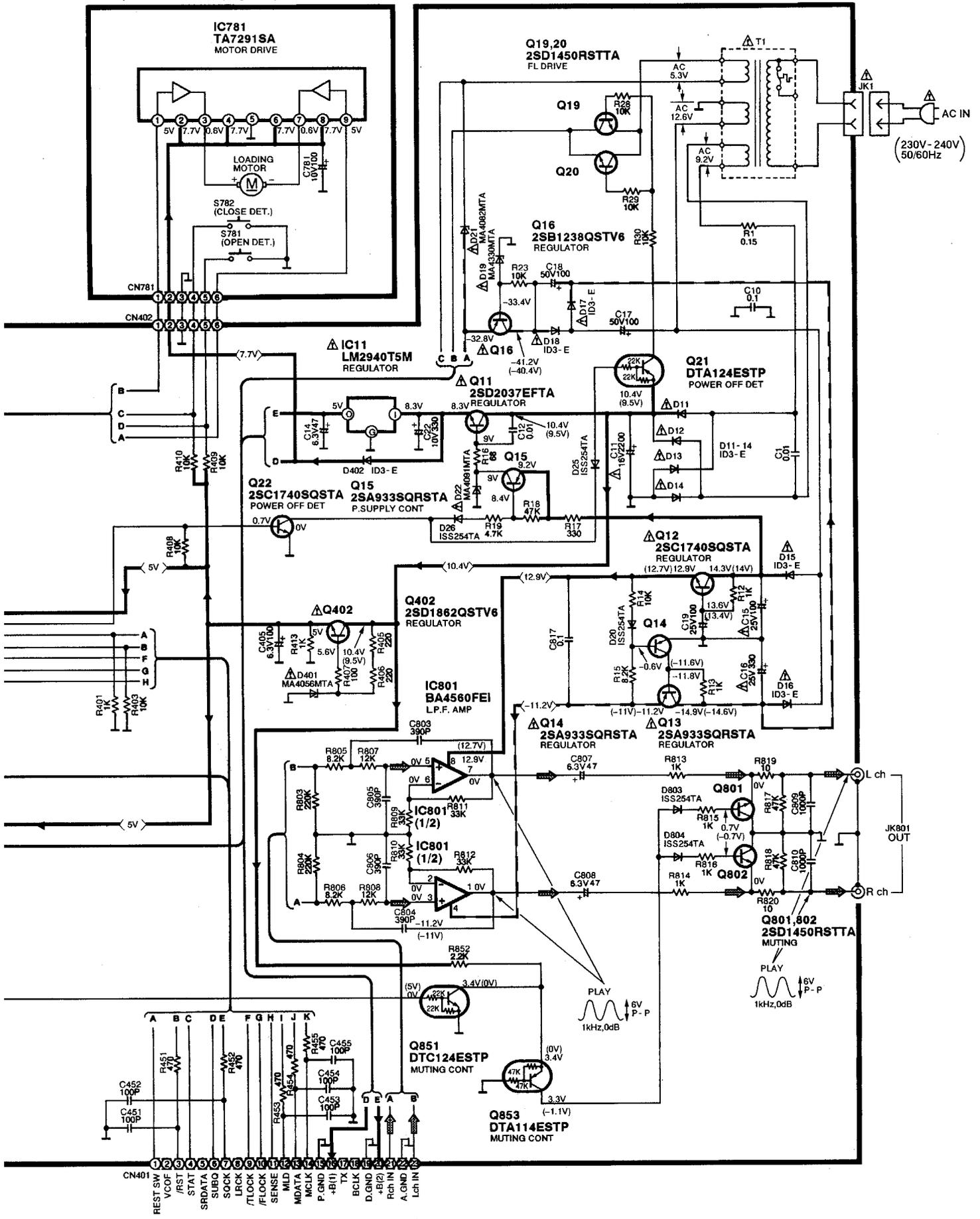
**C OPERATION CIRCUIT** (P.C.Board: on page 21)



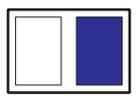
**D** LOADING MOTOR CIRCUIT  
(P.C. Board: on page 20)

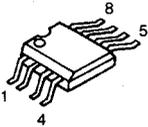
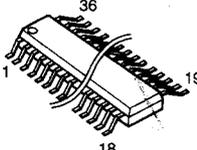
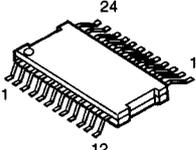
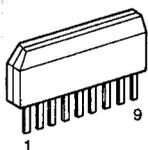
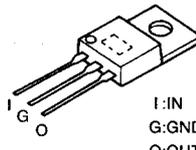
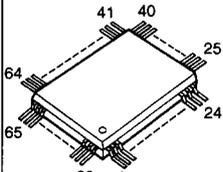
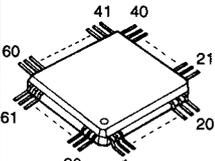
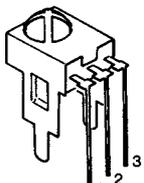
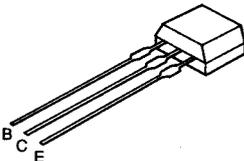
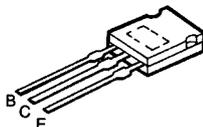
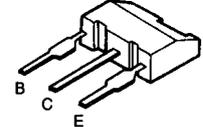
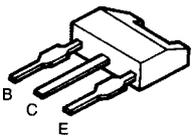
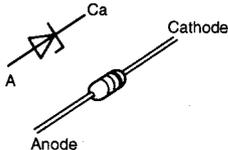
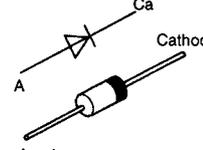
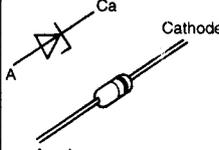
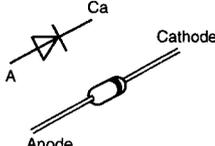
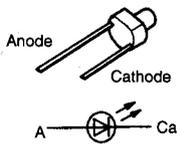


**E** MAIN CIRCUIT (P.C. Board: on page 21)



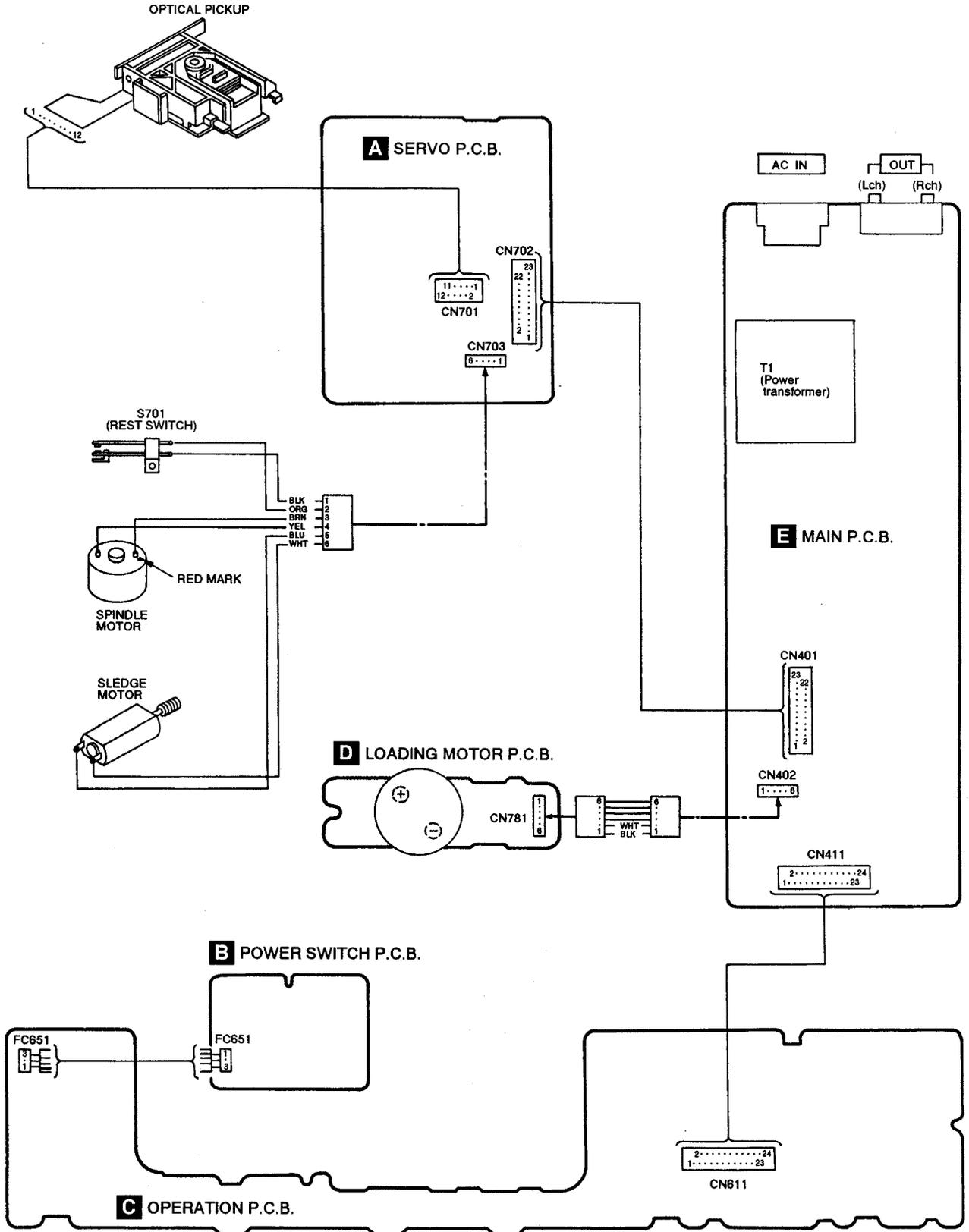
To **A** SERVO CIRCUIT (CN702) on page17



<p>BA4560FE1</p> 	<p>AN8805SBE1</p> 	<p>AN8389SE1</p> 	<p>TA7291SA</p> 	<p>LM2940T5</p>  <p>I:IN G:GND O:OUT</p>	<p>UPD78042A014</p> 
<p>MN662713RG1</p> 	<p>RCD12042TH</p> 	<p>2SA933SQR 2SC1740SQ DTA114ESTP DTA124ESTP DTC124EST</p>  <p>B C E</p>	<p>2SD2037EFTA</p>  <p>B C E</p>	<p>2SB1238QSTV6</p>  <p>B C E</p>	
<p>2SD1450RTA</p>  <p>E C B</p>	<p>2SD1862QSTV6</p>  <p>B C E</p>	<p>MA4039MTA MA4056MTA MA4082MTA MA4091-M</p>  <p>A Ca Cathode Anode</p>	<p>1D3-E</p>  <p>A Ca Cathode Anode</p>	<p>MA4330MTA</p>  <p>A Ca Cathode Anode</p>	
<p>1SS254TA</p>  <p>A Ca Cathode Anode</p>	<p>SLR-305LC</p>  <p>A Ca Cathode Anode</p>				

# Wiring Connection Diagram

**NOTE:**  
 BLK ..... Black  
 BLU ..... Blue  
 BRN ..... Brown  
 ORG ..... Orange  
 WHT ..... White  
 YEL ..... Yellow



## ■ Function of IC Terminals

### ● IC401 (UPD78042A014)

Pin No.	Terminal Name	I/O	Function
1 ~ 7	7G1G	O	FL grid drive signal output
8	VDD	—	Power supply (+ 5 V)
9	MCLK	O	Microprocessor command clock
10	MDATA	O	Microprocessor command data
11	STAT	I	Status signal input
12	/MLD	O	Microprocessor command load signal
13	/DMUTE2	O	No used, open
14	SQCK	O	External clock for sub-code Q register
15	NC	—	No used, open
16	SUBQ	I	Sub-code Q input
17	/RST	I	Reset signal input
18	/OPEN SW	I	Disc tray "open" sense switch status
19	/CLOSE SW	I	Disc tray "close" sense switch status
20	GND	—	Connect to GND
21	/OPEN	O	Open Disc Tray command output
22	/CLOSE	O	Close Disc Tray command output
23	SENSE	I	Sense signal input
24	/FLOCK	I	Focus servo pull-in signal
25	/TLOCK	I	Tracking servo pull-in signal
26	/S RST	O	Reset signal output (for servo)
27	REST SW	I	Innermost track sense switch status
28	/POWEROFF	O	Power off command output
29	VDD	—	Power supply (+ 5 V)
30	GND	—	Connect to GND
31	GND	—	Connect to GND
32	NC	—	No used, open
33	GND	—	Connect to GND
34	X1	I	Main clock (4.23 MHz) input
35	X2	O	Main clock output
36 ~ 39	P37 ~ P34	I	No used, open
40	P33	I	Connect to GND
41 ~ 43	P32 ~ P30	I	No used, open

Pin No.	Terminal Name	I/O	Function
44	/MRST	O	Reset signal output for MASH (IC801)
45	EMPH	O	Emphasis signal output
46	/DMUTE	O	Muting signal output
47	REMOCON	I	Remote control signal input
48	GND	—	Connect to GND
49	/STANDBY LED	O	STANDBY LED control signal output
50	/PAUSE LED	O	PAUSE LED control signal output
51	/PLAY LED	O	PLAY LED control signal output
52	VDD	—	Power supply (+ 5 V)
53	POWER SW	I	Power key switch signal input
54 ~ 58	P126 ~ P122	I	Key return signal input
59, 60	P121 ~ P120	—	Connect to GND
61 ~ 66	P16 ~ P11	O	FL anode drive signal and key scan signal output
67 ~ 70	P10 ~ P7	O	FL anode drive signal output
71	VPP	—	Power supply terminal for FL drive (– 32 V)
72 ~ 77	P6 ~ P1	O	FL anode drive signal output
78 ~ 80	10G ~ 8G	O	FL grid drive signal output

## ● IC701 (AN8805SBE1)

Pin No.	Terminal Name	I/O	Function
1	PD	I	APC amplifier input
2	LD	O	APC amplifier output (No used, open)
3	LD ON/OFF	I	APC ON/OFF control signal
4	REFSW	I	Capacitor connection for CROSS
5	VCC	—	Power supply
6	RF-	I	RF amplifier inversion signal input
7	RF	O	RF amplifier signal output
8	RFIN	I	AGC signal input
9	CAGC	I	AGC loop filter connection
10	ARF	O	AGC signal output
11	CENV	I	Capacitor connection for RF detection
12	CEA	I	Capacitor connection for HPF amplifier
13	CSBDO	I	Capacitor connection for-RF envelope detection
14	EDO	O	BDO signal output
15	CSBRT	I	Capacitor connection for RF envelope detection
16	OFTR	O	OFTR signal output
17	/RFDET	O	RFDET signal output
18	Vss	—	GND
19	ENV	O	3TENV signal output
20	VREF	O	VREF signal output
21	LD OFF	—	APC OFF signal control
22	VDET	O	VDET signal output
23	TEBPF	I	VDET signal input
24	CROSS	O	CROSS signal output
25	TEOUT	O	TE amplifier signal output
26	TE-	I	TE amplifier inversion signal input
27	FEOUT	O	FE amplifier signal output
28	FE-	I	FE amplifier inversion signal input
29	FBAL	I	F BAL control signal
30	TBAL	I	T BAL control signal
31	PDFR	—	Adjustment for I-V amplifier conversion resistor
32	PDER	—	Adjustment for I-V amplifier conversion resistor
33	E	I	I-V amplifier signal input
34	F	I	I-V amplifier signal input
35	B+D	I	I-V amplifier signal input
36	A+C	I	I-V amplifier signal input

## ● IC702 (MN662713RG1)

Pin No.	Terminal Name	I/O	Function
1	BCLK	O	Bit clock output for serial data
2	LRCK	—	L/R identification signal output
3	SRDATA	—	Serial data output
4	DVDD1	—	Power supply input (for digital circuit)
5	DVSS1	—	GND (for digital circuit)
6	TX	O	Digital audio interface signal output
7	MCLK	I	Microprocessor command clock signal input (Latches data at first transition)
8	MDATA	I	Microprocessor command data signal input
9	MLD	I	Microprocessor command load signal input
10	SENSE	O	Sense signal output (OFT, FESL, MAGEND, NAJEND, POSAD, SFG)
11	/FLOCK	O	Focus servo feeding signal output ("L": Feed)
12	/TLOCK	O	Tracking servo feeding signal output ("L": Feed)
13	BLKCK	O	Sub-code block clock signal output (fBLKCK = 75 Hz during normal playback) (no used, open)
14	SQCK	I	External clock signal input for sub-code Q resistor
15	SUBQ	O	Sub-code Q code output
16	DMUTE	I	Muting input ("H": Mute)
17	STAT	O	Status signal output (CRC, CUE, CLVS, TTSTVP, FCLV, SQCK)
18	/RST	I	Reset input
19	SMCK	—	1/2-divided clock signal of crystal oscillating at MSEL = "H" (fSMCK = 8.4672 MHz) 1/4-divided clock signal of crystal oscillating at MSEL = "L" (fSMCK = 4.2336 MHz) (no used, open)
20	PMCK	—	1/192-divided clock signal of crystal oscillating (fPMCK = 88.2 kHz) (no used, open)
21	TRV	O	Traverse forced feed output
22	TVD	O	Traverse drive output
23	PC	O	Spindle motor ON signal output ("L": ON)
24	ECM	O	Spindle motor drive signal output (forced mode output)
25	ECS	O	Spindle motor drive signal output (servo error signal output)
26	KICK	O	Kick pulse output
27	TRD	O	Tracking drive output
28	FOD	O	Focus drive output
29	VREF	I	D/A (drive) output (TVD, ECS, TRD, FOD, FBAL, TBAL) reference voltage input
30	FBAL	O	Focus balance adjustment output
31	TBAL	O	Tracking balance adjustment output
32	FE	I	Focus error signal input (analog input)
33	TE	I	Tracking error signal input (analog input)
34	RFENV	I	RF envelope signal input
35	VDET	I	Vibration detection signal input ("H": detection)
36	OFT	I	Off-track signal input ("H": off track)

## IC702 Continued

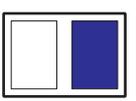
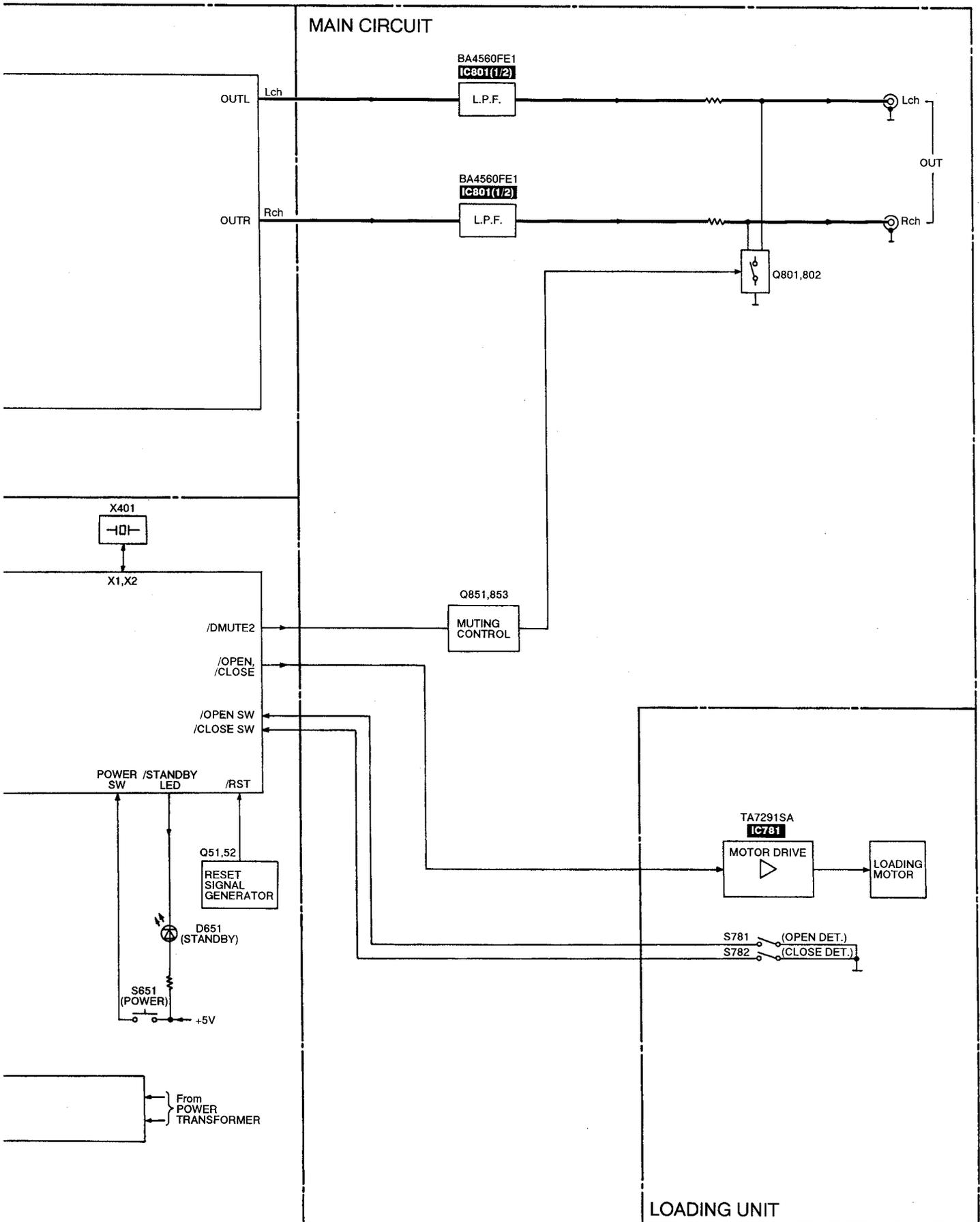
Pin No.	Terminal Name	I/O	Function
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detection signal input ("L": detection)
39	BDO	I	Dropout signal input ("H": Dropout)
40	LDON	O	Laser on signal output ("H": ON)
41	TES	O	Tracking error shunt signal output ("H": shunt) (no used, open)
42	PLAY	O	Play signal out ("H": PLAY) (no used, open)
43	WVEL	O	Double speed status signal output ("H": Double speed) (no used, open)
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	—	DSL bias (no used, open)
47	DSLFL	I/O	DSL loop filter
48	PLLFL	I/O	PLL loop filter
49	VCOFL	I/O	VCO loop filter
50	AVDD2	—	Power supply input (for analog circuit)
51	AVSS2	—	GND (for analog circuit)
52	EFM	—	EFM signal output (no used, open)
53	PCK	—	PLL extraction clock output (fPCK = 4.321 MHz during normal playback) (no used, open)
54	PDO	—	Phase comparison signal of EFM and PCK signals (no used, open)
55	SUBC	O	Sub-code serial data output (no used, open)
56	SBCK	I	Clock input for sub-code serial data
57	Vss	—	GND
58	X1	I	Crystal oscillating circuit input (f = 16.9344 MHz)
59	X2	O	Crystal oscillating circuit output (f = 16.9344 MHz)
60	VDD	—	Power supply input (for oscillating circuit)
61	BYTCK	—	Byte clock output (no used, open)
62	/CLDCK	O	Sub-code frame clock signal output (fCLDCK = 7.35 kHz during normal playback)
63	FCLK	—	Crystal frame clock signal output (fFCLK = 7.35 kHz, double = 14.7 kHz)
64	IPFLAG	O	Interpolation flag output ("H": Interpolation) (no used, open)
65	FLAG	O	Flag output (no used, open)
66	CLVS	O	Spindle servo phase synchronizing signal output ("H": CLV, "L": rough servo) (no used, open)
67	CRC	O	Sub-code CRC checked output ("H": OK, "L": NG) (no used, open)
68	DEMPH	O	De-emphasis ON signal output ("H": ON) (no used, open)
69	RESY	—	Frame resynchronizing signal output (no used, open)
70	/RST2	I	Reset input through MASH circuit ("L": Reset)
71	/TEST	I	Test input
72	AVDD1	—	Power supply input (for analog circuit)

Pin No.	Terminal Name	I/O	Function
73	OUTL	O	Left channel audio signal output
74	AVSS1	—	GND
75	OUTR	O	Right channel audio signal output
76	RSEL	I	RF signal polarity assignment input (at "H" level: RSEL = "H") (at "L" level: RSEL = "L")
77	CSEL	I	Crystal oscillating frequency designation input ("L": 16.9344 MHz, "H": 33.8688 MHz)
78	PSEL	I	Test input (normally, "L")
79	MSEL	I	Output frequency switching for SMCK terminal "H": SMCK = 8.4672 MHz "L": SMCK = 4.2336 MHz
80	SSEL	I	Output mode switching of SUBQ terminal ("H": Q code buffer mode)

## ● IC703 (AN8389SE1)

Pin No.	Terminal Name	I/O	Function
1	Vcc	—	Power supply
2	VREF	I	VREF input
3	IN4	I	Motor driver (4) input
4	IN3	I	Motor driver (3) input
5	GND	—	Ground connection
6	NC	—	Ground connection
7	NRESET	—	Reset input (no used, open)
8	GND	—	Ground connection
9	IN2	I	Traverse motor driver (2) input
10	PC2	I	PC2 (power cut) input
11	IN1	I	Spindle motor driver (1) input
12	PC1	I	PC1 (power cut) input
13	PVcc1	—	Power supply (1) for driver
14	PGND1	—	Ground connection (1) for driver
15	D1-	O	Spindle motor driver (1) reverse-action output
16	D1+	O	Spindle motor driver (1) forward-action output
17	D2-	O	Traverse motor driver (2) reverse-action output
18	D2+	O	Traverse motor driver (2) forward-action output
19	D3-	O	Tracking actuator (3) reverse-action output
20	D3+	O	Tracking actuator (3) forward-action output
21	D4-	O	Focus actuator (4) reverse-action output
22	D4+	O	Focus actuator (4) forward-action output
23	PGND2	—	Ground connection (2) for driver
24	PVcc2	—	Power supply (2) for driver





## ■ Replacement Parts List

**Notes:** \*Important safety notice:

 Components identified by  $\Delta$  mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

\*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

\*Remote Control Ass'y: Supply period for three years from termination of production.

\*[MB] Indicates in Remarks columns parts that are supplied by MBV.

\*Warning: This product uses a laser diode. Refer to caution statements on page 2.

\*ACHTUNG: Die Lasereinheit nicht zerlegen.

Die Lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

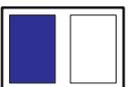
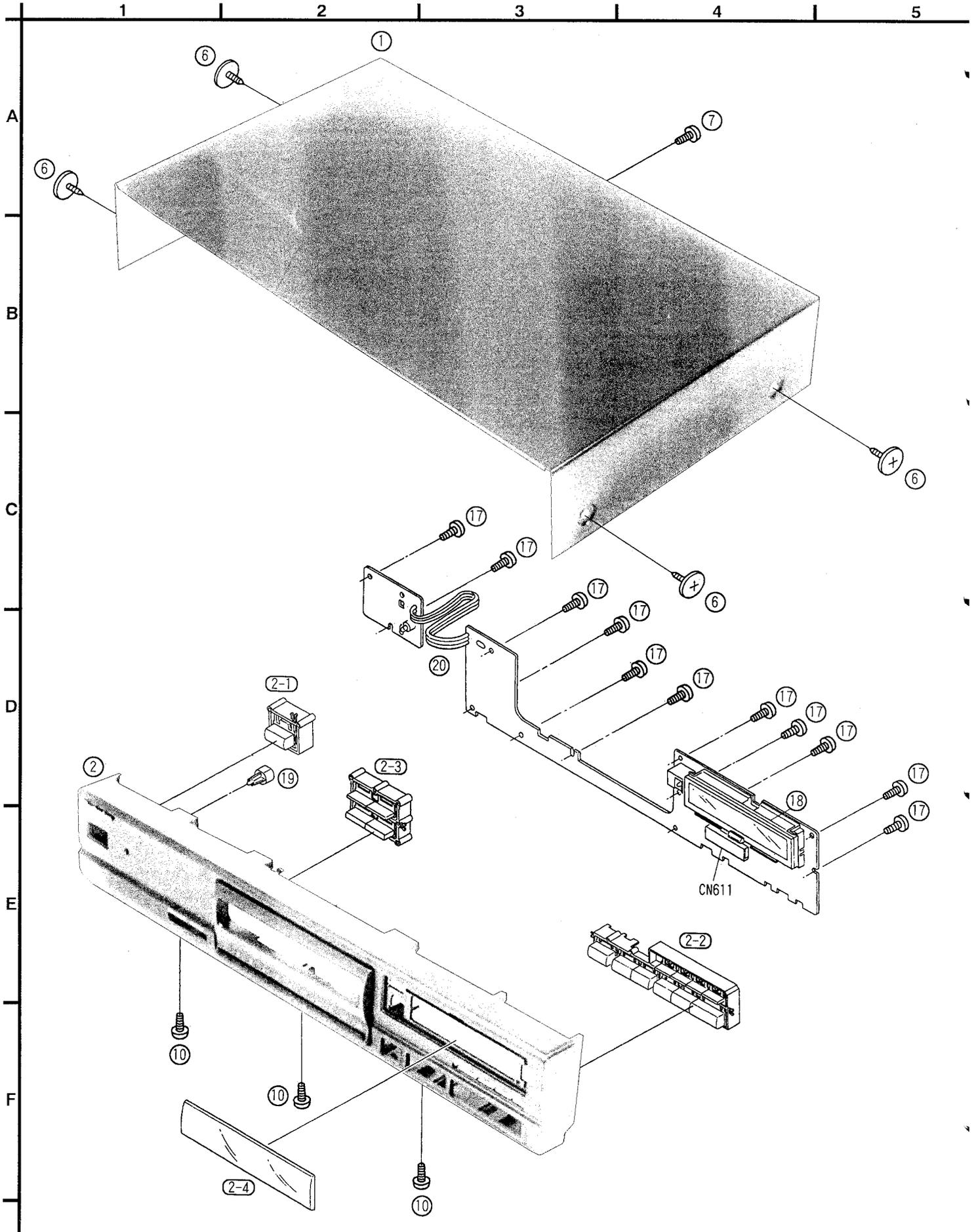
\*The "(SF)" mark denotes the standard part.

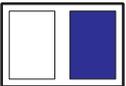
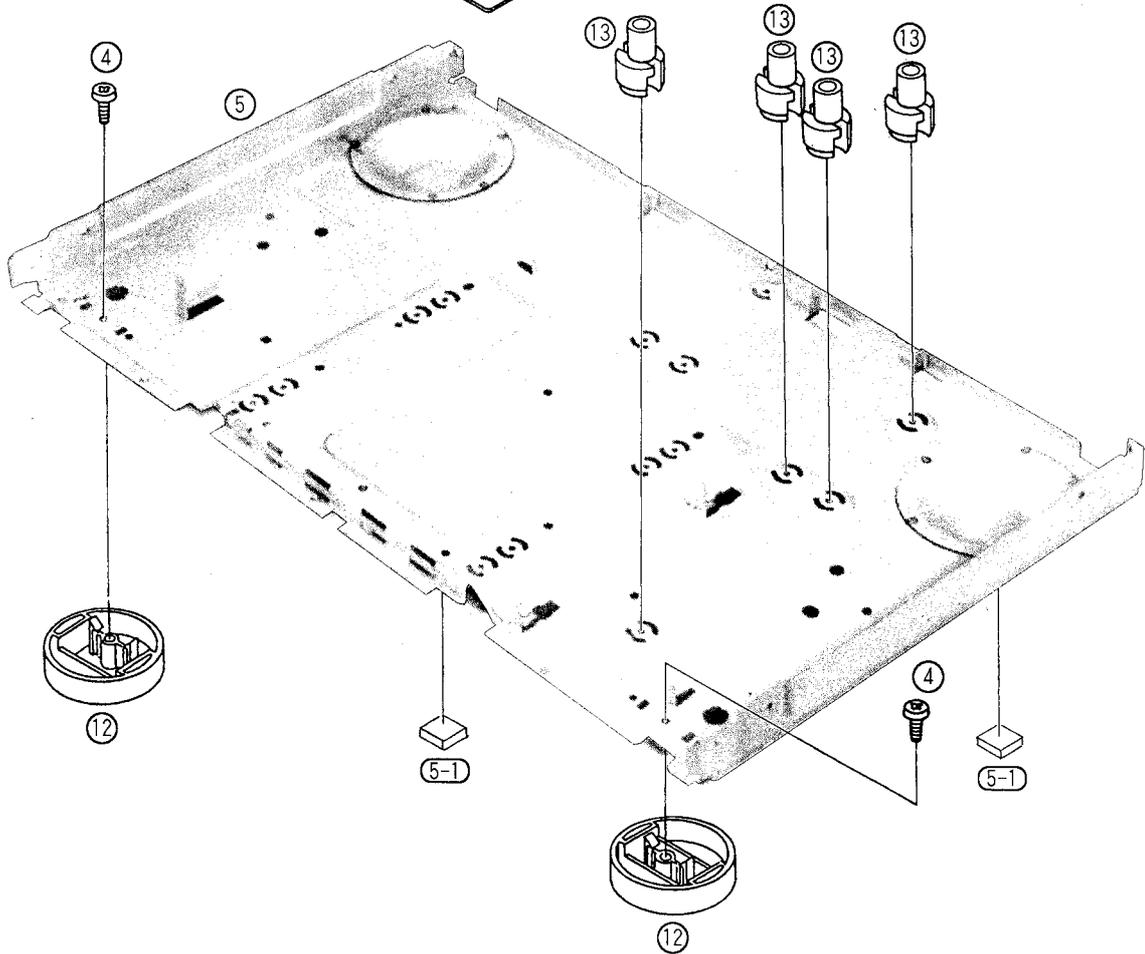
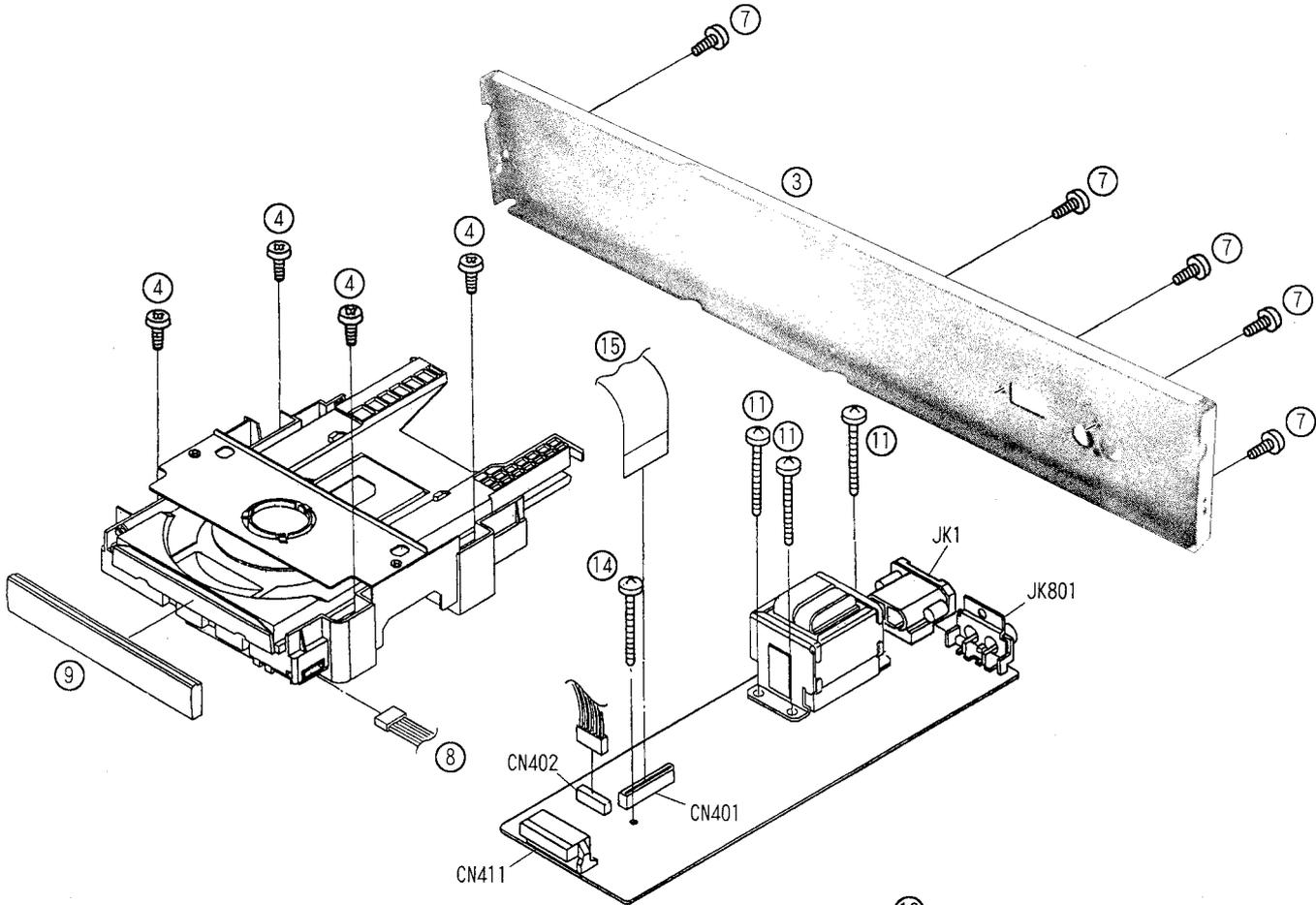
Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)				OSCILLATOR(S)	
IC11	LM2940T5	I. C. REGULATOR	$\Delta$				
IC401	UPD78042A014	I. C. SYSTEM CONTROL	[MB]	X401	RSXY4M23M01T	OSCILLATOR (4.23 MHz)	
IC651	RCD12042TH	I. C. REMOTE SENSOR		X701	RSXZ16M9M01T	OSCILLATOR (16.9344 MHz)	
IC701	AN8805SBE1	I. C. SERVO AMP.	[MB]			DISPLAY TUBE	
IC702	MN662713RG1	I. C. SERVO PROCESSOR	[MB]				
IC703	AN8389SE1	I. C. MOTOR DRIVE		FL601	RSL0201-F	DISPLAY TUBE	[MB]
IC781	TA7291SA	I. C. MOTOR DRIVE				SWITCH(ES)	
IC801	BA4560FE1	I. C. L. P. F. AMP.	[MB]	S601	EVQ21405R	SW, TIME MODE	
		TRANSISTOR(S)		S602	EVQ21405R	SW, AUTO CUE	
Q11	2SD2037EFTA	TRANSISTOR	$\Delta$	S604	EVQ21405R	SW, PEAK SEARCH	
Q12	2SC1740SQ	TRANSISTOR	$\Delta$	S605	EVQ21405R	SW, RANDOM	
Q13, 14	2SA933SQR	TRANSISTOR	$\Delta$	S621	EVQ21405R	SW, F. SKIP	
Q15	2SA933SQR	TRANSISTOR		S622	EVQ21405R	SW, PAUSE	
Q16	2SB1238QSTV6	TRANSISTOR	$\Delta$	S623	EVQ21405R	SW, OPEN/CLOSE	
Q19, 20	2SD1450RTA	TRANSISTOR		S624	EVQ21405R	SW, PROGRAM	
Q21	DTA124ESTP	TRANSISTOR		S625	EVQ21405R	SW, REPEAT	
Q22	2SC1740SQ	TRANSISTOR		S626	EVQ21405R	SW, STOP	
Q51, 52	2SC1740SQ	TRANSISTOR		S627	EVQ21405R	SW, PLAY	
Q402	2SD1862QSTV6	TRANSISTOR	$\Delta$	S628	EVQ21405R	SW, R. SKIP	
Q751	2SA933SQR	TRANSISTOR		S629	EVQ21405R	SW, CLEAR	
Q752	2SC1740SQ	TRANSISTOR		S630	EVQ21405R	SW, RECALL	
Q801, 802	2SD1450RTA	TRANSISTOR		S651	EVQ21405R	SW, POWER	
Q851	DTC124EST	TRANSISTOR		S781	RSHIA005	SW, TRAY OPEN DET.	
Q853	DTA114ESTP	TRANSISTOR		S782	RSHIA005	SW, TRAY CLOSE DET.	
		DIODE(S)				CONNECTOR(S)	
D11-18	1D3-E	DIODE	[MB] $\Delta$	CN401	RJS1A6823	CONNECTOR (23P)	
D19	MA4330MTA	DIODE	$\Delta$	CN402	RJT029W06VT	CONNECTOR (6P)	
D20	1SS254TA	DIODE		CN411	RJU076W24M1	CONNECTOR (24P)	[MB]
D21	MA4082MTA	DIODE	$\Delta$	CN611	RJT076W24M	CONNECTOR (24P)	[MB]
D22	MA4091-M	DIODE	$\Delta$	CN701	RJS12Q9ZA	CONNECTOR (12P)	[MB]
D25, 26	1SS254TA	DIODE		CN702	RJS1A6723-1Q	CONNECTOR (23P)	
D51	MA4039MTA	DIODE		CN703	RJT029W06VT	CONNECTOR (6P)	
D401	MA4056MTA	DIODE	$\Delta$	CN781	RJP6G17ZA	CONNECTOR (6P)	
D402	1D3-E	DIODE	[MB]			JACK(S)	
D601	1SS254TA	DIODE		JK1	SJS9236	AC INLET	$\Delta$
D605, 606	1SS254TA	DIODE		JK801	RJH3201N	LINE OUT	
D651	SLR-305LC	LED					
D701	1SS254TA	DIODE					
D803, 804	1SS254TA	DIODE					
		TRANSFORMER(S)					
T1	RTP1K4B024	POWER TRANSFORMER	[MB] $\Delta$				

Notes : \* Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)  
 \* Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM) , 1M=1,000k(OHM)

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS	R763	ERDS2TJ823T	1/4W 82K	C730	ECFR1E104ZF5	25V 0.1U
			R764	ERDS2TJ393	1/4W 39K	C731, 732	ECEA0JKA221I	6.3V 220U
			R765	ERDS2TJ224T	1/4W 220K	C733	ECFR1E104ZF5	25V 0.1U
R1	ERQ16NKWR15E	1W 0.15	R766	ERDS2TJ104	1/4W 100K	C734	ECEA1AKA221I	10V 220U
R12, 13	ERDS2TJ102	1/4W 1K	R772, 773	ERDS2TJ220T	1/4W 22	C735-737	ECBT1E223ZF	25V 0.022U
R14	ERDS2TJ103	1/4W 10K	R775, 776	ERDS2TJ392T	1/4W 3.9K	C738	ECFR1C183KR2	16V 0.018U
R15	ERDS2TJ822	1/4W 8.2K	R777	ERDS2TJ102	1/4W 1K	C739	ECBT1C152MR5	16V 1500P
R16	ERDS2TJ680T	1/4W 68	R803, 804	ERDS2TJ224T	1/4W 220K	C740	ECBT1C272MR5	16V 2700P
R17	ERDS2TJ331	1/4W 330	R805, 806	ERDS2TJ822	1/4W 8.2K	C742	ECFR1C273KR2	16V 0.027U
R18	ERDS2TJ473	1/4W 47K	R807, 808	ERDS2TJ123	1/4W 12K	C743	ECBT1E223ZF	25V 0.022U
R19	ERDS2TJ472	1/4W 4.7K	R809-812	ERDS2TJ333	1/4W 33K	C744	ECBT1C822MS5	16V 8200P
R23	ERDS2TJ103	1/4W 10K	R813-816	ERDS2TJ102	1/4W 1K	C747, 748	ECBT1C103NS5	16V 0.01U
R28-30	ERDS2TJ103	1/4W 10K	R817, 818	ERDS2TJ473	1/4W 47K	C751	ECEA1CKA100I	16V 10U
R51	ERDS2TJ331	1/4W 330	R819, 820	ERDS2TJ100	1/4W 10	C752	ECFR1E104ZF5	25V 0.1U
R52	ERDS2TJ272T	1/4W 2.7K	R852	ERDS2TJ222	1/4W 2.2K	C765	ECBT1H331KB5	50V 330P
R53, 54	ERDS2TJ472	1/4W 4.7K				C766	ECBT1H391KB5	50V 390P
R401	ERDS2TJ102	1/4W 1K			CAPACITORS	C767	ECEA1HKN010I	50V 1U
R403, 404	ERDS2TJ103	1/4W 10K	C1	ECFTD103KXL	50V 0.01U	C768	ECFR1E682KR	25V 6800P
R405, 406	ERDS2TJ221	1/4W 220	C10	ECFR1E104ZF5	25V 0.1U	C769	ECBT1C222MR5	16V 2200P
R407	ERDS2TJ101	1/4W 100	C11 Δ	ECA1CM222B	16V 2200U	C772-775	ECFR1E104ZF5	25V 0.1U
R408-411	ERDS2TJ103	1/4W 10K	C12	ECBT1C103NS5	16V 0.01U	C776	ECBT1H180J5	50V 18P
R413	ERDS2TJ102	1/4W 1K	C14	ECEA0JKA470B	6.3V 47U	C777	ECBT1H680J5	50V 68P
R451-455	ERDS2TJ471	1/4W 470	C15 Δ	ECEA1EU101	25V 100U	C781	ECEA1AKA101I	10V 100U
R601	ERDS2TJ220T	1/4W 22	C16 Δ	ECEA1EU331B	25V 330U	C803-806	ECBT1H391KB5	50V 390P
R651	ERDS2TJ221	1/4W 220	C17, 18	ECEA1HU101	50V 100U	C807, 808	ECEA0JKA470B	6.3V 47U
R701	ERDS2TJ561	1/4W 560	C19	ECEA1EU101	25V 100U	C809, 810	ECBT1H102KB5	50V 1000P
R703	ERDS2TJ823T	1/4W 82K	C22	ECEA1AU331	10V 330U	C817	ECFR1E104ZF5	25V 0.1U
R707, 708	ERDS2TJ334	1/4W 330K	C401	ECBT1C103NS5	16V 0.01U			
R709	ERDS2TJ683	1/4W 68K	C404	ECBT1C103NS5	16V 0.01U			
R711	ERDS2TJ154	1/4W 150K	C405	ECEA0JKA101B	6.3V 100U			
R712	ERDS2TJ221	1/4W 220	C451-455	ECBT1H101KB5	50V 100P			
R717, 718	ERDS2TJ102	1/4W 1K	C651	ECEA0JKA470I	6.3V 47U			
R721	ERDS2TJ101	1/4W 100	C703	ECEA0JKA101I	6.3V 100U			
R722	ERDS2TJ683	1/4W 68K	C704	ECFR1E104ZF5	25V 0.1U			
R723	ERDS2TJ183T	1/4W 18K	C705	ECEA1HKA010I	50V 1U			
R724	ERDS2TJ393	1/4W 39K	C706	ECBT1H101KB5	50V 100P			
R725	ERDS2TJ472	1/4W 4.7K	C707	ECFR1C273KR2	16V 0.027U			
R726	ERDS2TJ474	1/4W 470K	C708	ECBT1C472MR5	16V 4700P			
R727	ERDS2TJ153	1/4W 15K	C709	ECFR1C473KR2	16V 0.047U			
R728	ERDS2TJ822	1/4W 8.2K	C714	ECEA0JKA101I	6.3V 100U			
R731	ERDS2TJ223	1/4W 22K	C716	ECBT1H561KB5	50V 560P			
R732	ERDS2TJ183T	1/4W 18K	C717	ECFR1E104ZF5	25V 0.1U			
R733	ERDS2TJ822	1/4W 8.2K	C718	RCQ52C0224J9	63V 0.22U [MB]			
R735, 736	ERDS2TJ101	1/4W 100	C721, 722	ECBT1H270J5	50V 27P			
R745	ERDS2TJ155	1/4W 1.5M	C723	ECEA0JKA221I	6.3V 220U			
R751	ERDS2TJ102	1/4W 1K	C724	ECFR1E104ZF5	25V 0.1U			
R752, 753	ERDS2TJ392T	1/4W 3.9K	C725, 726	ECBT1H102KB5	50V 1000P			
R754	ERDS2TJ103	1/4W 10K	C727, 728	ECEA1HKA010I	50V 1U			
R761, 762	ERDS2TJ103	1/4W 10K						

# ■ Cabinet Parts Location





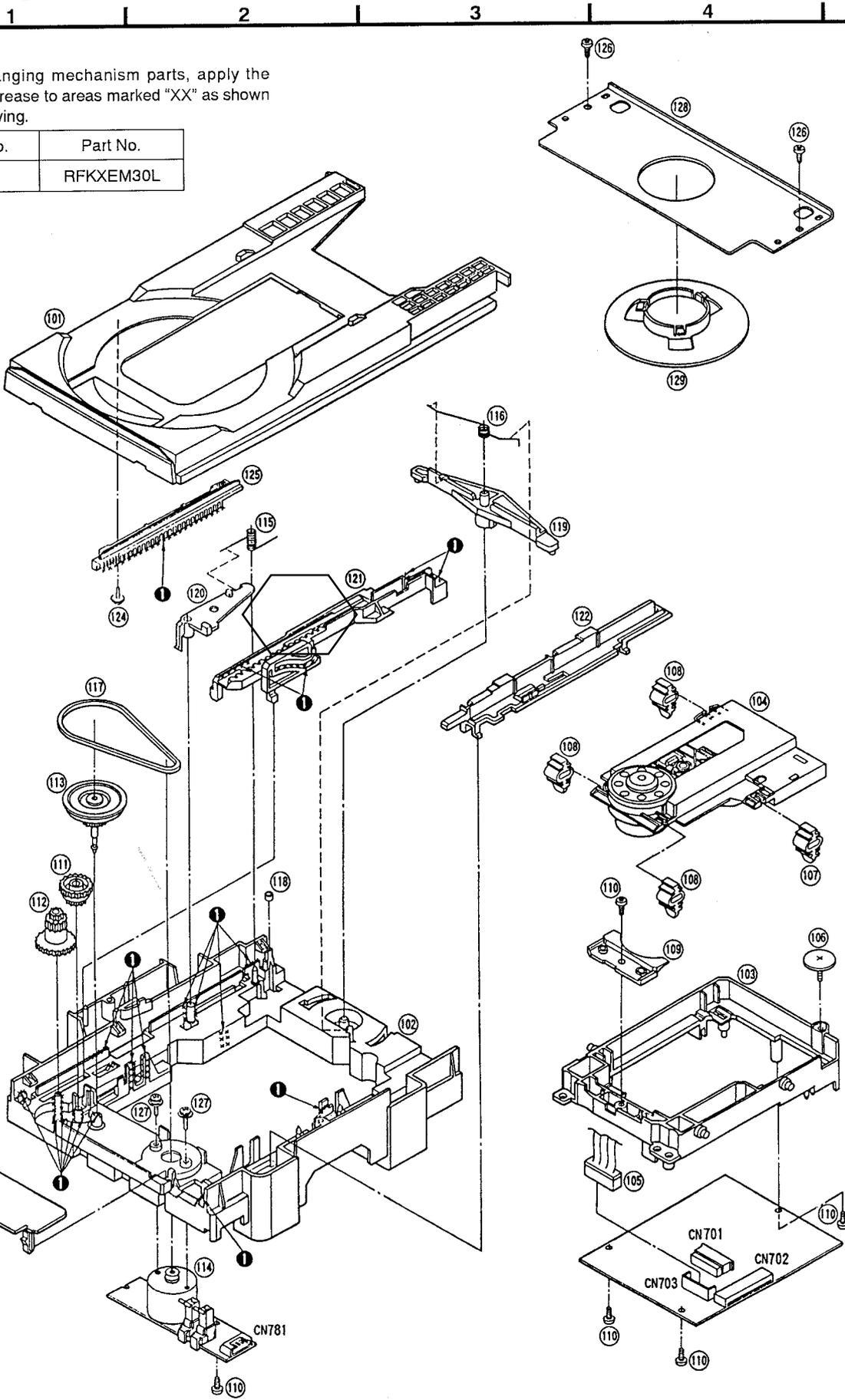
# Loading Unit Parts Location

**Note:**

When changing mechanism parts, apply the specified grease to areas marked "XX" as shown in the drawing.

Ref No.	Part No.
①	RFKXEM30L

A  
B  
C  
D  
E  
F



5

Note: The reference number SA represent the grease and tool used for this unit.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET PARTS					
1	RKMO98-K	CABINET	[MB]	125	RFKNLPG460AA	DRIVE RACK ASS'Y	[MB]
2	FYPO673Z-K	FRONT PANEL ASS'Y	[MB]	126	XTB3+8JFZ	SCREW	
2-1	RGU1029-K	BUTTON, POWER	[MB]	127	XYN2+F6FZ	SCREW	
2-2	RGU1197-K	BUTTON, MAIN	[MB]	128	RFKNLPG460AB	CLAMP BASE ASS'Y	[MB]
2-3	RGU1199-K	BUTTON, SUB	[MB]	129	RFKNLPG460AC	CLAMPER ASS'Y	[MB]
2-4	RKWO378A-R	PANEL	[MB]			PACKING MATERIALS	
3	RFKHLPG480AE	REAR PANEL ASS'Y	[MB] (EB)	P1	RPG2960	PACKING CASE	[MB]
3	RGRO154E-K	REAR PANEL	[MB] (E, EG)	P2	RPN0861	CUSHION	[MB]
4	XTB3+8JFZ	SCREW		P3	XZB23X35C03	PROTECTION COVER	
5	RFKJLPG370AE	BOTTOM CHASSIS ASS'Y	[MB]	P4	SPP730	PROTECTION COVER	
5-1	FMGO384-T	FOOT	[MB]			ACCESSORIES	
6	RHD30035-K1	SCREW		A1	EUR643900	REMOTE CONTROL	[MB]
7	XTBS3+8JFZ1	SCREW		A1-1	UR64EC1638	BATTERY COVER	[MB]
8	REX0577-1	CABLE ASS'Y (6P)	[MB]	A2	RJA0043-C	AC MAINS LEAD	[MB] Δ (E, EG)
9	RGKO703-K	ORNAMENT	[MB]	A2	RJA0044-C	AC MAINS LEAD	[MB] Δ (EB)
10	XTB3+10JFZ	SCREW		A3	RFKSLPG580AE	INSTRUCTIONS MANUAL ASS'Y	[MB] (E)
11	RHD30053	SCREW	[MB]	A3	RQT3479-B	INSTRUCTIONS MANUAL	[MB] (EB)
12	RKA0040B-K1	FOOT	[MB]	A3	RQT3477-D	INSTRUCTIONS MANUAL	[MB] (EG)
13	FMRO377-1	P. C. B. SUPPORT	[MB]	A4	SJP2249-3	STEREO CONNECTION CABLE	
14	XTBR3+20JFZ	SCREW	[MB]	A5	RQA0117	WARRANTY CARD	
15	FWJ5223130EE	FFC (23P)	[MB]	A6	RQCB0169	SERVICE CENTER LIST	
17	RHD26021	SCREW	[MB]			GREASE OR TOOL	
18	FMRO826-K	FL HOLDER	[MB]	SA1	RFKXEM30L	GREASE	
19	RGL0267-Q	LED INDICATOR	[MB]	SA2	SZZP1054C	TEST DISC	
20	FWJ1803150KK	FLAT CABLE (3P)					
		LOADING UNIT PARTS					
101	RGQ0130-K	TRAY	[MB]				
102	RFKJLPG460AE	MECHANISM CHASSIS ASS'Y	[MB]				
103	FMRO719-W1	MID. CHASSIS	[MB]				
104	RAE1100Z-2	TRAVERSE UNIT	[MB]				
105	REX0576	CABLE ASS'Y	[MB]				
106	RHD30047	SCREW	[MB]				
107	FMGO337-K	DAMPING RUBBER	[MB]				
108	FMGO337-Q	DAMPING RUBBER	[MB]				
109	FMRO750-W	STOPPER	[MB]				
110	XTBS26+8J	SCREW					
111	RDG0142	RELAY GEAR					
112	RDG0259	DRIVE GEAR	[MB]				
113	RDPO065	RELAY PULLY					
114	REMO047	MOTOR ASS'Y	[MB]				
115	RMEO063	LOCK LEVER SPRING					
116	RMEO087	ASSIST SPRING					
117	FMGO158	BELT					
118	FMGO338-Q	STOPPER RUBBER	[MB]				
119	RML0177	CHANGE LEVER					
120	RML0178-1	LOCK LEVER					
121	FMMD112	SLIDE PLATE 1	[MB]				
122	FMMD113	SLIDE PLATE 2	[MB]				
123	FMRO721-K	GEAR COVER	[MB]				
124	RHD20009-1	SCREW					

## ■ Packaging

