

Service Manual

Compact Disc Changer

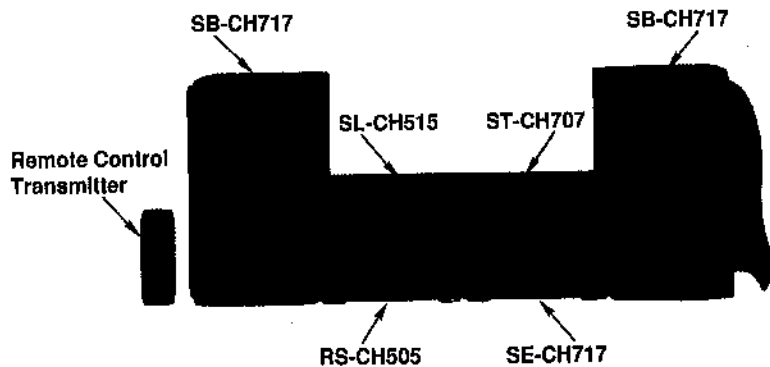
Compact Disc Player


MASH^{*1}
 multi-stage noise shaping

SL-CH515

Colour

(K) Black Type



•The photograph shows the SC-CH717 model.

Area

Suffix for Model No.	Area	Colour
(E)	Europe, Oceania	(K)
(GC)	Asia, Latin America, Middle Near East and Africa	

**System: SC-CH515
SC-CH717**

Because of unique interconnecting cables, when a component requires service, send or bring in the entire system.

NEW TRAVERSE DECK (RAE0113Z)

Specifications

- Audio
DA converter 1 bit 2 DAC MASH
- CD Graphics for (GC) area
Video format NTSC (M)/PAL (B, D, G, H, I)
- Pickup
Wavelength 780 nm
- General
Dimensions (W×H×D) 270×89×320 mm
Weight 2.9 kg

Notes:

- Weight and dimensions shown are approximate.
- Design and specifications are subject to change without notice.

*1

MASH is a trademark of NTT.

System	Tuner/Sound Processor	Compact Disc Player	Amplifier	Cassette Deck	Speakers
**SC-CH515	ST-CH505	SL-CH515	SE-CH515A	RS-CH505	*SB-CH515A
**SC-CH717	ST-CH707		SE-CH717		SB-CH717
**SC-CH717	ST-CH505				

Notes: *2for Europe area

*3for Asia, Latin America, Middle Near East and Africa area

*4for Oceania

*5Made in PAES

Technics

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NOTE:

Refer to the service manual for Model No. SE-CH515A (Order No. DA9312323C2) or SE-CH717 (Order No. AD9312322C3) for Information on "ACCESSORIES", "STACKING THE COMPONENTS", "CONNECTIONS" and "PACKING".

Handling Precautions for Traverse Deck

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body.

So, be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

● Handling of traverse deck (optical pickup)

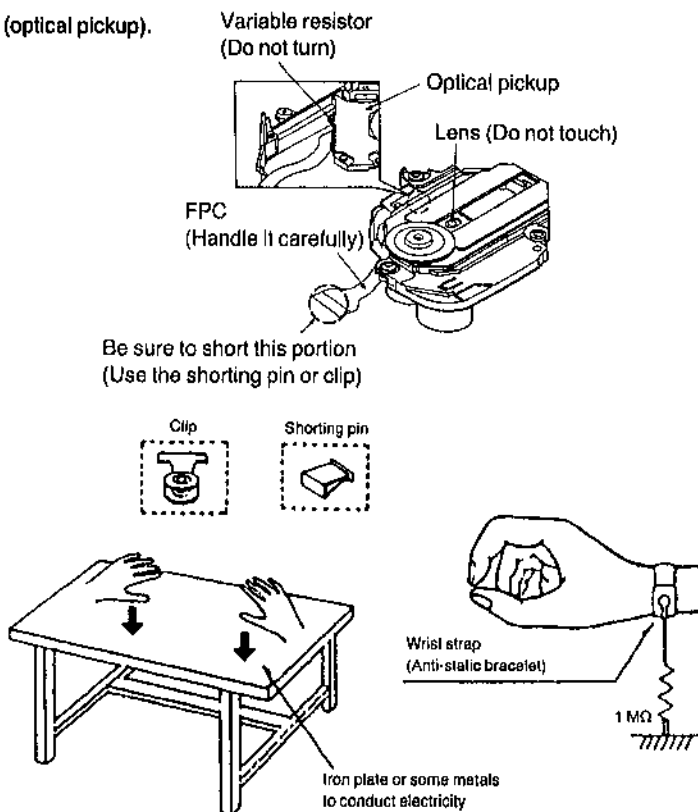
1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board (FPC board). When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board (FPC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

● Grounding for electrostatic breakdown prevention

1. Human body grounding
Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table grounding
Put a conductive material (sheet) or steel sheet on the area where the traverse deck (optical pickup) is placed, and ground the sheet.

Caution:

The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).



Precaution of Laser Diode

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pick up lens.
Wave length: 780 nm
Maximum output radiation power from pick up: 100 μ W/VDE

Laser radiation from the pick up unit is safety level, but be sure the followings:

1. Do not disassemble the optical pick up unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pick up lens for a long time.

ACHTUNG: Dieses produkt enthält eine laserdioden. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit abgestrahlt.

Wellenlänge: 780 nm

Maximale strahlungsleistung der lasereinheit: 100 µW/VDE

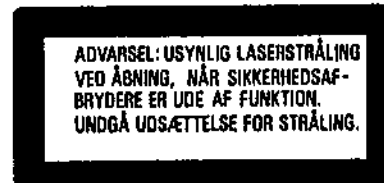
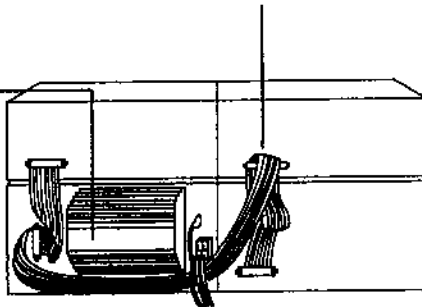
Die strahlung an der lasereinheit ist ungefährlich, wenn folgende punkte beachtet werden:

1. Die lasereinheit nicht zerlegen, da die strahlung an der freigelegten laserdioden gefährlich ist.
2. Den werkseitig justierten einstellregler der lasereinheit nicht verstellen.
3. Nicht mit optischen instrumenten in die fokussierlinse blicken.
4. Nicht über längere zeit in die fokussierlinse blicken.



LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

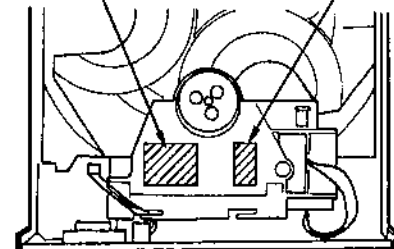
Heat prevention
cover



VARO! Avattessa ja suojakitus ohitettessa olet altistina näkymätön lasersträlylle. Älä katso silmiesi.

VARO! Osynlig laserstråling når denne del er åben og afbryderen er udkoplet. Betrakta ej strålen.

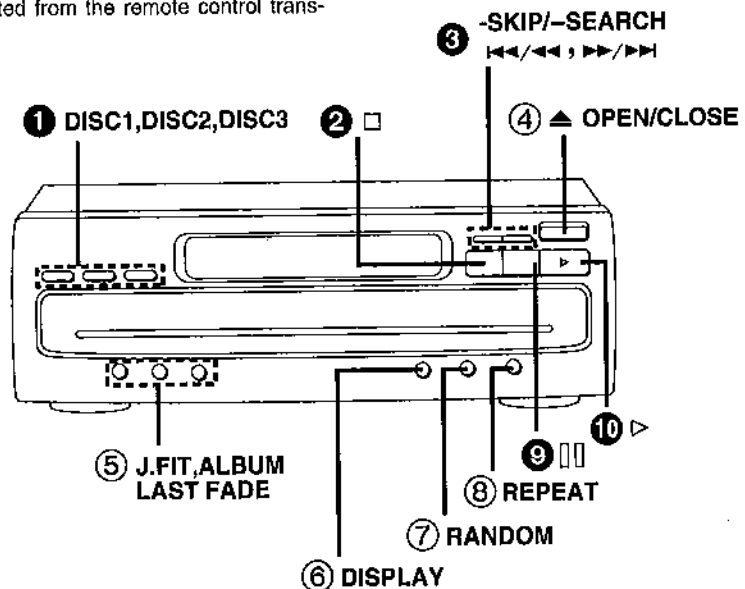
ADVARSEL! Usynlig laserstråling når deksel åbnes og sikkerhedsbryter. Undgå eksponering for strålen.



Location of Controls

- 1 Disc buttons
- 2 Stop button
- 3 Skip/search buttons
- 4 Loading drawer open/close button
- 5 Compact disc edit buttons
- 6 Display button
- 7 Random play button
- 8 Repeat play button
- 9 Pause button
- 10 Play button and indicator

The functions indicated by the numbers with black background (for example 1) can also be activated from the remote control transmitter.

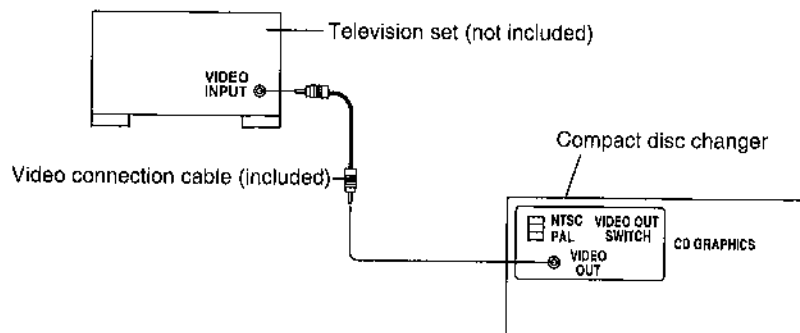


CD Graphics (For areas except Australia and New Zealand)

This unit has CD Graphics function. You can enjoy karaoke complete with visual imagery and the text by connecting your TV set to this unit. Use CDs marked **GRAPHICS** to enjoy CD graphics.

Notes

- Use CDs marked **GRAPHICS** to enjoy CD graphics. No picture will appear with CDs which are not marked in this way.
- Skipping forward or backward during CD graphics play may cause the picture to shift for a short period of time. This is not indicative of malfunctioning. If play is left to continue, the picture will return to normal.
- This unit does not come with a graphics channel selection or fade-out function.
- Set the CD changer according to the television set.
NTSC: When receiving NTSC signals
PAL: When receiving PAL signals
- For details, see the operation manual of the television set.



■ Listening to Compact Discs

Sequential play

Sequential play refers to play all tracks on the loaded discs in sequence beginning with the first track of the first disc and continuing in order to the last track of the last disc.

- 1 Switch on the power on the amplifier.**
- 2 Press $\blacktriangle$ OPEN/CLOSE to open the loading drawer.**
- 3 Load the disc(s) on the disc tray(s).**
Do not load 8 cm (3") and 12 cm (5") discs on the same disc tray.
Be sure to load a 8 cm (3") disc correctly at center position.
- 4 Press $\blacktriangle$ OPEN/CLOSE to close the loading drawer.**
- 5 Press $\triangleright$.**
Disc play begins from the first track on the first disc.
Play stops automatically when the last track on the last disc finishes playing.
- 6 Adjust the volume level as you like on the amplifier.**

To stop the disc play:

Press $\square$.

To temporarily stop the disc play:

Press $\square$.

$\triangleright$ indicator flashes.

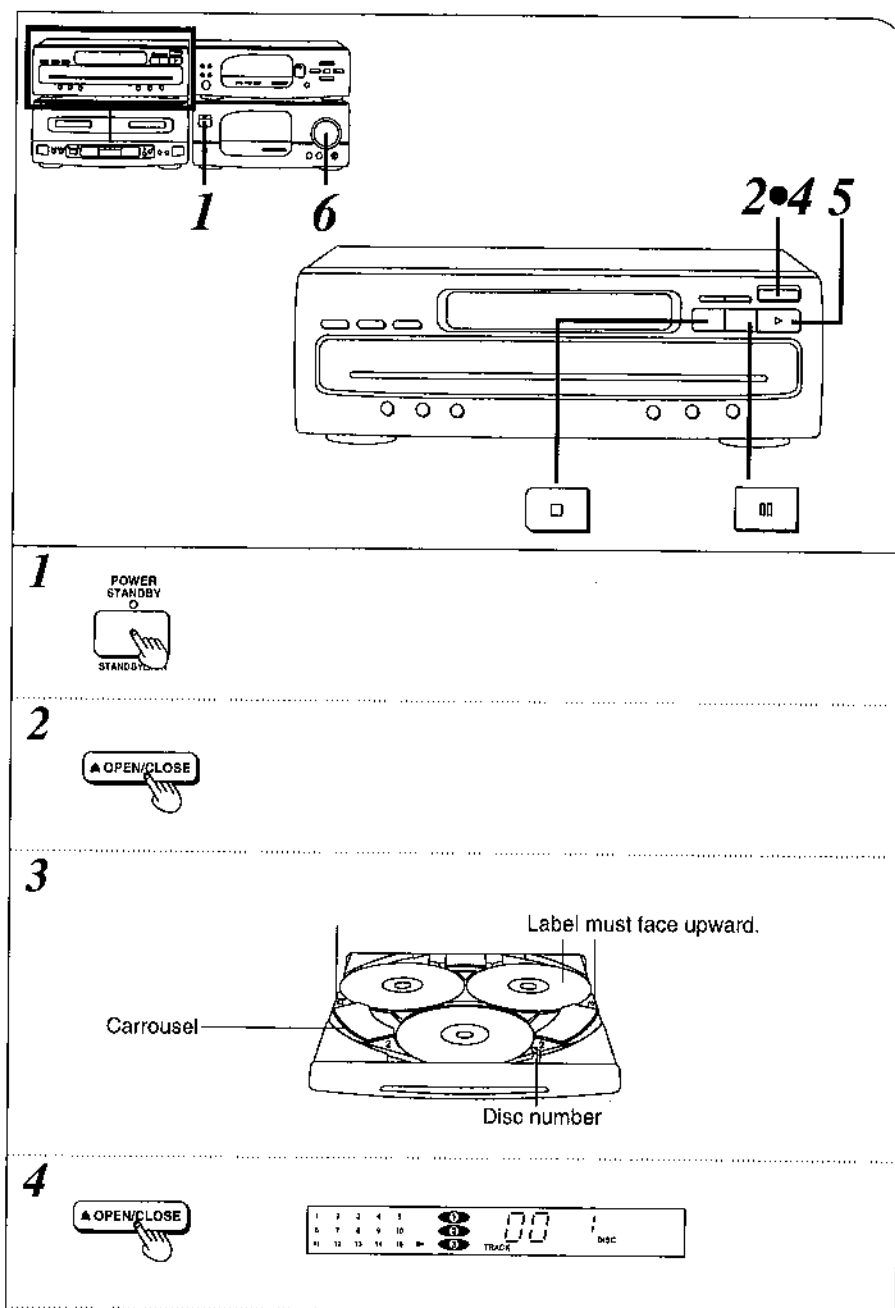
To play again, press $\triangleright$.

For your reference:

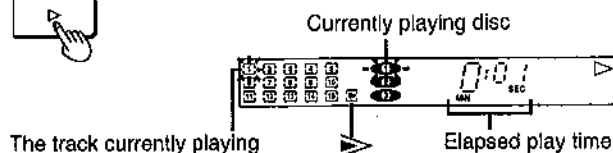
If you press $\triangleright$ instead of $\blacktriangle$ OPEN/CLOSE after inserting disc(s), the loading drawer will close and play will start directly.

The compact disc will automatically stop when a different sound mode is selected during its operation.

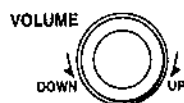
(To be continued)



5



6



(Continued)

About ▷ Indicator:

While halted: Lights in orange.

While playing: Lights in green.

When "▷" appears on the display:

It indicates there are 16 or more tracks on the disc at the playing position.

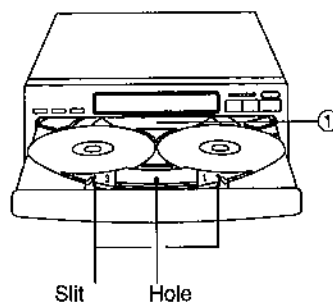
Concerning the total playing time on the display:

The total playing time displayed includes the silent sections between tracks. Hence, there will be a difference between the total playing time and the liner notes included with the disc.

Notes

- Do not cover the hole or slits. Otherwise the incorrect operation will take place.
- Do not insert another disc onto tray placed at ①, although the tray is partially showing, its disc is in the play position. **A**
- Be sure to load the discs correctly in the center position as shown in the drawing. **B**
- Do not touch the carousel or the loading drawer while it is moving.
- Do not turn the tray forcibly by hand because it may fail to operate normally.
- If the discs are not correctly loaded, play may not start. In such a case, reinsert the disc as following.
 1. Switch the power to the standby mode on the amplifier, and then back on.
 2. Press OPEN/CLOSE to open the loading drawer.
 3. Load the disc(s) on the tray(s) correctly.
- If you press OPEN/CLOSE while the play indicator (▷) is lit in green, the drawer will open to half position. To open fully, follow the procedure below.
 1. Press □.
 2. Press OPEN/CLOSE to close the loading drawer.
 3. Press OPEN/CLOSE again to open the drawer.
- Do not move this changer with a compact disc inside the unit. If a disc comes off the disc tray, it might be scratched or the changer might become incapable of playing.

(To be continued)

A**B**

8 cm (3") CD



12 cm (5") CD



(Continued)

To select the desired disc A

Press DISC1, DISC 2 or DISC 3 to select the disc which you want to play.

The play will automatically start from the first track of the disc you select.

To confirm the total playing time of the disc currently playing

Press DISPLAY.

The display will change (as described below) each time you press the button.

In the stop mode: B

- ① The display shows the total playing time of the disc at the playing position.
- ② The display shows the disc number and the total track number of the disc currently playing.

In the play mode: C

- ① The display shows the track number of the disc at the playing position.
- ② The display shows the elapsed time of the track currently playing.

To exchange discs during play

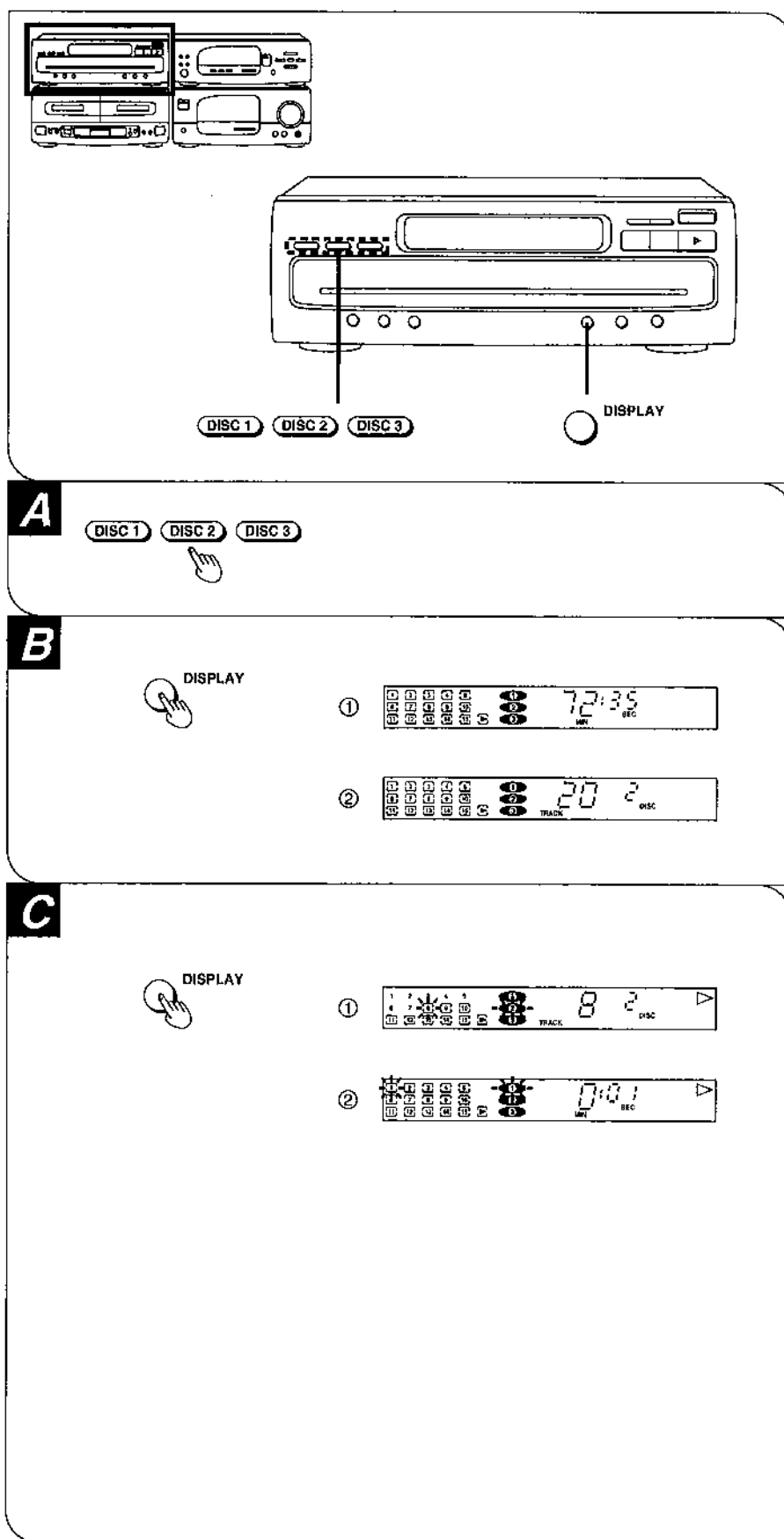
While a disc is playing, you can exchange discs.

1. Press OPEN/CLOSE during playing.
The loading drawer will open at half position.
2. Exchange the discs.
3. Press OPEN/CLOSE again to close the loading drawer.

After the last track on the current disc finishes playing, the changer will play all the remaining disc(s) loaded, and then stop.

Note

If you play a disc with the loading drawer open, the changer will automatically stop when the last track on the current disc finishes playing.



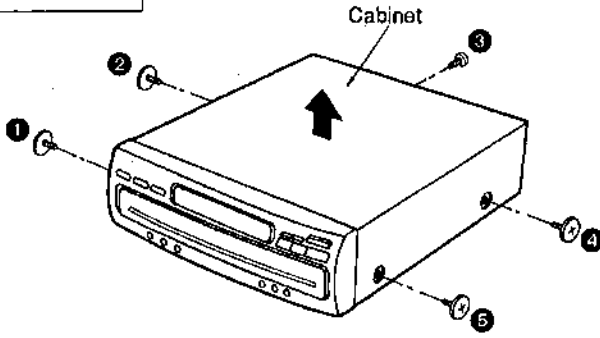
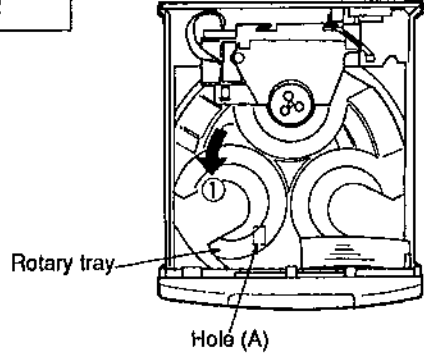
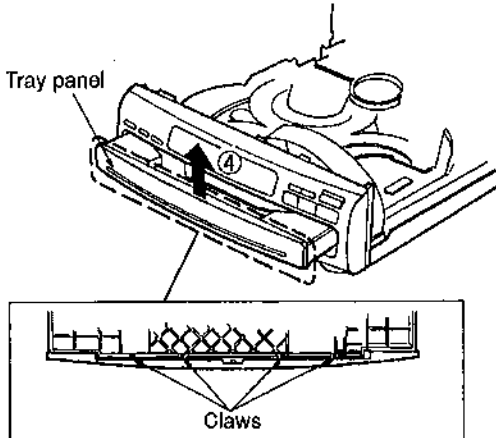
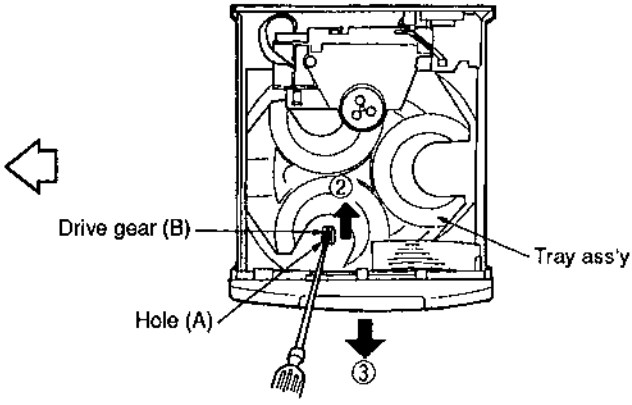
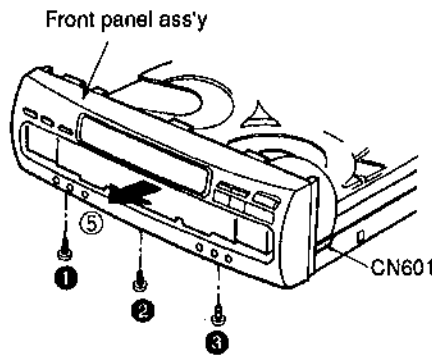
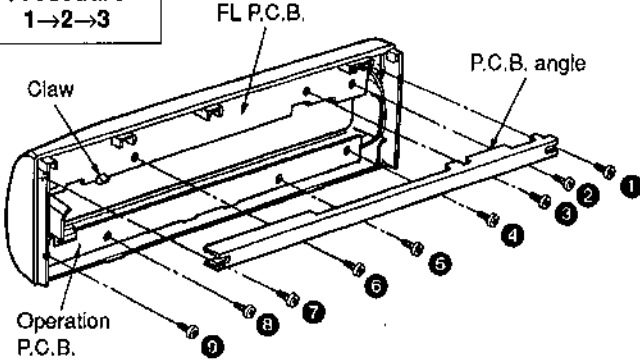
Disassembly Instructions

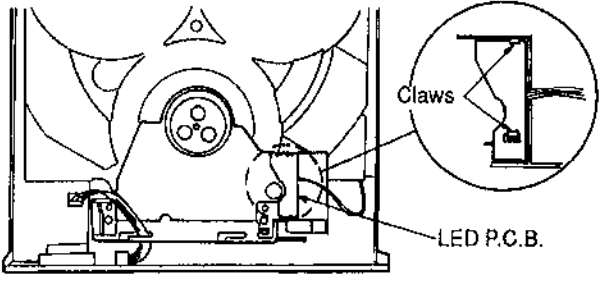
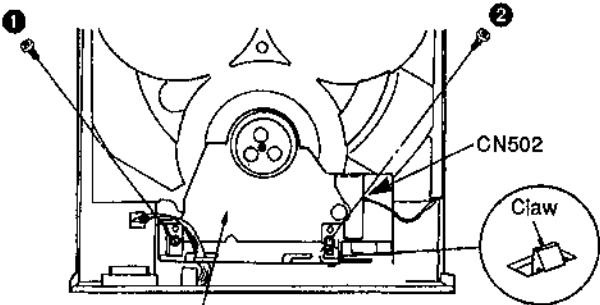
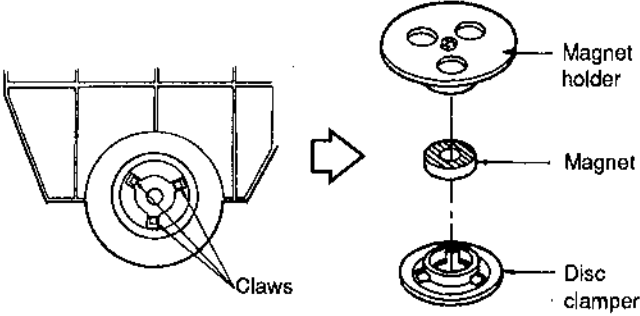
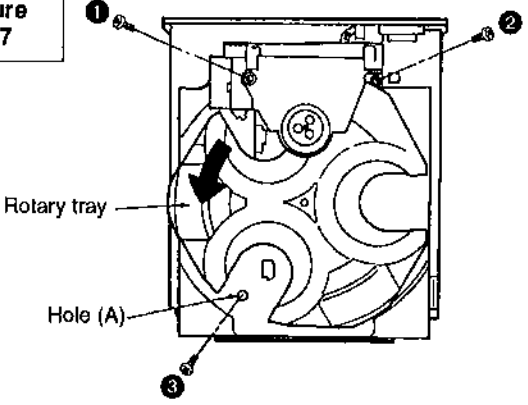
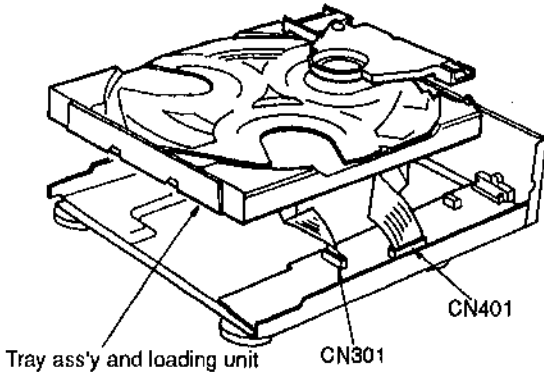
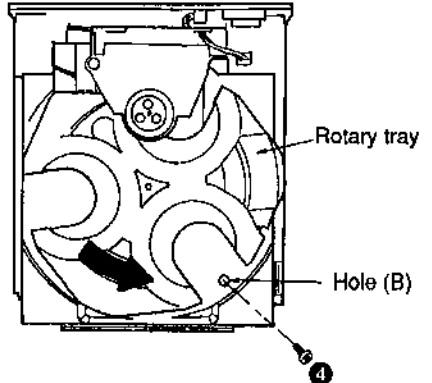
Warning: This product uses a laser diode. Refer to caution statements on page 2.

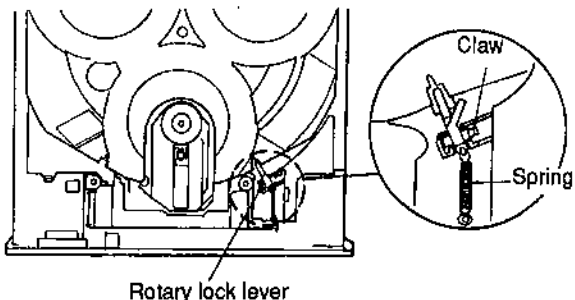
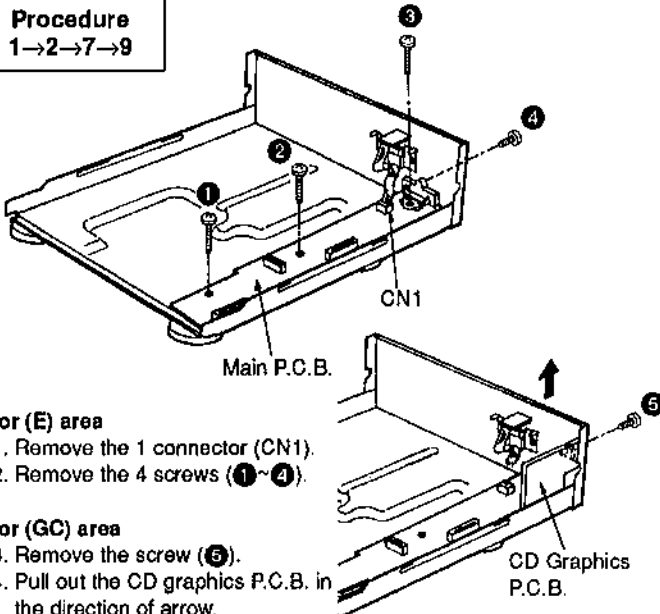
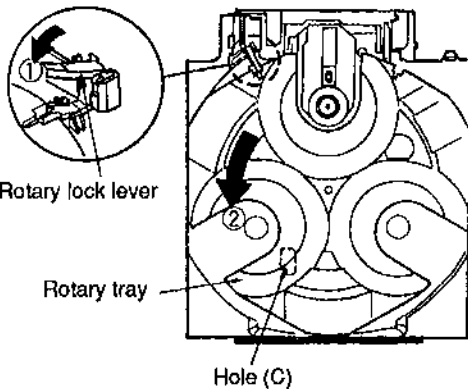
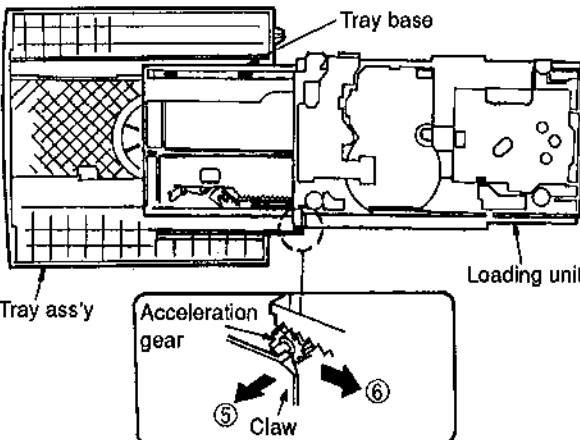
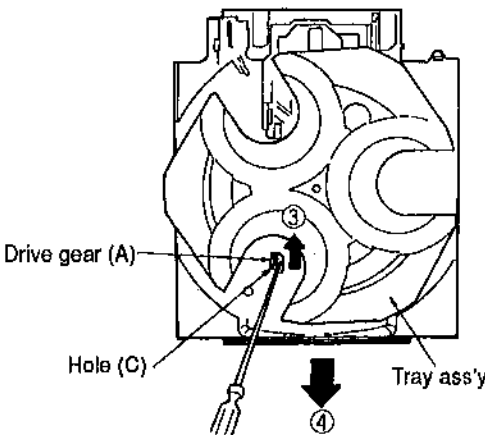
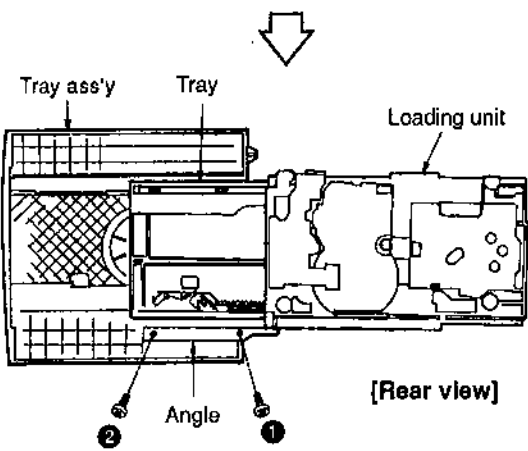
ACHTUNG: Die Lasereinheit nicht zerlegen.

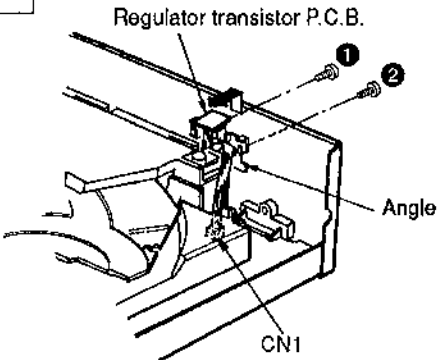
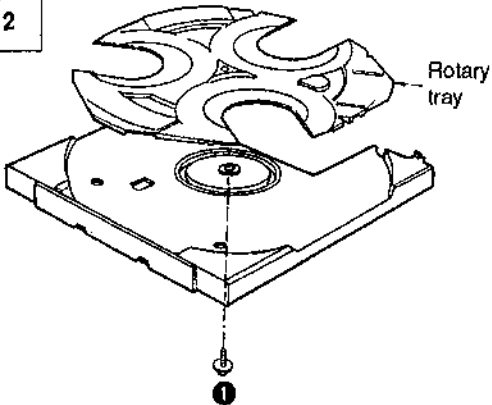
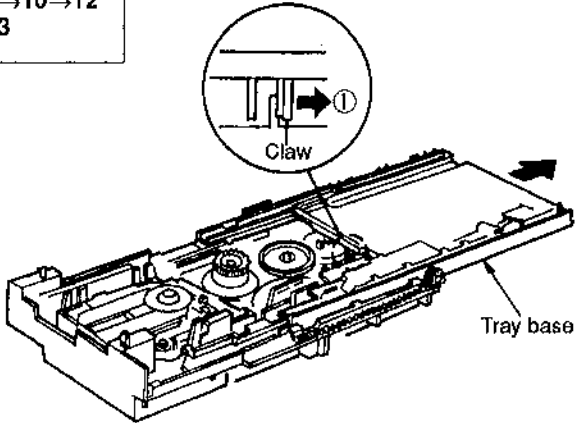
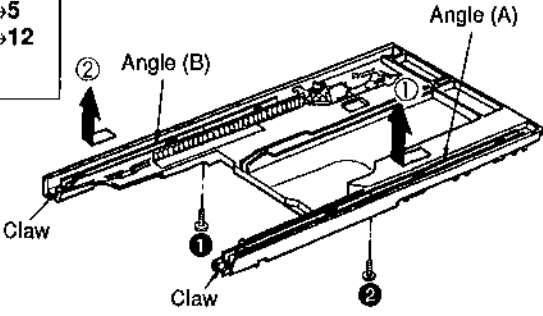
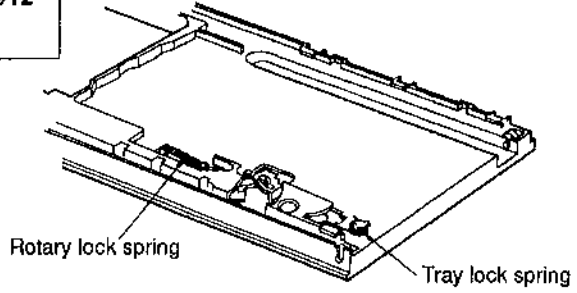
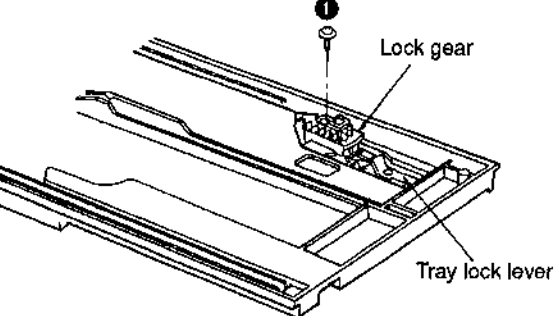
Die Lasereinheit darf nur gegen eine vom Hersteller spezifizierte Einheit ausgetauscht werden.

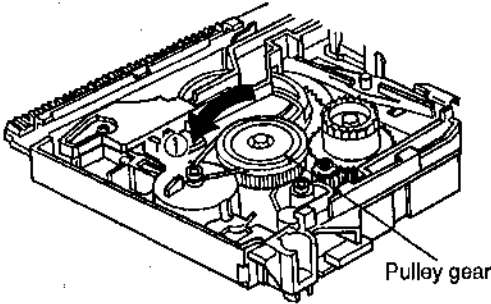
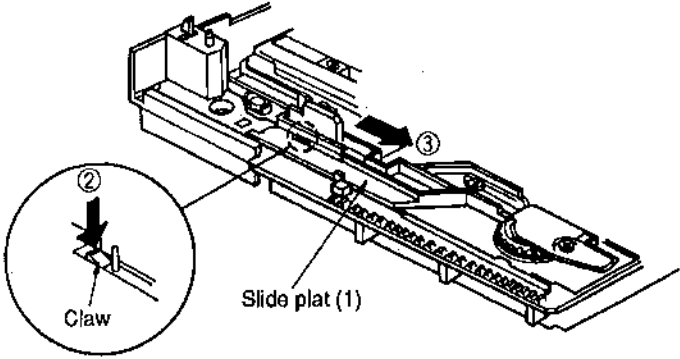
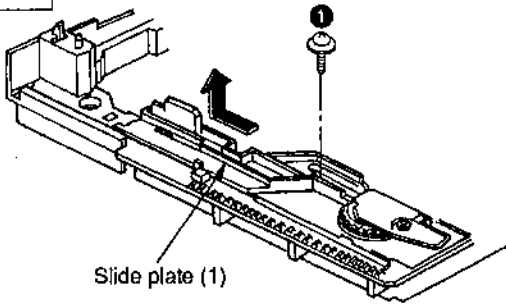
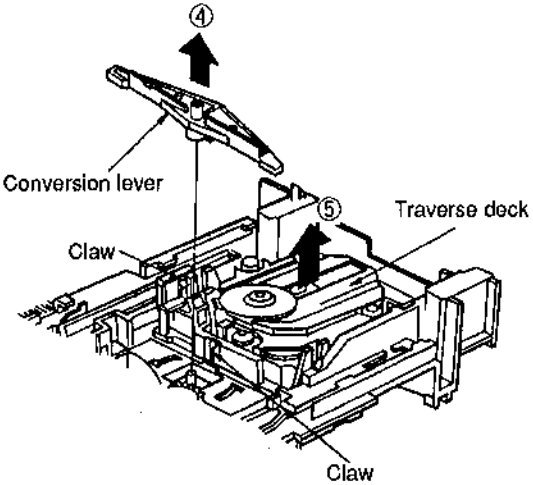
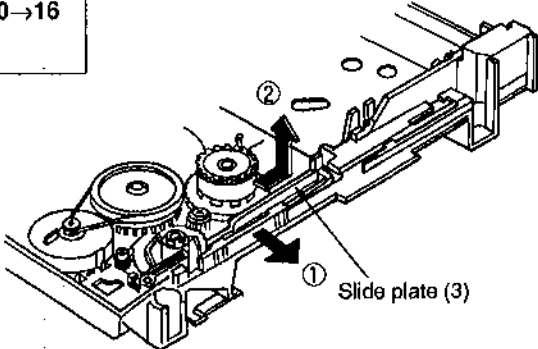
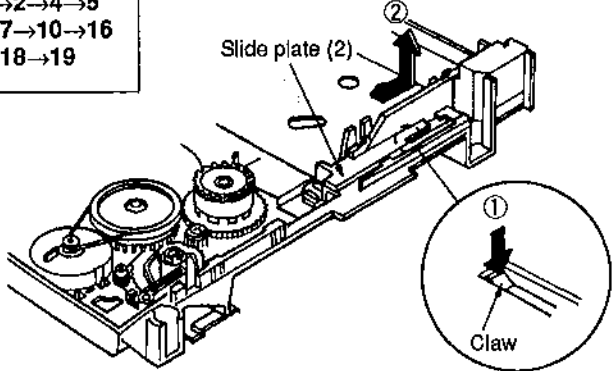
"ATTENTION SERVICER" Some chassis components may have sharp edges. Be careful when disassembling and servicing.

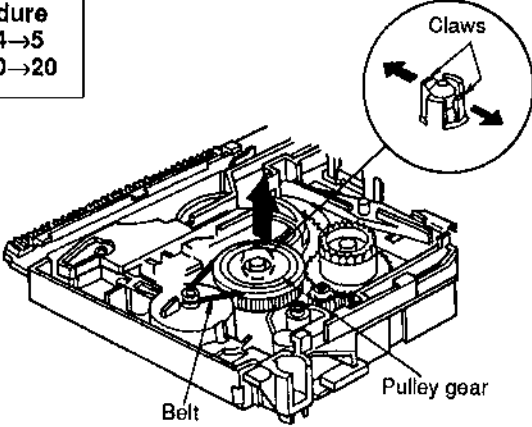
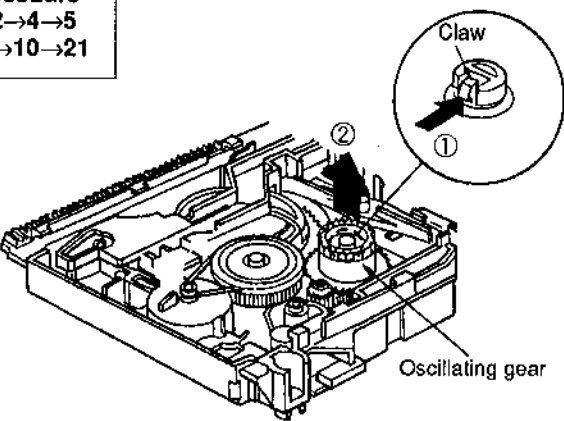
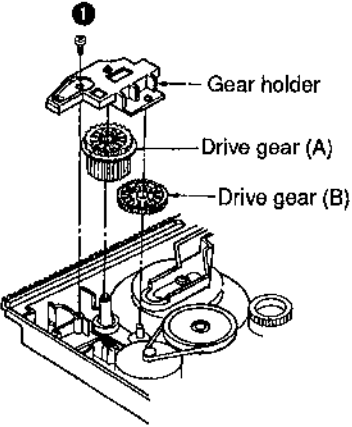
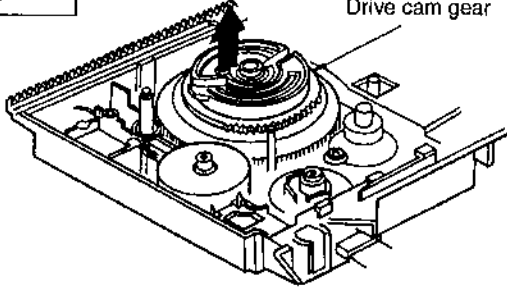
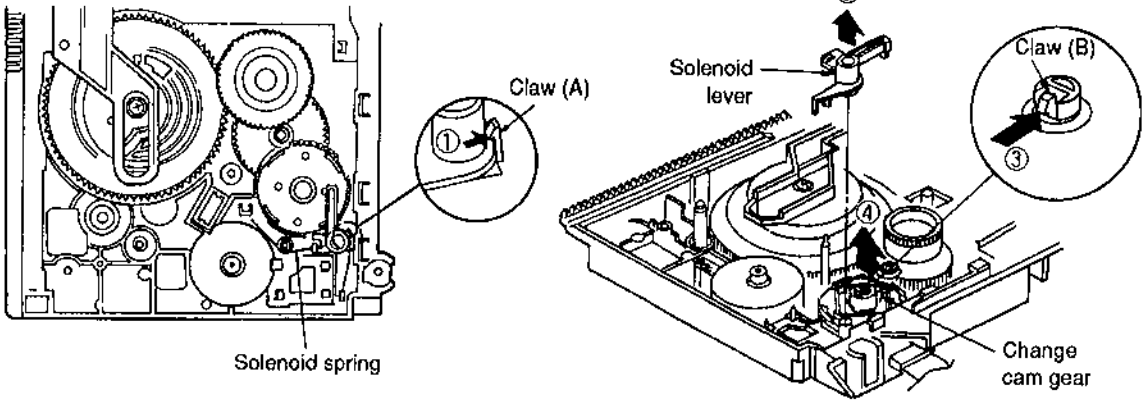
Ref. No. 1	Removal of the Cabinet	Ref. No. 2	Removal of the Front Panel Ass'y
Procedure 1	 1. Remove the 5 screws (①~⑤). 2. Remove the cabinet in the direction of arrow.	 1. Rotate the rotary tray to the position that can be confirmed the hole (A) in the direction of arrow ①.	
	 3. Remove the 4 claws and then remove the tray panel in the direction of arrow ④.	 2. Pressing the drive gear (B) in the direction of arrow ② with inserting the (-) screwdriver in the hole (A), the tray ass'y moves slightly in the direction of arrow ③.	
	 4. Remove the 3 screws (①~③). 5. Remove the 1 connector (CN601). 6. Remove the front panel ass'y in the direction of arrow ⑤.	 1. Remove the 9 screws (①~⑨). 2. Remove the P.C.B. angle. 3. Release the 1 claw.	

Ref. No. 4	Removal of the LED P.C.B.	Ref. No. 5	Removal of the Clamp Plate
Procedure 1→4		Procedure 1→4→5	
	 LED P.C.B. Claws • Release the 2 claws.		 CN502 Clamp plate Claw 1. Remove the 2 screws (1, 2). 2. Release the 1 claw.
Ref. No. 6	Removal of the Magnet Holder, Magnet and Disc Clamper	Ref. No. 7	Removal of the Tray Ass'y and Loading Unit
Procedure 1→4→5→6		Procedure 1→2→7	
	 Magnet holder Magnet Disc clamper Claws • Release the 3 claws.		 Rotary tray Hole (A) 1. Remove the 2 screws (1, 2). 2. Rotate the rotary tray to the position that can be confirmed the hole (A). 3. Remove the 1 screw (3). Note: In case that screw 3 cannot be removed due to narrowness of hole (A), refer to the instruction of Ref.10, remove the tray base, and remove screw 3.
 Tray ass'y and loading unit CN301 CN401 6. Lift up the tray ass'y and the loading unit and then remove the 2 connectors (CN301, CN401).			 Rotary tray Hole (B) 4. Rotate the rotary tray to the further position that can be confirmed the hole (B). 5. Remove the 1 screw (4).

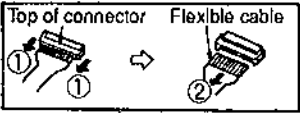
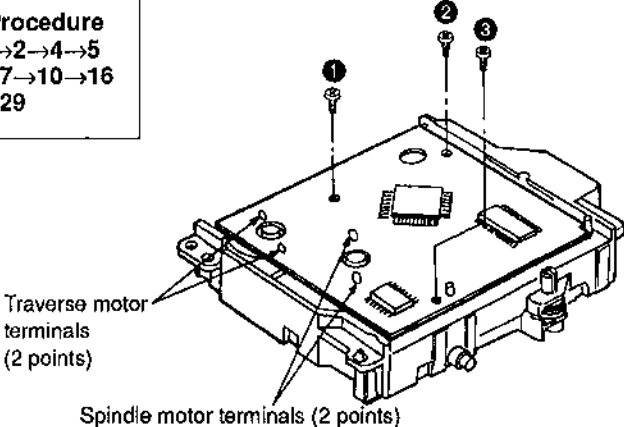
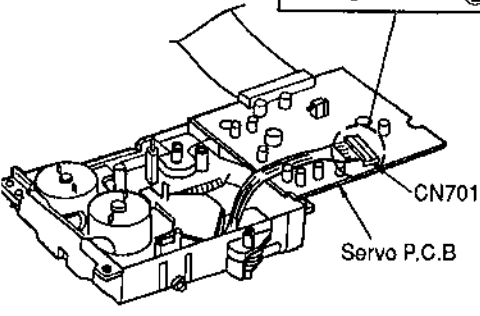
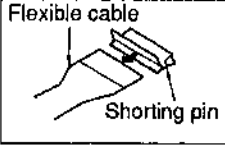
Ref. No. 8	Removal of the Rotary Lock Lever	Ref. No. 9	Removal of the Main P.C.B.
Procedure 1→4→5→8	 1. Remove the spring. 2. Release the claw.	Procedure 1→2→7→9	 for (E) area 1. Remove the 1 connector (CN1). 2. Remove the 4 screws (①~④). for (GC) area 3. Remove the screw (⑤). 4. Pull out the CD graphics P.C.B. in the direction of arrow.
Ref. No. 10	Removal of the Loading Unit and Tray Base		
Procedure 1→2→4→5 →7→10	 1. While pressing the rotary lock lever in the direction of arrow ① and then rotate the rotary tray to the position that can be confirmed the hole (C) in the direction of arrow ②.  5. Release the claw in the direction of arrow ⑤ and then remove the acceleration gear in the direction of arrow ⑥.	 2. Pressing the drive gear (A) in the direction of arrow ③ with inserting the (-) screwdriver in the hole (C), the tray ass'y moves slightly in the direction of arrow ④. Then, pull the tray ass'y in the direction of arrow ④.  1. Remove the 2 screws (①, ②). 2. Remove the angle.	

Ref. No. 11	Removal of the Regulator Transistor P.C.B.	Ref. No. 12	Removal of the Rotary Tray
Procedure 1→11	 1. Remove the 1 connector (CN1). 2. Remove the 2 screws (1, 2). 3. Remove the angle in the direction of arrow.	Procedure 1→2→4→5 →7→10→12	 ● Remove the 1 screw (1).
Ref. No. 13	Removal of the Tray Base	Ref. No. 14	Removal of the Angle (A) and Angle (B)
Procedure 1→2→4→5 →7→10→12 →13	 ● Release the claw in the direction of arrow 1 and then remove the tray base in the direction of arrow 2.	Procedure 1→2→4→5 →7→10→12 →13→14	 ■ Removal of the angle (A) 1. Remove the 1 screw (1). 2. Release the claw and then remove the angle (A) in the direction of arrow 1. ■ Removal of the angle (B) 1. Remove the 1 screw (2). 2. Release the claw and then remove the angle (B) in the direction of arrow 2.
Ref. No. 15	Removal of the Tray Lock Lever and Lock Gear		
Procedure 1→2→4→5 →7→10→12 →13→15	 1. Remove the rotary lock spring and tray lock spring.	 2. Remove the 1 screw (1).	

Ref. No. 16	Removal of the Traverse Deck and Conversion Lever	 Pulley gear  Slide plat (1) Claw 1. Rotate the pulley gear to full position in the direction of arrow ①. 2. Push the claw in the direction of arrow ②, and then move the slide plate (1) in the direction of arrow ③.	
Ref. No. 17	Removal of the Slide Plate (1)	 Slide plate (1)  Conversion lever Claw Traverse deck Claw 1. Remove the 1 screw (①). 2. Remove the slide plate (1) in the direction of arrow. 3. Remove the conversion lever in the direction of arrow ④. 4. Release the claw and then remove the traverse deck in the direction of arrow ⑤.	
Ref. No. 18	Removal of the Slide Plate (3)	Ref. No. 19	Removal of the Slide Plate (2)
Procedure 1→2→4→5 →7→10→16 →18	 Slide plate (3) • Push the slide plate (3) in the direction of arrow ①, and then remove it in the direction of arrow ②.	Procedure 1→2→4→5 →7→10→16 →18→19	 Slide plate (2) Claw • Push the claw in the direction of arrow ①, and then remove the slide plate (2) in the direction of arrow ②.

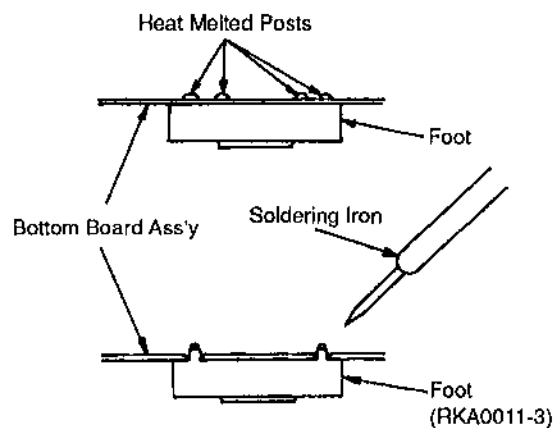
Ref. No. 20	Removal of the Pulley Gear	Ref. No. 21	Removal of the Oscillating Gear
Procedure 1→2→4→5 →7→10→20	 1. Remove the belt. 2. Release the 2 claws and then remove the pulley gear in the direction of arrow.	Procedure 1→2→4→5 →7→10→21	 • Release the claw in the direction of arrow ① and then remove the oscillating gear in the direction of arrow ②.
Ref. No. 22	Removal of the Gear Holder, Drive Gear (A) and Drive Gear (B)	Ref. No. 23	Removal of the Drive Cam Gear
Procedure 1→2→4→5 →7→10→22	 1. Remove the 1 screw (①). 2. Remove the gear holder, drive gear (A) and drive gear (B).	Procedure 1→2→4→5 →7→10→16 →17→20→21 →22→23	 • Remove the drive cam gear in the direction of arrow.
Ref. No. 24	Removal of the Change Cam Gear	 1. Remove the solenoid spring. 2. Release the claw (A) in the direction of arrow ① and then remove the solenoid lever in the direction of arrow ②. 3. Release the claw in the direction of arrow ③ and then remove the change cam gear in the direction of arrow ④.	

Ref. No. 25	Removal of the Reduction Gear and Gear Lever	Spring Reduction gear Gear lever 1. Remove the spring. 2. Remove the 1 screw (1). 3. Remove the reduction gear in the direction of arrow ①. 4. Turn the gear lever in the direction of arrow ②, and then remove it in the direction of arrow ③.	
Ref. No. 26	Removal of the Loading Motor P.C.B.	Claws Claw Loading motor P.C.B. 1. Remove the 3 screws (1~3). 2. Release the 5 claws in the direction of arrow ①. 3. Remove the loading motor P.C.B. in the direction of arrow ②.	
Ref. No. 27	Removal of the Loading Motor	Mark (+) Loading motor Unsolder the terminals Loading motor Loading motor P.C.B. •Unsolder the terminals of the loading motor.	
Ref. No. 28	Removal of the Photo Transistor P.C.B.	Procedure 1→2→4→5 →7→28 Photo TR. P.C.B. Claws Loading unit •Release the 2 claws.	

Ref. No. 29	Removal of the Servo P.C.B.	※ Push the top of the connector in the direction of arrow ①, and then pull out the flexible cable in the direction of arrow ②. 
Procedure 1→2→4→5 →7→10→16 →29	 1. Remove the 3 screws (①~③). 2. Unsolder the spindle motor terminals (2 points). 3. Unsolder the traverse motor terminals (2 points).	 4. Remove the connector (CN701). Note: Insert a shorting pin into the traverse unit flexible cable. (Refer to "handling precautions for traverse deck" on page 2.) 

● Replacement of the Foot

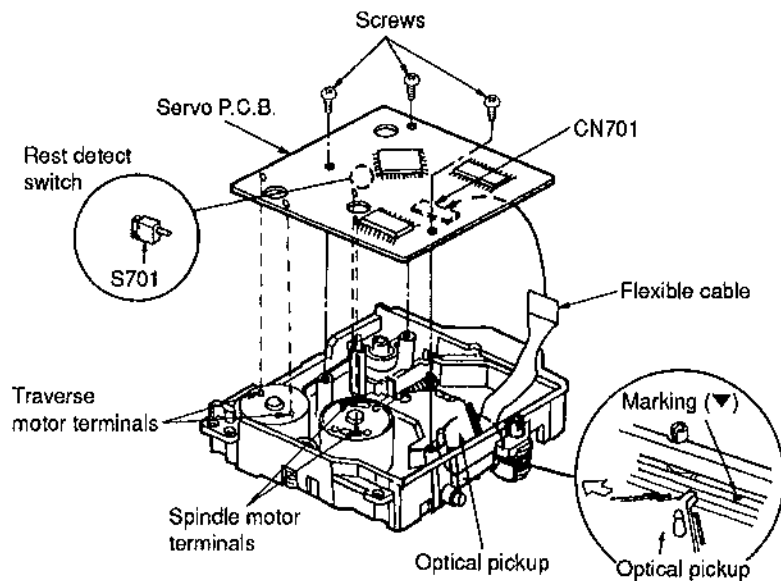
1. Remove the 4 heat melted posts on the Bottom board ass'y with a pair of nippers or similar tool.
2. To replace the foot (RKA0011-3) on the Bottom board ass'y, melt the 4 posts with a soldering iron.



● Installing Servo P.C.B.

1. Before installing the servo P.C.B., move the optical pickup toward the outer edge from the mark "▼".
[Otherwise, the rest detect switch (S701) mounted on the servo P.C.B. may be damaged.]
2. Connect the flexible cable to the connector (CN701).
3. Install the servo P.C.B. in the traverse deck unit with the three screws.
4. Solder the two terminals of the traverse motor and the two terminals of the spindle motor.

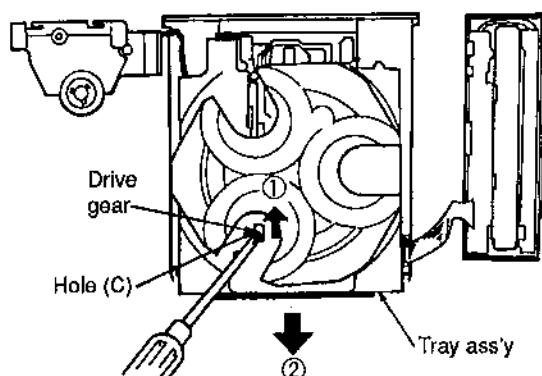
Note: Connect the flexible cable to the connector (CN701) firmly.
Tighten the 3 screws before soldering the terminals.



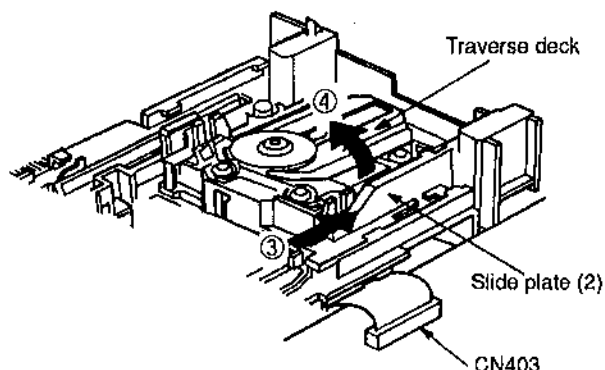
■ How to Check the Servo and Main P.C.B.

● Check the servo P.C.B.

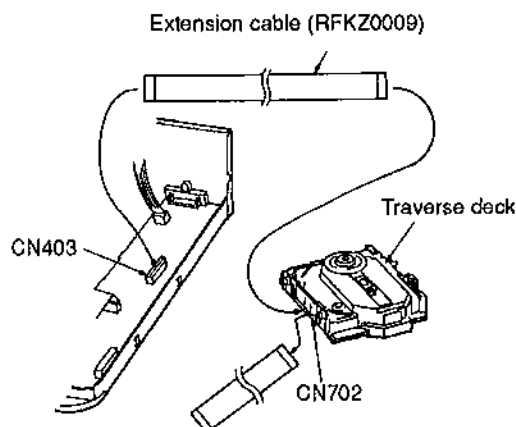
1. Remove the cabinet. (See Ref.No.1 of the disassembly instructions.)
2. Remove the front panel ass'y. (See Ref.No.2 of the disassembly instructions.)
Note: Take care not to remove the connector (CN603).
3. Remove the clamp plate. (See Ref.No.5 of the disassembly instructions.)
4. Remove the magnet holder, magnet and disc clamber. (See Ref.No.6 of the disassembly instructions.)



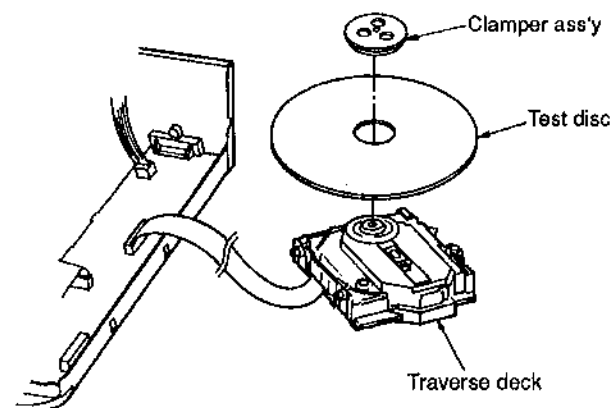
5. Pressing the lock gear in the direction of arrow ① with inserting the (–) screwdriver in the hole (C), the tray ass'y moves slightly in the direction of arrow ②. Then, pull out the tray ass'y in the direction of arrow ②.



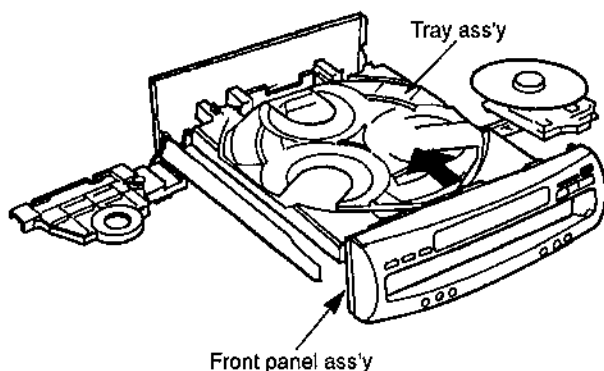
6. Remove the connector (CN403).
7. Pressing the slide plate (2) in the direction of arrow ③, and then remove the traverse deck in the direction of arrow ④.



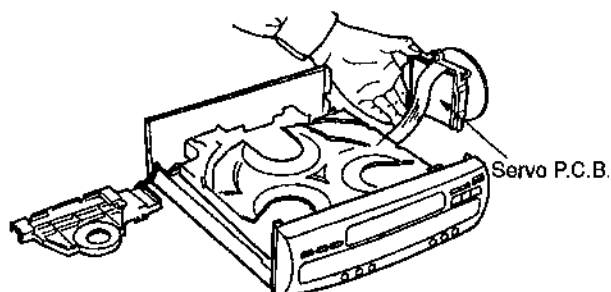
8. Substitute the serviceable extension cable for the F.P.C. between the connector (CN403) on main P.C.B. and the connector (CN702) on servo P.C.B..



9. Place the test disc and secure it by using the clamber ass'y.

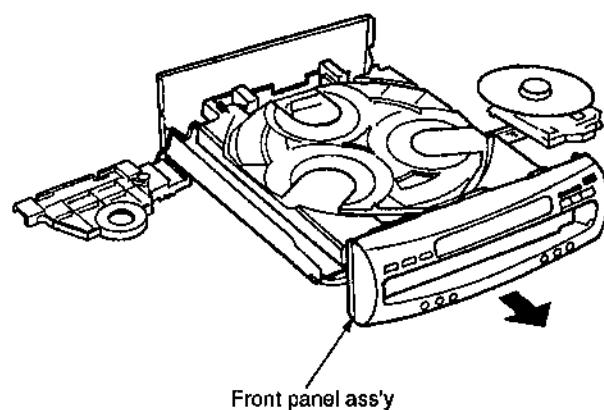


10. Remove the tray ass'y in the direction of arrow ⑤.
11. Reinstall the front panel ass'y to the main unit.

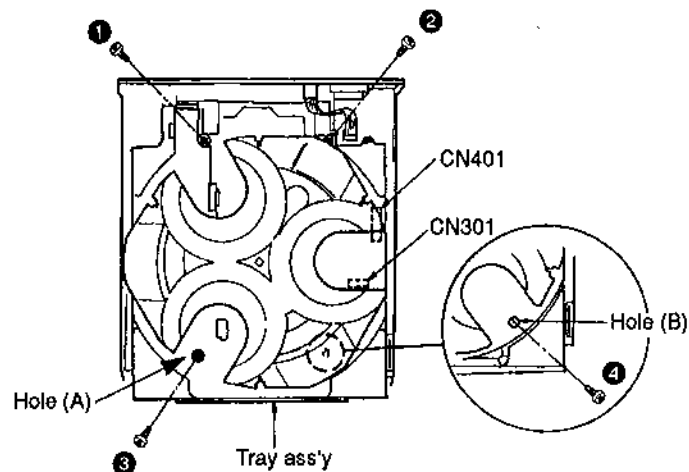


12. When checking the soldered surface of the servo P.C.B., do as shown above.

•Check the main P.C.B.



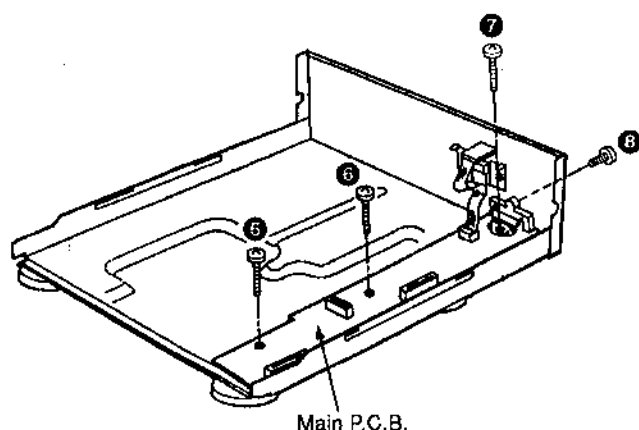
1. After checking the servo P.C.B., remove the front panel ass'y in the direction of arrow.



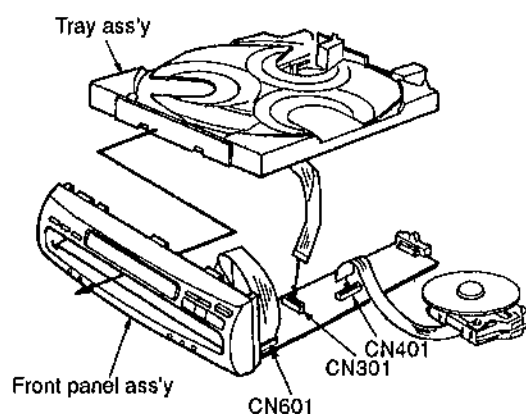
2. Remove the 4 screws (1~4) and then remove the tray ass'y.
3. Remove the 2 connector (CN301, CN401).

Note:

In case that screw 3 cannot be removed due to narrowness of hole (A), refer to the Disassembly Instruction Ref.No.10 and remove the tray base and screw 3.

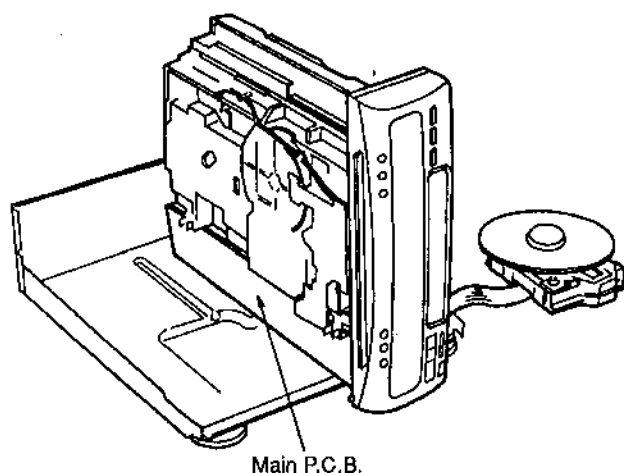


4. Remove the 4 screws (5~8).
5. Remove the main P.C.B..



6. Reinstall the front panel ass'y to main P.C.B..
7. Reinstall the tray ass'y to front panel ass'y.
8. Connect the 3 F.P.C. board (CN301, CN401, CN601).

■ Installation of the Loading Components



9. When checking the soldered surface of the main P.C.B., do as shown above.

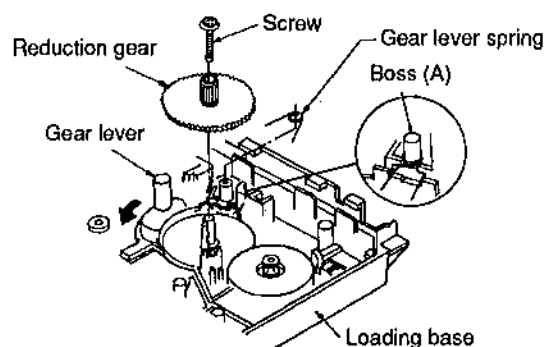


Fig.1

1. Install the gear lever on the loading base and then slide the gear lever in the direction of arrow ①. (See Fig.1.)
2. Install the reduction gear and secure it with a screw. (See Fig.1.)
3. Install the gear lever spring to the boss (A). (See Fig.1.)

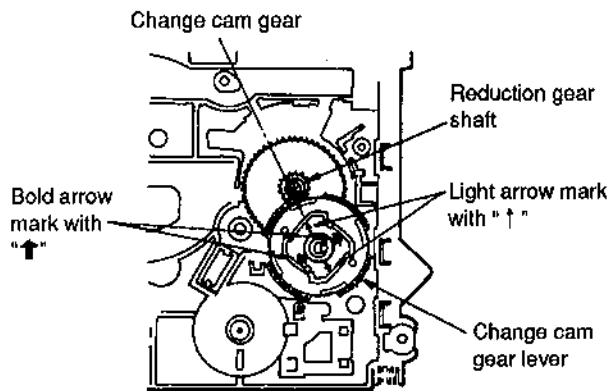


Fig. 2

4. Install the change cam gear. (See Fig. 2.)

Note: Align the tip of the light arrow marked with "↑" on the change cam gear with the axis of the reduction gear shaft.

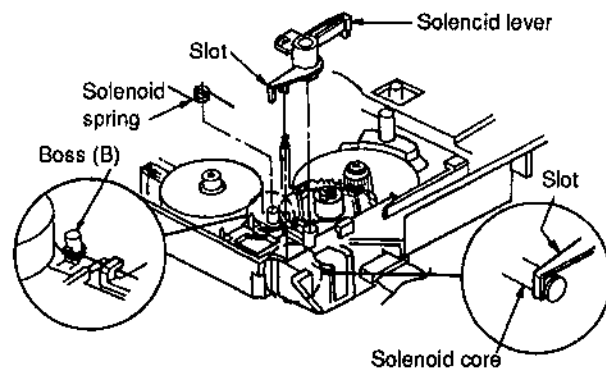


Fig. 3

5. Install the solenoid lever. (See Fig. 3.)

Note: Align the slot of the solenoid lever with the solenoid core.

6. Install the solenoid spring to the boss (B). (See Fig. 3.)

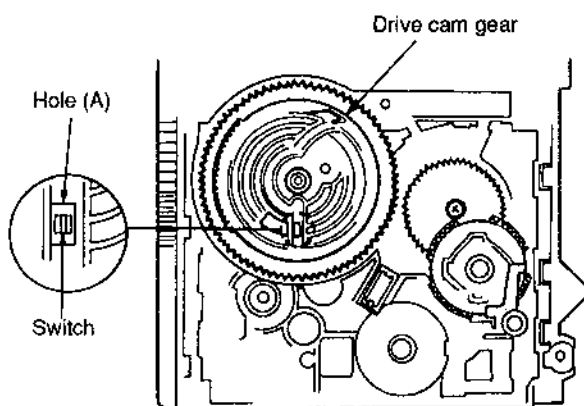


Fig. 4

7. Align the hole (A) of the drive cam gear with the switch, and then insert the drive cam gear. (See Fig. 4)

Note: In case that the drive cam gear is inserted into the holes except the hole (A) of the drive cam gear, the switch may be damaged.

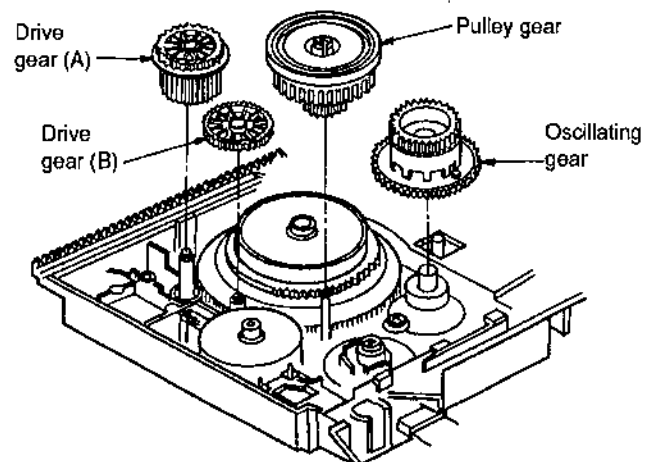


Fig. 5

8. Install the drive gear (B), the drive gear (A), the oscillating gear ass'y and the pulley gear. (See Fig. 5)

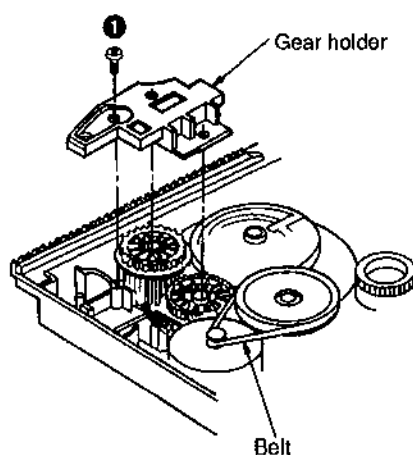


Fig. 6

9. Install the gear holder and secure it with a screw ①. (See Fig. 6.)

10. Install the belt. (See Fig. 6.)

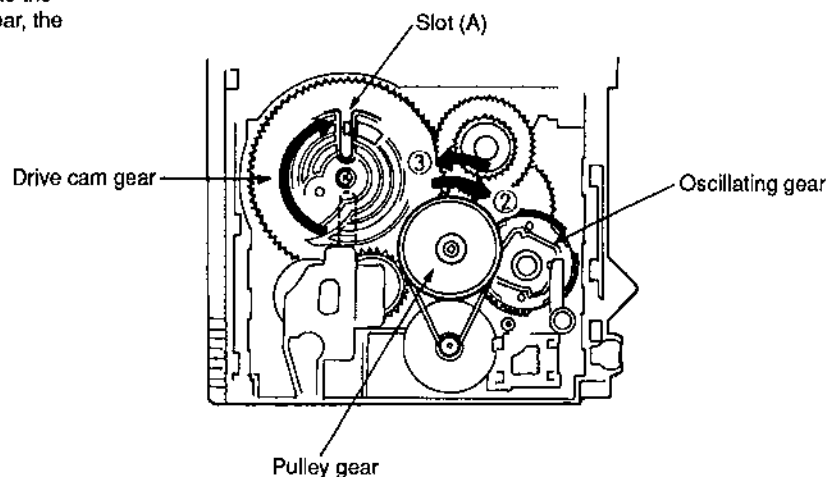


Fig. 7

11. Rotate the pulley gear in the direction of arrow ② and then rotate the pulley gear to full position in the direction of arrow ③ when the oscillating gear stops.

12. Rotate the drive cam gear so that the slot (A) of the drive cam gear is put into a given position as shown in fig. 7.

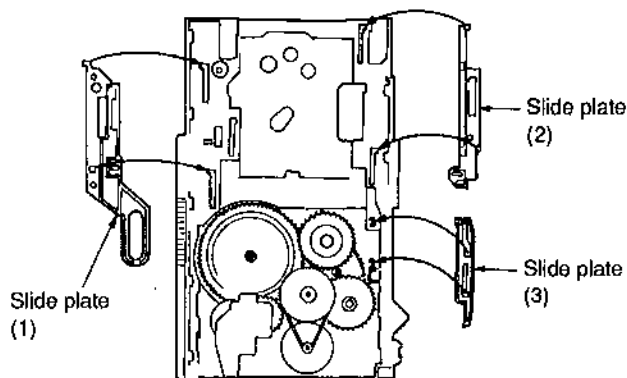


Fig.8

13. Install slide plate (1), slide plate (2) and slide plate (3).

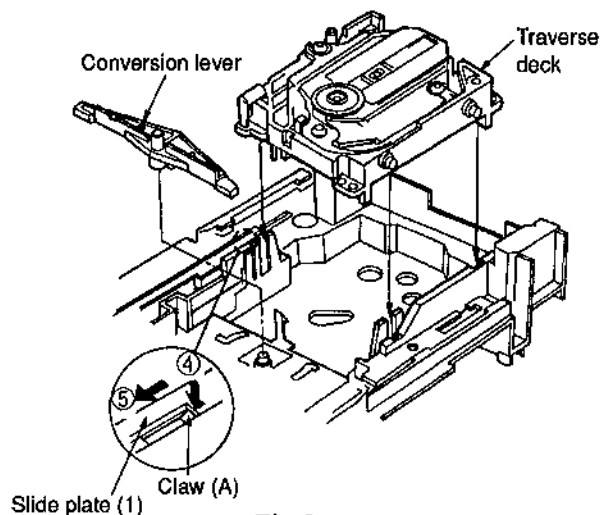


Fig.9

14. Press catch (A) in the direction of arrow ④ and then push slide (1) of the loading unit in the direction of arrow ⑤. (See Fig.9)

15. Install the traverse deck and the conversion lever. (See Fig.9)

■ Installation of the Tray Base and the Tray Ass'y

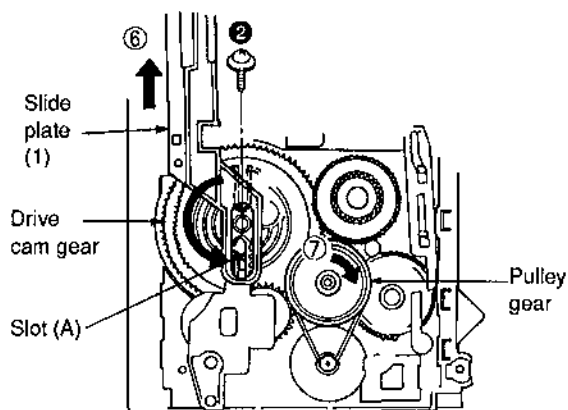


Fig.10

16. Push slide plate (1) in the direction of arrow ⑥, so that the catch (A) in Fig.9 engages with slide plate (1).
17. Secure slide plate (1) with a screw ②.
18. Rotate the pulley gear in the direction of arrow ⑦ so that slot (A) of the drive cam gear is in the position shown in Fig.10.

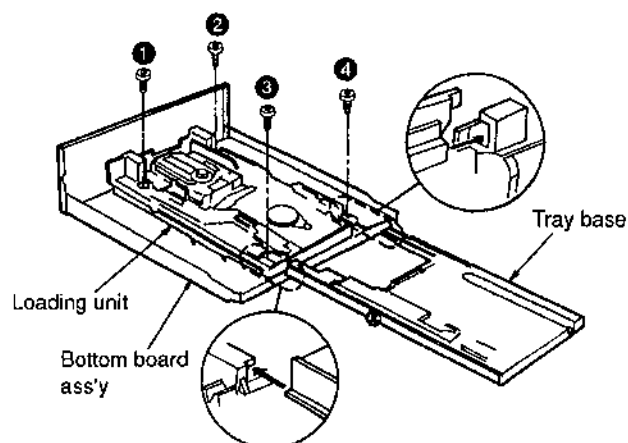


Fig.1

1. Install the loading unit on the bottom board ass'y and secure it with 4 screws ①~④. (See Fig.1)
2. Install the tray base on the loading unit. (See Fig.1)

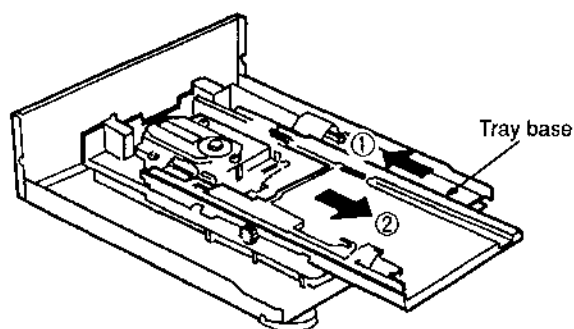


Fig.2

3. After sliding the tray base in the direction of arrow ①, draw the tray base gradually in the direction of arrow ②. (See Fig.2)
Slide the tray base until the tray base stops.

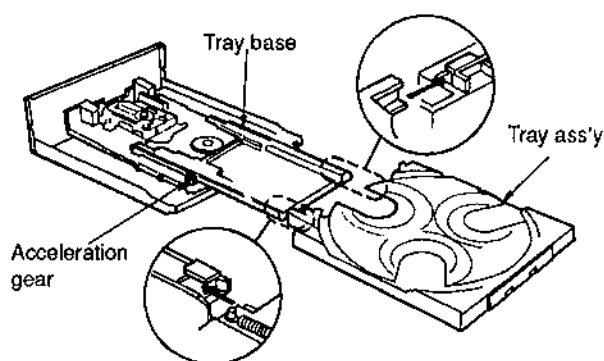
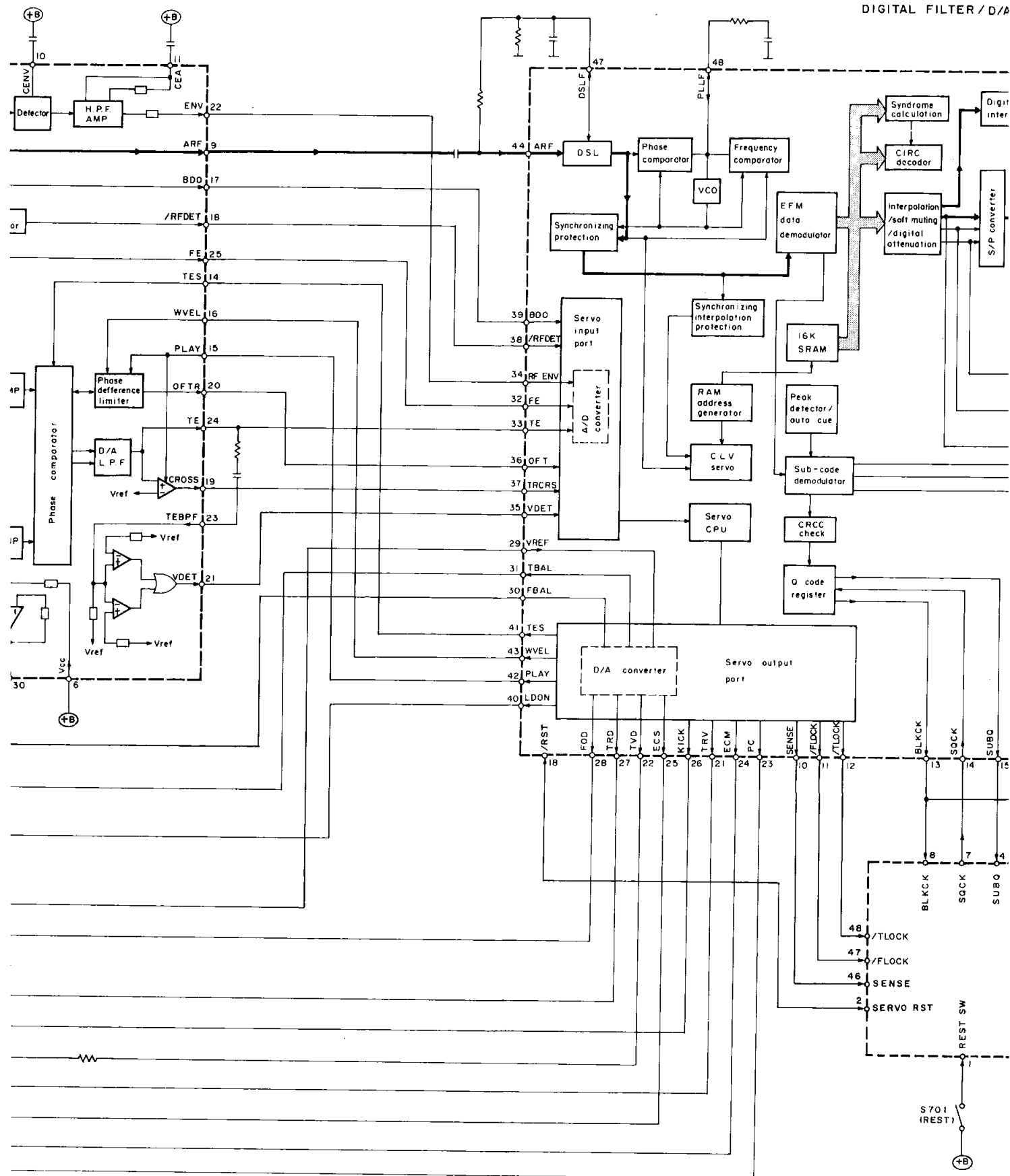
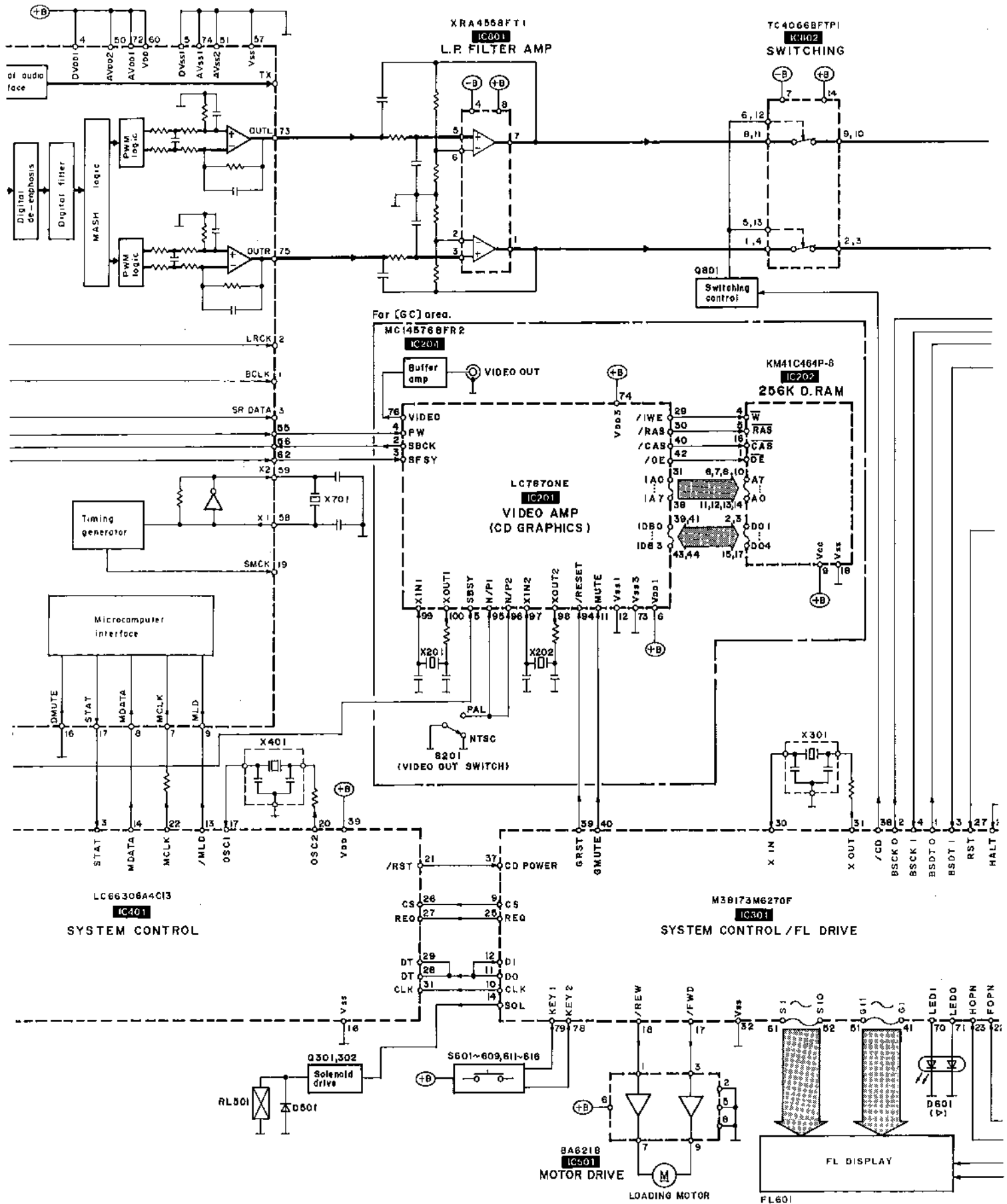


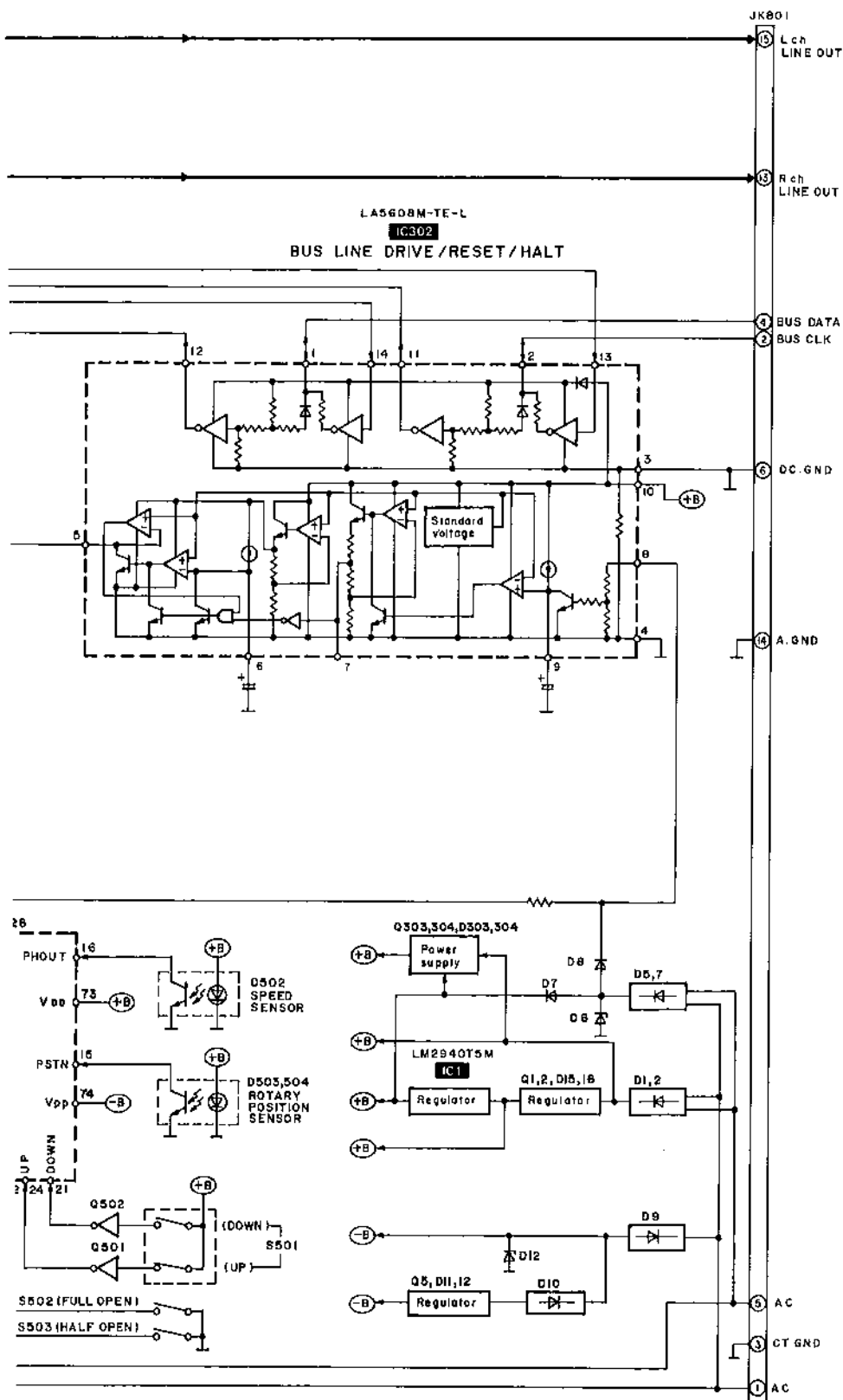
Fig.3

4. Holding the tray base, install the tray ass'y on the tray base and feed the tray ass'y slowly. (See Fig.3)
5. After engaging the acceleration gear, release the tray base which is held and feed the tray ass'y. (See Fig.3)

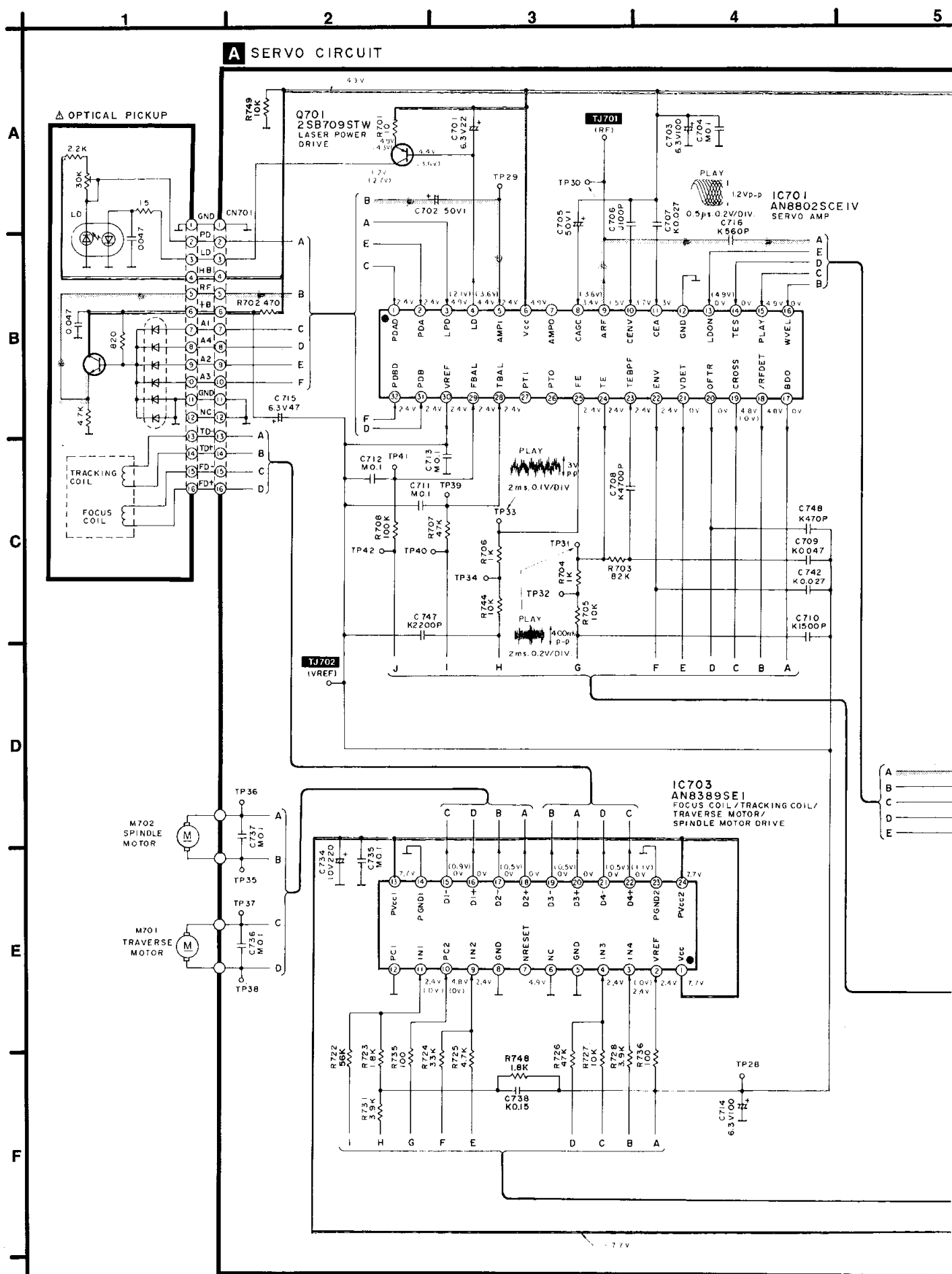


SERVO PROCESSOR/
DIGITAL FILTER/D/A

DIGITAL SIGNAL PROCESSOR/
A CONVERTER



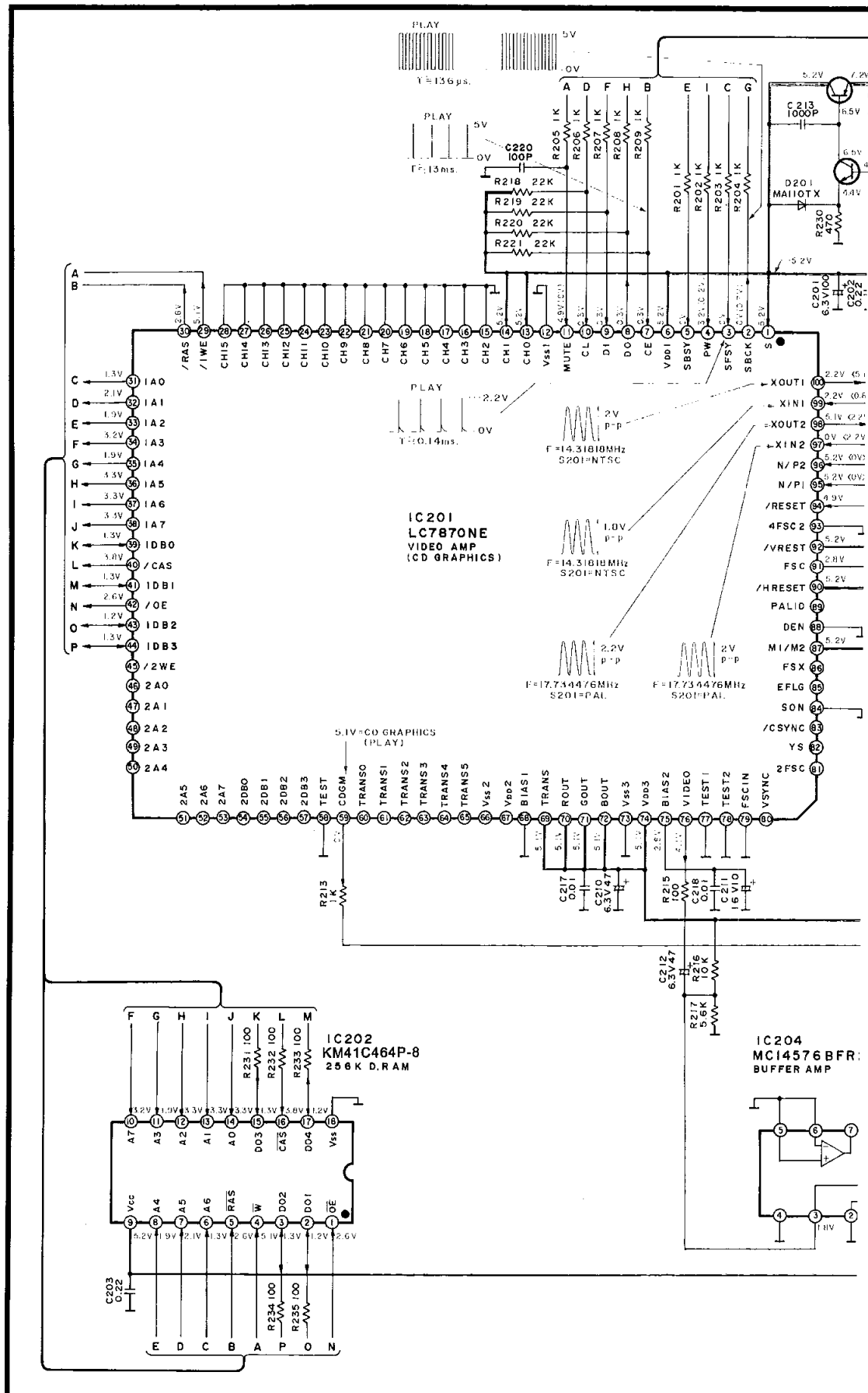
■ Schematic Diagram ● Optical Pickup/Servo Circuit (Parts list on page 54~57)





●CD Graphics Circuit (Parts list on page 54~57)

1 CD GRAPHICS CIRCUIT For [GC] area.

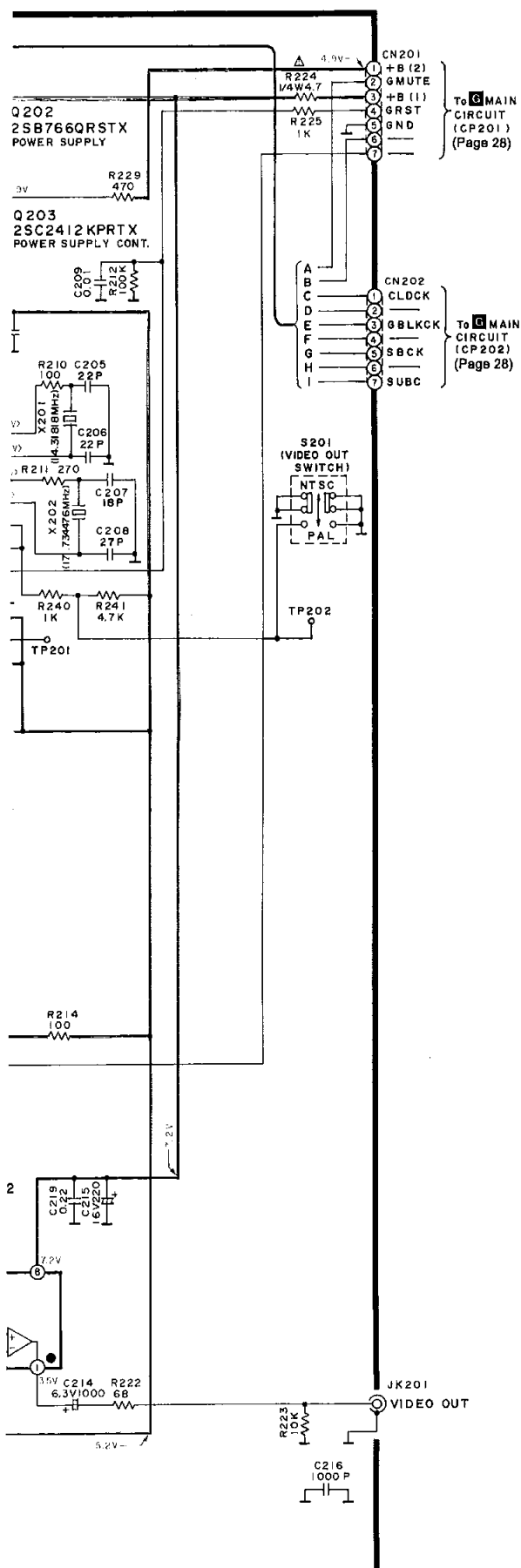


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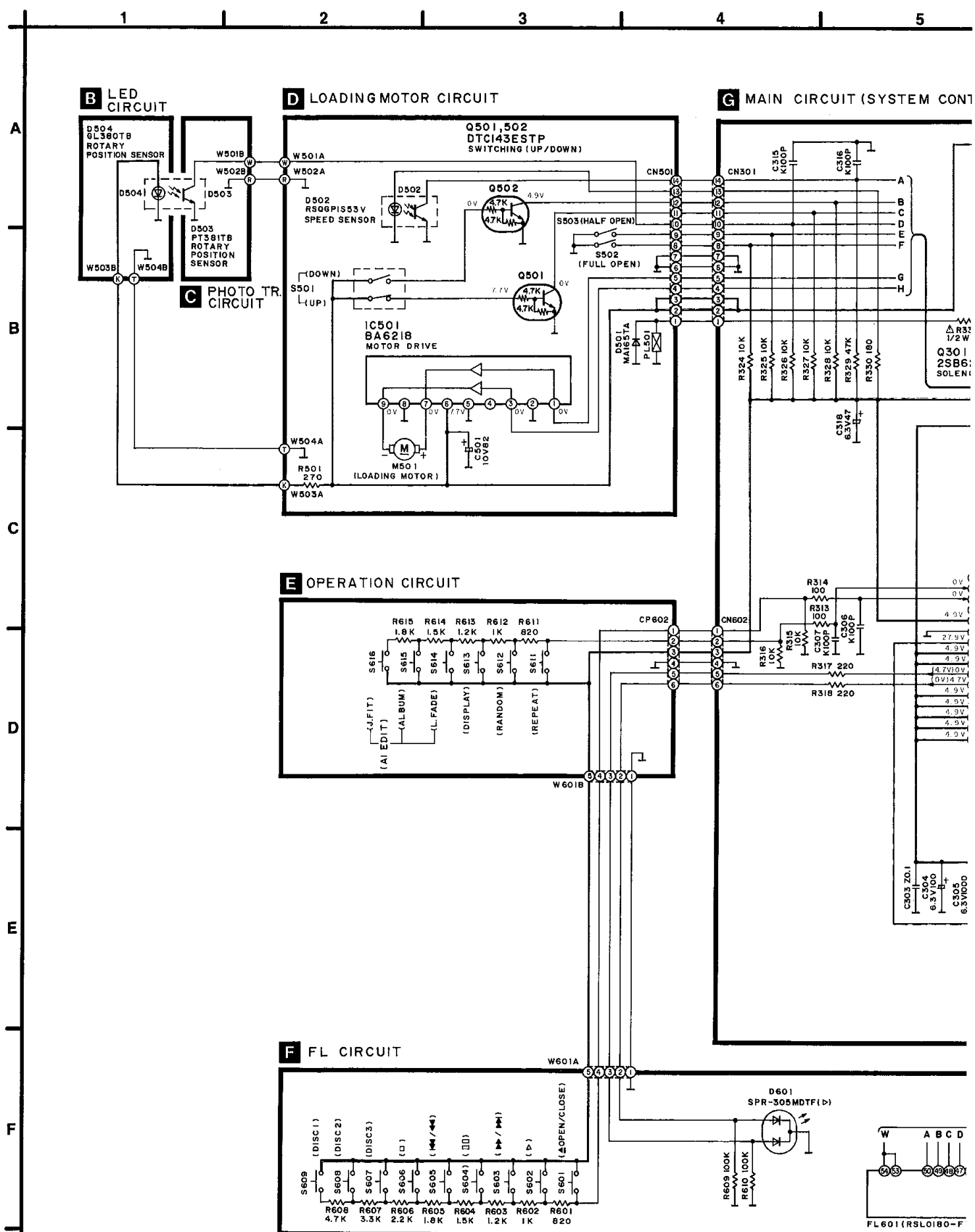
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9



●Main/LED/Photo TR./Loading Motor/Operation/FL/Regulator TR. Circuit (Parts list on page 54~57)



6

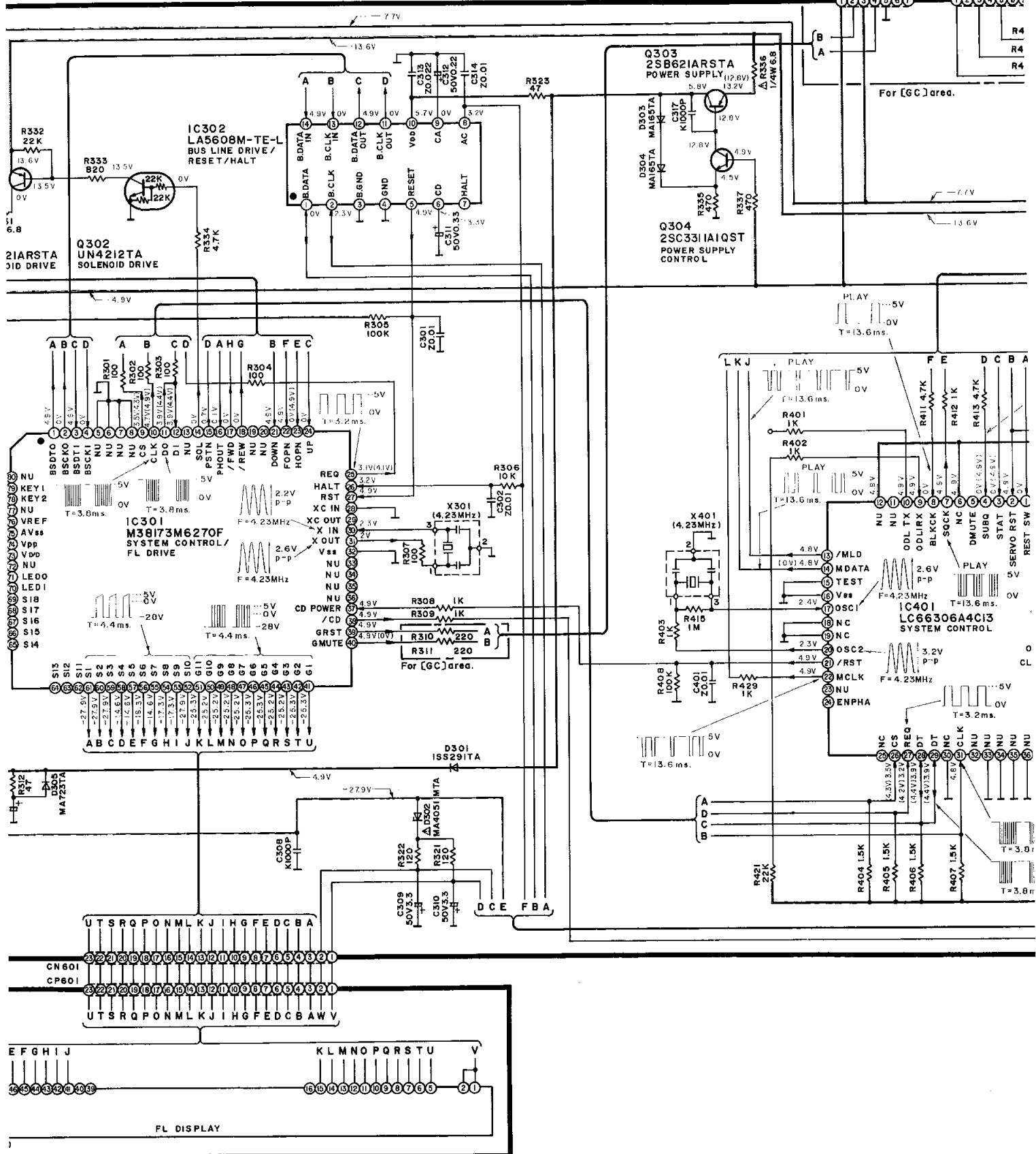
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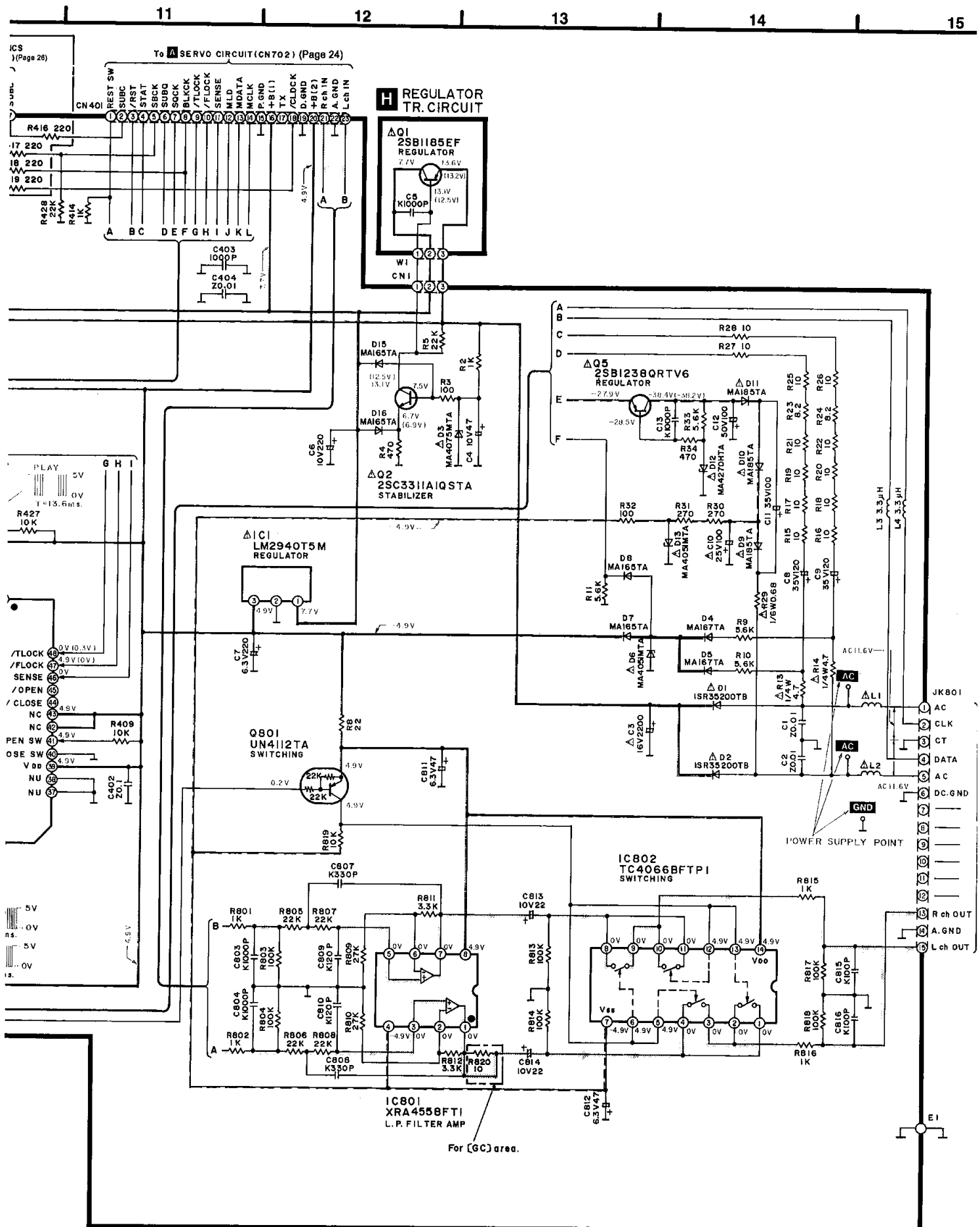
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9

10

ROL / FL DRIVE / L.P. FILTER AMP / SWITCHING / REGULATOR)





Notes:

- S201 : Video out switch (PAL/NTSC)
- S501 : Traverse deck position detect switch
- S502 : Disc tray full open detect switch
- S503 : Disc tray half open detect switch
- S601 : Loading drawer open/close switch (**▲ OPEN/CLOSE**)
- S602 : Play switch (**>**)
- S603 : F.Skip/search switch (**▶▶/▶▶I-SKIP/-SEARCH**)
- S604 : Pause switch (**⏸**)
- S605 : R.Skip/search switch (**◀◀/◀◀I-SKIP/-SEARCH**)
- S606 : Stop switch (**□**)
- S607 : Disc switch (**DISC 3**)
- S608 : Disc switch (**DISC 2**)
- S609 : Disc switch (**DISC 1**)
- S611 : Repeat switch (**REPEAT**)
- S612 : Random play switch (**RANDOM**)
- S613 : Display switch (**DISPLAY**)
- S614 : CD edit switch (**LAST FADE**)
- S615 : CD edit switch (**ALBUM**)
- S616 : CD edit switch (**J.FIT**)
- S701 : Rest switch

- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard.
Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

No mark : CD STOP (S201:NTSC)
 () : CD PLAY [1kHz, L+R, 0dB (S201 : NTSC)]
 < > : CD STOP/PLAY [1kHz, L+R, 0dB (S201 : PAL)]

●Important safety notice:

Components identified by **▲** 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.

Caution!

- IC and LSI are sensitive to static electricity.
 Secondary trouble can be prevented by taking care during repair.
- Cover the parts boxes made of plastics with aluminum coil.
 - Ground the soldering iron.
 - Put a conductive mat on the work table.
 - Do not touch the legs of IC or LSI with the fingers directly.

- This schematic diagram may be modified at any time with the development of new technology.

- The supply part number is described alone in the replacement parts list.

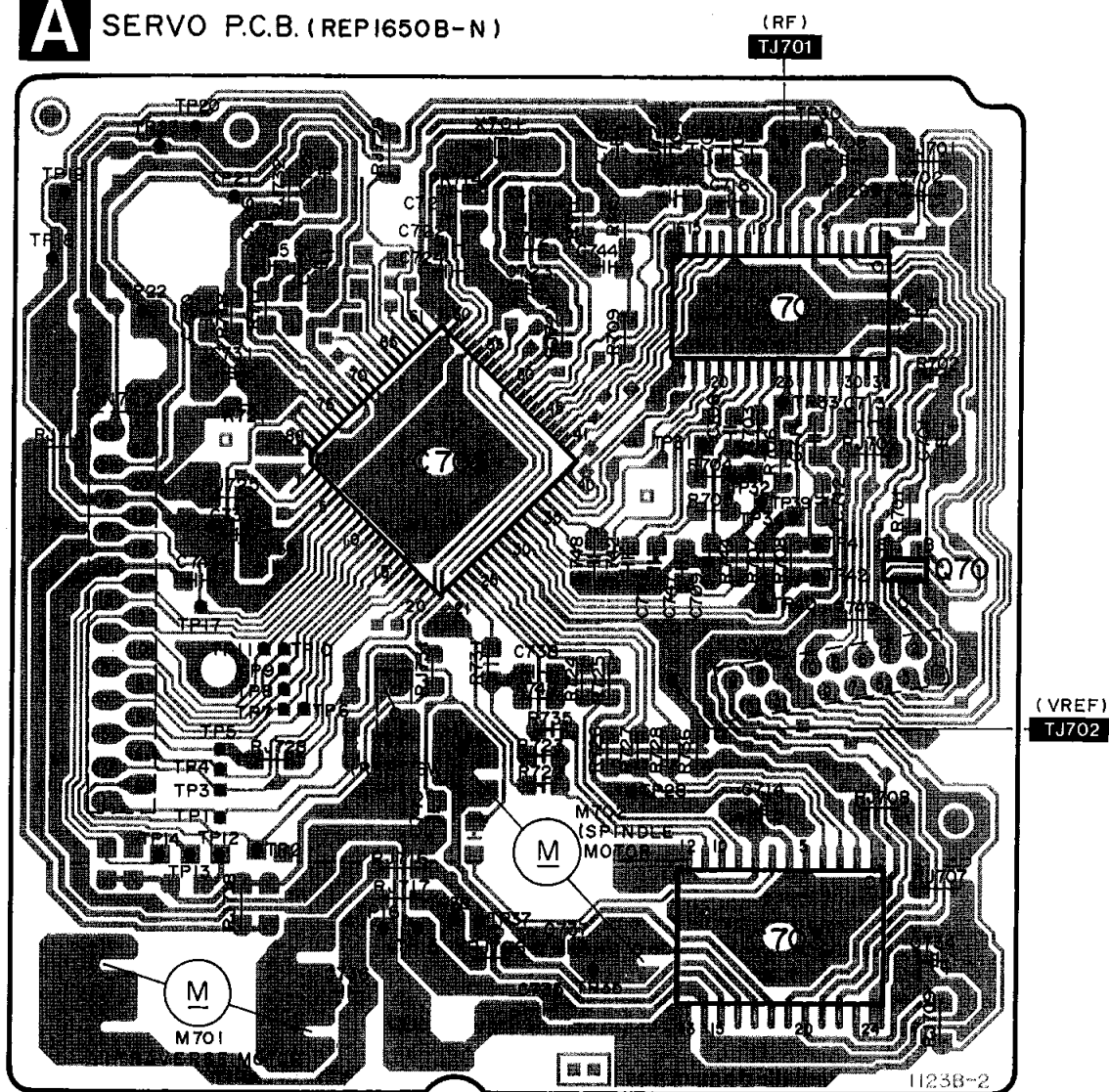
Ref. No	Production Parts No.	Supply Parts No.
IC1	LM2940T5M	LM2940T5

———— : Positive voltage line
 - - - - : Negative voltage line
 ■■■■■■ : CD signal line

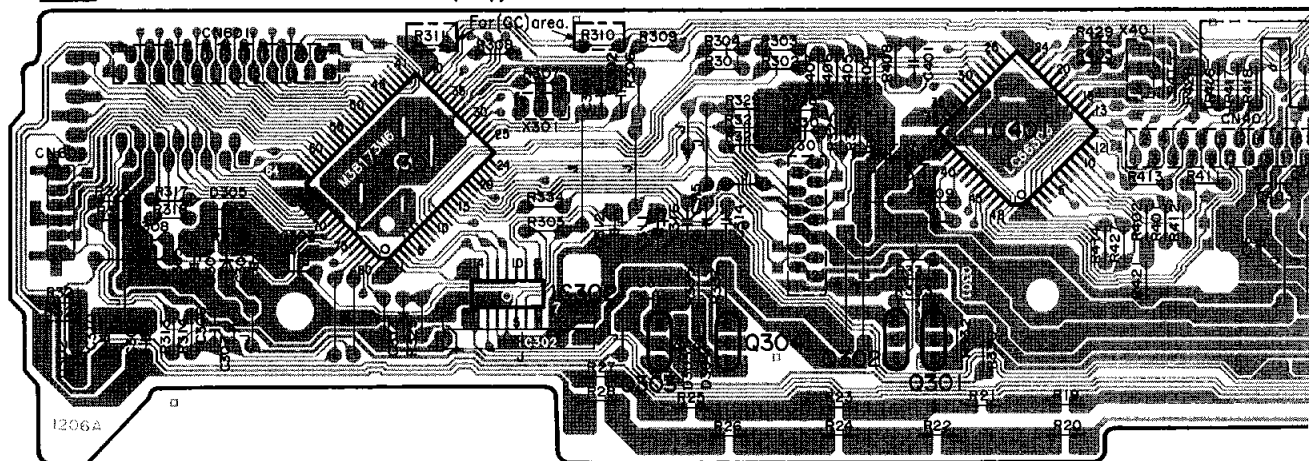
Printed Circuit Board Diagram

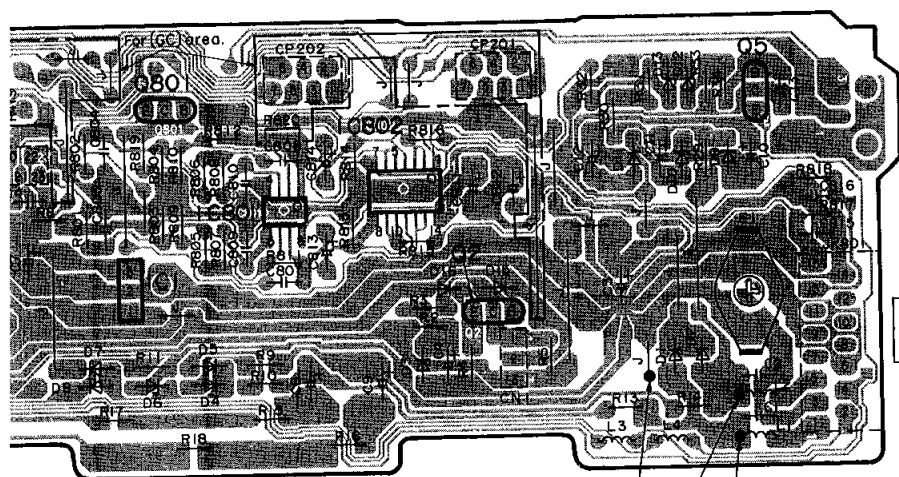
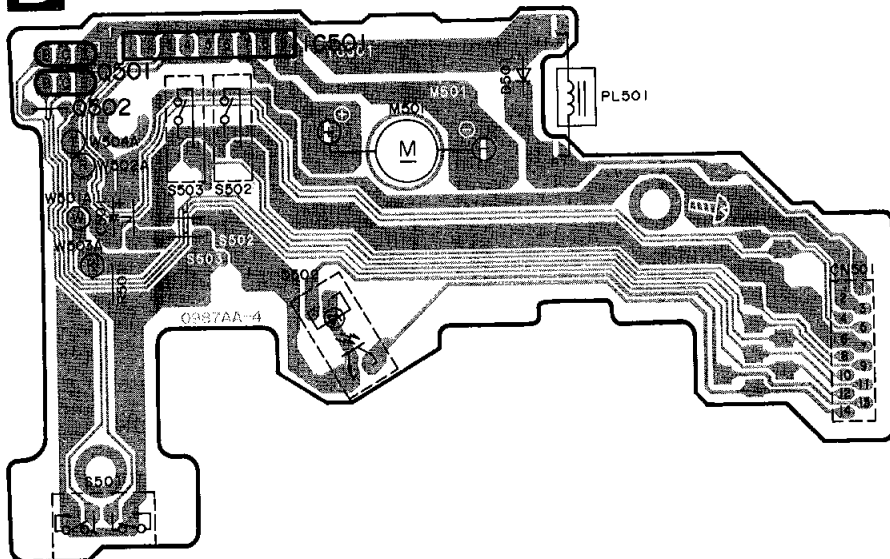
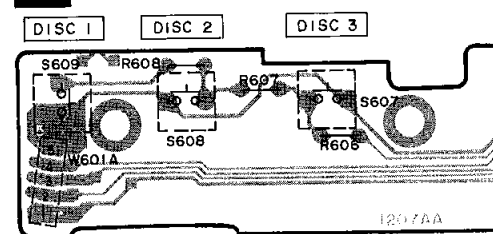
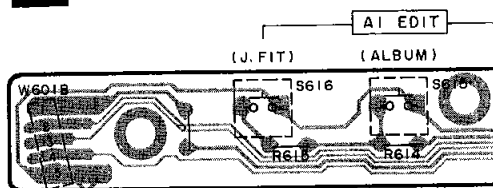
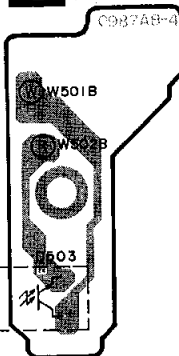
● This circuit board diagram may be modified at any time with the development of new technology.

A SERVO P.C.B. (REP1650B-N)

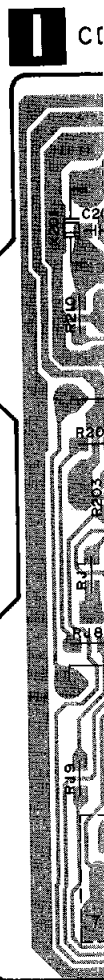


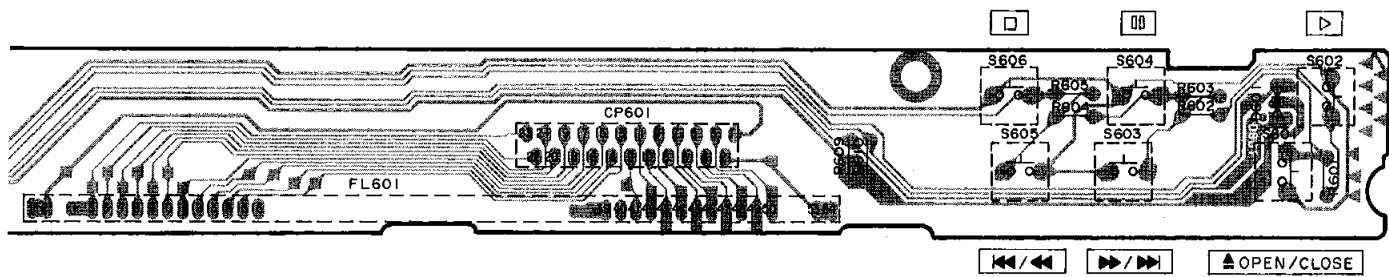
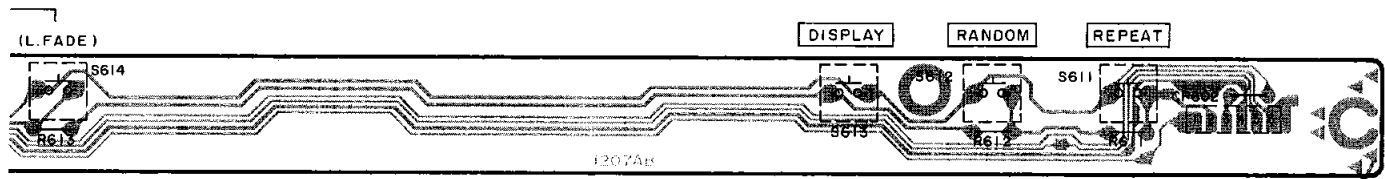
G MAIN P.C.B. (REP1841C-M... (E)
REP1841D-M... (GC))



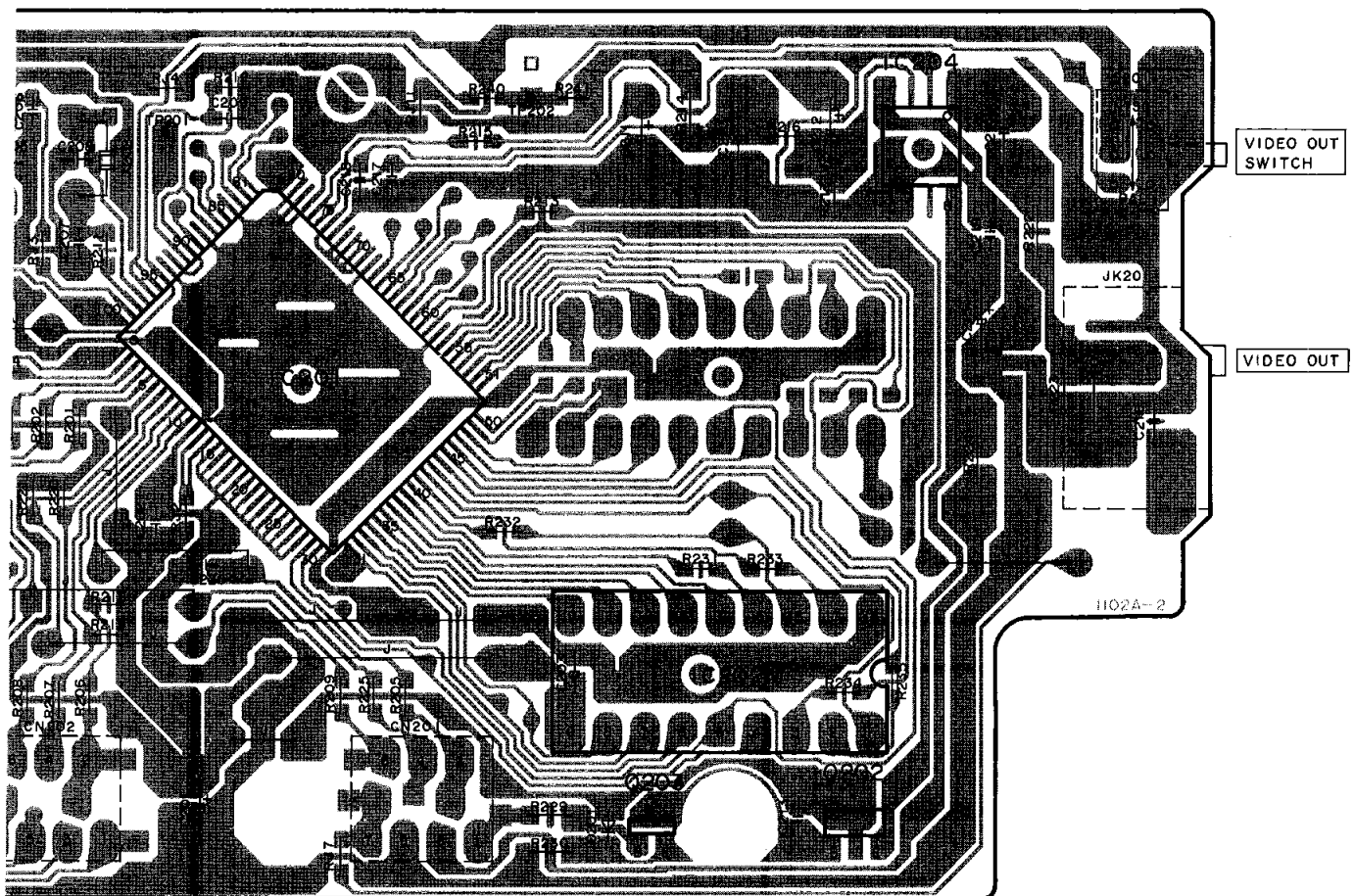


GND AC AC
POWER SUPPLY POINT





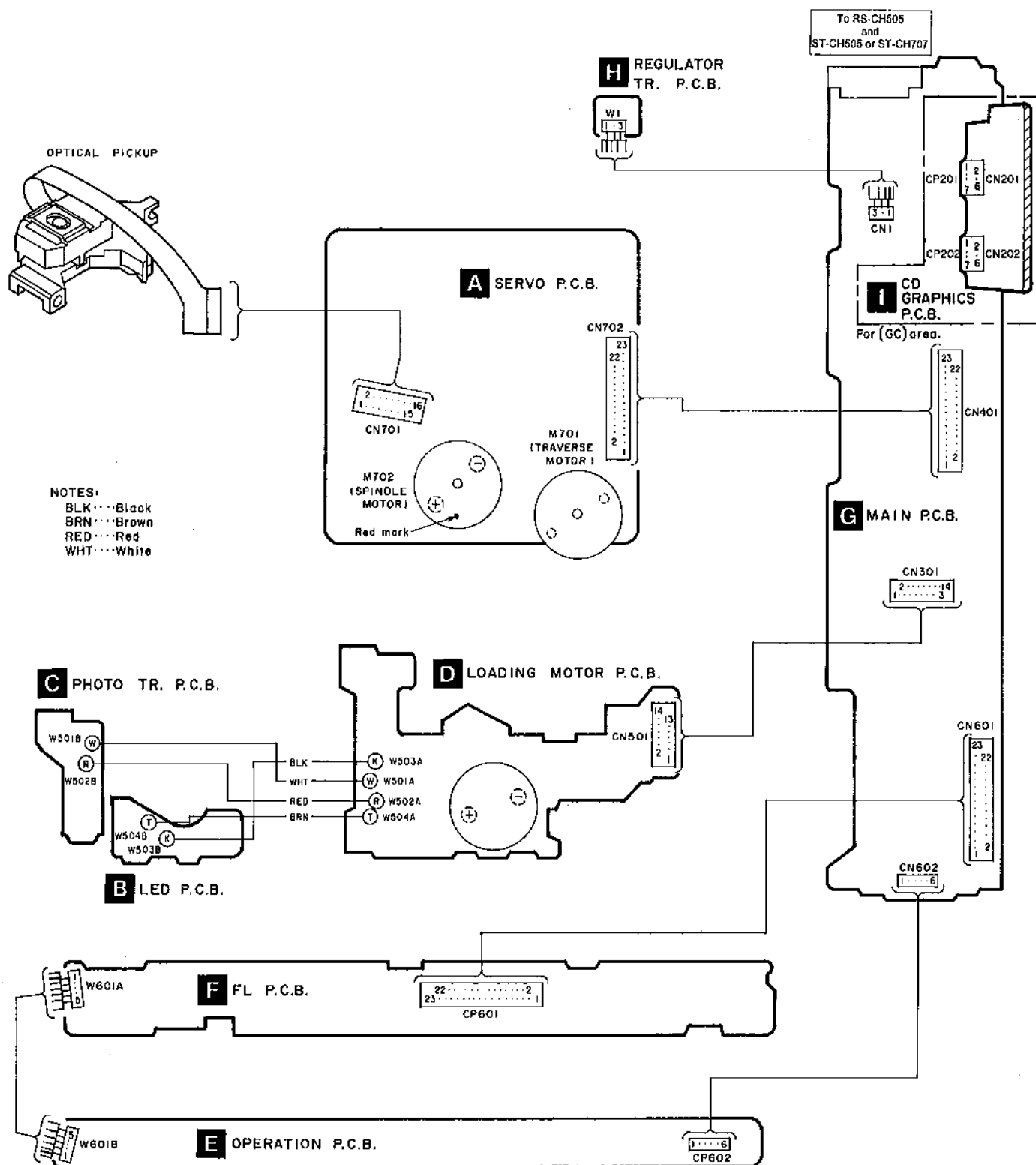
GRAPHICS P.C.B. For (gc) area. (REP1660A-T)



●Terminal guide of IC's, transistors and diodes

XRA4558FT1	TC4066BFTP1	<table><tr><td>MC14576BFR2</td><td>8Pin</td></tr><tr><td>LA5608M-TE-L</td><td>14Pin</td></tr><tr><td>AN8802SCE1V</td><td>32Pin</td></tr></table>		MC14576BFR2	8Pin	LA5608M-TE-L	14Pin	AN8802SCE1V	32Pin	MN66271RA	M38173M6270F
MC14576BFR2	8Pin										
LA5608M-TE-L	14Pin										
AN8802SCE1V	32Pin										
LC66306A4C13	LC7870NE	KM41C464P-8	BA6218	LM2940T5M	AN8389SE1						
		2SB1238QRTV6	2SB1185EF	2SB621ARSTA	DTC143ESTP						
2SC3311AQSTA UN4112TA UN4212TA											
2SB709STW 2SC2414KPRTX	2SB766QRSTX	MA4270HTA	MA165TA MA167TA MA185TA MA723TA 1SR35200TB 1SS291TA		MA4051MTA MA4075MTA						
MA110TX	GL380TB PT381TB	RSQGP1S53V	SPR-305MDTF								

■Wiring Connection Diagram



■ Measurements and Adjustments

Cautions:

- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.)
With the unit turned "on", laser radiation is emitted from the pickup lens.
- Avoid exposure to the laser beam, especially when performing adjustments.

This unit SL-CH515 is designed to operate on power supplied from the Amplifier SE-CH515A or SE-CH717 through the Tuner/Sound Processor ST-CH505 or ST-CH707.

When connecting the unit to other system components, do not connect to the Amplifier SE-CH515A or SE-CH717 directly. Be sure to connect this unit through the Tuner/Sound Processor ST-CH505 or ST-CH707. When operating the unit SL-CH515 alone for testing and servicing, without having power supplied from the Amplifier SE-CH515A or SE-CH707 and the Tuner/Sound Processor ST-CH505 or ST-CH707, use the following method.

Power Supply to This Unit alone

Apply 11V AC power to the section between **AC11V (AC)** of the coil (L1) and the jumper J1 (**GND**) as well as the section between **AC11V (AC)** of the coil (L2) and the jumper J1 (**GND**). (10V AC power can be also applied when using power supply tool.) (Shown in Fig.1)

To Check Signals

Connect the oscilloscope or the speaker with built-in amplifier to the section between LINE OUT (Lch) of the resistor R815 and the GND point of the jumper J1 as well as the section between LINE OUT (Rch) of the resistor R816 and the GND point of the jumper J1 and check if the signals are outputting from this unit. (Shown in Fig. 1)

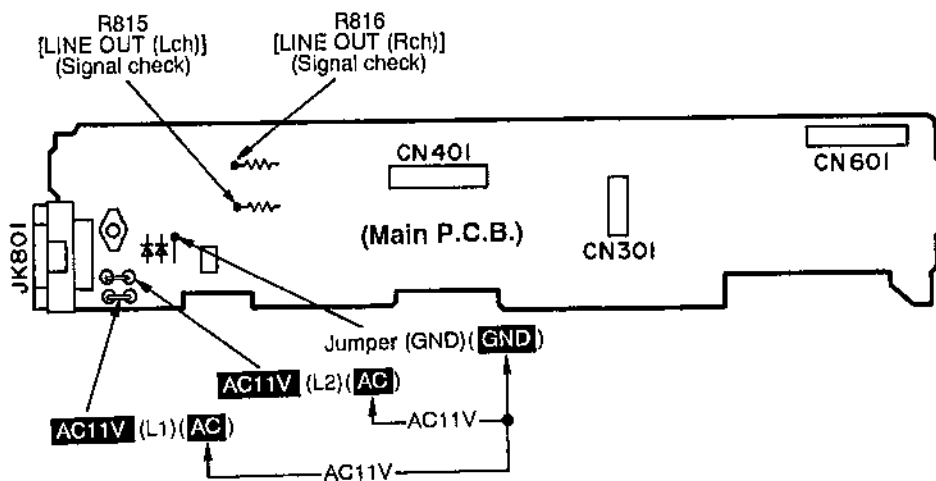


Fig. 1

(Apply 10 V AC power when using power supply tool.)

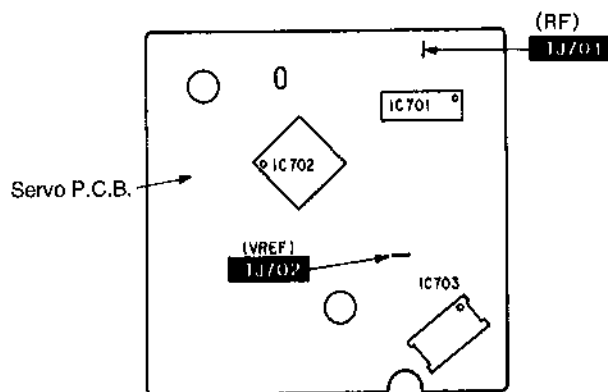


Fig. 2

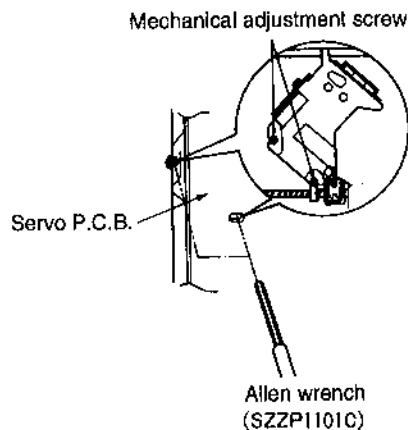


Fig. 3

●Preparation of Adjustment

1. Insert test disc into the unit as shown in "How to Check the Servo and Main P.C.B.". (Refer to page 15.)
2. Turn the power of this unit off and then turn it on. (The CD unit is adjusted automatically with it stood.)

Measuring Instruments and Special Tools

●Test disc

1. Playability test disc (SZZP1054C)
2. Uneven test disc (SZZP1056C)

●Allen wrench (M2.0) (SZZP1101C)

●Oscilloscope

(1) MECHANICAL ADJUSTMENT

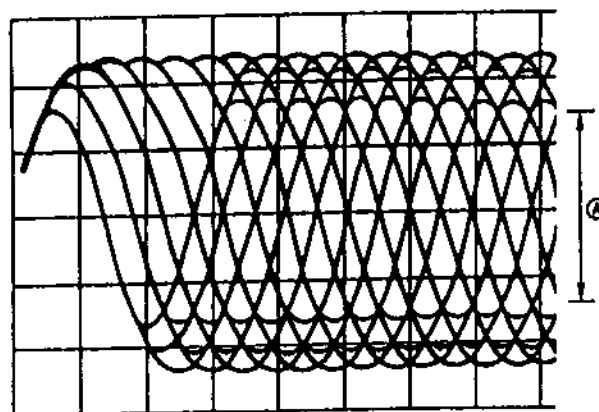
- When the traverse deck is replaced, making adjustments is not necessary. (The traverse deck ass'y is already adjusted.)
- Make adjustments to improve playability when the traverse deck has not been replaced. Make the electrical adjustments first.

1. Connect the oscilloscope's CH. 1 probe across **TJ701** (+) and **TJ702** (VREF) on the Servo P.C.B. (Shown in Fig. 2)

Oscilloscope setting:

VOLT 200 mV
 SWEEP 0.5 μ sec
 Input coupling AC

2. Switch the player power **ON**, and play track 19 on the test disc (SZZP1056C).
3. Leave the player in Play mode and place it as shown in the figure on the right.
4. Alternately adjust the two mechanical adjusting screws with the 2.0 mm allen wrench (SZZP1101C) until the RF signal amplitude on the oscilloscope is maximize. (Shown in Fig. 3)
5. After completing the adjustment, lock the mechanical adjustments with lock paint (RZZ0L01).



Ⓐ Maximize the amplitude.

(2) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

●Checking Skip Search

1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

●Checking Manual Search

1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

●Checking playability

1. Play the 0.7 mm black dot and the 0.7 mm wedge on the test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc and verify that no sound skip or noise occurs.

■About the self-diagnostic mode

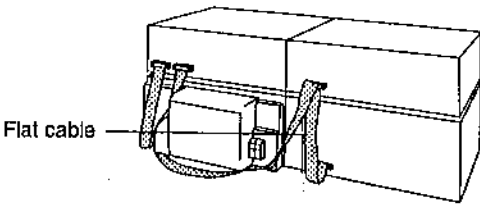
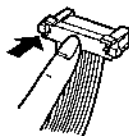
This unit is equipped with a self-diagnostic function which, in the event of a malfunction, automatically displays a code indicating the nature of the malfunction. Use this self-diagnostic function when servicing the unit.

SC-CH515 (SL-CH515, ST-CH505, SE-CH515A, RS-CH505, SB-CH515A)

SC-CH717 (SL-CH515, ST-CH707, SE-CH717, RS-CH505, SB-CH717)

Display method	Display location
To display the malfunction code U-70: Automatically displays on the tuner/sound processor and the CD changer when a malfunction occurs. F16~F25: .. Displays on the CD changer using the procedure described below. F-61 Automatically displays on the tuner/sound processor when a malfunction occurs. ●Display procedure - Switch on the power to the unit (SL-CH515). Connect the system and press the POWER button on the amplifier (SE-CH515A or SE-CH717). - While pressing the STOP button for at least 2 seconds, press the F.SKIP button. The self-diagnostic mode will be activated. If there is a malfunction, the above operation will cause the malfunction code (F16~F25) to be displayed. Note: There may be more than one malfunction at the same time, so after correction the first malfunction displayed, repeat the procedure above [steps (1) and (2)] to confirm that no other malfunction is displayed. If there is no other malfunction, "END" is displayed, the disc tray will half-eject, full-eject, and then close. To return to the normal display - For U-70: - Press an operation button (any button other than the OPEN/CLOSE button) on the unit (tuner/sound processor or CD changer) which displayed "U-70". - To re-display the code, switch the power off (POWER STANDBY button), and then switch power back on again. - For F16-F25: - Switch off the power (POWER STANDBY button). - To re-display the code, switch the power on (POWER STANDBY button) and then repeat the procedure above (step 1 and 2). - For F-61: - If "F-61" is displayed, the power will automatically be switched off and the standby indicator will light up. "F-61" will be displayed for 3 seconds, and then the clock will be displayed. - To re-display the code, switch the power on. "F-61" will be re-displayed, and then after 3 seconds the clock will be displayed and the power will automatically switch off.	CD changer Left speaker (SB-CH515A or SB-CH717) Right speaker (SB-CH515A or SB-CH717) Compact disc changer (SL-CH515) Tuner/sound processor (ST-CH505 or ST-CH707) Cassette deck (RS-CH505) Amplifier (SE-CH515A or SE-CH717) F.SKIP button STOP button POWER button Tuner/sound processor

●Display contents

Display code	Problem or condition	Correction procedure
U-70 (displayed automatically)	A bus-line communications error has occurred as a result of the flat cables being inserted incorrectly, thus preventing the system from operating. - If "U-70" is displayed on the tuner/sound processor, the tape deck cannot be operated by remote control. - If "U-70" is displayed on the CD changer, the CD changer cannot be operated by remote control.	 - To check for correct insertion of the flat cables - Match each connector with the color (black/white) of the connection port and insert until you hear a click. - Insert the flat cables at the back of the unit in the order indicated. Make sure the which side of the cable is on your right side. - Breakage of flat cable (Check and replace as necessary.) - If the problem is not corrected by items (1.) and (2.) above, this indicates a faulty IC. SL-CH515: IC301 (M38173M6270) IC302 (LA5608M-TE-L) Check these ICs and replace as necessary. 
F16	Faulty traverse deck UP switch. Example: The rotary hits the traverse deck.	- Check for faulty contact of the switch (S501), faulty soldering of switch terminals, and damaged foil. - Replace the switch, repair soldering or repair foil.
F17	Faulty traverse deck DOWN switch. Example: The tray opens.	- Check for faulty contact of the switch (S501), faulty soldering of switch terminals, and damaged foil, etc. - Replace the switch, repair soldering or repair foil.
F18	Faulty rotary turret rotation detection. Example: The turret continues to turn at the initial position without stopping.	Check the optical sensor (D503) and replace if necessary.
F20	Faulty loading motor rotation detection. Example: The turret repeatedly rotates in forward or reverse direction, or tray repeatedly moves out and back in.	Check the optical sensor (D502) and replace if necessary.
F21	Loading motor rotates in reverse. Example: The turret repeatedly rotates in forward or reverse direction, or tray repeatedly moves out and back in.	Check the mounting direction of the motor (M501), and if the direction is reversed, re-mount it in the correct direction.
F22	Faulty loading motor and loading mechanism. Example: Nothing happens when the PLAY button is pressed. The loading operation is not performed when the OPEN/CLOSE button is pressed.	Check the motor (M501) and replace if necessary. Check the cams and other of the loading mechanism to confirm that none are damaged or missing, and that all are mounted in the correct positions.
F24	Faulty half-open switch. Example: When the tray is opened during play, it opens completely (full open).	- Check for faulty switch contacts (S503), faulty soldering of switch terminals, and damaged foil. - Replace the switch, repair soldering or repair foil.
F25	Faulty full-open switch. Example: When the tray is opened, it closes after 3 or 4 seconds.	- Check for faulty switch contacts (S502), faulty soldering of switch terminals, and damaged foil. - Replace the switch, repair soldering or repair foil.
F-61	When the power switch is switched on, it automatically switches back off, making it impossible to switch power on.	- Faulty amplifier (SE-CH515A or SE-CH717) output IC (IC501). - Fan motor is burnt out, locked, or stopped. - Replace the output IC or fan motor as necessary.

■ Display Function of Automatically-Adjusted Results (Self-Check Function)

The SL-CH515 unit has a function that uses the FL display board to indicate the results from 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. Set the unit in the servo-board testing mode (refer to page 13).
2. Turn on the power to the unit (refer to page 3).

Note:

When the SL-CH515 unit is powered on, the error code "U-70" is displayed. Exit this mode using the STOP (□) key.

3. Check one of the disc trays in the rotary tray faces the front.
4. Hold down the STOP (□) key for more than two seconds and press the R.SKIP (⏮/⏭) key. This causes the unit to enter the automatic adjustment mode.
5. After automatic adjustment, the code display indicates the location of failure in the servo circuit.

● Troubleshooting using the automatic adjustment code

Notes:

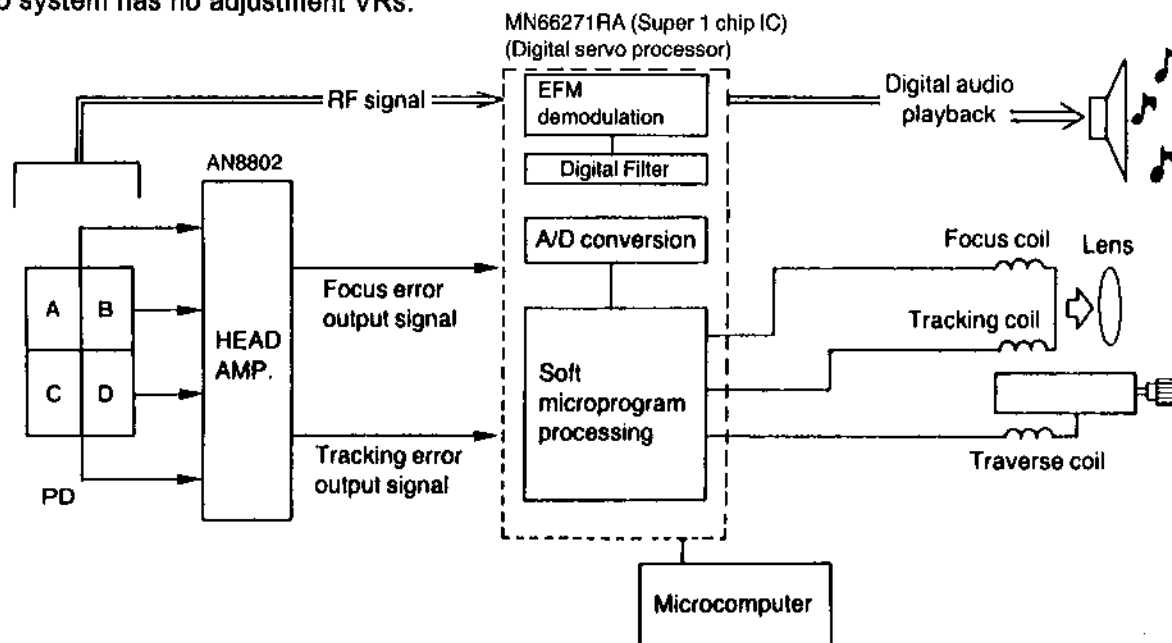
1. If "E-00" is displayed as an error code, this means no error has been found.
2. Check the disc and laser-detector lens for damage, contamination or stains.

FL error code display	Symptom	Probable cause	Signal to check		Normal the values of voltage and waveform	
			Signal name	Location	PLAY	STOP
E-01	Focus and tracking offset adjustments did not complete in the 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 the mechanism controller	MDATA	IC702 ⑥ pin		4.8V
			MCLK	IC702 ⑦ pin		4.8V
			MLD	IC702 ③ pin	0V	0V
			SENSE	IC702 ⑩ pin	4.9V	4.9V
			/RST	IC702 ⑪ pin		
			X2	IC702 ⑨ pin		
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 constangs.) ③ Spindle driver circuit ④ Optical pickup	FE	IC702 ⑨ pin		2.4V
			TE	IC702 ⑩ pin		2.4V
			FOD	IC702 ⑥ pin	2.4V	2.4V
			TRD	IC702 ⑦ pin	2.4V	2.4V
			KICK	IC702 ⑧ pin	2.4V	2.4V
			/FLOCK	IC702 ⑪ pin	0V	4.9V
			/RF DET	IC702 ⑫ pin	0V	4.8V
			RF	TJ701		3.4V
			STAT	IC702 ⑬ pin	4.9V	0V
E-4 E-6 E-C E-E	Best Eye (PD Balance) adjustment did not complete in the specified time period.	① Scratches or contaminants on disc surface. ② Focus and Tracking servo circuit (check waveforms, voltages, and constants.) ③ Optical pickup	FBAL	IC702 ⑭ pin	2.5V ± 1.25V	2.5V ± 1.25V
			RF	TJ701		3.4V
			FE	IC702 ⑨ pin		0V
			OFT	IC702 ⑩ pin	0V	0V
			/TLOCK	IC702 ⑪ pin	0V	0V
E-8 E-A	Focus or Tracking gain adjustment did not complete in the specified time period.	① Scratches or contaminants on disc surface. ② Focus and Tracking servo circuit (check waveforms, voltages, and part constants.) ③ Optical pickup	FE	IC702 ⑨ pin		2.4V
			TE	IC702 ⑩ pin		2.4V
			OFT	IC702 ⑪ pin	0V	0V
			/TLOCK	IC702 ⑫ pin	0V	0V

Digital Servo System

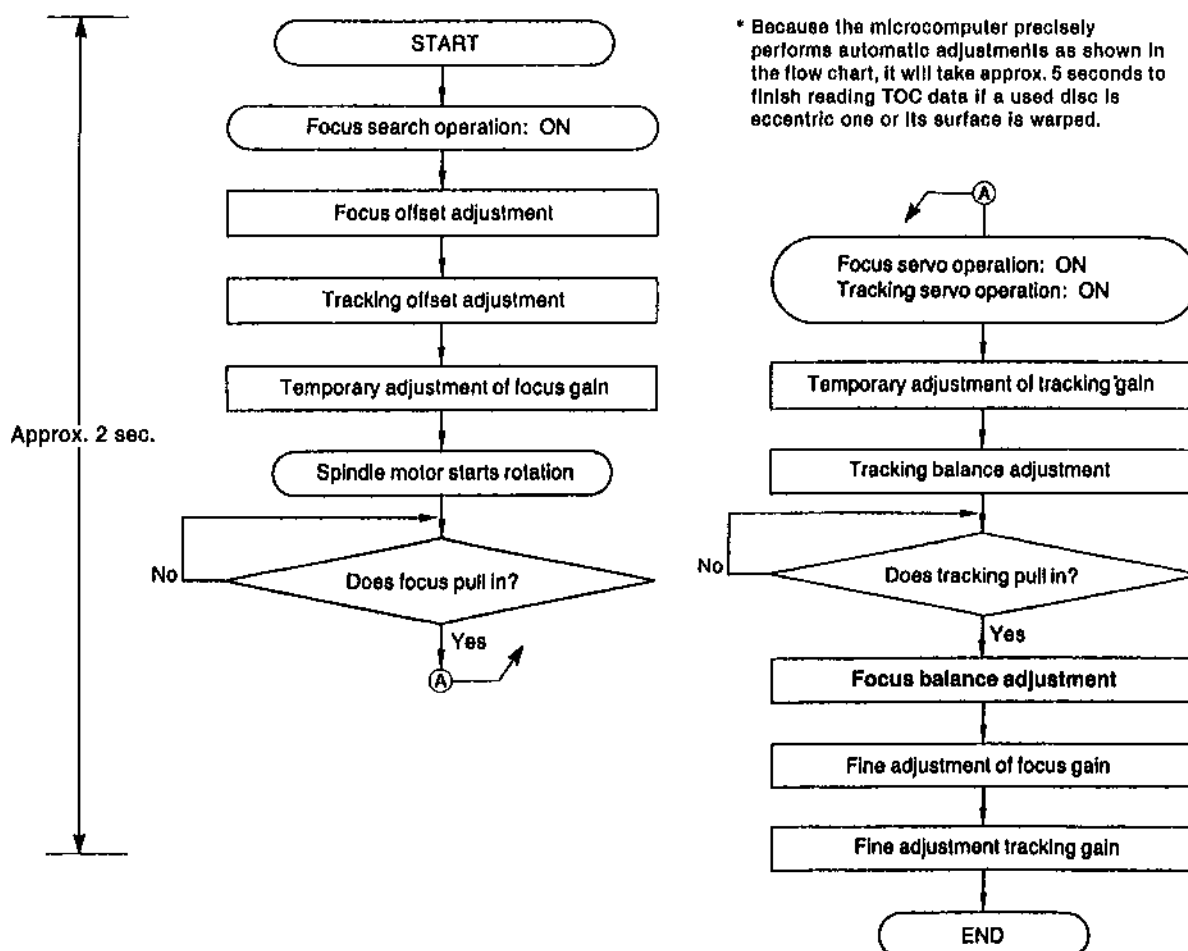
DIGITAL SERVO SYSTEM

This servo system has no adjustment VRs.

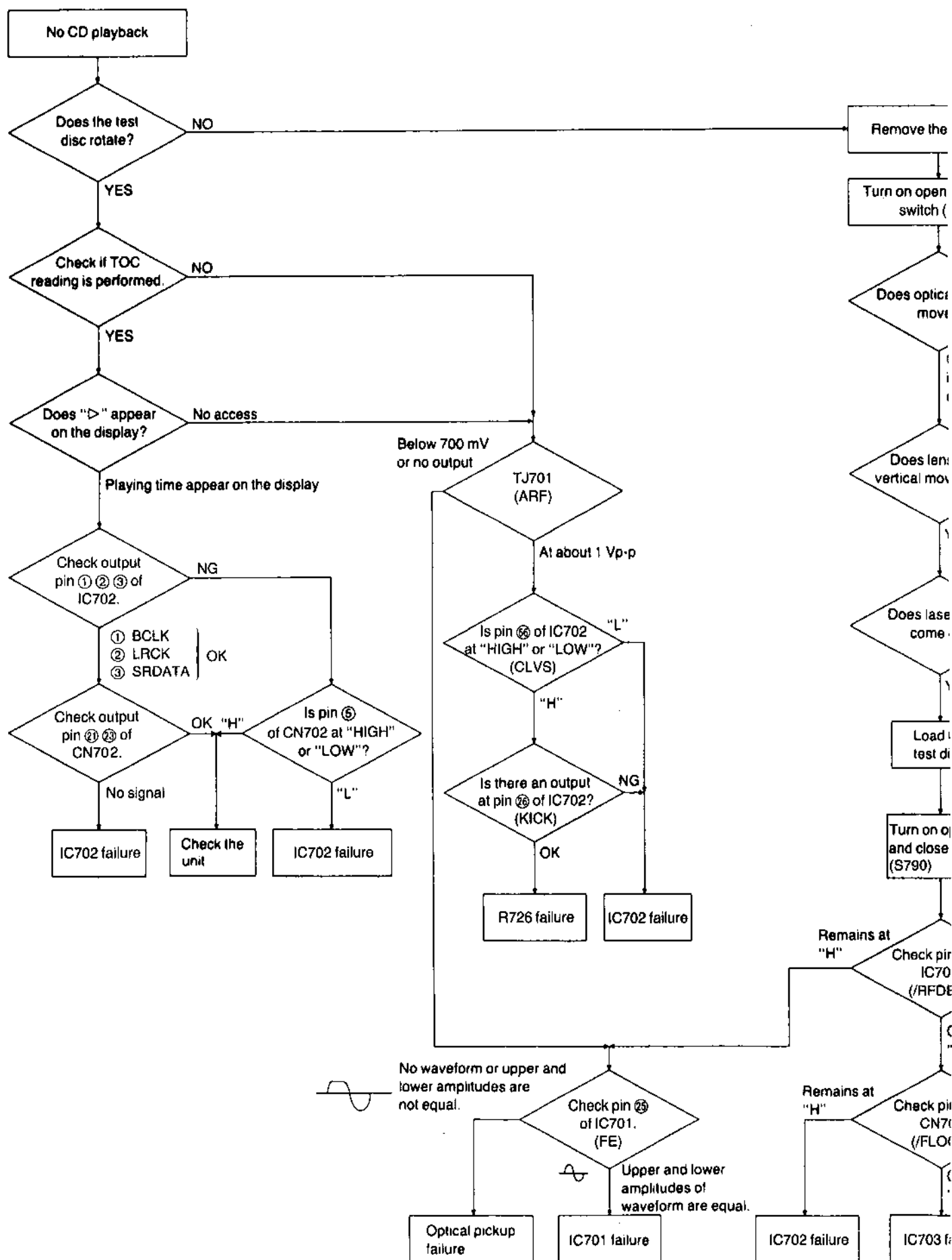


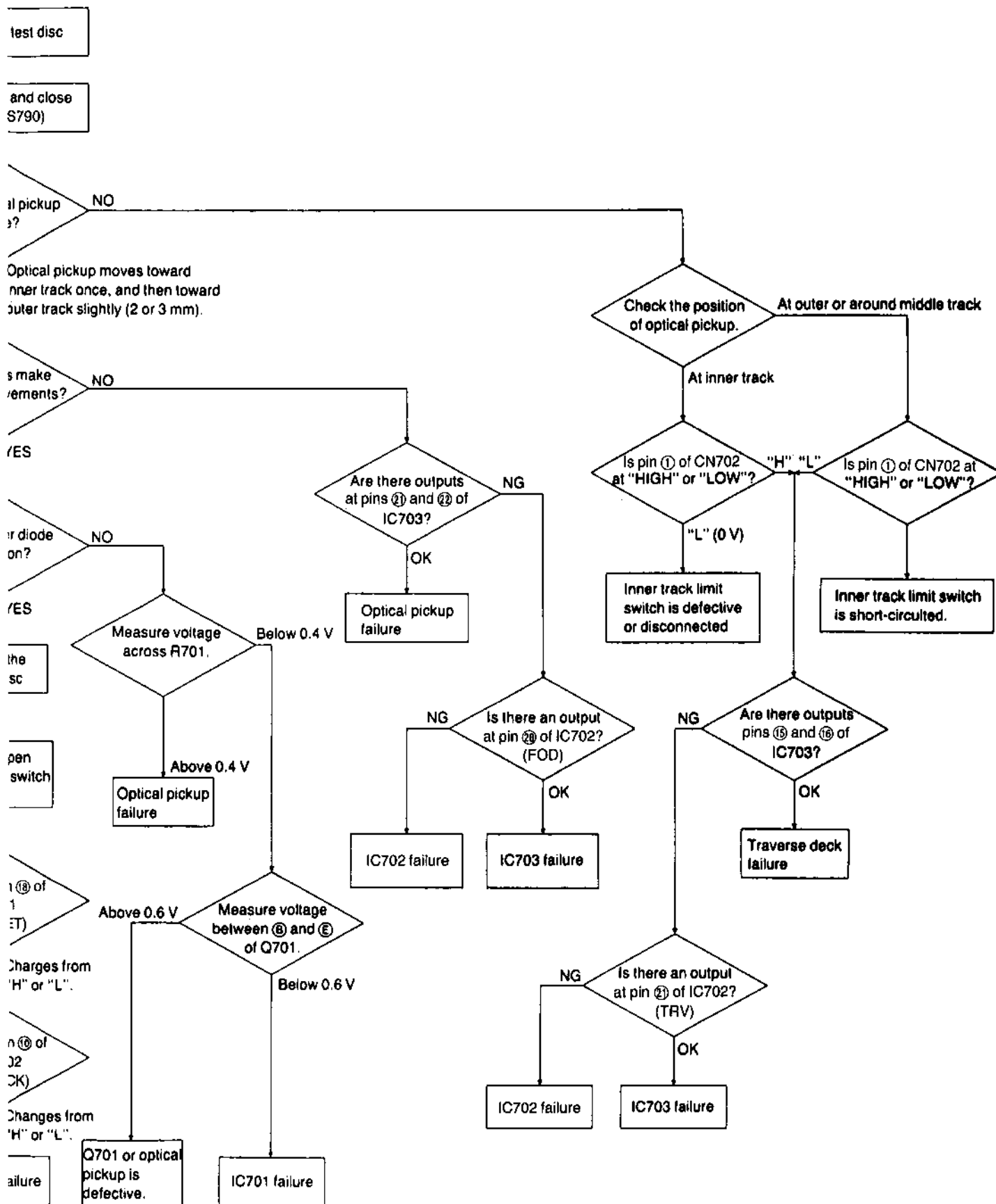
The following flow chart shows the sequence of automatic adjustments.

• Flow chart on automatic adjustment sequence



Troubleshooting Guide





■What is CD Graphics

CD-Graphics compact discs contain text and/or graphics information in reserved subcode channels that are separate from the main channels containing musical data.

There are eight subcode channels available on compact discs: i.e. P, Q, R, S, T, U, V, and W, of which only P and Q channels are currently in use. The remaining six 6-bit reserved channels, R through W, can be used to store text/graphics information. CD-Graphics CDs completely compatible with conventional CDs. Graphics information is read of the subcode channels (R through W), decoded by the CD graphics decoder, and shown on a video monitor.

Ninety eight (98) frames of subcode channels make up a single block.

Two of the 98 frames hold synchronization information that helps identify the first bit of each frame. Thus, 96 frame are actually available as subcode channels.

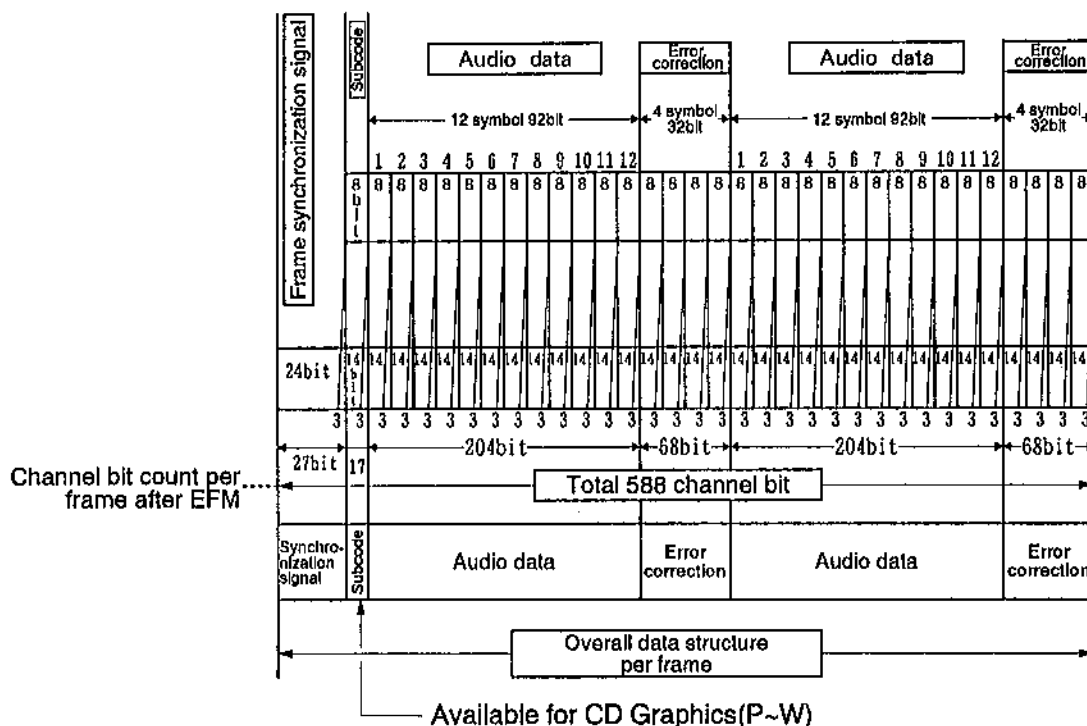
The total subcode bit count available in a single block is given by: $96 \text{ (frames)} \times 8 \text{ (bits)} = 768 \text{ bits}$.

The total storage capacity provided by the six subcode channels (R~W) is thus:

$$6 \text{ bits} \times 96 \text{ frames} \times 75 \text{ times/sec.} \times 3600 \text{ sec.} = 155,520,000 \text{ bits.}$$

As 8 bit make up a single byte, this translates into 19,440,000 bytes or 19.44 Mbytes.

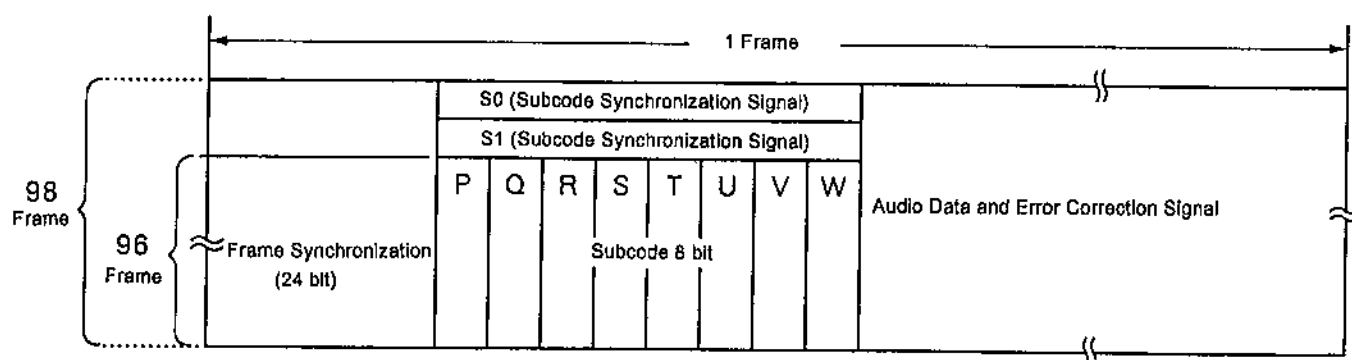
The six reserved subcode channels on a CD thus have a storage capacity close to 20 Mbytes, large enough to hold still graphics images or text data.



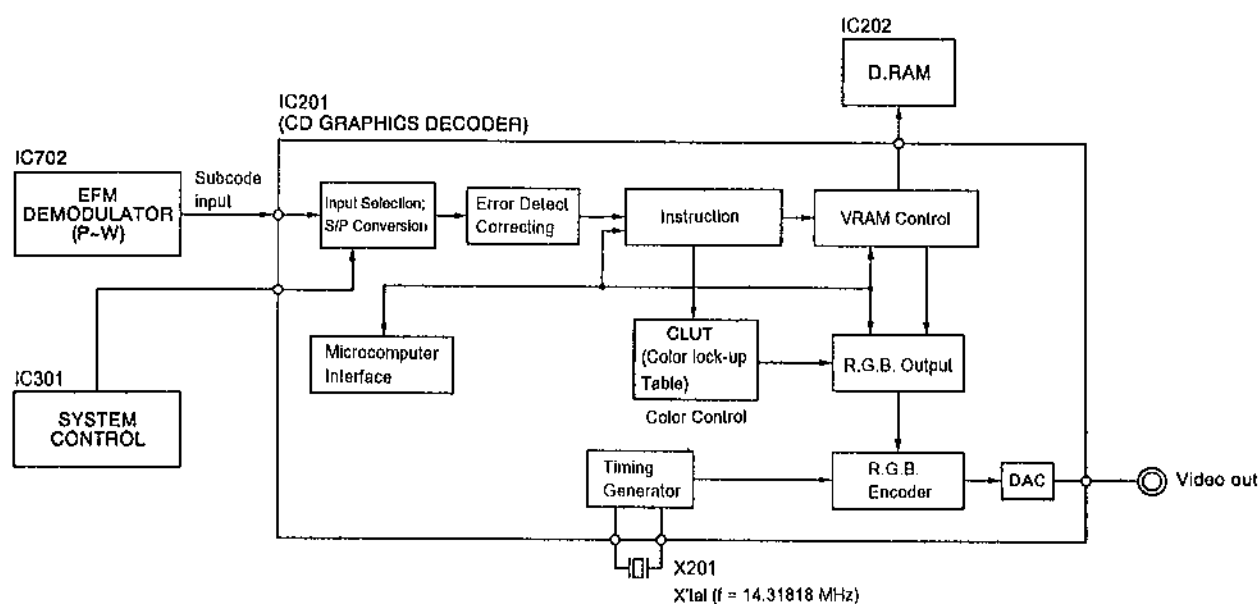
Frame data format used on CDs

●Contents of subcode channels

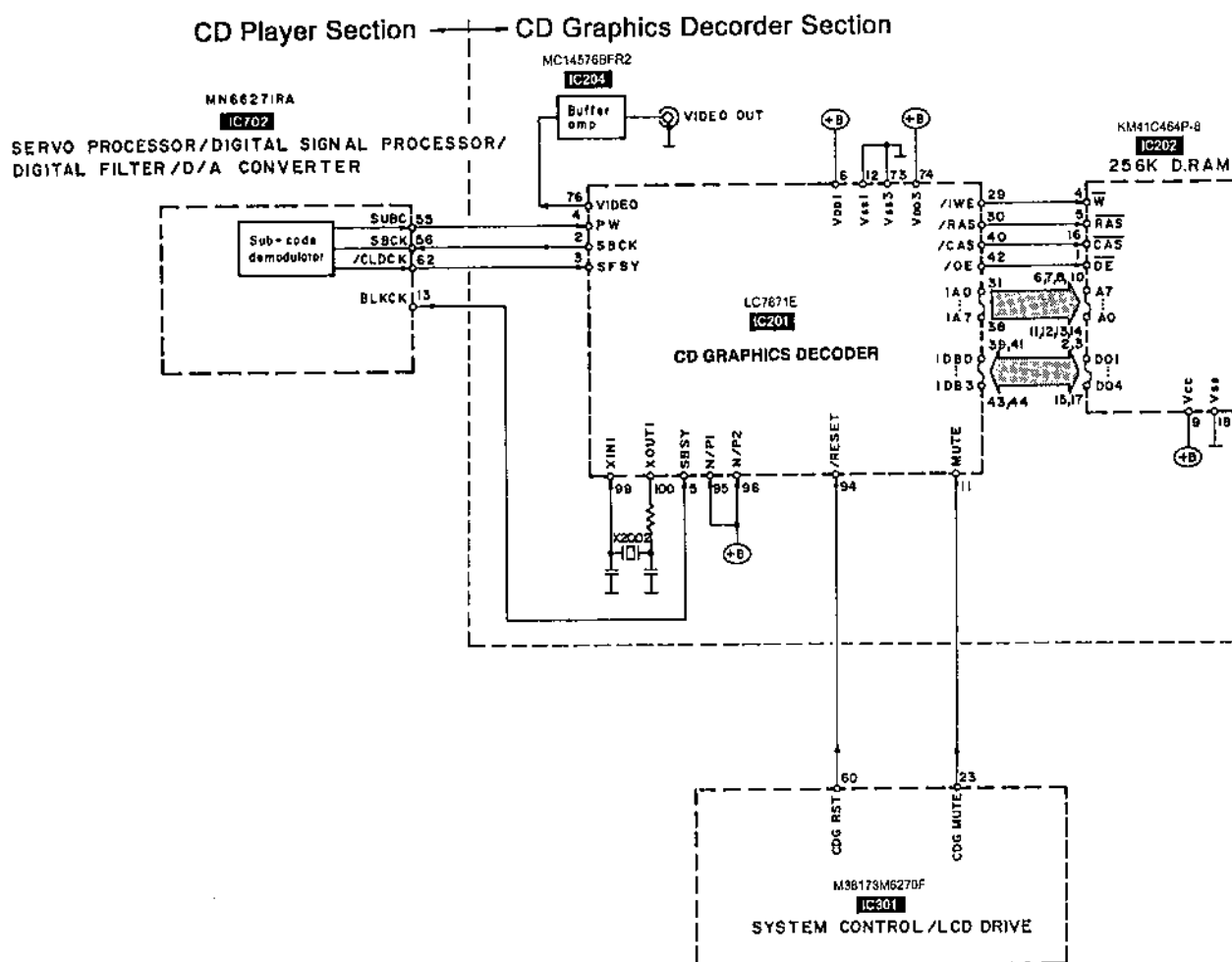
Number of Channels	Channel Name	Purpose	Channel bit Count
1	P	Presence of musical data (identifies inter-track spaces)	1 bit
2	Q	Control bits Number of audio channels Presence of pre-emphasis Address and contents of address Track number Index Time in minutes, seconds Frame number Cumulative time code (minutes seconds, frames) Serial disc number	1 bit
3	R	Available for CD graphics	1 bit
4	S		1 bit
5	T		1 bit
6	U		1 bit
7	V		1 bit
8	W		1 bit



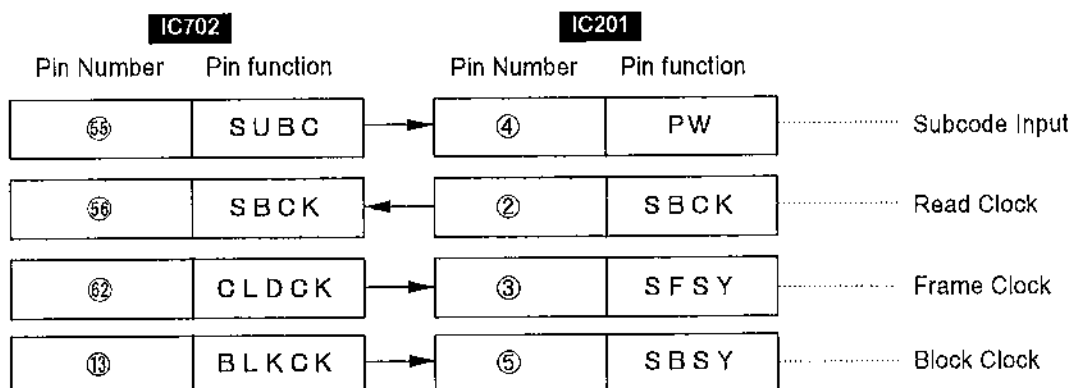
●IC201 (Subcode Decoder) Block Diagram



●Description of Operation



The clocks and subcode (P~W) demodulated by **IC702** are accessed by **IC201** through the following pins:



The subcode signal received at pin 4 of IC201 (CD Graphics Decoder) is processed into video data. The video data, appearing at pin 26 of IC201, feed IC204 (Video Amplifier), where it is amplified 6 dB. (For IC201's internal block diagram, see page 45.)

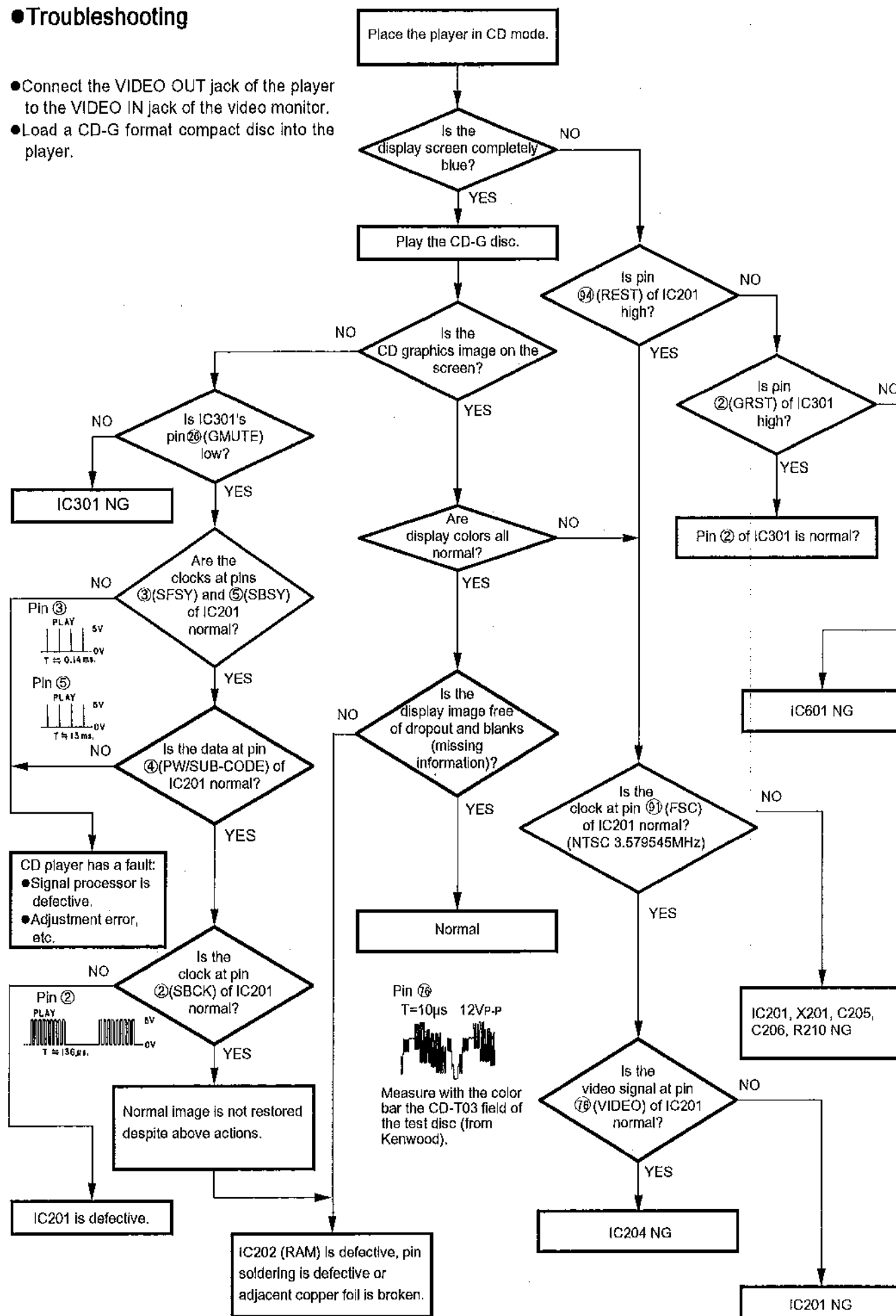
IC202 is a 256 kbit external DRAM.

Pins 94 (/RESET) and 11 (MUTE) of IC201 communicate with pins 2 and 26 of system microprocessor (IC601).

- Pin 2 is used to reset previous data and set the display screen to blue when the disc is replaced.
- Pin 26 is used to mute unwanted musical data when the SKIP key is pressed during playback.

●Troubleshooting

- Connect the VIDEO OUT jack of the player to the VIDEO IN jack of the video monitor.
- Load a CD-G format compact disc into the player.



■Function of IC Terminals

●IC301 (M38173M6270F)

Pin No.	Terminal Name	I/O	Function
1	BSDT0	O	Bus data output
2	BSCK0	O	Bus clock output
3	BSDT1	I	Bus data input
4	BSCK1	I	Bus clock input
5 └ 8	NU	—	—
9	CS	O	IC401 serial communication starting signal output
10	CLK	O	IC401 clock output
11 12	D0 D1	O	IC401 data output
13	NU	—	—
14	SOL	O	Solenoid drive signal output
15	PSTN	I	Photo sensor signal input
16	PHOUT	I	Photo sensor signal input (Speed detect)
17	/FWD	O	Motor control (FWD)
18	/REW	O	Motor control (REW)
19 20	NU	—	—
21	DOWN	O	Traverse down detect signal input
22	FOPN	I	Tray full open detect signal input
23	HOPN	I	Tray half open detect signal input
24	UP	I	Traverse up detect signal input
25	REQ	O	IC401 request signal output
26	HALT	I	Power failure detect signal input
27	RST	I	Reset signal input
28	XC IN	—	GND
29	XC OUT	—	—
30	X IN	I	Clock input

Pin No.	Terminal Name	I/O	Function
31	X OUT	O	Clock output
32	VSS		GND
33 └ 36	NU	—	—
37	CD POWER	O	Reset control signal output
38	/CD	O	Muting control signal output
39	GRST	O	Reset signal output
40	GMUTE	O	Video mute signal output
41 └ 51	G1 └ G11	O	FL grid drive signal output
52 └ 61	S10 └ S1	O	FL segment drive signal output
62 └ 69	S11 └ S18	O	FL segment drive signal output
70 71	LED1 LED0	O	LED control
72	NU	—	—
73	VDD	I	+5V
74	VPP	I	-28V
75	AVSS	—	GND
76	VREF	O	Reference voltage output
77	NU	—	—
78 79	KEY2, KEY1	I	Operation switch signal input
80	NU	—	—

●IC401 (LC66306A4C13)

Pin No.	Terminal Name	I/O	Function
1	REST SW	I	Innermost track sense switch status
2	SERVO RST	I	Reset signal input
3	STAT	I	Status signal input
4	SUBQ	I	Subcode Q input
5	D MUTE	—	Muting signal output (No use)
6	NC	—	—
7	SQCK	O	External clock for subcode Q register
8	BLKCK	I	Subcode block clock input
9	ODL RX	I	—
10	ODL TX	—	—
11	NU	—	—
12	NU	—	Tied high
13	MLD	O	Microprocessor command load signal
14	M DATA	O	Microprocessor command data
15	TEST	—	GND
16	Vss	—	
17	OSC1	I	Clock input from X401 (4.23 MHz)
18	NC	—	GND
19	NC	—	GND
20	OSC2	O	Clock signal output to X401 (4.23 MHz)
21	/RST	O	Reset signal output
22	M CLK	O	Microprocessor command clock
23	NU	—	—
24	NU	—	—
25	—	—	—

Pin No.	Terminal Name	I/O	Function
26	CS	I	Input of Serial communication starting to IC601 for system control
27	REQ	I	Input of Request signal from IC601 for system control
28	DT	I/O	Data Signal input/output from IC601 for system control
29			
30	NU	—	GND
31	CLK	I	Clock for communication with IC601
32	NU	—	—
33	NU	—	GND
34			
35			
36			
37			
38			
39	V _{DD}	I	Power supply
40	CLOSE SW	I	Disc tray "close" sense switch status
41	OPEN SW	I	Disc tray "open" sense switch status
42	NC	—	Connected to Vss
43			
44	/CLOSE	O	Close Disc Tray command output
45	/OPEN	O	Open Disc Tray command output
46	SENSE	I	Sense signal input
47	/FLOCK	I	Focus servo pull-in signal
48	/TLOCK	I	Tracking servo pull-in signal

●IC703 (AN8389SE1)

Pin No.	Terminal Name	I/O	Function
1	Vcc	I	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
8	GND	—	Ground connection
9	IN2	I	Motor driver (2) input
10	PC2	I	PC2 (power cut) input
11	IN1	I	Motor driver (1) input
12	PC1	I	PC1 (power cut) input (no use, open)

Pin No.	Terminal Name	I/O	Function
13	PVcc1	I	Power supply (1) for driver
14	PGND1	—	Ground connection (1) for driver
15	D1-	O	Motor driver (1) reverse-action output
16	D1+	O	Motor driver (1) forward-action output
17	D2-	O	Motor driver (2) reverse-action output
18	D2+	O	Motor driver (2) forward-action output
19	D3-	O	Motor driver (3) reverse-action output
20	D3+	O	Motor driver (3) forward-action output
21	D4-	O	Motor driver (4) reverse-action output
22	D4+	O	Motor driver (4) forward-action output
23	PGND2	—	Ground connection (2) for driver
24	PVcc2	I	Power supply (2) for driver

●IC701 (AN8802SCE1V)

Pin No.	Terminal Name	I/O	Function
1	POAD	I	PD A channel signal input with delay
2	PDA	I	PD A channel signal input without delay
3	LPD	I	Laser PD connection
4	LD	O	Power supply for LD driving
5	AMPI	I	RF amplifier input
6	Vcc	I	Power supply connection
7	AMPO	O	RF amplifier output (no use, open)
8	CAGC	I	AGC loop filter connection
9	ARF	O	RF AGC output
10	CENV	I	Capacitor connection for RF detection
11	CEA	I	Capacitor connection for HPF amplifier
12	GND	—	Ground connection
13	LDON	I	ON/OFF input of LD APC ("H": ON, "L": OFF)
14	TES	I	Tracking error shunt signal input ("H": shunt)
15	PLAY	I	Play signal input ("H": PLAY)
16	WVEL	I	WVEL control
17	BDO	O	BDO output
18	/RFDET	O	NRFDET output
19	CROSS	O	CROSS output
20	OFTR	O	OFTR output
21	VDET	O	VDET output
22	ENV	O	ENV output
23	TEBPF	I	Vibration detection input
24	TE	O	Tracking error output
25	FE	O	Focus error output
26	PTO	O	Potential amplifier output (no use, open)
27	PTI	I	Potential amplifier inversion input (no use, open)
28	TBAL	I	Tracking balance input
29	FBAL	I	Focus balance input
30	VREF	O	VREF output
31	PDB	I	PDB channel signal input without delay
32	PDBD	I	PDB channel signal input with delay

●IC702 (MN66271RA)

Pin No.	Terminal Name	I/O	Function
1	BCLK	—	Bit clock output for serial data (no use, open)
2	LRCK	—	L/R identification signal output (no use, open)
3	SRDATA	—	Serial data output (no use, open)
4	DVDD1	I	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)
14	SQCK	I	External clock signal input for sub-code Q register
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)
20	PMCK	—	1/192-divided clock signal of crystal oscillating (fPMCK=88.2 KHz) (no use, 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

Pin No.	Terminal Name	I/O	Function
29	VREF	I	D/A (drive) output (TV0, 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)
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)
42	PLAY	O	Play signal out ("H": PLAY)
43	WVEL	O	Double speed status signal output ("H": Double speed)
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	—	DSL bias (no use, open)
47	DSLIF	I/O	DSL loop filter
48	PLLIF	I/O	PLL loop filter
49	VCOF	—	VCO loop filter (no use, open)
50	AV _{DD} 2	I	Power supply input (for analog circuit)
51	AV _{SS} 2	—	GND (for analog circuit)
52	EFM	—	EFM signal output (not use, open)
53	PCK	—	PLL extraction clock output (fPCK=4.321 MHz during normal playback) (no use, open)
54	PDO	—	Phase comparison signal of EFM and PCK signals (no use, open)
55	SUBC	O	Sub-code serial data output (no use, open)
56	SBCK	I	Clock input for sub-code serial data (no use, open)
57	V _{SS}	—	GND
58	X1	I	Crystal oscillating circuit input (f=16.9344 MHz)
59	X2	O	Crystal oscillation circuit output (f=16.9344 MHz)
60	V _{DD}	I	Power supply input (for oscillating circuit)
61	BYTCK	—	Byte clock output (no use, open)

Pin No.	Terminal Name	I/O	Function
62	/CLDCK	O	Sub-code frame clock signal output (ICLDCK=7.35 kHz during normal playback)
63	FCLK	—	Crystal frame clock signal output (fFCLK=7.35 kHz, double=14.7 kHz)
64	PFLAG	O	Interpolation flag output ("H": Interpolation) (no use, open)
65	FLAG	O	Flag output (no use, open)
66	CLVS	O	Spindle servo phase synchronizing signal output ("H": CLV, "L": rough servo) (no use, open)
67	CRC	O	Sub-code CRC checked output ("H": OK, "L": NG) (no use, open)
68	DEMPH	O	De-emphasis ON signal output ("H": ON) (no use, open)
69	RESY	—	Frame resynchronizing signal output (no use, open)
70	/RST2	I	Reset input through MASH circuit ("L": Reset)
71	/TEST	I	Test input
72	AV _{DD} 1	I	Power supply input (for analog circuit)
73	OUTL	O	Left channel audio signal output
74	AV _{SS} 1	—	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	—	Crystal oscillating frequency designation input ("L": 16.9344 MHz, "H": 33.8688 MHz)
78	PSEL	—	Test input (normally, "L") (no use, open)
79	MSEL	—	Output frequency switching for SMCK terminal "H": SMCK=8.4672 MHz "L": SMCK=4.2336 MHz (no use, open)
80	SSEL	I	Output mode switching of SUBQ terminal ("H": Q code buffer mode)

●IC201 (LC7870NE) for (GC) area

Pin No.	Terminal Name	I/O	Function
1	S	I	CD display select signal input (Connected to V _{DD})
2	SBCK	O	Clock signal output for sub-code read
3	SFSY	I	Frame sync signal input for sub-code
4	PW	I	Data signal input for sub-code
5	SBSY	I	Block sync signal input for sub-code
6	V _{DD1}	—	Power source terminal for digital signal
7	CE	I	Control signal input at the serial signal input/output
8	DO	O	Serial data signal output
9	DI	I	Serial data signal input
10	CL	I/O	Serial data clock signal input/output
11	MUTE	I	Video mute signal input
12	V _{SS1}	—	GND terminal for digital signal
13 • 14	CH0 • CH1	I	Connected to V _{DD1}
15 • 28	CH2 • CH15	—	Connected to GND
29	/1WE	O	Connected to D-RAM IC202 (KM41C464P-B), memory writing control signal output
30	/RAS	O	Connected to D-RAM IC202 (KM41C464P-B), memory reading control signal output
31 • 38	1A0 • 1A7	O	D-RAM address signal output
39	1DB0	I/O	D-RAM data signal input/output
40	/CAS	O	D-RAM control signal output
41	1DB1	I/O	D-RAM data signal input/output
42	/OE	O	D-RAM control signal output
43 • 44	1DB2 • 1DB3	I/O	D-RAM data signal input/output
45	/2WE	—	D-RAM control signal output (Not used)
46 • 53	2A0 • 2A7	—	D-RAM address signal output (Not used)

Pin No.	Terminal Name	I/O	Function
54 • 57	2DB0 • 2DB3	—	D-RAM data signal input/output (Not used)
58	TEST	—	Test signal input (Connected to GND)
59	CDGM	O	CD graphics detect signal output (CD graphics mode: "H", CD mode: "L")
60 • 65	TRANS 0 • TRANS 5	—	Not used
66	V _{SS2}	—	GND terminal for analog signal (Not used)
67	V _{DD2}	—	Power source terminal for analog signal (Not used)
68	BIAS1	—	Connected to a condenser for ripple elimination (Connected to GND)
69	TRANS	O	Signal output for define-transparency
70	R OUT	O	6-bit data output for video signal (R)
71	G OUT	O	6-bit data output for video signal (G)
72	B OUT	O	6-bit data output for video signal (B)
73	V _{SS3}	—	GND terminal for analog signal
74	V _{DD3}	—	Power source terminal for analog signal
75	BIAS2	—	Connected to a condenser for ripple elimination
76	VIDEO	O	Composite video signal output (8-bit DAC output)
77 • 78	TEST1 • TEST2	—	Test signal input (Connected to GND)
79	FSCIN	—	Clock signal input for sub-carrier (Connected to GND)
80	V SYNC	O	Vertical sync signal output (Not used)
81	2FSC	—	2FSC signal output (Not used)
82	YS	—	Superimpose control signal output (Not used)
83	/CSYNC	—	Complex sync signal output (Not used)
84	SON	—	Superimpose ON/OFF signal output (Connected to GND)
85	EFLG	—	Error mode monitoring signal output (Not used)

Pin No.	Terminal Name	I/O	Function
86	FSX	—	Error mode monitoring trigger signal output (Not used)
87	M1/M2	I	D-RAM IC select signal input (Connected to V _{DD1})
88	DEN	—	Connected to GND
89	PALID	—	Not used
90	/H RESET	I	Connected to V _{DD1}
91	FSC	—	Clock signal output for sub-carrier (Connected to TP201)
92	/V REST	I	Connected to V _{DD1}
93	4FSC2	—	Connected to GND
94	/RESET	I	Reset signal input
95	N/P1	I	NTSC/PAL select signal input for RGB encoder (NTSC: "H", PAL: "L")
96	N/P2	I	NTSC/PAL select signal input for CD-EG decoder (NTSC: "H", PAL: "L")
97	XIN2	I	Connected to crystal oscillator X202 for PAL (17.734476 MHz input)
98	XOUT2	O	Connected to crystal oscillator X202 for PAL (17.734476 MHz output)
99	XIN1	I	Connected to crystal oscillator X201 for NTSC (14.31818 MHz input)
100	XOUT1	O	Connected to crystal oscillator X201 for NTSC (14.31818 MHz output)

■Replacement Parts List

Notes: *Important safety notice:

 Components identified by Δ 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.

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

*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)		D301	1SS291TA	DIODE	
				D302	MA4051MTA	DIODE	
				D303, 304	MA165	DIODE	
IC1	LM2940T5	I. C. REGULATOR	Δ	D305	MA723TA	DIODE	
IC201	LC7870NE	I. C. VIDEO AMP.	(GC)	D501	MA165	DIODE	
IC202	KM41C464P-8	I. C. 256K D. RAM	(GC)	D502	RSQCP1S53V	LED	
IC204	MC14576BFR2	I. C. BUFFER AMP.	(GC)	D503	PT381TB	LED	
IC301	M38173M6270F	I. C. FL. DRIVE/SYSTEM CONT.		D504	GL380TB	LED	
IC302	LA5608M-TE-L	I. C. BUS LINE/HALT/RESET		D601	SPR-305MDTF	LED	
IC401	LC66306A4C13	I. C. SYSTEM CONT.				COIL(S)	
IC501	BA6218	I. C. MOTOR DRIVE					
IC701	AN8802SCE1V	I. C. SERVO AMP.		L1, 2	BL02RN2R62T4	COIL	Δ
IC702	MN66271RA	I. C. SERVO PROCESSOR		L3, 4	ELEXT3R3KA9	COIL	
IC703	AN8389SE1	I. C. MOTOR DRIVE				OSCILLATOR(S)	
IC801	XRA4558FT1	I. C. L. P. F.					
IC802	TC4066BFTP1	I. C. SWITCHING					
		TRANSISTOR(S)		X201	RSXC14M3S01	OSCILLATOR (14. 3MHz)	(GC)
				X202	RSXC17M7S01	OSCILLATOR (17. 7MHz)	(GC)
Q1	2SB1185EF	TRANSISTOR	Δ	X301	EF0EC4234T3	OSCILLATOR (4. 23MHz)	
Q2	2SC3311AIQST	TRANSISTOR	Δ	X401	EF0EC4234T3	OSCILLATOR (4. 23MHz)	
Q5	2SB1238QRTV6	TRANSISTOR	Δ	X701	RSXB16M9J01T	OSCILLATOR (16. 93MHz)	
Q202	2SB766-QRSTX	TRANSISTOR	(GC)			DISPLAY TUBE	
Q203	2SC2412KPR1X	TRANSISTOR	(GC)	FL601	RSL0180-F	DISPLAY TUBE	
Q301	2SB621A-R	TRANSISTOR				SWITCH(ES)	
Q302	UN4212TA	TRANSISTOR					
Q303	2SB621A-R	TRANSISTOR		S201	RSS2B006-M	SW. VIDEO OUT	(GC)
Q304	2SC3311AIQST	TRANSISTOR		S501	RS12A001-2	SW. ROTARY POSITION	
Q501, 502	DTC143ESTP	TRANSISTOR		S502	RS11A005	SW. FULL OPEN	
Q701	2SB709S	TRANSISTOR		S503	RS11A005	SW. HALF OPEN	
Q801	UN4112	TRANSISTOR		S601	EVQ21405R	SW. OPEN/CLOSE	
		DIODE(S)		S602	EVQ21405R	SW. PLAY	
D1, 2	1SR35200TB	DIODE	Δ	S603	EVQ21405R	SW. F-SKIP	
D3	MA4075MTA	DIODE	Δ	S604	EVQ21405R	SW. PAUSE	
D4, 5	MA167	DIODE		S605	EVQ21405R	SW. R-SKIP	
D6	MA4051MTA	DIODE	Δ	S606	EVQ21405R	SW. STOP	
D7, 8	MA165	DIODE		S607	EVQ21405R	SW. DISC 3	
D9	MA185TA	DIODE	Δ	S608	EVQ21405R	SW. DISC 2	
D10, 11	MA185TA	DIODE	Δ	S609	EVQ21405R	SW. DISC 1	
D12	MA4270HTA	DIODE	Δ	S611	EVQ21405R	SW. REPEAT	
D13	MA4051MTA	DIODE	Δ	S612	EVQ21405R	SW. RANDOM	
D15, 16	MA165	DIODE		S613	EVQ21405R	SW. DISPLAY	
D201	MA110TX	DIODE	(GC)				

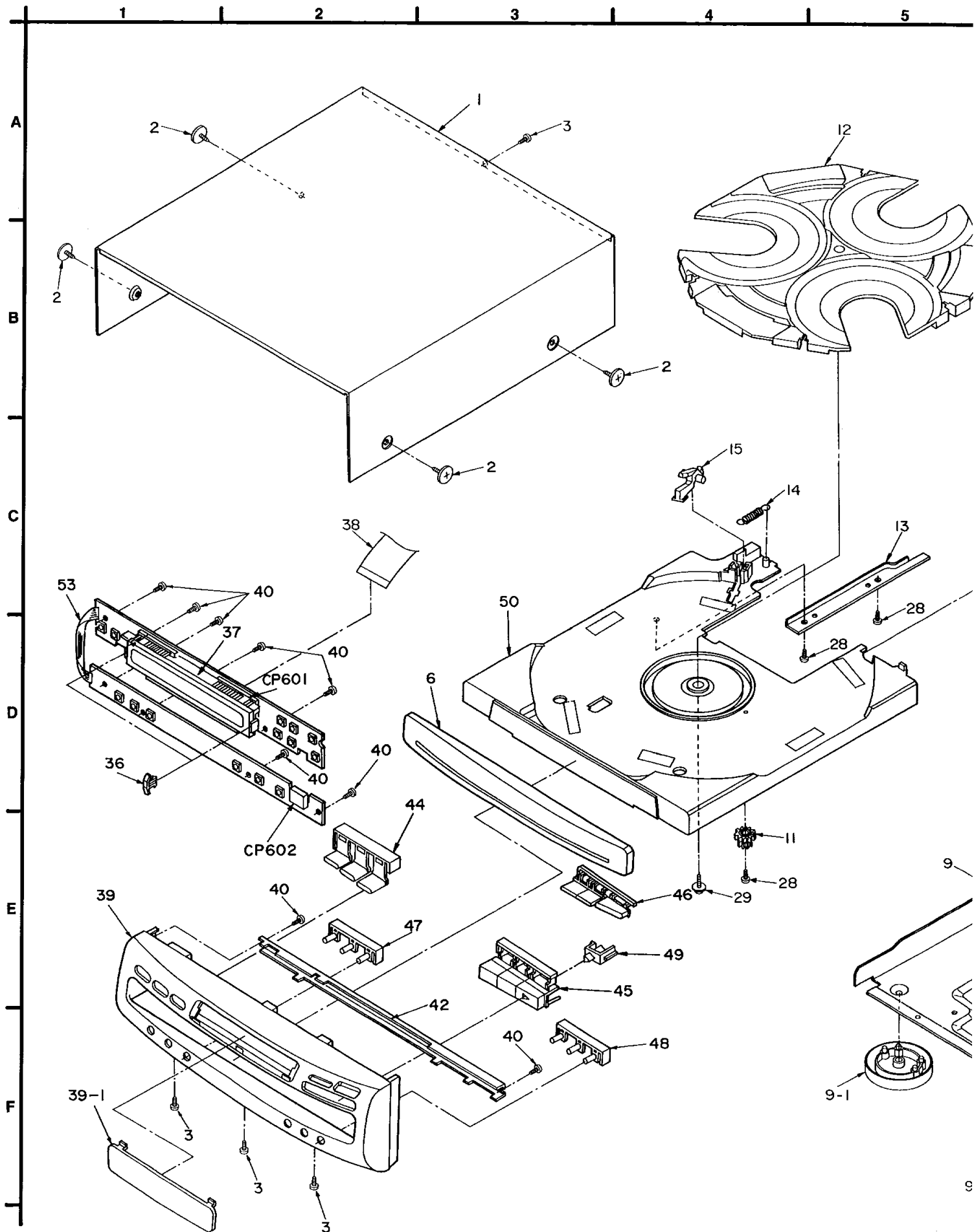
Notes : * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
 * Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM) , 1M=1,000k(OHM)

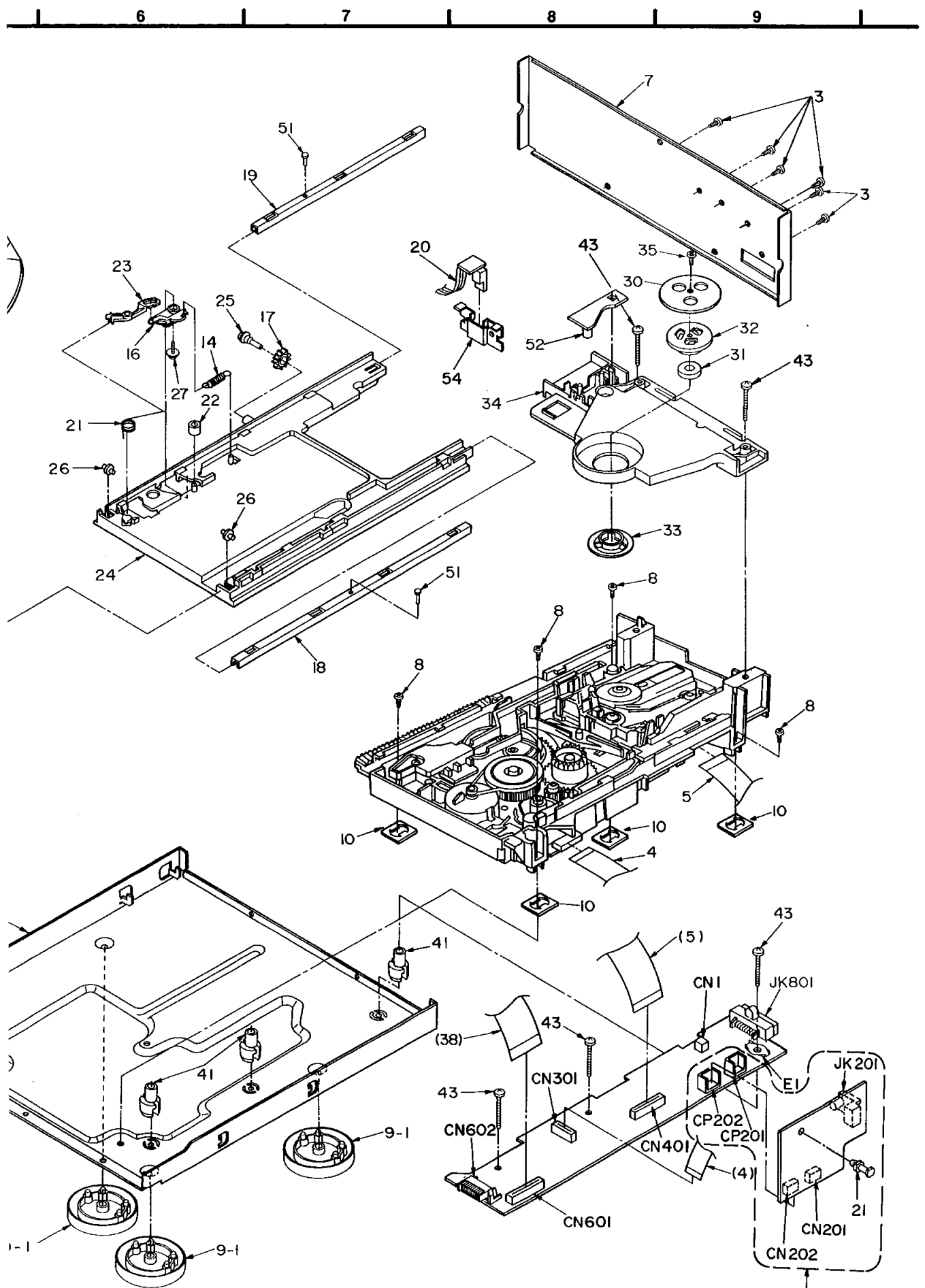
Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS	R324-328	ERDS2TJ103	1/4W 10K	R712	ERJ6GEYJ221V	1/10W 220
			R329	ERDS2TJ473	1/4W 47K	R714	ERJ6GEYJ121V	1/10W 120
			R330	ERDS2TJ181T	1/4W 180	R717, 718	ERJ6GEYJ102A	1/10W 1K
R2	ERDS2TJ102	1/4W 1K	R331	ERDS1FVJ6R8T	1/2W 6.8 Δ	R721	ERJ6GEYJ101V	1/10W 100
R3	ERDS2TJ101	1/4W 100	R332	ERDS2TJ223	1/4W 22K	R722	ERJ6GEYJ563V	1/10W 56K
R4	ERDS2TJ471	1/4W 470	R333	ERDS2TJ821	1/4W 820	R723	ERJ6GEYJ182V	1/10W 1.8K
R5	ERDS2TJ223	1/4W 22K	R334	ERDS2TJ472	1/4W 4.7K	R724	ERJ6GEYJ333V	1/10W 33K
R8	ERDS2TJ220T	1/4W 22	R335	ERDS2TJ471	1/4W 470	R725	ERJ6GEYJ472V	1/10W 4.7K
R9	ERDS2TJ562	1/4W 5.6K	R336	ERD2FCVJ6R8T	1/4W 6.8 Δ	R726	ERJ6GEYJ473V	1/10W 47K
R10, 11	ERDS2TJ562	1/4W 5.6K	R337	ERDS2TJ471	1/4W 470	R727	ERJ6GEYJ103V	1/10W 10K
R13, 14	ERD2FCVJ4R7T	1/4W 4.7 Δ	R401-403	ERDS2TJ102	1/4W 1K	R728	ERJ6GEYJ392V	1/10W 3.9K
R15-22	ERDS2TJ100	1/4W 10	R404-407	ERDS2TJ152	1/4W 1.5K	R731	ERJ6GEYJ392V	1/10W 3.9K
R23, 24	ERDS2TJ8R2T	1/4W 8.2	R408	ERDS2TJ104	1/4W 100K	R735, 736	ERJ6GEYJ101V	1/10W 100
R25-28	ERDS2TJ100	1/4W 10	R409	ERDS2TJ103	1/4W 10K	R744	ERJ6GEYJ103V	1/10W 10K
R29	ERQ16NKR68E	1/6W 0.68	R411	ERDS2TJ472	1/4W 4.7K	R745	ERJ6GEYJ155V	1/10W 1.5M
R30, 31	ERDS2TJ271	1/4W 270	R412	ERDS2TJ102	1/4W 1K	R748	ERJ6GEYJ182V	1/10W 1.8K
R32	ERDS2TJ101	1/4W 100	R413	ERDS2TJ472	1/4W 4.7K	R749	ERJ8GEYJ103V	1/8W 10K
R33	ERDS2TJ562	1/4W 5.6K	R414	ERDS2TJ102	1/4W 1K	R801, 802	ERDS2TJ102	1/4W 1K
R34	ERDS2TJ471	1/4W 470	R415	ERDS2TJ105T	1/4W 1M	R803, 804	ERDS2TJ104	1/4W 100K
R201-209	ERJ6GEYJ102V	1/10W 1K (GC)	R416-419	ERDS2TJ221	1/4W 220 (GC)	R805-808	ERDS2TJ223	1/4W 22K
R210	ERJ6GEYJ101V	1/10W 100 (GC)	R421	ERDS2TJ223	1/4W 22K	R809, 810	ERDS2TJ273	1/4W 27K
R211	ERJ6GEYJ271V	1/10W 270 (GC)	R427	ERDS2TJ103	1/4W 10K	R811, 812	ERDS2TJ332	1/4W 3.3K
R212	ERJ6GEYJ104V	1/10W 100K (GC)	R428	ERDS2TJ223	1/4W 22K	R813, 814	ERDS2TJ104	1/4W 100K
R213	ERJ6GEYJ102V	1/10W 1K (GC)	R429	ERDS2TJ102	1/4W 1K	R815, 816	ERDS2TJ102	1/4W 1K
R214	ERJ8GEYJ101V	1/8W 100 (GC)	R501	ERDS2TJ271	1/4W 270	R817, 818	ERDS2TJ104	1/4W 100K
R215	ERJ6GEYJ101V	1/10W 100 (GC)	R601	ERDS2TJ821	1/4W 820	R819	ERDS2TJ103	1/4W 10K
R216	ERJ6GEYJ103V	1/10W 10K (GC)	R602	ERDS2TJ102	1/4W 1K	R820	ERDS2TJ100	1/4W 10 (GC)
R217	ERJ6GEYJ562V	1/10W 5.6K (GC)	R603	ERDS2TJ122	1/4W 1.2K			CHIP JUMPER(S)
R218-221	ERJ6GEYJ223V	1/10W 22K (GC)	R604	ERDS2TJ152	1/4W 1.5K			
R222	ERJ8GEYJ680V	1/8W 68 (GC)	R605	ERDS2TJ182	1/4W 1.8K			
R223	ERJ6GEYJ103V	1/10W 10K (GC)	R606	ERDS2TJ222	1/4W 2.2K	J1-4	ERJ6GEYOR00V	1/10W 0 (GC)
R224	ERD2FCVJ4R7T	1/4W 4.7 Δ (GC)	R607	ERDS2TJ332	1/4W 3.3K	J7-9	ERJ6GEYOR00V	1/10W 0 (GC)
R225	ERJ6GEYJ102V	1/10W 1K (GC)	R608	ERDS2TJ472	1/4W 4.7K	J11	ERJ6GEYOR00V	1/10W 0 (GC)
R229, 230	ERJ8GEYJ471V	1/8W 470 (GC)	R609, 610	ERDS2TJ104	1/4W 100K	J701, 702	ERJ8GEYOR00A	1/8W 0
R231-235	ERJ6GEYJ101V	1/10W 100 (GC)	R611	ERDS2TJ821	1/4W 820	J707-709	ERJ8GEYOR00A	1/8W 0
R240	ERJ6GEYJ102V	1/10W 1K (GC)	R612	ERDS2TJ102	1/4W 1K	J714	ERJ8GEYOR00A	1/8W 0
R241	ERJ6GEYJ472V	1/10W 4.7K (GC)	R613	ERDS2TJ122	1/4W 1.2K	J716-718	ERJ8GEYOR00A	1/8W 0
R301-304	ERDS2TJ101	1/4W 100	R614	ERDS2TJ152	1/4W 1.5K	J721	ERJ6GEYOR00A	1/10W 0
R305	ERDS2TJ104	1/4W 100K	R615	ERDS2TJ182	1/4W 1.8K	J724-726	ERJ6GEYOR00A	1/10W 0
R306	ERDS2TJ103	1/4W 10K	R701	ERJ6GEYJ100	1/10W 10	J728, 729	ERJ8GEYOR00A	1/8W 0
R307	ERDS2TJ101	1/4W 100	R702	ERJ6GEYJ471V	1/10W 470	J731, 732	ERJ6GEYOR00A	1/10W 0
R308, 309	ERDS2TJ102	1/4W 1K	R703	ERJ6GEYJ823	1/10W 82K			CAPACITORS
R310, 311	ERDS2TJ221	1/4W 220 (GC)	R704	ERJ6GEYJ102A	1/10W 1K			
R312	ERDS2TJ470	1/4W 47	R705	ERJ6GEYJ103V	1/10W 10K			
R313, 314	ERDS2TJ101	1/4W 100	R706	ERJ6GEYJ102A	1/10W 1K	C1, 2	ECBT1E103ZF	25V 0.01u
R315, 316	ERDS2TJ103	1/4W 10K	R707	ERJ6GEYJ473V	1/10W 47K	C3	ECA1CM222B	16V 2200u Δ
R317, 318	ERDS2TJ221	1/4W 220	R708	ERJ6GEYJ104V	1/10W 100K	C4	ECEA1AKA470B	10V 47u
R321, 322	ERDS2EJ121	1/4W 120	R709	ERJ6GEYJ683V	1/10W 68K	C5	ECBT1H102KB5	50V 1000P
R323	ERDS2TJ470	1/4W 47	R711	ERJ6GEYJ154V	1/10W 150K	C6	ECEA1AKA221Q	10V 220u

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks			
C7	ECEAJKA221B	6.3V 220U	C713	ECUV1C104MBM	16V 0.1U			
C8, 9	ECA1VFQ121B	35V 120U	C714	ECEAJKA1011	6.3V 100U			
C10	ECA1EM101B	25V 100U Δ	C715	ECEAJKA470I	6.3V 47U			
C11	ECA1VM101B	35V 100U	C716	ECUE1H561KBN	50V 560P			
C12	ECA1HM101B	50V 100U	C717	ECUZ1E104MBN	25V 0.1U			
C13	ECBT1H102KB5	50V 1000P	C718	ECUV1C224KBM	16V 0.22U			
C201	ECAOJKF101B	6.3V 100U (GC)	C721	ECUV1H070DCN	50V 7P			
C202, 203	ECUV1C224KBM	16V 0.22U (GC)	C722	ECUV1H220JCN	50V 22P			
C205, 206	ECUV1H220GCN	50V 22P (GC)	C723	ECEAJKA221I	10V 220U			
C207	ECUV1H180GCN	50V 18P (GC)	C724	ECUV1C104MBM	16V 0.1U			
C208	ECUV1H270GCN	50V 27P (GC)	C725, 726	ECUV1H102JCN	50V 1000P			
C209	ECUV1H103KBN	50V 0.01U (GC)	C727, 728	ECEAHPK010I	50V 1U			
C210	ECEAJKA470B	6.3V 47U (GC)	C730	ECUZ1E104MBN	25V 0.1U			
C211	ECEAJKA100B	16V 10U (GC)	C731, 732	ECEAJK221I	6.3V 220U			
C212	ECEAJKA470B	6.3V 47U (GC)	C733	ECUZ1E104MBN	25V 0.1U			
C213	ECUV1H102KBN	50V 1000P (GC)	C734	ECEAJKA221I	10V 220U			
C214	ECAOJM102B	6.3V 1000U (GC)	C735-737	ECUZNE104MBN	25V 0.1U			
C215	ECA1CM221B	16V 220U (GC)	C738	ECUV1C154KBN	16V 0.15U			
C216	ECUV1H102KBN	50V 1000P (GC)	C742	ECUV1E273KBN	25V 0.027U			
C217, 218	ECUV1H103KBN	50V 0.01U (GC)	C743	ECUZNE104MBN	25V 0.1U			
C219	ECUV1C224KBM	16V 0.22U (GC)	C744	ECUE1E822KBN	25V 8200P			
C220	ECUV1H101KCN	50V 100P (GC)	C745	ECUE1H102KBN	50V 1000P			
C301, 302	ECBT1E103ZF	25V 0.01U	C747	ECUE1H222KBN	50V 2200P			
C303	ECBT1H104ZF5	50V 0.1U	C748	ECUV1H471KBM	50V 470P			
C304	ECEAJKA101B	6.3V 100U	C803, 804	ECBT1H102KB5	50V 1000P			
C305	ECAOJM102B	6.3V 1000U	C807, 808	ECBT1H331KB5	50V 330P			
C306, 307	ECBT1H101KB5	50V 100P	C809, 810	ECBT1H121KB5	50V 120P			
C308	ECBT1H102KB5	50V 1000P	C811, 812	ECEAJKA470B	6.3V 47U			
C309, 310	ECEAJKA3R3B	50V 3.3U	C813, 814	ECEAJKA220B	10V 22U			
C311	ECEAJKA33B	50V 0.33U	C815, 816	ECBT1H101KB5	50V 100P			
C312	ECEAJKA22B	50V 0.22U						
C313	ECBT1E223ZF	25V 0.022U						
C314	ECBT1E103ZF	25V 0.01U						
C315, 316	ECBT1H101KB5	50V 100P						
C317	ECBT1H102KB5	50V 1000P						
C318	ECEAJKA470B	6.3V 47U						
C401	ECBT1E103ZF	25V 0.01U						
C402	ECBT1H104ZF5	50V 0.1U						
C403	ECBT1H102KB5	50V 1000P						
C404	ECBT1E103ZF	25V 0.01U						
C501	ECA1AKF820B	10V 82U						
C701	ECEAJKA220	6.3V 22U						
C702	ECEAJKA010I	50V 1U						
C703	ECEAJKA101I	6.3V 100U						
C704	ECUZ1E104MBN	25V 0.1U						
C705	ECEAJKA010I	50V 1U						
C706	ECUE1H101JCN	50V 100P						
C707	ECUV1E273KBN	25V 0.027U						
C708	ECUE1H472KBN	50V 4700P						
C709	ECUE1C473KBN	16V 0.047U						
C710	ECUE1H152KBN	50V 1500P						
C711, 712	ECUZ1E104MBN	25V 0.1U						

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET PARTS		46	RFKNLCH515PC	BUTTON (C)	
1	RKM0222-K	CABINET		47	RFKNLCH515PD	BUTTON (D)	
2	RHD30007	SCREW		48	RFKNLCH515PE	BUTTON (E)	
3	XTBS3+8JFZ1	SCREW		49	RGL0226-Q	LEADING LIGHT PANEL	
4	REZ0555	FPC (14P)		50	RFKNLCH555PK	DISC TRAY ASS'Y	
5	REZ0639	FPC (23P)		51	XTN2+6F	SCREW	
6	RGK0612A-K	TRAY PANEL	(GC)	52	RMN0222	LED HOLDER	
6	RGK0612-K	TRAY PANEL	(E)	53	REZ0644	FLAT CABLE (W601)	
7	RFKHLCH515EK	REAR PANEL ASS'Y	(E)	54	RMN0261	ANGLE	
7	RFKHLCH515GC	REAR PANEL ASS'Y	(GC)	55	RMN0086	P. C. B. SPACER	(GC)
8	RHD30043	SCREW				LOADING PARTS	
9	RFKJLCH515PK	BOTTOM BOARD ASS'Y		101	RDG0194-1	GEAR	
9-1	RKA0011-3	FOOT		102	RDG0223	GEAR	
10	RMG0319-K	RUBBER		103	RDG0224	GEAR	
11	RDG0228	GEAR		104	RDG0245	GEAR	
12	RGTO014	ROTARY TRAY		105	RDG0244	GEAR	
13	RMA0681	ANGLE		106	RDK0022	GEAR	
14	RME0123	SPRING		107	RDK0023	GEAR	
15	RML0312	LEVER		108	RFKPLCH555PK	MOTOR ASS'Y	
16	RDG0225	GEAR		109	RDP0058	GEAR	
17	RDG0227	GEAR		110	RDV0025	BELT	
18	RMA0654	ANGLE		111	RMN0204	SENSOR HOLDER	
19	RMA0655	ANGLE		112	RMN0222	LED HOLDER	
20	REZ0651	FLAT CABLE (W1)		113	RHD26014	SCREW	
21	RME0139	SPRING		114	RMA0653	ANGLE	
22	RMG0293-C	RUBBER		115	RME0120	SPRING	
23	RML0291	LEVER		116	RME0121	SPRING	
24	RMRO627-K	TRAY BASE		117	RME0137	SPRING	
25	RMS0382	SHAFT		118	RML0177	LEVER	
26	SDRD14	ROLLER		119	RML0288	LEVER	
27	XTW3+6S	SCREW		120	RML0289	LEVER	
28	XTBS26+10J	SCREW		121	RMN0097	SLIDE PLATE (1)	
29	XTWS3+10T	SCREW		122	RMN0098	SLIDE PLATE (2)	
30	RDF0033	PLATE		123	RMN0099	SLIDE PLATE (3)	
31	RHM245ZA	MAGNET		124	RMS0398	PLUNGER	
32	RMRO334	MAGNET HOLDER		125	RMX0072	LEVER	
33	RMRO624-W	DISC CLAMPER		126	RSJ0003	SOLENOID	
34	RFKNLCH515EK	CLAMP PLAT ASS'Y	(E)	127	RMRO701-K	ROLLER	
34	RFKNLCH515GC	CLAMP PLAT ASS'Y	(GC)	128	XTB3+10JFZ	SCREW	
35	XTB3+6JFZ	SCREW		129	RFKJLCH555PB	MECHANISM CHASSIS ASS'Y	
36	RMN0195	FL SPACER		130	RAE0113Z	TRAVERSE UNIT ASS'Y	
37	RMN0257	FL HOLDER		130A	SHGD112	RUBBER (A)	
38	REZ0638	FPC (23P)		130B	SHGD113-1	RUBBER (B)	
39	RFKGLCH515PK	FRONT PANEL ASS'Y		130C	XQS17+A35FZ	SCREW	
39-1	RKW0328-V	FL PANEL		131	RME0109	SPRING (A)	
40	XTBS26+8J	SCREW		132	RME0142	SPRING (B)	
41	SHE185-2	P. C. B. SPACER		133	RMS0123-1	PIN (A)	
42	RMA0764	ANGLE		134	RMS0350	PIN (B)	
43	XTB3+16JFZ	SCREW		135	RMRO698-K	TRAVERSE CHASSIS	
44	RFKNLCH515PA	BUTTON (A)		136	XTV2+6G	SCREW	
45	RFKNLCH515PB	BUTTON (B)		137	RHD30046	SCREW	

Cabinet Parts Location





For (GC) only

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

Ref No.	Part No.
①	RFKXEM30L

