ORDER NO. HAD8606593C0
A6

Service Manual

Compact Disc Player

SL-P110

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

Color	Areas
(K)	[M].....U.S.A.
(K) (S)	[MC]...Canada.
(K) (S)	[E].....Switzerland and Scandinavia.
(K) (S)	[EK]....United Kingdom.
(K) (S)	[XL]....Australia.
(K) (S)	[EG] ...F.R. Germany.
(K) (S)	[EB]....Belgium.
(K) (S)	[EH] ...Holland.
(K) (S)	[EF]....France.
(K) (S)	[Ei].....Italy.
(K) (S)	[XA]....Asia, Latin America, Middle Near East, Africa and Oceania.
(K) (S)	[XB]....Saudi Arabia.
(K) (S)	[PA]....East PX.
(K) (S)	[PE]....European Miliary.
(K) (S)	[PC]....European Audio Club.

Color

(K)...Black Type
(S)...Silver Type

SPECIFICATIONS

(*Measured by EIAJ (CP-307))

■ Audio

No. of channels: 2 (left and right, stereo)
Frequency response: 4—20,000 Hz ±0.5 dB*
Dynamic range: More than 92 dB*
S/N ratio: More than 96 dB*
Harmonic distortion: 0.004% (1 kHz, 0 dB)
Total harmonic distortion: 0.006% (1 kHz, 0 dB)*
Channel separation: More than 96 dB*
Wow and flutter: Below measurable limit
Low-pass filter: High-resolution digital filter

■ Signal Format

Sampling frequency: 44.1 kHz
Correction system: Technics Super Decoding Algorithm
D-A conversion: 16-bit linear

■ Pickup

Type: Fine-focus, one beam
Access time: 1 second* (for long access)
Light source: Semiconductor laser
Wavelength: 780 nm
Traverse system: High-speed linear access system
Spindle system: Brushless DD motor

■ Functions

Automatic play: All tracks.
Random access play: Track number.
Repeat play: Entire disc or programmed tracks.
Search: Forward/backward track skip.
Forward/backward manual search.
Program play: For up to 20 selections
Preset edit play: Up to 99 minutes (for program play)
Display: Total tracks.
Current track.
Time display:
- Time display (min., sec.).
- The following four time modes display minutes and seconds according to the time mode select button setting:
  ① Disc remaining playing time.
  ② Track number and remaining playing time of current track.
  ③ Playing time from beginning of first track.
  ④ Track number and elapsed playing time from beginning of current track.

Indicator: Play indicator.
Pause indicator.
Repeat indicator.
Disc indicator.
Disc loading: Motor-driven horizontal type.

Technics

Matsushita Services Company
50 Meadowland Parkway,
Secaucus, New Jersey 07094

Panasonic Sales Company, Division of Matsushita Electric of Puerto Rico, Inc.
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Victoria Industrial Park
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Matsushita Electric Trading Co., Ltd.
6th Floor, World Trade Center Bldg.,
No. 4-1, Hamamatsu-cho 2-Chome, Minato-ku,
Tokyo 105, Japan

■ General

Power supply:	For U.S.A. and Canada: AC 120V, 60Hz For United Kingdom and Australia: AC 240V, 50Hz For Continental Europe: AC 220V, 50Hz For Others: AC110~127/220~240V, 50/60Hz
Power consumption:	10 W
Output voltage:	2 V (at 0 dB)*
Output impedance:	Approx. 550Ω
Load impedance:	More than 10 kΩ
Dimensions (W×D×H):	43×24×7.7 cm (16-15/16"×9-7/16"×3-1/32") [When disc holder is opened: 37.2 cm (14-21/32") (D)]
Weight:	3.1 kg (6.8 lbs.)

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

■ CONTENTS

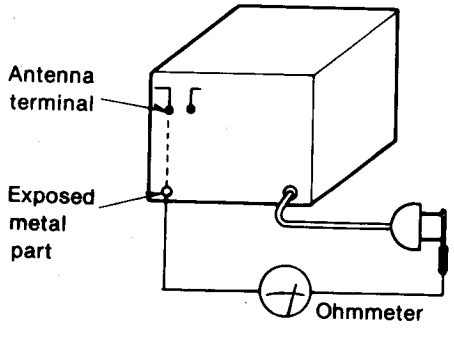
■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

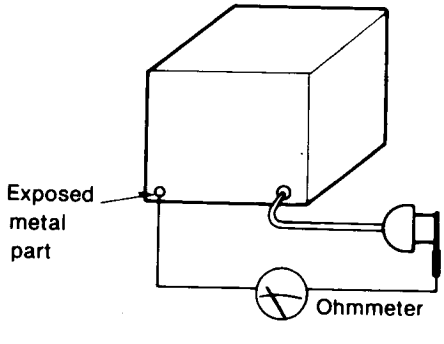
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



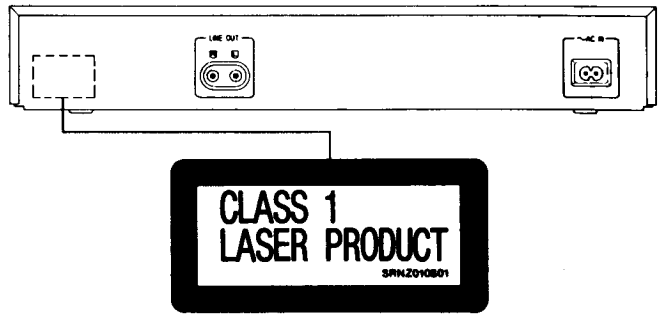
(Fig. B)

Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ PRECAUTION OF LASER DIODE

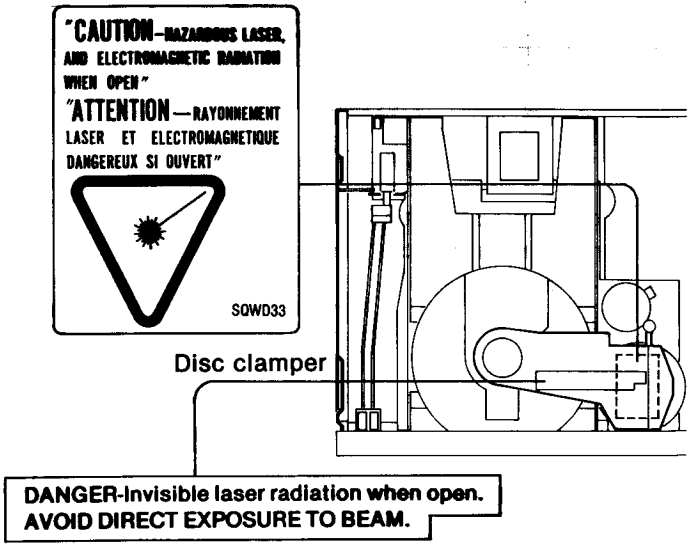
Caution: This product utilizes a laser diode.
ADVARSEL: I dette a apparat anvendes laser.

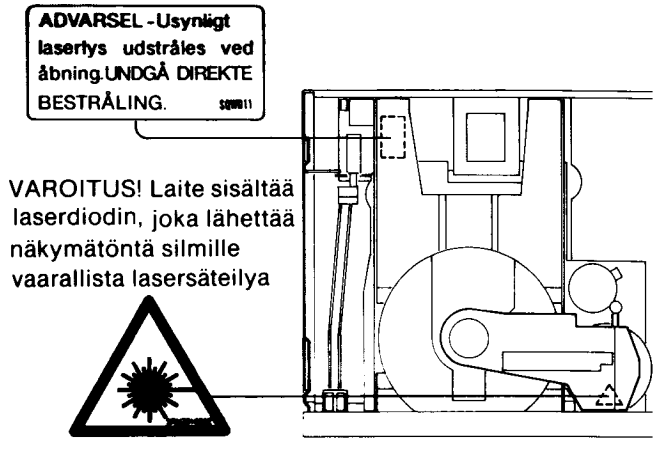


Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

- **Use of caution labels** Note: ○ Mark is used, × Mark is not used.

Areas	Disc clamper	SQWD33	SQWD11	SRNZ010S01	SRNZ010S02
[M], [PA], [PE], [PC]	○	×	×	×	×
[MC]	○	○	×	×	×
[E]	○	×	○	○	○
[EK], [XL], [EG] [EB], [EH], [EF] [EI], [XB], [XA]	○	×	×	○	○

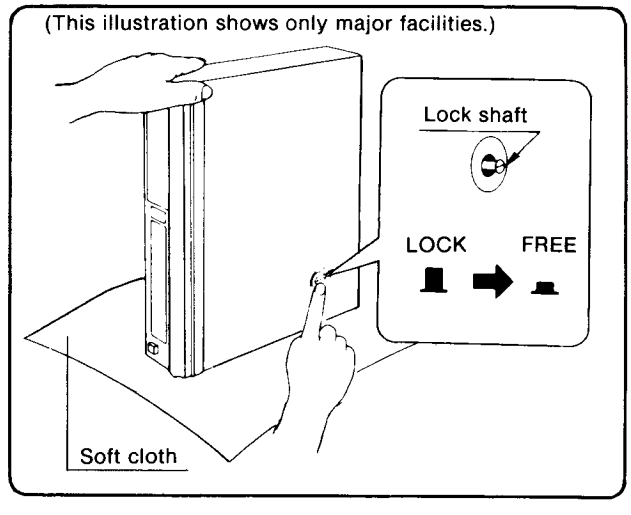




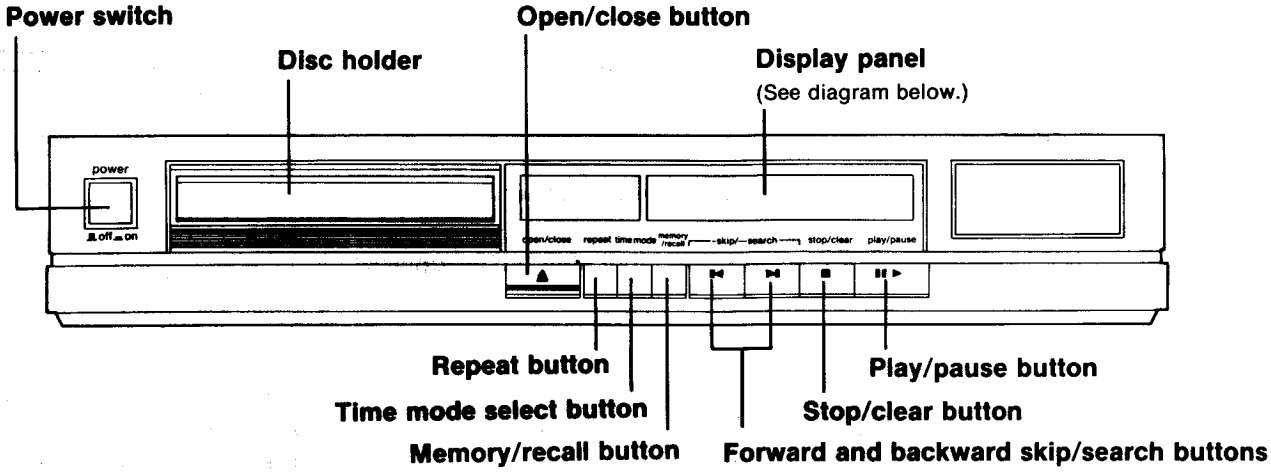
■ BEFORE USING THIS UNIT

1. Place a soft cloth under the unit to protect it from scratches.
2. Press the lock shaft on the bottom panel to the in (FREE) position (■→▬).

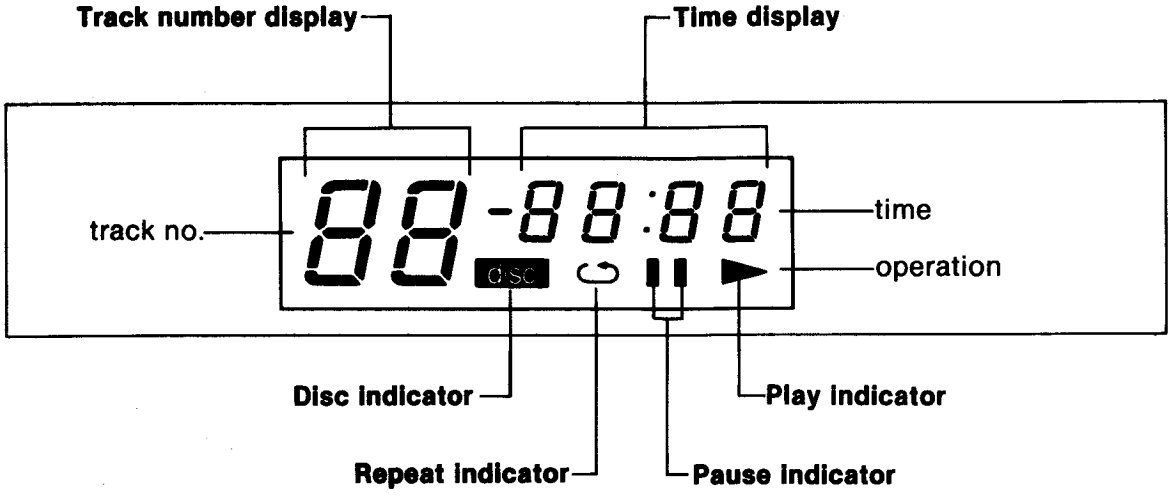
NOTE:
IF THE UNIT IS TRANSPORTED AGAIN, PERFORM THE FOLLOWING STEPS:
1) Remove the disc from the holder.
2) Pull the lock shaft to the out (LOCK) position (▬→■).
CAUTION:
Do not transport the unit without locking the lock shaft. **SEVERE DAMAGE WILL RESULT.**



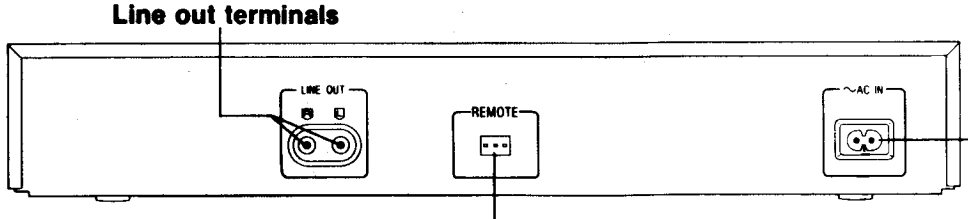
■ LOCATION OF CONTROLS



(Display panel)



(Rear panel of player)



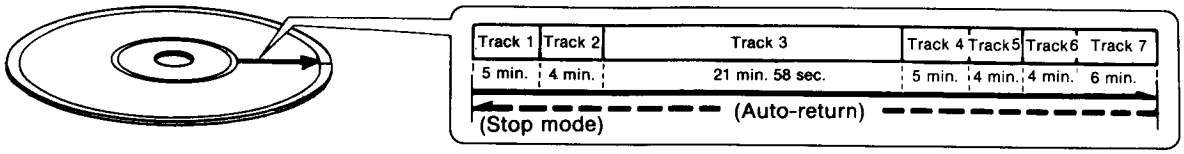
* **Remote control terminal**

This terminal is provided for remote control connection with future components of the stereo system only.

* The product for the U.S.A and Canada is not provided with the remote control terminal.

Playing a disc

The following explanation is for a disc containing 7 tracks having a total playing time of 49 minutes and 58 seconds.

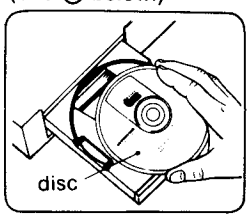


1 Automatic play (To play a disc from beginning to end.)

1 Press power (⏻ → ⏻). (See ① below.)

2 Press open/close ⏏ .

3 Insert a disc with the label side facing upward. (See ② below.)

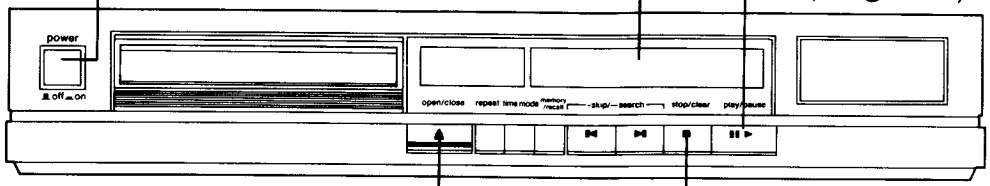


4 Press. (See ③, ④ below.)

5 Press play/pause ⏯ . (See ⑤ below.)

- **Press to briefly interrupt play.** (See ⑥ below.)
- **Press to resume play.** (See ⑦ below.)

6 Press (⏻ → ⏻). (See ⑨ below.)



■ Press stop/clear ■ **to stop play.** (See ⑧ below.)

① Display illuminates as shown below:

② Insert the disc only after the disc holder has opened all the way. If the disc is inserted too soon, it may be damaged. Do not tilt the unit while the disc holder is opening or closing since the disc could fall out of the holder.

③ Step 4 can be skipped by pressing the play/pause button after inserting a disc. In this case, the holder will close and disc play will begin immediately from track 1, but the tracks and total playing time will not be displayed.

④ If the open/close button is pressed, the display illuminates as shown below.

Disc information is read.
↓
Reading of disc information finished.
↓
Stop mode.

⑤ •The play indicator (▶) illuminates and play begins.

•After the last track has been played the pickup returns to the beginning of the first track and the unit switches to the stop mode.

⑥ The play indicator (▶) goes out, the pause indicator (⏸) illuminates and the unit switches to the pause mode.

⑦ The pause mode is cancelled and play is resumed.

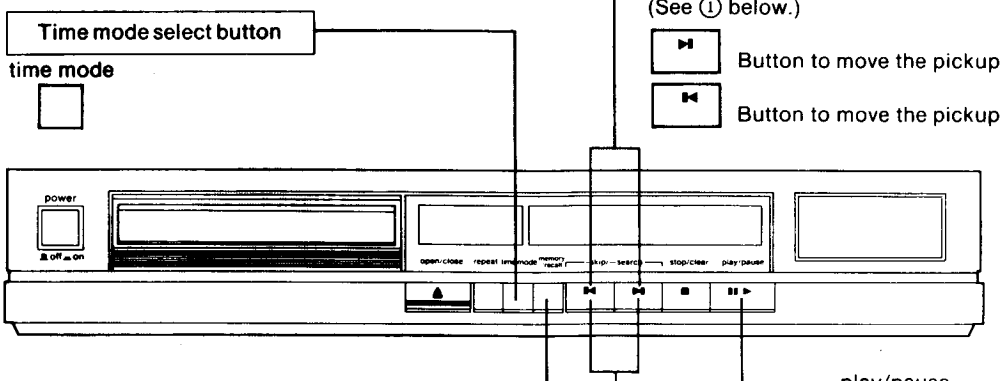
⑧ The pickup will return to the beginning of the first track and the unit will switch to the stop mode.

⑨ When the end of the disc is reached, the pickup returns to the beginning of the first track and the unit switches to the stop mode.
- •Remove the disc from the disc holder.
- •Turn off the power if the unit is not to be used again for a while.

- Since steps 1, 2, 3, 4 and 6 in this procedure are the same for all play procedures, they are not included in the following explanations.

2 Program play (When the unit is in the stop mode.)

Note:
- Program entries cannot be made during play or pause mode.



1 While watching the track number display, press for an instant to specify the desired track number.
(See ① below.)

⏭ Button to move the pickup forward.

⏮ Button to move the pickup backward.

2 Press to enter the displayed track number into memory.
memory/recall
(See ② below.)

3 Repeat steps 1 and 2 until the desired programming is complete.
⏮ or ⏭ ➡ memory/recall
(See ③ below.)
(A maximum of 20 selections can be programmed.)

4 Press play/pause ⏯ .
- Play begins from the first programmed track.

① • If more than 20 selections are entered "F" (full) is shown in the display panel and no further selections can be programmed.

• Keeping the ⏭ button (or ⏮ button) pressed will cause the track number display to advance (or go back) continuously.

• When the ⏭ button is kept pressed continuously, the track number display returns to the first track after passing the last track on the disc. For example, if there are 7 tracks on the disc, keeping the ⏭ button pressed, would display the track numbers as follows:

1 → 2 → 3 → 4 → 5 → 6 → 7 →

• Likewise, keeping the ⏮ button pressed results in the following display:

← 1 ← 2 ← 3 ← 4 ← 5 ← 6 ← 7 ←

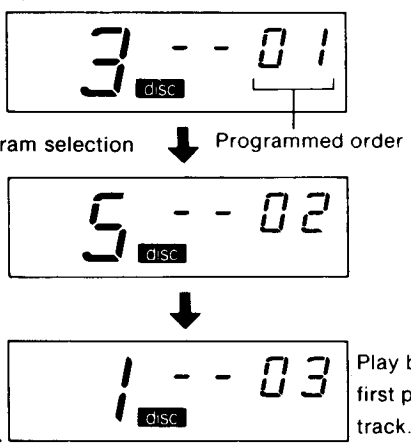
② To enter the same track number several times in succession, simply press the memory/recall button the same number of times that the track is to be played.
Each entry counts as one selection.

Total playing time confirmation

To display the total playing time of all programmed tracks.
Example: If tracks 3, 5 and 1 are specified and the time mode select button is pressed, 30 minutes 58 seconds is displayed.

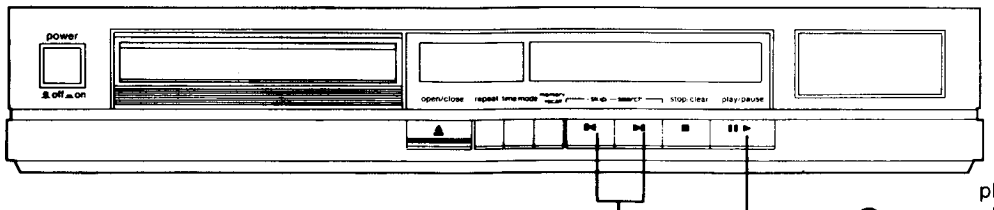
time mode
Press.

③ The diagram below shows track 3, track 5 and track 1 programmed in that order.



Play begins from the first programmed track.

3 Random access play (When the unit is in the stop mode.)



1 While watching the track number display, press for an instant (less than one second) to specify the desired track. (See ① below.)

⏭ Button to move the pickup forward.

⏮ Button to move the pickup backward.

2 Press ⏯ (See ② below.)

① The display below shows track 3 is specified.

Track number

② **The play** indicator (▶) illuminates and play begins from **track 3.**

4 Skip play

(During play or the pause mode.)

■ Forward or backward track skip play

■ **While watching the track number display, press for an instant the forward or backward skip/search button until the desired track has been located.** (See ① below.)

⏭ Forward skip/search button (Pickup skips forward)

⏮ Backward skip/search button (Pickup skips backward)

5 Manual search play

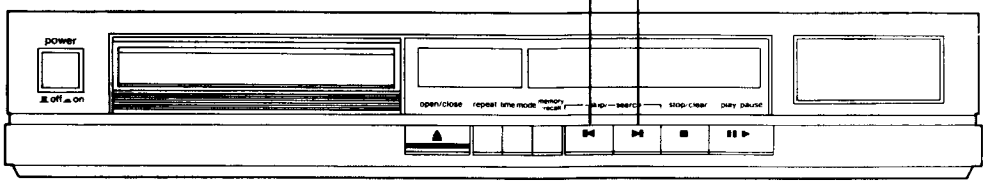
(During play or the pause mode.)

■ To play the disc from a specific point

■ **Keep the forward or backward skip/search button pressed to move the pickup forward or backward. Release the button when the desired point has been reached (as shown by the display).** (See ② below.)

⏭ Forward skip/search button (Pickup moves forward)

⏮ Backward skip/search button (Pickup moves backward)



① Pressing one of the skip buttons for an instant activates the quick skip mode.

Forward skip

- During automatic play, the pickup skips to the beginning of the next track each time the button is pressed.
- During program play or program repeat play, the pickup skips to the beginning of the next programmed track each time the button is pressed.

Backward skip

- During automatic play, the pickup skips to the beginning of the current track. If pressed again quickly, the pickup skips to the beginning of the previous track.
- During program play (repeat function not activated), the pickup skips backward only to the beginning of the current track.
- During program repeat play, the pickup skips to the beginning of the current track. If pressed again quickly, the pickup skips to the beginning of the previous programmed track.

② • The pickup moves slowly at first and then rapidly if one of the buttons is held down for more than about 3 seconds.

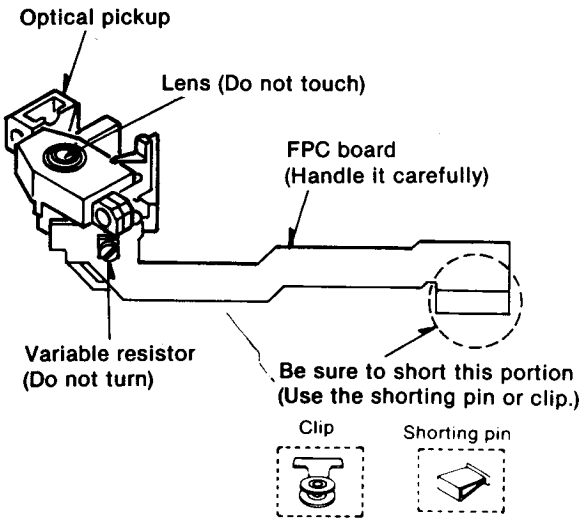
- If one of the buttons is pressed while a disc is being played, sound from the disc can be heard as the pickup moves. The output level at this time is decreased by 12 dB (1/4) compared with the normal level.
- During program play, the pickup can only be moved between the beginning and end of the track currently being played.

■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the 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 optical pickup.

• Handling of optical pickup

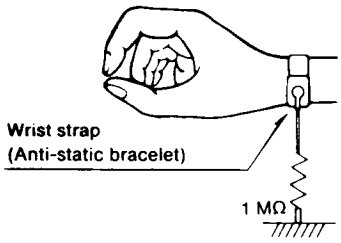
1. Do not give excessive shock to the optical pickup because it is of extremely precise structure.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. (FPC board)
   When removing or connecting the short pin, finish the job in as short time 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.

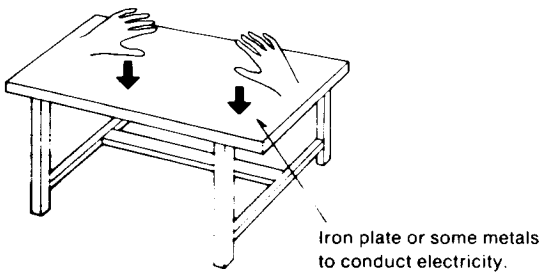


• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to relieve the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the 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 optical pickup.

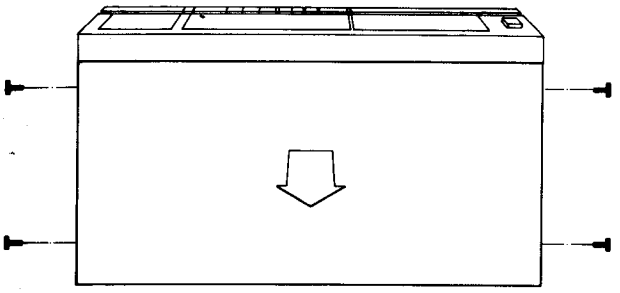




■ DISASSEMBLY INSTRUCTIONS

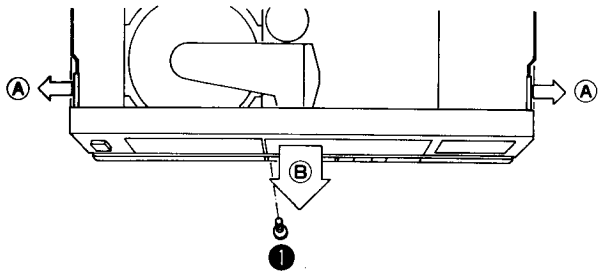
CAUTION:
- It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- When doing the job, removing the cabinet and disc clamper of this unit, be sure to turn the power supply off.

Ref. No. 1	How to remove the top case
Procedure 1	• Remove the 4 setscrews.

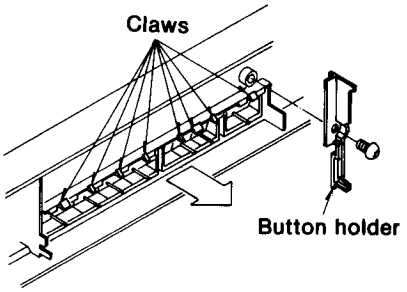


Note: When doing the job, Lock the lock shaft at bottom of the unit. (See page 3)

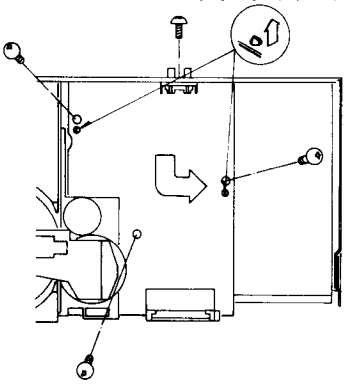
Ref. No. 2	How to remove the front panel
Procedure 1→2	1. Remove the setscrew ❶. 2. Slightly pull the front panel on both sides (arrow Ⓐ), then remove from the projection of the chassis. 3. Remove in the direction of the arrow Ⓑ.



Ref. No. 3	How to remove the operation button
Procedure 1→2→3	1. Remove the setscrew and button holder. 2. Release the 8 claws.



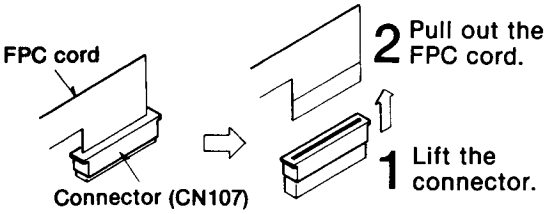
Ref. No. 4	How to remove the main P.C.B.
Procedure 1→2→4	1. Remove the 4 setscrews. 2. Lift the P.C.B. to remove it from the chassis projections. 3. Remove in the direction of the arrow.



How to check the main P.C.B.

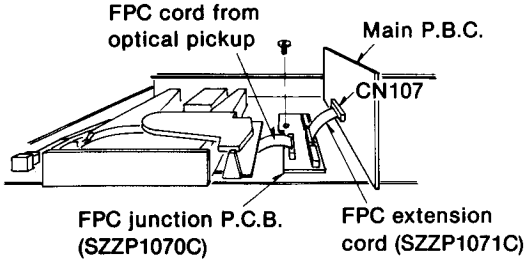
- When checking the soldered surfaces of the main P.C.B. and replacing the parts, do as shown.

1. Remove the main P.C.B.
2. Remove the FPC cord (CN107).



Caution: Insert the short pin into the FPC cord in order to prevent breakdown of laser diode. (See page 8)

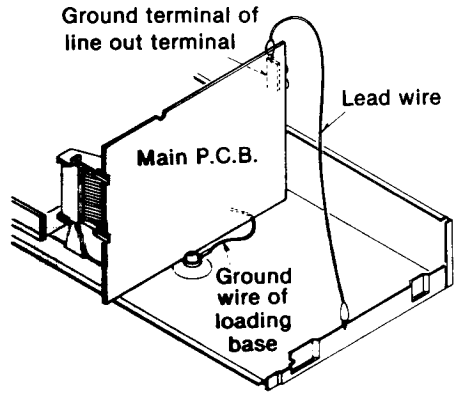
3. Mount FPC junction P.C.B. (SZZP1070C) on the chassis. (Do the job as shown by using the main P.C.B. setscrew.)
4. Connect FPC cord from optical pickup to FPC junction P.C.B.
5. Connect FPC extension cord (SZZP1071C) to FPC junction P.C.B. and CN107 of main P.C.B.



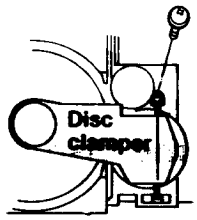
6. Place the main P.C.B. as shown in the figure.

Cautions:

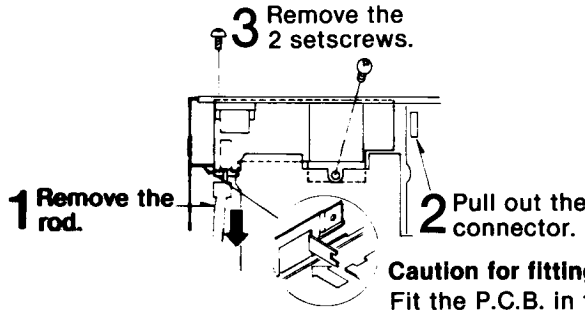
1. Be sure to connect the P.C.B. ground terminal (line out terminal) and chassis lead wire.
2. Connect the ground terminal of loading base to the chassis.



Ref. No. 5	How to remove the disc clamper
Procedure 1→5	• Remove the setscrew.



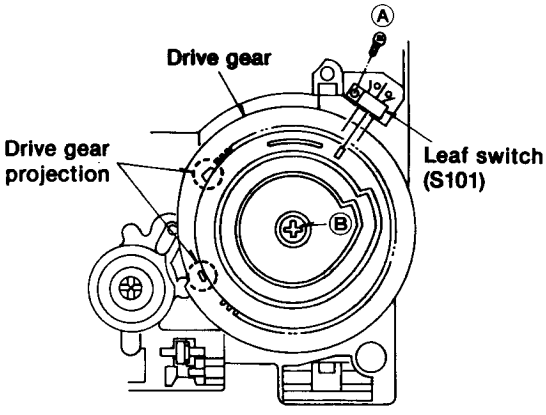
Ref. No. 6	How to remove the power supply P.C.B.
Procedure 1→6	• Remove in the numerical order shown. (Shift the disc holder forward.)



Caution for fitting
Fit the P.C.B. in the groove of chassis.

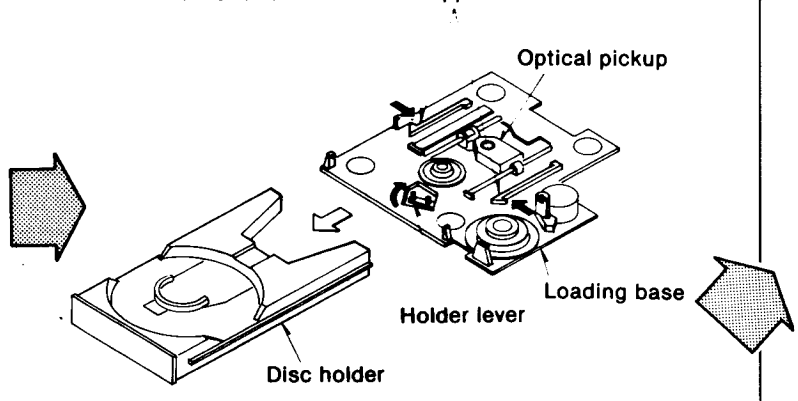
Ref. No. 7	How to remove the disc holder (disc tray)
Procedure 1→2→5→7	

• Make the drive gear as shown below. (Turn it completely to the right, then turn it to the left by about 20° so that drive gear teeth or projection will not touch the rack of disc holder.)



• To remove the drive gear
Remove the screw Ⓐ of leaf switch (S101), then remove the drive gear setscrew Ⓑ.

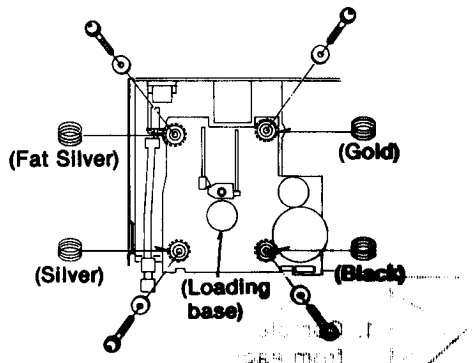
1. Push the holder lever backward, (From underneath the loading base.)
2. Pull the disc holder and bend the 2 claws of disc holder stopper of loading base toward the optical pickup.
3. Further pull out the disc holder to remove it.



• Caution for fitting
When fitting the disc holder, make the drive gear as shown on the left, and then insert the disc holder along the guide of loading base.
After inserting the disc holder completely, turn the drive gear to the right completely.

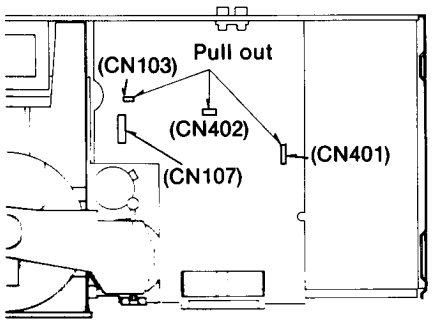
Ref. No. 8	How to remove the loading base
Procedure 7 → 8	**Note:** Lock the lock shaft at bottom of the unit. • Remove the 4 setscrews.

Refer to the optical pickup handling precautions (See page 8).



Note that the colors of 4 springs are all different.

1. Pull out the 3 connectors (CN103, 401, 402).
2. Remove the FPC cord (CN107).

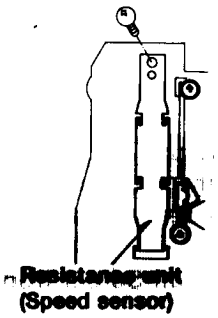


Caution: Insert the short pin into the FPC cord in order to prevent breakdown of laser diode. (See page 8)

Ref. No. 9	How to remove the optical pickup
Procedure 7 → 8 → 9	• Remove in the numerical order shown.

Refer to the optical pickup handling precautions (See page 8).

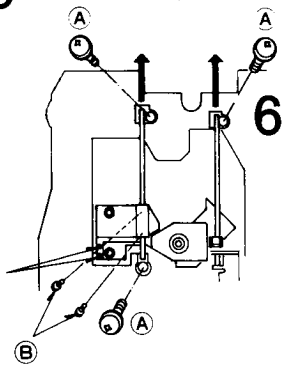
1 Remove the screw.



2 Remove the resistance unit.

3 Unsolder the 2 terminals.

5 Remove the 3 setscrews Ⓐ.

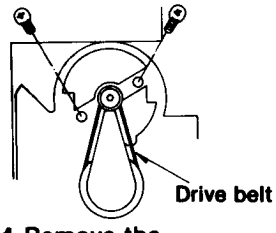


6 Pull out the optical pickup from the 2 guide shafts.

4 Remove the 2 setscrews Ⓑ. (Bottom side)

Ref. No. 10	How to remove the drive motor
Procedure 7 → 8 → 10	• Remove in the numerical order shown.

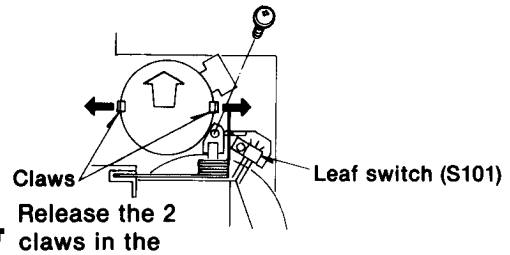
2 Remove the 2 setscrews.



1 Remove the drive belt.

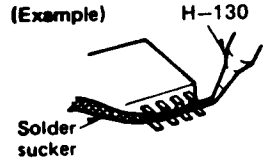
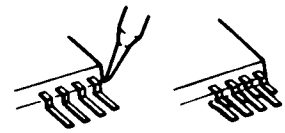
5 Lift up the drive motor.

3 Remove the setscrew.



4 Release the 2 claws in the direction of the arrows.

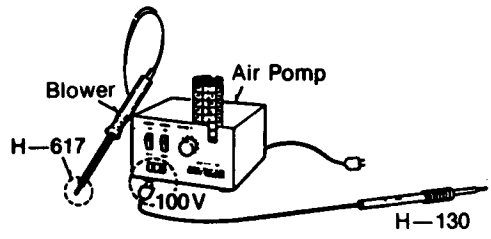
■ HOW TO REPLACE IC'S (Small outline type)

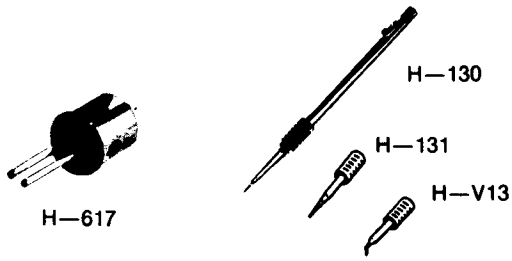
	Replacing procedure		Cautions
1	Reduce the amount of solder on each pin of the integrated circuit by use of a solder sucker.	(Example) H–130  	• Recommended tool .....Special soldering iron * H605M and H-130. * H605E and H-130. • Do not touch the soldering iron to the area for a long time. It may otherwise cause removal of the print foil. • When shifting the pin upward, do the job quickly while the solder is melting. If the solder is hard, it may cause removal or breakage of the print foil. • When using a pencil type soldering iron. 1. Completely remove the solder from each IC pin by use of solder sucker. 2. Raise each pin by means of an eyeleteer, hold the pliers then remove IC package from P.C.B.
2	Melt the solder on the pin (one electrode) with the soldering iron.		
3	While the solder is melting, shift the pin upward by the soldering iron to remove it from the foil.		
4	Remove each pin from the foil according to the above-mentioned procedure.		

*** Special soldering iron**
(Refer to Technical Information, ORDER NO. GAD64125486T1)...For U.S.A. and Canada
(Refer to Technical Information, ORDER NO. GAD64115476T8)...For others

•H–605 Spot Heater (hot-air solder iron)
This device that uses hot air to melt solder was developed to remove Flat-Package ICs, RHCs and chip parts.

- H–605M (For 120V power source)
- H–605E (For 200V/220V/240V power source)





•H–617 Twin Nozzle (for spot heater)
Special nozzle for the removal of RHCs and chip resistors. (Nozzle diameter: 1.0mm×2)

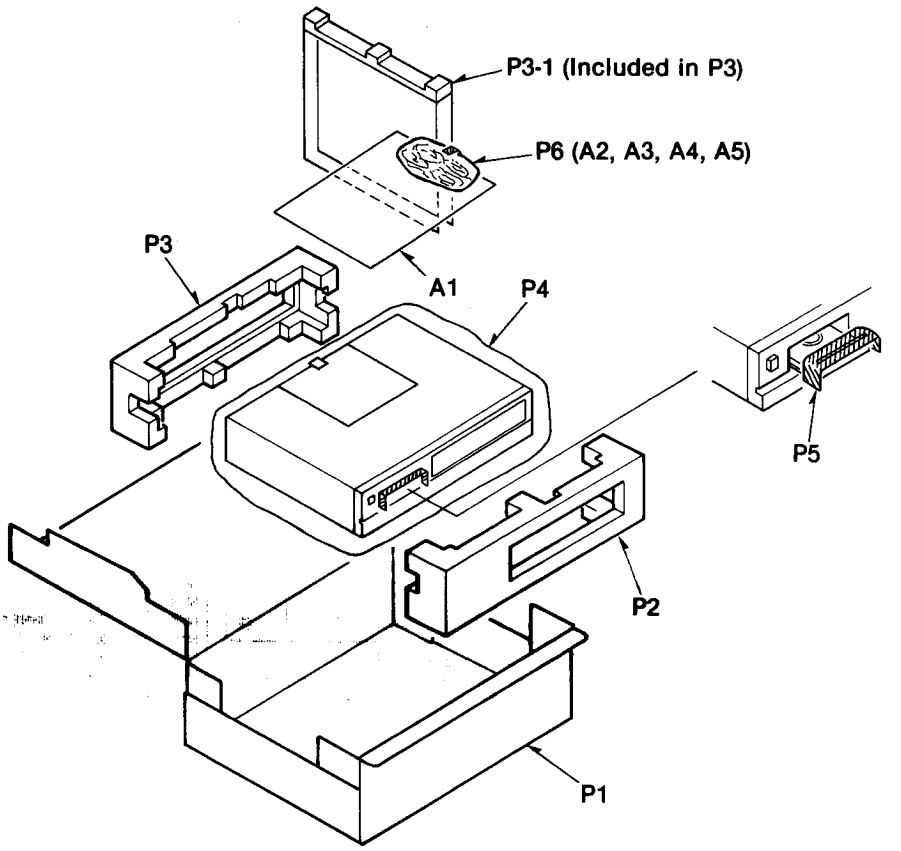
•H–130 Slim Pencil Solder Iron
An ultrasmall ceramic heater solder iron is extremely handy for soldering chip parts, RHCs, ICs etc., to high-density circuit boards.
Features:

•Rated power:	100V, 15W
•Max. temp.:	400℃
•Heater:	ceramic (long life)
•Insulation resistance:	100MΩ
•Length:	178mm
•Weight:	16g (not including cord)

•H–131, H–V13 Cap Bits
Solder tip for the slim pencil Solder Iron is composed of a bit holder and a corrosion resistance solder tip. Permits changing of solder tips even while still hot.

•Solder tip:	0.3mm

■ PACKING



■ REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in **Ref. No. columns specify the area. Parts without these indications can be used for all areas.**
4. **The "S" mark is service standard parts and may differ from production parts.**
5. **Ⓚ-marked parts are used** for black type only, while ○-**marked parts are for silver** type only.
6. Part other than Ⓚ-and ○-marked are used for both black and silver types.
7. The parenthesized numbers in the columns of description stand for the quantity per set.

Color

(K)...Black Type
(S)...Silver Type

Color	Areas
(K)	[M].....U.S.A.
(K) (S)	[MC]...Canada.
(K) (S)	[E].....Switzerland and Scandinavia.
(K) (S)	[EK]....United Kingdom.
(K) (S)	[XL]....Australia.
(K) (S)	[EG]...F.R. Germany.
(K) (S)	[EB]....Belgium.
(K) (S)	[EH]...Holland.
(K) (S)	[EF]....France.
(K) (S)	[Ei].....Italy.
(K) (S)	[XA]....Asia, Latin America, Middle Near East, Africa and Oceania.
(K) (S)	[XB]....Saudi Arabia.
(K) (S)	[PA]....East PX.
(K) (S)	[PE]....European Miliary.
(K) (S)	[PC]....European Audio Club.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC11, 12	SVIFU15	IC
IC13	SVIM5236L	IC
IC101	AN8370S	IC
IC102, 802	MN6636S	IC
IC103, 104	AN6554NS	IC
IC301	MN6617S	IC
IC302	MN6618A	IC
IC303	MN4416S	IC
IC304	EHDGA1243	IC
IC401	MN15261PDF−1	IC
IC402	AN6552	IC
IC403	MN1280−R	IC
IC404 Except [M, MC]	MN1550PDT	IC
IC501	AN8290S	IC

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC801	SVIPCM54HP	IC
IC803	AN8376S	IC
IC804, 805	SVIGA011	IC
TRANSISTORS		
Q11, 15, 141, 161, 181, 402	2SD973A	Transistor
Q12~14, 16, 142, 162, 182, 403	2SB793A−QRS	Transistor
Q17	2SB642	Transistor
Q101	2SD637	Transistor
Q801, 802	2SC3311−Q	Transistor
Q803	UN4113	Transistor
Q1001	UN4212	Transistor
Q1002	UN4112	Transistor

Ref. No.	Part No.	Description
DIODES		
D11, 12	MA4091−M	Zener
D15, 16	MA4068TA	Zener
D17	MA4330	Zener
D18	MA4082M	Zener
D19~26 ⚠	SVDMPG06G	Rectifier
D181, 182, 401~404, 406, 408~413, 803 1001~1004	MA165	Diode
D407, 415~418 Except [M, MC]	MA165	Diode
D501	MA153	Diode
CRYSTAL		
X301	SVQ16CKSS	16.9344MHz

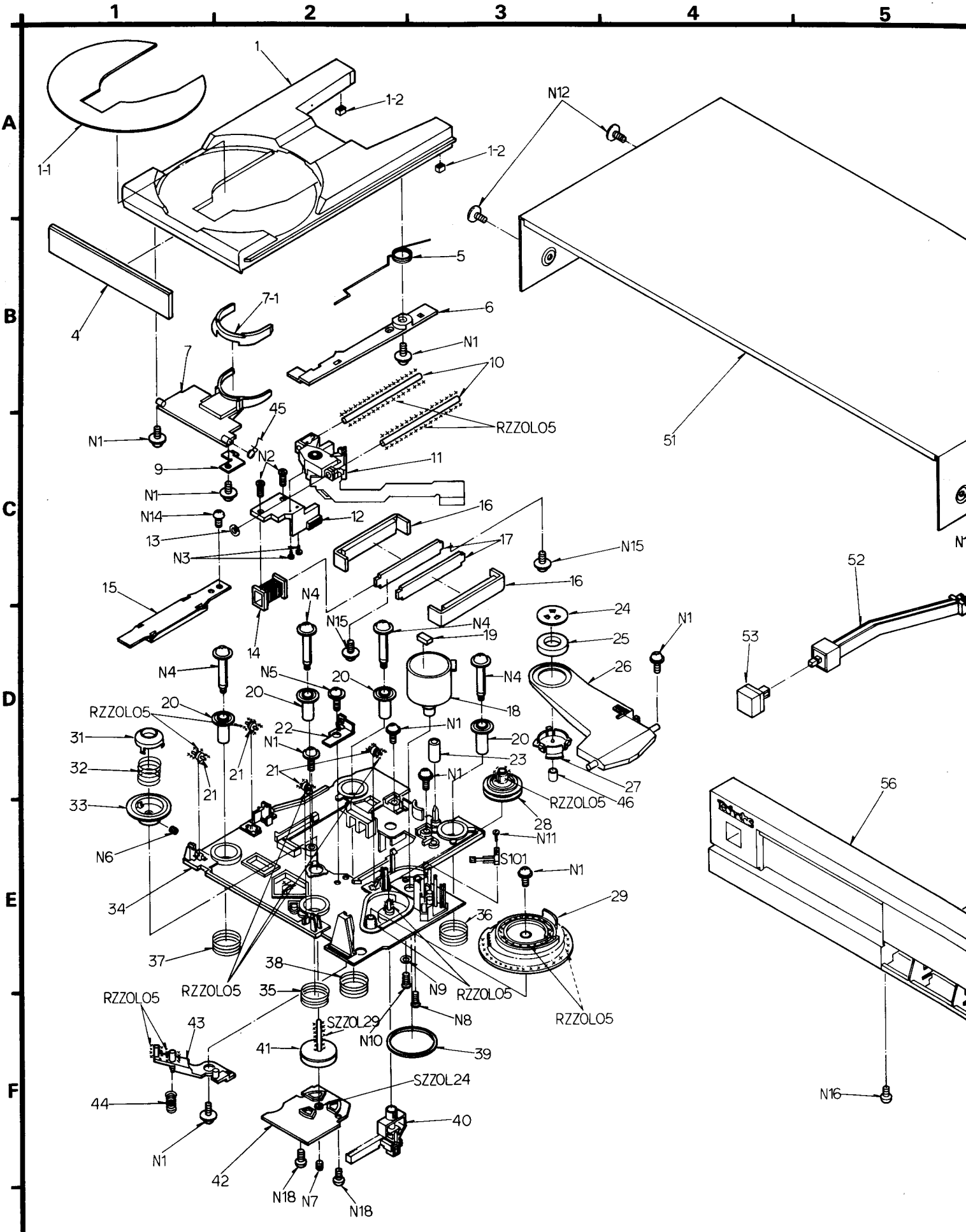
Ref. No.	Part No.	Description
VARIABLE RESISTORS		
VR101, 106	EVND3AA00B53	5kΩ (B)
VR102~105	EVND3AA00B14	10kΩ (B)
VR301	EVN38CA00B13	1kΩ (B)
FLUORESCENT DISPLAY TUBE		
FL401	SADD3	Display
HALL ELEMENTS		
H501, 502	OH-011	Hall Element
COIL		
L501	NL4532T100K2	10μH
POWER TRANSFORMERS		
T1 [M, MC]	⚠ SLTD5K022SC	Power Source
T1 [EK, XL]	⚠ SLTD5K024SG	Power Source
T1 [XA, XB, PA, PE, PC]	⚠ SLTD5K025SX	Power Source
T1 [other]	⚠ SLTD5K023SE	Power Source
SWITCHES		
S1	⚠ ESB8249V	Power
S2 [XA, XB, PA, PE, PC only]	⚠ SRDSHXW0251	Voltage Selector
S101	SSPD5	Open/Close Detector
S401~408	SSGD1-1	Operation
COMPONENT COMBINATION		
C2	⚠ EXRFS203ZS	0.01μF×2
RELAY		
RL1001	SFDYG5A273P	Muting
FUSES		
F1 Except [M, MC]	⚠ XBA2C012TB0S	250V, T125mA
F2 [XA, XB, PA, PE, PC only]	⚠ XBA2C025TB0S	250V, T250mA

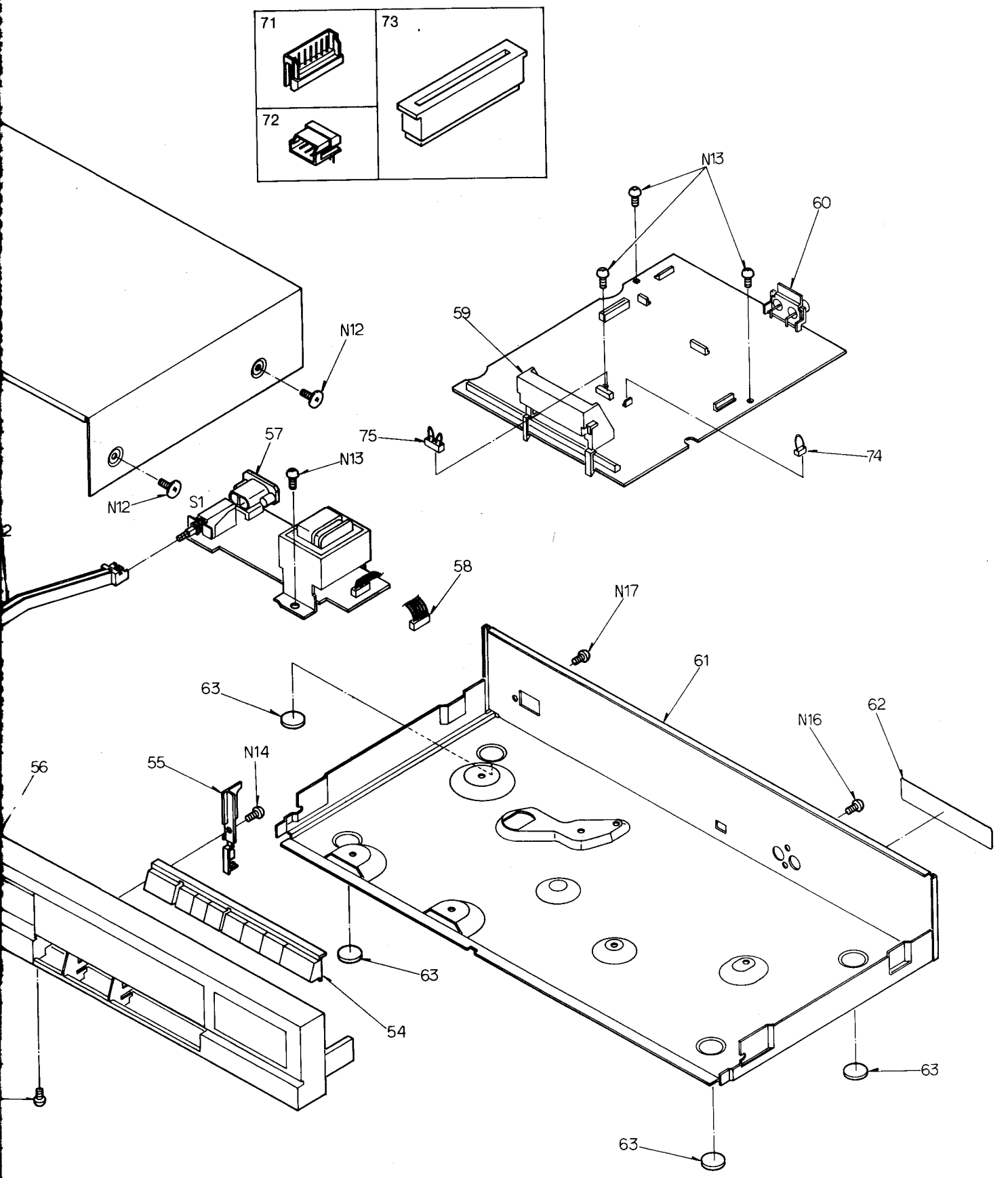
Ref. No.	Part No.	Description
LOADING UNIT PARTS		
1	SIRLP110-KM	Disc Tray Ass'y (1)
1-1	SHSD13	Sheet (1)
1-2	SHGD49	Rubber (2)
4 ○	SGXD170MA0A	Ornament Plate (1)
4 Ⓚ	SGXD270ZK0A	Ornament Plate (1)
5	SUSD29-1	Spring (1)
6	SIRD20	Lever (1)
7	SIRD16E-1	Holder Ass'y with Rubber (1)
7-1	SHGD46	Rubber, Holder (1)
9	SUWD46	Bracket (1)
10	SUXD25	Shaft (2)
11 ⚠	SOAD30A	Optical Pick Up (1)
12	EWSL04A00000	Holder (1)
13	SHGD47	Rubber (1)
14	SORD10E	Coil (1)
15	EWS7B0A00Q53	Resistance Unit (1)
16	SOYD8E	Yoke (2)
17	SOYD9	Yoke (2)
18	SJGD4E	Motor (1)
19	SHGD64	Rubber (1)
20	SHGD48-1	Rubber (4)

Ref. No.	Part No.	Description
LOADING UNIT PARTS		
21	SDRD2	Roller (4)
22	SUWD44	Bracket (1)
23	SHGD69	Rubber (1)
24	SOYD2	Yoke (1)
25	SOMD4	Magnet (1)
26	SIRD17E	Clamper (1)
27	SIRD6	Holder (1)
28	SDGD19	Gear (1)
29	SDGD20-1	Gear (1)
31	SDOD8	Ring (1)
32	SRQA010N04	Spring (1)
33	SDOD7-1	Turntable (1)
34	SISD7E	Base (1)
35	SUSD32-1	Spring (Black) (1)
36	SUSD43	Spring (Gold) (1)
37	SUSD44	Spring (Silver) (1)
38	SUSD42	Spring (Fat Silver) (1)
39	SMBD2-1	Belt (1)
40	SHRD23	Lock Shaft (1)
41	SOMD9A	Rotor (1)
42	SXPD630	Spindle P.C.B. Ass'y (1)
43	SHRD19	Lever (1)
44	SUSD31	Spring (1)
45	SUSD51	Spring (1)
46	SHGD73	Rubber (1)
CABINET and CHASSIS PARTS		
51 ○	SKCD40SY	Top Cover (1)
51 Ⓚ	SKCD40KZ	Top Cover (1)
52	SUBD5-M	Rod (1)
53 ○	SBC666	Button (1)
53 Ⓚ	SBC666-5	Button (1)
54 ○	SBCD220MA0A	Button (1)
54 Ⓚ	SBCD220ZK0A	Button (1)
55	SHRD22-M	Bracket (1)
56 ○	SGYLP110-SM	Front Panel Ass'y (1)
56 Ⓚ	SGYLP110-KM	Front Panel Ass'y (1)
57 [XL] ⚠	SJSD16	AC Socket (1)
57 ⚠ [other]	SJS9236	AC Socket (1)
58	SWKD110061	Connector (1)
59	SMND7-M	Holder (1)
60	SJFD4	Terminal (1)
61 [M, MC]	SGPD41ZF0A	Chassis (1)
61 [XA, XB, PA, PE, PC]	SGPD41ZF3A	Chassis (1)
61 [other]	SGPD41ZF1A	Chassis (1)
62 [MC]	SGTD77	Name Plate (1)
62 [E]	SGTD84	Name Plate (1)
62 [EK]	SGTD85	Name Plate (1)
62 [XL]	SGTD86	Name Plate (1)
62 [EG]	SGTD88	Name Plate (1)
62 [PA, PE, PC]	SGTD89	Name Plate (1)
62 [EB, EH, EF, Ei]	SGTD87	Name Plate (1)
63	SRGA008N01	Rubber (4)
CONNECTORS		
71	EMCS0250Z	2 Pin (CN301) (1)
71	EMCS0350Z	3 Pin (CN103) (1)
71	EMCS0550Z	5 Pin (CN402) (1)
71	EMCS0650Z	6 Pin (CN11) (1)
71	EMCS0750Z	7 Pin (CN401) (1)
71	EMCS0552M	5 Pin (CN102) (1)

Ref. No.	Part No.	Description
CONNECTORS		
72 Except [M, MC]	SJSD0307	3 Pin (CN405) (1)
73	SJSD1709	17 Pin (CN101) (1)
74	SWKD110021	2 Pin Shorting (CN301) (1)
75	SRDJ001N14E	5 Pin Shorting (CN102) (1)
SCREWS and WASHERS		
N1	SNSD10	Screw (9)
N2	XTN2+4G	Screw, ⊕2×4 (2)
N3	XQN17+A6	Screw, ⊕1.7×6 (2)
N4	SHDD1-1	Screw (4)
N5	XTW3+8T	Screw, ⊕3×8 (1)
N6	XXE26D5	Screw (1)
N7	SNSD9	Screw (1)
N8	XSN26+6	Screw, ⊕2.6×6 (1)
N9	SFXW120-01	Washer (1)
N10	XSN26+8	Screw, ⊕2.6×8 (1)
N11	XTN2+5G	Screw, ⊕2×5 (1)
N12 ○	SRXG007N10	Screw (4)
N12 Ⓚ	SRXG007N51	Screw (4)
N13	XTV3+8JFYR	Screw, ⊕3×8 (4)
N14	XTV3+8G	Screw, ⊕3×8 (1)
N15	SFXGQ06N01	Screw (2)
N16	XTV3+8JFZ	Screw, ⊕3×8 (2)
N17	XTV3+8GFZ	Screw, ⊕3×8 (1)
N18	XTV3+10G	Screw, ⊕3×10 (2)
PACKING PARTS		
P1 [MC] ○	SPND99	Carton Box (1)
P1 [EF] ○	SPND100	Carton Box (1)
P1 ○ [other]	SPND101	Carton Box (1)
P1 [MC] Ⓚ	SPND74-1	Carton Box (1)
P1 [EF] Ⓚ	SPND98	Carton Box (1)
P1 Ⓚ [other]	SPND73-1	Carton Box (1)
P2	SPSD45	Rad (1)
P3	SPSD46	Rad (1)
P4	XZB55X40A01	Polyethylene Bag, Unit (1)
P5	SPSD68	Sheet (1)
P6	XZB23X20C03	Polyethylene Bag (1)
ACCESSORIES		
A1 [M]	SQUD83	Instruction Book (1)
A1 [MC]	SQULP110-KMC	Instruction Book (1)
A1 [EK]	SQUD86	Instruction Book (1)
A1 [Ei]	SQUD87	Instruction Book (1)
A1 [PC]	SQULP110-KPC	Instruction Book (1)
A1 [E, EB, EH]	SQULP110-KE	Instruction Book (1)
A1 [PA, PE]	SQULP110-KPA	Instruction Book (1)
A1 [XB]	SQULP110-KXB	Instruction Book (1)
A1 [other]	SQUD85	Instruction Book (1)
A2 [M] ⚠	SJA170-1	AC Cord (1)
A2 [MC] ⚠	SJA170	AC Cord (1)
A2 [XL] ⚠	SJA173	AC Cord (1)
A2 [EK] ⚠	SFDAC05G02	AC Cord (1)
A2 [XB] ⚠	SJA183	AC Cord (1)
A2 ⚠ [PA, PE, PC]	SJA168-1	AC Cord (1)
A2 ⚠ [other]	SJA171	AC Cord (1)
A3	SJP2249-1	Output Cord (1)
A4 ⚠ [PA, PE, PC]	SJP9215	Adaptor (1)
A5 [XA] ⚠	SFDKI19118	Plug (1)

■ EXPLODED VIEWS





Note: When changing mechanism parts, apply the specified grease to the areas marked "× ×" shown in the drawing.

■ RESISTORS AND CAPACITORS

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. Unless otherwise specified. All resistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ. All capacitors are in MICORFARADS (μF), P = 10^{-6}μF.

Numbering System of Resistor

Example

ERD	S2	T	J	101
Type	Wattage (1/4W)	Shape	Tolerance (± 5%)	Value (1kΩ)

ERJ	8	GEY	J	102	⬚
Type	Wattage (1/8W)	Shape	Tolerance (± 5%)	Value (1kΩ)	Specialuse

Resistor Type	Wattage	Tolerance
ERD : Carbon ERJ : Chip Type Carbon	S2 : 1/4W 8 : 1/8W	J : ± 5% K : ± 10%

Numbering System of Capacitor

Example

ECKD	1H	102	K	C
Type	Voltage (50V)	Value (0.001μF)	Tolerance (± 10%)	Peculiarity

ECEA	0G	KS	470	L
Type	Voltage (4V DC)	Peculiarity use	Value (47μF)	Special use

GR426	B	273	K	25
Type	Peculiarity	Value (0.027μF)	Tolerance (± 10%)	Voltage (25V)

Type		Voltage	Tolerance
ECEA	: Electrolytic	**ECEA, AR, REC, ECEV Types**	F : ± 1 pF J : ± 5% K : ± 10% M : ± 20% Z : $^{+80}_{-20}$% N : ± 30% P : $^{+100}_{0}$%
ECEA..N	: Non-Polar Electrolytic	0G : 4V 0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1V : 35V 1H : 50V	
ECEV	: Electrolytic (Chip Type)		
ECQM	: Polyester		
ECFR, ECKD, ECFF, ECCD	: Ceramic	**Others**	
GR426	: Ceramic (Chip Type)	1E : 25V DC 1H : 50V DC 50 : 50V DC 2B : 125V DC KC : 125V AC	
RCBS	: Ceramic (Axial Type)		

- **Indication of RCBS type capacitor (Axial type)**
- **Rated voltage**

The rated voltages are indicated by insulating paint colors.

Rated voltage (DC)	Paint color
16V	Pink
50V	Light-green

- **Electrostatic capacity and characteristics**

The nominal electrostatic capacites (PF), tolerances and temperature characteristics are indicated by color codes.

Color band	Brown	Red	Orange	Yellow	Green	Blue	Purple	Gray	White	Black	Gold	Silver
1st, 2nd color bands (Effective number of nominal electrostatic capacity)	1	2	3	4	5	6	7	8	9	0	—	—
3rd color band (Multiplier of nominal electrostatic capacity)	10^1	10^2	10^3	10^4	—	—	—	—	—	10^0	10^{-1}	10^{-2}
4th color band (Tolerances)	—	—	—	—	—	—	—	N	Z	M	J	K
5th color band (Temperature characteristic)												

● RESISTORS

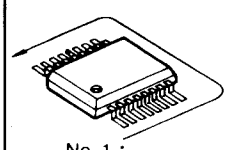
Ref. No.	Part No.	Value
R11, 12	ERDS2TJ681	680
R13	ERDS2TJ221	220
R14	ERDS2TJ101	100
R15, 16	ERDS2TJ561	560
R17	ERDS2TJ222	2.2K
R18	ERDS2TJ822	8.2K
R19	ERDS2TJ103	10K
R20	ERDS2TJ332	3.3K
R21	ERDS2TJ153	15K
R22, 23	ERDS2TJ682	6.8K
R24, 25	ERDS2TJ471	470
R26	ERDS2TJ471	470
R101	ERDS2TJ154	150K
R102, 103	ERDS2TJ472	4.7K
R104	ERDS2TJ223	22K
R105	ERDS2TJ334	330K
R107	ERDS2TJ683	68K
R108	ERDS2TJ332	3.3K
R109	ERDS2TJ822	8.2K
R110, 111	ERDS2TJ682	6.8K
R112	ERDS2TJ822	8.2K
R113, 114	ERDS2TJ182	1.8K
R115	ERDS2TJ102	1K
R116, 117	ERDS2TJ182	1.8K
R118	ERDS2TJ102	1K
R119	ERDS2TJ471	470
R120	ERDS2TJ120	12
R141	ERDS2TJ102	1K
R142	ERDS2TJ333	33K
R143	ERDS2TJ224	220K
R144	ERDS2TJ333	33K
R145	ERDS2TJ153	15K
R146	ERDS2TJ122	1.2K
R147	ERDS2TJ682	6.8K
R148	ERDS2TJ104	100K
R149	ERDS2TJ152	1.5K
R150	ERDS2TJ103	10K
R151	ERDS2TJ101	100
R152	ERDS2TJ153	15K
R153	ERDS2TJ270	27
R154	ERDS2TJ3R3	3.3
R161	ERDS2TJ333	33K
R162	ERDS2TJ222	2.2K
R163	ERDS2TJ333	33K
R164	ERDS2TJ153	15K
R165	ERDS2TJ122	1.2K
R166	ERDS2TJ102	1K
R167	ERDS2TJ681	680
R168	ERDS2TJ272	2.7K
R169	ERDS2TJ392	3.9K
R170	ERDS2TJ101	100
R171	ERDS2TJ270	27
R172	ERDS2TJ3R3	3.3
R180	ERDS2TJ474	470K
R181	ERDS2TJ222	2.2K
R182, 183	ERDS2TJ564	560K
R184	ERDS2TJ472	4.7K
R185, 186	ERDS2TJ473	47K
R187, 188	ERDS2TJ473	47K
R189	ERDS2TJ123	12K
R190	ERDS2TJ332	3.3K
R191	ERDS2TJ154	150K
R192	ERDS2TJ824	820K
R193	ERDS2TJ101	100
R194	ERDS2TJ683	68K
R195, 196	ERDS2TJ103	10K
R197	ERDS2TJ473	47K
R198	ERDS2TJ333	33K
R301	ERDS2TJ102	1K
R302	ERDS2TJ472	4.7K
R303, 304	ERDS2TJ102	1K
R305	ERDS2TJ104	100K
R401, 402	ERDS2TJ223	22K
R403	ERDS2TJ472	4.7K
R404	ERDS2TJ394	390K
R406	ERDS2TJ394	390K
R407	ERDS2TJ152	1.5K
R408, 409	ERDS2TJ472	4.7K
R410, 411	ERDS2TJ472	4.7K
R412, 413	ERDS2TJ472	4.7K
R414, 415	ERDS2TJ472	4.7K
R416	ERDS2TJ104	100K
R417	ERDS2TJ124	120K
R418	ERDS2TJ104	100K
R419	ERDS2TJ124	120K
R420	ERDS2TJ101	100
R421, 422	ERDS2TJ103	10K
R423 Except [M, MC]	ERDS2TJ103	10K
R424 Except [M, MC]	ERDS2TJ473	47K
R425, 426	ERDS2TJ103	10K
R427, 428	ERDS2TJ103	10K
R429, 430 Except [M, MC]	ERDS2TJ222	2.2K
R431, 432 Except [M, MC]	ERDS2TJ222	2.2K
R433	ERDS2TJ103	10K
R434	ERDS2TJ472	4.7K
R435 Except [M, MC]	ERDS2TJ331	330
R501, 502	ERJ8GEXK1R5	1.5
R503	ERJ8GEYJ223	22K
R801, 802	ERDS2TJ102	1K
R803, 804	ERDS2TJ122	1.2K
R805, 806	ERDS2TJ221	220
R807, 808	ERDS2TJ391	390
R809, 810	ERDS2TJ473	47K
R817, 818	ERDS2TJ102	1K
R819, 820	ERDS2TJ102	1K
R821	ERDS2TJ103	10K
R1001	ERDS2TJ103	10K

● CAPACITORS

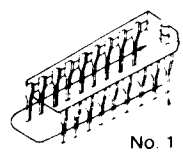
Ref. No.	Part No.	Value
C1 ⚠	ECKDKC103PF	0.01
C11, 12	ECFR1H104ZF	0.1
C13	ECEA1CU470	47
C14	ECFR1H104ZF	0.1
C15, 16	ECEA1CU221	220
C17	ECFR1H104ZF	0.1
C18	ECFF1H104ZF	0.1
C19, 20	REC1A101M0T	100
C21, 22	ECEA1CU222	2200
C23, 24	ECEA1CU331	330
C25, 26	ECEA1VU101	100
C27, 28	ECEA0JU331	330
C29	ECEA0JU101	100
C101	ECFR1H104ZF	0.1
C102, 103	ECKD1H102KB	0.001
C104	ECKD1H681KB	680P
C105, 106	ECKD1H471KB	470P
C107	ECCD1H220K	22P
C108	ECEA1HU0R1	0.1
C109	ECEA1HU010	1
C110	ECFR1H104ZF	0.1
C111, 112	ECEA1HU100	10
C113	ECEA1HKNR33	0.33
C114	RCBS1C182MXY	0.0018
C115	RCBS1C682MXY	0.0068
C116	ECQM1H333KV	0.033
C117	RCBS1H221KBY	220P
C118	ECEA1HU010	1
C119	ECEA0JU220	22
C120	ECKD1H681KB	680P
C121	ECKD1H103KB	0.01
C122, 123	ECCD1H101KB	100P
C124	ECFR1H104ZF	0.1
C125	ECEA0JU220	22
C126	ECEA0JU470	47
C127, 128	ECKD1H102KB	0.001
C141	ECQM1H153KV	0.015
C142	ECQM1H122KV	0.0012
C143	ECQM1H473KV	0.047
C144	ECEA1VSN2R2	2.2
C145	ECEA1HSNR22	0.22
C161	ECQM1H153KV	0.015
C162	ECKD1H681KB	680P
C163	ECQM1H103KV	0.01
C164	ECEA1ESN3R3	3.3
C165	ECEA1HSN0R1	0.1
C181	ECQM1H104KV	0.1
C182	ECCD1H221KB	220P
C183	ECQM1H103KV	0.01
C184	ECEA1HSN010	1
C186	ECFR1H104ZF	0.1
C187	ECEA1VSN2R2	2.2
C301	ECCD1H220K	22P
C302	ECCD1H070C	7P
C303	ECEA1VSN2R2	2.2
C304, 305	ECFR1H104ZF	0.1
C306	ECKD1H103KB	0.01
C307	ECKD1H471KB	470P
C308	ECFR1H104ZF	0.1
C401	ECFR1H104ZF	0.1
C402	ECEA0JU470	47
C403	ECKD1H103KB	0.01
C404, 405	ECFR1H104ZF	0.1
C501	ECEV1EV330	33
C502	ECEV1HV010	1
C504	GR426B273K25	0.027
C506	GR426B152K50	0.0015
C507	GR426F104Z25	0.1
C511, 512	ECEA1EN470S	47
C513	ECEA1EN470S	47
C801, 802	ECKD1H391KB	390P
C803, 804	RBP1CN220MCT	22
C805, 806	ECKD1H102KB	0.001
C807	ECEA0JU221	220
C810	ECFF1H104ZF	0.1
C811 Except [M, MC]	ECKF1H102KB	0.01
C812	ECKF1H103KB	0.01
C813, 814	ECEA1CN220S	22

● Terminal guide of IC's, transistors and diodes

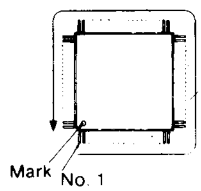
AN8370S.....42 pin
AN6554NS.....14 pin
MN4416S.....24 pin
AN8378S.....28 pin
MN6636S.....10 pin
AN8290S.....24 pin
MN1550PDT.....18 pin



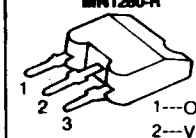
AN6552.....8 pin
MN15261PDF.....64 pin
SVIPCM54HP.....28 pin



MN6617S.....84 pin
MN6618A.....42 pin

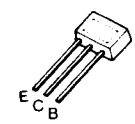


MN1280-R

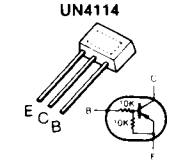


1---OUT
2---Vss
3---VDD

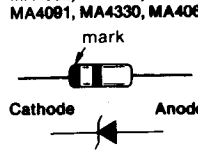
2SC3311



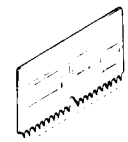
UN4114



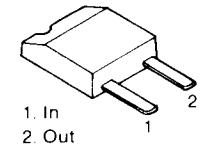
MA4082, MA4056,
MA4091, MA4330, MA4068

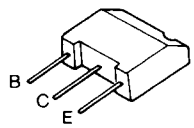


EHDGA1243.....15 pin
SVIGA011.....5 pin



SVIFU15





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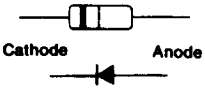
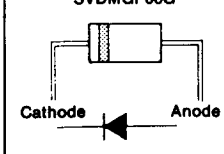
2SB911M
2SB973M
2SC2021M

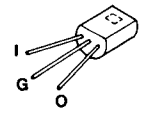
MA165



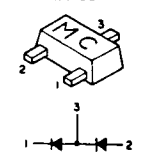
SVDMGP06G



SVIM5236L



MA153



■ TERMINAL FUNCTION OF LSI

• MN15261PDF (System Control and FL Drive)

Pin No.	Mark	Signal	I/O Devision	Function
1	VSS	GND	I	GND terminal
2	X0	——	O	Not used (Open)
3	X1	SENSE	I	Optical servo condition input
4	P00	PC	O	Spindle motor control signal (ON·OFF command)
5	P01	M DATA	O	Command data output
6	P02	MCLK	O	Command clock output
7	P03	MLD	O	Command load output
8	P10	M-RLY	O	Muting relay control
9	P11	D-DAT	O	Data output
10	P12	$\overline{\text{SYNC}}$	O	Synchro recording control (Not used)
11	P13	$\overline{\text{D-OP}}$	O	Direct operation control (Not used)
12	$\overline{\text{SYNC}}$	——	O	Not used (Open)
13	$\overline{\text{RST}}$	RESET	I	Reset signal input (reset at "L")
14	$\overline{\text{IRQ}}$	BLKCK	I	Sub-code block (Q data) clock (75Hz) input
15 P50 18 P53		——	I	Key scan input
19	$\overline{\text{SBT}}$	$\overline{\text{CLDCK}}$	I	Sub-code frame clock (7.35kHz)
20	$\overline{\text{SBD}}$	SUBQ	I	Sub-code Q data input
21	P20	TGC	O	——
22	P21	$\overline{\text{TRV-H}}$	O	Traverse servo control signal
23	P22	$\overline{\text{TRV-R}}$	O	Traverse reverse command signal
24	P23	$\overline{\text{RRV-F}}$	O	Traverse forward command signal
25	P30	CNT4	O	Optical servo IC control signal (KICKR: Kick direction [Reverse] command)
26	P31	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [Forward] command)
27	P32	CNT2	O	Optical servo IC control signal (TRON: Tracking servo)
28	P33	CNT1	O	Optical servo IC control signal (FOON: Focus servo)
29	P40	START	I	Key input strobe and processing status input from signal processing LSI traverse position detection.
30	P41	$\overline{\text{D END}}$	O	Data (end signal) signal
31	P42	$\overline{\text{FLOCK}}$	I	Optical servo condition (focus) input
32	P43	$\overline{\text{SENSE}}$	I	Optical servo condition (track cross) input
33	PE0	$\overline{\text{CLOSE}}$	O	Loading motor close command (ON at "L")
34	PE1	$\overline{\text{OPEN}}$	O	Loading motor open command (ON at "L")
35	P60	$\overline{\text{CLK}}$	O	Clock signal output
36	P61	D-STA	O	Data start signal
37	DAC	DAC	O	——
38	VPP	——	I	FL drive power supply (connected to −32V)
39 D0 52 DD		——	O	FL grid signal and key scan signal
53 S8 61 S0		——	O	FL anode signal
62	OSC2	——	I	Clock terminal
63	OSC1	——	I	Clock input
64	VDD	——	I	Power supply (connected to +5)

• MN1550PDT (Remote Control Signal Processing)

Pin No.	Mark	Signal	I/O Devision	Function
1	VDD	——	I	Power supply (connected to +5V)
2	OSC	SMCK	I	Clock input
3	P23	——	——	——
4	P22	——	——	——
5	RST	RESET	I	Reset signal input
6	P21	——	——	——
7	P20	——	I	Remote control signal input
8	IRQ	——	I	Program enable/de-enable control
9	SYNC	——	O	Clock output
10 P10 ~ 13 P13		Data	I	Key strobe
14 P00 ~ 17 P03		Data	I	Key strobe
18	VSS	GND	I	GND terminal

• MN6617 (Digital Signal Processing : EFM Decoder, Error Correction, CLV Servo)

Pin No.	Mark	I/O Devision	Function
1	BLKCK	O	Sub-code block (Q data) clock (75 Hz)
2	$\overline{\text{CLDCK}}$	O	Sub-code frame (Q data) clock (7.35 kHz)
3	$\overline{\text{SUBQ}}$	O	Sub-code (Q data) output
4	CRC	O	Sub-code (Q data) CRC check (Not used, open)
5	$\overline{\text{RST}}$	I	Reset signal input (reset at "L")
6	MLD	I	Command load input
7	MCLK	I	Command clock input
8	MDATA	I	Command data input
9	DMUTE	I	Muting control (muting ON at "H")
10	$\overline{\text{TRON}}$	I	Tracking servo ON signal (tracking servo ON at "L")
11	STAT	O	Processing condition (CRC, OTC, CLVOK, TT STOP) output
12	SMCK	O	Clock output (4.2336 MHz)
13	PMCK	O	Pitch control clock output (Not used, open)
14	ITC	I	Track counter input signal (Not used, connected to +5V)
15	$\overline{\text{TEST}}$	I	Test mode selection (Not used, connected to +5V)
16	X2	O	Clock output (16.9334 MHz)
17	X1	I	Clock input (16.9344 MHz)
18	SEL	I	DA output parallel/serial selection (serial at "L")
19	LDG/WDCK	O	L channel deglitch signal/serial data word clock.
20	RDG	O	R channel deglitch signal.
21	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")
22	IPFLAG	O	Interpolation flag (interpolation at "H")
23	FLAG0	O	Error flag (error at "H")
24	FLAG6	O	16 K RAM address reset signal (reset at "H")
25	XCK	O	Clock (16.9334 MHz) output (Not used, open)
26	DA15/ SRDATA	O	16-bit data output/serial data output (MSB first)
27	DA14/ SRDATAX	O	16-bit data output/serial data output (LSB first)
28	DA13/SRCK	O	16-bit data output/serial data beat clock.
29	DA12/WDCK	O	16-bit data output/serial data word clock (Not used)
30	DA11/ BYTCK	O	16-bit data output/serial data byte clock (Not used)
31	GND	I	GND terminal
32	DA10/RIL	O	16-bit data output/RIL signal
33	DA9/RESY	O	16-bit data output/ Resynchronizing signal

Pin No.	Mark	I/O Devision	Function
34	DA8/FCLV	O	16-bit data output/Synchronizing detection signal (Not used)
35	DA7/ IPBYTE	O	16-bit data output/Interpolation flag for each byte (Not used)
36	DA6/IPSEL	I/O	16-bit data output/ interpolation inhibit (Not used)
37	DA5/FLAG5	O	16-bit data output/C2 decoder correction flag 3 (Not used)
38	DA4/FLAG4	O	16-bit data output/C2 decoder correction flag 2 (Not used)
39	DA3/FLAG3	O	16-bit data output/C2 decoder correction flag 1 (Not used)
40	DA2/FLAG2	O	16-bit data output/C1 decoder correction flag 2 (Not used)
41	DA1/FLAG1	O	16-bit data output/C1 decoder correction flag 1 (Not used)
42	DA0/FLCK0	O	16-bit data output/Crystal frame clock
43 ∫ 50	D7 ∫ D0	I/O	16 K RAM data output
51	RAMOE	O	16 K RAM $\overline{\text{OE}}$ signal
52	RAMWE	O	16 K RAM $\overline{\text{WE}}$ signal
53 ∫ 63	RAMA 0 ∫ RAMA10	O	16 K RAM address signal (RAMA0 : LSB, RAMA10: MSB)
64	PC	O	Spindle motor ON signal (ON at "L")
65	EC	O	Spindle motor drive signal
66	FG	I	Spindle motor FG signal input
67	——	——	——
68	——	——	——
69	——	——	——
70	——	——	——
71	——	——	——
72	PCK	I	PLL extract clock input
73	VDD	I	Power supply (connected to +5V)
74	EFM	I	EFM signal input (PLL)
75	SRF	I	EFM signal input (DSL)
76	DO	I	Drop-out signal (Drop-out at "H")
77	CLVS	O	11T stereo OK signal (OK at "H")
78	FPC	O	PLL frequency comparision signal
79	BSSEL	O	PLL frequency in take operation signal.
80	——	——	——
81	——	——	——
82	——	——	——
83	SUBC	O	Sub-code serial output data
84	SBCK	I	Clock for sub-code serial output

• AN8370S (Optical Servo Control)

Pin No.	Mark	I/O Devision	Function
1	VEE	I	Power supply (connected to −5V)
2	LSA	I	Phase difference input (A)
3	GND	I	GND terminal
4	LSB	I	Phase difference input (B)
5	APC	O	Auto laser power control output
6	TEOUT	O	Tracking error signal output
7	TEG	I	Tracking error gain adjusting input
8	TE−	I	Phase difference-voltage conversion (−)
9	TE +	I	Phase difference-voltage conversion (+)
10	APC −	O	Laser power inversion input
11	C·MEM	I	Capacitor connection for phase difference memory
12	APC +	I	Laser power non-inversion input
13	VREF	O	Reference current generation
14	SENSE	O	Selector output (track-crossed)
15	HIN	I	Tracking hold circuit input
16	HOUT	O	Tracking hold circuit output
17	SPCNT	O	Track-cross speed control output (not used, grounded)
18	C·MSP	I	Track-cross reference speed setting capacitor connection (not used, grounded)
19	C·AF	I	Auto focus timer capacitor connection
20	KICK R/$\overline{F}$	O	Track kick signal output
21	VCC	I	Power supply (connected to +5V)
22	CNT1	I	Control input ($\overline{FOON}$: Focus servo ON signal)
23	CNT2	I	Control input ($\overline{TRON}$: Tracking servo ON signal)
24	CNT3	I	Control input (KICKF : Kick direction [forward] command)
25	CNT4	I	Control input (KICKR : Kick direction [reverse] command)
26	$\overline{F\cdot LOCK}$	O	Focus lock signal output
27	C·FBDO	O	Capacitor connection for inversion RF high speed detection
28	C·SBDO	O	Capacitor connection for inversion RF low speed detection
29	C·SBRT	O	Capacitor connection for non-inversion RF low speed detection
30	C· FBRT	O	Capacitor connection for non-inversion RF high speed detection
31	RF OUT	O	RF signal output
32	BDO	O	Drop-out detection output
33	RFIN	I	RF signal input
34	S·OUT	O	Focus search signal output
35	C·LW	I	Capacitor connection for triangular wave generation
36	FE·OUT	O	Focus error signal output
37	FEG	I	Focus error gain adjusting input
38	FE·REF	I	Focus error comparison voltage generation
39	PDB	I	Photo detector current input (B)
40	IVB	O	Current/voltage conversion output (B)
41	IVA	O	Current/voltage conversion output (A)
42	PDA	I	Photo detector current input (A)

• EHDGA1243 (Data Slice and PLL)

Pin No.	Mark	I/O Devision	Function
1	PCK	O	Clock output extracted from SRF
2	EFM	O	EFM signal output synchronized with PCK
3	D·GND	I	GND terminal (digital system)
4	SRF	O	RF signal output data-sliced into digital value
5	SLC	I	Slice level control signal input
6	DO	O	Drop-out detection pulse output
7	FPC	I	Frequency comparison error signal input.
8	VCC	I	Power supply (connected to +5V)
9	NC	——	Non connection
10	VR	I	Resistor connection for VCO oscillation frequency
11	VEE	I	Power supply (connected to −5V)
12	VC1	I	Capacitor connection for VCO oscillation frequency
13	VC2	I	Capacitor connection for VCO oscillation frequency
14	A·GND	I	GND terminal (analog system)
15	RF	I	RF signal input

• MN6618 (Digital Filter)

Pin No.	Mark	I/O Device	Function
1	———	——	———————
2	D012	O	16-bit parallel deta output
3	D011/SCK	O	16-bit parallel data output/ serial output bit clock
4	D010/SOUT	O	16-bit parallel data output/ serial output data
5	GND	I	GND terminal
6	D09	O	16-bit parallel data
7	———	——	———————
8	D08	O	16-bit parallel data
9	D07	O	16-bit parallel data
10	———	——	———————
11	———	——	———————
12	D06	O	16-bit parallel data
13	D05	O	16-bit parallel data
14	D04	O	16-bit parallel data
15	D03/2RLCK	O	16-bit parallel data/RL signal
16	———	——	———————
17	———	——	———————
18	D02/WCK	O	16-bit parallel data/serial output word clock
19	D01	O	16-bit parallel data
20	D00	O	16-bit parallel data (LSB)
21	MDATA	I	Command data input

Pin No.	Mark	I/O Device	Function
22	———	——	———————
23	MCLK	I	Command clock input
24	MLD	I	Command load input
25	———	——	———————
26	$\overline{RST}$	I	Reset signal input (reset at "L")
27	VDD	I	Power supply (connected to +5V)
28	LRCK	I	R/L signal
29	———	——	———————
30	SFT	I	Serial data input clock
31	SIN	I	Serial data input
32	———	——	———————
33	X OUT	O	Clock output (Not used)
34	X IN	I	Clock input (16.9344 MHz)
35	OSEL	I	DA output parallel/serial selection. (parallel at "H")
36	LDGL	O	L channel deglitch signal
37	RDGL	O	R channel deglitch signal
38	VDD	I	Power supply (connected to +5V)
39	D015	O	16-bit parallel data (MSB)
40	D014	O	16-bit parallel data
41	———	——	———————
42	D013	O	16-bit parallel data

• AN8290S (Spindle Motor Drive)

Pin No.	Mark	I/O Devision	Function
1	GND	I	Minimum potential of IC control. (In this unit, it is connected to VEE [−8.5V])
2	DCR	I	Standard voltage of FAI, PC, CLK. (In this unit, it is connected to 2.5V.)
3	FAI	I	Torque command filter amp. input. (Normar rotation command when FAI < DCR.)
4	FAO	O	Filter amp. output.
5	DI	I	Absolute value circuit input.
6	LPF	I	Capacitor terminal for low pass filter of current feedback loop.
7	A1	O	Drive signal output.
8	A2	O	
9	A3	O	
10	PGND	I	Minimum potential of IC power. (In this unit, it is connected to VEE [−8.5V])
11	CS	I	Drive current detection resistor terminal.
12	PVCC	I	Power input for IC power.

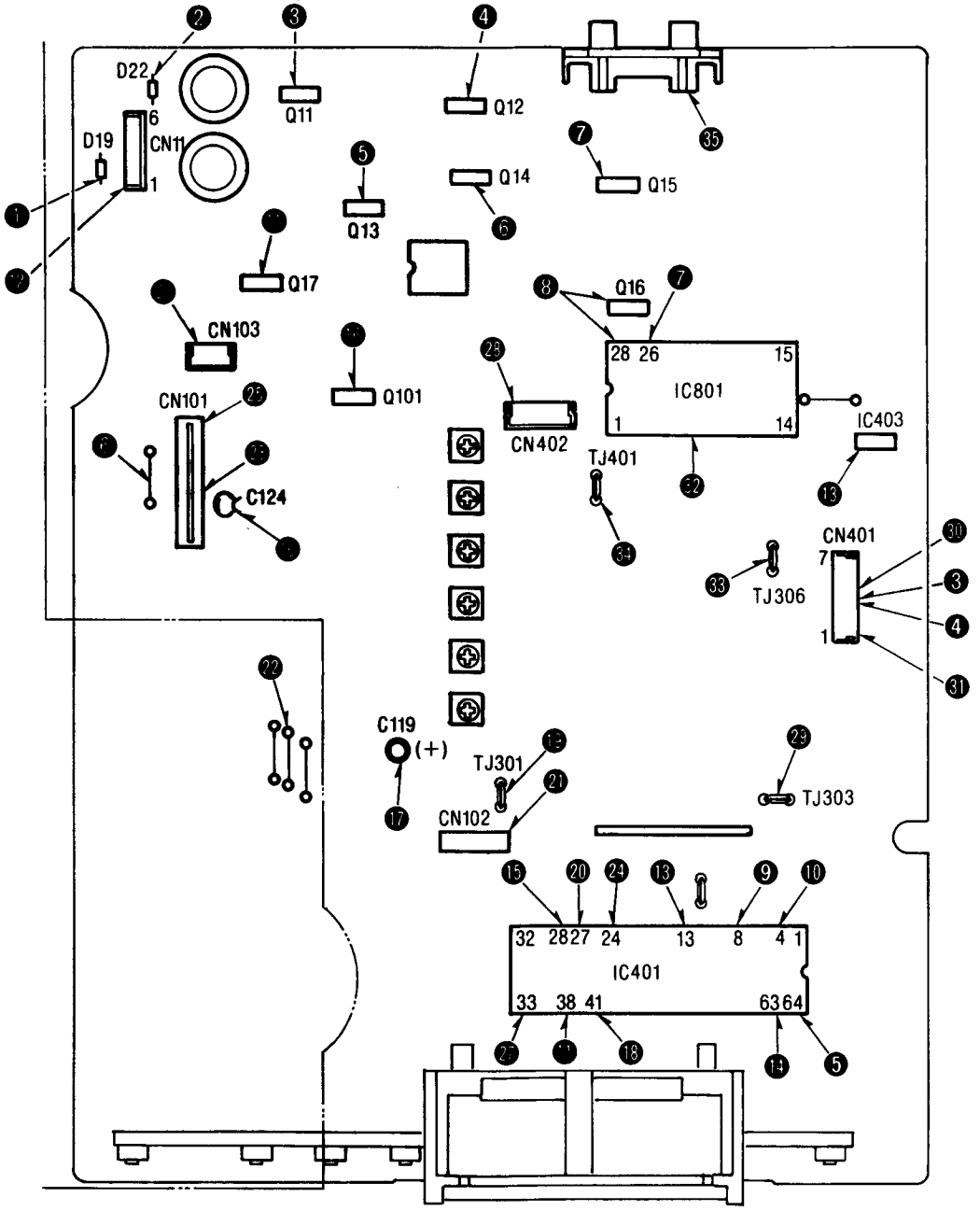
Pin No.	Mark	I/O Devision	Function
13	H3−	I	In this unit, not used.
14	H3+	I	
15	H2−	I	Negative output of Hall element is input.
16	H2+	I	Positive output of Hall element is input.
17	H1−	I	Negative output of Hall element is input.
18	H1+	I	Positive output of Hall element is input.
19	HSW	I	Bias switch of Hall element. (OFF when PC > DCR)
20	HB	I	Bias power of Hall element.
21	VCC	I	Power input for IC control.
22	PC	I	Power control. (Power down mode when PC > DCR)
23	CLK	I	Clock input. (DCR standard, operated at the edge of rise.)
24	TC	I	Triangular wave generation capacitor terminal.

■ TROUBLESHOOTING

Notes:

1. Carefully handle the compact disc because stain, dust or warping may cause generation of noise.
2. For the voltage value and waveform, refer to the schematic diagram. (The voltage value and waveform slightly varies depending on the measuring set and tester.)
3. Possible defects are mainly shown by the name of semi-conductor. The adjacent electronic circuits (such as C and R) are omitted.

- **Check points**



• Check the power supply circuit

Check point ❶

Check the voltage of D19 terminal (cathode)..... 8.9V — NO → AC cord, S1, T1, D19, 20 } defective

Check point ❷ YES

Check the voltage of D22 terminal (anode)..... ⊖9.3V — NO → D21, D22 } defective

Check point ❸ YES

Check the voltage of Q11 terminal (emitter) or CN401 4 pin..... 8.5V — NO → IC11, Q11, D11 } defective

Check point ❹ YES

Check the voltage of Q12 terminal (emitter) or CN401 3 pin..... ⊖8.5V — NO → IC12, Q12, D12 } defective

Check point ❺ YES

Check the voltage of Q13 terminal (collector) or IC401 64 pin..... 5V — NO → IC13, Q13 } defective

Check point ❻ YES

Check the voltage of Q14 terminal (emitter) or jumer wire..... ⊖5V — NO → IC402, Q14 } defective

Check point ❼ YES

Check the voltage of Q15 terminal (emitter) or IC801 26 pin..... 6.5V — NO → Q15, D15 } defective

Check point ❽ YES

Check the voltage of Q16 terminal (emitter) or IC801 28 pin..... ⊖6.5V — NO → Q16, D16 } defective

Check point ❾ YES

Check the voltage of IC401 8 pin..... 12.5V — NO → D23, D24 } defective

Check point ❿ YES

Check the voltage of IC401 4 pin..... ⊖12V — NO → D24, D25 } defective

Check point ⓫ YES

Check the voltage of Q17 terminal (emitter) or IC401 38 pin..... ⊖32V — NO → D18, D25, D26, Q17 } defective

Check point ⓬ YES

Check the voltage of CN11 ①, ②..... AC 2.3V — NO → T1, D18 } defective

• Check the focus servo

Check the power supply circuit

Check point ⓭ YES

Reset signal is "H (4.2V)"? (IC403 1 pin or IC401 13 pin) — NO → IC40

Check point ⓮ YES

Clock is oscillated (4.2336MHz)? (IC401 63 pin) — NO → IC30, R40

Check point ⓯ YES

Focus ON signal level is "L (0V)"? (IC401 28 pin) — NO → IC40, IC1

Check point ⓰ YES

Laser A.P.C. signal is ON? (Q101 collector or C124) — NO → IC1, Q10

Check point ⓱ YES

Focus search signal is emitted? (IC101 35 pin or C119) — NO → IC1

Check point ⓲ YES

Focus OK signal is "L (0V)"? (IC401 31 pin) — NO → IC1, IC40

YES

Focus lens moves up and down for a few seconds? (Not needed to set the disc) — NO → IC1, Q14, Pick

Check point ⓳ YES

RF signal is emitted? (Test pin TJ301) — NO → IC1, Pick

• Check the tracking servo

Check point ⓴

Check the TR ON signal (IC401 27 pin). "L" in play and "H" in search/skip. — NO → IC1, IC40

Check point ㉑ YES

Tracking error signal is emitted? (CN102 1 pin or 2 pin) — NO → IC1

Check point ㉒ YES

Track jump pulse is emitted during search/skip? (IC101 20 pin or jumper wire) — NO → IC1

Check point ㉓ YES

Tracking coil drive signal is emitted? (CN101 8 pin) — NO → IC1, Q16, Q16

ervo

circuit

YES

)"?
pin)

NO → IC402 defective

YES

36 MHz)?

NO → IC301, X301, R407, C403 } defective

YES

s "L (0V)"?

NO → IC401, IC101 } defective

YES

N?

NO → IC101, Q101 } defective

YES

emitted?

NO → IC101 defective

YES

0V)"?

NO → IC101, IC401 } defective

YES

nd down for a few
disc)

NO → IC104, Q141, 142, Pickup } defective

YES

NO → IC101, Pickup } defective

g servo

(IC401 27 pin).
search/skip.

NO → IC101, IC401 } defective

YES

emitted?

NO → IC101 defective

YES

itted during
pin or jumper wire)

NO → IC101 defective

YES

al is emitted?

NO → IC104, Q161, Q162 } defective

• Check the traverse servo

Check point ㉔

Kick pulse is emitted in skip mode?
(IC401 23, 24 pins)

NO → IC401 defective

YES

Check point ㉕

Traverse coil drive signal is emitted?
(CN101 17 pin)

NO → IC103, Q181, Q182 } defective

YES

Check point ㉖

Speed sensor signal is emitted?
(CN103 3 pin)

NO → Speed sensor } defective

• Check the loading motor drive

Check point ㉗

Loading motor close/open command signal is emitted?
(IC401 33, 34 pins)

NO → IC401 defective

YES

Check point ㉘

Loading motor drive signal is emitted?
(CN402 5 pin)

NO → IC402, Q402, 403, motor } defective

• Check the digital and audio

Check point ㉙

PCK signal is emitted?
(Test pin TJ303)

NO → IC304, IC301 } defective

YES

Check point ㉚

CLK signal is emitted?
(CN401 5 pin)

NO → IC301 defective

YES

Check point ㉛

Spindle motor ON command signal is "H (2.5V)"?
(CN401 pin)

NO → IC301 defective

YES

Check point ㉜

Data signal is emitted?
(IC801 2, 3, 5~18 pins)

NO → IC301, 302, IC801 } defective

YES

Check point ㉝

Deglitch signal is emitted?
(Test pin TJ306)

NO → IC301, IC302 } defective

YES

Check point ㉞

Muting signal level is "L (0V)"?
(Test pin TJ401)

NO → IC401, IC803 } defective

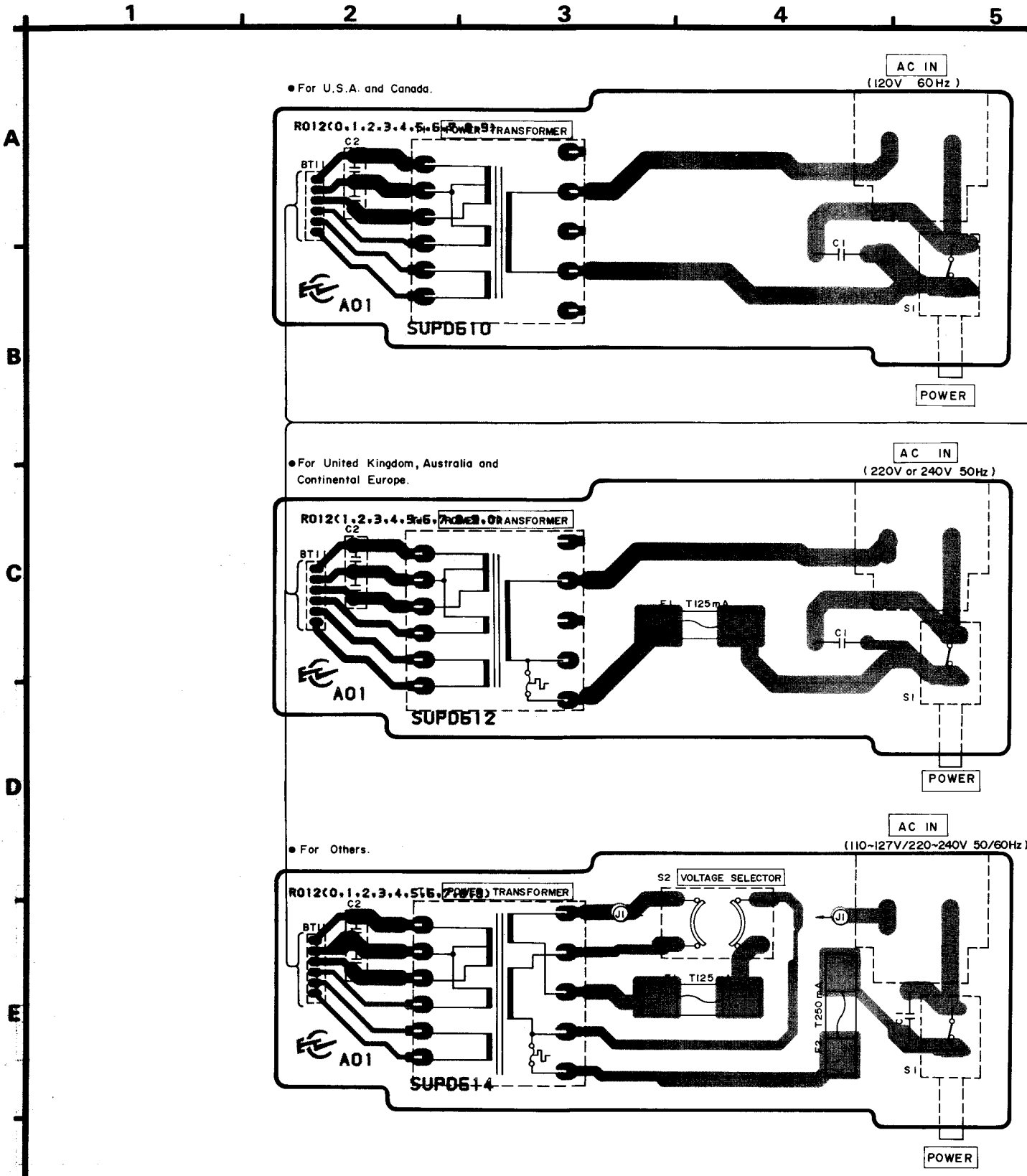
YES

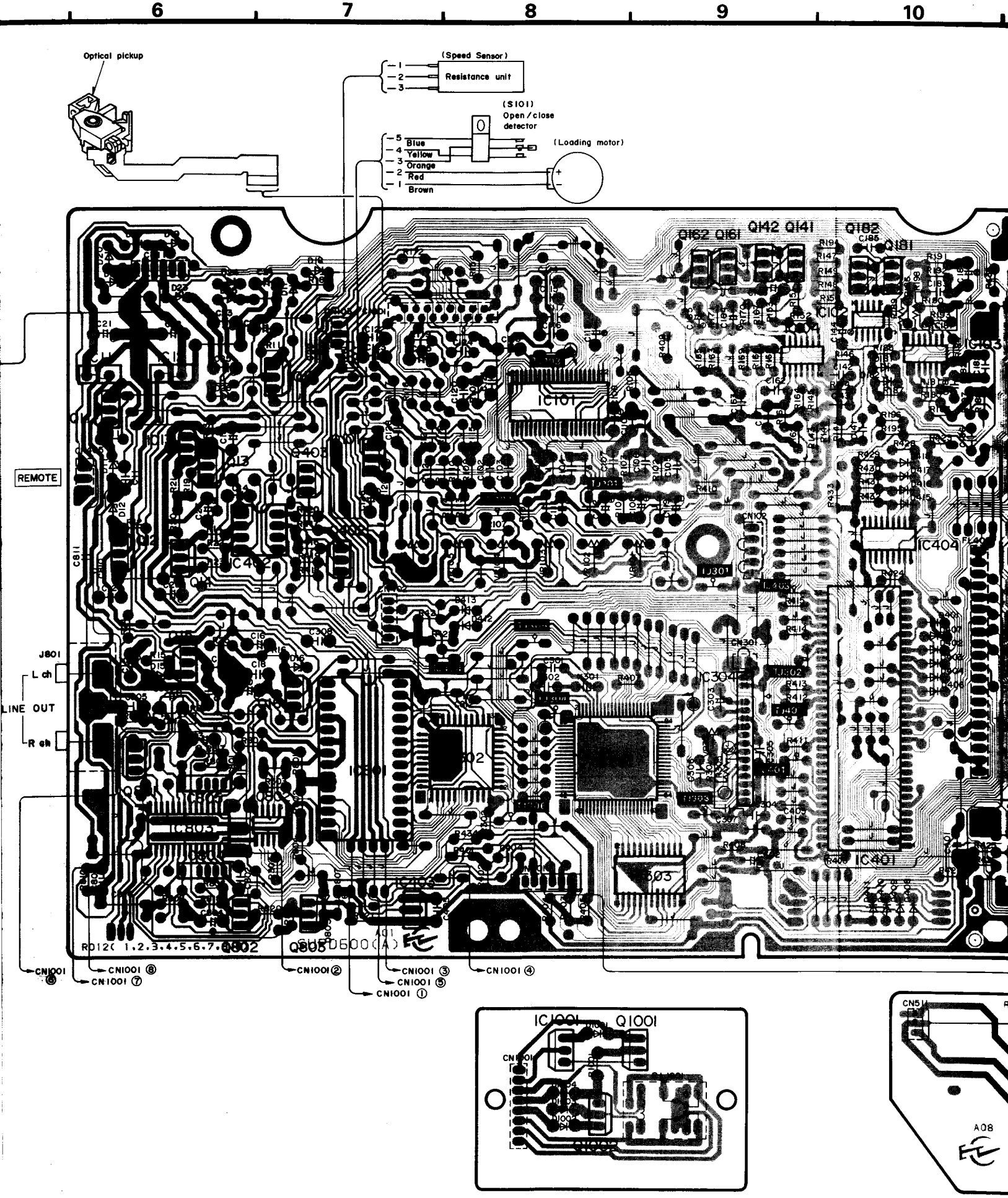
Check point ㉟

AF signal is emitted?
(Output terminal)

NO → IC802~804 defective

■CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM




6
7
8
9
10
Optical pickup
(Speed Sensor)
Resistance unit
(S101)
Open / close detector
(Loading motor)
Blue
Yellow
Orange
Red
Brown
REMOTE
J801
L ch
LINE OUT
R ch
IC1001
Q1001
CN1001
A08

■ SCHEMATIC DIAGRAM

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

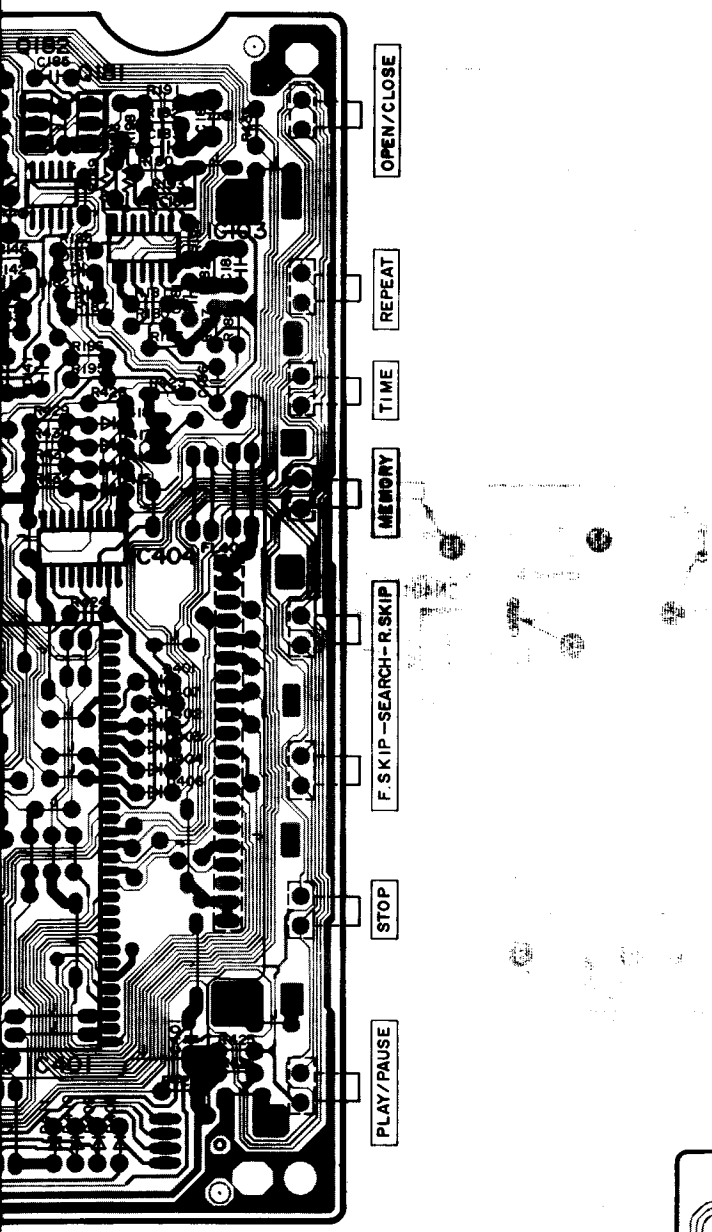
Notes:

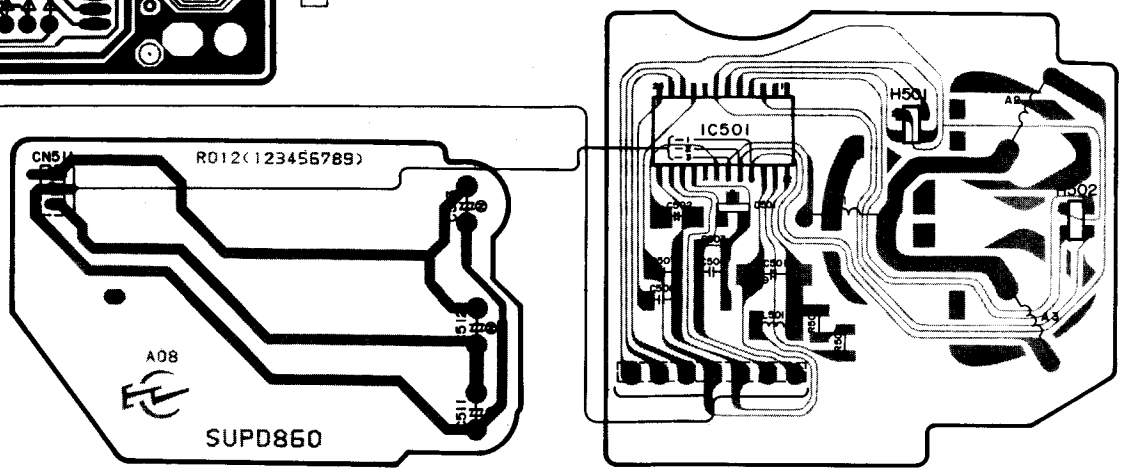
1. **S1** : Power switch in "**on**" position.
2. **S2** : Voltage selector switch. (For [XA], [XB], [PA], [PE] and [PC] areas)
3. **S101** : Disc holder open/close detection switch.
4. **S401** : Play/pause switch.
5. **S402** : Stop/clear switch.
6. **S403** : Forward skip/search switch.
7. **S404** : Backward skip/search switch.
8. **S405** : Memory/recall switch.
9. **S406** : Time mode select switch.
10. **S407** : Repeat switch.
11. **S408** : Open/close switch.
12. The voltage value and waveform are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
    * The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.
13. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
14. ——— : **Positive** voltage lines and negative voltage lines.
    ▒▒▒▒ : **Audio** signal lines.

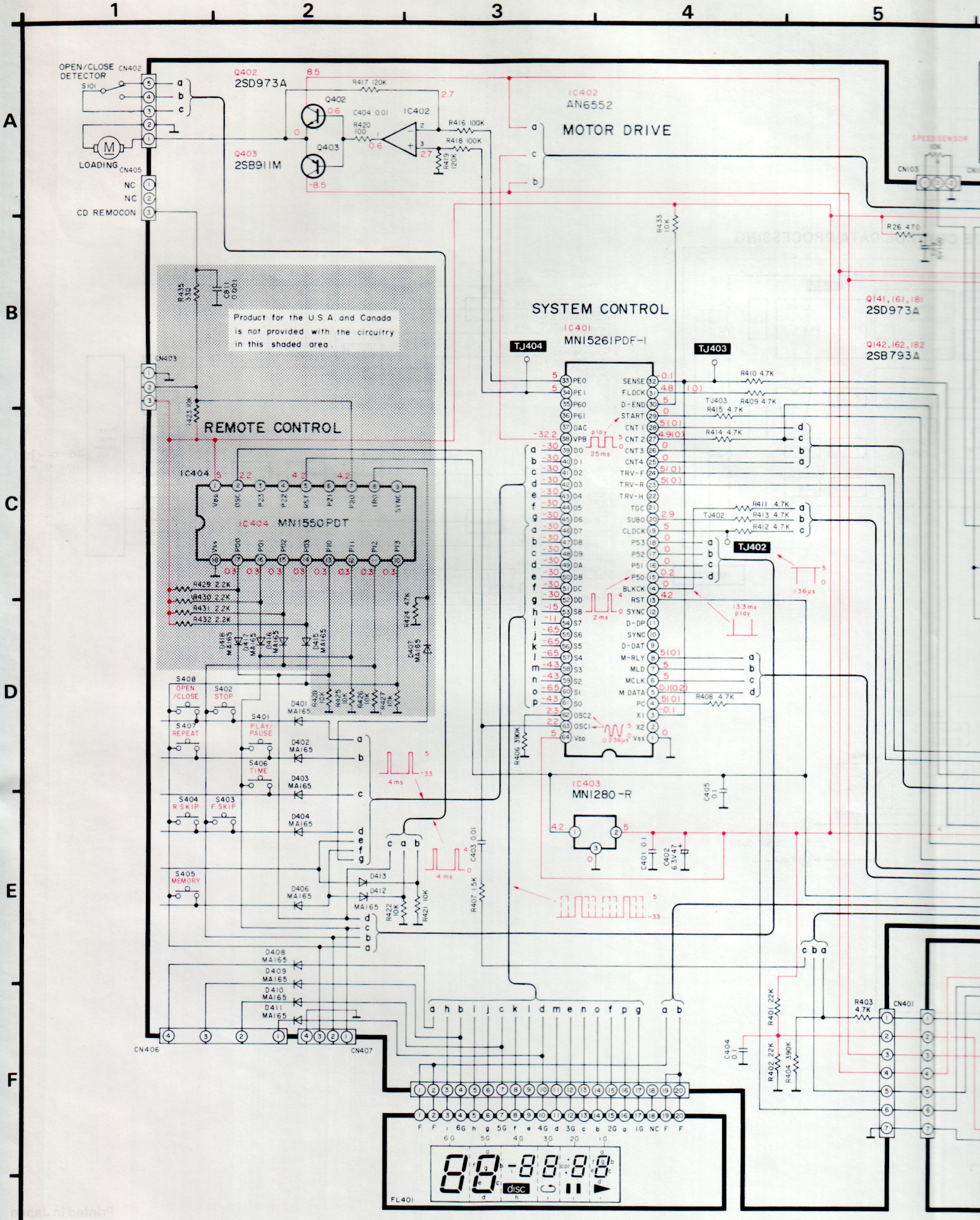
* Caution!

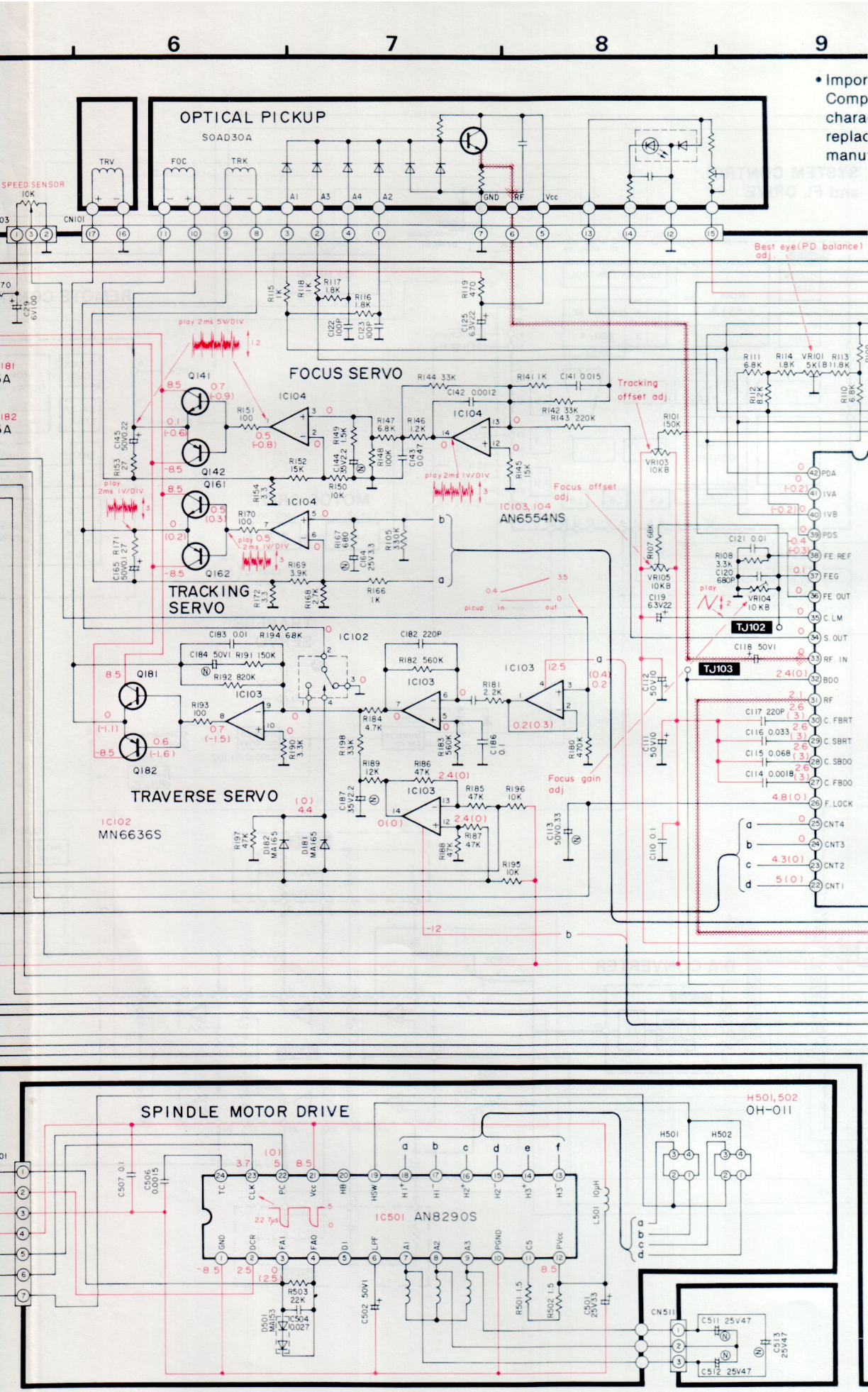
IC and LSI are aensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

* Cover the parts boxes made of plastics with aluminum foil.
* 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.



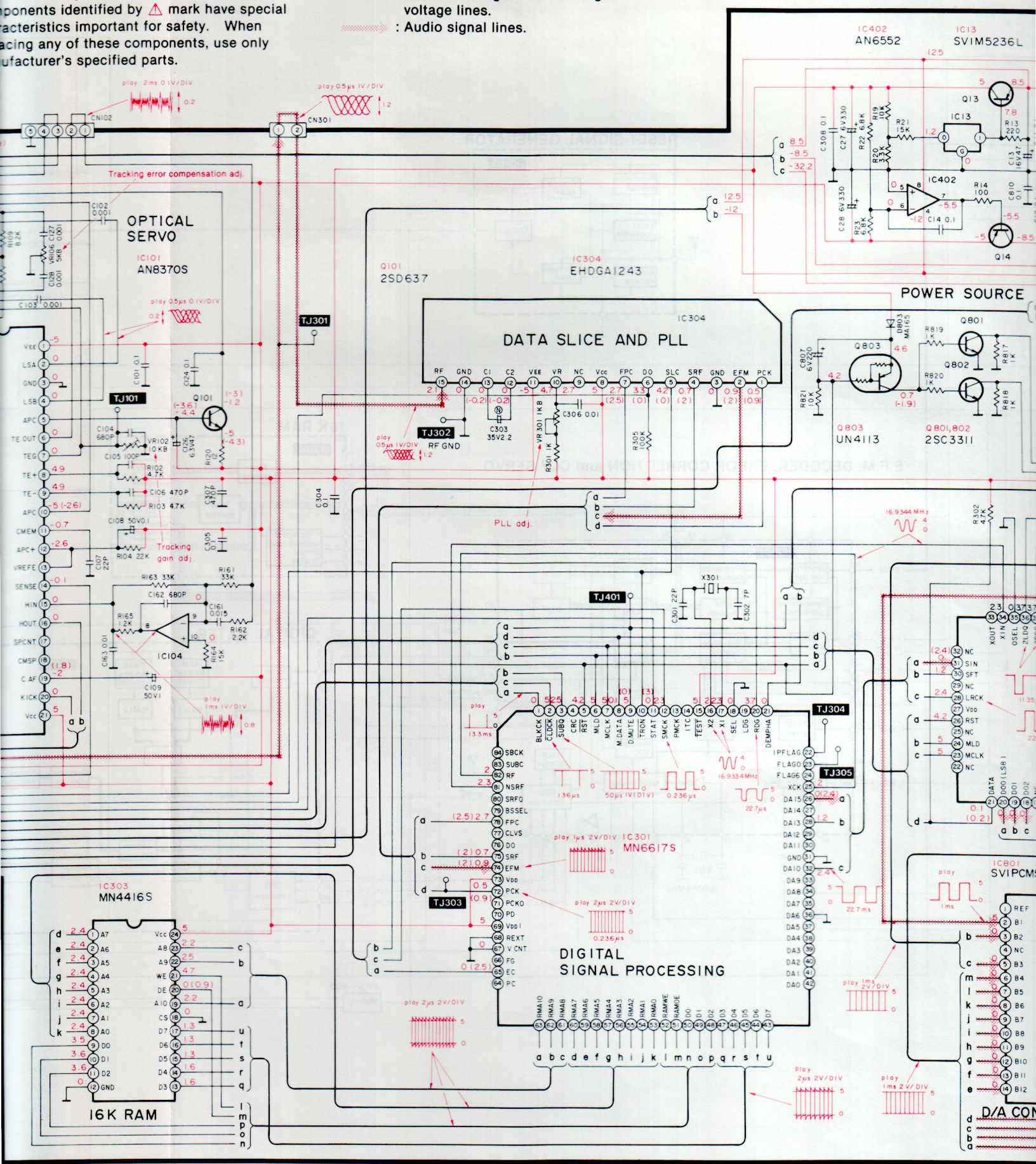


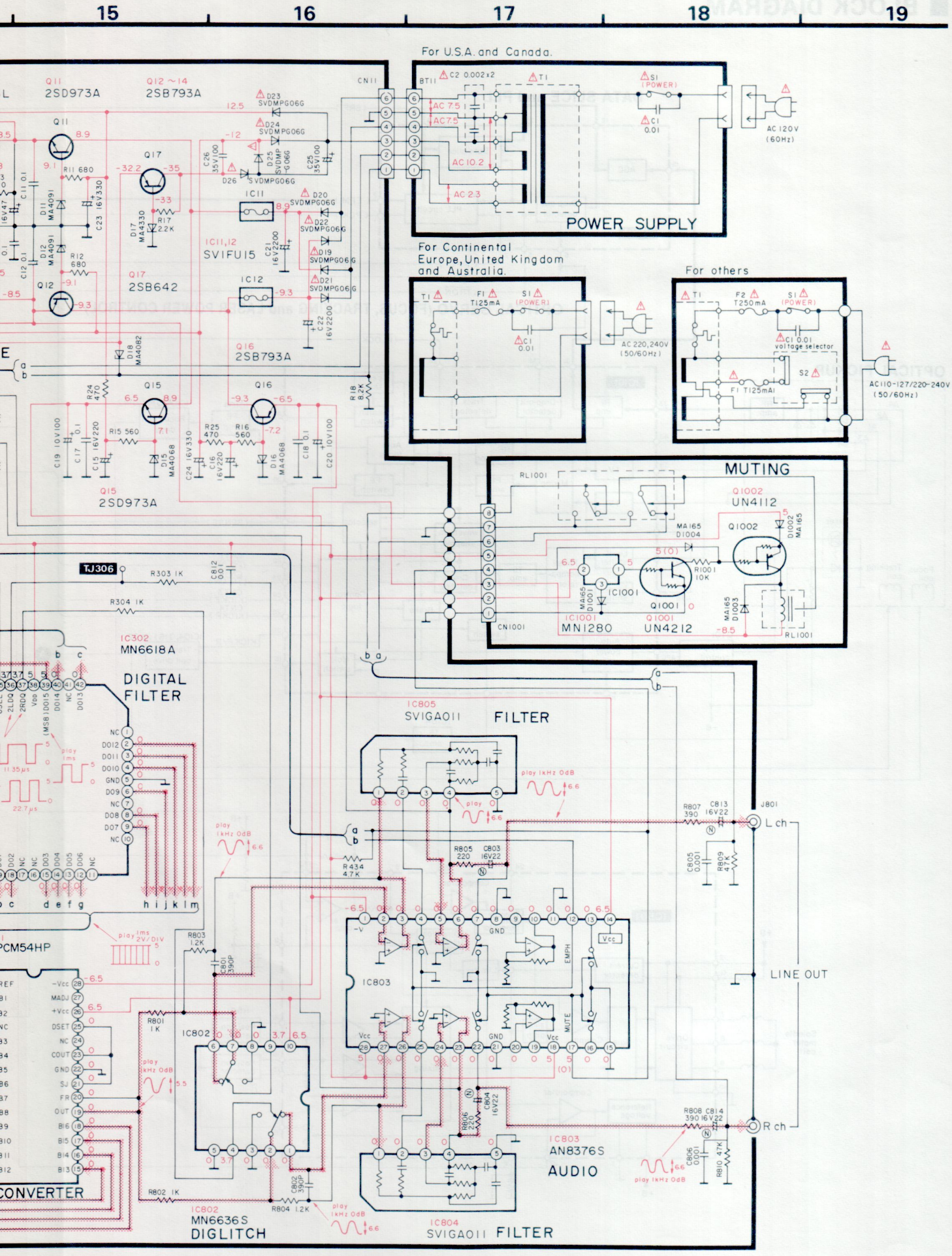

OPEN/CLOSE DETECTOR
CN402
S101
LOADING
CN405
NC
NC
CD REMOCON
Q402
2SD973A
Q403
2SB911M
IC402
AN6552
MOTOR DRIVE
SPEED SENSOR
CN103
Product for the U.S.A. and Canada is not provided with the circuitry in this shaded area.
SYSTEM CONTROL
IC401
MN1526IPDF-I
TJ404
TJ403
TJ402
Q141,161,181
2SD973A
Q142,162,182
2SB793A
REMOTE CONTROL
IC404
MN1550PDT
IC403
MN1280-R
S408 OPEN /CLOSE
S402 STOP
S401 PLAY/ PAUSE
S407 REPEAT
S406 TIME
S404 R.SKIP
S403 F.SKIP
S405 MEMORY
CN406
CN407
CN401
FL401
disc
— 29 —


OPTICAL PICKUP
SOAD30A
TRV
FOC
TRK
A1
A3
A4
A2
GND
RF
Vcc
CN101
SPEED SENSOR
10K
FOCUS SERVO
IC104
Q141
Q142
Q161
Q162
play 2ms 5V/DIV
play 2ms 1V/DIV
Tracking offset adj.
Focus offset adj.
IC103, 104
AN6554NS
TRACKING SERVO
Best eye(PD balance) adj.
VR103 10KB
VR105 10KB
VR104 10KB
VR101 5K(B)
TJ102
TJ103
PDA
IVA
IVB
PDS
FE REF
FEG
FE OUT
C. LM
S. OUT
RF. IN
BDO
RF
C. FBRT
C. SBRT
C. SBDO
C. FBDO
F. LOCK
CNT4
CNT3
CNT2
CNT1
IC103
IC102
MN6636S
TRAVERSE SERVO
Focus gain adj.
Q181
Q182
SPINDLE MOTOR DRIVE
IC501 AN8290S
H501, 502
OH-011
H501
H502
CN511

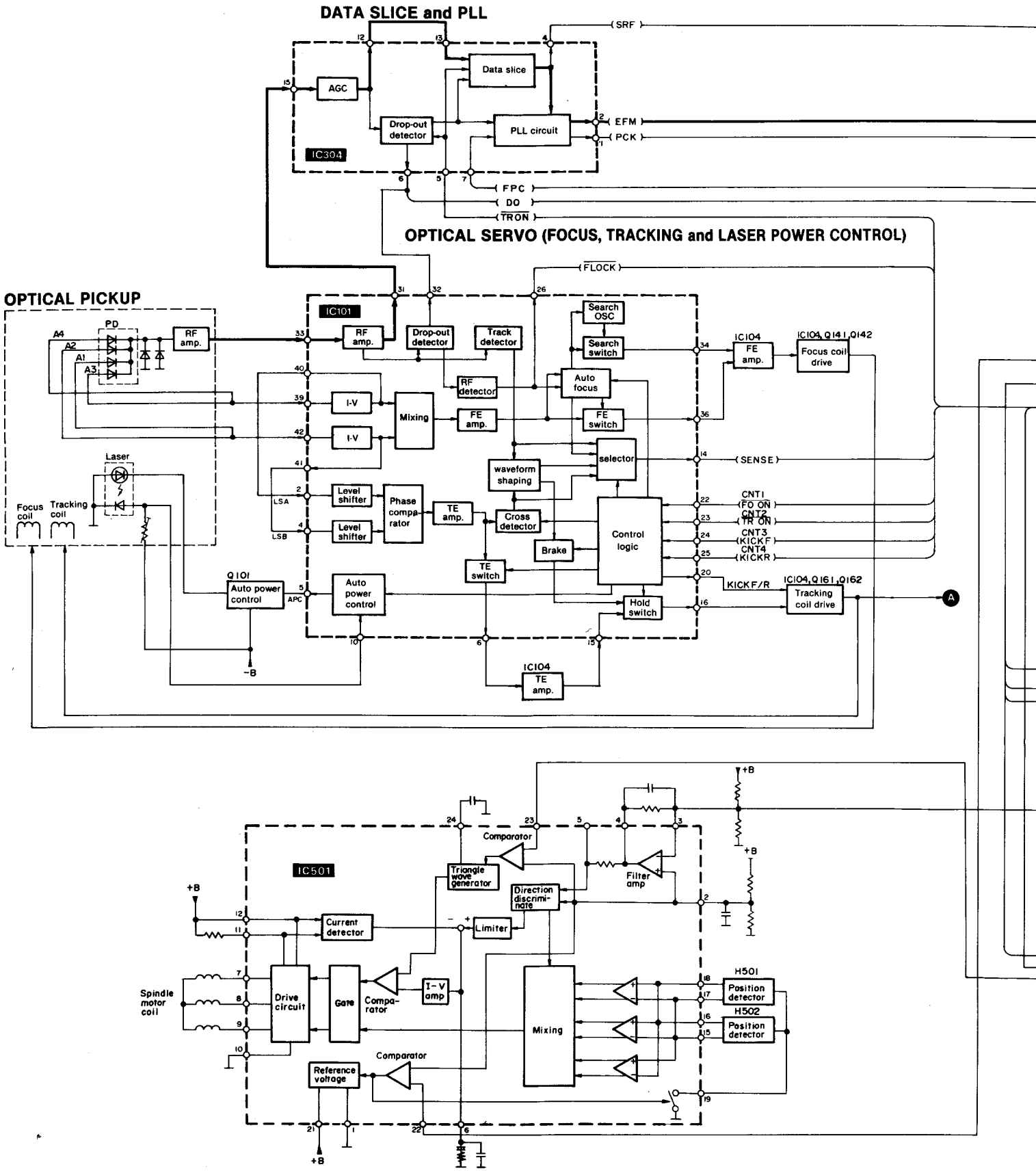
ortant safety notice:
nponents identified by ⚠ mark have special
racteristics important for safety. When
acing any of these components, use only
ufacturer's specified parts.

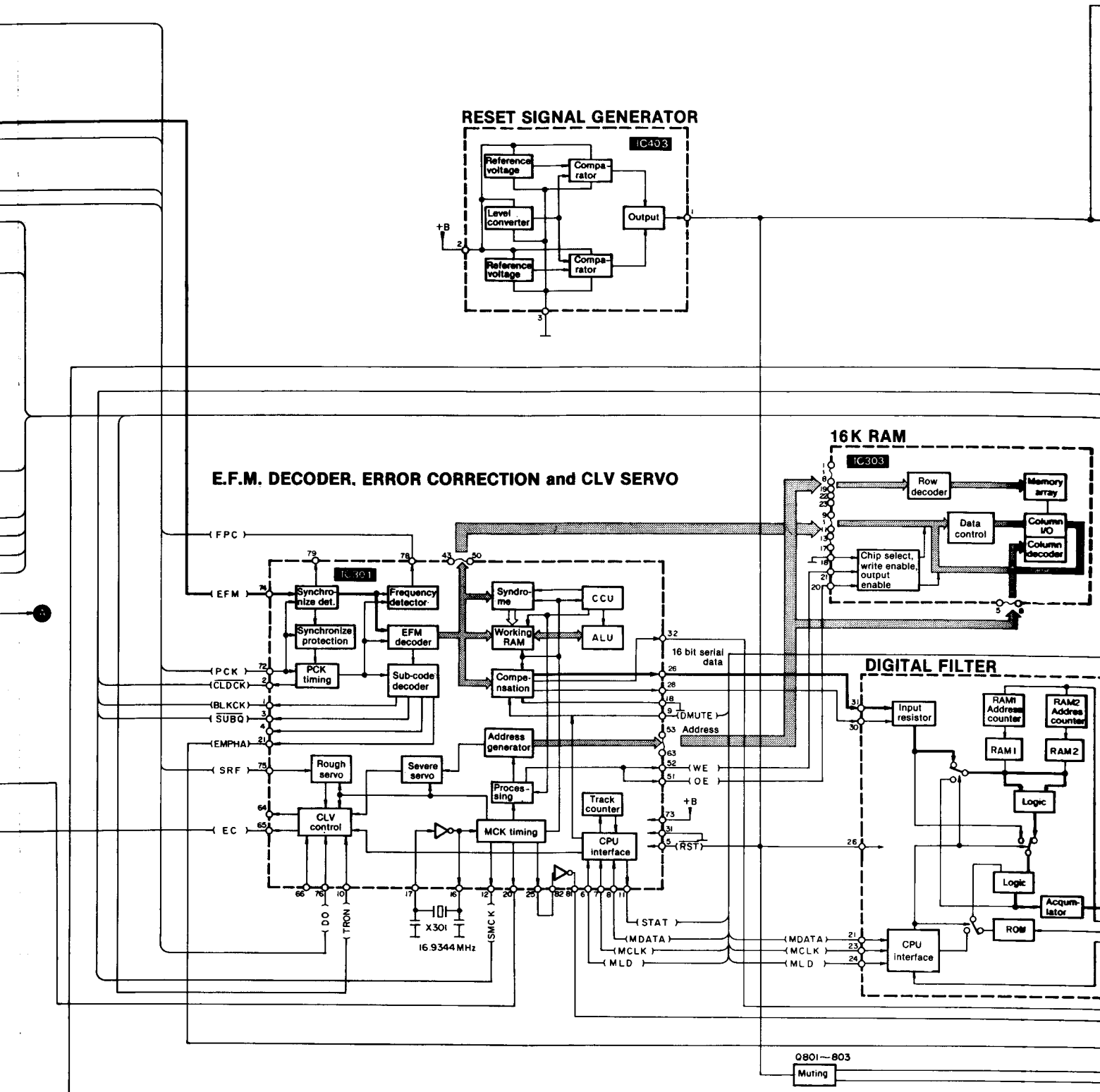
• ——— : Positive voltage lines and negative voltage lines.
⟿ : Audio signal lines.

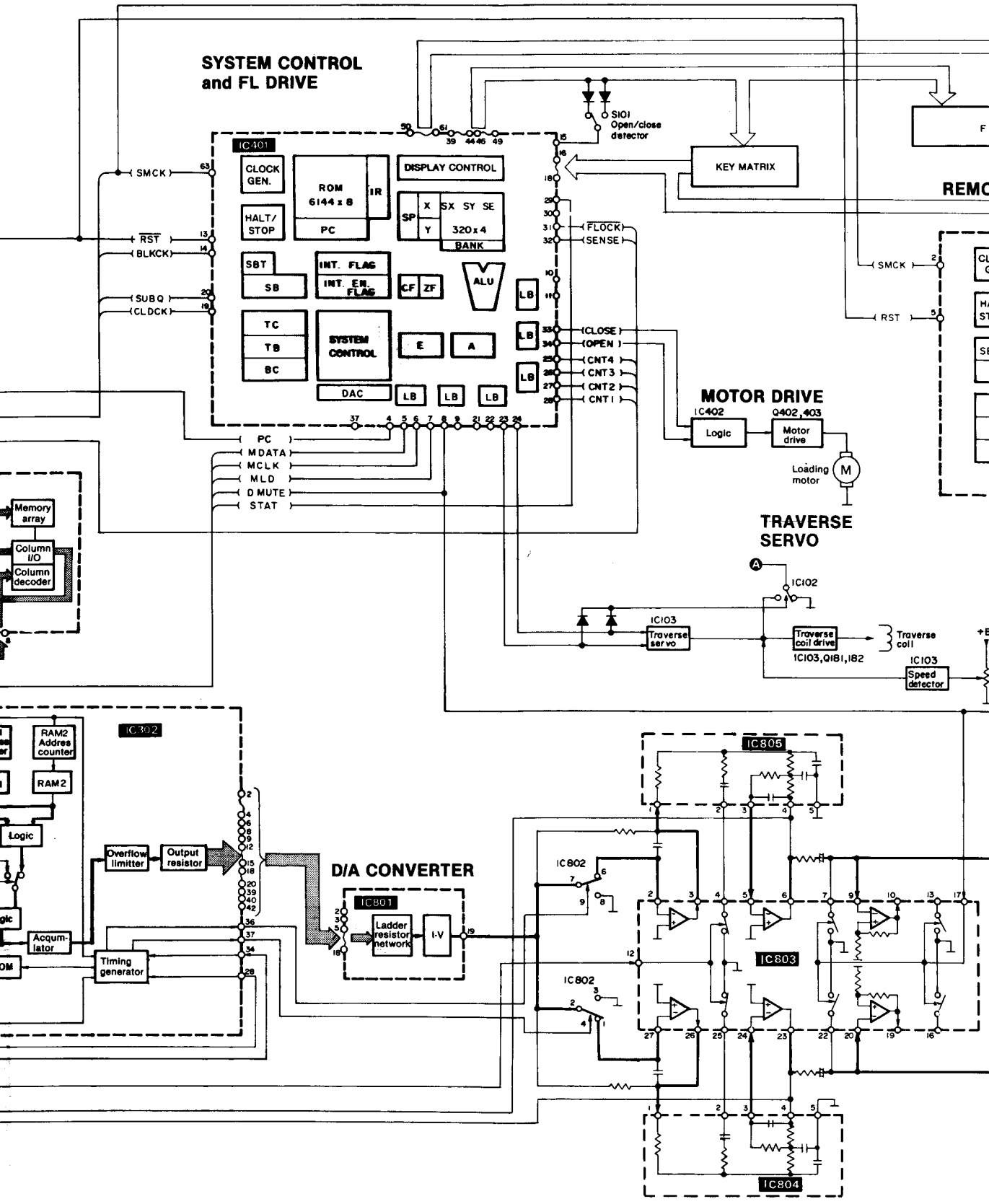


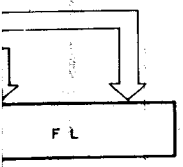

15
16
17
18
19
For U.S.A. and Canada.
POWER SUPPLY
AC 120V (60Hz)
For Continental Europe, United Kingdom and Australia.
AC 220,240V (50/60Hz)
For others
AC110-127/220-240V (50/60Hz)
MUTING
Q1002 UN4112
Q1001 UN4212
IC1001 MN1280
RL1001
CN1001
Q11 2SD973A
Q12~14 2SB793A
Q17 2SB642
Q16 2SB793A
Q15 2SD973A
IC11,12 SVIFU15
IC12
CN11
TJ306
IC302 MN6618A
DIGITAL FILTER
PCM54HP
IC805 SVIGA011 FILTER
IC803 AN8376S AUDIO
IC802 MN6636S DIGLITCH
IC804 SVIGA011 FILTER
CONVERTER
LINE OUT
L ch
R ch
J801

■ BLOCK DIAGRAM

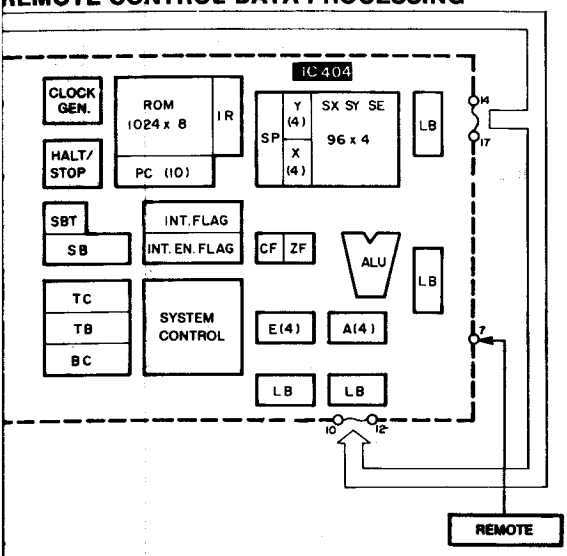


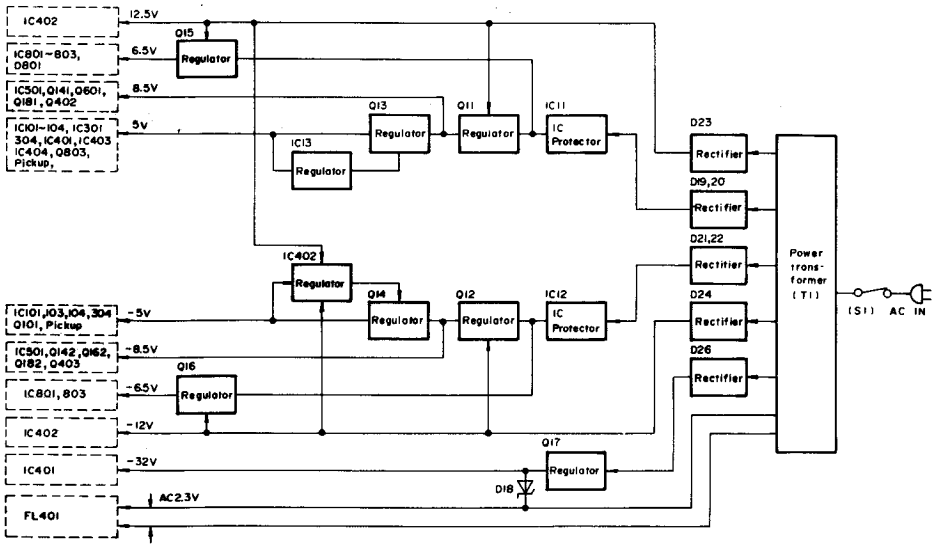

RESET SIGNAL GENERATOR
IC403
Reference voltage
Compa-rator
Level converter
Output
+B
Reference voltage
Compa-rator
16K RAM
IC303
Row decoder
Memory array
Data control
Column I/O
Column decoder
Chip select, write enable, output enable
E.F.M. DECODER, ERROR CORRECTION and CLV SERVO
IC301
FPC
EFM
PCK
CLDCK
BLKCK
SUBQ
EMPHA
SRF
EC
Synchro-nize det.
Frequency detector
Synchronize protection
EFM decoder
PCK timing
Sub-code decoder
Syndro-me
CCU
Working RAM
ALU
Compe-nsation
16 bit serial data
DMUTE
Address
Address generator
Rough servo
Severe servo
Proces-sing
CLV control
MCK timing
Track counter
CPU interface
WE
OE
+B
RST
DO
TRON
X301
16.9344MHz
SMCK
STAT
MDATA
MCLK
MLD
DIGITAL FILTER
Input resistor
RAM1 Address counter
RAM2 Address counter
RAM1
RAM2
Logic
Logic
Acqum-lator
ROM
CPU interface
Q801~803
Muting

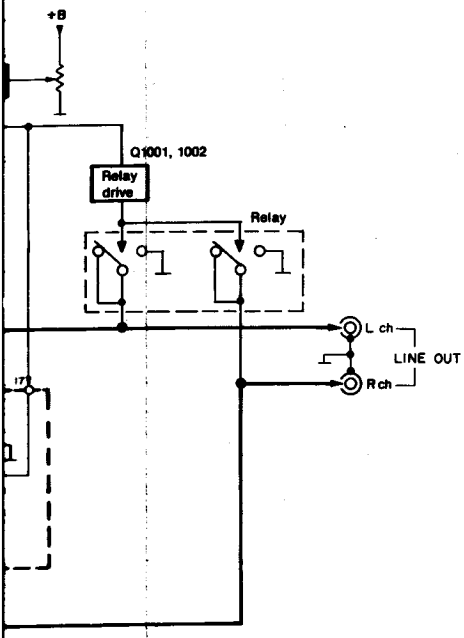

SYSTEM CONTROL
and FL DRIVE
IC401
CLOCK GEN.
ROM 6144 x 8
IR
PC
DISPLAY CONTROL
SP
X
Y
SX SY SE
320 x 4
BANK
HALT/ STOP
SBT
SB
INT. FLAG
INT. EN. FLAG
CF
ZF
ALU
TC
TB
BC
SYSTEM CONTROL
E
A
DAC
LB
SMCK
RST
BLKCK
SUBQ
CLDCK
SI01
Open/close detector
KEY MATRIX
FLOCK
SENSE
CLOSE
OPEN
CNT4
CNT3
CNT2
CNT1
PC
MDATA
MCLK
MLD
DMUTE
STAT
MOTOR DRIVE
IC402
Logic
Q402,403
Motor drive
Loading motor
M
TRAVERSE SERVO
IC102
IC103
Traverse servo
Traverse coil drive
IC103,Q181,182
Traverse coil
IC103
Speed detector
Memory array
Column I/O
Column decoder
IC302
RAM2 Addres counter
RAM2
Logic
Overflow limitter
Output resistor
Acqum-lator
Timing generator
D/A CONVERTER
IC801
Ladder resistor network
I-V
IC802
IC803
IC804
IC805



REMOTE CONTROL DATA PROCESSING







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