

Service Manual

COMPACT
disc
DIGITAL AUDIO

DIGITAL

Compact Disc Player
SL-PA10

Color

(A)...Gold Type

Area

Country Code	Area	Color
(E)	Continental Europe.	(A)
(EB)	Great Britain.	
(EG)	F.R. Germany & Italy.	



SL-P333 MECHANISM SERIES (SIWD113-3ZA)

SPECIFICATIONS

General

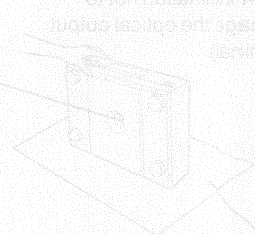
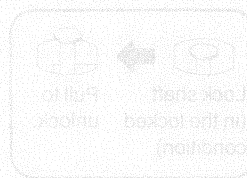
Power supply	AC 50/60 Hz, 110/127/220/240 V
Power consumption	10 W
Dimensions (W×H×D)	430×129×332.5 mm
Weight	7.8 kg

Pickup

Wavelength	780 nm
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Note:

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



Technics

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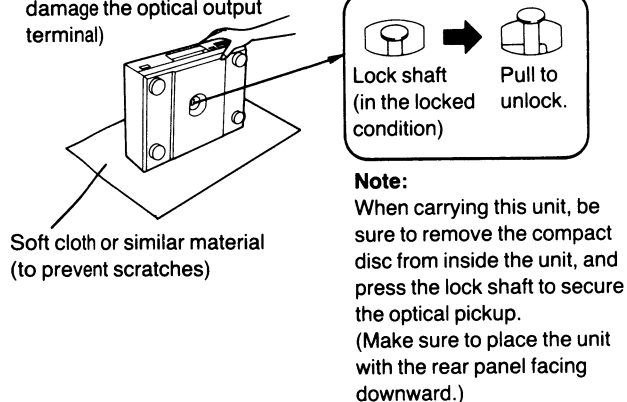
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PLACEMENT

Before placement

The optical pickup is secured to prevent damage during transport. Be sure to release it before use.

(With inclination not to damage the optical output terminal)



Notes of placement

- **This unit is a precision instrument. Be sure to place it on a flat surface.**
- **Avoid places such as the following:**
 - Near any equipment or device that generates strong magnetism.
 - On any heat-generating equipment or device, or in any place where the temperature is high (35°C or higher).
 - Extremely cold places (5°C or below).
 - Near a tuner or TV (It may cause noise in the broadcast, or disturbance of the TV picture.)
- **When carrying or storing the unit, handle it with care so it is not subjected to any strong bumps.**
Always remove the disc before storing the unit for any period of time.
- **To avoid problems due to vibration.**
 - Do not place a book or similar object under this unit.
 - Do not route the connection cables (of this or other units) across the operation panel, across the top, or under the unit.

ACCESSORIES

- AC power supply cord..... 1
 - [SJA187 (E, EG)]
 - [SJA193 (EB)]
- Remote control transmitter 1
(RAK-SL5006W)

- Optical-fiber cable 1
(SJPD16)
- Batteries..... 2
(UM-4NE/2S)

■ 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: 780nm

Maximum output radiation power from pick up: 100μW/VDE

Laser radiation from the pick up lens 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.

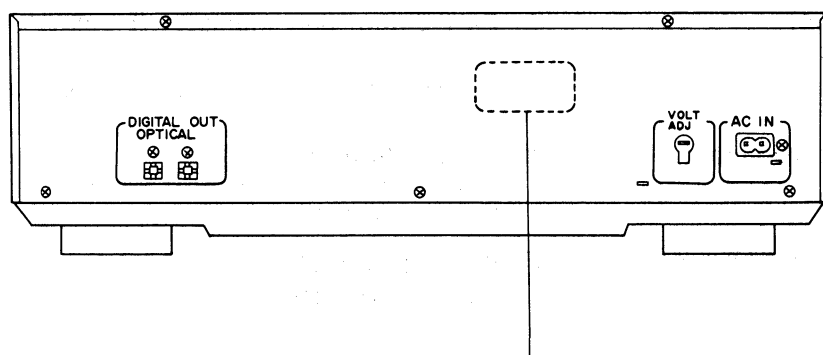
Wellenlänge: 780nm

Maximale strahlungsleistung der lasereinheit: 100μW/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 werksseitig justierten einstellregler der lasereinheit nicht verstellen.
3. Nicht mit optischen instrumenten in die fokussierlinse blicken.
4. Nicht über längere zeit in die fokussierlinse blicken.

ADVARSEL: I dette a apparat anvendes laser.



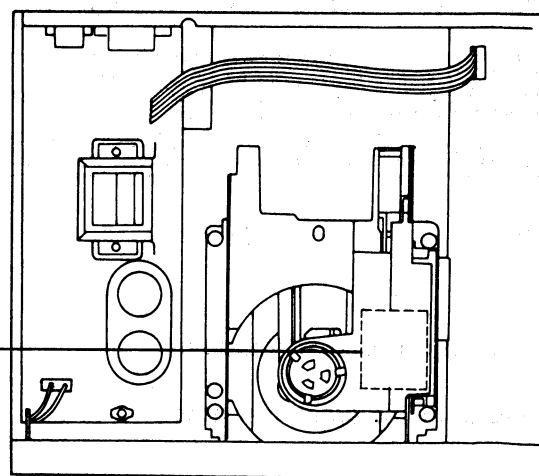
SQWD7

**CLASS 1
LASER PRODUCT**

SQWD7

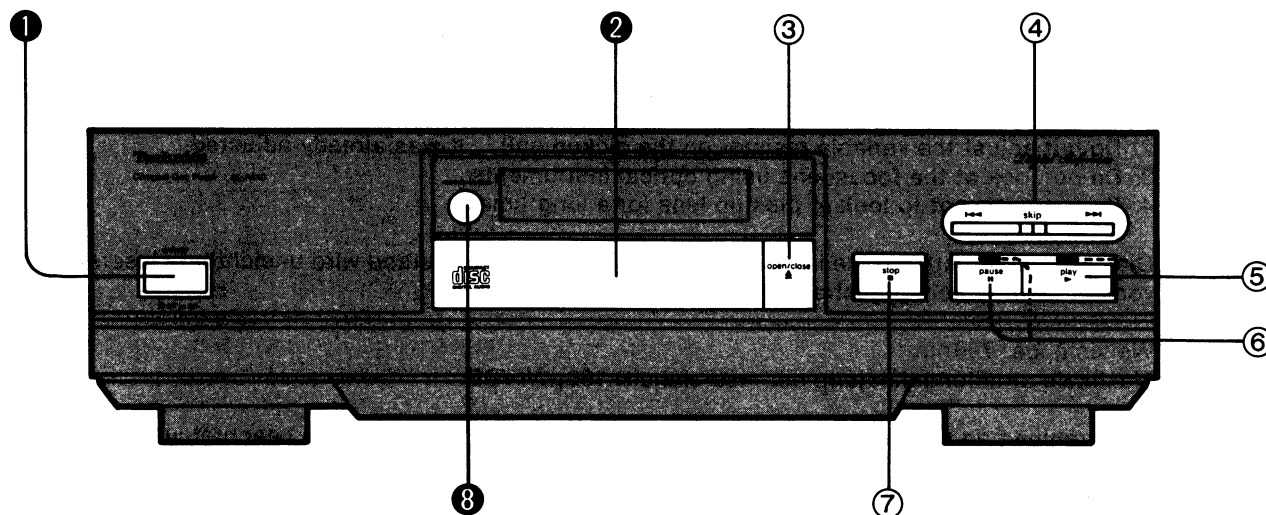
Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

RQLS0021



FRONT PANEL CONTROLS AND FUNCTIONS

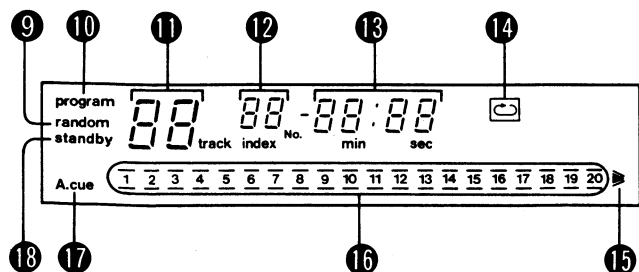
The functions indicated by the black numbers (with white background, ④ etc.) can also be activated using the remote control transmitter.



Control section

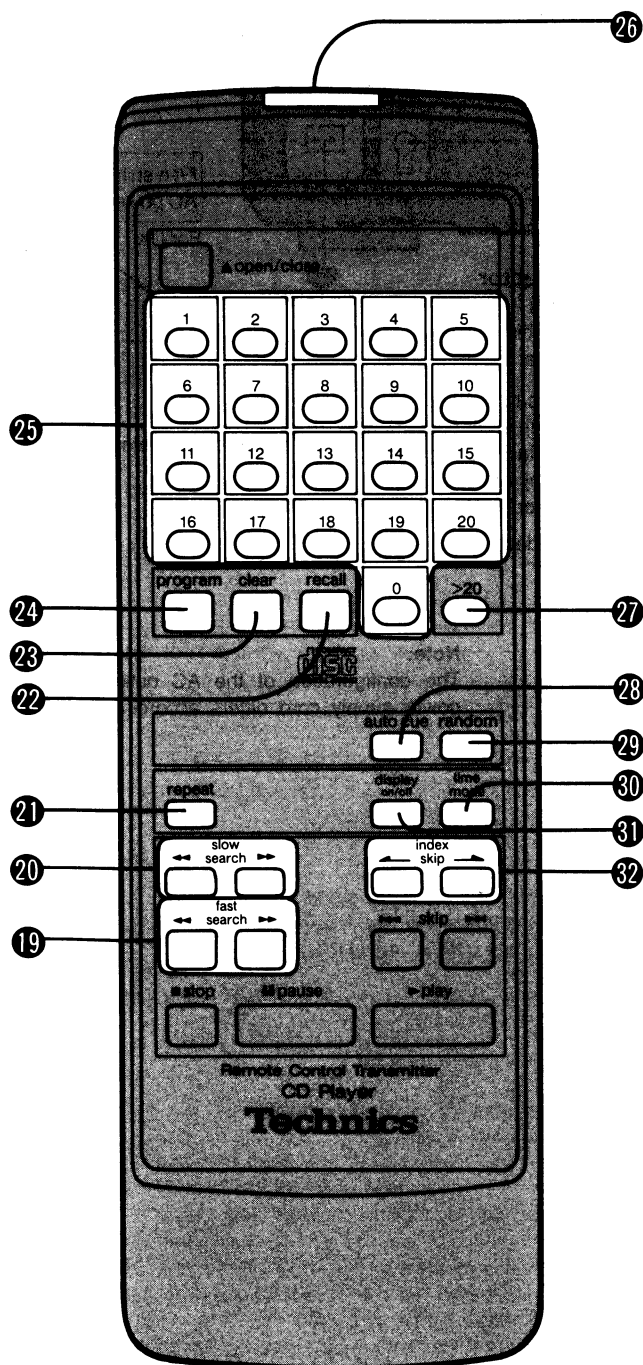
- ① Power switch (power off on)
- ② Disc holder
- ③ Disc holder open/close button ()
- ④ Skip buttons (skip)
These buttons are used to skip by track in the forward or reverse direction.
- ⑤ Play button and indicator (play)
- ⑥ Pause button and indicator (pause)
- ⑦ Stop button (stop)
This button can be used to stop disc play, as well as to cancel the various play modes.
- ⑧ Remote control signal sensor (remote sensor)

Indicators section



- ⑨ Random indicator (random)
- ⑩ Program indicator (program)
- ⑪ Track number display (track)
- ⑫ Index/program number display (index/No.)
- ⑬ Time display (min/sec)
- ⑭ Repeat indicator ()
- ⑮ "Over" mark ()
This indicator lights if the total number of tracks on the disc is 21 or more.
- ⑯ Track number indicator (1–20)
- ⑰ Auto cue indicator (A. cue)
- ⑱ Standby indicator (standby)
This indicator lights when the display on/off button is pressed twice in the stop mode.

Remote control transmitter

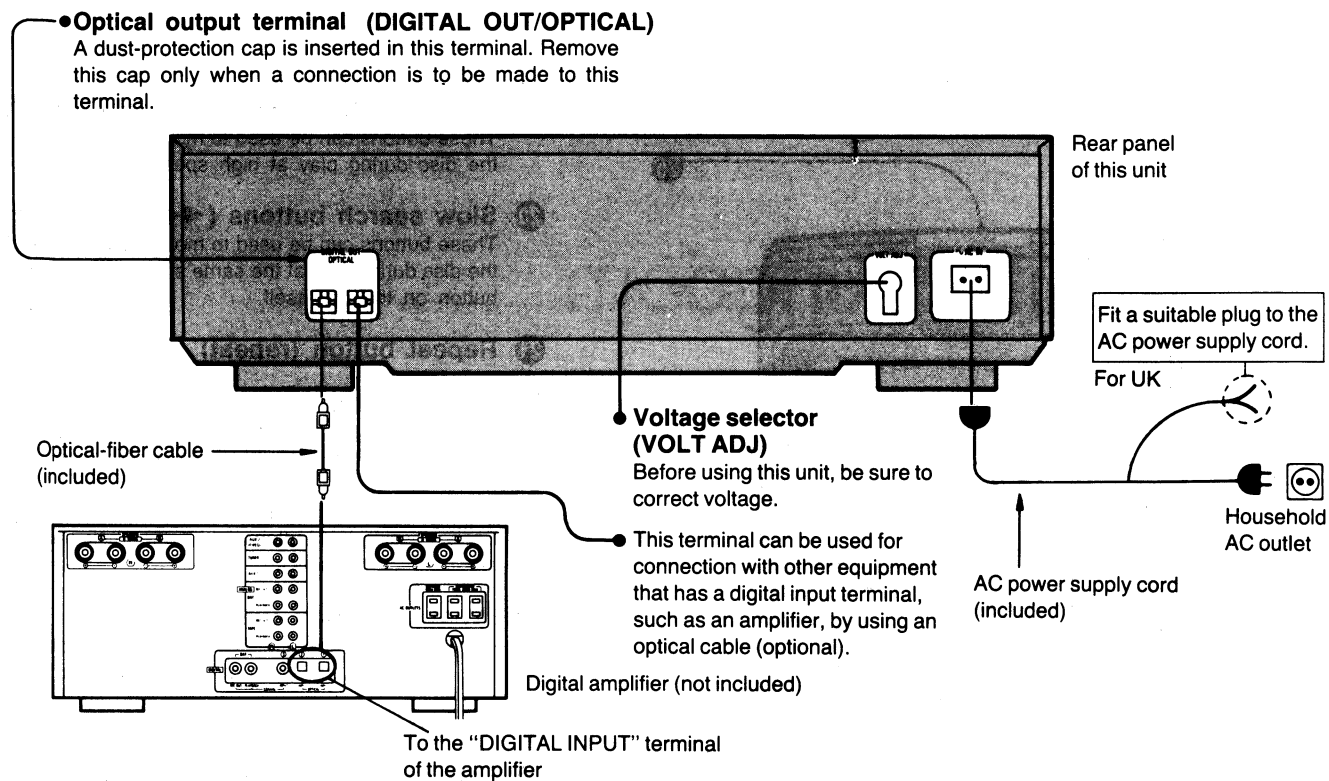


Unnumbered buttons on the remote control transmitter function identically to their corresponding parts on the unit.

- 19 Fast search buttons (◀◀ fast search ▶▶)**
These buttons can be used to move forward or backward on the disc during play at high speed.
- 20 Slow search buttons (◀◀ slow search ▶▶)**
These buttons can be used to move forward or backward on the disc during play at the same speed as that by the search button on the unit itself.
- 21 Repeat button (repeat)**
- 22 Recall button (recall)**
This button can be used to display the contents of the programmed track sequence for confirmation.
- 23 Clear button (clear)**
Each pressing this button makes one track cleared from the programmed sequence.
- 24 Program button (program)**
Pressing this button initiates the programmed play mode. You can then enter specific tracks using the numeric buttons.
- 25 Numeric buttons (0~20)**
- 26 Remote control signal transmission window**
- 27 Input mode button (>20)**
Press this button and then the numeric buttons (0~9) to specify the track number 21 and up.
- 28 Auto cue button (auto cue)**
Pressing this button enables the unit to stop at the beginning of every track and switch to the play standby mode.
- 29 Random button (random)**
This button can be used to play the tracks on a disc in a random sequence.
- 30 Time mode select button (time mode)**
- 31 Display on/off button (display on/off)**
Pressing this button enables the unit to delete the indicators on the display in two steps.
- 32 Index skip buttons (◀ index skip ▶)**
These buttons are used to skip by index number (sub divisions within the current track).

■ CONNECTIONS

Turn power off on all components before making connections.



Note:

The configuration of the AC outlet and AC power supply cord differs according to area.

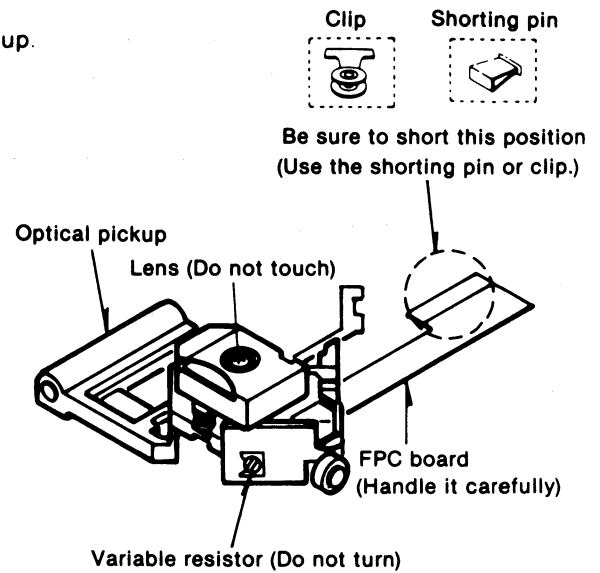
■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

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 subject the 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.

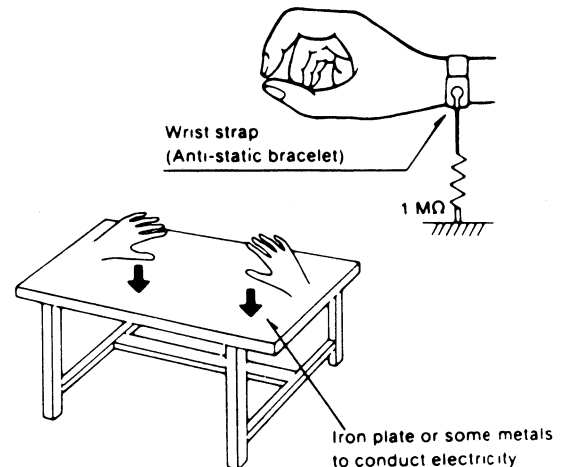


• Grounding for electrostatic breakdown prevention

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 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.



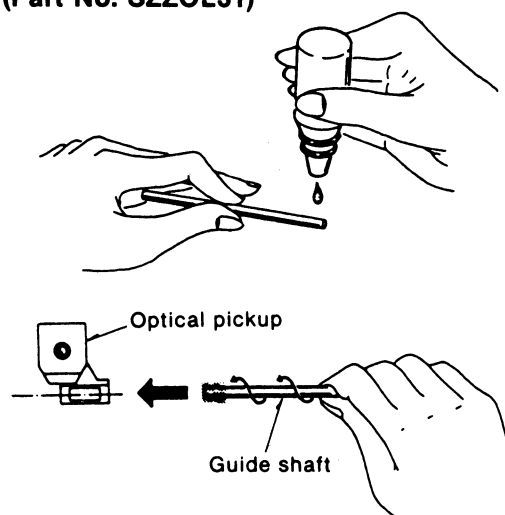
■ INSTRUCTIONS FOR TRAVERSE OIL (Part No. SZZOL31)

The container contains 6g (approx. 3ml) of oil.

One application (one shaft) uses 0.05ml of oil.

How to Use

- (1) Remove the guide shaft in the traverse deck from the optical pickup and clean off any dust from the guide shaft.
- (2) Apply one drop of the SZZOL31 to the tip of the guide shaft.
- (3) Hold the guide shaft so that its oiled end touches the optical pickup and insert it into the bearing while rotating it slowly.
- (4) After securing the guide shaft, move the optical pickup by hand several times to the left and right to distribute the oil on the guide shaft.



“ATTENTION SERVICER”

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

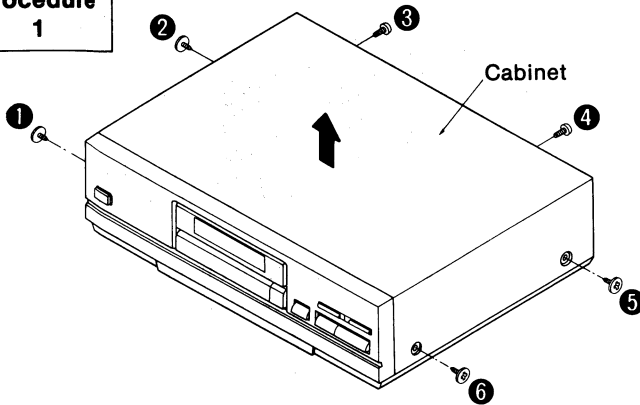
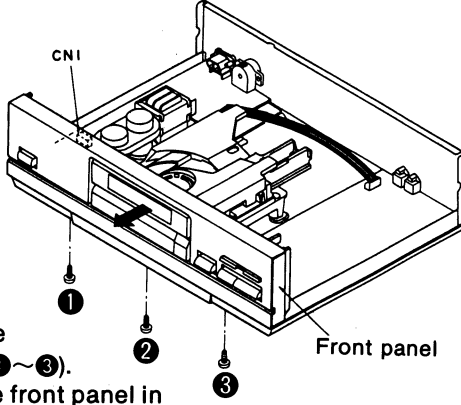
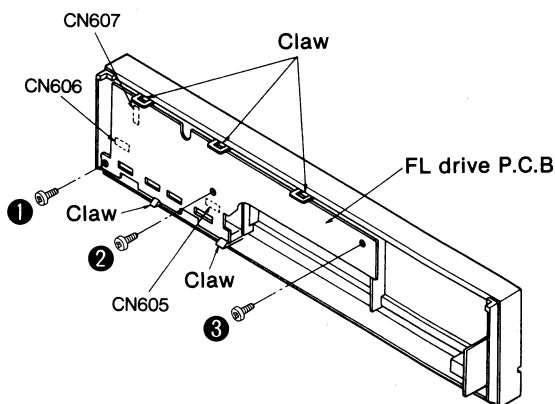
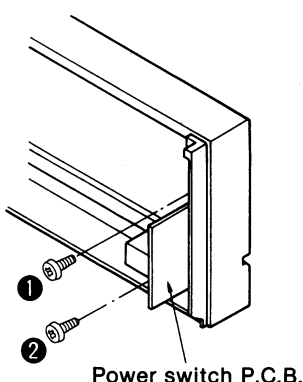
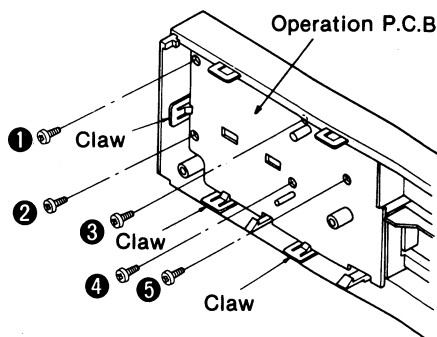
DISASSEMBLY INSTRUCTIONS

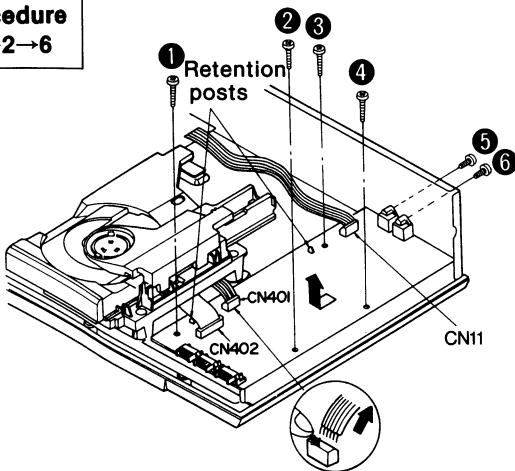
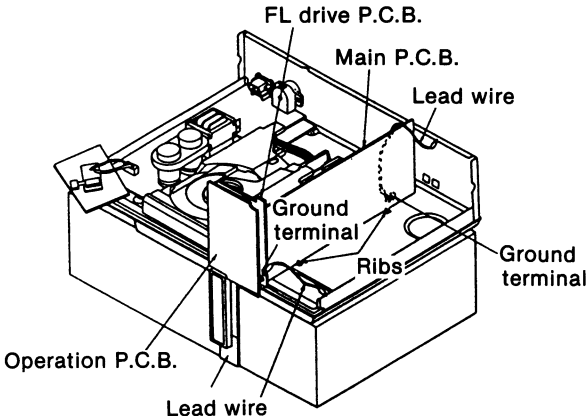
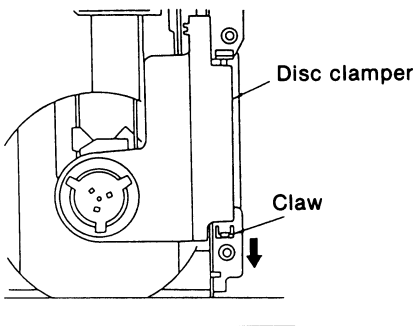
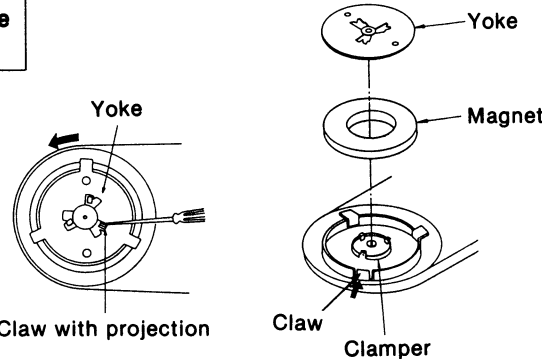
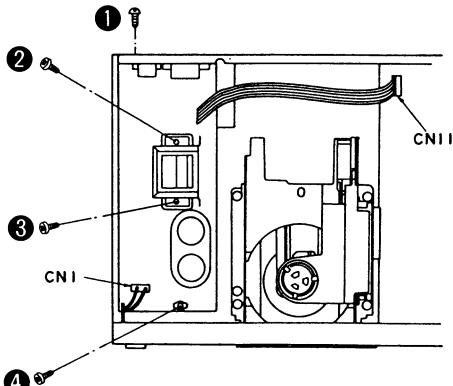
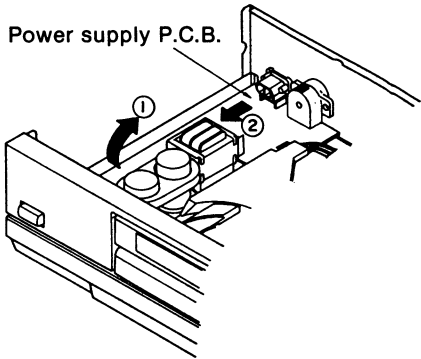
Warning: This product uses a laser diode. Refer to caution statements on page 3.

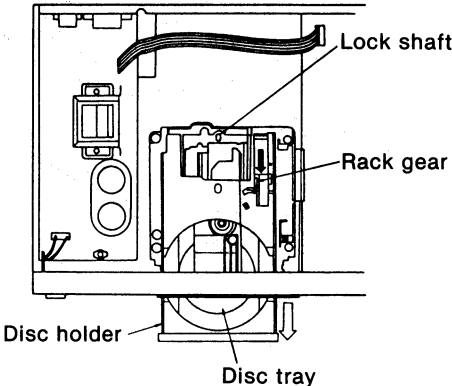
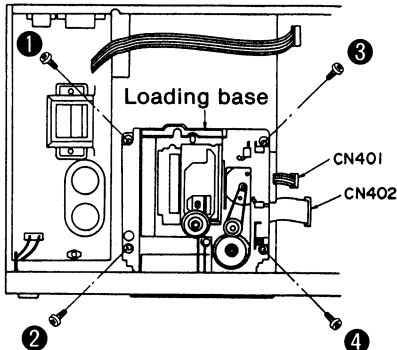
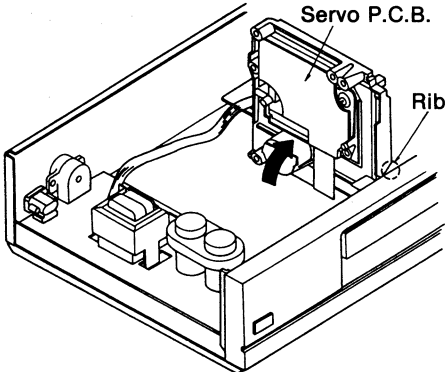
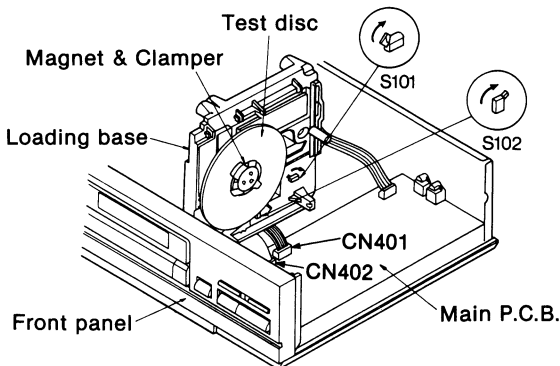
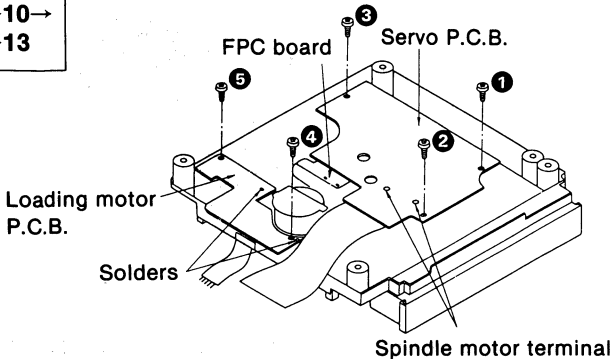
ACHTUNG: •Die Lasereinheit nicht zerlegen.

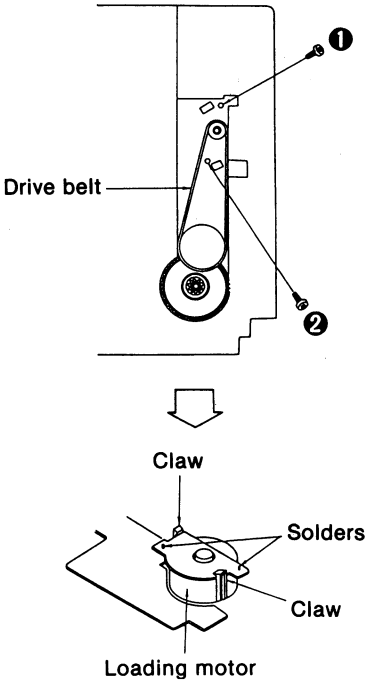
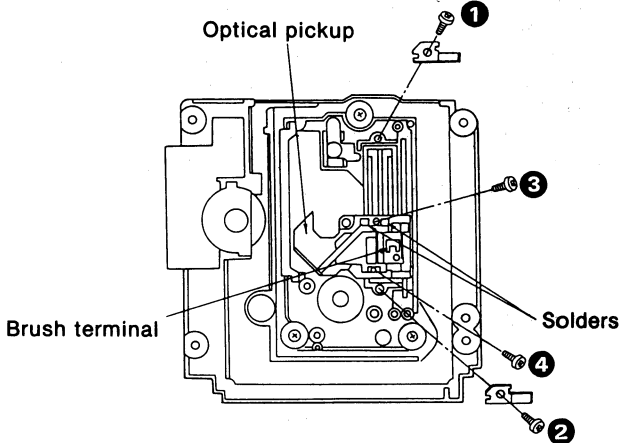
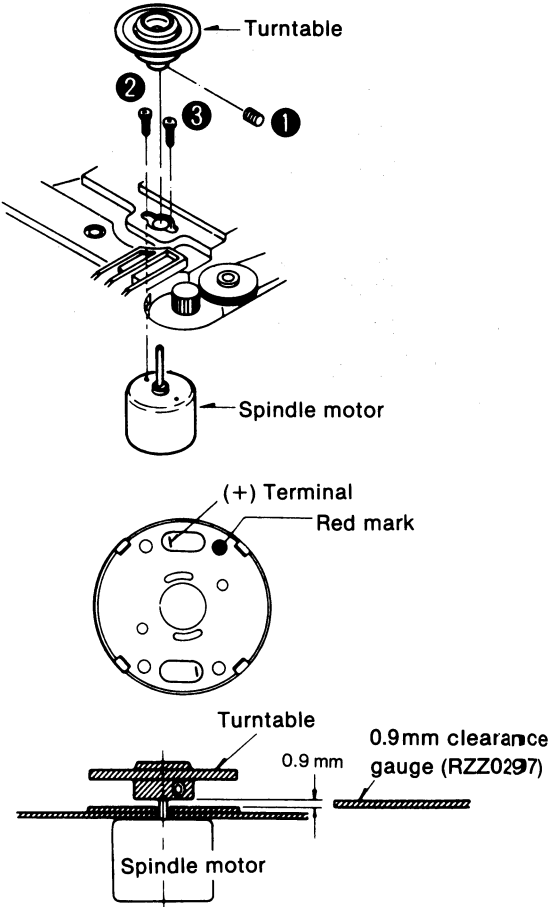
•Die Lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

*This CD player is equipped with FPC board so handle them with care during disassembly and reassembly.

Ref. No. 1	Removal of the cabinet	Ref. No. 2	Removal of the front panel
Procedure 1	 • Remove the 6 screws (①~⑥).	Procedure 1→2	 1. Remove the 3 screws (①~③). 2. Remove the front panel in the direction of the arrow.
Ref. No. 3	Removal of the FL drive P.C.B.	 1. Remove the 3 screws (①~③). 2. Remove the 5 claws. ※ Carefully the connectors (CN605, CN606, CN607).	
Ref. No. 4	Removal of the power switch P.C.B.	Ref. No. 5	Removal of the operation P.C.B.
Procedure 1→2→4	 • Remove the 2 screws (①, ②).	Procedure 1→2→3→5	 1. Remove the 5 screws (①~⑤). 2. Remove the 3 claws.

Ref. No. 6	Removal of the main P.C.B.	How to check the main P.C.B.	
Procedure 1→2→6	 1. Remove the 3 flat cable (CN11, CN401, CN402). 2. Remove the 6 screws (①～⑥). 3. Lift the main P.C.B. off the retention posts on the chassis. 4. Remove the main P.C.B. in the direction of the arrow.	 • When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown. • Don't remove the 3 flat cables (CN11, CN401, CN402). 1. Connect the main P.C.B. ground terminal to the chassis with a lead wire. 2. Connect the FL drive P.C.B. ground terminal to the chassis with a lead wire.	
Ref. No. 7	Removal of the disc clamber	Ref. No. 8	Removal of the magnet and clamber
Procedure 1→7	 • Push the claw in the direction of the arrow and remove the disc clamber.	Procedure 1→7→8	 1. While lifting the claw with a screwdriver, rotate clamber in the direction of the arrow and remove the yoke and magnet. 2. Release the claw of the clamber.
Ref. No. 9	Removal of the power supply P.C.B.		
Procedure 1→9	 1. Remove the 2 connectors (CN1, CN11). 2. Remove the 4 screws (①～④).	 3. Lift the power supply P.C.B. in the direction of the arrow ①, and remove it in the direction of the arrow ②.	

Ref. No. 10	Removal of the disc holder	Ref. No. 11	Removal of the loading base
Procedure 1→7→10	 1. Push the rack gear slowly in the direction of the arrow until the disc tray comes up. 2. Pull out slowly the disc holder. Note: Make sure to release the lock shaft.	Procedure 1→7→10→11	 1. Remove the 4 screws (①~④). 2. Remove the 2 flat cables (CN401, CN402).
Ref. No. 12	How to check the servo P.C.B.	How to play the disc	
Procedure 1→7→10→11→12	 • When checking the soldered surface of the servo P.C.B. and replacing the parts, do as shown. • Don't remove the 2 flat cables (CN401, CN402).	1. Place the test disc and magnet on the turntable. 2. Switch the player ON. 3. First push the open/close switch (S102) and next, push the S101. 4. After the test disc starts rotating, release the open/close switches (S101, S102).	
Ref. No. 13	Removal of the servo P.C.B. and loading motor P.C.B.		
Procedure 1→7→10→11→13		• Removal of the servo P.C.B. 1. Remove the 3 screws (①~③). 2. Unsolder the 2 terminals of spindle motor. 3. Remove the FPC board from the optical pickup. • Caution: To prevent the breakdown of the laser diode, antistatic shorting pin is inserted into the FPC board. • Removal of the loading motor P.C.B. 1. Remove the 2 screws (④, ⑤). 2. Unsolder the 2 terminals of the loading motor.	

Ref. No. 14	Removal of the loading motor	Ref. No. 15	Removal of the optical pickup
Procedure 1→7→10→ 11→14	 1. Remove the drive belt. 2. Remove the 2 screws (①, ②). 3. Release the 2 claws. 4. Unsolder the 2 terminals of the lead wire of the loading motor.	Procedure 1→7→10→ 11→13→15	Refer to the handling precautions for optical pickup and instructions for traverse oil (See page 7). 1. Remove the 2 screws (①, ②). 2. Unsolder the 2 terminals and the 2 screws (③, ④).  Caution: Take care not to touch the brush terminal.
Ref. No. 16	Removal of the spindle motor (DC motor)	 1. Loosen the screw (①) by using a 1.27 mm allen wrench and remove the turntable. 2. Remove the 2 screws (②, ③). Caution: 1. Turntable height adjustment is necessary any time the turntable or spindle motor is replaced. 2. The (+) terminal of the spindle motor is indicated by the red mark. Adjustment of turntable height 1. Insert a 0.9mm clearance gauge (RZZ0297) between the turntable and loading base as shown right. 2. Tighten the turntable set-screw by using a 1.27mm allen wrench. Caution: Refer to turntable height adjustment (see page 13).	

MEASUREMENTS AND ADJUSTMENTS

Caution:

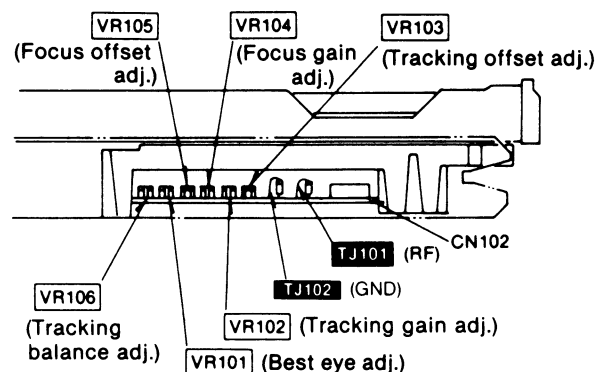
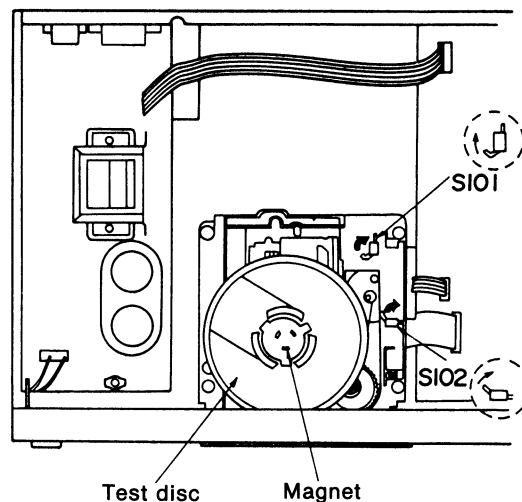
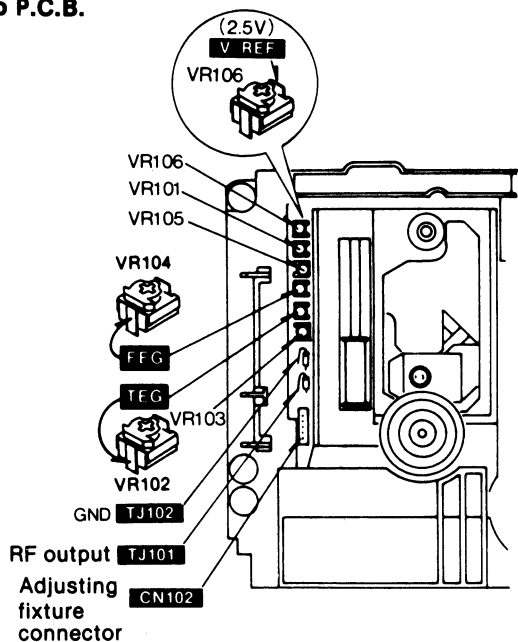
- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.)
With the unit turned "on", laser radiation is emitted from the pickup lens.
Avoid exposure to the laser beam, especially when performing adjustments.

PREPARATION

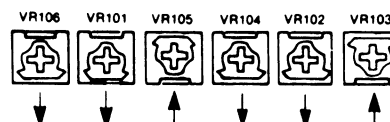
- Remove the cabinet (see Ref. No. 1 of the disassembly instructions).
- Remove the disc clumper and magnet (see Ref. No. 7, 8 of the same).
- Remove the disc holder. (see Ref. No. 10 of the same).
- Place the test disc and magnet on the turntable.
- Switch the player on.
- First push the Open/Close switch S102 in the direction of the arrow and then, push switch S101 in the direction of the arrow as shown in the figure.

ADJUSTMENT POINTS

• Servo P.C.B.



• Temporary setting of each VR



(Temporary VR setting if any of the trimmer VRs are replaced or require readjustment, temporarily set them to the following positions.)

Measuring Instruments and Special Tools

- * Servo gain adjuster (SZZP1017F or SZZP1094C-1)
- * Test discs
 1. Playability test disc (SZZP1054C or SZZP1014F)
 2. Uneven test disc (SZZP1056C)
 3. Black band test disc (SZZP1057C)
- * Normal disc
- * Dual-beam oscilloscope with bandwidth of 30 MHz or better (with EXT trigger and 1 : 1 probe).
- * Audio frequency (AF) oscillator
- * Conversion connector (SZZP1032F)

- * Allen wrench (M2.0) (SZZP1101C)
- * Allen wrench (M1.27)
- * 0.9mm clearance gauge (RZZ0297)
- * Filter

Perform adjustments depend on the part to be replaced according to followings:

- (1) Spindle motor Items (1), (3) to (8)
- (2) Turntable Items (1), (3) to (8)
- (3) Optical pickup Items (2) to (8)

Adjusting Procedure

- * If you have replaced the optical pickup, spindle motor, or turntable, do the following adjustment:

(1) TURNTABLE HEIGHT ADJUSTMENT

1. Insert the 0.9 mm clearance gauge (RZZ0297) between the turntable and the loading base (see the figure at right).
2. Tighten the turntable retention screw with the 1.27 mm allen wrench.
3. Connect the oscilloscope's CH. 1 probe across VR104's **FEG** (+) and VR106's **V. REF** (–) terminals via a filter.

(Note: A voltage of 2.5V appears at the V. REF terminal. Take care not to short the player's chassis to the oscilloscope ground.)

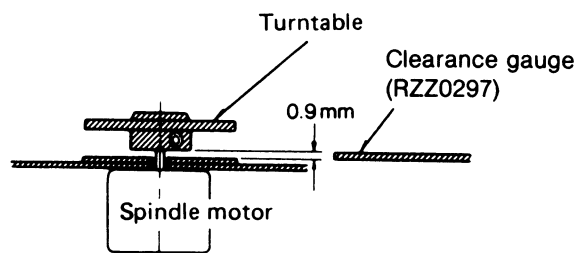
Oscilloscope setting: VOLT 50 mV
 SWEEP 1 ms.
 Input coupling ... DC

4. Adjust oscilloscope's DC zero balance.
5. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).
6. Measure the voltage amplitude of the signal on the oscilloscope.

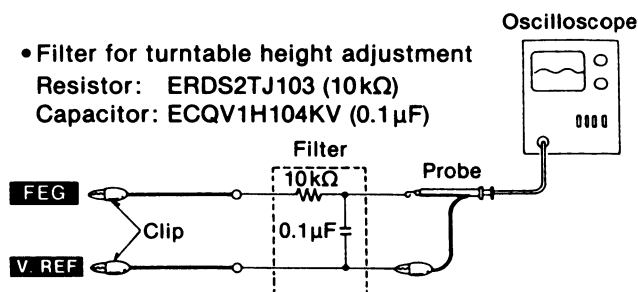
Note 1. If the measured amplitude is within a range of ± 15 mV, the turntable height is correct. If it is outside this range, adjust the turntable height by using the clearance gauge as a pry.

If the amplitude exceeds +15 mV, lower turntable.

If the amplitude is below -15 mV, elevate the turntable.



Note 2. If the measured amplitude greatly surpasses or falls short of the range above, set **VR105** at or around the center, then try to adjust the height again. (Then be sure to adjust the focus offset as well.)

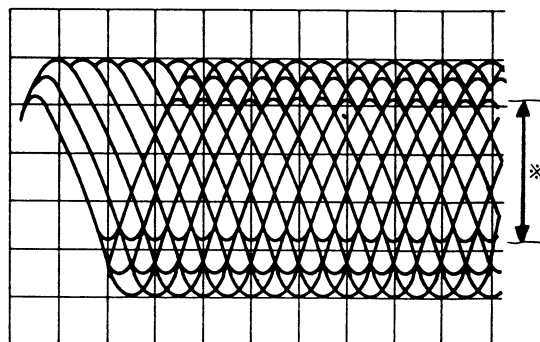
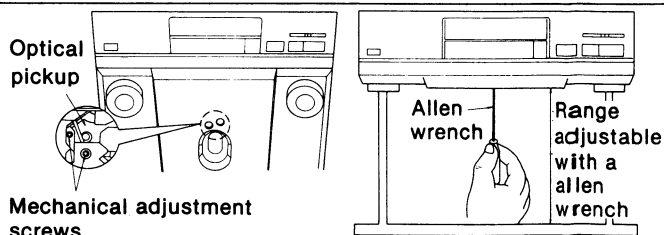


(2) MECHANICAL ADJUSTMENT

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B.

Oscilloscope setting: VOLT 100 mV
 SWEEP 0.5 μ s.
 Input coupling ... AC

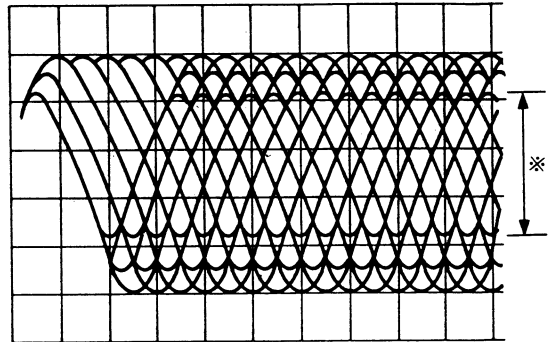
2. Switch the player power **ON**, and play track 9 on the test disc (SZZP1056C). (Playing any other track may yield a false adjustment.)
3. Leave the player in Play mode, and place it as shown in the figure on the right.
4. Alternately adjust the two mechanical adjusting screws with the 2.0mm allen wrench (SZZP1101C) until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.
5. After completing the adjustment, lock the **mechanical adjustments** with lock paint (RZZOL01).



* Most stretched eye pattern.

(3) BEST EYE (PD BALANCE) ADJUSTMENT

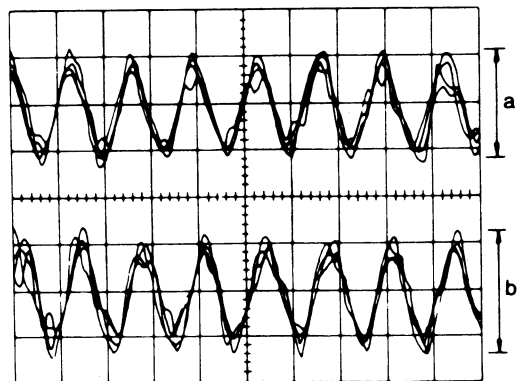
1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B.
Oscilloscope setting: VOLT 100 mV
SWEEP 0.5 μ s
Input coupling ... AC
2. Switch the player power **ON**, and play the 1kHz (track 1) on the test disc (SZZP1054C).
3. Adjust **VR101** until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.



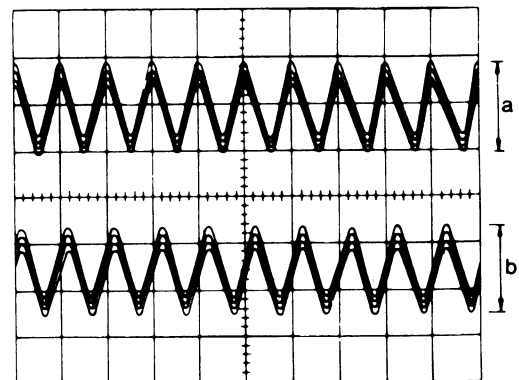
* Most stretched eye pattern.

(4) FOCUS GAIN ADJUSTMENT

1. Connect the servo gain adjuster to the player (see page 15).
2. Set the servo gain adjuster's gain switch to position "2" and the ON/OFF switch to **ON**.
3. Set up the AF oscillator output for **825Hz, 150 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
4. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, respectively (TP3 is GND).
Oscilloscope setting: VOLT 100 mV
(bboth channels)
SWEEP 0.2 ms.
Input coupling ... AC
5. Play the test disc (SZZP1014F or SZZP1054C).
6. Set the servo gain adjuster's gain switch to position "3", and you will see a 825 Hz signal on the oscilloscope. Adjust **VR104** until the signal amplitudes on both channels become identical to each other.
7. Set the gain switch back to position "2".

* Adjust **VR104** until a equals b.**(5) TRACKING GAIN ADJUSTMENT**

1. Set up the AF oscillator output for **1.1 kHz, 150 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
2. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, respectively (TP3 is GND).
Oscilloscope setting: VOLT 100 mV
(bboth channels)
SWEEP 0.2 ms.
Input coupling ... AC
3. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).
4. Set the servo gain adjuster's gain switch to position "1", and you will see a 1.1 kHz signal on the oscilloscope. Adjust **VR102** until the signal amplitudes on both channels become identical to each other.
5. Set the gain switch back to position "2".

* Adjust **VR102** until a equals b.

(6) FOCUS OFFSET ADJUSTMENT

Note: Make sure that the servo gain adjuster's gain switch is set to position "2".

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (-) on the Servo P.C.B. and its CH. 2 probe (+) to VR104's **FEG** terminal.

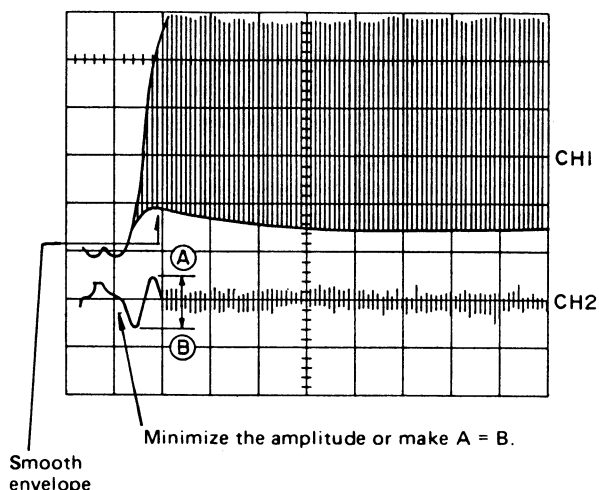
Oscilloscope setting: VOLT. 100 mV (CH. 1)
100 mV (CH. 2)

SWEEP. 0.2 ms.

Input coupling. . . AC (both CH. 1
and 2)

Trigger mode . . . NORM (trigger
CH. 1.)

2. Switch the player power **ON**, and play track 9 on the test disc (SZZP1057C).
3. Trigger the oscilloscope's CH. 1 so that the following waveforms are observed. Adjust **VR105** until the dip in the RF signal envelope on CH. 1 is smooth and the signal amplitude on CH. 2 is minimized, i.e. when amplitude A equals amplitude B.

**(7) TRACKING OFFSET ADJUSTMENT**

Note: Make sure that the servo gain adjuster's gain switch is set to position "2".

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (-) on the Servo P.C.B., and its CH. 2 probe (+) to VR102's **TEG** terminal.

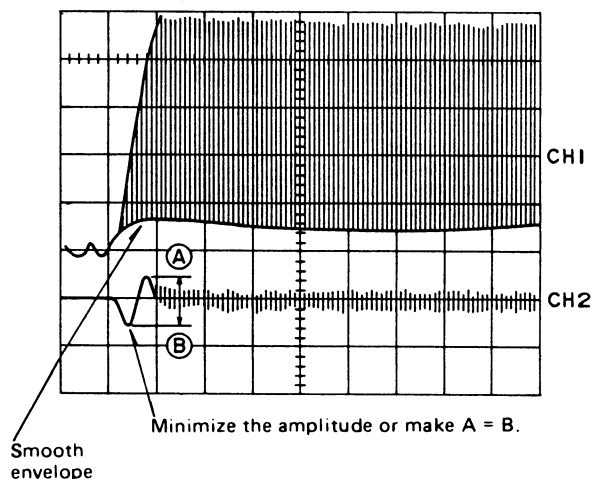
Oscilloscope setting: VOLT. 100 mV (CH. 1)
100 mV (CH. 2)

SWEEP. 0.2 ms.

Input coupling. . . AC (both CH. 1
and 2)

Trigger mode. . . NORM (trigger
CH. 1.)

2. Switch the player power **ON**, and play track 9 on the test disc (SZZP1057C).
3. Trigger the oscilloscope's CH. 1 so that the following waveforms are observed. Adjust **VR103** until the dip in the RF signal envelope on CH. 1 is smooth and the signal amplitude on CH. 2 is minimized, i.e. when amplitude A equals amplitude B.

**(8) TRACKING BALANCE ADJUSTMENT**

1. Make sure that the servo gain adjuster's gain switch is set to position "2".
2. Set up the AF oscillator output for 1.1 kHz, 600 mVp-p, and connect it across the OSC and GND terminals on the servo gain adjuster.

3. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (-) on the Servo P.C.B. and CH. 2 probe (+) to the OSC terminal on the servo gain adjuster.

Oscilloscope setting: VOLT. 100 mV (CH. 1)
200 mV (CH. 2)

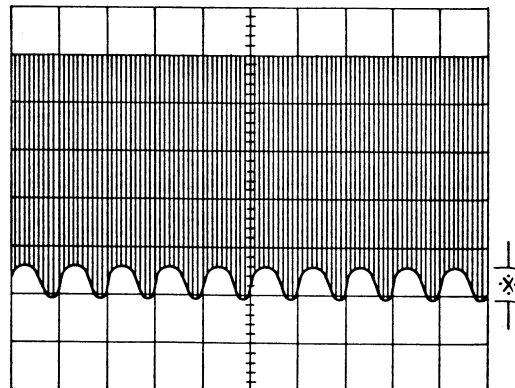
SWEEP. 0.1 ms.

Input coupling. . . AC (both CH. 1
and 2)

Trigger mode . . . NORM (trigger
CH. 2)

4. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).

5. Set the servo gain adjuster's gain switch to position "1", and adjust **VR106** so that the waveform of the output section marked with ✕ is balanced.
6. Disconnect the servo gain adjuster's leads from the player.



✕ This section of the waveform must be balanced.

(9) CHECK OF PLAY OPERATION AFTER ADJUSTMENT*** Checking Skip Search**

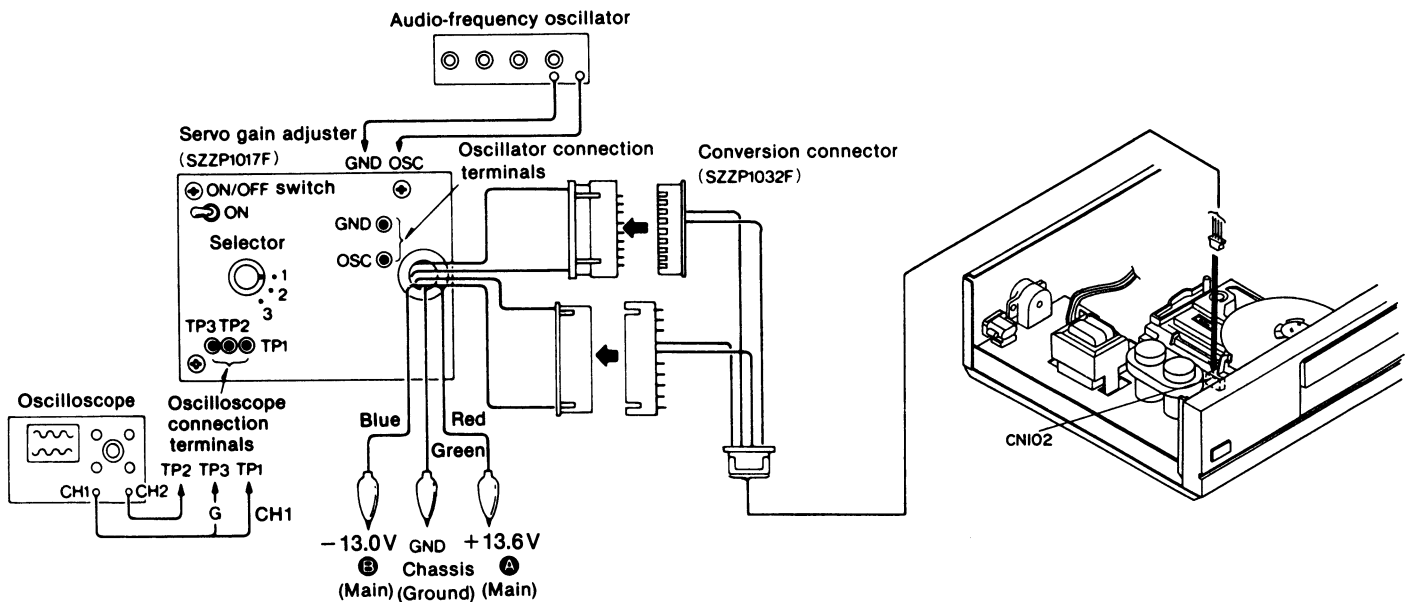
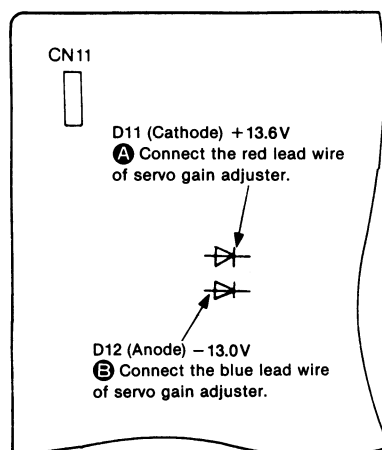
1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

*** 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 Using Defect Disc**

1. Play the 0.7 mm black dot and the 0.7 mm wedge on the defect 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.

• Connection of servo gain adjuster**• Main P.C.B.****■ NEW SERVO GAIN ADJUSTER (Servo Amp. Adjusting Fixture)**

The following introduces the improved version of the current servo gain adjuster (SZZP1017F):

Part number: SZZP1094C-1

Features:

- (1) Contains all oscillation frequencies and output adjustments needed for focus servo gain, tracking servo gain, and tracking balance adjustment (requires no external oscillator).
- (2) Panel indicators indicate the best points of focus and tracking servo gains (no oscilloscope needed).
- (3) Internal power supply eliminates the need for power supply from the CD player.

■ TERMINAL FUNCTION OF IC'S

● IC101 (AN8373S): Servo amp.

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1	AMP1	I	RF signal input (X30 amp.)	22	TPO	O	Tracking error signal output
2	PDAD	I	Photo detector current input (A2)	23	FPO	O	Focus error signal output
3	PDA	I	Photo detector current input (A1)	24	FGC	I	Focus gain up signal input (Not used, connected to GND)
4	PDBD	I	Photo detector current input (A4)	25	TGC	I	Tracking gain up signal input (Not used, connected to GND)
5	PDB	I	Photo detector current input (A3)	26	GD	I	Focus/Tracking down signal input (Not used, connected to GND)
6	LPD	I	Non-inverting laser power input	27	PTO	O	Position detecting amp. output
7	LD	O	Laser power auto control output	28	PTI	I	Position detecting amp. input
8	FBL1	I	PD balance adjustment	29	PBO	O	Position detecting buffer output
9	FBL2	I		30	POT	I	Position detecting buffer input
10	TBL1	I	Tracking balance adjustment	31	BDO	O	Dropout detection output
11	TBL2	I		32	$\overline{\text{RFDET}}$	O	RF detection signal output
12	FOOFS	I	Focus offset adjustment	33	SDO	O	Dropout detection pulse output
13	IVA	O	Current/voltage conversion output (A)	34	C. SBDO	I	Dropout detecting capacitor input
14	IVB	O	Current/voltage conversion output (B)	35	ARF	O	RF signal output
15	FE	O	Focus gain adjustment output	36	C. AGC	I	AGC detecting capacitor input
16	FPI	I	Focus error signal input	37	VCC	I	Power supply terminal
17	TPI	I	Tracking error signal input	38	LDON	I	Laser power control input
18	C. TPL	I	Tracking error filter capacitor input	39	RF IN	I	RF signal input
19	C. TPH			40	AMPO	O	RF signal output
20	C. FPL	I	Focus error filter capacitor input	41	VREF	O	Reference voltage output
21	C. FPH			42	GND	—	Ground terminal

● IC102 (AN8374S): Servo processor

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1	LSA	I	Phase difference input (A)	22	VDD	I	Power supply terminal
2	LSB	I	Phase difference input (B)	23	SPCNT	O	Track crossing speed control output output (Not used, open)
3	TEOFS	O	Tracking offset adjustment	24	SENSE	O	Selector output (track crossing state)
4	TE	O	Tracking gain adjustment	25	TRV	O	Traverse servo control output
5	TEG	I		26	$\overline{\text{FLOCK}}$	O	Focus lock signal output
6	TE OUT	O	Tracking error signal output	27	KICK	O	Track kick signal output
7	TE BPF	I	Tracking error gain detecting filter (Not used, open)	28	LDON	O	Laser power control output
8	FEG	I	Focus gain adjustment	29	VDET	O	Focus/tracking gain up output (Not used, open)
9	FE OUT	O	Focus error signal output	30	CNT1	I	Control input (FOON: Focus Servo On signal)
10	CLW	O	Triangular wave oscillator capacitor output	31	CNT2	I	Control input (TRON: Tracking Servo On signal)
11	VREF	I	Reference voltage input	32	CNT3	I	Control input (KICKF: Kick Direction (Forward) command)
12	ARF	I	RF signal input	33	CNT4	I	Control input (KICKR: KICK Direction (Backward) command)
13	CDSL	I	Data slice filter capacitor input	34	TRVF	I	Traverse forward command signal
14	FPC	I	Frequency difference signal input	35	TRVR	I	Traverse backward command signal
15	GND	—	Ground terminal	36	$\overline{\text{RFDET}}$	I	RF detection signal input
16	C. PLL	I	PLL loop filter constant	37	BDO	I	Dropout detection input
17	VSS	—	Ground terminal	38	VCC	I	Power supply terminal
18	CLK	I	Frequency pull-in clock signal (88.2 kHz) input	39	TVPO	O	Traverse position detecting resistor/capacitor inputs
19	SRF	O	Sliced and digitized RF signal output	40	TVPI	I	
20	PCK	O	Clock output extracted from SRF	41	BROUT	O	Tracking drive control output
21	EFM	O	EFM signal output synchronous with PCK	42	BRIN	I	Tracking error signal input

● IC103 (AN3877N): BTL drive

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1	PVCC	I	Drive power supply	9	TD—	O	Inverting output of tracking driver
2	VCC	I	Power supply terminal	10	TD+	O	Non-inverting output of tracking driver
3	TB	O	External transistor base driving output	11	FD—	O	Inverting output of focus driver
4	VMON	O	Voltage output	12	FD+	O	Non-inverting output of focus driver
5	TVDI	I	Traverse error signal input	13	TVD—	O	Inverting output of traverse driver
6	FDI	I	Focus error signal input	14	TVD+	O	Non-inverting output of traverse driver
7	TDI	I	Tracking error signal input	15	$\overline{\text{RESET}}$	O	Reset signal output
8	VREF	I	Reference voltage input	16	PC	I	PC input (connect to GND.)

• IC301 (MN6625): Digital signal processor

Pin No.	Mark	I/O Division	Function
1	BYTCK	O	Serial data byte clock (Not used, open)
2	FCLK	O	Crystal frame clock (7.35 kHz) (Not used, open)
3	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H") (Not used, open)
4	SRDATA	O	Serial data output (MSB first) (Not used, open)
5	SCK	O	Serial bit clock output (Not used, open)
6	LRCK	O	LR discrimination signal output (Not used, open)
7	WDCK	O	Serial data output word clock
8	LDG	O	L channel deglitch signal (Not used, open)
9	RDG	O	R channel deglitch signal (Not used, open)
10	IPFLAG	O	Interpolation flag (interpolation at "H")
11	FLAG	O	Error flag terminal
12	XCK	O	Clock (16.9344 MHz) output (Not used, open)
13	TEST	I	Test mode selection (Not used, connected to power supply.)
14	TX	O	Digital signal output (Not used, open)
15	SLEEP	I	Mode selector ("L": normal, "H": SLEEP mode) (Not used, connected to GND)
16	CSEL	I	Test terminal ("L": normal) (Not used, connected to GND)
17	X1	I	Clock input (16.9344 MHz)
18	X2	O	Clock output (16.9344 MHz) (Not used, open)
19	VSS	—	GND terminal
20	BLKCK	O	Sub-code block (Q data) clock (75 Hz)
21	CLDCK	O	Sub-code frame (Q data) clock (7.35 kHz)
22	SUBQ	O	Sub-code (Q data) output
23	RST	I	Reset signal input (reset at "L")
24	MLD	I	Command load signal input

Pin No.	Mark	I/O Division	Function
25	MCLK	I	Command clock signal input
26	MDATA	I	Command data input
27	DMUTE	I	Muting control
28	TRON	I	Tracking servo ON signal (tracking servo ON at "L")
29	STAT	O	Processing condition (CRC, CUE, CLVS, TT STOP, FCLV)
30	SUBC	O	Sub-code serial output data (Not used, open)
31	SBCK	I	Clock for sub-code serial output (Not used, open)
32	SMCK	O	Clock output (4.2336 MHz)
33	VDD	I	Power supply terminal
34	MEMP	I	Emphasis signal input
35	FG	I	Spindle motor FG signal input (Not used, open)
36	PC	O	Spindle motor ON signal (ON at "L")
37	EC	O	Spindle motor drive signal
38	RESY	O	Resynchronizing signal (Not used, open)
39	DO	I	Drop-out signal (Drop-out at "H")
40	SRF	I	EFM signal input (DSL)
41	EFM	I	EFM signal input (PLL)
42	PCK	I	PLL extract clock input (4.3218 MHz)
43	FPC	O	PLL frequency comparison signal
44 51	D7 D0	I/O	16K RAM data input/output
52	RAM/OE	O	16K RAM $\overline{\text{OE}}$ signal
53	RAM/WE	O	16K RAM $\overline{\text{WE}}$ signal
54 64	RAM/A0 RAM/A10	O	16K RAM address signal (RAMA0: LSB, RAMA10: MSB)

• IC401 (MN1554PEZ-1): System control

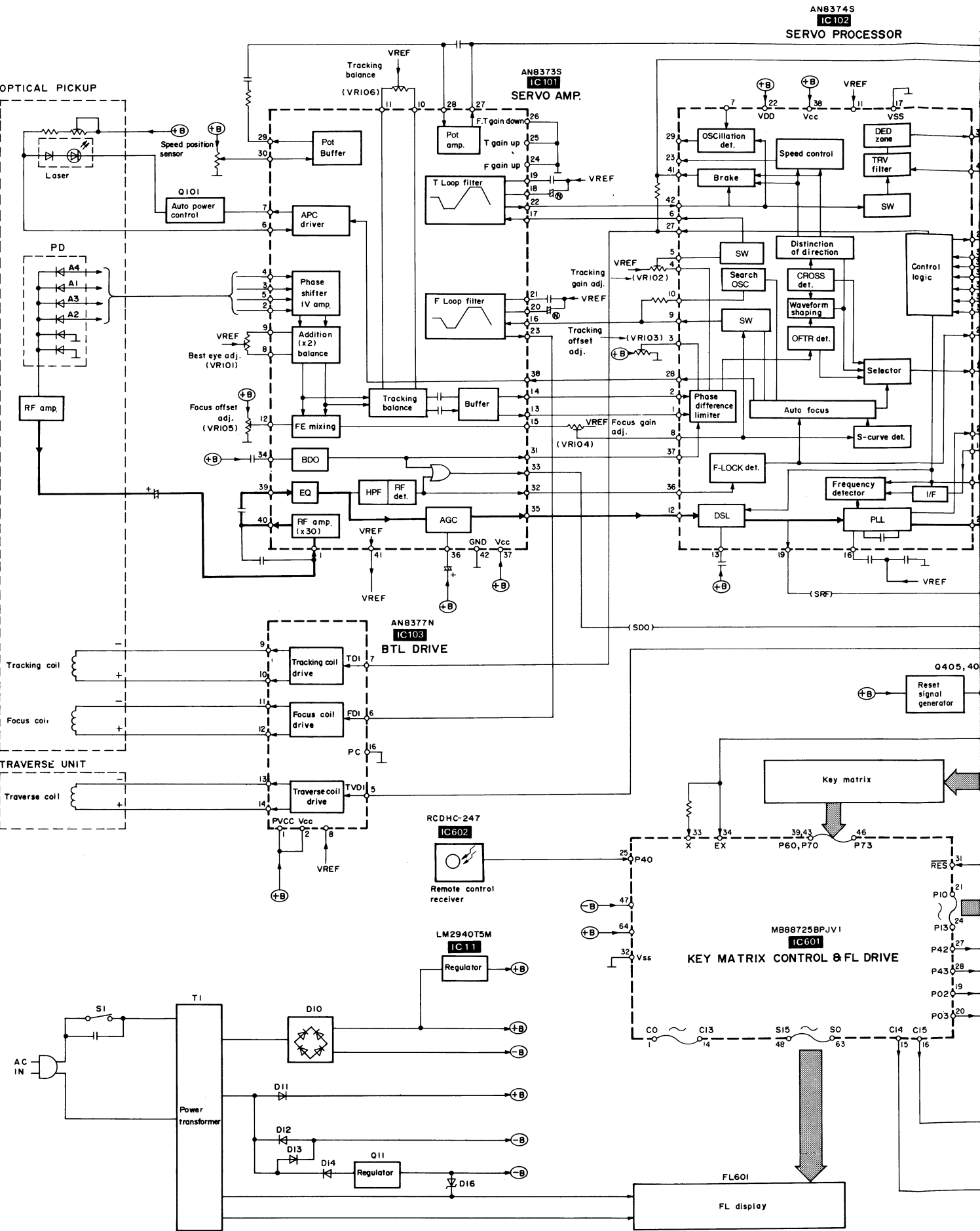
Pin No.	Mark	I/O Division	Function
1	BRECV	—	(Not used, open)
2	BSEND	—	(Not used, open)
3	SYNC	O	(Not used, open)
4	SIRQ	I	Not used (connected to power supply)
5	BLKCK	I	Sub-code block (Q data) clock input (75 Hz)
6	CLDCK	I	Sub-code block (Q data) clock input (7.35 kHz)
7	SBO	I	(Not used, open)
8	SUBQ	I	Sub-code (Q data) input
9	RST	I	Reset signal input
10 └ 13	F/S SW, P21 └ P23	O	Not used (connected to power supply)
14	CLOSE	O	Loading motor "Close" command
15	OPEN	O	Loading motor "Open" command
16	SLOW	O	(Not used, open)
17	MUTE	O	Muting control (Not used, open)
18	SEEK	O	Traverse servo control (Not used, open)
19	NC	—	Not connected
20	TRV.R	O	Traverse "Reverse" command signal
21	TRV.F	O	Traverse "Forward" command signal
22	CNT4	O	Optical servo IC control signal (KICKR: Kick direction [reverse] command)
23	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [forward] command)
24	CNT2	O	Optical servo IC control (TRON: Tracking servo)
25	VDD	I	Power supply terminal
26	DOWN	O	(Not used, open)
27	UP	O	(Not used, open)
28	CNT1	O	Optical servo IC control signal (FOON: Focus servo)

Pin No.	Mark	I/O Division	Function
29	CLOSE SW	I	Disc holder "Open" detection
30	OPEN SW	I	Disc holder "Close" detection
31	BCLK	I	(Not used, connected to GND)
32	BDATA	I	(Not used, connected to GND)
33	STAT	I	Processing status input from signal processing LSI
34	COMP	O	TOC reading control (ON at "L") (connected to GND)
35	FLOCK	I	Optical servo condition (focus) input
36	SENSE	I	Optical servo condition (track cross) input
37	RECV	I	Data receipt command signal
38	SEND	I	Data transmission command signal
39	ACK	I	Data discrimination signal
40	CLK	I	Data lock signal
41 └ 44	DATA0 └ DATA3	I	Key scan signal
45 └ 52	NC	I	Not connected
53	OSC2	I	Clock terminal
54	OSC1	I	Clock input
55	X1	I	Optical servo condition input
56	X0	O	(Not used, open)
57	GND	—	GND terminal
58	DMUTE	O	Muting control
59	MDATA	O	Command data output
60	MCLK	O	Data clock output (command clock signal)
61	MLD	O	Data output (command load signal)
62	DOUTON	O	Optical output control signal (Not used, open)
63	EMPH	O	Emphasis signal output
64	NC	—	Not connected

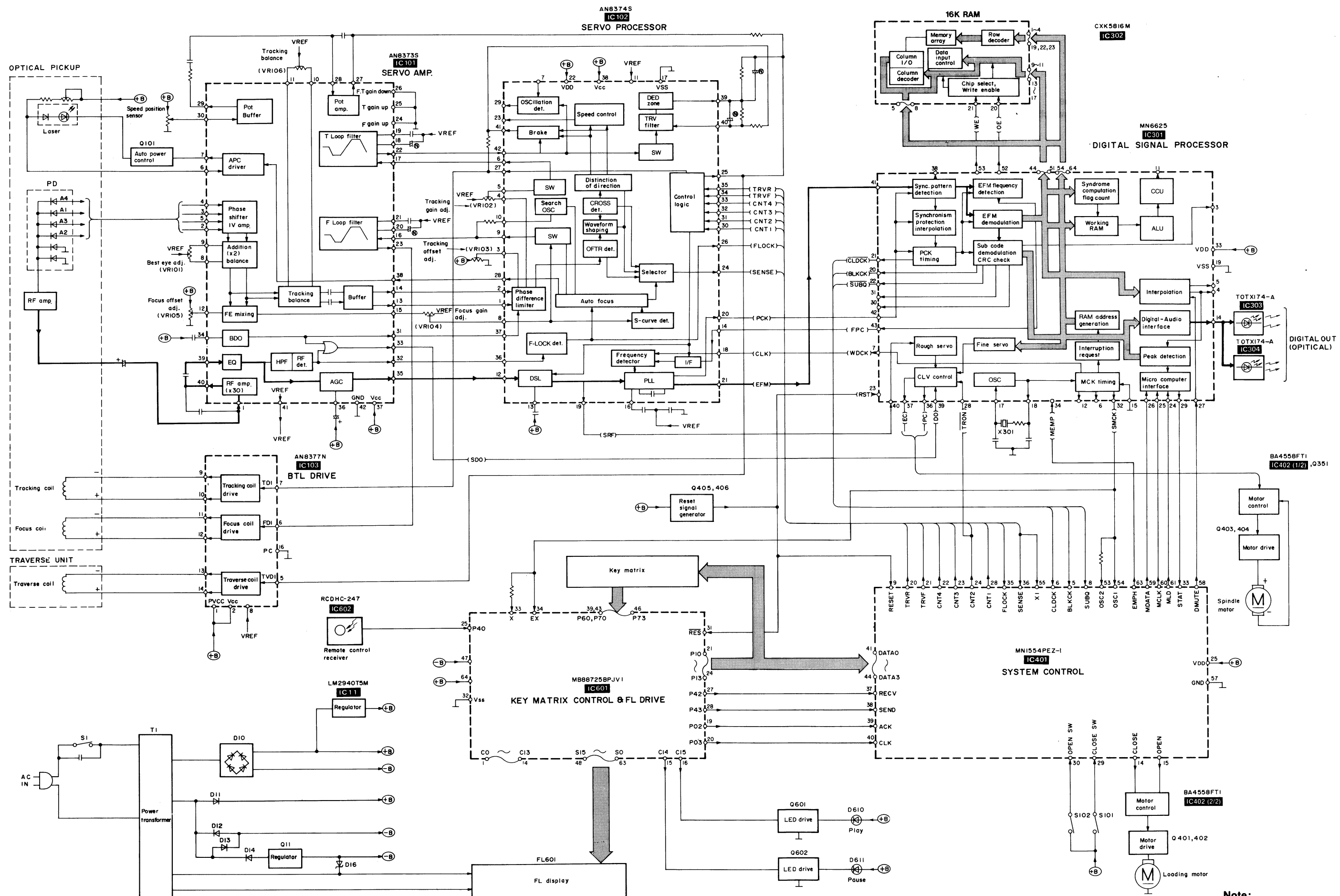
• IC601 (MB88725BPJV1): System control and FL drive

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1	C0	O	FL grid signal	33	X	I	Clock signal input (4.2336MHz)
14	C13	O	FL grid signal	34	EX	I	Clock signal input (4.2336MHz)
15	C14	O	LED drive signal (PAUSE)	35	SE	I	Not used, connected to power supply
16	C15	O	LED drive signal (PLAY)	36	FD	—	GND terminal
17	P00	O	Key scan signal (Not used, open)	37	XL	O	Not used, open
18	P01	O	Key scan signal (Not used, open)	38	EXL	O	(Not used, connected to GND)
19	P02	O	Data discrimination signal signal	39	P60	I	Key return signal
20	P03	O	Data lock signal	42	P63	I	
21	P10	O	Key scan signal	43	P70	I	
24	P13	O	Key scan signal	46	P73	I	
25	P40	I	Remote control signal input	47	VPP	I	FL drive power supply
26	P41	—	(Not used, connected to GND)	48	S0	O	FL anode signal
27	P42	O	Data receipt command signal	63	S15	O	FL anode signal
28	P43	O	Data transmission command signal	64	VCC	I	Power supply terminal
29	P50	—	Synchro edit control terminal				
30	P51	I	Synchro edit control terminal				
31	RES	I	Reset signal input (reset at "L")				
32	VSS	—	GND terminal				

■ BLOCK DIAGRAM



BLOCK DIAGRAM



Note:
→ Audio signal

SCHEMATIC DIAGRAM

(Parts list on pages 39, 40, 46.)

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

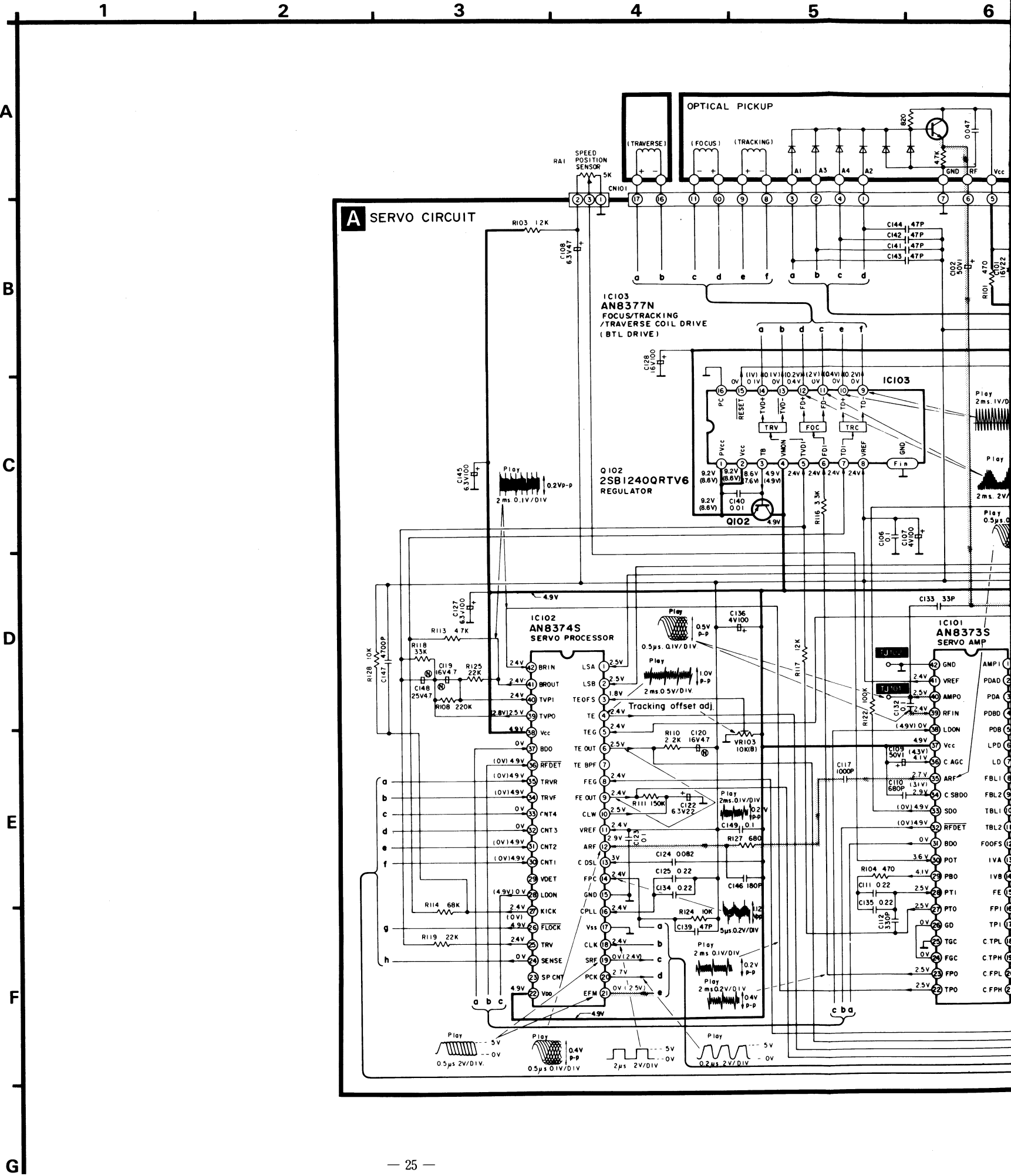
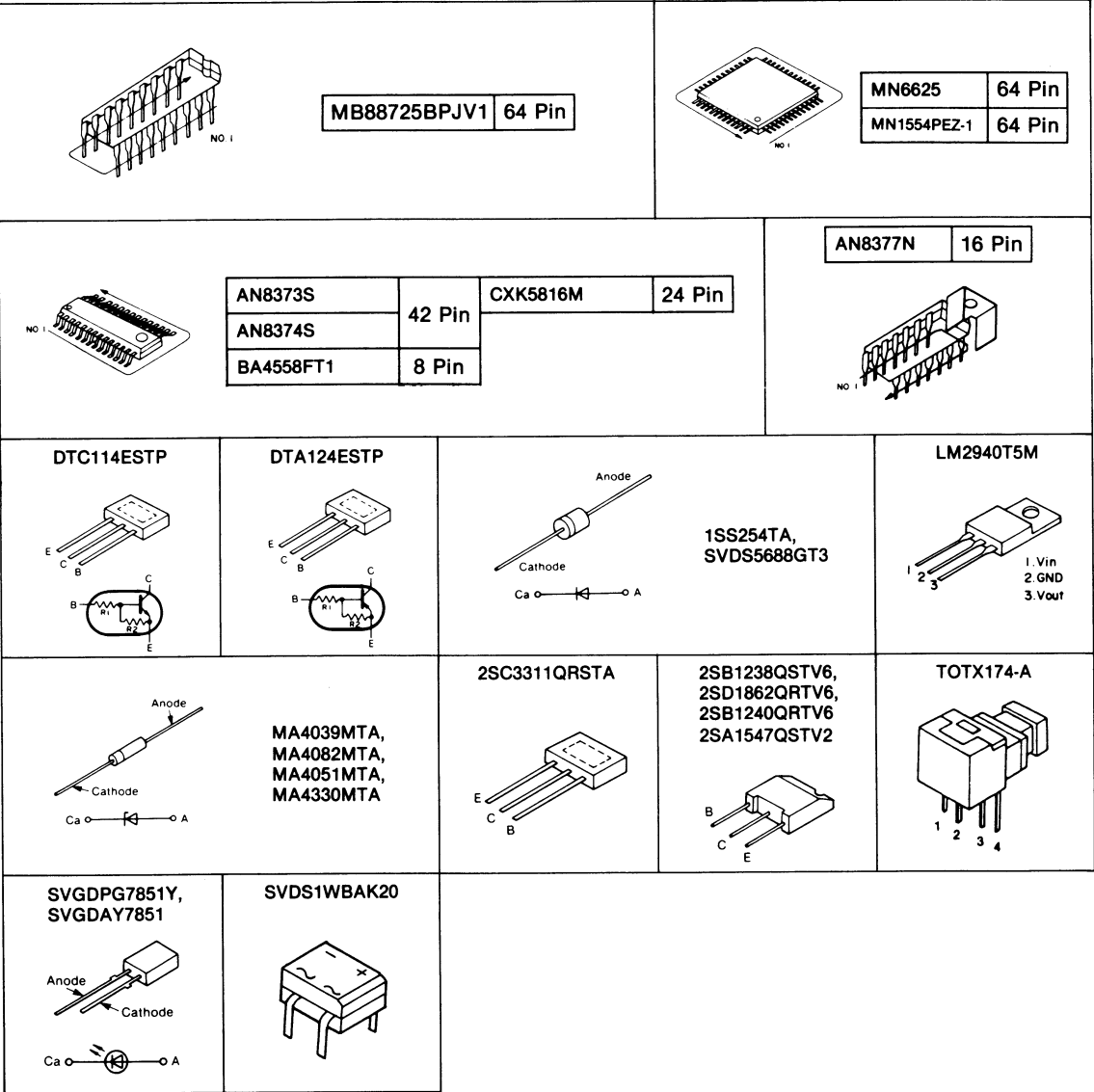
Notes:

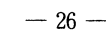
- S1 : Power (power) switch in "on" position.
- S2 : Voltage selector switch.
- S101, 102 : Disc holder open/close detection switches.
- S618 : Disc holder open/close (▲ open/close) switch.
- S625 : Stop (■ stop) switch.
- S630, 635 : Skip (skip) switches.
[S630: ►►, S635: ◄◄]
- S631 : Pause (pause) switch.
- S637 : Play (play) switch.

- The voltage value and waveforms 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.
- Important safety notice:
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- — / — : Positive voltage lines and negative voltage lines.
- : audio signal lines.

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 foil.
• Ground the soldering iron.
• Put a conductive mat on the work table.
• Do not touch the pins of IC or LSI with fingers directly.

Terminal guide of IC's, transistors and diodes





15

16

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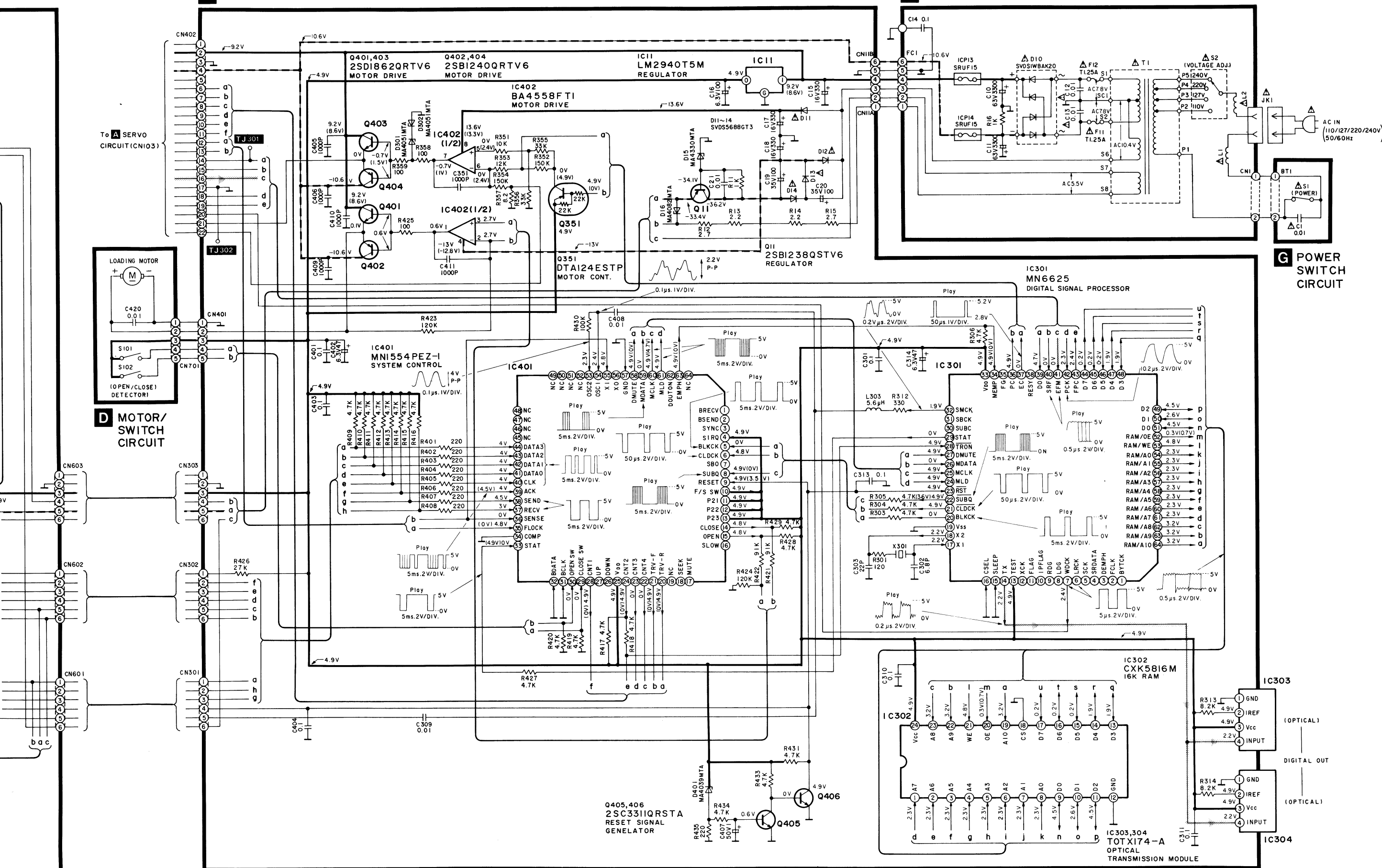
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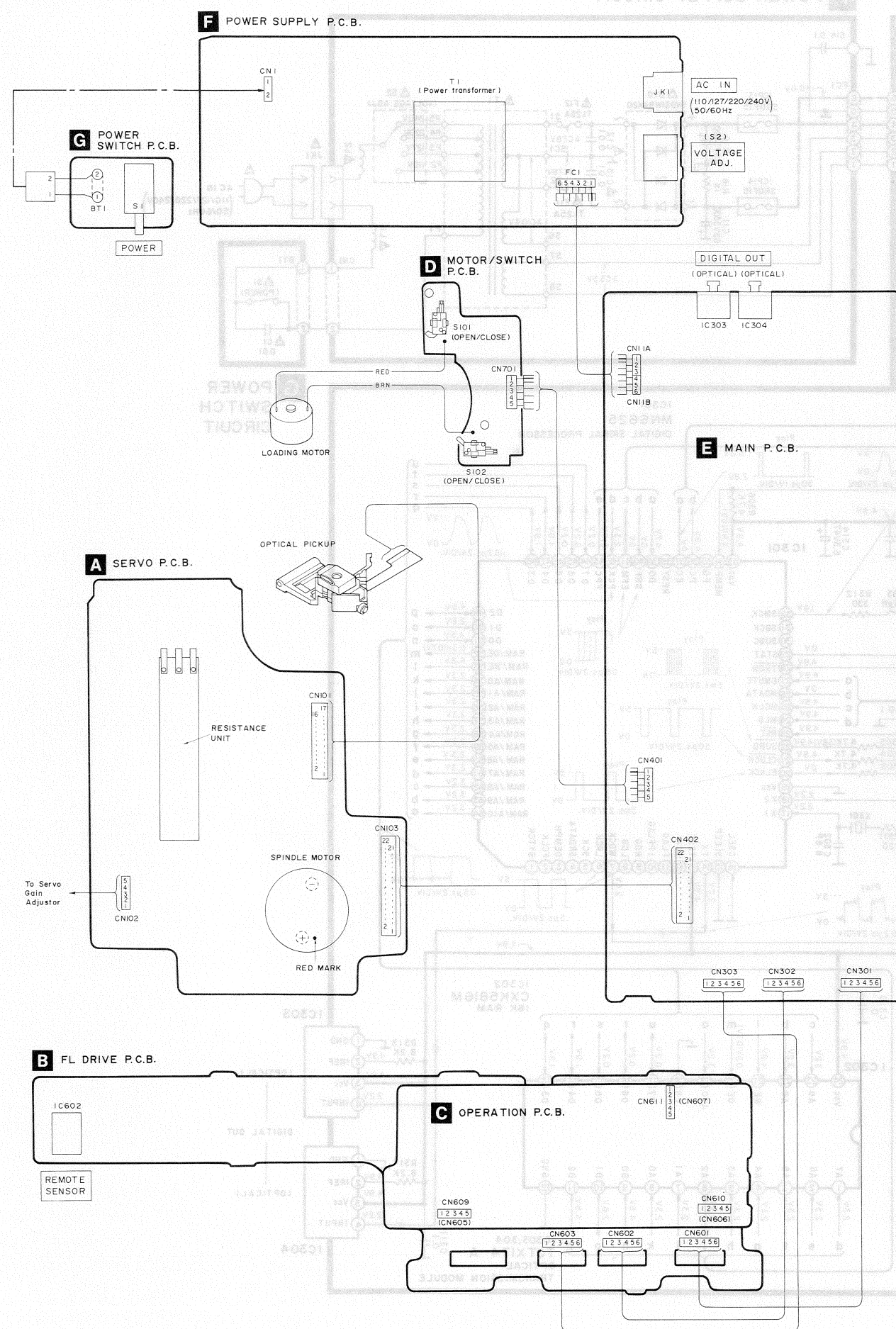
22

23

24

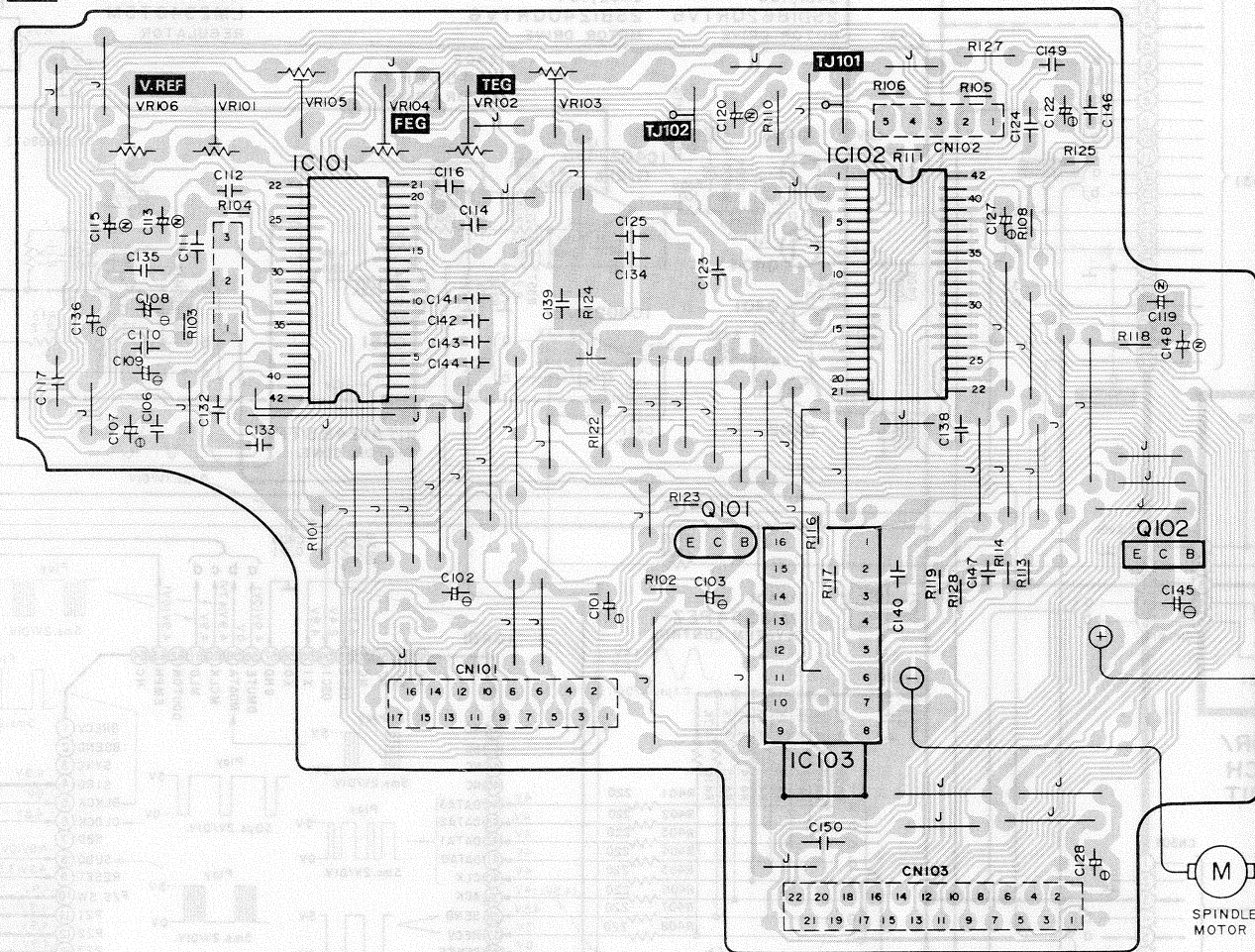
E MAIN CIRCUIT**F POWER SUPPLY CIRCUIT**

WIRING CONNECTION DIAGRAM

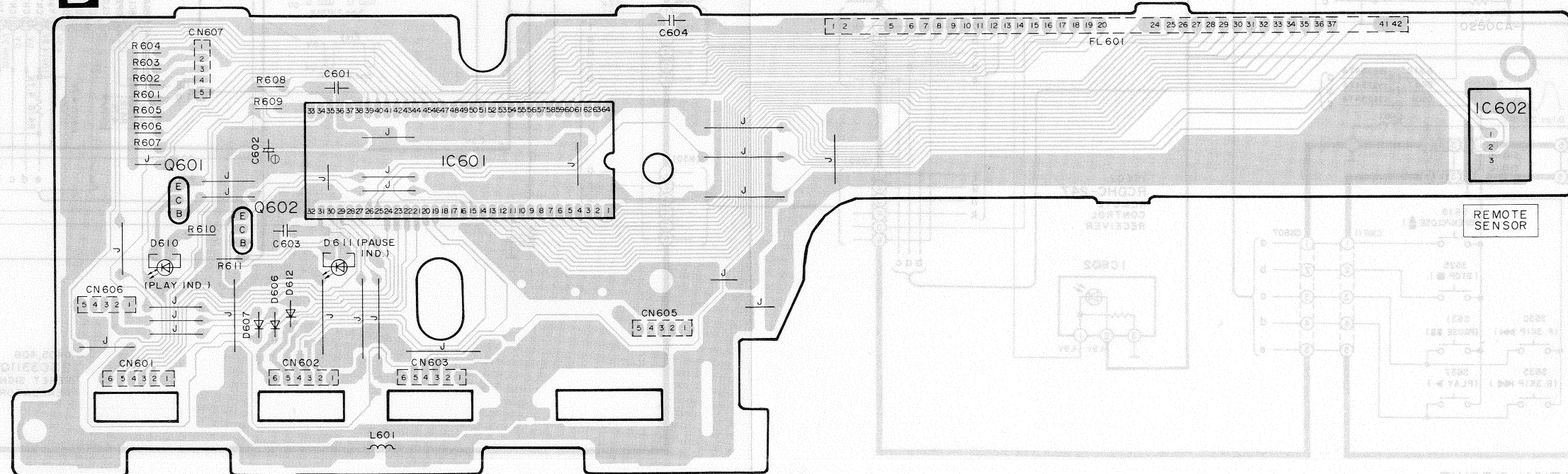


■ PRINTED CIRCUIT BOARDS

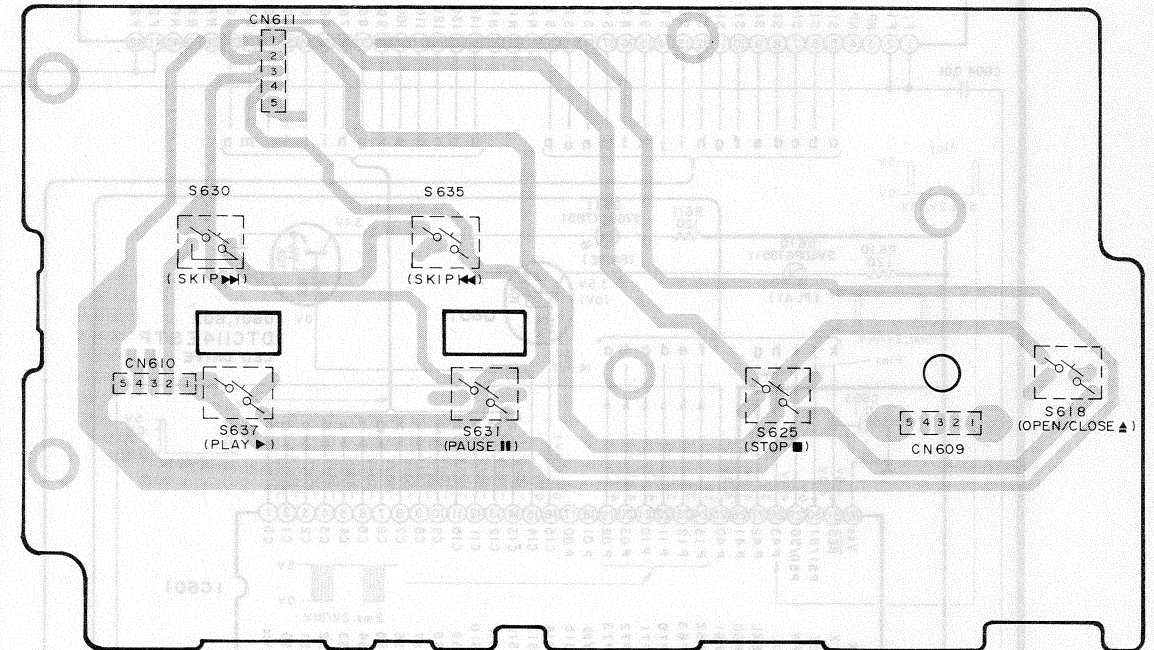
A SERVO P.C.B.



B FL DRIVE P.C.B.



C OPERATION P.C.B.



11

12

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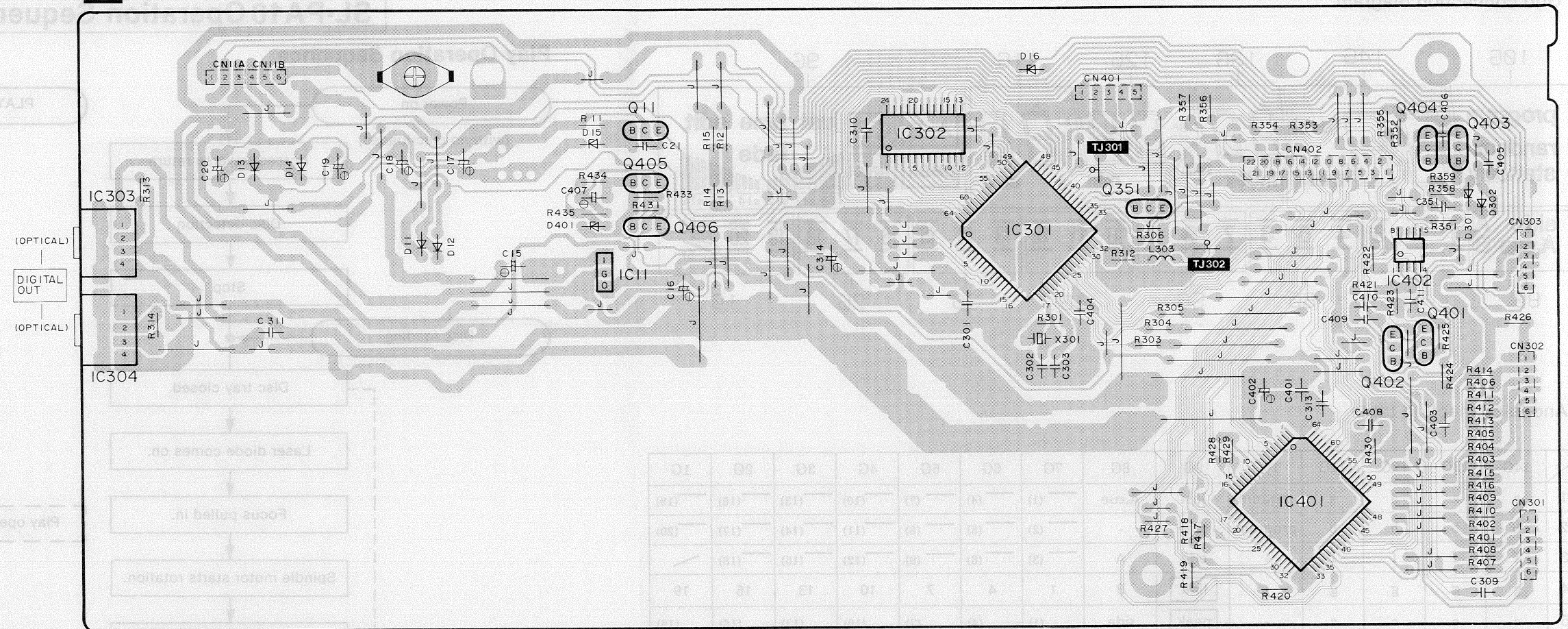
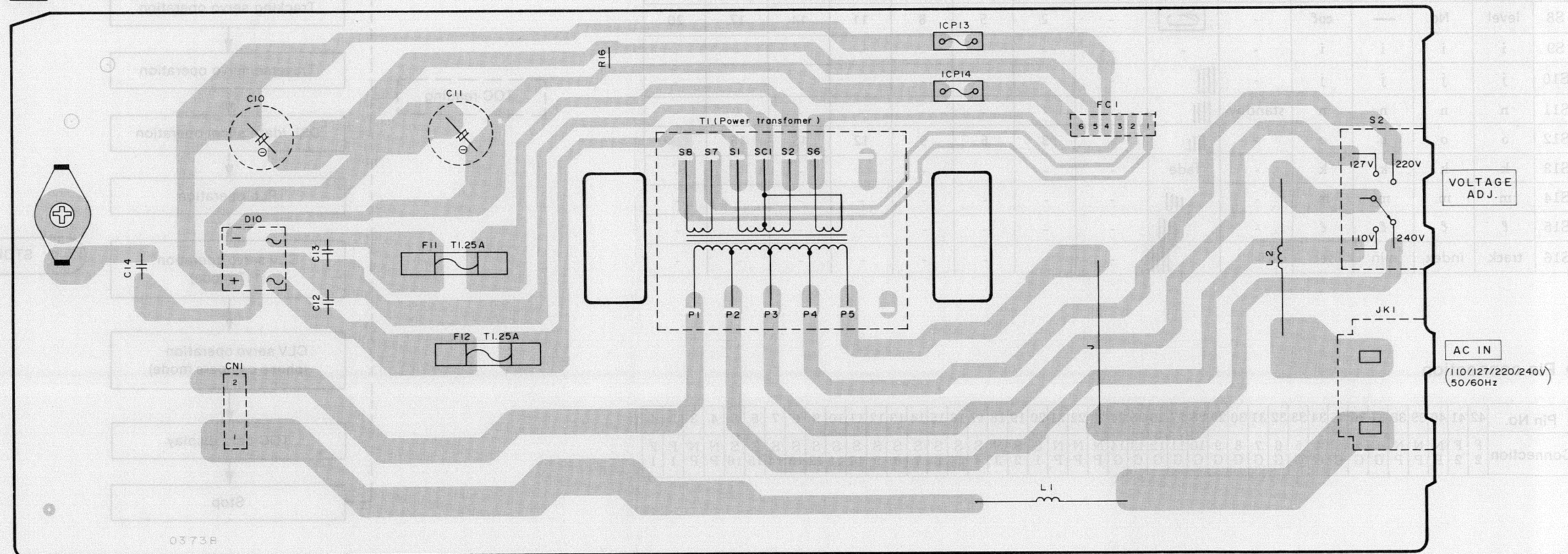
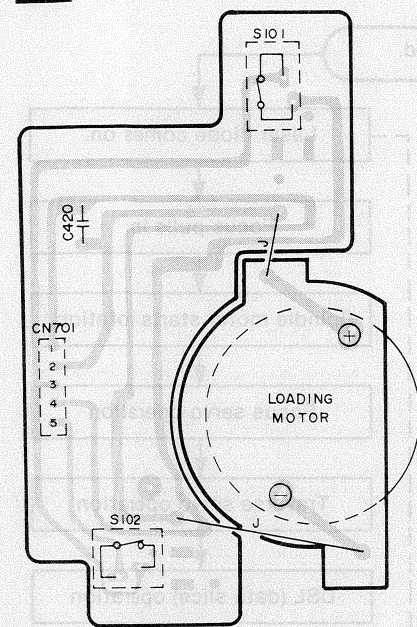
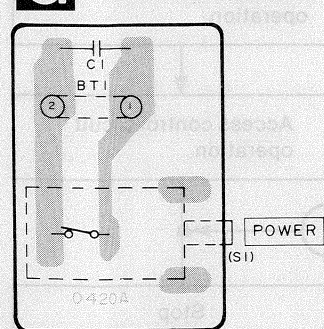
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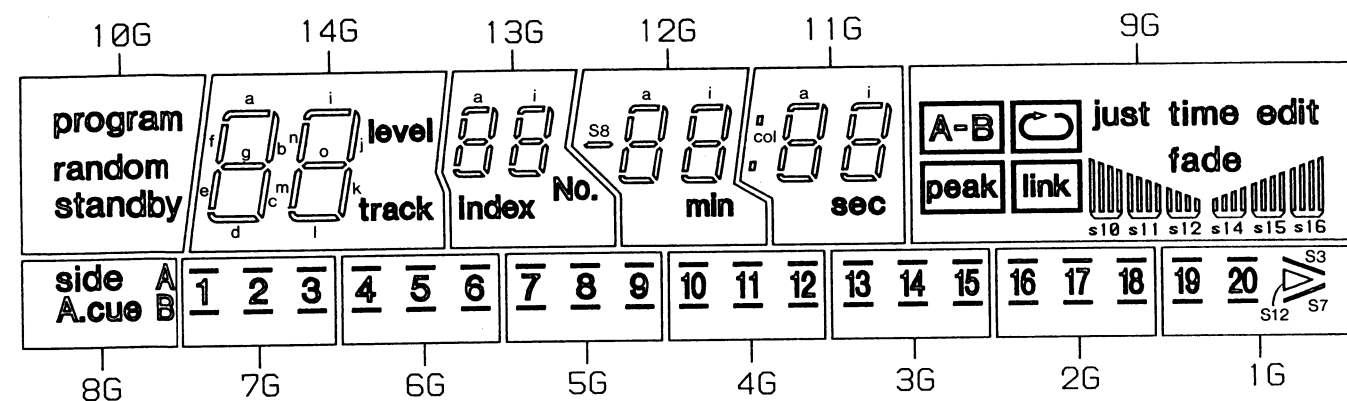
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E MAIN P.C.B.**F** POWER SUPPLY P.C.B.**D** MOTOR/SWITCH P.C.B.**G** POWER SWITCH P.C.B.

INTERNAL CONNECTION OF FL

• Grid connection diagram



• Anode connection table

	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
S1	a	a	a	a	random	just	A.cue	(1)	(4)	(7)	(10)	(13)	(16)	(19)
S2	b	b	b	b	program	time	-	(2)	(5)	(8)	(11)	(14)	(17)	(20)
S3	f	f	f	f	-	edit	A	(3)	(6)	(9)	(12)	(15)	(18)	/
S4	g	g	g	g	-	link	B	1	4	7	10	13	16	19
S5	c	c	c	c	-	peak	side	(1)	(4)	(7)	(10)	(13)	(16)	(19)
S6	e	e	e	e	-	A-	-	(2)	(5)	(8)	(11)	(14)	(17)	(20)
S7	d	d	d	d	-	B	-	(3)	(6)	(9)	(12)	(15)	(18)	/
S8	level	No.	—	col	-	—	-	2	5	8	11	14	17	20
S9	i	i	i	i	-	-	-	-	-	-	-	-	-	-
S10	j	j	j	j	-		-	-	-	-	-	-	-	-
S11	n	n	n	n	standby		-	-	-	-	-	-	-	-
S12	o	o	o	o	-		-	3	6	9	12	15	18	▶
S13	k	k	k	k	-	fade	-	-	-	-	-	-	-	-
S14	m	m	m	m	-		-	-	-	-	-	-	-	-
S15	l	l	l	l	-		-	-	-	-	-	-	-	-
S16	track	index	min	sec	-		-	-	-	-	-	-	-	-

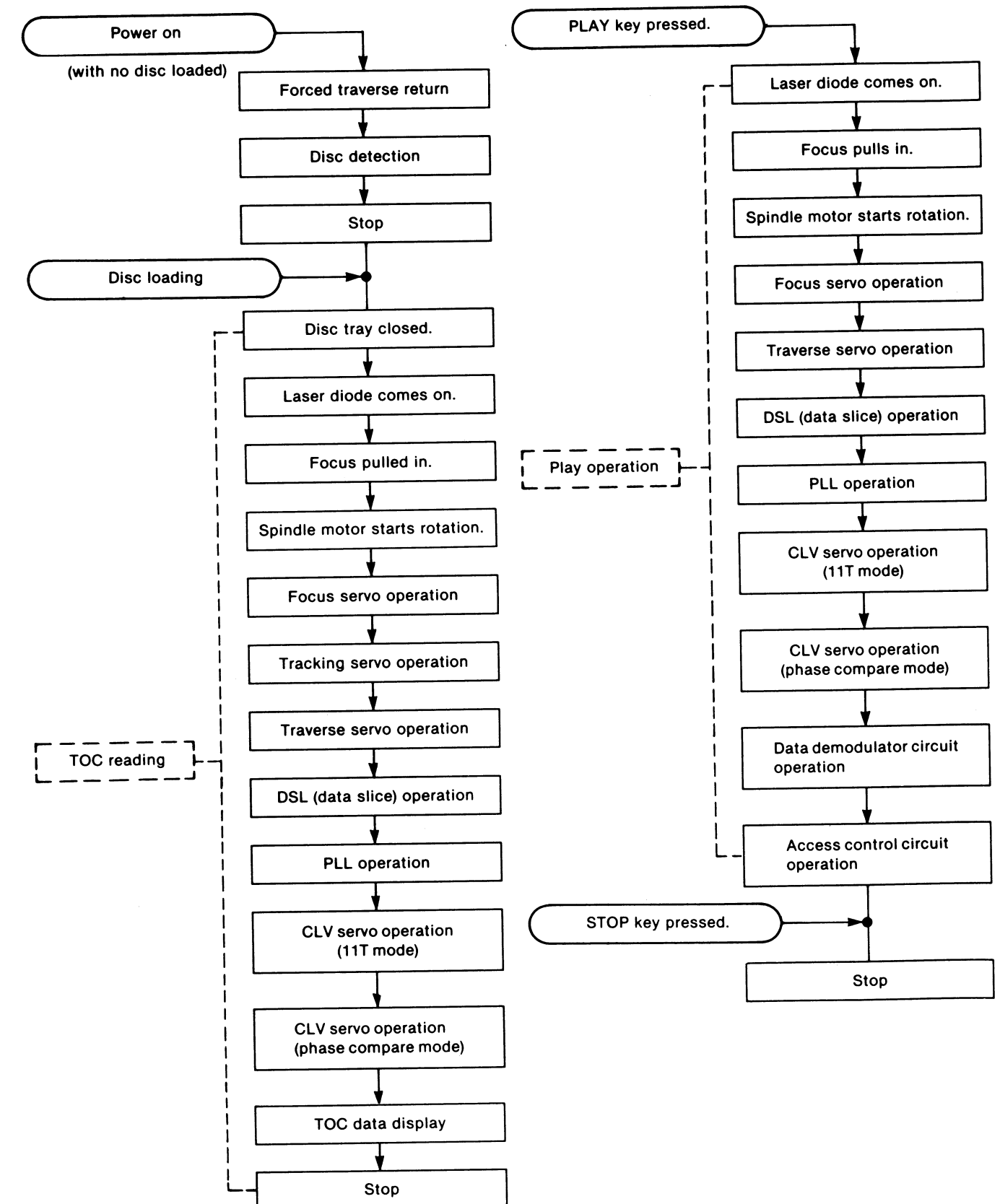
• Pin connection

Pin No.	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Connection	F ₂	F ₂	N _P	N _P	N _P	1 _G	2 _G	3 _G	4 _G	5 _G	6 _G	7 _G	8 _G	9 _G	10 _G	11 _G	12 _G	13 _G	14 _G	N _P	N _P	N _P	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈	S ₉	S ₁₀	S ₁₁	S ₁₂	S ₁₃	S ₁₄	S ₁₅	S ₁₆	N _P	N _P	F ₁	F ₁

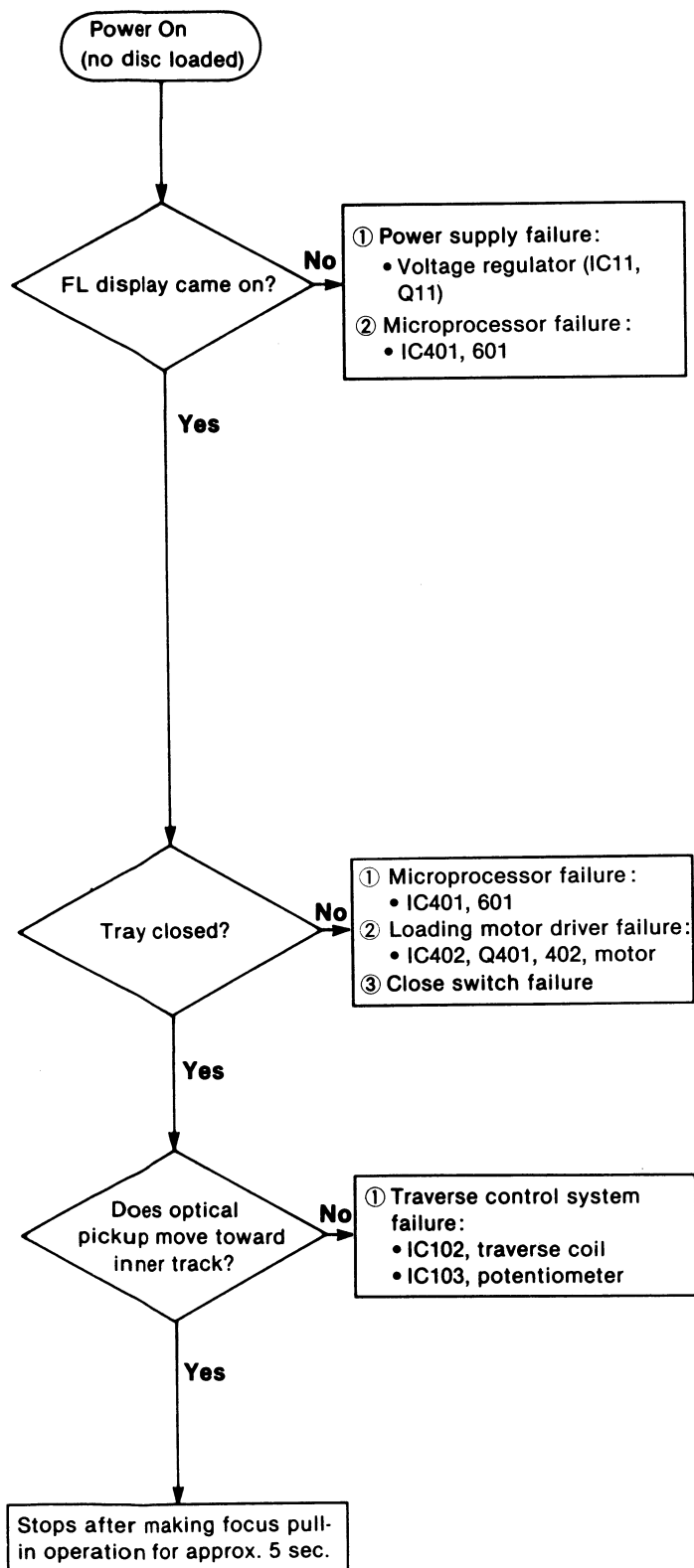
TROUBLESHOOTING GUIDE

SL-PA10 Operation Sequence Check Sheet

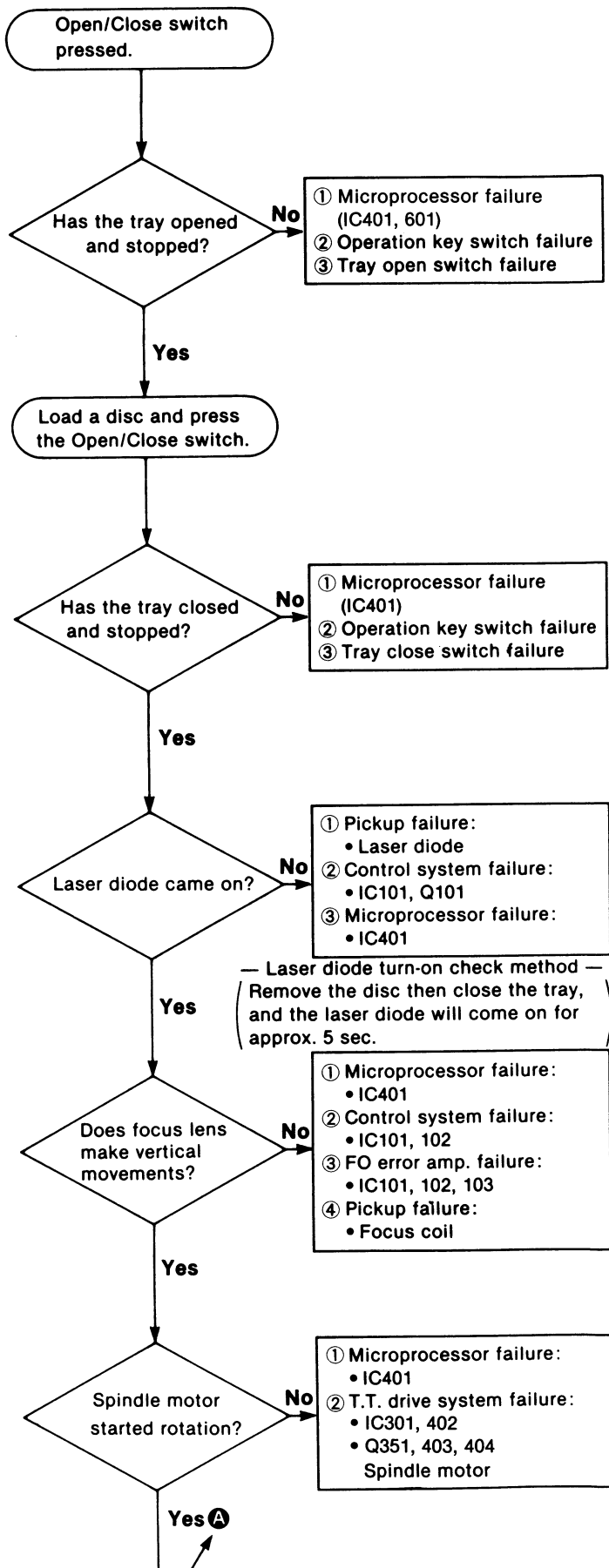
Play Operation Sequence

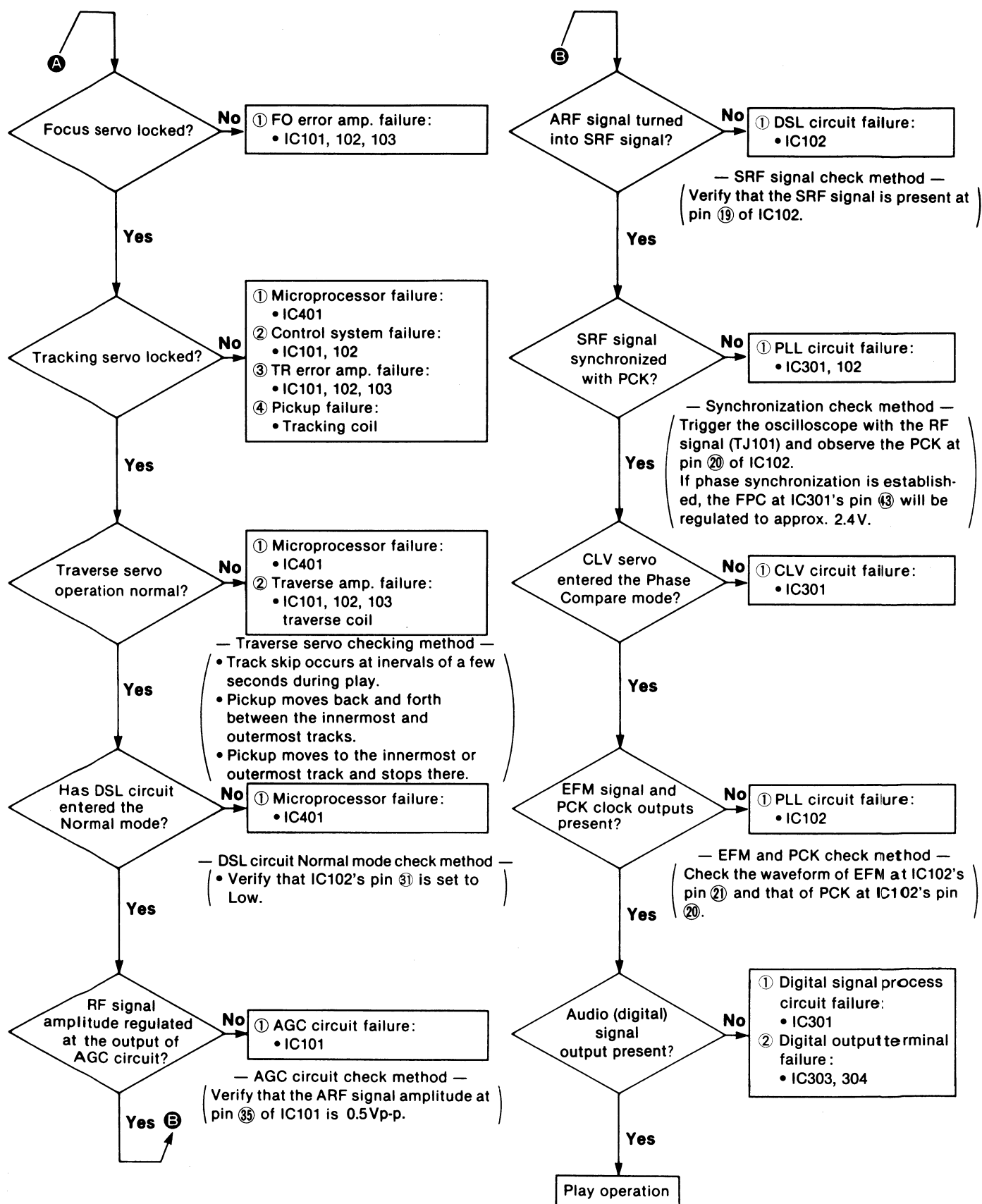


(Operation Sequence Just After Power On)



(TOC Read Operation-PLAY Operation)





■ REPLACEMENT PARTS LIST

Notes :

- * Important safety notice:
Components identified by the  mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
- * 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 laser diode. Refer to caution statements on page 3.
- * ACHTUNG:
Die lasereinheit nicht zerlegen.
Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

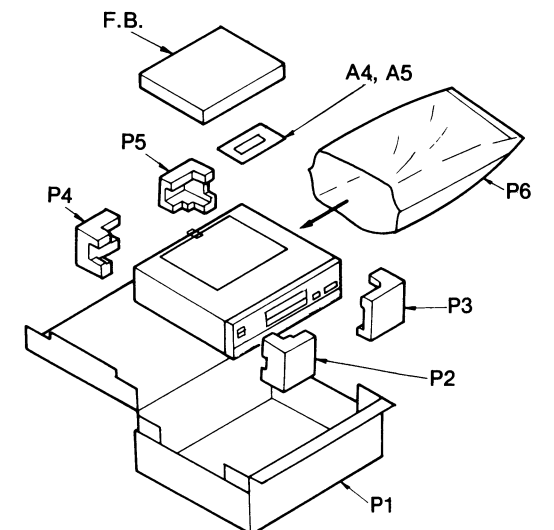
Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC11	LM2940T5M	IC, REGULATOR	
IC301	MN6625	IC, DSP	
IC302	CXK5816M	IC, 16K RAM	
IC303, 304	TOTX174-A	IC, DIGITAL OUT (OPTICAL)	
IC401	MN1554PEZ-1	IC, SYSTEM CONTROL	
IC402	BA4558FT1	IC, MOTOR DRIVE	
IC601	MB88725BPJV1	IC, SYSTEM CONTROL&FL DRIVE	
IC602	RCDHC-247	IC, REMOTE CONTROL RECEIVER	
		IC PROTECTOR	
ICP13, 14	SRUF15	IC PROTECTOR	
		TRANSISTOR(S)	
Q11	2SB1238QSTV6	TRANSISTOR	
Q351	DTA124ESTP	TRANSISTOR	
Q401	2SD1862QRTV6	TRANSISTOR	
Q402	2SB1240QRTV6	TRANSISTOR	
Q403	2SD1862QRTV6	TRANSISTOR	
Q404	2SB1240QRTV6	TRANSISTOR	
Q405, 406	2SC3311QRSTA	TRANSISTOR	
Q601, 602	DTC114ESTP	TRANSISTOR	
		DIODE(S)	
D10	SVDS1WBAK20	DIODE	△
D11-14	SVDS5688GT3	DIODE	△
D15	MA4330MTA	DIODE	
D16	MA4082MTA	DIODE	
D301, 302	MA4051MTA	DIODE	
D401	MA4039MTA	DIODE	
D606, 607	1SS254TA	DIODE	
D610	SVGDPG7851Y	DIODE	
D611	SVGDAY7851	DIODE	
D612	1SS254TA	DIODE	
		COIL(S)	
L1, 2	SLQX400-D	COIL	△
L303	RLQZP5R6KT-Y	COIL	
L601	EXCELSA35	COIL	
		TRANSFORMER(S)	

Ref. No.	Part No.	Part Name & Description	Remarks
		JUMPER RESISTOR(S)	
TJ301, 302	ERD25VOR00T	CHIP JUMER	
		<SERVO P. C. B>	
		INTEGRATED CIRCUITS	
IC101	AN8373S	IC, SERVO AMP	
IC102	AN8374S	IC, SERVO PROCESSOR	
IC103	AN8377N	IC, B. T. L. DRIVE	
		TRANSISTORS	
Q101	2SA1547QSTV2	TRANSISTOR	
Q102	2SB1240QRTV6	TRANSISTOR	
		VARIABLE RESISTORS	
VR101	EVND3AA00B14	V. R, BEST EYE ADJ.	
VR102	EVND3AA00B14	V. R, TRACKING GAIN ADJ.	
VR103	EVND3AA00B14	V. R, TRACKING OFFSET ADJ.	
VR104	EVND3AA00B14	V. R, FOCUS GAIN ADJ.	
VR105	EVND3AA00B14	V. R, FOCUS OFFSET ADJ.	
VR106	EVND3AA00B24	V. R, TRACKING BALANCE ADJ.	
		MAGNET RESISTOR ELEMENTS	
RA1	EWS7M0A00Q53	RESISTANCE UNIT	

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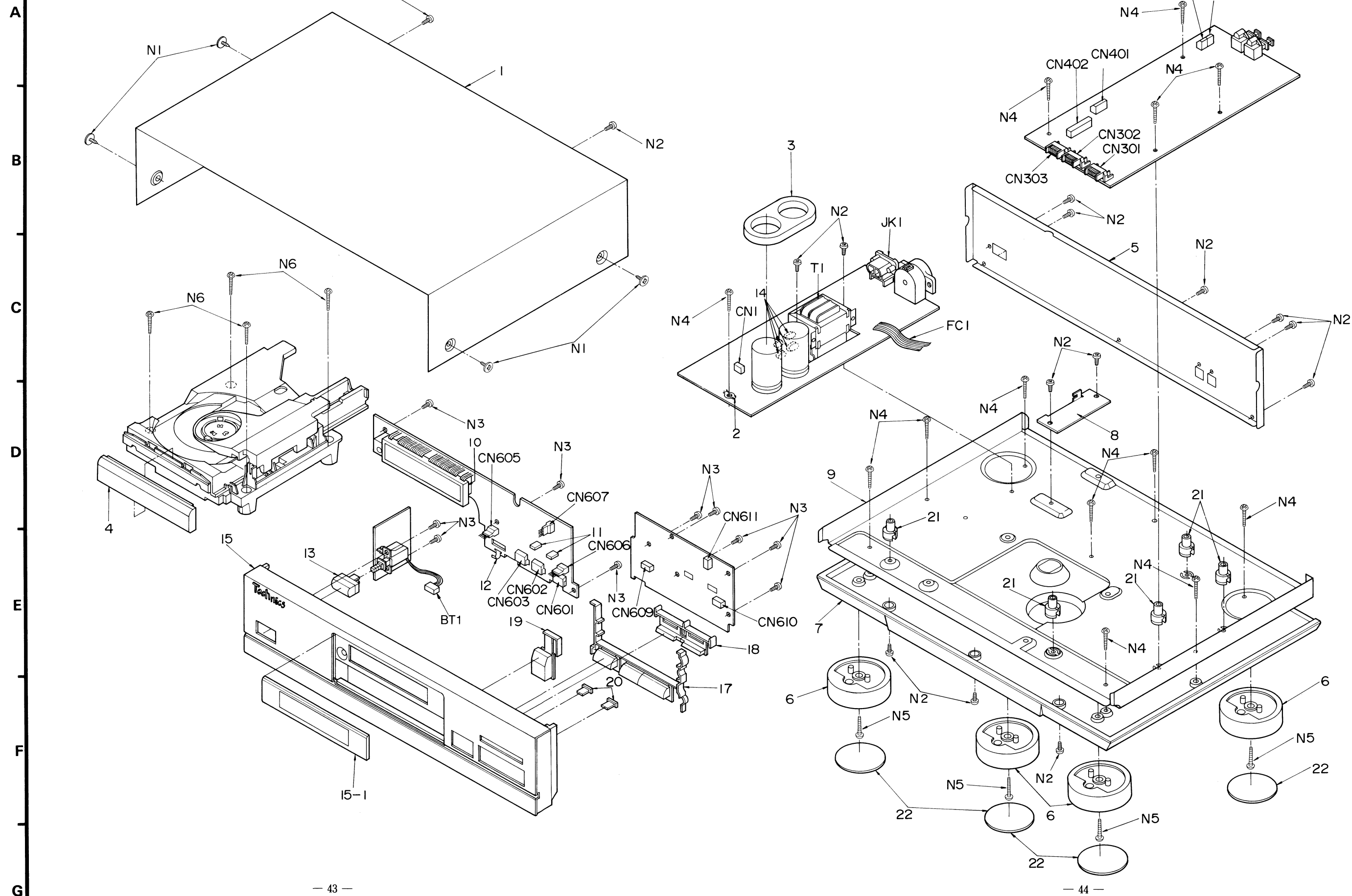
— 42 —

- **F.B.**

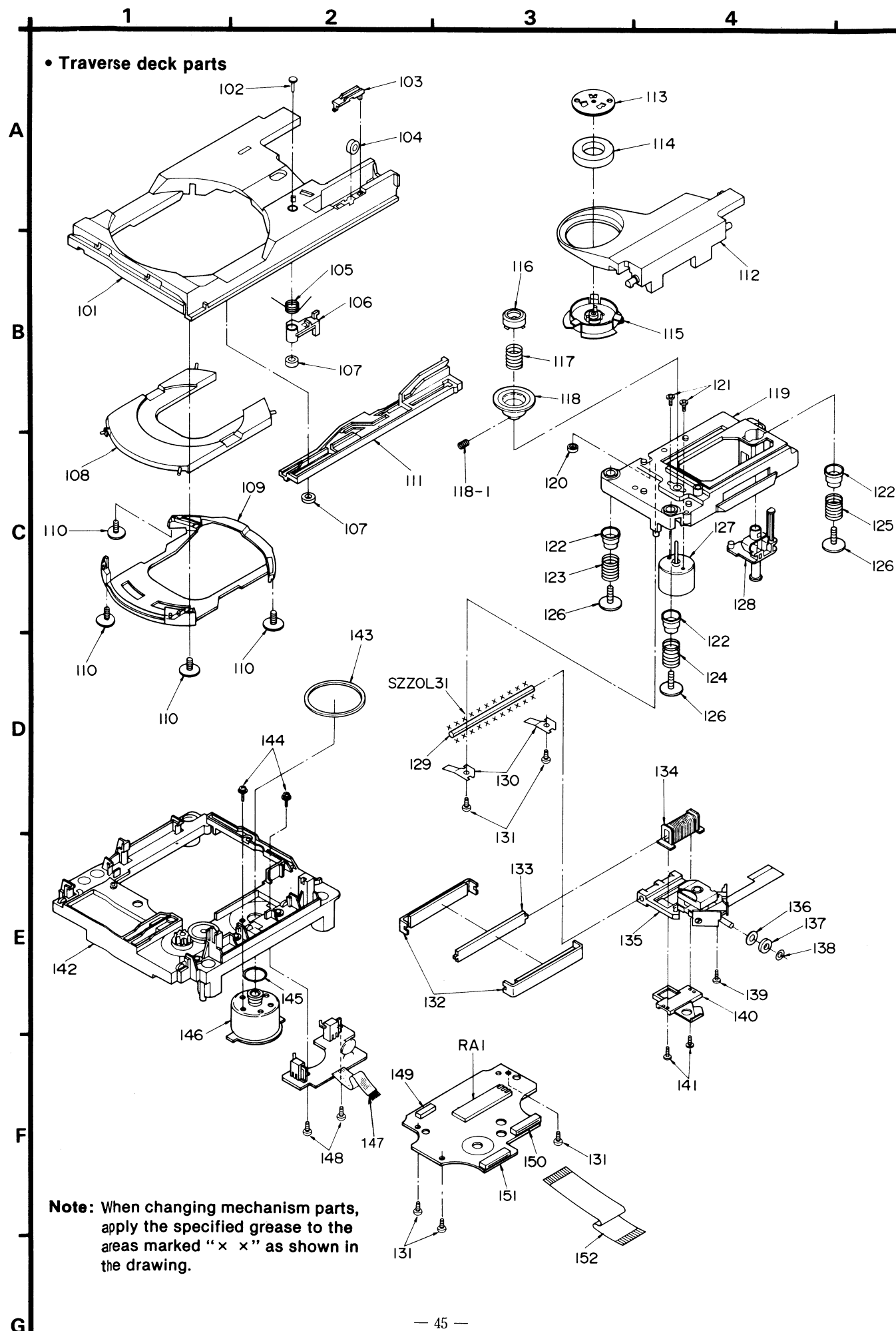


EXPLODED VIEWS

• Cabinet and chassis parts



• Traverse deck parts



RESISTORS & CAPACITORS

Notes : * Capacity value 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						
			C310, 311	ECFR1E104ZF5	25V 0.1U	C110	RCUV1H681KB	50V 680P
			C313	ECFR1E104ZF5	25V 0.1U	C111	ECUV1C224KR	16V 0.22U
			C314	ECEAOJU470B	6.3V 47U	C112	RCUV1H331KB	50V 330P
R11	ERDS2TJ102T	1/4W 1K	C351	ECBT1H102KB5	50V 1000P	C113	ECEA1HSN010I	50V 1U
R12	ERDS2TJ2R7T	1/4W 2.7	C401	ECFR1E104ZF5	25V 0.1U	C114	RCUV1E333KB	25V 0.033U
R13, 14	ERDS2TJ2R2T	1/4W 2.2	C402	ECEAOJU470B	6.3V 47U	C115	ECEA1HSN010I	50V 1U
R15	ERDS2TJ2R7T	1/4W 2.7	C403, 404	ECFR1E104ZF5	25V 0.1U	C116	RCUV1E333KB	25V 0.033U
R16	ERDS2TJ102	1/4W 1K	C405, 406	ECBT1H102KB5	50V 1000P	C117	ECBT1H102KB5	50V 0.001U
R301	ERDS2TJ121T	1/4W 120	C407	ECEA1HU010B	50V 1U	C119, 120	ECEA1CKM4R7I	16V 4.7U
R303-306	ERDS2TJ472T	1/4W 4.7K	C408	ECBT1C103NS5	16V 0.01U	C122	ECEA0JKS220I	6.3V 22U
R312	ERDS2TJ331T	1/4W 330	C409-411	ECBT1H102KB5	50V 1000P	C123	RCUV1E104ZF	25V 0.1U
R313, 314	ERDS2TJ822T	1/4W 8.2K	C420	ECKW1H103KB5	50V 0.01U	C124	ECUV1E823KB	25V 0.082U
R351	ERDS2TJ103T	1/4W 10K	C601	ECBT1C103NS5	16V 0.01U	C125	ECUV1C224KR	16V 0.22U
R352	ERDS2TJ154T	1/4W 150K	C602	ECEA1CKS100B	16V 10U	C127	ECEA0JKF101I	6.3V 100U
R353	ERDS2TJ123T	1/4W 12K	C603	ECFR1E104ZF5	25V 0.1U	C128	ECEA1CKA101I	16V 100U
R354	ERDS2TJ154T	1/4W 150K	C604	ECKR1H103ZF5	50V 0.01U	C132	ECUV1E104KB	25V 0.1U
R355, 356	ERDS2TJ333T	1/4W 33K				C133	RCUV1H330KC	50V 33P
R357	ERDS2TJ8R2T	1/4W 8.2			RESISTORS<SERVO P.C.B.>	C134, 135	ECUV1C224KR	16V 0.22U
R358, 359	ERDS2TJ101T	1/4W 100				C136	ECEA0GKS101I	4V 100U
R401-408	ERDS2TJ221T	1/4W 220	R101	ERDS2TJ471	1/4W 470	C138	RCUV1E104ZF	25V 0.1U
R409-420	ERDS2TJ472T	1/4W 4.7K	R102	ERJ6GEYJ120V	1/10W 12	C139	RCUV1H470KC	50V 47P
R421, 422	ERDS2TJ913T	1/4W 91K	R103	ERJ6GEYJ122	1/10W 1.2K	C140	RCUV1E103KB	25V 0.01U
R423, 424	ERDS2TJ124T	1/4W 120K	R104	ERJ6GEYJ471	1/10W 470	C141-144	RCUV1H470KC	50V 47P
R425	ERDS2TJ101T	1/4W 100	R105, 106	RRJ6GCJ102TE	1/6W 1K	C145	ECEA0JKF101I	6.3V 100U
R426	ERDS2TJ273T	1/4W 27K	R108	ERJ6GEYJ224V	1/10W 220K	C146	RCUV1H181KC	50V 180P
R427-429	ERDS2TJ472T	1/4W 4.7K	R110	ERDS2TJ222	1/4W 2.2K	C147	RCUV1H472KB	50V 4700P
R430	ERDS2TJ104T	1/4W 100K	R111	ERJ6GEYJ154V	1/10W 150K	C148	ECEA1ESN4R7I	25V 4.7U
R431	ERDS2TJ472T	1/4W 4.7K	R113	ERJ6GEYJ472V	1/10W 4.7K	C149	RCUV1E104ZF	25V 0.1U
R433, 434	ERDS2TJ472T	1/4W 4.7K	R114	ERJ6GEYJ683V	1/10W 68K	C150	RCUV1E103KB	25V 0.01U
R435	ERDS2TJ221T	1/4W 220	R116	ERJ6GEYJ332V	1/10W 3.3K			
R601-608	ERDS2TJ472T	1/4W 4.7K	R117	ERJ6GEYJ123	1/10W 12K			
R609	ERDS2TJ104T	1/4W 100K	R118	ERJ6GEYJ333V	1/10W 33K			
R610, 611	ERDS2TJ121T	1/4W 120	R119	RRJ6GCJ223TE	1/6W 22K			
		CAPACITORS	R122	ERDS2TJ104	1/4W 100K			
			R123	ERJ6GEYJ470V	1/10W 47			
			R124	RRJ6GCJ103TE	1/6W 10K			
C1	ECKDKC103PF2	400V 0.01U Δ	R125	RRJ6GCJ222TE	1/6W 2.2K			
C10, 11	ECESX1J332BA	63V 3300U	R127	ERDS2TJ681	1/4W 680			
C12, 13	ECFW1V103KR	35V 0.01U Δ	R128	RRJ6GCJ103TE	1/6W 10K			
C14	ECFW1E104KR	25V 0.1U						
C15	ECEA1CU331B	16V 330U			CAPACITORS<SERVO P.C.B.>			
C16	ECEAOJU101B	6.3V 100U						
C17, 18	ECEA1CU331B	16V 330U	C101	ECEA1CKS220I	16V 22U			
C19, 20	ECEA1VU101B	35V 100U	C102	ECEA1HKS010I	50V 1U			
C21	ECBT1C103NS5	16V 0.01U	C103	ECEA1CKS220I	16V 22U			
C301	ECFR1E104ZF5	25V 0.1U	C106	RCUV1E104ZF	25V 0.1U			
C302	ECBT1H6R8K5	50V 6.8P	C107	ECEA0GKS101I	4V 100U			
C303	ECBT1H220J5	50V 22P	C108	ECEA0JKS470I	6.3V 47U			
C309	ECBT1C103NS5	16V 0.01U	C109	ECEA1HKS010I	50V 1U			