

Service Manual

COMPACT
disc
DIGITAL AUDIO

DIGITAL

Compact Disc Player
SL-PS70

Color

(K)... Black Type

Area

Country Code	Area	Color
(E)	Continental Europe.	(K)
(EB)	Great Britain.	(K)
(EG)	F.R. Germany & Italy.	(K)
(GC)	Third Region.	(K)
(GN)	Oceania.	(K)
(PX)	Far East-PX.	(K)



SL-P333 MECHANISM SERIES (SIWD113-3ZA)

SPECIFICATIONS

Audio

No. of channels	2 (left and right, stereo)
Frequency response	2-20,000 Hz ± 0.3 dB
Output voltage	2 V (at 0 dB)
Dynamic range	96 dB
S/N ratio	112 dB
Total harmonic distortion	0.003% (1 kHz, 0 dB)
Harmonic distortion	0.002% (1 kHz, 0 dB)
Wow and flutter	Below measurable limit
DA converter	MASH* (8 DAC)
Output impedance	Approx. 1 kΩ
Load impedance	More than 10 kΩ
Headphone output level	15 mW max. 32Ω (adjustable)

*MASH

- MASH (Multi-Stage Noise Shaping) is an effective over-sampling D/A conversion technique which realizes a high S/N ratio and needs no highly complex manufacturing processes such as a laser trimming.
- MASH is a trademark of NTT (Nippon Telegraph and Telephone Corporation).

Pickup

Wavelength 780 nm

General

Power supply

For Great Britain and Oceania: AC 50/60 Hz, 240 V
For Continental Europe and F.R. Germany & Italy: AC 50/60 Hz, 220 V
For others: AC 50/60 Hz, 110 V/127 V/220 V/240 V

Power consumption

11 W

Dimensions (W×H×D)

430×126.5×332.5 mm

Weight

5.2 kg

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

Technics

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

Panasonic Tokyo Sales Department
Matsushita Electric Industrial Co., Ltd.
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2-chome, Minato-ku, Tokyo 105, Japan

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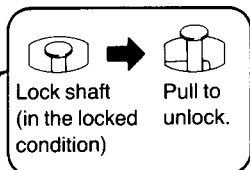
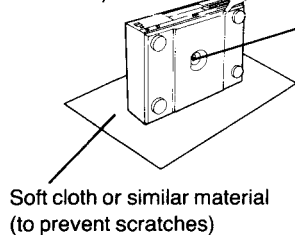
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PLACEMENT

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)



Note:

When carrying this unit, be sure to remove the compact disc from inside the unit, and press the lock shaft to secure the optical pickup. (Make sure to place the unit with the rear panel facing downward.)

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	• Stereo connection cable..... 1	• Remote control transmitter..... 1	• Batteries..... 2
[SJA187: (E, EG)	(SJP2249-3)	(RAK-SL5005W)	(UM-4NE/2S)
SJA193: (EB)			
SJA173: (GN)			
RJA0004: (GC, PX)			

■ 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: 100 μ W/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.

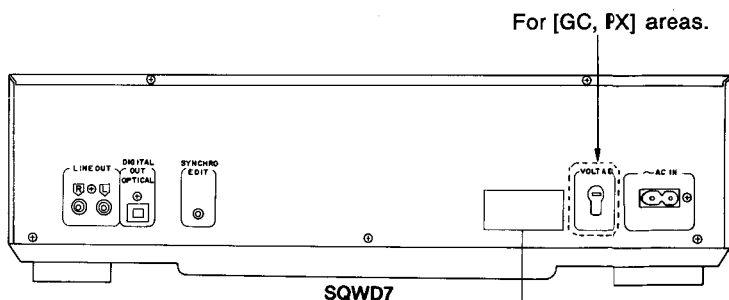
ACHTUNG: Dieses produkt enthält eine laserdioden. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit abgestrahlt.

Wellenlänge: 780nm
Maximale strahlungsleistung der lasereinheit: 100 μ W/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.



• Use of caution labels

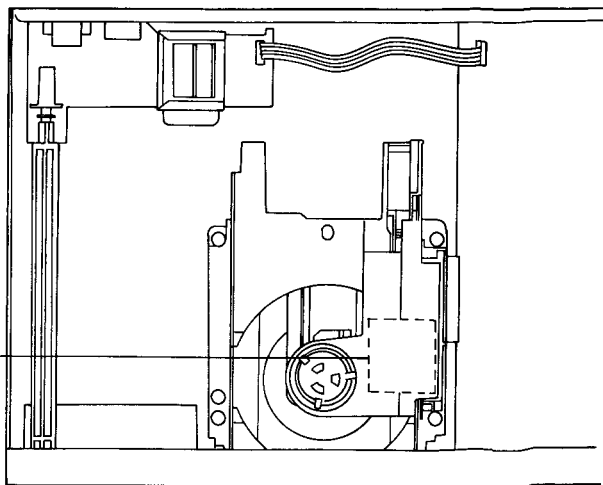
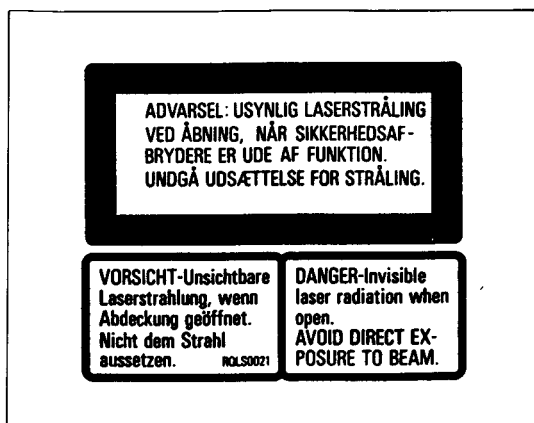
Note: ○ Mark is used, × Mark is not used.

Areas	SQWD7	RQLS0021
(PX)	×	×
Others	○	○



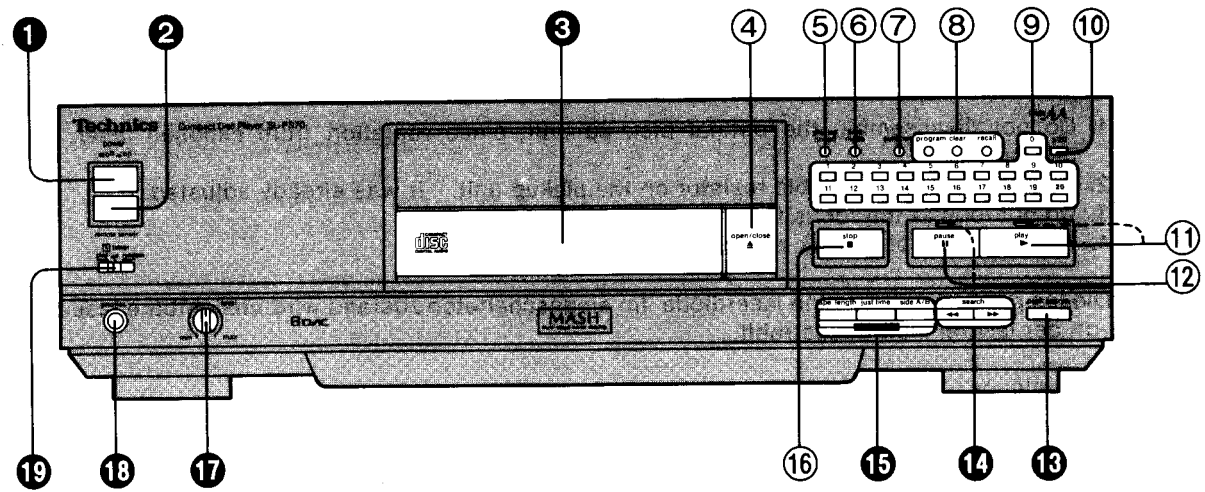
Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

RQLS0021



LOCATION OF CONTROLS

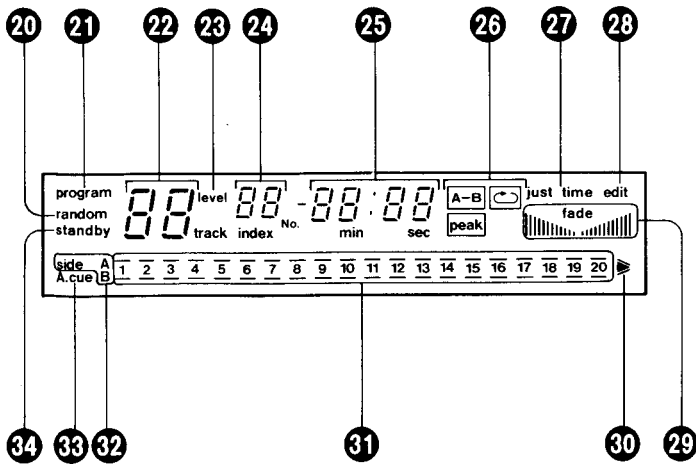
The functions indicated by the black numbers (with white background, ④ etc.) can also be activated using the remote control transmitter.



Control section

- ① Power switch (power \blacksquare off \blacktriangle on)**
- ② Remote control signal sensor (remote sensor)**
- ③ Disc holder**
- ④ Disc holder open/close button (\blacktriangle open/close)**
- ⑤ Display on/off button (display on/off)**
Pressing this button enables the unit to delete the indicators on the display in two steps.
- ⑥ Time mode select button (time mode)**
- ⑦ 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.
- ⑧ Buttons for program function**
 - **Program button (program)**
Pressing this button initiates the programmed play mode. You can then enter specific tracks using the numeric buttons.
 - **Clear button (clear)**
Each pressing this button makes one track cleared from the programmed sequence.
 - **Recall button (recall)**
This button can be used to display the contents of the programmed track sequence for confirmation.
- ⑨ Numeric buttons (0~20)**
- ⑩ Input mode button (>20)**
Press this button and then the numeric buttons (0~9) to specify the track number 21 and up.
- ⑪ Play button and indicator (\blacktriangleright play)**
- ⑫ Pause button and indicator ($\blacksquare\blacksquare$ pause)**
- ⑬ Peak level search button (peak search)**
Pressing this button enables the unit to search for the "peak signal" locations in tracks on a disc so as to adjust the suitable recording level on the cassette deck.
- ⑭ Search buttons (\blacktriangleleft search \blacktriangleright)**
These buttons can be used to move rapidly forward or backward on the disc during play.
- ⑮ Buttons for edit function (synchro edit)**
 - **Edit tape length button (tape length)**
When compact discs are to be recorded to tape, this button can be used to calculate the number of tracks that can be recorded on each side of the tape, depending on the length of the cassette tape used, so that as little tape as possible is wasted.
 - **Just time edit button (just time)**
When recording compact discs to tape, this button can be used to edit the tracks on a disc so as to leave the least possible amount of blank space on the cassette tape.
 - **Tape-side select button (side A/B)**
When recording compact discs to tape, this button can be used to check the number of tracks and amount of tape left over for side A or B.
- ⑯ Stop button (\blacksquare stop)**
This button can be used to stop disc play, as well as to cancel the various play modes.
- ⑰ Headphones volume control (level)**
- ⑱ Headphones jack (phones)**
- ⑲ Timer switch (\square timer)**

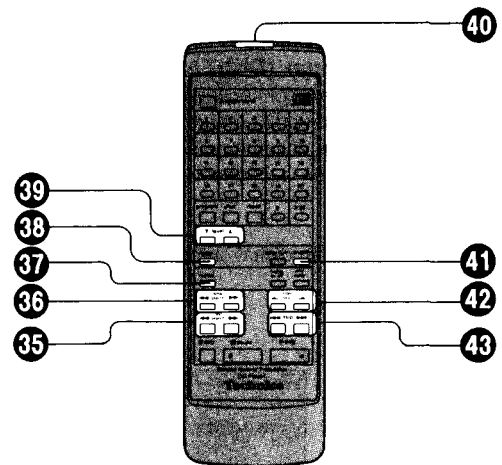
Avoid listening to music at high volume levels for extended periods of time.



Indicators section

- 20** Random indicator (random)
- 21** Program indicator (program)
- 22** Track number display (track)
- 23** Level indicator (level)
This indicator lights when the output level is attenuated by the remote control.
- 24** Index/program number display (index/No.)
- 25** Time display (min/sec)
- 26** Operation indicators
The following indicators light during their respective operations.

A-B	↺	peak	: Peak level search
↺	: Repeat play		
- 27** Just time edit indicator (just time)
- 28** Compact disc edit indicator (edit)
- 29** Fade in/fade out indicator (||||||| fade |||||)
- 30** "Over" mark (▶)
This indicator lights if the total number of tracks on the disc is 21 or more.
- 31** Track number indicator (1-20)
- 32** Tape side indicator (side A/B)
- 33** Auto cue indicator (A. cue)
- 34** Standby indicator
This indicator lights when the display on/off button is pressed twice in the stop mode.



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

Remote control transmitter

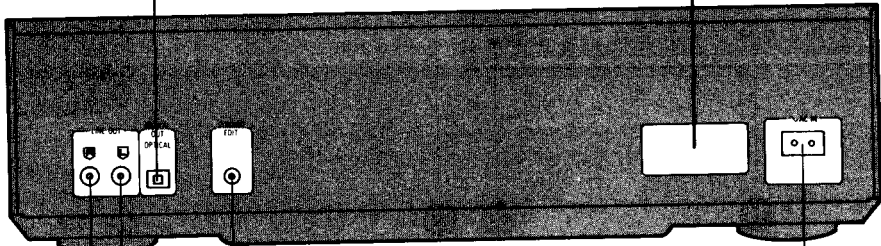
- 35** Fast search buttons (◀◀ fast search ▶▶)
These buttons can be used to move forward or backward on the disc during play at high speed.
- 36** Slow search buttons (◀◀ slow search ▶▶)
These buttons can be used to move forward or backward on the disc during play at the same speed as that by the search button on the unit itself.
- 37** Repeat button (repeat)
- 38** Fader button (fader)
Pressing this button in the pause mode initiates the fade in. Pressing this button during play initiates the fade out.
- 39** Level buttons (▼ level ▲)
These buttons can be used to control output level (from 0 dB to -12 dB).
- 40** Remote control signal transmission window
- 41** Random button (random)
This button can be used to play the tracks in a disc in a random sequence.
- 42** Index skip buttons (— index skip —)
These buttons are used to skip by index number (sub divisions within the current track).
- 43** Skip buttons (◀◀ skip ▶▶)
These buttons are used to skip by track in the forward or reverse direction.

CONNECTIONS

Turn power off on all components before making connections.

•Optical output terminal (DIGITAL OUT/OPTICAL)
 This terminal can be used for connection with other equipment that has a digital input terminal, such as an amplifier, by using an optical cable (optional). A dust-protection cap is inserted in this terminal. Remove this cap only when a connection is to be made to this terminal.

Note:
 When the unit is working with digital output, the following functions do not work;
 •Fade in/fade out function
 •Output level adjustment



Rear panel of this unit

Stereo connection cable (included)

L-type cable (not included)

AC power supply cord (included)

Fit a suitable plug to the AC power supply cord.

To the "CD" or "AUX" terminals of the amplifier

To the "SYNCHRO EDIT" terminal of the Technics cassette deck

Note:
 Be sure to connect the stereo connection cable with the amplifier when using the synchro edit function even if the optical cable has been connected.

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

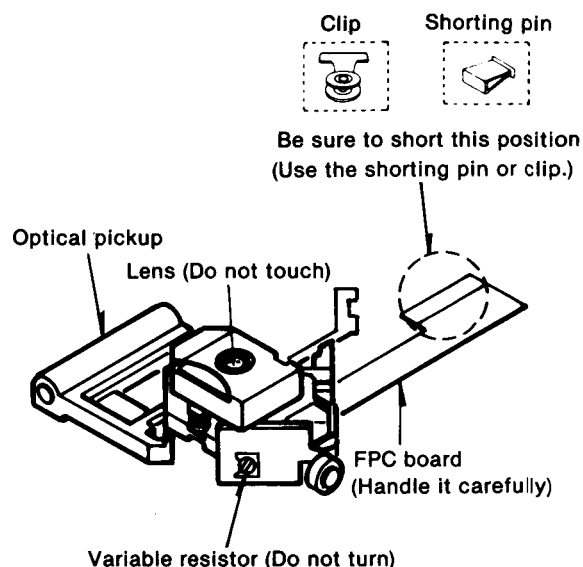
■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

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 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.

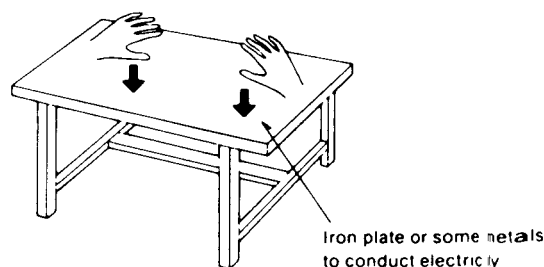
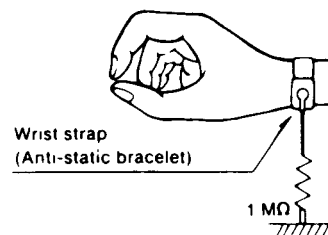


● Grounding for electrostatic breakdown prevention

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.

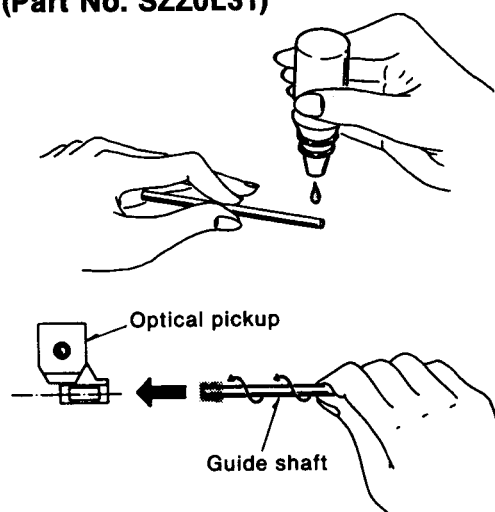


■ INSTRUCTIONS FOR TRAVERSE OIL (Part No. SZZ0L31)

The container contains 6g (approx. 3ml) of oil. Since 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 SZZ0L31 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.

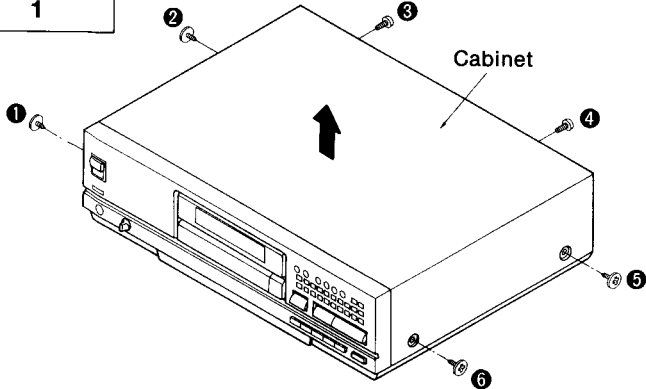
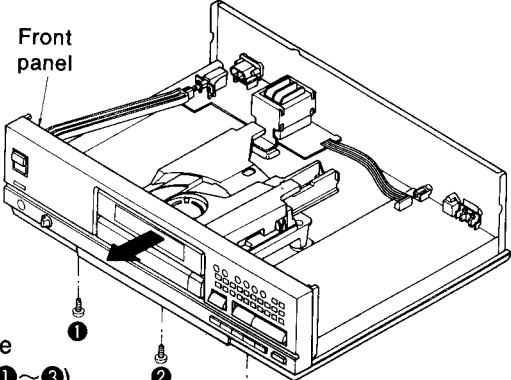
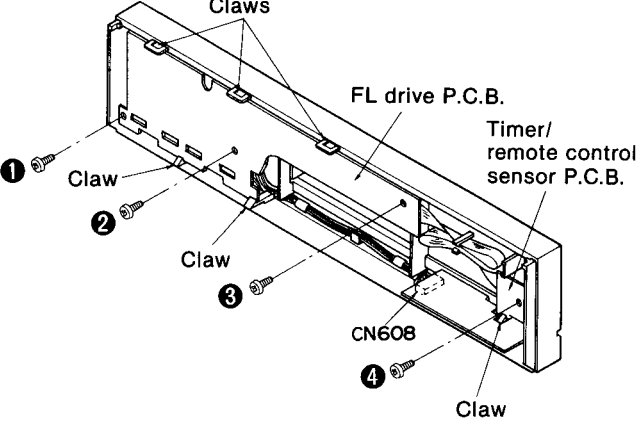
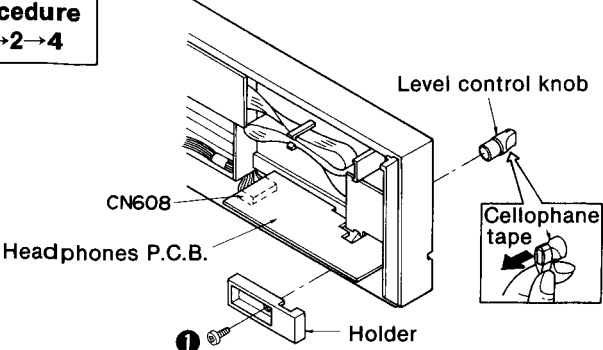
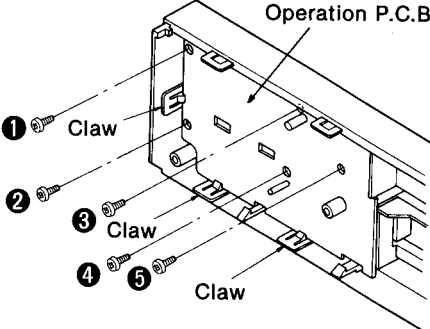


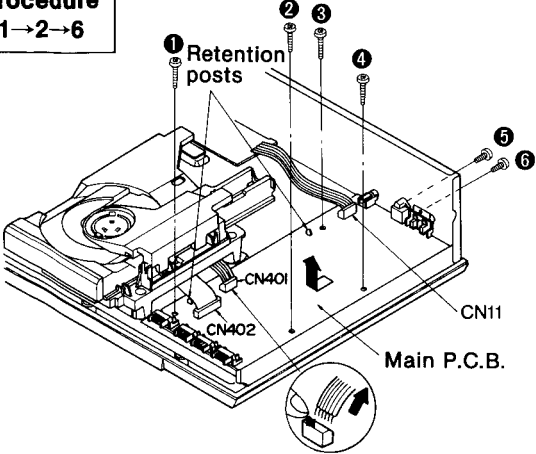
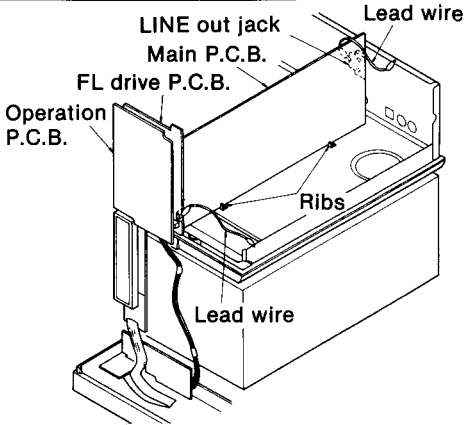
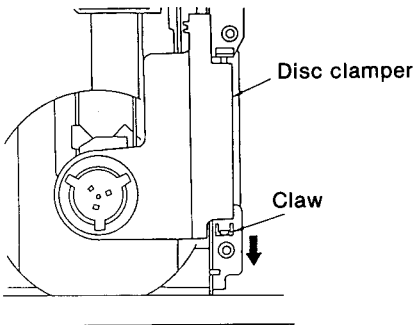
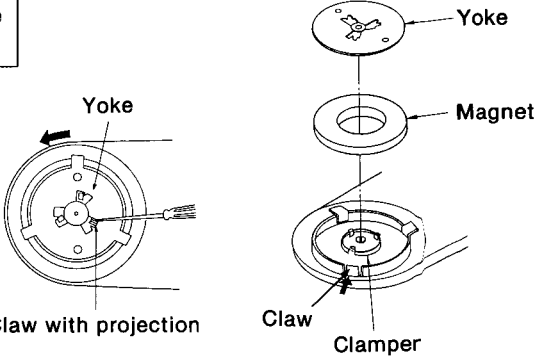
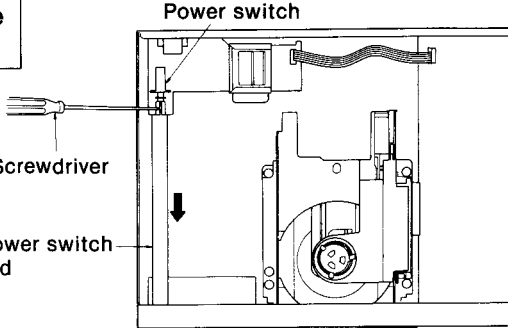
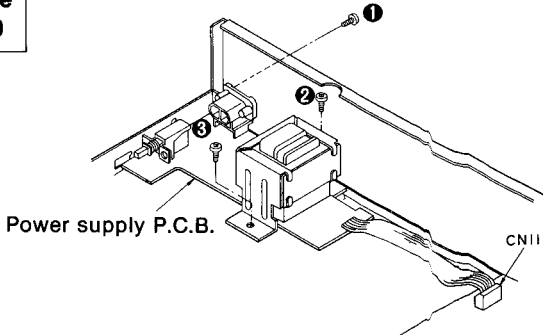
DISASSEMBLY INSTRUCTIONS

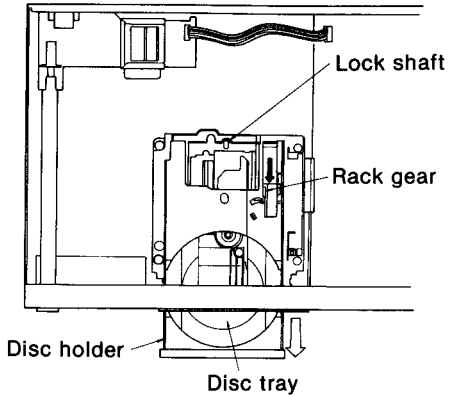
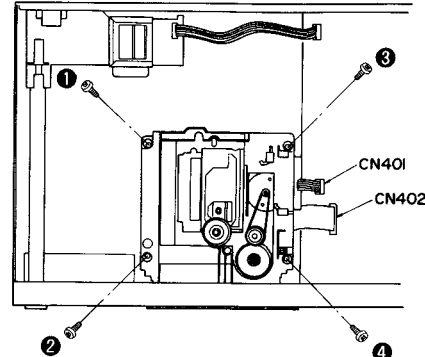
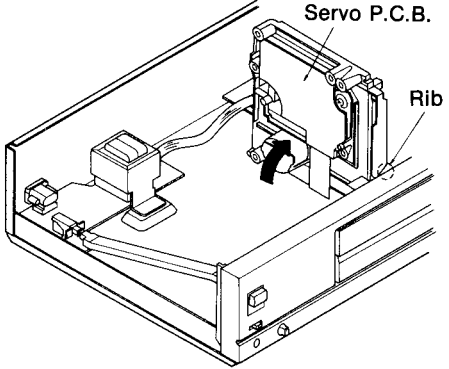
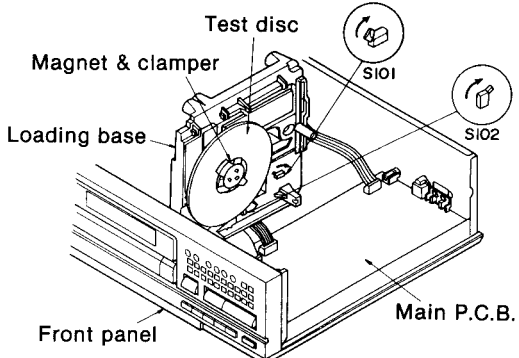
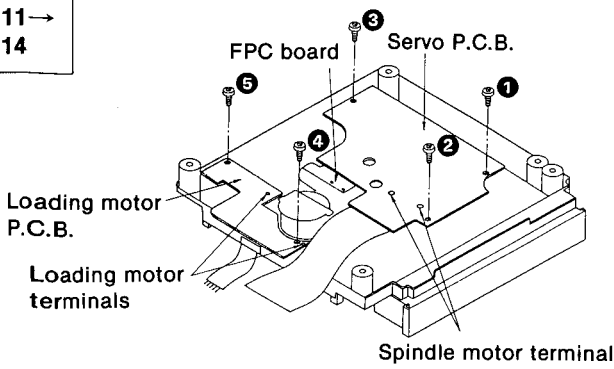
Warning: This product uses a laser diode. Refer to caution statements on page 3.

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	 <p>• Remove the 6 screws (①~⑥).</p>	Procedure 1→2	 <ol style="list-style-type: none"> 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. and timer/remote control sensor P.C.B.		
Procedure 1→2→3	<p>■ Removal of the FL drive P.C.B.</p> <ol style="list-style-type: none"> 1. Remove the 1 connector (CN608). 2. Remove the 3 screws (①~③). 3. Remove the 5 claws. <p>■ Removal of the timer/remote control sensor P.C.B.</p> <ol style="list-style-type: none"> 1. Remove the 1 screw (④). 2. Remove the 1 claw. 		
Ref. No. 4	Removal of the headphones P.C.B.	Ref. No. 5	Removal of the operation P.C.B.
Procedure 1→2→4	 <ol style="list-style-type: none"> 1. Pull out the level control knob. 2. Remove the 1 connector (CN608). 3. Remove the 1 screw (①). 4. Remove the holder. 	Procedure 1→2→3→5	 <ol style="list-style-type: none"> 1. Remove the 5 screws (①~⑤). 2. Remove the 3 claws.

<p>Ref. No. 6</p>	<p>Removal of the main P.C.B.</p>	<p>How to check the main P.C.B.</p>	
<p>Procedure 1→2→6</p>	 <ol style="list-style-type: none"> 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. 	 <ul style="list-style-type: none"> • 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). <ol style="list-style-type: none"> 1. Connect the main P.C.B. ground terminal (LINE OUT 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. 	
<p>Ref. No. 7</p>	<p>Removal of the disc clammer</p>	<p>Ref. No. 8</p>	<p>Removal of the magnet and clammer</p>
<p>Procedure 1→7</p>	 <ul style="list-style-type: none"> • Push the claw in the direction of the arrow and remove the disc clammer. 	<p>Procedure 1→7→8</p>  <ol style="list-style-type: none"> 1. While lifting the claw with a screwdriver, rotate clammer in the direction of the arrow and remove the yoke and magnet. 2. Release the claw of the clammer. 	
<p>Ref. No. 9</p>	<p>Removal of the power switch rod</p>	<p>Ref. No. 10</p>	<p>Removal of the power supply P.C.B.</p>
<p>Procedure 1→9</p>	 <ol style="list-style-type: none"> 1. Set the power switch in the "OFF" position. 2. Remove the power switch rod by using a screwdriver. 	<p>Procedure 1→9→10</p>  <ol style="list-style-type: none"> 1. Remove the 3 screws (①~③). 2. Remove the 1 connector (CN11). 	

<p>Ref. No. 11</p>	<p>Removal of the disc holder</p>	<p>Ref. No. 12</p>	<p>Removal of the loading base</p>
<p>Procedure 1→7→11</p>	 <p>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.</p> <p>Note: Make sure to release the lock shaft.</p>	<p>Procedure 1→7→11→12</p>	 <p>1. Remove the 4 screws (①~④). 2. Remove the 2 flat cables (CN401, CN402).</p>
<p>Ref. No. 13</p>	<p>How to check the servo P.C.B.</p>	<p>How to play the disc</p>	<p>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).</p>
<p>Procedure 1→7→11→12→13</p>	 <ul style="list-style-type: none"> •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). 		<ul style="list-style-type: none"> • Removal of the servo P.C.B. <ol style="list-style-type: none"> 1. Remove the 3 screws (①~③). 2. Unsolder the 2 terminals of spindle motor. 3. Remove the FPC board from the optical pickup. <p>Caution: To prevent the breakdown of the laser diode, antistatic shorting pin is inserted into the FPC board.</p> • Removal of the loading motor P.C.B. <ol style="list-style-type: none"> 1. Remove the 2 screws (④, ⑤). 2. Unsolder the 2 terminals of loading motor.
<p>Ref. No. 14</p>	<p>Removal of the servo P.C.B. and loading motor P.C.B.</p>		
<p>Procedure 1→7→11→12→14</p>			

Ref. No. 15	Removal of the loading motor
Procedure 1→7→11→ 12→15	<p>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.</p>

Ref. No. 16	Removal of the optical pickup
Procedure 1→7→11→ 12→14→16	<p>Refer to the handling precautions for optical pickup and instructions for traverse oil (See page 7).</p> <p>1. Remove the 2 screws (1, 2). 2. Unsolder the 2 terminals and the 2 screws (3, 4).</p> <p>Caution: Take care not to touch the brush terminal.</p>

Ref. No. 17	Removal of the spindle motor
Procedure 1→6→8→9 →11→17	<p>1. Loosen the screw (1) by using a 1.27 mm allen wrench and remove the turntable. 2. Remove the 2 screws (2, 3).</p> <p>Caution:</p> <p>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.</p> <p>Adjustment of turntable height</p> <p>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.</p> <p>Caution: Refer to turntable height adjustment (see page 13).</p>

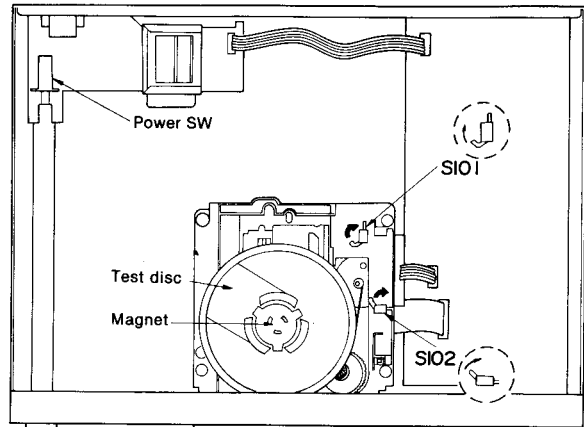
MEASUREMENTS AND ADJUSTMENTS

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.

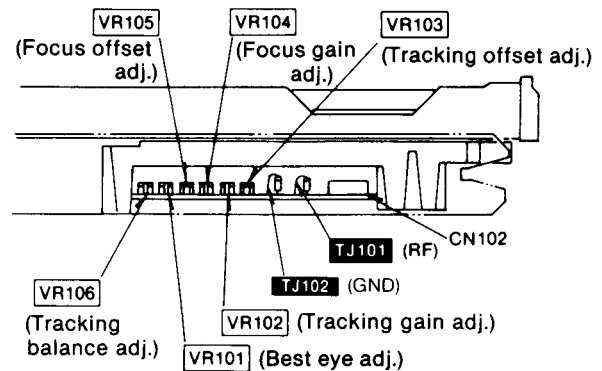
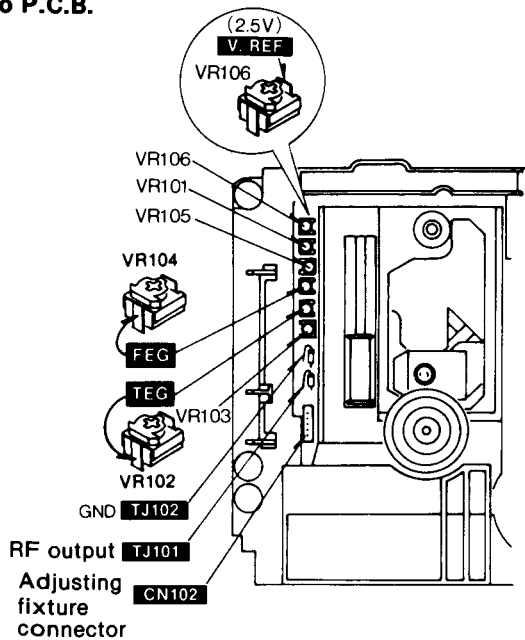
PREPARATION

1. Remove the cabinet (see Ref. No. 1 of the disassembly instructions).
2. Remove the disc clumper and magnet (see Ref. No. 7, 8 of the same).
3. Remove the disc holder and power switch rod (see Ref. No. 9, 11 of the same).
4. Place the test disc and magnet on the turntable.
5. Switch the player on.
6. 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.

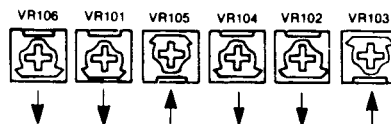


ADJUSTMENT POINTS

• 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.

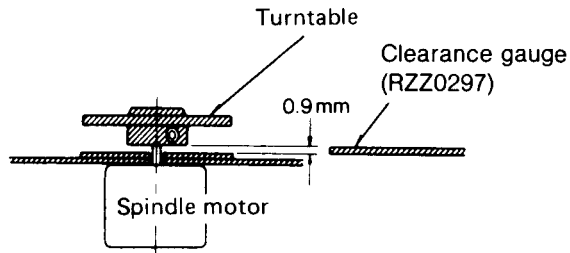
(Note: A voltage of 2.5V appears at the V. REF terminal. Take care not to short the player's chassis to the oscilloscope ground.)

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

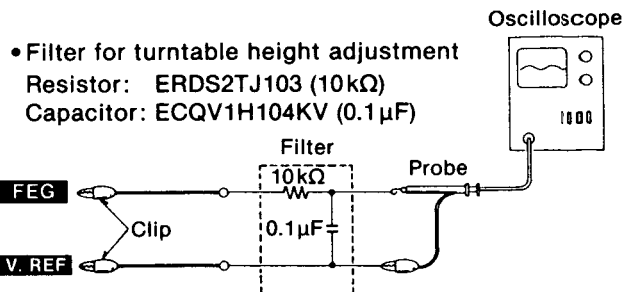
4. Adjust oscilloscope's DC zero balance.
5. Switch the player power ON, and play the test disc (SZZP1014F or SZZP1054C).
6. Measure the voltage amplitude of the signal on the oscilloscope.

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.)



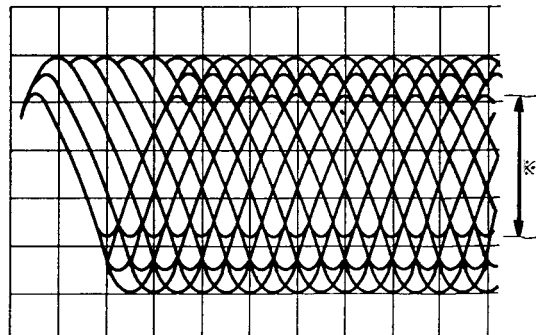
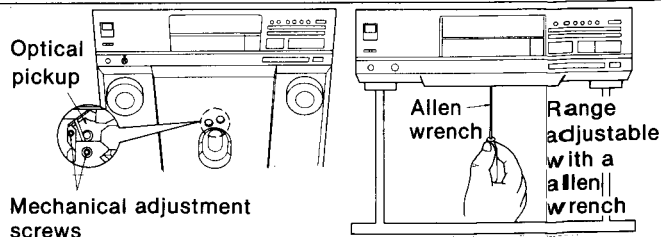
- Filter for turntable height adjustment
- Resistor: ERDS2TJ103 (10kΩ)
- Capacitor: ECQV1H104KV (0.1µF)

(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 µs.
 Input coupling ... AC

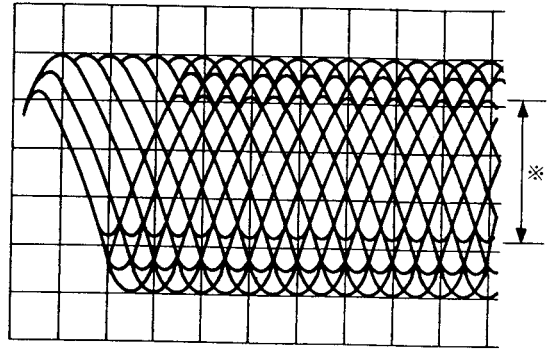
2. Switch the player power ON, and play track 9 on the test disc (SZZP1056C). (Playing any other track may yield a false adjustment.)
3. Leave the player in Play mode, and place it as shown in the figure on the right.
4. Alternately adjust the two mechanical adjusting screws with the 2.0mm allen wrench (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

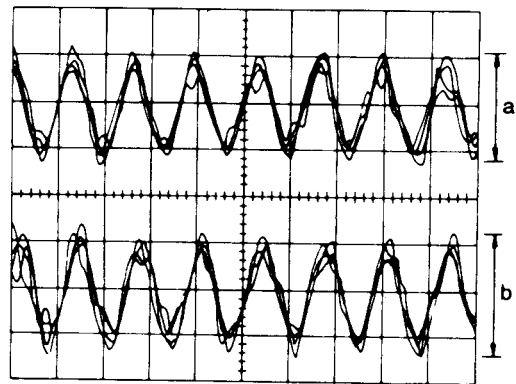
1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (-) on the Servo P.C.B.
Oscilloscope setting: VOLT 100 mV
SWEEP 0.5 μ s
Input coupling . . . AC
2. Switch the player power **ON**, and play the 1kHz (track 1) on the test disc (SZZP1054C).
3. Adjust **VR101** until the vertical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



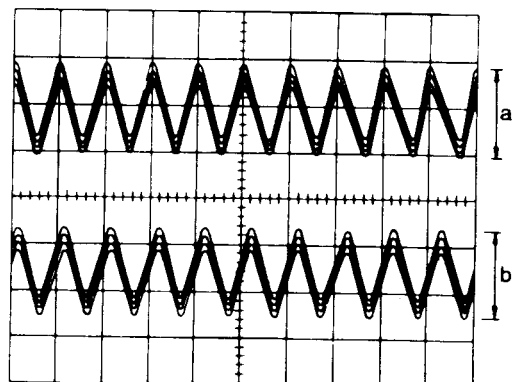
* Most stretched eye pattern.

(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
(both 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
(both 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.

(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).

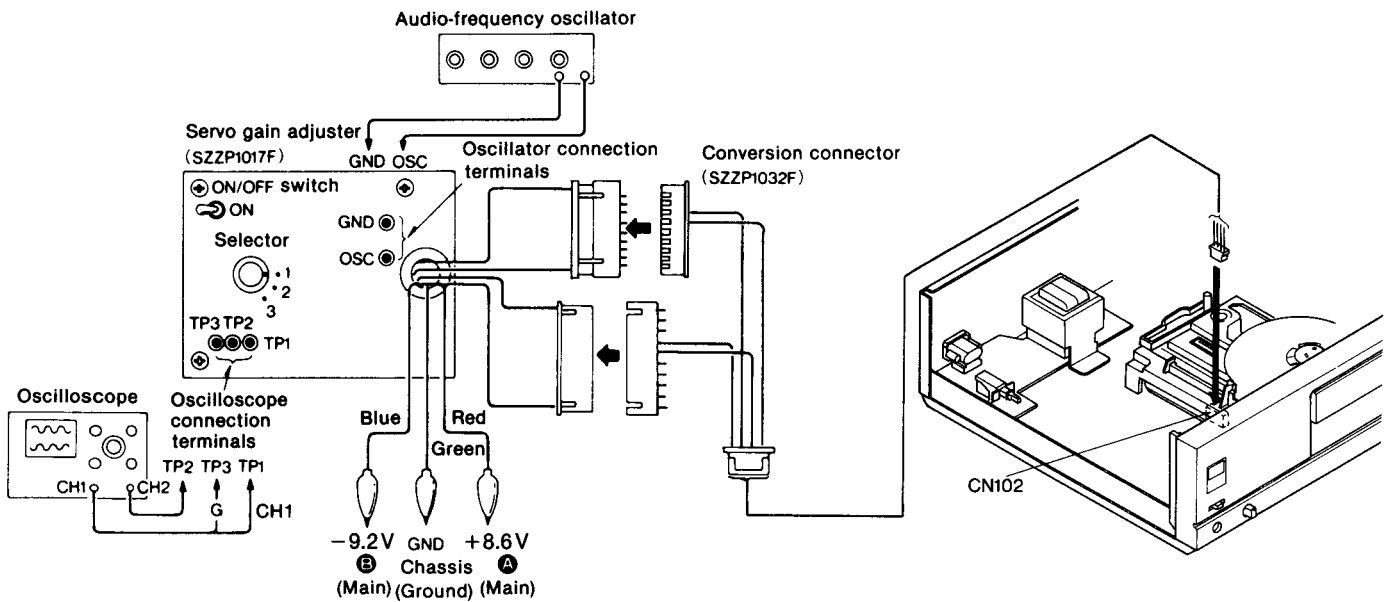
*** Checking Manual Search**

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).

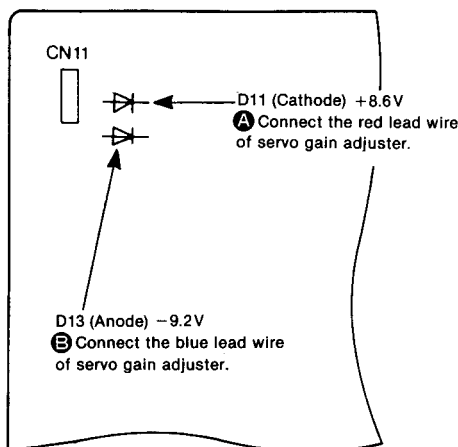
*** Checking Using Defect Disc**

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
1	AMP1	I	RF signal input (X30 amp.)
2	PDAD	I	Photo detector current input (A2)
3	PDA	I	Photo detector current input (A1)
4	PDBD	I	Photo detector current input (A4)
5	PDB	I	Photo detector current input (A3)
6	LPD	I	Non-inverting laser power input
7	LD	O	Laser power auto control output
8	FBL1	I	PD balance adjustment
9	FBL2	I	
10	TBL1	I	Tracking balance adjustment
11	TBL2	I	
12	FOOFS	I	Focus offset adjustment
13	IVA	O	Current/voltage conversion output (A)
14	IVB	O	Current/voltage conversion output (B)
15	FE	O	Focus gain adjustment output
16	FPI	I	Focus error signal input
17	TPI	I	Tracking error signal input
18	C. TPL	I	Tracking error filter capacitor input
19	C. TPH		
20	C. FPL	I	Focus error filter capacitor input
21	C. FPH		

Pin No.	Mark	I/O Division	Function
22	TPO	O	Tracking error signal output
23	FPO	O	Focus error signal output
24	FGC	I	Focus gain up signal input (Not used, connected to GND)
25	TGC	I	Tracking gain up signal input (Not used, connected to GND)
26	GD	I	Focus/Tracking down signal input (Not used, connected to GND)
27	PTO	O	Position detecting amp. output
28	PTI	I	Position detecting amp. input
29	PBO	O	Position detecting buffer output
30	POT	I	Position detecting buffer input
31	BDO	O	Dropout detection output
32	RFDET	O	RF detection signal output
33	SDO	O	Dropout detection pulse output
34	C. SBDO	I	Dropout detecting capacitor input
35	ARF	O	RF signal output
36	C. AGC	I	AGC detecting capacitor input
37	VCC	I	Power supply terminal
38	LDON	I	Laser power control input
39	RF IN	I	RF signal input
40	AMPO	O	RF signal output
41	VREF	O	Reference voltage output
42	GND	—	Ground terminal

● IC102 (AN8374S): Servo processor

Pin No.	Mark	I/O Division	Function
1	LSA	I	Phase difference input (A)
2	LSB	I	Phase difference input (B)
3	TEOFS	O	Tracking offset adjustment
4	TE	O	Tracking gain adjustment
5	TEG	I	
6	TE OUT	O	Tracking error signal output
7	TE BPF	I	Tracking error gain detecting filter (Not used, open)
8	FEG	I	Focus gain adjustment
9	FE OUT	O	Focus error signal output
10	CLW	O	Triangular wave oscillator capacitor output
11	VREF	I	Reference voltage input
12	ARF	I	RF signal input
13	CDSL	I	Data slice filter capacitor input
14	FPC	I	Frequency difference signal input
15	GND	—	Ground terminal
16	C. PLL	I	PLL loop filter constant
17	VSS	—	Ground terminal
18	CLK	I	Frequency pull-in clock signal (88.2 kHz) input
19	SRF	O	Sliced and digitized RF signal output
20	PCK	O	Clock output extracted from SRF
21	EFM	O	EFM signal output synchronous with PCK

Pin No.	Mark	I/O Division	Function
22	VDD	I	Power supply terminal
23	SPCNT	O	Track crossing speed control output (Not used, open)
24	SENSE	O	Selector output (track crossing state)
25	TRV	O	Traverse servo control output
26	FLOCK	O	Focus lock signal output
27	KICK	O	Track kick signal output
28	LDON	O	Laser power control output
29	VDET	O	Focus/tracking gain up output (Not used, open)
30	CNT1	I	Control input (FOON: Focus Servo On signal)
31	CNT2	I	Control input (TRON: Tracking Servo On signal)
32	CNT3	I	Control input (KICKF: Kick Direction (Forward) command)
33	CNT4	I	Control input (KICKR: Kick Direction (Backward) command)
34	TRVF	I	Traverse forward command signal
35	TRVR	I	Traverse backward command signal
36	<u>RFDET</u>	I	RF detection signal input
37	BDO	I	Dropout detection input
38	VCC	I	Power supply terminal
39	TVPO	O	Traverse position detecting resistor/capacitor inputs
40	TVPI	I	
41	BROUT	O	Tracking drive control output
42	BRIN	I	Tracking error signal input

● IC103 (AN3877N): BTL drive

Pin No.	Mark	I/O Division	Function
1	PVCC	I	Drive power supply
2	VCC	I	Power supply terminal
3	TB	O	External transistor base driving output
4	VMON	O	Voltage output
5	TVDI	I	Traverse error signal input
6	FDI	I	Focus error signal input
7	TDI	I	Tracking error signal input
8	VREF	I	Reference voltage input

Pin No.	Mark	I/O Division	Function
9	TD-	O	Inverting output of tracking driver
10	TD+	O	Non-inverting output of tracking driver
11	FD-	O	Inverting output of focus driver
12	FD+	O	Non-inverting output of focus driver
13	TVD-	O	Inverting output of traverse driver
14	TVD+	O	Non-inverting output of traverse driver
15	<u>RESET</u>	O	Reset signal output
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 (7.35kHz) (Not used, open)
3	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")
4	SRDATA	O	Serial data output (MSB first)
5	SCK	O	Serial bit clock output
6	LRCK	O	LR discrimination signal output
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 (Not used, open)
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{OE} signal
53	RAM/WE	O	16K RAM \overline{WE} signal
54 64	RAM/A0 RAM/A10	O	16K RAM address signal (RAMA0: LSB, RAMA10: MSB)

• IC401 (MN1554PJZ-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
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 (MB88725BPJV): System control and FL drive

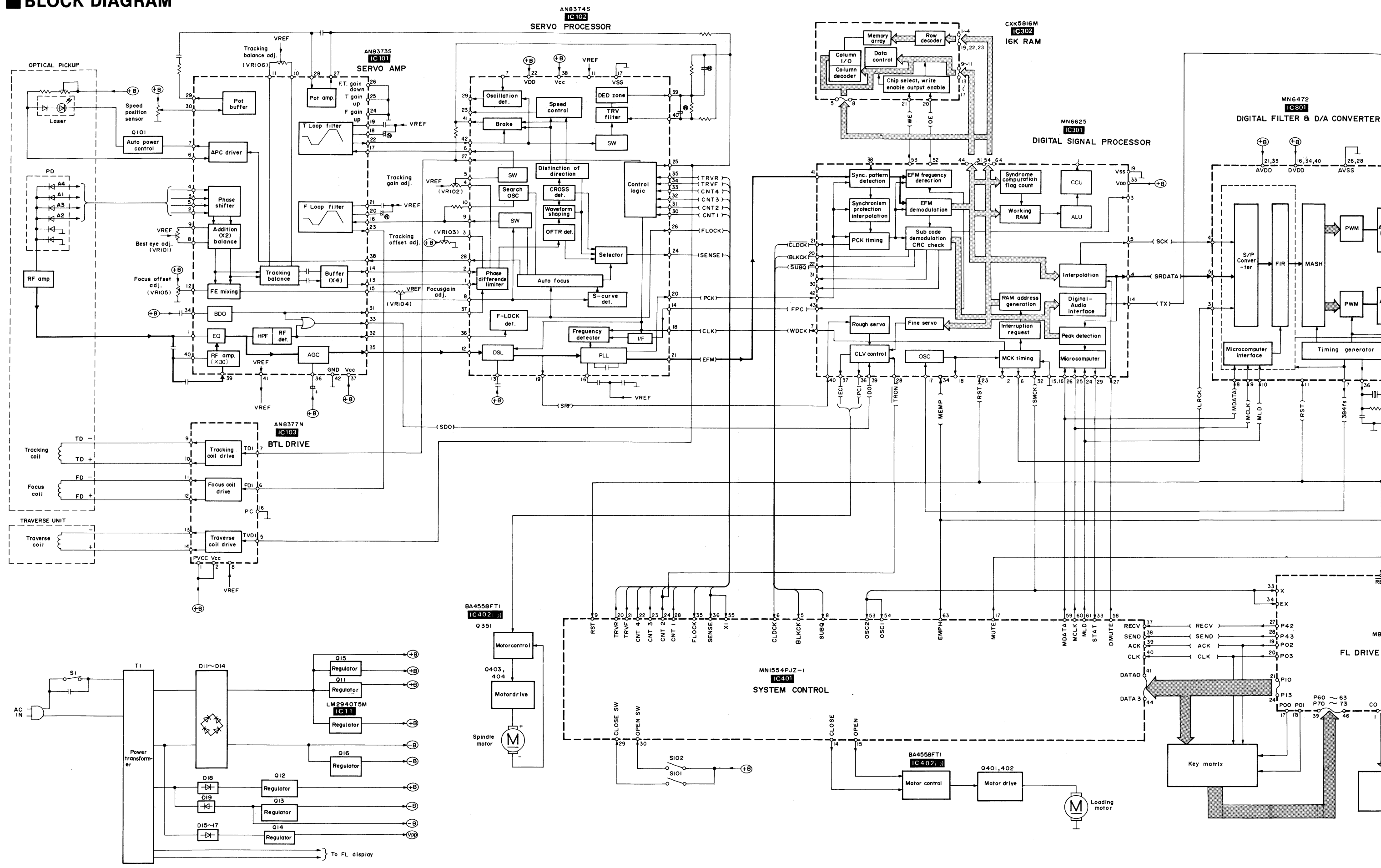
Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1 } 14	C0 } C13	O	FL grid signal	33	X	I	Clock signal input (4.2336MHz)
				34	EX		
15	C14	O	LED drive signal (PAUSE)	35	SE	I	Not used, connected to power supply
16	C15	O	LED drive signal (PLAY)	36	FD	—	GND terminal
17	P00	O	Key scan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

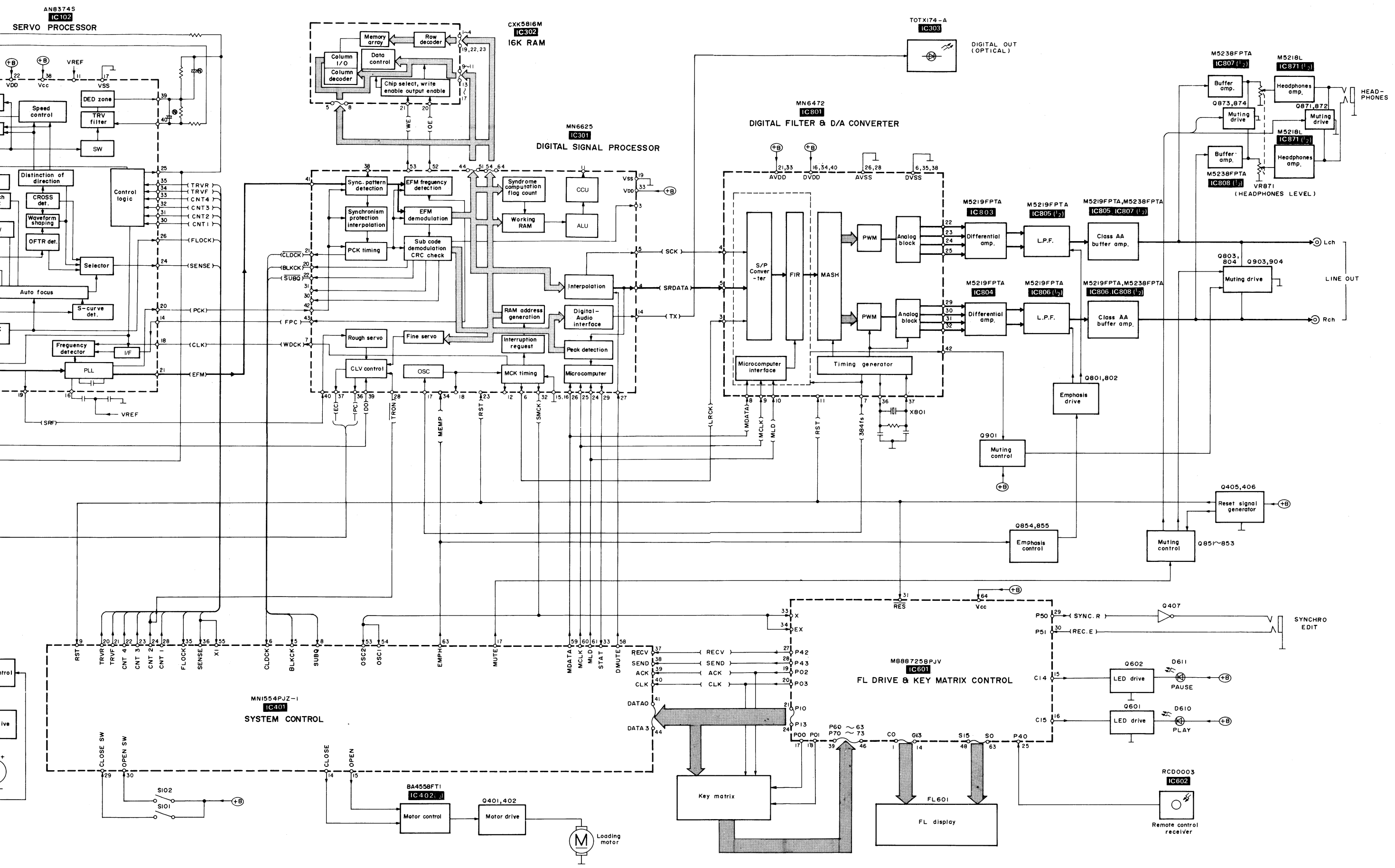
• IC801 (MN6472): Digital filter & D/A converter

Pin No.	Mark	I/O Division	Function
1	192fs	O	192 fs (8.4672MHz) output (Not used, open)
2	LRPOL	I	L/R clock selector (Not used, connected power supply)
3	LRCLK	I	L/R discrimination signal input
4	BCLK	I	Serial bit clock input
5	SR DATA	I	Serial data input (MSB first)
6	DV _{SS}	—	Digital GND terminal
7	384fs	O	384 fs (16.9344MHz) output
8	MDATA	I	Mode control data
9	MCLK	I	Data clock for MDATA
10	MLD	I	Command load input (load: L)
11	RST	I	Reset signal input
12	IE	I	(Not used, open)
13	TP1	O	Test terminal
14	TP2		
15	TEST1	I	Test terminal 1 (Connected to GND)
16	D V _{DD}	I	Digital power supply terminal
17	TEST2	I	Test terminal 2 (Connected to GND)
18	X3	I	(Not used, connected to GND)
19	SEL1	I	(Not used, connected to GND)
20	SEL2	I	(Not used, connected to GND)
21	A V _{DD} 1	I	Analog power supply terminal

Pin No.	Mark	I/O Division	Function
22	OUTL2 (-)	O	Lch data output (-)
23	OUTL2 (+)	O	Lch data output (+)
24	OUTL1 (-)	O	Lch data output (-)
25	OUTL1 (+)	O	Lch data output (+)
26	A V _{SS} 1	—	Analog GND terminal
27	NC	—	Not connected
28	A V _{SS} 2	—	Analog GND terminal
29	OUTR1 (+)	O	Rch data output (+)
30	OUTR1 (-)	O	Rch data output (-)
31	OUTR2 (+)	O	Rch data output (+)
32	OUTR2 (-)	O	Rch data output (-)
33	A V _{DD} 2	I	Analog power supply terminal
34	D V _{DD} 1	I	Digital power supply terminal
35	D V _{SS} 1	I	Digital GND terminal
36	X2	O	Clock output
37	X1	I	Clock input
38	D V _{SS} 2	—	Digital GND terminal
39	NSUB	I	Sub-strate terminal (Not used, connected to power supply)
40	D V _{DD} 2	I	Digital power supply terminal
41	CLK SEL	—	(Not used, connected to GND)
42	ZFLAGB	O	Zero input det. terminal

BLOCK DIAGRAM





Note:
 → Audio signal

SCHEMATIC DIAGRAM (Parts list on pages 44, 45, 51, 52.)

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

Notes:

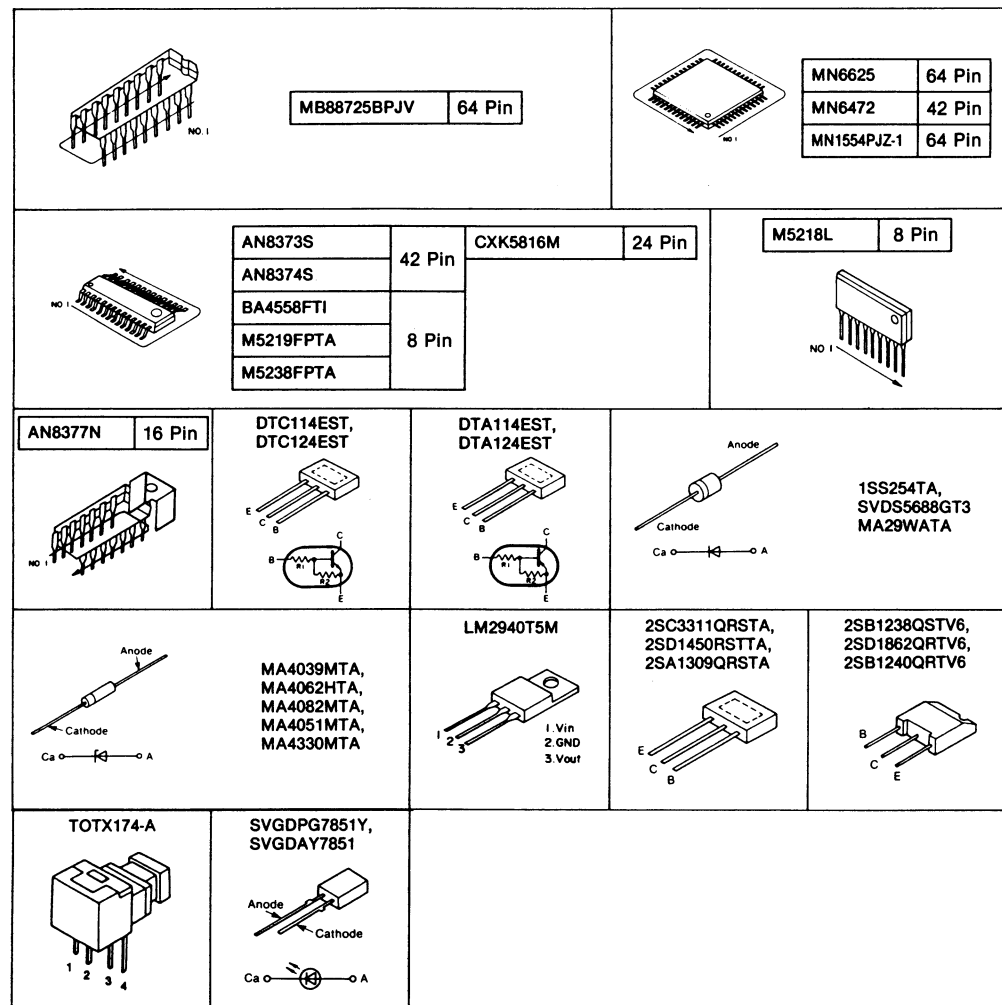
- **S1** : Power switch in "on" position.
- **S2** : Voltage selector switch. (For [GC, PX] areas.)
- **S101, 102** : Disc holder open/close detection switch.
- **S601** : Tape side select (side A/B) switch.
- **S602** : Time fade (time fade) switch.
- **S603** : Program (program) switch.
- **S604** : Tape length (tape length) switch.
- **S605** : Peak level search (peak search) switch.
- **S606** : Display on/off (display on/off) switch.
- **S607** : Recall (recall) switch.
- **S608** : Disc link (disc link) switch.
- **S609** : Just time (just time) switch.
- **S610** : Time mode select (time mode) switch.
- **S611** : Clear (Clear) switch.
- **S612~617** : Numeric (0~20) switches.
- **S618** : Disc holder open/close (\blacktriangle open/close) switch.
- **S625** : Stop (\blacksquare stop) switch.
- **S631** : Pause (\blacksquare pause) switch.
- **S637** : Play (\blacktriangleright play) switch.
- **S638** : Timer (timer) switch.
- **S639** : Auto cue (auto cue) 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 1 kHz, L+R, 0dB), others are voltage values in stop mode.

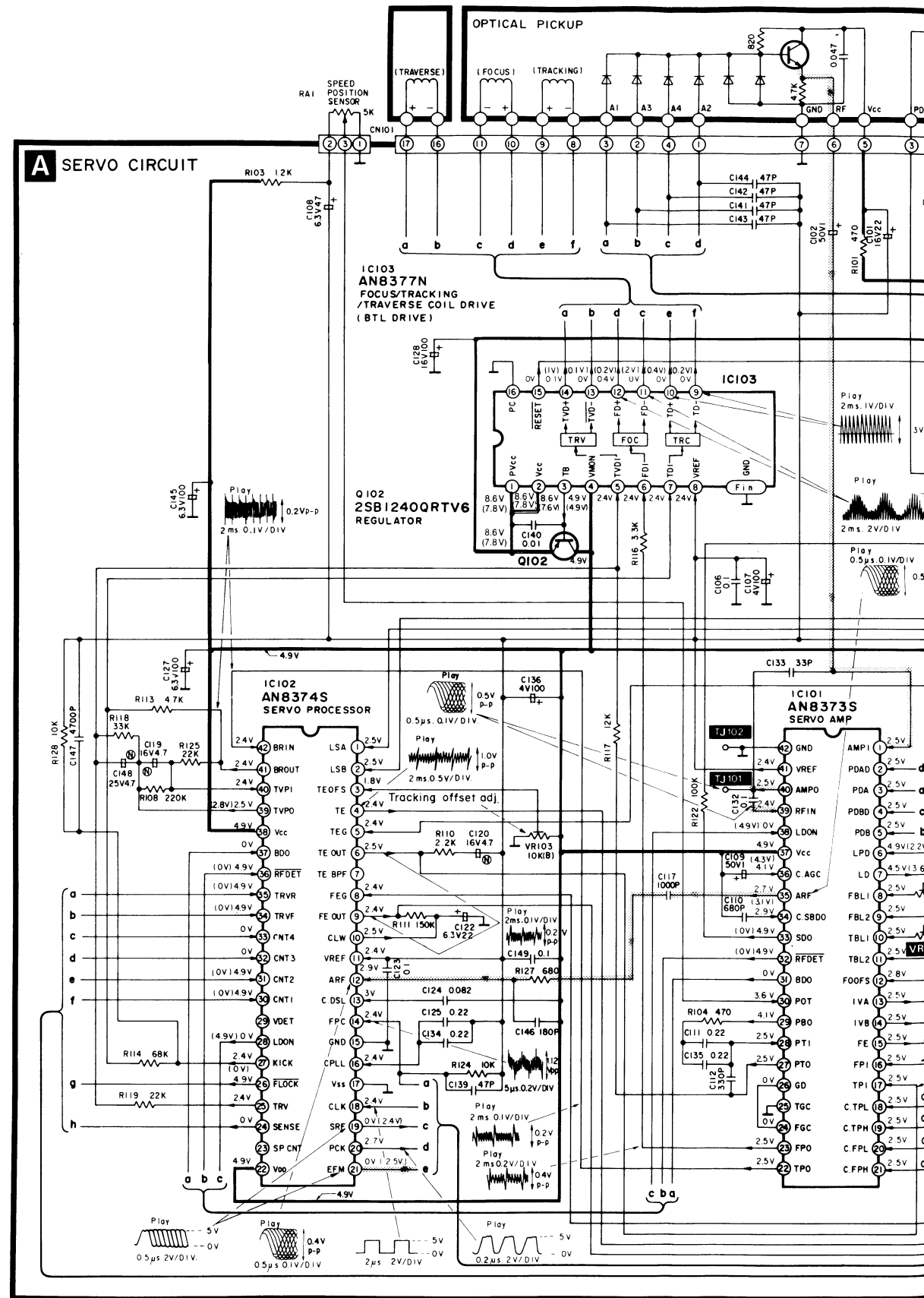
• Important safety notice:
Components identified by \triangle mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
• - < > - / < > : Positive voltage lines and negative voltage lines.
• \dashv : audio signal lines.

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



1
2
3
4
5
A
B
C
D
E
F
G



1 2 3 4 5 6 7 8 9

A

B

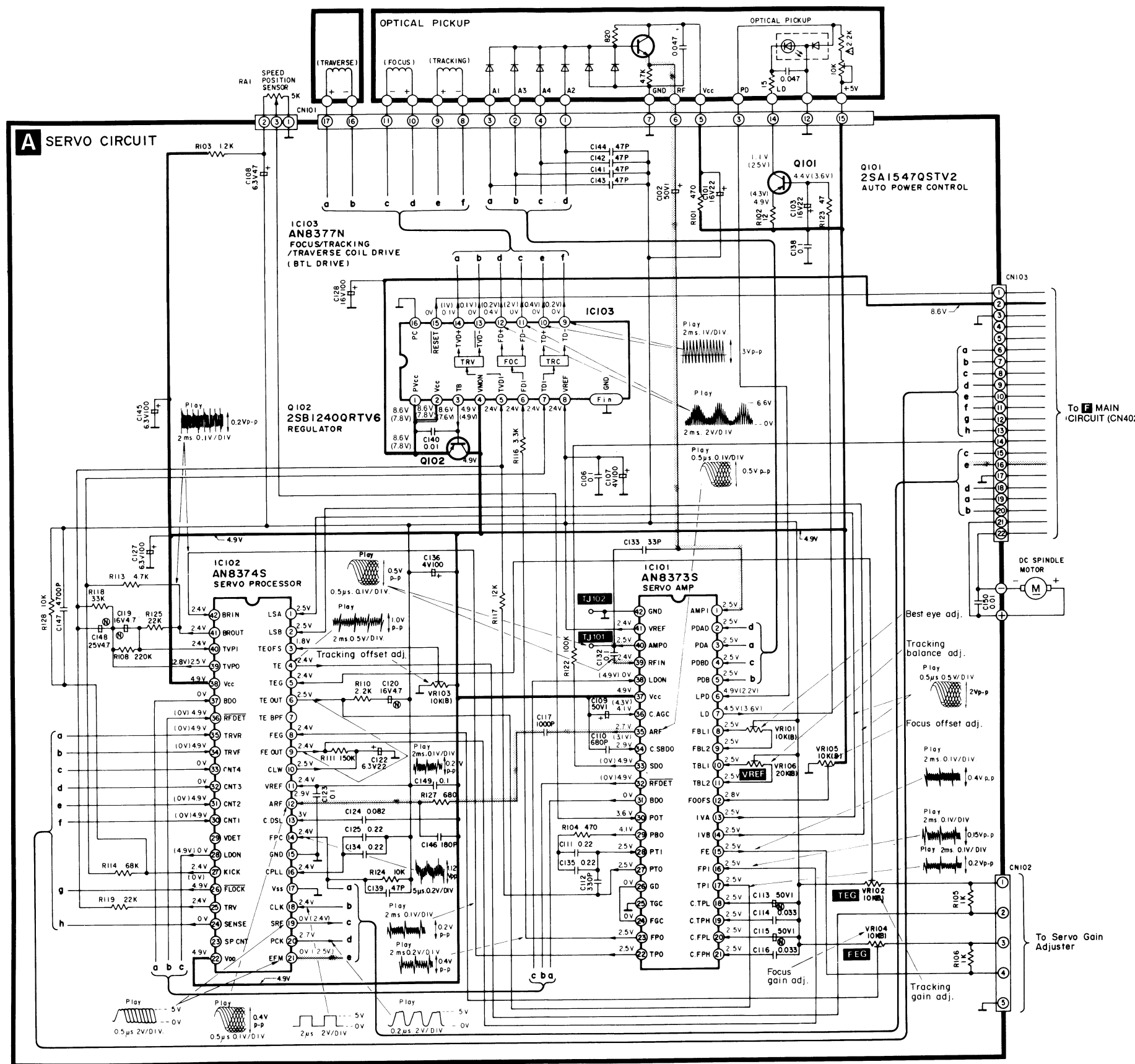
C

D

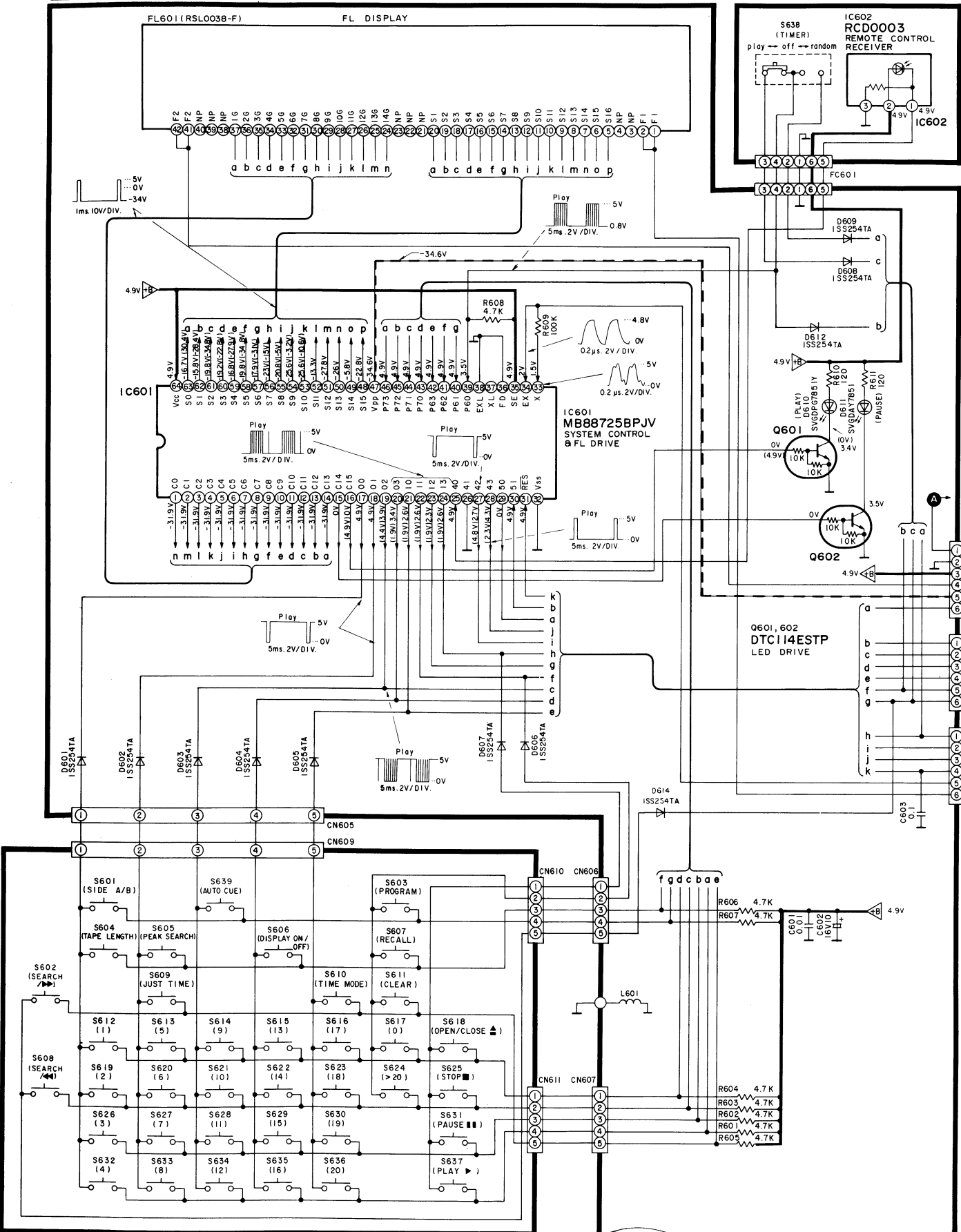
E

F

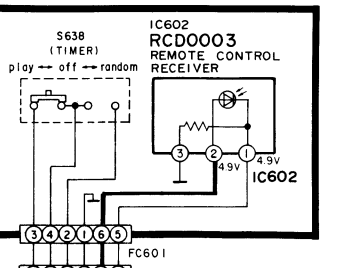
G



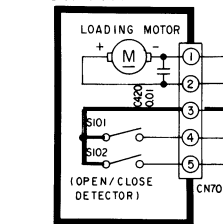
B FL DRIVE CIRCUIT



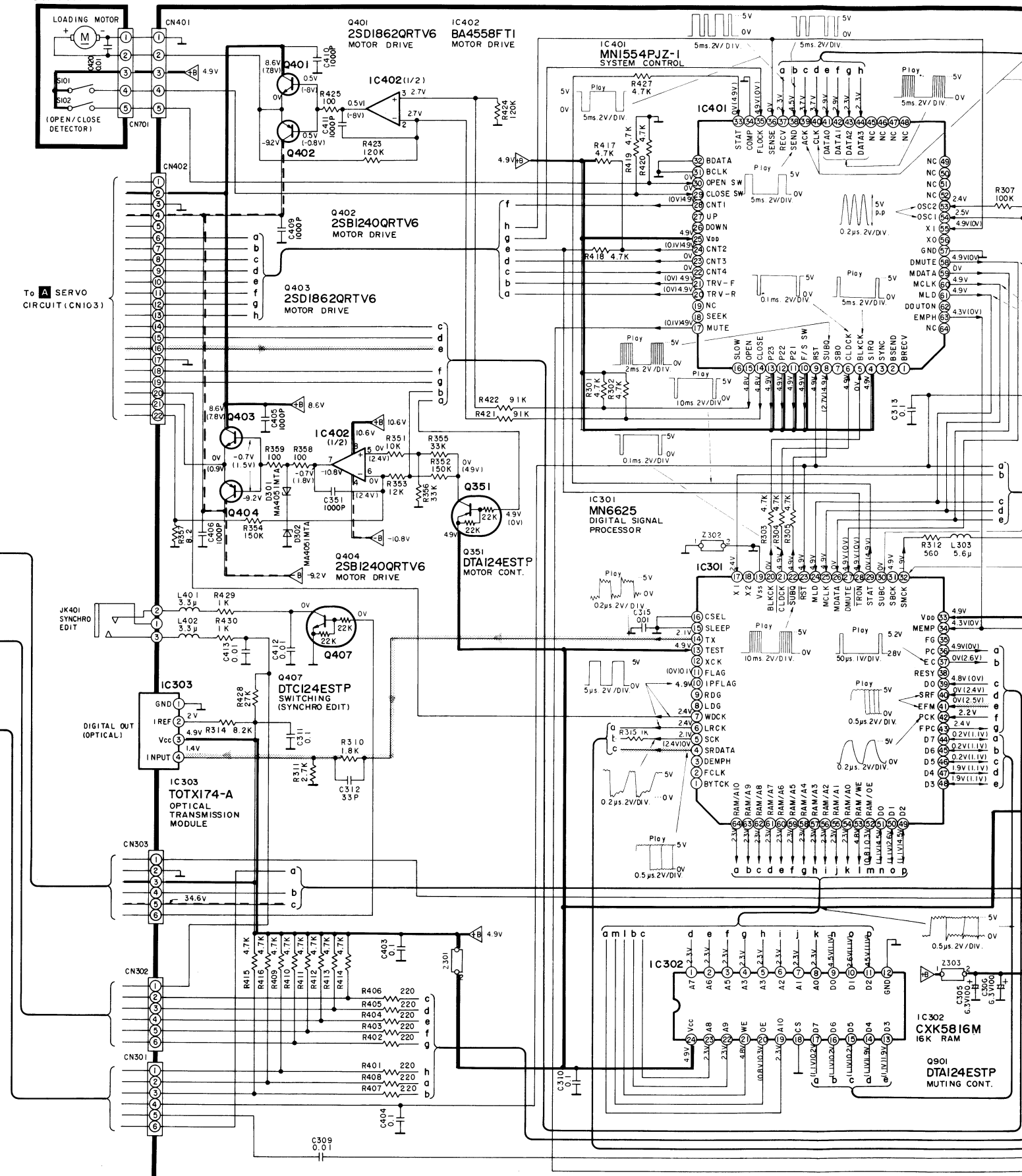
D TIMER SWITCH/REMOTE SENSOR CIRCUIT



E MOTOR/SWITCH CIRCUIT

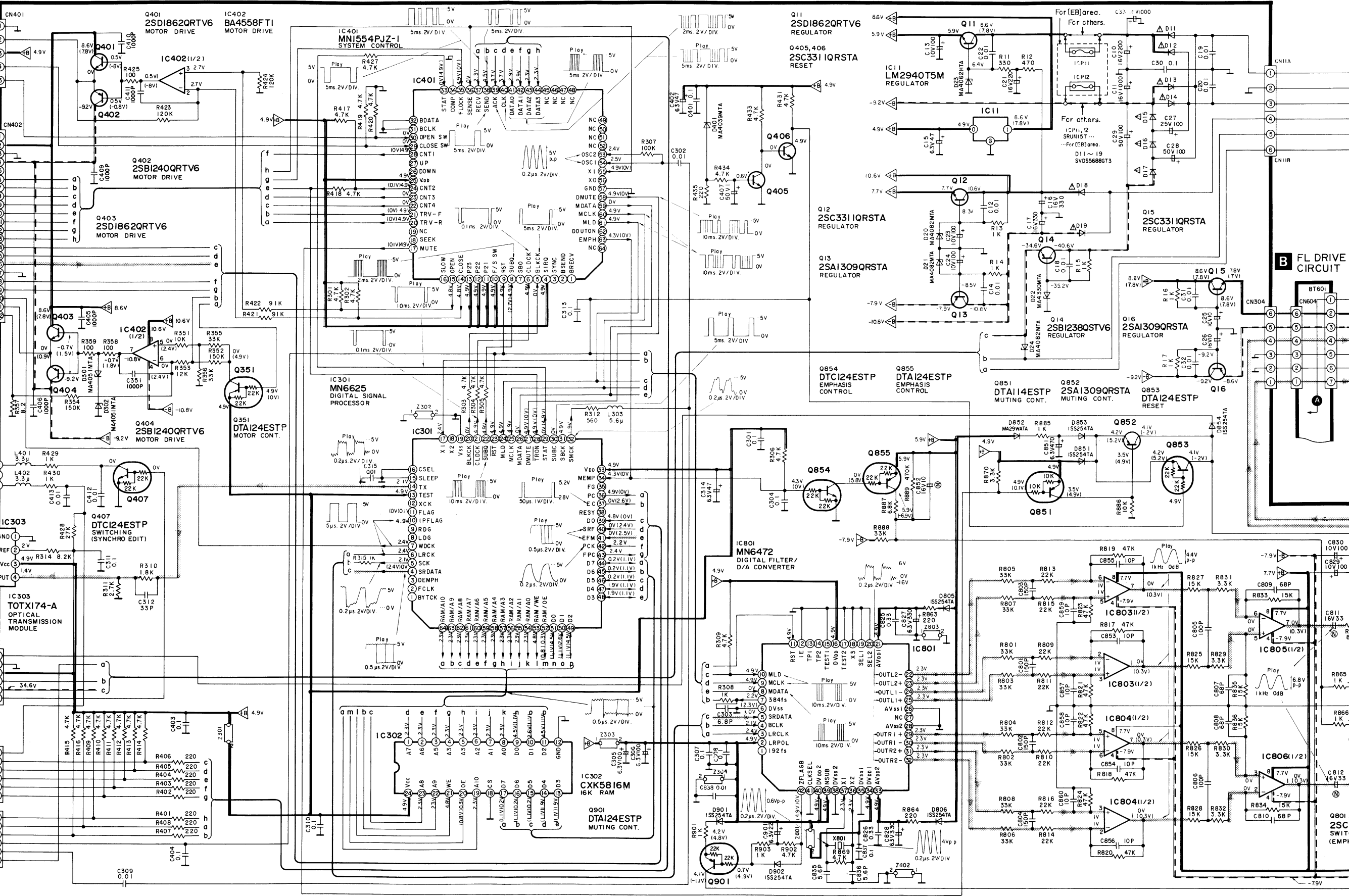


F MAIN CIRCUIT

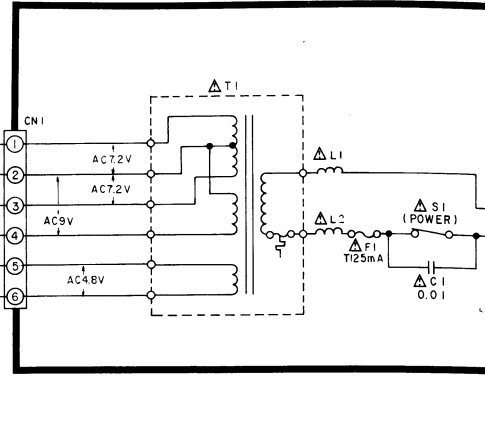


C OPERATION CIRCUIT

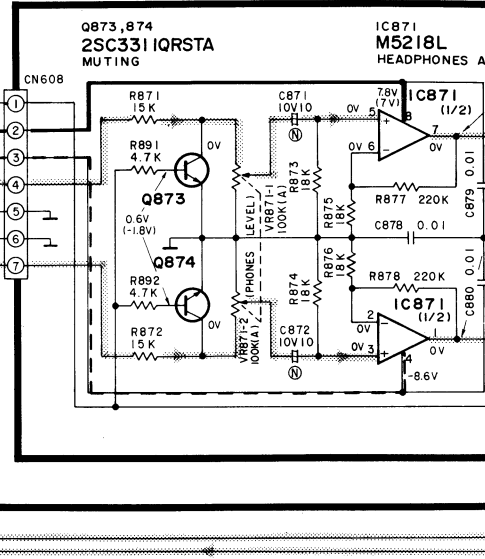
F MAIN CIRCUIT



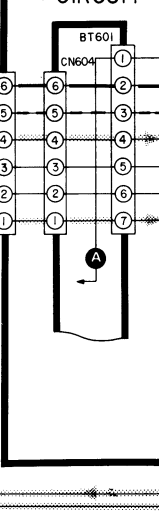
G POWER SUPPLY CIRCUIT For [E,EG,GN]

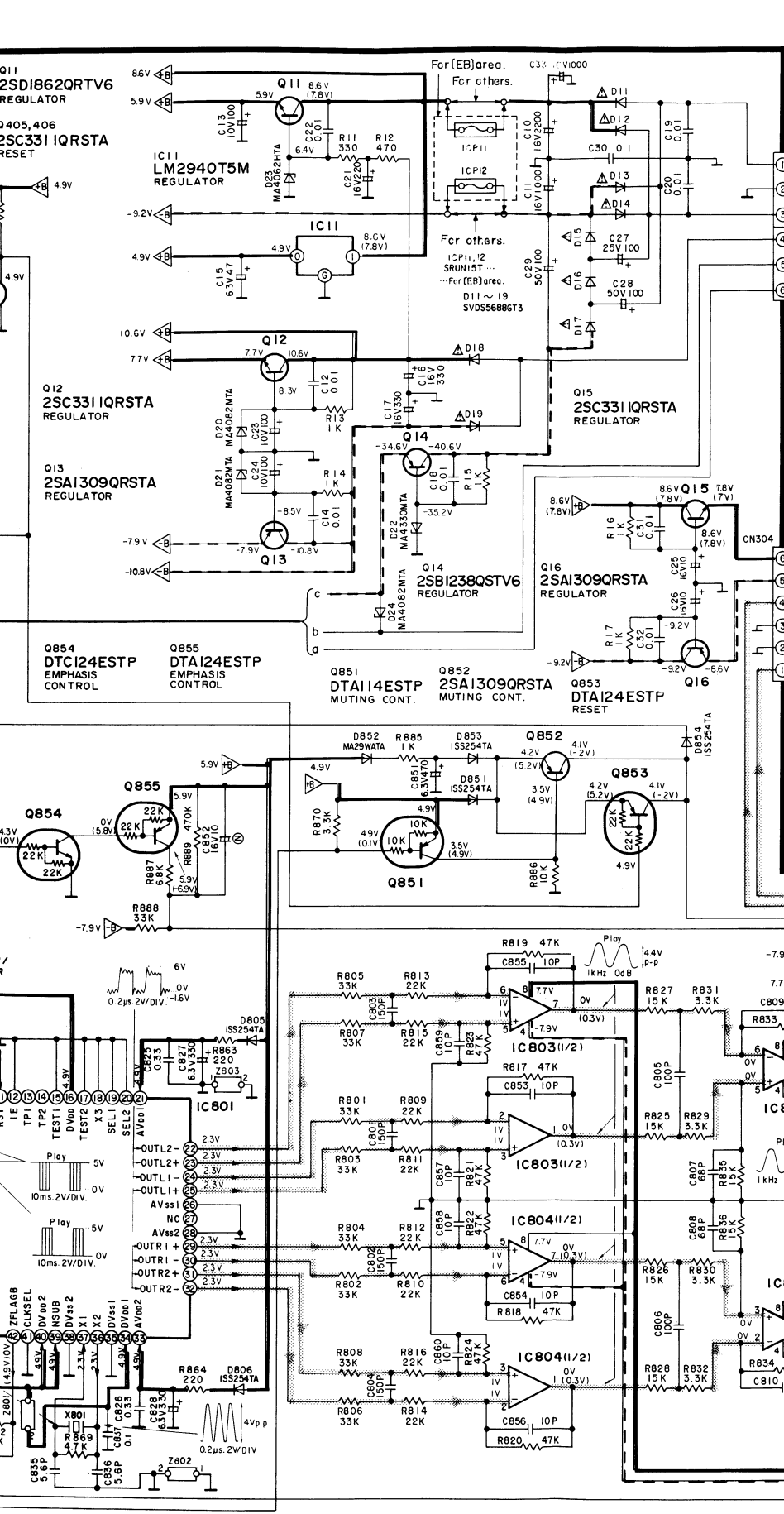


H HEADPHONES JACK CIRCUIT

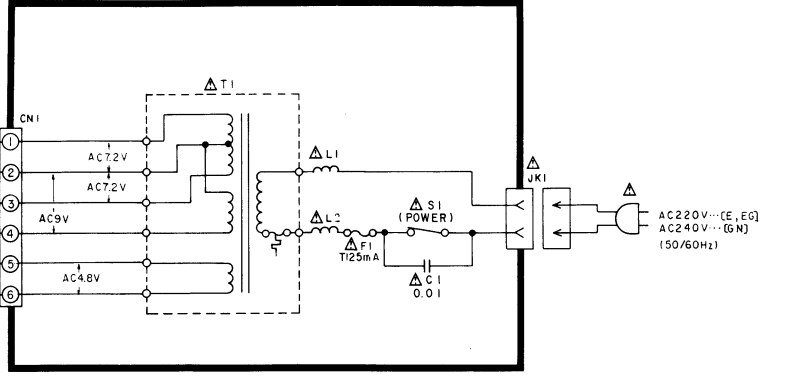


B FL DRIVE CIRCUIT

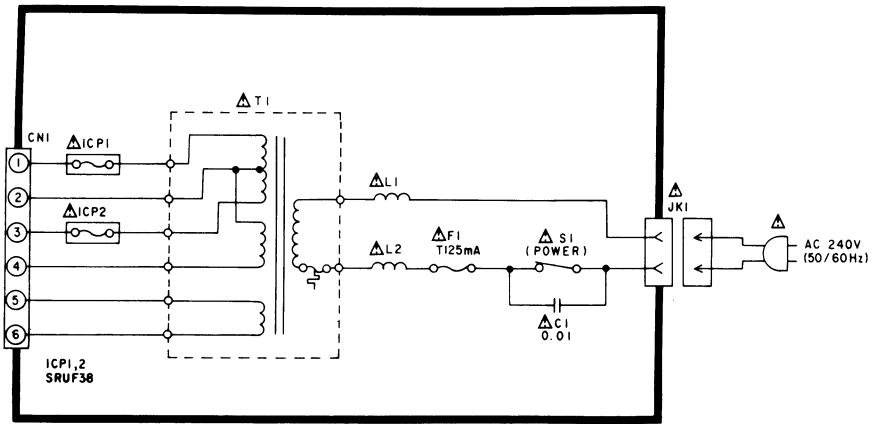




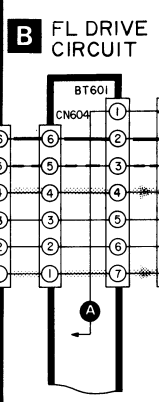
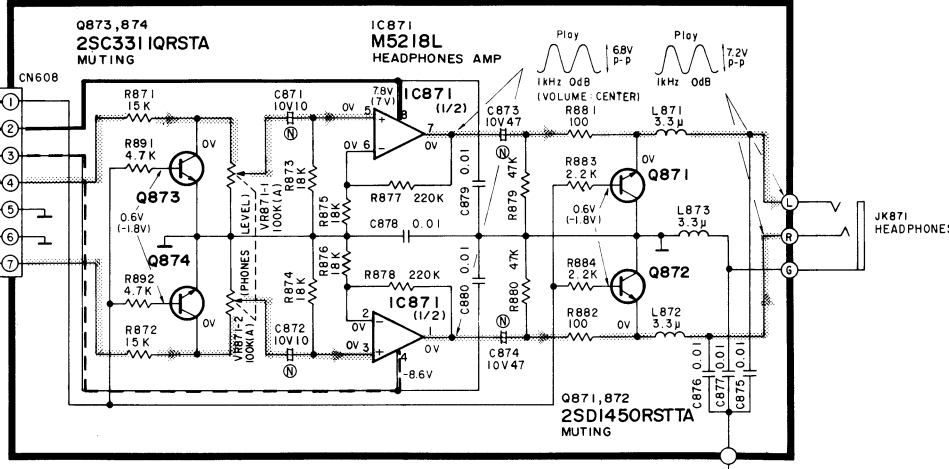
G POWER SUPPLY CIRCUIT For [E,EG,GN] areas.



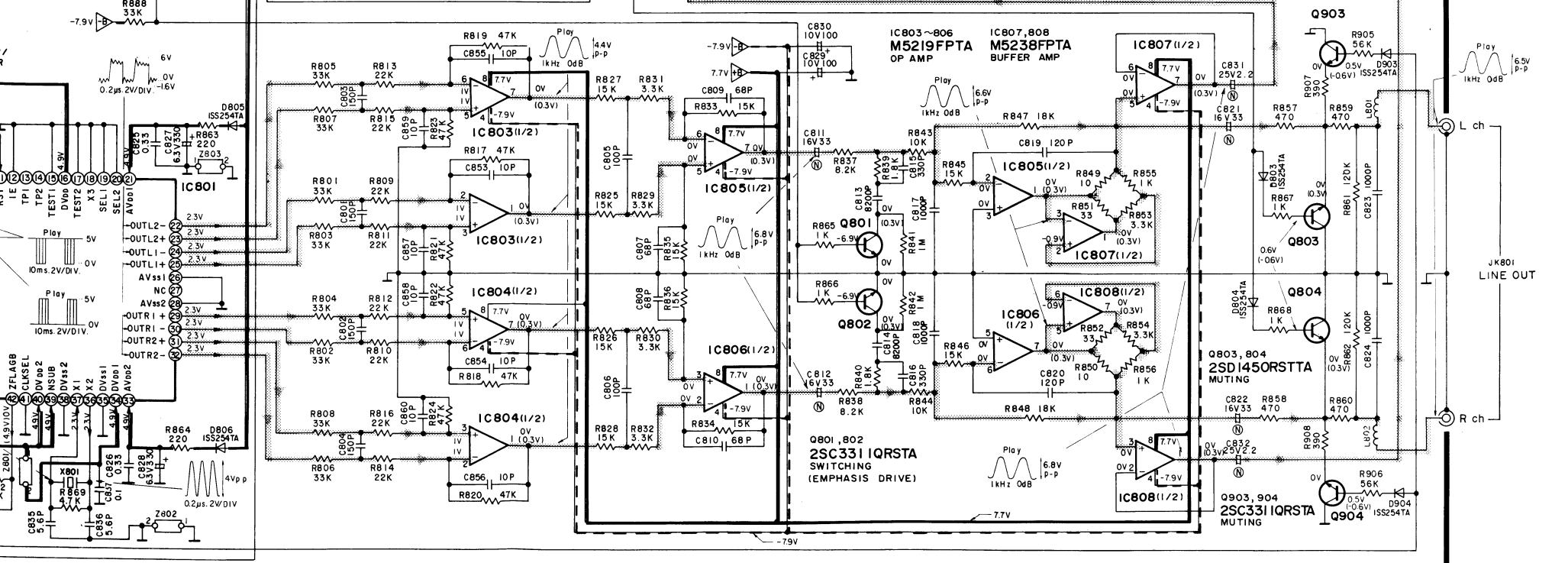
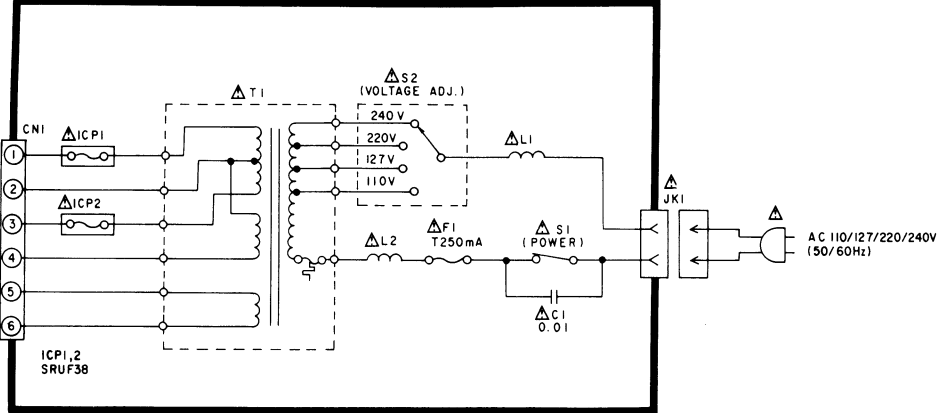
G POWER SUPPLY CIRCUIT For [EB] area.



H HEADPHONES JACK CIRCUIT

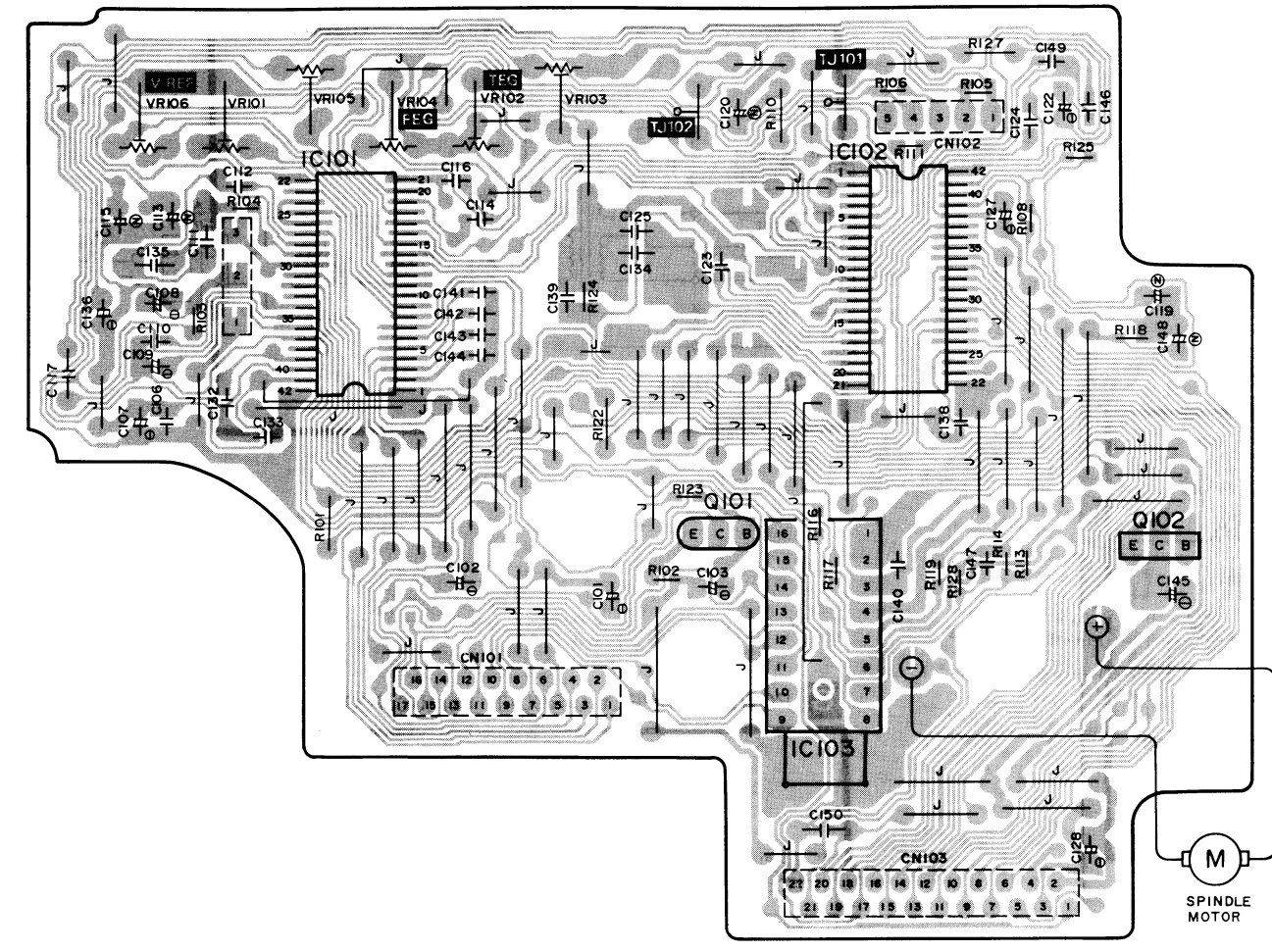


G POWER SUPPLY CIRCUIT For [GC,PX] areas.

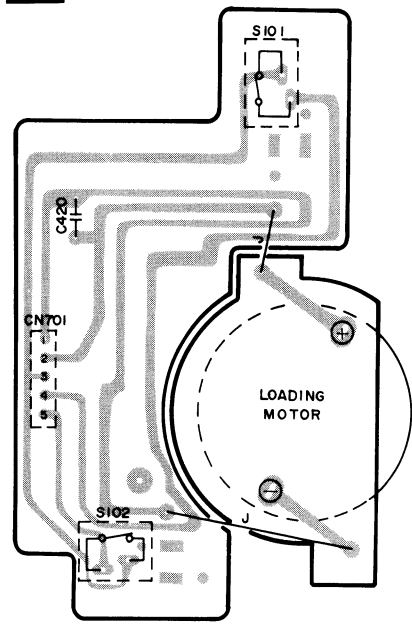


PRINTED CIRCUIT BOARDS

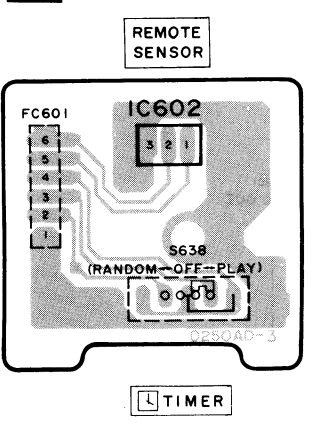
A SERVO P.C.B.



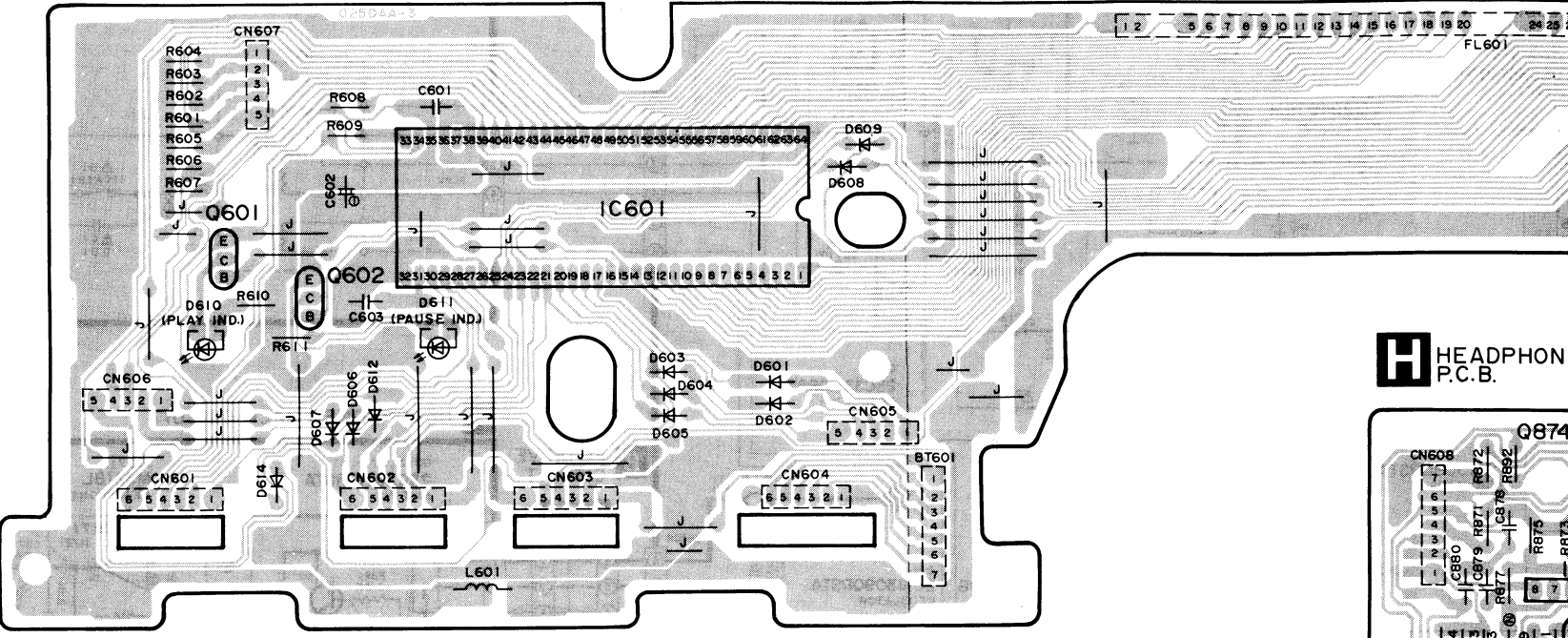
E MOTOR/SWITCH P.C.B.



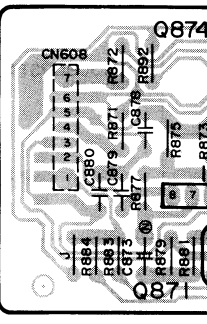
D TIMER SWITCH/REMOTE SENSOR P.C.B.



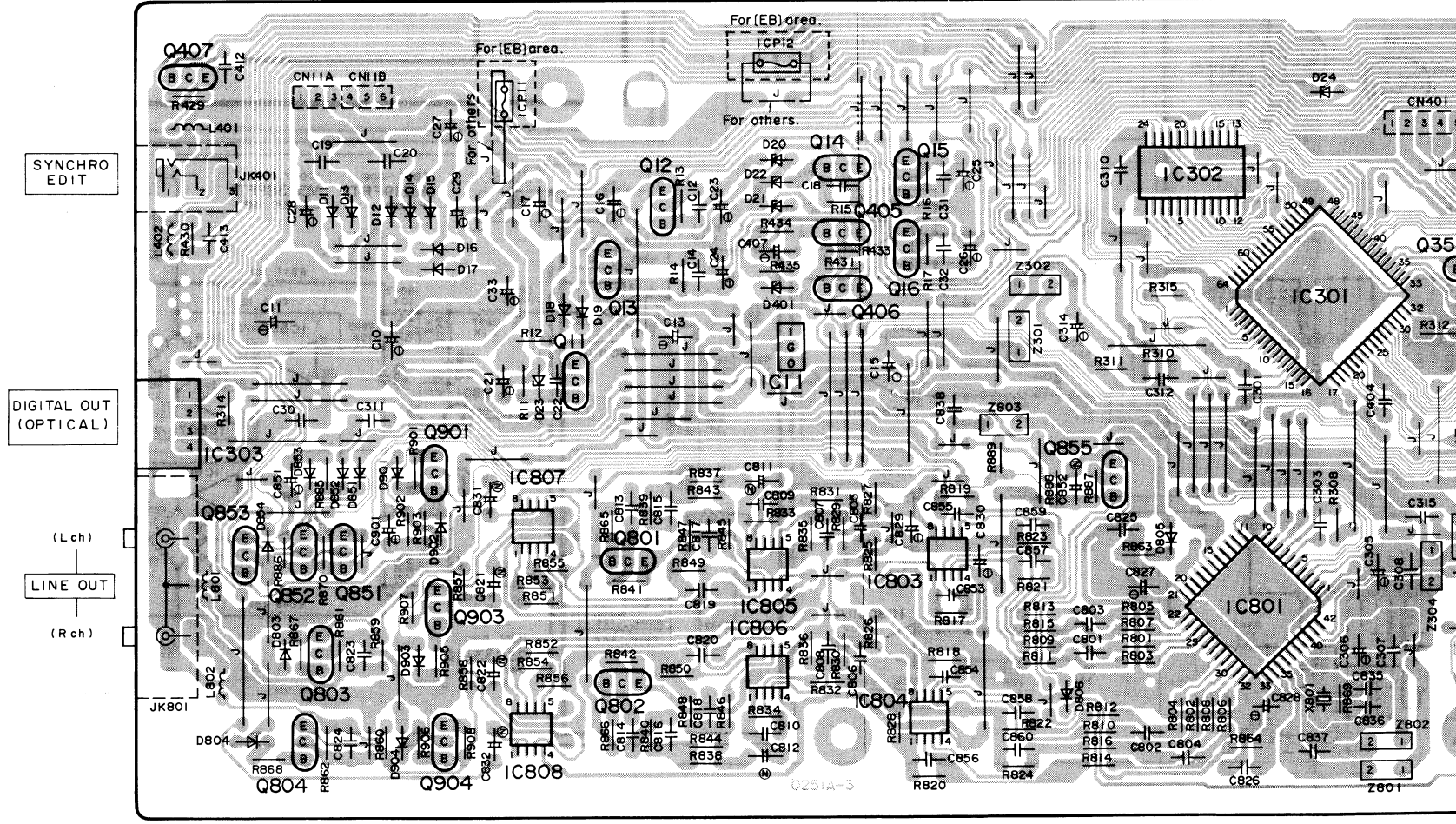
B FL DRIVE P.C.B.

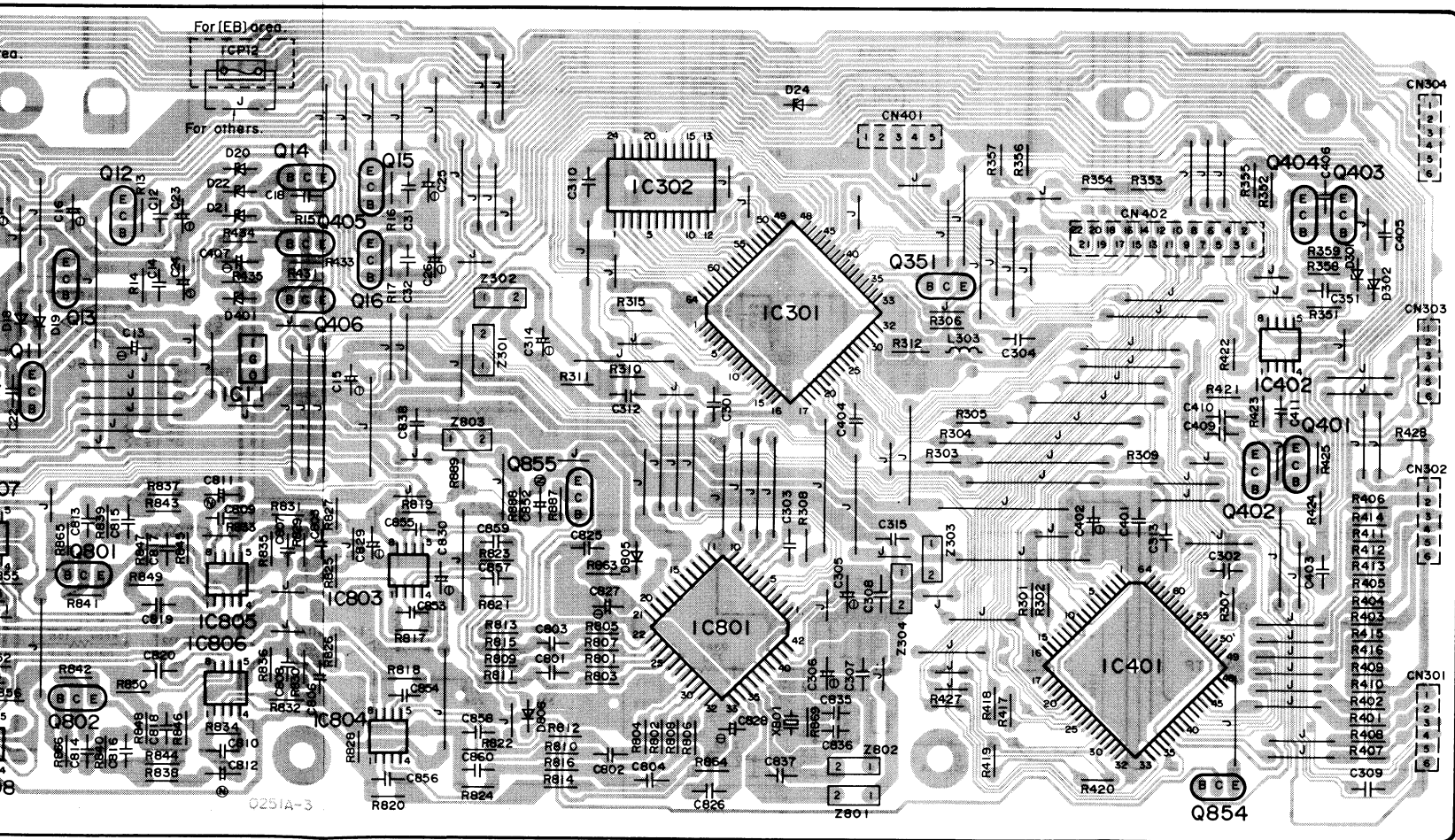
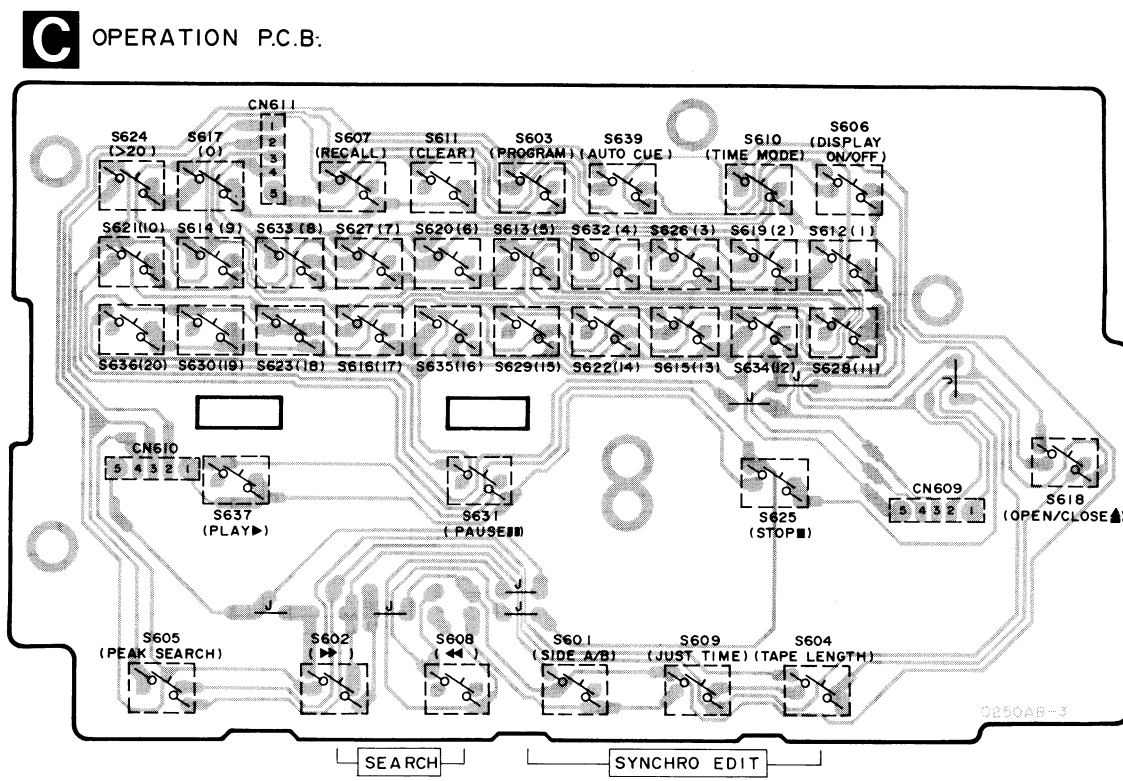
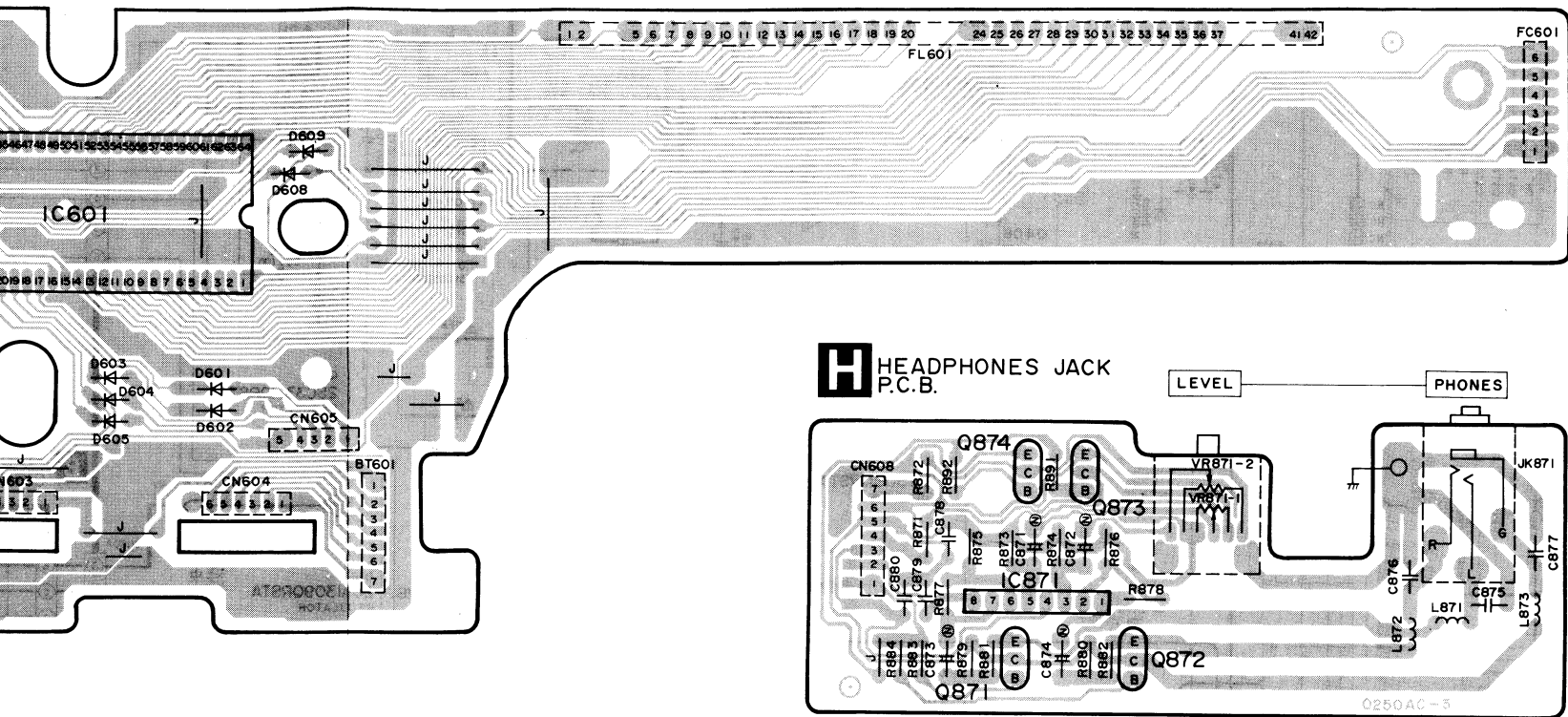


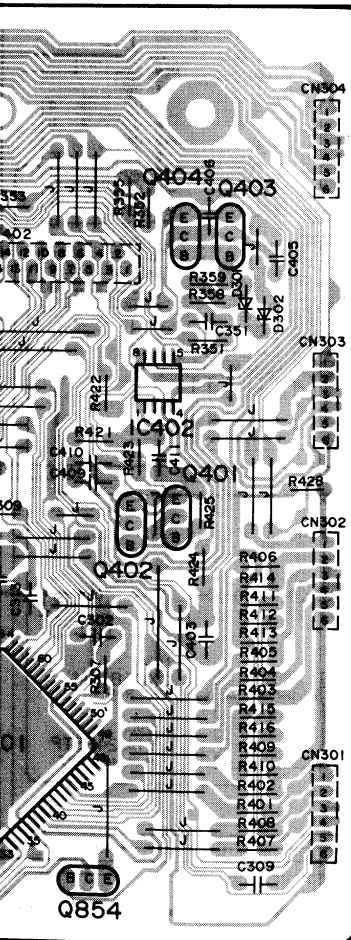
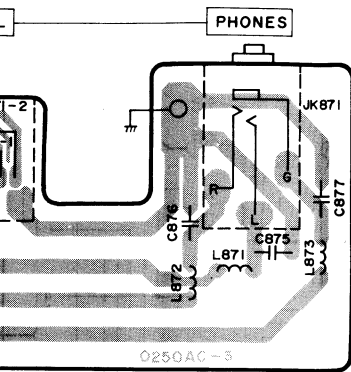
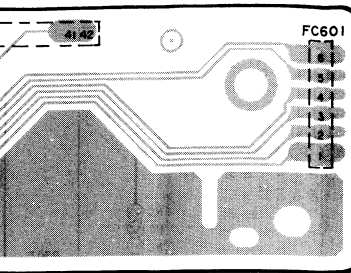
H HEADPHONE P.C.B.



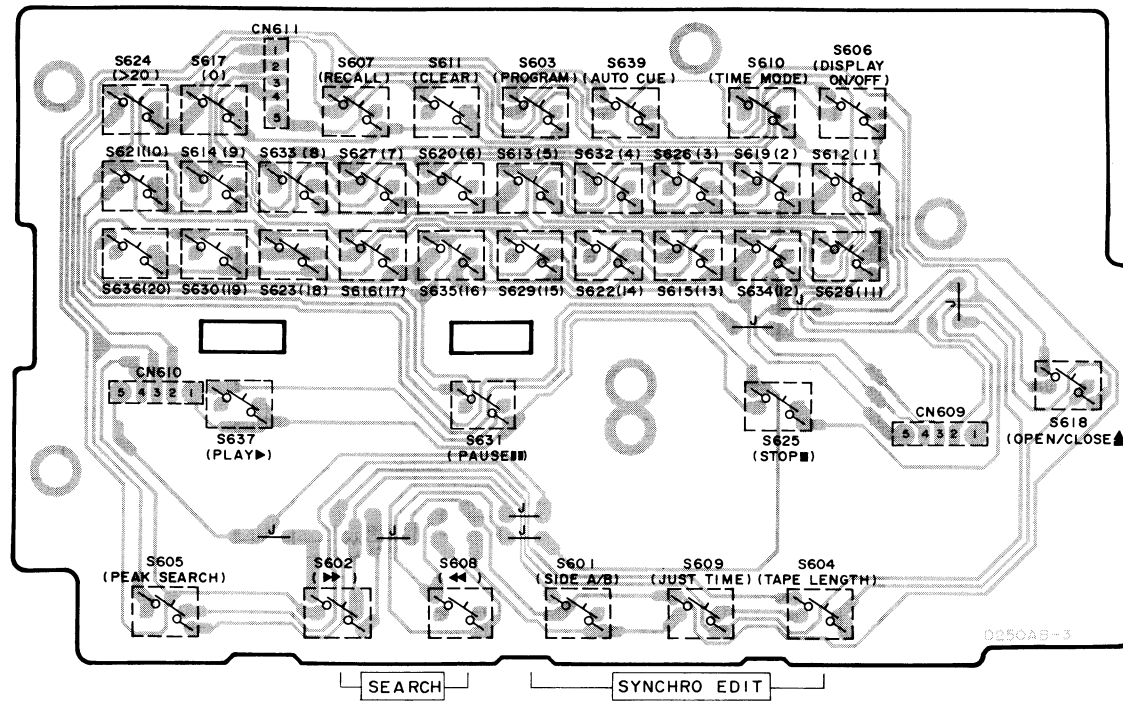
F MAIN P.C.B.



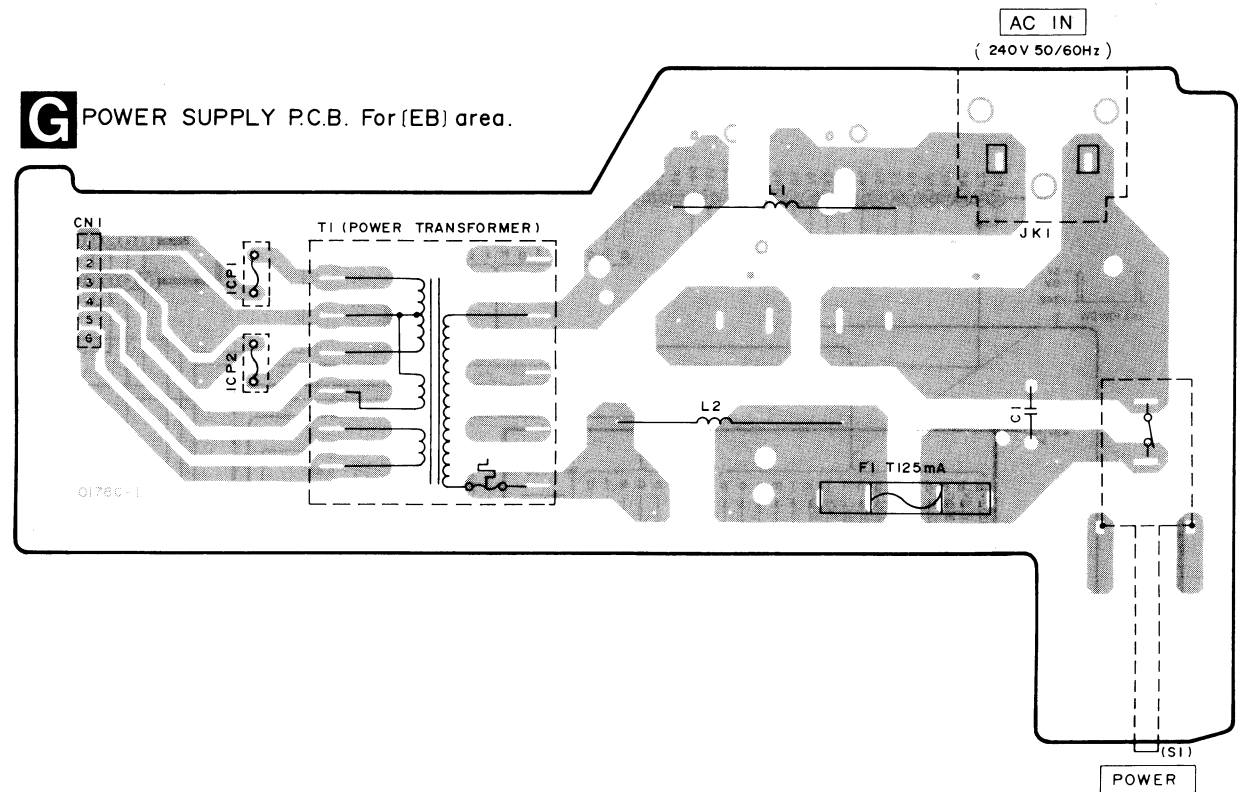




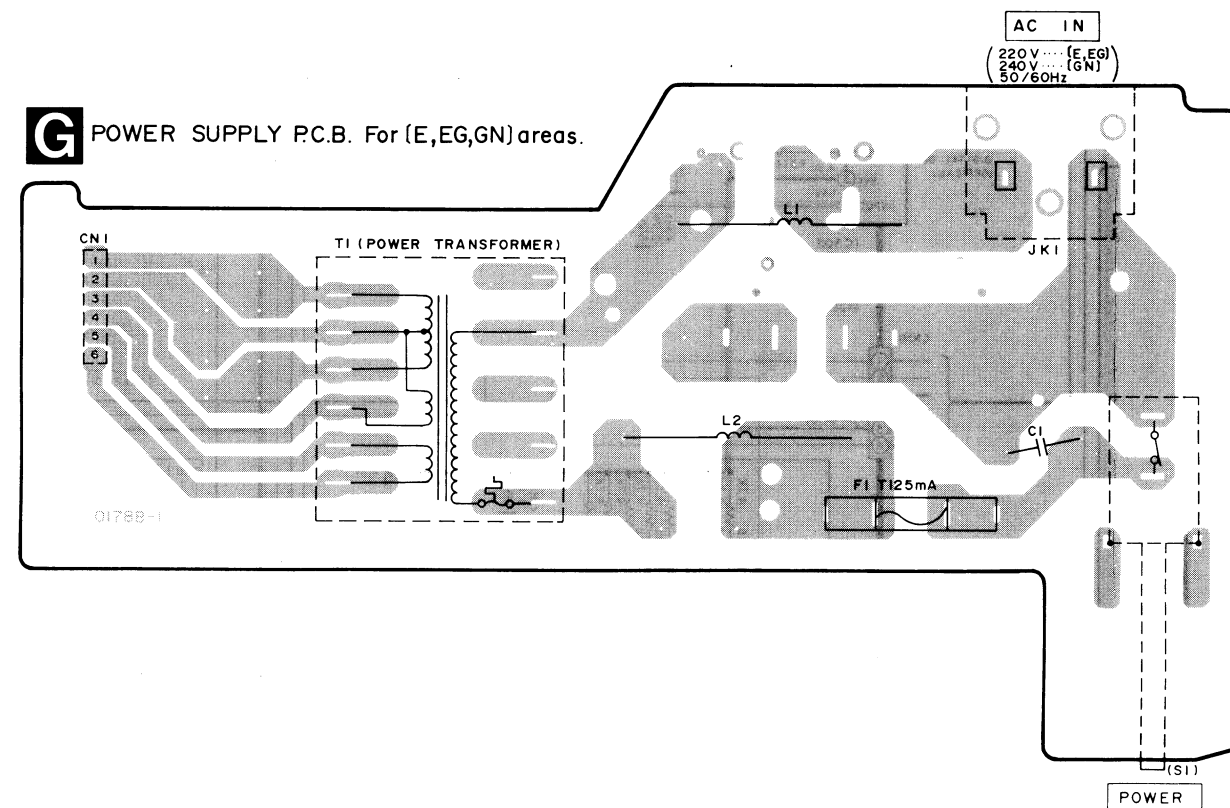
C OPERATION P.C.B.



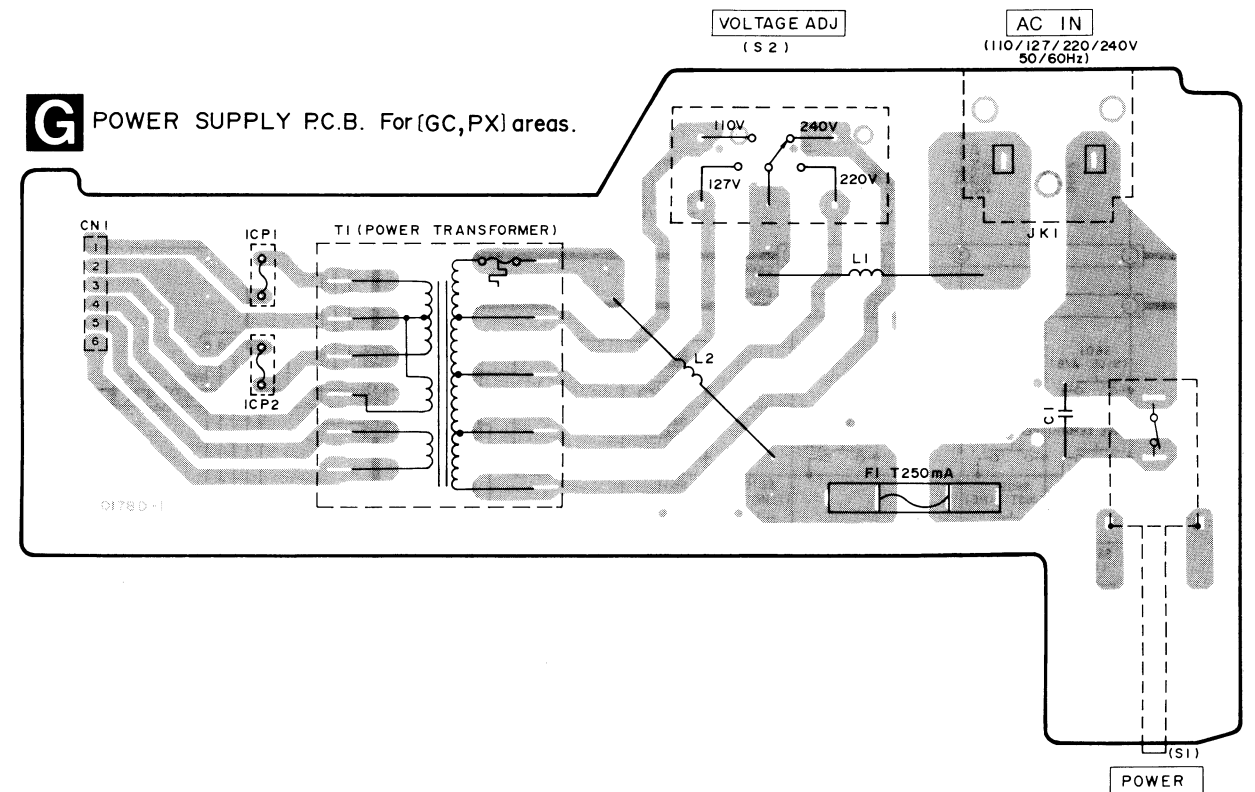
G POWER SUPPLY P.C.B. For (EB) area.



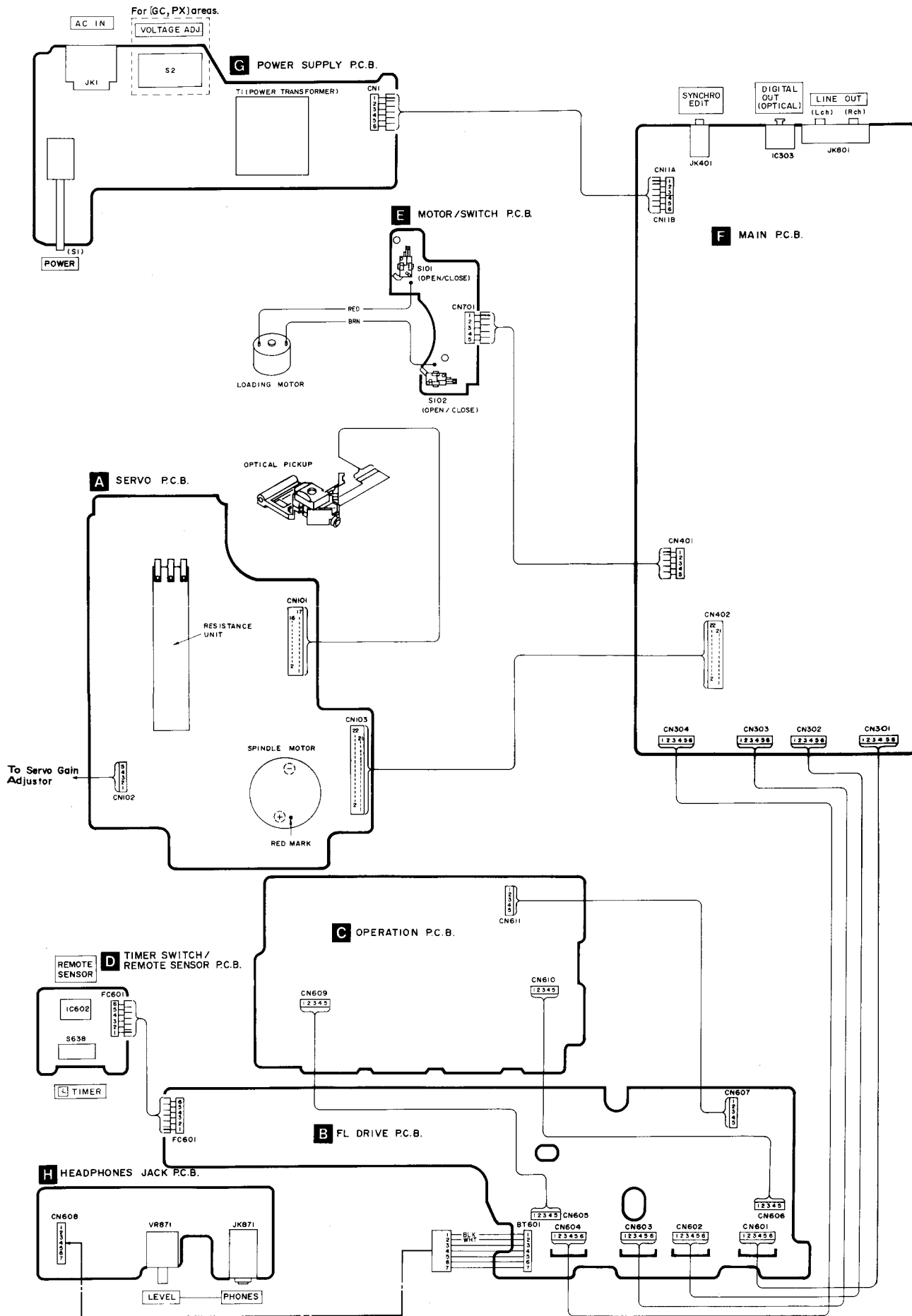
G POWER SUPPLY P.C.B. For (E,EG,GN) areas.



G POWER SUPPLY P.C.B. For (GC,PX) areas.

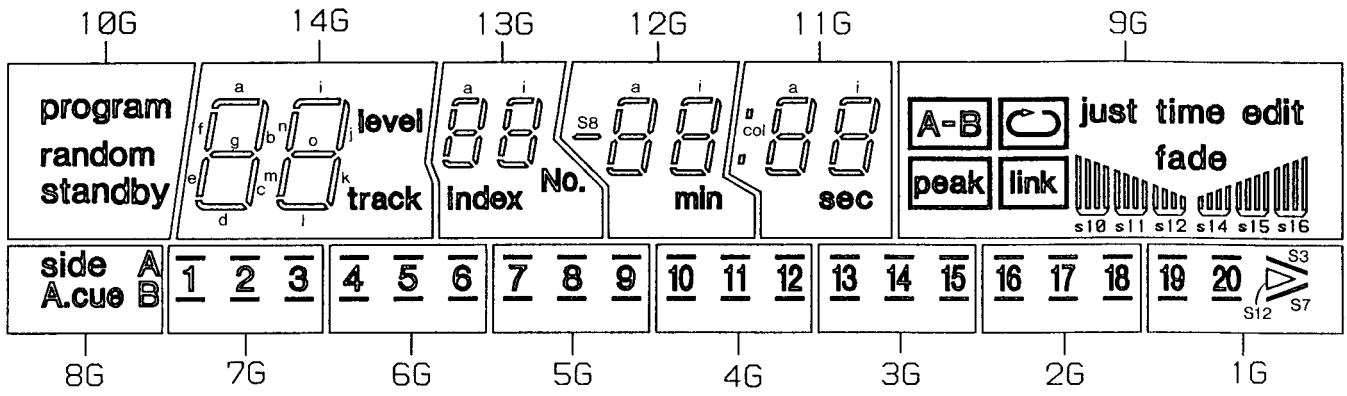


WIRING CONNECTION DIAGRAM



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	-		-	-	-	-	-	-	-	-

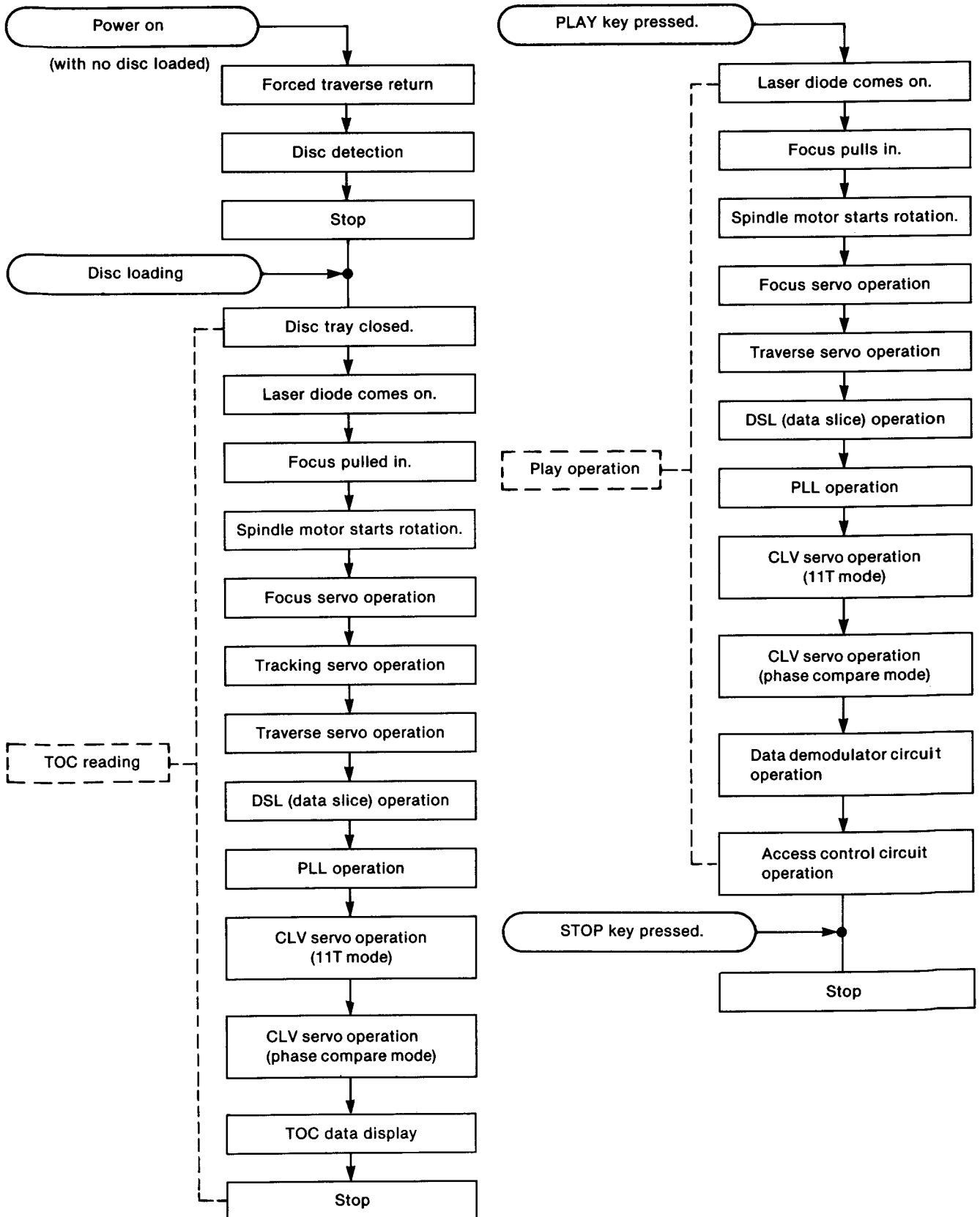
• Pin connection

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	F	N	N	N	G	G	G	G	G	G	G	G	G	G	G	G	G	N	N	N	N	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	N	N	F	F	

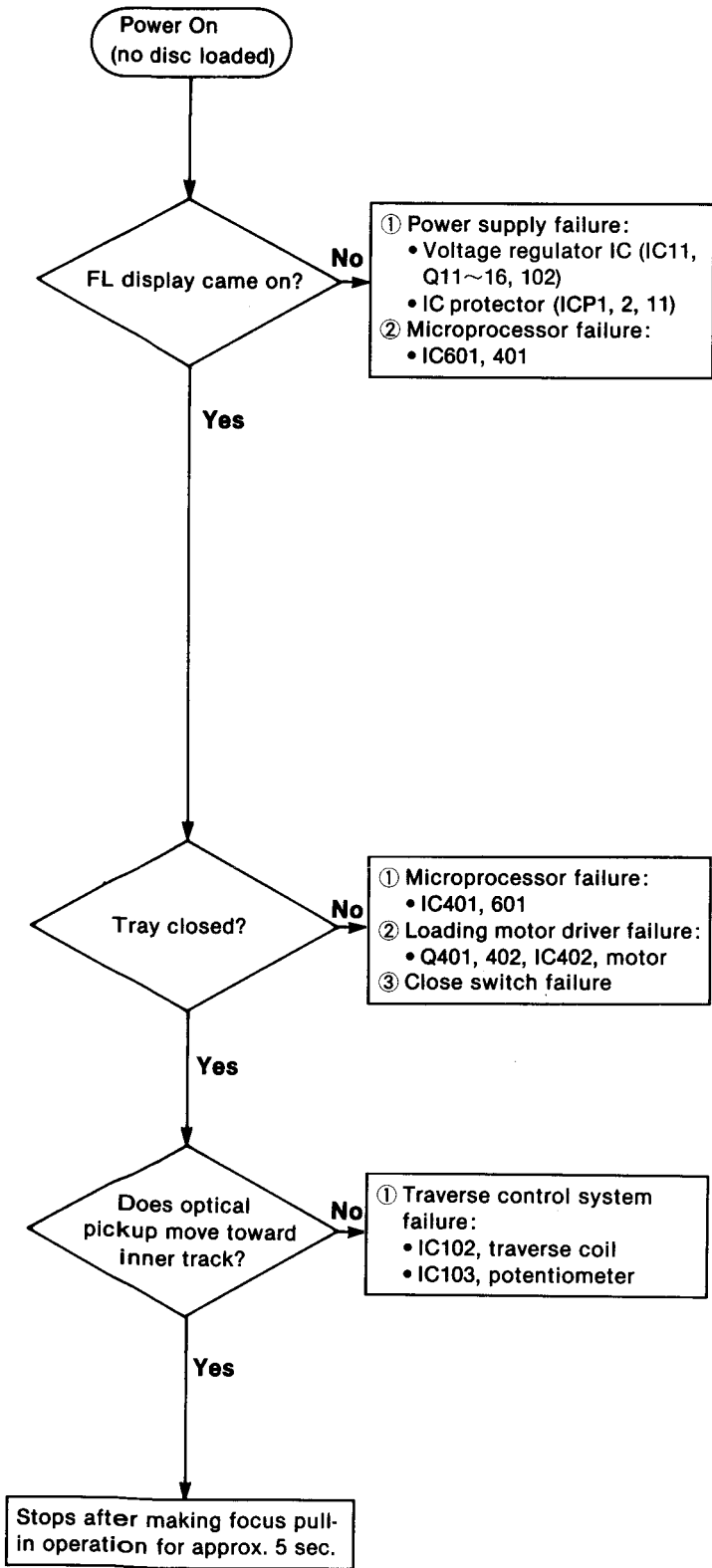
■ TROUBLESHOOTING GUIDE

SL-PS70 Operation Sequence Check Sheet

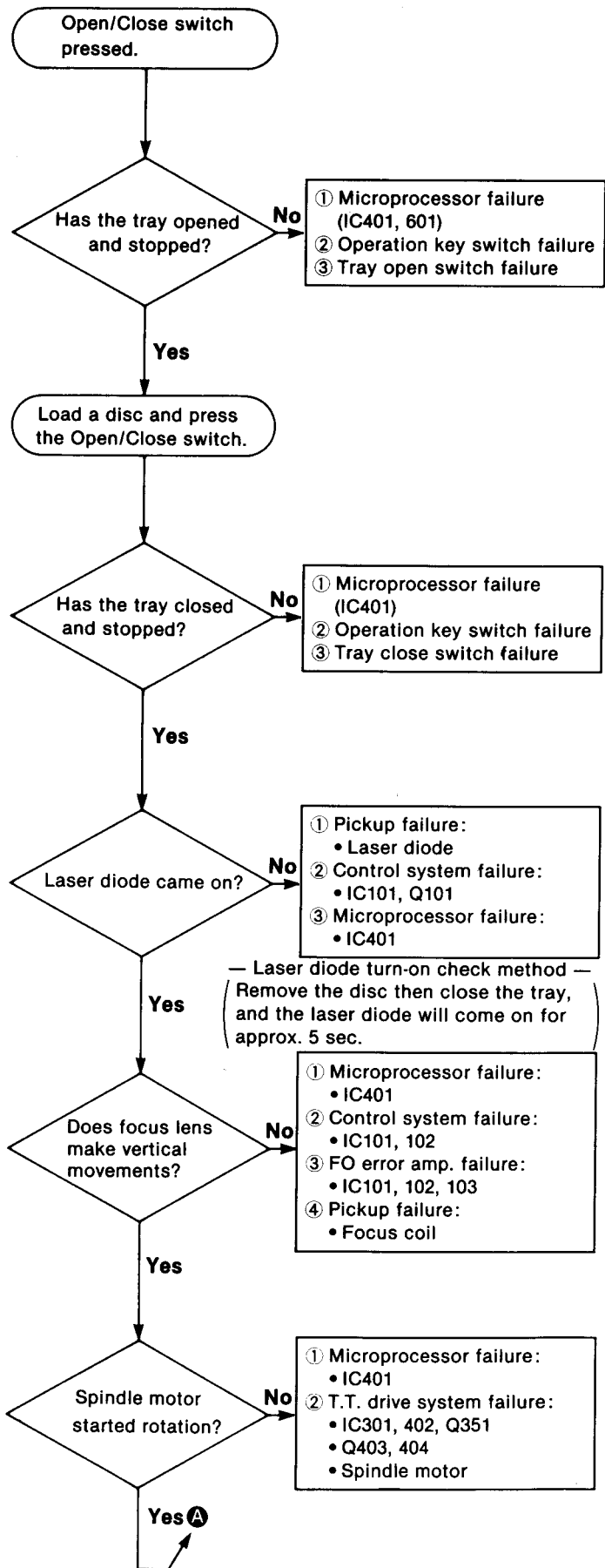
Play Operation Sequence

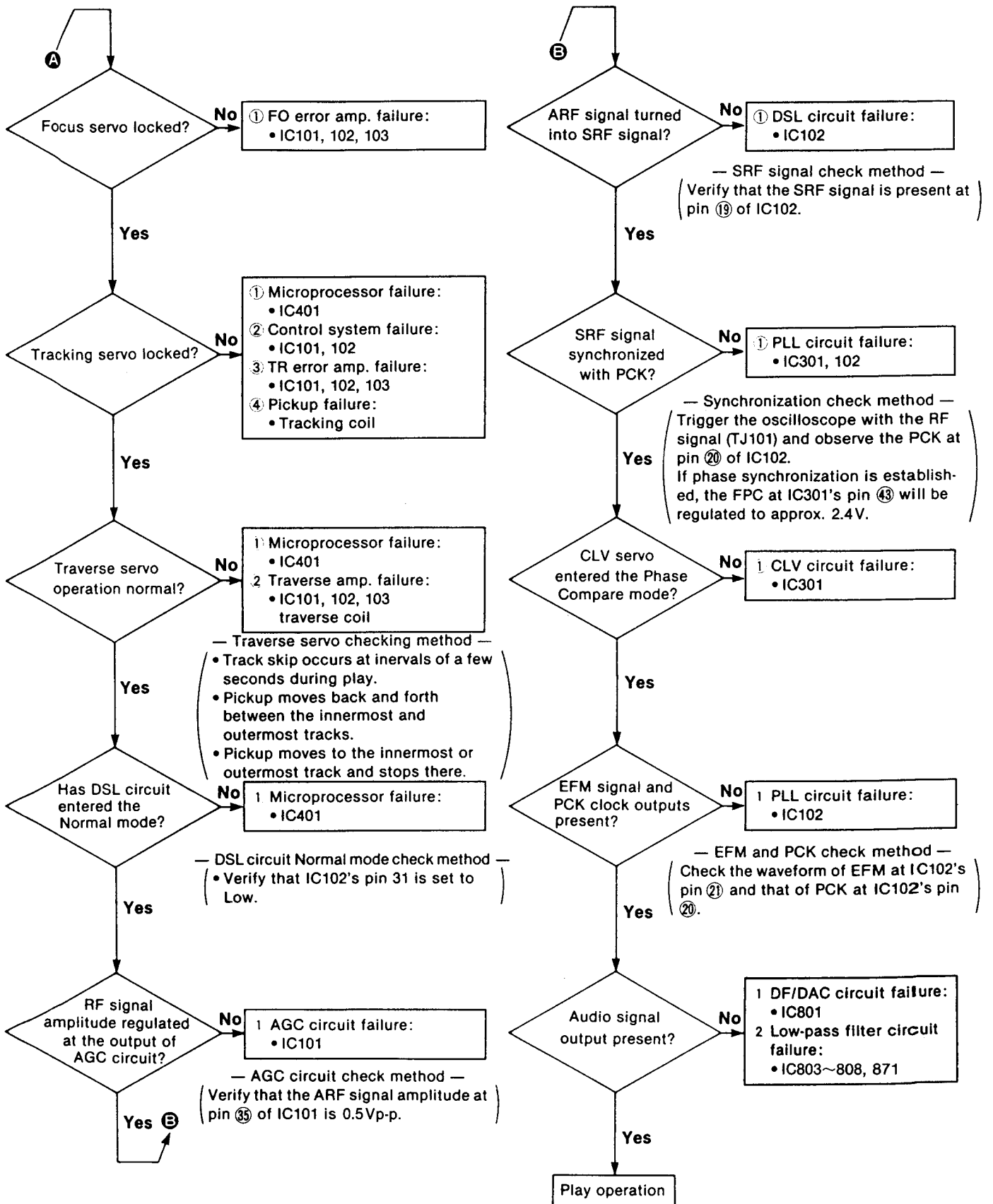


(Operation Sequence Just After Power On)



(TOC Read Operation-PLAY Operation)





REPLACEMENT PARTS LIST

Notes : * Important safety notice:
 Components identified by Δ 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.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)		D20, 21	MA4082MTA	DIODE	
				D22	MA4330MTA	DIODE	
				D23	MA4062HTA	DIODE	
IC11	LM2940T5M	I. C. REGULATOR		D24	MA4082MTA	DIODE	
IC301	MN6625	I. C. DIGITAL SIGNAL PROCESS.		D301, 302	MA4051MTA	DIODE	
IC302	CXK5816M	I. C. 16K RAM		D401	MA4039MTA	DIODE	
IC303	TOTX174-A	I. C. OPTICAL OUT		D601-609	1SS254TA	DIODE	
IC401	MN1554PJZ-1	I. C. SYSTEM CONTROL		D610	SVGDPG7851Y	DIODE	
IC402	BA4558FT1	I. C. MOTOR DRIVE		D611	SVGDAY7851	DIODE	
IC601	MB88725BPJV	I. C. SYSTEM CONTROL&FL DRIVE		D612	1SS254TA	DIODE	
IC602	RCD0003	I. C. REMOTE CONTROL RECEIVER		D614	1SS254TA	DIODE	
IC801	MN6472	I. C. DIF. &D/A CONV.		D803-806	1SS254TA	DIODE	
IC803-806	M5219FP	I. C. OP AMP		D851	1SS254TA	DIODE	
IC807, 808	M5238FPTA	I. C. BUFFER AMP		D852	MA29WATA	DIODE	
IC871	M5218L	I. C. HEADPHONES AMP		D853, 854	1SS254TA	DIODE	
		TRANSISTOR(S)		D901-904	1SS254TA	DIODE	
						I. C. PROTECTOR(S)	
Q11	2SD1862QRTV6	TRANSISTOR		ICP1, 2	SRUF38	IC PROTECTOR	(EB, GC, PX)
Q12	2SC3311QRSTA	TRANSISTOR		ICP11, 12	SRUN15T	IC PROTECTOR	(EB)
Q13	2SA1309QRSTA	TRANSISTOR				VARIABLE RESISTOR(S)	
Q14	2SB1238QSTV6	TRANSISTOR					
Q15	2SC3311QRSTA	TRANSISTOR		VR871	EVJCB0F02A15	V. R. HEADPHONES LEVEL	
Q16	2SA1309QRSTA	TRANSISTOR				COIL(S)	
Q351	DTA124EST	TRANSISTOR		L1, 2	SLQX400-D	COIL	Δ
Q401	2SD1862QRTV6	TRANSISTOR		L303	RLQZP5R6KT-Y	COIL	
Q402	2SB1240QRTV6	TRANSISTOR		L401, 402	RLQZP3R3KT-Y	COIL	
Q403	2SD1862QRTV6	TRANSISTOR		L601	EXCELSA35	COIL	
Q404	2SB1240QRTV6	TRANSISTOR		L801, 802	RLQZP3R3KT-Y	COIL	
Q405, 406	2SC3311QRSTA	TRANSISTOR		L871-873	RLQZP3R3KT-Y	COIL	
Q407	DTC124ESTP	TRANSISTOR				FUSE(S)	
Q601, 602	DTC114ESTP	TRANSISTOR		F1	XBA2C012TB0	FUSE	Δ (E, EB, EG, GN)
Q801, 802	2SC3311QRSTA	TRANSISTOR		F1	XBA2C025TB0	FUSE	Δ (GC, PX)
Q803, 804	2SD1450RSTTA	TRANSISTOR				TRANSFORMER(S)	
Q851	DTA114ESTP	TRANSISTOR					
Q852	2SA1309QRSTA	TRANSISTOR		T1	SLTD5K097SE	POWER TRANSFORMER	Δ (E, EG)
Q853	DTA124EST	TRANSISTOR		T1	SLTD5K098SG	POWER TRANSFORMER	Δ (EB, GN)
Q854	DTC124ESTP	TRANSISTOR		T1	SLTD5K099SX	POWER TRANSFORMER	Δ (GC, PX)
Q855	DTA124EST	TRANSISTOR				OSCILLATOR(S)	
Q871, 872	2SD1450RSTTA	TRANSISTOR					
Q873, 874	2SC3311QRSTA	TRANSISTOR					
Q901	DTA124EST	TRANSISTOR					
Q903, 904	2SC3311QRSTA	TRANSISTOR					
		DIODE(S)					
D11-19	SVDS5688GT3	DIODE	Δ				

Ref.No.	Part No.	Part Name & Description	Remarks	Ref.No.	Part No.	Part Name & Description	Remarks
X801	SVQ49U338S	OSCILLATOR		BT601	REX0144	CONNECTOR ASS' Y(7P)	
		DISPLAY TUBE		CN11A, B	RJS1A1703	CONNECTOR(6P)	
FL601	RSL0038-F	DISPLAY TUBE		CN301-303	RJU003K006M1	SOCKET(6P)	
		SWITCH(ES)		CN304	RJU003K006M1	SOCKET(6P)	
S1	ESB8249V	SW, POWER	△	CN401	SJT30543-V	CONNECTOR(5P)	
S2	SSR187-1	SW, VOLTAGE SELECTOR	(GC, PX) △	CN402	SJSD2221	CONNECTOR(22P)	
S101	SSPD17	SW, OPEN/CLOSE DET.		CN601-603	RJT003K006M	CONNECTOR(6P)	
S102	SSPD18	SW, OPEN/CLOSE DET.		CN604	RJT003K006M	CONNECTOR(6P)	
S601	EVQQTG05R	SW, SIDE A/B		CN605-607	SJT30549BB1	CONNECTOR(5P)	
S602	EVQQTG05R	SW, SEARCH		CN608	RJP7G172A	CONNECTOR(7P)	
S603	EVQQTG05R	SW, PROGRAM		CN609-611	SJS50581BB	SOCKET(5P)	
S604	EVQQTG05R	SW, TAPE LENGTH				FLAT CABLE(S)	
S605	EVQQTG05R	SW, PEAK SEARCH		FC1	REZ0156	FLAT CABLE(6P)	
S606	EVQQTG05R	SW, DISPLAY ON/OFF		FC601	REZ0157	FLAT CABLE(6P)	
S607	EVQQTG05R	SW, RECALL				JACK(S)	
S608	EVQQTG05R	SW, SEARCH		JK1	SJS9236	JACK, AC INLET	△ (E, EB, EG, GC, PX)
S609	EVQQTG05R	SW, JUST TIME		JK1	SJSD16	JACK, AC INLET	△ (GN)
S610	EVQQTG05R	SW, TIME MODE		JK401	RJJ33T01	JACK, SYNCHRO EDIT	
S611	EVQQTG05R	SW, CLEAR		JK801	RJH3201A	JACK, LINE OUT	
S612	EVQQTG05R	SW, NUMERIC 1		JK871	QJA0455ZC-A	JACK, HEADPHONE	
S613	EVQQTG05R	SW, NUMERIC 5				COMPONENT COMBINATION(S)	
S614	EVQQTG05R	SW, NUMERIC 9		Z301-304	EXCELD35V	COMBINATION PART	
S615	EVQQTG05R	SW, NUMERIC 13		Z801-803	EXCELD35V	COMBINATION PART	
S616	EVQQTG05R	SW, NUMERIC 17				<SERVO P. C. B>	
S617	EVQQTG05R	SW, NUMERIC 0				INTEGRATED CIRCUIT(S)	
S618	EVQQTG05R	SW, OPEN/CLOSE		IC101	AN8373S	IC, SERVO AMP	
S619	EVQQTG05R	SW, NUMERIC 2		IC102	AN8374S	IC, SERVO PROCESSOR	
S620	EVQQTG05R	SW, NUMERIC 6		IC103	AN8377N	IC, B. T. L DRIVE	
S621	EVQQTG05R	SW, NUMERIC 10				TRANSISTOR(S)	
S622	EVQQTG05R	SW, NUMERIC 14		Q101	2SA1547QSTV2	TRANSISTOR	
S623	EVQQTG05R	SW, NUMERIC 18		Q102	2SB1240QR	TRANSISTOR	
S624	EVQQTG05R	SW, NUMERIC >20				VARIABLE RESISTOR(S)	
S625	EVQQTG05R	SW, STOP		VR101	EVND3AA00B14	V. R, BEST EYE ADJ.	
S626	EVQQTG05R	SW, NUMERIC 3		VR102	EVND3AA00B14	V. R, TRACKING GAIN ADJ.	
S627	EVQQTG05R	SW, NUMERIC 7		VR103	EVND3AA00B14	V. R, TRACKING OFFSET ADJ.	
S628	EVQQTG05R	SW, NUMERIC 11		VR104	EVND3AA00B14	V. R, FOCUS GAIN ADJ.	
S629	EVQQTG05R	SW, NUMERIC 15		VR105	EVND3AA00B14	V. R, FOCUS OFFSET ADJ.	
S630	EVQQTG05R	SW, NUMERIC 19		VR106	EVND3AA00B24	V. R, TRACKING BALANCE ADJ.	
S631	EVQQTG05R	SW, PAUSE				MAGNET RESISTOR ELEMENT	
S632	EVQQTG05R	SW, NUMERIC 4		RA1	EWS7MDA00Q53	RESISTANCE UNIT	
S633	EVQQTG05R	SW, NUMERIC 8				CONNECTOR(S) & SOCKET(S)	
S634	EVQQTG05R	SW, NUMERIC 12					
S635	EVQQTG05R	SW, NUMERIC 16					
S636	EVQQTG05R	SW, NUMERIC 20					
S637	EVQQTG05R	SW, PLAY					
S638	RSS3A18YA-H	SW, TIMER					
S639	EVQQTG05R	SW, AUTO CUE					

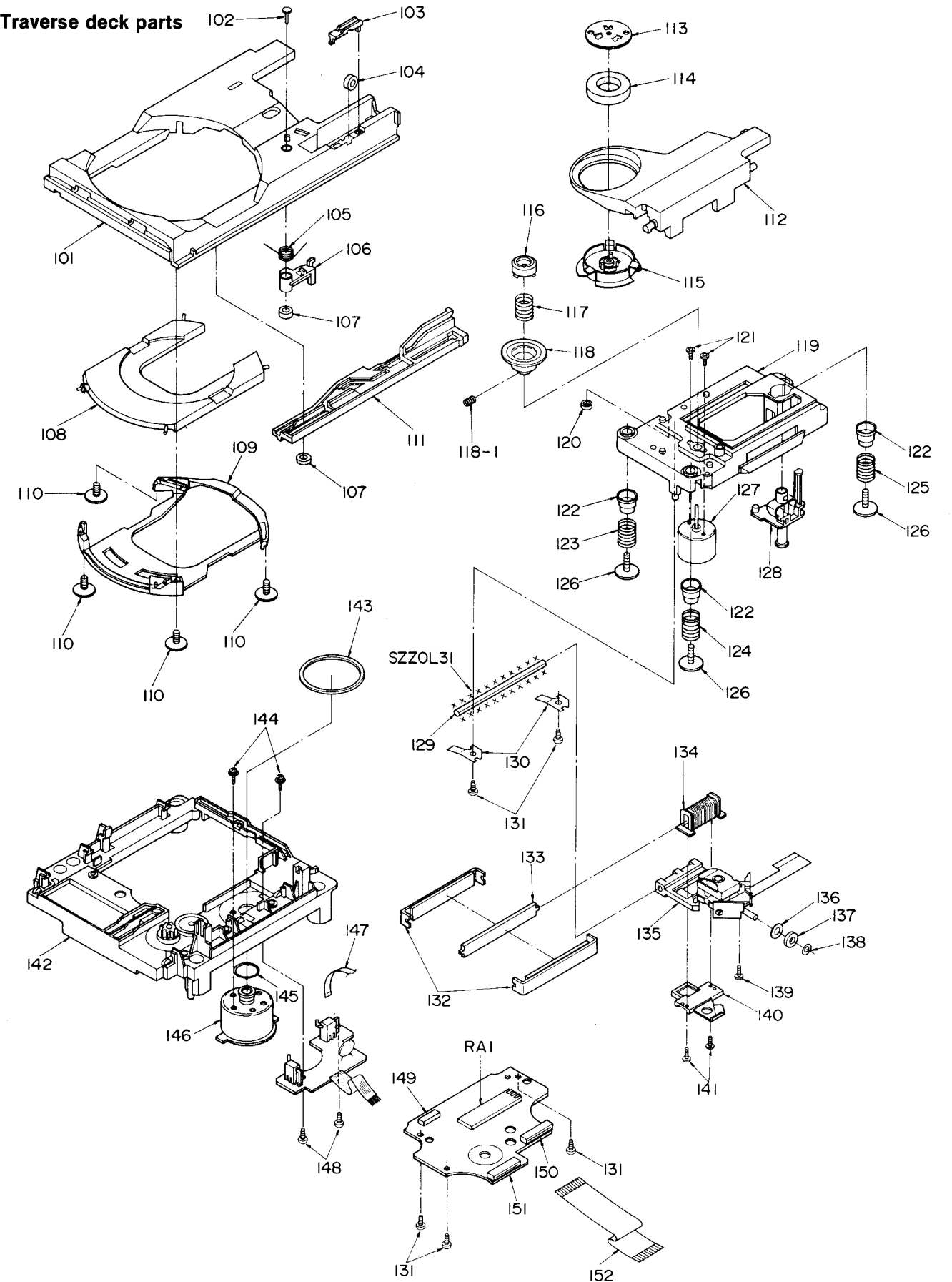
Notes : * Important safety notice:
 Components identified by △ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
 * The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
 Parts without these indications can be used for all areas.

Ref.No.	Part No.	Part Name & Description	Remarks	Ref.No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS		P5	RPN0237D	CUSHION (BR)	
1	RKM0089-1K	TOP CASE		P6	XZB60X60A01	PROTECTION BAG (UNIT)	
2	SNE2129-1	SCREW		P7	SPSD152	ACCESSORIES BOX	
3	XTB3+8JFZ	SCREW		P8	XZB26X17C03	PROTECTION BAG (F. B)	
4	RGK0168B-K	TRAY ORNAMENT				ACCESSORIES	
5	RFKHLPS70E-K	REAR PANEL ASS' Y	(E)	A1	RFKSLPS70E-K	INSTRUCTION MANUAL ASS' Y	(E)
5	RFKHLPS70EBK	REAR PANEL ASS' Y	(EB, GN)	A1	RQT0428-B	INSTRUCTION MANUAL	(EB)
5	RGRO064A-C	REAR PANEL	(EG)	A1	RQT0424-D	INSTRUCTION MANUAL	(EG)
5	RGRO064B-A	REAR PANEL	(GC)	A1	RQT0422-G	INSTRUCTION MANUAL	(GC, GN)
5	RFKHLPS70PXK	REAR PANEL ASS' Y	(PX)	A1	RQT0427-M	INSTRUCTION MANUAL	(PX)
6	RGU0030	POWER BUTTON		A2	RQA0013	WARRANTY CARD	(E, EB, EG, GC, GN)
7	RKU0014	BOTTOM BOARD		A2	SQX7071-1	WARRANTY CARD	(PX)
8	RMK0073-1	CHASSIS		A3	RQCB0169	SERVICENTER LIST	(E, EB, EG, GC, GN)
9	RMN0048	POWER SWITCH ROD		A4	SJA187	POWER CORD	(E, EG) △
10	RMCO063	H. P. EARTH ANGLE		A4	SJA193	POWER CORD	(EB) △
11	RMN0056	FL HOLDER		A4	RJA0004	POWER CORD	(GC, PX) △
12	SHRD169	LED HOLDER		A4	SJA173	POWER CORD	(GN) △
13	SUSD144	EARTH CONTACT		A5	SJP2249-4	PIN CORD	
14	RGW0048	KNOB, H. P. LEVEL		A6	RAK-SL5005W	REMOTE CONTROL TRANSMITTER	
15	RMRO222	H. P. P. C. B FIXER		A7	RKM0008	BATTERY COVER	
16	RFKGLPS70E-K	FRONT PANEL ASS' Y		A8	SJP9215	AC PLUG ADAPTOR	(GC, PX) △
16-1	RGB0020-1	MASH BADGE				TRAVERSE DECK	
17	RFKNLPS70-K	FRONT GRILLE ASS' Y		101	RFKNLP370PAK	DISC TRAY ASS' Y	
17-1	RKW0070	FL ORNAMENT BOARD		102	RMQ0044	PIN	
18	RGK0213	POWER BUTTON SLEEVE		103	SHRD150	ROLLER HOLDER	
19	RGU0264B	KNOB, OPERATION		104	SDRD12	ROLLER	
20	RGU0268B	KNOB, OPEN/CLOSE		105	SUSD83	SPRING	
21	SBD143	KNOB, TIMER		106	SIRD96-1	LOCK LEVER	
22	SHRD133	OP. CONDUCTION PLATE		107	SFUMZ15R61	WASHER	
23	SHRD170	COVER, REMOTE CONT. RECEIV.		108	SIRD98-3	DISC TRAY	
24	SHE185-2	P. C. B. SUPPORTER		109	SIRD107-1	TRAY BASE	
25	SKLD8-E	FOOT		110	SNSD36	SCREW	
26	XTB3+8JFZ1	SCREW		111	SIRD40-2	RACK GEAR	
27	XTB3+16JFZ	SCREW		112	SIRD42-5	CLAMPER	
28	XTB3+8F	SCREW		113	SOYD2	CLAMPER YOKE	
29	VJA1034	PROTECTION CAP		114	SOMD4	CLAMPER MAGNET	
30	SJT390	FUSE HOLDER	△	115	SIRD51-1	CLAMPER HOLDER	
		PACKING MATERIAL		116	SDOD29-2	RING	
P1	RPG0445	PACKING CASE	(E, EB, EG, GC, GN)	117	SRQA010N04	SPRING	
P1	RPG0446	PACKING CASE	(PX)	118	SDOD28-1E	TURNTABLE	
P2	RPN0237A	CUSHION (FL)		118-1	XXE26D5	SCREW	
P3	RPN0237B	CUSHION (FR)		119	SISD22-1	TRAVERSE BASE	
P4	RPN0237C	CUSHION (BL)		120	SHGD148	STOPPER RUBBER	

Ref. No.	Part No.	Part Name & Description	Remarks
121	XYN2+C8	SCREW	
122	SHGD153-1	CUSHION RUBBER	
123	SUSD137-1	SPRING (B)	
124	SUSD136-1	SPRING (A)	
125	SUSD145-1	SPRING (C)	
126	SNSD33	SCREW	
127	SJGDRF310T-2	SPINDLE MOTOR	
128	SHRD177-1	LOCK UNIT	
129	SUXD123-1	GUIDE SHAFT	
130	SUWD112	GUIDE SHAFT HOLDER	
131	XTB3+10G	SCREW	
132	SOYD21-E	YOKE (A)	
133	SOYD22	YOKE (B)	
134	SORD38-E	COIL	
135	SOAD70A	OPTICAL PICKUP	
136	SHWD33	WASHER	
137	SORD37	ROLLER	
138	SHWD34	WASHER	
139	SNSD31	SCREW	
140	SHRD176-E	COIL HOLDER	
141	XTB2+5G	SCREW	
142	RFKNLP370PBK	LOADING BASE ASS'Y	
142-1	XYN26+F7	SCREW	
142-2	RMG0050	MOTOR RUBBER	
143	SMBD7-2	BELT	
146	SIRD94-E	LOADING MOTOR ASS'Y	
147	SIKD150051F	FLAT CABLE	
148	XTB3+8G	SCREW	
149	EMCS0552MP	CONNECTOR (5P)	
150	SJSD1722M	SOCKET (17P)	
151	SJSD2222M	SOCKET (22P)	
152	SIKD150221-1	FLAT CABLE	

EXPLODED VIEWS

• Traverse deck parts



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

• Cabinet and chassis parts

