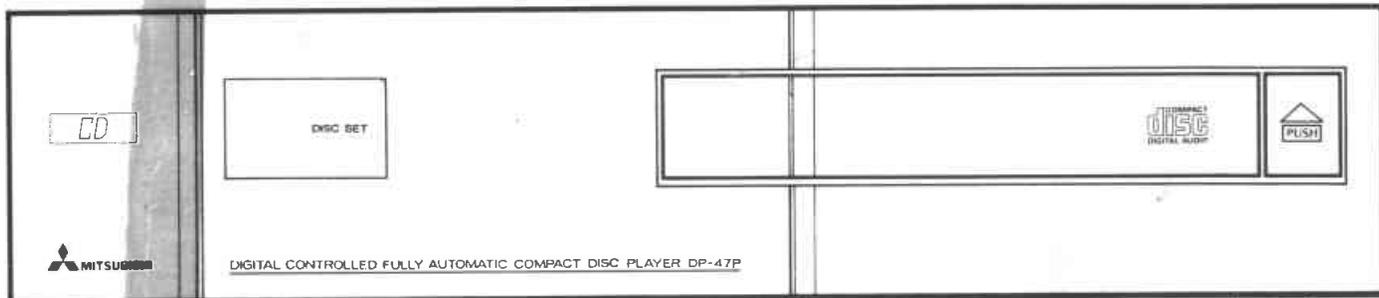


SERVICE MANUAL
COMPACT DISC PLAYER
MODEL DP-47P



CONTENTS

SPECIFICATIONS	2
FRONT PANEL TERMINOLOGY AND FUNCTIONS	3
DISASSEMBLING PROCEDURE	4
ADJUSTMENT PROCEDURE	6
TROUBLESHOOTING	17
INTERNAL DIAGRAMS AND PINOUT OF INTEGRATED CIRCUITS	22
BLOCK DIAGRAM	29
WIRING DIAGRAM	29
PRINTED CIRCUIT BOARD	30
SCHEMATIC DIAGRAM	35
PACKING INSTRUCTIONS	37
EXPLODED VIEW	38
PARTS LIST	40

CLASS 1 LASER PRODUCT

Product complies with DHHS rules CFR subchapter J part 1040:10 at date of manufacture.

DANGER—invisible laser radiation when open and interlock failed or defeated. Avoid direct exposure to the beam.

CAUTION—use of all controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Do not power on the unit when Lever and Holder Ass'y (part 15, 17 in page 38) is removed or when Optical Pickup (part 52 in page 39) is removed from the mechanism assembly.

SPECIFICATIONS

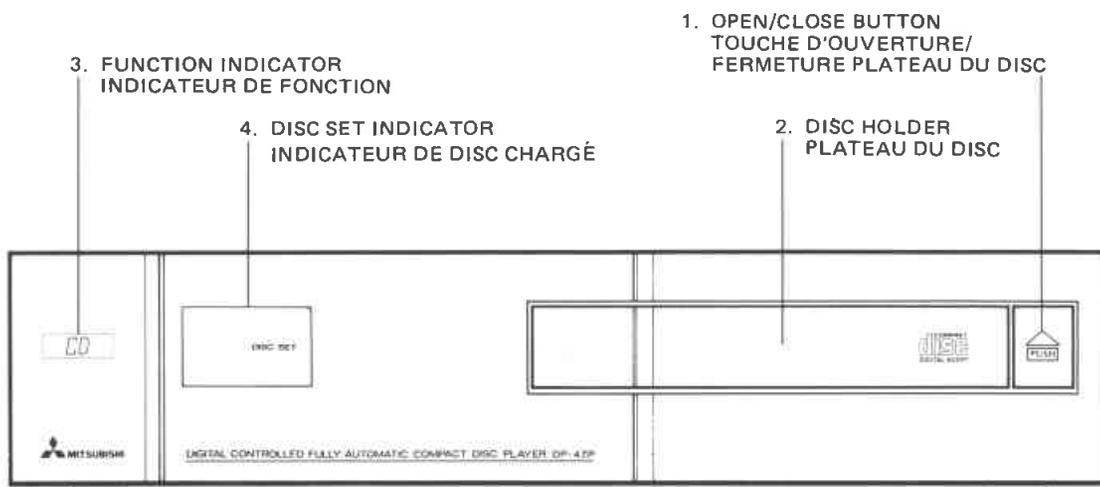
THIS UNIT CAN BE USED ONLY WITH THE MITSUBISHI RECEIVER MODEL DA-R47P AND CAN NOT BE CONNECTED TO ANY OTHER AMPLIFIER OR RECEIVER.

All operations except loading a disc can be done by pressing the buttons on the controller of the receiver. Please see the instruction book of the receiver for playback and selecting tracks.

Type	Compact disc type
Channels	Two-channel stereo
Sampling frequency	44.1 kHz
Digital-to Analog conv.	16 bit linear
Frequency response	20 – 18,000 Hz ± 1 dB
Dynamic range	Better than 90 dB (at 1 kHz)
Harmonic distortion	Less than 0.008 % (at 1 kHz, 0 dB)
Channel separation	Better than 84 dB (at 1 kHz)
Wow and flutter	Below measurable limits
Weight	4.0 kg (8 lb 13 oz)
Dimensions (W x H x D)	350 x 77 x 280 mm (13-3/4 x 3 x 11")

Specifications subject to modification without notice for improvement.

FRONT PANEL TERMINOLOGY AND FUNCTIONS



1. OPEN/CLOSE Button (Disc Holder Open/Close Button)

Push to open and close the disc holder. Cannot be operated when the power is off.

2. DISC HOLDER

Load the compact disc here.

Push the OPEN/CLOSE button with the power on and the disc holder opens. Place the compact disc onto the disc holder, push the OPEN/CLOSE button again and the disc holder closes.

3. FUNCTION Indicator

This indicator illuminates when this unit is operated for playback.

4. DISC SET Indicator

This indicator illuminates when the disc is loaded.

DISASSEMBLING PROCEDURE

1. Removal of the fixing screws used for transportation

- 1) Remove two red transit packing screws on the bottom of the unit used for transportation. (Fig. 1)

Note: Keep the transit packing screws in a secure location after removal in the event transport of this unit is required.

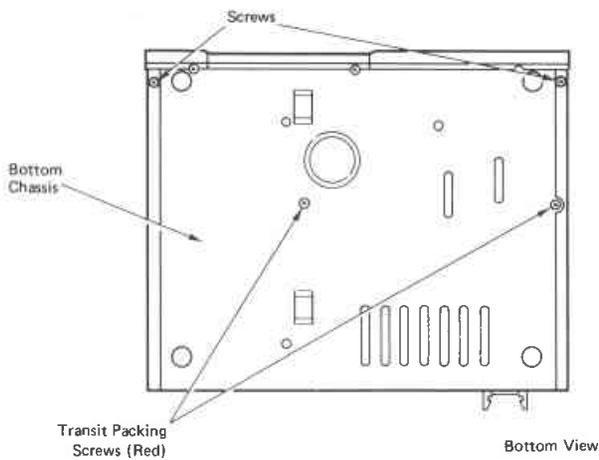


Fig. 1

2. Removal of the top cover

- 1) Remove two screws (Fig. 1) from the bottom chassis, and remove three screws from the back chassis. (Fig. 2)
- 2) Remove the top cover by sliding it to backward. When sliding, pay attention not to damage the lead wires inside of the unit.

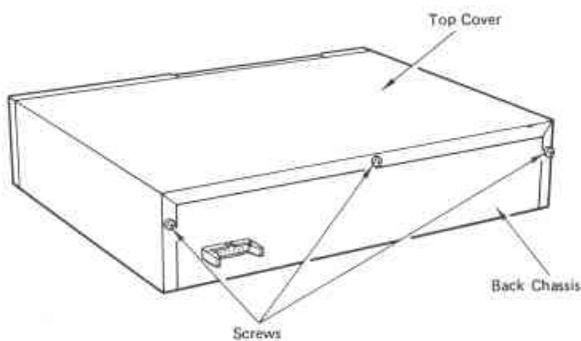


Fig. 2

3. Removal of the Mechanism Assembly

- 1) Remove two screws, fixing PCB PB-2 to the chassis. (Fig. 3)
- 2) Remove connector (J402) from PCB PB-2.
- 3) Remove two screws, fixing PCB PB-1 to the chassis. (Fig. 4)
- 4) Remove the four connectors (J202, J203, J205, J302) and the GND wire from PCB PB-1.
- 5) Remove four screws fixing mechanism ass'y from the chassis. (Fig. 4)

- 6) Pull back the mechanism ass'y to the rear side first, and then take out the ass'y from the tail end as shown by arrow mark, paying attention not to damage the mechanism ass'y.

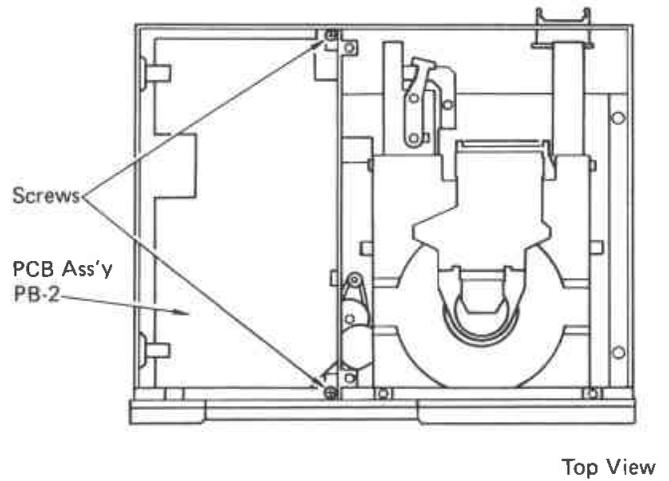


Fig. 3

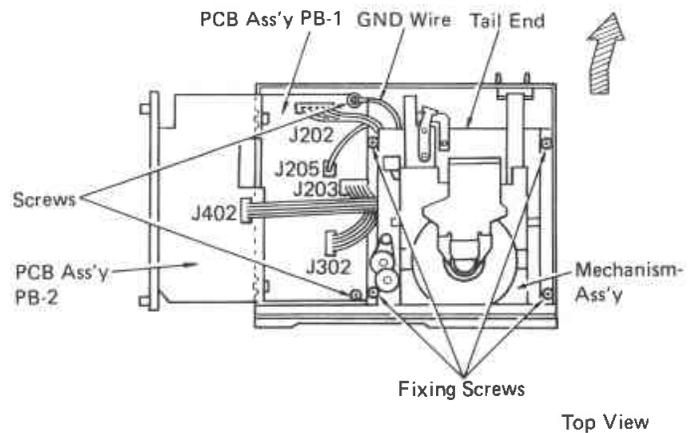


Fig. 4

4. Removal of the Optical Pickup

- 1) Lay the mechanism ass'y upside down.
- 2) Remove the E-ring ($\phi = 3$ mm) which fixes the rotary shaft of the lever, and remove the spring. (Fig. 5)

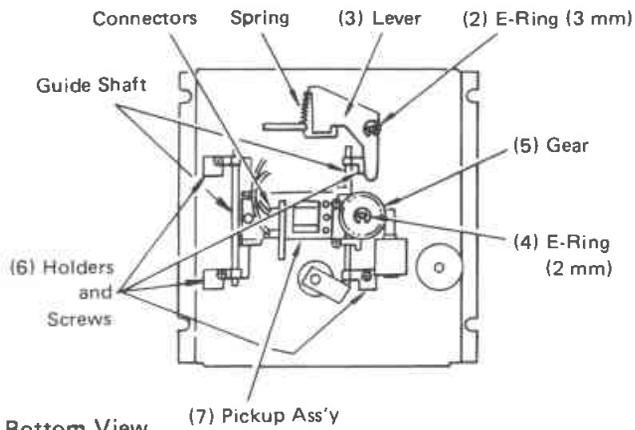


Fig. 5

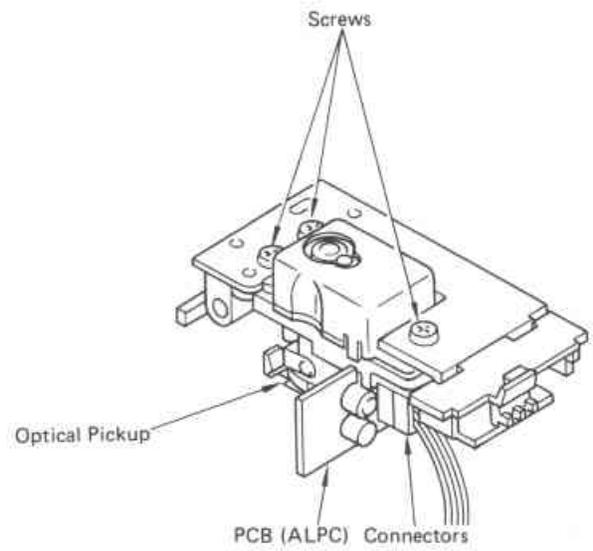


Fig. 6

- 3) Remove the lever.
- 4) Remove the E-ring ($\phi = 2$ mm) which fixes the rotary shaft of the gear.
- 5) Remove the gear.
- 6) Remove four screws and take off four holders holding the two guide shafts.
- 7) Remove the Pickup-Ass'y. (Fig. 6)
- 8) Remove three screws from the pickup holder, and the optical pickup can be removed. (Fig. 6)
- 9) Remove the two connectors which are connected with the optical pickup.
- 10) Replace the pickup with new one. When replacing, pay attention not to touch the PCB (ALPC), as the static may damage the laser diode.

5. Reassembling the mechanism after replacing the optical pickup.

Follow the procedure ① ~ ④ in the reverse order to reassemble the mechanism after replacing the optical pickup. When reassembling, pay attention not to damage the unit.

ADJUSTMENT PROCEDURE

• Pickup Inclination Adjustment Procedure

1. Pickup inclination adjustment

After replacing the pickup, it is necessary to fine-adjust J (Jitter) direction and R (Radial) direction of pickup inclination, before reassembling Mechanism Ass'y into the chassis.

Fine-adjust inclination of the pickup by turning the J direction and R direction adjusting screws of the mechanism ass'y. (Fig. 7)

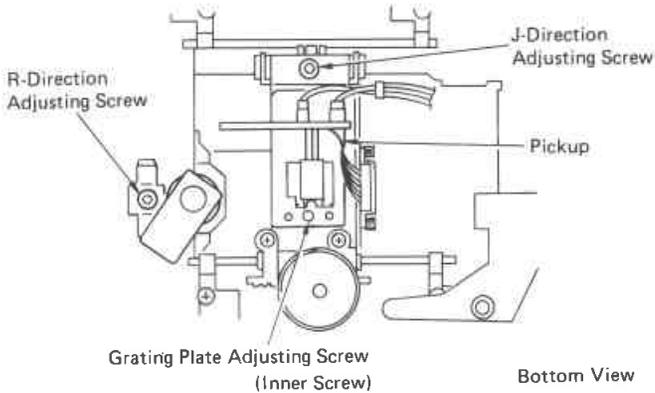


Fig. 7

2. Equipment and tools used for adjustment

- 1) Test disc CBS SONY, Type 3, 4 or any other ordinary disc is substitutive.
- 2) Dual trace synchroscope.
- 3) Signal input probe x 2
- 4) Hexagon screwdriver: 2.4 mm

3. Confirmation items before adjustment

- 1) It is not necessary to adjust the ALPC Circuit, because that is already adjusted in the factory.
- 2) Confirm that the installation distance between the top of turntable and the top of pickup ass'y is 12 ± 0.2 mm (Fig. 8).

Note: If the distance is out of criterion range, check if the pickup is installed in the right way. If there is found no fault with the pickup installation, Disc motor ass'y including turntable must be replaced, (there is no way to adjusting the distance.)

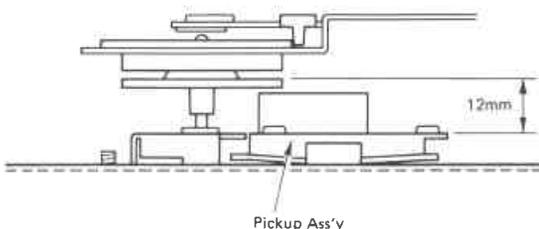


Fig. 8

4. Adjustment Procedure

- 1) Input the HF signal (TP201, HF and TP202, GND on PB-1) to CH-1 (Channel-1) of synchroscope and TE (Tracking Error) signal (J206, 1 on PB-1) to CH-2. Use CH-1 (HF) as the trigger source. Set the ranges of CH-1 and CH-2 to 1 V/div, 0.5 μ sec/div, and 0.2 V, 10 msec/div respectively.
- 2) Set the power supply of the unit to ON by pressing **POWER ON** key on the control unit. Press the **OPEN/CLOSE** button of the unit, and mount the test disc (Type 3 or 4) onto the disc holder. (Fig. 9)

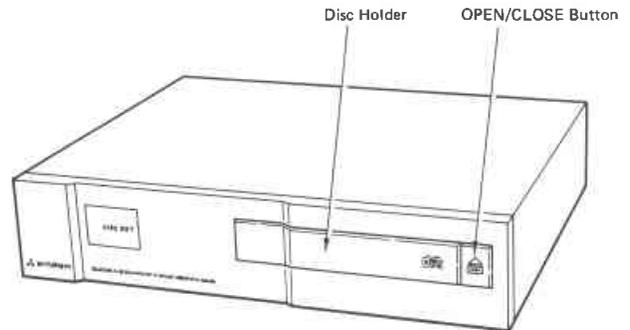
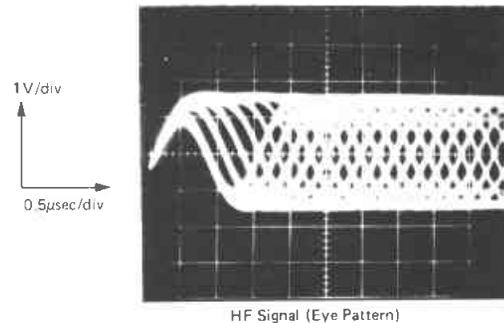


Fig. 9

- 3) Press the **CD** key of the control unit.
- 4) Confirm that the disc turns.
- 5) Press **CD**, *****, **5** keys of the control unit to move the pickup to the position of track No. 15, or to the center position of the disc when an ordinary disc is used.
- 6) Confirm that the HF signal (eye pattern) shown in Fig. 10 is seen at CH-1 on the synchroscope.



HF Signal (Eye Pattern)

Fig. 10

- 7) Adjust the R-direction of the pickup. (Fig. 11)
Turn the adjusting screw clockwise or counterclockwise to make the HF signal shown in Fig. 12 maximum.

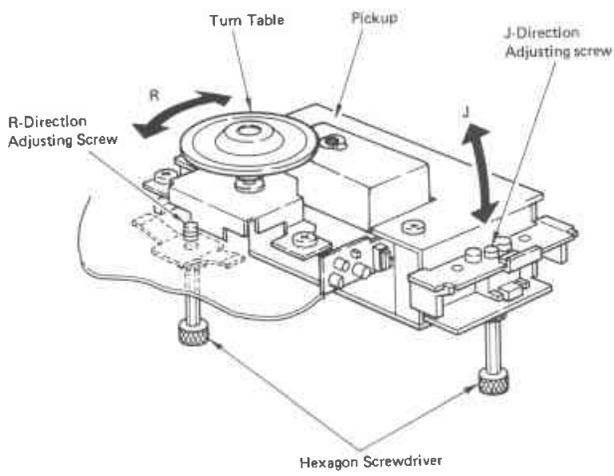


Fig. 11

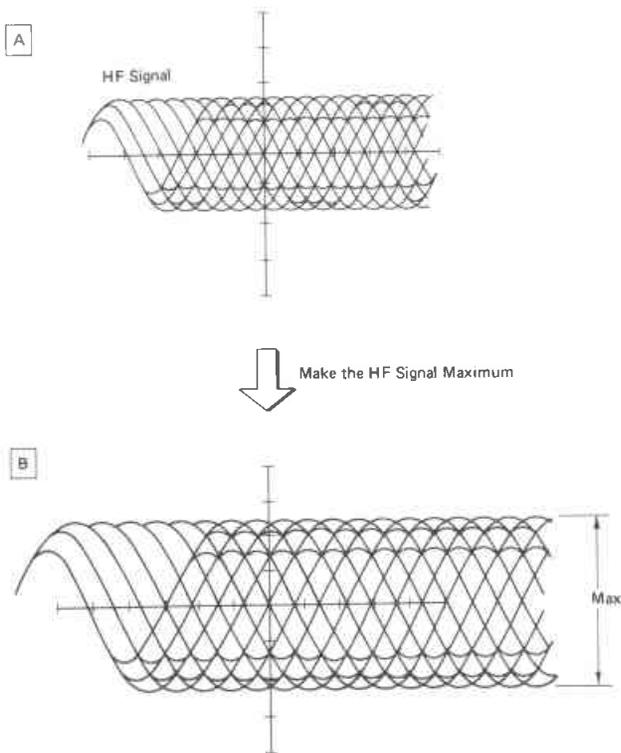


Fig. 12

- 8) Adjust the J-direction of the pickup. (Fig. 11)
Turn the J-direction adjusting screw so that HF signal shown in Fig. 13 is changed from state A to B.
- 9) Confirm that the level of HF signal is within the range of

$$2.4 \begin{matrix} +0.8 \\ -1.0 \end{matrix} \text{ V}$$

after R and J-direction adjustment.

- 10) Press the **STOP** key on the control unit and then press **CD** again to play back Track No. 1. Confirm that the level of HF signal at Track No. 1 (Inner circumference of the disc) is within $1.5 + 0.8 - 0.7 \text{ V}$ and that HF signal is clear as shown in Fig. 13-**B**.
- 11) Lock the head of J and R direction adjusting screws with screw locking compound after adjustment is completed.

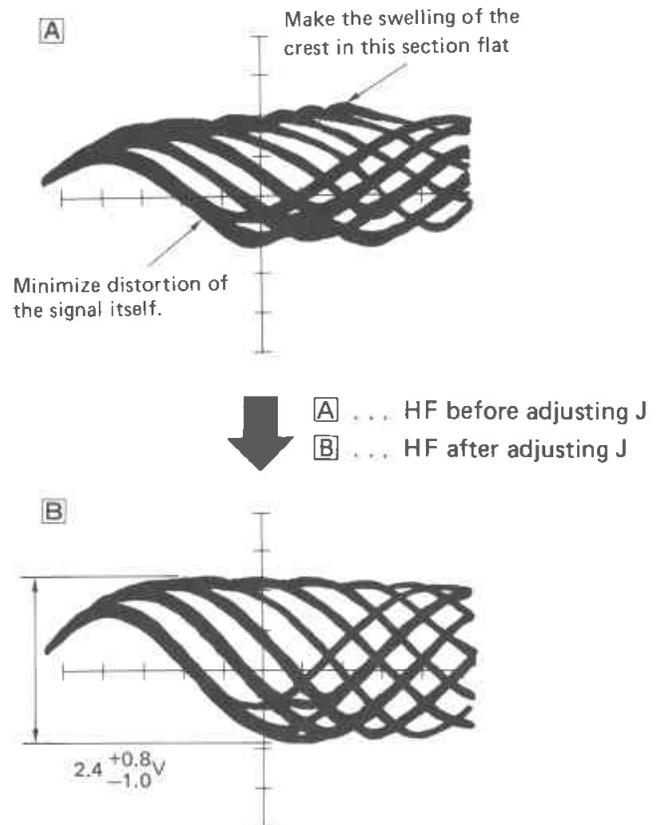


Fig. 13

• Servo Adjustment

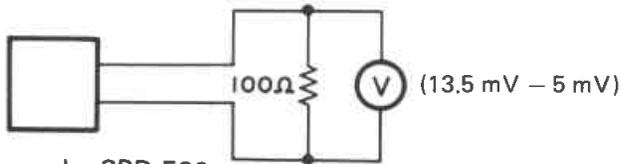
It is necessary to adjust servo control circuit when pickup is replaced. Adjust the circuit according to the following procedures in the order of the adjustment item, without skipping any items as the operation instruction is related to each previous step.

1. Equipment and tools used for adjustment

- 1) Laser power meter Wavelength of 780~820nm should be measured.
Power: 0.27 ~ 0.1 mW
If laser power meter is not available, connect items ① ~ ③ in the configuration indicated in Fig. 15.
- 1 Photo diode SPD series (Sharp Co.)
- 2 Resistor 100 Ω
- 3 Voltmeter 50 mV full scale

- 2) Oscilloscope Approx. 50 MHz (2 CH)
- 3) Receiver DAR 504.
- 4) Gain Adjustment Apparatus (Refer to page 25)
- 5) Short-connector for test mode J501 2 pin
J304 2 pin
- 6) Monitor cable with connector for test terminal J206 5 pin
J601 6 pin
- 7) Minus type screwdriver for VR adjustment
- 8) Test disc CBS SONY, TAPE 3, 4 or any other ordinary disc is substitutive.
- 9) Frequency counter 10 MHz, Input sensitivity 1 V
- 10) Hexagon screwdriver ... 2.4 mm

Photo Diode



Example: SPD-530

Fig. 14

IMPORTANT

Do not adjust ALPC if the reading is between 0.27 mW and 0.1 mW. (or 13.5~5mV)

Adjustments Points

PB-1

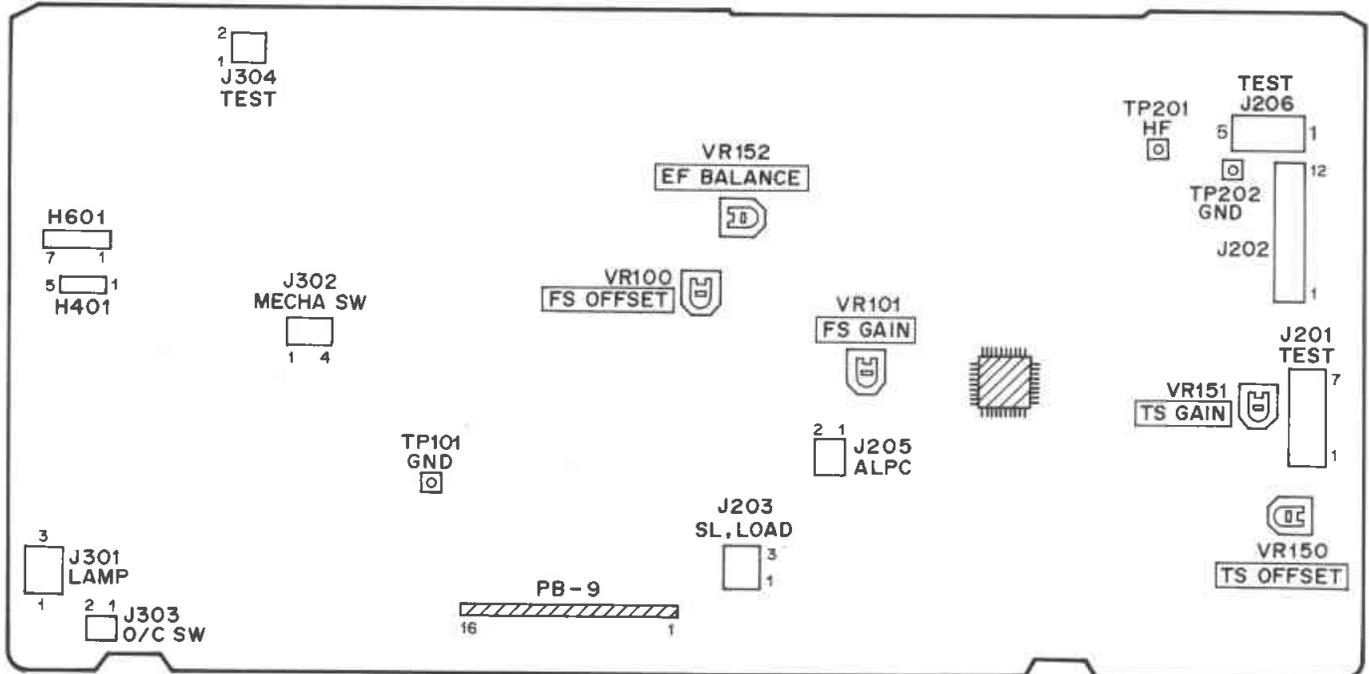


Fig. 15

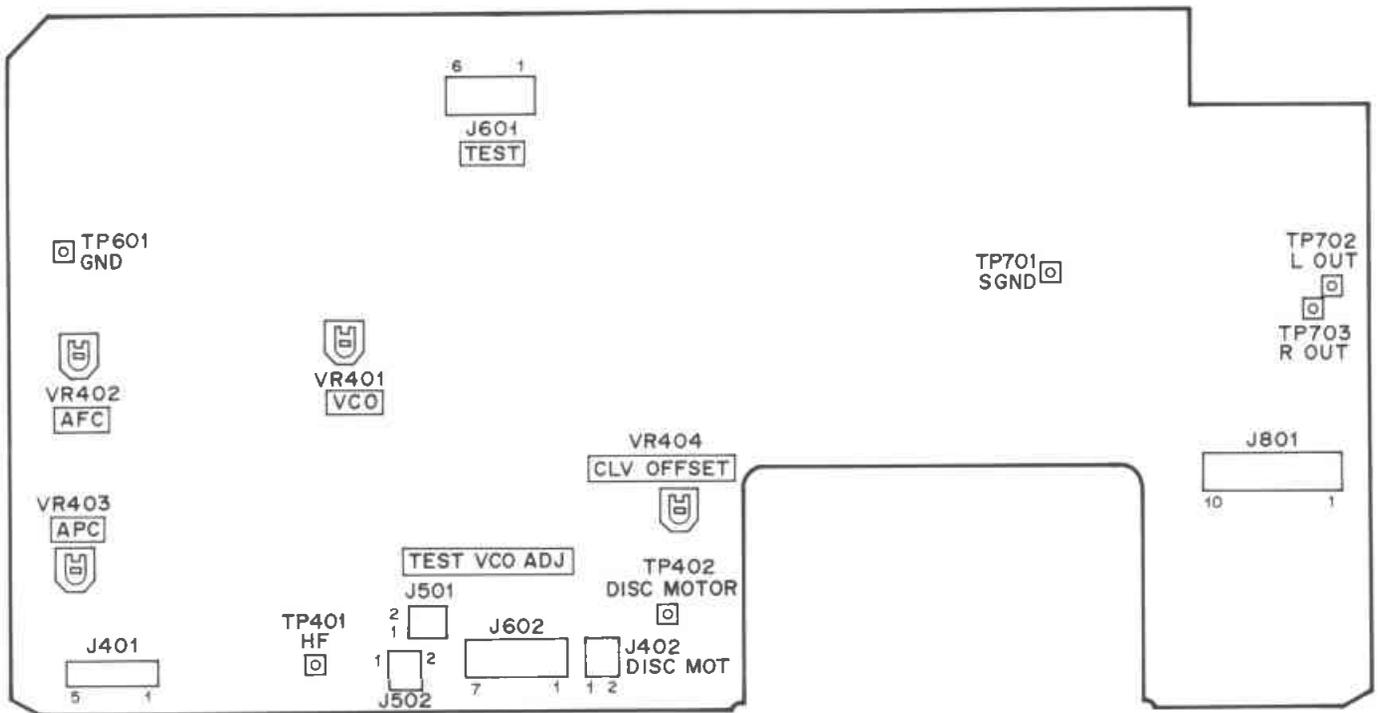


Fig. 16

2. Test Mode

- 1) Short-circuit pin 1 and 2 of J304 to drive the unit in the test mode. In this test mode the state of the unit can be set by pushing **CD** key as follows.
 - 1 push FS function ON
 - 2 push AFC function ON (FS is also kept ON)
 - 3 push TS & SL function is ON (FS & AFC are kept ON)
 - 4 push APC function is ON (FS, AFC, TS & SL are kept ON)
- To release these mode (FS, AFC, TS, SL, APC mode) push **STOP** key and the mode becomes stop mode.

Note: When drawing of the FS (Focus Servo) fails, even if the **CD** key is pressed twice, the mode will not shift to AFC.

Note: Shifting from the AFC mode to the TS mode must be conducted within one second. Otherwise, the disc may rotate in the reverse direction.

Note:

- 1) To reset the player from the TEST mode, set the receiver **POWER** key to the ON position after opening the short circuit between pins 1 and 2 of J304.
- 2) To move the slide mechanism (Pickup carriage):
 - In STOP mode: Press the **CD** key and three seconds later, press **FF** to move slide mechanism in the outer circumference direction or **FR** to move in the inner circumference direction.
 - In FS, AFC or TS mode: Press only the **FF** or **FR** key.

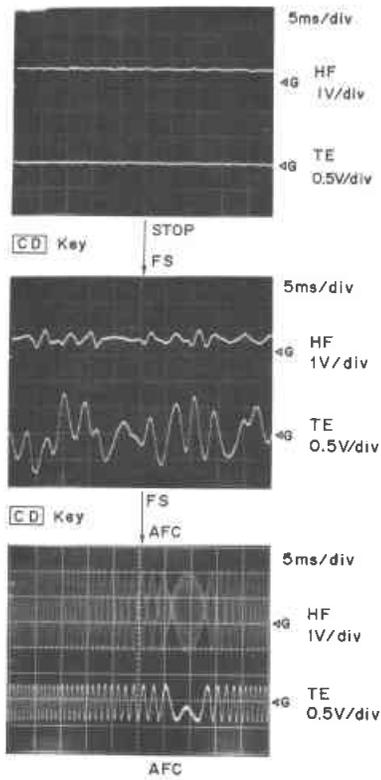
Note:

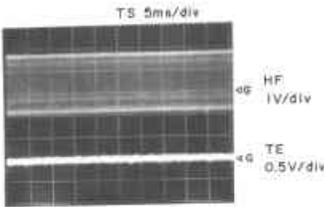
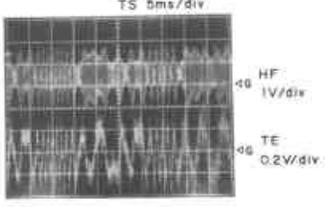
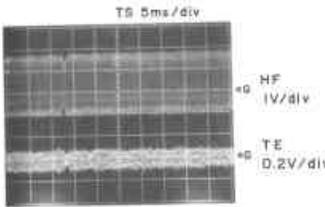
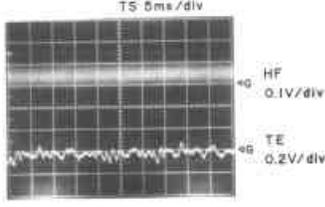
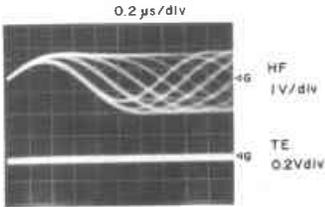
To stop movement of the slide mechanism, press the **CD** or **STOP** key. Beware that if the slide mechanism is moved excessively, mechanical lock will occur.

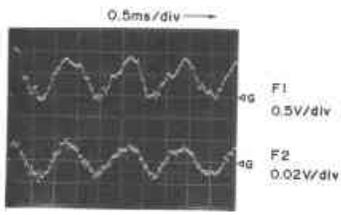
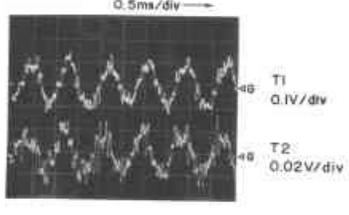
3. Adjustment Procedures

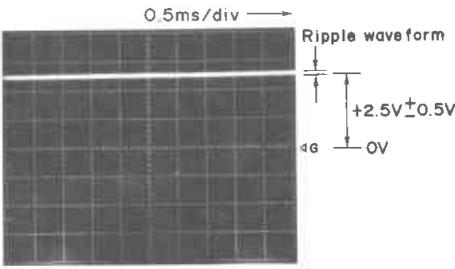
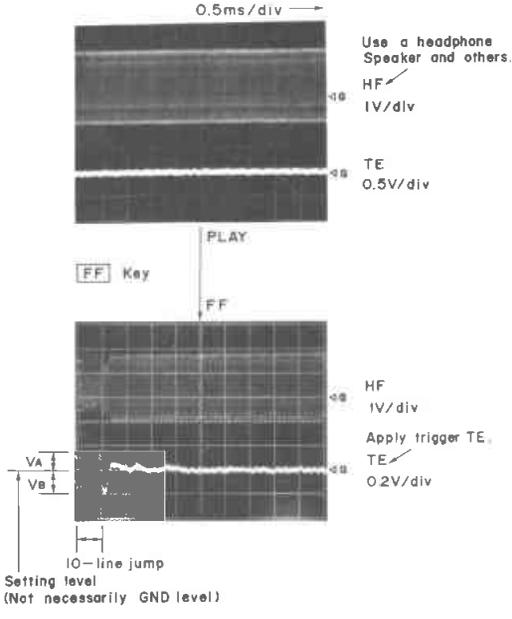
(Attention) Follow the sequence without skipping any step.

No.	Adjustment item	Adjustment procedure	Remarks
1	Presetting of VR knobs	All VR knobs should not be moved but are to be left as currently set.	
2	Setting to TEST mode	1) Insert a shorting connector to J304. 2) Turn on the receiver POWER switch.	Short-circuit J304 pin 1 ~ 2
3	*1 ALPC	It is not necessary to Adjust the ALPC VR. Because that is already adjusted at the factory, as long as the laser power meter indicates between 0.1 and 0.27 mW.	
4	*2 TS OFFSET (STOP mode)	1) Monitor J206 Pin 1 (TE). 2) Adjust to $0.00V \pm 0.01V$ using VR150.	
5	*3 SL OFFSET	1) Monitor J206 Pin 2 (SL). 2) Adjust to $0.0V \pm 0.1V$ using VR200.	
6	*4 FS drawing check (STOP mode → FS mode)	<p>1) Mount a disc. (Use OPEN/CLOSE key.)</p> <p>2) ● Monitor TP HF (1V/div 5ms/div AC) using scope probe ● J206 Pin 1 TE (0.5V/div 5ms/div DC)</p> <p>3) Press [CD] key to set to FS mode.</p> <p>4) Check FS drawing (pickup moves up and down three times.) When FS drawing is completed, random noise occurs to HF. TE. [If the signal (random noise) is unclear, a clear signal (noise) can be generated by gently rotating the disc by hand.]</p> <p>5) Turn VR404 (CLV OFFSET) clockwise to rotate the disc clockwise.</p> <p>6) The disc starts to rotate clockwise, and the waveform shown at right appears on HF. TE.</p>	<p>A disc should be mounted on all following adjustments.</p> <p>If no signal (noise) is observed, the FS drawing has failed, and the system returns to the STOP mode.</p> <p>This may be flat if the Grating has not been adjusted.</p>
7	Grating adjustment (AFC mode)	1) Turn the P.U. Grating so as to obtain the maximum level (pp) on J206 Pin 1 TE.	<p>Attention Extremely delicate adjustment. When turned in the wrong direction, or turned too far the TE signal polarity inverts. Do not adjust Grating over $\pm 90^\circ$.</p>



No.	Adjustment item	Adjustment procedure	Remarks
8	<p>TS gain (AFC mode → TS mode) (rough adjustment)</p>	<p>1) Monitor the following (AFC mode): ● TP HF ● J206 Pin 1 (TE)</p> <p>2) Set to the TS mode by pressing CD key.</p> <p>3) The waveform must be as shown in (a).</p> <p>4) If the waveform is as shown in (b) ~ (c), adjust each part until obtaining the waveform shown in (a).</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>(a) Optimum waveform</p> </div> <div style="text-align: center;">  <p>(b) Low TS gain ↓ Turn VR151 clockwise</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 20px;"> <div style="text-align: center;">  <p>(c) TS gain too large (oscillation) ↓ Turn VR151 counterclockwise.</p> </div> <div style="text-align: center;">  <p>(d) Inverted polarity of Grating ↓ Refer to Item 7. Readjustment of Grating.</p> </div> </div>	
9	<p>Pickup inclination adjustment (TS mode)</p> <p>Grating adjustment</p> <p>The Grating must be adjusted again after the inclination adjustment because the best point of the Grating moves as a result of the inclination adjustment.</p>	<p>1) Monitor TP HF (0.5V/div, 0.5 μS/div AC) adjusting the inclination for best eye pattern.</p> <p>2) Readjust the Grating of Item 7.</p> <div style="text-align: center; margin-top: 20px;">  </div>	
10	FS offset	<p>1) Monitor TP HF (0.5V/div, 0.5 μs/div AC) (set to TS mode).</p> <p>2) Obtain the best eye pattern using VR100.</p>	

No.	Adjustment item	Adjustment procedure	Remarks
11	FS Gain (TS mode)	1) Turn off the POWER switch of controller, and connect Gain adjustment jig to J201. Refer to Page 16. 2) Set FS/TS switch of gain adjustment jig to FS. 3) Monitor F1 and F2 signals of Gain adjustment jig. 4) Set to TS mode. 5) Adjust VR101 to obtain the same level of F1 and F2 signals. <div style="text-align: center; margin-top: 10px;">  </div>	*The adjustment method without using the gain adjustment jig is described later (refer to Page 15). A voltmeter may be used to compare the levels of F1 and F2 signals.
12	TS gain fine adjustment (TS mode)	1) Set FS/TS switch of Gain adjustment jig to TS. (Connect Gain adjustment jig with J201). Refer to Page 16. 2) Monitor T1 and T2 signals of Gain adjustment jig. 3) Set to TS mode. 4) Adjust VR151 to obtain the same level of T1 and T2 signals. <div style="text-align: center; margin-top: 10px;">  </div>	*The adjustment method without using the gain adjustment jig is described later (refer to Page 15).
13	FS offset (TS mode)	Readjust (since the optimum point moves as a result of FS gain adjustment).	
14	* ⁵ PLCK (FS mode)	1) Monitor J601 Pin 3 (PLCK) using a frequency counter. 2) Shortcircuit J501 (VCO ADJ) using a shorting pin. 3) Set to FS mode by pressing [CD] key. 4) Adjust VR401 (VCO) to obtain a reading of $4.40 \text{ MHz} \pm 0.06 \text{ MHz}$. 5) Remove the shortcircuit of J501.	Note) Use x10 probe on the counter input.
15	* ⁶ CLV offset (FS mode)	1) Set the controller to FS mode. 2) Monitor the TT402 (disc motor). 3) Adjust VR404 to obtain $0.0 \text{ V} \pm 0.1 \text{ V}$.	
16	* ⁷ AFC (TS mode)	1) Set the pickup to the position of starting tune. 2) Set to the TS mode by pressing [CD] key. 3) Adjust VR402 to obtain $7.35 \pm 0.15 \text{ kHz}$ for J601 Pin 2 (WFCK). Note) Turn VR402 clockwise to the full extent first and then adjust by turning it counter-clockwise.	The AFC mode must be changed to the TS mode within one second.

No.	Adjustment item	Adjustment procedure	Remarks
17	*8 APC (APC mode)	1) Set to APC mode by pressing [CD] key. 2) Monitor J601 Pin 1 (APC B) using an oscilloscope. 3) Adjust VR403 (APC) so that the Ripple waveform voltage is the minimum. At this time, the voltage value must be: $+2.5V \pm 0.5V$ 	
18	TEST mode Rest	1) Turn off the controller POWER switch. 2) Pull out the J304 shorting connector. 3) Turn on the controller POWER switch and press the [PWR ON] key.	
19	TS offset fine adjustment	1) Monitor the following points: <ul style="list-style-type: none"> ● TP HF (1V/div, 5ms/div) ● J206 Pin 1 (0.5V/div, 5ms/div) 2) Start playing by pressing [CD] key and check that sound can be heard. (Check of positioning to the starting point.) 3) Set to the FF mode by pressing the [FF] key. 4) Adjust VR150 until the TE level, at the time of 10-line jump, is vertically symmetrical to the setting level. ($V_A = V_B$) 	

- *1 ALPC : Automatic Laser Power Control
- *2 TS OFFSET : Tracking Servo Offset
- *3 SL OFFSET : Slide Offset
- *4 FS drawing : Focus Servo drawing

- *5 PLCK : Phase Locked Loop Clock
- *6 CLV : Constant Linear Velocity
- *7 AFC : Automatic Frequency Control
- *8 APC : Automatic Phase Control

Pickup Servo Adjustment Table

This table is a summary of ADJUSTMENT PROCEDURE on page 10 to 13.

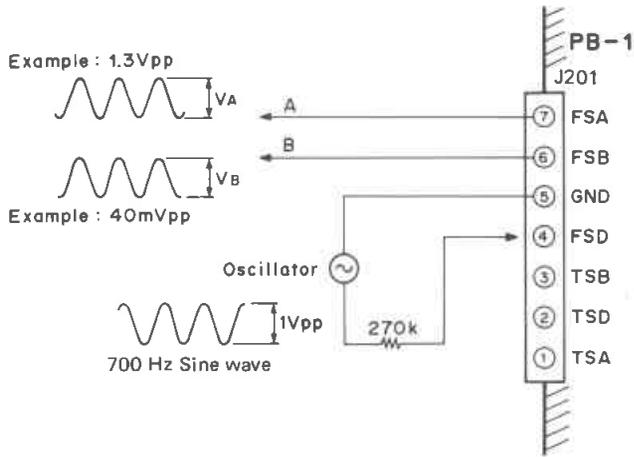
No.	Adjust item	Adjust place	Monitor pin	Adjust standard	Mode	Test Disc
1	Presetting of VR	A11 VR	—	Leave as they are		X
2	Setting to TEST mode	—	—	1. Insert a shorting connector to J304. 2. Turn on the receiver Power switch.		X
3	ALPC	VR1	Laser power meter	Do not adjust VR1, so long as reading is: 0.27 – 0.1 mW (or 13.5 – 5 mV)		X
4	TS offset	VR150 (PB-1)	J206 Pin 1 (T.E.)	0.00 ± 0.01 V	STOP	X
5	SL offset	VR200 (PB-2)	J206 Pin 2 (SL)	0.0 V ± 0.1 V	STOP	X
6	FS drawing check	—	• TP. (H.F.) • J206 Pin 1 (T.E.)	• Check FS drawing (Set to FS mode) • Make sure that random noise occurs to HF. TE.	STOP → FS	○
7	Grating	Pickup Grating adjust screw	J206 Pin 1 (T.E.)	T.E. = Maximum	AFC	○
8	TS gain (rough adjustment)	VR151 (PB-1)	J206 Pin 1 (T.E.)	Set at between: 1) Out of TS offset adjustment, and 2) TS adjustment is oscillating	TS (or APC or PLAY)	○
9	Inclination adjustment (J direction)	Pickup inclination adjust screw	TP H.F.	• Optimum eye pattern. • Minimum jitter	TS (or PLAY)	○
10	FS offset	VR100 (PB-1)	TP H.F.	• Optimum eye pattern • Minimum jitter	TS (or APC, or PLAY)	○
11	FS gain	VR101 (PB-1)	Gain adjust jig, F1 & F2 outputs	V _{pp} (F1) = V _{pp} (F2)	TS (or APC, or PLAY)	○
12	TS gain (fine adjustment)	VR151 (PB-1)	Gain adjust jig, T1 & T2 outputs	V _{pp} (T1) = V _{pp} (T2)	TS (or APC, or PLAY)	○
13	FS offset	VR100	TP, H.F.	Readjustment is necessary. (follow procedure item 10)	TS	○
14	PLCK	VR401 (PB-2)	J601 Pin 3 (J501 short)	4.40 ± 0.06 MHz	FS	○
15	CLV offset	VR404 (PB-2)	J401 Pin 1	0.0 V ± 0.1 V	STOP	○
16	AFC	VR402 (PB-2)	J601 Pin 2	7.35 +0.15 kHz –0.65 kHz	TS	○
17	APC	VR403 (PB-2)	J601 Pin 1	Ripple = Minimum	APC	○
18	TEST mode reset			Pull out J304 connector.		○
19	TS offset (fine adjustment)	VR150 (PB-1)	J206 Pin 1 (T.E.)	V _A = V _B (Refer to Page 13) at 10-line jump	PLAY (TEST mode is reset)	○

4. Gain Adjustment When Gain Adjustment Jig is not Available

4.1 FS Gain Adjustment

- 1) Set to the TS (Test mode) or PLAY mode (Normal mode).
- 2) Input signals of 700 Hz, 1 Vpp to J206 Pin 4 through a series 270 kΩ resistor.
- 3) Monitor the signal levels of J206 Pin 7 and Pin 6 using an oscilloscope.
- 4) Adjust VR101 (FS Gain) to obtain the following:

$$\frac{V_A}{V_B} = 32$$

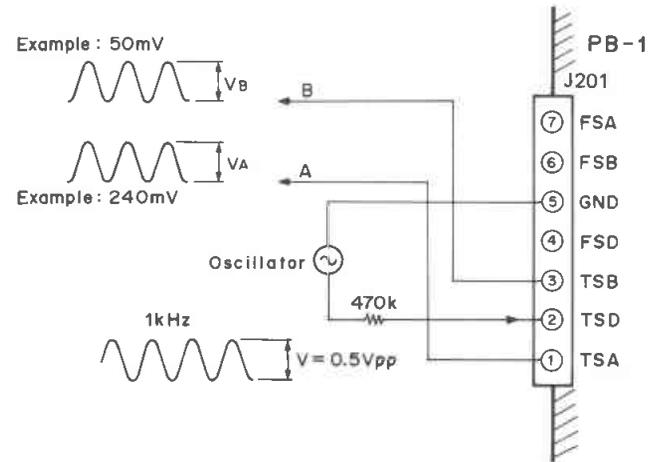


4.2 TS Gain Adjustment

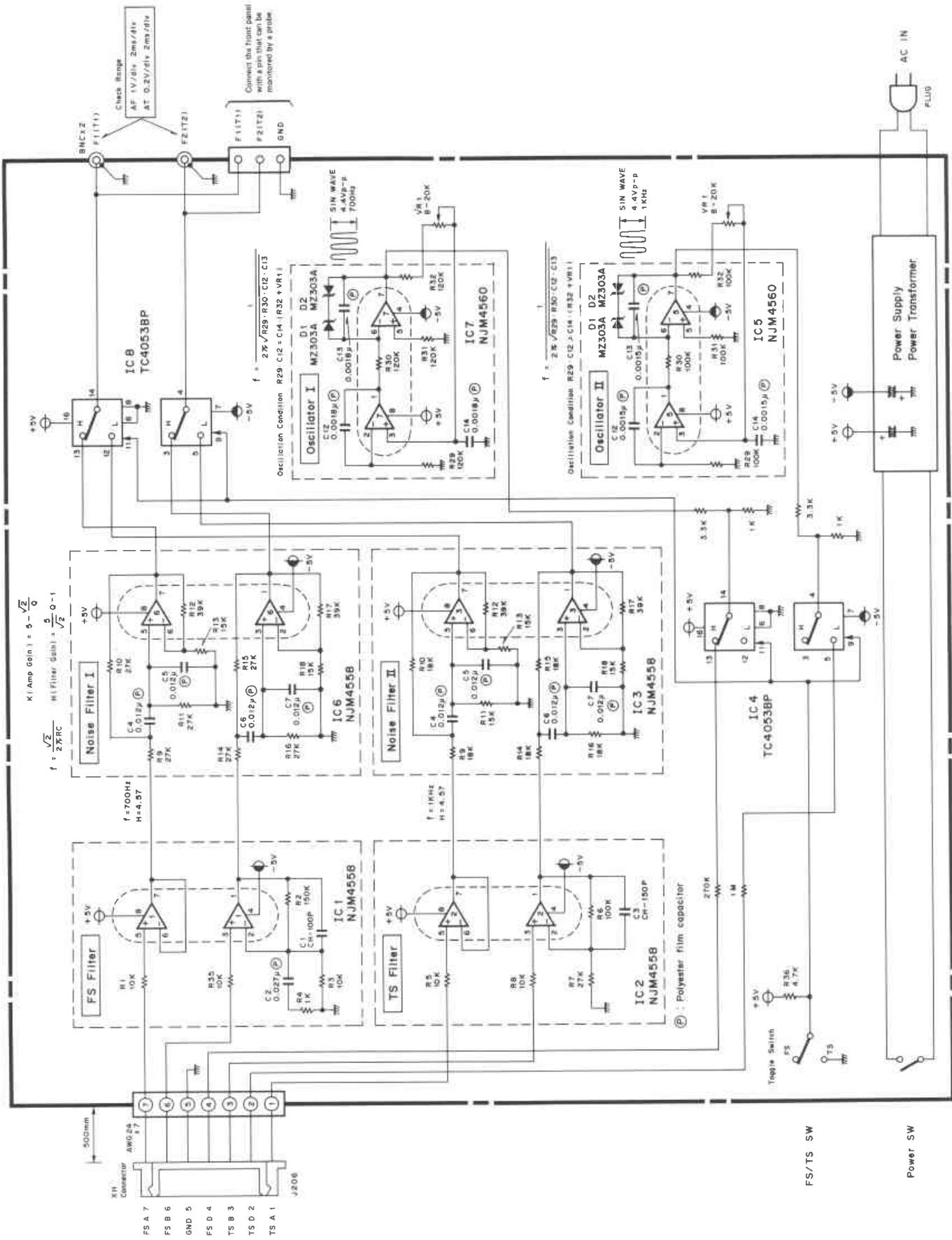
- 1) Set to the TS (TEST mode) or PLAY mode (Normal mode).
- 2) Input signals of 1 kHz, 0.5 Vpp to J206 Pin 2 through series 470 kΩ resistor.
- 3) Monitor the signal levels of J206 Pin 1 and Pin 3 using an oscilloscope.
- 4) Adjust VR151 (TS Gain) to obtain the following:

$$\frac{V_A}{V_B} = 4.7$$

Note: If the player is vibrated or when a faulty disc is used, noise overlaps on the waveform making monitoring difficult. When an eccentric or distorted disc is used, the waveform on the oscilloscope moves up and down, but this presents no problem.

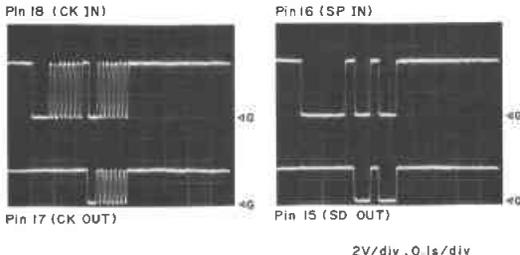
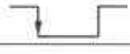


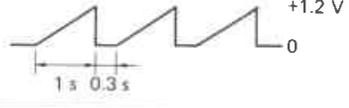
4.3 Gain Adjustment jig

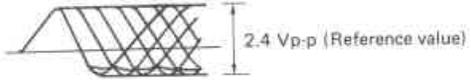
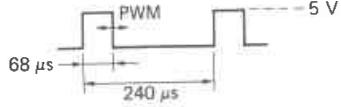
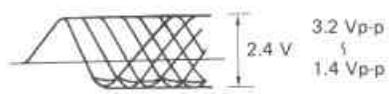


TROUBLESHOOTING

Printed circuit board	Place of improper adjustment	Control knob name	Symptom when mal-adjusted
PB-1	VR200	SL OFFSET	1) Player can not access the starting tune. 2) The slider (pickup) moves. 3) Too long access time (poor balanced access time of FWD to REV). Note: VR200 → Clockwise. Slider (pickup) moves to outer circumstance.
	VR150	TS OFFSET	1) Improper jump action. 2) Affected by disc marks.
	VR100	FS OFFSET	1) Takes too long to access the starting tune. 2) Too great an error rate (noise mixes in the sound). Too small HE amplitude. Jitter increase.
	VR101	FS GAIN	1) The focus will not drawn in. 2) The error stop approx. 7 sec. after turning on <input type="checkbox"/> CD (small HF amplitude).
	VR151	TS GAIN	1) Too long a time to access the starting tune. 2) Too long an access time.
	VR152	EF balance	1) Too long an access time. 2) Affected by disc marks.
PB-2	VR401	PLCK	1) Takes too long a time (or impossible) to access the starting tune. 2) Too long an access time.
	VR402	AFC	1) The pickup cannot access the starting tune. (Error stop in approx. 7 sec. after turning on <input type="checkbox"/> CD .)
	VR403	APC	1) The pickup cannot access the starting tune. 2) Noise affects the sound.
	VR404	CLV OFFSET	1) The pickup cannot access the starting tune. 2) The disc continues to rotate after the disc brake was activated when STOP is pressed.
Mechanism		Grating	1) The pickup cannot access the starting tune (too small HF amplitude). 2) Too long an access time. 3) Noise affects the sound (large HF jitter).
		Radian inclination	
		Jitter inclination	

No.	Symptom	Confirmation	Cause	Check																
1	Does not operate. (The OPEN/ CLOSE button is not effective.)	Power supply failure	Break of H951, H801	Check the power supply at J801 of PB-2 <table border="1"> <thead> <tr> <th>J801</th> <th>Voltage</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-5 ± 0.2 V</td> </tr> <tr> <td>2</td> <td>+5 ± 0.2 V</td> </tr> <tr> <td>6</td> <td>+12.5 ± 1 V</td> </tr> <tr> <td>7</td> <td>-12 ± 1 V</td> </tr> <tr> <td>9 ~ 10</td> <td>AC 8 Vrms</td> </tr> </tbody> </table>	J801	Voltage	1	-5 ± 0.2 V	2	+5 ± 0.2 V	6	+12.5 ± 1 V	7	-12 ± 1 V	9 ~ 10	AC 8 Vrms				
			J801	Voltage																
			1	-5 ± 0.2 V																
		2	+5 ± 0.2 V																	
		6	+12.5 ± 1 V																	
		7	-12 ± 1 V																	
		9 ~ 10	AC 8 Vrms																	
Load short-circuit	If the voltage of J801 is low or none at all, re- move the connector of each load and find the short-circuit. 1) J202 (P/U connector) 2) J203 (SL, Load motor) SL 54 Ω, Load 18 Ω 3) J402 (Disc motor), approx. 15 Ω 4) <table border="1"> <thead> <tr> <th>Printed circuit board</th> <th>Power supply</th> <th>Load resistance</th> </tr> </thead> <tbody> <tr> <td rowspan="4">PB-1</td> <td>+5 V system</td> <td>Approx. 1.4 kΩ</td> </tr> <tr> <td>-5 V system</td> <td>Approx. 2.8 kΩ</td> </tr> <tr> <td>+12 V system</td> <td>Approx. 16 kΩ</td> </tr> <tr> <td>-12 V system</td> <td>Approx. 5~50 kΩ</td> </tr> <tr> <td rowspan="3">PB-2</td> <td>+5 V SW system</td> <td>Approx. 15 Ω</td> </tr> <tr> <td>+12 V system</td> <td>Approx. 120 Ω</td> </tr> <tr> <td>-12 V system</td> <td>Approx. 25 kΩ</td> </tr> </tbody> </table> Measure using a test meter. (Value for your reference.)	Printed circuit board	Power supply	Load resistance	PB-1	+5 V system	Approx. 1.4 kΩ	-5 V system	Approx. 2.8 kΩ	+12 V system	Approx. 16 kΩ	-12 V system	Approx. 5~50 kΩ	PB-2	+5 V SW system	Approx. 15 Ω	+12 V system	Approx. 120 Ω	-12 V system	Approx. 25 kΩ
Printed circuit board	Power supply	Load resistance																		
PB-1	+5 V system	Approx. 1.4 kΩ																		
	-5 V system	Approx. 2.8 kΩ																		
	+12 V system	Approx. 16 kΩ																		
	-12 V system	Approx. 5~50 kΩ																		
PB-2	+5 V SW system	Approx. 15 Ω																		
	+12 V system	Approx. 120 Ω																		
	-12 V system	Approx. 25 kΩ																		
Fuse	Check fuse. (DAR504)																			
If the power supply is normal	Interface system failure	Check waveform on Pins 15, 16, 17, 18 of IC301 (microprocessor). 																		
	Defective IC301 (microprocessor)	Check that IC301 Pin 25 (XOUT) oscillates at 4.0 MHz.																		
	Defective OPEN/ CLOSE switch	IC301 Pin 27 must be as follows when the OPEN/CLOSE switch is pressed. 																		
	Defective loading motor	Check that J203 Pin 1 output +7 V at the time of OPEN and -7 V at the time of CLOSE.																		

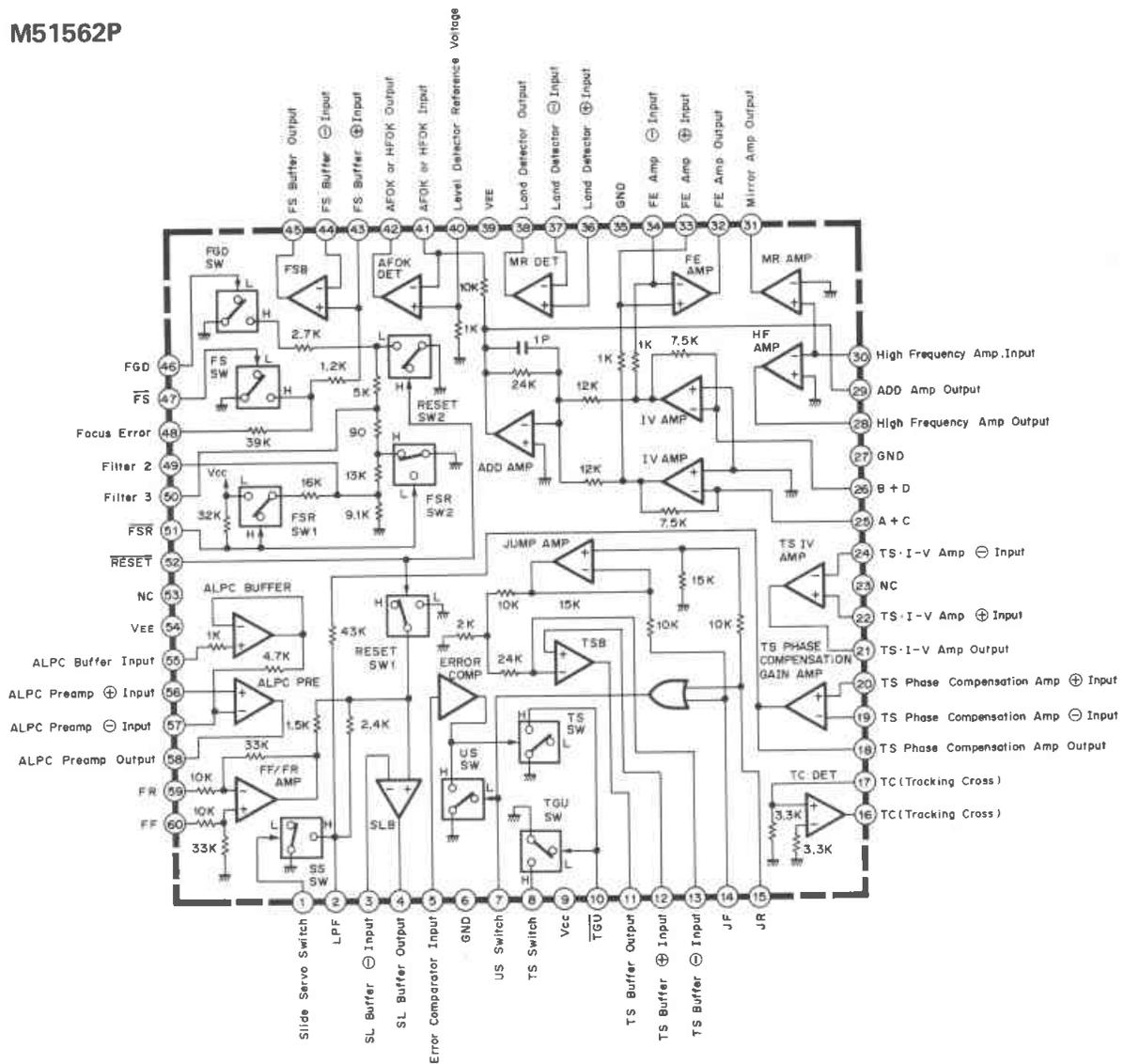
No.	Symptom	Confirmation	Cause	Check
			Defective PB-9 (IC981, IC983)	Check that output appears to IC301 Pin 50 (OPEN) and Pin 49 (CLOSE).
2	The disc tray automatically opens/closes at 3 sec. intervals.		J302	Check J302 of PB-1.
			Defective OPEN switch or CLOSE switch	Check that J301 Pin 30 (OPEN SW) and Pin 29 (CLOSE SW) are set as follows. 
3	No disc rotation	If pickup lens does not rise	Break in pickup cable	Check that the drive waveform is output to J206 Pin 3 (FS). 
			Break in pickup focus actuator cable	Check continuity between Pin 9 and Pin 10 of J202. Approx. 20 Ω.
			Defective PB-9 (IC982, IC984)	The waveform shown below should be at J201 Pin 7 (FSA). 
			Defective IC200	Check the waveform or Q101 collector. 
			If pickup lens rises	Defective ALPC switch
		Defective pickup laser diode	Set the player to TEST mode and measure the laser power. (reference value) 0.27 mV ~ 0.1 mW	
		Improper adjustment	Adjust VR101 (FS GAIN).	
		Improper mechanism alignment	Check the inclination adjustment (radial, jitter).	
		Defective IC200	Check the waveform on IC301 Pin 45 (HFOK) and Pin 44 (FZC). Pin 45:  Pin 44: 	
		4	Disc rotates at a high speed.	If disk rotates at a high speed immediately after power switch is turned on.
Defective IC403 or Q401, Q402	Check TP402 (Disc motor) of PB-2. Should be within ± 0.1 V.			

No.	Symptom	Confirmation	Cause	Check
4	Disc rotates at a high speed. (continued)	If disk rotates at a high speed after pressing CD . (automatically stops in about 7 sec.)	Break of J502 (shield wire)	Check TP401 HF of PB-2. 
			Break of J401 (flat cable)	Check J401.
			Defective IC401	1) J601 Pin 3 (PLCK)  2) IC401 Pin 25 (AFCO) (In TS or AFC mode)  3) IC401 Pin 20 (SVO -), Pin 19 (SVO +) +2.1 V
5	Disc rotates and error stop occurs 7 sec. later.		Small HF amplitude (large jitter)	Check TP401 (HF) of PB-2.  If the amplitude is small: <ul style="list-style-type: none"> • Improper adjustment of pickup grating. → Refer to Adjustment Procedures. (Page 10) • Improper inclination adjustment. → Refer to Adjustment Procedures. (Page 11) • Improper adjustment of FS OFFSET (VR100) → Refer to Adjustment Procedures. (Page 11)
			Improper PLCK adjustment	<ul style="list-style-type: none"> • Check the frequency of J601 Pin 3 (PLCK). Adjust VR401 (VCO). → Refer to Adjustment Procedures. (Page 14)
			Improper AFC adjustment	<ul style="list-style-type: none"> • Check the frequency of J601 Pin 2 (WFCK). Adjust VR402 (AFC). → Refer to Adjustment Procedures. (Page 12)
			Improper pickup Servo adjustment	<ul style="list-style-type: none"> • VR200 (SL OFFSET) • VR152 (EF BALANCE) • VR150 (TS OFFSET) • VR151 (TS GAIN) Refer to Adjustment Procedures. (Pages 10 ~ 13)

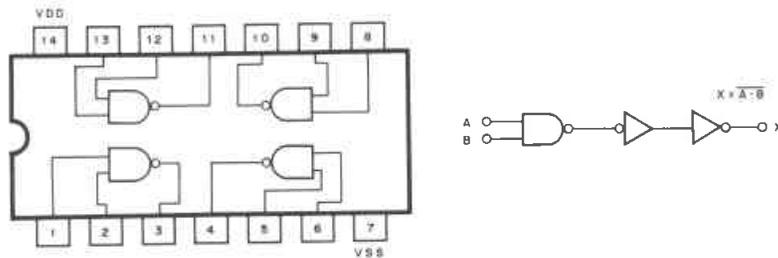
No.	Symptom	Confirmation	Cause	Check
6	Disc rotates but no sound is heard.		PLCK not synchronized.	Check that J601 Pin 4 (GFS) is "H". If "L", adjust VR401 (VCO). → Refer to Adjustment Procedures (Page 12)
			Too large an error rate (Error rate should be less than 200 Hz)	Measure the J601 Pin 6 (EST) frequency using a frequency counter. If the error rate is large readjust the pickup servo system. → Refer to Adjustment Procedures. (Page 12)
			Defective analog amplifier (IC705)	Check the waveform of IC702 (L) and TP703 (R) on PB-2.
			Defective D/A section	Check the waveform of IC702 Pin 1 and IC703 Pin on PB-2.
7	Too slow positioning of head to the starting tune.		Improper adjustment of track servo system	Check the waveform of J206 Pin 1 (TE). • VR152 (EF BALANCE) • VR151 (TS GAIN) • VR150 (TS OFFSET) • Grating → Refer to Adjustment Procedures. (Pages 10 ~ 13)
			Improper PLCK adjustment	Check the frequency of J601 Pin 1 (PLCK). • VR401 (VCO) → Refer to Adjustment Procedures. (Page 12)
8	A long time before output sound appears after track selection		Same as the above	Same as the above
9	Noise on sound.		Too large HF signal jitter.	• Check the waveform of PB-2 TP401 (HF). • If the error rate of J601 Pin 6 (EST) is 1 kHz or greater, adjust the pickup servo system. • VR100 (FS OFFSET) • Pickup inclination (Radian, jitter) • Pick up grating. → Refer to Adjustment Procedures. (Pages 10,11)
10	Sound jumps on disc marks.		Improper adjustment of track servo system.	Check the waveform of PB-1 J206 Pin 1 (TE). Adjust the following. • VR150 (TS OFFSET) • VR152 (EF BALANCE)

INTERNAL DIAGRAM AND PINOUT OF INTEGRATED CIRCUITS

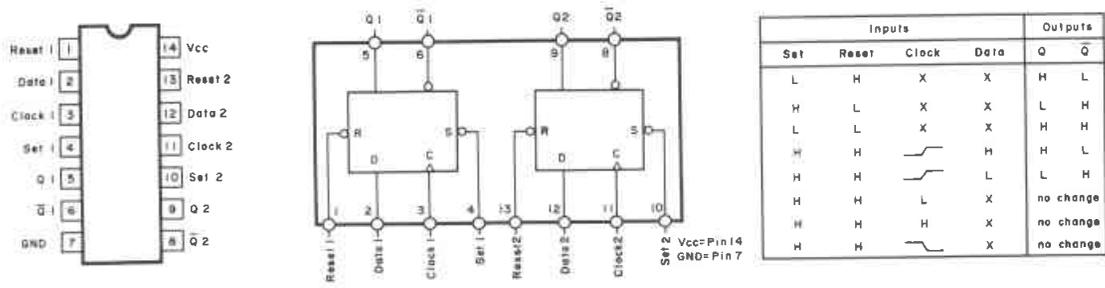
IC200: M51562P



IC201: TC4011BP

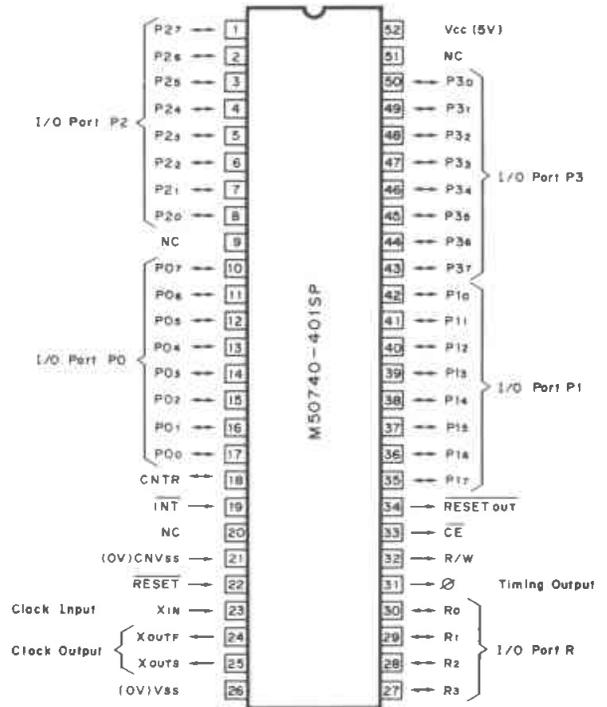
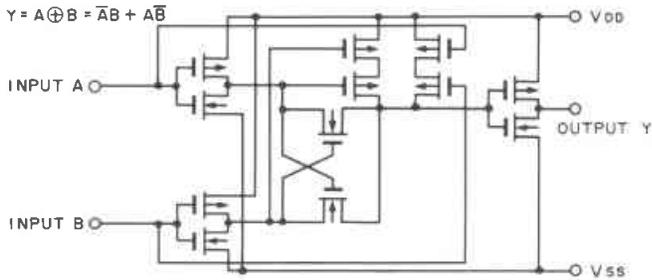
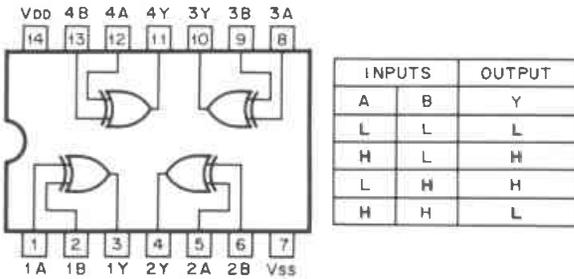


IC202: TC40H074P or TC74HC74

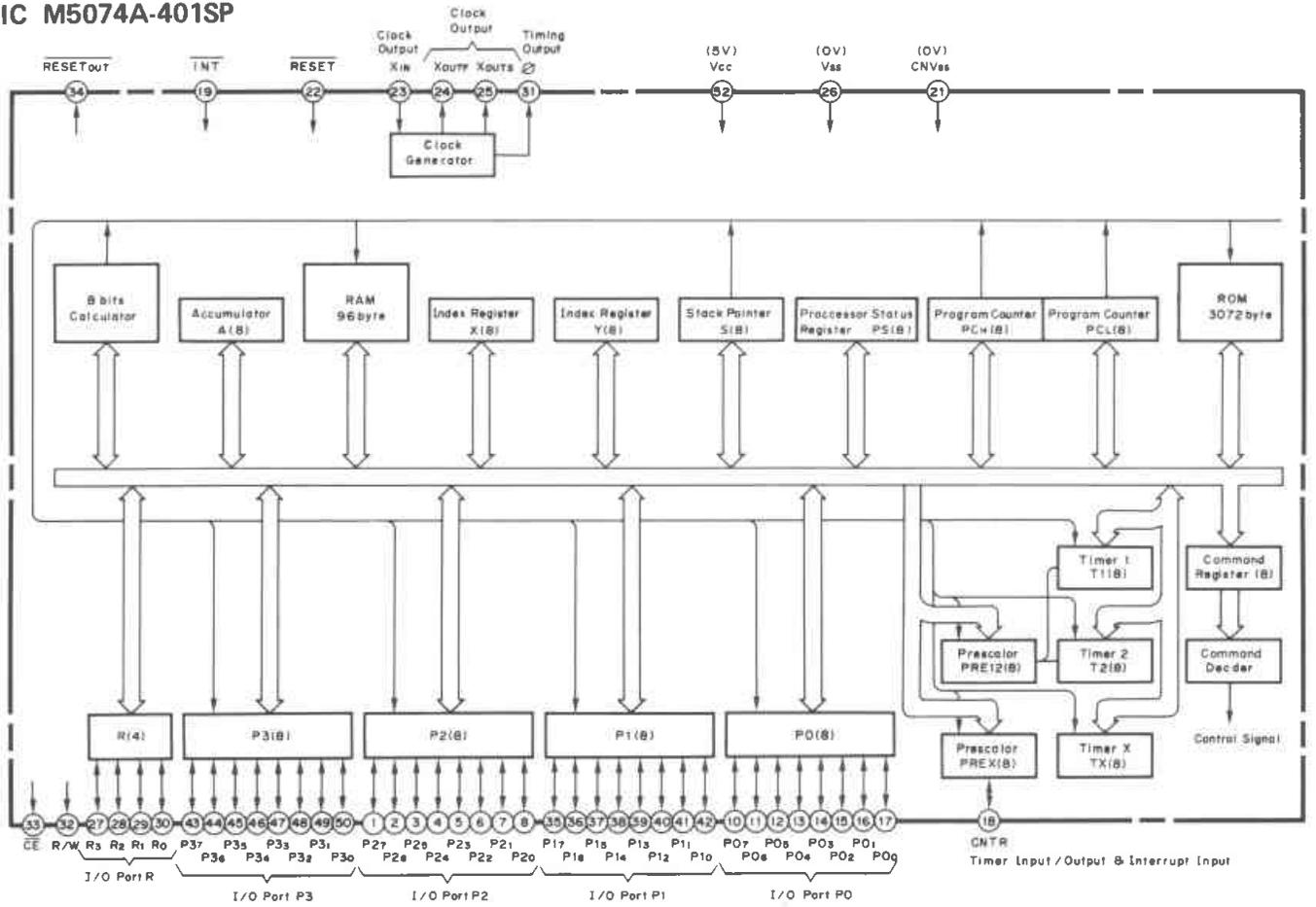


IC203: TC40H386P or TC4030BP

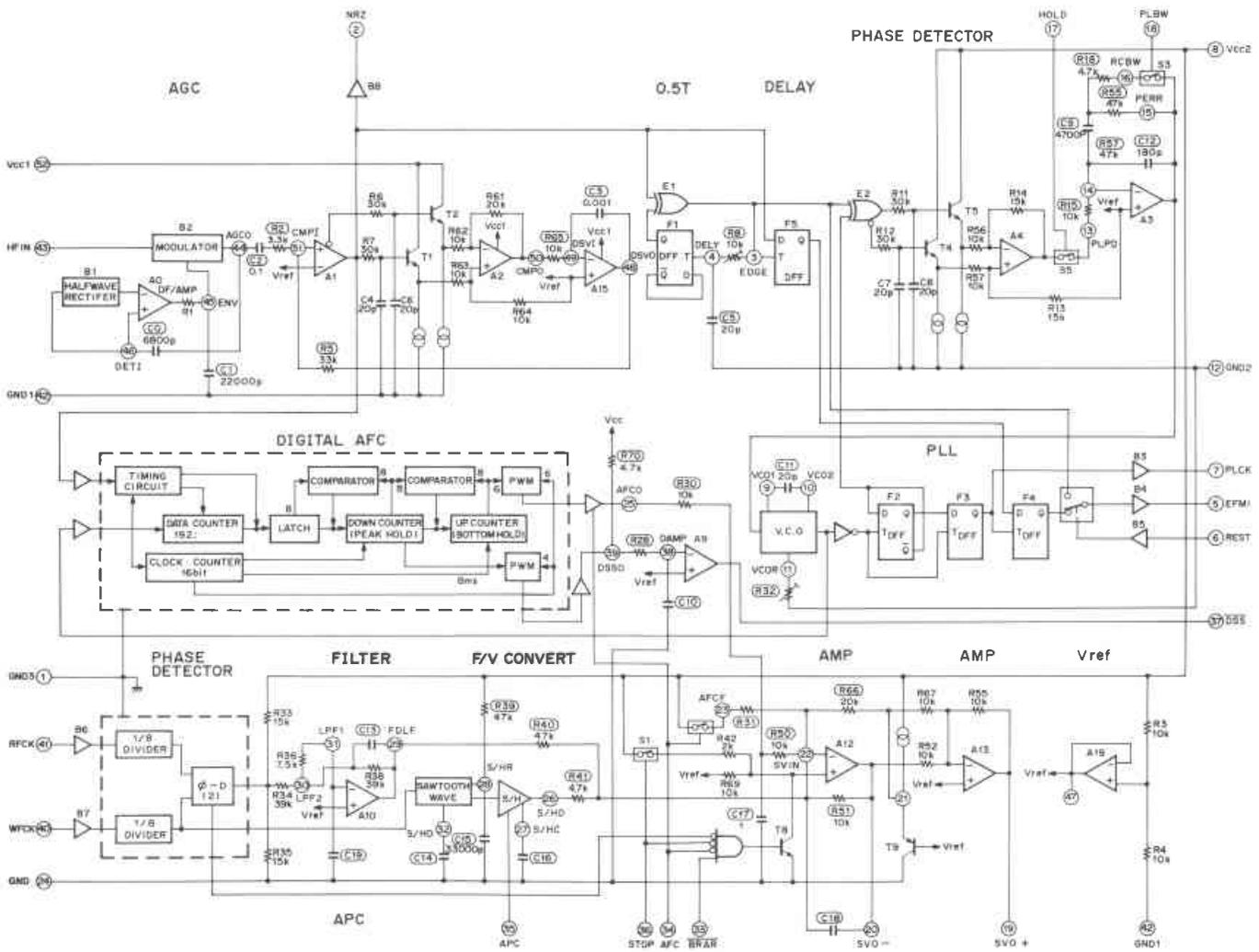
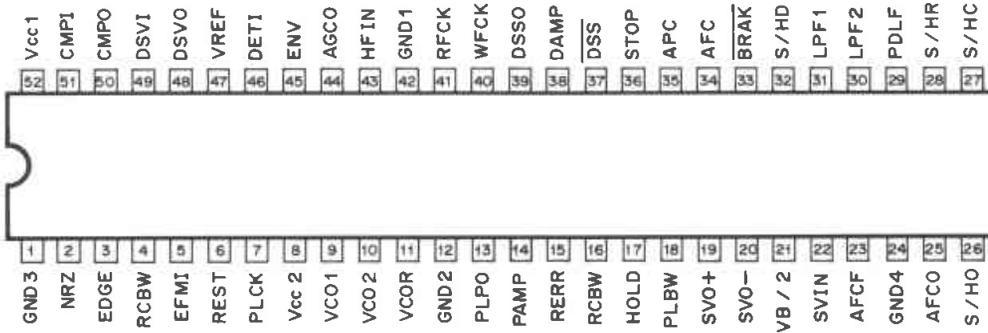
IC301: M50740A-401SP



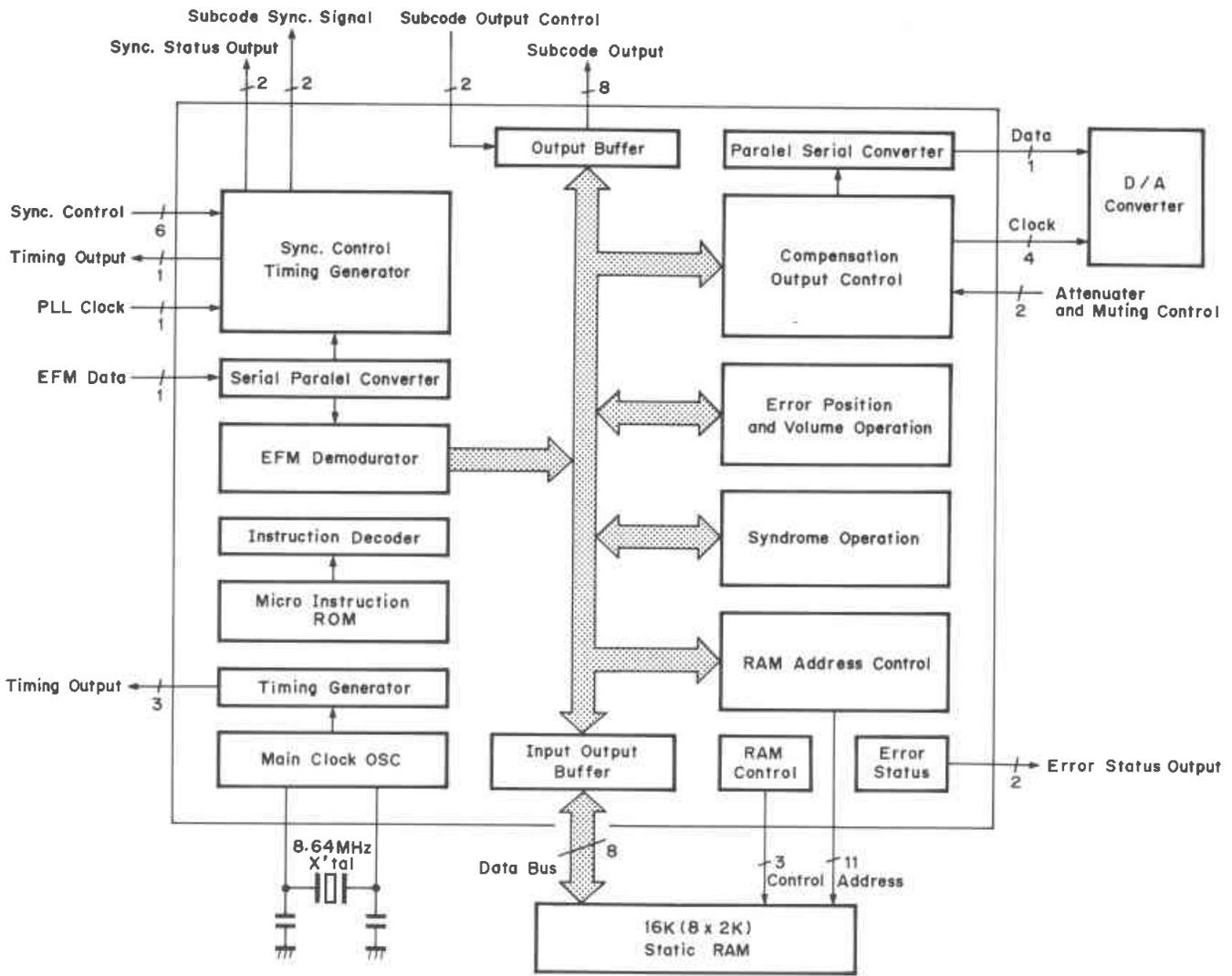
IC M5074A-401SP



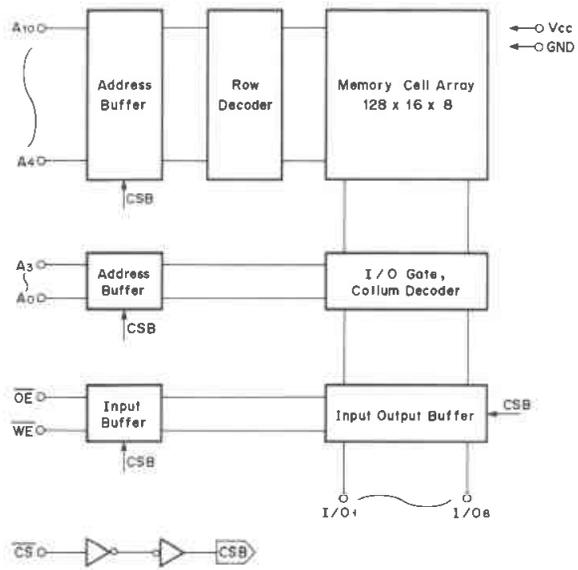
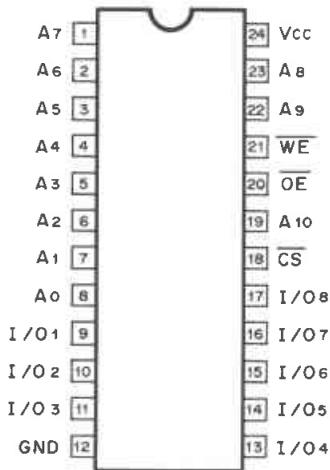
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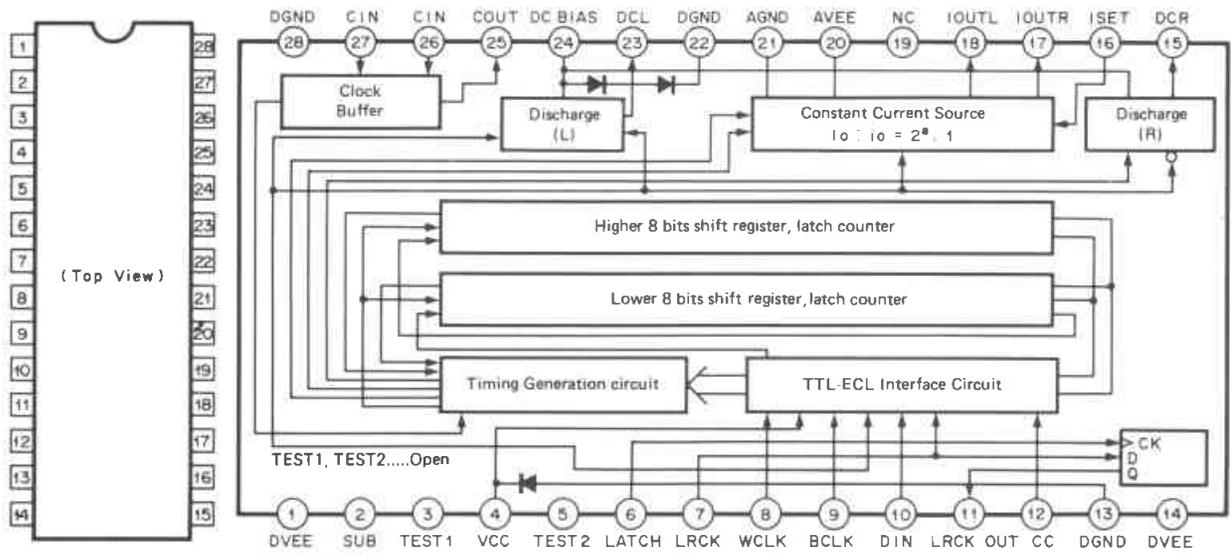
M50420-001P



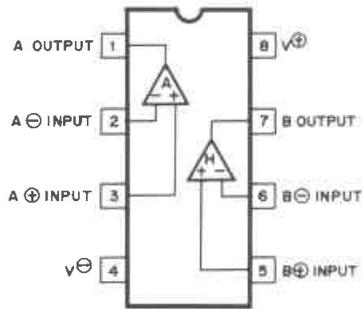
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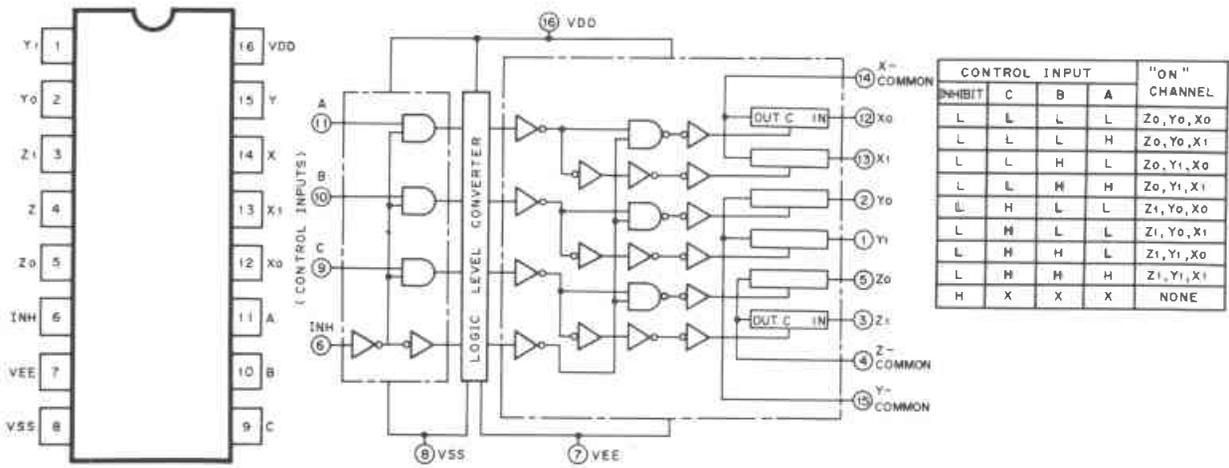
IC701: CX-20017



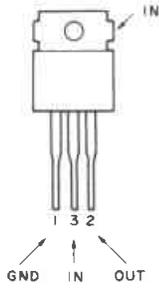
IC702, IC703: NJM082D



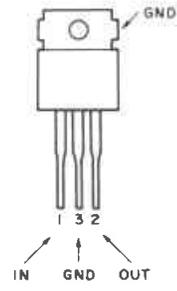
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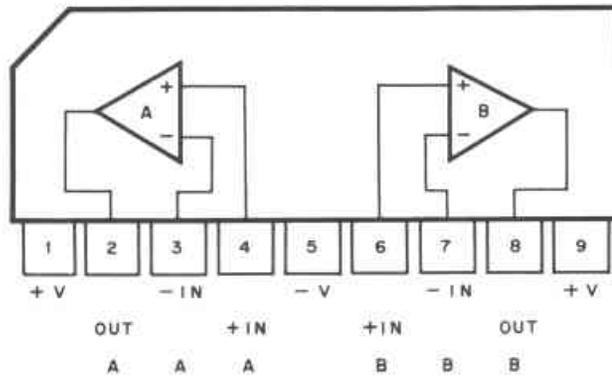
IC801: μ PC7805H



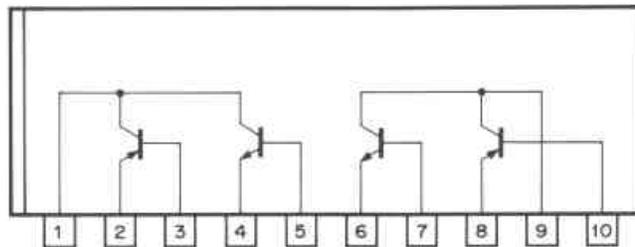
IC802: μ PC7905H



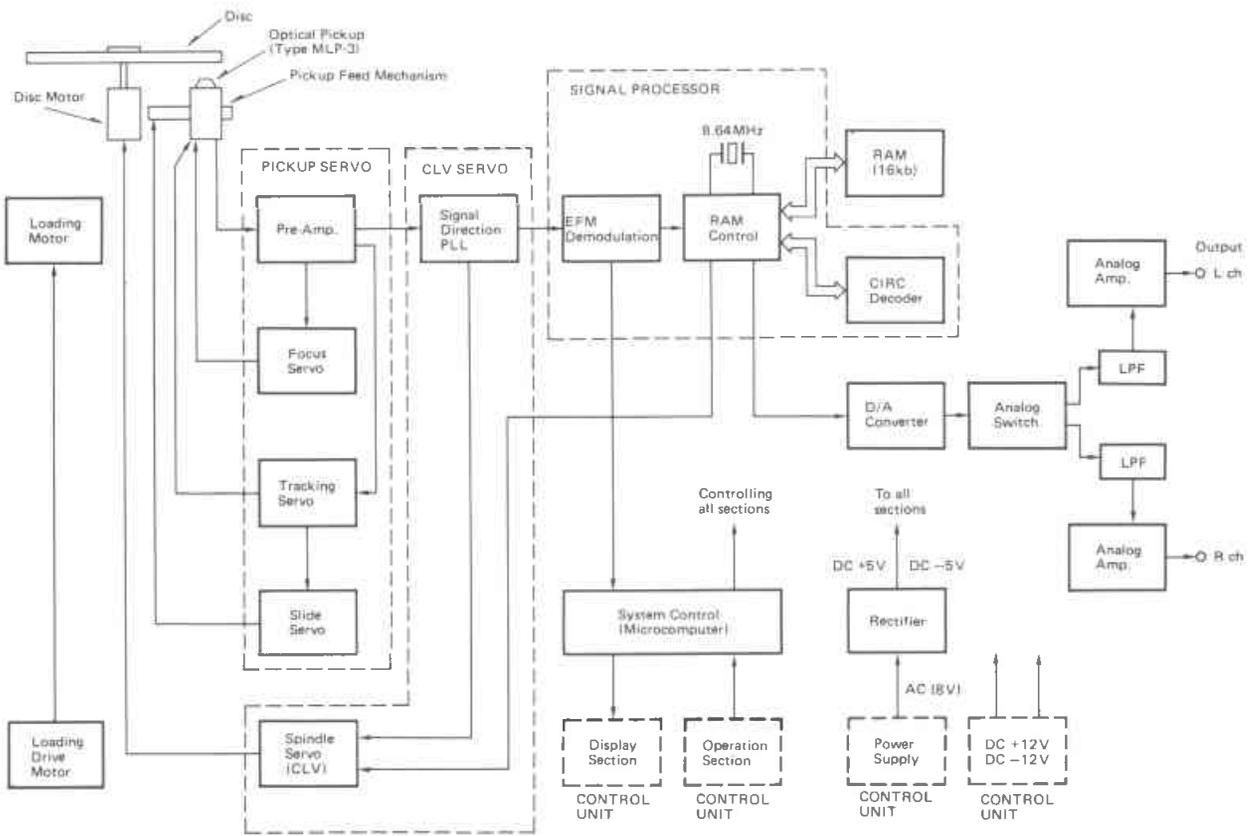
IC981, IC982: NJM4558S, NJM4556S



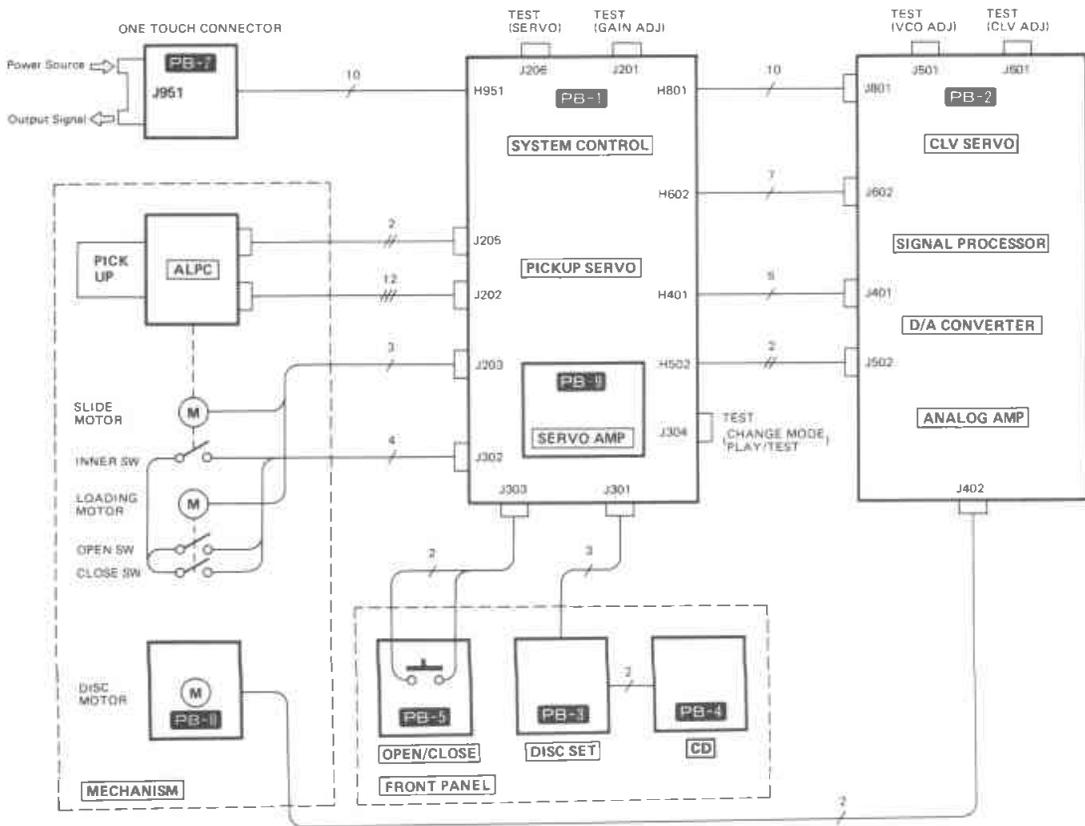
IC983, IC984: STA451C



BLOCK DIAGRAM

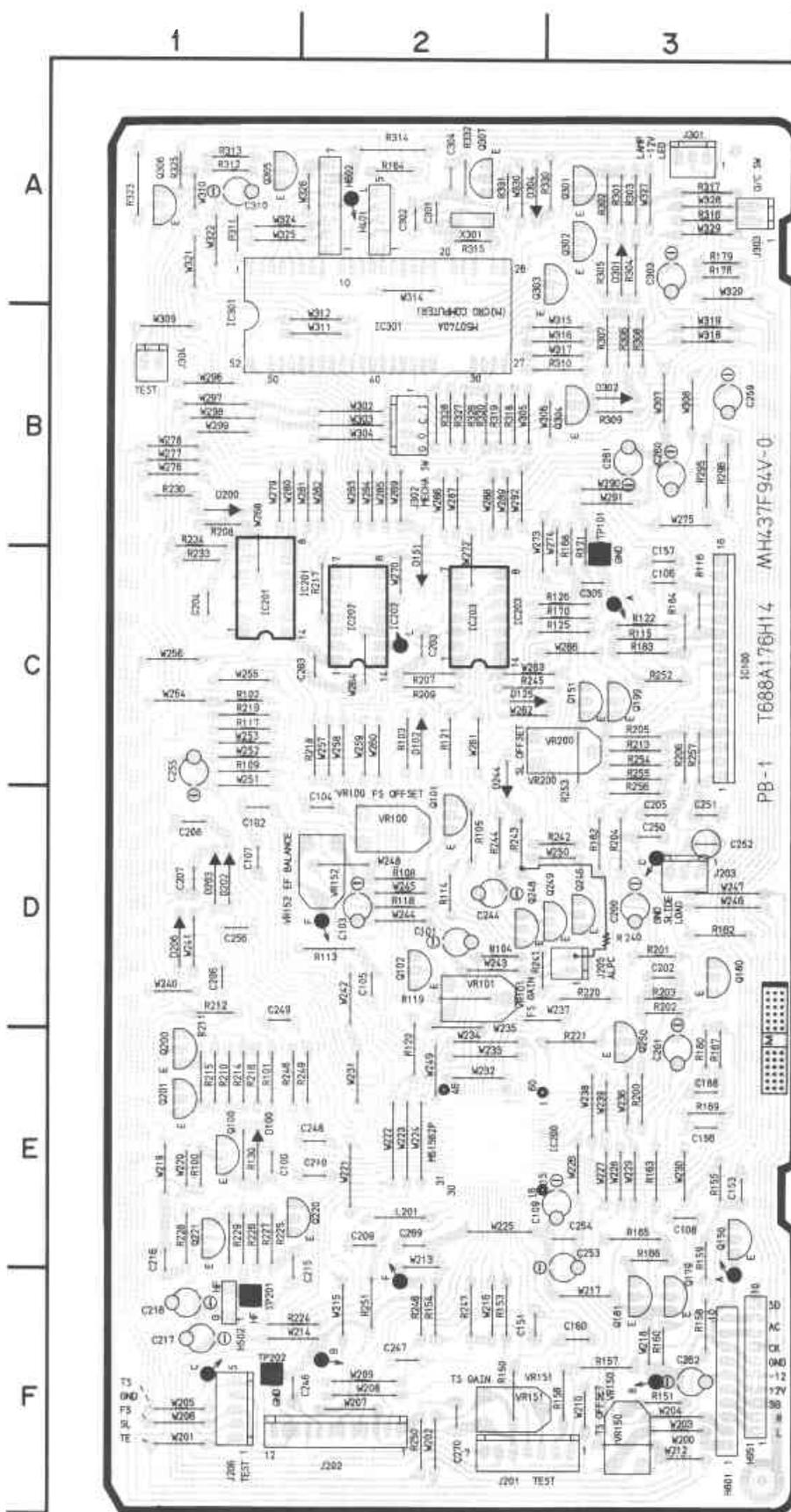


WIRING DIAGRAM



PRINTED CIRCUIT BOARD

PB-1



LOCATION TABLE PB-1

* This part is placed on the pattern side.

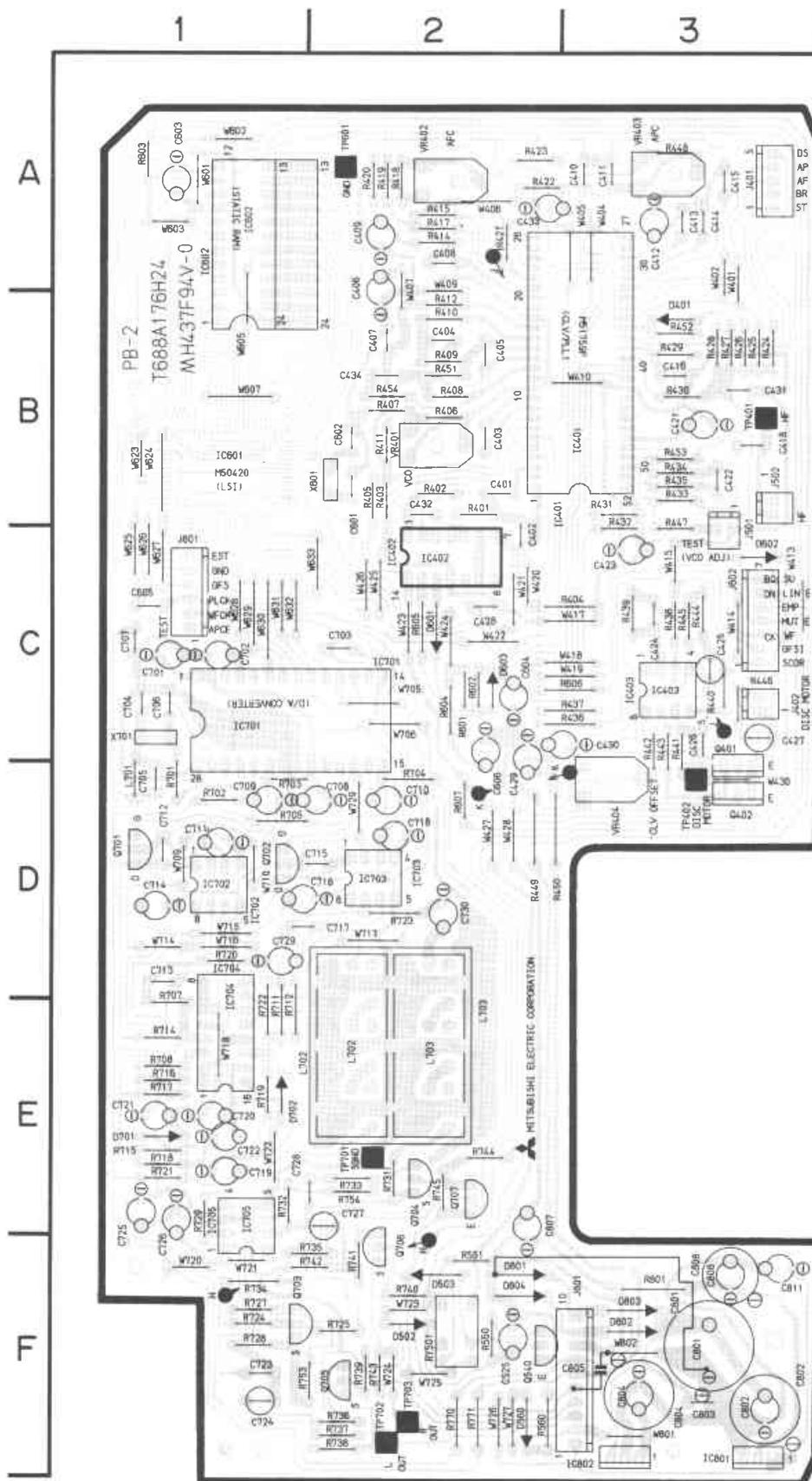
Symbol No.	Address
C100	1E
C101	2D
C102	1D
C103	2D
C104	2D
C105	2D
C106	3C
C107	1D
C108	3E
C109	3E
C151	2F
C153	3E
C156	3E
C157	3C
C160	3F
C188	3E
C200	3D
C201	3E
C202	3D
C203	2C
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C206	1D
C207	1D
C208	1D
C209	2E
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C216	1E
C217	1F
C218	1F
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C247	2F
C248	2E
C249	1D
C250	3D
C251	3D
C252	3D
C253	3E
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C255	1C
C256	1D
C259	3B
C260	3B
C261	3B
C262	3F
C263	2C
C269	2E
C270	2F
C301	2A
C302	2A
C303	3A
C304	2A
C305	3C
C310	1A
D100	1E
D102	2C
D151	2C

Symbol No.	Address
D200	1B
D202	1D
D203	1D
D206	1D
D215	2C
D244	2C
D301	3A
D302	3B
D304	2A
H401	2A
H502	1F
H602	2A
H801	3F
H951	3F
IC100	3C
IC200	2E
IC201	1C
IC202	2C
IC203	2C
IC301	2B
J201	2F
J202	2F
J203	3D
J205	3D
J206	1F
J301	3A
J302	2B
J303	3A
J304	1B
L201	2E
Q100	1E
Q101	2D
Q102	2D
Q150	3E
Q151	3C
Q179	3F
Q180	3D
Q181	3F
Q199	3C
Q200	1E
Q201	1E
Q221	1E
Q246	3D
Q248	2D
Q249	3D
Q250	3E
Q301	3A
Q302	3A
Q303	2A
Q304	3B
Q305	1A
Q306	1A
Q307	2A
R100	1E

Symbol No.	Address
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R102	1C
R103	2C
R104	2D
R105	2D
R108	2D
R109	1C
R113	2D
R114	2D
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R205	3C
R206	3C
R207	2C
R208	1B
R209	2C
R210	1E
R211	1E
R212	1D
R213	3C

Symbol No.	Address
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R215	1E
R216	1E
R217	2C
R218	2C
R219	1C
R220	3D
R221	3E
R225	1E
R226	1E
R227	1E
R228	1E
R229	1E
R230	1B
R233	1C
R234	1C
*R240	3D
R241	3D
R242	3D
R243	2D
R244	2F
R244	2D
R245	2C
R246	2F
R247	2F
R248	2E
R249	2E
R250	2F
R251	2F
R252	3C
R253	3C
R254	3C
R255	3C
R256	3C
R257	3C
R295	3B
R296	3B
R301	3A
R302	3A
R303	3A
R304	3A
R305	3A
R306	3B
R307	3B
R308	3B
R309	3B
R310	3B
R311	1A
R312	1A
R313	1A
R314	2A
R315	2A
R316	3A
R317	3A
R318	2B
R319	2B
R320	2B
R323	1A
R325	1A
R326	2B

Symbol No.	Address
R327	2B
R328	2B
R330	3A
R331	2A
R332	2A
TP101	3C
TP201	1F
TP202	1F
VR100	2D
VR101	2D
VR150	3F
VR151	2F
VR200	3C
X301	2A



LOCATION TABLE PB-2

* This part is placed on the pattern side.

Symbol No.	Address
C401	2B
C402	2C
C403	2B
C404	2B
C405	2B
C406	2B
C407	2B
C408	2A
C409	2A
C410	3A
C411	3A
C412	3A
C413	3A
C414	3A
C415	3A
C416	3B
C418	3B
C421	3B
C422	3B
C423	3C
C424	3C
C425	3C
C426	3C
C427	3C
C428	2C
C429	2D
C430	3C
C431	3B
C432	2B
C433	2A
C434	2B
C525	2F
C601	2B
C602	2B
C603	1A
C604	2C
C605	1C
C606	2D
C701	1C
C702	1C
C703	2C
C704	1C
C705	1D
C706	1C
C708	2D
C709	1D
C710	2D
C711	1D
C712	1D
C713	1D
C714	1D
C715	2D
C716	2D
C717	2D
C718	2D
C719	1E
C720	1E
C721	1E
C722	1E
C723	1F

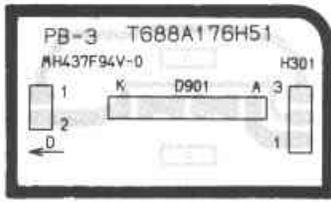
Symbol No.	Address
C724	1F
C725	1E
C726	1E
C727	2E
C728	2E
C729	1D
C730	2D
C801	3F
C802	3F
C803	3F
C804	3F
*C805	3F
C807	2E
C808	3F
C811	3F
D401	3B
D502	2F
D503	2F
D560	2F
D601	2C
D602	3C
D603	2C
D701	1E
D702	1E
D801	2F
D802	3F
D803	3F
D804	2F
IC401	3B
IC402	2C
IC403	3C
IC601	1B
IC602	1A
IC701	2C
IC701	1C
IC702	1D
IC703	2D
IC704	1E
IC705	1E
IC801	3F
IC802	3F
J401	3A
J402	3C
J501	3C
J502	3B
J601	1C
J602	3C
J801	3F
L701	1D
L702	2E
L703	2E
Q401	3C
Q402	3D
Q540	2F
Q701	1D

Symbol No.	Address
Q702	1D
Q703	2F
Q704	2E
Q705	2F
Q706	2F
Q707	2E
R402	2B
R403	2B
R404	3C
R406	2B
R407	2B
R408	2B
R409	2B
R410	2B
R411	2B
R412	2B
R414	2A
R415	2A
R417	2A
R418	2A
R419	2A
R420	2A
R421	2A
R422	2A
R423	2A
R424	3B
R425	3B
R426	3B
R427	3B
R428	3B
R429	3B
R430	3B
R431	3C
R431	3B
R433	3B
R434	3B
R435	3B
R436	3C
R437	3C
R438	3C
R439	3C
R440	3C
R441	3C
R442	3C
R443	3C
R444	3C
R445	3C
R446	3C
R447	3C
R448	3A
R449	2D
R450	3D
R451	2B
R452	3B
R453	3B
R454	2B
R550	2F
R551	2F
R560	2F

Symbol No.	Address
R601	2C
R602	2C
R603	1A
R604	2C
R605	2C
R606	3C
R607	2D
R701	1D
R702	1D
R804	2D
R705	1D
R707	1E
R708	1E
R709	1D
R711	1E
R712	1E
R714	1E
R715	1E
R716	1E
R717	1E
R718	1E
R719	1E
R720	1D
R721	1E
R722	1E
R723	2D
R724	1F
R725	2F
R727	1F
R728	1F
R729	1E
R731	2E
R732	1E
R733	2E
R734	1F
R735	2F
R736	2F
R737	2F
R738	2F
R739	2F
R740	2F
R741	2F
R742	2F
R743	2F
R744	2E
R745	2E
R753	2F
R754	2E
R770	2F
R771	2F
R801	3F
RY501	2F
TP401	3B
TP402	3D
TP601	2A
TP701	2E
TP702	2F
TP703	2F

Symbol No.	Address
VR401	2B
VR402	2A
VR403	3A
VR404	3D
X601	2B
X701	1C

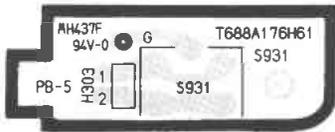
PB3



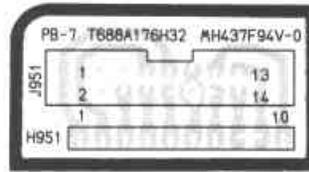
PB4



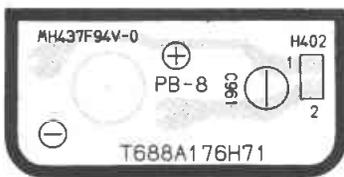
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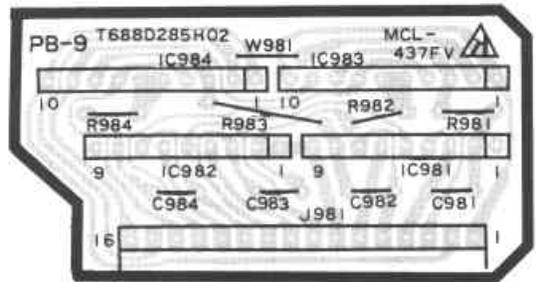
PB7



PB8



PB9



Short circuit
at PLCK
adjustment

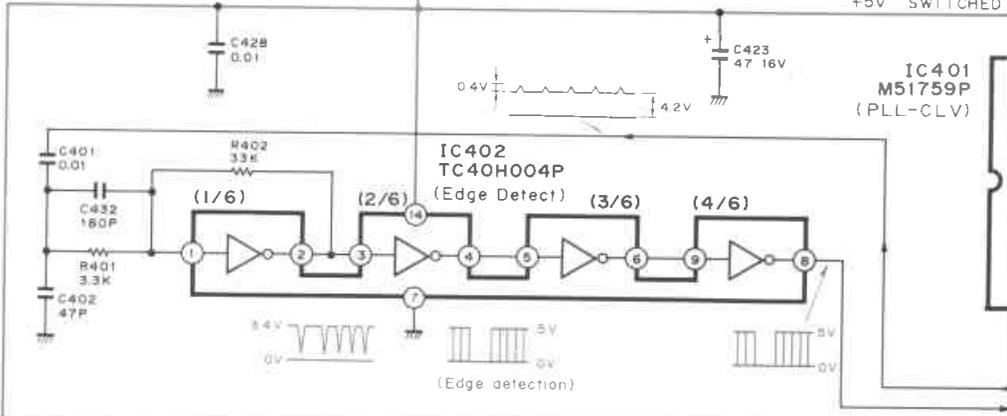
(VCO ADJ)

3.3K

R447
100

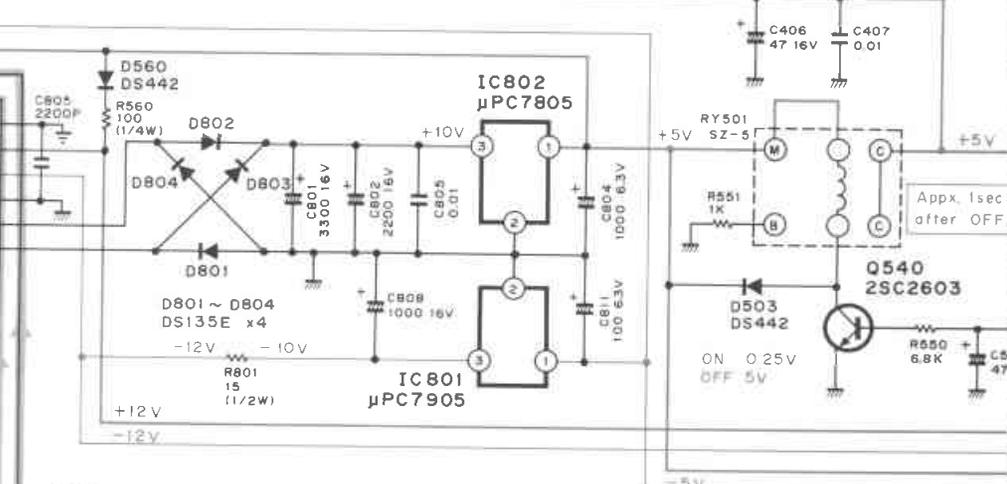
+5V SWITCHED

IC401
M51759P
(PLL-CLV)

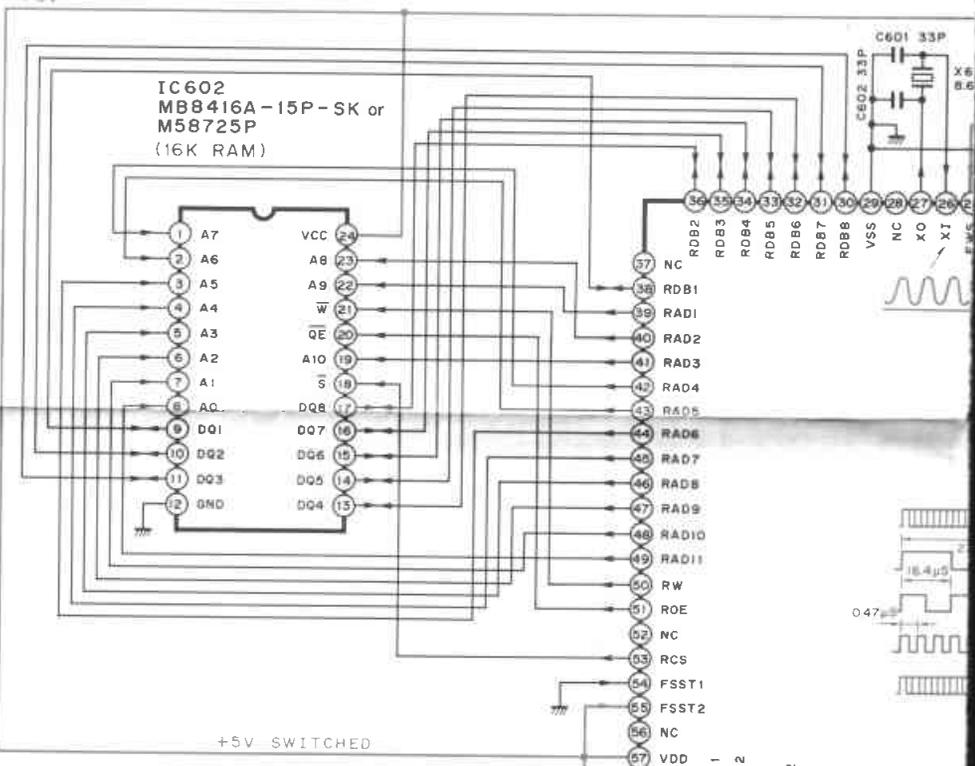


J801

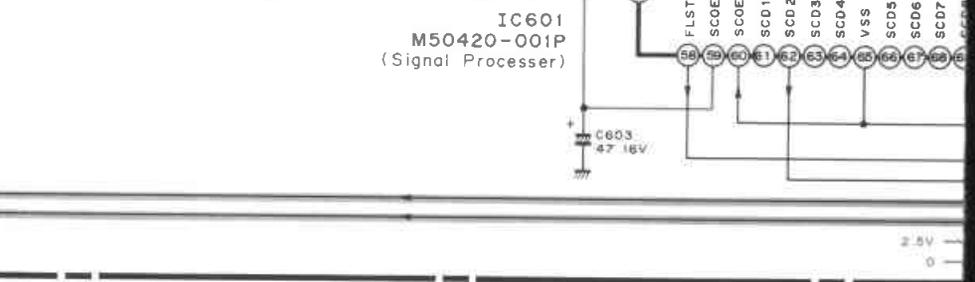
- 1 -5V
- 2 +5V
- 3 L OUT
- 4 R OUT
- 5 SG
- 6 +12V
- 7 -12V
- 8 DG
- 9 AC
- 10 AC



IC602
MB8416A-15P-SK or
M58725P
(16K RAM)



IC601
M50420-001P
(Signal Processor)



NOTE:

1. Unit of C and R
 - C No-symbol; μF
 - P-symbol; PF
 - R No-symbol; Ω
 - K-symbol; kΩ
 - M-symbol; MΩ
- Wattage for all unspecified resistor are 1/6W.
2. Voltage are those measured with DC 1MΩ digital voltmeter.
3. This circuit diagram may be changed due to circuit improvement.



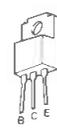
2SK152



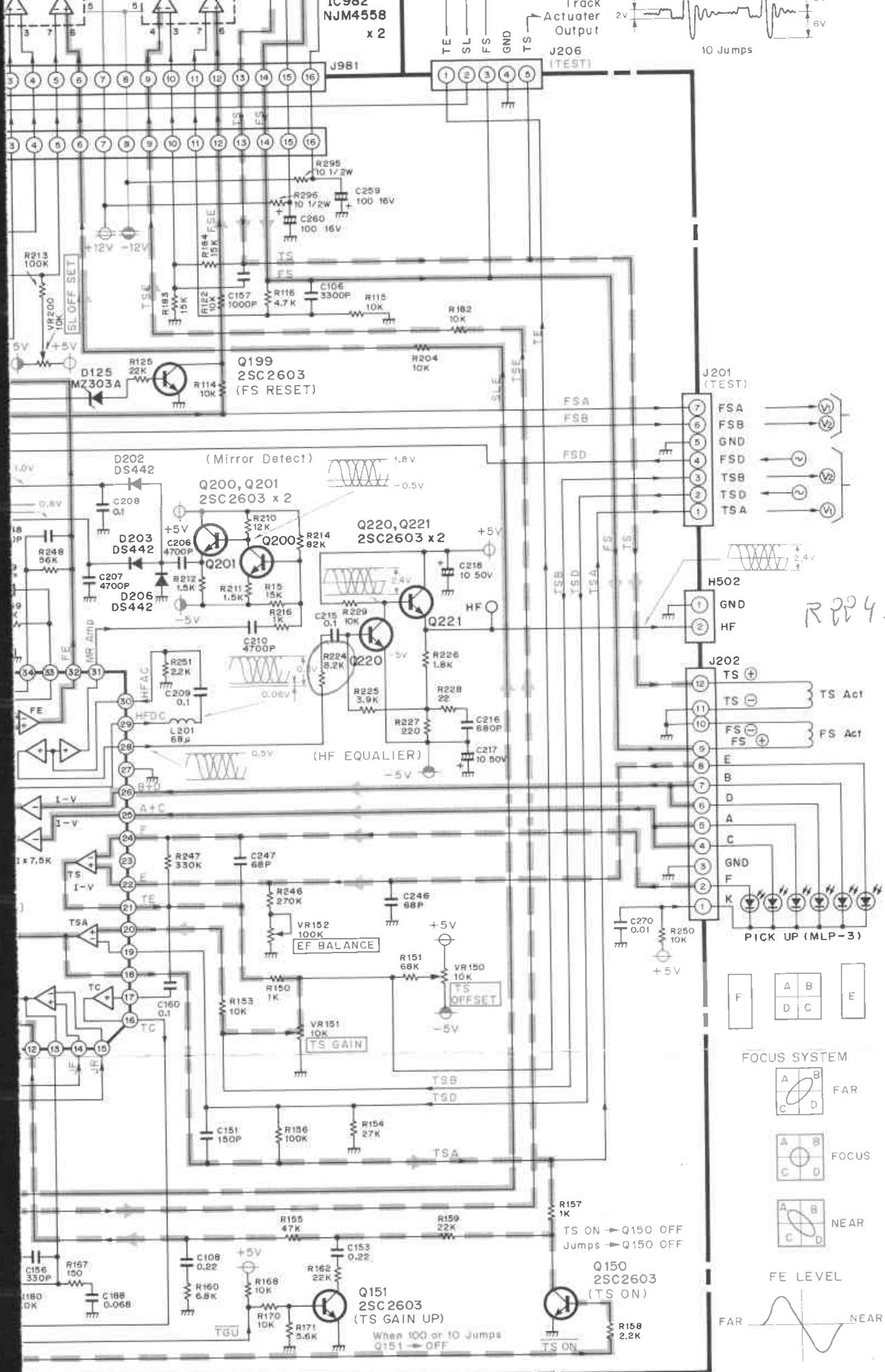
2SK381



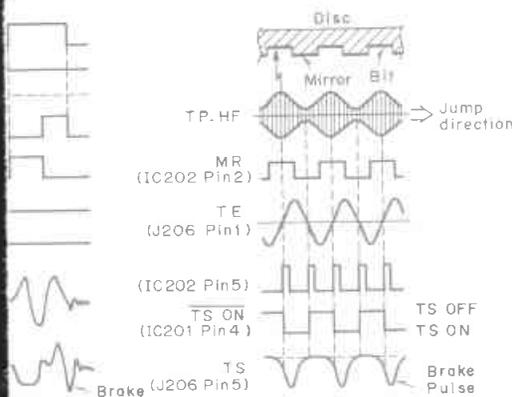
2SA1115
2SC2603



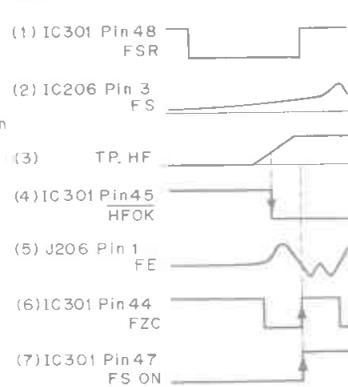
2SB514
2SD330



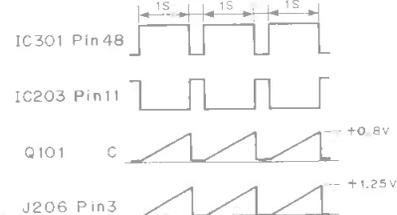
JUMP BRAKE OPERATION

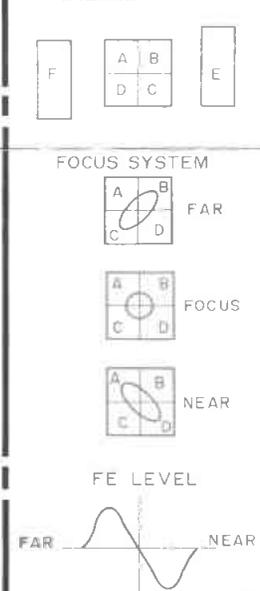
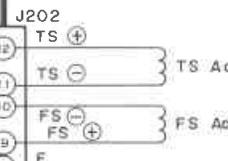
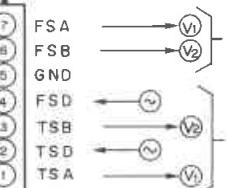
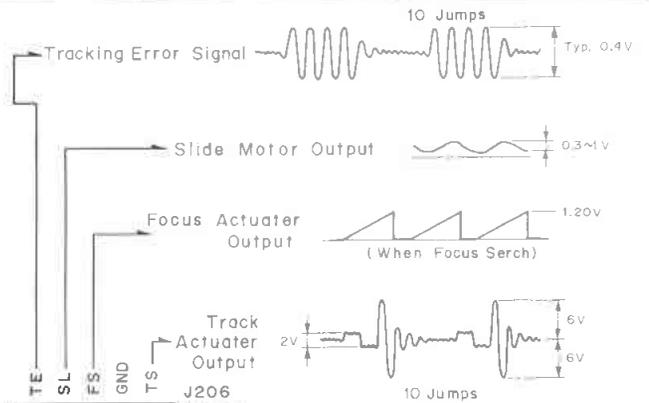
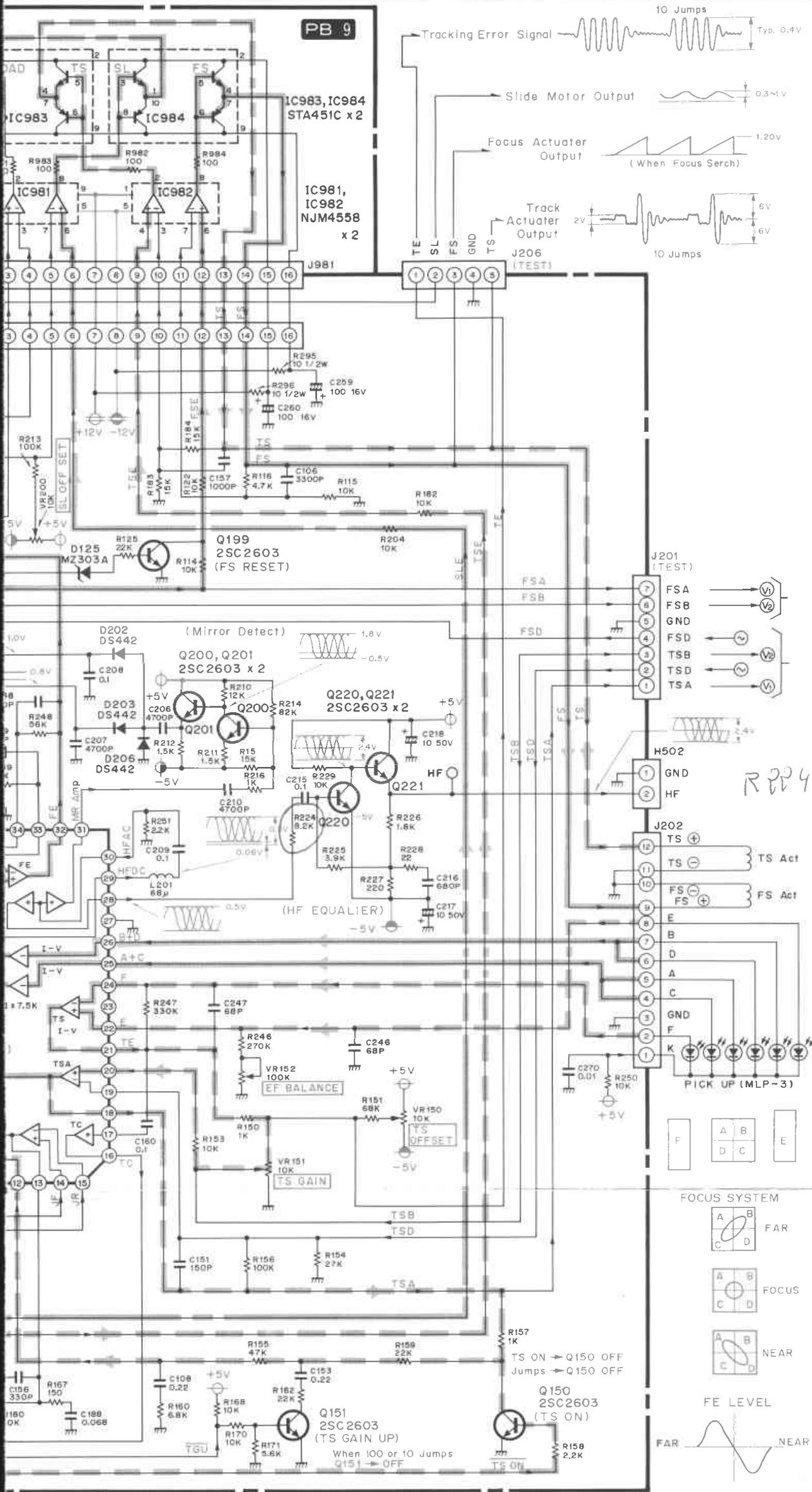


FOCUS DRAWING TIMING



FOCUS SEARCH

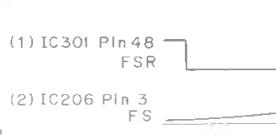




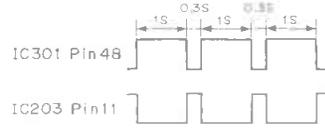
JUMP BRAKE OPERATION

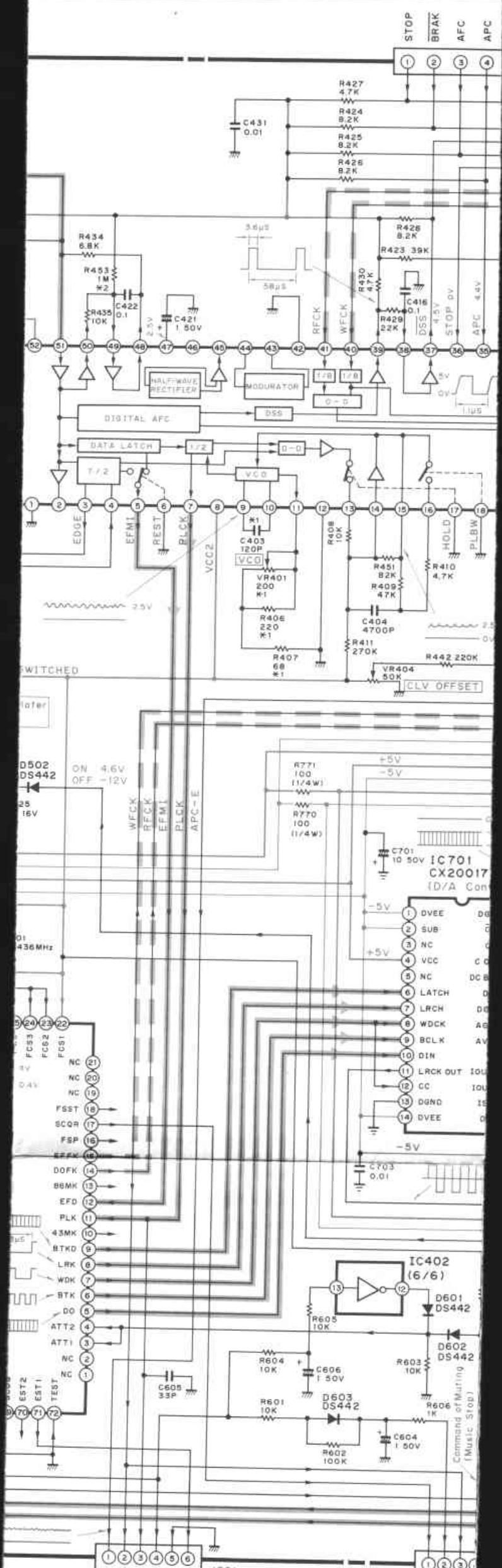


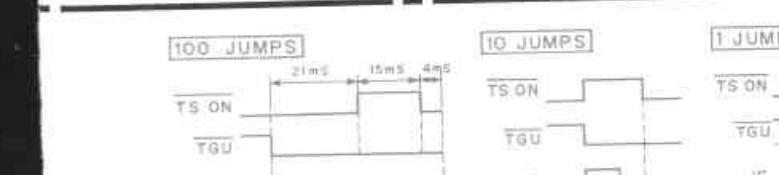
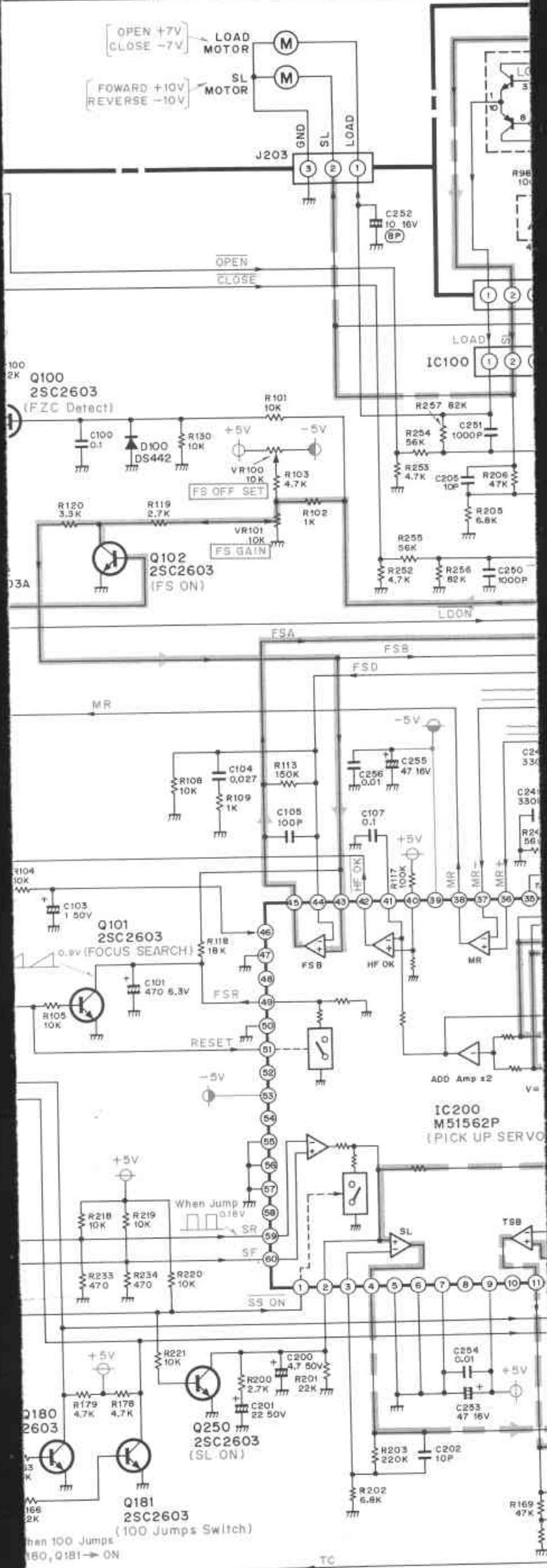
FOCUS DRAWING TIMING

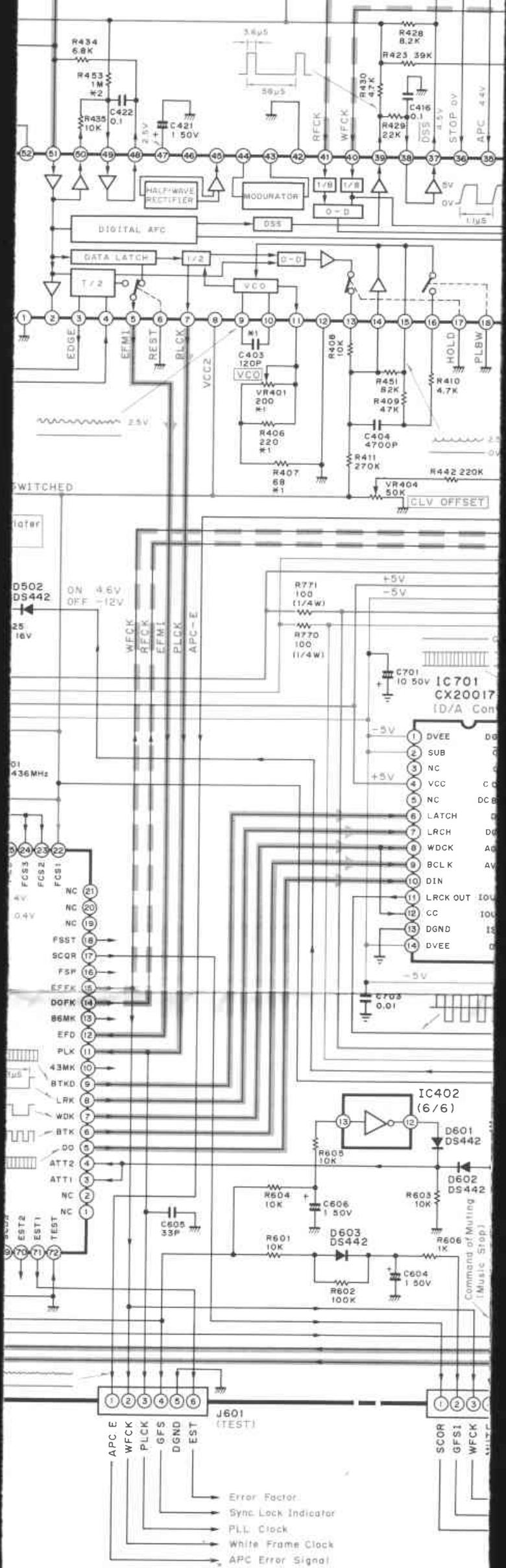


FOCUS SEARCH

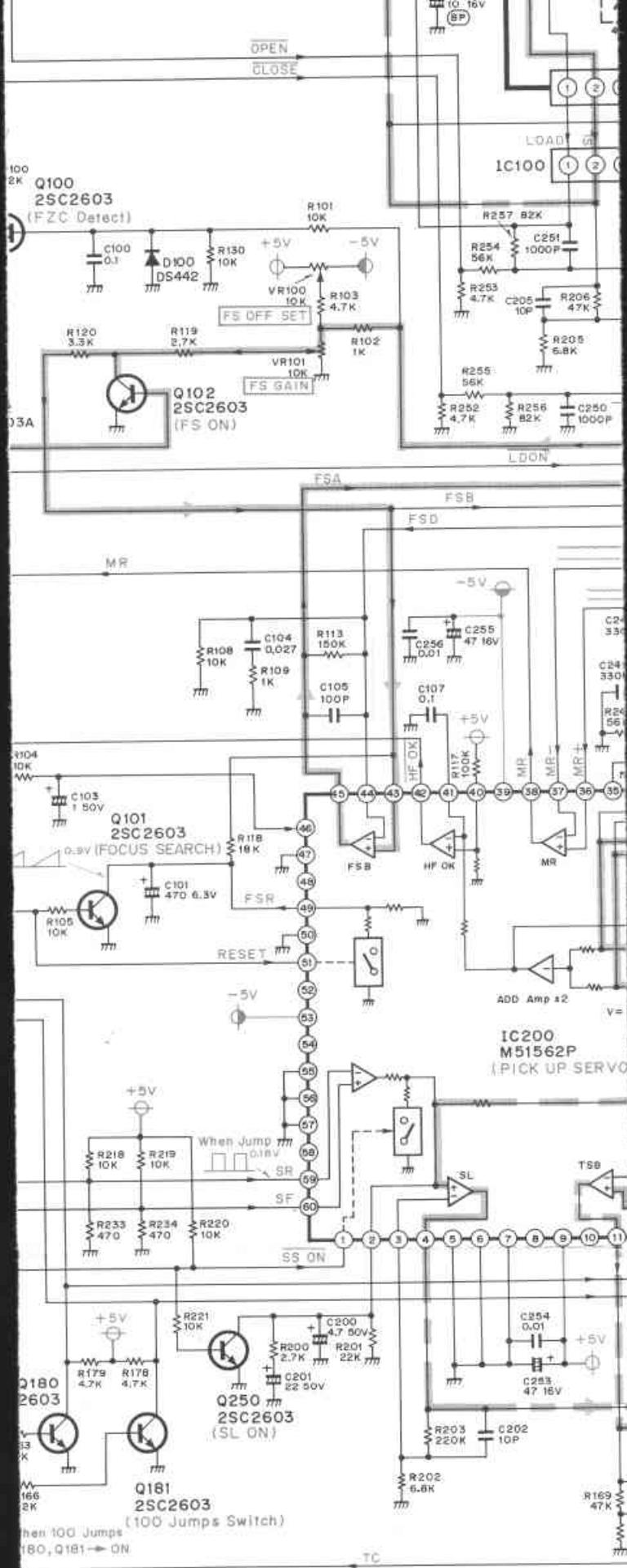




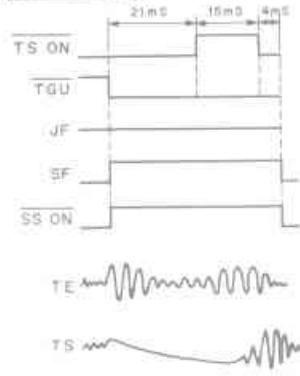




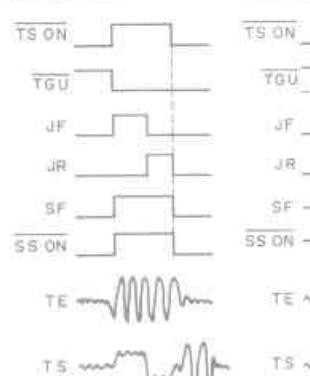
- Error Factor
- Sync Lock Indicator
- PLL Clock
- White Frame Clock
- APC Error Signal



100 JUMPS



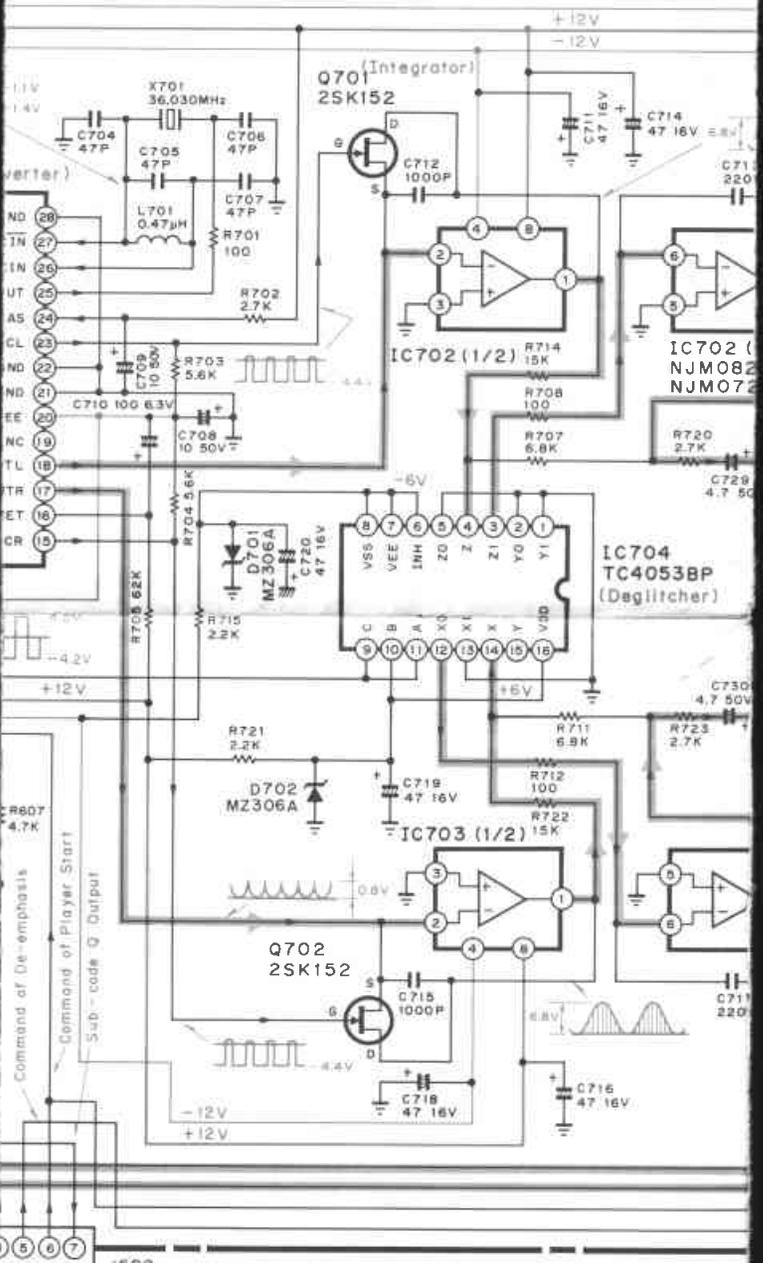
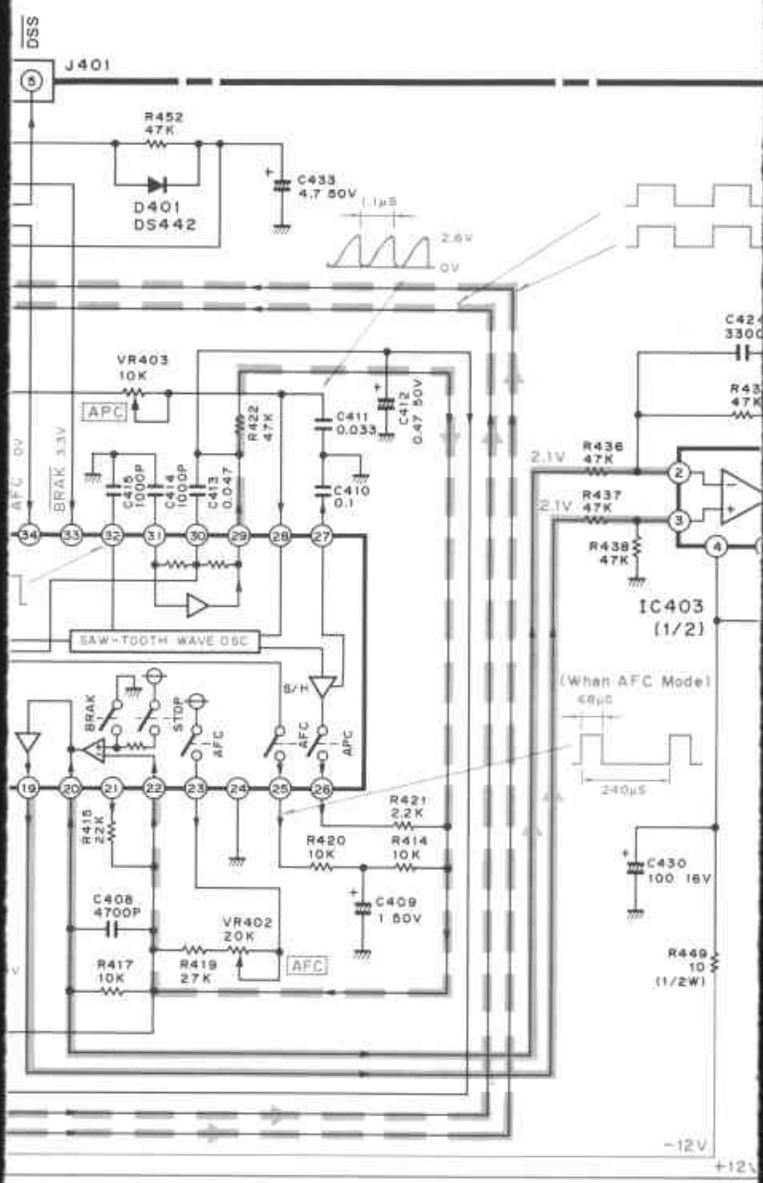
10 JUMPS

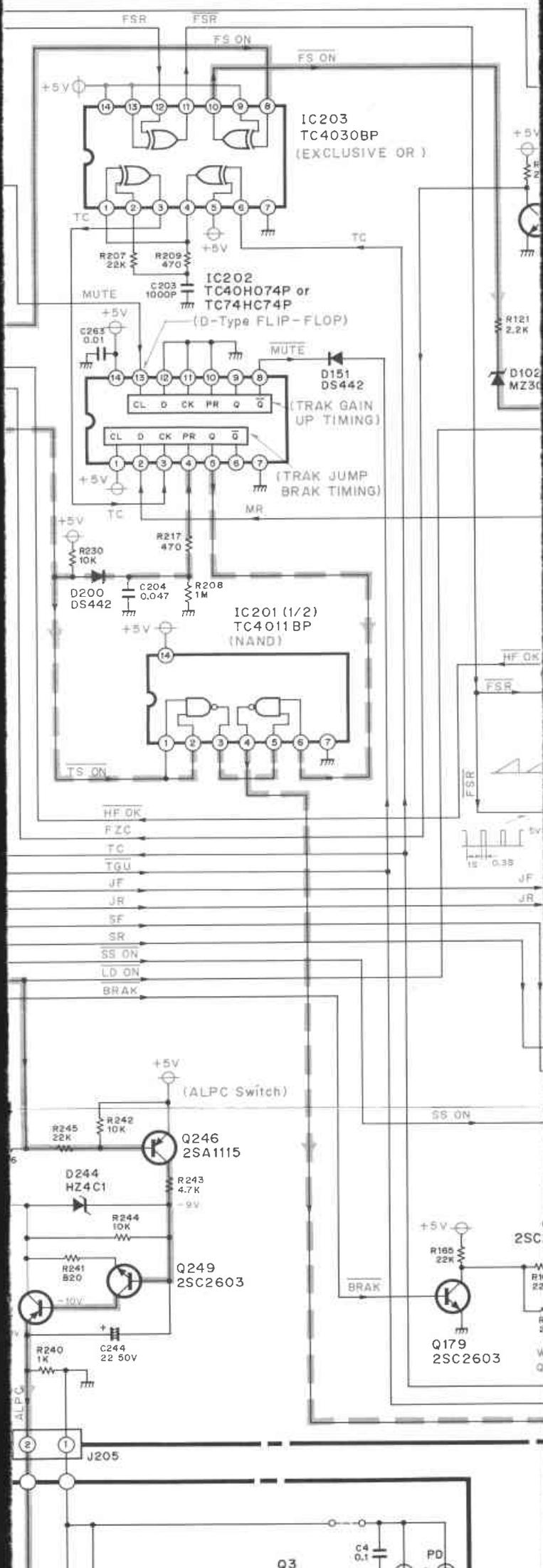


1 JUMP

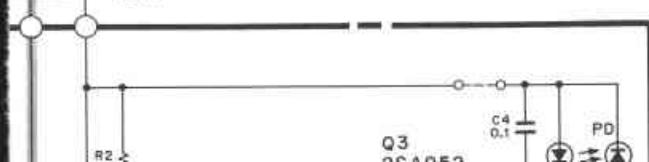
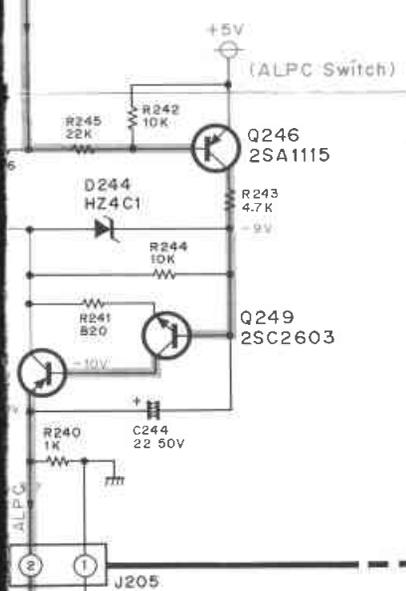


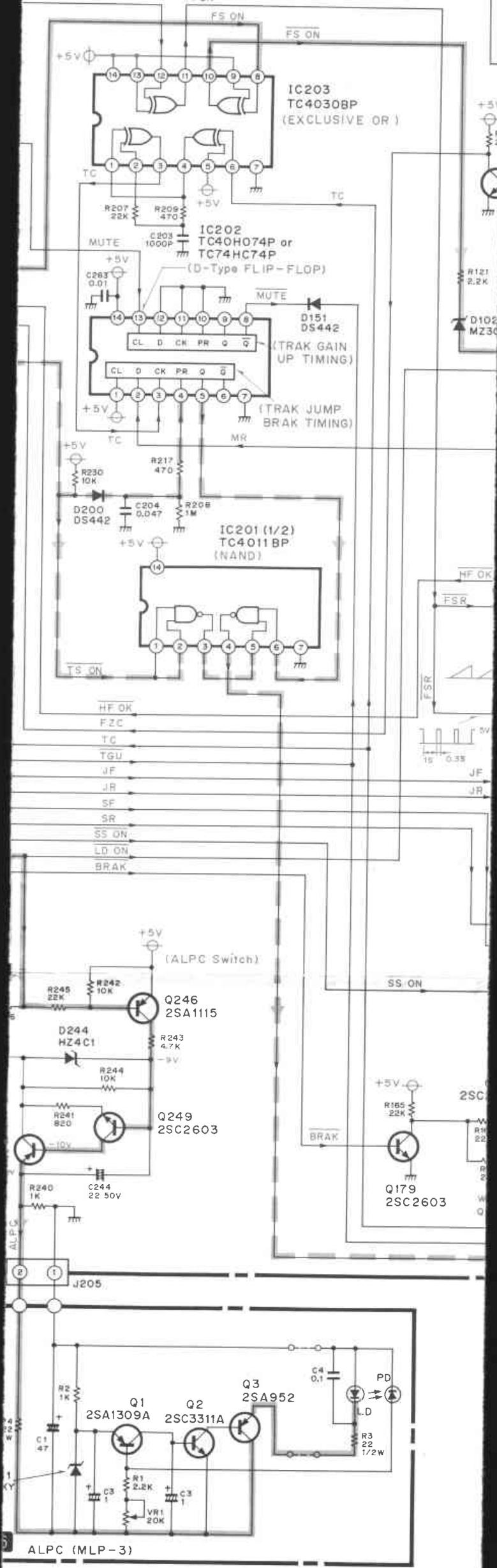
Brake

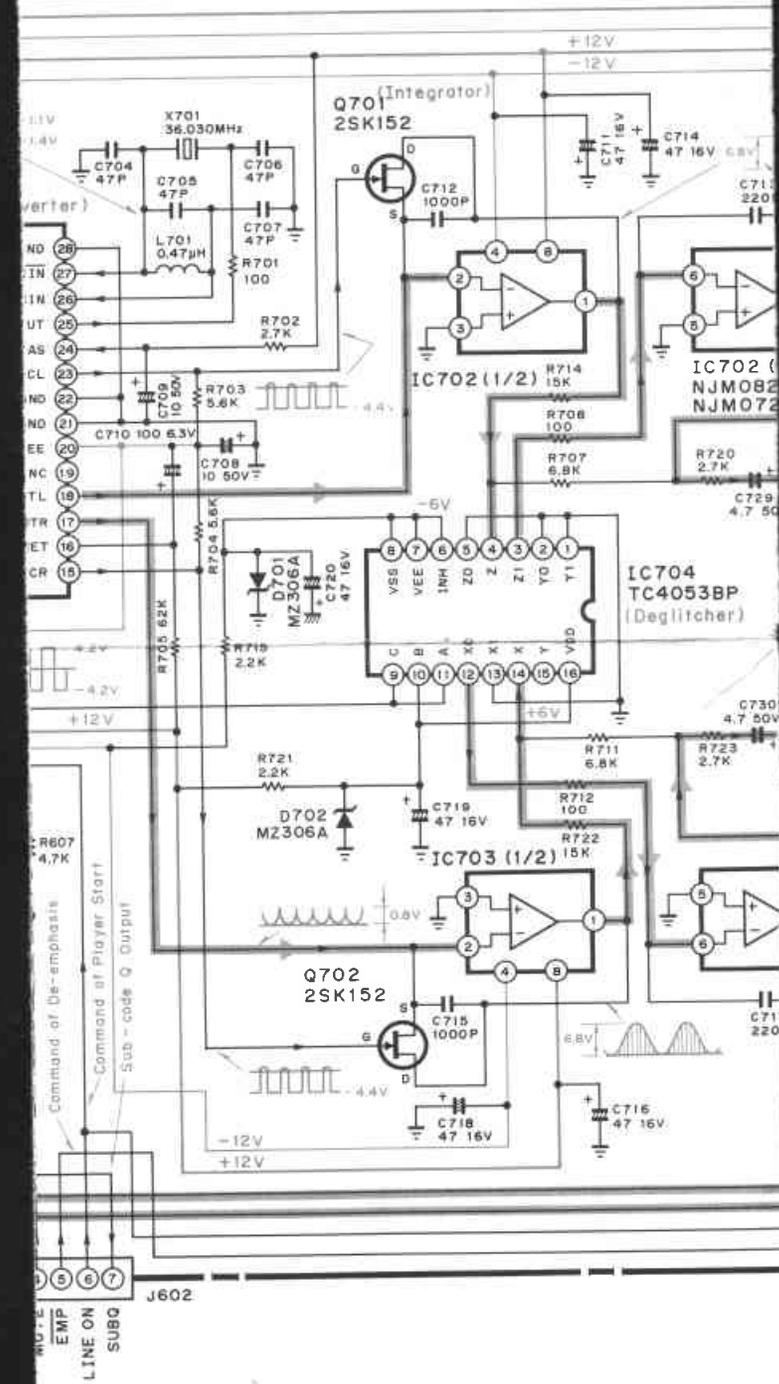
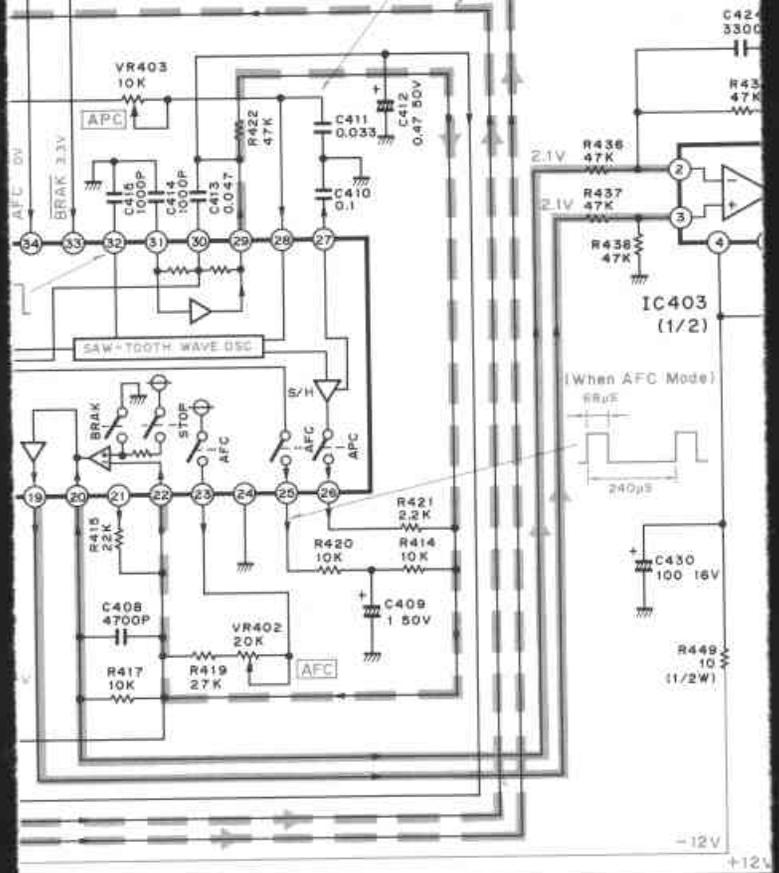




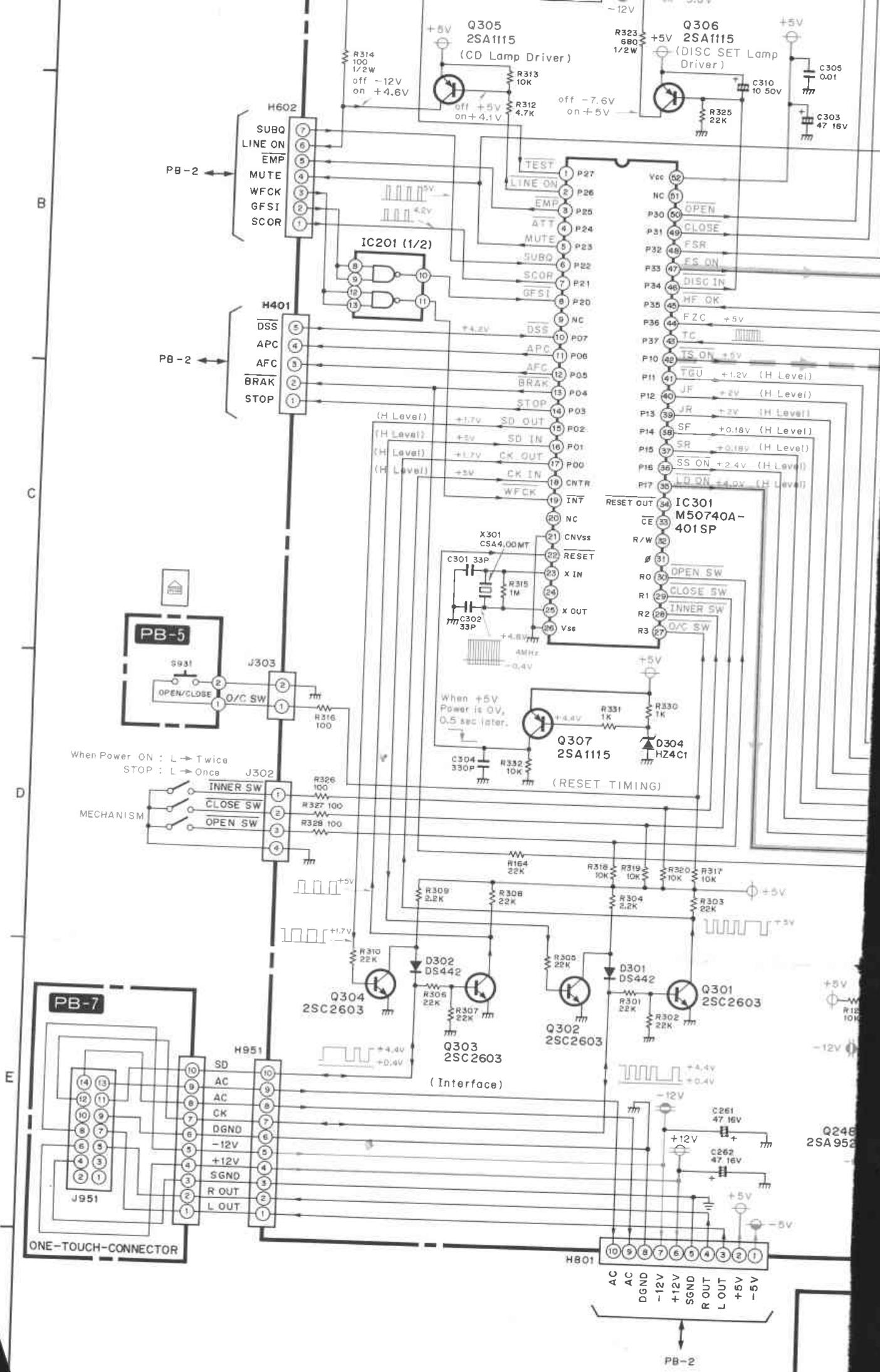
- HF OK
- FZC
- TC
- TGU
- JF
- JR
- SF
- SR
- SS ON
- LD ON
- BRAK





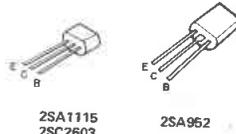


→ Write-Frame Clock (7.3KHz)
 → Sync- Lock Indicator
 → Synchronized Sub-code Output (75Hz)

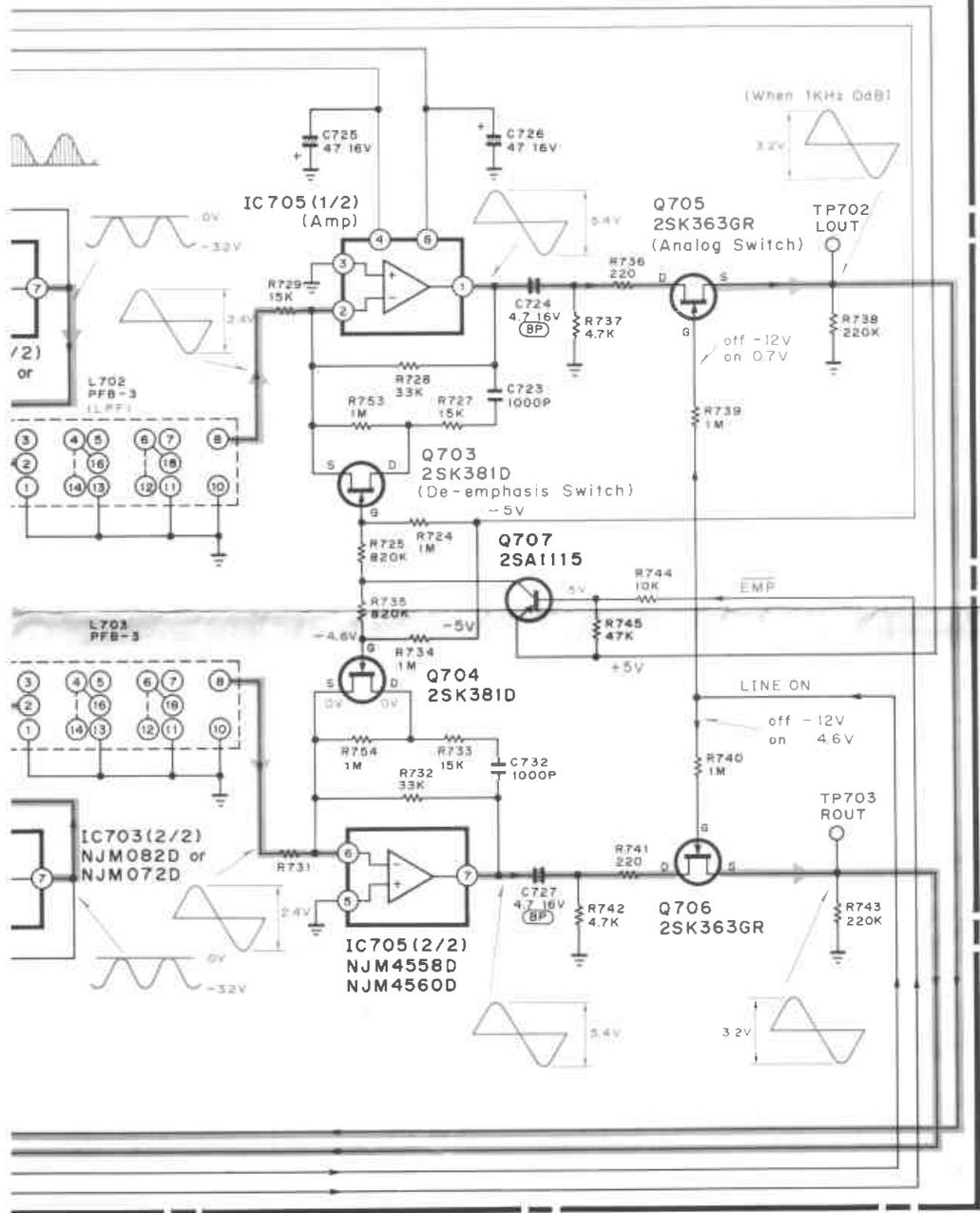
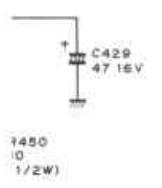
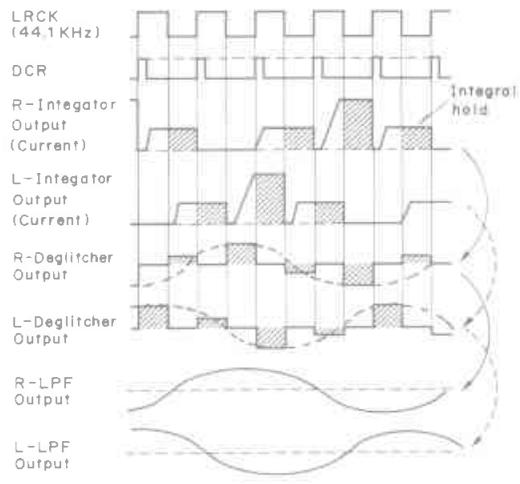
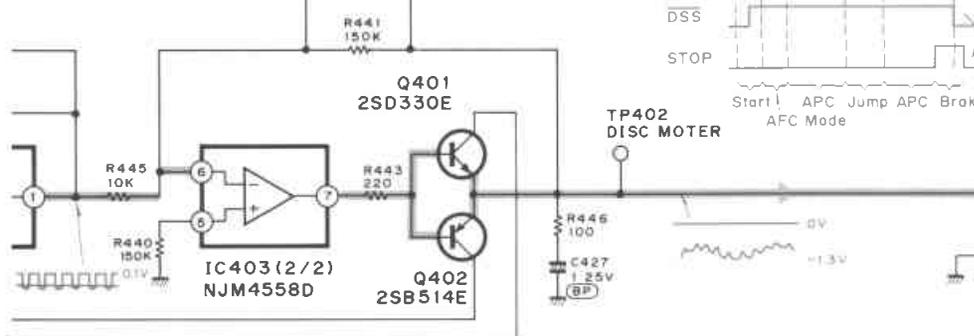


NOTE:

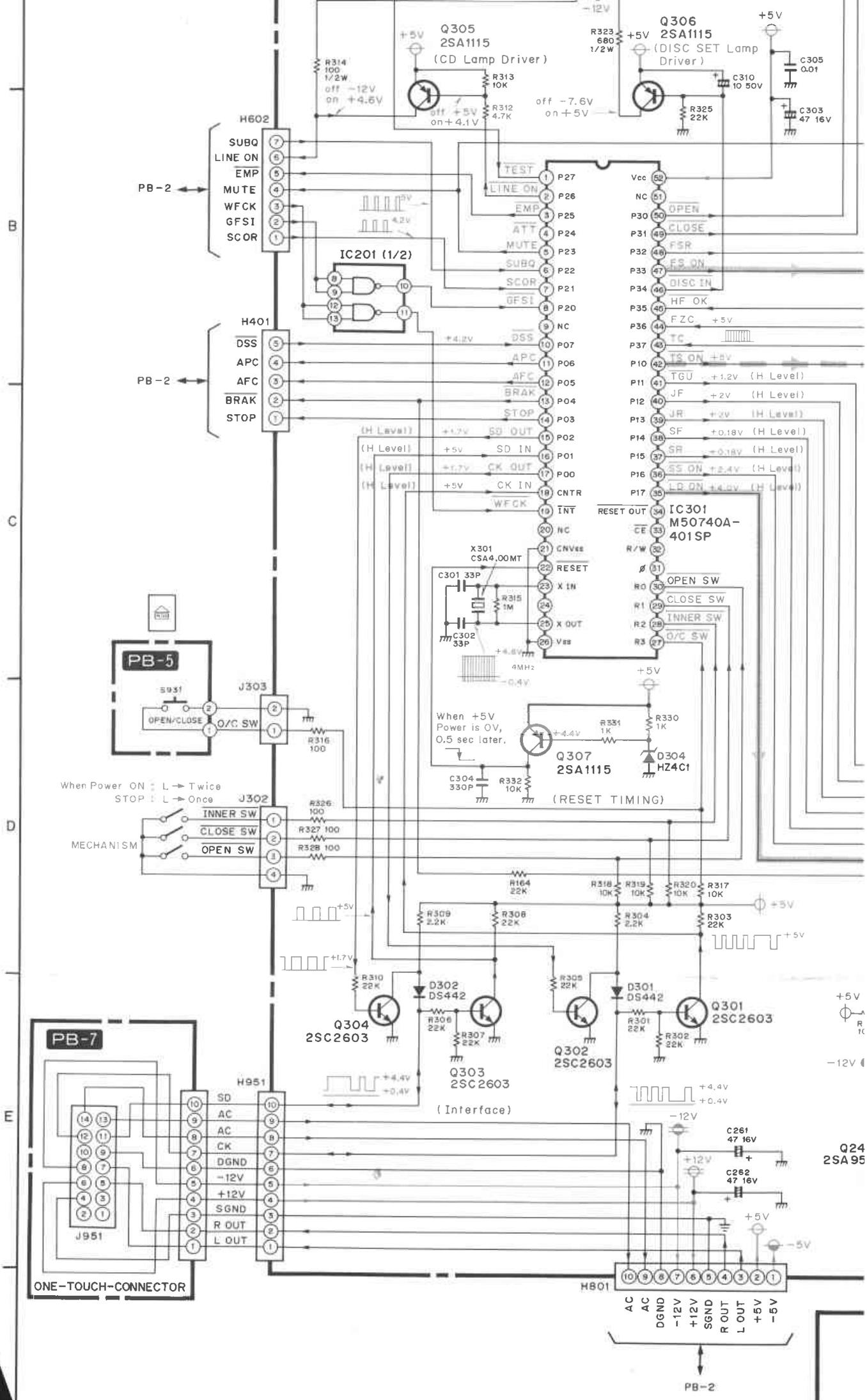
- Unit of C and R
 C No symbol; μ F
 P-symbol; PF
 R No symbol; Ω
 K-symbol; k Ω
 M-symbol; M Ω
- Wattage for all unspecified resistor are 1/8W.
 Voltage are those measured with DC 1MS Ω digital voltmeter.
- This circuit diagram may be changed due to circuit improvement.



GZA2.7-
 2
 PB-

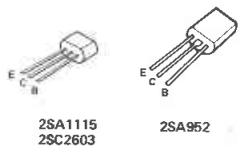


- *1 or VR401 1K
- R406 2.2K
- R407 270
- C403 47P
- *2 or NONE

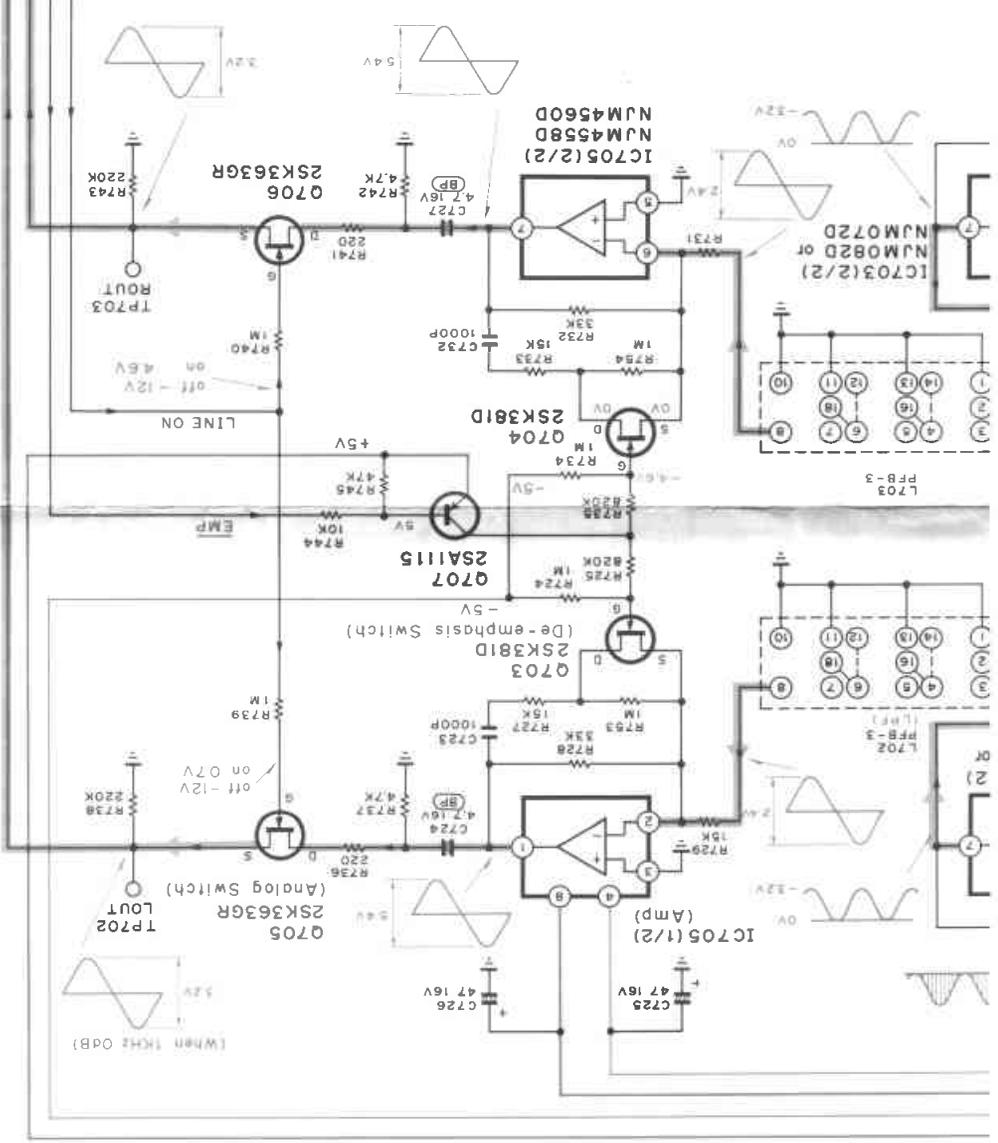
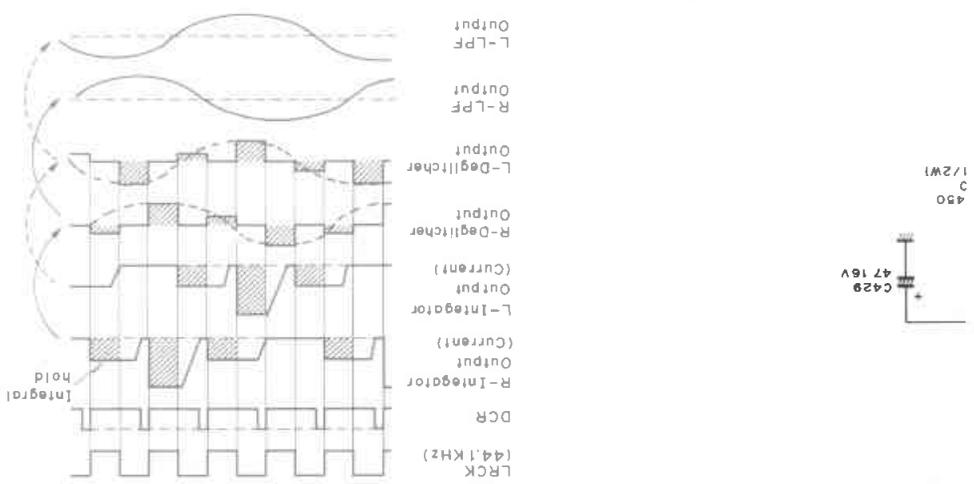
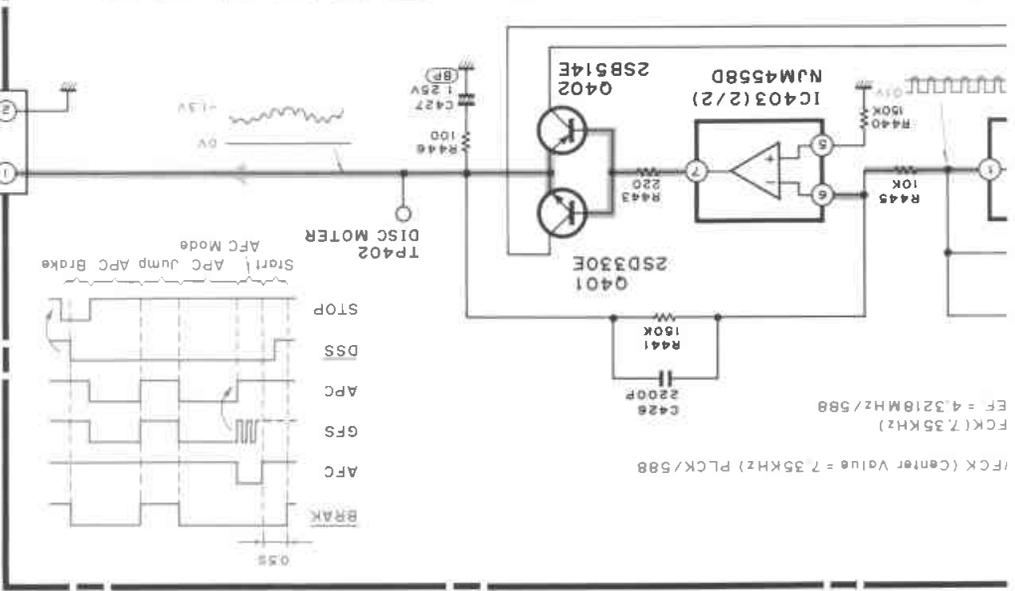


NOTE:

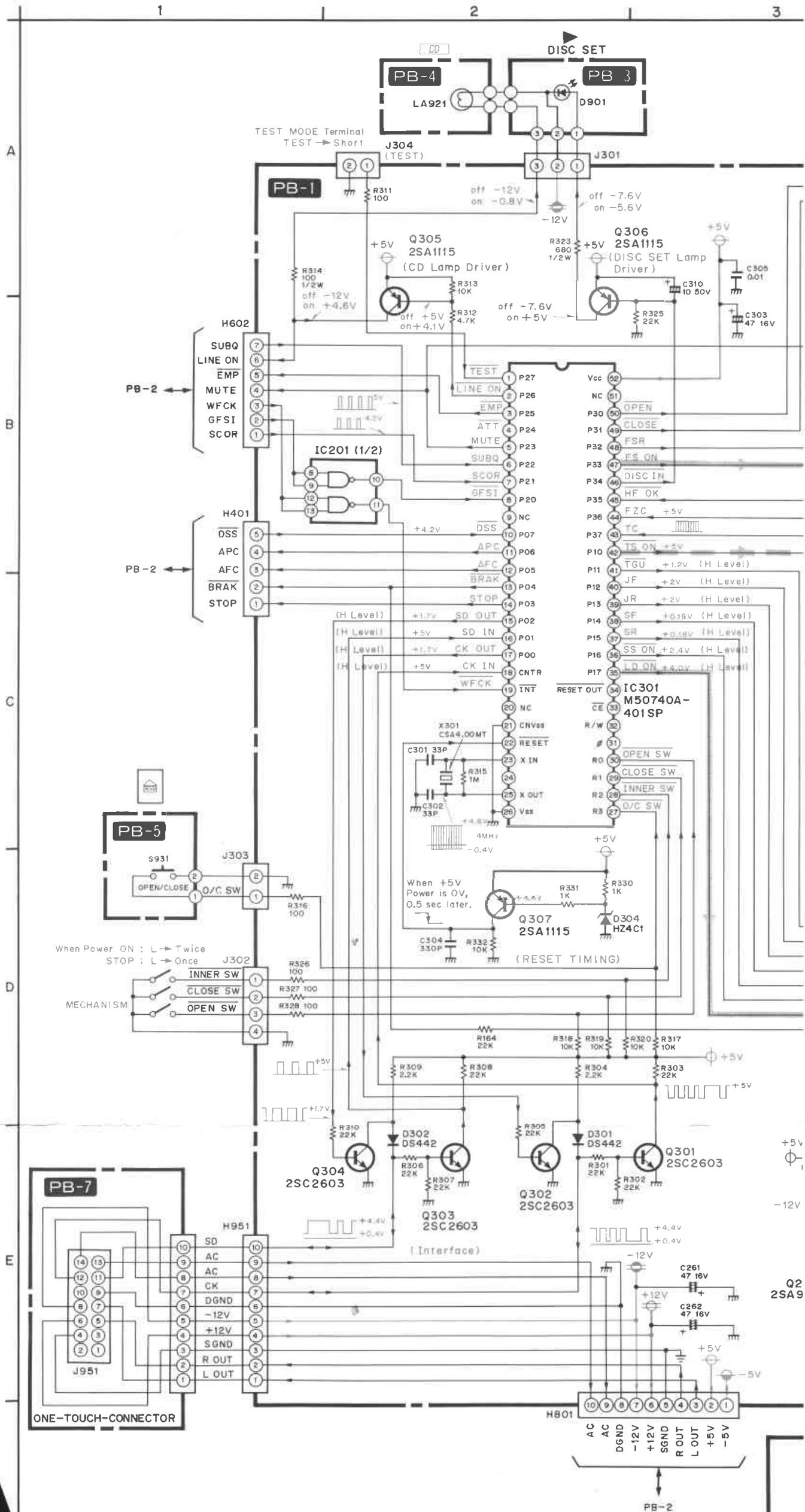
- Unit of C and R
 C No-symbol; μ F
 P-symbol; PF
 R No-symbol; Ω
 K-symbol; k Ω
 M-symbol; M Ω
- Wattage for all unspecified resistor are 1/8W.
- Voltage are those measured with DC 1M Ω digital voltmeter.
- This circuit diagram may be changed due to circuit improvement.



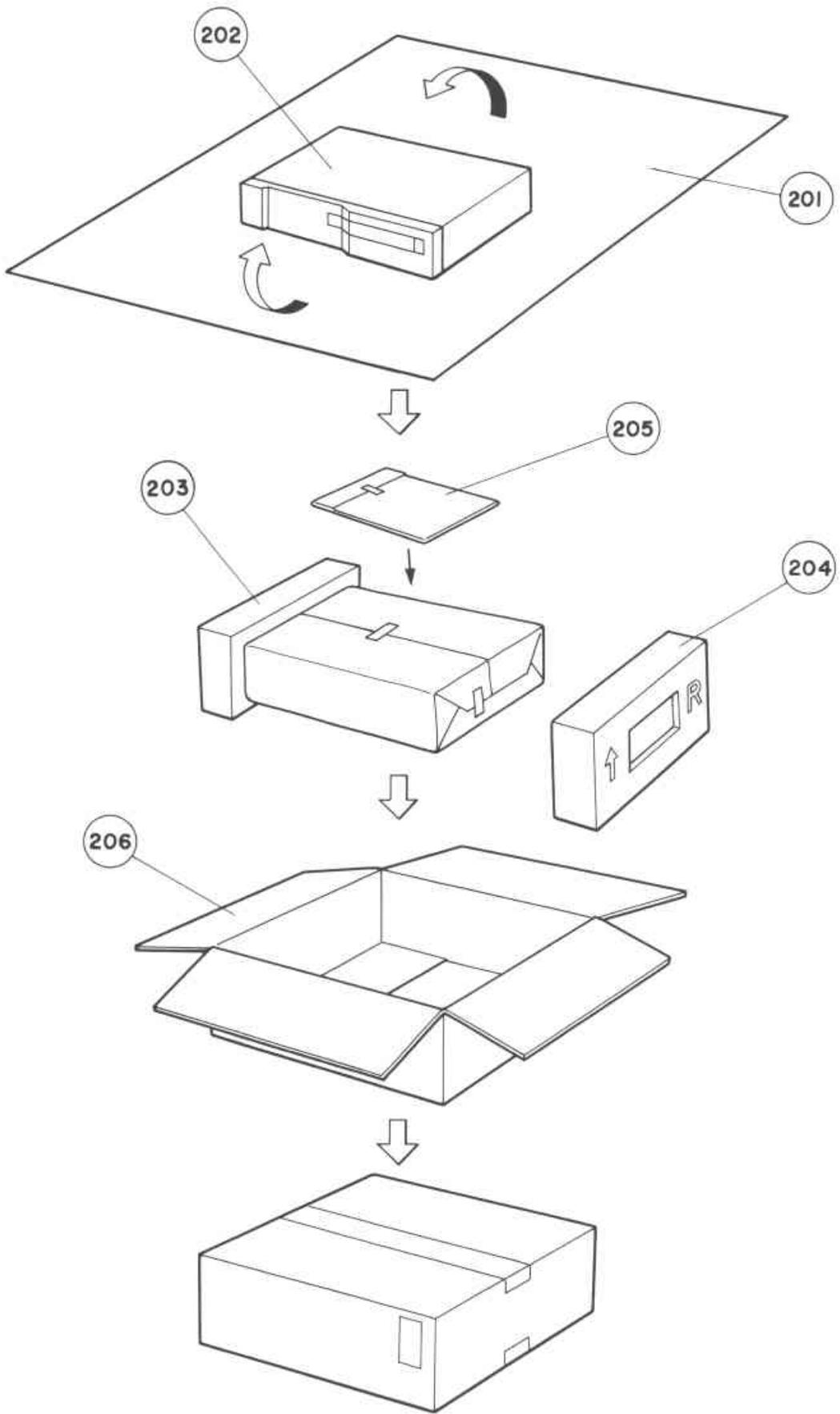
GZA2.7-
PB



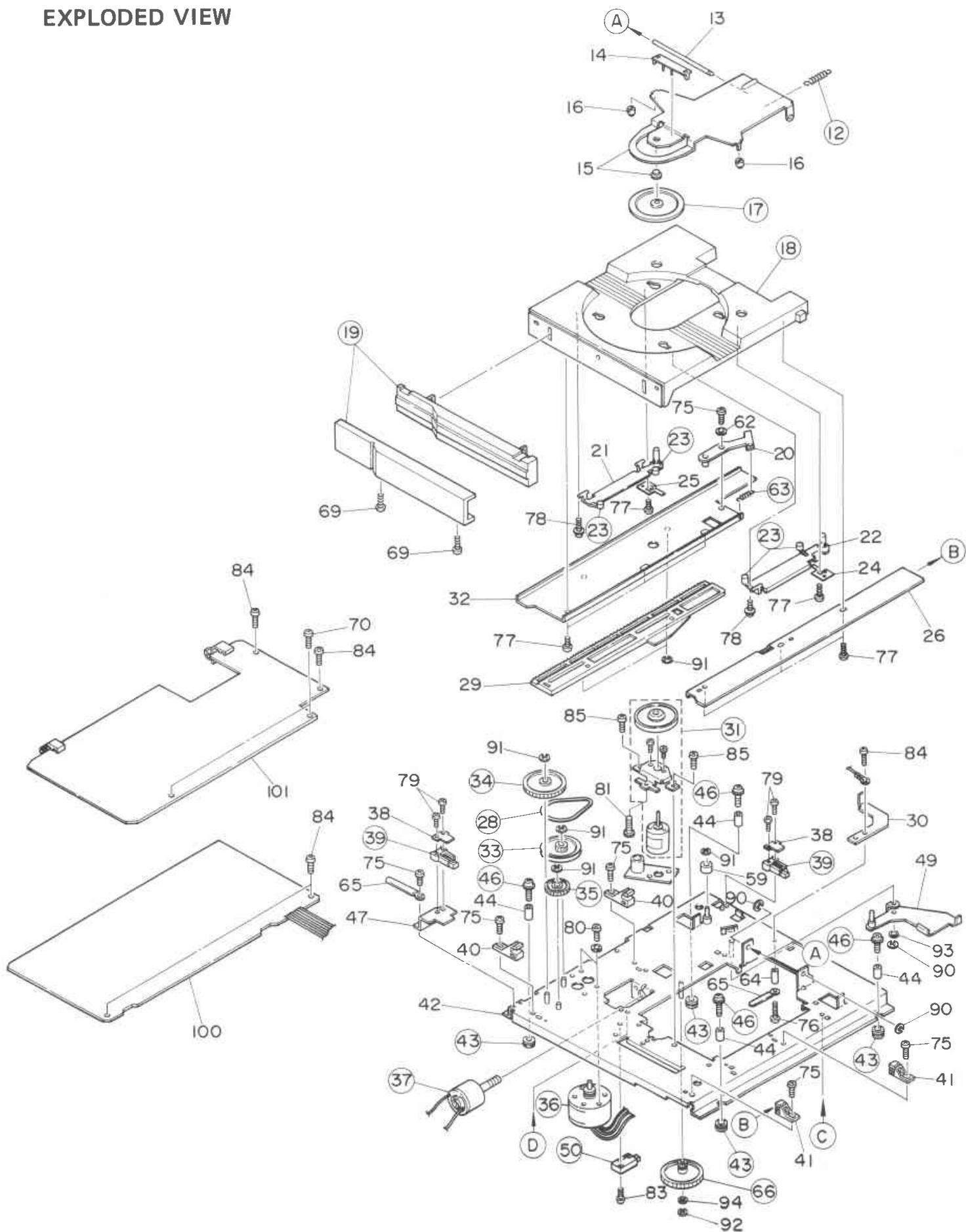
SCHEMATIC DIAGRAM

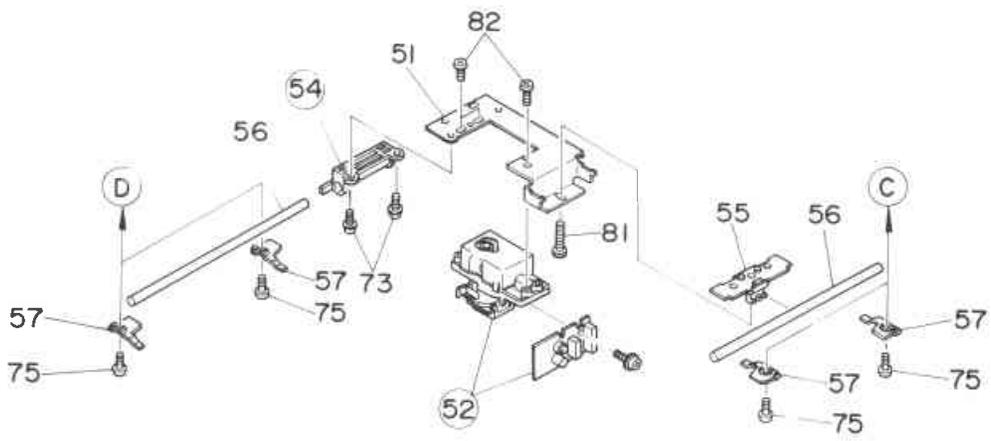
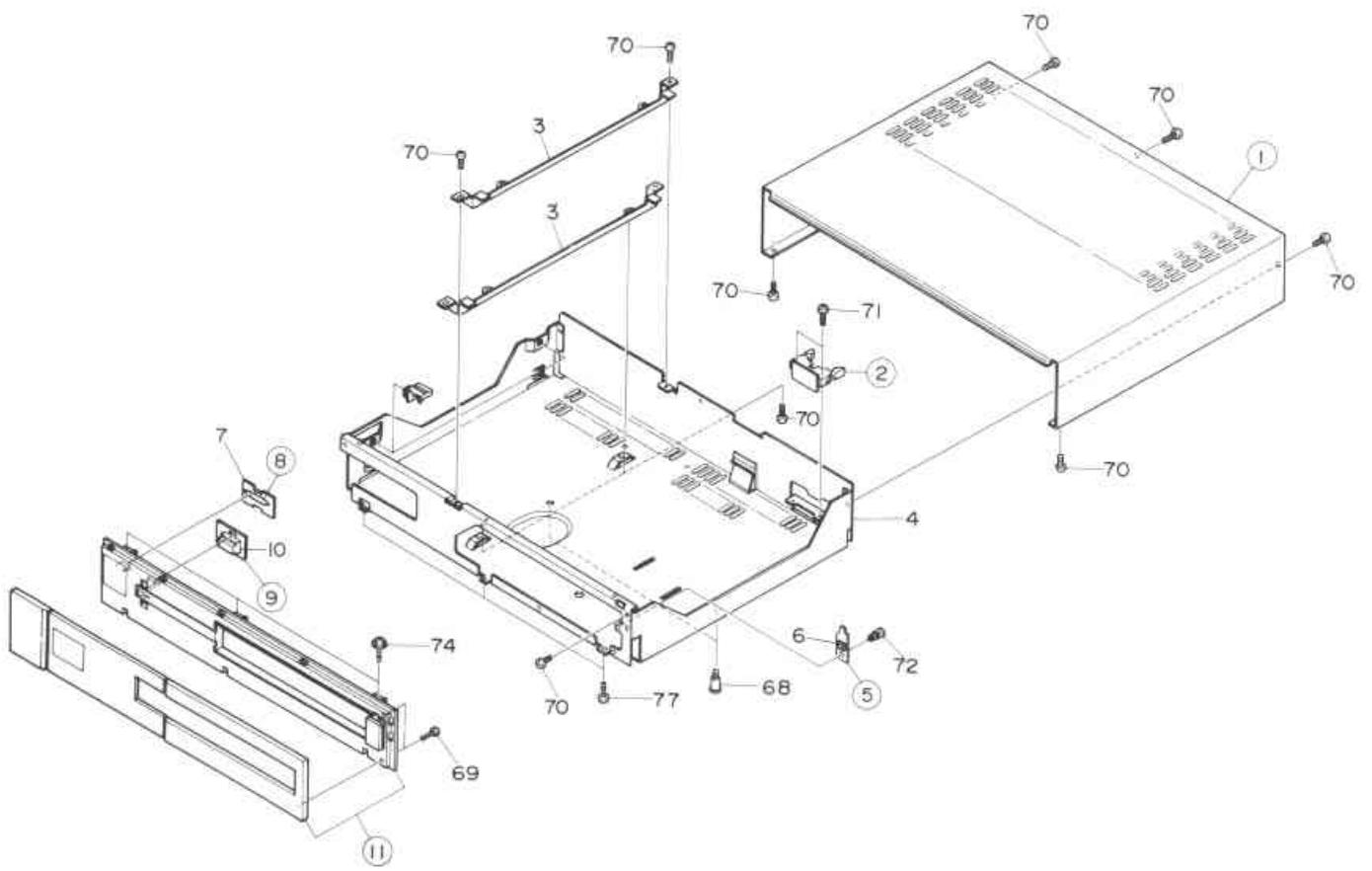


PACKING INSTRUCTIONS



EXPLODED VIEW





PARTS LIST

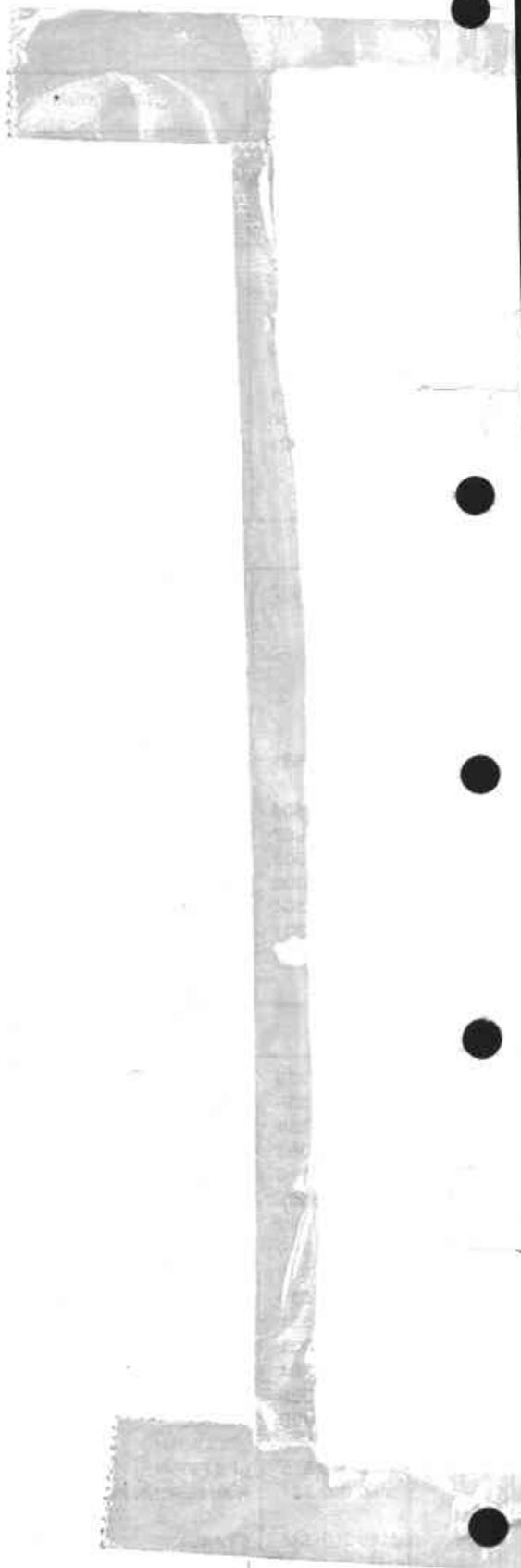
REF. NO.	PARTS NO.	DESCRIPTION	Q'TY
1	M40 203 104	CASE	1
2	M40 001 477	PLUG 5330-14BGS1 (PB-7)	1
3	-	PCB HOLDER	2
4	-	CHASSIS	1
5	-	PCB PB-5	1
6	M40 001 381	PUSH SWITCH (PB-5)	1
7	-	PCB PB-4	1
8	M40 001 309	LAMP MDT 12V 55mA (PB-4)	1
9	-	PCB PB-3	1
10	M40 001 321	DIODE (LED) SLF2068 (PB-3)	1
11	M40 203 101	PANEL ASS'Y	1
12	M40 001 760	SPRING WI	1
13	-	SHAFT	1
14	-	HOLDER-U	1
15	-	LEVER	1
16	-	HOLDER	2
17	M40 001 655	HOLDER ASS'Y	1
18	M40 001 626	DISC TRAY ASS'Y	1
19	M40 203 130	COVER TRAY ASS'Y	1
20	-	-	-
21	-	HOLDER DISC L	1
22	-	HOLDER DISC R	1
23	M40 001 186	CUSHION-GUM	4
24	-	SPRING-P-R	1
25	-	SPRING-P-L	1
26	-	PLATE RIGHT	1
27	-	-	-
28	M40 203 700	BELT-GUM	1
29	-	GEAR RACK	1
30	-	PLATE HOLDER	1
31	M40 001 552	MOTOR ASS'Y (DISC)	1
32	-	-	-
33	M40 203 730	PULLEY	1
34	M40 001 731	GEAR-R3	1
35	M40 001 732	GEAR R4	1
36	M40 203 550	MOTOR ASS'Y (LD)	1
37	M40 001 550	MOTOR ASS'Y (SL)	1
38	-	SHEET	2
39	M40 001 380	MICRO SWITCH	2
40	-	HOLDER LEFT	2
41	-	HOLDER RIGHT	2
42	-	BASE ASS'Y	1
43	M40 001 185	CUSHION GUM	4
44	-	SPACER	4
45	-	CAPACITOR (PB-8)	1
46	M40 001 770	SCREW METAL	4
47	-	HOLDER Z	1
48	-	-	-
49	-	LEVER P ASS'Y	1
50	M40 001 382	SLIDE SWITCH	1
51	-	PLATE HOLDER	1
52	M40 203 600	LASER PICKUP	1
53	-	PCB PB-6	1
54	M40 203 644	RACK ASS'Y	1
55	T110D114G01	ADJUSTER	1
56	T100D444H02	SHAFT-L	2
57	T262D048H02	HOLDER-L	4
58	M40 001 733	GEAR	1
59	-	-	-
60	-	-	-

REF. NO.	PARTS NO.	DESCRIPTION	Q'TY
61	-	COLLER	1
62	-	-	-
63	M40 001 761	SPRING W2	1
64	-	SPACER	1
65	-	CLAMPER	2
66	-	-	-
67	-	-	-
68	T029D177H01	Screw-SHIPPING	2
69	T004P003H20	Screw MBFB M2.6 x 5 mm	4
70	T029P282H31	Screw GBFB 3 x 6 mm	12
71	T000P003H15	Screw MPFB M2 x 10 mm	1
72	T079P031H01	Rivet-PL	1
73	T029P282H99	Screw GBFB 3 x 4 mm	3
74	T029P253H31	Screw GPFB 3 x 6 mm	3
75	T029P282H30	Screw GBFB 3 x 5 mm	10
76	T029P282H37	Screw GBFB 3 x 18 mm	1
77	T014P003H32	Screw TBFB 3 x 8 mm	9
78	T010P901H19	Screw TPFB-Z3 x 8 mm	2
79	T029D180H03	Screw-SPL	4
80	T029D180H02	Screw-SPL	2
81	T034P105H17	Bolt-IFZ M3 x 15 mm	2
82	T004P003H21	Screw MBFB M2.6 x 6 mm	2
83	T004P003H23	Screw MBFB M2.6 x 10 mm	1
84	T029P283H31	Screw GBFZ 3 x 6 mm	4
85	-	-	-
86	-	-	-
87	-	-	-
88	-	-	-
89	-	-	-
90	T060P000H13	R-Ring E3	5
91	T060P000H30	R-Ring E2.5	4
92	T060P000H12	R-Ring E2	1
93	T116D232H02	Washer-PL	1
94	T116D232H01	Washer-PL	1
100	-	PCB PB-1	1
101	-	PCB PB-2	1
201	-	PACKING BAG	1
202	-	CD PLAYER	1
203	T770A243H03	CUSHION-L	1
204	T770A244H03	CUSHION-R	1
205	T924C004H03	INSTRUCTION BOOK	1
206	T752B482H12	PACKING CASE	1

PARTS LIST

ELECTRICAL ELEMENTS ON PCB

Part No.	Description	Symbol No.	Part No.	Description	Symbol No.
Diodes			Electrical Parts		
M47 214 347	D442	D100, 200, 202 203, 206, 301 302, 401, 502 503, 560, 601 602, 603	M40 001 410	VR-SF V8K4-11 10K	VR100, 101, 150 151, 200, 403
M40 001 321	LED SLF 2068	D901 (PB-3)	M40 203 310	VR-SF TM8K(PV) 200	VR401
M40 001 320	DS135E	D801, 802, 803 804	M40 203 313	VR-SF V8K4-11 20K	VR402
M05 174 321	MZ303A	D102, 125	M40 203 311	VR-SF V8K4-11 50K	VR404
M72 900 550	MZ306A	D701, 702	M40 203 314	VR-SF V8K4-11 100K	VR152
M40 203 321	HZ4C-1	D244, 304	T719P133H31	COIL-P LAL03NA680K	L201
Transistors			M40 003 513	COIL-P LAL03NAR47M	L701
M17 517 582	2SC2603E	Q100, 101, 102 150, 151, 179 180, 181, 199 200, 201, 220 221, 249, 250 301, 302, 303 304, 540	M40 001 309	LAMP MDT12V55MA	LA921 (PB-4)
M17 517 581	2SA1115E	Q246, 305, 306 307, 707	M71 001 420	RELAY SZ-5	RY501
M40 203 500	2SA952	Q248	M40 203 438	LPF PFB-3	L702, 703
M40 001 302	2SD330E	Q401	M40 203 345	Crystal HC49/U 36.030MHZ	X701
M40 001 303	2SB514E	Q402	M07 708 345	Crystal HC43/U 8.6436MHZ	X601
M07 708 306	2SK152-3 (or 4)	Q701, 702	M72 900 592	CSA4.00MT	X301
M40 001 304	2SK381D	Q703, 704	M40 001 381	PUSH SWITCH	S931 (PB-5)
M40 001 301	2SK363GR	Q705, 706	M40 001 477	PLUG 5330-14BGS1	J951 (PB-7)
ICs					
M40 001 338	M51562P	IC200			
M40 001 335	TC4011BP	IC201			
M40 001 334	TC40H074P	IC202			
M07 708 393	or TC74HC74P	IC202			
M40 001 336	TC4030BP/TC40H386P	IC203			
M40 001 332	M50740A-401SP	IC301			
M40 203 332	M51759P	IC401			
M07 708 319	TC40H004P	IC402			
M07 708 339	NJM4558D	IC403, 705			
M40 203 330	M50420-001P	IC601			
M40 203 331	MB8416A-15P-SK	IC602			
M07 708 331	or M58725P	IC602			
M07 708 394	CX20017	IC701			
M07 708 338	NJM082D	IC702, 703			
M40 001 339	TC4053BP	IC704			
M07 708 312	μPC7905H	IC801			
M72 900 515	μPC7805H	IC802			
M40 002 331	NJM4558S/NJM4556S	IC981, 982 (PB-9)			
M40 203 334	STA451C	IC983, 984 (PB-9)			



 **MITSUBISHI ELECTRIC CORPORATION**
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