



# HITACHI

## SERVICE MANUAL

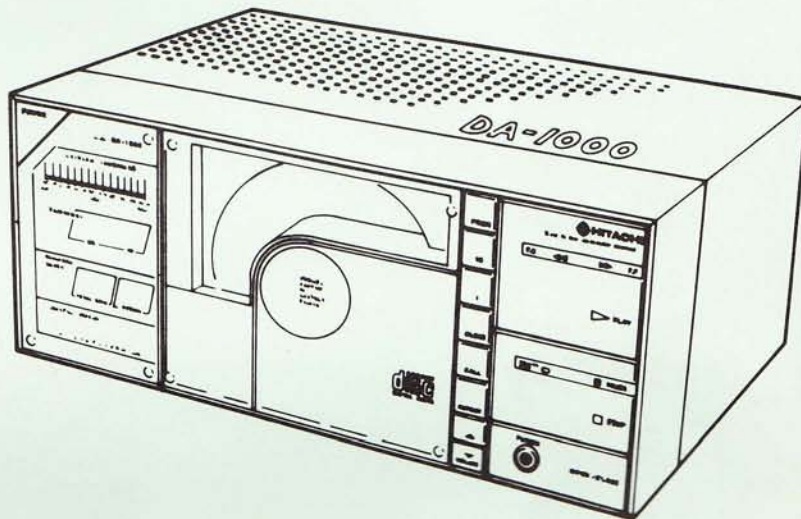
TY

No. 361 E

# DA-1000R

### Revised version

- \* This Service Manual applies to DA-1000 whose circuitry has been changed.
- \* "R" is marked on the rear panel of the modified unit.
- \* For servicing units other than those given in this Service Manual, refer to the former Manual (No. 348 E-1).



There is a "R" mark on the rear panel.

**DANGER-Invisible laser radiation when open.  
AVOID DIRECT EXPOSURE TO BEAM.**

### SAFETY PRECAUTION

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety related characteristics, always use genuine Hitachi's replacement parts. Especially critical parts in the power circuit block should not be replaced with those of other makers. Critical parts are marked with  $\Delta$  in the schematic diagram and circuit board diagram.
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.

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SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT.

# COMPACT DISC PLAYER

## April 1983 TOYOKAWA WORKS



**SPECIFICATIONS**

**AUDIO**

Number of channels	2
Frequency response	5 – 20,000 Hz ±0.5 dB
Dynamic range	93 dB
Signal-to-noise ratio	94 dB
Harmonic distortion	0.003%
Separation	92 dB (at 1 kHz)
Wow/flutter	Less than measurable limits (Crystal accuracy)
Output voltage	2.1 Vrms (with full scale)

**DISCS USED**

Playing time	60 minutes/one side
Diameter	120 mm

**SIGNALFORMAT**

Sampling frequency	44.1 kHz
Quantization number	16-bit linear/channel
Transmission bit rate	4.3218 Mb/sec

**PICK-UP**

System	Object lens drive system optical pick-up
Object lens drive system	2-dimensional parallel drive
Optical source	Semiconductor laser
Wavelength	790 nm

**GENERAL**

Power requirements	AC 120V 60 Hz, ~ 220V 50 Hz ~ 240V 50 Hz, ~ 120/220/240V 50, 60 Hz
Power consumption	25W (AC 120V 60 Hz, ~ 220V 50 Hz, 240V 50 Hz) 28W (~ 120/220/240V 50, 60 Hz)
Dimensions	320 (W) x 145 (H) x 234 (D) mm
Weight	5.6 kg

**FUNKIONS AND DISPLAYS**

Functions	Random memory search (max. 15 tracks) Self-program search system Skip play, memory stop, pause, repeat, output volume
Displays	Play position (5-min. steps), number of tracks, playing track number, elapsed play time, output volume level
Others	Variable level headphone jack, 2 sets output terminals (variable and fixed level)

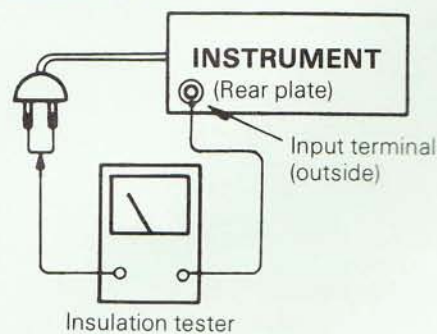
**ACCESSORIES**

Connecting pin cords

Check that exposed parts are acceptably insulated from the supply circuit before returning the instrument repaired to the customer.

● **Checking method**

Power switch is set to ON.  
Next, measure the resistance value between the both poles of attachment cup (Power supply plug) and the input terminal (outside) of rear plate and check that the resistance value is 500 kohms or more,



**SERVICE POINTS**

**BEFORE REPAIRING OR CHANGING PARTS**  
 Before repairing or changing a part, switch on the power and while the player is in the "STOP" mode, turn the left hand side of the unit face down and then tighten the transit screw by rotating it clockwise until it stops. After turning the power off, read the following items.

**1. Taking off the cover**

Slide off the back cover after disengaging screws ① (3 screws) and ② (2 screws).

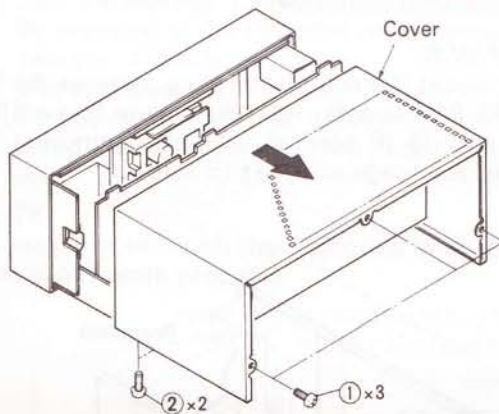


Fig. 1

**2. Taking off the front panels [A] and [B]**

Pull out the nylon rivets holding on the front panels [A] (4 rivets) and [B] (3 rivets), using a pointed object such as a pair of compasses.

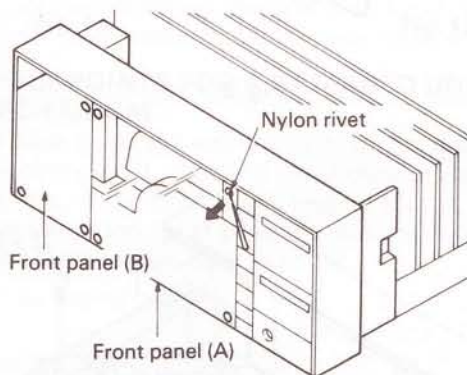


Fig. 2

**3. Removing the escutcheon plate**

After taking off the cover, disengage screw ③ (4 screws), and ③ -1 (3 screws).

**4. Removing the unit mechanism**

Switch on the power, push the door OPEN/CLOSE button and open the door. Then switch off the power and unplug and power cord. Next, after removing the escutcheon plate, remove the lead plate and disengage screw ④ (4 screws).

**NOTE 1**

On the lower part of escutcheon, there is a pressed protrusion. When dismantling or mounting the unit mechanism, be careful to cover the protrusion with a piece of thick paper such as drawing paper so as not to damage the lower part of the unit mechanism.

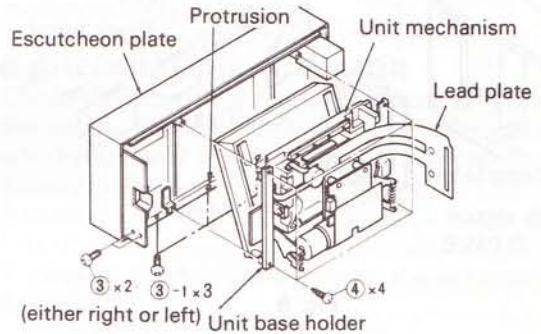


Fig. 3

**NOTE 2**

When the door does not open even after pressing the door OPEN/CLOSE button, Fig. 4 illustrates how it can be opened. After removing the lead line connector, the door can be opened by connecting a dry (1.5V) battery to the motor for door operation. When it is reversely connected the door will close.

**NOTE 3**

Since the unit base holder can easily get out of place, do not hold this portion to move the unit.

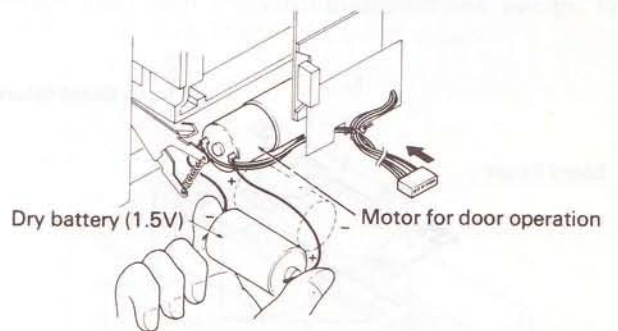


Fig. 4

**5. Removing the console**

After removing the unit mechanism, disengage screw ⑤ -1 (4 screws).

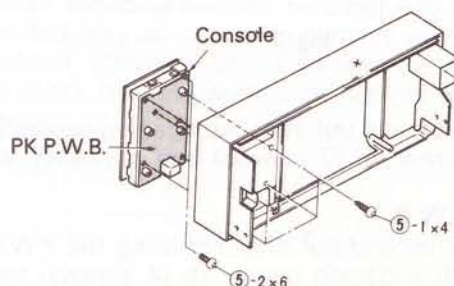


Fig. 5



**6. Removing the display section**

After disengaging screw ⑥ -1, 2 (3 screws) and removing the power switch, disengage screw ⑦ (3 screws).

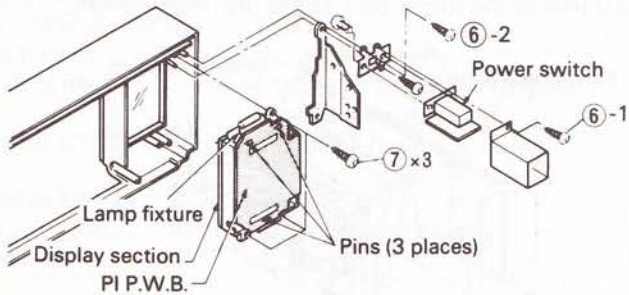


Fig. 6

**7. Removing the P.W.B.  
Kinds of P.W.B.**

PA P.W.B.	: Audio circuit
PP P.W.B.	: Pre amp circuit
PD P.W.B.	: Digital circuit
PS P.W.B.	: Servo circuit
PC P.W.B.	: Control, power circuit
PK P.W.B.	: Key circuit
PI P.W.B.	: Indicator circuit

**(1) PA P.W.B.**

Lift the board up and out after disengaging screw ⑧ (2 screws) and the board fixture.

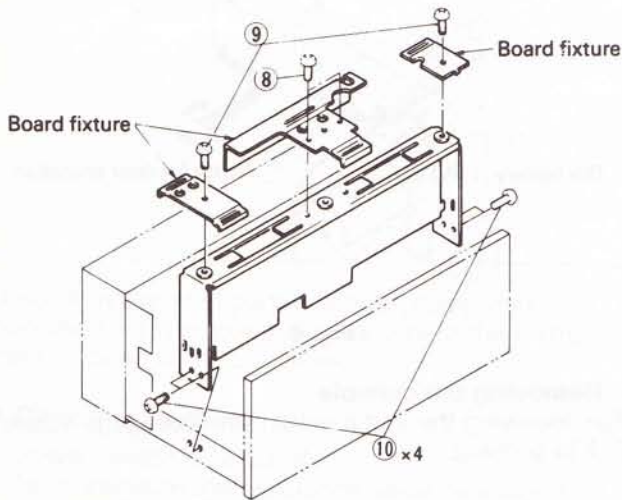


Fig. 7

**(2) PP P.W.B.**

Lift the P.W.B. up and out after disengaging screw ⑧ (2 screws), screw ⑨ (2 screws) and removing the P.W.B. fixture.

**(3) PD, PS P.W.B.**

Lift the P.W.B. up and out after removing the P.W.B. fixture, then disengaging screw ⑩ (4 screws) and removing the shield plate.

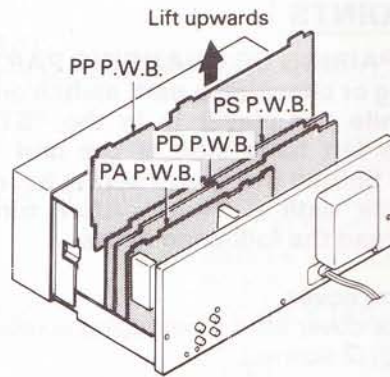


Fig. 8

**(4) PC P.W.B.**

After removing the escutcheon plate, remove the PA, PP, PD, PS P.W. boards. Next disengage screw ⑪ (2 screws) and ⑫ (6 screws), and after removing the rear plate, disengage screw ⑬ (8 screws).

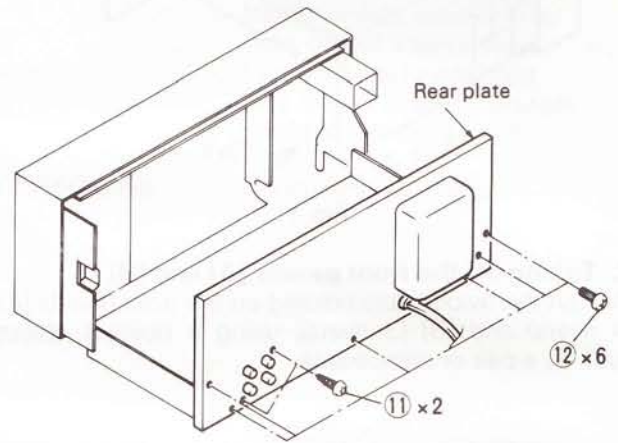


Fig. 9

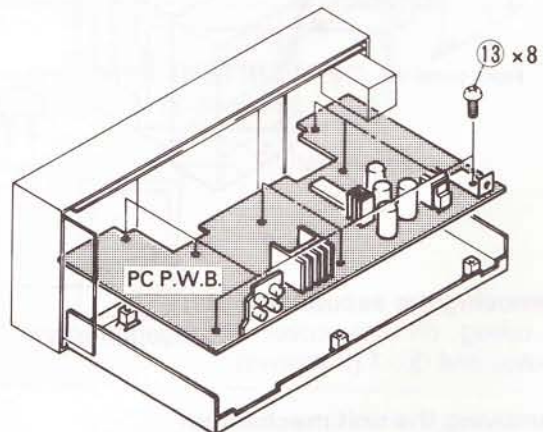


Fig. 10



**(5) PK P.W.B.**

After removing the console, which was explained in Item 5, disengage screw 5-2 (5 screws). (Refer to Fig. 5.)

**(6) PI P.W.B.**

After removing the display section, which was explained in Item 6, and the lamp fixture, remove the pins (in 3 places).

**8. Changing the pickup drive belt**

- (1) Switch on the power. Press the door OPEN/CLOSE button to open the door, then switch off the power. Turn the lefthand side of the unit face down.
- (2) Just the like Fig. 11 illustrates, remove the cover by pressing in the direction of the arrows with a tweezer or minus mini-driver.
- (3) Use the tweezers to remove the belt.
- (4) To put on the belt, put it over the motor axle by using the tweezers and then over the motor pulley.

**NOTE**

Be sure not to touch the objective lens. If you do, it may not work properly.

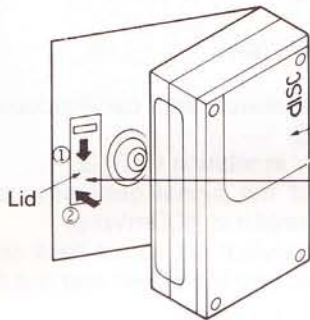


Fig. 11

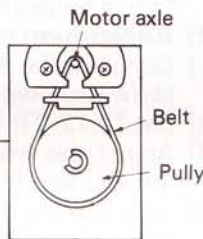


Fig. 12

**■ CHECKPOINTS FOR A DAMAGED UNIT MECHANISM**

If you have used the unit mechanism for a long time, before changing it, check to see if dust or dirt is fixed to the lens. If the EFM signal level is scarce, the laser may be damaged. First wipe the surface of the objective lens with a clean cleaning stick.

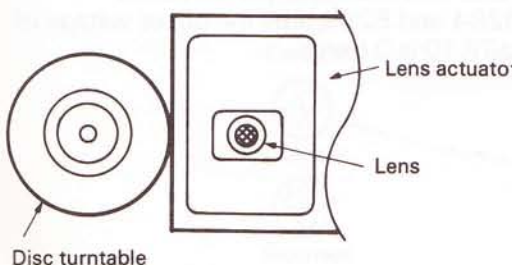


Fig. 13

**■ WHEN THE LASER IS DAMAGED**

The laser is normally activated at a current level of 60 ~ 100mA. It is possible for it to be activated up to 150mA under the laser control circuit (ordinary temperature).

Measure the value of laser driving current in the circuit. If the value reaches 150 mA, the laser might be malfunctioning.

**■ CHECKING THE ACTUATOR**

Check the resistor of the actuator coils. It is normal if the values are the same as those listed below (Also when you check it with the tester, you can see a slight activity in the lens.)

Focusing coil ..... 20 ohms  
Tracking coil ..... 4 ohms  
In case of open or short circuit, the actuator may be damaged.

**■ POINTS TO WATCH FOR WHEN SERVICING THE PLAYER**

**● CHANGING THE UNIT MECHANISM ASS'Y**

**1. Semiconductor laser**

In comparison to ordinary semiconductors, it is necessary to be more careful about surge and trouble from static electricity with semiconductor laser. As the figure below shows regarding the characteristics of the current and light intensity, if the threshold level is surpassed there will be a steep rise. Moreover, the current threshold level is slightly different for each laser. Subsequently, when you have changed the unit mechanism and want to set the laser's light volume, always start with the volume adjustment set to "0" and then turn it up to the stipulated volume.

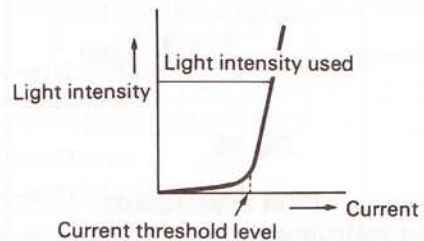


Fig. 14

**2. Regarding revolving arm section**

When servicing the unit, be careful to thread wirings so that they do not get in contact with revolving arm section. (Open/close the lid with the cover removed to check that the wirings do not get in contact with the arm.)



**ADJUSTING THE PLAYER**

Before adjusting the player, make sure that you have preset it. The procedure for adjusting the player is listed below.

● **PRESET**

Adjustment	Circuit number	Preset position
Laser diode output	R021	Lowest
Tracking servo offset	R013	Medium
Focus servo gain	R100	Medium
Focus servo offset	R102	Medium
Tracking servo gain	R152	Medium
Disc motor hall gain balance	R273	Medium
Disc motor hall (A) offset	R289	Medium
Disc motor hall (B) offset	R284	Medium

**1. Laser diode output adjustment**

**(1) Adjusting instrument**

Oscilloscope

**(2) Adjustment method**

- [1] Connect the oscilloscope between TP.11 (TDET) and TP.G (GND) (Fig. 17).
- [2] Insert a disc into the player and put it on playback mode.
- [3] Adjust R021 until the level of the EFM signal on the oscilloscope is 600mV.

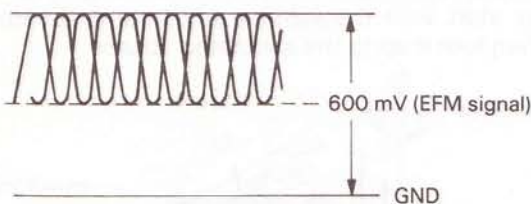


Fig. 15

**2. Tracking servo offset adjustment**

**(1) Adjusting instrument**

Oscilloscope

**(2) Adjustment method**

- [1] Follow the same procedure for the laser diode output adjustment (2), [1], [2].
- [2] Adjust R013 until the EFM signal is at its greatest amplitude.

**3. Focus servo offset adjustment**

**(1) Adjusting instrument**

Oscilloscope

**(2) Adjustment method**

- [1] Follow the same procedure for the laser diode output adjustment (2), [1], [2].
- [2] Adjust R102 until the EFM signal is at its greatest amplitude.

**4. Focus servo Focus servo gain adjustment**

**(1) Adjusting instrument**

Signal generator, Oscilloscope

**(2) Adjustment method**

- [1] Connect the signal generator and oscilloscope like it is illustrated in Fig. 18.
- [2] Set the frequency of the signal generator to 2 kHz. Adjust the output of the signal generator until it is 1 Vp-p (354mVrms).
- [3] Insert a disc into the player and set it to playback mode.
- [4] Adjust R100 so that the phase between ch1 and ch2 is 135 degrees as shown below.

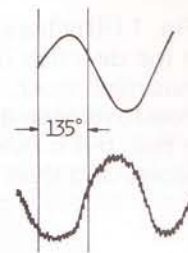


Fig. 16

**5. Tracking servo gain adjustment**

**(1) Adjusting instrument**

Signal generator, Oscilloscope

**(2) Adjustment method**

- [1] Connect the signal generator and oscilloscope like it is shown in Fig. 18.
- [2] Set TP.12 (TR GAIN) +5V in relation to TP.3.
- [3] Adjust the frequency of the signal generator to 1.8 kHz and the output until it is 800mVp-p.
- [4] After turning the power switch off, turn it back on again. Then, insert a disc into the player and put it on playback mode.
- [5] Adjust R152 until the resurge graph on the oscilloscope looks like the correct example in Fig. 18.

**6. Turntable motor hall gain and offset adjustment**

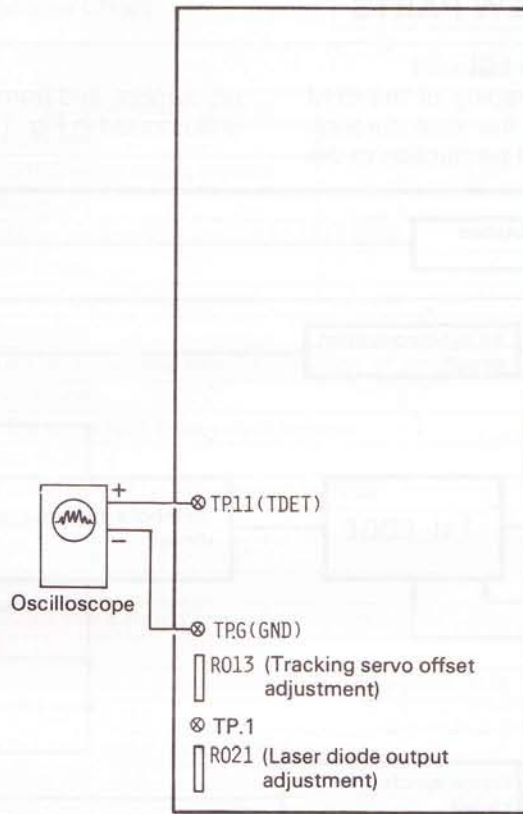
**(1) Adjusting instrument**

Oscilloscope

**(2) Adjustment method**

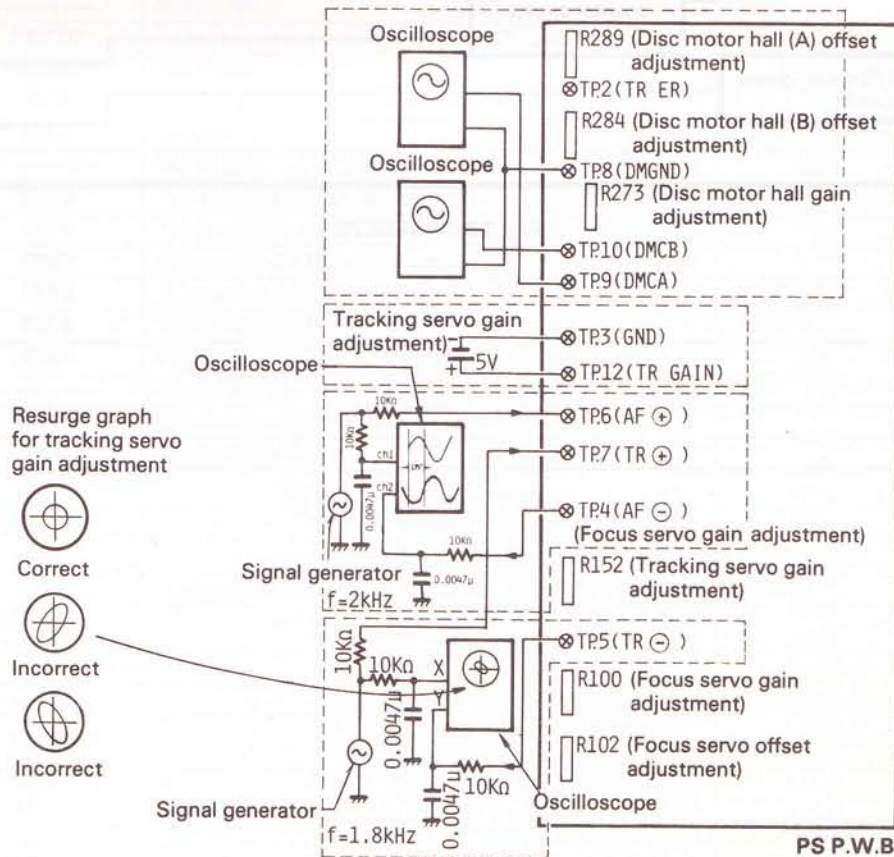
- [1] Connect the oscilloscope to TP.9 (DMCA) and TP.8 (DMGND) or to TP.10 (DMCB) and TP.8.
- [2] Adjust R273 until the output levels of TP.9 (DMCA) and TP.10 (DMCB) are the same.
- [3] Adjust R284 and R289 until the offset voltage of TP.9 and TP.10 is 0 (zero).





PP P.W.B.

Fig. 17



PS P.W.B.

Fig. 18



**EXPLANATION OF THE NEW PARTS**

**1. Explanation of the data strobe LSI**

This LSI performs the waveform shaping of the EFM signal which was obtained from the disc through pickup, as well as the derivation and production of the

bit, symbol, and frame sync signals. The system block is illustrated in Fig. 19.

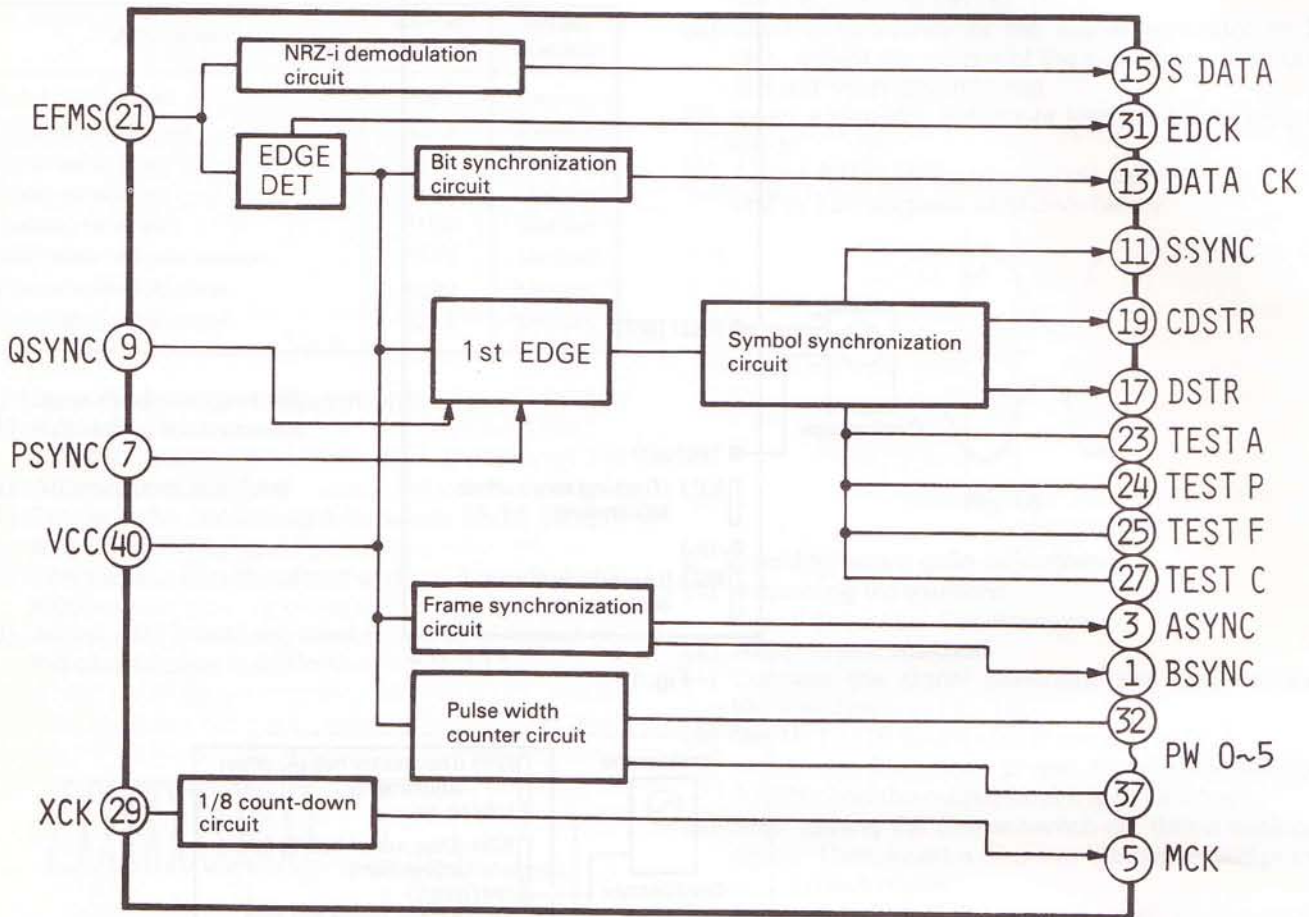


Fig. 19 MB15529

## MB15529 (IC402) Terminal Function Chart

Terminal number	Terminal symbol	Function
1	<b>BSYNC</b>	BSYNC signal output terminal
2	————	Not in use
3	<b>ASYNC</b>	ASYNC signal output terminal
4	————	Not in use
5	<b>MCK</b>	Master clock output terminal (4.3218 MHz)
6	————	Not in use
7	<b>PSYNC</b>	PSYNC signal input terminal
8	————	Not in use
9	<b>QSYNC</b>	QSYNC signal input terminal. Ordinary "H" processing
10	<b>GND</b>	Not in use
11	<b>SSYNC</b>	FEM signal latch pulse output terminal
12	————	Not in use
13	<b>DATAACK</b>	Data synchronous signal output terminal
14	————	Not in use
15	<b>SDATA</b>	EFM signal output terminal
16	————	Not in use
17	<b>DSTR</b>	Strobe signal output terminal for 8 bit data (only C & D)
18	————	Not in use
19	<b>CDSTR</b>	Strobe signal output terminal for 8 bit data (only C & D)
20	<b>VCC</b>	DC source (+5V)
21	<b>EFMS</b>	EFM serial signal input terminal
22	————	Not in use
23	<b>TEST</b>	Test signal output terminal
24	<b>TESTP</b>	Test signal output terminal
25	<b>TESTF</b>	Test signal output terminal
26	————	Not in use
27	<b>TESTC</b>	Test signal input terminal; ordinarily "L" processing
28	————	Not in use
29	<b>XCK</b>	Clock signal output terminal (34.5744 MHz)
30	<b>GND</b>	Ground
31	————	Not in use
32	<b>PWO</b>	Pulse width DATA output terminal
33	<b>PW1</b>	Pulse width DATA output terminal
34	<b>PW2</b>	Pulse width DATA output terminal
35	<b>PW3</b>	Pulse width DATA output terminal
36	<b>PW4</b>	Pulse width DATA output terminal
37	<b>PW5</b>	Pulse width DATA output terminal
38	————	Not in use
39	<b>EDCK</b>	Control signal output terminal
40	<b>VCC</b>	DC source (+5V)



2. Control LSI

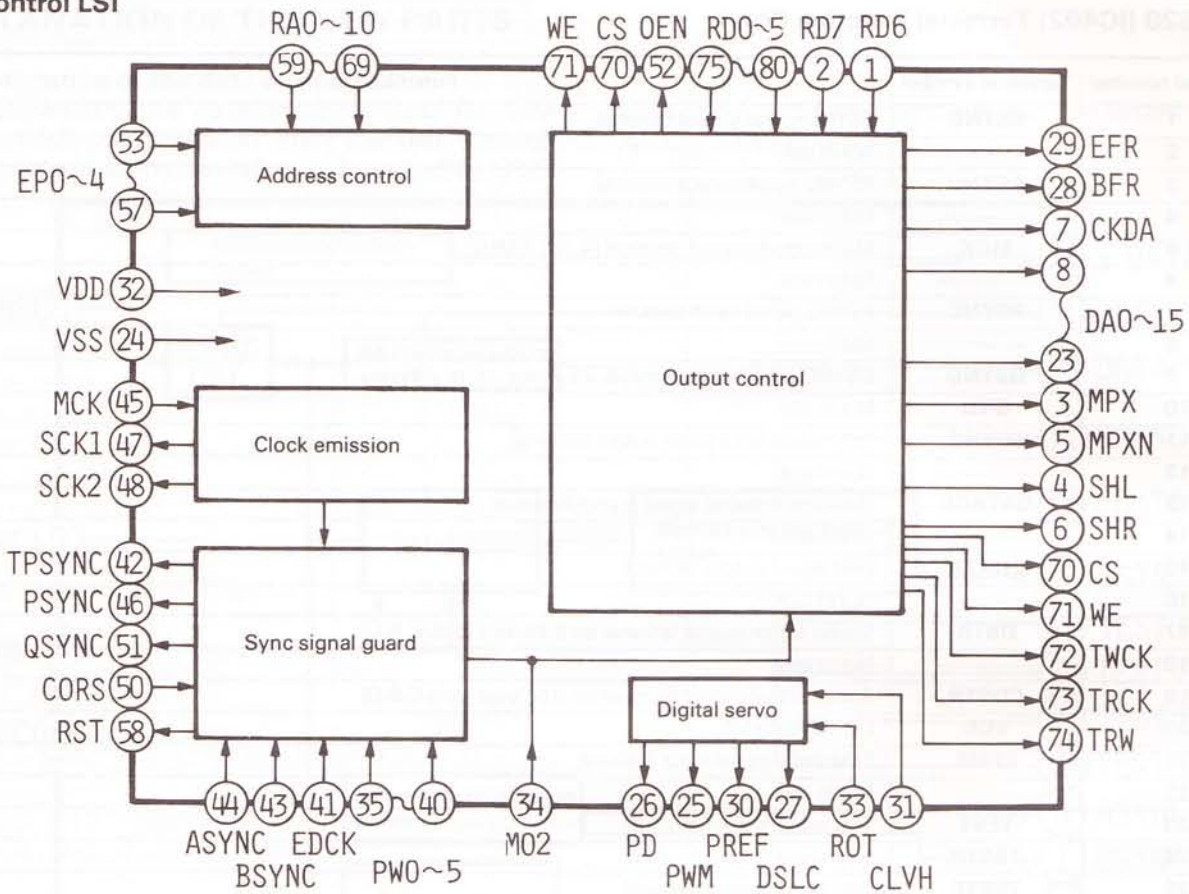


Fig. 20 HD61902

HD61902 (IC404) Terminal Function Table

Terminal number	Terminal symbol	Function
1	RD6	Terminal for DATA input from the external RAM
2	RD7	Terminal for DATA input from the external RAM (MSB)
3	MPX	MPX signal output terminal High...Rch, Low...Lch
4	SHL	Sampling hold signal output terminal (Lch) High...Sampling Low...Hold
5	MPXN	MRX signal output terminal (MPX)
6	SHR	Sampling hold signal output terminal (Rch) High...Sampling Low...Hold
7	CKDA	Clock output terminal (720 kHz) for D/A converter regulation
8	DA0	Data output terminal (LSB) for D/A
9	DA1	Data output terminal (LSB) for D/A
10	DA2	Data output terminal (LSB) for D/A
11	DA3	Data output terminal (LSB) for D/A
12	DA4	Data output terminal (LSB) for D/A
13	DA5	Data output terminal (LSB) for D/A
14	DA6	Data output terminal (LSB) for D/A
15	DA7	Data output terminal (LSB) for D/A
16	DA8	Data output terminal (LSB) for D/A
17	DA9	Data output terminal (LSB) for D/A
18	DA10	Data output terminal (LSB) for D/A
19	DA11	Data output terminal (LSB) for D/A
20	DA12	Data output terminal (LSB) for D/A
21	DA13	Data output terminal (LSB) for D/A
22	DA14	Data output terminal (LSB) for D/A
23	DA15	Data output terminal (LSB) for D/A
24	VSS	Power (GND)
25	PWM	Terminal for output of the largest pulse width control signal



Terminal number	Terminal symbol	Function
26	PD	Terminal for output of the DA sync signal and the PSYNC phase difference signal
27	DSLCL	Data slice level signal output terminal
28	BFR	Block error flag output terminal
29	EFR	Correction (mean interpolation and the previous value interpolation) flag output terminal
30	PREF	Terminal (duty - 50%) 33.8 kHz for output of the reference signal used for PWM, DSLCL
31	CLVH	Terminal for input of the control signal from the microcomputer
32	VDD	Power (+5V)
33	ROT	Terminal for input of the control signal from the microcomputer
34	MU2	MUTE signal input terminal Low...mute, High...normal
35	PW0	Pulse width data input terminal
36	PW1	Pulse width data input terminal
37	PW2	Pulse width data input terminal
38	PW3	Pulse width data input terminal
39	PW4	Pulse width data input terminal
40	PW5	Pulse width data input terminal
41	EDCK	Terminal for input of the control signal from the data strobe IC
42	TPSYNC	Test signal input terminal
43	BSYNC	BSTNC signal input terminal
44	ASYNCL	ASYNCL signal input terminal
45	MCK	Master clock input terminal 4.3218 MHz
46	PSYNCL	PSYNCL signal output terminal
47	SCK1	Output terminal for the basic signal processing clock (CK1)
48	SCK2	Output terminal for the basic signal processing clock (CK2)
49	MCK1	Output terminal for the basic signal processing clock (MCK1)
50	CORS	Terminal for output of the revision start signal
51	QSYNCL	QSYNCL signal output terminal
52	OEN	Terminal for output of the OEN signal from HD61901 to external RAM High...enable
53	EP0	Terminal for input of the error pointer data
54	EP1	Terminal for input of the error pointer data
55	EP2	Terminal for input of the error pointer data
56	EP3	Terminal for input of the error pointer data
57	EP4	Terminal for input of the error pointer data
58	RST	Reset signal input terminal Low...reset High...normal
59	RA0	External RAM address signal output terminal
60	RA1	External RAM address signal output terminal
61	RA2	External RAM address signal output terminal
62	RA3	External RAM address signal output terminal
63	RA4	External RAM address signal output terminal
64	RA5	External RAM address signal output terminal
65	RA6	External RAM address signal output terminal
66	RA7	External RAM address signal output terminal
67	RA8	External RAM address signal output terminal
68	RA9	External RAM address signal output terminal
69	RA10	External RAM address signal output terminal
70	C-S	External RAM chip select signal output terminal Low...chip select
71	WE	External RAM write enable signal output terminal Low...write enable
72	TWCK	Test signal input terminal
73	TRCK	Test signal input terminal
74	TRW	Test signal input terminal
75	RD0	Terminal for the input of data from the external RAM (LSB)
76	RD1	Terminal for the input of data from the external RAM (LSB)
77	RD2	Terminal for the input of data from the external RAM (LSB)
78	RD3	Terminal for the input of data from the external RAM (LSB)
79	RD4	Terminal for the input of data from the external RAM (LSB)
80	RD5	Terminal for the input of data from the external RAM (LSB)



### 3. Explanation of HD61901 HD61901 (IC403) Terminal Function Table

Terminal number	Terminal symbol	Function
1	TC1	C1 syndrome output terminal
2	TC2	C2 syndrome output terminal
3	EP4	Terminal for output of the error pointer DATA
4	EP3	Terminal for output of the error pointer DATA
5	EP2	Terminal for output of the error pointer DATA
6	EP1	Terminal for output of the error pointer DATA
7	EP0	Terminal for output of the error pointer DATA
8	OEN	Terminal for input of the DATA output permit signal to external RAM High...enable
9	QSYNC	QSYNC signal input terminal
10	CORS	Terminal for output of the revision start signal
11	MCK1	Terminal for the signal processing basic clock (MCK1) input
12	SCK2	Terminal for the signal processing basic clock (CK2) input
13	SCK1	Terminal for the signal processing basic clock (CK1) input
14	RST	Reset signal input terminal Low...Reset High...Normal
15	TC2STP	Test signal input terminal
16	TC1STP	Test signal input terminal
17	TCIFSTP	Test signal input terminal
18	VSS	Source (GND)
19	ASync	ASync signal output terminal
20	BSync	BSync signal output terminal
21	TEF	Test signal input/output terminal
22	TSEF	Test signal input/output terminal
23	EMP	C & D signal (emptesis) output terminal
24	VDD	Source (+5V)
25	CDS1	Terminal for output of the sync signal for C & D
26	SSync	EFM signal latch pulse input terminal
27	DATAACK	Terminal for input of the data sync signal which was derived from the data strobe
28	SDATA	EFM signal input terminal
29	DSTR	Terminal for input of the 8 bit data strobe signal (excluding C & D) after EFM demodulation
30	CDSTR	Terminal for input of the 8 bit data strobe signal (only D & D data) after EFM demodulation
31	T	Test signal input terminal
32	TCD	Test signal input terminal
33	TOE	Test signal input terminal
34	CD0	Terminal for input/output of the EFM demodulation signal (LSB)
35	CD1	Terminal for input/output of the EFM demodulation signal (LSB)
36	CD2	Terminal for input/output of the EFM demodulation signal (LSB)
37	CD3	Terminal for input/output of the EFM demodulation signal (LSB)
38	CD4	Terminal for input/output of the EFM demodulation signal (LSB)
39	CD5	Terminal for input/output of the EFM demodulation signal (LSB)
40	CD6	Terminal for input/output of the EFM demodulation signal (LSB)
41	CD7	Terminal for input/output of the EFM demodulation signal (MSB)
42	TEFM	Test signal input terminal
43	TCDR	Test signal input terminal
44	IRQ	CRCFLAG output terminal
45	CDQ0	C & D data output terminal
46	CDQ1	C & D data output terminal
47	CDQ2	C & D data output terminal
48	CDQ3	C & D data output terminal
49	CDP	C & D signal (program disc information) output terminal
50	MU1	Frame error rate signal output terminal
51	CKEXT	Internal RAM (C & D RAM) control signal input terminal
52	MUT	Terminal for input of the frame error count time

HD61901 (IC403) Terminal Function Table

Terminal number	Terminal symbol	Function
53	RD0	DATABUS (LSB) with the external RAM
54	RD1	DATABUS (LSB) with the external RAM
55	RD2	DATABUS (LSB) with the external RAM
56	RD3	DATABUS with the external RAM
57	RD4	DATABUS with the external RAM
58	RD5	DATABUS with the external RAM
59	RD6	DATABUS with the external RAM
60	RD7	DATABUS with the external RAM (MSB)

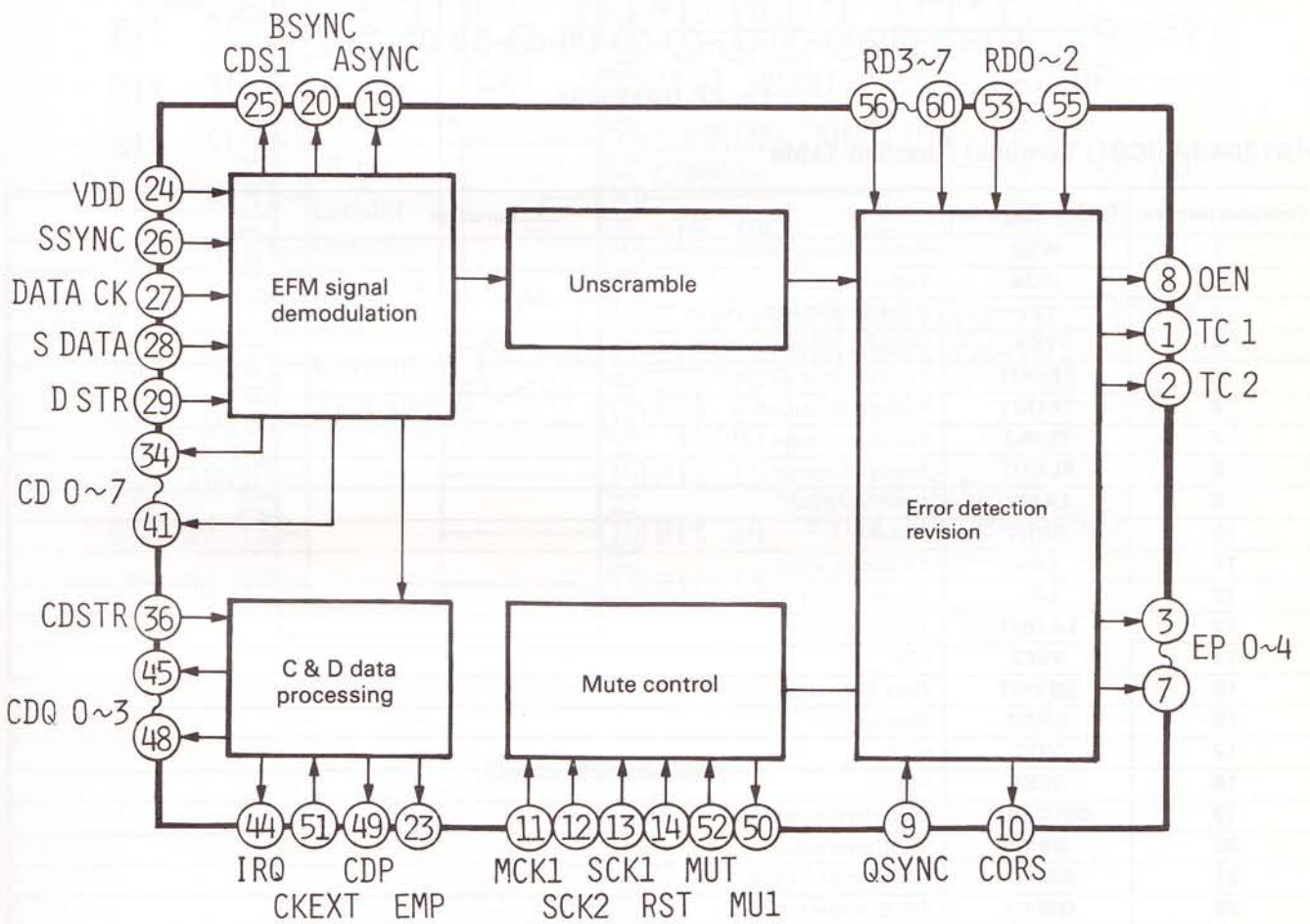


Fig. 21 HD61901



**4. Explanation of the preamplifier (HA12049A)**

The figure below shows a block illustration of pre amp IC01.

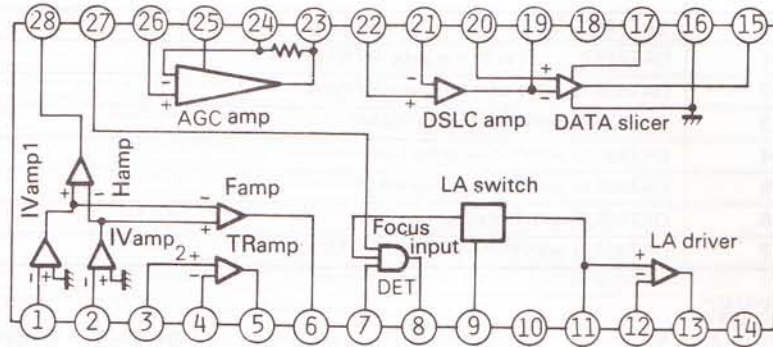


Fig. 22 HA12049A

**HA12049A (IC01) Terminal Function Table**

Terminal number	Terminal symbol	Function
1	IN13	Focus detector input
2	IN24	Focus detector input
3	TE -	Tracking detector (-) input
4	TE +	Tracking detector (+) input
5	TE OUT	Tracking error output
6	FE OUT	Focus error output
7	FL IN2	Focus error input
8	FL OUT	Focus OK output
9	LASW	Laser SW input
10	GND1	Ground
11	LA +	LA amp (+) input
12	LA -	LA amp (-) input
13	LA OUT	LA amp output
14	VEE2	-8V
15	DS OUT	Data slice output
16	GND2	Ground
17	VCC	+5V
18	VEE1	-5V
19	DSLCL OUT	DSLCL amp input
20	DSLCL IN	DSLCL amp output
21	DSLCL -	DSLCL amp (-) input
22	DSLCL +	DSLCL amp (+) input
23	AGC OUT	AGC amp output
24	AGC -	AGC amp (-) input
25	AGC BY PASS	AGC bypass
26	AGC +	AGC amp (+) input
27	FL IN1	HOUT filter input
28	H OUT	H amp output

**5. Explanation of DAC (PCM 53 JG-V)**

D/A converter is a self correcting type IC PCM 53 JG-V (IC401). The figure below shows a block diagram.

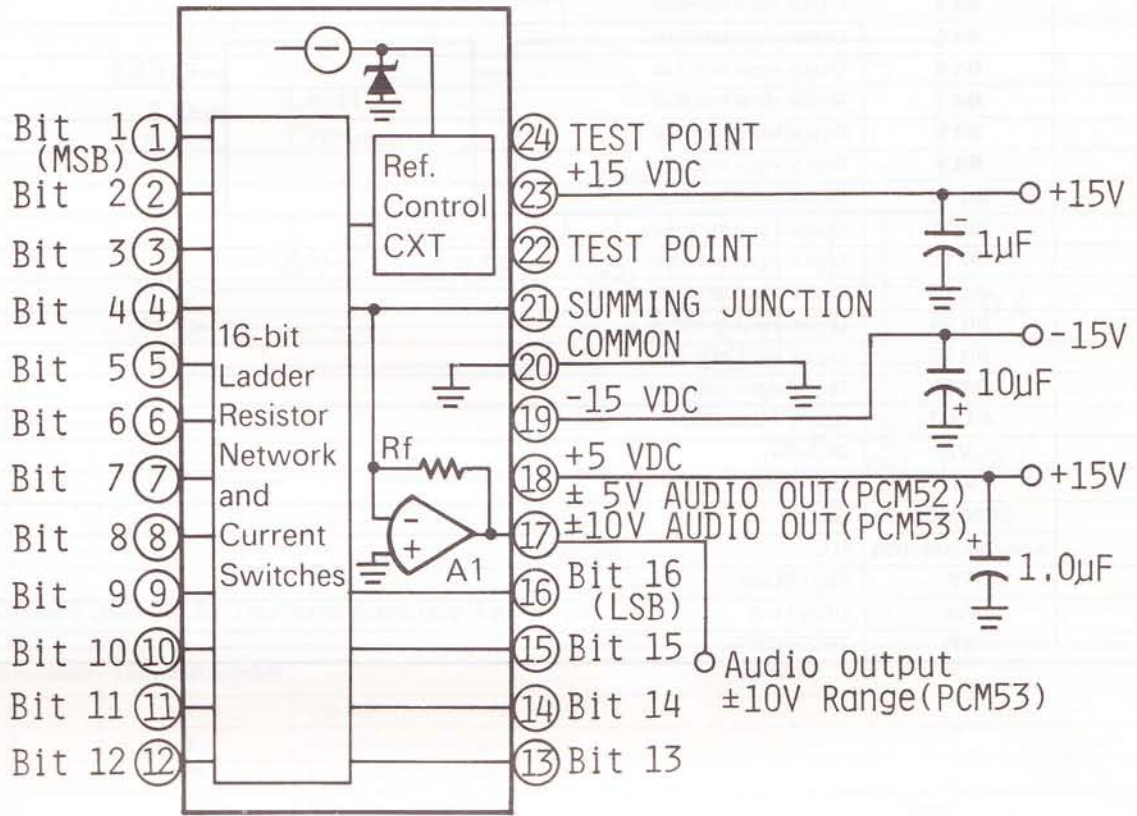


Fig. 23 PCM 53 JG-V



PCM 53 JG-V (IC406) Terminal Function Table

Terminal number	Terminal symbol	Function
1	Bit 1	Digital input terminal
2	Bit 2	Digital input terminal
3	Bit 3	Digital input terminal
4	Bit 4	Digital input terminal
5	Bit 5	Digital input terminal
6	Bit 6	Digital input terminal
7	Bit 7	Digital input terminal
8	Bit 8	Digital input terminal
9	Bit 9	Digital input terminal
10	Bit 10	Digital input terminal
11	Bit 11	Digital input terminal
12	Bit 12	Digital input terminal
13	Bit 13	Digital input terminal
14	Bit 14	Digital input terminal
15	Bit 15	Digital input terminal
16	Bit 16	Digital input terminal
17	A OUT	± 10V AUDIO OUT
18	VL	DC (+5V)
19	VEE	DC (-15V)
20	COMMON	Ground
21	SUMMING JUNCTION	N.C.
22	TP	TEST POINT
23	Vcc	DC (+15V)
24	TP	TEST POINT

**6. Explanation of sampling hold (HD14053)**

The figure below shows a block illustration of the sampling hold IC HD14053.

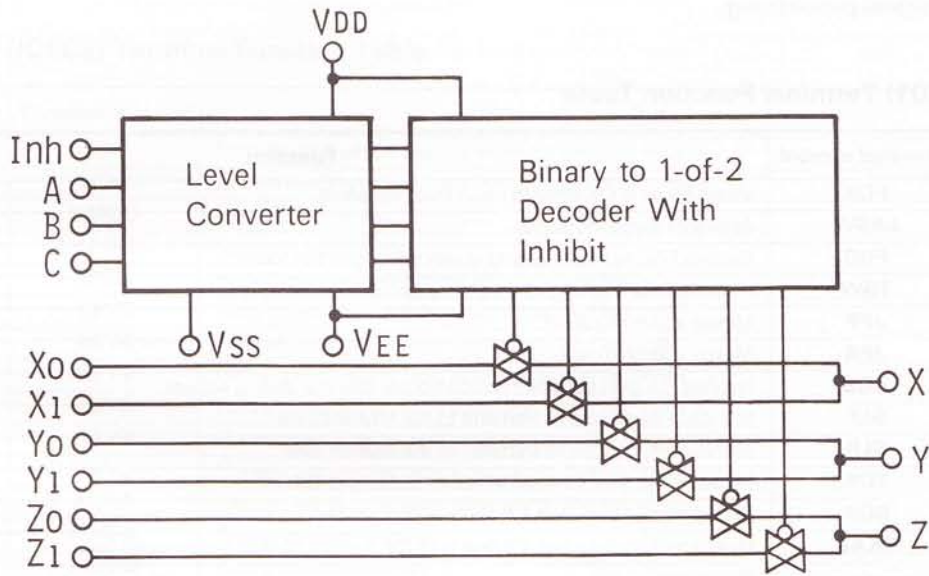


Abb. 24

**HD-14053BP (IC408LR) Terminal Function Table**

Terminal number	Terminal symbol	Function
1	Y <sub>1</sub>	Input/Output terminal
2	Y <sub>0</sub>	Input/Output terminal
3	Z <sub>1</sub>	Input/Output terminal
4	Z	Input/Output terminal
5	Z <sub>0</sub>	Input/Output terminal
6	INHIBIT	Control input terminal
7	V <sub>EE</sub>	-5V
8	V <sub>SS</sub>	Ground
9	C	Control input terminal
10	B	Control input terminal
11	A	Control input terminal
12	X <sub>0</sub>	Input/Output terminal
13	X <sub>1</sub>	Input/Output terminal
14	X	Input/Output terminal
15	Y	Input/Output terminal
16	V <sub>DD</sub>	+5V

**7. The AFL811WF (CP501LR) is used in low-pass filter circuit.**

**AFL811WF (CP501LR) Terminal Function Table**

Terminal number	Function
1	GND
2	INPUT
3	GND
4	Negative power supply terminal
5	GND
6	OUTPUT
7	Positive power supply terminal



**8. Explanation of the Access Microcomputer (HD44801A95)**

(1) The access microcomputer (IC601) HD44801-A95 controls all of the servo system, as well as all of the logic signal processing.

And the access microcomputer is controlled by the system control microcomputer.

**HD4480195 (IC601) Terminal Function Table**

Terminal number	Terminal symbol	Function
1	FOK	When focus is OK there is input from the servo
2	LASW	Activates the laser diode
3	FUD	Causes FAC to move up and down to bring in the focus
4	TSW	Activates the tracking and sending circuit
5	JPF	Makes a jump forward
6	JPR	Makes a jump to reverse
7	ACS	Notifies the gain control microcomputer that it is during access
8	SLF	Mandatorily caused to transmit to the forward side
9	SLR	Mandatorily caused to transmit to the reverse side
10	TOK	Made by the servo to input whether tracking is OK
11	BOK	Dual direction data bus, CK line with the system control microcomputer
12	CKAB	Dual direction data bus, CK line with the system control microcomputer
13	—	Not in use
14	—	Not in use
15	RESET	Microcomputer reset
16	GND	Ground
17	OSC1	Oscillator input terminal
18	OSC2	Oscillator input terminal
19	HLT	Hold terminal
20	TEST	Test terminal
21	VCC	+5V
22	MU2	Used for digital mute and audio mute
23	—	Not in use
24	START	Start signal for DAC regulation
25	MUT	Receives C1 error flag status
26	CDQ0	Inputs CDQ data
27	CDQ1	Inputs CDQ data
28	CDQ2	Inputs CDQ data
29	CDQ3	Inputs CDQ data
30	MU1	Receives C1 error flag status
31	IRA	Dual direction data bus, CK line with the system control microcomputer
32	DMSW	Disc motor switch
33	CLVH	Forced control of PD, PWM and DSLC
34	ROT	Forced control of PD, PWM and DSLC
35	—	Not in use
36	DATA0	Dual direction data bus, CK line with the system control microcomputer
37	DATA1	Dual direction data bus, CK line with the system control microcomputer
38	DATA2	Dual direction data bus, CK line with the system control microcomputer
39	DATA3	Dual direction data bus, CK line with the system control microcomputer
40	CDP	Reads COP from the logic circuit
41	IRQ	Reads CDQ from the logic circuit
42	CKEXT	Reads CDQ from the logic circuit

### 9. Explanation of the System microcomputer (HD44820A75)

This microcomputer is the master of all other micro-computers, governing the inputs and indications.

#### HD44820A75 (IC602) Terminal Function Table

Terminal number	Terminal symbol	Function
1	LID $\bar{O}$	Switch input which detects whether the door is open
2	LIDC	Switch input which detects whether the door is closed
3	KMOD	Receives key input
4	KPRO	Receives key input
5	GRI8	Fluorescent display tube scan signal and key input
6	KEY3	Fluorescent display tube scan signal and key input
7	KEY4	Fluorescent display tube scan signal and key input
8	KEY5	Fluorescent display tube scan signal and key input
9	KEY6	Fluorescent display tube scan signal and key input
10	KEY7	Fluorescent display tube scan signal and key input
11	KEY8	Fluorescent display tube scan signal and key input
12	KEY9	Fluorescent display tube scan signal and key input
13	POS-A	Pickup position display
14	POS-B	Pickup position display
15	POS-C	Pickup position display
16	POS-D	Pickup position display
17	DATA0	Dual direction data bus with the access control microcomputer
18	DATA1	Dual direction data bus with the access control microcomputer
19	DATA2	Dual direction data bus with the access control microcomputer
20	DATA3	Dual direction data bus with the access control microcomputer
21	RESET	Reset
22	GND	Ground
23	OSC1	Oscillator input terminal
24	OSC2	Oscillator input terminal
25	HLT	Hold input terminal
26	TEST	Test terminal
27	VCC	+5V
28	PLAY	LED lamp
29	PAUSE	LED lamp
30		LED lamp
31	FB	LED lamp
32	ST $\bar{O}$ P	LED lamp
33	MEM $\bar{O}$	LED lamp
34	PR $\bar{O}$	LED lamp
35	PEP	LED lamp
36	—	Not in use
37	LMSI	Switch for detecting whether pickup is at the inner circumference
38	SEG1	Scan signal for the fluorescent display tube and segment
39	SEG2	Scan signal for the fluorescent display tube and segment
40	SEG3	Scan signal for the fluorescent display tube and segment
41	SEG4	Scan signal for the fluorescent display tube and segment
42	SEG5	Scan signal for the fluorescent display tube and segment
43	SEG6	Scan signal for the fluorescent display tube and segment
44	SEG7	Scan signal for the fluorescent display tube and segment
45	—	Not in use
46	OPEN	Instruction signal for opening the door
47	CLOSE	Instruction signal for closing the door



## HD44820A75 (IC602) Terminal Function Table

Terminal number	Terminal symbol	Function
48	—————	Not in use
49	—————	Not in use
50	<b>IRA</b>	Dual direction data bus and CK line with the access control microcomputer
51	<b>BOK</b>	Dual direction data bus and CK line with the access control microcomputer
52	<b>CKAB</b>	dual direction data bus and CK line with the access control microcomputer
53	<b>GCM</b>	Input of information from the gain microcomputer about whether or not there is gain control mode
54	—————	Not in use

## 10. Explanation of the Gain control microcomputer (HD44700A17)

## HD44700A17 (IC180) Terminal Function Table

Terminal number	Terminal symbol	Function
1	—————	Not in use
2	—————	Not in use
3	—————	Not in use
4	<b>GCM</b>	Gain control completion terminal
5	<b>ACCESS</b>	During access, input from the access microcomputer for restoring tracking gain to TYP
6	<b>IRQ</b>	Input for detection of CDQ enable
7	<b>JPR</b>	Reverse jump
8	<b>TOK</b>	Input for tracking OK
9	<b>RESET</b>	Reset
10	<b>GND</b>	Ground
11	<b>OSC1</b>	Oscillator input terminal
12	<b>OSC2</b>	Oscillator input terminal
13	<b>HLT</b>	Hold input terminal
14	<b>VCC</b>	+5V
15	<b>MU1</b>	Receives the C1 error flag status
16	<b>MUT</b>	Receives the C1 error flag status
17	<b>LIDC</b>	Input for performing gain control after the door is shut
18	<b>FOK</b>	FOK signal detection input
19	<b>R20</b>	TR gain control
20	<b>R21</b>	TR gain control
21	<b>R22</b>	TR gain control
22	<b>R23</b>	TR gain control
23	—————	Not in use
24	—————	Not in use
25	—————	Not in use
26	—————	Not in use
27	—————	Not in use
28	—————	Not in use

## GLOSSARIES

Symbols	Description
<b>DMG</b>	Ground of disc turntable motor.
<b>DM + 5V</b>	+10V by the DC output before stabilized.
<b>DM -5V</b>	-10V by the DC output before stabilized.
<b>FAC</b>	Focus Actuator Coil.
<b>FACG</b>	Ground for focus actuator.
<b>TAC</b>	Tracking Actuator Coil.
<b>TACG</b>	Ground for tracking actuator.
<b>LIDM</b>	Lid (door) Motor.
<b>LIDMG</b>	Ground for lid (door) motor.
<b>CLOSE</b>	CLOSE instruction for lid motor.
<b>OPEN</b>	OPEN instruction for lid motor.
<b>LFIX</b>	Fixed output of L ch.
<b>LVAL</b>	Variable output of L ch.
<b>RFIX</b>	Fixed output of R ch.
<b>RVAL</b>	Variable output of R ch.
<b>AGND</b>	Analog ground.
<b>FC1, 2, 3, 4</b>	4 division focus 1, 2, 3, 4.
<b>TRA, TRC</b>	Tracking detector A, C.
<b>MDA</b>	Monitor Diode Anode
<b>LBG</b>	Ground of laser bias.
<b>LDK</b>	Laser Diode Kathode.
<b>SLM</b>	Slide (sending) Motor.

Symbols	Description
<b>SLMG</b>	Ground of slide motor.
<b>FER</b>	Focusing Error.
<b>TER</b>	Tracking Error.
<b>LA Gain</b>	Laser Gain (LAG in PWB).
<b>LASW</b>	Laser Switch.
<b>AF Gain</b>	Auto Focus Gain (AFG in PWB).
<b>AFO</b>	Auto Focus Offset (AFO in PWB).
<b>FOK</b>	Focusing OK.
<b>TR Offset</b>	Tracking Offset.
<b>TR Gain</b>	Tracking Gain.
<b>GCM</b>	Gain Control Microcomputer.
<b>TOK</b>	Tracking OK.
<b>TSW</b>	Tacking Switch.
<b>SLF</b>	Slide Forward.
<b>SLR</b>	Slide Reverse.
<b>JPF</b>	Jump Forward.
<b>JPR</b>	Jump Reverse.
<b>DSLCL</b>	Data Slice Level Control.
<b>PREF</b>	P Reference.
<b>DMCA</b>	Disc Motor Coil A.
<b>DMCB</b>	Disc Motor Coil B.
<b>MNR</b>	Music Number.



**MECHANISM SERVICING PRECAUTIONS**

The mechanism section of this unit is precision-engineered and critically adjusted. Do not disassemble it beyond the minimum requirements. Especially the performance of the guide rail and turntable motor mounting section may be impaired even by the intrusion of dust or other foreign matter.

**DANGER-Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.**

**NEVER DISASSEMBLE THE PARTS LISTED BELOW**

- (a) Lower guide rail ..... Serves as reference standard for pickup mounting dimensions.
- (b) Lens actuator, laser diode, optical parts and detectors of the pickup assembly..... These parts are critically adjusted for optical alignment.

**GENERAL PRECAUTIONS**

- (a) The mechanical parts are made of aluminium. Be careful not to overtighten screws, and do not scratch or bend the parts by exerting excessive force.
- (b) The flexible board has sufficient rigidity, but as replacement of this part only is not possible, handle it carefully.
- (c) Take care not to contaminate the objective lens of the lens actuator with dust or other particles.

**CAUTION**

When you replace the turntable motor, coil ass'y or the unit mechanism, make sure to do the procedure below.

**Turntable hall gain and offset adjustment**

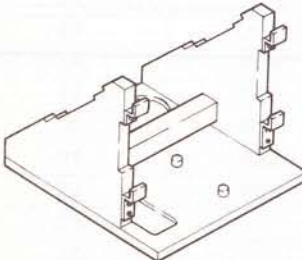
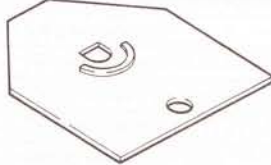
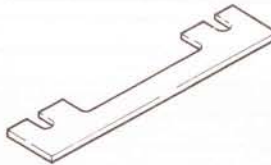
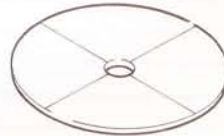

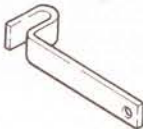


**(A) Adjusting instrument**

Oscilloscope

**(2) Adjustment method**

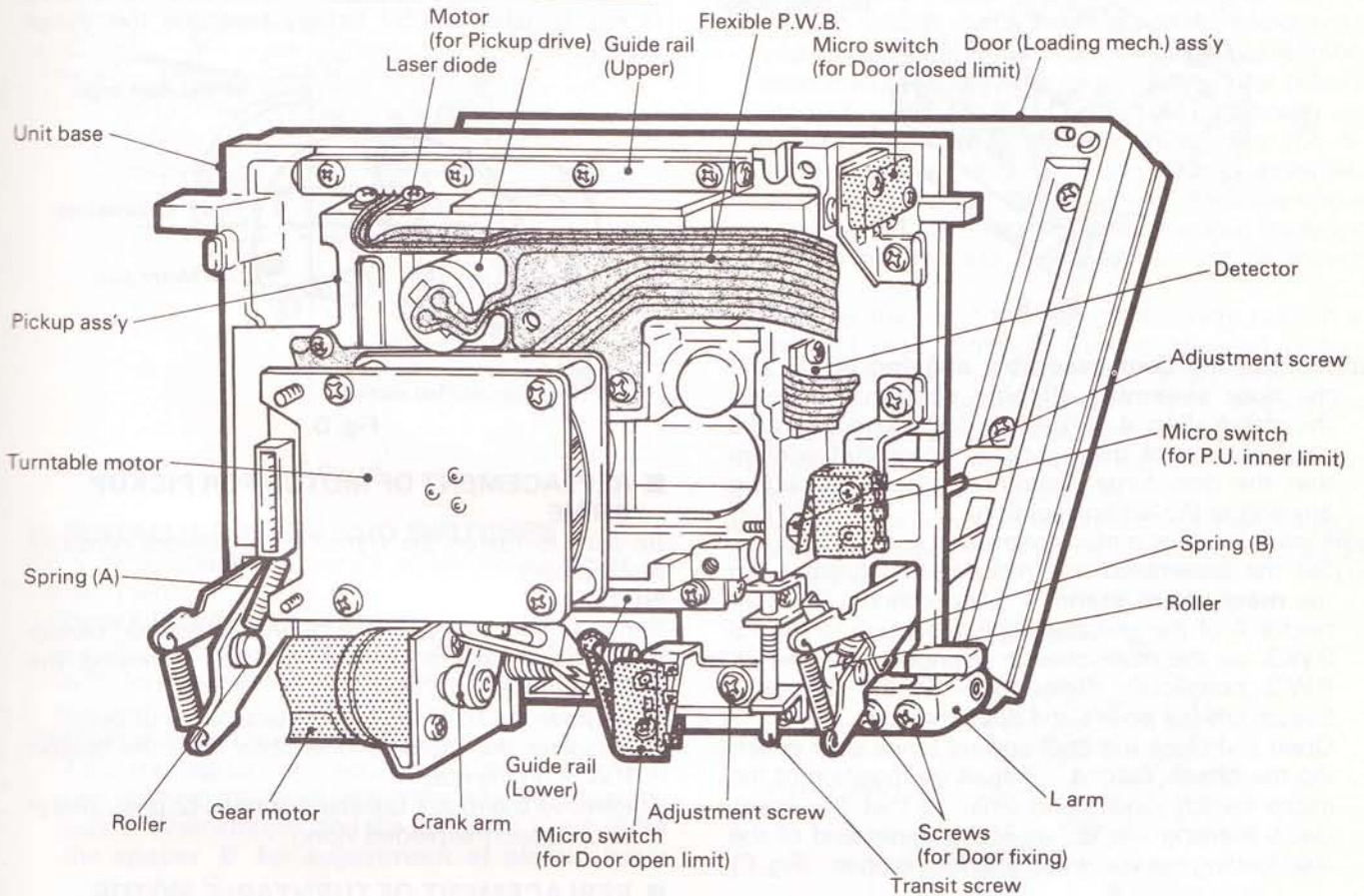
- [1] Connect the oscilloscope to TP.9 (DMCA) and TP.8 (DMGND) or to TP.10 (DMCB) and TP.8.
- [2] Adjust R273 until the output levels of TP.9 (DMCA) and TP.10 (DMCB) are the same.
- [3] Adjust R284 and R289 until the offset voltage of TP.9 and TP.10 is 0 (zero).

**SERVICING JIGS AND TOOLS**

<p>① MECH. STAND (PART No. 9501271)</p> 	<p>② DOOR ASS'Y ALIGNING JIG (PART No. 3959441)</p> 	<p>③ DOOR ASS'Y ALIGNING SPACER (PART No. 4451801)</p> 	<p>④ CHECK DISC (PART No. 395931)</p> 
<p>⑤ TURNTABLE INSTALLATION JIG (PART No. 4451791)</p> 	<p>⑥ SPACER for ADJUSTMENT of P.U. INNER LIMIT (PART No. 4451781)</p> 	<p>⑦ 1.5 mm HEXAGON WRENCH KEY</p> 	<p>⑧ 0.9 mm HEXAGON WRENCH KEY</p> 



**EXPLANATION OF UNIT MECHANISM**



**REMOVING THE DOOR (LOADING MECHANISM) ASSEMBLY**

Before performing repairs or replacements, switch on the power, set the unit to the "STOP" mode and fasten the transit screw.

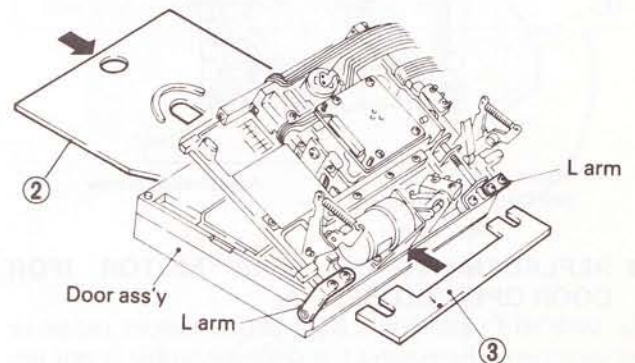
- (1) Remove springs A and B from roller shaft.
- (2) Remove the unit mechanism assembly from the main chassis.
- (3) Close the door by connecting the motor terminals to the main chassis or applying a 1.5V voltage from a battery.
- (4) Remove the door fastening screws (4 pcs) from the L arm, and remove the door (loading mechanism) assembly. (Use **1.5 mm hexagon wrench key 7**.)

**REINSTALLING THE DOOR (LOADING MECHANISM) ASSEMBLY**

- (1) Before installing the door assembly, loosen the gear motor's crank arm fastening hexagon socket screw.
- (2) Insert the door assembly and temporarily fasten the L arm with the door fastening screws (4 pcs).
- (3) Set the **door assembly aligning jig 2** into the disc loading section. Next, position the **door assembly aligning spacer 3**. (Refer to Fig. A) (This operation cannot be performed if the gear motor's crank arm fastening screws are tightened.)

**NOTE**

Nos. of figures are reference of **SERVICING JIGS AND TOOLS** on PAGE 70.



**Fig. A**

- (4) While pushing in the **door assembly aligning jig 2**, turn the rotor section of the turntable motor by hand. Confirm that the turntable, due to pressure from the jig, does not turn easily. In this condition, tighten the door fastening screws. (Fig. B)



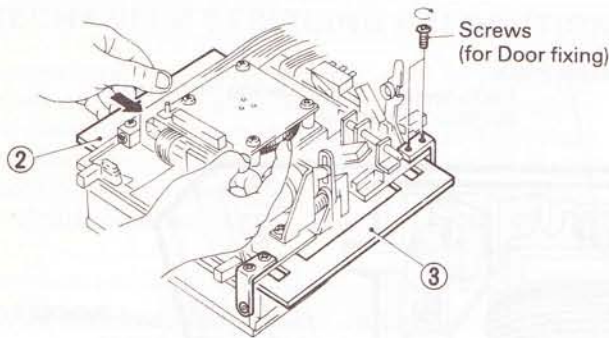


Fig. B

- (5) Remove the **door assembly aligning jig 3** and the **door assembly aligning spacer 3**. Insert the **check disc 4**. With the door closed, turn the rotor section of the turntable motor and confirm that the disc turns smoothly without contacting any part of the loading section.
- (6) Fasten the gear motor's crank arm.
- (7) Set the assembled unit mechanism assembly on the **mechanism stand 1**, and connect the connector A of the unit mechanism section to the PS P.W.B. on the main chassis. Connect also the PK P.W.B. connector. (Refer to the wiring diagram.) Switch ON the power and open the door. Open and close the door several times after inserting the **check disc 4**. Adjust the position of the micro switch (door open limit) so that the check disc's marking line is below the upper end of the disc loading section when the door is open. (Fig. C)

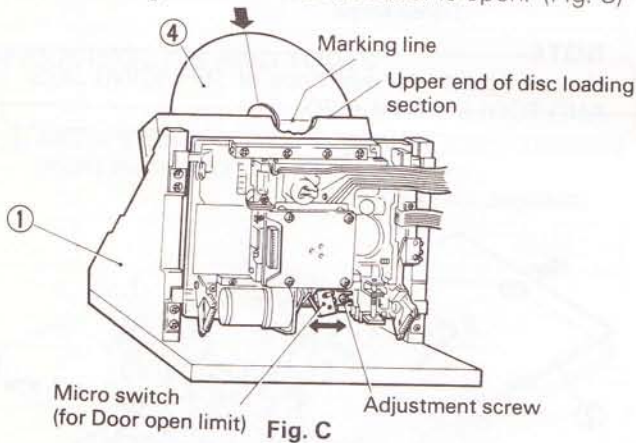


Fig. C

**REPLACEMENT OF GEAR MOTOR (FOR DOOR OPEN/CLOSE)**

Be sure to fasten the transit screw before repair or replacement. Removing the door assembly is not necessary.

- (1) Loosen the gear motor's crank fastening hexagon socket screw. (2φ Use **1.5 mm hexagon wrench key 7**.)
- (2) Remove the motor fastening screws (2 pcs).  
To install the motor, reverse the above procedure.

**NOTE**

Smooth installment of the door assembly is ensured by aligning the cut-out section of the motor axle when installing the motor. Correct alignment is

achieved when the cut-out (flat) section of the axle makes a right angle with the emboss line – as shown in Fig. D (Use a 1.5V battery to rotate the motor shaft.)

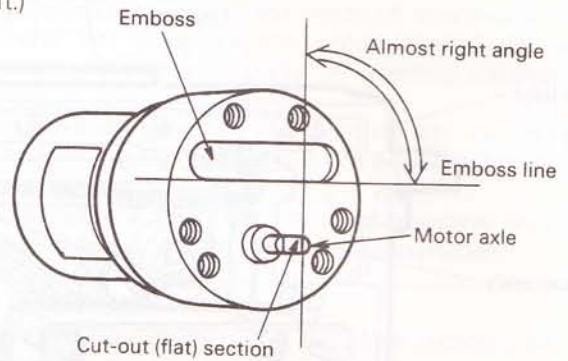


Fig. D

**REPLACEMENT OF MOTOR FOR PICKUP DRIVE**

Be sure to fasten the transit screw before repair or replacement.

**NOTE**

Removal and replacement of the motor for pickup drive motor only is possible without removing the door assembly.

- (1) Remove the lid of the belt replacement cut-out.
- (2) Unsolder the motor connections from the flexible P.W.B. on the rear.
- (3) Remove the motor fastening screws (2 pcs). (Refer to unit mech. exploded view.)

**REPLACEMENT OF TURNTABLE MOTOR**

Be sure to fasten the transit screw before repair or replacement.

**NOTE**

If the rotor section cannot be turned smoothly by hand, replace the motor according to the procedure described below. If the rotor section turns smoothly, the motor's electrical circuit is defective and the coil assembly must be replaced. In such a case, apply a small amount of the specified lubricator "LAUNA # 40" to the thrust axle bearing.

- (1) Remove the door assembly.  
In following the procedures hereafter, refer to the unit mech. exploded view.
- (2) Remove the TR stopper. (Remove the 2φ × 5 left handed flat head screw.)
- (3) Remove the turntable assembly. (Loosen the two 2φ hexagon socket screws.) (Use **0.9 mm hexagon wrench key 8**.) By loosening the transport screw, moving the pickup toward outside and performing the operation from the leeway hole for the lens actuator, the procedure is facilitated.
- (4) Remove the motor fastening screws (4 pcs). Position the pickup at the center of the guide rail and remove the motor by turning it by 90°.
- (5) To install the motor, reverse the procedure of step (4).
- (6) Install the turntable. Use the **turntable installation jig 5** to provide the accurate height for the turntable. (Fig. E)



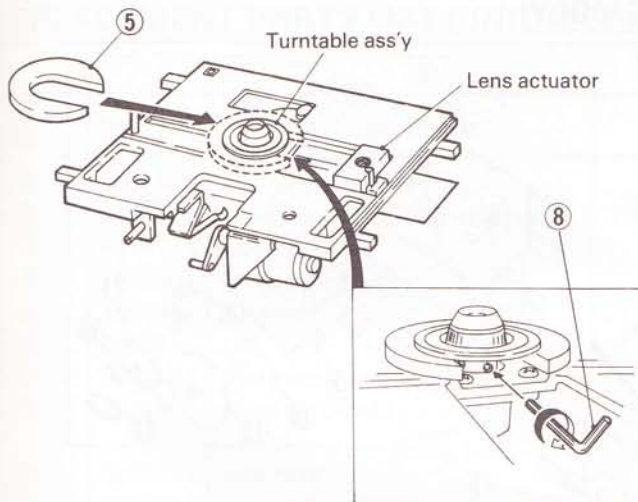


Fig. E

**■ INSTALLING THE MICRO SWITCHES**

Be sure to fasten the transit screw before repair or replacement.

**1) Door Close Limit Switch**

Install the switch so that the slider of the switch and the inside of the hole of the unit base are not in contact.

**2) Pickup Inner Limit Switch**

Turn the adjustment screw so that limit switch operation is triggered when the gap between the pickup inner stopper and the pickup is 1 mm. (Use the **spacer 6** for adjustment of pickup inner limit.) (Fig. F)

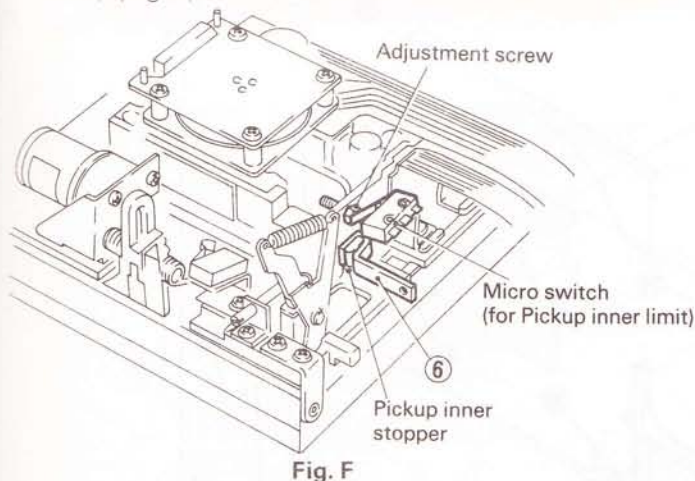


Fig. F

**3) Door Open Limit Switch**

Adjust the disc height at open door by sliding the switch fastening metal base. (Refer to step (7) of "REINSTALLING THE DOOR ASSEMBLY".)

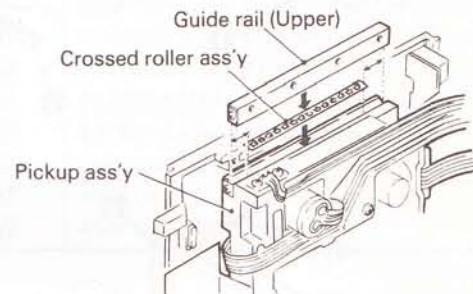
**■ REMOVING THE PICKUP ASSEMBLY**

Be sure to loosen the transit screw before repair or replacement.

- (1) Remove the turntable motor.
- (2) Remove the fastening screws (4 pcs) for the upper guide rail.

**■ INSTALLING THE PICKUP ASSEMBLY**

- (1) Insert the crossed roller assembly into the V-shaped groove of the lower guide rail (make right and left spacing equal). Set the pickup assembly onto the guide rail while aligning the outer side of the pickup with the outer side of the guide rail.
- (2) Insert the crossed roller assembly into the V-shaped groove on top of the pickup assembly (make right and left spacing equal). Align the upper guide rail and temporarily tighten the four fastening screws so that the assembly can still be moved freely.
- (3) Remove the lid of the belt replacement cut-out in the unit base. Strongly squeeze top and bottom edges of the guide rail at the center with thumb and forefinger, as illustrated in Fig. G. Apply force in an angle of about 45° to the guide rail face.
- (4) In this condition, first tighten the two inner screws and then the two outer screws.
- (5) Move the pickup assembly and check that the pickup moves smoothly without chattering caused by clearance.



**NOTE**

Never remove the lower guide rail! When installing the crossed rollers (upper and lower), apply the specified silicone grease (HIVAC-G) to the V-shaped groove of pickup ass'y.

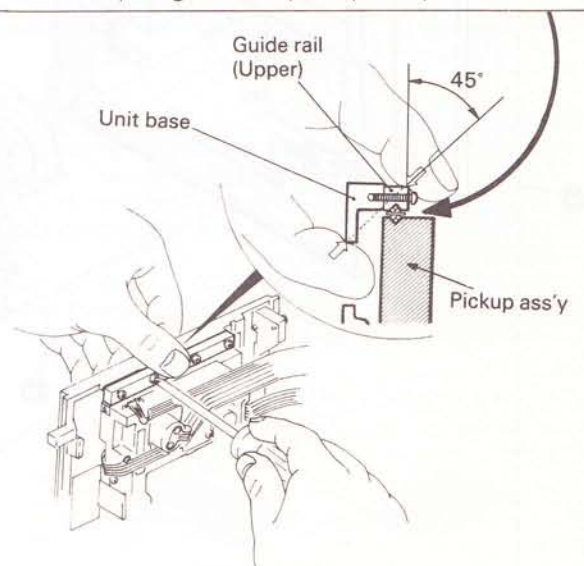
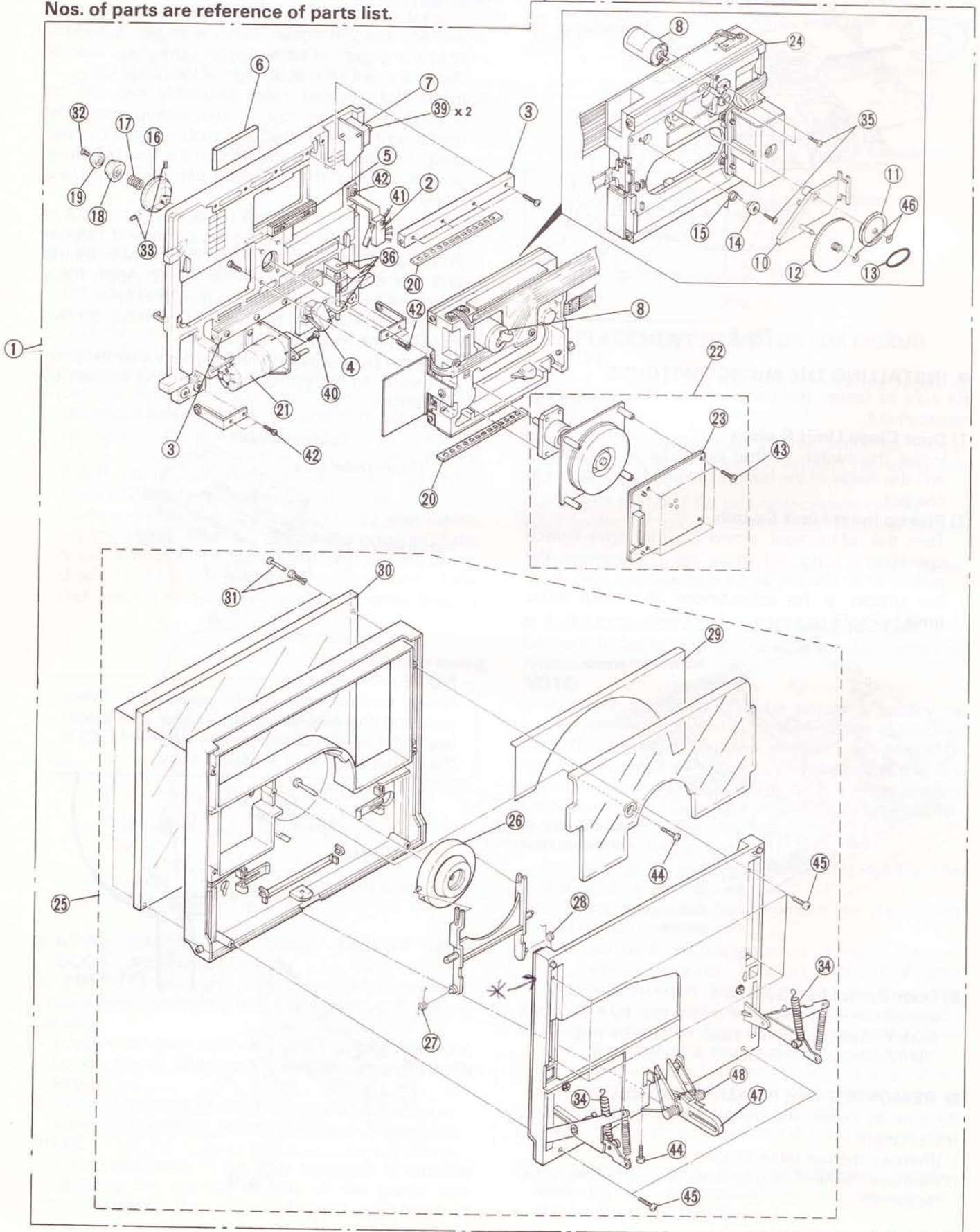


Fig. G



**EXPLODED VIEW (UNIT MECHANISM ASSEMBLY)**

Nos. of parts are reference of parts list.



## REPLACEMENT PARTS LIST (UNIT MECHANISM ASSEMBLY)

ITEM NO.	PART NO.	DESCRIPTION	ITEM NO.	PART NO.	DESCRIPTION
①	4022542	Unit mechanism ass'y	②4	4021251	Pickup mech. ass'y
②	2628171	Micro switch (for pickup inner limit)	②5	4022522	Door (Loading mechanism) ass'y
③	4584772	Guide rail ass'y	②6	4021631	Disc clasper ass'y
④	2638901	Micro switch (for door closed)	②7	3364401	C arm spring (L)
⑤	3953881	Rack gear	②8	3364402	C arm spring (R)
⑥	3953912	Lid	②9	4022561	Guide clear metal ass'y
⑦	2787622	Micro switch (for door open)	③0	3954202	Loading panel
⑧	2523551	Motor (for pickup)	③1	3947541	Nylon rivet
⑩	3953891	Gear base	③2	4584831	Left handed flat head screw
⑪	3953862	Reduction gear	③3	4584821	Hexagon socket screw
⑫	3953871	Sending gear	③4	3364782	Spring
⑬	4690071	Belt	③5	8711104	2 $\phi$ x 4 motor screw
⑭	4585781	Sleeve	③6	4453141	Transit screw kit
⑮	3364711	Twist coil spring	③9	4584803	2.6 $\phi$ x 10 DT bind screw
⑯	4585082	Turntable ass'y	④0	8711404	3 $\phi$ x 4 pan head screw
⑰	3362571	Coil spring	④1	4584795	2 $\phi$ x 10 DT bind screw
⑱	4585341	Taper ring	④2	4584812	3 $\phi$ x 6 DT bind screw
⑲	4585331	TR stopper	④3	4567412	3 $\phi$ x 8 DT bind screw
⑳	3901853	Crossed roller ass'y	④4	4572314	3 $\phi$ x 10 bind tapping screw
㉑	2523592	Gear motor ass'y	④5	4879444	3 $\phi$ x 14 bind tapping screw
㉒	4021971	Turntable motor	④6	4450043	1.5 $\phi$ E ring
㉓	2788583	Coil ass'y	④7	3959781	Driving arm lever
			④8	4586551	Lever pin

\* 4022529



**PROCEDURES FOR REPLACEMENT OF FLAT PACKAGED ICs  
(IC403-HD61901, IC404-HD61902, IC602-HD44820A75)**

**1. Tools to be used:**

(1) **Soldering iron** ..... Grounded soldering iron or soldering iron with leak resistance of 10 Mohms or more.

Form of soldering iron's tip:

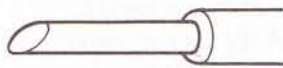


Fig. H

- (2) **Magnifying glass** .... for checking of finished works
- (3) **Tweezers** ..... for handling of IC and forming of leads
- (4) **Grounding ring** ..... Countermeasure for electrostatic breakdown
- (5) **Nipper** ..... for removing defective IC
- (6) **Small brush** ..... for application of flux

**2. Work Procedures:**

- (1) **Remove the defective IC**  
Cut all leads of the defective IC one by one using a nipper and remove the IC.
- (2) **Clean the pattern surface of the P.W.B.**  
Get rid of the remaining leads and solder.
- (3) **Check and form the leads of the new flat packaged IC to be installed.**  
Form every lead on the new IC using a pair of tweezers, so that all of them are aligned neatly without being risen, twisted or inclined toward one side. Especially the rising portion of every lead must be formed with greatest care.

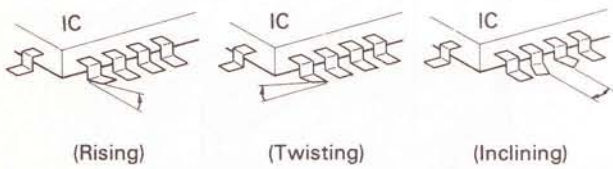


Fig. I

**(4) Apply flux to the P.W.B.**

Apply flux to the pattern surface of the P.W.B. which has been cleaned, as shown in the illustration. The area to be applied with flux is the portion of about 2.5 mm in width where the IC's leads are to be soldered. Be careful to apply minimum amount of flux required so as not to smear it on unwanted areas.

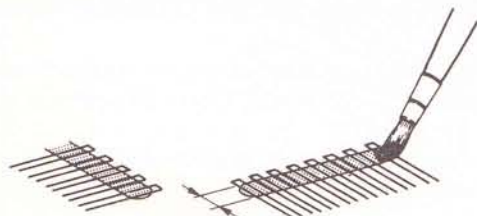


Fig. J

**(5) Temporarily tighten the IC**

Carefully align the pattern and IC's leads, so that the IC will be seated, so that the IC will be temporarily tightened to the pattern on the four leads at the corners. At this time, soldering is required, but no need to apply soldering material.

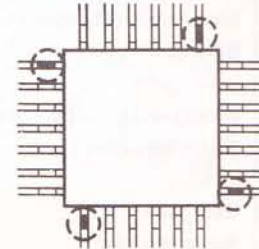


Fig. K

**(6) Apply flux to IC's leads**

Apply flux to the areas of IC's leads where soldering is to be performed. Be careful not to smear flux on the root portion of any lead or the body of IC.

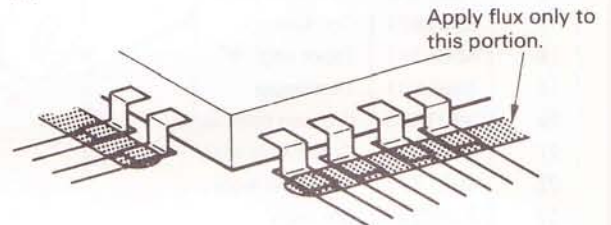


Fig. J

**(7) Soldering**

While attaching the tip of the soldering iron to the soldering point as shown in the illustration, feed 2 - 5 mm of soldering wire. Then, slowly move the iron in the direction indicated by the arrow in the illustration, so that the leads will be soldered to the pattern. Move the iron in the rate of approximately 1 cm in 5 sec. Proceed with your work while confirming a clean fillet of solder is formed on each lead, subsequent to the melting of flux.

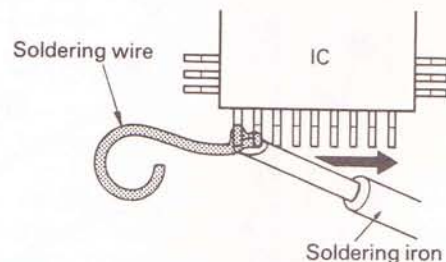


Fig. M

**CAUTION**

- 1) If you move the iron too quickly, loose soldering is likely to result.
- 2) Be especially careful when soldering the first lead where loose soldering is most liable to be formed.

**(8) Check the results**

When soldering of all leads is finished, check the soldered portion on every lead with a magnifying glass. A tester must not be used for checking of any soldered position.

**Check the following points:**

- 1) that a clean fillet covering two thirds or more of the area to be soldered is formed on every lead;
- 2) that the discrepancy between every lead and the pattern below is not more than approximately 0.1 mm in width;
- 3) that there exists no rising of the end tip of any lead;
- 4) that every lead is connected with correct polarity.

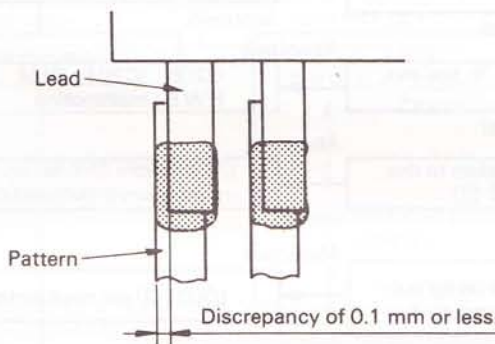
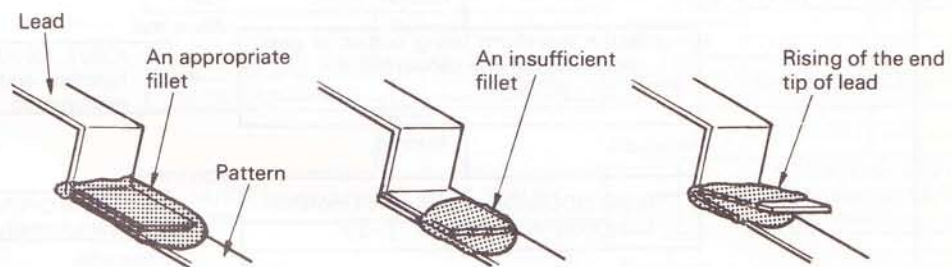
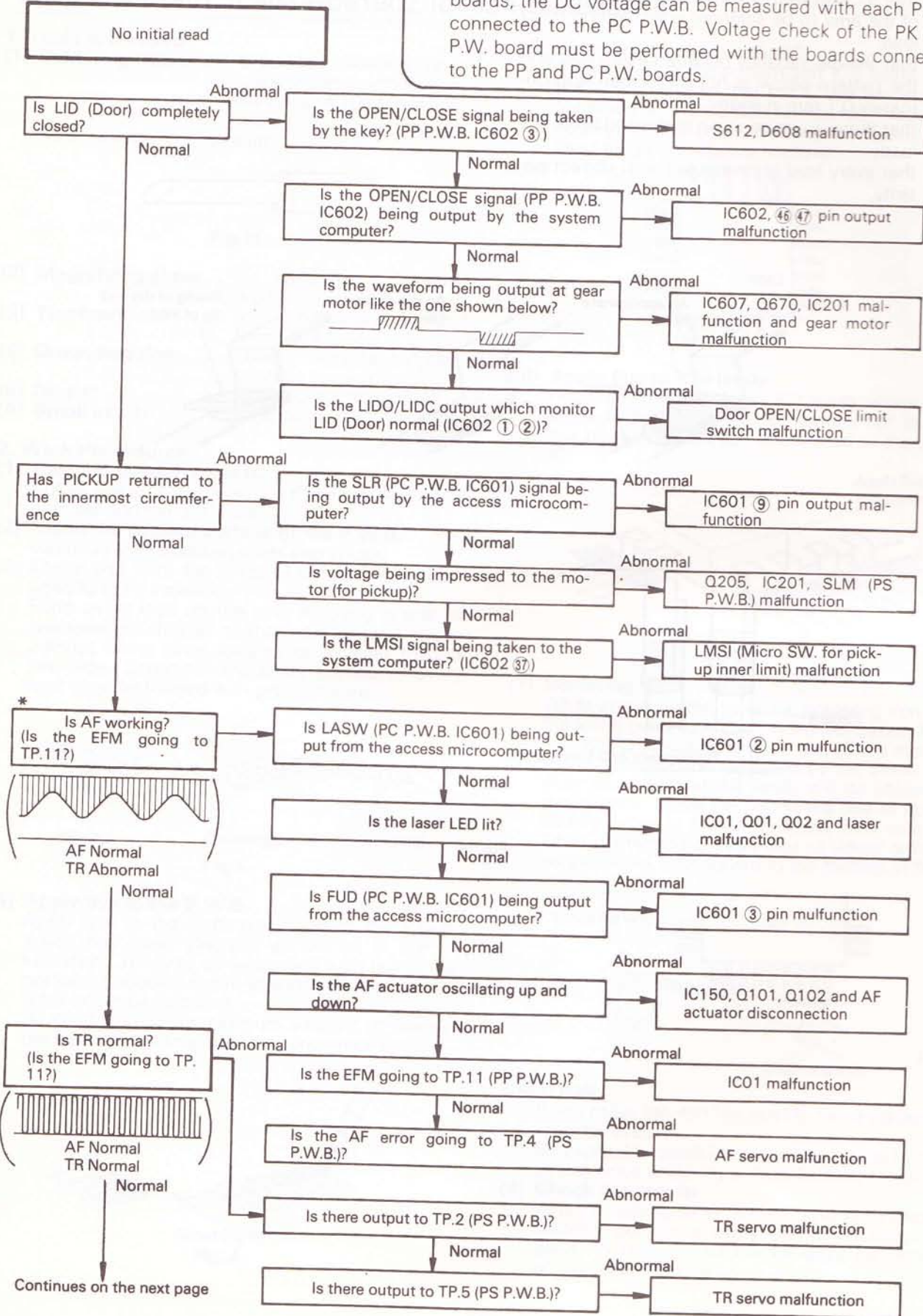


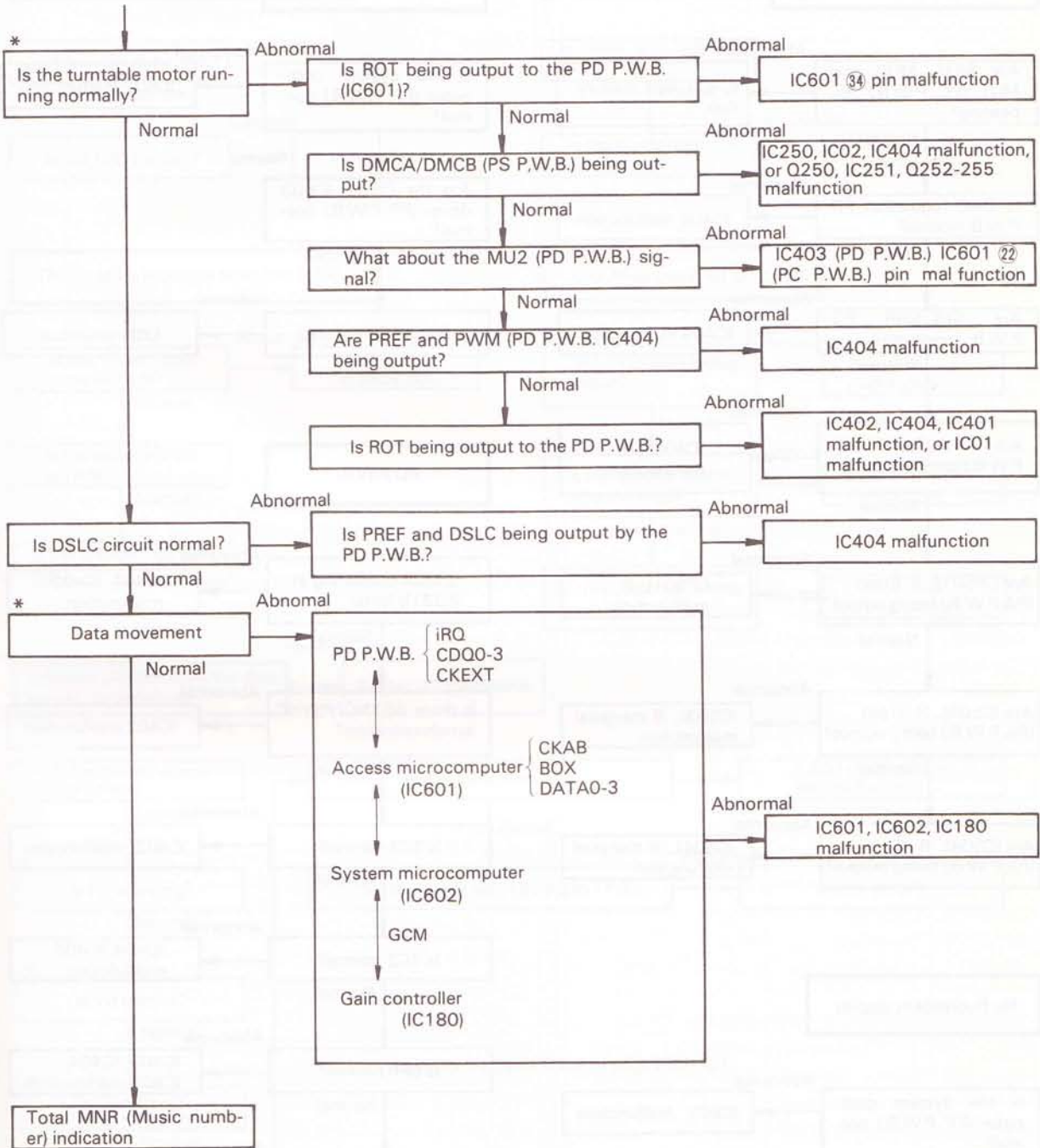
Fig. N



**TROUBLE SHOOTING**

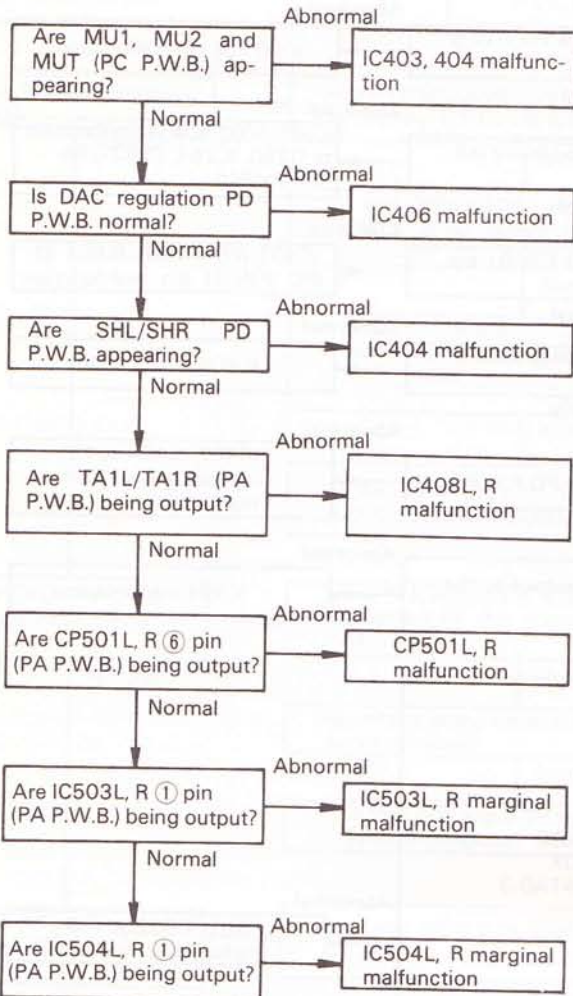
When checking the voltages of the PP, PS, PD and PA P.W boards, the DC voltage can be measured with each P.W.B. connected to the PC P.W.B. Voltage check of the PK or PI P.W. board must be performed with the boards connected to the PP and PC P.W. boards.



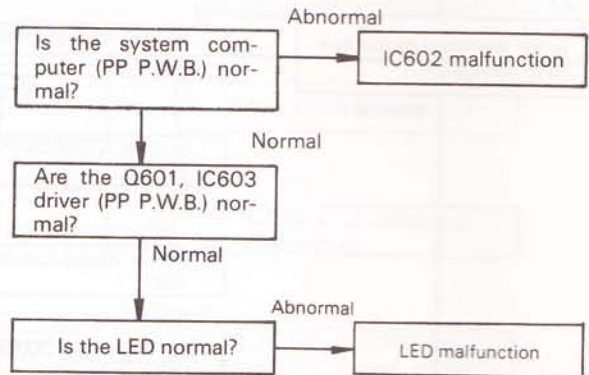




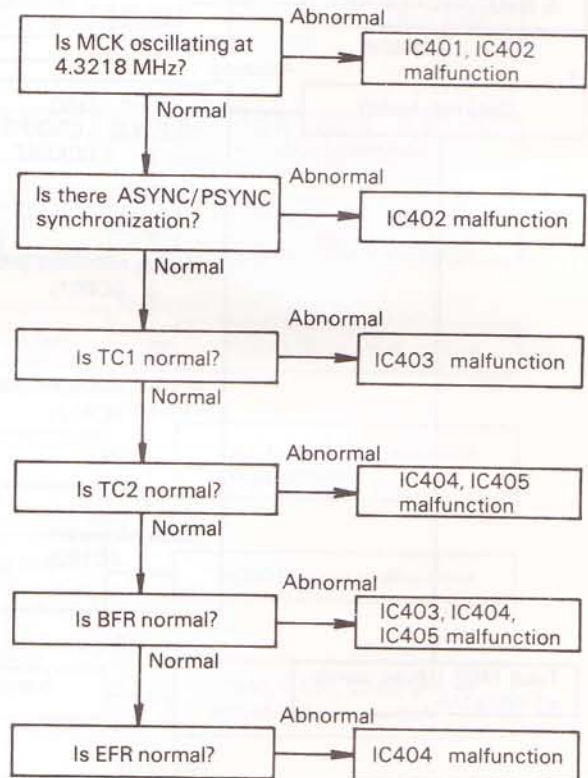
No sound (At VAL/FIX)



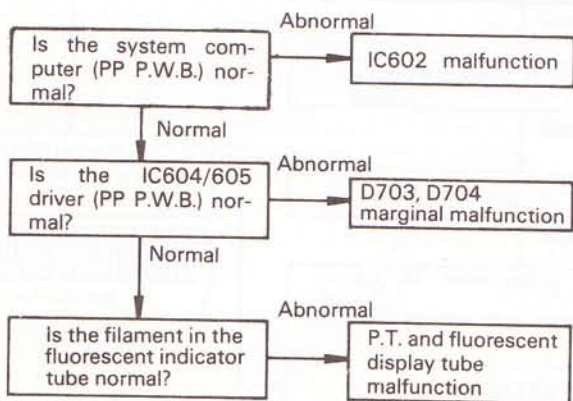
LED does not light



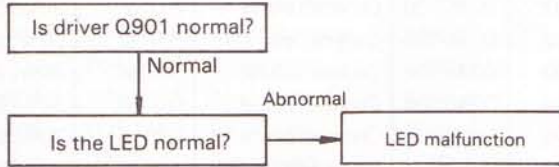
PD P.W.B.



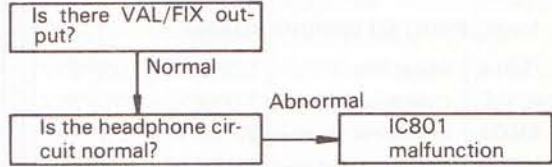
No fluorescent display



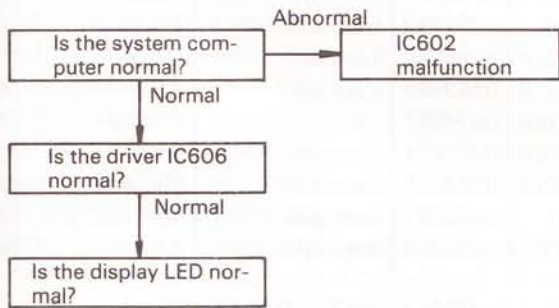
**Volume indicator does not light**



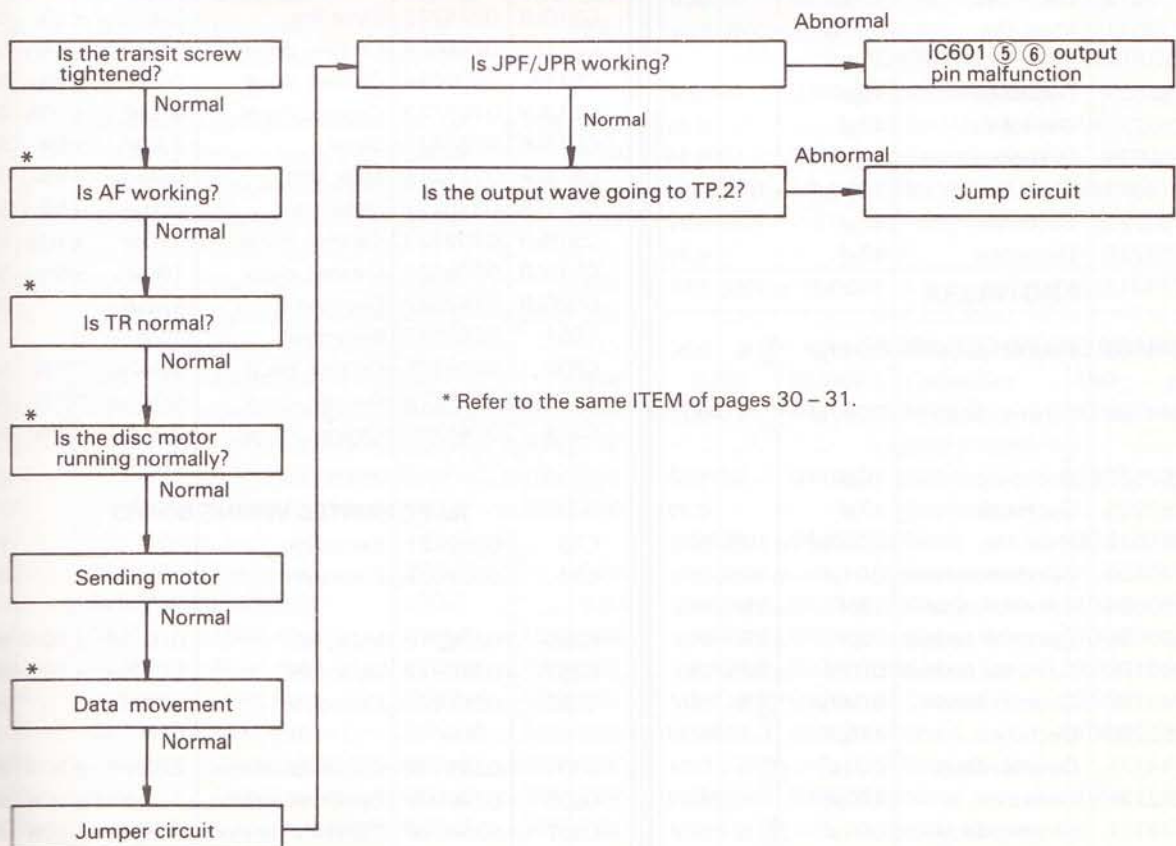
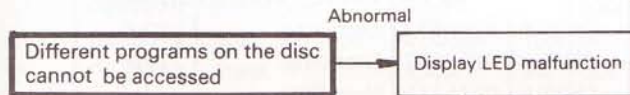
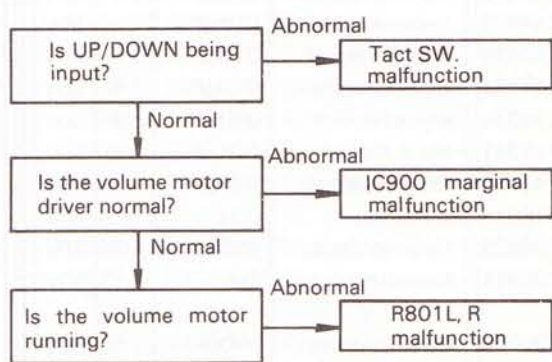
**No headphone output**



**The location indicator does not light**



**VAL level does not change**



\* Refer to the same ITEM of pages 30 - 31.



**REPLACEMENT PARTS LIST**

SYMBOL NO.	PART NO.	DESCRIPTION			
<b>CAPACITORS</b>					
<b>for PS PRINTED WIRING BOARD</b>					
C100	0275014	Mylar, film	0.033 $\mu$ F	$\pm 10\%$	50V
C101	0240106	Cylindrical ceramic	0.01 $\mu$ F	$\pm 30\%$	25V
C102	0240004	Cylindrical ceramic	220pF	$\pm 10\%$	50V
C103	0240106	Cylindrical ceramic	0.01 $\mu$ F	$\pm 30\%$	25V
C104	0252522	Electrolytic	22 $\mu$ F	$\pm 20\%$	16V
C151	0208524	Styrol	470pF	$\pm 5\%$	50V
C152	0275012	Mylar, film	0.015 $\mu$ F	$\pm 10\%$	50V
C153	0208692	Ceramic, discal	220pF	$\pm 5\%$	50V
C154	0244171	Ceramic, discal	0.01 $\mu$ F	$^{+80}_{-20}\%$	50V
C155	0244171	Ceramic, discal	0.01 $\mu$ F	$^{+80}_{-20}\%$	50V
C156	0244171	Ceramic, discal	0.01 $\mu$ F	$^{+80}_{-20}\%$	50V
C157	0275211	Mylar, film	0.01 $\mu$ F	$\pm 5\%$	50V
C158	0275211	Mylar, film	0.01 $\mu$ F	$\pm 5\%$	50V
C159	0240106	Ceramic, discal	0.01 $\mu$ F	$\pm 30\%$	25V
C160	0276011	Mylar, film	0.1 $\mu$ F	$\pm 10\%$	50V
C161	0209723	Ceramic, discal	470pF	$\pm 10\%$	50V
C162	0252811	Electrolytic	1 $\mu$ F		50V
C180	0209723	Ceramic, discal	470pF	$\pm 10\%$	50V
C181	0209733	Ceramic, discal	2200pF	$\pm 10\%$	50V
C182	0244171	Ceramic, discal	0.01 $\mu$ F	$^{+80}_{-20}\%$	50V
C183	0252225	Electrolytic	47 $\mu$ F		6.3V
C200	0252815	Electrolytic	4.7 $\mu$ F		50V
C201	0275011	Mylar, film	0.01 $\mu$ F	$\pm 10\%$	50V
C253	0252521	Electrolytic	10 $\mu$ F		16V
C254	0252225	Electrolytic	47 $\mu$ F		6.3V
C255	0252225	Electrolytic	47 $\mu$ F		6.3V
C256	0274011	Mylar, film	1000pF	$\pm 10\%$	50V
C257	0252225	Electrolytic	47 $\mu$ F		6.3V
C258	0252225	Electrolytic	47 $\mu$ F		6.3V
C259	0274011	Mylar, film	1000pF	$\pm 10\%$	50V
C261	0244185	Ceramic, discal	0.047 $\mu$ F	$^{+80}_{-20}\%$	50V
C263	0244185	Ceramic, discal	0.047 $\mu$ F	$^{+80}_{-20}\%$	50V
C300	0252521	Electrolytic	10 $\mu$ F		16V
C301	0252225	Electrolytic	47 $\mu$ F		6.3V
C302	0275013	Mylar, film	0.022 $\mu$ F	$\pm 10\%$	50V
C303	0240106	Cylindrical ceramic	0.01 $\mu$ F	$\pm 30\%$	25V
C304	0230024	Cylindrical ceramic	33pF	$\pm 5\%$	50V
C305	0230024	Cylindrical ceramic	33pF	$\pm 5\%$	50V
C306	0240106	Cylindrical ceramic	0.01 $\mu$ F	$\pm 30\%$	25V
C307	0244185	Ceramic, discal	0.047 $\mu$ F	$^{+80}_{-20}\%$	50V
△ C352	0252235	Electrolytic	470 $\mu$ F		6.3V
C353	0244171	Ceramic, discal	0.01 $\mu$ F	$^{+80}_{-20}\%$	50V
△ C354	0252235	Electrolytic	470 $\mu$ F		6.3V
C351	0244171	Ceramic, discal	0.01 $\mu$ F	$^{+80}_{-20}\%$	50V

SYMBOL NO.	PART NO.	DESCRIPTION			
<b>for PD PRINTED WIRING BOARD</b>					
C401	0240106	Ceramic, discal	0.01 $\mu$ F	$\pm 30\%$	25V
C402	0240106	Ceramic, discal	0.01 $\mu$ F	$\pm 30\%$	25V
C403	0240106	Ceramic, discal	0.01 $\mu$ F	$\pm 30\%$	25V
C404	0240106	Ceramic, discal	0.01 $\mu$ F	$\pm 30\%$	25V
C405	0240106	Ceramic, discal	0.01 $\mu$ F	$\pm 30\%$	25V
C408	0252531	Electrolytic	100 $\mu$ F	$\pm 30\%$	6.3V
C409	0240106	Ceramic, discal	0.01 $\mu$ F	$\pm 30\%$	25V
C410	0240106	Ceramic, discal	0.01 $\mu$ F	$\pm 30\%$	25V
C412	0252631	Electrolytic	100 $\mu$ F		25V
C413	0252631	Electrolytic	100 $\mu$ F		25V
C414	0252631	Electrolytic	100 $\mu$ F		25V
C415	0252232	Electrolytic	220 $\mu$ F		6.3V
C416LR	0252232	Electrolytic	220 $\mu$ F		6.3V
C417LR	0252232	Electrolytic	220 $\mu$ F		6.3V
C418LR	0274211	Electrolytic	0.001 $\mu$ F		50V
C419LR	0252631	Electrolytic	100 $\mu$ F		25V
C420LR	0252631	Electrolytic	100 $\mu$ F		25V
C421	0252531	Electrolytic	100 $\mu$ F		6.3V
C423	0252225	Electrolytic	47 $\mu$ F		6.3V

<b>for PA PRINTED WIRING BOARD</b>					
C506LR	0252632	Electrolytic	220 $\mu$ F		25V
C507LR	0252632	Electrolytic	220 $\mu$ F		25V
C509LR	0275211	Mylar film	0.01 $\mu$ F	$\pm 5\%$	50V
C510LR	0274213	Mylar film	0.0022 $\mu$ F	$\pm 5\%$	50V
C511L	0248684	Ceramic, discal	100pF	$\pm 5\%$	50V
C511R	0208684	Ceramic, discal	100pF	$\pm 5\%$	50V
C512LR	0209723	Ceramic, discal	470pF	$\pm 10\%$	50V
C513LR	0228323	Styrol	330pF	$\pm 5\%$	50V
C514LR	0274211	Mylar film	0.001 $\mu$ F	$\pm 5\%$	50V
C517LR	0275211	Mylar film	0.01 $\mu$ F	$\pm 5\%$	50V
C518LR	0209723	Ceramic, discal	470pF	$\pm 10\%$	50V
C519LR	0208684	Ceramic, discal	100pF	$\pm 5\%$	50V
C520LR	0252632	Electrolytic	220 $\mu$ F		25V
C551	0252521	Electrolytic	10 $\mu$ F		16V
C902	0209175	Ceramic, discal	0.047 $\mu$ F	$^{+80}_{-20}\%$	50V
C903	0209175	Ceramic, discal	0.047 $\mu$ F	$^{+80}_{-20}\%$	50V
C904	0244185	Ceramic, discal	0.047 $\mu$ F	$^{+80}_{-20}\%$	50V

<b>for PC PRINTED WIRING BOARD</b>					
C15	0252521	Electrolytic	10 $\mu$ F		16V
C17	0252521	Electrolytic	10 $\mu$ F		16V
C250	0275013	Mylar, film	0.022 $\mu$ F	$\pm 10\%$	50V
C251	0275013	Mylar, film	0.022 $\mu$ F	$\pm 10\%$	50V
C252	0251973	Electrolytic	0.22 $\mu$ F		25V
C601	0240102	Cylindrical ceramic	2200pF	$\pm 30\%$	25V
C602	0240008	Cylindrical ceramic	470pF	$\pm 10\%$	50V
C607	0240106	Cylindrical ceramic	0.01 $\mu$ F	$\pm 30\%$	25V



SYMBOL NO.	PART NO.	DESCRIPTION		
C626	0252225	Electrolytic	47 $\mu$ F	6.3V
C701	0244171	Ceramic, discal	0.01 $\mu$ F $\begin{smallmatrix} +80\% \\ -20\% \end{smallmatrix}$	50V
C702	0244171	Ceramic, discal	0.01 $\mu$ F $\begin{smallmatrix} +80\% \\ -20\% \end{smallmatrix}$	50V
△ C703	0252542	Electrolytic	2200 $\mu$ F	16V
△ C704	0252542	Electrolytic	2200 $\mu$ F	16V
△ C705	0252741	Electrolytic	1000 $\mu$ F	35V
△ C706	0252741	Electrolytic	1000 $\mu$ F	35V
C707	0252805	Electrolytic	0.47 $\mu$ F	50V
C708	0252805	Electrolytic	0.47 $\mu$ F	50V
C711	0252805	Electrolytic	0.47 $\mu$ F	50V
C712	0252805	Electrolytic	0.47 $\mu$ F	50V
C715	0240106	Cylindrical ceramic	0.01 $\mu$ F $\pm 30\%$	25V
C716	0252805	Electrolytic	0.47 $\mu$ F	50V
C717	0252805	Electrolytic	0.47 $\mu$ F	50V
C718	0252812	Electrolytic	2.2 $\mu$ F	50V
C719	0252831	Electrolytic	100 $\mu$ F	50V
C801LR	0252531	Electrolytic	100 $\mu$ F	16V
C802LR	0252525	Electrolytic	47 $\mu$ F	16V
C803LR	0252531	Electrolytic	100 $\mu$ F	16V
C901	0240106	Cylindrical ceramic	0.01 $\mu$ F $\pm 30\%$	25V

for PP PRINTED WIRING BOARD

C01	0240106	Cylindrical ceramic	0.01 $\mu$ F $\pm 30\%$	25V
C02	0252225	Electrolytic	47 $\mu$ F	6.3V
C03	0275014	Mylar, film	0.033 $\mu$ F $\pm 10\%$	50V
C04	0228315	Styrol	150pF $\pm 5\%$	50V
C05	0275015	Mylar, film	0.047 $\mu$ F $\pm 10\%$	50V
C06	0252225	Electrolytic	47 $\mu$ F	6.3V
C07	0275015	Mylar, film	0.047 $\mu$ F $\pm 10\%$	50V

C11	0240106	Cylindrical ceramic	0.01 $\mu$ F $\pm 30\%$	25V
C12	0252232	Electrolytic	220 $\mu$ F	6.3V
C13	0240106	Cylindrical ceramic	0.01 $\mu$ F $\pm 30\%$	25V
C14	0252232	Electrolytic	220 $\mu$ F	6.3V

C16	0252521	Electrolytic	10 $\mu$ F	16V
C18	0240106	Cylindrical ceramic	0.01 $\mu$ F $\pm 30\%$	25V

C21	0257181	Electrolytic	1 $\mu$ F	50V
C22	0244185	Ceramic, discal	0.047 $\mu$ F $\begin{smallmatrix} +80\% \\ -20\% \end{smallmatrix}$	50V
C23	0240106	Cylindrical ceramic	0.01 $\mu$ F $\pm 30\%$	25V
C24	0230076	Cylindrical ceramic	39pF $\pm 10\%$	50V
C25	0240106	Cylindrical ceramic	0.01 $\mu$ F $\pm 30\%$	25V

C30	0252232	Electrolytic	220 $\mu$ F	6.3V
C31	0252232	Electrolytic	220 $\mu$ F	6.3V
C32	0276013	Mylar, film	0.22 $\mu$ F $\pm 10\%$	50V
C33	0275013	Mylar, film	0.022 $\mu$ F $\pm 10\%$	50V
C34	0275013	Mylar, film	0.022 $\mu$ F $\pm 10\%$	50V
C35	0275013	Mylar, film	0.022 $\mu$ F $\pm 10\%$	50V
C36	0240106	Cylindrical ceramic	0.01 $\mu$ F $\pm 30\%$	25V
C37	0240106	Cylindrical ceramic	0.01 $\mu$ F $\pm 30\%$	25V
C38	0240106	Cylindrical ceramic	0.01 $\mu$ F $\pm 30\%$	25V

SYMBOL NO.	PART NO.	DESCRIPTION		
C39	0240106	Cylindrical ceramic	0.01 $\mu$ F $\pm 30\%$	25V
C40	0275015	Mylar, film	0.047 $\mu$ F $\pm 10\%$	50V
C41	0208635	Ceramic, discal	5pF $\pm 0.25$ pF	50V
C42	0230058	Cylindrical ceramic	4.7pF $\pm 10\%$	50V
C43	0244171	Ceramic, discal	0.01 $\mu$ F $\begin{smallmatrix} +80\% \\ -20\% \end{smallmatrix}$	50V
C44	0240106	Cylindrical ceramic	0.01 $\mu$ F $\pm 30\%$	25V
C45	0230012	Cylindrical ceramic	10pF $\pm 5\%$	50V
C46	0252232	Electrolytic	220 $\mu$ F	6.3V
C47	0252232	Electrolytic	220 $\mu$ F	6.3V

C50	0248672	Ceramic, discal	33pF $\pm 5\%$	50V
C52	0248672	Ceramic, discal	33pF $\pm 5\%$	50V
C53	0230030	Cylindrical ceramic	56pF $\pm 5\%$	50V
C603	0240102	Cylindrical ceramic	2200pF $\pm 30\%$	25V
C604	0240008	Cylindrical ceramic	470pF $\pm 10\%$	50V
C605	0252811	Electrolytic	1 $\mu$ F	50V
C606	0240106	Cylindrical ceramic	0.01 $\mu$ F $\pm 30\%$	25V

C608	0252322	Electrolytic	22 $\mu$ F	10V
C609	0240006	Cylindrical ceramic	330pF $\pm 5\%$	50V
C623	0240006	Cylindrical ceramic	330pF $\pm 5\%$	50V
C624	0252225	Electrolytic	47 $\mu$ F	6.3V
C625	0252521	Electrolytic	10 $\mu$ F	16V
C670	0252322	Electrolytic	22 $\mu$ F	10V

for PC PRINTED WIRING BOARD

△ C001	0243899	Ceramic, discal (for U.S.A. & Canada)	0.01 $\mu$ F $\begin{smallmatrix} +100\% \\ -0\% \end{smallmatrix}$	125V
△ C001	0243901	Ceramic, discal (except U.S.A. & Canada)	0.01 $\mu$ F $\begin{smallmatrix} +100\% \\ -0\% \end{smallmatrix}$	400V

RESISTORS

for PD PRINTED WIRING BOARD

R400	0129601	Carbon film	1k $\Omega$ $\pm 5\%$	SRD 1/4P
R401	0110609	Metal (fuse resistor)	47 $\Omega$ $\pm 5\%$	RN 1/4B
△ R402	0110607	Metal (fuse resistor)	33 $\Omega$ $\pm 5\%$	RN 1/4B
R403	0110607	Metal (fuse resistor)	33 $\Omega$ $\pm 5\%$	RN 1/4B
R405LR	0129561	Carbon film	100 $\Omega$ $\pm 5\%$	SRD 1/4P
R406LR	0129561	Carbon film	100 $\Omega$ $\pm 5\%$	SRD 1/4P
R407LR	0129615	Carbon film	3.9k $\Omega$ $\pm 5\%$	SRD 1/4P
R408LR	0129615	Carbon film	3.9k $\Omega$ $\pm 5\%$	SRD 1/4P
R409LR	0110621	Metal (fuse resistor)	100 $\Omega$ $\pm 5\%$	RN 1/4B
R410LR	0110621	Metal (fuse resistor)	100 $\Omega$ $\pm 5\%$	RN 1/4B



# HITACHI DA-1000 R

SYMBOL NO.	PART NO.	DESCRIPTION		
R412	0129601	Carbon film	1k $\Omega$ $\pm$ 5%	SRD 1/4P
R413	0129870	Carbon film	1k $\Omega$ $\pm$ 5%	SRD 1/4P
R414	0129870	Carbon film	1k $\Omega$ $\pm$ 5%	SRD 1/4P
R415	0129870	Carbon film	1k $\Omega$ $\pm$ 5%	SRD 1/4P
R418	0129601	Carbon film	1k $\Omega$ $\pm$ 5%	SRD 1/4P
R419	0129615	Carbon film	2.7k $\Omega$ $\pm$ 5%	SRD 1/4P
R420	0129603	Carbon film	1.2k $\Omega$ $\pm$ 5%	SRD 1/4P
R421LR	0129601	Carbon film	1k $\Omega$ $\pm$ 5%	SRD 1/4P
R422LR	0129613	Carbon film	3.3k $\Omega$ $\pm$ 5%	SRD 1/4P

## for PA PRINTED WIRING BOARD

$\Delta$ R507LR	0110601	Metal (fuse resister)	10 $\Omega$ $\pm$ 5%	RN 1/4B
$\Delta$ R508LR	0110601	Metal (fuse resister)	10 $\Omega$ $\pm$ 5%	RN 1/4B
R509LR	0129635	Carbon film	15k $\Omega$ $\pm$ 5%	SRD 1/4P
R510LR	0129605	Carbon film	1.5k $\Omega$ $\pm$ 5%	SRD 1/4P
R511LR	0129603	Carbon film	1.2k $\Omega$ $\pm$ 5%	SRD 1/4P
R512LR	0129605	Carbon film	1.5k $\Omega$ $\pm$ 5%	SRD 1/4P
R513LR	0129641	Carbon film	27k $\Omega$ $\pm$ 5%	SRD 1/4P
R514LR	0129609	Carbon film	2.2k $\Omega$ $\pm$ 5%	SRD 1/4P
R520LR	0129641	Carbon film	27k $\Omega$ $\pm$ 5%	SRD 1/4P
R521LR	0129605	Carbon film	1.5k $\Omega$ $\pm$ 5%	SRD 1/4P
R522LR	0129615	Carbon film	3.9k $\Omega$ $\pm$ 5%	SRD 1/4P
R523LR	0129643	Carbon film	33k $\Omega$ $\pm$ 5%	SRD 1/4P
R524LR	0129605	Carbon film	1.5k $\Omega$ $\pm$ 5%	SRD 1/4P
R525LR	0129617	Carbon film	4.7k $\Omega$ $\pm$ 5%	SRD 1/4P
R526LR	0129561	Carbon film	100 $\Omega$ $\pm$ 5%	SRD 1/4P
R551	0129631	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R552	0129631	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R553	0100667	Carbon film	180 $\Omega$ $\pm$ 5%	SRD 1/4P
R554	0129611	Carbon film	2.7k $\Omega$ $\pm$ 5%	SRD 1/4P
R555	0100667	Carbon film	180 $\Omega$ $\pm$ 5%	SRD 1/4P
R906	0129613	Carbon film	3.3k $\Omega$ $\pm$ 5%	SRD 1/4P
R907	0129565	Carbon film	150 $\Omega$ $\pm$ 5%	SRD 1/4P
R908	0129611	Carbon film	2.7k $\Omega$ $\pm$ 5%	SRD 1/4P

## for PS PRINTED WIRING BOARD

R023	0129934	Carbon film	470k $\Omega$ $\pm$ 5%	SRD 1/4P
R101	0129601	Carbon film	1k $\Omega$ $\pm$ 5%	SRD 1/4P
R103	0129651	Carbon film	68k $\Omega$ $\pm$ 5%	SRD 1/4P
R104	0129603	Carbon film	1.2k $\Omega$ $\pm$ 5%	SRD 1/4P
R105	0129633	Carbon film	12k $\Omega$ $\pm$ 5%	SRD 1/4P
R106	0129661	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R107	0129631	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R108	0129894	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R109	0129631	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R110	0129639	Carbon film	22k $\Omega$ $\pm$ 5%	SRD 1/4P
R111	0129643	Carbon film	33k $\Omega$ $\pm$ 5%	SRD 1/4P
R112	0129647	Carbon film	47k $\Omega$ $\pm$ 5%	SRD 1/4P

SYMBOL NO.	PART NO.	DESCRIPTION		
R113	0129639	Carbon film	22k $\Omega$ $\pm$ 5%	SRD 1/4P
R114	0129673	Carbon film	330k $\Omega$ $\pm$ 5%	SRD 1/4P
R130	0129908	Carbon film	39k $\Omega$ $\pm$ 5%	SRD 1/4P
R131	0129896	Carbon film	12k $\Omega$ $\pm$ 5%	SRD 1/4P
R132	0129902	Carbon film	22k $\Omega$ $\pm$ 5%	SRD 1/4P
R133	0129908	Carbon film	39k $\Omega$ $\pm$ 5%	SRD 1/4P
R134	0129918	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R135	0129918	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R136	0129918	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R137	0129902	Carbon film	22k $\Omega$ $\pm$ 5%	SRD 1/4P
R138	0129902	Carbon film	22k $\Omega$ $\pm$ 5%	SRD 1/4P
R139	0129633	Carbon film	12k $\Omega$ $\pm$ 5%	SRD 1/4P
R140	0129870	Carbon film	1k $\Omega$ $\pm$ 5%	SRD 1/4P
R141	0129918	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R142	0129613	Carbon film	3.3k $\Omega$ $\pm$ 5%	SRD 1/4P
R143	0129878	Carbon film	2.2k $\Omega$ $\pm$ 5%	SRD 1/4P
R144	0129661	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R145	0129894	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R146	0129918	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R147	0129854	Carbon film	220 $\Omega$ $\pm$ 5%	SRD 1/4P
R151	0129601	Carbon film	1k $\Omega$ $\pm$ 5%	SRD 1/4P
R153	0129631	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R154	0129603	Carbon film	1.2k $\Omega$ $\pm$ 5%	SRD 1/4P
R155	0129633	Carbon film	12k $\Omega$ $\pm$ 5%	SRD 1/4P
R156	0129661	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R157	0129631	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R158	0129631	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R159	0129631	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R160	0129906	Carbon film	33k $\Omega$ $\pm$ 5%	SRD 1/4P
R161	0129902	Carbon film	22k $\Omega$ $\pm$ 5%	SRD 1/4P
R162	0129894	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R163	0129894	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R164	0129643	Carbon film	33k $\Omega$ $\pm$ 5%	SRD 1/4P
R167	0129640	Carbon film	24k $\Omega$ $\pm$ 5%	SRD 1/4P
R168	0129640	Carbon film	24k $\Omega$ $\pm$ 5%	SRD 1/4P
R169	0129647	Carbon film	47k $\Omega$ $\pm$ 5%	SRD 1/4P
R170	0129647	Carbon film	47k $\Omega$ $\pm$ 5%	SRD 1/4P
R171	0129639	Carbon film	22k $\Omega$ $\pm$ 5%	SRD 1/4P
R173	0129904	Carbon film	27k $\Omega$ $\pm$ 5%	SRD 1/4P
R174	0129904	Carbon film	27k $\Omega$ $\pm$ 5%	SRD 1/4P
R180	0129701	Carbon film	1M $\Omega$ $\pm$ 5%	SRD 1/4P
R181	0129934	Carbon film	470k $\Omega$ $\pm$ 5%	SRD 1/4P
R182	0129898	Carbon film	15k $\Omega$ $\pm$ 5%	SRD 1/4P
R183	0129894	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R184	0129894	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R185	0129633	Carbon film	12k $\Omega$ $\pm$ 5%	SRD 1/4P
R186	0129880	Carbon film	2.7k $\Omega$ $\pm$ 5%	SRD 1/4P



SYMBOL NO.	PART NO.	DESCRIPTION		
R187	0129894	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R188	0129645	Carbon film	39k $\Omega$ $\pm$ 5%	SRD 1/4P
R189	0129638	Carbon film	20k $\Omega$ $\pm$ 5%	SRD 1/4P
R190	0129906	Carbon film	33k $\Omega$ $\pm$ 5%	SRD 1/4P
R193	0129906	Carbon film	33k $\Omega$ $\pm$ 5%	SRD 1/4P
R194	0129886	Carbon film	4.7k $\Omega$ $\pm$ 5%	SRD 1/4P
R200	0129661	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R201	0129894	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R203	0129904	Carbon film	27k $\Omega$ $\pm$ 5%	SRD 1/4P
R204	0129648	Carbon film	51k $\Omega$ $\pm$ 5%	SRD 1/4P
R205	0129677	Carbon film	470k $\Omega$ $\pm$ 5%	SRD 1/4P
R210	0129910	Carbon film	47k $\Omega$ $\pm$ 5%	SRD 1/4P
R211	0129643	Carbon film	33k $\Omega$ $\pm$ 5%	SRD 1/4P
R212	0129918	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R213	0129902	Carbon film	22k $\Omega$ $\pm$ 5%	SRD 1/4P
R214	0129922	Carbon film	150k $\Omega$ $\pm$ 5%	SRD 1/4P
R215	0129621	Carbon film	6.8k $\Omega$ $\pm$ 5%	SRD 1/4P
R216	0129918	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R217	0129663	Carbon film	120k $\Omega$ $\pm$ 5%	SRD 1/4P
R218	0129621	Carbon film	6.8k $\Omega$ $\pm$ 5%	SRD 1/4P
R219	0129918	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R220	0129623	Carbon film	8.2k $\Omega$ $\pm$ 5%	SRD 1/4P
R252	0129918	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R259	0129643	Carbon film	33k $\Omega$ $\pm$ 5%	SRD 1/4P
R260	0129661	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R261	0129601	Carbon film	1k $\Omega$ $\pm$ 5%	SRD 1/4P
R263	0129543	Carbon film	33 $\Omega$ $\pm$ 5%	SRD 1/4P
R264	0129601	Carbon film	1k $\Omega$ $\pm$ 5%	SRD 1/4P
R265	0129661	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R267	0129884	Carbon film	3.9k $\Omega$ $\pm$ 5%	SRD 1/4P
R268	0129908	Carbon film	39k $\Omega$ $\pm$ 5%	SRD 1/4P
R269	0129908	Carbon film	39k $\Omega$ $\pm$ 5%	SRD 1/4P
R270	0129884	Carbon film	3.9k $\Omega$ $\pm$ 5%	SRD 1/4P
R271	0129653	Carbon film	82k $\Omega$ $\pm$ 5%	SRD 1/4P
R272	0129902	Carbon film	22k $\Omega$ $\pm$ 5%	SRD 1/4P
R274	0129645	Carbon film	39k $\Omega$ $\pm$ 5%	SRD 1/4P
R275	0129884	Carbon film	3.9k $\Omega$ $\pm$ 5%	SRD 1/4P
R276	0129908	Carbon film	39k $\Omega$ $\pm$ 5%	SRD 1/4P
R277	0129645	Carbon film	39k $\Omega$ $\pm$ 5%	SRD 1/4P
R278	0129615	Carbon film	3.9k $\Omega$ $\pm$ 5%	SRD 1/4P
R279	0129653	Carbon film	82k $\Omega$ $\pm$ 5%	SRD 1/4P
R280	0129902	Carbon film	22k $\Omega$ $\pm$ 5%	SRD 1/4P
R281	0129916	Carbon film	82k $\Omega$ $\pm$ 5%	SRD 1/4P
R282	0129635	Carbon film	15k $\Omega$ $\pm$ 5%	SRD 1/4P

SYMBOL NO.	PART NO.	DESCRIPTION		
R283	0129601	Carbon film	1k $\Omega$ $\pm$ 5%	SRD 1/4P
R285	0129635	Carbon film	15k $\Omega$ $\pm$ 5%	SRD 1/4P
R286	0129601	Carbon film	1k $\Omega$ $\pm$ 5%	SRD 1/4P
R287	0129635	Carbon film	15k $\Omega$ $\pm$ 5%	SRD 1/4P
R288	0129601	Carbon film	1k $\Omega$ $\pm$ 5%	SRD 1/4P
R290	0129635	Carbon film	15k $\Omega$ $\pm$ 5%	SRD 1/4P
R291	0129601	Carbon film	1k $\Omega$ $\pm$ 5%	SRD 1/4P
R300	0129906	Carbon film	33k $\Omega$ $\pm$ 5%	SRD 1/4P
R301	0129896	Carbon film	12k $\Omega$ $\pm$ 5%	SRD 1/4P
R302	0129894	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R303	0129906	Carbon film	33k $\Omega$ $\pm$ 5%	SRD 1/4P
R304	0129651	Carbon film	68k $\Omega$ $\pm$ 5%	SRD 1/4P
R305	0129918	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R306	0129633	Carbon film	12k $\Omega$ $\pm$ 5%	SRD 1/4P
R307	0129619	Carbon film	5.6k $\Omega$ $\pm$ 5%	SRD 1/4P
R308	0129918	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R309	0129633	Carbon film	12k $\Omega$ $\pm$ 5%	SRD 1/4P
R310	0129631	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R311	0129631	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R312	0129631	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R313	0129894	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R314	0129894	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R315	0129894	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R316	0129934	Carbon film	470k $\Omega$ $\pm$ 5%	SRD 1/4P
R317	0129677	Carbon film	470k $\Omega$ $\pm$ 5%	SRD 1/4P
R318	0129631	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R319	0129934	Carbon film	470k $\Omega$ $\pm$ 5%	SRD 1/4P
R320	0129934	Carbon film	470k $\Omega$ $\pm$ 5%	SRD 1/4P
R321	0129934	Carbon film	470k $\Omega$ $\pm$ 5%	SRD 1/4P
R322	0129918	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R351	0129910	Carbon film	47k $\Omega$ $\pm$ 5%	SRD 1/4P
R352	0129649	Carbon film	56k $\Omega$ $\pm$ 5%	SRD 1/4P
R353	0129910	Carbon film	47k $\Omega$ $\pm$ 5%	SRD 1/4P
R354	0129912	Carbon film	56k $\Omega$ $\pm$ 5%	SRD 1/4P
R355	0129910	Carbon film	47k $\Omega$ $\pm$ 5%	SRD 1/4P

for PC PRINTED WIRING BOARD

R09	0129631	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R10	0138173	Carbon film	33k $\Omega$ $\pm$ 5%	SRD 1/4P
R11	0138173	Carbon film	33k $\Omega$ $\pm$ 5%	SRD 1/4P
R250	0129635	Carbon film	15k $\Omega$ $\pm$ 5%	SRD 1/4P
R251	0129635	Carbon film	15k $\Omega$ $\pm$ 5%	SRD 1/4P
R253	0129661	Carbon film	100k $\Omega$ $\pm$ 5%	SRD 1/4P
R254	0129635	Carbon film	15k $\Omega$ $\pm$ 5%	SRD 1/4P
R255	0129635	Carbon film	15k $\Omega$ $\pm$ 5%	SRD 1/4P
R256	0129647	Carbon film	47k $\Omega$ $\pm$ 5%	SRD 1/4P



# HITACHI DA-1000 R

SYMBOL NO.	PART NO.	DESCRIPTION		
R257	0129647	Carbon film	47kΩ ±5%	SRD 1/4P
R258	0129661	Carbon film	100kΩ ±5%	SRD 1/4P
R601	0129701	Carbon film	1MΩ ±5%	SRD 1/4P
R701	0119041	Metal (fuse resister)	10Ω ±10%	RN 1B
R702	0134285	Composition	4.7Ω ±10%	RC 1/2GF
△ R703	0113832	Metal (fuse resister)	15Ω ±5%	RN 1/2B
R802L	0129649	Carbon film	56kΩ ±5%	SRD 1/4P
R802R	0129912	Carbon film	56kΩ ±5%	SRD 1/4P
R803LR	0129615	Carbon film	3.9kΩ ±5%	SRD 1/4P
R804LR	0129613	Carbon film	3.3kΩ ±5%	SRD 1/4P
R805LR	0129561	Carbon film	100Ω ±5%	SRD 1/4P
R806LR	0129661	Carbon film	100kΩ ±5%	SRD 1/4P
R807LR	0129561	Carbon film	100Ω ±5%	SRD 1/4P
R808LR	0129846	Carbon film	100Ω ±5%	SRD 1/4P
R901	0129601	Carbon film	1kΩ ±5%	SRD 1/4P
∫ R904	∫ 0129601	∫ Carbon film	∫ 1kΩ ±5%	∫ SRD 1/4P
R905	0119047	Metal (fuse resister)	33Ω ±10%	RN 1B
R909	0129583	Carbon film	820Ω ±5%	SRD 1/4P

### for PK PRINTED WIRING BOARD

R608	0129565	Carbon film	150Ω ±5%	SRD 1/4P
R609	0129579	Carbon film	560Ω ±5%	SRD 1/4P
R610	0129565	Carbon film	150Ω ±5%	SRD 1/4P
R611	0129565	Carbon film	150Ω ±5%	SRD 1/4P
R612	0129565	Carbon film	150Ω ±5%	SRD 1/4P
R614	0129565	Carbon film	150Ω ±5%	SRD 1/4P

### for PP PRINTED WIRING BOARD

R01	0129601	Carbon film	1kΩ ±5%	SRD 1/4P
R02	0129601	Carbon film	1kΩ ±5%	SRD 1/4P
R03	0129647	Carbon film	47kΩ ±5%	SRD 1/4P
R04	0129569	Carbon film	220Ω ±5%	SRD 1/4P
R14	0129613	Carbon film	3.3kΩ ±5%	SRD 1/4P
R15	0129669	Carbon film	220kΩ ±5%	SRD 1/4P
R16	0129635	Carbon film	15kΩ ±5%	SRD 1/4P
R17	0129631	Carbon film	10kΩ ±5%	SRD 1/4P
R18	0134293	Composition	22Ω ±10%	SRD 1/4P
R19	0129561	Carbon film	100Ω ±5%	SRD 1/4P
R20	0129635	Carbon film	15kΩ ±5%	SRD 1/4P
R22	0129581	Carbon film	680Ω ±5%	SRD 1/4P
R24	0129613	Carbon film	3.3kΩ ±5%	SRD 1/4P
R25	0129613	Carbon film	3.3kΩ ±5%	SRD 1/4P
R26	0129603	Carbon film	1.2kΩ ±5%	SRD 1/4P
R27	0129613	Carbon film	3.3kΩ ±5%	SRD 1/4P

SYMBOL NO.	PART NO.	DESCRIPTION		
R28	0129613	Carbon film	3.3kΩ ±5%	SRD 1/4P
R29	0129621	Carbon film	6.8kΩ ±5%	SRD 1/4P
R30	0129601	Carbon film	1kΩ ±5%	SRD 1/4P
R31	0129601	Carbon film	1kΩ ±5%	SRD 1/4P
R32	0129631	Carbon film	10kΩ ±5%	SRD 1/4P
R33	0134289	Composition	10Ω ±10%	RC 1/2GF
R40	0129601	Carbon film	1kΩ ±5%	SRD 1/4P
R41	0129631	Carbon film	10kΩ ±5%	SRD 1/4P
R42	0129633	Carbon film	12kΩ ±5%	SRD 1/4P
R43	0129617	Carbon film	4.7kΩ ±5%	SRD 1/4P
R44	0129631	Carbon film	10kΩ ±5%	SRD 1/4P
R45	0129631	Carbon film	10kΩ ±5%	SRD 1/4P
R46	0129617	Carbon film	4.7kΩ ±5%	SRD 1/4P
R47	0129631	Carbon film	10kΩ ±5%	SRD 1/4P
R48	0129601	Carbon film	1kΩ ±5%	SRD 1/4P
R49	0129633	Carbon film	12kΩ ±5%	SRD 1/4P
R50	0129631	Carbon film	10kΩ ±5%	SRD 1/4P
R51	0129617	Carbon film	4.7kΩ ±5%	SRD 1/4P
R52	0129631	Carbon film	10kΩ ±5%	SRD 1/4P
R53	0129561	Carbon film	100Ω ±5%	SRD 1/4P
R54	0129561	Carbon film	100Ω ±5%	SRD 1/4P
R55	0129531	Carbon film	10Ω ±5%	SRD 1/4P
∫ R60	∫ 0129531	∫ Carbon film	∫ 10Ω ±5%	∫ SRD 1/4P
R61	0129617	Carbon film	4.7kΩ ±5%	SRD 1/4P
R62	0129631	Carbon film	10kΩ ±5%	SRD 1/4P
R70	0129667	Carbon film	180kΩ ±5%	SRD 1/4P
R71	0129613	Carbon film	3.3kΩ ±5%	SRD 1/4P
R73	0129669	Carbon film	220kΩ ±5%	SRD 1/4P
R74	0129613	Carbon film	3.3kΩ ±5%	SRD 1/4P
R75	0129613	Carbon film	3.3kΩ ±5%	SRD 1/4P
R603	0129617	Carbon film	4.7kΩ ±5%	SRD 1/4P
R604	0129663	Carbon film	120kΩ ±5%	SRD 1/4P
R605	0129663	Carbon film	120kΩ ±5%	SRD 1/4P
R606	0129701	Carbon film	1MΩ ±5%	SRD 1/4P
R607	0129631	Carbon film	10kΩ ±5%	SRD 1/4P
R613	0129565	Carbon film	150Ω ±5%	SRD 1/4P
R615	0129569	Carbon film	220Ω ±5%	SRD 1/4P
R616	0129631	Carbon film	10kΩ ±5%	SRD 1/4P
R617	0129579	Carbon film	560Ω ±5%	SRD 1/4P
R618	0129609	Carbon film	2.2kΩ ±5%	SRD 1/4P
R619	0129609	Carbon film	2.2kΩ ±5%	SRD 1/4P
R620	0129631	Carbon film	10kΩ ±5%	SRD 1/4P
R621	0129619	Carbon film	5.6kΩ ±5%	SRD 1/4P
R622	0129639	Carbon film	22kΩ ±5%	SRD 1/4P
R623	0129663	Carbon film	120kΩ ±5%	SRD 1/4P
R624	0129631	Carbon film	10kΩ ±5%	SRD 1/4P
∫ R638	∫ 0129631	∫ Carbon film	∫ 10kΩ ±5%	∫ SRD 1/4P



SYMBOL NO.	PART NO.	DESCRIPTION		
R639	0129613	Carbon film	3.3k $\Omega$ $\pm$ 5%	SRD 1/4P
R670	0129894	Carbon film	10k $\Omega$ $\pm$ 5%	SRD 1/4P
R671	0129888	Carbon film	5.6k $\Omega$ $\pm$ 5%	SRD 1/4P
R672	0129677	Carbon film	470k $\Omega$ $\pm$ 5%	SRD 1/4P

**ICS & TRANSISTORS****for PD PRINTED WIRING BOARD**

IC401	2789111	CXD-041
IC402	2387071	MB15529
IC403	2387081	HD61901
IC404	2387091	HD61902
IC405	2387101	HM6116P-4
IC406	2387451	PCM53JG-V
IC407LR	2387211	$\mu$ PC4081C
IC408LR	2387481	HD14053BP
IC409LR	2387211	$\mu$ PC4081C
Q402	2329333	2SC535 $\text{\textcircled{C}}$

**for PA PRINTED WIRING BOARD**

IC503LR	2367871	HA12017
IC504LR	2367871	HA12017
Q551	2328282	2SC458 $\text{\textcircled{C}}$
Q552	2328282	2SC458 $\text{\textcircled{C}}$
Q901	2327333	2SC1213 $\text{\textcircled{C}}$

**for PS PRINTED WIRING BOARD**

IC100	2369121	TL4558P-C
IC150	2369121	TL4558P-C
IC151	2387271	LA6393D
IC152	2369121	TL4558P-C
IC180	2387171	HD44700A17
IC181	2369071	M54560P
IC182	2369201	TC4066BP
IC183	2369121	TL4558P-C
IC200	2369121	TL4558P-C
IC201	2369121	TL4558P-C
IC202	2367461	TC4013BP
IC203	2387201	TC4528BP
IC251	2387241	IR3702
IC300	2387141	HA17901P

Q100	2329242	FET 2SK246 $\text{\textcircled{Y}}$
Q101	2327992	2SB562 $\text{\textcircled{B}}$
Q102	2328003	2SD468 $\text{\textcircled{C}}$
Q140	2328282	2SC458 $\text{\textcircled{C}}$
Q141	2329183	2SA1015 $\text{\textcircled{GR}}$
Q142	2329241	FET 2SK246 $\text{\textcircled{Y}}$ $\text{\textcircled{GR}}$ $\text{\textcircled{BL}}$

SYMBOL NO.	PART NO.	DESCRIPTION
Q143	2329241	FET 2SK246 $\text{\textcircled{Y}}$ $\text{\textcircled{GR}}$ $\text{\textcircled{BL}}$
Q144	2329241	FET 2SK246 $\text{\textcircled{Y}}$ $\text{\textcircled{GR}}$ $\text{\textcircled{BL}}$
Q150	2329242	FET 2SK246 $\text{\textcircled{Y}}$
Q151	2327992	2SB562 $\text{\textcircled{B}}$
Q152	2328003	2SD468 $\text{\textcircled{C}}$
Q200	2329242	FET 2SK246 $\text{\textcircled{Y}}$
Q203	2328003	2SD468 $\text{\textcircled{C}}$
Q204	2327992	2SB562 $\text{\textcircled{B}}$
Q205	2328282	2SC458 $\text{\textcircled{C}}$
Q206	2328282	2SC458 $\text{\textcircled{C}}$
Q250	2328282	2SC458 $\text{\textcircled{C}}$
Q252	2328003	2SD468 $\text{\textcircled{C}}$
Q253	2327992	2SB562 $\text{\textcircled{B}}$
Q254	2328003	2SD468 $\text{\textcircled{C}}$
Q255	2327992	2SB562 $\text{\textcircled{B}}$
Q300	2328282	2SC458 $\text{\textcircled{C}}$
Q301	2329183	2SA1015 $\text{\textcircled{GR}}$
Q302	2329183	2SA1015 $\text{\textcircled{GR}}$
Q303	2328282	2SC458 $\text{\textcircled{C}}$
Q304	2329183	2SA1015 $\text{\textcircled{GR}}$
Q305	2328282	2SC458 $\text{\textcircled{C}}$
Q306	2328282	2SC458 $\text{\textcircled{C}}$
Q351	2327992	2SB562 $\text{\textcircled{B}}$
Q352	2328003	2SD468 $\text{\textcircled{C}}$

**for PC PRINTED WIRING BOARD**

IC02	2367471	TC4069UBP
IC250	2367691	TC4001BP
IC601	2387163	HD44801A95
IC701	2369801	HA17805P
IC702	2387221	$\mu$ PC7905H
IC703	2369804	HA17815P
IC704	2387224	$\mu$ PC7915H
IC705	2387222	$\mu$ PC7908H
IC800	2369351	$\mu$ PC4557C
IC900	2369931	BA6109

**for PP PRINTED WIRING BOARD**

IC01	2387132	HA12049A
IC03	2387231	LM318P
IC04	2369121	TL4558P-C
IC05	2387231	LM318P
IC06	2369121	TL4558P-C
IC602	2387151	HD44820A75



# HITACHI DA-1000 R

SYMBOL NO.	PART NO.	DESCRIPTION
IC603	2369751	LB1275
IC604	2367631	TC5066BP
IC605	2367631	TC5066BP
IC606	2367751	HD74159P
IC607	2367691	TC4001BP
IC608	2387201	TC4528BP
Q01	2329183	2SA1015 (GR)
Q02	2327992	2SB562 (B)
Q03	2328282	2SC458 (C)
Q04	2328282	2SC458 (C)
Q05	2328282	2SC458 (C)
Q601	2328282	2SC458 (C)
Q602	2329183	2SA1015 (GR)
Q603	2328282	2SC458 (C)
Q604	2328282	2SC458 (C)
Q670	2328282	2SC458 (C)

## DIODES

### for PA PRINTED WIRING BOARD

D551	2337011	1S2076
D552	2337011	1S2076
D901	2337011	1S2076
D902	2337011	1S2076

### for PS PRINTED WIRING BOARD

D01	2337011	1S2076
D100	2337011	1S2076
D150	2337011	1S2076
D157	2337011	1S2076
D160	2337011	1S2076
D167	2337011	1S2076
D200	2337011	1S2076
D201	2337011	1S2076
D202	2337011	1S2076
D300	2337011	1S2076
D305	2337011	1S2076

### for PC PRINTED WIRING BOARD

D701	2337571	ESAB03-01B1
D702	2338721	S1WB-20
D703	2337762	ERB12-01R
D704	2337762	ERB12-01R
ZD701	2338596	RD 5.1EN1

SYMBOL NO.	PART NO.	DESCRIPTION
ZD901	2337629	4C-3
<b>for PI PRINTED WIRING BOARD</b>		
D614	2339781	LED GL-9NG4
D616	2339781	LED GL-9NG4
<b>for PK PRINTED WIRING BOARD</b>		
D602	2337011	1S2076
D608	2337011	1S2076
D609	2339483	LT-9200D
D610	2337751	LED GL-5PR6
D611	2337811	LED GL-5NG6
D612	2337811	LED GL-5NG6
D613	2339481	LT-9200N
D615	2337811	LED GL-5NG6
<b>for PP PRINTED WIRING BOARD</b>		
D601	2337011	1S2076
ZD01	2338602	RD 6.2EN1

## VARIABLE RESISTORS

### for PA PRINTED WIRING BOARD

R801LR	0158603	1k $\Omega$ (M) (for VOLUME with motor)
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### for PS PRINTED WIRING BOARD

R100	0158933	10k $\Omega$ (B) (for focus servo gain)
R102	0158933	10k $\Omega$ (B) (for focus servo offset)
R152	0158933	10k $\Omega$ (B) (for tracking servo gain)
R273	0158934	100k $\Omega$ (B) (for DISC motor hall gain)
R284	0158936	1k $\Omega$ (B) (for DISC motor hall (B) offset)
R289	0158936	1k $\Omega$ (B) (for DISC motor hall (A) offset)

### for PP PRINTED WIRING BOARD

R013	0158934	100k $\Omega$ (B) (for tracking servo offset)
R021	0158932	5k $\Omega$ (B) (for laser diode output)

## COIL

### for PP PRINTED WIRING BOARD

L01	2227352	Choke coil (22 $\mu$ H)
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## MISCELLANEOUS

### for PA PRINTED WIRING BOARD

RY551	2647151	Lead relay
RY552	2647151	Lead relay

SYMBOL NO.	PART NO.	DESCRIPTION
CP501LR	2387471	Low-pass filter (AFL811WF)
<b>for PS PRINTED WIRING BOARD</b>		
△ F151	2727892	Fuse-0.63A (for U.S.A. & Canada)
△ F151	2727197	Fuse-T500mA (except U.S.A. & Canada)
<b>for PC PRINTED WIRING BOARD</b>		
X601	2154421	Ceramic oscillator
CP1	0269014	Spark killer
△ S1	2639861	Power Switch
△ F1	2727015	Fuse-0.5A, UL (for U.S.A. & Canada)
△ F1	2727197	Fuse-T500mA (except U.S.A. & Canada)
	2727161	Lamp holder
	2727602	Fuse clip
	2677394	US pin jack
	4567412	3φ × 8 DT bind screw
<b>for PI PRINTED WIRING BOARD</b>		
	2789121	Fluorescent display tube
	4744837	Spacer
	4901271	LED Spacer
<b>for PK PRINTED WIRING BOARD</b>		
S601 ~ 615	2639682	Tact switch
	3954071	LED holder
<b>for PP PRINTED WIRING BOARD</b>		
CP601	0189014	Resistor array (100kΩ × 7)
CP602	0149571	Resistor array (100kΩ × 8)
X602	2154421	Ceramic oscillator
CP01,02	2136381	Low-pass filter
CP03,04	2136311	Low-pass filter
<b>for ACCESSORIES</b>		
△	2748842	Patch cord
△	2658361	E Socket adapter (for Asia & Latin American countries, etc.)
△	2727197	Fuse-T500mA (for Asia & Latin American countries, etc.)
<b>for CABINET CHASSIS ASSEMBLY</b>		
①	4445203	Cover ass'y
②	4022621	Front panel ass'y
③	3954152	Front panel
④	3954096	Blind
⑤	3947541	Nylon rivet (B)
⑥	3954101	Display frame
	3339596	Spring

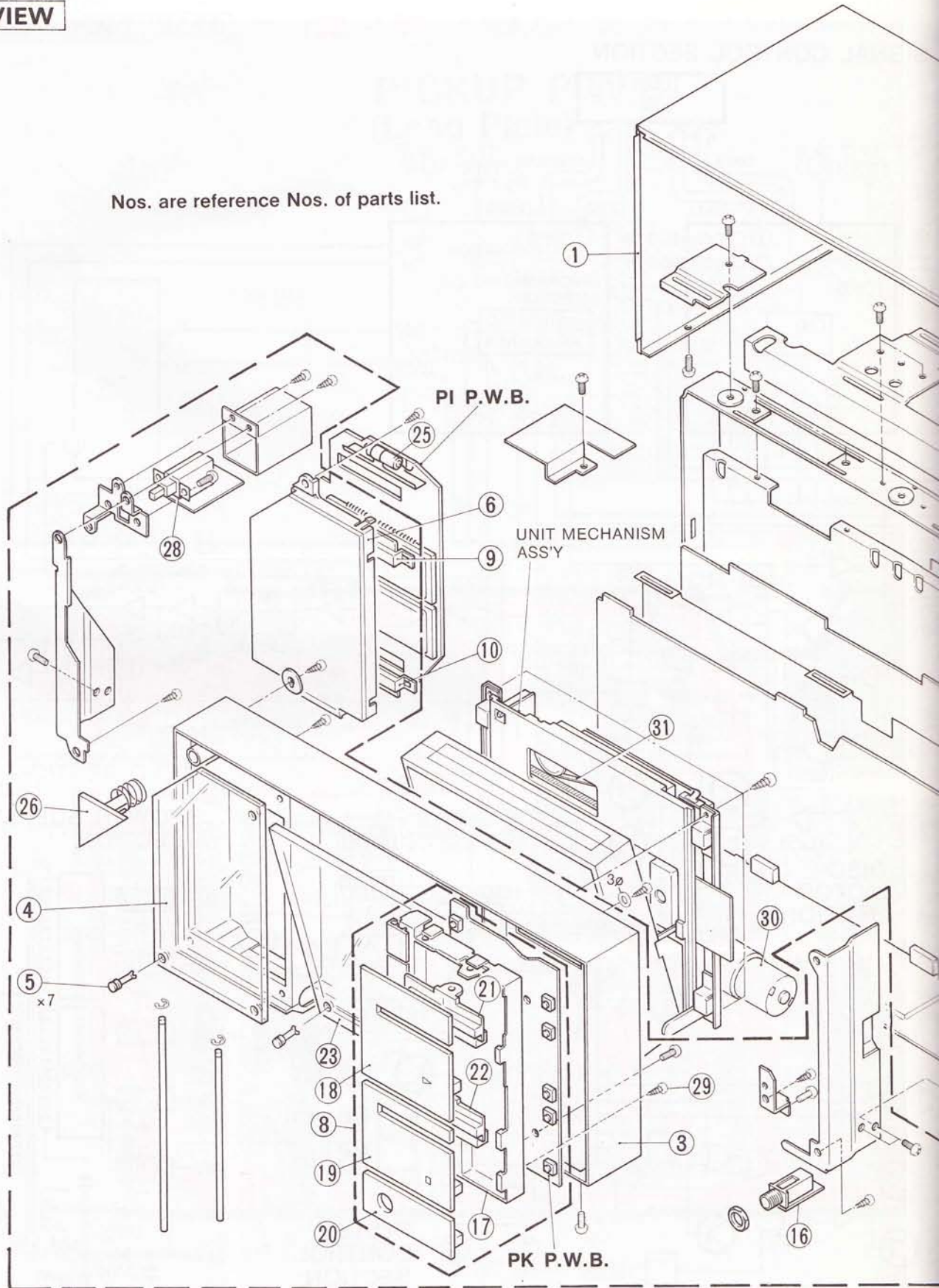
SYMBOL NO.	PART NO.	DESCRIPTION
⑧	3298312	Operation knob ass'y
⑨	2339791	LED LT-3321
⑩	2339801	LED LT-3322
⑪	3953651	Leg
⑫	4445222	Rear plate (for Canada)
	4445228	Rear plate (for U.S.A.)
	4445223	Rear plate (for France & West Germany)
	4445224	Rear plate (for Asia & Latin American countries, etc.)
	4451287	Rear plate (for Switzerland & Sweden)
	4451285	Rear plate (for U.K. & Australia)
△ ⑬	3913006	Bushing (for power supply cord)
△ ⑭	2718113	Power supply cord (for U.S.A. & Canada)
△	2748752	Power supply cord (except U.S.A., Canada, U.K., & Australia)
△	2749202	Power supply cord (for U.K.)
△	2749622	Power supply cord (for Australia)
△ ⑮	2248352	Power transformer (for U.S.A. & Canada)
△	2248353	Power transformer (except U.S.A., Canada, Asia & Latin American countries, etc.)
△	2248354	Power transformer (for Asia & Latin American countries, etc.)
⑯	2677751	Headphone jack
⑰	3296961	Operation frame
⑱	3296971	PLAY button ass'y
⑲	3296981	STOP button ass'y
⑳	3296991	OPEN/CLOSE button ass'y
㉑	3297002	Knob K ass'y
㉒	3297012	Knob L ass'y
㉓	3954204	Loading blind
PL1 ㉔	2767691	Lamp
㉕	4022452	POWER button ass'y
△	2618051	Voltage selector switch (for Asia & Latin American countries, etc.)
△	2727121	Fuse holder (for Asia & Latin American countries, etc.)
	4746911	Disc sheet
<b>SCREWS</b>		
⑳	4567441	4φ × 6 DT bind screw
㉑	4567431	3φ × 6 DT bind screw
㉒	4584813	3φ × 6 DT bind screw (for power sw others)



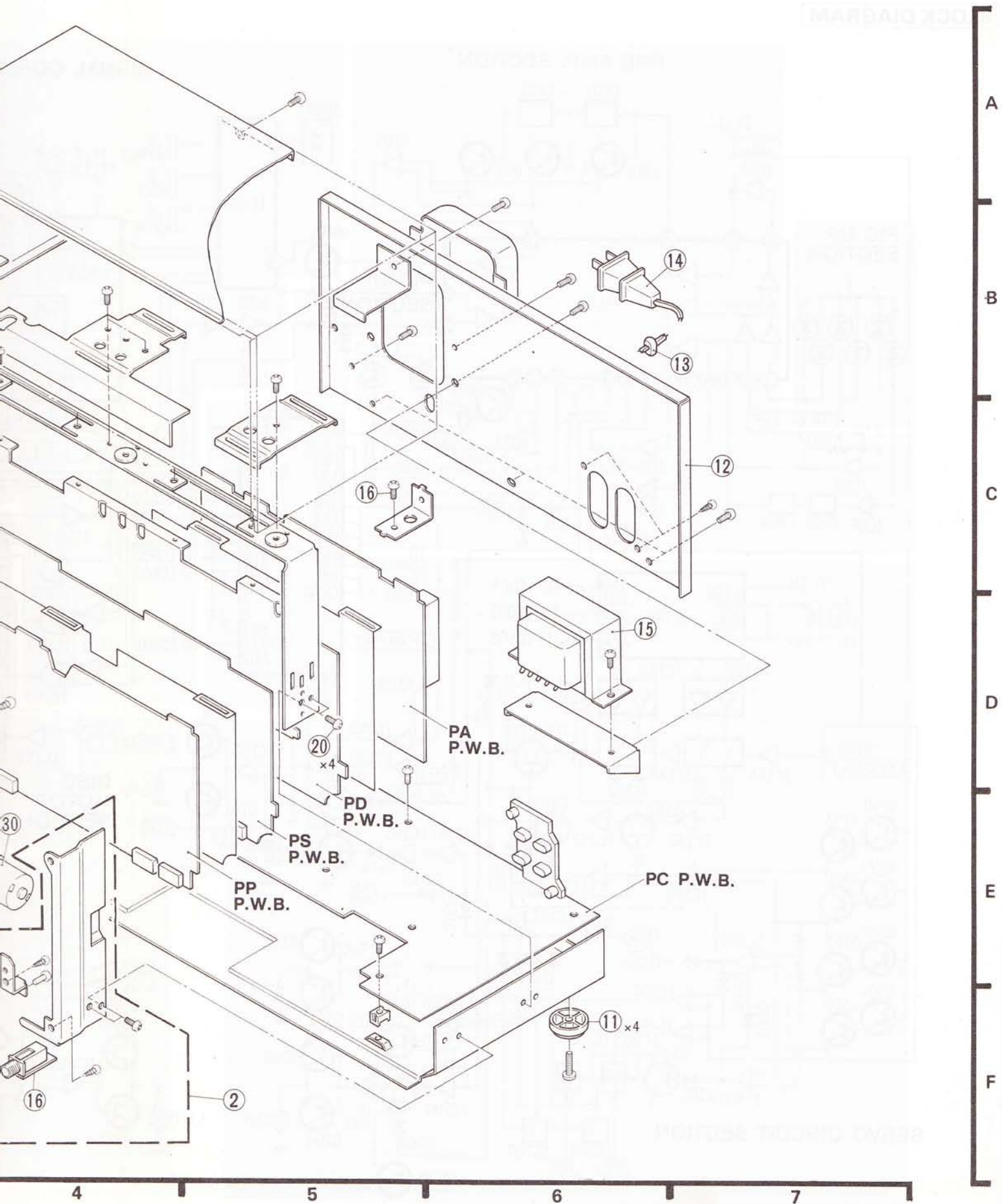


**EXPLODED VIEW**

Nos. are reference Nos. of parts list.



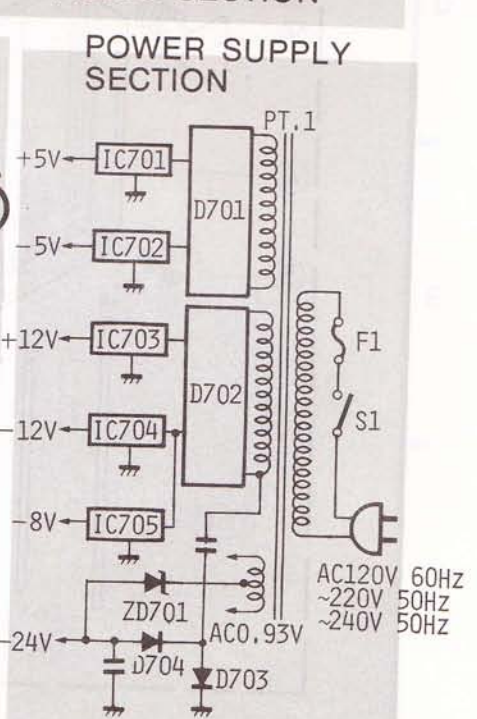
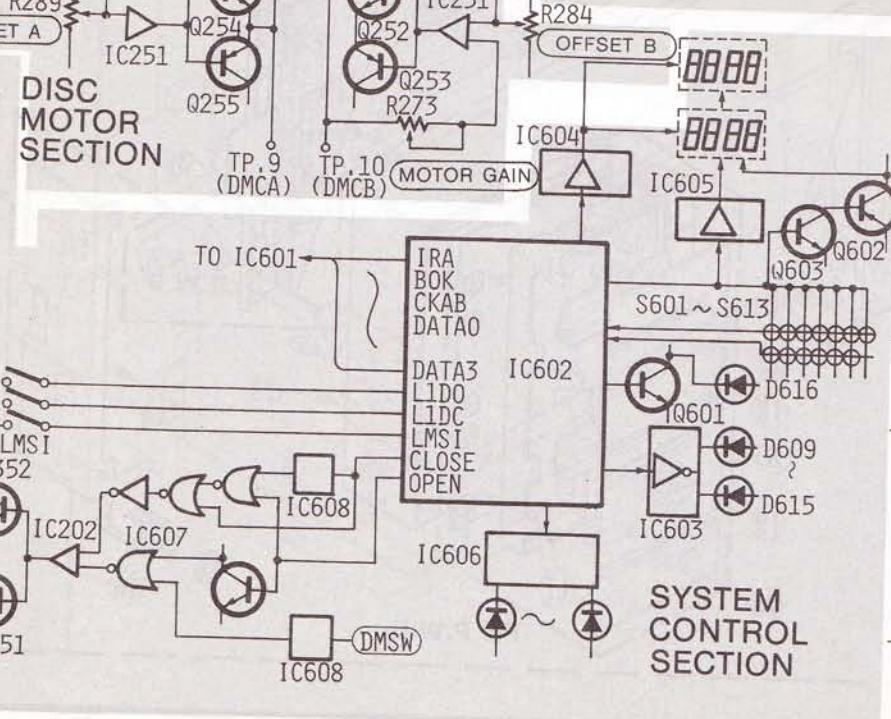
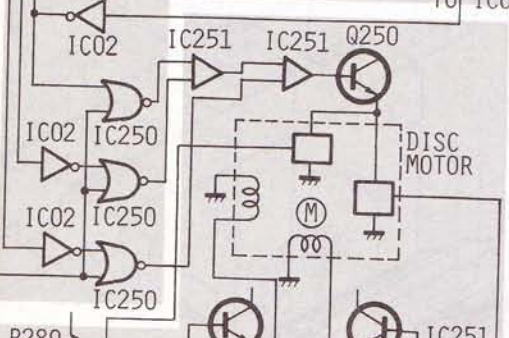
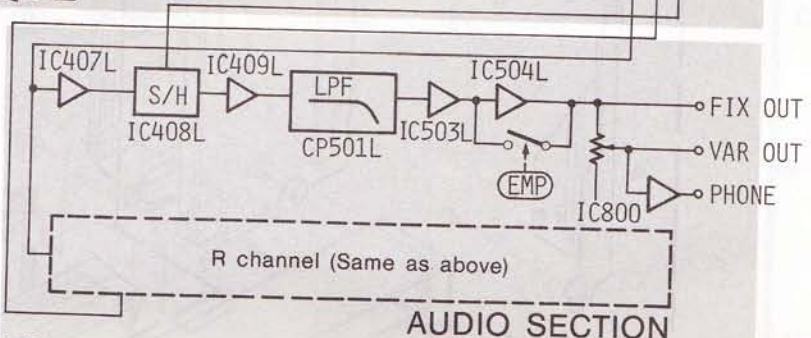
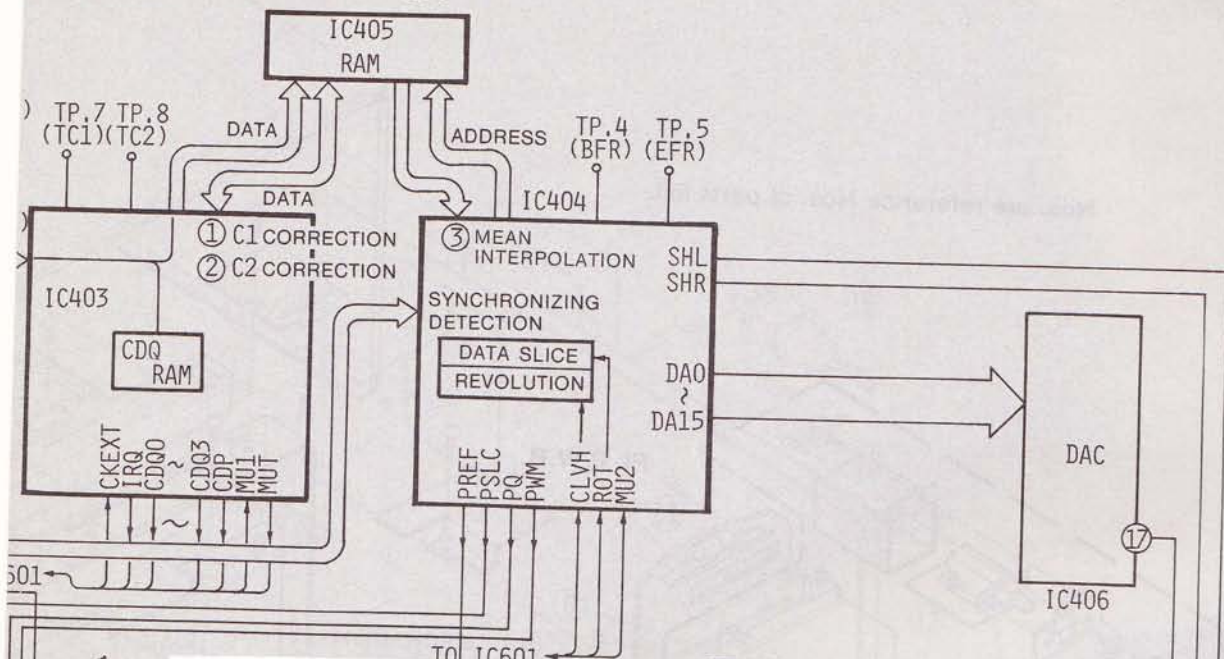








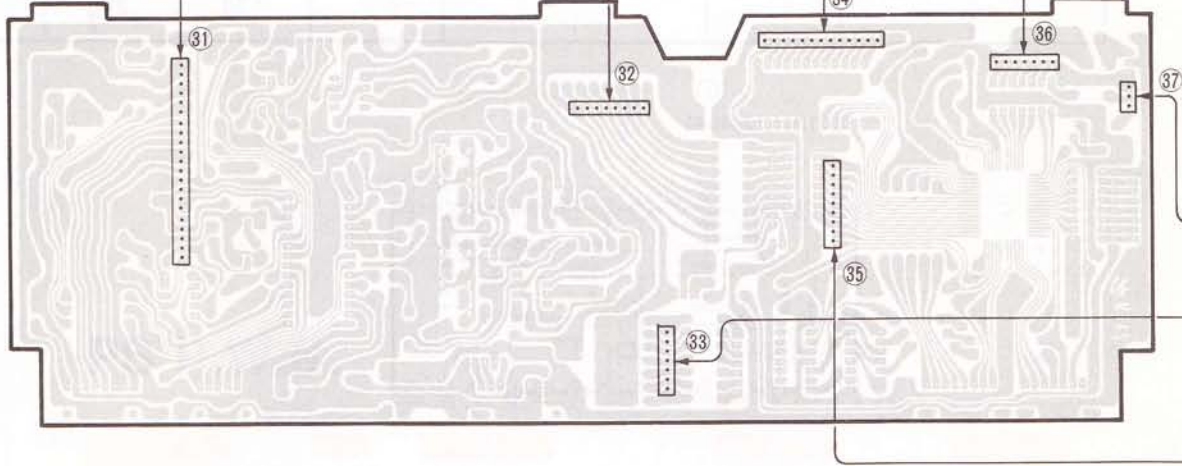
# GNAL CONTROL SECTION



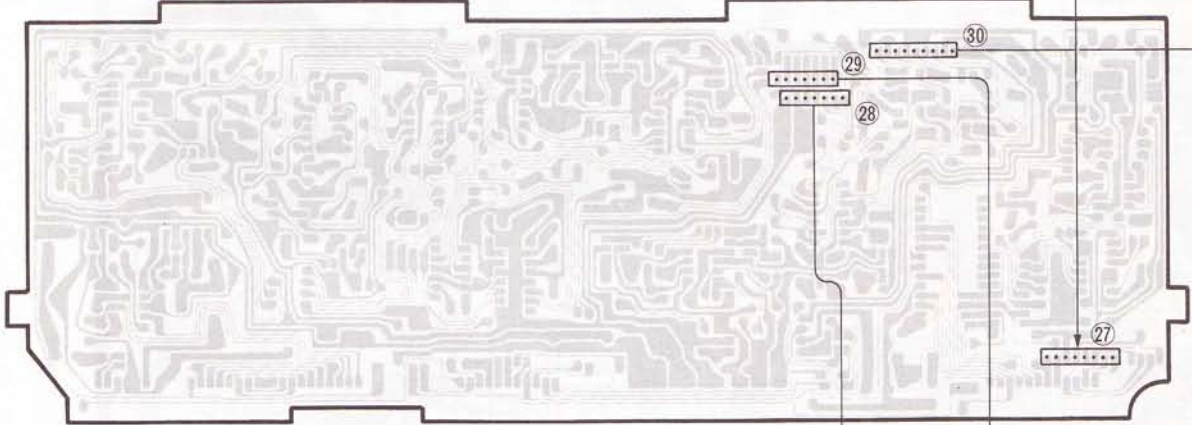
# WIRING DIAGRAM

Nos. of connector are reference of connector Nos. on each P.W.B.

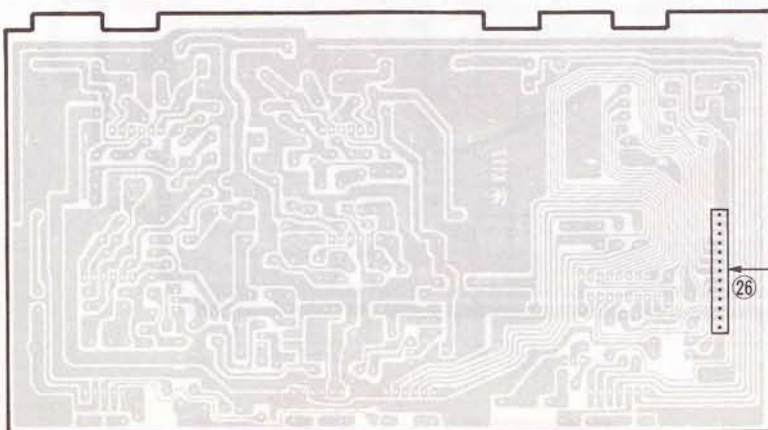
PP P.W.B.



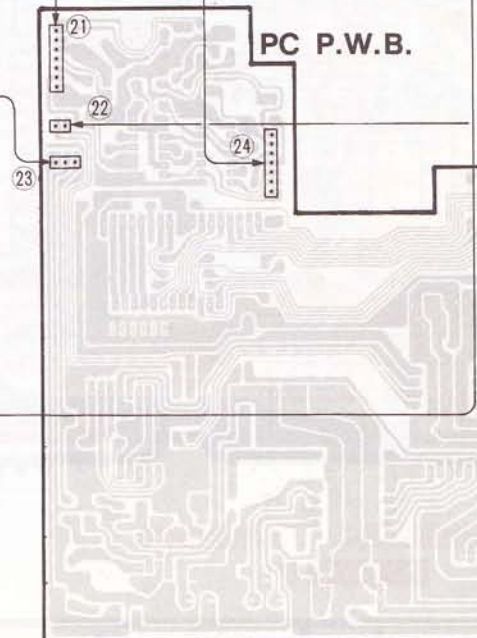
PS P.W.B.



PA P.W.B.



HEADPHONE JACK



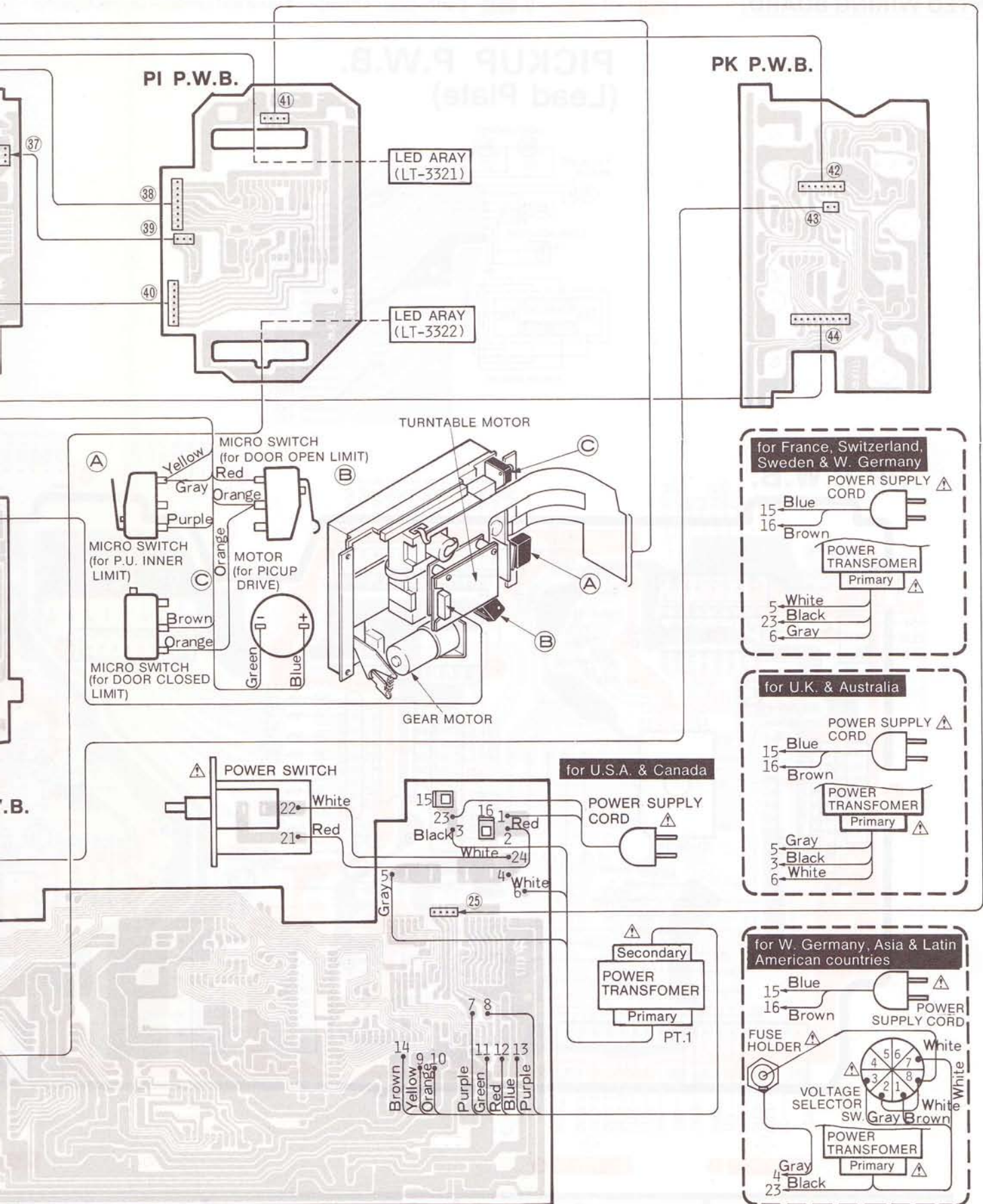
PC P.W.B.

(A)

MICRO SW (for P.U. INH LIMIT)

MICRO SW (for DOOR INH LIMIT)

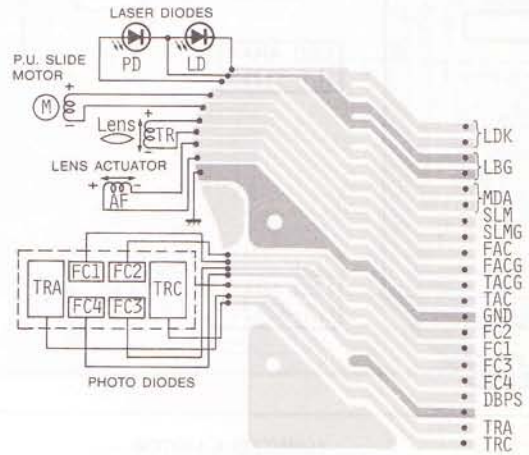




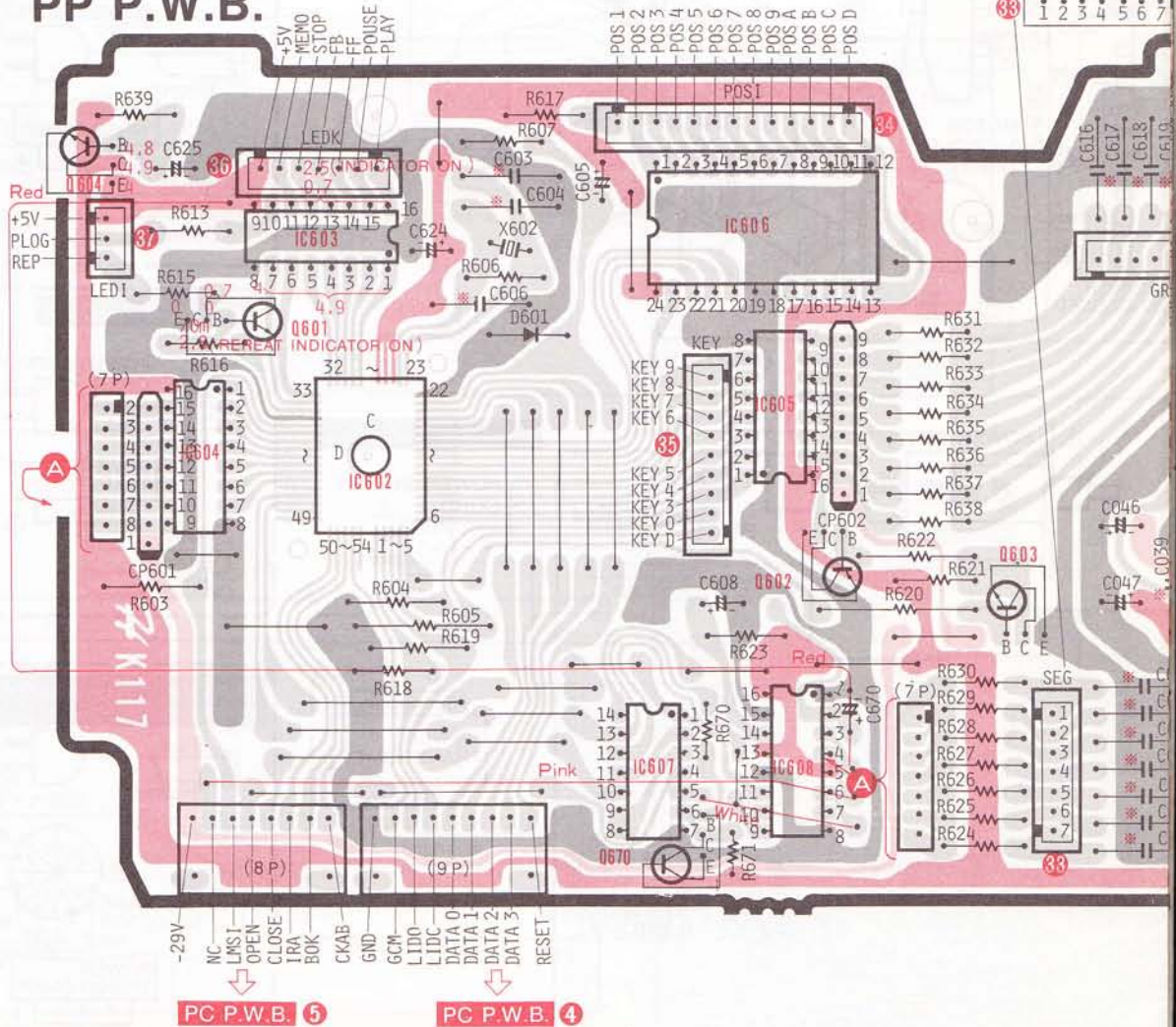
**PRINTED WIRING BOARD**

[Red: +B, Pink: -B, Grey: Earth, White: Other] \*: Axial lead cylindrical component

**PICKUP P.W.B. (Lead Plate)**



**PP P.W.B.**

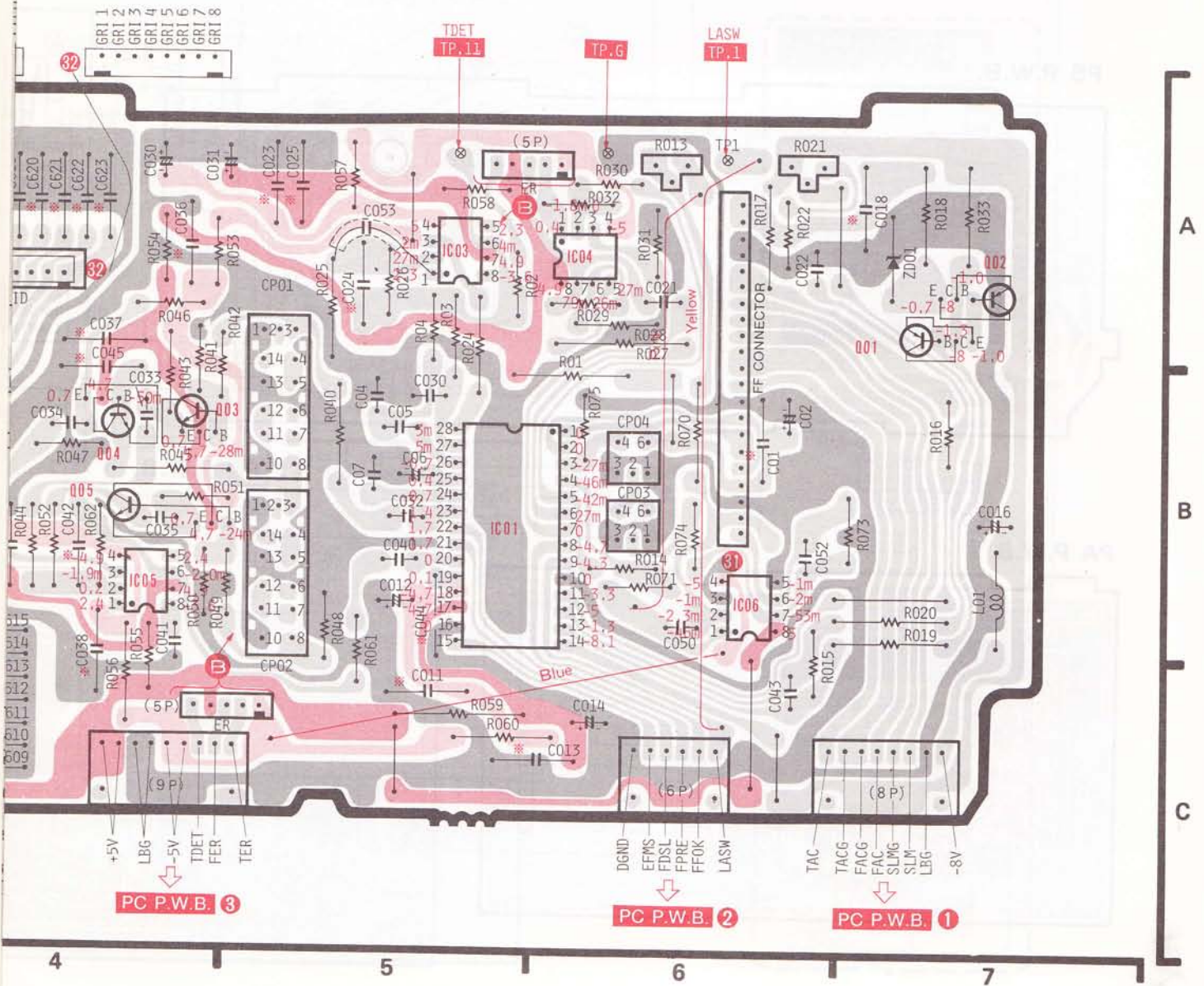
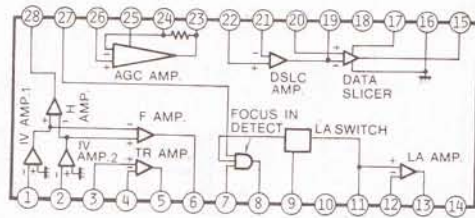




ceramic capacitor

LM318P TL4558P-C	LB1275 TC5066BP TC4528BP	HA-12049A	TC4001BP	HD74159P	HD44820A75	2SC458 (C) 2SA1015 (GR)	2SB562 (B)	RD6.2EN1

IC01(HA12049A)

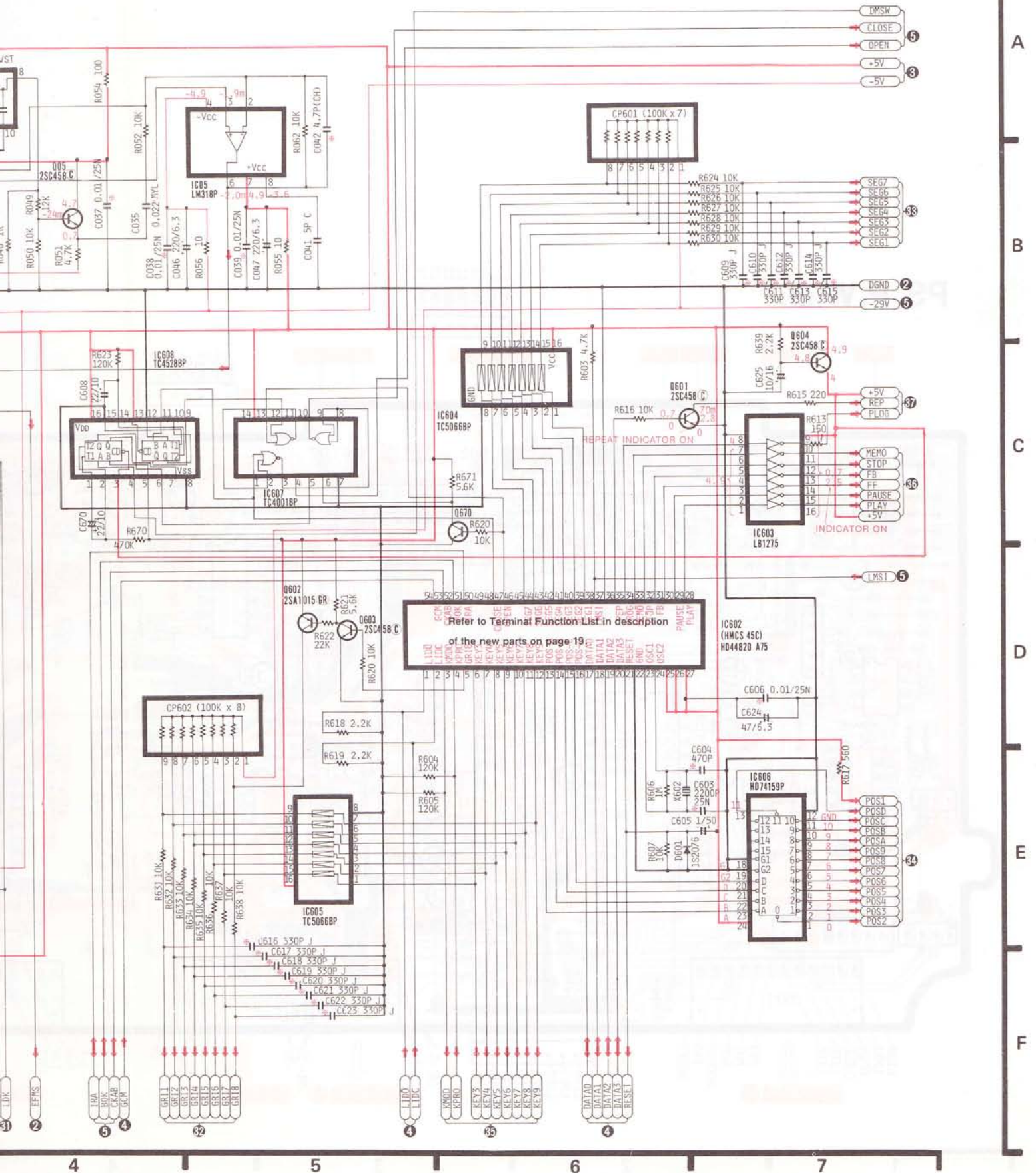








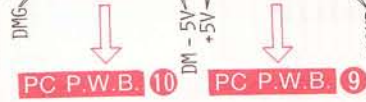
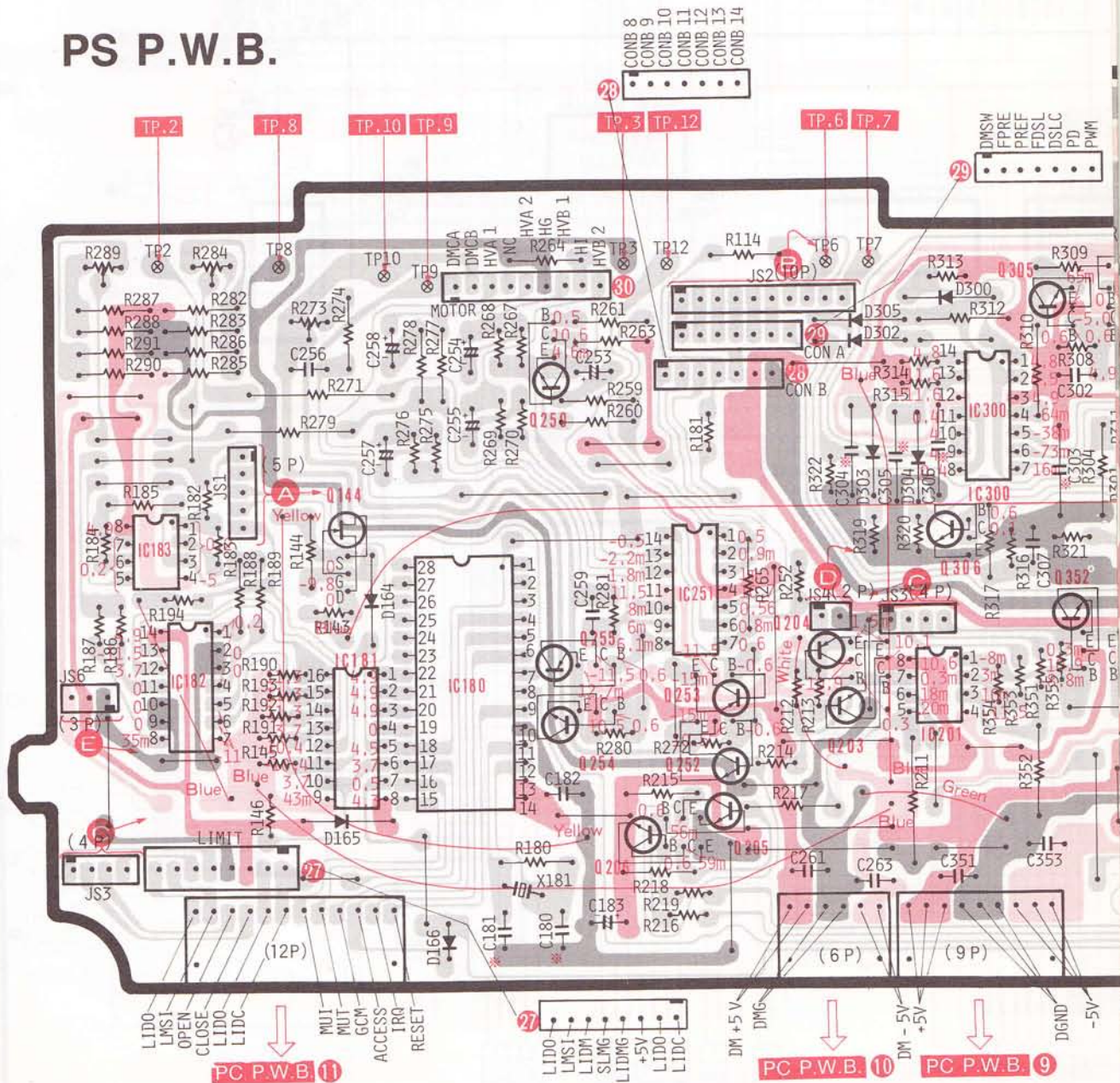
en the diameter of them is more than 10 mmφ





[  : +B,  : -B,  : Earth,  : Other]

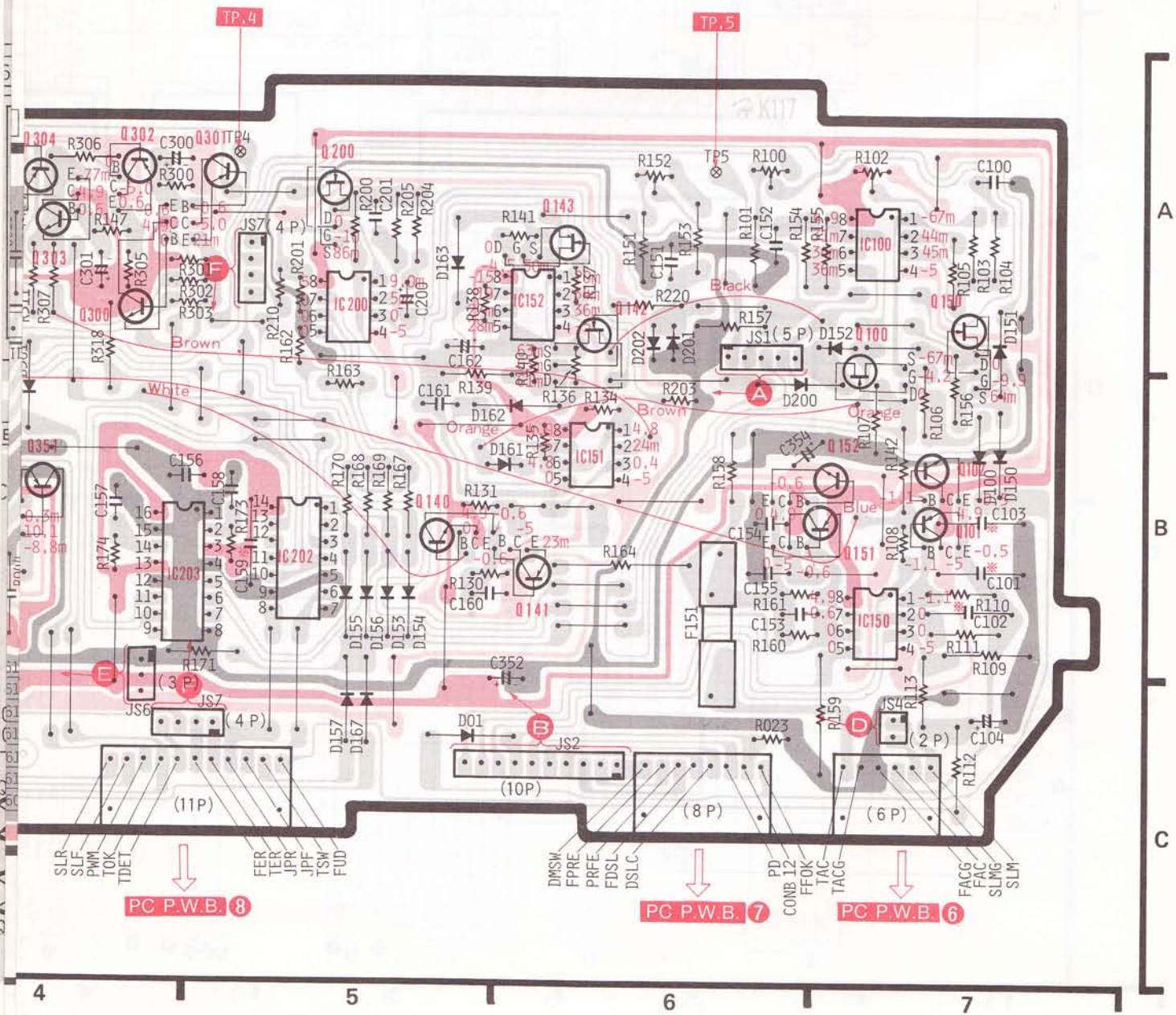
# PS P.W.B.





\*: Axial lead cylindrical ceramic capacitor

HD44700A17	M54560P TC4528BP	TC4013BP TC4066BP IR3702 HA17901P	LA6393D TL4558P-C	2SC458 (C) 2SC1015 (GR) 2SK246BL (GR)	2SD468 (C) 2SB562 (B)	1S2076



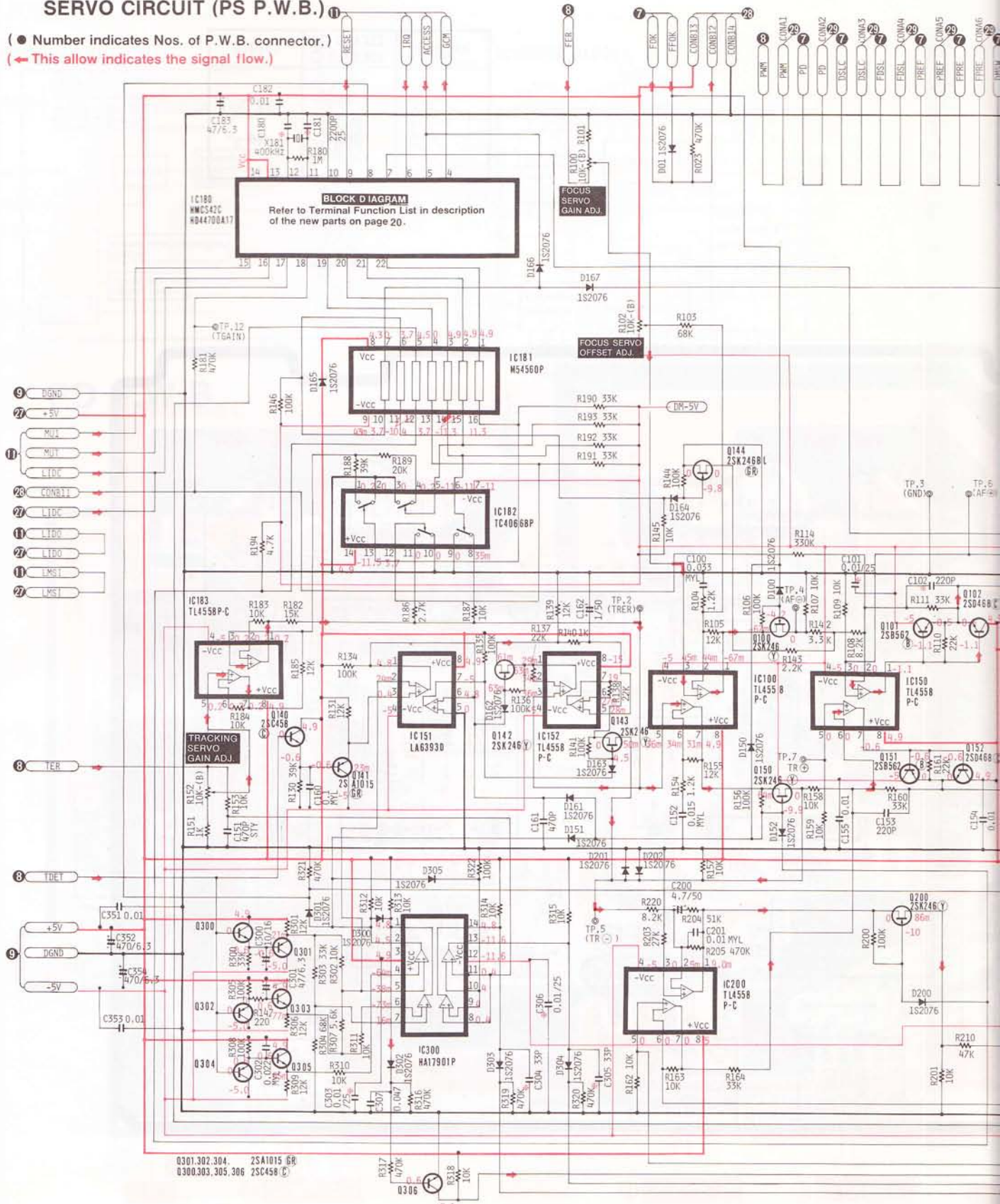


**CAUTION**

Use the electrolytic capacitors with explosion-proof valve when the diameter of them is more than 10 mmφ.

**SERVO CIRCUIT (PS P.W.B.)**

- (● Number indicates Nos. of P.W.B. connector.)
- (← This arrow indicates the signal flow.)



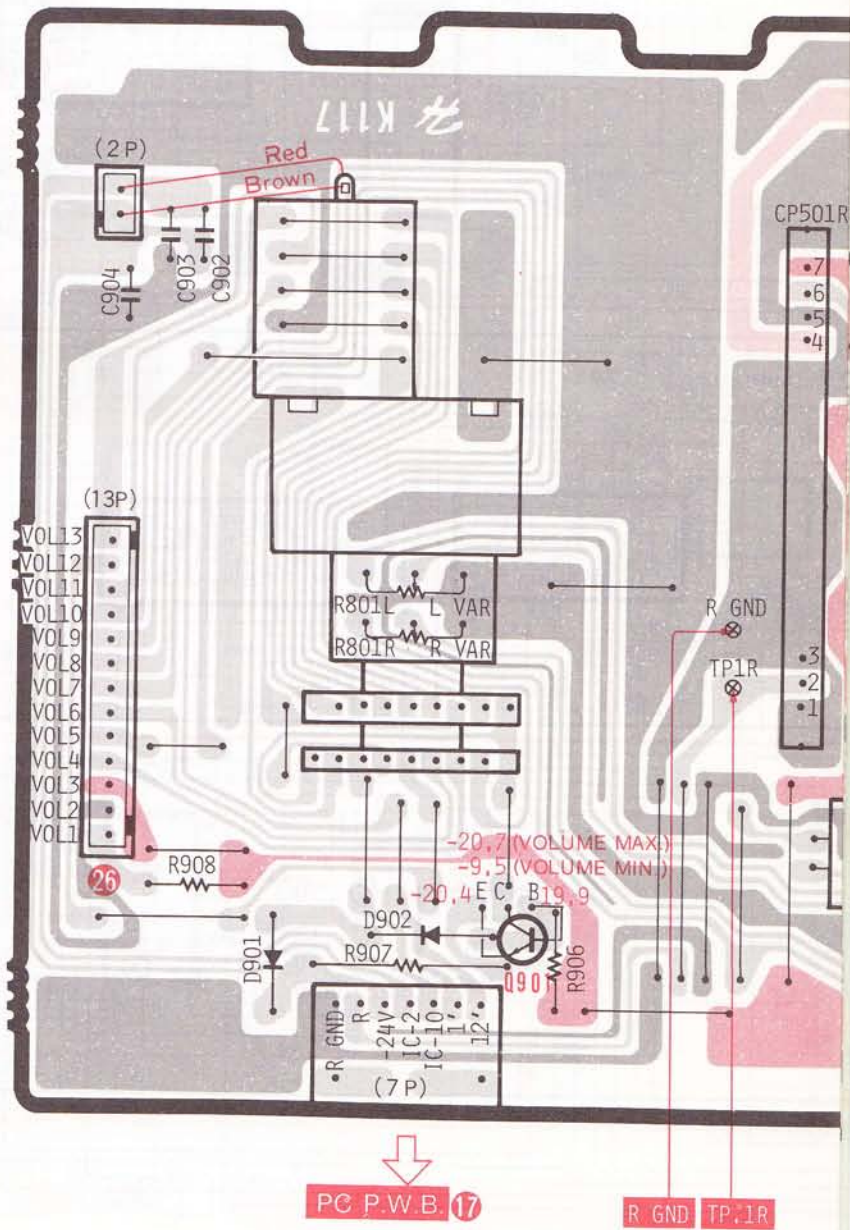
Q301.302.304. 2SA1015 GR  
Q300.303.305.306 2SC458 (C)





[ ■ : +B, ■ : -B, ■ : Earth, ■ : Other ]

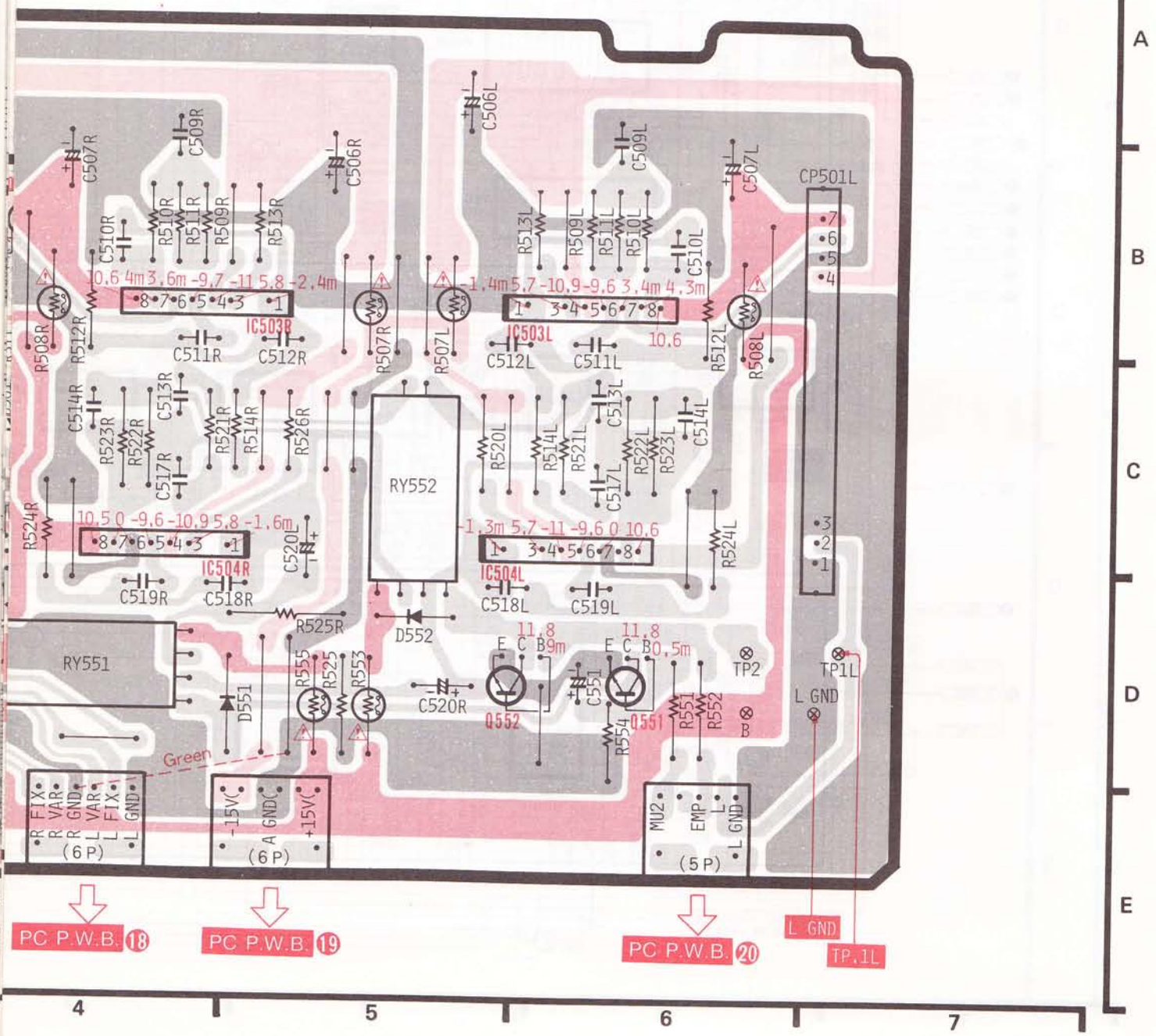
### PA P.W.B.





\*: Axial lead cylindrical ceramic capacitor

HA12017	2SC458 © 2SC1213 ©	1S2076



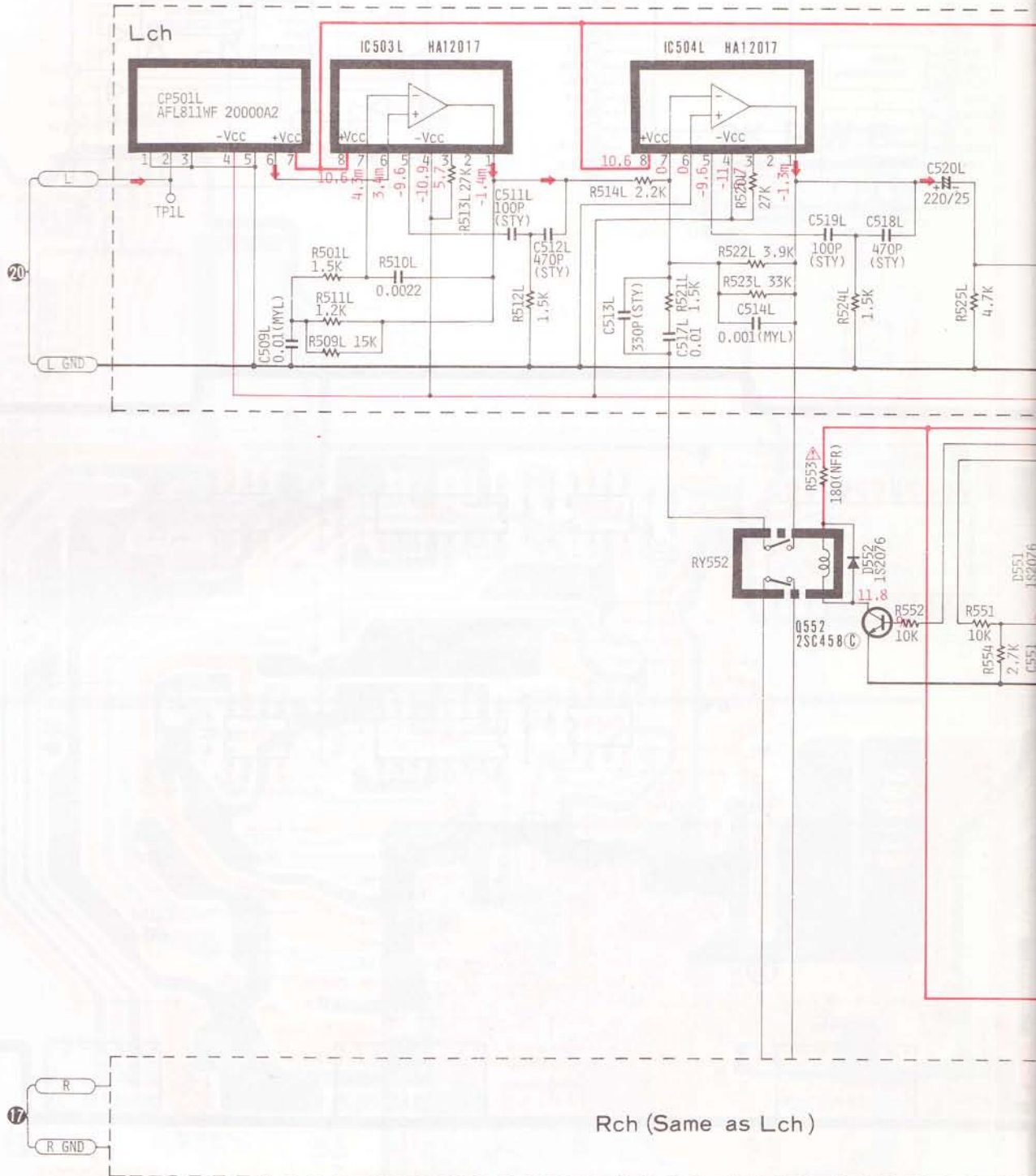
**CAUTION**

Use the electrolytic capacitors with explosion-proof valve when the diameter of them is more than 10 mm $\phi$ .

# AUDIO CIRCUIT (PA P.W.B.)

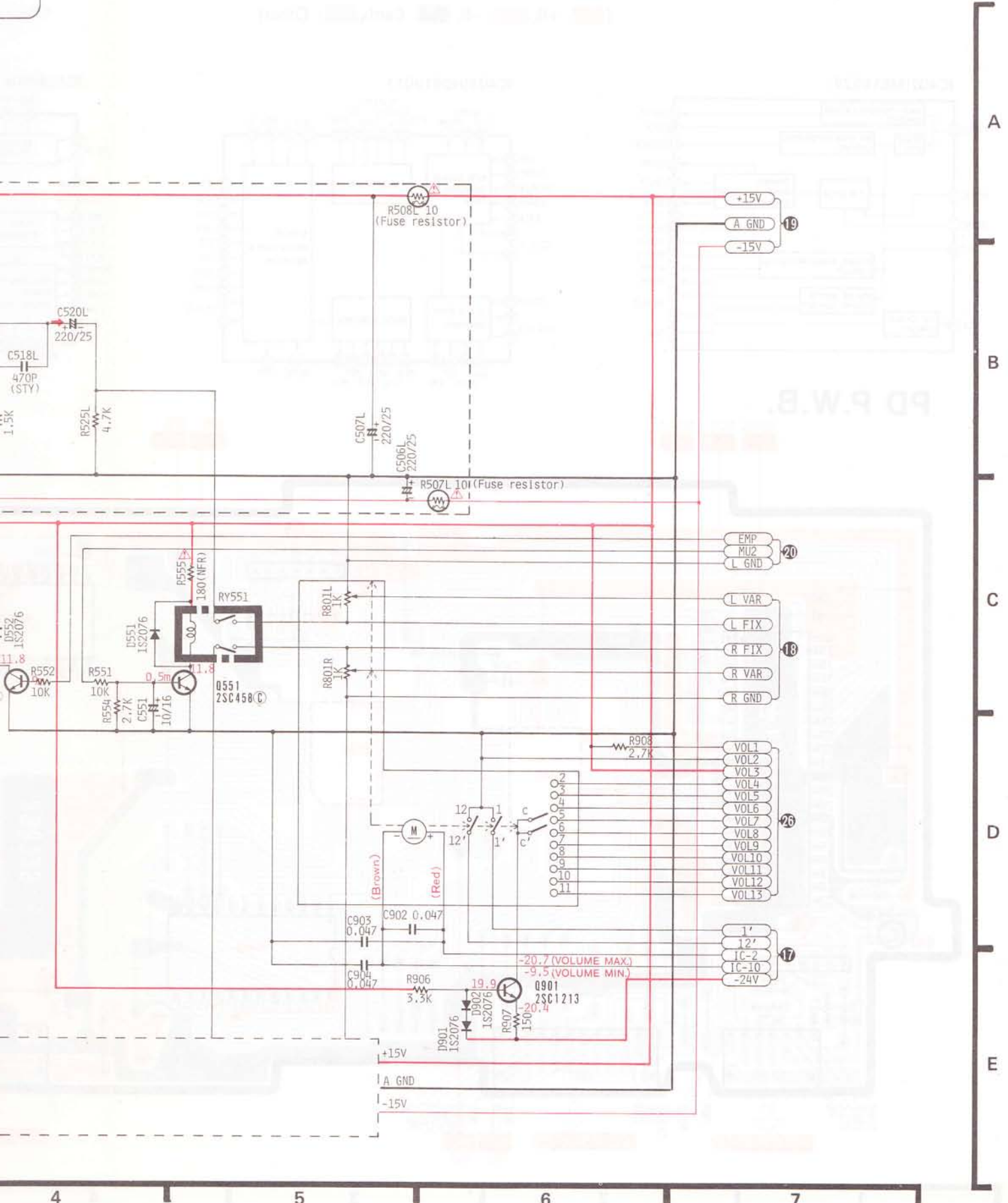
(● Number indicates Nos. of P.W.B. connector.)

(← This arrow indicates the signal flow.)





n the

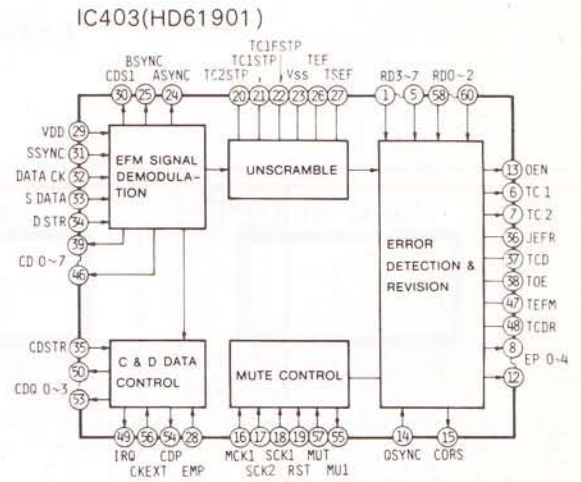
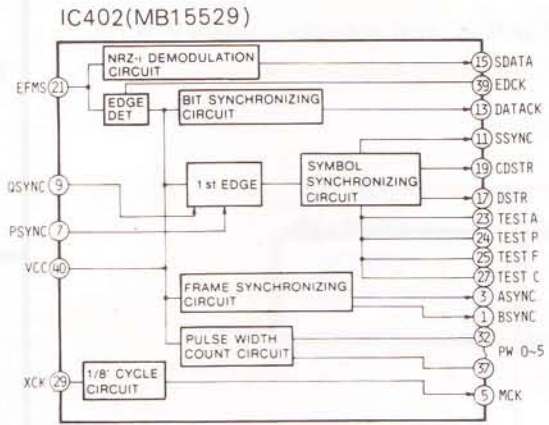


A  
B  
C  
D  
E

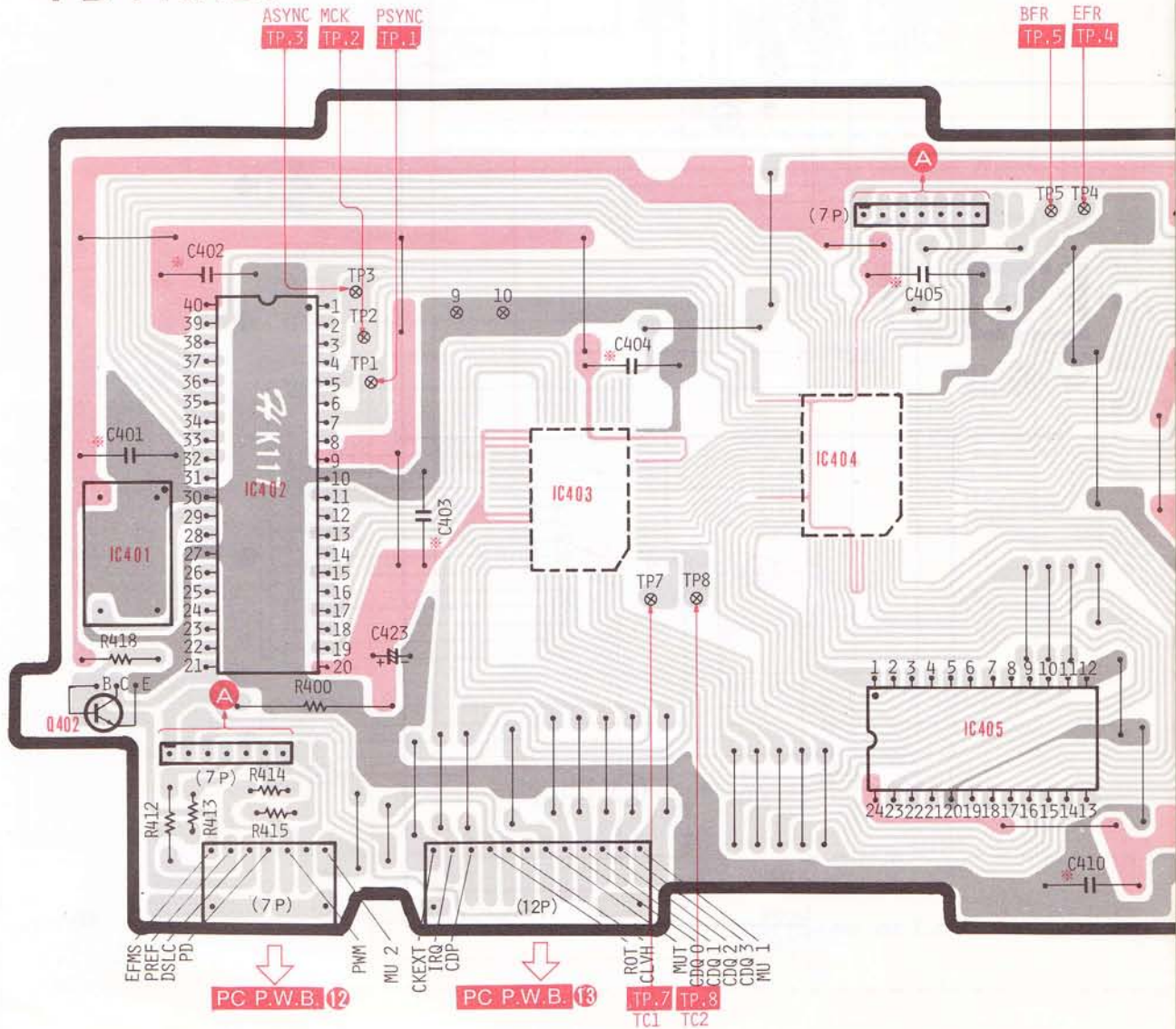
4 5 6 7

# HITACHI DA-1000 R

[  : +B,  : -B,  : Earth,  : Other ]



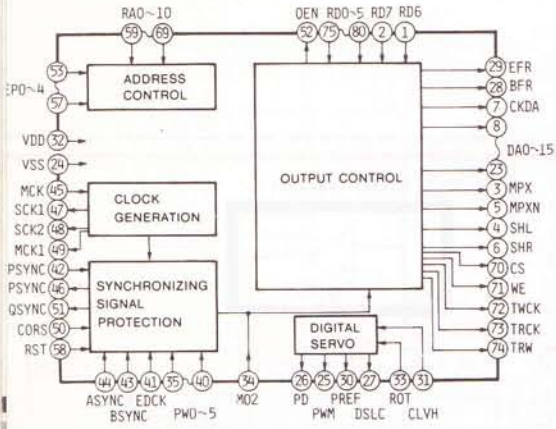
## PD P.W.B.



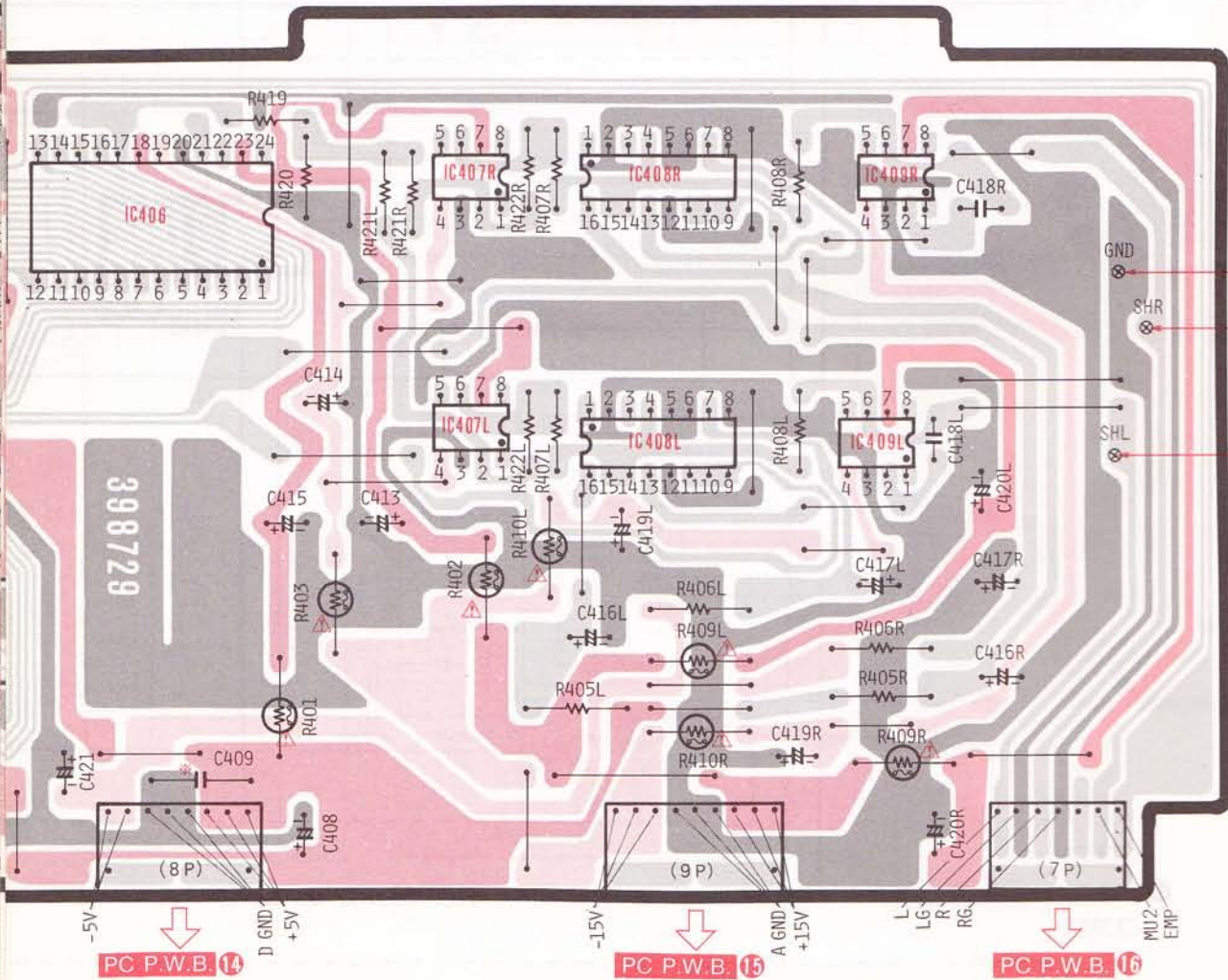
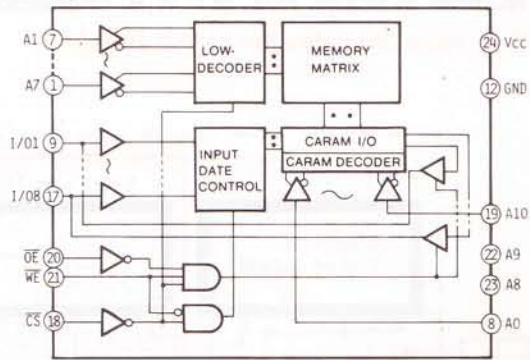


\* : Axial lead cylindrical ceramic capacitor

IC404(HD61902)



IC405(HM6116P-4)



A

B

C

GND  
SHR  
SHL

PC P.W.B. 14

PC P.W.B. 15

PC P.W.B. 16

4

5

6

7

**CAUTION**

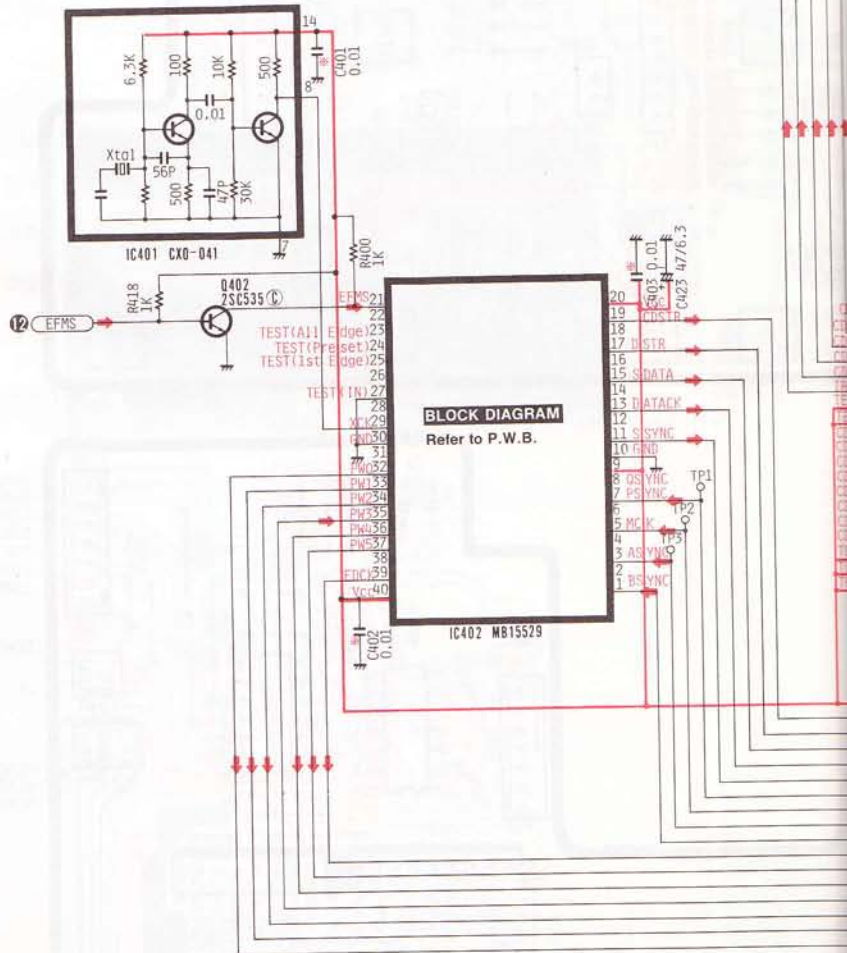
Use the electrolytic capacitor diameter of them is m

CX0-041	MB15529	HD61901	HD61902	HM6116P-4	HD14053BP	PCM53JG-V	μPC4081C	2SC

**DIGITAL CIRCUIT (PD P.W.B.)**

( ● Number indicates Nos. of P.W.B. connector.)

( ← This allow indicates the signal flow.)







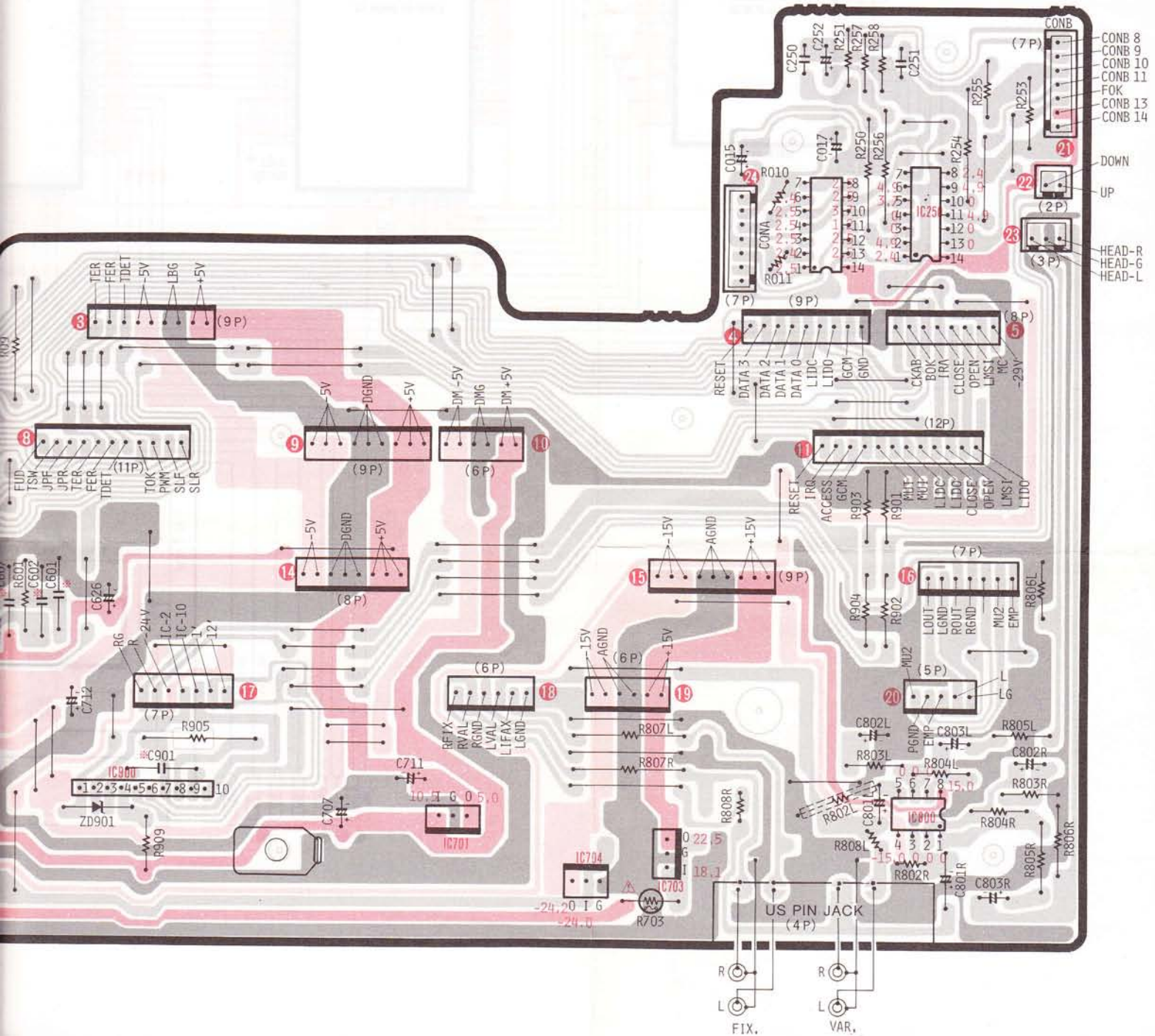
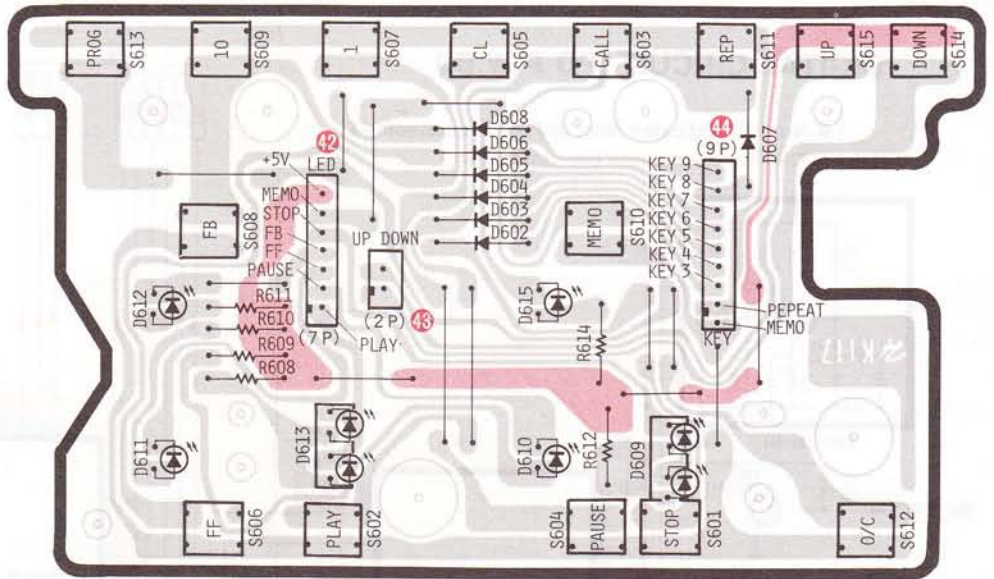








# PK P.W.B.



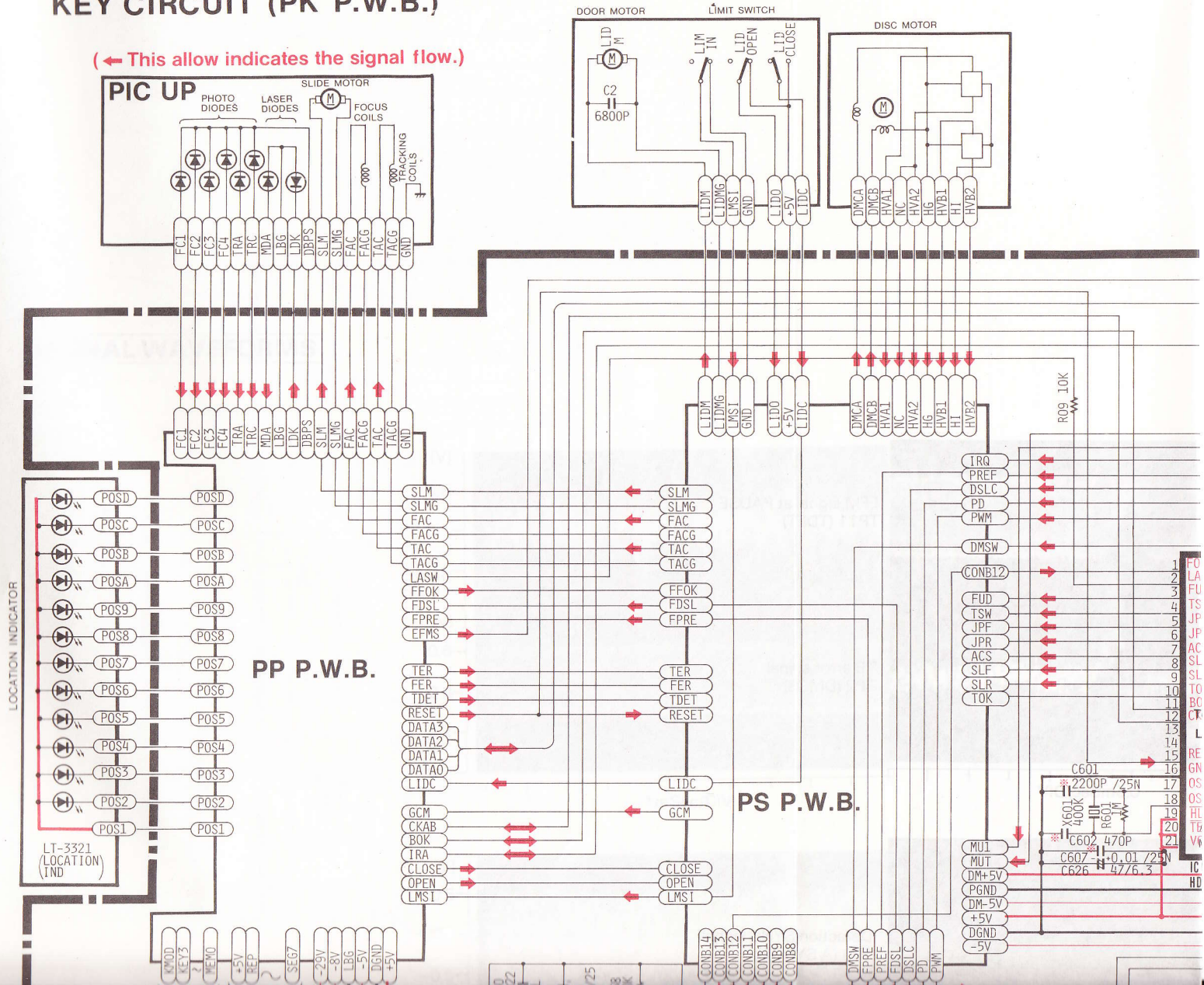


**CAUTION**

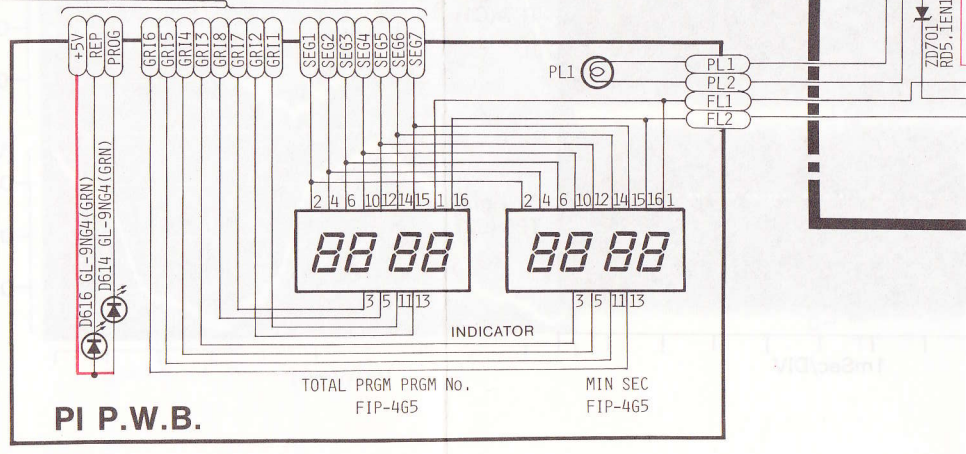
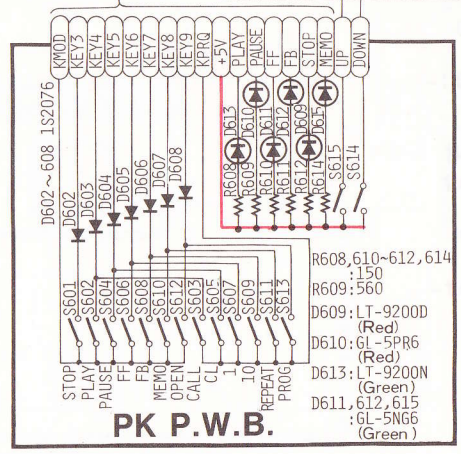
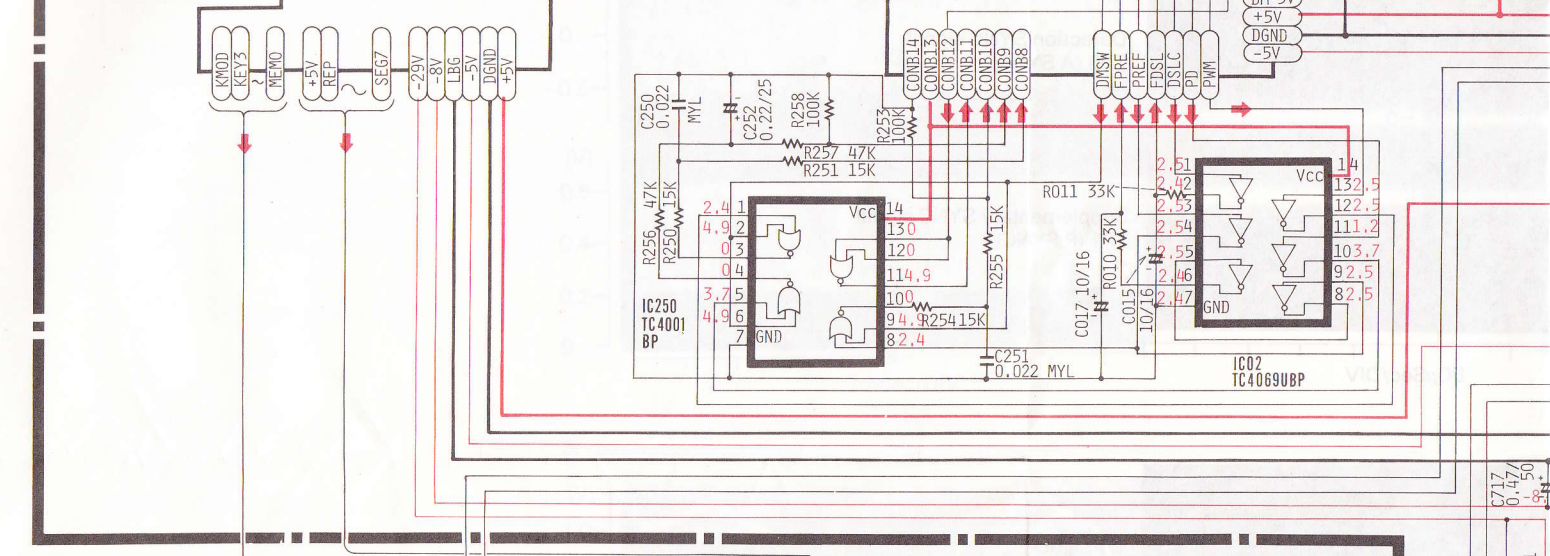
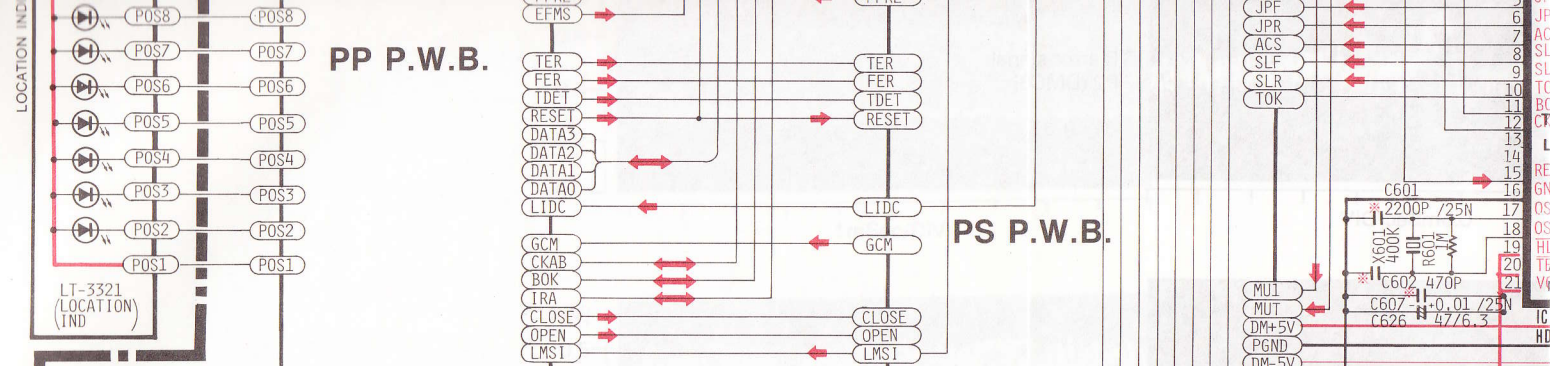
Use the electrolytic capacitors with explosion-proof valve when the diameter of them is more than 10 mmφ.

# CONTROL POWER SUPPLY CIRCUIT (PC P.W.B.) INDICATOR CIRCUIT (PI P.W.B.) KEY CIRCUIT (PK P.W.B.)

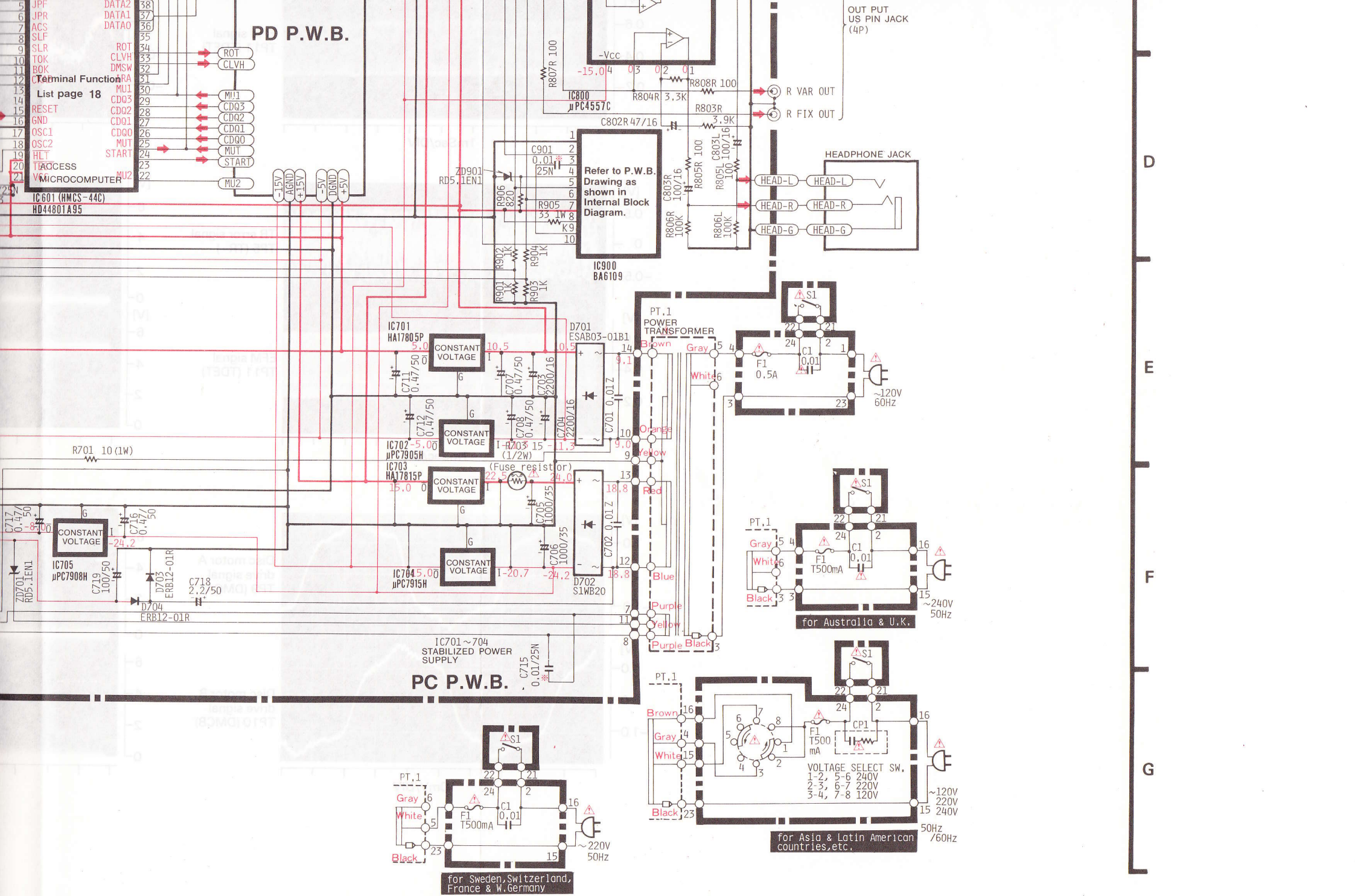
(← This arrow indicates the signal flow.)

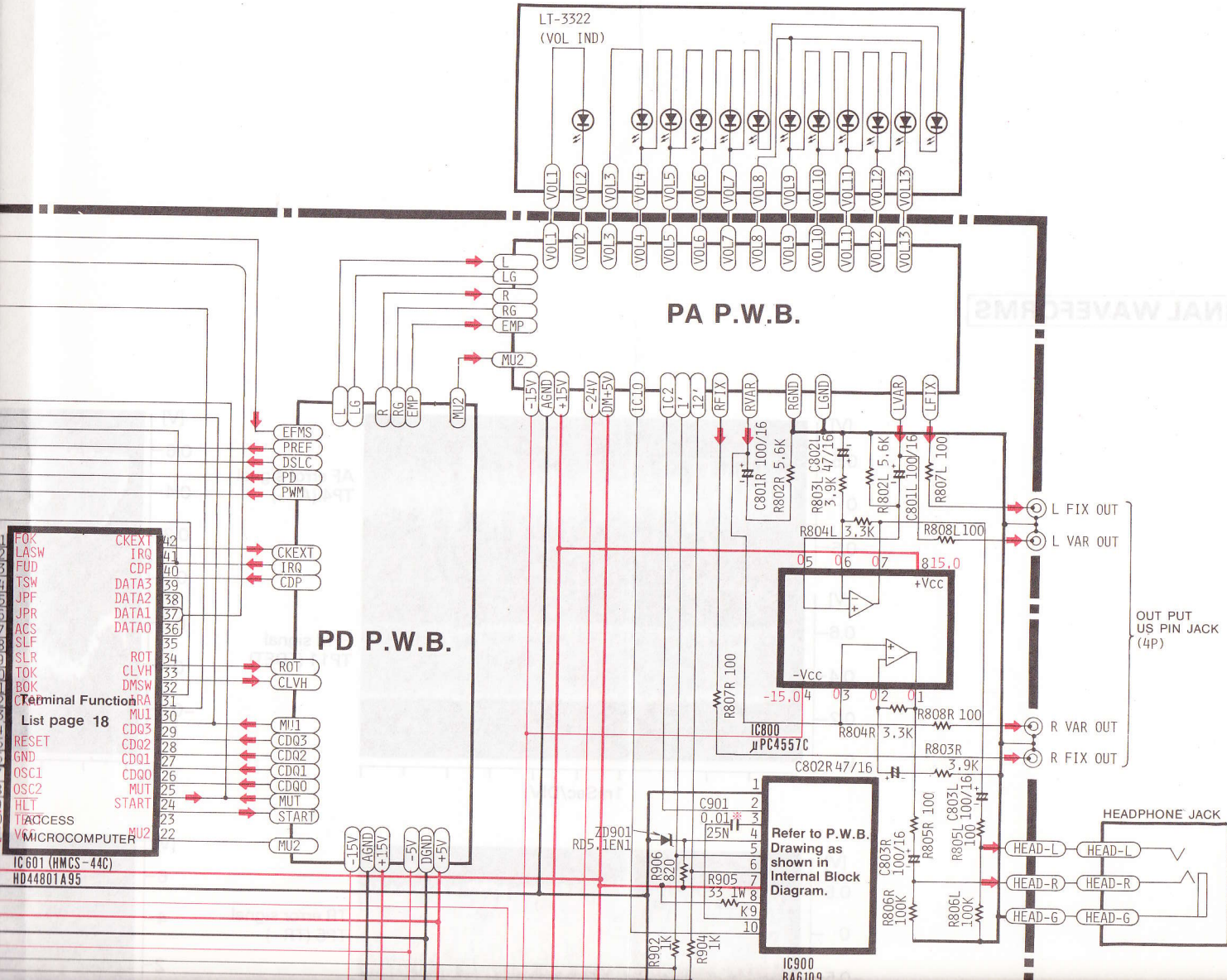












A

B

C

D

FOK	CKEX1	42
LASW	IRQ	41
FUD	CDP	40
TSW	DATA3	39
JPF	DATA2	38
JPR	DATA1	37
ACS	DATA0	36
SLF		35
SLR	ROT	34
TOK	CLVH	33
BOK	DMSW	32
RA	MU1	31
CDQ3	MU1	30
CDQ2	CDQ3	29
CDQ1	CDQ2	28
CDQ0	CDQ1	27
MUT	CDQ0	26
START	MUT	25
START	START	24
START	START	23
MU2	MU2	22

Terminal Function List page 18

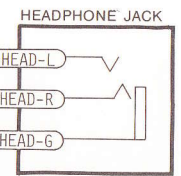
IC 601 (HMCS-44C)  
HD44801A95

Refer to P.W.B. Drawing as shown in Internal Block Diagram.

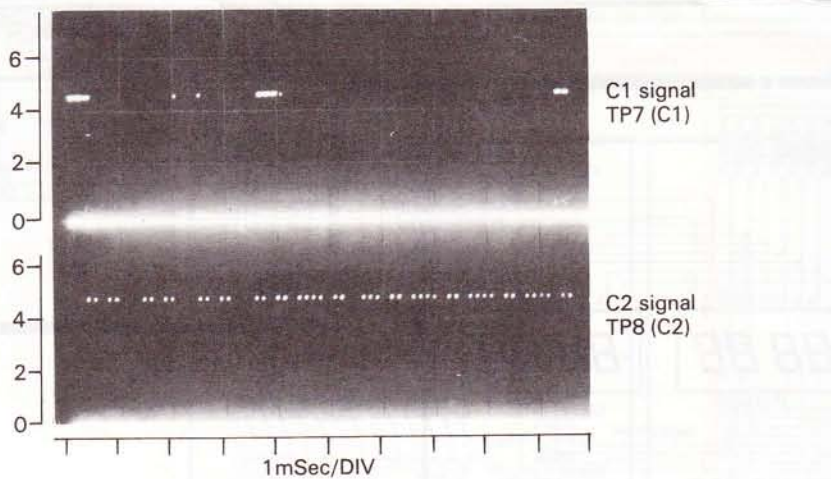
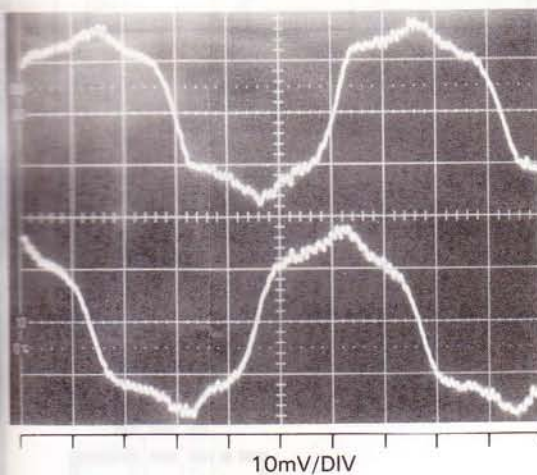
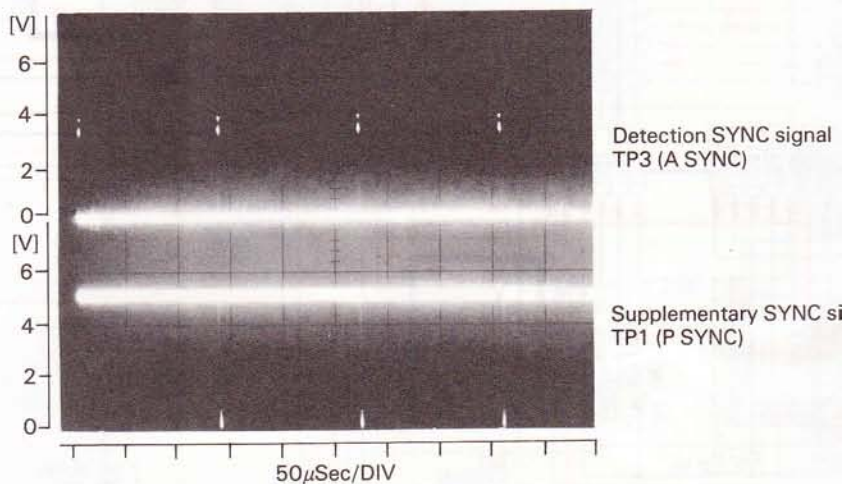
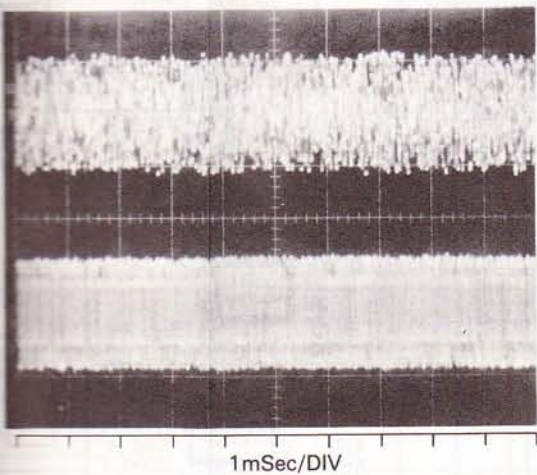
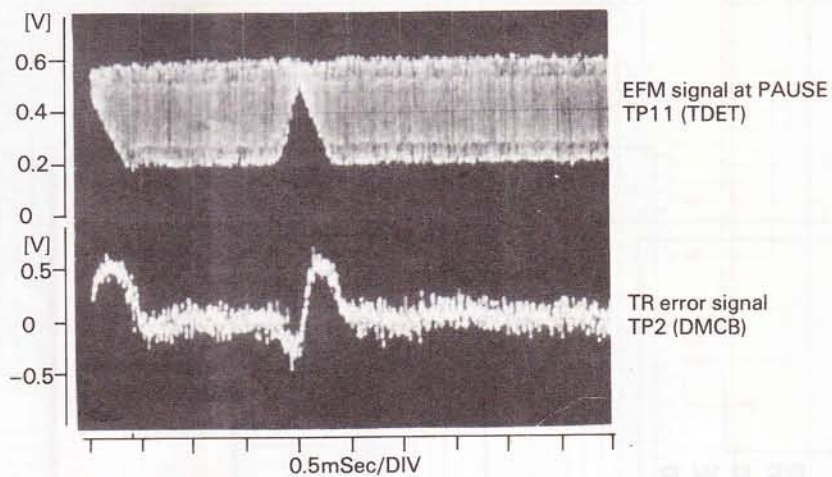
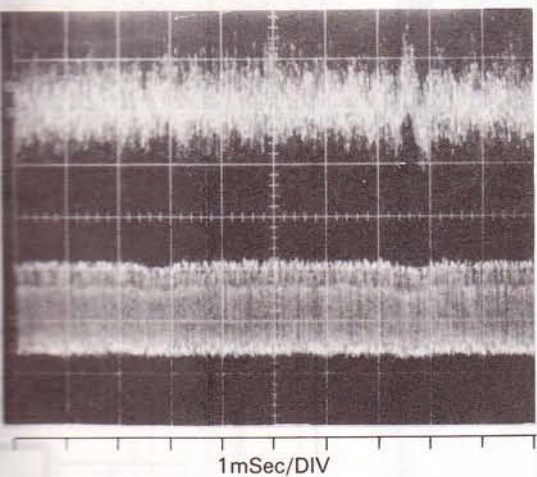
IC900  
BA6109

SIGNAL WAVEFORMS

OUT PUT  
US PIN JACK  
(4P)

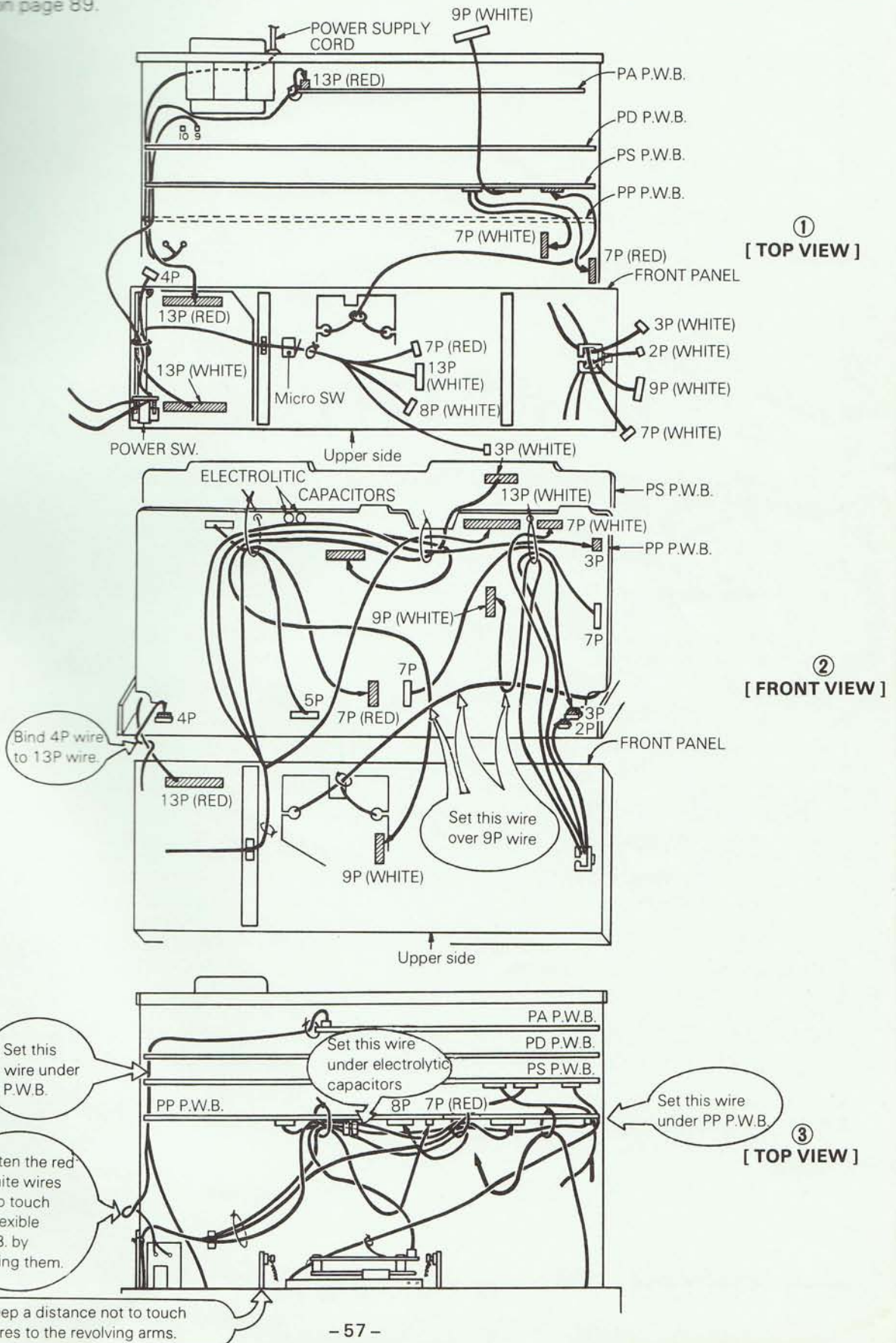






**WIRE LAYOUT DIAGRAM**

The wire layout diagram is shown below: Route the wires following numbers ① ~ ③. For details refer to the wiring diagram on page 89.





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