SL-P210

**Areas** 

[E].....Switzerland and Scandinavia. [EK]....United Kingdom.

[M] .....U.S.A.

[MC]...Canada.

[XL]....Australia.

[EB]....Belgium.

[EH] ... Holland.

[EF]....France.

[Ei] .....Italy.

[EG] ...F.R. Germany.

[XB]....Saudi Arabia.

[PA]....East PX.

[XA]....Asia, Latin America.

Middle Near East.

Africa and Oceania.

# Service Manua Compact Disc Player





Compact Disc Player



#### Color

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

#### SPECIFICATIONS

(\*Measured by EIAJ (CP-307))

#### ■ Audio

No. of channels: 2 (left and right, stereo) Frequency response: 4-20,000 Hz ±0.3 dB\* More than 95 dB\* Dynamic range: More than 96 dB\* S/N ratio: Harmonic distortion: 0.002% (1 kHz, 0 dB) Total harmonic distortion: 0.004% (1 kHz. 0 dB)\* Channel separation: More than 96 dB\* Below measurable limit Wow and flutter: Low-pass filter: High-resolution digital filter

#### ■ Signal Format

Sampling frequency: 44.1 kHz

Correction system: **Technics Super Decoding** 

Algorithm

16-bit linear **D-A conversion:** 

#### ■ Pickup

Type: Fine-focus, one beam

Access time: 1 second

(access to the last track)\*

Semiconductor laser **Light source:** Wavelength: 780 nm

High-speed linear access system Traverse system:

Spindle system: Brushless DD motor

#### **■** Functions

Automatic play: All tracks. Random access play: Track number. Repeat play:

Program play:

Display:

Time display:

Search:

Preset edit play:

Entire disc or programmed tracks. Forward/backward track skip.

Color

(K) (S)

(K) (S) (K) (S)

(K) (S)

(K) (S)

(K) (S)

(K) (S)

(K) (S)

(K) (S)

(K) (S) (K) (S)

(K) (S)

(K) (S)

(K)

(K)

Forward/backward manual search.

[PE]....European Miliary.

[PC]....European Audio Club.

For up to 20 selections Up to 99 minutes (for program play) Total tracks.

Current track •Time display (min. sec./dB).

•The following fourtime modes display minutes and seconds according to the time mode select button setting:

1 Disc remaining playing time.

(2) Track number and remaining playing time of surrent track.

3 Playing time from beginning of first track.

4) Track number and elapsed playing time fron beginning of current track.

Play indicator. Pause indicator. Repeat indicator. Disc indicator.

Remote control sensor Motor-driven horizonal type. 15 mW max. 32Ω (fixed)

Indicator:

Disc loading: Headphone output level:

Panasonic Hawaii Inc. 91-238 Kauhi St. Ewa Beach P.O. Box 774 Honolulu, Hawaii 96808-0774

of Canada Limited 5770 Ambler Drive, Mississauga,

Matsushita Electric Tridin & Co., Ltd.

P.O. Box 288, Central Isak a Japan

#### Panasonic Toky Of fice

6th Floor, World Trade Cener B ■dg., No. 4-1, Hamamatsu-cho 2-(horr ■e, Minato-ku, Tokyo 105, Japan



Panasonic Sales Company, Division of Matsushita Electric of Puerto Rico, Inc. Ave 65 De Infanteria, KM 9.7 Victoria Industrial Park

Carolina, Puerto Rico 00630

Matsushita Services Company

50 Meadowland Parkway, Secaucus, New Jersey 07094

Matsushita Electric Ontario, L4W 2T3

Infrared remote control unit

**Dimensions** 

**(W×D×H)**:  $6.5 \times 15.5 \times 1.8 \text{ cm}$ 

Batteries: UM-3 "AA" batteries or IEC R6

or equivalent (1.5V×2)

Remote control functions: Numeric buttons (0-9)

Memory button Clear button Repeat button

Digital volume attenuation buttons

Time mode select button Forward and backward skip/search buttons Stop button Play/pause button

140 g (including batteries)

■ General

Weight:

Power supply: For U.S.A. and Canada:

AC 120V, 60Hz

For United Kingdom and Australia:

AC 240V, 50Hz For Continental Europe: AC 220V, 50Hz

For Others:

AC110~127/220~240V, 50/60Hz

Power consumption: 10 W

 Output voltage:
 2 V (at 0 dB)\*

 Output impedance:
 Approx. 550Ω 

 Load impedance:
 More than 10 kΩ 

Dimensions

(W $\times$ D $\times$ H): 43 $\times$ 24 $\times$ 7.7 cm

(16-15/16"×9-7/16"×3-1/32") [When disc holder is opened:

37.2 cm (14-21/32") (D)] 3.1 kg (6.8 lbs.)

Weight:

Specifications are subject to change without notice for

further improvement.

Weight and dimensions are approximate.

#### **■ CONTENTS**

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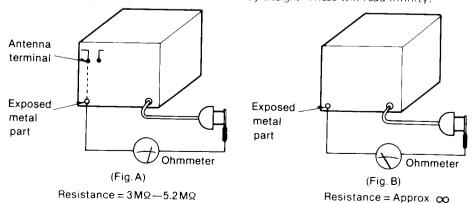
#### ■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

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

#### INSULATION RESISTANCE TEST

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

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



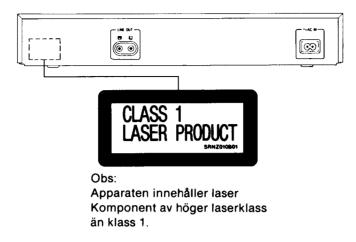
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

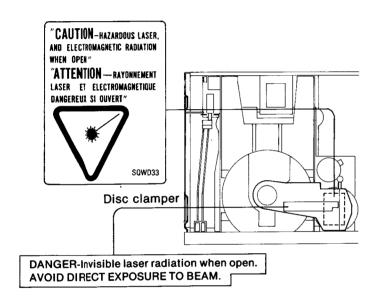
## ■ PRECAUTION OF LASER DIODE

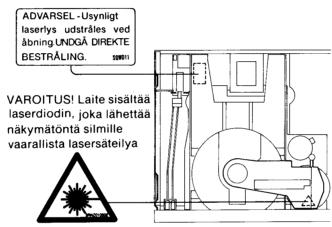
Caution: This product utilizes a laser diode. ADVARSEL: I dette a apparat anvendes laser.

#### • Use of caution labels Note: O Mark is used, × Mark is not used.

Areas	Disc clamper	SQWD33	SQWD11	SRNZ010S01	SRNZ010S02
{M}, [PA], [PE], [PC]	0	×	×	×	×
[MC]	0	0	×	×	×
(E)	0	×	0	0	0
[EK], [XL], [EG] [EB], [EH], [EF] [Ei], [XB], [XA]	0	×	×	0	0







#### **■** BEFORE USING THIS UNIT

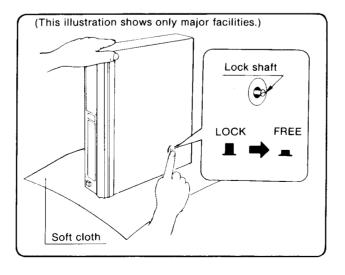
- 1. Place a soft cloth under the unit to protect it from scratches.
- Press the lock shaft on the bottom panel to the in (FREE) position (■→■).

#### NOTE:

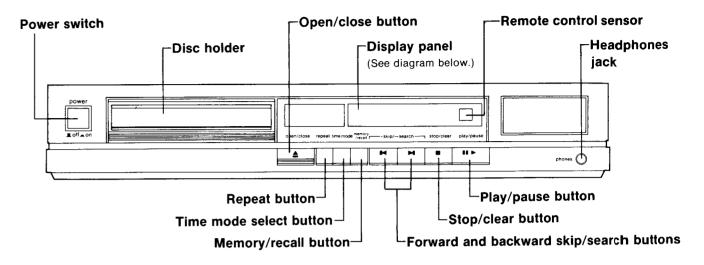
IF THE UNIT IS TRANSPORTED AGAIN, PERFORM THE FOLLOWING STEPS:

- Remove the disc from the holder.
- Pull the lock shaft to the out (LOCK) position (▲→▲).
   CAUTION:

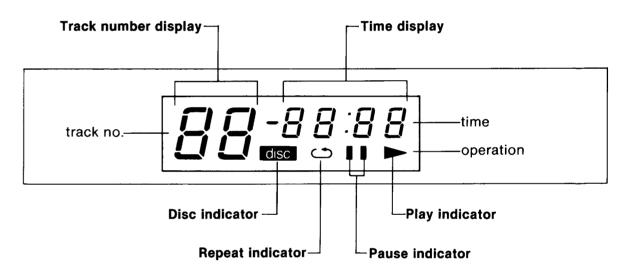
Do not transport the unit without locking the lock shaft. **SEVERE DAMAGE WILL RESULT.** 



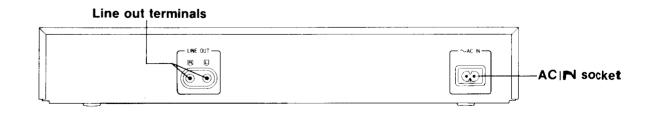
#### **■ LOCATION OF CONTROLS**

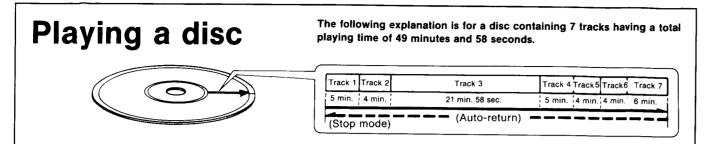


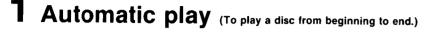
#### (Display panel)

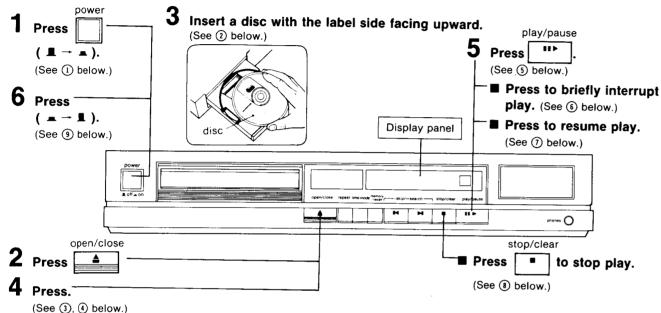


#### (Rear panel of player)









1 Display illuminates as shown below



- ② Insert the disc only after the disc holder has opened all the way. If the disc is inserted too soon, it may be damaged. Do not tilt the unit while the disc holder is opening or closing since the disc could fall out of the holder.
- ③ Step 4 can be skipped by pressing the play/pause button after inserting a disc. In this case, the holder will close and disc play will begin immediately from track 1, but the tracks and total playing time will not be displayed.
- If the open/close button is pressed, the display illuminates as shown below.



information finished.

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



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

- ⑤ The play indicator (▶) goes out, the pause indicator (■) illuminates and the unit switches to the pause mode.
- The pause mode is cancelled and play is resumed.
- The pickup will return to the beginning of the first track and the unit will switch to the stop mode.
- (9) When the end of the disc is reached, the pickup returns to the beginning of the first track and the unit switches to the <u>stop</u> mode.
- •Remove the disc from the disc holder.
- Turn off the power if the unit is not to be used again for a while.
- Since steps 1, 2, 3, 4 and 6 in this procedure are the same for all play procedures, they are not included in the following explanations.

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

#### Note:

• Program entries cannot be made during play or pause mode, using these forward and backward skip/search buttons. However, it is possible to program during play or pause mode if you use remote control unit's numeric buttons. While watching the track number display, press for an instant to specify the desired track number. (See (1) below.) Time mode select button Button to move the pickup forward. time mode Button to move the pickup backward. play/pause 2 Press to enter the displayed-11> Press track number into memory. • Play begins from the first programmed track. memory/ recall Repeat steps 1 and 2 until the desired programming is complete. (See 2) below.) recall (See 3) below.) (A maximum of 20 selections can be programmed.)

- ① •If more than 20 selections are entered " $\mathcal{F}$ " (full) is shown in the display panel and no further selections can be programmed.
- Keeping the button (or button) pressed will cause the track number display to advance (or go back) continuously.
- •When the button is kept pressed continuously, the track number display returns to the first track after passing the last track on the disc. For example, if there are 7 tracks on the disc, keeping the button pressed, would display the track numbers as follows:

 $\bigcirc$ 1 + 2 + 3 + 4 + 5 + 6 + 7

• Likewise, keeping the the following display:

-1 - 2 - 3 - 4 - 5 - 6 - 7 -

① To enter the same track number several times in succession, simply press the memory/recall button the same number of times that the track is to be played. Each entry counts as one selection.

#### Total playing time confirmation

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

time mode

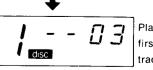
Press.



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

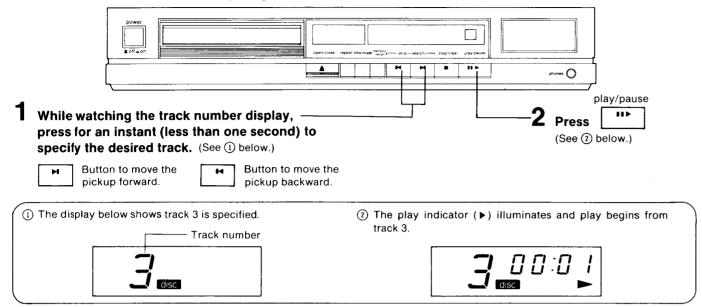






Play begin:from the first progranmaed track.

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



## 4 Skip play

(During play or the pause mode.)

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

H	Fo (P	rwa icku	rd sk p sk	ip/ ips	sea: forv	rch but vard)	ton
	_						

- Forward skip/search button (Pickup moves forward) Backward skip/search button (Pickup skips backward) Backward skip/search button (Pickup moves backward)
- 1) Pressing one of the skip buttons for an instant activates the quick skip mode.

#### Forward skip

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

#### Backward skip

• During automatic play, the pickup skips to the beginning of the current track. If pressed again quickly, the pickup skips to the beginning of the previous track.

• During program play (repeat function not activated), the pickup skips backward only to the beginning of the current

phones O

Manual search play

■ Keep the forward or backward skip/search

backward. Release the button when the desired point has been reached (as shown by

the display). (See ② below.)

point

■ To play the disc from a specific

button pressed to move the pickup forward or

- •During program repeat play, the pickup skips to the beginning of the current track. If pressed again quickly, the pickup skips to the beginning of the previous programmed
- (2) The pickup moves slowly at first and then rapidly if one of the buttons is held down for more than about 3 seconds.
  - If one of the buttons is pressed while a disc is being played, sound from the disc can be heard as the pickup moves. The output level at this time is decreased by 12 dB (1/4) compared with the normal level.
  - During program play, the pickup can only be moved between the beginning and end of the track currently being

## 6 Preset edit play

(When the unit is in the stop mode.)

It is possible to specify preset edit time using remote control

#### **Procedure Function** Confirm that the unit is in the stop mode. Preset edit play 1. Press the time mode select button. For example, to play only 15 minutes: 2. Press the forward or backward skip/search button to specify the playing time in minutes. time mode 3. Press the memory/recall button. (For automatic Press. play or repeat play, this step may be omitted.) disc 4. Press the play/pause button. 5. After playing the preset edit time the unit switches to the pause mode. Press. Notes: (Specify • If a preset edit time that is longer than the recorded playing disc 15 minutes.) time is specified, the unit switches to the stop mode after the last track has been played. • A maximum time of 99 minutes may be specified for program disc play. memory 15:00 • If you operate the search or skip function during preset edit recall play, preset edit play is cancelled. disc • For preset edit play during program play, the preset edit time Press. must be specified before the program selections are entered. play/pause 11> Press disc 15:00 disc (The above illustration shows a disc containing more than 15 minutes within the first track.) During automatic play, the unit switches to the pause mode after playing for 15 minutes. •During program play, the unit switches to the pause mode after playing for 15 minutes, and the next programmed track is displayed if there is a further programmed track. • During repeat play, the unit switches every 15 min utes to the pause mode. (Play is restarted by pressing the play/pause

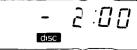
The time mode button can also be used for the following function.

#### Remaining specified time confirmation

#### To display the remaining specified time.

Example: If 15 minutes has been specified and then tracks 2→4→6 are programmed, pressing the time mode select button displays the remaining playing time between the end of the last programmed track and the specified preset edit time of 15 minutes.

In the example, track 2 has a playing time of 4 minutes, track 4 of 5 minutes and track 6 of 4 minutes, therefore the displayed remaining playing time is 2 minutes (15 minutes minus 13



## 7. Remote control unit

#### Remote control unit facilities

- 1 Automatic play
- ② Program play
- 3 Random access play
- Skip play
- (5) Manual search play
- 6 Repeat play
- 7 Time mode display function
- Preset edit play
- 9 Digital volume attenuation function
- (II) Program clear function
- (I) Program recall operation
- The following operations are not possible using the remote control unit.
- ① Power on/off
- 2 Disc holder open/close

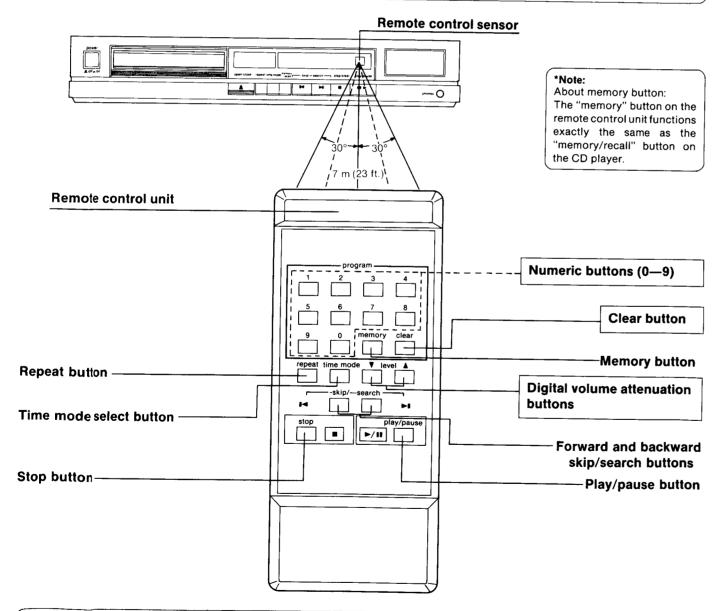
#### ■ Notes

- Always aim the remote control unit at the front panel receiver.
- The remote control unit can be used at an angle range of up to 30° from the direction in which the front panel faces.
- The remote control unit cannot be used from a distance of more than 7 meters (23 ft.)

#### ■ Remote control operation

Point the remote control unit at the front panel receiver and press the appropriate button(s).

#### Parts identification



When using the remote control unit, press the buttons slowly and accurately to avoid mistaken operation.

#### **—** 9 **—**

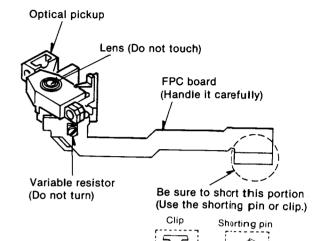
## ■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.

So, be careful of electrostatic breakdown during repair of the optical pickup.

#### Handling of optical pickup

- 1. Do not give excessive shock to the optical pickup because it is of extremely precise structure.
- 2. To prevent the breakdown of the laser diode, an antistatic shorting pin is inserted into the flexible board. (FPC board)
- When removing or connecting the short pin, finish the job in as short time as possible.
- 3. Take care not to apply excessive stress to the flexible board. (FPC board)
- 4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

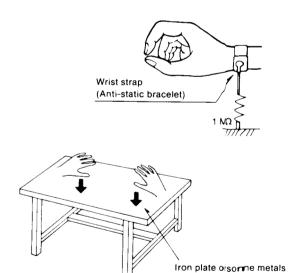


## Grounding for electrostatic breakdown prevention

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

#### Caution:

The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.

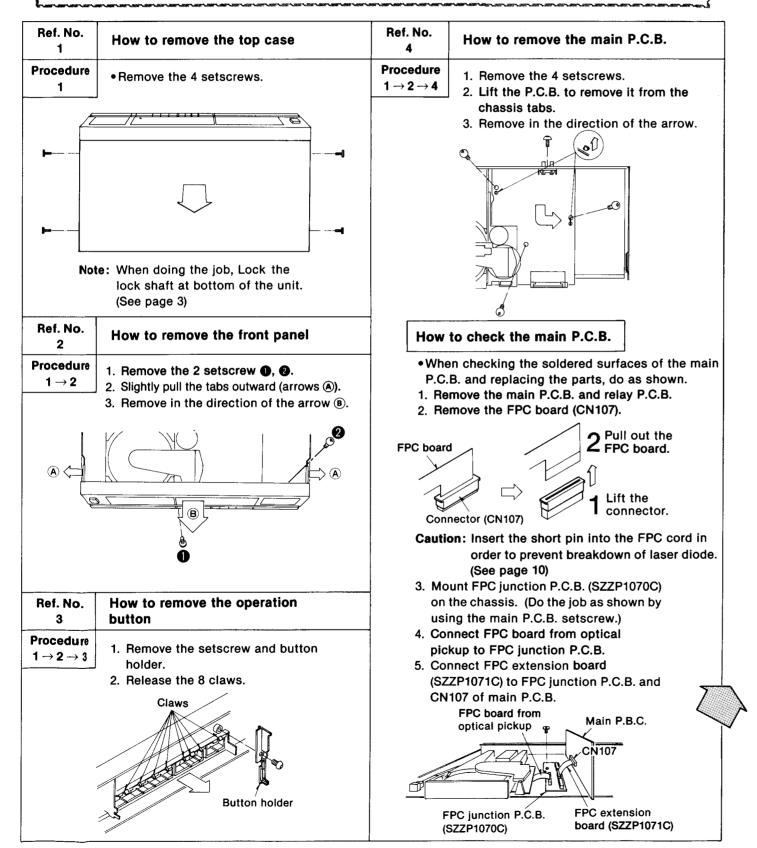


to conduct dect ricity

#### **■ DISASSEMBLY INSTRUCTIONS**

#### **CAUTION:**

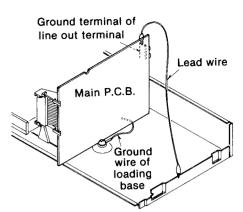
- It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- When doing the job, removing the cabinet and disc clamper of this unit, be sure to turn the power supply off.



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

#### Cautions:

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



4 \&	Ref. No. 5	How to remove the disc clamper	Ref. No.	How to remove the power supply P.C.B.
		Remove the setscrew.		<ul> <li>Remove in the numerical order shown.</li> <li>(Shift the disc holder forward.)</li> </ul>



Ref. No. How to remove the disc holder (disc tray)

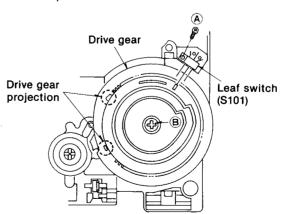
Remove the 2 setscrews.

Pull out the connector.

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

Procedure 1 → 2 → 5 → 7

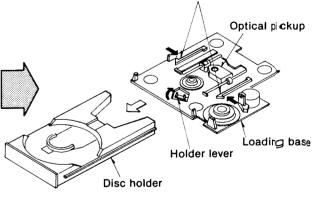
 Set the drive gear as shown below. (Turn it completely to the right, then turn it to the left by about 20° so that drive gear teeth or projection will not touch the rack of disc holder.)



• To remove the drive gear

Remove the screw (a) of leaf switch
(S101), then remove the drive gear
setscrew (b).

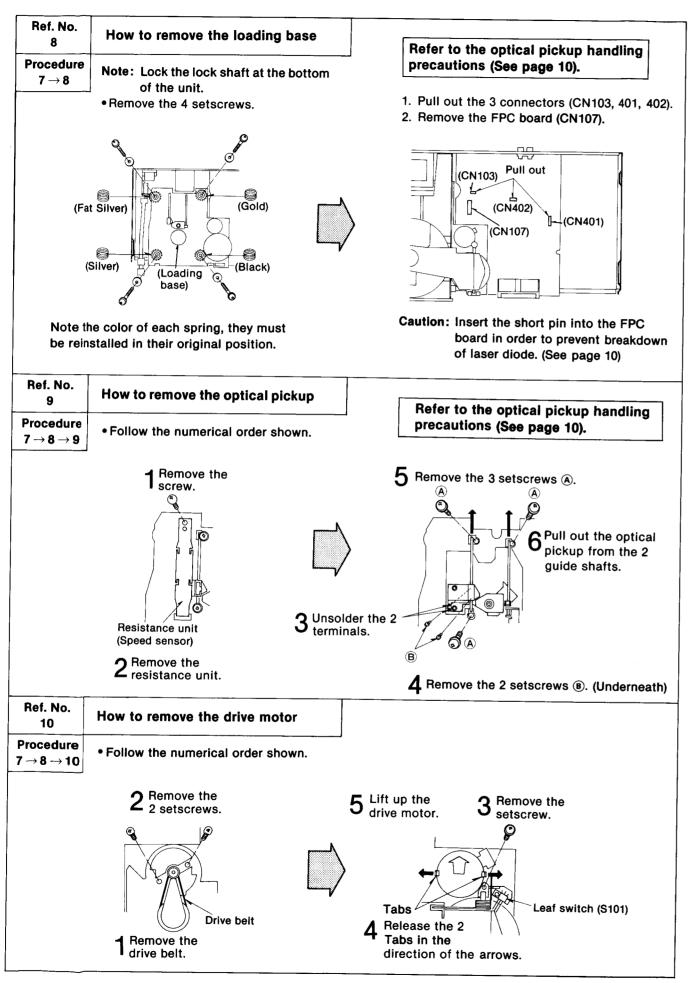
- 1. Push the holder lever backward, (From underneath the loading base.)
- 2. Pull the disc holder and bend the 2 claws of disc holder stopper of loading base toward the optical pickup.
- 3. Further pull out the disc holder to remove it. Stoppers



#### Caution for fitting

When fitting the disc holder, make the drive gear as shown on the left, and then insert the disc holder along the guide of loading base.

After inserting the disc holder completely, turn the drive gear to the right completely.



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

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

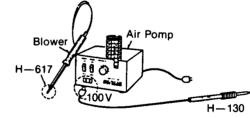
#### \* Special soldering iron

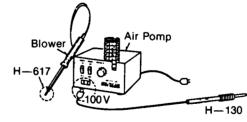
(Refer to Technical Information, ORDER NO. GAD84125486T1)...For U.S.A. and Canada (Refer to Technical Information, ORDER NO. GAD84115476T8)...For others

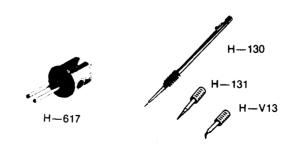
#### Spot Heater (hot-air solder iron)

This device that uses hot air to melt solder was developed to remove Flat-Package ICs, RHCs and chip parts.

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







## Twin Nozzle (for spot heater)

Special nozzle for the removal of RHCs and chip resistors. (Nozzle diameter: 1.0 mm × 2)

#### Slim Pencil Solder Iron

An ultrasmall ceramic heater solder iron is extremely handy for soldering chip parts, RHCs, ICs etc., to highdensity circuit boards.

#### Features:

• Rated power: 100 V, 15 W Max. temp.: 400°C

• Heater: ceramic (long life)

•Insulation resistance: 100 MΩ • Length: 178 mm

• Weight: 16g (not including cord)

#### •H-131, H-V13 Cap Bits

Solder tip for the slim pencil Solder Iron is composed of a bit holder and a corrosion resistance side r tip. Permits changing of solder tips even while sill hot.

Solder tip:

0.3 mm

## **■ TERMINAL FUNCTION OF LSI**

## • MN15261PDU (System Control and FL Drive)

Pin No.	Mark	Signal	I/O Devision	Function
No.			Devision	
1	vss	GND	1	GND terminal
2	X0		0	Not used (Open)
3	X1	SENSE	ı	Optical servo condition input
4	P00	PC	0	Spindle motor control signal (ON OFF command)
5	P01	M DATA	0	Command data output
6	P02	MCLK	0	Command clock output
7	P03	MLD	0	Command load output
8	P10	M-RLY	0	Muting relay control
9	P11	D-DAT	0	Data output
10	P12	SYNC	O	Synchro recording control (Not used)
11	P13	D-OP	0	Direct operation control (Not used)
12	SYNC		0	Not used (Open)
13	RST	RESET	1	Reset signal input (reset at "L")
14	ĪRQ	BLKCK	-	Sub-code block (Q data) clock (75 Hz) input
15	P50		1	Koy coop input
18	P53		'	Key scan input
19	SBT	CLDCK	1	Sub-code frame clock (7.35 kHz)
20	SBD	SUBQ	ı	Sub-code Q data input
21	P20	TGC	0	
22	P21	TRV-H	0	Traverse servo control signal
23	P22	TRV-R	0	Traverse reverse command signal
24	P23	RRV-F	0	Traverse forward command signal
25	P30	CNT4	0	Optical servo IC control signal (KICKR: Kick direction [Reverse] command)

	Pin No.	Mark	Signal	I/O Devision	Function
	26	P31	CNT3	0	Optical servo IC control signal (KICKF: Kick direction [Forward] command)
-	27	P32	CNT2	0	Optical servo IC control signal (TRON: Tracking servo)
	28	P33	CNT1	0	Optical servo IC control signal (FOON: Focus servo)
	29	P40	START	ı	Key input strobe and processing status input from signal processing LSI traverse position detection.
	30	P41	D END	0	Data (end signal) signal
	31	P42	FLOCK	ı	Optical servo condition (focus) input
	32	P43	SENSE	1	Optical servo condition (track cross) input
	33	PE0	CLOSE	0	Loading motor close command (ON at "L")
	34	PE1	OPEN	0	Loading motor open command (ON at "L")
1	35	P60	CLK	0	Clock signal output
	36	P61	D-STA	0	Data start signal
	37	DAC	DAC	0	
$\left  \cdot \right $	38	VPP		1	FL drive power supply (connected to $-32\text{V}$ )
	39	D0			FL grid signal and key
1	52	DD		0	scan signal
1	53	S8			El d l l
1	61	S0		0	FL anode signal
1	62	OSC2		ı	Clock terminal
$\ $	63	OSC1		1	Clock input
	64	VDD		ı	Power supply (connected to +5V)

#### • MN1550PDT (Remote Control Signal Processing)

Pin No.	Mark	Signal	I/O Devision	Function
1	VDD		ı	Power supply (connected to +5V)
2	osc	SMCK	ı	Clock input
3	P23			
4	P22			
5	RST	RESET	1	Reset signal input
6	P21			
7	P20		ı	Remote control signal input
8	IRQ		I	Program enable/de-enable control

Pin No.	Mark	Signal	I/O Devision	Function
9	SYNC		0	Clock output
10 ≀ 13	P10	Data		Nov. etraha
14	P00 ? P03	Data	1	├ Key strobe
18	vss	GND	ı	GND terminal

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

Pin No.	Mark	I/O Devision	Function	Pin No.	Mark	I/O Devision	Function
1	BLKCK	0	Sub-code block (Q data) clock (75 Hz)	34	DA8/FCLV	0	16-bit data output/Synchronizing detection signal (Not used)
2	CLDCK	0	Sub-code frame (Q data) clock (7.35 kHz)	35	DA7/ IPBYTE	0	16-bit data output/Interpolation flag for each byte (Not used)
3	SUBQ	0	Sub-code (Q data) output	36	DA6/IPSEL	1/0	16-bit data output/ interpolation inhibit (Not used)
4	CRC	0	Sub-code (Q data) CRC check (Not used, open)	37	DA5/FLAG5	0	16-bit data output/C2 decoder correction flag 3 (Not used)
5	RST	1	Reset signal input (reset at "L")				16-bit data output/C2 decoder
6	MLD	ı	Command load input	38	DA4/FLAG4	0	correction flag 2 (Not used)
7	MCLK	1	Command clock input	39	DA3/FLAG3	0	16-bit data output/C2 decoder correction flag 1 (Not used)
8	MDATA	1	Command data input				16-bit data output/C1 decoder
9	DMUTÉ	ı	Muting control (muting ON at "H")	40	DA2/FLAG2	0	correction flag 2 (Not used)
10	TRON	ļ	Tracking servo ON signal (tracking servo ON at "L")	41	DA1/FLAG1	0	16-bit data output/C1 decoder correction flag 1 (Not used)
11	STAT	0	Processing condition (CRC, OTC, CLVOK, TT STOP) output	42	DA0/FLCK0	0	16-bit data output/Crystal frame clock
12	SMCK	0	Clock output (4.2336 MHz)	43	D7		10 K BANLL
13	PMCK	0	Pitch control clock output (Not used, open)	50	D0	I/O	16 K RAM data output
			Track counter input signal	51	RAMOE	0	16 K RAM OE signal
14	ITC	1	(Not used, connected to +5V)	52	RAMWE	0	16 K RAM WE signal
15	TEST	ı	Test mode selection (Not used, connected to +5V)	53 5 63	RAMA 0 S RAMA10	О	16 K RAM address signal (RAMA0 : LSB, RAMA10: MSB)
16	X2	0	Clock output (16.9344 MHz)	-			Spindle motor ON signal
17	X1	ı	Clock input (16.9344 MHz)	64	PC	0	(ON at "L")
18	SEL	ļ ļ	DA output parallel/serial selection (serial at "L")	65	EC	0	Spindle motor drive signal
19	LDG/WDCK	0	L channel deglitch signal/serial data word clock,	66	FG		Spindle motor FG signal input
20	RDG	0	R channel deglitch signal.	68			
21	DEMPH	0	De-emphasis ON signal (de-emphasis ON at "H")	69			
22	IPFLAG	0	Interpolation flag (interpolation at "H")	70			
23	FLAG0	0	Error flag (error at "H")				
24	FLAG6	0	16 K RAM address reset signal	72	PCK	l I	PLL extract clock input
-			(reset at "H")	73	VDD	I	Power supply (connected to +5V)
25	XCK	0	Clock (16.9344 MHz) output (Not used, open)	74	EFM	1	EFM signal input (PLL)
26	DA15/ SRDATA	0	16-bit data output/serial data output (MSB first)	75 76	SRF	1	Drop-out signal (Drop-out at "H")
27	DA14/	0	16-bit data output/serial data	77	CLVS	0	11T servo OK signal (OK at "H")
	SRDATAX		output (LSB first)	78	FPC	0	PLL frequency comparision signal
28	DA13/SRCK	0	16-bit data output/serial data beat clock.	79	BSSEL	0	PLL frequency in take operation signal.
29	DA12/WDCK	0	16-bit data output/serial data word clock (Not used)	80			
30	DA11/ BYTCK	0	16-bit data output/serial data byte clock (Not used)	81			
31	GND	1	GND terminal	82			
32	DA10/RIL	0	16-bit data output/RIL signal	83	SUBC	0	Sub-code serial output data
33	DA9/RESY	0	16-bit data output/ Resynchronizing signal	84	SBCK	-	Clock for sub-code serial output

#### • AN8370\$ (Optical Servo Control)

Pin		1/0		]	ī —	1	Γ
No.	Mark	Devision	Function	Pin No	Mark	I/O Devision	Function
1	VEE	1	Power supply (connected to -5V)	_ 23	CNT2		Control input
2	LSA	1	Phase difference input (A)	-			(TRON : Tracking servo ON signal)
3	GND	ı	GND terminal	24	CNT3	ı	Control input (KICKF : Kick direction [forward]
4	LSB	ı	Phase difference input (B)	-	<u> </u>		command)
5	APC	0	Auto laser power control output	25	CNT4	1	Control input (KICKR : Kick direction [reverse]
6	TEOUT	0	Tracking error-signal output	<b>-</b>	<u> </u>		command)
7	TEG	1	Tracking error gain adjusting input	26	F-LOCK	0	Focus lock signal output
8	TE-	1	Phase difference-voltage conversion (—)	27	C-FBDO	0	Capacitor connection for inversion RF high speed detection
9	TE+	1	Phase difference-voltage conversion (+)	28	C-SBDO	0	Capacitor connection for inversion RF low speed detection
10	APC -	0	Laser power inversion input	29	C-SBRT	0	Capacitor connection for non- inversion RF low speed detection
11	С-МЕМ	l	Capacitor connection for phase difference memory	30	C · FBRT	0	Capacitor connection for non- inversion RF high speed detection
12	APC +	1	Laser power non-inversion input	31	RF OUT	0	RF signal output
13	VREF	0	Reference current generation	32	BDO	0	Drop-out detection output
14	SENSE	0	Selector output (track-crossed)	33	RFIN	1	RF signal input
15	HIN	1	Tracking hold circuit input	34	S-OUT	0	Focus search signal output
16	HOUT	0	Tracking hold circuit output	35	C·LW	ı	Capacitor connection for
17	SPCNT	0	Track-cross speed control output (not used, grounded)	36	FE-OUT	0	triangular wave generation
				$\parallel$		-	Focus error signal output
18	C·MSP	ı	Track-cross reference speed setting capacitor connection	37	FEG	. 1	Focus error gain adjusting input
			(not used, grounded)  Auto focus timer capacitor	38	FE·REF	1	Focus error comparison voltage generation
19	C·AF	1	connection	39	PDB	ı	Photo detector current input (B)
20	KICK R/F	0	Track kick signal output	40	IVB	0	Current/voltage conversion output (B)
21	VCC	1	Power supply (connected to +5V)				
22	CNT1	1	Control input (FOON: Focus servo ON signal)	41	IVA	0	Current/voltage conversion output (A)
			I I I I I I I I I I I I I I I I I I	42	PDA	1	Photo detector current input (A)

## • EHDGA1243 (Data Slice and PLL)

Pin No.	Mark	I/O Devision	Function	Pin No.	Mark	I/O Devision	Function
1	PCK	0	Clock output extracted from SRF	9	NC	T	Non connection
2	EFM	0	EFM signal output synchronized with PCK	10	VR	ı	Resistor connection for VCO oscillation frequency
3	D-GND		GND terminal (digital system)	11	VEE	1	Power supply (connected to −5V)
4	SRF	0	RF signal output data-sliced into digital value	12	VC1	ı	Capacitor connection for VCO oscillator frequency
5	SLC	1	Slice level control signal input	13	VC2		Capacitor connection for VCO
6	DO	0	Drop-out detection pulse output				oscillator frequency
7			Frequency comparison error signal	14	A-GND	'	GND terminal (analog system)
7	FPC		input.	15	RF	ı	RF signal input
8	VCC	ı	Power supply (connected to +5V)			<del>-1</del>	

#### • MN6618 (Digital Filter)

Pin No.	Mark	I/O Device	Function
1			
2	D012	0	16-bit parallel data output
3	D011/SCK	0	16-bit parallel data output/ serial output bit clock
4	D010/SOUT	0	16-bit parallel data output/ serial output data
5	GND	1	GND terminal
6	D09	0	16-bit parallel data
7			
8	D08	0	16-bit parallel data
9	D07	0	16-bit parallel data
10			
11			
12	D06	0	16-bit parallel data
13	D05	0	16-bit parallel data
14	D04	0	16-bit parallel data
15	D03/2RLCK	0	16-bit parallel data/RL signal
16			
17			
18	D02/WCK	О	16-bit parallel data/serial output word clock
19	D01	0	16-bit parallel data
20	D00	0	16-bit parallel data (LSB)
21	MDATA	I	Command data input

Pin No.	Mark	I/O Device	Function
22			
23	MCLK	1	Command clock input
24	MLD	1	Command load input
25			
26	RST	1	Reset signal input (reset at "L")
27	VDD	1	Power supply (connected to +5V
28	LRCK	ı	R/L signal
29			
30	SFT	ı	Serial data input clock
31	SIN	I	Serial data input
32			
33	X OUT	0	Clock output (Not used)
34	X IN	1	Clock input (16,9344 MHz)
35	OSEL	_	DA output parallel/serial selectio (parallel at "H")
36	LDGL	0	L channel deglitch signal
37	RDGL	0	R channel deglitch signal
38	VDD	ı	Power supply (connected to +5)
39	D015	0	16-bit parallel data (MSB)
40	D014	0	16-bit parallel data
41			
42	D013	0	16-bit parallel dat₃

#### • AN8290S (Spindle Motor Drive)

Pin No.	Mark	I/O Devision	Function
1	GND	1	Minimum potential of IC control. (In this unit, it is connected to VEE [-8.5V])
2	DCR	1	Standard voltage of FAI, PC, CLK. (In this unit, it is connected to 2.5 V.)
3	FAI	-	Torque command filter amp. input. (Normal rotation command when FAI < DCR.)
4	FAO	0	Filter amp. output.
5	DI	ı	Absolute value circuit input.
6	LPF	1	Capacitor terminal for low pass filter of current feedback loop.
7	A1	0	
8	A2	0	Drive signal output.
9	A3	0	
10	PGND	ı	Minimum potential of IC power. (In this unit, it is connected to VEE [ -8.5 V])
11	CS	1	Drive current detection resistor terminal.
12	PVCC	1	Power input for IC power.

Pin No.	Mark	I/O Devision	Function
13	H3-	ı	
14	H3+	ı	Not used in this unit.
15	H2-	ı	Negative output of Hallelement is input.
16	H2+	ı	Positive output of Hallelerment is input.
17	H1-	I	Negative output of Ha∥el⊜ment is input.
18	H1+	ı	Positive output of Hallelernent is input.
19	нѕѡ	1	Bias switch of Hall elemen t. (OFF when PC > DCR)
20	нв	ı	Bias power of Hall eleners t.
21	vcc	ı	Power input for IC corirol -
22	PC	ı	Power control. (Power down mode when PC>DCR)
23	CLK	ı	Clock input. (DCR standard, operate at the edge of rise.)
24	тс	ı	Triangular wave generation capacitor terminal.

#### ■ RESISTORS AND CAPACITORS

- Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
  - 2. Important safety notice: Components identified by  $\Lambda$  mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
- 3. Unless otherwise specified. All resistors are in OHMS ( $\Omega$ ) K = 1000 $\Omega$ , M = 1000k $\Omega$ . All capacitors are in MICORFARADS ( $\mu$ F), P = 10<sup>-6</sup> $\mu$ F.

#### **Numbering System of Resistor**

#### **Numbering System of Capacitor**

Exampl	e						Example				
ERD	S2		Т		J	101	ECKD	1H	102	κ	С
Type	Wattage (1/4W)	Sh	ape		erance 5%)	Value (1kΩ)	Туре	Voltage (50V)	Value (0.001μF)	Tolerance ( ± 10%)	Peculiarity
ERJ	8	GEY	J		102	$\square$	ECEA	_0G	KS	470	L
Type	Wattage (1/8W)	Shape	Tolera (± 5		Value (1kΩ)	Specialuse	Type	Voltage (4V DC)	Peculiarity use	Value (47μF)	Special use
Re	esistor Type	W	attage	Тс	olerance		GR426	В	273	κ	25
				+			<del>-</del>				

R	esistor Type	W	attage	Tolerance		
ERD ERJ	: Carbon : Chip Type Carbon	S2 8	: 1/4W : 1/8W	J : ± 5% K : ± 10%		

011420		273	IX.	25
Туре	Peculiarity	Value (0.027μF)	Tolerance (± 10%)	Voltage (25V)

#### • Indication of RCBS type capacitor (Axial type)

#### Rated voltage

The rated voltages are indicated by insulating paint colors.

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

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

#### • Electrostatic capacity and characteristics

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

	Color band	Brown	Red	Orange	Yellow	Green	Blue	Purple	Gray	White	Black	Gold	Silver
	1st, 2nd color bands (Effective number of nominal electrostatic capacity)	1	2	3	4	5	6	7	8	9	0		—
	3rd color band (Multiplier of nominal electrostatic capacity)	10 <sup>1</sup>	10 <sup>2</sup>	10 <sup>3</sup>	10 <sup>4</sup>	_	_	_	_	_	10 <sup>0</sup>	10 <sup>-1</sup>	10-2
	4th color band (Tolerances)	_		_	_	_	_		N	z	М	J	К
	5th color band (Temperature characteristic)								•	•			

#### • RESISTORS

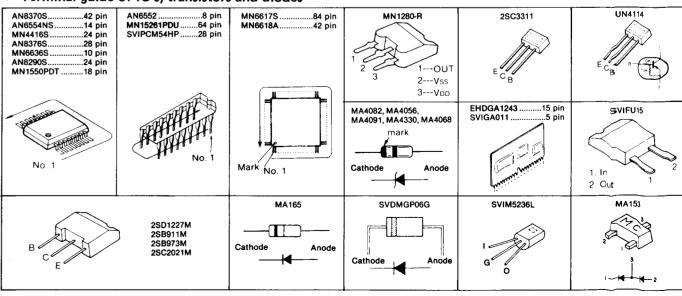
	T				$\overline{}$		T	T			1
Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
R11, 12	ERDS2TJ681	680	R141	ERDS2TJ102	1K	R181	ERDS2TJ222	2.2 K	R414, 415	ERDS2TJ472	4.7K
R13	ERDS2TJ221	220	R142	ERDS2TJ333	33 K	R182, 183	ERDS2TJ564	560 K	R416	ERDS2TJ913	91 K
R14	ERDS2TJ101	100	R143	ERDS2TJ224	220 K	R184	ERDS2TJ472	4.7 K	R417	ERDS2TJ124	120K
R15, 16	ERDS2TJ561	560	R144	ERDS2TJ333	33 K	R185, 186	ERDS2TJ473	47 K	R418	ERDS2TJ913	91 K
R17	ERDS2TJ222	2.2K	R145	ERDS2TJ153	15 K	R187, 188	ERDS2TJ473	47 K	R419	ERDS2TJ124	120 K
R18	ERDS2TJ822	8.2	R146	ERDS2TJ122	1.2K	R189	ERDS2TJ123	12K	R420	ERDS2TJ101	100
R19	ERDS2TJ103	10 K	R147	ERDS2TJ682	6.8 K	R190	ERDS2TJ332	3.3 K	R421, 422	ERDS2TJ103	10 K
R20	ERDS2TJ332	3.3 K	R148	ERDS2TJ104	100 K	R191	ERDS2TJ154	150 K	R423	ERDS2TJ103	10 K
R21	ERDS2TJ153	15 K	R149	ERDS2TJ152	1.5 K	R192	ERDS2TJ824	820 K	R424	ERDS2TJ473	470 K
R22, 23	ERDS2TJ682	6.8K	R150	ERDS2TJ103	10 K	R193	ERDS2TJ101	100	R425, 426	ERDS2TJ103	10K
		i	1			1		i	1		
R24, 25	ERDS2TJ471	470	R151	ERDS2TJ101	100	R194	ERDS2TJ683	68 K	R427, 428	ERDS2TJ103	10 K
R26	ERDS2TJ471	470	R152	ERDS2TJ153	15 K	R195, 196	ERDS2TJ103	10 K	R429, 430	ERDS2TJ222	2.2K
R101	ERDS2TJ154	150 K	R153	ERDS2TJ270	27	R197	ERDS2TJ473	47 K	R431, 432	ERDS2TJ222	2.2 K
R102, 103	ERDS2TJ472	4.7 K	R154	ERDS2TJ3R3	3.3	R198	ERDS2TJ333	33 K	R433	ERDS2TJ103	10K
R104	ERDS2TJ223	22 K	R161	ERDS2TJ333	33 K	R301	ERDS2TJ102	1 K	R434	ERDS2TJ472	4.7 K
R105	ERDS2TJ334	330 K	R162	ERDS2TJ222	2.2 K	R302	ERDS2TJ472	4.7 K	R501, 502	ERJ8GEXK1R5	1.5
R107	ERDS2TJ683	68 K	R163	ERDS2TJ333	33 K	R303, 304	ERDS2TJ102	1K	R503	ERJ8GEYJ223	22 K
R108	ERDS2TJ332	3.3 K	R164	ERDS2TJ153	15 K	R305	ERDS2TJ104	100 K	R801, 802	ERDS2TJ102	1 K
R109	ERDS2TJ822	8.2K	R165	ERDS2TJ122	1.2 K	R307	ERDS2TJ471	470	R803, 804	ERDS2TJ122	1.2 K
R110, 111	ERDS2TJ682	6.8K	R166	ERDS2TJ102	1K	R401, 402	ERDS2TJ223	22 K	R805, 806	ERDS2TJ221	220
			1		- 1	1		- 1			
R112	ERDS2TJ822	8.2K	R167	ERD\$2TJ681	680	R403	ERDS2TJ472	4.7 K	R807, 808	ERDS2TJ391	390
R113, 114	ERDS2TJ182	1.8K	R168	ERDS2TJ272	2.7 K	R404	ERDS2TJ394	390 K	R809, 810	ERDS2TJ473	47 K
R115	ERDS2TJ102	1 K	R169	ERDS2TJ392	3.9 K	R406	ERDS2TJ394	390 K	R811, 812	ERDS2TJ563	56 K
R116, 117	ERDS2TJ182	1.8K	R170	ERDS2TJ101	100	R407	ERDS2TJ152	1.5 K	R813, 814	ERDS2TJ560	56
R118	ERDS2TJ102	1K	R171	ERDS2TJ270	27	R408, 409	ERDS2TJ472	4.7 K	R815, 816	ERDS2TJ223	22 K
R119	ERDS2TJ471	470	R172	ERDS2TJ3R3	3.3	R410, 411	ERDS2TJ472	4.7K	R1001	ERDS2TJ103	10 K
R120	ERDS2TJ120	12	R180	ERDS2TJ474	470 K	R412, 413	ERDS2TJ472	4.7 K	I		

#### CAPACITORS

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
C1 A	ECKDKC103PF	0.01	C110	ECFR1H104ZF	0.1	C145	ECEA1HSNR22	0.22	C402	ECEAOJU470	47
C11, 12	ECFR1H104ZF	0.1	C111, 112	ECEA1HU100	10	C161	ECQM1H153KV	0.015	C403	ECKD1H103KB	0.01
C13	ECEA1CU470	47	C113	ECEA1HKNR33	0.33	C162	RCBS1H681KB	680 P	C404	ECFR1H104ZF	0.1
C14	ECFR1H104ZF	0.1	C114	RCBS1C182MXY	0.0018	C163	ECQM1H103KV	0.01	C405	ECFR1H104ZF	0.1
C15, 16	ECEA1CU221	220	C115	RCBS1C682MXY	0.0068	C164	ECEA1ESN3R3	3.3	C406	ECCD1H220K	22 P
C17	ECFR1H104ZF	0.1	C116	ECQM1H333KV	0.033	C165	ECEA1HSN0R1	0.1	C501	ECEV1 EV330	33
C18	ECFF1H104ZF	0.1	C117	RCBS1H221KBY	220 P	C181	ECQM1H104KV	0.1	C502	ECEV1 HV010	1
C19, 20	REC1A101M0T	100	C118	ECEA1HU010	1	C182	ECCD1H221KB	220 P	C504	GR426B273K25	0.027
C21, 22	ECEA1CU222	2200	C119	ECEA0JU220	22	C183	ECQM1H103KV	0.01	C506	GR426B152K50	0.0015
C23, 24	ECEA1CU331	330	C120	RCBS1H681KB	680 P	C184	ECEA1HSN010	1	C507	GR426B104Z25	0.1
C25, 26 C27, 28 C29	ECEA1VU101 ECEA0JU331 ECEA0JU101	100 330 100	C121 C122, 123 C124	ECKD1H103KB ECCD1H101KB ECFR1H104ZF	0.01 100 P 0.1	C186 C187 C301	ECFR1H104ZF ECEA1VSN2R2 ECCD1H220K	0.1 2.2 22 P	C511, 512 C513 C801, 802	ECEA1 EN470B ECEA1 EN470B ECKD1 H391KB	47 47 390 P
C101	ECFR1H104ZF	0.1	C125	ECEA0JU220	22	C302	ECCD1H220K	7P	C803, 804	RBP1CN220MCT	22
C102, 103 C104 C105, 106 C107 C108 C109	ECKD1H102KB ECKD1H681KB ECKD1H471KB ECCD1H220K ECEA1HU0R1 ECEA1HU010	0.001 680 P 470 P 22 P 0.1	C126 C127, 128 C141 C142 C143 C144	ECEA0JU470 ECKD1H102KB ECQM1H153KV ECQM1H122KV ECQM1H473KV ECEA1VSN2R2	47 0.001 0.015 0.0012 0.047 2.2	C303 C304, 305 C306 C307 C308 C401	ECEA1VSN2R2 ECFR1H104ZF ECKD1H103KB ECKD1H471KB ECFR1H104ZF ECFR1H104ZF	2.2 0.1 0.01 470 P 0.1 0.1	C805, 806 C810 C812 C813, 814	ECKD1 H102KB ECFR1 H104ZF ECKD1 H103KB ECEA1 CN220S	0.001 0.1 0.01 22

lue	Ref. No.	Part No.	Value
.22	C402	ECEAOJU470	47
015	C403	ECKD1H103KB	0.01
30 P	C404	ECFR1H104ZF	0.1
0.01	C405	ECFR1H104ZF	0.1
3.3	C406	ECCD1H220K	22 P
0.1	C501	ECEV1 EV330	33
0.1	C502	ECEV1 HV010	1
20P	C504	GR428B273K25	0.027
.01	C506	GR428B152K50	0.0015
1	C507	GR426B104Z25	0.1
0.1	C511, 512	ECEA1 EN470B	47
2.2	C513	ECEA1 EN470B	47
2P	C801, 802	ECKD1H391KB	390 P
7P	C803, 804	RBP1CIN220MCT	22
2.2	C805, 806	ECKD1 H102KB	0.001
0.1	C810	ECFR1 H104ZF	0.1
.01	C812	ECKD1 H103KB	0.01
'OP	C813, 814	ECEA1 CN220S	22
0.1			
٠. ۱	I		

#### • Terminal guide of IC's, transistors and diodes



#### ■ REPLACEMENT PARTS LIST

Ref. No.

IC11, 12 IC13 IC101 IC102 IC103, 104 IC301 IC302 IC303 IC304 IC401

IC402 IC403 IC404 IC501

IC602 [M, MC] IC602 [other]

TRANSISTORS

Q11 Q12~14 Q15 Q16 Q17 Q101 Q141 Q142 Q161 Q162

Q181 Q182 Q402 Q403

IC801 IC802 IC803 IC804, 805 IC1001

INTEGRATED CIRCUITS

- Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
  - 2. Important safety notice:

Part No.

Components identified by A mark have special characteristics important for safety. When replacing any of these components, use only

manufacturer's specified parts. 3. Bracketed indications in Ref. No. columns specify the area.

- Parts without these indications can be used for all areas. 4. The "S" mark is service standard parts and may differ from
- production parts. 5. (e)-marked parts are used for black type only, while ()-
- marked parts are for silver type only. 6. Part other than @-and O-marked are used for both black and silver types.
- 7. The parenthesized numbers in the columns of description stand for the quantity per set.

Description

#### Color

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

Part No.

Description

Ref. No.

TRANSISTORS

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

Ref. No.		Part No.	Description
FUSES			•
F1 Except [M, MC]	Δ	XBA2C012TB0S	250 V, T 125 mA
F2 XA, XB, PA, PE, PC only	Δ	XBA2C025TB0S	250 V, T 250 mA
COMPONEN	T C	OMBINATION	
C2	<b>A</b>	EXRES2037S	0.01uF × 2

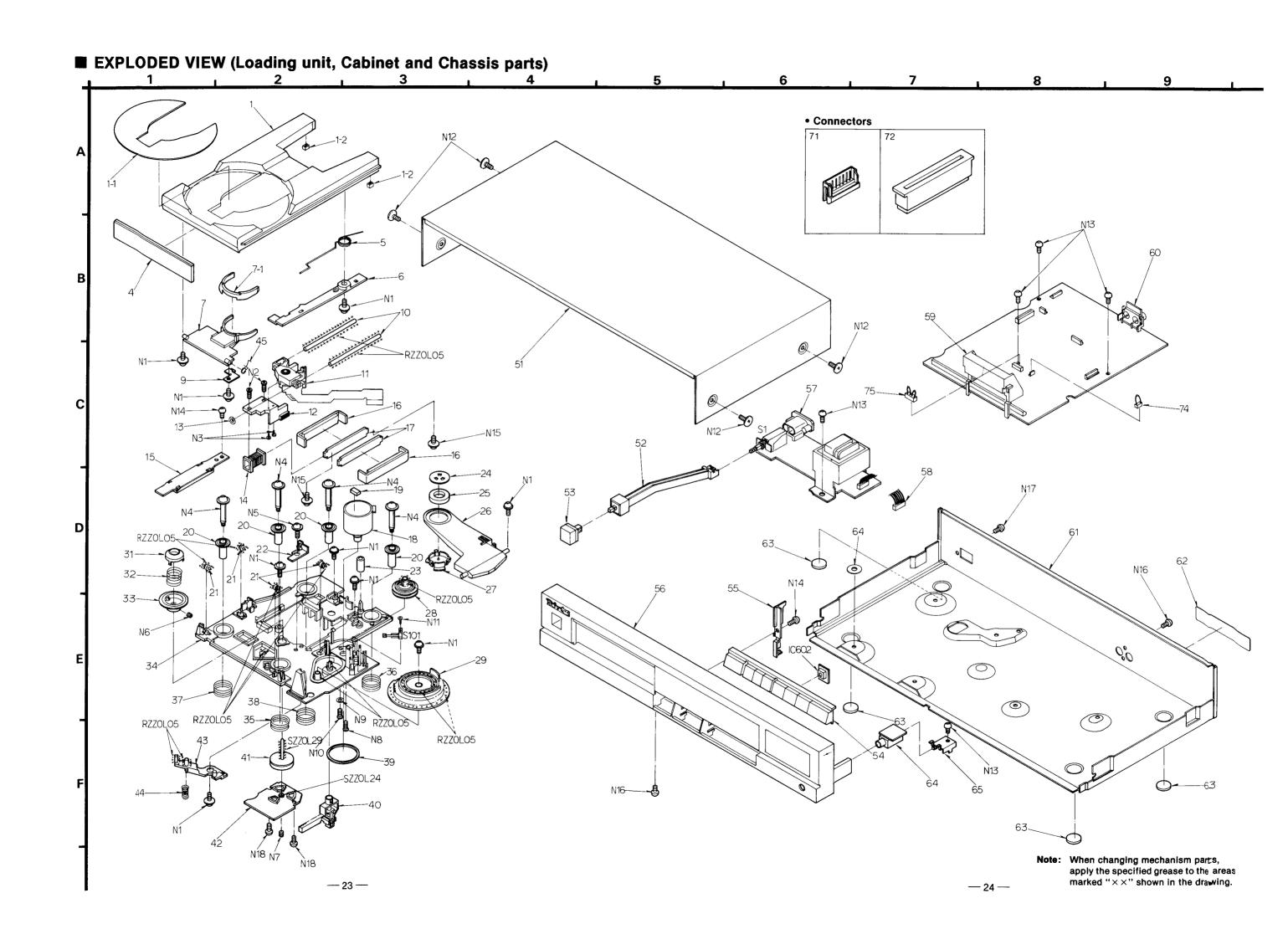
_			_	1 H					_	L				
	SVIFU15	Integrated Circuit			Q1001 Q1002		UN4212 UN4112	Transistor Transistor		F	1 Ex			012TB0S 250V, T12
	SVIM5236L	Integrated		l ⊩			014112	TIANSISTOI		F	2   X		B, ] A XBA2CO	25TB0S 250V, T25
	AN8370S	Circuit Integrated		l ⊦	DIODES				4	١	[P	A, PI C	E, ]	
	MN6636S	Circuit Integrated Circuit		П	D11, 12 D15, 16 D17		MA4091 – M MA4068TA MA4330	Zener Zener Zener		Ļ	on MO	<u> </u>	IENT COMBINE	TION
	AN6554NS	Integrated			D18		MA4082M	Zener		Ľ	OM	PUI	ENT COMBINA	ATION
	MN6617S	Circuit Integrated Circuit			D19~26 D181, 182, 401~404,		SVDMPG06G MA165	Rectifier Diode		ľ	2		▲ EXRFS2	03ZS 0.01μF×2
	MN6618A	Integrated Circuit			406~413, 415~418				-	L		_		
	MN4416S	Integrated Circuit			0501 01001~1004		MA153 MA165	Diode Diode		Г	Ref. t	No.	Part No.	Description
	EHDGA1243	Integrated Circuit		1	CRYSTAL				$\dashv$	⊦			UNIT PARTS	Description
	MN15261PDU	Integrated Circuit		Н	(301		SVQ16CKSS	16.9344 Hz	$\dashv$	1		,,,,,	SIRLP110-KM	Disc Tray Ass'y
	AN6552	Integrated Circuit	ĺ	F	RELAY				7		1-1 1-2		SHSD13 SHGD49	Sheet Rubber
	MN1280-R	integrated Circuit	1	F	RL1001		SFDYG5A237P	Muting	$\neg$	4		Q	SGXD170MA0A	Ornament Plate
	MN1550PDT	Integrated Circuit	1	٧	/ARIABLE	RES	ISTORS		٦,	4		€	SGXD270ZK0A	Ornament Plate
	AN8290S	Integrated Circuit			/R101 /R102~105		EVND3AA00B53 EVND3AA00B14	5kΩ(B) 10kΩ(B)	]	5 6 7			SUSD29-1 SIRD20 SIRD16E-1	Spring Lever Holder Ass'y with
	SVIHC-MD03M	Integrated	١		/R106 /R301		EVND3AA00B53 EVN38CA00B13	5kΩ(B) 1kΩ(B)		ί	7-1		(SHGD46	Rubber Rubber Holder
	SVIHC-MD01E	Circuit Integrated Circuit	ı	F	IALL ELEM	IEN	rs	<u> </u>		9 10			SUWD46 SUXD25	Bracket Shaft
	SVIPCM54HP-1	Integrated	١	Н	1501, 502		OH-011	Hall Element	1	12	!	Δ	SOAD30A EWSL04A00000	Optical Pickup Holder
	MN6636S	Circuit Integrated	ı	F	LUORESC	ENT	DISPLAY TUBE		71	13 14			SHGD47 SORD10E	Rubber Coil
	AN8376S	Circuit Integrated	١	F	L401		SADD3	Display	71	15			EWS7B0A00Q53	Resistance Unit
		Circuit	l	C	OIL				71	16 17			SOYD8E SOYD9	Yoke Yoke
	SVIGA011	Integrated Circuit	ı	h.,	501		NII 45007400140		-11	18			SJGD4E	Motor
	MN1280-S	integrated	ı	۳	301		NL4532T100K2	10μF	╝	19 20			SHGD64 SHGD48-1	Rubber Rubber
		Circult	Ţ	S	WITCHES				-11	21			SDRD2	Roller
_			1	<u></u>		•	505001011	_	┨╏	22			SUWD44	Bracket
s			J	S	? 2 [XA, XB,]	$\Delta$	ESB8249V SRDSHXW0251	Power Voltage		23			SHGD69	Rubber
	2SD973A	Transistor	ı	٦	PA, PE,		O DO TATIOZO	voltage	- 1 1	24			SOYD2	Yoke
	2SB793A - QRS	Transistor	ı	1	[PC ]				- [ ]	25			SOMD4	Magnet
	2SD973A	Transistor	ı	L	only				- 1 1	26			SIRD17E	Clamper
	2SB793A - QRS	Transistor	ı	S	101		SSPD5	Open/Close	- 1 1	27			SIRD28	Holder
	2SB642 2SD637	Transistor Transistor	ı	اءا	401~408		00001 4	Detector	- 1 1	28			SDGD19	Gear
	2SD973A	Transistor	ı	3	#U1~#U8		SSGD1-1	Operation	-11	29			SDGD20	Gear
	2SB793A - QRS	Transistor	ı	P	OWER TRA	NSI	ORMER		╗╏	31			SDOD8	Ring
	2SD973A	Transistor	ı	Ľ	CTTEN INA		UNIVER			32			SRQA010N04	Spring
	2SB793A-QRS	Transistor	١.	Īτ	[M, MC]	Δ	SLTD5K022SC	Power Source		33 34			SDOD7-1	Turntable
	2SD973A	Transistor			[EK, XL]	$\overline{\Delta}$	SLTD5K024SG	Power Source		34 35			SISD7E SUSD32-1	Base Spring (Black)
	2SB793A - QRS	Transistor	П	۱''	1	Δ	SLTD5K025SX	Power Source	-11					
	2SD973A QNS	Transistor	П	1	PA, PE, PC					36			SUSD43	Spring (Gold)
	2SB793A - QRS	Transistor	11	ĺ٠٠	[PC ]	Δ	SLTD5K023SE	Dawer Causes		37			SUSD44	Spring (Silver)
_			1,	<u>'''</u>	formerl	<i>دی</i>	GET DURUZUGE	Power Source	┙┖	38			SUSD42	Spring (Fat Silver)

	Ref. No.	Part No.	Description	$\neg$	Ref. No.	Part No.	Description		Ref. No.	Part No.	Description	
	LOADING	G UNIT PARTS			CABINE	T and CHASSIS	PARTS	$\overline{}$	ACCESS	<u> </u>		
	39 40 41 42 43 44	SMBD2-1 SHRD23 SOMD9A SXPD940 SHRD19 SUSD31	Belt Lock Shaft Rotor Spindle P.C.B. Ass'y Lever	(1)	63 64 65 CONNE	SRGA008N01 QJA0455ZC SMND9-1	Rubber Headphones Jack Bracket	(4) (1) (1)	A2 [M] A A2 [MC] A A2 [EK] A A2 [XL] A A2 [XA] A	SJA170 SFDAC05G02 SJA173 SJA171	AC Cord AC Cord AC Cord AC Cord AC Cord	(1) (1) (1) (1) (1)
	45	SUSD51	Spring Spring	(1) (1)	71	EMCS0350Z	3 Pin (CN103)	(1)	A2 [XB] <u>∧</u> A2 <u>∧</u>	SJA183 SJA168-1	AC Cord AC Cord	(1) (1)
ı	CABINET	and CHASSIS	PARTS		71 71	EMCS0550Z EMCS0650Z	5 Pin (CN402) 6 Pin (CN11)	(1) (1)	PA, PE,	]		
þ	51 O		Top Case Top Case	(1) (1)	4 71 72	EMCS0750Z SJSD1709	7 Pin (CN401) 17 Pin (CN101)	(1)	A2 <u>A</u> [other]	SJA171	AC Cord	(1)
	52	SUBD5-M	Rod	(1)	SCREWS	S and WASHERS		(1)	A3 A4 △	SJP2249-1 SJP9215	Output Cord Adaptor	(1) (1)
þ	53 O	SBC666 SBC666-5	Button Button	(1) (1)	N1 N2 N3	SNSD10 XTN2+4G XQN17+A6	Screw Screw, ⊕2×4 Screw, ⊕1.7×6	(9) (2) (2)	XB, PA, PE, PC only A5	SFDK-119118	Plug	(4)
þ	54 O 54 ®	SBCD220MA0A SBCD220ZK0A	Button Button	(1) (1)	N4 N5	SHDD1-2 XTW3+8T	Screw, ⊕3×8	(4) (1)	[XA] only	3FDK-119110	riug	(1)
١	55	SHRD22-M	Bracket	(1)	N6 N7	XXE26D5 SNSD9	Screw Screw	(1) (1)	PACKING			
þ	56 O 56 O	SGYLP210-SE SGYLP210-KM	Front Panel Ass'y Front Panel Ass'y	(1) (1)	N8 N9 N10	XSN26+6 SFXW120-01 XSN26+8	Screw, ⊕2.6×.6 Washer Screw, ⊕2.6×8	(1) (1) (1)	P1 [EF] () P1 () [other]	SPND102	Carton Box Carton Box	(1) (1)
	57 [XL] <u>A</u> 57 <u>A</u> [other]	SJSD16 SJS9236	AC Socket AC Socket	(1) (1)	N11 N12 O N12 ®		Screw, ⊕2×5 Screw Screw	(1) (4) (4)	P1 [MC] (k) P1 [EF] (k) P1 (k) [other]	SPND86-1 SPND113 SPND85-1	Carton Box Carton Box Carton Box	(1) (1) (1)
	58 59 60	SWKD110061 SMND7-1 SJFD4 SGPD41ZF2A	Connector Holder Terminal Chassis	(1) (1) (1)	N13 N14 N15 N16 N17	XTV3+8JFYR XTV3+8G SFXGQ06N01 XTV3+8JFZ XTV3+8JFZ	Screw, ⊕3×8 Screw, ⊕3×8 Screw Screw, ⊕3×8 Screw, ⊕3×8	(5) (1) (2) (2) (1)	P2 P3 P4	SPSD45 SPSD46 XZB55X40A01 SPSD68	Pad Pad Polyethylene Bag, Unit Sheet	(1) (1) (1)
	XA, XB, PA, PE, PC I [other]	SGPD41ZF0A	Chassis		ACCESS	XTV3+10G ORIES	Screw, ⊕3×10	(2)	P6	SRHZJ02N01	Polyethylene Bag, Remote Control Unit	(1)
	32 [M] 32 [MC] 32 [E] 32 [EK] 32 [XL] 32 [EG]	SGTD94 SGTD95 SGTD96 SGTD97 SGTD98 SGTD99 SGTD101	Name Plate	(1)	A1 [M] A1 [MC] A1 [EK] A1 [Ei] A1 [E, EB, EH A1 [XB]	SQUD99 SQULP210-KMC SQUD102 SQUD103 SQULP210-KE SQULP210-KXB SQULP210-KPA	Instruction Book Instruction Book Instruction Book Instruction Book Instruction Book Instruction Book	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	P7	XZB23X20C03	Polyethylene Bag, Cords	(1)
ļ,	PA, PE, PC ] 2 [other]	SGTD100	Name Plate	(1)	PA, PE, PC A1 [other]	SQUD101	Instruction Book	(1)				

#### • REMOTE CONTROL UNIT

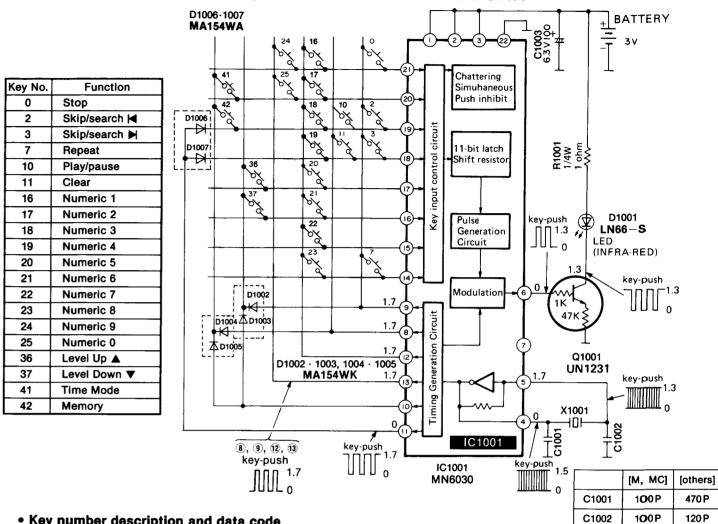
	Ref. No.	Part No.	Description
	INTEGRATED C	CIRCUITS	
ı	IC1001 [M, MC]	MN6030CA	Integrated
ı	IC1901 [other]	MN6030B	Circuit Integrated Circuit
	TRANSISTOR		
	Q1001	UN1231	Transistor
	DIODES		
	D1001 D1002~1005	LN66-S MA154WK	LED Diode
	D1006, 1007	MA154WA	Diode
	CERAMIC OSCI	LLATORS	
٢	X1001 [M, MC] X1001 [other]	CSB455EB1 CSB420PB1	455 KHz
٦	A 1001 (other)	CSB420PB1	420 KHz
	RESISTOR		
	R1001	ERDS2TJ1R0	Carbon, 1/4W, $1\Omega$ , $\pm 5\%$
	CAPACITORS		
ſ	C1001 [M, MC]	ECKD1H101KB	Ceramic, 50 V, 100 PF, ± 10 %
ן	C1001 [other]	ECKD1H471KB	Ceramic, 50V, 470PF, ±10%
П	C1002 [M, MC]	ECKD1H101KB	Ceramic, 50V,
4	C1002 [other]	ECKD1H121KB	100PF, ± 10% Ceramic, 50V, 120PF, ± 10%
	C1003	ECEA0JK101	Electrolytic, 6.3V, 100µF
•			-

	Ref. I	٧o.	Part No.	Description	
	CABI	NET	and CHASSIS I	PARTS	
	101		UR64PP246	Panel	(1)
4	102 102	(K)	UR64CS119A UR64CS119	Top Cover Top Cover	(1) (1)
	103 104 105		UR64SB125 UR64BT123A UR64CT122	Cover Button Rubber, Switch	(1) (20) (1)
I	106 106	( <u>C</u>	UR64CS120A UR64CS120	Bottom Cover Bottom Cover	(1) (1)
I	107		UR64LB126BL	Labei	(1)
	108 108	( <u>)</u>	UR64EC121A UR64EC121	Battery Cover Battery Cover	(1) (1)
	109 110 111		UR64TD128 UR64TD127 UR52TD101	Terminal ⊕ Terminal ⊕ Terminal	(1) (1) (1)
ľ	SCRE	ws			
	N101 N101	( <b>6</b> )	XTS26+12GFC XTS26+12GFZ	Screw, ⊕2.6×12 Screw, ⊕2.6×12	(2) (2)
_			-		

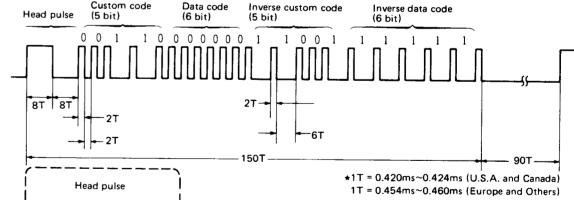


# **■ EXPLODED VIEW (Remote control parts)** D1001 N101 Q 110 109 Batteries: UM-3 "AA" or IEC R6 or equivalent (1.5V×2) **■ PACKING** P3-1 (Included in P3) P7 (A2, A3, A4, A5) Remote control unit P5 **— 25 —**

## ■ SCHEMATIC DIAGRAM OF REMOTE CONTROL UNIT







	Head pulse	!
	8T 8T	     
     	Data 1 6T 2T	1 1 1 1 1 1 1
	Data 0	

Key No.	Function	Data Code	Key No.	Function	Data Code
0	Stop	000000	20	Numeric 5	<b>©</b> 01010
2	Skip/search ►	010000	21	Numeric 6	101010
3	Skip/search ▶	110000	22	Numeric 7	O11010
7	Repeat	111000	23	Numeric 8	111010
10	Play/pause	010100	24	Numeric 9	O00110
_ 11	Clear	110100	25	Numeric 0	100110
16	Numeric 1	000010	36	Level Up ▲	Ø01001
17	Numeric 2	100010	37	Level Down ▼	₩01001
18	Numeric 3	010010	41	Time Mode	100101
19	Numeric 4	110010	42	Memory	Ø10101

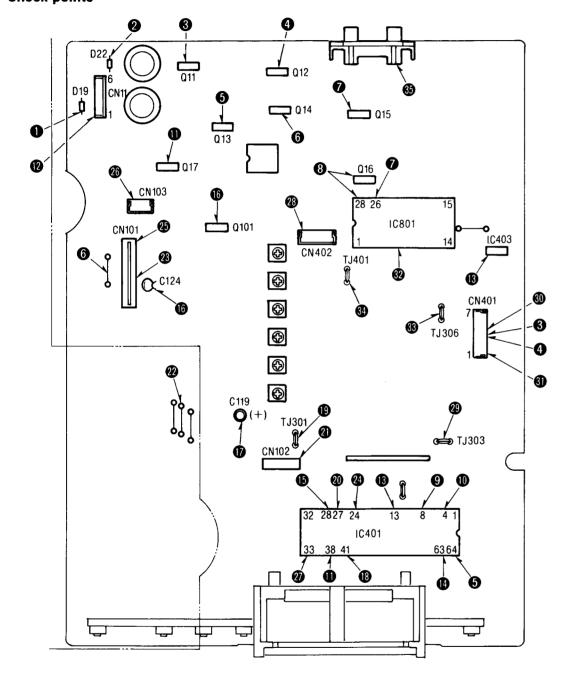
**— 26 —** 

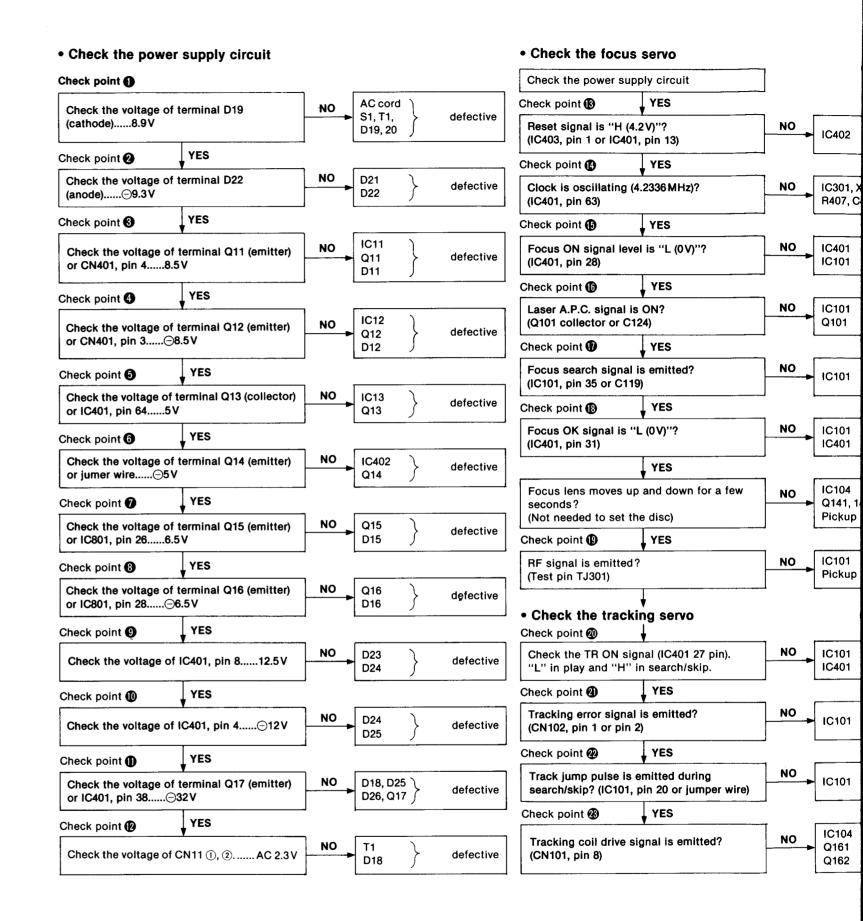
#### **■ TROUBLESHOOTING**

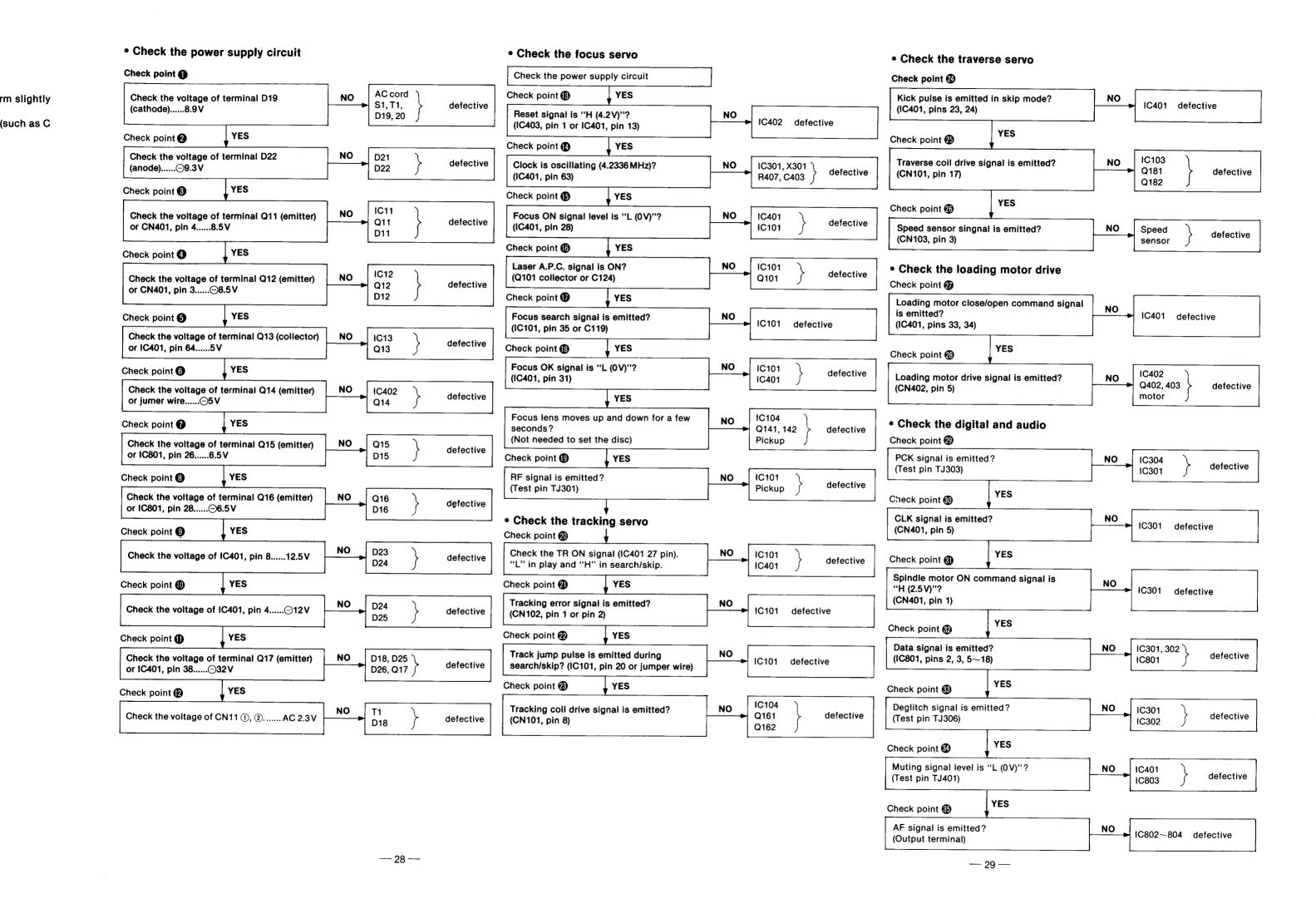
#### Notes:

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

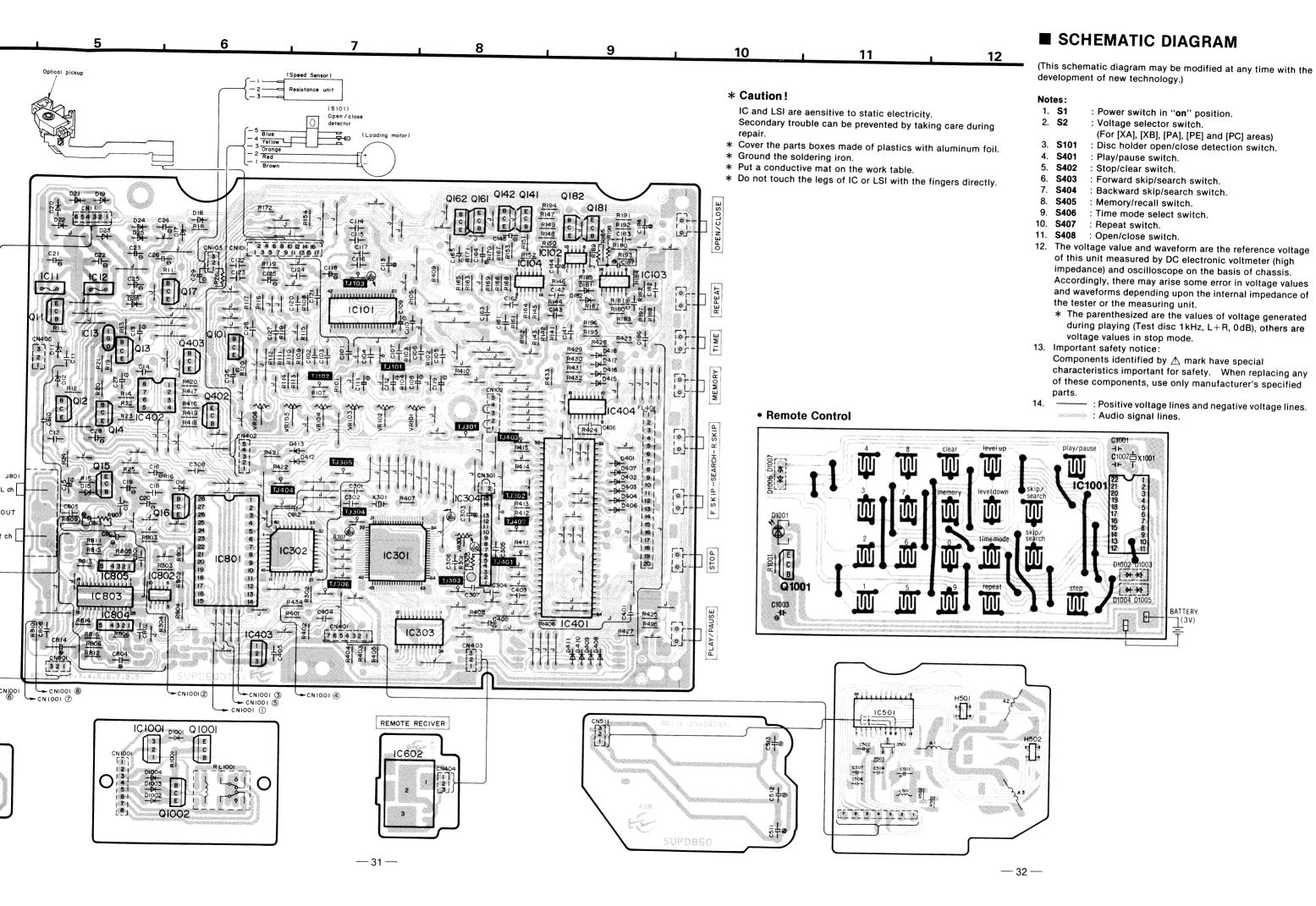
#### Check points







#### **■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM** 2 3 AC IN (120V 60Hz Optical pickup (Speed Sensor) ● For U.S.A. and Canada. \* Caution! IC and LSI are as 2 3 4 THE POWER TRANSFORMER (\$101) Open / close detector Secondary troub repair. <del>2</del>0 \* Cover the parts \* Ground the solde \* Put a conductive \* Do not touch the QI62 QI6I QI42 QI41 Q182 AOI POWER م ہ 00 AC IN For United Kingdom, Australia and ( 220V or 240V 50Hz ) Continental Europe [0] POWER TRANSFORMER R429 R430 R431 R432 R420 R417 Q402 R416 R419 R418 R22 • Remote D1006 D1007 10 11 12 13 14 15 16 17 POWER TJ404 - L ch [ D AC IN LINE OUT (110~127V/220~240V 50/60Hz) For Others R803 1C802 % S2 VOLTAGE SELECTOR [0] R815 R805 IC302 IC301 POWER TRANSFORMER 6 R813 5 4321 -(J) TJ306 IC805 Q100 C1003 R401 R426 (R406 1C401 R427 CN401 7654321 IC303 2 3 CN1001 (3) - CN1001 (5) - CN1001 (1) CNIOOI ® -cn1001(2) CN1001 (4) POWER REMOTE RECIVER IC 1001 DIOCI Q1001 10602 JK802 CN802 0 0 PHONES Q1002 **— 30 —** <del>--- 31 ---</del>



14

15

16

17

For U.S.A. and Canada.

▼ C5 0.005×5

18

19

12

• ---- : Positive voltage lines and negative

voltage lines.

: Audio signal lines.

13

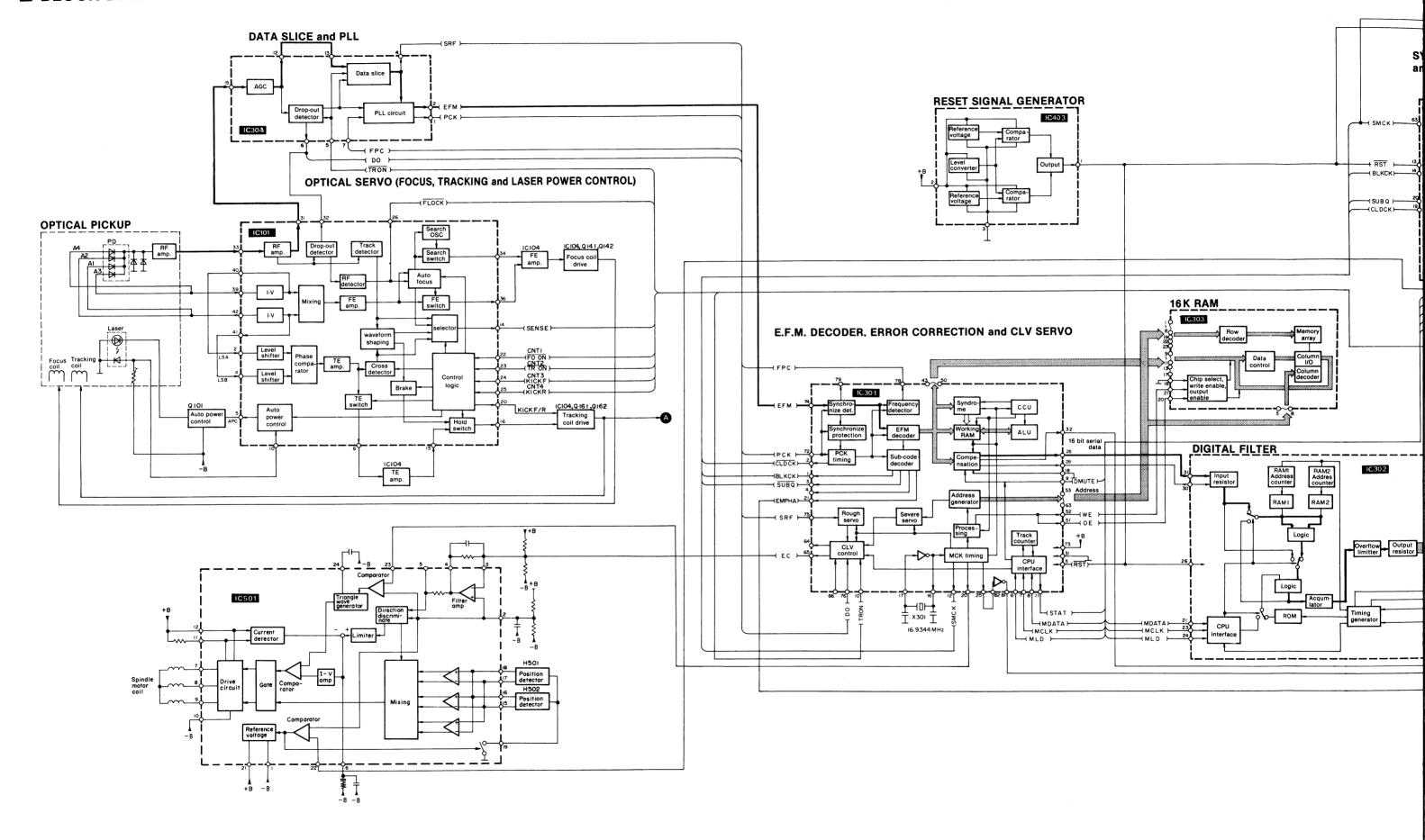
10

Components identified by  $\triangle$  mark have special

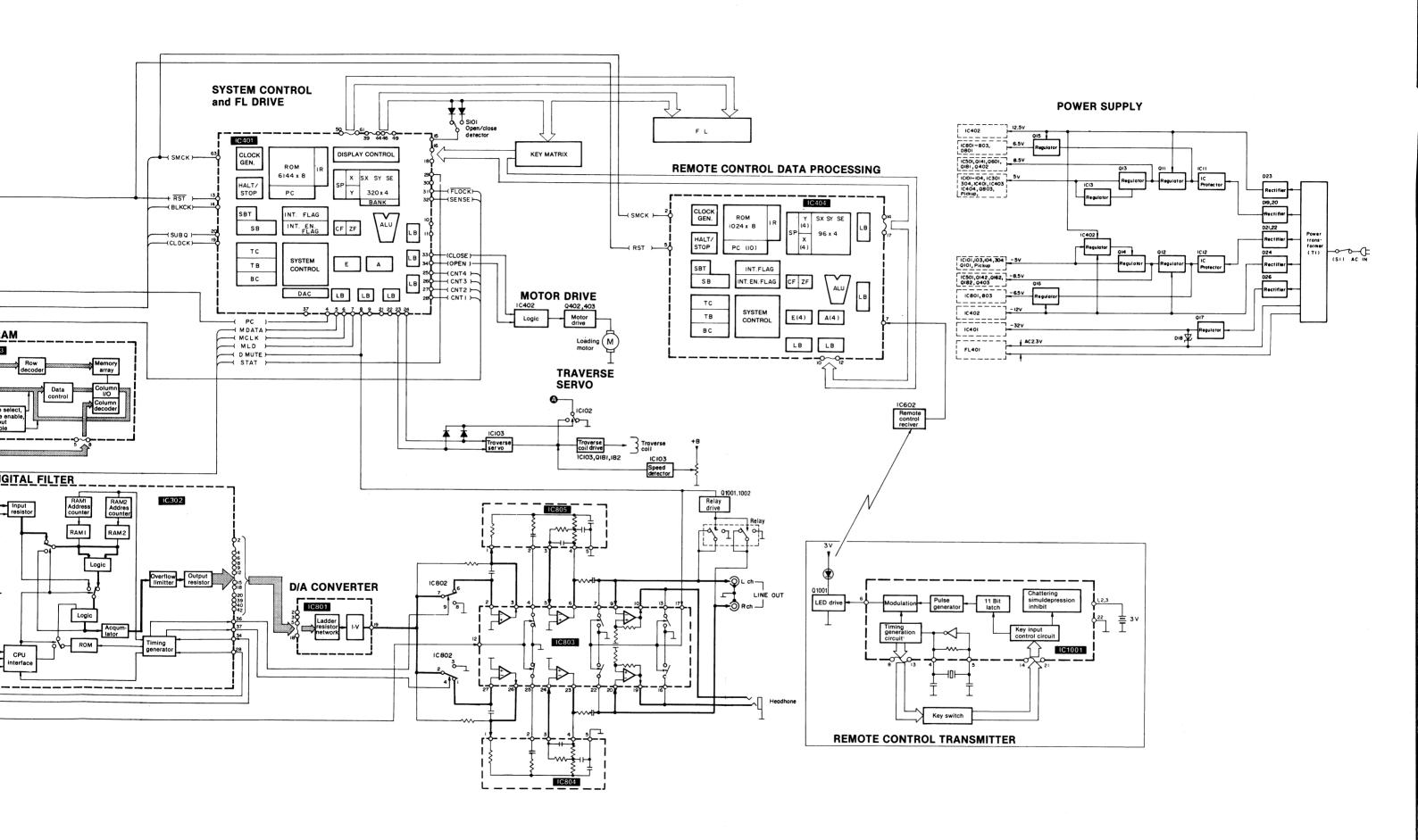
characteristics important for safety. When

Important safety notice:

11



— 38 —



# Parts Change Notice

Model No.

SL-P110/P115/P116/P210/P310

Service Manual Order No. HAD8606593C0 Order No. HAD8607634A1 Order No. HAD8607635A1 Order No. HAD8607631C0 Order No. HAD8607667C0

Please revise the original parts list in the Service Manual to conform to the change (s) shown herein. If new part numbers are shown, be sure to use them when orderring parts.

	Improve perfo	rmance		}				
2.	Change of ma	terial or dime	nsion	* *				
3.	To meel appro	ved specifica	tion					
4.	Standardization	on		· !				
5.	Addition			i !				
6.	Deletion			1				
7.	Correction			1				
8.	Other			† 1	articular description of the second			
Inte	rchangeabilit	y Code ***	The circled	item Indicate	s the interchangeability	. If no markin	ig, see the Notes in the bottom column.	
	Parts	Set Pro	duction	! !		e and the second of the second		
Α	Original	Early			or new parts may be use			
	New $\angle$	Late		Use origin	nal parts until exhauste	d, then stock	new parts.	
В	Original	Early		Original p	parts may be used in ear	ly production	sets only. New parts may be used in ear	rly or i
6	New $\angle$	Late		production	on sets. Use original par	ts where possi	ble, then stock new parts.	
	Original	Early		New part	s only may be used in e	arly or late or	oduction sets.	
С	New $<$	Late		Stock ne		,,		
	Original -	- Early		. Original e	parte may be used in ear	lu orodustion	sets only. New parts may be used in lat	
D	New	Late			on sets only. Stock both			•
	14044							
Ε	Other		~~~~~~~~~~					
	Other t Number	و المواقعة ا المواقعة المواقعة ال						
Par		Ref. No.	Origina	Part No.	New Part No.	Notes (****)	Part Name & Descriptions	 
Par	t Number	Ref. No.	Origina	Part No.	New Part No.	Notes (****)	Part Name & Descriptions	
Pari	t <i>Number</i> Model No.							
Par	Model No.	IC801	SVIPC	л54НР	SVIPCM54JPV	7, C	Integrated Circuit	
Par	Model No.  SL-P110 SL-P115	IC801 IC801		л54НР		7, C 7, C	Integrated Circuit	
Par	Model No.	IC801	SVIPC	л54НР л54НР	SVIPCM54JPV	7, C	Integrated Circuit	
Par	Model No.  SL-P110 SL-P115	IC801 IC801	SVIPCN SVIPCN SVIPCN	л54НР л54НР	SVIPCM54JP—V SVIPCM54JP—V	7, C 7, C	Integrated Circuit	
Par	Model No.  SL-P110 SL-P115 SL-P116	IC801 IC801 IC801	SVIPCN SVIPCN SVIPCN SVIPCN	л54НР л54НР л54НР	SVIPCM54JP—V SVIPCM54JP—V SVIPCM54JP—V	7, C 7, C 7, C	Integrated Circuit Integrated Circuit Integrated Circuit	
Par	<b>Model No.</b> SL-P110  SL-P115  SL-P116  SL-P210	IC801 IC801 IC801 IC801	SVIPCN SVIPCN SVIPCN SVIPCN	л54НР л54НР л54НР л54НР—1	SVIPCM54JP—V SVIPCM54JP—V SVIPCM54JP—V SVIPCM54JP—V	7, C 7, C 7, C 7, C	Integrated Circuit Integrated Circuit Integrated Circuit Integrated Circuit	
Par	<b>Model No.</b> SL-P110  SL-P115  SL-P116  SL-P210	IC801 IC801 IC801 IC801	SVIPCN SVIPCN SVIPCN SVIPCN	л54НР л54НР л54НР л54НР—1	SVIPCM54JP—V SVIPCM54JP—V SVIPCM54JP—V SVIPCM54JP—V	7, C 7, C 7, C 7, C	Integrated Circuit Integrated Circuit Integrated Circuit Integrated Circuit	
Par	<b>Model No.</b> SL-P110  SL-P115  SL-P116  SL-P210	IC801 IC801 IC801 IC801	SVIPCN SVIPCN SVIPCN SVIPCN	л54НР л54НР л54НР л54НР—1	SVIPCM54JP—V SVIPCM54JP—V SVIPCM54JP—V SVIPCM54JP—V	7, C 7, C 7, C 7, C	Integrated Circuit Integrated Circuit Integrated Circuit Integrated Circuit	
Par	<b>Model No.</b> SL-P110  SL-P115  SL-P116  SL-P210	IC801 IC801 IC801 IC801	SVIPCN SVIPCN SVIPCN SVIPCN	л54НР л54НР л54НР л54НР—1	SVIPCM54JP—V SVIPCM54JP—V SVIPCM54JP—V SVIPCM54JP—V	7, C 7, C 7, C 7, C	Integrated Circuit Integrated Circuit Integrated Circuit Integrated Circuit	
Par	<b>Model No.</b> SL-P110  SL-P115  SL-P116  SL-P210	IC801 IC801 IC801 IC801	SVIPCN SVIPCN SVIPCN SVIPCN	л54НР л54НР л54НР л54НР—1	SVIPCM54JP—V SVIPCM54JP—V SVIPCM54JP—V SVIPCM54JP—V	7, C 7, C 7, C 7, C	Integrated Circuit Integrated Circuit Integrated Circuit Integrated Circuit	
Par	<b>Model No.</b> SL-P110  SL-P115  SL-P116  SL-P210	IC801 IC801 IC801 IC801	SVIPCN SVIPCN SVIPCN SVIPCN	л54НР л54НР л54НР л54НР—1	SVIPCM54JP—V SVIPCM54JP—V SVIPCM54JP—V SVIPCM54JP—V	7, C 7, C 7, C 7, C	Integrated Circuit Integrated Circuit Integrated Circuit Integrated Circuit	
Par	<b>Model No.</b> SL-P110  SL-P115  SL-P116  SL-P210	IC801 IC801 IC801 IC801	SVIPCN SVIPCN SVIPCN SVIPCN	л54НР л54НР л54НР л54НР—1	SVIPCM54JP—V SVIPCM54JP—V SVIPCM54JP—V SVIPCM54JP—V	7, C 7, C 7, C 7, C	Integrated Circuit Integrated Circuit Integrated Circuit Integrated Circuit	

File this Parts Change Notice with your copy of the Service Manual.

**Technics** 

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

Panasonic Sales Company, Division of Matsushita Electric of Puerto Rico, Inc. Ave. 65 De Infanteria, KM 9.7 Victoria Industrial Park Carolina, Puerto Rico 00630 Panasonic Hawell, Inc. 91-238, Keuhi St. Ewa Baach P.O. Box 774 Honolulu, Hawaii 96808-0774

Metsushita Electric of Canada Limited 5770 Ambier Drive, Mississauga, Ontario, L4W 2T3 Matsushita Electric E'rading Co., Ltd. P.O. Box 288, jentrasi Osaka Japan

Panasonic Tolio Optice
Matsushila Eletric of rading Co., Ltd.
8th Floor, Worl Trace Center Bldg.,
No. 4-1, Hamanatsus-cho 2-Chome,
Minato-ku, Tolio 1055, Japan

Pinte d in Japan 81090 0250 ® HS

# Service Manual

Supplement



DIGIT/IL

SL-P210

Please use this manual together with the service manual for Model No. SL-P210, Order No. HAD8607631C0.

#### Notes:

- ★ The main P.C.B. of this unit was changed at the production. Be careful about this point during servicing. (Main changes)
- 1. Mounting the muting relay circuit into main P.C.B
- 2. Discontinuing of parts mounted on the foil side of P.C.B.
- ★ This supplement should be filed with the service manual for Model No. SL-P210, Order No. HAD8607631C0.

## **CHANGES**

#### REPLACEMENT PARTS LIST

	Char	nge of Part No.	Part Name & Descrption	Per Set	Remarks	
Ref. No.		NEW	Fart Name & Description	(Pcs.)	riemarks	
INTEGRATED	CIRCUITS					
IC806		MN1280-S	IC, Reset Signal Generator	1	Addition	
IC1001	MN1280-S		IC, Reset Signal Generator	0	Deletion	
TRANSISTORS	3					
Q801		UN4212	Transistor, Switching	1	Addition	
Q802		UN4113	Transistor, Switching	1	Addtion	
Q803		2SC3311-Q	Transistor, Relay Drive	1	Addition	
Q1001	UN4212		Transistor, Switching	0	Deletion	
Q1002	UN4112		Transistor, Relay Drive	0	Deletion	
DIODES						
D801		MA165	Diode	1	Addtion	
D1001 ~1004	MA165		Diode	0	Deletion	
RELAYS			•			
RL801	SSYD2		Relay, Muting	1	Addtion	
RL1001		SFDYG5A237P	Relay, Muting	0	Deletion	
RESISTORS						
R819	ERDS2TJ102		Carbon, 1/4W, 1kΩ, ±5%	1	Addtion	
R820	ERDS2TJ102		Carbon, 1/4W, 1kΩ, ±5%	1	Addtion	
R821	ERDS2TJ103		Carbon, $1/4W$ , $10k\Omega$ , $\pm 5\%$	1	Addtion	
R1001		ERDS2TJ103	Carbon, 1/4W, 10kΩ, ±5%	0	Deletion	
CAPACITOR						
C817	ECFD1H104ZF		Semiconductor, 50V, $0.1\mu$ F, $\pm \frac{80}{20}\%$	1	Addition	

**Technics** 

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

Victoria Industrial Park Carolina, Puerto Rico 00630

Panasonic Sales Company, Division of Matsushita Electric of Puerto Rico, Inc. Ave. 65 De Infanteria, KM 9.7

Panasonic Hawaii Inc. 91-238 Kauhi St. Ewa Beach

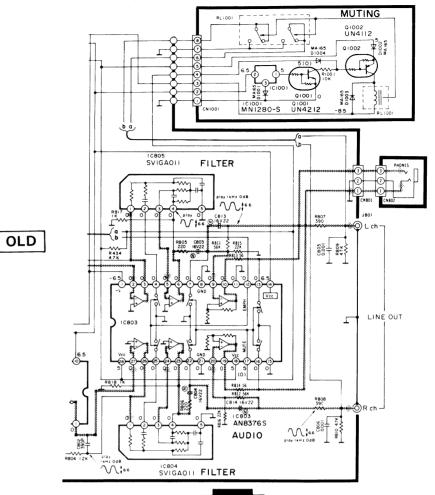
Matsushita Electric of Canada Limited 5770 Ambler Drive, Mississauga, Ontario, L4W 2T3

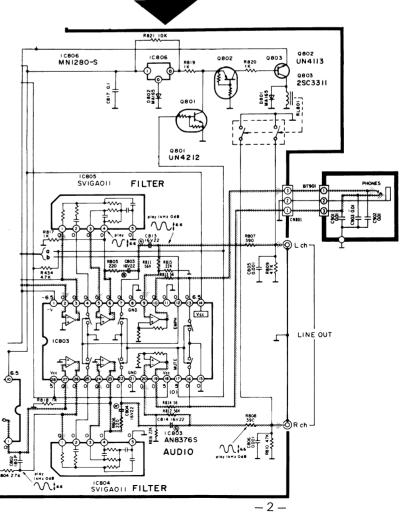
Matsushita Electric Trading Co., Ltd. P.O. Box 288, Central Osaka Japan

Panasonic Tokyo Office Matsushita Electric Trading Co., Ltd. 6th Floor, World Trade Center Bldg., No. 4-1, Hamamatsu-cho 2-Chome, Minato-ku,

#### **■ SCHEMATIC DIAGRAM**

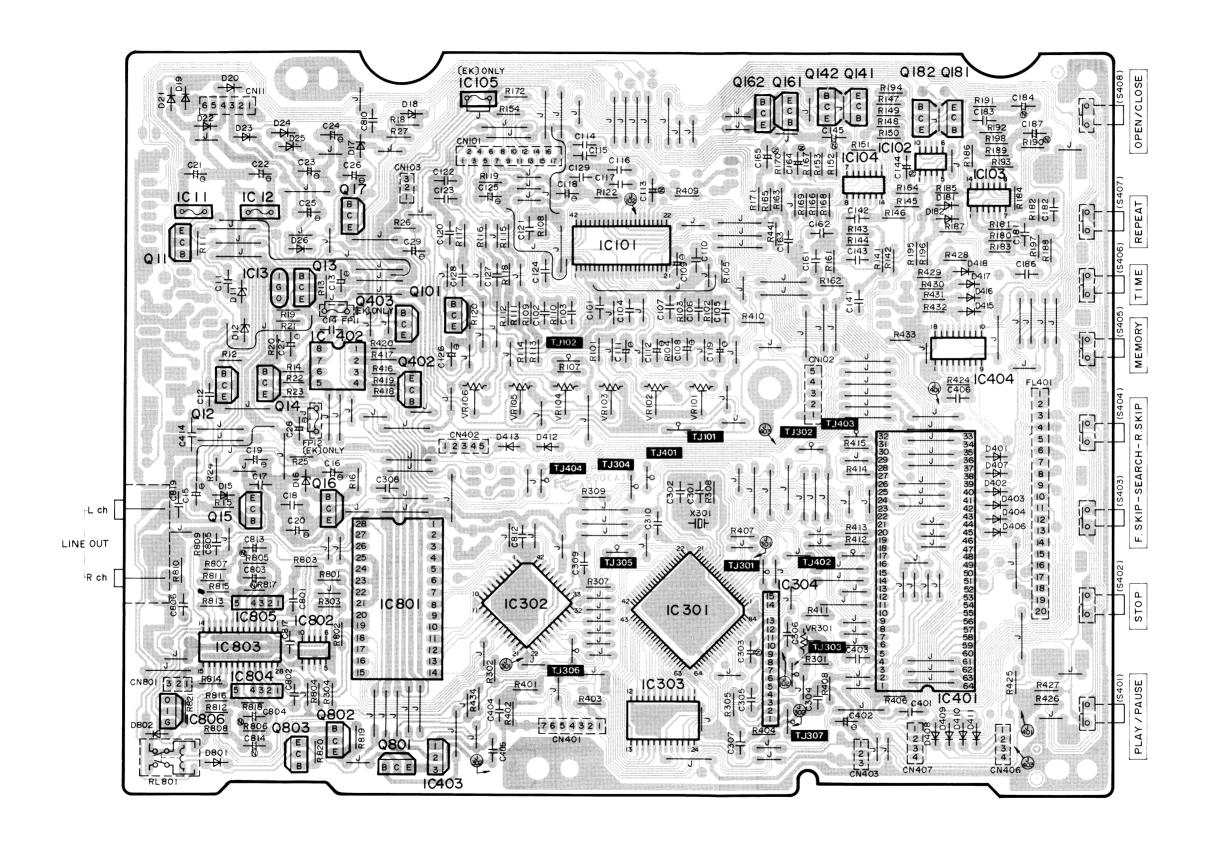
NEW





#### **PRINTED CIRCUIT BOARD**

– 3 –

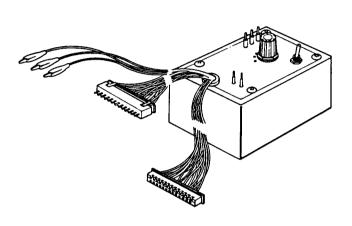


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-4861/1 0000 ⊗ AM

## 1-2. Measuring Instruments and Special Tools

Must provide special tools prior to starting electric adjustment and optical pick-up adjustment. The special tools are available through the ordinary part supply route. Specify the part numbers (SZZP ----) when placing your order.

#### Servo gain adjuster (SZZP1017F)



- 2. Test disc
- Test disc (SZZP1014F) old type
  Test disc (SZZP1014F) new type
  Inspection test disc (SZZ1054C)
  Uneven disc (SZZP1056C)
  Black band disc (SZZP1057C)

- 3. Ordinary disc
- 2-channel oscilloscope (with external trigger more than 30MHz)
- 5. Low frequency oscillator
- 6. Adjusting screwdriver ---- SZZP1043C
- 7. Allen wrench ----- SZZP1044C
- 9. General servicing tools

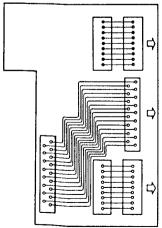
Adjusting screwdirver (SZZP1043C)



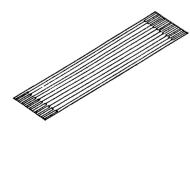
7. Allen wrench (1.5 mm) (SZZP1044C)



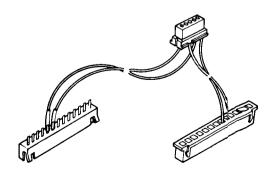
## 10. Junction PCB (SZZP1070C)



## 11. Junction FPC cord (SZZP1071C)



## 8. Conversion connector (SZZP1032F)



## Adjustment Manual

#### 1. ADJUSTMENT PROCEDURE

Refer to the service manual for the disassembling methods of each parts.

(Note) Avoid the direct entrance of laser rays into the eyes and exposure of the body to laser rays which are dangerous. Especially be carefull in the electric and optical pick-up adjustments because a laser beam is radiated from the lens of the optical pick-up when the power supply of unit is turned on. Also follow the adjusting procedures given in the manual.

#### Preparation for Electric Adjustments

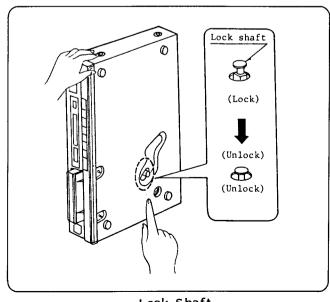
- ① Remove the cabinet, and front panel.
- 2 Remove the power switch rod.
- 3 Release the optical pick-up lock by pressing in the lock shaft located on the bottom side of unit ( $\blacksquare$  (Lock) $\rightarrow$  $\blacksquare$  (Free)).

#### (Note 1)

The pick-up detects signals recorded on the disc with a laser beam. The pick-up moves as the programs are played back but the movement is not visible from outside.

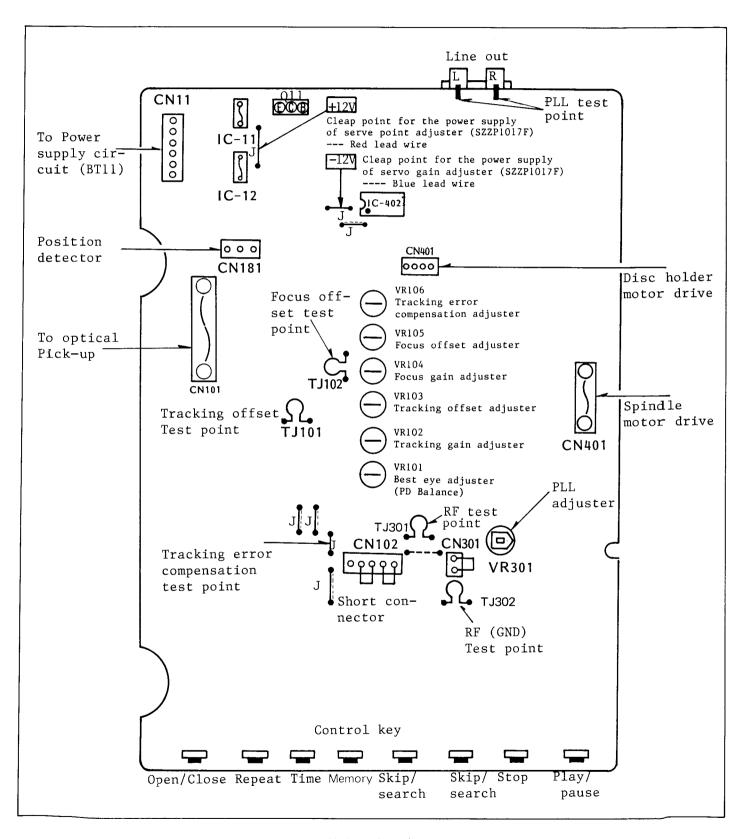
#### Caution:

- •Must remove a disc from the player and lock the pick-up by pressing in the lock shaft when the player is transported as in moving. Otherwise, the disc loading mechanism is moved and damaged.
- •Also lock the pick-up by pressing in the lock shaft in (-→ ) prior to disassembling the player.



Lock Shaft

#### 2. ADJUSTING POINT AND TEST POINT ILLUSTRATION



Main circuit

#### • TEST DISC (SZZP1014F) old type

#### Contents

TON	PURPOSE	SIGNAL	Time
		(TOC)	
1	Servo adjustment	Wowble Tone -10dB L+R	2'00"
2	Pickup assenmetry adjustment	Wowble Tone -10dB L+R	
3	Reference	1 kHz 0 dB L+R	1'00"
4	Freq. Response	20kHz 0 dB L+R	0'30"
5	Emphasis	16 kHz -0.96 L+R	0'30"
6	Channel Separation	L 1kHz 0 dB R-∞	0'30"
7	Channel Separation	R 1kHz 0 dB L-∞	0'30"
8	Dynamic range	1 kHz -60 dB L+R	1'00"
9	Linearity	1 kHz -80 dB L+R	1'00"
10	S/N	œ	2'00"
11	THD	1 kHz 0 dB L+R	1'00"
12	Black Spot	Wowble Tone -10 dBL+R	
13	Black Spot	Wowble Tone -10 dBL+R	5'00"
14	Finger Print	Wowble Tone -10 dBL+R	5'00"
15	Finger Print	Wowble Tone -10 dBL+R	9'00"
16	Wedge	Wowble Tone -10 dBL+R	4'00"
17	Wedge	Wowble Tone -10 dBL+R	4'00"
18	Reference	1 kHz 0 dB L+R	0'30"

TON	PURPOSE	SIGNAL	Time
19	Freq. Response	15 Hz	0'30"
20	Freq. Response	20	0'30"
21	Freq. Response	50	0'30"
22	Freq. Response	100	0'30"
23	Freq. Response	200	0'30"
24	Freq. Response	500	0'30"
25	Freq. Response	2K	0'30"
26	Freq. Response	5K	0'30"
27	Freq. Response	10K	0'30"
28	Freq. Response	12K	0'30"
29	Freq. Response	15K	0'30"
30	Freq. Response	18K	0'30"
31	Freq. Response	20K	0'30"
32	Channel Separation	L 100Hz 0 dB R - ∞	0'30"
33	Channel Separation	R 100Hz 0 dB L - ∞	0'30"
34	Channel Separation	L 10kHz 0 dB R - ∞	0'30"
35	Channel Separation	R 10kHz 0 dB L - ∞	0'30"
36	Channel Separation	L 20kHz 0 dB L - ∞	0'30"
37	Channel Separation	R 20kHz 0 dB L - ∞	

- \* This old type test disc has been changed to new type (CDT-002)
- \* This old type test disc has 37 tracks and display shown 37 tracks when this disc is played
- \* Characteristics of old type and new type (CDT-002) are completely same. And both disc can use for same purpose

#### • TEST DISC (SZZP1014F) new type

#### Contents

TON	PURPOSE	SIGNAL	Time
1	Reference	1 kHz L+R 0dB	1'40"
2	S/N	1 kHz L+R -	1'40"
3	Separation	1 kHz L 0dB	1'40"
4	Separation	1 kHz R 0dB	1'40"
5	Dynamic Range	1 kHz L+R -24dB	1'40"
6	Emphsis	16kHz L+R 0dB	1'40"
7	Black Band 0.4 mm	400Hz L+R -10dB	3'00"
8	Black Band 0.5 mm	400Hz L R -10dB	2'30"
9	Wedge 0.7 mm	400Hz L+R -10dB	5'00"
10	Fingerprint No.3	400Hz L+R -10dB	2'00"
11	, , , , , , , , , , , , , , , , , , , ,	1.440Hz L+R -10dB	8'00"
	Index	2.880Hz L+R -10dB	8'00"
		3.1760Hz L+R -10dB	1'00"
12	Repeat check	1 kHz L+R 0dB	0'05"

#### • INSPECTION TEST DISC (SZZP1054C) CDT-016

#### Contents

TON	PURPOSE	SIGNAL	Time
1	Reference	1 kHzL+R 0dB	1'00"
2	Reference	400Hz L+R 0dB	1'40"
3	Wedge 0.4 mm	400Hz L+R -10dB	2'10"
4	Wedge 0.5 mm	400Hz L+R -10dB	2'20"
5	Wedge 0.6 mm	400Hz L+R -10dB	2'20"
6	Wedge 0.7 mm	400Hz L+R -10dB	2'40"
7	Wedge 0.8 mm	400Hz L+R -10dB	2'40"
8	Wedge 0.9 mm	400Hz L+R -10dB	3'10"
9	Black dot 0.3 mm	400Hz L+R -10dB	3'55"
10	Black dot 0.4 mm	400Hz L+R -10dB	4'10"
11	Black dot 0.5 mm	400Hz L+R -10dB	4'20"
12	Black dot 0.6 mm	400Hz L+R -10dB	5'05"
13	Black dot 0.7 mm	400Hz L+R -10dB	5'10"
14	Black dot 0.8 mm	400Hz L+R -10dB	6'05"
15	Black dot 0.9 mm	400Hz L+R -10dB	9'45"

#### • UNEVEN DISC (SZZP1056C)

Structure: Ordinary disc with small piece for uneveness

Usage : Optical pick up mechanical adjustment

#### • BLACK BAND DISC (SZZP1057C)

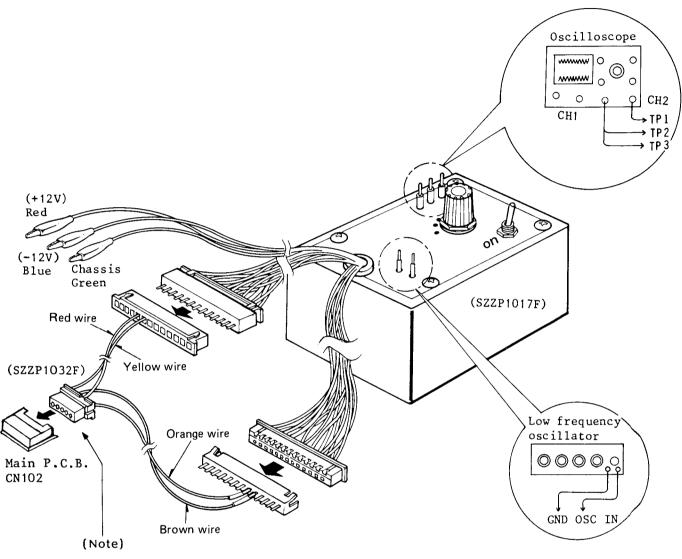
Structure: Ordinary disc with 0.5 mm width tape at both

side

Usage : Adjustment for regular size FF1 CD player

(1) Tracking offset adjustment(2) Focus offset adjustment

#### 2-1. Servo gain adjuster and its connection



CN102 of the main PCB is provided with a short circuiting connector.

Remove the CN102 connector and install the conversion connector (SZZP1032F) for adjustment.

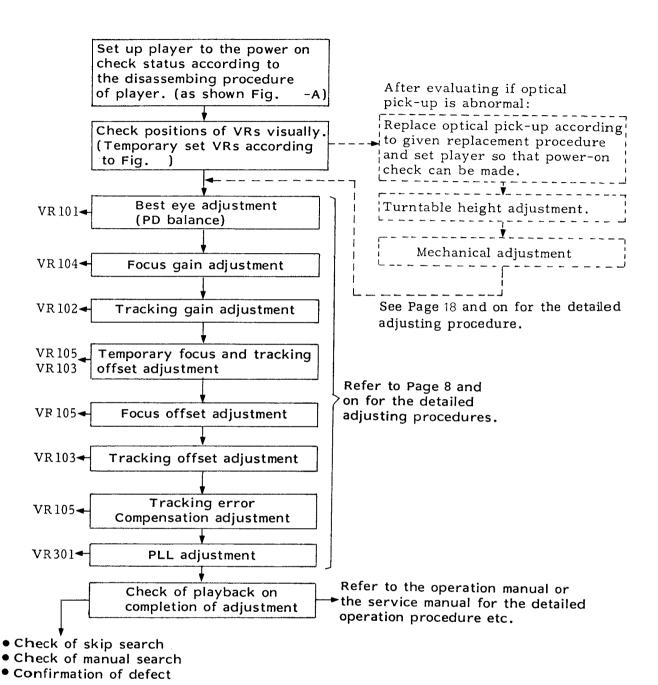
On completion of adjustment, must return the short-circuiting connector to its place.

Servo Gain Adjuster

#### Caution:

- (1) Do not look into the lens when power is applied to the unit, since there is laser radiation (H.H.S./D.H.W./etc., regulation).
- (2) These steps must be followed in order.

#### 3. ELECTRIC ADJUSTMENT STEPS AND POINTS



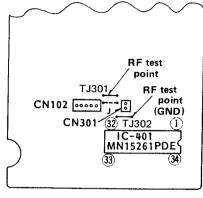
By setting the VRs temporarily as shown in Fig. the player run somehow that the optical pick-up is satisfactory but VRs must be adjusted optimum y finally.

#### 5. ELECTRICAL ADJUSTMENT PROCEDURE

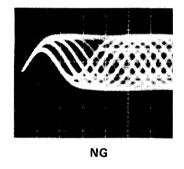
#### A. Best Eye (PD Balance) Adjustment

(1) Connect CH-1 of the oscilloscope to the RF test point (TJ301) and the grounding test Point (TJ302) on the main PCB as shown in illustration.

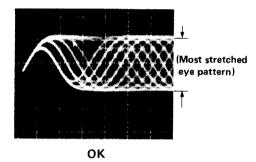
- (2) Turn on the power supply switch of the player.
- (3) Place the test disc (SZZP1014F) or (SZZP1054C) in to the disc holder by open/close key.
- (4) The player to the play mode.
- (5) Play of the test disc. (BS 0.5mm)
  SZZP1014F (Old) ---- Track 13
  (New) ---- Track 8
  SZZP1054C ----- Track 11
- (6) Adjust VR101 so that the eye pattern of RF signal is stretched most as shown in illustration.









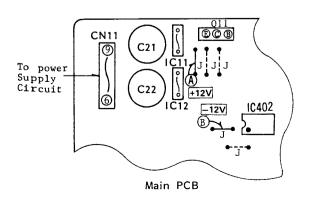


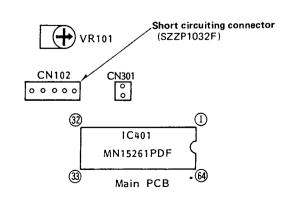
Best eye

(7) Turn off the power supply switch of the player.

#### B. Focus Gain Adjustment

(1) Connect the servo gain adjuster (SZZP1017F) with conversion connector (SZZP1032F) to the player as shown in illustration.

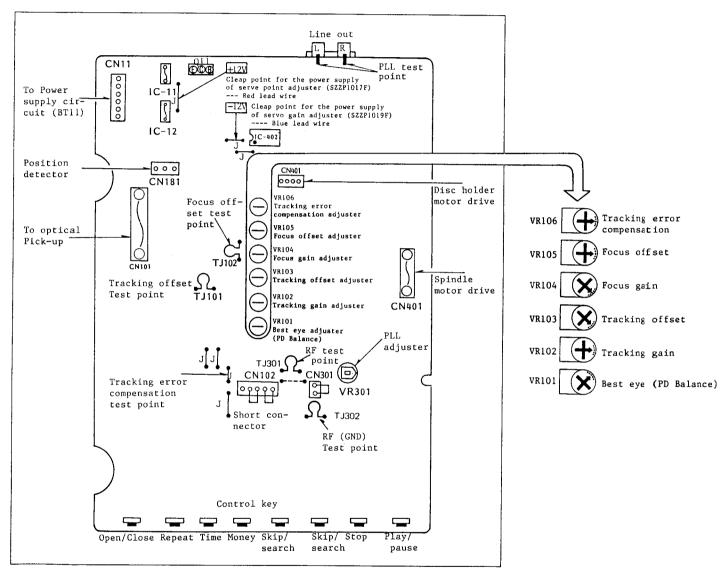




## 4. INITIAL SETTING POINTS OF ADJUSTING VARIABLE RESISTORS (VR)

#### Adjusting Variable Resistors and Test Points

The player operates but not optimum at the above settings of the adjusting variable resistors. Adjust them according to the adjusting procedure.



Main circuit

Most conduct the electric adjustment when any electric part is replaced. Perform 1) optical pick-up adjustment and 2 electric adjustment in the stated order when the optical pick-up (SOAD30A) is replaced.

Arrangement of the adjusting variable resistors viewing the side face. All the electric adjustments are possible by setting as shown in Fig. . (Removed the power supply switch rod for the convenience of adjustment.)

#### D. Temporary focus and tracking offset adjustment

#### (Focus offset)

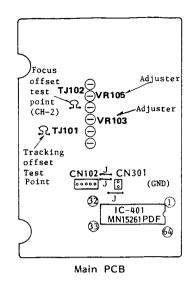
(1) Connect CH-1 of the oscilloscope of the TJ102 (Focus offset test point) and GND to the chassis.

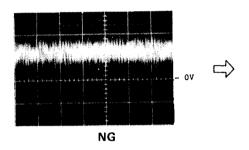
Oscilloscope setting --- Volt : 100mV Sweep : 5ms Input selector: DC

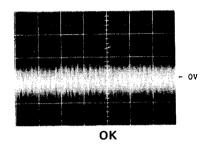
(2) Turn on the power supply switch of the player.

(3) Place the test disc (SZZP1057C . . . Black band disc) in to the disc holder by open/close key.

(4) After TOC reading, the set will become stop mode, then check the waveform on the oscilloscope and adjust VR105, so that the waveform at TJ102 shall be Ground level as shown in illustration.



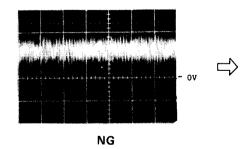


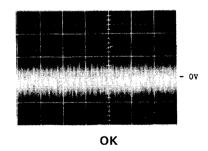


#### (Tracking offset)

- (1) Connect CH-1 of the oscilloscope to the TJ101 (tracking offset test point) and GND to the chassis.
- (2) Turn on the power supply switch of the Player.
- (3) Place the test disc (SZZP1057C . . . Black band disc) in to the disc holder by open/close key.
- (4) After TOC reading the set will become stop mode, then check the waveform on the oscilloscope and adjust VR103, so that the waveform at TJ101 shall be Ground level as shown in illustration.

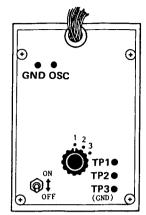
Oscilloscope setting--- \begin{cases} \text{Volt} & : 100mV \ \text{Sweep} & : 5ms \ \text{Input selector} : DC \end{cases}





(5) Turn off the power supply switch of the Player.

#### Initial setting mode of servo gain adjuster



- (1) mode select switch to "2" position.
- (2) ON/OFF switch to "ON" position.

Servo Gain Adjuster (SZZP1017F)

- (2) Set the low frequency oscillator to a frequency 750 Hz and an output voltage of 150m Vp-p then connect the oscillator to the terminals OSC IN and GND of the servo gain adjuster (SZZP1017F).
- (3) Connect CH-1 and CH-2 of the oscilloscope to TP1 and TP2 of the Servo gain adjuster (SZZP1017F). (TP3 is the grounding terminal.)

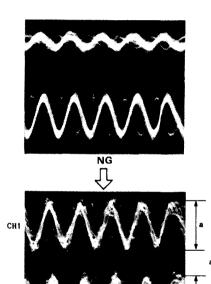
- (4) Turn on the power supply switch of the player.
- (5) Place the test disc (SZZP1014F) or (SZZP1054C) in to the disc holder by open/close key and in the Playback mode.
- (6) Set the rotary switch of the servo gain adjuster (SZZP1017F) to "2" → "1".
- (7) The player to the Play mode and the 750 Hz signal will be displayed on the oscilloscope, then adjust VR104 so that the waveforms and amplitudes of the both channels shall be equal as shown in illustration.
- (8) Turn off the power supply switch of the player.

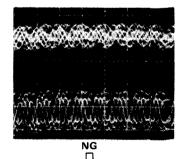
(Note) Please do not remove the servo gain adjuster also shorting connector.

#### C. Tracking Gain Adjustment

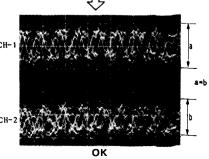
- (1) Set the low frequency oscillator to a frequency of 1.0 kHz and an output of 150 mVp-p, and connect the oscillator to the OSC IN and GND of the gain adjuster (SZZP1017F).
- (2) Connect the CH-1 and CH-2 of the oscilloscope to the TP1 and TP2 of the gain adjuster (SZZP1017F). (TP3 is a grounding terminal.)

- (3) Turn on the power supply switch of the Player.
- (4) Place the test disc (SZZP1014F) or (SZZP1054C) in the disc holder by open/close key and in the Playback mode.
- (5) Set the rotary switch of the servo gain adjuster (SZZP1017F) to "2" → "3".
- (6) The player to the play mode and the 1.0 kHz signal will be displayed on the oscilloscope, then adjust VR102 so that the waveforms and amplitudes of the both channels shall be equal as shown in illustration.
- (7) Turn off the power supply switch of the player.
- (8) After completing the above mentioned adjustment, remove the servo gain adjuster and insert the shorting connector into CN102 as it was.





OK Focus gain



#### E. Focus offset Adjustment

Connect CH-1 of the oscilloscope to the TJ301 (RF test point) and CH-2 to the terminal TJ102.
 (Focus offset test point) on the main PCB.
 TJ302 of RF test point (GND) on the main PCB as shown in illustration.

TJ301 (CH-1) TJ102(CH-2)

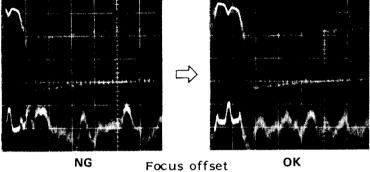
Volt : 500mV 100mV

Sweep : 0.5msec

Oscilloscope - Sweep : 0.5msec
setting Input Selector: AC DC

Mode : NORM(Triggering Via CH-1).

- (2) Turn on the power supply switch of the player.
- (3) Place the test disc (SZZP1057C . . . Black band disc) in to the disc holder by open/close key.
- (4) The player to the play mode.
- (5) Play TR9 of the test disc.
- (6) Check the waveforms of CH-1 and CH-2 on the oscilloscope and adjust VR105 so that the waveform around the triggering point as shown in illustration.



(7) Turn off the power supply switch of the player.

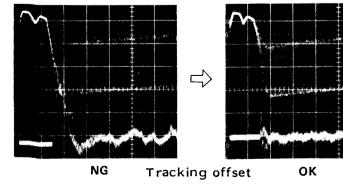
#### F. Tracking offset Adjustment

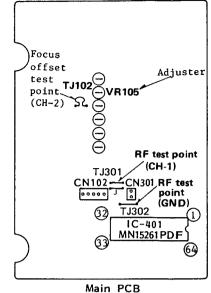
(1) Connect CH-1 of the oscilloscope to the TJ301 (RF test point) and CH-2 to the terminal TJ101. (Tracking offset test point) on the main PCB. Connect GND of the oscilloscope to the RF test point (TJ302) on the main PCB as shown in illustration.

CH-1).
(2) Turn on the power supply switch of the player.

- (3) Place the test disc (SZZP1057C . . . Black band disc)
- (4) The player to the play mode.
- (5) Play TR9 of the test disc.

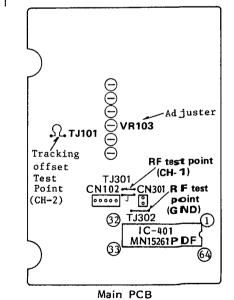
(6) Check CH-1 and CH-2 waveforms displayed on the oscilloscope and adjust VR103 so that the waveforms as shown in illustration.

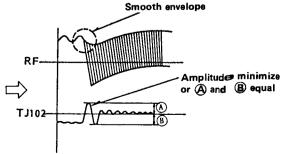




Smooth envelope

Amplitude minimize or (A) and (B) equal





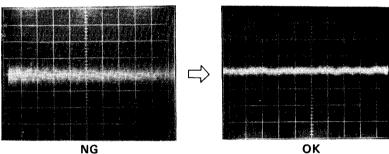
(7) Turn off the power supply switch of the player.

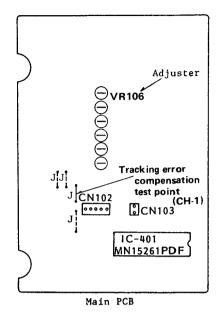
## G. Tracking error Compensation Adjustment

(1) Connect CH-1 of the oscilloscope to the tracking error compensation test point (Jumper) and GND to chassis as shown in illustration.

Oscilloscope setting | Volt : 50mv | Sweep : 1ms | Input selector: DC

- (2) Turn on the power supply switch of the player.
- (3) Place the test disc (SZZP1014F of SZZP1054C) in to the disc holder by open/close key.
- (4) The player to the play mode.
- (5) Play TR1 of the test disc
- (6) Check the waveform on the oscilloscope and adjust VR106, so that the waveform of DC level less than 0±5mVas shown in illustration.





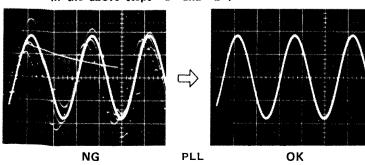
(7) Turn off the power supply switch of the player.

### H. PLL Adjustment

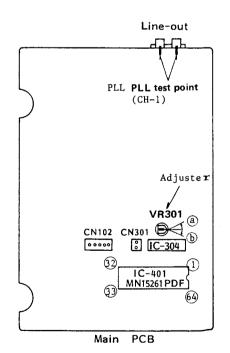
(1) Connect CH-1 of the oscilloscope to the line out terminal (either of L-CH or R-CH) of the main PCB and the terminal GND of the chassis.

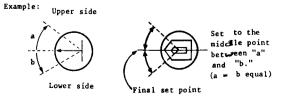
Oscilloscope setting --- Volt : 1.0V Sweep : 1msec. Input selector: DC

- (2) Turn on the power supply switch of the player.
- (3) Place the test disc (SZZP1054C) in to the disc holder by open/close key.
- (4) The player to the play mode.
- (5) Play of the test disc Track 7 (WG 0.8mm).
- (6) Check the waveform displayed on the oscilloscope and adjust VR301 in the following steps.
- (a) Turn VR301 upwards slowly and learn the point at which the waveform on the oscilloscope begins to be disturbed as shown in waveform NC.
- (b) Turn VR301 downwards slowly (opposite direction to that in the above para, "a") and learn the point at which the waveform on the oscilloscope begins to be disturbed.
- Set VR301 in the middle between the points learned in the above steps "a" and "b".



(7) Turn off the power switch of the player.





### I. Check of Play Operation after Adjustment

- (1) Check of skip search
  - 1) Play an ordinary disc.
  - 2) Press the skip button and check to see that skip search is given (Forward and reverse)
- (2) Check of manual search

  - Play an ordinary disc.
     Press the manual search button and check to see that smooth manual search can be done at low and high speeds (Forward and reverse)
- (3) Check to make sure the best adjusted condition for defects.
  - 1) Play the Technics test disc "SZZP1054C".
  - 2) Play the track 12 (Wedge 0.6 mm), track 13 (Wedge 0.7mm), and see that there is no sound skip or
  - 3) Play the tracks (Black spot 0.6mm), track 6 (Black spot 0.7mm) and see that there is no sound skip or noise.

Technics Test	Disc "SZZP1054C"
Track number 12	0.6mm Wedge
Track number 13	0.7mm Wedge
Track number 5	0.6mm Black spot
Track number 6	0.7mm Black spot

- MEMO -	
	,

# 6. OPTICAL PICK-UP ADJUSTMENT

(Note) • Check if the optical pick-up is serviceable in the following methods prior to the adjustment of the optical

Check if APC signal level at ® of Q101 is "H". 6-1. Evaluation of Optical Pick-up Serviceability Connect oscilloscope to the Jumper (RF test Point). (RF test point = GND) on the main PCB as illustration. Check of EC signal level at pin (1) of CN401 is "H". pick-up. Turn on the power supply switch of the Player and • If faulty, follow the next paragraph on optical pick-up Place the test disc, then set to play mode. replacement and adjustment. Focus servo works but Out of Focus Servo TOC is not read, or noisy. Probably faulty location Is DC voltage at pin (5) Probably faulty location (optical servo circuit) o1C-12 Check RF signal. • PD balance setting of CN101 5V? ∘Other NO (Connect oscilloscope • PLL setting Yes 🔻 to the jumper (RF) test (Refer to Page 8 and Check S OUT signal point) on the main PCB. Check visually if focus Probably faulty-location. at pin 34 of IC101. Sweep----- 0.5 μ sec. lens moves up and No o IC-101 down for about 5 Sweep ..... 0.1 sec. Volt ----- 0.5V o Other Volt ..... 0.5 V Input ----- AC seconds. (Disc needs Input ..... DC not be inserted.) Yes Yes 🔻 Yes Probably faulty location Laser diode may be faulty Check focus search NO Optical servo circuit Check RF signal amplitude NO if amplitude is below 0.8 signal at pin (1) of (IC-104, Q141, Q142)  $(1.2 V_{p-p}).$  $V_{p-p}$ . CN 101. o Other Sweep----- 0.5 μ sec. (SOAD30A) Yes • Volt ----- 0.5V Check coil resistance Replace optical pick-up Input ---- AC NO pins (1) and (1) of (SOAD30A) CN101 with power supply off. Yes 🕨 Readjust Mechanical adjust-Readjust PD balance. NO Check best eye pattern. NO ment. (Refer to Page 8.) (Refer to Page 8. ) (Refer to Page 23.) Probably faulty location Is voltage difference Replace optical pick-up Deterioration of NO (SOAD30A) across R115 about laser diode if voltage 0.5 V? Adjust tracking offset. NO Readiust. (Optical servo circuit) difference is about 1.0V. (Refer to page 11.) (Refer to Page 11.) Yes 🛊 Adjust PLL. Adjust. Place test disc. No (Refer to Page 12.) (Refer to Page 12.) Probably faulty location Disc detector circuit. Must conduct following on Is SENSE signal level o IC101 Replace optical pick-up completion of replacement at pin 32 of IC 401 "H"? o Other (SOAD30A). procedure. Yes o Optical pick-up adjustment Probably faulty location Does disc run and does NO Temporarily adjust • Electric adjustment o IC101 focus offset voltage to focus servo work? o Other 0 mV at loading out or disc standing mode. Does tracking servo Probably faulty location Yes (Method) NO work? o IC101 Test point ---- TJ102 O Broken PU coil Adjusting VR -- VR105 Tracking servo driver Sweep ----- 0.5 μsec Volt ------100 mV Check tracking offset. NO Readjust tracking offset. Replace optical pick-up. Input -----DC (SOAD30A). (Refer to Page 11.) (Refer to Page 11.) Probably faulty location Servo circuit PD balance setting

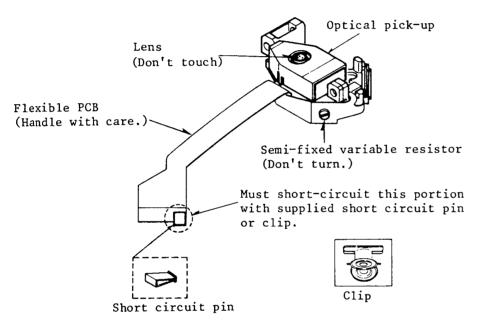
**— 16 ---**

# 6-2. HOW TO HANDLING OPTICAL PICK-UP

The laser diode in the optical pick-up may be damaged by potential difference caused by static charge on clothing or body. Pay careful attention to damage by static charge when repaired.

# • Handling of Optical Pick-up

- 1. Don't give a heavy shock to the optical pick-up which is very precisely constructed.
- 2. A charge prevention pin is inserted in the flexible PCB for preventing damage to the laser diode. The pin should be removed or installed in a short time.
- 3. Handle the flexible PCB with care because PCB may be cut if an excessive stress is applied.
- 4. Don't meddle with the laser power adjusting VR which is adjusted prior to shipping.



### • Grounding for Preventing Static Charge Damge

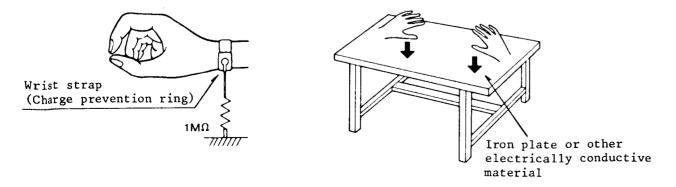
### 1. Body Grounding

Put on the charge preventing wrist strap for discharging electricity from the body.

### 2. Working Table Grounding

Lay electrically conductive material (conductive sheet) or an iron plate on the table where the optical pick-up is placed, and ground the material or sheet to the floor.

Note: Static charge of clothing is not discharged from the wrist strap. Exercise care so that clothing shall not touch the wrist strap.

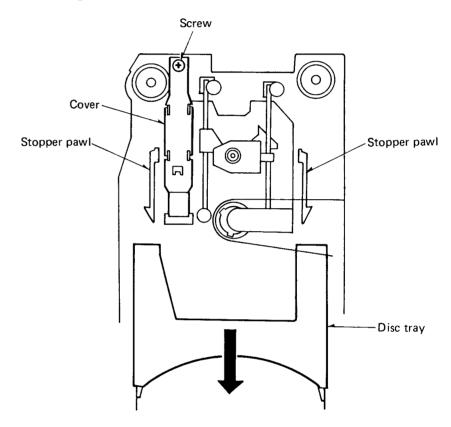


### 7. OPTICAL PICK-UP REPLACEMENT PROCEDURE

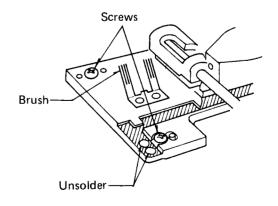
Note: Exercise care so that disassembled parts shall not be lost.

Set up the player so that it can be power on checked as shown in illustration according to the disassembly procedure outlined in the service manual.

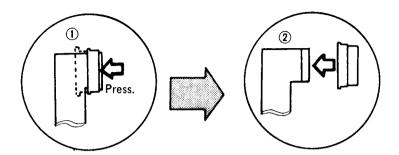
- (1) Remove the front panel.
- (2) Pushing the two stopper pawls of the disc holder inward simultanouely, pull the holder to remove it.
  - Note: The stopper pawls are nothing to reassembling.
- (4) Remove the resisting plate for the position detector.



- (5) Unsolder the linear motor drive coil and optical pick-up to separate them.
- (6) Remove the two linear motor drive coil fastening screws.
  Note: Pay due attention to the contact brush.

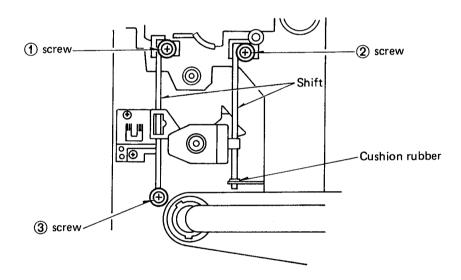


- (7) Disconnect the optical pick-up 17-pin flexible cord from connector CN101 on the main PCB. Note: 1. Pull out the connector at the point indicated by the arrow side.
  - 2. Pull out the flexible cord.

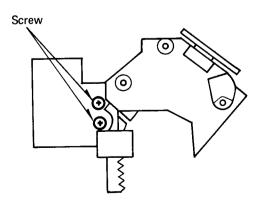


- (8) Remove the three optical pick-up fastening screws.
- (9) Remove the optical pick-up fastening shaft.
  - Note: Be careful not to lose or misplace the cushion rubber.
- (10) The optical pick-up has been completely separated with this.

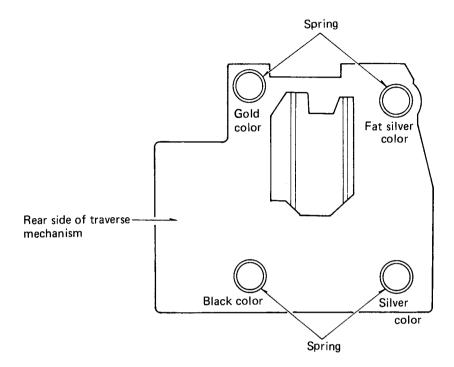
  It is not necessary to remove the traverse unit as before. If the unit needs to be removed, pay attention to the four springs during removing.



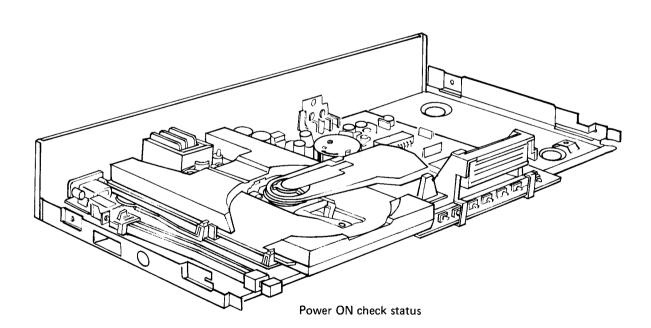
(11) Remove the linear motor coil fastening bracket.



(12) Install the optical pick-up in the reverse order of disassembling so that Power On check can be conducted as shown in illustration.

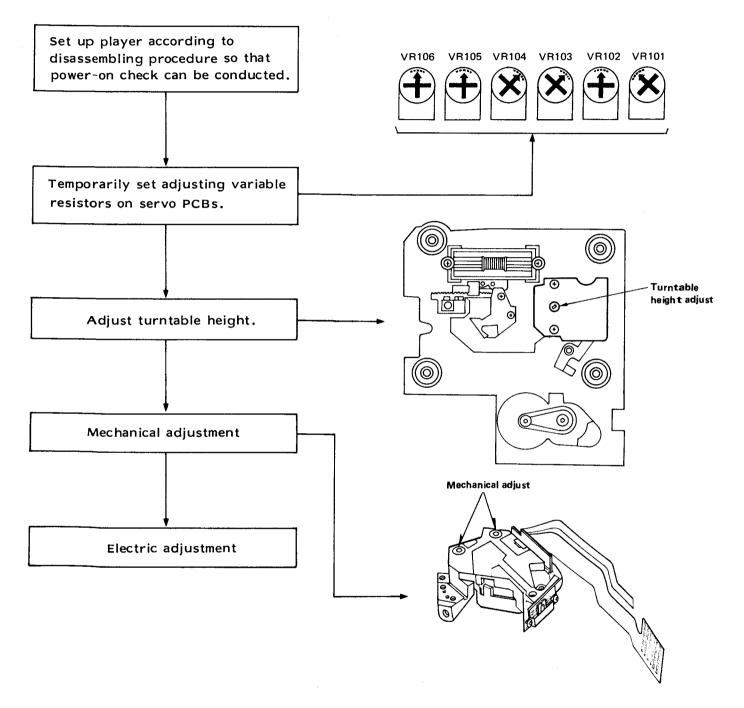


Front side



## 8. ADJUSTING PROCEDURE OF OPTICAL PICK-UP

# 8-1. Adjusting steps and Points of optical pick-up



# 8-2. Required Measuring Instruments and Tools

- 1. Two-channel oscilloscope (with external trigger), over 30 MHz.
- 2. Test desc (SZZP1014F) or (SZZP1054C)
- 3. Allen wrench ----- 1.5 mm (SZZP1044C)
- 4. General tools

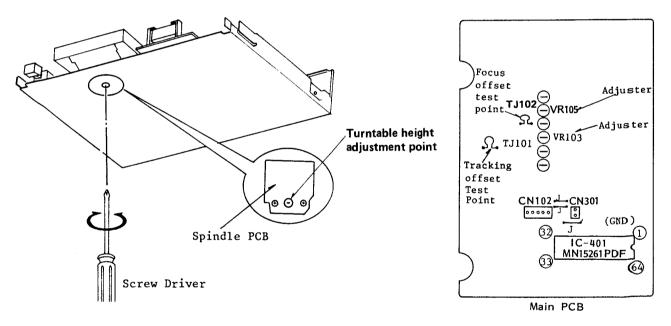
# 9. MECHANICAL ADJUSTMENT PROCEDURE

### A. Turntable Hight Adjustment

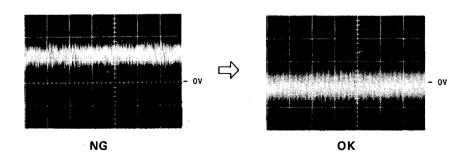
- (1) Turn on the power supply switch of the player.
- (2) Place the test disc (SZZP1014F) or (SZZP1054C) to the disc holder
- (3) Turn off the power supply switch of the player.
- (4) Set the oscilloscope to DC zero balance.
- (5) Connect the CH-1 of the oscilloscope to TJ102 of the servo circuit and GND to the chassis.

Oscilloscope settings -- Sweep : 5m sec. Volt : 100mV Input selector: DC

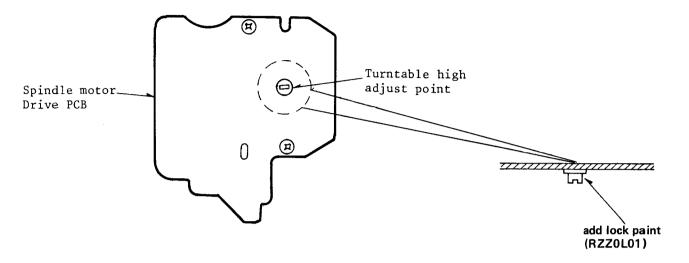
- (6) Turn on the power supply switch of the player.
- (7) Play back a desired track.
- (8) Place the unit in the corner of the workbench -- in the place that allows the adjustment -- and set it as illustrated with care not go give vibration to the unit.



(9) Turn the adjusting screw on the underside of the spindle motor PCB by a flat screwdriver so that the waveform at TJ102 shall be  $0\pm50mV$  as shown in illustration.



- (10) Turn off the power supply switch of the player.
- (11) Lock the adjusting screw with "Screw lock paint (RZZ0L01)" on completion of adjustment.



### B. Mechanical Adjustment

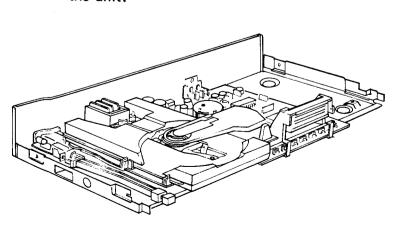
- (1) Turn on the power supply switch of the player.
- (2) Insert the test disc (SZZP1056C) in the disc holder.
- (3) Turn off the power supply switch of the player.
- (4) Set the oscilloscope as stated below.

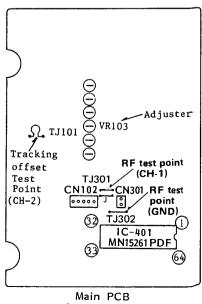
- (5) Connect CH-1 of the oscilloscope to TJ301 of RF test point and GPD to TJ302 of RF test point (GND).
- (6) Turn on the power supply switch of the player.
- (7) Play back TR9.

Note: If any track other than TR9 is played back, this adjustment cannot be achieved.

If the temporary adjustment takes much time, it is advisable to set the player in the repeat mode.

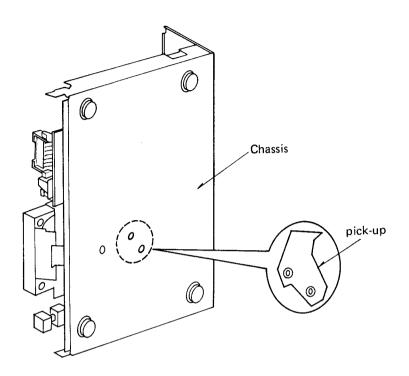
(8) Set the player in the playback mode as shown in illustration with care not to give vibration to the unit.





(9) Keeping the player in the playback mode, place it as illustrated (stand it on its left side).

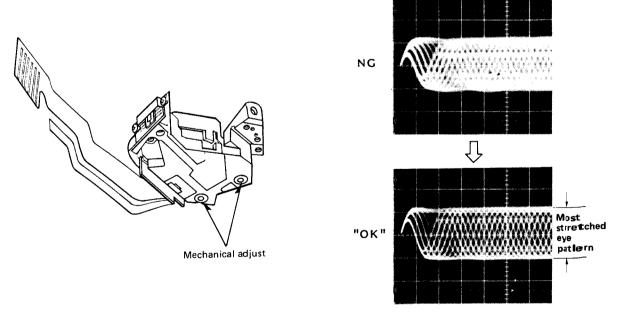
Note: If the player is stood on its right side, the adjustment cannot be accomplished perfectly.



(10) Check if the RF signal waveform is as shown in illustration (NG). If the waveform can not be checked or is unlike the given waveform, proceed to the following steps.

(11) Set the allen wrench (SZZP1044C...1.5mm) into the socket in the heads of the mechanical adjusting screws shown in illustration and turn the both screws right or left to optimum

positions.

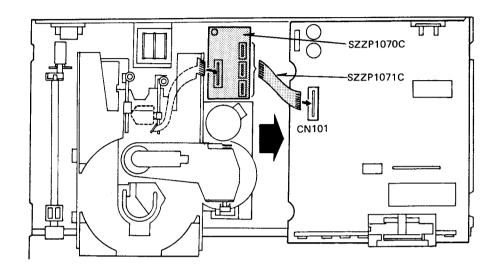


(12) Turn off the power supply switch of the player.

(13) Lock the adjusting both screw with screw lock paint (RZZ0L01) on completion of adjustment.

# 10. CHECKING PROCEDURE FOR THE WHOLE ELECTRICAL CIRCUIT (IN TROUBLESHOOTING)

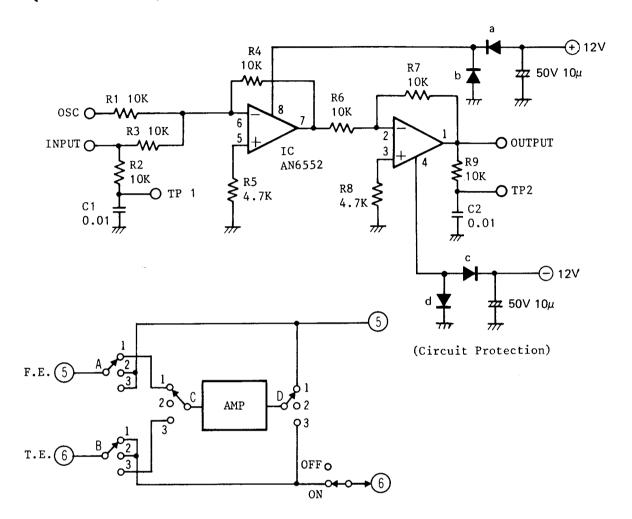
The FPC cord from the optical pick-up is too short to check the back of the main PCB with case. So use the servicing fixture (SZZP1070C) and (SZZP1071C) and follow the procedure shown below. This fixture is not a must in the electrical and mechanical adjustments.



- (1) Disconnect the FPC cord from CN101.
- (2) Attach a clip to the top end of the FPC cord. (This is for protecting the optical pick-up against the breakdown due to static electricity. The clip is not a must, however, when a destaticizing mat or the like is already in use in servicing.)
- (3) Remove the four main PCB fastening screws.
- (4) Shift the main PCB to the right side.
- (5) Attach the servicing fixture (SZZP1070C) as illustrated.
- (6) Connect the FPC cord from the optical pick-up to the connector of the fixture. (The other connectors are for the SL-P1200. Use care not to mistake any of these for the above connector.)
- (7) Connect further the junction FPC cord (SZZP1071C) to the output connector from the fixture, then connect the cord to CN101 on the main PCB.

  Each part on the back of the main PCB can easily be checked now.

# 11. SCHEMATIC DIAGRAMS OF SERVO GAIN ADJUSTER (SZZP1017F)



Ref. No.	Part No.	Q'ty
IC	AN6552	1
R 1,2,3,4,6,7,9	ERDS2TJ103	7
R 5,8	ERDS2TJ472	2
C 1,2	ECKD1H103ZF	2
С	ECEA1HU100	2
Connector	SSDJB13BXHA	1
Lead Wire	(180,600mm)	2
3 Wire with		1
abcd (Diode)	MA162	4

# iervice Manua







Compact Disc Player

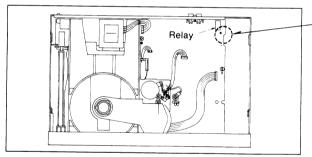
**SL-P210** 

Please use this manual together with the service manual for Model No. SL-P210, Order No. HAD8607631C0.

Notes: ★ The muting circuit relay was changed partway through production from a 6V drive relay to a 12V drive relay.

- ★ This unit is manufactured to use either relay.
- ★ When exchanging the relay during servicing, take particular care to follow the instructions below describing how to distinguish between the two relays.
- ★ This supplement should be filed with the service manual for Model No. SL-P210. (Order No. HAD8607631C0.)

# ■ HOW TO DISTINGUISH BETWEEN THE 6V DRIVE RELAY AND **12V DRIVE RELAY**



(Upper view of unit after removal of top case)

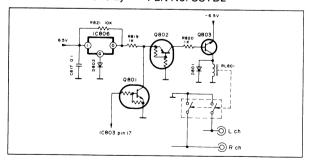
Units with a red mark near the lower side of the relay were manufactured using a 12V drive relay (Part No. SSYD3)

Note: The 6V drive relay and 12V drive relay look exactly the same. They cannot be distinguished by appearance or shape.

# ■ SCHEMATIC DIAGRAM

For 6V drive relay

Part No. SSYD2



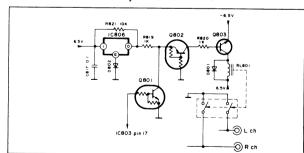
**Technics** 

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

Panasonic Sales Company, Division of Matsushita Electric of Puerto Rico, Inc. Ave. 65 De Infanteria, KM 9.7 Victoria Industrial Park Carolina, Puerto Rico 00630

For 12V drive relay

Part No. SSYD3



Panasonic Hawaii, Inc. 91-238, Kauhi St. Ewa Beach P.O. Box 774 Honolulu, Havrii 96808-0774

Matsushita ∜∫ુક્

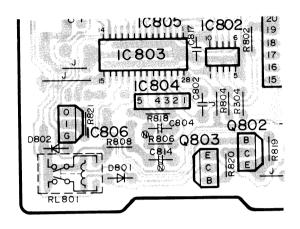
Matsushita Electric Trading Co., Ltd. P.O. Box 288, Central Osaka Japan

Panasonic Tokyo Office Matsushita Electric Trading Co., Ltd. 6th Floor, World Trade Center Bldg., No. 4-1, Hamamatsu-cho 2-Chome. Minato-ku, Tokyo 105, Japan

# ■ PRINTED CIRCUIT BOARD AND SERVICE

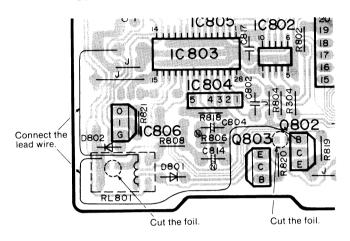
# When a 6V drive relay (Part No. SSYD2) is used

### Printed circuit board



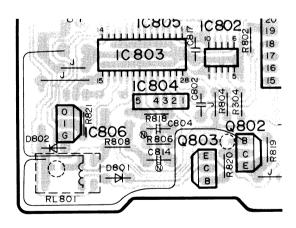
### • Service

- 1. To replace with a 6V drive relay (Part No. SSYD2).
  - Detach the relay. Replace with another of the same type.
- 2. To replace with a 12V drive relay (Part No. SSYD3).
  - Cut the foil on the P.C.B. as shown in the figure below.
  - Connect the 2 lead wires as shown below.



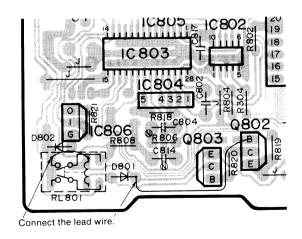
### When a 12V drive relay (Part No. SSYD3) is used

#### Printed circuit board



### Service

- 1. To replace with a 12V drive relay (Part No. SSYD3).
  - Detach the relay, and replace with another of the same type.
- 2. To replace with a 6V drive relay (Part No. SSYD2).
  - Detach the 2 lead wires.
  - Attach the 2 lead wires at the place shown in the figure below.



# ■ REPLACEMENT PARTS LIST

Ref. No.	Part No.	Description	Remarks
RL801	SSYD2	Muting Relay	6V Drive Relay
RL801	SSYD3	- Relay	12V Drive Relay

ORDER NO. HAD8610750S0 Service Manual

Supplement



SL-P210

Please use this manual together with the service manual for Model No. SL-P210, Order No. HAD8607631C0.

### Notes:

- ★ The main P.C.B. of this unit was changed at the production. Be careful about this point during servicing.
- 1. Mounting the muting relay circuit into main P.C.B
- 2. Discontinuing of parts mounted on the foil side of P.C.B.
- ★ This supplement should be filed with the service manual for Model No. SL-P210, Order No. HAD8607631CO.

# **CHANGES**

# ■ REPLACEMENT PARTS LIST

Ref. No.	Change of Part No.				Remarks
Her. NO.	OLD NEW		Part Name & Descrption	Per Set (Pcs.)	
INTEGRATED	CIRCUITS				L
IC806		MN1280-S	IC, Reset Signal Generator	1	Addition
IC1001	MN1280-S		IC, Reset Signal Generator	0	Deletion
TRANSISTOR	S				20.00.00
Q801		UN4212	Transistor, Switching	1	Addition
Q802		UN4113	Transistor, Switching	1	Addtion
Q803		2SC3311-Q	Transistor, Relay Drive	1	Addition
Q1001	UN4212		Transistor, Switching	0	Deletion
Q1002	UN4112		Transistor, Relay Drive		Deletion
DIODES	T				
D801		MA165	Diode	1	Addtion
D1001~1004	MA165		Diode	0	Deletion
RELAYS				1	
RL801	SSYD2		Relay, Muting 1		Addtion
RL1001		SFDYG5A237P	Relay, Muting	0	Deletion
RESISTORS					
R819	ERDS2TJ102		Carbon, 1/4W, 1kΩ, ±5% 1		Addtion
R820	ERDS2TJ102		Carbon, 1/4W, 1kΩ, ±5% 1		Addtion
R821	ERDS2TJ103		Carbon, 1/4W, 10kΩ, ±5%		Addtion
R1001		ERDS2TJ103	Carbon, 1/4W, 10kΩ, ±5%	0	Deletion
CAPACITOR			•		
C817	ECFD1H104ZF		Semiconductor, 50V, $0.1\mu\text{F}$ , $\pm \frac{80}{20}\%$	1	Addition



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

Panasonic Sales Company, Division of Matsushita Electric of Puerto Rico, Inc. Ave. 65 De Infanteria, KM 9.7 Victoria Industrial Park Carolina, Puerto Rico 00630

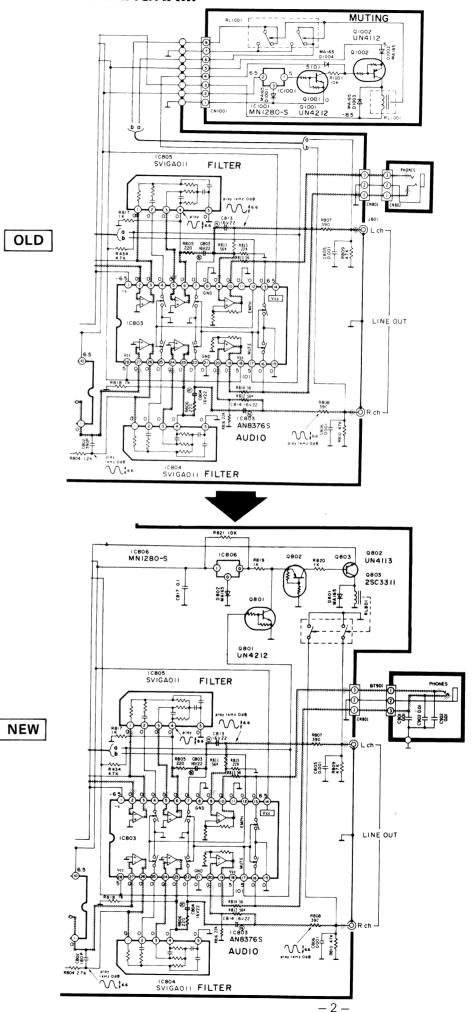
Panasonic Hawaii Inc. 91-238 Kauhi St. Ewa Beach P.O. Box 774 Honolulu, Hawaii 96808-0774

Matsushita Electric of Canada Limited 5770 Ambler Drive, Mississauga. Ontario, L4W 2T3

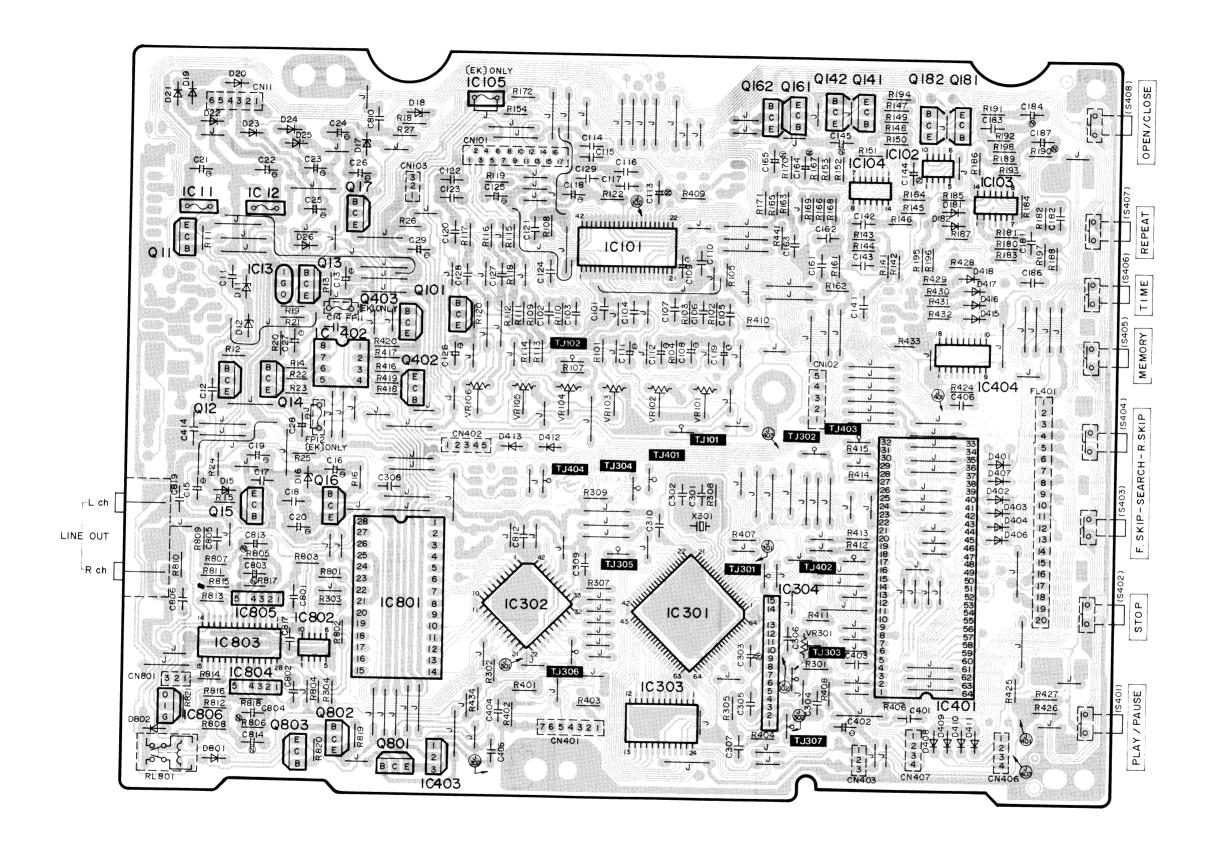
Matsushita Electric Trading Co., Ltd. P.O. Box 288, Central Osaka Japan

Panasonic Tokyo Office Matsushita Electric Trading Co., Ltd. 6th Floor, World Trade Center Bldg., No. 4-1, Hamamatsu-cho 2-Chome, Minato-ku. Tokyo 105, Japan

# SCHEMATIC DIAGRAM



# ■ PRINTED CIRCUIT BOARD



# Parts Change Notice

Model No. SL-P110/P210

Reason for Change

Service Manual Order No. HAD8606593C0 Order No. HAD8607631C0

Please revise the original parts list in the Service Manual to conform to the change (s) shown herein. If new part numbers are shown, be sure to use them when orderring parts.

\*The circled item indicates the reason. If no marking, see the Notes in the bottom column.

neason for chang			e reason. It no marking, se	- 110 140 103 11	The bottom column,	
1. Improve perfor						
2. Change of mate						
3. To meel appro		tion				
4. Standardization	n 					
5. Addition			,			
6. Deletion 7. Correction						
8. Other					•	
	Code **	The circled Item Indic	ates the interchangeability	. If no markin	ng, see the Notes in the bottom column.	
Parts	···	duction				
Original <	Early	Origin	al or new parts may be use	d in early or	late production cet	
A New $\geq$	Late		iginal parts until exhausted			
Original	= Early	Origin	al parte may be used in eas	ly production	n sets only. New parts may be used in ear	
B New	Late	produ	ction sets. Use original par	ts where poss	ible, then stock new parts.	riy Or late
Original	Early	New r	arts only may be used in e	arly or late o	raduction sate	
C New _	Late		new parts.	uriy or rate p	oddellon sets.	
Original —	- Early	Origin	al narts may be used in ear	ly production	sets only. New parts may be used inlat	
D New	Late		ction sets only. Stock both			e
E Other				· · · · · · · · · · · · · · · · · · ·		
Part Number						
Model No.	Ref. No.	Original Part No.	New Part No.	Notes (****)	Part Name & Descriptions	
SL-P110/210	C110	ECFR1H104ZF	ECQV1H104JZ	1, C	Polyester, 50V, 0.1μF, ±5%	
SL-P110	C812	ECKF1H103KB	ECQV1H104JZ	1, C	Polyester, 50V, 0.1µF, ±5%	
SL-P110/210	Q11	2SD973A	2SD1227M-Q	1, C ·	Transistor	
			l l	j - i		
SL-P210	C120	RCBS1H681KB	RCBS1H681KBY	8, C	Ceramic, 50V, 680pF, ±10%	
SL-P210	C812	ECKD1H103KB	ECQV1H104JZ	1, C	Polyester, 50V, 0.1 $\mu$ F, ±5%	
		•				
					•	
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File this Parts Change Notice with your copy of the Service Manual.



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Metsushila Electric of Canada Limited 5770 Ambier Drive, Mississauga, Ontario, L4W 2T3 Matsushita Electri; Trusding Co., Ltd. P.O. Box 288, Ceirzi — Osaka Japan

Panasenic Tokyopmice
Matsushita Electrificading Co., Ltd.
6th Floor, World Tade Center Bidg.,
No. 4-1, Hamamay.—cho 2-Chome,
Minato-ku, Tokyotos , Japan

Primed in Japan 86000≥185 ⊗ AM