

# Service Manual

**COMPACT**  
**disc**  
DIGITAL AUDIO

**DIGITAL**



Compact Disc Player



Compact Disc Player

**SL-PJ20**

Free service manuals  
Gratis schema's

Digitized by

## Color

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

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.

## SECIFICATIONS

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

### ■ Audio

No. of channels: 2 (left and right, stereo)  
Frequency response: 4–20,000 Hz  $\pm 0.5$  dB\*  
Dynamic range: More than 92 dB\*  
S/N ratio: More than 96 dB\*  
Harmonic distortion: 0.004% (1 kHz, 0 dB)  
Total harmonic distortion: 0.006% (1 kHz, 0 dB)\*  
Channel separation: More than 96 dB\*  
Wow and flutter: Below measurable limit\*  
Low-pass filter: High-resolution digital filter

### ■ Functions

Automatic play:  
Random access play:  
Repeat play:  
Search:  
Program play:  
Preset edit play:  
Display:  
Time display:

All tracks.  
Track number.  
Entire disc or programmed tracks.  
Forward/backward track skip.  
Forward/backward manual search.  
For up to 20 selections  
Up to 99 minutes  
(for program play)  
Total tracks.  
Current track.  
• Time display (min., sec.).  
• The following four time 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 the current track.  
③ Playing time from the beginning of the first track.  
④ Track number and elapsed playing time from the beginning of the current track.

### ■ Signal Format

Sampling frequency: 44.1 kHz  
Correction system: Technics Super Decoding  
Algorithm  
D-A conversion: 16-bit linear

### ■ Pickup

Type: Fine-focus, one beam



### Access time:

1 second\*  
(access to the last track)\*

### Light source:

Semiconductor laser

### Wavelength:

780 nm

### Traverse system:

High-speed linear access system

### Spindle system:

Brushless DD motor



Indicator:

Disc loading:

Play indicator.

Pause indicator.

Repeat indicator.

Disc indicator.

Motor-driven horizontal type.

# 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 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

## ■ General

### Power supply:

For U.S.A. and Canada:  
AC 120 V, 60 Hz  
For United Kingdom and Australia:  
AC 240 V, 50 Hz  
For Continental Europe:  
AC 220 V, 50 Hz  
For Others:  
AC 110~127/220~240 V,  
50/60 Hz

Power consumption: 10 W  
Output voltage: 2 V (at 0 dB)\*

### Output impedance:

### Load impedance:

### Dimensions

(W×D×H):

Approx. 550Ω

More than 10 kΩ

31.5×24×7.6 cm

(12-13/32"×9-7/16"×3")

[When disc holder is opened:

37.2 cm (14-21/32") (D)]

3 kg (6.6 lbs.)

### Weight:

Specifications are subject to change without notice for further improvement.

Weight and dimensions are approximate.

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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

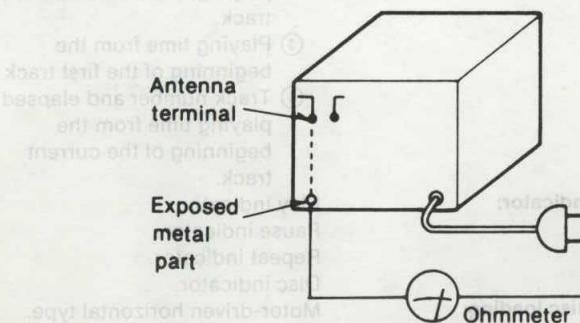
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.

2. Turn on the power switch.

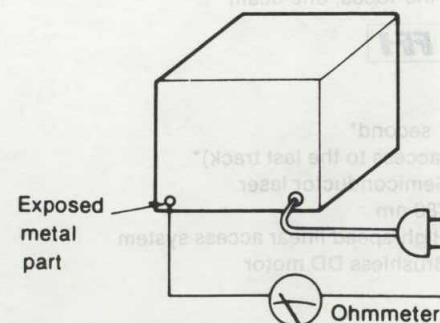
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads, antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between  $3M\Omega$  and  $5.2M\Omega$  to all exposed parts. (Fig. A) Equipment 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.

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(Fig. A)



(Fig. B)

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.

# 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 careful during 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 is turned on. Follow the adjusting procedure in the manual.

### 1-1. 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 at the bottom ( □ (Lock) → ▲ (Free)). See Fig. 1 below.

#### (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 the outside.

#### Caution:

- Be sure to remove a disc from the player and lock the pick-up by pressing in the lock shaft, when the player is transported or disassembled. Otherwise, the disc loading mechanism is shifted and can be damaged.

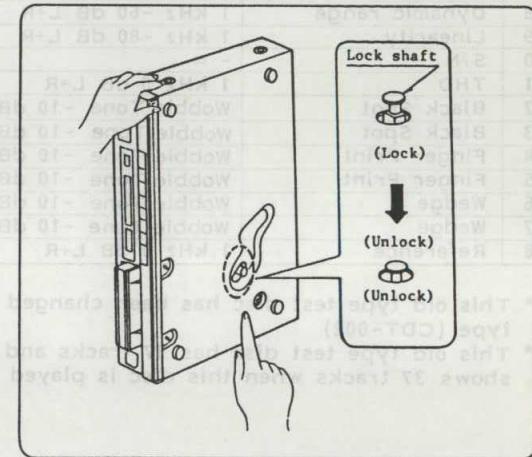


Fig.1 Lock Shaft

### 1-2. Measuring Instruments and Special Tools

Special tools are required prior to starting electric and optical pick-up adjustments. The special tools are available through the ordinary part supply route.

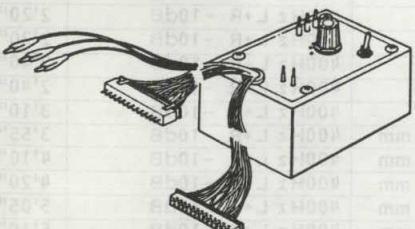
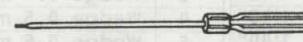
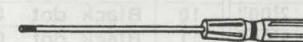
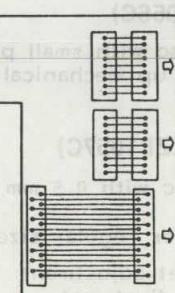
1. Servo gain adjuster (SZZP1017F)	6. Adjusting screwdriver (SZZP1043C)	3. Ordinary disc
		4. 2-channel oscilloscope (with external trigger more than 30MHz)
2. Test disc	7. Allen wrench (1.5 mm) (SZZP1044C)	5. Low frequency oscillator
		6. Adjusting screwdriver -- SZZP1043C
8. Conversion connector (SZZP1032F)	10. Junction PCB (SZZP1070C)	7. Allen wrench ----- SZZP1044C
		9. General servicing tools
11. Junction FPC cord (SZZP1071C)		

Fig. 2

- Test disc (SZZP1014F) old type
- Test disc (SZZP1014F) new type
- Inspection test disc (SZZP1054C)
- Uneven disc (SZZP1056C)
- Black band disc (SZZP1057C)

- TEST DISC (SZZP1014F) old type
- TESTDISK (SZZP1014F); alte Ausführung
- DISQUE D'ESSAI (SZZP1014F) - ancien type
- PRUEBA DE DISCO (SZZP1014F) tipo antiguo

### Contents

TR	PURPOSE	SIGNAL	Time
(TOC)			
1	Servo adjustment	Wobble Tone - 10dB L+R	2'00"
2	Pickup assymetry adjustment	Wobble Tone -10dB L+R	5'00"
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	- ∞	2'00"
11	THD	1 kHz 0 dB L+R	1'00"
12	Black Spot	Wobble Tone -10 dB L+R	5'00"
13	Black Spot	Wobble Tone -10 dB L+R	5'00"
14	Finger Print	Wobble Tone -10 dB L+R	5'00"
15	Finger Print	Wobble Tone -10 dB L+R	9'00"
16	Wedge	Wobble Tone -10 dB L+R	4'00"
17	Wedge	Wobble Tone -10 dB L+R	4'00"
18	Reference	1 kHz 0 dB L+R	0'30"

- \* This old type test disc has been changed to new type (CDT-002)
- \* This old type test disc has 37 tracks and display shows 37 tracks when this disc is played

TR	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 - ∞	0'30"

- \* Characteristics of old type and new type (CDT-002) are identical. Both disc can be used for same purpose.

- TEST DISC (SZZP1014F) new type
- TESTDISK (SZZP1014F); neue Ausführung
- DISCHE D'ESSAI (SZZP1014F) - nouveau type
- PRUEBA DE DISCO (SZZP1014F) tipo nuevo

- INSPECTION TEST DISC (SZZP1054C) CDT-016
- INSPEKTIONSDISK (SZZP1054C) CDT-016
- DISQUE D'ESSAI D'INSPECTION (SZZP1054C) CDT-016
- DISCO DE PRUEBA DE INSPECCION (SZZP1054C) CTD-016

### Contents

TR	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	Emphasis	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	Index	1.440Hz L+R -10dB 2.880Hz L+R -10dB 3.1760Hz L+R -10dB	8'00" 8'00" 1'00"
12	Repeat check	1 kHz L+R 0dB	0'05"

### Contents

TR	PURPOSE	SIGNAL	Time
1	Reference	1 kHz L+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 unevenness  
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. ADJUSTMENT AND TEST POINT LOCATIONS

## 2. EINSTELLUNG UND LAGE DER MESSPUNKTE

## 2. RÉGLAGE ET EMPLACEMENTS DES POINTS DE MESURE

## 2. POSICION DEL AJUSTE Y EL PUNTO DE PRUEBA

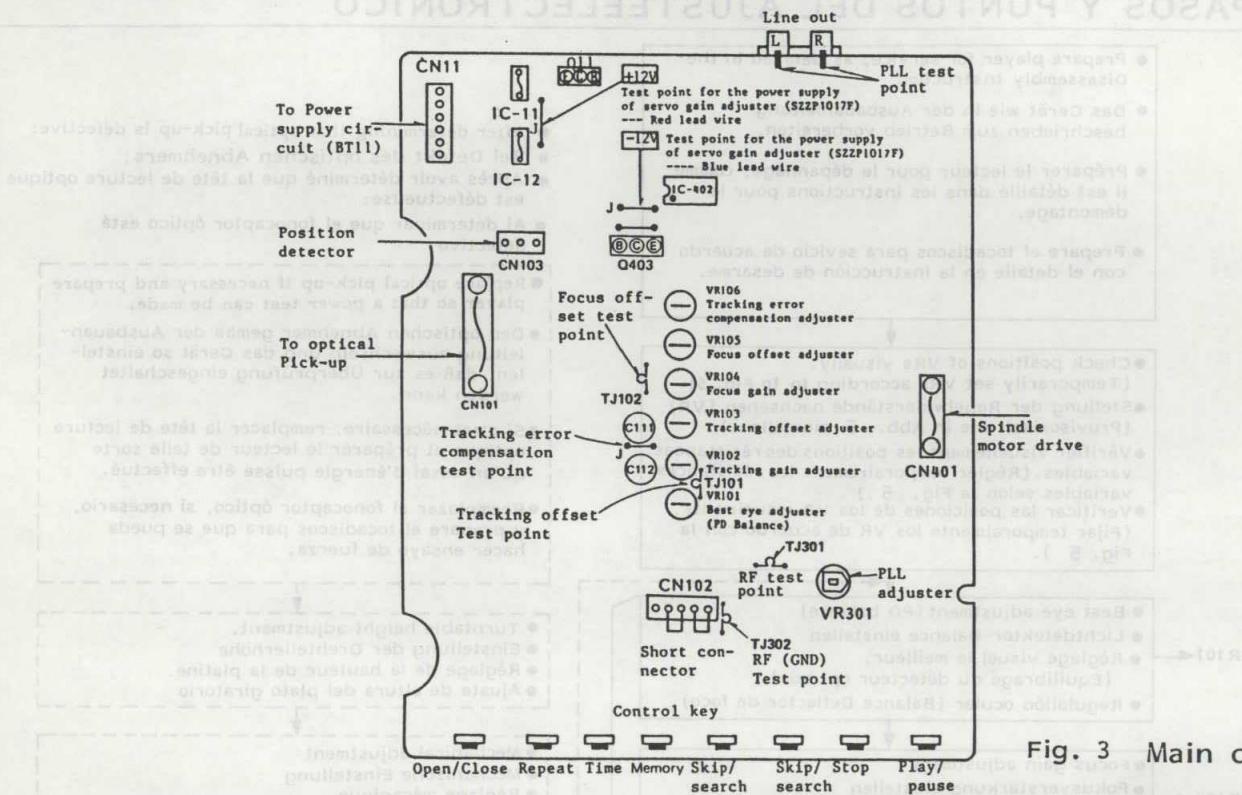


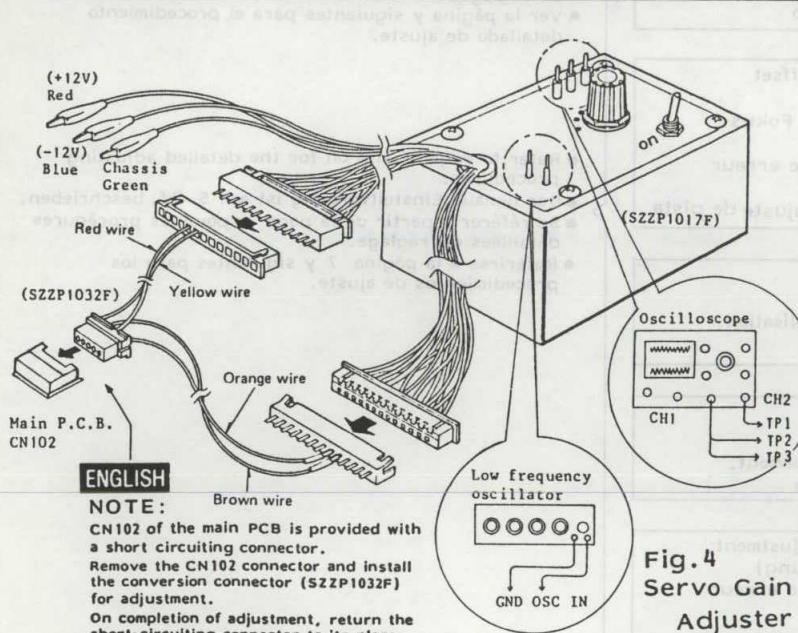
Fig. 3 Main circuit

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

### 2-1. Servo-Verstärkungsregler mit Anschluß

### 2-1. Ajusteur de l'amplification asservie et son raccordement

### 2-1. Ajustador de ganacia de servo y su conexión



### DEUTSCH

### HINWEIS:

### FRANÇAIS

### NOTA:

### ESPAÑOL

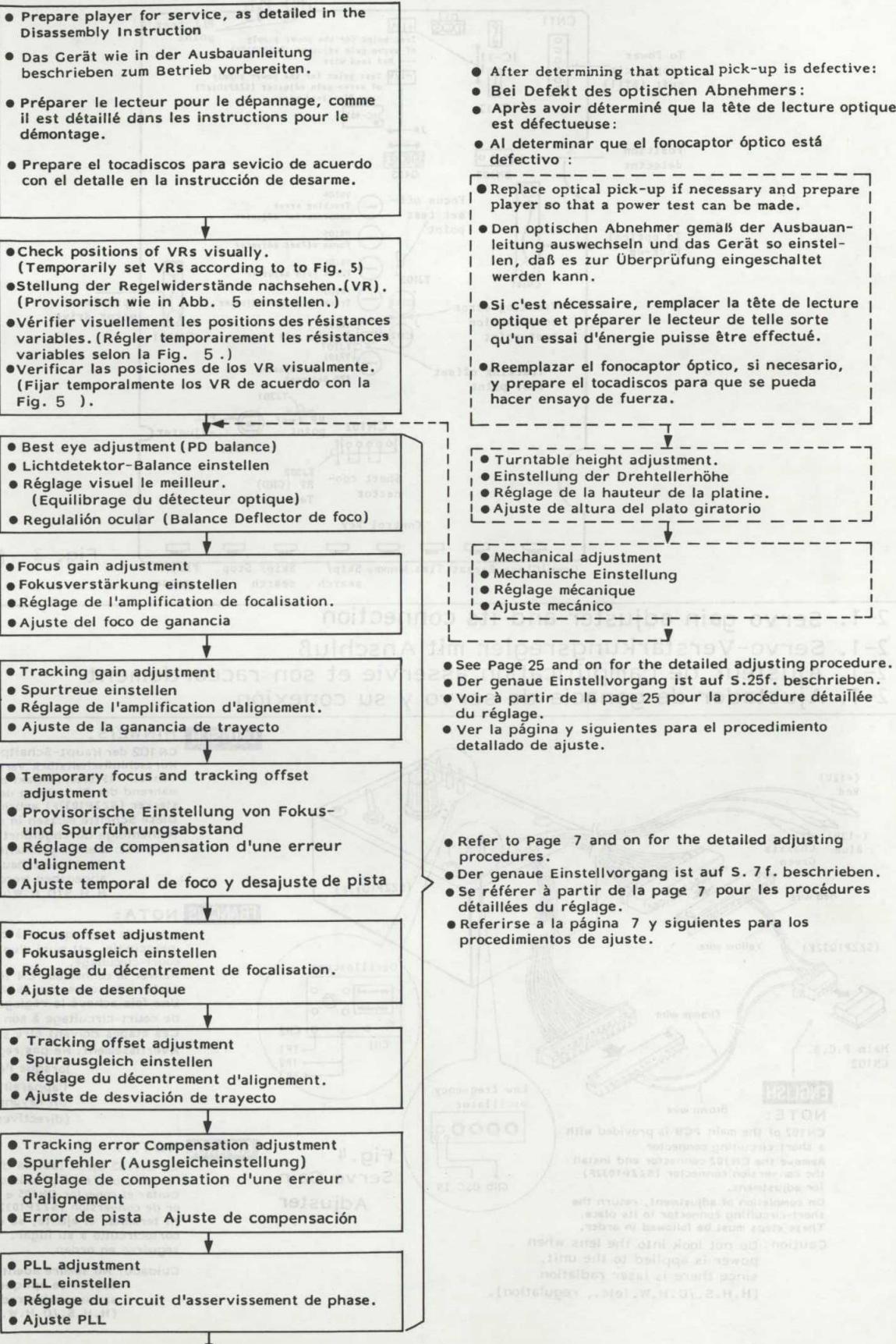
### NOTA:

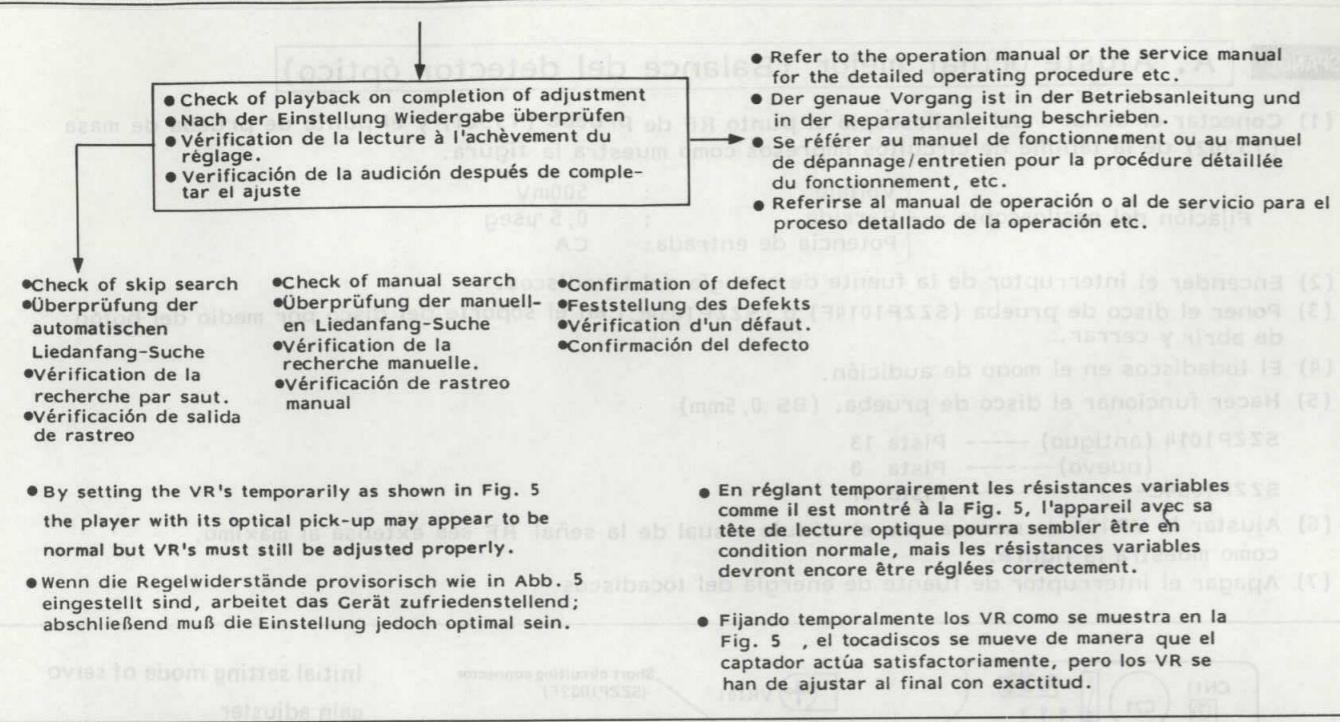
### 3. ELECTRON ADJUSTMENT STEPS

### 3. SCHRITTE UND VORGÄNGE BEI DER ELEKTRONISCHEN EINSTELLUNG

### 3. ÉTAPES POUR LE RÉGLAGE ÉLECTRONIQUE

### 3. PASOS Y PUNTOS DEL AJUSTE ELECTRÓNICO





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

## 4. VORLÄUFIGE EINSTELLUNG DER REGELWIDERSTÄNDE (VR)

## 4. RÉGLAGE INITIAL DES RÉSISTANCES VARIABLES (VR)

## 4. FIJACION INICIAL DE LAS RESISTENCIAS VARIABLES DE AJUSTE (VR)

### ENGLISH

#### • Adjusting Variable Resistors and Test Points

The player operates, but not at its best with the initial setting of the variable resistors. Adjust them according to the proper procedure.

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

For adjusting the variable resistors, view the drawing to the right of the above Fig. 5. All the electronic adjustments are possible by adjusting as shown in Fig. 5. (Remove the power supply switch rod for the convenience of adjustment.)

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### DEUTSCH

#### • Einstellung der Regelwiderstände und der Prüfkontakte

Bei der oben dargestellten Stellung der Regelwiderstände funktioniert das Gerät, aber nicht optimal. Gemäß dem Einstellvorgang einstellen.

Die elektrische Einstellung muß immer durchgeführt werden, wenn ein elektrisches Teil ausgetauscht wird. Bei Auswechseln des optischen Abnehmers immer ① die Einstellung des optischen Abnehmers und ② elektrische Einstellung in dieser Reihenfolge durchführen. (Optischer Abnehmer = SO AD 30 A)

Die Regelwiderstände an der Seitenfläche können alle wie in Abb. 5 eingestellt werden. (Um die Arbeit bei der Einstellung zu erleichtern, kann der Schaltstab des Netzschalters abgenommen werden.)

### FRANÇAIS

#### • Réglage des résistances variables et des points de mesure

L'appareil fonctionne, mais non dans les conditions optima du réglage initial des résistances variables. Les régler selon la procédure appropriée.

Réaliser un réglage électronique lorsque n'importe quel élément électrique est remplacé. Effectuer ① le réglage de la tête de lecture optique et ② le réglage électronique dans l'ordre indiqué, lorsque la tête de lecture optique (SOAD30A) est remplacée.

Pour le réglage des résistances variables, voir le schéma à la droite de la Fig. 5 ci-dessus. L'ensemble des mises au point électroniques est possible en réglant comme il est montré à la Fig. 5. (Retirer la tige d'attaque de l'interrupteur d'alimentation pour la commodité de l'ajustement.)

### ESPAÑOL

#### • inicial de las resistencias variables.

Se tiene que hacer un ajuste electrónico cuando se cambia cualquier pieza eléctrica. Hacer ① primero el ajuste del colector óptico y luego ② el ajuste electrónico en el orden debidos cuando se cambie el colector óptico (SOAD30A)

los ajustes electrónicos haciendo la fijación tal como indica la Fig. 5.

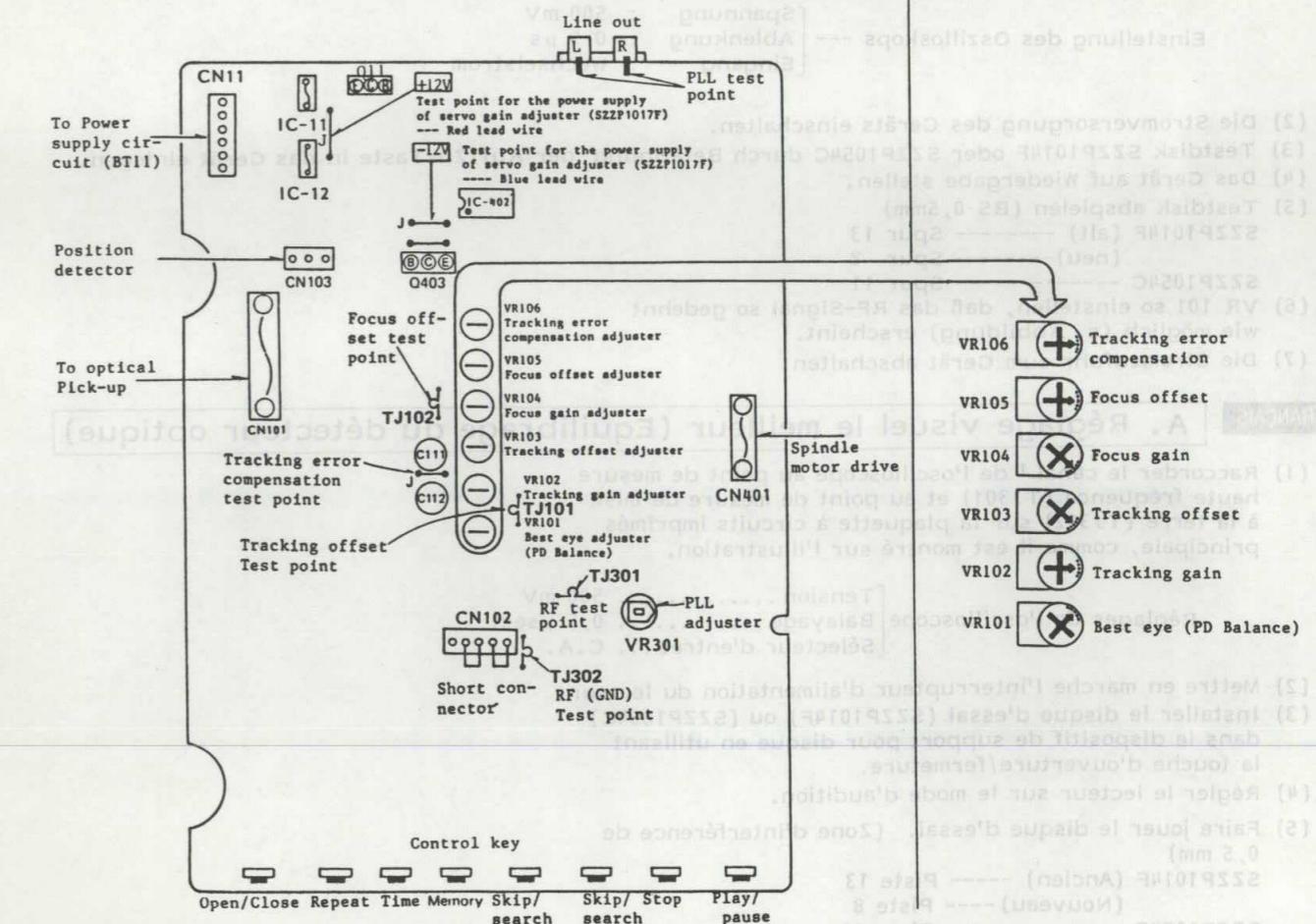


Fig. 5 Main circuit

## 5. ELECTRONIC ADJUSTMENT PROCEDURE

## 5. EINSTELLVORGANG FÜR ELEKTRONIK

## 5. PROCÉDURE POUR LE RÉGLAGE ELECTRONIQUE

## 5. PROCEDIMIENTO DEL AJUSTE ELECTRONICO

### ENGLISH 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 the illustration.

Oscilloscope setting --- [Volt : 500 mV  
Sweep : 0.5  $\mu$ sec  
Input : AC]

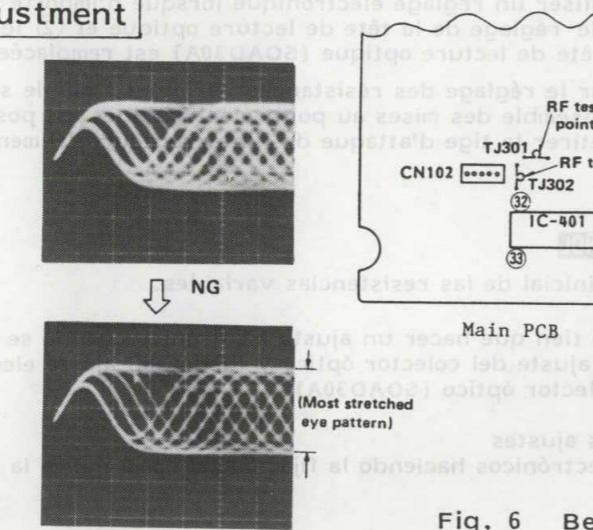


Fig. 6 Best eye

(2) Turn on the power supply switch of the player.  
(3) Place the test disc (SZZP1014F) or (SZZP1054C) into the disc holder by open/close button.

(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 to maximum as shown in the illustration.

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

### DEUTSCH A. Einstellung der Lichtdetektor-Balance (Best Eye)

(1) CH-1 des Oszilloskops an den RF-Meßpunkt (TJ301) und an den Erdungsmeßpunkt (TJ302) der Haupt-Schaltplatte wie in der Abbildung gezeigt anschließen.

Einstellung des Oszilloskops --- [Spannung : 500 mV  
Ablenkung : 0,5  $\mu$ s  
Eingang : Wechselstrom]

(2) Die Stromversorgung des Geräts einschalten.  
(3) Testdisk SZZP1014F oder SZZP1054C durch Betätigung der Auf/Zu-Taste in das Gerät einlegen.  
(4) Das Gerät auf Wiedergabe stellen.  
(5) Testdisk abspielen (BS 0,5mm)  
SZZP1014F (alt) ----- Spur 13  
(neu) ----- Spur 8  
SZZP1054C ----- Spur 11  
(6) VR 101 so einstellen, daß das RF-Signal so gedehnt wie möglich (s. Abbildung) erscheint.  
(7) Die Stromzufuhr zum Gerät abschalten.

### FRANÇAIS A. Réglage visuel le meilleur (Equilibrage du détecteur optique)

(1) Raccorder le canal 1 de l'oscilloscope au point de mesure haute fréquence (TJ301) et au point de mesure de mise à la terre (TJ302) sur la plaque à circuits imprimés principale, comme il est montré sur l'illustration.

Réglages de l'oscilloscope [Tension ..... 500 mV  
Balayage ..... 0,5  $\mu$ sec.  
Sélecteur d'entrée... C.A.]

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.

(3) Installer le disque d'essai (SZZP1014F) ou (SZZP1054C) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture.

(4) Régler le lecteur sur le mode d'audition.

(5) Faire jouer le disque d'essai. (Zone d'interférence de 0,5 mm)

SZZP1014F (Ancien) ----- Piste 13  
(Nouveau) ----- Piste 8

SZZP1054C ----- Piste 11

(6) Régler VR101 de telle sorte que l'oscillogramme visuel du signal de haute fréquence soit étiré au maximum, comme il est montré sur l'illustration.

(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

ESPAÑOL

### A. Ajuste ocular mejor (Balance del detector óptico)

(1) Conectar el Canal-1 del osciloscopio al punto RF de prueba (TJ301) y el punto de prueba de masa (TJ302) de la tablilla de circuitos impresos como muestra la figura.

Fijación del osciloscopio --- [Voltaje : 500mV  
Barrido : 0,5  $\mu$ seg  
Potencia de entrada: CA]

(2) Encender el interruptor de la fuente de energía del tocadiscos.  
(3) Poner el disco de prueba (SZZP1014F) o (SZZP1054C) en el soporte del disco por medio del botón de abrir y cerrar.

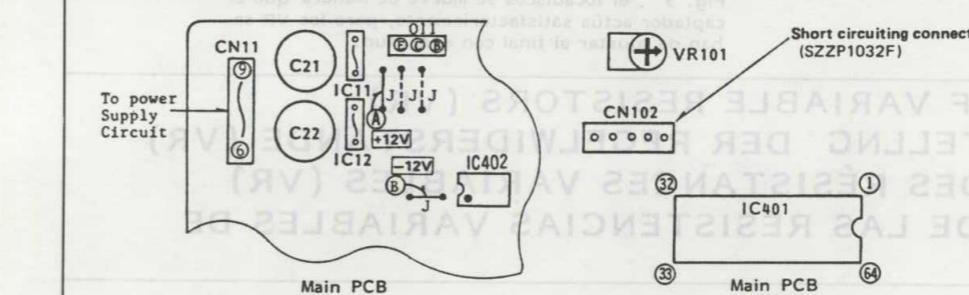
(4) El tocadiscos en el modo de audición.

(5) Hacer funcionar el disco de prueba. (BS 0,5mm)

SZZP1014 (antiguo) ----- Pista 13  
(nuevo) ----- Pista 8  
SZZP1054C ----- Pista 11

(6) Ajustar la VR101 de manera que el módulo visual de la señal RF sea extensa al máximo, como muestra la figura.

(7) Apagar el interruptor de fuente de energía del tocadiscos.



Initial setting mode of servo gain adjuster

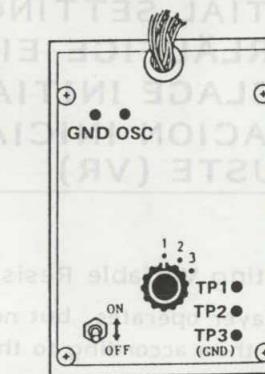


Fig. 7  
(1) mode select switch to "2" position.  
(2) ON/OFF switch to "ON" position.

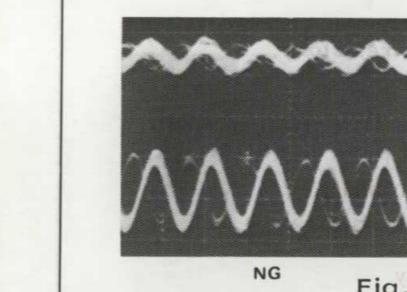


Fig. 9 Focus gain

### B. Focus Gain Adjustment

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

Connecting points  
Red lead wire ----- A Jumper +12V near Q11 terminals on the main PCB.  
Blue lead wire ----- B Jumper -12V near IC402 on the main PCB.  
Green read wire --- Chassis  
Connector ----- Remove the short-circuiting plug CN102 on the Main

PCB and connect the conversion connector (SZZP1032F).

(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.)

Oscilloscope setting --- [Volt ..... 100 mV  
Sweep ..... 1 ms  
Input selector..... DC]

(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 button 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, the 750 Hz signal will be displayed on the oscilloscope. Then adjust VR104 so that the waveforms and amplitudes of both channels shall be equal as shown in the illustration.  
 (8) Turn off the power supply switch of the player.  
 (Note) Please Do not remove the servo gain adjuster also shorting connector.

## B. Einstellung der Fokusverstärkung

(1) Den Servo-Verstärkungsregler (SZZP1017F) mit Hilfe des Konverter-Steckkontakte (SZZP1032F) wie in der Abbildung gezeigt an das Gerät anschließen.  
 Roter Draht ---- Brücke A **+12V** neben den Q11-Kontakten auf der Haupt-Schaltplatte  
 Anschlußpunkte Blauer Draht --- Brücke B **-12V** neben dem IC402-Kontakt auf der Haupt-Schaltplatte  
 Grüner Draht--- Chassis  
 Stecker ----- Kurzschlußkontakt von CN102 auf der Haupt-Schaltplatte entfernen und den Konverter-Steckkontakt (SZZP1032F) anschließen. Den Steckkontakt mit der Konverterseite (5 Nadeln) an CN 102 anschließen.  
 (2) Auf dem Niederfrequenz-Oszillatator eine Frequenz von 750 Hz und Ausgangsspannung von 150mVp-p einstellen, dann den Oszillatator an die Klemmen OSC IN und GND des Servo-Verstärkungsreglers anschließen (SZZP1017F).  
 (3) CH-1 und CH-2 des Oszilloskops an TP1 und TP2 des Servoverstärkungsreglers (SZZP1017F) anbringen. (TP3 ist die Erdungsklemme.)  
 Einstellung des Oszilloskops: Spannung ..... 100 mV  
 Ablenkung ..... 1 ms  
 Eingangsumschalter ..... Gleichstrom  
 (4) Die Stromversorgung des Geräts einschalten.  
 (5) Testdisk SZZP1014F oder SZZP1054C durch Betätigung der Auf/Zu-Taste in das Gerät einlegen und auf Wiedergabe-Betrieb schalten.  
 (6) Den Schaltknopf für den Servo-Verstärkungsregler (SZZP1017F) von "2" auf "1" stellen.  
 (7) Wenn das Gerät auf Wiedergabe geschaltet ist und das 750Hz-Signal auf dem Oszilloskop erscheint, muß VR104 so eingestellt werden, daß die Signalformen und Amplituden beider Kanäle gleich sind (s. Abb.).  
 (8) Die Stromversorgung des Geräts abschalten.  
 (Hinweis) Kurzschlußstecker und Stecker des Servo-Verstärkungsreglers bitte nicht abnehmen.

## B. Réglage de l'amplification de focalisation

(1) Raccorder l'ajusteur de l'amplification asservie (SZZP1017F) avec le connecteur de conversion (SZZP1032F) au lecteur, comme il est montré sur l'illustration.  
 Points de raccordement Fil de jonc- ---- ① Jarretière **+12V** près des bornes Q11 sur la plaque à circuits imprimés principale.  
 Fil de jonc- ---- ② Jarretière **-12V** près de IC402 sur la plaque à circuits imprimés principale.  
 Fil de jonc- ---- Châssis  
 Connecteur----- Retirer la fiche de court-circuitage de CN102 sur la plaque à circuits imprimés principale et raccorder le connecteur de conversion (SZZP1032F).  
 (2) Régler l'oscillateur à basses fréquences sur une fréquence de 750 Hz et une tension de sortie de 150 mV crête-à-crête. Puis, brancher l'oscillateur aux bornes OSC IN (entrée d'oscillateur) et GND (terre) de l'ajusteur d'amplification asservie (SZZP1017F).  
 (3) Raccorder le canal 1 et le canal 2 de l'oscilloscope à TP1 et TP2 de l'ajusteur d'amplification asservie (SZZP1017F). (TP3 est la borne de mise à la terre.)  
 Réglages de l'oscilloscope Tension ..... 100 mV  
 Balayage ..... 1 ms  
 Sélecteur d'entrée ... C.C.  
 (4) Mettre en marche l'interrupteur d'alimentation du lecteur.  
 (5) Installer le disque d'essai (SZZP1014F) ou (SZZP1054C) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture et en réglant sur le mode de lecture.  
 (6) Régler le commutateur rotatif de l'ajusteur d'amplification asservie (SZZP1017F) sur "2" + "1".  
 (7) Le lecteur étant sur le mode de lecture, un signal de 750 Hz sera affiché sur l'oscilloscope. Puis, régler VR104 de telle sorte que les formes d'ondes et les amplitudes des deux canaux soient égales, comme il est montré sur l'illustration.  
 (8) Mettre hors circuit l'interrupteur d'alimentation en courant du lecteur.  
 (Nota) Veuillez ne pas retirer l'ajusteur de l'amplification asservie ainsi que le connecteur de court-circuitage.

## B. Ajuste de ganancia de foco

(1) Conectar el ajustador de ganancia de servo (SZZP1017F) con el conector de conversión (SZZP1032F) al tocadiscos como muestra la figura.  
 Hilo conductor ----- (A) Puente **+12V** junto a los terminales Q11 en la tablilla de circuitos impresos principal.  
 Hilo conductor ----- (B) Puente **-12V** cerca del terminal IC402 en la tablilla de circuitos impresos principal.  
 Hilo conductor ----- Masa (chasis)  
 Conector ----- Quitar el borne de cortocircuito de CN102 en la tablilla principal de CN102 en la tablilla principal de circuitos impresos y empalmar el conector de conversión (SZZP1032F).  
 (2) Fijar el oscilador de baja frecuencia a una frecuencia de 750 Hz y un voltaje de potencia de salida de 150 mVp-p y luego conectar el oscilador a los terminales OSC IN y TIERRA del ajustador de ganancia de servo (SZZP1017F).  
 (3) Conectar el CANAL-1 y el CANAL-2 al osciloscopio al TP1 y TP2 del ajustador de ganancia de servo (SZZP1017F).  
 Fijación del osciloscopio -- Voltaje ..... 100 mV  
 Barrido ..... 1 ms  
 Selector de potencia de entrada ..... CD  
 (4) Encender el interruptor de la fuente de energía del tocadiscos.  
 (5) Colocar el disco de prueba (SZZP1014F) o (SZZP1054C) en el soporte del círculo por medio del botón de abrir/cerrar en el modo de audioreproducción.  
 (6) Fijar el interruptor rotativo del ajustador de ganancia de servo (SZZP1017F) en "2" → "1".  
 (7) Con el tocadiscos en el modo de audioreproducción en el osciloscopio se verá la señal de 750Hz, ajustándose luego VR104 de manera que las formas de onda y las amplitudes de ambos canales sean iguales como se muestra en la figura.  
 (8) Apagar el interruptor de la fuente de energía del tocadiscos.  
 (Nota) No quitar el ajustador de ganancia de servo ni el conector de cortocircuito.

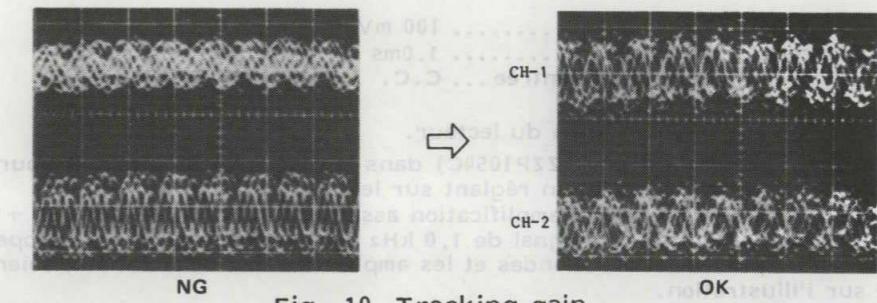


Fig. 10 Tracking gain

## C. Tracking Gain Adjustment

(1) Set the low frequency oscillator to 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.)  
 Oscilloscope setting --- Volt : 100mV  
 Sweep : 1.0ms  
 Input selector : DC  
 (3) Turn on the power supply switch of the Player.  
 (4) Place the test disc (SZZP1014F) or (SZZP1054C) into the disc holder by open/close button and in the Playback mode.  
 (5) Set the rotary switch of the servo gain adjuster (SZZP1017F) to "2" → "3".  
 (6) With the player to the play mode, the 1.0 kHz signal will be displayed on the oscilloscope, then adjust VR104 so that the waveforms and amplitudes of both channels shall be equal as shown in the 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.

### C. Einstellung der Spurtreue

- (1) Den Niederfrequenz-Oszillator auf eine Frequenz von 1.0kHz und einen Ausgangswert von 150mVp-p einstellen und an OSC IN und GND des Verstärkungsreglers (SZZP1017F) anschließen.
- (2) CH-1 und CH-2 des Oszilloskops an die Klemmen TP1 und TP2 des Verstärkungsreglers (SZZP1017F) anschließen. (TP3 ist eine Erdungsklemme).

Einstellung des Oszilloskops --

Spannung .....	100mV
Ablenkung .....	1.0ms
Eingangsumschalter .....	Gleichstrom

- (3) Die Stromversorgung des Geräts einschalten.
- (4) Testdisk SZZP1014F oder SZZP1054C durch Betätigung der Auf/Zu-Taste in das Gerät einlegen und auf Wiedergabe-Betrieb schalten.
- (5) Den Schaltknopf für den Servo-Verstärkungsregler (SZZP1017F) von "2" auf "3" stellen.
- (6) Wenn das Gerät auf Wiedergabe geschaltet ist und das 1,0kHz-Signal auf dem Oszilloskop erscheint, muß VR 102 so eingestellt werden, daß die Signalformen und Amplituden beider Kanäle gleich sind (s. Abb.).
- (7) Die Stromzufuhr zum Gerät abschalten.
- (8) Nach beendigter Einstellung den Servo-Verstärkungsregler entfernen und das Kurzschlußschaltstück wie zu Anfang an CN102 anbringen.

### C. Réglage de l'amplification d'alignement

- (1) Régler l'oscillateur de basses fréquences sur 1,0 kHz et une sortie de 150 mV crête-à-crête, puis brancher l'oscillateur aux bornes OSC IN (entrée d'oscillateur) et GND (terre) de l'ajusteur d'amplification asservie (SZZP1017F).
- (2) Raccorder le canal 1 et le canal 2 de l'oscilloscope à TP1 et TP2 de l'ajusteur d'amplification asservie (SZZP1017F). (TP3 est la borne de mise à la terre.)

Réglages de l'oscilloscope --

Tension .....	100 mV
Balayage .....	1.0ms
Sélecteur d'entrée ...	C.C.

- (3) Mettre en marche l'interrupteur d'alimentation du lecteur.
- (4) Installer le disque d'essai (SZZP1014F) ou (SZZP1054C) dans le dispositif du support pour disque en utilisant la touche d'ouverture/fermeture et en réglant sur le mode de lecture.
- (5) Régler le commutateur rotatif de l'ajusteur d'amplification asservie (SZZP1017F) sur "2" → "3".
- (6) Avec la lecteur sur le mode de lecture, un signal de 1,0 kHz sera affiché sur l'oscilloscope; puis, régler VR102 de telle sorte que les formes d'ondes et les amplitudes des deux canaux soient égales, comme il est montré sur l'illustration.
- (7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.
- (8) Après l'achèvement du réglage mentionné ci-dessus, retirer l'ajusteur d'amplification asservie et insérer le connecteur de court-circuitage dans CN102.

### C. Ajuste de gancia de trayectoria

- (1) Ajustar el oscilador de baja frecuencia a la frecuencia de 1.0 kHz y una potencia de salida de 150mVp-p, y conectar el oscilador a OSC IN y TIERRA del ajustador de ganancia (SZZP1017F).
- (2) Conectar el CANAL-1 y el CANAL-2 del osciloscopio a TP1 y TP2 del ajustador de ganancia (SZZP1017F). (TP3 es un terminal de tierra.)

Fijación del osciloscopio --

Voltaje .....	100 mV
Barrido .....	1.0 ms
Selector de potencia de entrada.....	CD

- (3) Encender el interruptor de fuente de energía del tocadiscos.
- (4) Colocar el disco de prueba (SZZP1014F) o (SZZP1054C) en el soporte del disco por medio de la tecla de abrir/cerrar y en el modo de audioreproducción.
- (5) Fijar el interruptor rotativo del ajustador de ganancia de servo (SZZP1017F) en "2" + "1".
- (6) Con el todaciscos en el modo de audioreproducción se verá en el osciloscopio la señal de 1,0kHz, ajustando luego VR102 de manera que las formas de onda y las amplitudes de ambos canales sean iguales, como muestra la figura.
- (7) Apagar el interruptor de fuente de energía del tocadiscos.
- (8) Después de completar los referidos ajustes, quitar el ajustador de ganancia de servo e insertar el conector de cortocircuito en CN102.

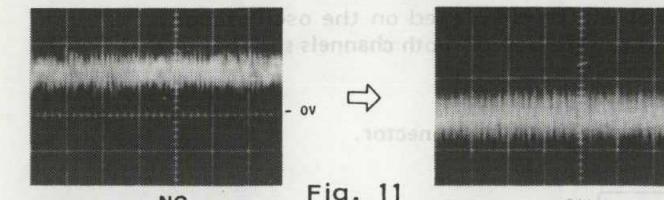
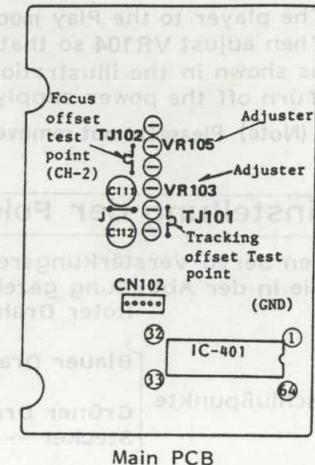


Fig. 11



Fig. 12



### D. Temporary focus and tracking offset adjustment

#### (Focus offset)

- (1) Connect CH-1 of the oscilloscope to 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) into the disc holder by open/close button.
- (4) After TOC reading, the set will enter the stop mode. Then check the waveform on the oscilloscope and adjust VR105, so that the waveform at TJ102 is at 0V (Ground level) as shown in the illustration.

#### (Tracking offset)

- (1) Connect CH-1 of the oscilloscope to TJ101 (tracking 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 button.
- (4) After TOC reading, the set will enter the stop mode. Then check the waveform on the oscilloscope and adjust VR103, so that the waveform at TJ101 is at 0V (Ground level) as shown in the illustration.
- (5) Turn off the power supply switch of the Player.

### D. Provisorische Einstellung von Fokus- und Spurführungsabstand

#### (Fokusabstand)

- (1) CH-1 des Oszilloskops an TJ102 (Fokusabstand-Meßpunkt) und GND (Erdung) an das Gehäuse anschließen.

Oszilloskopeinstellung --

Spannung	: 100mV
Ablenkung	: 5ms
Eingangswahlschalter	: Gleichstrom

- (2) Stromzufuhr zum Gerät einschalten.
- (3) Testdisk (SZZP1057C...Schwarzes Band) durch Betätigung der Auf/Zu-Taste in das Gerät einlegen.
- (4) Nach erfolgter Ablesung schaltet sich das Gerät ab; Signalform auf dem Oszilloskop überprüfen und VR 105 so einstellen, daß das Signal an TJ102 wie auf der Abbildung auf 0V (Grundlinie) liegt.

#### (Spurführungsabstand)

- (1) CH-1 des Oszilloskops an TJ101 (Meßpunkt für den Spurführungsabstand) und GND (Erdung) an das Gehäuse anschließen.

Oszilloskopeinstellung --

Spannung	: 100mV
Ablenkung	: 5ms
Eingangswahlschalter	: Gleichstrom

- (2) Stromzufuhr zum Gerät einschalten.
- (3) Testdisk (SZZP1057C... Schwarzes Band) durch Betätigung der Auf/Zu-Taste in das Gerät einlegen.
- (4) Nach erfolgter Ablesung schaltet sich das Gerät ab; Signalform auf dem Oszilloskop überprüfen und VR 103 so einstellen, daß das Signal an TJ101 wie auf der Abbildung auf 0 V (Grundlinie) liegt.
- (5) Die Stromzufuhr zum Gerät abschalten.

## D. Réglage du décentrement de l'alignement et de la focalisation temporaire

### (Décentrement de la focalisation)

(1) Raccorder le canal 1 de l'oscilloscope à TJ102 (point de mesure du décentrement de focalisation) et la mise à la terre au châssis.

Réglage de l'oscilloscope -- -- --

Tension	: 100mV
Balayage	: 5ms
Sélecteur d'entrée	: C.C.

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.  
 (3) Installer le disque d'essai (SZZP1057C... Disque à plage noire) dans le dispositif du support pour disque en utilisant la touche d'ouverture/fermeture.  
 (4) Après lecture de TOC (vérification du décentrement d'alignement), l'appareil sera mis sur le mode d'arrêt. Puis, vérifier la forme d'onde sur l'oscilloscope et régler VR105, de telle sorte que la forme d'onde à TJ102 soit à 0V (niveau de la mise à la terre) comme il est montré sur l'illustration.

### (Décentrement de l'alignement)

(1) Raccorder le canal 1 de l'oscilloscope à TJ101 (point de mesure du décentrement de l'alignement) et la mise à la terre au châssis.

Réglage de l'oscilloscope -- -- --

Tension	: 100mV
Balayage	: 5ms
Sélecteur d'entrée	: C.C.

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.  
 (3) Installer le disque d'essai (SZZP1057C... Disque à plage noire) dans le dispositif du support pour disque en utilisant la touche d'ouverture/fermeture.  
 (4) Après lecture de TOC (vérification du décentrement d'alignement), l'appareil sera mis sur le mode d'arrêt. Puis, vérifier la forme d'onde sur l'oscilloscope et régler VR103 de telle sorte que la forme d'onde à TJ101 soit à 0V (niveau de la mise à la terre) comme il est montré sur l'illustration.  
 (5) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

## D. Ajuste temporal del foco y de descentramiento de pista

### (Descentramiento de foco)

(1) Conectar el canal 1 del osciloscopio al TJ102 (Punto de prueba de descentramiento de foco) y TIERRA/ a la masa (chasis).

Fijación del osciloscopio -- -- --

Voltaje	: 100mV
Barrido	: 5ms
Selector de potencia de entrada	: CD

(2) Conectar el interruptor de la fuente de energía del tocadiscos.  
 (3) Poner el disco de prueba (SZZP1057P) ... disco de la banda negra) en el soporte del disco con el botón de abrir/cerrar.  
 (4) Después de leer TOC, la fijación pasará al modo de paro, verificándose después la forma de onda en el osciloscopio y ajustando VR105 estando la forma de onda en TJ102 (en nivel de TIERRA) como muestra la figura.

### (Descentramiento de pista)

(1) Conectar el canal 1 del osciloscopio al TJ101 (Punto de prueba de descentramiento de pista) y TIERRA/ a la masa.

Fijación del osciloscopio -- -- --

Voltaje	: 100mV
Barrido	: 5ms
Selector de potencia de entrada	: CD

(2) Conectar el interruptor de fuente de energía del tocadiscos.  
 (3) Poner el disco de prueba (SZZP1057C... Disco de la banda negra) en el soporte del disco con el botón de abrir/cerrar.  
 (4) Después de leer TOC el juego se pondrá en el modo de paro, verificando luego la forma de onda en el osciloscopio y ajustando VR103 de manera que la forma de onda en TJ101 estando en 0V se pasará al modo de paro (en el nivel de TIERRA) como muestra la figura.  
 (5) Desconectar el interruptor de la fuente de energía del tocadiscos.

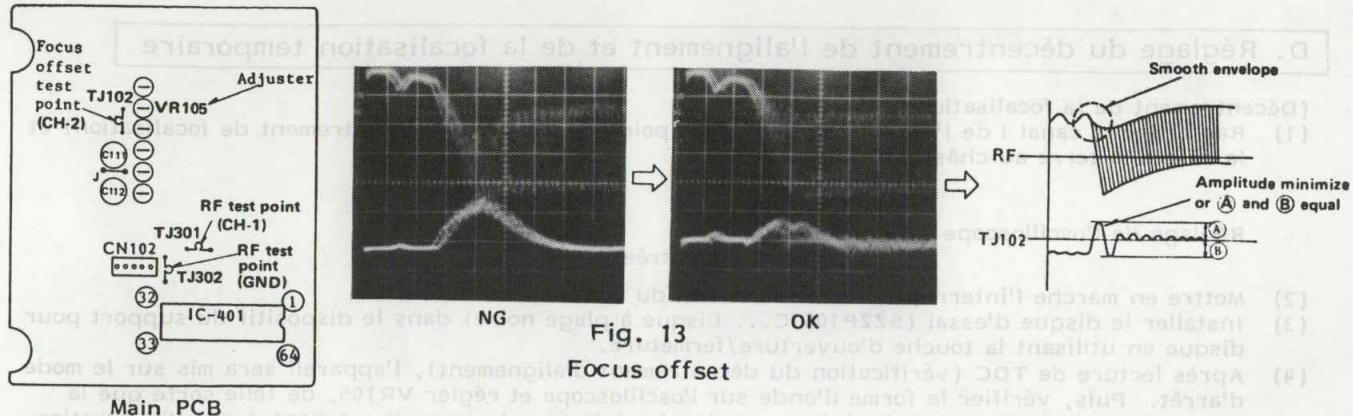


Fig. 13

## Focus offset

**E. Focus Offset Adjustment**

(1) 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)
Oscilloscope setting	Volt : 500mV	100mV
	Sweep : 0.5msec	
	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) into the disc holder by open/close button.  
 (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 shall be as shown in the illustration.  
 (7) Turn off the power supply switch of the player.

**E. Einstellung des Fokusausgleichs**

(1) CH-1 des Oszilloskops an TJ301 (RF-Meßpunkt) und CH-2 an die Klemme TJ102 anschließen (Meßpunkt für Fokusabstand auf der Haupt-Schaltplatte). TJ302 des RF-Meßpunkts (GND) auf der Haupt-Schaltplatte ist wie auf der Abbildung.

	TJ301(CH-1)	TJ102 (CH-2)
Einstellung des Oszilloskops	Spannung : 500mV	100mV
	Ablenkung : 0.5 msec.	
	Eingangsumschalter : Wechselstrom Gleichstrom	
	Betriebsart : NORM (Auslösung über CH-1)	

(2) Die Stromversorgung des Geräts einschalten.  
 (3) Testdisk (SZZP1057C...Schwarzes Band) durch Betätigung der Auf/Zu-Taste in das Gerät einlegen.  
 (4) Das Gerät auf Wiedergabe stellen.  
 (5) TR (Spur) 9 auf dem Testdisk abspielen.  
 (6) Signalformen von CH-1 und CH-2 auf dem Oszilloskop überprüfen und VR 105 so einstellen, daß die Signalform um den Auslösepunkt wie auf der Abbildung aussieht.  
 (7) Die Stromzufuhr zum Gerät abschalten.

**E. Réglage du décentrement de focalisation**

(1) Raccorder le canal 1 de l'oscilloscope à TJ301 (point de mesure à haute fréquence) et le canal 2 à la borne TJ102 (point de mesure du décentrement de la focalisation) sur la plaque à circuits imprimés principale. TJ302 du point de mesure à haute fréquence (terre) sur la plaque à circuits imprimés principale est tel qu'il est montré sur l'illustration.

	TJ301 (Canal 1)	TJ102 (Canal 2)
Réglages de l'oscilloscope	Tension : 500 mV	100 mV
	Balayage : 0,5msec.	
	Sélecteur d'entrée : C.A. C.C.	
Mode	: NORM (Déclenchement via le canal 1)	

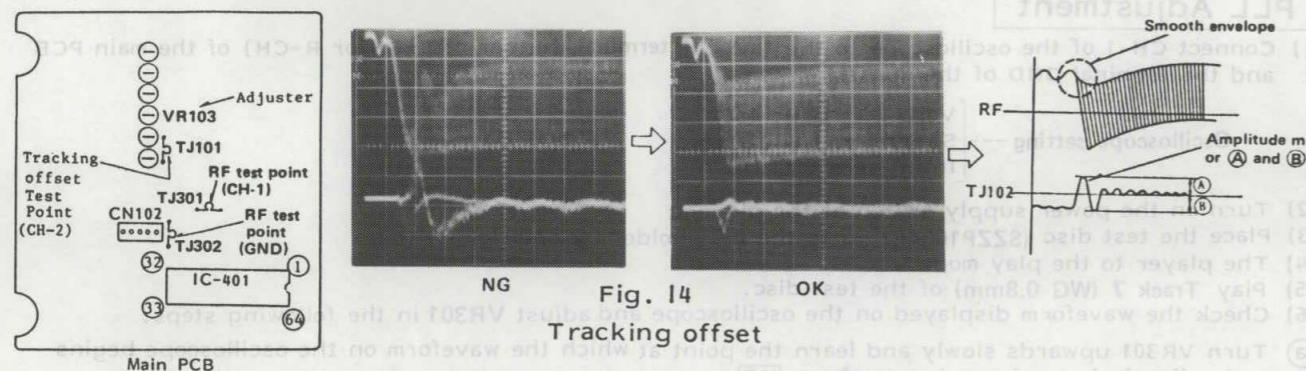
(2) Mettre en marche l'interrupteur d'alimentation du lecteur.  
 (3) Installer le disque d'essaie (SZZP1057C.. Disque à plage noire) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture.  
 (4) Régler le lecteur sur le mode d'audition.  
 (5) Faire jouer la piste 9 du disque d'essai.  
 (6) Vérifier les formes d'ondes du canal 1 et du canal 2 sur l'oscilloscope et régler VR105 de telle sorte que la forme d'onde autour du point de déclenchement soit telle qu'il est montré sur l'illustration.  
 (7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

## E. Ajuste del desenfoque

- Conectar el canal 1 del osciloscopio al TJ301 (Punto de prueba RF) y el canal 1 al terminal TJ101, (Punto de prueba de desenfoque) de la tablilla principal de circuitos impresos.

Fijación del osciloscopio	TJ301(CANAL-1) : Voltaje 500mV Barrido : 0.5msec. Selector de potencia de entrada: CA Modo : NORM (Disparo vía CANAL-1)	TJ102 (CANAL-2)
	100mV	
	0.5sec.	
	CD	

- Encender el interruptor de fuente de energía del tocadiscos.
- Poner el disco de pureba (SZZP1057C...el disco de la banda negra) en el soporte del disco con el botón de abrir/cerrar.
- El tocadiscos en el modo de audición.
- Tocar TR9 del disco de prueba.
- Verificar las formas de onda del canal 1 y el canal 2 en el osciloscopio y ajustar VR105 de manera que la forma de onda alrededor del punto de disparo tiene que estar como muestra la figura.
- Apagar el interruptor de la fuente de energía del tocadiscos.



## F. Tracking Offset Adjustment

- Connect CH-1 of the oscilloscope to the TJ301 (RF test point) and CH-2 to 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 the illustration.

Oscilloscope setting	TJ301 (CH-1) : Volt 500mV Sweep : 0.5msec Input Selector: AC Mode : NORM(Triggering Via CH-1).	TJ101(CH-2) : 100mV
----------------------	---	---------------------

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- Turn on the power supply switch of the player.
- Place the test disc (SZZP1057C...Black band disc) into the disc holder.
- The player to the play mode.
- Play TR9 of the test disc.
- Check CH-1 and CH-2 waveforms displayed on the oscilloscope and adjust VR103 so that the waveforms shall be as shown in the illustration.
- Turn off the power supply switch of the player.

## F. Einstellung des Spurausgleichs

- CH-1 des Oszilloskops an TJ301 (RF-Meßpunkt) und CH-2 an die Klemme TJ101 (Meßpunkt für Spurführungs-Abstand) auf der Haupt-Schaltplatte anschließen. GND (Erdung) des Oszilloskops an den RF-Meßpunkt auf der Haupt-Schaltplatte (TJ302) wie in der Abbildung anschließen.

Einstellung des Oszilloskops--	TJ301(CH-1) : Spannung 500 mV Ablenkung : 0,5 msec. Eingangsumschalter: Wechselstrom Gleichstrom Betriebsart : NORM (Auslösung über CH-1)	TJ102 : 100mV
--------------------------------	--	---------------

- Stromversorgung des Geräts einschalten.
- Testdisk (SZZP1057C...Schwarzes Band) durch Betätigung der Auf/Zu-Taste in das Gerät einlegen.
- Das Gerät auf Wiedergabe stellen.
- TR (Spur) 9 auf dem Testdisk abspielen.
- Signalformen von CH-1 und CH-2 auf dem Oszilloskop überprüfen und VR103 so einstellen, daß die Signalformen wie auf der Abbildung aussehen.
- Stromzufuhr zum Gerät abschalten.

## F. Réglage du décentrement d'alignement

- Raccorder le canal 1 de l'oscilloscope à TJ301 (point de mesure à haute fréquence) et le canal 2 à la borne TJ101 (point de mesure du décentrement d'alignement) sur la plaque à circuits imprimés principale.

Raccorder la mise à la terre de l'oscilloscope au point de mesure à haute fréquence (TJ302) sur la plaque à circuits imprimés principale, comme il est montré sur l'illustration.

Réglages de l'oscilloscope --	TJ301 (Canal 1) : Tension 500 mV Balayage : 0,5 msec. Sélecteur d'entrée : C.A. Mode : NORM (Déclenchement via la canal 1)	TJ101 (Canal 2) : 100 mV
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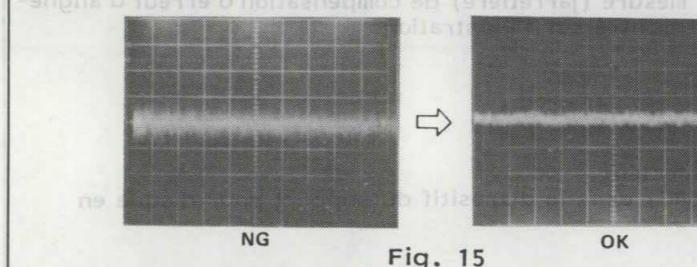
- Mettre en marche l'interrupteur d'alimentation du lecteur.
- Installer le disque d'essai (SZZP1057C...Disque à plage noire) dans le dispositif de support pour disque.
- Régler le lecteur sur le mode d'audition.
- Faire jouer la piste 9 du disque d'essai.
- Vérifier les formes d'ondes du canal 1 et du canal 2 affichées sur l'oscilloscope et régler VR103 de telle sorte que les formes d'ondes soient telles qu'il est montré sur l'illustration.
- Mettre hors circuit l'interrupteur d'alimentation du lecteur.

## F. Ajuste del desvío de trayectoria

- Connectar el canal 1 del osciloscopio a TJ301 (Punto de prueba RF) y el canal 2 al terminal TJ101. (Punto de prueba de descentramiento de pista) en la tablilla de circuitos integrados.

Fijación del osciloscopio	TJ301 (CANAL-1) : Voltaje 400mV Barrido : 0,5mseg. Selector de potencia de entrada: CA Modo : NORMA (Disparo vía CANAL-1)	TJ101 (CANAL-2) : 100mV
---------------------------	--	-------------------------

- Encender el interruptor de fuente de energía del tocadiscos.
- Poner el disco de prueba (SZZP1057C...disco de la banda negra) en su soporte.
- El tocadiscos en el modo de audición.
- Tocar TR9 en el disco de prueba.
- Verificar las formas de onda de los canales 1 y 2 que se muestran en el oscilador y ajustar VR103 de manera que las formas de onda sean como muestra la figura.
- Apagar el interruptor de fuente de energía del tocadiscos.

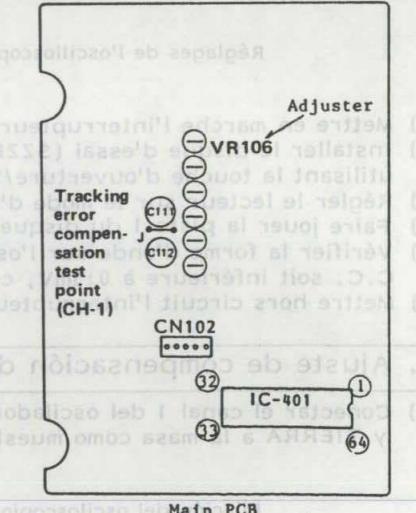


## G. Tracking error Compensation Adjustment

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

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

- Turn on the power supply switch of the player.
- Place the test disc (SZZP1014F or SZZP1054C) into the disc holder by open/close button.
- The player to the play mode.
- Play TR1 of the test disc.
- Check the waveform on the oscilloscope and adjust VR106, so that the waveform at DC level less than  $0\pm5\text{mV}$  as shown in the illustration.
- Turn off the power supply switch of the player.



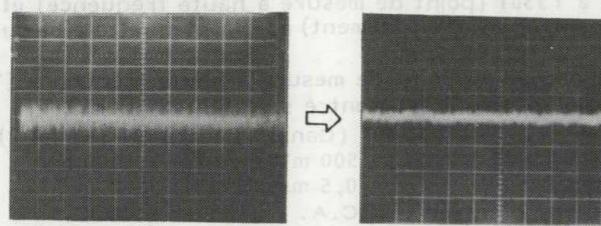
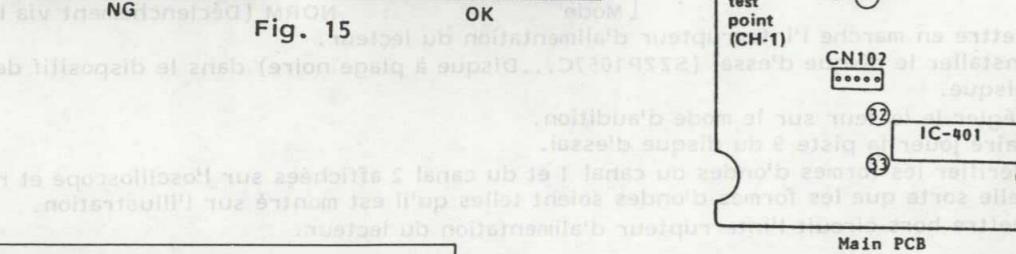


Fig. 15



### G. Einstellung des Spurfehlerausgleichs

- CH-1 des Oszilloskops an den Meßpunkt für Spurfehlerausgleich (Brücke) und GND (Erdung) an das Gehäuse anschließen (s. Abb.).
- Einstellung des Oszilloskops---

Spannung	: 50 mV
Ablenkung	: 1ms
Eingangsumschalter	: Gleichstrom
- Stromzufuhr zum Gerät einschalten.
- Testdisk SZZP1014F oder SZZP1054C durch Betätigung der Auf/Zu-Taste einlegen.
- Das Gerät auf Wiedergabe schalten.
- TR (Spur) 1 auf dem Testdisk abspielen.
- Signalform auf dem Oszilloskop überprüfen und VR 106 so einstellen, daß das Signal des Gleichstroms wie in der Abbildung weniger als  $0\pm 5\text{mV}$  beträgt.
- Stromzufuhr zum Gerät abschalten.

### G. Réglage de la compensation d'erreur d'alignement

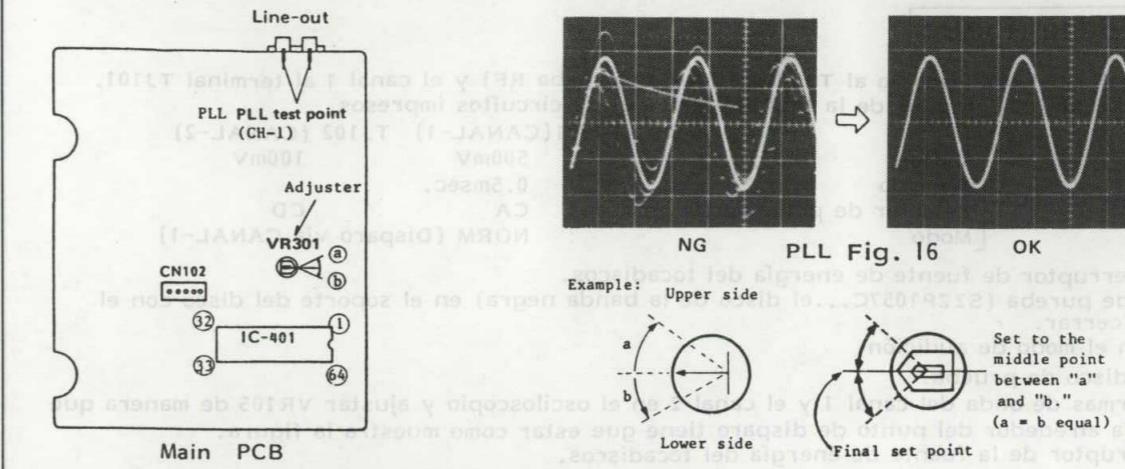
- Raccorder le canal 1 de l'oscilloscope au point de mesure (jarretière) de compensation d'erreur d'alignement et la mise à la terre au châssis, comme il est montré sur l'illustration.
- Réglages de l'oscilloscope ---

Tension	: 50 mV
Balayage	: 1 msec.
Sélecteur d'entrée	: C.C.
- Mettre en marche l'interrupteur d'alimentation du lecteur.
- Installer le disque d'essai (SZZP1014F ou SZZP1054C) dans le dispositif du support pour disque en utilisant la touche d'ouverture/fermeture.
- Régler le lecteur sur le mode d'audition.
- Faire jouer la piste 1 du disque d'essai.
- Vérifier la forme d'onde sur l'oscilloscope et régler VR106 de telle sorte que la forme d'onde au niveau C.C. soit inférieure à  $0\pm 5\text{mV}$ , comme il est montré sur l'illustration.
- Mettre hors circuit l'interrupteur d'alimentation du lecteur.

### G. Ajuste de compensación de error de pista

- Conectar el canal 1 del oscilador al punto de prueba de compensación de error de pista (puente) y TIERRA a la masa como muestra la figura.
- Fijación del osciloscopio ---

Voltaje	: 50 mV
Barrido	: 1mseg.
Selector de potencia de entrada	: CD
- Conectar el interruptor de fuente de energía del tocadiscos.
- Poner el disco de prueba (SZZP1014F o SZZP1054C) en el soporte del disco con el botón de cerrar/abrir.
- Poner el tocadiscos en el modo de audioreproducción.
- Tocar TR1 en el tocadiscos.
- Verificar la forma de onda en el osciloscopio, ajustando VR106 de manera que la forma de onda del nivel CD sea menor de  $0\pm 5\text{mV}$  como se ve en la figura.
- Desconectar el interruptor de fuente de energía del tocadiscos.



### H. PLL Adjustment

- 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
- Turn on the power supply switch of the player.
- Place the test disc (SZZP1054C) in to the disc holder by open/close key.
- The player to the play mode.
- Play Track 7 (WG 0.8mm) of the test disc.
- Check the waveform displayed on the oscilloscope and adjust VR301 in the following steps.
  - Turn VR301 upwards slowly and learn the point at which the waveform on the oscilloscope begins to be disturbed as shown in waveform NG.
  - Turn VR301 downward slowly (opposite direction) and observe the point at which the waveform on the oscilloscope begins to be disturbed.
  - Set VR301 in the middle between the points observed in the above steps "a" and "b".
- Die Stromzufuhr zum Gerät abschalten.

### H. PLL-Einstellung

- CH-1 des Oszilloskops an die Line out-Klemme (von L-CH oder R-CH) auf der Haupt-Schaltplatte und die GND-Klemme des Gehäuses anschließen.
- Einstellung des Oszilloskops---

Spannung	: 1,00 V
Ablenkung	: 1ms
Eingangsumschalter	: Gleichstrom
- Die Stromversorgung des Geräts einschalten.
- Mit dem open/close-Schalter den Testdisk (SZZP1054C) in das Gerät einlegen.
- Das Gerät auf Wiedergabe stellen.
- TR (Spur) 7 auf dem Testdisk (WG 0,8mm) abspielen.
- Die Signalform auf dem Oszilloskop beobachten und VR 301 folgendermaßen einstellen.
  - VR 301 langsam nach oben drehen und dabei auf den Punkt achten, an dem die Signalform wie in der Abbildung NG (falsch) gestört wird.
  - VR 301 langsam nach unten drehen (entgegengesetzt zu a) (oben) und herausfinden, an welchem Punkt die Signalform auf dem Oszilloskop beginnt, gestört zu werden.
  - VR 301 in eine Mittelposition zwischen den Punkten aus den Schritten a) und b) einstellen.

## H. Réglage du circuit d'asservissement de phase

(1) Raccorder le canal 1 de l'oscilloscope à la borne de sortie de ligne (soit au canal de gauche soit au canal de droite) de la plaquette à circuits imprimés principale et à la borne de mise à la terre du châssis.

Réglages de l'oscilloscope ---	Tension : 1,0 V	Traceur 2 : 1,0	Traceur 3 : 1,0
	Balayage : 1 msec.		
	Sélecteur d'entrée : C.C.		

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.  
 (3) Placer le disque d'essai (SZZP1054C) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture.  
 (4) Régler le lecteur sur le mode d'audition.  
 (5) Faire jouer la piste 7 du disque d'essai (coin de 0,8 mm).  
 (6) Vérifier la forme d'onde affichée sur l'oscilloscope et régler VR301 selon les étapes suivantes.  
 (a) Tourner lentement VR301 vers le haut et observer le point où la forme d'onde sur l'oscilloscope commence à être perturbée, comme il est montré sur la forme d'onde NG (incorrect).  
 (b) Tourner lentement vers le bas VR301 (dans la direction opposée) et observer le point où la forme d'onde sur l'oscilloscope commence à être perturbée.  
 (c) Régler VR301 au milieu, entre les points observés aux étapes "a" et "b" ci-dessus.

1) Ajuster l'oscilloscope sur la touche de lecture et la touche de mise à la terre.  
 2) Placer le disque d'essai (SZZP1054C) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture.  
 3) Régler le lecteur sur le mode d'audition.  
 4) Faire jouer la piste 7 du disque d'essai (coin de 0,8 mm).  
 5) Vérifier la forme d'onde affichée sur l'oscilloscope et régler VR301 selon les étapes suivantes.  
 6) Tourner lentement VR301 vers le haut et observer le point où la forme d'onde sur l'oscilloscope commence à être perturbée.  
 7) Tourner lentement vers le bas VR301 (dans la direction opposée) et observer le point où la forme d'onde sur l'oscilloscope commence à être perturbée.  
 8) Régler VR301 au milieu, entre les points observés aux étapes "a" et "b" ci-dessus.

## H. Ajuste PLL

(1) Conectar el canal 1 del osciloscopio al terminal de la línea de salida (canal de la izquierda o de la derecha) de la tablilla principal de circuitos impresos y el terminal de TIERRA a masa.

Fijación del osciloscopio --	Voltaje : 1,0 V
	Barrido : 1mseg.
	Selector de potencia de entrada: CD

(2) Encender el interruptor de fuente de energía del tocadiscos.  
 (3) Poner el disco de prueba (SZZP1054C) en su soporte con la llave de abierto/cerrado.  
 (4) El todaciscos en el modo de audición.  
 (5) Tocar la pista 7 (WG 0,8mm) del disco de prueba.

(6) Verificar la forma de onda que se muestra en el osciloscopio y ajustar VR 301 (resistencia variable) en los siguientes pasos.  
 (a) Girar poco a poco hacia arriba VR301 y observar el punto en que la forma de onda del osciloscopio comienza a disturbarse como muestra la forma de onda NG.  
 (b) Hacer girar VR301 hacia abajo poco a poco (en dirección contraria) y tomar nota del punto en que la forma de onda en el osciloscopio comienza a deformarse, opio comienza a deformarse.  
 (c) Fijar VR 301 en el punto medio entre los dos anotados en los pasos arriba mencionados "a" y "b".  
 (7) Apagar el interruptor de la fuente de energía del tocadiscos.

1) Conectar el canal 1 del osciloscopio al terminal de la línea de salida (canal de la izquierda o de la derecha) de la tablilla principal de circuitos impresos y el terminal de TIERRA a masa.  
 2) Fijación del osciloscopio --

3) Tocar la pista 7 (WG 0,8mm) del disco de prueba con la llave de abierto/cerrado.  
 4) Verificar la forma de onda que se muestra en el osciloscopio y ajustar VR 301 (resistencia variable) en los siguientes pasos.  
 5) Girar poco a poco hacia arriba VR301 y observar el punto en que la forma de onda del osciloscopio comienza a disturbarse como muestra la forma de onda NG.  
 6) Hacer girar VR301 hacia abajo poco a poco (en dirección contraria) y tomar nota del punto en que la forma de onda en el osciloscopio comienza a deformarse, opio comienza a deformarse.  
 7) Fijar VR 301 en el punto medio entre los dos anotados en los pasos arriba mencionados "a" y "b".  
 8) Apagar el interruptor de la fuente de energía del tocadiscos.

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

## 1. 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 the skip search functions (Forward and reverse)
- (2) Check of manual search
  - 1) Play an ordinary disc.
  - 2) 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 noise.
  - 3) Play the tracks (Black spot 0.6mm), track 6 (Black spot 0.7mm) and see that there is no sound skip or noise.

## 1. Vérification du fonctionnement de l'audition après le réglage

- (1) Vérification de la recherche par sauts :
  1. Faire jouer un disque normal.
  2. Appuyer sur les touches de saut et vérifier si la recherche par sauts fonctionne (vers l'avant et vers l'arrière).
- (2) Vérification de la recherche manuelle :
  1. Faire jouer un disque normal.
  2. Appuyer sur la touche de recherche manuelle et vérifier si une recherche manuelle (vers l'avant et vers l'arrière) aisée et sans à-coups peut être effectuée à des vitesses faibles et élevées.
- (3) Vérifier pour s'assurer des conditions de réglage les meilleures pour localiser les défauts.
  - 1) Faire jouer le disque d'essai Technics "SZZP1054C".
  - 2) Faire jouer la piste 12 (coin de 0,6 mm) et la piste 13 (coin de 0,7 mm), et vérifier qu'il n'y ait pas de zones de silence ou de bruit.
  - 3) Faire jouer la piste 5 (zone d'interférence de 0,6 mm) et la piste 6 (zone d'interférence de 0,7 mm) et vérifier qu'il n'y ait pas de zones de silence ou de bruit.

## 1. Überprüfung der Wiedergabe nach der Einstellung

- (1) Überprüfung der autom. Liedanfang-Suche:
  1. Einen normalen Disk abspielen.
  2. Suchknopf drücken und vergewissern, daß die Suche durchgeführt wird. (Vorwärts und rückwärts).
- (2) Überprüfung der manuellen Liedanfang-Suche:
  1. Einen normalen Disk spielen.
  2. Handsuchknopf drücken und vergewissern, daß die manuelle Suche bei hoher und normaler Geschwindigkeit reibungslos abläuft. (Vorwärts und rückwärts)
- (3) Die optimale Einstellung im Falle von Störungen herausfinden.
  - 1) Technics Testdisk "SZZP1054C" abspielen.
  - 2) Spur 12 (Keil 0,6mm) und Spur 13 (Keil 0,7mm) abspielen und darauf achten, daß nichts übersprungen wird und daß kein Geräusch auftritt.
  - 3) Spur 5 (schwarzer Fleck 0,6mm) und Spur 6 (schwarzer Fleck 0,7mm) abspielen und darauf achten, daß nichts übersprungen wird und daß kein Geräusch auftritt.

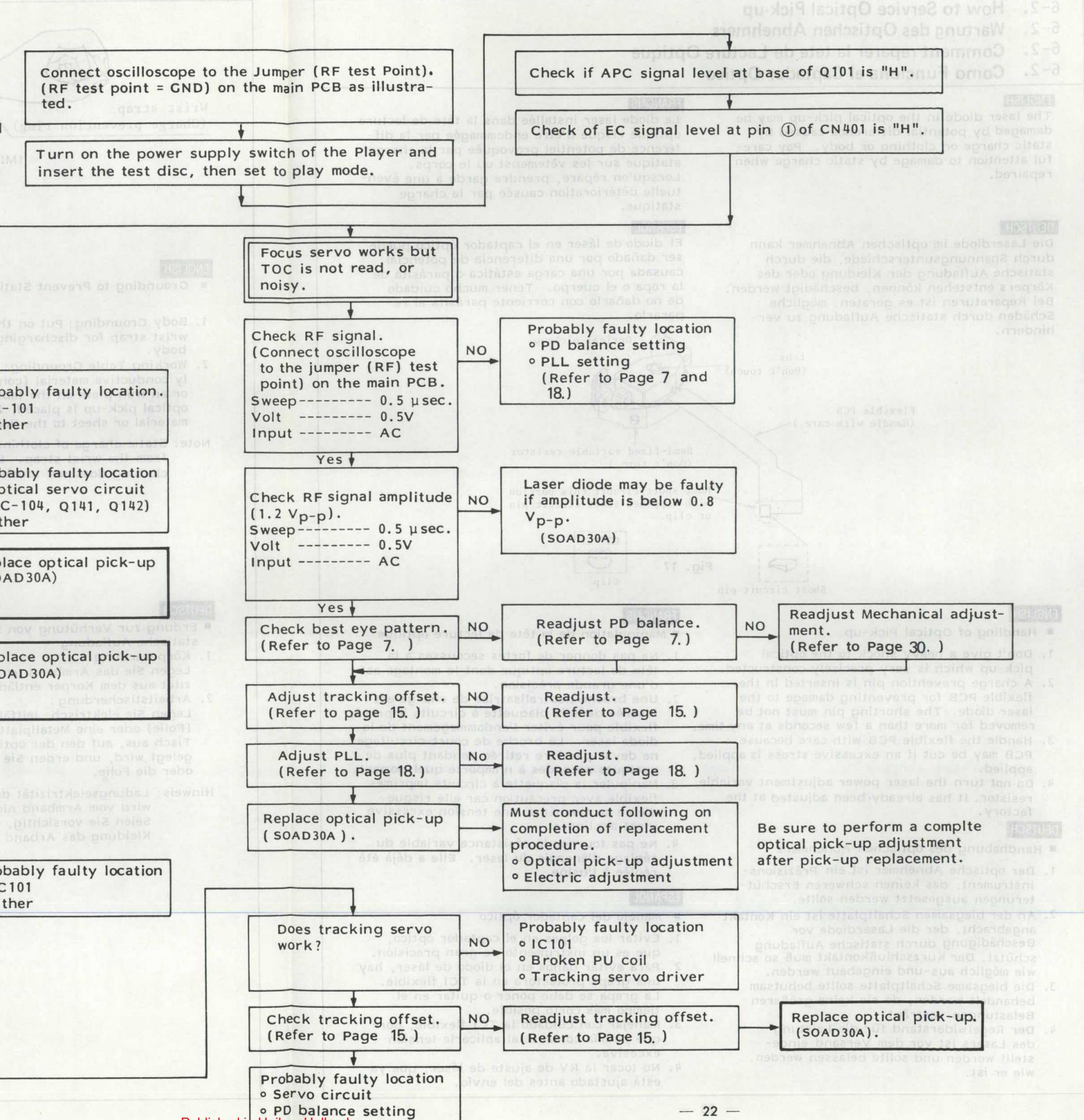
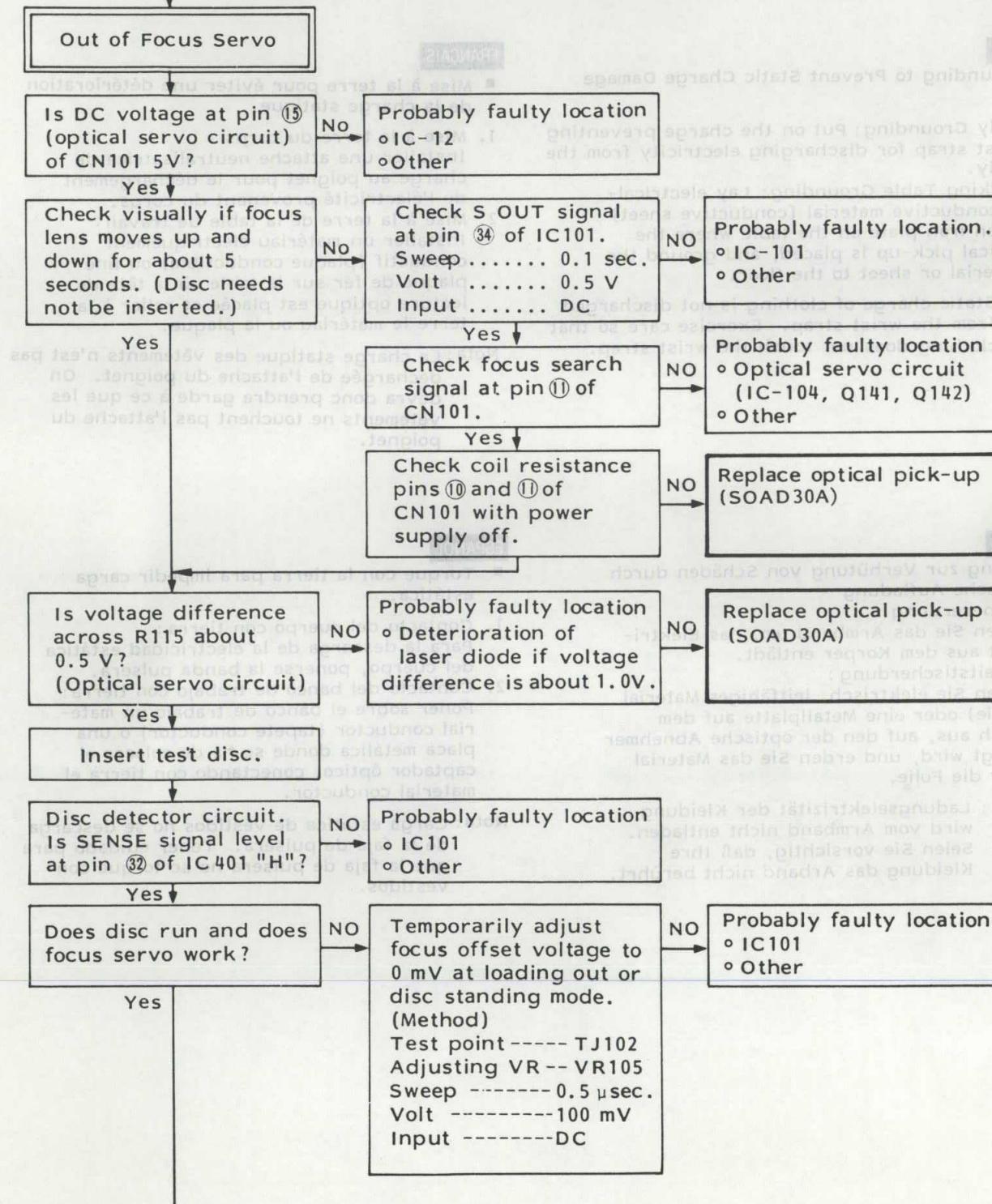
## 1. Verificación de la operación de audición después del ajuste

- (1) Verificación del salto de rastreo:
  1. Tocar una disqueta ordinaria.
  2. Presionar el botón de salto (silencio) y verificar si ocurre el salto de rastreo. (De avance y retroceso).
- (2) Verificación del rastreo manual:
  1. Tocar una disqueta ordinaria.
  2. Presionar el botón de rastreo manual y comprobar si se realiza suavemente el rastreo manual a velocidades bajas y altas (De avance y retroceso).
- (3) Verificar y asegurarse que se ha ajustado sin ningún defecto.
  - 1) Tocar el disco de prueba de Technics "SZZP1054C"
  - 2) Tocar la pista 12 (Desplazamiento 0,6mm), la pista 13 (Desplazamiento 0,7mm), viendo si hay saltos de sonido o ruído.
  - 3) Tocar las pistas (Punto negro 0,6mm), la pista 6 (punto negro 0,7mm) viendo si hay saltos de sonido o ruído.

## 6. OPTICAL PICK-UP ADJUSTMENT

### 6-1. Evaluation of Optical Pick-up Serviceability

(Note) • Check if the optical pick-up is serviceable using the following methods prior to the adjustment of the optical pick-up.  
 • If faulty, follow the next paragraph on optical pick-up replacement and adjustment.



## 6-2. How to Service Optical Pick-up

### 6-2. Wartung des Optischen Abnehmers

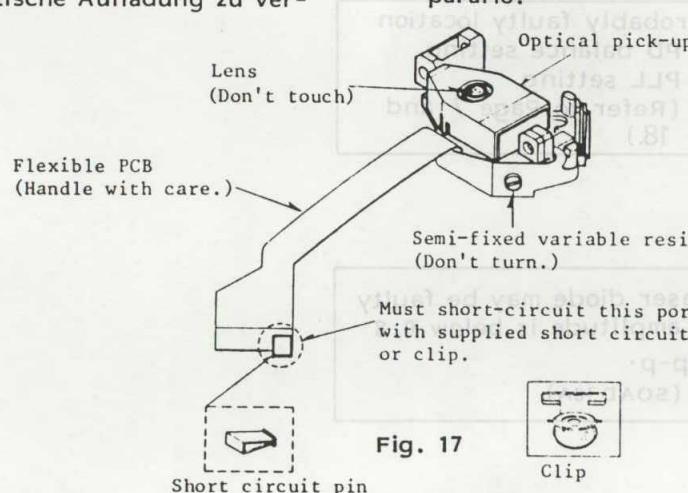
### 6-2. Comment reparer la tête de Lecture Optique

#### ENGLISH

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.

#### DEUTSCH

Die Laserdiode im optischen Abnehmer kann durch Spannungsunterschiede, die durch statische Aufladung der Kleidung oder des Körpers entstehen können, beschädigt werden. Bei Reparaturen ist es geraten, mögliche Schäden durch statische Aufladung zu verhindern.



#### ENGLISH

##### ■ 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 shorting pin must not be removed for more than a few seconds at any time.
3. Handle the flexible PCB with care because PCB may be cut if an excessive stress is applied.
4. Do not turn the laser power adjustment variable resistor. It has already been adjusted at the factory.

#### DEUTSCH

##### ■ Handhabung des optischen Abnehmers

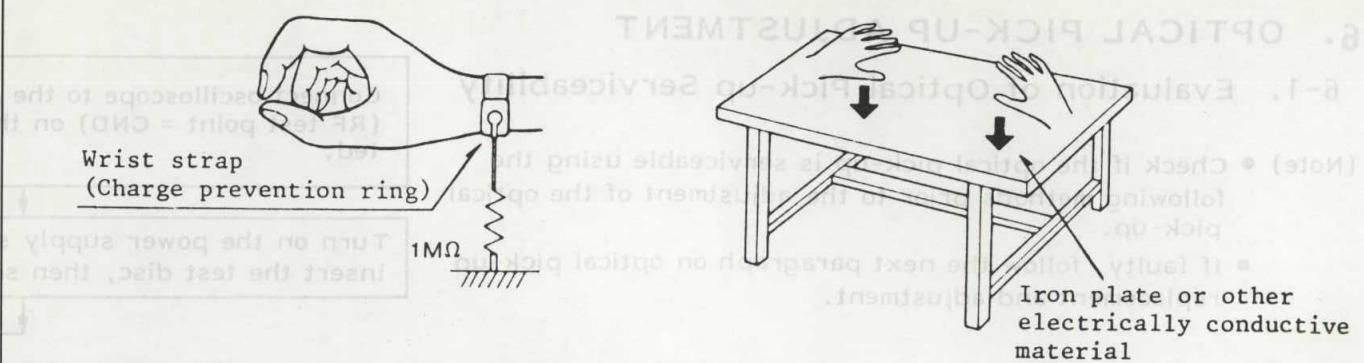
1. Der optische Abnehmer ist ein Präzisionsinstrument, das keinen schweren Erschütterungen ausgesetzt werden sollte.
2. An der biegsamen Schaltplatte ist ein Kontakt angebracht, der die Laserdiode vor Beschädigung durch statische Aufladung schützt. Der Kurzschlußkontakt muß so schnell wie möglich aus- und eingebaut werden.
3. Die biegsame Schaltplatte sollte behutsam behandelt werden, da sie keine größeren Belastungen verträgt.
4. Der Regelwiderstand für die Leistung des Lasers ist vor dem Versand eingestellt worden und sollte belassen werden, wie er ist.

#### FRANÇAIS

La diode laser installée dans la tête de lecture optique risque d'être endommagée par la différence de potentiel provoquée par la charge statique sur les vêtements ou le corps. Lorsqu'on répare, prendre garde à une éventuelle détérioration causée par la charge statique.

#### ESPAÑOL

El diodo de láser en el captador óptico puede ser dañado por una diferencia de potencial causada por una carga estática o parásita de la ropa o el cuerpo. Tener mucho cuidado de no dañarlo con corriente parásita al repararlo.



#### ENGLISH

##### ■ Grounding to Prevent Static Charge Damage

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 does not touch the wrist strap.

#### FRANÇAIS

##### ■ Mise à la terre pour éviter une détérioration de la charge statique.

1. Mise à la terre du corps: Installer une attache neutralisatrice de la charge au poignet pour le décharge de l'électricité provenant du corps.
2. Mise à la terre de la table de travail: Installer un matériau électriquement conductif (plaqué conductible) ou une plaque de fer sur la table où la tête de lecture optique est placée et relier à la terre le matériau ou la plaque.

Nota: La charge statique des vêtements n'est pas déchargée de l'attache du poignet. On devra donc prendre garde à ce que les vêtements ne touchent pas l'attache du poignet.

#### DEUTSCH

##### ■ Erdung zur Verhütung von Schäden durch statische Aufladung

1. Körpererdung: Legen Sie das Armband um, das Elektrizität aus dem Körper entlädt.
2. Arbeitstischerdung: Legen Sie elektrisch leitfähiges Material (Folie) oder eine Metallplatte auf dem Tisch aus, auf den der optische Abnehmer gelegt wird, und erden Sie das Material oder die Folie.

Hinweis: Ladungselektrizität der Kleidung wird vom Armband nicht entladen. Seien Sie vorsichtig, daß Ihre Kleidung das Armband nicht berührt.

#### ESPAÑOL

##### ■ Torque con la tierra para impedir carga estática.

1. Contacto del cuerpo con tierra: Para la descarga de la electricidad estática del cuerpo, ponerse la banda pulsera.
2. Contacto del banco de trabajo con tierra: Poner sobre el banco de trabajo un material conductor (tapete conductor) o una placa metálica donde se ha de colocar el captador óptico, conectando con tierra el material conductor.

Nota: Carga estatica de vestidos no se descarga de la faja de pulsera. Tener cuidado para que la faja de pulsera no se torque con vestidos.

#### ESPAÑOL

##### ■ Manejo del captador óptico

1. Evitar los golpes en el captador óptico, que es un instrumento de gran precisión.
2. Para evitar daños en el diodo de láser, hay una grapa protectora en la TCI flexible. La grapa se debe poner o quitar en el tiempo más corto posible.
3. Manejar con cuidado la TCI flexible, porque podría cortarse al aplicarle tensión excesiva.
4. No tocar la RV de ajuste de láser, que ya está ajustado antes del envío.

## 7. OPTICAL PICK-UP REPLACEMENT PROCEDURE

Note: Exercise care so that disassembled parts are not lost.

Prepare the player for service under power as shown in the illustration follow the disassembly procedure outlined in the service manual.

- (1) Remove the front panel.
- (2) Pushing the two stopper pawls of the disc holder inward simultaneously, pull the holder to remove it.
- (3) Remove the resisting plate for the position detector.

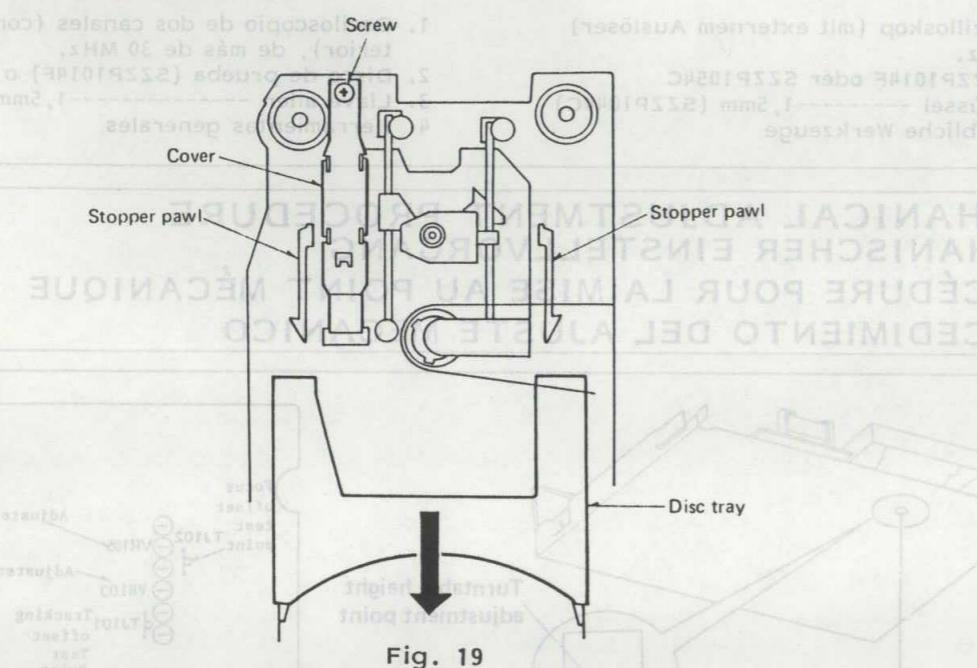
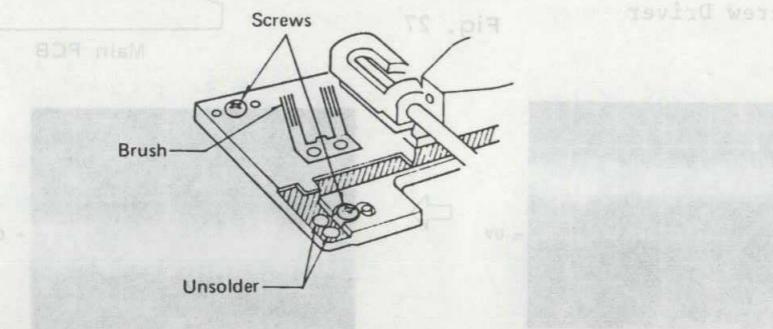


Fig. 19

- (4) Unsolder the linear motor drive coil and optical pick-up to separate them.
- (5) Remove the two linear motor drive coil fastening screws.

Note: Handle the contact brush carefully.



- (6) 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.  
2. Pull out the flexible cord.

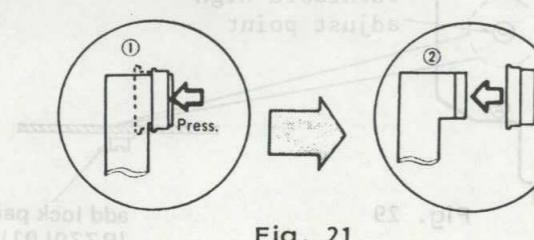


Fig. 21

- (7) Remove the three optical pick-up fastening screws.

- (8) Remove the optical pick-up fastening shaft.

Note: Be careful not to lose or misplace the cushion rubber.

- (9) The optical pick-up has now been completely separated.

It is not necessary to remove the traverse unit as before. If the unit needs to be removed, pay attention to the four springs. (See page 20 Fig. 24)

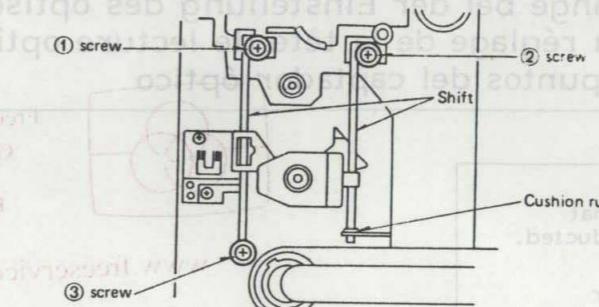


Fig. 22

- (10) Remove the linear motor coil fastening bracket.

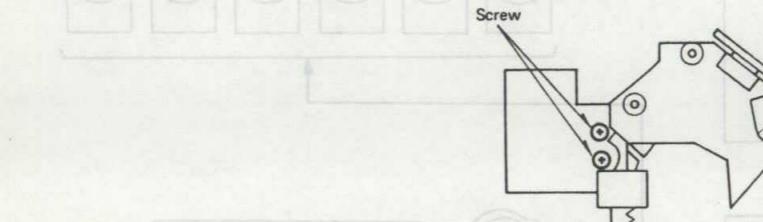


Fig. 23

- (11) Install the optical pick-up in the reverse order of disassembly so that Power On Check can be conducted. Refer to the illustrations.

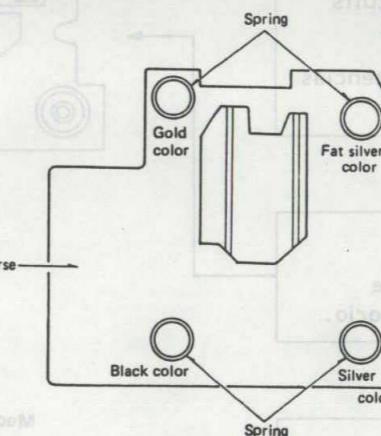


Fig. 24 Front side

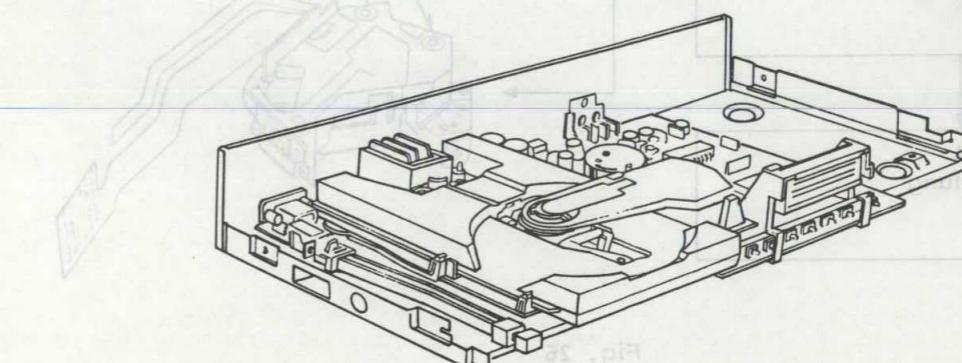


Fig. 25 Power ON check status

## 8. ADJUSTING PROCEDURE OF OPTICAL PICK-UP

### 8. EINSTELLUNG DES OPTISCHEN ABNEHMERS

### 8. PROCEDURE DE RÉGLAGE DE LA TÊTE DE LECTURE OPTIQUE

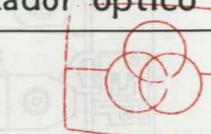
### 8. PROCEDIMIENTO DE AJUSTE DEL CAPTADOR OPTICO

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

#### 8-1. Schritte und Vorgänge bei der Einstellung des optischen Abnehmers

#### 8-1. Points et étapes du réglage de la tête de lecture optique

#### 8-1. Pasos del ajuste y puntos del captador óptico



Free service manuals

Gratis schema's

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- Set up player according to disassembly procedure so that power-on check can be conducted.

- Regelwiderstände auf der Haupt-Schaltplatte wie in der Abbildung gezeigt provisorisch einstellen.

- Monter l'appareil selon la procédure inverse du démontage de telle sorte qu'une vérification de mise sous tension puisse être effectuée.

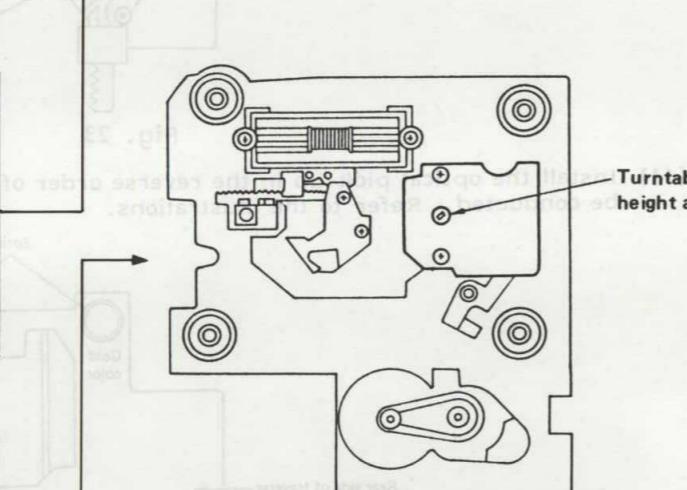
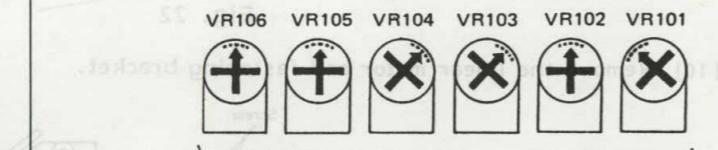
- Fijar el tocadiscos para el proceso de desarmado de forma que se pueda hacer la verificación del contacto con la fuente de energía

- Temporarily set variable resistors on main PCB as shown.
- Regelwiderstände provisorisch an die Servo-Schaltplatte legen.
- Regler temporairement les résistances variables sur la plaque à circuits imprimés principale comme il est illustré.
- Ajustar temporalmente las resistencias variables de la TCI de servo.

- Adjust turntable height.
- Drehstellerhöhe einstellen.
- Hauteur de réglage de la platine
- Ajustar la altura del plato giratorio.

- Mechanical adjustment
- Mechanische Einstellung
- Réglage mécanique
- Ajuste mecánico.

- Electric adjustment
- Elektrische Einstellung
- Réglage électrique
- Ajuste eléctrico.



Mechanical adjust

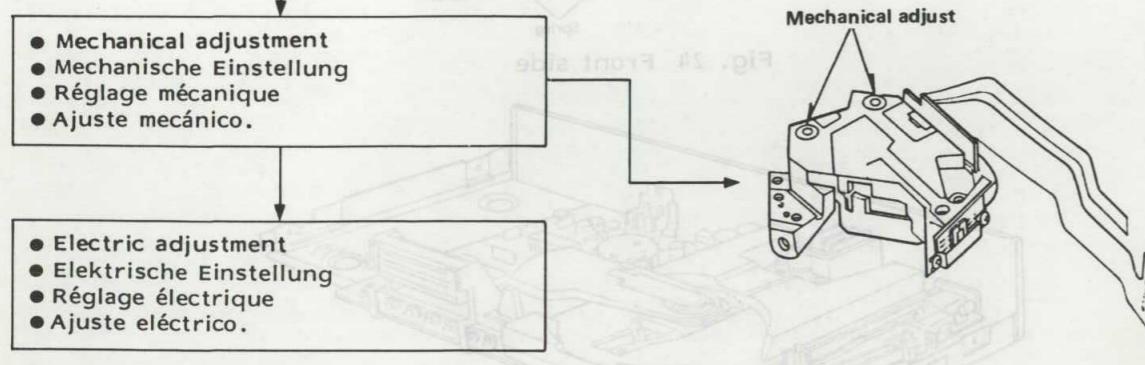


Fig. 26

## 8-2. Required Measuring Instruments and Tools

## 8-2. Appareils et outils de mesure requis

- Two-channel oscilloscope (with external trigger), over 30 MHz.
- Test disc (SZZP1014F) or (SZZP1054C)
- Hexagonal wrench-----1.5 mm (SZZP1044C)
- General tools

- Oscilloscope à double canal (avec déclenchement extérieur); plus de 30 MHz.
- Disque d'essai (SZZP1014F) ou (SZZP1054C).
- Clé hexagonale -----1,5mm (SZZP1044C)
- Outils généraux

## 8-2. Erforderliche Instrumente und Werkzeuge

- 2-Kanal Oszilloskop (mit externem Auslöser) über 30 MHz.
- Testdisk SZZP1014F oder SZZP1054C
- Inbus-Schlüssel -----1,5mm (SZZP1044C)
- Allgemein übliche Werkzeuge

## 8-2. Pasos y puntos de ajuste del captador óptico

- Osciloscopio de dos canales (con disparo exterior), de más de 30 MHz.
- Disco de prueba (SZZP1014F) o (SZZP1054C).
- Llave allen -----1,5mm (SZZP1044C)
- Herramientas generales

## 9. MECHANICAL ADJUSTMENT PROCEDURE

### 9. MECHANISCHER EINSTELLVORGANG

### 9. PROCÉDURE POUR LA MISE AU POINT MÉCANIQUE

### 9. PROCEDIMIENTO DEL AJUSTE MECANICO

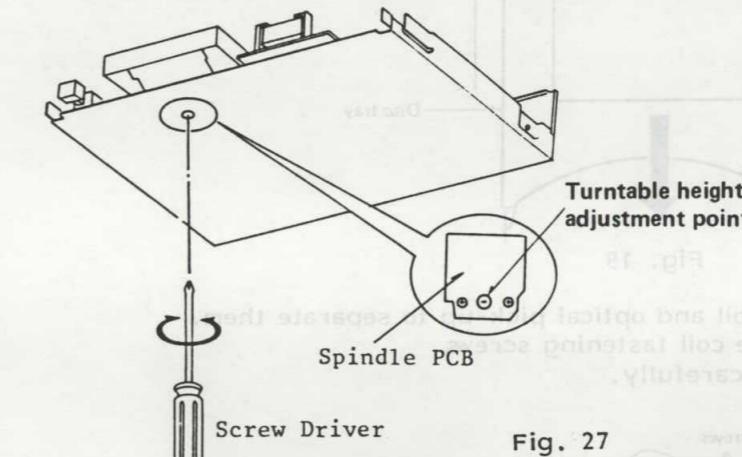
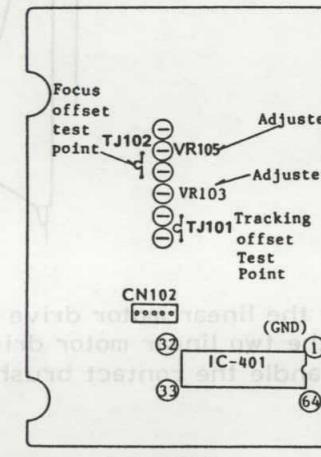
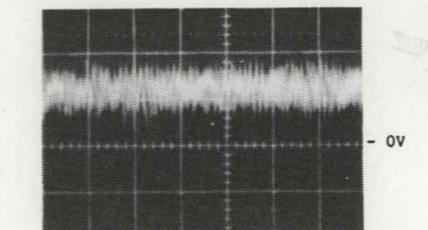


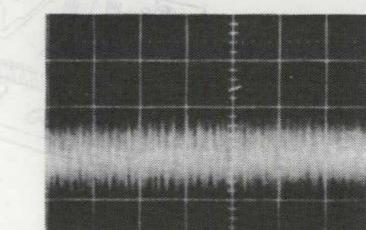
Fig. 27



Main PCB



NG



OK

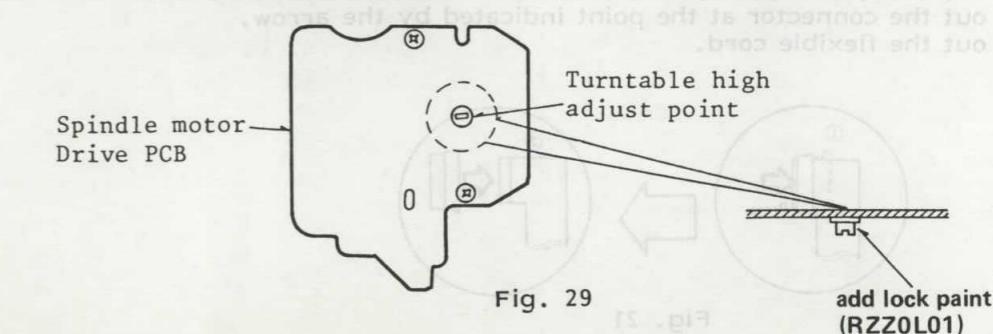


Fig. 29

## A. Turn Table Height Adjustment

- (1) Turn on the power supply switch of the player.
- (2) Place the test disc (SZZP1014F) or (SZZP1054C) into 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 prepare as illustrated. Do not jar or jolt the unit.
- (9) Turn the adjusting screw on the underside of the spindle motor PCB with a flat screwdriver so that the waveform at TJ102 is  $0 \pm 50\text{mV}$ , as shown in the 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.

## A. Einstellung der Drehstellerhöhe

- (1) Stromversorgung des Geräts einschalten.
- (2) Testdisk SZZP1014F oder SZZP1054C einlegen.
- (3) Stromversorgung des Geräts abschalten.
- (4) Das Oszilloskop wie unten beschrieben einstellen.
- (5) CH-1 des Oszilloskops an TJ 102 des Servo-Schaltkreises und GND (Erdung) des Gehäuses anschließen.

### Einstellung des Oszilloskops

Ablenkung	: 5ms
Spannung	: 100mV
Eingangsumschalter	: Gleichstrom

- (6) Stromzufuhr zum Gerät einschalten.
- (7) Gewünschte Spur abspielen.
- (8) Das Gerät auf der Stelle der Werkbank, die für die Einstellung geeignet ist, anbringen und vorsichtig damit umgehen, ohne es zu erschüttern.
- (9) Die Einstellschraube an der Unterseite des Wellenmotor-Kontakts mit einem flachen Schraubenzieher so drehen, daß die Signalform wie in Abb. 5-3 bei TJ 102  $0 \pm 50\text{mV}$  beträgt.
- (10) Die Stromzufuhr zum Gerät abschalten.
- (11) Die Einstellschraube nach erfolgter Einstellung mit "Arretierlack (RZZ0L01)" fixieren.

## A. Réglage de la hauteur de la platine

- (1) Mettre en marche l'interrupteur d'alimentation de l'appareil.
- (2) Installer le disque d'essai (SZZP1014F) ou (SZZP1054C) dans le dispositif de support pour disque.
- (3) Mettre hors tension l'interrupteur d'alimentation de l'appareil.
- (4) Régler l'oscilloscope avec un équilibrage sur zéro C.C.
- (5) Raccorder le canal 1 de l'oscilloscope à TJ102 du circuit d'asservissement et GND (mise à la terre) au châssis.

### Réglages de l'oscilloscope

Barage	: 5 msec.
Tension	: 100 mV
Sélecteur d'entrée: C.C.	

- (6) Mettre en marche l'interrupteur d'alimentation de l'appareil.
- (7) Faire jouer la piste désirée.
- (8) Placer l'appareil au coin d'un établi -- à l'endroit qui vous permettra d'effectuer la mise au point -- et préparer comme il est illustré. Ne pas heurter ou donner de secousses à l'appareil.
- (9) Tourner la vis de réglage située sur la face inférieure de la plaquette à circuits imprimés du moteur à pivot avec un tournevis à lame plate de telle sorte que la forme d'onde à TJ102 soit de  $0 \pm 50\text{mV}$ , comme il est montré sur l'illustration.
- (10) Mettre hors tension l'interrupteur d'alimentation de l'appareil.
- (11) Bloquer la vis de réglage avec une peinture pour blocage de vis (RZZ0L01) une fois achevée la mise au point.

## A. Ajuste de la altura del plato giratorio

- (1) Encender el interruptor de fuente de energía del tocadiscos.
- (2) Poner el disco de prueba (SZZP1014F) o (SZZP1054C) en el soporte del disco.
- (3) Encender el interruptor de fuente de energía del tocadiscos.
- (4) Fijar el osciloscopio en el balance cero de CD.
- (5) Conectar el CANAL-1 del osciloscopio a TJ102 del circuito de servo y TIERRA al chassis.

### Fijaciones del osciloscopio

Barido	: 5m
Voltaje	: 100mV
Selector de potencia de entrada: CD	

- (6) Encender el interruptor de la fuente de energía del tocadiscos.
- (7) Tocar algo en la pista que se deseé.
- (8) Poner la unidad en la esquina del banco de trabajo --- en un lugar que se avenga al ajuste--preparándolo tal como muestra la figura con cuidado de no agitarlo o golpearlo.
- (9) Hacer girar el tornillo de fijación en la parte baja de la TCI del motor de vástago con un destornillador plano hasta que la forma de onda en TJ102 sea  $\pm 50\text{mV}$  como se muestra en la Fig. 5-3.
- (10) Encender el interruptor de la fuente de energía del tocadiscos.
- (11) Asegurar el tornillo de ajuste con "pintura aseguradora (RZZ0L01)" al completar el ajuste.

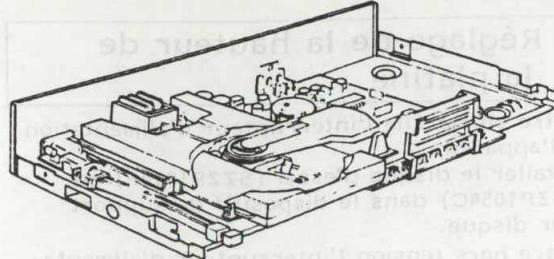


Fig. 30

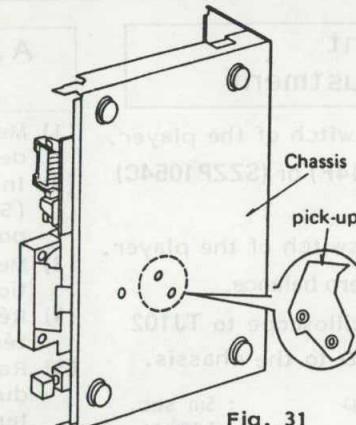
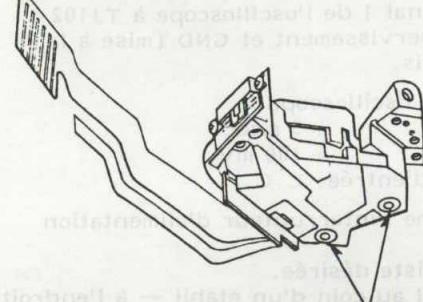


Fig. 31



NG

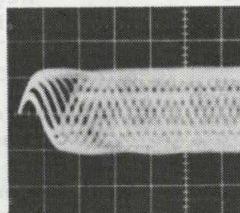
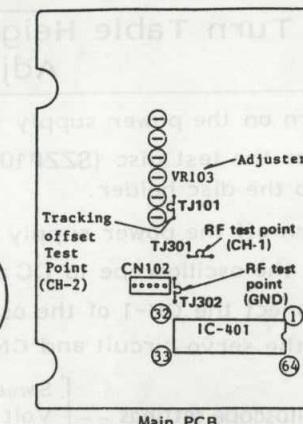
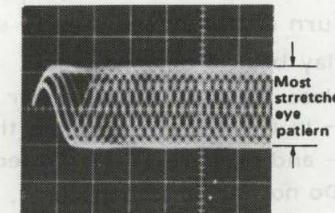


Fig. 32



Main PCB



## 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.

Oscilloscope settings

Sweep	: 0.5 $\mu$ sec.
Volt	: 0.5V
Input selector:	AC

- (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 the illustration. Do not jar or jolt 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 made properly.
- (10) Check if the RF signal waveform is as shown in the illustration (NC). 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 the illustration and turn the both screws right or left to optimum positions.
- (12) Turn off the power supply switch of the player.
- (13) Lock both adjusting screw with screw lock paint (RZZ0L01) on completion of adjustment.

## B. Mechanische Einstellung

- (1) Stromversorgung des Geräts einschalten.
- (2) Testdisk (SZZP1056C) in den Halter einlegen.
- (3) Stromversorgung des Geräts abschalten.
- (4) Das Oszilloskop wie unten beschrieben einstellen.

Einstellung des Oszilloskops

Ablenkung	: 0,5 $\mu$ s
Spannung	: 0,5V
Eingangsumschalter:	Wechselstrom

- (5) CH-1 des Oszilloskops an TJ301 des RF-Meßpunkts und PGD an TJ302 des RF-Meßpunkts und GPD an TJ302 des RF-Meßpunkts (GND) anschließen.
- (6) Stromversorgung des Geräts einschalten.
- (7) TR6 abspielen.
- (8) Das Gerät wie in der Abbildung auf Wiedergabe schalten und dabei aufpassen, daß es nicht erschüttert wird.

- (9) Das auf Wiedergabe geschaltete Gerät wie in der Abbildung plazieren (auf seine linke Seite stellen). Hinweis: Wenn das Gerät auf die rechte Seite gestellt wird, kann die Einstellung nicht optimal durchgeführt werden.
- (10) Darauf achten, ob die RF-Signalform wie in der Abbildung (NG=falsch) aussieht. Falls sie nicht überprüft werden kann oder von der gegebenen Form abweicht, wie in den folgenden Schritten vorgehen.
- (11) Sechskantschlüssel (SZZP1044C...1,5mm) wie in der Abbildung gezeigt in die Vertiefungen der Einstellschrauben einsetzen und beide Schrauben bis zur optimalen Einstellung nach rechts und links drehen.
- (12) Stromzufuhr zum Gerät abschalten.
- (13) Beide Schrauben nach erfolgter Einstellung mit Arretierlack (RZZ0L01) fixieren.

## B. Réglage mécanique

- (1) Mettre en marche l'interrupteur d'alimentation de l'appareil.
- (2) Intaller le disque d'essai (SZZP1056C) dans le dispositif de support pour disque.
- (3) Mettre hors tension l'interrupteur d'alimentation de l'appareil.
- (4) Régler l'oscilloscope comme il est indiqué ci-dessous.

Réglages de l'oscilloscope	Balayage : 0,5 $\mu$ sec. Tension : 0,5 V Sélecteur d'entrée : C.A.
----------------------------	---

- (5) Raccorder le canal 1 de l'oscilloscope à TJ301 du point de mesure de haute fréquence et la mise à la terre à TJ302 du point de mesure de haute fréquence (masse).
- (6) Mettre en marche l'interrupteur d'alimentation de l'appareil.
- (7) Faire jouer la piste 6.
- (8) Régler le lecteur sur le mode de lecture, comme il est montré sur l'illustration. Ne pas heurter ou donner de secousses à l'appareil.
- (9) Tout en laissant le lecteur sur le mode de lecture, l'installer comme il est illustré (le déposer sur son côté gauche).  
Nota: Si le lecteur est placé sur le côté droit, le réglage ne pourra être effectué correctement.
- (10) Vérifier si la forme d'onde du signal de haute fréquence est telle qu'elle est montrée sur l'illustration (NG: incorrect). Si la forme d'onde ne peut être vérifiée ou si elle est différente de la forme d'onde donnée, procéder selon les étapes suivantes.
- (11) Placer la clé hexagonale (SZZP1044C...1,5mm) dans l'alvéole des têtes des vis de réglage mécanique comme il est montré sur l'illustration et tourner les deux vis de droite et de gauche aux positions optimales.
- (12) Mettre hors circuit l'interrupteur d'alimentation du lecteur.
- (13) Bloquer les deux vis de réglage avec une peinture pour blocage de vis (RZZ0L01) une fois achevée la mise au point.

## B. Ajuste mecánico

- (1) Encender el interruptor de la fuente de energía del tocadiscos.
- (2) Poner la disqueta de prueba (SZZP1056C) en su soporte.
- (3) Apagar el interruptor de la fuente de energía del tocadiscos.
- (4) Fijar el osciloscopio de la manera que se indica a continuación.

Fijaciones del osciloscopio	Barrido : 0,5 useg. Voltaje : 0,5 V Selector de potencia de entrada: CA
-----------------------------	---

- (5) Conectar el canal 1 del osciloscopio a TJ301 o al punto de prueba y TIERRA A TJ301 del punto de prueba RF (TIERRA).
- (6) Encender el interruptor de la fuente de energía del tocadiscos.
- (7) Escuchar la audición de la pista 6.
- (8) Fijar el tocadiscos en el modo de audioreproducción como muestra la figura con cuidado de no agitarlo o golpearlo.
- (9) Manteniendo el tocadiscos en el modo de audioreproducción, colocarlo según muestra la figura (Aguantándose sobre su lado izquierdo).  
(Nota): Si se le hace aguantar sobre el lado derecho, el ajuste no se puede hacer debidamente.
- (10) Verificar si la forma de onda de señal RF es como muestra la figura (NG). Si no se puede verificar la forma de onda o no se da con regularidad, tomar los siguientes pasos.
- (11) Fijar la llave allen (SZZP104C)...1,5mm) en la cartela de las cabezas de los tornillos de ajuste mecánico como se muestra en la figura y hacer girar ambos tornillos a la derecha o a la izquierda hasta obtener la mejor posición.
- (12) Desconectar el interruptor de fuente de energía del tocadiscos.
- (13) Asegurar los dos tornillos de ajuste con pintura aseguradora (RZZ0L01) al completar el ajuste.

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

## 10. PRÜFVORGANG FÜR DIE ELEKTRISCHEN SCHALTKREISE (FEHLERSUCHE)

## 10. PROCÉDURE DE VÉRIFICATION POUR L'ENSEMBLE DU CIRCUIT ÉLECTRIQUE (LORS D'UN DÉPANNAGE)

## 10. PROCEDIMIENTO DE VERIFICACION PARA TODO EL CIRCUITO ELECTRICO (PARA SOLUCION DE DIFICULTADES)

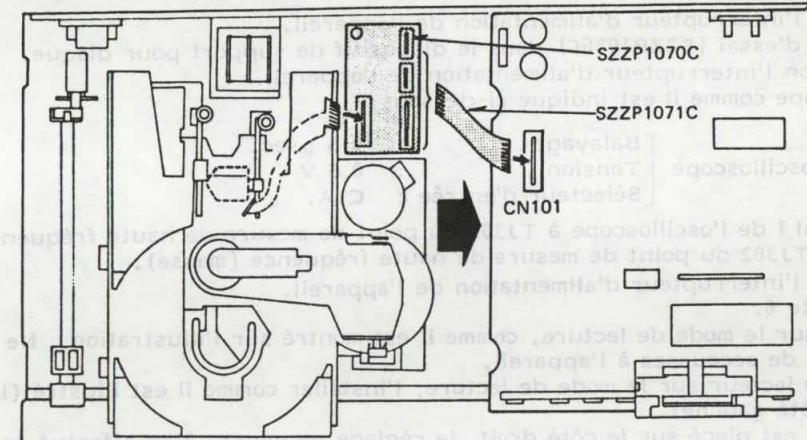


Fig.33

**ENGLISH**

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

- (1) Disconnect the FPC cord from CN101.
- (2) Attach a clip to the top end of the FPC cord. Do this within seconds after cord disconnect. (This is for protecting the optical pick-up against the breakdown due to static electricity.)
- (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 to the fixture. (The other connectors are for the SL-P1200. Do not get them mixed up with the above connector.)
- (7) Connect 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.

**DEUTSCH**

Die Kürze des elastischen Steckkontaktkabels erlaubt keine Überprüfung der Rückseite der Haupt-Schaltplatte, ohne daß das Gehäuse abgenommen wird. Wartungsvorrichtungen SZZP1070C und SZZP1071C verwenden und wie unten gezeigt vorgehen. Die Wartungsvorrichtung ist bei elektrischen und mechanischen Einstellungen nicht unbedingt nötig.

- (1) FPC-Kabel von CN101 abnehmen.
- (2) Am Ende des FPC-Kabels unverzüglich nach dem Ausstecken eine Klammer anbringen. (Die Klammer schützt den optischen Abnehmer vor statischer Elektrizität. Sie ist aber nicht unbedingt nötig, wenn bei der Wartung eine Schutzmatte oder ähnliches verwendet wird.)
- (3) Die vier Halteschrauben der Haupt-Schaltplatte abnehmen.
- (4) Haupt-PCB nach rechts schieben.
- (5) Die Wartungsvorrichtung (SZZP1070C) wie gezeigt anbringen.
- (6) FPC-Kabel vom optischen Abnehmer am Stecker der Wartungsvorrichtung anbringen. (Die anderen Stecker sind für SL-P 1200. Bitte nicht verwechseln.)
- (7) Außerdem das FPC-Verbindungskabel (SZZP1071C) am Ausgangsstecker der Vorrichtung anbringen und das Kabel mit CN101 auf der Haupt-Schaltplatte verbinden. Alle Teile auf der Rückseite der Haupt-Schaltplatte können nun leicht überprüft werden.

## FRANÇAIS

Le câble à circuit imprimé flexible de la tête de lecture optique est trop court pour pouvoir vérifier le dos de la plaquette à circuits imprimés principale. Utiliser les dispositifs de dépannage (SZZP1070C) et (SZZP1071C), et suivre la procédure indiquée ci-dessous. Ces dispositifs ne sont pas nécessaires pour effectuer des réglages électrique et mécanique.

- (1) Débrancher le câble à circuit imprimé flexible de CN101.
- (2) Fixer une patte d'attache à l'extrémité supérieure du câble à circuit imprimé flexible. Effectuer cela en deçà de quelques secondes après avoir débranché la câble. (Ceci est pour protéger la tête de lecture optique d'une panne due à l'électricité statique.)
- (3) Retirer les quatre vis de fixation de la plaquette à circuits imprimés principale.
- (4) Déplacer la plaquette à circuits imprimés principale vers le côté droit.
- (5) Placer le dispositif de dépannage (SZZP1070C) comme il est illustré.
- (6) Raccorder le câble à circuits imprimés flexible de la tête de lecture optique au connecteur du dispositif de dépannage. (Les autres connecteurs sont pour le SL-1200. Ne les mélanger pas avec la connecteur ci-dessus.)
- (7) Raccorder ultérieurement le câble à circuit imprimé flexible de jonction (SZZP1071C) au connecteur de sortie du dispositif de dépannage, puis raccorder le câble à CN101 sur la plaquette à circuits imprimés principale. Chaque élément au dos de la plaquette à circuits imprimés principale peut maintenant être facilement vérifié.

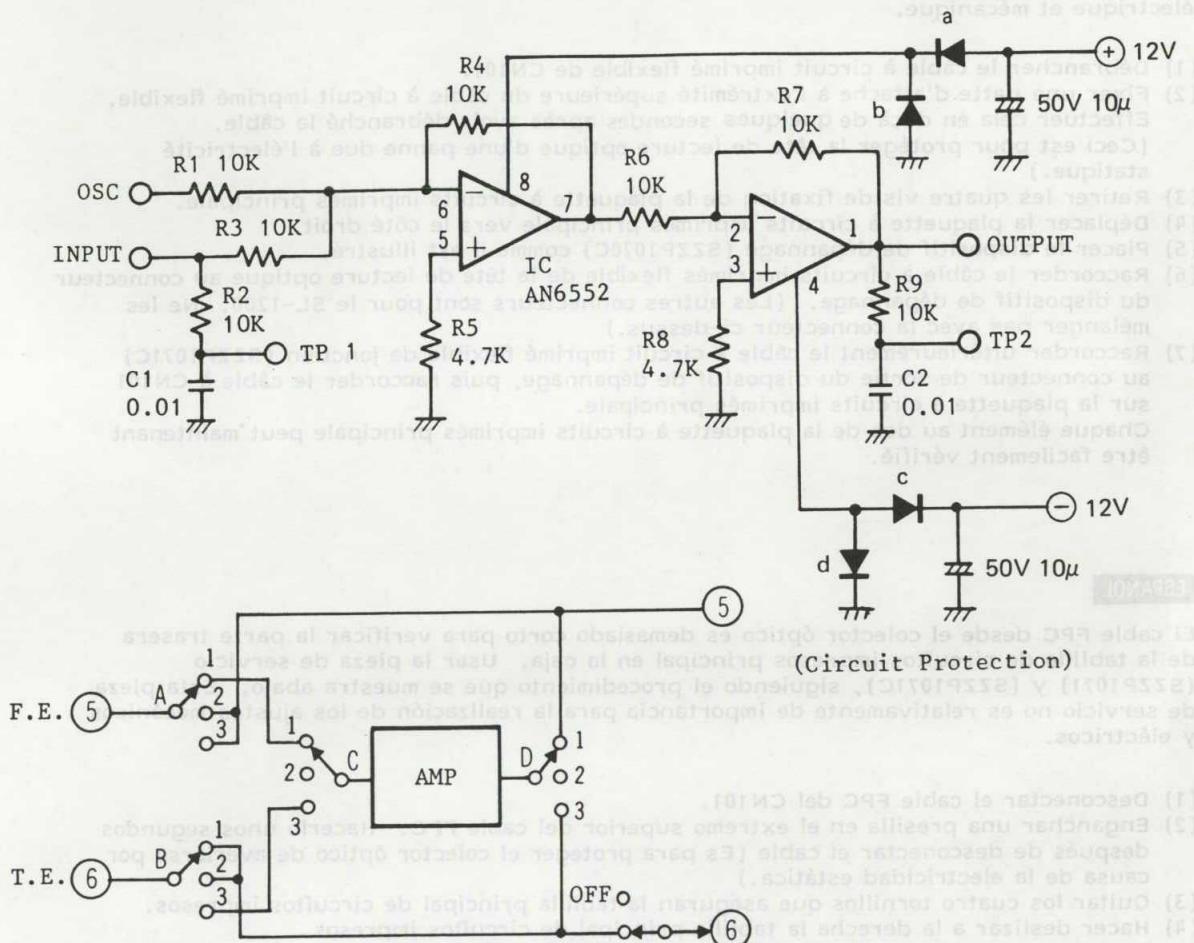
## ESPAÑOL

El cable FPC desde el colector óptico es demasiado corto para verificar la parte trasera de la tablilla de circuitos impresos principal en la caja. Usar la pieza de servicio (SZZP1071) y (SZZP1071C), siguiendo el procedimiento que se muestra abajo. Esta pieza de servicio no es relativamente de importancia para la realización de los ajustes mecánicos y eléctricos.

- (1) Desconectar el cable FPC del CN101.
- (2) Enganchar una presilla en el extremo superior del cable FPC. Hacerlo unos segundos después de desconectar el cable (Es para proteger el colector óptico de averiarse por causa de la electricidad estática.)
- (3) Quitar los cuatro tornillos que aseguran la tablilla principal de circuitos impresos.
- (4) Hacer deslizar a la derecha la tablilla principal de circuitos impresos.
- (5) Poner la pieza de servicio (SZZP1070C) como muestra la figura.
- (6) Conectar el cable FPC desde el captador óptico al conector de la pieza de servicio. (Los otros conectores son para el SL-P1200). No mezclarlos con dichos conectores).
- (7) Conectar además el cable FPC de unión (SZZP1071C) al; conector de potencia de salida de la pieza de servicio, y luego a CN101 de la tablilla principal de circuitos impresos. Ahora se podrán verificar fácilmente los componentes de la tablilla principal de circuitos impresos.

Q'té	Part. No.	Ref. No.
1	AN6225	10
1	ERD237103	R.1.5.3.P.1.5.3
1	ERD237105	R.2.8.8
1	ECRD1H034F	C.1.5
1	ECRD1H0300	C
1	2ZD1813BXHA	Coussinets
1	(180.000mm)	Lesd. Mise
1		3. Mise Mise
1	MAT	9. P. e. q. (Droits)

## 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
C	ECEA1HU100	2
Connector	SSDJB13BXHA	1
Lead Wire	(180,600mm)	2
3 Wire with		1
a b c d (Diode)	MA162	4

## ■ PRECAUTION OF LASER DIODE

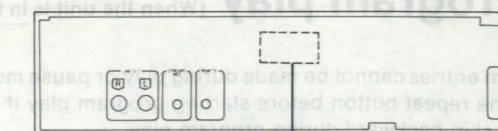
**Caution: This product utilizes a laser diode.**

**ADVARSEL: I dette a apparat anvendes laser.**

### • Use of caution labels

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

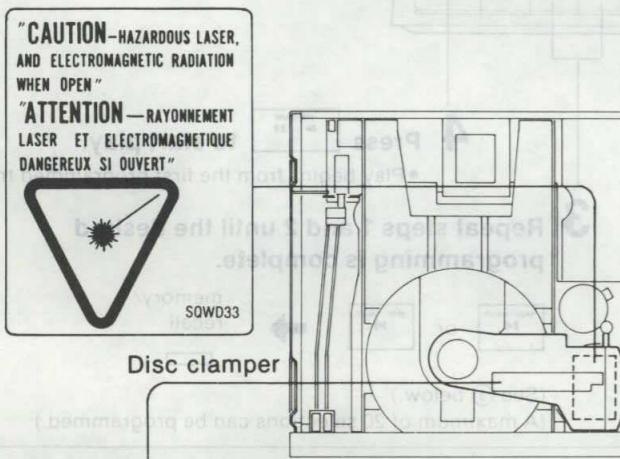
Areas	Disc clammer	SQWD33	SQWD11-1	SRNZ010S01	SRNZ010S02
[M]	○	×	×	×	×
[MC]	○	○	×	×	×
[E]	○	×	○	○	○
[EK], [XL], [EG]					
[EB], [EH], [EF]					
[Ei], [XB], [XA]					



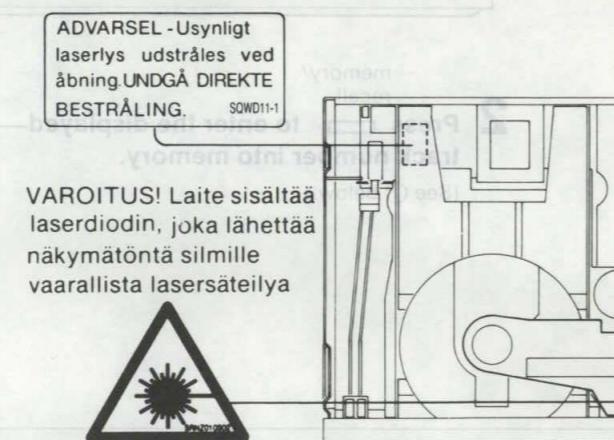
**CLASS 1 LASER PRODUCT**  
SRNZ010S01

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

www.freeservicemanuals.info



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



**VAROITUS! Laite sisältää  
laserdiordin, joka lähtää  
näkymätöntä silmille  
vaarallista lasersäteilyä**

## ■ BEFORE USING THIS UNIT

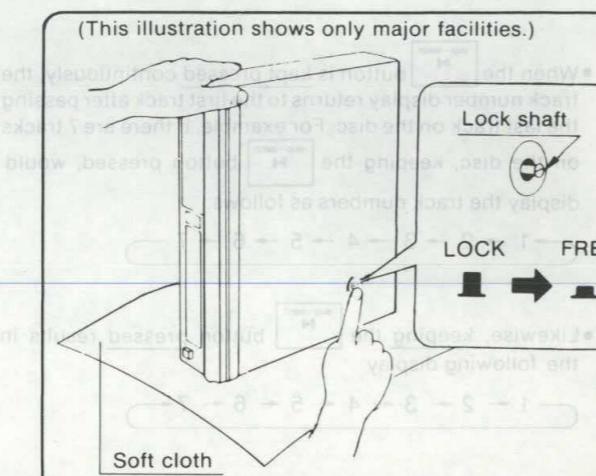
1. Place a soft cloth under the unit to protect it from scratches.
2. Press the lock shaft on the bottom panel to the in (FREE) position (▲→■).

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

- 1) Remove the disc from the holder.
- 2) Pull the lock shaft to the out (LOCK) position (■→▲).

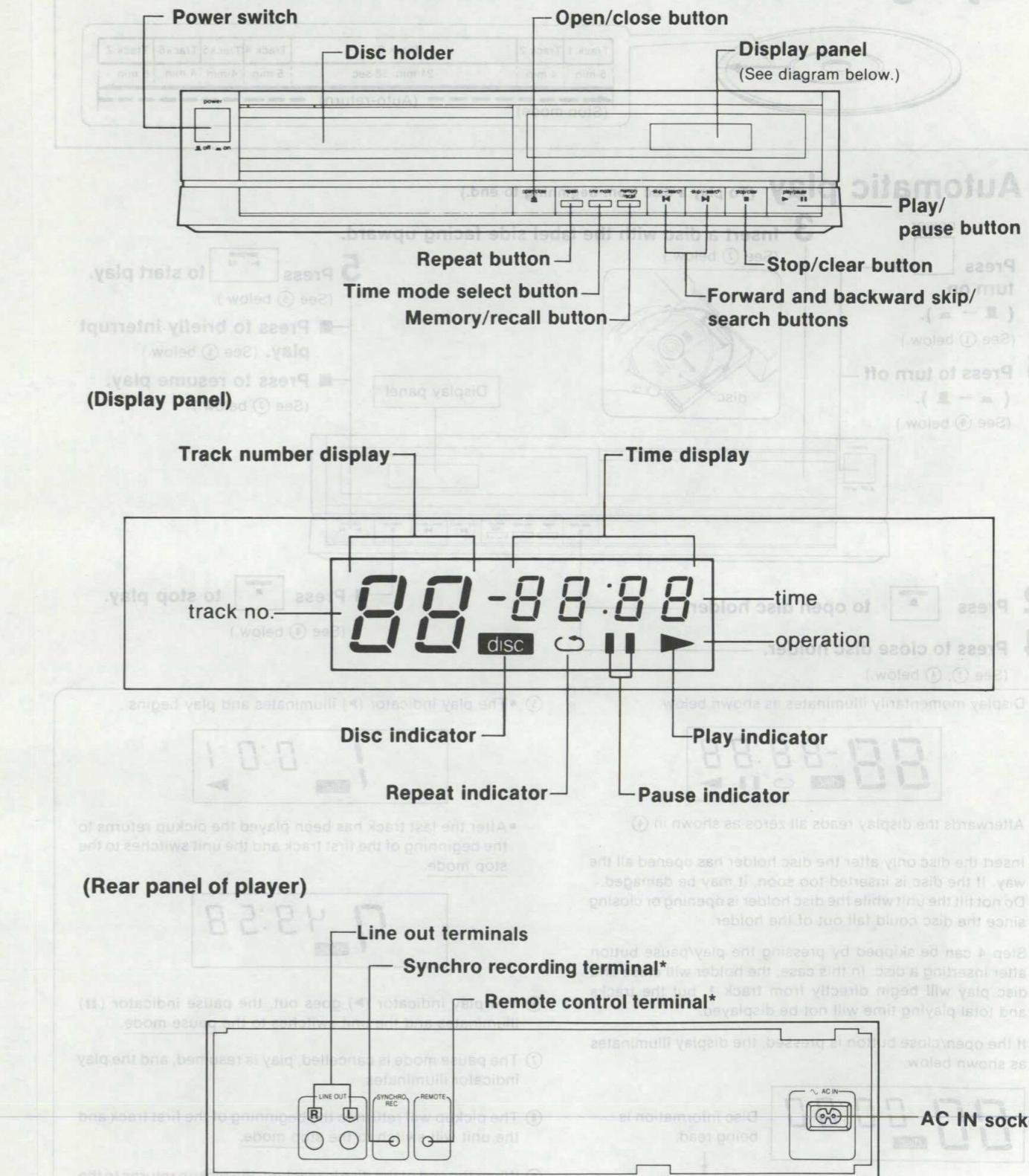
**CAUTION:**

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



## ■ LOCATION OF CONTROLS

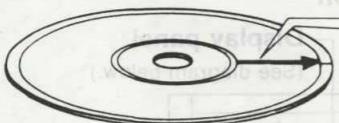
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\* The product for the U.S.A. and Canada is not provided with the Synchro-recording terminal and the Remote control terminal.

# Playing a disc

All of the examples on pages 6-10 refer to a disc which contains 7 tracks and has a total playing time of 49 minutes and 58 seconds.



Track 1	Track 2	Track 3	Track 4	Track 5	Track 6	Track 7
5 min.	4 min.	21 min. 58 sec.	5 min.	4 min.	4 min.	6 min.

(Stop mode) (Auto-return)

## 1 Automatic play (To play a disc from beginning to end.)

- 1 Press to turn on ( $\square \rightarrow \square$ ). (See ① below.)
- 2 Press to open disc holder. (See ② below.)
- 3 Insert a disc with the label side facing upward. (See ③ below.)
- 4 Press to close disc holder. (See ④ below.)
- 5 Press to start play. (See ⑤ below.)
- 6 Press to briefly interrupt play. (See ⑥ below.)
- 7 Press to resume play. (See ⑦ below.)
- 8 Press to stop play. (See ⑧ below.)

① Display momentarily illuminates as shown below:



Afterwards the display reads all zeros as shown in ④.

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 directly from track 1, but the tracks and total playing time will not be displayed.

④ If the open/close button is pressed, the display illuminates as shown below.



Disc information is being read.

Reading of disc information finished.

Stop mode.

⑤ The play indicator ( $\blacktriangleright$ ) illuminates and play begins.



⑥ 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.



⑦ The play indicator ( $\blacktriangleright$ ) goes out, the pause indicator ( $\bullet\bullet$ ) illuminates and the unit switches to the pause mode.

⑧ The pause mode is cancelled, play is resumed, and the play indicator illuminates.

⑨ The pickup will return to the beginning of the first track and the unit will switch to the stop mode.

⑩ When the end of the disc is reached, the pickup returns to the beginning of the first track and the unit switches to the stop mode.

- Remove the disc from the disc holder.
- Turn off the power (mains) 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.)

### Notes:

- Program entries cannot be made during play or pause mode.
- Press the repeat button before starting program play if you wish to skip backward during program play.

- 1 While watching the track number display, press momentarily to specify the desired track number. (See ① below.)

Button to move the pickup forward.

Button to move the pickup backward.

- 2 Press to enter the displayed track number into memory. (See ② below.)
- 3 Repeat steps 1 and 2 until the desired programming is complete. (See ③ below.)
- 4 Press to start play. (See ④ below.)

• Play begins from the first programmed track.

① Display momentarily illuminates as shown below:

### Total playing time confirmation

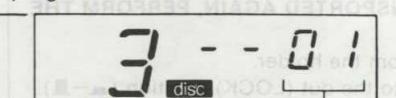
To display the total playing time of all programmed tracks. Example: If tracks 3, 5 and 1 are specified and the time mode select button is pressed, 30 minutes 58 seconds is displayed.

### time mode

Press.



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



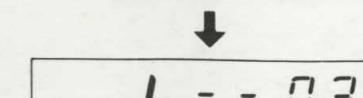
Program selection

Programmed order



Program selection

Programmed order



Program selection

Programmed order

Play begins from the first programmed track.

① If more than 20 selections are entered, "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:

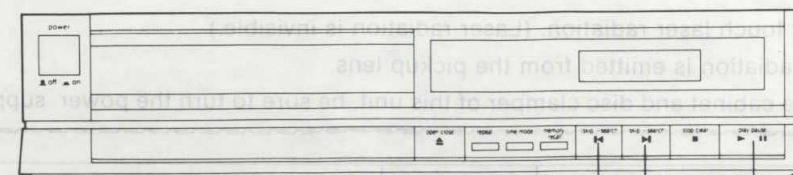
$\rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6 \rightarrow 7$

• Likewise, keeping the button pressed results in the following display:

$\leftarrow 1 \leftarrow 2 \leftarrow 3 \leftarrow 4 \leftarrow 5 \leftarrow 6 \leftarrow 7$

② 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.

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



1 While watching the track number display, press momentarily (less than one second) to specify the desired track. (See ① below.)

Button to move the pickup forward.      Button to move the pickup backward.

① The display below shows track 3 is specified.



Track number

2 Press **play/pause** to start play.

- Play begins from the first programmed track. (See ② below.)

② The play indicator (►) illuminates and play begins from track 3.



### 4 Skip play

(During play or in the pause mode.)

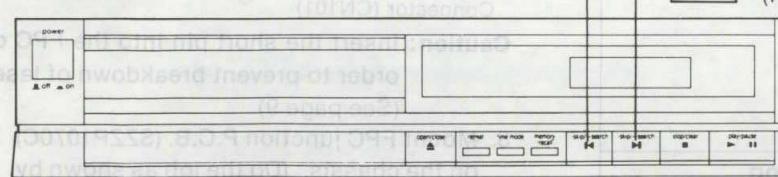
#### ■ Forward or backward track skip play

■ While watching the track number display, press the forward or backward skip/search button momentarily to locate the desired track.

(See ① below.)

Forward skip/search button (Pickup skips forward)

Backward skip/search button (Pickup skips backward)



① Momentarily pressing one of the skip buttons 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.

### 5 Manual search play

(During play or in the pause mode.)

#### ■ To play the disc from a specific point

■ Keep the forward or backward skip/search button pressed to move the pickup forward or backward. Release the button when the desired point has been reached (as shown by the display). (See ② below.)

Forward skip/search button (Pickup moves forward)

Backward skip/search button (Pickup moves backward)

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

• 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 track.

- 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 played.

### 6 Preset edit play

(When the unit is in the stop mode.)

#### Procedure

Confirm that the unit is in the stop mode.

- 1 Press the time mode select button.
- 2 Press the forward or backward skip/search button to specify the playing time in minutes.
- 3 Press the memory/recall button. (For automatic play or repeat play, this step may be omitted.)
- 4 Press the play/pause button.
- 5 After playing the preset edit time the unit switches to the pause mode.

#### Notes:

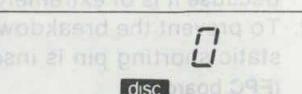
- If a preset edit time that is longer than the recorded playing time is specified, the unit switches to the stop mode after the last track has been played.
- A maximum time of 99 minutes may be specified for program disc play.
- If you operate the search or skip function during preset edit play, preset edit play is cancelled.
- For preset edit play during program play, the preset edit time must be specified before the program selections are entered.

#### Function

##### Preset edit play

For example, to play only 15 minutes:

time mode  
1.  Press.



2.  Press.  
or  Press.  
(Specify 15 minutes.)



3.  Press.



4.  Press.



- 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 minutes to the pause mode. (Play is restarted by pressing the play/pause button.)



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#### Note:

It is possible to specify preset edit time using remote control unit.



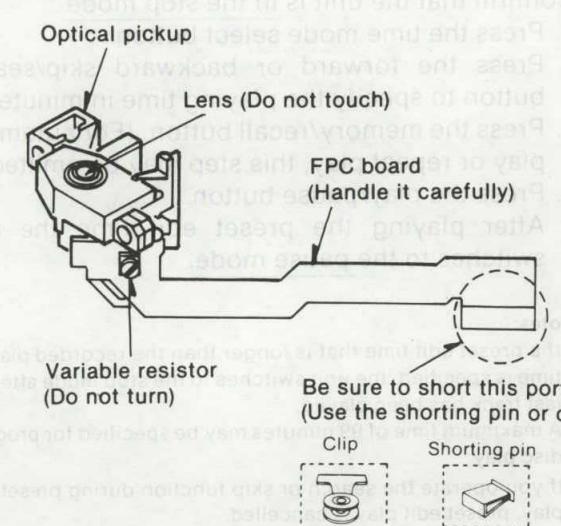
In the example, track 2 has a playing time of 4 minutes, track 4 of 5 minutes and track 6 of 4 minutes, therefore the displayed remaining playing time is 2 minutes (15 minutes minus 13 minutes).

## ■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.  
So, be careful of electrostatic breakdown during repair of the optical pickup.

### • Handling of optical pickup

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

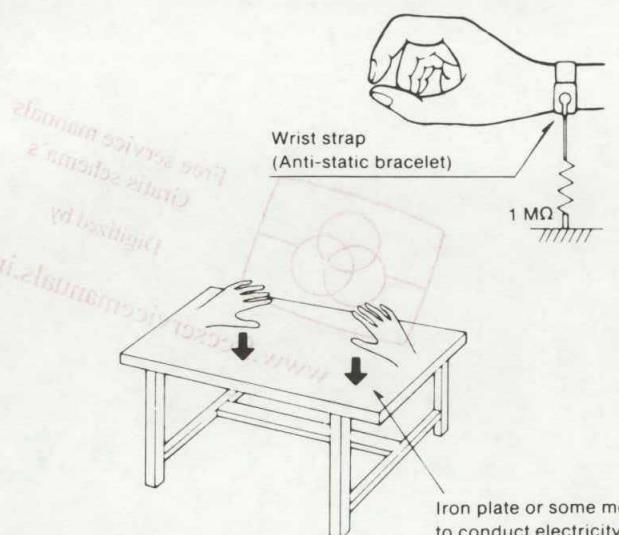


### • Grounding for electrostatic breakdown prevention

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

#### Caution:

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



## ■ DISASSEMBLY INSTRUCTIONS

### CAUTION:

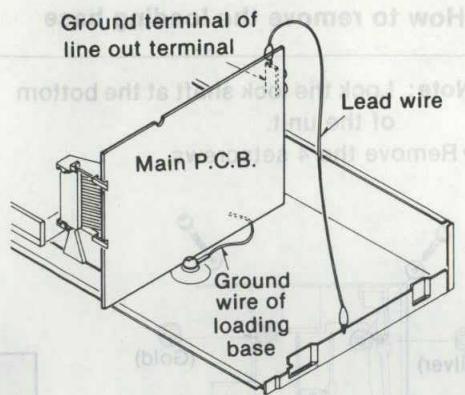
- It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- When doing the job, removing the cabinet and disc clamper of this unit, be sure to turn the power supply off.

Ref. No. 1	How to remove the top case	Ref. No. 4	How to remove the main P.C.B.
Procedure 1	<ul style="list-style-type: none"> <li>• Remove the 4 setscrews.</li> </ul> <p><b>Note:</b> When doing the job, Lock the lock shaft at bottom of the unit. (See page 3)</p>	Procedure 1 → 2 → 4	<ol style="list-style-type: none"> <li>1. Remove the 3 setscrews.</li> <li>2. Lift the P.C.B. to remove it from the chassis tabs.</li> <li>3. Remove in the direction of the arrow.</li> </ol>
Ref. No. 2	<b>How to remove the front panel</b>	Ref. No. 3	<b>How to check the main P.C.B.</b>
Procedure 1 → 2	<ol style="list-style-type: none"> <li>1. Remove the setscrew.</li> <li>2. Slightly pull the tabs outward (arrows A).</li> <li>3. Remove in the direction of the arrow B.</li> </ol>	Procedure 1 → 2 → 3	<ul style="list-style-type: none"> <li>• When checking the soldered surfaces of the main P.C.B. and replacing the parts, do as shown.</li> </ul> <ol style="list-style-type: none"> <li>1. Remove the main P.C.B.</li> <li>2. Remove the FPC board (CN101).</li> </ol> <p><b>2</b> Pull out the FPC board. <b>1</b> Lift the connector.</p> <p><b>Caution:</b> Insert the short pin into the FPC cord in order to prevent breakdown of laser diode. (See page 9)</p> <ol style="list-style-type: none"> <li>3. Mount FPC junction P.C.B. (SZZP1070C) on the chassis. (Do the job as shown by using the main P.C.B. setscrew.)</li> <li>4. Connect FPC board from optical pickup to FPC junction P.C.B.</li> <li>5. Connect FPC extension board (SZZP1071C) to FPC junction P.C.B. and CN101 of main P.C.B.</li> </ol>

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

**Cautions:**

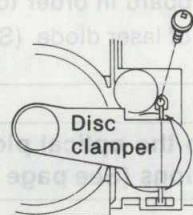
1. Be sure to connect the P.C.B. ground terminal (line out terminal) and chassis lead wire.
2. Connect the ground wire of loading base to the chassis.



**Ref. No. 5 How to remove the disc clamer**

**Procedure 1 → 5**

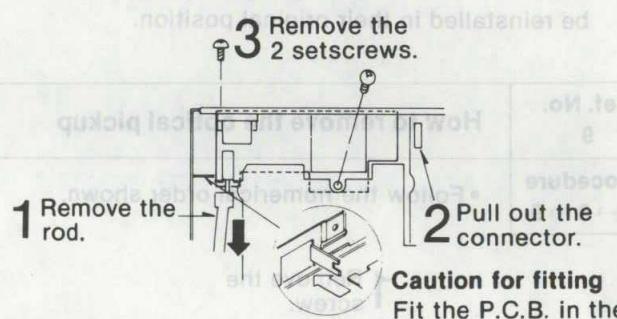
- Remove the setscrew.



**Ref. No. 6 How to remove the power supply P.C.B.**

**Procedure 1 → 6**

- Remove in the numerical order shown. (Shift the disc holder forward.)

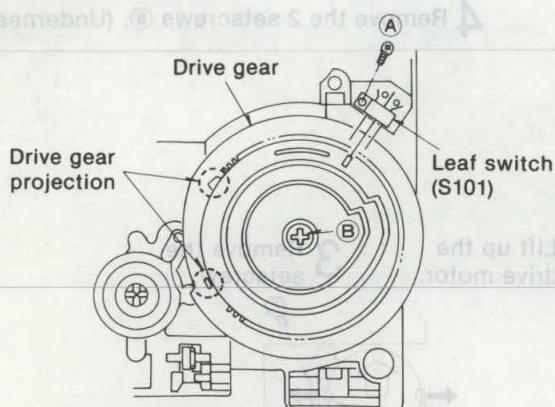


**Caution for fitting**  
Fit the P.C.B. in the groove of chassis.

**Ref. No. 7 How to remove the disc holder (disc tray)**

**Procedure 1 → 2 → 5 → 7**

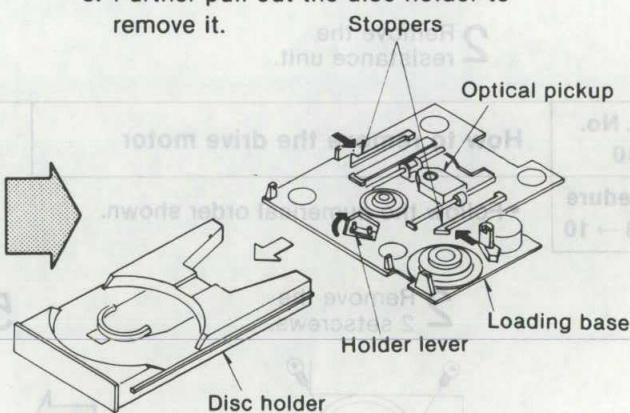
- Set the drive gear as shown below. (Turn it completely to the right, then turn it to the left by about 20° so that drive gear teeth or projection will not touch the rack of disc holder.)



**• To remove the drive gear**

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

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.

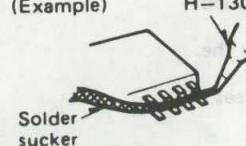
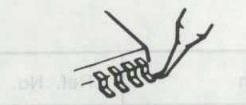
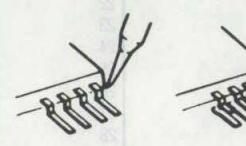
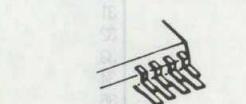


**• Caution for fitting**

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.

Ref. No. 8	<b>How to remove the loading base</b>	Refer to the optical pickup handling precautions (See page 9).
Procedure 7 → 8	<p><b>Note:</b> Lock the lock shaft at the bottom of the unit.</p> <ul style="list-style-type: none"> <li>Remove the 4 setscrews.</li> </ul> <p>Note the color of each spring, they must be reinstalled in their original position.</p>	<ol style="list-style-type: none"> <li>Pull out the 3 connectors (CN103, 401, 402).</li> <li>Remove the FPC board (CN101).</li> </ol>
Ref. No. 9	<b>How to remove the optical pickup</b>	Refer to the optical pickup handling precautions (See page 9).
Procedure 7 → 8 → 9	<ul style="list-style-type: none"> <li>Follow the numerical order shown.</li> </ul> <ol style="list-style-type: none"> <li>Remove the screw.</li> <li>Remove the resistance unit (Speed sensor).</li> <li>Unsolder the 2 terminals.</li> </ol>	<ol style="list-style-type: none"> <li>Remove the 3 setscrews Ⓐ.</li> <li>Pull out the optical pickup from the 2 guide shafts.</li> <li>Remove the 2 setscrews Ⓑ. (Underneath)</li> </ol>
Ref. No. 10	<b>How to remove the drive motor</b>	
Procedure 7 → 8 → 10	<ul style="list-style-type: none"> <li>Follow the numerical order shown.</li> </ul> <ol style="list-style-type: none"> <li>Remove the drive belt.</li> <li>Remove the 2 setscrews.</li> <li>Remove the setscrew.</li> <li>Release the 2 Tabs in the direction of the arrows.</li> </ol>	

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

Replacing procedure		Cautions
1	Reduce the amount of solder on each pin of the integrated circuit by use of a solder sucker.	(Example) 
2	Melt the solder on the pin (one electrode) with the soldering iron.	
3	While the solder is melting, shift the pin upward by the soldering iron to remove it from the foil.	
4	Remove each pin from the foil according to the above-mentioned procedure.	

### \* Special soldering iron

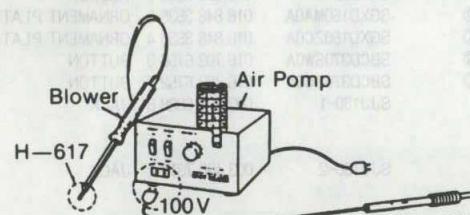
(Refer to Technical Information, ORDER NO. GAD84125486T1)...For U.S.A. and Canada  
(Refer to Technical Information, ORDER NO. GAD84115476T8)...For others

### • H-605 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 200V/220V/240V power source)



### • H-617 Twin Nozzle (for spot heater)

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

### • H-130 Slim Pencil Solder Iron

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

#### Features:

- Rated power: 100V, 15W
- Max. temp.: 400°C
- Heater: ceramic (long life)
- Insulation resistance: 100MΩ
- Length: 178mm
- 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 solder tip. Permits changing of solder tips even while still hot.

- Solder tip: 0.3mm



## ■ RESISTORS & CAPACITORS

### Notes: \* Important safety notice:

Components identified by **Δ** mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

\* Bracketed indications in Ref. No. columns specify the area.

Parts without these indications can be used for all areas.

### Numbering System of Resistor

#### Example

ERD	25	F	J	102
Type	Wattage	Shape	Tolerance	Value
ERX	2	AN	J	471
Type	Wattage	Shape	Tolerance	Value 47x10 <sup>1</sup> (ohm)

### Numbering System of Capacitor

#### Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity
ECEA	50		M	330
Type	Voltage		Peculiarity	Value (33x10 <sup>1</sup> microfarad)

Resistor Type	Wattage	Tolerance
ERD	: Carbon	10 : 1/8W
ERG	: Metal Oxide	12 : 1/2W
ERX	: Metal Film	25 : 1/4W
ERQ	: Fuse Type Metal	1A : 1W
ERD [ ] L	: Carbon (chip)	18 : 1/8W
ERD [ ] K	: Metal Film (chip)	S2 : 1/4W
ERC	: Solid	S1 : 1/2W
		2F : 1/4W
		50 : 1/2W
		2A : 2W

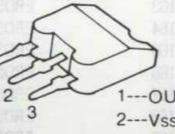
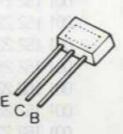
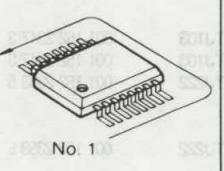
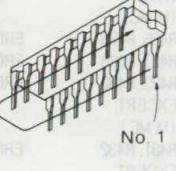
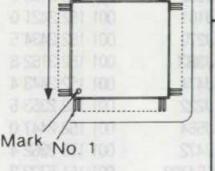
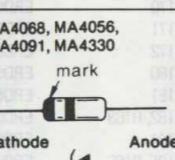
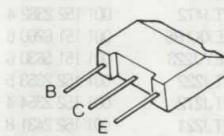
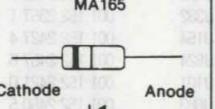
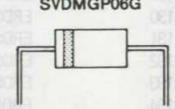
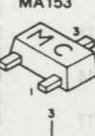
Capacitor Type	Voltage	Tolerance
ECE	: Electrolytic	0J : 6.3V
ECCD	: Ceramic	1A : 10V
ECKD	: Ceramic	1C : 16V
ECQM	: Polyester	1E : 25V
ECQP	: Polypropylene	1H : 50V
ECG	: Ceramic	1V : 35V
ECEA [ ] N	: Non Polar Electrolytic	50 : 50V
QCU [ ]	: Ceramic (Chip Type)	2A : 100V
ECUX	: Ceramic (Chip Type)	1 : 100V
ECF	: Semiconductor	KC : 400V AC
		KC : 125VAC (UL)
EECW	: Liquid electrolyte double layer capacitor	1J : 63V

Ref. No.	Part No.	Part Code	Ref. No.	Part No.	Part Code	Ref. No.	Part No.	Part Code
<b>RESISTORS</b>								
R153	ERDS2TJ270	001 152 2434 5	R414, R415	ERDS2TJ472	001 152 2362 4			
R154	ERDS2TJ3R3	001 152 3152 8	R416	ERDS2TJ913	001 152 3708 4			
R161	ERDS2TJ333	001 152 2358 0	R417	ERDS2TJ124	001 152 2425 6			
R162	ERDS2TJ222	001 152 2353 5	R418	ERDS2TJ913	001 152 3708 4			
R163	ERDS2TJ333	001 152 2358 0	R419	ERDS2TJ124	001 152 2425 6			
R164	ERDS2TJ153	001 152 2351 7	R420	ERDS2TJ101	001 152 2421 0			
R165	ERDS2TJ122	001 152 2423 8	R423	ERDS2TJ103	001 152 2347 3			
R166	ERDS2TJ102	001 152 2346 4						
R167	ERDS2TJ681	001 152 2449 8						
R168	ERDS2TJ272	001 152 2354 4						
R169	ERDS2TJ392	001 152 2439 0						
R170	ERDS2TJ101	001 152 2421 0						
R171	ERDS2TJ270	001 152 2434 5	R425, R426	ERDS2TJ103	001 152 2347 3			
R172	ERDS2TJ3R3	001 152 3152 8	R427, R428	ERDS2TJ103	001 152 2347 3			
R173	ERDS2TJ392	001 152 2439 0	R429, R430	ERDS2TJ222	001 152 2353 5			
R180	ERDS2TJ474	001 152 2443 4						
R181	ERDS2TJ222	001 152 2353 5						
R182	ERDS2TJ564	001 152 2447 0						
R183	ERDS2TJ332	001 152 2357 1						
R184	ERDS2TJ472	001 152 2362 4	R431, R432	ERDS2TJ222	001 152 2353 5			
R185, R186	ER052TKF4702	001 151 5723 2						
R187, R188	ER052TKF4702	001 151 5723 2						
R189	ERDS2TJ123	001 152 2424 7						
R190	ERDS2TJ332	001 152 2357 1						
R191	ERDS2TJ154	001 152 2427 4						
R192	ERDS2TJ824	001 152 2457 8						
R193	ERDS2TJ101	001 152 2421 0	R801, R802	ERDS2TJ222	001 152 2353 5			
R194	ERDS2TJ683	001 152 2450 5	R803, R804	ERDS2TJ272	001 152 2354 4			
R195, R196	ERDS2TJ103	001 152 2347 3	R805, R806	ERDS2TJ221	001 152 2431 8			
R197	ERDS2TJ473	001 152 2363 3	R807, R808	ERDS2TJ391	001 152 2360 6			
R198	ERDS2TJ333	001 152 2358 0	R809, R810	ERDS2TJ473	001 152 2363 3			
R199	ERDS2TJ102	001 152 2436 4	R817, R818	ERDS2TJ102	001 152 2346 4			
R200	ERDS2TJ472	001 152 2362 4	R819, R820	ERDS2TJ102	001 152 2346 4			
R201	ERDS2TJ103	001 152 2347 3	R821	ERDS2TJ103	001 152 2347 3			

## ■ RESISTORS & CAPACITORS

Ref. No.	Part No.	Part Code	Ref. No.	Part No.	Part Code	Ref. No.	Part No.	Part Code
C25, C26	ECEA1VU101	001 120 2929 5	C129	RCBS1H681KBY	001 103 5642 2	C310, C401	ECFD1H104ZF	001 108 0906 2
C27, C28	ECEA0JS331	001 120 2975 9	C141	ECQM1H153JZ	001 106 0704 0	C402	ECEA0JU470	001 120 3125 9
C29	REC1A101MOT	001 120 5628 3	C142	ECQM1H122JZ	001 106 0683 8	C403	ECFTD103KXL	001 108 0341 7
C101	ECFD1H104ZF	001 108 0906 2	C143	ECQM1H473JZ	001 106 0810 9	C404, C405	ECD1H104ZF	001 108 0906 2
C102, C103	ECKD1H102KB	001 103 1414 8	C144	ECEA1VSNR2R	001 120 5070 9	C406	ECCC1H220K	001 103 0493 7
C104	ECKD1H681K	001 103 1580 5	C145	ECEA1HSNR2R	001 120 4836 1		EXCEPT	
C105, C106	ECKD1H471KB	001 103 1551 0	C161	ECQM1H153JZ	001 106 0704 0		(M, MC)	
C107	ECCC1H220K	001 103 0493 7	C162	RCBS1H681KBY	001 103 5642 2	C408, C409	ECFTD103KXL	001 108 0341 7
C108	ECEA1HSR1	001 120 3250 5	C163	ECQM1H103JZ	001 106 0667 8		(EG) ONLY	
C109	ECEA1HU010	001 120 2842 1	C164	ECEA1ESN3R3	001 120 5060 1	C414, C416		
C110	ECQM1H104JZ	001 106 0675 8	C165	ECEA1HSNR1	001 120 4837 0		(EG) ONLY	
C111, C112	ECEA1HU100	001 120 3251 4	C181	ECQM1H104JZ	001 106 0675 8	C501	ECE1EV330	001 120 5624 7
C113	ECEA1HKNR33		C182	ECCD1H221KB	001 103 3009 9	C502	ECEV1HV010	001 120 5625 6
C114	RCBS1C182MXY	001 103 8660 8	C183	ECQM1H103JZ	001 106 0667 8	C504	GR426B273K25	001 103 7125 0
C115	RCBS1C682MXY	001 103 7092 2	C184	ECEA1HSN010	001 120 3237 2	C506	GR426B152K50	001 120 5626 5
C116	ECQM1H333JZ	001 106 0779 1	C186	ECD1H104ZF	001 108 0906 2	C507	GR426B104Z25	
C117	RCBS1H21KBY	001 103 5303 9	C187	ECEA1VSNR2R	001 120 5070 9	C511, C512	ECEA1EN470S	001 120 2394 4
C118	ECEA1HU010	001 120 2842 1	C301	ECCC1H220K	001 103 0493 7	C513	ECEA1EN470S	001 120 2394 4
C119	ECEA0JU220	001 120 4670 5	C302	ECCD1H070CC	001 103 0271 9	C801, C802	ECCD1H181KB	001 103 0467 9
C120	RCBS1H681KBY	001 103 5642 2	C303	ECEA1VSNR2R	001 120 5070 9	C803, C804	RBP1CN220CT	001 120 5015 6
C121	ECFTD103KXL	001 103 0341 7	C304, C305	ECD1H104ZF	001 108 0906 2	C805, C806	ECKD1H102KB	001 103 1414 8
C122, C123	ECD1H101KB	001 103 5369 0	C306	ECFTD103KXL	001 108 0341 7	C810	ECD1H104ZF	001 108 0906 2
C124	ECKD1H222KB	001 103 1494 2	C307	ECKD1H471KB	001 103 1551 0	C812	ECQM1H104JZ	001 106 0675 8
C125	ECEA0JU220	001 120 4670 5	C308	ECD1H104ZF	001 108 0906 2	C813, C814	RBP1CN220CT	001 120 5015 6
C126	ECEA0JU470	001 120 3125 9	C309	ECCD1H070CC	001 103 0271 9	C817	ECD1H104ZF	001 108 0906 2
C127, C128	ECKD1H102KB	001 103 1414 8	EXCEPT (M, MC)					

- Terminal guide of IC's, transistors and diodes

AN8370S ..... 42 pin AN6554NS ..... 14 pin MN4416S ..... 24 pin AN8376S ..... 28 pin MN6636S ..... 10 pin AN8290S ..... 24 pin MN1550PDT ..... 18 pin	AN6552 ..... 8 pin MN15261PDU ..... 64 pin SVIPCM54HP-1 ..... 28 pin	MN6617S ..... 84 pin MN6618A ..... 42 pin	<b>MN1280-R</b>  1---OUT 2---Vss 3---Vdd	<b>2SC3311</b>  E C B	<b>UN4212</b> <b>UN4113</b> <b>SVTDA124EST</b>  E C B
 No. 1	 No. 1	 Mark No. 1		<b>MA4068, MA4056, MA4091, MA4330</b>  mark Cathode Anode	<b>EHDGA1243 ..... 15 pin</b> <b>SVIGA011 ..... 5 pin</b>  1. In 2. Out
 B C E	<b>2SB793A</b> 2SD973A 2SD642 2SD637	<b>MA165</b>  Cathode Anode	<b>SVDMGP06G</b>  Cathode Anode	<b>SVIM5236L</b>  I G O	<b>MA153</b>  1 2 3
1 4832 201 100 1 8060 801 100 1 2683 051 100 1 2020 804 100 1 2285 051 100 1 8060 801 100 1 15523 051 100 1 4704 051 100 1 0505 051 100	5900104825 5900104825 5900104825 5900104825 5900104825 5900104825 5900104825 5900104825 5900104825	1 4832 201 100 1 8060 801 100 1 2683 051 100 1 2020 804 100 1 2285 051 100 1 8060 801 100 1 15523 051 100 1 4704 051 100 1 0505 051 100	1 4832 201 100 1 8060 801 100 1 2683 051 100 1 2020 804 100 1 2285 051 100 1 8060 801 100 1 15523 051 100 1 4704 051 100 1 0505 051 100	1 4832 201 100 1 8060 801 100 1 2683 051 100 1 2020 804 100 1 2285 051 100 1 8060 801 100 1 15523 051 100 1 4704 051 100 1 0505 051 100	1 4832 201 100 1 8060 801 100 1 2683 051 100 1 2020 804 100 1 2285 051 100 1 8060 801 100 1 15523 051 100 1 4704 051 100 1 0505 051 100

## ■ REPLACEMENT PARTS LIST

**Notes:\*** Important safety notice:

Components identified by  $\Delta$  mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

\* Bracketed indications in Ref. No. columns specify the area.

Parts without these indications can be used for all areas.  
\* “(S)” mark parts are used for silver type only.

\* **(K)** mark parts are used for black type only.  
Parts other than **(S)** and **(K)** marked are used for both silver and black types.

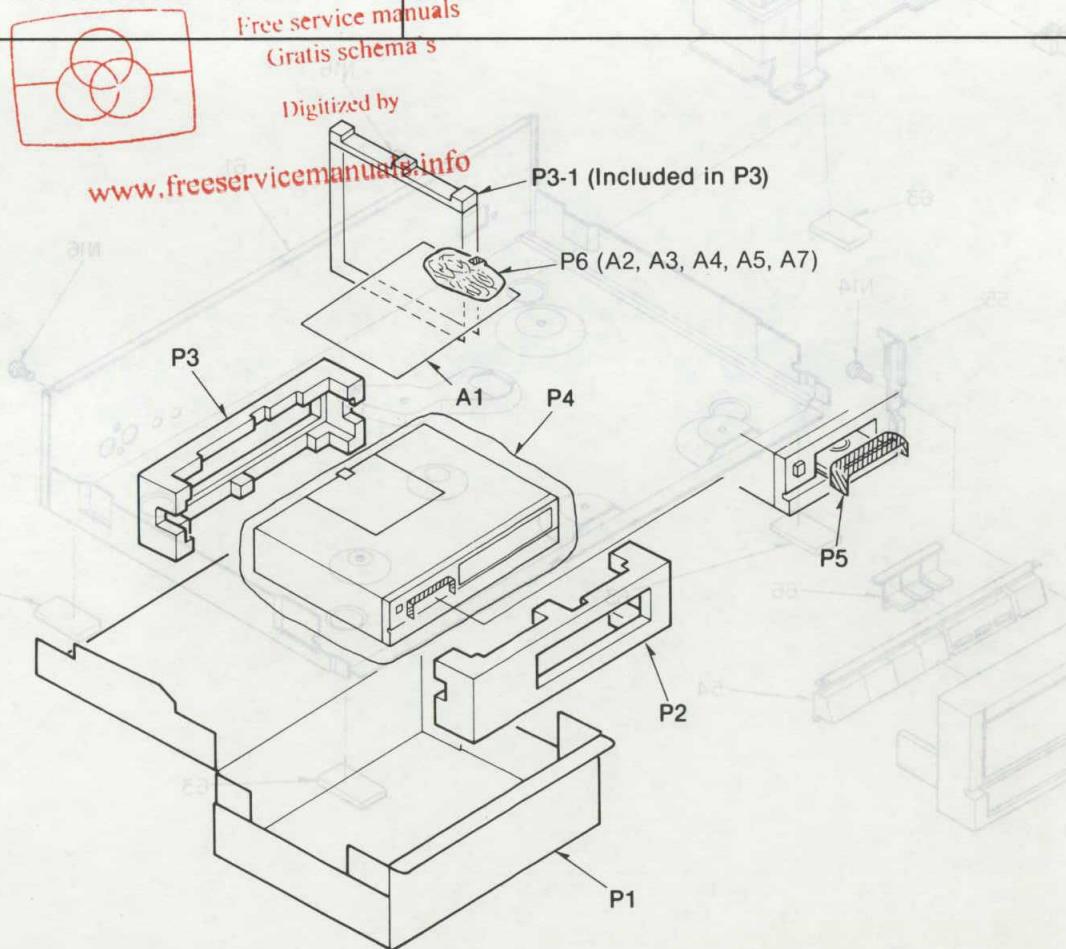
Ref. No.	Part No.	Part Code	Description	Ref. No.	Part No.	Part Code	Description
<b>LOADING MECHANICAL</b>							
1 (M, MC)	SIRLP110-KM	016 631 0045 5	DISC TRAY ASS'Y	20	SHGD48-1	016 653 1073 5	RUBBER
1 (OTHERS)	SIRLP115-KM	016 631 0051 7	DISC TRAY ASS'Y	21	SDRD2	016 740 0117 8	PULLEY
1-1 (M) (MC) ONLY	SHSD13	016 655 0646 4	SHEET	22	SWD44	016 650 5250 5	BRACKET
1-2	SHGD49	016 653 1079 9	RUBBER	23	SHGD69	016 653 1078 0	RUBBER
4	SGXD160ZKOA	016 846 3529 3	ORNAMENT PLATE	24	SOYD2	016 634 0111 7	YODE
5	SUSD29-1	016 726 0845 5	SPRING	25	SOMD3	003 453 0241 8	MAGNET
6	SIRD20	016 718 3355 2	LEVER	26	SIRD17E	016 645 0165 2	CLAMPER
7	SIRD16E	016 631 0042 8	HOLDER ASS'Y	27	SIRD28	016 631 0053 5	HOLDER
7-1	SHGD46	016 653 1080 6	RUBBER	28	SDGD19	016 745 0199 5	GEAR
9	SUSD46	016 650 5256 9	BRACKET	29	SDGD20-1	016 745 0202 7	GEAR
10	SUXD25	016 634 0124 2	SHAFT	31	SD0D8	005 512 0399 3	RETAINING RING
11	SOALP1200-KM	001 271 0692 3	OPTICAL PICKUP	32	SRQA010N04	017 726 0412 8	SPRING
12	EWSL04A00000	016 631 0044 6	HOLDER	33	SD0D7-1	016 766 0190 7	TURNTABLE ASS'Y
13	SHGD47	016 653 1070 8	RUBBER	34	SISD7E	016 827 0313 6	BASE
14	SORD10E	001 211 3219 8	COIL	35	SUSD32-1	016 726 0839 3	SPRING (BLACK)
15	EWS780A00Q53	001 174 8773 3	RESISTANCE UNIT	36	SUSD43	016 726 0842 8	SPRING (GOLD)
16	SOYD8E	016 634 0128 8	YODE	37	SUSD44	016 726 0840 0	SPRING (SILVER)
17	SOYD9	016 634 0125 1	YODE	38	SUSD42	016 726 0841 9	SPRING (FAT SILVER)
18	SJGD4E	002 310 2308 2	MOTOR ASS'Y	39	SMBD2-1	016 754 0059 5	BELT
19	SHGD64	016 653 1072 6	RUBBER	40	SHRD23	016 652 0633 4	LOCK SHAFT
				41	SOMA9A	016 743 0060 3	ROTOR ASS'Y
				42	SXPD940	003 483 0882 3	SPINDLE PC BOARD ASS'Y
				43	SHRD19	016 652 0634 3	LEVER
				44	SUSD81	016 726 0843 7	SPRING
				45	SUSD51	016 726 0846 4	SPRING

Ref. No.	Part No.	Part Code	Description	Ref. No.	Part No.	Part Code	Description				
<b>CABINET AND CHASSIS</b>											
51 	SKCD50KZ0A	016 800 2908 4	TOP COVER	61 	SGPLPJ20-KXL	016 840 7188 8	CHASSIS ASS'Y				
51 	SKCD50SY0A	016 800 2912 8	TOP COVER	63	SKL293	016 828 0269 8	RUBBER				
52	SUBD6	016 712 0337 6	ROD	65 	SGXD150MA0A	016 846 3535 5	ORNAMENT PLATE				
53 	SBC666	016 702 5545 6	BUTTON	65 	SGXD150ZC0A	016 846 3536 4	ORNAMENT PLATE				
53 	SBC666-5	016 702 6679 9	BUTTON	66 	SBCD370SW0A	016 702 6756 3	BUTTON				
54 	SBCD3801MA0A	016 702 6757 2	BUTTON	66 	SBCD370ZC0A	016 702 6752 7	BUTTON				
54 	SBCD3801ZC0A	016 702 6759 0	BUTTON	68	SJJ130-1	003 400 6828 8	JACK				
55	SHRD22-M	016 650 5257 8	BRACKET	EXCEPT (M, MC)		EXCEPT (M, MC)					
56 	SGYLPJ20-KE	016 840 7153 9	FRONT PANEL	69	SJJ130-2	003 400 7317 2	JACK				
<b>(OTHERS)</b>											
56 	SGYLPJ20-KM	016 840 7154 8	FRONT PANEL	<b>SCREWS, WASHERS AND NUTS</b>							
56 	SGYLPJ20-SE	016 840 7150 2	FRONT PANEL	N1	SNSD10	005 500 5675 8	SCREW				
57 	SJSD16	003 400 7436 6	AC SOCKET	N2	XTN2+4G	005 501 2780 5	SCREW				
	SJS9236	003 403 4660 7	AC SOCKET	N3	XQN17+A6	005 500 4900 2	SCREW				
				N4	SHDD1-1	016 634 0123 3	SCREW				
57 				N5	XTW3+8T	005 501 1358 9	SCREW				
<b>(OTHERS)</b>				N6	XXE26D5	005 500 5095 2	SCREW				
59	SMND7-1	016 631 0050 8	HOLDER	N7	SNSD9	016 726 0765 4	SCREW				
60	SJFD4	003 410 7707 6	TERMINAL	N8	XSN26+6	005 500 1364 6	SCREW				
61 	SGPD60ZF0B	016 840 7163 7	CHASSIS	N9	SFXW120-01	005 513 0957 0	WASHER				
<b>(E)</b>				N10	XSN26+8	005 500 1368 2	SCREW				
61 	SGPD60ZF1A	016 840 7172 6	CHASSIS	N11	XTN2+4G	005 501 3534 3	SCREW				
61 	SGPD60ZF2A	016 840 7164 6	CHASSIS	N12 	SRXG007N10	005 500 5434 3	SCREW				
<b>(M)</b>				N12 	SRXG007N51	005 500 5012 1	SCREW				
61 	SGPLPJ20-KEB	016 840 7191 3	CHASSIS ASS'Y	N13	XTV3+8JFN	005 501 1326 7	SCREW				
61 	SGPLPJ20-KEG	016 840 7187 9	CHASSIS ASS'Y	N14	XTV3+6G	005 501 0896 2	SCREW				
61 	SGPLPJ20-KEK	016 840 7189 7	CHASSIS ASS'Y	N15	SFXGQ06N01	005 500 4983 3	SCREW				
61 	SGPLPJ20-KMC	016 840 7190 4	CHASSIS ASS'Y	N16	XTV3+8JFZ	005 501 0919 2	SCREW				
<b>(EG)</b>				N18	XTV3+14G	005 501 0851 5	SCREW				



## ■ REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Code	Description	Ref. No.	Part No.	Part Code	Description
<b>CONNECTORS</b>							
71	EMCS0350Z	003 402 1227 7	CONNECTOR (CN103)	75	EMCS0552M	003 402 0112 1	CONNECTOR (CN102)
72	EMCS0550Z	003 402 1233 9	CONNECTOR (CN402)	76	SJSD1709		CONNECTOR (CN101)
73	EMCS0650Z	003 402 1235 7	CONNECTOR (CN11)	77	SRDJ001N14E	003 410 6157 8	SHORTING PIN (CN102)
74	EMCS0750Z	003 402 1238 4	CONNECTOR (CN401)				
<b>PACKINGS</b>							
P1 (K) (OTHERS)	SPND106	016 971 4728 4	CARTON BOX	(E1)	SQULPJ20-KE	016 983 4821 2	INSTRUCTION BOOK
P1 (K) (EF)	SPND107	016 971 4727 5	CARTON BOX	(E) (EB) (EH)	SQULPJ20-KMC	016 983 4822 1	INSTRUCTION BOOK
P1 (S) (OTHERS)	SPND108	016 971 4726 6	CARTON BOX	(MC)	SQULPJ20-KXB	016 983 4858 9	INSTRUCTION BOOK
P1 (S) (EF)	SPND109	016 971 4724 8	CARTON BOX	(XB)	SFDAC05G02	003 490 2613 3	POWER CORD
P1 (K) (MC)	SPND110	016 971 4723 9	CARTON BOX	A2 △	SJA170	003 490 4064 2	POWER CORD
P2	SPSD65	016 977 3118 8	PAD	A2 △	SJA170-1	003 490 5022 8	POWER CORD
P3	SPSD66	016 977 3117 9	PAD	A2 △	SJA171	003 490 4160 3	POWER CORD
P4	XZB45X40A01	016 978 0470 2	POLYETHYLENE BAG	(OTHERS)	SJA173	003 490 4161 2	POWER CORD
P5	SPSD68	016 977 3081 4	SHOOT	A2 △	SJA183	003 490 4873 7	POWER CORD
P6	XZB23X20C03	016 978 0480 0	POLYETHYLENE BAG	(XL)	SJA183	003 490 4873 7	POWER CORD
<b>ACCESSORIES</b>							
A1 (M)	SQUD141	016 983 4827 6	INSTRUCTION BOOK	(XB)	SJP2249-1	003 492 6446 4	OUTPUT CORD
A1 (OTHERS)	SQUD143	016 983 4826 7	INSTRUCTION BOOK	A3	SFDKI19118	003 402 0523 6	PLUG
A1 (EK)	SQUD144	016 983 4825 8	INSTRUCTION BOOK	A4 △	SJP2257	003 492 4915 4	SYNC. CORD
A1	SQUD145	016 983 4824 9	INSTRUCTION BOOK	(XA) ONLY	RJP120ZBS-H	003 402 1437 9	PLUG
<i>Free service manuals Gratis schema's</i>							



## ■ PACKING

## ■ REPLACEMENT PARTS LIST

**Notes:** \* Important safety notice:  
Components identified by △ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

\* Bracketed indications in Ref. No. columns specify the area.  
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Code	Description	Ref. No.	Part No.	Part Code	Description
<b>INTEGRATED CIRCUITS</b>							
IC13	SVIM5236L	001 060 5358 9	INTEGRATED CIRCUIT	D408, D409	MA165	001 032 0494 0	DIODE
IC101	AN8370S	001 060 8399 8	INTEGRATED CIRCUIT	D410, D411	MA165	001 032 0494 0	DIODE
IC102	MN6636S	001 061 3044 7	INTEGRATED CIRCUIT	D412, D413	MA165	001 032 0494 0	DIODE
IC103, IC104	AN6554NS	001 060 4860 4	INTEGRATED CIRCUIT	D415, D416	MA165	001 032 0494 0	DIODE
IC301	MN6617	001 060 8411 9	INTEGRATED CIRCUIT	EXCEPT (M, MC)			
IC302	MN6618A	001 061 3043 8	INTEGRATED CIRCUIT	D417, D418	MA165	001 032 0494 0	DIODE
IC303	MN4416S	001 061 3040 1	INTEGRATED CIRCUIT	EXCEPT (M, MC)			
IC304	EHDGA1243	001 061 3036 7	INTEGRATED CIRCUIT	D421, D422	MA165	001 032 0494 0	DIODE
IC401	MN15261PDU	001 061 3086 7	INTEGRATED CIRCUIT	EXCEPT (M, MC)			
IC402	AN6552F	001 060 0274 2	INTEGRATED CIRCUIT	D501	MA153	001 032 0489 7	DIODE
IC403	MN1280-R	001 060 8669 5	INTEGRATED CIRCUIT	D801, D802	MA165	001 032 0494 0	DIODE
IC404	MN1550PDT		INTEGRATED CIRCUIT				
EXCEPT (M, MC)							
IC501	AN8290S	001 061 3034 9	INTEGRATED CIRCUIT				
IC801	SV1PCM54HP-1	001 061 3098 3	INTEGRATED CIRCUIT				
IC802	MN6636S	001 061 3044 7	INTEGRATED CIRCUIT				
IC803	AN8376S	001 061 3035 8	INTEGRATED CIRCUIT				
IC804, IC805	SV1GA011	001 061 3045 6	INTEGRATED CIRCUIT				
IC806	MN1280-S	001 061 3084 9	INTEGRATED CIRCUIT				
<b>TRANSISTORS</b>							
Q11	2SD1227M-Q		TRANSISTOR				
Q12, Q13	2SB793A	001 030 2370 3	TRANSISTOR				
Q14	2SB793A	001 030 2370 3	TRANSISTOR				
Q15	2SD973A	001 030 1947 8	TRANSISTOR				
Q16	2SB793A	001 030 2370 3	TRANSISTOR				
Q17	2SB642	001 030 0694 4	TRANSISTOR				
Q101	2SD637	001 030 1794 7	TRANSISTOR				
Q141	2SD973A	001 030 1947 8	TRANSISTOR				
Q142	2SB793A	001 030 2370 3	TRANSISTOR				
Q161	2SD973A	001 030 1947 8	TRANSISTOR				
Q162	2SB793A	001 030 2370 3	TRANSISTOR				
Q181	2SD973A	001 030 1947 8	TRANSISTOR				
Q182	2SB793A	001 030 2370 3	TRANSISTOR				
Q402	2SD973A	001 030 1947 8	TRANSISTOR				
Q403	2SB793A	001 030 2370 3	TRANSISTOR				
Q405, Q406	UN4212	001 030 3019 1	TRANSISTOR				
EXCEPT (M, MC)							
Q408	SVTDTA124EST	001 030 6078 8	TRANSISTOR				
EXCEPT (M, MC)							
Q409	UN4212	001 030 3019 1	TRANSISTOR				
EXCEPT (M, MC)							
Q801	UN4212	001 030 3019 1	TRANSISTOR				
Q802	UN4113	001 030 2900 9	TRANSISTOR				
Q803	2SC3311-Q	001 030 2936 7	TRANSISTOR				
<b>DIODES</b>							
D11, D12	MA4091-M	001 032 7213 5	DIODE				
D15, D16	MA4068	001 032 5830 4	DIODE				
D17	MA4330L	001 032 7228 8	DIODE				
D18	MA4056-M	001 032 7209 1	DIODE				
D19, D20	SVDMPG06G	001 032 9230 6	RECTIFIER				
D21, D22	SVDMPG06G	001 032 9230 6	RECTIFIER				
D23, D24	SVDMPG06G	001 032 9230 6	RECTIFIER				
D25, D26	SVDMPG06G	001 032 9230 6	RECTIFIER				
D181, D182	MA165	001 032 0494 0	DIODE				
D401, D402	MA165	001 032 0494 0	DIODE				
D403, D404	MA165	001 032 0494 0	DIODE				
D406	MA165	001 032 0494 0	DIODE				
D407	MA165	001 032 0494 0	DIODE				
EXCEPT (M, MC)							
S1	ESB8249V	003 435 5877 0	SWITCH, POWER				
S2	SRDSHXW0251	003 438 1067 7	SWITCH, VOLTAGE SELECTOR				
(XA, XB) ONLY							
S101	SSPD5	003 434 1032 8	SWITCH, REST				
S401~S40							

## ■ TERMINAL FUNCTION OF LSI

### • MN15261PDU (System Control and FL Drive)

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

### • MN1550PDT (Remote Control Signal Processing)

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

Pin No.	Mark	Signal	I/O Devision	Function
9	SYNC	—	O	Clock output
10	P10	Data	I	Key strobe
13	P13	—	—	—
14	P00	Data	I	—
17	P03	—	—	—
18	VSS	GND	I	GND terminal

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

Pin No.	Mark	I/O Devision	Function
1	BLKCK	O	Sub-code block (Q data) clock (75 Hz)
2	CLDCK	O	Sub-code frame (Q data) clock (7.35 kHz)
3	SUBQ	O	Sub-code (Q data) output
4	CRC	O	Sub-code (Q data) CRC check (Not used, open)
5	RST	I	Reset signal input (reset at "L")
6	MLD	I	Command load input
7	MCLK	I	Command clock input
8	MDATA	I	Command data input
9	DMUTE	I	Muting control (muting ON at "H")
10	TRON	I	Tracking servo ON signal (tracking servo ON at "L")
11	STAT	O	Processing condition (CRC, OTC, CLVOK, TT STOP) output
12	SMCK	O	Clock output (4.2336 MHz)
13	PMCK	O	Pitch control clock output (Not used, open)
14	ITC	I	Track counter input signal (Not used, connected to +5V)
15	TEST	I	Test mode selection (Not used, connected to +5V)
16	X2	O	Clock output (16.9344 MHz)
17	X1	I	Clock input (16.9344 MHz)
18	SEL	I	DA output parallel/serial selection (serial at "L")
19	LDG/WDCK	O	L channel deglitch signal/serial data word clock.
20	RDG	O	R channel deglitch signal.
21	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")
22	IPFLAG	O	Interpolation flag (interpolation at "H")
23	FLAG0	O	Error flag (error at "H")
24	FLAG6	O	16 K RAM address reset signal (reset at "H")
25	XCK	O	Clock (16.9344 MHz) output (Not used, open)
26	DA15/SRDATA	O	16-bit data output/serial data output (MSB first)
27	DA14/SRDATAX	O	16-bit data output/serial data output (LSB first)
28	DA13/SRCK	O	16-bit data output/serial data beat clock.
29	DA12/WDCK	O	16-bit data output/serial data word clock (Not used)
30	DA11/BYTCK	O	16-bit data output/serial data byte clock (Not used)
31	GND	I	GND terminal
32	DA10/RIL	O	16-bit data output/RIL signal
33	DA9/RESY	O	16-bit data output/Resynchronizing signal
34	DAB/FCLV	O	16-bit data output/Synchronizing detection signal (Not used)
35	DA7/IPBYTE	O	16-bit data output/Interpolation flag for each byte (Not used)
36	DA6/IPSEL	I/O	16-bit data output/interpolation inhibit (Not used)
37	DA5/FLAG5	O	16-bit data output/C2 decoder correction flag 3 (Not used)
38	DA4/FLAG4	O	16-bit data output/C2 decoder correction flag 2 (Not used)
39	DA3/FLAG3	O	16-bit data output/C2 decoder correction flag 1 (Not used)
40	DA2/FLAG2	O	16-bit data output/C1 decoder correction flag 2 (Not used)
41	DA1/FLAG1	O	16-bit data output/C1 decoder correction flag 1 (Not used)
42	DA0/FLCK0	O	16-bit data output/Crystal frame clock
43	D7	I/O	16 K RAM data output
50	D0	—	—
51	RAMOE	O	16 K RAM OE signal
52	RAMWE	O	16 K RAM WE signal
53	RAMA 0	O	16 K RAM address signal (RAMA0 : LSB, RAMA10 : MSB)
63	RAMA10	—	—
64	PC	O	Spindle motor ON signal (ON at "L")
65	EC	O	Spindle motor drive signal
66	FG	I	Spindle motor FG signal input
67	—	—	—
68	—	—	—
69	—	—	—
70	—	—	—
71	—	—	—
72	PCK	I	PLL extract clock input
73	VDD	I	Power supply (connected to +5V)
74	EFM	I	EFM signal input (PLL)
75	SRF	I	EFM signal input (DSL)
76	DO	I	Drop-out signal (Drop-out at "H")
77	CLVS	O	11T servo OK signal (OK at "H")
78	FPC	O	PLL frequency comparision signal
79	BSSEL	O	PLL frequency in take operation signal.
80	—	—	—
81	—	—	—
82	—	—	—
83	SUBC	O	Sub-code serial output data
84	SBCK	I	Clock for sub-code serial output

## • AN8370S (Optical Servo Control)

Pin No.	Mark	I/O Devision	Function
1	VEE	I	Power supply (connected to -5V)
2	LSA	I	Phase difference input (A)
3	GND	I	GND terminal
4	LSB	I	Phase difference input (B)
5	APC	O	Auto laser power control output
6	TEOUT	O	Tracking error signal output
7	TEG	I	Tracking error gain adjusting input
8	TE-	I	Phase difference-voltage conversion (-)
9	TE +	I	Phase difference-voltage conversion (+)
10	APC -	O	Laser power inversion input
11	C-MEM	I	Capacitor connection for phase difference memory
12	APC +	I	Laser power non-inversion input
13	VREF	O	Reference current generation
14	SENSE	O	Selector output (track-crossed)
15	HIN	I	Tracking hold circuit input
16	HOUT	O	Tracking hold circuit output
17	SPCNT	O	Track-cross speed control output (not used, grounded)
18	C-MSP	I	Track-cross reference speed setting capacitor connection (not used, grounded)
19	C- <u>AF</u>	I	Auto focus timer capacitor connection
20	KICK R/F	O	Track kick signal output
21	VCC	I	Power supply (connected to +5V)
22	CNT1	I	Control input (FOON : Focus servo ON signal)

## • EHDGA1243 (Data Slice and PLL)

Pin No.	Mark	I/O Devision	Function
1	PCK	O	Clock output extracted from SRF
2	EFM	O	EFM signal output synchronized with PCK
3	D-GND	I	GND terminal (digital system)
4	SRF	O	RF signal output data-sliced into digital value
5	SLC	I	Slice level control signal input
6	DO	O	Drop-out detection pulse output
7	FPC	I	Frequency comparison error signal input.
8	VCC	I	Power supply (connected to +5V)

## • MN6618 (Digital Filter)

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

Pin No.	Mark	I/O Device	Function
22	—	—	—
23	MCLK	I	Command clock input
24	MLD	I	Command load input
25	—	—	—
26	RST	I	Reset signal input (reset at "L")
27	VDD	I	Power supply (connected to +5V)
28	LRCK	I	R/L signal
29	—	—	—
30	SFT	I	Serial data input clock
31	SIN	I	Serial data input
32	—	—	—
33	X OUT	O	Clock output (Not used)
34	X IN	I	Clock input (16.9344 MHz)
35	OSEL	I	DA output parallel/serial selection. (parallel at "H")
36	LDGL	O	L channel deglitch signal
37	RDGL	O	R channel deglitch signal
38	VDD	I	Power supply (connected to +5V)
39	D015	O	16-bit parallel data (MSB)
40	D014	O	16-bit parallel data
41	—	—	—
42	D013	O	16-bit parallel data

## • AN8290S (Spindle Motor Drive)

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

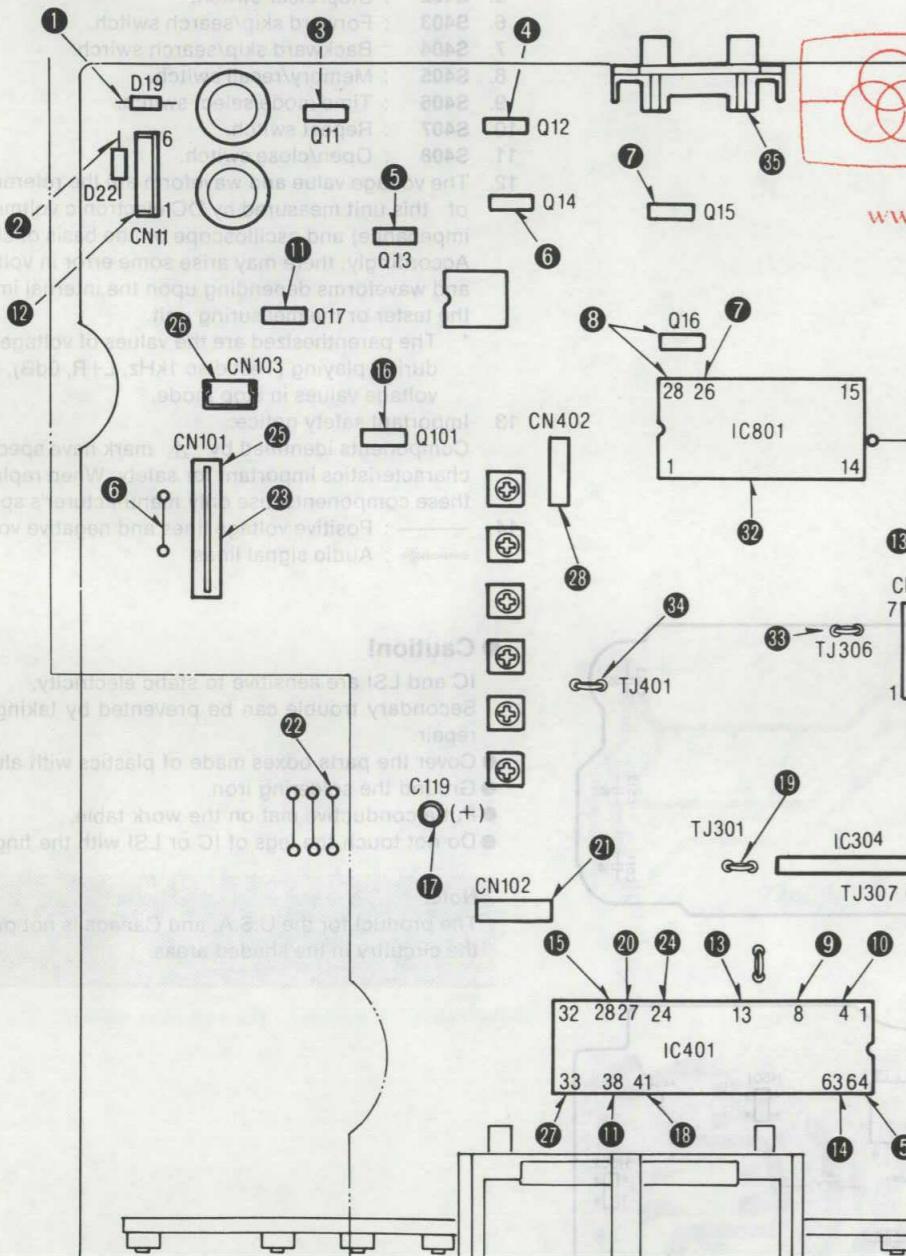
Pin No.	Mark	I/O Devision	Function
13	H3-	I	Not used in this unit.
14	H3+	I	
15	H2-	I	Negative output of Hall element is input.
16	H2+	I	Positive output of Hall element is input.
17	H1-	I	Negative output of Hall element is input.
18	H1+	I	Positive output of Hall element is input.
19	HSW	I	Bias switch of Hall element. (OFF when PC > DCR)
20	HB	I	Bias power of Hall element.
21	VCC	I	Power input for IC control.
22	PC	I	Power control. (Power down mode when PC > DCR)
23	CLK	I	Clock input. (DCR standard, operated at the edge of rise.)
24	TC	I	Triangular wave generation capacitor terminal.

## TROUBLESHOOTING SCHEMATIC

**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



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Gratis schema's  
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### Check the power supply circuit

#### Check point 1

Check the voltage of terminal D19 (cathode).....8.9V

NO → AC cord S1, T1, D19, 20 } defective

#### Check point 2

Check the voltage of terminal D22 (anode).....8.3V

NO → D21, D22 } defective

#### Check point 3

Check the voltage of terminal Q11 (emitter) or CN401, pin 4.....8.5V

NO → IC11, Q11, D11 } defective

#### Check point 4

Check the voltage of terminal Q12 (emitter) or CN401, pin 3.....8.5V

NO → IC12, Q12, D12 } defective

#### Check point 5

Check the voltage of terminal Q13 (collector) or IC401, pin 64.....5V

NO → IC13, Q13 } defective

#### Check point 6

Check the voltage of terminal Q14 (emitter) or jumper wire.....5V

NO → IC402, Q14 } defective

#### Check point 7

Check the voltage of terminal Q15 (emitter) or IC801, pin 26.....6.5V

NO → Q15, D15 } defective

#### Check point 8

Check the voltage of terminal Q16 (emitter) or IC801, pin 28.....6.5V

NO → Q16, D16 } defective

#### Check point 9

Check the voltage of IC401, pin 8.....12.5V

NO → D23, D24 } defective

#### Check point 10

Check the voltage of IC401, pin 4.....12V

NO → D24, D25 } defective

#### Check point 11

Check the voltage of terminal Q17 (emitter) or IC401, pin 38.....32V

NO → D18, D25, D26, Q17 } defective

#### Check point 12

Check the voltage of CN11 ①, ②.....AC 2.3V

NO → T1, D18 } defective

### Check the focus servo

#### Check point 13

Check the power supply circuit

Check point 13 YES

Reset signal is "H (4.2V)"? (IC403, pin 1 or IC401, pin 13)

NO → IC402 defective

#### Check point 14

Clock is oscillating (4.2336MHz)? (IC401, pin 63)

NO → IC301, X301, R407, C403 } defective

#### Check point 15

Focus ON signal level is "L (0V)"? (IC401, pin 28)

NO → IC401, IC101 } defective

#### Check point 16

Laser A.P.C. signal is ON? (Q101 collector)

NO → IC101, Q101 } defective

#### Check point 17

Focus search signal is emitted? (IC101, pin 35 or C119)

NO → IC101 defective

#### Check point 18

Focus OK signal is "L (0V)"? (IC401, pin 31)

NO → IC101, IC401 } defective

#### Check point 19

Focus lens moves up and down for a few seconds? (Not needed to set the disc)

NO → IC104, Q141, 142, Pickup } defective

#### Check point 20

RF signal is emitted? (Test pin TJ301)

NO → IC101, Pickup } defective

### Check the tracking servo

#### Check point 20

Check the TR ON signal (IC401 27 pin). "L" in play and "H" in search/skip.

NO → IC101, IC401 } defective

#### Check point 21

Tracking error signal is emitted? (CN102, pin 1 or pin 2)

NO → IC101 defective

#### Check point 22

Track jump pulse is emitted during search/skip? (IC101, pin 20 or jumper wire)

NO → IC101 defective

#### Check point 23

Tracking coil drive signal is emitted? (CN101, pin 8)

NO → IC104, Q161, Q162 } defective

### Check the traverse servo

#### Check point 24

Kick pulse is emitted in skip mode? (IC401, pins 23, 24)

NO → IC401 defective

#### Check point 25

Traverse coil drive signal is emitted? (CN101, pin 17)

NO → IC103, Q181, Q182 } defective

#### Check point 26

Speed sensor signal is emitted? (CN103, pin 3)

NO → Speed sensor } defective

### Check the loading motor drive

#### Check point 27

Loading motor close/open command signal is emitted? (IC401, pins 33, 34)

NO → IC401 defective

#### Check point 28

Loading motor drive signal is emitted? (CN402, pin 5)

NO → IC402, Q402, 403, motor } defective

### Check the digital and audio

#### Check point 29

PCK signal is emitted? (Test pin TJ307)

NO → IC304, IC301 } defective

#### Check point 30

CLK signal is emitted? (CN401, pin 5)

NO → IC301 defective

#### Check point 31

Spindle motor ON command signal is "H (2.5V)"? (CN401, pin 1)

NO → IC301 defective

#### Check point 32

Data signal is emitted? (IC801, pins 2, 3, 5~18)

NO → IC301, 302, IC801 } defective

#### Check point 33

Deglitch signal is emitted? (Test pin TJ306)

NO → IC301, IC302 } defective

#### Check point 34

Muting signal level is "L (0V)"? (Test pin TJ401)

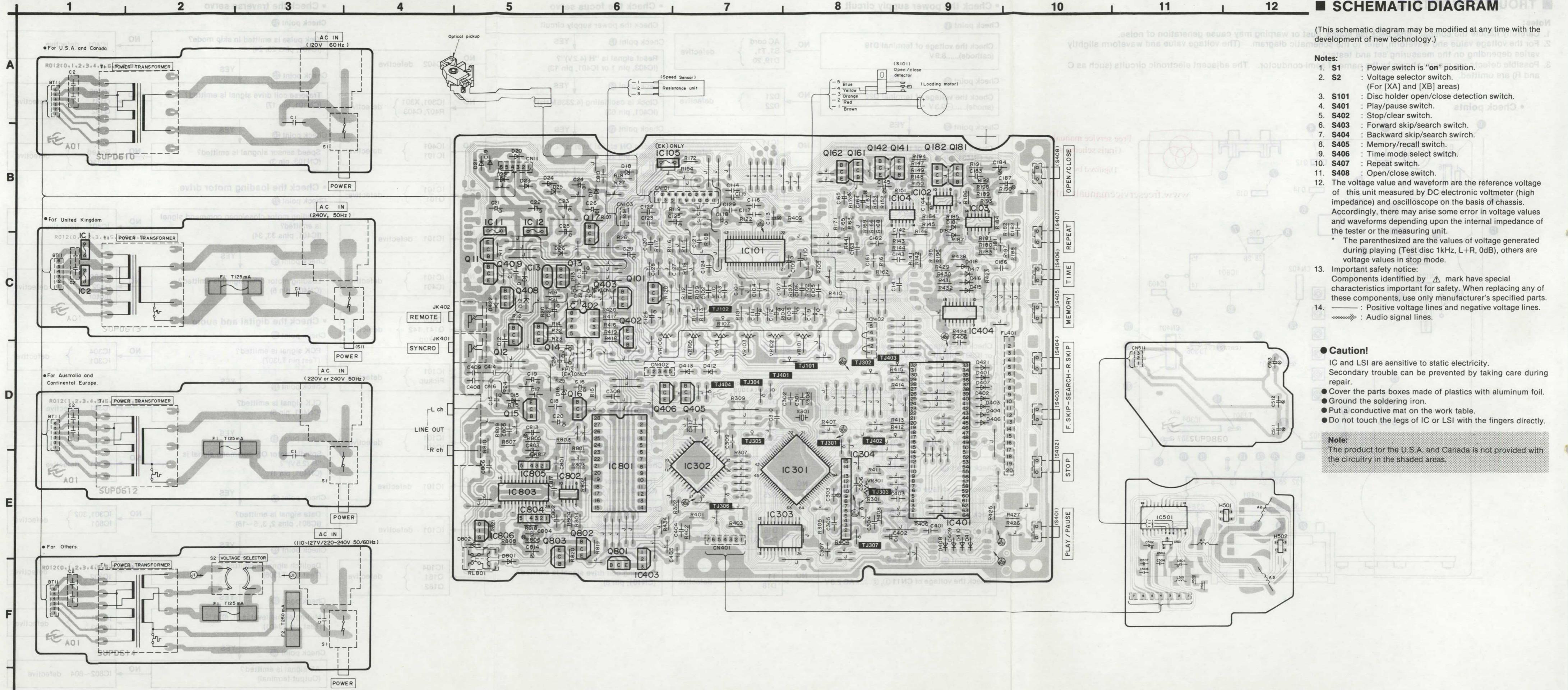
NO → IC401, IC803 } defective

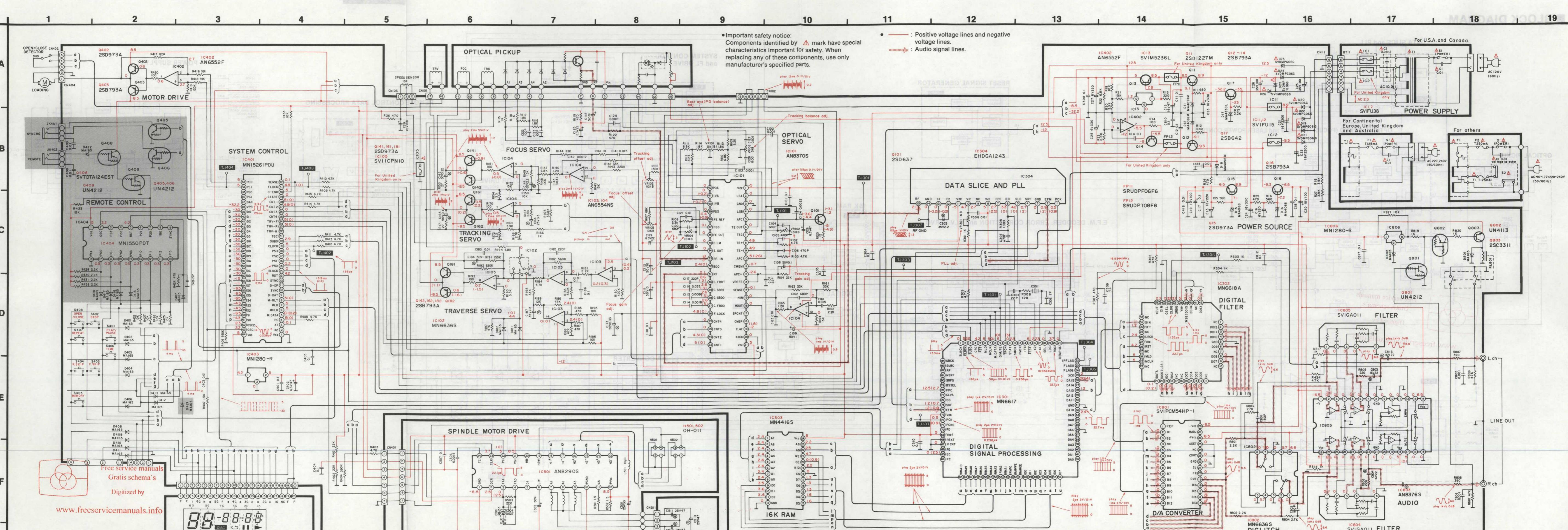
#### Check point 35

AF signal is emitted? (Output terminal)

NO → IC802~804 defective

## ■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM





## ■ BLOCK DIAGRAM

