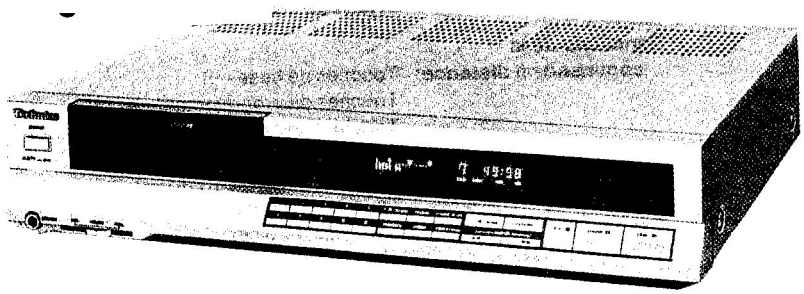
ORDER NO. DAD84100105C0
A-6

Service Manual

Compact Disc Player

DIGITAL

SL-P2



Color

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

Color	Area
(S) (K)	[M] ...U.S.A.
(S)	[MC]...Canada.
(S) (K)	[E] ...Switzerland and Scandinavia.
(S) (K)	[EK] ...United Kingdom.
(S) (K)	[XL] ...Australia.
(S) (K)	[EG] ...F.R. Germany.
(S) (K)	[EB] ...Belgium.
(S) (K)	[EH] ...Holland.
(S) (K)	[EF] ...France.
(S) (K)	[Ei] ...Italy.
(S) (K)	[XA] ...Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
(S) (K)	[XZ] ...New Zealand.
(S) (K)	[PA] ...East PX.
(S) (K)	[PE] ...European Military.
(S) (K)	[PC] ...European Audio Club.

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Technics

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

SL-P2

English

Specifications

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

■ General

Power supply: For U.S.A. and Canada: 120V, AC 60Hz
For others: ~110~120V/ 220~240V, 50/60Hz

Power consumption: 30 watts

Output voltage: 2 volts (at 0 dB)

Output Impedance: 330Ω

Load impedacne: more than 5 kΩ

Dimensions (W×D×H): 43×33.4×8.2 cm
(16 15/16" × 13 5/32" × 3 7/32")
When disc holder is opened
45.9 cm (18 1/16") (D)

Weight: 5.1 kg (11.2 lbs)

■ Audio

No. of channels: 2(left and right stereo)

Frequency response: 4–20,000 Hz±0.5 dB

Dynamic range: more than 96 dB

S/N ratio: more than 96b dB

Total harm. distortion: less than 0.003% (1 kHz. 0 dB)

Channel separation: more than 90 dB

Wow and flutter: below measurable limit

■ Signal Format

Sampling frequency: 44.1 kHz

Correction system: Technics Super Decoding Algorithm

D-A conversion: 16-bit linear

■ Pickup

Type: Astigma 3-beam

Light source: Semiconductor laser

Wavelength: 800 nm

■ Functions (Features)

Search modes: Manual search,
Track skip,
Music scan
Track program

Features: Auto play,
Track random access,
Index random access,
Programmable play,
(15 track memory),
Forward skip,
Reverse skip,
Forward search (track and index),
Reverse search (track and index),
Repeat play,
A–B repeat play,
Music scan

Display: (Digital display),
No. of tracks,
Total playing time (min., sec.),
Track being played,
Elapsed playing time,
Remaining time,
Index no.,
(Segment display),
No. of tracks,
Track being played,
Programmed tracks

Operation buttons: Basic buttons—7
Program buttons—12
Music scan button—1
Repeat button—1
A–B repeat button—1
Main time button—1

Disc loading: Motor-driven horizontal type

Headphone output level: Max. 80 mV (adjustable), 32Ω

Infrared Remote Control Unit:

Remote control functions: Basic buttons—6
Program buttons—12
Music scan button—1
Repeat button—1
A-B repeat button—1
Recall button—1

Dimensions (W×H×D): 5.6×13.5×1.5 cm

Batteries: UM-4 "AAA" batteries or IEC R03 or equivalent (1.5 V×2)

Deutch

TECHNISCHE DATEN

Änderungen der technischen Daten vorbehalten.
Die angegebenen Gewichts- und Abmessungsdaten sind ungefähre Werte.

■ Allgemeines

Stromversorgung: ~110–120/220–240 V, 50/60 Hz

Strombedarf: 30 Watt

Ausgangsspannung: 2 Volt (bei 0 dB)

Ausgangsimpedanz: 330Ω

Lastimpedanz: mehr als 5 kΩ

Abmessungen (B×T×H) 43×33,4×8,2 cm
Wenn Disc-Halter offen ist
45,9 cm (T)

Gewicht: 5,1 kg

■ Audio

Kanalanzahl: 2 (links und rechts, Stereo)

Frequenzgang: 4–20 000 Hz±0,5 dB

Dynamikbereich: mehr als 96 dB

Rauschabstand: mehr als 96 dB

Totalklirrverzerrung: weniger als 0,003% (1 kHz, 0 dB)

Kanaltrennung: mehr als 90 dB

Gleichlaufschwankungen: unterhalb Messbarkeit

■ Signalgröße

Probefrequenz: 44,1 kHz
Korrektionssystem: Technics Super Decoding Algorythm
D-A Umwandlung: 16-Bit linear

■ Tonabnehmer

Typ: Astigma 3-Bündel
Lichtquelle: Halbleiterlaser
Wellenlänge: 800 nm

■ Funktionen (Eigenschaften)

Sucharten: Manuelle Suche, Spursprung, Musikübersicht
Programmfunktionen: Spurprogramm
Funktionen: Autom. Abspielen, Spur- und Indexbestimmung, Programmabspiel, (15-Spur-Speicher), Vorwärts- und Rückwärtssprung, Vowärts- und Rückwärtssuche (Spur und Index), Wiederholtes Abspielen, A–B Wiederholung, Musikübersicht
Anzeigefunktionen: Digitalanzeige— Spuranzahl, Gesamtspieldauer (Min., Sek.), gespielt werdende Spur, verstrichene Abspielzeit, Indexnummer, (Balkenanzeige) verbleibende Abspielzeit
Balkenanzeige— Spuranzahl, gespielt werdende Spur, programmierte Spuren

Bedienungselemente: Grundtasten—7
Programmtasten—12
Musikübersichtstaste—1
Wiederholtaste—1
A–B Wiederholtaste—1
Hauptzeittaste—1
Disc-Einlegung: Motorangetriebener, horizontaler Typ
Kopfhörer-Ausgangspegel: Max. 80 mW (einstellbar), 32Ω

Infrarot-Fernbedienungseinheit:

Fernbedienungsfunktionen: Grundtasten—6
Programmtasten—12
Musikübersichtstaste—1
Wiederholtaste—1
A–B Wiederholtaste—1
Abruftaste—1
Abmessungen (B×H×T): 5,6×13,5×1,5 cm
Batterien: UM-4 "AAA" Batterien oder IEC R03 oder gleichwertige (1,5 V×2)

Français

CARACTERISTIQUES

Les spécifications sont susceptibles d'être modifiées sans préavis.
Le poids et les dimensions donnés sont approximatifs.

■ Généralités

Alimentation: 110–120/220–240 V, 50/60 Hz
Consommation: 30 watts
Tension de sortie: 2 volts (à 0 dB)
Impédance de sortie: 330Ω
Impédance de charge: plus de 5 kΩ
Dimensions (L×P×H): 43×33,4×8,2 cm [Lorsque le support du disque est ouvert : 43×45,9×8,2 cm.]
Poids: 5,1 kg

■ Audio

Nombre de canaux: 2 (droite et gauche stéréo)
Réponse en fréquence: 4–20.000 Hz±0,5 dB
Gamme dynamique: plus de 96 dB
Rapport signal/bruit: plus de 96 dB
Distorsion harmonique totale: moins que 0,003% (1 kHz, 0 dB)
Ecart des canaux: plus de 90 dB
Scintillation et pleurage: au-dessous de la limite mesurable

■ Formation des signaux

Fréquence de commutation: 44,1 kHz
Système de correction: Système algorithmique de superdécodage Technics
Conversion de numérique à analogique: 16 bits linéaires

■ Lecteur de disques

Type: Astigmatique à 3 faisceaux
Source lumineuse: Laser à semi-conducteurs
Longueur d' onde: 800 nm

■ Fonctions (Caractéristiques)

Modes de recherches: Recherche manuelle
Saut d'une piste
Exploration musicale
Programmation d'une piste

Fonctions:	Audition automatique, Accès aléatoire d'une piste, Accès sélectif d'un repère, Audition programmable, (Mémorisation de 15 pistes), Saut vers l'avant, Saut vers l'arrière, Recherche vers l'avant (piste et repère), Recherche vers l'arrière (piste et repère), Audition répétée, Audition répétée A–B, Exploration musicale.
Affichage:	(Affichage numérique), Nos des pistes, Durée d'audition totale (min., sec.), Piste en train d'être jouée, Durée d'audition écoulée, Durée d'audition restante, Nos des repères (Affichage à segments), Nos des pistes, Pistes programmées.
Touches opérationnelles:	Touches de base—7 Touches de programmation—12 Touche d'exploration musicale—1 Touche de répétition—1 Touche de répétition A-B—1 Touche de durée principale—1
Chargement du disque:	Type horizontal à commande par moteur
Niveau de sortie du casque écouteur:	Max. de 80 mW (réglable), 32Ω

Unité de la commande à distance à infrarouge

Fonctions de la commande à distance:	Touches de base—6 Touches de programmation—12 Touche d'exploration musicale—1 Touche de répétition—1 Touche de répétition A-B—1 Touche de rappel—1
Dimensions (L×H×P):	5,6×13,5×1,5 cm
Piles:	Piles UM-4 "AAA" ou IEC R03 ou leur équivalent (1,5 V×2)

Español

ESPECIFICACIONES

Las especificaciones quedan sujetas a cambios sin aviso previo.
El peso y las dimensiones indicados son apromimados.

■ En general

Fuente de alimentación:	110–120/220–240 V, 50/60 Hz
Consumo de corriente:	30 vàtios
Tensión de salida:	2 voltios (a 0 dB)
Impedancia de salida:	330Ω
Impedancia de carga:	más de 5 kΩ
Dimensiones (An.×Prof.×Al.):	43×33,4×8,2 cm (Cuando el compartimiento del disco está abierto: 45,9 cm (prof.)
Peso:	5 ,1 kg

■ Audio

Cantidad de canales:	2 (derecho e izquierdo, estéreo)
Respuesta de frecuencia:	4–20.000 Hz ±0,5 dB
Gama dinámica:	más de 96 dB
Relación de señal a ruido:	más de 96 dB
Distorsión armónica total:	menos de 0,003% (1 kHz, 0 dB)
Separación de canales:	más de 90 dB
Ululaciones y trémolo:	Inferior a límite medible

■ Formato de las señales

Frecuencia de muestreo:	44,1 kHz
Sistema de corrección:	Algoritmo superdescodificador Technics
Conversión numérica-analógica:	Lineal de 16 bitios

■ Fonocaptor

Tipo:	Astigmático de 3 haces
Fuente de luz:	Laser de semiconductor
Longitud de onda:	800 nm

■ Funciones (Ventajas)

Modalidades de búsqueda:	Búsqueda manual Salto de piezas Exploración de música Programas de piezas
Funciones:	Ejecución automática, acceso libre a las piezas, acceso libre a los índices, ejecución programable (memoria para 15 piezas), salto hacia adelante, salto hacia atrás, búsqueda hacia adelante (piezas e índices), búsqueda hacia atrás (piezas e índices), ejecución repetida, ejecución repetida A-B, exploración de música
Exhibición:	(Exhibición digital) Num. de piezas, tiempo total (min., seg.) de ejecución, pieza que se está ejecutando, tiempo de ejecución transcurrido, núm. de índice, tiempo remanente (Exhibición por segmentos) Núm. de piezas, pieza que se está tocando, piezas programadas
Botones de operación:	Botones básicos—7 Botones de programas—12 Botón de exploración de música—1 Botón de repetición—1 Botón de repetición A-B—1 Botón principal de tiempo—1
Carga del disco:	Tipo horizontal con accionamiento por motor
Nivel de salida de los auriculares:	Máx. 80 mW (regulable), 32Ω

Unidad de control remoto por infrarrojos

Funciones de control remoto:
- Botones básicos—6
- Botones de programas—12
- Botón de exploración de música—1
- Botón de repetición—1
- Botón de repetición A-B—1
- Botón de llamada—1

Dimensiones (An.×Al.×Prof.): 5,6×13,5×1,5

Pilas: Pilas UM-4 "AAA", IER R03 o equivalentes (2×1,5 V)

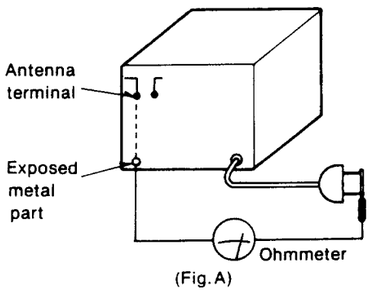
■ SAFETY PRECAUTION

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

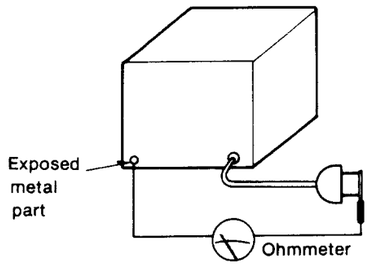
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ 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.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



(Fig. B)

Resistance = Approx ∞

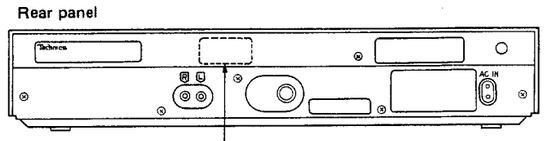
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

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

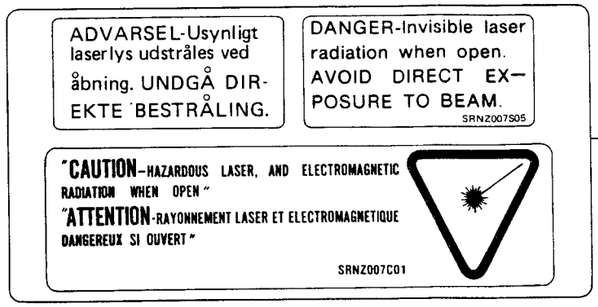
• Use of caution labels

	U.S.A.	Canada	Europe	Others
SRNZ010S01	X	X	○	○
SRNZ007S05	○	X	○	○
SRNZ007C01	X	○	X	X
SRNZ010S02	X	X	○	○

Note: ○ Mark Label is used. X Mark Label is not used.

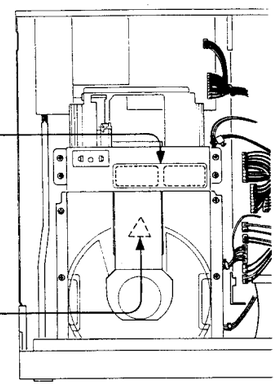






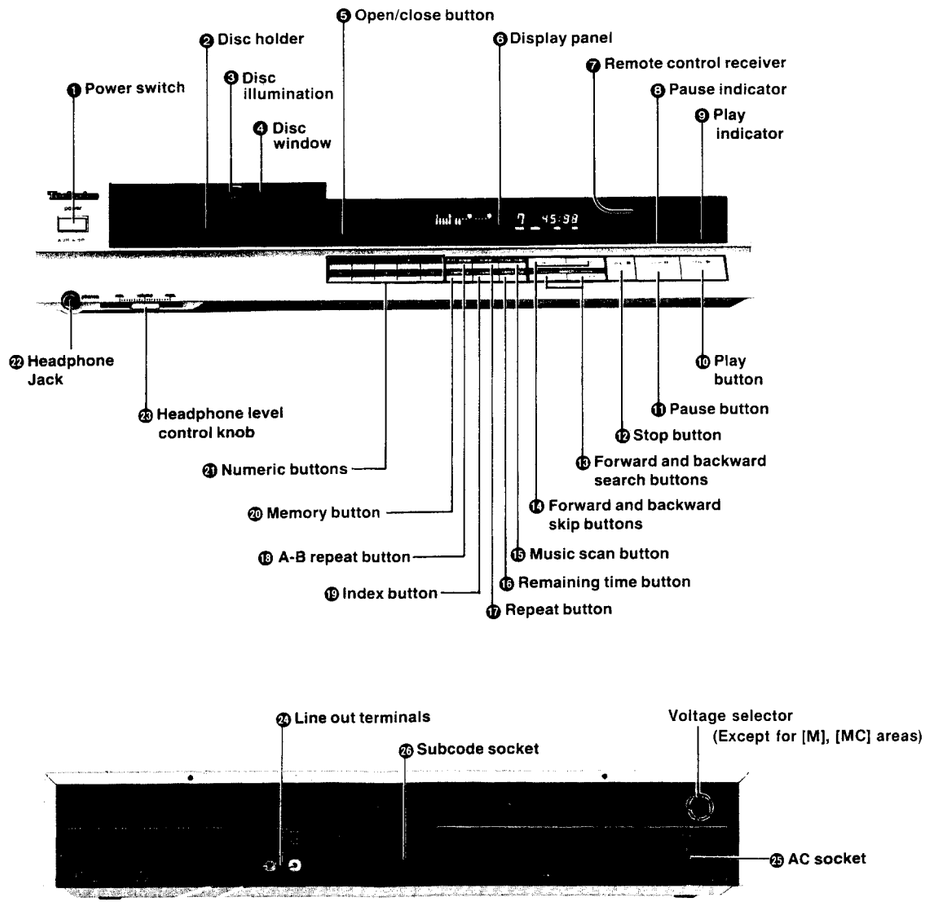


VAROITUS! Laite sisältää laserdiodin, joka lähettää näkymätöntä, silmille vaarallista infrapunasäteilyä. Laitteen sisällä on laserdiodin läheisyydessä kuvan 1. mukainen varoitusmerkki.



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

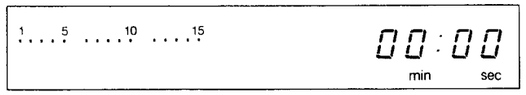
■ LOCATION OF CONTROLS



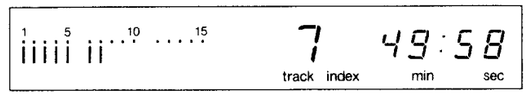
■ FUNCTIONS

❶ Power switch

- Press (▙▁▁▟) to turn power on and press again (▟▁▁▙) to turn power off.
- When power is turned on, the display panel lights as shown below:.



If there is a disc in the holder, it will begin spinning, the total number of tracks and total playing time of the disc will be displayed and the unit will switch to the standby mode*[Note. 1]. Shown below is the display reading when a disc having seven tracks and a total playing time of 49 minutes 58 seconds is in the holder.



Note-1:
Standby mode:
In the standby mode, the pickup* is at the beginning of the first track and the display shows the total number of tracks and total playing time of the disc.
*The pickup is the device that reads the information on the disc surface using a laser. The pickup moves across the disc as the disc is played, but it is not visible from outside of the cabinet.

❷ Disc holder

- The disc is inserted in this holder with the label side up.

❸ Disc illumination

Lights when power is switched on. The prism effect of the disc window allows easy visual confirmation that a disc has been loaded.

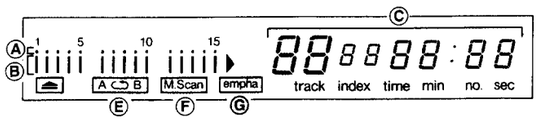
❹ Disc window

❺ Open/close button

Press this button to open and close the disc holder
When this button is pressed, the disc holder slides out and the open indicator lights. Press this button again to close the disc holder (indicator goes out).

❻ Display panel

The display shows a wide range of information concerning the disc, the progress of disc play and player settings.



Ⓐ Track scale:

Indicates the track numbers for the 15 track bars.

Ⓑ Track bars:

Bars light to indicate the number of tracks on the disc. The bar of the track being played flashes on and off and then goes out once the track has been played. If there are more than 15 tracks on a disc, the "▶" indicator to the right of the last bar lights. For program disc play, only the bars of the programmed tracks light.

Ⓒ Digital display:

track: Shows a track number (track lights) (up to 99)

index: Shows an index number[Note 2] (index lights)
When a disc having no indexes is played, "01" is constantly displayed in the index section.

time min: This display differs depending on the present mode selected.
1. Time (minutes) displayed (min lights)
2. Displays remaining time on disc (min., sec.) when remaining time button is pressed during disc play.

no sec: This display differs depending on the present mode selected.
1. Time (seconds) displayed (sec lights)
2. Displays the track number just selected when the memory key is pressed to enter that track number in the memory (no lights).
3. Displays each programmed track number one by one each time the recall button is pressed.

Note-2:
Index:
In some Compact Discs, indexes are used to divide tracks into smaller sections for easy access. If a disc includes indexes, a list of the indexes will be contained in the liner note included with that disc.

Ⓓ Open indicator:

Lights when the open/close button is pressed to open the disc holder and flashes on and off while the holder is sliding open or closed. This indicator remains off when the holder is closed.

Ⓔ Repeat indicator:

Lights when the repeat mode is activated by pressing the repeat button or the A-B repeat button.
- "⊃" lights when the repeat button is pressed.
- "A⊃" lights when the A-B repeat button is pressed once.
- "A⊃B" lights when the A-B repeat button is pressed again.
- If the A-B repeat button is pressed once more, this indicator goes out to show that A-B repeat has been cancelled.

Ⓕ Music scan indicator:

Lights when the music scan button is pressed.
The music scan indicator goes out when music scan play has finished.

Ⓖ Emphasis indicator:[Note: 3]

Lights when a disc containing pre-emphasis is played.

Note-3:
Pre-emphasis:
In order to further improve the S/N ratio of compact discs, some discs include a degree of emphasis in the high range called pre-emphasis. If these discs are played without any compensation, the high range will be unnaturally strong. Therefore, a corresponding amount of de-emphasis is needed to obtain the proper response. The de-emphasis circuitry of this unit is automatically activated when a disc having pre-emphasis is played.

❼ Remote control receiver

Signals from the accessory infrared remote control unit are received here.
The remote control indicator lights to show when a command from the remote control has been received.

❽ Pause indicator

This indicator (❚❚) lights when the pause button has been activated and goes out when the pause mode is cancelled.

❾ Play indicator

This indicator (▶) lights when the play button has been pressed and goes out when disc play is stopped.

❿ Play button

Press this button to begin disc play.
- When this button is pressed during disc play, the pickup returns to the beginning of the first track and starts playing the disc again.
  During program disc play, the pickup returns to the first programmed track and starts playing the programmed sequence again.
  (Auto return play function)

⓫ Pause button

Press this button to briefly stop disc play.
- When this button is pressed, the player switches to the standby mode.
- To continue disc play, press the play button.

⓬ Stop button

Press this button to stop disc play.
- When this button is pressed, all settings are cancelled and the player returns to the standby mode.

⓭ Forward and backward search buttons

Use these buttons to move the pickup forward and backward (Manual search play function).
- When either of these buttons is pressed, the pickup will move slowly at first and then rapidly if the button is held down for more than about three seconds.
- Use the search buttons when the player is in the pause mode or during disc play to move the pickup to a specific point on the disc.
  - Press the [▷▷] button to move the pickup forward.
  - Press the [◁◁] button to move the pickup backward.

Release the search button when the pickup has moved to the desired location (as shown by the display panel).
- During disc play, search can be performed while listening to the signal from the disc to aid in locating a specific point. The output level is −12 dB (¼) compared with the level during standard disc play.

⓮ Forward and backward skip buttons

Use these buttons to move the pickup to the beginning of the next track in the forward or backward direction (forward and backward skip play function).
- When a skip button is pressed during disc play or the pause mode, the pickup will skip the same number of tracks as the number of times the button is pressed.
- When a skip button is pressed during program disc play, the pickup will move to the beginning of the next or previous programmed track.
  - Press the skip [skip ▷▷|] button to move the pickup forward.
  - Press the [|◁◁ skip] skip button to move the pickup backward.
- When either of these buttons is held down, tracks are skipped continuously. (Quick skip)

⓯ Music scan button

When this button is pressed, the first ten seconds (or the specified time) of each track on the disc or each programmed track is played. This is very useful for quickly ascertaining the contents of a disc.
The time that each track is played can be adjusted from 1 to 99 seconds by using the numeric buttons.
(programmable music scan function)

⓰ Remaining time button

Press this button while a disc is being played to display the remaining playing time (min. and sec.) of a disc.
When this button is pressed, the time indicator lights and the display switches to the remaining time display mode. Press this button again to return to the elapsed playing time mode.

⓱ Repeat button

Press this button to activate the repeat mode.
- When this button is pressed, the repeat mode is activated.
- If this button is pressed after a program has been entered, the programmed tracks will be played repeatedly.
- Press this button again to cancel the repeat mode. It is also possible to cancel the repeat mode by pressing the stop button, but this will also cancel all other settings as well.

⓲ A–B repeat button

Press this button to use the A–B repeat mode.
The first time this button is pressed ("A⊃" repeat indicator lights), the starting point of the disc section to be played repeatedly is set. The second time this button is pressed ("A⊃B" repeat indicator lights), the ending point of the repeat section is set. The section of the disc between these two points will now be played repeatedly until this button is pressed a third time to cancel the A–B repeat mode. This function is very convenient because it allows you to specify a section to be played repeatedly while listening to a disc.

⓳ Index button

Press this button to enter the index number using the numeric buttons.

⓴ Memory button

Press this button to enter track numbers just specified by the numeric buttons in the memory.
(Remember that programs can contain up to 15 random steps.)

㉑ Numeric buttons

Use these buttons to specify track numbers and index numbers.

㉒ Headphone jack

㉓ Headphone level control knob

- Use to control the output level to the headphones.

㉔ Line out terminals (LINE OUT)

These are the audio output terminals.
- Connect the line out terminals to the AUX/CD/VIDEO or TAPE PLAYBACK terminals on your amplifier or receiver.
- Do not connect to the amplifier PHONO terminals as you would with a conventional turntable.

㉕ AC socket (AC IN)

Connect this socket to a wall socket using the power cord.

㉖ Subcode socket

The Compact Disc subcode signal is output through this socket.
This socket is provided for system connections with future components.
(Do not connect any components to this socket.)

■ Remote Control Unit Facilities

- In addition, the remote control unit has two buttons that are not on the player itself: a clear button that cancels all programmed entries and a recall button that displays each programmed entry in order one by one.

- The following operations are not possible using the remote control unit.

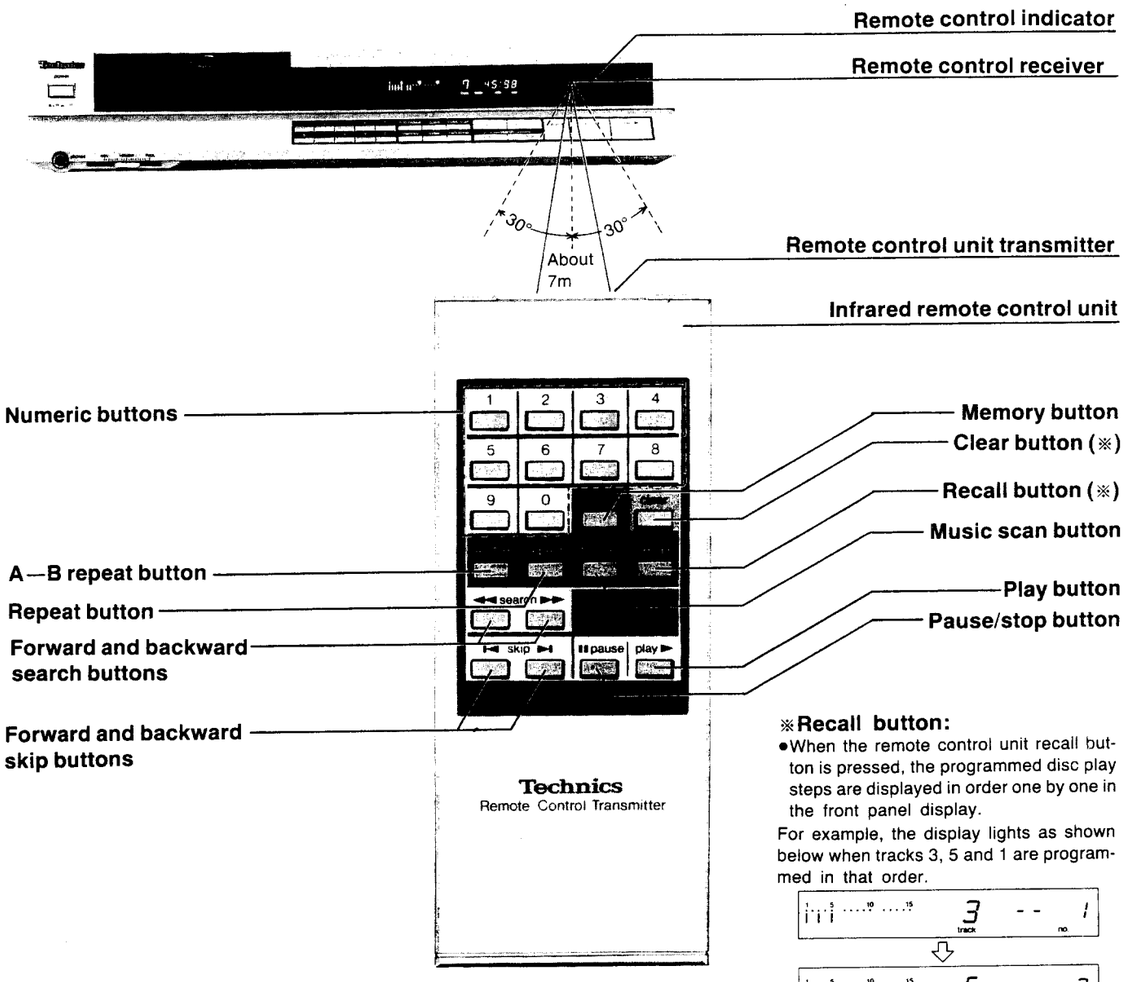
① Power on/off
② Headphones volume control
③ Disc holder open/close
④ Stop button operations
⑤ Remaining time button operations
⑥ Index buton operations

■ Notes

- Always aim the remote control unit at the front panel receiver.
- The remote control unit can be used at an angle of up to 60° from the direction in which the front panel faces.
- The remote control unit can not be used from a distance of more than 7 meters.

■ Remote Control Operation

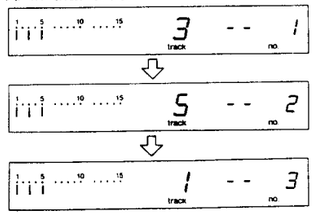
Point the remote control unit at the front panel receiver and press the apporopriate button(s). The front panel remote control indicator lights as long as each button is held down.



※Recall button:

- When the remote control unit recall button is pressed, the programmed disc play steps are displayed in order one by one in the front panel display.

For example, the display lights as shown below when tracks 3, 5 and 1 are programmed in that order.



※Clear button:

Press to clear the memory.
When this button is pressed, all programmed entries are cancelled.

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

■ INSTALLATION

■ This unit incorporates many sensitive optical components. To enjoy optimum performance at all times, avoid using this unit under the following conditions.

- In a closed vehicle or other location where the temperature could exceed 100°F (40°C).
- For long periods of time in direct sunlight.
- Very cold places. (below 40°F; 5°C)
- Very humid locations.
- Near a heat outlet or heating appliance.
- Dusty or smoky locations.
- Locations prone to vibrations.
- When placed on an unstable or uneven surface.
- Near appliances generating strong magnetic fields.
- Immediately above or below a radio, tuner, amplifier or television set.
- Within reach of children.

■ Do not place near a tuner or television.

This unit uses high frequency signals and can cause interference with radio and television reception. If this occurs, move this unit farther away from the radio or television or change from an interior to an exterior television antenna.

■ Do not block the ventilation openings.

This unit is equipped with ventilation openings to prevent the internal temperature from rising too high. Therefore, do not operate it with a tablecloth or other covering placed over the top or with the unit placed on a bed, deep carpet or other soft surface. If proper ventilation is obstructed, the internal temperature will rise and the laser diode protection circuit will be activated to shut off the player.

■ In locations where ventilation is insufficient.

■ In locations where the rear panel is less than 10 cm away from the wall or back of an audio rack.

■ Do not place heavy objects on top of this unit.

■ CONCERNING COMPACT DISCS

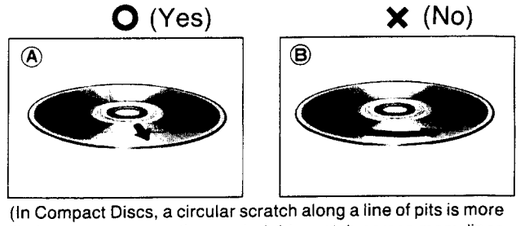
Handling precautions

Only compact discs identified with this mark can be used with this player.

COMPACT disc DIGITAL AUDIO

Observe the following precautions to enjoy the same outstanding sonic performance from your Compact Discs for many years.

- Hold compact discs by the edges so the surface is not soiled with fingerprints.
- Be careful not to scratch the surface with fingernails or other sharp objects, particularly when inserting and removing discs from their cases.
- Do not bend the disc.
- Do not use record cleaning sprays or static electricity prevention liquids.
- Do not wipe with benzene, thinner or any other solvent. If the surface is soiled, wipe gently with a soft, damp (water only) cloth.
- When wiping discs, always move the cloth directly outward from the center of the disc, not in a circular motion as with standard phonograph records.



(In Compact Discs, a circular scratch along a line of pits is more likely to cause errors than a straight scratch across many lines of pits.)

- If the disc is brought from a cold environment into a warm room, dew may form on the disc. Wipe this off with a soft, dry cloth before using the disc.
- Do not try to dry discs with a hair dryer.
- Do not write on the label side with a ball-point pen, hard pencil or other writing utensil.

Storage precautions

- Be sure to store discs in their cases to protect them from dust, scratches and warping.
- Do not place or store discs in the following places:
  1) Locations exposed to direct sunlight.
  2) Locations with high humidity or a lot of dust.
  3) Locations directly exposed to a heat outlet or heating appliance.
  4) In the glove compartment or rear ledge of an automobile.

■ PLAYING A DISC

The following explanation is for a disc containing 7 tracks having a total playing time of 49 minutes and 58 seconds.

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

Procedure

1. Press the power switch to the on position.
   - Display lights as shown below.

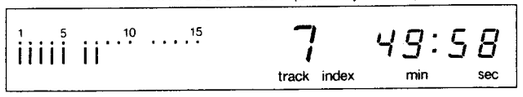


2. Press the disc holder open/close button.
   - Disc holder opens.
3. Insert a disc with the label side facing upward.
4. Press the disc holder open/close button.
   - Step 4 can be skipped by pressing the play button after inserting a disc. In this case, the holder will close and disc play will begin immediately from track 1 but the tracks and total playing time will not be displayed.

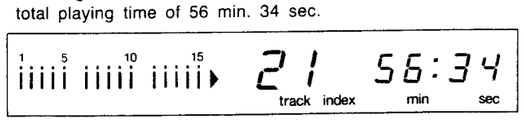
•Open indicator goes out when holder is completely closed.
•Disc data are being read.



•After disc data have been read. (standby mode)

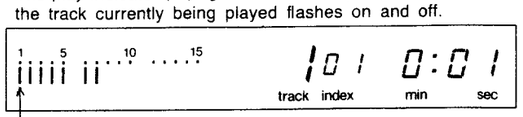


•The overflow mark "▶" lights if the disc contains more than 15 tracks.
•The diagram below is for a disc containing 21 tracks having a total playing time of 56 min. 34 sec.



5. Press the play button.

•The play indicator (▶) lights and disc play begins. The bar of the track currently being played flashes on and off.

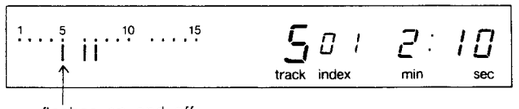


flashes on and off

•A maximum of 99 tracks can be displayed.
•When a disc having no indexes is played, "01" is constantly displayed in the index section.
•If the play button is pressed during disc play, disc play is started again from the first track.

Remaining time display function

•Press the time button while a disc is being played to display the remaining playing time of the disc. For example, when the 2 min. 10 sec. point of track 5 is being played:



flashes on and off

If the remaining time button is pressed, the display will switch to the remaining time mode.

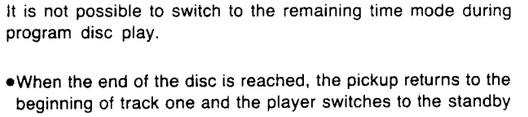


flashes on and off

remaining playing time of disc

Press the remaining time button again to return to the elapsed playing time mode.
This procedure is the same in the following explanations as well.
It is not possible to switch to the remaining time mode during program disc play.

•When the end of the disc is reached, the pickup returns to the beginning of track one and the player switches to the standby mode.



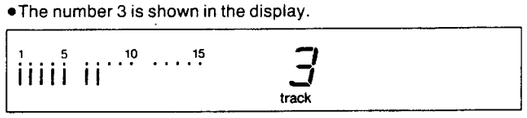
2. To play a disc from a specific track (track random access)

Example: To play a disc from track 3 when the player is in the standby mode.

Procedure

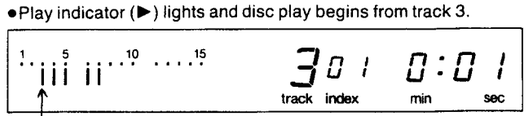
1. Press the number 3 of the numeric button.

•The number 3 is shown in the display.



2. Press the play button.

•Play indicator (▶) lights and disc play begins from track 3.



flashes on and off

3. When the end of the disc is reached, the pickup returns to the first track and the player switches to the standby mode.

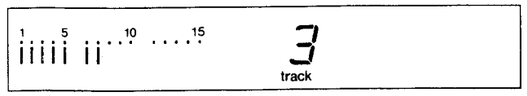
3. To play a disc from a specific index (index random access)

- **When specifying an index number obtained from the disc's liner note. (For example, to start disc play from track 3, index 2.)**

Procedure:

1. Press the number 3 of the numeric button.

•Confirm that the desired track and index numbers are shown in the display.



•Remember to enter track number 1 even on discs having only one track.

2. Press the index button.
3. Press the number 2 of the numeric button.

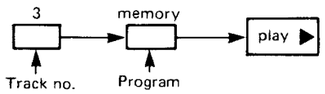


4. Press the play button.
5. Disc play begins from index 2 of track 3.
6. When the end of the disc is reached, the pickup returns to the first track and the player switches to the standby mode.

4. Program Disc Play

- **To program only one track (single program)**

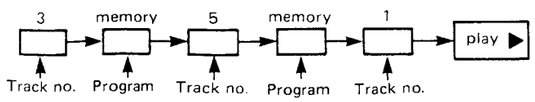
1. To play one track from beginning to end.
   (Example: To play track 3 from the beginning.)



- If you enter the wrong number, press the stop button to cancel it and then enter the correct number.
- The player switches to the standby mode after track 3 has been played.

- **To program more than one track (multi-program)**

1. To play several tracks out of order
   (Example: To play track 3, track 5 and track 1 in that other.)



- The disc is played in the programmed sequence. (A maximum of 15 tracks can be programmed.)

•To play the same track several times in succession, using the program function, it is possible to enter that track by pressing the corresponding numeric button once and then the memory button the desired number of times.

- **To enter a program during disc play**

A new program can be entered while a disc is being played. When the new program is entered, the previous programs will be erased and disc play based on the new program will begin.

Note:

- When entering a program during disc play, the program buttons must be operated without interruption. If there is a gap of more than 30 seconds between the time two program buttons are pressed, the new program will not be entered and disc play will continue in the normal manner.
- It is impossible to program index numbers.

- **To cancel a program**

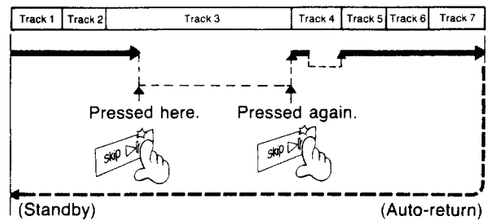
Press the stop button. The program will be cleared.

5. Skip Play

Skip play can be performed when the player is in the play or pause mode.

■ To move to the beginning of the next track or several tracks ahead (forward skip)

Example : While listening to the third track the forward skip button is pressed to advance to the beginning of the fourth track and then again to advance to the beginning of the fifth track.

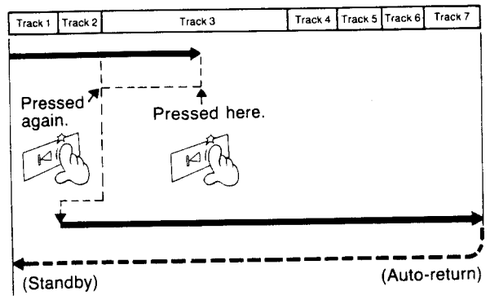


•The pickup skips the same number of tracks as the number of times the button is pressed.

•Watch the display to be sure the desired track has been located.
•During program disc play, the pickup moves to the beginning of the next programmed track when the forward skip button is pressed.
•The pickup moves to the beginning of the next track (or programmed track) each time the skip button is pressed.
•To skip directly from the third track to the beginning of the fifth track, press the forward skip button twice in a row.
(Skips to the beginning of the next programmed track during program disc play.)
•Holding down the skip button activates the quick skip mode.
•When the skip ▷◁ button is pressed during the last track, the pickup will go to the beginning of the last track (Unless the repeat function is on).

■ To return to the beginning of the present track or any previous track (backward skip)

Example : While listening to the third track the backward skip button is pressed to return to the beginning of that track and then again to return to the beginning of the second track.



- **The pickup skips the same number of tracks as the number of times the button is pressed.**
- Watch the display to be sure the desired track has been located.
- During program disc play, the pickup moves to the beginning of the previous programmed track when the backward skip button is pressed.
- The pickup returns to the previous track (or programmed track) each time this button is pressed.
- To return quickly to the beginning of track 2 when listening to track 4, quickly press the backward skip button three times.
- Remember that for backward skip, the present track is included in the count.
- Holding down the skip button activates the quick skip mode.

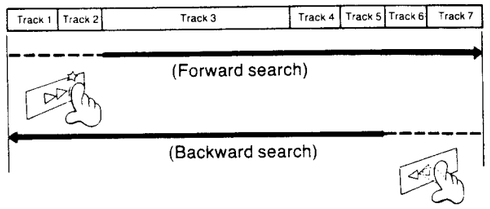
6. Manual Search Play

Manual search play can be performed when the player is in the play or pause mode.

■ To play the disc from a specific point

- Press the forward or backward search button to move the pickup forward or backward.
  The pickup moves slowly at first and then rapidly if a search button is held down for more than about 3 seconds.
- Release the button when the desired point has been reached (as shown by the display).

- If a search button 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 −12 dB (¼) compared with the level during standard disc play.



- During program disc play, the pickup can only be moved between the beginning and end of the track currently being played using the search buttons.
- To use search for another track during program disc play, press one of the skip buttons to move to the desired track and then use the search buttons.
- However, search is possible across both tracks A and B during A-B repeat play. If the play key is then pressed, the disc will be played from the first specified A-B track sector.

7. Repead Play

■ Entire disc and programmed track repeat play

- Press the repeat button before beginning disc play.
- Press the repeat button again to cancel repeat play. (Pressing the stop button also cancels repeat play, but this also stops disc play).

- Repeat indicator "⊃" lights and the repeat play mode is activated.
- Indicator goes out.
- If the unit is in the program disc play mode, only the programmed tracks will be played repeatedly.

■ Repeat play between points A and B

(setting is possible only during disc play)

1. While a disc is being played, press the A–B repeat button.
2. Press the A–B repeat button again at the point where repeat play is to end.

- "A⊃" repeat indicator lights to show that the starting point (A) for repeat play has been set.

- "A⊃B" repeat indicator lights to show that the ending point (B) has been set.
  Press the A • B repeat button again to cancel this repeat mode (repeat indicator goes out). The A-B sector can be played repeatedly any number of times.
- After specifying a track A-B section, the A-B repeat play mode will be cancelled if the forward or backward skip button is pressed.

8. The Music Scan Function

■ Use this function to quickly listen to the songs on a disc or the songs that are programmed.

- Press the music scan button.
- The music scan indicator lights and the first 10 seconds of each track on the disc is played. After the beginning of the last track has been played, the music scan indicator goes out and disc play begins from track one.
- To stop music scan and resume normal disc play from that point, press the play button.
- Press the pause or stop button to stop music scan before the last track has been reached.

■ Adjusting the music scan interval

- The numeric buttons can be used to change the amount of time that each track is played during music scan between one and 99 seconds.

For example, to change the interval to 5 seconds:

1. Press the number 5 of the numeric button.
2. Press the music scan button.

- In this case, music scan operation will immediately begin and the first 5 seconds of each track will be heard.
- The music scan time returns to the standard 10 sec. setting each time power is turned off.

■ DISASSEMBLY INSTRUCTIONS

CAUTION:

It is very dangerous to look at or touch the 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.

• How to remove the cabinet

1. Remove the 4 setscrews [**Fig. 1** : ❶ ~ ❹] of the cabinet.
2. Remove the cabinet in the direction of the arrow as in **Fig. 1**.

• How to remove the front panel

1. Remove the cabinet.
2. Remove the front panel setscrew, and ground terminal setscrew. [**Fig. 2** : ❺, ❻]
3. Slightly open the front panel on both sides (arrow Ⓐ in **Fig. 2**), then remove the front panel from the projection of chassis.
4. Remove the front panel in the direction of the arrow Ⓑ, with care not to scratch the disc holder. [**Fig. 2**]
5. Open the lid of 4 connectors (CN401 ~ CN404) of main P.C.B. (arrow Ⓒ in **Fig. 2**) and then pull out the flat cable.
6. Cut off the wire clamper and pull at the connector (CN803).

• How to remove the disc illumination

1. Remove the cabinet and front panel.
2. Remove the 2 setscrews [**Fig. 3** : ❼, ❽] of the reinforcement plate.
3. Remove the disc illumination in the direction of the arrow as in **Fig. 3**.

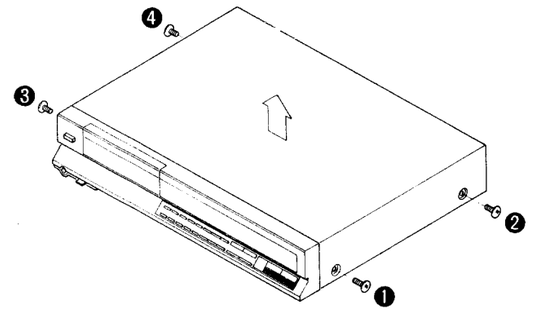


Fig. 1

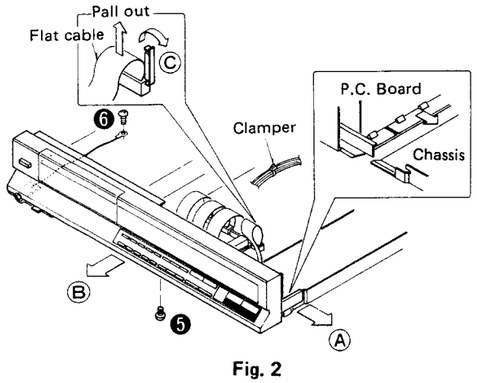


Fig. 2

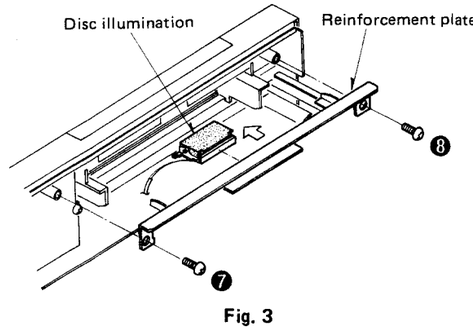


Fig. 3

NOTE: The precautions for front panel fitting are mentioned on the next page.

• How to remove the operation button

1. Remove the cabinet and front panel.
2. Remove the reinforcement plate.
3. Remove the 5 setscrews [**Fig. 4 :** ⑨ ~ ⑬] of the keyboard/display P.C.B., then the keyboard/display P.C.B. can be removed.
4. Release the 12 claws of operation button case to remove the operation button case from keyboard/display P.C.B.
5. Search button can be removed by releasing the claws Ⓐ in **Fig. 5.**
6. Play button ass'y can be removed by releasing the claw Ⓑ in **Fig. 5.**

Note: Remove the search button before removing the play button ass'y.

7. Memory/index/repeat button can be removed by releas- in the claw Ⓒ in **Fig. 5.**
8. Repeat button can be removed by removing memory button.
9. Numeric button can be removed by releasing the claws Ⓓ in **Fig. 5.**

• How to remove the remote control receiver

1. Remove the cabinet and front panel.
2. Remove the keyboard/display P.C.B.
3. Pull out the connector (P305) of the remote control receiver. **[Fig. 4]**
4. Release the 2 claws of the front panel, then the remote control receiver can be removed.

• How to remove the headphone level control knob

1. Remove the cabinet and front panel.
2. Remove the 2 headphone jack and headphone amplifier P.C.B. fitting setscrews. [**Fig. 6 :** ⑭ , ⑮]
3. Remove the setscrew [**Fig. 6 :** ⑯] of the headphone amplifier P.C.B.
4. Pull out the headphone level control knob in the direction of the arrow as in **Fig. 6.**

• Front panel fitting

★ The disc illumination lead wire should come under the reinforcement plate. **(See Fig. 7)**

★ The headphone amplifier P.C.B. lead wire should not touch the disc holder. (Bring it under the front panel.)

1. Release the power switch rod from power switch. (Power switch should then be set at "off".)
2. Insert the chassis between front panel and keyboard/ display P.C.B., then lift the front panel top to fit the front panel on chassis. **[Fig. 7-1]** Take care not to damage the disc holder.
3. Set the power switch rod.

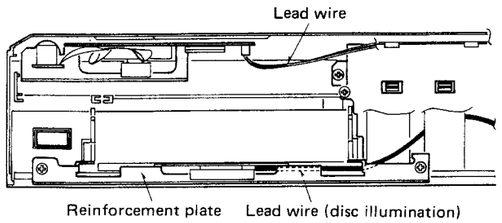


Fig. 7

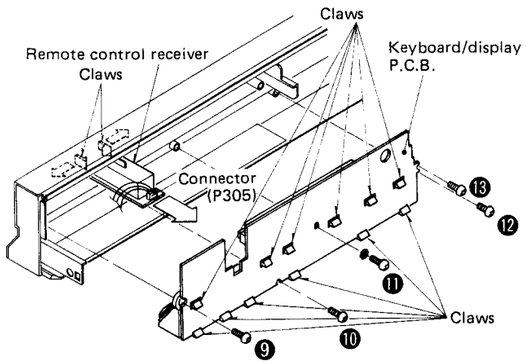


Fig. 4

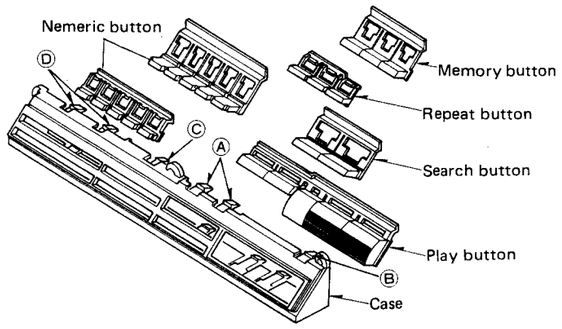


Fig. 5

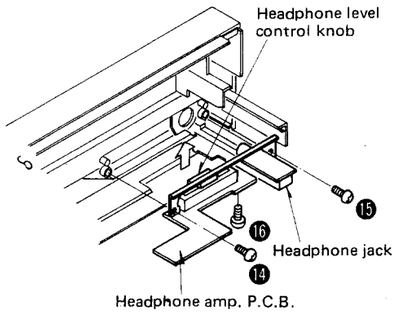


Fig. 6

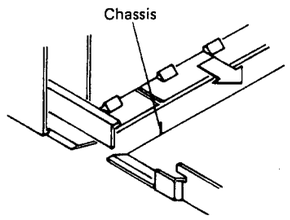


Fig. 7-1

• How to remove the main P.C.B.

1. Remove the cabinet and front panel.
2. Remove the 2 setscrews [**Fig. 8 :** ⑰ ~ ⑱] of the main P.C.B.
3. Main P.C.B. is secured with claws of main P.C.B. support. So, release the claws to remove the main P.C.B. from main P.C.B. support.
4. Remove the main P.C.B. in the direction of the arrow as in **Fig. 8.**

Note: The supplied of L.S.I. module P.C.B. is assembly. (Part No. SRDP001N02A)

• How to remove the disc clamper

1. Remove the cabinet.
2. Shift the disc holder forward.
3. Remove the 4 setscrews [**Fig. 9 :** ⑳ ~ ㉓] of the disc clamper, then the disc clamper can be removed.

Note: Shift the disc holder forward to remove the disc clamper.

4. To remove the magnet of disc clamper, raise the claw of magnet fixing plate and turn it clockwise. **[Fig. 10]**

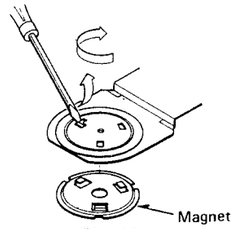


Fig. 10

• How to remove the power transformer

1. Remove the cabinet.
2. Shift the disc holder forward.
3. Release power switch rod from the power switch.
4. Remove the 3 setscrews [**Fig. 11 :** ㉔ ~ ㉖] of the power transformer and take the power transformer block out of the chassis.
5. Unsolder the power transformer terminals of power source P.C.B., then the power transformer can be removed.
6. To remove the fuse P.C.B., unsolder the terminals of fuse P.C.B.

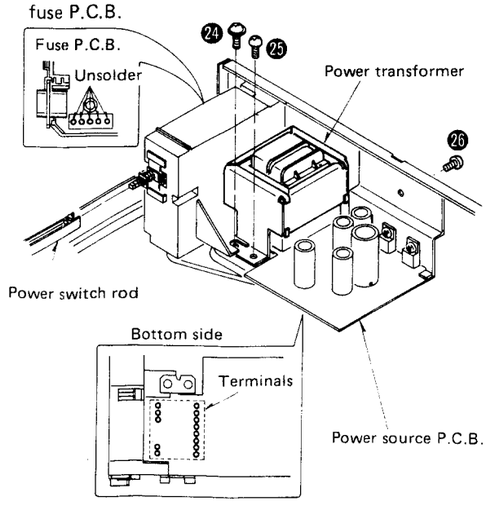


Fig. 11

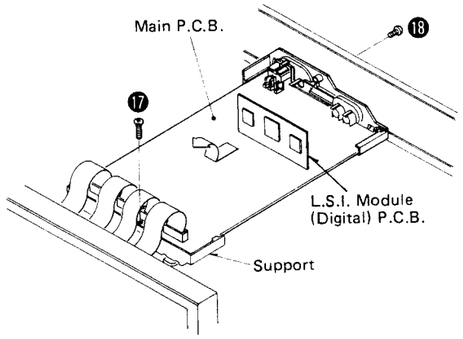


Fig. 8

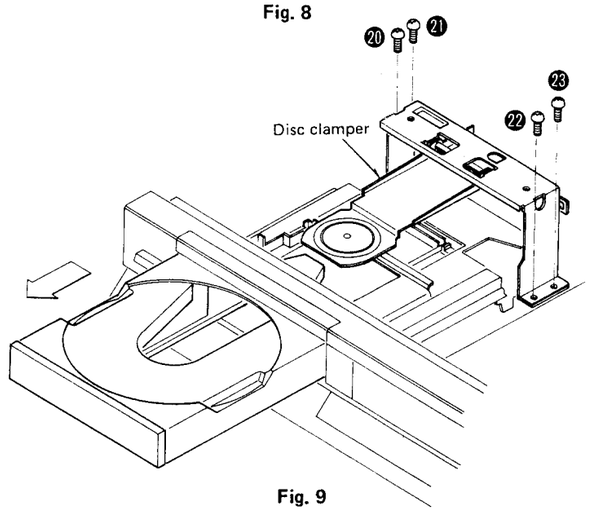


Fig. 9

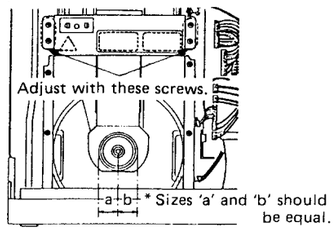
CAUTION:

Precautions for disc clamper fitting

When fitting the disc clamper again, follow the procedure given below. (Be sure to turn power switch "off".)

1. Remove the magnet of disc clamper.
2. Temporarily tighten the 4 setscrews of disc clamper with disc holder projected.
3. Close the disc holder.
4. Move the disc clamper so that the size between the turntable platter center spindle and disc clamper is as shown below. Then tighten the disc clamper setscrews.
5. Set the magnet in place.

Note: If the above-mentioned size is deflected, noise might be produced from disc clamper during play mode.



• How to remove the disc holder

1. Remove the cabinet and front panel.
2. Shift the disc holder forward.
3. Remove the disc holder setscrews. [Fig. 12 : ㉗, ㉘].
4. Release the 2 claws from the bottom.
5. Remove the disc holder in the direction of the arrow as in Fig. 12.
6. Before fitting the disc holder, make sure that the switch arm end is on the groove side of drive rack top. (See Fig. 13.)

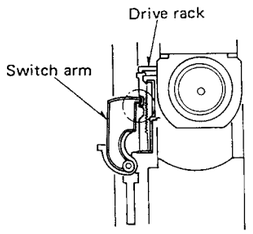


Fig. 13

• How to remove and set the disc tray

1. Remove the disc holder.
2. Release the 2 claws from the bottom of disc holder and then remove the disc tray.
3. When setting the disc tray, accurately fit the lever onto the boss as illustrated.

*** It can be easily set by pushing the lever in the direction of the arrow. [Fig. 14]**

• How to remove the loading guide

1. Remove the disc clamper and disc holder.
2. Remove the 6 setscrews [Fig. 13 : ㉙ ~ ㉞] on the right and left side of loading guide holder. Then the loading guide can be removed.

• How to remove the drive rack

1. Remove the loading guide.
2. Move the drive rack in the direction of arrow Ⓐ while opening the switch arm in the direction of arrow Ⓑ, and then pull out the drive rack downward. (Fig. 16)
3. When the drive rack is fitted, the switch arm end should be on the groove side of drive rack top. (See Fig. 13.)

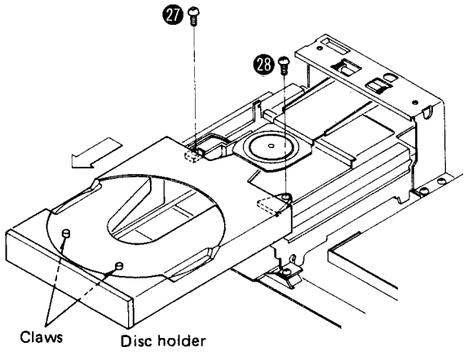


Fig. 12

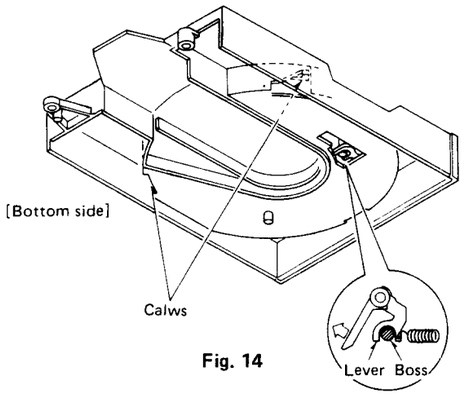


Fig. 14

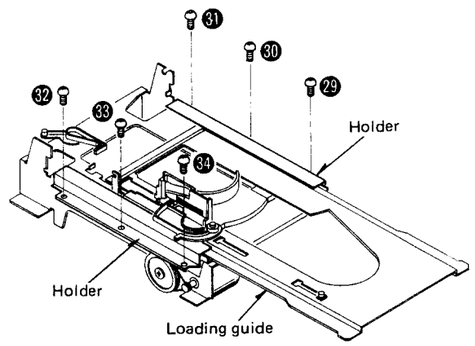


Fig. 15

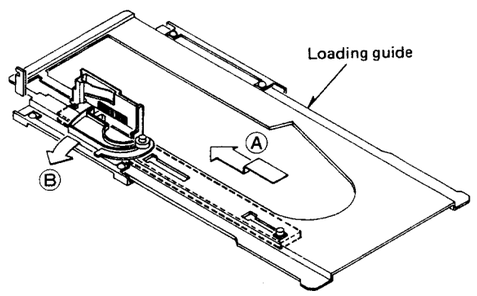


Fig. 16

• How to remove the traverse unit ass'y [Optical deck unit]

1. Remove the front panel.
2. Remove the 4 setscrews [Fig. 17 : ㉟ ~ ㊳] of traverse unit. Screws ㉟ ~ ㊳ are red.
3. Pull out the 8 connectors (CN405 ~ CN409, CN411, CN412, CN501) connected from traverse unit to main P.C.B.
4. Turn over the traverse unit and remove the nuts [Fig. 18 : ㊴ ~ ㊷], then the traverse unit ass'y can be removed.
   Note that the front and rear springs are different in color.

• How to remove the optical servo P.C.B. and spindle motor drive coil P.C.B.

1. Remove the 4 setscrews [Fig. 17 : ㉟ ~ ㊳] of traverse unit.
2. Turn over the traverse unit and remove the optical servo P.C.B. setscrew [Fig. 19 : ㊸].
3. Release the claw from the optical servo P.C.B. Then the optical servo P.C.B. can be removed.
4. Remove the 2 setscrews [Fig. 19 : ㊹, ㊺] of spindle motor drive coil P.C.B.
   Then the spindle motor drive coil P.C.B. can be removed.

• How to remove the limit switch [Rest and end detecting switch]

1. Remove the optical servo P.C.B.
2. Remove the 2 setscrews [Fig. 19 : ㊻, ㊼] of limit switch, and unsolder the limit switch.

*** After fitting the limit switch [rest: disc's innermost position detection] again, it is necessary to re-adjust the position.**

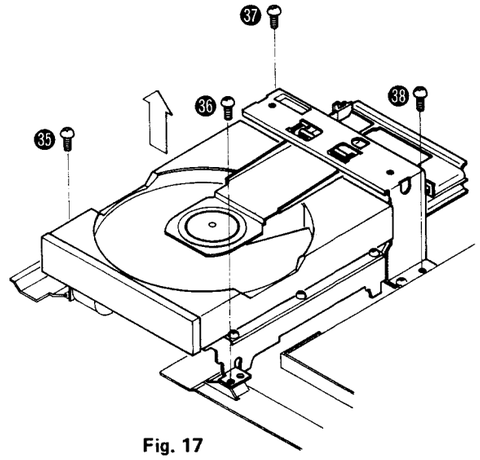


Fig. 17

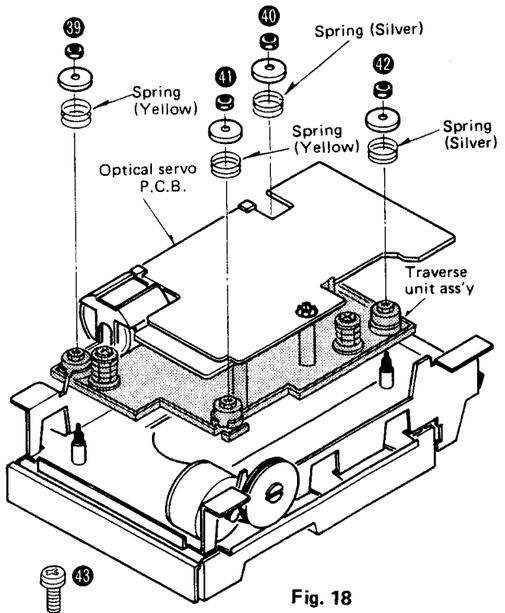


Fig. 18

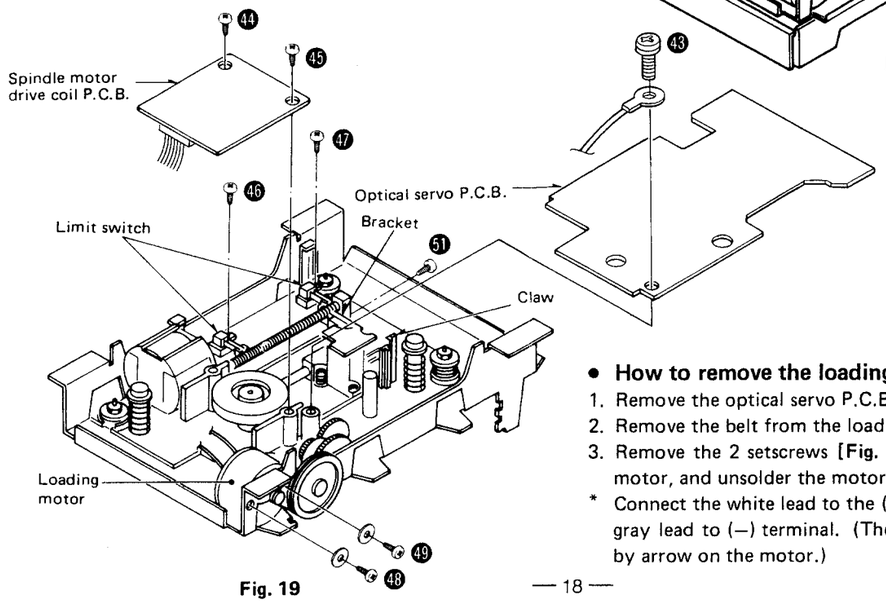


Fig. 19

• How to remove the loading motor

1. Remove the optical servo P.C.B.
2. Remove the belt from the loading motor pulley.
3. Remove the 2 setscrews [Fig. 19 : ㊽, ㊾] of loading motor, and unsolder the motor leads.

* Connect the white lead to the (+) terminal of motor, and gray lead to (—) terminal. (The (—) terminal is indicated by arrow on the motor.)

• How to remove the turntable

1. Remove the traverse unit.
2. Remove the spindle motor drive coil P.C.B.
3. Remove the C ring which fastens the magnet shaft of spindle motor. [Fig. 20]
4. Remove the screw [Fig. 20 : ㊿] by use of a hexagonal wrench, then the turntable can be removed.

***If the turntable is removed, it is necessary to re-adjust the height of turntable.**

• How to remove the laser pickup

1. Remove the traverse unit.
2. Remove the optical servo P.C.B.
3. Pull out the connectors (CN101, CN102) of optical servo P.C.B.
4. Remove the bracket setscrew [Fig. 19 : ㊶] of pickup to remove the bracket.
5. Remove the guide rail retainer setscrew [Fig. 20 : ㊷] and pull out the laser pickup from the two guide rails.

***The pickup must be re-adjusted when it is replaced or fitted after removal.**

• How to remove the bottom cover of remote control unit

1. Remove the battery cover in the direction of the arrow and take out the batteries.
2. Remove the bottom cover setscrew. **(Fig. 21 : ㊸)**
3. Insert a screwdriver between bottom and top covers to release them little by little.
4. Releasing the periphery of cover in a similar manner, remove the bottom cover. **(Portions 1 ~ 4)**

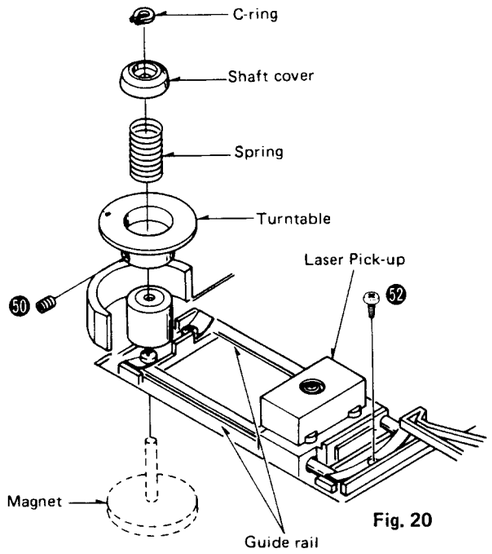


Fig. 20

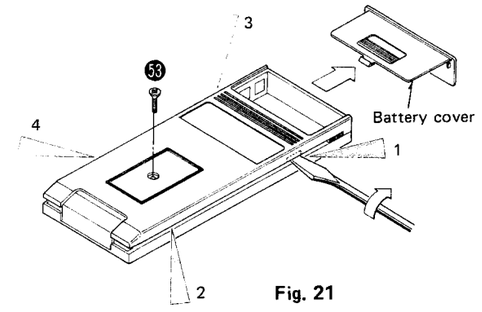
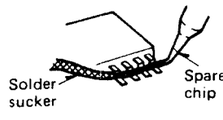
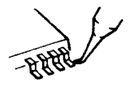
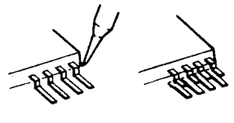
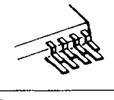


Fig. 21

■ 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.		• **Recommended tool** ..... Special soldering iron (with spare chip) HM-354 • Do not touch the soldering iron to the area for a long time. It may otherwise cause removal of the print foil. • When shifting the pin upward, do the job quickly while the solder is melting. If the solder is hard, it may cause removal or breakage of the print foil. • When using a pencil type soldering iron. 1. Completely remove the solder from each IC pin by use of solder sucker. 2. Raise each pin by means of an eyeleteer, hold the pliers then remove IC package from P.C.B.
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.		

■ HOW TO CHEK THE PRINTED CIRCUIT BOARD

*** For removal of each part, refer to disassembly instruction on pages 11 ~ 15.**

• Main P.C.B.

1. Remove the cabinet.
2. Check each part. (Part side)

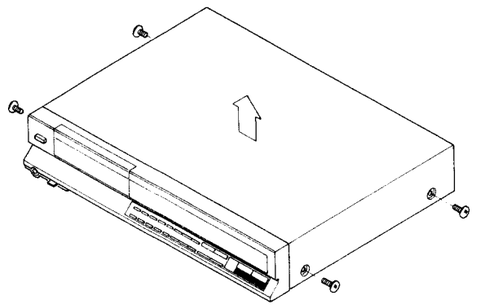


Fig. 22

3. When checking the soldered parts and replacing them,
   (1) Remove the front panel and main P.C.B.
   (2) Place the main P.C.B. as shown in **Fig. 23**.

Note: When checking as in **Fig. 23**, be sure to connect the ground spring of main P.C.B. to the chassis lead wire.

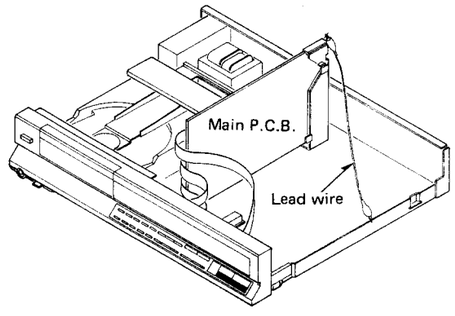


Fig. 23

• Keyboard/display P.C.B.

1. Remove the cabinet.
2. Remove the front panel setscrew.
3. Remove the front panel.

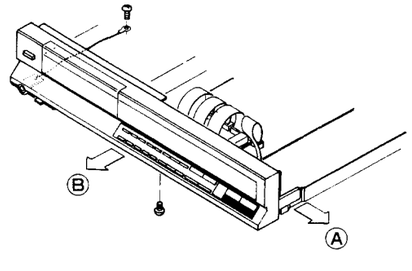


Fig. 24

3. Check the P.C.B. as shown in **Fig. 25.**

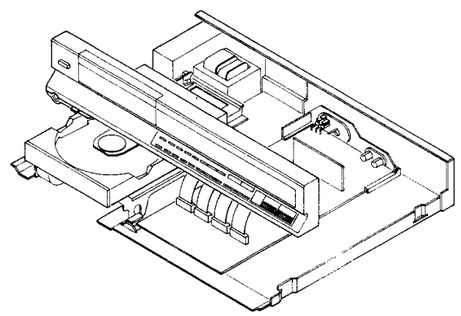


Fig. 25

4. Also remove the 7 setscrews of reinforcement plate and keyboard/display P.C.B.

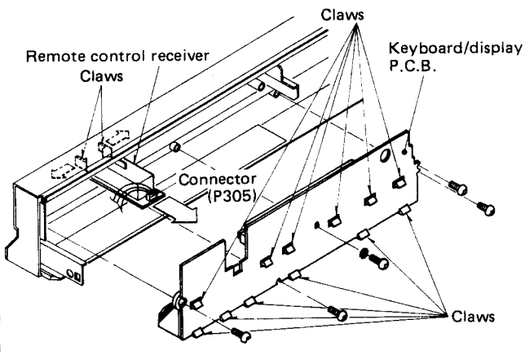


Fig. 26

5. Shift it as in **Fig. 27** and check.

Note: Take care not to damage F. L.

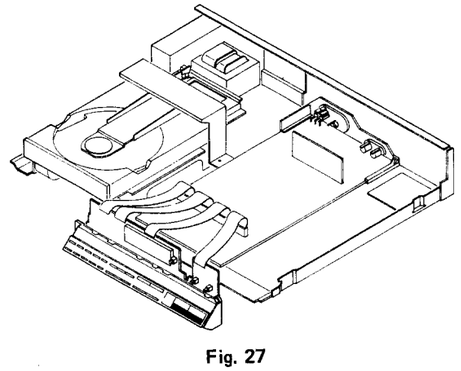


Fig. 27

• Optical servo (Head amplifier) P.C.B.

1. Remove the cabinet and front panel.
2. Disconnect connectors (CN405 ~ CN409, CN411, CN412, CN501) of main P.C.B.
3. Remove the traverse unit. The entire traverse unit can then be removed from the unit.

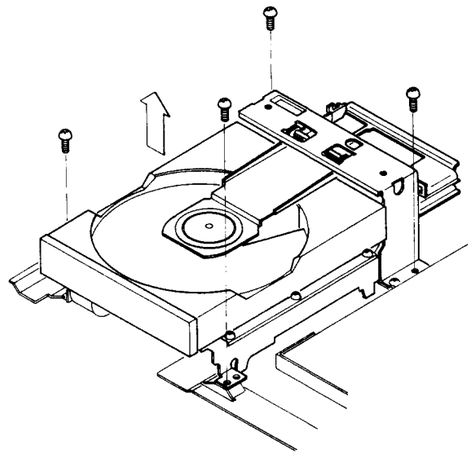


Fig. 28

4. Turn over the traverse unit and remove the nuts. The tray and the traverse unit can then be separated.

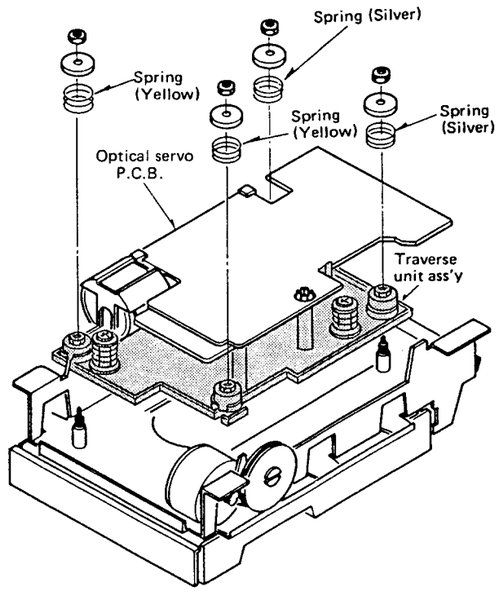


Fig. 29

5. Remove the disc clamper magnet from the disc clamper.

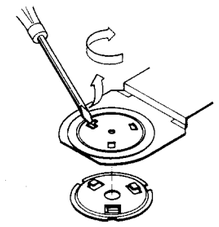


Fig. 30

6. Temporarily faster the tray and front panel. After that, connect only connectors (CN405, CN406 and CN408) remove in step 2.
7. Remove the insulator rubber and optical servo P.C.B. of traverse unit.
8. Mount the traverse unit on the traverse unit base.
9. Connect connectors (CN407, CN409, CN411, CN412, CN501) removed in step 2.
10. Shift it as in **Fig. 31** check.

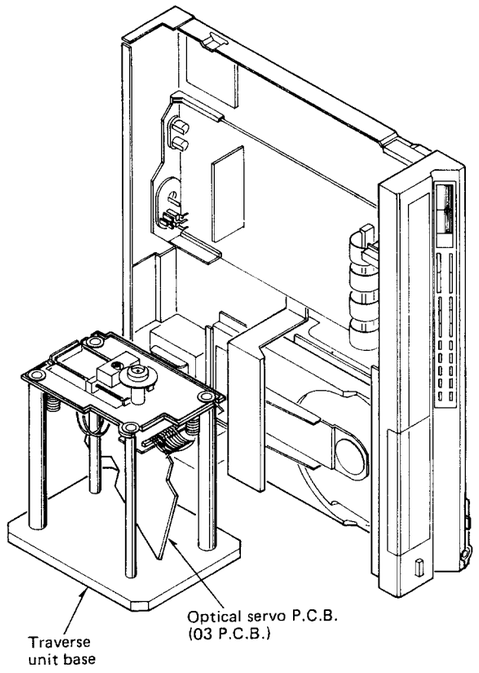


Fig. 31

■TERMINAL FUNCTION OF MICRO COMPUTER

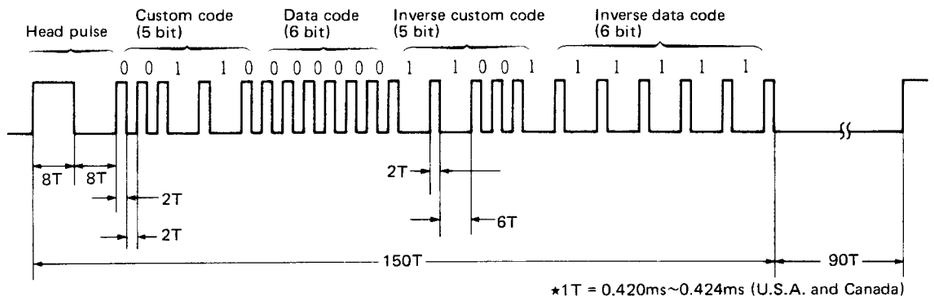
• MN15844PCQ

Pin No.	Name of pin	Signal	I/O Devision	Function
1	VSS	——	——	Ground
2	PO0	$\overline{TTON}$	O	Turntable ON/OFF select. (ON at "L")
3	PO1	BREAK	O	Turntable stop command (stop at "L")
4	PO2	ACC	O	Turntable drive command (ON at "H")
5	PO3	FREE	O	CLV servo selection command
6	P10	$\overline{TRON}$	O	Tracking servo ON/OFF select
7	P11	$\overline{THOLD}$	O	Tracking servo ON/OFF select
8	P12	KICKR	O	Kick direction (Reverse) command
9	P13	KICKF	O	Kick direction (Forward) command
10	SYNC	——	——	Not used
11	$\overline{RST}$	——	I	Reset terminal (Micom is reset at "L")
12	IRQ	$\overline{BLKCK}$	I	Sub-code terminal
13	P50	$\overline{TTSTOP}$	I	Turntable stop command.
14	P51	——	——	Not used
15	P52	$\overline{RFDEL}$	I	RF signal detection, effective at "L"
16	P53	CLOSS	I	Track jump control
17	XI	TCNT	I	Track counter
18	XO	——	——	Not used
19	$\overline{SBT}$	$\overline{CLDCK}$	I	Synchronizing signal extracted from disc
20	$\overline{SB1}$	SUBQ	I	Input for sub-code test from EFM demodulator.
21	$\overline{SB0}$	——	——	Not used
22	P60	TRVE	I	Tracking error signal input terminal
23	P61	——	——	
24	VREF	——	I	Traverse servo standard detection
25	P20	$\overline{STROBE}$	O	Traverse servo standard detection
26	P21	$\overline{LDON}$	O	Laser diode, focus servo ON/OFF
27	P22	REV	O	Traverse Reverse command, effective with "H" pulse
28	P23	FWD	O	Traverse Forward command, effective with "H" pulse
29	P30	——	I	Key scan input
30	P31	——	I	Key scan input
31	P32	——	I	Key scan input
32	P33	——	I	Key scan input
33	P40	ATSB	O	Attenuation ON/OFF, effective at "H"
34	P41	MUTE	O	Muting relay ON/OFF
35	P42	SYNCREC	O	Synchro-recc control
36	P43	EMPH	O	Effective with de-emphasis switch ON/OFF at "H"
37	P70	OPEN	O	Disc holder open command
38	P71	CLOSE	O	Disc holder close command
39	P72	PAUSE	O	Pause indicator display (Light up at "H")
40	P73	PLAY	O	Play indicator display (Light up at "H")
41	DA	11G	O	Display data (Digit) and key matrix data output
42	D9	10G	O	Display data (Digit) and key matrix data output
43	D8	9G	O	Display data (Digit) and key matrix data output
44	D7	8G	O	Display data (Digit) and key matrix data output
45	D6	7G	O	Display data (Digit) and key matrix data output
46	D5	6G	O	Display data (Digit) and key matrix data output
47	D4	5G	O	Display data (Digit) and key matrix data output
48	D3	4G	O	Display data (Digit) and key matrix data output
49	D2	3G	O	Display data (Digit) and key matrix data output
50	D1	2G	O	Display data (Digit) and key matrix data output
51	D0	1G	O	Display data (Digit) and key matrix data output
52	S8	j	O	Display data (segment) output
53	S7	g	O	Display data (segment) output
54	S6	f	O	Display data (segment) output
55	S5	e	O	Display data (segment) output
56	S4	d	O	Display data (segment) output
57	S3	h	O	Display data (segment) output
58	S2	c	O	Display data (segment) output
59	S1	b	O	Display data (segment) output
60	S0	a	O	Display data (segment) output
61	VPP	——	I	Power supply
62	OSC2	——	——	Not used
63	OSC1	TTCK	I	Clock (4.32 MHz) input
64	VDD	——	I	Power Supply (+5V)

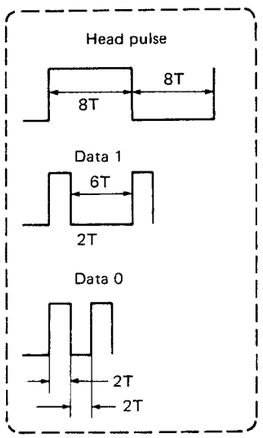
- **MN1402PCT**

Pin No.	Name of pin	I/O Devision	Function	Pin No.	Name of pin	I/O Devision	Function
1	Vss	———	Ground	15	EO0	O	Data output • "H" output in timing of key scan input (AI0 ~ 3, BI0 ~ 3, SNS0).
2	CO9	———	Not used	16	EO1		
3	CO8	O	Test mode for clock frequency adjustment • Pull up input terminals BI2 and BI3 to VDD (5V) and reset them. Then 1/24 of clock frequency is outout in duty 1 : 7.	17	EO2		
				18	EO3		
				19	RST	I	Reset terminal
4	CO7	O	Volume down control of remote control (effective at "H")	20	TEST	———	Ground
5	CO6	O	Volume up control of remote control (effective at "H")	21	DO3	O	Not used
				22	DO2		
6	CO5	O	Remote control signal reception display LED output • "L" output when signal is received by remote control input terminal (SNS1).	23	DO1		
				24	DO0		
				25	SNS0	I	Key scan strobe
7	AI3	O	Key scan strobe	26	SNS1	I	Remote control signal receiving terminal • Data code shown below is received.
8	AI2						
9	AI1			27	VDD	I	Power supply (+5V)
10	AI0			28	OSC	I	Clock frequency (600kHz) input terminal.
11	BI3						
12	BI2						
13	BI1						
14	BI0						

- **Remote control transmitter data code (MN6030).**



★1T = 0.420ms~0.424ms (U.S.A. and Canada)
1T = 0.454ms~0.460ms (Europe and Others)



Control Button	Data Code	Control Button	Data Code
1	000010	clear	110100
2	100010	A←→B repeat	000100
3	010010	repeat	111000
4	110010	M scan	111100
5	001010	recall	100100
6	101010	◀◀ search	001000
7	011010	search ▶▶	101000
8	111010	|◀ skip	010000
9	000110	skip ▶|	110000
0	100110	‖ pause	011000
memory	010101	play ▶	010100

■ REPLACEMENT PARTS LIST (Electric Part)

Notes: 1. Part numbers are indicated on mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
3. The Ⓢ mark is service standard parts and may differ from production parts.
4. The parenthesized numbers in the column of description stand for the quantity per set.
5. Bracketed indications in Ref. No. columns specify the areas. Parts without these indications can be used for all areas.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	AN78M15	Regulator
IC2	AN79N15	Regulator
IC3	AN7805	Regulator
IC4, 5	SVIICP-F15	IC Protector
IC101, 404	AN78L05	Regulator
IC102	AN79N05	Regulator
IC103	AN7677S	Head (Focus) Amplifier
IC104	AN7678S	Head (Tracking) Amplifier
IC105	AN6554NS	Focus and Tracking Error Amplifier
IC201	AN6552	Operational Amplifier
IC301, 303	SVITC40H004P	Inverter
IC302	SVINJM082D	Operational Amplifier
IC304	SVITC40H386P	Exclusive OR Gate
IC305	DN74LS74A	D Flip Flop
IC306	DN74LS107	JK Flip Flop
IC401	MN15844PCQ	Micro Computer
IC402	SVIBA6209	Loading Motor Drive
IC403	AN1393	Comparator
IC501	AN6638	Sprindle Motor Drive
IC502	AN1358	Operational Amplifier
IC503	MN4066B	Analog Switch
IC504	MN4001B	NOR Gate
IC505	AN90B20	Inverter
IC601	MN1402PCT	Micro Computer
IC651, 652	MN4538B	Multivibrator
IC653	MN4023B	NAND Gate
IC706	MN4069UB	Inverter
IC801	SVIPCM53JP-V	D/A Converter
IC802, 805	SVIUPD4053BC	Analog Switch
IC803, 804, 806	SVILM833NA	Operational Amplifier
IC851	SVINJM4556S	Headphone Amplifier
LSI Module	SRDP001N02A	Digital P.C.B. Ass'y
TRANSISTORS		
Q1 Ⓢ	2SA722-S	Regulator
Q101	2SD638	Laser Power Control
Q102~104	2SB641	Laser Power Control
Q105	2SK301	Tracking Control
Q106	UN4212	Tracking Control

Ref. No.	Part No.	Description
TRANSISTORS		
Q107, 109	2SD1226M	Actuator Drive
Q108, 110	2SB910M	Actuator Drive
Q201, 202, 407, 503	2SC3311-Q	Traverse Control, Relay Drive and Drop Out Detector
Q203	2SD1266	Traverse Motor Drive
Q204	2SB941	Traverse Motor Drive
Q401, 408, 502	2SA1309Q	Regulator, Drop Out Detector
Q402, 409, 504, 505	UN4212	Switching
Q403~406	UN4112	Switching
Q501	2SC641	Drop Out Detector
Q601~603, 621, 622	2SD637	Switching
Q651~654	2SA1309Q	Switching
Q655	2SC3311-Q	Switching
DIODES		
D1 ⚠	SVDS1WB40	Rectifier
D2 ⚠	SVDS2VB20	Rectifier
D3	MA1180	Zener, 18V
D4	MA1082	Zener, 8.2V
D6, 7 Ⓢ	MA162A	Switching
D101, 301, 407, 408, 420~422, 601~609, 614~617	MA165	Switching
D303	SVDKV1230Z	Variable Capacitor
D401	MA4047	Zener, 4.7V
D405, 406	SVD1SR35200V	Rectifier
D410, 801, 802	MA4056	Zener, 5.6V
D501	MA4091	Zener, 9.1V
D611	SVDGL-9HY4	Pause Indicator
D612	SVDGL-9PG4	Play Indicator
D613	SVDGL-9PR4	Repeat Indicator
D631~633	SVDSLR-54MW4	Disc Lamp
D651~667	MA165	Switching
VARIABLE RESISTORS		
VR101, 103, 104, 106	SVN1C103B01L	Focus Gain, Offset and Tracking Gain, Offset Adj., 10kΩ (B)
VR102	SVN1C222B01L	Focus Balance Adj., 2.2kΩ (B)

Ref. No.	Part No.	Description
VARIABLE RESISTORS		
VR105	SVN1C472B01L	Tracking Balance Adj., 4.7kΩ (B)
VR501	EVN38CA00B14	11T Adj., 10kΩ (B)
VR851	EWAMA1X05C15	Headphon Level Control, 100kΩ (A)
COIL		
L301	SL07KM8R1	PLL Adj.
COMPONENT COMBINATIONS		
R524	EXBP84333K	33kΩ×4
R609	EXBP84222K	2.2kΩ×4
C11•12, 13•14 ⚠	EXRFS203ZS	0.01μF×2
LOW PASS FILTERS		
LPF801, 802	SVIAL016	Filter
RELAY		
RLY801	SFDYG5A237P	Muting
CRYSTAL		
X701	SVQNR8643	8.643MHz
CERAMIC OSCILLATOR		
X601	SVFCSB600P11	600kHz
FLUORESCENT DISPLAY TUBE		
FL601	SRDQCP5226GR	Display
POWER TRANSFORMERS		
T1 [M] ⚠	SLT54JL8A	Power Source
T1 [MC] ⚠	SLT54JS8C	Power Source
T1 [other areas] ⚠	SLT54JE7E	Power Source
SWITCHES		
S1 ⚠	ESB823V	Power
S2 Exclude [M, MC] ⚠	SRDSHXW0251	Voltage Selector
S101, 102	SRDSBSW-180	Rest and End
S103	SRDSMLS-1	Close
S104	SRDSBSW97-2	Open
S601~611, 615, 616, 618~628	EVQQS405K	Operation Switch
FUSES		
F1 [MC] ⚠	XBA2F035NU	250V, 350mA
F1 Except for [M] area ⚠	XBA2C012TR0	250V, T 125mA
F2 Except for [M, MC] areas	XBA2C025TR0	250V, T 250mA
HALL ELEMENTS		
H501, 502	OH-001	Spindle Motor Control

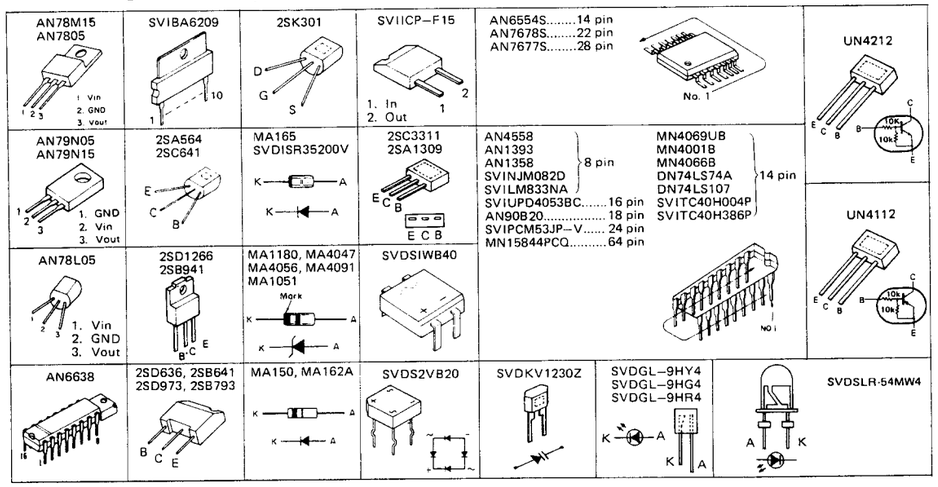
• REMOTE CONTROL PARTS

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1 [M, MC]	MN6030CA	Remote Control Signal Processing
IC1 [other areas]	MN6030B	Remote Control Signal Processing
IC800	AN5020	Remote Control Signal Amplifier
TRANSISTORS		
Q1	2SD1458	Amplifier
Q800	2SD636	O.S.C

Ref. No.	Part No.	Description
DIODES		
D1	LN66	L.E.D (Transmitter)
D4, 5	MA154WK	Switching
D6, 7	MA154WA	Switching
D800	PH302	Phote Diode
D801	MA165	Switching
CERAMIC OSCILLATOR		
X1 [M, MC]	CSB455EB1T	455kHz
X1 [other areas]	CSB420PB1T	420kHz

Ref. No.	Part No.	Description
COIL		
T800 [M, MC]	EIR7QF003B	O.S.C
T800 [other areas]	ELM7Q206A	O.S.C
THERMISTER		
TH800	ERTD2ZHK104	100kΩ
VARIABLE RESISTOR		
R802	EVNN1AA00B13	Gain Adj., 1kΩ (B)

• Terminal guide of IC's, transistors and diodes



■ RESISTOR AND CAPACITORS

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics importnat for safety. When replacing any of these components use only manufacturer's specified parts.
3. This "Ⓢ" mark is service standard parts and may differ from production parts.
4. Unless otherwise specified. All resistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ All capacitors are in MICROFARADS (μF) P = 10^{-6} μF.

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

ERG	1	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	25 : 1/4W	F : ±1%
ERG : Metal Oxide	1 : 1W	J : ±5%
ERX : Metal Film		G : ±2%

ERDS2TJ □□□ ——→ Small type carbon (1/4W)
EROS2TKF □□□ ——→ Small type metal film (1/4W)

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type			Voltage		Tolerance
			ECEA Type	Others	
ECEA	:	Electrolytic	1A : 10V	1H : 50V DC	J : ±5%
ECKD	:	Ceramic	1C : 16V	2H : 500V DC	K : ±10%
ECQM	:	Polyester	1E : 25V	1 : 100V	Z : +80%, −20%
ECCD	:	Ceramic	1V : 35V	AL : 125V AC	P : +100%, −0%
ECKF	:	Ceramic	1H : 50V	MY : 125V AC	M : ±20%
			1J : 63V	KC : 400V AC	
			50 : 50V		

• RESISTORS

Ref. No.	Part No.	Value
R11 Ⓢ	ERD25FJ102	1K
R13 Ⓢ ⚠	ERD25FJ330	33
R101	ERDS2TJ222	2.2K
R102	ERDS2TJ102	1K
R103	ERDS2TJ682	6.8K
R104	ERDS2TJ103	10K
R105	ERDS2TJ473	47K
R106	ERDS2TJ223	22K
R107	ERDS2TJ120	12
R112	ERDS2TJ472	4.7K
R113	ERDS2TJ102	1K
R114	ERDS2TJ472	4.7K
R115, 116	ERDS2TJ332	3.3K
R117	ERDS2TJ102	1K
R120	ERDS2TJ683	68K
R121	ERDS2TJ682	6.8K
R122	ERDS2TJ331	330
R123	ERDS2TJ681	680
R124	ERDS2TJ682	6.8K
R125	ERDS2TJ392	3.9K
R126	ERDS2TJ473	47K
R127	ERDS2TJ392	3.9K
R128	ERDS2TJ101	100
R130	ERDS2TJ683	68K
R131	ERDS2TJ821	820
R132	ERDS2TJ153	15K
R133	ERDS2TJ682	6.8K
R134	ERDS2TJ153	15K
R135	ERDS2TJ561	560
R136	ERDS2TJ103	10K
R137	ERDS2TJ472	4.7K
R138	ERDS2TJ101	100
R139	ERDS2TJ103	10K
R140 Ⓢ ⚠	ERD25FJ2R2	2.2
R161	ERDS2TJ101	100
R162	ERDS2TJ154	150K
R163, 164	ERDS2TJ103	10K
R165	ERDS2TJ152	1.5K
R171	ERDS2TJ122	1.2K
R172	ERDS2TJ153	15K
R173	ERDS2TJ682	6.8K
R174	ERDS2TJ153	15K
R175	ERDS2TJ561	560
R176	ERDS2TJ104	100K
R177	ERDS2TJ103	10K
R178	ERDS2TJ472	4.7K
R179	ERDS2TJ334	330K
R180	ERDS2TJ103	10K
R181	ERDS2TJ101	100
R182 Ⓢ ⚠	ERD25FJ2R2	2.2
R183	ERDS2TJ104	100K
R201, 202	ERDS2TJ104	100K
R203, 204	ERDS2TJ104	100K
R205	ERDS2TJ472	4.7K
R206, 207	ERDS2TJ152	1.5K
R208	ERDS2TJ103	10K
R209	ERDS2TJ472	4.7K
R210	ERDS2TJ563	56K
R211	ERDS2TJ104	100K
R213	ERDS2TJ563	56K
R214	ERDS2TJ104	100K
R215	ERDS2TJ101	100
R301	ERDS2TJ560	56
R302	ERDS2TJ103	10K
R303	ERDS2TJ392	3.9K
R304	ERDS2TJ123	12K
R305	ERDS2TJ332	3.3K
R306	ERDS2TJ103	10K
R307	ERDS2TJ472	4.7K
R308	ERDS2TJ104	100K
R309	ERDS2TJ472	4.7K
R310	ERDS2TJ104	100K
R311	ERDS2TJ682	6.8K
R312	ERDS2TJ102	1K
R314, 315	ERDS2TJ102	1K
R316	ERDS2TJ103	10K
R317	ERD25TJ473	47K
R318	ERDS2TJ182	1.8K
R319	ERDS2TJ103	10K
R320	ERDS2TJ473	47K
R321	ERDS2TJ182	1.8K
R323	ERDS2TJ222	2.2K
R324	ERDS2TJ183	18K
R325, 326	ERDS2TJ222	2.2K
R401	ERDS2TJ222	2.2K
R402, 403	ERDS2TJ102	1K
R404	ERDS2TJ183	18K
R405, 406	ERDS2TJ104	100K
R407	ERDS2TJ104	100K
R408	ERDS2TJ223	22K
R409	ERDS2TJ273	27K
R410, 411	ERDS2TJ222	2.2K
R412	ERDS2TJ222	2.2K
R413	ERDS2TJ332	3.3K
R414 Ⓢ ⚠	ERD25FJ100	10
R421, 422	ERDS2TJ103	10K
R423	ERDS2TJ472	4.7K
R501 Ⓢ	ERX1ANJ3R3	3.3
R502	ERDS2TJ104	100K
R503	ERDS2TJ103	10K
R504	ERDS2TJ153	15K
R505	ERDS2TJ101	100
R506	ERDS2TJ273	27K
R507	ERDS2TJ222	2.2K
R508	ERDS2TJ474	470K
R509	ERDS2TJ682	6.8K
R510	ERDS2TJ332	3.3K
R511, 512	ERDS2TJ221	220
R513, 514	ERDS2TJ473	47K
R515	ERDS2TJ103	10K
R516	ERDS2TJ474	470K
R517	ERDS2TJ473	47K
R518	ERDS2TJ824	820K
R519	ERDS2TJ684	680K
R520	ERDS2TJ153	15K
R521	ERDS2TJ224	220K
R522, 523	ERDS2TJ332	3.3K
R525	ERDS2TJ223	22K
R526, 527	ERDS2TJ332	3.3K
R528, 529	ERDS2TJ223	22K
R530	ERDS2TJ223	22K
R531	ERDS2TJ332	3.3K
R532	ERDS2TJ472	4.7K
R533	ERDS2TJ332	3.3K
R601, 602	ERDS2TJ103	10K
R603, 604	ERDS2TJ103	10K
R605	ERDS2TJ471	470
R606	ERDS2TJ151	150
R607	ERDS2TJ471	470
R610, 611	ERDS2TJ103	10K
R612	ERDS2TJ103	10K
R621	ERDS2TJ474	470K
R622	ERDS2TJ472	4.7K
R623	ERDS2TJ103	10K
R631	ERDS2TJ471	470
R651, 652	ERDS2TJ103	10K
R653	ERDS2TJ103	10K
R654	ERDS2TJ394	390K
R655	ERDS2TJ103	10K
R656	ERDS2TJ184	180K
R657	ERDS2TJ103	10K
R658	ERDS2TJ394	390K
R659, 660	ERDS2TJ103	10K
R661	ERDS2TJ274	270K
R662	ERDS2TJ103	10K
R663	ERDS2TJ274	270K
R664	ERDS2TJ103	10K
R665	ERDS2TJ332	3.3K
R666	ERDS2TJ182	1.8K
R701, 702	ERDS2TJ472	4.7K
R801	ERDS2TJ102	1K
R802	ERDS2TJ222	2.2K
R803	EROS2TKF1502	15K
R804	EROS2TKF4301	4.3K
R805	ERDS2TJ474	470K
R807	EROS2TKF4701	4.7K
R808	EROS2TKF2401	2.4K
R809, 810	EROS2TKF4701	4.7K
R811	EROS2TKF6801	6.8K
R812	ERDS2TJ391	390
R813	ERDS2TJ221	220
R814	ERDS2TJ473	47K
R815	EROS2TKF1502	15K
R816	EROS2TKF4301	4.3K
R817	ERDS2TJ474	470K
R819	EROS2TKF4701	4.7K
R820	EROS2TKF2401	2.4K
R821	ERDS2TJ391	390
R822	ERDS2TJ221	220
R823	ERDS2TJ473	47K
R851	ERDS2TJ272	2.7K
R852	ERDS2TJ123	12K
R853	ERDS2TJ820	82
R854	ERDS2TJ272	2.7K
R855	ERDS2TJ123	12K
R856	ERDS2TJ820	82

• CAPACITORS

Ref. No.	Part No.	Value
C1 ⚠	ECKDKC103PF	0.01
C15, 16	ECEA1VU102	1000
C17	ECEA1CU472	4700
C18	ECEA1VU102	1000
C19, 20	ECEA1CU470	47
C22	ECEA0JU470	47
C24	ECEA1CU222	2200
C101, 102	ECEA1EK220	22
C103, 104	ECEA0JK330	33
C105	ECKD1H103ZF	0.01
C106	ECEA1CK100	10
C107, 108	ECKD1H103ZF	0.01
C111	ECEA0JK220	22
C112	ECKD1H472KB	0.0047
C113	ECKD1H102KB	0.001
C114	ECEA1EK3R3	3.3
C115	ECKD1H103ZF	0.01
C116	ECKD1H391KB	390P
C117	ECKD1H103ZF	0.01
C118	ECKD1H331KB	330P
C119, 120	ECEA1HK2R2	2.2
C121 ⚠	ECEA1EN4R7S	4.7
C131	ECQM1H273KV	0.027
C132	ECQM1H332KV	0.0033
C133	ECQM1H473KV	0.047
C134 ⚠	ECEA1HN010S	1
C135 ⚠	ECEA1HNR47S	0.47
C161	ECKD1H103ZF	0.01
C162	ECKD1H471KB	470P
C163	ECKD1H101KB	100P
C164	ECBS1H102MDY	0.001
C165	ECKD1H102KB	0.001
C171	ECQM1H273KV	0.027
C172	ECQM1H222KV	0.0022
C173	ECQM1H333KV	0.033
C174 ⚠	ECEA1HN010S	1
C175	ECQM1H823KV	0.082
C201 ⚠	ECEA1EN3R3	3.3
C202, 203	ECQM1H683KV	0.068
C204	ECEA1CU100	10
C205, 206	ECEA1CU330	33
C207	ECEA1CU100	10
C301	ECEA1CU100	10
C302	ECKD1H332KV	0.0033
C303	ECQM1H333KV	0.033
C304	ECQM1H153KV	0.015
C305	ECKD1H472KB	0.0047
C306	ECQM1H153KV	0.015
C307	ECKD1H473ZV	0.047
C308, 309	ECCD1H470JC	47P
C310, 311	ECQM1H223KV	0.022
C312	ECQM1H472KV	0.0047
C313	ECCD1H270JU	27P
C314	ECCD1H680JU	68P
C315	ECQM1H102KV	0.001
C401	ECEA1CU330	33
C402	ECEA0JU101	100
C403	ECKD1H473ZV	0.047
C404	ECKD1H102KV	0.001
C405, 406	ECEA1AU101	100
C407	ECKD1H473ZV	0.047
C408	ECQM1H473KV	0.047
C409	ECKD1H331KB	330P
C420	ECKD1H102KB	0.001
C501	ECEA1CU101	100
C502	ECKD1H333ZF	0.033
C503, 504 ⚠	ECEA1HN010	1
C505	ECEA1HUR22	0.22
C506	ECKD1H102KB	0.001
C507	ECEA1CU100	10
C508	ECQM1H102KV	0.001
C509	ECQM1H103KV	0.01
C510	ECQM1H104KV	0.1
C511	ECEA1HUR22	0.22
C512	ECQM1H333KV	0.033
C513	ECEA1CU100	10
C516, 517	ECKD1H103ZF	0.01
C514	ECQM1H333KV	0.033
C601	ECKD1H103ZF	0.01
C621	ECKD1H471KB	470P
C622	ECKD1H101KB	100P
C651	ECQM1H102KV	0.001
C652	ECQM1H123KV	0.012
C653	ECQM1H183KV	0.018
C654, 655	ECEA1HU010	1
C656	ECFR1H104ZF	0.1
C701, 702	ECKD1H473ZV	0.047
C703, 704	ECCD1H100D	10P
C801, 802	ECEA1CU470	47
C804	ECKD1H471KB	470P
C805	ECQP1103GZ	0.01
C806, 807	ECQP1102GZ	0.001
C808 ⚠	ECEA1CN101S	100
C809	ECQM1H332KV	0.0033
C810	ECKD1H471KB	470P
C811	ECQP1103GZ	0.01
C812	ECQP1102GZ	0.001
C813 ⚠	ECEA1CN101S	100
C814	ECQM1H332KV	0.0033
C815, 816	ECFR1H104ZF	0.1
C817, 818	ECEA1EU3R3	3.3
C819, 820	ECFR1H104ZF	0.1
C851, 852	ECKD1H472KB	0.0047

• REMOTE CONTROL PARTS

• RESISTORS

Ref. No.	Part No.	Value
R1	ERDS2TJ102	1K
R2	ERDS2TJ473	47K
R3	ERDS2TJ1R0	1
R800	ERD10TLJ154	150K
R801	ERD10TLJ221	220
R803	ERD10TLJ103	10K
R804	ERD10TLJ334	330K
R805	ERD10TLJ272	2.7K
R806	ERD10TLJ151	150
R807	ERD10TLJ681	680
R808	ERD10TLJ272	2.7K
R809	ERD10TLJ181	180

• CAPACITORS

Ref. No.	Part No.	Value
C1 [M, MC]	ECKD1H101KB	100P
C1 [other areas]	ECKD1H471KB	470P
C2 [M, MC]	ECKD1H101KB	100P
C2 [other areas]	ECKD1H121KB	120P
C3	ECEA0JU101	100
C800	ECKD1H221KB	220P
C801, 802	ECEA1HK0R1	0.1
C803	ECEA1CK100	10
C804	ECKD1H102KB	0.001
C805	ECEA1HKR33	0.33
C806	ECQP1392JZ	0.0039
C807	ECEA1HKR22	0.22
C808	ECEA1HK2R2	2.2
C809	ECEA1CK330	33

■ REPLACEMENT PARTS LIST
(Cabinet, chassis and Optical deck unit parts)

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The " Ⓢ " mark is service standard parts and may differ from production parts.
5. Ⓚ -marked parts are used for black only, while ○marked parts are for silver type only.
6. Parts other than Ⓚ -and ○marked are used for both black and silver types.
7. The parenthesized numbers in the columns of description stand for the quantity per set.

Color	Area
(S) (K)	[M] . . . . .U.S.A.
(S)	[MC] . . . . .Canada.
(S) (K)	[E] . . . . .Switzerland and Scandinavia.
(S) (K)	[EK] . . . . .United Kingdom.
(S) (K)	[EK] . . . . .Australia.
(S) (K)	[EG] . . . . .F.R. Germany.
(S) (K)	[EB] . . . . .Belgium.
(S) (K)	[EH] . . . . .Holland.
(S) (K)	[EF] . . . . .France.
(S) (K)	[Ei] . . . . .Italy.
(S) (K)	[XA] . . . . .Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
(S) (K)	[XZ] . . . . .New Zealand.
(S) (K)	[PA] . . . . .East PX.
(S) (K)	[PE] . . . . .European Military.
(S) (K)	[PC] . . . . .European Audio Club.

Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
1	○	SRAC002N01E	Front Panel Ass'y (Silver Type)	(1)
1	Ⓚ	SRAC002N21E	Front Panel Ass'y (Black Type)	(1)
1-1		SRKT001N06	Button, Open/Close	(1)
1-2	○	SRKB001N01	Badge, Technics (Silver Type)	(1)
1-2	Ⓚ	SRKB001N21	Badge, Technics (Black Type)	(1)
2		SRKK002N01	Ornament Plate, Display	(1)
3		SRKK002N03	Filter, Display	(1)
4	○	SRUM002N01	Case, Operation Button (Silver Type)	(1)
4	Ⓚ	SRUM002N21	Case, Operation Button (Black Type)	(1)
5	○	SRKT001N01	Button, Play/Pause/ Stop/Skip (Silver Type)	(1)
5	Ⓚ	SRKT001N31	Button, Play/Pause/ Stop/Skip (Black Type)	(1)
6	○	SRKT001N02	Button, Search (Silver Type)	(1)
6	Ⓚ	SRKT001N32	Button, Search (Black Type)	(1)
7	○	SRKT001N03	Button, Memory/ Index/Rem Time (Silver Type)	(1)
7	Ⓚ	SRKT001N23	Button, Memory/ Index/Rem Time (Black Type)	(1)
8	○	SRKT001N04	Button, Number 6 – 0 (Silver Type)	(1)
8	Ⓚ	SRKT001N24	Button, Number 6 – 0 (Black Type)	(1)
9	○	SRKT001N05	Button, Number 1 – 5 (Silver Type)	(1)
9	Ⓚ	SRKT001N25	Button, Number 1 – 5 (Black Type)	(1)
10	○	SRKT002N02	Button, Repeat/Music Scan (Silver Type)	(1)
10	Ⓚ	SRKT002N21	Button, Repeat/Music Scan (Black Type)	(1)
11		SRKK001N05	Ornament Plate, Disc Holder	(1)
12		SRDJHLJ15401	Jack, Head Phone	(1)
13	○	SRUM002N03	Spacer (Silver Type)	(1)
13	Ⓚ	SRUM002N23	Spacer (Black Type)	(1)
14	○	SRKT002N02	Knob, Headphone Level Control (Silver Type)	(1)
14	Ⓚ	SRKT002N22	Knob, Headphone Level Control (Black Type)	(1)

Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
15		SRUM002N04	Holder, Disc Illuminator	(1)
16		SRGZ002N01	Rubber, LED Holder	(1)
17		UR41FT8	Filter, Remote Control Receiver	(1)
18	○	SRKTK15N26	Knob, Power (Silver Type)	(1)
18	Ⓚ	SRKT015N26	Knob, Power (Black Type)	(1)
19		SRUM001N04	Rod, Power Switch	(1)
20		SRUM001N02	Support, Main P.C. Board	(1)
21		SRUM001N01	Terminal Plate	(1)
22		SRDJ007N04	Jack, Sub Code	(1)
23		SRDJ007N05	Jack, Rch Output	(1)
24		SRDJ007N06	Jack, Lch Output	(1)
25		SRQS001N01	Spring, Ground	(1)
26		SRUP001N01	Chassis	(1)
27 [M, MC]		SRUP002N04	Rear Panel	(1)
27 [other areas]		SRUP002S04	Rear Panel	(1)
28		SRGA008N01	Foot	(4)
29		SRUM001N10	Spacer, P.C. Board Support	(2)
30 [M]		SRUM001M03	Cover, Fuse P.C. Board	(1)
30 [other areas]		SRUM001N03	Cover, Fuse P.C. Board	(1)
31 [MC]		SJT345	Holder, Fuse	(2)
31 Except for [M] area		SJT347	Holder, Fuse	(4)
32 [XZ]	⚠	SFDJHSC515 – 1	AC Socket	(1)
32 [M, MC, XL, XA, PA, PE, PC]	⚠	SFDJHSC0509	AC Socket	(1)
32 [other areas]	⚠	SFDJHSC0515	AC Socket	(1)
33	○	SRAC001N03	Cabinet (Silver Type)	(1)
33	Ⓚ	SRAC001N23	Cabinet (Black Type)	(1)
34 [MC]		SRNN002C01	Name Plate	(1)
34 [E]		SRNN002S01	Name Plate	(1)
34 [EK, XL, XZ]		SRNN002G01	Name Plate	(1)
34 [XA, XM]		SRNN002X01	Name Plate	(1)
34 [PA, PE]		SRNN002P01	Name Plate	(1)
34 [PC]		SRNN002P02	Name Plate	(1)
34 [EG]		SRNN002R01	Name Plate	(1)
35		SRUZ001N03	Sheet, Cabinet	(1)

Ref. No.	Part No.	Description	
LOADING MECHANICAL PARTS			
41	SRUP001N05	Base, Clamper	(1)
42	SRUM001N07	Bracket, Switch	(1)
43	SRDJ001N13E	Connector Ass'y (2 pin)	(1)
44	SRUP001N06	Plate, Clamper	(1)
45	SRUZ001N02	Sheet, Clamper Plate	(2)
46	SRUM001N06	Clamper, Disc	(1)
47	SRKD001N01E	Magnet	(1)
48	SRUP001N07E	Plate, Clamp	(1)
49	SRXJ001N01	Clamp Shaft	(1)
50	SRQA001N01	Spring, Clamp	(1)
51	SRQA001N02	Spring, Clamp	(1)
52	SRUM007N05E	Disc Tray Ass'y	(1)
53	SRUM001N09	Disc Case	(1)
54	SRKK002N04	Ornament Plate, Disc Case	(1)
55	SRUM007N07	Cam, Disc Case	(1)
56	SRQH007N02	Spring, Cam	(1)
57	SRUP001N09E	Loading Guide	(1)
58	SRGC007N05	Rubber, Loading Guide	(2)
59	SRUM001N13	Rack Gear	(1)
60	SRUM001N08	Switch Arm	(1)
61	SRQS007N02	Spring, Switch Arm	(1)
62	SRUM007N15	Guide Plate	(2)
63	SRUP007N07	Holder	(2)
64	SRUP001N08R	Loading Base	(1)
65	SRUM007N06	Lock Arm	(1)
66	SRQS007N03	Spring, Lock Arm	(1)
67	SRUM007N17	Cover, Switch	(1)
68	SRDJ001N03E	Connector Ass'y (2 pin)	(1)
69	SRUG007N02	Gear, Transmission	(1)
70	SRUG007N03	Gear, Loading	(1)
71	SRUG001N01	Gear, Pulley	(1)
72	SRMH001N02R	Motor Loading	(1)
73	SRDJ001N02E	Connector Ass'y (2 pin)	(1)
74	SRGC001N01	Rubber, Motor	(2)
75	SRGB007N02	Belt, Loading Motor	(1)
76	SFYB – 5 – 32 – P	Ball	(8)
77	SRGC007N06	Rubber, Cam	(1)
OPTICAL PICK-UP DECK UNIT PARTS			
81 ⚠	SRLP007N01A	Optical Pick-Up Ass'y	(1)
82	SRUM007N22	Bracket, Optical Pick-Up	(1)
83	SRQS007N01	Spring, Bracket	(1)
84	SRLC007N03	Cover, P.C. Board	(1)
85	SRUK007N02E	Optical Deck Unit Base	(1)
86	SRMH001N01R	Motor, Pick-Up Drive	(1)
87	SRDJ001N01E	Connector Ass'y (2 pin)	(1)
88	SRGC007N01	Cushion Rubber	(1)
89	SRUM007N19	Holder, Motor	(1)
90	SRTM007N01A	Rotary Magnet	(1)
91	SRDJ001N04E	Connector Ass'y (4 pin)	(1)
92	SRGC007N02	Cushion Rubber	(4)
93	SRXG007N06	Rod	(1)
94	SRXG007N07	Rod	(1)

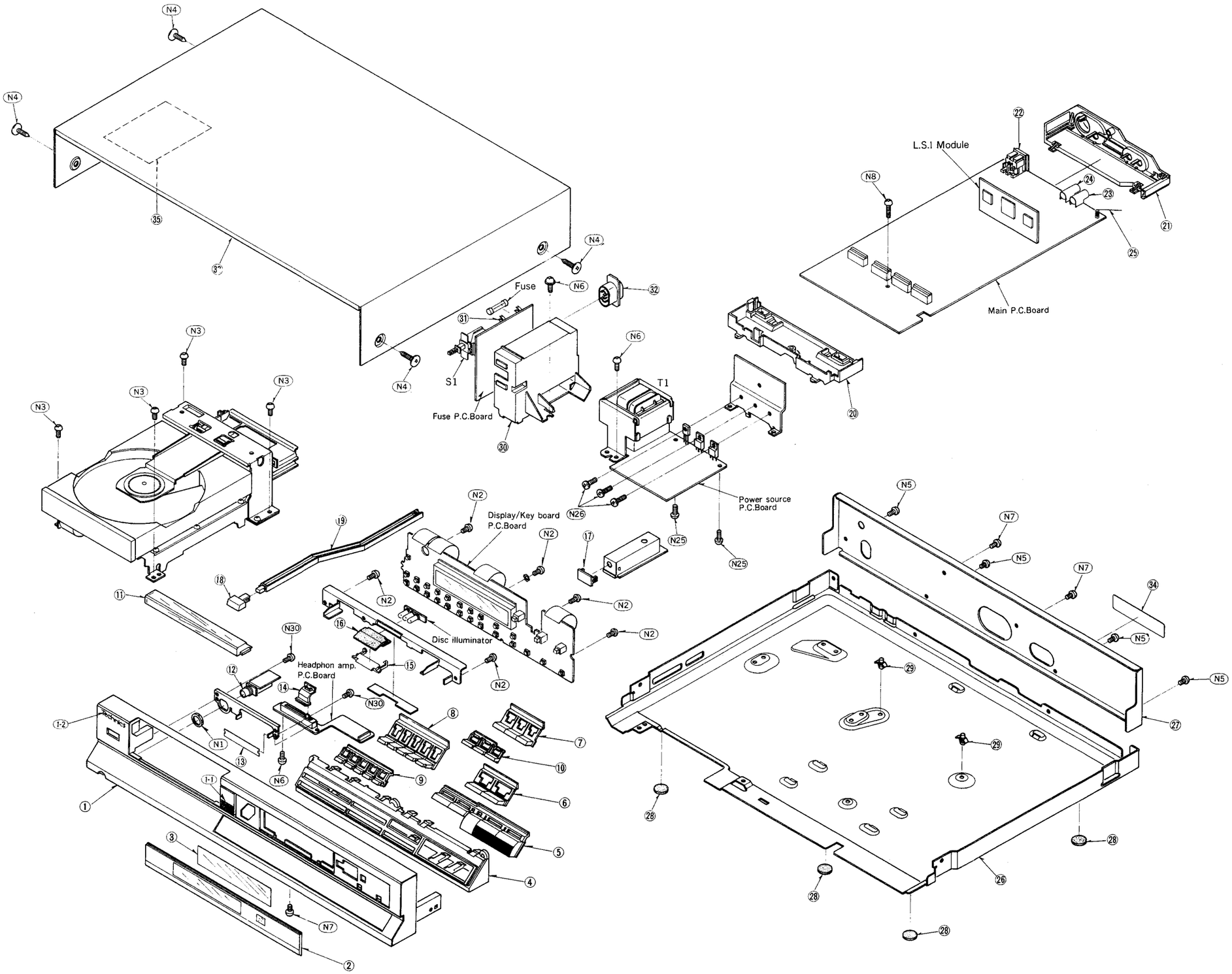
Ref. No.	Part No.	Description	
OPTICAL PICK-UP DECK UNIT PARTS			
95	SRQA007N03	Spring, Rod	(2)
96	SRQP007N01	Spring	(1)
97	SRTE007N11E	Turntable	(1)
98	SRTE007N03	Holder, Turntable	(1)
99	SRQA010N04	Spring, Turntable Holder	(1)
100	SRXG007N01E	Worm Gear	(1)
101	SRGB007N03	Belt, Worm Gear	(1)
102	SRXJ007N01	Shaft, Pick-Up Guide	(2)
103	SRUP007N08	Holder, Shaft	(1)
104	SRUP007N09	Holder, Shaft	(1)
105	SRQA007N01	Spring, Cushion Rubber (Yellow)	(2)
106	SRQA007N02	Spring, Cushion Rubber (Silver)	(2)
107	SRUM001N14	Clamper, Lead Wire	(1)
108	SRLH007N08	Clamper, Lead Wire	(1)
109	EMCM0201S	Shorting Pin	(2)
110	SRDJ001N10E	Connector Ass'y (10 pin)	(1)
SCREWS, WASHERS AND NUTS			
N1	XNSS12	Nut, ϕ8	(1)
N2	XTV3 + 10G	Screw, ⊕3 × 10	(6)
N3	XTV3 + 6JFYR	Screw, ⊕3 × 6	(4)
N4 ○	SRXG007N10	Screw (Silver)	(4)
N4 Ⓚ	SRXG007N51	Screw (Black)	(4)
N5	XTV3 + 6JFZ	Screw, ⊕3 × 6	(4)
N6	XTV3 + 6J	Screw, ⊕3 × 6	(8)
N7	XTV3 + 8JFZ	Screw, ⊕3 × 8	(2)
N8	XTV3 + 14J	Screw, ⊕3 × 14	(1)
N9	SRXG001N02	Screw	(2)
N10	SRXG001N01	Screw	(1)
N11	XWA3A	Washer, ϕ3	(1)
N12	XNG3F	Nut, ϕ3	(1)
N13	SFXGB20 – 01	Screw	(2)
N14	SRXG007N02	Screw	(1)
N15	XWE4A8BW	Washer, ϕ4	(1)
N16	XTN2 + 6J	Screw, ⊕2 × 6	(2)
N17	XTN3 + 8J	Screw, ⊕3 × 8	(2)
N18	XXE26D5FZ	Screw	(1)
N19	GTW – 3	Washer	(1)
N20	SRXW007N03	Washer	(1)
N21	XYN3 + 6S	Screw, ⊕3 × 6	(3)
N22	XYC3 + CG10	Screw, ⊕3 × 10	(1)
N23	SRUP001N10	Washer	(4)
N24	XNG26H	Nut, ϕ2.6	(4)
N25	XYE3 + EJ8	Screw, ⊕3 × 8	(2)
N26	XYN3 + C8	Screw, ⊕3 × 8	(3)

Ref. No.	Part No.	Description	
SCREWS, WASHERS AND NUTS			
N27	XUC3FZ	Clip	(2)
N28	XSN3 + 12	Screw, ⊕3 × 12	(1)
N29	XTN3 + 6J	Screw, ⊕3 × 6	(2)
N30	XTV3 + 8G	Screw, ⊕3 × 8	(1)
N31	SRXW007N02	Washer	(1)
ACCESSORIES			
A1 [M]	SRNU002M01	Instruction Book	(1)
A1 [MC]	SRNU002C01R	Instruction Book	(1)
A1 [EK]	SRNU002G01	Instruction Book	(1)
A1 [Ei]	SRNU002I01	Instruction Book	(1)
A1 [E, EB, EH, EC]	SRNU002S01R	Instruction Book	(1)
A1 [EG, EF, XL, XZ, XA, XM]	SRNU002X01	Instruction Book	(1)
A1 [PA, PE, PC]	SRNU002P01	Instruction Book	(1)
A2	SFDHC05N01	Output Cord	(1)
A3 ⚠ [M, MC]	SFDAC05M01	AC Cord	(1)
A3 ⚠ [E, EB, EH, EC, Ei, EG, EF]	SFDAC05E02	AC Cord	(1)
A3 ⚠ [XA, XM]	SFDAC05X01	AC Cord	(1)
A3 [EK] ⚠	SFDAC05G02	AC Cord	(1)
A3 [XL] ⚠	SFDAC05L01	AC Cord	(1)
A3 [XZ] ⚠	SRDA007L01	AC Cord	(1)
A3 ⚠ [PA, PE, PC]	SFDAC05N01	AC Cord	(1)
A4 ⚠ [XA, XM]	SFDKI19118	Plug	(1)
A5 ⚠ [PA, PE, PC]	QJP0603S	Adaptor	(1)
A6 [M, MC]	UM – 4NEP – 2P	Battery	(2)
A6 [other areas]	UM – 4NE – 2P	Battery	(2)
PACKING PARTS			
P1 ○ [MC, EF]	SRHP002C01	Carton Box (Silver Type)	(1)

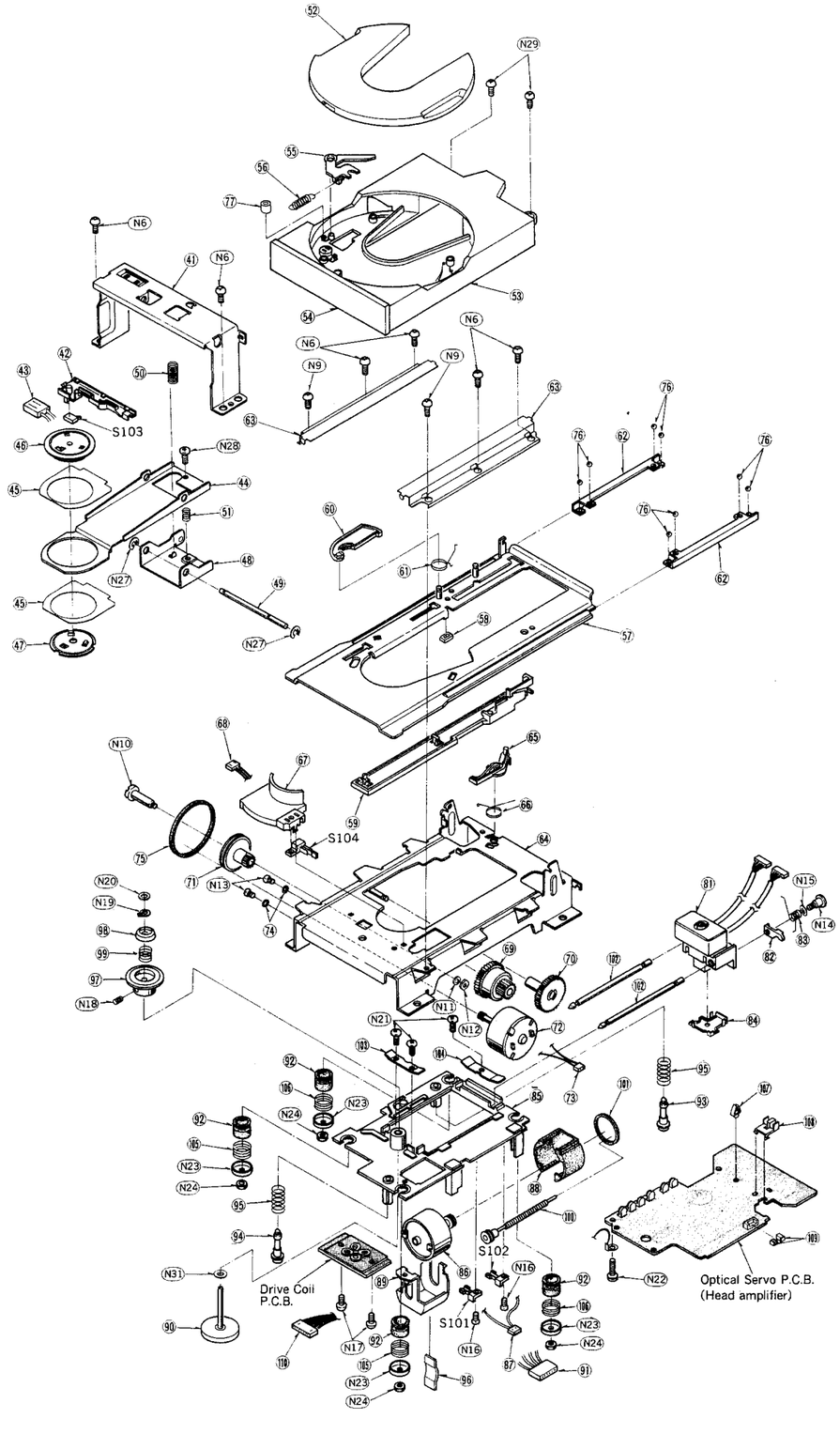
Ref. No.		Part No.	Description	
PACKING PARTS				
P1	○	SRHP002M01	Carton Box (Silver Type)	(1)
[other areas]				
P1	Ⓚ	SRHP002C21	Carton Box (Black Type)	(1)
[MC, EF]				
P1	Ⓚ	SRHP002M21	Carton Box (Black Type)	(1)
[other areas]				
P2		SRHH001N01	Pad, Front	(1)
P3		SRHH001N02	Pad, Rear	(1)
P4		SFYH60X60	Polyethylene Bag, Unit	(1)
P5		SFYF23A35	Polyethylene Bag, Accessories	(1)
P6		SRNZ007M03	Causion Label, Clamp	(1)
P7		SRHZJ02N01	Polyethylen Bag, Remote Control	(1)
REMOTE CONTROL UNIT PARTS				
121		UR50PP440A	Display Panel	
122	○	UR50CS437	Top Cover (Silver Type)	
122	Ⓚ	UR50CS437A	Top Cover (Black Type)	
123		URC180TD10A	Terminal	
124		UR50TD151	Terminal (–)	
125		UR50TD150	Terminal (+)	
126		UR50CB24	Cover	
127		UR50CT147G	Button, Switch	
128	○	UR50CS438	Bottom Cover (Silver Type)	
128	Ⓚ	UR50CS438A	Bottom Cover (Black Type)	
129	○	UR50EC144C	Battery Cover (Silver Type)	
129	Ⓚ	UR50EC144B	Battery Cover (Black Type)	
130 [M, MC]		UR50LB447	Name Plate	
130 [other areas]		UR50LB448	Name Plate	
SCREW AND NUT				
N1	○	XSS26 + 12FC	Screw, 2.6 + 12 (Silver Type)	
N1	Ⓚ	XSS26 + 12FZ	Screw, 2.6 + 12 (Black Type)	
N2		XNG26B	Nut, ϕ2.6	

■ EXPLODED VIEW

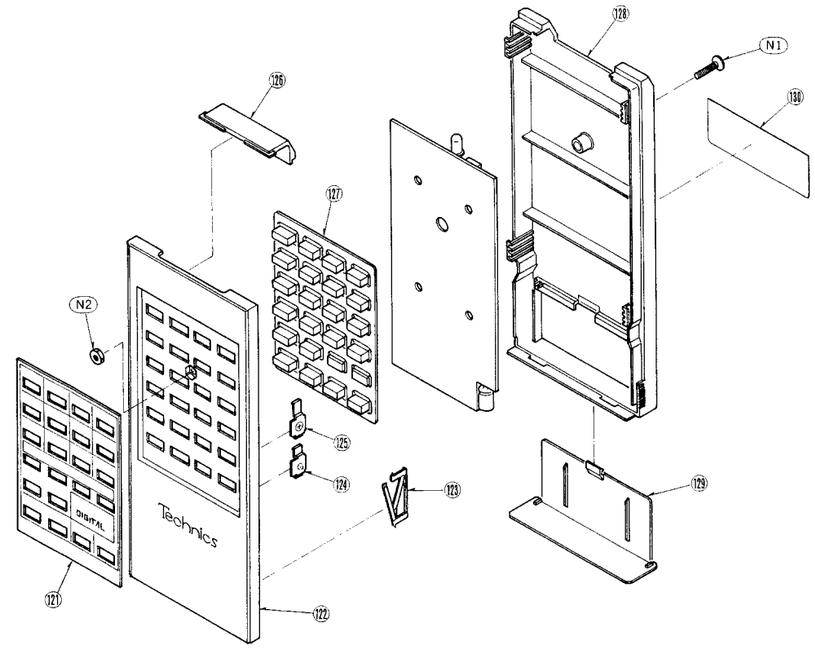
- **Cabinet and chassis parts**



- **Loading drive mechanism and optical deck unit parts**



- **Remote control unit parts**

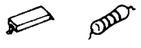


■ HOW TO REPLACE CHIPS

(Resistor, capacitor and jumper)

- **Removing procedure**

1. Completely remove the solder from both ends of the chip by use of solder sucker.
2. Touch the soldering iron to the end of the chip as shown in Fig. 22, then turn the tweezers in the direction of the arrow.



Witout color cord With color cord

Chip resistor

Do not re-use chip resistor or capacitor without color cord.

- **Replacing procedure**

1. Place solder on the foil where the chip is fitted.
   Then solder the chip by holding the soldering iron as shown in Fig. 23.

Note:

1. If the chip jumper is removed, connect a coated lead wire to the part. (See Fig. 24).
   Chip jumper is marked with "J" on the printed circuit board.

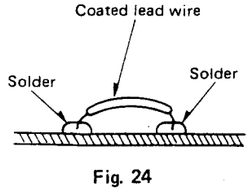


Fig. 24

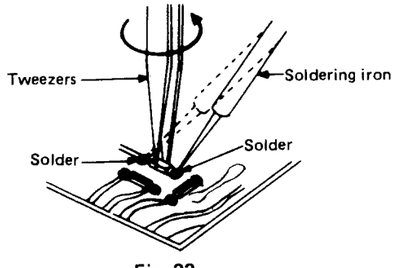


Fig. 22

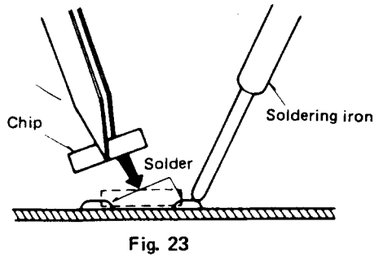
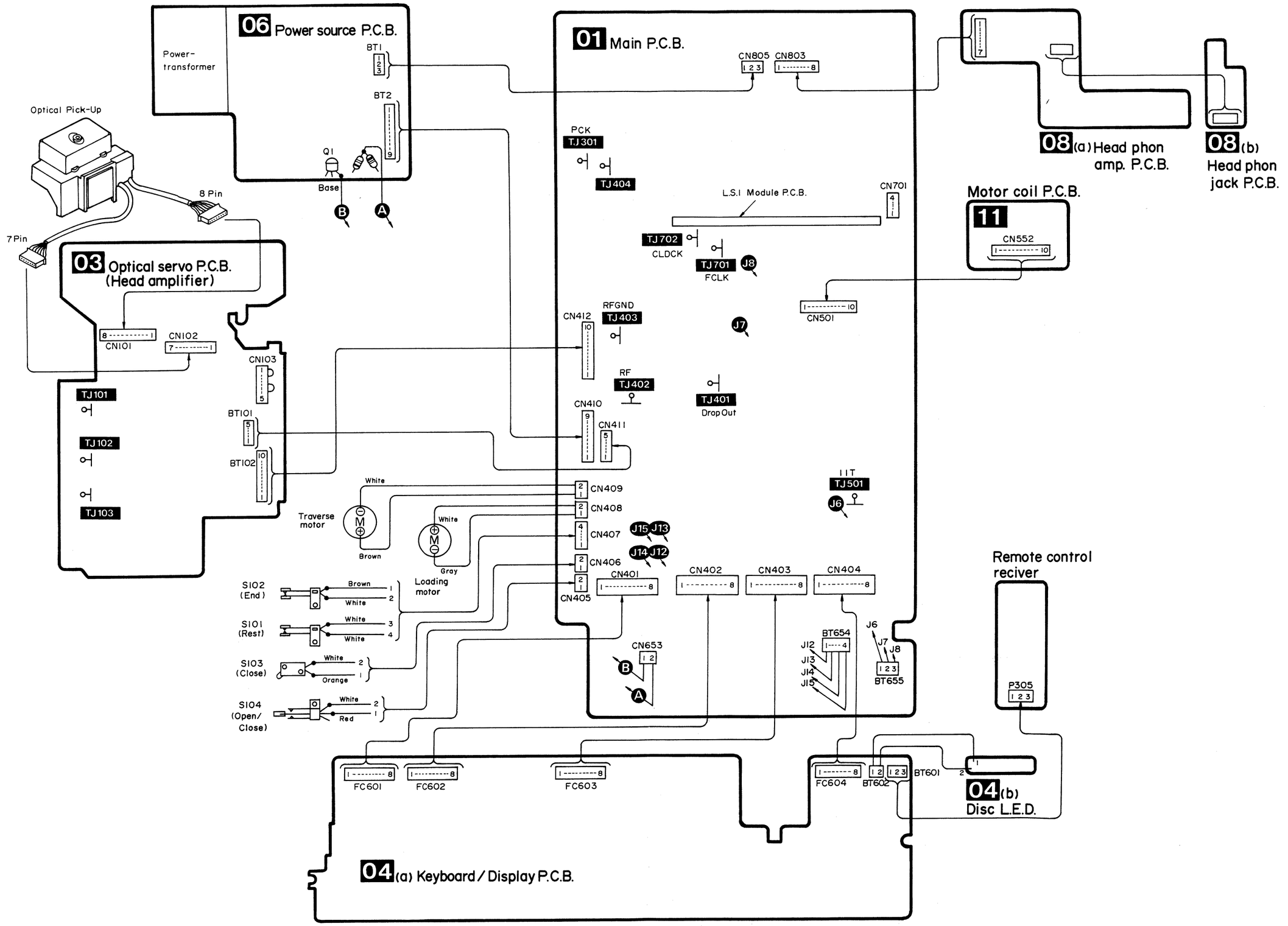


Fig. 23

- **Note for replacing chips**

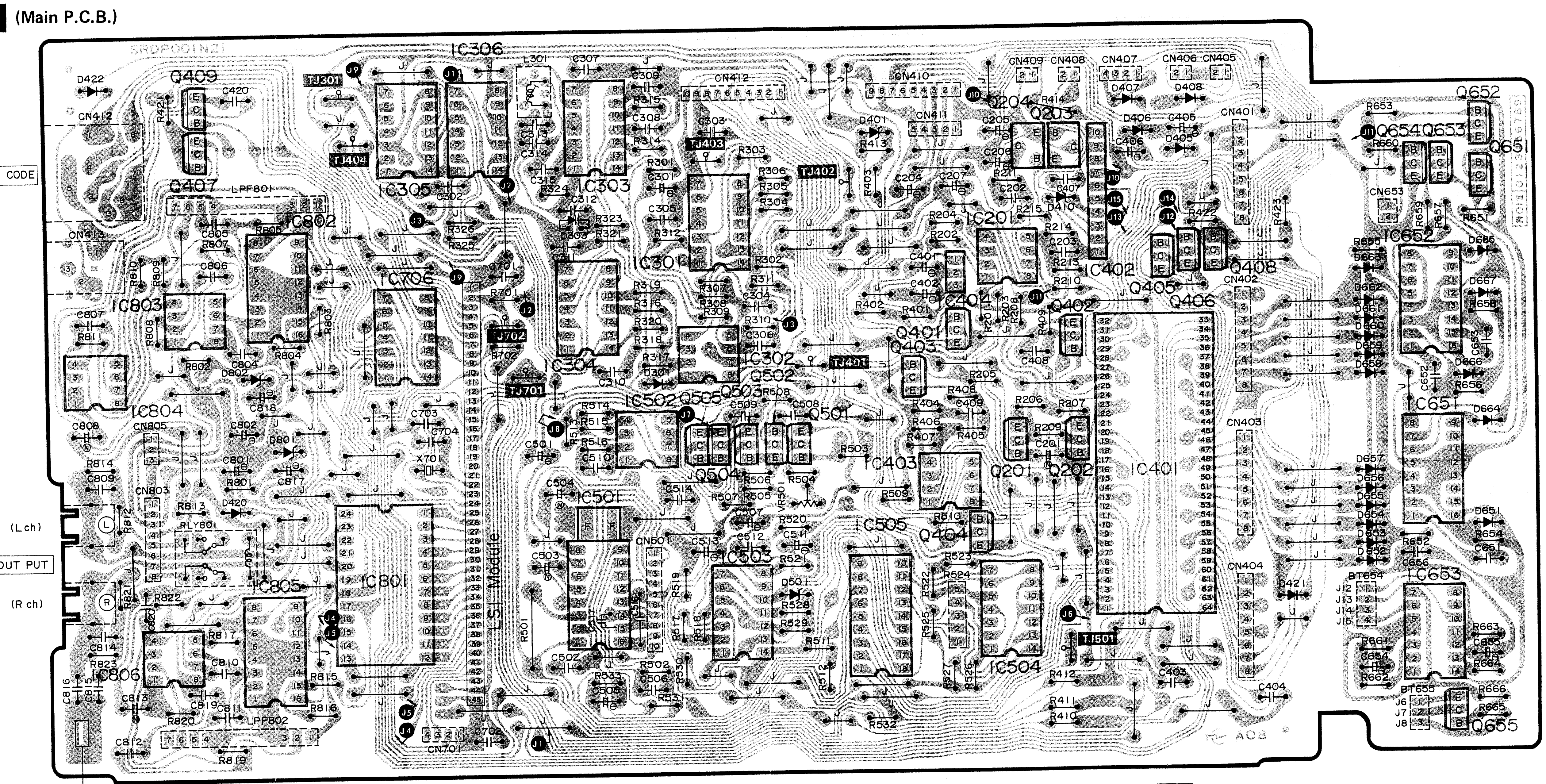
1. Do not heat the chip more than 3 seconds.
2. Do not rub the electrode against the chip.
3. Use the tweezers with care not to damage the surface of the chip.
4. It is desirable to use a pencil type soldering iron. And use soldering iron less than 60W.

■ PRINTED CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

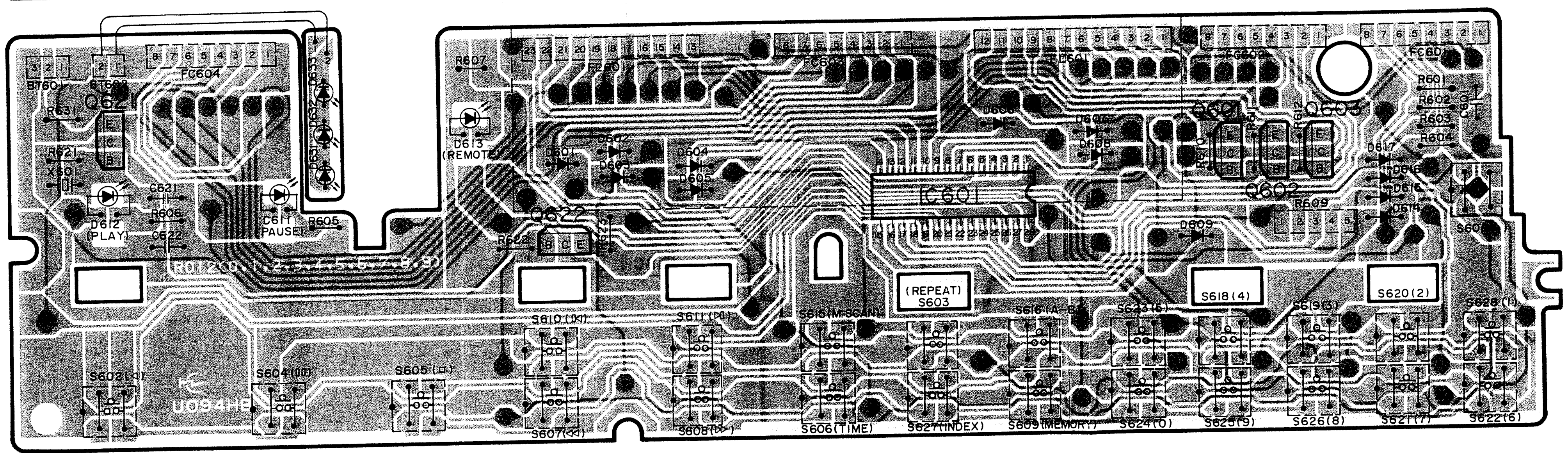


■ PRINTED CIRCUIT BOARDS

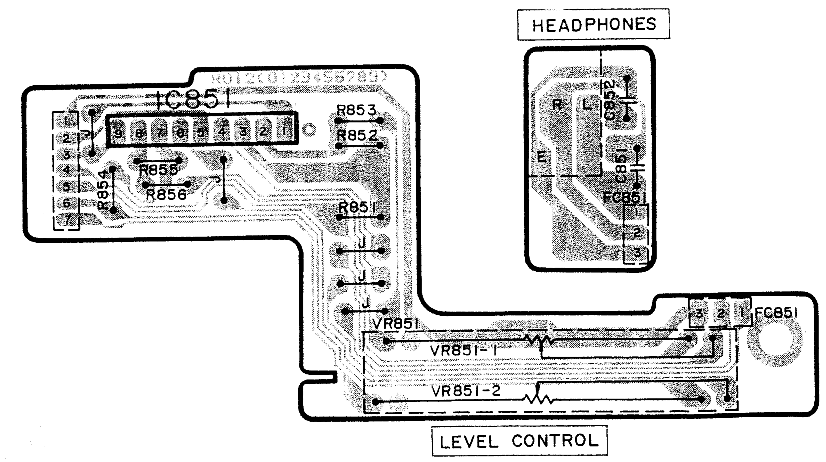
01 (Main P.C.B.)



04 (Keyboard/Display P.C.B.)

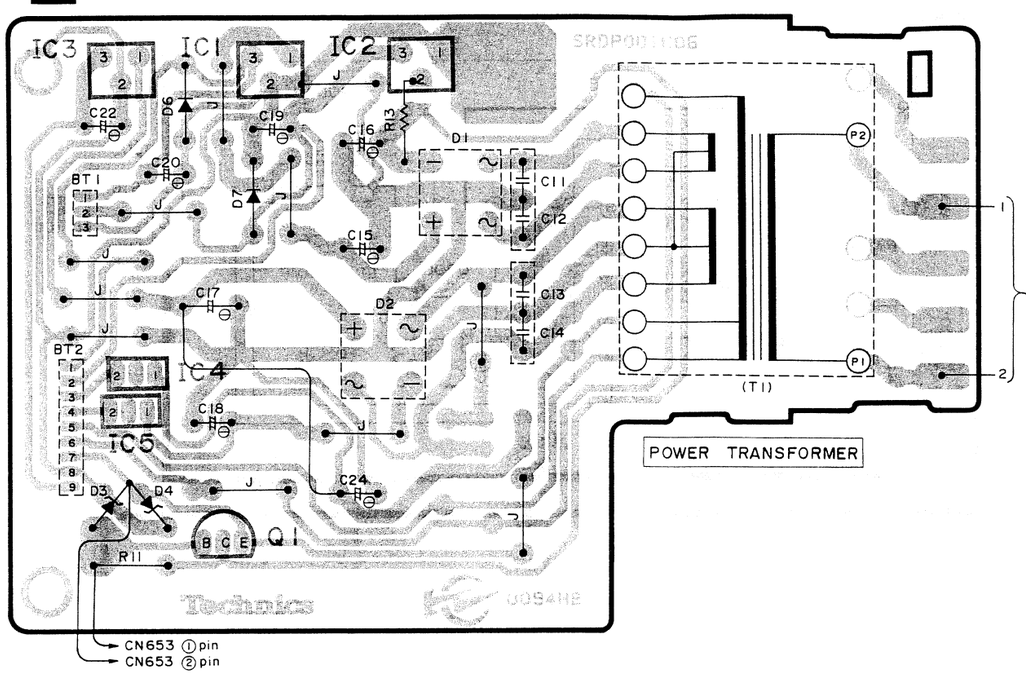


08 (Headphone amplifier P.C.B.)

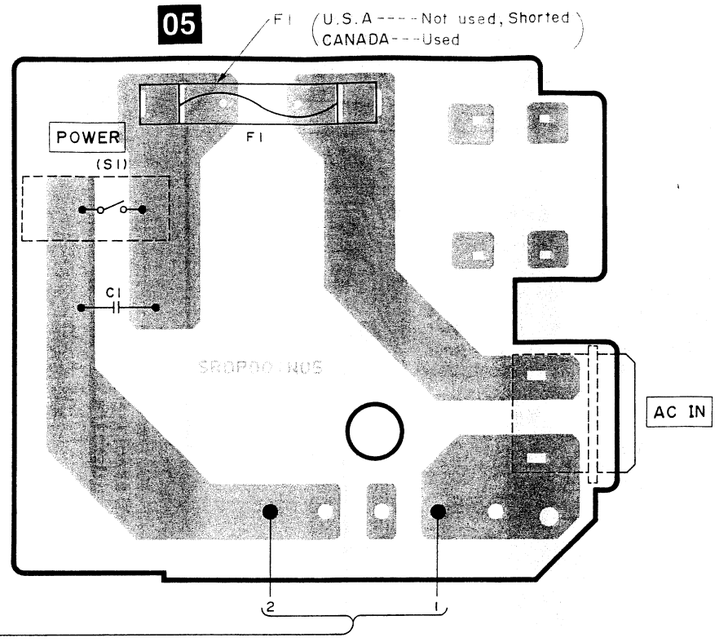


- Power source P.C.B. (For U.S.A. and Canada.)

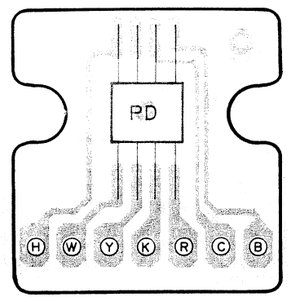
06



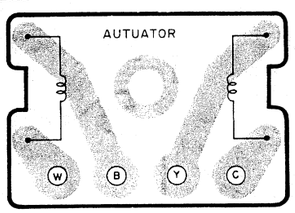
05



32 (Photo detector P.C.B.)

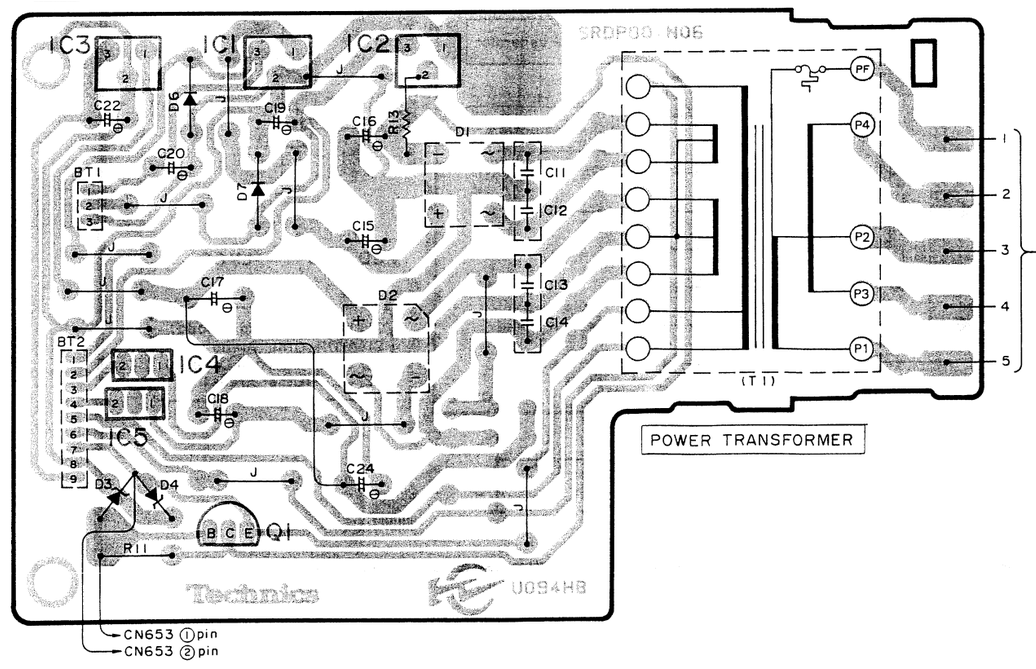


33 (Actuator coil P.C.B.)

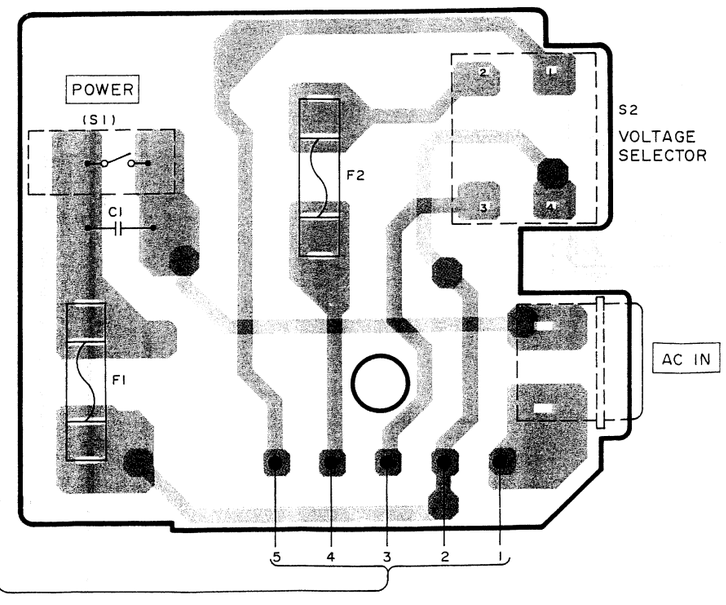


- Power source P.C.B. (For others.)

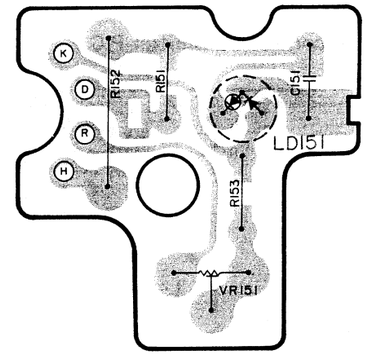
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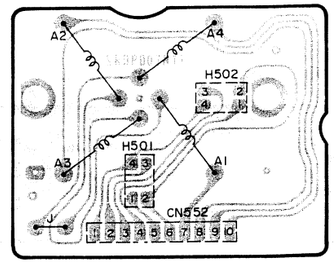
05



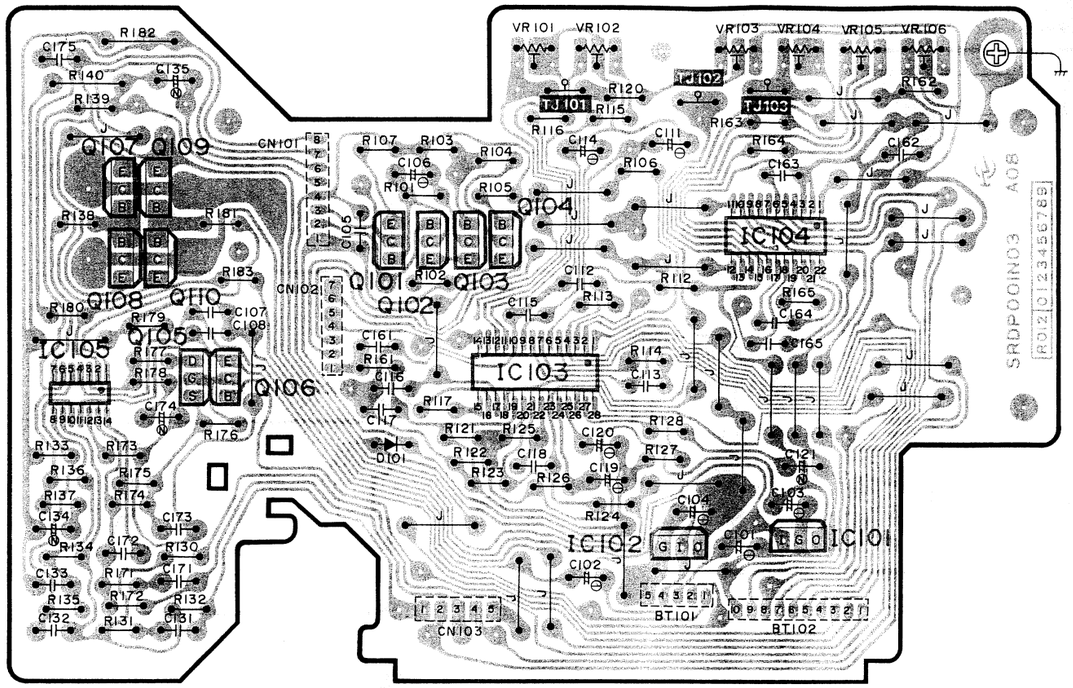
35 (Laser P.C.B.)



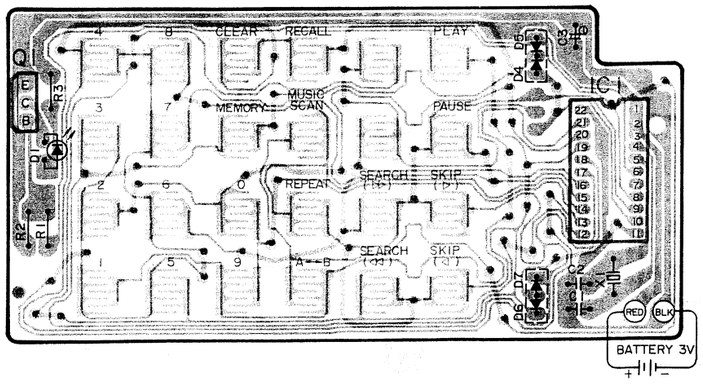
11 (Spindle motor drive coil P.C.B.)



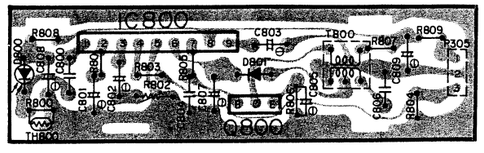
03 (Optical servo P.C.B.)



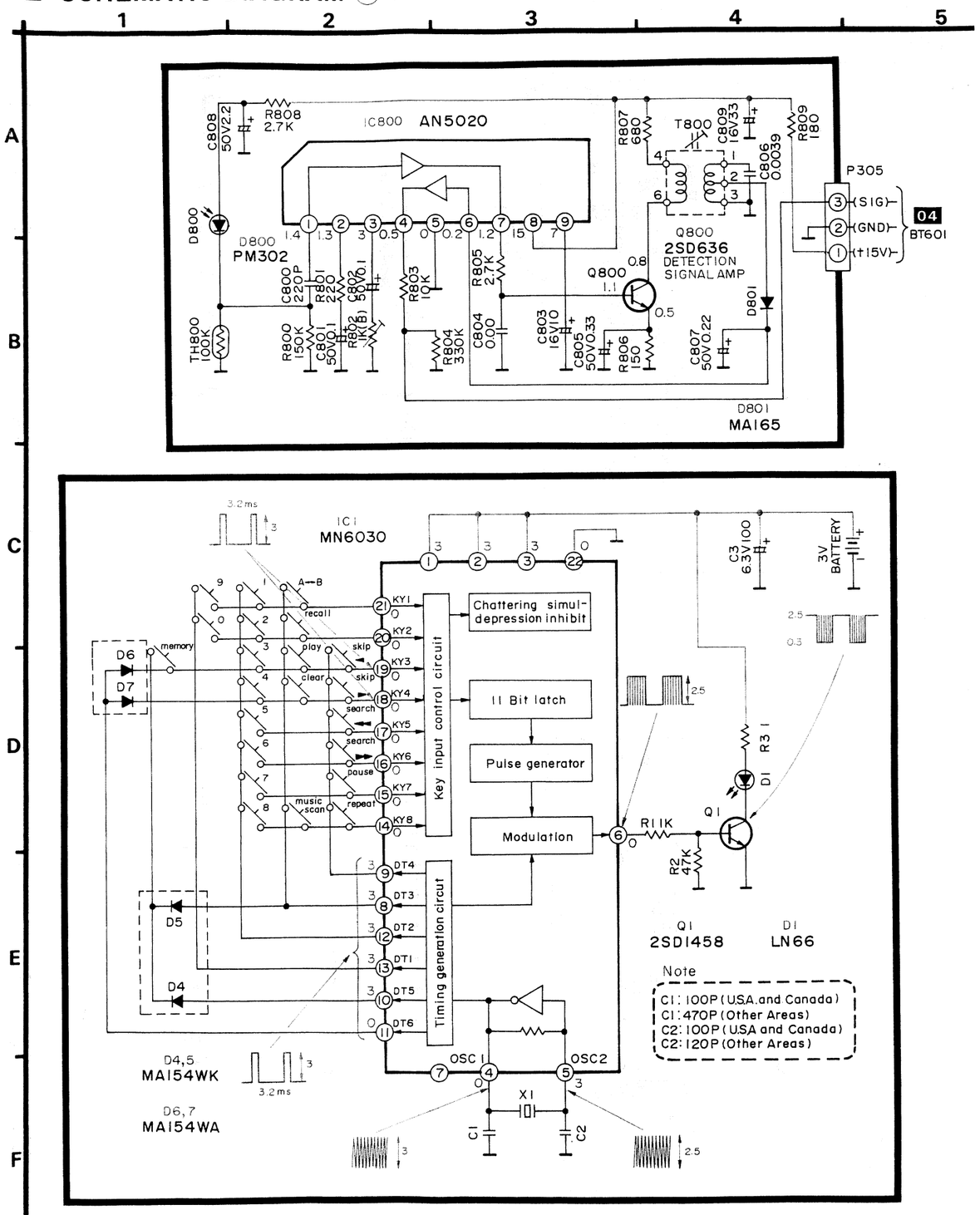
- **Remote control transmitter P.C.B.**



- **Remote control receiver P.C.B.**



■ SCHEMATIC DIAGRAM Ⓐ (Remote control circuit)



Note:

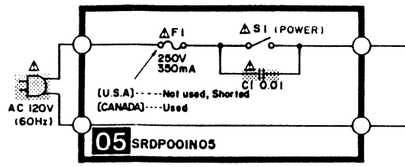
1. The voltage value is the standards of this unit measured by DC electronic voltmeter (high impedance).
2. The waveform are those generated during signal transmission. ("play" button depressed for signal transmission.)
3. This schematic diagram may be modified at any time with the development of new technology.
4. — : +B voltage line.

■ SCHEMATIC DIAGRAM Ⓑ

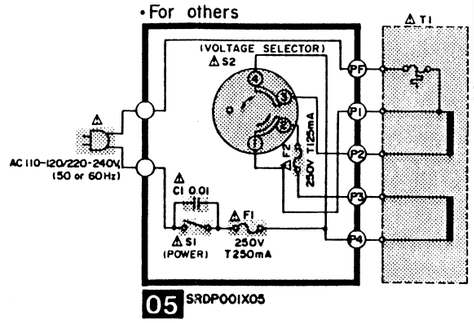
Notes:

1. **S1** : Power switch
2. **S2** : Voltage selector switch. (Except for [M], [MC] areas.)
3. **S101** : Rest switch. (Disc innermost position detection.)
4. **S102** : End switch. (Disc outside detection.)
5. **S103** : Disc holder close detection switch.
6. **S104** : Disc holder open detection switch.
7. **S601** : Disc holder open/close switch.
8. **S602** : Play (start) switch.
9. **S603** : Repeat switch
10. **S604** : Pause switch
11. **S605** : Stop switch
12. **S606** : Remaining time switch.
13. **S607** : Forward search switch.
14. **S608** : Backward search switch.
15. **S609** : Memory switch
16. **S610** : Forward skip switch.
17. **S611** : Backward skip switch.
18. **S615** : Music scan switch.
19. **S616** : A – B repeat switch.
20. **S618 ~ S626** : Nemeric switch.
21. **S627** : Index switch
22. **S628** : Nemeric (No. 1) switch.
23. This schematic diagram may be modified at any time with the development of new technology.
24. The voltage value, and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in the voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
    * The parenthesized are the values of voltage generated during playing. Others are the voltage values in stop mode.
25. Part No. with ✪ mark are not identical between regular part No. and repair part No. supplied. So, when placing an order for repair parts, use the part No. in the replacement part list of repair parts.
26. ——— : +B voltage lines ..... : Audio signal lines
    ——— : –B voltage lines.
27. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety.

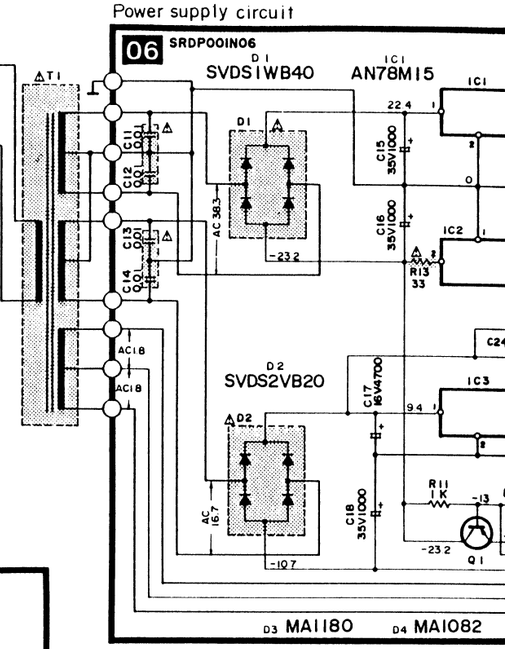
• For U.S.A and Canada

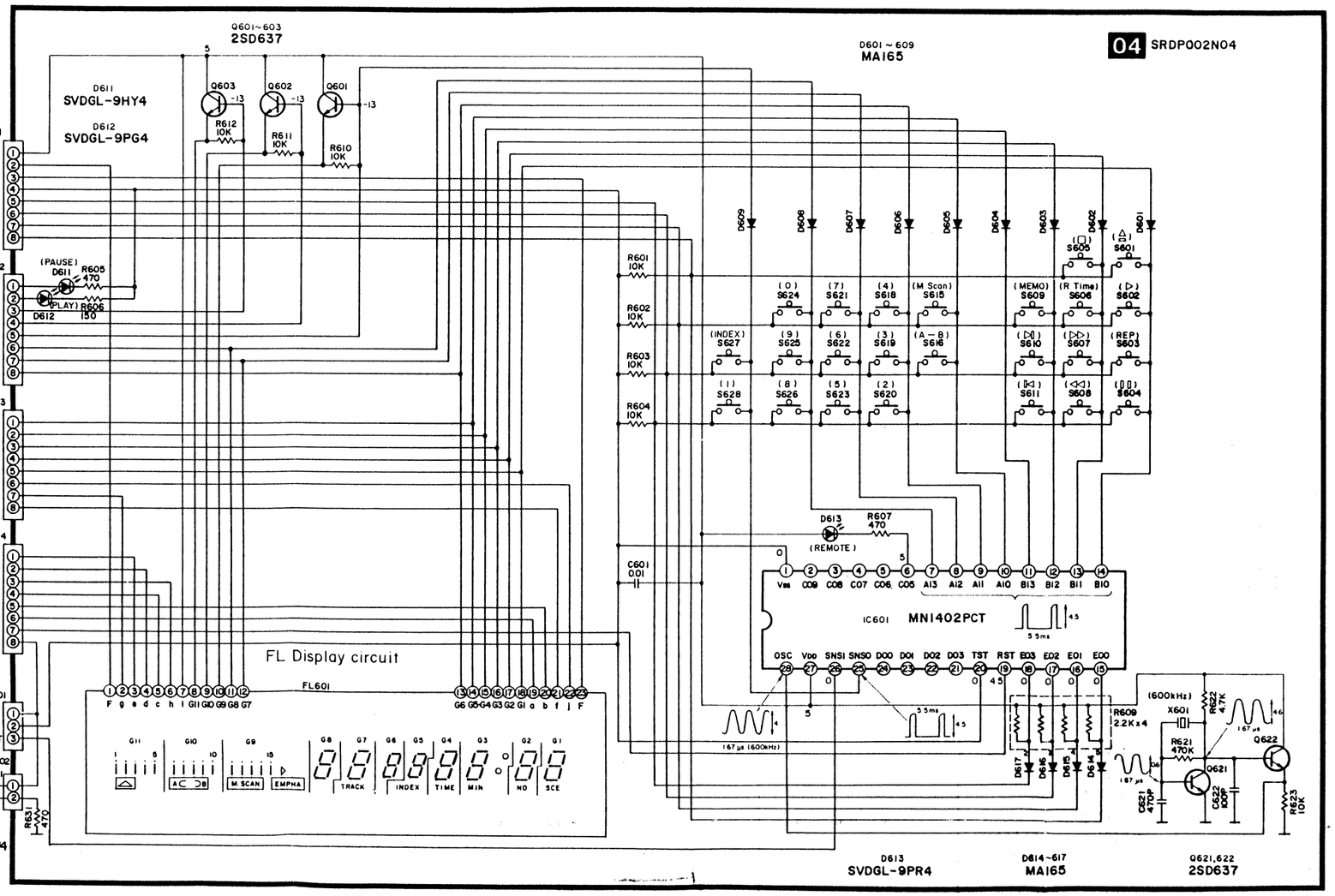


• For others



Power supply circuit





• Product for MC only

FUSE REPLACEMENT

Symbol located near the fuse indica
fast operating type. For continued protecti
against fire hazard, replace with same type fu
Refer to the symbol for fuse rating.

FUSIBLE REMPLACEMENT

Le symbole qui se trouve près du fusi
singifie un fusible à action rapide. Pour u
protection contiue contre les risques d'incend
n'utiliser que des fusibles du même type.
rapporter au symbole pour la valeur des fusib

IMPORTANT SAFETY NOTICE

The shaded area on this schematic diagram incor
porates special features important for protectio
from fire and electrical shock hazards.
When servicing it is essential that only manufactur
er's specified parts be used for the critical com
ponents in the shaded areas of the schematic.

10 11 12 13 14 15 16 17 18 19

IC1 AN78M15 IC2 AN79N15 IC3 AN7805

D6,7 MAI50

IC4,5 SVIICP-FI5

D4 MAI082

Q1 2SA564A

BT101 BT102

IC102 AN79N05

IC101 AN78L05

DI01 MAI65

IC104 AN7678S

IC103 AN7677S

Focus servo

Focus offset adj.

Focus gain adj.

Focus balance adj.

Tracking balance adj.

Tracking servo

Traking gain adj

Tracking offset adj.

Focus error amp

Actuator drive

IC105 AN6554S

Tracking control

Tracking error amp.

Laser power control

Q107,109 2SD973A

Q108,110 2SB793A

Q105 2SK301

Q106 UN4212

Q101 2SD638

Q102,103,104 2SB641

03 SRDP001N03

SRDP007N32

SRLP007N01A
OPTICAL PICK-UP ASSY

SRDP007N35

SRDP007N33

ACTUATOR

11 SRDP007N11

H501, 502 OH-001

CN501 CN411 CN410 CN412 CN805

08 SRDP002N08

HEADPHON LEVEL

FC851 HEAD PHONES

only

PLACEMENT

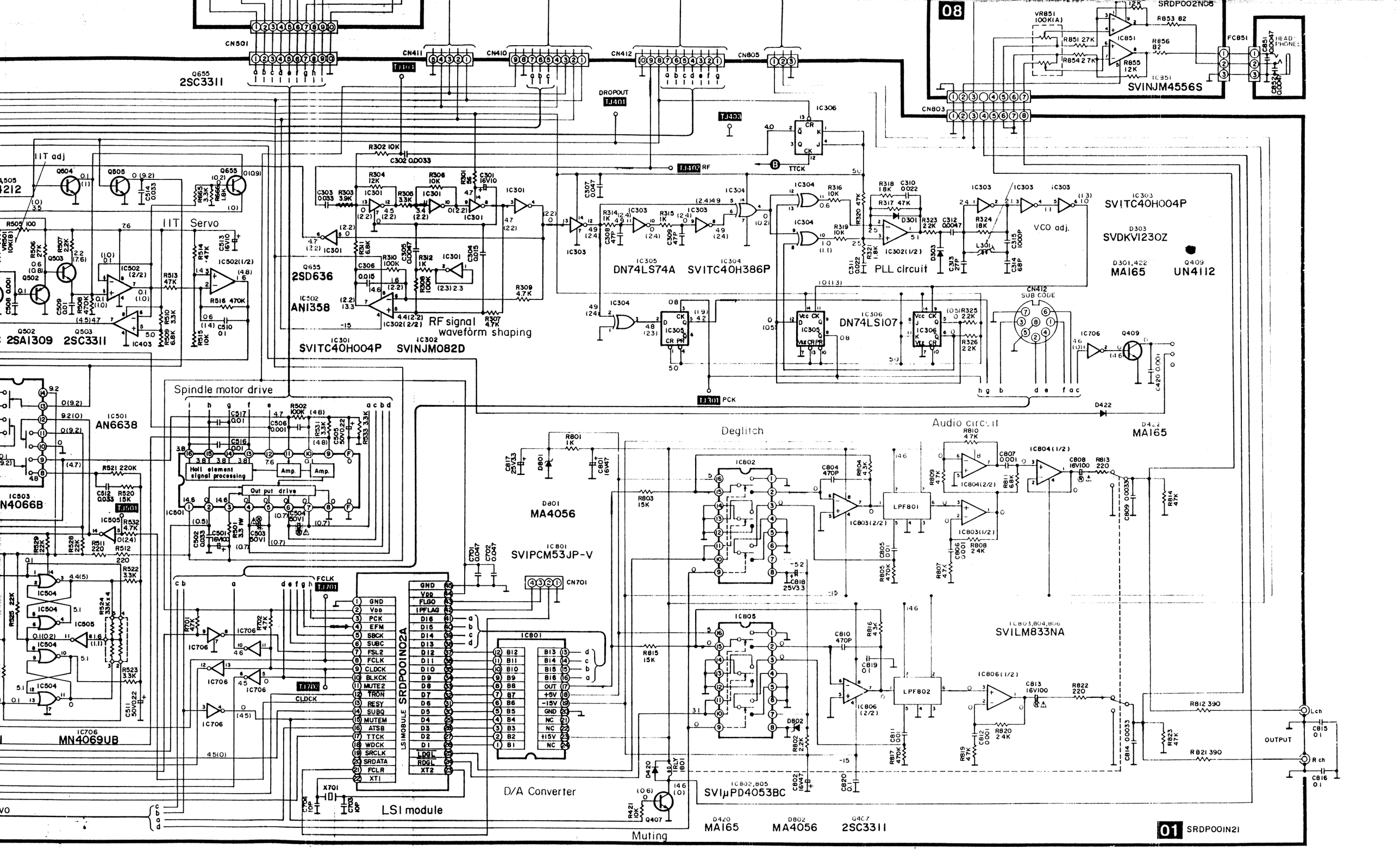
near the fuse indicates For continued protection place with same type fuse. or fuse rating.

EMPLACEMENT

se trouve près du fusible action rapide. Pour une ntre les risques d'incendie, ibles du même type. Se pour la valeur des fusibles.

SAFETY NOTICE

s schematic diagram incor- important for protection shock hazards. ntial that only manufactur- used for the critical com- nes of the schematic.



• LSI Module

NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24,25	26	27	28~41	42	43	44	45
STOP	0	4.6	0.23μsec (4.32MHz)	0.5μsec 2V/DIV	0	0	0	136μsec (7.35kHz)	136μsec (7.35kHz)	0	0	4.7	0	50μsec 2V/DIV	0	4.6	0.23μsec (4.32MHz)	11.6msec	0.46μsec (8.64MHz)	11.6msec	136μsec	3.4Vp-p	0.2μsec DIV	22.7msec	4.4	0	0	4.4	4.4	4.6	0
PLAY	0	4.6			0	13.2msec	4.6			13.2msec	4.6	0	3.1		4.5	0				0.2msec/μs					1msec		5μsec/DIV	20μsec/DIV	136μsec	4.6	0

D631,632,633
SVDSLR-54MW4

D613
SVDGL-9PR4

D614-617
MA165

Q621,622
2SD637

Traverse servo

Loading motor drive

CN408
LOADING MOTOR

Q203
2SD1266

IC402
SVIBA6209
Direction select
Amp
Drive
Speed designation

C202 0.068
C207 16V10
R211 100K
R215 100
IC201 (2/2)
R210 56K
R214 100K
C203 0.068
R213 56K
C205 16V33
C407 0.047
D410
MA4056

CN409
TRAVERSE MOTOR

Q204
IC201
AN4558

CN407
SI01 REST
SI02 END
SI03 CLOSE
SI04 OPEN
CN405
CN401

C201 16V10
C206 16V33
Q204
2SB941
D407
D407,408,421
MA165
D408
D405,406
SVDISR35200V
Q408
2SA1309
C405 10V100
D405
C406 10V100
D421
R422 10K
R423 4.7K

Q405,406
UN4112
Q406
Q405

System control

IC653
MN4023

CN402
CN403
CN404
CN653
Q1, Ⓑ
D1, Ⓚ

D651 ~ 667
MA165
IC651,652
MN4538
Q651~654
2SA1309

C651 0.001
R654 330K
D651
IC651
R651 10K
C656 0.1
D652
D653
D654
D655
D656
D657
D658
D659
R652 10K
D660
D661
D662
C652 0.01
D666
D664
D665
C653 0.018
D667
R658 330K
IC652
R657 10K
R659 10K
Q653
Q651
Q652
Q654
R653 10K
R655 10K
R656 180K
D663

R664 10K
R663 270K
C663 10V1
R662 10K
R661 270K
C661 10V1
IC653

IC401
MN15844PCQ
C403 0.047
C404 0.001
IC505
AN90B20

D401
MA4047
Q401
2SA1309
D401
R413 3.3K
R403 1K
R401 2.2K
R402 1K
IC404
AN78L05
C402 6.3V100
C401 16V33
R208 4.7K
Q201,202
2SC3311
Q202
Q201
R205 4.7K
R207 1.5K
R206 1.5K
R208 10K
C201 25V3.3
IC403
AN1393
Q403
UN4112
R408 22K
R407 100K
R405 100K
C409 330P
R404 18K
R406 100K
Wave from shaping
Q402
UN4212
R409 27K
C408 0.047
Q404
UN4112
R203 100K
R204 100K
IC201(1/2)
R201 100K
R202 100K
PLAY SW AT ON
STOP SW AT ON
136µsec
R412 22K
R411 2.2K
R410 22K

TTCK
11T adj
Q504,505
UN4212
Q504
Q505
C514 0.033
R505 100
Q501
Q502
Q503
R503 10K
R504 15K
R506 27K
R507 22K
C506 0.001
C509 0.001
R508 470K
IC502 (2/2)
R513 47K
R510 3.3K
R509 6.8K
IC403
Q501 Q502 Q503
2SC641PKC 2SA1309 2SC3311

R519 680K
R517 47K
R518 820K
IC501
AN6638
IC503
MN4066B
R521 220K
C512 Q.033
R520 15K
IC505
R532 4.7K
R530 22K
R528 22K
R529 22K
R511 220
R512 220
IC504
MN4001B
R526 33K
R525 22K
R524 33K×4
R522 33K
R527 33K
R523 3.3K
D501
MA4091
IC706
MN4069UB
C511 50V0.22
R701 47K

CLV Servo

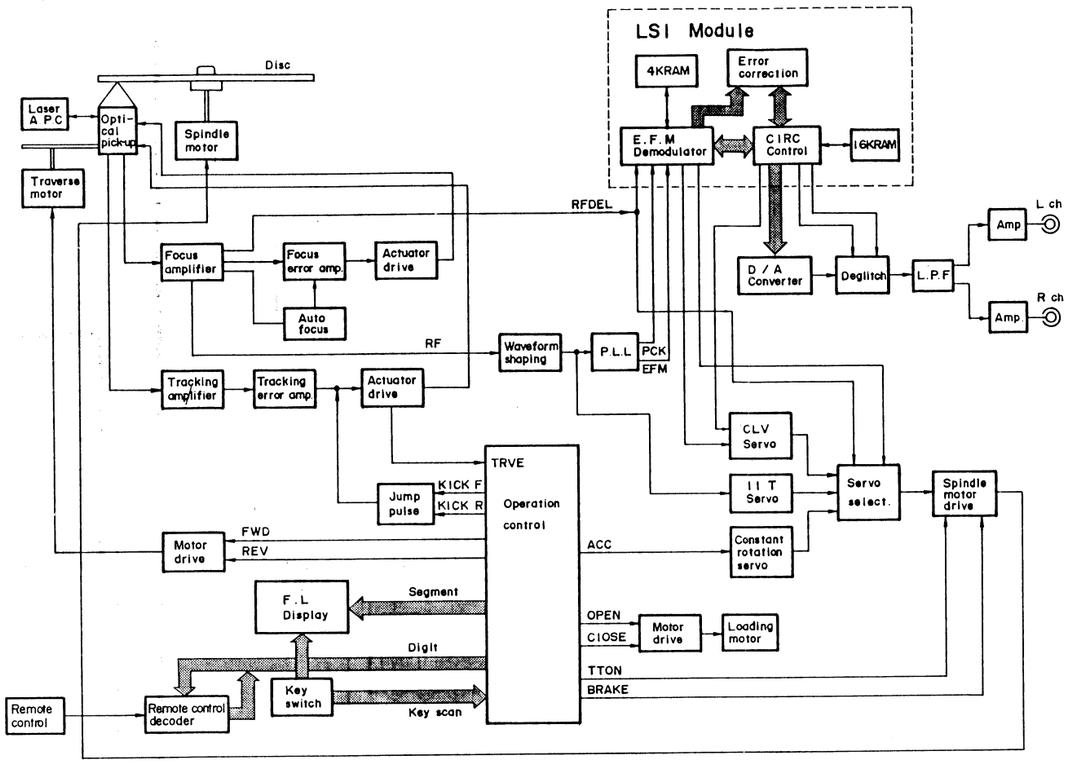
• IC401 MN15844PCQ

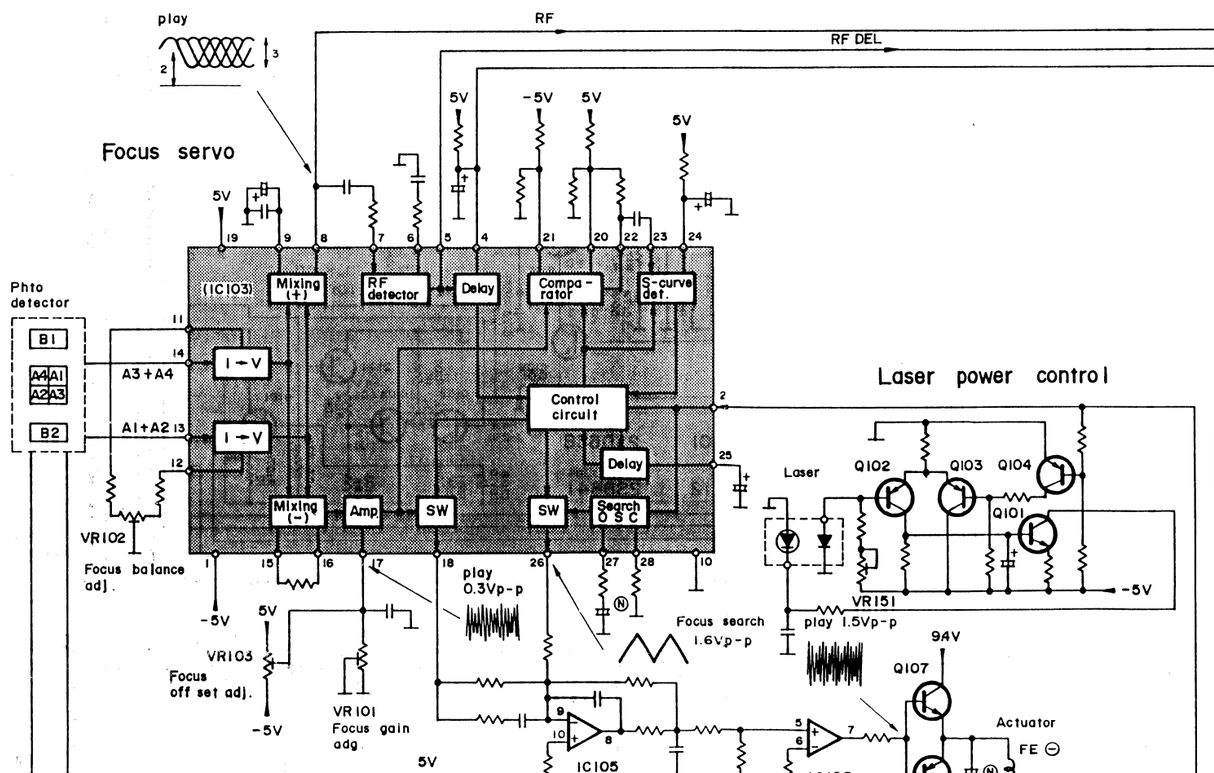
NO	1	2	3	4	5	6	7	8,9	10	11	12	13	14	15	16	17	18	19	20	21	22,23	24	25	26	27	28	29	30~32	33~35	36~38	39	40	41 ~ 51	52 ~ 60	61	62	63	64
STOP	0	4.8	0.1	0.1	0.1	4.7	4.7	0.1	2.7µsec	1.2	4.7	4.7	4.6	3.6	0.1msec 1V/DIV	0.1msec DIV	0.1msec 1V/DIV	136µsec	0.1msec 1V/DIV	10msec 1V/DIV	1.8	0	3.5	4.0	0.1	0.1	5.7msec	0.7	4.6	0	4.7	4.7	5.6msec		-16	0	0.23µsec (4.32MHz)	5.0
PLAY	0	0	0	0	0	0	4.4	0	4.4Vp-p	1.0	13msec	4.5	4.4	0							1.0	0	3.3	0	0	1.42msec		0.6	0	0	4.5	0			-16	0	3.7Vp-p	5.0

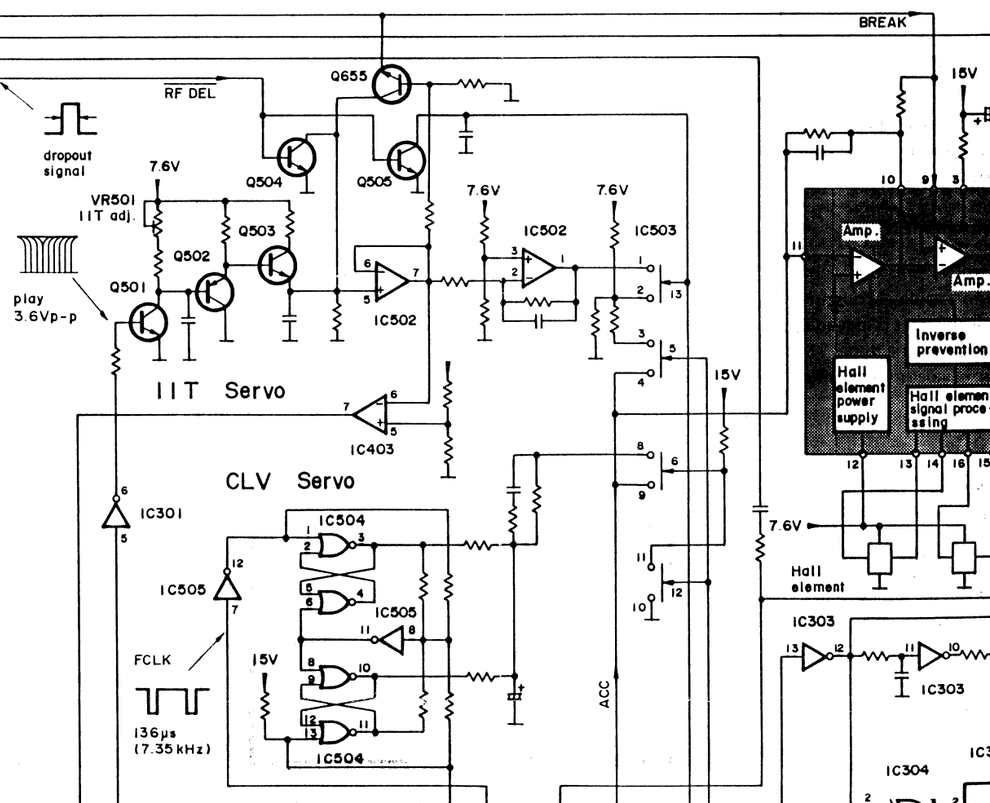
• LSI Module

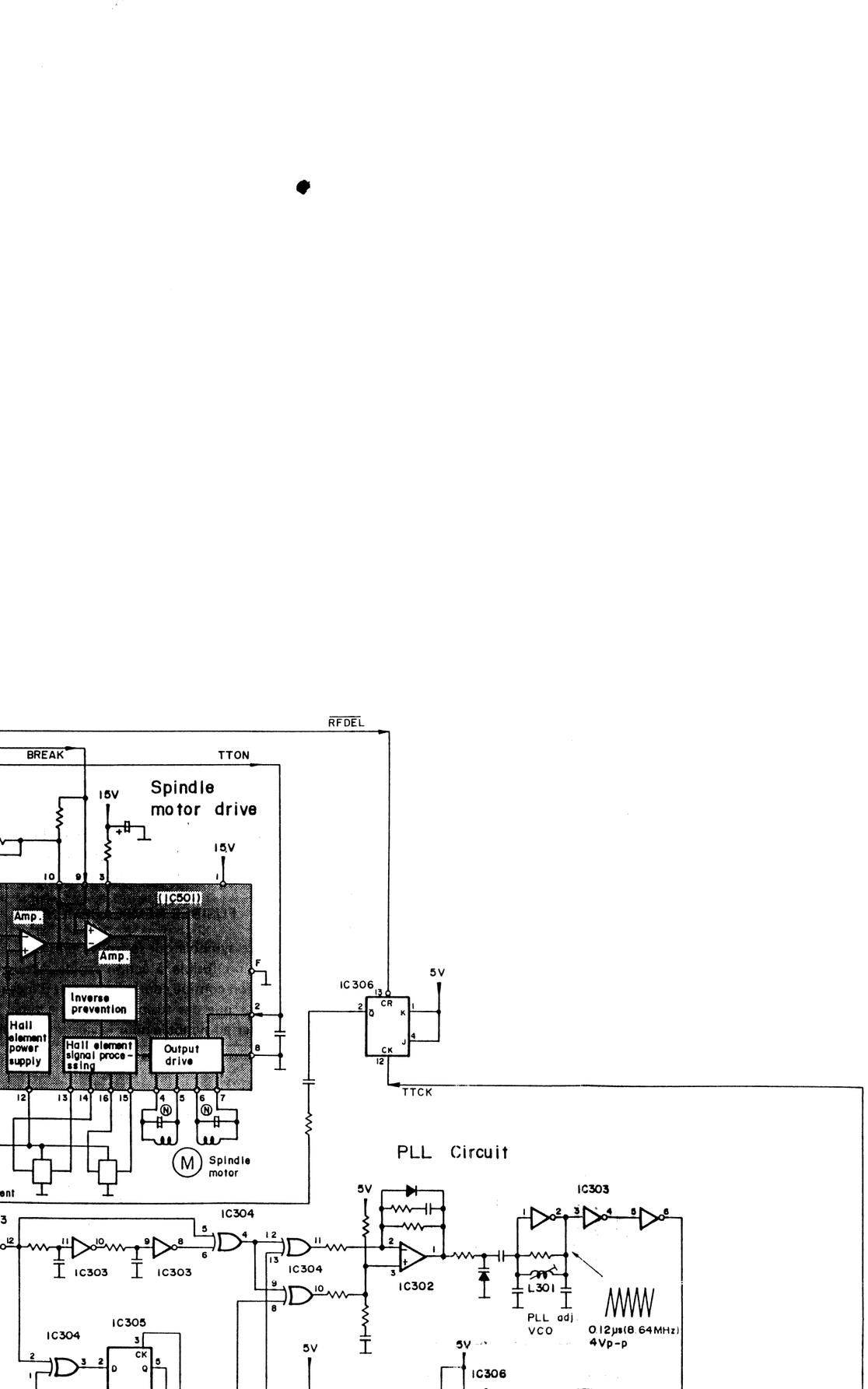
NO	1	2	3	4
STOP	0	4.6	0.23µsec (4.32MHz)	
PLAY	0	4.6		0.5µs 2V/D

■ BLOCK DIAGRAM

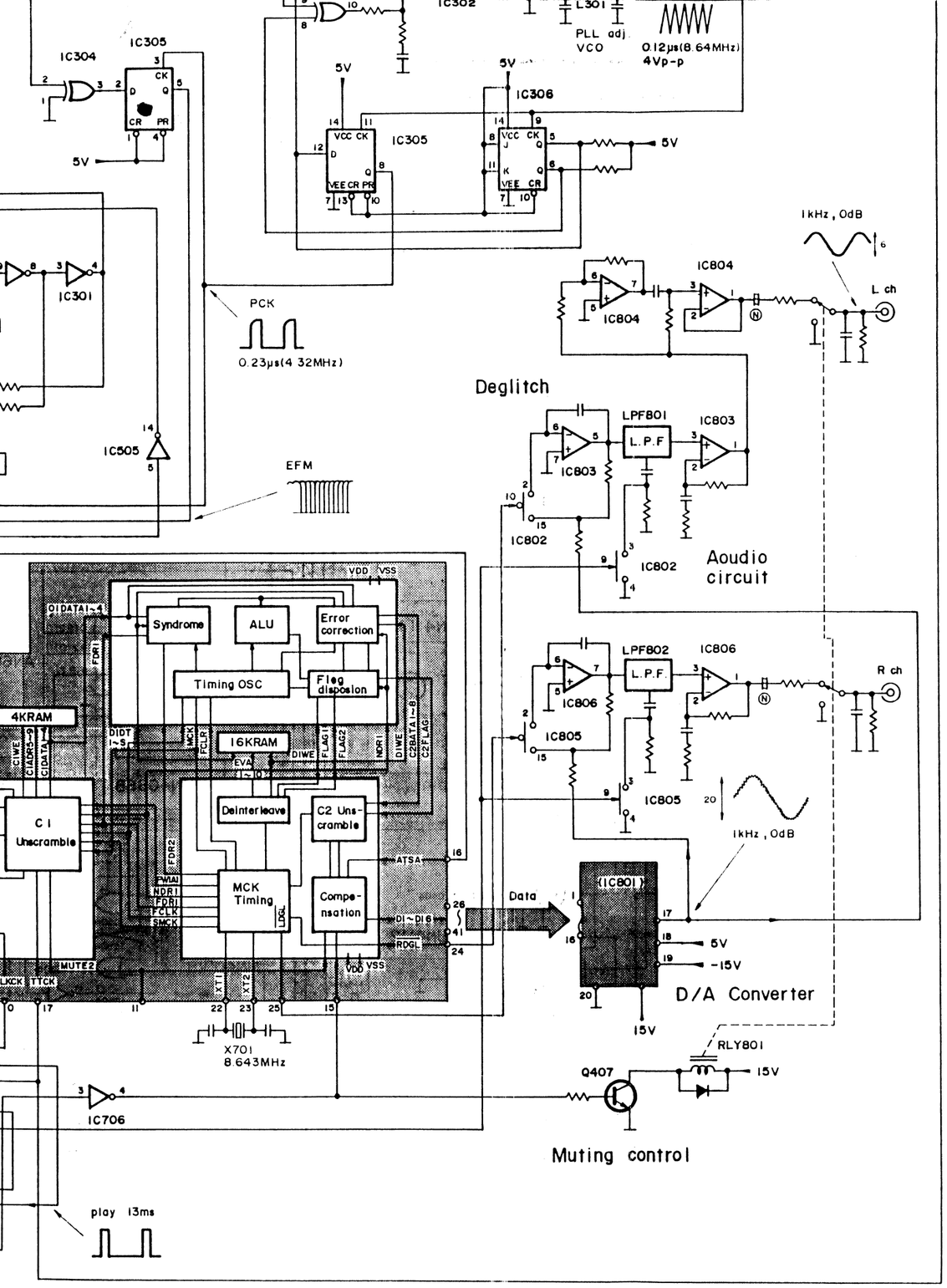







RFDEL
BREAK
TTON
Spindle
motor drive
15V
15V
IC301
Amp.
Amp.
Inverse
prevention
Hall
element
power
supply
Hall element
signal proce-
ssing
Output
drive
F
2
8
10
9
3
1
12
13
14
16
15
4
5
6
7
N
N
M
Spindle
motor
IC306
13
2
CR
D
K
1
4
J
CK
12
5V
TTCK
PLL Circuit
5V
IC303
IC304
IC303
IC303
IC304
IC302
L301
PLL adj
VCO
0.12μs(8.64MHz)
4Vp-p
IC304
IC305
CK
D
Q
5V
5V
IC306

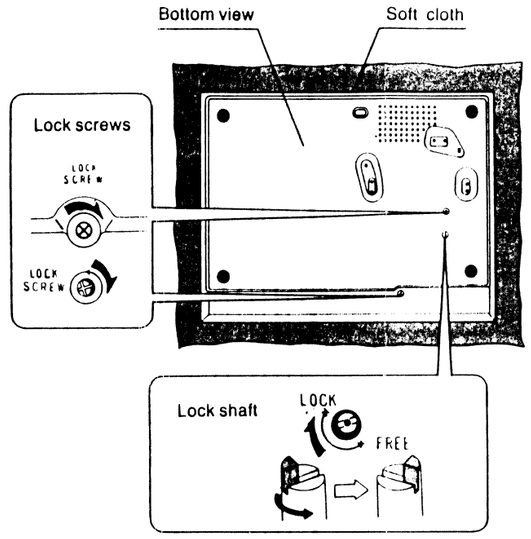
SL-P2



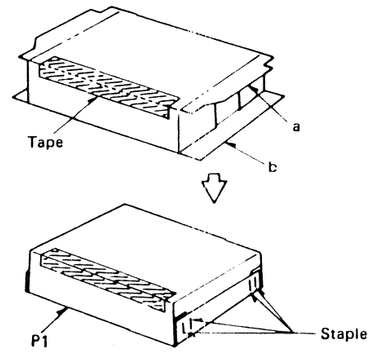
SL-P2

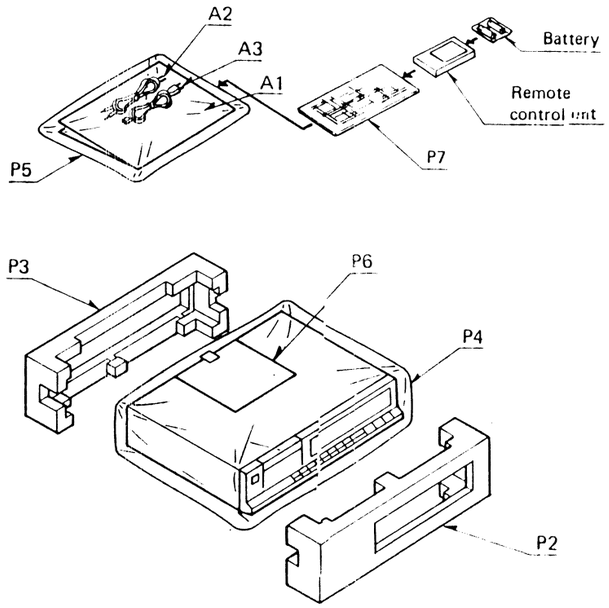
■ PACKING

1. Put a soft cloth under the unit to protect it from scrathes.
2. Turn the lock shaft 180° clockwise.
3. Turn the lock screws (about 5 to 6 times) clockwise.

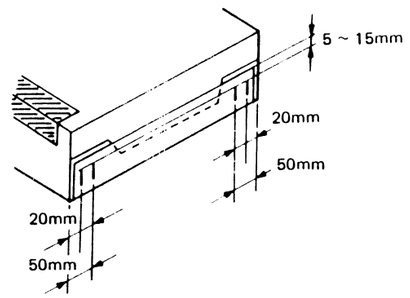


4. Plase the unit (with cushions attached, as illustrated.
5. Fold the flaps according to the line marks.
6. Seal the top with adhesive tape.
   * Use gum tape or adhesive cloth tape of 50mm wide at least.
7. For the edges, first fold the flap "a" and then flap "b", and staple. Remember to staple only flap "b". (Use 15 or 16mm staple)





Stapling positions are shown below.



Printed in Japan
841008800 (H) AM/YW

Focus off set adj.
-5V
VR101 Focus gain adg.
IC105
Focus error amp.
VR106 Tracking off set adj.
5V
-5V
VR104
Tracking gain adj.
Tracking servo
Q107
Actuator
FE ⊖
FE ⊕
IC105
Q108
-10.7
Actuator drive
Q403
IC403
Waveform shaping
play 4Vp-p
136µs (7.35kHz)
IC504
IC505
IC304
IC305
FREE
RESY
IC301
RF signal waveform shaping
IC302
IC706
Q402
B2
B1
I→V
Amp
Buffer
Mixing (−)
Comparator
SW
(IC104)
VR105
Tracking balance adj.
search
play 4Vp-p
Actuator drive
9.4V
Q109
Q110
Tracking control
IC105
Q105
Q106
Tracking error amp.
Battery 3V
IC1 AN6030
Remote control transmitter
Modulation
Pulse generator
11 Bit Latch
Chattering simul-depression inhibit
(IC1)
Timing generation circuit
Key input control circuit
Remote control key switch
Q201
Q202
TE ⊕
TE ⊖
-10.7V
-15V
IC201
Q404
Loading motor drive
Drive
Pre amp.
Direction select
Speed designation
(IC402)
Loading motor
S101 Rest
S102 End
S103 Close
S104 Open
FL
Digit
Segment
Key switch
IC800 AN5020
Amplifier
(IC800)
Gain adj.
T800
Q800
D800
Q1
D1
15V
3V
IC601 MN1402
SNS1
AI3→AI0
BI3→BI0
SNS0
Vss
Vdd
EO0→EO3
(IC401)
TTSTOP
RF DEL
LDON
TCNT
TTON
CLOCK
CLOSS
TRON
BREAK
STROBE
VREF
TSYE
TEST
ATSA
VDD
TTCK
SUBQ
KICK R
KICK F
THOLD
BLKCK
EMPH
MUTE
REV
FWD
PAUSE
PLAY
FREE
ACC
0.23µs (4.32MHz)
LSI Module
4KRAM
EFM decoder & synchronize detection
C1 Unscramble
Sub code decoder
play 13ms
play/search
Q203
Q204
IC201
0.6V
Traverse motor
Traverse servo
9.5V
-9.5V
Pause
Play

1302

ORDER NO. HAD850823250
A6

Service Manual

Supplement

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

SL-P2

Original

Please use this manual together with the service manual for Model No. SL-P2, Order No. DAD84100105C0.

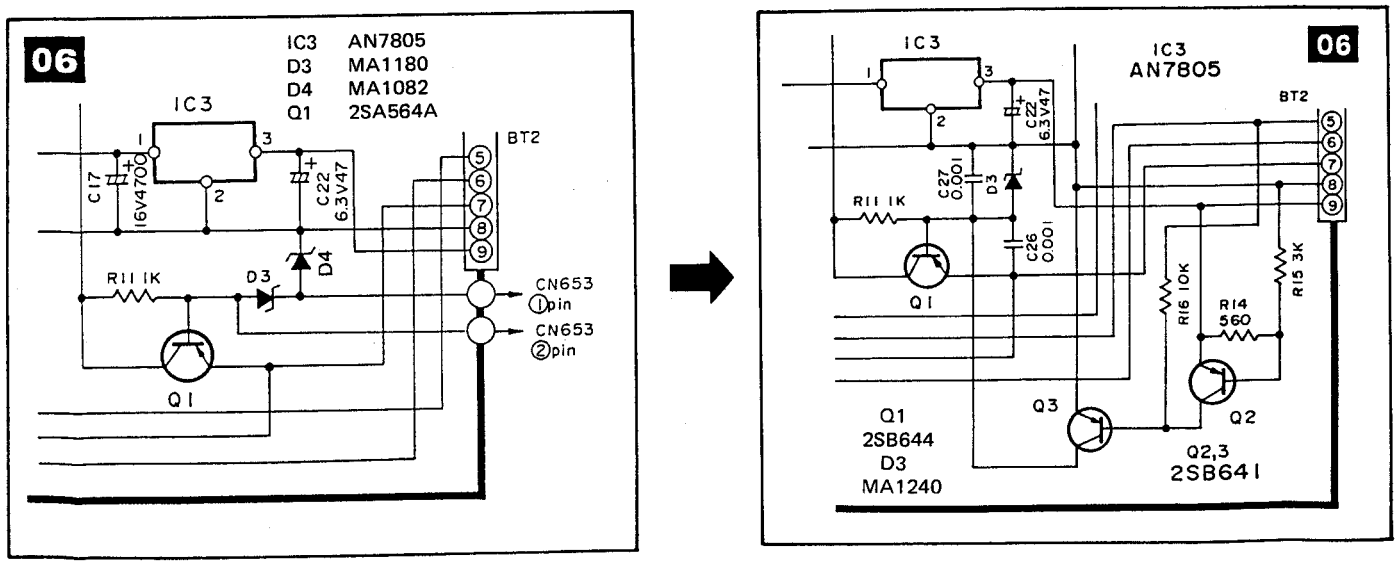
Notes: ★ This supplement contains the following. Please keep this point in mind when servicing.
1. The circuit has been changed for the improvement of performance.
2. List of parts replaced as a result of circuit change.
3. Correction of adjustment manual.
4. Correction (re-check) of DC voltage in schematic diagram.

★ This supplement should be filed with the service manual for Model No. SL-P2, (Order No. DAD84100105C0).

CHANGES

■ CHANGE IN SCHEMATIC DIAGRAM

- **Power supply circuit**



Technics

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Secaucus. New Jersey 07094

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Carolina, Puerto Rico 00630

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

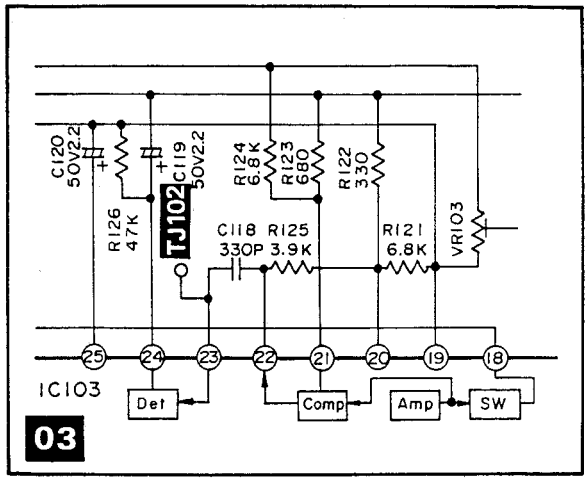
Matsushita Electric of Canada Limited
5770 Ambler Drive, Mississauga,
Ontario, L4W 2T3

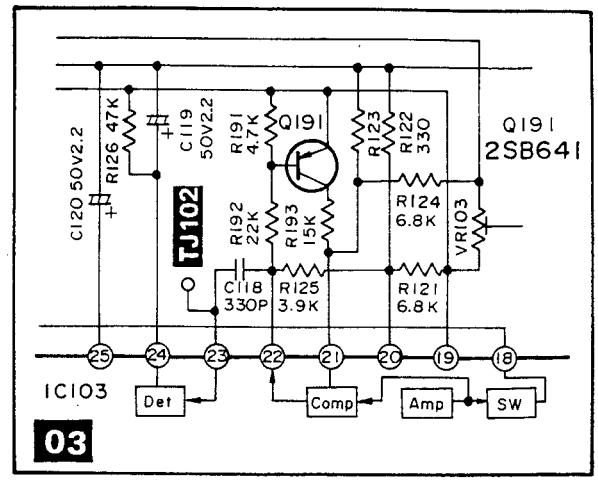
Matsushita Electric Trading Co., Ltd.
P.O. Box 288. Central Osaka Japan

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

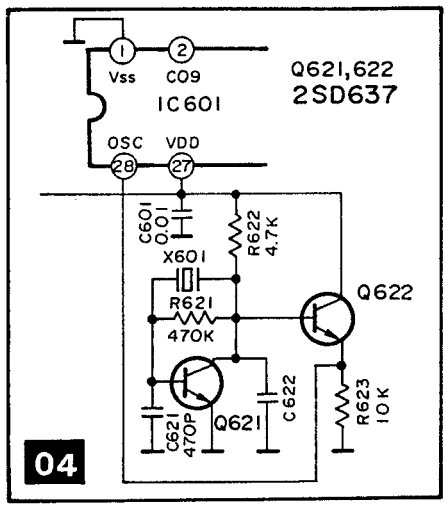
1302

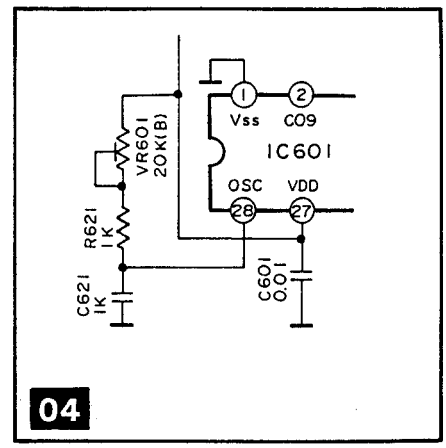
- **Focus servo circuit**





- **Oscillator circuit of MN1402PCT**





■ CHANGE IN REPLACEMENT PARTS LIST

Ref. No.	Change of Part		Description	Remarks
	OLD	**NEW**		
INTEGRATED CIRCUITS				
IC302	SVINJM082D	**SVITL082CP**	Operational Amp	Change
IC401	MN15844PCQ	**MN15844PCV**	Microcomputer	Change
IC651 IC652	MN4538B	.....	.....	Deletion
IC653	MN4023B	.....	.....	Deletion
TRANSISTORS				
Q1	2SA564A	**2SB644**	Regulator	Change
Q2, 3	.....	**2SB641**	Regulator	Addition
Q191	.....	**2SB641**	Focus Servo	Addition
Q621 Q622	2SD637	.....	.....	Deletion
Q651~ 654	2SA1309Q	.....	.....	Deletion
DIODES				
D3	MA1180	**MA1240**	Zener	Change
D4	MA1082	.....	.....	Deletion
D651~ 667	MA165	.....	.....	Deletion
VARIABLE RESISTOR				
VR601	.....	**EVMH1GA00B24**	Clock Adjustment	Addition
CERAMIC OSCILLATOR				
X601	SVFCSB600P11	.....	.....	Deletion

Ref. No.	Change of Part		Description	Remarks
	OLD	**NEW**		
FUSE				
F1	XBA2F035NU	.....	(For Canada Only)	Deletion
RESISTORS				
R14	.....	**EROS2TKF5600**	560Ω, 1/4W, ±1%	Addition
R15	.....	**EROS2TKF3001**	3kΩ, 1/4W, ±1%	Addition
R16	.....	**ERD25FJ103**	10kΩ, 1/4W, ±5%	Addition
R120	ERDS2TJ683	**ERDS2TJ333**	33kΩ, 1/4W, ±5%	Change
R191	.....	**ERDS2TJ472**	4.7kΩ, 1/4W, ±5%	Addition
R192	.....	**ERDS2TJ223**	22kΩ, 1/4W, ±5%	Addition
R193	.....	**ERDS2TJ153**	15kΩ, 1/4W, ±5%	Addition
R206	ERDS2TJ152	**ERDS2TJ222**	2.2kΩ, 1/4W, ±5%	Change
R207	ERDS2TJ152	**ERDS2TJ222**	2.2kΩ, 1/4W, ±5%	Change
R422	ERDS2TJ103	**ERDS2TJ473**	47kΩ, 1/4W, ±5%	Change
R606	ERDS2TJ151	**ERDS2TJ181**	180Ω, 1/4W, ±5%	Change
R617	.....	**ERDS2TJ472**	4.7kΩ, 1/4W, ±5%	Addition
R621	ERDS2TJ474	**ERDS2TJ102**	1kΩ, 1/4W, ±5%	Change
R622	ERDS2TJ472	.....	.....	Deletion
R623	ERDS2TJ103	.....	.....	Deletion
R651~ 653	ERDS2TJ103	.....	.....	Deletion
R654	ERDS2TJ394	.....	.....	Deletion

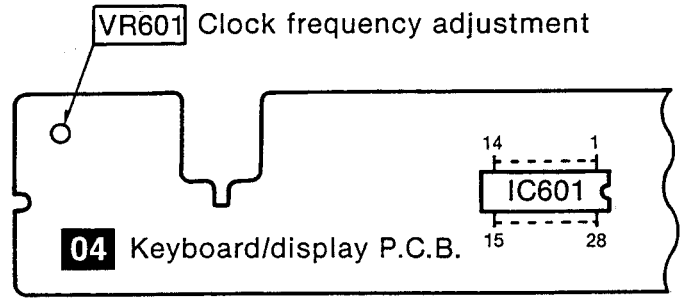
Ref. No.	Change of Part		Description	Remarks
	OLD	NEW		
R655	ERDS2TJ103	·····	·····	Deletion
R656	ERDS2TJ184	·····	·····	Deletion
R657	ERDS2TJ103	·····	·····	Deletion
R658	ERDS2TJ394	·····	·····	Deletion
R659	ERDS2TJ103	·····	·····	Deletion
R660	ERDS2TJ103	·····	·····	Deletion
R661	ERDS2TJ274	·····	·····	Deletion
R662	ERDS2TJ103	·····	·····	Deletion
R663	ERDS2TJ274	·····	·····	Deletion
R664	ERDS2TJ103	·····	·····	Deletion
R803	EROS2TKF1502	**EROS2TKF6801**	6.8kΩ, 1/4W, ±1%	Change
R804	EROS2TKF4301	**EROS2TKF2201**	2.2kΩ, 1/4W, ±1%	Change
R807	EROS2TKF4701	**ERDS2TJ821**	820Ω, 1/4W, ±5%	Change
R808	EROS2TKF2401	**ERDS2TJ331**	330Ω, 1/4W, ±5%	Change
R815	EROS2TKF1502	**EROS2TKF6801**	6.8kΩ, 1/4W, ±1%	Change
R816	EROS2TKF4301	**EROS2TKF2201**	2.2kΩ, 1/4W, ±1%	Change
R819	EROS2TKF4701	**ERDS2TJ821**	820Ω, 1/4W, ±5%	Change
R820	EROS2TKF2401	**ERDS2TJ331**	330Ω, 1/4W, ±5%	Change
CAPACITORS				
C25	·····	**ECKD1H103ZF**	0.01μF, 50V, $^{+80\%}_{-20\%}$	Addition
C26, 27	·····	**ECKD1H102KB**	0.001μF, 50V, ±10%	Addition

Ref. No.	Change of Part		Description	Remarks
	OLD	NEW		
C105	ECKD1H103ZF	**ECQM1H104KV**	0.1μF, 50V, ±10%	Change
C116	ECKD1H391KB	**ECQM1H332KV**	0.0033μF, 50V, ±10%	Change
C121	ECEA1EN4R7S	**ECEA1CN100S**	10μF, 16V	Change
C402	ECEA0JU101	**ECEA1AU101**	100μF, 10V	Change
C431	·····	**ECFR1H104ZF**	0.1μF, 50V, $^{+80\%}_{-20\%}$	Addition
C516	ECKD1H103ZF	**ECFF1H104ZF**	0.1μF, 50V, $^{+80\%}_{-20\%}$	Change
C517	ECKD1H103ZF	**ECFF1H104ZF**	0.1μF, 50V, $^{+80\%}_{-20\%}$	Change
C602	·····	**ECFR1H104ZF**	0.1μF, 50V, $^{+80\%}_{-20\%}$	Addition
C621	ECKD1H471KB	**ECCD1H101J**	100pF, 50V, ±5%	Change
C622	ECKD1H101KB	·····	·····	Deletion
C651	ECQM1H102KV	·····	·····	Deletion
C652	ECQM1H123KV	·····	·····	Deletion
C653	ECQM1H183KV	·····	·····	Deletion
C654	ECEA1HU010	·····	·····	Deletion
C655	ECEA1HU010	·····	·····	Deletion
C656	ECFR1H104ZF	·····	·····	Deletion
C806	ECQP1102GZ	**ECQM1H222KV**	0.0022μF, 50V, ±10%	Change
C812	ECQP1102GZ	**ECQM1H222KV**	0.0022μF, 50V, ±10%	Change
C853	·····	**ECFF1H104ZF**	0.1μF, 50V, $^{+80\%}_{-20\%}$	Addition
C854	·····	**ECFF1H104ZF**	0.1μF, 50V, $^{+80\%}_{-20\%}$	Addition
C855	·····	**ECKD1H102KB**	0.001μF, 50V, ±10%	Addition

ADDITION

- **Clock frequency adjustment**

1. Remove the cabinet and front panel. (Do not remove the connectors.)
2. Connect IC601 pins 11 and 12 to pin 27 (+5V) of keyboard/display (04) P.C.B.
3. Connect the frequency counter to IC601 pin 3.
4. Turn ON the power switch.
5. Adjust VR601 so that the frequency counter is 25.6 kHz ± 0.2 kHz.



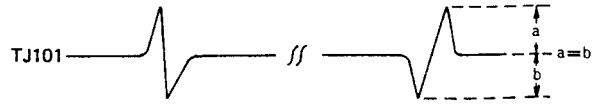
CORRECTIONS

■ MEASUREMENT AND ADJUSTMENTS

- **Focus balance adjustment (Page 3 of Adjustment manual)** ▒▒ : **Correction part**

2. Focus balance Adjustment

1. Set the servo gain adjuster power SW "on" and the rotary selector switch to "2" and disconnect the input from the oscillator.
2. Connect TJ102 on 03 P.C.B. to ground by use of clip lead.
3. Pull out connector CN501 on 01 P.C.B.
4. Connect the oscilloscope to TJ101 on 03 P.C.B. and place the disc on the turntable.
   Oscilloscope setting:
   VOLT 500 mV, SWEEP 5 ms, Input AC
5. Turn power switch ON. When the laser lights up, a S-shaped waveform appears on the oscilloscope. Then adjust VR102 so that the top and bottom peak values are equal to each other.



Note: The above-mentioned S-shaped waveform will continue for about 2 minutes if CN412 pin 7 (01 P.C.B.) is connected to ground while LD is lighted as LD stops in 5 ~ 6 sec.

6. After the adjustment, shift the clip lead and CN501 back as they were.

- Turntable height adjustment (Page 22 of Adjustment manual) ▒▒▒ : **Correction part**

2. Turntable height adjustment

Note: Necessary after Direct Drive spindle motor is replaced or RF signal is not obtained.

1. Disable focus search by remove the R130 on 03 P.C.B.
2. Insert the thin end of Feeler blade gauge between the turntable and the shaft bearing.
3. Slide the Feeler blade gauge toward the thick end and mark the gauge with a pencil, where it and the turntable touch and until the blade can not be fed anymore than remove the gauge.
4. Connect the oscilloscope to TJ402 pin 01 (Main) P.C.B.
5. Place a disc on the turntable and clamp it with the magnet.
6. Apply power to the unit.
7. Press eject "out" and eject "IN".
8. Confirm if RF signal is present. If not, proceed to the next step.
9. To confirm:
   Gently tap the disc at point "A". If RF signal appears, the turntable is too low. If RF signal does not appear, tap the disc at point "B".
   RF signal should appear indicating that the turntable is too high.
10. To adjust:

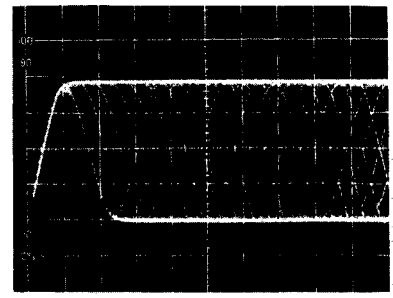
(1) Insert the Feeler blade gauge between the turntable and the shaft bearing to the previously marked point.

(2) Loosen the hexagonal screw of turntable set screw.
(Use a hexagonal wrench 1. 27 mm).

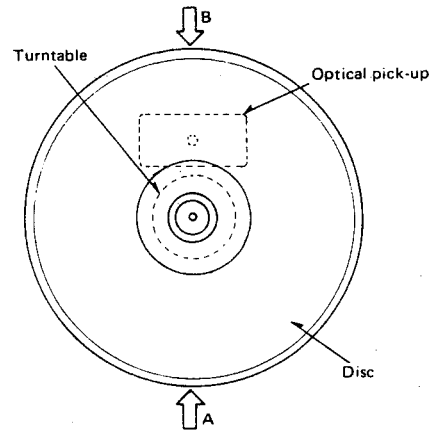
(3) If the turntable is too low, slide the Feeler blade gauge about 4 mm (5/32") towards the thick end and remove feller blade gauge.
Reapply power and check for RF signal.
(This is a "trial and error" adjustment, several attempts may be required to obtain RF signal).

(4) If the turntable is too high, insert the Feeler blade gauge and move about 4 mm (5/32") towards the thin end, using the same method as in step 3.

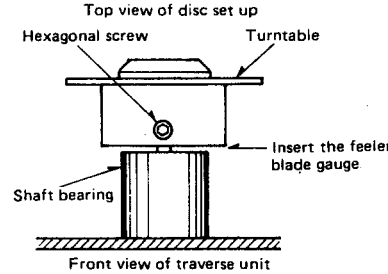
(5) Reconnect R130 to enable focus search.



RF signal



Top view of disc set up



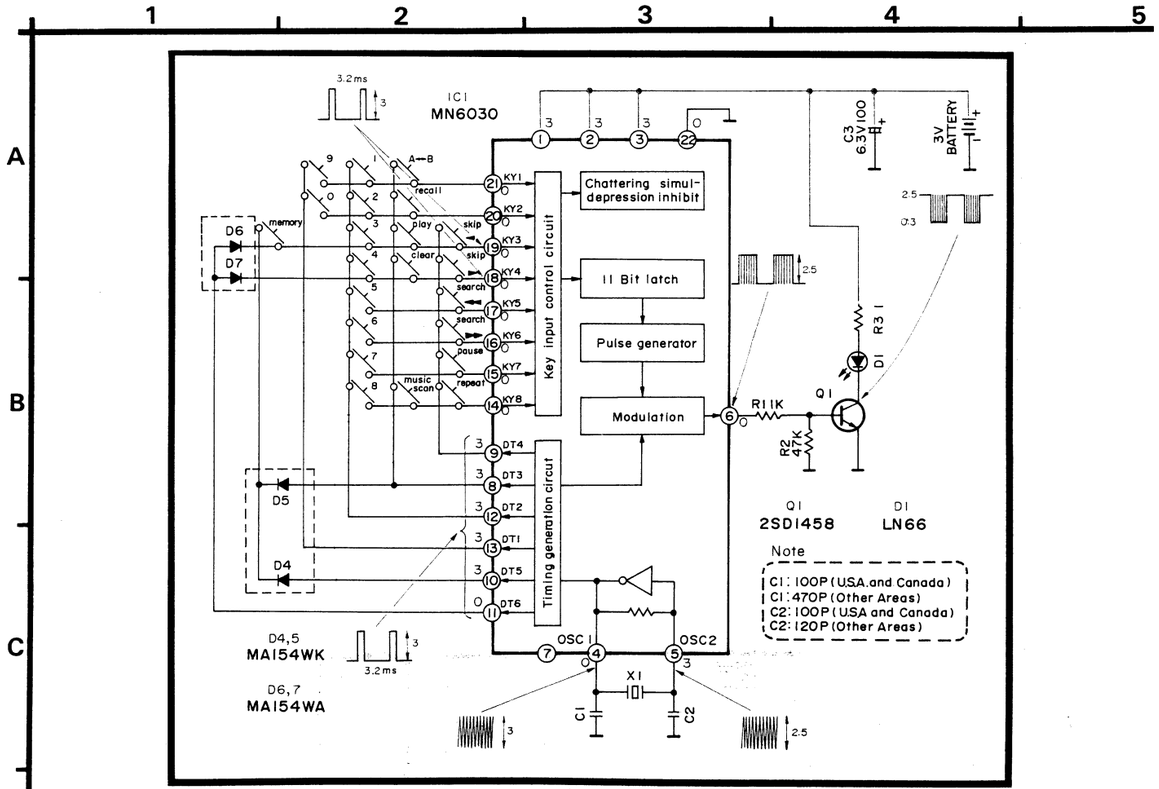
Front view of traverse unit

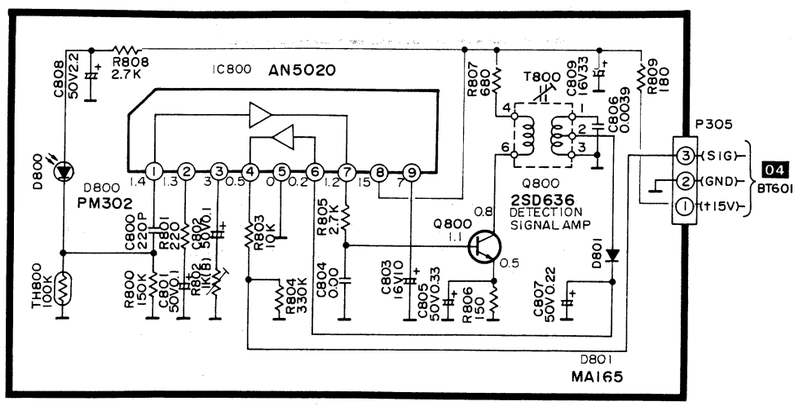
■ SCHEMATIC DIAGRAM

Notes:

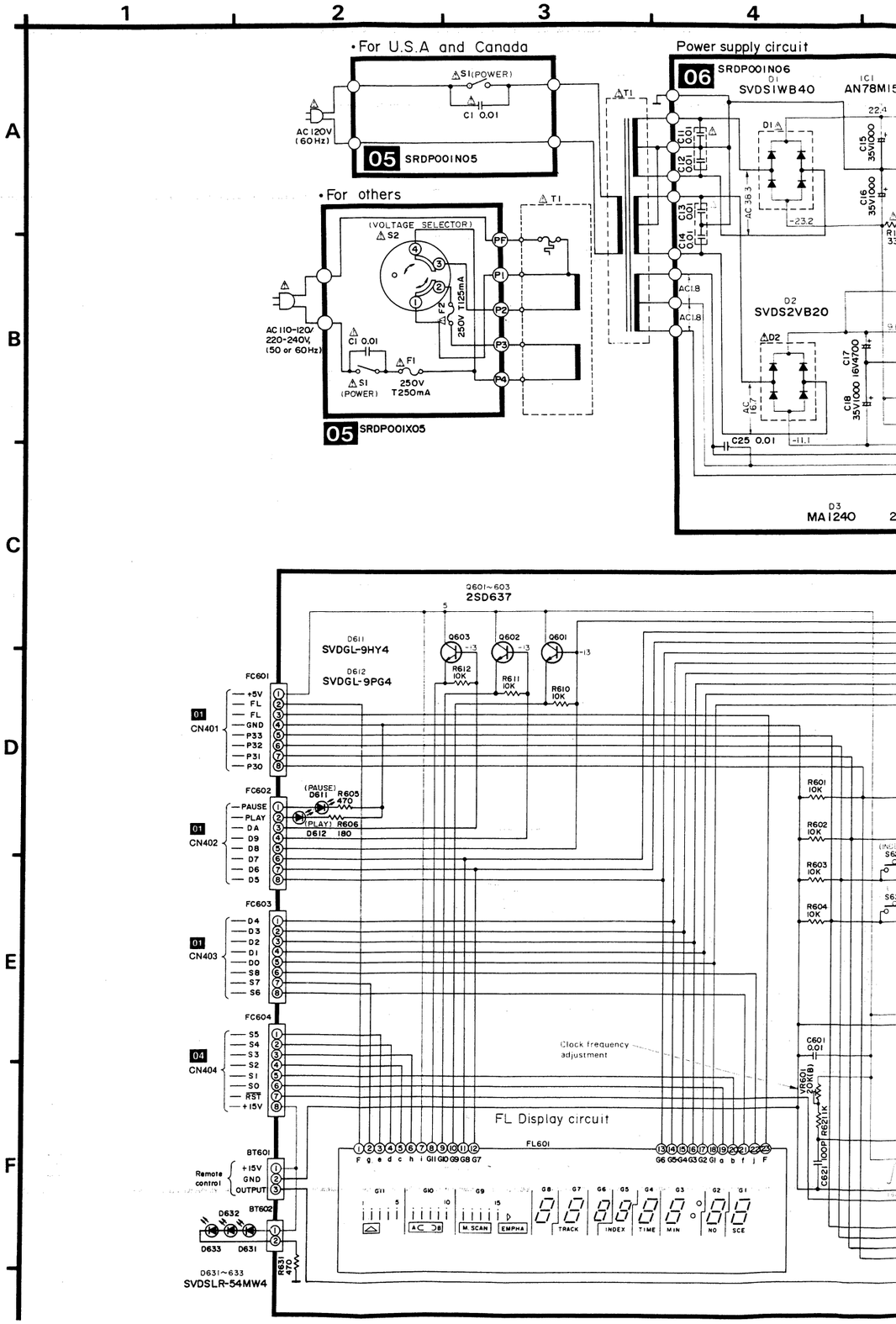
1. DC voltage in SL-P2 service manual (Order No. DAD84100105C0) was wrong. So, DC voltages in all circuits were re-checked beforehand.
2. The circuit of this schematic diagram was changed to improve the performance.
3. The voltage value, and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.
   Accordingly, there may arise some error in the voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
   * The parenthesized are the values of voltage generated during playing. Others are the voltage values in stop mode.
4. 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.
5. ——— : Positive voltage lines and negative voltage lines.

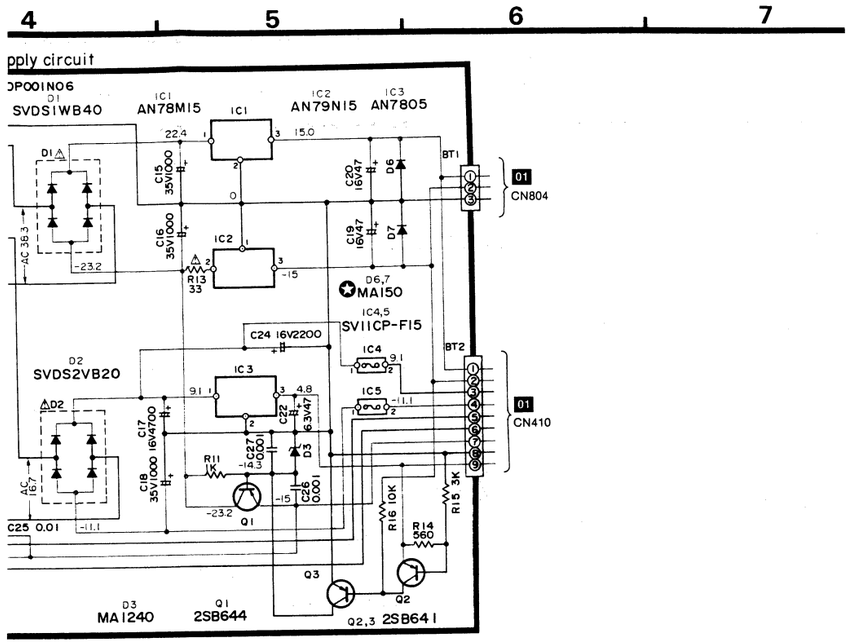
• Remote control circuit

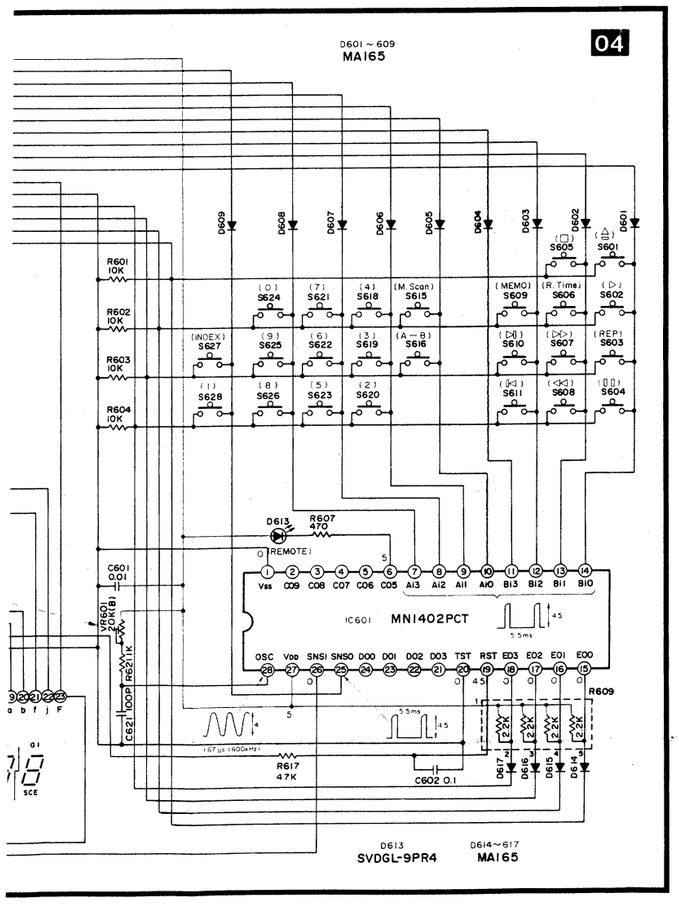




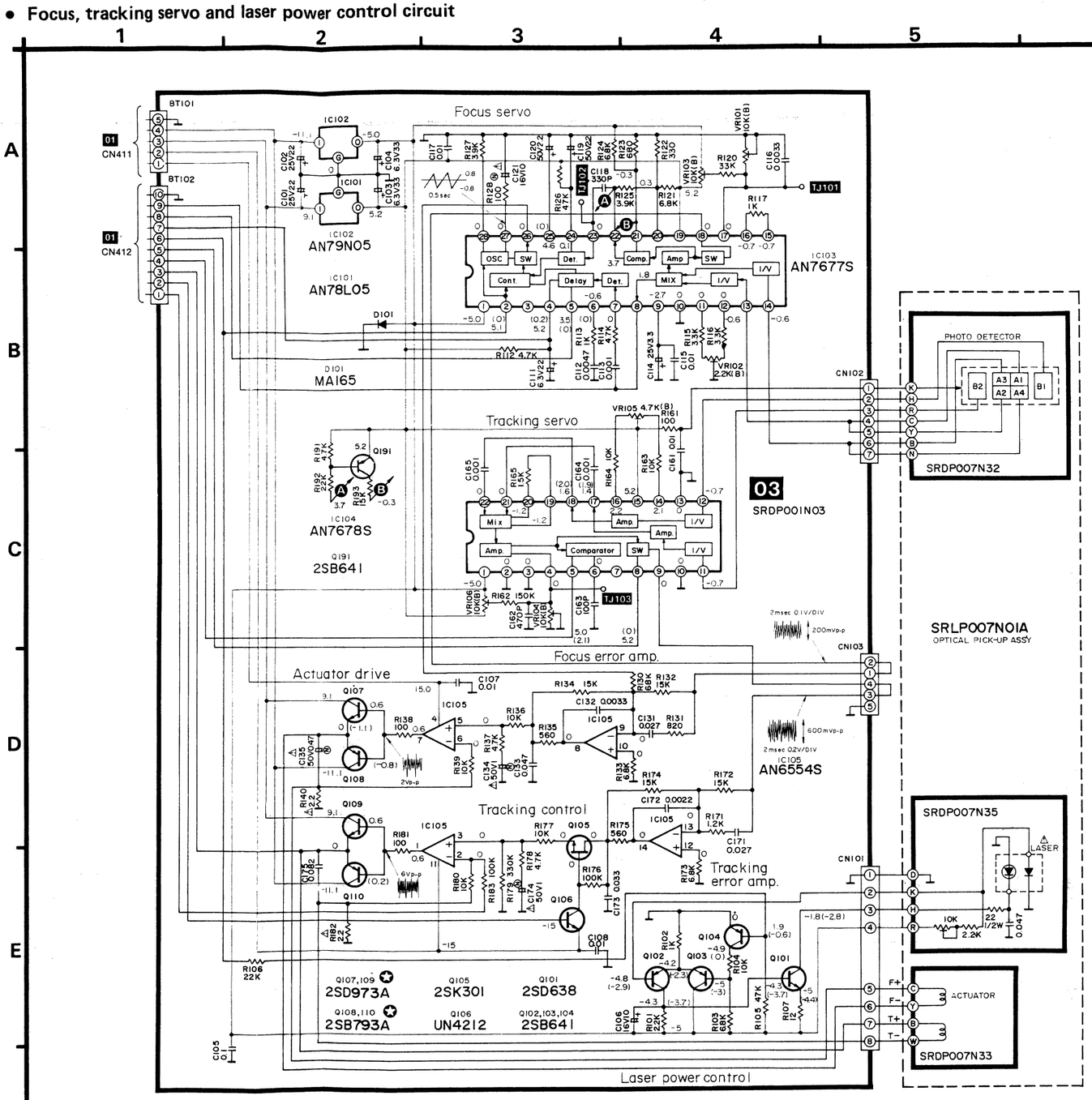
• Power supply and FL display circuit



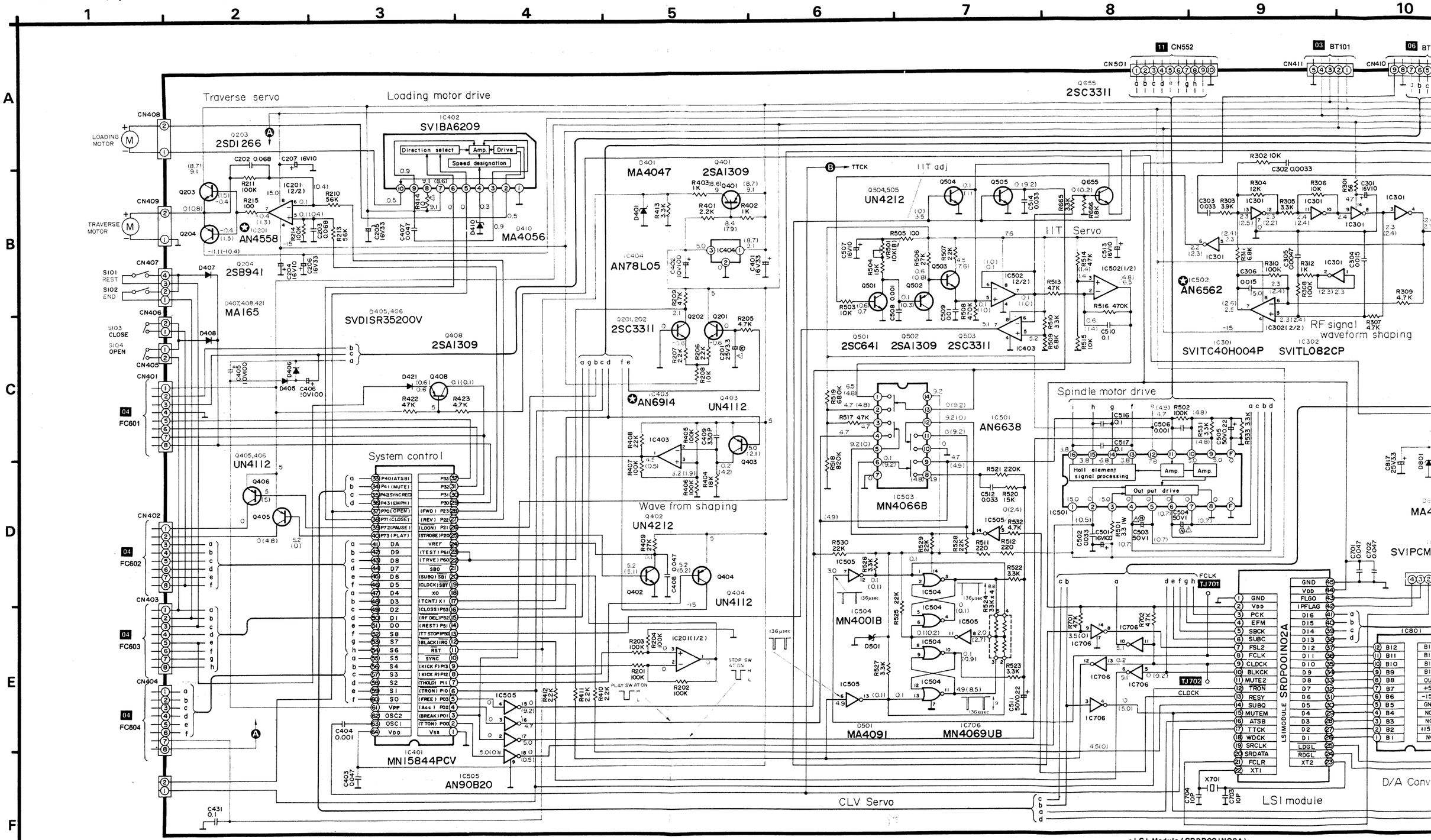




• Focus, tracking servo and laser power control circuit



• Main circuit (System control, Digital, PLL, Audio and CLV servo)



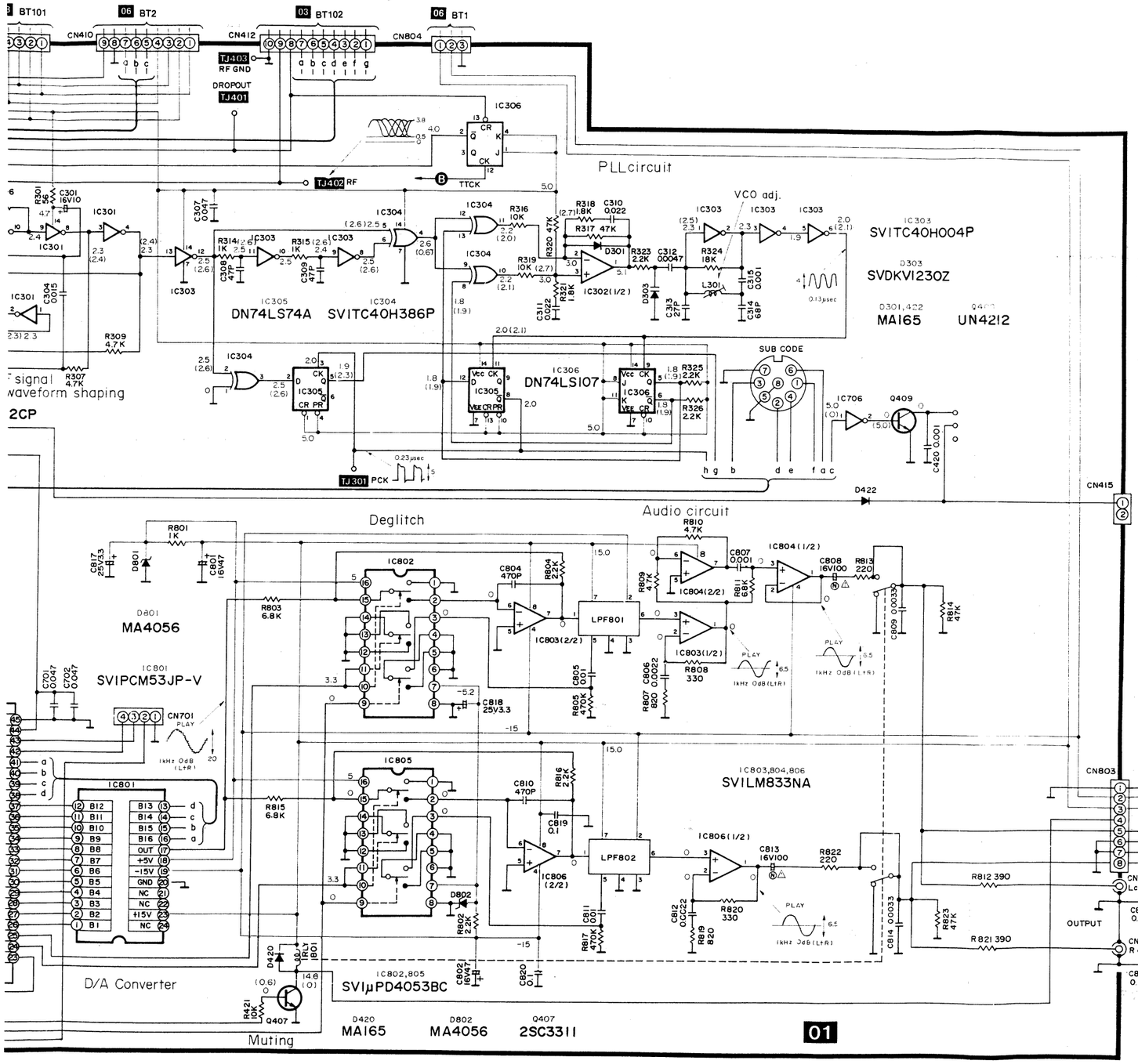
•IC401 MN15844PCV

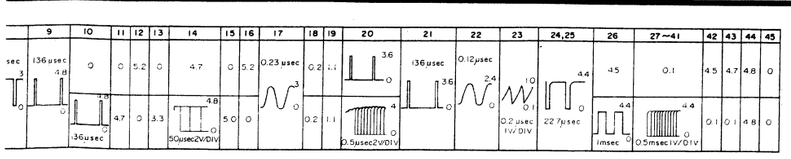
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STOP	0	5.0	0	5.2	5.2	0	3.9	4.7	5.2	5.1	5.2	5.2	0.1msec/V/DIV	0.3	136 µsec	4.7	0.2	2.1	0	5.0	5.1	0	0	5.6msec	0	5.2	0	0	5.0	5.2	5.6 msec	0.23 µsec (4.32MHz)	-24	0.23 µsec (4.32MHz)	5.0
PLAY	0	0	0	0	5.2	0	3.9	4.6	13.3 msec	5.1	5.2	0.2	0.1msec/V/DIV	0.3		2msec/V/DIV	0.2	2.1	0	39.5 msec	0	0	1.42msec		0	0	0	OPEN 4.0	CLOSE 4.0	5.0	0			-24		5.0

•LSI Module (SRDP001N02A)

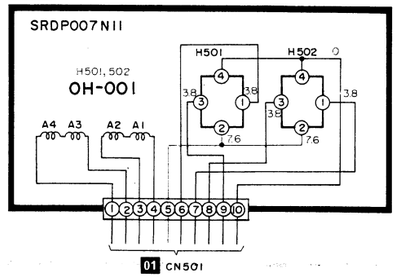
No	1	2	3	4	5	6	7	8	9	10	11	12	13
STOP	0	4.8	0.23µsec (4.32MHz)	0.46 µsec	0.3	4.6 136 µsec	0.1	136µsec	136 µsec	4.8	0	5.2	0
PLAY	0	4.8		0.5µsec/2V/DIV	0.3	3.8 133msec	5.1			4.8 136µsec	4.7	0.3	0

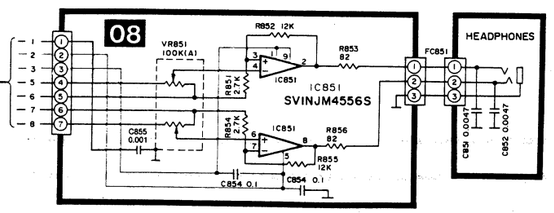
10 11 12 13 14 15 16 17 18 19





11





*** Caution !**

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.

Printed in Japan
850810400 Ⓗ AM

Adjustment Manual

■ MEASUREMENT AND ADJUSTMENTS English

ENGLISH

Caution

It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.) With the unit turned "on", laser radiation is emitted from the pick-up lens. Be careful during adjustments in particular.

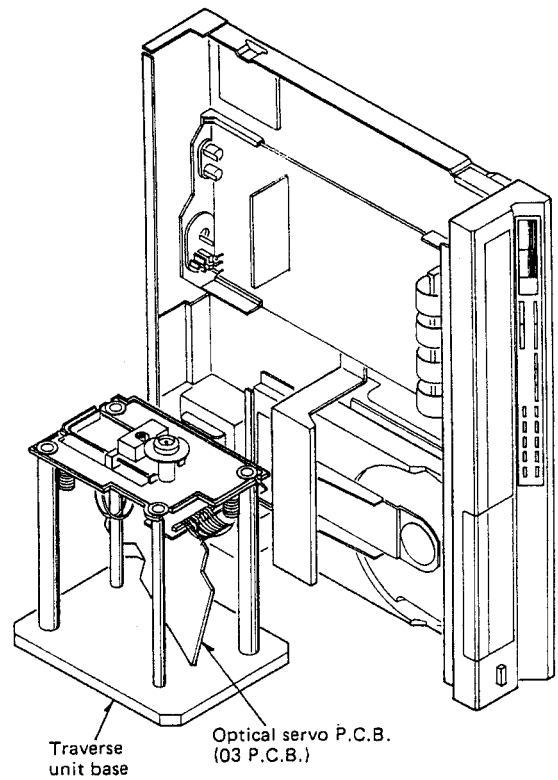
★ **Perform these adjustments by use of a traverse unit base in accordnace with the traverse unit servicing method to improve the workability.**

★ **In case the optical pick-up is individually replaced, it is necessary to perform mechanism adjustment before these adjustment, refer to pages 19 ~ 32.**

Traverse unit servicing method

★ **For removal of each part, refer to disassembly instructions.**

1. Remove the cabinet and front panel.
2. Disconnect connectors (CN405 ~ CN409, CN411, CN412 and CN501) of main P.C.B.
3. Remove the traverse unit. The entire traverse unit can then be removed from the unit.
4. Turn over the traverse unit and remove the nuts. The tray and the traverse unit can then be separated.
5. Remove the disc clamper magnet from the disc clamper.
6. Temporarily fasten the tray and front panel. After that, connect only connectors (CN405, CN406, CN408) removed in step 2.
7. Remove the insulator rubber and optical servo P.C.B. of traverse unit.
8. Mount the traverse unit on the traverse unit base.
9. Connect connectors (CN407, CN409, CN411 and CN501) removed in step 2.



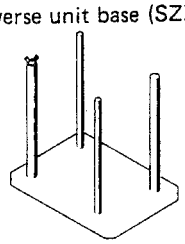
Testers and Jigs for Adjustments

Testers:

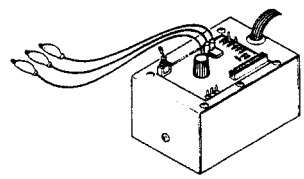
1. Two-channel oscilloscope (with trigger) of 30 MHz or over.
2. Low frequency oscillator.
3. Digital voltmeter.

Jigs:

1. Traverse unit base (SZZP1016F)



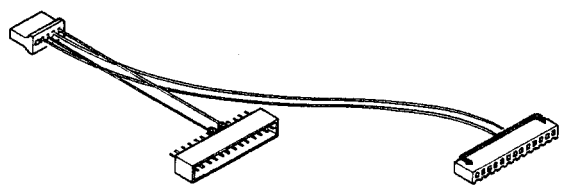
2. Servo gain adjuster (SZZP1017F)



3. Test disc (SZZP1014F)



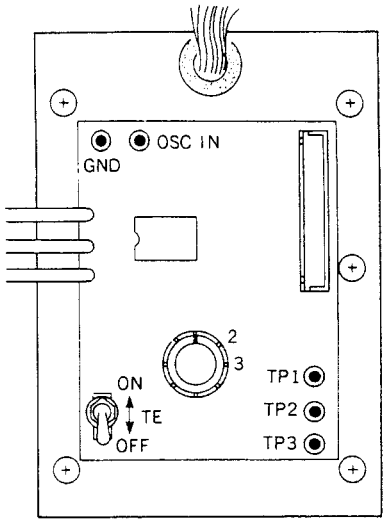
4. Short leads with clip.
5. Ordinary disc.
6. Conversion connector (SZZP1032F)



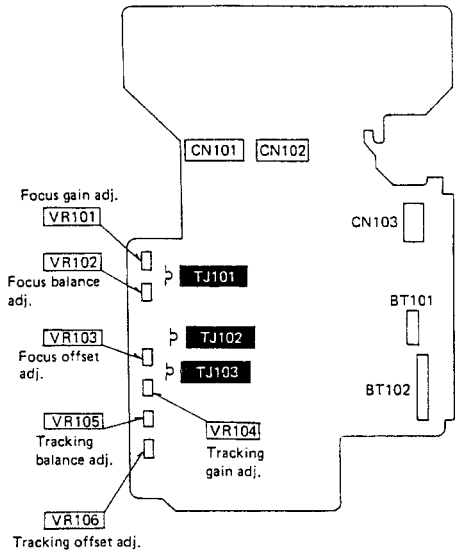
ENGLISH

Adjustment points

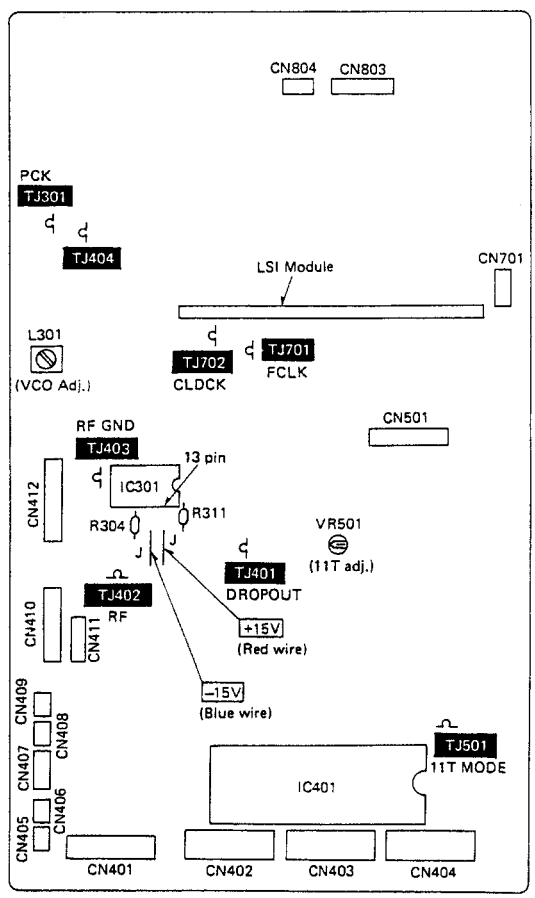
• Servo gain adjuster



• 03 (Optical servo) P.C.B.

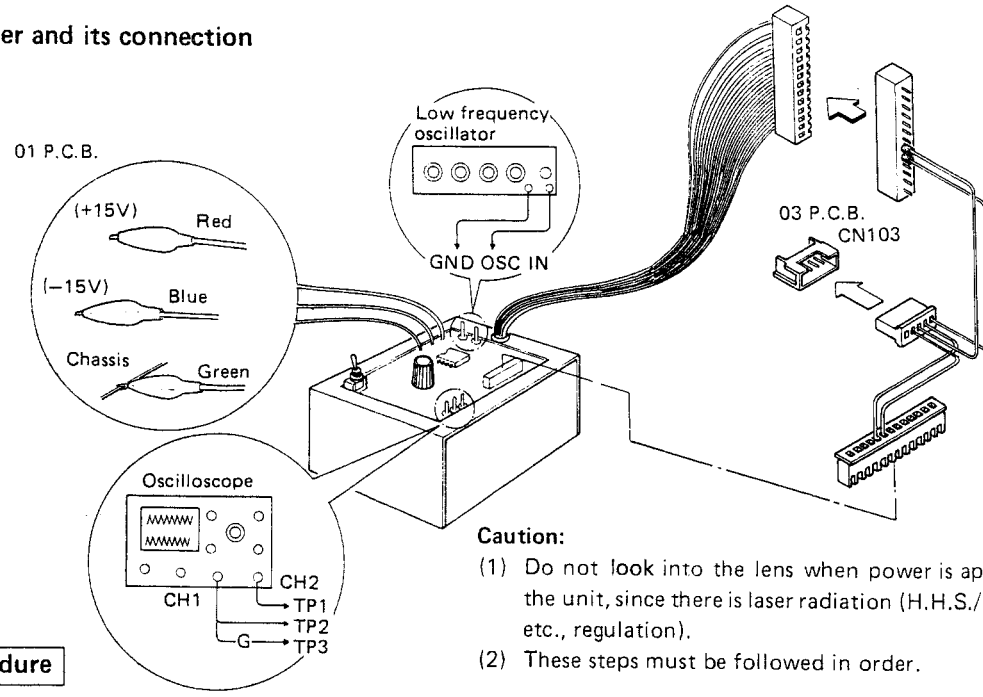


• 01 (Main) P.C.B.



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- **Servo gain adjuster and its connection**



Caution:

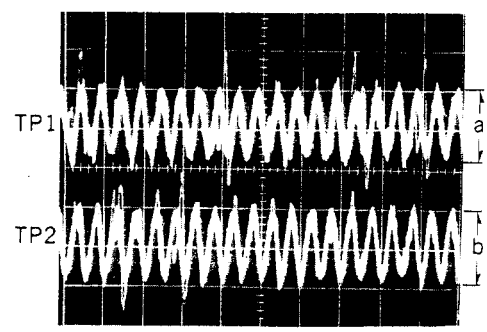
(1) Do not look into the lens when power is applied to the unit, since there is laser radiation (H.H.S./D.H.W./ etc., regulation).

(2) These steps must be followed in order.

Adjustment Procedure

1. Focus gain adjustment

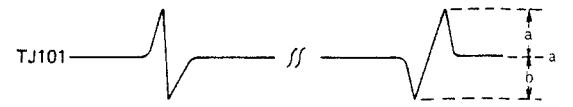
1. Connect the gain adjusting jig with conversion connector to the set.
   Red . . . . . Jumper beside IC301 pin 13 on 01 P.C.B.
   Blue . . . . . Jumper beside IC301 pin 12 on 01 P.C.B.
   Green . . . . . Chassis
   Connector . . . . Pull out the shorting pins of CN103 on 03 P.C.B. and connect the conversion connector to the jig and then connect then connector (5P) from conversion connector to CN103.
2. Adjust the low frequency oscillator to 750 Hz frequency and 150mVp-p output voltage, and connect it to TEST pin OSC IN and GND of the servo gain adjuster.
3. Connect CH1 and CH2 of oscilloscope to TP1 and TP2 of the servo gain adjuster. (TP3 is GND).
   Oscilloscope setting:
   VOLT 100mV (both channels), SWEEP 2ms, Input AC, Mode CHOP



4. Set the servo gain adjuster power SW "on" and the rotary selector switch to "1" and place the disc on turntable.
5. Turn power switch ON. When turntable beings to rotate, 750 Hz signal appears on the oscilloscope. Then adjust VR101 so that the waveforms of both channels are equal to each other.

2. Focus balance adjustment

1. Set the servo gain adjuster power SW "on" and the rotary selector switch to "2" and disconnect the input from the oscillator.
2. Connect TJ102 on 03 P.C.B. to ground by use of clip lead.
3. Pull out connector CN501 on 01 P.C.B.
4. Connect the oscilloscope to TJ101 on 03 P.C.B. and place the disc on turntable.
   Oscilloscope setting:
   VOLT 500mV, SWEEP 5ms, Input AC
5. Turn power switch ON. When the laser lights up, S-shaped waveform appears on the oscilloscope. Then adjust VR102 so that the top and bottom peak values are equal to each other.



Note: The above-mentioned S-shaped waveform will continue for about 2 minutes if CN412 pin 4 (01 P.C.B) is connected to ground while LD is lighted as LD stops in 5 ~6 sec.

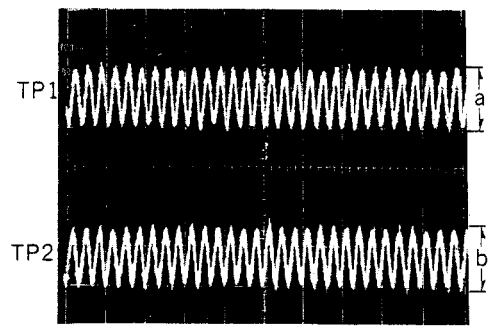
6. After the adjustment, shift the clip lead and CN501 back as they were.

3. Focus offset adjustment

1. Set the servo gain adjuster power SW "on" and the rotary selector switch at "2".
2. Place the unit in the Eject mode. (tray open).
3. Connect a voltmeter to TJ101 on 03 P.C.B. (Optical servo).
4. Turn power switch ON, and adjust VR103 so that DC voltage is 0 ± 10 mV.

4. Tracking gain adjustment

1. Set the servo gain adjuster power SW "on" and the rotary selector switch to "3".
2. Adjust the low frequency oscillator to 1.5 kHz and 150mVp-p output. And connect it to TEST pin OSC IN and GND of servo gain adjuster.
3. Connect CH1 and CH2 of oscilloscope to TEST pin TP1 and TP2 of the servo gain adjuster. (TP3 is GND), and place the disc on turntable.
   Oscilloscope setting: VOLT 100mV (both channels), SWEEP 2ms, Input AC, Mode CHOP
4. Turn power switch ON. When turntable beings to rotate, 1.5 kHz signal appears on the oscilloscope. Then adjust VR104 so that the waveform amplitudes of both channels, are equal to each other.

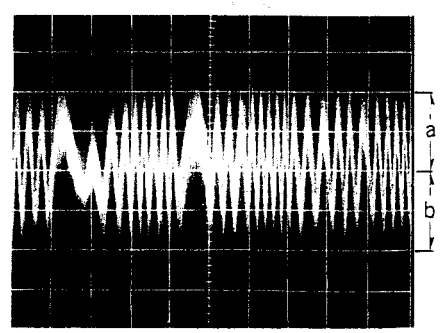


5. Tracking offset temporary adjustment

1. Set the servo gain adjuster power SW "on" and the rotary selector switch to "2", and disconnect the input from oscillator.
2. Place the unit in the Eject mode (tray open).
3. Connect a voltmeter to TJ103 on 03 P.C.B. (Optical servo).
4. Turn power switch ON, and adjust VR106 so that DC voltage is 0 ± 3 mV.

6. Tracking balance adjustment

1. Set the servo gain adjuster power SW "on" and the rotary selector switch at "2".
2. Connect the oscilloscope to TJ103 on 03 P.C.B. and then place the disc on turntable.
   Oscilloscope setting:
   VOLT 200mV, SWEEP 5ms, Input DC
3. Turn power switch ON. When turntable begins to rotate and the tracking servo switch of servo gain adjuster is turned OFF, TE (tracking error) signal appears, on the oscilloscope.
   Then adjust VR105 so that the top and bottom peak values are equal to each other.



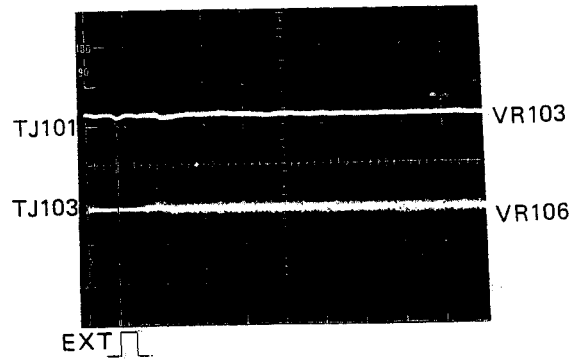
7. Tracking offset adjustment

1. Set the servo gain adjuster power SW "on" and the rotary selector switch at "2".
2. Place the unit in the Eject mode (tray open).
3. Connect a voltmeter to TJ103 on 03 P.C.B (Optical servo).
4. Turn power switch ON, and adjust VR106 so that the DC voltage is 0 ± 3mV.

Note: After completing the above-mentioned adjustment, remove the servo gain adjuster and insert the shorting pin into CN103 as it was.

8. Offset adjustment in drop-out

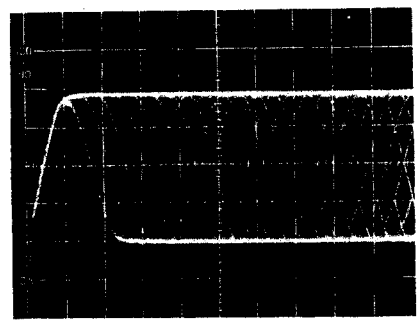
1. Connect the oscilloscope to the points specified below.
   CH1 . . . . . TJ101 (03 P.C.B.)
   CH2 . . . . . TJ103 (03 P.C.B.)
   EXT . . . . . TJ401 (01 P.C.B.)
   Oscilloscope setting:
   VOLT 1V (both channel), SWEEP 0.5ms, Input AC, Trigger EXT. NORM
2. Play band 13 (0.5 mm black spot) of the test disc.
3. Watching the waveform of CH1 of the oscilloscope, adjust VR103 so that the waveform amplitude near the trigger point is minimized. If not minimized, adjust so that the waveform top and bottom are nearly symmetrical.



4. Watching the waveform of CH2 of the oscilloscope, adjust VR106 so that the waveform amplitude near the trigger point is minimized. If not minimized adjust so that the waveform top and bottom are nearly symmetrical.

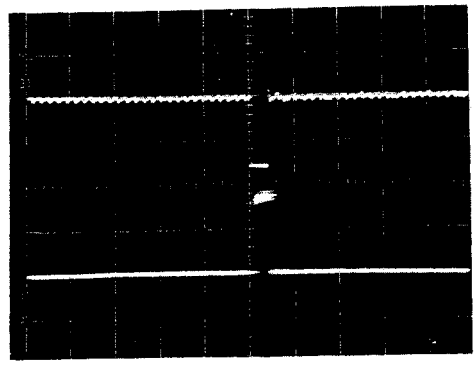
9. Best eye adjustment

1. Connect CH1 of oscilloscope to TJ402 on main P.C.B.
   Oscilloscope setting:
   VOLT 1V, SWEEP 0.5μs, Input AC
2. Insert disc and place unit in play mode.
3. Adjust VR102 so that the eye pattern of RF signal is widest open.



10. PLL adjustment

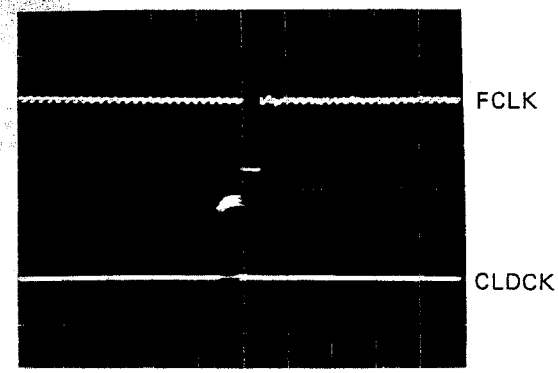
1. Place the unit in the Eject mode. (tray open)
2. Connect CH1 and CH2 of the oscilloscope to test points TJ701 "FCLK" and TJ702 "CLDCK" on 01 P.C.B.
   Oscilloscope setting:
   VOLT 2V (both channels), SWEEP 20μs, Input AC, Trigger CH1 + CH2 (NORM) ⊖ slope, Mode ALT.
3. Connect IC301 pin 13 on 01 P.C.B. to GND.
4. Adjust L301 so that the timing waveform appears as shown below.



Match the centers of both waveforms.

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5. After the above-mentioned adjustment, remove the short lead in step 3.
6. Maximize VR501 by turning it fully clockwise.
7. Place the disc on turntable and press Play button. (Play mode).
8. In play mode, connect TJ501 on 01 P.C.B. to GND.
9. In the same oscilloscope mode as in step 2, adjust VR501 so that the oscilloscope wave is formed shown below.



Match the negative edges of both waveforms.

11. Check of play operation after adjustment

Check of skip search

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

Check of manual search

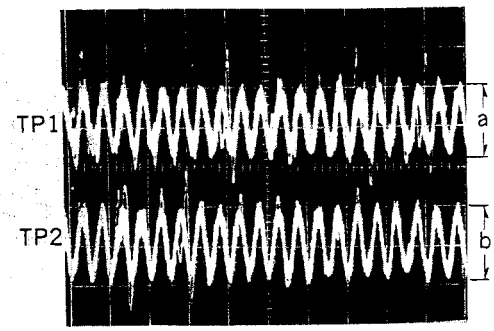
1. Play an ordinary disc
2. Press the manual search button and check to see that smooth manual search can be done at low and high speeds. (Forward and reverse)

Check for defects

1. Play the band 12 of test disc, and check to see that there is no sound skip or noise. (Black spot)
2. Play the band 14 of test disc, and check to see that there is no sound skip or noise. (Fingle print)

1. Justierung der Fokus-Verstärkung

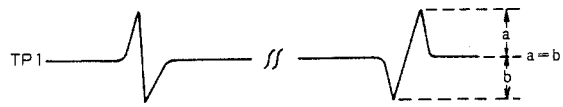
1. Die Verstärkungs-Justiervorrichtung mit Umschaltanschluß an das Gerät anschließen.
   Rot. . . . . Kurzschlußbrücke (+15V) neben Stift 13 von IC301 auf der 01-Platine.
   Blau . . . . . Kurzschlußbrücke (−15V) neben Stift 12 von IC301 auf der 01-Platine.
   Grün. . . . . Chassis
   Steckverbindung . . . . Den kurzen Stift von CN103 auf der 03-Platine herausziehen und den Umschaltanschluß am die Justiervorrichtung anschließen; dann den Anschluß (5P) vom Umschaltanschluß an CN103 anschließen.



2. Den Niederfrequenz-Oszillator auf eine Frequenz von 750Hz und 150 mVss Ausgangsspannung einstellen und TEST pin OSC IN und GND der Justiereinheit anschließen.
3. Kanal 1 und Kanal 2 des Oszilloskops an TP1 und TP2 der Justiereinheit anschließen. (TP3 ist Masse.)
   Einstellungen am Oszilloskop:
   VOLT. . . . . .100 mV (beide Kanäle), SWEEP . . . . . .2 ms, Input. . . . . AC (Wechselspannung)
4. Den Netzschalter der Justiereinheit einschalten und den Drehschalter der Justiereinheit auf "1" stellen; danach eine Platte auflegen.
5. Den Netzschalter einschalten. Wenn der Plattenteller sich zu drehen beginnt, erscheint 750Hz-Signal auf dem Oszilloskop. Dann VR101 so einstellen, daß die Wellenform beider Kanäle gleich ist.

2. Justierung der Fokus-Balance

1. Den Netzschalter der Justiereinheit einschalten und den Drehschalter auf "2" eistellen; danach den Eingangsanschluß vom Oszillator trennen.
2. TJ102 auf der 03-Platine mit einem Klemmenkabel an Masse anschließen.
3. Anschluß CN501 auf der 01-Platine herausziehen.
4. Oszilloskop an TP1 auf 03-Platine anschließen und Platte auflegen.
   Anmerkung: TP1 befindet sich zwischen VR102 und VR103.
   Einstellungen am Oszilloskop:
   VOLT. . . . . .200 mV, SWEEP. . . . . 5 ms, Input. . . . . Wechselspannung
5. Den Netzschalter einschalten. Wenn der Laser aufleuchtet, erscheint eine S-förmige Wellenform auf dem Oszilloskop. VR102 dann so einstellen, daß die untere und obere Spitze der Wellenform gleich sind.



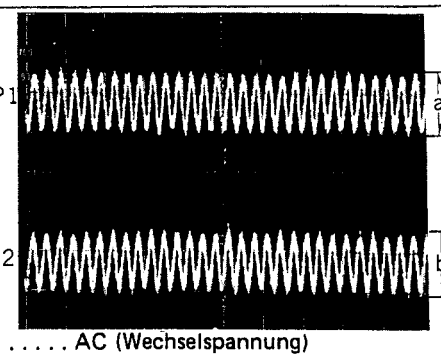
   Anmerkung: Die oben erwähnte S-förmige Wellenform dauert ca. 2 Minuten lang an, wenn Stift 4 von CN412 an Masse angeschlossen wird, während LD leuchtet, da die LD nach 5 ~6 Sekunden stoppt.
6. Nach erfolgter Justierung ist das Klemmenkabel und CN501 wieder in den ursprünglichen Zustand zu versetzen.

3. Justierung der Fokus-Abweichung

1. Den Netzschalter der Justiereinheit einschalten und den Drehschalter auf "2" stellen.
2. Das Gerät auf Auswurf (Eject) schalten.
3. Ein veränderliches Voltmeter an TJ101 auf der 03-Platine anschließen.
4. Den Netzschalter einschalten und VR103 so einstellen, daß die Gleichspannung des Voltmeters 0 ± 10 mV beträgt.

4. Justierung der Spurlage-Verstärkung

1. Den Netzschalter der Justiereinheit einschalten und den Drehschalter auf "3" stellen.
2. Den Niederfrequenz-Oszillator auf 1,5 kHz und 150 mVss Ausgangsleistung einstellen, und ihn dann an TEST pin OSC IN und GND (Masse) der Justiereinheit anschließen.
3. Kanal 1 und Kanal 2 des Oszilloskops an TEST pin TP1 und TP2 der Justiereinheit anschließen.
   (TP3 ist Masse.)
   Einstellungen am Oszilloskop:
   VOLT. . . . . 100 mV (beide Kanäle), SWEEP. . . . . 2 ms, Input . . . . . AC (Wechselspannung)



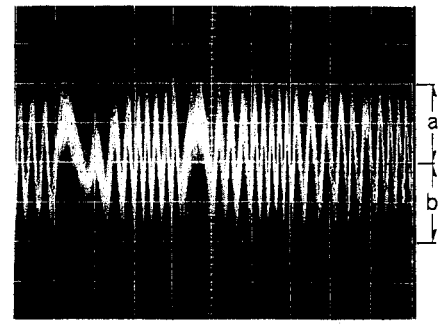
4. Den Netzschalter einschalten. Wenn der Plattenteller sich zu drehen beginnt, erscheint 1,5 kHz-Signal auf dem Oszilloskop. Danach VR104 so einstellen, daß die Wellenform-Amplituden beider Kanäle identisch sind.

5. Provisorische Justierung der Spurlage-Abweichung

1. Den Netzschalter der Justiereinheit einschalten und den Drehschalter auf "2" einstellen; den Eingangsanschluß vom Oszillator trennen.
2. Das Gerät auf Plattenauswurf (Eject) schalten.
3. Ein veränderliches Voltmeter an TJ103 auf der 03-Platine anschließen.
4. Den Netzschalter einschalten und VR106 so einstellen, daß die Gleichspannung des Voltmeters 0 ± 3 mV beträgt.

6. Justierung der Spurlage-Balance

1. Den Netzschalter der Justiereinheit einschalten und den Drehschalter auf "2" einstellen.
2. Das Oszilloskop an TJ103 auf der 03-Platine anschließen und dann eine Platte auflegen.
   Einstellungen am Oszilloskop:
   VOLT . . . . . .200 mV
   SWEEP . . . . . .5 ms
   Input . . . . . .DC (Gleichspannung)
3. Den Netzschalter einschalten. Wenn der Plattenteller sich zu drehen beginnt, und der Spurlage-Servo-Schalter (Tracking Servo) der Justiereinheit sich in der OFF-Position befindet, erscheint das TE-Signal (Tracking Error = Spurlagefehler) auf dem Oszilloskop. VR105 dann so einstellen, daß die oberen und unteren Spitzenwerte gleich sind.



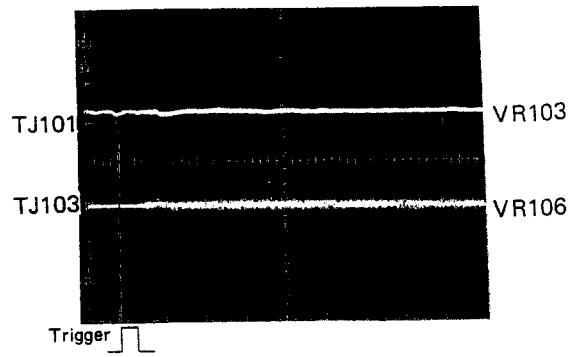
7. Justierung der Spurlage-Abweichung

1. Den Netzschalter der Justiereinheit einschalten und den Drehschalter auf "2" einstellen.
2. Das Gerät auf Plattensuswurf (Eject) schalten.
3. Ein veränderliches Voltmeter an TJ103 auf der 03-Platine anschließen.
4. Den Netzschalter einschalten und VR106 so einstellen, daß die Gleichspannung des Voltmeters 0 ± 3 mV beträgt.

Anmerkung: Nach obiger Justierung ist die Verstärkungs-Justiereinheit zu entfernen, und CN103 ist so anzuschließen, daß der Originalzustand des Gerätes wiederhergestellt wird.

8. Offset-Justierung des Signalausfalls

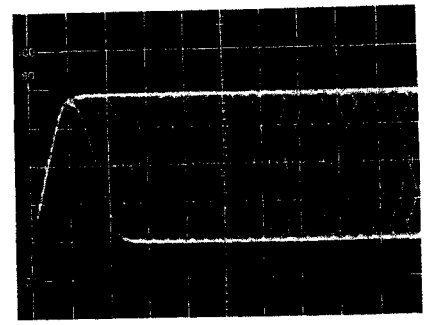
1. Das Oszilloskop an die nachstehenden Punkte anschließen.
   CH1 (Kanal 1) TJ101 (03-Platine)
   CH2 (Kanal 2) TP103 (03-Platine)
   EXT TJ401 (01-Platine)
   Einstellungen am Oszilloskop:
   VOLT . . . . . .1V (beide Kanäle)
   SWEEP . . . . . .0,5 ms
   Trigger . . . . . .EXT. NORM



2. Programm 13 (0,5 mm-großer schwarzer Punkt) auf der Testplatte abspielen.
3. Die Wellenform von CH1 auf dem Oszilloskop beobachten und VR103 so einstellen, daß die Wellenform-Amplitude nahe dem Triggerpunkt auf ein Mindestmaß reduziert wird.
   Falls sie nicht auf ein Mindestmaß reduziert wird, so einstellen, daß Unter- und Oberteil der Wellenform beinahe symmetrisch sind.
4. Die Wellenform von CH2 auf dem Oszilloskop beobachten und VR106 so einstellen, daß die Wellenform-Amplitude nahe dem Triggerpunkt auf ein Mindestmaß reduziert wird. Falls sie nicht auf ein Mindestmaß reduziert wird, so einstellen, daß Unter- und Oberteil der Wellenform beinahe Symmetrisch sind.

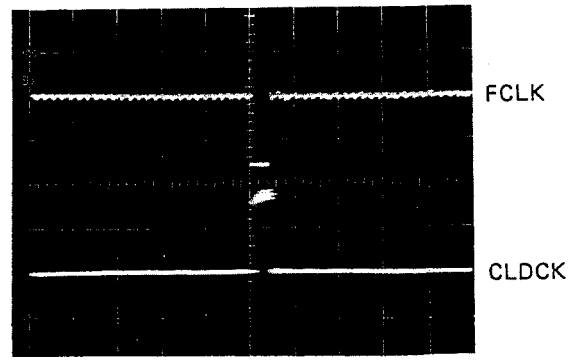
9. Justierung auf "bestes Auge"

1. HF-Signal auf dem Oszilloskop beobachten.
2. Das Oszilloskop an die nachstehenden Punkte anschließen
   CH1 (Kanal 1) ⊕ TJ402 (01-Platine)
   CH1 (Kanal 1) ⊖ TJ403 (01-Platine)
   Einstellungen am Oszilloskop:
   VOLT 1V
   SWEEP . . . . . .0,5 μs
   Input . . . . . .AC (Wechselspannung)
3. VR102 so einstellen, daß das Augenmuster des HF-Signals am weitesten offen ist.



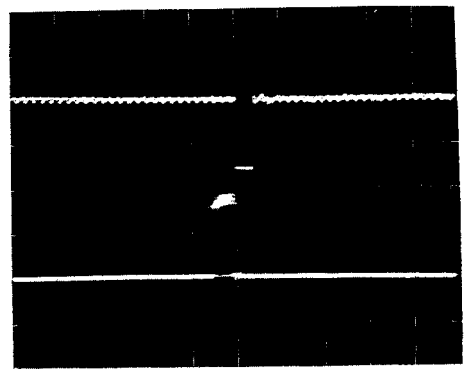
10. PLL-Justierung

1. Das Geräteschloß in die EJECT-Betriebsart stellen.
2. Kanal 1 und Kanal 2 des Oszilloskops an TJ701 (FCLK) und TJ702 (CLDCK) auf der 01-Platine anschließen.
   Einstellung des Oszilloskops:
   VOLT 2V
   SWEEP 20μs
   Input . . . . . AC (Wechselspannung)
   Trigger . . . . . CH1 + CH2 (NORM)
   Mode . . . . . ALT
3. Stift 13 von IC301 auf der 01-Platine an Masse anschließen.
4. L301 (VCO) so justieren, daß die Oszilloskopwelle so geformt ist, wie nachstehend gezeigt.



Die Pulsbreitenmitte beider Wellenformen aufeinander ausrichten.

5. Nach der obigen Justierung ist die Kurzschlußbrücke (in Schritt 3) zu entfernen.
6. VR501 (11T) durch Drehung im Uhrzeigersinn bis zum Anschlag auf Maximum einstellen.
7. Die Platte auflegen und die Taste PLAY drücken.
8. In der Wiedergabe-Betriebsart TJ501 (11TMODE) auf der 01-Platine an Masse anschließen.
9. In der gleichen Oszilloskop-Betriebsart wie in Schritt 2) ist VR501 so zu justieren, daß die Oszilloskop-Wellenform so wird, wie nachstehend gezeigt.



11. Überprüfung des Wiedergabebetriebs nach der Justierung

Prüfen des Überspring-Suchlaufs

1. Eine gewöhnliche Platte abspielen.
2. Die Überspring-Taste drücken und überprüfen, ob Überspring-Suchlauf ausgeführt wird. (Vorwärts und rückwärts)

Prüfen des manuellen Suchlaufs

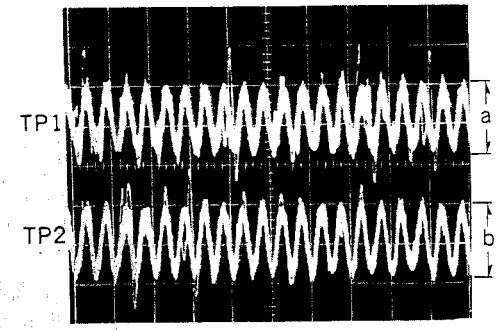
1. Eine gewöhnliche Platte abspielen.
2. Die Taste für manuellen Suchlauf drücken und überprüfen, ob glatter manueller Suchlauf mit niedriger und hoher Geschwindigkeit ausgeführt werden kann. (Vorwärts und rückwärts)

Prüfen auf Defekte

1. Programm 12 der Testplatte abspielen und überprüfen, daß kein Tonausfall oder Rauschen auftritt. (Schwarzer Punkt)
2. Programm 14 der Testplatte abspielen und überprüfen, daß kein Tonausfall oder Rauschen auftritt. (Fingerabdruck)

1. Ajustement de l'amplification de focalisation

1. Raccorder le gabarit d'ajustement de gain avec le connecteur de changement de l'appareil.
   - Rouge . . . . . Fil d'interconnexion (+15V) à côté de la broche 13 IC301 sur la plaquette à circuits imprimés 01.
   - Bleu . . . . . Fil d'interconnexion(−15V) à côté de la broche 12 IC301 sur la plaquette à circuits imprimés 01.
   - Vert . . . . . Châssis
   - Connecteur . . . Retirer la broche de court-circuitage de CN103 sur la plaquette à circuits imprimés 03 et raccorder le connecteur de changement au gabarit. Puis, raccorder le connecteur (5P) à partir du connecteur de changement à CN103.



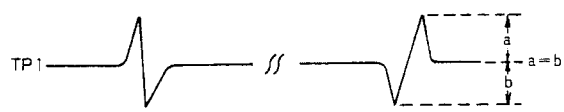
2. Régler l'oscillateur à basse fréquence sur la fréquence de 750 Hz et sur une tension de sortie de crête à crête de 150 mV, et le raccorder à la masse (GND) et a l'entrée d'oscillateur (OSC IN) de labroche d'essai (TEST) de l'élément d'étalonnage.
3. Raccorder les canaux 1 et 2 (CH1/CH2) de l'oscilloscope à TP1 et TP2 de l'élément d'étalonnage (TP3 est la masse).
   Réglage de l'oscilloscope:
   Tension . . . . . 100 mV (les deux canaux) Mode . . . . . CHOP
   Balayage . . . . . 2 ms
   Entrée. . . . . C.A.
4. Régler l'interrupteur d'alimentation "on" (mise en circuit) de l'élément d'étalonnage et l'interrupteur rotatif de l'élément d'étalonnage sur "1" et installer le disque.
5. Mettre en marche l'interrupteur d'alimentation. Lorsque la platine commence à tourner, un signal de 750 Hz apparaît sur l'oscilloscope. Ajuster ensuite VR101 de telle sorte que les formes d'ondes des deux canaux soient réciproquement égales.

2. Ajustement de l'équilibrage de focalisation

1. Régler l'interrupteur d'alimentation "on" (mise en circuit) de l'élément d'étalonnage et l'interrupteur rotatif de l'élément d'étalonnage sur "2" et débrancher l'entrée provenant de l'oscillateur.
2. Raccorder TJ102 sur la plaquette à circuits imprimés 03 à la masse (GND) en utilisant un fil de raccordement à pince.
3. Retirer le connecteur CN501 situé sur la plaquette à circuits imprimés 01.
4. Raccorder l'oscilloscope à TJ101 sur la plaquette à circuits imprimés 03 et placer le disque.

Réglage de l'oscilloscope: Tension. . . . . 500 mV
Balayage . . . . . 5 ms
Entrée . . . . . C. A.

5. Mettre en marche l'interrupteur d'alimentation. Lorsque le laser s'éclaire, une forme d'onde en forme de S apparaît sur l'oscilloscope. Ajuster alors VR102 de telle sorte que les valeurs de crête supérieure et inférieure soient mutuellement égales.



Nota: La forme d'onde en forme de S ci-dessus mentionnée continuera pendant à peu près 2 minutes si la broche 4 de CN412 est raccordée à la masse (GND) alors que LD est éclairé dès que LD s'arrête en 5 ou 6 secondes.

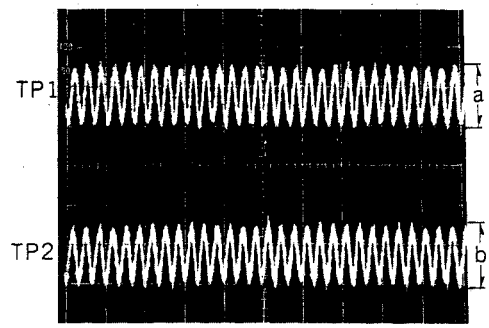
6. Après la mise au point, remettre en place le fil de raccordement à pince ainsi que CN501, comme ils étaient.

3. Ajustement du décentrement de focalisation

1. Maintenir l'interrupteur d'alimentation "on" (mise en circuit) de l'élément d'étalonnage et l'interrupteur rotatif de l'élément d'étalonnage sur "2".
2. Placer l'appareil sur le mode "EJECT" (éjection).
3. Raccorder un voltmètre réglable à TJ101 sur la plaquette à circuits imprimés 03.
4. Mettre en marche l'interrupteur d'alimentation et régler VR103 de telle sorte que la tension de C.C. du voltmètre soit de 0 ± 10 mV.

4. Ajustement du gain d'alignement

1. Régler l'interrupteur d'alimentation "on" (mise en circuit) de l'élément d'étalonnage et l'interrupteur rotatif de l'élément d'étalonnage sur "3".
2. Ajuster l'oscillateur à basse fréquence sur 1,5 kHz et sur une puissance de sortie de crête à crête de 150 mV et le raccorder à la masse (GND) et à l'entrée d'oscillateur (OSC IN) de la broche d'essai (TEST) de l'élément d'étalonnage.
3. Raccorder les canaux 1 et 2 (CH1/CH2) de l'oscilloscope à la broche d'essai (TEST) TP1 et TP2 de l'élément d'étalonnage (TP3 est la masse).
   Réglage de l'oscilloscope:
   Tension..... 100 mV (les deux canaux)
   Balayage..... 2 ms
   Entrée..... C. A. Mode..... CHOP



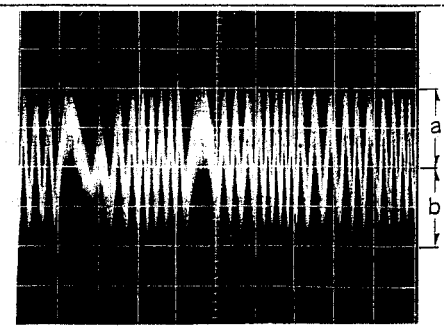
4. Mettre en marche l'interrupteur d'alimentation. Lorsque la platine commence à tourner, un signal de 1,5 kHz apparaît sur l'oscilloscope. Ajuster ensuite VR104 de telle sorte que les amplitudes des formes d'ondes des deux canaux soient réciproquement égales.

5. Ajustement temporaire du décentrement d'alignement

1. Régler l'interrupteur d'alimentation "on" (mise en circuit) de l'élément d'étalonnage et l'interrupteur rotatif de l'élément d'étalonnage sur "2" et débrancher l'entrée provenant de l'oscillateur.
2. Placer l'appareil sur le mode "EJECT" (éjection).
3. Raccorder un voltmètre réglable à TP2 sur la plaquette à circuits imprimés 03.
4. Mettre en marche l'interrupteur d'alimentation et ajuster VR106 de telle sorte que la tension de C.C. du voltmètre soit de 0 ± 3 mV.

6. Ajustement de l'équilibrage d'alignement

1. Maintenir l'interrupteur d'alimentaiton "on" (mise en circuit) de l'élément d'étalonnage et l'interrupteur rotatif de l'élément d'étalonnage sur "2".
2. Raccorder l'oscilloscope à TJ103 sur la plaquette à circuits imprimés 03, puis installer le disque.
   Réglage de l'oscilloscope:
   Tension..... 200 mV
   Balayage..... 5 ms
   Entrée..... C.C.



3. Mettre en marche l'interrupteur d'alimentation. Lorsque la platine commence à tourner et que l'interrupteur asservi d'alignement de l'élément d'étalonnage est mis hors circuit, le signal TE (erreur d'alignement) apparaît sur l'oscilloscope.
   Puis, ajuster VR105 de telle sorte que les valeurs de crête supérieure et inférieure soient égales mutuellement.

7. Ajustement du décentrement d'alignement

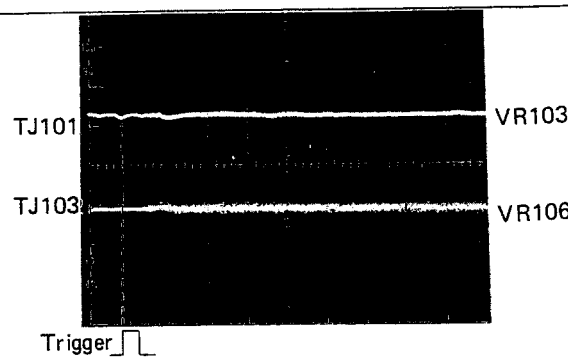
1. Maintenir l'interrupteur d'alimentation "on" (mise en circuit) de l'élément d'étalonnage et l'interrupteur rotatif de l'élément d'étalonnage sur "2".
2. Placer l'appareil sur le mode "EJECT" (éjection).
3. Raccorder un voltmètre réglable à TJ103 sur la plaquette à circuits imprimés 03.
4. Mettre en marche l'interrupteur d'alimentaiton et ajuster VR106 de telle sorte que la tension de C.C. du voltmètre soit de 0 ± 3 mV.

Nota: Après l'ajustement mentionné ci-dessus, retirer l'élément d'étalonnage de l'ajustement du gain et raccorder CN103 pour rétablir la condition initiale de l'appareil.

8. Ajustement du décentrement dans l'intensité de désexcitation

1. Raccorder l'oscilloscope aux points mentionnés ci-dessous.
   - Canal 1 . . . . TJ101 (Plaquette à circuits imprimés 03)
   - Canal 2 . . . . TJ103 (Plaquette à circuits imprimés 03)
   - EXT . . . . . TJ401 (Plaquette à circuits imprimés 01).

   Réglage de l'oscilloscope:
   - Tension. . . . . 1V (les deux canaux)
   - Balayage. . . . . 0,5 ms
   - Entrée . . . . . .C. A.
   - Déclenchement . . . . EXT. NORM

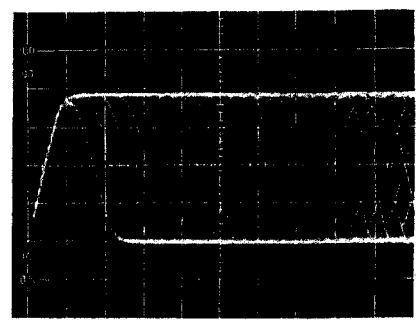


2. Faire jouer la plage 13 (zone de piste noire de 0,5 mm) du disque d'essai.
3. Tout en observant la forme d'onde du canal 1 de l'oscilloscope, ajuster VR103 de telle sorte que l'amplitude de la forme d'onde à proximité du point de déclenchement soit réduite au minimum.
   Si elle n'est pas réduite au minimum, ajuster de telle sorte que le haut et que le bas de la forme d'onde soient sensiblement symétriques.
4. Tout en observant la forme d'onde du canal 2 de l'oscilloscope, ajuster VR106 de telle sorte que l'amplitude de la forme d'onde à proximité du point de déclenchement soit réduite au minimum. Si elle n'est pas réduite au minimum, ajuster de telle sorte que le haut et que le bas de la forme d'onde soient sensiblement symétriques.

9. Ajustement le meilleur de l'oeil

1. Signal de hautes fréquences du moniteur d'analyse sur l'oscilloscope.
2. Raccorder l'oscilloscope aux points mentionnés cidessous.
   - Canal 1 (+) . . . . . TJ402 (Plaquette à circuits impromés 01)
   - Canal 1 (—) . . . . . TJ403 (Plaquette à circuits imprimés 01)

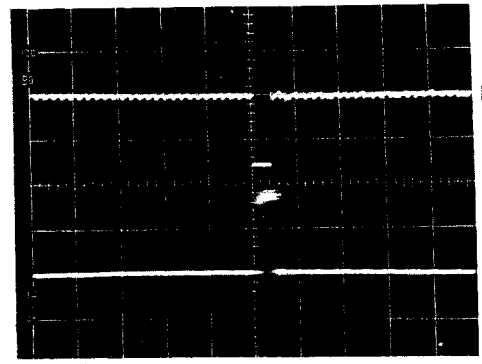
   Réglage de l'oscilloscope:
   - Tension. 1V
   - Balayage. . . . . 0,5 μs
   - Entrée. . . . . C. A.
3. Ajuster VR102 de telle sorte que le modèle d'oeil du signal de hautes fréquences soit le plus largement ouvert possible.



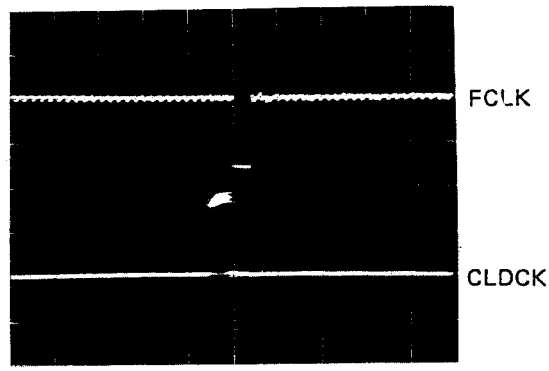
FRANCAIS

10. Réglage du circuit d'asservissement de phase (PLL)

1. Placer le dispositif de verrouillage sur le mode "EJECT" (éjection).
2. Raccorder le canal 1 et le canal 2 de l'oscilloscope à TJ701 (FCLK) et à TJ702 (CLDCK) sur la plaquette à circuits imprimés 01.
   Réglage de l'oscilloscope:
   Tension 2V
   Balayage 20μs
   Entrée. . . . . C.A.
   Trigger . . . . . Canal 1 + Canal 2 (NORM)
   Mode . . . . . ALT
3. Raccorder la broche 13 de IC301 sur la plaquette à circuits imprimés 01 à la masse (GND).
4. Régler L301 (Oscillateur commandé par variation de tension), de telle sorte que l'onde de l'oscilloscope soit formée telle qu'elle est montrée ci-dessous.
5. Après la mise au point mentionnée ci-dessus, retirer le fil de court-circuitage de l'étape 3).
6. Maximaliser VR501 (11T) en le tournant complètement dans le sens des aiguilles d'une montre.
7. Installer le disque et appuyer sur la touche "PLAY" (audition).
8. Sur le mode d'autition, raccorder TJ501 (11TMODE) sur la plaquette à circuits imprimés 01 `a la masse (GND).
9. Sur le même mode d'oscilloscope que celui de l'étape 2), régler VR501 de telle sorte que l'onde de l'oscilloscope soit formée comme il est montré ci-dessous.



Faire coincider les centres des largeurs d'impulsions des deux formes d'ondes.



11. Vérification du fonctionnement de l'audition après l'ajustement

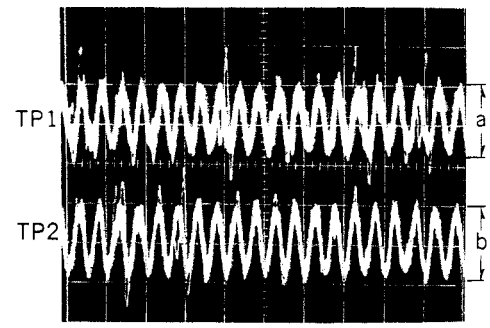
Vérification de la recherche par saut
1. Faire jouer un disque normal.
2. Appuyer sur la touche de saut et vérifier si la recherche par saut est obtenue. (Marches en avant et en arrière)

Vérification de recherche manuelle
1. Faire jouer un disque normal.
2. Appuyer sur la touche de recherche manuelle et vérifier si une recherche manuelle facile peut être obtenue à des vitesses faible et élevée. (Marches en avant et en arrière)

Vérification des défauts
1. Faire jouer la plage 12 du disque d'essai et vérifier s'il n'y a pas de bruit ou de zone de silence du son. (Zone de piste noire)
2. Faire jouer la plage 14 du disque d'essai et vérifier s'il n'y a pas de bruit ou de zone de silence du son. (Impression par touche)

1. Ajuste de ganancia de enfoque

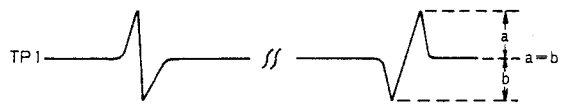
1. Conectar la plantilla de ajuste de ganancia con conectar de cambio al aparato.
   - Rojo . . . . . Puente conectar (+15V) junto a perno 13 de IC301 en P.C.B. 01.
   - Azul . . . . . Puente conectar (−15V) junto a perno 12 de IC301 en P.C.B. 01.
   - Verde . . . . . Chasis
   - Conector . . . Saque el perno corto de CN103 en P.C.B. 03 y conecte el conectar de cambio a la plantilla y luego conecte el conectar (5P) del conectar de cambio a CN103.



2. Ajustar el oscilador de baja frecuencia a frecuencia de 750 Hz y voltaje de salida de 150 mVp-p, y conectarlo a ENTRADA DE OSC. (OSC IN) de perno de PRUEBA y TIERRA (GND) de la plantilla.
3. Conectar CH1 y CH2 de osciloscopio a TP1 y TP2 de la plantilla (TP3 et TIERRA.)
   Puesta de osciloscopio: VOLTAJE. . . . . 100 mV (ambos canales)
   BARRIDO. . . . . 2 ms
   Entrada. . . . . CA
4. Poner le INTER. de corriente en "on" (conectado) de plantilla y el interruptor rotatorio de plantilla en "1" y colocar el disco.
5. Prender el interruptor de corriente. Cuando el plato giradiscos comienza a girar, una señal de 750 Hz aparece en el osciloscopio. Luego adustar VR101 de manera que las formas de onda de ambos canales sean iguales una a otra.

2. Ajuste de equilibrio de enfoque

1. Poner el INTER. de corriente en "on" de plantilla y el interruptor rotatorio de plantilla en "2" y desconectar la entrada del oscilador.
2. Conecte TJ102 en P.C.B. 03 a tierra (GND) mediante cordón de prueba con presilla.
3. Saque el conectar CN501 en P.C.B. 01.
4. Conectar el osciloscopio a TJ101 en P.C.B. 03 y colocar el disco.
   Puesta de osciloscopio: VOLTAJE. . . . . 500 mV
   BARRIDO. . . . . 5 ms
   Entrada. . . . . CA
5. Prender el interruptor de corriente. Cuando el laser se ilumina, la forma de onda de forma-S aparece en el osciloscopio. Entonces ajustar VR102 de manera que los valores de cresta máximos y mínimos sean iguales uno al otro.



Nota: La forma de onda de forma-S, antes mencionada, continuará por unos 2 minutos si perno 4 de CN412 es conectado a tierra mientras LD está iluminado como paradas LD en 5 ~6 seg.

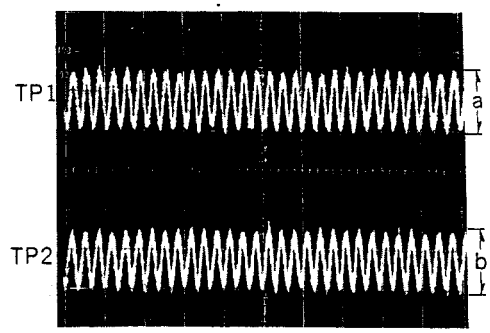
6. Después del ajuste, cambie el cordón de prueba con presilla y CN501 de nuevo como estaban antes.

3. Ajuste de desviación de enfoque

1. Mantener el INTER'. de corriente en "on" (encendido) de fog. y el interruptor rotatorio de plantilla en "2".
2. Cambiar el aparato a modalidad de EYECCION (eject).
3. Conectar un voltímetro variable a TJ101 en P.C.B. 03.
4. Prender el interruptor de corriente y ajustar VR103 de manera que el voltaje CC del voltímetro se 0 ± 10 mV.

4. Ajuste de ganancia de seguimiento

1. Poner el INTER. de corriente en "on" de plantilla y el interruptor rotatorio de la plantilla en "3".
2. Ajustar el oscilador de baja frecuencia a salida de 1.5kHz y 150 mVp-p. Y conectarlo a ENTRADA DE OSC. de perno de PRUEBA y TIERRA (GND) de la plantilla.
3. Conectar osciloscopio de CH1 y CH2 a TP1 y TP2 de perno de PRUEBA de la plantilla. (TP3 está puesto a TIERRA GND.)
   Puesta de osciloscopio:
   VOLTAJE. . . . 100 mV (ambos canales)
   Barrido. . . . . 0,5 ms
   Entrada. . . . . CA



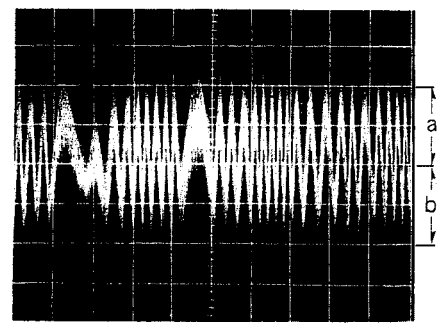
4. Prender el interruptor de corriente. Cuando el plato giradiscos comienza a girar, una señal de 1,5 kHz aparece en el osciloscopio. Entonces ajustar VR104 de manera que las amplitudes de forma de onda de ambos canales son iguales una a la otra.

5. Ajuste provisional de desviación de seguimiento

1. Poner el INTER. de corriente en "on" y el interruptor rotatorio de plantilla en "2", y desconectar la entrada del oscilador.
2. Cambiar el aparato a modalidad de EYECCION (eject).
3. Conectar un voltímetro variable a TJ103. en P.C.B. 03.
4. Prender el interruptor de corriente y ajustar VR106 de manera que el voltaje CC del voltímetro sea 0 ± 3 mV.

6. Ajuste de equilibrio de seguimiento

1. Poner el INTER. de corriente en "on" de plantilla y el interruptor rotatorio de plantilla en "2".
2. Conectar el osciloscopio a TJ103 en P.C.B. 03 y luego colocar el disco.
   Puesta de osciloscopio:
   VOLTAJE. . . . 200 mV
   BARRIDO. . . . 5 ms
   Entrada. CC
3. Prender el interruptor de corriente. Cuando el plato giradiscos comienza a girar y el servointerruptor de seguimiento de plantilla se desconecta, la señal TE (error de seguimiento) aparece en el osciloscopio.
   Entonces ajustar VR105 de manera que los valores de cresta máximos y mínimos sean iguales uno al otro.



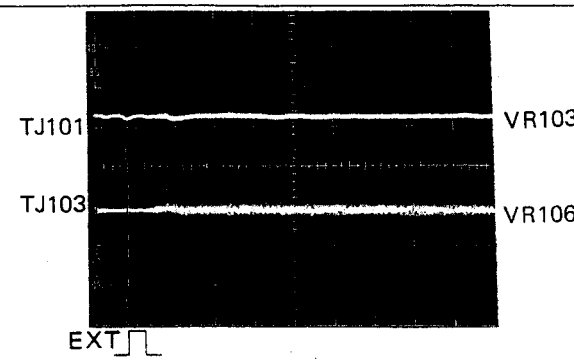
7. Ajuste de desviación de seguimiento

1. Mantener el INTER. de corriente "encendido" de plantilla y el interruptor rotatorio de plantilla en "2".
2. Cambiar el aparato a modalidad de EYECCION (eject).
3. Conectar un voltímetro variable a TJ103. en P.C.B. 03.
4. Prender el interruptor de corriente y ajustar VR106 de manera que el voltaje CC de voltímetro sea 0 ± 3 mV.

Nota: Después del ajuste antes mencionado, remover la plantilla de ajuste de ganancia y conectar el estado original de la unidad.

8. Ajuste de desviación en desexcitación

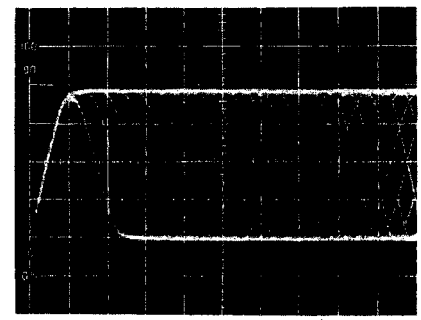
1. Conectar el osciloscopio a los puntos mencionados abajo.
   CH1 . . . . . TJ101 (P.C.B. 03.)
   CH2 . . . . . TJ103 (P.C.B. 03.)
   EXT. . . . . TJ401 (P.C.B. 01.)
   Puesta de osciloscopio:
   VOLTAJE. . . . 1V
   BARRIDO. . . . 0,5 ms
   Entrada. . . . . CA
   Disparador. . . . NORMA EXT.
2. Interpretar la banda 13 (punto negro de 0,5 mm) del disco de prueba.



3. Observando la forma de onda de CH1 dèl osciloscopio, ajustar VR103 de manera que la amplitud de forma de onda, cerca del punto de disparo, se minimice.
   Si no se minimiza, ajustar de manera que la parte superior e ingerior de la forma de onda sean casi simétricas.
4. Observando la forma de onda de CH2 del osciloscopio, ajustar VR106 de manera que la amplitud de forma de onda, cerca del punto de disparo, se minimice. Si no se minimiza, ajustar de manera que la parte superior e inferior de forma de onda sean casi simétricas.

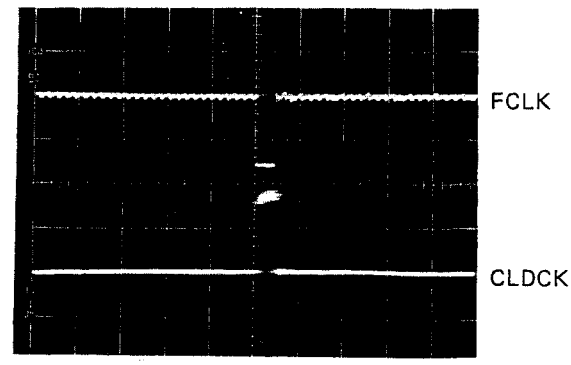
9. Ajuste de ojo óptimo

1. Señal RF de monitor en osciloscopio.
2. Conectar CH1 de osciloscopio a los puntos TJ402 en P.C.B.
   Puesta de osciloscopio:
   VOLTAJE. . . . 1V
   BARRIDO. . . . 0,5 ms
   Entrada. . . . . CA
3. Ajustar VR102 de manera que el patrón de ojo de señal RF esté lo máximo abierta.



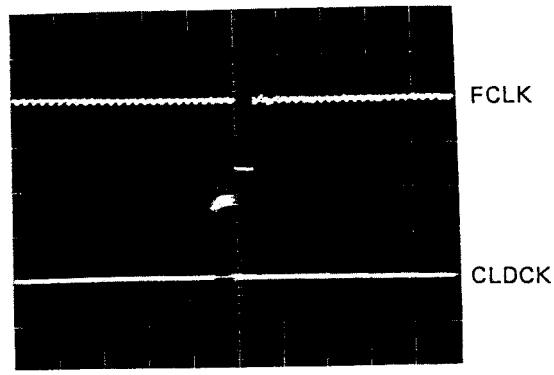
10. Ajuste PLL (bucle de enganche de fase)

1. Cambie el bloqueo de aparato a modalidad de EYECCION.
2. Connecte CH1 y CH2 de osciloscopio a TJ701 (FCLK) y TJ702 (CLDCK) en P.C.B. 01.
   Puesta de osciloscopio:
   VOLTAJE 2V
   BARRIDO 20μs
   Entrada . . . . . CA
   Disparador . . . . . CH1 + CH2 (NORM.)
   Modalidad . . . . . ALT:
3. Connecte perno 13 de IC301 en P.C.B. 01 a tierra (GND).
4. Ajuste L301 (VCO) de manera que la onda de osciloscopio se forme como se muestra abajo.



Aparee los centros de anchura de impulso de ambas formas de onda.

5. Después del ajuste arriba mencionado, remueva el cable corto en paso 3).
6. Maximice VR501 (11T) girándolo completamente a la derecha.
7. Ponga el disco y apriete el botón de INTERPRETACION.
8. En la modalidad de interpretación, conecte TJ501 (11TMODE) en P.C.B. 01 a tierra (GND).
9. En la misma modalidad de osciloscopio como en paso 2), ajuste VR501 de manera que la onda de osciloscopio se forme como abajo.



11. Comprobación de operación de interpretación después

Comprobación de busca de salto
1. Interpretar un disco ordinario.
2. Oprimir el botón de salto y comprobar para ver si se da busca de salto. (Adelante y atrás)

Comprobación de busca manual
1. Interpretar un disco ordinario.
2. Optimir el botón de busca manual y comprobar para ver si se puede hacer busca de salto suave a las velocidades baja y alta. (Adelante y atrás)

Comprobación para defectos
1. Interpretar la banda 12 de disco de prueba y comprobar para ver si no hay salto de sonido o ruido. (Punto negro)
2. Interpretar la banda 14 de disco de prueba y comprobar para ver si no hay salto de sonido o ruido. (Huella digital)

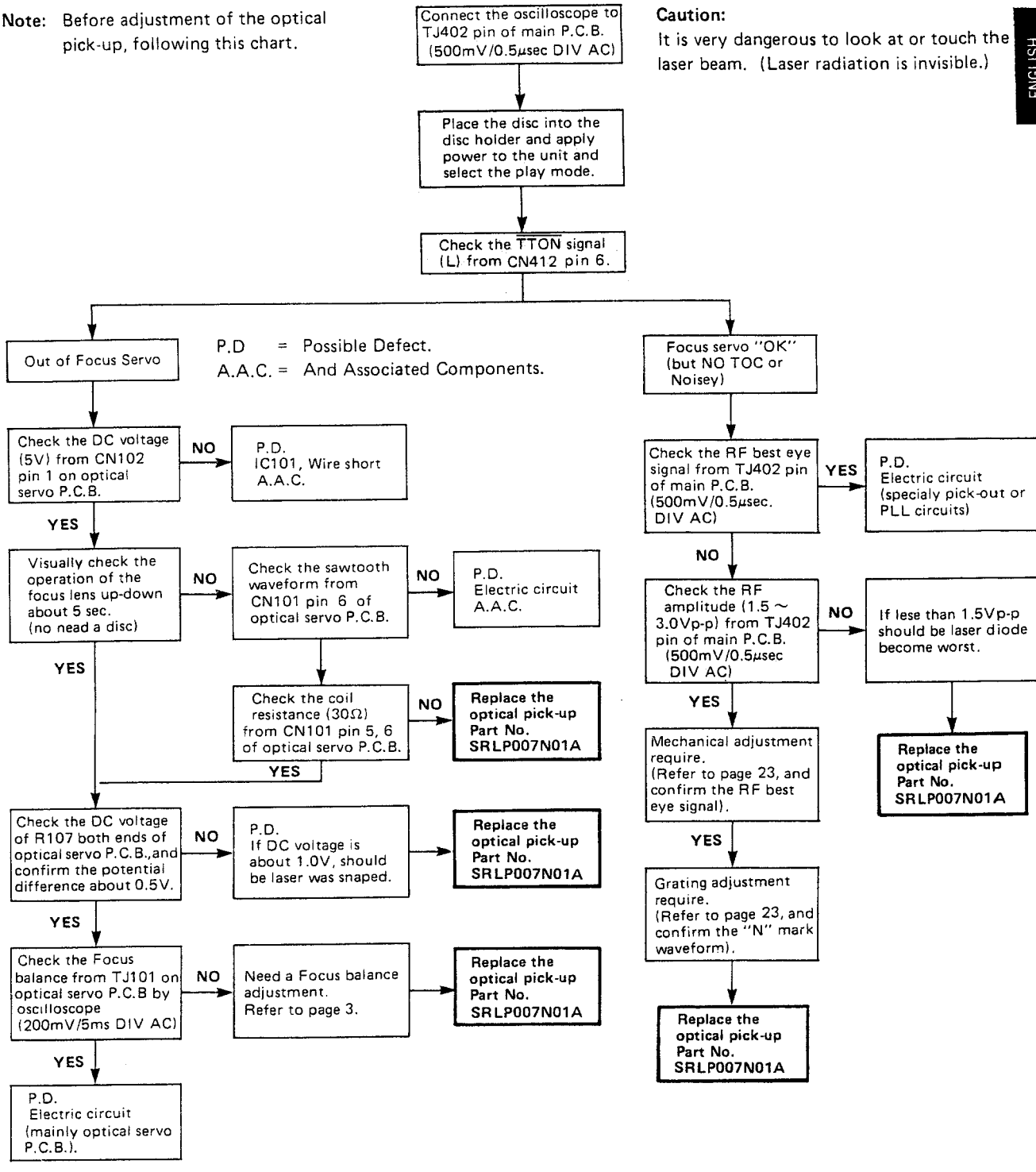
ADJUSTMENT OF OPTICAL PICK-UP

Approval Judgement of defect for Optical Pick-up

Note: Before adjustment of the optical pick-up, following this chart.

Caution:
It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.)

ENGLISH



Replacement Procedure

* For servicing of traverse unit, refer to page 1.

ENGLISH

1. Mount the traverse unit on the traverse unit base, and make sure mounting screw is tight.
2. Position the assembly as shown in **Fig. 1.**
3. Remove the optical bracket and screw from the optical pick-up body as shown in **Fig. 2.**

Note: A) Be careful when removing the screw, the spring can snap out very fast and be lost.
B) Also note the position of the spring so that when ready to re-assembly it, you will remember its position.

4. Remove the shaft clamp mounting screw as shown in **Fig. 3** .
5. Remove the two suspension shafts by lifting and pulling to the left. Optical pick-up body can be separated from the deck as shown in **Fig. 3.**
6. Before proceeding to replace the optical pick-up, observe the following precautions:
   A) The laser diode can be destroyed if P101 remains open too long (about 20 seconds).
   Do not remove the shorting pin from P101 until you are ready to connect it to 03 module CN101 as shown in **Fig. 4.**
   B) Be certain that rest detection switch (S101) and end detection switch (S102) have not been bent. If they have, traverse motor will remain on. **(Fig. 5)**
7. Reassemble the optical pick-up to the traverse unit by following step 6 through 1 in reverse procedure.

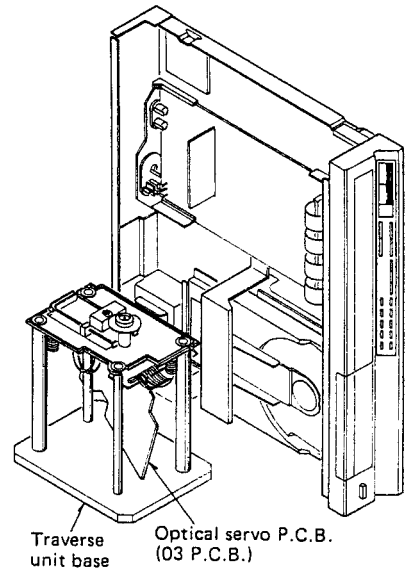


Fig. 1

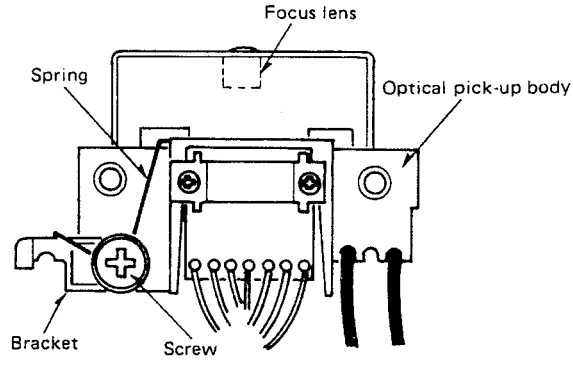
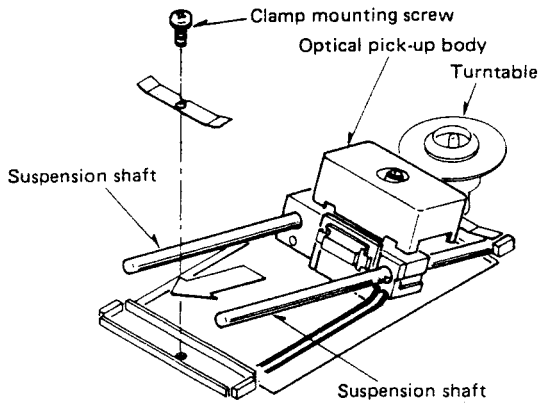


Fig. 2



[Fig. 3]

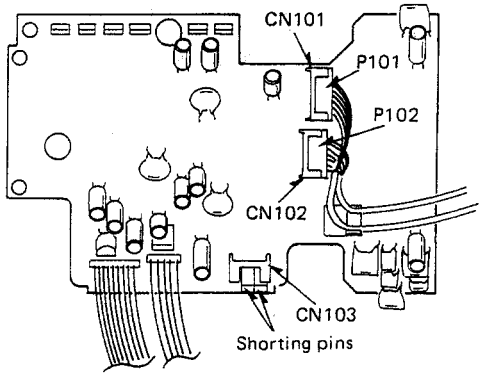
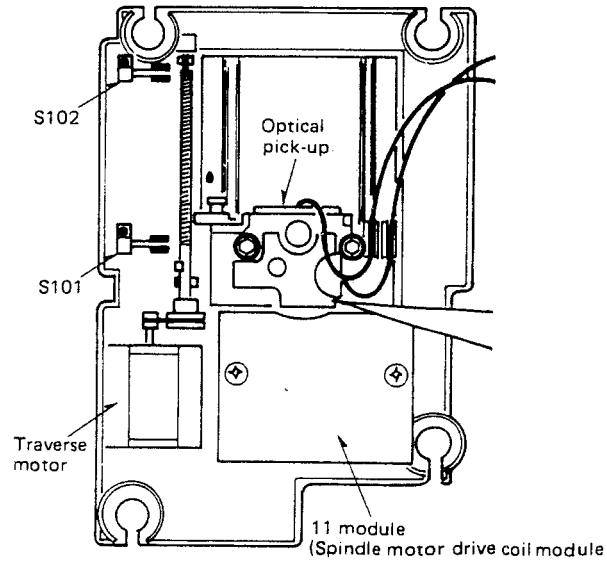


Fig. 4

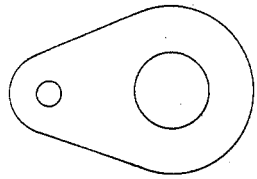


Bottom view of traverse unit

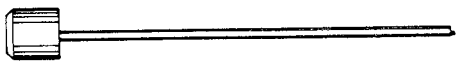
Fig. 5

Testers and jigs for adjustments

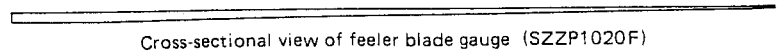
1. Two-channel oscilloscope of 30 MHz or over.
2. Ordinary disc and test disc (SZZP1014F)
3. Hexagonal wrenches (1.27mm and 2 mm)
4. Gauge ket (SZZP1022F)



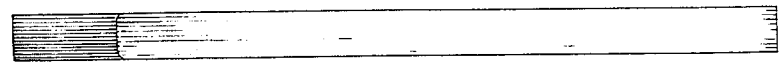
REST position gauge (SZZP1019F)



Grating adjustment tool (SZZP1018F)



Cross-sectional view of feeler blade gauge (SZZP1020F)



Top view of feeler blade gauge (SZZP1020F)

Caution

It is very dangerous to look at or touch the laser beam.
(Laser radiation is invisible.)
With the unit turned "on", laser radiation is emitted from the pick-up lens. Be careful during adjustments in particular.

Adjustment Procedure

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

1. Rest position adjustment

1. Assure that leaf switches S101 (Rest detection) and S102 (End detection) have not been mashed during reassembly and therefore set to "ON".
   If they are, carefully separate the contacts about 2 mm.
2. Apply power to the unit. This will cause the traverse motor to wind the optical pick-up to the REST position.
3. Turn the power switch "OFF".
4. Place the REST position gauge on the turntable.
5. Assure that the lens is concentric within the hole of the REST position gauge as shown in **Fig. B**.

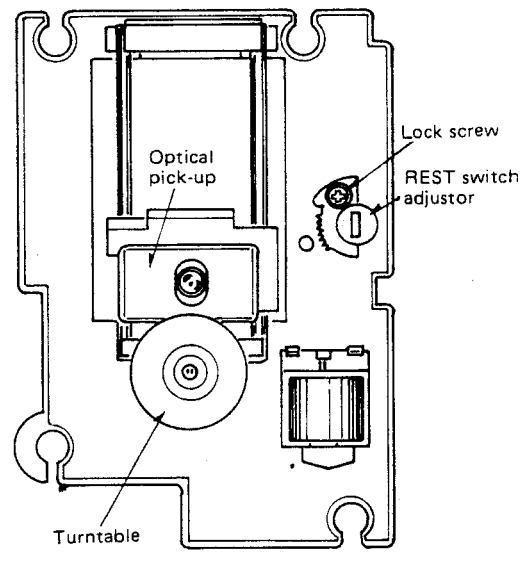


Fig. A

Optical pick-up is too close to the turntable. (Fig. B)
To adjust:

1. Loosen the lock screw and turn the REST switch adjustor clockwise.
2. Note that if the Rest detection switch (S101) is too much toward S102, then the pick-up will Rest too far away from the turntable at Rest position. If so, apply power and repeat step 1 above until Rest detection is detected when the lens is connectric with the hole of the REST position gauge.

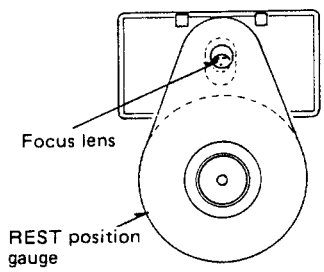


Fig. B "NG" (too close)

No adjustment required (Fig. C)

Optical pick-up is too far from the turntable. (Fig. D)
To adjust:
Loosen the lock screw and turn the Rest switch adjustor counter-clockwise.

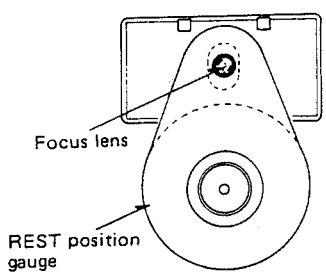


Fig. C "OK"

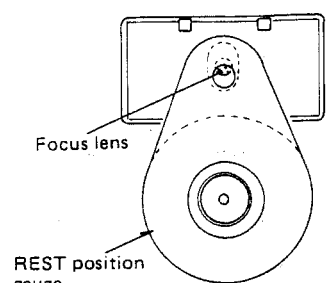


Fig. D "NG" (too far)

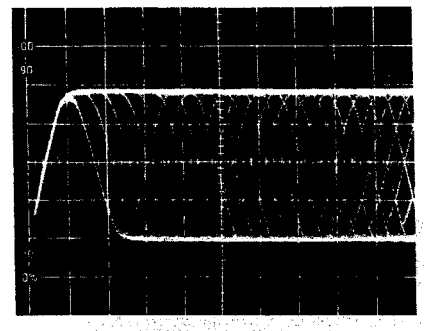
6. To verify correct adjustment, place the disc on the turntable and apply power to the unit. This will auto cycle the optical pick-up. Re-check alignment with the REST position gauge as shown in **Fig. C**.

2. Turntable height adjustment

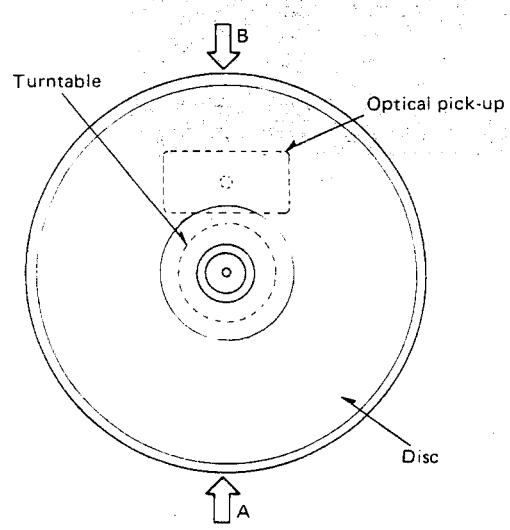
Note: Necessary after Direct Drive spindle motor is replaced or RF signal is not obtained.

1. Disable focus search by pull out the shorting pins of CN103 on 03 P.C.B.
2. Insert the thin end of Feeler blade gauge between the turntable and the shaft bearing.
3. Slide the Feeler blade gauge toward the thick end and mark the gauge with a pencil, where it and the turntable touch and until the blade can not be fed anymore than remove the gauge.
4. Connect the oscilloscope to TJ402 pin 01 (Main) P.C.B.
5. Place a disc on the turntable and clamp it with the magnet.
6. Apply power to the unit.
7. Press eject "out" and eject "IN".
8. Confirm if RF signal is present. If not, proceed to the next step.
9. To confirm:
   Gently tap the disc at point "A". If RF signal appears, the turntable is too low. If RF signal does not appear, tap the disc at point "B".
   RF signal should appear indicating that the turntable is too high.
10. To adjust:

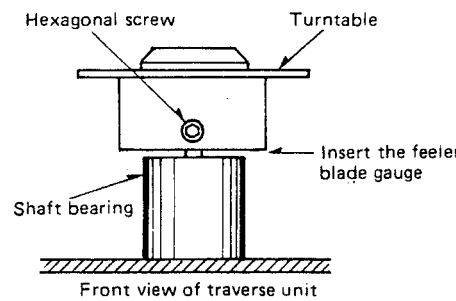
(1) Insert the Feeler blade gauge between the turntable and the shaft bearing to the previously marked point.
(2) Loosen the hexagonal screw of turntable set screw. (Use a hexagonal wrench 1.27 mm)
(3) If the turntable is too low, slide the Feeler blade gauge about 4 mm (5/32") towards the thick end and remove feller blade gauge.
   Reapply power and check for RF signal.
   (This is a "trial and error" adjustment, several attempts may be required to obtain RF signal).
(4) If the turntable is too high, insert the Feeler blade gauge and move about 4 mm (5/32") towards the thin end, using the same method as in step 3.
(5) Reconnect shorting pins to enable focus search.



RF signal



Top view of disc set up



Front view of traverse unit

3. Mechanical adjustment

1. Place the Test disc on the turntable with clamper magnet.
2. Connect the oscilloscope to TJ402 pin on 01 (Main) P.C.B.
3. Apply power to the unit and select the play mode.
4. Confirm that RF signal is as shown in **Fig. A.** If it is not present, proceed to next step.
   If RF signal is as shown, skip step 5.
5. Adjust hexagonal screw (Use a hexagonal wrench 2 mm) to the right or left to obtain the RF signal (Visual check) as shown in Fig. B.

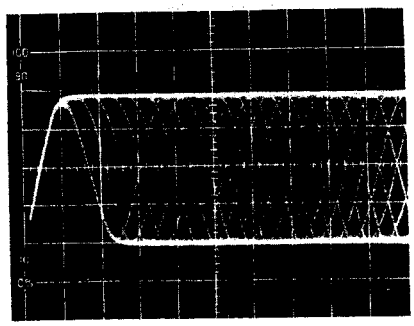


Fig. A. RF signal

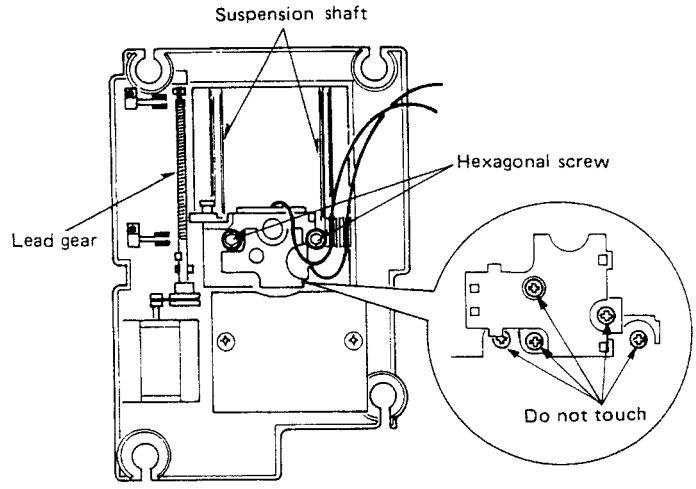


Fig. B. Bottom view of traverse unit

4. Grating adjustment

1. Place the Test disc on the turntable and clamper with the magnet.
2. Connect the oscilloscope as follows:
   Sweep speed. . . . . .2μs.
   CH1 . . . . . .TJ402 pin on 01 (Main) P.C.B.
   CH2 . . . . . .C164 on 03 P.C.B. (IC104 17 pin)
3. Apply power to the unit and select play mode.
4. If RF signal and "N" mark are present no adjustment is required as in **Fig. A.**
   If RF signal and "N" mark are not present, perform step 5.
5. Insert the Grating adjustment tool into the hole on the left side of the optical pick-up body as shown in **Fig. B.**
6. Rotate the Grating adjustment tool toward right or left until the "N" mark is sharpest and maximum RF signal is obtained.

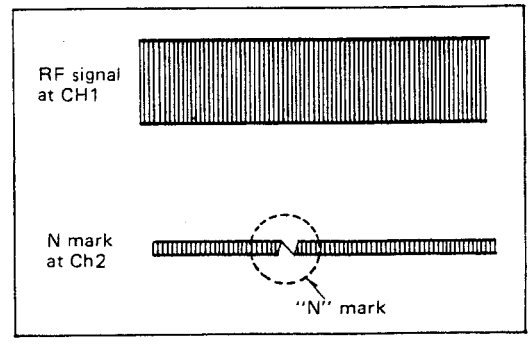


Fig. A RF signal and "N" mark

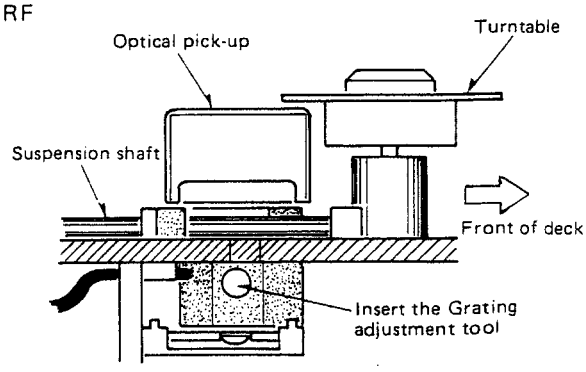


Fig. B. Left side view of traverse unit

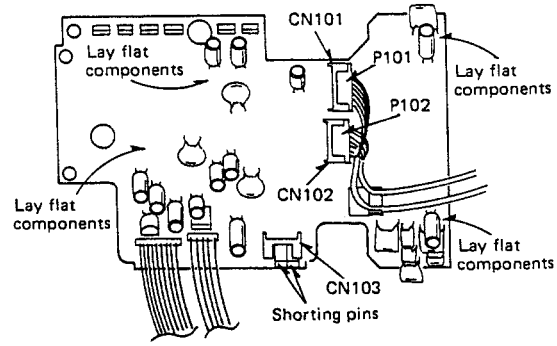
ENGLISH

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5. Electrical alignment of main unit. Follow the adjustment, refer to pages 1 ~ 6.

6. Check of the 03 module (Head amplifier module)

* After adjustment dress all components to lay flat on 03 P.C.B., and reassemble on the traverse unit.
* Once the 03 P.C.B. is mounted, assure that the bottom of the pick-up does not interfere with any of the components.
  Therefore make sure that the tracks in the outer edges of the disc are accessible.



■ MESSUNGEN UND JUSTIERUNGEN Deutsch

1. Justierung der Ruheposition

1. Sicherstellen, daß die Blattschalter S101 (Ruhedetektion) und S102 (Endedetektion) während des Zusammenbaus nicht zerdrückt wurden und daher auf "ON" einstellen.
   Falls sie zusammengedrückt wurden, die Kontakte ca. 2 mm trennen.
2. Dem Gerät Strom zuführen. Dies verursacht, daß der Traversenmotor den optischen Abtaster zur Ruheposition umspult.
3. Den Netzschalter ausschalten.
4. Die Ruhepositions-Schablone auf den Plattenteller auflegen.
5. Überprüfen, ob die Linse im Loch der Ruhepositions-Schablone konzentrisch liegt., wie in **Abb. B** gezeigt.

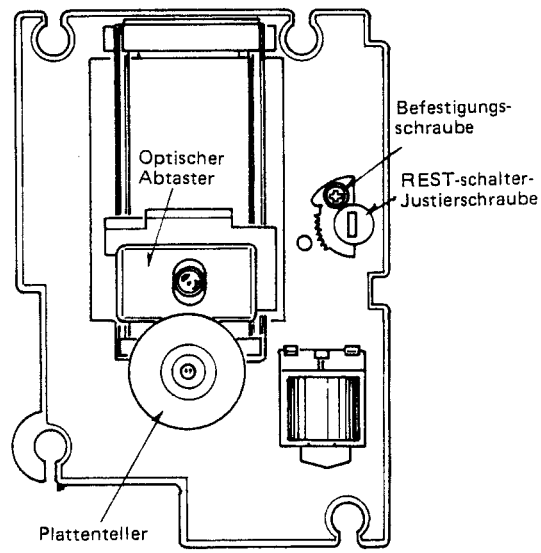


Abb. A

Wenn der optische Abtaster zu nahe beim Plattenteller ist (Abb. B):
Justierung:

1. Die Befestigungsschraube lösen und die REST-Schalter-Justierschraube im Uhrzeigersinn drehen.
2. Falls der Ruhedetektionsschalter (S101) zu nahe bei S102 ist, ist zu beachten, daß der Abtaster in der Ruheposition zu weit weg vom Plattenteller zu liegen kommt. In diesem Fall ist die Stromzufuhr einzuschalten, und Schritt 1 oben ist zu wiederholen, bis die Ruheposition erfaßt wird, wenn die Linse konzentrisch im Loch der Ruhepositions-Schablone liegt.

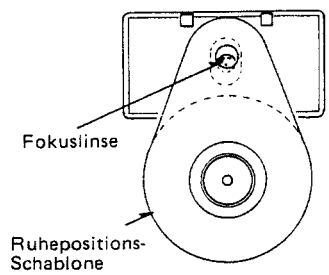


Abb. B: schlecht (zu nahe)

Justierung ist nicht nötig (Abb. C):

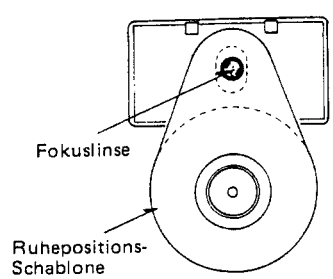


Abb. C: gut

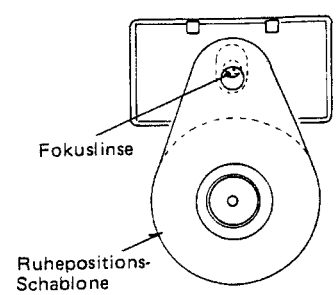


Abb. D: schlecht (zu weit weg)

Der optische Abtaster ist zu weit weg vom Plattenteller (Abb. D):
Justierung:

Die Befestigungsschraube lösen und die REST-Schalter-Justierschraube entgegen dem Uhrzeigersinn drehen.

6. Um richtige Justierung zu überprüfen, die Platte auf den Plattenteller legen und Stromzufuhr einschalten. Dadurch wird der optische Abtaster in den Auto-Zyklus versetzt. Die Abgleichung mit der Ruhepositions-Schablone erneut überprüfen, wie in **Abb. C** gezeigt.

2. Justierung der Tonarmhöhe

Anmerkung: Dies ist nötig nach Ersetzen des Direktantrieb-Spindelmotors, oder wenn kein HF-Signal vorhanden ist.

1. Den kurzen Stift von CN103 auf der 03-Platine herausziehen.
2. Das dünne Ende der Fühleklingenlehre zwischen dem Plattenteller und dem Achslager einführen.
3. Die Fühlerklingenlehre gegen das dicke Ende schieben und die Stelle, wo sie den Plattenteller berührt und bis sie nicht mehr weitergeschoben werden kann, mit Bleistift markieren. Dann die Lehre entfernen.
4. Das Oszilloskop an den TJ402-Stift am 01-Platine (Servo) anschließen.
5. Eine Platte auf den Plattenteller legen und sie mit dem Magneten festklemmen.
6. Die Stromzufuhr zum Gerät einschalten.
7. "Eject Out" und "Eject In" drücken.
8. Überprüfen, ob HF-Signal vorhanden ist.
   Falls nicht vorhanden, mit dem nächsten Schritt weiterfahren.
9. Zu überprüfen:
   Die Platte am Punkt "A" leicht antippen. Fall HF-Signal auftritt, ist der Plattenteller zu tief. Falls kein HF-Signal auftritt, an Punkt "B" auf die Platte tippen. HF-Signal sollte auftreten um anzuzeigen, daß der Plattenteller zu hoch ist.
10. Justierung:

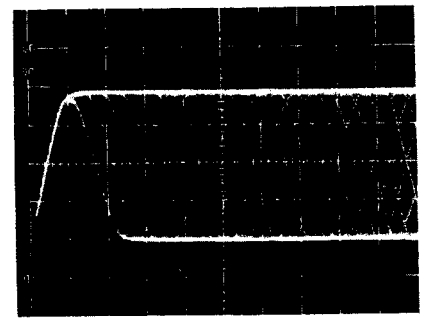
(1) Die Fühlerklingenlehre zwischen dem Plattenteller und dem Achslager bis zum vorher markierten Punkt einführen.

(2) Die Sechskant-Plattenteller-Befestigungsschraube lösen. (1,27mm-Sechskantschlüssel verwenden.)

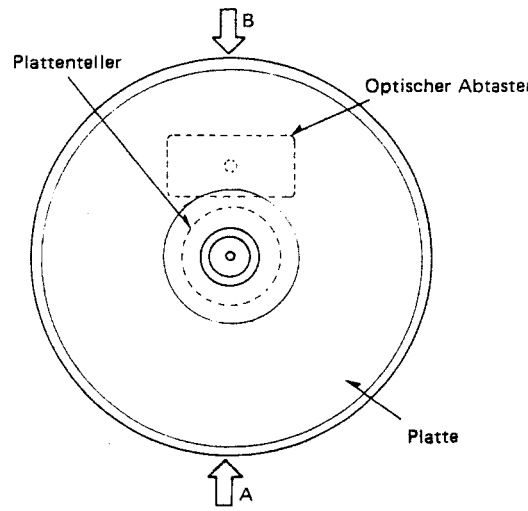
(3) Falls der Plattenteller zu tief ist, die Fühler-klingenlehre ca. 4mm gegen das dicke Ende hin schieben und sie dann entfernen.
Stromzufuhr wieder einschalten und prüfen, ob HF-Signal vorhanden ist.
(Es handelt sich hier um eine Justierung "auf gut Glück"; es dürften daher mehrere Versuche nötig sein, bis ein HF-Signal auftritt.)

(4) Der Plattenteller ist zu hoch; die Fühlerklingenlehre einführen und ca. 4mm gegen das dünne Ende hin schieben, d.h. auf gleiche Weise vorgehen, wie in Schritt 3.

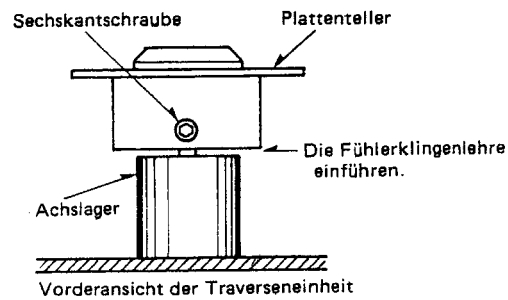
(5) CN103 wieder anschließen, damit Fokus-Suchlauf funktioniert.



HF-Signal



Ansicht von oben bei aufgelegter Platte



Vorderansicht der Traverseneinheit

3. Mechanische Justierung

1. Die Testplatte auf den Plattenteller legen und mit dem Magneten festklemmen.
2. Das Oszilloskop an den TJ402 am 01-Platine (Servo) anschließen.
3. Die Stromzufuhr zum Gerät einschalten und Wiedergabe-Betriebsart wählen.
4. Überprüfen, ob das HF-Signal so ist, wie in **Abb. A** gezeigt. Falls nicht vorhanden, mit dem nächsten Schritt weiterfahren.
   Falls HF-Signal wie gezeigt ist, Schritt 5 überspringen.
5. Die Sechskantschraube (mit einem 2mm-Sechskantschlüssel) nach links oder rechts drehen, bis HF-Signal auftritt (Prüfung von Auge), wie in **Abb. B** gezeigt.

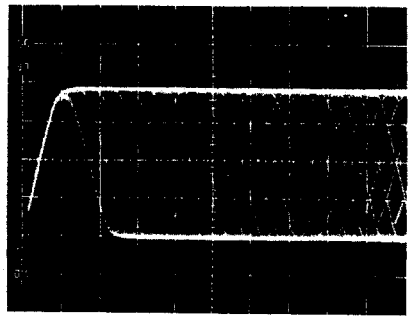


Abb. A: HF-Signal

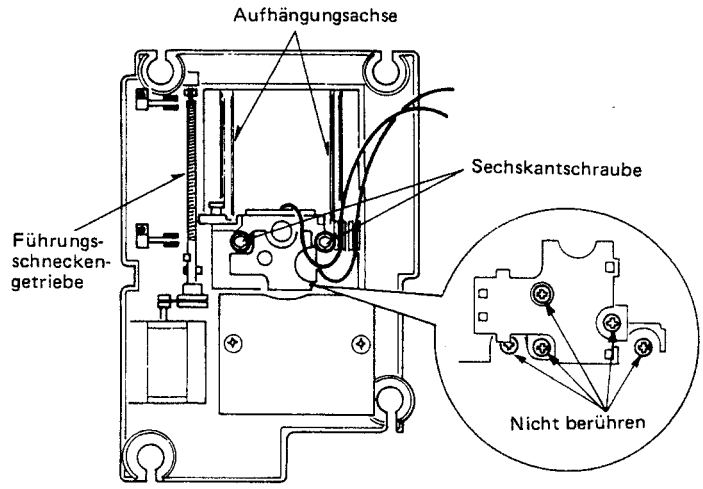


Abb. B: Traverseneinheit von unten gesehen

4. Gitterjustierung

1. Die Testplatte auf den Plattenteller legen und mit dem Magneten festklemmen.
2. Das Oszilloskop wie folgt anschließen:
   SWEEP 2μs
   CH1 (Kanal 1) . . . . . TJ402 an 01-Platine
   CH2 (Kanal 2) . . . . . C164 an 03-Platine (Stift 17 von IC104)
3. Stromzufuhr des Gerätes einschalten und Wiedergabe-Betriebsart wählen.
4. Falls HF-Signal und "N"-Marke vorhanden sind, wie in **Abb. A** gezeigt, ist keine Justierung nötig.
   Falls HF-Signal und "N"-Marke nicht vorhanden sind, Schritt 5 durchführen.
5. Den Gitterjustierstift in das Loch auf der linken Seite des Gehäuses des optischen Abtasters einführen, wie in **Abb. B** gezeigt.
6. Den Gitterjustierstift links- oder rechtsherum drehen, bis die "N"-Marke am schärfsten und das HF-Signal maximal ist.

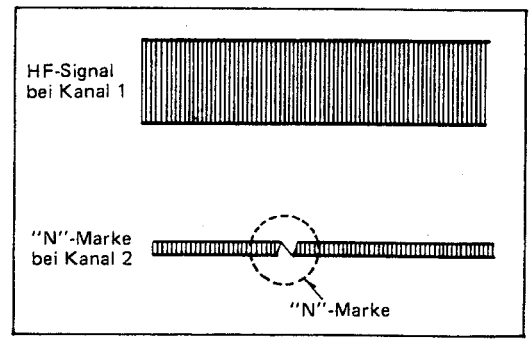


Abb. A: HF-Signal und "N"-Marke

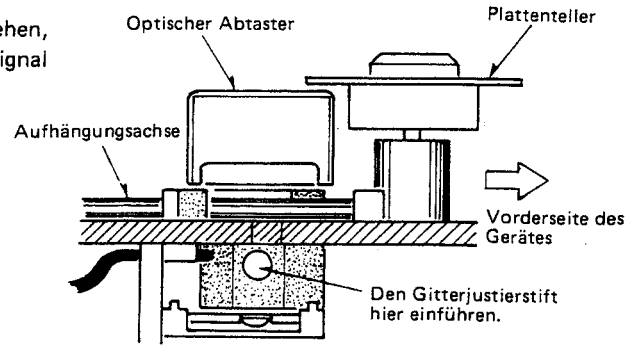
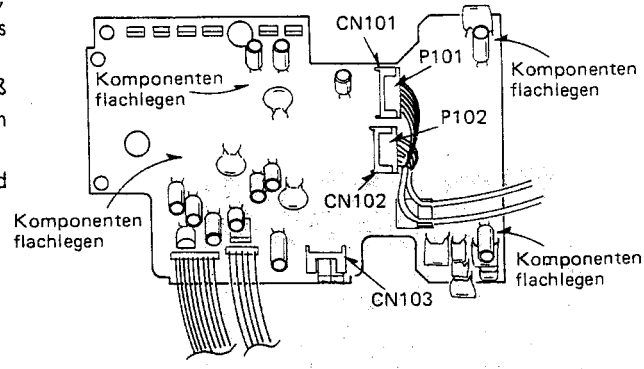


Abb. B: Ansicht der linken Seite der Traverseneinheit

5. Elektrische Justierung der Haupteinheit. Für die Durchführung der Justierung, siehe Seite 7 ~10.

6. Prüfung des 03-Platine

* Nach der Justierung sind alle Komponenten umzubiegen, so daß sie flach auf dem 03-Platine liegen, und dieses wieder in die Traverseneinheit einbauen.
* Nach Montieren des 03-Platine ist sicherzustellen, daß die Unterseite des Abtasters keine der Komponenten behindert.
  Daher ist sicherzustellen, daß die Spuren am Außenrand der Platte erreichbar sind.



DEUTSCH

FRANÇAIS

■ MESURAGES ET RÉGLAGES — Français

1. Réglage de la position de repos

1. S'assurer que les interrupteurs à lames S101 (détection du repos) et S102 (détection terminale) n'ont pas été mélangés pendant le réassemblage et par conséquent réglés sur "ON" (en circuit).
   S'ils le sont, séparer avec soin les contacts d'à peu près 2 mm.
2. Mettre l'appareil en marche. Cela entraînera le moteur transversal à enrouler le capteur optique à la position de REPOS.
3. Tourner le commutateur d'alimentation sur "OFF" (hors circuit).
4. Placer le calibre de positionnement de REPOS sur la platine.
5. S'assurer que la lentille est concentrique en deçà de l'orifice du calibre de positionnement du REPOS, comme il est montré à la **Fig. B.**

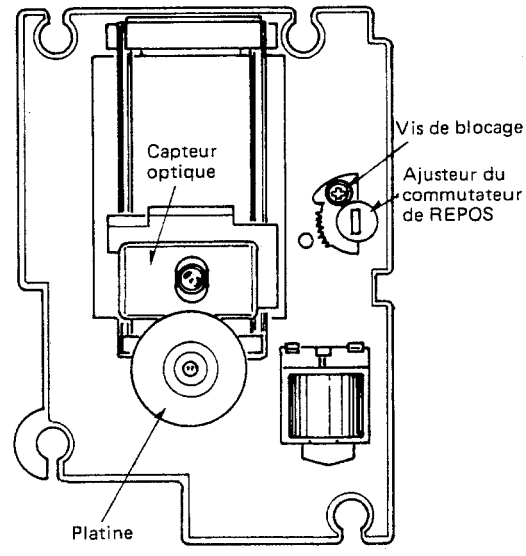


Fig. A

Le capteur optique est trop proche de la platine. (Fig. B)

Pour régler:

1. Desserrer la vis de blocage et tourner l'ajusteur du commutateur de REPOS dans le sens des aiguilles d'une montre.
2. Noter que si l'interrupteur de détection de repos S101 est trop proche de S102, le capteur sera alors trop éloigné de la platine à la position de repos. Si c'est le cas, appliquer l'énergie et répéter l'étape 1 ci-dessus jusqu'à ce que la détection de repos soit détectée lorsque la lentille est concentriqué avec l'orifice du calibre de positionnement du REPOS.

Aucun réglage n'est nécessaire. (Fig. C)

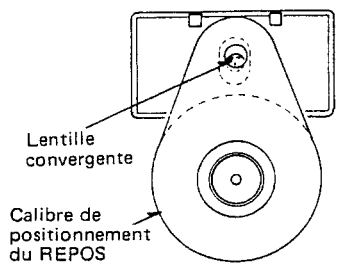


Fig. B "Incorrect" (trop proche)

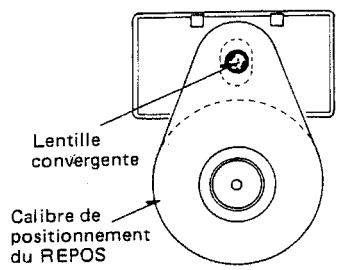


Fig. C "Correct"

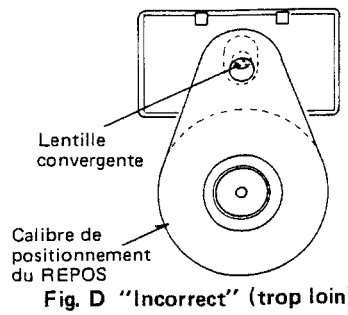


Fig. D "Incorrect" (trop loin)

Le capteur optique est trop éloigné de la platine. (Fig. D)
Pour régler:
Desserrer la vis de blocage et tourner l'ajusteur du commutateur de repos dans le sens inverse des aiguilles d'une montre.

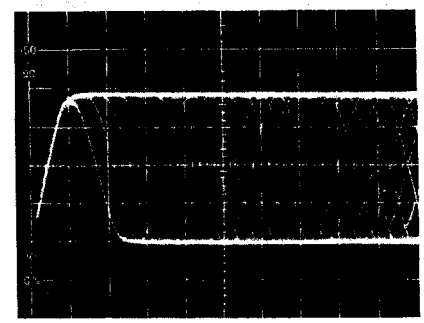
6. Pour vérifier si le réglage est correct, placer le disque sur la platine et appliquer l'énergie à l'appareil. Cela provoquera la cyclisation automatique du capteur optique. Vérifier à nouveau l'alignement avec le calibre de positionnement du REPOS, comme il est montré à la **Fig. C**.

2. Réglage de la hauteur de la platine

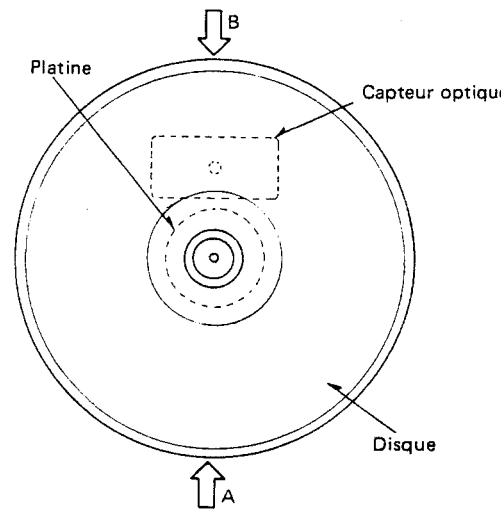
Nota: Réglage nécessaire après que le moteur sur pivot à entraînement direct soit remplacé ou qu'un signal à haute fréquence ne soit pas obtenu.

1. Retirer la broche de court-circuitage de CN103 sur la plaquette à circuits imprimés 03.
2. Insérer l'extrémité mince du calibre à lame d'épaisseur entre la platine et le support de l'axe.
3. Faire glisser le calibre à lame d'épaisseur vers l'extrémité épaisse et faire un trait de repère sur le calibre avec un crayon là où il touche la platine et jusqu'à ce que la lame ne puisse s'introduire davantage. Puis, retirer le calibre.
4. Raccorder l'oscilloscope à TJ402 sur la plaquette à circuits imprimésol.
5. Placer un disque sur la platine et le fixer avec l'aimant.
6. Mettre l'appareil en marche.
7. Appuyer sur l'éjection "OUT" (extérieur) et l'éjection "IN" (intérieur).
8. S'assurer si un signal à haute fréquence est présent. Dans la négative, passer à l'étape suivante.
9. Pour s'assurer:
   Tapoter doucement le disque au point "A". Si un signal à haute fréquence apparaît, la platine est disposée trop bas. Si un signal à haute fréquence n'apparaît pas, tapoter doucement le disque au point "B".
   Un signal à haute fréquence apparaîtra indiquant que la platine est disposée trop haut.
10. Pour régler:

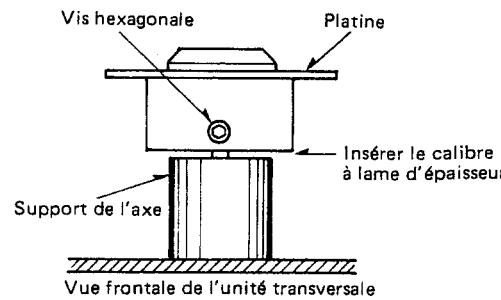
(1) Insérer le calibre à lame d'épaisseur entre la platine et le support de l'axe au point de repère marqué préalablement.
(2) Desserrer la vis hexagonale de la vis de réglage de la platine. (Utiliser une clé hexagonale de 1,27mm.)
(3) Si la platine est trop basse, glisser le calibre à lame d'épaisseur d'à peu près 4mm (5/32 de pouce) vers l'extrémité épaisse, puis retirer le calibre à lame d'épaisseur.
   Remettre en marche l'énergie et vérifier s'il y a un signal à haute fréquence.
   (Ceci étant une mise au point "d'essai et d'erreur", plusieurs tentatives devront être effectuées pour obtenir un signal à haute fréquence.)
(4) Si la platine est trop haute, insérer le calibre à lame d'épaisseur et déplacer d'à peu près 4 mm (5/32e de pouce) vers l'extrémité mince, en utilisant la même méthode qu'à l'étape 3.
(5) Reconnecter CN103 pour permettre la recherche de focalisation.



Signal à haute fréquence



Vue de haut de l'installation du disque



Vue frontale de l'unité transversale

3. Mise au point mécanique

1. Installer le disque d'essai sur la platine avec l'aimant de fixation.
2. Raccorder l'oscilloscope à TJ402 sur la plaquette à circuits imprimés 01.
3. Mettre l'appareil en marche et choisir le mode d'audition.
4. S'assurer que le signal à haute fréquence est tel que celui montré à la **Fig. A.** S'il n'y a pas de signal, passer à l'étape suivante.
   Si le signal à haute fréquence est tel qu'il est montré, sauter l'étape 5.
5. Ajuster la vis hexagonale (utiliser une clé hexagonale de 2 mm) vers la droite ou vers la gauche pour obtenir un signal à haute fréquence (vérification visuelle) tel qu'il est montré à la **Fig. B.**

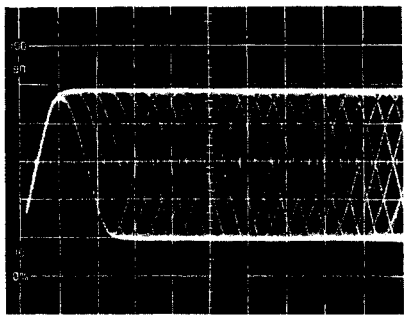


Fig. A Signal à haute fréquence

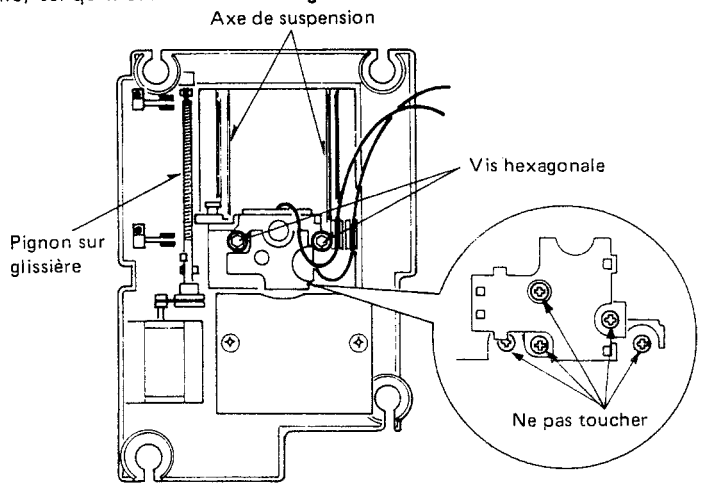


Fig. B Vue de dessous de l'unité transversale

4. Mise au point de la trame

1. Placer le disque d'essai sur la platine et fixer avec l'aimant.
2. Raccorder l'oscilloscope de la manière suivante:
   Tension 2μs
   Canal 1 . . . . . TJ402 (Plaquette à circuits imprimés 01)
   Canal 2 . . . . . C164 sur la plaquette à circuits imprimés 03. (broche 17 de IC104)
3. Mettre l'appareil en marche et choisir le mode d'audition.
4. Si le signal à haute fréquence et le repère "N" sont présents aucune mise au point n'est nécessaire, comme il est montré é la **Fig. A.**
   Si le signal à haute fréquence et le repère "N" sont absents, passer à l'étape 5.
5. Insérer l'outil d'ajustement de la trame dans l'orifice situé sur le côté gauche du corps du capteur optique, comme il est montré à la **Fig. B.**
6. Tourner l'outil d'ajustement de la trame vers la droite ou vers la gauche, jusqu'à ce que le repère "N" soit le plus net possible et qu'un signal à haute fréquence maximal soit obtenu.

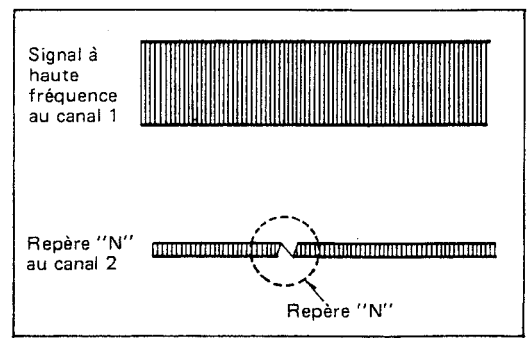


Fig. A Signal haute fréquence et repère "N"

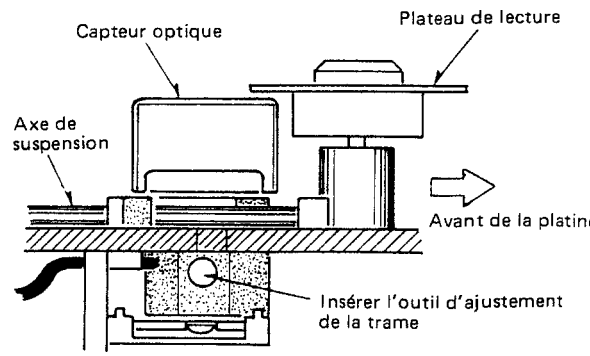


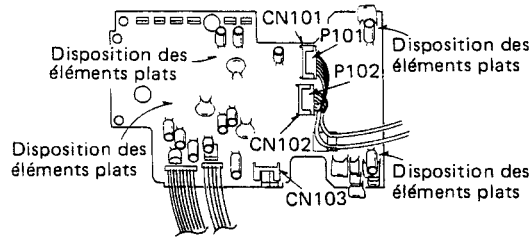
Fig. B Vue latérale gauche de l'unité transversale

5. Alignement électrique de l'unité principlale. Suivre le réglage, en se référant aux pages 11 ~ 14.

6. Vérification du module 03

* Après le réglage, dresser tous les éléments du montage en les disposant à plat sur le odule 03 et réassembler sur l'unité transversale.

* Une fois que le module 03 est monté, s'assurer que la face inférieure du capteur n'interfère avec aucun des éléments du montage.
Par conséquent, s'assurer que les pistes sur le bord extérieur du disque soient accessibles.



■ MEDICIONES Y AJUSTE — Español

1. Ajuste de posición de reposo

1. Asegúrese de que los interruptores de hoja S101 (posición de reposo) y S102 (posición de fin) no han sido magullados durante el rearme y, por lo tanto, puestos en "ON".
   Si están, cuidadosamente separe los contactos unos 2 mm.
2. Aplique energía a la unidad. Esto hará que el motor de movimiento transversal enrolle el fonocaptor óptico a la posición de REPOSO.
3. Desconecte el interruptor de alimentación.
4. Coloque la galga de posición de REPOSO sobre el plato giradiscos.
5. Asegúrese de que la lente está concéntrica dentro del agujero de la galga de posición de REPOSO, como mostrado en la **Fig. B.**

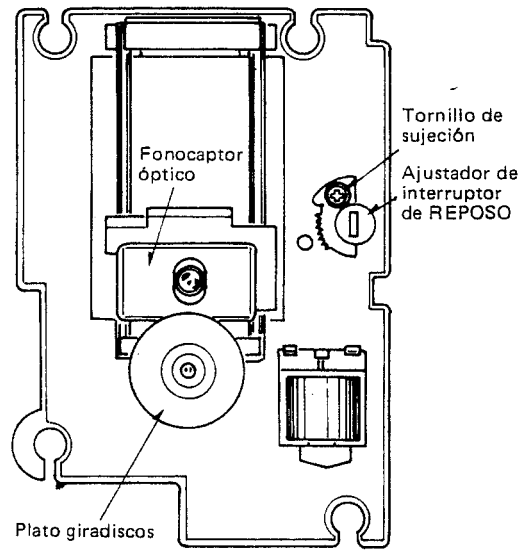


Fig. A

Fonocaptor óptico está demasiado cerca del plato giradiscos. (Fig. B)
Para ajustar:

1. Afloje el tornillo de sujeción y gire el ajustador de interruptor de REPOSO a la derecha.
2. Observe que si el interruptor de detección de Reposo (S101) está demasiado hacia S102, entonces el fonocaptor reposará demasiado apartado del plato giradiscos en la posición de Reposo. Si así fuera, aplique energía y repita el paso 1 de arriba hasta que se detecta la detección de Reposo cuando la lente está concéntrica con el agujero de la galga de posición de REPOSO.

No se requiere ningún ajuste (Fig. C)

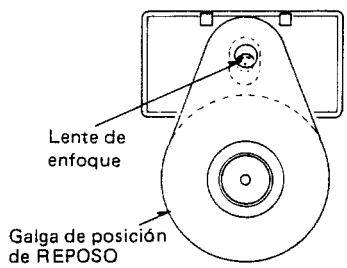


Fig. B "NG" (demasiado cerca)

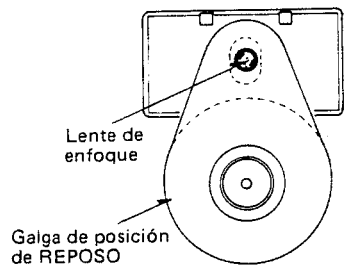


Fig. C "Ok"

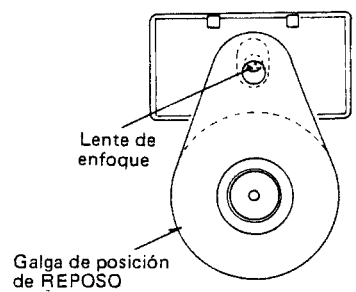


Fig. D "NG" (demasiado apartado)

Fonocaptor óptico está demasiado apartado del plato giradiscos. (Fig. D)
Para ajustar:
Afloje el tornillo de sujeción y gire el ajustador de interruptor de Reposo a la izquierda.

6. Para verificar el ajuste correcto, coloque el disco sobre el plato giradiscos y aplique energía a la unidad. Esto autociclará el fonocaptor óptico. Vuelva a comprobar alineamiento con la galga de posición de REPOSO, como mostrado en la Fig. C.

2. Ajuste de altura de plato giradiscos

Nota: Necesario después que el motor de huso de accionamiento directo es reemplazado o no se obtiene señal RF.

1. Saque el perno corto de CN103 en P.C.B. 03.
2. Inserte el extremo fino de la galga de cuchilla palpadora entre el plato giradiscos y el cojinete de eje.
3. Deslice la galga de cuchilla palpadora haca el extremo grueso y marque la galga con un lápiz donde ésta y el plato giradiscos se toquen y hasta que la cuchilla no se pueda meter ya más, entonces remueva la galga.
4. Connecte el osciloscopio a perno TJ402 en P.C.B. 01 (Servo).
5. Coloque un disco sobre el plato giradiscos y fíjelo con el imán.
6. Aplique energía a la unidad.
7. Apriete eyección "out" y ejección "IN".
8. Confirme si se presenta señal RF. Si no, proceda al siguiente paso.
9. Para confirmar:
   Suavemente golpee el disco en el punto "A". Si aparece señal RF, el plato giradiscos está demasiado bajo. Si no aparece señal RF, golpee el disco en el punto "B". La señal RF debe aparecer indicando que el plato giradiscos demasiado alta.
10. Para ajustar:

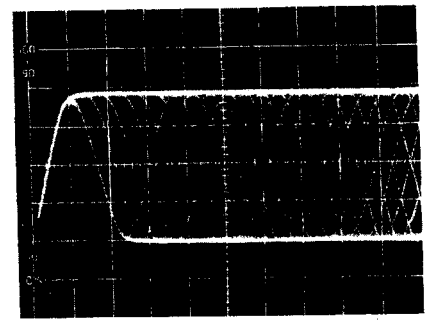
(1) Inserte la galga de cuchilla palpadora entre el plato giradiscos y el cojinete de eje al punto previamente marcado.

(2) Afloje el tornillo hexagonal del tornillo de ajuste de plato giradiscos. (Use una llave hexagonal 1,27 mm)

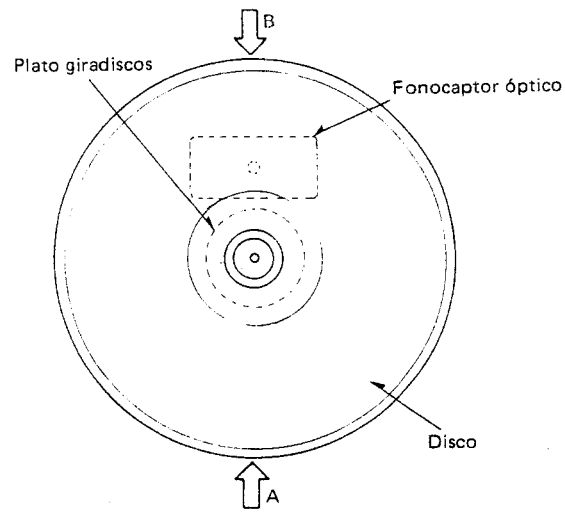
(3) Si el plato giradiscos está demasiado bajo, deslice la galga de cuchilla palpadora unos 4 mm (5/32") hacia el extremo grueso y remueva la galga de cuchilla palpadora.
Vuelva a aplicar energía y compruebe por señal de RF. (Este es un ajuste de "prueba". Puede requerirae varios tanteos para obtener señal RF).

(4) Si el plato giradiscos está demasiado alto, inserte la galga de cuchilla palpadora y mueva unos 4 mm(5/32") hacia el extremo fino, usando el mismo método que en el paso 3.

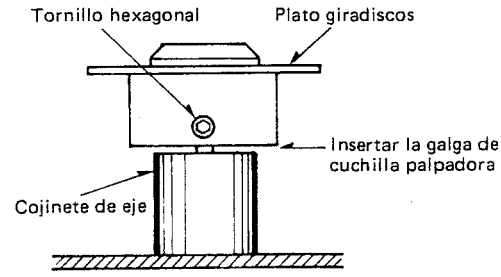
(5) Vuelva a conectar CN103 para habilitar exploración de enfoque.



Señal RF



Vista superior de disco colocado



Vista frontal de unidad transversal

3. Ajuste mecánico

1. Coloque el Disco de prueba sobre el plato giradiscos con fijador de imán.
2. Conecte el osciloscopio a perno TJ402 en P.C.B. 01 (Servo).
3. Aplique energía a la unidad y seleccione la modalidad de interpretación.
4. Confirme que la señal RF es como mostrado en la **Fig. A.**
   Si ésta no se presenta, proceda al siguiente paso.
   Si la señal RF es como mostrada, salte el paso 5.
5. Ajuste el tornillo hexagonal (use una llave hexagonal 2 mm) a la derecha o izquierda para obtener la señal RF (comprobación visual), como mostrado en la **Fig. B.**

ESPAÑOL

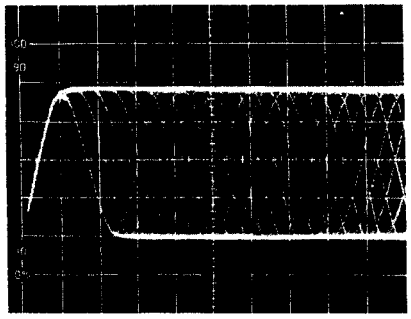


Fig. A Señal RF

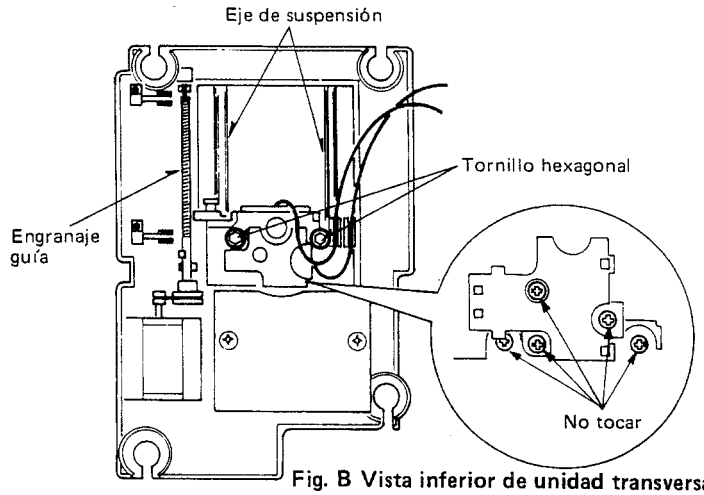


Fig. B Vista inferior de unidad transversal

ESPAÑOL

4. Ajuste de rejilla

1. Coloque el Disco de prueba sobre el plato giradiscos y fije con el imán.
2. Conecte el osciloscopio como sigue:
   BARRIDO . . . . . 2μs.
   CH1 . . . . . TJ402 (P.C.B. 01)
   CH2 . . . . . C164 en P.C.B. 03 (Perno 17 de IC104).
3. Aplique energía a la unidad y seleccione la modalidad de interpretación.
4. Si se presentan señal RF y marca "N", no se requiere ningún ajuste como en la Fig. A.
   Si no se presentan señal RF y marca "N", efectúe el paso 5.
5. Inserte la herramienta de ajuste de rejilla dentro del agujero del lado izquierdo del cuerpo de fonocaptor óptico como mostrado en la Fig. B.
6. Haga girar la herramienta de ajuste de rejilla hacia la derecha o izquierda hasta que la marca "N" es lo más nítida y se obtenga la máxima señal RF.

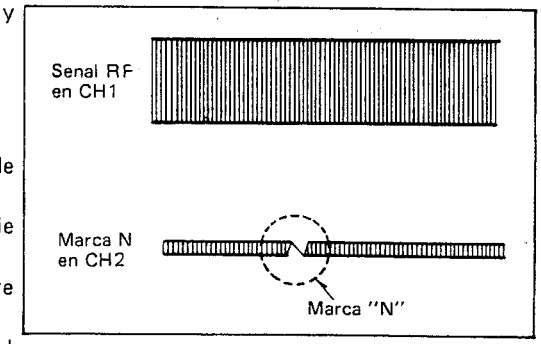


Fig. A Señal RF y marca "N"

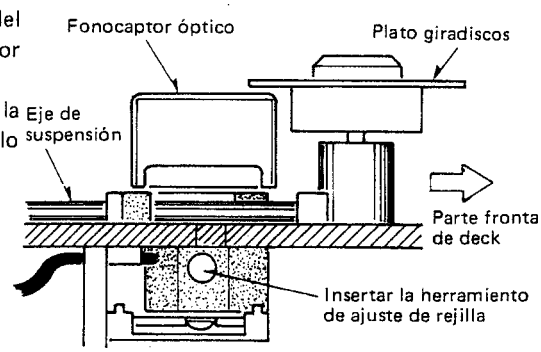
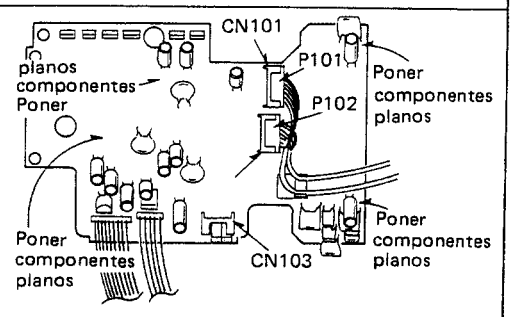


Fig. B Vista lateral izquierda de unidad transversal

5. Alineamiento eléctrico de unidad principal. Siga el ajuste, refiera a la páginas 15 ~ 18.

6. Comprobación del P.C.B. 03

* Después del ajuste, ordene todos los componentes para que estén planos sobre P.C.B. 03, y rearme sobre la unidad transversal.
* Una vez se ha montado el P.C.B. 03, asegúrese de que la parte inferior del fonocaptor no interfiere con ninguno de los componentes.
  Por lo tanto, asegúrese de que los surcos en los bordes externos del disco son accesibles.



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