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Service Manual

DC Servo Automatic Turntable System

SL-3

[E], [EK], [XL], [EG], [EB], [EF],
[XA], [EH], [Ei], [EC], [XM]

SL-3(K)

[E], [EK], [EG], [EF]



is the standard mark for the "P-mount" plug-in-connector system. Products carrying this mark are inter-changeable and compatible with each other.

- * The cabinet and dust cover are available in black color and silver types.
- * The black type model is provided with (K) in the Service Manual.

Areas

- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EG] is available in F.R. Germany.
- * [EB] is available in Belgium.
- * [EF] is available in France.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [EH] is available in Holland.
- * [Ei] is available in Italy.
- * [EC] is available in Czechoslovakia.
- * [XM] is available in Central South America.

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English

Specifications

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

General

Power supply:	220 V, 50/60 Hz
Power consumption:	7 W
Dimensions:	31.5 x 8.8 x 31.5 cm
(W x H x D)	(12-1/2" x 3-1/2" x 12-1/2")
	31.5 x 39 x 31.5 cm
	(12-1/2" x 15-23/64" x 12-1/2")
	(Maximum height when top (dust cover) is open.)
Weight:	3.2 kg (7.1 lb.)

Turntable section

Type:	Automatic turntable
Features:	Auto start/Auto lead-in

Auto return
Auto stop
Repeat play
Auto speed select
Manual speed selection possible
Auto size select
Record presence detection
Belt drive
DC motor
DC servo control
Aluminum die-cast
Diameter 30 cm (12")
33-1/3 rpm and 45 rpm
Auto speed select
(Manual selection possible)

Drive method:

Motor:

Drive control method:

Turntable platter:

Turntable speeds:

Technics

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

Wow and flutter: 0.045% WRMS (JIS C5521)
±0.06% peak
(IEC 98A Weighted)

Rumble: -70 dB (IEC 98A Weighted)

■ Tonearm section

Type: Dynamic balanced type
Linear tracking tonearm
4-pivot gimbal suspension

Effective length: 10.5 cm (4-1/8")

Tracking error angle: Within ±0.1°

Effective mass: 9 g (including cartridge)

Resonance frequency: 12 Hz

Tonearm drive motor: DC motor

Phono cable capacitance: 150 pF

■ Cartridge section

Type: Moving magnet stereo cartridge
All laminated core

Magnetic circuit: 10 Hz ~ 30 kHz

Frequency response: 20 Hz ~ 10 kHz ±1 dB

Output voltage: 2.5 mV at 1 kHz, 5 cm/s. zero to peak lateral velocity
(7 mV at 1 kHz, 10 cm/s. zero to peak 45° velocity [DIN 45 500])

Channel separation: 22 dB at 1 kHz

Channel balance: Within 2 dB at 1 kHz

Recommended load impedance: 47 kΩ ~ 100 kΩ

Compliance (dynamic): 12 x 10⁻⁶ cm/dyne at 100 Hz

Stylus pressure range: 1.25 ± 0.25 g (12.5 ± 2.5 mN)

Weight: 6.0 g (cartridge only)

Replacement stylus: EPS-24CS

- The power supply for this unit varies depending upon the areas. Also, the parts used for power supply are different. So, refer to the circuit diagram and the replacement parts list.
- ★ 220V (50/60 Hz) for Continental Europe.
- ★ 240V (50/60 Hz) for United Kingdom and Australia.
- ★ 110V/120V/220V/240V (50/60 Hz) for other areas.
- [XA and XM areas] for other areas is provided with voltage selector.

Deutsch

TECHNISCHE DATEN

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

■ Allgemeine Daten

Stromversorgung: 220 V, 50/60 Hz
Wechselstrom

Leistungsaufnahme: 7 W

Abmessungen: 31,5 x 8,8 x 31,5 cm
(B x H x T)
31,5 x 39 x 31,5 cm
(Maximale Höhe bei vollständig geöffnetem Gehäuseoberteil.)

Gewicht: 3,2 kg

■ Plattenspieler

Typ: Automatischer Plattenspieler
Auto-Start/Auto-Zuführung
Rückführautomatik
Stopp-Automatik
Wiederhol-Betrieb
Automatische Drehzahlwahl
Manuelle Drehzahlwahl möglich
Automatische Plattengrößewahl
Plattenpräsenz-Registrierung
Riemenantrieb

Antrieb: Gleichstrommotor

Motor: DC-Servo-Steuerung

Antriebsregel-Methode: Aluminium-Druckguß

Plattenteller: Durchmesser 30 cm

Plattenteller-Drehzahlen: 33-1/3 und 45 U/min
Automatische Drehzahlwahl
(manuelle Wahl möglich)

Gleichlaufschwankungen: 0.045% WRMS (JIS C5521)
±0.06% Spitze
(IEC 98A bewertet)

Rumpel-Fremdspannungsabstand: -70 dB (IEC 98A bewertet)

■ Tonarm

Typ: Dynamisch ausbalancierter
Tangential-Tonarm mit Kardan-
aufhängung mit 4-Punkt-
Drehlager

Effektive Länge: 10,5 cm

Spurfehlwinkel: Innerhalb ±0.1°

Effektive Masse: 9 g (einschließlich Tonabnehmer)

Resonanzfrequenz: 12 Hz

Tonarm-Antriebsmotor: Gleichstrommotor

■ Tonabnehmer

Typ: Stereo-Magnet-Tonabnehmer mit
Einpunkt-Aufhängungssystem
Ganzlamellenkern

Magnetkreis: 10 Hz bis 30 kHz

Frequenzgang: 20 Hz bis 10 kHz ±1 dB

Ausgangsspannung: 2,5 mV bei 1 kHz
5 cm/s. Null-zu-Spitze, lateral
[7 mV bei 1 kHz 10 cm/s. Null-
zu-Spitze, 45° (DIN 45 000)]

Kanaltrennung: 22 dB bei 1 kHz

Kanalabweichung: Innerhalb 2 dB bei 1 kHz

Empfohlene Endimpedanz: 47 kΩ ~ 100 kΩ

Nachgiebigkeit (dynamisch): 12 x 10⁻⁶ cm/dyn bei 100 Hz

Auflagekraft-Einstellbereich: 1,25 ± 0,25 g (12,5 ± 2,5 mN)

Gewicht: 6,0 g (nur Tonabnehmer)

Ersatznadel: EPS-24CS

Français

CARACTERISTIQUES

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

■ Généralités

Alimentation: 220 V, 50/60 Hz
Consommation: 7 W
Dimensions: 31,5 x 8,8 x 31,5 cm
(L x H x P)
(Hauteur maximum lorsque le dessus (couvercle protège-poussière) est ouvert.)
Poids: 3,2 kg

■ Platine de lecture

Type: Platine automatique
Départ automatique/Entrée automatique
Retour automatique
Arrêt automatique
Audition répétée
Sélection de vitesse automatique
Sélection automatique du diamètre
Sélection de vitesse manuelle possible
Détection de la présence d'un disque

Système d'entraînement:

Entraînement par courroie
Moteur C.C.

Moteur:

Système de commande d'entraînement:

Servocommande C.C.
Aluminium moulé sous pression

Plateau de lecture:

Diamètre 30 cm
33-1/3 et 45 t/p.m.
Sélecteur de vitesse automatique
(Sélection manuelle possible)

Vitesses de la platine:

Pleurage et scintillement:

0,045% de valeur efficace
(JIS C5521)
±0,06% de crête
(IEC 98A Pondéré)

Ronflement: -70 dB (IEC 98A Pondéré)

■ Bras de lecture

Type: Bras de lecture d'alignement linéaire de type à équilibre dynamique avec suspension à la cardan à 4 pivots
Longueur effective: 105 mm
Angle d'erreur de piste: En deçà de ±0,1°
Masse réelle: 9 g (y compris la cellule pick-up)

Fréquence de résonance: 12 Hz
Moteur d'entraînement du bras de lecture: Moteur C.C.

■ Cellule pick-up

Type: Cellule pick-up stéréo à aimant mobile
Circuit magnétique: Noyau entièrement feuilleté
Réponse en fréquence: 10 Hz à 30 kHz
20 Hz à 10 kHz ±1 dB
2,5 mV à 1 kHz; 5 cm/s., zéro à vitesse latérale de crête
(7 mV 1 kHz; 10 cm/s., zéro à vitesse 45° de crête [DIN 45 000])
Tension de sortie: 22 dB à 1 kHz
En deçà de 2 dB à 1 kHz

Séparation des canaux: 22 dB à 1 kHz
Équilibrage des canaux: En deçà de 2 dB à 1 kHz
Impédance de charge recommandée: 47 kΩ ~ 100 kΩ
Elasticité (dynamique): 12 x 10⁻⁶ cm/dyne à 100 Hz
Plage de la force verticale d'appui: 1,25 ±0,25 g (12,5 ±2,5 mN)
6,0 g (cellule seule)
Poids:
Remplacement de la pointe de lecture: EPS-24CS

Español

ESPECIFICACIONES

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

■ En general

Alimentación de corriente: 220 V, 50/60 Hz
Consumo de corriente: 7 W
Dimensiones: 31,5 x 8,8 x 31,5 cm
(Ancho x Alto x Prot.)
(Altura máxima cuando la parte de arriba (tapa contra el polvo) está abierta.)
Peso: 3,2 kg

■ Sección del plato giratorio

Tipo: Plato giratorio automático
Arranque automático/
Descenso automático
Retorno automático
Parada automática

Método de accionamiento: Ejecución repetida
Selección automática de la velocidad
Es posible seleccionar la velocidad a mano
Selección automática del tamaño
Detección de presencia de disco
Motor: Accionamiento por correa
Motor de corriente continua
Método de control de accionamiento: Servocontrol de corriente continua

Platillo del plato giratorio: Aluminio fundido
30 cm de diámetro

Velocidades del plato giratorio:

33-1/3 y 45 rpm
Selección automática de la velocidad
(También posibilidad de seleccionar a mano)

Ululaciones y trémolo: 0,045% WRMS (JIS C5521)
±0,06% cresta
(IEC 98A Ponderado)

Ruido de rodadura: -70 dB (IEC 98A Ponderado)

■ Sección del brazo sonoro

Tipo: Brazo sonoro de seguimiento lineal de tipo con equilibrio dinámico con suspensión cardánica de 4 pivotes
10,5 cm

Longitud efectiva: Inferior a ±0,1° aproxim.
Angulo de error de seguimiento: 9 g (incluyendo el cartucho)
Masa efectiva: 12 Hz
Frecuencia de resonancia: Motor de accionamiento del brazo sonoro: Motor de corriente continua

■ Sección del cartucho

Tipo: Cartucho estereofónico de imán móvil
Núcleo totalmente laminado

Circuito magnético: 10 Hz a 30 kHz
Respuesta de frecuencia: 20 Hz a 10 kHz ±1 dB
2,5 mV a 1 kHz

Voltaje de salida: Velocidad lateral de cero a cresta de 5 cm/s.
(7 mV a 1 kHz. Velocidad de 45° de cero a cresta de 10 cm/s [DIN 45 000])

Separación de canales: 22 dB a 1 kHz
Equilibrio de canales: Inferior a 2 dB a 1 kHz

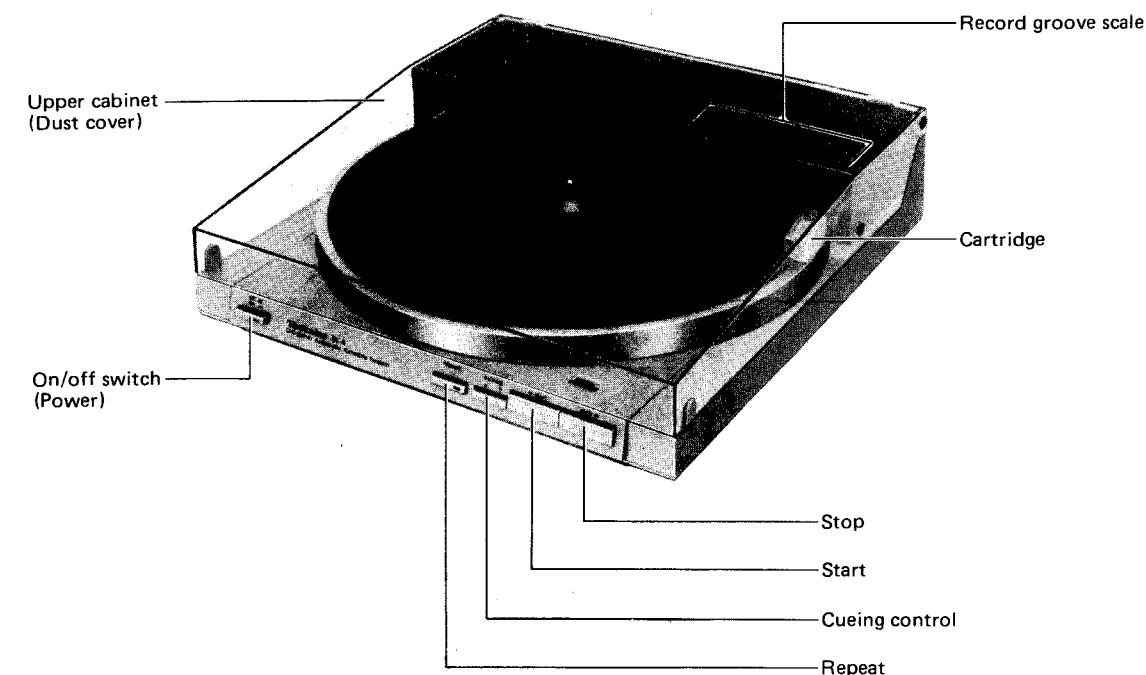
Impedancia de carga recomendada: 47 kΩ a 100 kΩ

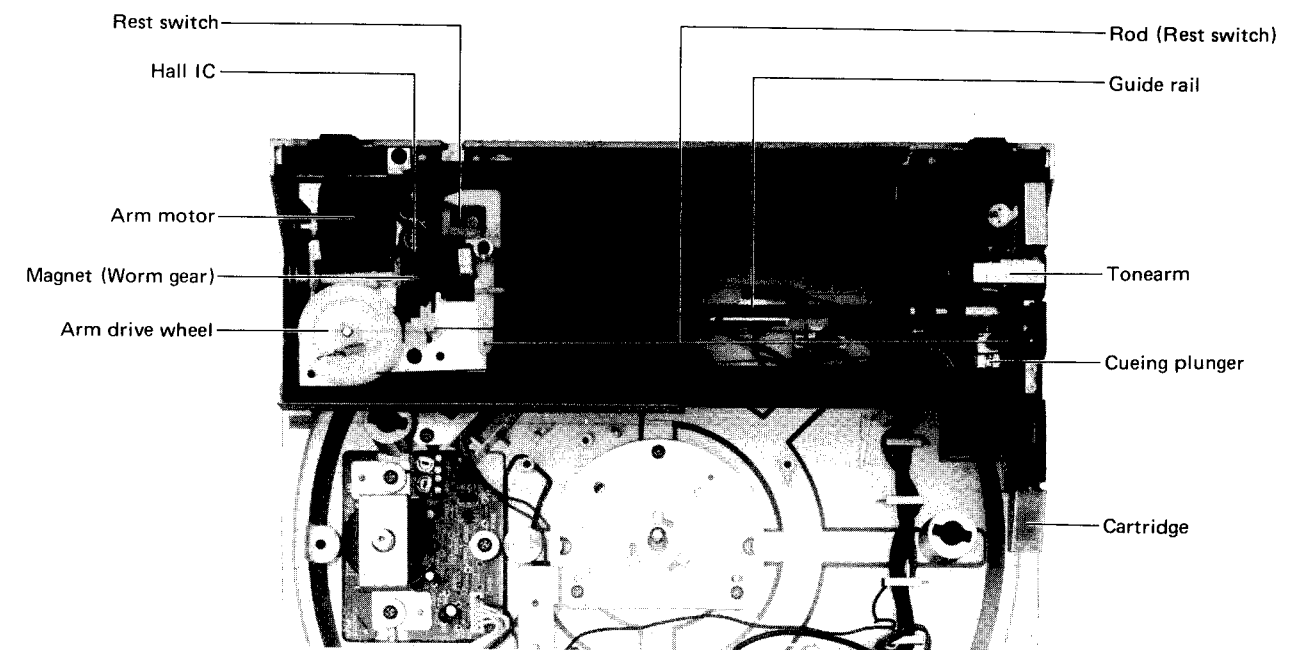
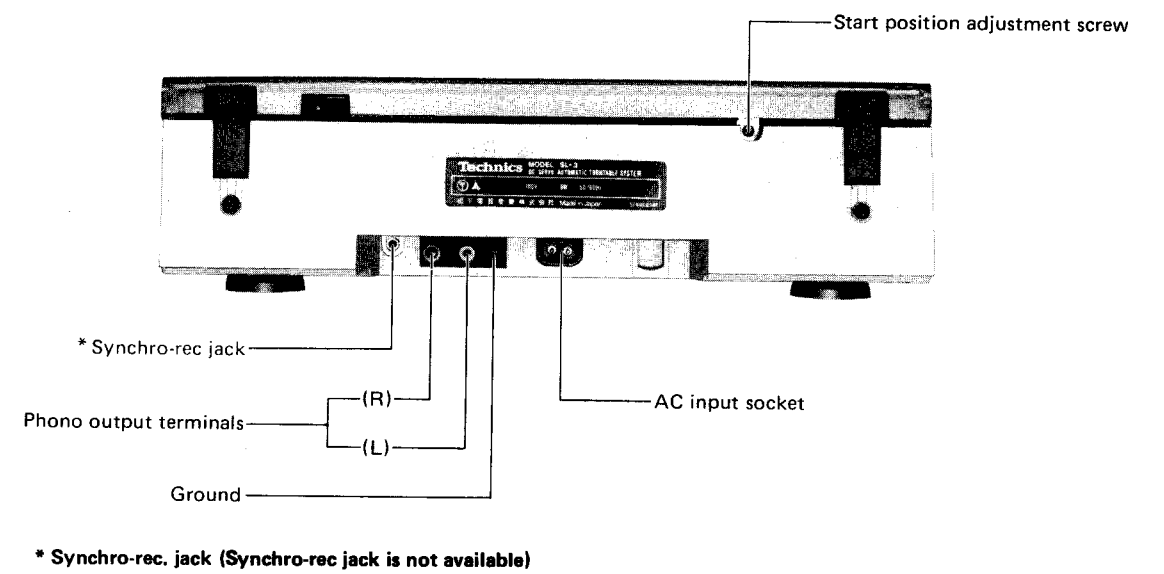
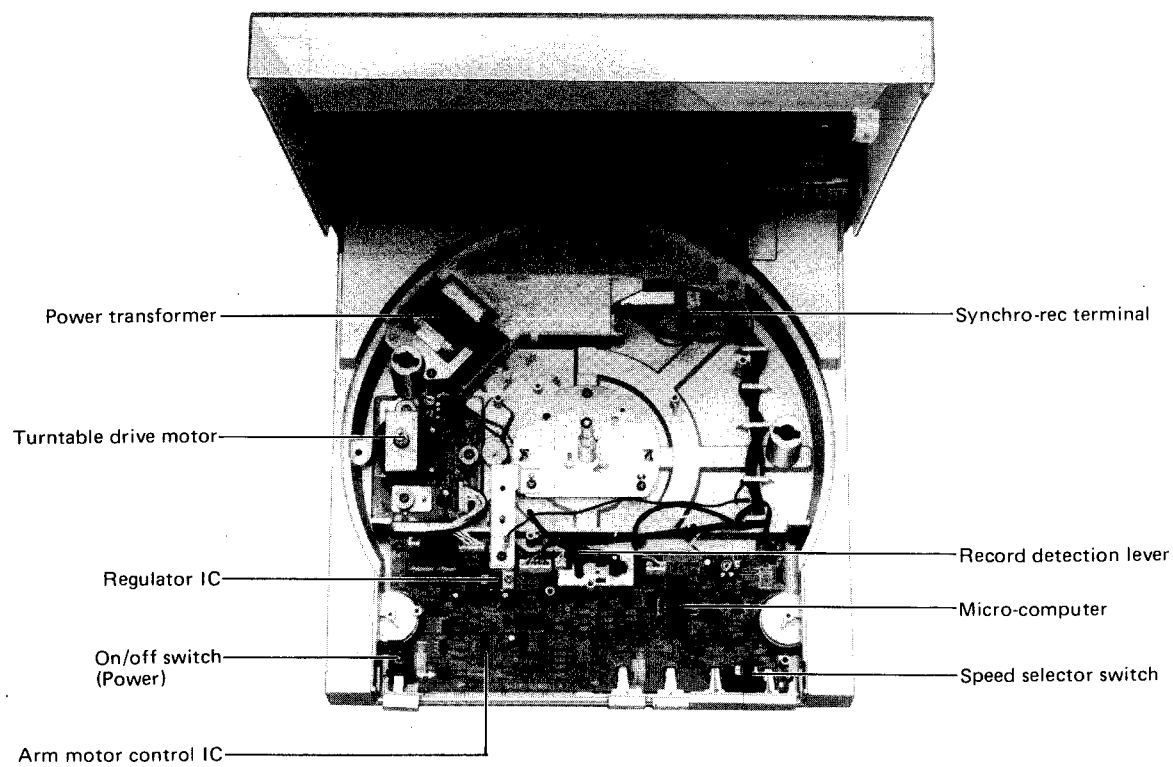
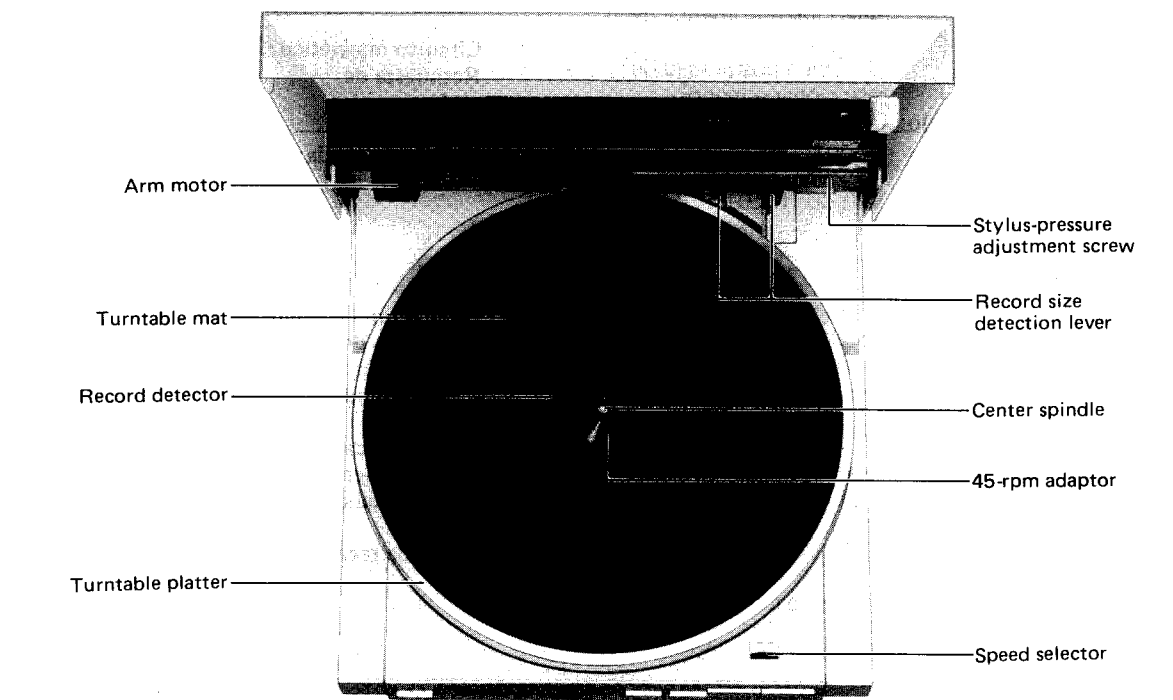
Elasticidad (dinámica): 12 x 10⁻⁶ cm/dina a 100 Hz

Radio de presión de la aguja: 1,25 ±0,25 g (12,5 ±2,5 mN)

Peso: 6 g (cartucho solamente)
Aguja de recambio: EPS-24CS

■ LOCATION OF CONTROLS





DISASSEMBLY INSTRUCTIONS

● How to remove the cartridge

1. Open the upper cabinet.
2. Completely loosen the cartridge setscrew and pull out the cartridge. (Fig. 2)

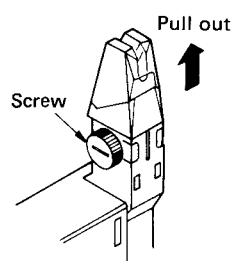
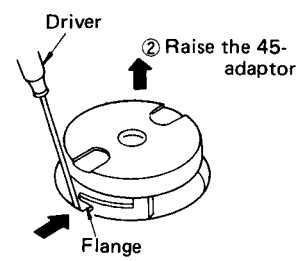


Fig. 2



① Push the flange in the direction of the arrow.

Fig. 3

● How to remove the turntable platter

1. Open the upper cabinet.
2. Remove the turntable mat, turn the 45 adaptor counter-clockwise to raise it from the turntable platter surface.
3. Remove the 45 adaptor. (Fig. 3)
4. Remove the stopper ring from the center spindle. (Fig. 4)
5. Remove the belt and lift the turntable platter.

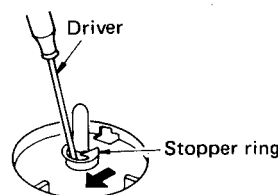


Fig. 4

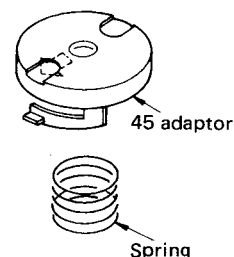


Fig. 5

★ To mount the turntable platter

1. Put the turntable platter in place, and fit the stopper ring onto the center spindle.
2. Put on the spring and fit in the 45 adaptor.

Note: Align the arrow → on the back of 45 adaptor to the arrow ← on the turntable platter. (Fig. 5)

3. Set the belt over the capstan and put on the turntable mat.

● How to remove the control knob cover.

1. Remove the turntable platter. (Refer to "How to remove the turntable platter".)
2. Remove the 4 setscrews (Fig. 6: ① ~ ④) of the cover.
3. Remove the lead wires from the claws. (Fig. 6)
4. Release the 4 claws of the cover from the main cabinet. (Fig. 6, 7)
5. Remove the cover in the direction of arrow A. (Fig. 6)

Note: When installing the control knob cover, set the speed selector switch to "auto" position and then reversely follow the procedures 1 ~ 5.

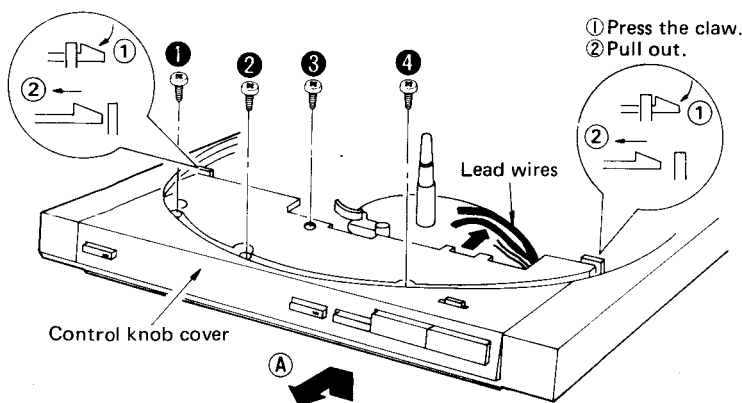


Fig. 6

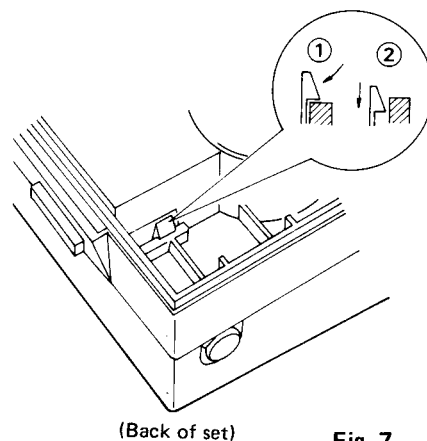


Fig. 7

● How to remove the main circuit P.C.B.

(Micro-computer, arm control and constant voltage circuit)

1. Remove the control knob cover. (Refer to "How to remove the control knob cover".)
2. Remove the 5 setscrews (Fig. 8: ⑤ ~ ⑨) of P.C.B. and 2 setscrews (Fig. 8: ⑩, ⑪) of radiator panel.

Note: For P.C.B. setscrews (⑤ ~ ⑨),  is printed on the P.C.B.

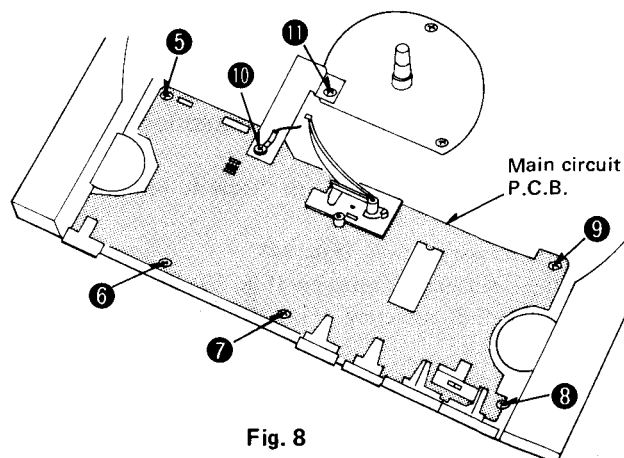


Fig. 8

• How to remove the record detection switch

1. Remove the turntable platter. (Refer to "How to remove the turntable platter".)
2. Remove the main circuit P.C.B. (Refer to "How to remove the main circuit P.C.B.".)
3. Remove the switch cover from the P.C.B. (Fig. 9)
4. Remove solder from the switch terminals and remove the switch.

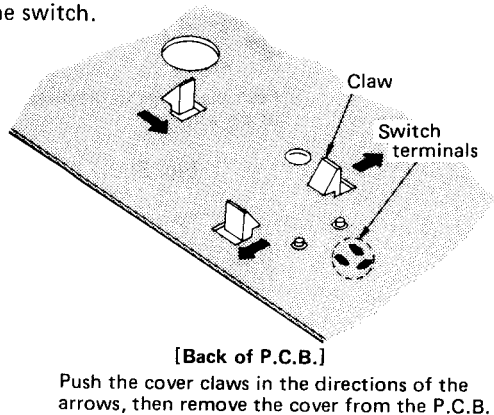


Fig. 9

• How to remove the record size detecting switch

1. Remove the turntable platter. (Refer to "How to remove the turntable platter".)
2. Remove the switch cover setscrew (Fig. 11 : 15) and lift the cover in the direction of the arrow and then remove the synchro-rec jack from the cover.
3. Pull the switch cover out of the cabinet, then turn over the switch cover and remove the switch setscrew (Fig. 12 : 16).

Note: When setting the switch cover, take care not to squeeze the lead wire with the cabinet.

• How to remove the dust cover.

1. Remove the right and left rivets of the dust cover. (Fig. 13)
2. Lift the dust cover.

• How to remove the tonearm.

1. Remove the dust cover. (Refer to "How to remove the dust cover".)
2. Remove the tonearm cover. (Fig. 14)
3. Turn the worm gear by hand to move the tonearm a little inward.
4. Remove the tonearm setscrew (Fig. 15: 17).
5. Remove solder from the output lead wires and disconnect the wires, then remove the tonearm in the direction of the arrow. (Fig. 15)

• How to remove the offset angle detection circuit P.C.B.

1. Remove the dust cover. (Refer to "How to remove the dust cover".)
2. Remove the tonearm cover. (Fig. 14)
3. Remove the needle cover setscrew (Fig. 15: 18).
4. Loosen the P.C.B. setscrew (Fig. 15: 19) and lift the P.C.B.

Note: After removing the P.C.B., be sure to adjust the servo gain and offset voltage.

8 (Refer to the adjustment procedure on Page 11.)

• How to remove the drive circuit P.C.B.

1. Remove the turntable platter. (Refer to "How to remove the turntable platter".)
2. Remove the 3 setscrews (Fig. 10: 12 ~ 14) of P.C.B.

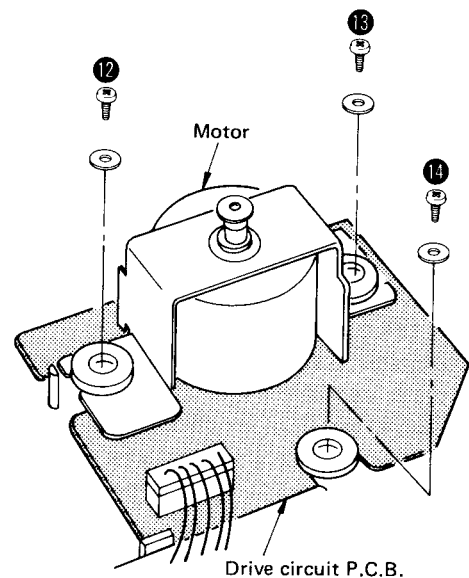


Fig. 10

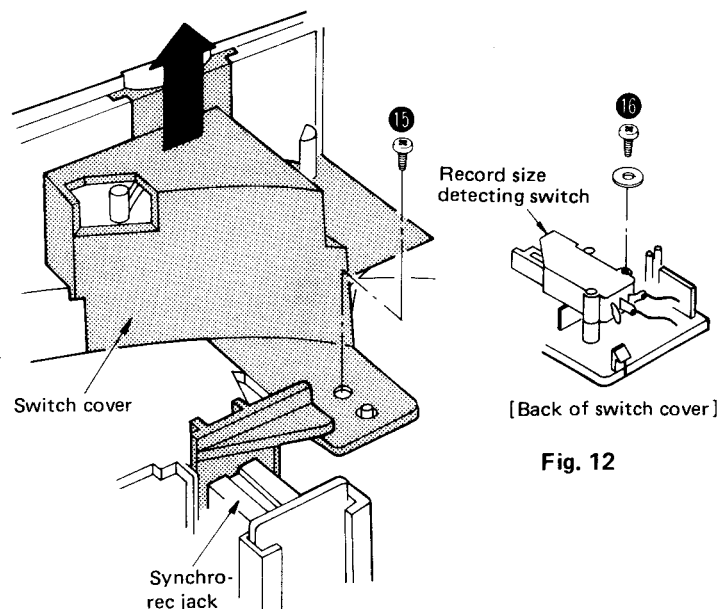


Fig. 12

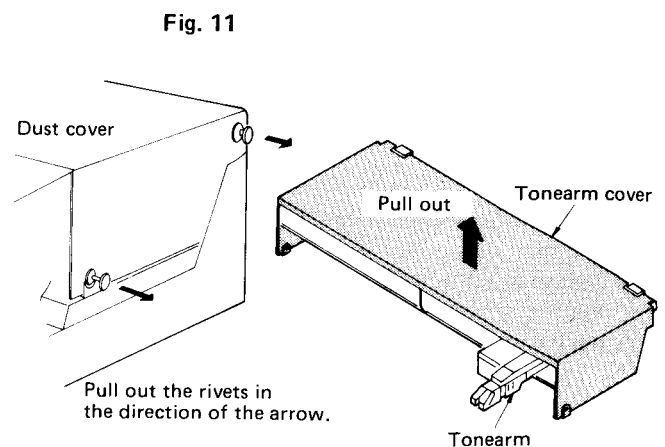


Fig. 13

Fig. 14

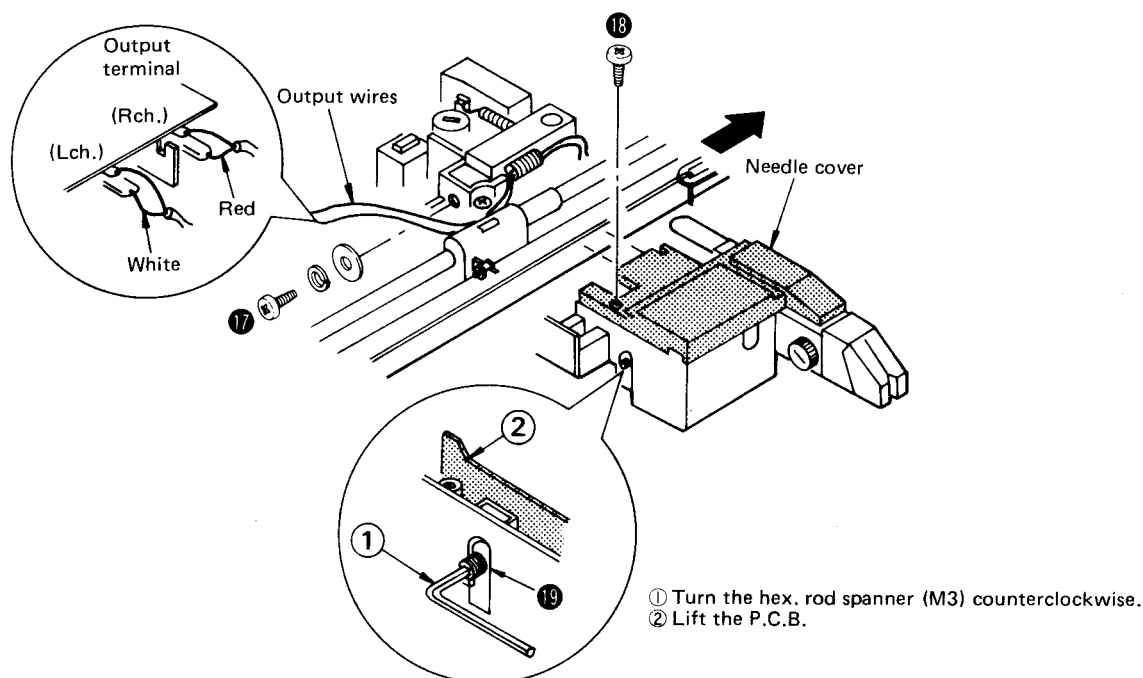


Fig. 15

• How to remove the cueing plunger

1. Remove the dust cover. (Refer to "How to remove the dust cover".)
2. Remove the tonearm cover. (Fig. 14)
3. Remove the plunger setscrew (Fig. 16: 20).
4. Remove the offset angle detection P.C.B. and unsolder the 2 lead wires of plunger, then the plunger can be removed.

Note: The plunger must be fitted in the position of Fig. 17.

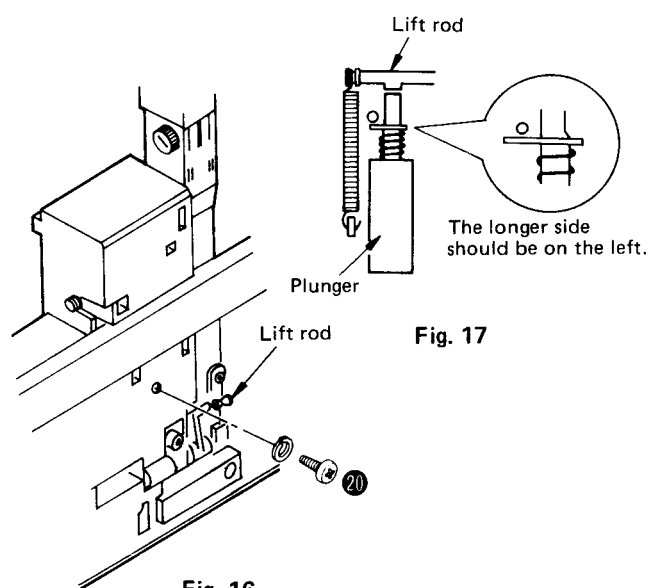


Fig. 17

Fig. 16

• How to remove the arm position detecting circuit P.C.B.

1. Remove the dust cover. (Refer to "How to remove the dust cover".)
2. Remove the tonearm cover. (Fig. 14)
3. Remove the P.C.B. setscrew (Fig. 18: 22).

Note: Clearance between Hall IC and magnet should be $0.8\text{mm} \pm 0.2\text{mm}$. Adjust it as in Fig. 19.

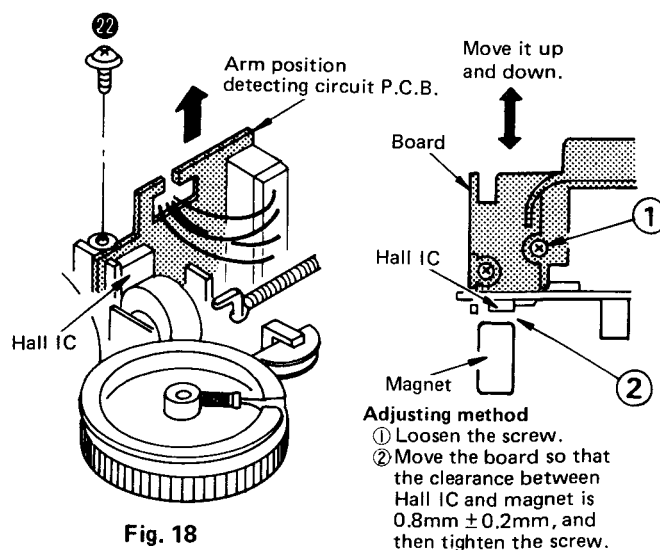


Fig. 18

Fig. 19

■ HOW TO SET THE TONEARM DRIVE ROPE

When setting the rope, follow the procedure given below.

1. Remove the dust cover and tonearm cover. (Refer to "How to remove the dust cover.")
2. Remove the roller cover. (Fig. 20)
3. Set the rope in the order of 1 ~ 5. (Fig. 20)
4. Fit the rope connector to the tonearm.
5. Set the roller cover and turn the worm gear by hand to see that the tonearm moves.

Note: The arm drive wheel is not fixed. So, take care not to let it come loose during servicing. (Stop it with C-ring to prevent its removal.)

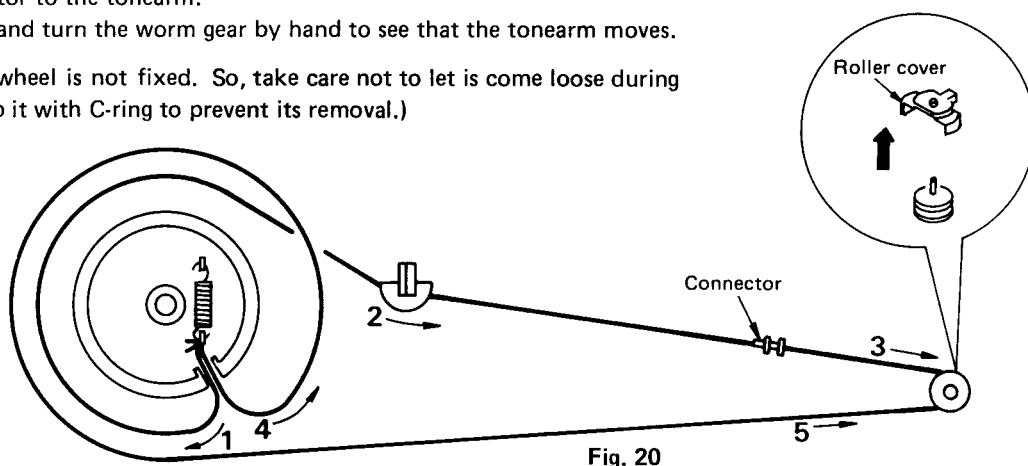


Fig. 20

■ MEASUREMENTS AND ADJUSTMENT English

• Instruments used

1. Oscilloscope
2. DC voltmeter
3. 30cm record
4. Screwdriver
5. Hex. wrench (M3)

• Cautions

1. To adjust servo gain and offset voltage (Refer to "How to remove parts")
 - 1) Remove the dust cover and tonearm cover.
 - 2) Remove the turntable platter and control knob cover.
 - 3) Disassemble the tonearm as in Fig. 21.
2. To adjust clock frequency
 - 1) Remove the turntable platter and control knob cover.

Step	Item	Preparations	Parts adjusted	Procedure
1	Start position	1) Put 30 cm record on turntable mat and close upper cabinet. 2) Set power switch to "on". 3) Push start button switch.	Start position adjust screw. (Fig. 22)	1) If stylus drops between tunes, turn adjust screw counterclockwise. 2) If stylus drops outside record disc, turn adjust screw clockwise.
2	Tonearm offset angle	1) Open upper cabinet. 2) Set power switch to "on". 3) Push start button to move tonearm inside, then set power switch to "off".	Offset angle adjust screw. (Fig. 23)	1) Turn offset angle adjust screw so that tonearm center is aligned to V-groove of lift rod.
3	Servo gain	1) Connect DC voltmeter to CN303 terminal 3 (+) and 2 (-) of main circuit P.C.B. (Fig. 24) 2) Set power switch to "on".	VR501 (Fig. 21)	1) Completely shift tonearm to the right. 2) Adjust VR501 so that output voltage is 3.6V.
4	Offset voltage	1) Connect DC voltmeter to CN303 terminal 3 (+) and 2 (-) of main circuit P.C.B. (Fig. 24) 2) Set power switch to "on".	Offset voltage adjust screw. (Fig. 21)	1) Set tonearm to center. 2) Turn adjust screw so that output voltage is 1.8V. (Use hexagonal wrench.)
5	Clock frequency	1) Connect lead wire with clip to IC301 pin 7 and pin 27 of main circuit P.C.B. 2) Connect oscilloscope to IC301 pin 6. (Fig. 24)	VR301 (Fig. 24)	1) Set power switch to "on". 2) Adjust VR301 so that the cycle output waveform is $30\mu\text{F} \pm 1\mu\text{s}$.
6	Rotating speed	1) Open upper cabinet and set speed selector switch to "33". 2) Set power switch to "on" and push start button.	VR101 33 r.p.m. (Fig. 25)	1) Adjust VR101 to obtain rated speed.
		1) Open upper cabinet and set speed selector switch to "45". 2) Set power switch to "on" and push start button.	VR102 45 r.p.m. (Fig. 25)	1) Adjust VR102 to obtain rated speed.

■ ADJUSTMENT POINTS

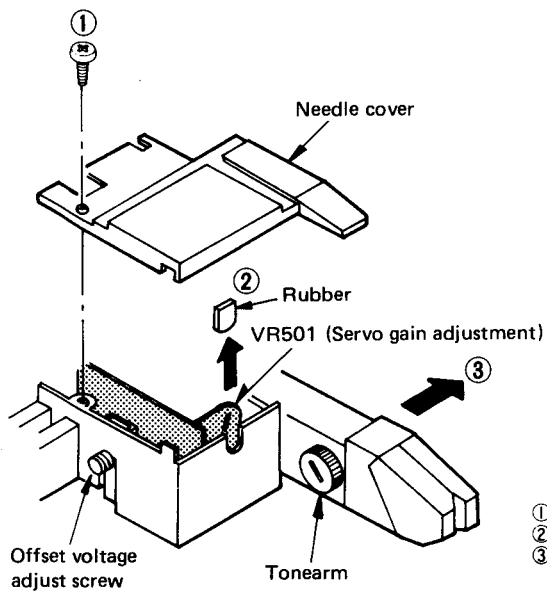


Fig. 21
(Abb. 21)

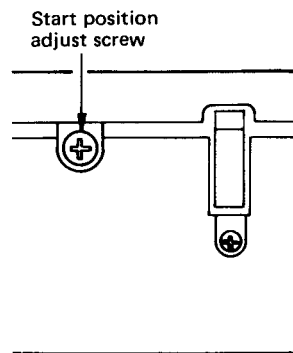


Fig. 22
(Abb. 22)

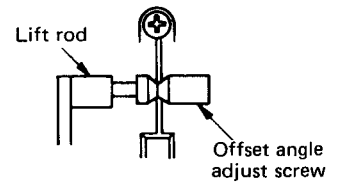


Fig. 23
(Abb. 23)

- ① Remove the needle cover.
- ② Remove the rubber.
- ③ When adjusting the servo gain, set the tonearm in the direction of the arrow.

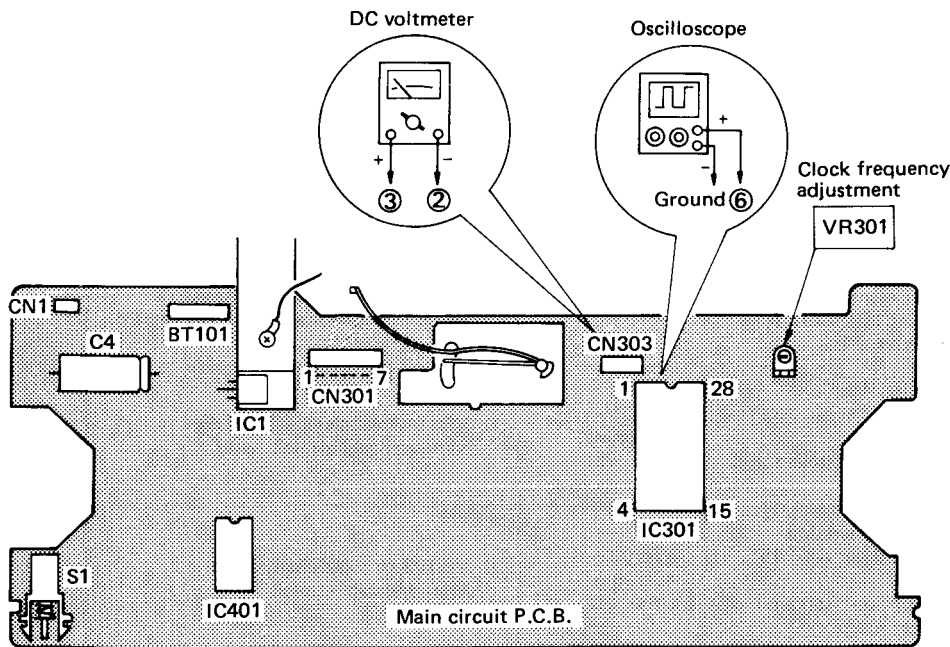


Fig. 24
(Abb. 24)

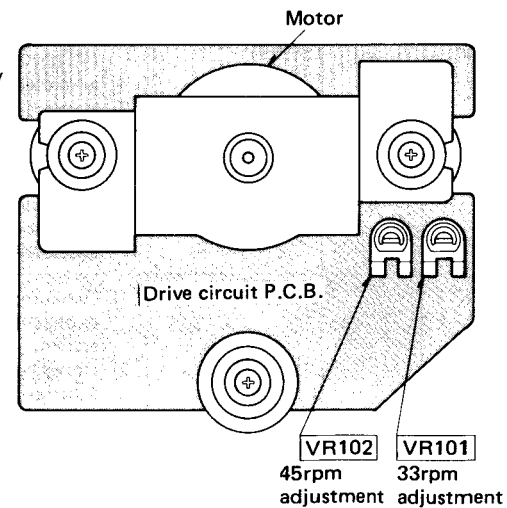


Fig. 25
(Abb. 25)

■ MESSUNGEN UND JUSTIERUNGEN Deutsch

• Zu verwendende Instrumente

1. Oszilloskop
2. Gleichstrommeter
3. 30cm-Schallplatte
4. Schraubendreher
5. Sechskantschlüssel (M3)

• Achtung

1. Zur Justierung der Servoverstärkung und Offsetspannung
(Siehe "Ausbauen von Teilen")
 - 1) Die Staubabdeckung und die Tonarmabdeckung entfernen.
 - 2) Den Plattenteller und die Reglerknopf-Abdeckung entfernen.
 - 3) Den Tonarm auseinandernehmen, wie in Abb. 21 gezeigt.
2. Zur Justierung der Taktgeberfrequenz
 - 1) Den Plattenteller und die Reglerknopf-Abdeckung entfernen.

Schritt	Posten	Vorbereitung	Zu justieren- de Teile	Vorgehen
1	Start-Position	1) 30cm-Platte auflegen und Plattenspieler-Gehäuseoberteil schließen. 2) Netzschalter auf "on" stellen. 3) Start-Taste drücken.	Startposition-Justierschraube (Abb. 22)	1) Falls Nadel im Musikstück aufsetzt, entgegen dem Uhrzeigersinn drehen. 2) Falls Nadel außerhalb der Platte aufsetzt, Justierschraube im Uhrzeigersinn drehen.
2	Tonarmwinkel	1) Gehäuseoberteil öffnen. 2) Netzschalter auf "on" stellen. 3) Start-Taste drücken, um Tonarm nach innen zu bewegen; dann Netzschalter auf "off" stellen.	Spurfehlwinkel-Justierschraube (Abb. 23)	1) Spurfehlwinkel-Justierschraube drehen, bis die Tonarmmitte mit der V-Kerbe der Liftstange übereinstimmt.
3	Servo-Verstärkung	1) Gleichstrom-Voltmeter an CN303, Anschluß 3 (+) und 2 (-) der Hauptleiterplatte anschließen. (Abb. 24) 2) Netzschalter auf "on" stellen.	VR501 (Abb. 21)	1) Tonarm ganz nach rechts bewegen. 2) VR501 so abgleichen, daß die Ausgangsspannung 3,6V beträgt.
4	Offset-Spannung	1) Gleichstrom-Voltmeter an CN303, Anschluß 3 (+) und Anschluß 2 (-) der Hauptleiterplatte anschließen. (Abb. 24) 2) Netzschalter auf "on" stellen.	Offsetspannungs-Justierschraube (Abb. 21)	1) Tonarm in die Mitte stellen. 2) Justierschraube so einstellen, daß Ausgangsspannung 1,8V beträgt. (Sechskantschlüssel verwenden.)
5	Taktgeberfrequenz	1) Anschlußdraht mit Klemmen an IC301, Stift 7 und Stift 27 der Hauptleiterplatte anschließen. 2) Oszilloskop an IC301, Stift 6 anschließen. (Abb. 24)	VR301 (Abb. 24)	1) Netzschalter auf "on" stellen. 2) VR301 so justieren, daß Ausgangswellenformperiode $30\mu s \pm 1\mu s$ beträgt.
6	Drehzahl	1) Gehäuseoberteil öffnen und Drehzahl-Wahlschalter auf "33" stellen. 2) Netzschalter auf "on" stellen und Starttaste drücken.	VR101 33U/min. (Abb. 25)	1) VR101 so abgleichen, daß die Nenndrehzahl erreicht wird.
		1) Gehäuseoberteil öffnen und Drehzahl-Wahlschalter auf "45" stellen. 2) Netzschalter auf "on" stellen und Starttaste drücken.	VR102 45U/min. (Abb. 25)	1) VR102 so abgleichen, daß die Nenndrehzahl erreicht wird.

■ MESURAGES ET RÉGLAGES Français

• Instruments et appareils utilisés

1. Oscilloscope
2. Voltmètre à C.C.
3. Disque de 30 cm
4. Tournevis
5. Clef hexagonale (M3)

• Précautions

1. Pour régler l'amplification servo-mécanique et la tension de suppression (Se référer à "Comment retirer les éléments".)
 - 1) Retirer le couvercle protège-poussière et la coiffe du bras de lecture.
 - 2) Retirer la platine et la coiffe du bouton de réglage.
 - 3) Démonter le bras de lecture comme il est montré à la Fig. 21.
2. Pour régler la fréquence des impulsions de rythme
 - 1) Retirer la platine et la coiffe du bouton de réglage.

Etape	Article	Préparatifs	Eléments à régler	Marche à suivre
1	Position de mise en marche	1) Placer un disque de 30 cm sur la platine et refermer le boîtier supérieur. 2) Régler l'interrupteur d'alimentation sur "on" (marche). 3) Appuyer sur l'interrupteur à bouton de mise en marche.	Vis d'ajustement du positionnement de mise en marche. (Fig. 22)	1) Si la pointe de lecture descend entre les plages du disque, tourner la vis d'ajustement dans le sens inverse des aiguilles d'une montre. 2) Si la pointe de lecture descend en dehors du disque d'enregistrement, tourner la vis d'ajustement dans le sens des aiguilles d'une montre.
2	Angle de décalage du bras de lecture	1) Ouvrir le boîtier supérieur. 2) Régler l'interrupteur d'alimentation sur "on" (marche). 3) Appuyer sur l'interrupteur à bouton de mise en marche pour faire déplacer le bras de lecture vers l'intérieur, puis régler l'interrupteur d'alimentation sur "off" (hors circuit).	Vis d'ajustement de l'angle de décalage. (Fig. 23)	1) Tourner la vis d'ajustement de l'angle de décalage de telle sorte que le centre du bras de lecture soit aligné sur la rayure en V de la tige d'élévation.
3	Amplification servo-mécanique	1) Brancher un voltmètre à C.C. à la borne 3 (+) et 2 (-) CN303 de la plaquette à circuits imprimés du montage principal. (Fig. 24) 2) Régler l'interrupteur d'alimentation sur "on" (marche).	VR501 (Fig. 21)	1) Faire pivoter entièrement vers la droite le bras de lecture. 2) Ajuster VR501 de telle sorte que la tension de sortie soit de 3,6V.
4	Tension de suppression	1) Brancher un voltmètre à C.C. à la borne 3 (+) et 2 (-) CN303 de la plaquette à circuits imprimés du montage principal. (Fig. 24) 2) Régler l'interrupteur d'alimentation sur "on" (marche).	Vis d'ajustement de la tension de suppression. (Fig. 21)	1) Placer le bras de lecture au milieu. 2) Tourner la vis d'ajustement de telle sorte que la tension de sortie soit de 1,8V. (Utiliser la clef hexagonale.)
5	Fréquence des impulsions de rythme	1) Connecter le fil de jonction à pince à la broche 7 et à la broche 27 IC301 de la plaquette à circuits imprimés du montage principal. 2) Brancher un oscilloscope à la broche 6 de IC301. (Fig. 24)	VR301 (Fig. 24)	1) Régler l'interrupteur d'alimentation sur "on" (marche). 2) Ajuster VR301 de telle sorte que la période de forme d'onde de sortie soit de $30\mu \pm 1\mu s$.
6	Vitesse de rotation	1) Ouvrir le boîtier supérieur et régler le commutateur sélecteur de vitesse sur "33". 2) Régler l'interrupteur d'alimentation sur "on" (marche) et appuyer sur le bouton de mise en marche.	VR101 33 t/p.m. (Fig. 25)	1) Ajuster VR101 pour obtenir une vitesse nominale de rotation.
		1) Ouvrir le boîtier supérieur et régler le commutateur sélecteur de vitesse sur "45". 2) Régler l'interrupteur d'alimentation sur "on" (marche) et appuyer sur le bouton de mise en marche.	VR102 45 t/p.m. (Fig. 25)	1) Ajuster VR102 pour obtenir une vitesse nominale de rotation.

■ MEDICIONES Y AJUSTE

Español

● Instrumentos usados

- Osciloscopio
- Voltímetro de CC
- Disco de 30cm
- Destornillador
- Llave hex.

● Precauciones

- Ajustar servogancia y contratensión (Referir a "Cómo remover piezas")
 - Remover la tapa contra el polvo y la cubierta de brazo fonocaptor.
 - Remover la cubierta del plato giradiscos y perilla de control.
 - Desmontar el brazo fonocaptor como en la Fig. 21.
- Para ajustar la frecuencia de reloj
 - Remover la cubierta del plato giradiscos y perilla de control.

Peso	Item	Preparación	Piezas ajustadas	Procedimento
1	Posición de arranque	1) Poner disco de 30cm sobre plato giradiscos y cerrar el gabinete superior. 2) Poner interruptor de corriente en "on". 3) Apretar interruptor botón de arranque.	Tornillo de ajuste de posición de arranque (Fig. 22)	1) Si la aguja cae entre tonadas, girar el tornillo de ajuste a la izquierda. 2) Si la aguja cae fuera del disco, girar el tornillo de ajuste a la derecha.

Peso	Item	Preparación	Piezas ajustadas	Procedimento
2	Angulo de fricción de brazo fonocaptor	1) Abrir gabinete superior. 2) Poner interruptor de corriente en "on". 3) Apretar botón de arranque para mover brazo fonocaptor dentro, luego poner interruptor de corriente en "off".	Tornillo de ángulo de fricción (Fig. 23)	1) Girar tornillo de ajuste de ángulo de fricción de manera que el centro del brazo de fonocaptor esté alineado con ranura-V de varilla de alza.
3	Servogancia	1) Conectar voltímetro de CC a terminal CN303 3 (+) y 2 (-) de circuito principal P.C.B. (Fig. 24) 2) Poner interruptor de corriente en "on".	VR501 (Fig. 21)	1) Cambiar completamente el brazo fonocaptor a la derecha. 2) Ajustar VR501 de manera que tensión de salida sea 3,6V.
4	Contratensión	1) Conectar voltímetro de CC a terminal CN303 3 (+) y 2 (-) de circuito principal P.C.B. (Fig. 24) 2) Poner interruptor de corriente en "on".	Tornillo de ajuste de ángulo de fricción. (Fig. 21)	1) Poner brazo de fonocaptor en centro. 2) Girar tornillo de ajuste de manera que tensión de salida sea 1,8V. (Usar llave hexagonal.)
5	Frecuencia de reloj	1) Conectar hilo conductor con mordaza a perno 301 CI (7) y perno (27) de circuito principal P.C.B. 2) Conectar osciloscopio a perno 301 CI (6). (Fig. 24)	VR301 (Fig. 24)	1) Poner interruptor de corriente en "on". 2) Ajustar VR301 de manera que periodo de forma de onda de salida sea $30\mu \pm 1\mu s$.
6	Velocidad rotativa	1) Abrir gabinete superior y poner interruptor selector de velocidad en "33". 2) Poner interruptor de corriente en "on" y apretar botón de arranque.	VR101 33 r.p.m. (Fig. 25)	1) Ajustar VR101 para obtener velocidad nominal.
		1) Abrir gabinete superior y poner interruptor selector de velocidad en "45". 2) Poner interruptor de corriente en "on" y apretar botón de arranque.	VR102 45 r.p.m. (Fig. 25)	1) Ajustar VR102 para obtener velocidad nominal.

■ RESISTOR AND CAPACITORS

- Notes:
- Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
 - Important safety notice:
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
 - This "S" mark is service standard parts and may differ from production parts.
 - Unless otherwise specified.
All resistors are in OHMS (Ω) K = 1000 Ω , M = 1000k Ω
All capacitors are in MICROFARADS (μF) P = $\mu\mu F$
 - Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Numbering System of Resistor

Example

ERD	25	F	J	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	J : $\pm 5\%$
ERG : Metal Oxide	1 : 1W	G : $\pm 2\%$

ERD2FCG□□□ $\rightarrow$ Fuse type carbon (1/4W)

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
ECKD	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 : $\pm 5\%$
ECEA...N : Non Polar Electrolytic	1C : 16V	2H : 500V DC	K : $\pm 10\%$
ECKD : Ceramic	1E : 25V		Z : +80%, -20%
ECQM : Polyester	1V : 35V		P : +100%, -0%
ECEB : Electrolytic	1H : 50V		M : $\pm 20\%$
ECCD : Ceramic	50 : 50V		

Ref. No.		P
RESISTORS		
RF1	Δ	ERD2F
R1	\$	ERD25
R2	\$	ERD25
R3	\$	ERG1A
R101	\$	ERD25
R102	\$	ERD25
R103	\$	ERD25
R104	\$	ERD25
R105,106	\$	ERD25
R107	\$	ERD25
R301	\$	ERD25
R302,303	\$	ERD25
R304,305	\$	ERD25
R306	\$	ERD25
R308	\$	ERD25
R310	\$	ERD25
R313,314	\$	ERD25
R315,316	\$	ERD25

■ TERMINAL

* These are the terminals that are partially used.

No.	Mark
1	VSS
2	CO9
3	CO8
4	CO7
5	CO6
6	CO5
7	A13
8	A12
9	A11
10	A10
11	B13
12	B12
13	B11
14	B10

à suivre

cture descend entre ue, tourner la vis s le sens inverse e montre. cture descend en d'enregistrement, justement dans le d'une montre.

ajustement de e de telle sorte bras de lecture soit re en V de la tige

ièrement vers la lecture. e telle sorte que la soit de 3,6V.

lecture au milieu. ajustement de telle on de sortie soit (hexagonale.)

eur d'alimentation e). e telle sorte que la d'onde de sortie s.

our obtenir une de rotation.

our obtenir une de rotation.

Peso	Item	Preparación	Piezas ajustadas	Procedimiento
2	Angulo de fricción de brazo fonocaptor	1) Abrir gabinete superior. 2) Poner interruptor de corriente en "on". 3) Apretar botón de arranque para mover brazo fonocaptor dentro, luego poner interruptor de corriente en "off".	Tornillo de ángulo de fricción (Fig. 23)	1) Girar tornillo de ajuste de ángulo de fricción de manera que el centro del brazo de fonocaptor esté alineado con ranura-V de varilla de alza.
3	Servogranancia	1) Conectar voltímetro de CC a terminal CN303 3 (+) y 2 (—) de circuito principal P.C.B. (Fig. 24) 2) Poner interruptor de corriente en "on".	VR501 (Fig. 21)	1) Cambiar completamente el brazo fonocaptor a la derecha. 2) Ajustar VR501 de manera que tensión de salida sea 3,6V.
4	Contratensión	1) Conectar voltímetro de CC a terminal CN303 3 (+) y 2 (—) de circuito principal P.C.B. (Fig. 24) 2) Poner interruptor de corriente en "on".	Tornillo de ajuste de ángulo de fricción. (Fig. 21)	1) Poner brazo de fonocaptor en centro. 2) Girar tornillo de ajuste de manera que tensión de salida sea 1,8V. (Usar llave hexagonal.)
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6	Velocidad rotativa	1) Abrir gabinete superior y poner interruptor selector de velocidad en "33". 2) Poner interruptor de corriente en "on" y apretar botón de arranque.	VR101 33 r.p.m. (Fig. 25)	1) Ajustar VR101 para obtener velocidad nominal.
		1) Abrir gabinete superior y poner interruptor selector de velocidad en "45". 2) Poner interruptor de corriente en "on" y apretar botón de arranque.	VR102 45 r.p.m. (Fig. 25)	1) Ajustar VR102 para obtener velocidad nominal.

RESISTOR AND CAPACITORS

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ECQM : Polyester	1V : 35V		P : +100%, -0%
ECEB : Electrolytic	1H : 50V		M : $\pm 20\%$
ECCD : Ceramic	50 : 50V		

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
RESISTORS			RESISTORS		
RF1	Δ ERD2FCG180	18	R317	\$ ERD25FJ102	1K
R1	\$ ERD25FJ681	680	R318,319	\$ ERD25FJ332	3.3K
R2	\$ ERD25FJ221	220	R320	\$ ERD25FJ272	2.7K
R3	\$ ERG1ANJ390	39	R321,322	\$ ERD25FJ331	330
R101	\$ ERD25FJ152	1.5K	R323	\$ ERD25FJ562	5.6K
R102	\$ ERD25FJ472	4.7K	R324	\$ ERD25TJ223	22K
R103	\$ ERD25FJ821	820	R325	\$ ERD25FJ103	10K
R104	\$ ERD25FJ681	680	R326	\$ ERD25FJ272	2.7K
R105,106	\$ ERD25FJ103	10K	R331	\$ ERD25FJ102	1K
R107	\$ ERD25TJ473	47K	R332	\$ ERD25FJ562	5.6K
R301	\$ ERD25TJ273	27K	R334	\$ ERD25FJ222	2.2K
R302,303	\$ ERD25FJ102	1K	R335	\$ ERD25FJ332	3.3K
R304,305	\$ ERD25FJ102	1K	R336	\$ ERD25FJ562	5.6K
R306	\$ ERD25FJ471	470	R337	\$ ERD25FJ472	4.7K
R308	\$ ERD25FJ331	330	R338	\$ ERD25FJ471	470
R310	\$ ERD25FJ562	560	R339	\$ ERD25FJ472	4.7K
R313,314	\$ ERD25TJ333	33K	R340	\$ ERD25TJ153	15K
R315,316	\$ ERD25TJ333	33K	R341,342	\$ ERD25FJ332	3.3K
			R343	\$ ERD25FJ332	3.3K

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
RESISTORS			CAPACITORS		
R345	\$ ERD25FJ472	4.7K	C1,2	Δ \$ ECKD1H223PF	0.22
R347	\$ ERD25FJ102	1K	C3	Δ \$ ECQM1H223JZ	0.22
R348	\$ ERD25FJ471	470	C4	\$ ECEB1VS102	1,000
R349	\$ ERD25FJ102	1K	C5,6	\$ ECQM1H104JZ	0.1
R401,402	\$ ERD25TJ683	68K	C101	\$ ECEA50Z2R2	2.2
R403	\$ ERD25FJ472	4.7K	C102	\$ ECEA1ES470	47
R404	\$ ERD25FJ122	1.2K	C103	\$ ECEA50Z3R3	3.3
R405	\$ ERD25FJ222	2.2K	C104	\$ ECEA50Z2R2	2.2
R406	\$ ERD25FJ102	1K	C301	\$ ECCD1H680K	68P
R407	\$ ERD25TJ224	220K	C302	\$ ECQM1H104JZ	0.1
R408	\$ ERD25FJ222	2.2K	C304	\$ ECEA1AS470	47
R409	\$ ERD25FJ102	1K	C306	\$ ECQM1H104JZ	0.1
R410	\$ ERD25TJ224	220K	C307	\$ ECQM1H223JZ	0.022
R411	\$ ERD25FJ272	2.7K	C308	\$ ECEA50Z3R3	3.3
R412	\$ ERD25FJ681	680	C309	ECKD2H102KB	0.001
R413,414	\$ ERD25FJ101	100	C401,402	\$ EQM1H223JZ	0.022
R415,416	\$ ERD25FJ471	470	C403	\$ ECEA1CS330	33
R501	\$ ERD25FJ391	390	C404,405	\$ ECEA1AS470	47
R502	\$ ERD25FJ681	680	C601	ECFB1B104ZM	0.1

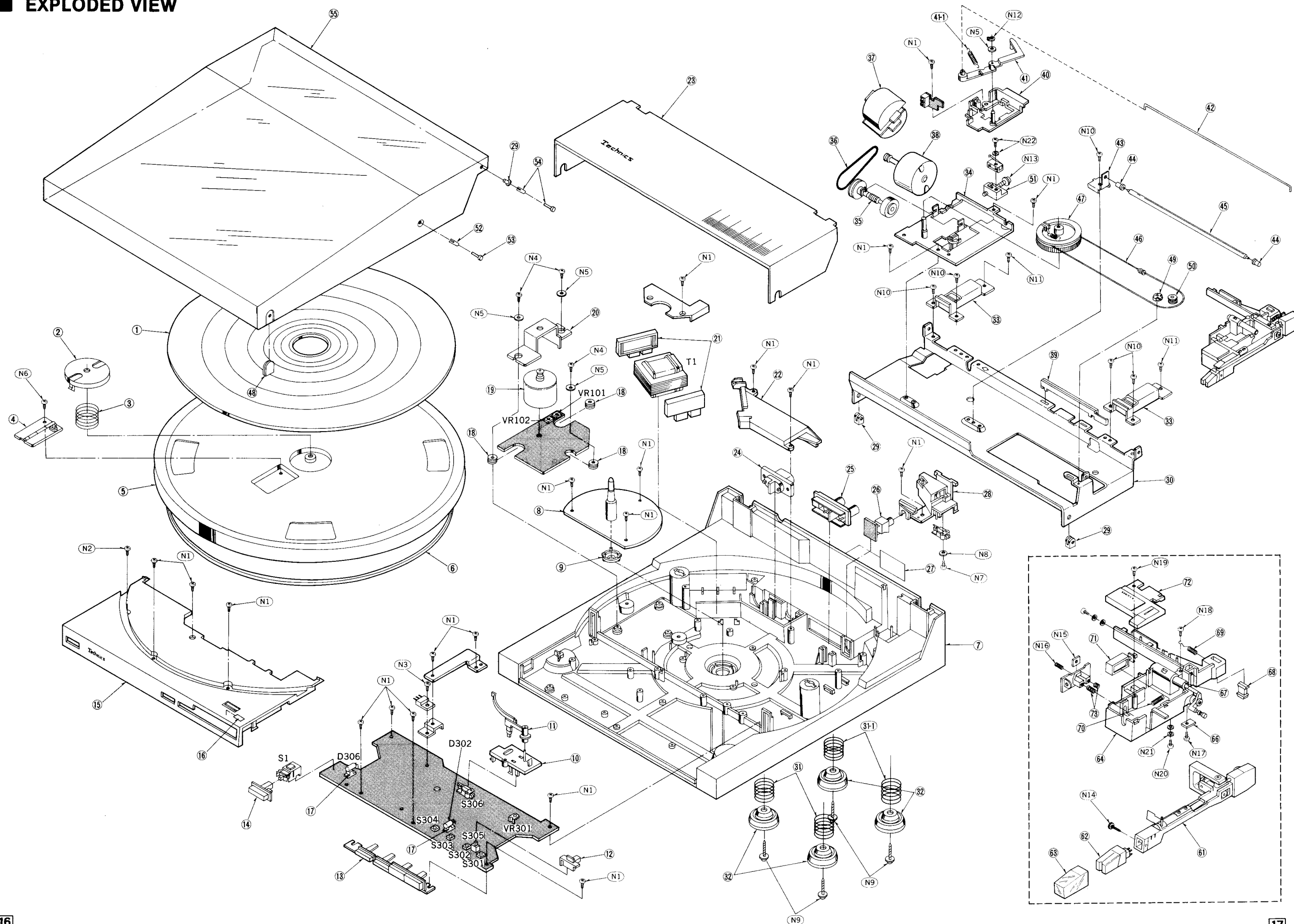
TERMINALS OF MN1421FPC

* These are the basic functions of MN1421FPC. Therefore, some terminals are not necessary or circuit functions may be partially changed depending on the purposes.

No.	Mark	Description
1	VSS	Ground terminal
2	CO9	Cueing control terminal ("H" during cueing and cueing down)
3	CO8	Cueing control terminal ("H" only during cueing down — about 1 sec.)
4	CO7	Key scan output terminal
5	CO6	
6	CO5	
7	A13	
8	A12	Key scan input terminal
9	A11	
10	A10	
11	B13	Auto size · speed select terminal Terminal ⑪, ⑫ "L" → 30cm record · 33rpm Terminal ⑪ "L" ⑫ "H" pulse → 17cm record · 45rpm
12	B12	
13	B11	Rest position detecting terminal ("H" when tonearm is at rest position)
14	B10	Record detection terminal ("H" when record is present)

No.	Mark	Description
15	EO0	Tonearm drive motor control terminal (Arm servo)
16	EO1	
17	EO2	
18	EO3	
19	TEST	Test terminal (not used, connected to ground)
20	RST	Reset terminal (micom is reset at "L")
21	SNSO	Offset angle detection input terminal
22	SNS1	Arm position detecting input terminal
23	DO0	Turntable speed select terminal ("H" in 45rpm; "L" in 33rpm)
24	DO1	Repeat indicator terminal (ON at "L")
25	DO2	Synchro-rec on/off terminal ("H" at on; "L" at off)
26	DO3	Turntable start/stop select terminal ("L" at start; "H" at stop)
27	VDD	Power supply (+5V)
28	OSC	Oscillation circuit (Clock frequency is adjusted to 30 μs $\pm 1\mu s$)
28	OSC	

EXPLODED VIEW



REPLAC

- Notes:
1. Part number
 2. Important
 3. Component
 4. Characteristics
 5. When repl
 6. factor's
 7. Bracketed
 8. area. Par
 9. areas.
 10. The "S"
 11. from prod
 12. ① -mar
 13. marked pa
 14. 6. Parts othe
 15. black and
 16. 7. The paren
 17. stand for t

Ref. No.		
INTEGRATED CIRCUIT		
IC1		AN78
IC2		DN68
IC101		AN68
IC301		MN14
IC401		AN65
TRANSISTORS		
Q1		2SD63
Q101		2SD63
Q102		2SK30
Q301		2SD63
Q303		2SD63
Q304		2SD8
Q305		2SB64
Q306		2SD63
Q307		2SD63
Q308		2SB64
Q309		2SD63
Q401		2SD97
Q402		2SD97
Q403		2SD63
Q404		2SD63
DIODE		
D1	△	SVDS
D2		MA10
D101	\$	MA16
D102	\$	MA16
D301		MA10
D302,306		LN81
D303 ~ 305	\$	MA16
D308	\$	MA16
D501	\$	MA16
PHOTO INTERRUPTER		
PC501		ON 11
SWITCHES		
S1	△	SFDS
S301 ~ 304		EVQQ
S305		SFDS
S306		SFDS
S307		SFDS
S601		SFDS
S901 [XA XM only]	△	SFDS
VARIABLE RESISTORS		
VR101		EVN5
VR102		EVN5
VR301		EVNK

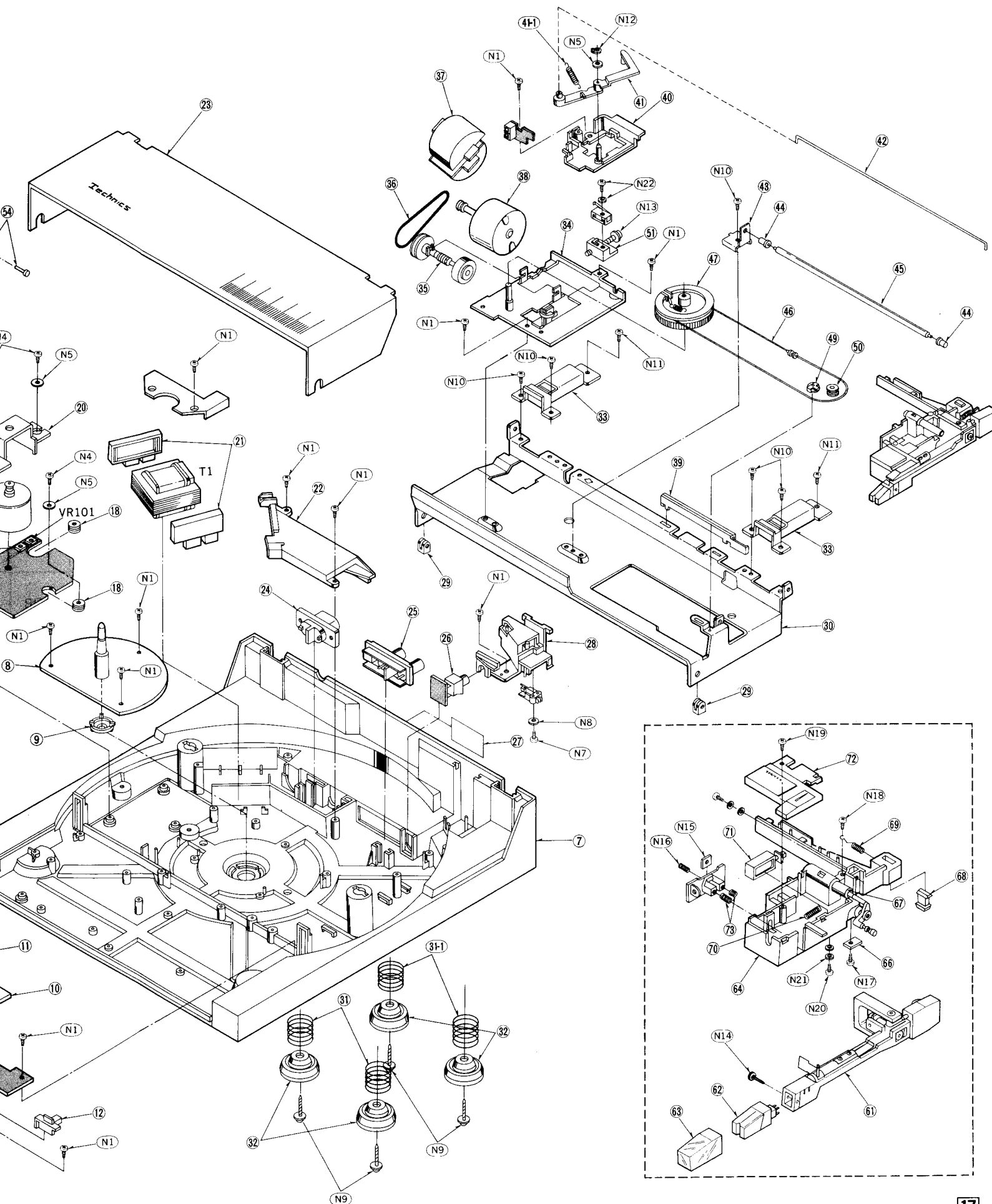
REPLACEMENT PARTS LIST

- 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 Δ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
 3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
 4. The "S" mark is service standard parts and may differ from production parts.
 5. $\odot$ -marked parts are used for black only, while $\circ$ -marked parts are for silver type only.
 6. Parts other than $\odot$ - and $\circ$ -marked are used for both black and silver types.
 7. The parenthesized numbers in the columns of description stand for the quantity per set.

Black type model No. : SL3 (K)

Areas

- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EG] is available in F.R. Germany.
- * [EB] is available in Belgium.
- * [EF] is available in France.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [EH] is available in Holland.
- * [Ei] is available in Italy.
- * [EC] is available in Czechoslovakia.
- * [XM] is available in Central South America.

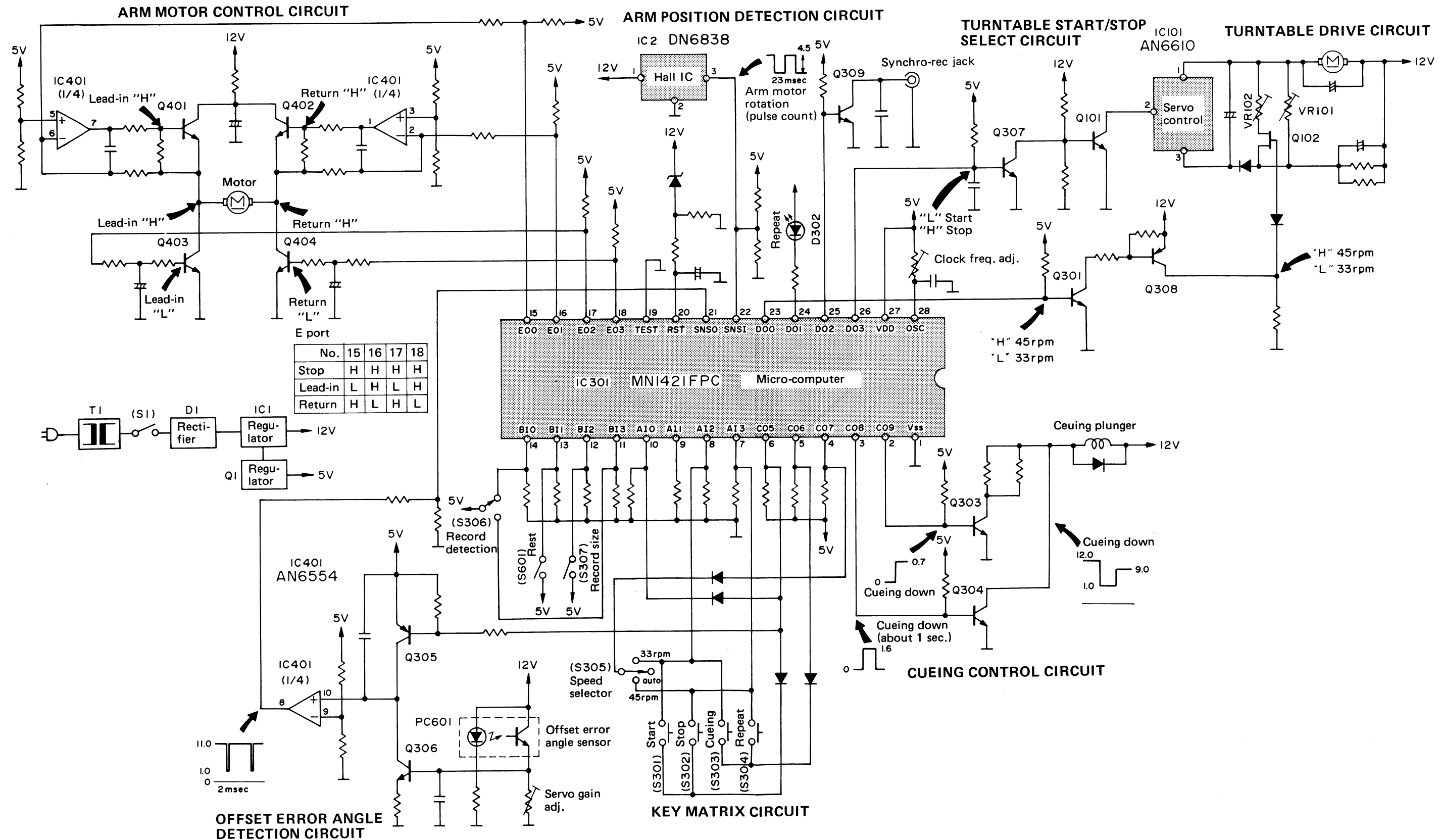


Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	AN78M12	Regulator
IC2	DN6838S	Arm Position
IC101	AN6610	DC Servo Control
IC301	MN1421FPC	Micro Computer
IC401	AN6554	Comparator
TRANSISTORS		
Q1	2SD638	Regulator
Q101	2SD638	Turntable Start / Stop
Q102	2SK301	Speed Select
Q301	2SD636	Speed Select
Q303	2SD636	Speed Select
Q304	2SD892	Cueing Control
Q305	2SB641	Cueing Control
Q306	2SD636	Offset angle
Q307	2SD636	Sensor
Q308	2SB641	Turntable Start / Stop
Q309	2SD636	Speed Select
Q401	2SD973	Synchro-rec Select
Q402	2SD973	Arm Motor Control
Q403	2SD973	Arm Motor Control
Q404	2SD973	Arm Motor Control
DIODE		
D1	Δ SVD5IRBA20F	Rectifier
D2	MA1056	5.6V Zener
D101	Δ MA162A	Drive Motor Control
D102	Δ MA162A	Speed Select
D301	MA1075A	7.5V Zener
D302,306	LN81CPH	Light Emitting Diode
D303 ~ 305	Δ MA162A	Key Matrix
D308	Δ MA162A	Key Matrix
D501	Δ MA162A	Key Matrix
PHOTO INTERRUPTERS		
PC501	0N 1186	Offset Angle
SWITCHES		
S1	Δ SFDSC02N02	Power
S301 ~ 304	EVQJR02K	Start, Stop, Cueing, Repeat
S305	SFDHSHW0699	Speed Selector
S306	SFDSC02N01	Record Size
S307	SFDSC05N02	Selector
S601	SFDSC02N03	Record Size
S901 [XA, XM] only	SFDHSHW225-2	Rest
VARIABLE RESISTORS		
VR101	EVN51AA00B53	33r. p.m Adjuster 5K Ω (B)
VR102	EVN51AA00B23	45r.p.m Adjuster 2K Ω (B)
VR301	EVNK6AA00B54	Clock Frequency Adjuster 50K Ω (B)

Ref. No.	Part No.	Description
VARIABLE RESISTORS		
VR501	Δ EVN00AA00B53	Servo Gain Adjuster 5K Ω (B)
FUSES		
F1	Δ XBAS2C04T1B	T 400mA, 250V
F2 [XA, XM] only	Δ XBAS2C01T1B	T 100mA, 250V
POWER TRANSFORMER		
T1 [EK, XL]	Δ SLT48DT16E	Power Source
T1 [XA, XM]	Δ SLT48DT17E	Power Source
T1 [Other Areas]	Δ SLT48DT15E	Power Source
Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
1	SFTGC02N01	Turntable Mat (1)
2	SFVEC02N01	45 rpm Adaptor (1)
3	SFGAC06N01	Spring (1)
4	SFUMC05N11A	Record Detector (1)
5	SFTEC02N01A	Turntable Platter (1)
6	SFGB321-1	Belt (1)
7	$\circ$ SFACC02N01	Cabinet (Silver) (1)
7	$\odot$ SFACC02N21	Cabinet (Black) (1)
8	SFTJC02N01Z	Turntable Shaft Assy' (1)
9	SFUMC02N19	Cap (1)
10	SFUMC02N35	Cover, Switch, S306 (1)
11	SFUMC02N33E	Lever, Record detector (1)
12	SFKTC02N03	Knob, Speed Selector (1)
13	SFKTC02N01A	Knob Assy, Control (1)
14	SFKTC02N02A	Knob, Power (1)
15	$\circ$ SFUMC02N01	Cover, Front Cabinet (Silver) (1)
15	$\odot$ SFUMC02N21	Cover, Front Cabinet (Black) (1)
16	SFKKC05N02	Label, Speed Selector (1)
17	SFUMC02N09	Holder, Diode, D302, D306 (2)
18	SFGZB33N01	Cushion Rubber (1)
19	SFUMHL11R21E	Motor Assy' (with Pulley) (1)
20	SFUP11R21	Guide, Motor (1)
21	SFGCC02N02	Cushion Rubber, Transformer (1)
22	SFUMC02N04	Cover, Power (1)
23	SFUMC02N08	Cover, Tonearm (1)
24	SFDJHSC04912	Socket, AC (1)
[XA, XM]	SFDJHSC0492	Socket, AC (1)
24 [EK, XL]	SFDJHSC0491	Socket, AC (1)
24 [Other Areas]	SFDJHSC0492	Socket, AC (1)
25	SFDJC03N08E	Jack, Output (1)
26	SFDJC06N02	Jack, Synchro - rec (1)
27 [E, EC]	SFNNC03S01	Name Plate (1)
27 [EK, XL]	SFNNC03G01	Name Plate (1)
27 [XA, XM]	SFNNC03X01	Name Plate (1)
27 [Other Areas]	SFNNC03R01	Name Plate (1)
28	SFUMC02N03A	Lever Assy, Record detector (1)
29	SFGZC02N02	Rubber, Dust Cover (2)
30	SFUUC02N01E	Plate Assy, Tonearm (1)
31	SFQCC02N01	Spring, Audio Insulator (Front) (2)
31-1	SFQCC02N02	Spring, Audio Insulator (Rear) (2)

Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
32	SFGAC05N02	Audio Insulator (4)
33	SFATC02N01E	Hinge, Dust Cover (2)
34	SFUPC02N01E	Plate Assy, Tonearm (1)
35	SFUM11R02A	Worm Assy' (1)
36	SFGBC10-01	Belt, Tonearm (1)
37	SFUMC02N07	Cover, Tonearm Motor (1)
38	SFMHC02N01E	Motor Assy, Tonearm Drive (1)
39	SFUMC02N12	Holder, Lead Wire (1)
40	SFUMC02N13	Plate Assy, Rest Switch (1)
41	SFUMC02N05	Lever, Rest Switch (1)
41-1	SFQHQ34N22	Spring, Rest Switch Lever (1)
42	SFUZC02N01	Rod, Rest Switch (1)
43	SFUPC02N03	Bracket, Guide Rail (1)
44	SFGCC05N05	Cap, Guide Rail Rubber (1)
45	SFXJC02N03	Guide Rail (1)
46	SFUZC05N02E	Lope Assy' (1)
47	SFUM11R03	Arm Drive Wheel (1)
48	SFGCC02N01	Rubber, Dust Cover (2)
49	SFUMC06N11	Cap (1)
50	SFUMC05N22	Pulley (1)
51	SFQA913 - 01	Spring (1)
52	SFUMC02N04	Holder (2)
53	SFUMC02N15	Latch, Dust Cover (2)
54	SFUMC02N18	Latch, Dust Cover (2)
55	SFADC02N01	Dust Cover (1)
TONEARM PARTS		
61	SFPAM00301A	Tonearm (1)
62	$\star$ EPC - P24S	Cartridge (1)
62	$\star$ EPS - 24CS	Stylus (1)
63	SFPCN02301	Cover, Stylus (1)
64	SFPKD00301R	Base, Tonearm (1)
66	SFPZB00301	Plate (1)
67	SFPJU00301	Bracket, Guide Rail (1)
68	SFPGML1101	Rubber (1)
69	SFPSP00304	Spring (1)
70	SFPSP00504	Spring (1)
71	SFDZC05N01E	Cueing Plunger (1)
72	SFPCS00301	Cover, Tonearm Position (1)
73	SFPSP00302	Spring (2)
SCREWS, WASHERS and CIRCLIPS		
N1	Δ XTV 3+8 BFN	Screw, $\pm 3 \times 8$ (15)
N2	Δ XTV 3+20 BFN	Screw, $\pm 3 \times 20$ (1)
N3	Δ XTN 3+ C5S	Screw, $\pm 3 \times 5$ (1)
N4	SFXG 172-01	Screw, (3)
N5	Δ XWE3	Washer, $\phi 3$ (3)
N6	Δ XTN 3+6 BFZ	Screw, $\pm 3 \times 6$ (1)
N7	Δ XTN 2+10B	Screw, $\pm 2 \times 10$ (1)
N8	Δ XWE2BW	Washer, $\phi 2$ (1)
N9	Δ XTW 3+12	Screw, $\pm 3 \times 12$ (4)
N10	Δ XTV 3+6 BFN	Screw, $\pm 3 \times 6$ (5)
N11	Δ XTWS 3+14TFZ	Screw, $\pm 3 \times 14$ (2)
N12	CSTW3	Washer, $\phi 3$ (1)
N13	XSN 3+3 0S	Screw, $\pm 3 \times 30$ (1)
N14	SFPEV00502	Screw, Cartridge (1)
N15	SFXN 623-1	Nut (1)
N16	XXE3D10FZS	Screw, $\pm 3 \times 10$ (1)
N17	Δ XTN 2+4B	Screw, $\pm 2 \times 4$ (1)
N18	Δ XTN 3+8 BFZ	Screw, $\pm 3 \times 8$ (1)
N19	Δ XTN 26+6 BFZ	Screw, $\pm 2.6 \times 6$ (1)
N20	XSN 2+4	Screw, $\pm 2 \times 4$ (1)
N21	Δ XWA2B	Washer, $\phi 2$ (1)
N22	Δ XTN 16+10G	Screw, $\pm 1.6 \times 10$ (1)

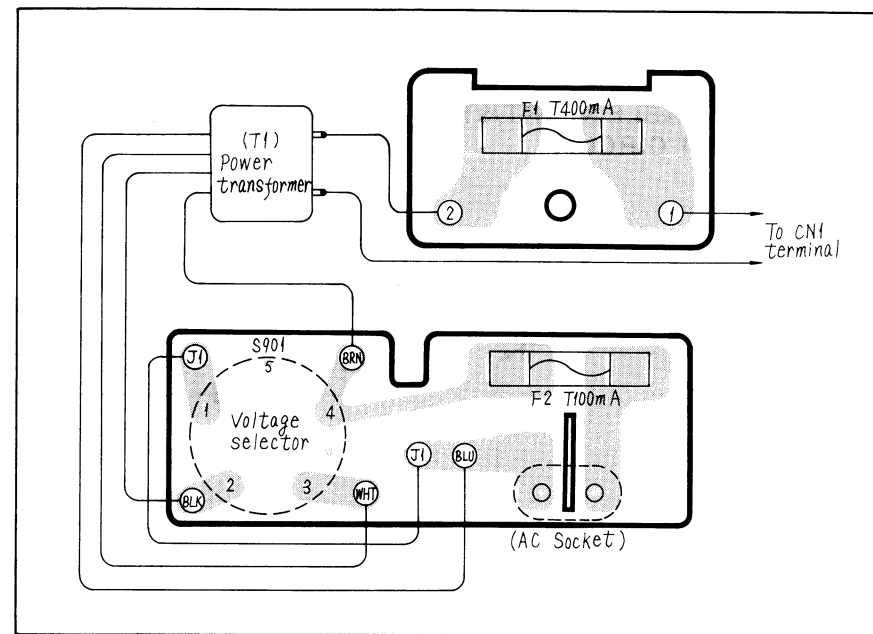
■ BLOCK DIAGRAM



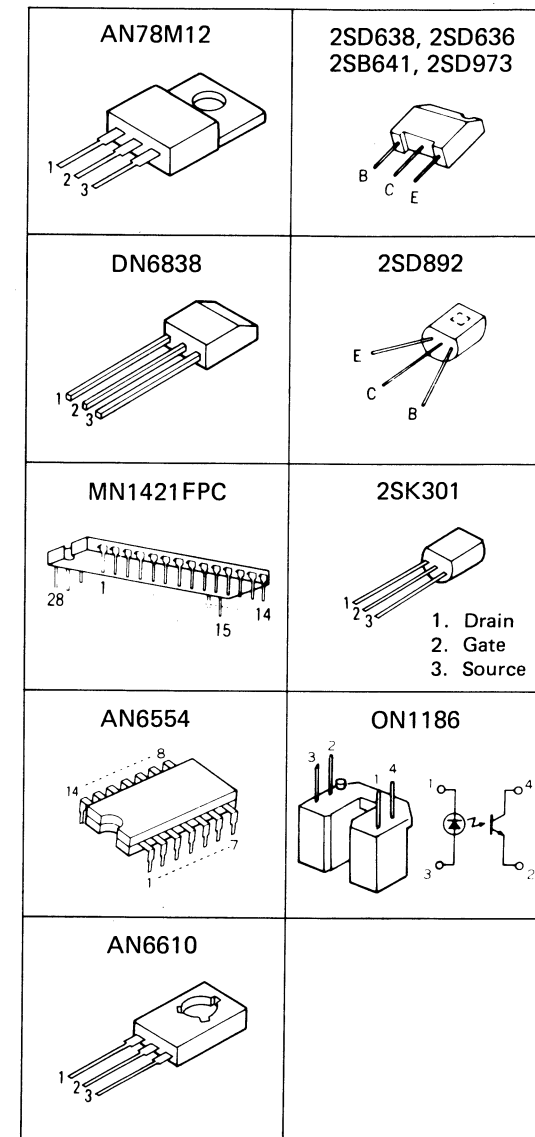
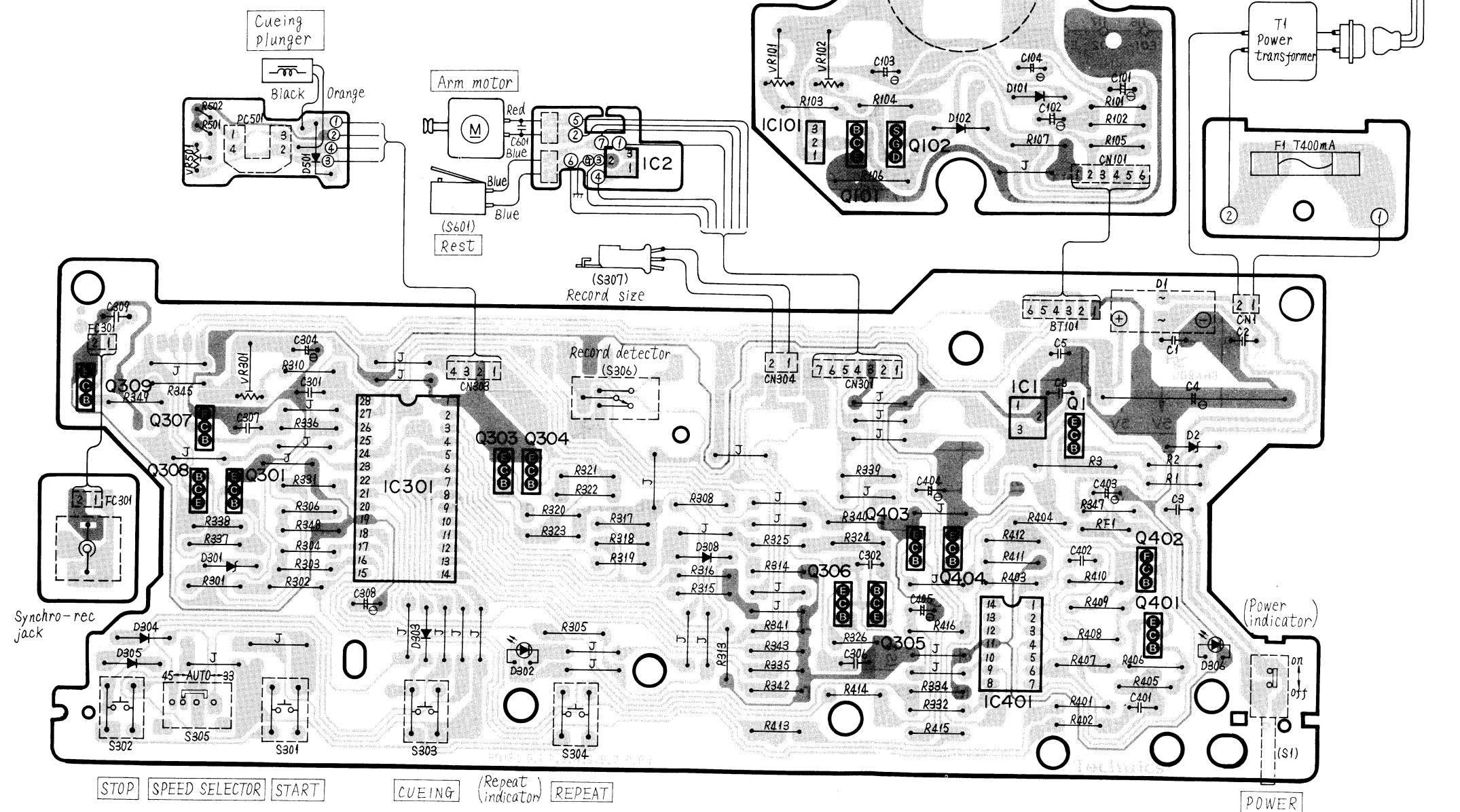
■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM


Ground (Earth) lines

- **Terminal guide of transistors, photo interrupters and IC's.**

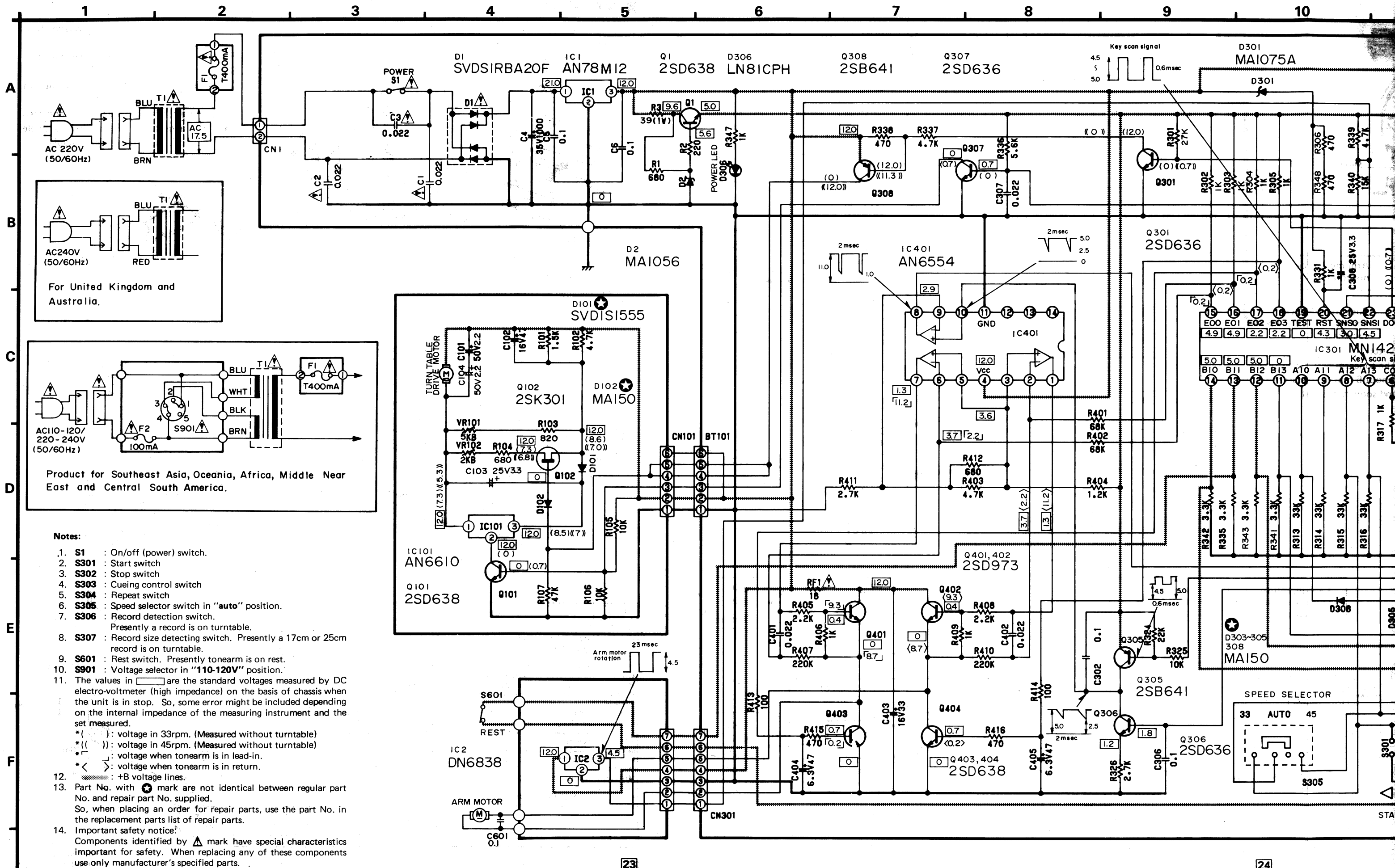


- **Power supply circuit**
(For Southeast Asia, Oceania, Africa, Middle Near East and Central South America)



SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)





■ TROUBLE SHOOTING

To repair and check the unit
(Refer to "How to remove the parts.")

- **Main circuit (micro-computer, arm motor control and power supply circuit):**
Remove the turntable platter and control knob cover, and open the upper cabinet. (Fig. 26)
- **Turntable drive circuit:**
Remove the turntable platter and open the upper cabinet.
- **Offset angle detecting sensor and arm position detecting Hall IC:**
Remove the dust cover and tonearm cover.

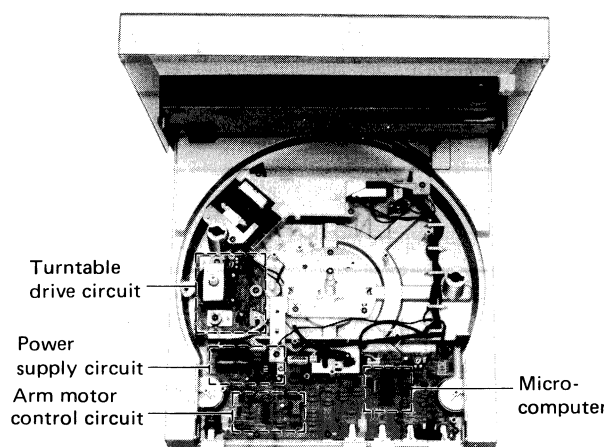
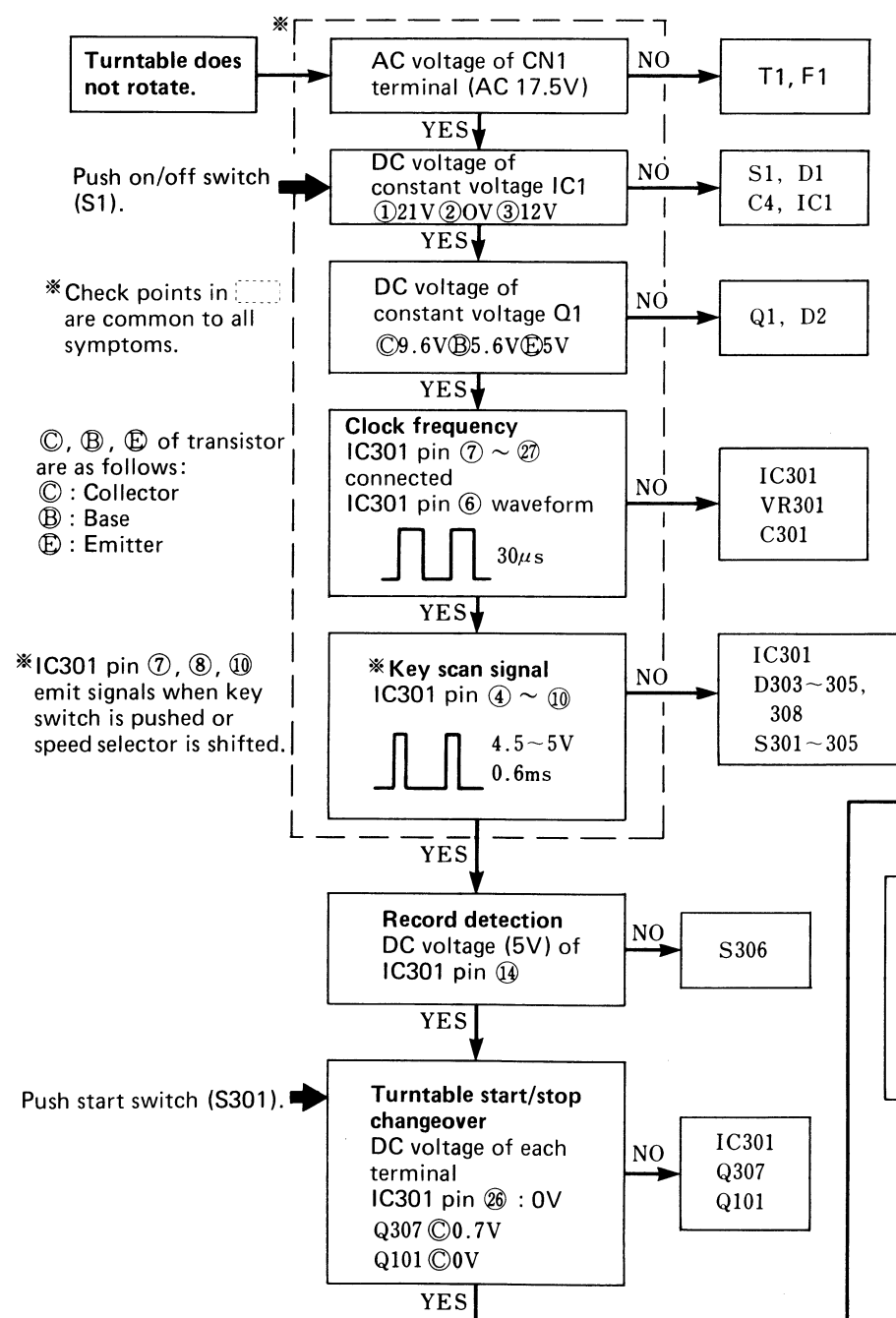


Fig. 26



Note:

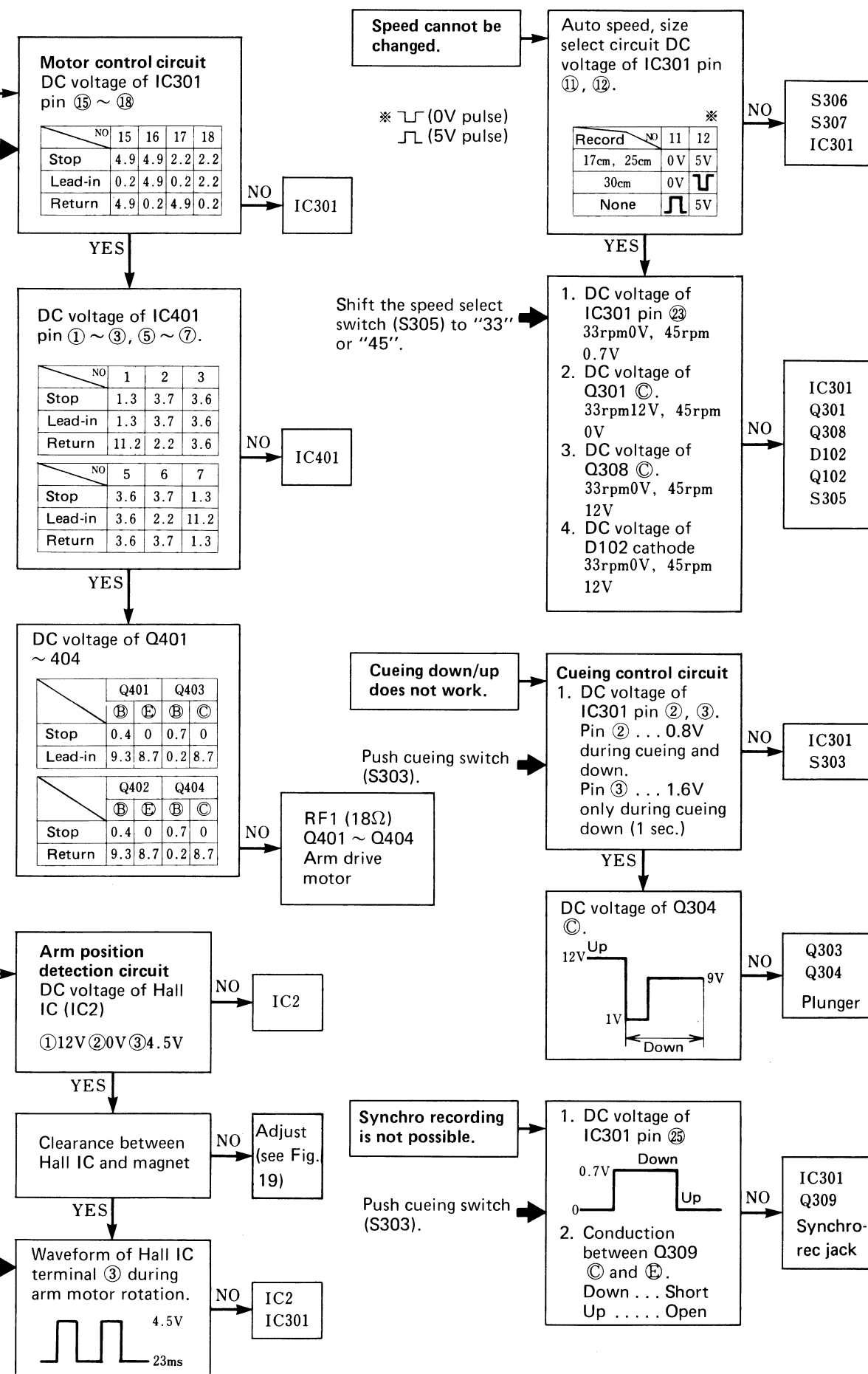
The tonearm first moves slowly (about 5 mm from start position) and soon moves fast.

Arm motor does not rotate.

Push start (S301) and stop (S302) switches.

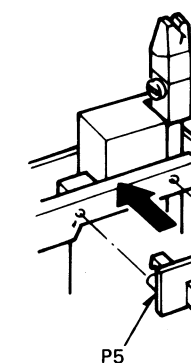
Lead-in, return defective with 17cm record.

Push start switch (S301).



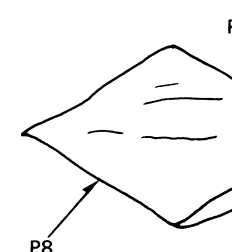
■ PACKING

1. Open the upper place.
2. Fit the turntable cover spacer in place.



3. Put the set into the package as shown.

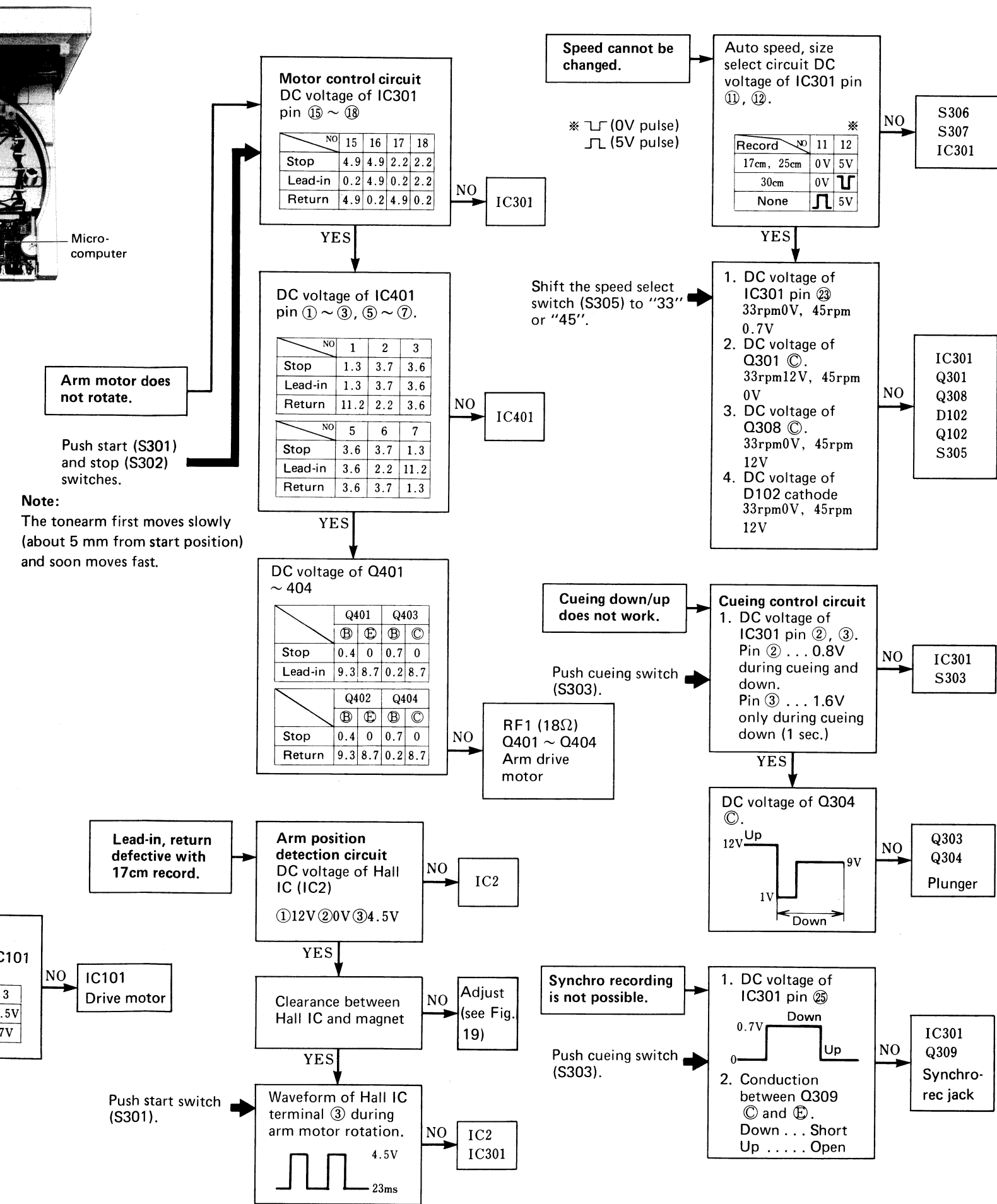
Turntable



P8

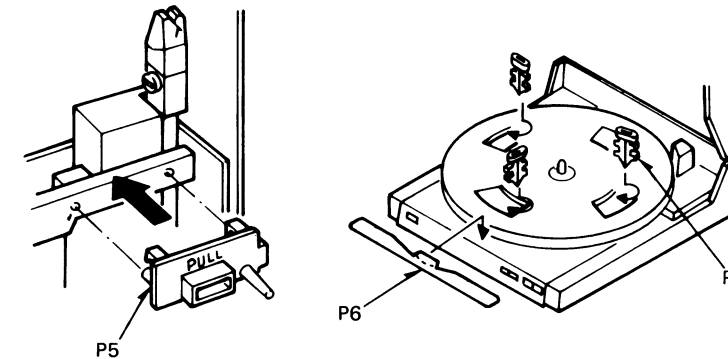
P2

Ref. No.	Part No.
ACCESSORIES	
A1(EK)	SFNUC02G01
A1	SFNUC02X01
[XA, XM]	
A1(EG)	SFNUC02R01
A1(EF)	SFNUC02F01
A1(EI)	SFNUC02I01
A1[Other Areas]	SFNUC02S01
A1(XL)	SFNUC02L01
A2	SFNUC05N01
A3	SFNUC05N01
M(XL)S	RJA26Z
M(EK)S	RJA43Z
M	QFC1103
[XA, XM]S	
M[Other Areas]	RJA20Z
A5	SFNUC05N24
A6(XA) only	SFNUC05N18

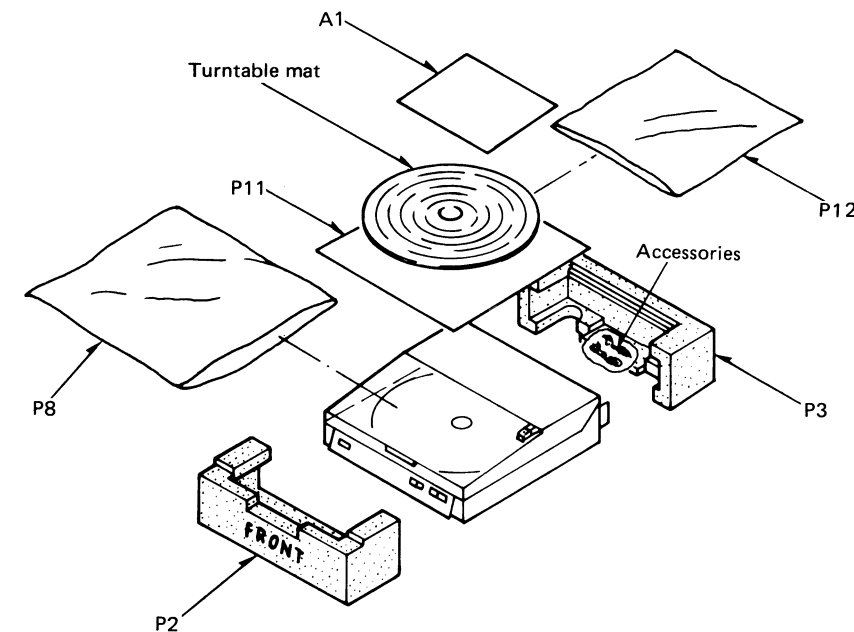


PACKING

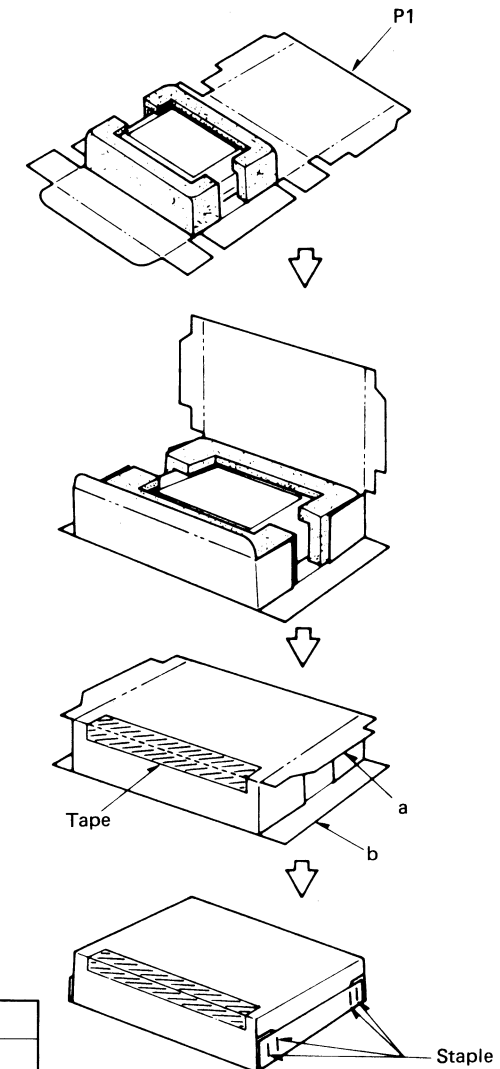
1. Open the upper cabinet and fit the spacer in place.
2. Fit the turntable platter clumper and dust cover spacer in place.



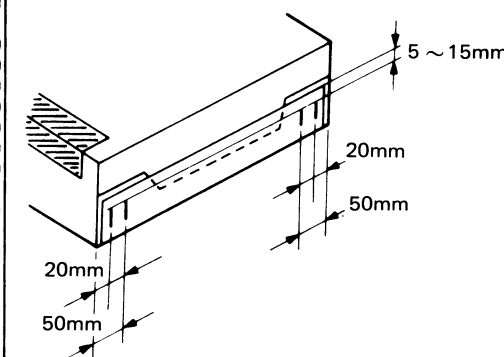
3. Put the set into polyethylene bag, and make the package as shown below.



4. Place 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.



Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
ACCESSORIES			PACKING PARTS		
A1(EK)	SFNUC02G01	Instruction Book (1)	P1(EF)	SFHPC02C01	Carton Box (Silver) (1)
A1(XA, XM)	SFNUC02X01	Instruction Book (1)	P1(EF)	SFHPC02C21	Carton Box (Black) (1)
A1(EG)	SFNUC02R01	Instruction Book (1)	P1(Other)	SFHPC02M01	Carton Box (Silver) (1)
A1(EF)	SFNUC02F01	Instruction Book (1)	P1(Other)	SFHPC02M21	Carton Box (Black) (1)
A1(EI)	SFNUC02I01	Instruction Book (1)	P2	SFHHC02N01	Pad, Front (1)
A1(Other)	SFNUC02S01	Instruction Book (1)	P3	SFHHC02N02	Pad, Rear (1)
A1(XL)	SFNUC02L01	Instruction Book (1)	P4	SFHHC02N01	Clamper, Turntable (3)
A2	SFHDC05N01	Phono Cord (1)	P5	SFHHC02N01	Spacer, Tonearm (1)
A3	SFDLC05N01	Ground Wire (1)	P6	SFHSC06N01	Spacer, Dust Cover (1)
A4(XL)S	RJA26Z	AC Cord (1)	P7	SFYR13C120Y	Ribbon, Belt (1)
A4(EK)S	RJA43Z	AC Cord (1)	P8	SFYH45X50	Polyethylene Bag, Cabinet (1)
A4	QFC1103	AC Cord (1)	P9	SFYH17X16	Polyethylene Bag, Accessories (1)
A4(XA, XM)S	RJA20Z	AC Cord (1)	P10	SFYF05A06	Polyethylene Bag, 25cm Adaptor (1)
A4(Other)S	SFUMC05N24	Adaptor, 25cm Record (1)	P11	SFHDD05N01	Pad, Turntable Mat (1)
A5	SFDKI19118	2P Plug (1)	P12	SFYF33B35	Polyethylene Bag, Turntable Mat (1)
A6(XA) only					