

Service Manual

Direct Drive Automatic Turntable System

SL-DL1

[PA], [PE], [PC]

SL-DL1(K)

[PC]

Areas

- * [PA] is available in far East PX.
- * [PE] is available in European Military.
- * [PC] is available in European Audio Club.

- * The colors of this model included silver and black.
- * The black type model is provided with (K) in the Service Manual.

For additional information, please refer to the service manual for Model No. SL-DL1/SL-DL1 (K) (ORDER NO. SD81041862C8).

- Notes:
- * This service manual included only the change of the **SL-DL1/SL-DL1 (K)** service manual (ORDER NO. SD81041862C8).
 - * When servicing model **SL-DL1 [PA, PE, PC] /SL-DL1 (K) [PC]**, this service manual and **SL-DL1/SL-DL1 (K)** (ORDER NO. SD81041862C8) service manual should be used together.

CHANGES

REPLACEMENT PARTS LIST

| Ref. No. | Change of Part No. | | Part Name & Description | Per Set (Pcs.) | Remarks |
|---------------------------|---|-----------------------------------|-----------------------------------|----------------|---------|
| | SL-DL1/SL-DL1 (K) (ORDER NO. SD81041862C8) | SL-DL1/SL-DL1 (K) [PA, PE, PC] | | | |
| MAIN CABINET PARTS | | | | | |
| 23 | SFNND11S01 | SFNND11P01 [PA], [PE] | Name Plate | 1 | ○ |
| | SFNND11G02 | | | | |
| | SFNND11R01 | SFNND11P02 [PC] | Name Plate | 1 | ○ |
| | SFNND11X01 | | | | |
| 24 | SJA88 | SJA83 | AC Cord | 1 | |
| | QFC1205M | | | | |
| | QFC1208M | | | | |
| 25 | SFUM190-11 | SFUM190-12 | Bushing, AC Cord | 1 | |
| | SFUM190-12 | | | | |
| ACCESSORIES | | | | | |
| A1 | SFNUD11S01 | SFNUD11P01 | Instructions Book, Printed Matter | 1 | ○ |
| | SFNUD11G01 | | | | |
| | SFNUD11X01 | | | | |
| A3 | SFDK119118 | Deletion | 2 Pin Plug | 0 | |
| A4 | Addition | QJP0603S | Adaptor, Gimens | 1 | |

| Ref. No. | Change of Part No. | | Part Name & Description | Per Set (Pcs.) | Remarks |
|----------------------|---|-------------------------------------|-------------------------|-------------------------------------|---------|
| | SL-DL1/SL-DL1 (K) (ORDER NO. SD81041862C8) | → SL-DL1/SL-DL1 (K) [PA, PE, PC] | | | |
| PACKING PARTS | | | | | |
| P1 | ○ | SFHPD11M01 | SFHPD11M01 | Carton Box (Silver) | 1 |
| | ○ | SFHPD11C01 | | | |
| | ⊗ | SFHPD11M21 | SFHPD11M21 | Carton Box (Black) | 1 |
| P11 | | SFHSC07-02 | Deletion | Spacer (A), Corner | 0 |
| P12 | | SFHSC07-03 | Deletion | Spacer (B), Corner | 0 |
| CAPACITORS | | | | | |
| C401 | ⚠ | ECNC4A473MD | ECQE2A473MZ | Polyester, 0.047μF 250VAC, ± 20% | 1 |
| | | ECQE2A473MZ | | | |
| C501 | ⚠ | ECQE2A103MZ | Deletion | Polyester, 0.01μF, 250VAC, ± 20% | 0 |

ORDER NO. SD81041862C8

Service Manual

Direct Drive Automatic Turntable System

SL-DL1

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

SL-DL1(K)

[E], [XL], [EG],
[EH], [XA], [XM]

* The colors of this model include silver and black.
* 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.
- * [EB] is available in Belgium.
- * [EF] is available in France.
- * [EG] is available in F.R. Germany.
- * [EI] is available in Italy.
- * [EH] is available in Holland.
- * [XA] is available in East South Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XM] is available in Central South America.

English

Specifications

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

General

| | |
|---------------------------|--|
| Power supply: | ~ 110-120/220-240V, 50/60 Hz |
| Power consumption: | 17 W |
| Dimensions: | 43 x 8.8 x 35 cm |
| (W x H x D) | 43 x 39.7 x 35 cm (Maximum height when top (dust cover) is open.) |
| Weight: | 7.1 kg (15.6 lb.) |

Turntable section

| | |
|---------------------------|---|
| Type: | Automatic turntable Auto start/Auto lead-in Auto return Auto stop Repeat play Auto speed select Manual speed selection possible. Auto size select 2-speed search functions Record presence detection |
| Drive method: | Direct drive |
| Motor: | Brushless DC motor |
| Drive method: | F.G. servo control |
| Turntable platter: | Aluminum die-cast Diameter 31.2 cm |

| | |
|--------------------------|--|
| Turntable speeds: | 33-1/3 rpm and 45 rpm Auto speed select (Manual selection possible) |
| Pitch control: | 10% adjustment range |
| Wow and flutter: | 0.012% WRMS* 0.025% WRMS (JIS C5521) ± 0.035% peak (IEC 98A Weighted) |

* Measured by obtaining signal from built-in frequency generator of motor assembly.

| | |
|----------------|--|
| Rumble: | -56 dB (IEC 98A Unweighted) -78 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 |

SL-DL1

Cartridge section

| | |
|----------------------------|--|
| Type: | Moving magnet stereo cartridge One point suspension system |
| Magnet: | Samarium cobalt (Sm-Co) |
| Magnetic circuit: | All laminated core |
| Frequency response: | 10 Hz to 35 kHz 20 Hz to 10 kHz ± 1 dB |
| Output voltage: | 2.5 mV at 1 kHz, 5cm/s. zero to peak lateral velocity (7 mV at 1 kHz, 10cm/s. zero to peak 45° velocity [DIN 45 500]) |

| | |
|------------------------------------|---|
| Channel separation: | More than 22 dB at 1 kHz |
| Channel balance: | Within 1.8 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 g (cartridge only) |
| Replacement stylus: | EPS-23CS (Equivalent replacement stylus: EPS-23ES) |

Deutsch

TECHNISCHE DATEN

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

Allgemeine Daten

| | |
|---------------------------|--|
| Stromversorgung: | ~ 110-120/220-240V, 50/60 Hz Wechselstrom |
| Leistungsaufnahme: | 17 W |
| Abmessungen: | 43 x 8,8 x 35 cm |
| (B x H x T) | 43 x 39,7 x 35 cm (Maximale Höhe bei vollständig geöffnetem Gehäuseoberteil.) |
| Gewicht: | 7,1 kg |

Plattenspieler

| | |
|-------------------------------|---|
| Type: | Automatischer Plattenspieler Auto-Start/Auto-Zuführung Rückführautomatik Stopp-Automatik Wiederhol-Betrieb Automatische Drehzahlwahl Manuelle Drehzahlwahl möglich 2-Geschwindigkeiten- Suchfunktionen Plattenpräsenz-Registrierung Direktantrieb |
| Antrieb: | Kollektorloser Gleichstrommotor |
| Motor: | FG-Servo-Steuerung |
| Antriebsregel-Methode: | Aluminium-Druckguß |
| Plattenteller: | Durchmesser 31,2 cm |

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

| | |
|----------------------------------|---|
| Drehzahl-Feinregulierung: | 10% Einstellbereich |
| Gleichlaufschwankungen: | 0,012% WRMS* 0,025% WRMS (JIS C5521) ± 0,035% Spitzwert (IEC 98A bewertet) |

* Gemessen anhand von Signalen vom eingebauten Frequenzgenerator des Motorbauteils.

| | |
|---|-----------------------------|
| Rumpel-Fremdspannungsabstand: | -56 dB (IEC 98A unbewertet) |
| Rumpel-Geräuschspannungsabstand: | -78 dB (IEC 98A bewertet) |

Tonarm

| | |
|------------------------------|--|
| Type: | Dynamisch ausbalancierter Tangential-Tonarm mit Kardan- aufhängung mit 4-Punkt-Drehlager |
| Effektive Länge: | 105 mm |
| Spurfehlwinkel: | Innerhalb ± 0,1° |
| Effektive Masse: | 9 g (einschließlich Tonabnehmer) |
| Resonanzfrequenz: | 12 Hz |
| Tonarm-Antriebsmotor: | Gleichstrommotor |

Tonabnehmer

| | |
|--------------------------------------|---|
| Type: | Stereo-Magnet-Tonabnehmer mit Einpunkt-Aufhängungssystem |
| Magnet: | Samarium-Kobalt (SM-Co) |
| Magnetkreis: | Ganzlamellenkern |
| Frequenzgang: | 10 Hz bis 35 kHz 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 45 500]) |
| Kanaltrennung: | Mehr als 22 dB bei 1 kHz |
| Kanalabweichung: | Innerhalb 1,8 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 g (nur Tonabnehmer) |
| Ersatznadel: | EPS-23CS (Gleichwertige Ersatznadel: EPS-23ES) |

Technics

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

SL-DL1

Français

CARACTERISTIQUES

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

■ Généralités

Alimentation: Alternatif 110-120/220-240V, 50/60 Hz
Consommation: 17 W
Dimensions: 43 x 8,8 x 35 cm
 (L x H x P)
 43 x 39,7 x 35 cm
 (Hauteur maximum lorsque le dessus (couvercle protégé-poussière) est ouvert.)
Poids: 7,1 kg

■ Platine de lecture

Type: Platine automatique
 Départ automatique/Entrée automatique
 Retour automatique
 Arrêt automatique
 Audition répétée
 Sélection de vitesse automatique
 Sélection de vitesses manuelle possible
 Sélection automatique du diamètre
 Fonctions exploratrices à 2 vitesses
 Détection de la présence d'un disque

■ Système d'entraînement:

Entraînement direct

■ Moteur:

Moteur C.C. sans balai

■ Groupe de réglage:

Servocommande du générateur de fréquence

■ Plateau de lecture:

Aluminium moulé sous pression
 Diamètre 31,2 cm

■ Vitesses de rotation:

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

■ Réglage d'écart:

Plage de réglage de 10%

■ Pleurage et scintillement:

0,012% de valeur efficace*
 0,025% de valeur efficace (JIS C5521)
 ± 0,035% de crête (IEC 98A Pondéré)

Ronflement: -56 dB (IEC 98A Non pondéré)
 -78 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. sans noyau

■ Cellule pick-up

Type: Cellule pick-up stéréo à aimant mobile
 Système de suspension ponctuelle
 Samarium-Cobalt (Sm-Co)
Aimant: Noyau entièrement feuilleté
Circuit magnétique: Noyau entièrement feuilleté
Réponse en fréquence: 10 Hz à 35 kHz
 20 Hz à 10 kHz ± 1 dB
Tension de sortie: 2,5 mV à 1 kHz; 5 cm/s., zéro à vitesse latérale de crête
 (7 mV à 1 kHz; 10 cm/s., zéro à vitesse 45° de crête [DIN 45 500])
Séparation des canaux: Plus de 22 dB à 1 kHz
Équilibrage des canaux: En deçà de 1,8 dB à 1 kHz
Impédance de charge recommandée: 47 kΩ ~ 100kΩ
Elasticité (dynamique): 12 x 10⁻⁶ cm/dyne à 100 Hz
Plage de la force verticale: 1,25 ± 0,25 g (12,5 ± 2,5 mN)
Poids: 6 g (cellule seule)
Remplacement de la pointe de lecture: EPS-23CS
 (Pointe de lecture de remplacement équivalente: EPS-23ES)

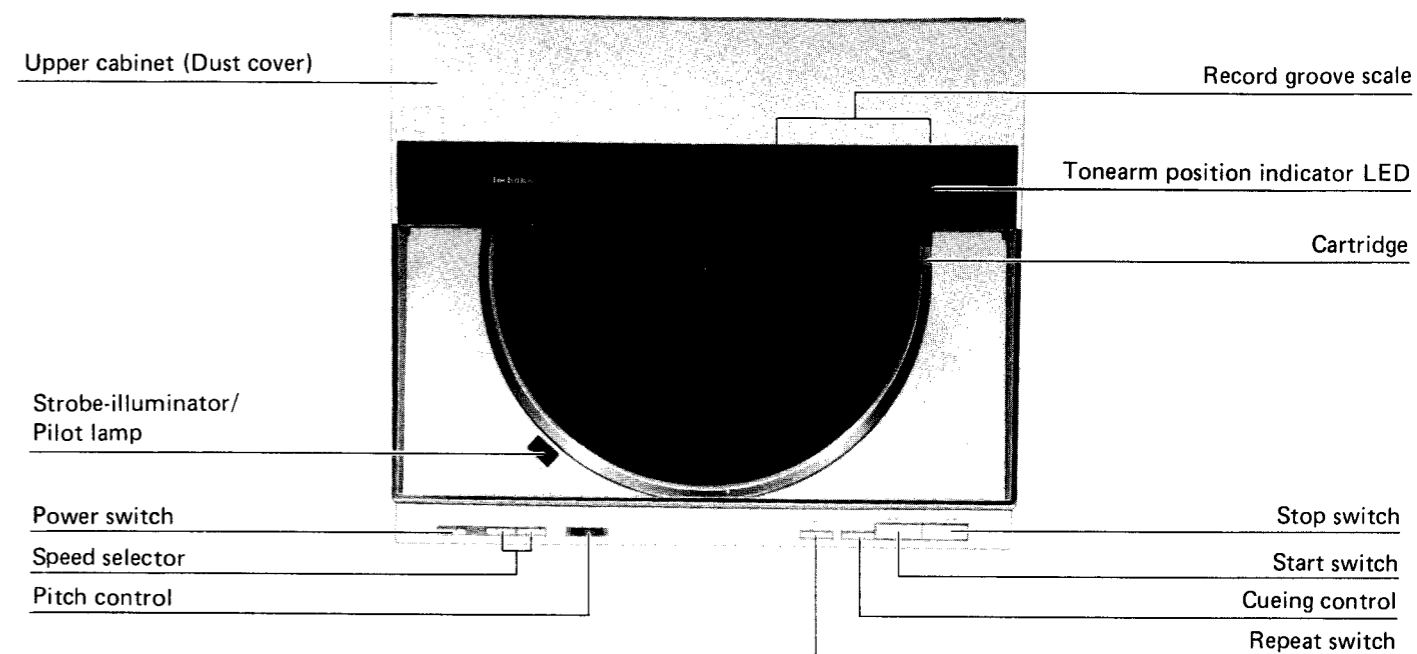
* Mesuré par l'obtention d'un signal provenant du générateur de fréquences incorporé de l'ensemble du moteur.

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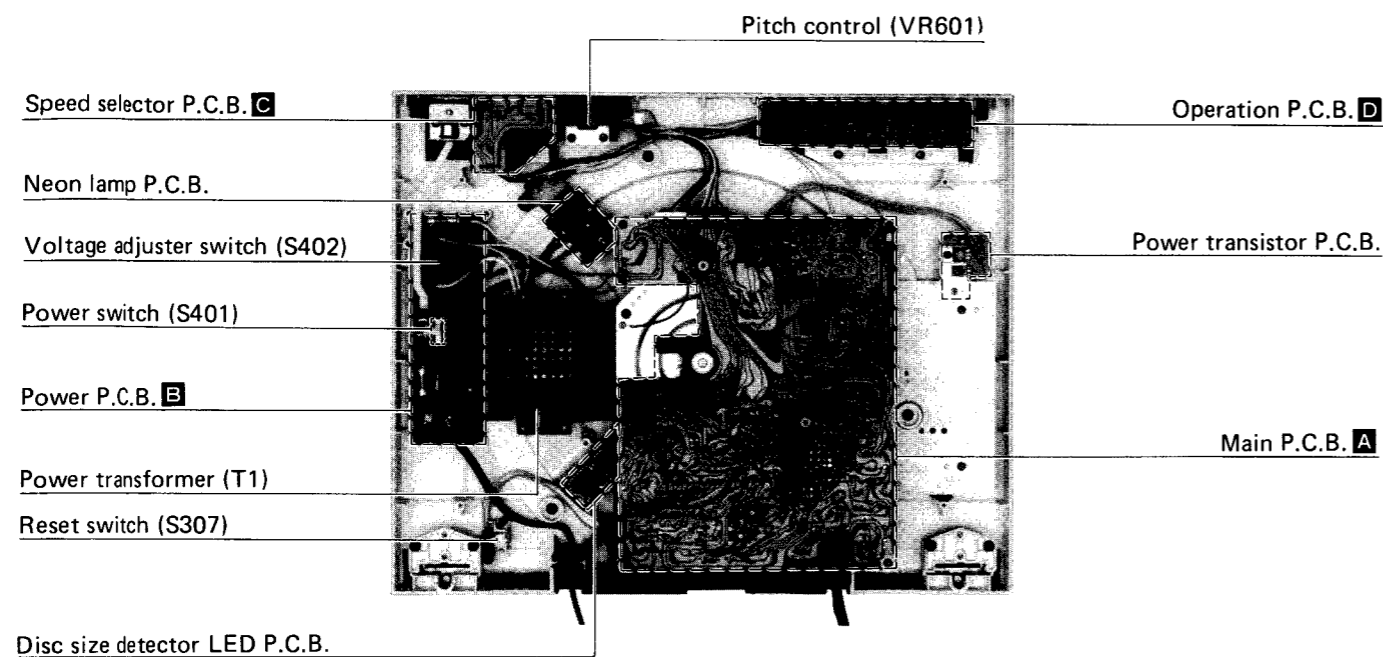
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■ LOCATION OF CONTROLS



SL-DL1 SL-DL1

■ FEATURES



Dynamic balanced linear tracking tonearm employs optical sensor and groove deflection angle detection for extremely stable and accurate tracking.

The linear tracking tonearm moves across the record surface in the same way as the cutter head used to make the record in the first place. Therefore there is virtually no tracking error or skating force.

Located by the stylus is an optical sensor that detects tracking conditions by means of groove deflection angle. Based on this information, tonearm movement is controlled to maintain optimum tracking at all times.

A precision DC motor is used for tonearm drive to assure quiet and accurate control.

A precision DC motor and low-friction slide bearing assure accurate tonearm movement.

A 4-point pivot bearing gimbal suspension developed by Technics reduces friction and raises sensitivity while contributing to smooth tracing ability.

Simple base operation. Completely automatic play.

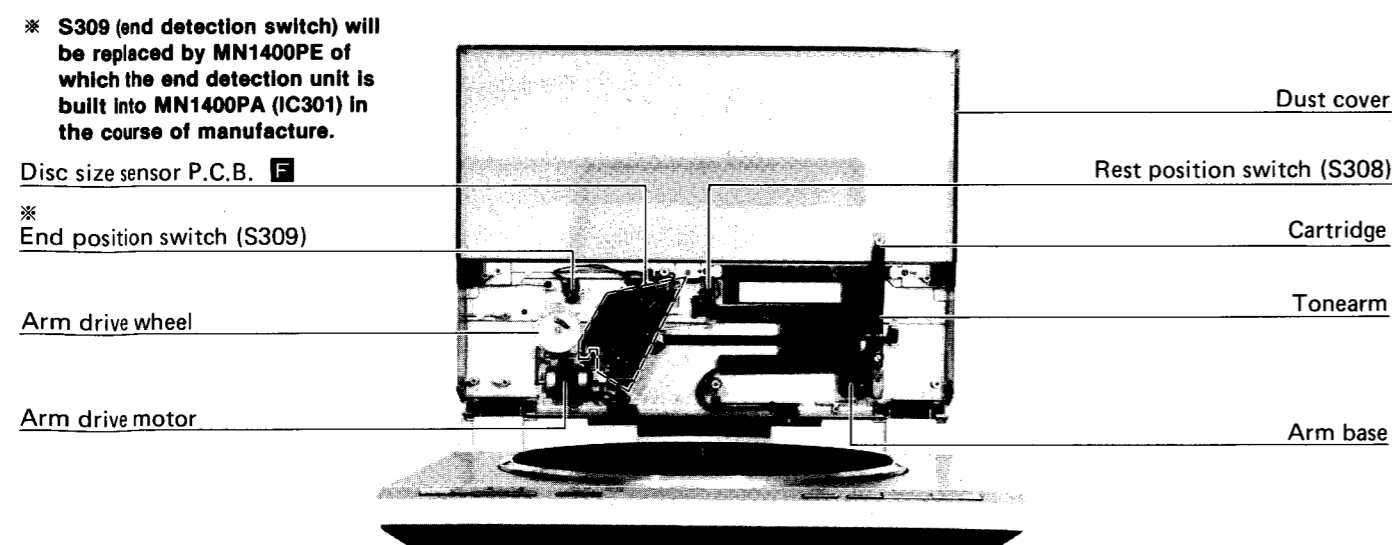
Turn on the power, put on a record, close the top and press the start switch. After that, everything is handled by the microcomputer and optical sensor which automatically detect record size, select correct speed and cue the tonearm to the lead-in groove.

For non-standard records, front panel speed selectors let you select the correct speed manually (large 45s, or small 33-1/3 records, for example).

The tonearm automatically returns to the start position after completing play. The tonearm does not move if no record is on the platter.

Complex operation also possible.

Although easy operation is a basic feature of this unit, complex functions are also possible. The "search" function allows start, stop switches controlled inward and outward movement of the tonearm at slow and fast speed, plus fine control in approximately 1 mm steps.



■ QUICK REFERENCE CHART FOR START AND STOP OPERATION

| Switch pressed | Start Switch | | | | Stop Switch | | | |
|--------------------|--|--------------------------------------|---------------------------------|---------------------------------|--|---------------------------------------|----------------------------------|---------------------------------|
| | Pressed momentarily (less than one second) | Pressed intermittently | Pressed continuously | | Pressed momentarily (less than one second) | Pressed intermittently | Pressed continuously | |
| | | | Lightly ◁ ◁ | Hard ◀ ◀ | | | Lightly ▶ ▷ | Hard ▶ ▶ |
| Cueing up/down | | | | | | | | |
| Cueing up (▼) | | Tonearm moves inward in small steps. | Tonearm moves inward. | Moves faster. | | Tonearm moves outward in small steps. | Tonearm moves outward. | Moves faster. |
| Cueing down (▲) | Tonearm rises and returns to start position and begins play again. | | Tonearm rises and moves inward. | Tonearm rises and moves faster. | Auto-return (reject) | | Tonearm rises and moves outward. | Tonearm rises and moves faster. |

SL-DL1

DISASSEMBLY INSTRUCTIONS

How to remove the bottom board and main P.C.B.

1. Remove the turntable and turntable seat.
2. Turn the main body upside down, using a soft sheet of cloth or the like as a cushion to protect the upper cabinet and dust cover.
3. Remove the insulator and bottom board setscrews ① ~ ⑪. Then the bottom board can be removed. (See Fig. 1)
4. Remove the rear cover setscrews ⑫ and ⑬ to remove the rear cover. (Fig. 2)
5. Remove the main P.C.B. setscrews ⑭ ~ ⑳ and connectors ㉒ ~ ㉗. Then the main P.C.B. can be removed. (See Fig. 3)

*When installing the main P.C.B. onto the main body, make sure that the connector ㉘ (CN102) is engaged with the stator frame pin. (Fig. 3)

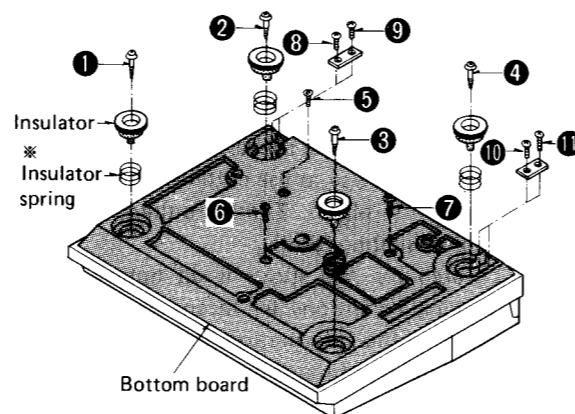


Fig. 1
*Please note that the front and rear insulator springs are different from each other.
FrontWhite
RearYellow

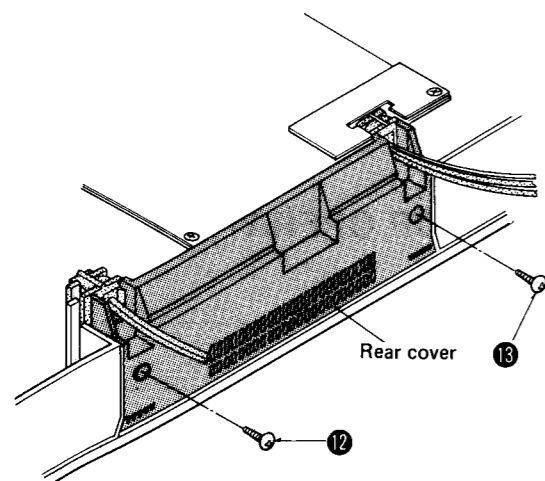


Fig. 2

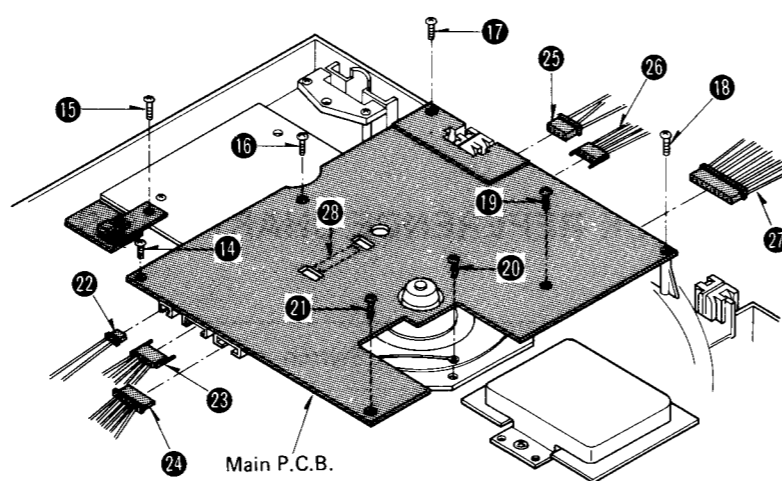


Fig. 3

How to remove the stator frame

1. Remove the main P.C.B. (Refer to "How to remove the bottom board and main P.C.B.")
2. Remove the stator frame setscrews ㉙ ~ ㉛. Then the stator frame can be removed. (Fig. 4)

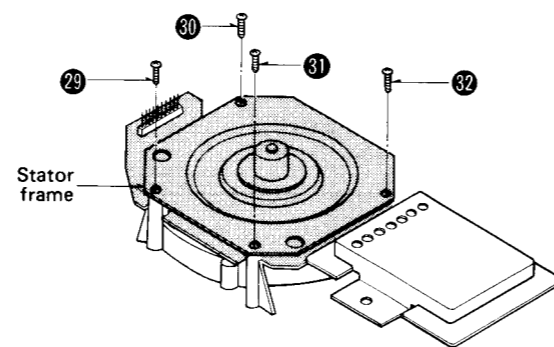


Fig. 4

How to remove the cartridge

1. Open the upper cabinet and turn the arm lock in the direction of the arrow to lock the tonearm.
2. Loosen the cartridge setscrew with the screwdriver. (Turn the set-screw until it is freed as shown in Fig. 5.)
3. Pull out the cartridge, taking care not to touch the stylus. (Fig. 6)
4. When mounting the cartridge, match the tonearm connector with the cartridge pin and completely insert the cartridge and tighten the setscrew. (Fig. 6)

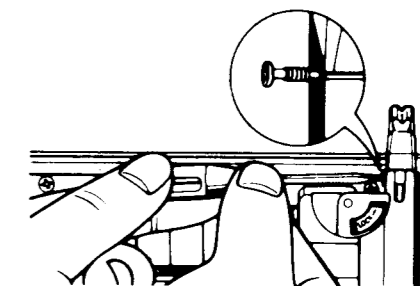


Fig. 5

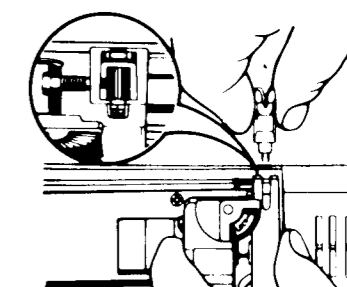


Fig. 6

How to remove the surface plate and dust cover

1. Remove the cartridge. (Refer to "How to remove the cartridge".)
2. Open the upper cabinet and push the scale part of the surface plate from inside. (Fig. 7)
* Carefully remove the surface plate since it is secured with double-sided tape.
3. Remove the dust cover setscrews ㉜ ~ ㉝. (Fig. 8)
4. Completely open the dust cover; remove the upper cabinet cover setscrews ㉞ ~ ㉟; and remove the upper cabinet cover while pulling the tonearm in the direction of the arrow. (Fig. 9)
5. Remove the dust cover setscrews ㊱ and ㊲.
Then the dust cover can be removed by pulling it in the direction of the arrow. (Fig. 10)

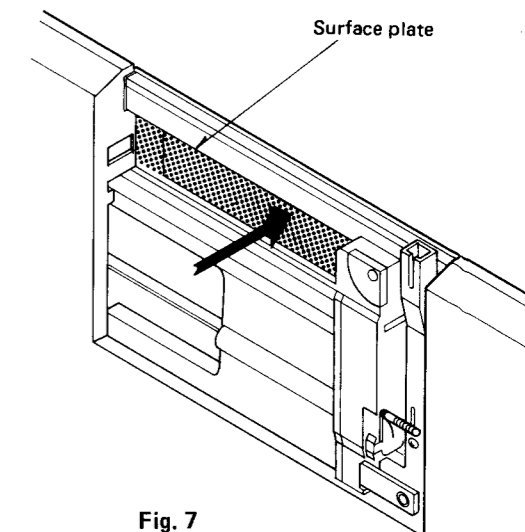


Fig. 7

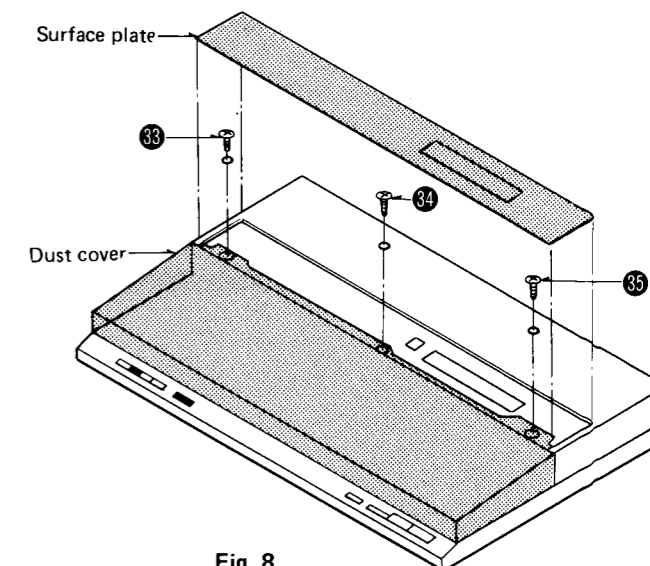


Fig. 8

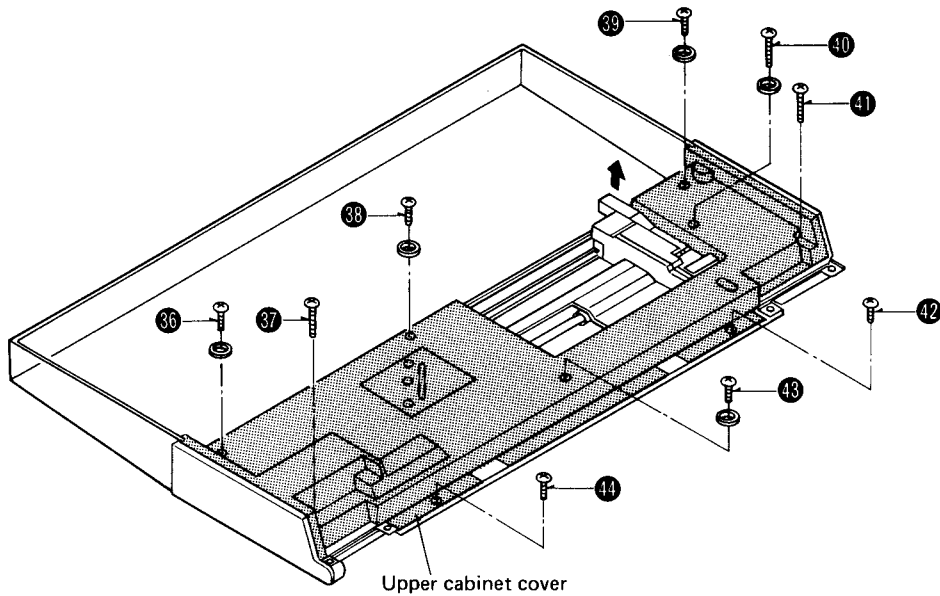


Fig. 9

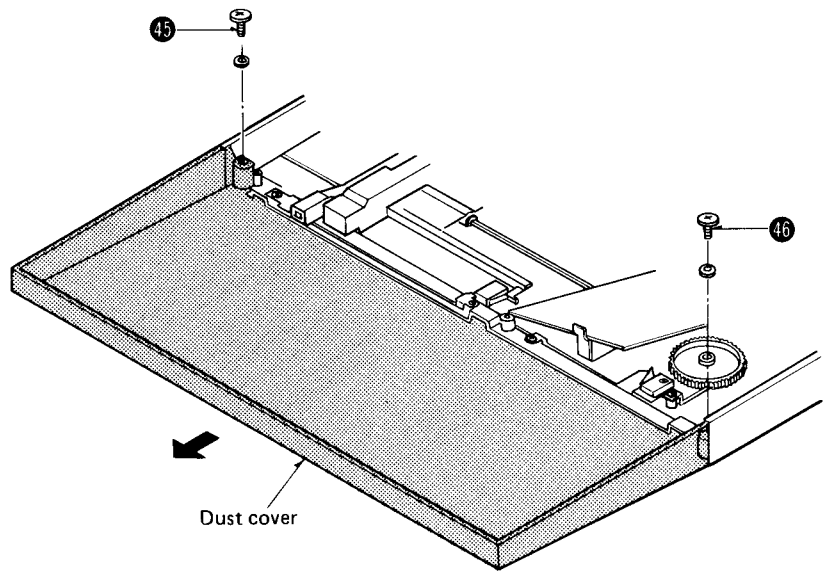


Fig. 10

● **How to remove the upper cabinet**

1. Remove the rear cover. (Refer to "How to remove the bottom board and main P.C.B.")
2. Remove the connectors 47 ~ 49. (Fig. 11)
3. Remove the hinge setscrews 50 ~ 53; open the upper cabinet and remove it by lifting. (Fig. 11)

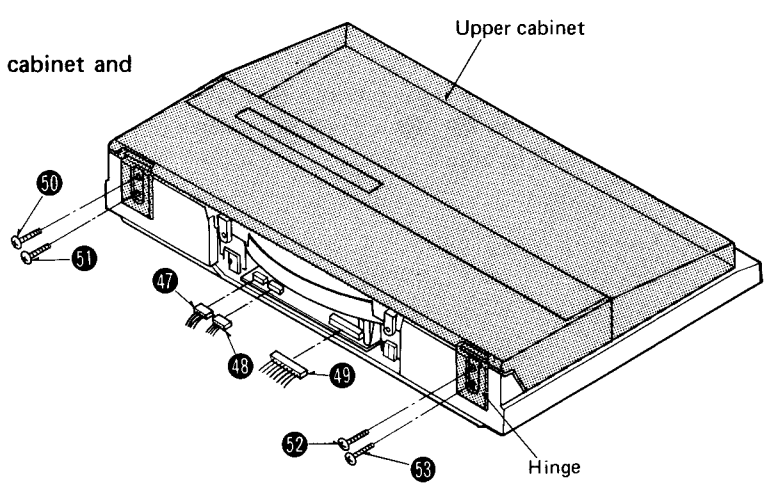


Fig. 11

SL-DL1

● How to remove the arm drive plate and disc size sensor P.C.B.

1. Remove the upper cabinet cover. (Refer to "How to remove the surface plate and dust cover.")
2. Remove the disc size sensor P.C.B. setscrew 54 and connectors 55, 56. (Fig. 12)
3. To remove the disc size sensor P.C.B. completely, remove the upper cabinet and the lead wire clamber setscrews 57 in Fig. 12. (Refer to "How to remove the upper cabinet.")
4. Remove the arm drive rope from the tonearm, and remove the arm drive plate setscrews 58 ~ 61. Then the arm drive board can be detached. (Fig. 12)

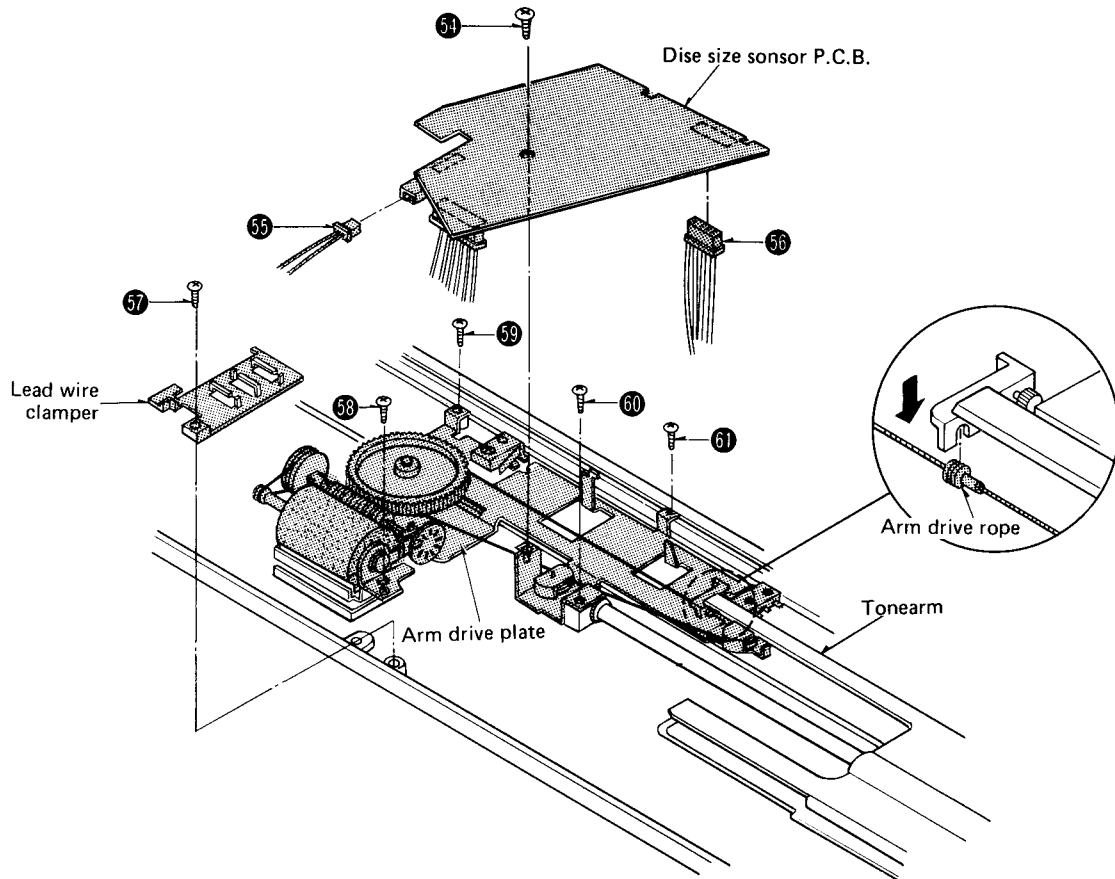


Fig. 12

● How to remove the tonearm

1. Remove the upper cabinet. (Refer to "How to remove the upper cabinet.")
2. Remove the arm drive plate. (Refer to "How to remove the arm drive plate and disc size sensor P.C.B.")
3. Remove the tonearm guide rail setscrew 62 and lead wire clamber setscrews 63, 64. Then the tonearm can be removed. (Fig. 13)

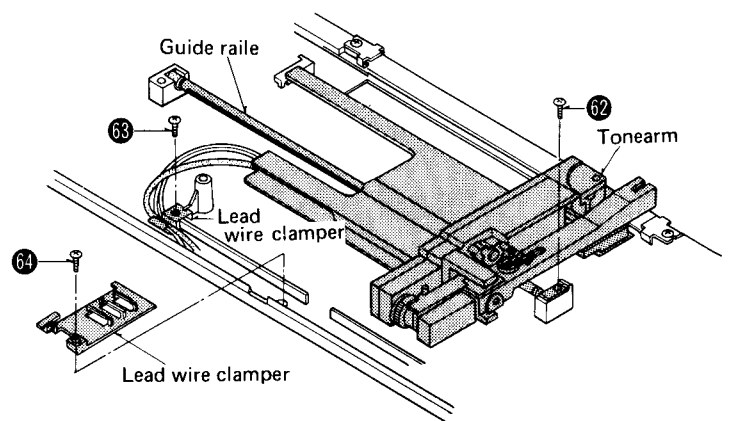


Fig. 13

■ HOW TO SET THE TONEARM DRIVE ROPE

If the rope is disengaged or when setting a new rope, follow the procedure below.

1. Remove the upper cabinet cover.
(Refer to "Disassembly instructions.")
2. Remove the E-ring **65** and washer **66** to remove the arm drive wheel. (Fig. 14)
3. Turn over the arm drive wheel, and set the rope according to the steps 1 ~ 3 in Fig. 15.
4. Holding the rope set over the arm drive wheel, set the drive wheel and rope according to the steps 4 ~ 5 in Fig. 16.
5. After setting the rope, rotate the worm gear by hand to adjust the tonearm and rope connector positions, and secure them.
6. Rotate the worm gear by hand to check that the tonearm moves smoothly.
7. Mount the E-ring **65** and washer **66**.

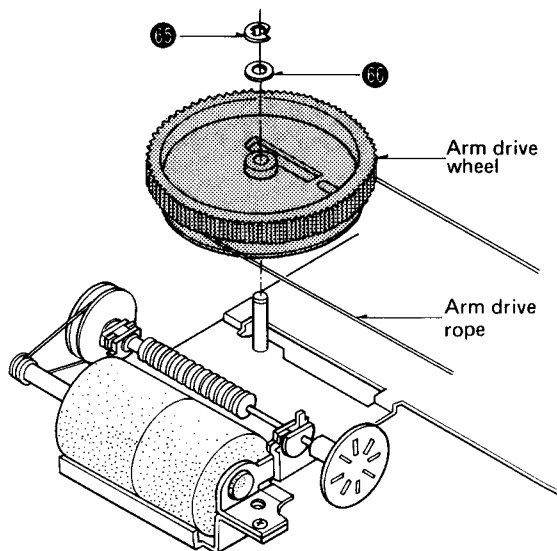


Fig. 14

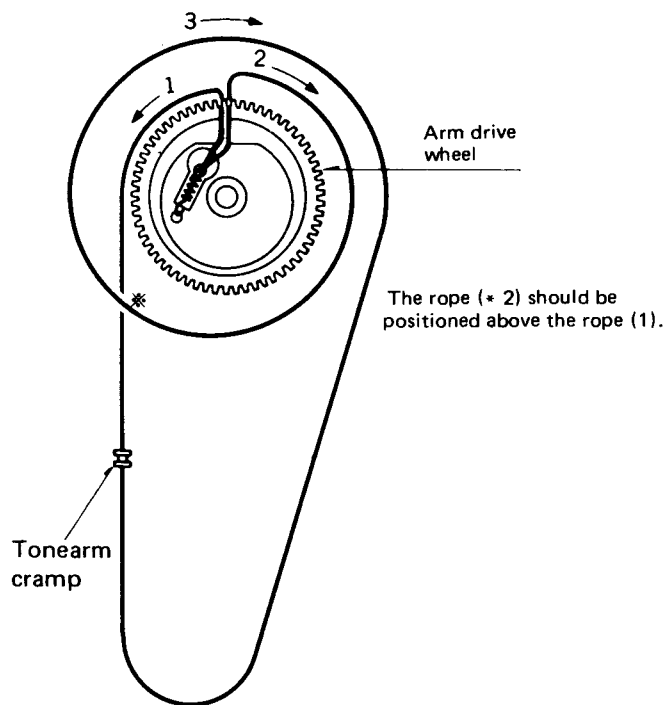


Fig. 15

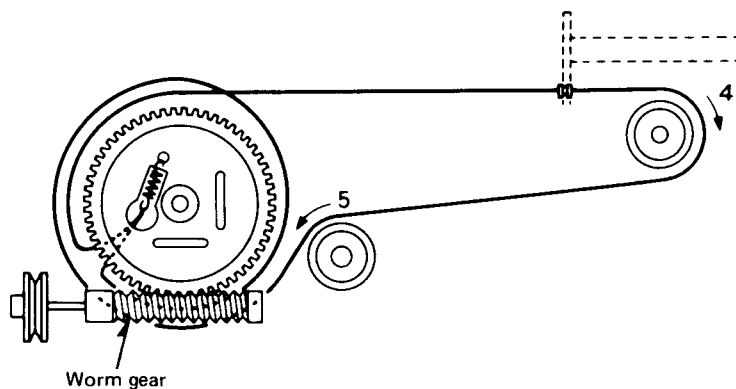


Fig. 16

■ REPLACEMENT OF HALL ELEMENT

When replacing the Hall element of the stator frame, be sure to place it with the marking side up as shown Fig. 17.

* The leg position is not specified provided that the marking side is up.

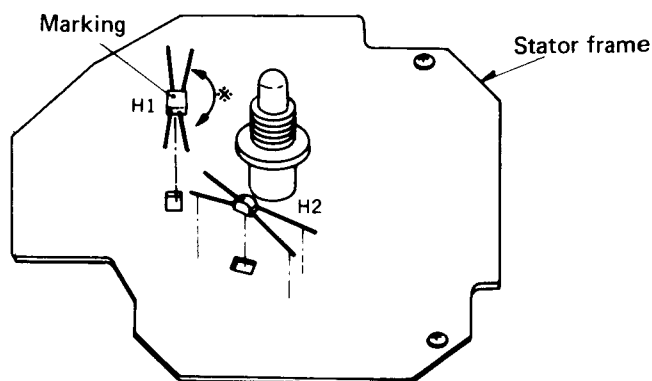


Fig. 17

SL-DL1

DESCRIPTION OF CONNECTOR

Two types of connectors are used for this unit: one is directly soldered to the printed circuit board, and the other is insertion type.

The insertion type is represented by "CN", while the direct soldering type is by "BT". (See Fig. 18)

Note: Soldered connectors (indicated by BT) cannot be pulled out.

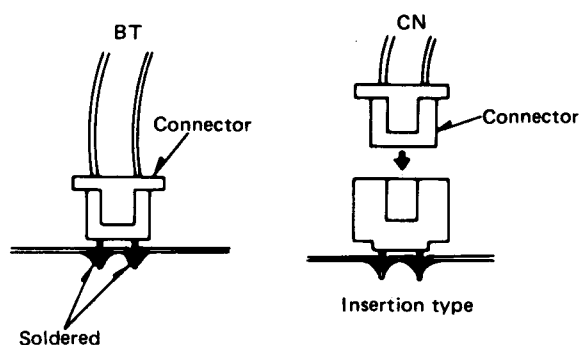


Fig. 18

MEASUREMENTS AND ADJUSTMENTS English

Adjustment of auto start

(Use a 30cm disc for this adjustment.)

1. Remove the surface plate. (Refer to "Disassembly instructions.")
2. Make sure that the tonearm is at the start position (the outermost periphery of turntable).
3. Insert the screwdriver into the adjusting hole. (Fig. 19)
 - * The start position is too much inside:
Turn the screwdriver counterclockwise.
 - * The start position is too much outside:
Turn the screwdriver clockwise.
4. If the start position is still deflected, turn the auto start position adjusting screw. (Fig. 19)
 - * The start position is too much inside:
Turn it clockwise.
 - * The start position is too much outside:
Turn it counterclockwise.
5. After the adjustment, be sure to lock the adjusting screw with bond.

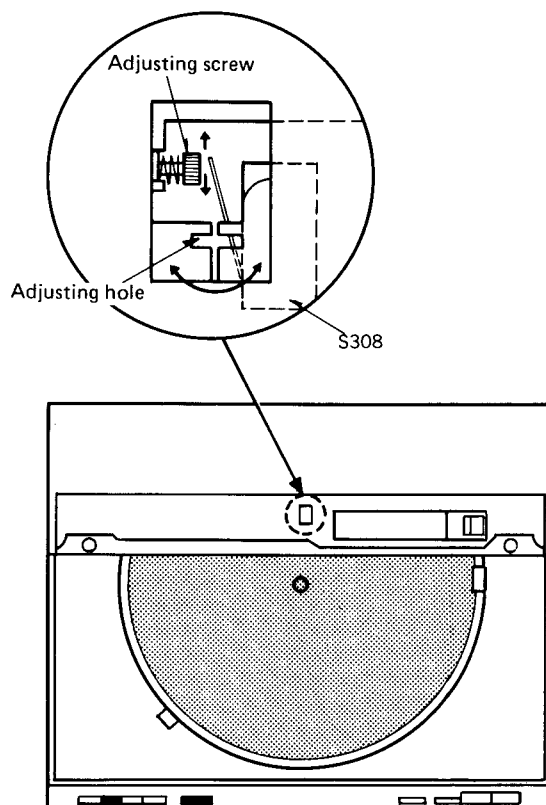


Fig. 19

Adjustment for the stylus pressure

Stylus pressure is normally set to 1.25 g but may be raised or lowered by ± 0.25 g. It may be necessary to increase stylus pressure when playing records cut at high levels, or when room temperature is low, or when the unit easily picks up external vibrations. This will help prevent distortion and groove-skipping. In such cases turn the screw clockwise (+) so the dial scale shows the desired stylus pressure, as indicated in the illustration. (Fig. 20)

Note: Do not turn the stylus-pressure adjustment screw further than the set limits (1.5 g ~ 1.0 g).

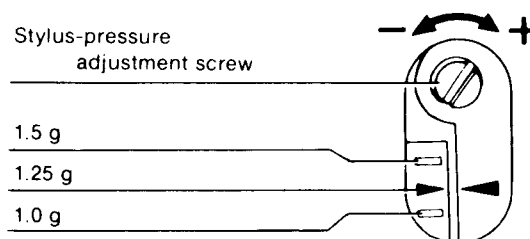


Fig. 20

SL-DL1

● **Offset adjustment of tonearm and servo gain**

After repair of the tonearm and arm drive circuit, make the adjustment according to the following procedure.

Tools and equipment used

1. DC electronic voltmeters (VTVM).
2. 1mm pitch record.
3. Flat head screwdriver (small).
4. Phiplips head screwdriver (small).
5. Hexagon wrench (M1.5).

Condition of the set

1. Remove the dust cover and surface plate. (Refer to "Disassembly instructions.")
2. Turn the reset switch (S307) "on" by pressing it with tape. (Fig. 21)
3. Remove the rear cover. (Refer to "Disassembly instructions.")
4. Completely open the upper cabinet and make sure that the tonearm operates when the start button is pressed.

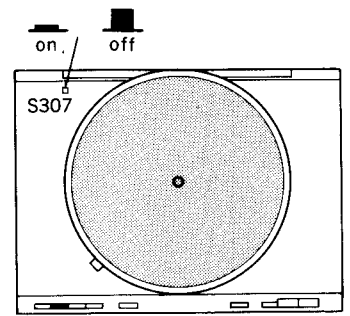
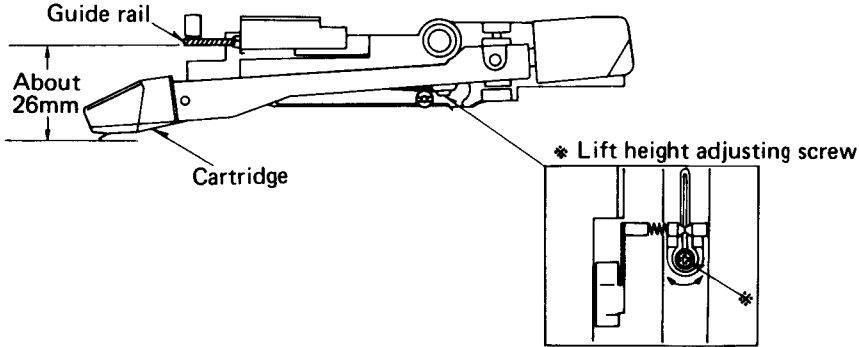
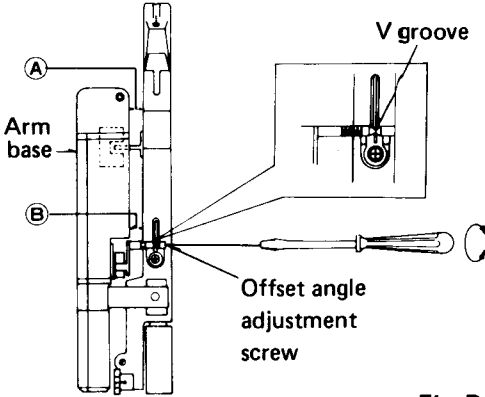


Fig. 21

Note: The tonearm does not operate with the turntable removed.

| Step | Item | Adjustment method |
|------|---|--|
| 1 | Adjustment of arm lift height (See Fig. A) | <p>① Turn the power switch "on" and move the tonearm towards the center of disc by pressing the start button.</p> <p>② Press the cueing button to check that the clearance between the cartridge stylus and the guide rail is about 26mm.</p> <p>③ If the clearance is incorrect, adjust the lift height by turning the adjusting screw with a flat head screwdriver.</p> <ul style="list-style-type: none"> - Turn clockwise when excessive (> 26mm). - Turn anticlockwise when insufficient (< 26mm). <p>Note: The lift height adjusting screws of the replacement tonearm is completely tightened up. So, loosen the adjusting screw before making the above adjustment.</p>  <p style="text-align: right;">Fig. A</p> |
| 2 | Offset angle adjustment of tonearm (See Fig. B) | <p>① Turn the power switch "on" and move the tonearm towards the center of disc by pressing the start button.</p> <p>② Make sure that the arm center is aligned with the V groove of the lift lever.</p> <p>③ Make sure that the arm base is in parallel with the arm. (Check the clearance between (A) and (B) in Fig. B.)</p> <p>④ If the arm base is not in parallel with the arm, adjust it by turning the offset angle adjusting screw.</p>  <p style="text-align: right;">Fig. B</p> |

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| Step | Item | Adjustment method |
|------|-----------------------------------|--|
| 3 | Adjustment of tonearm sensitivity | <ol style="list-style-type: none"> ① Turn the power switch "on" and move the tonearm towards the center of disc by pressing the start button. ② Press the cueing button and make sure that the arm is lowered. ③ Connect the DC VTVM to the connector pin. (See Fig. C, D) ④ Read the voltage values with the tonearm fully shifted to the right and left respectively. (See Fig. E, F) ⑤ Calculate the center voltage from the difference between the two voltage values. For example, when the voltage is 1.5V in Fig. E and 0.02V in Fig. F then $\frac{(1.5V - 0.02V)}{2} + 0.02V = 0.76V$ (middle point voltage) ⑥ Set the tonearm to the center position, and turn the adjusting screw of the arm base by a hexagon wrench until the center voltage is achieved. (See Fig. G) |
| 4 | Servo gain and offset adjustment | <ol style="list-style-type: none"> ① Put a recrod on the turntable. ② Open the dustcover 1 or 2 cm, turn the power switch "on" and lower the tonearm. (In this case, do not allow the stylus to touch the disc.) ③ Connect the DC VTVM to the connector pin. (See Fig. H) ④ Make sure that VR301 has been completely turned clockwise. ⑤ Turn VR302 until the DC VTVM indicates 0.72V: (Servo gain adjustment) ⑥ Put a 1 mm-pitch record on the turntable, close the dust cover, and play the record. ⑦ Turn VR301 until the DC VTVM indicates 0.6V. (Offset adjustment) |

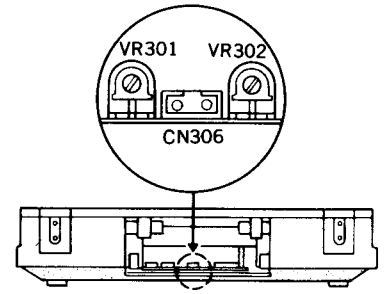


Fig. C

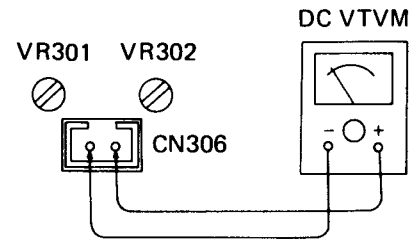


Fig. D

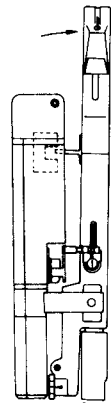


Fig. E

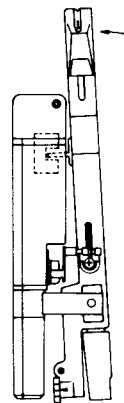


Fig. F

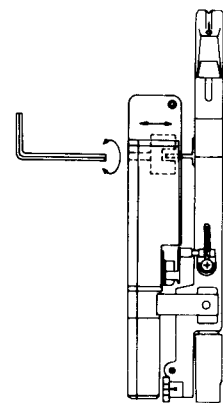


Fig. G

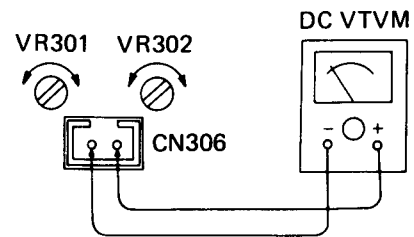


Fig. H

● Adjustment of rotational speed

After replacement of drive IC (IC101) and variable resistors (VR101, 102) or when the rated speed is not obtained by turning the pitch control knob, perform the adjustment according to the following procedure.

1. Remove the bottom plate. (Refer to "Disassembly Instructions".)
2. Place the set on the player repair table. (See Fig. 22.)
3. Put on the record and play. (Or, set the reset switch S307 to "on" and the record size selection knob to "30 cm"; rotate the turntable with the upper cabinet opened.)
4. Push the speed selector button to "45 r.p.m.".
5. Turn the pitch control knob to central position.
6. Adjust VR101 by the screwdriver from under the set until the rated speed (45 r.p.m.) is obtained while checking it through the stroboscope. (See Fig. 23.)
7. Push the speed selector button to "33 r.p.m.".
8. Adjust VR102 by the screwdriver until the rated speed (33-1/3 r.p.m.) is obtained while checking it through the stroboscope. (See Fig. 23.)
9. After completing the above-mentioned adjustment, check that the rated speeds can be obtained by pushing the speed selector button.

Note: Be sure to perform the adjustment of 45 r.p.m. first. As a simple method, it is also possible to adjust VR101 and VR102, removing the turntable. (See Fig. 24.)

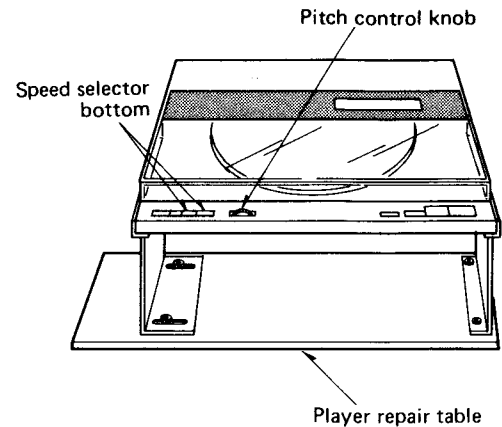


Fig. 22

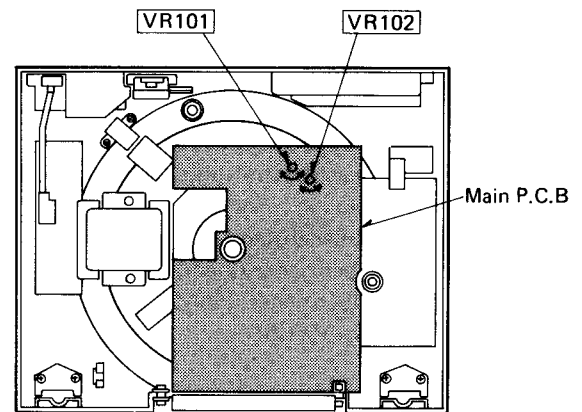


Fig. 23

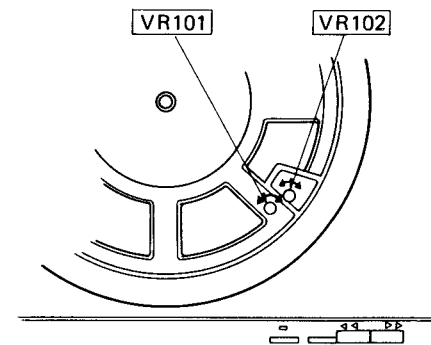


Fig. 24

■ MESSUNGEN UND JUSTIERUNGEN Deutsch

● Justierung der Auto-Start-Position

(Für diese Justierung ist eine 30cm-Platte zu verwenden.)

1. Die Deckplatte abnehmen. (Siehe "Entfernen der Deckplatte".)
2. Überprüfen, daß der Tonarm in der Start-Position ist (am Außenrand des Plattentellers).
3. Den Schraubenzieher in das Justierloch einführen. (Abb. 19)
 - * Die Start-Position ist zu weit innen: Den Schraubenzieher entgegen dem Uhrzeigersinn drehen.
 - * Die Start-Position ist zu weit außen: Den Schraubenzieher im Uhrzeigersinn drehen.
4. Wenn die Start-Position noch immer von der korrekten Position abweicht, die Auto-Start-Position-Justierschraube drehen. (Abb. 19)
 - * Die Start-Position ist zu weit innen: Im Uhrzeigersinn drehen.
 - * Die Start-Position ist zu weit außen: Entgegen dem Uhrzeigersinn drehen.
5. Nach erfolgter Justierung muß die Justierschraube mit Lack gesichert werden.

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● **Justieren Sie die Auflagekraft in den folgenden Fällen.**

Die normale Auflagekraft beträgt 1,25 g, doch kann sie um ± 0,25g gesenkt oder erhöht werden.

Es könnte notwendig sein, die Auflagekraft zu erhöhen, wenn Platten abgespielt werden, die bei hohem Pegel geschnitten wurden, wenn die Raumtemperatur tief ist, oder wenn der Plattenspieler externer Vibration ausgesetzt

ist. Dies hilft dabei, Verzerrung und Überspringen der Rillen zu vermeiden.

Drehen Sie die Schraube in einem solchen Fall im Uhrzeigersinn (+), bis die Skala die gewünschte Auflagekraft anzeigt, wie in der Skizze gezeigt. (Abb. 20)

Anmerkung:

Drehen Sie die Auflagekraft-Justierschraube nie weiter, als bis zu den Begrenzungen (1,5 g ~ 1,0 g).

● **Reibungswinkel-Justierung des Tonarms und der Servo-Verstärkung**

Nach der Reparatur des Tonarms und der Tonarm-Antriebschaltung, sind die folgenden Justierungen durchzuführen.

Benötigte Werkzeuge und Instrumente

1. Elektronisches Gleichstrom-Röhrenvoltmeter oder Prüfgerät.
2. Platte mit 1mm-Rillenabstand.
3. Flachkopf-Schraubenzieher (klein).
4. Kreuzkopf-Schraubenzieher (Philips) (klein).
5. Sechskant-Schlüssel (M1,5).

Zustand des Gerätes

1. Die Staubabdeckung und die Plattentellerauflage entfernen. (Siehe "Anleitung für die Zerlegung".)
2. Den Deckelschalter (S307) durch Drücken mit Band einschalten. (Abb. 21)
3. Die Gehäuserückseite entfernen. (Siehe "Anleitung für die Zerlegung".)
4. Das obere Gehäuse vollständig öffnen und überprüfen, daß der Tonarm funktioniert, wenn die Start-Taste gedrückt wird.

Anmerkung: Der Tonarm funktioniert bei ausgebautem Plattenteller nicht.

| Schritt | Einstell-Gegenstand | Justiermethode |
|---------|---|--|
| 1 | Justierung der Tonarm-Lifthöhe (Siehe Abb. A) | <ol style="list-style-type: none"> ① Den Netzschalter einschalten und den Tonarm durch Drücken der Start-Taste gegen die Plattenmitte bewegen. ② Die Lifftaste drücken und überprüfen, daß der Abstand zwischen der Tonabnehmer-Nadelspitze und der Führungsschiene ca. 26mm beträgt. ③ Falls der Abstand nicht korrekt ist, die Lifthöhe durch Drehen der Justierschraube mit einem Flachkopf-Schraubenzieher justieren. – Bei zu großem Abstand: im Uhrzeigersinn drehen (> 26mm). – Bei zu kleinem Abstand: entgegen dem Uhrzeigersinn drehen (< 26mm). Anmerkung: Die Lifthöhe-Justierschraube des Ersatztonarms ist vollständig angezogen. Die Justierschraube ist daher vor dem Durchführen obiger Justierung zu lösen. |
| 2 | Reibungswinkel-Justierung des Tonarms (Siehe Abb. B) | <ol style="list-style-type: none"> ① Den Netzschalter einschalten und den Tonarm durch Drücken der Start-Taste gegen die Plattenmitte bewegen. ② Überprüfen, daß die Tonarmmitte mit der V-Kerbe der Lifftachse übereinstimmt. ③ Überprüfen, daß der Tonarm parallel zum Tonarmträger ist. (Den Abstand zwischen (A) und (B) in Abb. B überprüfen.) ④ Falls der Tonarmträger nicht parallel zum Tonarm ist, durch Drehen der Reibungswinkel-Justierschraube justieren. |

| Schritt | Einstell-Gegenstand | Justiermethode |
|---------|--|---|
| 3 | Justierung der Tonarm-Empfindlichkeit | <ol style="list-style-type: none"> ① Den Netzschalter einschalten und den Tonarm durch Drücken der Start-Taste gegen die Plattenmitte bewegen. ② Die Lifttaste drücken und überprüfen, daß der Tonarm abgesenkt wird. ③ Das Gleichstrom-Röhrenvoltmeter an die Anschlußstifte anschließen. (Siehe Abb. C und D) ④ Die Spannungswerte bei ganz nach rechts und dann nach links gestelltem Tonarm ablesen. (Siehe Abb. E und F) ⑤ Vom Unterschied zwischen den beiden Spannungswerten die Mittelspannung berechnen. Zum Beispiel, wenn die Spannung in Abb. E 1,5V, und in Abb. F 0,02V beträgt: $\frac{(1,5V - 0,02V)}{2} + 0,02V = 0,76V$ <p style="text-align: center;">(Mittelpunkt-Spannung)</p> ⑥ Den Tonarm in die Mittelposition stellen, und die Justierschraube der Armbasis mit dem Sechskantschlüssel drehen, bis die Mittelspannung erreicht wird. (Siehe Abb. G) |
| 4 | Servo-Verstärkungs- und Reibungswinkel-Justierung | <ol style="list-style-type: none"> ① Eine Platte auf den Plattenteller legen. ② Die Staubabdeckung 1 oder 2 cm öffnen, den Netzschalter einschalten und den Tonarm absenken. (In diesem Fall darauf achten, daß die Abtastnadel die Platte nicht berührt.) ③ Das Gleichstrom-Röhrenvoltmeter an die Steckerstifte anschließen. ④ Überprüfen, daß VR301 bis zum Anschlag im Uhrzeigersinn gedreht worden ist. ⑤ VR302 drehen, bis das Gleichstrom-Röhrenvoltmeter, 0,72V anzeigt. (Servo-Verstärkungs-Justierung) ⑥ Die Platte mit 1mm-Rillenabstand auf den Plattenteller auflegen, die Staubabdeckung schließen, und die Platte abspielen. ⑦ VR301 drehen, bis das Gleichstrom-Röhrenvoltmeter 0,6V anzeigt. (Reibungswinkel-Justierung) |

• Justierung der Drehzahl

Nach dem Auswechseln des Antriebs-IC (IC101) und die Drehwiderstände (VR101, 102), oder wenn die Nenndrehzahl durch Drehen des Drehzahl-Feineinstellers nicht erreicht werden kann, sind die folgenden Justierungen durchzuführen.

1. Die Bodenplatte abnehmen. **(Siehe "Ausbauen".)**
2. Die Gerät auf den Plattenspieler-Reparaturtisch stellen. **(Siehe Abb. 22)**
3. Eine Platte auflegen und abspielen. (Oder den Rückstellschalter S307 auf "on" und den Plattengröße-Wahlschalter auf "30 cm" stellen; der Plattenteller kann sich dadurch bei geöffnetem Gehäuseoberteil drehen.)
4. Den Drehzahl-Wahlschalter auf "45 U/min" einstellen.
5. Den Drehzahl-Feineinsteller in die Mitte stellen.

6. VR101 von der Unterseite her mit einem Schraubenzieher justieren, bis die Nenndrehzahl (45 U/min) anhand des Stroboskops festgestellt wird. **(Siehe Abb. 23)**

7. Die Drehzahl-Wahlschaltertaste auf "33 U/min" drücken.

8. VR102 mit dem Schraubenzieher justieren, bis die Nenndrehzahl anhand des Stroboskops festgestellt wird. **(Siehe Abb. 23)**

9. Nach dem Durchführen der obigen Justierungen überprüfen, daß die Nenndrehzahlen durch Drücken der Drehzahl-Wahlschaltertaste erreicht werden.

Anmerkung: Die Justierung für 45 U/min muß unbedingt zuerst durchgeführt werden.

Eine einfache mögliche Justiermethode besteht darin, VR101 und VR102 nach Abnehmen des Plattentellers zu justieren. **(Siehe Abb. 24)**

SL-DL1**MESURAGES ET MISES AU POINT Français**

- **Mise au point du démarrage automatique**

(Utiliser un disque de 30 cm pour cette mise au point.)

1. Enlever la plaque ornementale. (Se référer aux "Instructions pour le Démontage".)
2. S'assurer que le bras de lecture est sur la position de démarrage (la périphérie la plus à l'extérieure de la platine).
3. Insérer le tournevis dans le trou de réglage. (Fig. 19)
 - * La position de démarrage est trop à l'intérieur: Tourner le tournevis dans le sens inverse des aiguilles d'une montre.
 - * La position de démarrage est trop à l'extérieur: Tourner le tournevis dans le sens des aiguilles d'une montre.

- **Mettre au point la force verticale d'appui de la pointe de lecture dans les cas suivants.**

La force verticale d'appui de la pointe de lecture est normalement réglée sur 1,25 g, mais elle peut être augmentée ou diminuée de $\pm 0,25$ g.

Il pourra être nécessaire d'augmenter la force verticale d'appui de la pointe lorsqu'on joue des disques enregistrés à des niveaux élevés, ou lorsque la température de la pièce est basse, ou encore lorsque l'appareil capte facilement des vibrations extérieures.

- **Mise au point du décalage du bras de lecture et de l'amplification servo-mécanique**

Après la révision du bras de lecture et du circuit d'entraînement du bras, effectuer la mise au point suivante selon la procédure ci-dessous.

Outils et équipement à utiliser:

1. Vérificateur ou voltmètre électronique (VTVM) à C.C.
2. Disque à écarts de 1 mm.
3. Tournevis à tête plate (petit).
4. Tournevis à tête Philips (petit).
5. Clef hexagonale (M1,5).

4. Si la position de démarrage est encore déviée, tourner la vis de mise au point du démarrage automatique. (Fig. 19)

* La position de démarrage est trop à l'intérieur: La tourner dans le sens des aiguilles d'une montre.

* La position de démarrage est trop à l'extérieur: La tourner dans le sens inverse des aiguilles d'une montre.

5. Après la mise au point, s'assurer de bloquer la vis de mise au point avec un adhésif.

Cela aidera à empêcher une distorsion et un sautillerment des sillons. En pareils cas, tourner la vis de réglage dans le sens des aiguilles d'une montre (+), de façon à ce que la graduation du cadran indique la force verticale d'appui désirée de la pointe de lecture, comme il est montré sur l'illustration. (Voir Fig. 20)

Nota:

Ne pas tourner la vis de réglage de la force verticale d'appui de la pointe de lecture plus que les limites de réglage admissibles (1,5 ~ 1,0 g).

Conditions du réglage:

1. Retirer le couvercle protège-poussière et la plaque de surface. (Se référer aux "Instructions pour le Démontage".)
2. Mettre "en marche" le commutateur (S307) du couvercle en appuyant dessus avec un ruban. (Fig. 21)
3. Retirer le capot arrière. (Se référer aux "Instructions pour le Démontage".)
4. Ouvrir complètement le boîtier supérieur et s'assurer que le bras de lecture fonctionne lorsqu'on appuie sur la touche de démarrage.

Nota: Le bras de lecture ne fonctionne pas lorsque la platine est retirée.

| Etape | Article | Méthode de réglage |
|-------|--|---|
| 1 | Mise au point de la hauteur d'élévation du bras (Voir Fig. A) | <ol style="list-style-type: none"> ① Mettre "en marche" l'interrupteur d'alimentation et déplacer le bras de lecture vers le centre du disque en appuyant sur la touche de démarrage. ② Appuyer sur la touche de pose/relevage pour vérifier si l'intervalle entre la pointe de lecture de la cellule pick-up et le rail de guidage est d'à peu près 26 mm. ③ Si l'intervalle n'est pas suffisant, ajuster la hauteur d'élévation en tournant la vis de réglage avec un tournevis à tête plate. <ul style="list-style-type: none"> – Tourner dans le sens des aiguilles d'une montre si l'intervalle est excessif (> 26 mm). – Tourner dans le sens inverse des aiguilles d'une montre si l'intervalle est insuffisant (< 26 mm). <p>Nota: La vis de réglage de la hauteur d'élévation du bras de lecture de rechange est serrée à fond. Aussi, la desserrer avant d'effectuer la mise au point ci-dessus.</p> |
| 2 | Mise au point de l'angle de décalage du bras de lecture (Voir Fig. B) | <ol style="list-style-type: none"> ① Mettre "en marche" l'interrupteur d'alimentation et déplacer le bras de lecture vers le centre du disque en appuyant sur la touche de démarrage. ② S'assurer que le centre du bras soit aligné avec l'encoche en V du levier d'élévation. ③ S'assurer que le socle du bras soit parallèle au bras. (Vérifier l'intervalle entre (A) et (B) dans la Fig. B) ④ Si le socle du bras n'est pas parallèle au bras, l'ajuster en tournant la vis de réglage de l'angle de décalage. |
| 3 | Mise au point de la sensibilité du bras de lecture | <ol style="list-style-type: none"> ① Mettre "en marche" l'interrupteur d'alimentation et déplacer le bras de lecture vers le centre du disque en appuyant sur la touche de démarrage. ② Appuyer sur la touche de pose/relevage et s'assurer que le bras soit abaissé. ③ Brancher le voltmètre électronique à C.C. à la broche du connecteur. (Voir les Figs. C et D) ④ Observer les valeurs de tension avec le bras de lecture complètement orienté respectivement vers la droite et la gauche. (Voir les Figs. E et F) ⑤ Calculer la tension moyenne à partir de la différence entre les deux valeurs de tension. Par exemple, lorsque la tension est de 1,5V dans la Fig. E et de 0,02V dans la Fig. F, alors: $\frac{(1,5V - 0,02V)}{2} + 0,02V = 0,76V$ (tension du point intermédiaire) ⑥ Placer le bras de lecture sur la position du centre, et tourner la vis de réglage du socle du bras avec une clef hexagonale jusqu'à ce que la tension médiane soit obtenue. (Voir Fig. G) |
| 4 | Mise au point du décalage et de l'amplification servomécanique | <ol style="list-style-type: none"> ① Placer un disque sur la platine. ② Ouvrir le couvercle protège-poussière de 1 à 2 cm, mettre "en marche" l'interrupteur d'alimentation et abaisser le bras de lecture. (Dans ce cas, ne pas laisser la pointe de lecture toucher le disque.) ③ Brancher le voltmètre électronique à C.C. à la broche du connecteur. ④ S'assurer que VR301 à été entièrement tourné dans le sens des aiguilles d'une montre. ⑤ Tourner VR302 jusqu'à ce que le voltmètre électronique à C.C. indique 0,72V. (Mise au point de l'amplification servo-mécanique.) ⑥ Placer un disque à écarts de 1 mm sur la platine, refermer le couvercle protège-poussière et faire jouer le disque. ⑦ Tourner VR301 jusqu'à ce que le voltmètre électronique à C.C. indique 0,6V. (Mise au point du décalage.) |

SL-DL1

● Réglage de la vitesse rotationnelle

Après la remise en place du circuit intégré de commande (IC101) et des résistances variables (VR101, 102) ou lorsque la vitesse nominale de rotation n'est pas obtenue en tournant le bouton de réglage d'écart, exécuter la mise au point selon le mode opératoire suivant.

1. Retirer le plateau inférieur. (Se référer à "Comment démonter".)
2. Placer l'appareil sur la table de réparation pour électrophone. (Voir Fig. 22)
3. Placer dessus un disque et le faire jouer. (Ou, placer l'interrupteur de réenclenchement S307 sur "on" et la manette de sélection du diamètre de disque sur "30 cm"; faire tourner la platine en laissant le boîtier supérieur ouvert.)
4. Appuyer le bouton-commutateur de vitesse sur "45 r.p.m" (45 t/p.m.).
5. Tourner le bouton de réglage d'écart sur la position centrale.

6. Régler VR101 avec un tournevis à partir du dessous de l'appareil jusqu'à ce que la vitesse nominale de rotation (45 t/p.m) soit obtenue, tout en la vérifiant par l'intermédiaire du stroboscope. (Voir la Fig. 23)
7. Appuyer le bouton-commutateur de vitesse sur "33 r.p.m" (35 t/p.m.).
8. Régler VR102 avec un tournevis jusqu'à ce que la vitesse nominale de rotation (33 1/3 t/p.m.) soit obtenue, tout en la vérifiant par l'intermédiaire du stroboscope. (Voir la Fig. 23)
9. Après l'achèvement de la mise au point mentionnée cidessus, vérifier que les vitesses nominales de rotations peuvent être obtenues en appuyant sur la bouton-commutateur de vitesse.

Nota: S'assurer d'effectuer tout d'abord la mise au point pour 45 t/p.m.

Comme méthode plus simplifiée, il est possible aussi de régler VR101 et VR102, en retirant la platine. (Voir la Fig. 24)

■ REPLACEMENT PARTS LIST...Cabinet & Chassis 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 **Δ** make have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
 3. **Ⓚ**-marked parts are used for black type only, while **○**-marked parts are for silver type only.

4. Parts other than **Ⓚ** and **○**-marked are used for both black and silver types.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Black type model No. : SL-DL1 (K)

| Ref. No. | Part No. | Part Name & Description |
|-------------------------------|-------------------|----------------------------------|
| MAIN CABINET PARTS | | |
| 1 | SFTGQ11N01 | Turntable Mat |
| 2 | SFTED11N01A | Turntable |
| 3 | ○ SFACD11N01 | Cabinet |
| 3 | Ⓚ SFACD11N21 | Cabinet (Black) |
| 4 | SFUMQ11N11 | Cover, Rear |
| 5 | SFAZD11N01 | Supporter, Hinge |
| 6 | SFUMQ11N01E | Knob Ass'y Start & Stop |
| 7 | SFUMD11N02 | Cover, Indication Start & Stop |
| 8 | SFUMQ11N03 | Guide, 33/45 Selector |
| 9 | SFUMD11N03 | Cover, Indication 33/45 Selector |
| 10 | SFKTQ11N03 | Knob, 33/45 Selector |
| 11 | SFKTQ11N04 | Knob, Power |
| 12 | SFUMQ11N06 | Shaft, Power Switch |
| 13 | SFUPQ11N04 | Guide, Power Switch |
| 14 | SFGZD11N01 | Spacer, L.E.D |
| 15 | SFDJQ11N02E | Connector Ass'y (6P) |
| 16 | SFUMC07-08 | Holder, L.E.D |
| 17 | SFDJC07-05E | Connector Ass'y |
| 18 | SFUMD11N04 | Panel, Strove |
| 19 | SFUMD11N05E | Strove Cover Ass'y |
| 20 | SFUMD11N01 | Guide, Speed Adjustment |
| 21 | SFKTD11N01 | Knob, Speed Adjustment |
| 22 | SFDJQ11N05E | Connector Ass'y (3P) |
| 23 [E] | SFNND11S01 | Name Plate |
| 23 [EK, XL] | SFNND11G02 | Name Plate |
| 23 [EG, EB, EF, EH, EI] | SFNND11R01 | Name Plate |
| 23 [XA, XM] | SFNND11X01 | Name Plate |
| 24 [E, EH, EG, XM] EB, EF, XA | Δ SJA88 | AC Cord |
| 24 [EK] only | Δ QFC1205M | AC Cord |
| 24 [XL] only | Δ QFC1208M | AC Cord |
| 25 | SFUM190-11 | Bushing, AC Cord |
| 25 [XL] only | SFUM190-12 | Bushing, AC Cord |

| Ref. No. | Part No. | Part Name & Description |
|----------------------------|--------------|---------------------------------|
| 26 | SFDHC07-01A | Phono Cord |
| 27 | SFUM190-11 | Bushing, Phono Cord |
| 28 | SFMZD11N01Z | Stator Frame Ass'y |
| 29 | SFUZQ11N03 | Shield Plate |
| 30 | SFUMQ11N05 | Shaft, Connection |
| 31 | SFDSTWM9901A | Power Switche Supporter |
| 32 | SFGCQ11N04 | Rubber, Power Transformer |
| 33 | SFUPQ11N09 | Cover, Power Transformer |
| 34 | SFAUQ11N01E | Bottom Board |
| 35 | SFUPD11N03 | Plate, Hinge |
| 36 | SFQCC07-01 | Spring, Audio Insulator (Front) |
| 37 | SFQCC11N01 | Spring, Audio Insulator (Rear) |
| 38 | SFGAD11N01E | Audio Insulator |
| 39 | SFUZD11N01 | Sheet, Knob Guide |
| 40 | SFDJD11N03E | Connector Ass'y (6P) |
| 41 | SFDJD11N02E | Connector Ass'y (3P) |
| 42 | SFDJQ11N01E | Connector Ass'y (8P) |
| 43 | SFDJD11N01E | Connector Ass'y (2P) |
| 44 | SFNHD11X01 | Lable |
| 45 | SFGZD11N02 | Spacer, L.E.D |
| 46 | SFUZD11N02 | Spacer, Strove Panel |
| 47 | SFDBC07-01 | Bushing, Transistor |
| UPPER CABINET PARTS | | |
| 50 | SFUMQ11N12 | Upper Cabinet Cover |
| 51 | SFNZC07-02 | Lable Disc Size Selector |
| 52 | SFUPQ11N08 | Guide, Upper Cabinet Cover |
| 53 | SFUMC07-16 | Shutter |
| 54 | SFGCQ11N01 | Cushion, Guide Rail |
| 55 | SFXJQ11N01 | Guide Rail, Tonearm |
| 56 | SFUPC07-04 | Supporter, Guide Rail |
| 57 | SFUPQ11N03 | Guide Rail, Upper Cabinet |
| 58 | SFUPQ11N05 | Supporter, Guide Rail |
| 59 | SFGCQ11N02 | Cushion, Guide Rail |
| 60 | ○ SFACQ11N02 | Upper Cabinet (Silver) |
| 60 | Ⓚ SFACQ11N04 | Upper Cabinet (Black) |

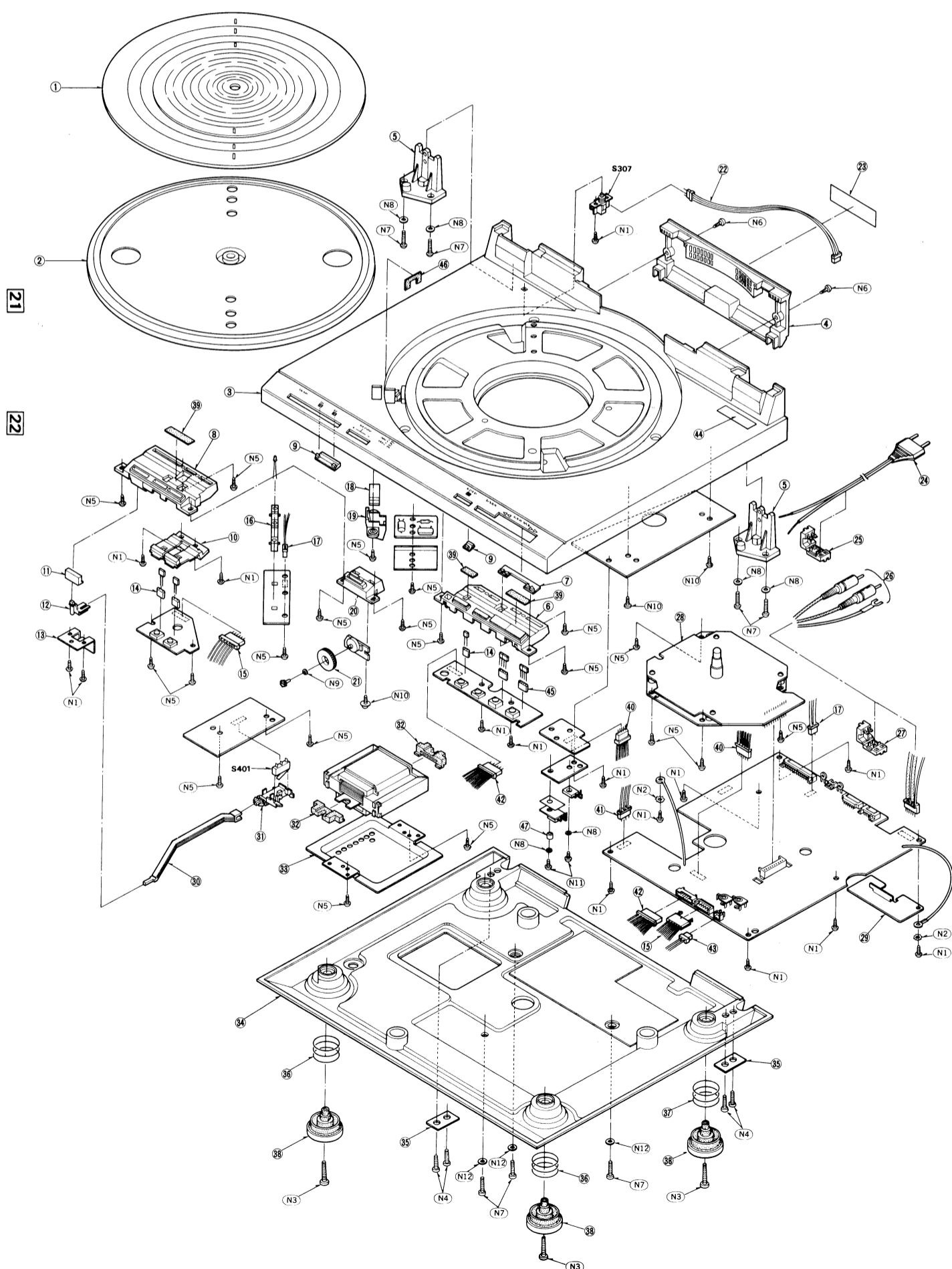
| Ref. No. | Part No. | Part Name & Description |
|----------------------|-------------|-------------------------------|
| 61 | SFADD11N01E | Dust Cover |
| 62 | SFUMC07-09 | Guide, Lead Wire |
| 63 | SFKKD11N01 | Surface Plate |
| 64 | SFATQ11N02A | Hing |
| 65 | SFUPC07-01E | Arm Drive Plate |
| 66 | SFUPC07-07 | Clamper, Lead Wire |
| 67 | SFUMC07-23 | Pulley |
| 68 | SFUMC07-22 | Stopper, Pulley |
| 69 | SFUMC10-05 | Arm Drive Wheel |
| 70 | SFDJC10-02E | Connector, 4 Pin (With Wire) |
| 71 | SFXZC07-01R | Worm Ass'y |
| 72 | SFGBC10-01 | Belt, Arm Drive |
| 73 | SFUZC07-05E | Arm Drive Rope |
| 74 | SFMHC07-01E | Arm Drive Motor |
| 75 | SFGC11N03 | Cushion, Arm Drive Motor |
| 76 | SFUPQ11N15 | Supporter, Arm Drive Motor |
| 77 | SFDJC07-01E | Connector, 12 Pin (With Wire) |
| 78 | SFUZQ11N02 | Label, Surface Plate |
| TONEARM PARTS | | |
| 101 | SFPAM00701A | Tonearm |
| 102 | EPCP23SK | Cartridge |
| | EPS-23CS | Stylus |
| 103 | SFPCS00701A | Tonearm Position Indicator |
| 104 | SFPKD00701E | Arm Base |
| 105 | SFDZC07-01E | Cueing Plunger (RL501) |
| 106 | SFJL00701A | Lift Ass'y |
| 107 | SFSP01505 | Spring, Lift Ass'y |
| 108 | SFPKD00702 | Arm Base Cover |

| Ref. No. | Part No. | Part Name & Description |
|-------------------------------------|-------------|-----------------------------------|
| 109 | SFSP00706 | Spring, Rest Position Adjustment |
| 110 | SFDJC07-03E | Connector, Phono (With Wire) |
| 111 | SFDJC07-02E | Connector, 5 Pin (With Wire) |
| 113 | SFPGM00702 | Cushion, Lead Wire |
| 114 | SFPZB00709 | Bracket, Arm Base |
| 115 | SFGZ172-01 | Spacer, Arm Base Cover |
| SCREWS, WASHERS and CIRCLIPS | | |
| N1 | XTV3+8BFN | Screw, Tapping, \oplus 3 x 8 |
| N2 | XWC3B | Washer, ϕ 3 |
| N3 | XTV3+20BFN | Screw, Tapping, \oplus 3 x 8 |
| N4 | XTN4+12BFZ | Screw, Tapping, \oplus 4 x 20 |
| N5 | XTV3+10BFZ | Screw, Tapping, \oplus 3 x 10 |
| N6 | XTV3+10BFZ | Screw, Tapping, \oplus 3 x 10 |
| N7 | XTV3+14BFZ | Screw, Tapping, \oplus 3 x 14 |
| N8 | XWA3B | Washer, ϕ 3 |
| N9 | XWA2B | Washer, ϕ 2 |
| N10 | | Screw |
| N11 | XSN3+8S | Screw |
| N12 | XWE3 | Washer |
| N13 | XTV3+16BFZ | Screw, Tapping, \oplus 3 x 16 |
| N14 | XTN3+8BFZ | Screw, Tapping, \oplus 3 x 8 |
| N15 | XTV3+8BFN | Screw, Tapping, \oplus 3 x 6 |
| N16 | XYN23+C10BN | Screw, Tapping, \oplus 2.3 x 10 |
| N17 | XTS26+6B | Screw, Tapping, \oplus 2.6 x 6 |
| N18 | SFXGQ11N01 | Screw, Dust Cover |
| N19 | SFXWQ11N01 | Washer, Dust Cover |

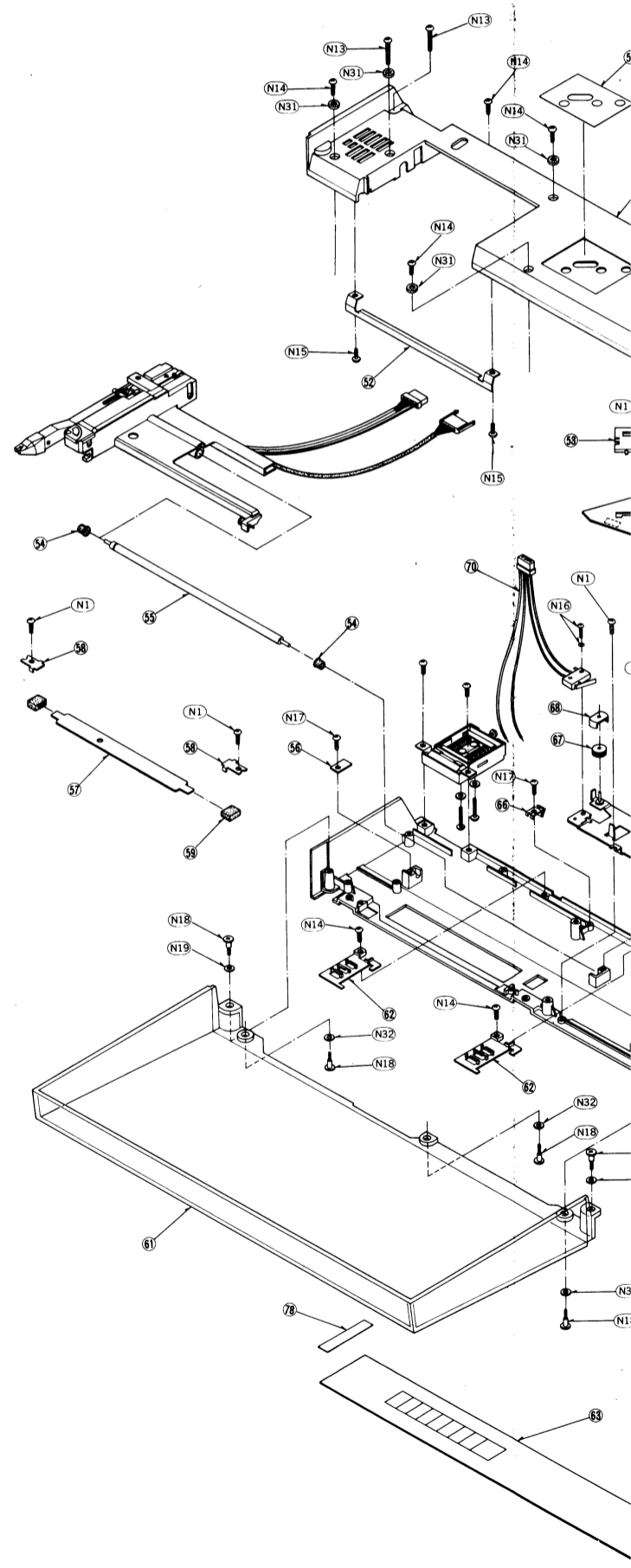
| Ref. No. | Part No. | Part Name & Description |
|----------------------|--|-----------------------------------|
| N20 | XYC4+CJ20FZ | Screw, Tapping, \oplus 3 x 20 |
| N21 | XUC3FT SFHW551D2 XTV3+8BFZ XXE3D6FZ XTN23+6BFZ XTN3+4B SFPEV00702 XSN2+4BV XXE3D3FZS SFXGC10-06 SFXWQ11N05 SFXWQ11N04 | Circlip, ϕ 3 |
| N22 | | Washer |
| N23 | | Screw, Tapping, \oplus 3 x 8 |
| N24 | | Screw, Offset Angle Adjustment |
| N25 | | Screw, Tapping, \oplus 2.3 x 6 |
| N26 | | Screw, Tapping, \oplus 3 x 4 |
| N27 | | Screw, Tonearm |
| N28 | | Screw, Tapping, \oplus 2 x 4 |
| N29 | | Screw, Tonearm |
| N30 | | Screw |
| N31 | | Washer, Upper Cabinet Cover |
| N32 | | Washer, Dust Cover |
| ACCESSORIES | | |
| A1 [E] only | SFNUD11S01 | Instructions Book, Printed Matter |
| A1 [EK] only | SFNUD11G01 | Instructions Book, Printed Matter |
| A1 | SFNUD11X01 | Instructions Book, Printed Matter |
| A2 | SFWE212-01 | 45 Adaptor |
| A3 [XA, XM] only | SFKD119118 | 2 Pin Plug |
| PACKING PARTS | | |
| P1 | ○ SFHPD11M01 ○ SFHPD11C01 ○ SFHPD11M21 | Carton Box (Silver) |
| P1 [EF] only | | Carton Box (Silver) |
| P1 | | Carton Box (Black) |
| P2 | SFHHQ11N01 | Pad, Front |
| P3 | SFHHQ11N02 | Pad, Rear |

■ EXPLODED VIEW

Main Cabinet



Upper Cabinet

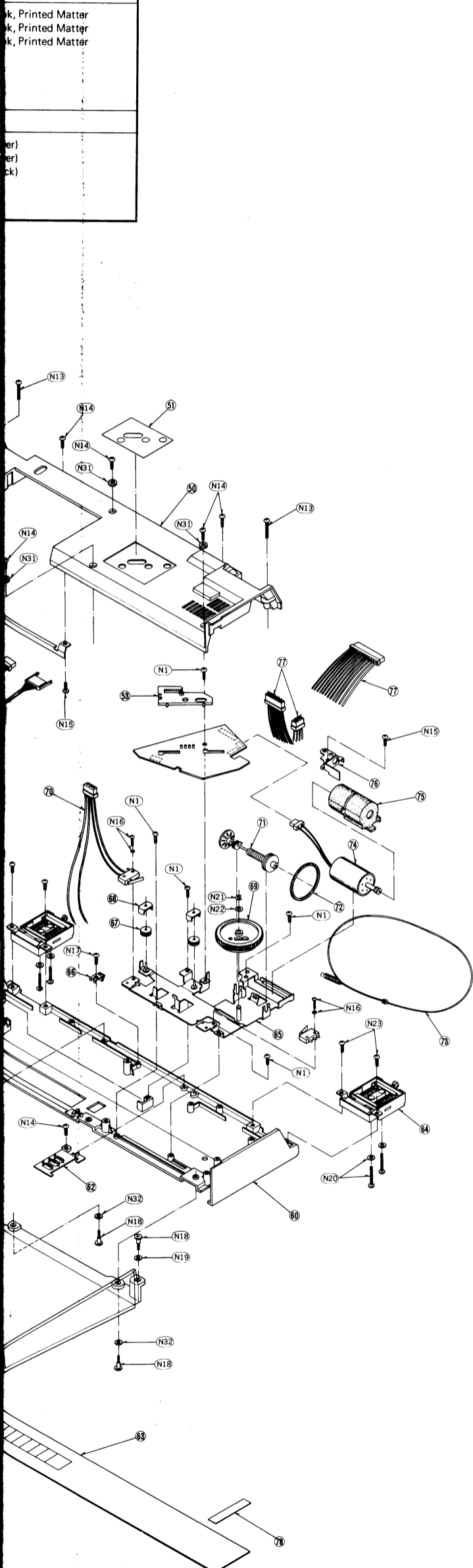
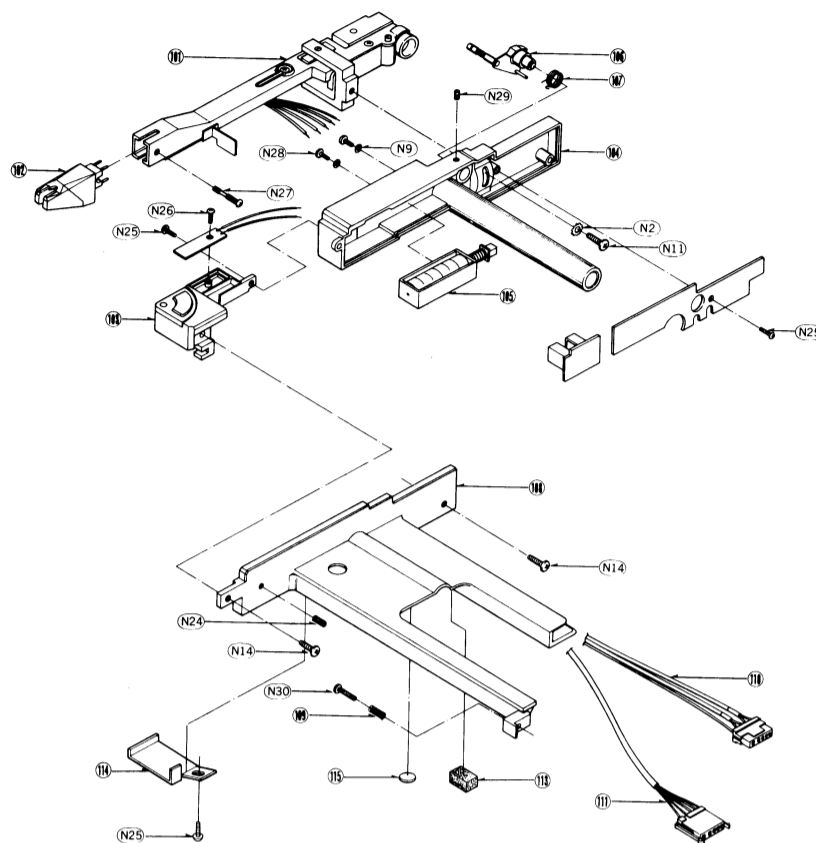


| Name & Description | Ref. No. | Part No. | Part Name & Description |
|--------------------|-----------------|-------------|------------------------------|
| ⊕ 3 x 20 | P4 | SFHDQ11N01 | Pad, Top |
| ⊕ 3 x 8 | P5 | SFHSD11N03 | Cabinet Spacer |
| Angle Adjustment | P6 | SFHSD11N01E | Arm Spacer |
| ⊕ 2.3 x 6 | P7 | SFHSD11N02 | Dust Cover Spacer |
| ⊕ 3 x 4 | P8 | SFYH60X60 | Polyethylene Bag, Unit |
| ⊕ 2 x 4 | P9 | SFYH40X45 | Polyethylene Bag, Turntable |
| Cabinet Cover | P10 | SFYF09A15 | Polyethylene Bag, 45 Adaptor |
| Cover | P11[XA, XM]only | SFHSC07-02 | Spacer (A), Corner |
| | P12[XA, XM]only | SFHSC07-03 | Spacer (B), Corner |

Areas

- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EB] is available in Belgium.
- * [EF] is available in France.
- * [EG] is available in F.R. Germany.
- * [E1] is available in Italy.
- * [EH] is available in Holland
- * [XA] is available in East South Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XM] is available in Central South America.

Tonearm



REPLACEMENT PARTS LIST...Electrical 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 Δ make 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.

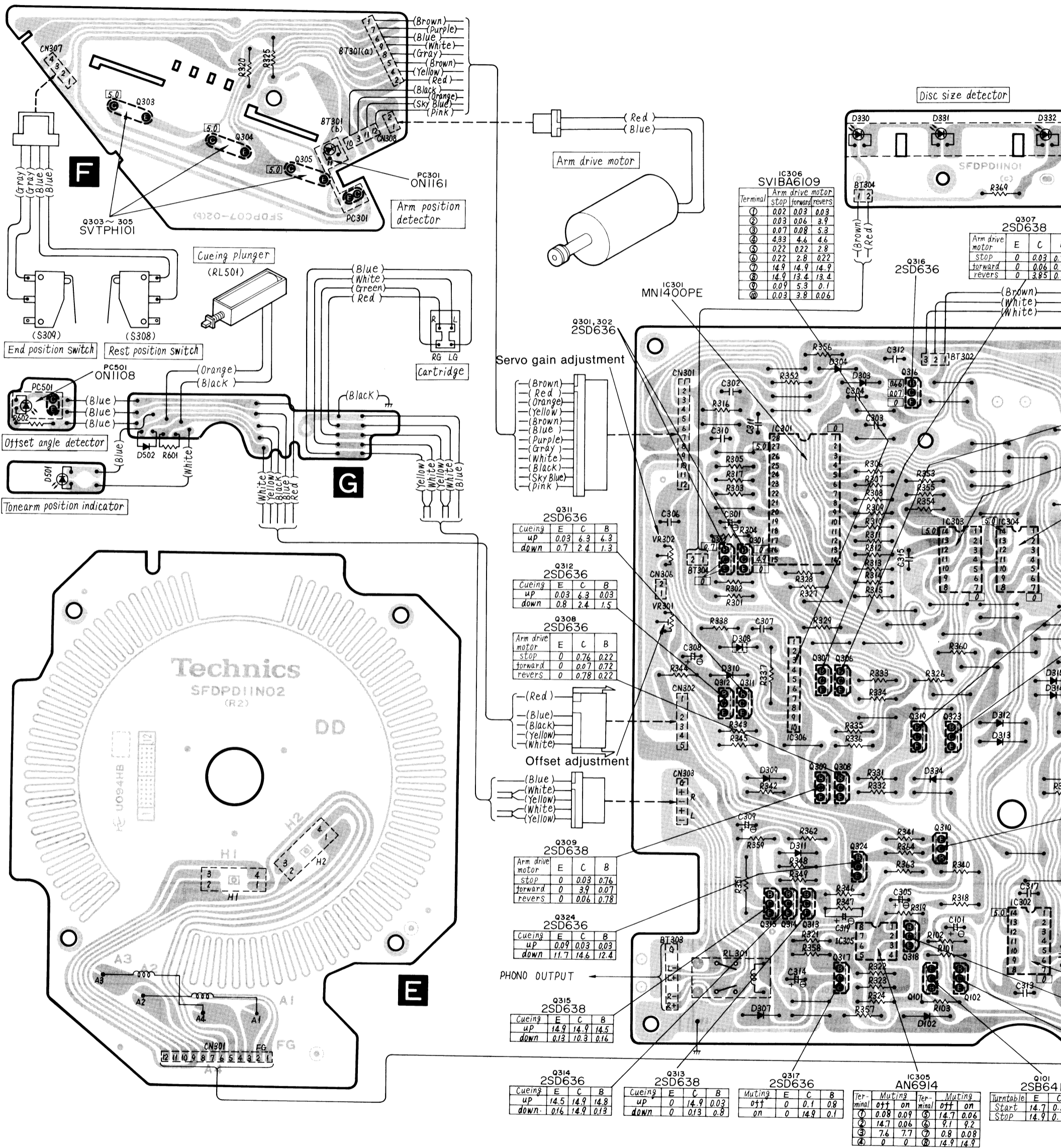
| Ref. No. | Part No. | Part Name & Description |
|---------------------------|----------------------|---|
| INTEGRATED CIRCUIT | | |
| IC101 | AN6636 | IC, Drive |
| IC301 | MN1400PE | IC, Micro-Computer |
| IC302 | SVIM53200P | IC, Nand |
| IC303 | SVIM53217P | IC, Buffer |
| IC304 | SVIM53216P | IC, Inverter |
| IC305 | AN6914 | IC, Comparater |
| IC306 | SVIBA6109 | IC, Arm Motor Drive |
| TRANSISTORS | | |
| Q1, 2 | 2SD636 | Transistor, Regulator & Drive Detector |
| Q3 | 2SC1826 | Transistor, Regulator |
| Q4, 101 | 2SB641 | Transistor, Regulator & Drive Detector |
| Q5 | 2SC1846-R | Transistor, Regulator |
| Q102 ~ 104 | 2SD636 | Transistor, Regulator & Switching |
| Q105 | 2SA1015-Y | Transistor, Regulator |
| Q301, 302, 306 | 2SD636 | Transistor, Buffer |
| 308, 311, 312 | | Switching & Muting Relay Drive |
| 314, 316 ~ 319 | | |
| 323, 324 | | |
| Q303 ~ 305 | SVTPH101-Q2 | Photo Transistor, Disc Size Detector |
| Q307, 309, 313 | 2SD638 | Transistor, Buffer |
| 315 | | |
| Q310, 331, 332 | 2SB641 | Transistor, Switching |
| DIODES | | |
| D1 | Δ SVDRM1Z | Diode |
| D2 | Δ SVDS1RBA20Z | Diode, Rectifier |
| D3 | MA1051A | Diode, 5.1V Zener |
| D101, 301 ~ 307 | MA162A | Diode |
| 309 ~ 311, 314 | | |
| 315, 334 | | |
| D102, 312, 313 | 20A90 | Diode |
| D308 | MA26TO-A | Diode |
| D321 ~ 325 | SVDPR5531K | Light Emitting Diode, Red |
| D326, 327 | 20A90 | Diode |
| D328, 329 | SVDPR5531K | Light Emitting Diode, Red |
| D330 ~ 332 | SVDAR3402S | Light Emitting Diode, Disc, Size Detector |
| D501 | SVDEBR3432S | Light Emitting Diode, Arm Indicator |
| PHOTO INTERRUPTERS | | |
| PC301 | ON1161 | Photo Interrupter, Arm Position Detector |
| PC501 | ON1108 | Photo Interrupter, Offset Angle Detector |

| Ref. No. | Part No. | Part Name & Description |
|---------------------------|-----------------------|---|
| RELAY | | |
| RL301 | SFDYQ11N01 | Relay, Muting |
| RL501 | SFDZC07-01E | Plunger, Cueing |
| LAMP | | |
| LN501 | Δ SFDNE2HU | Lamp |
| SWITCHES | | |
| S301, 302 | EVQQBR08K | Switch, Start & Stop |
| S303, 304, 305 | EVQQB04K | Switch, Repeat, Cueing & Speed Selector |
| 306 | | |
| S307 | ESB6247 | Switch, Reset Switch |
| S308, 309 | SFDSD2MSL-4 | Switch, Rest & End Detector |
| S401 | Δ SFDSS5GLS | Switch, Power Source |
| S402 | Δ SFDSHXW01317 | Switch, Voltage Adjuster |
| FUSES | | |
| F1 | Δ XBAS2C025T1A | Fuse, T250mA, 250V |
| F2, 3 | Δ XBA2C10TR0 | Fuse, T1A, 250V |
| VARIABLE RESISTORS | | |
| VR101 | EVTS3MA00B54 | Speed Adjustment (45) 50k Ω (B) |
| VR102 | EVTS3MA00B24 | Speed Adjustment (33) 20k Ω (B) |
| VR301 | EVNM0AA00B14 | Offset Adjustment 10k Ω (B) |
| VR302 | EVNM0AA00B13 | Servo Gain Adjustment 1k Ω (B) |
| VR601 | EVLEAAT12B24 | Pitch Control 20k Ω (B) |
| POWER TRANSFORMER | | |
| T1 | Δ SLT66PS7E | Power Transformer |
| HALL ELEMENT | | |
| H1, 2 | H-300A | Hall Element, Turntable Position Detector |

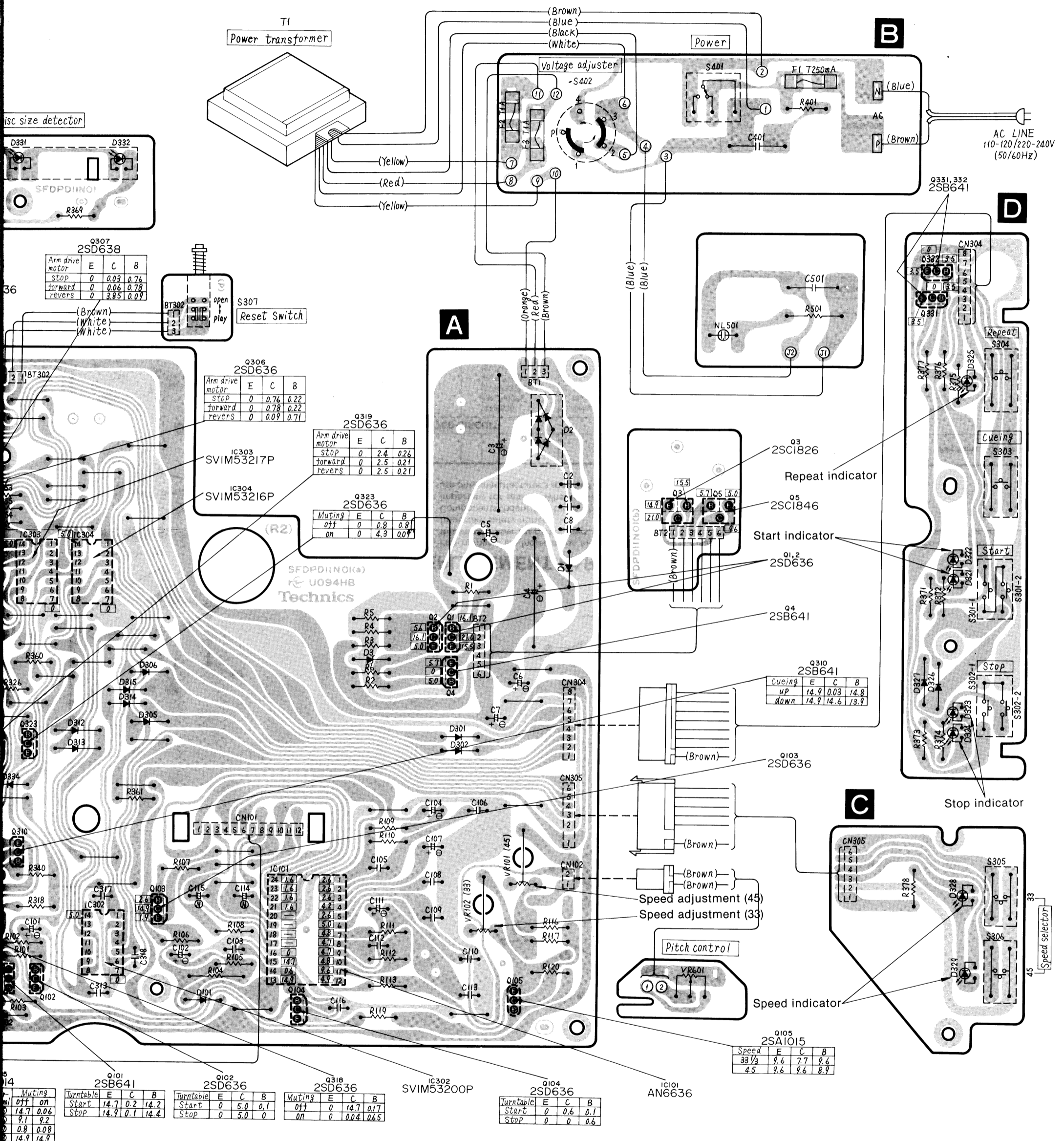
Continued on page 31

25 ■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

Ground (Earth) Lines



26



Q307 2SD638

| Arm drive motor | E | C | B |
|-----------------|---|------|------|
| stop | 0 | 0.03 | 0.76 |
| forward | 0 | 0.06 | 0.78 |
| revers | 0 | 3.85 | 0.09 |

Q306 2SD636

| Arm drive motor | E | C | B |
|-----------------|---|------|------|
| stop | 0 | 0.76 | 0.22 |
| forward | 0 | 0.78 | 0.22 |
| revers | 0 | 0.09 | 0.71 |

Q319 2SD636

| Arm drive motor | E | C | B |
|-----------------|---|-----|------|
| stop | 0 | 2.4 | 0.26 |
| forward | 0 | 2.5 | 0.21 |
| revers | 0 | 2.5 | 0.21 |

Q323 2SD636

| Muting | E | C | B |
|--------|---|-----|------|
| off | 0 | 0.8 | 0.8 |
| on | 0 | 4.3 | 0.09 |

Q310 2SB641

| Cueing | E | C | B |
|--------|------|------|------|
| up | 14.9 | 0.03 | 14.8 |
| down | 14.9 | 14.6 | 13.9 |

Q105 2SA1015

| Speed | E | C | B |
|--------|-----|-----|-----|
| 33 1/3 | 9.6 | 7.7 | 9.6 |
| 45 | 9.6 | 9.6 | 8.9 |

Q101 2SB641

| Muting | E | C | B |
|--------|------|-----|------|
| off | 14.7 | 0.2 | 14.2 |
| on | 9.1 | 9.2 | 0.8 |
| Start | 14.9 | 0.1 | 14.4 |

Q102 2SD636

| Turntable | E | C | B |
|-----------|---|-----|-----|
| Start | 0 | 5.0 | 0.1 |
| Stop | 0 | 5.0 | 0 |

Q318 2SD636

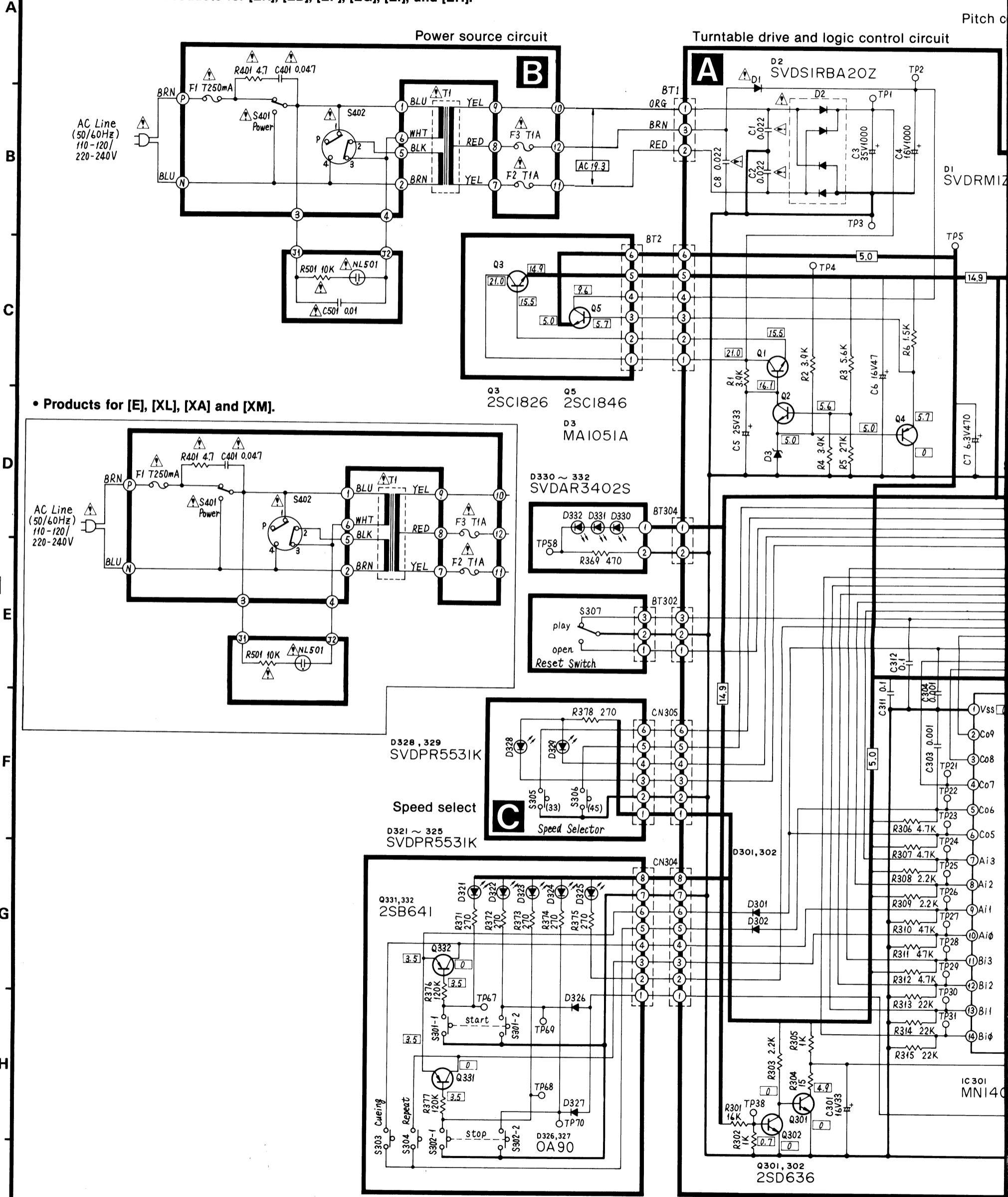
| Muting | E | C | B |
|--------|---|------|------|
| off | 0 | 14.7 | 0.17 |
| on | 0 | 0.04 | 0.65 |

Q104 2SD636

| Turntable | E | C | B |
|-----------|---|-----|-----|
| Start | 0 | 0.6 | 0.1 |
| Stop | 0 | 0 | 0.6 |

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

• Products for [EK], [EB], [EF], [EG], [EI], and [EH].



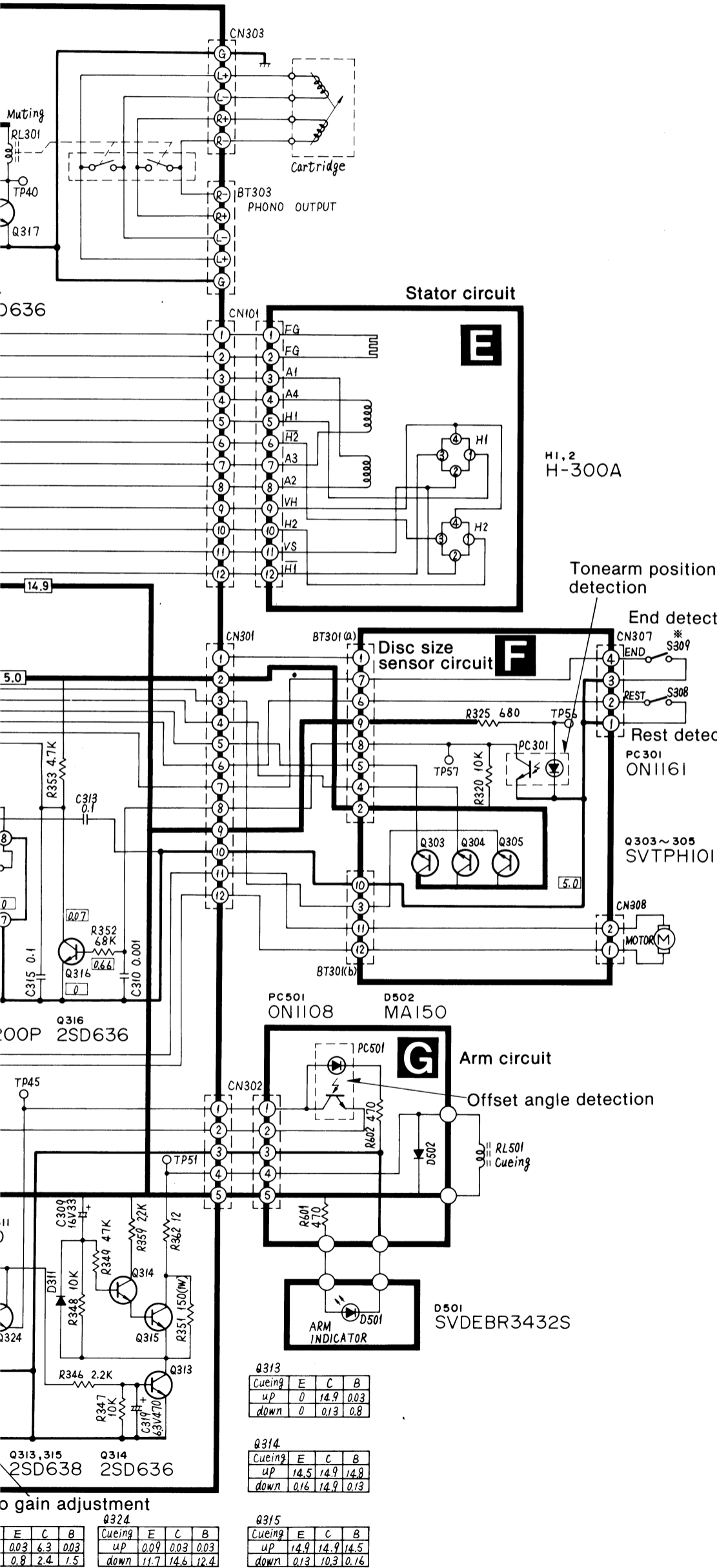
• Products for [E], [XL], [XA] and [XM].

D Operation circuit

| IC305 | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-------|------|------|-----|---|------|-----|------|------|---|
| off | 0.08 | 14.7 | 7.6 | 0 | 14.7 | 9.1 | 0.8 | 14.9 | |
| on | 0.09 | 0.06 | 7.7 | 0 | 0.06 | 9.2 | 0.08 | 14.9 | |

| IC306 | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------|------|------|------|------|------|------|------|------|------|------|----|
| stop | 0.02 | 0.03 | 0.07 | 4.33 | 0.22 | 0.22 | 14.9 | 14.9 | 0.09 | 0.03 | |
| forward | 0.03 | 0.06 | 0.08 | 4.6 | 0.22 | 2.8 | 14.9 | 13.4 | 5.3 | 3.8 | |
| revers | 0.03 | 3.9 | 5.3 | 4.6 | 2.8 | 0.22 | 14.9 | 13.4 | 0.1 | 0.06 | |

| | | | |
|----|---|------|-----|
| Hz | E | C | B |
| F | 0 | 0.1 | 0.8 |
| | 0 | 14.9 | 0.1 |



Notes:

- S301-1, 301-2** : Start switch in "off" position. (not push condition).
 ◀◀ Moves inward (S301-1)
 ◀◀ Moves faster (S301-2)
- S302-1, 302-2** : Stop switch in "off" position. (not push condition).
 ▶▶ Moves outward (S302-1)
 ▶▶ Moves faster (S302-2)
- S303** : Cueing switch in "▼" position. (not push condition).
- S304** : Repeat switch in "off" position. (not push condition).
- S305, 306** : Speed select switch in "off" position. (not push condition).
 S305..... 33-1/3 r.p.m. S306..... 45 r.p.m.
- S307** : Reset switch in "on" position.
- S308** : Rest position switch in "off" position.
- S309** : End position switch in "off" position.
- S401** : Power switch in "on" position.
- S402** : Voltage adjuster switch in "220 - 240V" position.
 110 - 120V ↔ 220 - 240V
- The value in is the standard voltage for this unit operated at 33-1/3r.p.m., which was measured by DC electronic voltmeter (high impedance) on the basis of the chassis. Accordingly, the voltage value may sometimes include a slight error depending on the internal impedance of the DC voltmeter (tester, etc.) used for the measurement.
- +⊕ voltage line.
- 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.

* **S309 (end detection switch)** will be replaced by **MN1400PE** of which the end detection unit is built into **MN1400PA (IC301)** in the course of manufacture. At the time of servicing, it is possible to replace **MN1400PA** with **MN1400PE**, but not **MN1400PE** with **MN1400PA**. Incidentally, **MN1400PE** will be supplied as repair parts.

Terminal guide of transistors, IC's, diodes and photo interrupters

| | | |
|---|----------------------|---|
| AN6636 | MN1400PE | H-300A |
| SVIM53217P SVIM53216P SVIM53200P | SVIBA6109 | AN6914 |
| 2SC1846 | 2SA1015 | 2SC1826 |
| 2SD636 2SD638 2SB641 | SVTPH101 | SVDEBR3432S SVDAR3402S |
| ON1108 | ON1161 | SVDP5531K |

Reference voltage and waveform at each IC terminal (pin)

This indicated voltage values and waveform are measured by oscilloscope at 33r.p.m. rotation.

IC101 (AN6636)

| | Stop | Start | | Stop | Start | | Stop | Start |
|---|------|-------|---|-------|-------|---|-------|-------|
| ① | 2.6V | 2.6V | ⑥ | 8.1V | 5.0V | ⑰ | 0V | * |
| ② | 2.6V | | ⑦ | 7.8V | 4.8V | | | |
| | | | ⑧ | 0.26V | 4.7V | | | |
| | | | ⑨ | 0.23V | 4.8V | | | |
| ③ | 2.6V | 2.6V | ⑩ | 5.4V | 4.8V | | | |
| ④ | 9.3V | | ⑪ | 9.6V | 9.6V | ⑲ | 0V | |
| | | | ⑫ | 5.0V | 4.9V | | | |
| ⑤ | 8.7V | | ⑬ | 14.9V | 14.9V | ⑳ | 1.58V | 1.6V |
| | | | ⑭ | 0V | 0.6V | ㉑ | 1.54V | 1.6V |
| | | | ⑮ | 14.9V | 14.7V | ㉒ | 1.5V | 1.6V |
| | | | ⑯ | 0V | 0.0V | ㉓ | 1.6V | 1.6V |

* The waveform was obtained with oscilloscope connected between terminals ⑰ - ⑱, ⑲ - ⑳.

Gain adjustment

| | | | | | |
|-----------|--------|------|------|------|------|
| Q313, 315 | Q314 | | | | |
| 2SD638 | 2SD636 | | | | |
| E | C | B | E | C | B |
| 0.03 | 6.3 | 0.03 | 0.09 | 0.03 | 0.03 |
| 0.8 | 2.4 | 1.5 | up | 14.9 | 14.9 |
| | | | down | 0.16 | 14.9 |

Q313

| | | | |
|--------|---|------|------|
| Cueing | E | C | B |
| up | 0 | 14.9 | 0.03 |
| down | 0 | 0.13 | 0.8 |

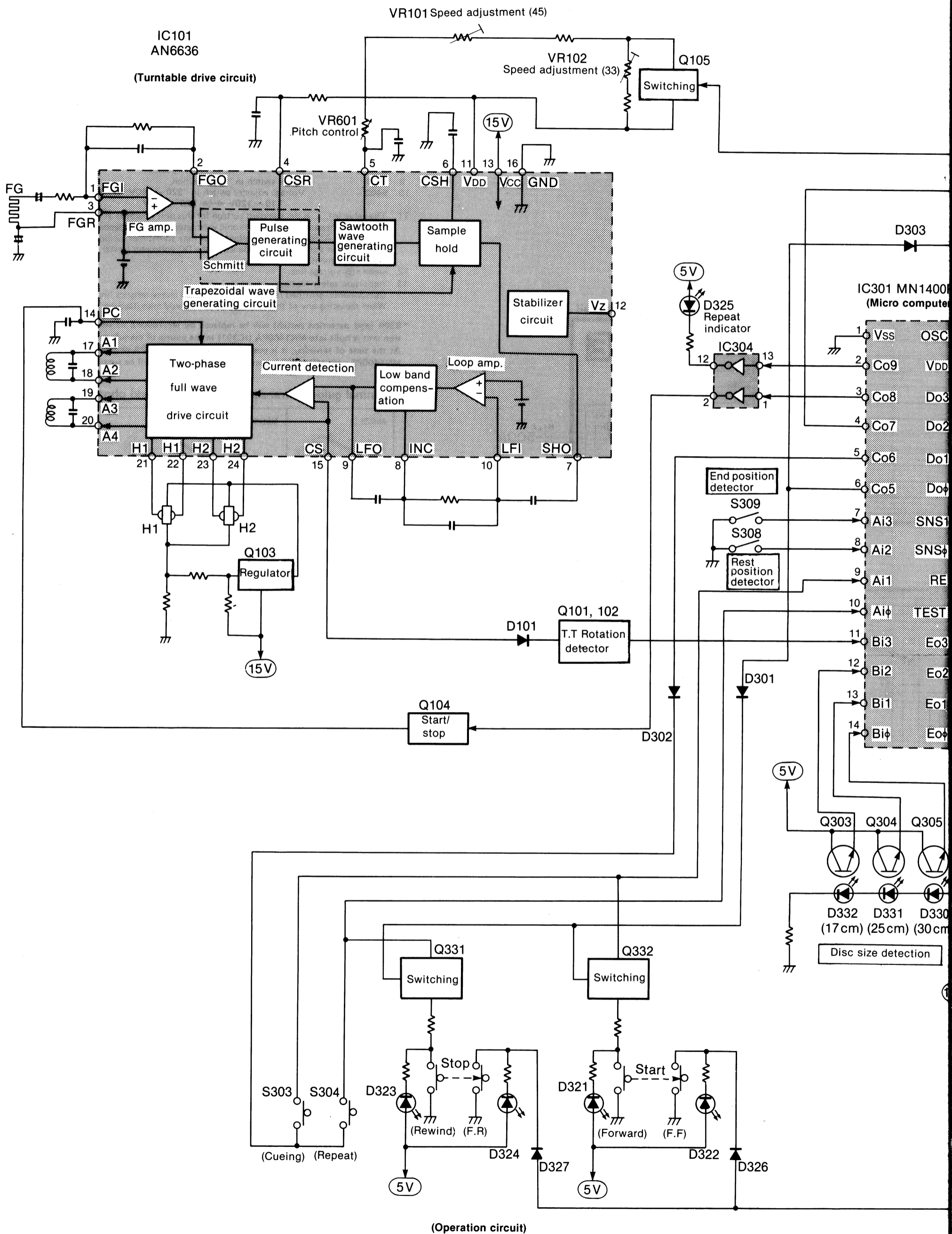
Q314

| | | | |
|--------|------|------|------|
| Cueing | E | C | B |
| up | 14.5 | 14.9 | 14.8 |
| down | 0.16 | 14.9 | 0.13 |

Q315

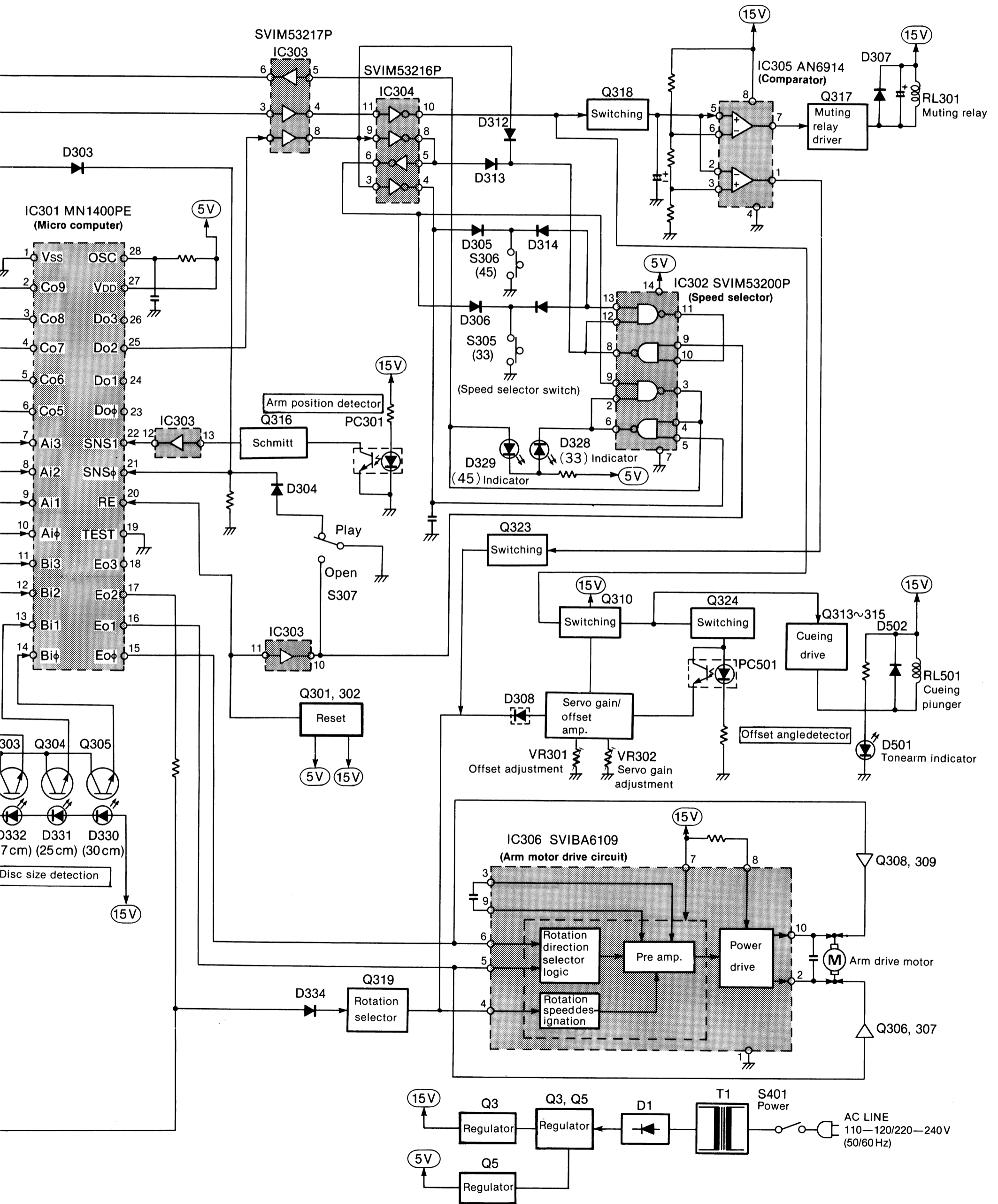
| | | | |
|--------|------|------|------|
| Cueing | E | C | B |
| up | 14.9 | 14.9 | 14.5 |
| down | 0.13 | 10.3 | 0.16 |

■ BLOCK DIAGRAM



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Continued from page 23

| Ref. No. | Part No. | Part Name & Description |
|------------------|--------------|------------------------------|
| RESISTORS | | |
| R1, 2 | ERD25FJ392 | Carbon, 1/4W, 3.9kΩ, ± 5% |
| R3 | ERD25FJ562 | Carbon, 1/4W, 5.6kΩ, ± 5% |
| R4 | ERD25FJ392 | Carbon, 1/4W, 3.9kΩ, ± 5% |
| R5 | ERD25TJ273 | Carbon, 1/4W, 27kΩ, ± 5% |
| R6 | ERD25FJ152 | Carbon, 1/4W, 1.5kΩ, ± 5% |
| R101 | ERD25FJ103 | Carbon, 1/4W, 10kΩ, ± 5% |
| R102 | ERD25FJ222 | Carbon, 1/4W, 2.2kΩ, ± 5% |
| R103 | ERD25TJ473 | Carbon, 1/4W, 47kΩ, ± 5% |
| R104 | ERX1ANJ2R2 | Metal Oxide, 1W, 2.2Ω, ± 5% |
| R105 | ERD25FJ220 | Carbon, 1/4W, 22Ω, ± 5% |
| R106 | ERD25TJ153 | Carbon, 1/4W, 15kΩ, ± 5% |
| R107 | ERD25FJ182 | Carbon, 1/4W, 1.8kΩ, ± 5% |
| R108 | ERD25FJ221 | Carbon, 1/4W, 220Ω, ± 5% |
| R109 | ERD25FJ820 | Carbon, 1/4W, 82Ω, ± 5% |
| R110 | ERD25TJ153 | Carbon, 1/4W, 15kΩ, ± 5% |
| R111 | ERD25TJ473 | Carbon, 1/4W, 47kΩ, ± 5% |
| R112 | ERD25TJ104 | Carbon, 1/4W, 100kΩ, ± 5% |
| R113 | ERD25TJ333 | Carbon, 1/4W, 33kΩ, ± 5% |
| R116 | ERO25CKF6802 | Metal Film, 1/4W, 68kΩ, ± 1% |
| R117 | ERD25TJ273 | Carbon, 1/4W, 27kΩ, ± 5% |
| R119 | ERD25FJ472 | Carbon, 1/4W, 4.7kΩ, ± 5% |
| R120 | ERD25FJ471 | Carbon, 1/4W, 470Ω, ± 5% |
| R301 | ERD25TJ163 | Carbon, 1/4W, 16kΩ, ± 5% |
| R302 | ERD25FJ102 | Carbon, 1/4W, 1kΩ, ± 5% |
| R303 | ERD25FJ222 | Carbon, 1/4W, 2.2kΩ, ± 5% |
| R304 | ERD25FJ150 | Carbon, 1/4W, 15Ω, ± 5% |
| R305 | ERD25FJ102 | Carbon, 1/4W, 1kΩ, ± 5% |
| R306, 307 | ERD25FJ472 | Carbon, 1/4W, 4.7kΩ, ± 5% |
| R308, 309 | ERD25FJ222 | Carbon, 1/4W, 2.2kΩ, ± 5% |
| R310, 311 | ERD25TJ473 | Carbon, 1/4W, 47kΩ, ± 5% |
| R312 | ERD25FJ472 | Carbon, 1/4W, 4.7kΩ, ± 5% |
| R313, 314 | ERD25TJ223 | Carbon, 1/4W, 22kΩ, ± 5% |
| R315, 316 | ERD25TJ223 | Carbon, 1/4W, 22kΩ, ± 5% |
| R317 | ERD25TJ473 | Carbon, 1/4W, 47kΩ, ± 5% |
| R318 | ERD25TJ104 | Carbon, 1/4W, 100kΩ, ± 5% |
| R319 | ERD25FJ101 | Carbon, 1/4W, 100Ω, ± 5% |
| R320 | ERD25FJ103 | Carbon, 1/4W, 10kΩ, ± 5% |
| R321 | ERD25TJ153 | Carbon, 1/4W, 15kΩ, ± 5% |
| R322 | ERD25FJ392 | Carbon, 1/4W, 3.9kΩ, ± 5% |
| R323, 324 | ERD25FJ103 | Carbon, 1/4W, 10kΩ, ± 5% |
| R325 | ERD25FJ681 | Carbon, 1/4W, 680Ω, ± 5% |
| R326, 327 | ERD25FJ392 | Carbon, 1/4W, 3.9kΩ, ± 5% |
| R328 | ERD25FJ392 | Carbon, 1/4W, 3.9kΩ, ± 5% |
| R329 | ERD25TJ153 | Carbon, 1/4W, 15kΩ, ± 5% |
| R331 | ERD25FJ271 | Carbon, 1/4W, 270Ω, ± 5% |
| R332 | ERD25FJ331 | Carbon, 1/4W, 330Ω, ± 5% |
| R333 | ERD25FJ103 | Carbon, 1/4W, 10kΩ, ± 5% |
| R334 | ERD25FJ681 | Carbon, 1/4W, 680Ω, ± 5% |
| R335 | ERD25FJ103 | Carbon, 1/4W, 10kΩ, ± 5% |
| R336 | ERD25FJ681 | Carbon, 1/4W, 680Ω, ± 5% |
| R337 | ERG1ANJ270 | Metal Oxide, 1W, 27Ω, ± 5% |
| R338 | ERD25FJ122 | Carbon, 1/4W, 1.2kΩ, ± 5% |
| R340 | ERD25FJ222 | Carbon, 1/4W, 2.2kΩ, ± 5% |
| R341 | ERD25FJ102 | Carbon, 1/4W, 1kΩ, ± 5% |
| R342 | ERD25TJ563 | Carbon, 1/4W, 56kΩ, ± 5% |
| R343 | ERD25FJ181 | Carbon, 1/4W, 180Ω, ± 5% |
| R344 | ERD25FJ681 | Carbon, 1/4W, 680Ω, ± 5% |
| R345 | ERD25FJ121 | Carbon, 1/4W, 120Ω, ± 5% |
| R346 | ERD25FJ222 | Carbon, 1/4W, 2.2kΩ, ± 5% |
| R347, 348 | ERD25FJ103 | Carbon, 1/4W, 10kΩ, ± 5% |
| R349 | ERD25TJ473 | Carbon, 1/4W, 47kΩ, ± 5% |
| R351 | ERG1ANJ151 | Metal Oxide, 1W, 150Ω, ± 5% |
| R352 | ERD25TJ683 | Carbon, 1/4W, 68kΩ, ± 5% |

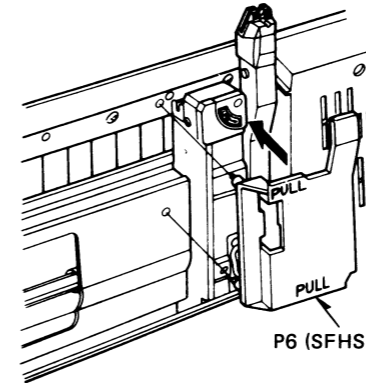
| Ref. No. | Part No. | Part Name & Description |
|---------------------------------------|-------------|------------------------------------|
| R353, 354 | ERD25FJ472 | Carbon, 1/4W, 4.7kΩ, ± 5% |
| R355 | ERD25FJ102 | Carbon, 1/4W, 1kΩ, ± 5% |
| R356 | ERD25FJ472 | Carbon, 1/4W, 4.7kΩ, ± 5% |
| R357 | ERD25TJ683 | Carbon, 1/4W, 68kΩ, ± 5% |
| R358 | ERD25FJ103 | Carbon, 1/4W, 10kΩ, ± 5% |
| R359 | ERD25FJ222 | Carbon, 1/4W, 2.2kΩ, ± 5% |
| R360 | ERD25FJ103 | Carbon, 1/4W, 10kΩ, ± 5% |
| R361 | ERD25TJ473 | Carbon, 1/4W, 47kΩ, ± 5% |
| R362 | ERD25FJ120 | Carbon, 1/4W, 12Ω, ± 5% |
| R363 | ERD25FJ102 | Carbon, 1/4W, 1kΩ, ± 5% |
| R364 | ERD25FJ181 | Carbon, 1/4W, 180Ω, ± 5% |
| R369 | ERD25FJ471 | Carbon, 1/4W, 470Ω, ± 5% |
| R371, 372 | ERD25FJ271 | Carbon, 1/4W, 270Ω, ± 5% |
| R373, 374 | ERD25FJ271 | Carbon, 1/4W, 270Ω, ± 5% |
| R375 | ERD25FJ271 | Carbon, 1/4W, 270Ω, ± 5% |
| R376, 377 | ERD25TJ124 | Carbon, 1/4W, 120kΩ, ± 5% |
| R378 | ERD25FJ271 | Carbon, 1/4W, 270Ω, ± 5% |
| R401 | ERD50FJ4R7 | Carbon, 1/2W, 4.7kΩ, ± 5% |
| R501 | ERG1ANJ103 | Metal Oxide, 1W, 10kΩ, ± 5% |
| R601, 602 | ERD25FJ471 | Carbon, 1/4W, 470Ω, ± 5% |
| CAPACITORS | | |
| C1, 2 | ECKD1H223PF | Ceramic, 50V, 0.022μF, ± 100% |
| C3 | ECEB1VS102 | Electrolytic, 35V, 1000μF |
| C4 | ECEB1CS102 | Electrolytic, 16V, 1000μF |
| C5 | ECEA1VS330 | Electrolytic, 25V, 33μF |
| C6 | ECEA1ES470 | Electrolytic, 25V, 47μF |
| C7 | ECEA0JS471 | Electrolytic, 6.3V, 470μF |
| C8 | ECKD1H223PF | Ceramic, 50V, 0.022μF, ± 100% |
| C101 | ECEA1AS101 | Electrolytic, 10V, 100μF |
| C102 | ECEA1ES101 | Electrolytic, 25V, 100μF |
| C103 | ECQM1H104KZ | Polyester, 50V, 0.1μF, ± 10% |
| C104 | ECEA1AS470 | Electrolytic, 10V, 47μF |
| C105 | ECQM1H104KZ | Polyester, 50V, 0.1μF, ± 10% |
| C106 | ECQM1H473KZ | Polyester, 50V, 0.047μF, ± 10% |
| C107 | ECEA1AS470 | Electrolytic, 10V, 47μF |
| C108 | ECQM1H473KZ | Polyester, 50V, 0.047μF, ± 10% |
| C109 | ECQM1H224KZ | Polyester, 50V, 0.22μF, ± 10% |
| C110 | ECQM1H104KZ | Polyester, 50V, 0.1μF, ± 10% |
| C111 | ECEA25Z4R7 | Electrolytic, 50V, 4.7μF |
| C112, 113 | ECQM1H104KZ | Polyester, 50V, 0.1μF, ± 10% |
| C114, 115 | ECEA1CN101S | Non-Polar Electrolytic, 16V, 100μF |
| C116 | ECKD1H223PF | Ceramic, 50V, 0.022μF, ± 100% |
| C301 | ECEA1CS330 | Electrolytic, 16V, 33μF |
| C302 | ECCD1H101K | Ceramic, 50V, 100pF, ± 10% |
| C303, 304 | ECKD1H102KB | Ceramic, 50V, 0.001μF, ± 10% |
| C305 | ECEA16Z33 | Electrolytic, 16V, 33μF |
| C307 | ECQM1H103KZ | Polyester, 50V, 0.01μF, ± 10% |
| C308 | ECEA50Z1 | Electrolytic, 50V, 1μF |
| C309 | ECEA1CS330 | Electrolytic, 16V, 33μF |
| C310 | ECQM1H102KZ | Polyester, 50V, 0.001μF, ± 10% |
| C311, 312 | ECKF1E104ZV | Ceramic, 25V, 0.1μF, ± 80% |
| C313 | ECKF1E104ZV | Ceramic, 25V, 0.1μF, ± 80% |
| C314 | ECEA1ES101 | Electrolytic, 25V, 100μF |
| C315 | ECKF1E104ZV | Ceramic, 25V, 0.1μF, ± 80% |
| C317, 318 | ECKF1E104ZV | Ceramic, 25V, 0.1μF, ± 80% |
| C319 | ECEA0JS471 | Electrolytic, 6.3V, 470μF |
| C401 [E], [EK], [XL] | ECNC4A473MD | Paper, 450VAC, 0.047μF, ± 20% |
| C401 | ECQE2A473MZ | Polyester, 250VAC, 0.047μF, ± 20% |
| C501 [EK], [EG] [EB], [EF] [EH], [EI] | ECQE2A103MZ | Polyester, 250VAC, 0.01μF, ± 20% |

Areas

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

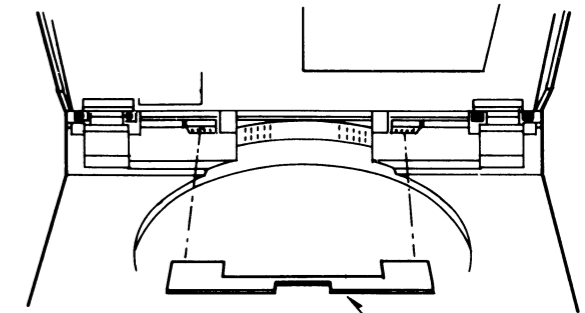
PACKING

1. Make sure that the tonearm is at the start position (the outermost periphery of turntable).
2. Mount the arm spacer. (Do not lock the arm.)



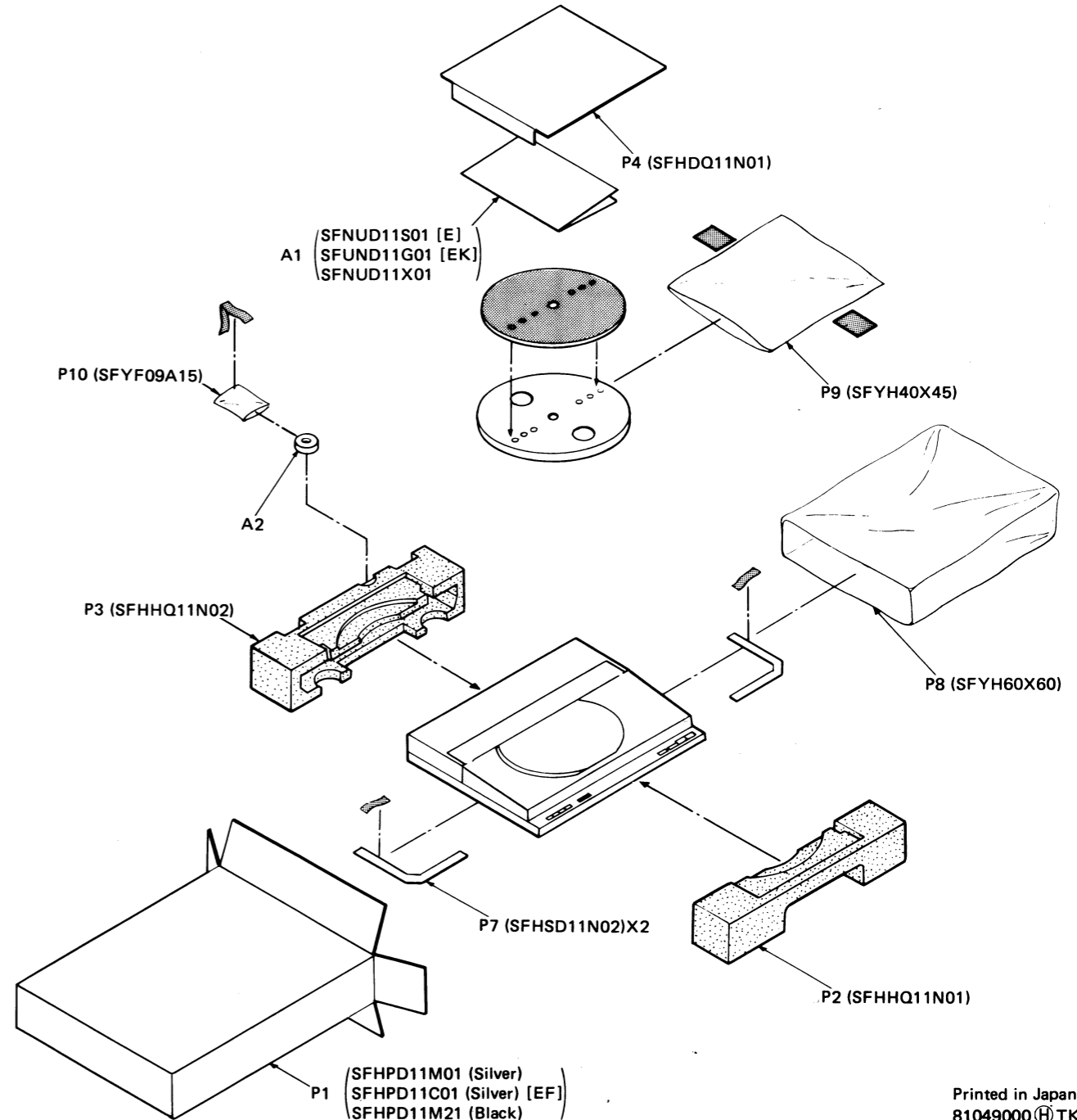
P6 (SFHSD11N01E)

3. Insert the main body spacer between the main body and upper cabinet.



P5 (SFHSD11N03)

4. Pack the components according to the following procedure.



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