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# Service Manual

QUARTZ Direct Drive Automatic Turntable System

# SL-15

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

# SL-15(K)

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

**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.
* [XM] is available in Central South America.
* [EH] is available in Holland.
* [Ei] is available in Italy.

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

English

## Specifications

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

### General

**Power supply:** ~110–120/220–240 V, 50/60 Hz
DC 12 V (DC input jack)

**Power consumption:** 20 W (AC)
6 W (DC)

**Dimensions:** (W x H x D) 31.5 x 8.8 x 31.5 cm
(12-1/2" x 3-1/2" x 12-1/2")
With the cabinet top open to maximum position:
31.5 x 38.5 x 31.5 cm
(12-1/2" x 15-5/32" x 12-1/2")

**Weight:** 6.6 kg (14.3 lb.)

### Turntable section

**Type:** Quartz-phase-locked control direct-drive automatic turntable
Automatic operation
Programmable band selection
Repeat play
Program repeat
2-speed inward/outward search
Program skip
Program in-band repeat
Auto start/Auto lead-in
Auto return
Auto stop
Auto speed select
Auto size select
Record presence detection

**Drive method:** Direct drive
**Motor:** Bruschless DC motor
**Drive control method:** Quartz-phase-locked control
**Turntable platter:** Aluminum diecast
Diameter 30 cm (12 inches)
**Turntable speeds:** 33-1/3 rpm and 45 rpm
Auto speed select
(Manual selection possible)
**Speed deviation:** Within ± 0.002%
**Wow and flutter:** 0.012% WRMS*
0.025% WRMS (JIS C5521)
± 0.035% peak
(IEC 98A weighted)

*This rating refers to turntable assembly alone, excluding effects of record, cartridge or tonearm, but including platter. Measured by obtaining signal from built-in frequency fenerator 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-mass:** 9 g (including cartridge)
**Tracking error angle:** Within ± 0.1°
**Resonance frequency:** 12 Hz
**Tonearm drive motor:** Coreless DC motor

Technics

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

## ■ Cartridge section

| | |
|---|---|
| **Type:** | Moving magnet stereo cartridge<br>Disc-shaped magnet<br>One point suspension system |
| **Magnet circuit:** | All "HPF" core, precision ground finish |
| **Cantilever:** | Pure boron pipe |
| **Damper:** | TTDD (**T**echnics **T**emperature **D**efense **D**amper) |
| **Magnet:** | Samarium-cobalt (Sm-Co)<br>(BH) max. = 30 MG-Oe |
| **Frequency response:** | 5 Hz – 80 kHz<br>15 Hz – 60 kHz ± 3 dB<br>20 Hz – 15 kHz ± 0.5 dB |
| **Temperature characteristics: (5°C – 35°C)** | ± 0.5 dB (10 kHz)<br>(0 dB at 1 kHz, 20°C)<br>± 2 dB (20 kHz)<br>(0 dB at 1 kHz, 20°C) |
| **Output voltage:** | 2 mV (1 kHz), 5 cm/s. zero to peak, lateral velocity<br>(5.7 mV 1 kHz 10 cm/s. zero to peak, 45° velocity, DIN 45 500) |
| **Channel separation:** | More than 25 dB (1 kHz)<br>More than 20 dB (10 kHz) |
| **Channel balance:** | Within 0.7 dB (1 kHz) |
| **Compliance:** | $12 \times 10^{-6}$ cm/dyne<br>(100 Hz, dynamic) |
| **Vertical tracking angle:** | 20° |
| **DC resistance:** | 500 Ω |
| **Inductance:** | 240 mH |
| **Impedance:** | 1.6 kΩ (1 kHz) |
| **Recommended load resistance:** | 47k Ω – 100 kΩ |
| **Recommended load capacitance:** | Less than 200 pF |
| **Stylus tip:** | 0.2 x 0.7 mil (5 x 18μm)<br>Elliptical diamond stylus |
| **Effective moving mass:** | 0.149 mg |
| **Stylus pressure range:** | 1.25 ± 0.25 g (12.5 ± 2.5 mN) |
| **Weight:** | 6 g (cartridge only) |
| **Replacement stylus:** | EPS-P205ED3 |

■ **Accessories supplied:**

Stylus cleaning brush . . . . . .1
Screwdriver (large) . . . . . .1
Screwdriver (small) . . . . . .1

eutsch

# TECHNISCHE DATEN

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

## ■ Allgemeine Daten

| | |
|---|---|
| **Stromversorgung:** | ~110–120/220–240 V, 50/60 Hz Wechselstrom<br>12 V Gleichstrom (Ausgestattet mit Gleichstrom-Eingangsbuchse) |
| **Leistungsaufnahme:** | 20 W (Wechselstrom)<br>6 W (Gleichstrom) |
| **Abmessungen: (B x H x T)** | 31,5 x 8,8 x 31,5 cm<br>(Bei vollständig geöffnetem Gehäuseoberteil:<br>31,5 x 38,5 x 31,5 cm) |
| **Gewicht:** | 6,6 kg |

## ■ Plattenspieler

| | |
|---|---|
| **Typ:** | Automatischer Quarzgesteuerter Direktantrieb-Plattenspieler<br>Automatischer Betrieb<br>Programmierbare Musikstück-Auswahl<br>Wiederholtes Abspielen<br>Programm-Wiederholung<br>Suchlauf nach innen/außen mit 2 Geschwindigkeiten<br>Programm-Überspringen<br>Wiederholung im programmierten Musikstück<br>Auto-Start/Auto-Zuführung<br>Rückführautomatik<br>Stopp-Automatik<br>Automatische Drehzahlwahl<br>Automatische Plattengrößewahl<br>Plattenpräsenz-Registrierung |
| **Antrieb:** | Direktantrieb |
| **Motor:** | Kollektorloser Gleichstrommotor |
| **Antriebsregel-Methode:** | Quarz-Steuerung (QPL) |
| **Plattenteller:** | Aluminium-Druckguß<br>Durchmesser 30 cm |
| **Plattenteller-Drehzahlen:** | 33-1/3 und 45 U/min<br>Automatische Drehzahlwahl<br>(manuelle Wahl möglich) |
| **Drehzahlabweichung:** | Innerhalb ± 0,002% |
| **Gleichlaufschwankungen:** | 0,012% WRMS*<br>0,025% WRMS (JIS C5521)<br>± 0,035% Spitze<br>(IEC 98A bewertet) |

*Diese Nennleistung bezieht sich auf das Laufwerk-Bauteil allein, ausschließlich Einflüsse von Schallplatte, Tonabnehmer oder Tonarm, aber einschließlich Plattenteller. Gemessen anhand von Signalen vom eingebauten Frequenzgenerator des Motorbauteils.

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

## ■ Tonarm

| | |
|---|---|
| **Typ:** | Dynamisch ausbalancierter Tangential-Tonearm mit Kardanaufhängung mit 4-Punkt-Drehlager |
| **Effektive Masse:** | 9 g (einschließlich Tonabnehmer) |
| **Spurfehlwinkel:** | Innerhalb ± 0,1° |
| **Resonanzfrequenz:** | 12 Hz |
| **Tonarm-Antriebsmotor:** | Kernloser Gleichstrommotor |

## ■ Tonabnehmer

| | |
|---|---|
| **Typ:** | Magnetischer Stereo-Tonabnehmer (MM), Scheibenförmiger Magnet, Einpunkt-Aufhängungssystem |
| **Magnetschaltung:** | Ganz-"HPF"-Kern, Präzisionsschliff-Verarbeitung |
| **Nadelträger:** | Röhre aus reinem Bor |
| **Dämpfer:** | TTDD (**T**echnics **T**emperature **D**efense **D**amper) |
| **Magnet:** | Samarium-Kobalt (Sm-Co)<br>(BH) max. = 30MG·Oe |
| **Frequenzgang:** | 5 Hz – 80 kHz<br>15 Hz – 60 kHz ± 3 dB<br>20 Hz – 15 kHz ± 0,5 dB |





| | |
|---|---|
| **Temperatureigenschaften: (5°C–35°C)** | ± 0,5 dB (10 kHz)<br>(0 dB bei 1 kHz, 20°C)<br>± 2 dB (20 kHz)<br>(0 dB bei 1 kHz, 20°C) |
| **Ausgangsspannung:** | 2 mV bei 1 kHz<br>5 cm/s. Null-zu-Spitze, lateral<br>[5,7 mV bei 1 kHz 10 cm/s. Null-zu-Spitze, 45° (DIN 45 500)] |
| **Kanaltrennung:** | Mehr als 25 dB bei 1 kHz<br>Mehr als 20 dB bei 10 kHz |
| **Kanalabweichung:** | Innerhalb 0,7 dB bei 1 kHz |
| **Nachgiebigkeit:** | $12 \times 10^{-6}$ cm/dyn bei 100 Hz |
| **Vertikaler Spurwinkel:** | 20° |
| **Gleichstromwiderstand:** | 500Ω |
| **Induktivität:** | 240 mH |
| **Impedanz:** | 1,6 kΩ bei 1 kHz |
| **Empfohlener Belastungswiderstand:** | 47 kΩ – 100 kΩ |
| **Empfohlene Belastungskapazität:** | Weniger als 200 pF |
| **Nadelspitze:** | 0,2 x 0,7 Mil (5 x 18μm)<br>Elliptische Diamantnadel |
| **Effektive bewegliche Masse:** | 0,149 mg |
| **Auflagekraft-Einstellbereich:** | 1,25 ± 0,25 g (12,5 ± 2,5 mN) |
| **Gweicht:** | 6 g (nut Tonabnehmer) |
| **Ersatznadel:** | EPS-P205ED3 |

■ **Mitgeliefertes Zubehör**

Nadel-Reinigungspinsel . . . . . .1
Schraubenzieher (groß). . . . . .1
Schraubenzieher (klein) . . . . . .1

Français

# CARACTERISTIQUES

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

## ■ Généralités

| | |
|---|---|
| **Alimentation:** | Alternatif 110–120/220–240 V, 50/60 Hz<br>12V C.C. (borne d'entrée C.C.) |
| **Consommation:** | 20 W (C.A.)<br>6 W (C.C.) |
| **Dimensions: (L x H x P)** | 31,5 x 8,8 x 31,5 cm<br>(12-1/2" x 3-1/2" x 12-1/2")<br>Avec le dessus du boîtier ouvert à la position maximale:<br>31,5 x 38,5 x 31,5 cm,<br>(12-1/2" x 15-5/32" x 12-1/2") |
| **Poids:** | 6,6 kg (14,3 livres) |

## ■ Platine de lecture

| | |
|---|---|
| **Type:** | Platine automatique à entraînement direct à réglage d'asservissement de phase par quartz.<br>Fonctionnement automatique<br>Sélection de plage programmable<br>Audition répétpée<br>Répétition de programmes<br>Fonction de recherche à 2 vitesses vers l'intérieur/extérieur<br>Omission de programmes<br>Répétition de la plage programmée<br>Départ automatique/Entrée automatique<br>Retour automatique<br>Arrêt automatique<br>Sélection de vitesse automatique<br>Sélection de diamètre automatique<br>Détection de la présence d'un disque |
| **Système d'entraînement:** | Entraînement direct |
| **Moteur:** | Moteur C.C. sans balai |
| **Groupe de réglage:** | Réglage d'accrochage de phase par quartz |
| **Plateau de lecture:** | Aluminium moulé sous pression<br>Diamètre 30 cm (12 pouces) |
| **Vitesses de rotation:** | 33-1/3 et 45 t/p.m.<br>Sélecteur de vitesse automatique<br>(Sélection manuelle possible) |
| **Déviation de la vitesse:** | En degcà de ± 0,002% |
| **Pleurage et scintillement:** | 0,012% de valeur efficace*<br>0,025% de valeur efficace (JIS C5521)<br>± 0,035% de crête<br>(IEC 98A Pondéré) |

*Ce régime nominal se rapporte à l'ensemble du tournedisque seul, excluant les effets du disque, de la cellule pick-up ou du bras de lecture, mais comprenant le plateau, Mesuré par l'obtention d'un signal provenant du générateur de fréquences incorporé de l'ensemble du moteur.

| | |
|---|---|
| **Ronflement:** | –56 dB (IEC 98A Non pondéré)<br>–78 dB (IEC 98A Pondéré) |

## ■ Bras de lecture

| | |
|---|---|
| **Type:** | Bras de lecture à alignement linéaire de type à équilibre dynamique avec suspension à la cardan à 4 pivots. |
| **Masse réelle:** | 9 g (y compris la cellule pick-up) |
| **Angle d'erreur d'alignement:** | En deçà de ± 0.1° |
| **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.<br>Aimant en forme de disque.<br>Système de suspension ponctuelle. |
| **Circuit magnètique:** | Noyau entièrement en ferrite comprimé à chaud (HPF), finition précise de la masse. |
| **Porte-à-faux:** | Tube à bore pur |
| **Amortisseur:** | TTDD (**T**echnics **T**emperature **D**efense **D**amper) |
| **Aimant:** | Samarium-Cobalt (Sm-Co)<br>(BH) max. = 30 MG·Oe |
| **Réponse en fréquence:** | 5 Hz – 80 kHz<br>15 Hz – 60 kHz ± 3 dB<br>20 Hz – 15 kHz ± 0,5 dB |
| **Caractéristiques de température : (5°C–35°C)** | ± 0,5 dB (10 kHz)<br>(0 dB à 1 kHz, 20°C)<br>± 2 dB (20 kHz),<br>(0 dB à 1 kHz, 20°C) |
| **Tension de sortie:** | 2 mV à 1 kHz; 5 cm/s., zéro à vitesse latérale de crête (5,7 mV à 1 kHz; 10 cm/s., zéro à vitesse 45° de crête [DIN 45 500]) |
| **Séparation des canaux:** | Plus de 25 dB à 1 kHz<br>Plus de 20 dB à 10 kHz |
| **Equilibrage des canaux:** | En deçà de 0,7 dB à 1 kHz |
| **Elasticité:** | $12 \times 10^{-6}$ cm/dyne<br>(100 Hz dynamique) |

| | |
|---|---|
| **Angle d'alignement vertical:** | 20° |
| **Résistance C.C.:** | 500 Ω |
| **Inductance:** | 240 mH |
| **Impédance:** | 1,6 k Ω à 1 kHz |
| **Résistance de charge recommandée:** | 47 k Ω – 100k Ω |
| **Capacitance de charge recommandée:** | Moins de 200 pF |
| **Extrémité de la pointe de lecture:** | 0,2 x 0,7 mil (5 x 18μm) Pointe de lecture à diamant ellipsoidal |
| **Masse de déplacement réelle:** | 0,149 mg |
| **Plage de la force verticale d'appui:** | 1,25 ± 0,25 g (12,5 ± 2,5 mN) |
| **Poids:** | 6 g (cellule seule) |
| **Pointe de lecture de remplacement:** | EPS-P205ED3 |

**Accessoires fournis:**

Brosse de nettoyage pour la pointe de lecture. . . . . 1
Tournevis (grand). . . . . 1
Tournevis (petit). . . . . 1

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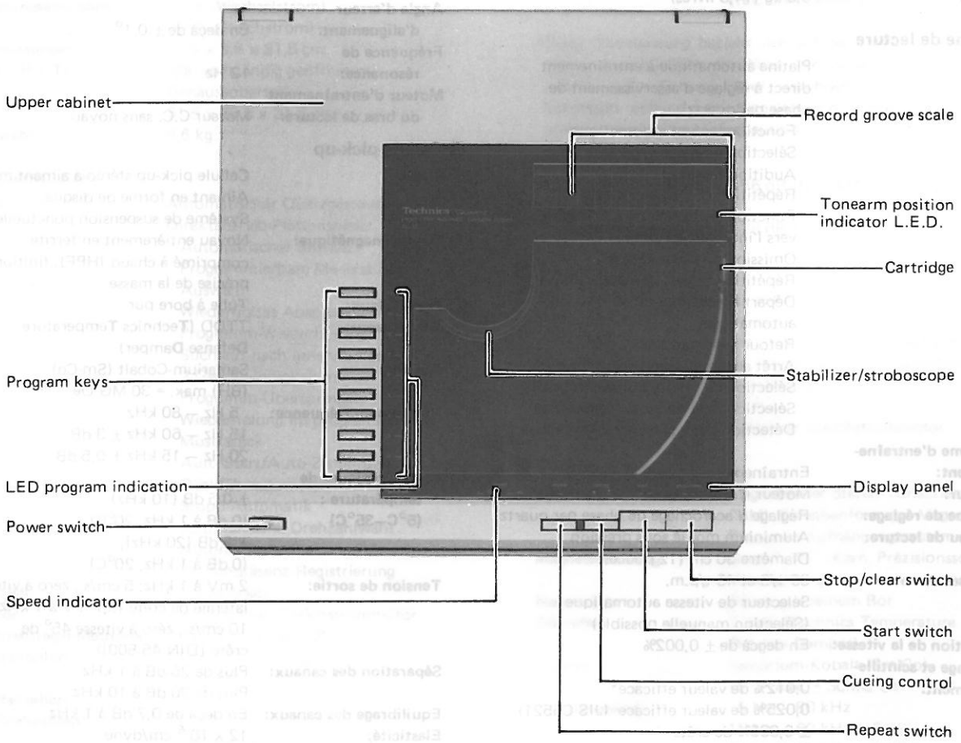
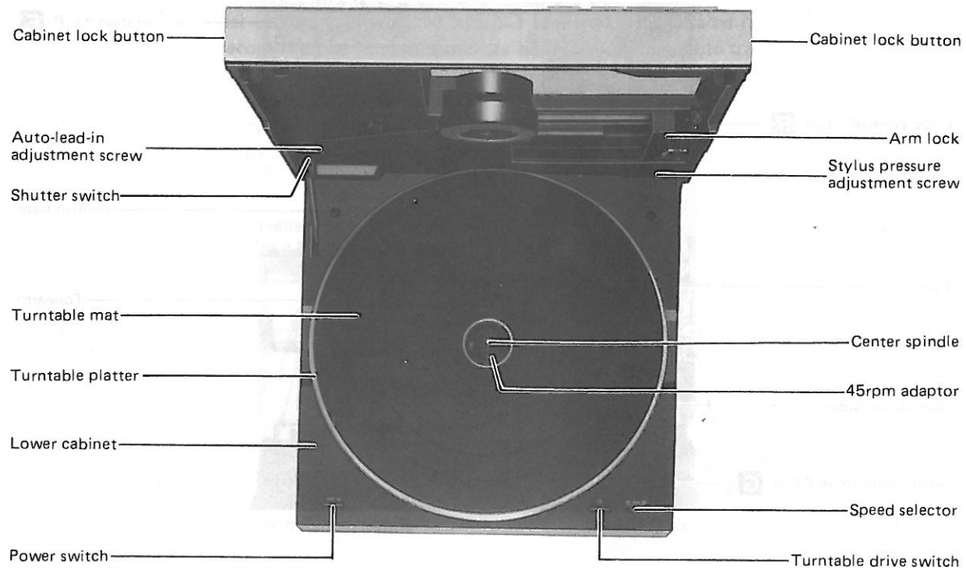
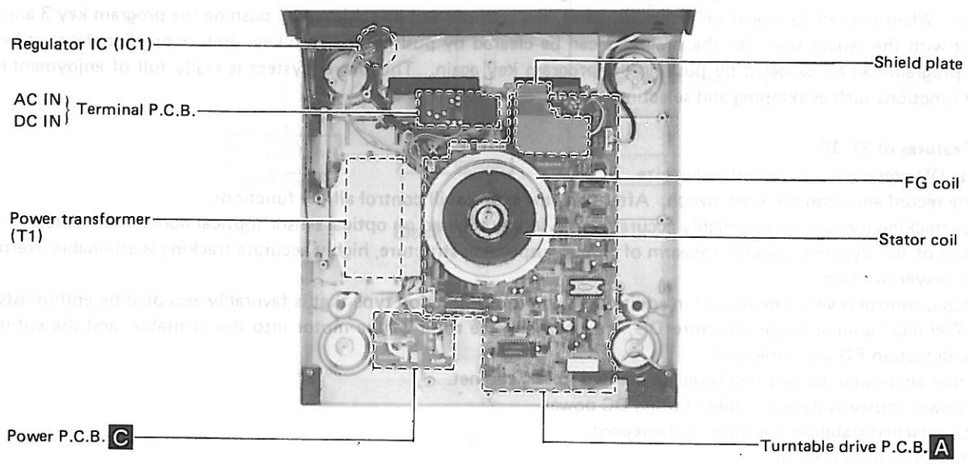
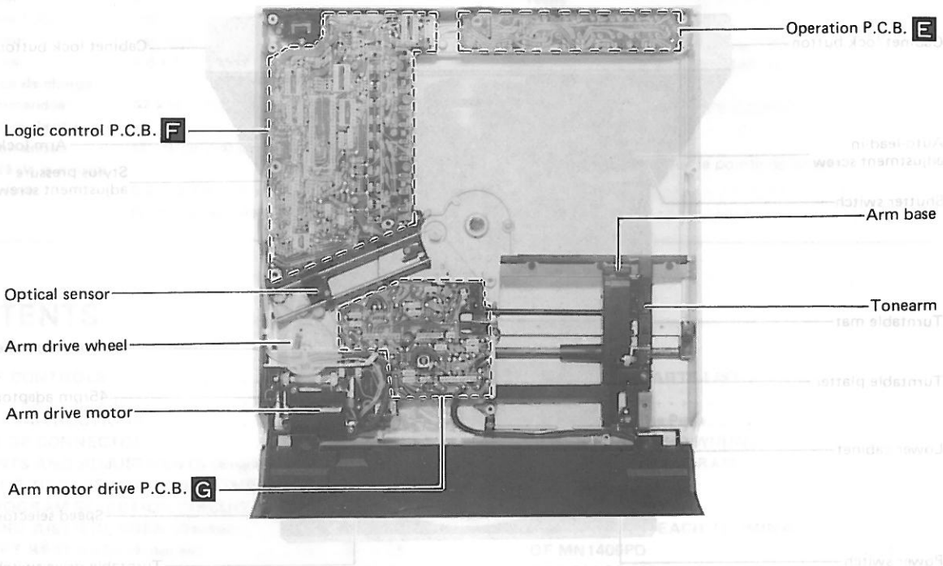
## LOCATION OF CONTROLS










## GENERAL

This is a high efficiency quartz DD player system provided with an automatic program selecting function, taking over the size and functions of SL-10 **[See (Note).]**.
The automatic program selecting function is to detect the blank between specific bands on the record disc by the reflection type optical sensor using infrared ray and to move the tonearm to the head of the band by the microcomputer. This detecting sensor is built into the upper cabinet, but it is located away from the tonearm and cartridge positions, and is interlocked with the tonearm operating mechanism to detect the number of bands and their positions. Thus, the detection system is very unique.
Normal operation of this unit without touching the program keys brings about the same functions as those of SL-10. When the program keys are touched, the tonearm once moves to the inner periphery of the record, while the reflection type otpical sensor reads the number of bands and their positions on the record; then, pushing start key causes the tonearm to play the programed bands in order.
For example, when the start key is pushed after setting the program keys 2, 5, 3, 1 and 4 in order, the 2nd, 5th, 3rd 1st and 4th programs are played in order. During the play, the program LED blinks indicating the position of band being played. Also, with it interlocked with the repeat key, the programs can be continuously played in the order of 2nd, 5th, 3rd, 1st and 4th bands. When desired to repeat only the 3rd band, the purpose can be achieved by pushing the program key 3 and interlocking it with the repeat key. All the programs can be cleared by pushing the stop key. Before pressing the start key, the selected program can be canceled by pushing the program key again. This player system is really full of enjoyment having multiple functions such as skipping and selecting of the programs.

**Note: Features of SL-10**

1. Quartz DD compacted to record jacket size.
   Set the record and push the start switch. After that, the player will control all the functions.
2. Linear tracking tonearm having highly accurate servo function based on optical sensor (optical non-contact detection).
   Because of the dynamic balance tonearm of gimbal suspension structure, highly accurate tracking is attainable irrespective of the player positions.
3. The basic control is very simple, and in addition, it is of multi-function type that is favorably accepted by enthusiasts.
4. The Technics' unique single structure DD, incorporating the rotor of the motor into the turntable, and the entire periphery detection FG are employed.
5. Precision aluminum die-cast two-layer (upper and lower) cabinet.
6. Two-power source system, capable of using DC power.
7. Strobe-attached stabilizer for holding the record.
8. Adapter (45 r.p.m) built-in.
9. Dial scale to check the tonearm position.





- **Automatic program selection (See Fig. A)**

The optical sensor unit in the upper cabinet is interlocked with the tonearm. The infrared ray radiated from the infrared LED of the Sensor is cast on the record disc, and the reflected ray is received by the photo transistor. The reflection factor is higher at the blank groove causing the amount of light entering the photo transistor to increase. At the sound groove, the amount of light entering the photo transistor decreases due to diffused reflection.
The blank between bands is found by detecting the difference in reflection factor between the blank and sound grooves. The reflected signal is then processed by the microcomputer to control the tonearm operation.

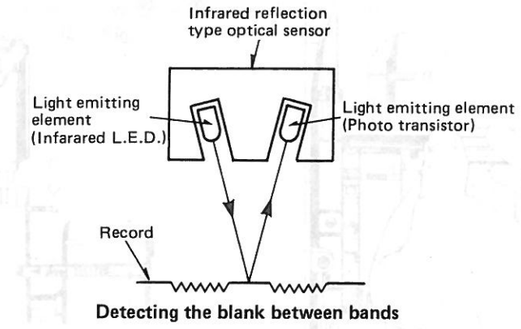
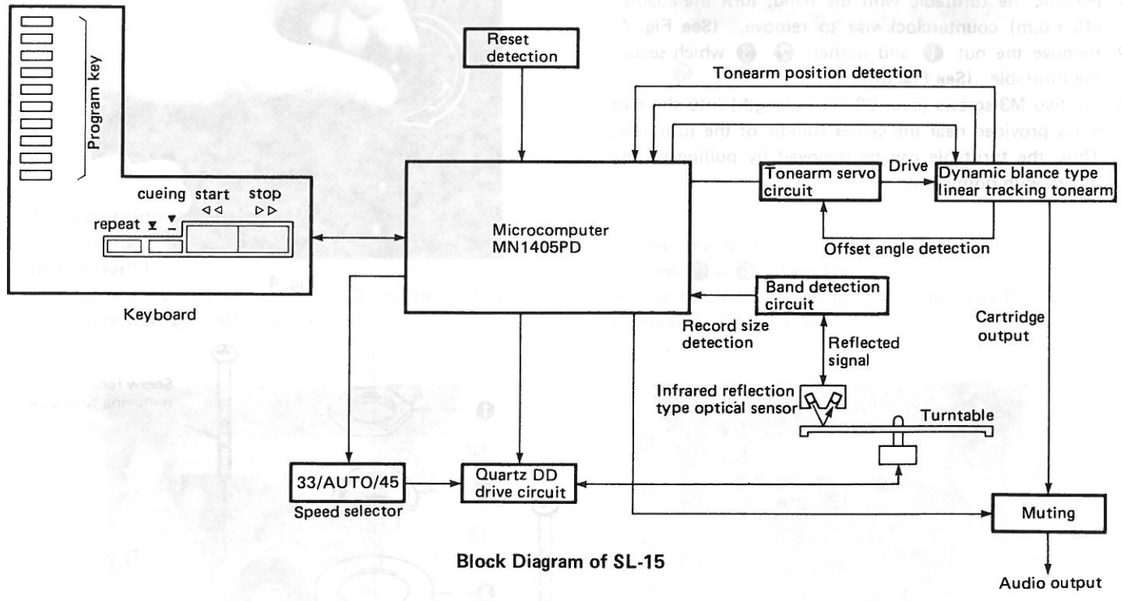



Fig. A




Block Diagram of SL-15

# DISASSEMBLY INSTRUCTIONS

## How to remove the cartridge

1. Push the lock button and slowly open the upper cabinet.
2. Lock the tonearm by sliding the arm lock. **(See Fig. 1)**
3. Loosen the cartridge setscrew with the screwdriver (large). (Loosen the screw until it is freed as illustrated.) **(Fig. 2)**
4. Pull out the cartridge taking care not to touch the stylus tip. **(See Fig. 3)**
5. When installing the cartridge, match the cartridge pin with the tonearm connector, completely insert the pin and then tighten the setscrew.

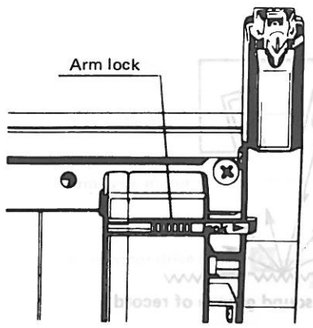



Fig. 1

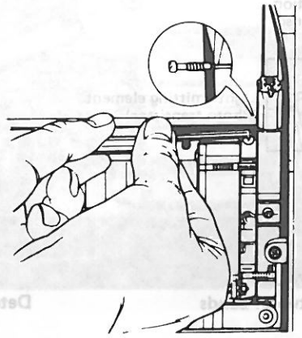


Fig. 2

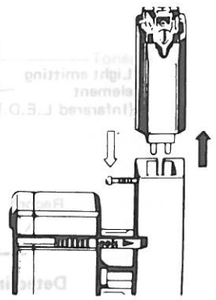


Fig. 3

## How to remove the turntable

1. Holding the turntable with the hand, turn the adapter (45 r.p.m) counterclockwise to remove. **(See Fig. 4)**
2. Remove the nut ❶ and washers ❷, ❸ which secure the turntable. **(See Fig. 5)**
3. Fit two M3 screws (over 30mm in length) into the two holes provided near the center spindle of the turntable. Thus, the turntable can be removed by pulling up the screws with both hands.

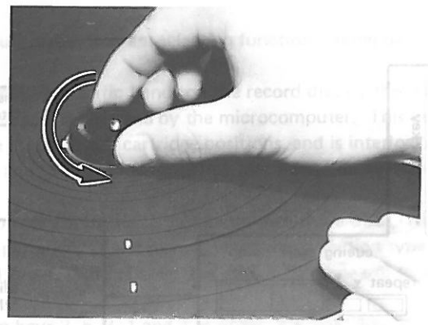


Fig. 4

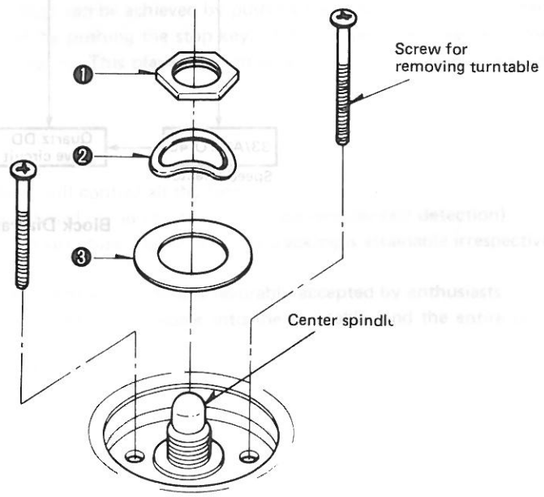



Fig. 5





## How to remove the body cover

1. Completely open the upper cabinet, pull the stay toward you and remove it from the damper. **(See Fig. 6)**
2. Remove the turntable. **(Refer to "How to remove the turntable".)**
3. Remove the cover of the power source P.C.B. and detach the connectors ❹ and ❺ from the connector ❻ of the drive P.C.B. **(See Fig. 7)**
4. Remove the 4 rubber caps of the body cover; remove the body cover setscrews ❼ ~ ⓯ ; then the body cover can be removed. **(See Fig. 7)**

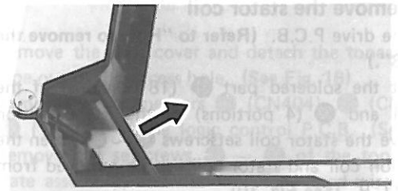


Fig. 6

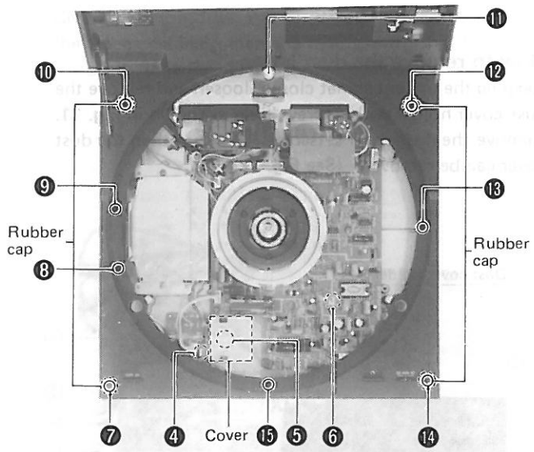



Fig. 7

## How to remove the drive P.C.B.

1. Remove the body cover. **(Refer to "How to remove the body cover".)**
2. Remove the shield cover setscrew ⓰ and drive circuit board setscrews ⓱ ~ ㉑ . **(See Fig. 8)**
3. Remove the 6 connectors ㉒ ~ ㉗ and stator cover setscrews ㉘ ~ ㉚ . **(See Fig. 9)**
4. Remove the IC1 setscrew ㉛ ; then the drive P.C.B. can be removed. **(See Fig. 9)**

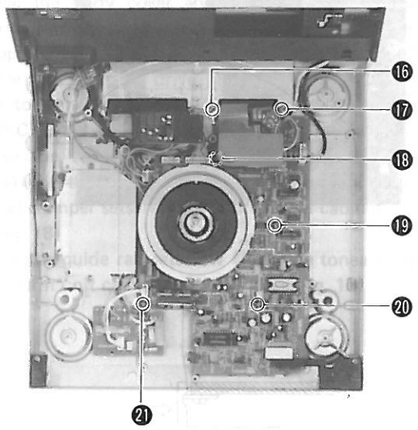



Fig. 8

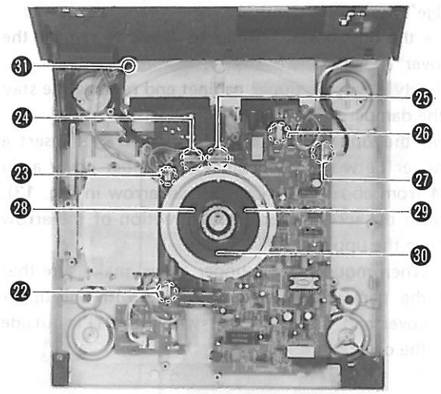



Fig. 9

### How to remove the stator coil

Remove the drive P.C.B. **(Refer to "How to remove the drive P.C.B".)**

Disconnect the soldered part ㉛ (18 portions) of the stator coil and ㉜ (4 portions) of the FG detection coil; remove the stator coil setscrews ㉝ ~ ㉟ , then the FG detection coil and stator coil can be removed from the drive P.C.B. **(See Fig. 10)**

**Note:** When removing only the stator coil, unsolder the part ㉛ (18 portions) and remove the setscrews ㉝ ~ ㉟ .

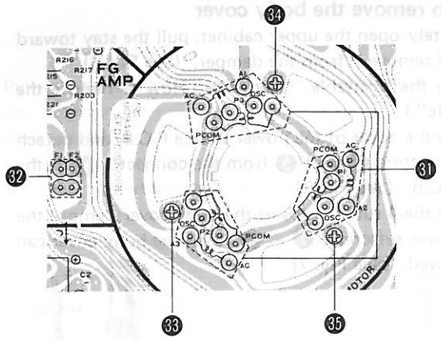



Fig. 10

### How to remove the dust cover

Keeping the upper cabinet closed, loosen and remove the dust cover holder with a screwdriver as shown in **Fig. 11.** Remove the dust cover setscrews ㊱ ~ ㊳ ; then the dust cover can be removed. **(See Fig. 12)**

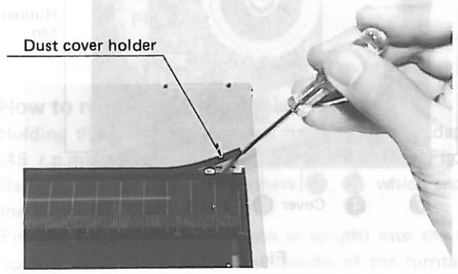



Fig. 11

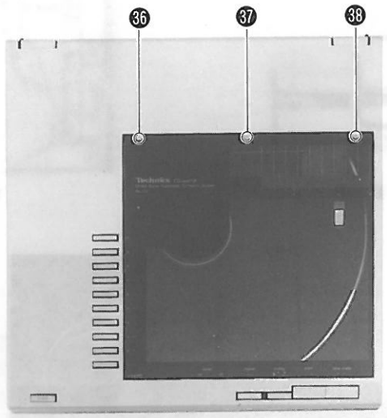


Fig. 12

### How to remove the upper cover

. Shift the tonearm inwards, and set the power switch to "off".
. Remove the cartridge. **(Refer to "How to remove the cartridge".)**
. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
. Completely open the upper cabinet and remove the stay from the damper. **(See Fig. 6)**
. Remove the upper cover setscrews ㊴ ~ ㊿ ; insert a screwdriver between the cabinet and upper cover as in **Fig. 14** from above the cabinet (near arrow in **Fig. 13**); then push the screwdriver in the direction of the arrow to remove the upper cover.

**Note:** When mounting the upper cover, make sure that the part of **Fig. 14** is engaged with the upper cover and that the cover switch (S301) is outside the cover.

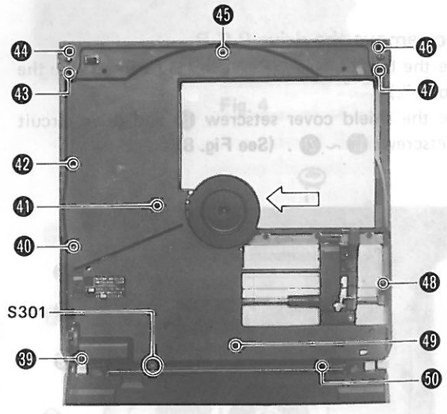



Fig. 13

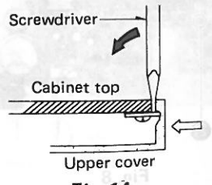



Fig. 14





### • How to remove the logic control P.C.B., arm motor drive P.C.B. and operation P.C.B.

1. Remove the upper cover. **(Refer to "How to remove the upper cover".)**
2. Remove the logic control P.C.B. setscrews ㊶ ~ ㊺ . **(See Fig. 15)**
3. Remove the connector ㊻ (CN204) and ㊼ (CN401) of the logic control P.C.B.; remove the setscrews ㊽ ~ ㊿ of the operation P.C.B. then the operation P.C.B. can be removed. **(See Fig. 15)**

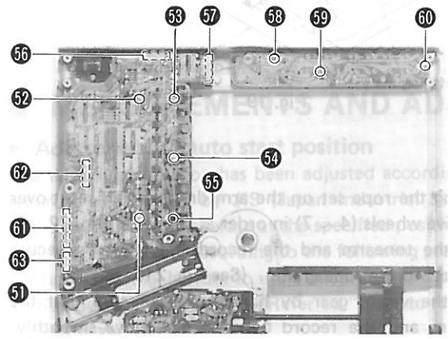


Fig. 15

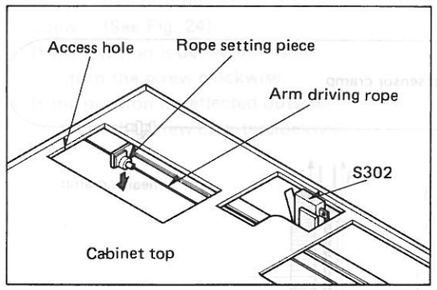



Fig. 16

### • How to remove the tonearm unit

1. Remove the body cover and upper cover. **(Refer to "How to remove the body cover" and "How to remove the upper cover".)**
2. Remove the tonearm drive plate assembly. **(Refer to "How to remove the logic control P.C.B., arm motor drive P.C.B. and operation P.C.B.")**
3. Remove the two connectors ㎀ (PHONO IN) and ㎁ (CN204) of the drive P.C.B.; remove the bushing ㎂ and lead clamper setscrew ㎃ of the upper cabinet. **(See Fig. 18)**
4. Remove the guide rail setscrew ㎄ of the tonearm; then the tonearm unit can be removed. **(See Fig. 18)**
4. Remove the dust cover and detach the tonearm driving rope out of the access hole. **(See Fig. 16)**
5. Remove the connectors ㏁ (CN404), ㏂ (CN405) and ㏃ (CN403) of the logic control P.C.B. **(See Fig. 15)**
6. Remove the setscrews ㏄ ~ ㏆ of the tonearm drive plate assembly, and disconnect the lead wires from the clamper. **(See Fig. 17)**
7. Remove the setscrew ㏇ of the arm motor drive P.C.B. the connector ㏈ (CN303) and ㏉ (CN301); then the arm motor drive P.C.B. can be removed. **(See Fig. 17)**
8. When removing the logic control P.C.B. completely, remove the body cover and two connectors (CN201, CN202) of the drive P.C.B.; detach the bushing ㏐ of the upper cabinet; then the logic control P.C.B. can be removed. **(See Fig. 17)**

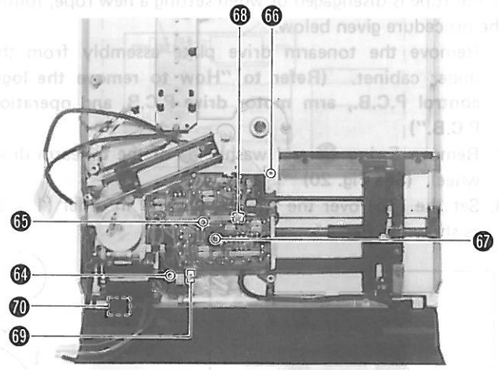


Fig. 17

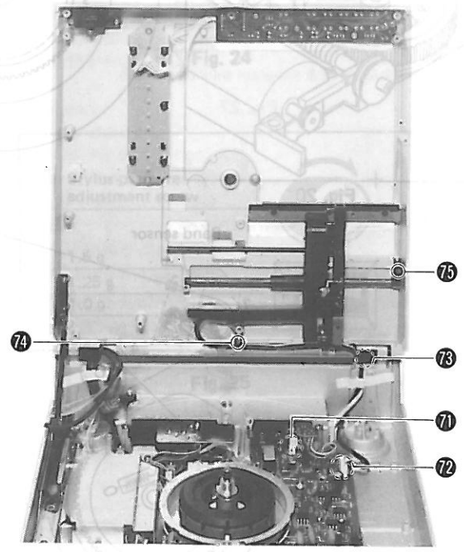


Fig. 18

### • How to remove the lift rod assembly

1. Remove the tonearm unit. **(Refer to "How to remove the tonearm unit".)**
2. Remove the setscrew ⑯ of the lift rod assembly. **(See Fig. 19)**
3. Press the outer periphery of the lift rod with a screwdriver as shown in **Fig. 19.**

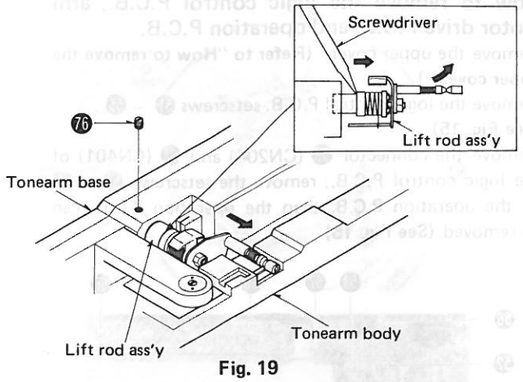



Fig. 19

### • How to set the tonearm drive rope

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

1. Remove the tonearm drive plate assembly from the upper cabinet. **(Refer to "How to remove the logic control P.C.B., arm motor drive P.C.B. and operation P.C.B.")**
2. Remove E-ring ⑰ and washer ⑱ of the tonearm drive wheel. **(See Fig. 20)**
3. Set the rope over the arm drive wheel in order (1 ~ 3) as shown in **Fig. 21.**
4. Holding the rope set on the arm drive wheel, set it over the drive wheels (4 ~ 7) in order as shown in **Fig. 22.**
5. Slide the tonearm and the record band sensor; secure the parts to the rope cramp. **(See Fig. 21)**
6. Turn the worm gear by hand to make sure that the tonearm and the record band sensor move smoothly.
7. Fit the arm drive wheel with E-ring ⑰ and washer ⑱ .

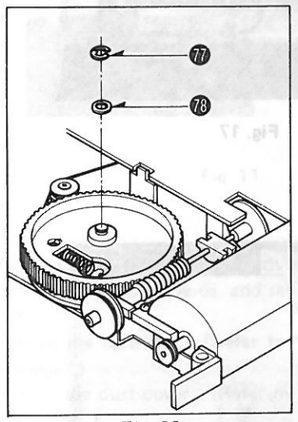



Fig. 20

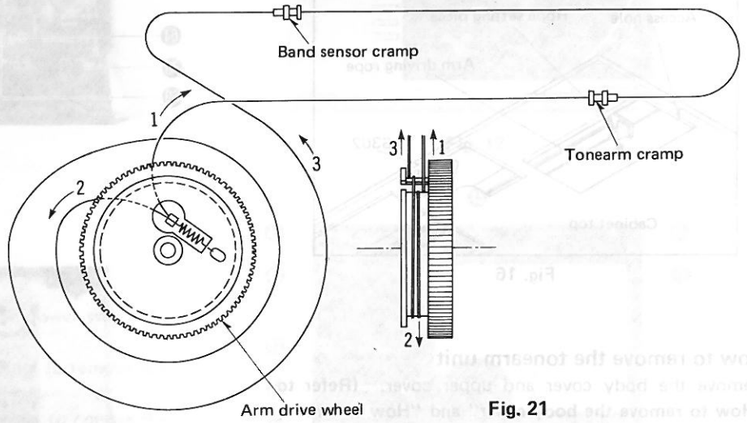



Fig. 21

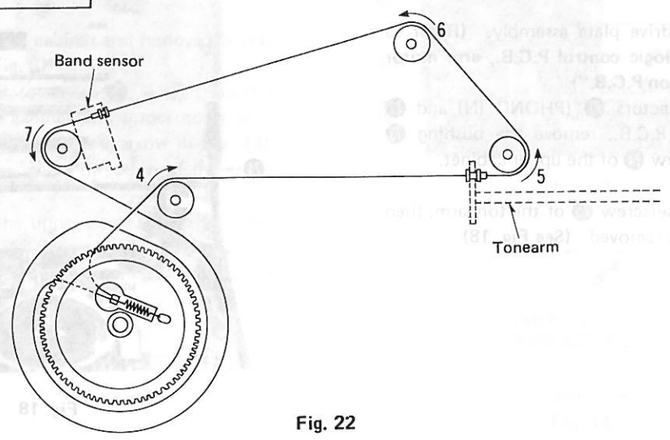



Fig. 22





## ■ 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. 23)**
**Note:** Soldered connectors (indicated by BT) cannot be pulled out.

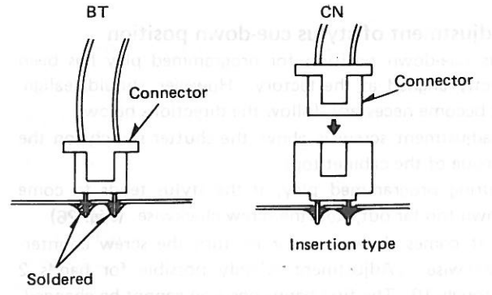



Fig. 23

## ■ MEASUREMENTS AND ADJUSTMENTS English

### • Adjustment of auto start position

The auto start position has been adjusted according to the record size specified by JIS (Japan Industrial Standards). If the stylus fails to operate at the specified position on the record disc, adjust it according to the following procedure.
* When adjusting, be sure to use a 30cm record disc.

1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Make sure that the tonearm is at the start position (on the rest).
3. Adjust by turning the auto start position adjusting screw. **(See Fig. 24)**
   If the position is deflected inside. . . . . turn the screw clockwise.
   If the position is deflected outside. . . . . turn the screw counterclockwise.

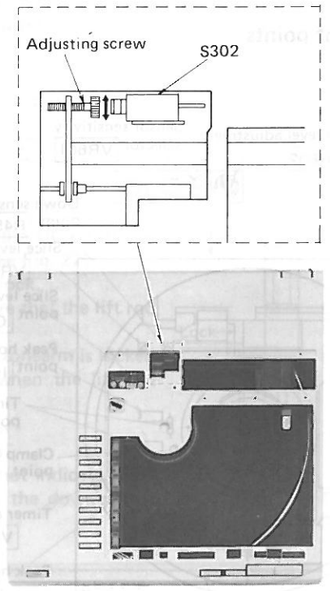



Fig. 24

### • Adjustment of stylus pressure

Stylus pressure is normally set to 1.25 grams but may be raised or lowered by ± 0.25 grams.
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 prevend distortion and groove-skipping.
In such cases, turn the screw clockwise (+) so that dial scale shows the desired stylus pressure, as indicated in the illustration. **(See Fig. 25)**
**Note:**
Do not turn the stylus-pressure adjustment screw further than the set limits (1.5 g ~ 1.0 g).

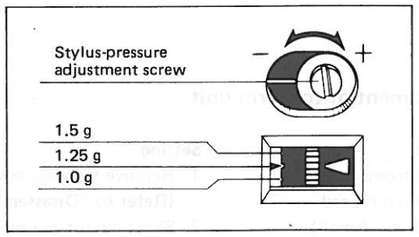



Fig. 25

## • Adjustment of stylus cue-down position

Stylus cue-down position for programmed play has been correctly aligned at the factory. However, should realignment become necessary, follow the directions below.
The adjustment screw is above the shutter switch (on the underside of the cabinet top).

- During programmed play, if the stylus tends to come down too far out, turn the screw clockwise. **(Fig. 26)**
- If it comes down too far in, turn the screw counterclockwise. Adjustment is only possible for bands 2 through 10. The first bands position cannot be changed.

* **For the adjustment of the stylus cue-down position for the 1st band, adjust the auto start position.**

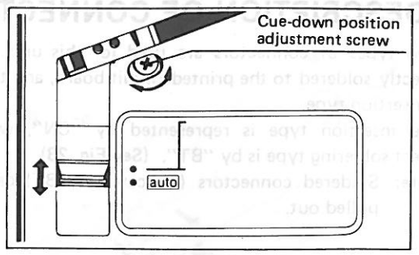



Fig. 26

## • Adjustment points

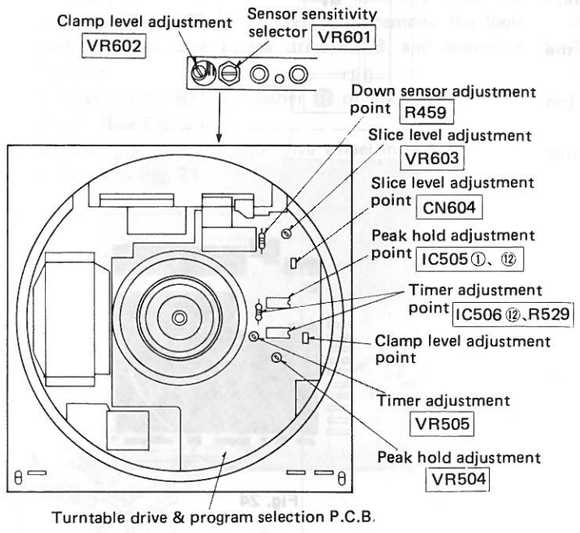



Fig. 27

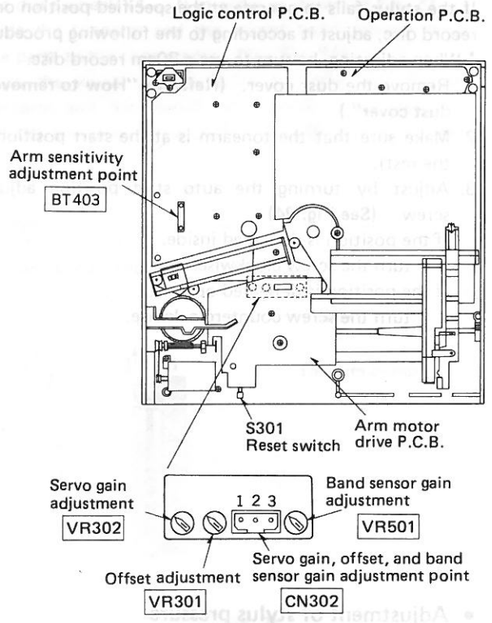



Fig. 28

## • Adjustment of tonearm unit

**Tools used**

1. DC electronic voltmeter
2. 1mm pitch record
3. Screwdriver (small)
4. Hexagon wrench (M1.5)
5. Adjusting screwdriver

**Setting**

1. Remove the dust cover and top cover. **(Refer to "Disassembly Intructions".)**
2. Short-circuit the reset switch (S301), **(See Fig. 29)**
3. Open the upper cabinet and make sure that the tonearm can be operated by switch.

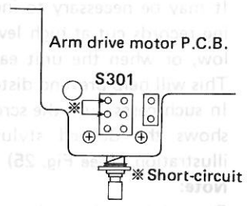
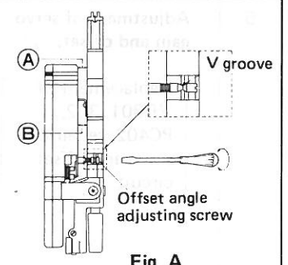
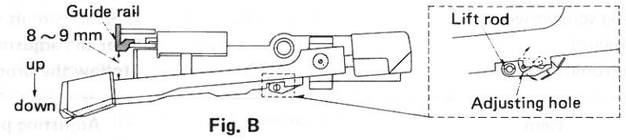
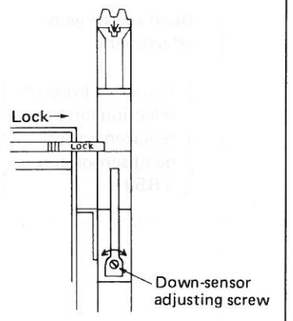
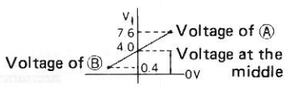
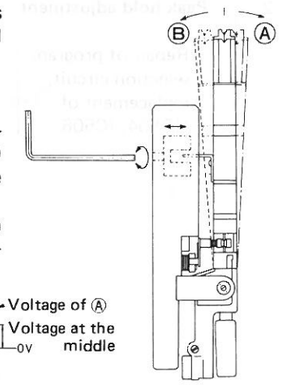



Fig. 29





| Step | Item | Adjustment procedure |
|---|---|---|
| 1 | **Adjustment of tonearm offset angle.**<br>〔Repair of tonearm unit; assembly and replacement of lift rod.〕 | ① Put on the record and push the start button to move the arm inward and turn off the power switch.<br>② Open the upper cabinet and make sure that tonearm center matches the V groove of the lift rod. **(See Fig. A)**<br>③ Make sure that the tonearm is parallel with the arm base. (Check the spaces Ⓐ and Ⓑ in **Fig. A.**)<br>④ If the parallelism is not obtained adjust it by turning the offset angle adjusting screw.<br>  <br>**Fig. A** |
| 2 | **Adjustment of arm lift height.**<br>〔Repair of tonearm unit; assembly and replacement of lift rod.〕 | ① Open the upper cabinet. Move the tonearm by pushing the start button.<br>② Lower the tonearm by pushing the cueing button.<br>③ Make sure that the distance between arm and guide rail is 8 ~ 9 mm. **(See Fig. B)**<br>④ If the distance is wrong, adjust it by turning the lift adjusting hole with a screwdriver. **(See Fig. B)**<br>  <br>**Fig. B** |
| 3 | **Sensitivity adjustment of down-sensor.**<br>〔Repair of down-sensor; assembly and replacement of tonearm unit.〕 | ① Remove the turntable and connect the DC electronic voltmeter the both ends of R459. **(See Fig. 27)**<br>② Lock the tonearm by sliding the arm lock.<br>③ Push the cueing button and make sure that the lift rod moves down.<br>(Only the lift rod descends since the tonearm is locked.)<br>④ Read the voltage values indicated when the lift rod moves down and up.<br>Down . . . . . 3.5V or over<br>Up . . . . . 0.5V or less<br>⑤ If the DC electronic voltmeter does not indicate these voltage values, adjust it by turning the down-sensor adjusting screw. **(See Fig. C)**<br>  <br>**Fig. C** |
| 4 | **Adjustment of tonearm sensitivity.**<br>〔Repair of arm base unit; replacement of PC402.〕 | ① Connect the DC electronic voltmeter to the terminals ① (+) and ⑨ (–) of BT403 of the logic control P.C.B. **(See Fig. 28)**<br>② Push the start button to move the tonearm.<br>③ Push the cueing button to move the arm down.<br>④ Read the voltage values indicated when the arm is completely moved in the directions Ⓐ and Ⓑ. **(See Fig. D)**<br>⑤ Calculate the voltage at the central point from the difference between the voltage values.<br>For example, when the voltage is 7.6V in the direction of Ⓐ, and 0.4V in the direction of Ⓑ, then the calculation is as follows.<br>$(7.6 - 0.4) \div 2 + 0.4 = 4.0V$<br>  <br>⑥ Match the arm center with the V groove of the lift rod, and adjust by turning the adjusting screw of the arm base with a hexagon wrench.<br>  <br>**Fig. D** |

| Step | Item | Adjustment procedure |
|---|---|---|
| 5 | **Adjustment of servo gain and offset.**<br>[Replacement of VR301, 302, PC402; repair of servo and offset circuit.] | ① Connect the DC electronic voltmeter to the terminals ① and ② of connector (CN301) in the adjusting hold. **(See Fig. E)**<br>② Push the cueing button to move the arm down.<br>③ Completely turn VR301 clockwise, and then turn VR302 so that the DC electronic voltmeter indicates 0.72V. **(See Fig. E)** . . . . . **Servo gain adjustment.**<br>④ Put a 1 mm pitch record on the turntable and play it.<br>⑤ Turn VR301 so that the DC electronic voltmeter indicates 0.6V. **(See Fig. E)** . . . . . **Offset adjustment.** |

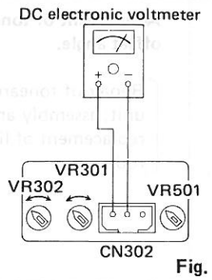


Fig. E

## • Adjustment of program selection circuit

**Toolese used**

1. Oscilloscope (two channel type)
2. Adjusting screwdriver
3. 30 cm record
4. DC electronic voltmeter

**Setting**

1. Remove the dust cover. **(Refer to "Disassembly instructions".)**
2. Short-circuit reset switch (S301).

*** For the adjustment of the program selection circuit, follow the procedure in the table below.**

| Step | Item | Adjusting procedure |
|---|---|---|
| 1 | **Band sensor gain adjustment.**<br>[Repair of program selection circuit; replacement of band sensor and VR501.] | ① Connect the oscilloscope to CN302 [terminals ②,③] in the access hole of the upper cabinet. **(See Fig. F)**<br>② Place the record on the turntable and move the tonearm toward the center of the disc where there is no sound groove.<br>③ Stop the turntable by hand and adjust VR501 so that the output voltage is **1.7 ± 0.1V. (See Fig. G)**<br>**Note:** Be sure to stop the turntable because the output waveform changes if the turntable is rotating. |
| 2 | **Peak hold adjustment**<br>[Repair of program selection circuit; replacement of VR504, IC506.] | ① Remove the turntable. **(See "Disassembly Procedure".)**<br>② Connect CH1 of the oscilloscope (two channel type) to IC505 terminal ①, and CH2 to terminal ⑫. **(See Fig. 27)**<br>③ Bring the no-sound groove (around the disc center) of the record disc close to the band sensor of the upper cabinet and secure it with tape. **(See Fig. H)**<br>④ Adjust VR504 so that the peak wave phase of CH2 is as shown in **Fig. I.**<br>The output of CH1 varies in peak value depending on the interval between the record disc and sensor or the reflection factor of record surface. |

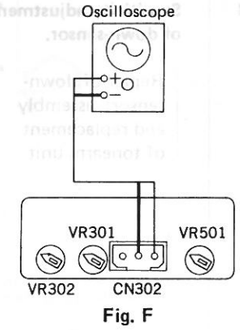


Fig. F

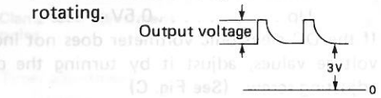


Fig. G

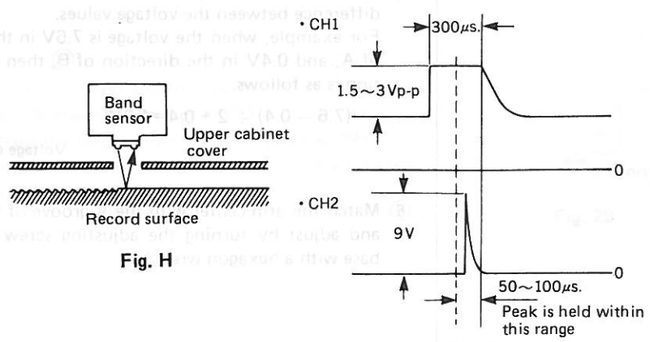


Fig. H

Fig. I





| Step | Item | Adjusting procedure |
|---|---|---|
| 3 | **Slice level adjustment**<br>[Repair of program selection circuit; replacement of VR603.] | ① Connect the DC voltmeter to CN604. **(See Fig. 27)**<br>② Lock the tonearm and push the cueing button to lower the lift. (Then, make sure the illuminating lamp goes out.)<br>③ Adjust VR603 so that the voltage value is **0.5 ± 0.02V.** |
| 4 | **Clamp level adjustment**<br>[Repair of program selection circuit; replacement of VR602.] | ① Connect the DC electronic voltmeter to CN603 [terminals①,③]. **(See Fig. 27)**<br>② Lock the tonearm and push the cueing button to lower the lift. (Then make sure the illuminating lamp goes out.)<br>③ Adjust VR602 so that the voltage value is **1.0 to 1.3V.** |
| 5 | **Timer adjustment**<br>[Replacement of IC506, VR505.] | ① Remove the turntable, then connect an oscilloscope to No. ⑩ terminal of IC506 at the pointer intermediated by R529. **(See Fig. 27 and J)**<br>② Short circuit the 9V of No. ⑯ terminal of IC506 with No. ⑫ terminal, supply trigger pulse as the input, then adjust VR505 so as the output pulse width at R529 becomes 100ms. |
| 6 | **Descend-at-blank position adjustment**<br>[Repair of program selection circuit; replacement of band sensor.] | ① After completing the adjustment above, let the tonearm descend between the 1st and 2nd bands. (To play the program.)<br>② If the position is incorrect, adjust it according to the same procedure as in **"Adjustment of stylus cue-down position".** |

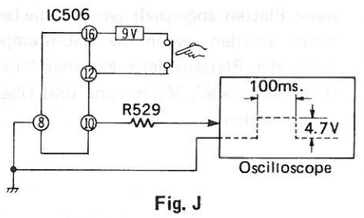


Fig. J

## ■ SYMPTOMS DUE TO DEFECTIVE ADJUSTMENTS OF THE PROGRAM SELECTION CIRCUIT

**1. Band sensor gain adjustment**

Gain is insufficient:
- * Since turntable detection at rest position is impossible, 17 cm and 25 cm records are detected as 30 cm record.
- * Blank between bands is skipped.

Gain is excessive:
- * A 30 cm record is not detected as 30 cm record but as 25 cm or 17 cm record.
- * In this case, the stylus is liable to drop into sound groove.

**2. Peak hold adjustment**
- * Record size cannot be detected.
- * Blank between bands cannot be detected.

**3. Slice level adjustment and clamp level adjustment**

Level is too high:
- * Blank between bands is skipped.
- * Stylus is liable to drop into sound groove.

**4. Timer adjustment**

Time is too long:
- * It is impossible to detect bands whose width is about 2 mm.

Time is too short:
- * Blanks in a band are detected by mistake as blanks between bands, resulting in faulty detection.

## ■ MESSUNGEN UND JUSTIERUNGEN — Deutsch

### • Justierung der Auto-Start-Position

Die Auto-Start-Position wurde in Übereinstimmung mit der durch die JIS (Japanische Industrienorm) vorgeschriebenen Plattengröße justiert. Wenn die Abtastnadel nicht an der Korrekten Stelle auf die Platte abgesenkt wird, ist auf folgende Weise zu korrigieren.

*Für diese Justierung muß unbedingt eine 30cm-Platte verwendet werden.

1. Die Staubabdeckung abnehmen. **(Siehe "Entfernen der Staubabdeckung".)**
2. Überprüfen, daß der Tonarm in der Start-Position ist (auf der Ablage).
3. Durch Drehen der Auto-Start-Position-Justierschraube justieren. **(Siehe Abb. 24)**
   Falls die Start-Position zu weit innen ist . . . . . die Schraube im Uhrzeigersinn drehen.
   Falls die Start-Position zu weit außen ist . . . . . die Schraube entgegen dem Uhrzeigersinn drehen.

### • Justieren Sie die Auflagekraft in den folgenden Fällen

Die normale Auflagekraft beträgt 1,25 g, doch kann sie um ± 0,25 g 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. 25)**

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

### • Justierung der Nadel-Absenkposition

Die Nadelabsenkposition für das programmierte Abspielen wurde werkseitig korrekt justiert. Falls trotzdem eine Neujustierung nötig wird, auf folgende Weise vorgehen.
Die Justierschraube befindet sich über dem Blendenschalter (an der Unterseite des Gehäuseoberteils).

*Wenn die Abtastnadel beim programmierten Abspielen generell zu weit außen abgesenkt wird, die Schraube im Uhrzeigersinn drehen. **(Abb. 26)**

*Wenn die Abtastnadel zu weit innen abgesenkt wird, die Schraube entgegen dem Uhrzeigersinn drehen. Die Justierung ist nur möglich für die Musikstücke 2 bis 10. Die Position des ersten Musikstückes kann mit dieser Schraube nicht justiert werden.

*Für die Justierung der Nadelabsenkposition für das erste Musikstück ist die Auto-Start-Position zu justieren.

### • Justierung der Tonarmeinheit

**Benötigte Werkzeuge und Instrumente**

1. Elektronisches Gleichstrom-Voltmeter
2. Platte mit 1 mm-Rillenabstand
3. Schraubenzieher (klein)
4. Sechskantschlüssel (M1.5)
5. Justierschraubenzieher

**Zustand des Gerätes**

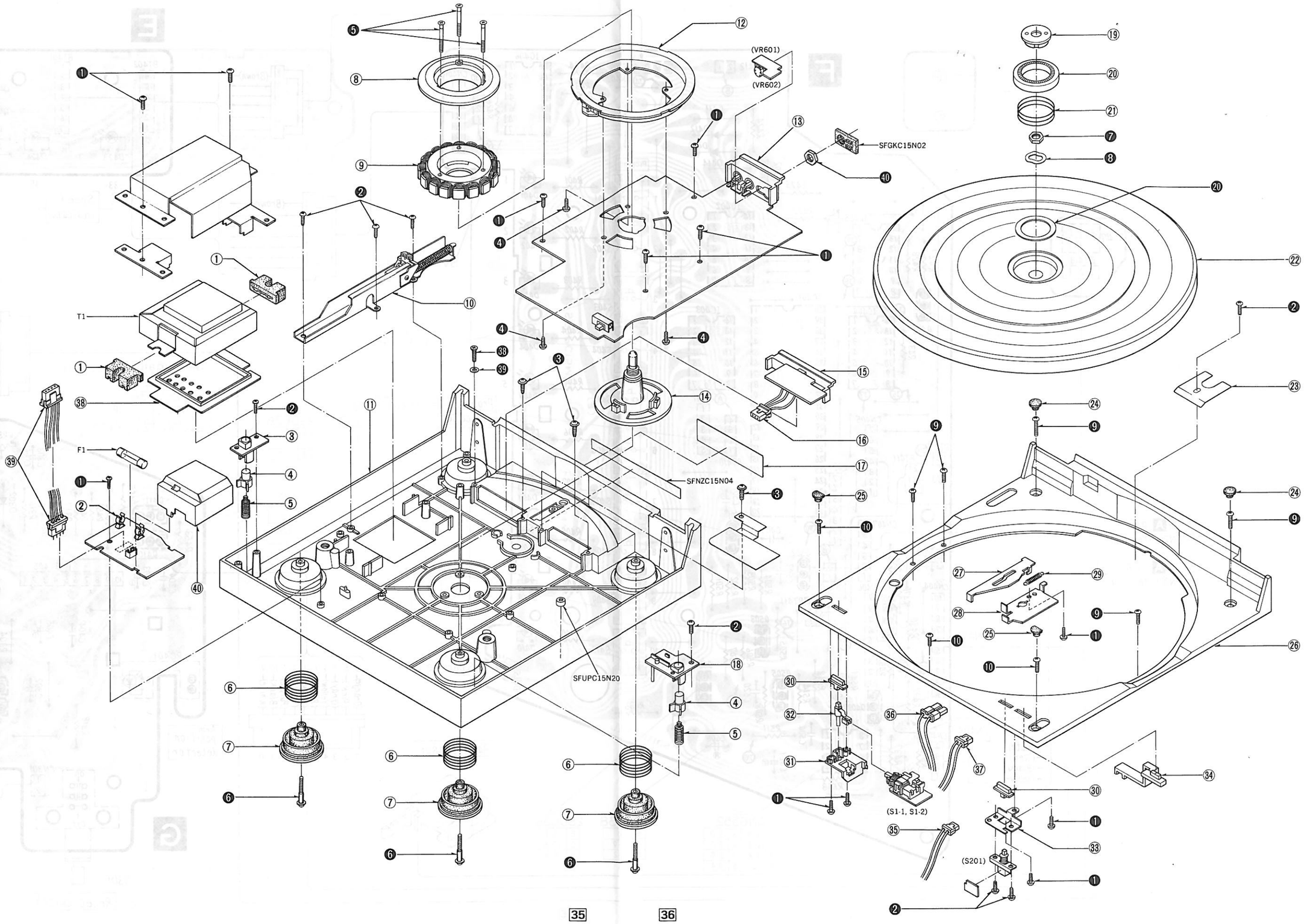
1. Die Staubabdeckung und die Oberabdeckung entfernen. **(Siehe "Anleitung für die Zerlegung".)**
2. Den Deckelschalter (S301) kurzschließen. **(Siehe Abb. 29)**
3. Das Gehäuseoberteil öffnen und überprüfen, daß der Tonarm funktioniert, wenn die Start-Taste gedrückt wird.



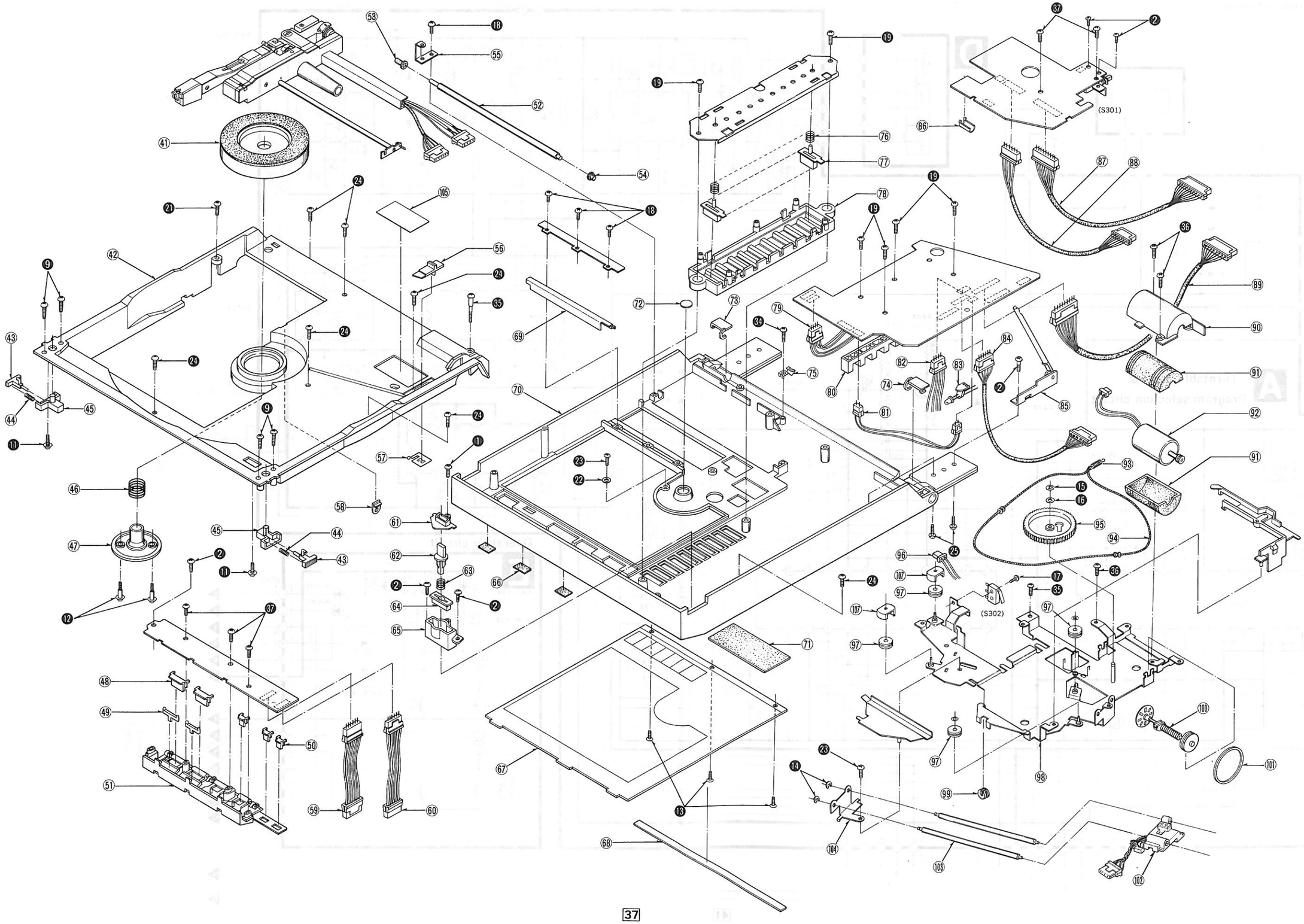


| Schritt | Einstell-Gegenstand | Justiermethode |
|---|---|---|
| 1 | **Justierung des Tonearm-Reibungswinkels**<br>[Reparatur der Tonarmeinheit; Zusammenbau und Ersetzen der Tonarm-Liftachse.] | ① Eine Platte auflegen, die Start-Taste drücken, um den Tonarm nach innen zu bewegen, und den Netzschalter ausschalten.<br>② Das Gehäuseöberteil öffnen und überprüfen, daß die Tonarmmitte mit der V-Kerbe der Liftachse übereinstimmt. **(Siehe Abb. A)**<br>③ Überprüfen, daß der Tonarm parallel zum Tonarmträger ist. **(Die Abstände Ⓐ und Ⓑ in Abb. A überprüfen.)**<br>④ Falls Parallelität nicht erreicht wird, durch Drehen der Reibungswinkel-Justierschraube justieren. |
| 2 | **Justierung der Tonarm-Lifthöhe**<br>[Reparatur der Tonarmeinheit; Zusammenbau und Ersetzen der Tonarm-Liftachse.] | ① Das Gehäuseoberteil öffnen. Den Tonarm durch Drücken der Start-Taste gegen die Plattenmitte bewegen.<br>② Den Tonarn durch Drücken der Lifttaste absenken.<br>③ Überprüfen, daß der Abstand zwischen dem Tonarm und der Führungsschiene 8 ~ 9 mm beträgt. **(Siehe Abb. B)**<br>④ Falls der Abstand nicht korrekt ist, durch Drehen der Lifthöhe-Justierschraube mit einem Schraubenzieher justieren. **(Siehe Abb. B)** |
| 3 | **Justierung der Absenksensor-Empfindlichkeit**<br>[Reparatur des Absenksensors; Zusammenbau und Ersetzen der Tonarmeinheit.] | ① Den Plattenteller entfernen und das elektronische Gleichstrom-Voltmeter an beide Enden von R459 anschließen. **(Siehe Abb. 27)**<br>② Die Tonarmverriegelung gegen den Tonarm schieben, um diesen zu verriegeln.<br>③ Die Lifttaste drücken und überprüfen, daß die Liftachse abgesenkt wird. (Nur die Liftachse wird abgesenkt, da der Tonarm verriegelt ist.)<br>④ Die angezeigten Spannungswerte ablesen, wenn der Tonarm abgesenkt und angehoben wird.<br>AUF . . . . . 3,5V oder mehr<br>AB . . . . . 0,5V oder weniger<br>⑤ Wenn die angezeigten Werte von den obigen Werten abweichen, durch Drehen der Absenksensor-Justierschraube justieren. **(Siehe Abb. C)** |
| 4 | **Justierung der Tonarm-Empfindlichkeit**<br>[Reparatur der Tonarmbasis; Ersetzen von PC402.] | ① Das elektronische Gleichstrom-Voltmeter an die Anschlüsse ① (+) und ⑨ (–) von BT403 auf der Platine anschließen. **(Siehe Abb. 28)**<br>② Den Tonarm durch Drücken der Start-Taste gegen die Plattenmitte bewegen.<br>③ Den Tonarm durch Drücken der Lifttaste absenken.<br>④ Die Spannungswerte bei bis zum Anschlag in Richtung Ⓐ und Ⓑ bewegtem Tonarm ablesen. **(Siehe Abb. D)**<br>⑤ Vom Unterschied zwischen den beiden Spannungswerten die Spannung am Mittelpunkt berechnen.<br>Zum Beispiel, wenn die Spannung in der Richtung Ⓐ 7,6V beträgt, und in der Richtung Ⓑ 0,4V:<br>$(7{,}6 - 0{,}4) \div 2 + 0{,}4 = 4{,}0V$<br>⑥ Die Tonarmitte mit der V-Kerbe der Liftachse in Übereinstimmung bringen und durch Drehen der Justierschraube des Tonarmträgers mit einem Sechskantschlüssel justieren. |
| 5 | **Justierung der Servo-Verstärkung und des Ausgleichs**<br>[Ersetzen von VR301, VR302, PC402; Reparatur der Servo-und der Ausgleichs-Schaltung.] | ① Das elektronische Gleichstrom-Voltmeter an die Steckerstifte ① und ② der Steckverbindung (CN301) im Justierloch anschliessen. **(Siehe Abb. E)**<br>② Die Lifttaste drücken, um den Tonarm abzusenken.<br>③ VR301 im Uhrzeigersinn bis zum Anschlag drehen, und dann VR302 so drehen, daß das elektronische Gleichstrom-Voltmeter 0,72V anzeigt. **(Siehe Abb. E)** . . . . . **Servo-Verstärkungs-Justierung.**<br>④ Eine Platte mit 1 mm-Rillenabstand auflegen und abspielen.<br>⑤ VR301 so drehen, daß das elektronische Gleichstrom-Voltmeter 0,6V anzeigt. **(Siehe Abb. E)**. . . . . **Ausgleichsjustierung.** |

## ■ EXPLODED VIEW.....Main Cabinent



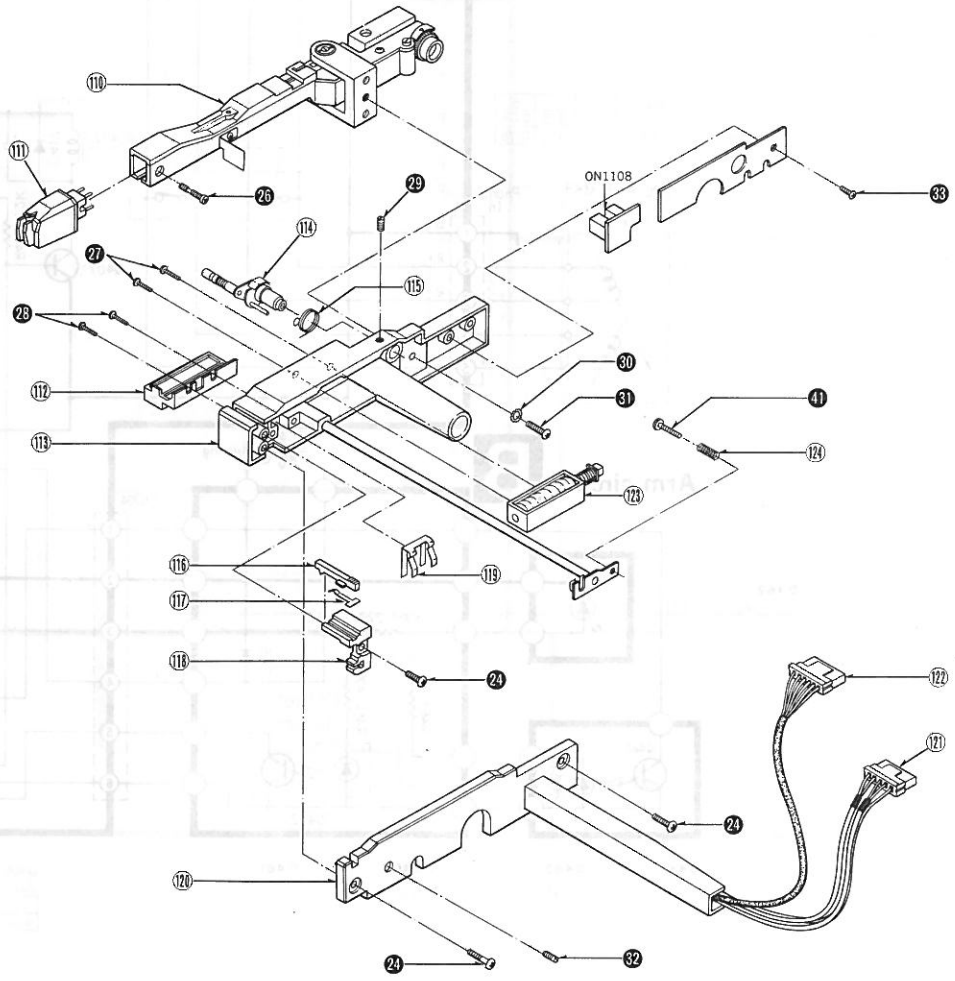
## ■ EXPLODED VIEW.....Upper Cabinent



| Ref. No. | | Part No. | Part Name & Description |
|---|---|---|---|
| **SCREWS, WASHERS and NUTS** | | | |
| ❶ | | **XTV3+8BFN** | Screw, Tapping, ⊕ 3 x 8 |
| ❷ | | **XTN3+6B** | Screw, Tapping, ⊕ 3 x 6 |
| ❸ | | SFPEV17202 | Screw |
| ❹ | | **XTN26+6B** | Screw, Tapping, ⊕ 2.6 x 6 |
| ❺ | | SFXGC10–03 | Screw |
| ❻ | | SFXGQ20–01 | Screw, Insulator |
| ❼ | | **XNS12** | Nut, ϕ12 |
| ❽ | | SFXWC10–01 | Washer |
| ❾ | | **XTN3+20BFZ** | Screw, Tapping, ⊕ 3 x 20 |
| ❿ | | **XTN3+10BFZ** | Screw, Tapping, ⊕ 3 x 10 |
| ⓫ | | SFXGC10–05 | Screw |
| ⓬ | | SFXGC10–02 | Screw |
| ⓭ | | **XSS26+5BN** | Screw, Tapping, ⊕ 2.6 x 5 |
| ⓮ | | **XUC2FT** | Washer |
| ⓯ | | **XUC3FT** | Washer |
| ⓰ | | SFXW551D2 | Washer |
| ⓱ | | XYN23+C10BN | Screw, Tapping, ⊕ 2.3 x 10 |
| ⓲ | | XTS26+6JFZ | Screw, Tapping, ⊕ 2.6 x 6 |
| ⓳ | | **XTN3+8B** | Screw, Tapping, ⊕ 3 x 8 |
| ⓴ | | SFXWC10–05 | Washer |
| ㉑ | | XYN3+C6FZ | Screw, Tapping, ⊕ 3 x 6 |
| ㉒ | | SFXWC10–04 | Washer |
| ㉓ | | XTN3+5J | Screw, Tapping, ⊕ 3 x 5 |
| ㉔ | | **XTN3+8BFZ** | Screw, Tapping, ⊕ 3 x 8 |
| ㉕ | | **XTB3+8JFX** | Screw, Tapping, ⊕ 3 x 8 |
| ㉖ | | SFPEV00701 | Screw Cartridge |
| ㉗ | | XYN2+C4FZ | Screw, Tapping, ⊕ 2 x 4 |
| ㉘ | | XTN23+4JFZ | Screw, Tapping, ⊕ 2.3 x 4 |
| ㉙ | | SFPTN00702 | Screw |
| ㉚ | | **XWC3B** | Washer, ϕ3 |
| ㉛ | | **XNS3+6S** | Screw, Tapping, ⊕ 3 x 6 |
| ㉜ | | XXE3D4FZS | Screw, Tapping, ⊕ 3 x 4 |
| ㉝ | | **XTN23+6BFZ** | Screw, Tapping, ⊕ 2.3 x 6 |
| ㉞ | | XTW3+6J | Screw, Tapping, ⊕ 3 x 6 |
| ㉟ | | XTN3+25JFZ | Screw, Tapping, ⊕ 3 x 25 |
| ㊱ | | **XTV3+6BFN** | Screw, Tapping, ⊕ 3 x 6 |

| Ref. No. | | Part No. | Part Name & Description |
|---|---|---|---|
| ㊲ | | **XTN3+12B** | Screw, Tapping, ⊕ 3 x 12 |
| ㊳ | | **XTS3+8BFZ** | Screw, Tapping, ⊕ 3 x 8 |
| ㊴ | | SFXWC10–06 | Washer |
| ㊵ | | **XNG7E** | Nut, ϕ7 |
| ㊶ | | SFXGC10–06 | Screw |
| **ACCESSORIES** | | | |
| **A1** [E] only | | SFNUC15S01 | Instructions Book, Printed Matter |
| **A1** [EK] only | | SFNUC15G01 | Instrcutions Book, Printed Matter |
| **A1** | | SFNUC15X01 | Instructions Book, Printed Matter |
| A2 | | SFCZB30001 | Bruch |
| A3 | | SFWTC07–01 | Screw, Driver |
| A4 | | SFCFB10101 | Screw, Driver |
| **A5** [XA], [XM] | ⚠ | **QFC1103** | AC Cord |
| **A5** [XL] only | ⚠ | **RJA26Z** | AC Cord |
| **A5** | ⚠ | **RJA20Z** | AC Cord |
| **A5** [EK] only | ⚠ | **RJA43Z** | AC Cord |
| A6 | | SFDHC10–02 | Phono Cord |
| A7 | | SFNZC15X05 | Caution Sheet |
| A8 [XA], [XL] | | SFKDI19118 | 2 Pin Plug |
| **PACKING PARTS** | | | |
| **P1** | ○ | SFHPC15M01 | Carton Box (Silver) |
| **P1** [EF] only | ○ | SFHPC15C01 | Carton Box (Silver) |
| **P1** | Ⓚ | SFHPC15M21 | Carton Box (Black) |
| P2 | | SFHHC15N01 | Pad, Unit |
| P3 | | SFHSC10–03 | Spacer, Corner (A) |
| P4 | | SFHSC10–04 | Spacer, Corner (B) |
| P5 | | SFHSC15N01E | Spacer, Arm |
| P6 | | SFHSC10–01 | Spacer, Turntable |
| P7 | | XSN4D20FYBS | Screw |
| P8 | | SFYH45X60 | Polyethylene Bag, Unit |
| P9 | | SFYF10A30 | Polyethylene Bag, Cord |
| P10 | | SFYF09A15 | Polyethylene Bag, Accessory |

## ■ EXPLODED VIEW.....Tonearm



SL-15

## ■ SCHEMATIC DIAGRAM Ⓐ

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

1 2 3 4 5 6 7 8 9

A B C D E F

**C Power source circuit**

AC LINE (50/60Hz) 110-120/220-240V

F3 250mA

S3 Voltage adjuster

CN207

T1

Power

S1-1 S1-2

F2 0.8A

F1 1A

CN208 CN203

AC18 6

IC1 SV1μPC7812H

D1 SVDSIRBA20Z

DC 12V IN

AC/DC Selector

S2

CN206

TP1 TP2 TP3 TP4 TP5

C3 35V2200 C4 0.1 C5 0.1

**D**

VR602 1KB VR601 5KC

BT602

Clamp level adjustment

Sensor sensitivity selector

Slice level adjustm

**A Turntable drive & Program selection circuit**

S201 Cleaner Switch

CN205

Phono Out G R L

Q203 2SC1328

D205 SVDRD7.5JB2

R214 470 R219 3.3K R216 150K R218 1K R215 220 R217 22K C215 50V1 C221 16V33 R203 47

C108 16V100 C103 0.1 C110 0.1 R107 5.6K R102 3.3(1W) R103 47K C111 0.0056 C107 0.01

C212 50V3.3 C211 0.047 C230 0.047 C205 63V470 C206 50V1 C204 0.047 C203 50V1

R207 56K R206 18K R208 220K C210 0.22 R209 150K R210 22K R213 22K R212 22K C214 16V100

R204 2.7K R205 120K R104 47K C112 16V10

IC201 AN6680

IC101 AN6675

R201 330 R202 470 Q201 C231 16V100

C217 0.1 C209 16V47 R224 27K X201 C207 150P R222 390 C208 33P Q202 C218 50V1 R459 56K C220 01

C106 0.1 C105 0.1 C104 0.1 R106 15 R105 10K C103 16V33 C102 16V33 C101 16V33

Speed Select 45 AUTO 33

TP22 TP18 TP19 TP17 TP16 TP15 TP20 TP21 TP13 TP12 TP11 TP10 TP9 TP8 TP7

R101 1

Q407

| Muting | E | C | B |
|---|---|---|---|
| on | 0 | 11.5 | 0.09 |
| off | 0 | 0 | 0.76 |

EPC-P205CMK3 Cartridge

Phono In G R+ R- L+ L-

Muting RL402 D417 C450 16V100 R443 2.2K Q407

Q407 2SD636

D202,416,417 MA150

Q405,406 2SD638

D202

**B Arm circuit**

RL401 Cueing

CN204

D462 SFDNC10-01

D462 R461 220 D461 R463 1K R462 470 Offset angle detection PC402

Q461 D463

R457 2.2K R441 150(1W) Q405 R440 39K Q404 R439 10K D416 Q406 R438 10K R460 2.2K R458 100K C406 16V33

Q404 2SD636

Q201 2SD638 Q202 2SD636

CN201 CN202

Q461 PN120S D463 LN62S PC402 ON1108 D461 MA150

Q405

| Cueing | E | C | B |
|---|---|---|---|
| up | 11.5 | 11.5 | 11.1 |
| down | 0 | 8.5 | 0 |

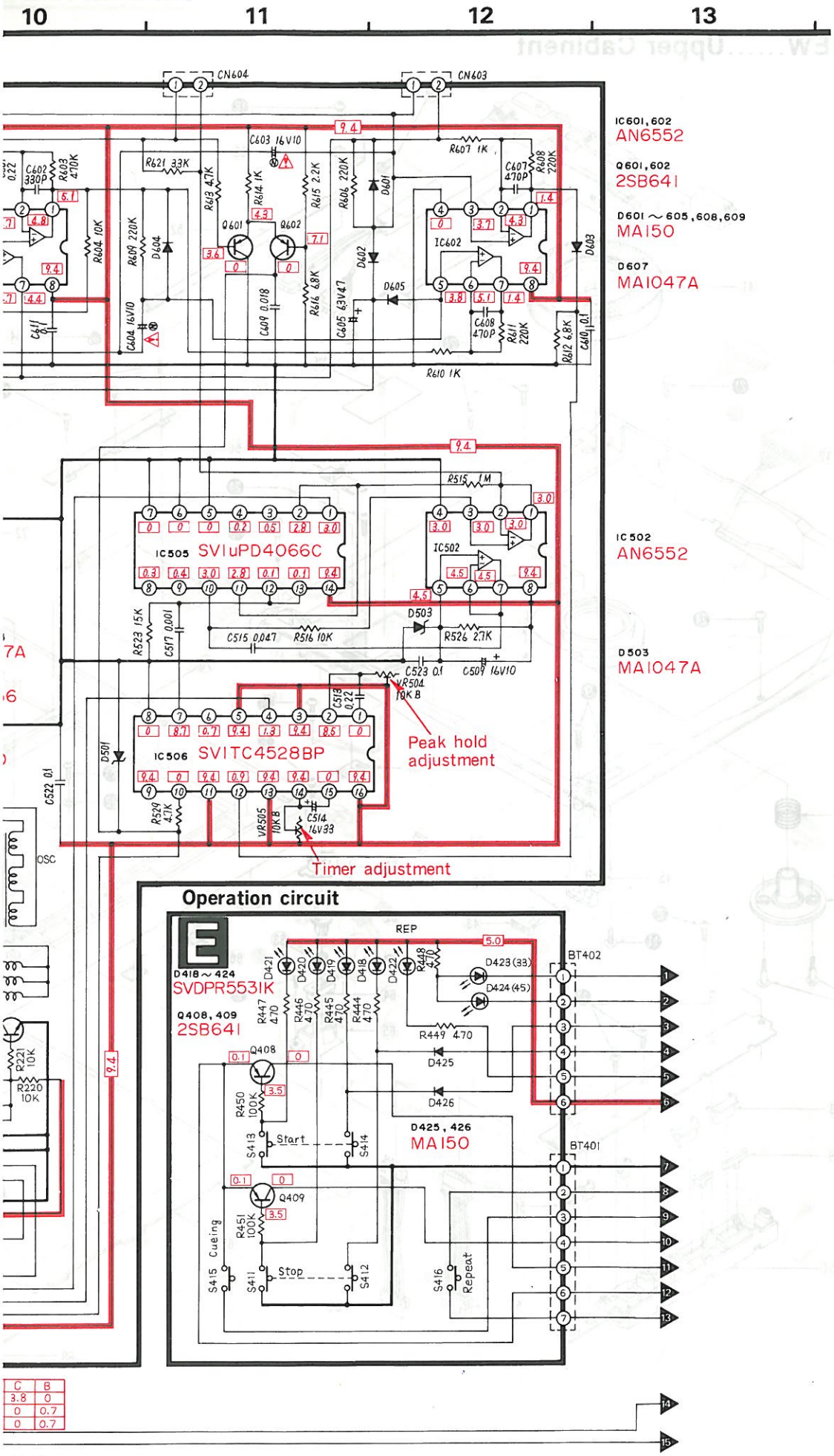
Q406

| Cueing | E | C | B |
|---|---|---|---|
| up | 0 | 11.5 | 0 |
| down | 0 | 0 | 0.7 |

Q404

| Cueing | E | C | B |
|---|---|---|---|
| up | 11.1 | 11.7 | 11.6 |
| down | 0 | 11.6 | 0.1 |

# SL-15




| C | B |
|---|---|
| 3.8 | 0 |
| 0 | 0.7 |
| 0 | 0.7 |

## ■ SCHEMATIC DIAGRAM Ⓑ

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

**F** Logic control circuit

IC402, 403 SVIM53204P

IC401 MN1405PD

IC404 SVIM53217P

IC405 SVIM53216P

IC407 SVIμPC78M05H

D401~410 SVDPR553IK

D411~414 MA150

Q402, 403 2SB643

D415 SVDGD4205ALC

Q401 2SD636

IC406 SVITC4069UBP

Program indicator 1~10

Program key

Q501, 502 2SD889

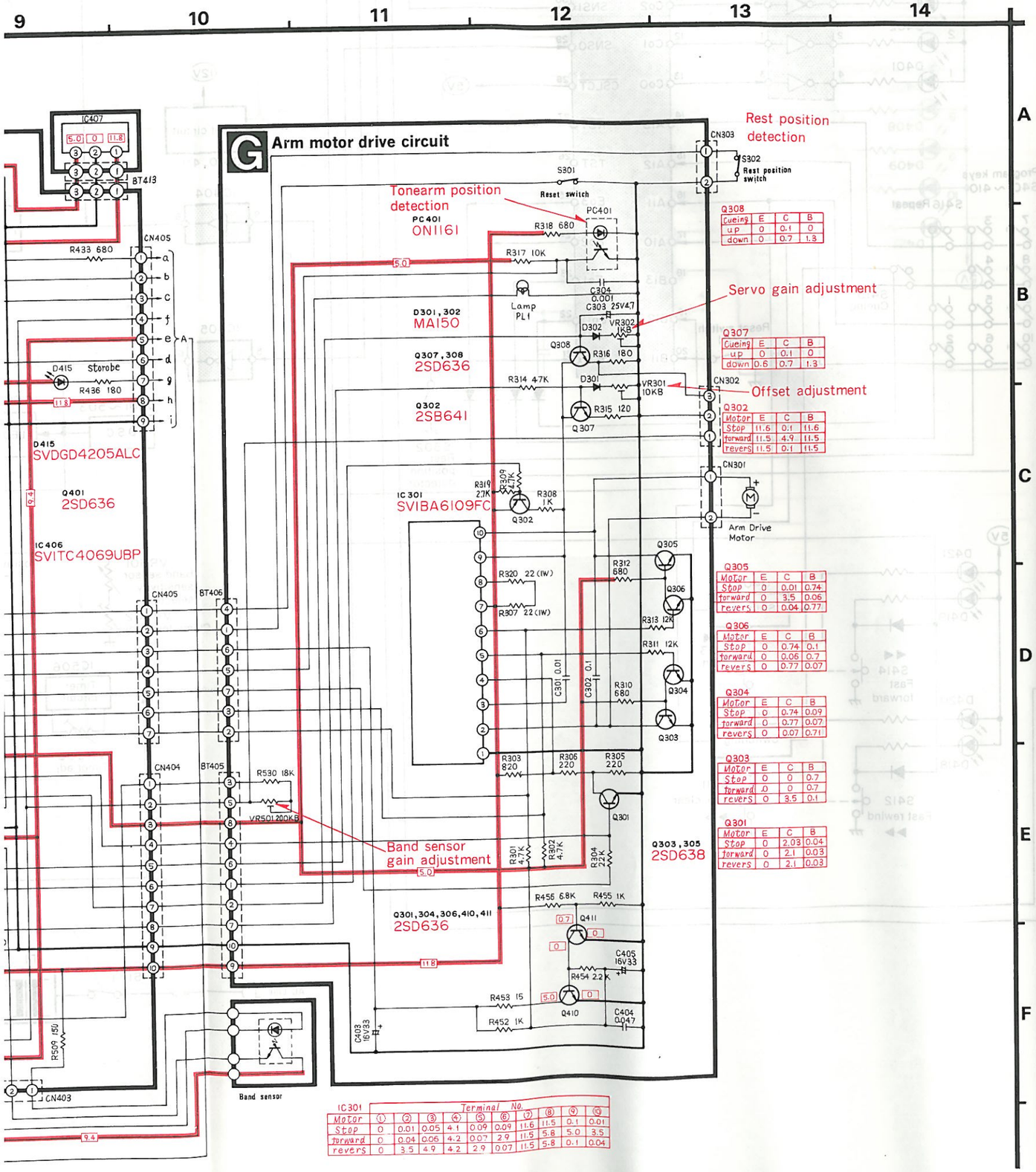
Q503 2SB643

Q504 2SD636

Q505 2SD638

IC501 AN6552

**Program selection circuit**



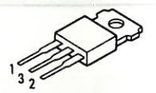
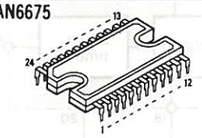
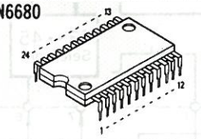
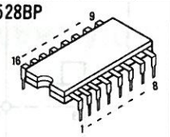
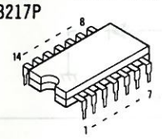
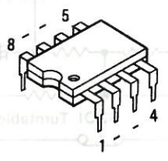
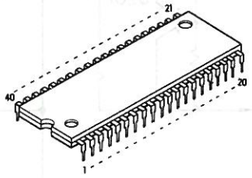
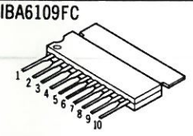
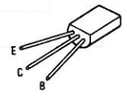
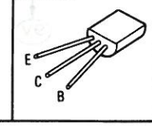
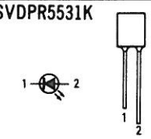
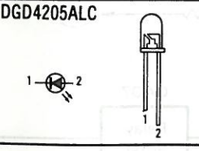
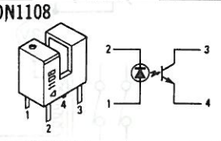
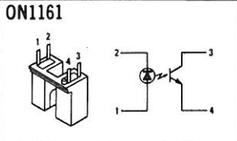




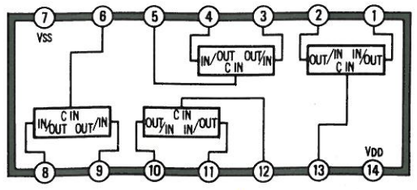

**Notes:**

1. **S1-1** : Power switch in "**on**" position. (Primary side)
2. **S1-2** : Power switch in "**on**" position. (Secondary side)
3. **S2** : AC/DC select switch in "**AC**" position.
   (AC/DC input terminal built-inswitch – AC priority)
4. **S3** : Voltage adjuster switch in "**220V – 240V**" position.
   110V – 120V ⟷ 220V – 240V
5. **S201** : Turntable drive (cleaner) switch in "**off**" position.
6. **S202** : Speed select switch in "**auto**" position. (**33** ⟷ **auto** ⟷ **45**)
7. **S301** : Reset switch in "**on**" position.
8. **S302** : Rest detecting switch in "**on**" position.
9. **S401 ~ 410** : Program switch (Program key 1 ~ 10) in "**off**" position.
   (not push condition)
10. **S411** : Stop/clear switch ( ▶ ▷ ) in "**off**" position. (not push condition)
11. **S412** : Fast rewind switch ( ▶ ▶ ) in "**off**" position. (not push condition)
12. **S413** : Start switch ( ◁ ◀ ) in "**off**" position. (not push condition)
13. **S414** : Fast forward switch ( ◀ ◀ ) in "**off**" position. (not push condition)
14. **S415** : Cueing switch in "**off**" position. (not push condition)
15. **S416** : Repeat switch in "**off**" position. (not push condition)
16. The value in ▭ is the reference voltage at stop of the turntable, measured by DC electronic circuit tester (high-impedance) on the basis of chassis.
    Therefore, the measured value may include some error depending on the internal impedance of the DC circuit tester and other conditions.
17. ▬ + Ⓑ voltage line.
18. 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.

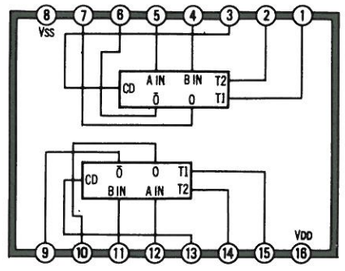
## • Terminal guide of transistors, diodes and IC's

| | | |
|---|---|---|
| SVIUPC7812H<br>SVIUPC78M05H<br>  | AN6675<br>  | AN6680<br>  | SVITC4528BP<br>  |
| SVITC4069UBP SVIM53204P<br>SVIM53216P SVIUPD4066C<br>SVIM53217P<br>  | AN6553<br>  | MN1405PD<br>  | |
| SVIBA6109FC<br>  | 2SB641, 2SD636<br>2SB643, 2SD638<br> | 2SC1328<br>  | 2SD889<br>  | SVDPR5531K<br>  |
| SVDGD4205ALC<br>  | ON1108<br>  | ON1161<br>  | |

## • Block diagram of IC's

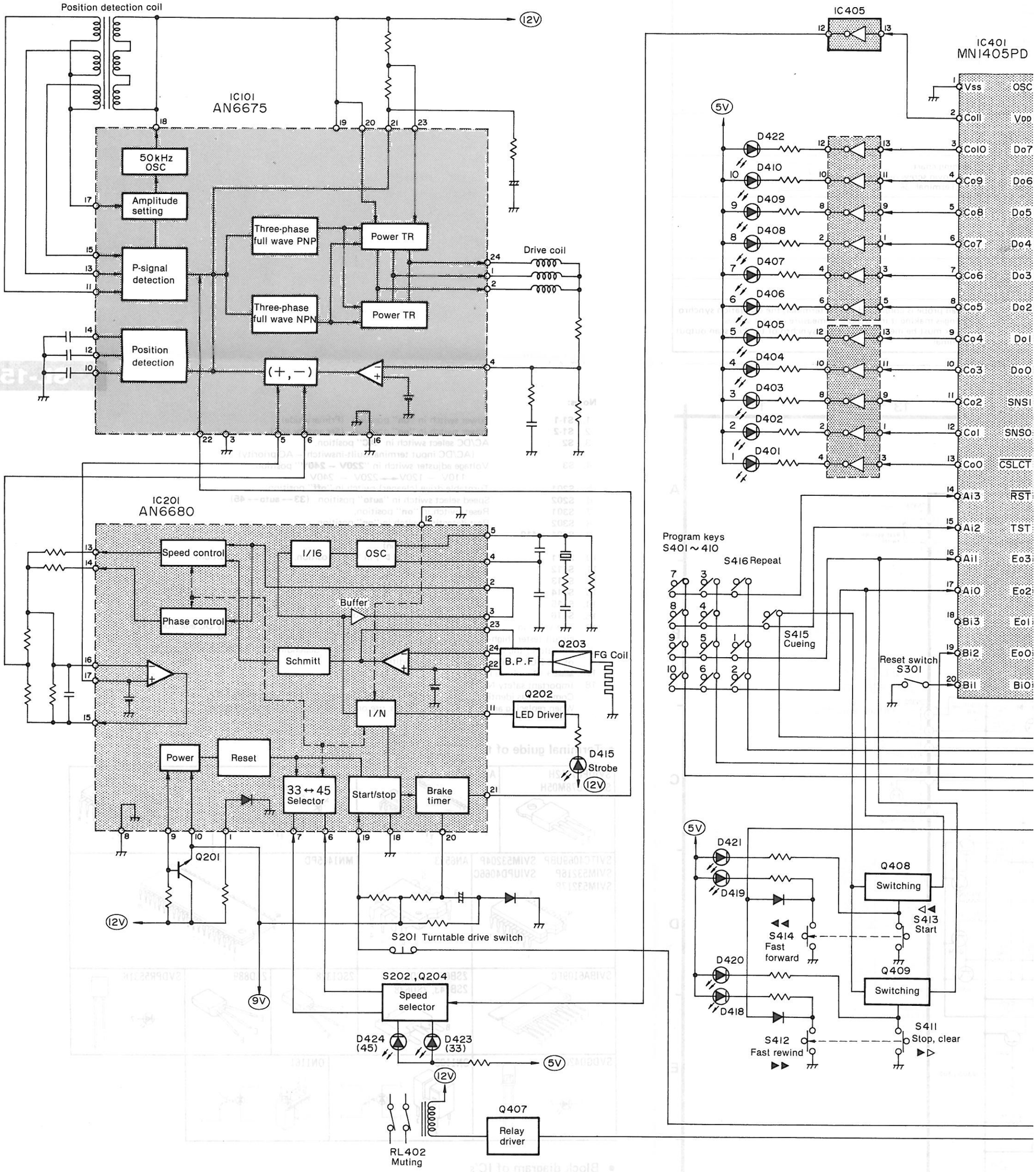


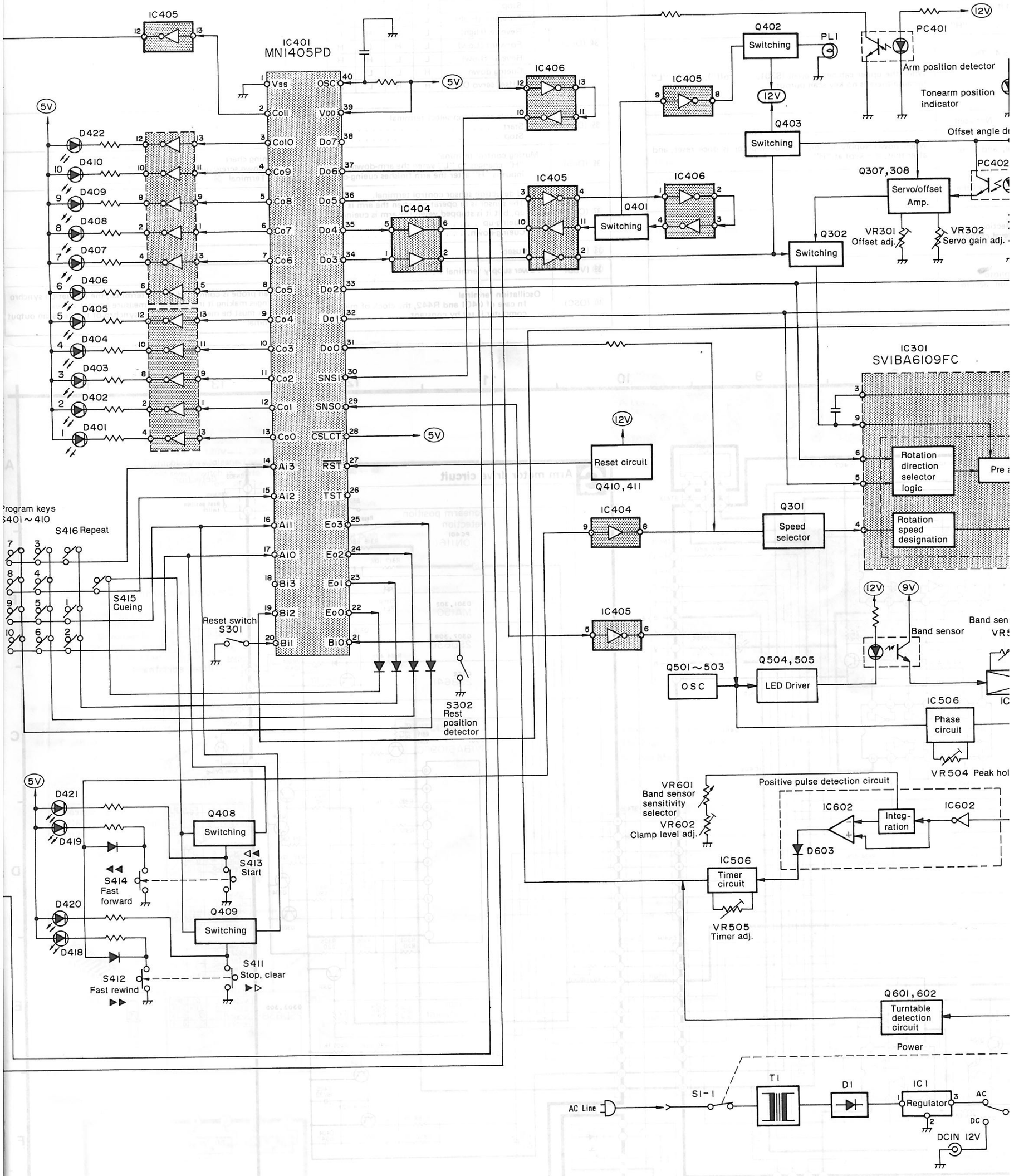

IC505 (SVITC4069)

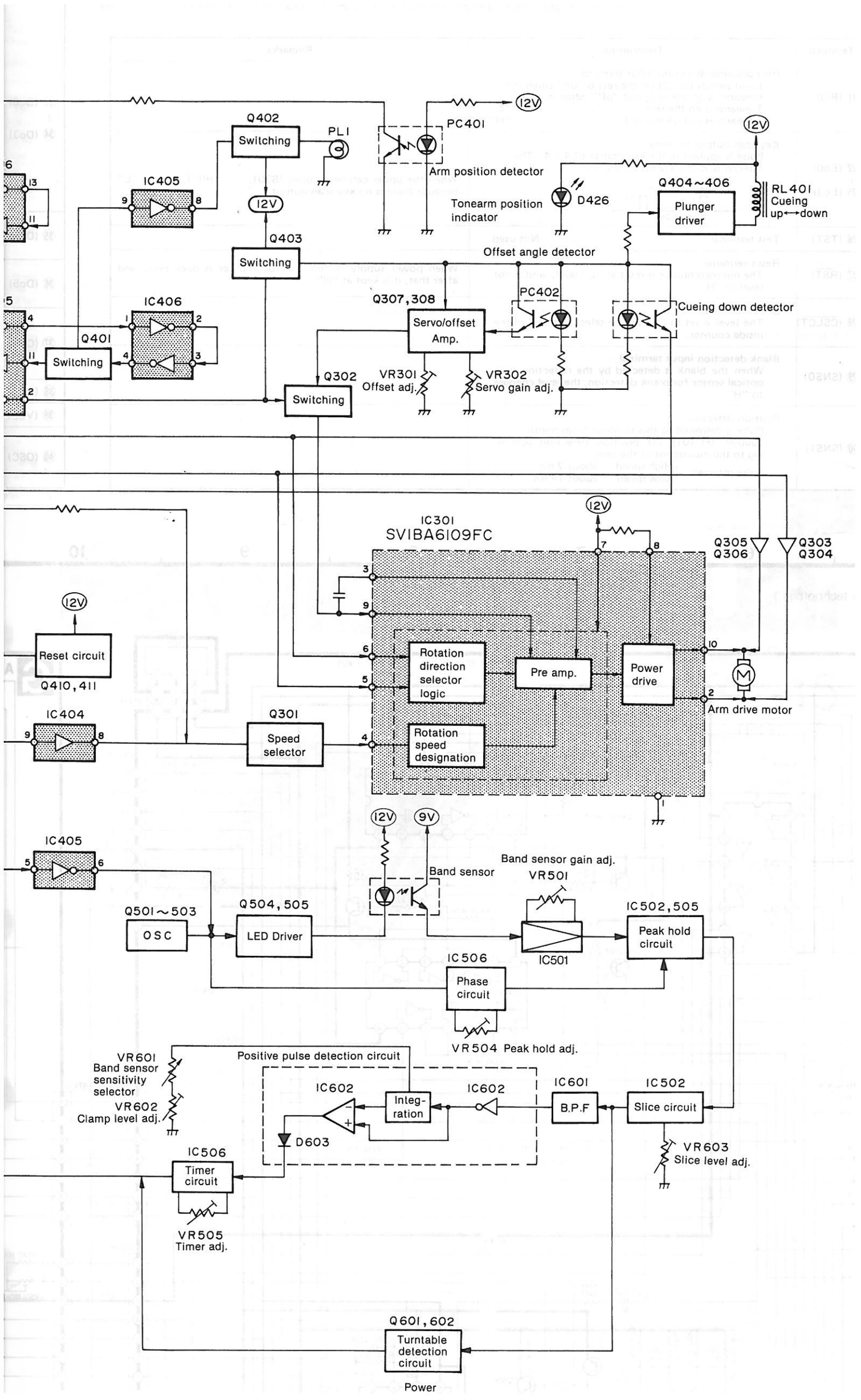



IC506 (SVITC4528BP)

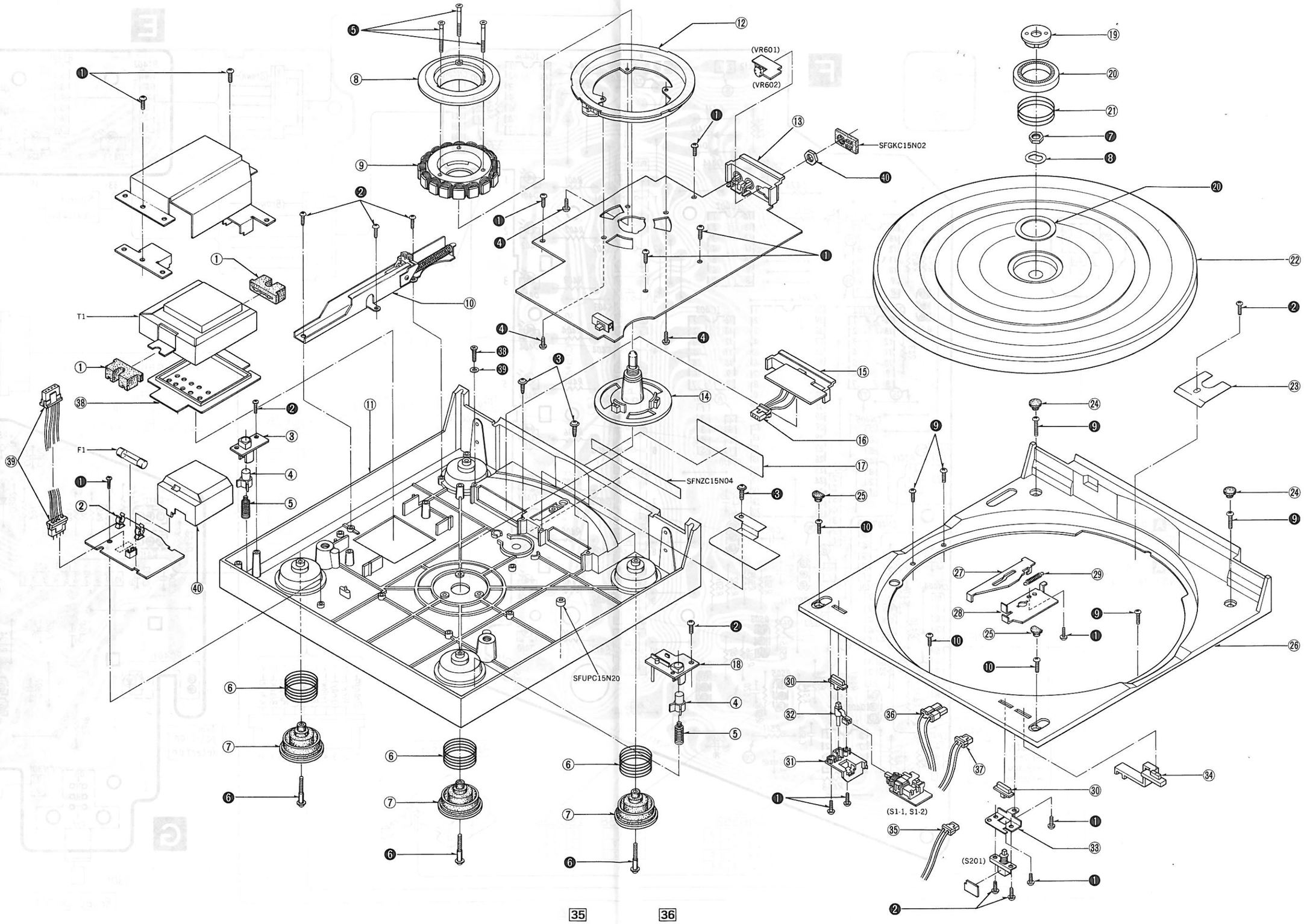
## ■ BLOCK DIAGRAM



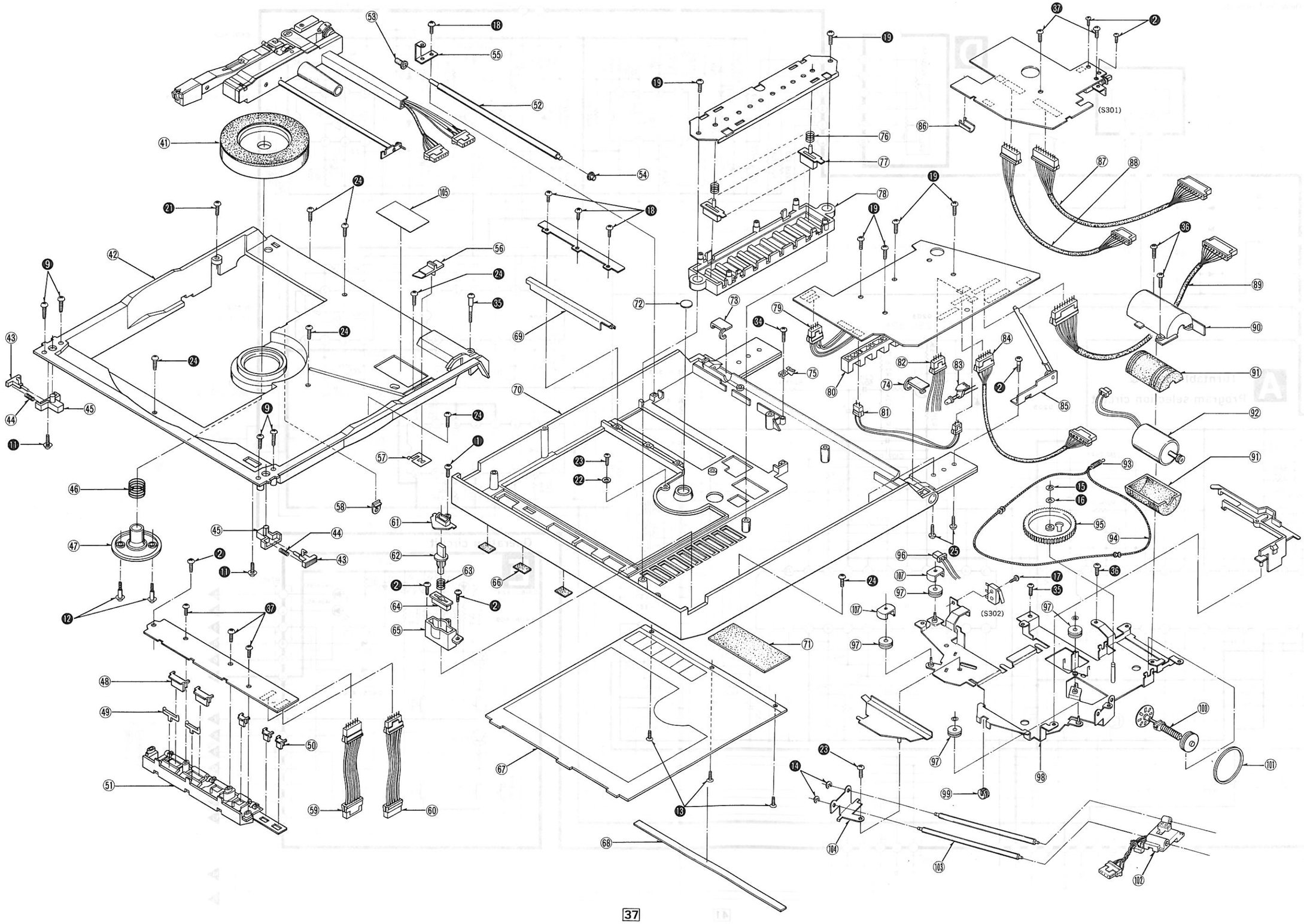

IC405
IC401
MN1405PD
Vss
OSC
Coll
Vdd
Col0
Do7
Co9
Do6
Co8
Do5
Co7
Do4
Co6
Do3
Co5
Do2
Co4
Do1
Co3
Do0
Co2
SNS1
Col
SNS0
Co0
CSLCT
Ai3
RST
Ai2
TST
Ai1
Eo3
Ai0
Eo2
Bi3
Eo1
Bi2
Eo0
Bi1
Bi0
5V
D422
D410
D409
D408
D407
D406
D405
D404
D403
D402
D401
IC404
IC406
Q401
Switching
Q402
PL1
PC401
Arm position detector
Tonearm position indicator
Q403
Offset angle de
PC402
Q307,308
Servo/offset Amp.
VR301
Offset adj.
VR302
Servo gain adj.
Q302
IC301
SVIBA6109FC
Rotation direction selector logic
Rotation speed designation
Reset circuit
Q410,411
Q301
Speed selector
Program keys
S401~410
S416 Repeat
S415
Cueing
Reset switch
S301
S302
Rest position detector
Q501~503
OSC
Q504,505
LED Driver
Band sensor
Band sen
VR5
IC506
Phase circuit
VR504 Peak hol
VR601
Band sensor sensitivity selector
VR602
Clamp level adj.
Positive pulse detection circuit
IC602
Integ-ration
D603
Timer circuit
VR505
Timer adj.
Q601,602
Turntable detection circuit
Power
AC Line
SI-1
TI
DI
IC1
Regulator
AC
DC
DCIN 12V
D421
D419
D420
D418
Q408
Switching
Q409
S413
Start
S414
Fast forward
S411
Stop, clear
S412
Fast rewind


12V
Q402
Switching
PL1
PC401
Arm position detector
IC405
Q403
Switching
Tonearm position indicator
D426
Q404~406
Plunger driver
RL401
Cueing up↔down
Offset angle detector
IC406
Q401
Switching
Q307,308
Servo/offset Amp.
PC402
Cueing down detector
Q302
Switching
VR301
Offset adj.
VR302
Servo gain adj.
IC301
SVIBA6109FC
Q305
Q306
Q303
Q304
Reset circuit
Q410,411
Rotation direction selector logic
Pre amp.
Power drive
Arm drive motor
IC404
Q301
Speed selector
Rotation speed designation
9V
IC405
Band sensor
Band sensor gain adj.
VR501
Q501~503
OSC
Q504,505
LED Driver
IC502,505
Peak hold circuit
IC501
IC506
Phase circuit
VR504 Peak hold adj.
VR601
Band sensor sensitivity selector
VR602
Clamp level adj.
Positive pulse detection circuit
IC602
Integ-ration
IC602
IC601
B.P.F
IC502
Slice circuit
D603
VR603
Slice level adj.
IC506
Timer circuit
VR505
Timer adj.
Q601,602
Turntable detection circuit
Power

## ■ EXPLODED VIEW.....Main Cabinent



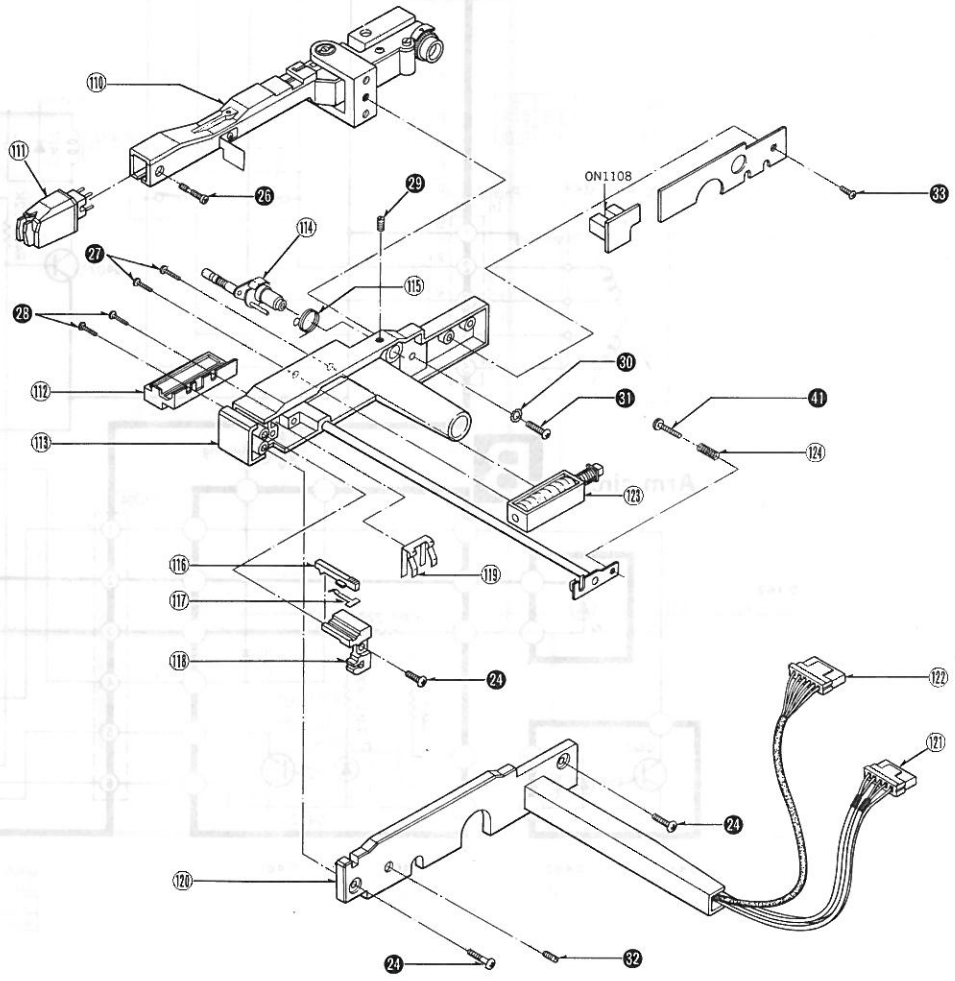
## ■ EXPLODED VIEW.....Upper Cabinent



| Ref. No. | | Part No. | Part Name & Description |
|---|---|---|---|
| **SCREWS, WASHERS and NUTS** | | | |
| ❶ | | **XTV3+8BFN** | Screw, Tapping, ⊕ 3 x 8 |
| ❷ | | **XTN3+6B** | Screw, Tapping, ⊕ 3 x 6 |
| ❸ | | SFPEV17202 | Screw |
| ❹ | | **XTN26+6B** | Screw, Tapping, ⊕ 2.6 x 6 |
| ❺ | | SFXGC10–03 | Screw |
| ❻ | | SFXGQ20–01 | Screw, Insulator |
| ❼ | | **XNS12** | Nut, ϕ12 |
| ❽ | | SFXWC10–01 | Washer |
| ❾ | | **XTN3+20BFZ** | Screw, Tapping, ⊕ 3 x 20 |
| ❿ | | **XTN3+10BFZ** | Screw, Tapping, ⊕ 3 x 10 |
| ⓫ | | SFXGC10–05 | Screw |
| ⓬ | | SFXGC10–02 | Screw |
| ⓭ | | **XSS26+5BN** | Screw, Tapping, ⊕ 2.6 x 5 |
| ⓮ | | **XUC2FT** | Washer |
| ⓯ | | **XUC3FT** | Washer |
| ⓰ | | SFXW551D2 | Washer |
| ⓱ | | XYN23+C10BN | Screw, Tapping, ⊕ 2.3 x 10 |
| ⓲ | | XTS26+6JFZ | Screw, Tapping, ⊕ 2.6 x 6 |
| ⓳ | | **XTN3+8B** | Screw, Tapping, ⊕ 3 x 8 |
| ⓴ | | SFXWC10–05 | Washer |
| ㉑ | | XYN3+C6FZ | Screw, Tapping, ⊕ 3 x 6 |
| ㉒ | | SFXWC10–04 | Washer |
| ㉓ | | XTN3+5J | Screw, Tapping, ⊕ 3 x 5 |
| ㉔ | | **XTN3+8BFZ** | Screw, Tapping, ⊕ 3 x 8 |
| ㉕ | | **XTB3+8JFX** | Screw, Tapping, ⊕ 3 x 8 |
| ㉖ | | SFPEV00701 | Screw Cartridge |
| ㉗ | | XYN2+C4FZ | Screw, Tapping, ⊕ 2 x 4 |
| ㉘ | | XTN23+4JFZ | Screw, Tapping, ⊕ 2.3 x 4 |
| ㉙ | | SFPTN00702 | Screw |
| ㉚ | | **XWC3B** | Washer, ϕ3 |
| ㉛ | | **XNS3+6S** | Screw, Tapping, ⊕ 3 x 6 |
| ㉜ | | XXE3D4FZS | Screw, Tapping, ⊕ 3 x 4 |
| ㉝ | | **XTN23+6BFZ** | Screw, Tapping, ⊕ 2.3 x 6 |
| ㉞ | | XTW3+6J | Screw, Tapping, ⊕ 3 x 6 |
| ㉟ | | XTN3+25JFZ | Screw, Tapping, ⊕ 3 x 25 |
| ㊱ | | **XTV3+6BFN** | Screw, Tapping, ⊕ 3 x 6 |

| Ref. No. | | Part No. | Part Name & Description |
|---|---|---|---|
| ㊲ | | **XTN3+12B** | Screw, Tapping, ⊕ 3 x 12 |
| ㊳ | | **XTS3+8BFZ** | Screw, Tapping, ⊕ 3 x 8 |
| ㊴ | | SFXWC10–06 | Washer |
| ㊵ | | **XNG7E** | Nut, ϕ7 |
| ㊶ | | SFXGC10–06 | Screw |
| **ACCESSORIES** | | | |
| **A1** [E] only | | SFNUC15S01 | Instructions Book, Printed Matter |
| **A1** [EK] only | | SFNUC15G01 | Instrcutions Book, Printed Matter |
| **A1** | | SFNUC15X01 | Instructions Book, Printed Matter |
| A2 | | SFCZB30001 | Bruch |
| A3 | | SFWTC07–01 | Screw, Driver |
| A4 | | SFCFB10101 | Screw, Driver |
| **A5** [XA], [XM] | ⚠ | **QFC1103** | AC Cord |
| **A5** [XL] only | ⚠ | **RJA26Z** | AC Cord |
| **A5** | ⚠ | **RJA20Z** | AC Cord |
| **A5** [EK] only | ⚠ | **RJA43Z** | AC Cord |
| A6 | | SFDHC10–02 | Phono Cord |
| A7 | | SFNZC15X05 | Caution Sheet |
| A8 [XA], [XL] | | SFKDI19118 | 2 Pin Plug |
| **PACKING PARTS** | | | |
| **P1** | ○ | SFHPC15M01 | Carton Box (Silver) |
| **P1** [EF] only | ○ | SFHPC15C01 | Carton Box (Silver) |
| **P1** | Ⓚ | SFHPC15M21 | Carton Box (Black) |
| P2 | | SFHHC15N01 | Pad, Unit |
| P3 | | SFHSC10–03 | Spacer, Corner (A) |
| P4 | | SFHSC10–04 | Spacer, Corner (B) |
| P5 | | SFHSC15N01E | Spacer, Arm |
| P6 | | SFHSC10–01 | Spacer, Turntable |
| P7 | | XSN4D20FYBS | Screw |
| P8 | | SFYH45X60 | Polyethylene Bag, Unit |
| P9 | | SFYF10A30 | Polyethylene Bag, Cord |
| P10 | | SFYF09A15 | Polyethylene Bag, Accessory |

## ■ EXPLODED VIEW.....Tonearm



SL-15

## ■ SCHEMATIC DIAGRAM Ⓐ

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

1 2 3 4 5 6 7 8 9

A B C D E F

**C Power source circuit**

AC LINE (50/60Hz) 110-120/220-240V

F3 250mA

S3 Voltage adjuster

CN207

T1

Power

S1-1 S1-2

F2 0.8A

F1 1A

CN208 CN203

AC18 6

IC1 SV1μPC7812H

D1 SVDSIRBA20Z

DC 12V IN

AC/DC Selector

S2

CN206

TP1 TP2 TP3 TP4 TP5

C3 35V2200 C4 0.1 C5 0.1

**D**

VR602 1KB VR601 5KC

BT602

Clamp level adjustment

Sensor sensitivity selector

Slice level adjustm

**A Turntable drive & Program selection circuit**

S201 Cleaner Switch

CN205

Phono Out G R L

Q203 2SC1328

D205 SVDRD7.5JB2

R214 470 R219 3.3K R216 150K R218 1K R215 220 R217 22K C215 50V1 C221 16V33 R203 47

C108 16V100 C103 0.1 C110 0.1 R107 5.6K R102 3.3(1W) R103 47K C111 0.0056 C107 0.01

C212 50V3.3 C211 0.047 C230 0.047 C205 63V470 C206 50V1 C204 0.047 C203 50V1

R207 56K R206 18K R208 220K C210 0.22 R209 150K R210 22K R213 22K R212 22K C214 16V100

R204 2.7K R205 120K R104 47K C112 16V10

IC201 AN6680

IC101 AN6675

R201 330 R202 470 Q201 C231 16V100

C217 0.1 C209 16V47 R224 27K X201 C207 150P R222 390 C208 33P Q202 C218 50V1 R459 56K C220 01

C106 0.1 C105 0.1 C104 0.1 R106 15 R105 10K C103 16V33 C102 16V33 C101 16V33

Speed Select 45 AUTO 33

TP22 TP18 TP19 TP17 TP16 TP15 TP20 TP21 TP13 TP12 TP11 TP10 TP9 TP8 TP7

R101 1

Q407

| Muting | E | C | B |
|---|---|---|---|
| on | 0 | 11.5 | 0.09 |
| off | 0 | 0 | 0.76 |

EPC-P205CMK3 Cartridge

Phono In G R+ R- L+ L-

Muting RL402 D417 C450 16V100 R443 2.2K Q407

Q407 2SD636

D202,416,417 MA150

Q405,406 2SD638

D202

**B Arm circuit**

RL401 Cueing

CN204

D462 SFDNC10-01

D462 R461 220 D461 R463 1K R462 470 Offset angle detection PC402

Q461 D463

R457 2.2K R441 150(1W) Q405 R440 39K Q404 R439 10K D416 Q406 R438 10K R460 2.2K R458 100K C406 16V33

Q404 2SD636

Q201 2SD638 Q202 2SD636

CN201 CN202

Q461 PN120S D463 LN62S PC402 ON1108 D461 MA150

Q405

| Cueing | E | C | B |
|---|---|---|---|
| up | 11.5 | 11.5 | 11.1 |
| down | 0 | 8.5 | 0 |

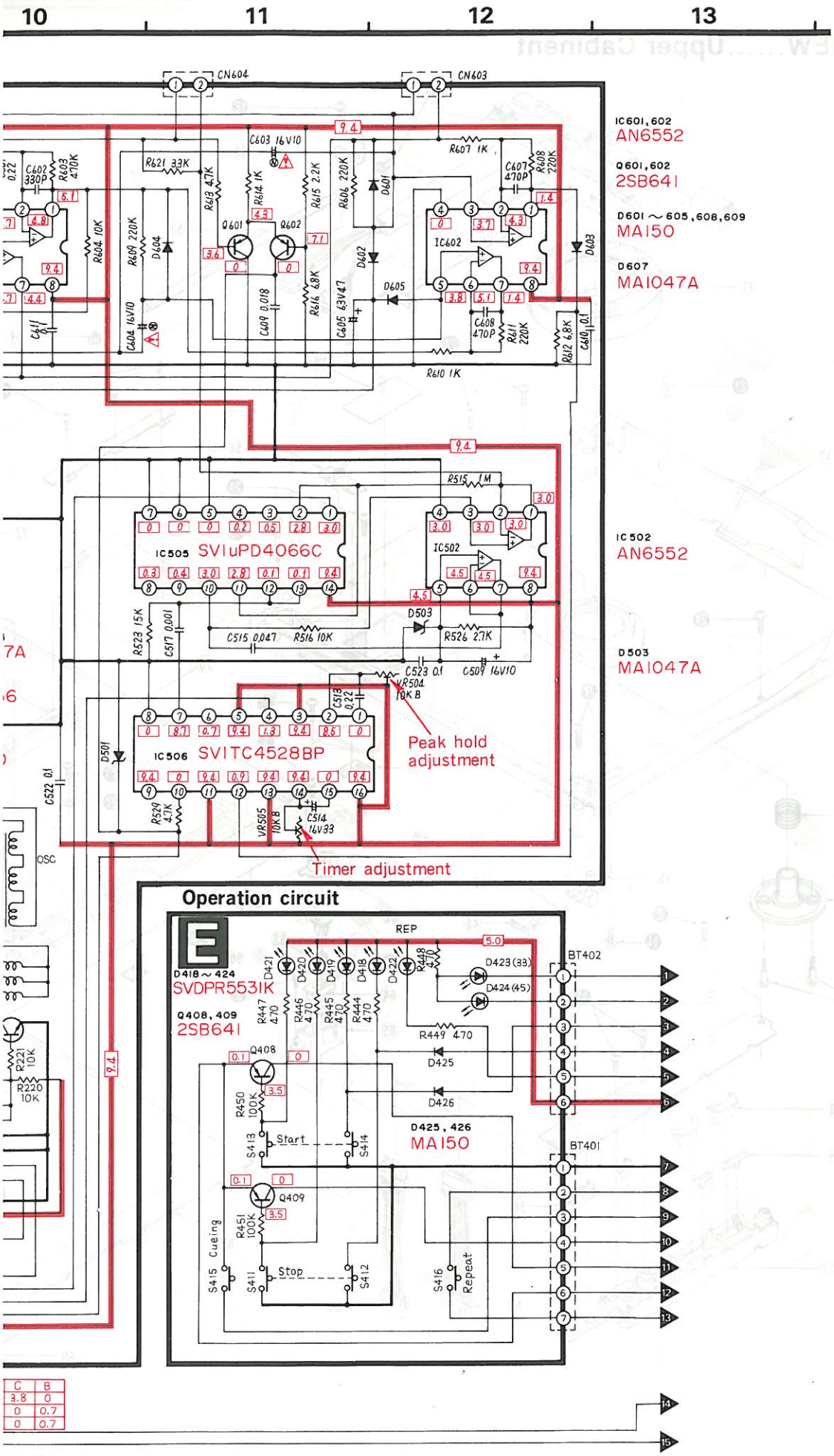
Q406

| Cueing | E | C | B |
|---|---|---|---|
| up | 0 | 11.5 | 0 |
| down | 0 | 0 | 0.7 |

Q404

| Cueing | E | C | B |
|---|---|---|---|
| up | 11.1 | 11.7 | 11.6 |
| down | 0 | 11.6 | 0.1 |

# SL-15




| C | B |
|---|---|
| 3.8 | 0 |
| 0 | 0.7 |
| 0 | 0.7 |

## ■ SCHEMATIC DIAGRAM Ⓑ

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

**F** Logic control circuit

IC402, 403 SVIM53204P

IC401 MN1405PD

IC404 SVIM53217P

IC405 SVIM53216P

IC407 SVIμPC78M05H

D401~410 SVDPR553IK

D411~414 MA150

Q402, 403 2SB643

D415 SVDGD4205ALC

Q401 2SD636

IC406 SVITC4069UBP

Program indicator 1~10

Program key

Q501, 502 2SD889

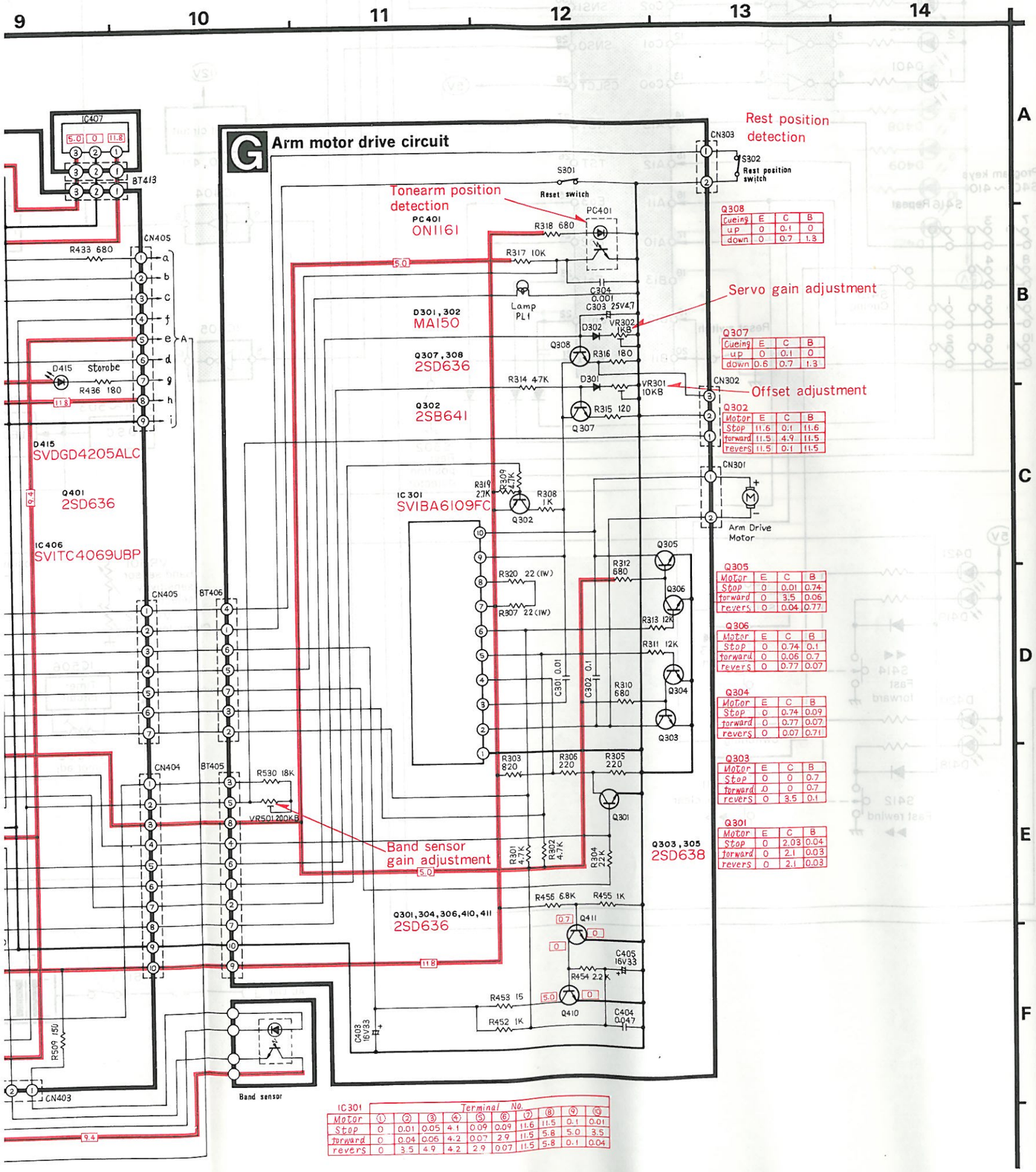
Q503 2SB643

Q504 2SD636

Q505 2SD638

IC501 AN6552

**Program selection circuit**



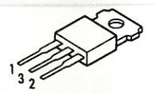
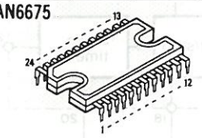
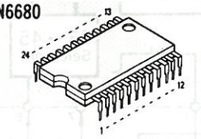
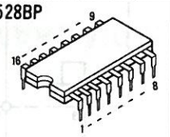
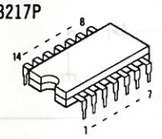
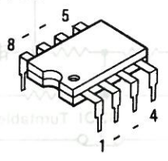
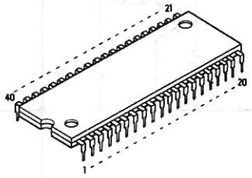
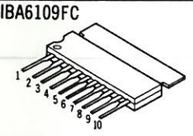
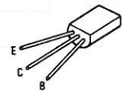
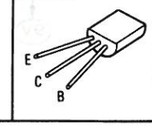
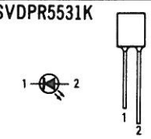
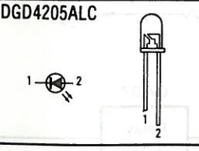
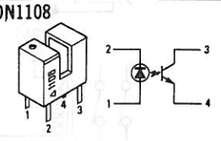
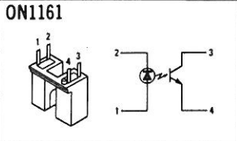




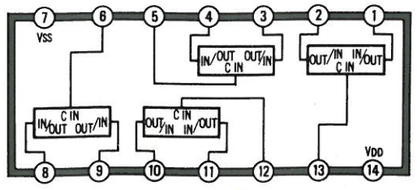

**Notes:**

1. **S1-1** : Power switch in "**on**" position. (Primary side)
2. **S1-2** : Power switch in "**on**" position. (Secondary side)
3. **S2** : AC/DC select switch in "**AC**" position.
   (AC/DC input terminal built-inswitch – AC priority)
4. **S3** : Voltage adjuster switch in "**220V – 240V**" position.
   110V – 120V ⟷ 220V – 240V
5. **S201** : Turntable drive (cleaner) switch in "**off**" position.
6. **S202** : Speed select switch in "**auto**" position. (**33** ⟷ **auto** ⟷ **45**)
7. **S301** : Reset switch in "**on**" position.
8. **S302** : Rest detecting switch in "**on**" position.
9. **S401 ~ 410** : Program switch (Program key 1 ~ 10) in "**off**" position.
   (not push condition)
10. **S411** : Stop/clear switch ( ▶ ▷ ) in "**off**" position. (not push condition)
11. **S412** : Fast rewind switch ( ▶ ▶ ) in "**off**" position. (not push condition)
12. **S413** : Start switch ( ◁ ◀ ) in "**off**" position. (not push condition)
13. **S414** : Fast forward switch ( ◀ ◀ ) in "**off**" position. (not push condition)
14. **S415** : Cueing switch in "**off**" position. (not push condition)
15. **S416** : Repeat switch in "**off**" position. (not push condition)
16. The value in ▭ is the reference voltage at stop of the turntable, measured by DC electronic circuit tester (high-impedance) on the basis of chassis.
    Therefore, the measured value may include some error depending on the internal impedance of the DC circuit tester and other conditions.
17. ▬ + Ⓑ voltage line.
18. 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.

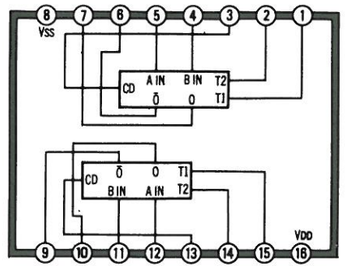
## • Terminal guide of transistors, diodes and IC's

| | | |
|---|---|---|
| SVIUPC7812H<br>SVIUPC78M05H<br>  | AN6675<br>  | AN6680<br>  | SVITC4528BP<br>  |
| SVITC4069UBP SVIM53204P<br>SVIM53216P SVIUPD4066C<br>SVIM53217P<br>  | AN6553<br>  | MN1405PD<br>  | |
| SVIBA6109FC<br>  | 2SB641, 2SD636<br>2SB643, 2SD638<br> | 2SC1328<br>  | 2SD889<br>  | SVDPR5531K<br>  |
| SVDGD4205ALC<br>  | ON1108<br>  | ON1161<br>  | |

## • Block diagram of IC's

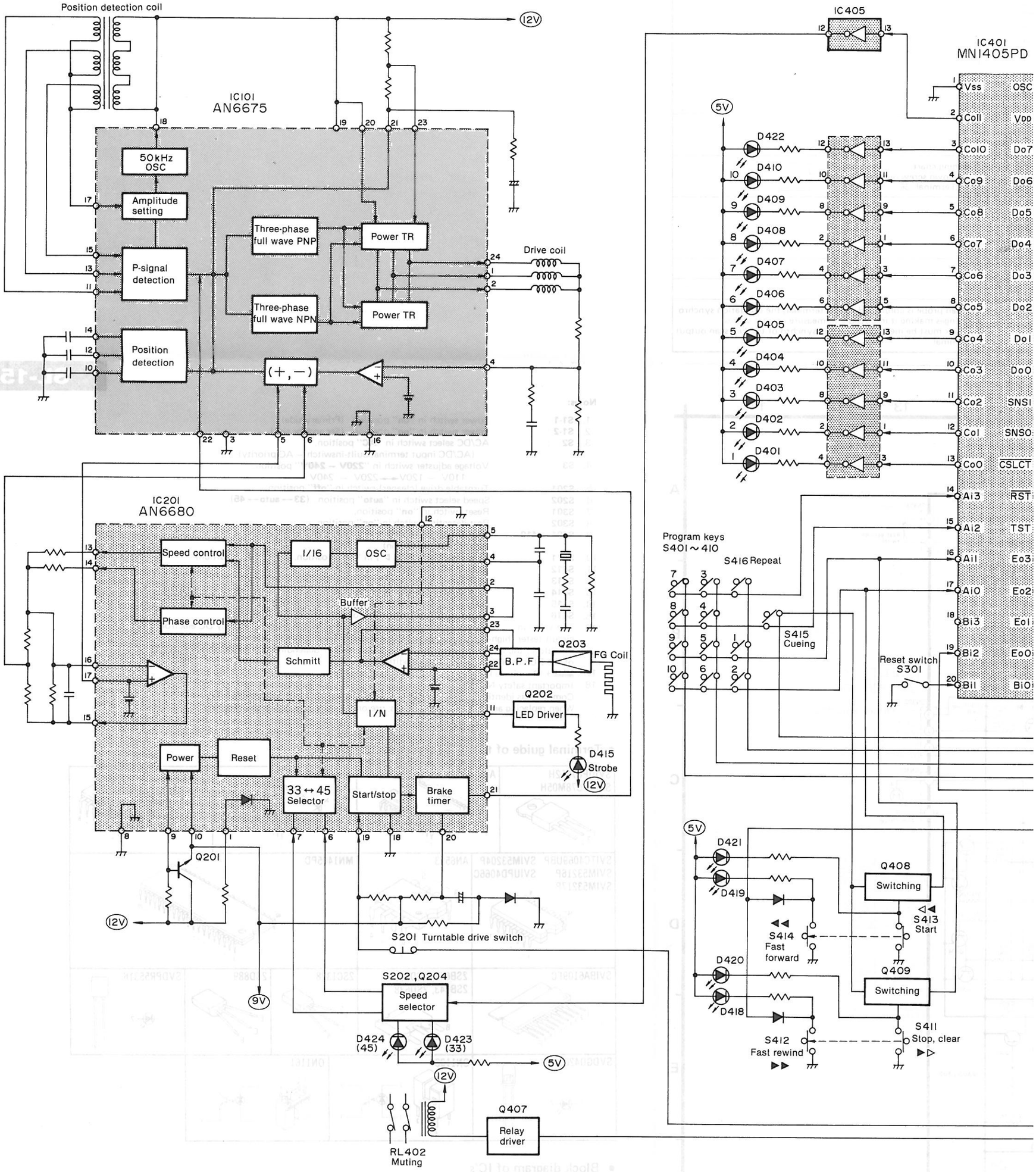


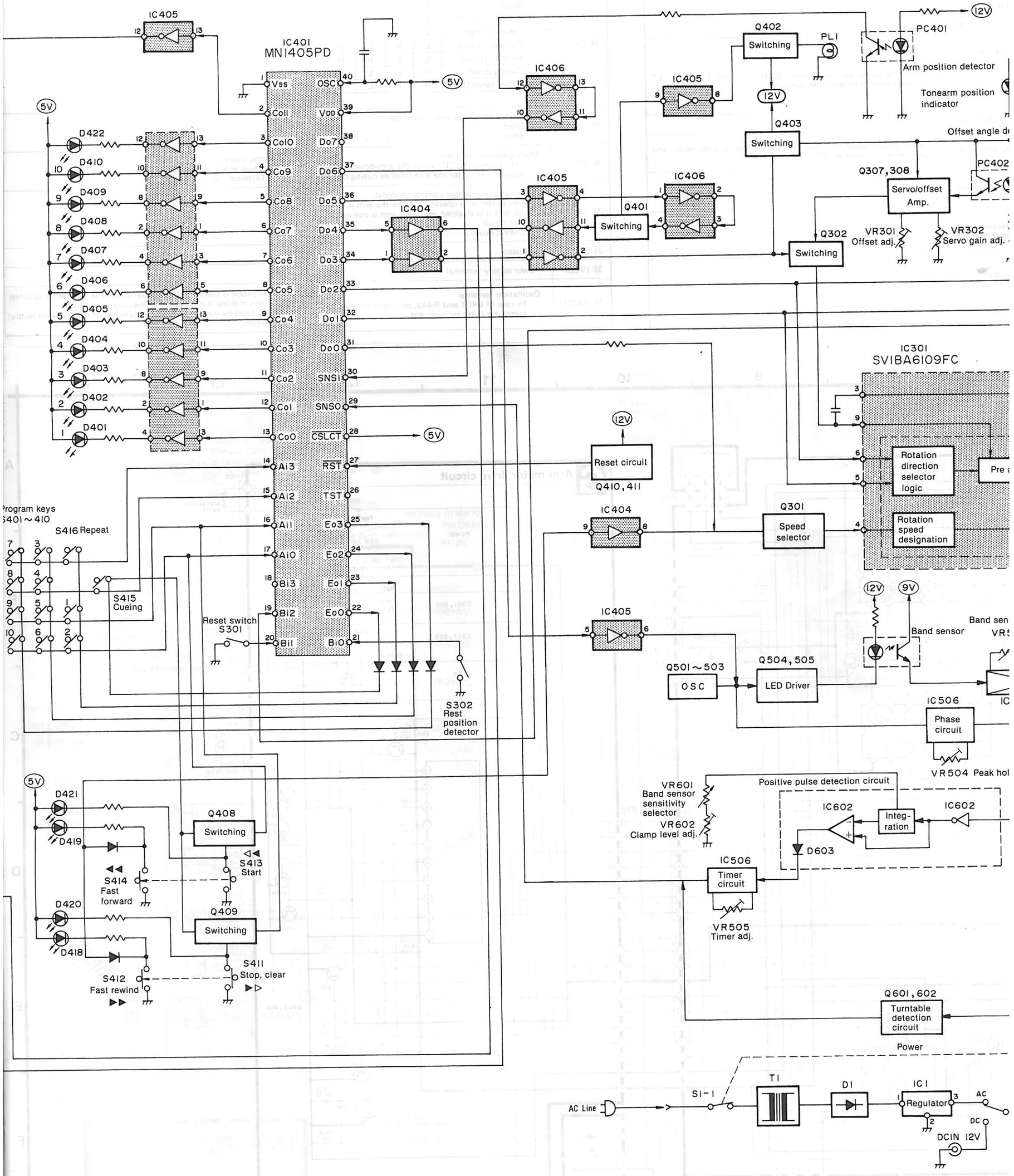

IC505 (SVITC4069)

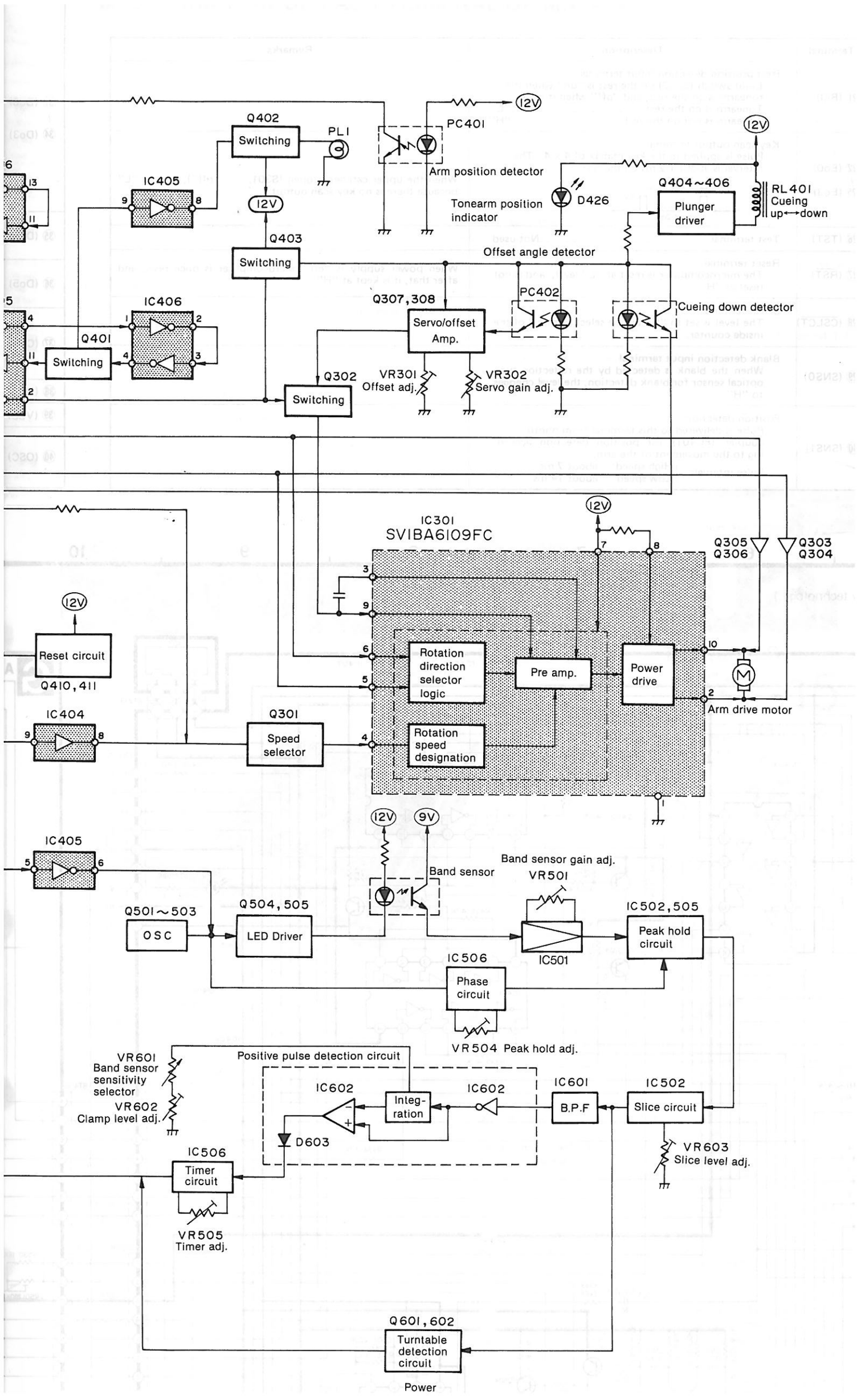



IC506 (SVITC4528BP)

## ■ BLOCK DIAGRAM




IC405
IC401
MN1405PD
Vss
OSC
Coll
Vdd
Col0
Do7
Co9
Do6
Co8
Do5
Co7
Do4
Co6
Do3
Co5
Do2
Co4
Do1
Co3
Do0
Co2
SNS1
Col
SNS0
Co0
CSLCT
Ai3
RST
Ai2
TST
Ai1
Eo3
Ai0
Eo2
Bi3
Eo1
Bi2
Eo0
Bi1
Bi0
5V
D422
D410
D409
D408
D407
D406
D405
D404
D403
D402
D401
IC404
IC406
Q401
Switching
Q402
PL1
PC401
Arm position detector
Tonearm position indicator
Q403
Offset angle de
PC402
Q307,308
Servo/offset Amp.
VR301
Offset adj.
VR302
Servo gain adj.
Q302
IC301
SVIBA6109FC
Rotation direction selector logic
Rotation speed designation
Reset circuit
Q410,411
Q301
Speed selector
Program keys
S401~410
S416 Repeat
S415
Cueing
Reset switch
S301
S302
Rest position detector
Q501~503
OSC
Q504,505
LED Driver
Band sensor
Band sen
VR5
IC506
Phase circuit
VR504 Peak hol
VR601
Band sensor sensitivity selector
VR602
Clamp level adj.
Positive pulse detection circuit
IC602
Integ-ration
D603
Timer circuit
VR505
Timer adj.
Q601,602
Turntable detection circuit
Power
AC Line
SI-1
TI
DI
IC1
Regulator
AC
DC
DCIN 12V
D421
D419
D420
D418
Q408
Switching
Q409
S413
Start
S414
Fast forward
S411
Stop, clear
S412
Fast rewind


12V
Q402
Switching
PL1
PC401
Arm position detector
IC405
Q403
Switching
Tonearm position indicator
D426
Q404~406
Plunger driver
RL401
Cueing up↔down
Offset angle detector
IC406
Q401
Switching
Q307,308
Servo/offset Amp.
PC402
Cueing down detector
Q302
Switching
VR301
Offset adj.
VR302
Servo gain adj.
IC301
SVIBA6109FC
Q305
Q306
Q303
Q304
Reset circuit
Q410,411
Rotation direction selector logic
Pre amp.
Power drive
Arm drive motor
IC404
Q301
Speed selector
Rotation speed designation
9V
IC405
Band sensor
Band sensor gain adj.
VR501
Q501~503
OSC
Q504,505
LED Driver
IC502,505
Peak hold circuit
IC501
IC506
Phase circuit
VR504 Peak hold adj.
VR601
Band sensor sensitivity selector
VR602
Clamp level adj.
Positive pulse detection circuit
IC602
Integ-ration
IC602
IC601
B.P.F
IC502
Slice circuit
D603
VR603
Slice level adj.
IC506
Timer circuit
VR505
Timer adj.
Q601,602
Turntable detection circuit
Power