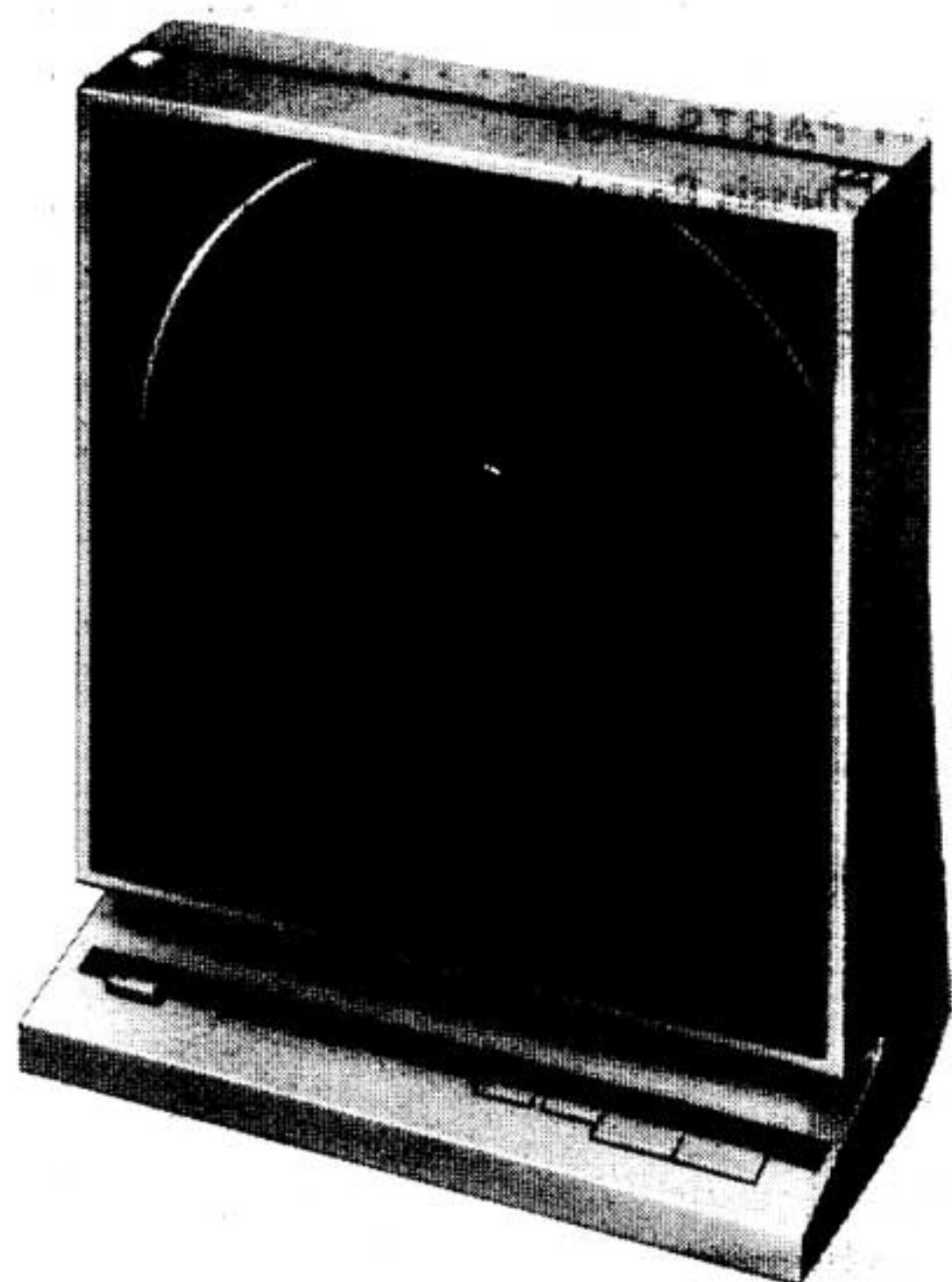


Service Manual

Direct Drive Automatic Turntable System

SL-V5
[M], [MC]



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

Areas

- * [M] is available in U.S.A.
- * [MC] is available in Canada.

* The cartridge shown here is an option.

Specifications

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

■ General

Power supply: 120V AC, 60 Hz
Power consumption: 13 W
Dimensions: 31.5 x 37.2 x 18.5 cm
(W x H x D) (12-1/2" x 14-41/64" x 7-9/32")
Weight: 6.2 kg (13.7 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
Record presence detection
Drive method: Direct drive
Motor: Brushless DC motor
Turntable platter: Aluminum die-cast
Diameter 30 cm (12")

Turntable speeds: 33-1/3 r.p.m and 45 r.p.m.
Wow and filter: 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
Phono cable capacitance: 150 pF

Technics

Matsushita Engineering and
Service Company
50 Meadowland Parkway,
Secaucus, New Jersey 07094

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

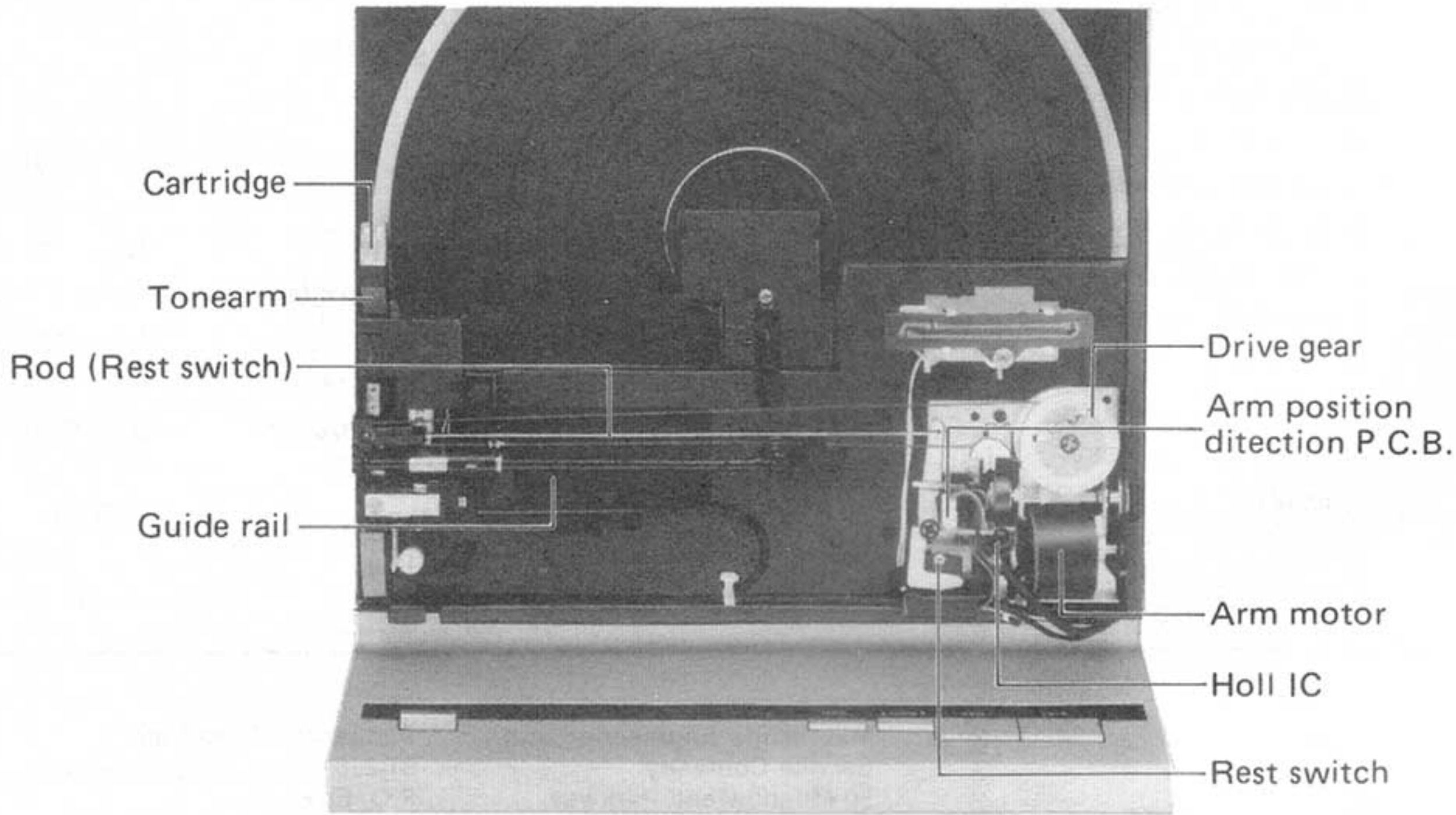
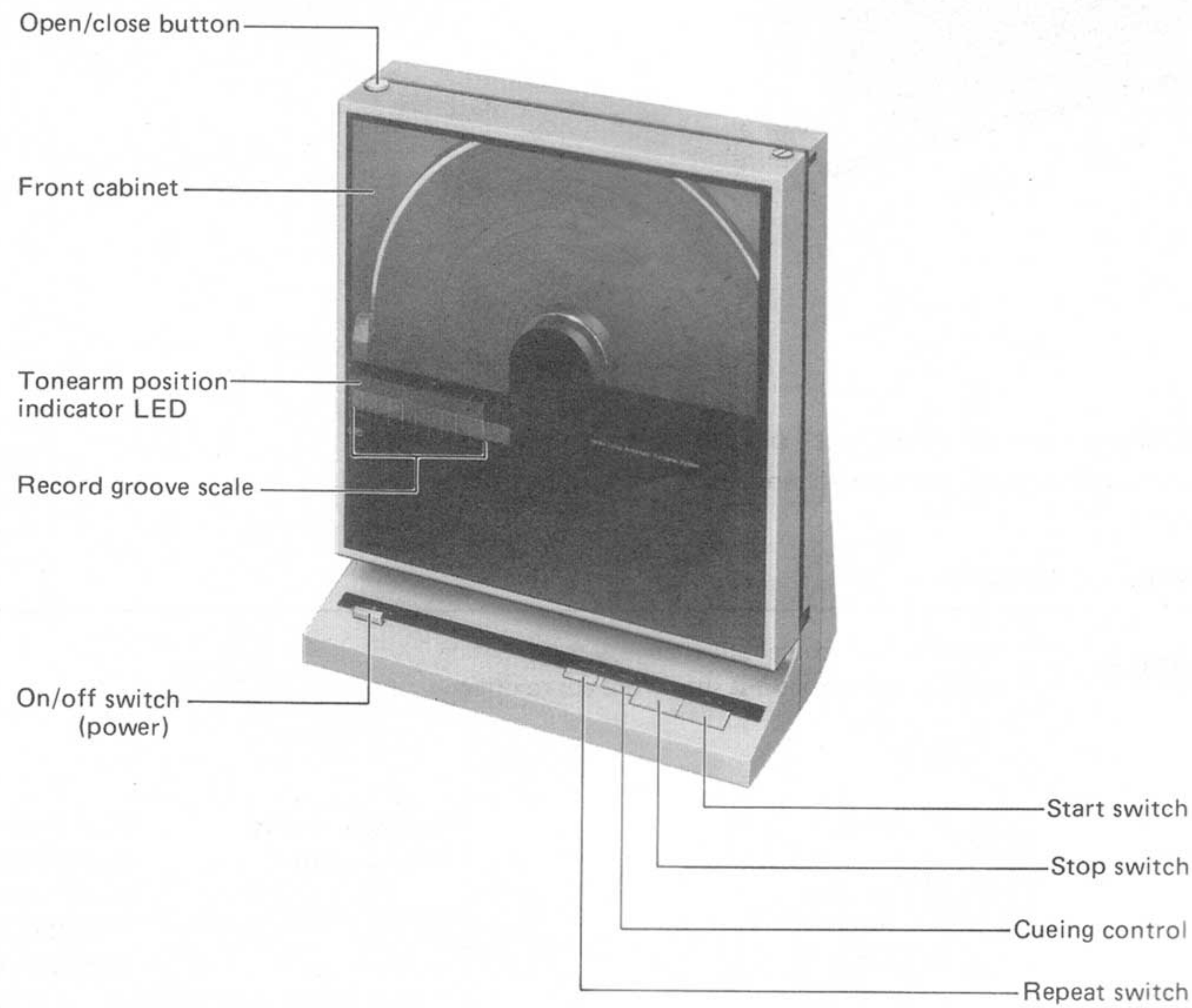
Matsushita Electric
of Canada Limited
5770 Ambler Drive, Mississauga,
Ontario, L4W 2T3

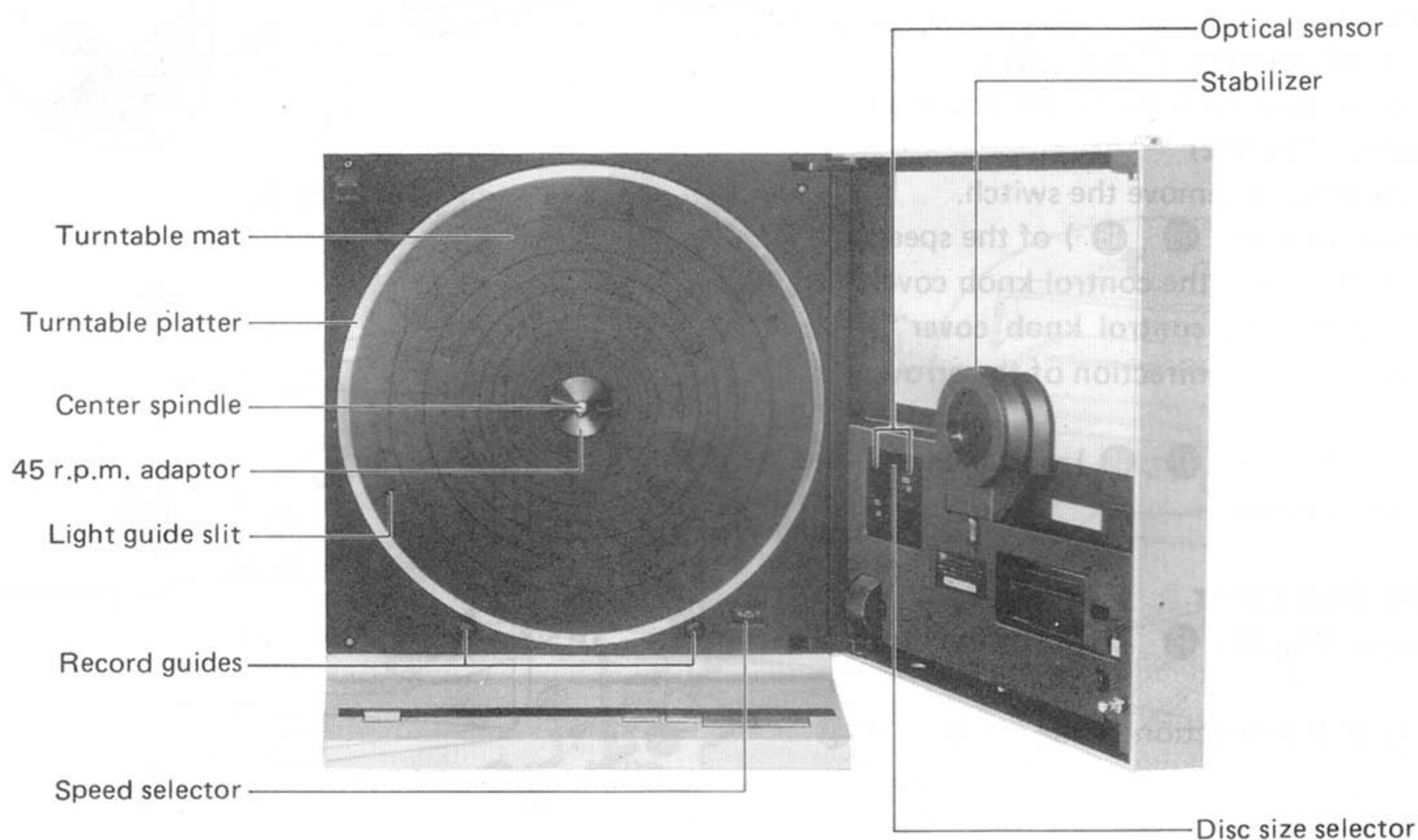
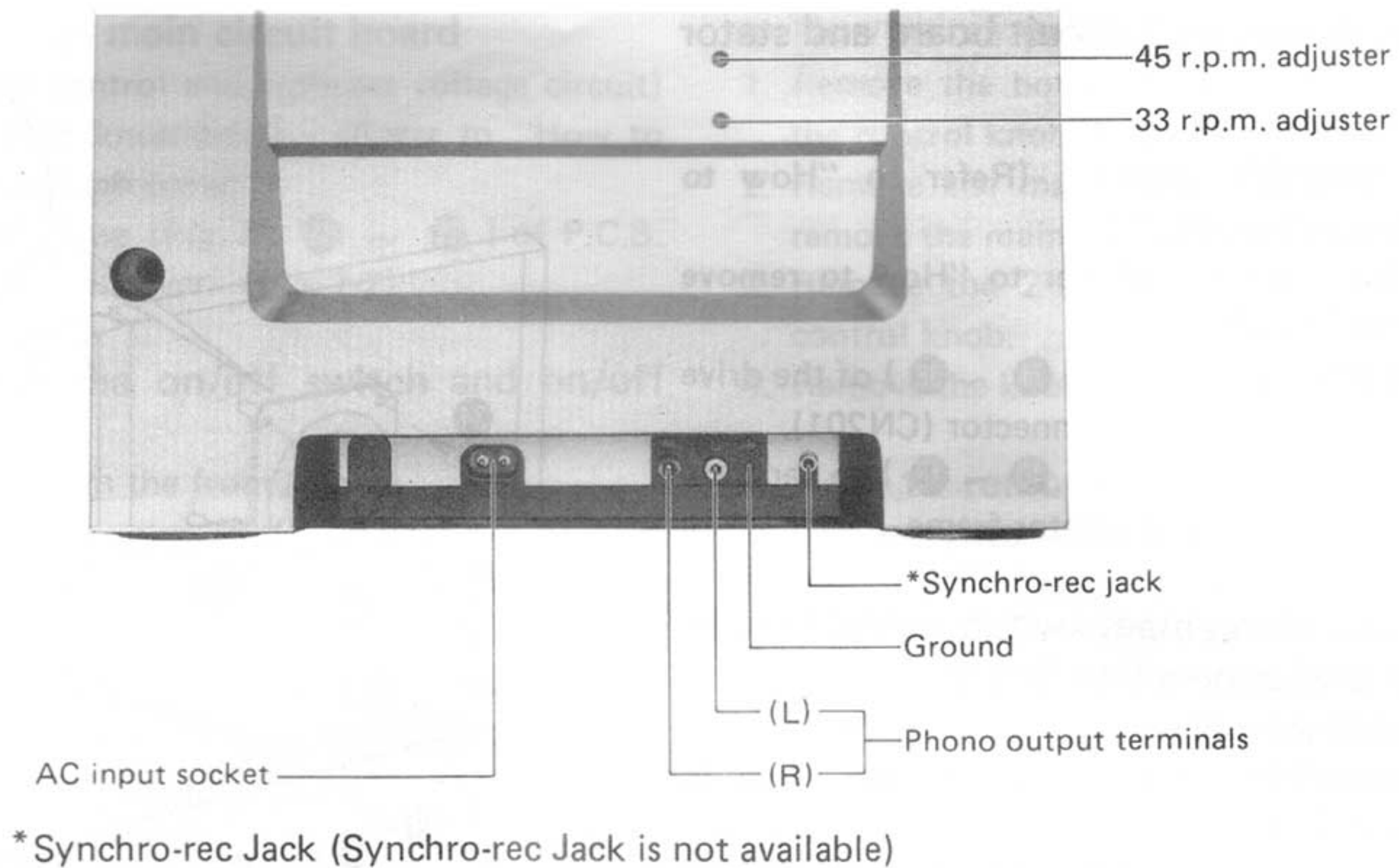
Panasonic Sales Company,
Division of Matsushita Electric
of Puerto Rico, Inc.
Ave. 65 De Infanteria, KM 9.7
Victoria Industrial Park
Carolina, Puerto Rico 00630

CONTENTS

	Page		Page
LOCATION OF CONTROLS	2 ~ 3	BLOCK DIAGRAM.	17 ~ 19
DISASSEMBLY INSTRUCTIONS	4 ~ 8	CIRCUIT BOARD AND WIRING	
HOW TO SET THE TONEARM DRIVE ROPE	8	CONNECTION DIAGRAM	20 ~ 22
HOW TO REPLACE CHIPS (RESISTOR)	9	SCHEMATIC DIAGRAM	23 ~ 26
CHECKING METHOD OF THE UNIT	10	EXPLODED VIEW	27, 28
TROUBLE SHOOTING	11, 12	REPLACEMENT PARTS LIST	
MEASUREMENTS AND ADJUSTMENTS	13, 14	(Cabinet and Chassis Parts).	29
REPLACEMENT PARTS LIST (Electric Parts)	15, 16	PACKING	30

LOCATION OF CONTROLS





■ SAFETY PRECAUTIONS

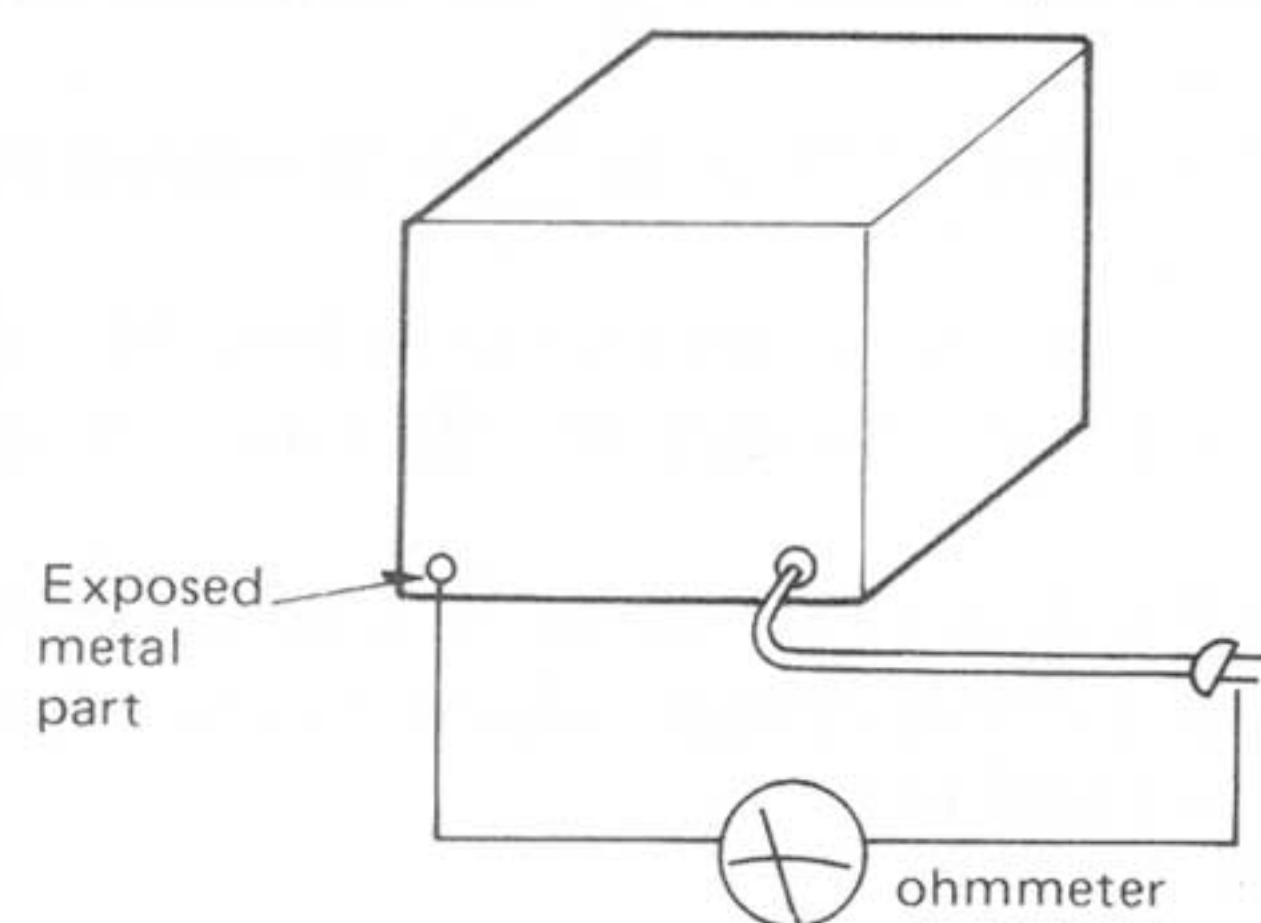
1. Before servicing (such as replacement of components), unplug the power supply cord to prevent an electric shock.
2. Use only manufacturer's recommended components for safety.
Check condition of power supply cord and replace if wear or damage is evident.
3. After servicing, be sure to restore the following to the condition in which they were originally installed:
 - (1) the lead dress and
 - (2) insulation barriers, insulation papers, shields or the like.
4. Before returning a serviced apparatus to a customer, make the following insulation resistance test to prevent the customer from shock hazard.

● Insulation resistance test (See Fig. 1)

1. Unplug the power supply cord and connect a jumper wire between the two prongs on the plug.
2. Turn on the power switch of the apparatus.
3. Measure the resistance value (with an ohmmeter) between the jumpered AC plug and each exposed metallic cabinet part on the apparatus, such as screwheads, control shafts, handle brackets, etc.

The reading should be as shown in figure 1.

In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the apparatus should be repaired and rechecked before it is returned to a customer.



$R = \text{nearly } \infty$

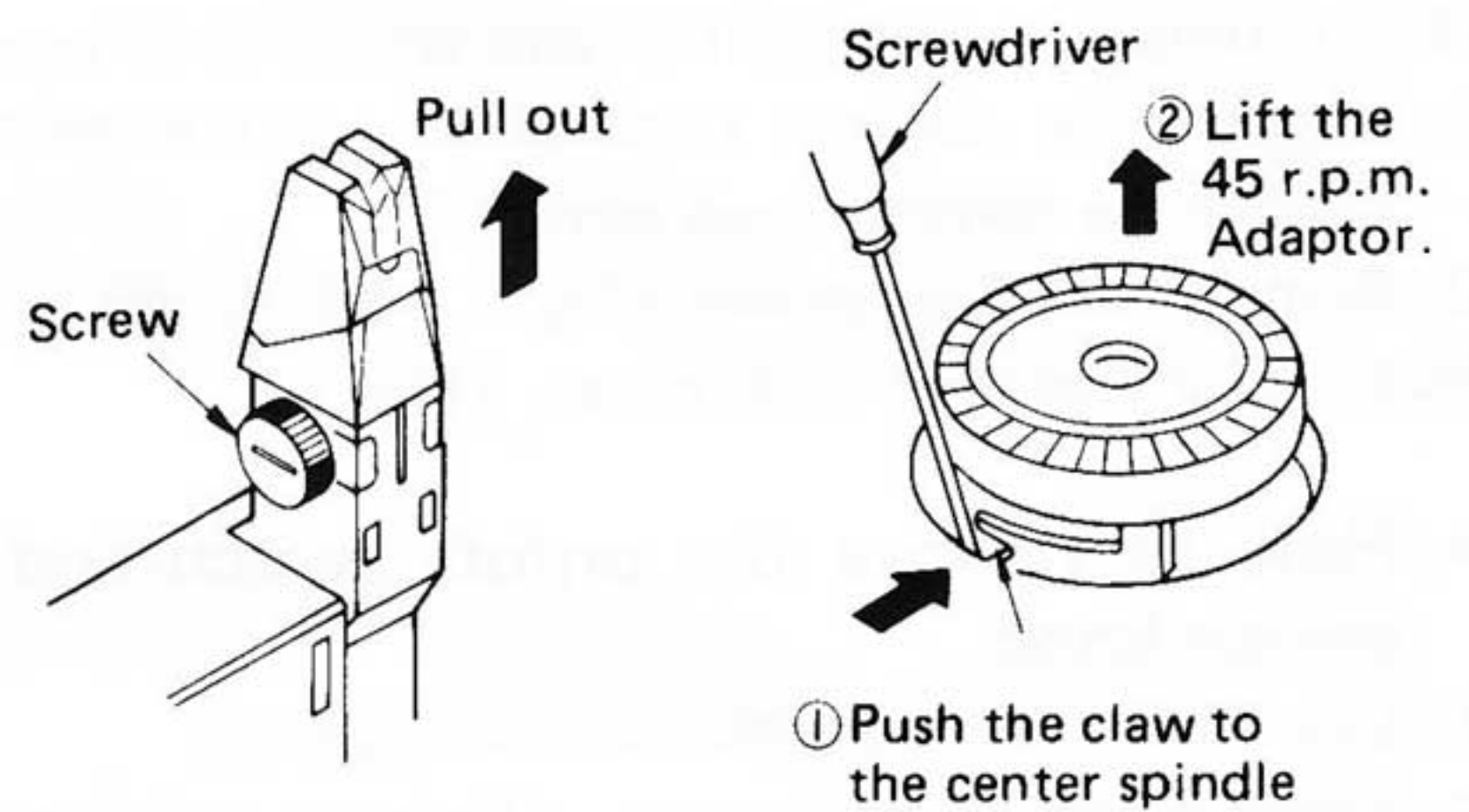
Where, R : resistance value

[Fig. 1]

■ DISASSEMBLY INSTRUCTIONS

● How to remove the cartridge

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

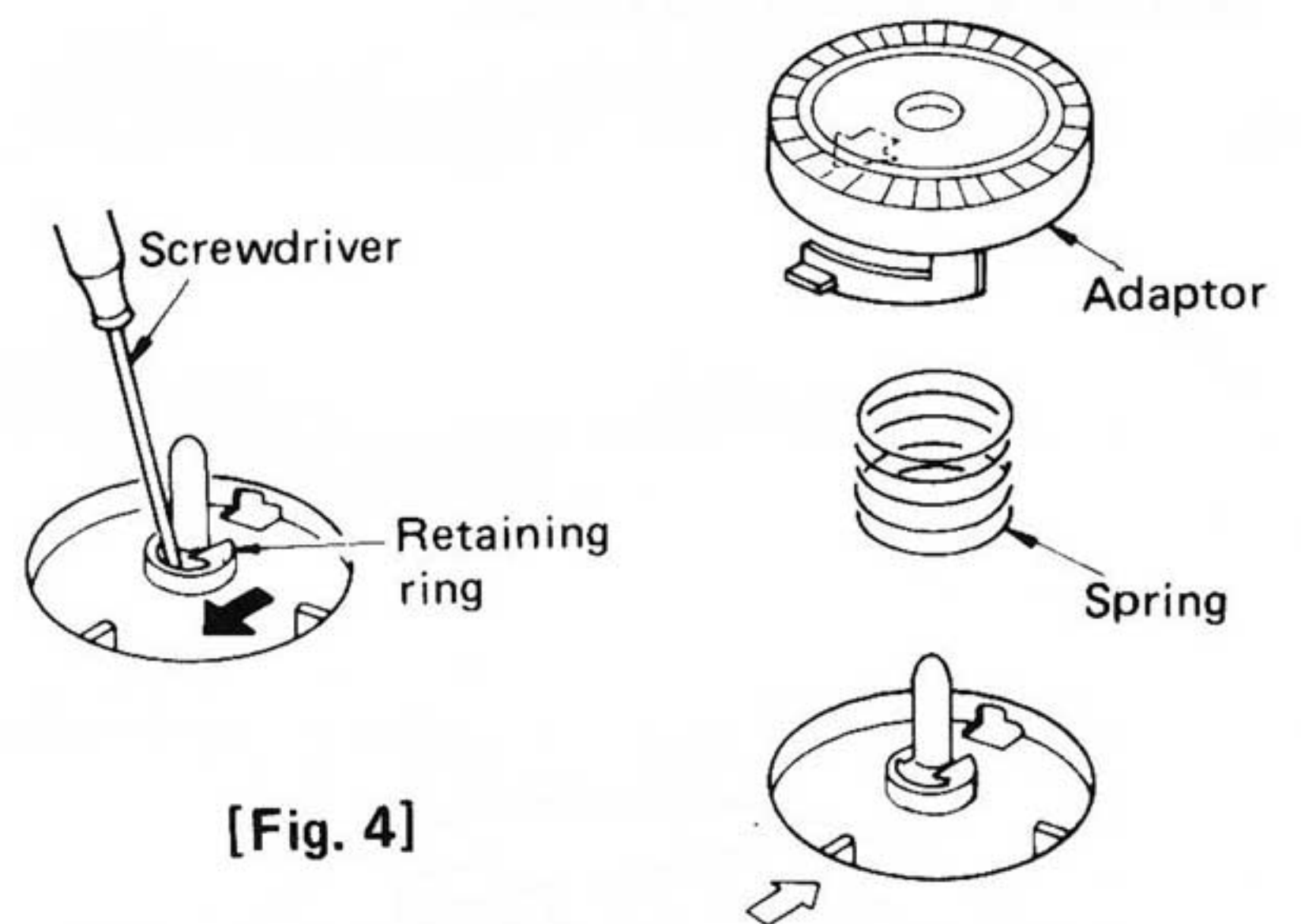


[Fig. 2]

[Fig. 3]

● How to remove the turntable platter

1. Open the front cabinet.
 2. Turn the 45 r.p.m. adaptor counterclockwise to raise it from the turntable platter.
* The turntable mat is glued to the turntable platter.
 3. Remove the turntable platter. (Fig. 3)
- Note:** Take care not to break the claw by pushing it excessively.
4. Remove the retaining ring from the center spindle. (Fig. 4)
 5. Hold up the turntable.



[Fig. 4]

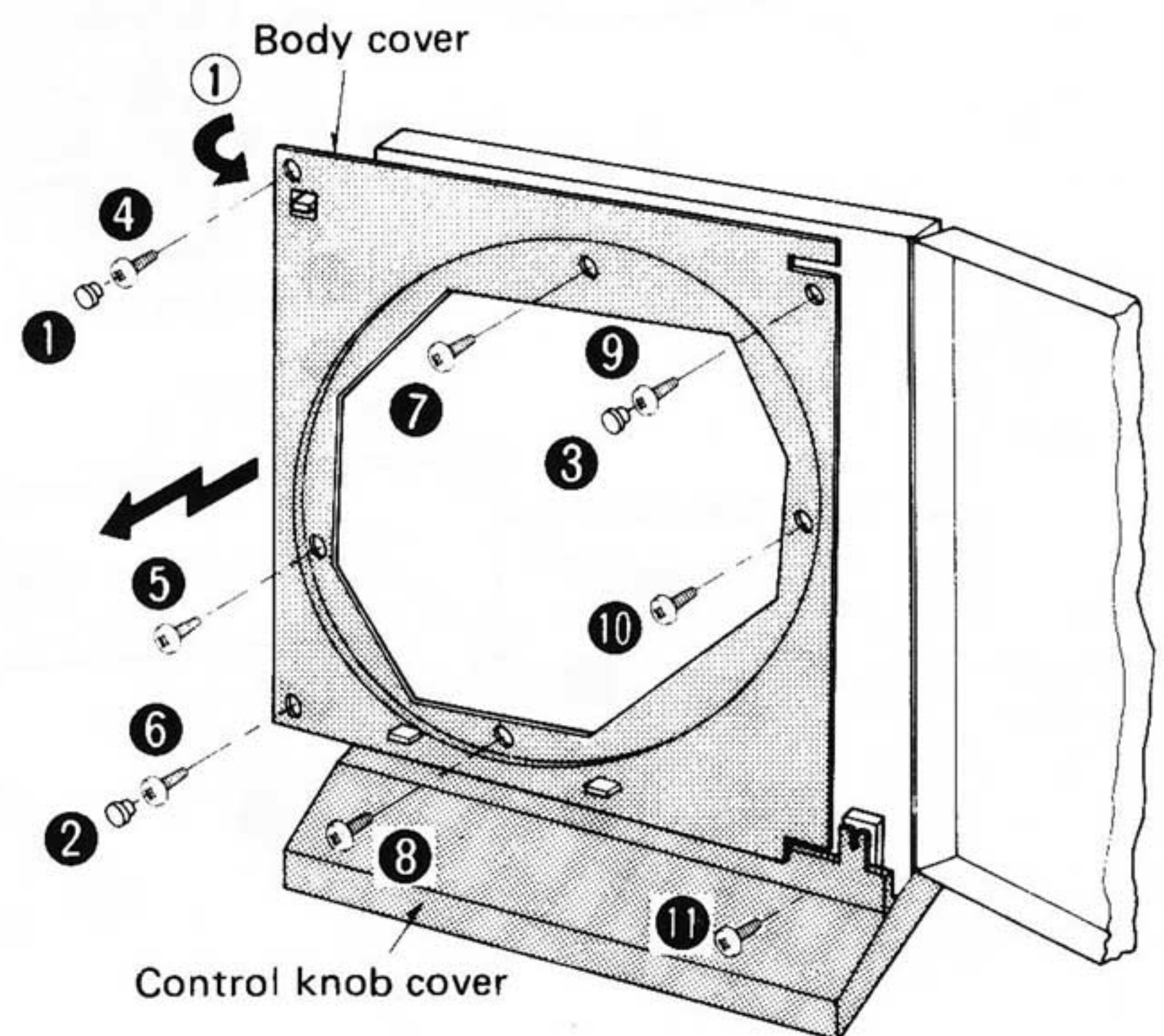
[Fig. 5]

* To set the turntable platter

1. Put the turntable platter in place, and fit the cam and retaining ring onto the center spindle.
 2. Put on the spring and fit the 45 r.p.m. adaptor.
- Note:** Match the ⇨ on the back of 45 r.p.m. adaptor with the ⇐ of the turntable platter. (Fig. 5)

● How to remove the control knob cover

1. Remove the body cover screw caps (Fig. 6 : ① ~ ③).
2. Remove the 7 setscrews (Fig. 6 : ④ ~ ⑩) of the body cover.
3. Remove the body cover in the direction of the arrow.
Note: Slightly turn the cover as shown by the arrow because the cover is engaged with the hinge.
4. Remove the cover setscrew (Fig. 6 : ⑪).
5. Lay down the unit with the front side up as in Fig. 7.
6. Remove the 6 setscrews (Fig. 7 : ⑫ ~ ⑰) of the bottom cover.
7. Remove the bottom cover in the direction of the arrow. (Fig. 7)
8. Remove the 4 setscrews (Fig. 7 : ⑱ ~ ㉑) which fasten the control knob cover to the cabinet. Then remove the 2 fitting plates.
9. Remove the control knob cover in the direction of arrow. (Fig. 7-1)



[Fig. 6]

• How to remove the main circuit board

(Microcomputer, arm control and constant voltage circuit)

1. Remove the control knob cover. (Refer to "How to remove the control knob cover".)

2. Remove the 6 setscrews (Fig. 7 : 22 ~ 27) of P.C.B.

Note: Remove the P.C.B. cover. (Fig. 7-2)

• How to remove the on/off switch and on/off switch knob

1. Lay down the unit with the front side up.

2. Remove the bottom cover. (Refer to "How to remove the control knob cover" item 6.)

3. Remove the 2 setscrews (Fig. 7-3 : 22, 28) which secure the on/off switch cover.

4. Take out the switch and unsolder the knob and switch terminal to remove the switch.

• How to remove the control knob

1. Remove the bottom cover. (Refer to "How to remove the control knob cover" item 6.)

2. Remove the main circuit board. (Refer to "How to remove the main circuit board".)

3. Remove the 2 setscrews (Fig. 7-4 : 29, 30) of the control knob.

4. Remove the knob in the direction of the arrow.

• How to remove the output socket, AC socket, and synchro-rec jack

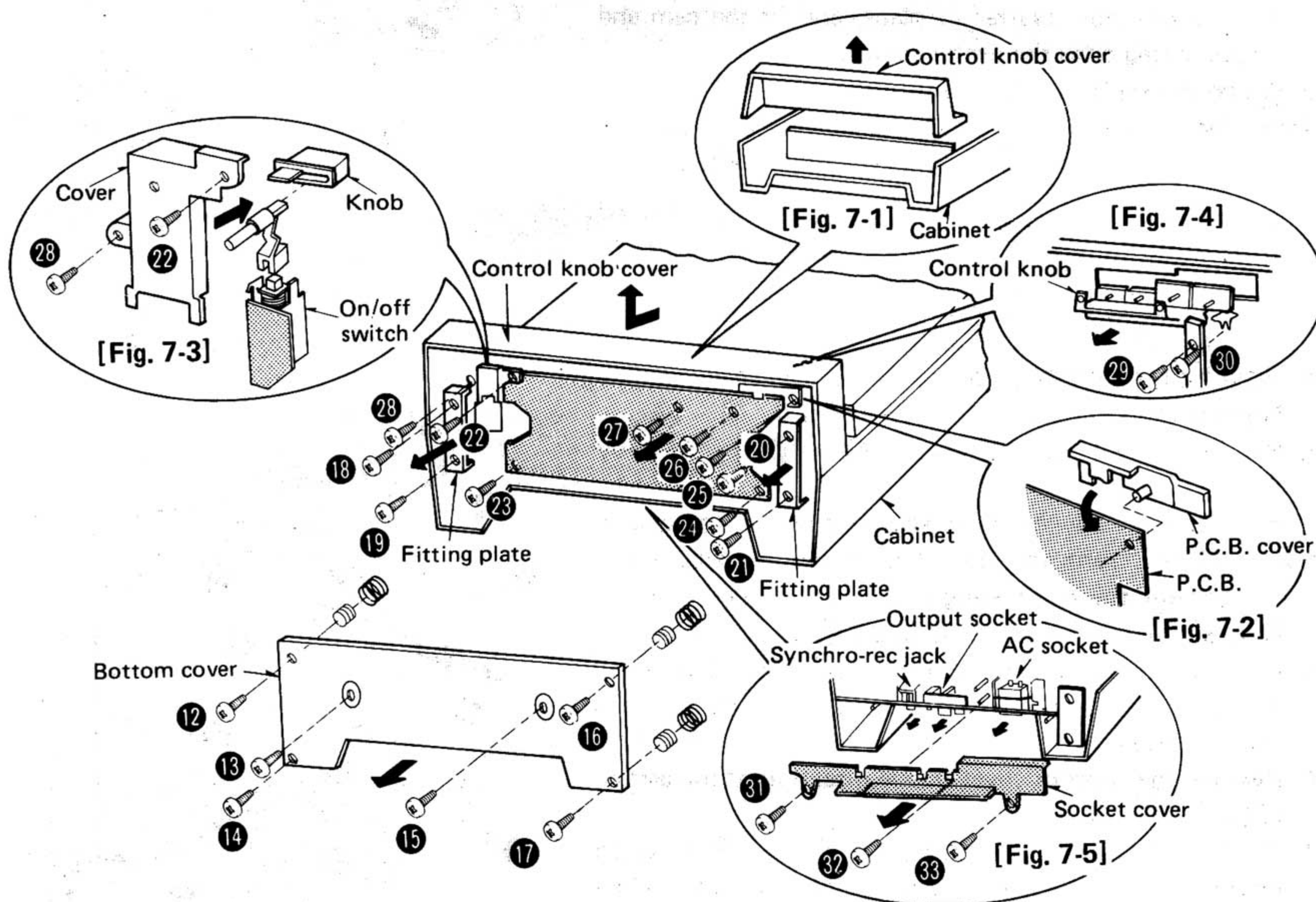
1. Remove the bottom cover. (Refer to "How to remove the control knob cover item 6.")

2. Remove the 3 setscrews (Fig. 7-5 : 31 ~ 33) of the socket cover.

3. Remove the cover in the direction of the arrow.

Note: Pull out the 2-pin connector (CN1) and then remove the cover.

4. Remove each socket in the direction of the arrow.



[Fig. 7]

- **How to remove the drive circuit board and stator frame**

1. Open the front of the unit.
2. Remove the turntable platter. (Refer to "How to remove the turntable platter".)
3. Remove the body cover. (Refer to "How to remove the control knob cover".)
4. Remove the 6 setscrews (Fig. 8 : 34 ~ 38) of the drive circuit board, and pull out the connector (CN201).
5. Remove the setscrews (Fig. 8-1 : 40 ~ 43) to separate the drive circuit board and the stator frame.

- **How to remove the cabinet switch, speed selector switch knob and connection board**

1. Open the front of the unit.
2. Remove the turntable platter. (Refer to "How to remove the turntable platter".)
3. Remove the body cover. (Refer to "How to remove the control knob cover".)
4. Remove the cabinet switch setscrew (Fig. 8 : 44).
5. Release the switch cover claw from the board and then remove the switch cover. (Fig. 8-2)

Unsolder the switch terminal to remove the switch.

6. Remove the 2 setscrews (Fig. 8 : 45 , 46) of the speed selector switch knob, and remove the control knob cover. (Refer to "How to remove the control knob cover".) The knob can be removed in the direction of the arrow. (Fig. 8-3)
7. Remove the 2 setscrews (Fig. 8 : 47 , 48), and then the connector board can be removed.

- **How to remove the dust cover**

1. Remove the 4 setscrews (Fig. 9 : 49 ~ 52) of the dust cover.
2. Remove the dust cover in the direction of the arrow.

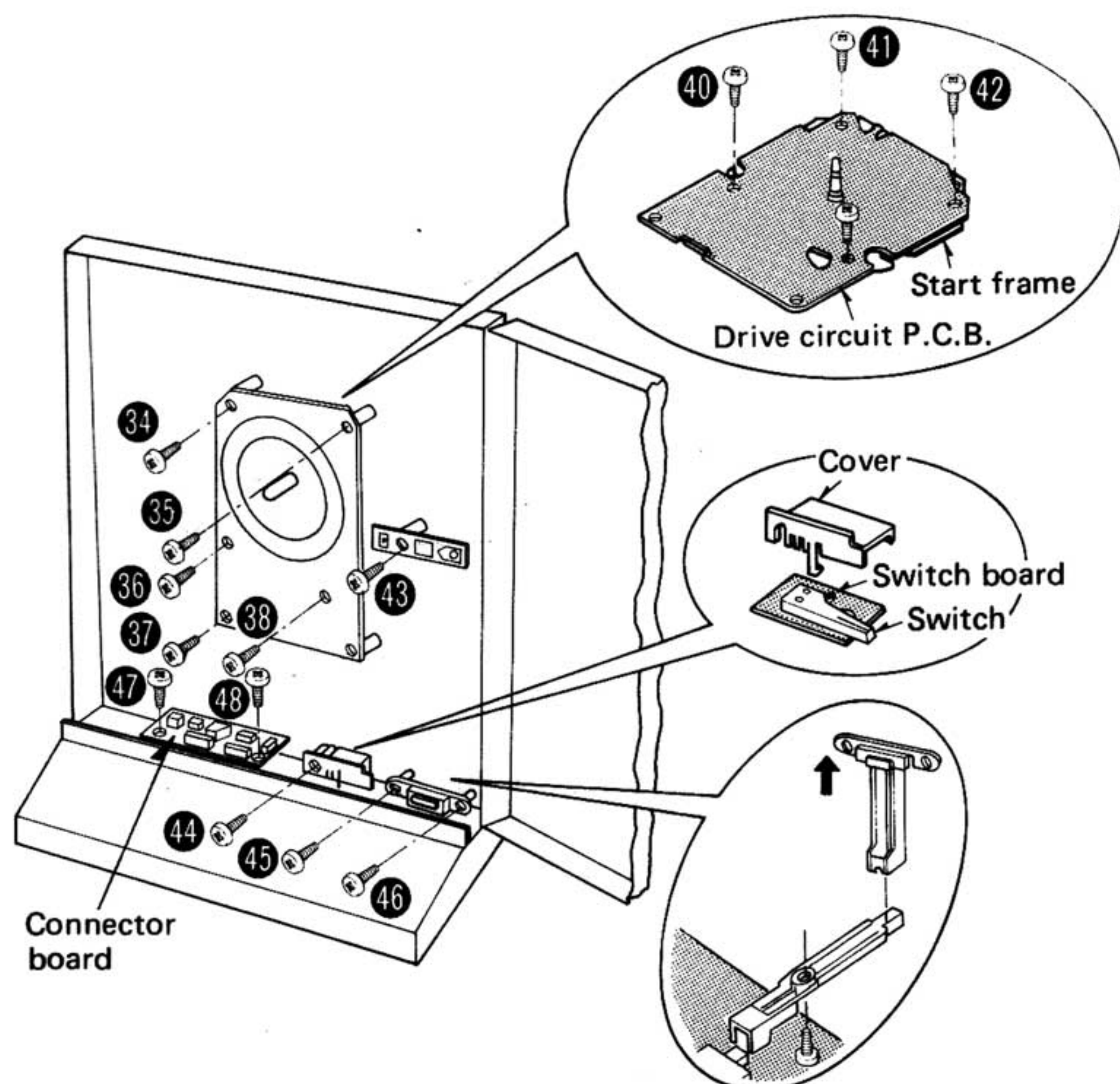
- **How to remove the tonearm**

1. Remove the dust cover. (Refer to "How to remove the dust cover".)
2. Turn the worm gear by hand and slightly shift the tonearm inward.
3. Remove the tonearm setscrew (Fig. 10 : 53).
4. Disconnect the output lead wire from the connector board and then remove the tonearm in the direction of the arrow. (Fig. 10)

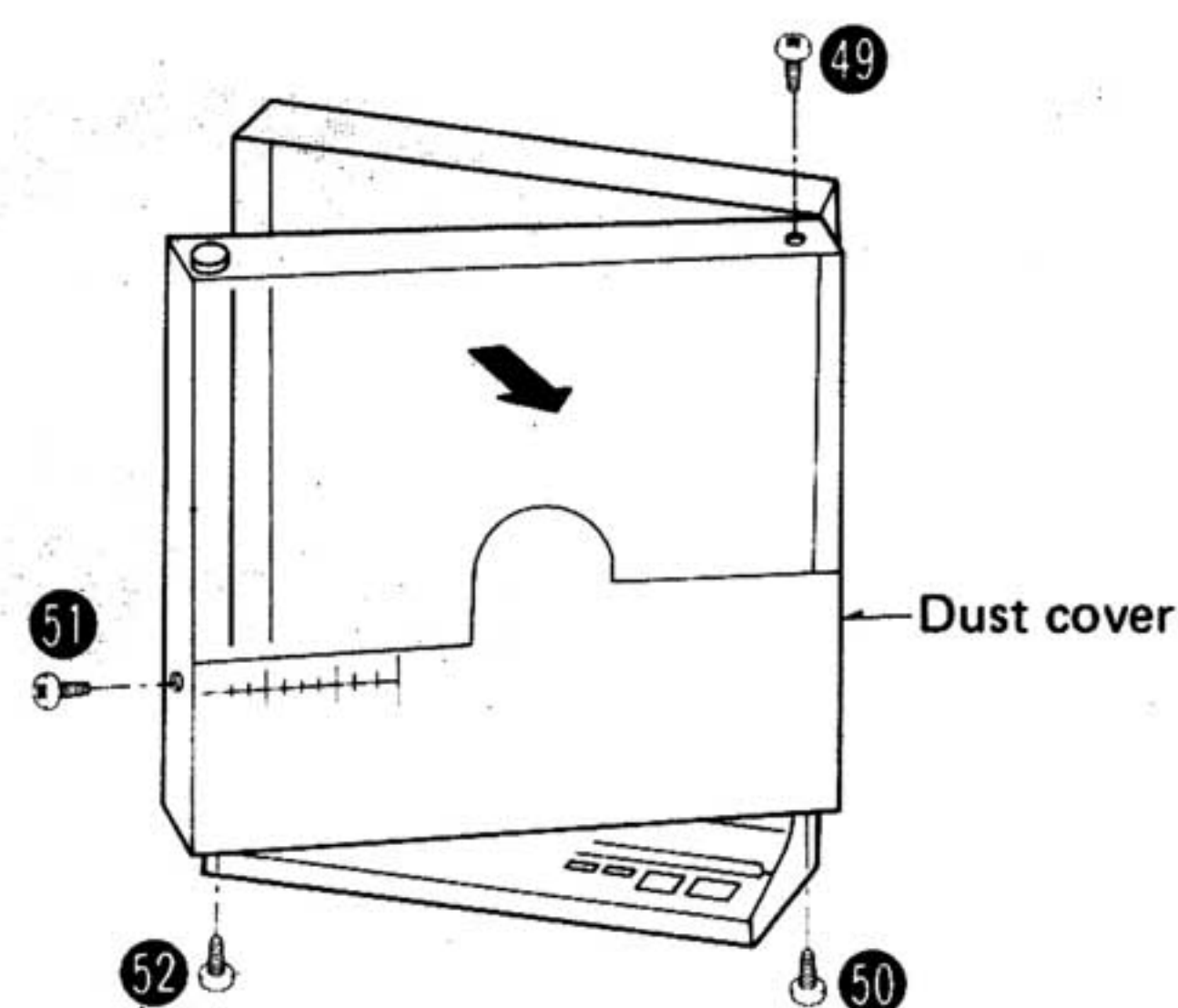
- **How to remove the offset angle detection circuit board**

1. Remove the dust cover. (Refer to "How to remove the dust cover".)
2. Remove the stylus indicator cover setscrew (Fig. 10 : 54).
3. Loosen the P.C.B. setscrew (Fig. 10 : 55) and lift the P.C.B.

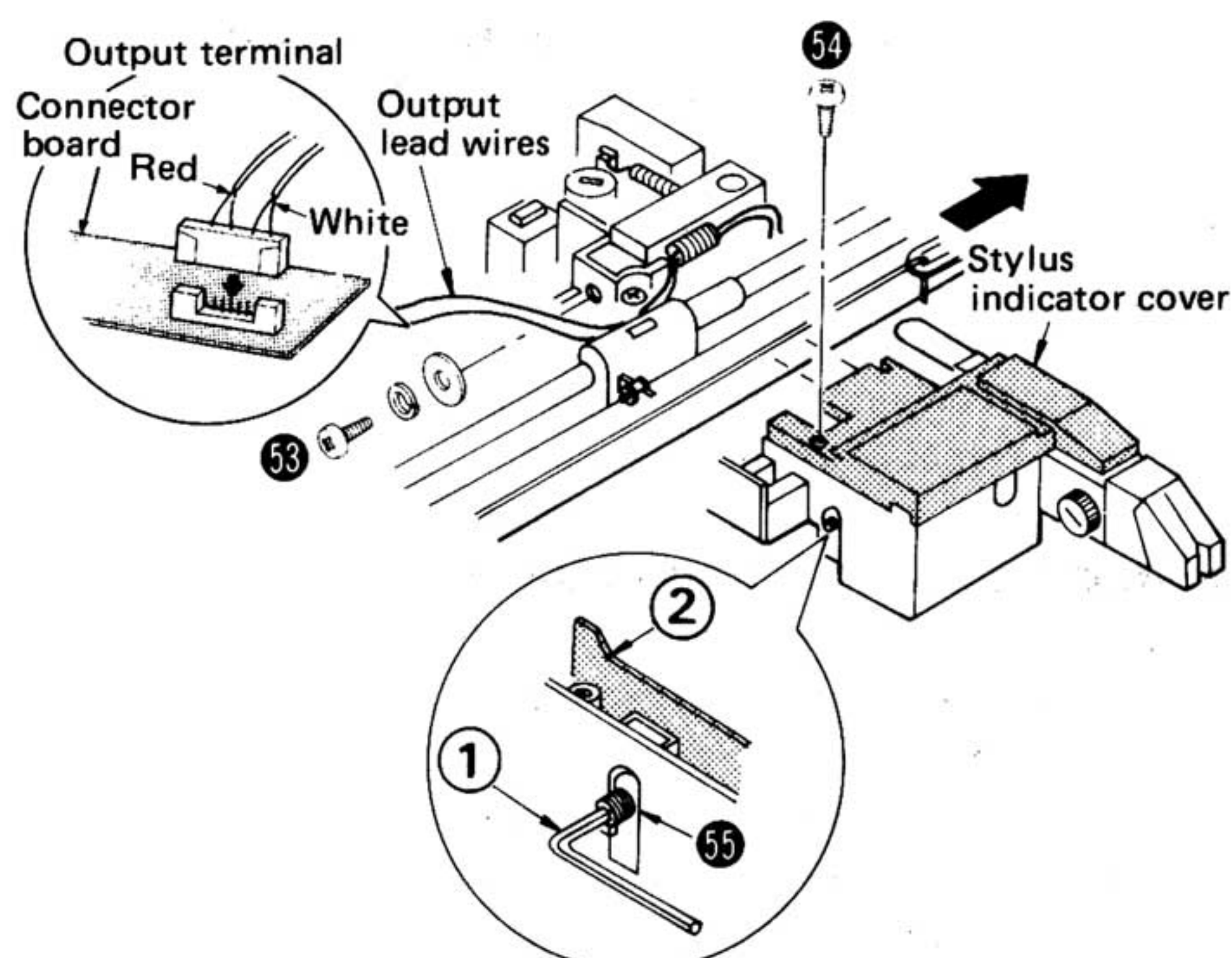
Note: When the P.C.B. is removed, be sure to adjust the servo gain and offset voltage. (Refer to the adjusting procedure on P13.)



[Fig. 8]



[Fig. 9]



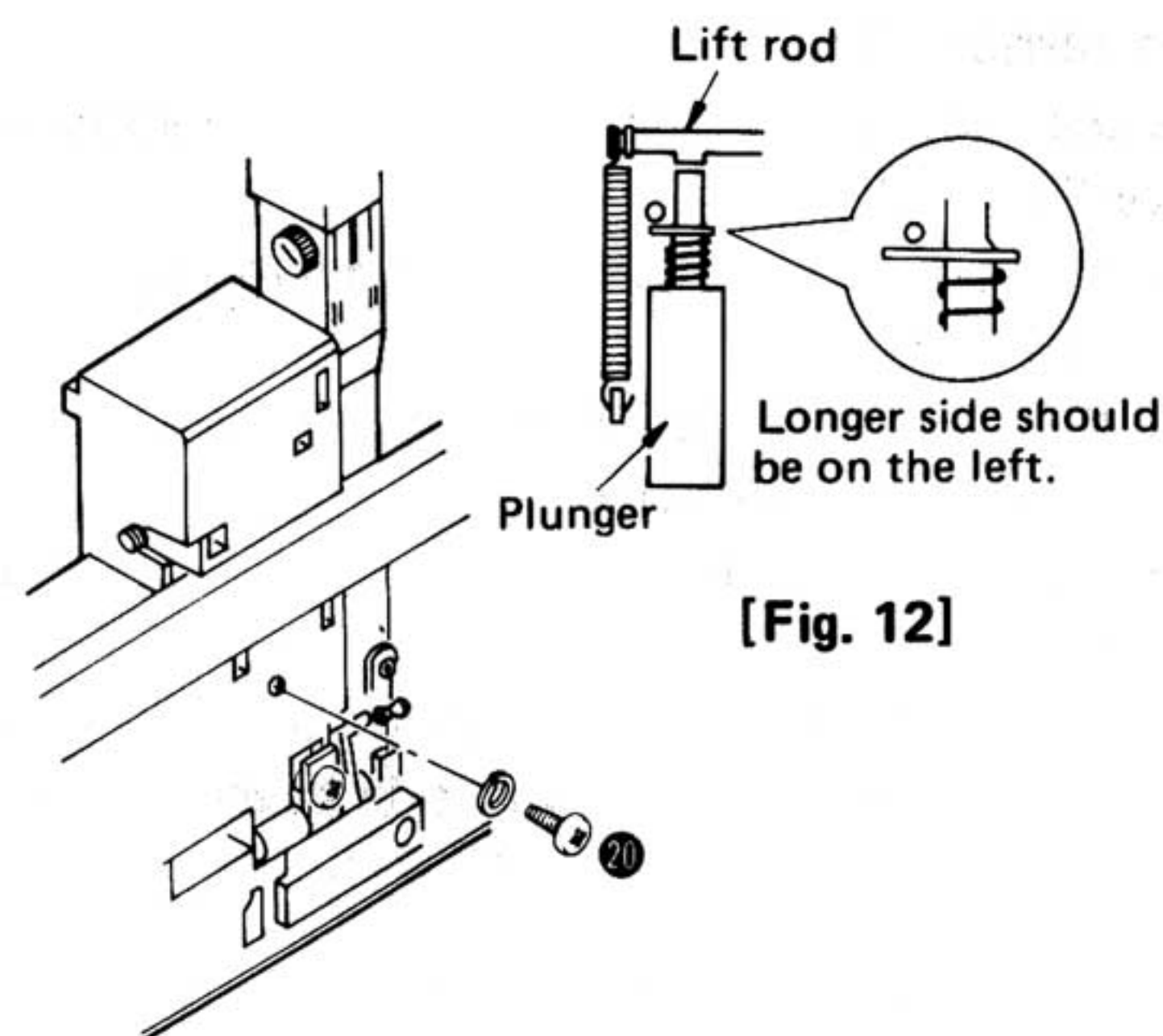
- ① Turn the hex. rod wrench (M3) to counterclockwise.
- ② Lift the P.C.B.

[Fig. 10]

● How to remove the cueing plunger

1. Remove the dust cover. (Refer to "How to remove the dust cover".)
2. Remove the plunger setscrew (Fig. 11 : 56).
3. Remove the offset angle detection P.C.B. and unsolder the 2 leads of plunger. Then the plunger can be removed.

Note: The plunger should be fitted in the position as in Fig. 12.



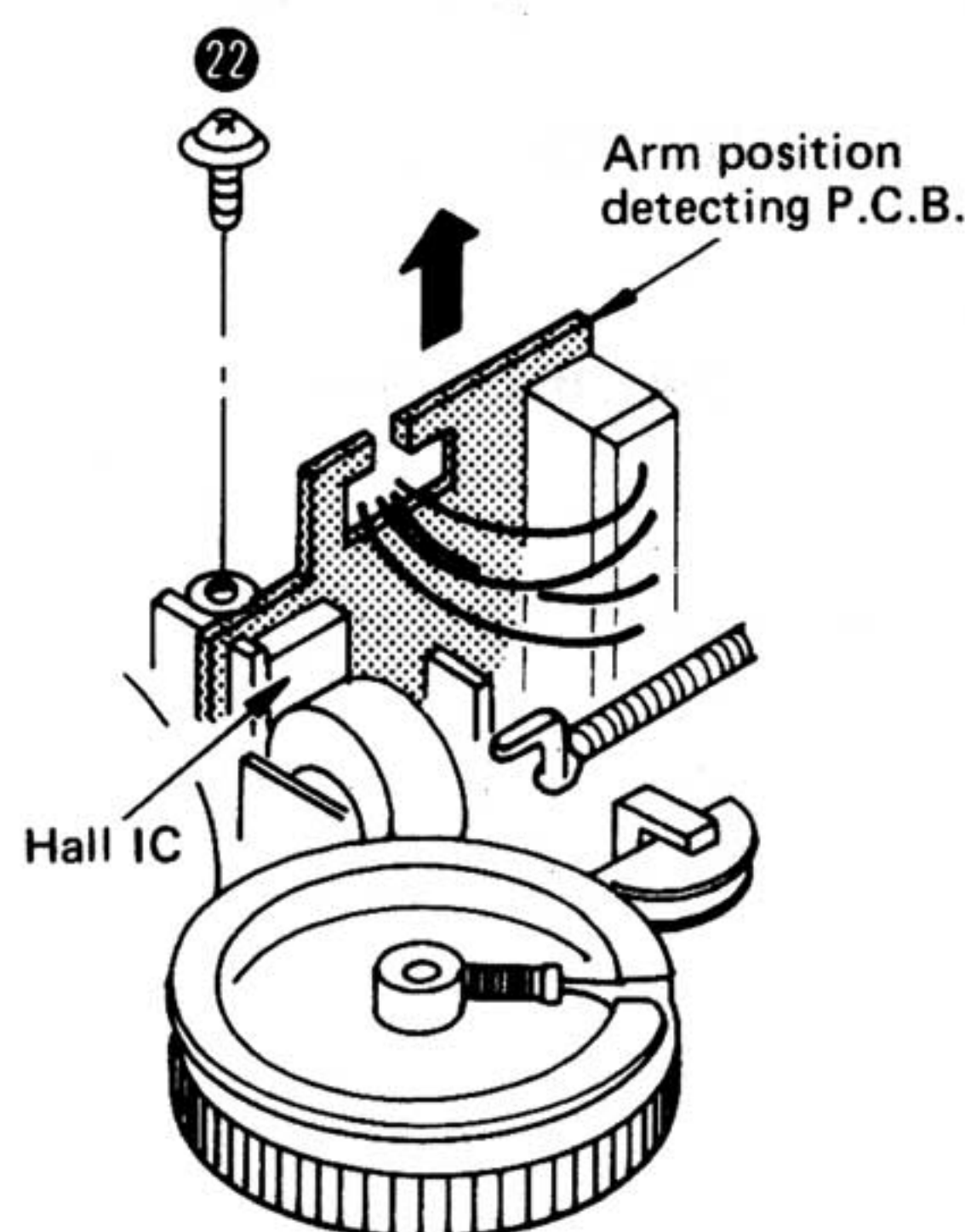
[Fig. 12]

[Fig. 11]

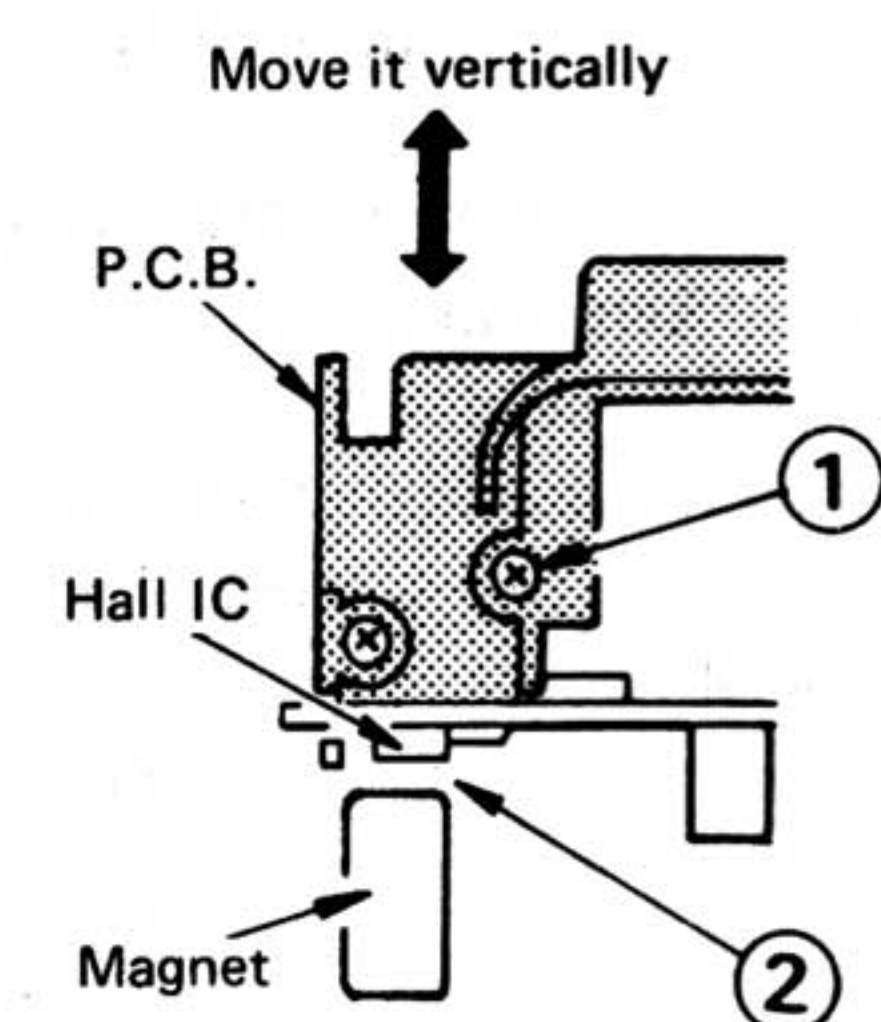
● How to remove the Arm position detecting P.C.B.

1. Remove the dust cover. (Refer to "How to remove the dust cover".)
2. Remove the P.C.B. setscrew (Fig. 13 : 57).

Note: The clearance between Hall IC and magnet should be $0.8 \text{ mm} \pm 0.2 \text{ mm}$. It can be adjusted as in Fig. 14.



[Fig. 13]

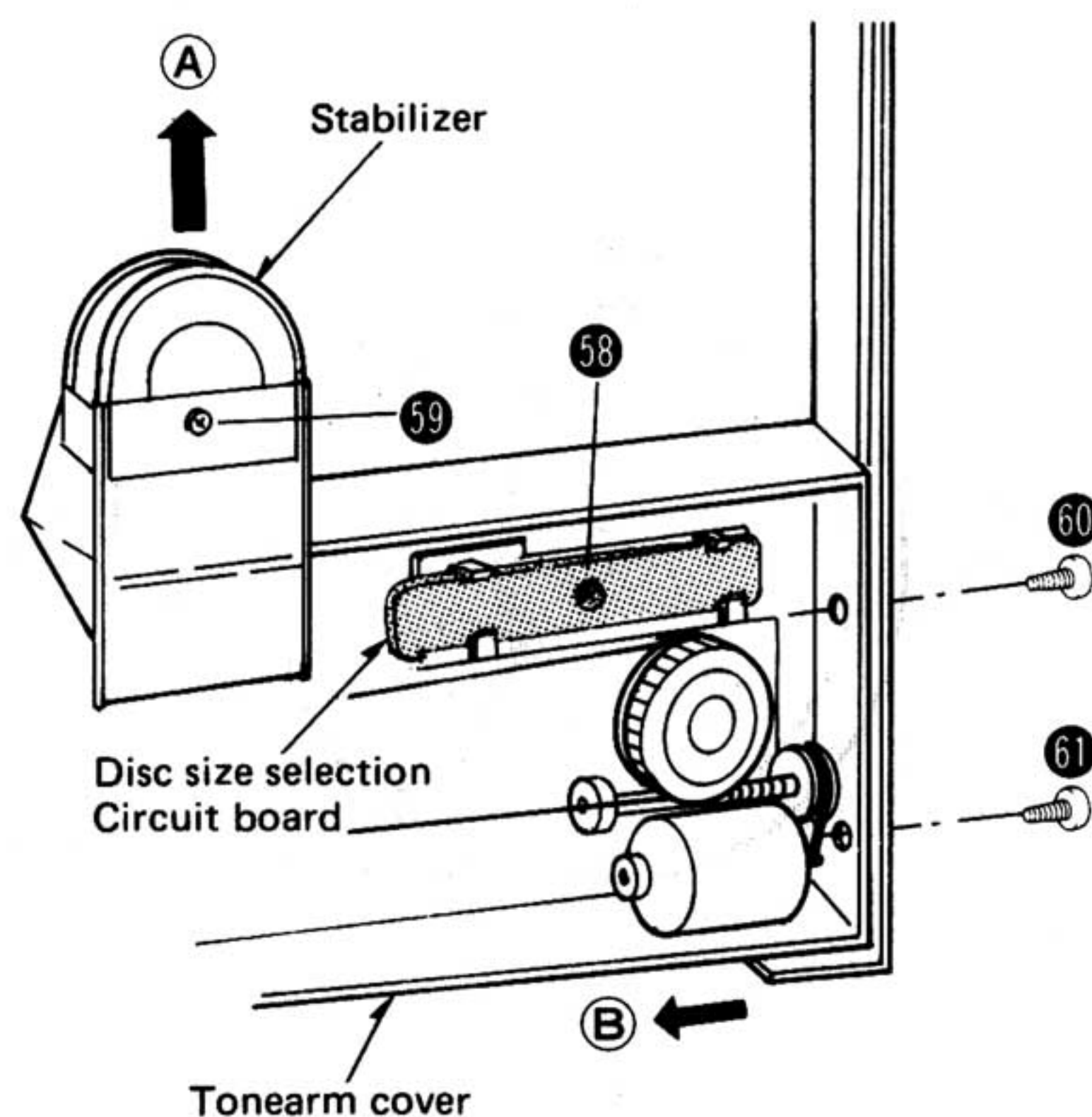


Adjusting method
 ① Loosen the screw.
 ② Move the P.C.B. so that the clearance between Hall IC and magnet is $0.8 \pm 0.2 \text{ mm}$, and then tighten the setscrew.

[Fig. 14]

● How to remove the disc size selector (record size selection P.C.B.), stabilizer, and tonearm cover

1. Remove the dust cover. (Refer to "How to remove the dust cover".)
2. Remove the disc size selector setscrew (Fig. 15 : 58).
3. Remove the stabilizer setscrew (Fig. 15 : 59).
4. Remove the stabilizer in the direction of the arrow (A).
5. Remove the tonearm cover setscrews (Fig. 15 : 60 , 61).
6. Remove the tonearm in the direction of the arrow (B).



[Fig. 15]

● How to remove the hinge

1. Remove the dust cover. (Refer to "How to remove the dust cover".)
2. Remove the body cover. (Refer to "How to remove the control knob cover".)
3. Remove the control knob cover. (Refer to "How to remove the control knob cover".)
4. Remove the hinge setscrews and stopper rings (Fig. 16 : 62 ~ 66).
5. Remove the hinge in the direction of the arrow, and then remove the upper and lower side covers of hinge.

* To fit the hinge

1. Fit the upper side cover to the hinge. (Fig. 16 : A)
2. Fit the lower side cover to the hinge. (Fig. 16 : B)

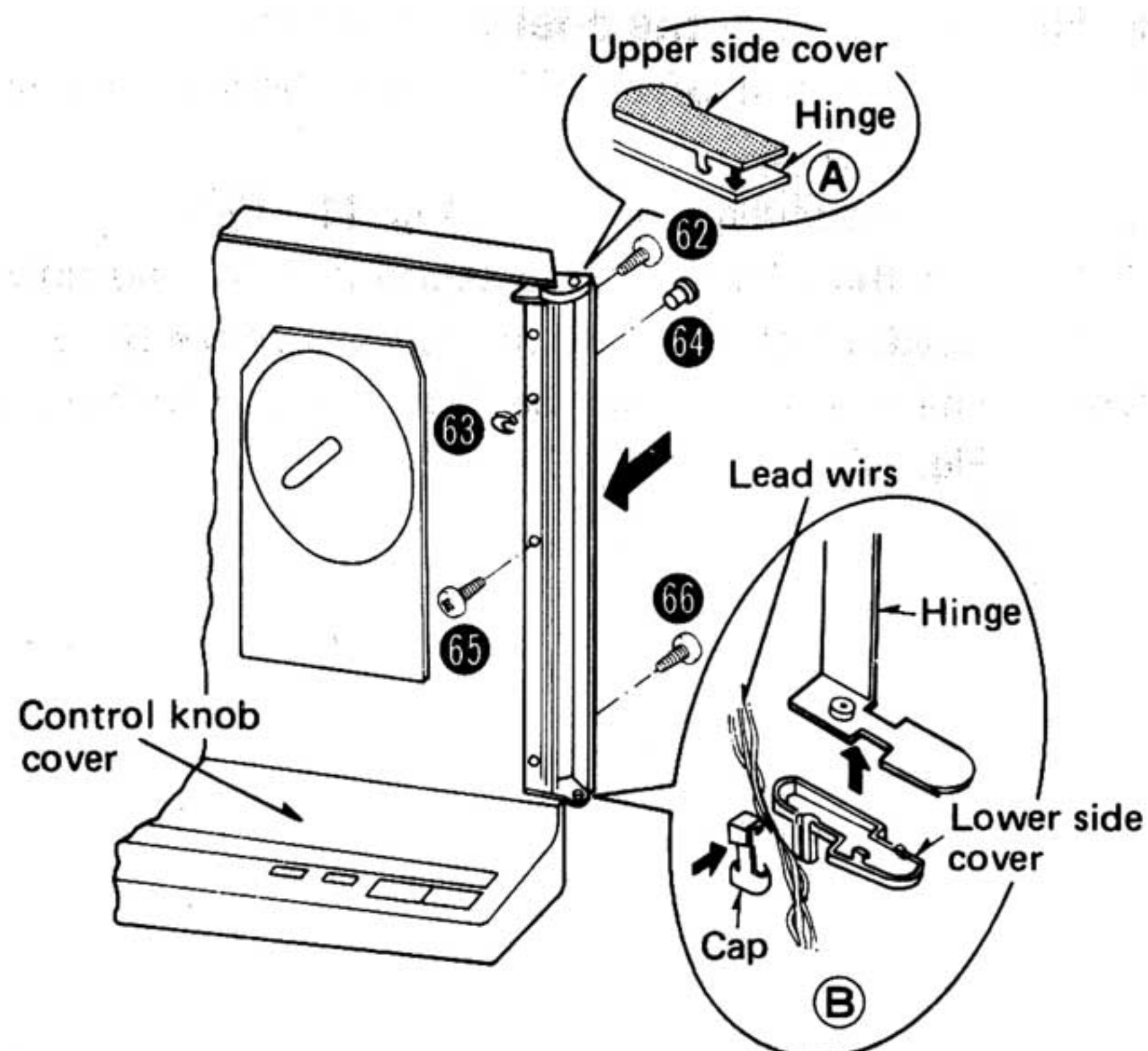
Note: Fit the leads in the lower side cover groove, and set with leads clasper.

3. Secure the hinge with setscrews (Fig. 16 : 62 ~ 66).

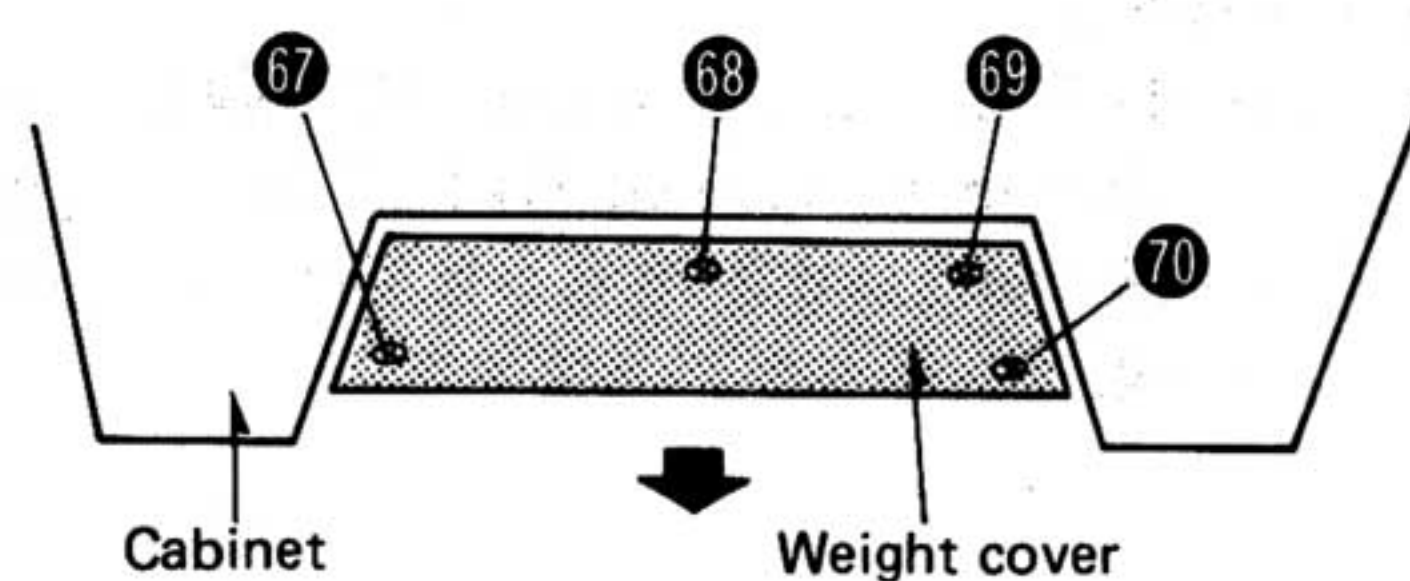
● How to remove the weight

Note: Remember to set the weight when the cabinet is replaced.

1. Lay down the unit with the front side up.
2. Remove the 4 setscrews (Fig. 17 : 67 ~ 70) of the weight cover.
3. Remove the cover in the direction of the arrow and take out the weight.



[Fig. 16]

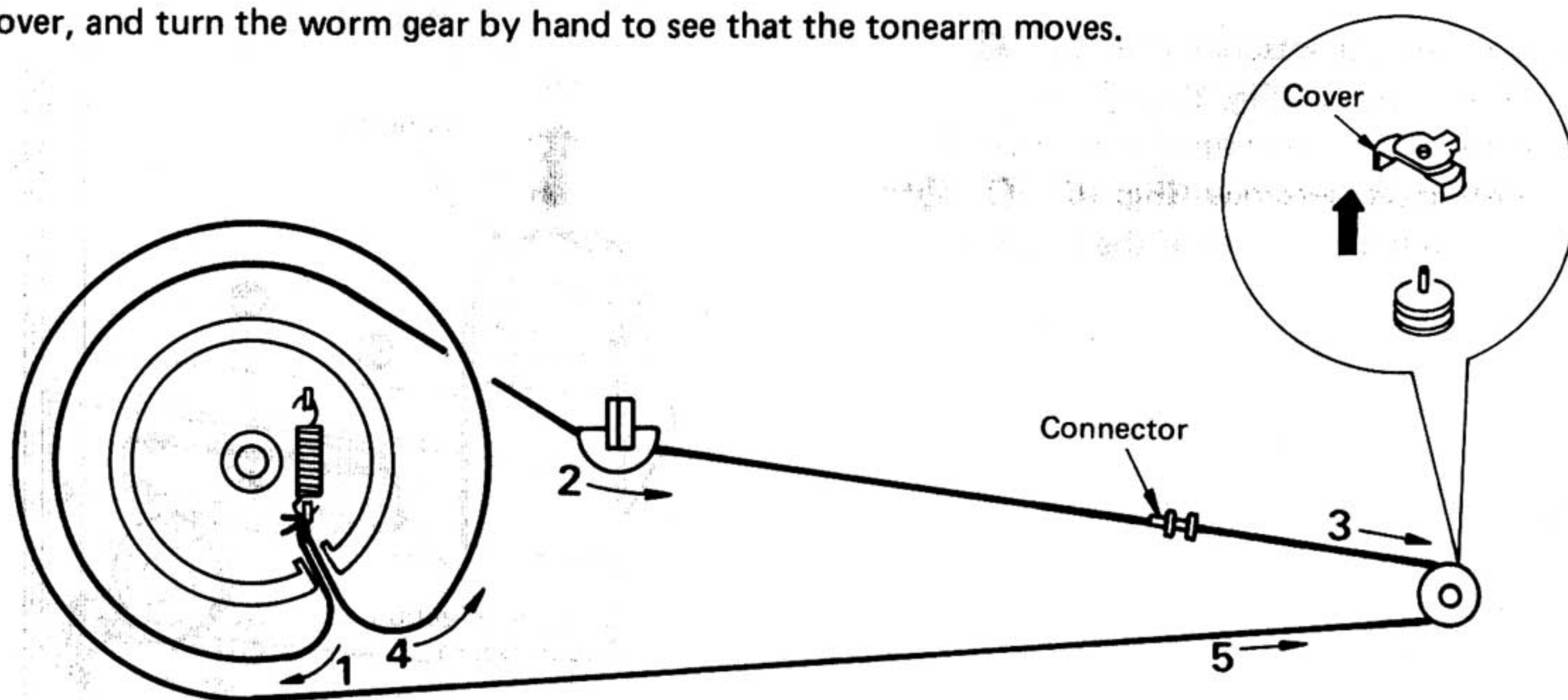


[Fig. 17]

■ HOW TO SET THE TONEARM DRIVE ROPE

Set the rope according to the following procedure.

1. Remove the dust cover. (Refer to "How to remove the dust cover".)
2. Remove the roller cover. (Fig. 18)
3. Set the rope in the order of 1 ~ 5. (Fig. 18)
4. Attach the rope connector to the tonearm.
5. Set the roller cover, and turn the worm gear by hand to see that the tonearm moves.

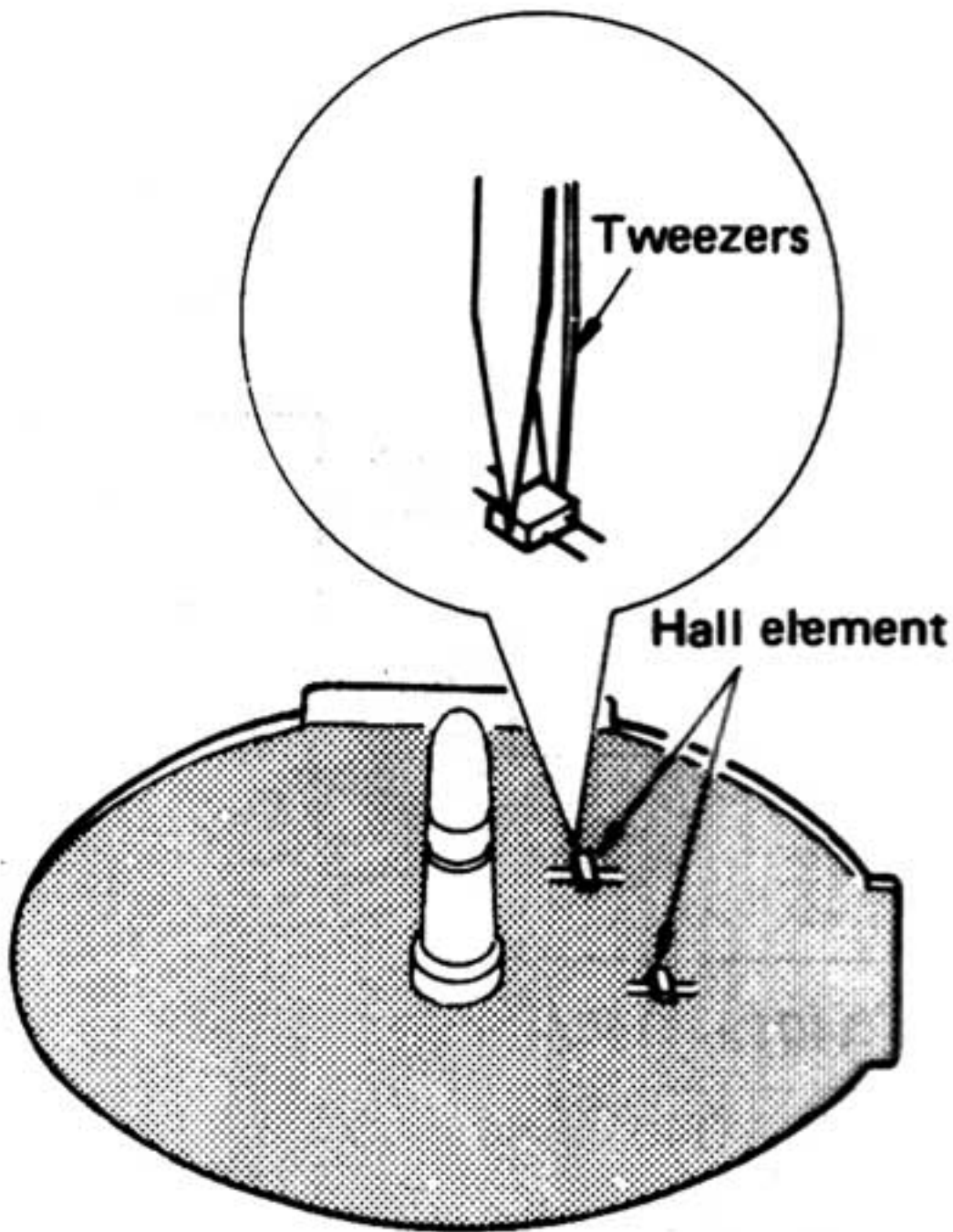


[Fig. 18]

● **How to remove Hall element**

- 1. Remove the turntable platter.
- 2. Remove the terminal solder by use of solder sucker.
- 3. Hold the Hall element with a tweezers and remove it while touching the soldering iron to the terminal.

Note: Fit the Hall element with the part No. printed up. The revers in terminal position is allowable provided that the printed side is up.



[Fig. 19]

■ **HOW TO REPLACE CHIPS (RESISTORS)**

● **Replacing procedure**

- 1. Put solder on the foil where the chip is fitted, and then solder the chip by touching the soldering iron to it as shown in Fig. 20.

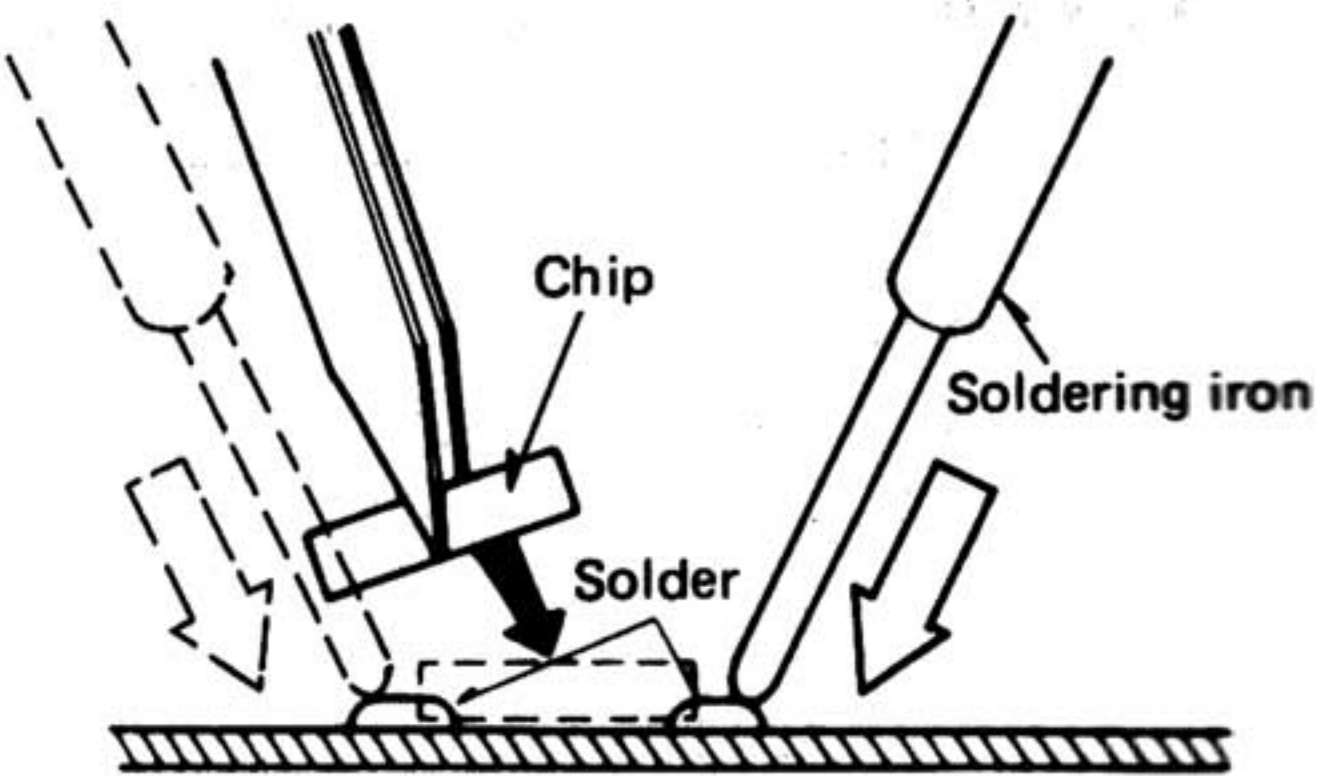
● **Removing procedure**

- 1. Completely unsolder the both ends of the chip bu use of solder sucker.
- 2. Remove chip with tweezers by rotating it while removing solder as shown in Fig. 21.

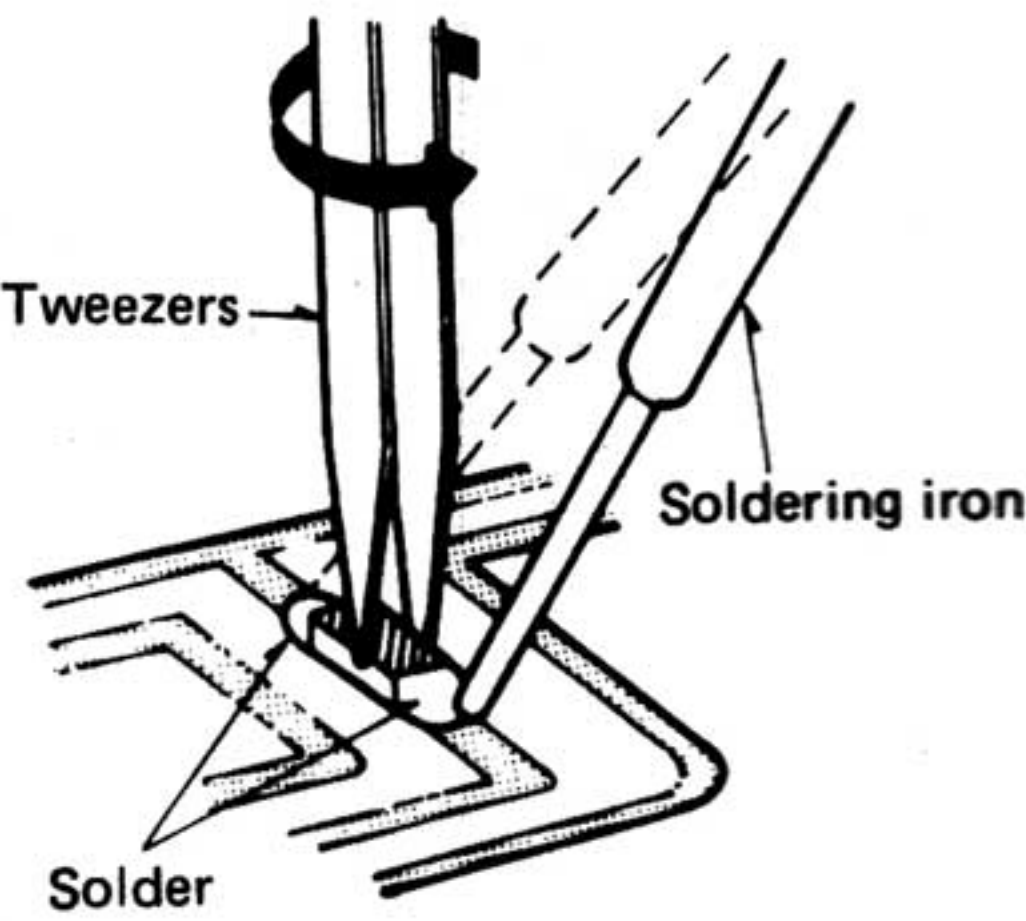
Note: Do not use chip again which is removed from P.C.B.

[Note for replacing chips]

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

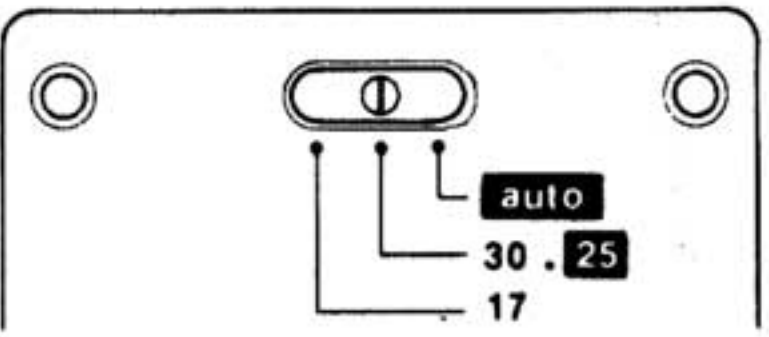
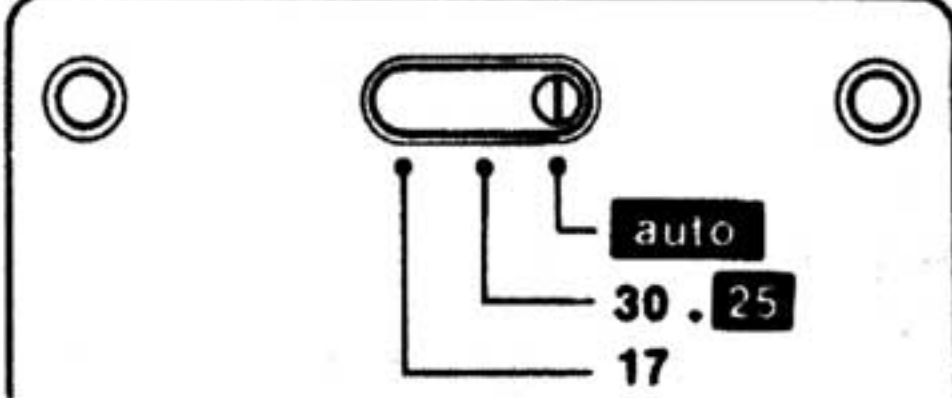


[Fig. 20]



[Fig. 21]

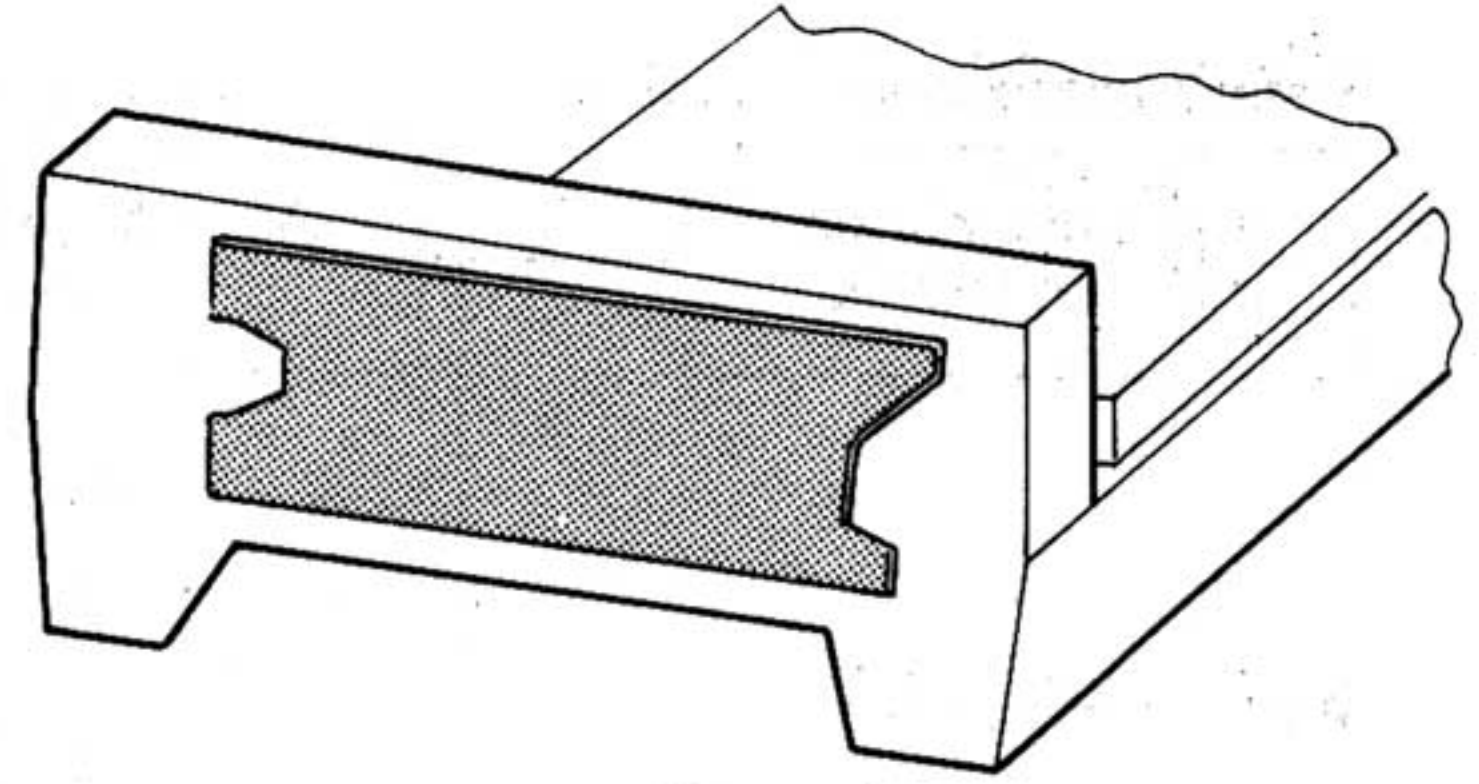
■ **The turntable may not perform as expected when playing the following kinds of records. This does not mean that there is anything wrong with the turntable. In such cases, follow the directions below.**

Record		Operation	Notes
■ 25 cm records. 		1. Set the disc size selector at the "30. 25" position. 2. Hold down the start switch so that the tonearm moves over to a position above the desired record's lead-in grooves. 3. Push the cueing control.	● Ordinarily, the disc size selector should be left at the "auto" position. 
■ Records that are transparent, colored or translucent black-any record that does not completely block light.	30 cm record	1. Set the disc size detector at the "30. 25" position. 2. Use with the auto play or search play mode.	● Repeat play is not possible for 25 cm records or records that do not meet the industry standard dimensions because size is not automatically detected. ● Set the speed selector to 33 or 45 depending on the correct speed for the record in question. ● In some cases it is not possible to play records that do not meet the industry standard dimensions.
	17 cm record	1. Set the disc size detector at the "17" position. 2. Use with the auto play or search play mode.	

■ CHECKING METHOD (Refer to “Disassembly Instructions”)

1. Main P.C.B. checking method (Fig. A)

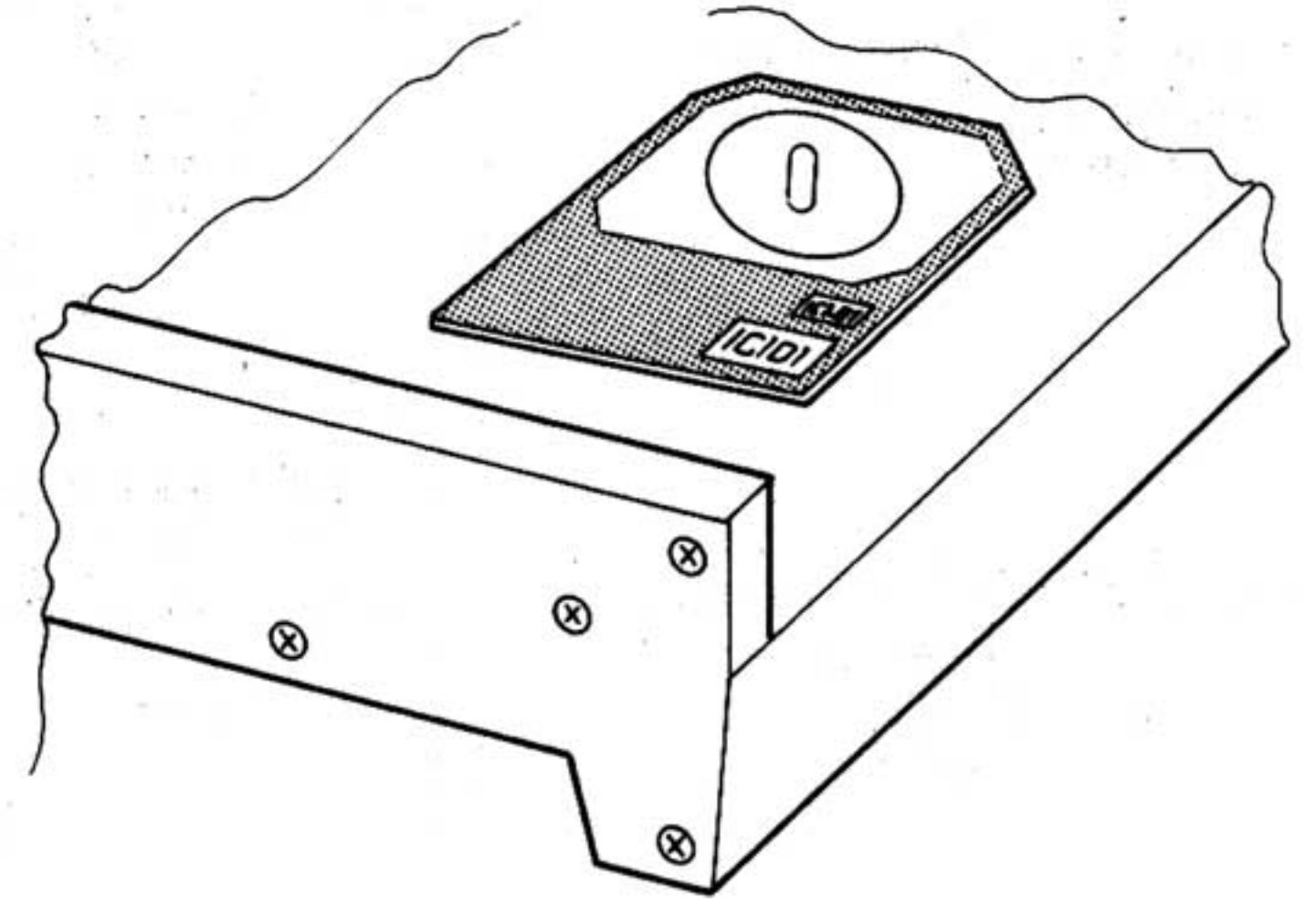
- 1) Lay down the unit.
- 2) Remove the bottom plate.
- 3) Put on the record and check each circuit from the bottom of the unit.



(Fig. A)

2. Turntable drive circuit checking method (in stop mode) (Fig. B).

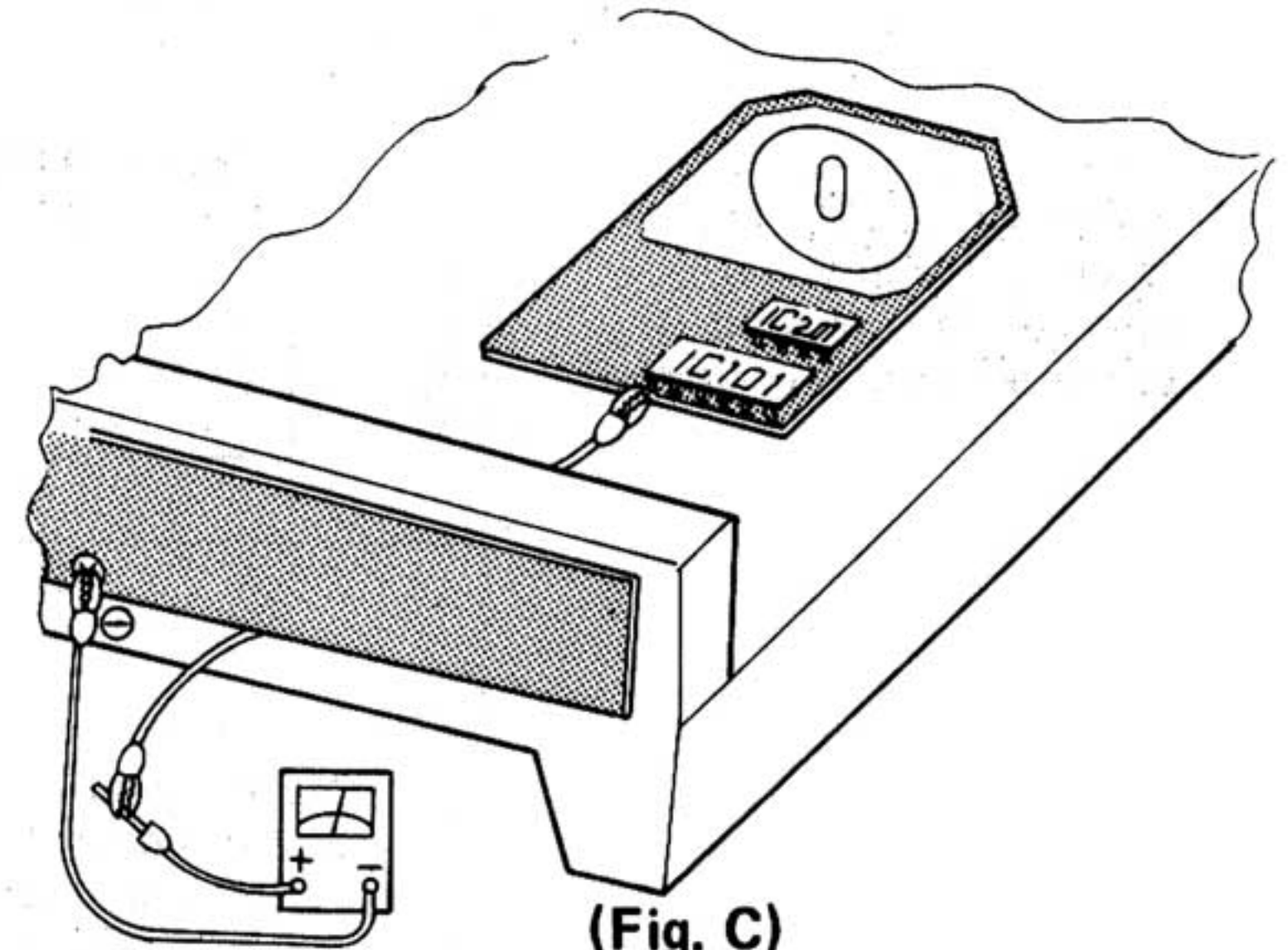
- 1) Lay down the unit.
- 2) Open the front cabinet.
- 3) Remove the turntable platter.
- 4) Turn on the on/off switch and check the drive circuit.



(Fig. B)

3. Turntable drive circuit checking method (in operation mode) (Fig. C)

- 1) Lay down the unit.
- 2) Remove the bottom plate.
- 3) Open the front cabinet and remove the turntable platter.
- 4) Insert the lead into the gap at the bottom and connect it to the probe. (When use oscilloscope and tester)
- 5) Set the turntable platter and turn on the power switch to start the turntable.
- 6) Check the circuit in turntable operation mode.



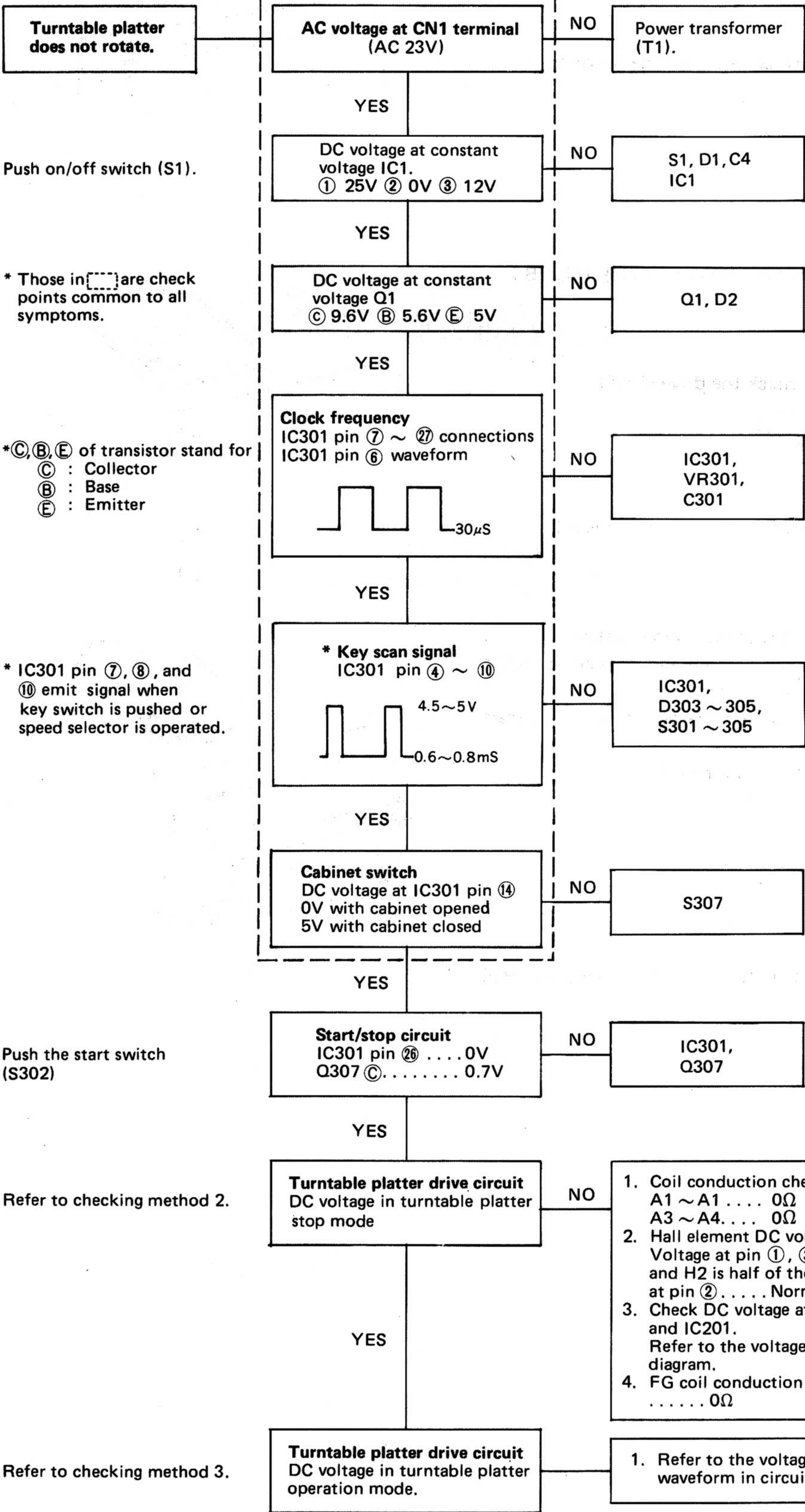
(Fig. C)

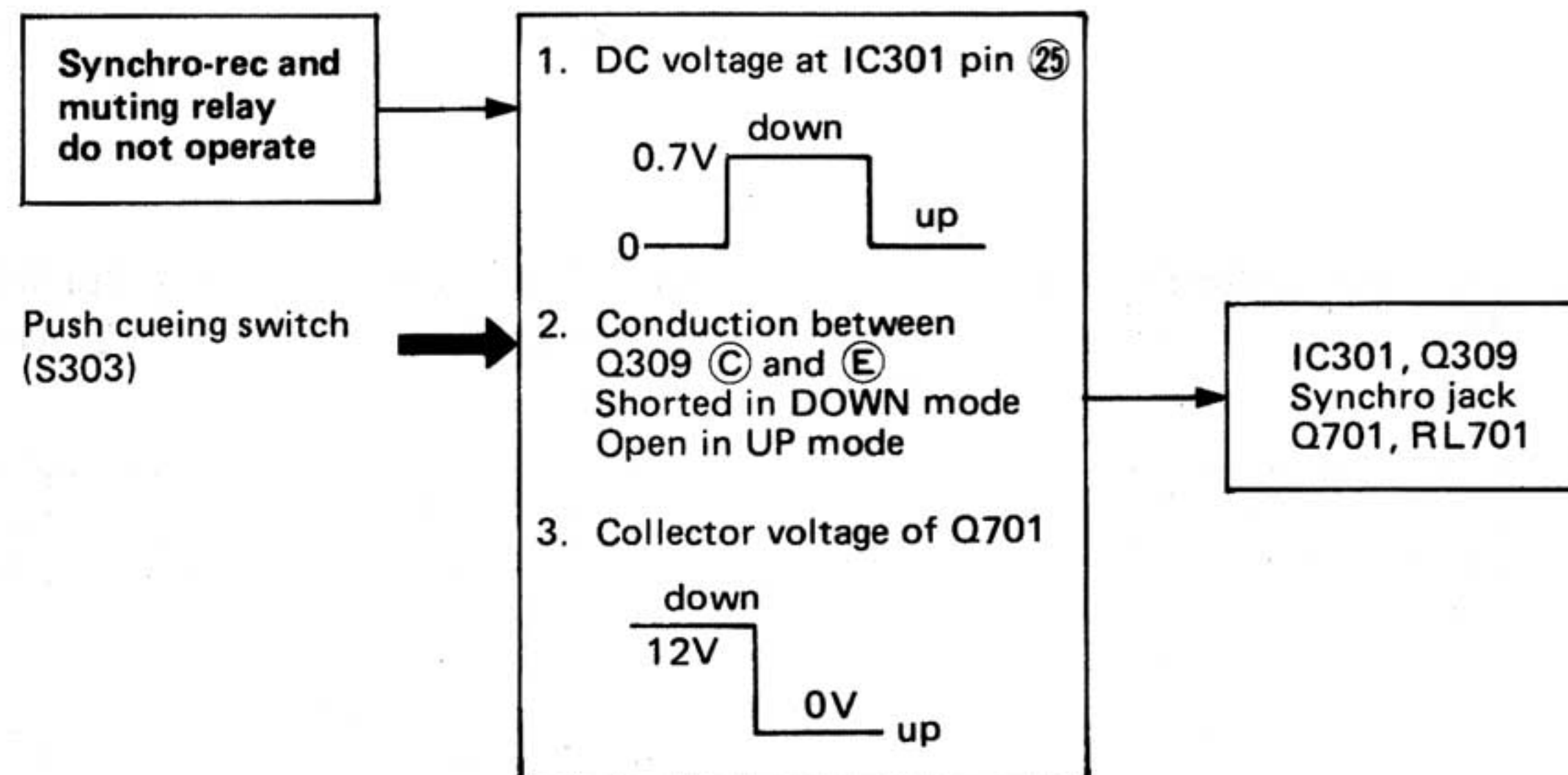
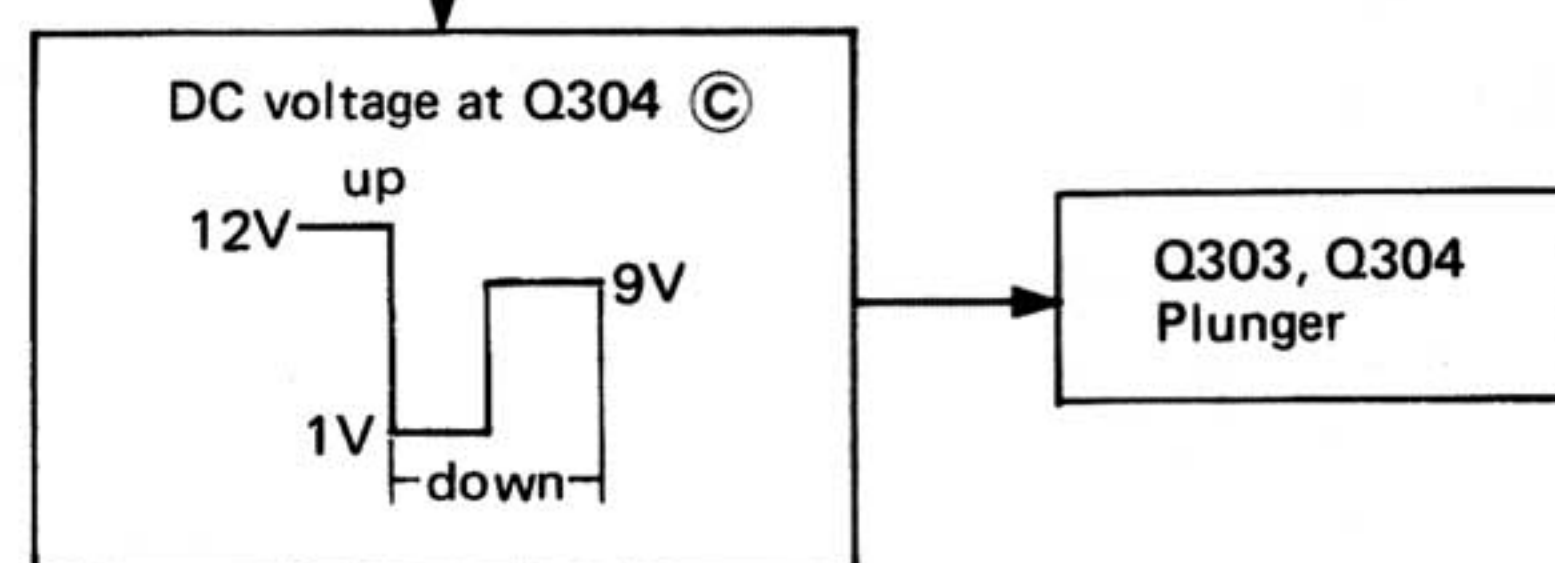
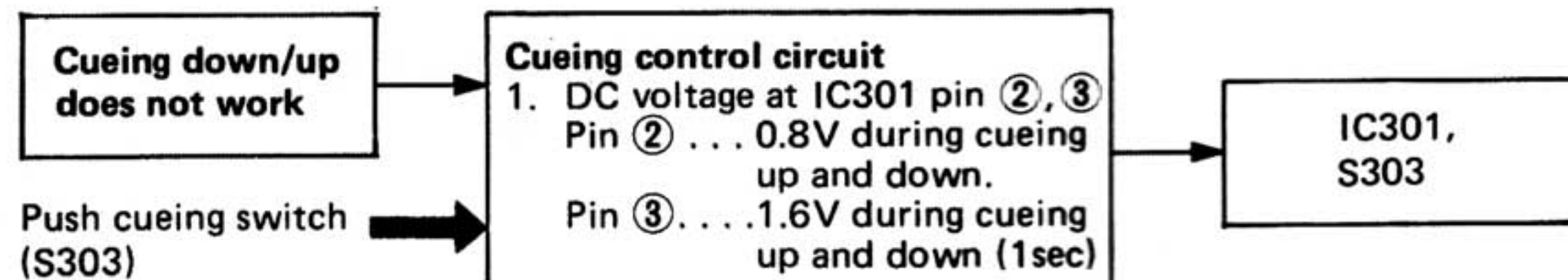
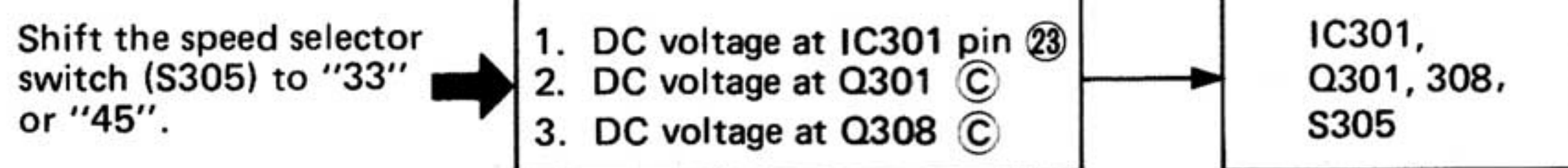
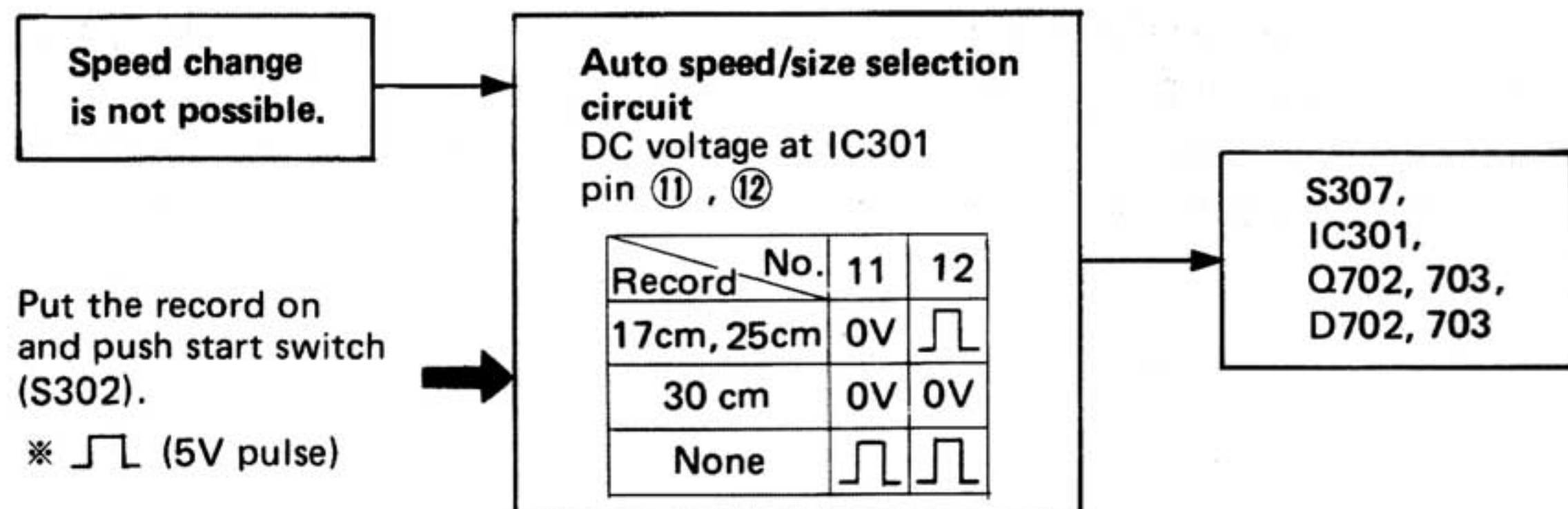
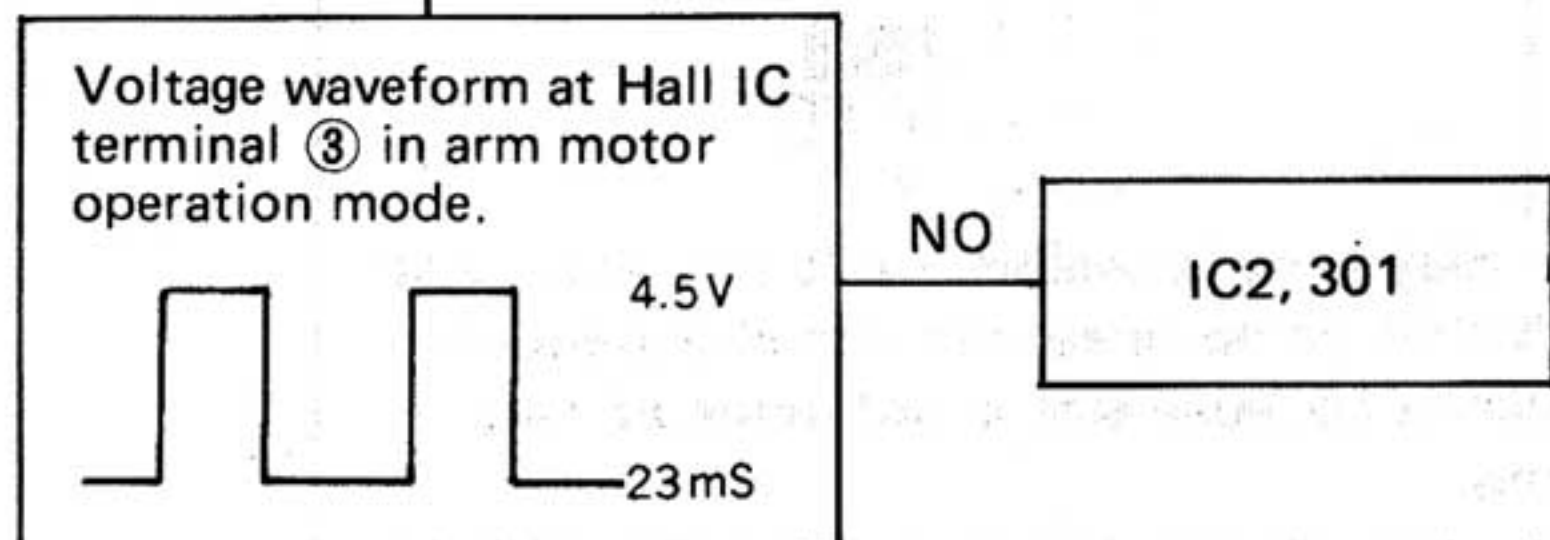
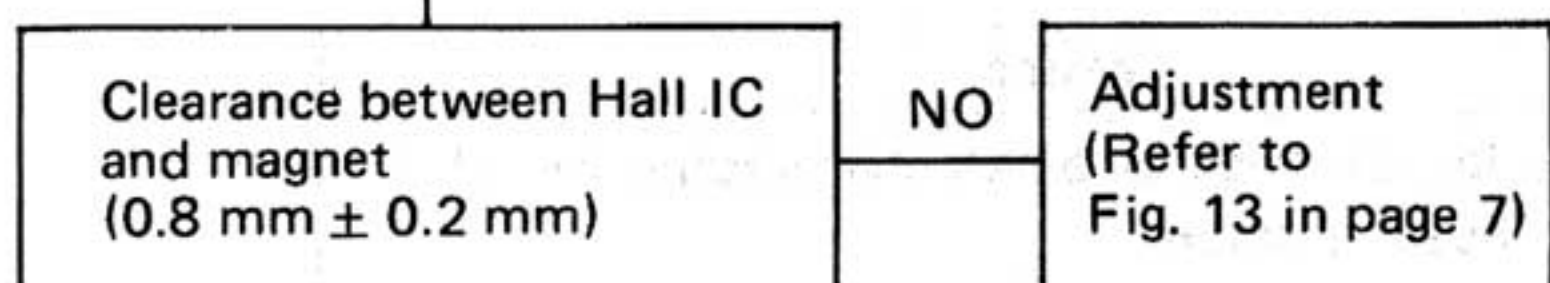
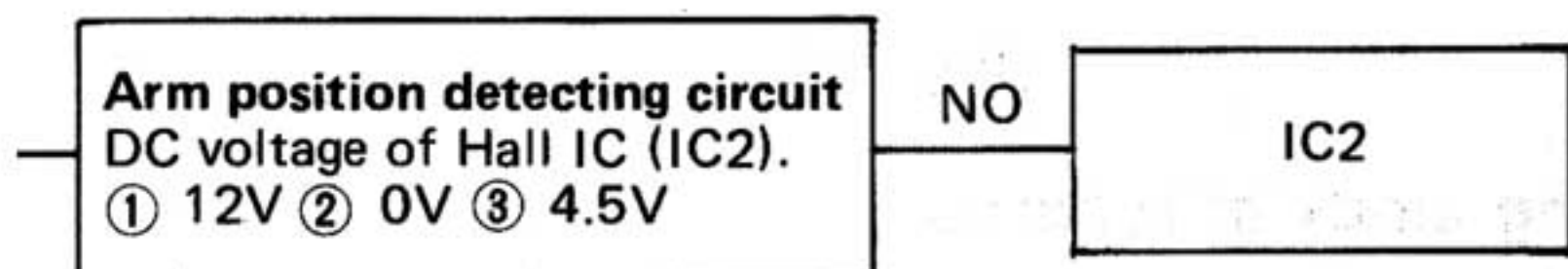
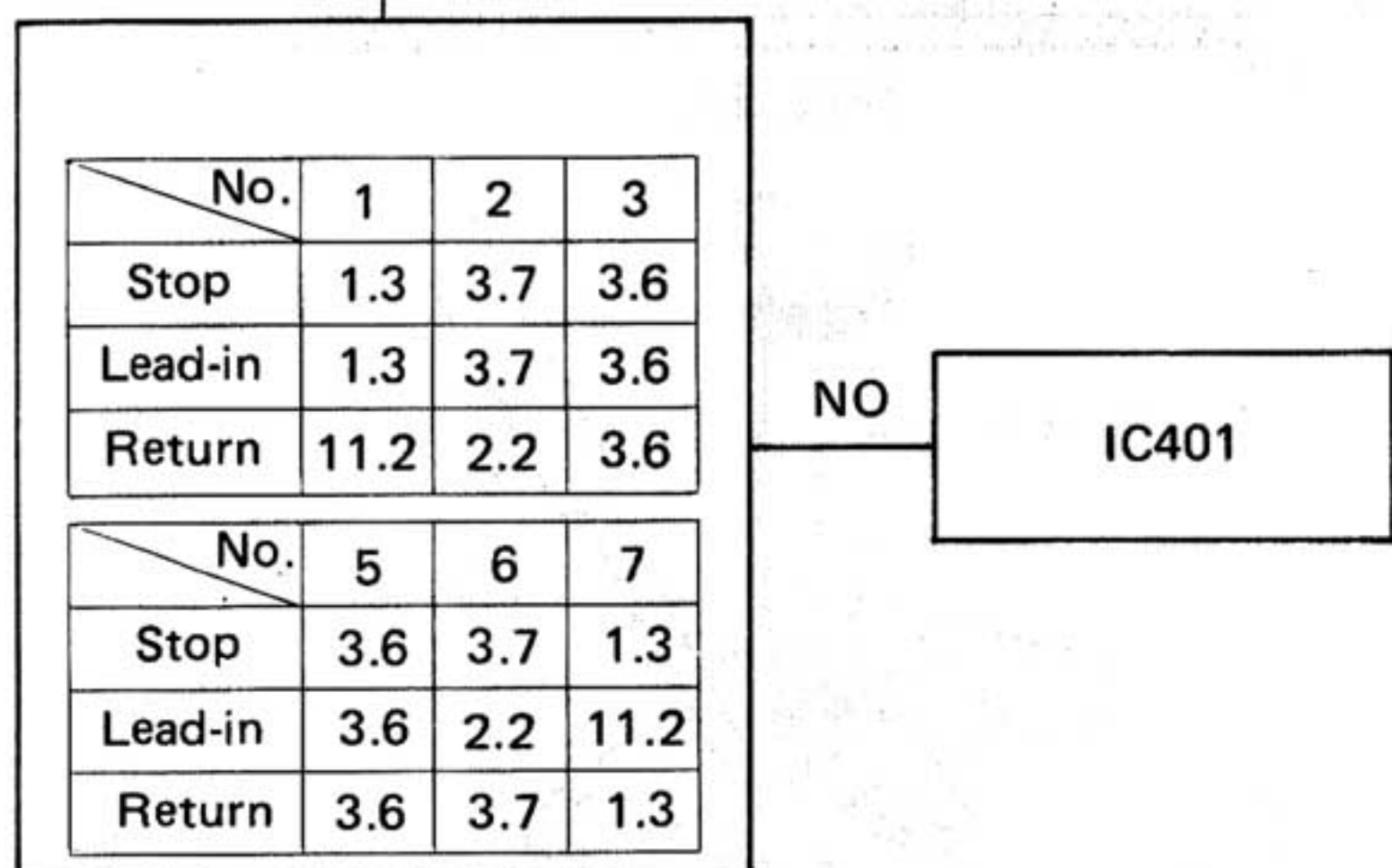
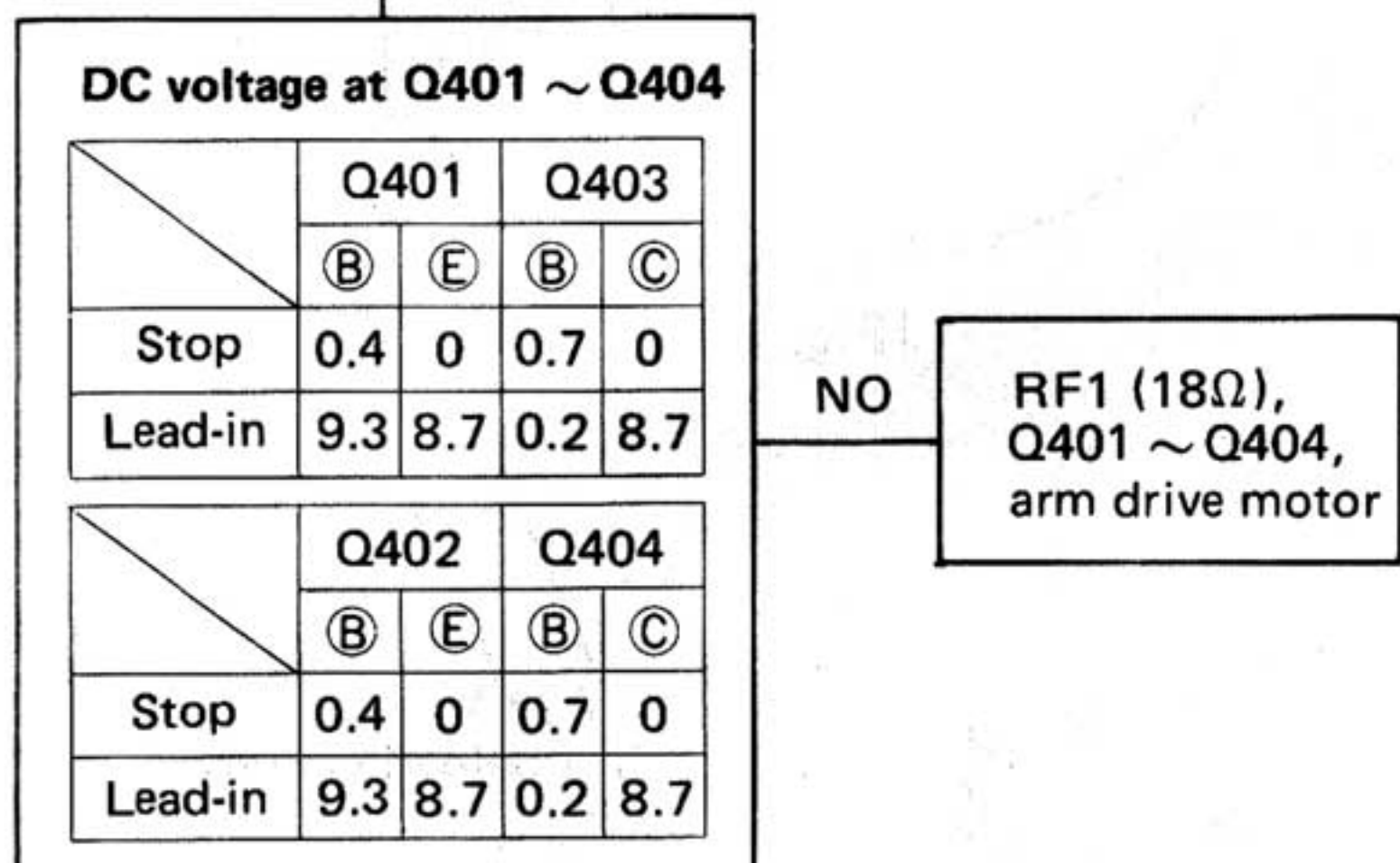
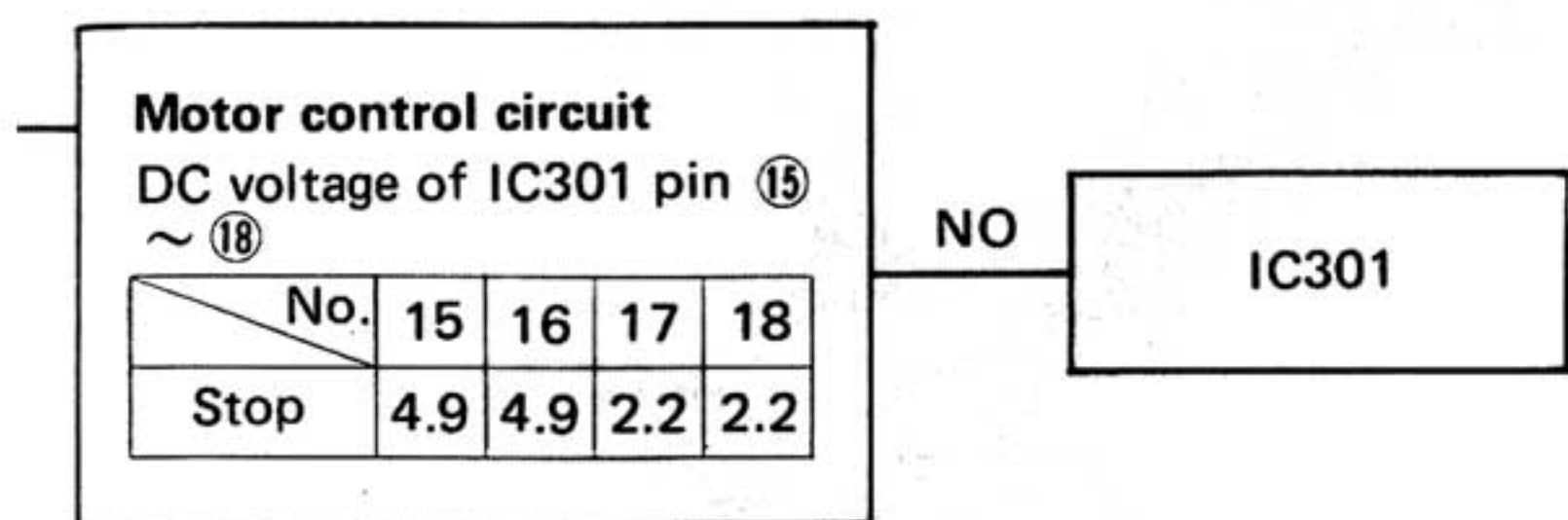
4. Offset angle detecting sensor and Arm position detecting Hall IC checking method

- 1) Remove the dust cover.
- 2) Check each circuit.

■ TROUBLE SHOOTING

Refer to checking method 1.





MEASUREMENTS AND ADJUSTMENT

• Equipment used and condition of the set

1. Oscilloscope

2. DC voltmeter

3. 30 cm record
4. Screwdrivers ⊕ , ⊖

5. Hex. rod wrench (M3)

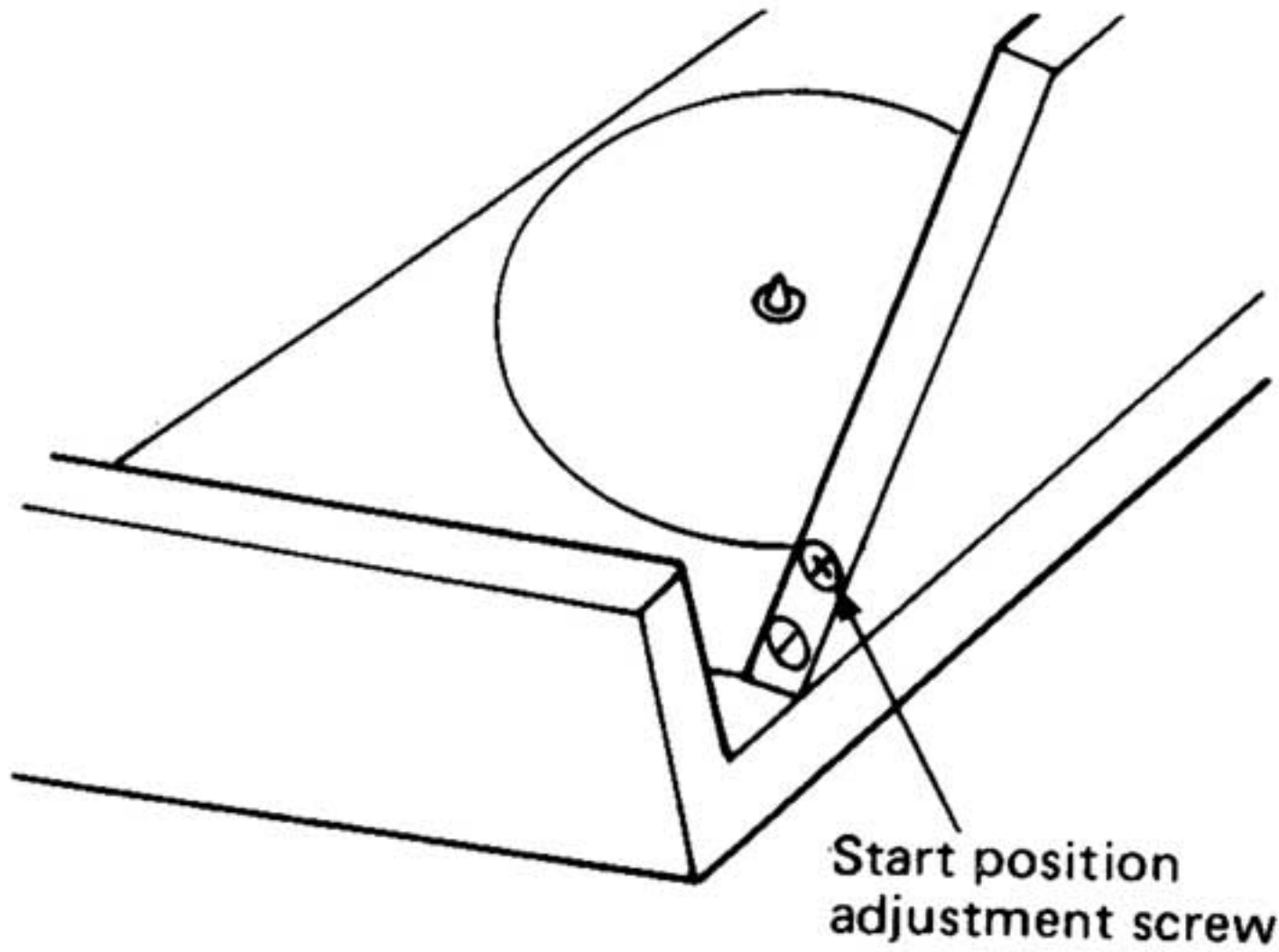
Step	Item	Preparations	Portion	Procedure
1	Start position	1. Put 30 cm record on and close the front cabinet. 2. Turn on the on/off switch. 3. Push the start switch.	Start position screw (Fig. 22)	1. Open the front cabinet. 2. If the tonearm drops between tunes, adjust it by turning the screw counterclockwise. 3. If the tonearm drops to outside the record, adjust it by turning the screw clock wise.
2	Tonearm offset angle	1. Open the front cabinet, and hold the cabinet switch with tape. 2. Blind the 2 inside light guide slits with 2 black tapes. 3. Turn on the on/off switch. Push the start switch to shift the tonearm inward.	Offset angle adjustment screw (Fig. 24)	1. Turn the offset angle adjustment screw so that the tonearm center matches the V-groove of lift rod.
3	Servo gain	1. Connect the voltmeter to CN303 terminal 3 (+) and 2 (−) of main P.C.B. (Fig. 23) 2. Turn on the on/off switch.	VR501 (Fig. 25)	1. Completely shift the tonearm to the right. 2. Adjust the VR501 so that the output voltage is 3.6V.
4	Offset voltage	1. Connect DC voltmeter to CN303 terminal ③ (+) and ② (−) of main P.C.B. (Fig. 23) 2. Turn on the on/off switch.	Offset voltage adjustment screw (Fig. 25)	1. Shift the tonearm to the center. 2. Turn the adjustment screw so that the output voltage is 1.8V. (Use hex. rod wrench.)
5	Clock frequency	1. Connect Q1 emitter and IC301 pin ⑦ with a jumper. (Fig. 23) 2. Connect the oscilloscope to IC301 pin ⑥.	VR301 (Fig. 23)	1. Turn on the on/off switch. 2. Adjust VR301 so that the output waveform cycle is 30μs ± 1 μs.
6	Rotating speed	1. Open the front cabinet, and put the record on.. 2. Put the stroboscope on. 3. Close the front cabinet.	VR201 (45 r.p.m.) VR202 (33 r.p.m.)	1. Turn on the on/off switch. 2. Set the speed selector switch to 45 r.p.m. 3. Adjust VR201 so that the speed is at the rating speed (45 r.p.m.). 4. Set the speed selector switch to 33 r.p.m. 5. Adjust VR202 so that the speed is at the rating speed (33-1/3 r.p.m.) Note: Be sure to adjust the speed 45 r.p.m. first.

TERMINAL DESCRIPTION OF MN1421FPC

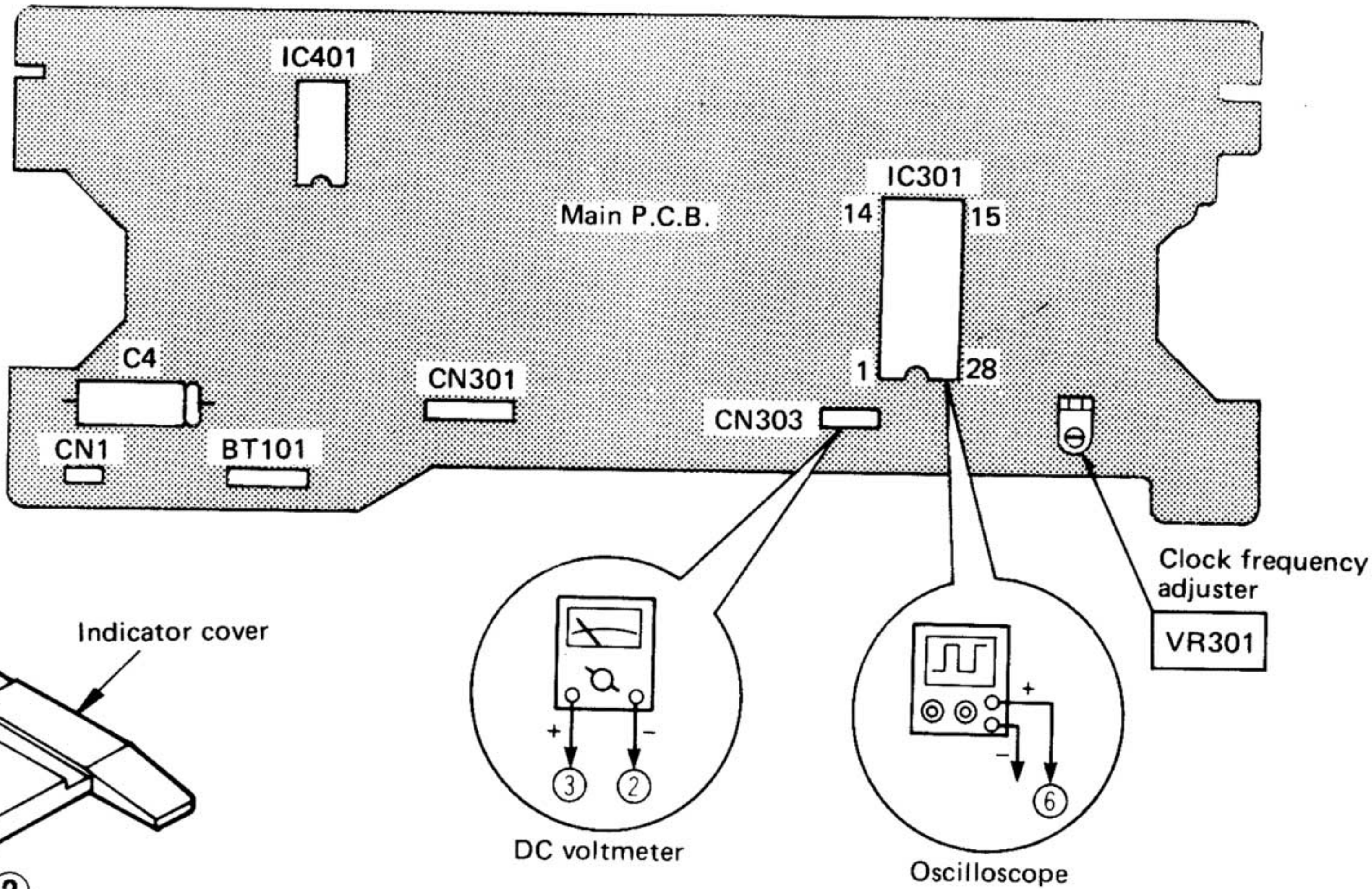
* Mentioned here are the basic functions of the MN1421FPC.
So, there may be terminals not needed or partial change in circuit function depending on the using method.

No.	Symbol	Description	No.	Symbol	Description
1	VSS	Grand terminal	11	Bi3	Auto size and speed change terminals (Terminals ⑪ , ⑫ at "L" → 30 cm record 33 r.p.m. ⑪ at "L", ⑫ at "H" → 17 cm record 45 r.p.m.)
2	CO9	Cueing control terminal ("H" during cueing up and down)	12	Bi2	
3	CO8	Cueing control terminal ("H" only during cueing down for about 1 sec.)	13	Bi1	Rest position detecting terminal ("H" when tonearm is in rest position.)
4	CO7	Key scan output terminal	14	Bi0	Cabinet open/close detecting terminal
5	CO6		15	EO0	Tonearm drive motor control terminal (arm servo)
6	CO5		16	EO1	
7	Ai3	Key scan input terminal	17	EO2	
8	Ai2		18	EO3	
9	Ai1		19	TEST	Test terminal (nut used, connected to grand)
10	Ai0		20	RST	Reset terminal (micon is reset at "L")

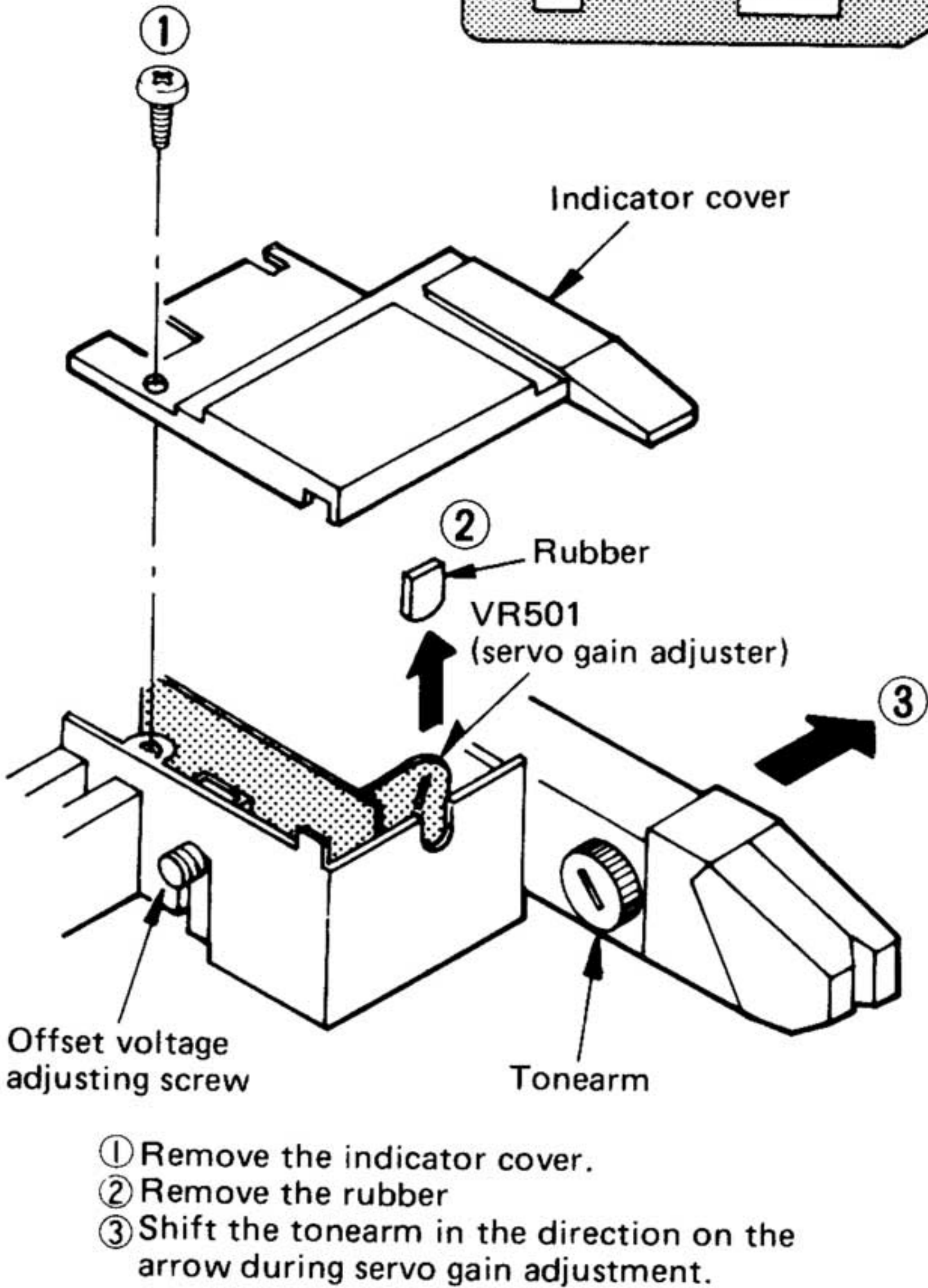
No.	Symbol	Description	No.	Symbol	Description
21	SNS1	Offset angle detecting output/input terminal	25	DO2	Synchro-rec on/off terminal ("L" at on; "L" at off)
22	SNS1	Arm position detecting input terminal	26	DO3	Turntable platter start/stop terminal ("L" at start; "H" at stop)
23	DO0	Turntable platter speed change terminal ("H" at 45 r.p.m.; "L" at 33 r.p.m.)	27	VDD	Power supply (+5V)
24	DO1	Repeat indicator terminal (ON at "L")	28	OSC	Oscillation terminal (clock frequency is adjusted to $30\mu s \pm 1\mu s$)



[Fig. 22]

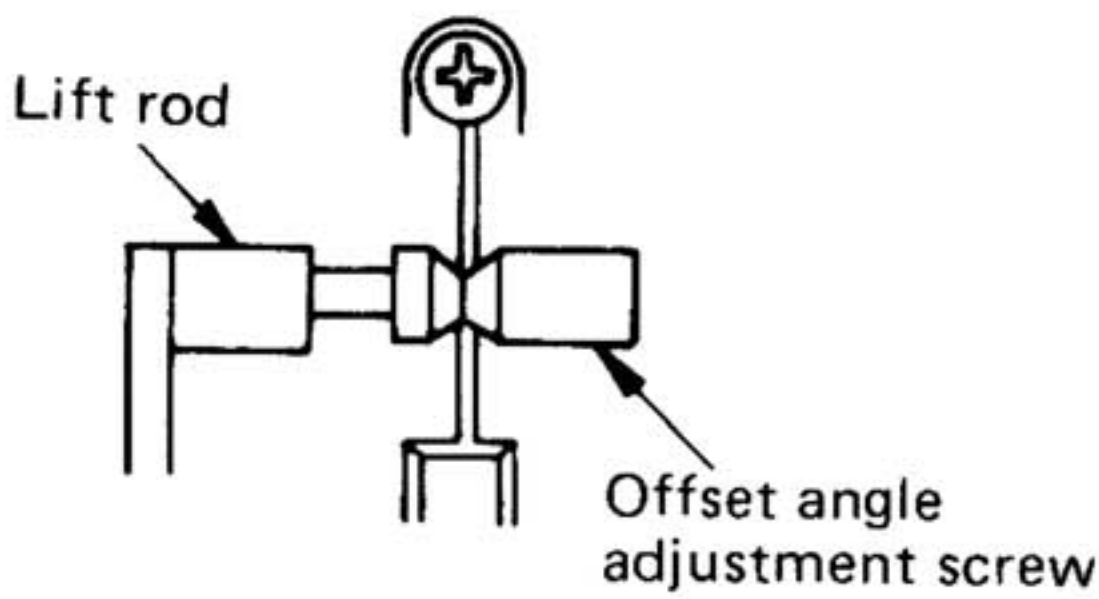


[Fig. 23]



- ① Remove the indicator cover.
- ② Remove the rubber
- ③ Shift the tonearm in the direction on the arrow during servo gain adjustment.

[Fig. 25]



[Fig. 24]

REPLACEMENT PARTS LIST...Electric Parts

- Notes:
1. Part numbers are indicated on most mechanical parts.

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

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

4. The " S " mark is service standard parts and may differ from production parts.

5. The parenthesized numbers in the column of description stand for the quantity per set.
- Areas

* [M] is a available in U.S.A.
* [MC] is available in Canada.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
INTEGRATED CIRCUITS			TRANSISTORS			SWITCHES		
IC1	AN7812	Regulator	Q702,703	PN150MS	Disc Size Selector	S305	SFDSHSW0757	Speed Selector
IC2	DN6838S	Arm Position Detector	DIODES			S307	SFDSC05N01	Cabinet
IC101	AN6636	Drive	D1	 SVDS1RBA20F	Rectifier	S601	SFDSC02N03	Rest
IC201	AN6552	F.G.Amplifier & Constant Voltage (Hall Element)	D2	S MA1056	5.6V Zener	HALL ELEMENTS		
IC301	MN1421FPC	Micro Computer	D301	S RVDRD7R5FB	7.5V Zener	H1,2	OH-002	Turntable Position Detector
IC401	AN6554	Operation Amplifier	D302	LN81CPH	Light Emitting Diode(Repeat)	VARIABLE RESISTORS		
TRANSISTORS			D303~305	S MA162A	Key Matrix	VR201	S EVTS3MA00B54	45r.p.m.Adjuster 50 KΩ(B)
Q1	2SD638	Regulator	D501	S MA162A	Diode	VR202	S EVTS3MA00B54	33r.p.m.Adjuster 50 KΩ(B)
Q301,303	2SD636	Speed Selector, Cueing Drive	D503	SVDEBR3432S	Light Emitting Diode(Stylus Position)	VR301	EVNK6AA00B54	Clock Frequency Adjuster 50KΩ(B)
Q304	2SD892	Cueing Drive	D701	S MA162A	Muting Relay Drive	VR501	S EVNMOAA00B53	Servo Gein Adjuster 5KΩ(B)
Q305	2SB641	Offset Angle Detector	D702,703	SVDEBR5505S	Light Emitting Diode(Record Size)	RELAY		
Q306,307	2SD636	Offset Angle Detector	PHOTO INTERRUPTER			RL701	SFDYQ11N02	Muting
Q308	2SB641	Speed Selector	PC501	ON1186	Offset Angle Detector	POWER TRANSFORMER		
Q309	2SD636	Synchro-rec Selector	SWITCHES			TI	(M)  SLT48DTL5A	Power Sourse
Q401,402	2SD973	Arm Motor Control	S1	 SFDSC05N08	On/off(Power)	TI	(MC)  SLT48DT19C	Power Sourse
Q403,404	2SD638	Arm Motor Control	S301~304	EVQJQR02K	Start, Stop, Cueing & Repeat	FUSE		
Q701	2SD636	Muting Drive				F2	(MC)only  XBA2F08NU100	800mA 250V

RESISTORS AND CAPACITORS

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

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value
ERG	1	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity
ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

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

ERD2FCG□□□ → Fuse type carbon (1/4W)

Capacitor Type	Voltage		Tolerance
	ECEA Type	Others	
ECEA : Electrolytic	1A : 10V	1H : 50V DC	J : ±5%
ECEA...N : Non Polar Electrolytic	1C : 16V	2H : 500V DC	K : ±10%
ECKD : Ceramic	1E : 25V		Z : +80%, -20%
ECQM : Polyester	1V : 35V		P : +100%, -0%
ECEB : Electrolytic	1H : 50V		M : ±20%
ECCD : Ceramic	50 : 50V		

Ref. No.	Part No.	Value
RESISTORS		
R1	S ERD25FJ681	680
R2	S ERD25FJ221	220
R3	S ERG1ANJ390	39
R101	S ERD10TLJ150U	15
R102	S ERX1ANJ1R8	1.8
R105	ERD10TLJ153U	15k
R106	ERD10TLJ223U	22k
R201	ERD10TLJ102U	1k
R202	ERD10TLJ153U	15k
R203	ERD10TLJ333U	33k
R204	ERD10TLJ104U	100k
R205	ERD10TLJ473U	47k
R206	ER010MKG1913	191k
R207	ER010MKG5622	56.2k
R221	ERD10TLJ102U	1k
R222	ERD10TLJ153U	15k
R301	S ERD25TJ273	27k
R302,303	S ERD25FJ102	1k
R304,305	S ERD25FJ102	1k
R306	S ERD25FJ471	470
R308	S ERD25FJ331	330
R310	S ERD25FJ562	5.6k
R313,314	S ERD25TJ333	33k
R315,316	S ERD25TJ333	33k
R317	S ERD25FJ102	1k

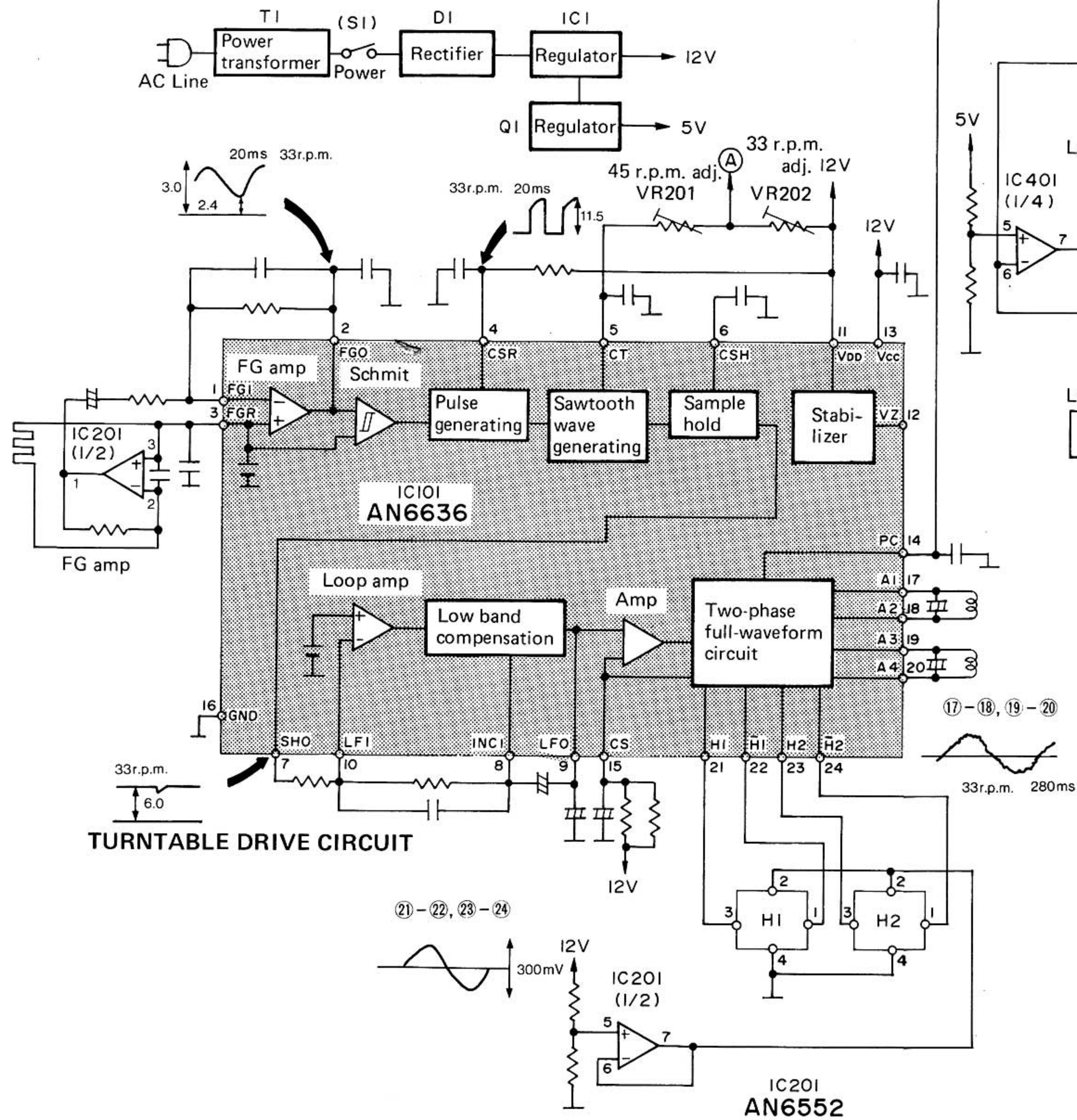
Ref. No.	Part No.	Value
RESISTORS		
R318,319	S ERD25FJ332	3.3k
R320	S ERD25FJ272	2.7k
R321,322	S ERD25FJ331	330
R323	S ERD25FJ562	5.6k
R324	S ERD25TJ223	22k
R325	S ERD25FJ103	10k
R326	S ERD25FJ272	2.7k
R331	S ERD25FJ102	1k
R332	S ERD25FJ562	5.6k
R334	ERD25FJ222	2.2k
R335	S ERD25FJ332	3.3k
R336	S ERD25FJ562	5.6k
R337	S ERD25FJ472	4.7k
R338	S ERD25FJ471	470
R339	S ERD25FJ472	4.7k
R340	S ERD25TJ153	15k
R341	S ERD25TJ473	47k
R342	S ERD25FJ332	3.3k
R343	S ERD25TJ473	47k
R345	S ERD25FJ472	4.7k
R346	S ERD25FJ471	470
R347	S ERD25FJ102	1k
R348	S ERD25FJ471	470
R349	S ERD25FJ102	1k
R401,402	S ERD25TJ683	68k

Ref. No.	Part No.	Value
RESISTORS		
R403	S ERD25FJ472	4.7k
R404	S ERD25FJ122	1.2k
R405	S ERD25FJ222	2.2k
R406	S ERD25FJ102	1k
R407	S ERD25TJ224	220k
R408	S ERD25FJ222	2.2k
R409	S ERD25FJ102	1k
R410	S ERD25TJ224	220k
R411	S ERD25FJ272	2.7k
R412	S ERD25FJ681	680
R413,414	S ERD25FJ101	100
R415,416	S ERD25FJ471	470
R501	S ERD25FJ391	390
R502	S ERD25FJ681	680
R503	S ERD25FJ561	560
R701	S ERD25FJ102	1k
RF1	 ERD2FCG180	18
CAPACITORS		
C1,2	S  ECKD1H223pF	0.022
C3	 ECQM1223KZ	0.022
C4	S ECEB1VS222	2200
C5,6	S ECQM1H104JZ	0.1
C101	ECUV1E333KB	0.033
C102,103	S ECEA1CN470S	47

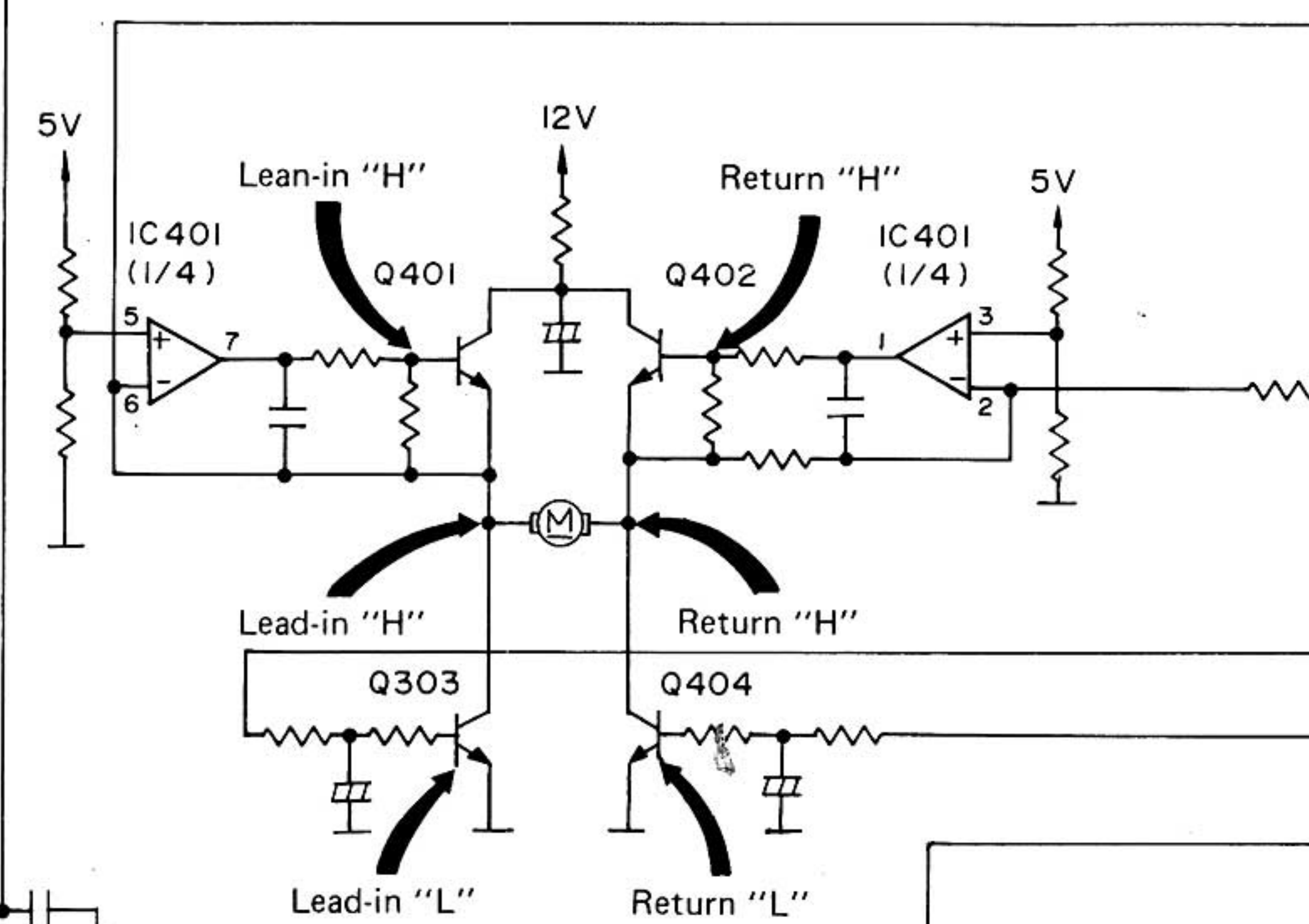
Ref. No.	Part No.	Value
CAPACITORS		
C104	S ECEA1ES101	100
C105	S ECEA1ES330	33
C201	S ECEA50Z3R3	3.3
C202	ECQM1H104JZ	0.1
C203	S ECQM1H333JZ	0.033
C205	ECUV1E473KB	0.047
C206	S ECQM1H104JZ	0.1
C207	S ECQM1H104JZ	0.1
C208	S ECEA25Z4R7	4.7
C209	ECQM1H104JZ	0.1
C210	S ECEA50Z2R2	0.22
C212,213	ECUV1H102MD	0.001
C301	S ECCD1H680K	68pF
C302	S ECQM1H104JZ	0.1
C304	S ECEA1AS470	47
C306	S ECQM1H104JZ	0.1
C307	S ECQM1H223JZ	0.022
C308	S ECEA50Z3R3	3.3
C309	ECKD2H102PE	0.001
C401,402	ECQM1H223JZ	0.022
C403	S ECEA1CS330	33
C404,405	S ECEA1AS470	47
C601	ECFB1B104ZM	0.1
C701	S ECEA1CS101	100

■ BLOCK DIAGRAM

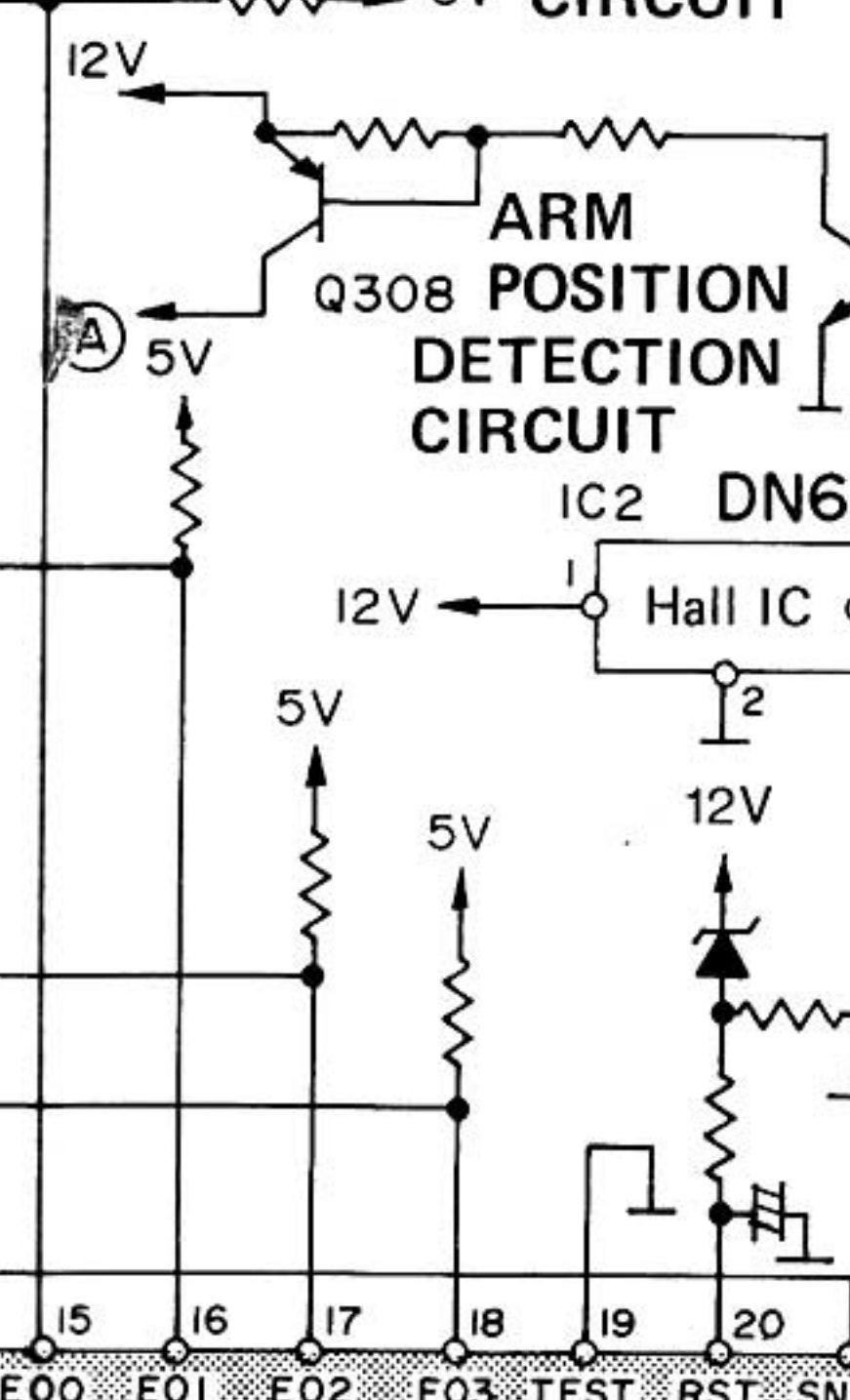
POWER SUPPLY CIRCUIT



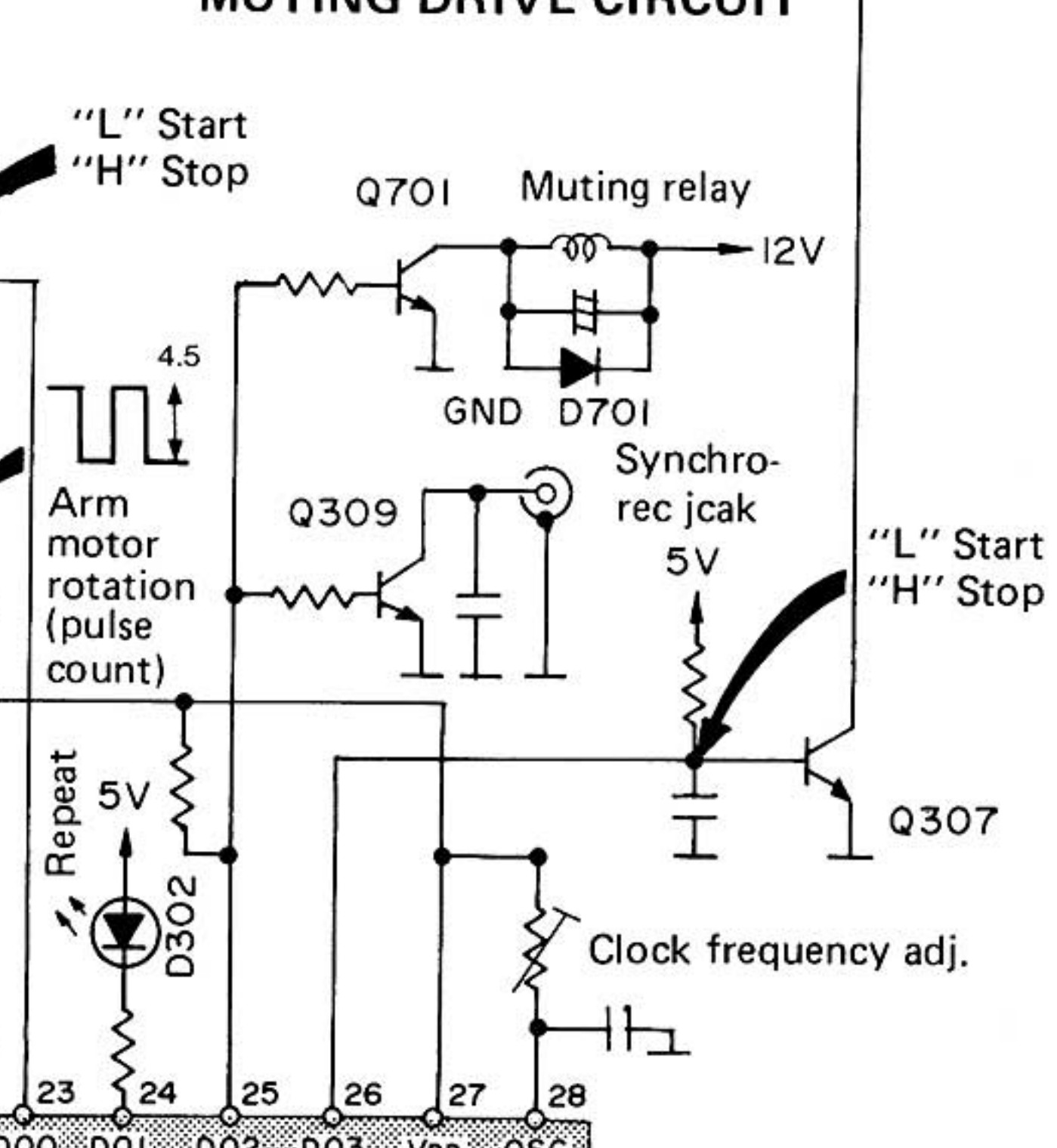
ARM MOTOR CONTROL CIRCUIT



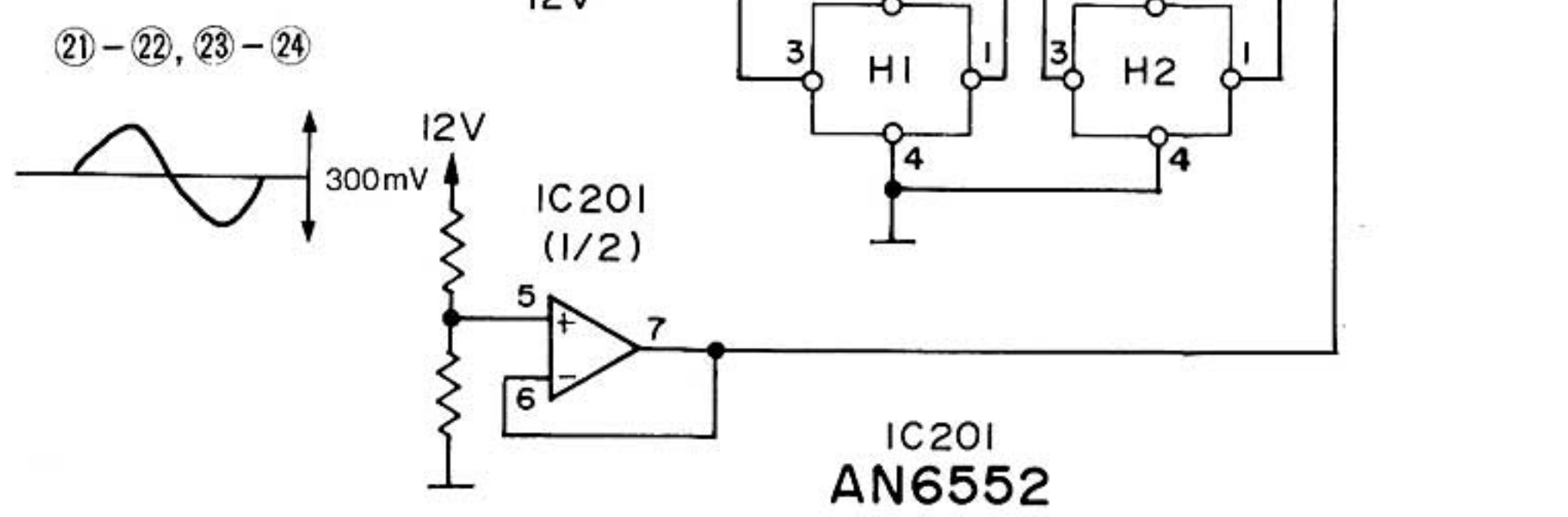
SPEED SELECTOR
 5V **CIRCUIT**



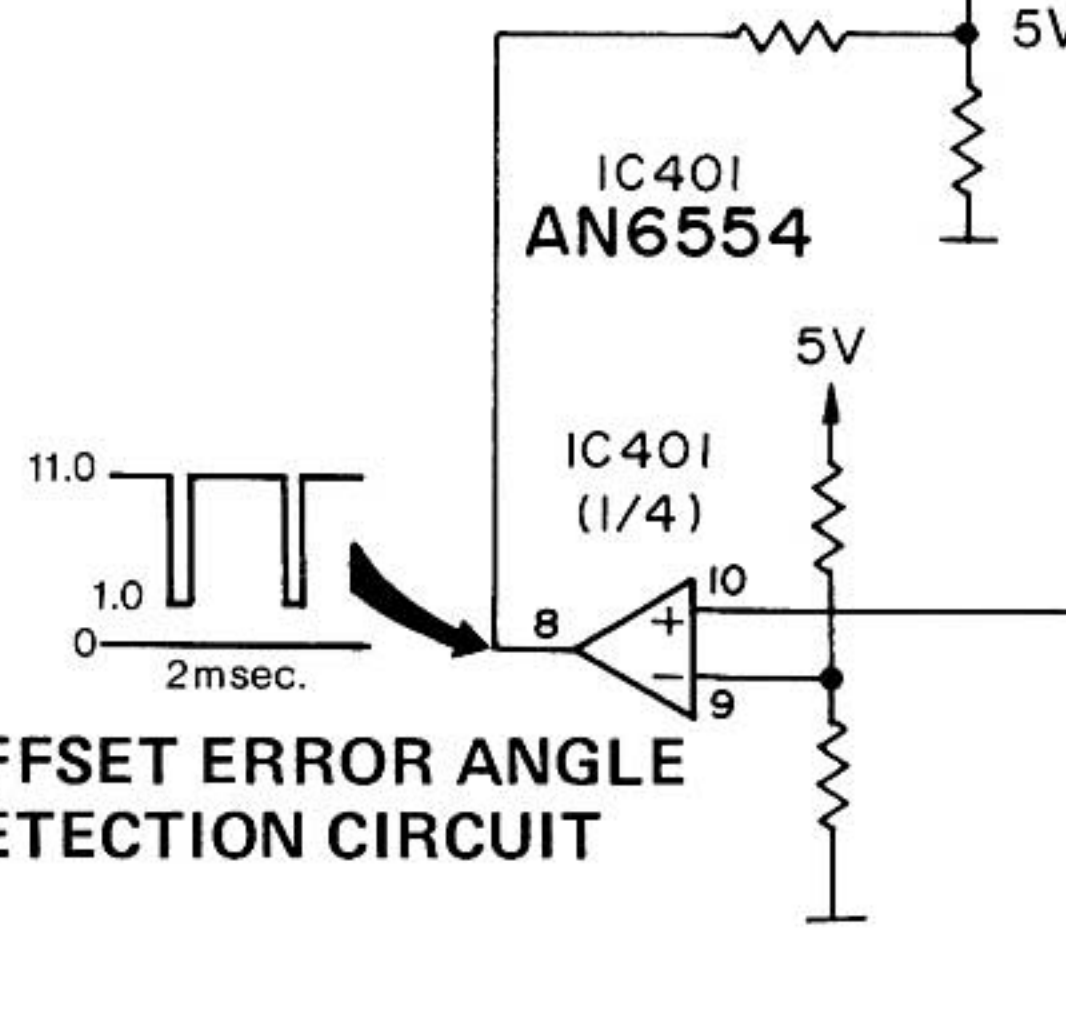
MUTING DRIVE CIRCUIT



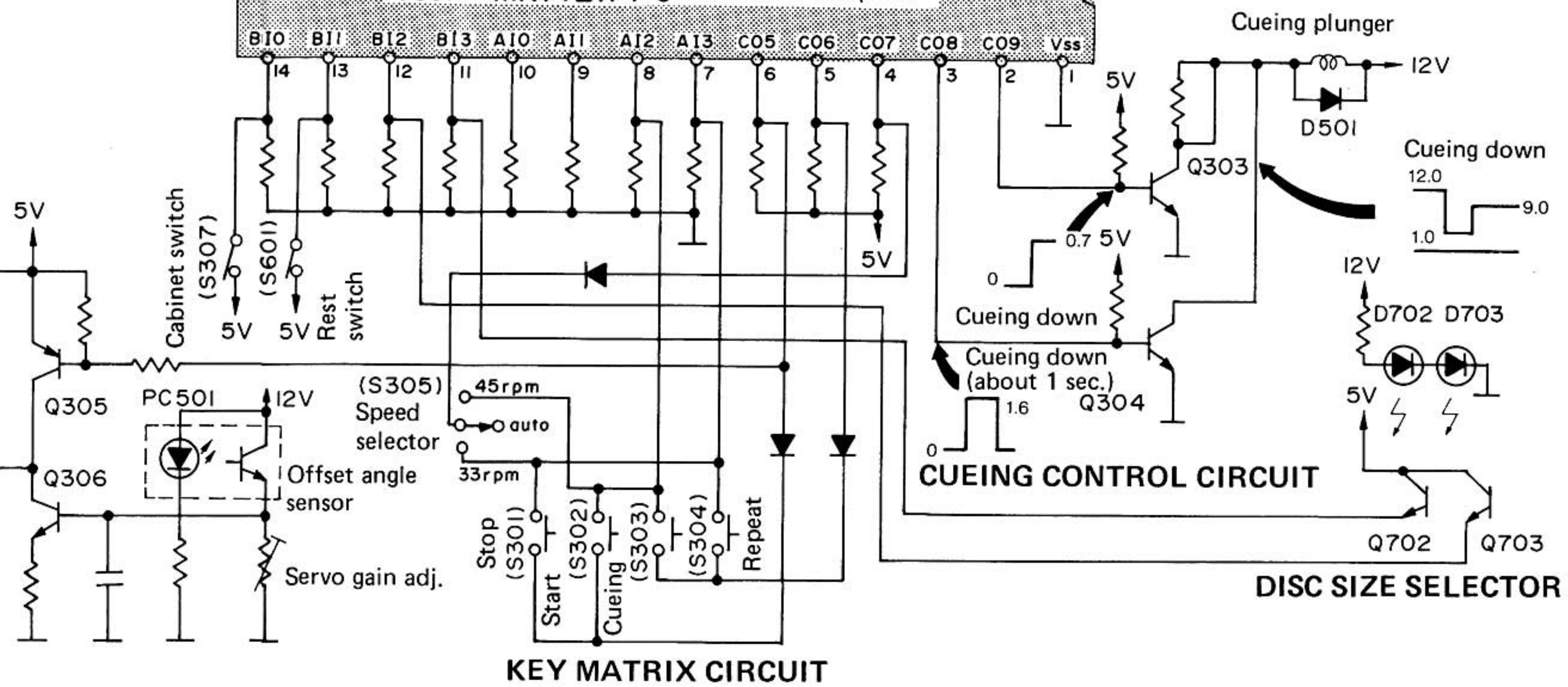
TURNTABLE DRIVE CIRCUIT

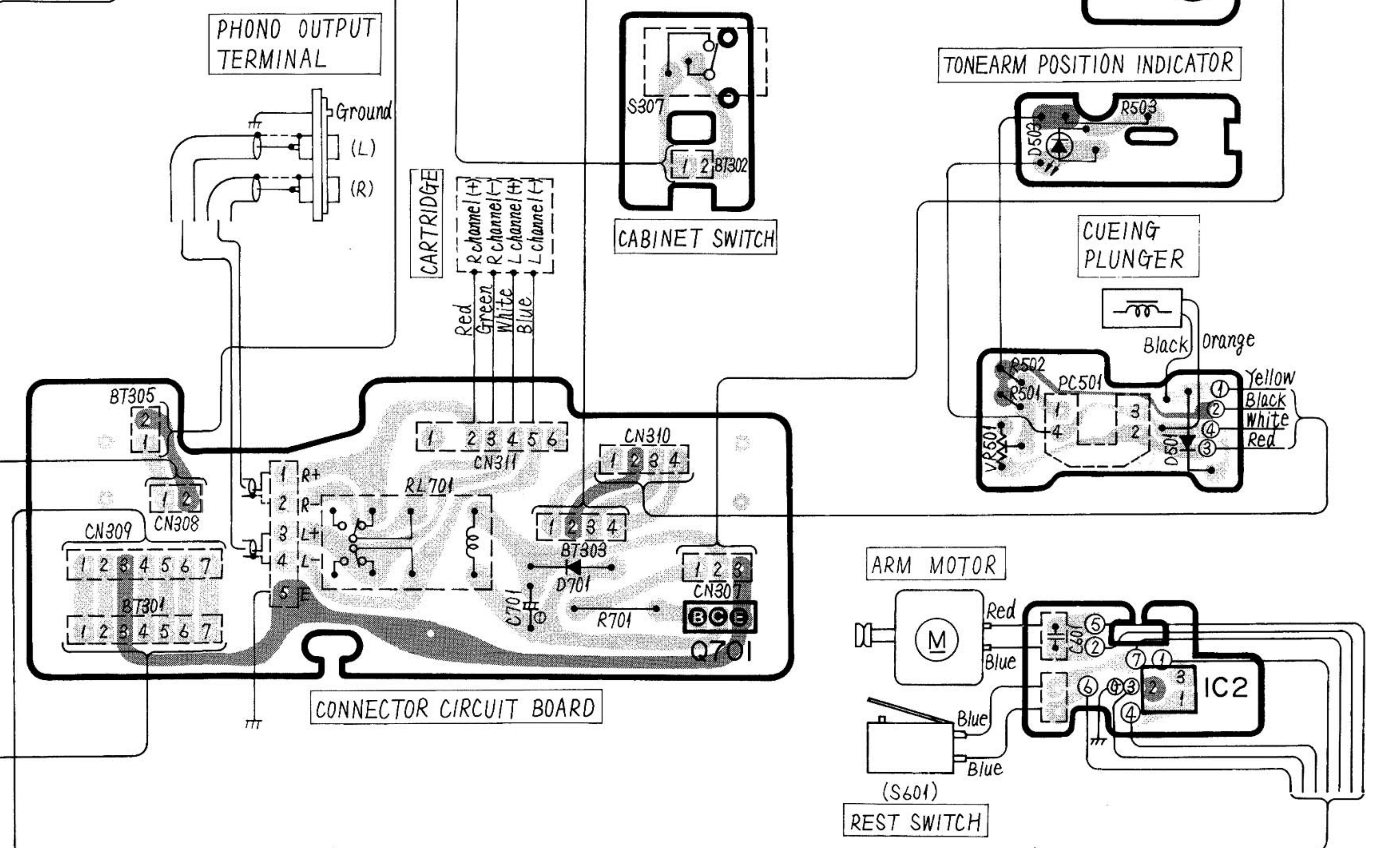
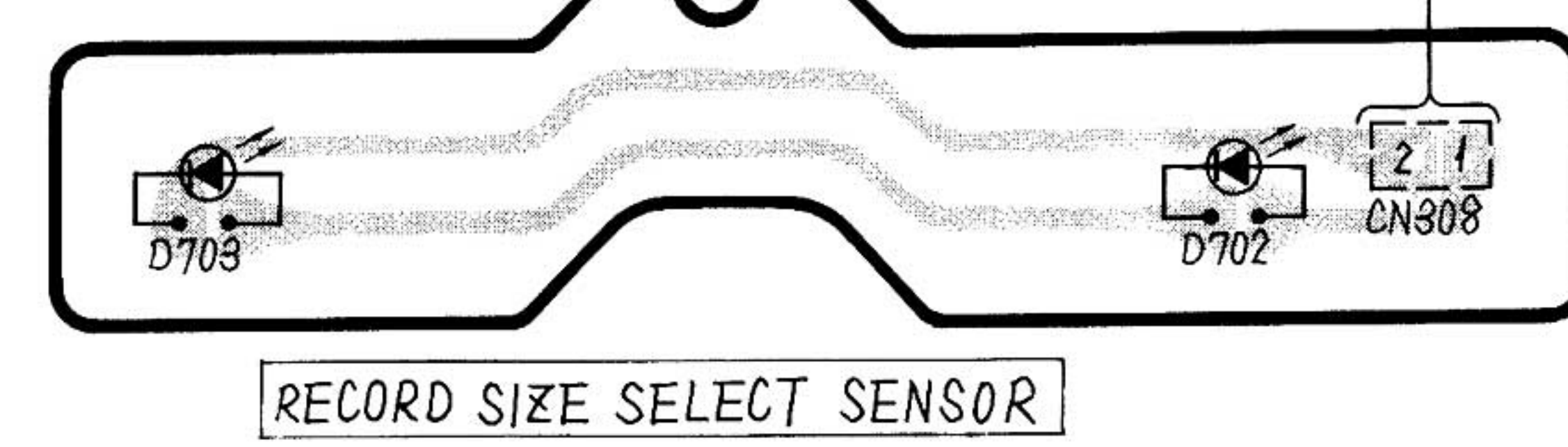
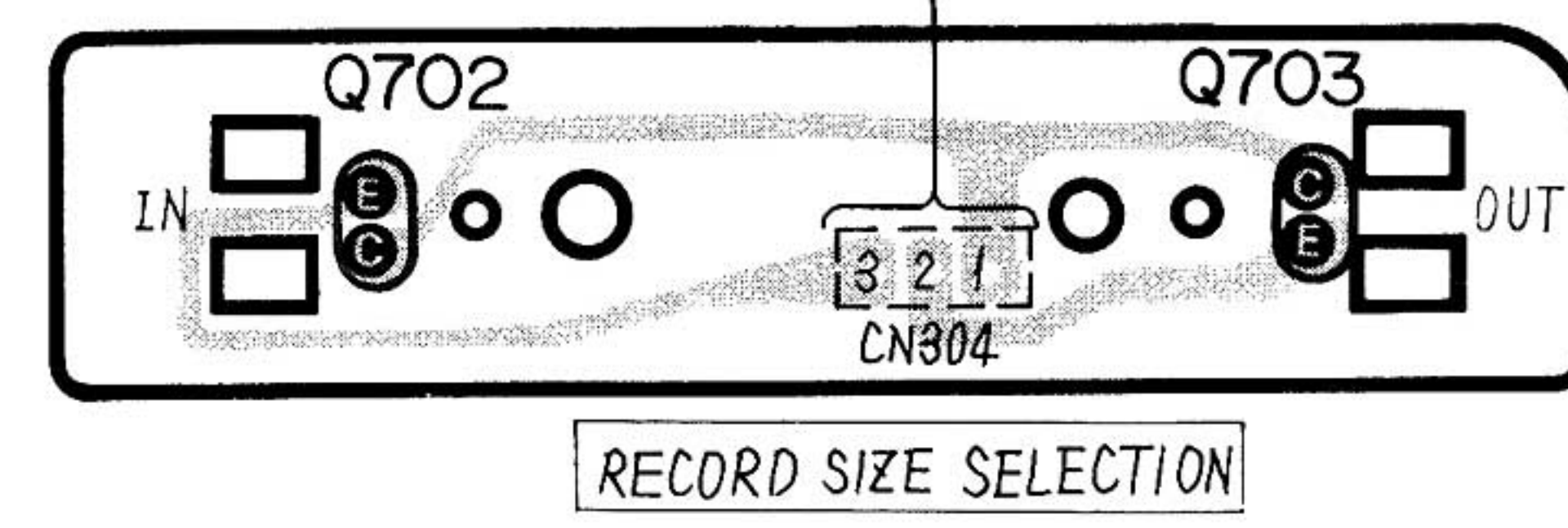
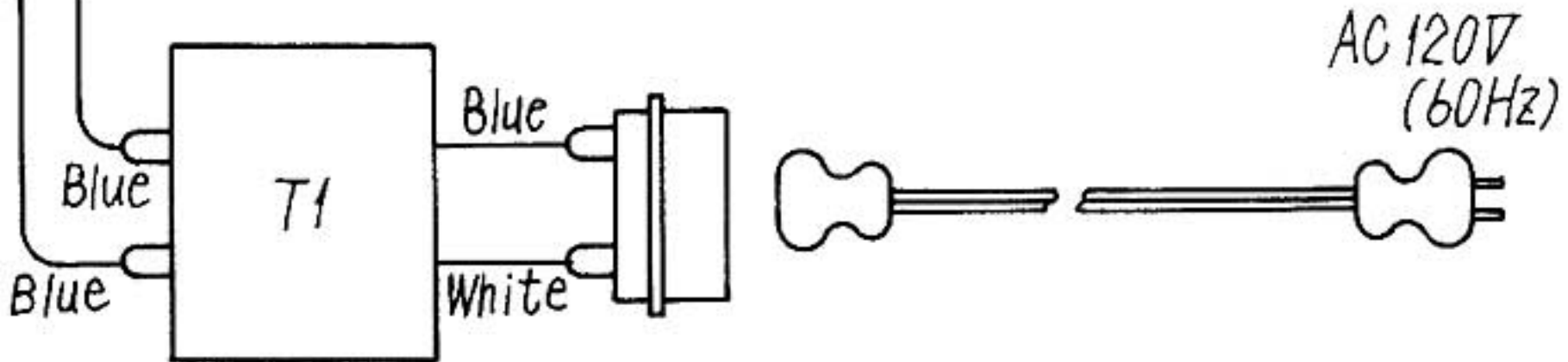
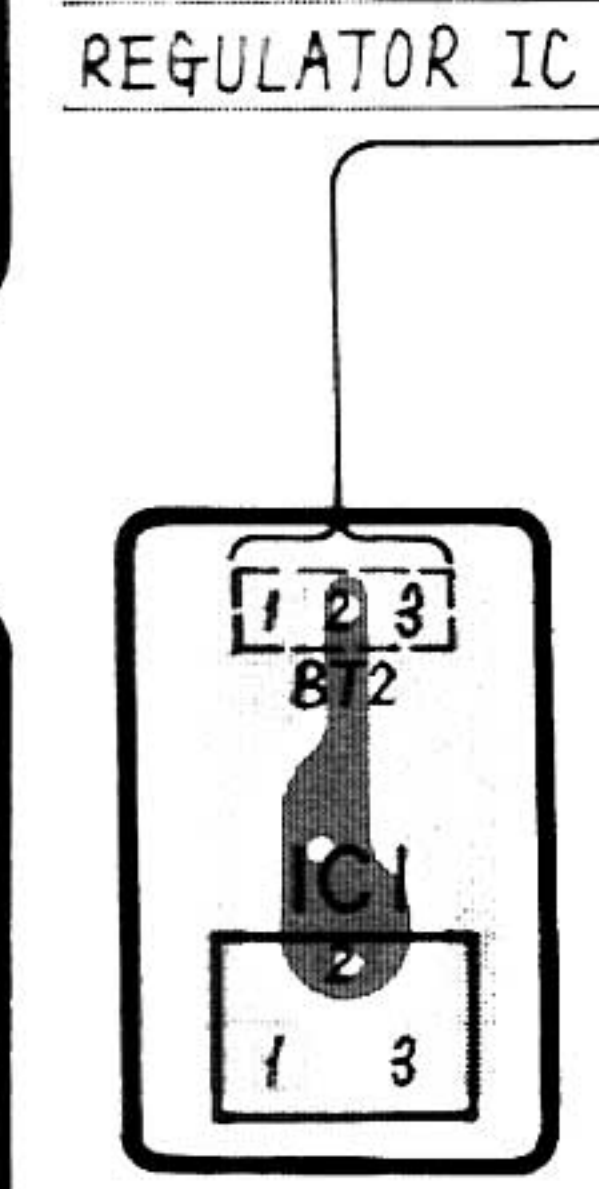


OFFSET ERROR ANGLE DETECTION CIRCUIT

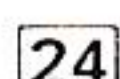


KEY MATRIX CIRCUIT



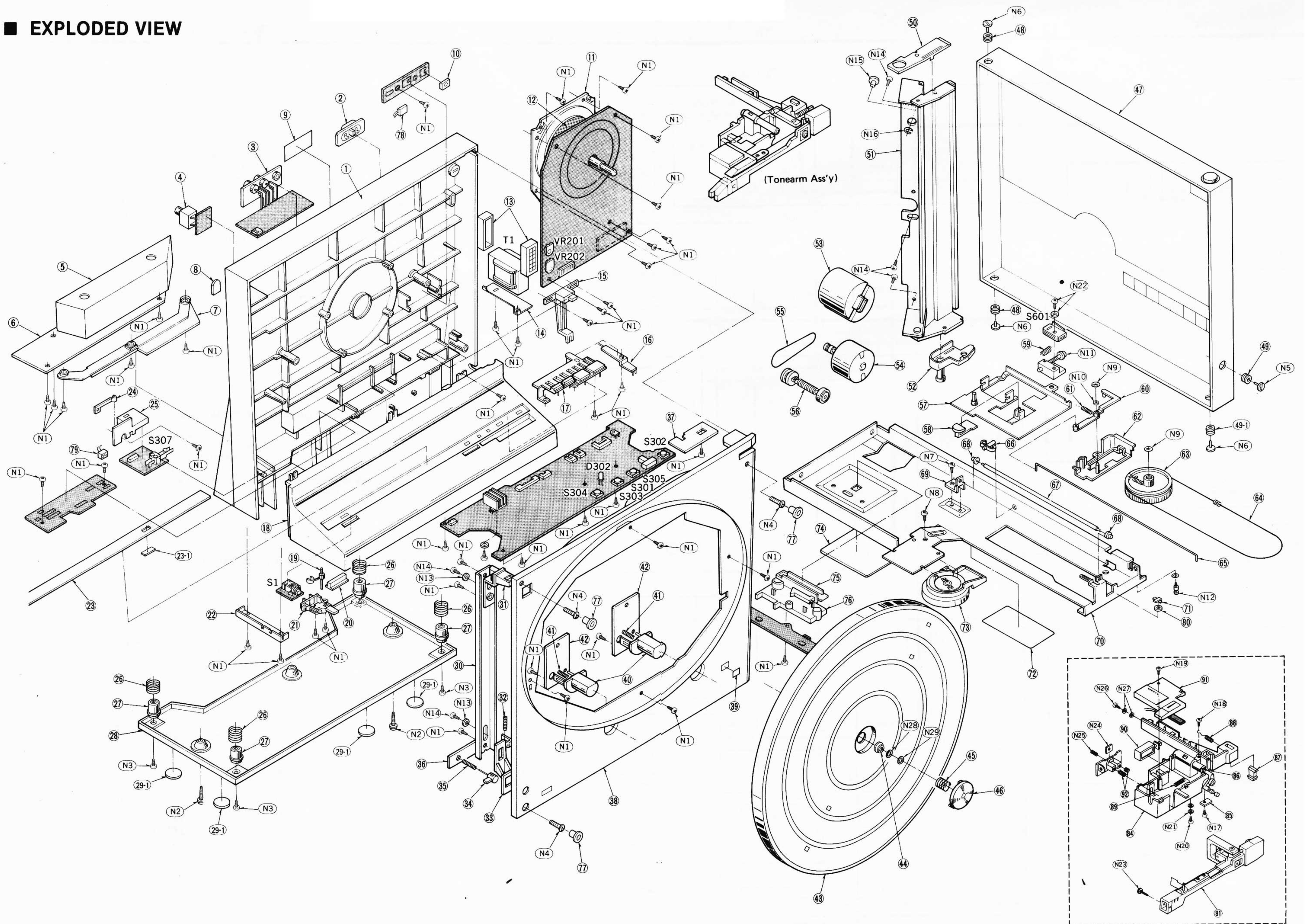


23



26

EXPLODED VIEW



REPLACEMENT PARTS LIST...Cabinet & Chassis Parts

- Notes:**
- Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
 - Important safety notice:
Components identified by **Δ** mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
 - The "S" mark is service standard parts and may differ from production parts.
 - Bracketed indications in Ref. No. columns specify the area.
 - The parenthesized number in the column of description stand for the quantity per set.

Areas

- * [M] is available in U.S.A.
- * [MC] is available in Canada.

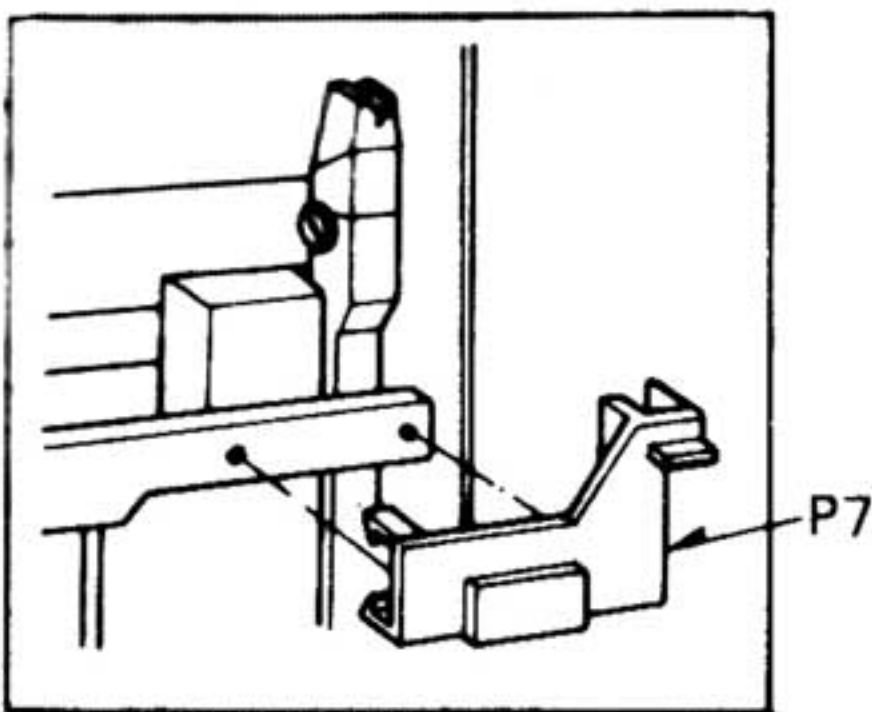
Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
1	SFACV05N01	Cabinet (1)
2	Δ SFDJHSC0491	Socket, A.C.Power (1)
3	SFDJV05N09E	Terminal, Phono Output (1)
4	SFDJC06N02	Jack, Synchro-rec (1)
5	SFUPV05N06	Weight (1)
6	SFUMV05N16	Cover, Weight (1)
7	SFUMV05N17	Cover, Socket, Jack, & Tarminal (1)
8	SFUMV05N30	Cover, (1)
9	[M] SFNNV05M01	Name Plate (1)
9	[MC] SFNNV05C01	Name Plate (1)
10	SFUML11N02	Holder, L.E.D. (2)
11	SFMZV05N03A	Stator Frame (1)
12	SFMGQ34N01	Cover, F.G.Coil (1)
13	SFGCV05M03	Cushion Rubber, Power Transformer. (2)
14	SFUPV05N07	Plate, Power Transformer (1)
15	SFKTV05N03	Knob, Speed Selector (1)
16	SFUMV05N04	Lever, Speed Selector (1)
17	SFKTV05N02	Knob Ass'y, Key Switch (1)
18	SFUMV05N01	Cover, Control knob (1)
19	SFXJV05N01E	Joint Ass'y, On/off Switch (1)
20	SFKTV05N01	Knob, On/off Switch (1)
21	SFUMV05N18	Switch Base, On/off Switch (1)
22	SFUPV05N08	Bracket, Cabinet & Cabinet Cover (2)
23	SFKKV05N01	Surface Plate (1)
23-1	SFUPV05N11	Filter, Surface Plate (1)
24	SFQPC05N01	Spring, Cabinet Switch (1)
25	SFUMV05N07	Cover, Cabinet Switch (1)
26	SFQAV05N03	Spring, Audio Insulator (4)
27	SFGAV05N01	Audio Insulator (4)
28	SFUPV05N09	Bottom Board (1)
29-1	SFGAV05N02	Cushion Rubber (4)
30	SFUPV05N03	Rod, Open/close Front Cabinet (1)
31	SFUMV05N02	Lever, Open/close Front Cabinet (1)
32	SFQHV05N01	Spring, Open/close Front Cabinet (1)
33	SFUMV05N11	Lever, Open/close Front Cabinet (1)
34	SFUMV05N03	Shutter, Open/close Front Cabinet (1)
35	SFQAV05N01	Spring, Shutter (1)
36	SFUMV05N27	Plate, Shutter (1)
37	SFUMV05N26	Plate, Main P.C.B. (1)
38	SFUMV05N10	Cover, Cabinet Label, Speed Selector (1)

Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
40	SFUMV05N13	Record Guide (2)
41	SFQAV05N02	Spring, Record Guide (2)
42	SFUMV05N14	Plate, Record Guide (2)
43	SFTEV05N01E	Turntable Pillater Ass'y (with Turntable Mat) (1)
44	SFUMV05N15	Cam, Turntable Pillater (1)
45	SFQAC06N01	Spring, E.P. Adaptor (1)
46	SFWEV05N01	E.P. Adaptor, 45r.p.m. (1)
47	SFADV05N01Z	Dust Cover Ass'y, (1)
48	SFGCV05N01	Cushion Rubber, Dust Cover (2)
49	SFGCV05N02	Cushion Rubber, Dust Cover (1)
49-1	SFGCV05N04	Cushion Rubber, Dust Cover (1)
50	SFUMV05N05	Upper Cover, Hinge (1)
51	SFUPV05N05Z	Hinge (1)
52	SFUMV05N06	Lower Cover, Hinge (1)
53	SFUMC02N07	Cover, Tonearm Motor (1)
54	SFMHC02N01E	Motor Ass'y, Tonearm Drive (1)
55	SFGBC10-01	Belt, Tonearm Drive (1)
56	SFUML11R02A	Worm Gear Ass'y (1)
57	SFUPC02N10E	Plate Ass'y, Motor (1)
58	SFUMC02N10	Lope Guide (1)
59	SFQA913-01	Spring, Rest Switch Adjuster (1)
60	SFUMC02N05	Lever Ass'y, Rest Switch (1)
61	SFQHQ34N22	Spring, Rest Switch Lever (1)
62	SFUMC02N13	Plate Ass'y, Rest Switch (1)
63	SFUML11R03	Arm Drive Wheel (1)
64	SFUZC05N02E	Arm Drive Lope Ass'y (1)
65	SFUZC02N01	Rod, Rest Switch (1)
66	SFEZQ34N01	Clamper, Lead wires (1)
67	SFXJC02N03	Guide Rail, Tonearm Drive (1)
68	SFGCC05N05	Cushion Rubber, Guide Rail (2)
69	SFUPC02N03	Bracket, Guide Rail (1)
70	SFUKV05N01E	Plate Ass'y, Tonearm (1)
71	SFUMC06N11	Cap, Pulley (1)
73	SFUMV05N12E	Stabilizer (1)
74	SFNZV05M01	Caution Label (1)
75	SFUMV05N09	Disk Size Selector (1)
76	SFUMV05N08	Spacer, Disk Size Selector (1)

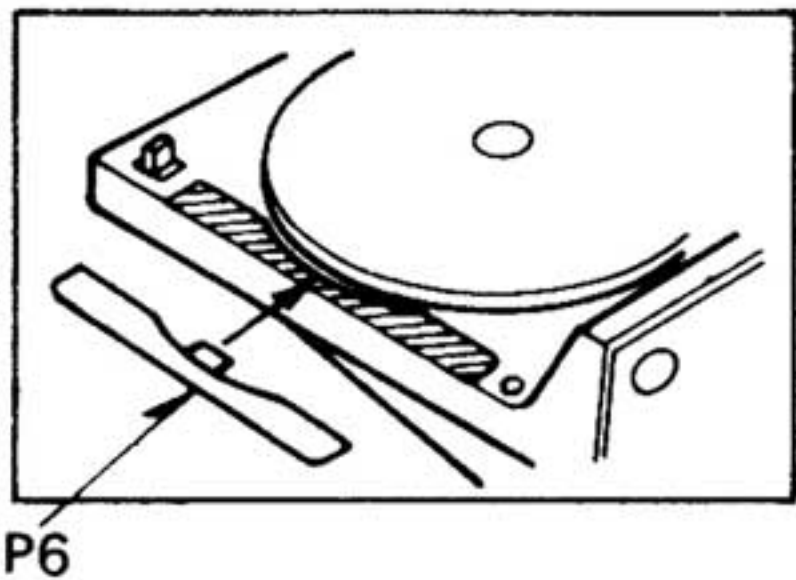
Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
77	SFGKC10-01	Cap. Cabinet Cover (3)
78	SFDJV05N11E	Connector Ass'y, 3 P CN304 (1)
79	SFDJV05N01E	Connector Ass'y, 2 P CN302 (1)
	SFDJV05N06E	Connector Ass'y, 3 P (1)
	SFDJ109N13E	Connector Ass'y, 6 P (1)
	SFDJV05N04E	Connector Ass'y, 2 P (1)
	SFDJV05N05E	Connector Ass'y, 2 P (1)
	SFDJV05N07E	Connector Ass'y, 4 P (1)
	SFDJV05N08E	Connector Ass'y, 7 P (1)
80	SFUMC05N22	Pulley (1)
ONEARM PARTS		
81	SFPAM0V501A	Tonearm Ass'y (1)
84	SFPKD00301R	Base Ass'y. Tonearm (1)
85	SFPZB00301	Plate (1)
86	SFPJU00301	Bracket, Guide Rail (1)
87	SFPGML1101	Rubber (1)
88	SFPSP0V501	Spring, Lead Wires (1)
89	SFPSP00504	Spring (1)
90	SFDZC05N01E	Cueing Plunger (1)
91	SFPCS0V501E	Cover, Tonearm Position Indicator (1)
92	SFPCS00302	Spring (2)
SCREWS, WASHERS and CIRCLIPS		
N1	S XTV3+10BFN	Screw (44)
N2	S SFXGD20-01	Screw (2)
N3	S XTV3+10GFYR	Screw (3)
N4	S XTV3+14BFN	Screw (3)
N5	SFXGV05N03	Screw (1)
N6	SFXGV05N02	Screw (3)
N7	S XTV3+6BFN	Screw (1)
N8	S XTV3+8B	Screw (1)
N9	S CSTW3	Washer (2)
N10	S XWE3	Washer (1)
N11	SFXGV05N01	Screw (1)
N12	SFXWC10-03	Screw (1)
N13	S XWE3	Washer (2)
N14	SXTW3+10Q	Screw (4)
N15	SFXJV05N03	Screw (1)
N16	SFXW130-01	Washer (1)
N17	S XTN2+4B	Screw (1)
N18	S XTN3+8BFZ	Screw (1)
N19	S XTN26+6BFZ	Screw (1)
N20	S XSN2+4	Screw (1)
N21	S XWA2B	Washer (1)
N22	SXTN16+10G	Screw (1)
N23	SFPEV00502	Screw (1)
N24	SFXN623-1	Nut (1)
N25	SXEX3D10FZS	Screw (1)
N26	S XSN3+12S	Screw (1)
N27	S XWA3B	Washer (1)
N28	SFXWV05N02	Washer (1)
N29	S XUC6FT	Screw (1)

■ PACKINGS

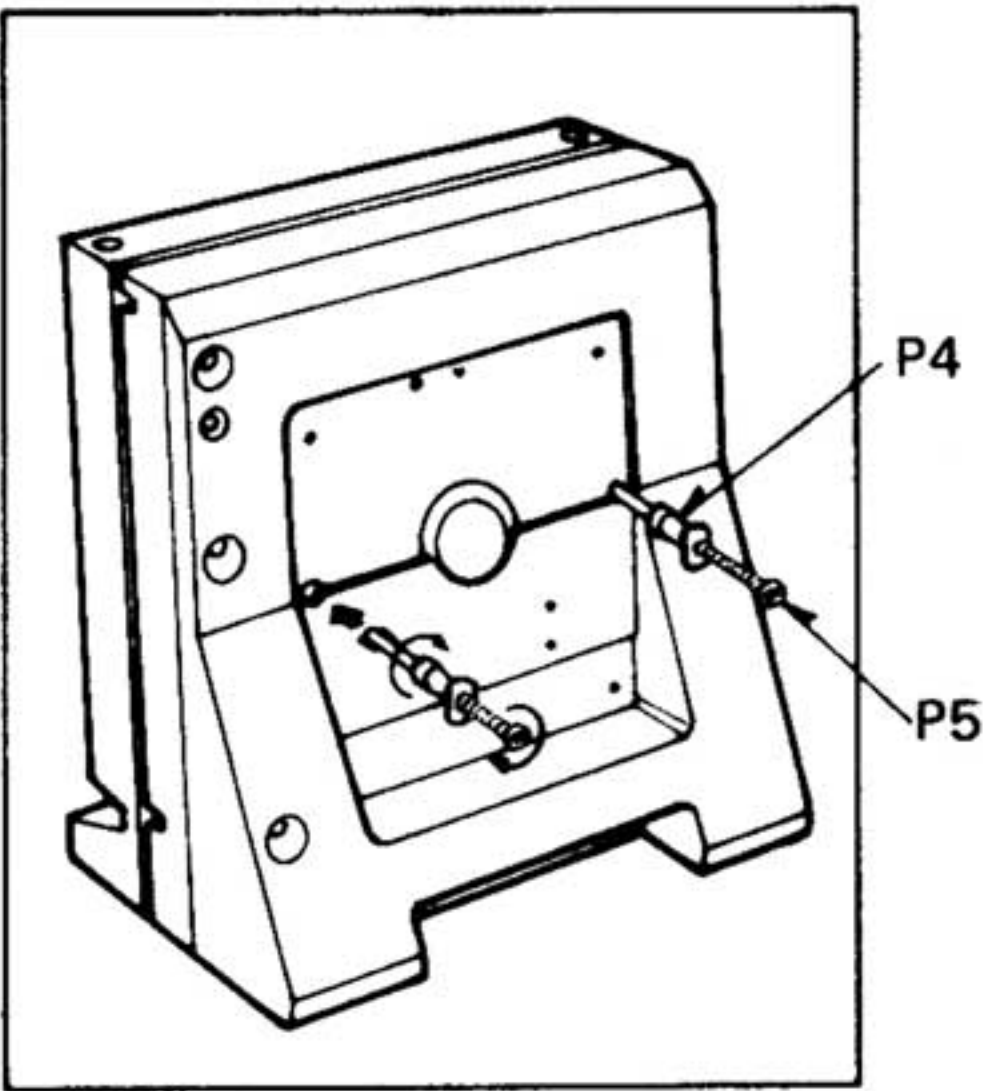
1. Open the cabinet and fit the spacer for tonearm protection in place.



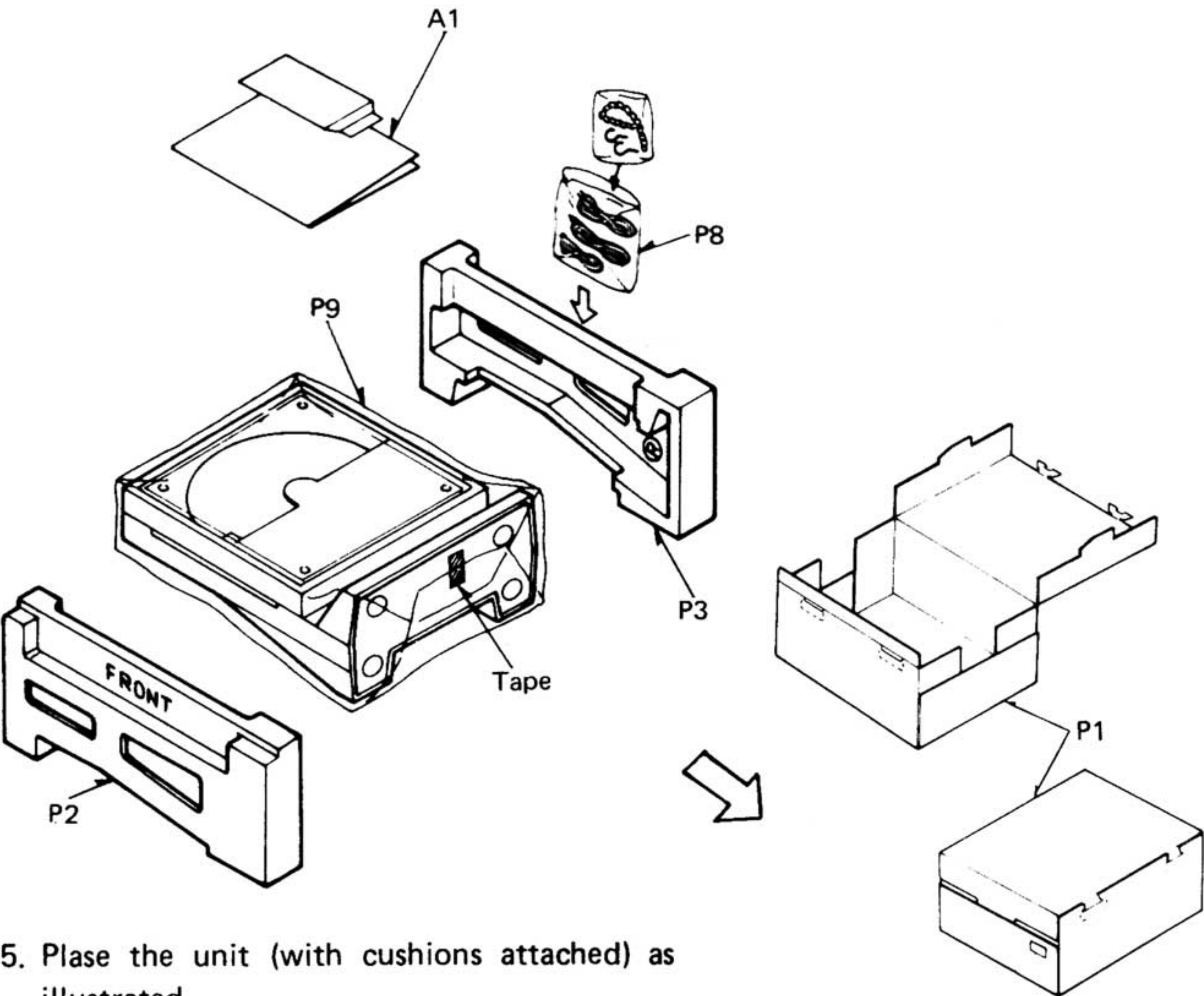
2. Fit the dust cover spacer.



3. Fit the turntable clamper.



4. Put the set into the polyethylene bag, then pack it as shown below.



5. Place the unit (with cushions attached) as illustrated.

6. Fold the flaps according to the line marks.

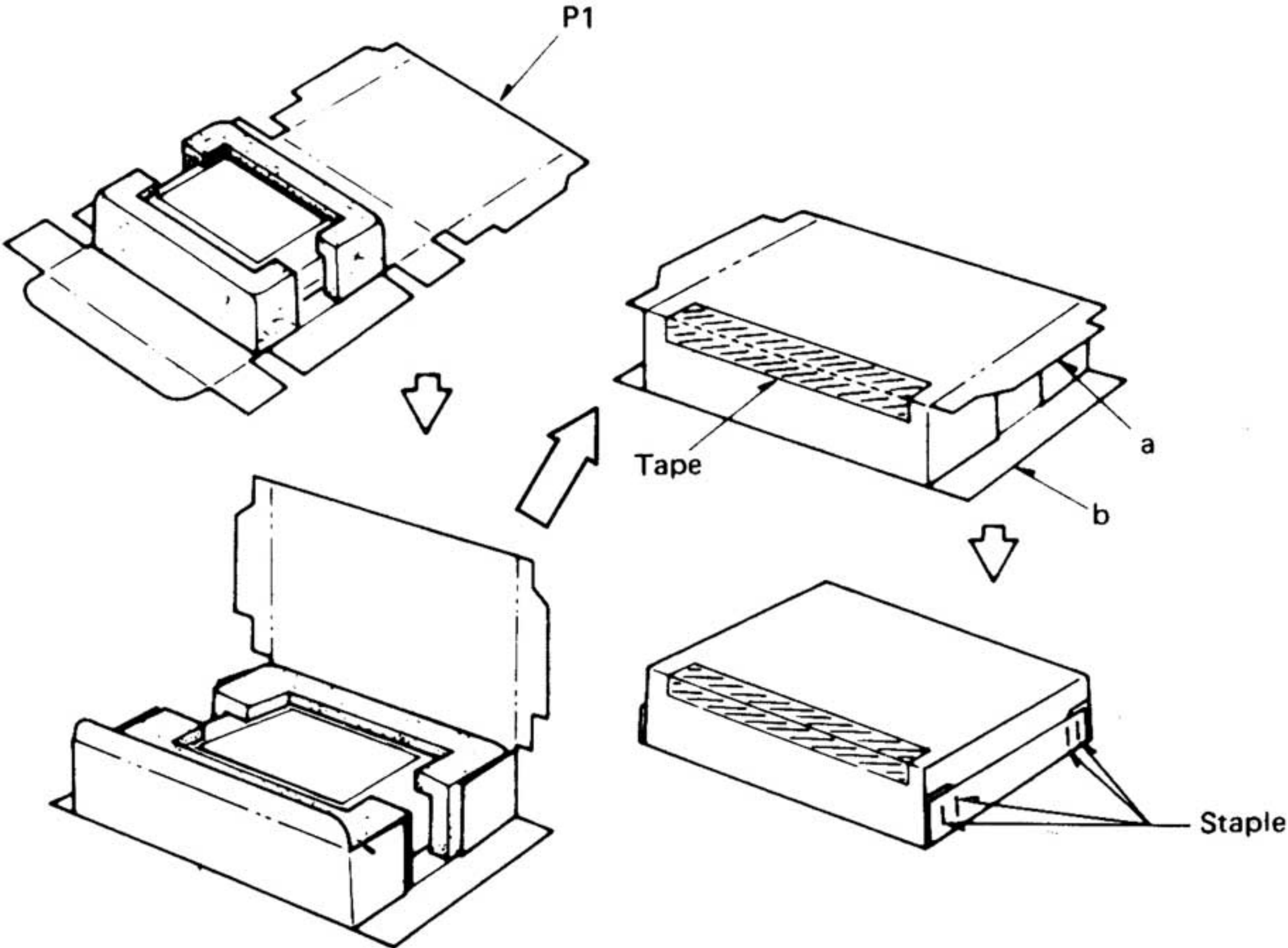
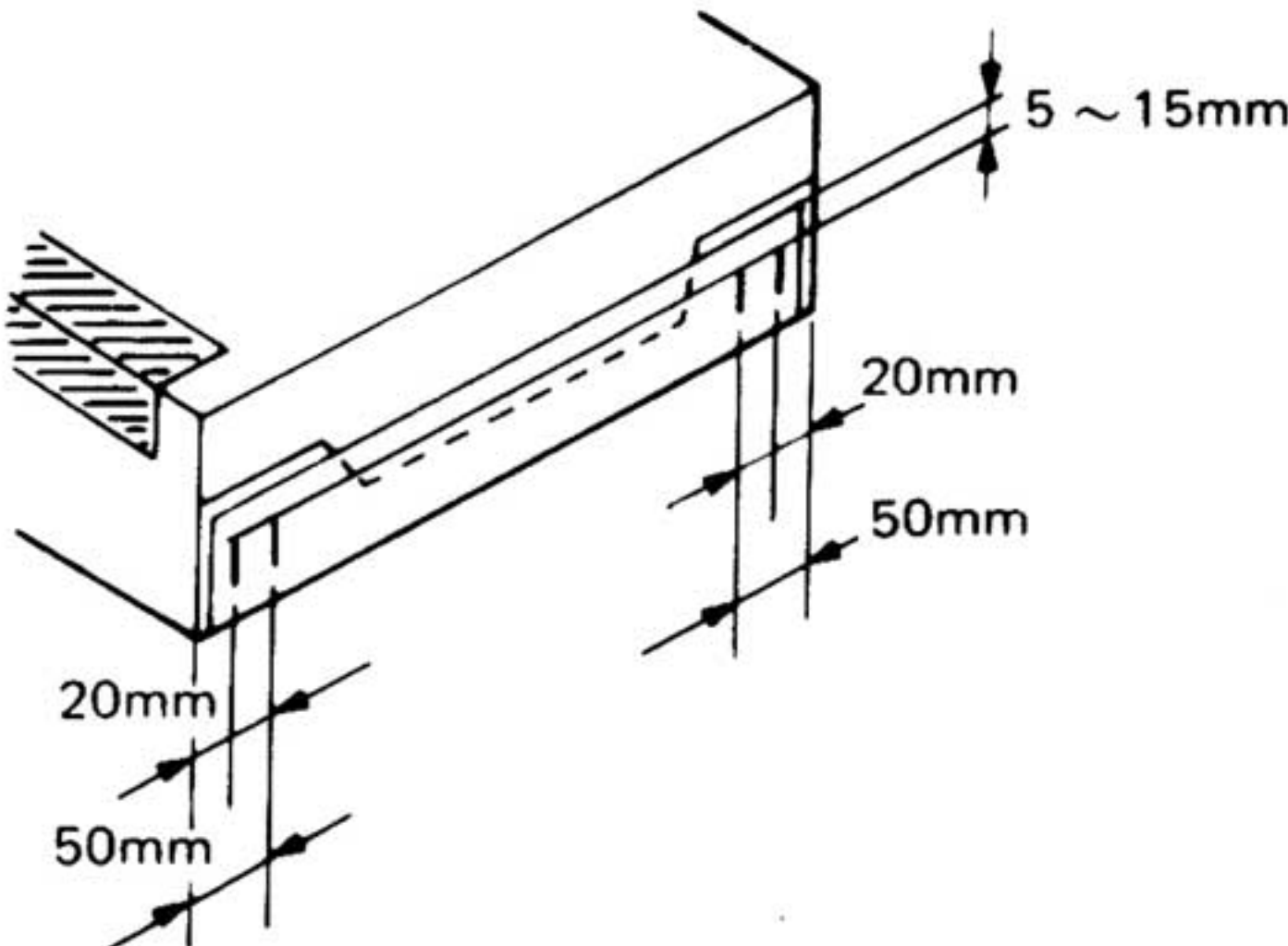
7. Seal the top with adhesive tape.

* Use gum tape or adhesive cloth tape of 50 mm wide at least.

8. For the edges, first fold the flap "a" and then flap "b", and staple. Remember to staple only flap "b".

(Use 15 or 16 mm staple)

* Stapling positions are shown below.



Ref. No.		Part No.	Description
ACCESSORIES			
A1	(M)	SFNUV05M01	Instruction Book (1)
A1	(MC)	SFNUV05C01E	Instruction Book (1)
A2		SFDHC05N01	Phono Cord (1)
A3		SFDLC05N01	Ground Wire (1)
A4	S ⚠	RJA22	AC Cord (1)
PACKING PARTS			
P1	(M)	SFHPV05M01	Carton Box (1)
P1	(MC)	SFHPV05C01	Carton Box (1)
P2		SFHVV05N01	Pad, Left (1)
P3		SFHVV05N02	Pad, Right (1)
P4		SFHKV05N02	Clamper, Turntable Platter (2)
P5		XSN4+70FYBS	Screw, Clamper (2)
P6		SFHSV05N01	Spacer, Dust Cover (1)
P7		SFHKV05N01	Spacer, Tonearm(1)
P8		SFYH52×60	Polyethylene Bag, Cord (1)
P9		SFYH17×16	Polyethylene Bag, Unit (1)