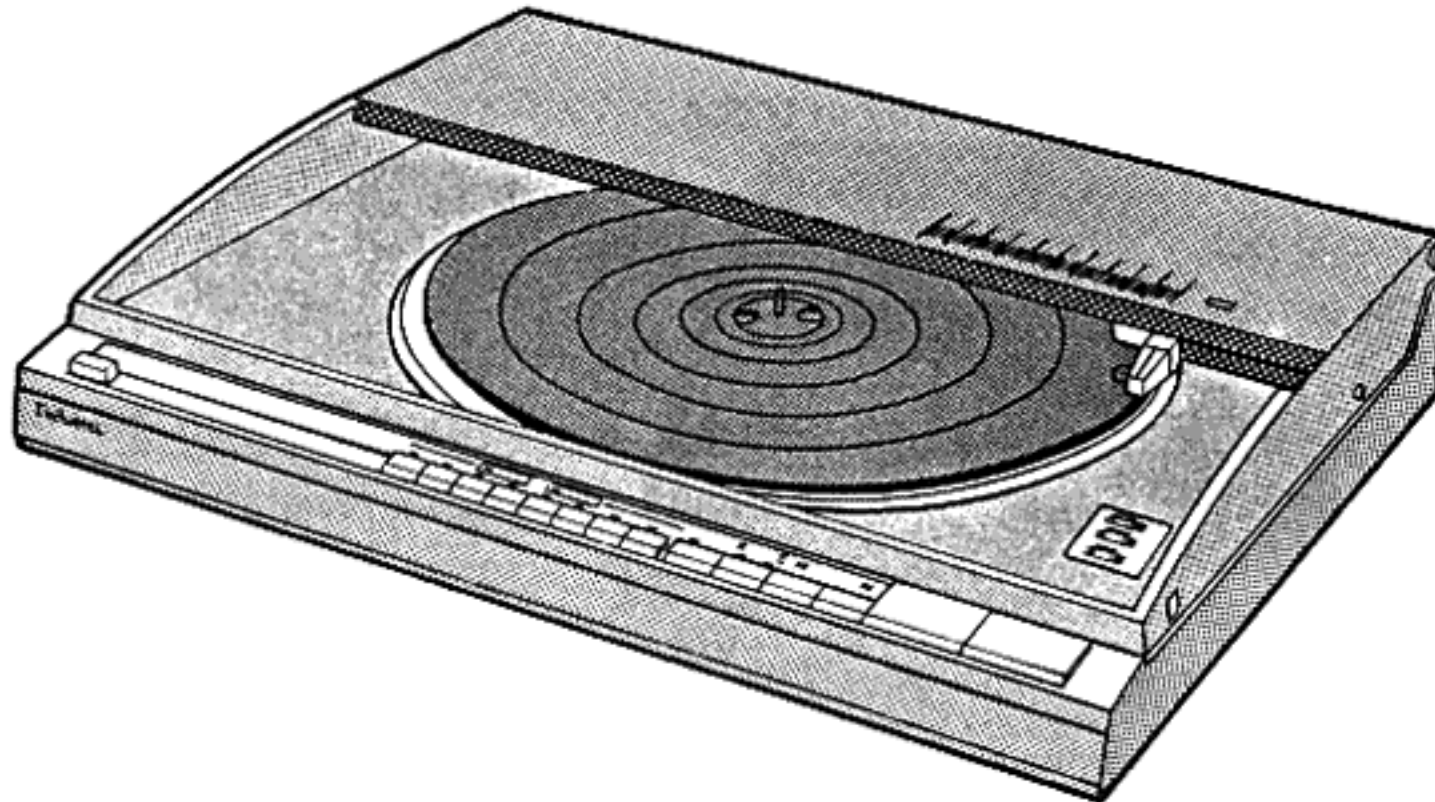


Service Manual

Turntable System

SL-L3

QUARTZ Direct Drive
Fully Automatic Turntable System



Color

(S)...Silver Type

Area

[M]U.S.A.

[MC]Canada

T4P is the standard mark for the "P-mount" plug-in-connector system. Products carrying this mark are interchangeable and compatible with each other.

SPECIFICATIONS

■ Turntable section

Type:	Quartz direct drive Automatic turntable system
Features:	Auto start/Auto lead-in, Auto return/Auto stop, Repeat play, Program play, Direct music select play, Forward and backward skip play, Forward and backward search play, Auto size select, Record presence detection
Drive method:	Direct drive
Motor:	Brushless DC motor
Drive control method:	Quartz-phase-locked control
Turntable platter:	Aluminum die-cast Diameter 30 cm (12")
Turntable speeds:	33-1/3 rpm and 45 rpm Auto speed select (Manual selection possible)
Wow and flutter:	0.012% WRMS* 0.025% WRMS (JIS C5521) ±0.035% peak (IEC 98A Weighted)
*Measured by obtaining signal from built-in frequency generator of motor assembly.	
Rumble:	-56 dB (IEC 98A Unweighted) -78 dB (IEC 98A Weighted)

■ Tonearm section

Type:	Linear tracking tonearm 4-pivot gimbal suspension T4P
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
Applicable cartridge weight:	6 g
Stylus pressure:	1.25 g (Fixed)
Phono cable capacitance:	150 pF

■ General

Power supply:	AC 120 V, 60 Hz
Power consumption:	16 W
Dimensions: (W × H × D)	43 × 9 × 35 cm (16-15/16" × 3-17/32" × 13-25/32") (Maximum height when dust cover is open) 39 cm (15-11/32")
Weight:	5.2 kg (11.5 lb.)

Specifications are subject to change without notice for further improvement.

Weight and dimensions shown are approximate.

Technics

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and Service Company
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Secaucus, New Jersey 07094

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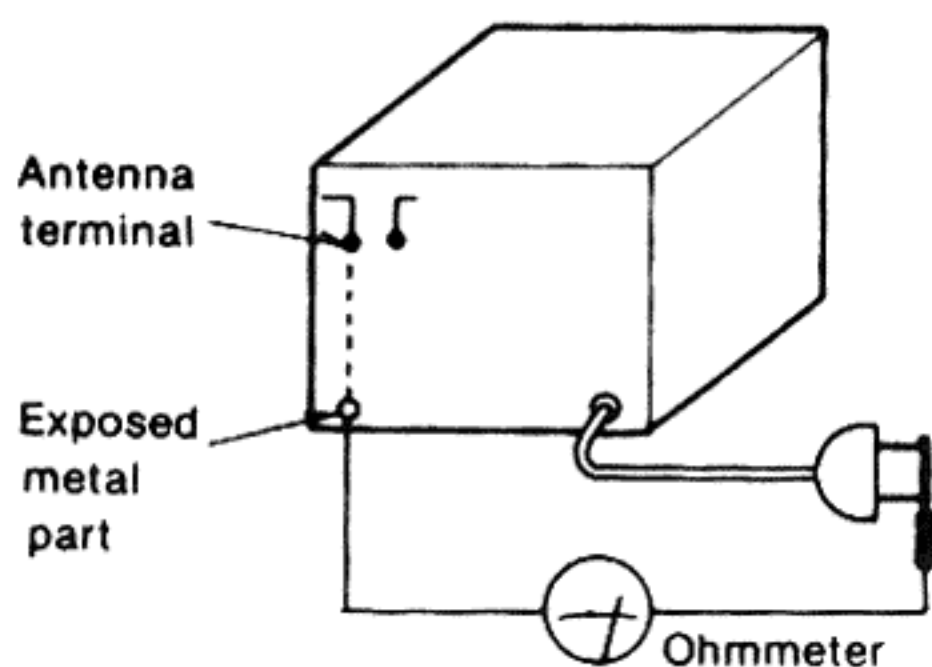
■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

● INSULATION RESISTANCE TEST

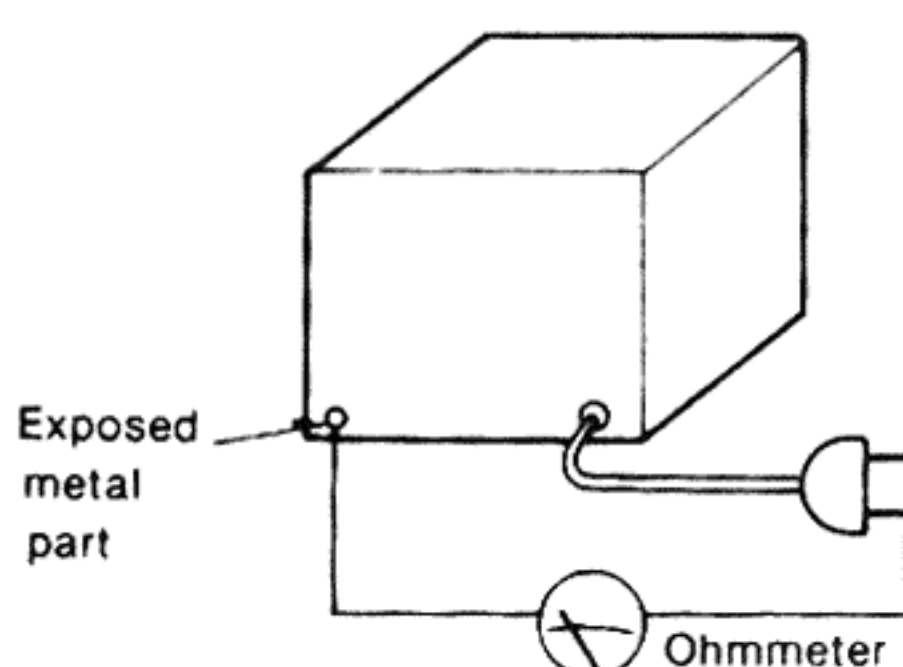
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between $3M\Omega$ and $5.2M\Omega$ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = $3M\Omega - 5.2M\Omega$

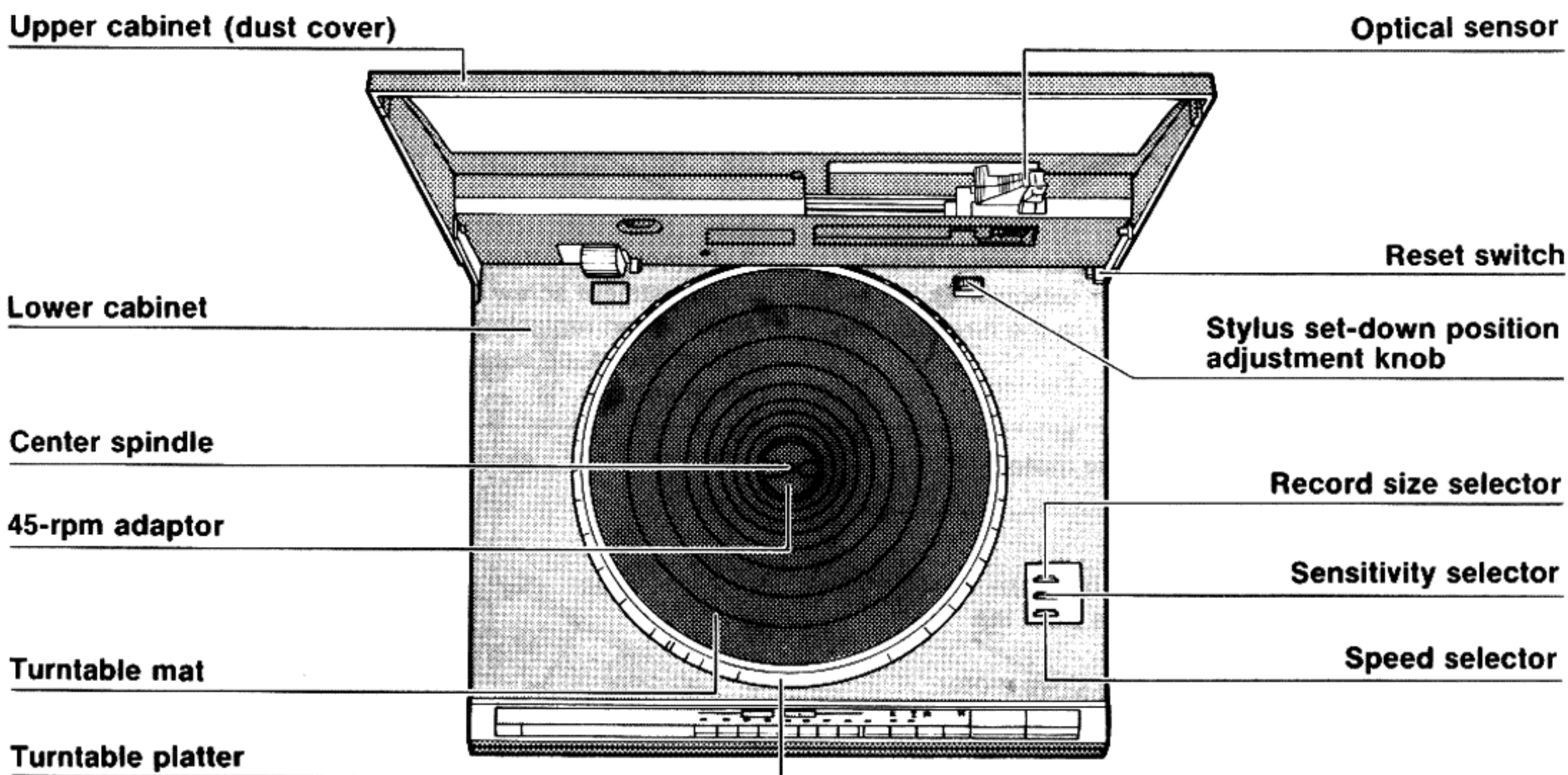
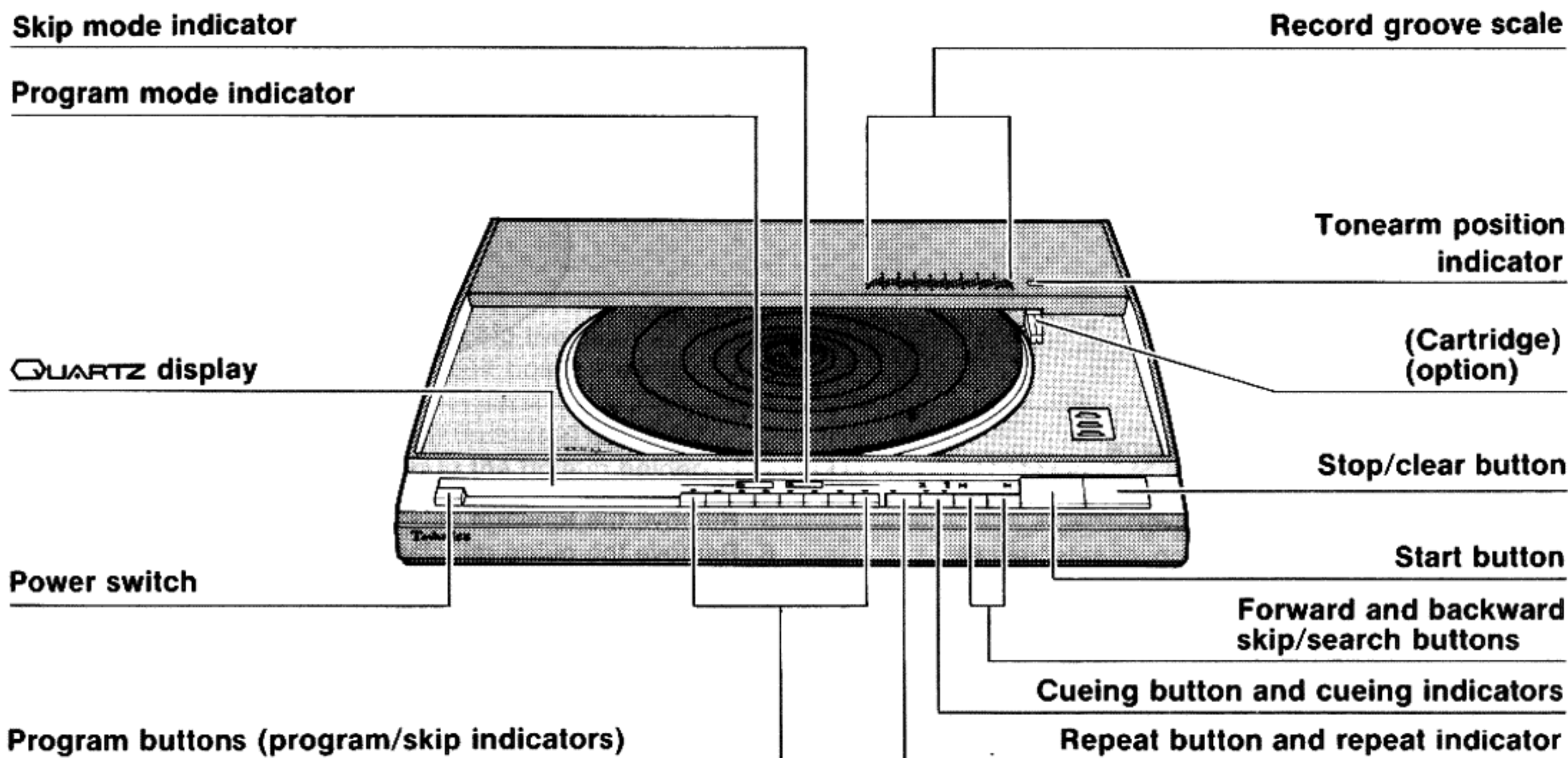


(Fig. B)

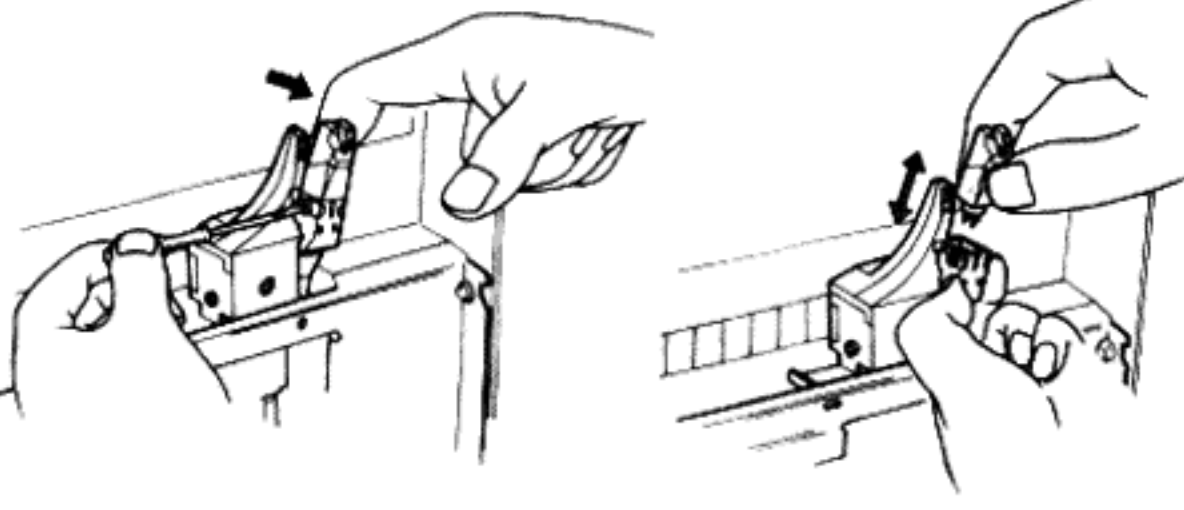
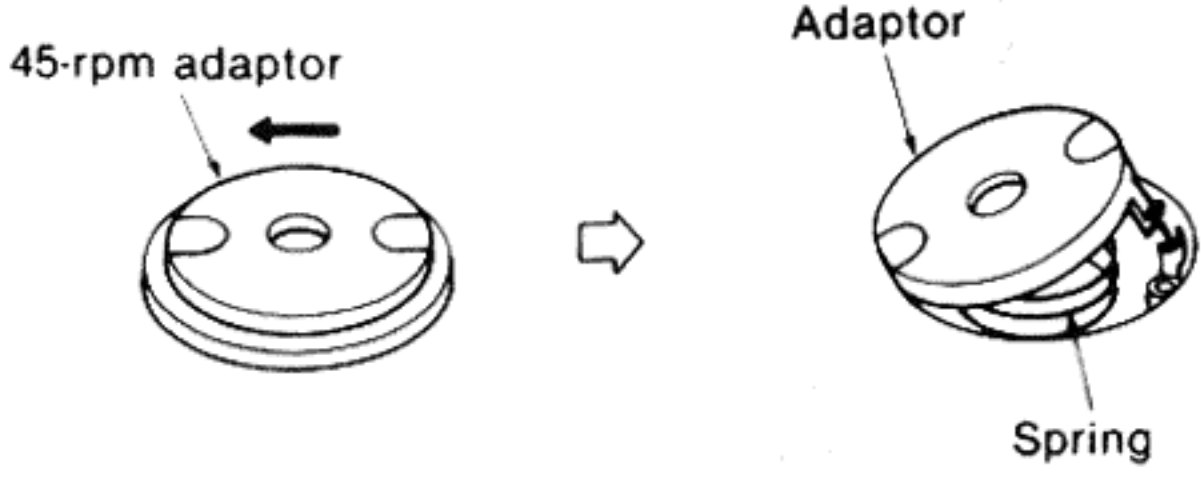
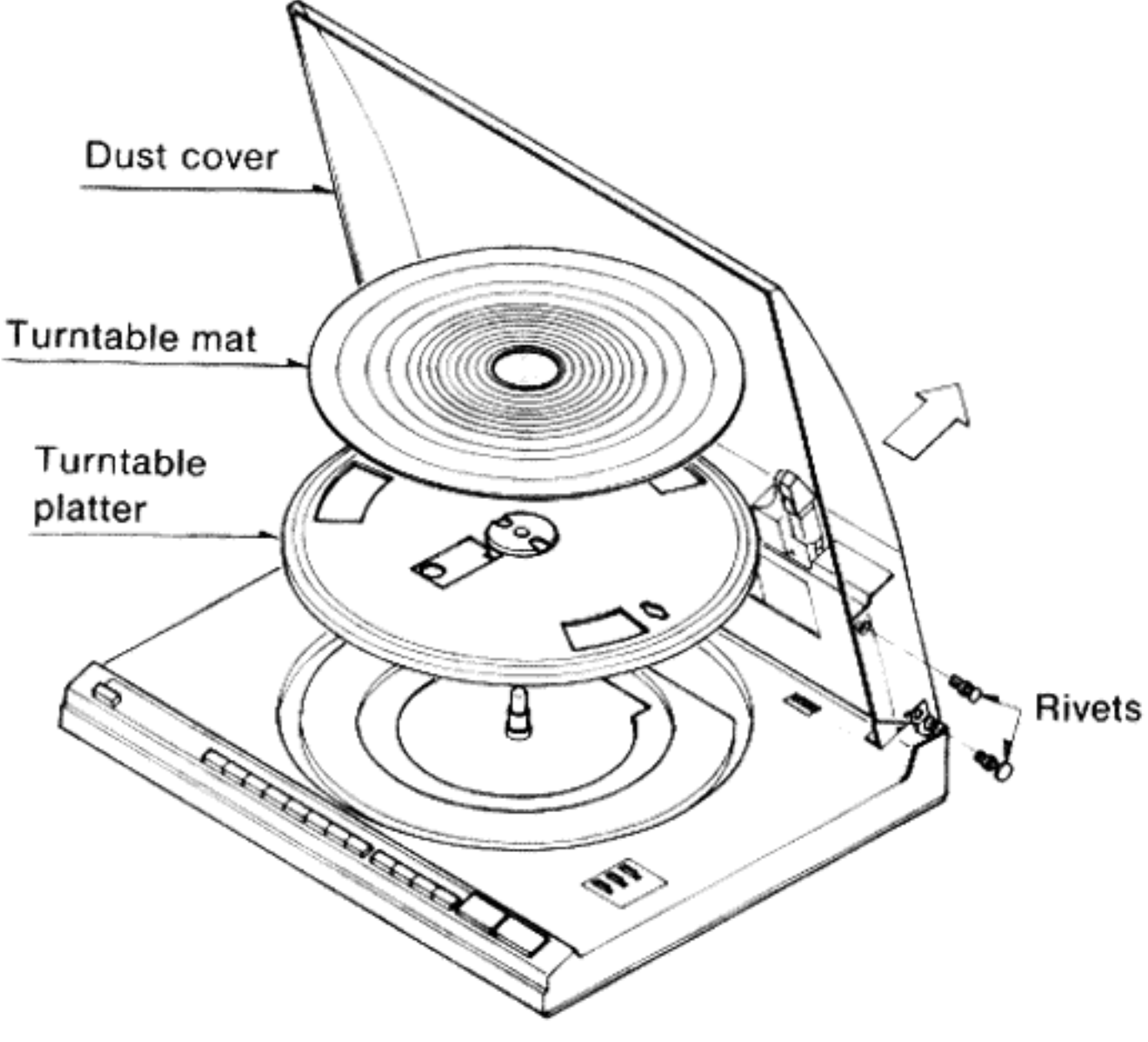
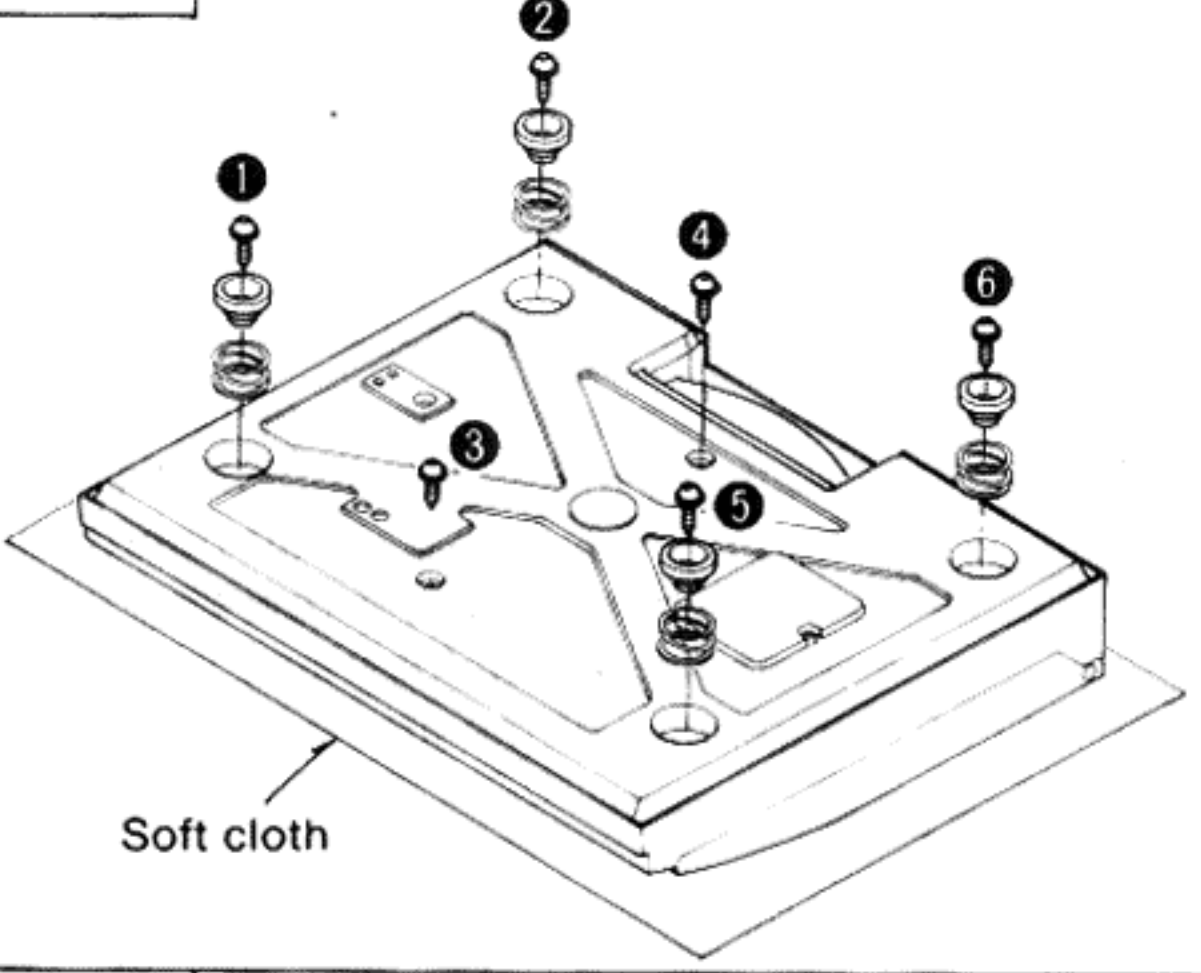
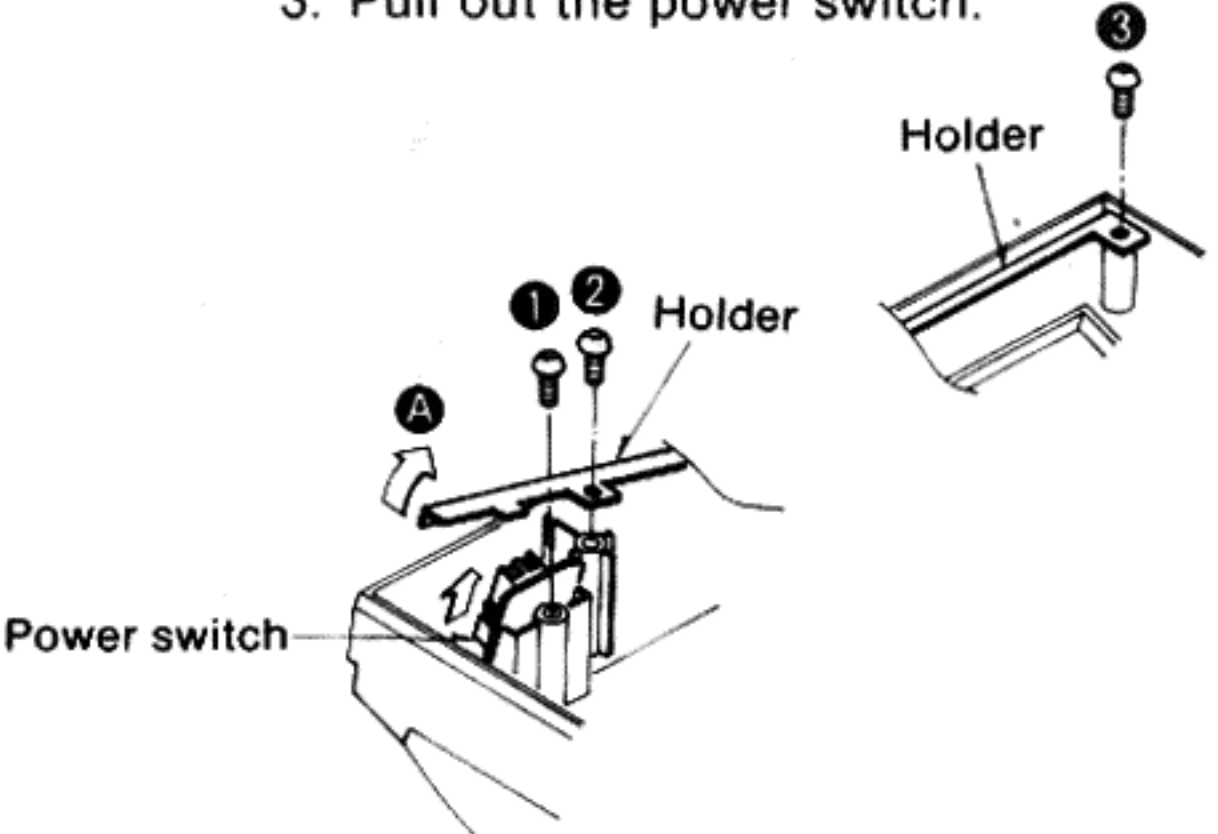
Resistance = Approx ∞

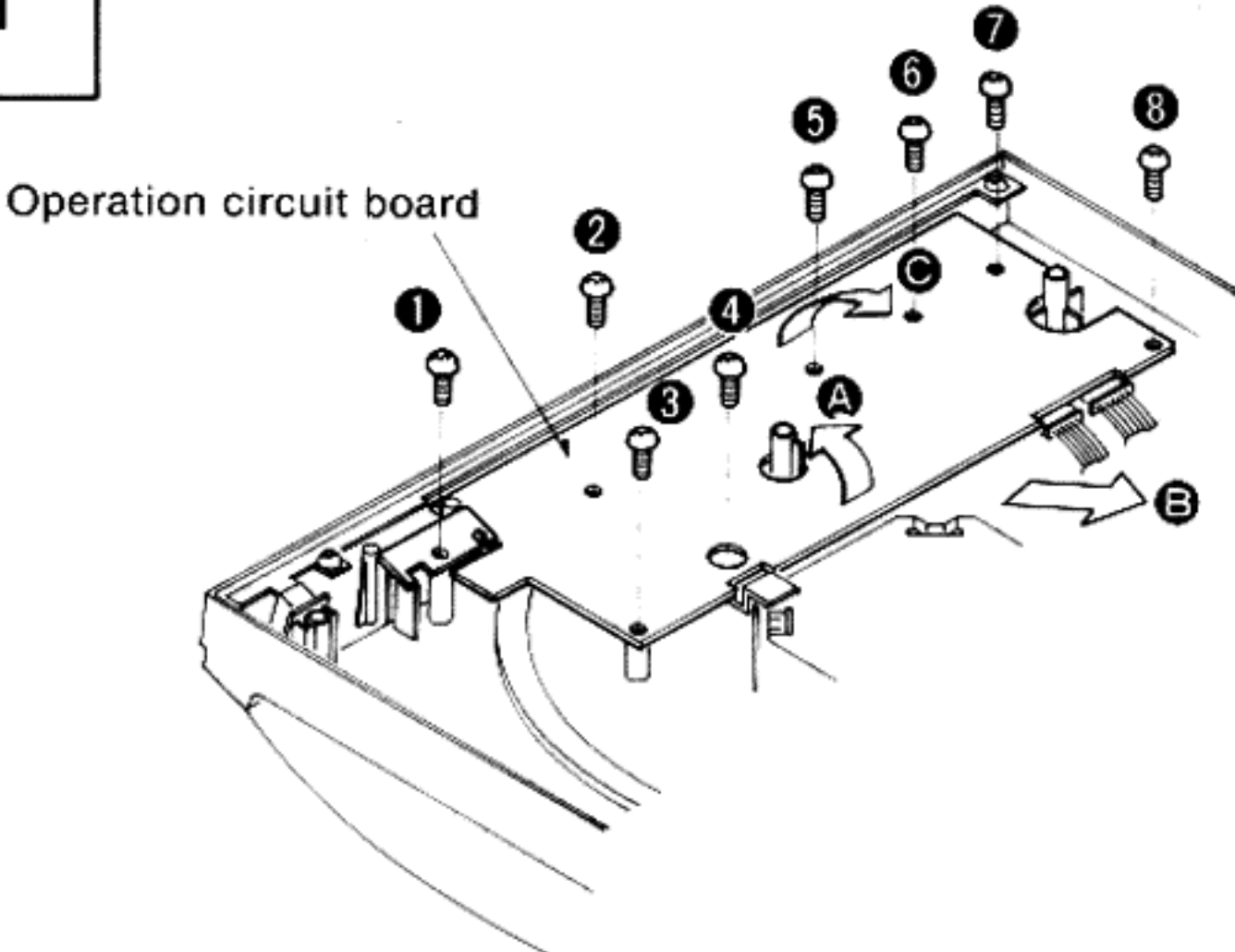
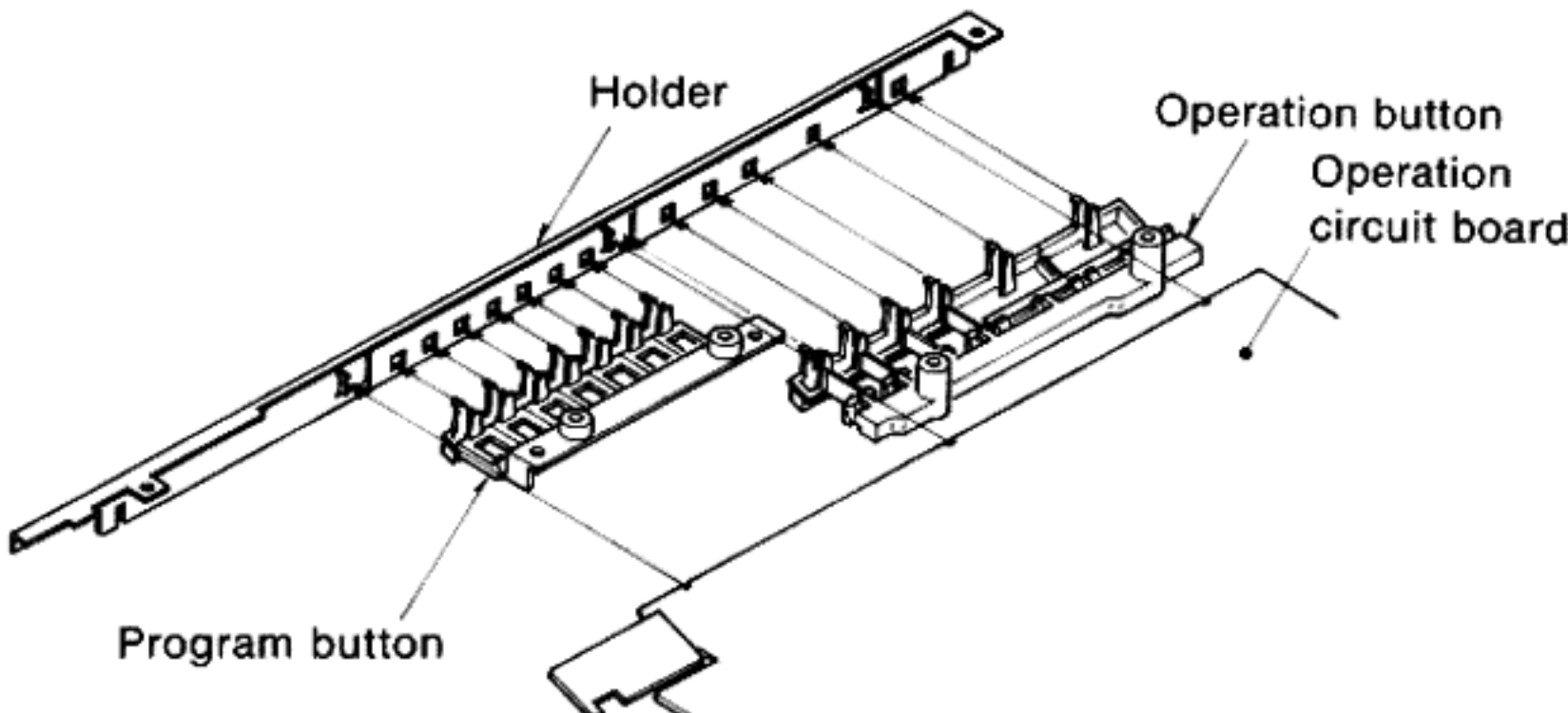
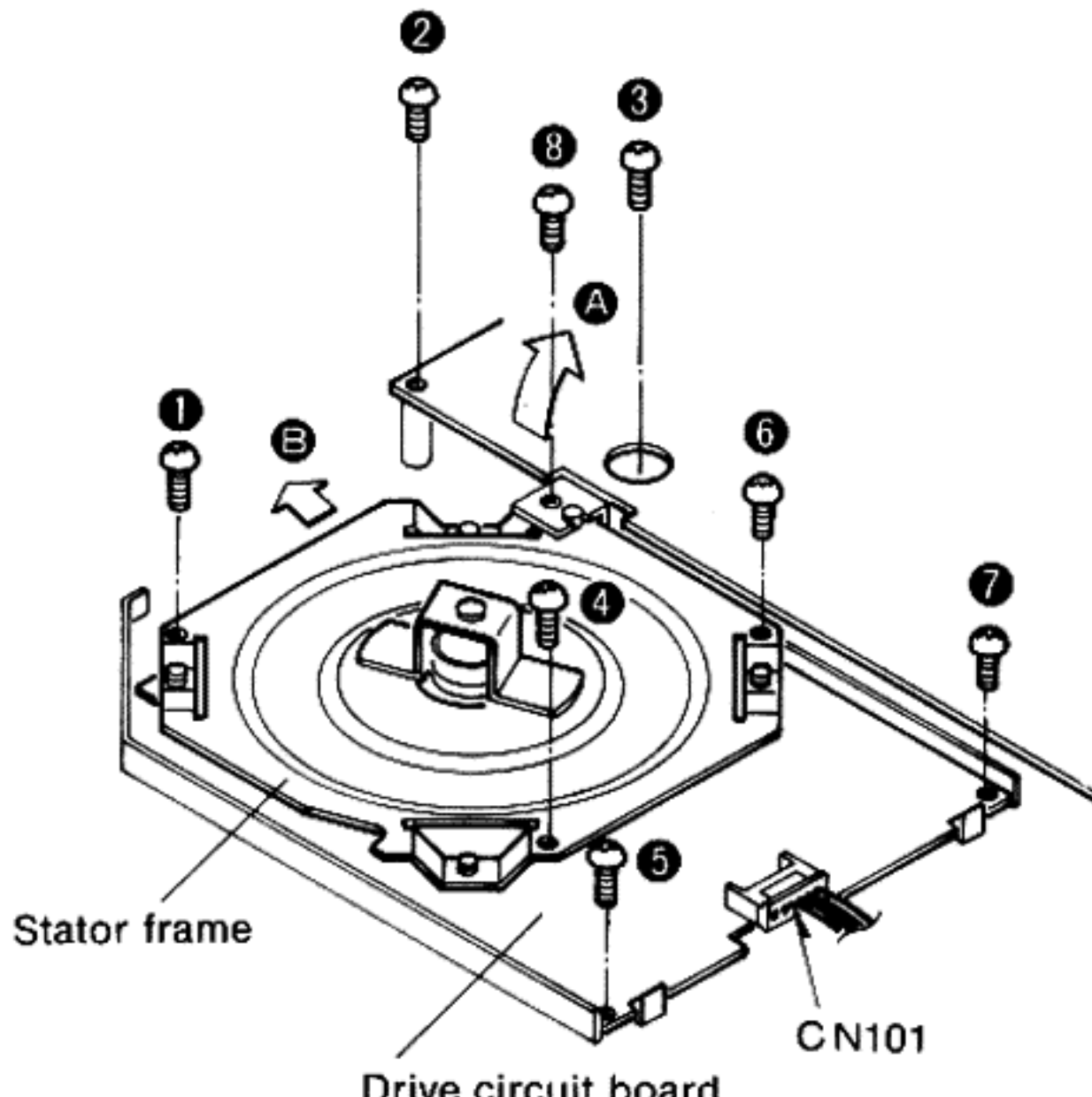
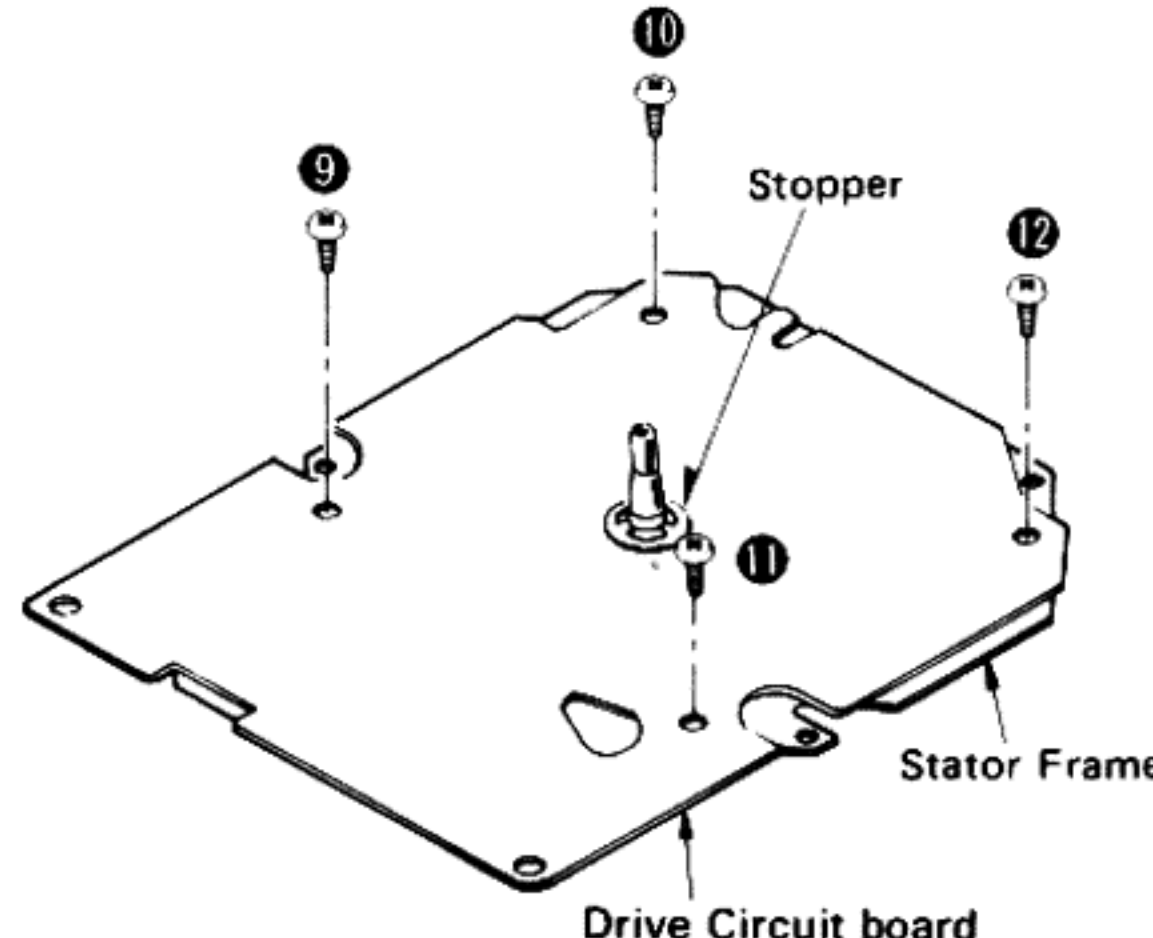
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

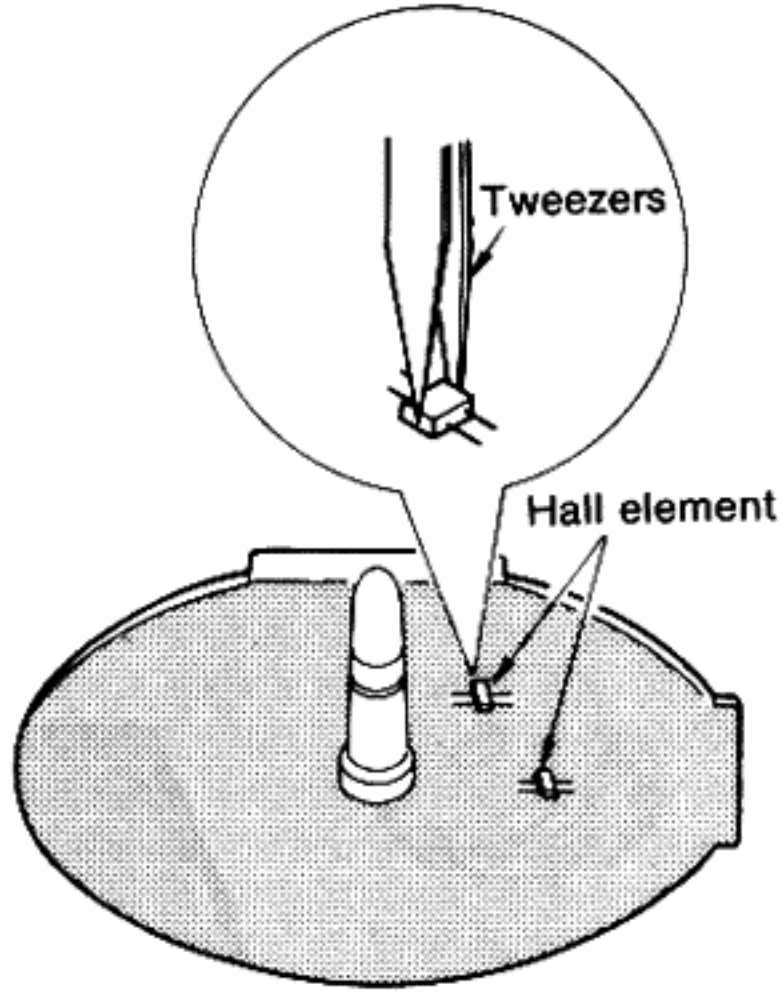
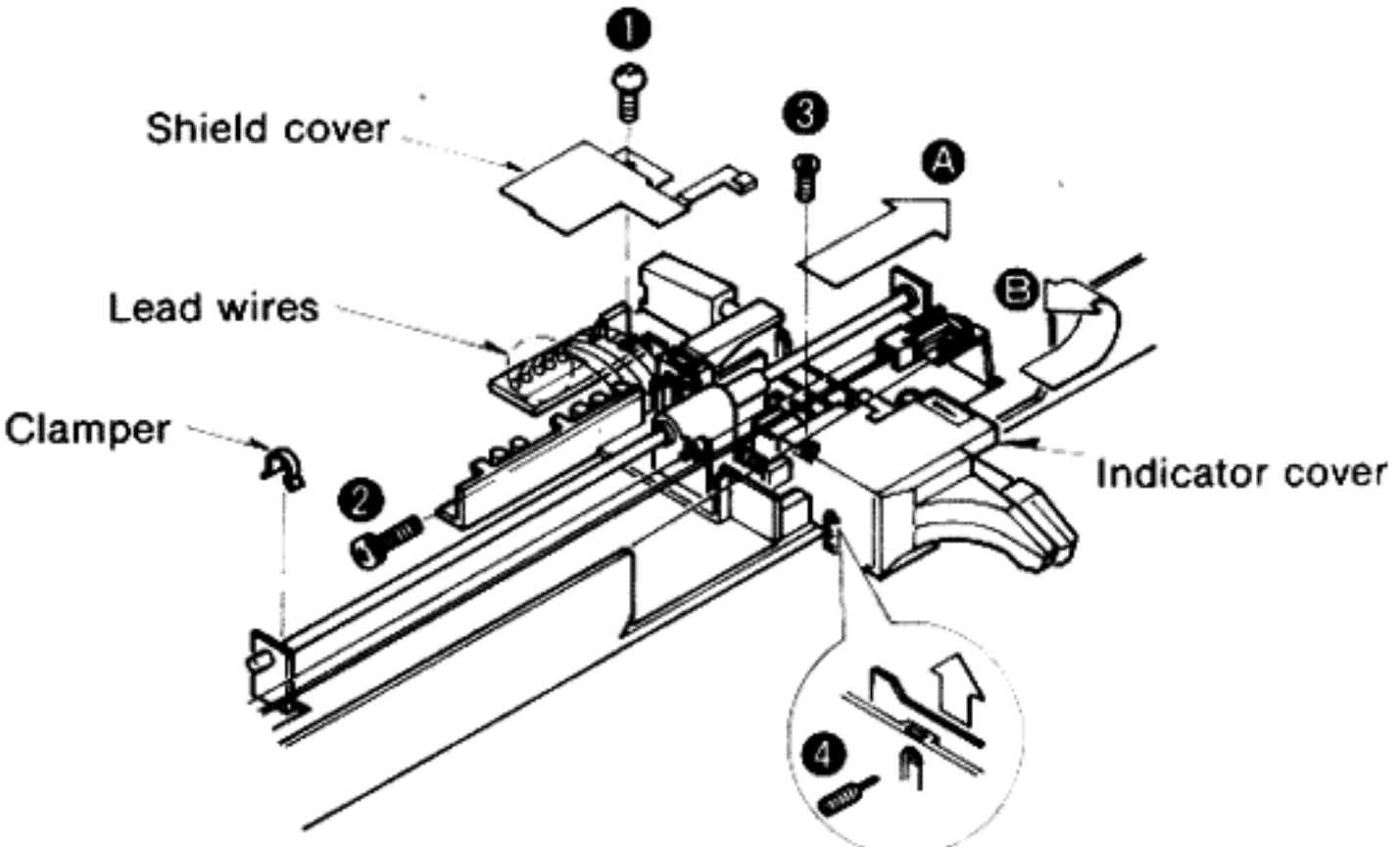
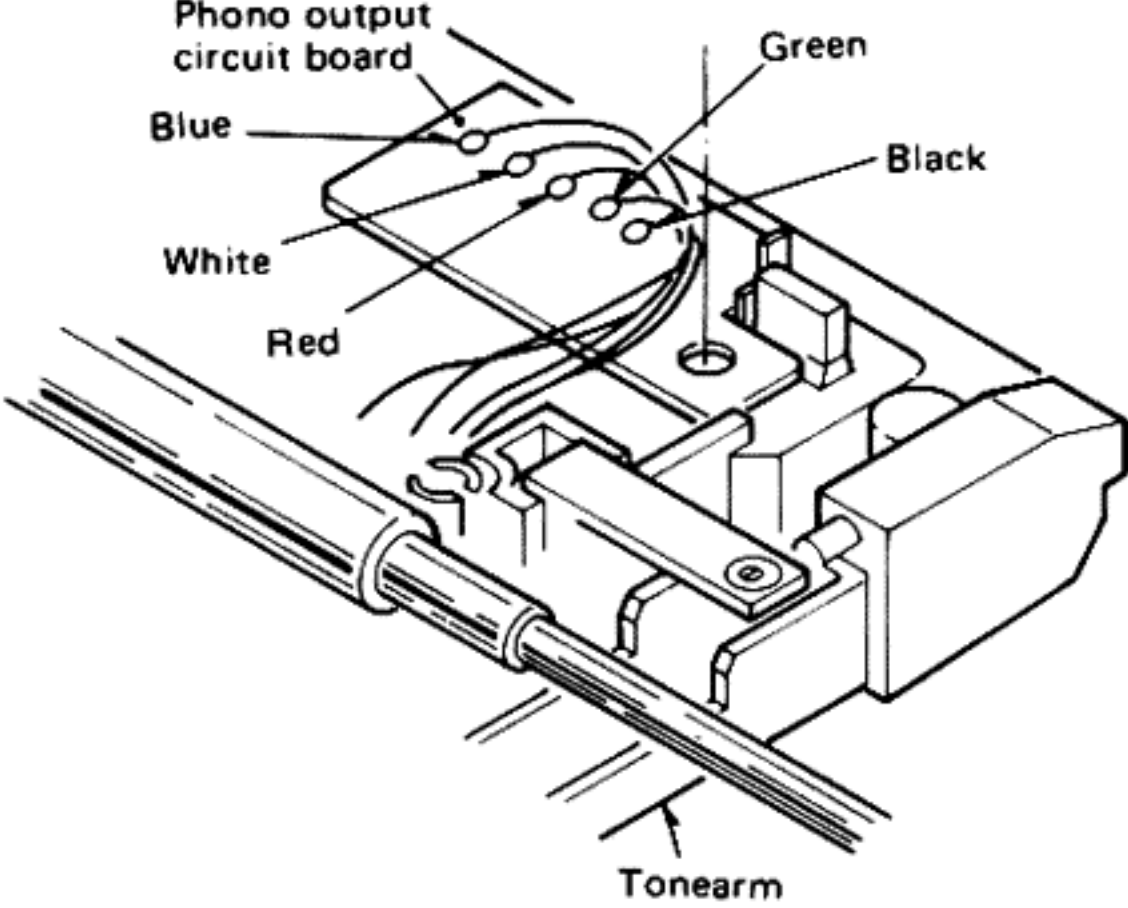
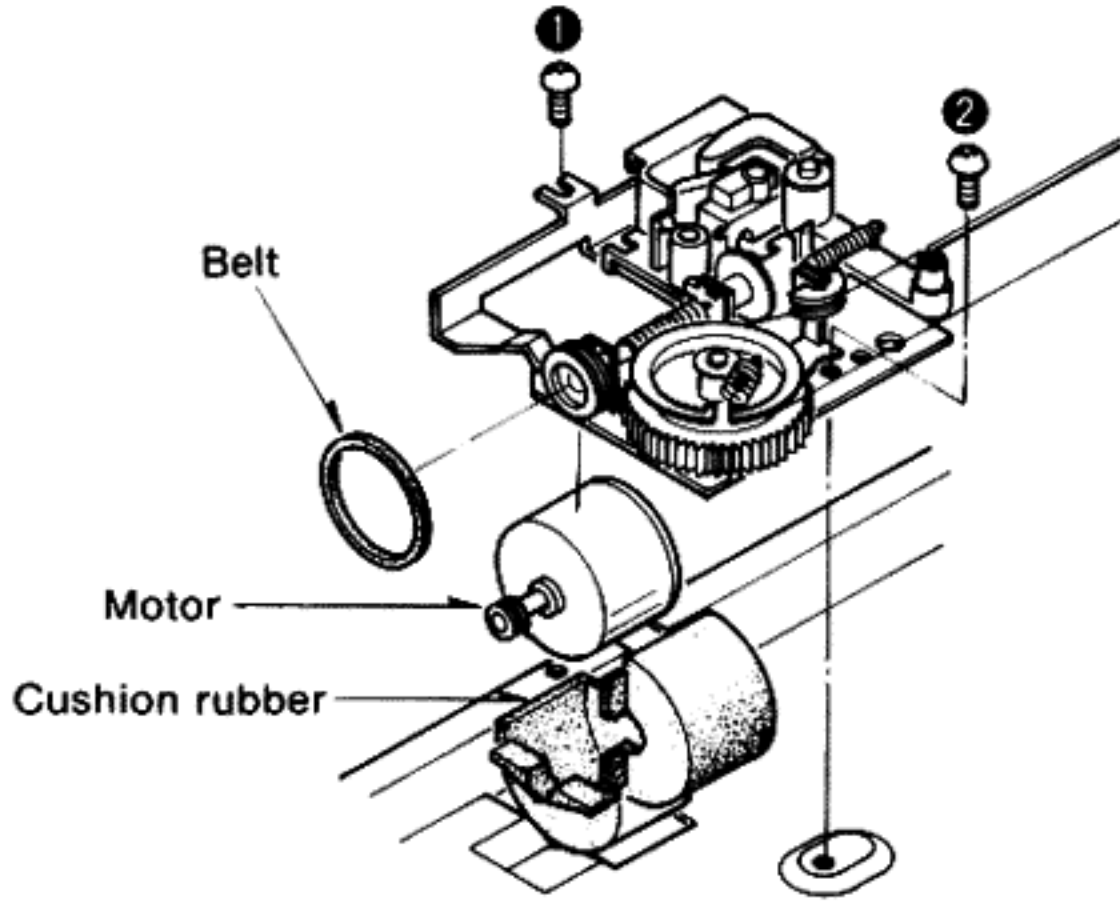
■ LOCATION OF CONTROLS

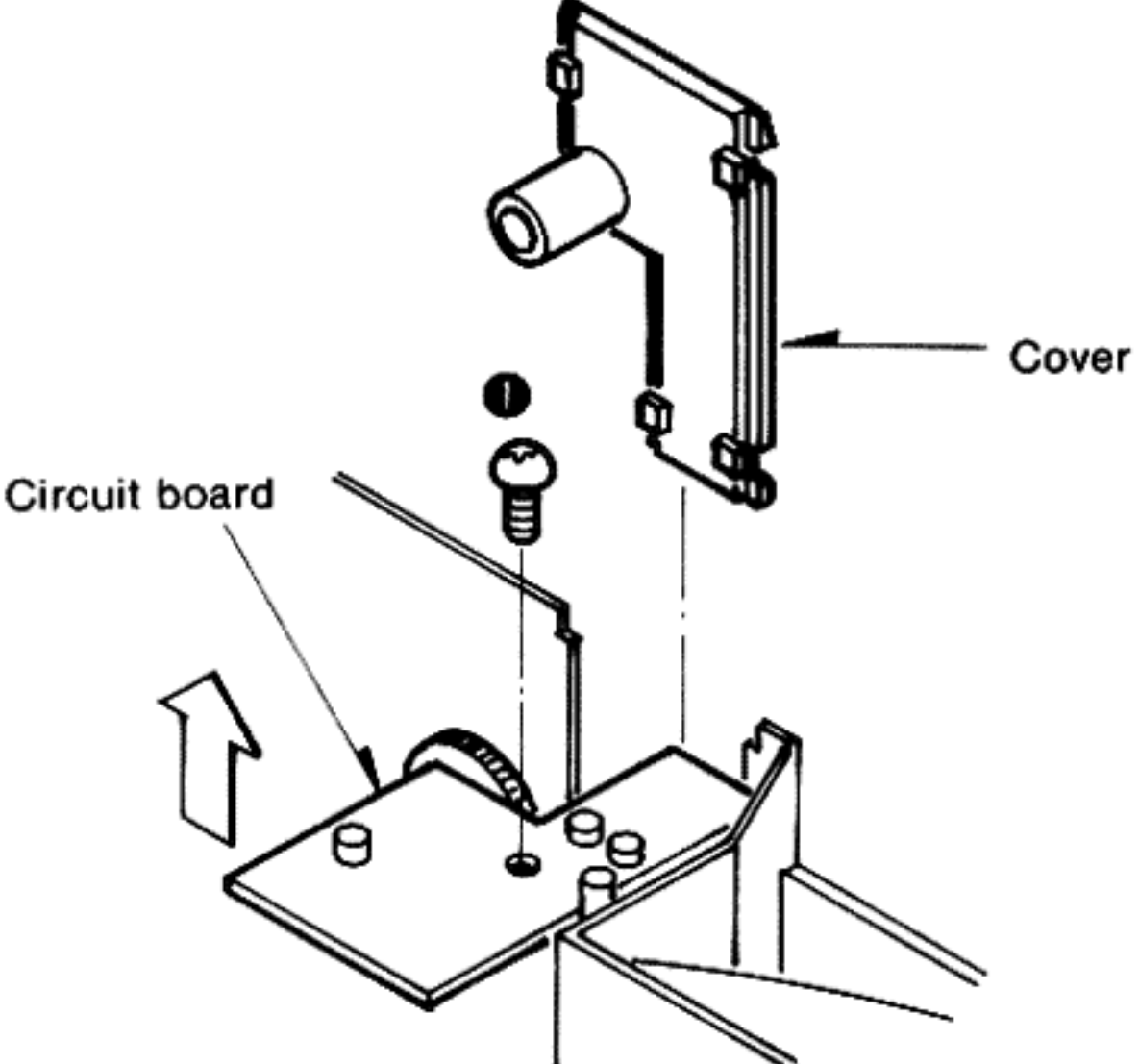
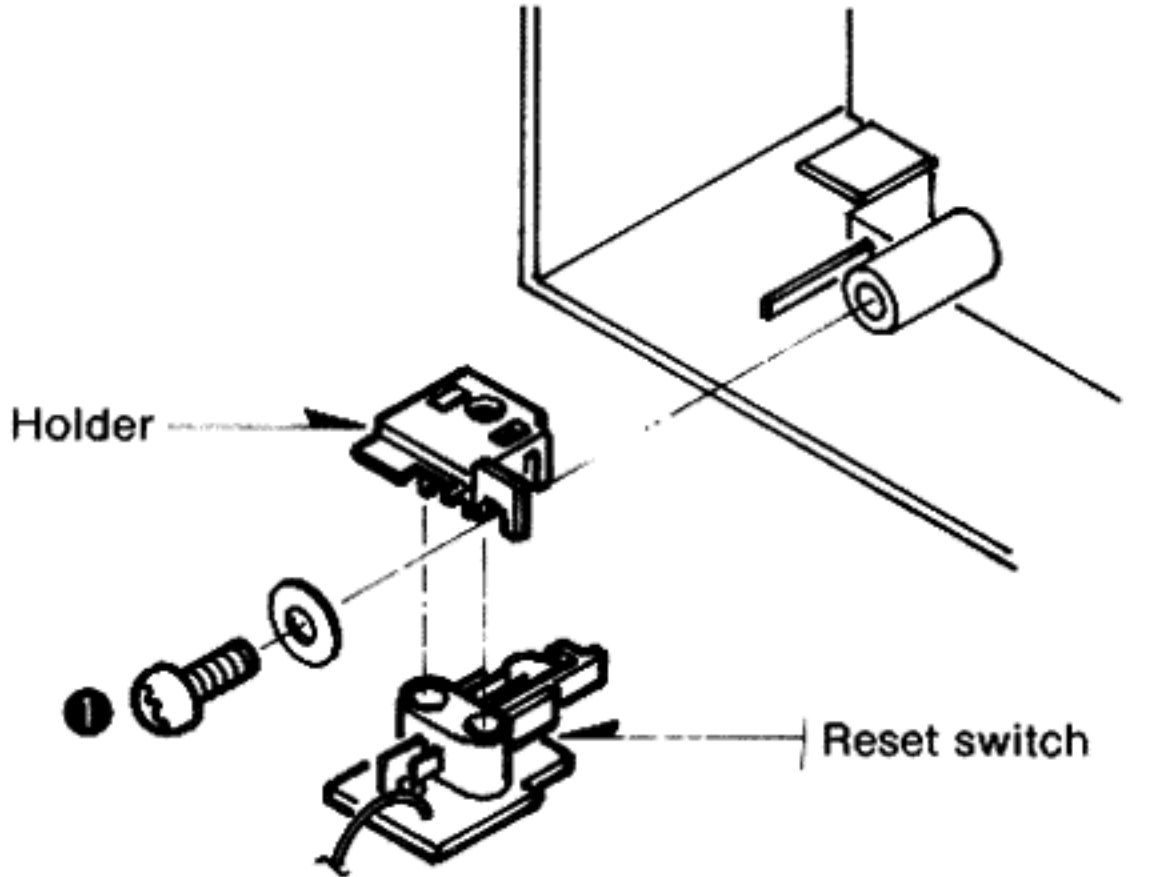


■ DISASSEMBLY INSTRUCTIONS

Ref. No 1	How to remove the cartridge	Ref. No 3	How to remove the 45 rpm adaptor
Procedure 1	1. Open the upper cabinet. 2. Remove the setscrew and pull out the cartridge. Note: When attaching the cartridge again, match the tonearm connector with the cartridge pin, then completely insert it and tighten the setscrew. 	Procedure 2 + 3	• The 2 adaptor claws fit into the turntable platter, so remove the 45 rpm adaptor by pushing it in the direction of the arrow.  Note: When removing the 45 rpm adaptor, remove the turntable platter; otherwise the 45 rpm adaptor claws will be broken.
Ref. No 2	How to remove the turntable platter	Ref. No 4	How to remove the bottom board
Procedure 2	1. Open the upper cabinet. 2. Remove the turntable mat, and lift the turntable platter. Note: • When removing the turntable platter, it is not necessary to remove the 45 rpm adaptor. • The turntable platter is tightly fitted to the center spindle. When removing the turntable platter, take care not to damage the upper cabinet.  ★ To remove the dust cover 1. Pull out the 4 right and left rivets. 2. Remove the dust cover in the direction of the arrow.	Procedure 2 + 4	1. Turn over the unit on a soft cloth. 2. Remove the 6 setscrews (① ~ ⑥). 
Ref. No 5	How to remove the power switch		
Procedure 2 + 4 + 5	1. Remove the 3 setscrews (① ~ ③). 2. Lift the holder slightly in the direction of arrow A. 3. Pull out the power switch. 		

Ref. No 6	How to remove the operation circuit board	
Procedure 2 → 4 → 6	1. Remove the 8 setscrews (① ~ ⑧). 2. Lift the circuit board up in the direction indicated by arrow ①. 3. Next, while Pulling in the direction of arrow ②, lift it up in the direction of the arrow ③.	
★ Caution when replacing the board 1. The operation circuit board fits into guide rails. 2. Match the operation button and program button to the hole in holder.		
 Operation circuit board  Holder Program button Operation button Operation circuit board		
Ref. No 7	How to remove the drive circuit board and stator frame	
Procedure 2 → 4 → 7	1. Remove the 8 setscrews (① ~ ⑧). 2. Pull out the connector CN101. 3. Lift the operation circuit board slightly in the direction of arrow ①. 4. Remove the stator frame in the direction of the arrow ②. 5. Cut off the stopper with nippers. 6. Remove the 4 setscrews (⑨ ~ ⑫). 7. Then, separate the drive circuit board and stator frame.	
 Stator frame Drive circuit board CN101   Stopper Stator Frame Drive Circuit board		

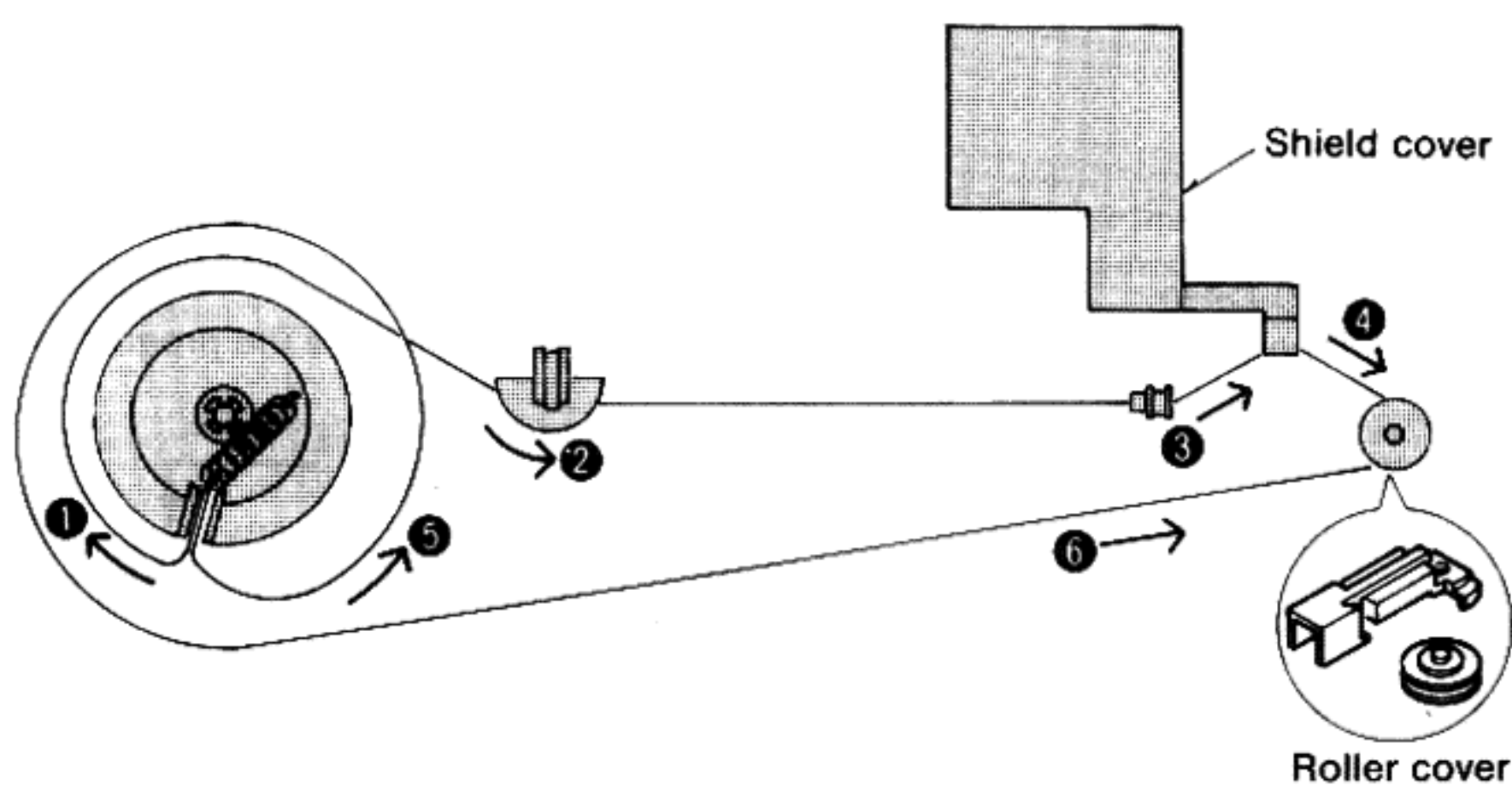
Ref. No 8	How to remove the Hall element	
Procedure 2 ⇨ 8	1. Remove the terminal solder by use of solder sucker. 2. Hold the Hall element with a tweezers and remove it while touching the soldering iron to the terminal. Note: Fit the Hall element with the part No. print up.	
Ref. No 9	How to remove the tonearm	5. Remove the tonearm setscrew ①. 6. Remove the guide rail clamber, and pull out the guide rail. 7. Remove the tonearm in the direction of arrow A. 
Procedure 2 ⇨ 9	1. Remove the dust cover. 2. Remove the shield cover setscrew ①. 3. Unsolder the 5 lead wires. 4. Turn the worm gear with your fingers to move the tonearm inward.  ★ To remove offset angle detection circuit board 1. Remove the indicator cover setscrew ①. 2. Remove the indicator cover in the direction the arrow B. Note: When replacing the offset angle detection circuit board, be sure to adjust the servo gain and offset voltage.	
Ref. No 10	How to remove the arm drive motor	
Procedure 2 ⇨ 10	1. Remove the dust cover. 2. Remove the 2 setscrews (①, ②). 3. Unsolder the 2 lead wires from the motor. 4. Remove the belt and arm drive motor 5. Open the cushion rubber. Note: Connection of the arm drive motor Red wire (+) terminal of the arm drive motor. Blue wire (-) terminal of the arm drive motor. • An arrow mark is the (-) terminal.	

Ref. No 11	How to remove the stylus set-down position volume circuit board	Ref. No 12	How to remove the reset switch
Procedure 2 ▶ 4 ▶ 11	1. Remove the cover. 2. Remove the stylus set-down position volume circuit board setscrew ❶.	Procedure 2 ▶ 4 ▶ 12	1. Remove the screw ❶. 2. Remove the 2 claws of the switch holder. 3. Unsolder the 2 switch terminals. Note: When replacing the reset switch, be sure to open the upper cabinet.
			

■ HOW TO SET THE TONEARM DRIVE ROPE

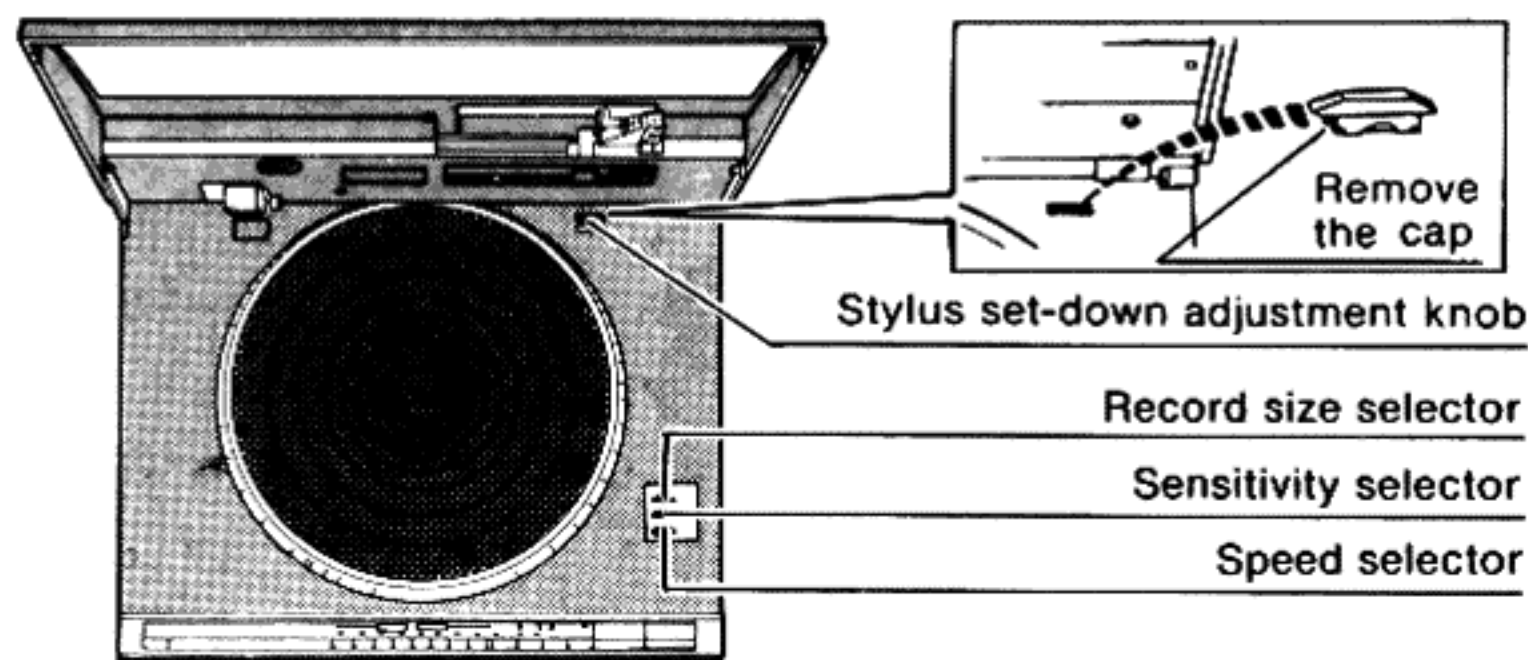
When setting the rope, follow the procedure given below.

1. Remove the dust cover.
2. Remove the roller cover.
3. Set the rope in the order of steps ❶ ~ ❸.
4. Fit the rope connector to the tonearm.
5. Set the roller cover and turn the worm gear by hand to see that the tonearm moves.



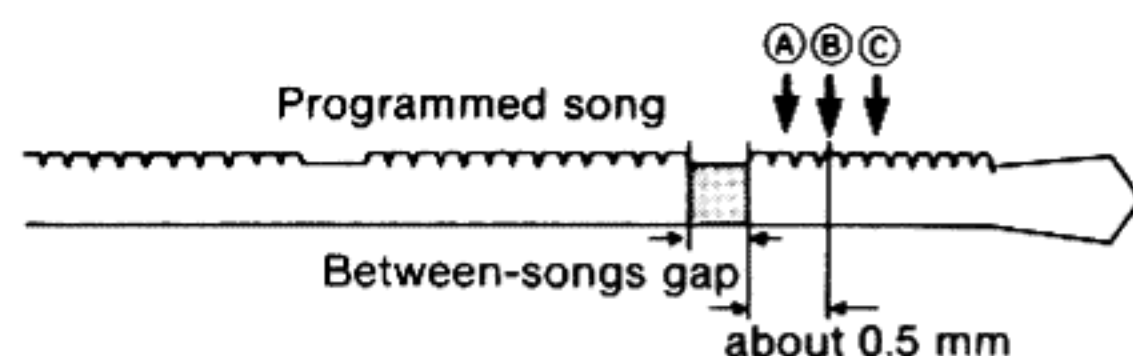
■ PLAYING NON-STANDARD AND SPECIAL RECORDS AND MAKING ADJUSTMENTS

In order to perform program record play, direct song selection, and forward and backward skip functions properly, this unit is designed so that the stylus is lowered shortly before (about 0.5 mm) the beginning of the between-songs gap. Because of this, no sound is heard for about ten seconds after the stylus contacts the record when using one of the above functions.



1. Adjusting the tonearm lowering position

- The stylus set-down adjustment knob is properly set at the factory. However, if it has been jarred loose during shipment, the tonearm may be lowered too far to one side as shown in the diagram to the right. If necessary, correct the problem as described below.



- Ⓐ Tonearm lowered too far to the left.
- Ⓑ Proper location
- Ⓒ Tonearm lowered too far to the right.

Problem	Confirmation/Adjustment
Ⓐ Tonearm lowered too far to the left • No sound is heard even when the stylus reaches the beginning of the specified song.	① Set sensitivity selector to H. ② If beginning of song is cut off during program record play: ③ Rotate knob in the OUT direction (to the right). Note: Always return the sensitivity selector to M after completing the above adjustment.
Ⓒ Tonearm lowered too far to the right • No sound is heard for a long time (more than 30 seconds) after the stylus contacts the record.	① Set sensitivity selector to H. ② If the end of the song before the programmed song is heard: ③ Rotate knob in the IN direction (to the left). Note: Always return the sensitivity selector to M after completing the above adjustment.

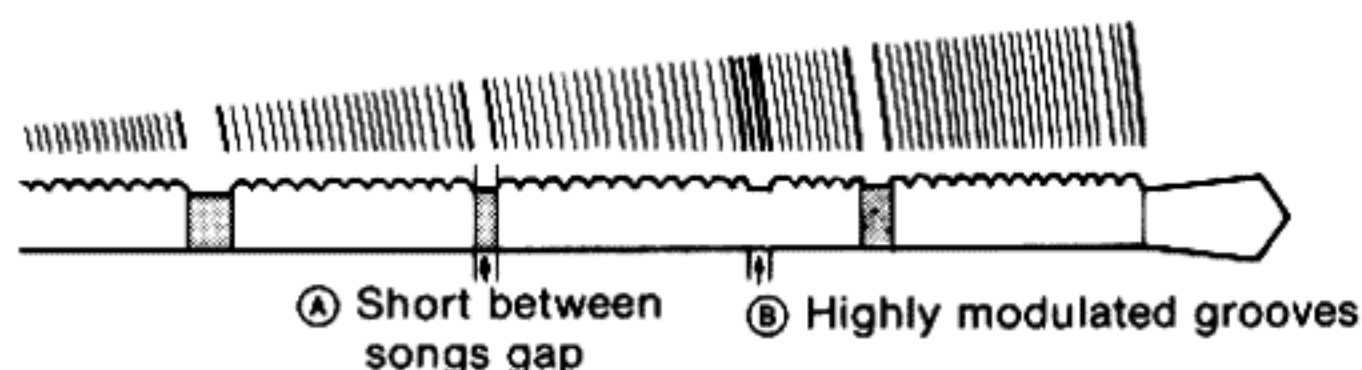
- The tonearm lowering position for the first song of a record cannot be adjusted. Adjustment is possible only for songs 2 through 8.
- If between-songs gaps are extremely short or contain music and when an eccentric record is used, the problem cannot be corrected by this adjustment.

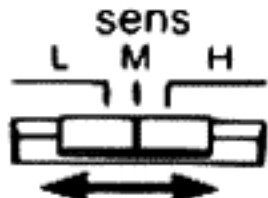
2. Using the sensitivity selector

The between-songs detection function may not operate properly when using the following kinds of records:

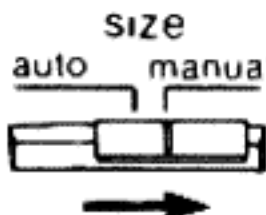
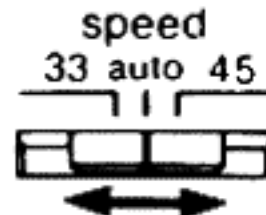
- A) Records having extremely short spaces between songs.
- B) Records made at a very high recording level (highly modulated grooves).

In these cases, it may be necessary to change the sensitivity selector.



Problem	Confirmation/Adjustment
Short spaces between songs - Specified song is skipped over and the next song is played instead. - Tonearm lowers at beginning of specified song but no sound is heard.	Set sensitivity selector to H. (If the beginning of the song is still not played correctly, adjust the stylus set-down adjustment knob.) 
Highly modulated grooves - Tonearm is lowered at point such as the one shown above. - Song before the specified song is played. (For example, song 4 is heard even though song 5 has been programmed.)	- Set sensitivity selector to L. Notes: - Always return the sensitivity selector to M before playing other records. - With some records, the problem will persist even after making the above adjustment. In this case, program record play, direct song selection and skip functions cannot be used. Play the record using the search function or automatic operation.

3. When playing non-standard records

Record type and problem	Operation and adjustment
- Records having very short between-songs gaps - Severely warped or eccentric records - Colored records - Very dusty and scratched records 30 cm (12") transparent or colored records and sonosheets (including black records that allow some light to pass through or that have very reflective surfaces)	- Program record play, direct song selection, forward/backward skip and repeat play are not possible. - Set the record size selector to manual and use the search play function.  - Set the selector to auto for colored records having a diameter of 17 cm (7") and for standard records.
17 cm (7") diameter 33 rpm records 30 cm (12") diameter 45 rpm records	Set the speed selector to the correct speed for the record to be played.  The speed selector should be left in the auto position at all other times.

■ MEASUREMENTS AND ADJUSTMENTS

- **Equipment used and condition of the set**
 1. Oscilloscope
 2. DC voltmeter
 3. Record (SFTR007) for adjustment
 4. Set the optical sensor sensitivity selector to "M".

Step	Item	Preparations	Parts adjusted	Procedure
1	Start position	1) Open the upper cabinet and put on the record. 2) Turn the power switch on. 3) Push the "start" switch.	Start position adjust screw. (Fig. 1)	1) Turn the start position adjusting screw. If it descends between tunes, turn the screw counterclockwise.
2	Sensor gain	1) Connect DC voltmeter to IC401 12-pin (+) and ground (-). 2) Put on the record for adjustment with side A up.	VR401 (Fig. 2)	1) Turn the power switch on. 2) Tonearm is on a between songs gap (blank area of the record). 3) Adjust VR401 so that the output voltage is $8.5\pm0.3V$.
3	Sensor resolution	1) Connect the oscilloscope to the IC401 9-pin (+) and ground (-). 2) Put on the record for adjustment with side A up.	VR402 (Fig. 2)	1) Turn the power switch on. 2) Keep the F skip switch depressed to move the tonearm. (Output is delivered between the tunes.) 3) Adjust VR402 so that the peak output between tunes is $3V\pm0.3V$. (Fig. 3)
4	Stylus set-down position	1) Connect lead wire with clip to CN301 6-pin to 2-pin of operation circuit board. (Muting operation stops.) 2) Open the upper cabinet and hold the reset switch with tape. 3) Put on the record for adjustment with side B up. 4) Close the upper cabinet. 5) Connect the unit to the amplifier (Connect the speakers to the speaker terminals.)	VR302 (Fig. 4)	1) Turn the power switch on. 2) Push the program key 2, followed by start switch. 3) After completion of cueing down, push the program key 2 for the purpose of skipping. 4) Make sure the descending at count "13". 5) Adjust VR302 so that the descending position is at count "13". Note: • VR302 can also be adjusted from the back of the set. (Fig. 4 (B))
5	Tonearm offset angle	1) Remove the dust cover. (Refer to "DISASSEMBLY INSTRUCTIONS.") 2) Open the upper cabinet and hold the reset switch with tape. 3) Close the upper cabinet. 4) Put on the record.	Adjusting screw (Fig. 5)	1) Turn the power switch on. 2) Keep the F skip switch depressed to move the tonearm. 3) Turn the adjusting screw so that the arm center matches the V-groove of the lift bar.
6	Servo gain and offset voltage	1) Remove the dust cover. (Refer to "DISASSEMBLY INSTRUCTIONS.") 2) Open the upper cabinet and hold the reset switch with tape. 3) Connect the DC voltmeter to CN301 5-pin (+) 2-pin (-). 4) Remove the sensor cover.	VR501 (Servo gain) (Fig. 6) Screw (Offset voltage) (Fig. 6)	1) Turn the power switch on. 2) Keep the F skip switch depressed to move the tonearm. 3) Open the upper cabinet. 4) Completely shift the tonearm to the left. Then, adjust VR501 so that the voltage is 6.0V (Servo gain). 5) Set the tonearm to the center and make sure that the output voltage is 3.0V. 6) If the voltage is not 3.0V, adjust screw so that the output voltage is 3.0V (Offset voltage).

• Adjustment points

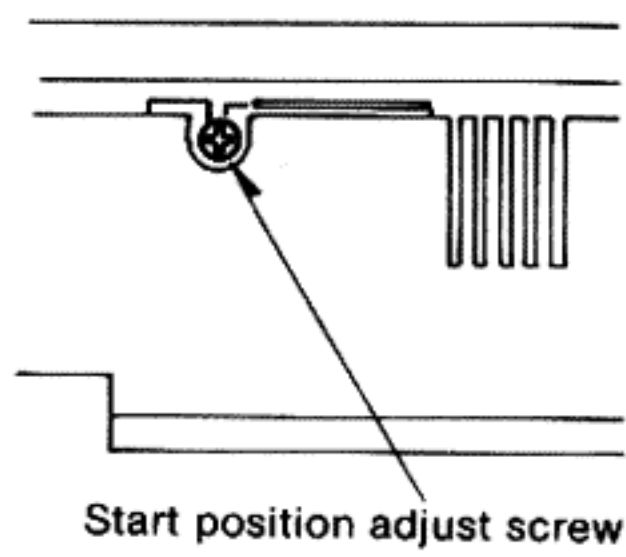


Fig. 1

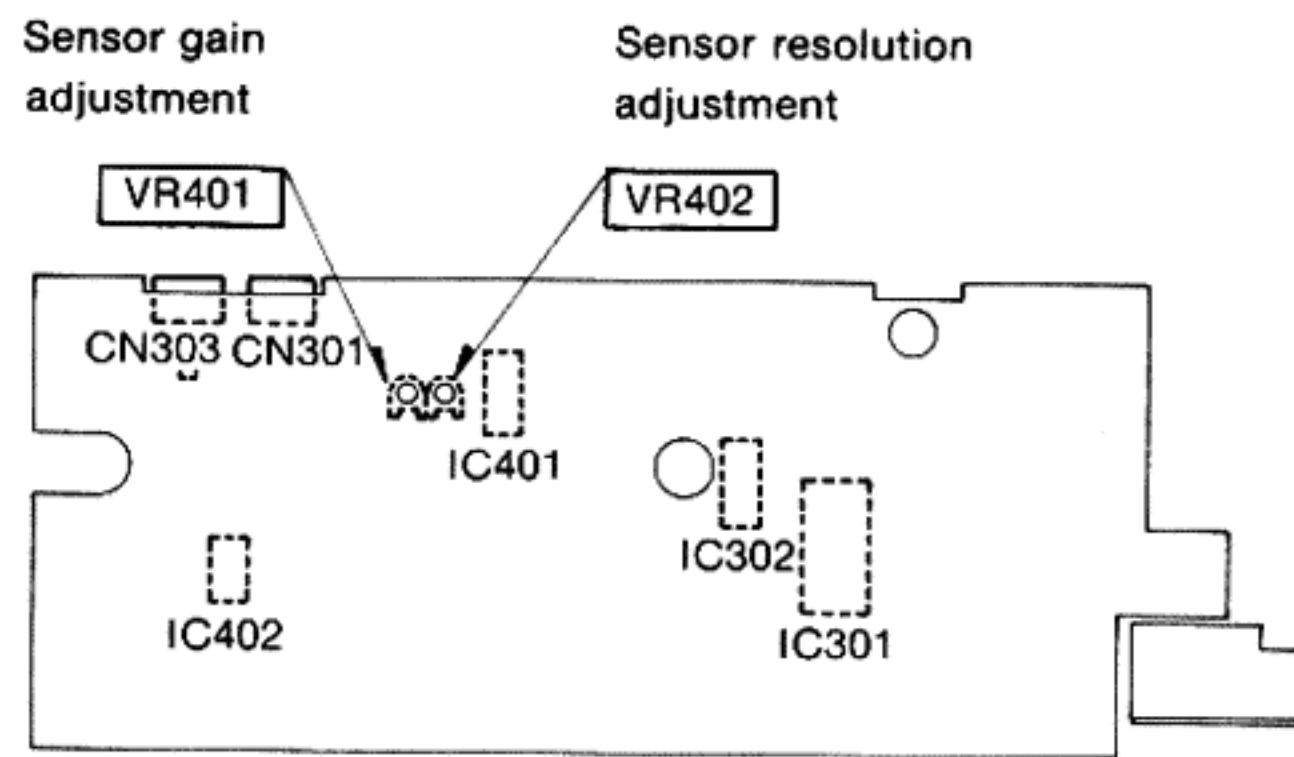


Fig. 2

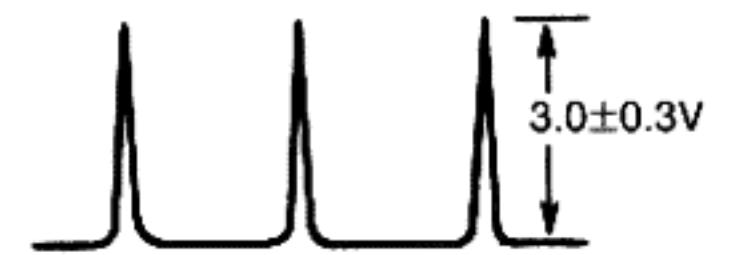


Fig. 3

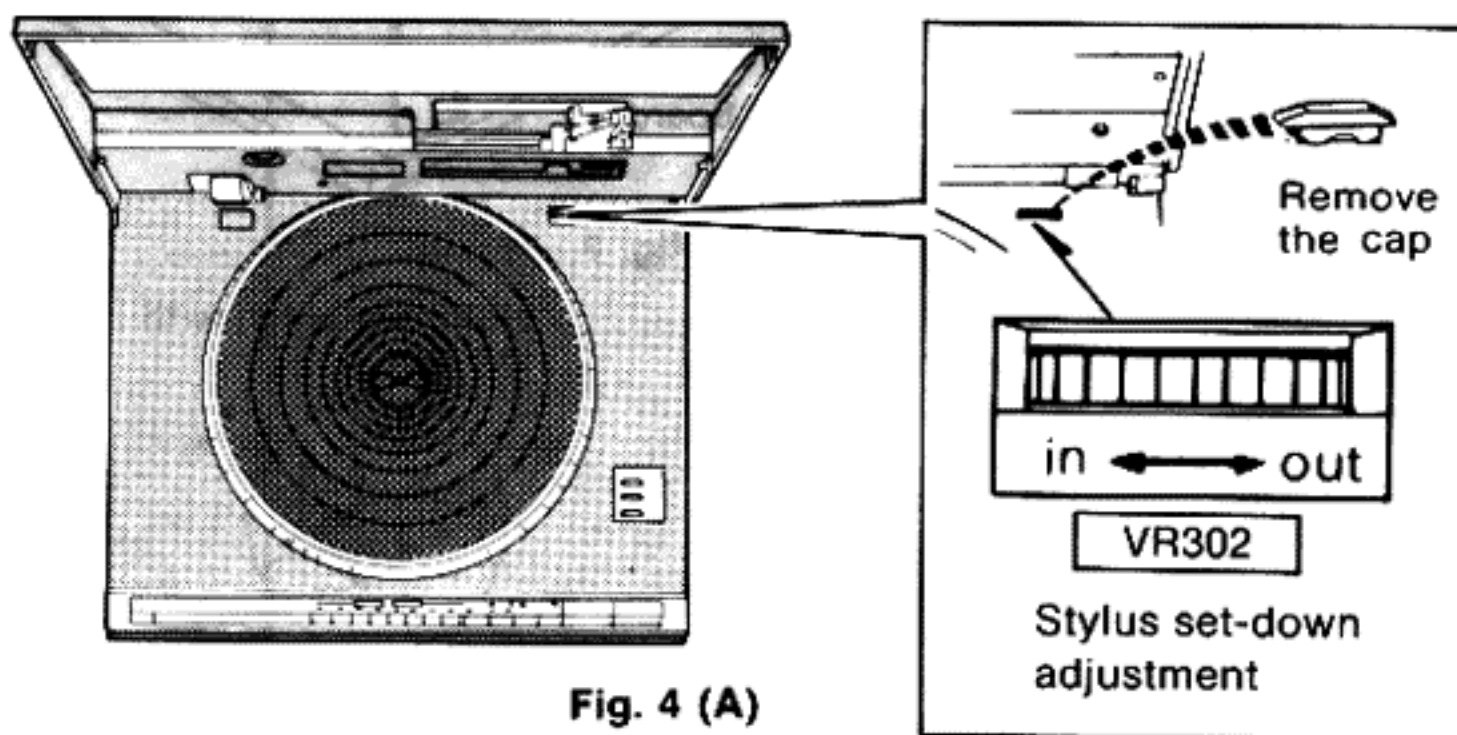


Fig. 4 (A)

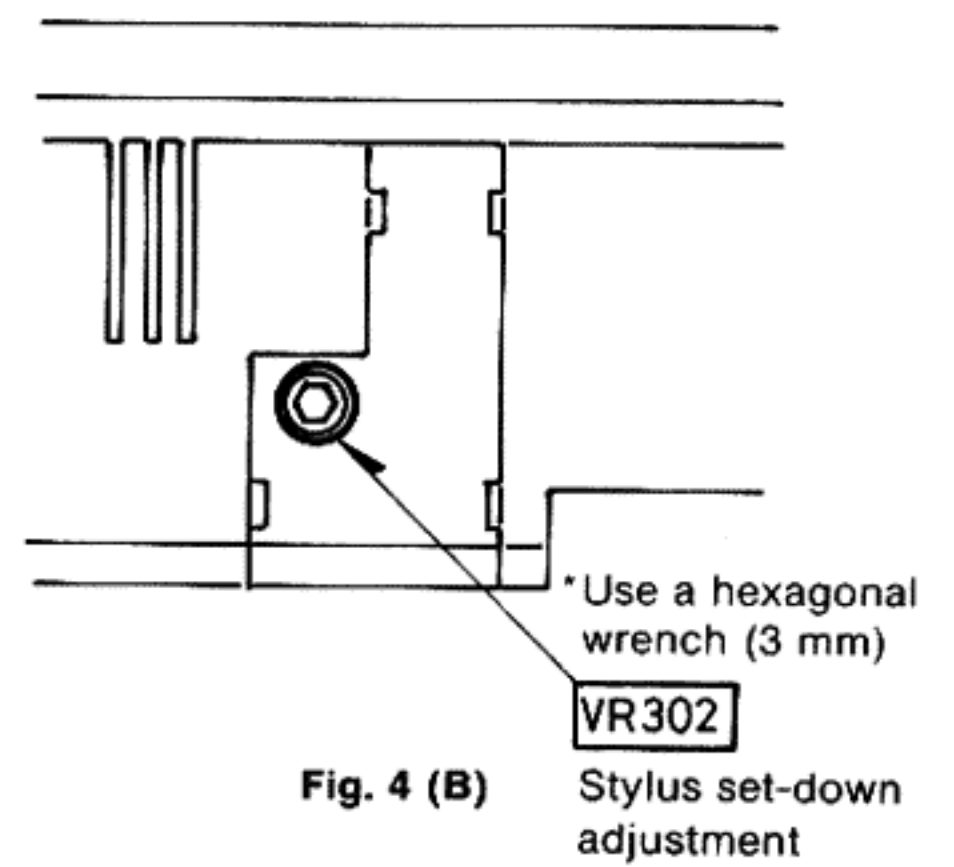


Fig. 4 (B)

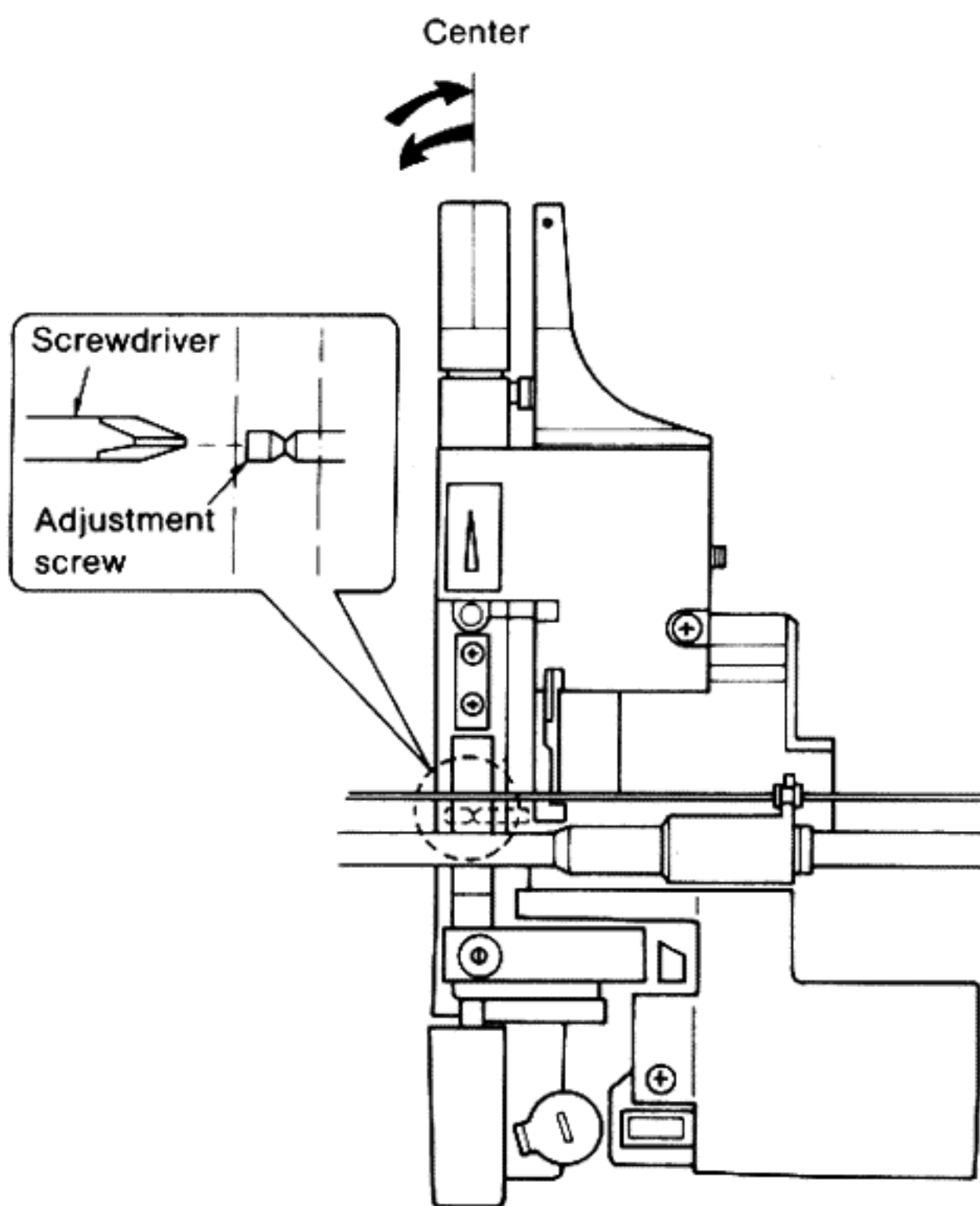
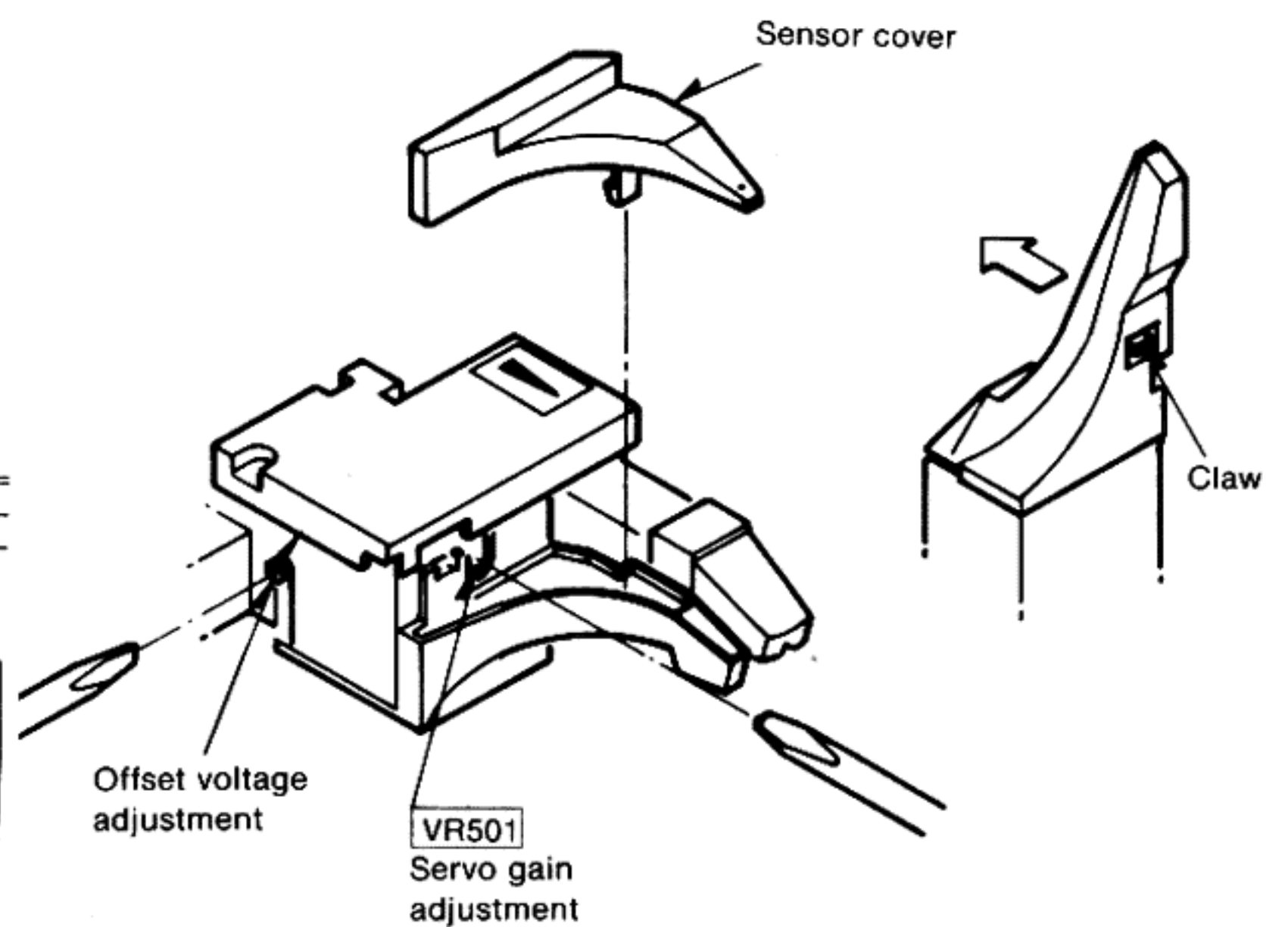


Fig. 5



(Fig. 6)

■ TROUBLESHOOTING

1. How to use the repair table (Fig. 7)

- ① Remove the bottom board.
- ② Remove the operation circuit board and connect the P.C.B. ground terminal to the chassis (Stator frame.)
- ③ Put the unit on the repair table.
- ④ Fit the turntable platter and put on the turntable mat.
- ⑤ Put on the record and check the circuits from under the unit.

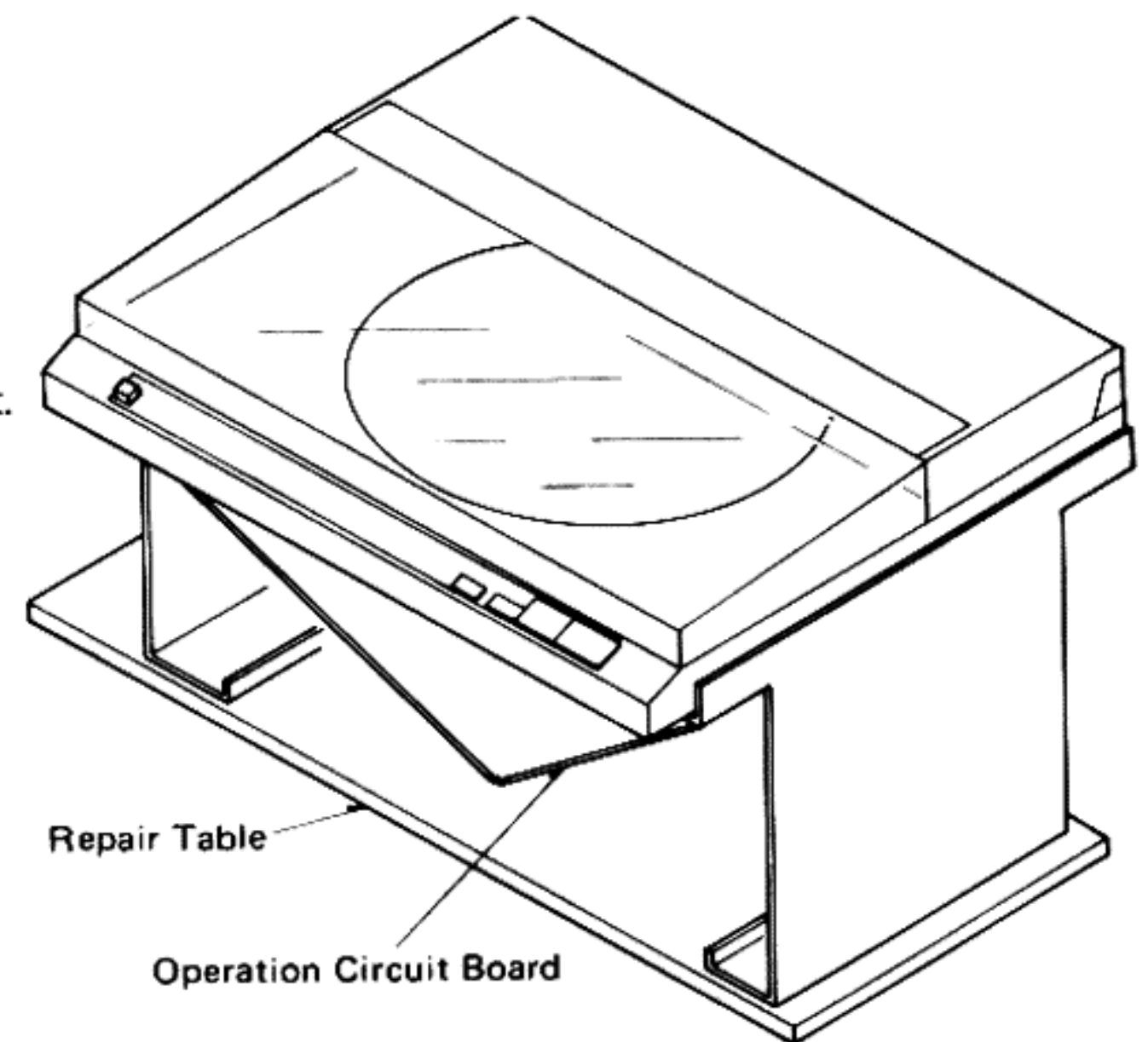


Fig. 7

2. How to raise the set (Fig. 8)

Note: Turntable platter is not fixed on the center spindle.
Take care so that the turntable platter will not come loose. Also, take care allow the set to fall down.

- ① Remove the bottom board.
- ② Completely open the upper cabinet.
- ③ Hold the reset switch with the tape.
- ④ Fit the turntable platter.
- ⑤ Raise the unit and check the circuits.

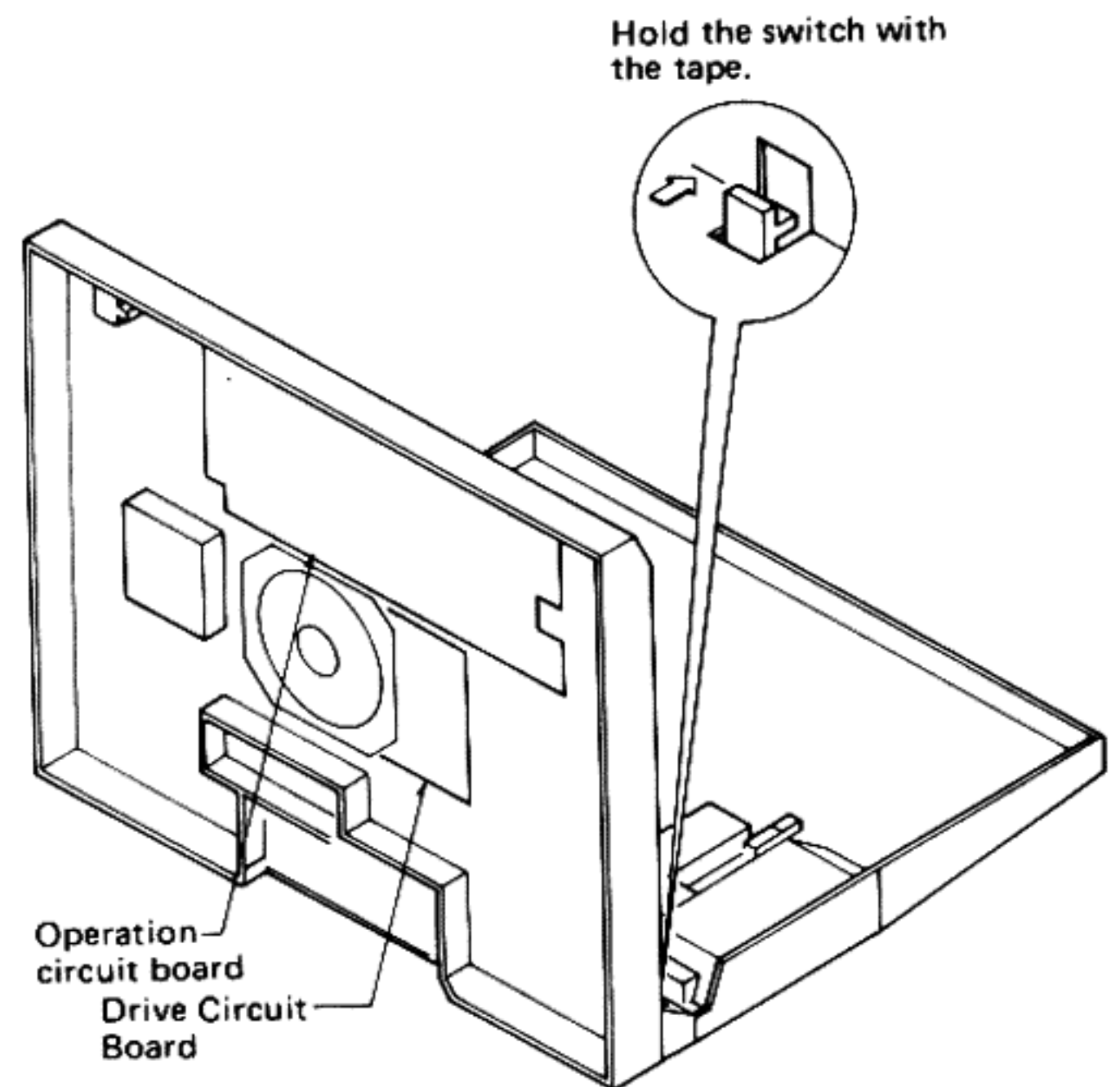


Fig. 8

3. How to turn over the set (Fig. 9)

Note: This purpose is to check the voltage of each circuit during stop of the turntable.

- ① Remove the turntable platter and turn over the unit.
- ② Remove the bottom board.
- ③ Turn the power switch "on" and check the voltage.

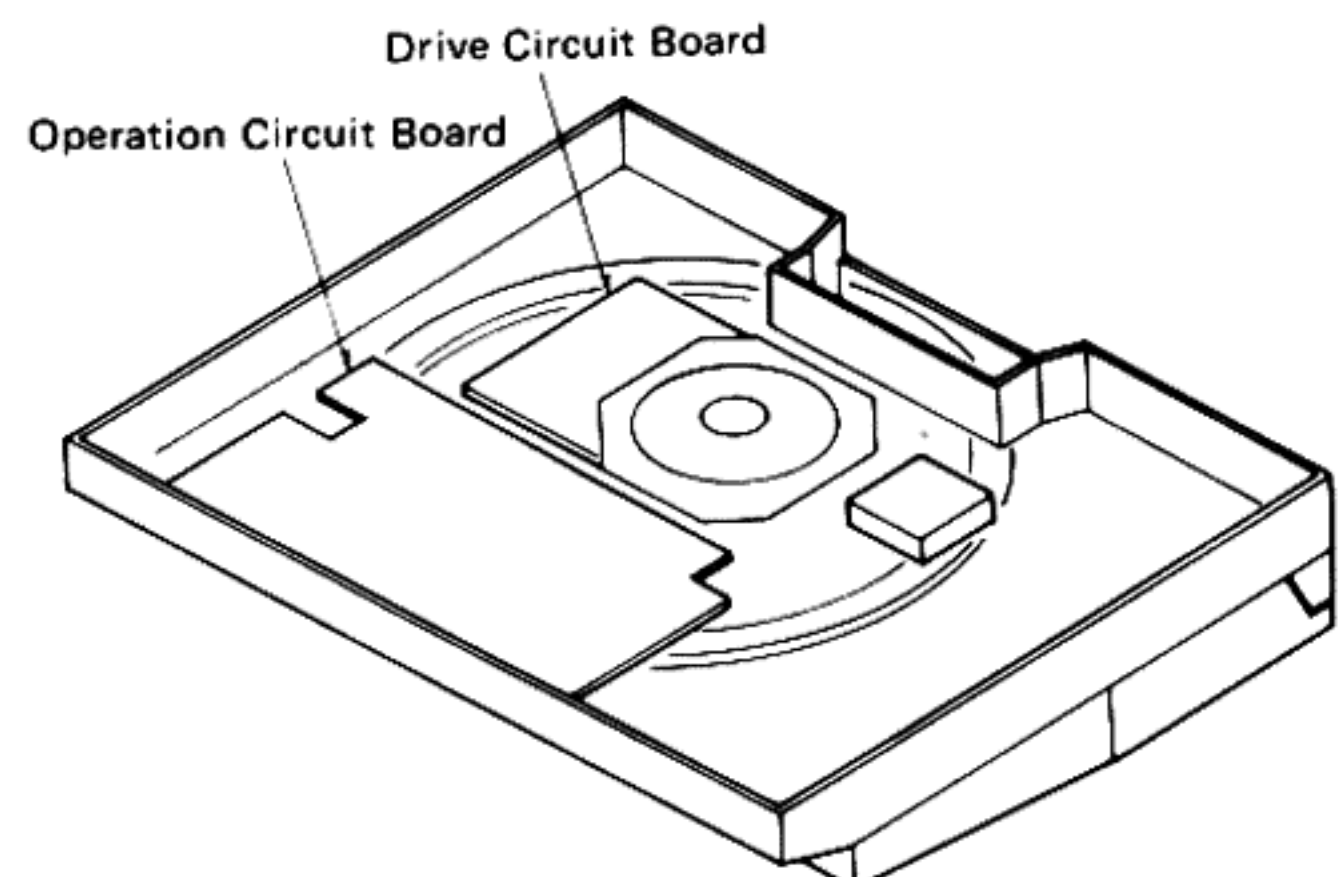
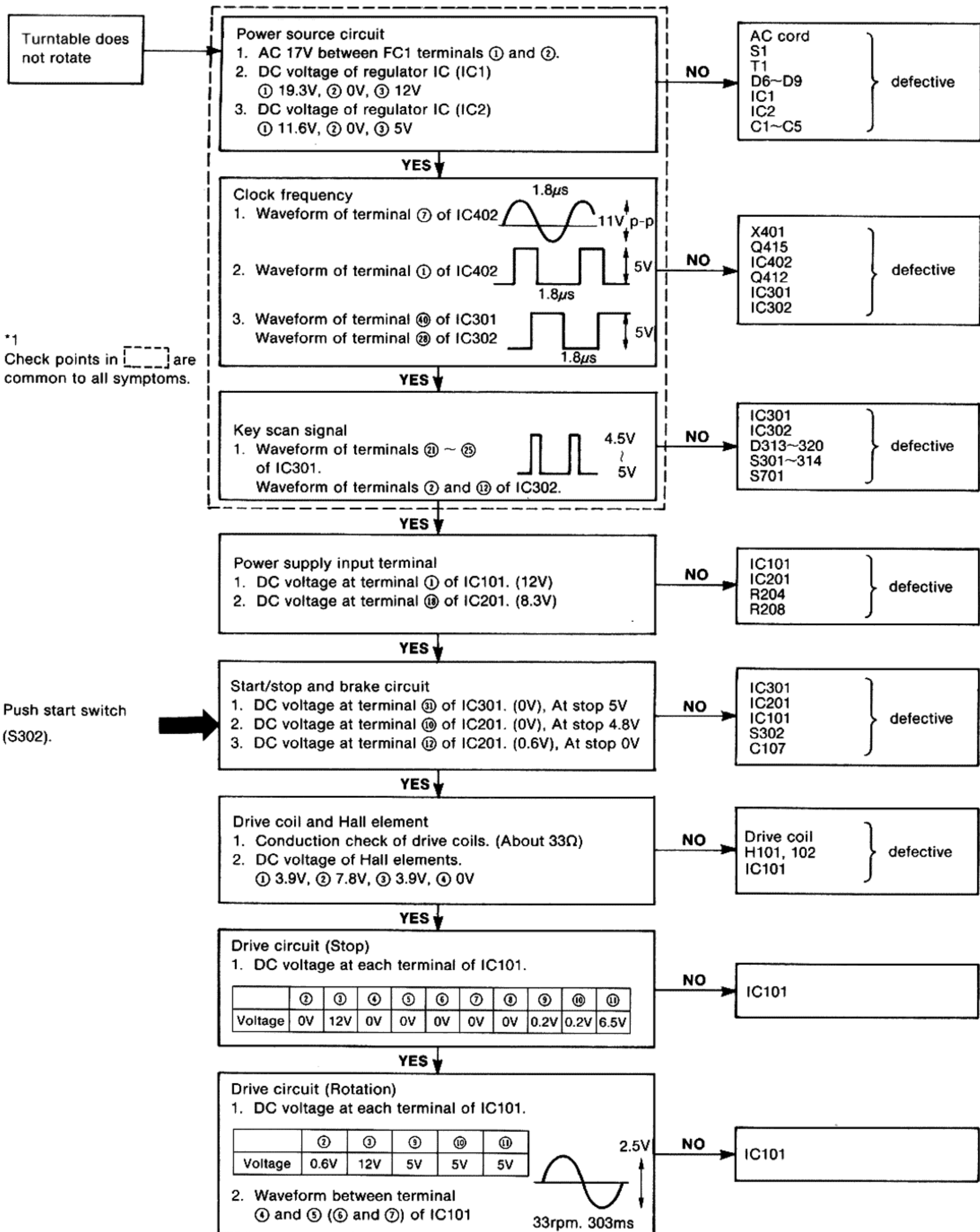
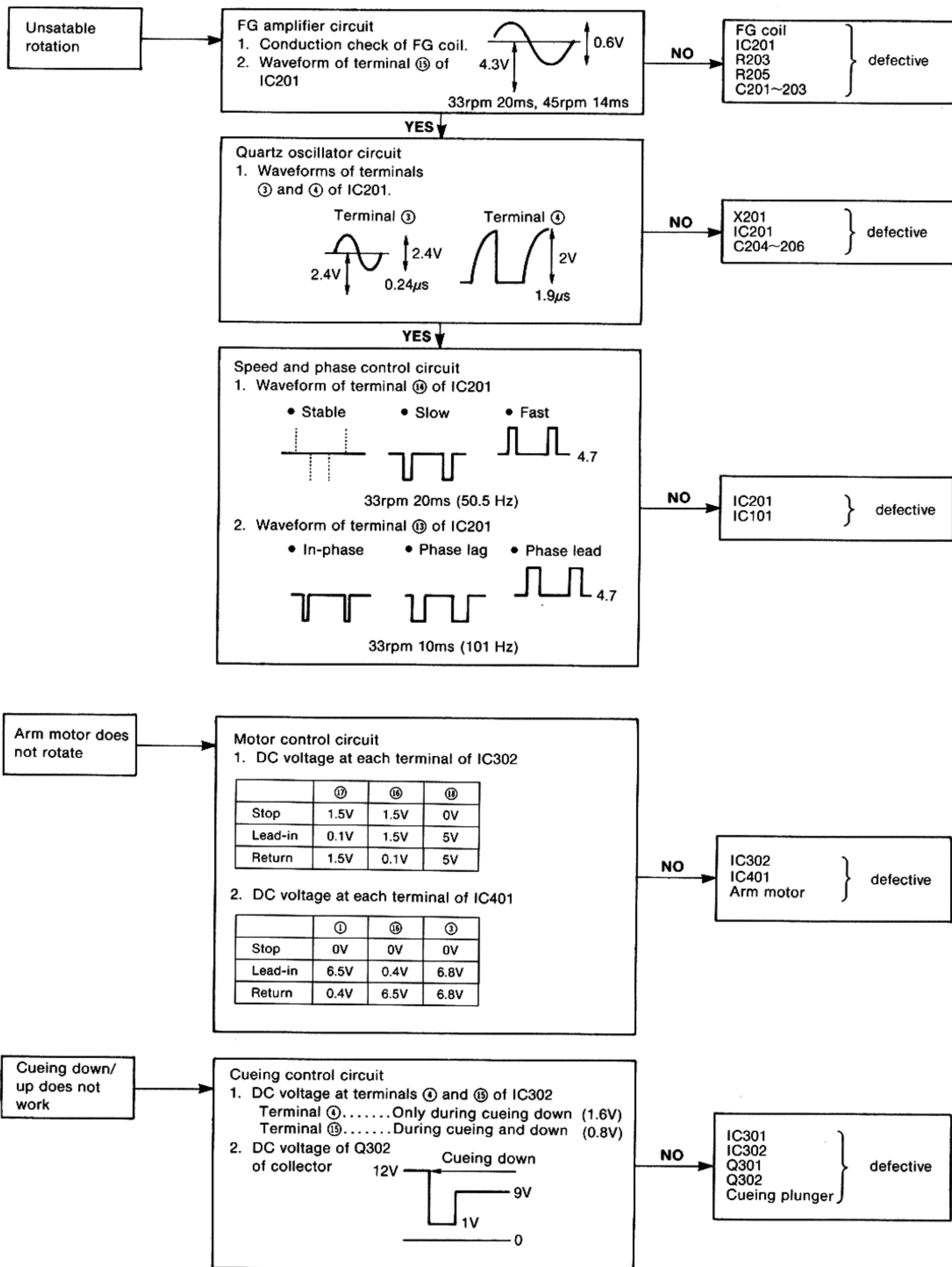


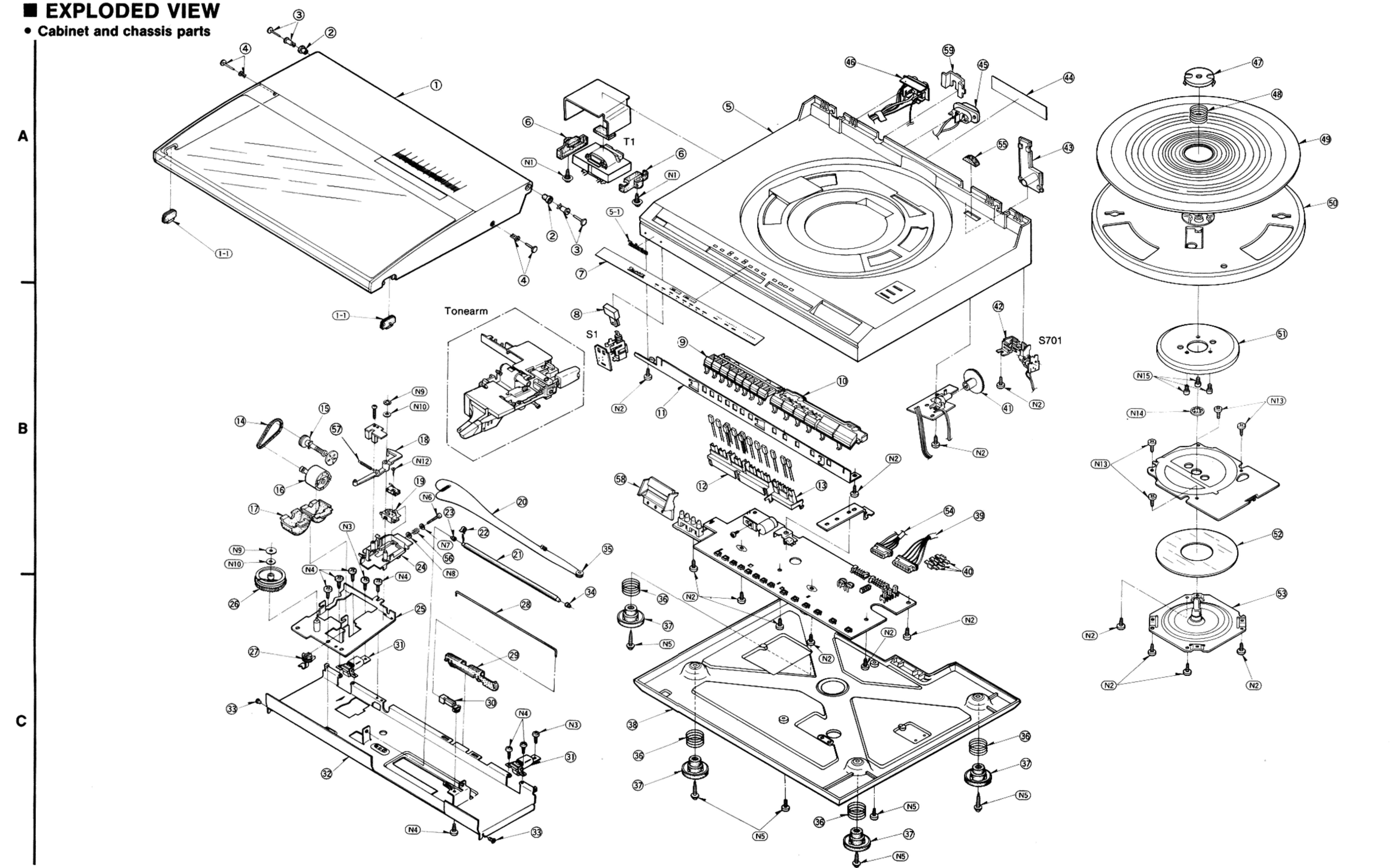
Fig. 9





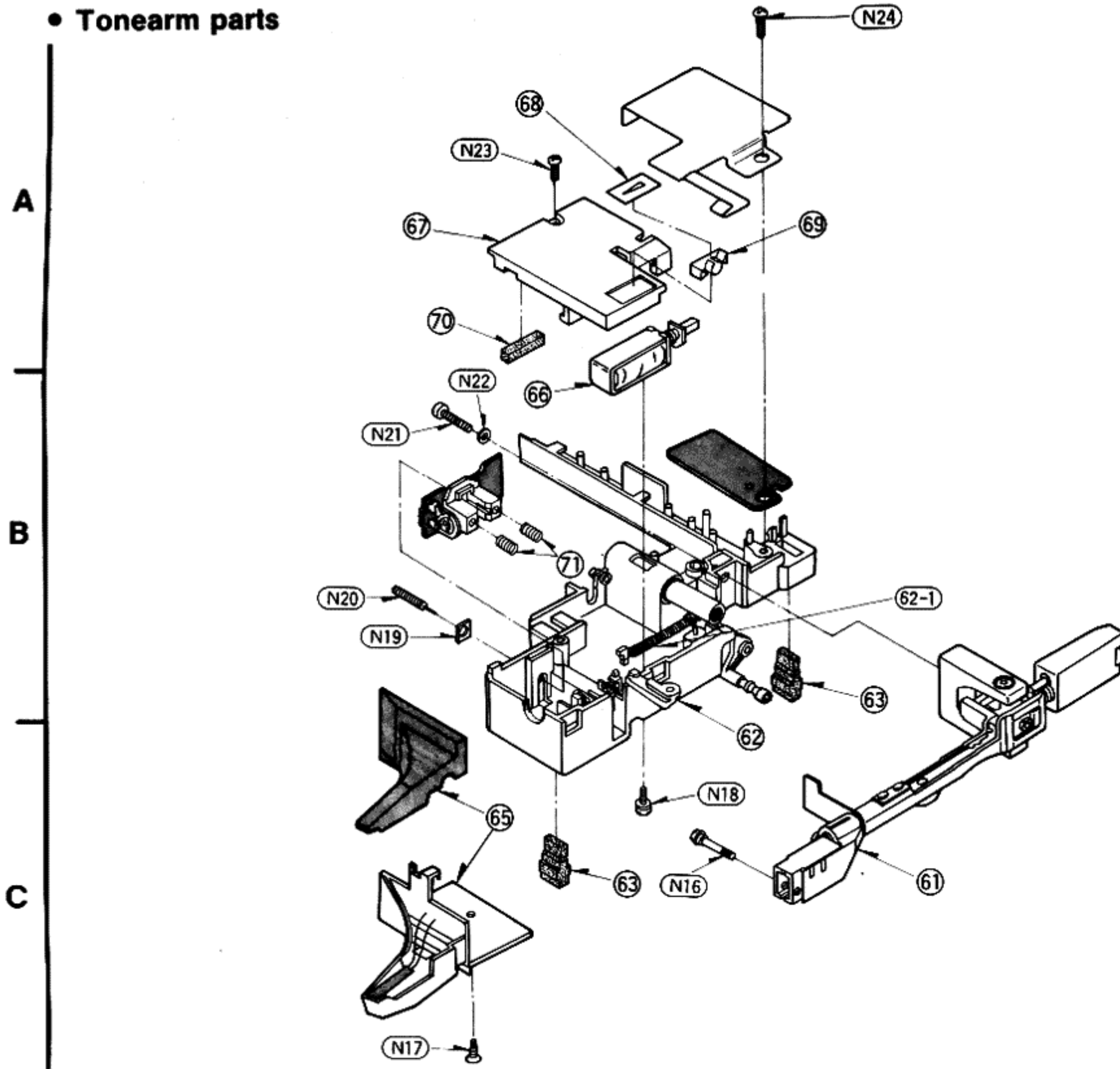
EXPLODED VIEW

Cabinet and chassis parts



A	(1-1)	④	③	②	①	④	⑥	②	③	⑦	(5-1)	⑥	⑤	④⑥	⑤⑨	④⑤	⑤⑤	④③	④④	④⑦	④⑧	④⑨	⑤⑩						
B	⑭	⑰	⑱	⑮	⑤⑦	(1-1)	⑰	⑱	②④	②③	⑤⑥	②②	②①	②①	⑧	③⑤	⑤⑧	⑪	⑨	⑩	⑬	⑩	⑤④	④①	③⑨	④②	④①	⑤①	⑤②
C	③③	②⑥	②⑦	③②	③①	②⑤	③①	②⑨	②⑧	③③	③①	③④	③⑧	③⑦	③⑥	③⑥	③⑦	③⑥	③⑦	③⑥	③⑦	③⑥	③⑦	③⑥	③⑦	③⑥	③⑦	③⑥	③⑦

- **Tonearm parts**



A	(67) (70) (68) (69)
B	(66) (71) (63) (62-1)
C	(65) (63) (62) (61)

■ REPLACEMENT PARTS LIST

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.

2. Important safety notice:

Components identified by a  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 columns of description stand for the quantity per set.

Area

[M]..... U.S.A.

[MC] Canada

Ref. No.	Part. No.	Description
INTEGRATED CIRCUITS		
IC1	AN7812	Regulator
IC2	AN78N05	Regulator
IC101	AN6638	Turntable Drive
IC201	AN6683	Turntable Control
IC301	MN1425FPT	Micro Computer
IC302	MN1402FPM	Micro Computer
IC401	AN6690	Arm Motor Drive & Blank Groove Detector
IC402	AN6912	Comparator
IC951	AN6914	Comparator

Ref. No.	Part. No.	Description
TRANSISTORS		
Q301, 304, 364, 402, 951	2SD636	Switching
Q302, 303	2SD892	Switching
Q306, 311, 412, 952, 953	2SB641	Switching
Q401, 411, 413	UN1111	Switching
Q415	2SC2206	OSC
Q430	2SD638	Regulator

Ref. No.	Part. No.	Description
DIODES		
D2~5	SVDAY5525S	LED
D6~9	 SVD1SR35200V	Rectifier
D301, 302, 343	SVDGL-9PG2	LED
D303~311, 342	SVDGL-9HY82	LED
D312	MA4062	6.2V Zener
D313~319, 321~323, 347, 430, 431, 951 952	MA165	Switching

Ref. No.	Part. No.	Description
D401	MA4068	6.8V Zener
D402	MA4110	11V Zener
D501, ⑤ 701	MA162A	Switching
D502	SVDSL31VC3	LED
CRYSTAL		
X201	SVQSH41TR	4.1931 MHz
CERAMIC OSC		
X401	SVFCSB540P3	540 kHz
VARIABLE RESISTORS		
VR302	EVJE1AF20B54	Stylus Set-down Position Control, 50 kΩ(B)
VR401	EVN61AA00B55	Sensor Gain Adjustment, 500kΩ(B)
VR402	EVN61AA00B25	Sensor Resolution Adjustment, 200kΩ(B)
VR501	EVNK0AA00B14	Servo Gain Adjustment, 10kΩ(B)
RELAY		
RL701	SFDYQ11N02	Muting
SWITCHES		
S1	△ SFDSC02N02	Power
S301~314	EVQQS405K	Operation
S315, 317	SFDSHSW08314	Speed and Size Selector
S316	SFDSHSW08315	Sens Selector
S601	SFDSC02N03	Rest
S701	SFDSC05N01	Reset
PHOTO INTERRUPTERS		
PC501	0N1186	Offset Angle Sensor
PC502	SFPABJ0205R	Blank Groove Sensor
PC601	0N1161	Tonearm Position Sensor
HALL ELEMENT		
H101, 102	0H-002	Turntable Position Detector
POWER TRANSFORMER		
T1 [M]	△ SLT57DTL2A	Power Source
T1 [MC]	△ SLT57DTS18C	Power Source
FUSE		
F1 [MC]	△ XBA1F10NU14 only	250V, 1A
CABINET AND CHASSIS PARTS		
1	SFADC13M01E	Dust Cover (1)
1-1	SFGZJ02N01	Rubber Cushion (2)
2	SFGZC02N01	Rubber Cushion (2)
3	SFUMC02N14	Latch, Dust Cover (2)
4	SFUMQ06N22	Latch, Dust Cover (2)
5	SFACC13N01E	Cabinet (1)
5-1	SFKBBD2N01	Badge (1)
6	SFGCQ06X01	Rubber Cushion, Transformer (2)
7	SFKKC13N01	Ornament (1)

Ref. No.	Part. No.	Description
8	SRKTK15N26	Knob, Power (1)
9	SFKTC13N02	Knob, Program (1)
10	SFKTC13N01	Knob, Operation (1)
11	SFUPC13N01	Guide (1)
12	SFUMC13N02	Holder (B) (1)
13	SFUMC13N01	Holder (A) (1)
14	SFGBC10-01	Belt (1)
15	SFUMQ06N06A	Worm Ass'y (1)
16	SFMHC02N02R	Motor, (With Capstan) (1)
17	SFUMC02N07	Rubber Cushion (1)
18	SFUMC02N05	Lever, Switch (1)
19	SFUMQ06N09	Holder, Rest Switch (1)
20	SFUZC05N02E	Rope Ass'y (1)
21	SFXJC02N03	Guide, Rail (1)
22	SFUMQ06N07	Clamper, Guide Rail (1)
23	SFGCQ06N01	Rubber, Cushion (1)
24	SFUMC02N06	Base, Rest Switch (1)
25	SFUPBL3N11E	Base, Motor (1)
26	SFUML11R03	Wheel, Tonearm Drive (1)
27	SFUMC02N10	Holder, Lead Wire (1)
28	SFUZC02N01	Rod, Rest Switch (1)
29	SFUMC02N12	Holder, Lead Wire (1)
30	SFUMV05N23	Cap (1)
31	SFATQ06N01E	Hinge (2)
32	SFUKC13N01E	Base, Tonearm (1)
33	SFGZBL3N03	Rubber Cushion (1)
34	SFGCC05N05	Rubber Cushion, Guide Rail (1)
35	SFUMC05N22	Pulley (1)
36	SFQCC05N01	Spring, Insulator (4)
37	SFGAJ02N01	Insulator (4)
38	SFAUC13N01	Bottom Cover (1)
39	SFEHJ02N02E	Phono Output Cord (1)
40	SFKTK06N01	Knob, Selector (3)
41	SFKTK06N02	Knob, Tonearm Down Adjuster (1)
42	SFUMJ02N14	Cover, Rest Switch (1)
43	SFACC13N011	Cover (1)
44 [M]	SFNNC13M01	Name Plate (1)
44 [MC]	SFNNC13C01	Name Plate (1)
45	△ SFDJHSC0491	AC Socket (1)
46	SFDJJ02N04E	Jack, Phono Output (1)
47	SFWEC06N01	45 rpm Adaptor (1)
48	SFQAC06N01	Spring, 45 rpm Adaptor (1)
49	SFTGQ06N01	Turntable Mat (1)
50	SFTEQ05N01	Turntable Platter (1)
51	SFTMC07-01E	Magnet (1)
52	SFMGQ34N01	Cover, Coil (1)
53	SFMZC06N01R	Stator Flame Ass'y (1)
54	SFDJC13N03E	Connector, Ass'y (1)
55	SFGKQ06N01	Cap (1)
56	SFQA913-01	Spring (1)
57	SFQHQ34N22	Spring (1)
58	SFUMC13N03	Prism (1)
59	SFACC13N012	Cover (1)

Ref. No.	Part. No.	Description
TONEARM PARTS		
61	SFPAMJ0201A	Tonearm Ass'y (1)
62	SFPKDJ0201R	Tonearm Base (1)
62-1	SFPSP00504	Spring (1)
63	SFPGML1101	Rubber, Tonearm Guide (2)
65	SFPABJ0205R	Sensor Ass'y (1)
66	SFDZC05N01E	Solenoid Ass'y (1)
67	SFPCS0Q601	Cover, Indicator (1)
68	SFPAK0Q601	Plate, Indicator (1)
69	SFPCSJ0201	Holder, LED (1)
70	SFPGM0Q601	Rubber, LED (1)
71	SFPSP00302	Spring, Adjustor (2)
SCREWS, WASHERS AND NUTS		
N1	SFXGQ06N01	Screw (2)
N2	⑤ XTV3+10BFN	Screw, ⊕3×10 (11)
N3	XTW3+14TFZ	Screw, ⊕3×14 (2)
N4	XTV3+6JFZ	Screw, ⊕3×6 (4)
N5	XTW3+14QFYR	Screw, ⊕3×14 (6)
N6	XSN3+30S	Screw, ⊕3×30 (1)
N7	XWE3D10	Washer, φ3 (1)
N8	XNC3HS	Nut (1)
N9	CSTW3	Washer (2)
N10	XWE3A8BW	Washer (1)
N11	XTV3+20J	Screw, ⊕3×20 (1)
N12	XTN16+10G	Screw, ⊕16×10 (1)
N13	⑤ XTV3+6BFN	Screw, ⊕3×6 (4)
N14	SFXWC06N02	Washer (1)
N15	⑤ XSN3+5S	Screw (3)
N16	SFPEV0Q601	Screw, Cartridge (1)
N17	XTS26+6JFZ	Screw, ⊕2.6×6 (1)
N18	XYN2+C4FZ	Screw, ⊕2×4 (1)
N19	SFXN623-1	Nut (1)
N20	SFPTN00301	Screw (1)
N21	⑤ XSN3+12S	Screw, ⊕3×12 (1)
N22	⑤ XWA3B	Washer (1)
N23	XTN23+6JFZ	Screw, ⊕2.3×6 (1)
ACCESSORIES		
A1 [M]	SFNUC13M01	Instruction Book (1)
A1 [MC]	SFNUC13C01E	Instruction Book (1)
A2	SFDHC05N01	Phono Output Cord (1)
A3	SFDLJ02N11E	Ground Wire (1)
A4	△ SFDAC05M01	AC Cord (1)
PACKING PARTS		
P1 [M]	SFHPC13M01	Carton Box (1)
P1 [MC]	SFHPC13C01	Carton Box (1)
P2	SFHHC13N01	Pad, Front (1)
P3	SFHHC13N02	Pad, Rear (1)
P4	SFHKC05N01	Clamper, Turntable Platter (2)
P5	SFHKQ06N01	Spacer, Tonearm (1)
P6	SFHSC13N01	Spacer, Dust Cover (1)
P7	SFYH60×60	Polyethylene Bag (1)
P8	SFYH17×16	Polyethylene, Cord (1)
P9	SFYF32A35	Polyethylene, Turntable Mat (1)
P10	SFHDD04N01	Pad, Turntable Mat (1)

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 Δ 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 = 1000 Ω , M = 1000k Ω

All capacitors are in MICROFARADS(μ F), P = 10⁻⁶ μ F.

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	S2 : 1/4W	F : $\pm 1\%$
ERG : Metal Oxide	25 : 1/4W	J : $\pm 5\%$
ERX : Metal Film	1 : 1W	G : $\pm 2\%$
	2 : 2W	

ERD2FCG□□□ → Fuse type carbon (1/4W)

ERDS2TJ□□□ → Small type carbon (1/4W)

Capacitor Type	Voltage		Tolerance
	ECEA Type	Others	
ECEA : Electrolytic	1A : 10V	1H : 50V DC	J : $\pm 5\%$
ECKD : Ceramic	1C : 16V	2H : 500V DC	K : $\pm 10\%$
ECQM : Polyester	1E : 25V	1 : 100V	Z : +80%, -20%
ECCD : Ceramic	1V : 35V		P : +100%, -0%
ECKD : Ceramic	1H : 50V		M : $\pm 20\%$
ECEB : Electrolytic	1J : 63V		
ECFR : Ceramic	50 : 50V		
ECFB : Ceramic			

Ref. No.	Part No.	Value
RESISTORS		
R3	ERG2SJ101	100
R4	ERDS2TJ271	270
R103	ERDS2TJ104	100K
R104	ERX1ANJ2R7	2.7
R105	ERDS2TJ270	27
R201	ERDS2TJ273	27K
R202	ERDS2TJ394	390K
R203	ERDS2TJ680	68
R204	ERDS2TJ151	150
R205	ERDS2TJ223	22K
R207	ERDS2TJ102	1K
R208	ERDS2TJ680	68
R301, 302	ERDS2TJ471	470
R303, 304	ERDS2TJ471	470
R305, 306	ERDS2TJ471	470
R307, 308	ERDS2TJ471	470
R309, 310	ERDS2TJ471	470
R311	ERDS2TJ471	470
R312	ERDS2TJ223	22K
R313	ERDS2TJ123	12K
R314	ERDS2TJ332	3.3K
R318, 319	ERDS2TJ333	33K
R321	ERDS2TJ102	1K
R324	ERDS2TJ821	820
R325	ERDS2TJ101	100
R326	ERDS2TJ271	270
R327	ERDS2TJ101	100
R332	ERDS2TJ103	10K
R333	ERDS2TJ101	100
R335, 336	ERDS2TJ332	3.3K
R337, 338	ERDS2TJ332	3.3K
R341, 342	ERDS2TJ332	3.3K
R343, 344	ERDS2TJ103	10K
R346, 347	ERDS2TJ563	56K
R348	ERDS2TJ562	5.6K
R349, 350	ERDS2TJ272	2.7K

Ref. No.	Part No.	Value
R351	ERDS2TJ103	10K
R352	ERDS2TJ101	100
R353	ERDS2TJ222	2.2K
R354	ERDS2TJ333	33K
R355, 356	ERDS2TJ101	100
R381	ERDS2TJ331	330
R383	ERDS2TJ331	330
R385	ERDS2TJ152	1.5K
R386	ERDS2TJ154	150K
R387	ERDS2TJ102	1K
R389, 390	ERDS2TJ223	22K
R393, 394	ERDS2TJ333	33K
R396	ERDS2TJ471	470
R397	ERDS2TJ122	1.2K
R398	ERDS2TJ153	15K
R401	ERDS2TJ103	10K
R402, 403	ERDS2TJ123	12K
R404, 405	ERDS2TJ474	470K
R406	ERDS2TJ104	100K
R407	ERDS2TJ122	1.2K
R408	ERDS2TJ271	270
R409	ERDS2TJ473	47K
R410	ERDS2TJ102	1K
R412	ERDS2TJ222	2.2K
R413	ERDS2TJ821	820
R414	ERDS2TJ561	560
R415	ERDS2TJ271	270
R416	ERDS2TJ153	15K
R417	ERDS2TJ224	220K
R418, 419	ERDS2TJ333	33K
R420	ERDS2TJ103	10K
R421, 422	ERDS2TJ333	33K
R423	ERDS2TJ563	56K
R424	ERDS2TJ224	220K
R425	ERDS2TJ393	39K
R426	ERDS2TJ153	15K
R427	ERDS2TJ224	220K

Ref. No.	Part No.	Value
R428	ERDS2TJ392	3.9K
R430	ERDS2TJ562	5.6K
R431	ERDS2TJ563	56K
R432	ERDS2TJ154	150K
R433	ERDS2TJ471	470
R434, 435	ERG1SJ390	39
R436	ERDS2TJ471	470
R437	ERDS2TJ5R6	5.6
R501	⑤ ERD25FJ391	390
R502	⑤ ERD25FJ271	270
R503	⑤ ERD25FJ471	470
R951	ERDS2TJ823	82K
R952	ERDS2TJ103	10K
R953	ERDS2TJ272	2.7K
R954	ERDS2TJ274	270K
R955	ERDS2TJ472	4.7K
R956	ERDS2TJ563	56K
R957	ERDS2TJ683	68K
RF1	Δ ERD2FCG120	12

Ref. No.	Part No.	Value
CAPACITORS		
C1, 2	Δ ECQG1223KZ	0.022
C3	Δ ECQG1223KZ	0.022
C4	ECEB1EU222	2200
C5	ECEA1CU330	33
C6	ECEA0JU470	47
C101	ECEA1CU330	33
C102	⑤ ECEA50ZR22	0.22
C103	ECQV05274JZ	0.27
C105, 106	Δ ECEA1AN470S	47
C107	ECEA1HU010	1
C201	ECEA0JU470	47
C202	⑤ ECEA50ZR22	0.22
C203	ECQM1H683KV	0.068
C204	ECCD1H121J	120P
C205	ECCD1H330JC	33P
C206	ECCD1H121J	120P
C207	ECEA0JU470	47
C208	ECEA1AU221	220
C302	ECEA1EU4R7	4.7
C305	ECFR1E104ZFM	0.1
C310, 311	ECFR1E104ZFM	0.1
C320	ECFR1E104ZFM	0.1
C401	ECEA1HUR47	0.47
C402	Δ ECEA1CN100	10
C403, 404	ECQG1H473KZ	0.047
C405	ECEA1CU100	10
C411, 412	ECQG1H104KZT	0.1
C413	ECFR1E104ZFM	0.1
C414	ECCD1H181J	180P
C415	ECQG1H682KZ	0.0068
C601	ECFB1B104ZM	0.1
C701	ECEA1CU101	100
C951	ECEA1HU010	1
C952	ECEA1CU101	100
C953	ECEA0JU101	100

■ HOW TO REPLACE CHIPS

(Resistor, capacitor and jumper)

● **Removing procedure**

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

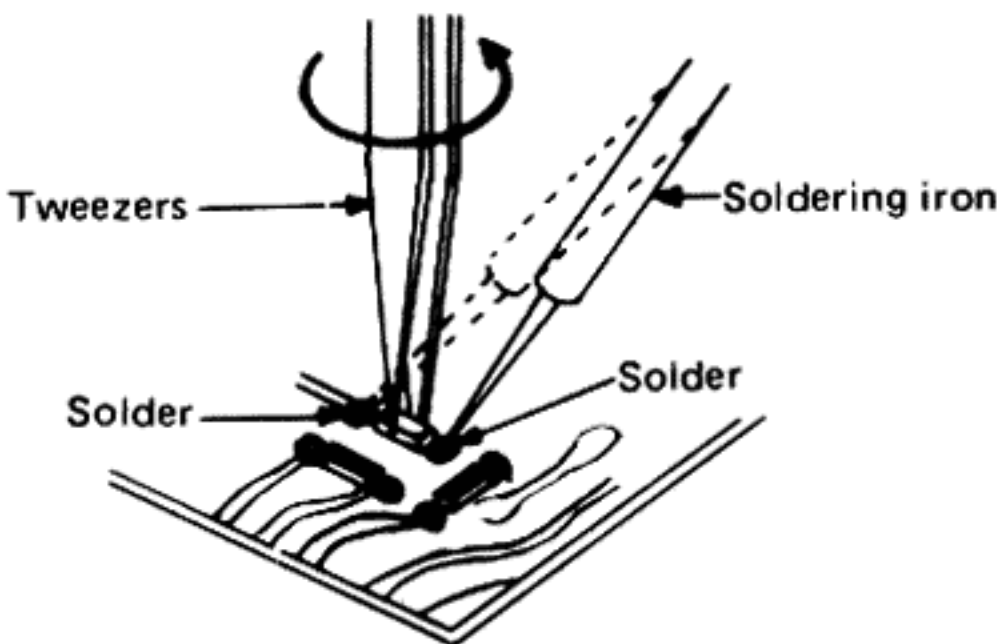
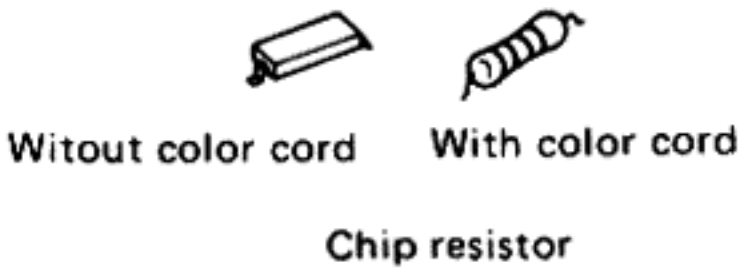


Fig. A

● **Replacing procedure**

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

Note:

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

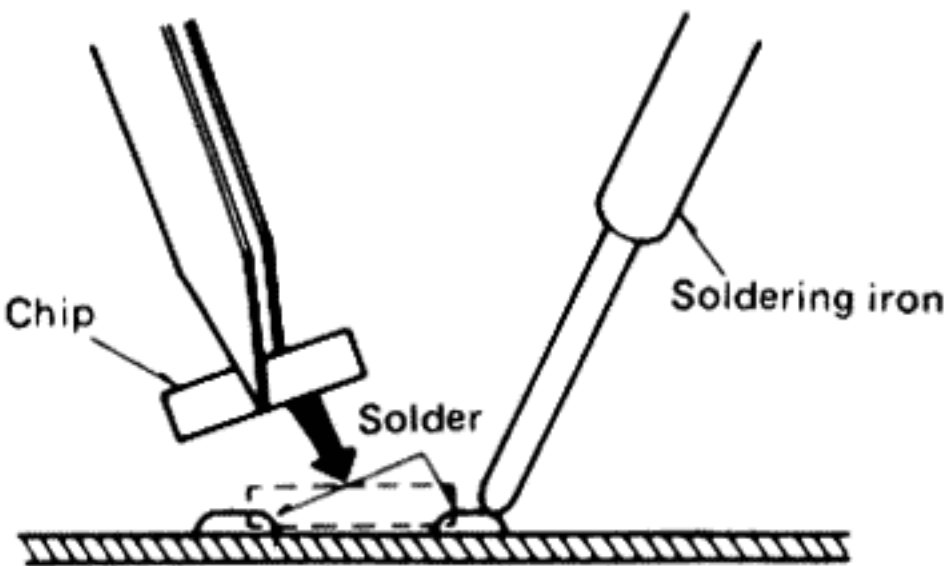


Fig. B

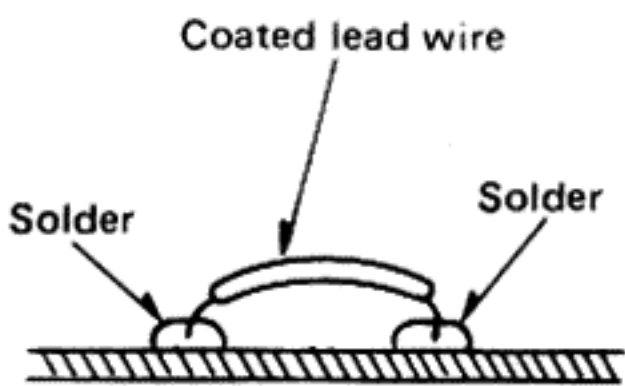


Fig. C

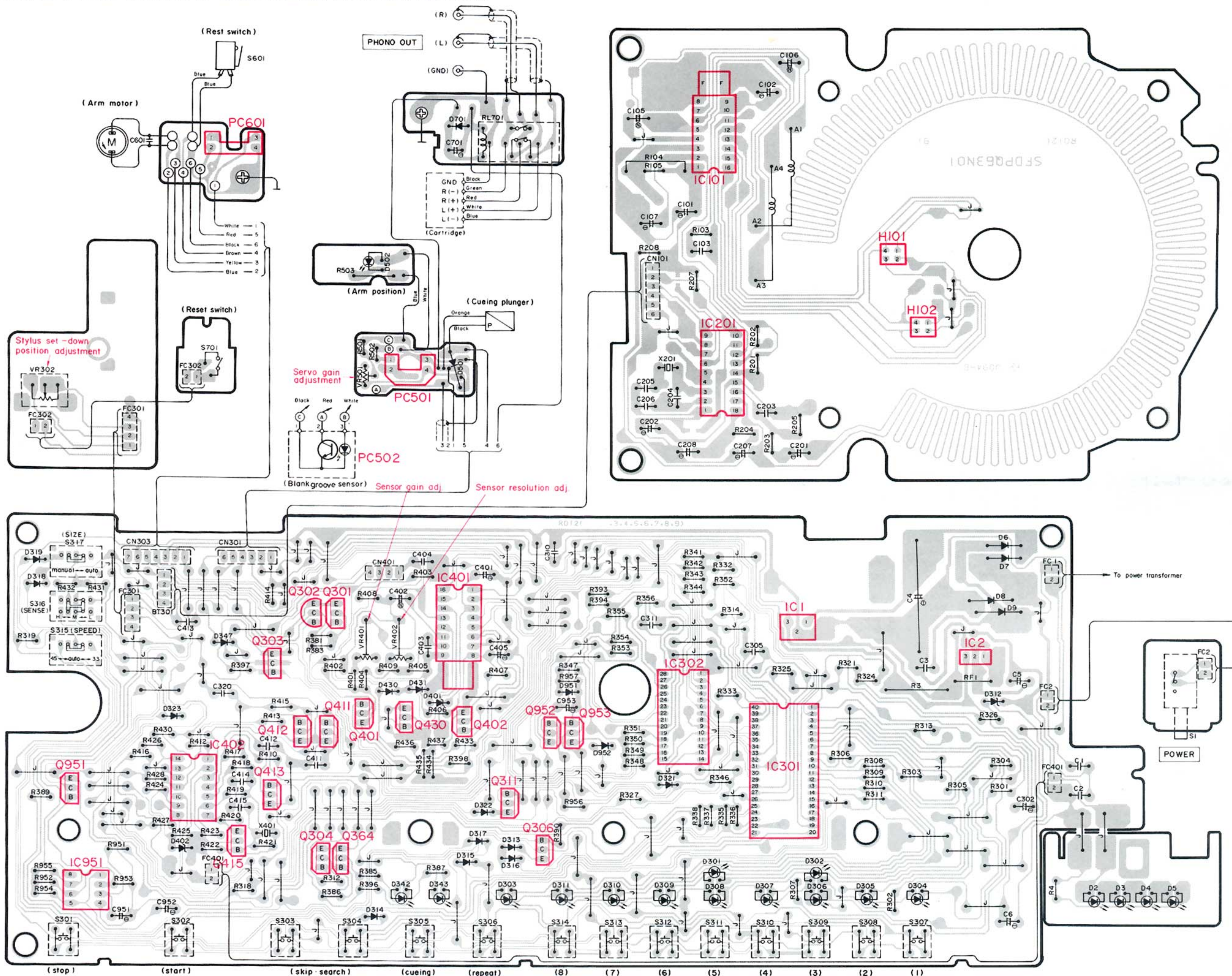
● **Note for replacing chips**

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

● **Terminal guide of transistors, and IC's.**

NO.1	<table><tr><td>AN6914</td><td>8 pin</td></tr><tr><td>AN6912</td><td>14 pin</td></tr><tr><td>AN6683</td><td>18 pin</td></tr><tr><td>MN1425</td><td>40 pin</td></tr><tr><td>MN1402</td><td>28 pin</td></tr></table>	AN6914	8 pin	AN6912	14 pin	AN6683	18 pin	MN1425	40 pin	MN1402	28 pin	16 1	AN6638, AN6690	1 2 3	AN78N05	1.Vin 2.GND 3.Vout
AN6914	8 pin															
AN6912	14 pin															
AN6683	18 pin															
MN1425	40 pin															
MN1402	28 pin															
2SB641, 2SD636, 2SD638, 2SC2206	B C E	2SD892	E C B	AN7812	1 2 3	1. Vin 2. GND 3. Vout	UN1111	E C B 10k 10k C E								

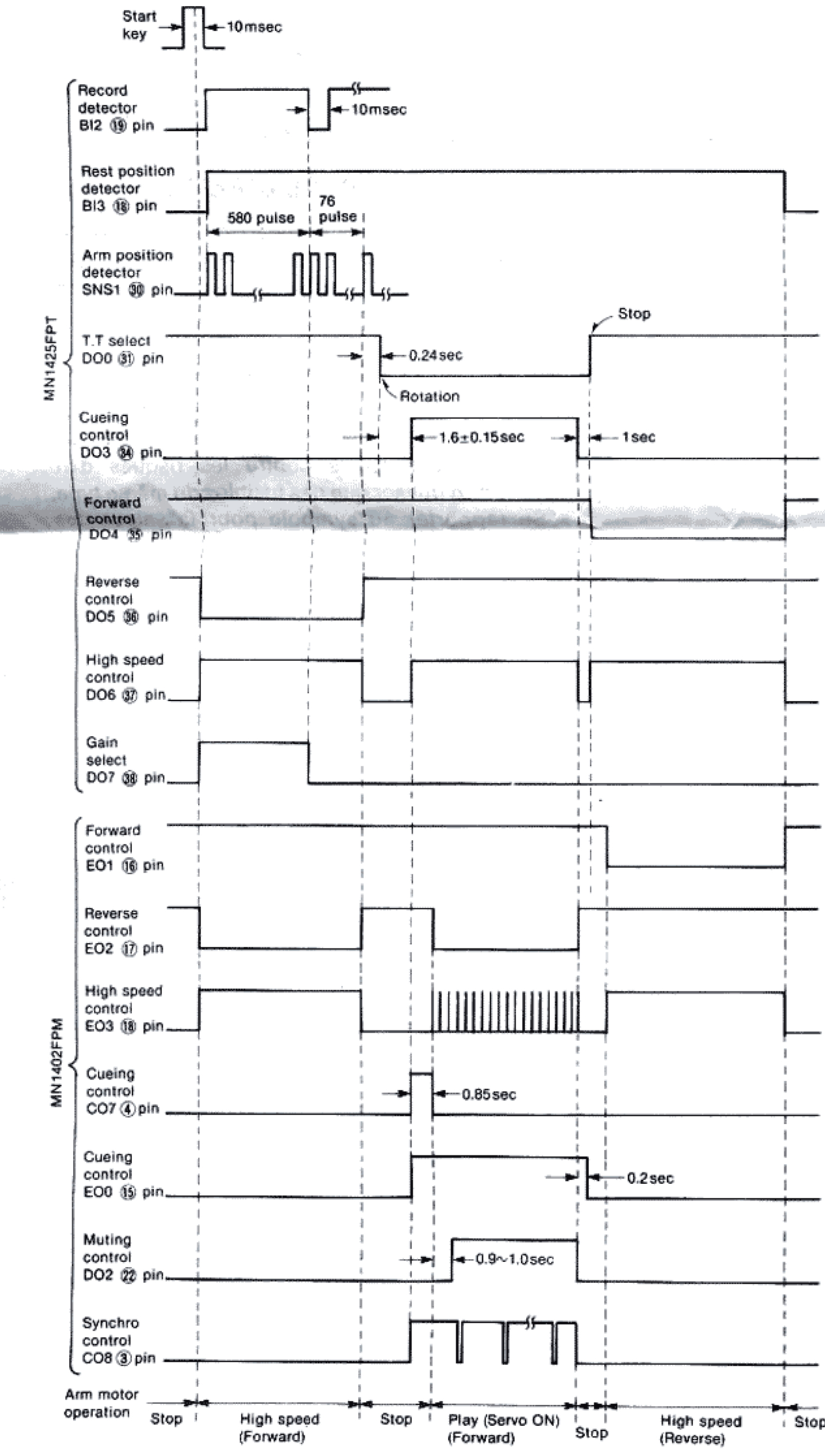
■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM



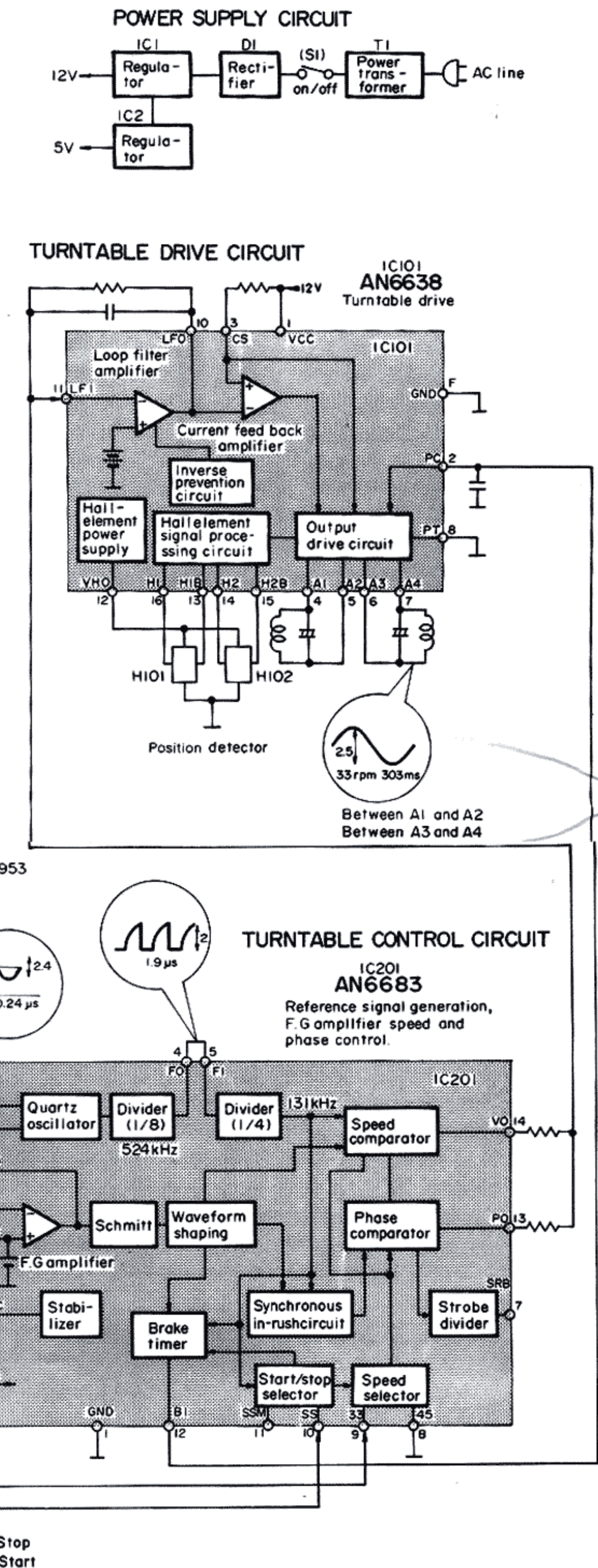
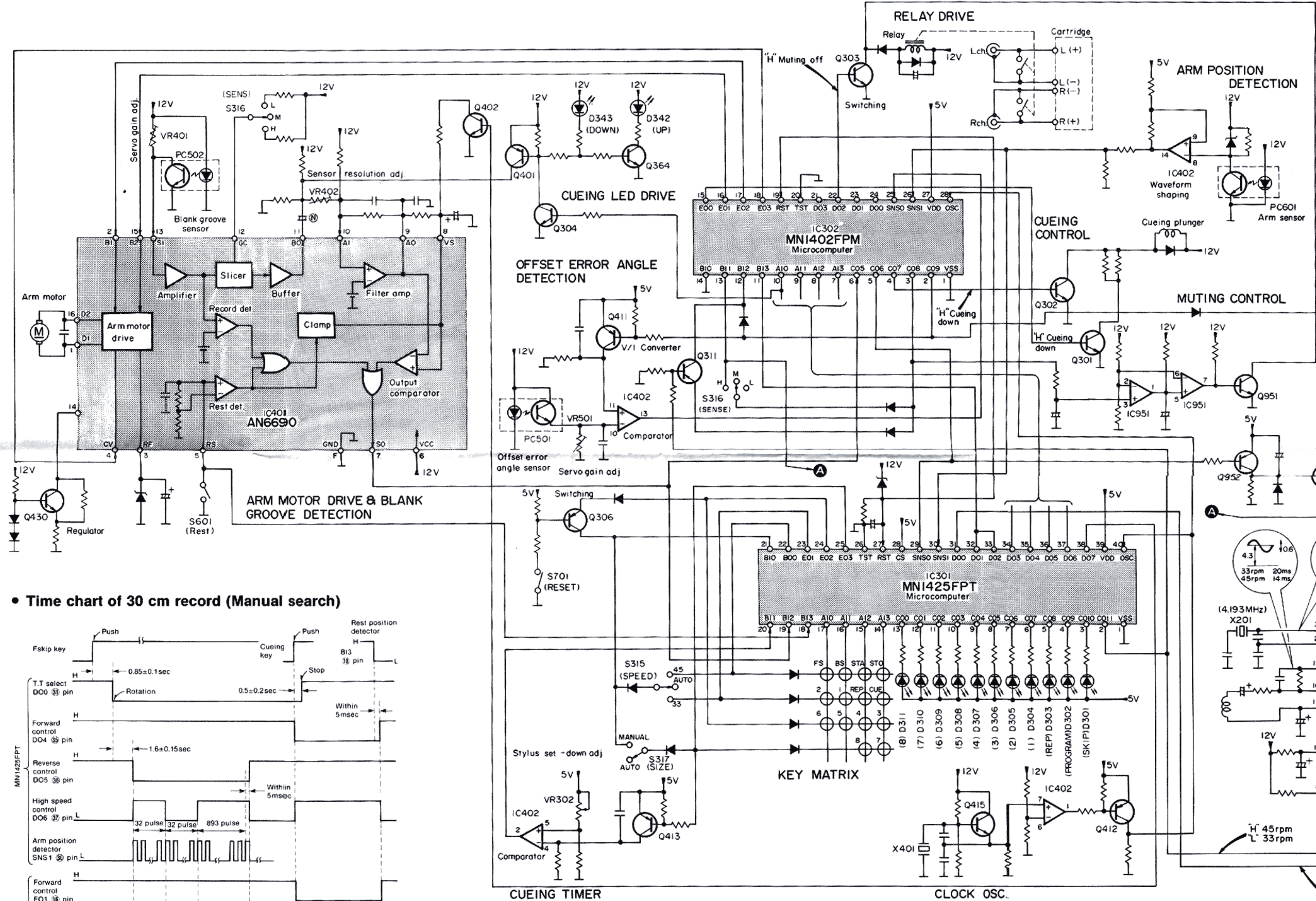
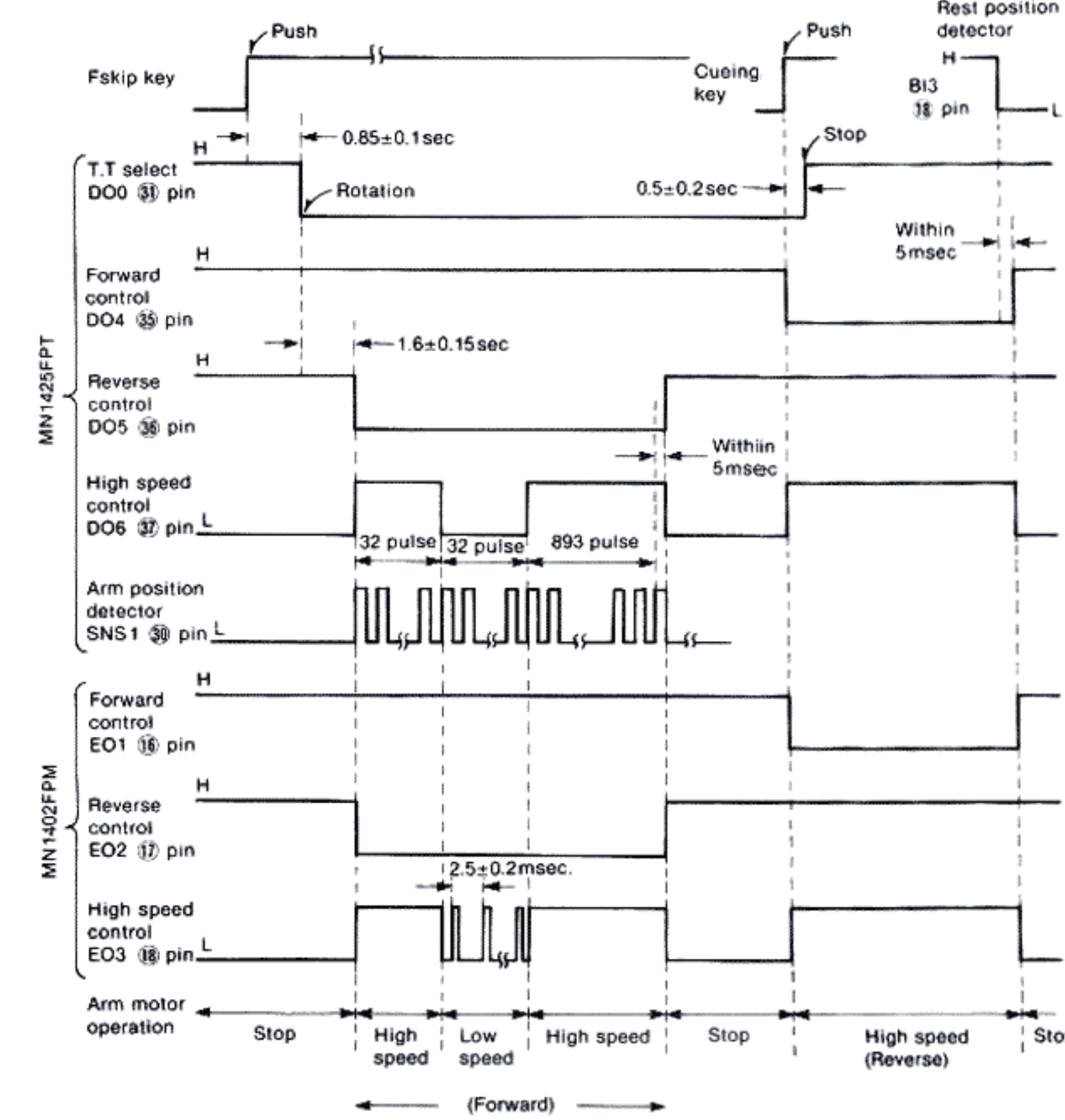
 Le symbole qui se trouve près du fusible signifie un fusible à action rapide. Pour une protection continue contre les risques d'incendie, n'utiliser que des fusibles du même type. Se reporter au symbole pour la valeur des fusibles.

■ BLOCK DIAGRAM

• Time chart of 17 cm record (Lead-in)



• Time chart of 30 cm record (Manual search)



• Function of terminal of MN1425FPT

No.	Symbol	Description
1	VSS	Ground terminal
2	CO11	Turntable speed select (45 rpm "H", 33 rpm "L")
3	CO10	Skip indicator display
4	CO9	Program indicator display
5	CO8	Repeat indicator display
6	CO7	Program No. 1 indicator display
7	CO6	Program No. 2 indicator display
8	CO5	Program No. 3 indicator display
9	CO4	Program No. 4 indicator display
10	CO3	Program No. 5 indicator display
11	CO2	Program No. 6 indicator display
12	CO1	Program No. 7 indicator display
13	CO0	Program No. 8 indicator display
14	AI3	Key (F skip, B skip, start, stop, repeat, cueing and program) are read by key scan of E port (pin No. ② ~ ⑤).
15	AI2	
16	AI1	
17	AI0	
18	BI3	Rest position detection ("L" when tonearm is on rest)

No.	Symbol	Description
19	BI2	30 cm record is present No record 17 cm record is present Blank pulse read (during cueing up) and blank width correction pulse count end (during cueing down) signa input terminal. Blank pulse is active at "L". Record detection
20	BI1	Reading to stylus lowering adjust timer. E03 BI1 Time to until BI1 is "H" after E03 becomes "H" just before cueing down of arm is read into microcomputer.
21	BI0	Turntable platter speed select, reset switch detection and record size select are performed by key scan (E port pin No. ② ~ ⑤) and BI0 key scan.
22	EO0	Keys (F skip, Bskip, start, stop, repeat, cueing and program) are read by key scan of A port (pin No. ④ ~ ⑦), and turntable platter speed select, reset switch detection, and record size selector are performed by key scan of E port and BI0.
23	EO1	
24	EO2	
25	EO3	

No.	Symbol	Description
26	TST	Test terminal
27	RST	Reset terminal (Micom is reset at "L")
28	CSLCT	Select terminal
29	SNS0	Return detection in play mode (Return at "H")
30	SNS1	Arm position detection signal input terminal
31	DO0	Turntable start, stop select ("H" stop, "L" start)
32	DO1	Speed detection program play mode. (ON at "H")
33	DO2	
34	DO3	Tonearm motor and cueing (muting) control
35	DO4	
36	DO5	
37	DO6	Gain select in record size select mode (ON at "H")
38	DO7	
39	VDD	Power supply
40	OSC	Clock oscillation (Frequency : 525 kHz)

• Function of terminal of MN1402FPL

No.	Symbol	Description																									
1	VSS	Ground terminal																									
2	CO9	Key scan strobe (Offset error angle read strobe)																									
3	CO8	Key scan strobe (Synchro. rec. control, ON at "H")																									
4	CO7	Cueing control																									
5	CO6	Return detection in play mode (return at "H")																									
6	CO5	Pulse count end signal (end at "L")																									
7	AI3	• Tonearm motor and cueing (muting) control • The 4-bit signal from MN1425FPT causes the state to become as follows:																									
8	AI2	<table><tr><th>No.</th><th>7</th><th>8</th><th>9</th><th>10</th></tr><tr><td>Arm free</td><td>L</td><td>L</td><td>L</td><td>L</td></tr><tr><td>Forward search</td><td>L</td><td>L</td><td>H</td><td>L</td></tr><tr><td>Backward search</td><td>L</td><td>H</td><td>L</td><td>L</td></tr><tr><td>Brake (stop)</td><td>L</td><td>H</td><td>H</td><td>L</td></tr></table>	No.	7	8	9	10	Arm free	L	L	L	L	Forward search	L	L	H	L	Backward search	L	H	L	L	Brake (stop)	L	H	H	L
No.	7	8	9	10																							
Arm free	L	L	L	L																							
Forward search	L	L	H	L																							
Backward search	L	H	L	L																							
Brake (stop)	L	H	H	L																							
9	AI1	<table><tr><th>No.</th><th>7</th><th>8</th><th>9</th><th>10</th></tr><tr><td>Lead-in</td><td>H</td><td>L</td><td>H</td><td>L</td></tr><tr><td>Return</td><td>H</td><td>H</td><td>L</td><td>L</td></tr></table>	No.	7	8	9	10	Lead-in	H	L	H	L	Return	H	H	L	L										
No.	7	8	9	10																							
Lead-in	H	L	H	L																							
Return	H	H	L	L																							
10	AI0																										
11	BI3	Speed (blank) detection during program play (ON at "H")																									
12	BI2	} Key scan Sensitivity and speed selector keys are read by key scan of C08, C09, BI1, BI2.																									
13	BI1																										
14	BI0	Not used in this unit (Ground)																									
15	EO0	Cueing control																									
16	EO1	Arm motor control																									
17	EO2	<table><tr><th>No.</th><th>16</th><th>17</th><th>18</th></tr><tr><td>Arm free</td><td>L</td><td>L</td><td>L</td></tr><tr><td>Brake</td><td>H</td><td>H</td><td>L</td></tr><tr><td>Forward slow</td><td>H</td><td>L</td><td>L</td></tr></table>	No.	16	17	18	Arm free	L	L	L	Brake	H	H	L	Forward slow	H	L	L									
No.	16	17	18																								
Arm free	L	L	L																								
Brake	H	H	L																								
Forward slow	H	L	L																								
18	EO3	<table><tr><th>No.</th><th>16</th><th>17</th><th>18</th></tr><tr><td>Lead-in</td><td>H</td><td>L</td><td>H</td></tr><tr><td>Backward slow</td><td>L</td><td>H</td><td>L</td></tr><tr><td>Return</td><td>L</td><td>H</td><td>H</td></tr></table>	No.	16	17	18	Lead-in	H	L	H	Backward slow	L	H	L	Return	L	H	H									
No.	16	17	18																								
Lead-in	H	L	H																								
Backward slow	L	H	L																								
Return	L	H	H																								
19	RST	Reset terminal (Micom is reset at "L")																									
20	TST	Test terminal																									
21	DO3	Not used in this unit																									
22	DO2	Muting control ("H" muting OFF)																									
23	DO1	} Not used in this unit																									
24	DO0																										
25	SNS0	Offset angle detection signal input terminal																									
26	SNS1	Arm position detection signal input terminal																									
27	VDD	Power supply																									
28	OSC	Clock oscillation (Frequency : 525 kHz)																									

Service Manual

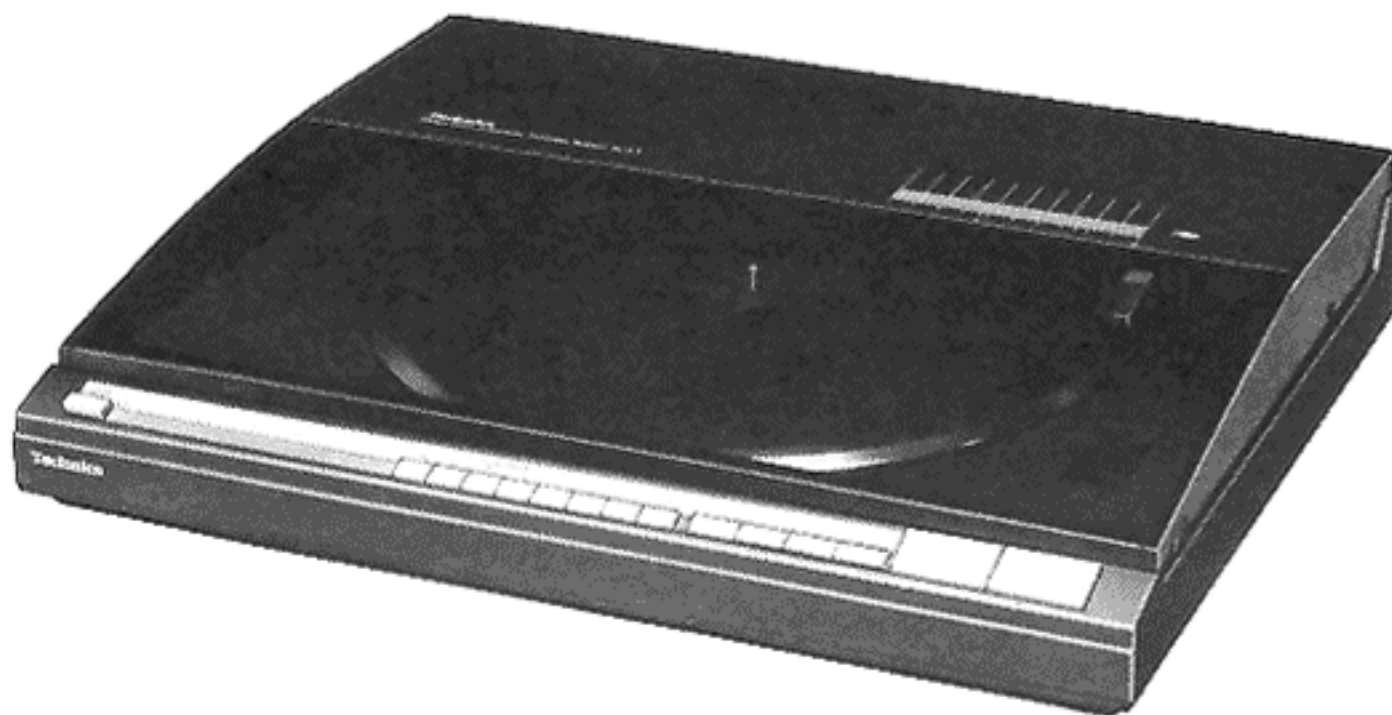
QUARTZ Direct Drive
Automatic Turntable System

Turntable System

SL-L3

Color

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



T4P is the standard mark for plug-in-connector type.
Products carrying this mark are interchangeable and adaptable
among each other.

Color	Areas
(S) (K)	[E] Switzerland and Scandinavia.
(S) (K)	[EK] United Kingdom.
(S) (K)	[XL] Australia.
(S) (K)	[EG] ... F.R. Germany.
(S) (K)	[EB] Belgium.
(S) (K)	[EH] Holland.
(S) (K)	[EF] France.
(S) (K)	[Ei] Italy.
(S) (K)	[EC] Czechoslovakia.
(S) (K)	[XA] Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
(S) (K)	[PA] Far East PX.
(S) (K)	[PE] European Military.
(S) (K)	[PC] European Audio Club.

Please use this manual together with the service manual for Model No. SL-L3 [M],
Order No. HAD85042489C1.

SPECIFICATIONS

■ Turntable section

Type: Direct drive
Automatic turntable

Features: Auto start/Auto lead-in,
Auto return,
Auto stop,
Forward search play,
Backward search play,
Repeat play,
Record presence detection

Drive method: Direct drive

Motor: Brushless DC motor

Turntable platter: Aluminum die-cast
Diameter 30 cm

Turntable speeds: 33-1/3 rpm and 45 rpm

Wow and flutter: 0.012% WRMS*
0.025% WRMS (JIS C5521)
±0.035% peak
(IEC 98A Weighted)

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

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

■ Tonearm section

Type: 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

Technics

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

Panasonic Tokyo Office
Matsushita Electric Trading Co., Ltd.
1-2, 1-chome, Shibakoen, Minato-ku, Tokyo 105, Japan

Tonearm drive motor: DC motor
Stylus pressure: 1.25 g (fixed)

■ Cartridge section

Model No.: EPC-P33
Type: Moving magnet stereo cartridge

Magnetic circuit: All laminated core
Frequency response: 10 Hz ~ 50 kHz
20 Hz ~ 10 kHz ± 1 dB
Output voltage: 2.5 mV at 1 kHz, 5 cm/s. zero to peak lateral velocity
(7 mV at 1 kHz, 10 cm/s. zero to peak 45° velocity [DIN 45 500])
Channel separation: 22 dB at 1 kHz
Channel balance: Within 1.8 dB at 1 kHz
Recommended load impedance: 47 k Ω ~100 k Ω
Compliance (dynamic): 12 $\times 10^{-6}$ cm/dyne at 100 Hz
Stylus pressure range: 1.25 ± 0.25 g (12.5 ± 2.5 mN)
Weight: 6 g (cartridge only)
Replacement stylus: EPS-33ES (Elliptical)

■ General

Power supply: For Australia and United Kingdom: AC 240 V, 50 Hz
For continental Europe: AC 220 V, 50 Hz
For others: ~ 110-127/220-240 V, 50 or 60 Hz
Power consumption: For Australia, United Kingdom and continental Europe: 14 W
For others: 16 W
Dimensions: 43 $\times$ 9 $\times$ 35 cm
(W $\times$ H $\times$ D)
(Maximum height when the dust cover is open)
39 cm
Weight: 5.2 kg

Specifications are subject to change without notice for further improvement.

TECHNISCHE DATEN

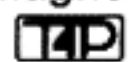
■ Plattenteller

Typ: Automatischer Plattenteller mit Quarz-Direktantrieb
Eigenschaften: Auto-Start/Auto-Zuführung
Auto-Rückkehr/Auto-Stop
Wiederholtes Abspielen
Programm-Abspielen
Direktmusikwahl
Vorwärts- und Rückwärts-Sprungabspiel
Vorwärts- und Rückwärts-Suchabspiel
Autom. Plattengrößenwahl
Schallplattendetektion
Antrieb: Direktantrieb
Motor: Kollektorloser Gleichstrommotor
Antriebsregel-Methode: Quarz-Steuerung QPL
Plattenteller: Aluminium-Druckguß
Durchmesser 30 cm
Plattenteller-Drehzahlen: 33-1/3 und 45 U./min
Automatische Drehzahlwahl
(manuelle Wahl möglich)
Gleichlaufschwankungen: 0,012% WRMS*
0,025% WRMS (JIS C5521)
 $\pm 0,035\%$ Spitze
(IEC 98A bewertet)
*Gemessen anhand von Signalen vom eingebauten Frequenzgenerator des Motorteils.
Rumpeln: -56 dB (IEC 98A unbewertet)
-78 dB (IEC 98A bewertet)

■ Tonarm

Typ: Linearabtastungs-Tonarm mit Kardanaufhängung mit 4-Punkt-Drehlager
Effektive Länge: 10,5 cm
Spurfehlwinkel: Innerhalb $\pm 0,1^\circ$
Effektive Masse: 9 g (einschließlich Tonabnehmer)
Resonanzfrequenz: 12 Hz
Tonarm-Antriebsmotor: Gleichstrommotor
Nadeldruck: 1,25 g (nicht einstellbar)

■ Tonabnehmer

Modell Nr.: EPC-P33
Typ: Beweglicher Magnet-Stereo-tonabnehmer 
Magnetkreis: Ganzlamellenkern
Frequenzgang: 10 Hz bis 50 kHz
20 Hz bis 10 kHz ± 1 dB
Ausgangsspannung: 2,5 mV bei 1 kHz
5 cm/s. Null-zu-Spitze, lateral
[7 mV bei 1 kHz 10 cm/s. Null-zu-Spitze, 45° (DIN 45 500)]
22 dB bei 1 kHz
Kanaltrennung: Innerhalb 1,8 dB bei 1 kHz
Kanalabweichung:
Empfohlene Endimpedanz: 47 k Ω ~100 k Ω
Nachgiebigkeit (dynamisch): 12 $\times 10^{-6}$ cm/dyn bei 100 Hz
Nadeldruckbereich: 1,25 $\pm 0,25$ g (12,5 $\pm 2,5$ mN)
Gewicht: 6 g (nur Tonabnehmer)
Ersatznadel: EPS-33ES (elliptisch)

■ Allgemeine Daten

Stromversorgung: ~220 V, 50 Hz
Leistungsaufnahme: 14 W
Abmessungen: 43 $\times$ 9 $\times$ 35 cm
(B $\times$ H $\times$ T)
(Maximale Höhe bei vollständig geöffnetem Gehäuseoberteil)
39 cm
Gewicht: 5,2 kg

Die technischen Daten können infolge von Verbesserungen ohne Ankündigung geändert werden.

CARACTERISTIQUES

■ Section de la platine

Type:	Entraînement direct par quartz Système de platine automatique
Caractéristiques:	Démarrage automatique/Entrée automatique, Retour automatique/Arrêt automatique, Audition répétée, Audition programmée, Audition sélectionnée musicale directe, Audition de saut vers l'avant et l'arrière, Audition de recherche vers l'avant et l'arrière, Sélection automatique du diamètre des disques, Détection de la présence d'un disque.
Système d'entraînement:	Entraînement direct
Moteur:	Moteur C.C. sans balai
Système de commande d'entraînement:	Réglage d'accrochage de phase par quartz
Plateau de lecture:	Aluminium moulé sous pression Diamètre 30 cm
Vitesses de la platine:	33-1/3 et 45 t/p.m. Sélecteur de vitesse automatique (Sélection manuelle possible)
Pleurage et scintillement:	0,012% de valeur efficace* 0,025% de valeur efficace (JIS C5521) ±0,035% de crête (IEC 98A pondéré)

* 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) -78 dB (IEC 98A pondéré)
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■ Section du bras de lecture

Type:	Bras de lecture d'alignement linéaire de type à suspension à la cardan sur 4 pivots
Longueur effective:	10,5 cm
Erreur d'angle d'alignement de piste:	En deçà de $\pm 0,1^\circ$
Masse réelle:	9 g (y compris la cellule)
Fréquence de résonance:	12 Hz
Moteur d'entraînement du bras de lecture:	Moteur C.C.
Force verticale d'appui:	1,25 g (Fixé)

■ Section de la cellule pick-up

N°-olu modèle:	EPC-P33
Type:	Cellule pick-up stéréo à aimant mobile 
Circuit magnétique:	Noyau entièrement feuilleté
Réponse en fréquence:	10 Hz à 50 kHz 20 Hz à 10 kHz ± 1 dB
Tension de sortie:	2,5 mV à 1 kHz; 5 cm/s. zéro à vitesse latérale de crête [7 mV à 1 kHz; 10 cm/s. zéro à vitesse 45° de crête (DIN 45 500)]
Séparation des canaux:	22 dB à 1 kHz
Equilibrage des canaux:	En deçà de 1,8 dB à 1 kHz
Impédance de charge recommandée:	47 k Ω ~100 k Ω
Elasticité acoustique: (dynamique)	12 $\times 10^{-6}$ cm/dyne à 100 Hz
Plage de la force verticale d'appui:	1,25 $\pm$ 0,25 g (12,5 $\pm$ 2,5 mN)
Poids:	6 g (cellule seule)
Remplacement de la pointe de lecture:	EPS-33ES (Pointe de lecture ellipsoïdale)

■ Généralités

Alimentation:	~220V, 50 Hz
Consommation:	14 W
Dimensions: (L $\times$ H $\times$ P)	43 $\times$ 9 $\times$ 35 cm (Hauteur maximum lorsque le couvercle protège-poussière est ouvert: 39 cm)
Poids:	5,2 kg

Sujet à changement sans préavis.

ESPECIFICACIONES

■ Sección del plato giratorio

Tipo:	Plato giratorio automático con accionamiento directo de cuarzo
Ventajas:	Arranque/Descenso automáticos Retorno/Parada automáticos Ejecución repetida Ejecución programada Ejecución con selección directa de música Ejecución con salto hacia adelante y hacia atrás Ejecución con búsqueda hacia adelante y hacia atrás Selección automática de tamaño Detección de disco metido
Método de accionamiento:	Accionamiento directo
Motor:	Motor de corriente continua sin escobillas
Método de control de accionamiento:	Control enclavado de fase de cuarzo
Platillo del plato giratorio:	Aluminio fundido 30 cm de diámetro
Velocidades del plato giratorio:	33-1/3 y 45 rpm Selección automática de la velocidad (También posibilidad de seleccionar a mano)
Ululaciones y trémolo:	0,012% WRMS* 0,025% WRMS (JIS C5521) ±0,035% cresta (IEC 98A Ponderado)
*Medido obteniendo una señal proveniente del generador de frecuencias incorporado del conjunto del motor.	
Ruido de rodadura:	-56 dB (IEC 98A No ponderado) -78 dB (IEC 98A Ponderado)

■ Sección del brazo sonoro

Tipo:	Brazo sonoro de seguimiento lineal con suspensión cardánica de 4 pivotes
Longitud efectiva:	10,5 cm
Angulo de error de seguimiento:	Inferior a 0,1° aproxim.
Masa efectiva:	9 g (incluyendo el cartucho)
Frecuencia de resonancia:	12 Hz
Motor de accionamiento del brazo sonoro:	Motor de corriente continua
Presión de la aguja:	1,25 g (fija)

■ Sección del cartucho

Núm. del modelo:	EPC-P33
Tipo:	Cartucho estereofónico de imán móvil 
Circuito magnético:	Núcleo totalmente laminado
Respuesta de frecuencia:	10 Hz a 50 kHz 20 Hz a 10 kHz ±1 dB
Voltaje de salida:	2,5 mV a 1 kHz Velocidad lateral de cero a cresta de 5 cm/s (7 mV a 1 kHz, Velocidad de 45° de cero a cresta de 10 cm/s [DIN 45 500])
Separación de canales:	22 dB a 1 kHz
Equilibrio de canales:	Inferior a 1,8 dB a 1 kHz
Impedancia de carga recomendada:	47 kΩ a 100 kΩ
Elasticidad (dinámica):	12×10 ⁻⁶ cm/dina a 100 Hz
Radio de presión de la aguja:	1,25±0,25 g (12,5±2,5 mN)
Peso:	6 g (cartucho solamente)
Aguja de recambio:	EPS-33ES (Aguja elíptica)

■ En general

Alimentación de corriente:	~110-127/ 220-240V, 50 ó 60 Hz
Consumo de corriente:	16W
Dimensiones: (Ancho×Alto×Prof.)	43 × 9 × 35 cm (Altura máxima cuando la tapa contra el polvo está abierta: 39 cm)
Peso:	5,2 kg

Estas especificaciones están sujetas a cualquier cambio sin previo aviso.

■ MESSUNGEN UND JUSTIERUNGEN

Deutsch

• Verwendete Geräte und Zustand des Gerätes

1. Oszilloskop

2. Gleichstrom-Voltmeter
3. Plate (SFTR007) für Justierung

4. Den Empfindlichkeits-Wahlschalter des optischen Sensors auf "M" stellen.

Schritt	Gegenstand	Vorbereitungen für die Justierung	Zu justierende Teile	Justiermethode
1	Startposition	1) Das Gehäuseoberteil öffnen und die Platte auflegen. 2) Den Ein/Aus-Schalter einschalten. 3) Den Startschalter drücken.	Absenk-positions-Justierschraube (Abb. 1)	Die Startposition-Justierschraube drehen. Falls er zwischen Musikstücken absenkt, die Schraube entgegen dem Uhrzeigersinn drehen.
2	Sensorverstärkung	1) Das Gleichstrom-Voltmeter an IC401, Stift 12 (+) und Masse (–) anschließen. 2) Die Platte für Justierung mit Seite A auflegen. 3) Das Gehäuseoberteil schließen.	VR401 (Abb. 2)	1) Den Ein/Aus-Schalter einschalten. 2) Der Tonarm ist in der Ruheposition. (Unbespielter Teil der Platte.) 3) VR401 so abgleichen, daß die Ausgangsspannung $8,5V\pm0,3V$ beträgt.
3	Sensorauflösung	1) Das Oszilloskop an IC401, Stift 9 (+) und Masse (–) anschließen. 2) Die Platte für Justierung mit Seite A auflegen. 3) Das Gehäuseoberteil schließen.	VR402 (Abb. 2)	1) Den Ein/Aus-Schalter einschalten. 2) Den F-Überspring-Schalter gebrückt halten, um den Tonarm zu bewegen. (Ausgangsleistung tritt auf zwischen den Musikstücken.) 3) VR402 so abgleichen, daß die maximale Ausgangsleistung zwischen den Musikstücken $3V\pm0,3V$ beträgt. (Abb. 3)
4	Nadel-Absenkposition	1) Leistungsdraht mit Klemme an CN301, Shift 6 und Stift 2 der Betriebs-Platine anschließen. (Stummschal tungsbetrieb stoppt.) 2) Das Gehäuseoberteil öffnen und den Gehäuseschalter mit Klebband in der gedrückten Stellung arretieren. 3) Die Platte für Justierung mit Seite B auflegen. 4) Das Gehäuseoberteil schließen. 5) Das Gerät an den Verstärker anschließen. (Die Lautsprecher an die Lautsprecher-Anschlüsse anschließen.)	VR302 (Abb. 4)	1) Den Ein/Aus-Schalter einschalten. 2) Die Programmtaste 2 und anschließend den Startschalter drücken. 3) Nach Beendigung des Liftbetriebs die Programmtaste 2 zum Zwecke des Überspringens drücken. 4) Überprüfen, daß die Absenkposition bei "13" liegt. 5) VR302 so justieren, daß die Absenkposition bei "13" auf der Skala ist. Anmerkung: VR302 Kann auch von der Geräterückseite her justiert werden. (Abb. 4 (B))
5	Tonarm-Spurfehlwinkel	1) Die Staubabdeckung entfernen. (Siehe "ANLEITUNG FÜR DIE DEMONTAGE".) 2) Das Gehäuseoberteil öffnen und den Gehäuseschalter mit Klebband in der gedrückten Stellung arretieren. 3) Das Gehäuseoberteil schließen. 4) Eine Platte auflegen.	Justierschraube (Abb. 5)	1) Den Ein/Aus-Schalter einschalten. 2) Den F-Überspring-Schalter gedrückt halten, um den Tonarm zu bewegen. 3) Die Justierschraube so weit drehen, daß die Tonarmmitte mit der V-Kerbe der Liftstange übereinstimmt.
6	Servo-Verstärkung und Offsetspannung	1) Die Staubabdeckung entfernen. (Siehe "ANLEITUNG FÜR DIE DEMONTAGE".) 2) Das Gehäuseoberteil öffnen und den Gehäuseschalter mit Klebband in der gedrückten Stellung arretieren. 3) Das Gleichstrom-Voltmeter an CN301, Stift 5 (+) und Stift 2 (–) anschließen. 4) Die Sensorabdeckung entfernen.	VR501 (Servo Verstärkung) Schraube (Offset-Spannung) (Abb. 6)	1) Den Ein/Aus-Schalter einschalten. 2) Den F-Überspring-Schalter gedrückt halten, um den Tonarm zu bewegen. 3) Das Gehäuseoberteil öffnen. 4) Den Tonarm ganz nach links bewegen. Dann VR501 so justieren, daß die Spannung $6,0V$ beträgt. (Servo-Verstärkung) 5) Den Tonarm zur Mitte him stellen und überüfen, daß die Ausgangsspannung $3,0V$ beträgt. 6) Falls die Spannung nicht $3,0V$ beträgt, ist die Schraube so zu justieren, daß die Ausgangsspannung $3,0V$ beträgt. (Offset-Spannung)

■ MESURAGES ET RÉGLAGES

Français

• Equipement utilisé et conditions de service de l'appareil

1. Oscilloscope

2. Voltmètre à C.C.
3. Disque (SFTR007) pour la mise au point

4. Régler le sélecteur de sensibilité de détecteur optique sur "M".

Etape	Artiele	Préparatifs pour la réglage	Portion du réglage	Méthode de mise au point
1	Position de démarrage	1) Ouvrir la boîte supérieure et installer un disque. 2) Mettre en circuit l'interrupteur d'alimentation. 3) Appuyer sur la touche "Start" (mise en marche).	Vis d'ajustement de la position descendante. (Fig. 1)	• Tourner la vis de réglage du positionnement de démarrage. Si elle descend entre les plages, la tourner dans le sens inverse des aiguilles d'une montre.
2	Gain du dispositif dérecteur	1) Raccorder un voltmètre à C.C. aux 12 ergotes (+) de IC401 et à la terre (-). 2) Installer le disque pour la mise au point avec le côté A vers le haut. 3) Refermer le boîtier supérieur.	VR401 (Fig. 2)	1) Mettre en marche l'interrupteur d'alimentation. 2) Le bras de lecture est à la position de repos. (Zone vierge du disque.) 3) Ajuste VR401 de telle sorte que la tension de sortie soit de 8,5V±0,3V.
3	Résolution du dispositif détecteur	1) Raccorder l'oscilloscope aux 9 ergots (+) de IC401 et à la terre (-). 2) Installer le disque pour la mise au point avec le côté A vers la haut. 3) Refermer le boîtier supérieur.	VR402 (Fig. 2)	1) Mettre en circuit l'interrupteur d'alimentation. 2) Maintenir enfoncé le commutateur de saut F pour déplacer le bras de lecture. (La puissance de sortie est délivrée entre les plages.) 3) Ajuster VR402 de telle sorte que la puissance de crête entre les plages soit de 3V±0,3V. (Fig. 3)
4	Position de pose/ relevage de la pointe de lecture	1) Raccorder le fil de jonction avec attache à la broche 2 et à la broche 6 de CN301 du circuit de fonctionnement. (Arrête fonctionnement de l'accord silencieux.) 2) Ouvrir le boîtier supérieur et maintenir appuyée la touche du boîtier avec une bande adhésive. 3) Installer le disque pour la mise au point avec le côté B vers le haut. 4) Refermer le boîtier supérieur. 5) Raccorder l'appareil à o'amplificateur. (Raccorder les haut-parleurs aux bornes des hautparleurs.)	VR302 (Fig. 4)	1) Mettre en circuit l'interrupteur d'alimentation. 2) Appuyer respectivement sur la touche de programmation 2 et sur la touche de mise en marche. 3) Après l'achèvement de la pose, appuyer sur la touche de programmation 2 dans le but d'opérer un saut. 4) S'assurer que la position descendante est au compte de "13". 5) Régler VR302 de telle sorte que la position descendante soit au comptage de "13". Nota: • VR302 peut aussi être ajusté à partir de l'arrière de l'appareil. (Fig. 4 (B))
5	Angle de décalage du bras de lecture	1) Retirer le couvercle protège-poussière. (Se référer aux "INSTRUCTIONS POUR LE DÉMONTAGE".) 2) Ouvrir la boîte supérieure et maintenir appuyée la touche du boîtier avec une bande adhésive. 3) Refermer le boîtier supérieur. 4) Installer un disque.	Vis de réglage (Fig. 5)	1) Mettre en circuit l'interrupteur d'alimentation. 2) Maintenir enfoncé le commutateur de saut F pour déplacer le bras de lecture. 3) Tourner la vis de réglage de façon à ce que le centre de bras coincide avec la rainure en V de la tige d'élévation.
6	Amplification servo-mécanique et tension d'écart de réglage	1) Retirer le couvercle protège-poussière. (Se référer aux "INSTRUCTIONS POUR LE DÉMONTAGE".) 2) Ouvrir le boîtier supérieur et maintenir appuyée la touche du boîtier avec une bande adhésive. 3) Raccorder le voltmètre à C.C. à la broche 5 (+) et à la broche 2 (-) de CN301. 4) Retirer le couvercle du dispositif détecteur.	VR501 (Amplification servo-mécanique) Plaquette à Vis. (Tension de décalage) (Fig. 6)	1) Mettre en circuit l'interrupteur d'alimentation. 2) Maintenir enfoncé le commutateur de saut F pour déplacer le bras de lecture. 3) Ouvrir le boîtier supérieur. 4) Déplacer complètement le bras de lecture vers la gauche. Puis, ajuster VR501 de telle sorte que la tension soit de 6,0V. (Amplification servo-mécanique) 5) Régler le bras de lecture au centre et s'assurerque la tension de sortie soit de 3,0V. 6) Si la tension n'est pas de 3,0V, ajuster la vis de telle sorte que la tension de sortie soit de 3,0V. (Tension de décalage)

• Equipos usados y estado del aparato

1. Osciloscopio

2. Voltímetro de corriente continua
3. Disco (SFTR007) de ajuste

4. Poner el selector de sensibilidad del sensor óptico en "M".

Paso	Punto tratado	Preparativos para el ajuste	Porción a ajustar	Manera de hacer el ajuste
1	Posición de arranque	1) Abrir el gabine superior y colocar el disco. 2) Encender el interruptor de la corriente. 3) Empujar el interruptor de arranque ("Start").	Tornillo de regulación de la posición de descenso (Fig. 1)	Hacer girar el tornillo de regulación de la posición de descenso. Si se deposita en medio de una pieza, girar el tornillo hacia la izquierda.
2	Ganancia del sensor	1) Conectar el voltímetro de CC al perno 12 (+) de IC401 y tierra (-). 2) Colocar el disco de ajuste con el lado A mirando hacia arriba. 3) Cerrar el gabinete superior.	VR401 (Fig. 2)	1) Encender el interruptor de la corriente. 2) El brazo sonoro está en la posición de descanso. (Area negra del disco.) 3) Regular VR401 de manera tel que la tensión de salida sea de 8,5V ±0,3V.
3	Rasolución del sensor	1) Conectar el osciloscopio al perno 9 (+) de IC401 y tierra (-). 2) Colocar el disco de ajuste con el lado A mirando hacia arriba. 3) Cerrar el gabinete superior.	VR402 (Fig. 2)	1) Encender el interruptor de la corriente. 2) Mantener el interruptor de salto F oprimido para mover el brazo sonoro. (La salida se suministra entre las piezas.) 3) Regular VR402 de manera tal que la salida de cresta entre las piezas sea de 3V±0,3V. (Fig. 3)
4	Posición de descenso de aguja.	1) Conectar el hilo conductor con clip a 6 pernos y 2 perno CN301 de tablero de circuitos de operation. (Cesa la operación de silenciamiento.) 2) Abrir el gabinete superior y sujetar el interruptor del mismo con cinta. 3) Colocar el disco de ajuste con el lado B mirando hacia arriba. 4) Cerrar el gabinete superior. 5) Conectar el aparato al amplificador. (Conectar los altoparlantes a los bornes para conexión de los mismos.)	VR302 (Fig. 4)	1) Encender el interruptor de la corriente. 2) Apretar la tecla de programa 2 seguida del interruptor de arranque. 3) Una vez que el brazo sonoro haya descendido, apretar la tecla de programa 2 con el fin de saltar. 4) Asegurarse de que la posición de descenso se encuentre el el número "13". 5) Regular VR302 de manera que la posición de descenso esté en conteo "13". Nota: VR302 puede también ajustarse desda la parte posterior del aparato. (Fig. 4 (B))
5	Angulo de descentramiento del brazo sonoro	1) Remover la tapa contra el polvo. (Referir a "INSTRUCCION DE DESMONTAJE".) 2) Abrir el gabinete superior y sujetar el interruptor del mismo con cinta. 3) Cerrar el gabinete superior. 4) Colocar el disco.	Tornillo de ajuste (Fig. 5)	1) Encender el interruptor de la corriente. 2) Manetener el interruptor de salto F oprimido para mover el brazo sonoro. 3) Girar el tornillo de ajuste de manera tal que el centro del brazo concuerde con la ranura en V de la barra de elevación.
6	Canancia del sarvome canismo y tensión de desnivel	1) Remover la tapa contra el polvo. (Referir a "INSTRUCCION DE DESMONTAJE".) 2) Abrir el gabinete superior y sujetar el interruptor del mismo con cinta. 3) Conectar el voltímetro de CC a 5 pernos (+) y 2 pernos (-) de CN301. 4) Remover la cubierta de sensor.	VR501 (Ganancia del servo-mecanismo) Tornillo (Tensión de desnivel) (Fig. 6)	1) Encender el interruptor de la corriente. 2) Mantener el interruptor de salto F oprimido para mover el brazo sonoro. 3) Abrir el gabinete superior. 4) Mover completamente el brazo sonoro a la izquierda. Luego, regular VR501 de manera que la tensión sea 6,0V. (Ganancia del servomecanismo.) 5) Colocar el brazo sonoro en el centro y asegurarse de que la tension de salida sea de 3,0V. 6) Si la tensión no es 3,0V, regular el tornillo de manera que la tensión de salida sea 3,0V. (Tensión de desnivel)

CHANGE IN REPLACEMENT PARTS LIST

Notes:

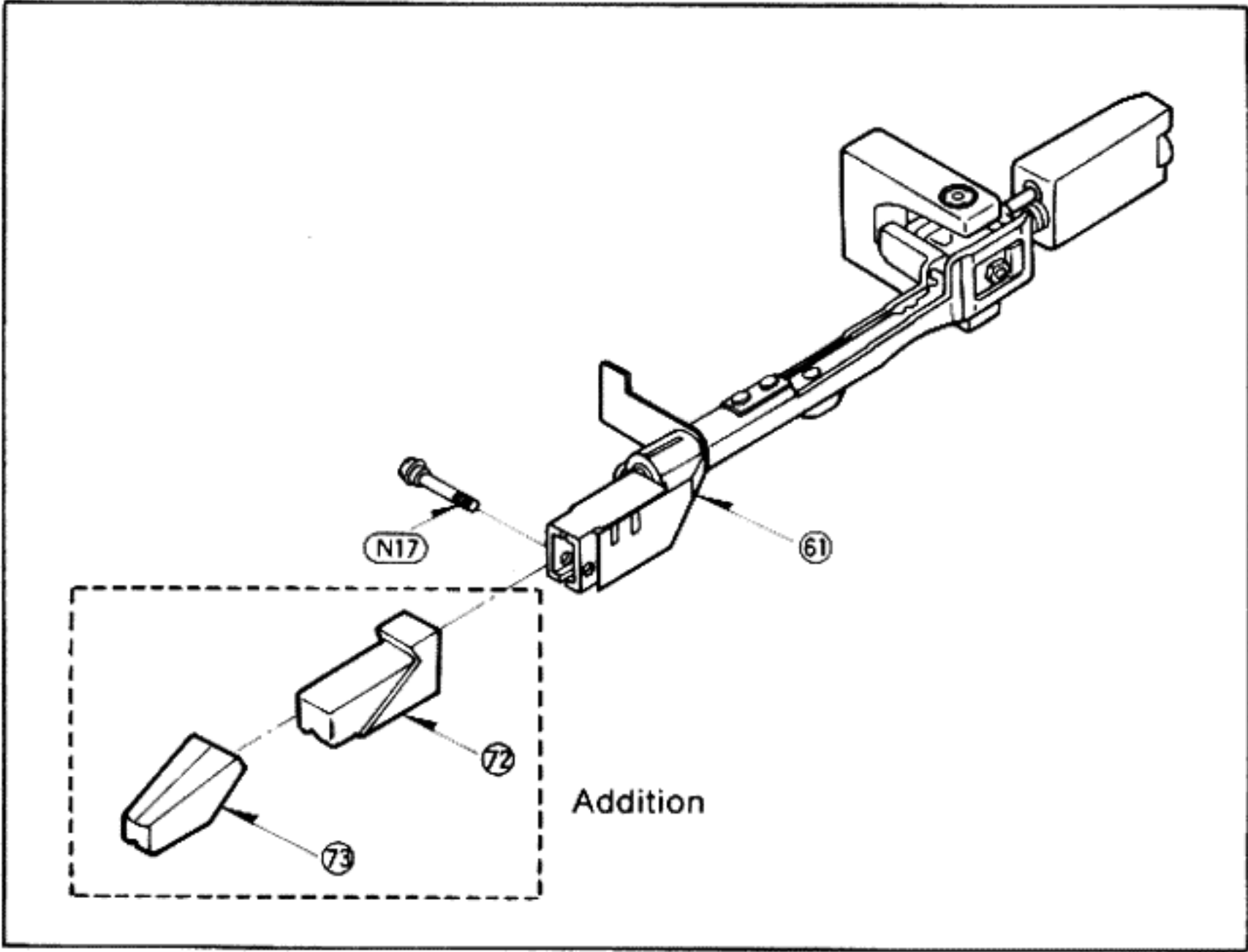
- 1. Mentioned in this parts list are only those changes in Model No. SL-L3 for destination [M] area.
- 2. Important safety notice:
Components identified by a  mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
- 3. -marked parts are used for black only, while -marked parts are for silver type only.
- 4. Parts other than -and -marked are used for both black and silver types.
- 5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Ref. No.	Change of Part		Area & Color	Part Name & Description
	SL-L3 [M]	SL-L3/(K)		
SWITCH				
S901	Addition	SFDSHXW225-3	[XA, PA, PE, PC] only	Voltage Selector ⚠
POWER TRANSFORMER				
T1	SLT57DTL2A	SLT57DTE15E	[EK, XL]	Power Source ⚠
		SLT57DTS17E	[XA, PA, PE, PC]	
		SLT57DTS16E	[other]	
FUSES				
F1	Addition	XBAS2C016T1B	[XA, PA, PE, PC]	250V, T160mA ⚠
		XBA2C06T1B	[other]	250V, T630mA ⚠
F2	Addition	XBA2C06T1B	[XA, PA, PE, PC] only	250V, T630mA ⚠
CABINET AND CHASSIS PARTS				
1	SFADC13M01E	SFADC13N01E		Dust Cover
5	SFACC13N01E	SFACC13N01E	○	Cabinet
		SFACC13N21E	⊗	
5-1	SFKBBD2N01	SFKBBD2N01	○	Badge
		SFKBBD2N21	⊗	
7	SFKKC13N01	SFKKC13S01		Ornament Plate
43	SFACC13N011	SFACC13N011	○	Cover
		SFACC13N211	⊗	
44	SFNNC13M01	SFNNC13X01	[XA]	Name Plate
		SFNNC13R01	[EG]	
		SFNNC13S01	[E, EC]	
		SFNNC13P02	[PC]	
		SFNNC13P01	[PA, PE]	
		SFNNC13G01	[EK, XL]	
		SFNNC13Q01	[other]	
45	SFDJHSC0491	SFDJHSC0491	[XL]	AC Socket ⚠
		SFDJHSC04912	[XA, PA, PE, PC]	
		SFDJHSC0516	[other]	

Ref. No.	Change of Part		Area & Color	Part Name & Description
	SL-L3 [M]	SL-L3/(K)		
59	SFACC13N012	SFACC13N012	○ Except for [XA, PA, PE, PC]	Cover
		SFACC13N212	⊗ Except for [XA, PA, PE, PC]	
TONEARM PARTS				
72	Addition	EPC-P33		★ Cartridge
73	Addition	EPS-33ES		★ Stylus
ACCESSORIES				
A1	SFNUC13M01	SFNUC13G01	[EK]	Instruction Book
		SFNUC13I01	[Ei]	
		SFNUC13P01	[PA, PE, PC]	
		SFNUC13S01E	[E, EB, EH, EC]	
		SFNUC13X01	[other]	
A4	SFDAC05M01	SFDAC05G02	[EK]	AC Cord ⚠
		SFDAC05L01	[XL]	
		SFDAC05X02	[XA]	
		SFDAC05N01	[PA, PE, PC]	
		SFDAC05E02	[other]	
A5	Addition	SFDKI19118	[XA] only	2 Pin Plug ⚠
A6	Addition	QJP0803S	[PA, PE, PC] only	Adaptor ⚠
PACKING PART				
P1	SFHPC13M01	SFHPC13C01	○ [EF] only	Carton Box
		SFHPC13M01	○ [other]	
		SFHPC13F21	⊗ [EF] only	
		SFHPC13S21	⊗ [other]	

EXPLODED VIEW

- Addition of cartridge and stylus



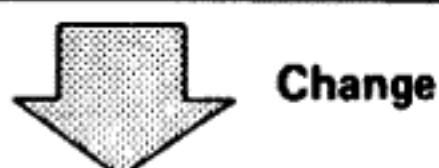
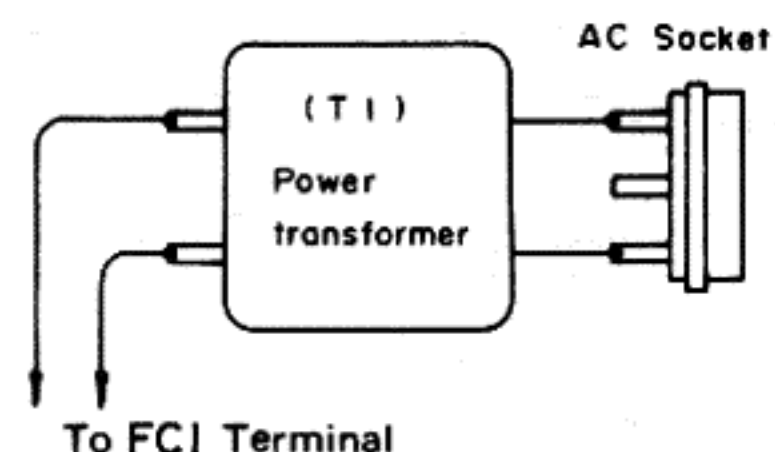
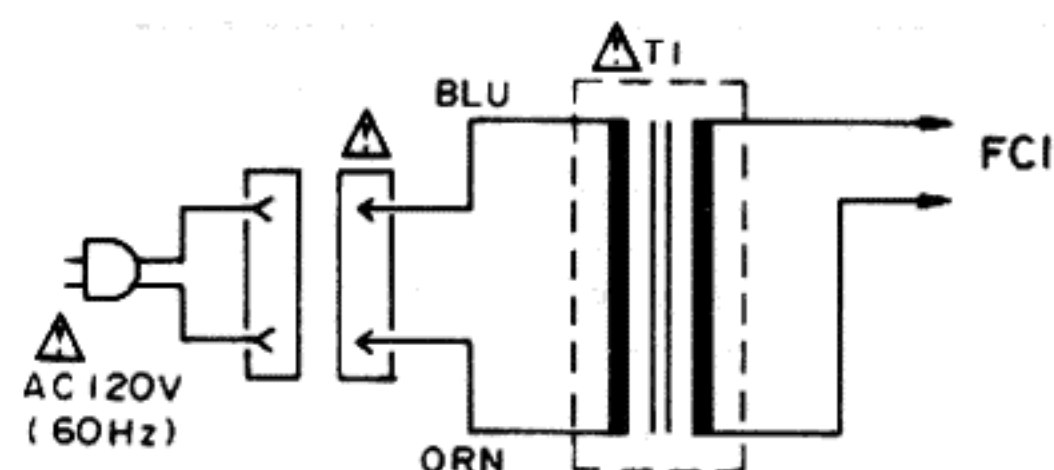
■ SCHEMATIC DIAGRAM AND PRINTED CIRCUIT BOARD

Important safety notice:

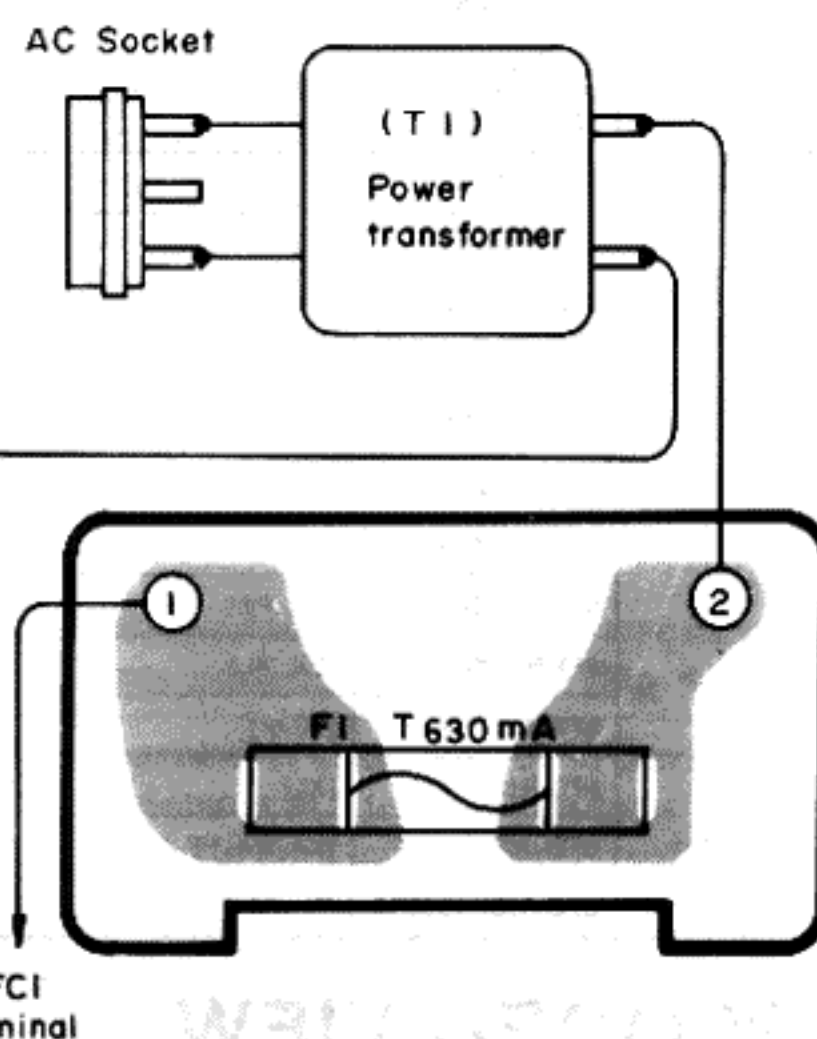
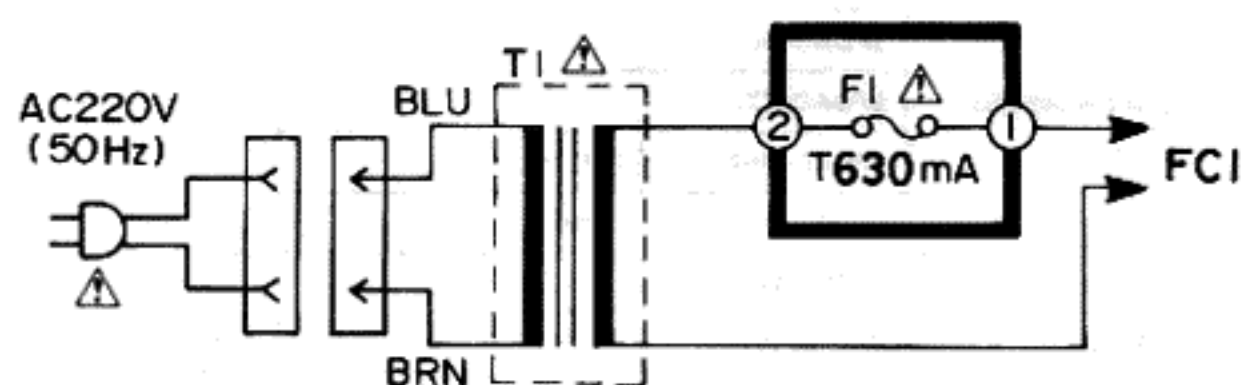
Components identified by Δ mark have special characteristics important for safety.
When replacing any of these components use only manufacturer's specified parts.

• Change in power source circuit

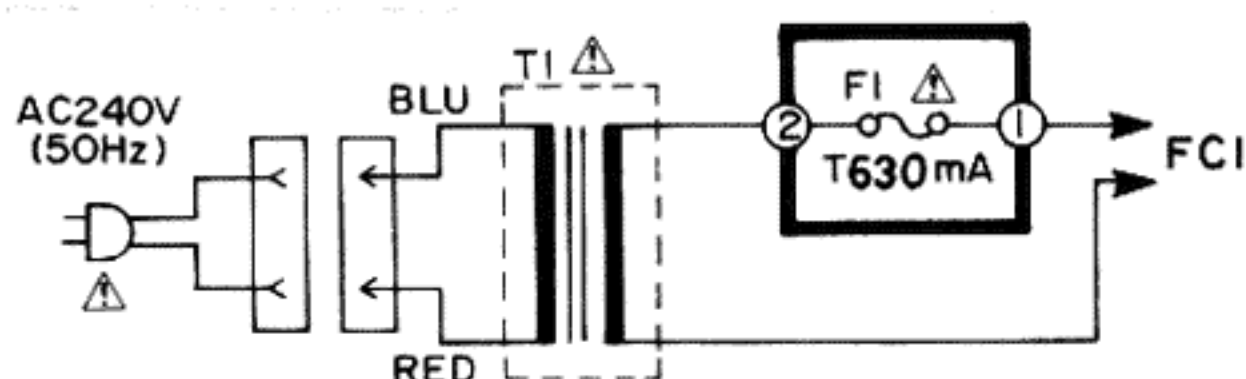
Product for U.S.A. ([M] area)



Product for Continental Europe ([E], [EG], [EB], [EH], [EF], [Ei] and [EC] areas.)

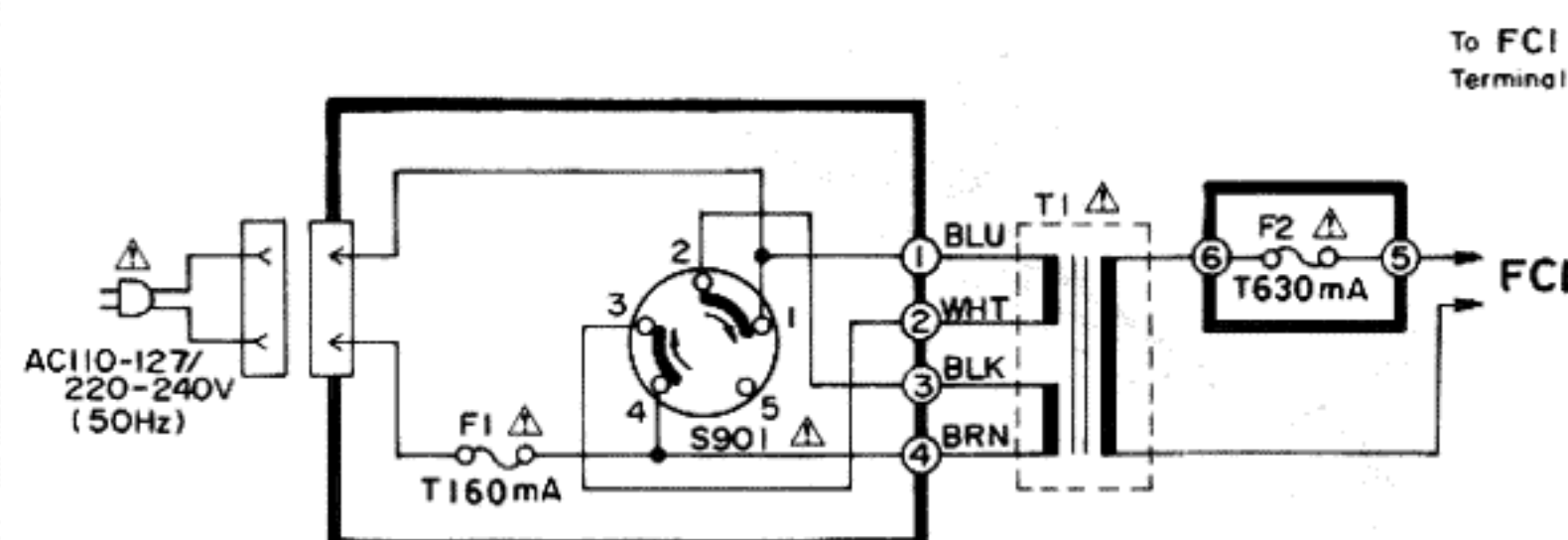


Product for United Kingdom and Australia ([EK] and [XL] areas)

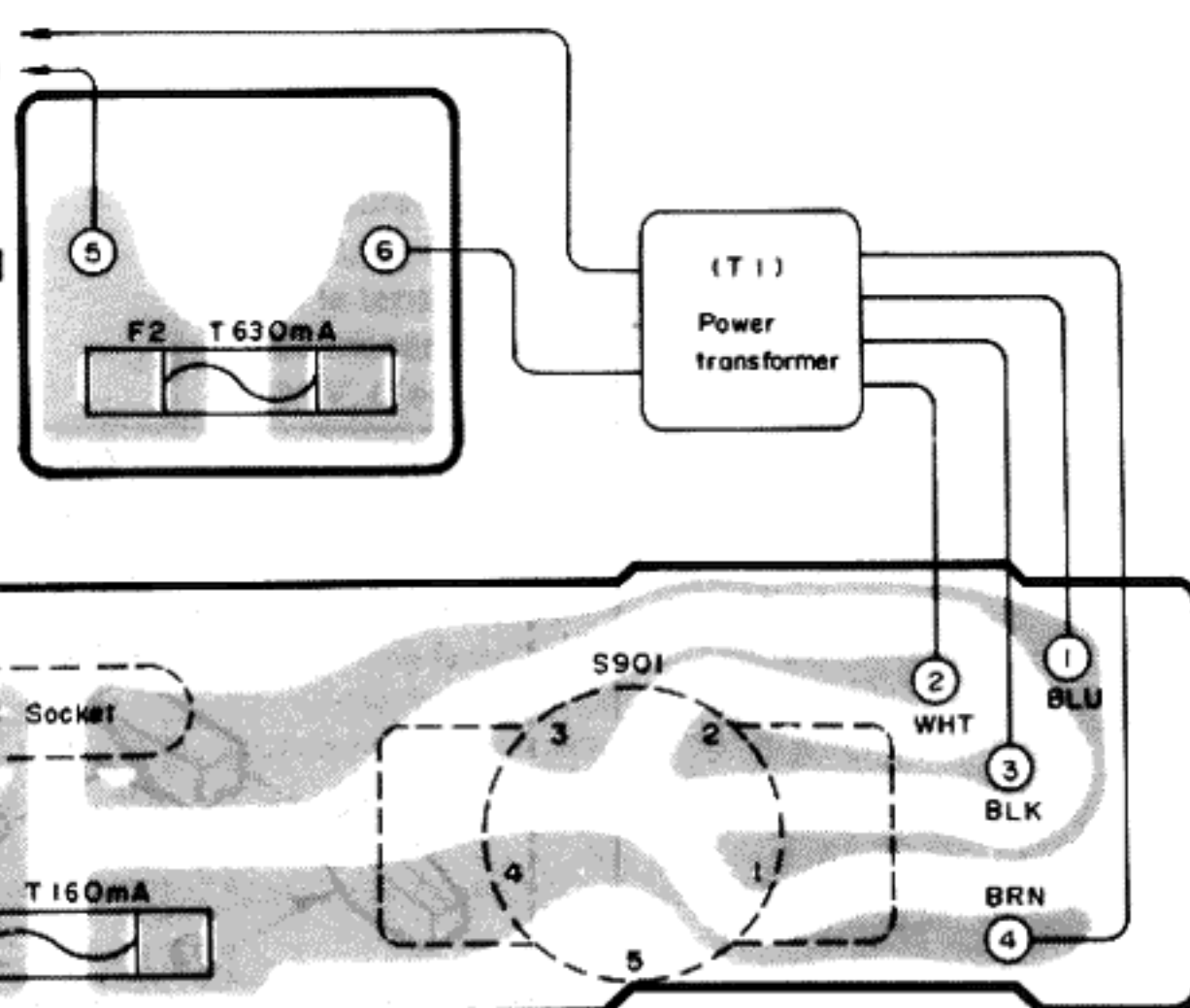


To FCI Terminal

Product for Southeast Asia, Oceania, Africa, Middle Near East, Central South America, Far East PX, European Military and European Audio Club. ([XA], [PA], [PE], and [PC] areas.)



To FCI Terminal



■ REPLACEMENT PARTS LIST

Notes:

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

Ref. No.	Part. No.	Description
INTEGRATED CIRCUITS		
IC1	AN7812	Regulator
IC2	AN78N05	Regulator
IC101	AN6638	Turntable Drive
IC201	AN6683	Turntable Control
IC301	MN1425FPT	Micro Computer
IC302	MN1402FPM	Micro Computer
IC401	AN6690	Arm Motor Drive & Blank Groove Detector
IC402	AN6912	Comparator
IC951	AN6914	Comparator
TRANSISTORS		
Q301, 304, 364, 402, 951	2SD636	Switching
Q302, 303	2SD892	Switching
Q306, 311, 412, 952, 953	2SB641	Switching
Q401, 411, 413	UN1111	Switching
Q415	2SC2206	OSC
Q430	2SD638	Regulator
DIODES		
D2~5	SVDAY5525S	LED
D6~9	Δ SVD1SR35200V	Rectifier
D301, 302, 343	SVDGL-9PG2	LED
D303~311, 342	SVDGL-9HY82	LED
D312	MA4062	6.2V Zener
D313~319, 321~323, 347, 430, 431, 951, 952	MA165	Switching
D401	MA4068	6.8V Zener
D402	MA4110	11V Zener
D501, 701	$\textcircled{S}$ MA162A	Switching
D502	SVDSL31VC3	LED
CRYSTAL		
X201	SVQSH41TR	4.1931 MHz
CERAMIC OSC		
X401	SVFCSB540P3	540 kHz
VARIABLE RESISTORS		
VR302	EVJE1AF20B54	Stylus Cue-down Position Control, 50 k Ω (B)
VR401	EVN61AA00B55	Sensor Gain Adjustment, 500k Ω (B)
VR402	EVN61AA00B25	Sensor Resolution Adjustment, 200k Ω (B)
VR501	EVNK0AA00B14	Servo Gain Adjustment, 10k Ω (B)
RELAY		
RL701	SFDYQ11N02	Muting

Ref. No.	Part. No.	Description
SWITCHES		
S1	Δ SFDSC02N02	Power
S301~314	EVQQS405K	Operation
S315, 317	SFDSHSW08314	Speed and Size Selector
S316	SFDSHSW08315	Sens Selector
S601	SFDSC02N03	Rest
S701	SFDSC05N01	Reset
S901	Δ SFDSHXW225-3	Voltage Selector
[XA, PA, PE, PC] only		
PHOTO INTERRUPTERS		
PC501	0N1186	Offset Angle Sensor
PC502	SFPABJ0205R	Blank Groove Sensor
PC601	0N1161	Tonearm Position Sensor
HALL ELEMENT		
H101, 102	0H-002	Turntable Position Detector
POWER TRANSFORMER		
T1	Δ SLT57DTE15E	Power Source
[EK, XL]		
T1	Δ SLT57DTS17E	Power Source
[XA, PA, PE, PC]		
T1 [other]	Δ SLT57DTS16E	Power Source
FUSE		
F1	Δ XBAS2C016T1B	250V, T160 mA
[XA, PA, PE, PC]		
F1 [other]	Δ XBA2C06T1B	250V, T630 mA
F2	Δ XBA2C06T1B	250V, T630 mA
[XA, PA, PE, PC] only		
CABINET AND CHASSIS PARTS		
1	SFADC13N01E	Dust Cover (1)
1-1	SFGZJ02N01	Rubber Cushion (2)
2	SFGZC02N01	Rubber Cushion (2)
3	SFUMC02N14	Latch, Dust Cover (2)
4	SFUMQ06N22	Latch, Dust Cover (2)
5	$\textcircled{O}$ SFACC13N01E	Cabinet (1)
5	$\textcircled{K}$ SFACC13N21E	Cabinet (1)
5-1	$\textcircled{O}$ SFKBB2N01	Badge (1)
5-1	$\textcircled{K}$ SFKBB2N21	Badge (1)
6	SFGCQ06X01	Rubber Cushion, Transformer (2)
7	SFKKC13S01	Ornament (1)
8	SRKTK15N26	Knob, Power (1)
9	SFKTC13N02	Knob, Start Stop (1)
10	SFKTC13N01	Knob, Operation (1)
11	SFUPC13N01	Guide (1)
12	SFUMC13N02	Holder (B) (1)
13	SFUMC13N01	Holder (A) (1)
14	SFGBC10-01	Belt (1)

Ref. No.	Part. No.	Description
15	SFUMQ06N06A	Worm Ass'y (1)
16	SFMHC02N02R	Motor, (With Capstan) (1)
17	SFUMC02N07	Rubber Cushion (1)
18	SFUMC02N05	Lever, Switch (1)
19	SFUMQ06N09	Holder, Rest Switch (1)
20	SFUZC05N02E	Rope Ass'y (1)
21	SFXJC02N03	Guide, Rail (1)
22	SFUMQ06N07	Clamper, Guide Rail (1)
23	SFGCQ06N01	Rubber, Cushion (1)
24	SFUMC02N06	Base, Rest Switch (1)
25	SFUPBL3N11E	Base, Motor (1)
26	SFUML11R03	Wheel, Tonearm Drive (1)
27	SFUMC02N10	Holder, Lead Wire (1)
28	SFUZC02N01	Rod, Rest Switch (1)
29	SFUMC02N12	Holder, Lead Wire (1)
30	SFUMV05N23	Cap (1)
31	SFATQ06N01E	Hinge (2)
32	SFUKE13N01E	Base, Tonearm (1)
33	SFGZBL3N03	Rubber Cushion (1)
34	SFGCC05N05	Rubber Cushion, Guide Rail (1)
35	SFUMC05N22	Pulley (1)
36	SFQCC05N01	Spring, Insulator (4)
37	SFGAJ02N01	Insulator (4)
38	SFAUC13N01	Bottom Cover (1)
39	SFEHJ02N02E	Phono Output Cord (1)
40	SFKTQ06N01	Knob, Selector (3)
41	SFKTQ06N02	Knob, Tonearm Down Adjuster (1)
42	SFUMJ02N14	Cover, Rest Switch (1)
43	$\textcircled{O}$ SFACC13N011	Cover (1)
43	$\textcircled{K}$ SFACC13N211	Cover (1)
44 [XA]	SFNNC13X01	Name Plate (1)
44 [EG]	SFNNC13R01	Name Plate (1)
44 [PC]	SFNNC13P02	Name Plate (1)
44	SFNNC13P01	Name Plate (1)
[PA, PE]		
44 [E, EC]	SFNNC13S01	Name Plate (1)
44	SFNNC13G01	Name Plate (1)
[EK, XL]		
44 [other]	SFNNC13Q01	Name Plate (1)
45 [XL]	Δ SFDJHSC0491	AC Socket (1)
45	Δ SFDJHSC04912	AC Socket (1)
[XA, PA, PE, PC]		
45 [other]	Δ SFDJHSC0516	AC Socket (1)
46	SFDJJ02N04E	Jack, Phono Output (1)
47	SFWEC06N01	45 rpm Adaptor (1)
48	SFQAC06N01	Spring, 45 rpm Adaptor (1)
49	SFTGQ06N01	Turntable Mat (1)
50	SFTEQ05N01	Turntable Platter (1)
51	SFTMC07-01E	Magnet (1)
52	SFMGQ34N01	Cover, Coil (1)
53	SFMZC06N01R	Stator Flame Ass'y (1)
54	SFDJC13N03E	Connector, Ass'y (1)
55	SFGKQ06N01	Cap (1)
56	SFQA913-01	Spring (1)
57	SFQHQ34N22	Spring (1)

Ref. No.	Part. No.	Description	
58	SFUMC13N03	Prism	(1)
59	○ SFACC13N012	Cover	(1)
Except for [XA, PA, PE, PC]			
59	Ⓢ SFACC13N212	Cover	(1)
Except for [XA, PA, PE, PC]			
TONEARM PARTS			
61	SFPAMJ0201A	Tonearm Ass'y	(1)
62	SFPKDJ0201R	Tonearm Base	(1)
62-1	SFPSP00504	Spring	(1)
63	SFPGML1101	Rubber, Tonearm Guide	(2)
65	SFPABJ0205R	Sensor Ass'y	(1)
66	SFDZC05N01E	Solenoid Ass'y	(1)
67	SFPCS0Q601	Cover, Indicator	(1)
68	SFPAK0Q601	Plate, Indicator	(1)
69	SFPCSJ0201	Holder, LED	(1)
70	SFPGM0Q601	Rubber, LED	(1)
71	SFPSP00302	Spring, Adjustor	(2)
72	EPC-P33	★ Cartridge	(1)
73	EPS-33ES	★ Stylus	(1)
SCREWS, WASHERS AND NUTS			
N1	SFXGQ06N01	Screw	(2)
N2	Ⓢ XTV3+10BFN	Screw, Ⓢ3×10	(11)
N3	XTW3+14TFZ	Screw, Ⓢ3×14	(2)
N4	XTV3+6JFZ	Screw, Ⓢ3×6	(4)
N5	XTW3+14QFYR	Screw, Ⓢ3×14	(6)
N6	XSN3+30S	Screw, Ⓢ3×30	(1)
N7	XWE3D10	Washer, Ⓢ3	(1)
N8	XNC3HS	Nut	(1)

Ref. No.	Part. No.	Description	
N9	CSTW3	Washer	(2)
N10	XWE3A8BW	Washer	(1)
N11	XTV3+20J	Screw, Ⓢ3×20	(1)
N12	XTN16+10G	Screw, Ⓢ1.6×10	(1)
N13	Ⓢ XTV3+6BFN	Screw, Ⓢ3×6	(4)
N14	SFXWC06N02	Washer	(1)
N15	Ⓢ XSN3+5S	Screw, Ⓢ3×5	(3)
N16	SFPEV0Q601	Screw, Cartridge	(1)
N17	XTS26+6JFZ	Screw, Ⓢ2.6×6	(1)
N18	XYN2+C4FZ	Screw, Ⓢ2×4	(1)
N19	SFXN623-1	Nut	(1)
N20	SFPTN00301	Screw	(1)
N21	Ⓢ XSN3+12S	Screw, Ⓢ3×12	(1)
N22	Ⓢ XWA3B	Washer	(1)
N23	XTN23+6JFZ	Screw, Ⓢ2.3×6	(1)
ACCESSORIES			
A1 [EK]	SFNUC13G01	Instruction Book	(1)
A1 [Ei]	SFNUC13I01	Instruction Book	(1)
A1	SFNUC13P01	Instruction Book	(1)
[PA, PE, PC]			
A1	SFNUC13S01E	Instruction Book	(1)
[E, EB, EH, EC]			
A1 [other]	SFNUC13X01	Instruction Book	(1)
A2	SFDHC05N01	Phono Output Cord	(1)
A3	SFDLJ02N11E	Ground Wire	(1)
A4 [EK]	Ⓢ SFDAC05G02	AC Cord	(1)
A4 [XL]	Ⓢ SFDAC05L01	AC Cord	(1)
A4 [XA]	Ⓢ SFDAC05X02	AC Cord	(1)
A4	Ⓢ SFDAC05N01	AC Cord	(1)
[PA, PE, PC]			
A4 [other]	Ⓢ SFDAC05E02	AC Cord	(1)

Ref. No.	Part. No.	Description	
A5 [XA]	Ⓢ SFDKI19118	2 Pin Plug	(1)
only			
A6	Ⓢ QJP0603S	Adaptor	(1)
[PA, PE, PC] only			
PACKING PARTS			
P1	○ SFHPC13C01	Carton Box	(1)
[EF] only			
P1	○ SFHPC13M01	Carton Box	(1)
[other]			
P1	Ⓢ SFHPC13F21	Carton Box	(1)
[EF] only			
P1	Ⓢ SFHPC13S21	Carton Box	(1)
[other]			
P2	SFHHC13N01	Pad, Front	(1)
P3	SFHHC13N02	Pad, Rear	(1)
P4	SFHKC05N01	Clamper, Turntable Platter	(2)
P5	SFHKQ06N01	Spacer, Tonearm	(1)
P6	SFHSC13N01	Spacer, Dust Cover	(1)
P7	SFYH60×60	Polyethylene Bag	(1)
P8	SFYH17×16	Polyethylene, Cord	(1)
P9	SFYF32A35	Polyethylene, Turntable Mat	(1)
P10	SFHDD04N01	Pad, Turntable Mat	(1)

Color	Areas	Color	Areas
(S) (K)	[E] Switzerland and Scandinavia.	(S) (K)	[XA] Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
(S) (K)	[EK] United Kingdom.		
(S) (K)	[XL] Australia.		
(S) (K)	[EG] ... F.R. Germany.		
(S) (K)	[EB] Belgium.	(S) (K)	[PA] Far East PX.
(S) (K)	[EH] Holland.	(S) (K)	[PE] European Military.
(S) (K)	[EF] France.	(S) (K)	[PC] European Audio Club.
(S) (K)	[Ei] Italy.		
(S) (K)	[EC] Czechoslovakia.		