2284

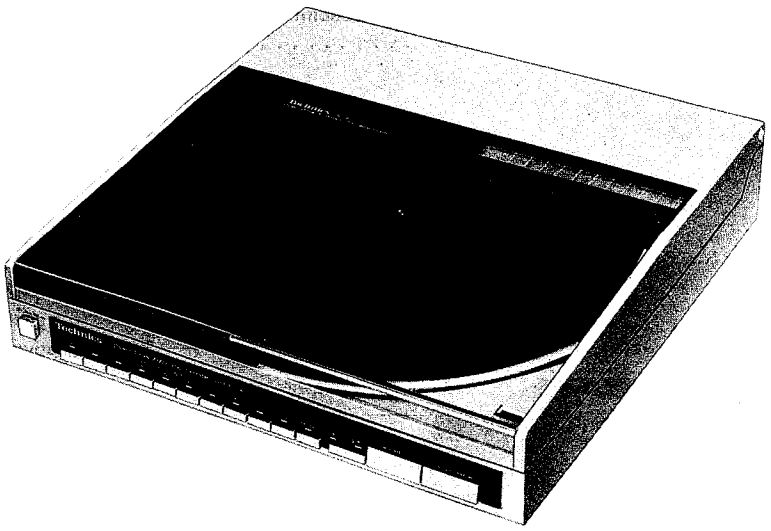
ORDER NO. SD82082288C1

Service Manual

Direct Drive Automatic Turntable System

SL-6

[M], [MC]



*** The cartridge shown here is an option.**

Areas

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

Specifications

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

■ General

Power supply:	120 V AC, 60 Hz
Power consumption:	12 W
Dimensions: (W×H×D)	31.5 × 8.8 × 31.5 cm (12-1/2" × 3-1/2" × 12-1/2") 31.5 × 39 × 31.5 cm (12-1/2" × 15-23/64" × 12-1/2") (Maximum height when top (dust cover) is open.)
Weight:	4.7 kg (10.4 lb.)

■ Turntable section

Type:	Direct drive Fully automatic turntable
Features:	Auto start/Auto lead-in Auto return Auto stop Programmable band selection Repeat play Auto speed select Manual speed selection possible Auto size select Record presence detection
Drive method:	Direct drive
Motor:	Brushless DC motor
Drive control method:	F·G servo 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:	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

Panasonic Company
Division of Matsushita Electric Corporation of America
One Panasonic Way, Secaucus, New Jersey 07094

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

Panasonic Canada
Division of 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

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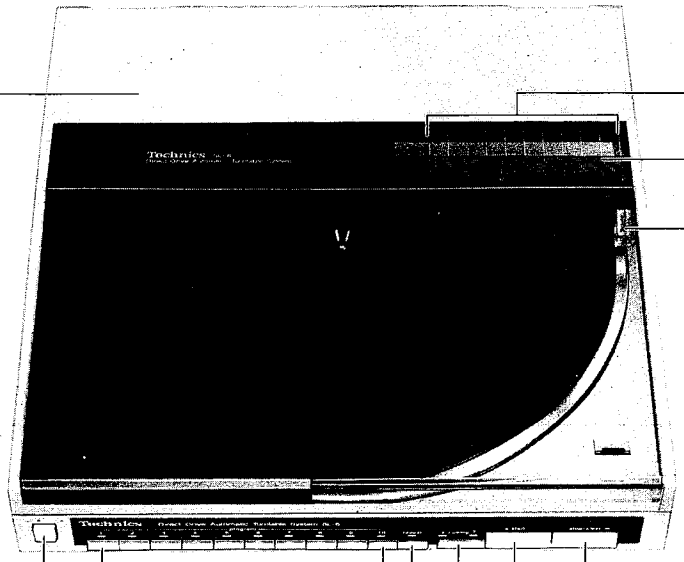
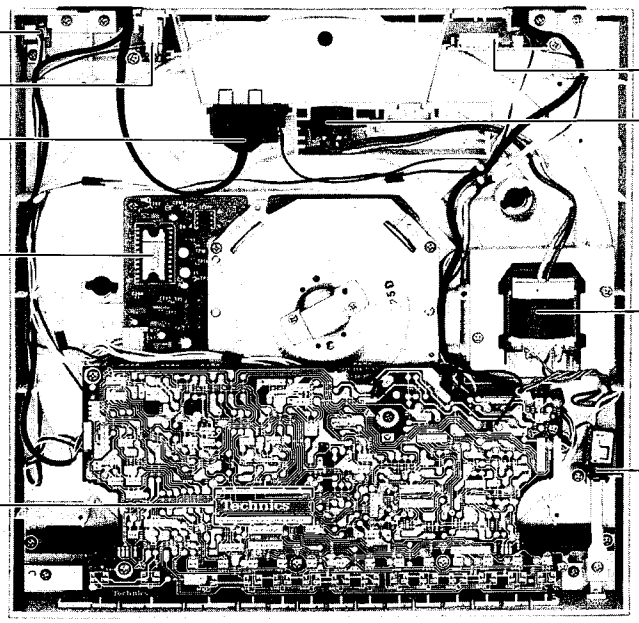
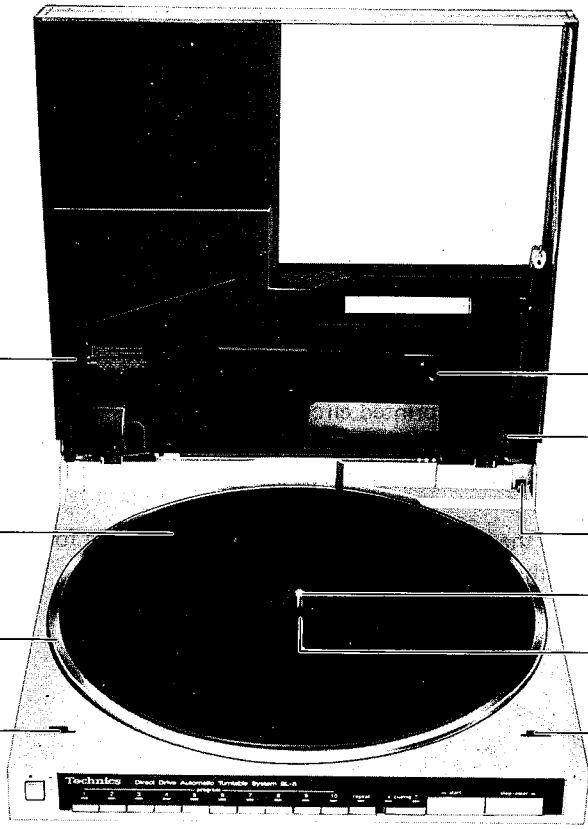
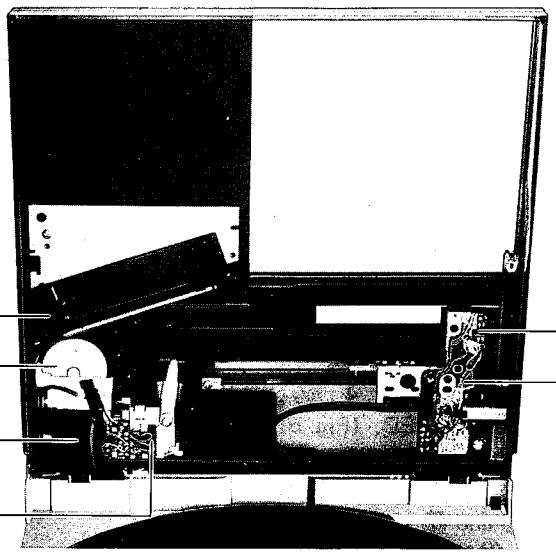
■ LOCATION OF CONTROLS






Technics
Synchro-rec jack
(R)
Phono output terminals
(L)
AC input socket
Ground


Shutter switch
Turntable mat
Turntable platter
Optical sensor sensitivity selector
Stylus cue-down position adjustment screw
Stylus pressure adjustment screw
Cabinet switch
Center spindle
45-rpm adaptor
Speed selector


Blank detecting sensor
Drive gear
Arm motor
Rest switch
Offset sensor
Phono output P.C.B.

■ DISASSEMBLY INSTRUCTIONS

• How to remove the turntable platter

1. Open the upper cabinet.
2. Remove the turntable mat and lift the turntable platter. **(Fig. 1)**

Note:

(1) When removing the turntable platter, it is not necessary to remove the 45 r.p.m. adaptor.

(2) The turntable platter is tight fitted onto the center spindle. When removing the turntable platter, take care not to give damage to the upper cabinet, arm motor cover and tonearm cover.

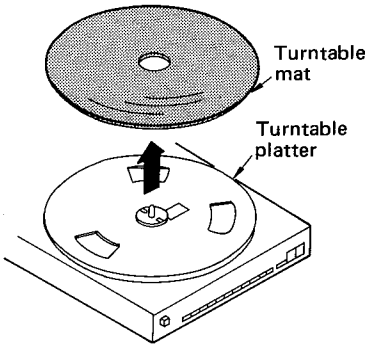


Fig. 1

• How to remove the bottom board

1. Remove the turntable platter.
2. Remove the 4 screws. **(Fig. 2 : ❶ ~ ❹)**

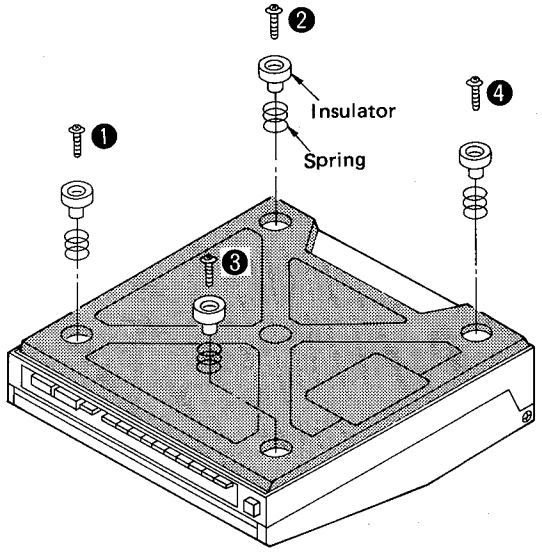


Fig. 2

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

1. Remove the bottom board.
2. Remove the 7 setscrews **(Fig. 3 : ❺ ~ ⓫)** of the printed circuit board.
3. Remove the optical sensor sensitivity selector switch and speed selector switch from the knob. **(Fig. 3-A)**
4. Remove the printed circuit board in the direction to the arrow Ⓐ.

Note:

The printed circuit board is grounded to the chassis by screw ⓫. When checking for conduction removing the screw ⓫, connect the earth terminal of P.C.B. to the chassis (stator frame).

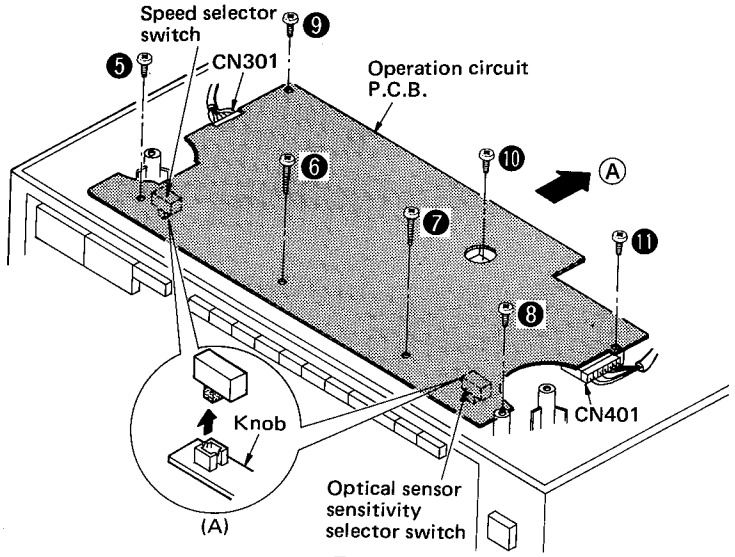


Fig. 3

• How to remove the switch (S301 ~ S312)

(Program keys, repeat and cueing control switches)

1. Remove the operation circuit P.C.B.
2. When removing S301 ~ S305, cut off the 2 claws **(Fig. 4 : ⓬, ⓭)** of LED holder. **(Fig. 4-A)**
3. Remove the LED from the holder, and raise the LED. **(Fig. 5)**
4. Release the claw Ⓐ of LED holder and remove the LED holder from the printed circuit board. **(Fig. 4)**
5. Unsolder to remove the switch terminals.
6. To remove S306 ~ S310, cut off claws ⓮ and ⓯.
7. To remove S311 and S312, cut off claws ⓰ and ⓱.

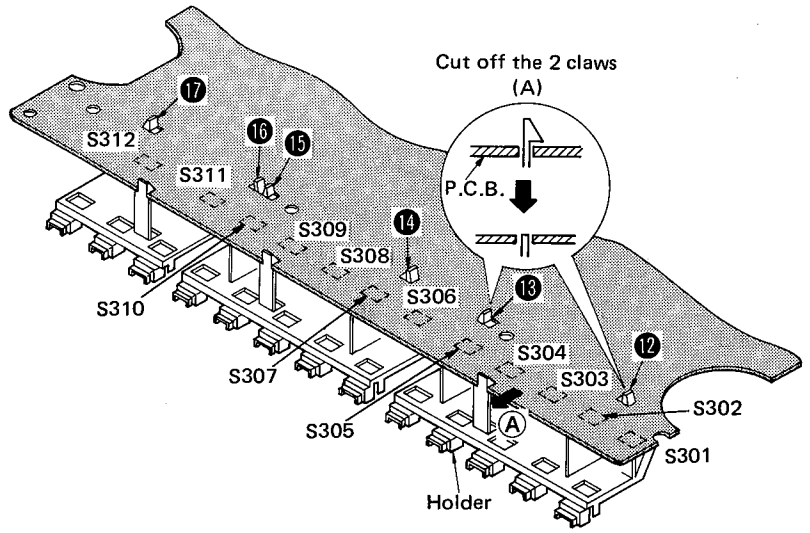


Fig. 4

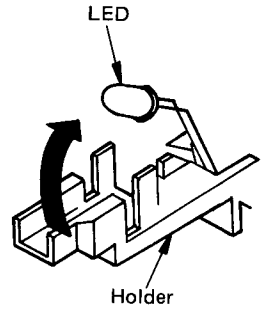


Fig. 5

- **How to remove the drive circuit P.C.B. and stator frame.**

1. Remove the operation circuit P.C.B.
2. Remove the 5 setscrews (**Fig. 6 :** ⑱ ~ ㉒) of the drive circuit P.C.B. and stator frame.
3. Pull out the connector. Then the drive circuit P.C.B. and stator frame can be removed.
4. Remove the 4 setscrews (**Fig. 7 :** ㉓ ~ ㉖) to separate the drive circuit P.C.B. and stator frame.

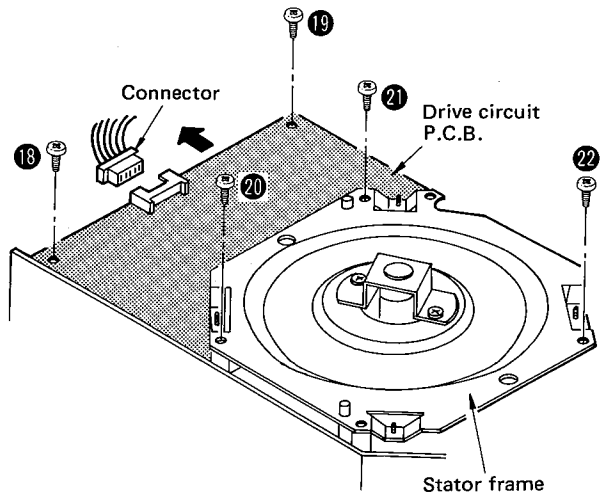


Fig. 6

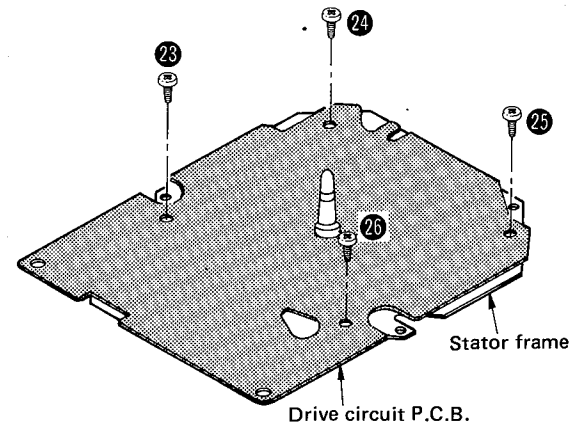


Fig. 7

- **How to remove the arm motor cover**

1. Open the upper cabinet.
2. Remove the 4 screws of the arm motor cover (**Fig. 8 :** ㉗ ~ ㉚) and detach the arm motor cover in the direction of the arrow.

- **How to remove the tonearm cover**

1. Open the upper cabinet.
2. Remove the 3 screws of the tonearm cover (**Fig. 8 :** ㉛ ~ ㉝) and detach the tonearm cover in the direction of the arrow.

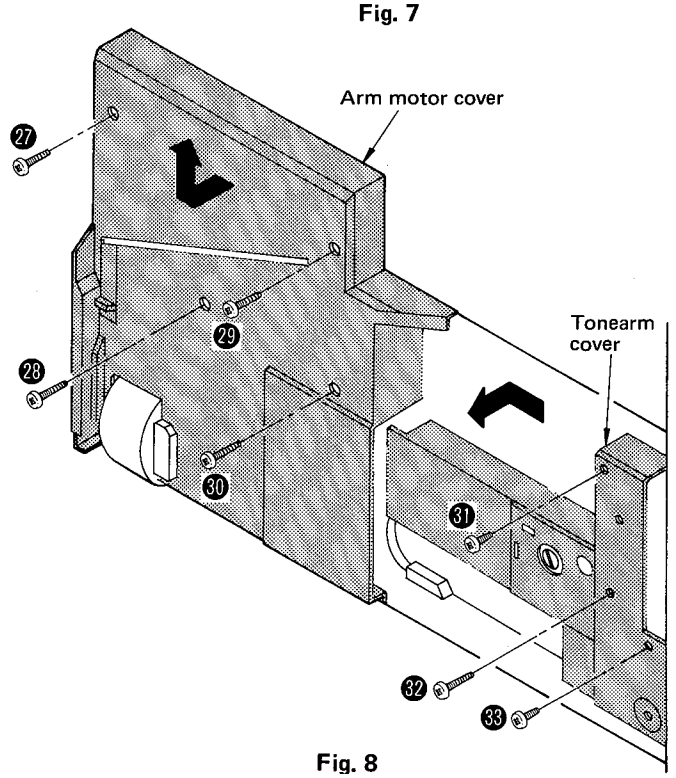


Fig. 8

- **How to remove the dust cover**

1. Open the upper cabinet and arm motor cover.
2. Turn the worm gear by hand to shift the tonearm a little inward.
3. Remove the 3 screws (**Fig. 9 :** ㉞ ~ ㊱) of the dust cover.
4. Remove the 2 setscrews (**Fig. 10 :** ㊲ , ㊳) of the dust cover. Then the dust cover can be removed.

- **How to remove the blank detecting sensor**

1. Open the upper cabinet and remove the arm motor cover.
2. Unsolder the lead wires of the blank detecting sensor.
3. Remove the screw of the guide plate. (**Fig. 9 :** ㊴)
4. Remove the rope fixture of the sensor. (**Fig. 9**)
5. Remove the guide rod fitting clip ㊵ and remove the guide rod. (**Fig. 9**)
6. Pull out the sensor in the direction of the arrow Ⓐ. (**Fig. 9**)

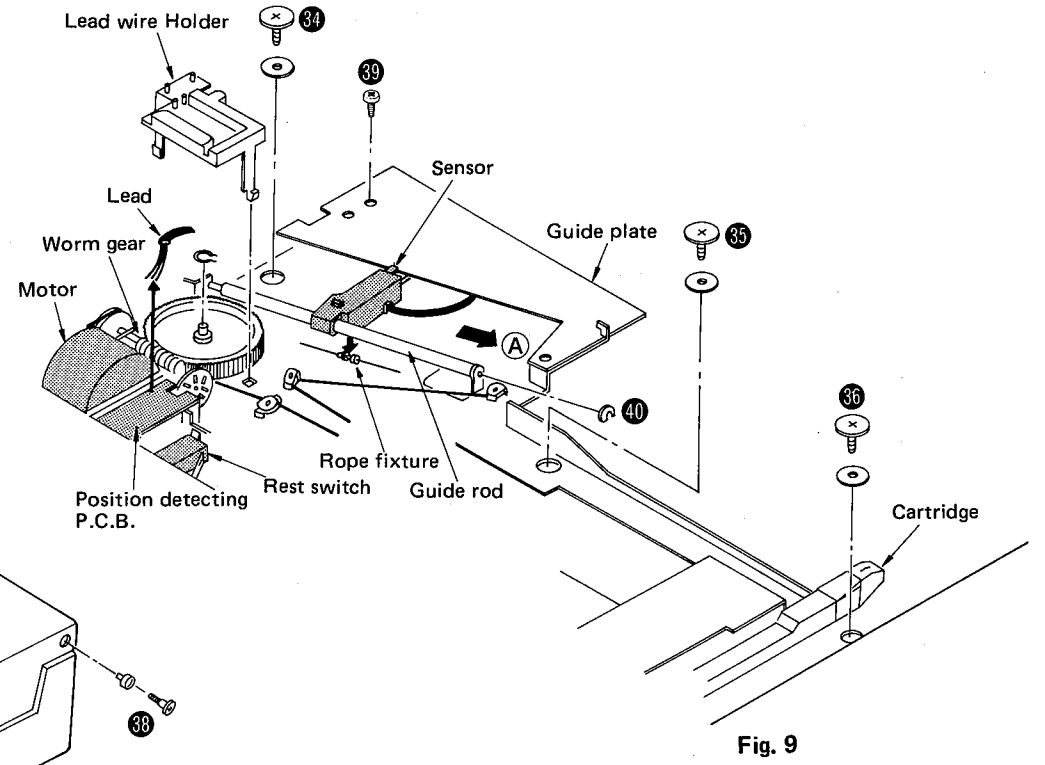


Fig. 9

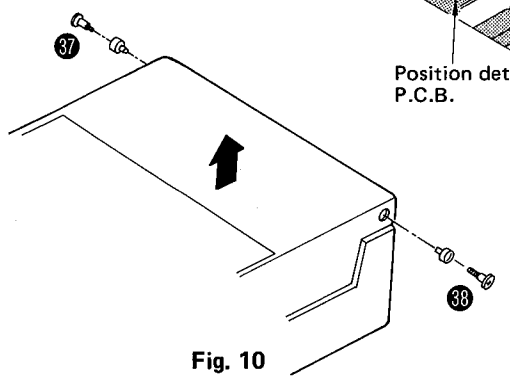
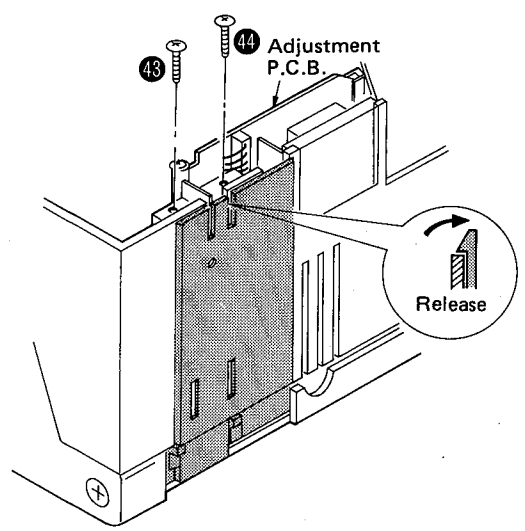


Fig. 10

- **How to remove the upper cabinet (Separation of upper cabinet and lower cabinet)**

1. Remove the bottom board.
2. Unsolder the lead wires of output terminal and remove the output terminal from the lower cabinet.
3. Pull out the 2 connectors (CN301, CN401) of the operation circuit P.C.B.
4. Remove the 4 screws (**Fig. 11, 12 :** ㊶ ~ ㊹) of the hinge.
5. The hinge claws are engaged with the lower cabinet. Release the claws and slowly lift the lower cabinet to separate it from the upper cabinet.



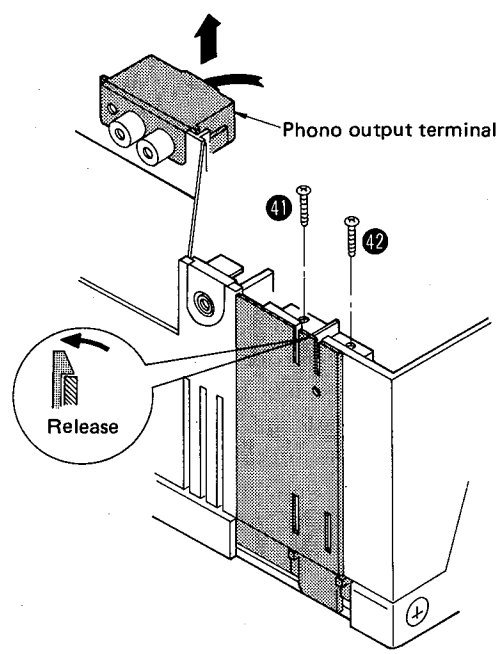


Fig. 11

• How to remove the tonearm

1. Remove the dust cover and tonearm cover.
2. Turn the worm gear by hand to move the tonearm inwards.
3. Unsolder the 5 lead wires of the cartridge. **(Fig. 13)**
4. Remove the screw of the tonearm. **(Fig. 14 : 45)**

• How to remove the cueing control ass'y

1. Remove the tonearm cover.
2. Unsolder the 2 lead wires of the cueing plunger. **(Fig. 13)**
3. Remove the 2 screws **(Fig. 13 : 46 , 47)** of the cueing control ass'y, and remove th ass'y in the direction of the arrow A.

• How to remove the tonearm position indicator board

1. Remove the tonearm cover.
2. Unsolder the 2 lead wires of the indicator. **(Fig. 13)**
3. Remove the screw of the tonearm position indicator board. **(Fig. 13 : 48)**

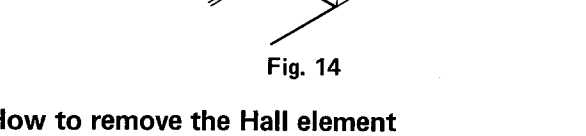


Fig. 14

• How to remove the 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. **(Fig. 15)**

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

• How to remove the 45 rpm adaptor

1. Remove the turntable platter.
2. The adaptor claw catches the turntable plater. Remove the adaptor by pusing it in the direction of the arrow. **(Fig. 16)**

Note: When removing the adaptor, be sure to remove the turntable platter beforechand, Otherwise, the adaptor claw will be broken.

* The turntable platter of this unit is greased. **(Fig. 17)** After replacing the turntable platter or when the adaptor operation is not smooth, apply grease to the platter. (It is recommended to use Grease 3 of Kit No. SZZE1003C.)

Note: Do not apply grease to parts other than those specified (outside surfaces of adaptor in particular). Alos, apply a proper amount of grease so that it will not run into the set.

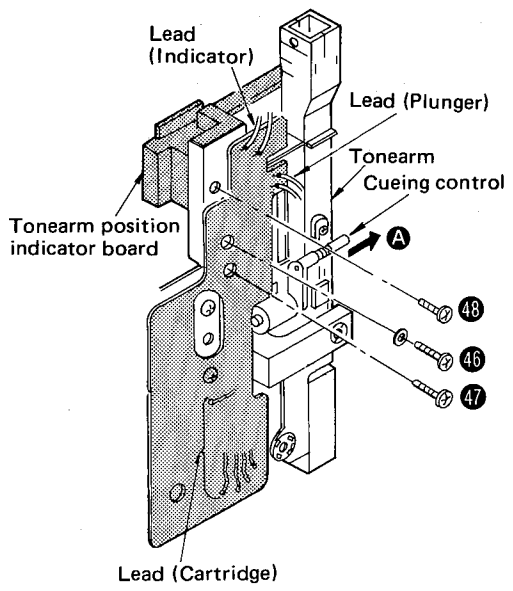


Fig. 13

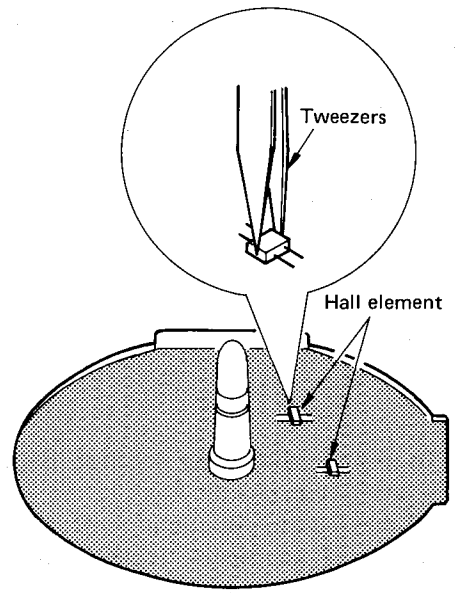


Fig. 15

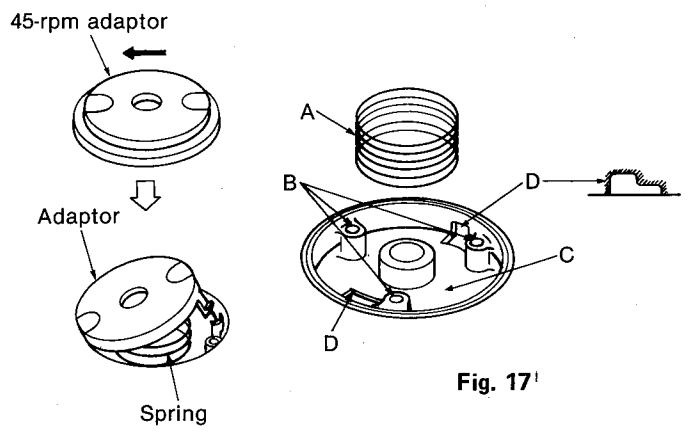


Fig. 16

Fig. 17

A: Side of spring
B: Bosses (3 portions) of turntable platter
C: Bottom of turntable platter
D: Notches (2 portions) of turntable platter

■ HOW TO SET THE TONEARM DRIVE ROPE

Set the rope according the following procedure.

1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Remove the lead wire holder. **(See Fig. 18)**
3. Remove the C-ring of the arm drive wheel and remove the drive wheel. **(See Fig. 18 : 49)**
4. Turn over the arm drive wheel, and set the rope in the order of 1 ~ 2. **(Fig. 19)**
5. Holding the rope with the hand, set the drive wheel and rope in the order of 3 ~ 8 of **Fig. 20.**
6. After setting the rope, match in tonearm and sensor with the position of rope fixture, and secure the parts.
7. Turn the worm gear by hand to see that the tonearm and sensor move, then set the C-ring.

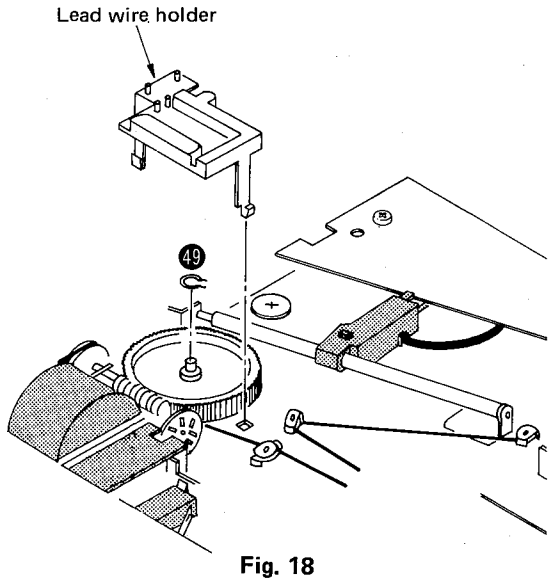


Fig. 18

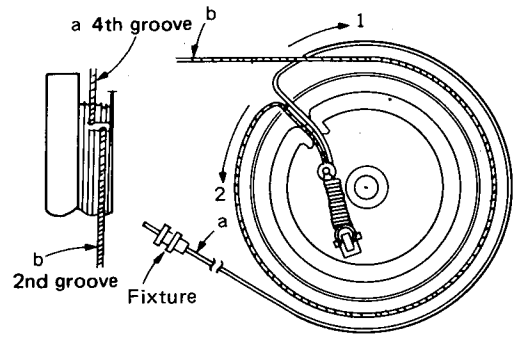


Fig. 19

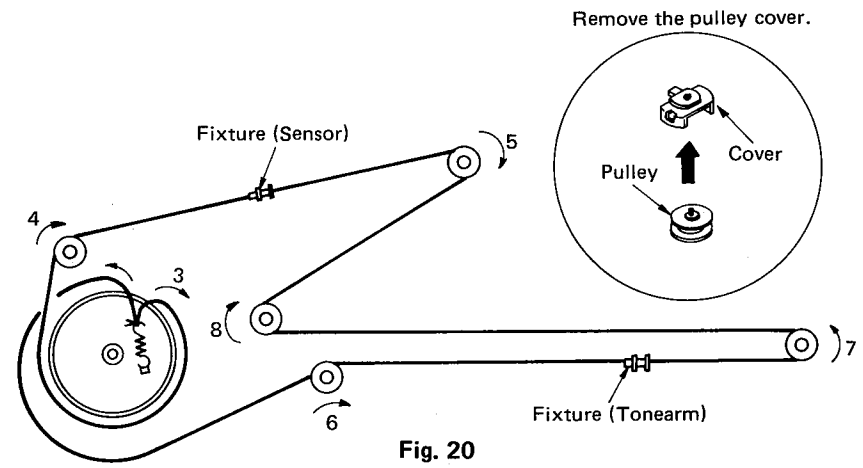


Fig. 20

■ HOW TO REPLACE CHIPS (RESISTOR)

1. Unsolder from chip by using solder sucker.
2. Remove chip with tweezers by rotating it while removing solder as shown in **Fig. 21.**
3. Solder circuit board first and then solder chip in the direction of the arrow as shown in **Fig. 22.**

Notes:

1. Do not use chip again which is removed from printed circuit board.
2. Use lead wire with insulator for replacement instead of chip jumper.

• Note for replacing chips

1. Do not heat chips more than three (3) seconds.
2. Be careful not to damage the electrode of chips.
3. Use soldering iron (less than 60W) and tweezers for replacing chips.

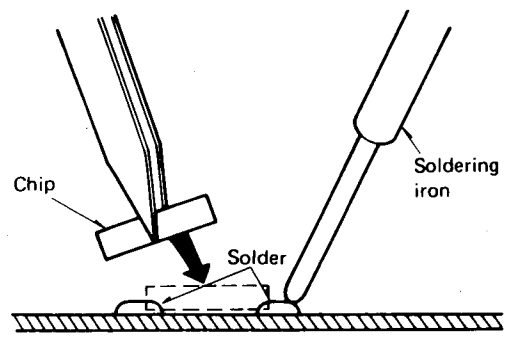
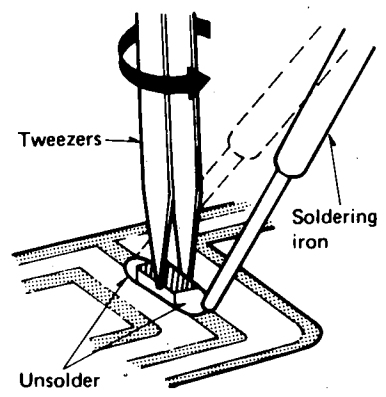


Fig. 21



■ CHECKING METHOD OF THE UNIT

1. How to use the repair table (Fig. 23)

① Remove the bottom board.
② Remove the operation circuit P.C.B. and connect the P.C.B. earth terminal to the chassis (Stator frame).
③ Put the set 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 set.

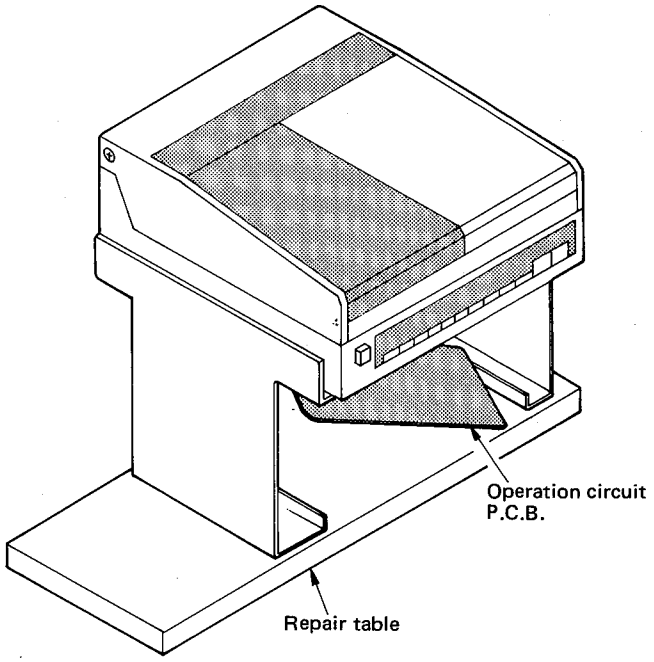


Fig. 23

2. How to raise the set (Fig. 24)

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 cabinet switch with tape.
④ Fit the turntable platter.
⑤ Raise the set and check the circuits.

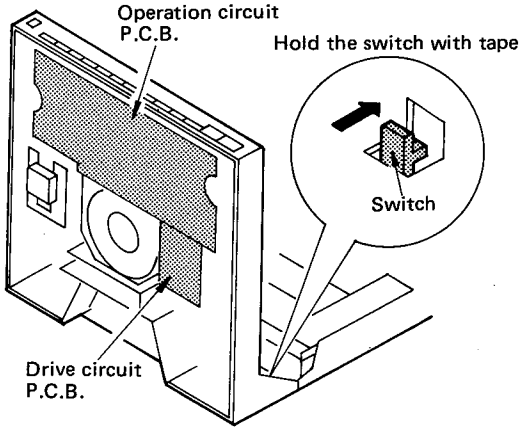


Fig. 24

3. How to turn over the set (Fig. 25)

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 set.
② Remove the bottom board.
③ Turn the power switch "on" and check the voltage.

Note: Do not push other switches.
[If the unit is operated under no-load condition (with turntable removed) for a long period of time, the drive IC will be damaged.]

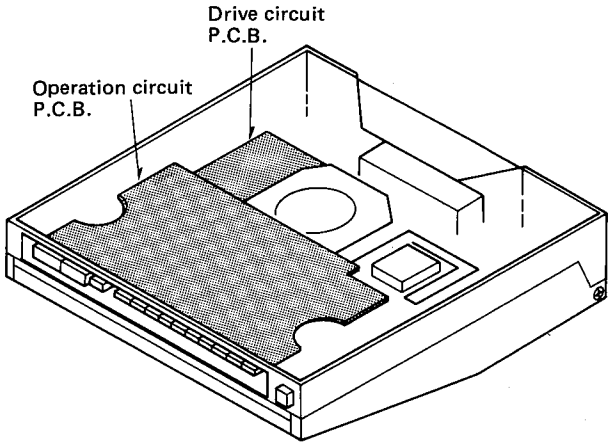


Fig. 25

■ MEASUREMENTS AND ADJUSTMENT

- **Adjustment points**

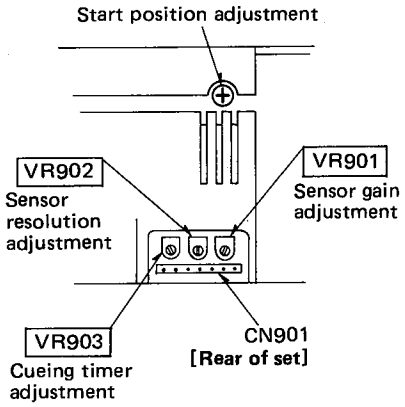


Fig. 26

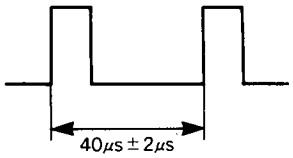


Fig. 28

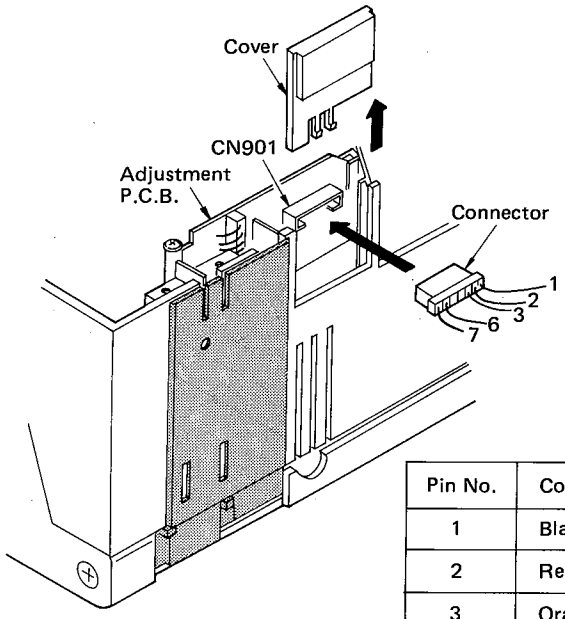


Fig. 29

Pin No.	Color	Description
1	Black	Ground
2	Red	Muting signal
3	Orange	Cueing signal
6	Blue	Sensor amp. output signal
7	Violet	Filter amp. output signal

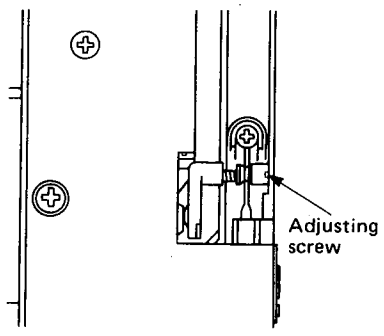
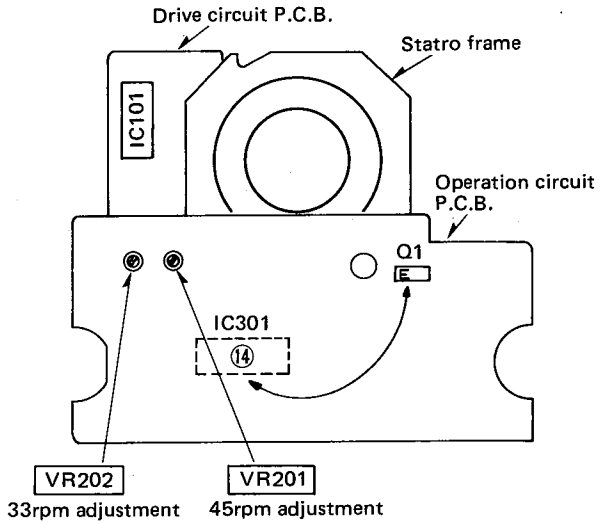


Fig. 33



* Connect between Q1 Ⓔ and IC301 ⑭ pin for clock frequency adjustments.

Fig. 27

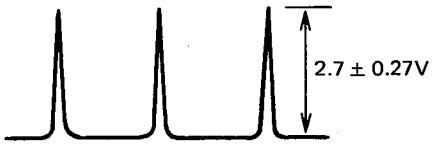


Fig. 30

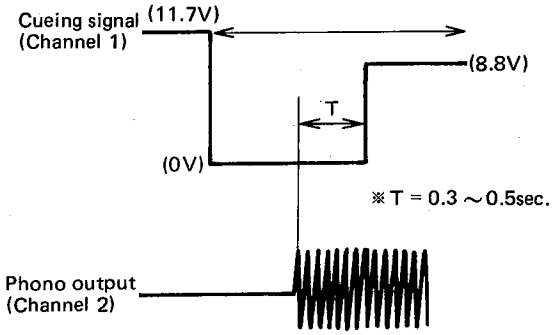


Fig. 31

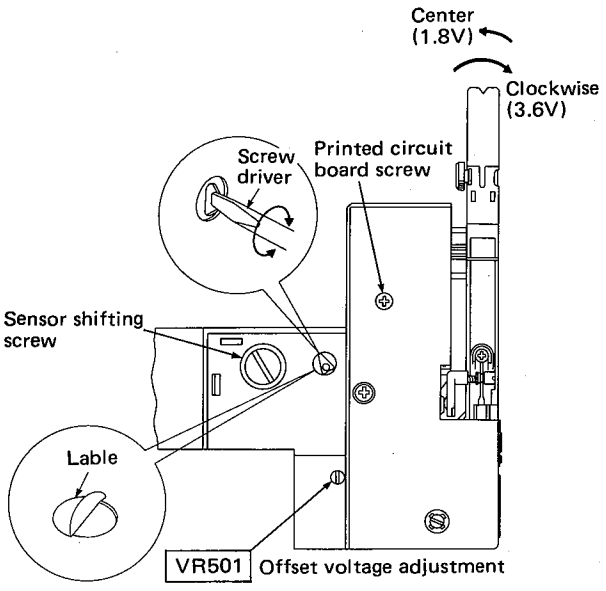


Fig. 32

• Equipment used and condition of the set

1. Oscilloscope (two channels)
2. DC voltmeter.
3. Record (SFTR007) for adjustment.
4. Connector for adjustment.
5. Remove the bottom board and remove the cover. **(Fig. 29)**
6. Set the optical sensor sensitivity selector to "M".

Step	Item	Preparations for adjustment	Adjusting portion	Adjusting method
1	**Start position**	1. Open the upper cabinet and put on the record. 2. Turn the power switch on. 3. Push the "Start" switch.	Descending position adjusting screw. (Fig. 26)	1. Turn the descending position adjusting screw. If it descends between tunes, turn the screw clockwise. If it descends outside the disc, turn the screw counterlockwise.
2	**Clock frequency**	1. Connect Q1 emitter to IC301 14-pin. (Fig. 27) 2. Connect the oscilloscope to IC301 13-pin.	VR301	1. Turn the power switch on. 2. Adjust VR301 so that the cycle of output waveform is 40μs ± 2μs. (Fig. 28)
3	**Sensor gain**	1. Remove the cover and insert the connector for adjustment into terminal CN901. (Fig. 29) 2. Connect the oscilloscope to 6-pin (+) and 1-pin (–). 3. Put on the record for adjustment with side A up.	VR901 (Fig. 26)	1. Turn the power switch on and move the tonearm to the blank area of the record. 2. Adjust VR901 so that the output voltage is 4V ± 0.4V.
4	**Sensor resolution**	1. Remove the cover and insert the connector for adjustment into terminal CN901. (Fig. 29) 2. Connect the oscilloscope to 7-pin (+) and 1-pin (–). 3. Put on the record for adjustment with with side A up.	(VR902) (Fig. 26)	1. Turn the power switch on. 2. Push the program key to let it search the tonearm. (Output is delivered between the tunes.) 3. Adjust VR902 so that the peak output between tunes is 2.7V ± 0.27V. (Fig. 30)
5	**Cueing timer**	1. Remove the cover and insert the connector for adjustment into terminal CN901. (Fig. 29) 2. Connect the unit to the amplifier. (Phono output) 3. Connect 3-pin (+) and 1-pin (–) to the channel (1) of two channel oscilloscope. 4. Connect the speaker terminal of amplifier to the channel (2) of two channel oscilloscope. 5. Connect the 2-pin and 1-pin. (Muting operation stops.) 6. Put on the record for adjustment with side B up.	VR903 (Fig. 26)	1. Turn the power switch on. 2. Move the tonearm to a recorded (groove) part of the record, and push the cueing switch for cueing down. 3. Check the time until completion of cueing (rise of cueing signal) after the stylus touches the record surfase. 4. Adjust VR903 so that the time until completion of cueing is 0.3 ~ 0.5 sec. (Fig. 31) Note: Set the sweep time of oscilloscope to 0.2 sec/cm or 0.5 sec/cm. For example, in the case of 0.2 sec/cm range, adjust it so that the cueing completion signal is delivered 2 scale (0.4 sec) later than delivery of phono output signal.
6	**Descending between tunes**	1. Open the upper cabinet and hold the cabinet switch with tape. 2. Put on the record for adjustment with side B up. 3. Close the upper cabinet. 4. Connect the unit to the amplifier. (Connect the speakers to speaker terminals.)	Sensor shifting screw (Fig. 32)	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 that descending position is at count "20 ~ 21". 5. If the descending position is wrong, open the upper cabinet and turn the sensor shifting screw. 6. Close the upper cabinet and push the program key 2. 7. Adjust so that the descending position is at count "20 ~ 21". Repeat steps 4 ~ 7.
7	**Tonearm offset angle**	1. Open the upper cabinet and hold the cabinet switch with tape. 2. Close the upper cabinet.	Adjusting screw (Fig. 33)	1. Turn the power switch on and push the start switch to shift the tonearm inward. 2. Open the upper cabinet. 3. Turn the adjusting screw so that the arm center matches the V-groove of the lift bar.

Step	Item	Preparations for adjustment	Adjusting portion	Adjusting method
8	**Servo gain and offset voltage**	1. Open the upper cabinet and hold the cabinet switch with the tape. 2. Close the upper cabinet. 3. Connect the DC voltmeter to CN301 terminal 3 and ground terminal. 4. Remove the lable of the tonearm cover.	VR501 (Servo gain) P.C.B. (Offset voltage) (Fig. 32)	1. Turn the power switch on and push the start switch to shift the tonearm inward. 2. Open the upper cabinet. 3. Completely shift the tonearm to the right. Then, adjust VR501 so than the voltage is 3.6V. **(Servo gain)** 4. Set the tonearm to the center and make sure that the output voltage is 1.8V. 5. If the voltage is not 1.8V, loosen the printed circuit board screw and move the board to the right or left with a screw-driver so that the output voltage becomes 1.8V. After the adjustment, tighten the printed circuit board screw. **(Offset adjustment)**
9	**Rotation speed**	1. Open the upper cabinet and put on the record.	VR201 (45 rpm) VR202 (33 rpm)	1. Turn the power switch on. 2. Set the speed selector switch to 45 rpm. 3. Turn VR201 to adjust the speed to the speed to the rated speed (45 rpm). 4. Set the speed selector switch to 33 rpm. 5. Turn VR202 to adjust the speed to the rated speed (33-1/3 rpm). **Note: Be sure to adjust 45 rpm. first.**

■ REPLACEMENT PARTS LIST...Electric Parts

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ 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.

Areas

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

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	AN7812	Regulator
IC101	AN6636	Drive
IC201	AN6552	FG Amplifier & Constant Voltage (Hall Element)
IC301	MN1425FPE	Micro Computer
IC401	AN6562	Arm Motor Control
IC801	AN6562	DC amplifier & Band Pass Filter
IC802	AN6912	Comparator
TRANSISTORS		
Q1 S	2SC1383Q	Regulator
Q301	2SD636	Speed Select
Q302	2SD636	Muting Relay Drive
Q303	2SD636	Cueing Drive
Q304	2SD892	Cueing Drive
Q305	2SB641	Switching
Q306	2SD636	Converter
Q308, 309	2SB641	Waveform Shaping
Q310	2SB641	Speed Select
Q311	2SD636	Start/Stop Select
Q312	2SD636	Switching
Q401, 402	2SD592	Arm Motor Control
Q403, 404	2SD638	Arm Motor Control
Q801	2SB641	Biass
DIODES		
D1 ⚠	SVDS1RBA20F	Rectifier
D2 S	MA1056	5.6V Zener
D301 ~ 311	SVDPR5704SF	Light Emitting Diode
D312 ~ 317	MA162A	Switching
D319 S	RVDRD7R5FB	7.5V, Zener
D320	SVDPR5704SF	Light Emitting Diode
D321	SVDPG5724SYF	Light Emitting Diode
D501	MA162A	
D502	MA162A	
D503	SVDPR3432S	Light Emitting Diode
D801, 802	MA162A	Slice & Integration
D803	MA1047TA	4.7V, Zener
D804, 805	MA162A	Biass
D806 S	RVDRD7R5FB	7.5V, Zener
SWITCHES		
S1 ⚠	SFDSC05N08	Power
S301 ~ 314	EVQQSH03B	Program, Reset, Cueing, Start & Stop
S315	SFDSHSW0699	Speed Selector
S601	SFDSD2MSL–C	Rest
S701	SFDSC05N01	Cabinet
S801	SFDSHSW0699	Gain Selector
VARIABLE RESISTORS		
VR201, 202	EVTS3MA00B54	Speed Adj., 50kΩ (B)
VR301	EVNK6AA00B24	Clock Frequency Adj., 20kΩ (B)
VR501	EVNK6AA00B54	Servo Gain Adj., 50kΩ (B)
VR901	EVNK6AA00B15	Gain Adj., 100kΩ (B)
VR902	EVNK6AA00B15	Detecting Sensitivity Adj., 100kΩ (B)
VR903	EVNK6AA00B24	Cueing Timer Adj., 20kΩ (B)

Ref. No.	Part No.	Description
COMPONENT COMBINATION		
Z301	EXBT44471K	470Ω x 4
Z302	EXBRB7471K	470Ω x 7
Z303	EXBP84333K	33kΩ x 4
Z304	EXBP84103K	10kΩ x 4
Z305	EXBP84332K	3.3kΩ x 4

Ref. No.	Part No.	Description
PHOTO INTERRUPTERS		
PC501 PC601 PC701	ON1186 ON1161 ON2159	Arm Position Offset Angle Blank Grovve
RELAY		
RL501	SFDYQ11N01	Muting

Ref. No.	Part No.	Description
HALL ELEMENT		
H1, 2	OH–002	Turntable Posistor Detector
POWER TRANSFORMER		
T1 [M] ⚠	SLT48DTL3A	Power Source
T1 [MC] ⚠	SLT48DT11C	Power Source
FUSE		
F1 [MC] only ⚠	XBA2F08NU100	800mA, 250V

Ref. No.		Part No.	Value
RESISTORS			
R1	S	ERD25FJ471	470
R2	S	ERD25FJ101	100
R3	S	ERX1ANJ270	27
R4	S	ERD25FJ102	1K
R101		ERD10TLJ270U	27
R102	S	ERX1ANJ2R7	2.7
R105		ERD10TLJ153U	15K
R106		ERD10TLJ223U	22K
R201		ERD10TLJ102U	1K
R202		ERD10TLJ153U	15K
R203		ERD10TLJ333U	33K
R204		ERD10TLJ104U	100K
R205		ERD10TLJ683U	68K
R206		ERO10MKG1913	191K
R207		ERO10MKG5622	56.2K
R221		ERD10TLJ102U	1K
R222		ERD10TLJ153U	15K
R320	S	ERD25TJ333	33K
R321	S	ERD25FJ471	470
R322	S	ERD25FJ102	1K
R323	S	ERD25FJ103	10K
R324, 325	S	ERD25FJ472	4.7K
R326, 327	S	ERD25FJ152	1.5K
R328	S	ERD25FJ472	4.7K
R329	S	ERD25FJ392	3.9K
R330	S	ERD25FJ103	10K
R331	S	ERD25FJ472	4.7K
R334, 335	S	ERD25FJ331	330
R336	S	ERD25FJ103	10K
R337	S	ERD25TJ223	22K

Ref. No.		Part No.	Value
R338	S	ERD25FJ272	2.7K
R341	S	ERD25TJ563	56K
R343	S	ERD25FJ103	10K
R345	S	ERD25FJ472	4.7K
R346	S	ERD25TJ333	33K
R347	S	ERD25TJ563	56K
R348	S	ERD25FJ103	10K
R349	S	ERD25FJ471	470
R350	S	ERD25FJ472	4.7
R351	S	ERD25FJ471	470
R352, 353	S	ERD25FJ222	2.2K
R354	S	ERD25TJ223	22K
R355	S	ERD25FJ103	10K
R356	S	ERD25FJ152	1.5K
R357	S	ERD25TJ223	22K
R358	S	ERD25TJ333	33K
R359	S	ERD25FJ561	560
R401	S	ERD25TJ683	68K
R402	S	ERD25FJ152	1.5K
R403	S	ERD25FJ102	1K
R404	S	ERD25TJ224	220K
R405	S	ERD25TJ683	68K
R406	S	ERD25FJ152	1.5K
R407	S	ERD25FJ102	1K
R408	S	ERD25TJ224	220K
R409	S	ERD25TJ273	27K
R410	S	ERD25FJ103	10K
R413	⚠	ERD2FCG180	18
R501	S	ERD25FJ561	560
R502	S	ERD25FJ391	390
R601	S	ERD25FJ681	680
R801	S	ERD25TJ154	150

Ref. No.		Part No.	Value
R802	S	ERD25FJ472	4.7K
R803	S	ERD25TJ154	150K
R805	S	ERD25FJ222	2.2K
R806	S	ERD25FJ472	4.7K
R807	S	ERD25FJ332	3.3K
R808	S	ERD25FJ682	6.8K
R809	S	ERD25FJ102	1K
R810	S	ERD25FJ103	10K
R811	S	ERD25TJ684	680K
R812	S	ERD25TJ223	22K
R813	S	ERD25TJ104	100K
R814	S	ERD25TJ684	680K
R815	S	ERD25TJ224	220K
R816	S	ERD25FJ221	220
R817	S	ERD25TJ104	100K
R818	S	ERD25FJ102	1K
R820	S	ERD25FJ222	2.2K
R821	S	ERD25FJ272	2.7K
R822	S	ERD25FJ220	22
R823	S	ERD25FJ103	10K
R825	S	ERD25FJ101	100
R826	S	ERD25TJ223	22K
R828	S	ERD25TJ223	22K
R829	S	ERD25FJ682	6.8K
CAPACITORS			
C1	⚠ S	ECQM1223KZ	0.022
C2, 3	⚠ S	ECKD1H223PF	0.022
C4	S	ECEB1VS222	2200
C5	S	ECEA1CS330	33
C101		ECUV1E333KBM	0.033

Ref. No.		Part No.	Value
C102, 103	⚠ S	ECEA1CN470S	47
C104	S	ECEA1CS101	100
C105	S	ECEA1CS330	33
C201	S	ECEA1HS3R3	3.3
C202	S	ECQM1H104KV	0.1
C203	S	ECQM1H333KV	0.033
C205		ECUV1E473KBM	0.047
C206	S	ECQM1H104JV	0.1
C207	S	ECQM1H104KV	0.1
C208	S	ECEA1ES4R7	4.7
C209	S	ECQM1H104KV	0.1
C210	S	ECEA1HSR22	0.22
C212, 213		ECUV1H102MBM	0.001
C301	S	ECCD1H680K	68P
C302	S	ECQM1H104KV	0.1
C303	S	ECKF1E104ZVD	0.1
C304	S	ECEA0JS330	33
C305	S	ECKD1H223PF	0.022
C306	S	ECKD1H102KB	0.001
C401, 402	S	ECQM1H223KZ	0.022
C501	S	ECEA1CS101	100
C601	S	ECFB1B104ZRM	0.1
C801	S	ECQM1H103KV	0.01
C802, 803	S	ECQM1H104KV	0.1
C804	S	ECEA1CS220	22
C805	S	ECEA1CS470	47
C806	S	ECQM1H473KV	0.047

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

ERX	2	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value

Numbering System of Capacitor

Example

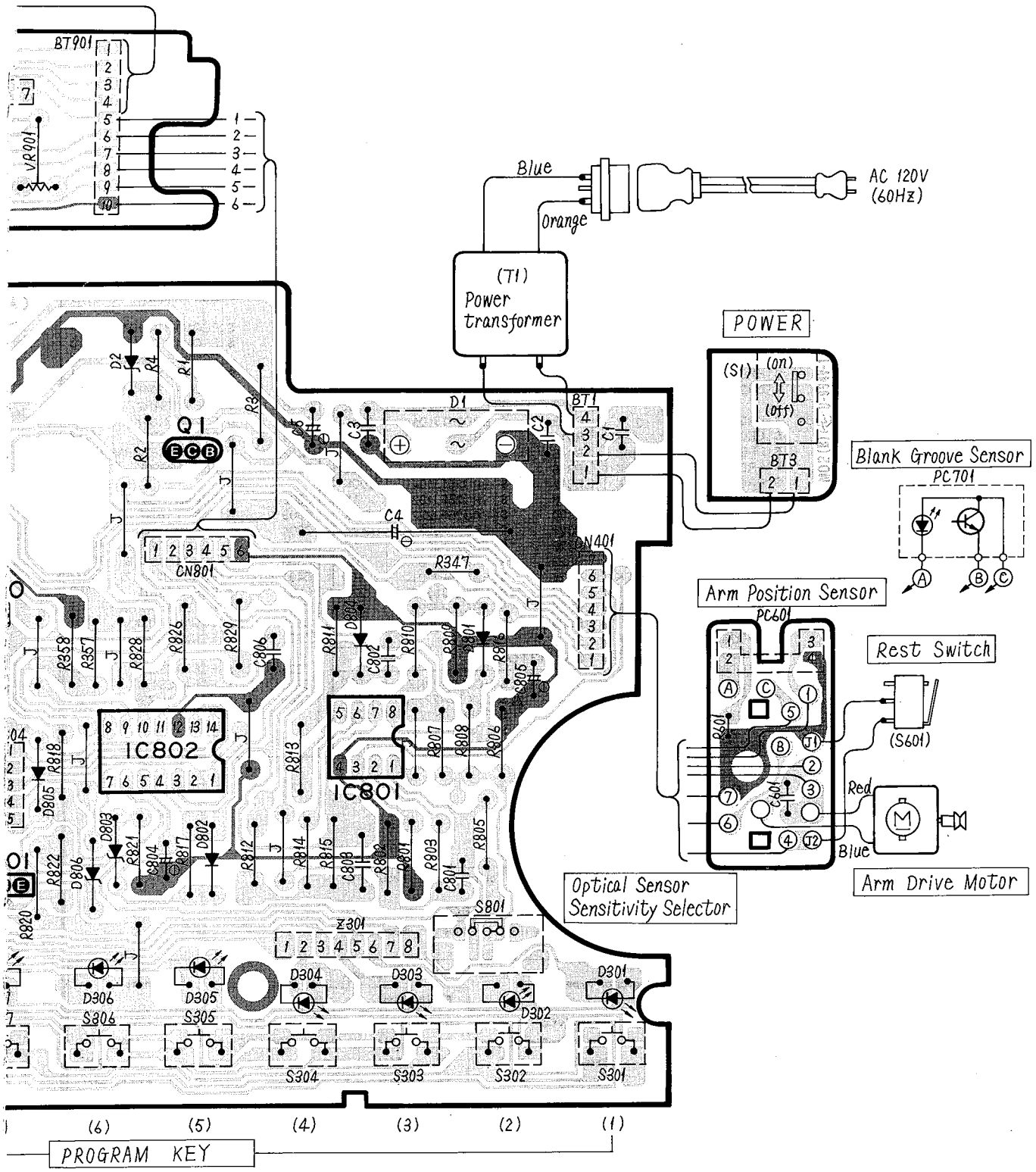
ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W	J : ±5%
ERX : Metal Film	25 : 1/4W	G : ±2%
ERO : Metal Film	1 : 1W	

ERD10TLJ□□□ ⟶ Chip type carbon
ERO10MKG□□□ ⟶ Chip type metal film
ECUV1H□□□ ⟶ Chip type ceramic

Capacitor Type	Voltage		Tolerance
	ECEA Type	Others	
ECEA : Electrolytic	0J : 6.3V	1H : 50V DC	J : ±5%
ECEA...N : Non Polar Electrolytic	1A : 10V	2H : 500V DC	K : ±10%
ECKD : Ceramic	1C : 16V		Z : +80%, −20%
ECQM : Polyester	1E : 25V		P : +100%, −0%
ECEB : Electrolytic	1H : 50V		M : ±20%
ECUV : Ceramic	1J : 63V		
ECKF : Ceramic	50 : 50V		
	25 : 25V		

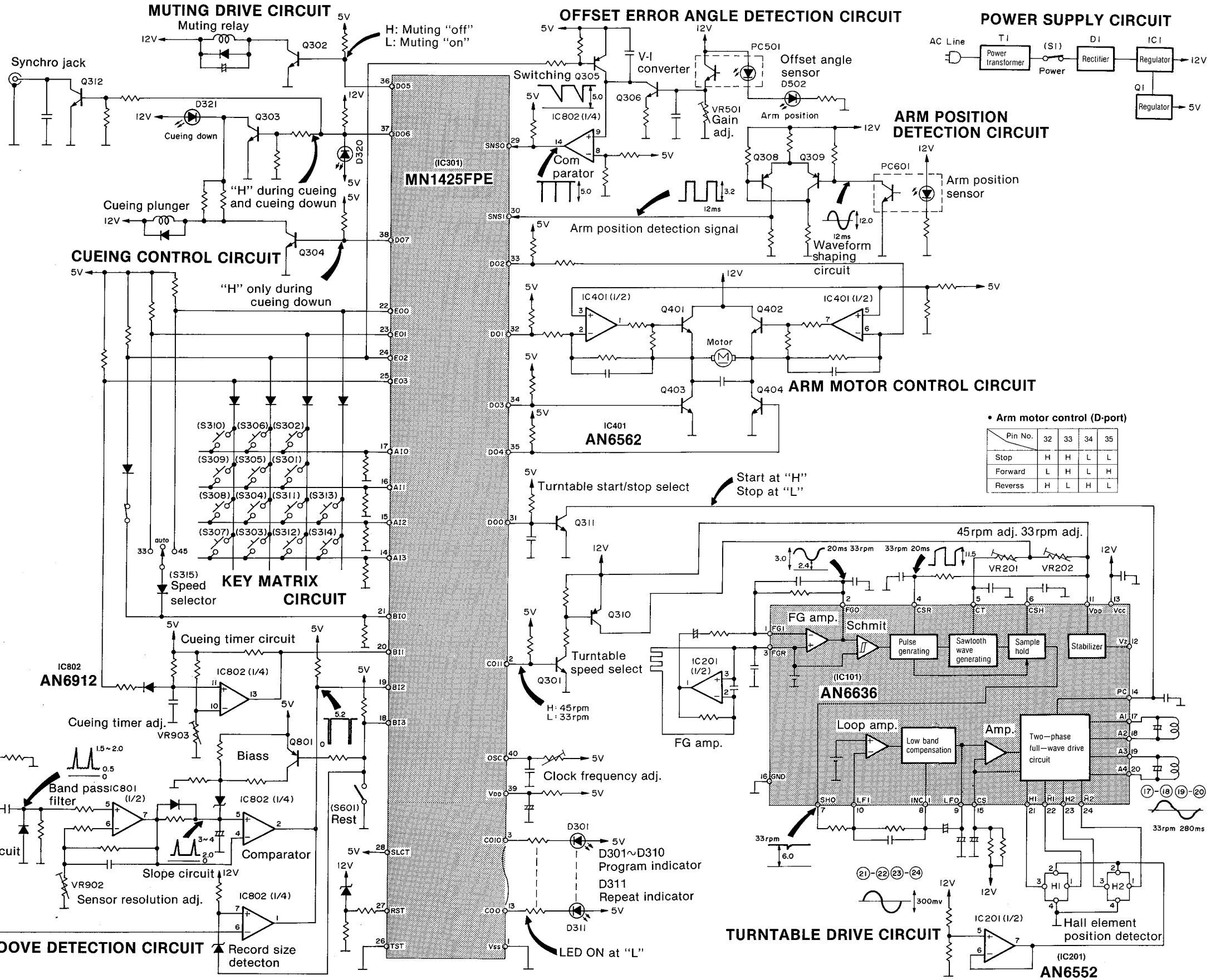

BT901
VR901
Blue
Orange
AC 120V
(60Hz)
(T1)
Power
transformer
POWER
(S1)
(on)
(off)
BT3
BT1
Blank Groove Sensor
PC701
Arm Position Sensor
PC601
Rest Switch
(S601)
Red
Blue
Arm Drive Motor
Optical Sensor
Sensitivity Selector
CN801
CN401
IC802
IC801
Q1
S801
S306
S305
S304
S303
S302
S301
D306
D305
D304
D303
D302
D301
PROGRAM KEY

SL-6

■ BLOCK DIAGRAM

• Description of each terminal of MN1425FPE

Pin No.	Symbol	Description
1.	VSS	Ground terminal
2	CO11	Turntable speed select output terminal (45 rpm at "H". 33 rpm at "L".)
3 4 5 6 7 8 9 10 11 12	CO10 CO9 CO8 CO7 CO6 CO5 CO4 CO3 CO2 CO1	Program LED display output terminal (LED ON at "L")
13	CO0	Repeat LED display output terminal (LED ON at "L")
14 15 16 17	AI3 AI2 AI1 AI0	Key scan input terminal (Each key is read in through key scan with E-port.)
18	BI3	Rest position detection input terminal ("L" when tonearm is on rest.)
19	BI2	Blank groove detection and record detection terminal [Blank groove detection pulse is active "L". When it is "H" at start, 30cm record is detected. When it is "L", it is judged that there is no 30cm record (17cm or 25cm record is present)].
20	BI1	Cueing time read input terminal.
21	BI0	Turntable speed select and cabinet opening/closing detection terminal. (Each operation is done through key scan with E-port.)
22 23 24 25	EO0 EO1 EO2 EO3	Key scan output terminal (Each key-is read in through key scan with A-port).
26	TST	Test terminal (connected to Ground not used)
27	RST	Reset terminal (The microcomputer is reset at "L", and is not reset at "H".)
28	SLCT	Select terminal (The level is set to "H" by the select terminal of the inside counter.)
29	SNSO	Offset angle detection signal input terminal
30	SNSI	Arm position detection signal input terminal
31	DO0	Turntable start/stop select terminal (Start at "L", stop at "H".)
32 33 34 35	DO1 DO2 DO3 DO4	Arm motor drive control terminal
36	DO5	Muting control terminal
37	DO6	Cueing control terminal ("H" during cueing and cueing down.)
38	DO7	Cueing control terminal ("H" only during cueing down.)
39	VDD	Power supply terminal
40	OSC	Oscillation terminal

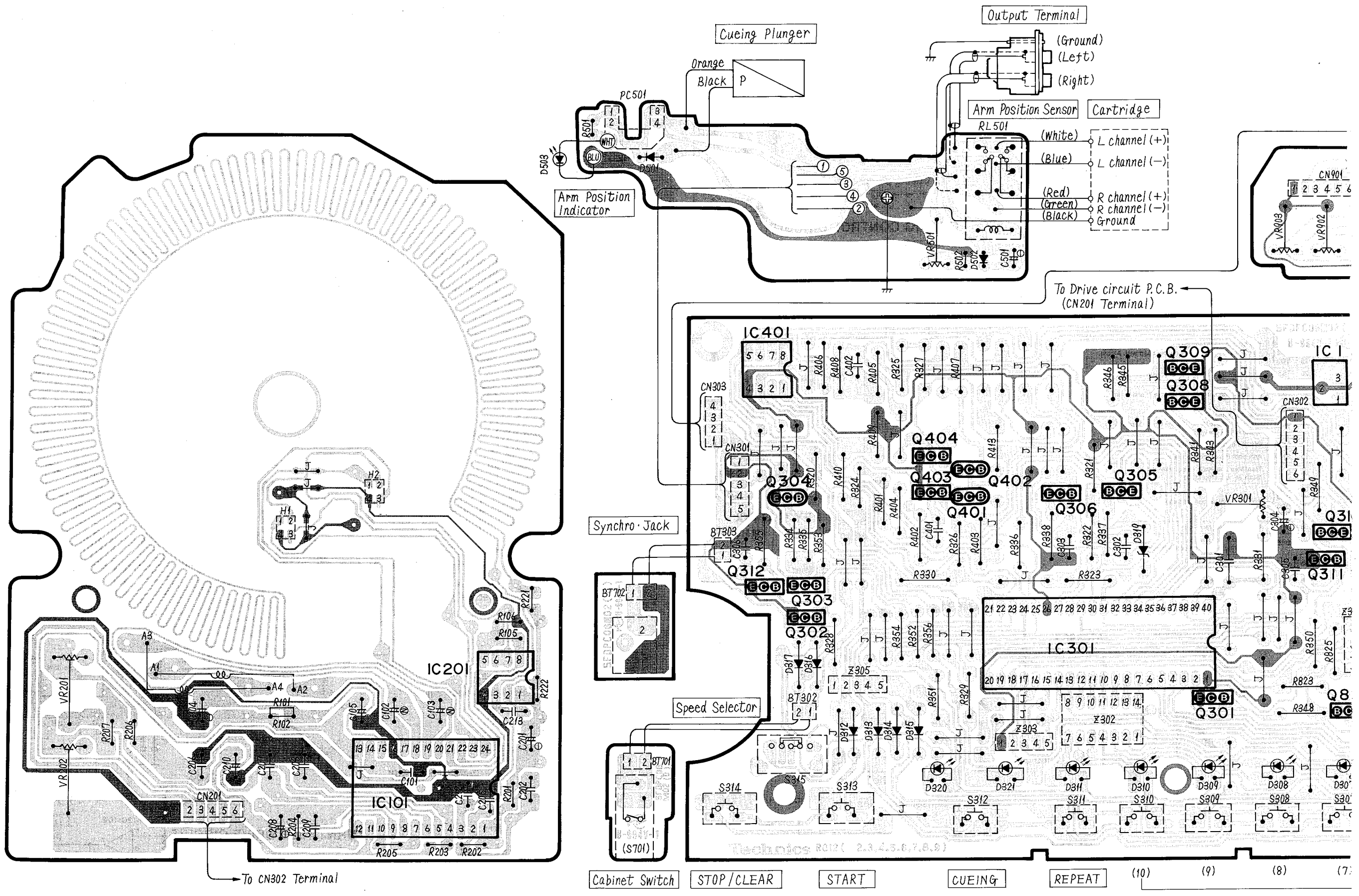


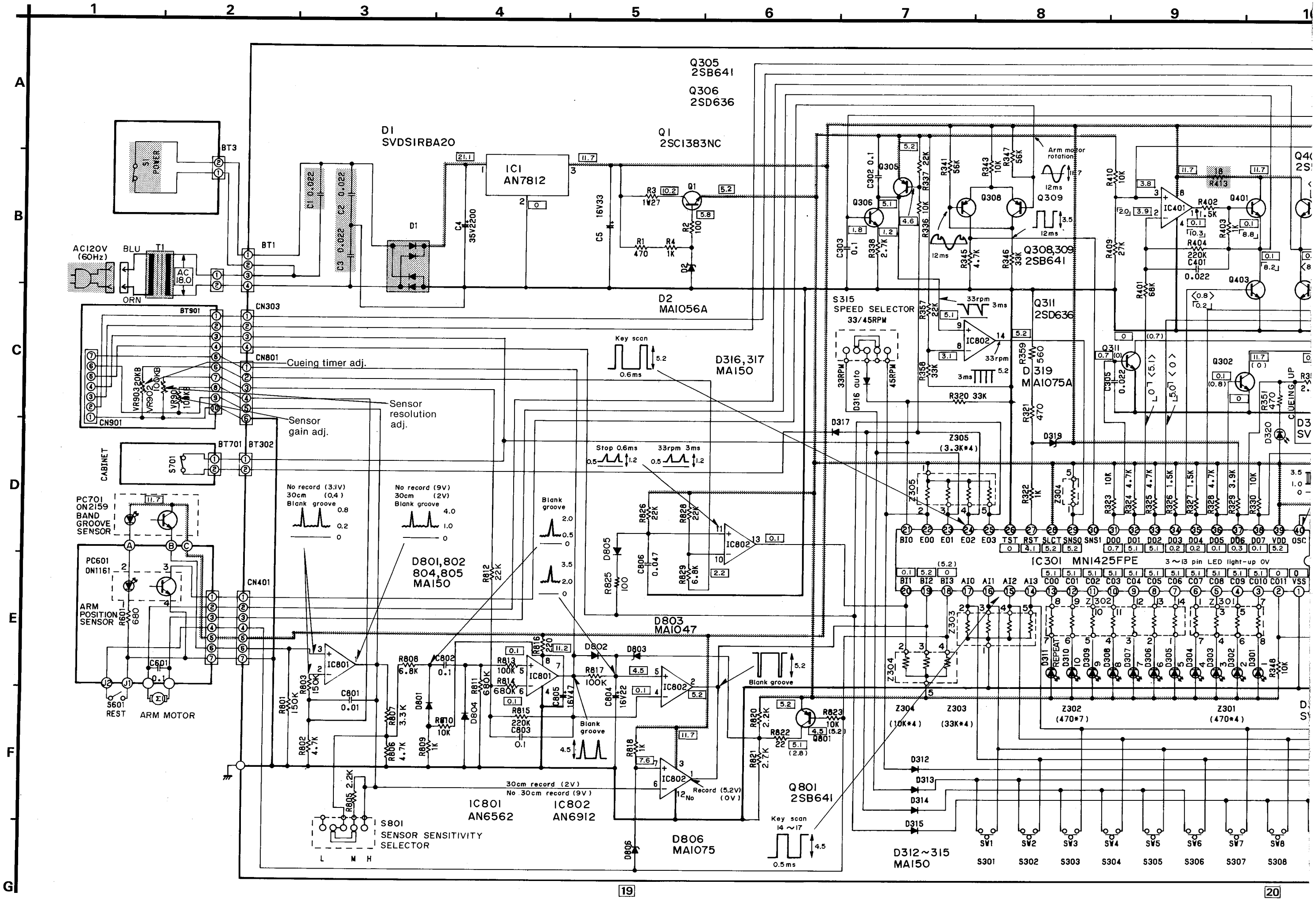
• Arm motor control (D-port)

Pin No.	32	33	34	35
Stop	H	H	L	L
Forward	L	H	L	H
Reverss	H	L	H	L

■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

Ground (Earth) lines




Q305 2SB641
Q306 2SD636
D1 SVDSIRBA20
Q1 2SC1383NC
IC1 AN7812
D2 MA1056A
D316,317 MA150
D319 MA1075A
Q308,309 2SB641
Q311 2SD636
S315 SPEED SELECTOR 33/45RPM
Arm motor rotation
Key scan
Cueing timer adj.
Sensor resolution adj.
Sensor gain adj.
CABINET
PC701 ON2159 BAND GROOVE SENSOR
PC601 ON1161 ARM POSITION SENSOR
S601 REST
ARM MOTOR
No record (3.1V) 30cm (0.4) Blank groove
No record (9V) 30cm (2V) Blank groove
D801,802 804,805 MA150
D803 MA1047
D806 MA1075
IC801 AN6562
IC802 AN6912
30cm record (2V) No 30cm record (9V)
Record (5.2V) (0V)
Q801 2SB641
S801 SENSOR SENSITIVITY SELECTOR
IC301 MN1425FPE
3~13 pin LED light-up 0V
Z305 (3.3K*4)
Z304 (10K*4)
Z303 (33K*4)
Z302 (470*7)
Z301 (470*4)
D312~315 MA150
S301 S302 S303 S304 S305 S306 S307 S308
CUEING UP

■ REPLACEMENT PARTS LIST...Cabinet & Chassis 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.

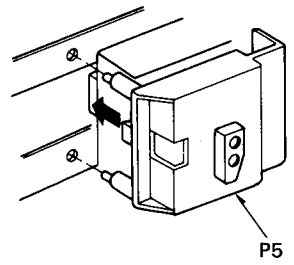
Areas

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

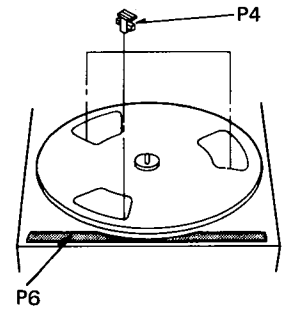
Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
1		SFWEC06N01	45r.p.m. Adaptor	(1)
2		SFQAC06N01	Spring	(1)
3		SFTGC06N01	Turntable Mat	(1)
4		SFTEC06N01A	Turntable	(1)
5		SFACC06N01	Cabinet	(1)
6	[M]	SFNNC06M01	Name Plate	(1)
6	[MC]	SFNNC06C01	Name Plate	(1)
7		SFKKC06N02	Plate, Front	(1)
8		SFKTC06N03	Knob, Speed Selector	(1)
9		SFKTC06N02	Knob, Start and Stop	(1)
10		SFKTC06N01	Knob, Music Selector	(1)
11		SFUMC06N01	Rod, Power Switch	(1)
12		SFKTC06N04	Knob, Power Switch	(1)
13		SFKKC06N01	Lable, Sensitivity Selector	(1)
14		SFKKC05N02	Lable, Speed Selector	(1)
15		SFQPC05N01	Spring	(1)
16	⚠	SFDJHSC0491	Socket, AC	(1)
17		SFDHC05N02E	Socket, Input	(1)
18		SFMGQ34N01	Film, Stator Frame Ass'y	(1)
19		SFMZC06N01R	Stator Frame Ass'y	(1)
20		SFUMC06N06	Holder, L.E.D.	(2)
21		SFUMC06N07	Holder, L.E.D.	(1)
22		SFAUC06N01	Bottom Board	(1)
23		SFQCC05N01	Spring, Audio Insulator	(4)
24		SFGAC05N02	Audio Insulator	(1)
25		SFGCC06N01	Cushion Rubber, Power Transformer	(2)
26		SFUMC06N04E	Cover	(1)
27		SFUMC06N10	Shutter	(1)
28		SFUPC15N11	Bracket, Shutter	(1)
29		SFUMC06N08	Holder, Lead Wire	(1)
30		SFUMC05N17	Arm Drive Wheel	(1)
31		SFUMC05N16A	Worm Ass'y	(1)
32		SFGBC10–01	Belt, Arm Drive	(1)
33		SFMHC05N01E	Arm Drive Motor (with Pulley)	(1)
34		SFUMC05N02E	Plate, Rest Switch	(1)
35		SFUZC05N01	Rod, Rest Switch	(1)
36		SFUMC05N06	Guide, Rod Rest Switch	(1)
37		SFUMC06N05E	Sensor Ass'y	(1)
38		SFXJC06N01	Guide Rail, Sensor Ass'y	(1)
39		SFUMC05N22	Pulley	(5)
40		SFUMC05N23	Cap, Pulley	(5)
41		SFUZC06N01E	Arm Drive Lope Ass'y	(1)
42		SFUPC05N03	Bracket, Guide Rail	(1)
43		SFXJC05N01	Guide Rail, Arm Drive	(1)
44		SFGCC05N05	Cushion Rubber, Guide Rail	(2)
45		SFUKC06N01A	Plate Ass'y	(1)
46		SFATC05N02A	Hinge, (Left)	(1)
47		SFATC05N01A	Hinge, (Right)	(1)
48		SFUMC05N20	Guide, Lead Wire	(1)
49		SFUZC05N03	Latch	(1)
50		SFADC06N01E	Dust Cover	(1)
51		SFGCC05N03	Cushion Rubber	(3)
52		SFGCC05N06	Cushion Cover	(2)
53		SFKKC06N03	Surface Plate	(1)
54		SFNZC06M02	Label, Shutter	(1)
55		SFUPC06N04	Felt, Front Panel	(4)
56		SFDJC06N02	Jack, Synchro-Rec	(1)
TONEARM PARTS				
60		SFPAM00501A	Tonearm	(1)
61		SFPAB00501E	Tonearm Position Indicator	(1)
62		SFPZB00605E	Lift Plate Ass'y	(1)
63		SFPAB00502	Bracket, Tonearm	(1)
64		SFPSP00503	Spring, Lead Wire	(1)
65		SFPCS00601	Cover, Tonearm Base	(1)
66		SFPZB00602	Cam, Adjustment	(1)
67		SFPSP00602	Spring, Adjustment Cam	(1)
68		SFPZB00603	Wheel, ADjustment Cam	(1)
69		SFPJK00601	Shaft, Wheel	(1)
70		SFPZB00604	Worm	(1)
SCREWS, WASHERS and NUT				
N1		XTN3+20JFZ	Screw	(2)
N2		XTN3+10JFZ	Screw	(2)
N3		XTV3+10G	Screw	(3)
N4		XTV3+6JFZ	Screw	(4)
N5		XTV3+20G	Screw	(4)
N6		SFXGC05N02	Screw	(3)
N7		SFXGC05N04	Washer	(3)
N8		SFXGC05N03	Screw	(2)
N9		XNC3HS	Nut, φ3	(3)
N10		XTW3+14QFYR	Screw	(4)
N11		XTV3+20G	Screw	(2)
N12		XTV3+8BFZ	Screw	(1)
N13		XSN3+5S	Screw	(1)
N14		XUC3FT	Washer	(1)
N15		SFPEV00502	Screw	(1)
N16		XTV3+10BFZ	Screw	(1)
N17		XSN26+10BV	Screw	(1)
ACCESSORIES				
A1	[M]	SFNUC06M01	Instruction Book	(1)
A1	[MC]	SFNUC06C01E	Instruction Book	(1)
A2		SFDHC05N01	Phono Cord	(1)
A3		SFDLC05N01	Ground Wire	(1)
A4	S ⚠	RJA22Y	AC Cord	(1)
A5		SFNZC06N01	Caution Sheet	(1)
PACKING PARTS				
P1	[M]	SFHPC06M01	Carton Box	(1)
P1	[MC]	SFHPC06C01	Carton Box	(1)
P2		SFHHC05N01	Pad, Front	(1)
P3		SFHHC05N02	Pad, Rear	(1)
P4		SFHKC05N01	Clamper, Turntable	(3)
P5		SFHKC05N02	Spacer, Tonearm	(1)
P6		SFHSC06N01	Spacer, Dust Cover	(1)
P7		SFYH45X50	Polyethylene Bag, Unit	(1)
P8		SFYH17X16	Polyethylene Bag, Cord	(1)

■ PACKINGS

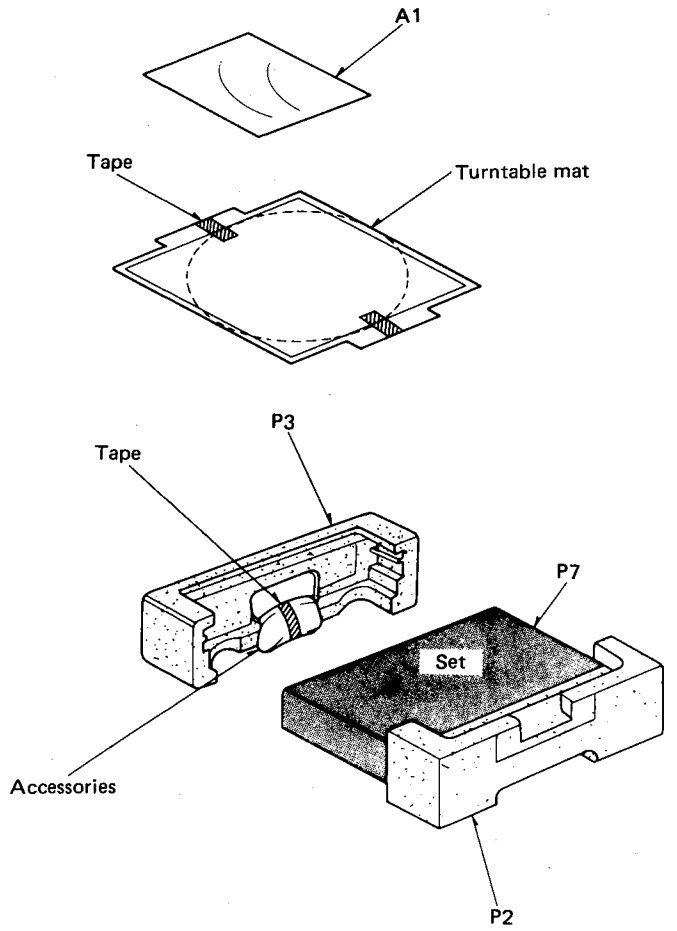
1. Set the tonearm to the start position.
2. Attach the arm spacer.



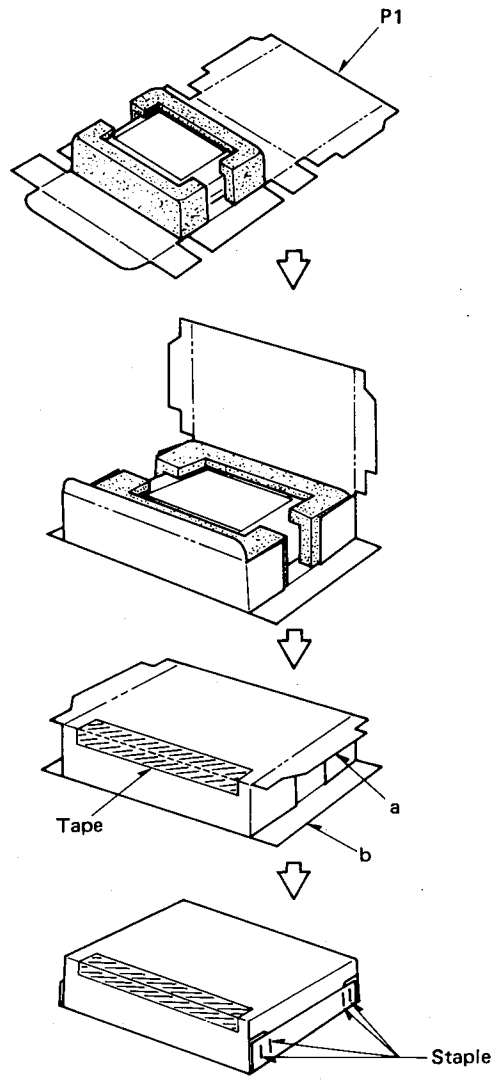
3. Attach the clamper and dust cover specer.
4. Stick the protection sheet on the top of dust cover.



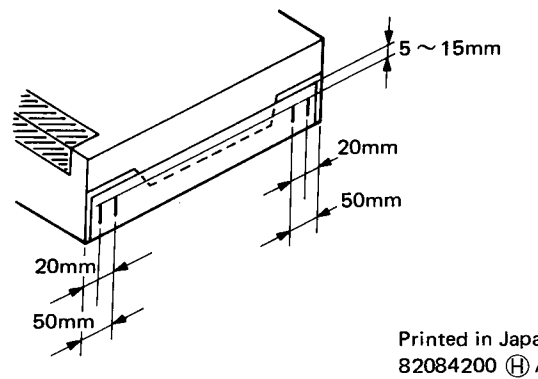
5. Put the set into the polyethylene bag and then pack it as illustrated.



6. Plase the unit (with cushions attached) as illustrated.
7. Fold the flaps according to the line marks.
8. Seal the top with adhesive tape.
   * Use gum tape or adhesive cloth tape of 50mm wide at least.
9. For the edges, first fold the flap "a" and then flap "b", and staple. Remember to staple only flap "b". (Use 15 or 16mm staple)



* Stapling positions are shown below.



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■ SCHEMATIC DIAGRAM

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

Notes:

1. **S1** : Power switch in "**on**" position.
2. **S301 ~ S310** : Program switch (Program key 1 ~ 10).
3. **S311** : Repeat switch.
4. **S312** : Cueing control switch.
5. **S313** : Start switch.
6. **S314** : Stop/clear switch.
7. **S315** : Speed selector switch in "**auto**" position.
8. **S601** : Rest switch in "**off**" position. (Tonearm is off the rest position.)
9. **S701** : Cabinet switch in "**on**" position. (Upper cabinet is closed.)
10. **S801** : Optical sensor sensitivity selector switch in "**M**" position.
11. The voltage value and waveform are the standard values of this measured by DC electronic voltmeter (high impedance) and oscilloscope on the bais of chassis. Therefore, the voltage value and waveform may include some erroe due to the internal impedance of the tester or the measuring set.
    * [ ] is the voltage when turntable is in stop.
    * ( ) is the voltage when turntable is in rotation. (at 33 rpm)
    * ⌜ ⌟ is the voltage when tonearm is in lead-in mode.
    * 〈 〉 is the voltage when tonearm is in return mode.
    * (( )) is the voltage at 45 rpm.
12. ⋯⋯ Positive voltage lines.

IMPORTANT SAFETY NOTICE

The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards.
When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

• Product for MC only

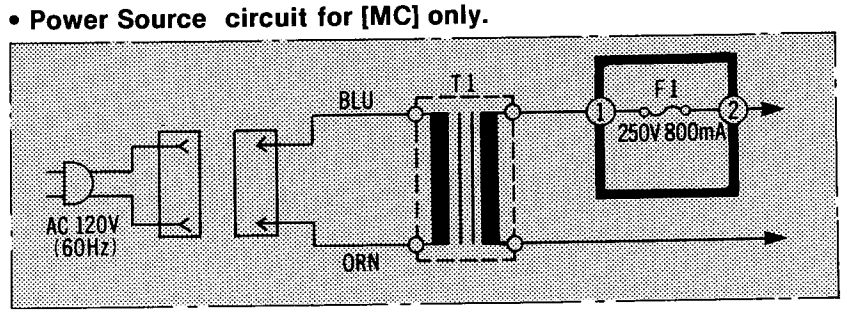
FUSE REPLACEMENT

Symbol located near the fuse indicates fast operating type. For continued protection against fire hazard, replace with same type fuse. Refer to the symbol for fuse rating.

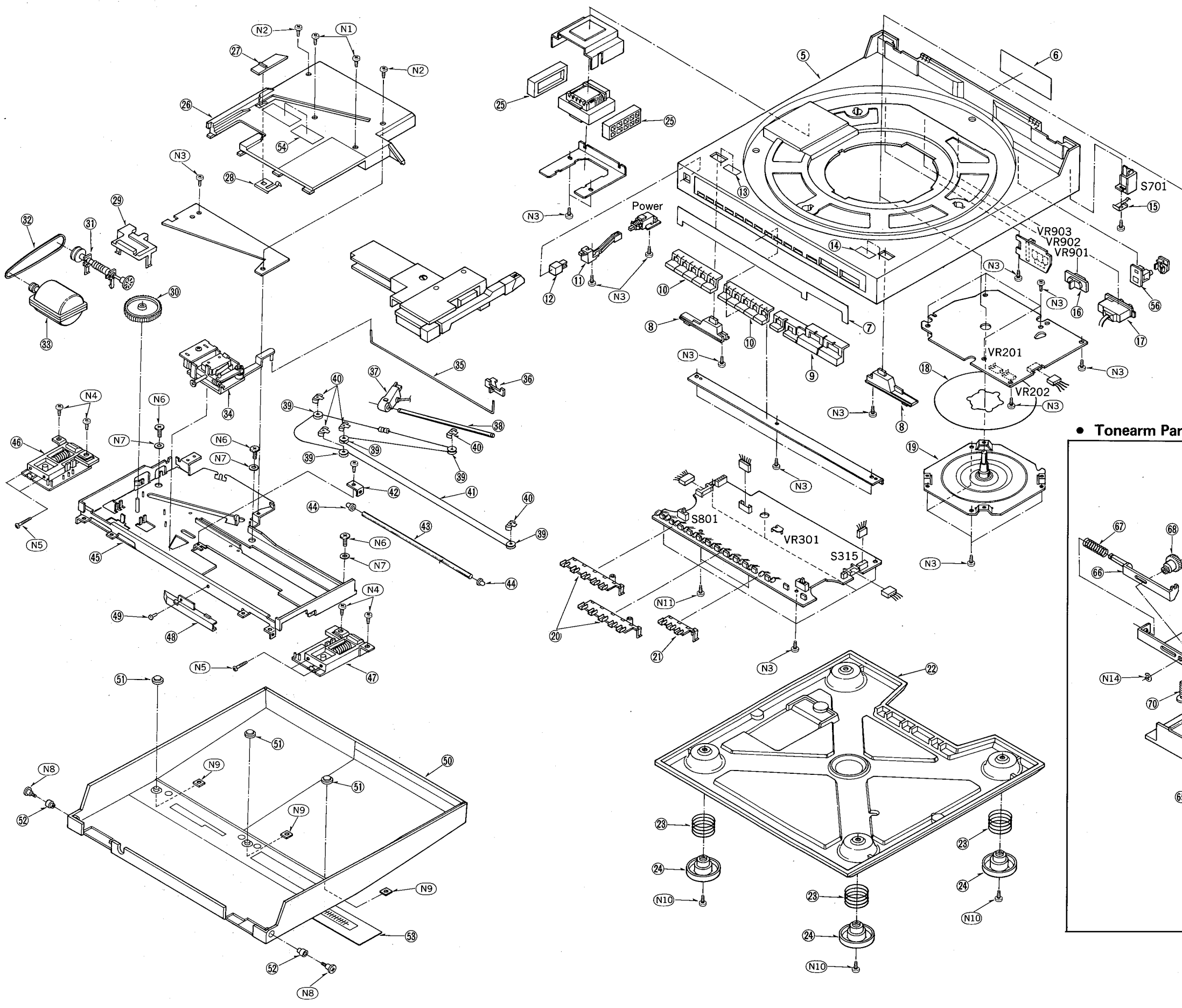
FUSIBLE REMPLACEMENT

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

• Power Source circuit for [MC] only.



■ EXPLODED VIEW



- **Tonearm Parts**