ORDER NO. SD7709-1271

Service Manual

QUARTZ Synthesizer Direct Drive Turntable System

SL-1500MK2 (M, MC)

- The model SL-1500MK2 (M) is available in America only.
- The model SL-1500MK2 (MC) is available in Canada only.

SPECIFICATIONS (Specifications are subject to change without notice for further improvement)

General	
Power supply	AC 120 V, 50 or 60 Hz
Power consumption	12 W
Dimensions (H x W x D)	14.5 x 45.3 x 38.4 cm (5-45/64 x 17-45/64 x 15-7/64 inches)
Weight	11.8 kg (26.0 lb)
Turntable section	
Type	Quartz-phase-locked control direct drive turntable with quartz synthesizer pitch control, Manual play
Drive method	Direct Drive
Motor	Brushless DC motor
Drive control method	Quartz-phase-locked control
Turntable platter	Aluminum die-cast, diameter 33 cm (13"), weight 2.5 kg (5.5 lb.)
Moment of inertia	340 kg·cm^2 (116 lb·in^2)
Turntable speeds	33-1/3 and 45 r.p.m.
Turntable speed fine adjustment	Adjustable up to ±9.9% in 0.1% increments by digital indication
Starting torque	1.5 kg·cm (1.3 lb·in)
Build-up characteristics	90° or 1/4 rotation to 33-1/3 rpm
Braking system	Electronic brake
Speed fluctuation due to load torque	0% within 1.5 kg·cm (1.3 lb·in)
Speed drift	Within 0.002%
Wow and flutter	0.025% WRMS (JIS C5521) ±0.035% weighted zero to peak (DIN 45507)
Rumble	−50 dB (DIN 45539A) −73 dB (DIN 45539B)
Tonearm section	
Type	Gimbal suspended universal "S" shaped tubular arm, static-balanced type
Effective length	230 mm (9-1/16")
Overhang	15 mm (19/32")
Tracking error angle	+3° at the outer groove of 30 cm (12") record +1° at the inner groove of 30 cm (12") record
Offset angle	21.5°
Friction	Less than 7 mg (lateral, vertical)
Effective mass	22 g (with a cartridge weighting 6 g at 1.25 g stylus pressure)
Tonearm height adjustment	In 1mm steps to a range of 6 mm
Adjustable stylus pressure range	0 ~ 3 g
Cartridge weight range	5-11 g
Cartridge mounting dimensions	12.7 mm (1/2") mounting space
Headshell terminal lug	1.2 mm, for 4-pin terminal
Headshell weight	9.5 g

Weights and dimensions shown are approximate.

Technics by Panasonic

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Ontario, Canada M9W 1B5

■ FEATURES

Encounter two separate isolation stages. The first stage effectively damps out harmful external vibrations which may reach the unit through its resting surface. The all-important turntable, motor and tonearm assembly are then supported on a second isolation system. These isolators are specially designed with material and springs of calculated, finely-tuned elasticity to absorb external vibrations.
Isolation from feedback lets you enjoy clear, transparent sound even at high volume levels.

Technics unique motor construction in which the rotor of the motor is integrally formed with the turntable.

High torque motor delivering 1.5kg·cm makes it possible to reach 33-1/3 r.p.m. from standstill within 0.7 sec. (1/4 rotation) and to effect instantaneous speed change. (Fig. 1).

Superior load characteristic of 0 rotational deviation even at a stylus pressure of 300 g. (Fig. 2).

High performance with wow and flutter of only 0.025% (JIS C5521) and rumble of −73 dB (DIN 45539B).
Since the development of the DD turntable, Technics has continually strived for further improvement of player performance and has introduced numerous high performance models on the market.
The SL-1500MK2 series is brought into being by combination of experience and research.
The characteristic values of rumble −73 dB (DIN 45539B) and wow and flutter of 0.025% (W.R.M.S JIS C5521) by far exceed the standards to which record albums are made.

Quartz Controlled Rotation Accuracy
The SL-1500MK2 utilizes the oscillation of a quartz crystal as a reference signal or source. This oscillation is not affected by temperature change or power fluctuations. By synchronizing the rotation of the turntable platter accurately to the reference signal, speed drift of the SL-1500MK2 is held within ±0.002%. This means that for a record with a playing time of 30 min, total playing time variation can amount to no more than 0.036 sec. This stable and accurate rotation sets a new standard of precision.
The accuracy under controlled operating conditions as in a listening room is about ±0.00001% as shown in Fig. 3.

Highly sensitive universal tonearm.
For the finest tracking sensitivity, the tonearm rests in a gimbal suspension equipped with two pairs of low friction pivot bearings. Gimbal suspension and low tonearm mass means that accurate tracking is possible at tracking forces as low as 0.25 grams. With enhanced rotational sensitivity of 7 mg. the tonearm is allowed free, gyroscopic movement to ensure flawless balance during tracking. The longer-than-usual effective tonearm length (9-1/16" or 230 mm, stylus to pivot) contributes to the arm's low tracking error, and this in turn facilitates the design of the anti-skating control for precise and reliable tracking. With this design, a single precise anti-skating scale counteracts side thrust for all types of styli.

Arm height is adjustable within a range of 6 mm to accomodate varying cartridge dimensions.

Resonance dampened headshell with unique overhang adjuster.

Low capacitance phonocables.

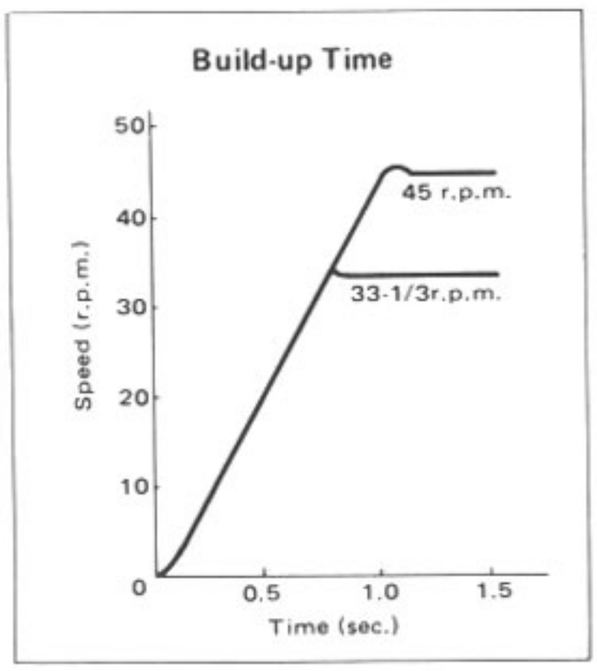


Fig. 1

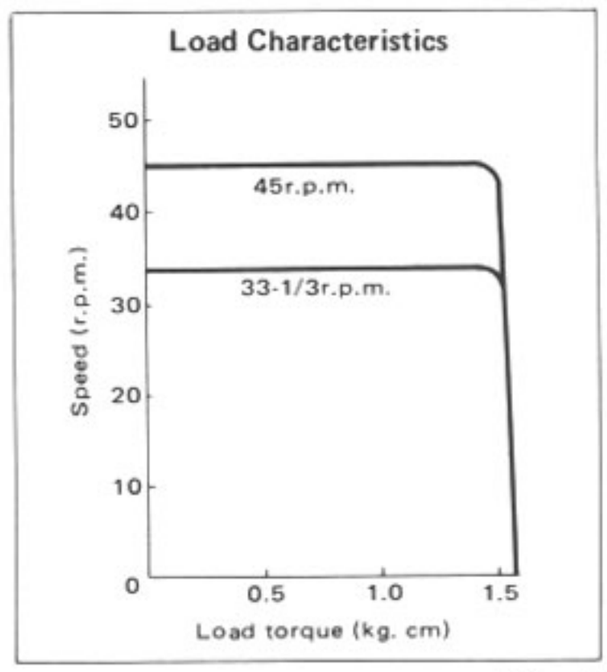


Fig. 2

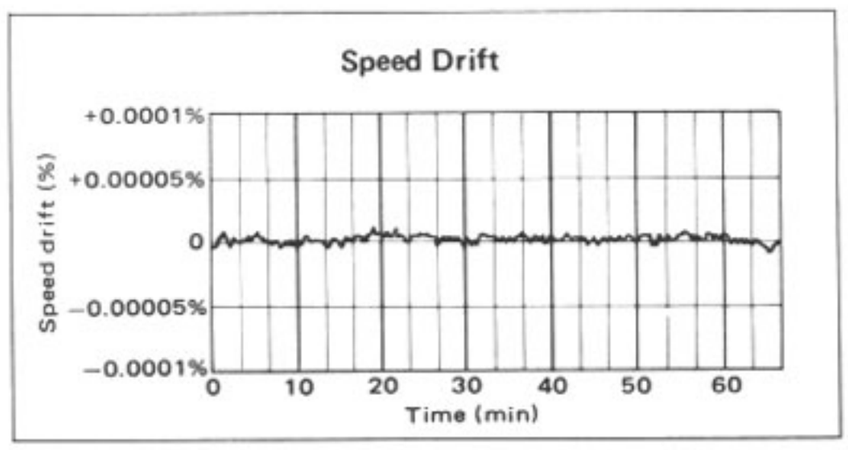


Fig. 3

■ CROSS SECTION OF MOTOR PORTION AND DOUBLE INSULATOR

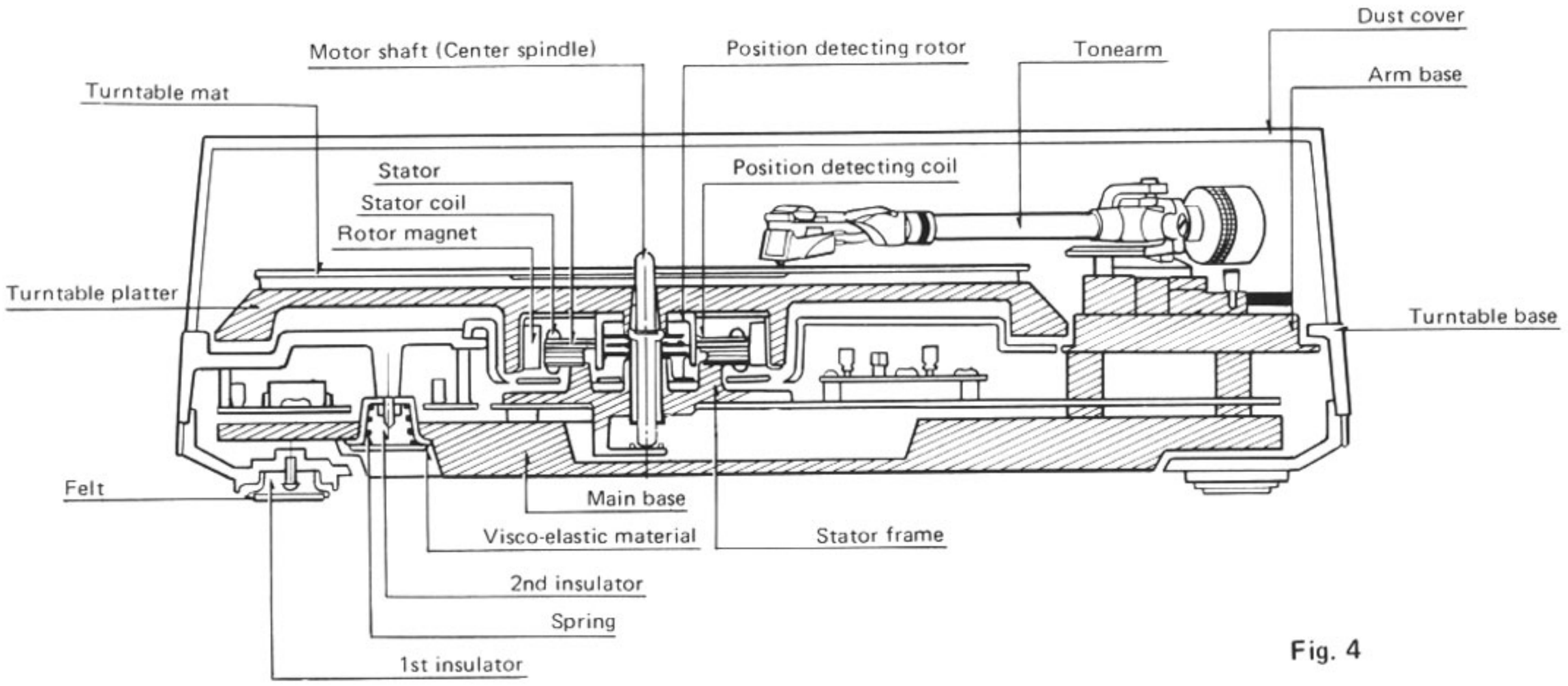


Fig. 4

■ PARTS IDENTIFICATION

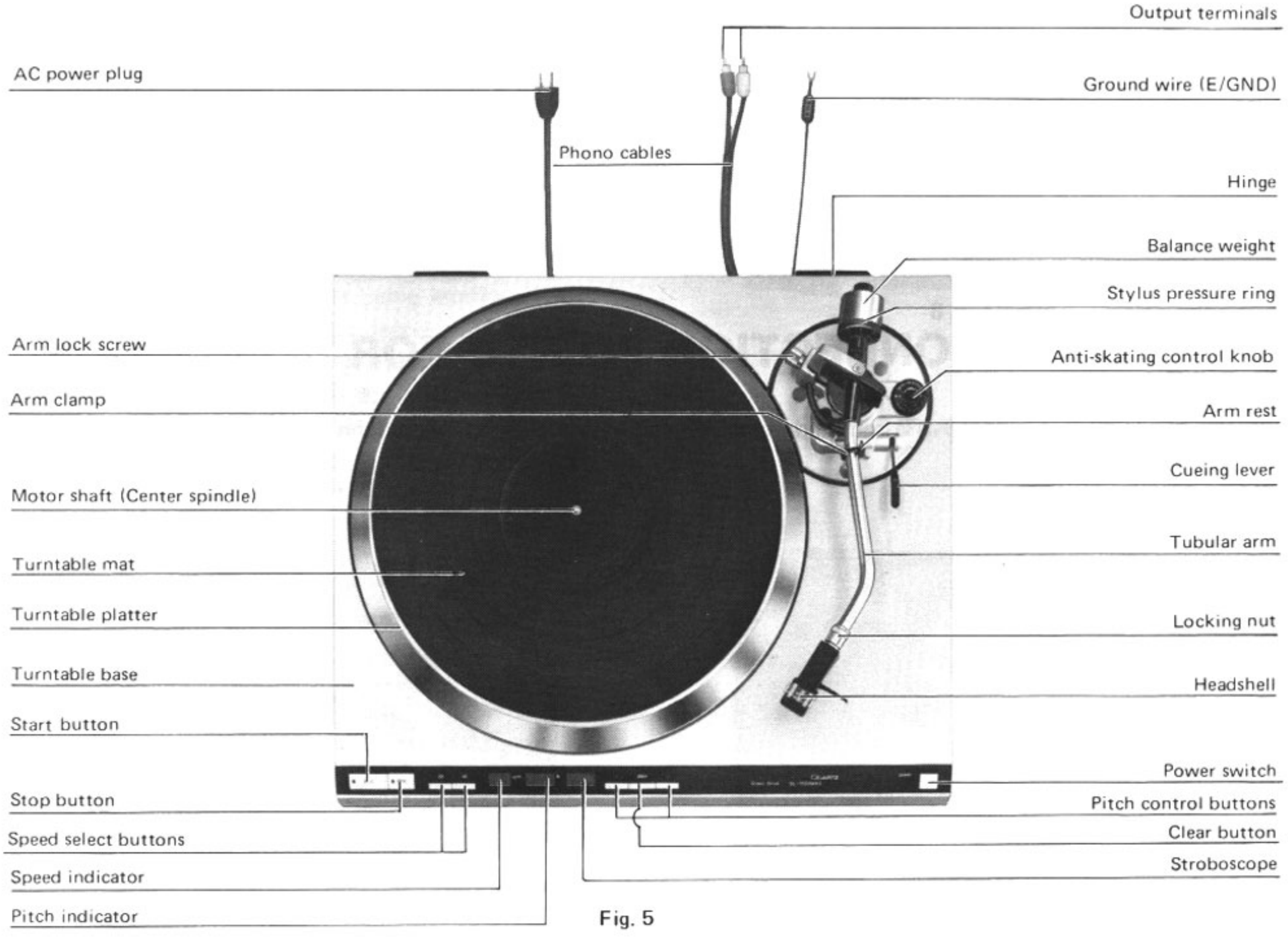


Fig. 5

■ TO REMOVE CABINET AND BOTTOM COVER

1. Remove headshell and balance weight.
2. Clamp tone arm to the arm rest.
3. Remove turntable platter.
4. Close dust cover.
5. Turn unit upside down taking special care not to damage or scratch the dust cover.
6. Remove the 7 screws from bottom cabinet (Fig. 6).
7. Remove the 4 screws from main base (Fig. 7).
8. Holding the player firmly with both hands, to prevent separation of upper section (turntable base) from lower section (main base), turn it carefully upwards.
9. Remove dust cover.
10. Remove the 6 screws from the panel cover (Fig. 8).
11. Unplug the 2 plug-in connectors and 1 cord clamp (Fig. 9).
12. To remove the turntable base from the main base bottom section, turn cueing lever upward (cueing position) and move tone arm towards center of spindle. Top section can be lifted up easily.
13. To reassemble, perform steps 1 through 12 in reverse.

Note:
The turntable horizontally to the panel face is already adjusted before shipment.
If deviated, correct it by means of the adjust screws using a 5 mm box spanner.

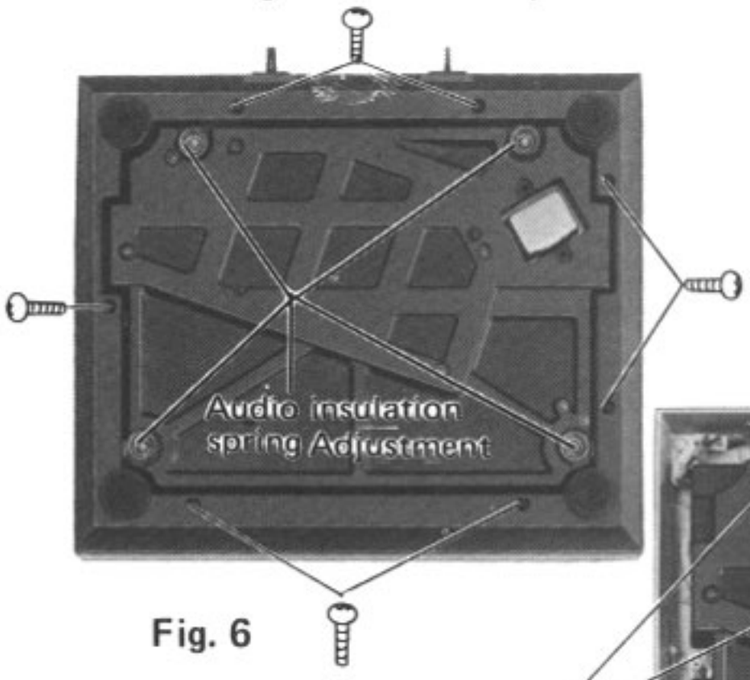


Fig. 6

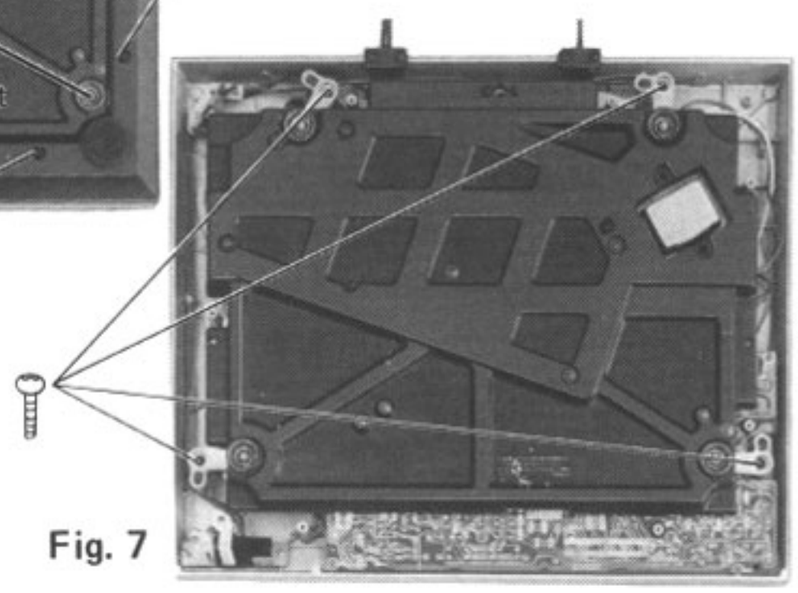


Fig. 7

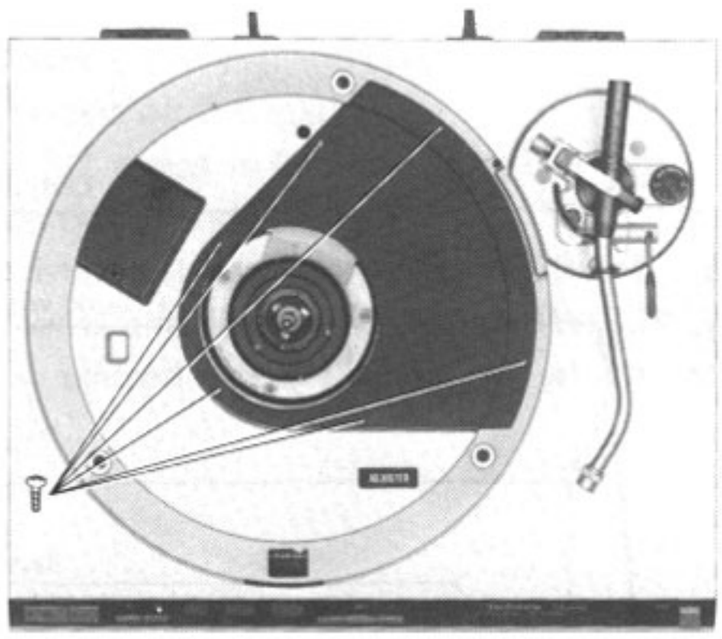


Fig. 8

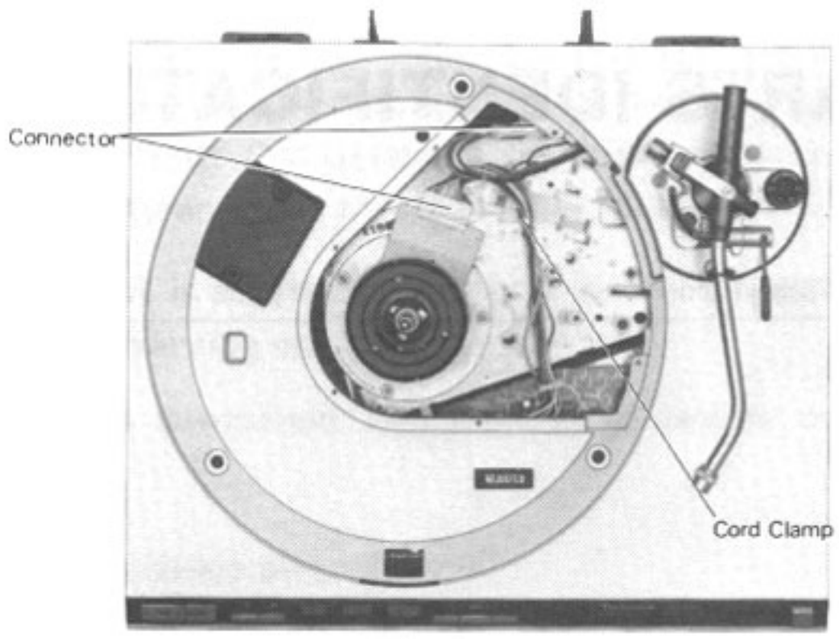


Fig. 9

■ CONNECTOR CONNECTION POINTS FOR INSPECTION

Connect the disassembled main unit and main base as shown in the Figure below.

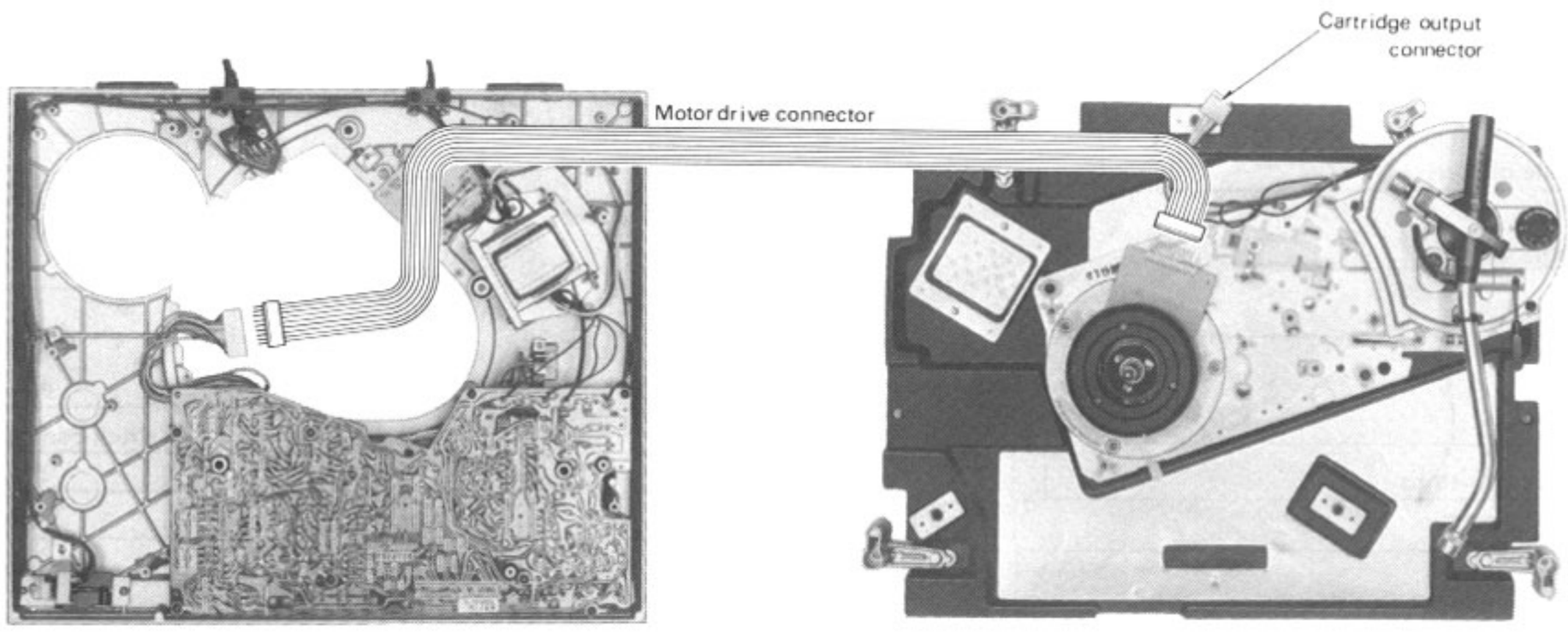


Fig. 10

■ ADJUSTMENTS-1

Adjustment of the arm height. (See Fig. 11, 12)

- This tonearm has been locked in the highest position before shipping from the factory, adjust the arm height according to your cartridge height.
- Loosen the arm lock screw. And push the arm pivot bearing support downward until the tonearm is paralled with the record surface.

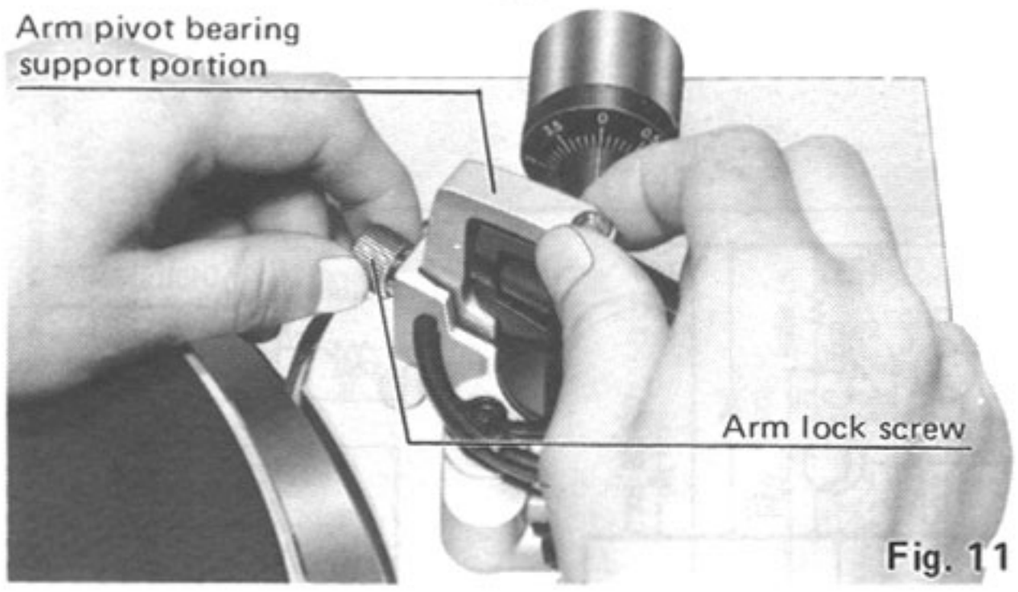


Fig. 11

- If the cartridge height is 18 mm as shown in figure 11, align the fourth line ("18") on the gimbal support portion with the arm base edge as shown in the picture. (See Fig. 12)
  The arm height can be ajusted in 1 mm steps over a range of 6 mm.

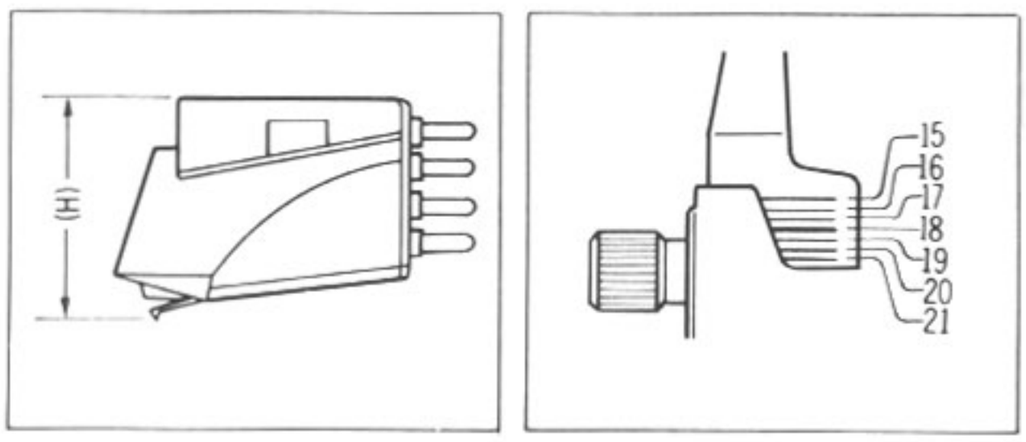


Fig. 12

Pitch control (turntable speed fine adjustment)

The Quartz Synthesizer system is being employed for the first time in the world. A high degree of pitch control accuracy over a wide range (±9.9%) in 0.1% increments can be obtained, with the quartz perfectly locked. The pitch variations which are clearly indicated by the LED digital indicator provide you with accurate and easy selection.

- The pitch control can be selected in increments of 0.1% which is below the threshold of human perception. This function can be very effective for minor extention of reduction of broadcasting time in professional applications.

- The pitch control also enables you to accurately and precisely tune musical instruments, and by varying the pitch slightly to obtain a musical note from phono discs.
  For a half-tone change:
  +5.9% (#)
  –5.6% (b)

- Another feature of the variable pitch control over a wide range of ±9.9% is that it makes singing along with a melody easy for a choros or playing a phono disc for accompaniment only.
  By pressing the clear button which is located between the "+" and "–" pitch buttons, you can quickly return the set to normal playing speed.

Adjustment of the muting time and arm height.
(See Fig. 13 and 14)

This unit employs "muting switch" combination with arm lift to cut off the irritating noise when the stylus is set down on or lifted up from the record. You can adjust the muting time by adjusting the arm lift height (distance between the stylus tip and record surface when cueing lever is raised).

If the clearance becomes too narrow or too wide because of the physical size of the different cartridge on the market, turn the adjustment screw screw clockwise or counterclockwise, while pushing the arm lift down.

If the noise is heard

Adjust the arm lift height adjustment screw clockwise to reduce the distance between the record and stylus tip.

If the sound is not heard even after the stylus tip sets down on the recorded groove

Adjust the screw counterclockwise to increase the distance.

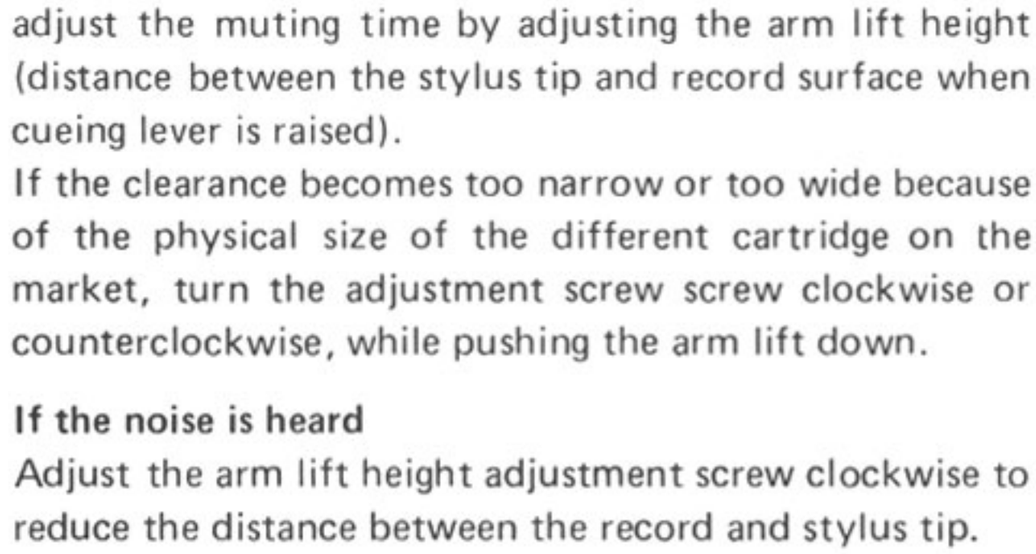


Fig. 13

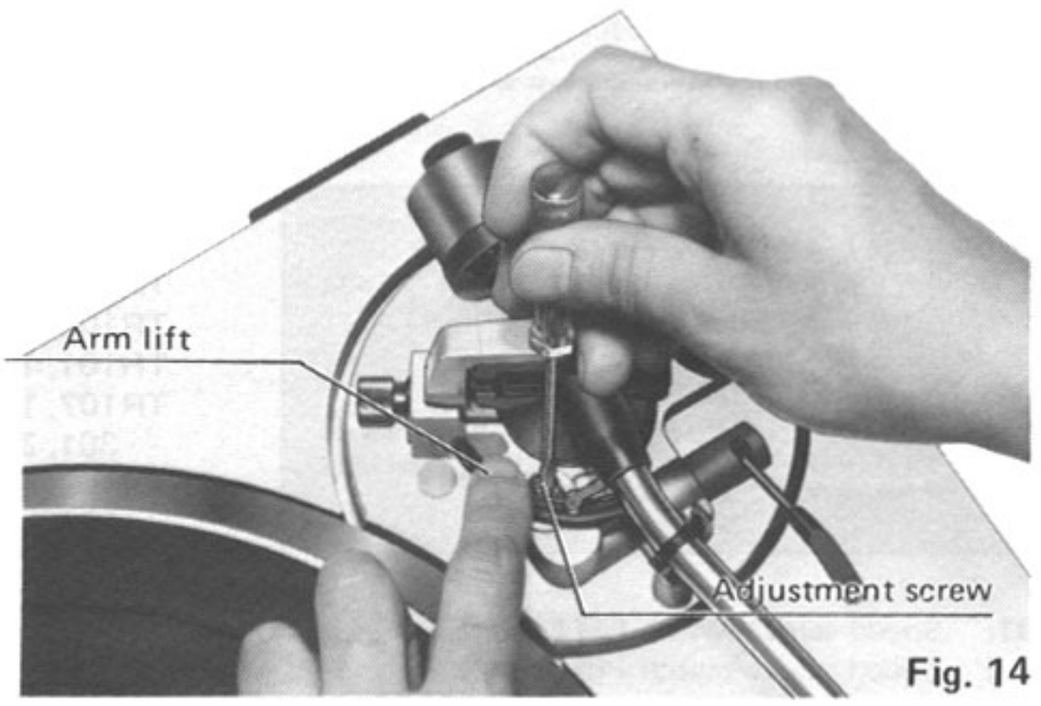


Fig. 14

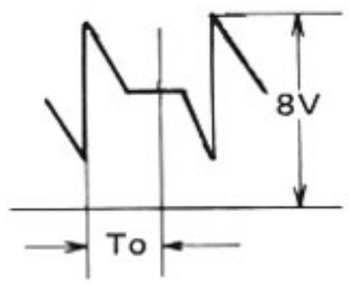
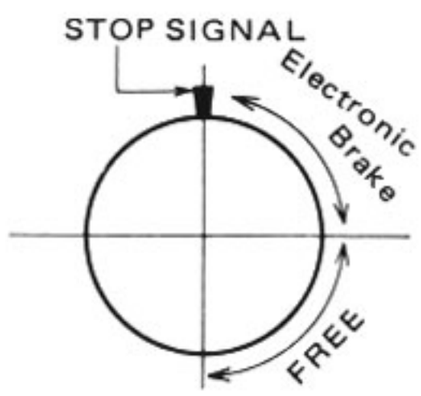
Note:

As the adjusting screw has a hexagon head, be sure to make the adjustment while depressing the arm lift, and be sure that the hexagon head retract correctlys into the arm lift when released.

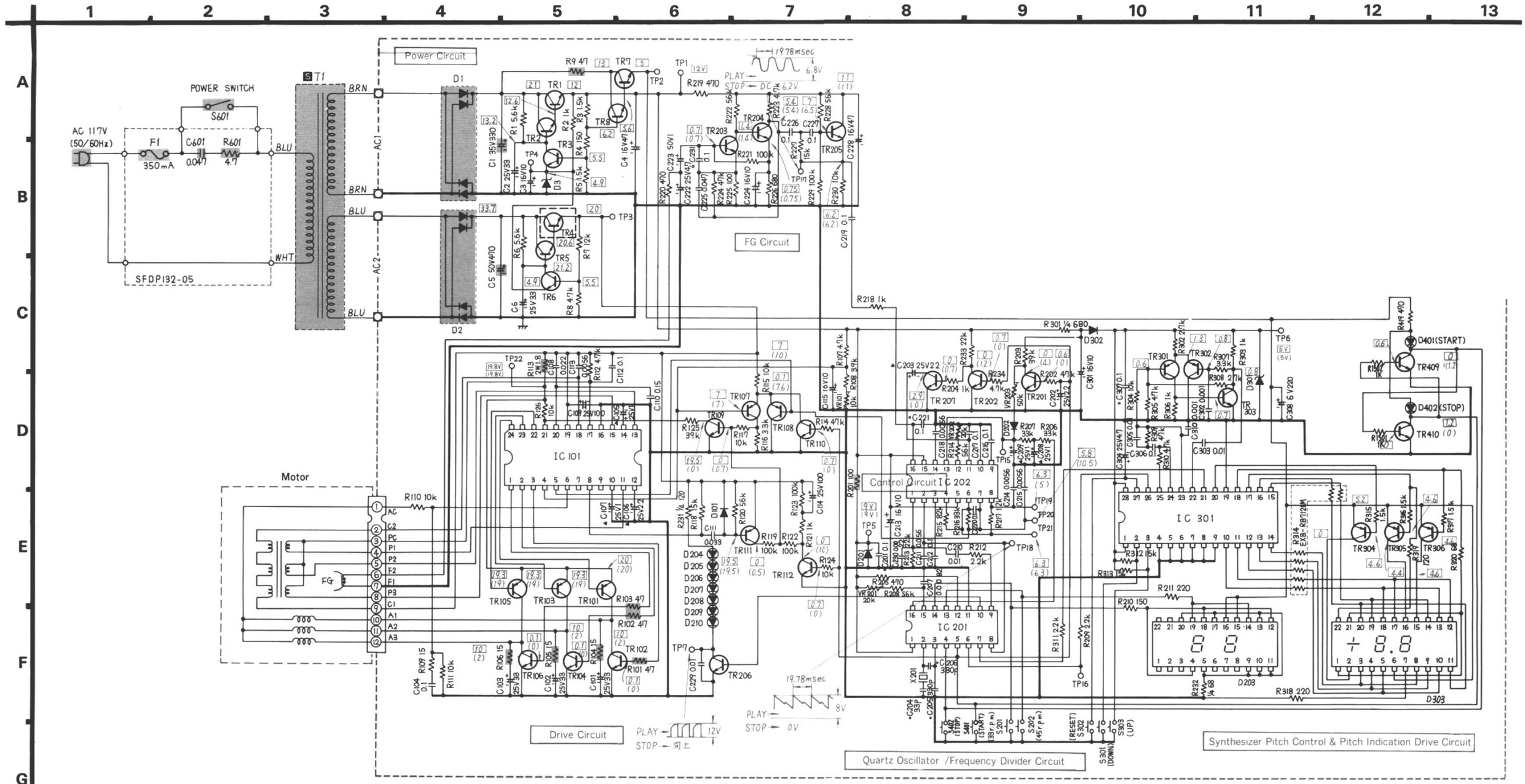
■ ADJUSTMENTS-2

Adjustment Points of Electrical System

NOTE: Make the following adjustments after replacing parts such as IC's, transistors, diodes, etc.

	Adjustment	Connection Points	Adjustment Point	Adjustment Method
A	Adjustment of standard voltage (VS)	DC voltmeter or Oscilloscope ⊕ → TP15 ⊖ → GROUND	**VR201**	Turn start switch on to begin turntable rotation. For 33 rpm . . . adjust VR201 for DC 2.10V ±0.05V. For 45 rpm . . . confirm that there is DC 2.80 ~ 2.86V.
B	Adjustment of current source (IR)	DC voltmeter or Oscilloscope ⊕ → TP19 ⊖ → TP21	**VR202**	Turn start switch on to begin turntable rotation. Adjust VR202 for 0V potential difference of TP19 and TP21.
C	Tracking adjustment	Oscilloscope ⊕ → TP18 ⊖ → GROUND	**VR101**	**TP18 waveform**  For 33 rpm . . . adjust VR101 for $8 \leqq To \leqq 8.5$ ms. For 45 rpm . . . confirm that $5.8 \leqq To \leqq 6.4$ ms.
D	Braking adjustment	——	**VR203**	 Adjust VR203 for complete stop within 90° ~ 180° after stop signal initiated. (Turntable becomes free a few seconds after stop.)

Schematic Diagram ..... Model SL-1500MK2 (This schematic diagram may be modified at any time with the development of new technology.)



■ TERMINAL GUIDE

① 2SC1826

② 2SC1383, 2SC1384, 2SA719, 2SA564, 2SC828, 2SC828A

③ 2SC1406, 2SA751

④ AN640

⑤ AN660, DN860

⑥ MN6042

⑧ SVDGL-7R204

⑨ SVDGL-7R203

IMPORTANT SAFETY NOTICE

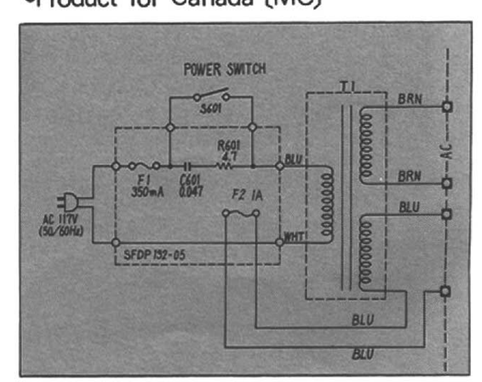
THE SHADED AREA ON THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR SAFETY.
WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTUR'S SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SHADED AREAS OF THE SCHEMATIC.

Notes:

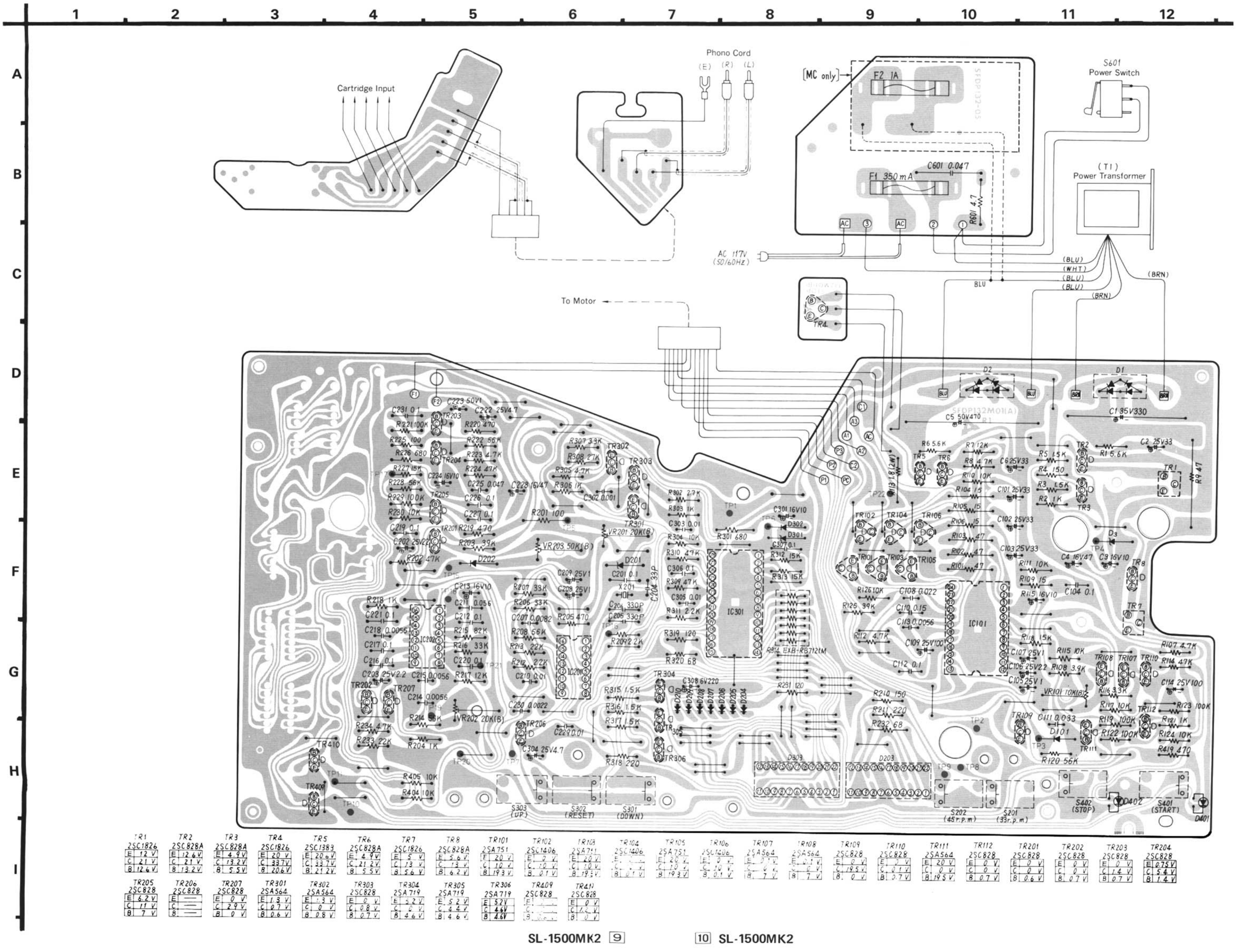
1. **S201:** Speed select switch (33 r.p.m.)
2. **S202:** Speed select switch (45 r.p.m.)
3. **S301:** Pitch Control switch (Down)
4. **S302:** Pitch Control switch (Reset)
5. **S303:** Pitch Control switch (Up)
6. **S401:** Start switch in "**off**" position.
7. **S402:** Stop switch in "**off**" position.
8. **S601:** Power switch in "**off**" position.
9. The voltage values entered are the values measured from the chassis with a standard tester that has an internal resistance of 100KΩ /V.

TR1, 4, 7	2SC1826
TR2, 3, 6, 8	2SC1328-T
TR5	2SC1384
TR102, 104, 106	2SC1406
TR101, 103, 105	2SA752
TR107, 107, 111 301, 302,	2SA666AI-R
TR109, 110, 112, 201～207, 303 409,410	2SC1328-T
TR304～306	2SA719
IC101	AN640
IC201	DN860
IC202	AN660
IC301	MN6042
D1, 2	SVDRIRBA20
D3, 301	SVDRD5.1EBS
D101, 202, 302	MA150
D201	SVDR9.1EBS
D203	SVDGL-7R204
D204～210	SVDSR105C
D303	SVDGL-7R203
D401, 402	SVDSR105C

•Product for Canada (MC)



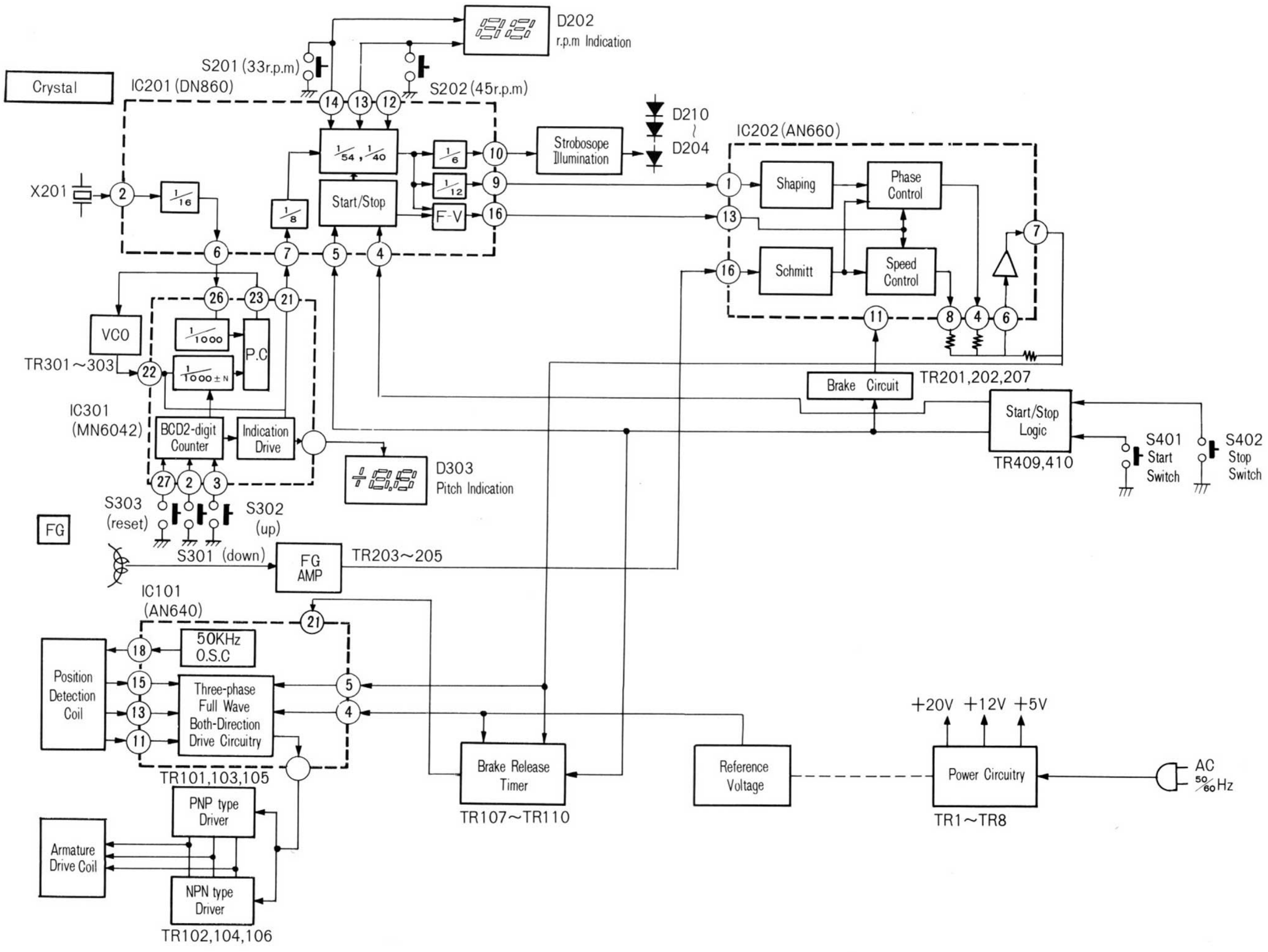
Printed Circuit Board SL-1500MK2



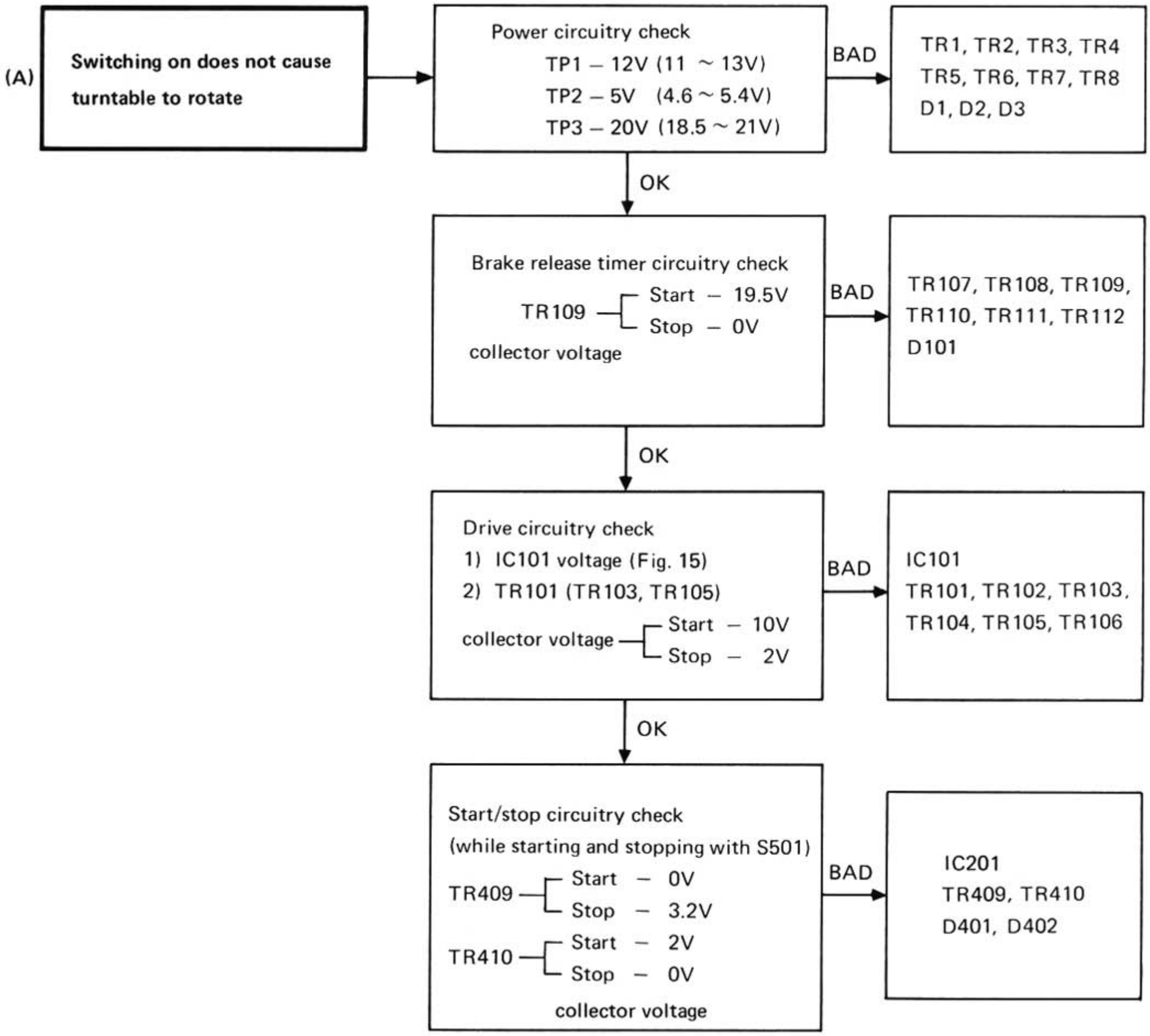
	TR1 2SC1826	TR2 2SC828A	TR3 2SC828A	TR4 2SC1826	TR5 2SC1383	TR6 2SC828A	TR7 2SC1826	TR8 2SC828A	TR101 2SA751	TR102 2SC1406	TR103 2SA711	TR104 2SC1406	TR105 2SA751	TR106 2SC1406	TR107 2SA564	TR108 2SA564	TR109 2SC828	TR110 2SC828	TR111 2SA564	TR112 2SC828	TR201 2SC828	TR202 2SC828	TR203 2SC828	TR204 2SC828
E	12 V	12.6 V	4.9 V	20 V	20.6 V	4.9 V	5 V	5.6 V	20 V	0 V	20 V	—	20 V	0 V	0.7 V	0.1 V	0 V	0 V	20 V	0 V	0 V	0 V	0 V	0.75 V
C	21 V	21 V	13.2 V	33.7 V	33.7 V	21.2 V	13 V	13 V	10 V	10 V	10 V	—	10 V	10 V	0 V	0.1 V	19.5 V	0.1 V	0 V	0 V	0 V	0 V	1.4 V	5.4 V
B	12.6 V	13.2 V	5.5 V	20.6 V	21.2 V	5.5 V	5.6 V	6.2 V	19.3 V	0.1 V	19.3 V	—	19.3 V	0.1 V	7 V	7 V	0 V	0.7 V	19.5 V	0.7 V	0.6 V	0.7 V	0.7 V	1.4 V

	TR205 2SC828	TR206 2SC828	TR207 2SC828	TR301 2SA564	TR302 2SA564	TR303 2SC828	TR304 2SA719	TR305 2SA719	TR306 2SA719	TR401 2SC828	TR411 2SC828
E	6.2 V	—	0 V	1.3 V	1.3 V	0 V	5.2 V	5.2 V	5.2V	0 V	0 V
C	11 V	—	2.9 V	0.7 V	0 V	0.8 V	0 V	4.4 V	4.6V	12 V	0 V
B	7 V	—	0 V	0.6 V	0.8 V	0.7 V	4.6 V	4.6 V	4.6V	0 V	0 V

■ BLOCK DIAGRAM



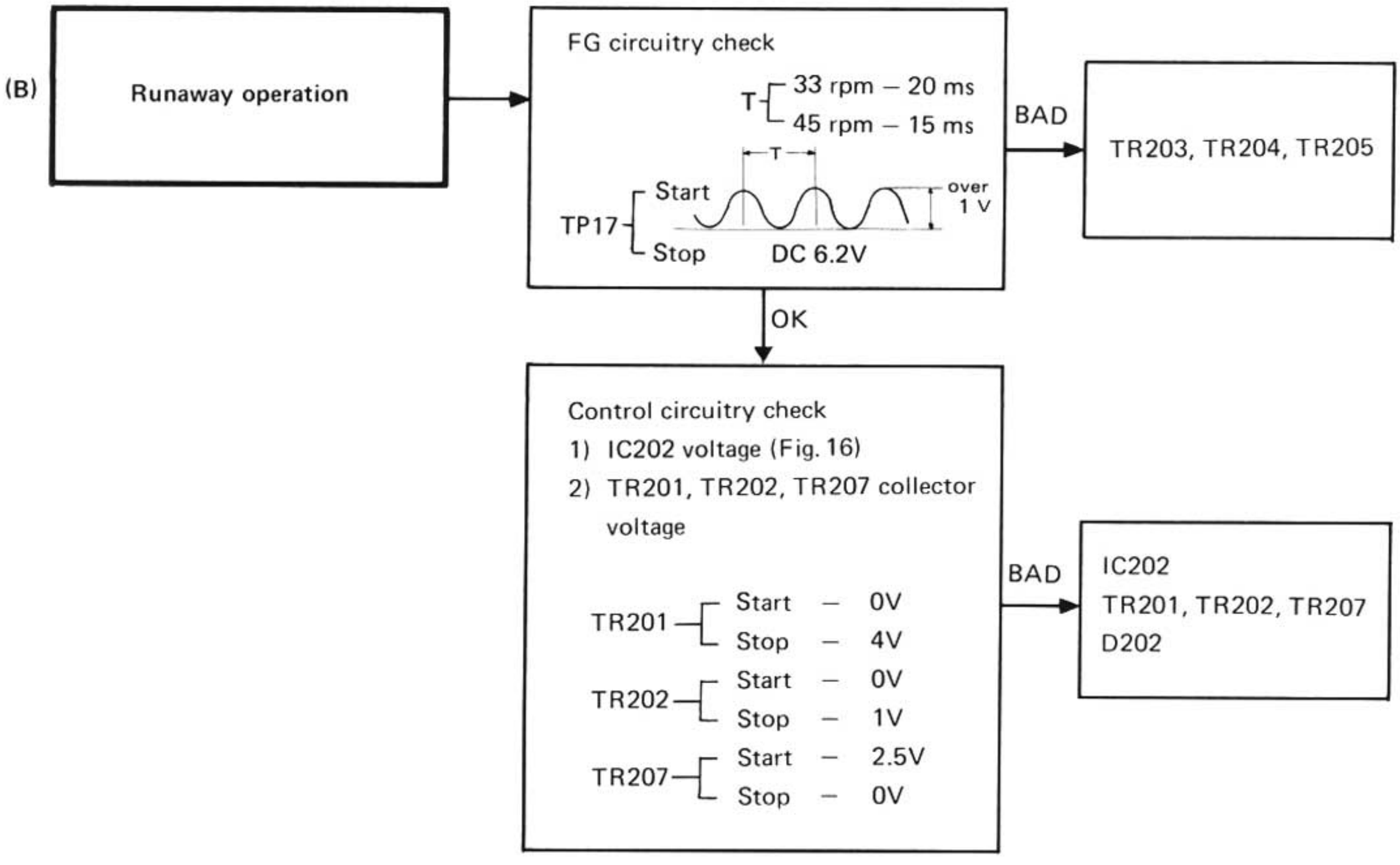
■ TROUBLE SHOOTING



Reference voltage of each pin of IC101

(Fig. 15)

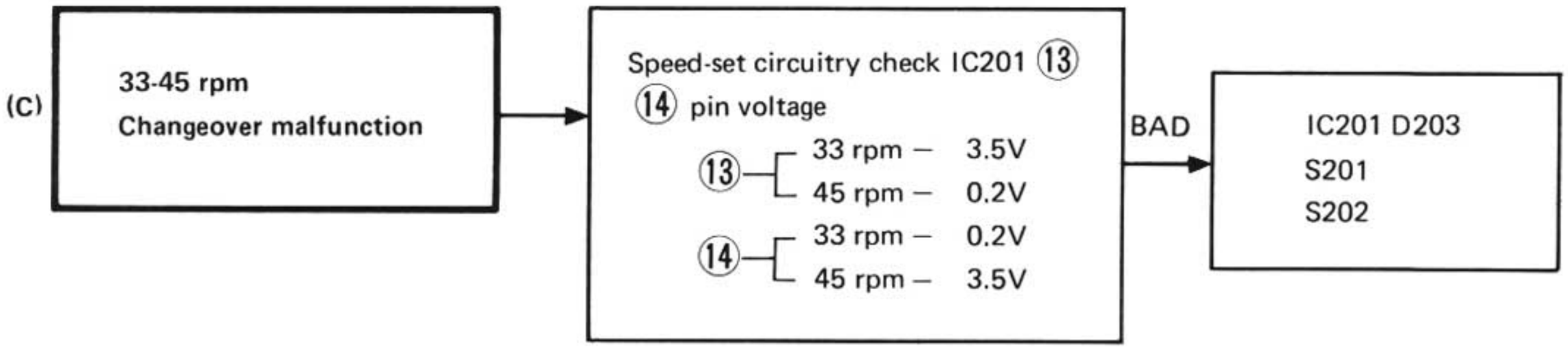
	Start	Stop		Start	Stop		Start	Stop
①②③	0.8V	0.1V	⑩	14.5V	15.2V	⑰	15.5V	15.5V
④	5.8V	6.1V	⑪⑬⑮	20ms 15.6V	Same as at left	⑱	20ms 20V	Same as at left
⑤	5.9V	10.5V				⑲	20.6V	20.6V
⑥	4.7V	2.2V	⑫	14.9V	15V	⑳	15.3V	1.4V
⑦	4.9V	4.9V				㉑	20.5V	16.4V
⑧	20.5V	20.5V	⑭	14.9V	15V	㉒㉓㉔	20V	20V
⑨	5V	0.2V	⑯	0V	0V			



Reference voltage of each pin of IC202

(Fig. 16)

	Start	Stop		Start	Stop		Start	Stop
①	20ms, 4.6V	0 V	⑥	6.3V	6.3V	⑫	2.1V	2.7V
②	Same at TP18	0 V	⑦	5.8V	10.5V	⑬	2.1V	2.7V
③	20ms, 4.8V	6.1V	⑧	6.3V	5.0V	⑭	20ms, 8V	7.5V
④	6.6V	6.2V	⑨	20ms, 6.2V	7.1V	⑮	11.7V	11.7V
⑤	11.7V	11.7V	⑩	0 V	0 V	⑯	20ms, 6.2V	5.5V
			⑪	20ms, 7V	7.5V			



(D) **Pitch control malfunction**
Stroboscope synchronization malfunction

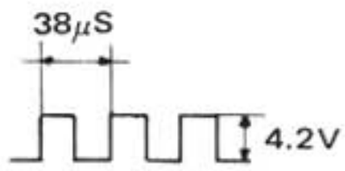
→ Quartz-crystal oscillation power check
TP5 – 9V (8.5 ~ 9.5V)
BAD → D201

OK ↓

VCO power check
TP6 – 5V (4.6 ~ 5.4V)
BAD → D301, D302

OK ↓

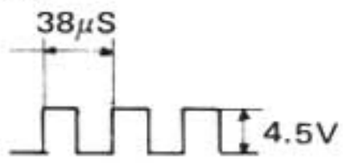
Quartz-crystal oscillation circuitry check
1) TP16



2) IC201 voltage (Fig. 17)
BAD → X201, IC201

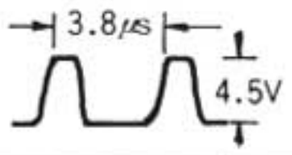
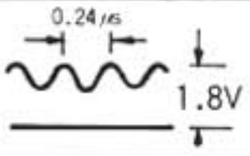
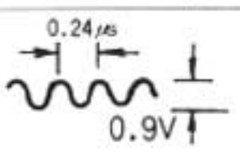
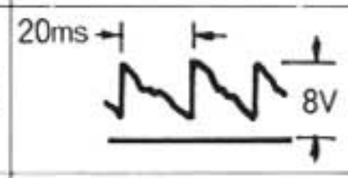
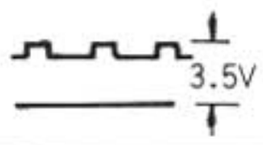
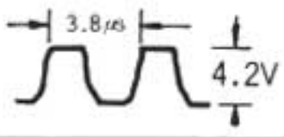
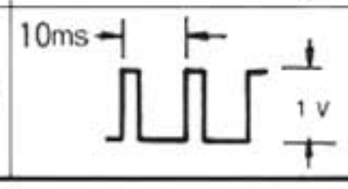
OK ↓

Pitch control circuitry check
1) IC201 (7) pin

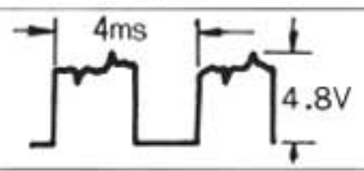
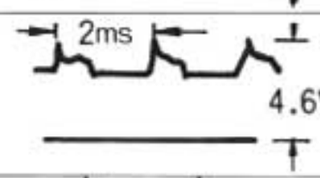
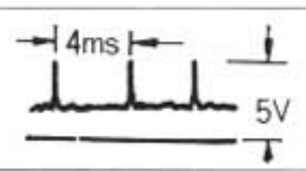
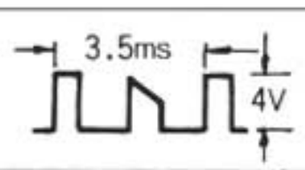
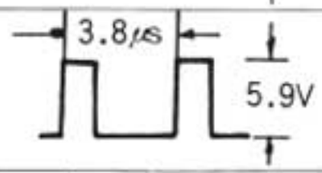
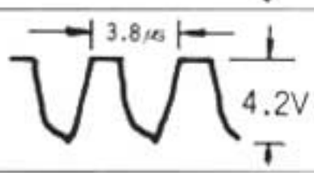
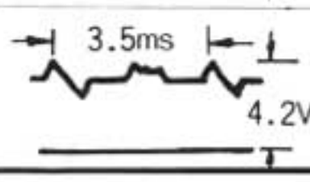
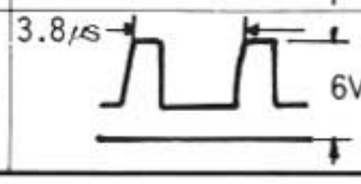


2) IC301 voltage (Fig. 18)
BAD → IC301, TR301,TR302,TR303, TR304,TR305,TR306, D303

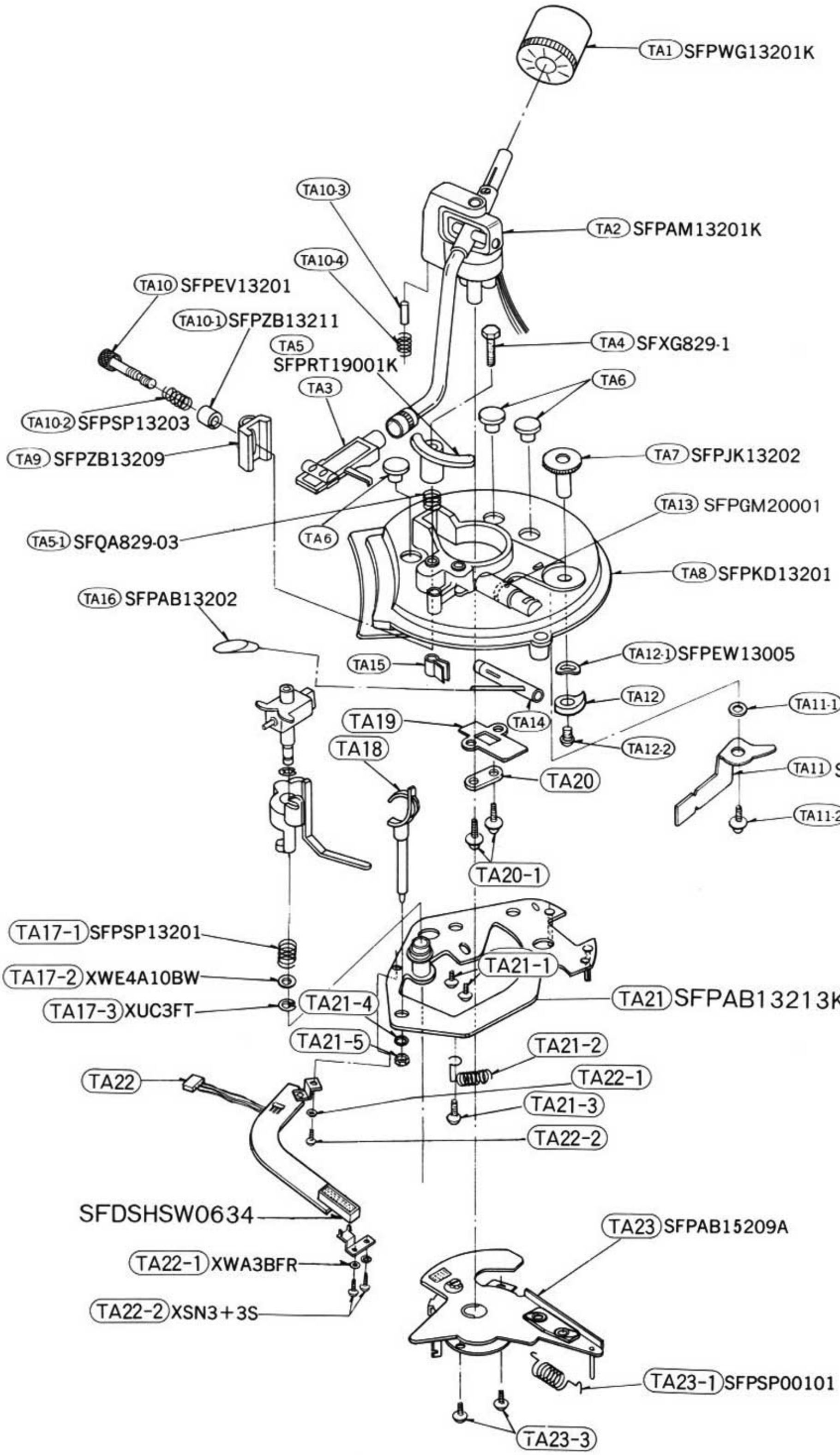
Reference voltage of each pin of IC201 **(Fig. 17)**

	Start	Stop		Start	Stop		Start	Stop
①	9.4V	9.4V	⑦		Same as at left	⑪	0 V	0 V
②		Same as at left				⑫	6 V	6 V
③		Same as at left	⑧		0 V	⑬		Same as at left
④	0 V	3.2V				⑭	0.2V	0.2V
⑤	2.0V	0 V	⑨		4.3V	⑮		Same as at left
⑥		Same as at left	⑩		Same as at left	⑯		0 V

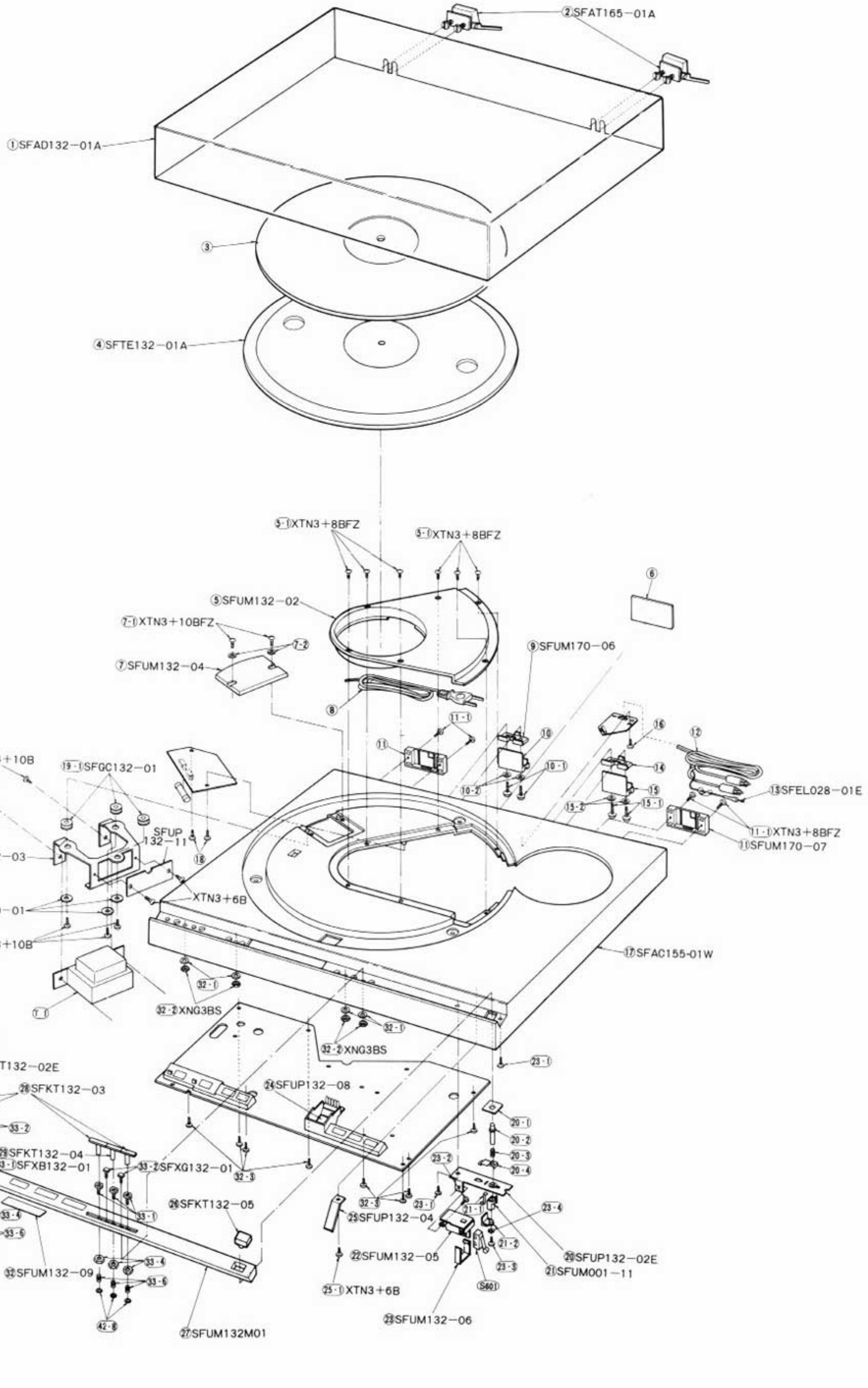
Reference voltage of each pin of IC301 **(Fig. 18)**

	Start	Stop		Start	Stop		Start	Stop
① ② ③	4.9V	4.9V	⑰ ⑱		Same as at left	㉓	2.4V	Same as at left
						㉔	2.4V	Same as at left
④ ⑧ ⑤ ⑨ ⑥ ⑩ ⑦	0 V	0 V	⑳		Same as at left	㉕		Same as at left
⑩ ⑬ ⑪ ⑭ ⑫ ⑮		Same as at left	㉑		Same as at left	㉖		Same as at left
⑯		Same as at left	㉒		Same as at left	㉗	5 V	5 V
						㉘	5 V	5 V

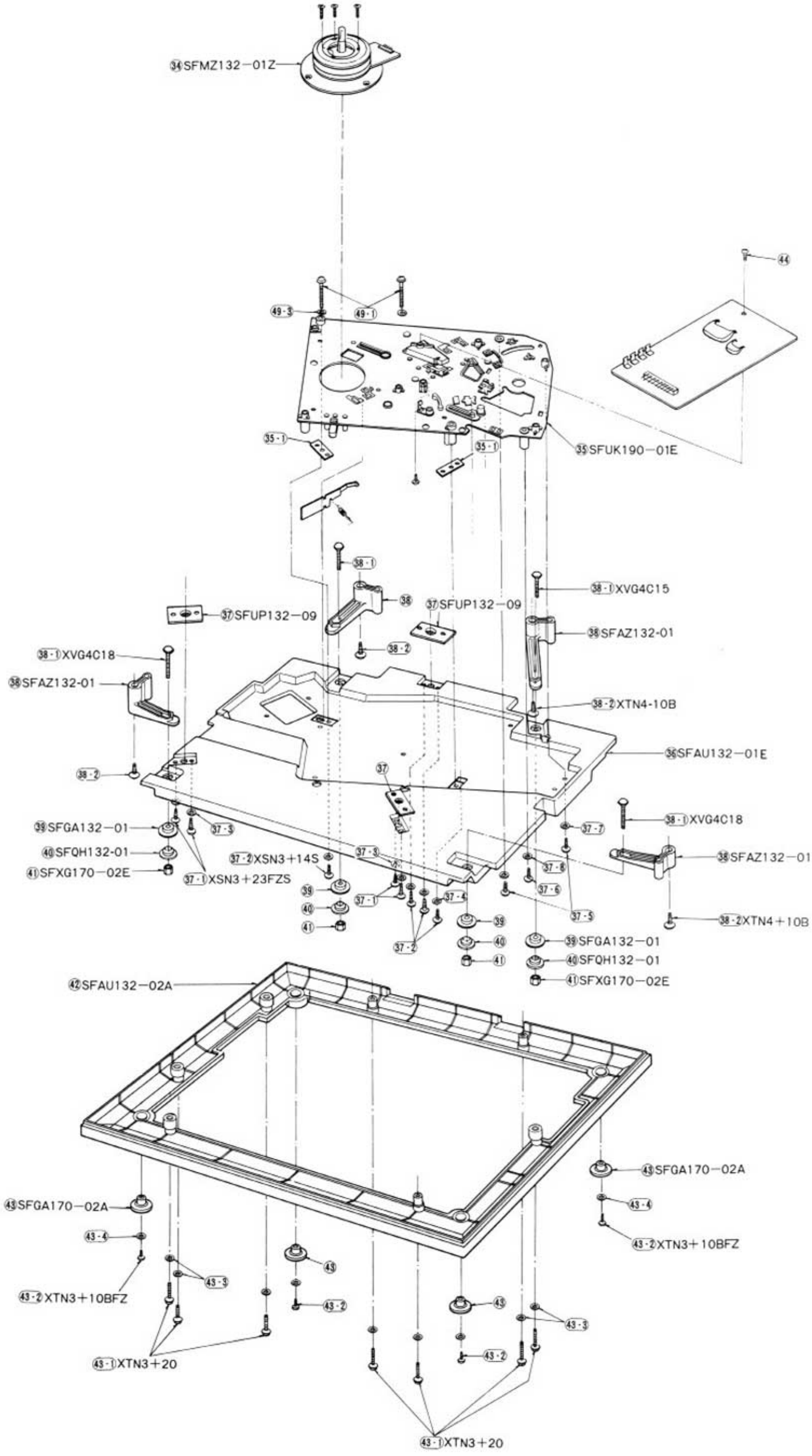
■ EXPLODED VIEW



■ EXPLODED VIEW



■ EXPLODED VIEW



■ REPLACEMENT PARTS LIST

Important Safety Notice

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

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

2. SL-1500MK2[M] ——→[M]
SL-1500MK2[MC] ——→[MC]

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
		INTEGRATED CIRCUITS			
IC101	AN640	Drive Circuit	1		
IC201	DN860	Frequency Divider Circuit	1		
IC202	AN660	Control Circuit	1		
IC301	MN6042	Pitch Control Circuit	1		
		TRANSISTORS			
TR1, 4, 7	**2SC1826-Y**	Transistors (Use in ranks O or Y or G)	3		
TR2, 3, 6, 8,	2SC1328G	Transistors	4		
TR5	**2SC1384A-Q**	Transistor (Use in ranks Q or R or S)	1		
TR101	**2SA752-Q**	Transistor	1		
TR102	**2SC1406-Q**	Transistor **(Use in pair ranks Q or R or S)**	1		
TR103	**2SA752-Q**	Transistor	1		
TR104	**2SC1406-Q**	Transistor **(Use in pair ranks Q or R or S)**	1		
TR105	**2SA752-Q**	Transistor	1		
TR106	**2SC1406-Q**	Transistor **(Use in pair ranks Q or R or S)**	1		
TR107, 108, 111 301, 302	**2SA666AI-R**	Transistor (Use in ranks Q or R or S)	5		
TR109, 110, 112, 201, 202, 203, 204, 205, 206, 207, 303, 409, 410	**2SC1328-T**	Transistor	13		
TR304, 305, 306	**2SA719-P**	Transistors (Use in ranks P or Q or R or S)	3		
		DIODES			
D1, 2	SVDSIRBA20	Rectifier	2		
D3, 301	SVDRD5.1EBS	5.1V Zener, Voltage Stabilizer	2		
D101, 202, 302,	MA150	Diodes	3		
D201	SVDRD9.1EBS	9.1V Zener, Voltage Stabilizer	1		
D203	SVDGL-7R204	Light Emitting Diode (r.p.m)	1		
D204, 205, 206, 207, 208, 209, 210, 401, 402	SVDSR105C	Light Emitting Diode	9		
D303	SVDGL-7R203	Light Emitting Diode (pitch)	1		
		CRYSTAL			
X204	SVQU306115	4.19328MHz Oscillater	1		
		TRANSFORMER			
T1	SLT60EU3B	Power Transformer	1		
		FUSE			
F1	XBA2E04NU100	400mA (Fuse)	1		
F2 [MC only]	XBA2E10NU100	1A (Fuse)	1		

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
		SWITCHES			
S201, 202	EVQP4R04K	Speed Selector Switches	2		
S301, 302, 303	EVQP4R04K	Pitch Control Switches	3		
S401, 402	EVQP4R04K	Start or Stop Switches	2		
S601	SFDSSS5GL2	Power Switch	1		
	SFDSHSW0634	Switch, Muting	1		
		RESISTORS			
R1	**ERD25TJ562**	Carbon, 5.6kΩ, 1/4W, ± 5%	1		
R2	**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%	1		
R3	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ± 5%	1		
R4	**ERD25TJ151**	Carbon, 150Ω, 1/4W, ± 5%	1		
R5	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ± 5%	1		
R6	**ERD25TJ562**	Carbon, 5.6kΩ, 1/4W, ± 5%	1		
R7	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ± 5%	1		
R8	**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%	1		
R9	**ERG3ANJ470**	Metal Film, 47Ω, 3W, ± 5%	1		
R101, 102, 103	**ERX1ANJ470**	Metal Film, 47Ω, 1W, ± 5%	3		
R104, 105, 106	**ERX1ANJ150**	Metal Film, 15Ω, 1W, ± 5%	3		
R107	**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%	1		
R108	**ERD25TJ392**	Carbon, 3.9kΩ, 1/4W, ± 5%	1		
R109	**ERD25TJ150**	Carbon, 15Ω, 1/4W, ± 5%	1		
R110, 111	**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%	2		
R112	**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%	1		
R113	**ERX1ANJ1R8**	Metal Film, 1.8Ω, 1W, ± 5%	1		
R114	**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ± 5%	1		
R115	**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%	1		
R116	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ± 5%	1		
R117	**ERD25TJ103**	Carbon, 10kΩ 1/4W, ± 5%	1		
R118	**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ± 5%	1		
R119	**ERD25TJ104**	Carbon 100kΩ, 1/4W, ± 5%	1		
R120	**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ± 5%	1		
R121	**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%	1		
R122, 123	**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ± 5%	2		
R124	**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%	1		
R125	**ERD25TJ393**	Carbon, 39kΩ, 1/4W, ± 5%	1		
R126	**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%	1		
R201	**ERX1ANJ101**	Metal Film, 100Ω, 1W, ± 5%	1		
R202	**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ± 5%	1		
R203	**ERD25TJ393**	Carbon, 39kΩ, 1/4W, ± 5%	1		
R204	**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%	1		
R205	**ERD25TJ471**	Carbon, 470Ω, 1/4W, ± 5%	1		
R206, 207	**ERD25TJ333**	Carbon, 33kΩ, 1/4W, ± 5%	2		
R208	**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ± 5%	1		
R209	**ERD25TJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%	1		
R210	**ERD25TJ151**	Carbon, 150Ω, 1/4W, ± 5%	1		
R211	**ERD25TJ221**	Carbon, 220Ω, 1/4W, ± 5%	1		
R212	**ERD25TJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%	1		
R213	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%	1		
R214	**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ± 5%	1		
R215	**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ± 5%	1		
R216	**ERD25TJ333**	Carbon, 33kΩ, 1/4W, ± 5%	1		
R217	**ERD25TJ123**	Carbon, 12KΩ, 1/4W, ± 5%	1		
R218	**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%	1		

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
R219, 220	**ERD25TJ471**	Carbon, 470Ω, 1/4W, ± 5%	2		
R221	**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ± 5%	1		
R222	**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ± 5%	1		
R223	**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%	1		
R224	**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ± 5%	1		
R225	**ERD25TJ101**	Carbon, 100Ω, 1/4W, ± 5%	1		
R226	**ERD25TJ681**	Carbon, 680Ω, 1/4W, ± 5%	1		
R227	**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ± 5%	1		
R228	**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ± 5%	1		
R229	**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ± 5%	1		
R230	**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%	1		
R231	**ERD25TJ121**	Carbon, 120Ω, 1/4W, ± 5%	1		
R232	**ERD25TJ680**	Carbon, 68Ω, 1/4W, ± 5%	1		
R233	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%	1		
R234	**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%	1		
R301	**ERD25TJ391**	Carbon, 390Ω, 1/4W, ± 5%	1		
R302	**ERD25TJ272**	Carbon, 2.7kΩ, 1/4W, ± 5%	1		
R303	**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%	1		
R304	**ERD25TJ103**	Carbon, 10kΩ, 1/4W, ± 5%	1		
R305	**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%	1		
R306	**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%	1		
R307	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ± 5%	1		
R308	**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ± 5%	1		
R309, 310	**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ± 5%	2		
R311	**ERD25TJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%	1		
R312, 313	**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ± 5%	2		
R314	EXBRB7121M	Composite Resistor, 120Ω, x 7, ±20%	1		○
R315, 316, 317	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ± 5%	3		
R318	**ERD25TJ221**	Carbon, 220Ω, 1/4W, ± 5%	1		
R319	**ERD25TJ121**	Carbon, 120Ω, 1/4W, ± 5%	1		
R320	**ERD25TJ680**	Carbon, 68Ω, 1/4W, ± 5%	1		
R419	**ERD25TJ471**	Carbon, 470Ω, 1/4W, ± 5%	1		
R601	**ERD50TJ4R7**	Carbon, 4.7Ω, 1/2W, ± 5%	1		
R1501	**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%	1		
R1502	**ERD25TJ102**	Carbon, 1kΩ, 1/4W, ± 5%	1		
VARIABLE RESISTORS					
VR101	**EVLS3AA00B14**	Period Adjustment	1		
VR201	**EVLS3AA00B24**	VS Adjustment	1		
VR202	**EVLS3AA00B24**	IR Adjustment	1		
VR203	**EVLS3AA00B54**	Brake Adjustment	1		
CAPACITORS					
C1	**ECEB35V330**	Electrolytic, 330μF, 35V	1		
C2	**ECEA25V33**	Electrolytic, 33μF, 25V	1		
C3	**ECEA16V10**	Electrolytic, 10μF, 16V	1		
C4	**ECEA16V47**	Electrolytic, 47μF, 16V	1		
C5	**ECEB50V470**	Electrolytic, 470μF 50V	1		
C6	**ECEA25V33**	Electrolytic, 33μF, 25V	1		
C101, 102, 103	**ECEA25V33**	Electrolytic, 33μF, 25V	3		
C104	**ECQM1H104KZ**	Polyester, 0.1μF, 50V, ±10%	1		
C105	ECSZ25EF1	Electrolytic, 1μF, 25V	1		
C106	ECSZ25EF2R2	Electrolytic, 2.2μF, 25V	1		
C107	ECSZ25EF1	Electrolytic, 1μF, 25V	1		
C108	**ECQM1H223KZ**	Polyester, 0.022μF, 50V, ±10%	1		
C109	ECEA25Z100	Electrolytic, 100μF, 25V	1		

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
C110	**ECQM05154KZ**	Polyester, 0.15μF, 50V, ±10%	1		
C111	**ECQM1H333KZ**	Polyester, 0.033μF, 50V, ±10%	1		
C112	**ECQM1H104KZ**	Polyester, 0.1μF, 50V, ±10%	1		
C113	**ECQM1H562KZ**	Polyester, 0.0056μF, 50V, ±10%	1		
C114	**ECEA25V100**	Electrolytic, 100μF, 25V	1		
C115	**ECEA16V10**	Electrolytic, 10μF, 16V	1		
C201	ECKD1E104ZFZ	Ceramic, 0.1μF 50V	1		
C202	**ECEA25V2R2**	Electrolytic, 2.2μF, 25V	1		
C203	ECSZ25EF2R2	Electrolytic, 2.2μF, 25V	1		
C204	ECCD1H330K	Ceramic, 33pF, 50V, ±10%	1		
C205, 206	ECCD1H331K	Ceramic, 330pF, 50V, ±10%	2		
C207	**ECQM1H822KZ**	Polyester, 0.0082μF, 50V, ±10%	1		
C208, 209	ECSZ25EF1	Electrolytic, 1μF, 25V	2		
C210	**ECQM1H103KZ**	Polyester, 0.01μF, 50V, ±10%	1		
C211	**ECQM1H563KZ**	Polyester, 0.056μF, 50V, ±10%	1		
C212	**ECQM1H104KZ**	Polyester, 0.1μF, 50V, ±10%	1		
C213	**ECEA16V10**	Electrolytic, 10μF, 16V	1		
C214	**ECQM1H562KZ**	Polyester, 0.0056μF, 50V, ±10%	1		
C215	**ECQM1H562KZ**	Polyester, 0.0056μF, 50V, ±10%	1		
C216, 217	**ECQM1H104KZ**	Polyester, 0.1μF, 50V, ±10%	1		
C218	**ECQM1H562KZ**	Polyester, 0.0056μF, 50V, ±10%	1		
C219, 220	**ECQM1H104KZ**	Polyester, 0.1μF, 50V, ±10%	1		
C221	ECKD1E104ZFZ	Ceramic, 0.1μF, 50V	1		
C222	**ECEA50V4R7**	Electrolytic, 4.7μF, 50V	1		
C223	**ECEA50V1**	Electrolytic, 1μF, 50V	1		
C224	**ECEA16V10**	Electrolytic, 10μF, 50V	1		
C225	**ECQM1H473KZ**	Polyester, 0.047μF, 50V, ±10%	1		
C226, 227	**ECQM1H104KZ**	Polyester, 0.1μF, 50V, ±10%	2		
C228	**ECEA16V47**	Electrblytic, 47μF, 16V	1		
C229	**ECQM1H103KZ**	Polyester, 0.01μF, 50V, ±10%	1		
C230	**ECQM1H102KZ**	Polyester, 0.001μF, 50V, ±10%	1		
C231	ECKD1E104ZFZ	Ceramic, 0.1μF, 50V,	1		
C301	**ECEA16V10**	Electrolytic, 10μF, 16V	1		
C302	**ECQM1H102KZ**	Polyester, 0.001μF, 50V, ±10%	1		
C303	**ECQM1H103KZ**	Polyester, 0.01μF, 50V, ±10%	1		
C304	**ECEA50V4R7**	Electrolytic, 4.7μF, 50V	1		
C305	**ECQM1H103KZ**	Polyester, 0.01μF, 50V, ±10%	1		
C306	**ECQM1H104KZ**	Polyester, 0.1μF, 50V, ±10%	1		
C307	ECKD1E104ZFZ	Ceramic, 0.1μF, 50V	1		
C308	**ECEA6V220**	Electrolytic, 220μF, 6V	1		
C310	**ECQM1H102KZ**	Polyester, 0.001μF, 50V, ±10%	1		
C601 [M]	ECQF1A473MD	Polyester, 0.047μF, 125V, ±20%	1		
C601 [MC]	ECQU1A473MC	Polyester, 0.047μF, 125V, ±20%	1		
CABINET and CHASSIS PARTS					
1	SFAD132-01A	Dust Cover	1		
2	SFAT165-01A	Hinge Ass'y	2		
3 [M]	SFTG170M01	Turntable Mat	1		
3 [MC]	SFTG170-01	Turntable Mat	1		
4	SFTE132-01A	Turntable	1		
5	SFUM132-02	Cover, Panel	1		
5-1	**XTN3+8BFZ**	Screw, Panel Cover	6		
6 [M]	SFNN155M01	Name Plate	1		*○
6 [MC]	SFNN155C01	Name Plate	1		*○
7	SFUM132-04	Cover, Transformer	1		

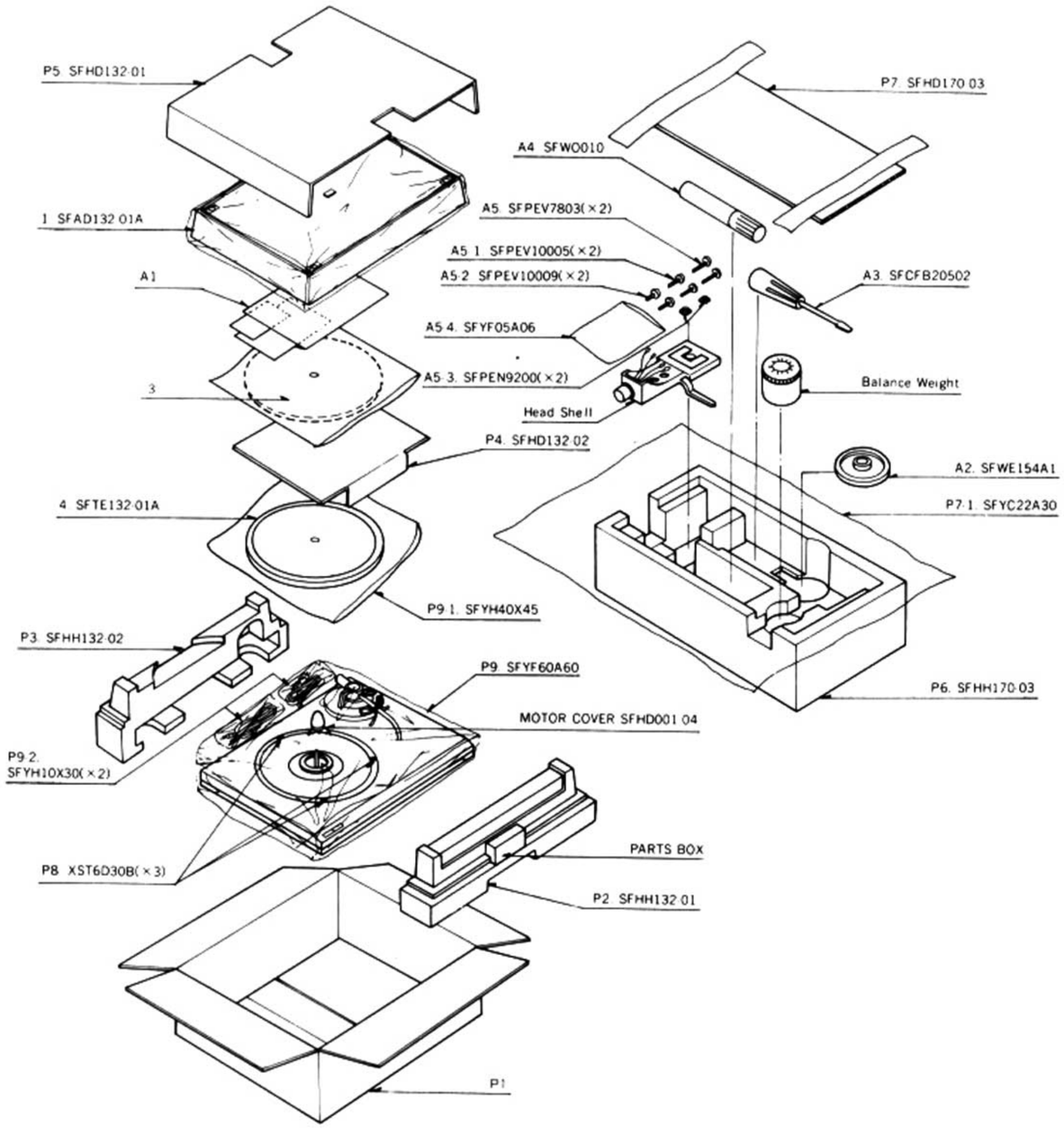
Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
7-1	**XTN3+10BFZ**	Screw, Transformer Cover	2		
7-2	**XWG3**	Washer, Transformer Cover	2		
8	**RJA10A**	AC Cord	1		
9	SFUM170-06	Spacer, AC Power Cord	1		
10	SFUM170-05	Bracket, AC Power Cord	1		
10-1	**XTN3+14BFZ**	Screw, AC Cord Bracket	2		
10-2	**XWG3**	Washer, AC Cord Bracket	2		
11	SFUM170-07	Case, Hinge Ass'y	2		
11-1	**XTN3+8BFZ**	Screw, Hinge Ass'y Case	4		
12 [M]	SFDH360M01	Phono Cord	1		
12 [MC]	SFDH028-01	Phono Cord	1		
13	SFEL028-01E	Ground Wire	1		
14	SFUM170-06	Spacer, Phono Cord	1		
15	SFUM170-11	Bracket, Phono Cord	1		
15-1	**XTN3+14BFZ**	Screw, Phono Cord Bracket	2		
15-2	**XWG3**	Washer, Phono Cord Bracket	2		
16	**XTN3+8B**	Screw, Phono Cord P.C.B.	1		
17	SFAC155-01W	Cabinet	1		○
17-1	SFUZ132-03	Sheet, Panel Cover	1		○
18	**XTN3+8B**	Screw, P.C.B.	2		
19	SFUP132-03	Bracket, Power Transformer	1		
19-1	SFGC132-01	Spacer (Rubber), Power Transformer Bracket	3		
19-2	**XTN4+10B**	Screw, Power Transformer	2		
19-3	SFXW750-01	Washer, Power Transformer Bracket	3		
19-4	**XTN3+10B**	Screw, Power Transformer Bracket	3		
19-5	SFUP132-11	Plate, Shield	1		
20	SFUP132-02E	Bracket, Power Switch	1		
20-1	SFUZ132-02	Felt, Power Switch Knob	1		
20-2	SFXJ132-03	Support, Power Switch Knob	1		
20-3	SFQA001-02	Spring, Power Switch Knob	1		
20-4	SFUP001-10	Support, Power Switch Knob	1		
21	SFUM001-11	Cam, Power Switch	1		
21-1	SFUP001-12	Support, Power Switch	1		
21-2	SFUM132-07	Cam, Power Switch Cam	1		
22	SFUM132-05	Holder, Power Switch	1		
23	SFUM132-06	Holder, Power Switch	1		
23-1	**XTN3+8B**	Screw, Power Switch Bracket	2		
23-2	**XTN3+16B**	Screw, Power Switch Holder	1		
23-3	**XSN3+10S**	Screw, Power Switch Cam	1		
23-4	**XWC3B**	Washer, Power Switch Cam	1		
24	SFUP132-08	Mirror	1		
25	SFUP132-04	Bracket, Panel	1		
25-1	**XTN3+6B**	Screw, Panel Bracket	1		
26	SFKT132-05	Knob, Power Switch	1		
27	SFUM155M01	Panel	1		○
28	SFKT132-03	Knob, Operation	4		
29	SFKT132-04	Knob, Operation	1		
30	SFKT132-01E	Knob, Operation	1		
31	SFKT132-02E	Knob, Operation	1		
32	SFUM132-09	Felt	1		
32-1	**XWA3B**	Washer, Panel	4		
32-2	**XNG3BS**	Nut, Panel	4		
32-3	**XTN3+8B**	Screw, P.C.B.	8		
33	SFXB132-02	Spacer, Operation	2		
33-1	SFXB132-01	Spacer, Operation	5		
33-2	SFXG132-01	Screw, Operation	4		
33-3	**XNS6JM**	Nut, Operation Spacer	2		
33-4	**XNG4HS1**	Nut, Operation Spacer	5		
33-5	SFQA132-01	Spring, Operation Knob	2		
33-6	SFQA132-02	Spring, Operation Knob	5		
33-7	**XUC3FT**	Circlip, Operation Knob	2		
33-8	**XUC25FT**	Circlip, Operation Knob	5		
34	SFMZ132-01Z	D.D. Motor Ass'y	1		
35	SFUK190-01E	Base, Automatic Mechanism	1		
35-1	SFUP190-02	Bracket, Automatic Mechanism Base	2		
36	SFAU132-01E	Base, Main	1		
37	SFUP132-09	Bracket, Main Base	3		
37-1	**XSN3+23FZS**	Screw, Main Base Bracket	4		
37-2	**XSN3+14S**	Screw, Main Base Bracket	4		
37-3	**XWG3**	Washer, Main Base Bracket	4		
37-4	**XWG3**	Washer, Main Base Bracket	4		
37-5	**XTN4+35B**	Screw, Main Base	2		
37-6	**XTN3+35B**	Screw, Main Base	6		
37-7	**XWG4**	Washer, Main Base	2		
37-8	**XWG3**	Washer, Main Base	6		
38	SFAZ132-01	Insulator (A)	4		
38-1	XVG4C18	Screw, Insulator (A)	4		
38-2	**XTN4+10B**	Screw, Insulator (A)	4		
39	SFGA132-01	Rubber, Insulator (A)	4		
40	SFQH132-01	Spring, Insulator (A)	4		
41	SFXG170-02E	Nut, Insulator (A)	4		
42	SFAU132-02A	Bottom, Cover	1		
43	SFGA170-02A	Insulator (B)	4		
43-1	**XTN3+20**	Screw, Bottom Cover	7		
43-2	**XTN3+10BFZ**	Screw, Insulator (B)	4		
43-3	**XWG3**	Washer, Bottom Cover	7		
43-4	**XWG4**	Washer, Insulator (B)	4		
44	**XTN3+8B**	Screw, P.C.B.	1		

TONE ARM and ARM BASE

TA1	SFPWG13201K	Balance Weight Ass'y	1		
TA2	SFPAM13201K	Tone Arm Ass'y	1		
TA3	SFPCC10001K	Head Shell	1		
TA4	SFXG829-1	Screw, Tone Arm Lift Adjustment	1		
TA5	SFPRT19001K	Lift Ass'y	1		
TA5-1	SFQA829-03	Spring, Lift Ass'y	1		
TA6 [M]	SFGK132M01	Cap, Rubber	3		
TA6 [MC]	SFGK132-01	Cap, Rubber	3		
TA7	SFPJK13202	Knob, Anti-skate Force Control	1		
TA8	SFPKD13201	Arm Base	1		
TA9	SFPZB13209	Bracket, Tone Arm	1		
TA10	SFPEV13201	Screw, Tone Arm Bracket	1		
TA10-1	SFPZB13211	Cover, Spring	1		
TA10-2	SFPSP13203	Spring, Tone Arm Bracket Screw	1		
TA10-3	SFPZB13212	Pin, Tone Arm Bracket Screw	1		
TA10-4	SFPSP13204	Spring, Tone Arm Bracket Screw	1		
TA11	SFPSH13201	Support, Anti-skate Force Control	1		
TA11-1	XWE3A7BW	Washer, Anti-skate Force Control Support	1		
TA11-2	XTN3+5B	Screw, Anti-skate Force Control Support	1		
TA12	SFPJK17002	Cam, Anti-skate Force Control	1		
TA12-1	SFPEW13005	Washer, Anti-skate Force Control Knob	1		
TA12-2	XTN26+5B	Screw, Anti-skate Force Control Knob	1		

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
TA13	SFPGM20001	Rubber, Cueing Lever	1		
TA14	SFPJL13201K	Cueing Lever Ass'y	1		
TA15	SFPZB13204	Plate, Arm Rest	1		
TA16	SFPAB13202	Knob, Arm Lift	1		
TA17	SFPJL13203K	Lift Bar Ass'y	1		
TA17-1	SFPSP13201	Spring, Arm Lift Base	1		
TA17-2	XWE4A10BW	Washer, Arm Lift Base	1		
TA17-3	**XUC3FT**	Circlip, Arm Lift Base	1		
TA18	SFPRT13201K	Arm Rest	1		
TA19	SFPAB13203	Plate, Lift	1		
TA20	SFPZB13208	Support, Lift	1		
TA20-1	**XTN3+5B**	Screw, Lift Support	2		
TA21	SFPAB13213K	Base, Arm Lift	1		
TA21-1	**XSN3+5S**	Screw, Arm Lift Base	2		
TA21-2	SFPSP13202	Spring	1		
TA21-3	**XSN3+3S**	Screw, Spring	1		
TA21-4	**XWA26B**	Washer, Arm Rest	1		
TA21-5	**XNG26BFN**	Nut, Arm Rest	1		
TA22 [M]	SFPAB13218K	PU Output Cord Ass'y	1		
TA22 [MC]	SFPAB13215K	PU Output Cord Ass'y	1		
TA22-1	XWA3B	Washer, P.C.B. Ass'y	2		
TA22-2	XSN3+3S	Screw, P.C.B. Ass'y	2		
TA23	SFPAB15209A	Tone Arm Fixing Plate Ass'y	1		
TA23-1	SFPSP00101	Spring, Anti-Skating	1		
TA23-3	**XSN3+6S**	Screw	2		
		ACCESSORIES			
A1 [M]	SFNU155M01	Instruction Book	1		○
A1 [MC]	SFNU155C01	Instruction Book	1		○
A2	SFWE154A1	Adaptor, 45 r.p.m	1		
A3	SFCFB20502	Screw driver	1		
A4	SFWO010	Oil	1		
A5	SFPEV7803	Screw, Cartridge	2		
A5-1	SFPEV10005	Screw, Cartridge	2		
A5-2	SFPEV10009	Screw, Cartridge	2		
A5-3	SFPEN9200	Nut, Cartridge	2		
A5-4	SFYF05A06	Polyethylene Bag	1		
		PACKING PARTS			
P1 [M]	SFHP155M01	Carton	1		
P1 [MC]	SFHP155C01	Carton	1		
P2	SFHH132-01	Pad, Front	1		
P3	SFHH132-02	Pad, Rear	1		
P4	SFHD132-02	Pad, Turntable	1		
P5	SFHD132-01	Pad, Top	1		
P6	SFHH170-03	Parts Box	1		
P7	SFHD170-03	Pad, Top, Parts Box	1		
P7-1	SFYC22A30	Polyethylene Cover	1		
P8	XST6D30B	Screw, Clamp	3		
P9	SFYF60A60	Polyethylene Bag, Player Unit	1		
P9-1	SFYH40X45	Polyethylene Bage Turntable	1		
P9-2	SFYH10X30	Polyethylene Bag, AC Cord	2		

■ PACKINGS



Printed in Japan
7708-3,350 ❷