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SERVICE MANUAL

798

STEREO TURNTABLE

SANSUI SR-636/838



Sansui

SANSUI ELECTRIC CO., LTD.

SPECIFICATIONS

● SR-636

Type	Two-speed direct-driven
Speeds	33-1/3, 45 rpm
Fine speed adjustment range	±2.5%
Platter	Aluminum alloy die-cast 318 mm (12-9/16") diameter, 1.6 kg (3.5 lbs.)
Motor	20-pole brushless DC servo-type
Wow and flutter	less than 0.028% (W.R.M.S.)
S/N	better than 63 dB (IEC-B)
Rumble	better than 71 dB (DIN-B)
Tonearm	Statically-balanced S-shaped tubular type
Tonearm length	230 mm (9-1/16")
Overhang	16.1 mm (11/16")
Optimum cartridge weight When the headshell supplied is employed	4 ~ 11 g
Dimensions	490 mm (19-5/16") W 167 mm (6-5/8") H 390 mm (15-3/8") D
Weight	12.8 kg (28.2 lbs) net 14.8 kg (32.6 lbs) packed
Power Consumption	7W (rated)
Cartridge	SV-43
Frequency response	10 ~ 20,000 Hz
Output voltage	3.3 mV per channel (1,000 Hz 50 mm/sec)
Load impedance	47 kΩ
Tracking force	2.0 g
Stylus	diamond (SN-43)

● SR-838

Type	Two-speed direct-driven
Speeds	33-1/3, 45 rpm
Fine speed adjustment range	±2.5%
Platter	Aluminum alloy die-cast 318 mm (12-9/16") diameter, 1.7 kg (3.7 lbs.)
Motor	20-pole brushless DC servo-type (Quartz-servo)
Wow and flutter	less than 0.025% (W.R.M.S.)
S/N	better than 64 dB (IEC-B)
Rumble	better than 72 dB (DIN-B)
Tonearm	Statically-balanced S-shaped tubular type
Tonearm length	230 mm (9-1/16")
Overhang	16.1 mm (11/16")
Optimum cartridge weight When the headshell supplied is employed	4 ~ 11 g (11 ~ 20.5 g with the sub-weight mounted)
Dimensions	490 mm (19-5/16") W 167 mm (6-5/8") H 390 mm (15-3/8") D
Weight	12.8 kg (28.2 lbs) net 14.8 kg (32.6 lbs) packed
Power Consumption	7W (rated)
Cartridge	SV-43
Frequency response	10 ~ 20,000 Hz
Output voltage	3.3 mV per channel (1,000 Hz 50 mm/sec)
Load impedance	47 kΩ
Tracking force	2.0 g
Stylus	diamond (SN-43)

● Design and specifications subject to change without notice for improvements.

1. BLOCK DIAGRAM

1) SR-636

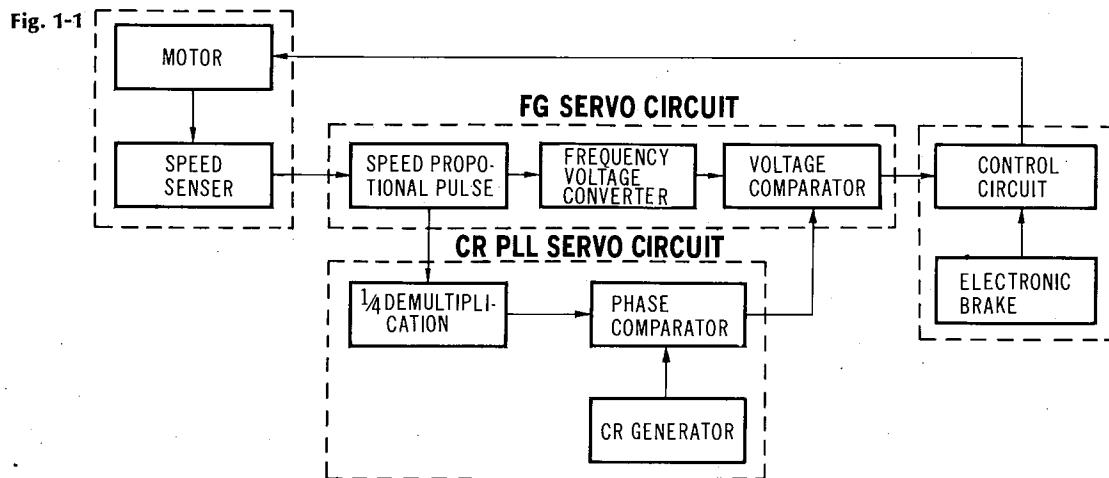
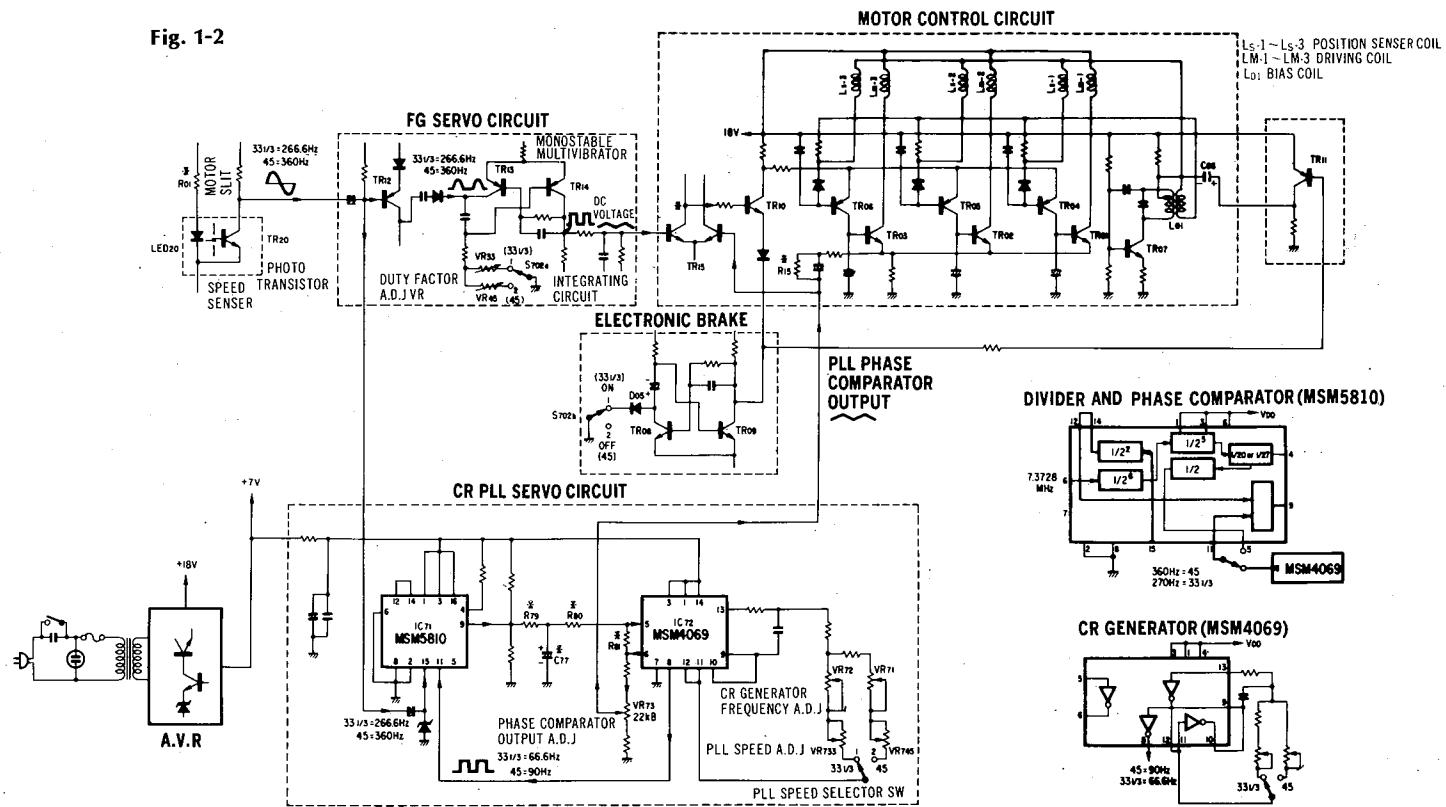


Fig. 1-2



◆SR-636, SR-838 Main Circuit

The electronic circuitry in this set is two servo circuits and a motor control circuit.

The servo circuit employs the PLL servo system and the speed control system (Frequency-Generator servo) together.

The F-G servo system is effective for the threshold characteristic and also control of PLL-Lock-out.

However, PLL servo system has an advantage against the influence by load fluctuation.

For this reason, this set employs both the F-G servo system and PLL servo system by which rotation fluctuation is always locked in the reference signal.

PLL servo circuit of the phase control system, is both CR generator and quartz generator used in this model.

2) SR-838

Fig. 1-3

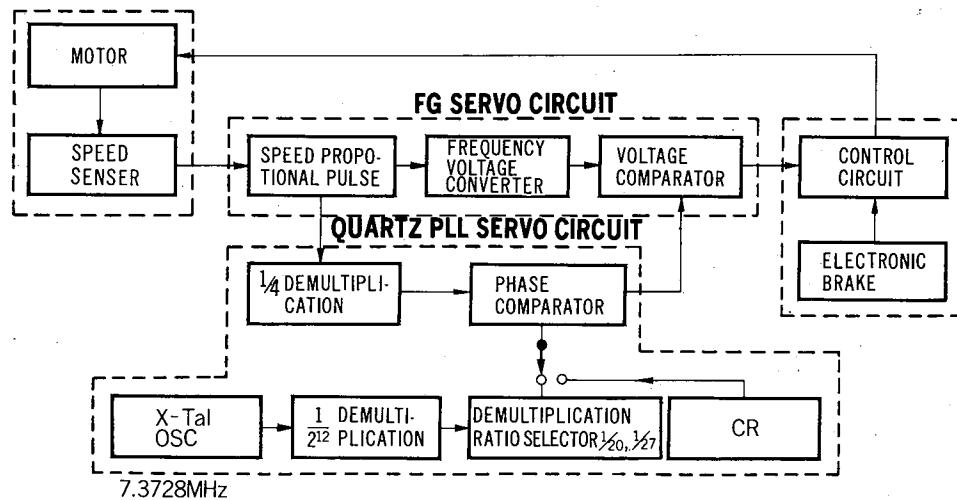
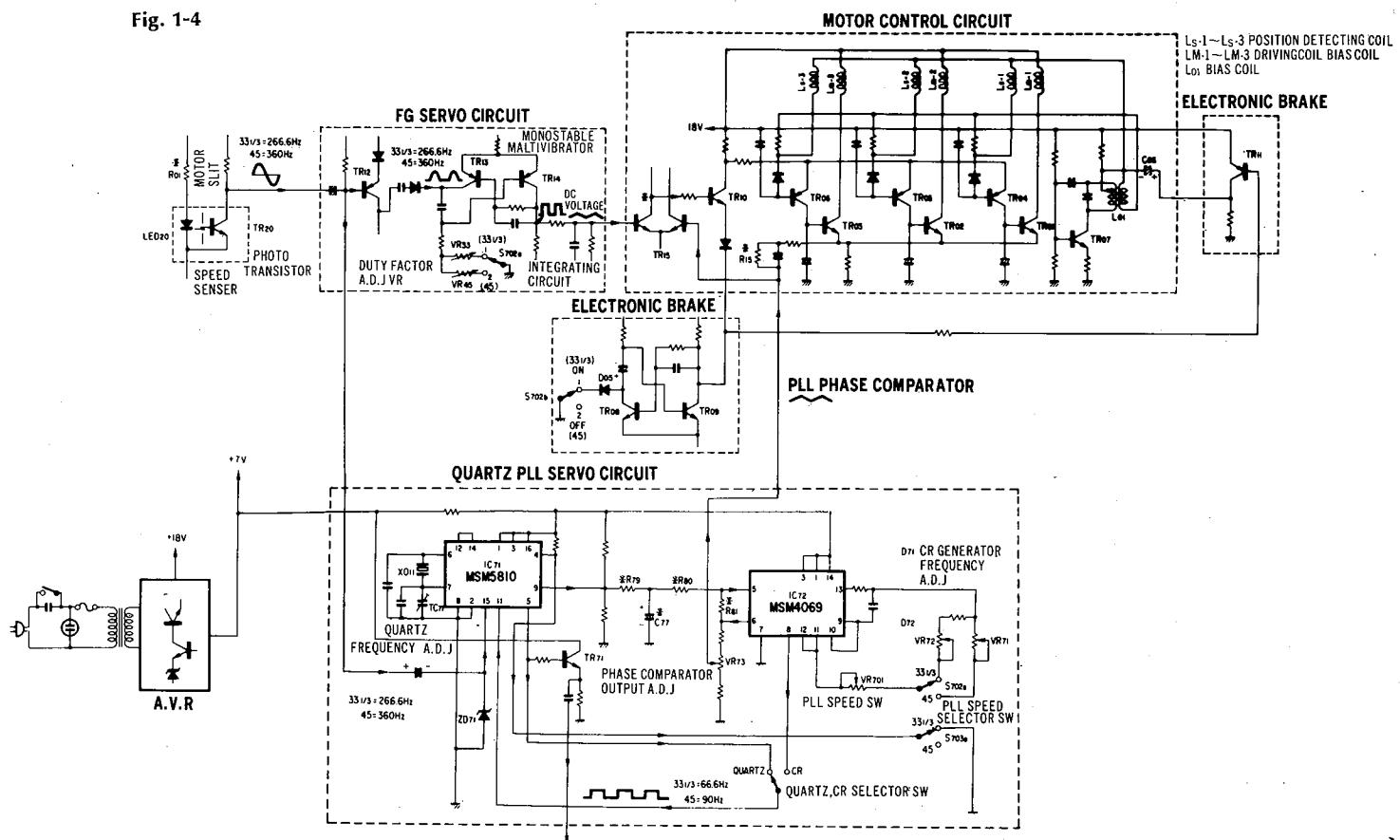


Fig. 1-4



2. OPERATION OF NEW CIRCUIT

1) The Function and Operation of MSM5810 (Fig. 2-1)

The MSM 5810 includes divider of PLL servo circuit, selector terminal of 1/20 (45 rpm) and 1/27 (33 1/3 rpm) and phase comparator.

A). Quartz PLL

1. Input signal 7.3728 MHz from quartz generator is added to the pin, No. 6, and is demultiplied as $1/2^6 \times 1/2^5 \times 1/20 \times 1/2$ (45 rpm) by passing through the divider; then, it is applied to phase comparator.
2. The pin No. 1, 2, 3, are selector terminal of dividing ratio from $1/2$ to $1/2^n$. By supplying VDD to pins No. 1, No. 3, and by grounding pin No. 2, $1/25$ of dividing ratio is obtained.
3. Divided output signal appears at pin No. 5, and it switches TR71 to light the neon lamp.
4. Since trigger pulse frequency changes with turntable revolution speed, the dividing ratio is necessary to shift accordingly to the turntable revolution speed; therefore by adding H level or L level to pin No. 4, the dividing ratio of 1/20 or 1/27 is selected.
5. A signal from speed sensor is supplied to pin No. 15, and after divided into 1/2, the signal is supplied to phase comparator.

B). CR. PLL

1. From CR generator in MSM4069, the reference signal enters into the pin No. 11, of MSM5810.
2. A signal from speed sensor is supplied to pin No. 15 and after divided into 1/2, the signal is supplied to phase comparator.
3. In quartz PLL, the revolution speed is locked by its generating frequency; however, in CR PLL, pitch is controllable by altering its generating frequency.

2) Frequency-voltage Converter Circuit (Fig. 2-2)

The frequency-voltage converter circuit is composed of a mono-stable multivibrator by TR13, TR14.

When trigger pulse detected by speed sensor is supplied to TR13, pulses which width are defined by time constant CR20, R22, R68, and VR33 (R22, VR45), appears at the collector of TR14 as the same number as input trigger pulses.

The volume of VR33 and VR45 are for duty factor adjustment to determine the "t", the pulse width.

With fluctuation of turntable revolution speed, the trigger pulse frequency occurred in a unit period varies.

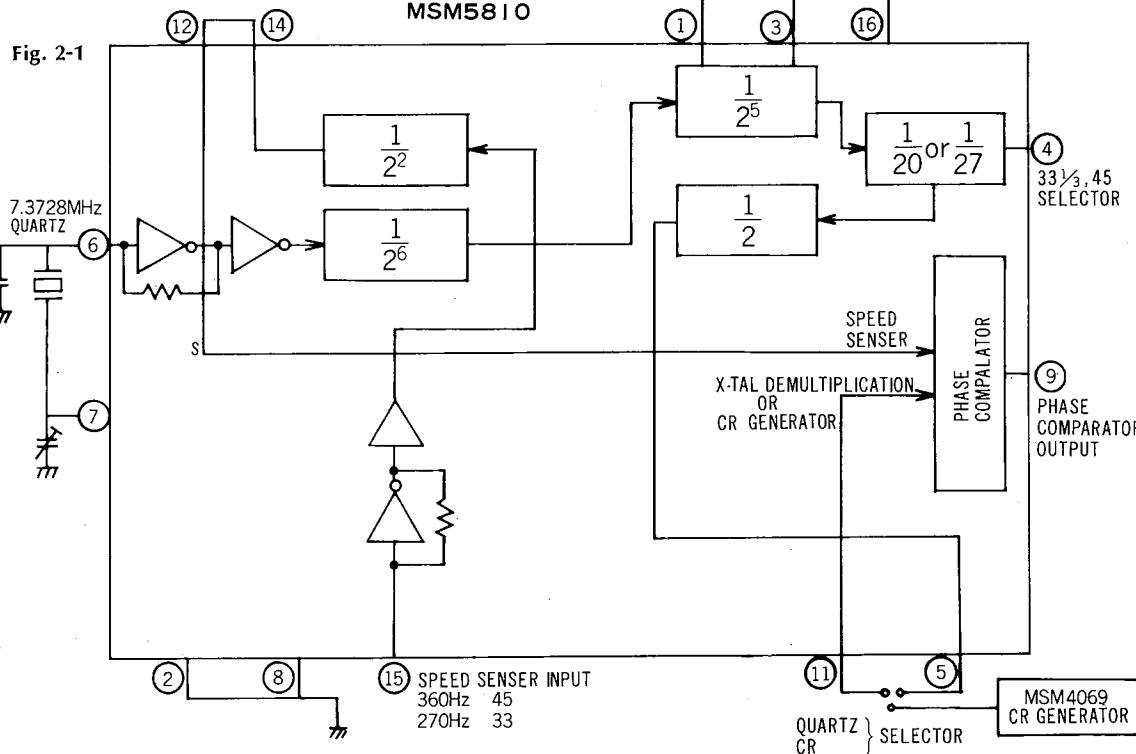
As the width "t" of the pulse is defined by above mentioned C, R, it would not change but term "T" in which the trigger occurs, would change.

Therefore, at the output of the next stage, integrating circuit, the proportioned D.C output to the trigger pulse frequency is obtained.

● Duty Factor

When a pulse of width "t" is occurring in a certain term "T", t/T is so called DUTY FACTOR.

$$\text{DUTY FACTOR (D)} = \frac{\text{PULSE WIDTH (t)}}{\text{TERM (T)}}$$



3) Electronic Brake (Fig. 2-3)

As turntables (platters) which are employed in direct drive system players, have great inertial moment, it requires certain time to settle the rotation when shifting the revolution speed from 45 rpm to 33-1/3 rpm.

To avoid above phenomenon, this model is developed to have Electronic Brake. The torque needed for the brake is obtained by reversing the revolving direction of motor to eliminate the capacitor C06 electrically from high frequency oscillator in the motor control circuit and by switching off the speed control transistor (TR10) to omit the servo control that the revolution torque is increased.

In fact, turntable platter would not begin reverse turn because of the inertial moment and time length of braking.

The circuit to eliminate the capacitor C06 electrically and to turn off the speed control transistor is monostable multivibrator and selector switch as shown in Fig. 2-3.

Operation

A circuit including TR08 and TR09 is a monostable multivibrator and usually its operation is in stable state with TR09 being ON. When TR09 is ON, TR10 functions normally and TR11 is ON. C06 and R20 are parallelly connected and functioning to TR11. When revolution speed is shifted from 45 rpm to 33-1/3 rpm, namely S702 is switched from 2 to 1, a minus trigger is supplied to monostable multivibrator.

At the same time, plus pulse defined by R13 and C11 is generated at the collector of TR09. By this pulse, the emitter voltage of TR10 is increased so that TR10 becomes not to function as speed control and the servo system does not function.

Since this pulse is supplied to the base of TR11 simultaneously, TR11 turns off and makes C06 not function completely.

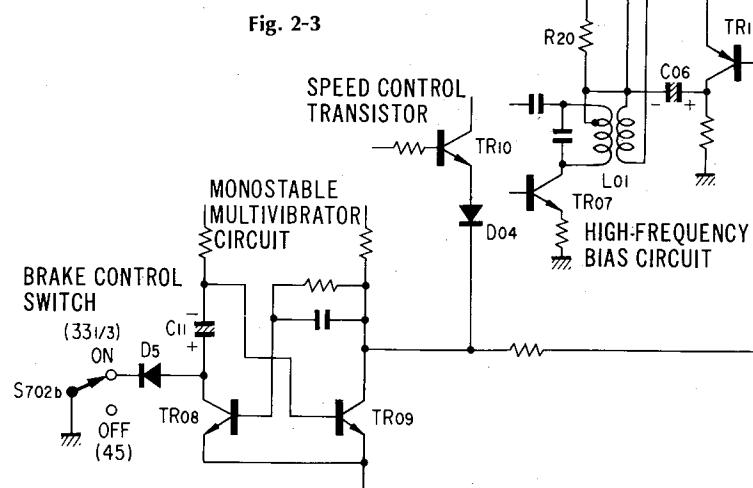
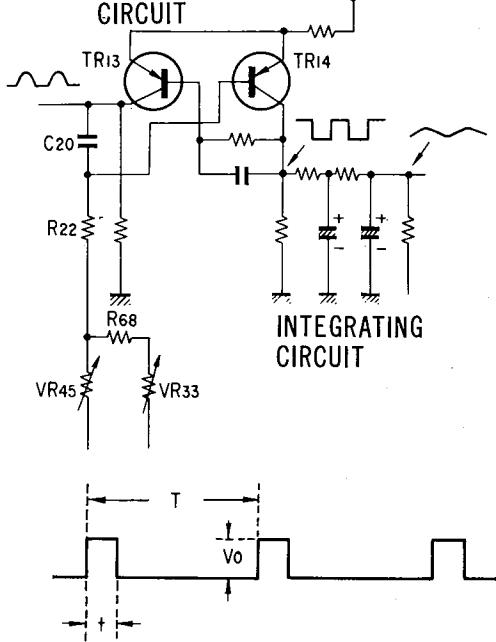
When C06 is eliminated electrically, both reverse turn and torque increase by cutting off the servo system occur at once. Consequently, the brake functions only while the pulse is generated.

Reverse Revolution

At normal revolution, the direction is defined by relation between position sensor coil and magnet, position sensor coil and driving coil, and others. One of 3 position sensor coils functions successively and individually which turns on the switching transistors connected to position sensor coil to function driving coils. At reverse revolution, a signal wave having $90^\circ \sim 180^\circ$ of phase difference against standard wave is mixed to preceding standard wave by eliminating C06 electrically. Then the mixed wave is supplied to switching transistors.

Above function breaks the electrical balance of position sensor coils and its function becomes opposite; therefore, the position sensor coil which is normally ON turns OFF and other coils become ON. As a result, the opposite revolution torque for brake is obtained.

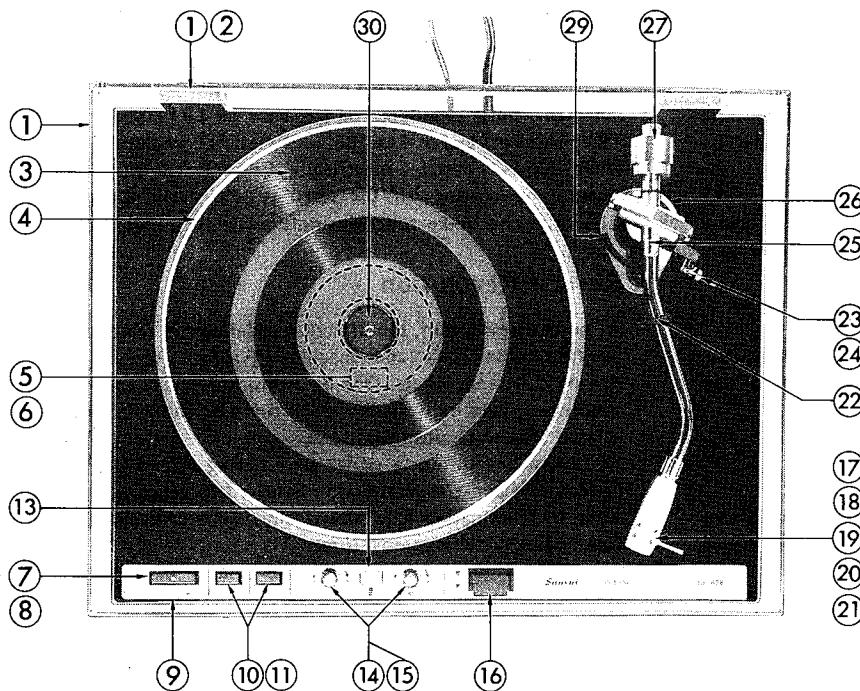
Fig. 2-2 MONOSTABLE MULTIVIBRATOR CIRCUIT



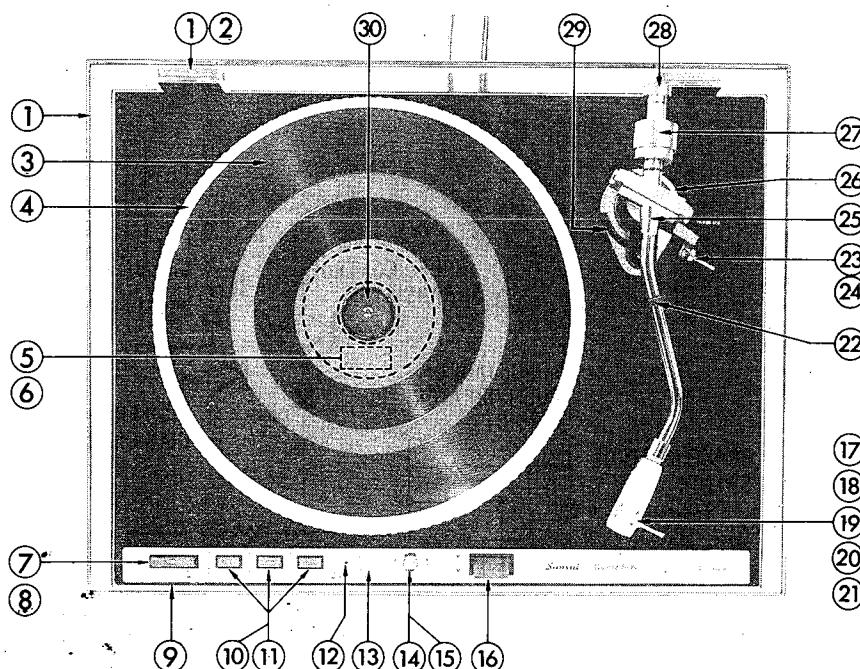
3. MECHANISM PARTS LOCATION AND PARTS LIST

1) Top View Parts List

● SR-636<Top View> Fig. 1



● SR-838<Top View> Fig. 2



NOTE:

AS to U.L., C.S.A., B.S., ES and XX marked in the Parts Lists, note the followings:
 U.L., C.S.A... Approved parts used in the unit which is applicable to the U.S. and Canada under safety standard.
 B.S. Approved parts used in the unit which is applicable to British under safety requirement.
 E.U. Approved parts used in the unit which is applicable to Sweden, Denmark, Norway, Finland, West Germany, and Switzerland under safety requirement.
 XX Parts used in the unit which is applicable to other countries excepting mentioned above.

* Parts unspecified such as CSA, UL, EU & XX in "Description" are common parts.

Parts List<SR-636/838 Top View>

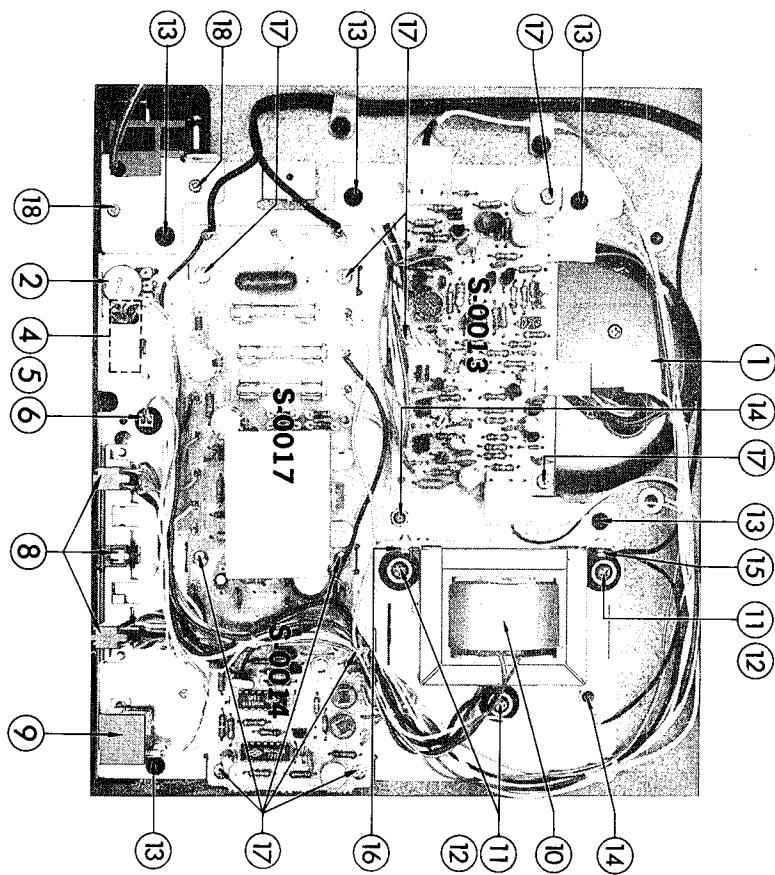
No.	Parts No.	Stock No.	Description
1	7012150 6922320 6922370 5502711 5102663		Dust Cover Ass'y Auto Hinge Plate, Dust Cover Auto Hinge, Dust Cover Rubber Cushion F Type Screw M4×10, Dust Cover
2	6922300		Auto Hinge Lock Plate, Cabinet
3	{5502741 5502851		Rubber Mat EU, CSA, BS. Rubber Mat XX, UL
4	{6112202 6112191		Turntable (Platter) (SR-838 only) Turntable (Platter) (SR-636 only)
5	LD01	0319140	SR 106C L.E.D. Speed Sensor
6	TR20	0390010	PH 101 Photo Transistor
7	5322150		Push Button, Power Switch
8	5392201		Button Guide, Power Switch
9	5332090		Sonsui Badge
10	5322160		Push Button, Selector, Quartz
11	5392190		Button Guide, Selector, Quartz
12	0319130		Quartz indicator L.E.D. (SR-838 only)
13	5442020		Illuminator
14	5312280		Knob, Pitch-Control
15	5392210		Knob Guide, Pitch Control
16	5392220		Lever Guide, Lifter
17	6642250		Head Shell
18	4310340		Cartridge Ass'y (SV-45) XX (Stylus, Screw Ass'y, Stylus Cover)
19	4940220		Stylus (SN-43)
20	5012080		Stylus Cover
21	5192150		Screw Ass'y
22	6622270		Arm Rest Ass'y
23	6912610		I.F.C. Mechanical Ass'y (I.F.C. Weight, I.F.C. Shaft)
24	6912620		I.F.C. Thread Ass'y
25	7092710		Tonearm Ass'y
26	7092720		Arm Base Ass'y
27	{5172290 5192140		Base nut Hox Socket Screw M3×4, Arm Base
28	6912590		Main Weight
29	{6912600 7082310		Sub Weight (SR-838 only) Tonearm Guide Ass'y (Piston Hoxsocket Screw)
30	5192130 6172040		Hox Socketscrew M4×0.7, Tonearm Guide 45 Adaptor

Abbreviations

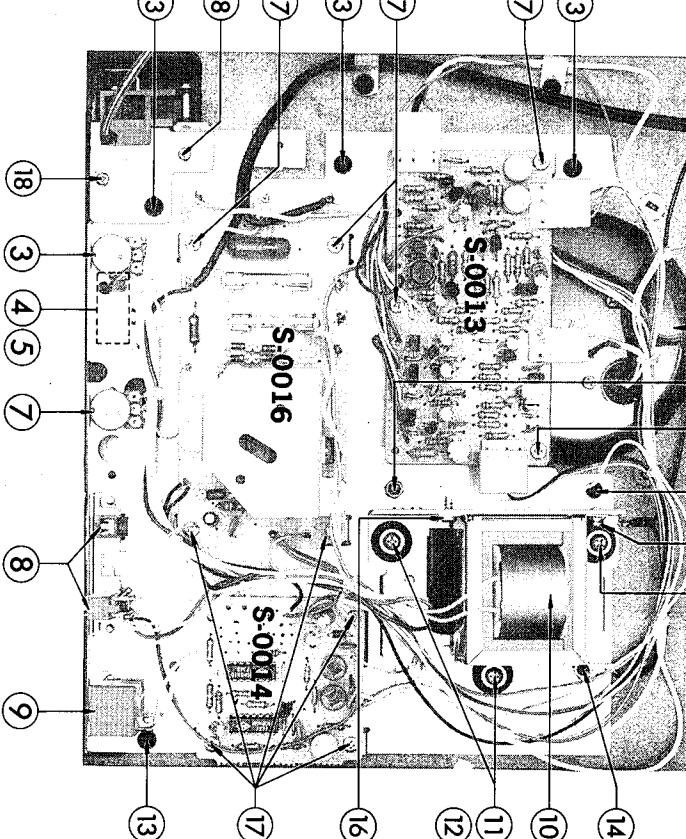
1. Pan Head Tapping Screw	PT Type	10. Round Head Wood ScrewRH Type
2. Washer Head Tapping Screw	WT Type	11. Hex. Socket Setscrew..SC Type
3. Pan Head Screw	P Type	12. Slot Type Setscrew..SS Type
4. Pan Head SEMS A Screw	PSA Type	13. Binding Head SEMS B ScrewBSB Type
5. Pan Head SEMS B Screw	PSB Type	14. Spring Washer ..S Type
6. Binding Head SEMS F Screw ..	BSF Type	15. Plain Washer ..P Type
7. Binding Head Screw ..	B TYPE	16. Retaining Ring (E Washer).E Type
8. Flat Counter Sunk Head Screw..	F Type	17. Toothed Lock Washer (External)TLE Washer
9. Flat Counter Sunk Wood Screw	FC Type	18. Wave Washer
19. Hexagon Nut H Type Nut		

2) Bottom View Parts List

● SR-636 <Bottom View> Fig. 3



● SR-838 <Bottom View> Fig. 4



◇ Main Parts Replacement

- 1) Pitch Control VR, Speed Selector SW, PowerSW, Quartz Indicator, Neon Lamp.
 - A. Pull the Pitch Control VR Knob to remove.
 - B. Remove the screws No. 13, No. 18 and Nut No. 14 in Fig. 3, 4.
 - C. Lift the chassis (Pay attention not to hurt the wires)
 - D. Each parts is now interchangeable individually.
- 2) Tone arm Ass'y
 - A. Loosen the Hox screw beside Lifter mechanical Ass'y, No. 8 in Fig. 5.
 - B. Take off the Lifter mechanical Ass'y.
 - C. Remove the shield plate over S-0012.
 - D. Disconnect the Lead wires soldered on S-0012.
 - E. Remove the Base Nut No. 7 in Fig. 5.
 - F. Pull the Tone arm Ass'y upward.
- 3) Insulators (Rubber Leg on bottom plate)

Since pressure on each insulator differs at each corner, the shape of insulators, spring and fixing screws are different.

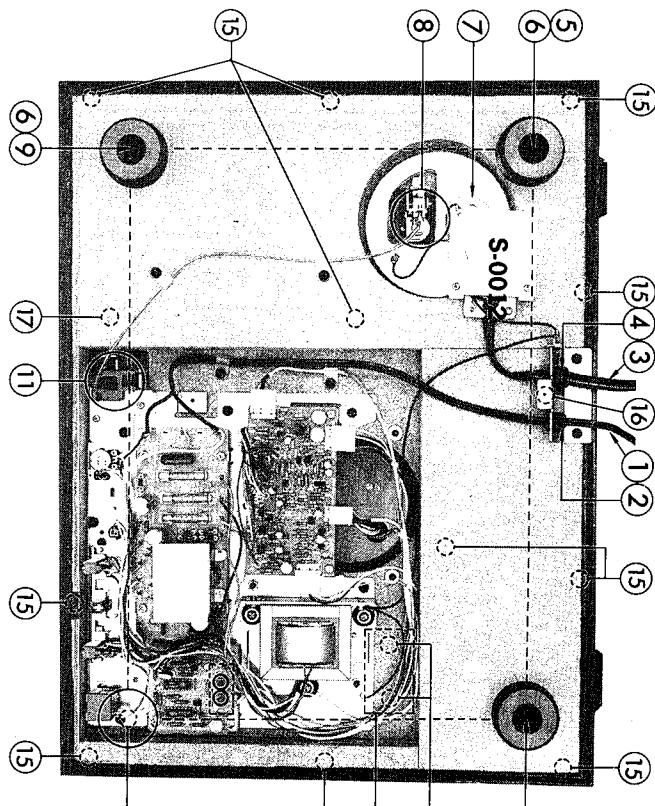
In Fig. 5, No. 5, 9, 12 indicate insulators.

4. PACKING LIST

No.	Parts No.	Stock No.	Description
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No.	Parts No.	Stock No.	Description
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No.	Parts No.	Stock No.	Description
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With units sold in U.S.A., Canada and certain European countries, no cartridge is provided.

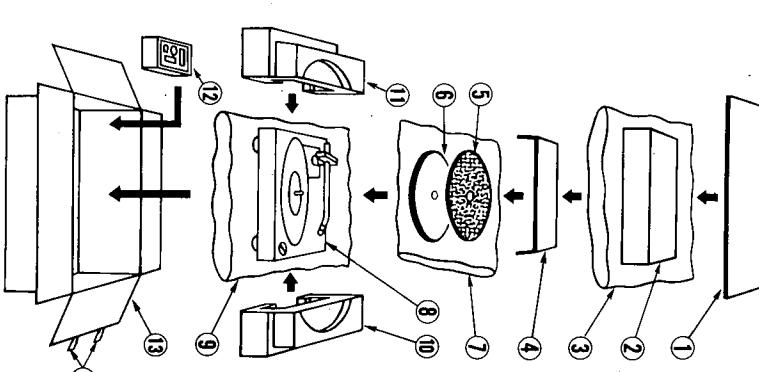
Cartridge	Remarks
CSA model	None
UL model	Stamp E on carton case
Audio club	Stamp E on carton case
BS model	Stamp E on carton case
EU model	Stamp E on carton case
XX model	SV-43
	No marks on carton case

5. ACCESSORY PARTS LIST

No.	Parts No.	Stock No.	Description
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No.	Parts No.	Stock No.	Description
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No.	Parts No.	Stock No.	Description
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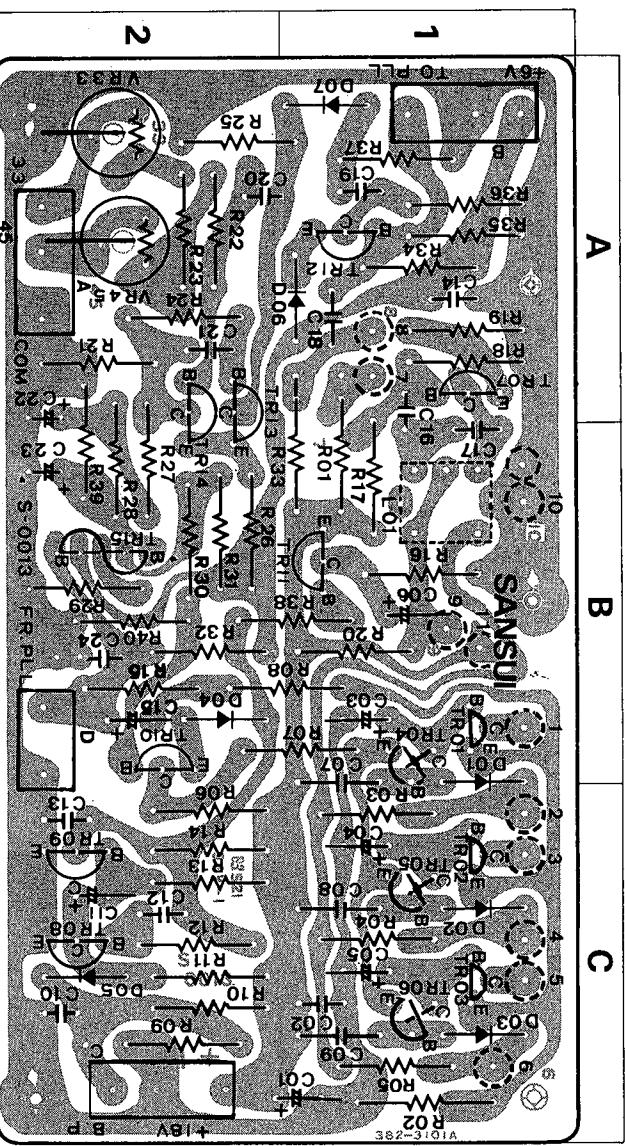


SR-636/838 SR-636/838

6. PARTS LOCATION & PARTS LIST

1) S-0013 Motor Control Circuit Board (Stock No. 7595771 SR-636/SR-838)

Since some of capacitors and resistors are omitted from parts lists in this Service Manual, refer to the common parts list for capacitors & resistors which was appended previously to each Sansui Manual.



2) S-0014-PLL Servo Circuit Board (Stock No. 7595371 SR-636)



Parts List			
Part No.	Stock No.	Description	Position
TR01-03	0308590-2	2SD471 (M, L, K)	1B, 1C
TR04-16	0308680-1	2SA733 (P, Q)	1B, 1C
TR07-09	0308591-3	2SC945 (G, P, K)	1A, 1C
TR10	0308592	2SC945 (P, Q)	C4a
TR11, 12	0308680-1	2SA733 (P, Q)	2B
TR13, 14	0308680-1	2SA733 (P, Q)	2A
TR15	0308680-1	2SC1583 (G)	2B
D01-07	0311050	1N583 Diode	R01
C02	0656223	22000pF 25V C.C.	1C

Parts List <SR-636>			
Part No.	Stock No.	Description	Position
IC1	0346560	MS45810	A
IC2	0346570	MS44469	A
ZD1	0315770	EQ401-065 Zener Diode	B
C7-80	0308723	22000pF 50V C.C.	B
R72	0231334	330Ω 1/2W M.R.	A
R73	0231354	150kΩ 1/2W M.R.	A
VR71, 72	1034360	330kΩ (B)	B
VR73	1035150	22kΩ (B)	B

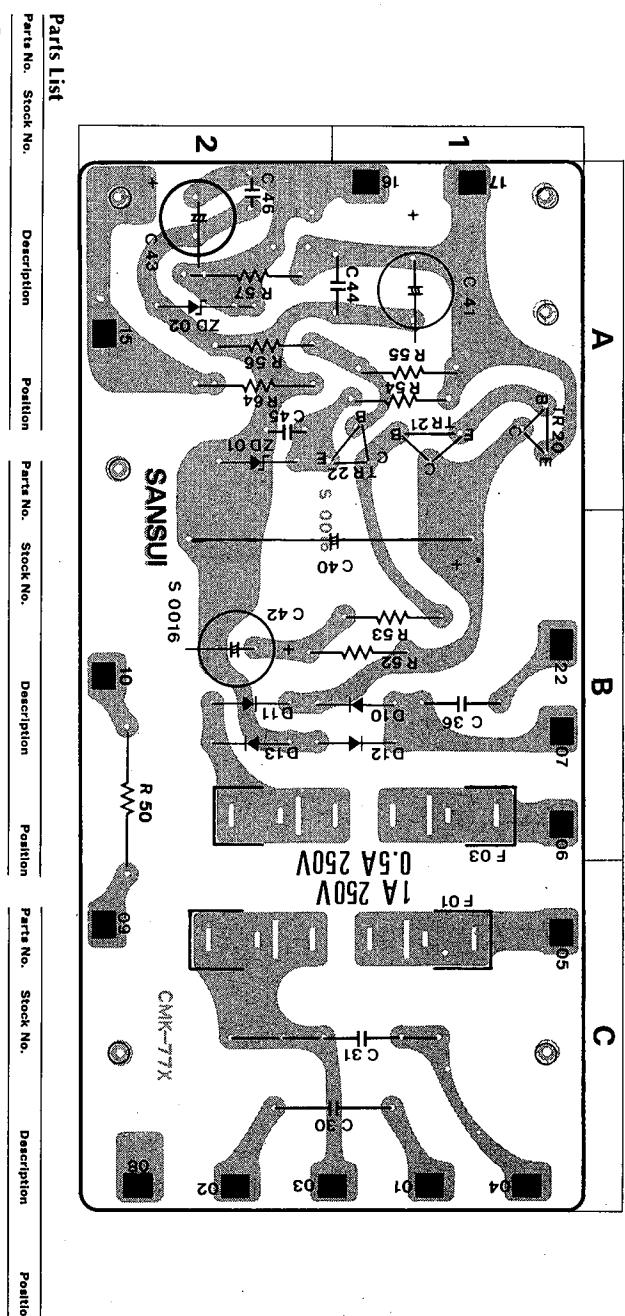
Parts List <SR-838>

Part No.	Stock No.	Description	Position
TR21	0308591-3	2SC945 (Q, P, K)	A, B
IC1	0346560	MS45810 (IC)	A
IC2	0346570	MS44469 (IC)	A
D01, 72	0311050	1N583 Diode	B
ZD71	0315770	EQ401-065 Zener Diode	B

Parts List

Part No.	Stock No.	Description	Position
TR20	0308591-3	2SD313A(L, D, E, F)	1A
IC2	0346570	MS44469	1A
R21	0231334	330Ω 1/2W M.R.	1A
R22	0231354	150kΩ 1/2W M.R.	1A
VR21, 22	1034360	330kΩ (B)	2B
VTR3	1055150	22kΩ (B)	2B
TR21	1230060	Transistor	2C
XO71	031630	Quartz Element	A

4) S-0017 Power Supply Circuit Board (Stock No. 7502441 XX, 7502443 EU, 7502448 UL, 7502449 BS) (SR-838 only)



2) S-0014-PLL Servo Circuit Board (Stock No. 7595371 SR-636)



Parts List			
Part No.	Stock No.	Description	Position
TR20	0308591-3	2SD313A(L, D, E, F)	1A
IC2	0346570	MS44469	1A
R21	0231334	330Ω 1/2W M.R.	1A
R22	0231354	150kΩ 1/2W M.R.	1A
VR21, 22	1034360	330kΩ (B)	2B
VTR3	1055150	22kΩ (B)	2B
TR21	1230060	Transistor	2C
XO71	031630	Quartz Element	A

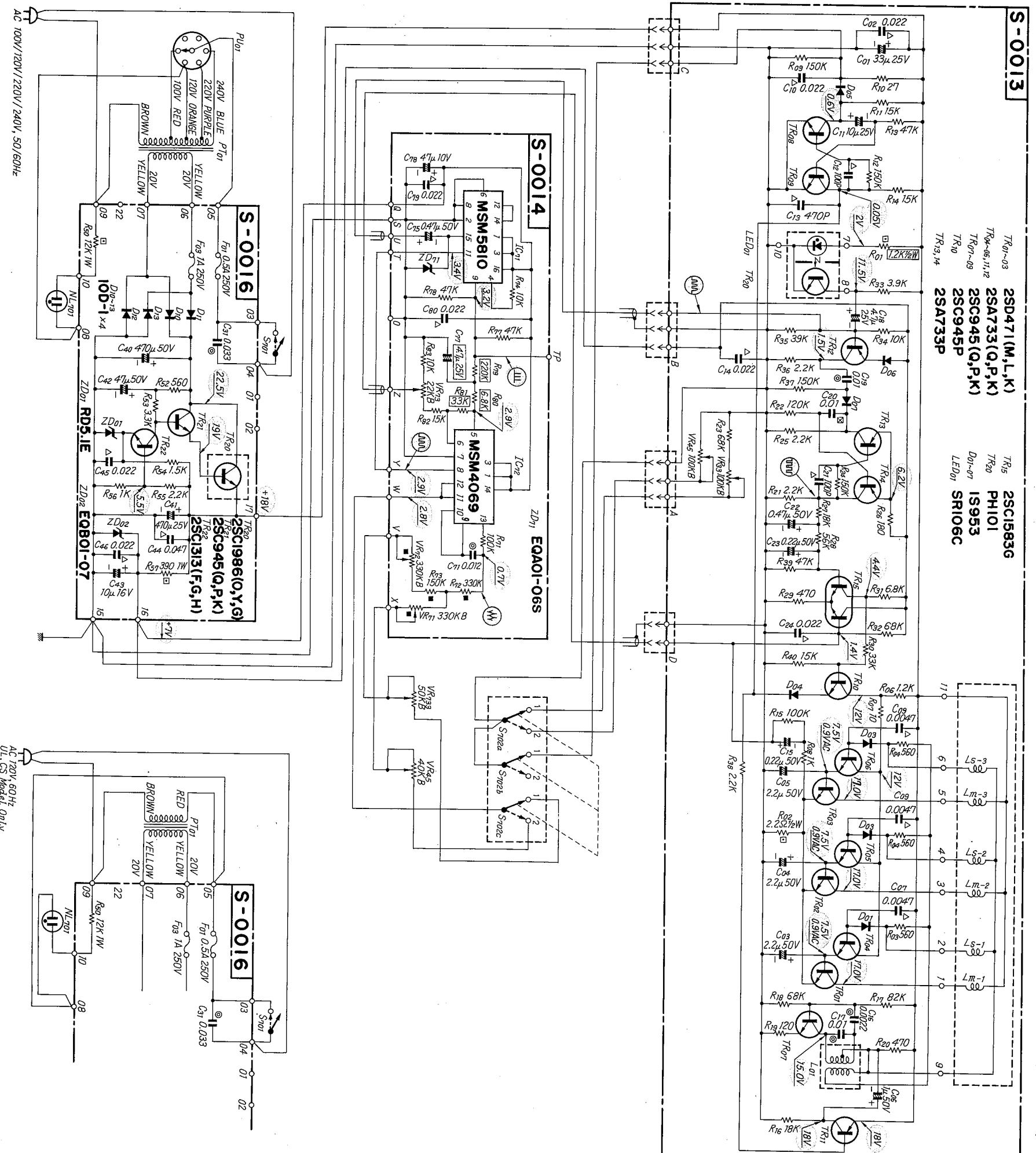
Parts List

Part No.	Stock No.	Description	Position
TR20	0308591-3	2SD313A(L, D, E, F)	1A
IC2	0346570	MS44469	1A
R21	0231334	330Ω 1/2W M.R.	1A
R22	0231354	150kΩ 1/2W M.R.	1A
VR21, 22	1034360	330kΩ (B)	2B
VTR3	1055150	22kΩ (B)	2B
TR21	1230060	Transistor	2C
XO71	031630	Quartz Element	A

SR-636/838

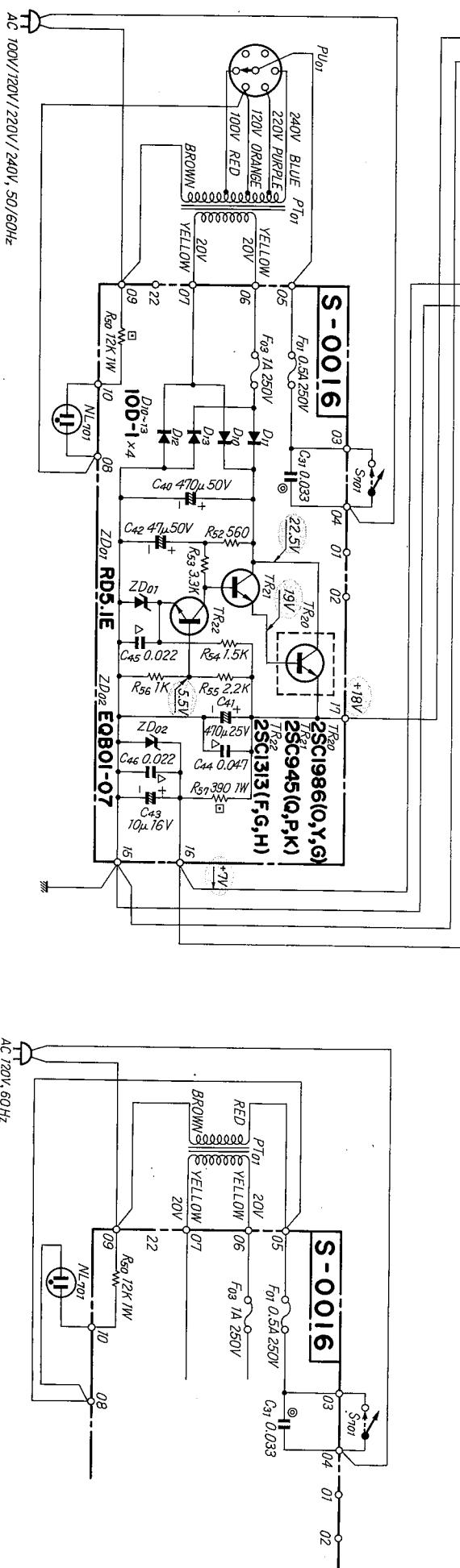
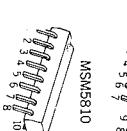
SR-636/838

7. SCHEMATIC DIAGRAM/1) SR-636



* La présentation et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.
* Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.
* Design and specifications subject to change without notice for improvements.

Each D.C. Voltage measured by the instruments described below shows the nominal value in volts at 33 1/3 rpm.
Measuring instruments
Volt Meter DC 20kΩ/V, AC 1kΩ/V
Oscilloscope 5MHz



SR-636/838 SR-636/838

A

B

C

D

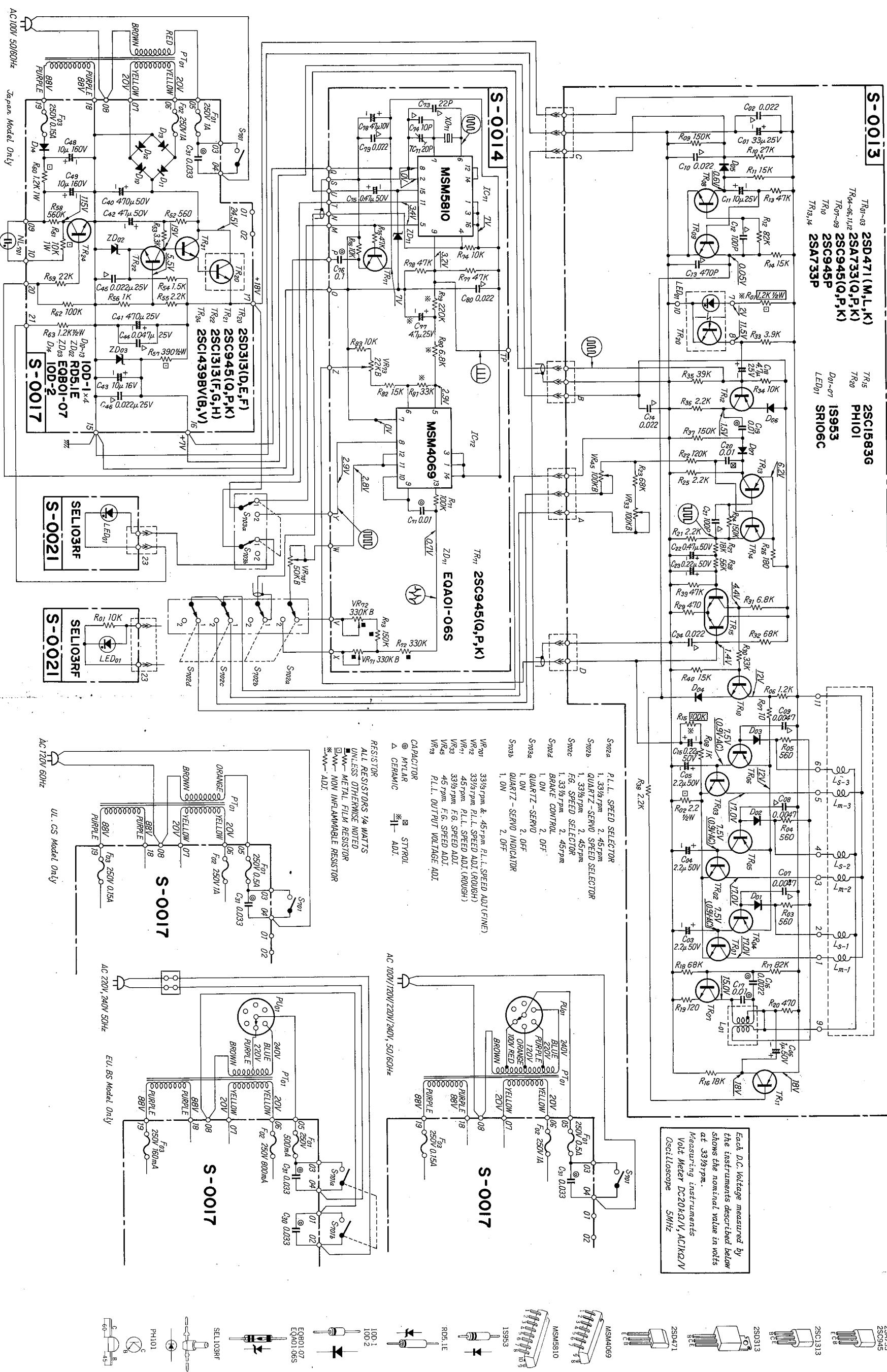
E

F

G

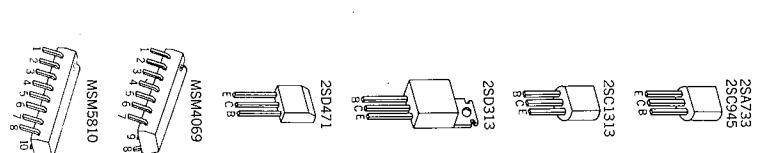
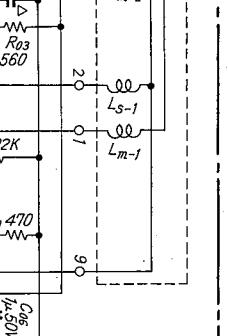
H

2) SR-838



2SA733
2SC945
2SC1313
2SC173

Each D.C. Voltage measured by
the instruments described below
shows the nominal value in volts
at 33⅓ rpm.



8. ADJUSTMENTS

1) SR-838

Please complete these adjustment below when replacing volumes, C, R, and ICs or when the strobo marking pattern would not synchronize despite of turning the adjustment knob on panel. For this adjustment, see the unit horizontally and mount the turntable platter.

A. Adjustment with oscilloscope

STEP	SELECTOR SW	QUARTZ SW	ADJUST	ADJUST FOR	REMARKS
1	33-1/3	ON	VR73 (S0014)	Strobo marking pattern appears to standstill.	
2	33-1/3	ON	VR33 (S0013)	Set the waveform on oscilloscope to adjusted one as Fig. 2.	Connect oscilloscope as Fig. 1.
3	45	ON	VR45 (S0013)	Same as above	Same as above
4	33-1/3	OFF	VR701 (control knob) (on panel)	Center Position	
5	33-1/3	OFF	VR72 (S0014)	Strobo marking pattern appears to standstill.	
6	45	OFF	VR71 (S0014)	Same as above	

B. Adjustment without oscilloscope

If unable to adjust when QUARTZ switch is turned OFF, complete adjustment (A) instead of (B).

STEP	SELECTOR SW	QUARTZ SW	ADJUST	ADJUST FOR	REMARKS
1	33-1/3	ON	VR73 (S0014)	Strobo marking pattern appears to standstill.	
2	33-1/3	ON	VR33 (S0013)	DC 1.4V	Connect a voltmeter to D terminal on S0013 (Fig. 1).
3	45	ON	VR45 (S0013)	DC 1.4V	Same as above
4	33-1/3	OFF	VR701 (Control knob) (on panel)	Center position	
5	33-1/3	OFF	VR72 (S0014)	Strobo marking pattern appears to standstill.	
6	45	OFF	VR71 (S0014)	Same as above	

Fig. 1

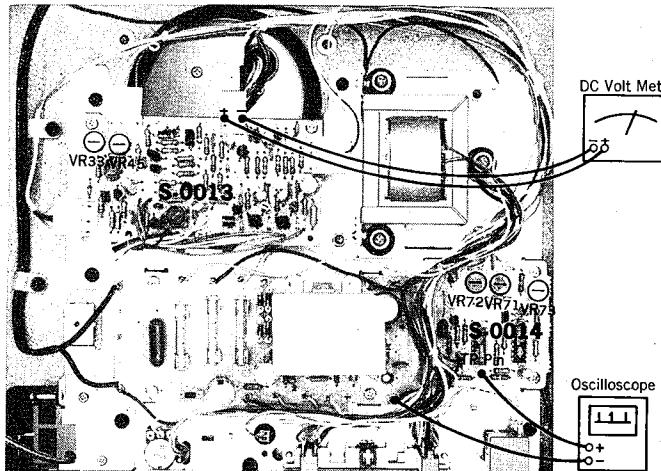
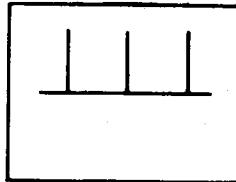
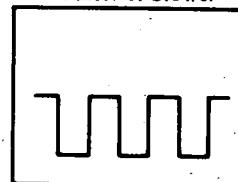


Fig. 2

Correct Speed



Faster or Slower



Waveform on oscilloscope

2) SR-636

For adjustment, set the unit horizontally and attach the turntable platter.

A. Adjustment in case of replacing Parts except IC MSM4069, R71, R72, R73, C71, C72, VR71, VR72, VR733 and VR745 on circuit board S0014.

1) Adjustment with oscilloscope

STEP	SELECTOR SW	ADJUST FOR	ADJUST FOR	REMARKS
1	33-1/3	VR73 (S0014)	Storobo marking pattern appears to standstill.	
2	33-1/3	VR33 (S0013)	Set the waveform on oscilloscope to adjusted one as Fig. 2.	Connect oscilloscope as Fig. 1.
3	45	VR45 (S0013)	Same as above	Same as above

2) Adjustment without oscilloscope

STEP	SELECTOR SW	ADJUST FOR	ADJUST FOR	REMARKS
1	33-1/3	VR73 (S0014)	Storobo marking pattern appears to standstill.	
2	33-1/3	VR33 (S0013)	DC 1.4V	Connect a volt meter to D terminal on S0013 (Fig. 1).
3	45	VR45 (S0013)	DC 1.4V	Same as above

B. Adjustment in case of replacing some from parts of IC MSM 4049, R71, R72, R73, C71, C72, VR71, VR72, VR733 and VR745 on circuit board S0014.

STEP	SELECTOR SW	ADJUST	ADJUST FOR
1	33-1/3	VR733, VR745 (Control knob) on panel	Center position
2	33-1/3	VR72 (S0014)	Storobo marking pattern appears to standstill.
3	45	VR71 (S0014)	Same as above

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