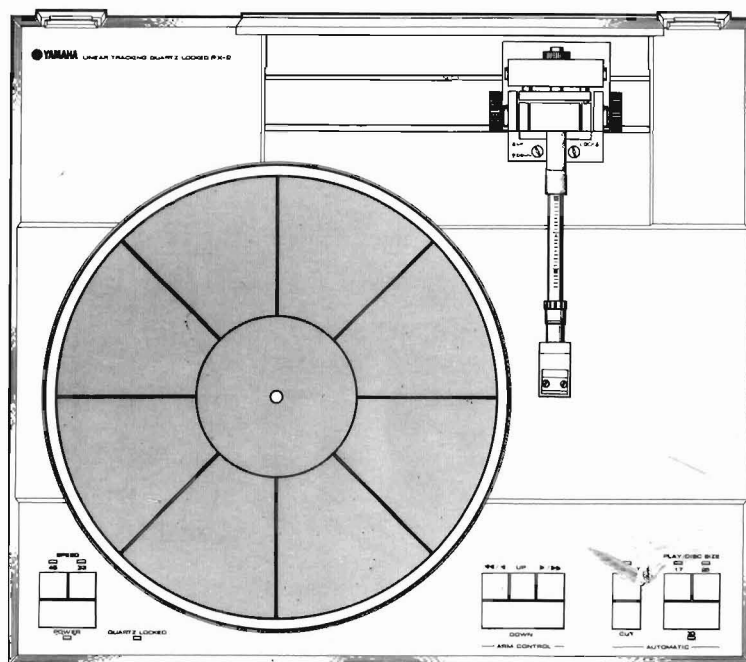


PX-2

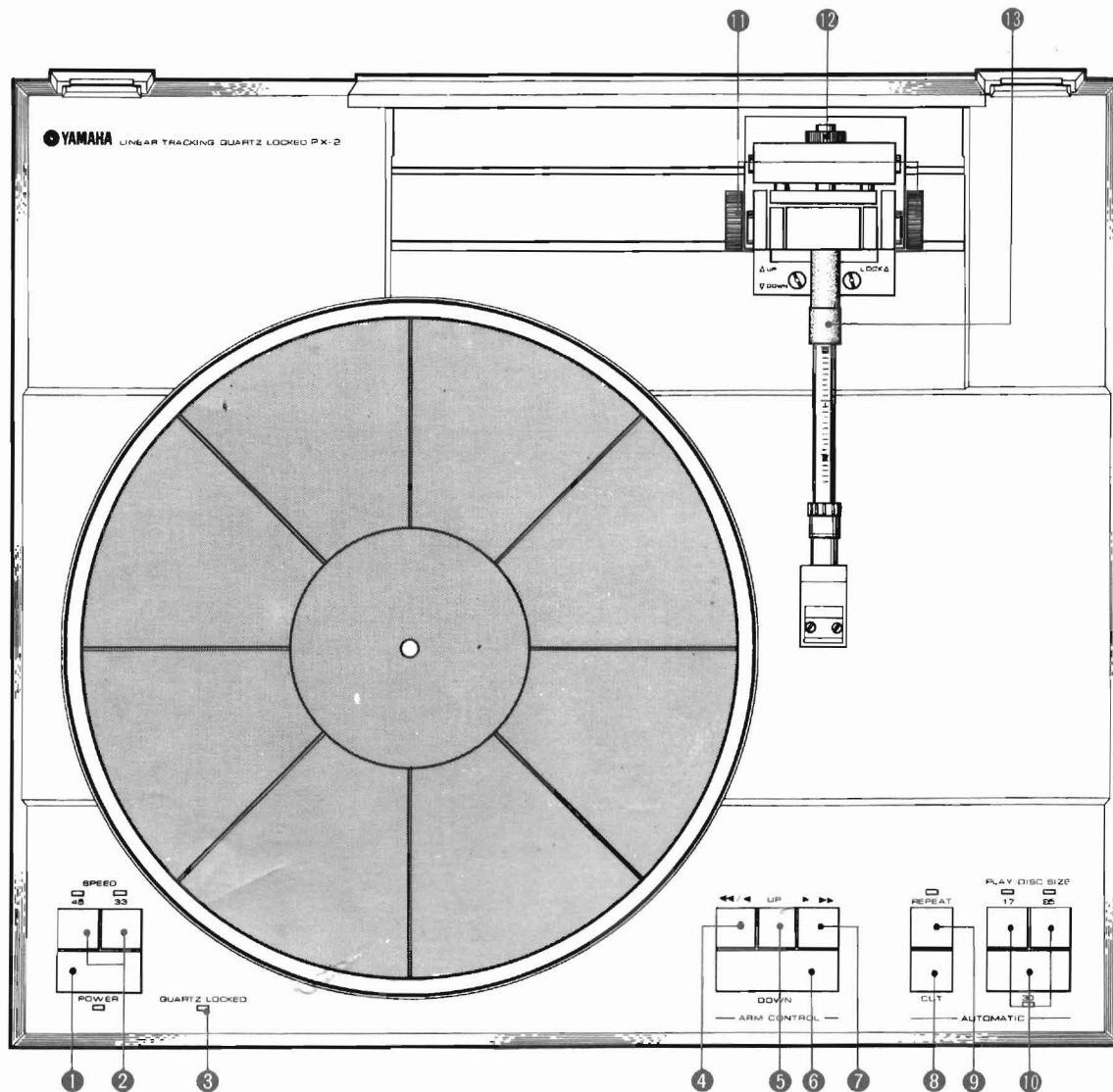
SERVICE MANUAL



CONTENTS

PANEL OPERATION	1
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PANEL OPERATION

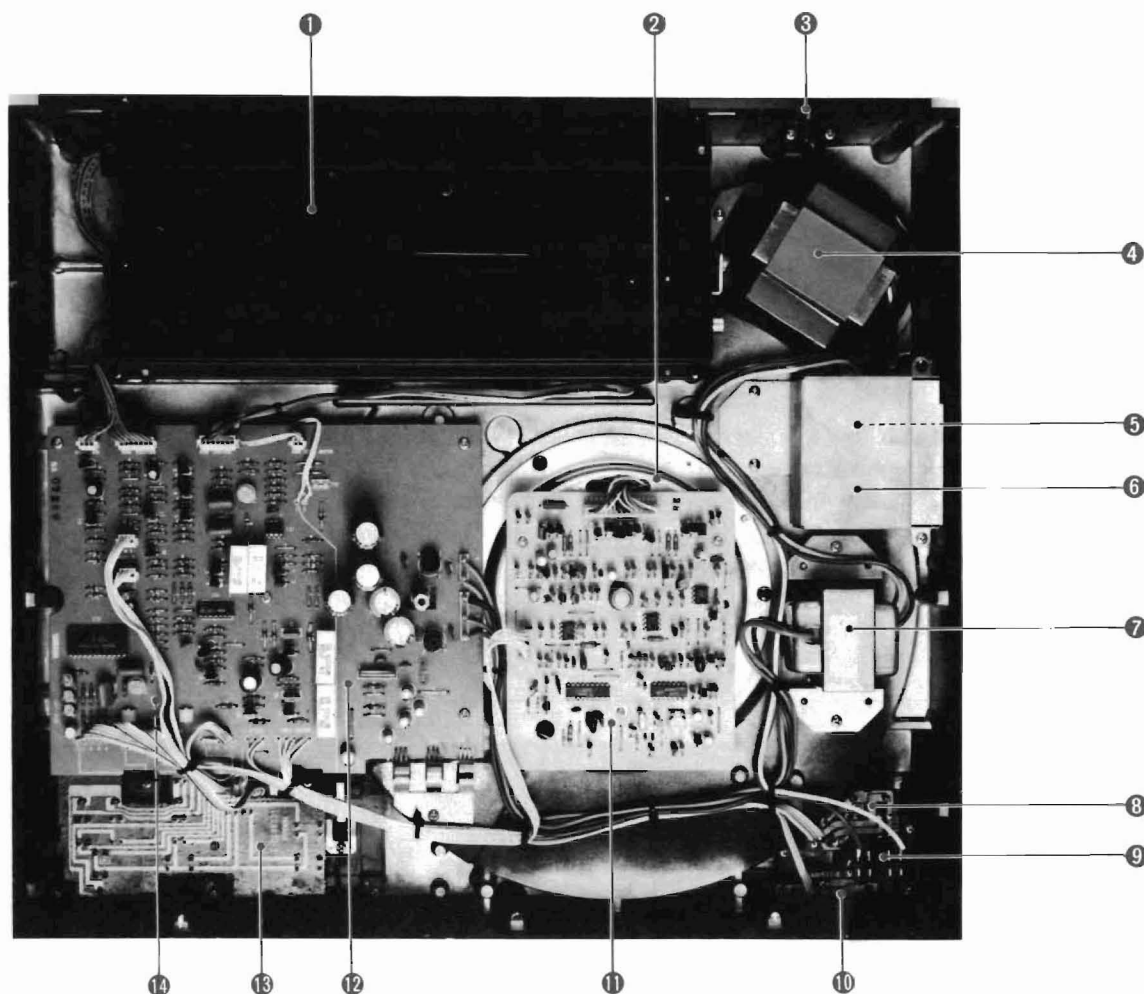


- ① POWER (Power Switch)
- ② SPEED (Speed Changing Switch)
- ③ QUARTZ LOCKED (Quartz Locked Indicator)
- ARM CONTROL (MANUAL)**
- ④ ◀◀ / ◀ (Leftward Feed Switch for Tonearm)
- ⑤ UP (Cueing-UP Switch)
- ⑥ DOWN (Cueing Down Switch)
- ⑦ ▶ / ▶▶ (Rightward Feed Switch for Tonearm)

AUTOMATIC PLAY

- ⑧ CUT (Play Discontinuing Switch)
- ⑨ REPEAT (Repeat Switch)
- ⑩ PLAY/DISC SIZE (Disc Size Switch)
- ⑪ Arm Height Adjusting Knob
- ⑫ Main Weight & Balance Control Knob
- ⑬ Tracking Force Adjusting Weight

INTERNAL VIEW



- ① Tonearm Unit (SS06019)
- ② Motor (JC00048)
- ③ Power Cord
- ④ Power Transformer-L
U.S. & Canadian Models: GA6272
N.European Model: GA6273
Australian & British Models: GA6284
General Model: GA6274
- ⑤ Fuse C. Board
- ⑥ Fuse Cover
- ⑦ Power Transformer-S
U.S. & Canadian Models: GA6276
N.European Model: GA6277
Australian & British Models: GA6279
General Model: GA6278

- ⑧ r.p.m. SW C. Board
- ⑨ Power Switch
- ⑩ Power Indicator C. Board
- ⑪ Motor Servo C. Board
- ⑫ Control C. Board
- ⑬ Tonearm Control SW C. Board
- ⑭ Tonearm Speed VR C. Board

■ DISASSEMBLY PROCEDURE

Before disassembly, remove the turntable and lift up the rear side of the unit and turn the unit over. If the unit is lifted from its side, the tonearm may slide causing possible damage to the unit. Place the unit in such a way that it is level, using magazines or similar materials to level and stabilize the unit, thereby preventing possible damage to the tonearm, center spindle and operation switches.

Disassembly of Main Unit

1. Removal of bottom cover

Turn over the unit, remove the bottom cover by loosening screws ① to ③ shown in Photo 1.

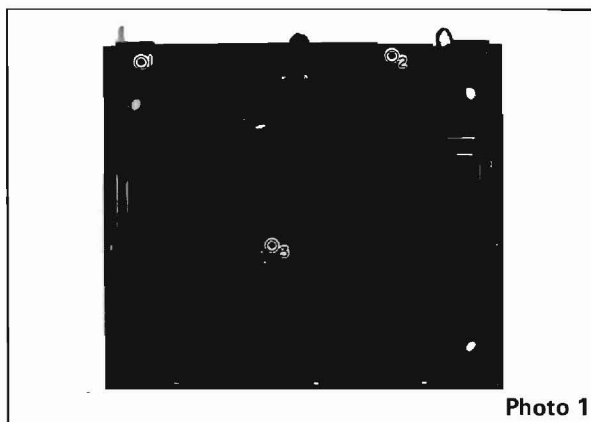


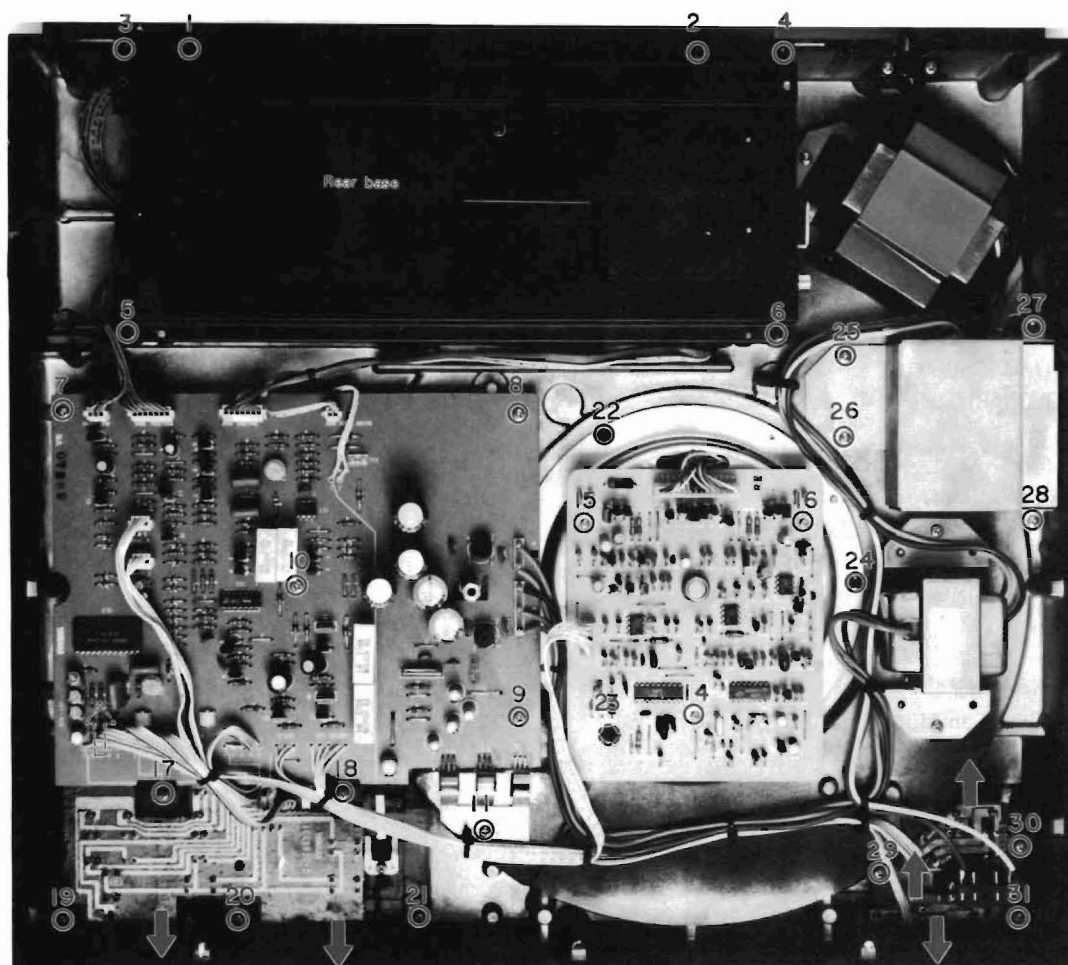
Photo 1

2. Removal of tonearm unit

Remove the rear cover by loosening screws ① and ② shown in Photo 2. And then, after disconnecting the connectors, loosen screws ③ to ⑥ shown in Photo 2, lift up and remove the tonearm unit. Remember, the headshell must be removed prior to removal of the tonearm unit.

3. Removal of control circuit board

Disconnect the connectors and wires, loosen screws ⑦ to ⑪ shown in Photo 2, gently work the control circuit board free and remove it from the unit.



Widen the stopper gap.

Widen the stopper gap.

Photo 2

4. Removal of motor servo circuit board

Disconnect the connectors, loosen screws ⑭ to ⑯ shown in Photo 2.

5. Removal of tonearm SW (switch) base and control SW base

Remove the control circuit board (refer to step 3). And then loosen screws ⑰ to ⑳ shown in Photo 2 to remove both bases. The tonearm control SW circuit board can be removed by widening the stopper gap.

6. Removal of phonomotor

Disconnect the control circuit board connectors, and loosen screws ㉒ to ㉔ shown in Photo 2 to remove the phonomotor.

7. Removal of fuse circuit board

Remove the fuse cover by loosening screws ㉕ to ㉘ shown in Photo 2. And then, disconnect the wiring and loosen screws ① to ③ shown in Photo 3. When assembling the board, wind the wire around the terminal post, and solder it to insure a good connection.

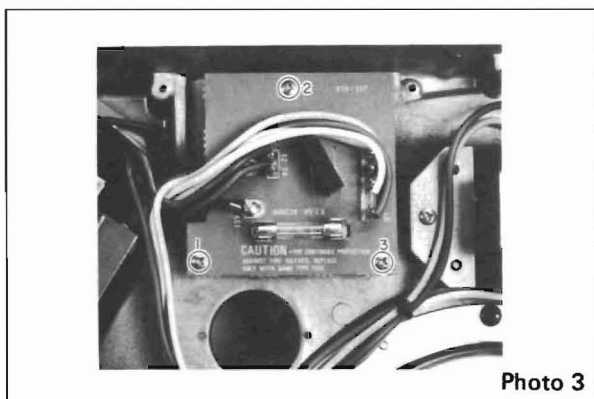


Photo 3

8. Removal of power switch base

Loosen screws ㉙ to ㉛ shown in Photo 2 and remove the power switch base.

Disassembly of Tonearm Assembly

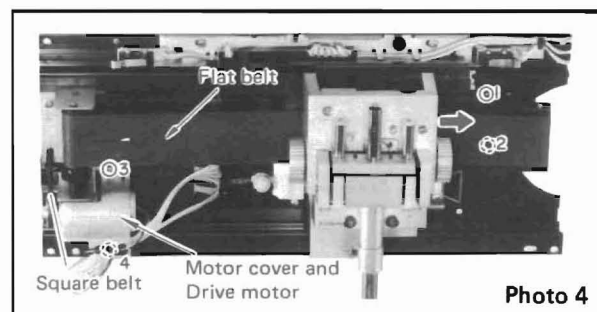
Before disassembling, remove the tonearm unit (Refer to step 2).

1. Removal of tonearm

Loosen screws ① and ② shown in Photo 4 and remove the pulley bearing support in order to loosen the flat belt. And then, disconnect the tension two springs and the connectors in Photo 4. Remove the tonearm from the rear base by sliding it in the direction of the arrow (➡).

2. Removal of drive motor

Remove the square belt, loosen screws ③ and ④ shown in Photo 4 to remove the motor cover and the drive motor.



■ ADJUSTMENT

Before adjustment, check the following items.

1. Place the PX-2 at a level position. Adjustment of the unit may be affected if it is in an inclined or tilted position.
2. Temperature and humidity during normal adjustment conditions should be 18 to 22°C and 60 to 70%, respectively. In the event that no problem exists, adjustments can still be made even though the temperature ranges from 5 to 35°C or the humidity is less than 85%.
3. Adjustment of the phonomotor should be made with the turntable on the unit. (Do not keep the phonomotor rotating for a long period of time without the turntable on the unit.)

Specifications

1. Wow and flutter:
Less than 0.05% WRMS.
 2. Turntable acceleration time:
0 to .33-1/3r.p.m., within 2 seconds (at rated voltage).
 3. Turntable vibrations should be less than 0.1mm horizontally, and less than 0.2mm vertically (when an outer dimension of the turntable is measured).
 4. A standard cartridge with a tracking force of 1.5g (Shure 75EMII, EDII) is used.
- Confirm that each switch operation operates in accordance with the owners manual and other related material.

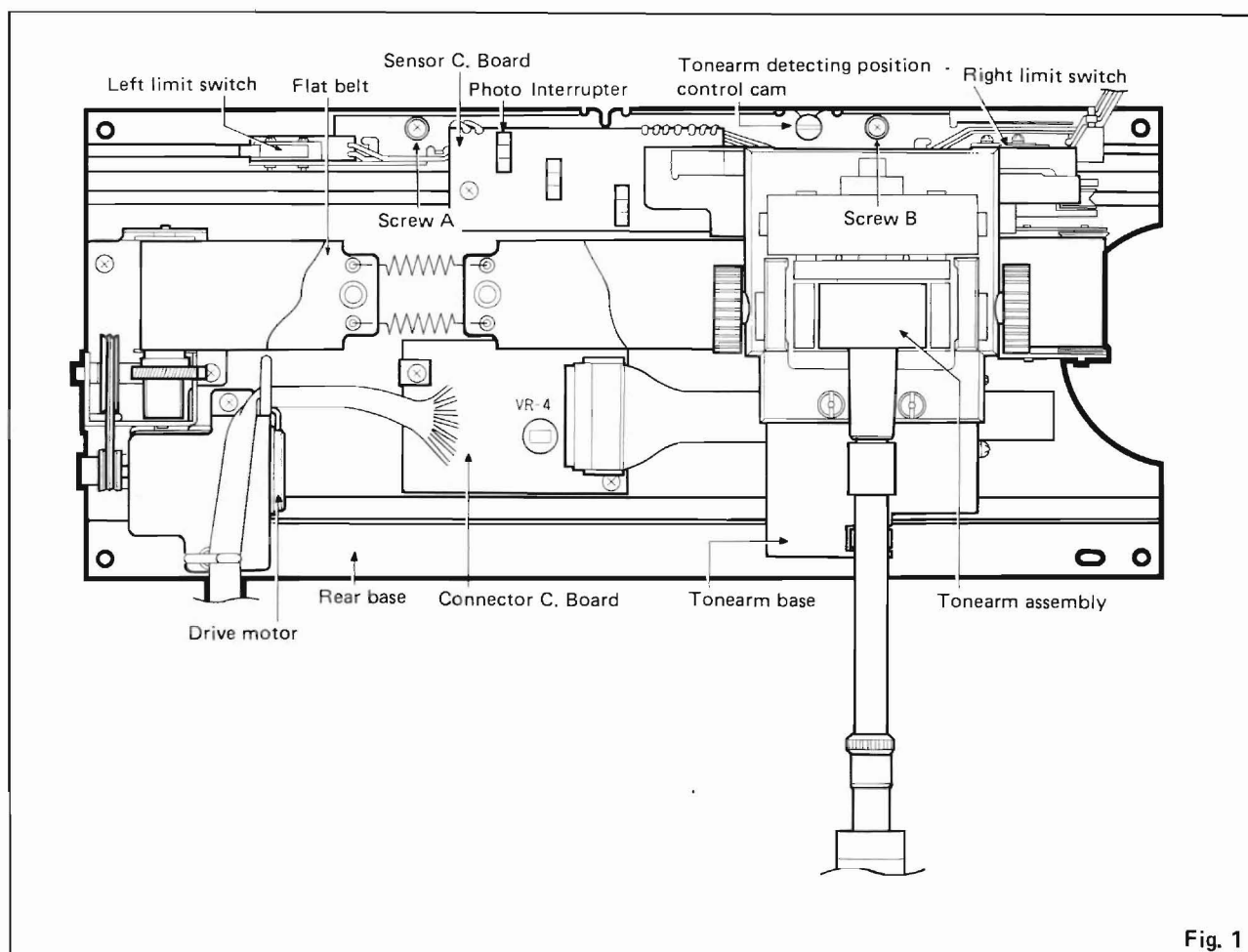


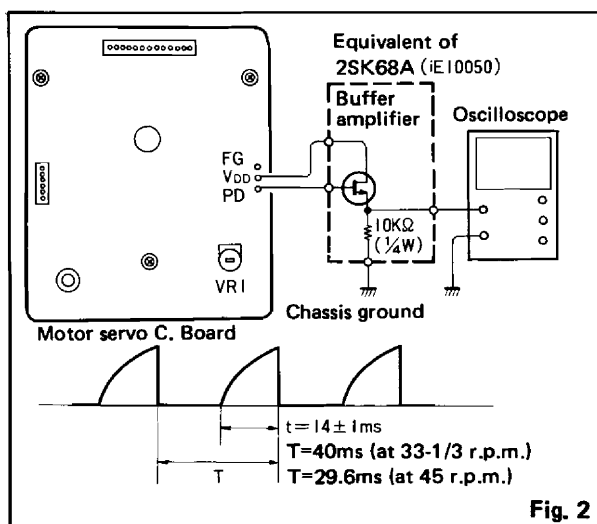
Fig. 1

Adjustment of phonomotor synchronization

1. Adjustment of quartz synchronization

- 1) As in Fig. 2, connect the buffer amplifier to the motor servo circuit board.
- 2) Set the speed selector switch at 45 r.p.m.

- 3) Connect an oscilloscope set at 10 kohms resistance level, to both terminals of the source in the buffer amplifier. Adjust the VR 1 so that "t" of the saw tooth wave is $14 \pm 1\text{ms}$ as in Fig. 2.



Adjustment of control circuit board and tonearm unit

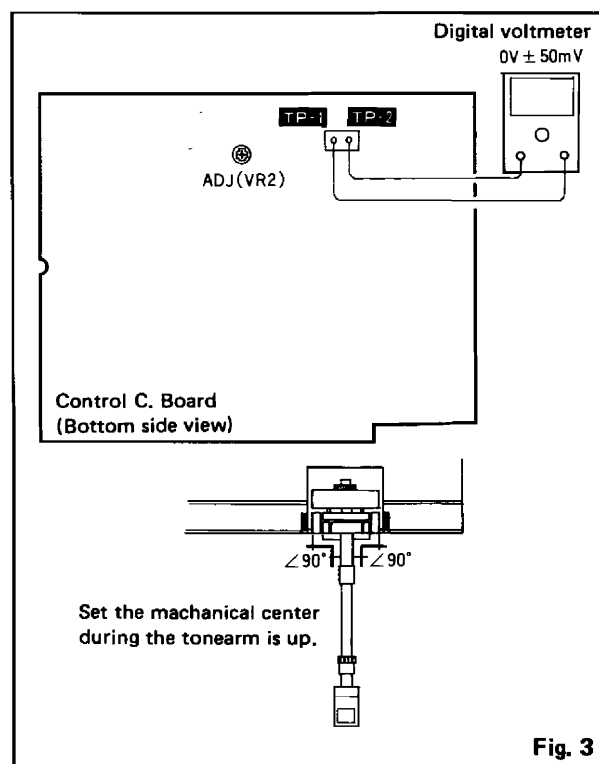
- For adjustment of the control circuit board and the tonearm unit section, remove the bottom cover and rear cover of the PX-2.

Tonearm angle adjustment

The following adjustments should be made when the tonearm angle takes a diagonal attitude or it sways.

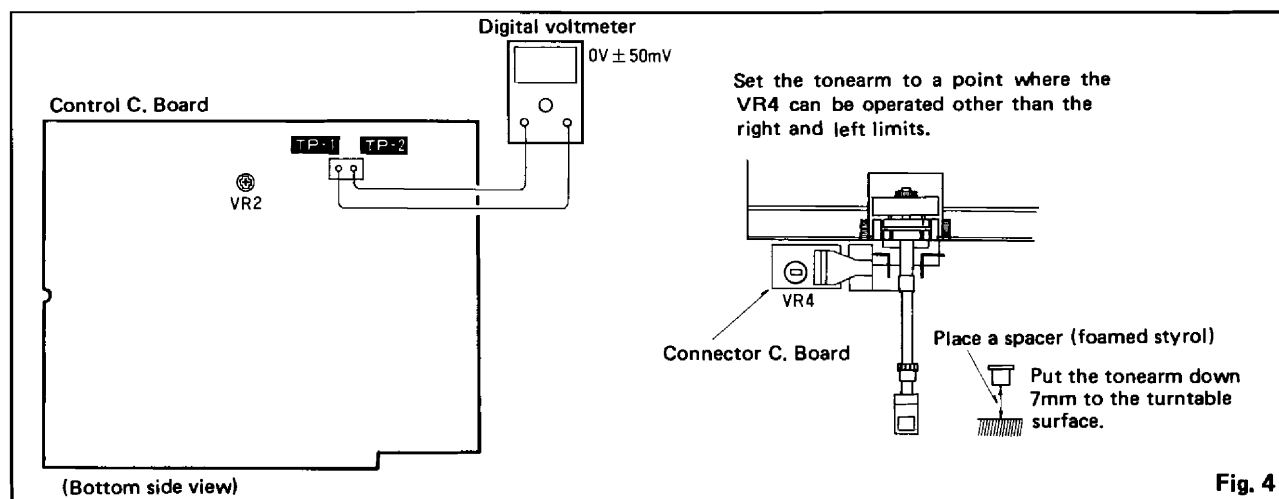
1. Adjustment when the tonearm is in the raised position

- As in Fig. 3, set the tonearm mechanically at the center when it is in the raised position, turn the power switch to "ON".
- Connect a digital voltmeter or a similar test meter to the test points **TP1** and **TP2** in the control circuit board. And adjust the volume of VR2 (2.2 k ohms) to set at $0V \pm 50mV$ (see Fig. 3).



2. Adjustment when the tonearm is the lowered position

- As in Fig. 4, set the tonearm down to the position less than 7mm from the tonearm rest by the Down SW.
- Connect a digital voltmeter or a similar test meter to the test points **TP1** and **TP2** in the control circuit board and adjust the volume of VR4 (4.7 k ohms) to $0V \pm 50mV$.
- Confirm that the meter keeps showing $0V \pm 50mV$ by repeatedly raising and lowering the tonearm.



Tonearm position detecting adjustment

Adjustment should be made when the arm detects incorrect positions. (After selecting the record size, whether it is 30, 25 or 17cm, the tonearm comes down and may slip out of place.) Loosen screws A and B shown in Fig. 5 and turn the adjustment cam with a $\ominus$ screw driver if either 30, 25 or 17 position slips out of place.

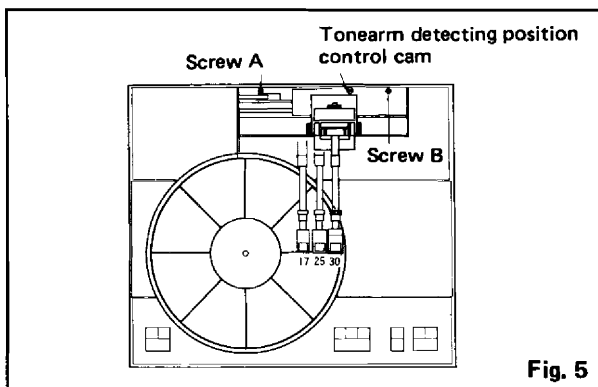


Fig. 5

Adjustment of auto-up at the tonearm lead-out groove

When the tonearm enters the lead-out groove of the record, it is detected according to the intervals (speed) of the lead-out grooves. This may cause the auto-up mechanism to not work according to the record played. In such cases, the following adjustments should be made.

1. As in Fig. 6, connect a frequency counter and an oscilloscope to the 24th pin of IC3 in order to confirm that the frequency is at $128\text{Hz} \pm 1\text{Hz}$, and that the waveform is a saw tooth wave (regard these as standard conditions).
2. When the auto-up mechanism does not work in accordance with the record played, the value

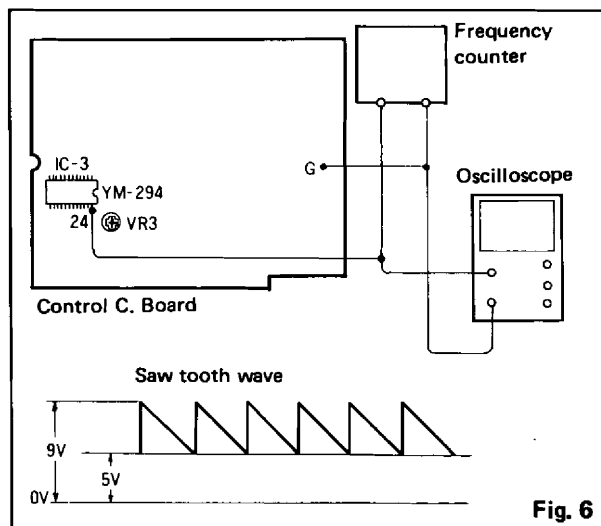


Fig. 6

can be varied to suit the record (raised the frequency when the pitch of the lead-out grooves is narrow).

Note: For tests of the auto-up mechanism use NEC's ES-1008 record. For the tonearm to be automatically raised, confirm that it works within 21 counts when the pitch is 3mm at 33-1/3 r.p.m., and does not work within 21 counts when the pitch is 1mm at 45 r.p.m. (under standard conditions).

Tonearm driving speed adjustment

There are cases where the tonearm speed is slow to slide to either side (movement towards the determined record size position), when the disc size select/ start switch is set to either 30, 25 or 17, or when the tonearm driving switch $\ll/\triangleleft$ or $\triangleright/\gg$ is depressed. In these case, the following adjustments should be made.

1. As in Fig. 7, adjustments should be made along with the tonearm's movement (moving speed). However, there is a case where the tonearm does not operated due to the adjustment position when the tonearm driving switch $\ll/\triangleleft$ or $\triangleright/\gg$ as set to LOW (the switch is being softly depressed). Check the operation when this adjustment is made.

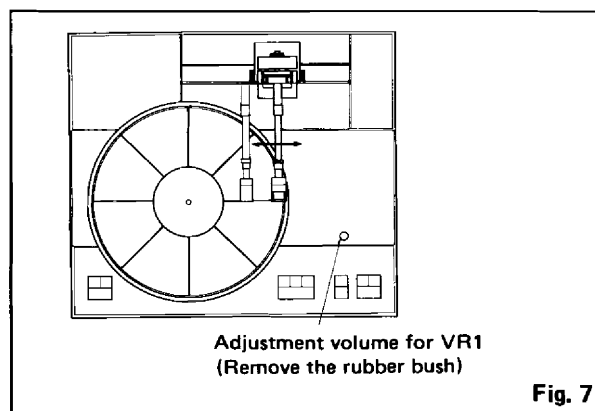
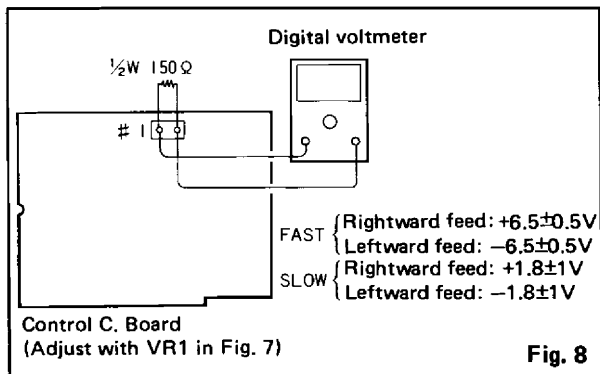


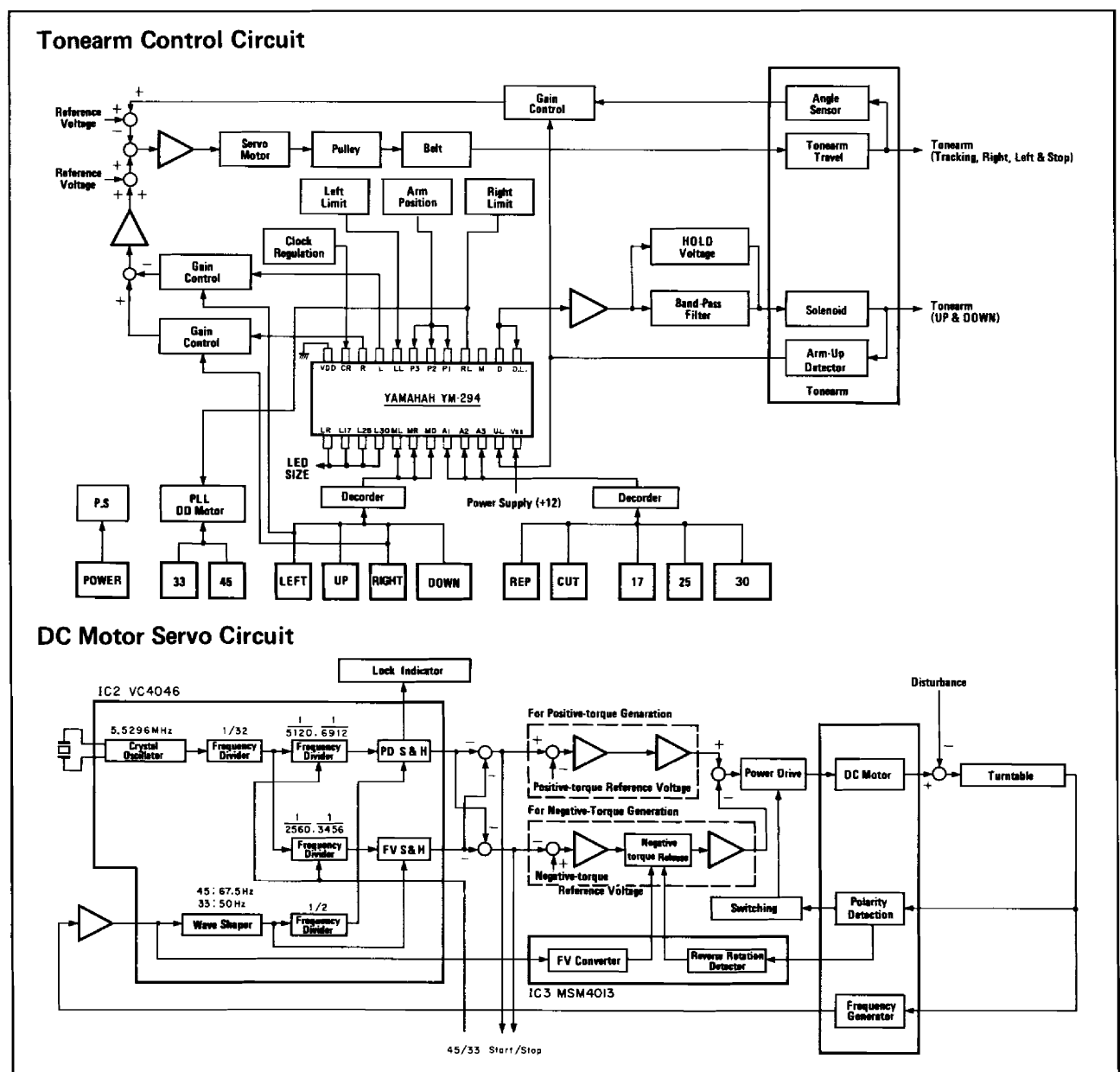
Fig. 7

2. Normal tonearm driving speed adjustment

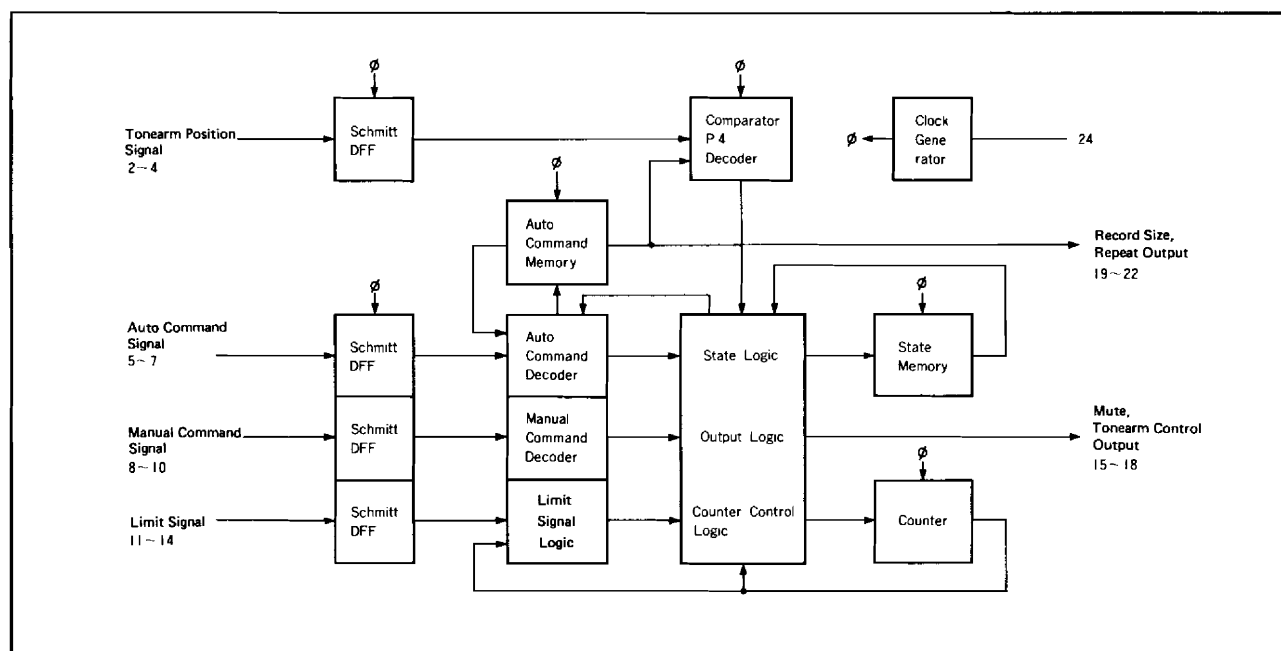
- 1) Connect a digital voltmeter to the 1st pin of the connector No. 1 in the control circuit board as in Fig. 8, and adjust VR 1 so that the voltages display the values shown in Fig. 8 when the tonearm is driven to move right and left (this means FAST) by, depressing each 30, 25 or 17 of the record size selector, or the tonearm is driven to move "FAST" in both directions (the switch is being strongly depressed).
- 2) Confirm that the voltage displays the value at SLOW mode shown in Fig. 8 when the tonearm driving $\ll/\triangleleft$ or $\triangleright/\gg$ switch is set to SLOW mode (the switch is being softly depressed).



■ BLOCK DIAGRAM



LOGIC CONTROL IC : YM-294



Pin arrangement

Power voltage +12V	1	VSS	CR	24	Clock (Input/Output)
	2	P1	VDD	23	
	3	P2	L30	22	
	4	P3	L25	21	
	5	A1	L17	20	Ground
	6	A2	LR	19	
	7	A3	M	18	
	8	MD	R	17	
	9	ML	L	16	Output
	10	MR	D	15	
	11	UL	LL	14	
	12	DL	RL	13	

Input

Output

Input

Input Signal

1. Limit Signal: Highest priority signal in logic operation.

Pin 11; UL . . .UP Limit

Pin 12; DL . . .Down Limit

*Arm vertical position signal. Determined by position of lead switch.

Pin 13; RL . . .Right Limit

Pin 14; LL . . .Left Limit

*Arm lateral position signal.

Note: Due to the arrangement of the circuit, the above signals cannot be input simultaneously.

2. Manual Command Signal: This signal has second priority after the limit signal. When one of these signals appears, the auto command signal will be inhibited and cancelled.

Pin 8; MD . . .Manual Down

Pin 9; ML . . .Manual Left

Pin 10; MR . . .Manual Right

Input			Output		Operations
MD	ML	MR	L	R	
0	0	0	0	0	No Operation
0	0	1	0	1	Manual Right
0	1	0	1	0	Manual Left
0	1	1	1	1	Manual Up/Initial Clear
1	0	0	0	0	Manual Down
1	0	1	0	1	Manual Right
1	1	0	1	0	Manual Left
1	1	1	0	0	Manual Up

3. Auto Command Signal: These are command signals which automatically operate the arm. This signal is inhibit by the Manual Command Signal.
Pin 5 to 7

A logic table without manual command signal.

A3	A2	A1	Operations	Output
0	0	0	No Operation	
0	0	1	Memorize the record size 30cm	L30=1
0	1	0	Memorize the record size 25cm	L25=1
0	1	1	Memorize the record size 17cm	L17=1
1	0	0	* Reverse the repeat memory	LR reverse
1	0	1	No Operation	
1	1	0	No Operation	
1	1	1	Cut command	

* Reverse operation is performed only when L30=1, L25=1 and L17=1.

4. Tonearm Position Signal: A signal that indicates the tonearm position in both directions. It indicates the posit on where a play starts at the full automatic mode or the tonearm returns to the tonearm rest at the full- or semi-auto mode.
Pin 2 to 4

P3	P2	P1	Meaning
0	0	0	Arm position: Outer periphery
0	0	1	" 30cm lead-in
0	1	1	" 30cm to 25cm
0	1	0	" 25cm lead-in
1	1	0	" 25cm to 17cm
1	1	1	" 17cm lead-in
1	0	1	" Less than 17cm *
1	0	0	" Inner periphery *

*In inner-most grooves, the operation repeats in a 2mm pitch so that the tonearm moving speed can be detected.

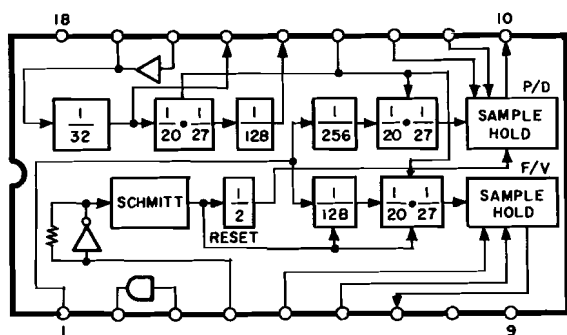
Output Signal

Output signals come to all output terminals synchronizing to the clock.

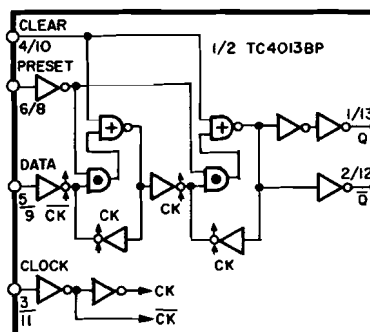
1. Tonearm Control Signal: The signal designates the arm's up and down, and right and left movements in all modes such as full auto, semi-auto and manual operations.
2. Mute Signal: As the signal generated when the arm is raised and lowered in all mode such as full auto, semi-auto and manual operations, it can be used for muting of audio signals.
3. Record Side, Repeat Signal: At the full auto mode, the signal drives LEDs so that they can display the record size and repeat operation, corresponding to the auto command signal.
Pin 19; LR . . .LED Repeat
Pin 20; L17 . .LED 17cm Record
Pin 21; L25 . .LED 25cm Record
Pin 22; L30 . .LED 30cm Record

■ IC FUNCTIONAL BLOCK DIAGRAM

VC4046 (IC2: Motor servo C. Board)



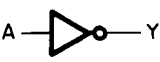
TC4013BP (IC2: Control C. Board)

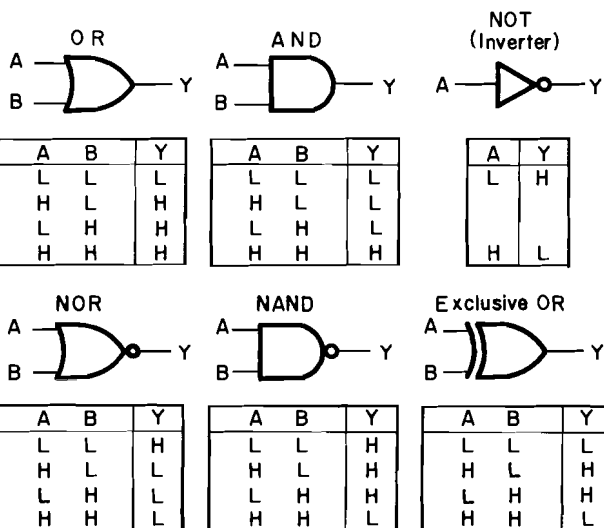


INPUTS				OUTPUTS	
CL	PR	D	CP Δ	Q _{n+1}	$\bar{Q}_{n+1}$
L	H			H	L
H	L			L	H
H	H			L	H
L	L	L		L	H
L	L	H		H	L
L	L			Q _n	$\bar{Q}_n$

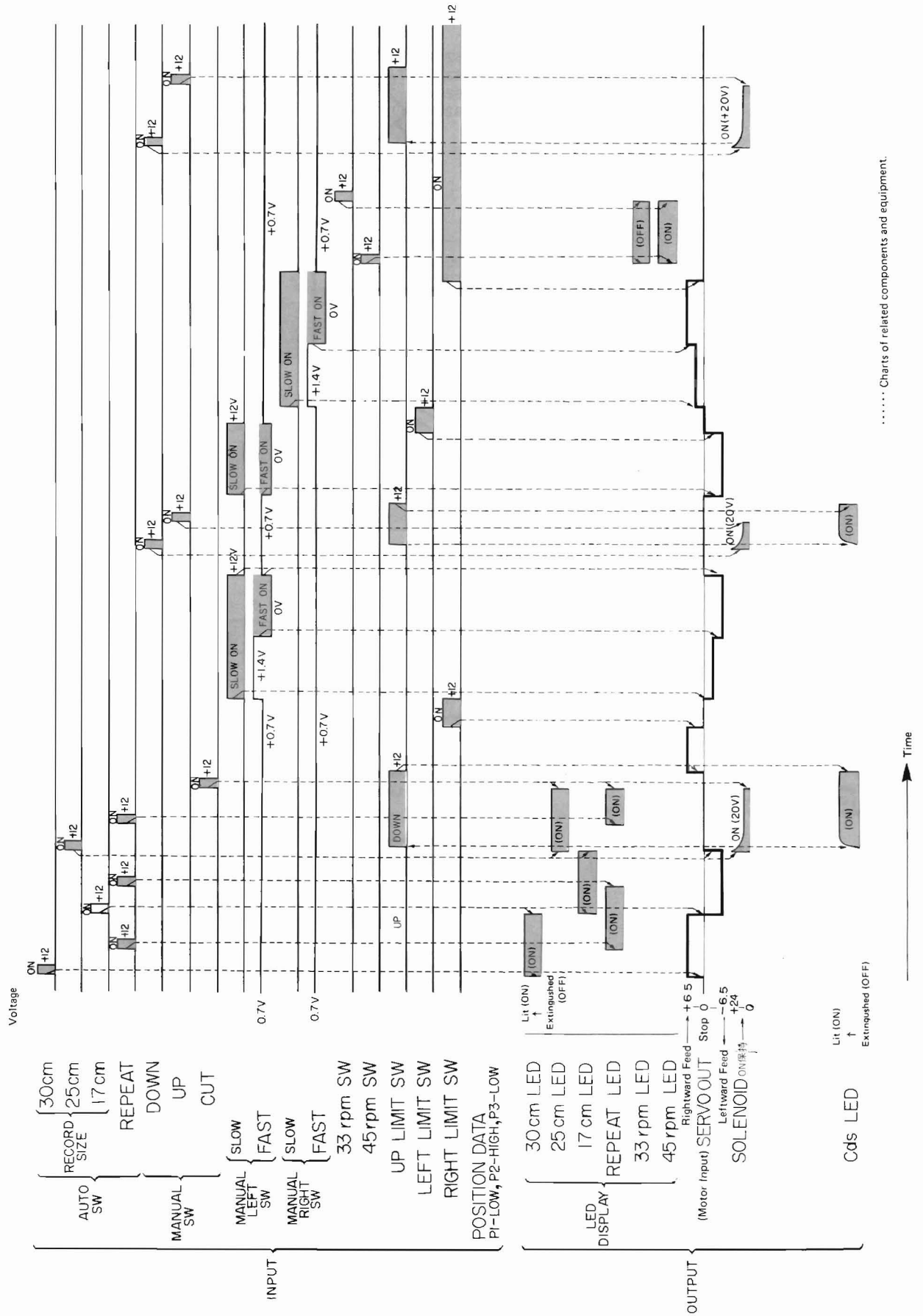
✖: Don't Care
 Δ: Level Change
 ●: No Change

● LOGIC SYMBOL

Function	LOGIC SYMBOL	
	MIL	YAMAHA
O R		
AND		
NOT (INVERTER)		
NOR		
NAND		



TIMING CHART



SPECIFICATIONS

TONEARM SECTION

Arm type	Linear tracking arm
Servo system	Photo-electric tracking sensor plus servo motor
Total length	236 mm (9-9/32")
Effective length	190 mm (7-15/32")
Tracking force device	Static balance type sliding weight system 0 to 2.5 g, in 0.1 g steps
Effective mass	Proportional type to tracking force
(In cartridge-less state)	
1.0 g (Tracking force)	16.5 g
1.5 g (Tracking force)	17.0 g
2.0 g (Tracking force)	17.5 g
Applicable cartridge weight range	5 to 11 g, (Using sub-weights) 10 to 16 g
Maximum horizontal tracking error angle	$\pm 0.15^\circ$, at stylus tip ± 0.5 mm
Arm lifter	Oil damp type cueing
Adjustable range of arm height	± 4.0 mm
Head shell	Pure, forged aluminum, weight: 8.0 g, Plug-in type conforming to EIA Standards
PU Cable	NEGLEX 2496, Low-impedance, double cylindrical cord
	Capacitance: 130pF
	Resistance: 1Ω
Cartridge (Not provided)	Replaceable

ROTARY SECTION

Motor	DC, 4-phase, 8-pole coreless Hall motor
Starting torque	1 kg-cm, or more
Drive system	Direct drive
Servo system	Quartz PLL, Negative/positive two-direction servo
Locking torque	450g-cm
F.G.	Total circumference integrating type
Speed (With Lock Indicator)	33-1/3 r.p.m., 45 r.p.m.
Platter	31 cm (12-1/4") diameter, aluminum die-cast, Weight: 2.1 kg (4.62 lbs) (Including rubber mat)
Moment of inertia	270 kg-cm ² (Including rubber mat)

EXTERNAL DESIGN

Cabinet	Aluminum, die-cast, 5 mm thick black enamel coating
Dust cover	Acrylic, Resins, 5 mm thick, weighting 1.3 kg, Front operating type
Hinges	Free stop, detachable type
Insulator	Combination of spring-and-rubber type with height adjustment

CONTROL SECTION

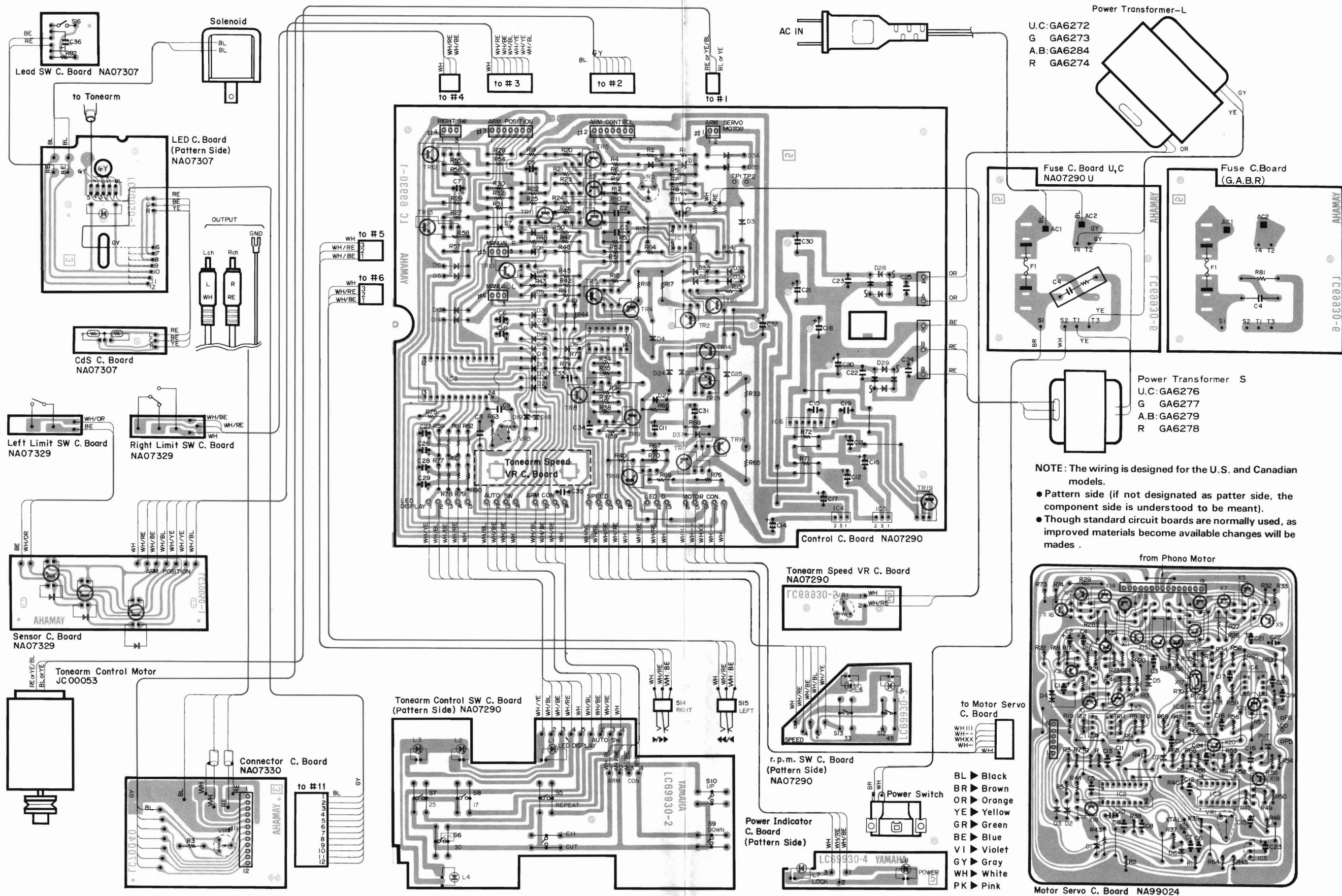
Automatic functions	AUTO-LEAD-IN/ AUTO-RETURN/ REPEAT/ AUTO-UP (During Power-OFF)
Size selector	17 / 25 / 30 cm (7" / 10" / 12")
Manual functions	ARM-UP/ ARM-DOWN/ LEFTWARD & RIGHTWARD 2-speed feeding/ CUT
Speed	33-1/3 r.p.m. and 45 r.p.m.
Others	Power switch

GENERAL

Signal to Noise ratio	.80 dB (IEC 98A Weighted)
Wow and flutter	0.01 % WRMS (FG direct)
Power supply and consumption	
U.S. and Canadian Models	120V AC, 60Hz, 25W
European Model	220V AC, 50Hz, 25W
Australian and British Models	240V AC, 50Hz, 25W
General Model	110/120/130/220/230/240V AC, 50/60Hz, 22W
Dimensions (W x H x D)	493 x 156 x 428 mm (19-7/16" x 6-5/32" x 16-27/32")
Total weight	17 kg (37.4 lb)

Specifications are subject to change without notice.

WIRING





PARTS LIST

PX-2

■ CONTENTS	Page
■ EXPLODED VIEW (All over)	1
■ PARTS LIST (All over)	2
■ EXPLODED VIEW (Tone Arm)	4
■ PARTS LIST (Tone Arm)	5
■ PARTS LIST (Circuit Board)	6

SINCE 1887



YAMAHA

NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN

004403

■



Ref. No.	Part No.		Description	(部 品 名)	Remarks	Common model	Markets
1	32 00 00	AA 06 42 40	Cord Stopper	コードストッパー			
※ 2	32 00 00	AA 09 75 30	Jointed Rod	連結棒			
※ 3	32 00 00	AA 09 75 40	Holder, Power Transformer	トランス止め板			
※ 4	32 00 00	AA 09 77 90	Cover for Fuse	ヒューズカバー			U,C,G,B,A
5	32 00 00	AA 07 39 20	Wire Clip	束線止め			
※ 6	32 00 00	AA 60 08 10	Spacer, Rear Cover	リヤカバースペーサー			
※ 7	32 00 00	BA 07 58 10	Panel	パネル			
※ 8	32 00 00	BA 07 57 80	Turn Table	ターンテーブル			
※ 9	32 00 00	BA 07 58 30	Rear Cover	リヤカバー			
※ 10	32 00 00	CB 09 26 80	Circuit Board Holder	シートホルダー			
※ 11	42 00 00	CA 06 90 60	Screw Tem Plate	固定ビスシート			
※ 12	32 00 00	CB 09 26 70	Wire Clip	ワイヤークリップ			
※ 13	32 00 00	CB 09 26 50	Screw Grommet	スクリューグロメット			
14	32 00 00	CB 07 85 80	Cushion for Power Transformer	トランスクッション			
15	32 00 00	CB 08 03 80	Turn Table Sheet	ターンテーブルシート		YP-D3	R,A,G,C,B
"	32 00 00	CB 08 30 30	"	"		YP-D10	U
16	32 00 00	CB 08 40 00	Lens, Illuminate	表示レンズ			
※ 17	32 00 00	CB 09 18 70	Cushion for Power Transformer	トランスクッション			
20	42 00 00	CB 06 92 50	Binding Tie	インシュロックタイ			
※ 21	42 00 00	GA 62 71 10	Power Transformer (L)	電源トランスL			J
※ "	42 00 00	GA 62 72 10	"	"			U,C
※ "	42 00 00	GA 62 73 10	"	"			G
※ "	42 00 00	GA 62 84 10	"	"			A,B
※ 22	42 00 00	GA 62 75 00	Power Transformer (S)	電源トランスS			J
※ "	42 00 00	GA 62 76 00	"	"			U,C
※ "	42 00 00	GA 62 77 00	"	"			G
※ "	42 00 00	GA 62 79 00	"	"			A,B
※ 23	32 00 00	CB 09 59 50	Bush for Panel	パネルブッシュ			
※ 25	42 00 00	JC 00 04 80	Motor Ass'y MC938E	モーターユニット			
※ 26	42 00 00	MG 00 04 10	AC Cord	電源コード			J
"	42 00 00	MG 00 08 40	"	"		YP-D8	R,U,C
"	42 00 00	MG 00 09 50	"	"		K-850	G
"	42 00 00	MG 00 09 20	" SAA2P	"			A
※ "	32 00 00	MZ 07 59 50	AC Cord Ass'y	BS電源コードAss'y			B
※ 26-1	42 00 00	GA 62 74 10	Power Transformer (L)	電源トランスL			R
※ 26-2	42 00 00	GA 62 78 00	" (S)	電源トランスS			R
26-3	42 00 00	LB 20 02 60	Voltage Selector	電圧切換器			R
※ 27	32 00 00	MZ 07 53 50	Leaf Switch (L) Ass'y	リーフSW(L)Ass'y			
※ 27-1	32 00 00	NB 09 39 70	Switch Ass'y	スイッチAss'y			
※ 28	32 00 00	MZ 07 53 70	Leaf Switch (R) Ass'y	リーフSW(R)Ass'y			
※ 28-1	32 00 00	NB 09 39 80	Switch Ass'y	スイッチAss'y			
※ 29	32 00 00	NA 07 28 90	Control Circuit Board Ass'y	コントロールシートAss'y			J
※ "	32 00 00	NA 07 29 00	"	"			U
※ "	32 00 00	NA 07 29 10	"	"			C
※ "	32 00 00	NA 07 29 20	"	"			G
※ "	32 00 00	NA 07 29 30	"	"			R
※ "	32 00 00	NA 07 29 60	"	"			B
※ "	32 00 00	NA 07 29 70	"	"			A
※ 30	32 00 00	NB 09 11 50	Bottom Cover Ass'y	底板Ass'y			
※ 30-1	32 00 00	CB 09 17 50	Cushion (L) for Bottom Cover	底板クッション(L)			
※ 30-2	32 00 00	CB 09 17 60	Cushion (S) For Bottom Cover	底板クッション(S)			
※ 31	32 00 00	NB 09 11 70	Dust Cover Ass'y	上蓋Ass'y			
※ 31-1	32 00 00	CB 09 17 90	Cushion For Dust Cover	上蓋クッション			

※ : New Part (新部品)

DESTINATION ABBREVIATIONS

J: Japan, R: General, U: U.S.A, C: Canadian, B: British, G: North European, A: Australian

※ : New Part (新部品)



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※ : New Part (新部品)

PARTS LIST(Circuit Board)

PX-2

Ref. No.	Part No.				Description		(部 品 名)	Remarks	Common model	Markets
	32	00	00	NA 07 28 90	Control C-B Ass'y		コントロールシート Ass'y			J
	32	00	00	NA 07 29 00	#		#			U
	32	00	00	NA 07 29 10	#		#			C
	32	00	00	NA 07 29 20	#		#			G
	32	00	00	NA 07 29 30	#		#			R
	32	00	00	NA 07 29 60	#		#			B
	32	00	00	NA 07 29 70	#		#			A
R1	42	00	00	HK 35 64 70	Carbon Resistor	4.7K Ω	カーボン抵抗			
R2	42	00	00	HK 35 71 50	#	15K Ω	#			
R4	42	00	00	HJ 35 62 70	Carbon Resistor	2.7K Ω	カーボン抵抗			
R5 R6	42	00	00	HJ 35 71 00	#	10K Ω	#			
R7	42	00	00	HJ 35 54 70	#	470 Ω	#			
R8 R9	42	00	00	HJ 35 74 70	#	47K Ω	#			
R10	42	00	00	HJ 35 54 70	#	470 Ω	#			
R11	42	00	00	HJ 35 82 70	#	270K Ω	#			
R12 R13	42	00	00	HJ 35 84 70	#	470K Ω	#			
R14	42	00	00	HJ 35 61 20	#	1.2K Ω	#			
R15 R16	42	00	00	HJ 35 74 70	#	47K Ω	#			
* R17 R18	42	00	00	HM 03 42 20	Cement Molded Resistor 3w	22 Ω	セメント抵抗	MO-4P		
R19	42	00	00	HJ 35 74 70	Carbon Resistor	47K Ω	カーボン抵抗			
R20	42	00	00	HJ 35 72 20	#	22K Ω	#			
R21	42	00	00	HJ 35 81 00	#	100K Ω	#			
R22	42	00	00	HJ 35 74 70	#	47K Ω	#			
R23	42	00	00	HJ 35 76 80	#	68K Ω	#			
R24	42	00	00	HJ 35 71 00	#	10K Ω	#			
R25	42	00	00	HJ 35 63 30	#	3.3K Ω	#			
R26	42	00	00	HJ 35 73 30	#	33K Ω	#			
R27	42	00	00	HJ 35 71 20	#	12K Ω	#			
R28	42	00	00	HJ 35 56 80	#	680 Ω	#			
R29	42	00	00	HJ 35 64 70	#	4.7K Ω	#			
R30 ~32	42	00	00	HJ 35 71 00	#	10K Ω	#			
* R33	42	00	00	HM 05 42 70	Cement Molded Resistor 5w	27 Ω	セメント抵抗	MO-4P		
R34	42	00	00	HJ 35 74 70	Carbon Resistor	47K Ω	カーボン抵抗			
R35	42	00	00	HJ 35 72 20	#	22K Ω	#			
R36	42	00	00	HJ 35 61 00	#	1K Ω	#			
R37	42	00	00	HJ 35 74 70	#	47K Ω	#			
R38	42	00	00	HJ 35 72 20	#	22K Ω	#			
R39 R40	42	00	00	HJ 35 61 00	#	1K Ω	#			
R41	42	00	00	HJ 35 72 20	#	22K Ω	#			
R42	42	00	00	HJ 35 71 20	#	12K Ω	#			
R43	42	00	00	HJ 35 63 30	#	3.3K Ω	#			
R44	42	00	00	HJ 35 72 20	#	22K Ω	#			
R45	42	00	00	HJ 35 66 80	#	6.8K Ω	#			
R46	42	00	00	HJ 35 72 20	#	22K Ω	#			
R47	42	00	00	HJ 35 71 20	#	12K Ω	#			
R48	42	00	00	HJ 35 63 30	#	3.3K Ω	#			
R49	42	00	00	HJ 35 72 20	#	22K Ω	#			
R50	42	00	00	HJ 35 66 80	#	6.8K Ω	#			
R51 ~53	42	00	00	HJ 35 81 00	#	100K Ω	#			
R54	42	00	00	HJ 35 61 00	#	1K Ω	#			
R55	42	00	00	HJ 35 72 20	#	22K Ω	#			
R56	42	00	00	HJ 35 81 00	#	100K Ω	#			

* : New Part (新部品)

Ref. No.	Part No.					Description	(部 品 名)	Remarks	Common model	Markets
R57	42 00 00	HJ 35 74 70				Carbon Resistor 47K Ω	カーボン抵抗			
R58	42 00 00	HJ 35 72 20				" 22K Ω	"			
R59 62	42 00 00	HJ 35 55 60				" 560 Ω	"			
R63 R64	42 00 00	HJ 35 81 00				" 100K Ω	"			
* R65	42 00 00	HM 05 42 70				Cement Molded Resistor 5w 27 Ω	セメント抵抗	MO-4P		
R66	42 00 00	HJ 35 81 00				Carbon Resistor 100K Ω	カーボン抵抗			
R67	42 00 00	HJ 35 74 70				" 47K Ω	"			
R68	42 00 00	HJ 35 64 70				" 4.7K Ω	"			
R69	42 00 00	HJ 35 71 00				" 10K Ω	"			
R70	42 00 00	HJ 35 72 20				" 22K Ω	"			
R71 R72	42 00 00	HJ 35 71 00				" 10K Ω	"			
R73 R74	42 00 00	HJ 35 75 60				" 56K Ω	"			
R75	42 00 00	HJ 35 71 00				" 10K Ω	"			
R76	42 00 00	HJ 35 72 20				" 22K Ω	"			
R77 80	42 00 00	HJ 35 55 60				" 560 Ω	"			
R81	42 00 00	HG 10 51 00				" 1 2W 100 Ω	"			R,A,G,B
VR1	42 00 00	HT 41 01 00				Semi Variable Resistor B220K Ω	ソリッドボリューム			
VR2	42 00 00	HT 41 00 30				" B2.2K Ω	"			
VR3	42 00 00	HT 41 01 40				" B47K Ω	"			
C1	42 00 00	FG 21 21 00				Ceramic Capacitor 100PF	セラコン			
C2 C3	42 00 00	FA 45 51 00				Mylar Capacitor 0.1 μ F	マイラーコンデンサ			
C5	42 00 00	FJ 34 71 00				Electrolytic Capacitor 10 μ F 25V	ケミコン(タテガタ)			
C6	42 00 00	FJ 33 71 00				" 10 μ F 16V	"			
C7	42 00 00	FJ 34 71 00				" 10 μ F 25V	"			
C8 C9	42 00 00	FA 45 51 00				Mylar Capacitor 0.1 μ F	マイラーコンデンサ			
C10	42 00 00	FJ 24 61 00				Electrolytic Capacitor 1 μ F 25V	ケミコン(タテガタ)			
C11	42 00 00	FJ 24 81 00				" 100 μ F 25V	"			
C12 C13	42 00 00	FJ 15 71 00				" 10 μ F 35V	"			
C14	42 00 00	FJ 16 71 00				" 10 μ F 50V	"			
C15	42 00 00	FG 21 21 00				Ceramic Capacitor 100PF	セラコン			
C16 C17	42 00 00	FJ 16 54 70				Electrolytic Capacitor 0.47 μ F 50V	ケミコン(タテガタ)			
C18	42 00 00	FJ 15 84 70				" 470 μ F 35V	"			
C19	42 00 00	FG 21 31 00				Ceramic Capacitor 1000PF	セラコン			
C20	42 00 00	FJ 15 84 70				Electrolytic Capacitor 470 μ F 35V	ケミコン(タテガタ)			
* C21	42 00 00	FZ 00 19 10				" 1000 μ F 50V	"			
C22 25	42 00 00	FG 24 41 00				Ceramic Capacitor 0.01 μ F 50V	セラコン			
C26 29	42 00 00	FJ 33 72 20				Electrolytic Capacitor 22 μ F 16V	ケミコン(タテガタ)			
* C30	42 00 00	FZ 00 19 10				" 1000 μ F 50V	"			
C31	42 00 00	FJ 44 72 20				" 22 μ F 25V	"			
C32	42 00 00	FZ 00 19 10				" 1000 μ F 50V	"			
C33 35	42 00 00	FG 24 41 00				Ceramic Capacitor 0.01 μ F 50V	セラコン			
IC1	42 00 00	i G 00 13 90				IC NJM4558DV	IC			
IC2	42 00 00	i G 00 11 80				" TC4013P	"			
* IC3	32 00 00	i T 29 40 00				" YM294	"			
* IC4	42 00 00	i G 03 41 10				" FS7824	"			
* IC5	42 00 00	i G 03 08 10				" FS7812M	"			
* IC6	42 00 00	i G 02 62 00				" HA1457	"			
TR1	42 00 00	i C 23 20 10				Transistor 2SC2320E,F	トランジスタ			
TR2	42 00 00	i D 06 67 00				" 2SD667C,D	"			

* : New Part (新部品)

Ref. No.	Part No.			Description		(部 品 名)	Remarks	Common model	Markets
TR3	42:00:00	i A	09:99:10	Transistor	2SA999 E.F	トランジスタ			
TR4	42:00:00	i B	06:47:30	"	2SB647 C.D	"			
TR5	42:00:00	i A	09:99:10	"	2SA999 E.F	"			
TR6	42:00:00	i C	23:20:10	"	2SC2320 E.F	"			
TR7	42:00:00	i A	09:99:10	"	2SA999 E.F	"			
TR8 -13	42:00:00	i C	23:20:10	"	2SC2320 E.F	"			
TR14	42:00:00	i D	06:69:00	"	2SD669 C.D	"			
TR15	42:00:00	i C	23:20:10	"	2SC2320 E.F	"			
TR16	42:00:00	i B	06:49:00	"	2SB649 C.D	"			
TR17	42:00:00	i A	09:99:10	"	2SA999 E.F	"			
TR18	42:00:00	i C	23:20:10	"	2SC2320 E.F	"			
TR19	42:00:00	i B	06:49:00	"	2SB649 C.D	"			
D1 D2	42:00:00	i F	00:03:20	Zener Diode	WZ061	ツェナーダイオード			
D3 D4	42:00:00	i H	00:07:10	Diode	W06C	ダイオード			
D5 -23	42:00:00	i F	00:00:40	"	1S1555	"			
D24 -26	42:00:00	i H	00:07:10	"	W06C	"			
D27	42:00:00	i F	00:00:40	"	1S1555	"			
D28 D29	42:00:00	i H	00:04:70	Bridge Diode	ID4B1	ブリッジダイオード			
D30 -33	42:00:00	i F	00:00:40	Diode	1S1555	ダイオード			
D34 D35	42:00:00	i H	00:07:10	"	W06C	"			
D36 D37	42:00:00	i F	00:00:40	"	1S1555	"			
#1	42:00:00	LB	20:13:90	Post with Base	B2P-SHF-1AA	ベース付ポスト			
#2 #3	42:00:00	LB	60:24:60	"	B7P-SHF-1AA	"			
#4 -6	42:00:00	LB	30:07:30	"	B3P-SHF-1AA	"			
	42:00:00	LA	00:21:40	Wrapping Pin I Type	2P P=10	I型ラッピングピン			
	42:00:00	LA	00:21:50	"	3P P=10	"			
	42:00:00	LA	00:21:10	"	2P P=5	"			
L1 -8	42:00:00	i F	00:08:90	LED	TLR-106	LED			
※	32:00:00	CB	09:17:10	Guide for LED		LEDガイド			
L5 -13	42:00:00	KA	80:09:10	Push Switch		プッシュスイッチ			
	42:00:00	LA	00:05:30	Press Terminal		ハネ付ハトメ	VF		
F1	42:00:00	KB	00:03:40	Fuse	T1.5A 250V	ヒューズタイラッシュ			J,R
"	42:00:00	KB	00:12:90	" UL	SS-2 1.5A 250V	ULヒューズ			U,C
"	42:00:00	KB	00:06:40	" S	250mA 250V	ヒューズSタイムラグ			A,G,B
C4	42:00:00	FZ	00:01:10	Spark-Killer Capacitor	$120\Omega + 0.033$ 125V AC	スパークキラーコン			J,U
"	42:00:00	FZ	00:11:20	"	"	"			C
"	42:00:00	FZ	00:22:50	"	0.022 μ F 250V	"			R,A,G,B
	42:00:00	LB	20:09:00	Fuse Holder Pin		ヒューズホルダーピン			
	42:00:00	Mi	06:72:50	Ribbon Wire		リボンワイヤー 2 芯			
	42:00:00	Mi	06:75:70	"		" 3 芯			
	42:00:00	Mi	06:78:20	"		" 4 芯			
	42:00:00	Mi	06:81:20	"		" 5 芯			
※	42:00:00	Mi	06:81:80	"		" 5 芯			

※ : New Part (新部品)

Ref. No.	Part No.	Description	(部 品 名)	Remarks	Common model	Markets
※	32:00:00 NA:07:30:70	LED. C. Board	LEDシート組立			
	42:00:00 i F:00:12:50	LED TLR-121	LED			
	42:00:00 i K:00:02:40	CDS (Dual Type) P1234	デュアルCDS			
※	42:00:00 KA:00:00:40	Micro Lead Switch	マイクロリードスイッチ			
	42:00:00 HJ:35:71:00	Carbon Resister 10K Ω	カーボン抵抗			
	42:00:00 FP:35:54:70	Tantalume E. Capacitor 0.47 μ F 35V	タンタルコンデンサ			
※	32:00:00 NA:07:32:90	Sensor C. Board	センサーシート組立			
※	42:00:00 KA:60:03:80	Micro Switch	マイクロスイッチ			
※	42:00:00 i K:00:02:50	Photo Interrupter	フォトインタラプタ			
※	32:00:00 NA:07:33:00	Terminal C.Board	中継シート組立			
※	42:00:00 LB:60:34:50	Connector BS12P, SHF-JAA-B	NHコネクタサイド型 ベース付ポスト			
※	42:00:00 HY:00:03:70	Variable Resistor B4.7K Ω CR-19R	メタルグレースVR			
	42:00:00 HJ:35:71:20	Carbon Resistor 12K Ω	カーボン抵抗			
※	42:00:00 JC:00:04:80	Motor Unit MC938E	モーターユニット			
※	42:00:00 NA:99:02:40	Power C. Board	パワーシート			
X1	42:00:00 i C:09:45:90	Transistor 2SC945 (P or K)	トランジスタ			
X2	42:00:00 i A:07:33:00	" 2SA733 (P or K)	"			
X3	42:00:00 i C:09:45:90	" 2SC945 (P or K)	"			
X4 ~8	42:00:00 i A:07:33:00	" 2SA733 (P or K)	"			
X9 X10	42:00:00 i D:05:71:00	" 2SD5711(K1 or K2)	"			
X11 ~14	42:00:00 i A:07:33:00	" 2SA733 (P or K)	"			
X15 X16	42:00:00 i D:05:71:00	" 2SD571 (K1 or K2)	"			
X17	42:00:00 i C:15:83:10	" 2SC1583 (G or F)	"			
X18 ~21	42:00:00 i C:09:45:90	" 2SC945 (P or K)	"			
※	PUT 42:00:00 i X:00:00:10	Programmable Uni-Junction Transistor N13T1	PUT			
D1 ~3	42:00:00 i F:99:04:00	Diode 1SS53	ダイオード			
D4 D5	42:00:00 i F:99:00:60	Varistor Diode VD1220	バリスタダイオード			
D6 D7	42:00:00 i F:99:04:00	Diode 1SS53	ダイオード			
IC1	42:00:00 i G:00:13:90	IC NJM4558 DV	IC			
※	IC2 42:00:00 i G:99:02:10	" VC4046	"			
	IC3 42:00:00 i G:00:11:80	" JC4013BP	"			
	IC4 42:00:00 i G:02:84:00	" NJM4558.DV	"			
※	IC5 42:00:00 i G:99:03:40	" NJM78L08A	"			
	IC6 42:00:00 i G:00:13:90	" NJM4558 DV	"			
VR1	42:00:00 HT:41:00:80	Sem Variabl Resistor 2.2K (RVAV310-223)	半固定抵抗			
X'tal	42:00:00 QU:99:00:10	Quarts Crystal Unit 5.5296MHz	水晶発振器			
R1	42:00:00 HJ:35:71:00	Carbon Resistor 1/4W 10K Ω	カーボン抵抗			
R2	42:00:00 HJ:35:63:90	" 3.9K Ω	"			
R3	42:00:00 HJ:35:71:50	" 15K Ω	"			
R4 R5	42:00:00 HJ:35:81:00	" 100K Ω	"			
R6 R7	42:00:00 HJ:35:82:70	" 270K Ω	"			
R8	42:00:00 HJ:35:81:50	" 150K Ω	"			
R9	42:00:00 HJ:35:91:20	" 1.2K Ω	"			
R10	42:00:00 HJ:35:81:00	" 100K Ω	"			
R11	42:00:00 HJ:35:86:80	" 680K Ω	"			
R12	42:00:00 HJ:35:91:00	" 1M Ω	"			
R13 R14	42:00:00 HN:75:73:00	" 30K Ω	"			
R15	42:00:00 HJ:35:62:20	" 2.2K Ω	"			
R16	42:00:00 HJ:35:63:30	" 3.3K Ω	"			
R17	42:00:00 HJ:35:51:00	" 100 Ω	"			

※ : New Part (新部品)

Ref. No.	Part No.				Description	(部 品 名)	Remarks	Common model	Markets
R18	42 00 00	HJ 35 61 20	Carbon Resistor 1/4W 1.2KΩ		カーボン抵抗				
R19	42 00 00	HN 75 71 30	" " 13KΩ		"				
R20	42 00 00	HJ 35 62 20	" " 2.2KΩ		"				
R21	42 00 00	HJ 35 63 30	" " 3.3KΩ		"				
R22	42 00 00	HJ 35 54 70	" " 470Ω		"				
R23	42 00 00	HJ 35 51 00	" " 100Ω		"				
R24	42 00 00	HJ 35 61 20	" " 1.2KΩ		"				
R25 28	42 00 00	HJ 35 46 80	" " 68Ω		"				
R29	42 00 00	HZ 00 07 00	Metal Film Resistor, 1W, 2.7Ω		金属皮膜抵抗	QRXO16 T-2R7			
R30 R31	42 00 00	HJ 35 64 70	Carbon Resistor 1/4W 4.7KΩ		カーボン抵抗				
R32 R33	42 00 00	HJ 35 61 00	" " 1KΩ		"				
R34	42 00 00	HJ 35 63 30	" " 3.3KΩ		"				
R35 R36	42 00 00	HJ 35 64 70	" " 4.7KΩ		"				
R37	42 00 00	HJ 35 51 00	" " 100Ω		"				
R38	42 00 00	HJ 35 84 70	" " 470KΩ		"				
R39	42 00 00	HJ 35 71 00	" " 10KΩ		"				
R40	42 00 00	HJ 35 71 80	" " 18KΩ		"				
R41	42 00 00	HJ 35 71 50	" " 15KΩ		"				
R42	42 00 00	HJ 35 71 00	" " 10KΩ		"				
R43	42 00 00	HJ 35 63 90	" " 3.9KΩ		"				
R44	42 00 00	HJ 35 71 80	" " 18KΩ		"				
R45	42 00 00	HJ 35 71 00	" " 10KΩ		"				
R46	42 00 00	HJ 35 53 90	" " 390Ω		"				
R47	42 00 00	HN 75 93 30	" " 3.3MΩ		"				
R48	42 00 00	HJ 35 44 70	" " 47Ω		"				
R49	42 00 00	HJ 35 76 80	" " 68KΩ		"				
R50	42 00 00	HJ 35 66 80	" " 6.8KΩ		"				
R51	42 00 00	HJ 35 81 00	" " 100KΩ		"				
R52	42 00 00	HJ 35 72 70	" " 27KΩ		"				
R53	42 00 00	HJ 35 75 60	" " 56KΩ		"				
R54	42 00 00	HJ 35 88 20	" " 820KΩ		"				
R55	42 00 00	HJ 35 48 20	" " 82Ω		"				
R56	42 00 00	HJ 35 72 20	" " 22KΩ		"				
R57	42 00 00	HJ 35 71 00	" " 10KΩ		"				
R58	42 00 00	HJ 35 71 00	" " 10KΩ		"				
R59	42 00 00	HJ 35 81 50	" " 150KΩ		"				
R60	42 00 00	HJ 35 61 00	" " 1KΩ		"				
R61	42 00 00	HJ 35 72 00	" " 22KΩ		"				
R62	42 00 00	HJ 35 91 00	" " 1MΩ		"				
R63	42 00 00	HJ 35 61 00	" " 1KΩ		"				
R64	42 00 00	HG 30 54 70	" 1/2W 470Ω		"				
R65	42 00 00	HJ 35 72 20	" 1/4W 22KΩ		"				
R66	42 00 00	HJ 35 71 00	" " 10KΩ		"				
R67	42 00 00	HJ 35 72 20	" " 22KΩ		"				
R68	42 00 00	HJ 35 71 00	" " 10KΩ		"				
R69	42 00 00	HJ 35 83 90	" " 390KΩ		"				
R70	42 00 00	HJ 35 61 00	" " 1KΩ		"				
R71	42 00 00	HJ 35 83 90	" " 390KΩ		"				
R72 74	42 00 00	HJ 35 61 00	" " 1KΩ		"				
C1	42 00 00	FJ 24 64 70	Electrolytic Capacitor 4.7μF/25V		ケミコン				
C2 4	42 00 00	FJ 46 54 70	" 0.47μF/50V		"				
C5	42 00 00	FG 24 44 70	Ceramic Capacitor 50V0.047μF		セラコン				
C6 C7	42 00 00	FG 71 13 30	" 33PF		"				

* : New Part (新部品)

※: New Part (新部品)