

SERVICE MANUAL

YP-D8

STEREO TURNTABLE



SINCE 1887



YAMAHA

NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN

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■ SPECIFICATIONS

TURNTABLE MOTOR SECTION

Drive System	FG Servo-control direct drive
Motor	12-Poles 24-slots DC Hall motor
Motor Torque	1,000g-cm
Turntable Platter	31.5 cm (12-1/4") die-cast aluminum, Weight, 2.7 kg (6 lbs). (including rubber mat)
Turntable Moment of Inertia	360 kg-cm ² (including rubber mat)
Speed	33-1/3 r.p.m. 45 r.p.m.
Signal-to-Noise Ratio	Better than 70 dB (DIN-B)
Wow and Flutter	Less than 0.03% (wrms)
Fine Speed Adjustment	±3% (with strobo indicator)

TONEARM SECTION

Arm Type	S-type static balance arm with gimbel supports
Tonearm Effective Length	232 mm (9-1/8")
Overhang	16 mm (1/4")
Tonearm Stand Base/Weight	Diecast zinc/1,000g (2.2 lbs)
Range of Tonearm Height	
Adjustment	±3 mm (1/8")
Inside Force Canceller	Counterweight and string roller
Sensitivity	Vertical; 3 mg, Horizontal; 5 mg.
Arm Lifter	Oil dump system
Auto-Up Stop	Non-contact photo-electric speed detector, linked with cueing lever and power OFF switch.

Headshell

Possible Cartridge Weights
Output Leads

Diecast aluminum alloy (inter-changeable to EIA specs: weight 12g)
2~15g. 9~23g (with subweight)
Gold-plated plugs fitted, using NEGLEX type wire

GENERAL

Power Supplies

120V AC 60 Hz (USA & Canada)
110/130/220/240V AC 50/60 Hz (General)
110/130/220/240V AC 60 Hz (Europe)
220V AC 50 Hz (North Europe)
240V AC 50 Hz (Australia)

Power Consumption

6W (U.S.A. & Canada)
5W (Europe, General, North Europe, Australia)

Cabinet

High density coniferous particle board with black polyurethane open-pore decorative paint finish
Acrylic

Dust Cover

Free-setting, detachable

Hinges

Large double-type insulators, with adjustable height

Acoustic insulators

Dimensions (W x H x D)

470 x 163 x 378 mm
(18-1/2" x 6-1/16" x 14-7/8")

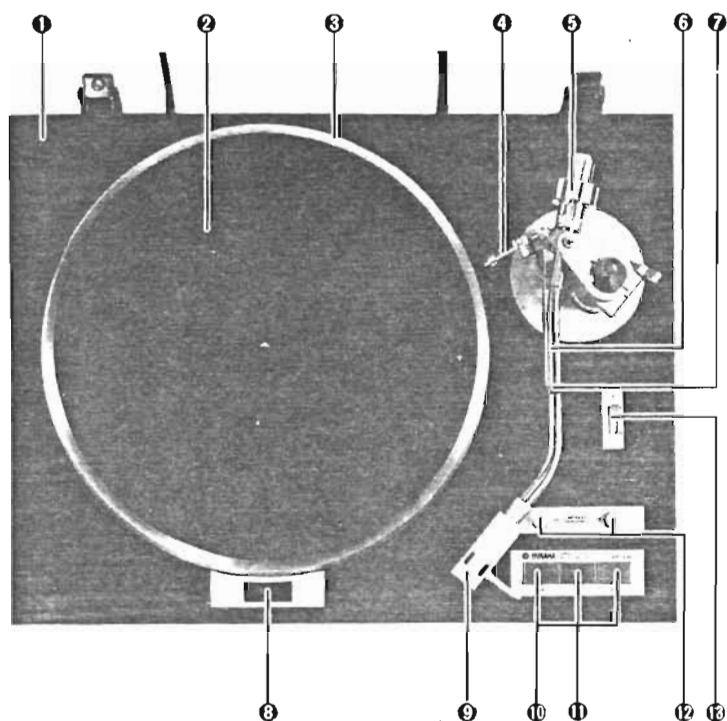
Weight

15 kg (33 lbs 1 oz)

Specifications subject to change without notice.

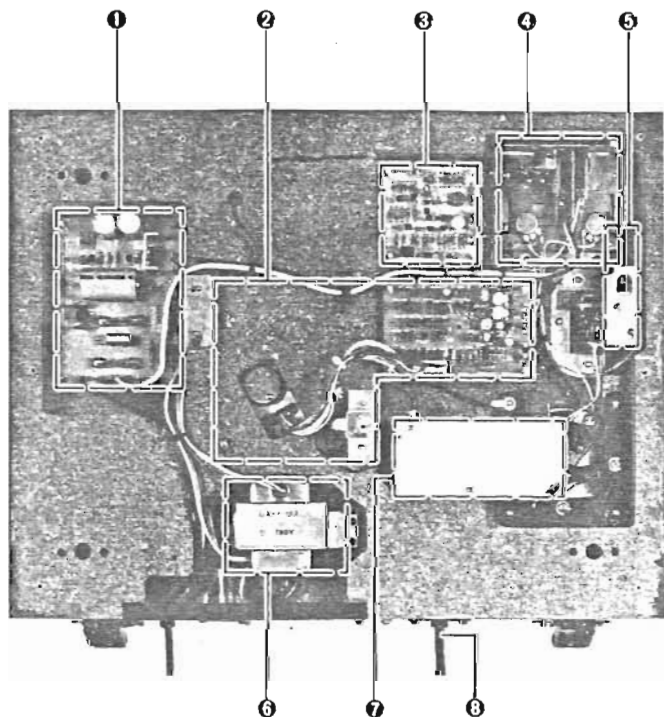
INTERNAL VIEW

TOP VIEW



- ① Cabinet
- ② Rubber Mat
- ③ Turntable Platter
- ④ Inside Force Canceler
- ⑤ Main Weight
- ⑥ Tone Arm
- ⑦ Arm Rest
- ⑧ Storobo Scope
- ⑨ Head Shell
- ⑩ Speed Selector Switches
- ⑪ OFF/Stop Switch
- ⑫ Speed Control Knobs
- ⑬ Cueing Lever

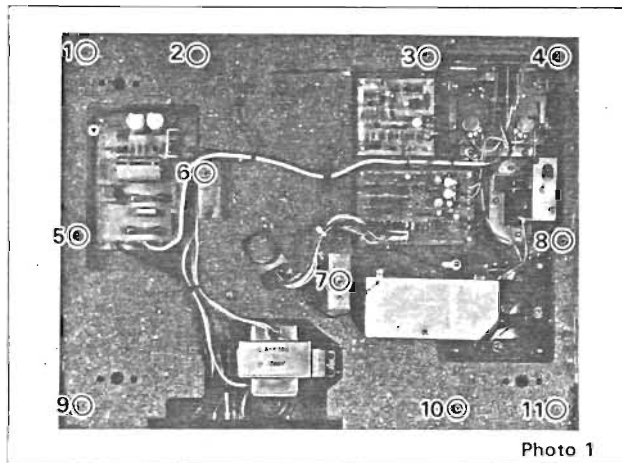
BOTTOM VIEW



- ① Power Supply Circuit Board
- ② Motor Assembly & Motor Servo Circuit Board
- ③ Auto Up Circuit Board
- ④ Speed Control Assembly
- ⑤ Solenoid Plunger
- ⑥ Power Transformer
- ⑦ Shield Plate
- ⑧ AC Cord

DISASSEMBLY PROCEDURES

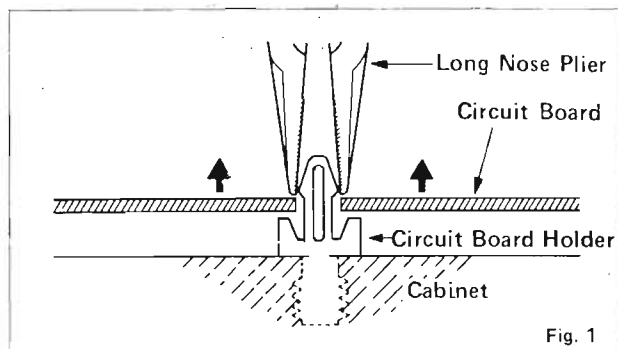
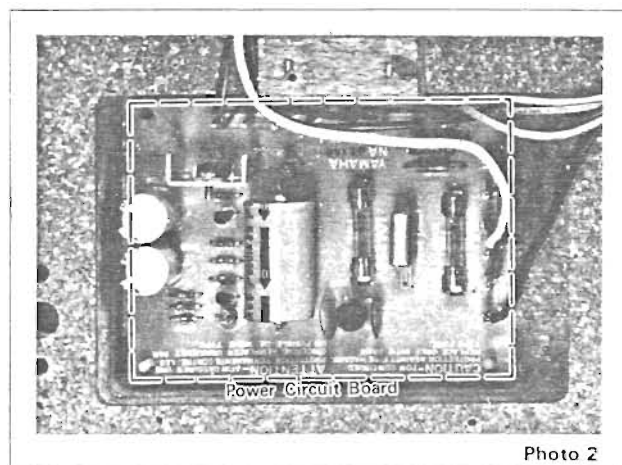
Before disassembling the unit, remove the platter and headshell with cartridge, and securely tie the arm to the arm rest with string, etc. Then, gently turn the unit upsidedown and place it on books, etc. piled up on both sides to protect the arm and cabinet from damage.



1. Power Supply Circuit Board Removal

(shown in photo 2)

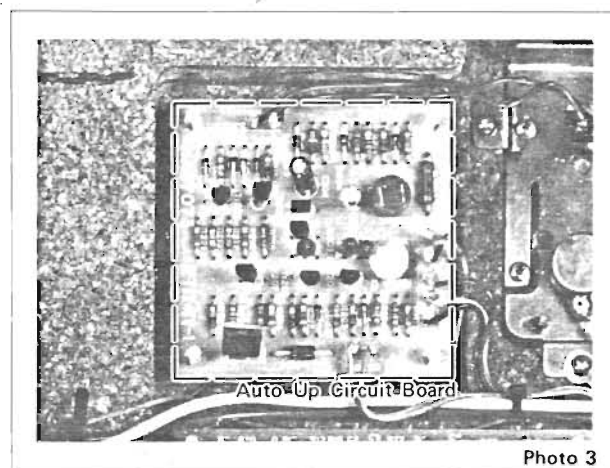
- Remove screws 1 to 11 as shown in photo 1, then remove the bottom cover.
- Pinch the hooked end of Circuit Board Holders on each corner of Power Supply Circuit Board by means of Long Nose Plier and gently lift the corner to remove the Power Supply Circuit Board, as shown in Figure 1.



2. Auto Up Circuit Board Removal

(shown in photo 3)

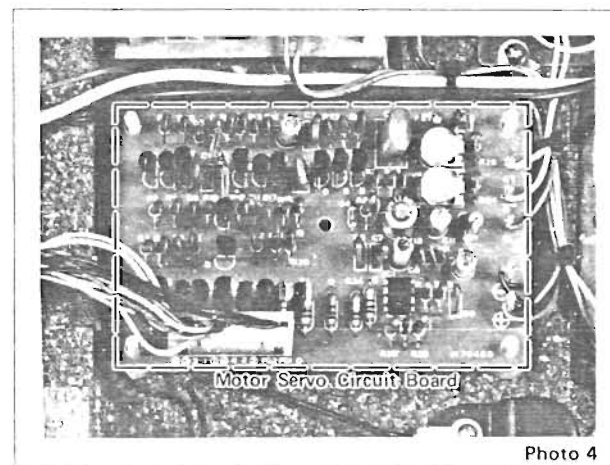
- Remove the bottom cover. (Refer to Step 1.)
- Remove the Auto Up Circuit Board. (Refer to Step 1.)



3. Motor Servo Circuit Board Removal

(shown in photo 4)

- Remove the bottom cover. (Refer to Step 1.)
- Remove the Motor Servo Circuit Board. (Refer to Step 1.)



4. Power Transformer Removal

(shown in photo 5)

- Remove the bottom cover. (Refer to Step 1.)
- Remove the screws 1 to 4 and lead wire in photo 5, and take them out.

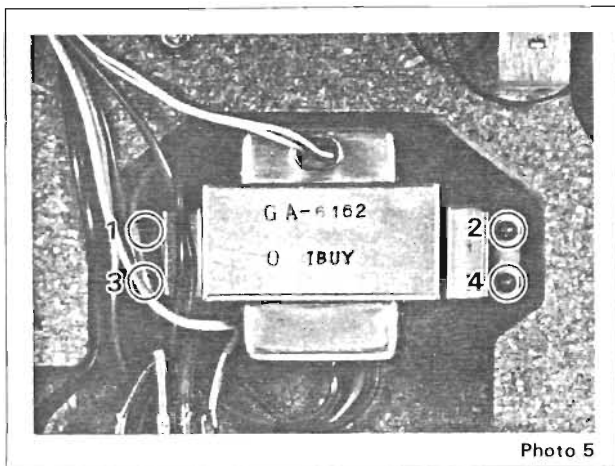


Photo 5

5. Switch Assembly Removal

(shown in photo 6)

- Remove the bottom cover. (Refer to Step 1.)
- Pull out the two speed control knobs on the upper surface of the cabinet.
- Remove screws 1 to 4, then the Switch Assembly can be removed.

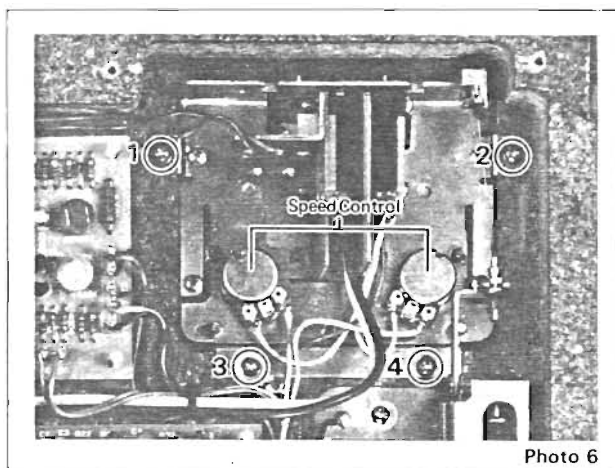


Photo 6

6. Tone Arm Assembly Removal

(shown in photo 7)

- Remove the bottom cover. (Refer to Step 1.)
- Remove the shield plate by unscrewing two screws.

- Remove the six lead wires on DET Circuit Board and lifter wire.
- Remove screws 1 to 3, S-washers and flat washers, all securing the tonearm assembly.

NOTE: When the arm assembly is reattached, re-adjustment of the auto-return position is needed (see "ADJUSTMENTS"). Therefore, do not dismantle the arm assembly unless required.

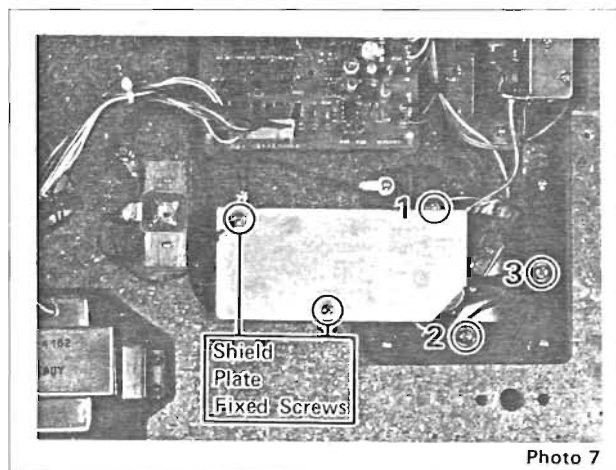


Photo 7

7. Motor Removal

(shown in photo 8)

- Remove the bottom cover. (Refer to Step 1.)
- Remove the motor-shielding board from the Cabinet surface.
- Disconnecting the connector to the motor Servo Circuit Board.
- Remove screws 1 to 3, then motor can be removed.

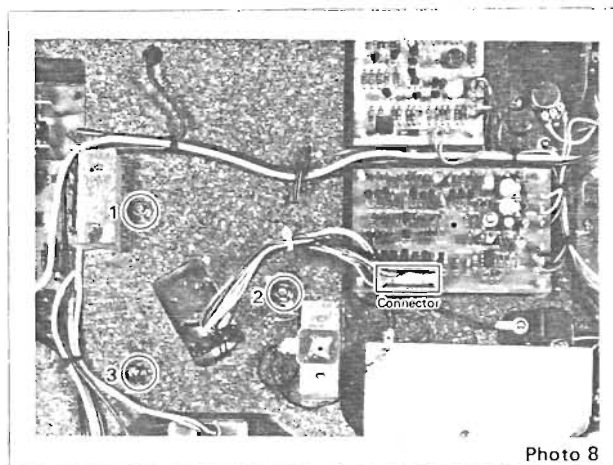


Photo 8

8. Stroboscope Assembly Removal

(shown in photos 9 and 10)

- a. Remove screws 1 and 2, then the Strobo cover can be removed, as shown in photo 9.
- b. Remove screws 1, 2 and 3, then the Strobo case and Neon Lamp can be removed, as shown in photo 10.

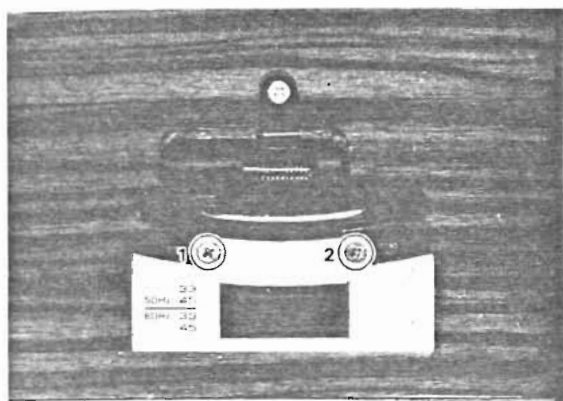


Photo 9

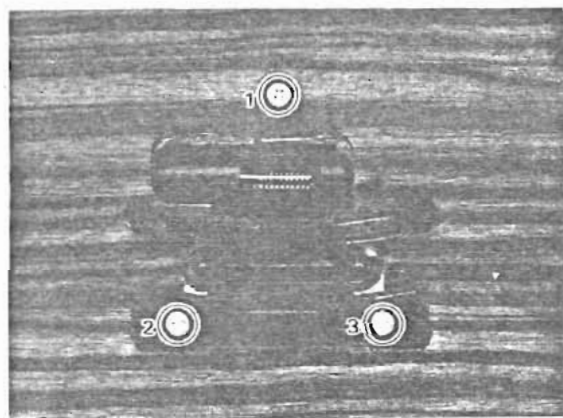


Photo 10

1. Circuit Board Adjustments

■ Motor Servo Circuit Board (r.p.m. adjustment)

The semi-fixed variable resistors VR1 and VR2 provided on the motor servo circuit board are controls for adjusting the motor's rotational speed, VR1 being for 33-1/3 r.p.m. and VR2 for 45 r.p.m. Since they have been perfectly adjusted prior to delivery, they are not to be moved, because it will deteriorate the various characteristics, making normal operations difficult at times. However, when the rotational speed cannot be controlled by means of the speed controls located on the upper surface of the body alone, VR1 and VR2 are to be adjusted in the range shown below.

For 33 r.p.m.: $33-1/3 \pm 3\%$ (± 1) r.p.m., or more

For 45 r.p.m.: $45 \pm 3\%$ (± 1.35) r.p.m., or more

By the slip type count method, adjustment is possible in the following range.

For 33 r.p.m.: (2,060~1,940) or more,

Center (2,000) or more.

For 45 r.p.m.: (2,780~2,619) or more,

Center (2,700) or more.

The procedure is as follows. First set the speed controls "33" and "45" on the upper surface of the body to the center of the variable range. Then, adjust VR2 and VR1 in that order so as to make the specified stroboscope stop at the respective rotational speed. Adjust again, using the speed controls.

■ Auto Up Circuit Board (auto up adjustment)

VR201 : CdS bias voltage adjustment

Connect a DC voltmeter (with input impedance of not less than 100k Ω) between CdS and + terminals on the Auto Up Circuit Board. And turn on the SPEED SELECTOR switch (33/45). (The arm is positioned on the arm rest.)

Fully turn VR201 clockwise, then turn it back counter-clockwise until the voltmeter reads $10 \pm 0.2V$.

VR202 : Up point adjustment

After adjusting the mechanism, adjust VR202 while monitoring the output when the test record ES-1008 (NEC) is played.

1. Adjusting the return point (3mm pitch grooves on the first side of the test record.)

Fully turn VR202 clockwise, then descend the

cartridge onto the outside (count of 10 or less) of the 3mm pitch grooves of the test record. After that, turn VR202 counter-clockwise so that the arm automatically ascends at count of 15 to 21. If this adjustment cannot be achieved at one time, repeat it for complete adjustment.

2. Confirming the non-action of the arm (1mm pitch grooves on the second side of the test record).

Confirm that the arm does not automatically ascend at count of 21 or more after the cartridge is lowered on the outside (count of 10 or less) of the 1mm pitch grooves of the test record.

If the arm automatically ascends, make readjustment according to Item "Adjusting the return point".

2. Mechanism Adjustment

(Positioning of the sub-arm assembly)

When the sub-arm assembly is removed for replacement of the arm, etc., the following adjustment will be required thereafter.

Rough adjustment (Attaching the sub-arm assembly)

With the tonearm locked on the arm rest, tighten the set screws so that the distance between the lamp holder and sub-arm is 22 mm, as illustrated below.

Here, previously set the sub-arm near the center of the adjustable range by means of the fine adjustment screw. Tighten the set screw 1 first and tighten the set screw 2 after turning the sub-arm A clockwise, using a hexagonal wrench for M3 (1.5 mm dia.)

Fine adjustment (Setting the end grooves position)

This fine adjustment is made while monitoring the voltage between CdS and + terminals on the Auto Up Circuit Board.

After setting VR201 (see "Circuit Board Adjustment"), move the tonearm so that stylus tip is positioned at a distance of 53.2 mm from the center shaft. (That is, the final groove on a template attached. Then, after having fully turned the fine adjustment screw for sub-arm assembly clockwise, rotate it counter-clockwise so that the voltage between CdS and + terminals becomes $5.0 \pm 0.1V$. Use a voltmeter with input impedance of 100 k Ω or more.)

Non-contact Photo-electric Detection Auto Stop

The YP-D8 employs a photo-electric detection auto stop mechanism that detects the end groove of the record, lifts the arm and simultaneously turns off the power.

In the end groove detection mechanism, a shutter interlocked with the arm is inserted between LED and CdS. This shutter serves to block light between LED and CdS. At this time, the speed of the shutter is detected to actuate electric circuits which operate the cueing lever through a solenoid plunger.

Thus, this non-contact photo-electric detection system poses no load to the arm and has no adverse effect on tracking ability. Shown below is block diagram of the non-contact photo-electric detection system.

[Start]

When the switch 33 or 45 is pressed, a micro-switch turns on the primary side of the power transformer, and current flows to the circuits.

When the power supply circuit is turned on, current momentarily flows into C204 On the Auto Up Circuit Board to actuate a flip-flop circuit which holds TR206 in ON condition and TR205 in OFF condition.

[Detection Circuit]

When the stylus tip approaches the end of the record, the shutter interlocked with the arm (sub-arm) inserts between LED and CdS to change the amount of light which is radiated to CdS. Therefore, the resistance value of CdS increases. When the stylus tip traces the inside grooves with rough pitches (4 to 9 mm : JIS) after the end of play, the resistance of CdS changes rapidly. The resistance of CdS determines the base voltage of TR201, changes in the resistance appear at the

emitter of TR201 (Emitter follower) and are transmitted to the gate of FET201 through C202. C202 and R206 constitute a differentiation circuit. This means the higher the change speed, the shorter the rising time and the higher the trigger wave height. Thus, the end of the record can be detected by means of the inside rough pitch grooves.

[Discriminating Circuit]

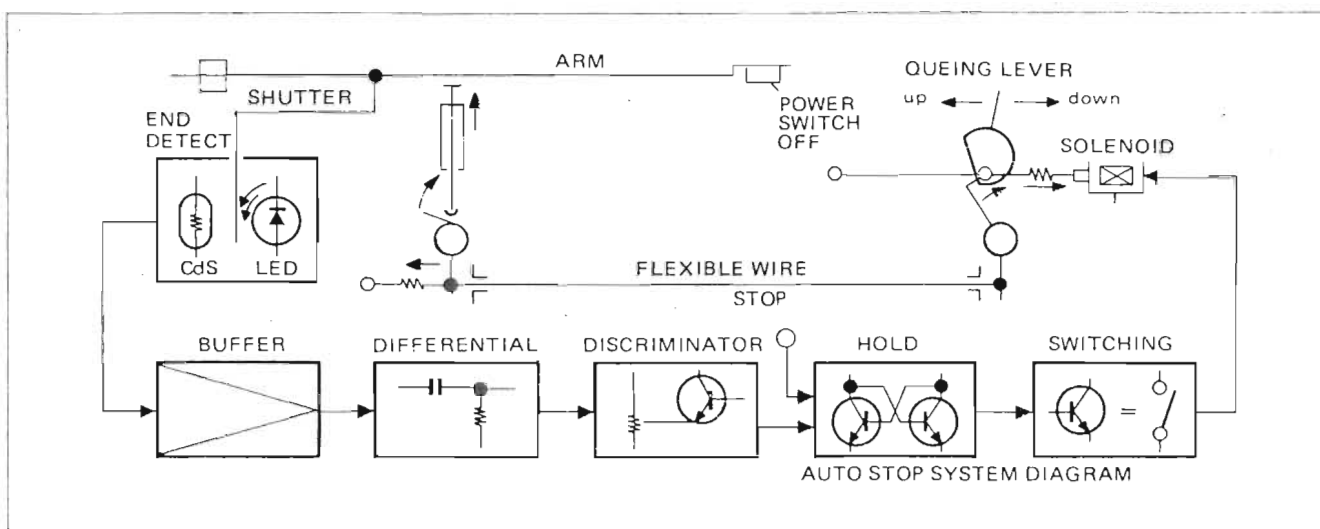
VR202 (see Item "ADJUSTMENT") delivers the bias voltage to the emitter of TR203 to discriminate whether the waveform of currents from the detection circuit is caused by rough pitch grooves or not. This discriminating circuit actuates when groove pitch is 3 mm or more, and prevents erroneous operation due to eccentricity of the record (loose fit between the center shaft and record hole). Only the waveform above the Zener voltage of the inverse-connected D205 can pass the discriminating circuit.

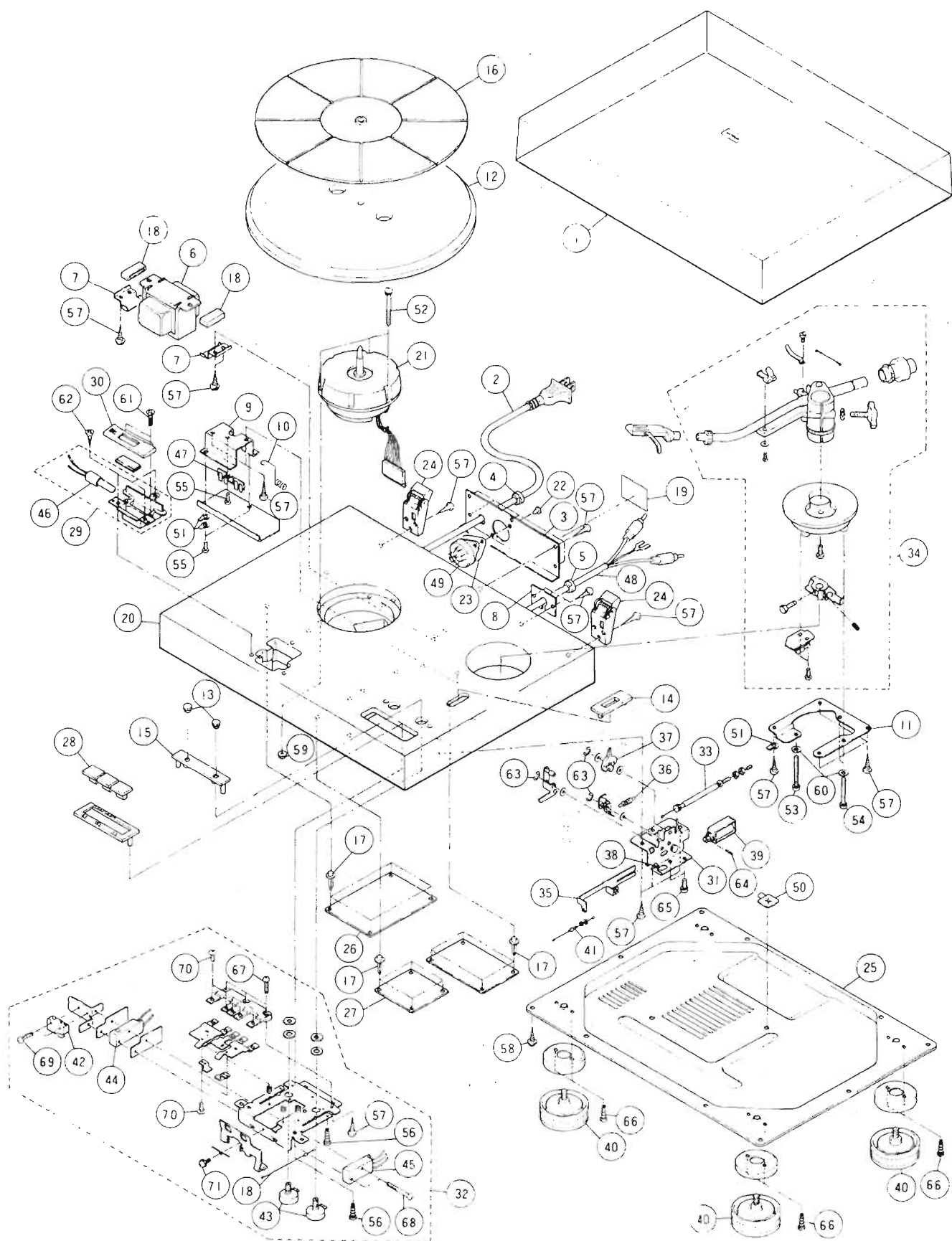
[Hold Circuit]

This hold circuit holds TR206 in ON condition and TR205 in OFF condition when the power is turned on. When the pulse that passes D205 is transmitted to the base of TR205, the hold circuit is inverted.

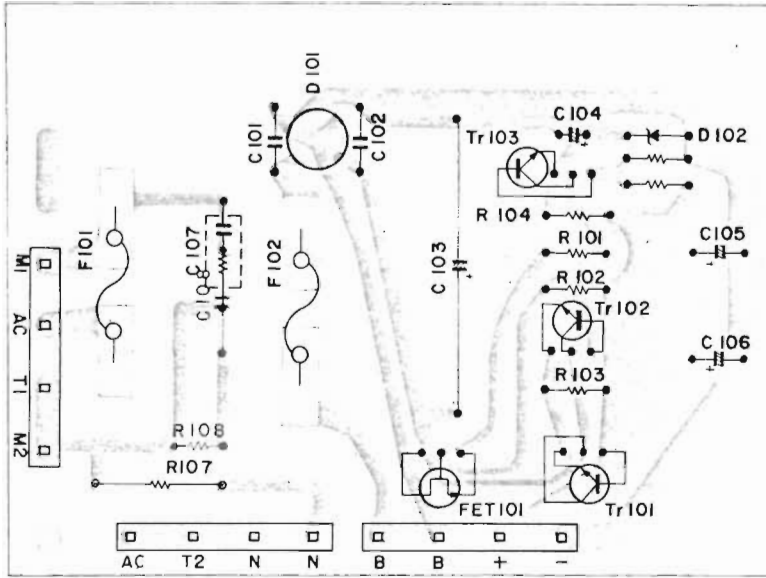
[Switching Circuit]

At the moment when TR206 is turned off, the rising portion of the voltage passes through D209, which turns on TR207 and TR208. As a result, the solenoid plunger is actuated to operate the cueing lever. Thus lifting of the arm is completed and turns off the power switch interlocked with the solenoid plunger. Now the circuitry is completely shut off. (Refer to the attached schematic diagram.)

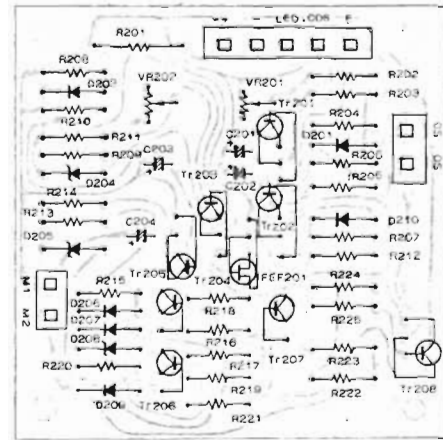




Power Supply Circuit Board



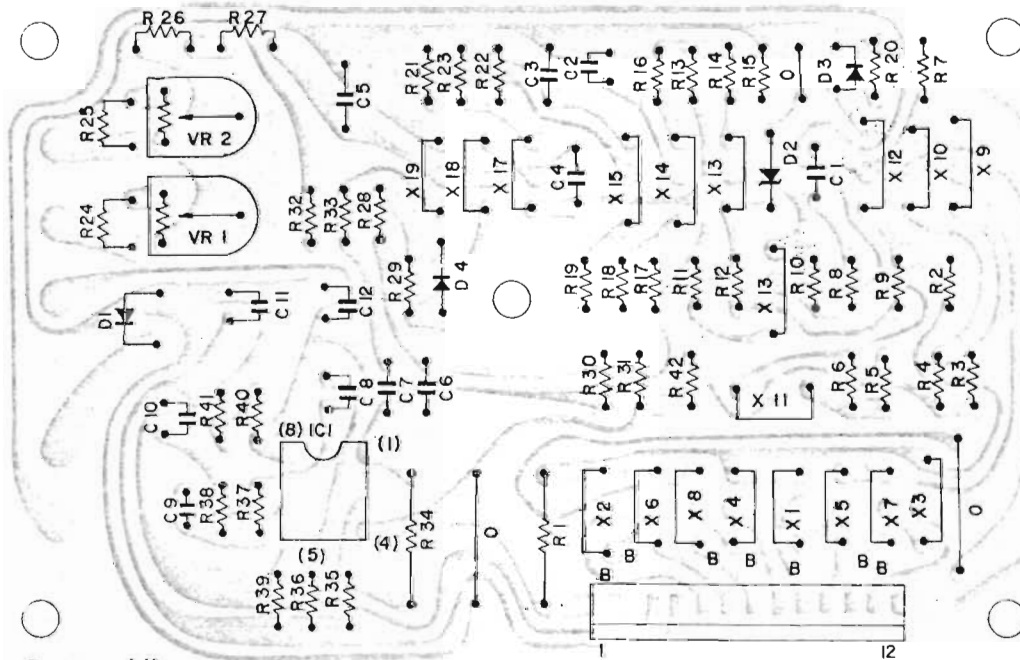
Auto Up Circuit Board



Bottom View

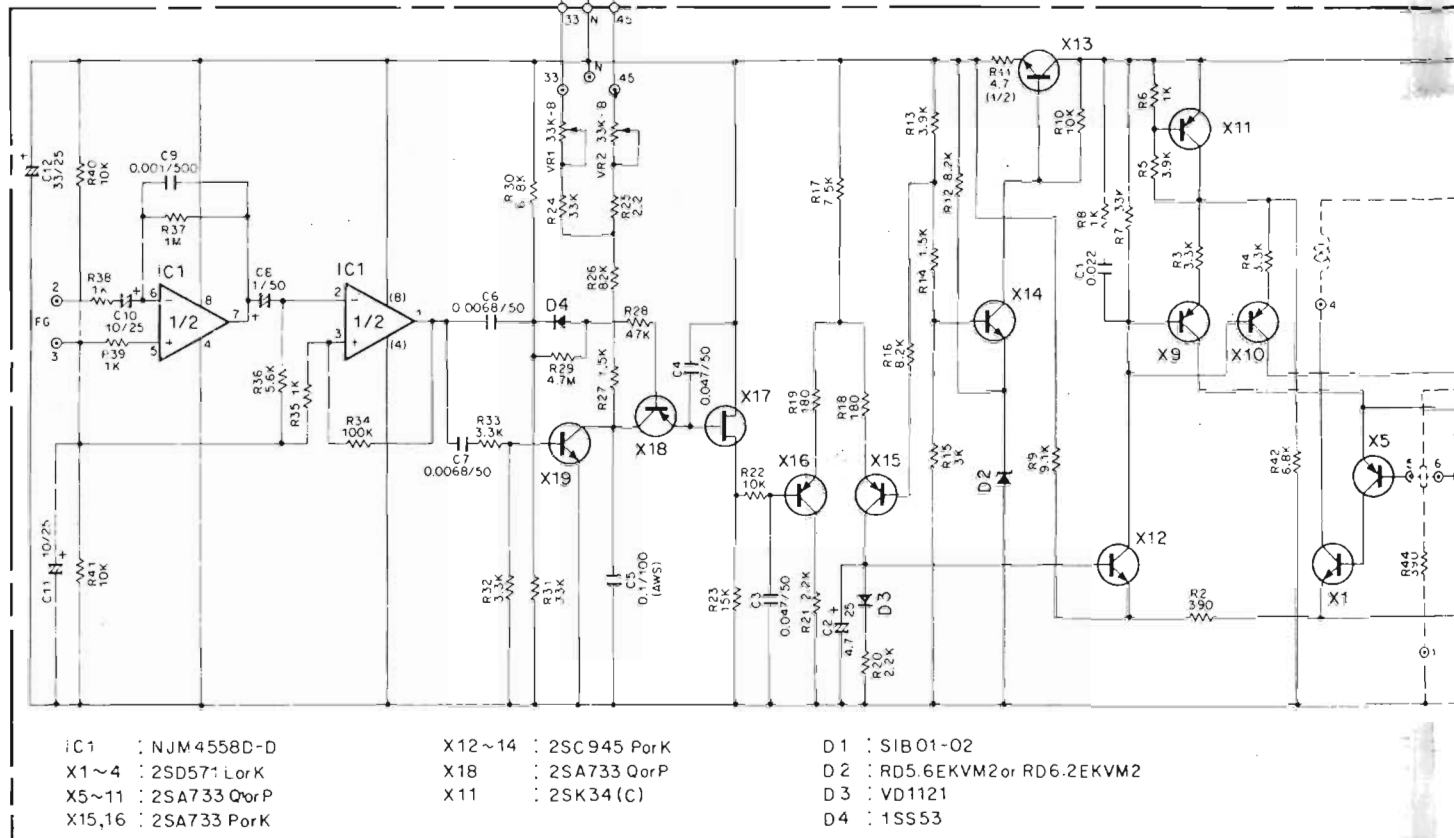
Auto Up Circuit Board Adjustments
 VR201: Cds bias voltage adjustment
 VR202: Up point adjustment

Motor Servo Circuit Board



Bottom View

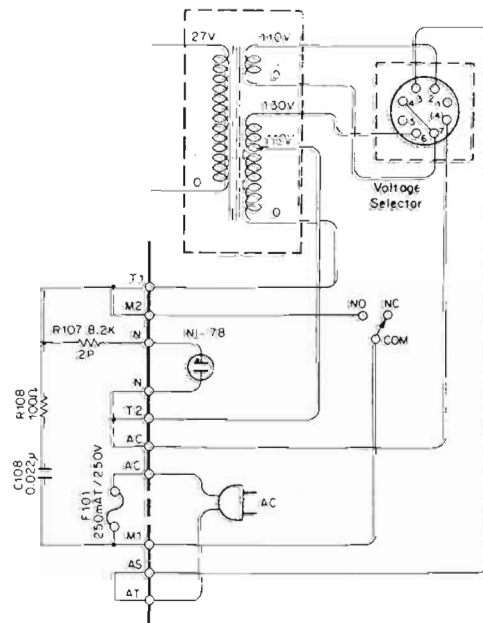
MOTOR C. BOARD

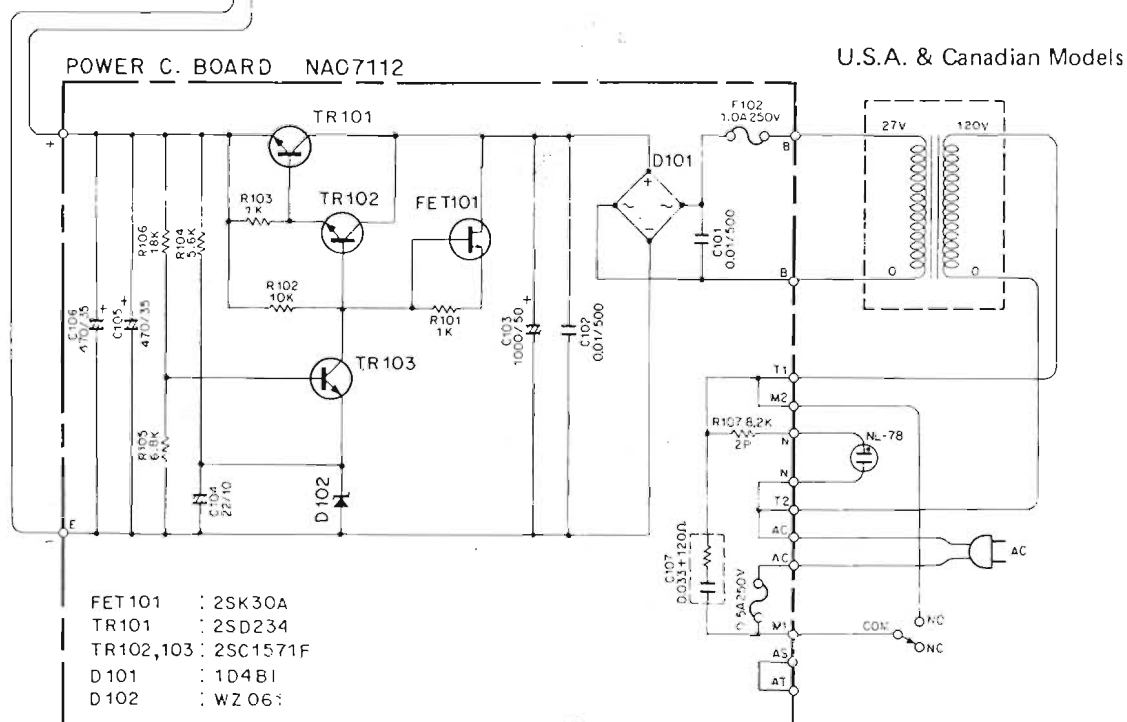
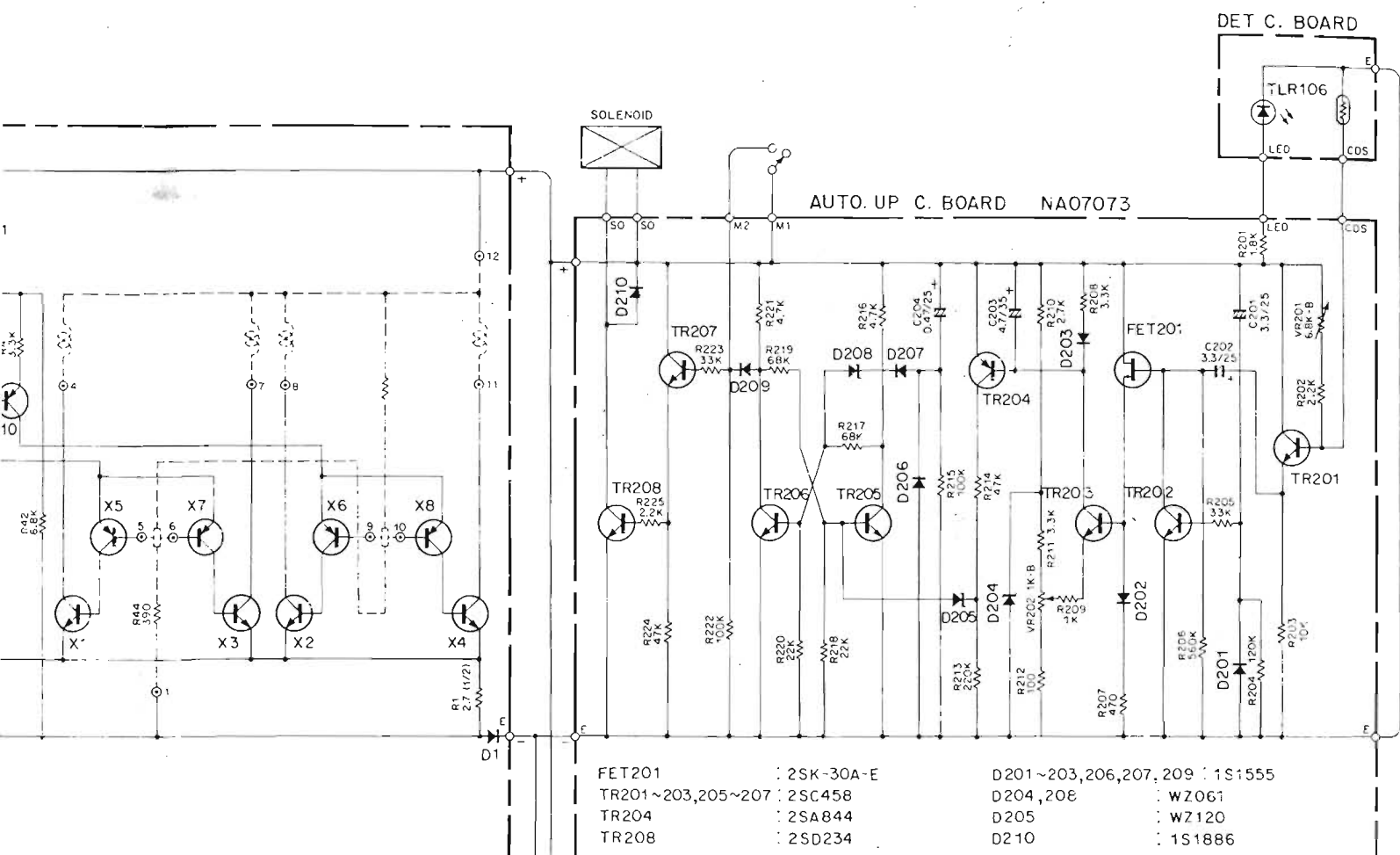


General Export Model

RESISTOR	
SYMBOL	PARTS NAME
	FUSE RESISTOR
	METALIZED OXIDE RESISTOR
	CEMENT RESISTOR
NO MARK	CARBON RESISTOR
	CEMENT MOLDED RESISTOR
	METALIZED FILM RESISTOR

CAPACITOR	
SYMBOL	PARTS NAME
	MYLAR CAPACITOR
NO MARK	CERAMIC CAPACITOR
	POLYSTYRENE CAPACITOR
NO MARK	BIPOLAR ELECTROLYTIC CAPACITOR
	LOW-NOISE ELECTROLYTIC CAPACITOR
	TANTALUM CAPACITOR





PARTS LIST

Ref. No.	Part No.	Description	Markets	Remarks
1	32:00:00 NB:08:34:00	Top Cover		
2	42:00:00 MG:00:02:90	AC Cord 412	G	
	42:00:00 MG:00:40	— do. — UL. CSA	R. U. C	*
3	32:00:00 AA:09:27:30	Rear Panel (G)	G	*
	32:00:00 AA:09:27:20	— do. — (R)	R	*
4	42:00:00 CB:06:86:30	Cord Stopper	R. U. C	
5	42:00:00 CB:07:27:50	— do. — SR-4N-4	R. U. G. C	
6	42:00:00 GA:61:61:00	Power Transformer	U. C	*
	42:00:00 GA:61:62:00	— do. —	R. G	*
7	32:00:00 AA:08:40:80	Transformer Fixing Metal		
8	32:00:00 AA:08:11:70	Cord Holder PU Cord		
	32:00:00 AA:09:11:20	— do. —	U. C	
9	32:00:00 AA:08:77:60	Shield Cover		
10	32:00:00 AA:08:90:30	Cord Hook		
11	32:00:00 AA:08:72:40	Arm Fixing Board		
12	32:00:00 BA:07:33:40	Turntable Platter		
13	32:00:00 BA:06:94:40	Speed Control Knob		
14	32:00:00 CB:08:60:00	Queing Make Up Plate		*
15	32:00:00 CB:07:85:70	Volume Plate		
16	32:00:00 CB:08:30:30	Rubber Mat	U	
	32:00:00 CB:08:03:80	— do. —	R. G. C	
17	32:00:00 CB:01:09:80	Spacer		
18	32:00:00 CB:08:24:60	Cushion Transformer		
19	42:00:00 CB:07:15:40	Label		
20	32:00:76 25:62:00:10	Cabinet (U)	U. C	*
	32:00:76 25:62:01:10	— do. — (G)	R. G	*
21	42:00:00 JC:00:04:10	Motor Mc-9358		*
22	32:00:00 CB:06:88:80	Plastic Rivet.	R. G	
23	32:00:00 CB:07:64:00	Vs Insulation Plate	R. G	
24	32:00:00 NB:08:23:50	Auto Hinge Assembly		
25	32:00:00 NB:08:54:90	Bottom Cover A	U	*
	32:00:00 NB:08:55:00	— do. —	R. G. C	*
26	32:00:00 NA:07:11:20	Power C. Board Assembly	R. G	*
	32:00:00 NA:07:11:30	— do. —	U. C	*
27	32:00:00 NA:07:07:30	Auto UP C. Board Assembly		*
	32:00:00 MZ:07:31:40	Voltage Selector Assembly	R. G	*
28	32:00:00 NB:08:55:60	Switch Button Assembly		*
29	32:00:00 NB:08:55:50	Strobo Assembly		*
30	32:00:00 NB:08:55:40	Make-Up Plate Strobo Assembly		*
31	32:00:00 NB:08:55:30	Queing Base Assembly		*
32	32:00:00 NB:08:56:00	Switch Assembly	U. C. R	*
	32:00:00 NB:08:55:90	— do. —	G	*
	42:00:00 MZ:07:31:60	PJ Cord Assembly	U	*
	42:00:00 MZ:07:31:50	— do. —	R. G. C	*
33	32:00:00 PB:06:08:00	Queing Wire		*
34	32:00:00 SS:06:01:60	Tone Arm Unit YA-22		*
35	32:00:00 AA:09:20:70	Solenoid Arm		*
36	32:00:00 AA:09:27:50	Lever Spring		*
37	32:00:00 BA:07:33:50	Lever A		*
38	32:00:00 CB:08:60:20	Rubber Cushion		*
39	42:00:00 JF:00:00:50	Solenoid		
40	32:00:00 NB:08:23:30	Insulator Assembly	R. G. C	
	32:00:00 NB:08:29:80	— do. —	U	

• NEW PARTS

Ref. No.	Part No.	Description	Markets	Remarks
41	32:00:00 PB 06:08:10	Stop Wire		•
42	42:00:00 KA 60:02:30	Micro Switch (Stop sw) AH2424		
43	42:00:00 HS 11:02:40	Volume V16L 4N25KC B-10KΩ		•
44	42:00:00 KA 60:01:30	Micro Switch (Power sw) AM47009	R. U. C	
	42:00:00 KA 60:01:80	— do. — XGC-53		
45	42:00:00 KA 60:01:90	— do. — (Selector) AM4100		
46	42:00:00 JB 00:06:90	Neon Lamp	C	•
	42:00:00 JB 00:06:50	— do. —	R. U. G	•
47	42:00:00 LA 00:01:10	4PIL Lug Plate		
48	42:00:00 Mi 06:65:70	PU Cord	U	•
	42:00:00 Mi 06:65:60	— do. —	R. G. C	•
49	42:00:00 LB 20:02:50	Voltage Selector	R.G	
50	32:00:00 BB 06:59:10	Earth Metal		
51	42:00:00 LA 00:02:90	Earth Lug φ4		
52	42:00:00 EH 04:06:00	Cums Screw M4 X 60 ZMC2-Y		
53	42:00:00 EH 04:03:50	— do. — M4 X 35 — do. —		
54	42:00:00 EH 04:02:50	— do. — M4 X 25 — do. —		
55	42:00:00 EL 03:00:60	Tap Tight Screw M3 X 6 — do. —		
56	42:00:00 EI 02:60:80	Bind Head Tapping Screw M2.6 X 8 — do. —		
57	42:00:00 EO 33:11:60	Round Head Wood Screw M3.1 X 16 ZMC2-BL		
58	42:00:00 EO 33:11:60	Round Head Wood Screw With Frange M3.1 X 16—do.—		
59	42:00:00 EV 19:04:00	Hexagonal Nut With Frange φ4 M4		
60	42:00:00 EV 41:00:40	Toothed Lock Washer φ4 ZMC2-Y		
61	42:00:00 EO 13:00:80	Flat Head Tapping Screw M3 X 12 FNM3-3G		
62	42:00:00 EP 13:11:30	Flat Head Wood Screw M3.1 X 13 — do. —		
63	42:00:00 EV 50:13:00	E Ring φ3 ZMC2-Y FNM3-3G		
64	42:00:00 EZ 00:08:00	Spring Pin φ2 L=8		
65	42:00:00 EH 02:60:50	Cums Screws With Flat Washer M2.6 X 5 ZMC2-Y		
66	42:00:00 EJ 33:06:00	Pan Head Tapping Screw M3 X 6 ZMC2-BL		
67	42:00:00 EA 03:01:00	Pan Head Screw M3 X 10 ZMC2-Y		
68	42:00:00 EA 03:03:00	— do. — M3 X 30 — do. —		
69	42:00:00 EA 02:31:00	— do. — M2.3 X 10 — do. —		
70	42:00:00 ED 02:60:50	Bind Head Screw M2.6 X 5 — do. —		
71	42:00:00 EH 03:00:40	Serns Screw With Flat Washer M3 X 4 — do. —		
	32:00:00 NA 07:07:30	Auto UP C. Board		
FET201	42:00:00 IE 10:10:00	FET 2SK30 E		
TR201-3	42:00:00 IC 04:59:10	Transister 2SC458 D		
204	42:00:00 IA 08:44:00	— do. — 2SA844		
205-7	42:00:00 IC 04:59:10	— do. — 2SC458 D		
208	42:00:00 ID 02:34:20	— do. — 2SD238 Y		
D201-3	42:00:00 IF 00:00:40	Diode 1SI555		
204	42:00:00 IF 00:03:20	Zener Diode WZ 061		
205	42:00:00 IF 00:02:00	— do. — WZ 120		

• NEW PARTS

Ref. No.	Part No.	Description	Markets	Remarks
D206,7,9	42:00:00:IF:00:00:40	Diode 1S1555		
208	42:00:00:IF:00:03:20	Zener Diode Wz 061		
210	42:00:00:IF:00:02:50	Diode 1S1886		
R201	42:00:00:HL:31:61:80	Metal Oxide Film Resistor 1P 18K		
202	42:00:00:HK:35:62:20	Carbon Resistor 2.2K		
203	42:00:00:HK:35:71:00	- do. - 10K		
204	42:00:00:HK:35:81:20	- do. - 120K		
205	42:00:00:HK:35:73:30	- do. - 33K		
206	42:00:00:HK:35:85:60	- do. - 560K		
207	42:00:00:HK:35:54:70	- do. - 470K		
208	42:00:00:HK:35:63:30	- do. - 3.3K		
209	42:00:00:HK:35:61:00	- do. - 1K		
210	42:00:00:HK:35:62:70	- do. - 2.7K		
211	42:00:00:HU:57:63:30	Metal Film Resistor 3.3K		
212	42:00:00:HK:35:51:00	- do. - 100K		
213	42:00:00:HK:35:82:20	- do. - 220K		
214	42:00:00:HK:35:74:70	- do. - 47K		
215	42:00:00:HK:35:81:00	- do. - 100K		
216	42:00:00:HK:35:64:70	- do. - 4.7K		
217	42:00:00:HK:35:76:80	- do. - 68K		
218	42:00:00:HK:35:72:20	- do. - 22K		
219	42:00:00:HK:35:76:80	- do. - 68K		
220	42:00:00:HK:35:72:20	- do. - 22K		
221	42:00:00:HK:35:64:70	- do. - 4.7K		
222	42:00:00:HK:35:81:00	- do. - 100K		
223	42:00:00:HK:35:73:30	- do. - 33K		
224	42:00:00:HK:35:74:70	- do. - 47K		
225	42:00:00:HK:35:62:20	- do. - 2.2K		
C201,2	42:00:00:FP:14:63:30	Tantalum Capacitor 3.3 μ F 25V		
203	42:00:00:FJ:15:64:70	Electrolytic Capacitor 4.7 μ F 35V		
204	42:00:00:FJ:24:54:70	- do. - 0.47 μ F 25V		
VR201	42:00:00:HT:41:06:70	Variable Resistor (Solide) B-6.8K		
202	42:00:00:HY:00:01:90	- do. - (Metal Grazed) B-1K		
	42:00:00:LA:00:20:40	Lapping Pin Type 5P P = 5		
	42:00:00:LA:00:21:10	- do. - 2P P = 2		
	32:00:00:NA:07:11:20	Power Supply C. Board	U. C	
	32:00:00:NA:07:11:30	- do. -	R. G	
FET101	42:00:00:IE:00:00:20	FET 2SK30A GR		
TR101	42:00:00:ID:02:34:00	Transistor 2SD234		
102,103	42:00:00:IC:15:71:40	- do. - 2SC1571 FG		
D101	42:00:00:IH:00:04:70	Diode 1D4B1		
102	42:00:00:IH:00:03:20	Zener Diode WZ 061		
R101,103	42:00:00:HK:35:61:00	Carbon Resistor 1K		
102	42:00:00:HK:35:71:00	- do. - 10K		
104	42:00:00:HK:35:65:60	- do. - 5.6K		
105	42:00:00:HK:35:66:80	- do. - 6.8K		
106	42:00:00:HK:35:71:80	- do. - 1.8K		
107	42:00:00:HL:62:68:20	Metal Oxide Film Resistor 2P 8.2K		

[illegible]