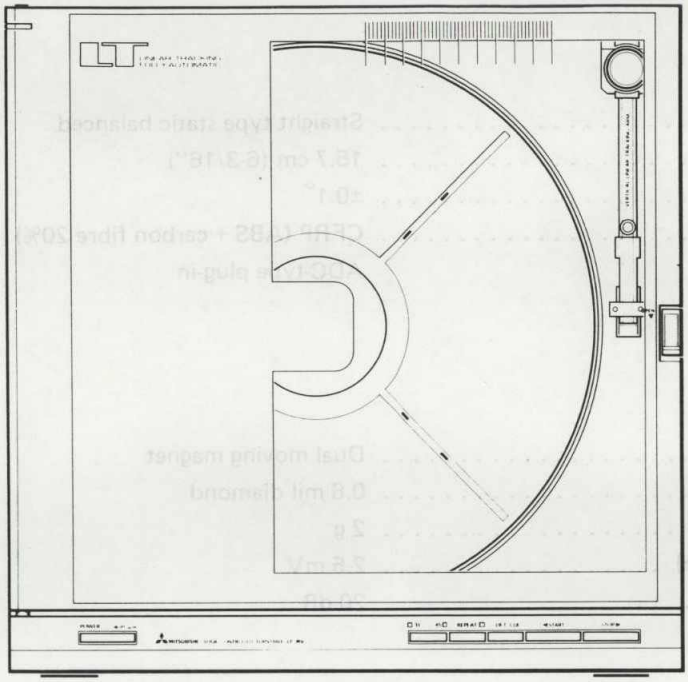
MITSUBISHI AUDIO SYSTEMS

SERVICE MANUAL

TURNTABLE

MODEL LT-15V



CONTENTS

MITSUBISHI ELECTRIC CORPORATION

SPECIFICATIONS

PHONO MOTOR SECTION

Drive mechanism	Belt drive
Motor	DC servo motor
Platter Diameter	30 cm (12")
Weight	1.0 kg (2.2 lbs)
Platter speed	33-1/3, 45 r.p.m.
Platter speed selection	Automatic/Manual
Wow and flutter	±0.055 % (Wrms)
Signal to noise ratio	73 dB (DIN-B)

TONEARM SECTION

Type	Straight type static balanced
Effective length	15.7 cm (6-3/16")
Tracking error	±0.1°
Headshell	CFRP (ABS + carbon fibre 20%) ADC-type plug-in

CARTRIDGE SECTION

Type	Dual moving magnet
Stylus	0.6 mil diamond
Recommended tracking force	2 g
Output level (1 kHz, 5 cm/sec)	2.5 mV
Channel separation (1 kHz)	20 dB

GENERAL

Power consumption	11 W
Dimensions (W x H x D)	355 x 355 x 150 mm (14 x 14 x 5-15/16")
Weight	8 kg (17.6 lbs)

Design and specifications are subject to change without notice for improvement.

ADJUSTMENT PROCEDURE

Before adjustment, remove the back lid from main body and place the player horizontally.

1. STYLUS HEIGHT ADJUSTMENT

1) Remove the main turntable belt and the horizontal motor belt. With no record, lift the tone arm base with the finger and move it to the centre of turntable. Press the lever of REST micro switch to put the switch into the ON state. (See Fig. 1)

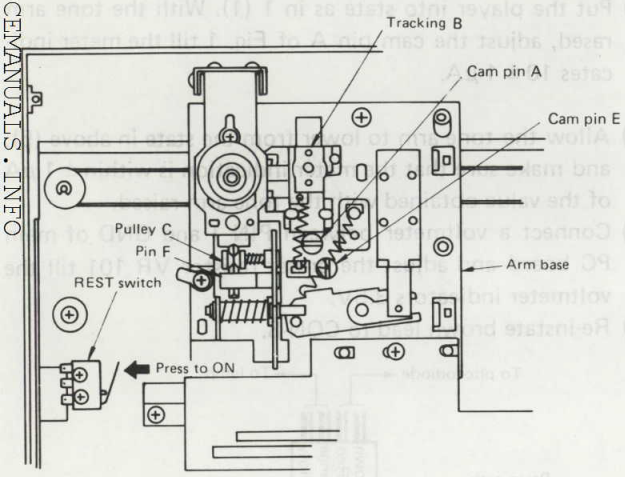


Fig. 1

2) With the tone arm raised, turn the cam pin E to adjust the stylus height such that its tip is 8 ± 1 mm above the turntable. (See Fig. 2)
3) After adjustment, lock the cam pin E with screw-lock and reinstall the belts.

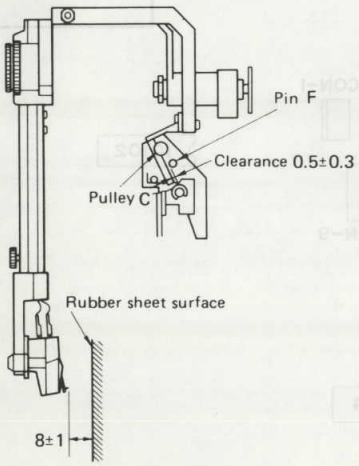


Fig. 2

2. TONE ARM PERPENDICULARITY.

1) Put the player into the state as 1 (1). Hang a plumb line from the top-surface of player. Adjust the stylus pressure weight of tone arm to 0 g. (See Fig. 3)
2) Loosen hexagon screw (1.5mm) locking the main weight. Adjust the main weight until arm is perpendicular. After adjustment, tighten hexagon screw of main weight. Be sure to lock the screw.

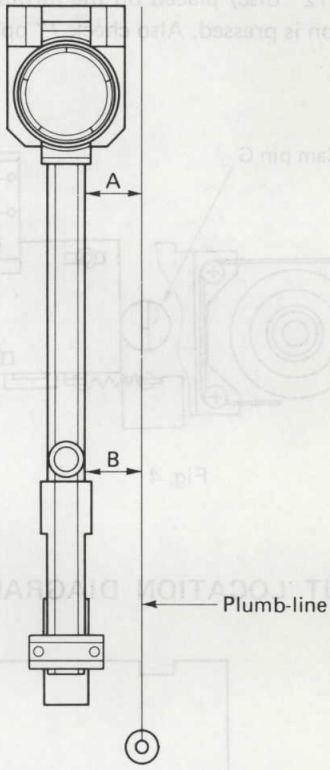


Fig. 3

3. ADJUSTMENT ARM LIFTER

1) Put the player into a state as in 1 (1). Press the LIFT/CUE button to lower the tone arm. Press again the LIFT/CUE button to raise the arm and make sure that the arm rises without tiliting to right or left. If the arm tilts to either right or left, allow the arm to lower and adjust a screw of pulley C (Fig. 1) untill the tone arm rises and lowers without tiliting.

4. ARM LIFT TIMING.

Note: This adjustment should be made with the player detached from the cabinet main body.

1) Put the player into a state of 1 (1). With the tone arm raised, turn the pin F to adjust the clearance between the pulley C and pin F (shown in Fig. 1) to 0.5 ± 0.3 mm.

5. ADJUSTING THE LEAD-IN POSITION

1) Remove the back cover.
2) Adjust the cam pin G (Fig. 5) so that the stylus lowers correctly in the lead in grooves along the periphery of record (a 12" disc) placed on the turntable when the START button is pressed. Also check 7" operation.

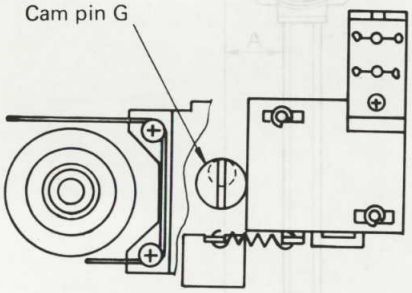


Fig. 4

6. TRACKING SERVO ADJUSTMENT

1) This adjustment should be made after the adjustment of 1 to 3. Disconnect connector CON-8 (4 pin) from the main PC board.
2) The removed connector CON-8 is wired as shown in Fig. 6. Press pin 1 with a standard screwdriver and pull out the brown wire.
3) Insert the connector CON-8 again into the main PC board.
4) Connect the Multimeter as shown in Fig. 6.
5) Put the player into state as in 1 (1). With the tone arm rased, adjust the cam pin A of Fig. 1 till the meter indicates 10 ± 1 μA.
6) Allow the tone arm to lower from the state in above (5), and make sure that the meter indication is within ± 1 μA of the value obtained with the tone arm raised.
7) Connect a voltmeter between PIN 1 and GND of main PC board and adjust the preset resistor VR 101 till the voltmeter indicators 3.5V.
8) Re-instate brown lead to CON-8.

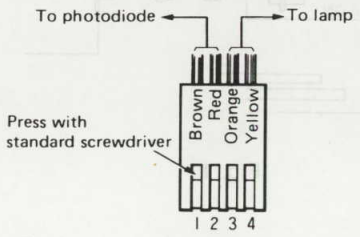


Fig. 5

ADJUSTMENT LOCATION DIAGRAM

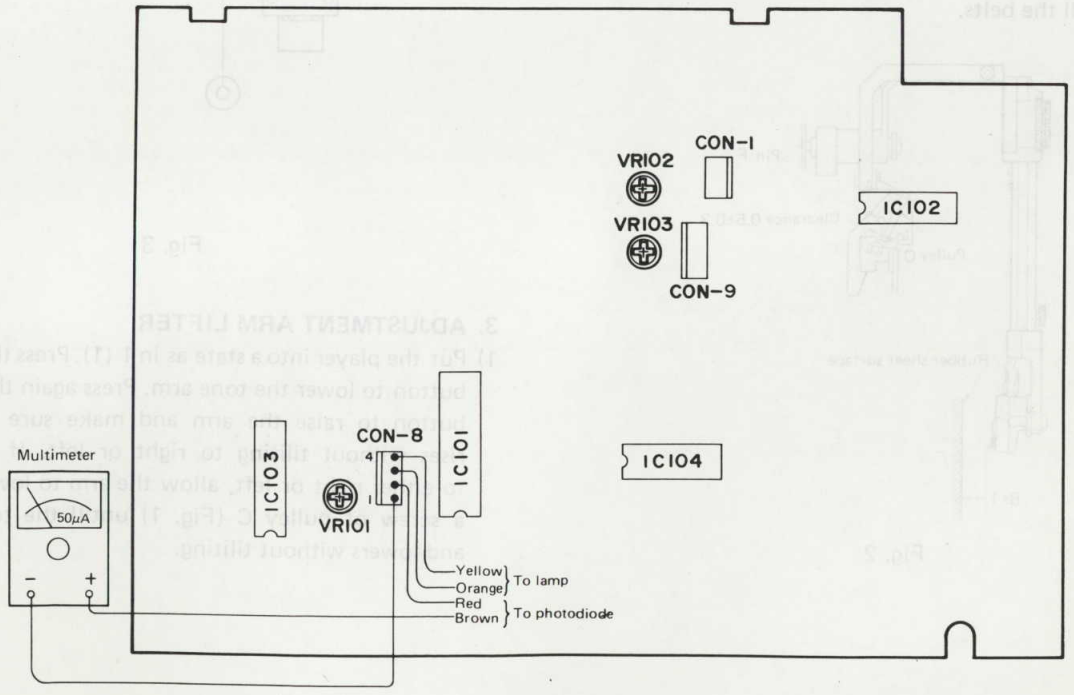


Fig. 6

6. SERVO MOTOR SPEED ADJUSTMENT

1) Place a test record on the turntable and connect a frequency counter to the output terminal of player via an amplifier.
2) Remove the back of player and set the turntable speed to 33 rpm.
3) Play back 3 KHz of test record and adjust the preset resistor VR 103 for 3020Hz.
4) Set the turntable speed to 45 rpm. Play back as in above (3) and adjust the preset resistor VR 102 till the counter indicates 4070Hz.

DISMANTLING

1. DECK REMOVAL

1) Remove turntable fixing nut by using the supplied wrench. To remove nut, turn it clockwise. (See Fig. 7)

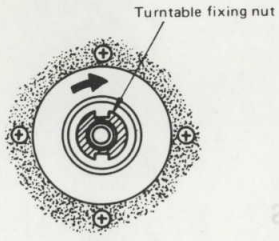


Fig. 7

2) To remove the turntable, re-fit the centre spindle. Steady the spindle, and turn the turntable counterclockwise. (See Fig. 8)

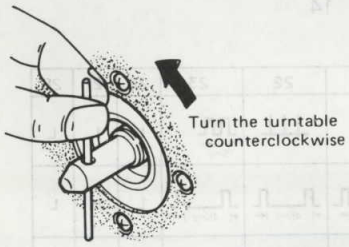


Fig. 8

3) Remove nine set screws (T1-3 x 12) and remove the back. Remove four screws (T1-3 x10) to remove cover (Fig. 9) under red this the turntable. Then hold the base of tone arm and move the tone arm toward the centre shaft.
4) Remove five fixing screws (A) and (B) of player unit shown in Fig. 10. The player unit can then be removed from the cabinet body.

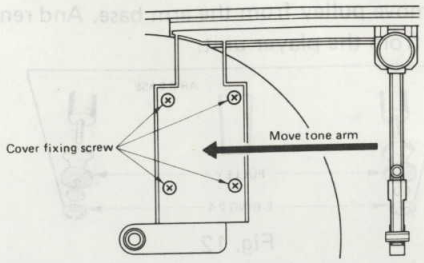


Fig. 9

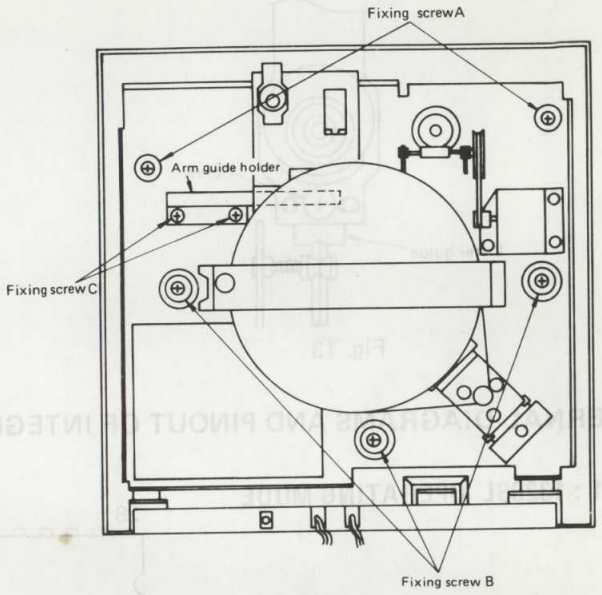


Fig. 10

2. TONE ARM REMOVAL

1) Remove the player unit from the cabinet main body according to the procedure in above 1.
2) Remove the slit plate from the arm base, as shown in Fig. 11.

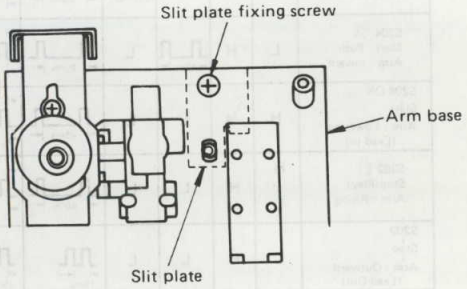


Fig. 11

3) Remove dial thread from the pulley and remove fixing screws (C) in Fig. 10.

4) Remove tow E-rings for mounting pulley on the arm base. Remove pulley from the arm base. And remove the arm base from the player unit.

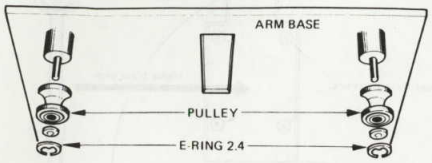


Fig. 12

5) Remove the screw shown in Fig. 13 and remove the lifter guide from the tone arm.

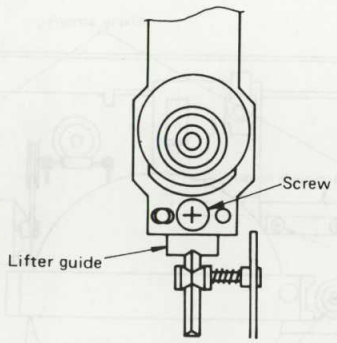


Fig. 13

6) Remove nut fixing the tone arm in Fig. 14 and disassemble the tone arm from the arm base.

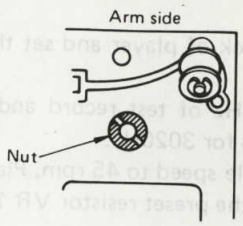
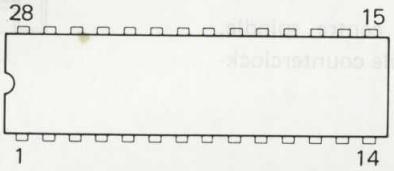


Fig. 14

7) Disconnect the tone arm output lead wires from the main PC board.
8) Replace the tone arm in this condition.
9) When replacing the tone arm, always carry out adjustments.

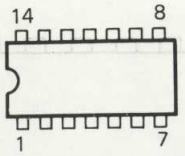
INTERNAL DIAGRAMS AND PINOUT OF INTEGRATED CIRCUITS

IC101 : 1320SL OPERATING MODE



Pin No.	2	3	5	6	7	8	14	15	16	17	21	22	23	26	27	28
Arm Rest Position (Power ON)	L	H	L	L	15ms	14ms	H	L	H	L	15ms		15ms	L	L	L
Disk Side S203 CUE (Arm : Down)	L	H	L	45ms	45ms	10ms 45ms	H	H	H	H	45ms	45ms	45ms	L	H	L
S204 Start : Push Arm : Inward	L	H	45ms	L	45ms	10ms 45ms	L	H	H	L	45ms		45ms	L	H	L
S204 ON Start Arm : Lowering (Lead-In)	H	H	L	L	45ms	10ms 45ms	H	H	H	H		45ms	45ms	L	H	L
S202 Stop(Play) Arm : Rising	H→L	H	L	L	45ms	10ms 45ms	H	H	H	H→L	45ms		45ms	L	H	L
S202 Stop Arm : Outward (Lead-Out)	L	H	L	L	15ms	15ms	H	L	H	L		15ms	15ms	L	H	L
Arm Lift S204 Pushing	L	H	20ms	L	20ms	20ms	L	H	L	L	20ms	20ms	20ms	L	H	L
Arm Lift S202 Pushing	L	H	L	L	20ms	20ms	H	L	L	L	20ms	20ms	20ms	L	H	L
Auto-End Detection	L	H	L	L	10ms 45ms	45ms	H	H	H	H→L		45ms	45ms	L	H	L

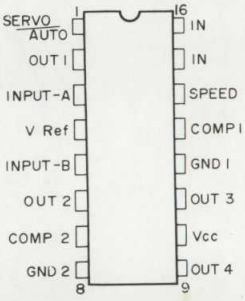
IC102 : TC4081BP OPERATING MODE

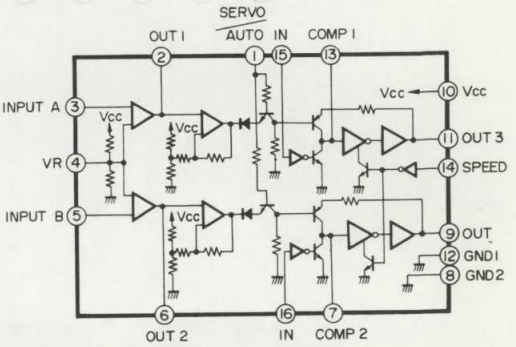


Pin No. / Actual	1	2	3	4	5	6	8	9	10	11	12	13
No Disk S204 ◁	L→H 17 Groove	10ms	10ms	10ms	10ms	L→H	L		L	L		L
30cm Disk S204 ◁ Start	L	45ms	L	45ms	45ms	L→H	H	45ms	45ms	45ms	45ms	H
17cm Disk S204 ◁ Start	H 17 Groove	45ms	45ms	45ms	45ms	L→H	H	45ms	45ms	L	45ms	L

IC103 : MSA-117RS OPERATING MODE

Mode / Pin No.	①	⑨	⑪	⑭	⑮	⑯
LEAD-IN	L	L	H	H	H	L
LEAD-OUT	L	H	L	H	L	H
CUEING (Arm up)	—	—	—	L	—	—
Tracking Servo activiated	H	L	L	H	L	L

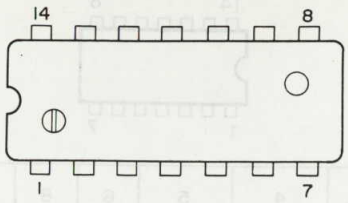


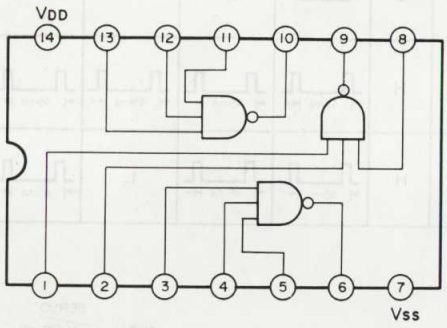


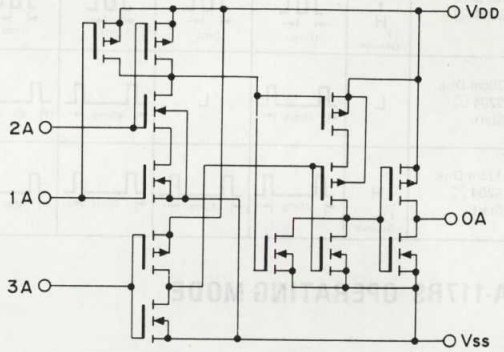
IC104 : TC4081BP OPERATING MODE

Pin No. / Actual	1	2	3	4	5	6	8	9	10	11	12	13
Rest Position (Power ON) Cover : Close	L	15ms	L	L	15ms	L	L	15ms	L	15ms	15ms	H
Rest Position (Power ON) Cover : Open	L	15ms	L	L	15ms	L	H	15ms	15ms	15ms	15ms	H
S203 ▯▯ Cue (Rest Position)	H	45ms	45ms	L	45ms	L	L	45ms	L	45ms	45ms	H
S204 ◁ Start	L	45ms	L	45ms	45ms	H	L	45ms	L	L	45ms	L
S202 ▷ Stop	L	45ms	L	L	45ms	L	H	45ms	45ms	L	45ms	L

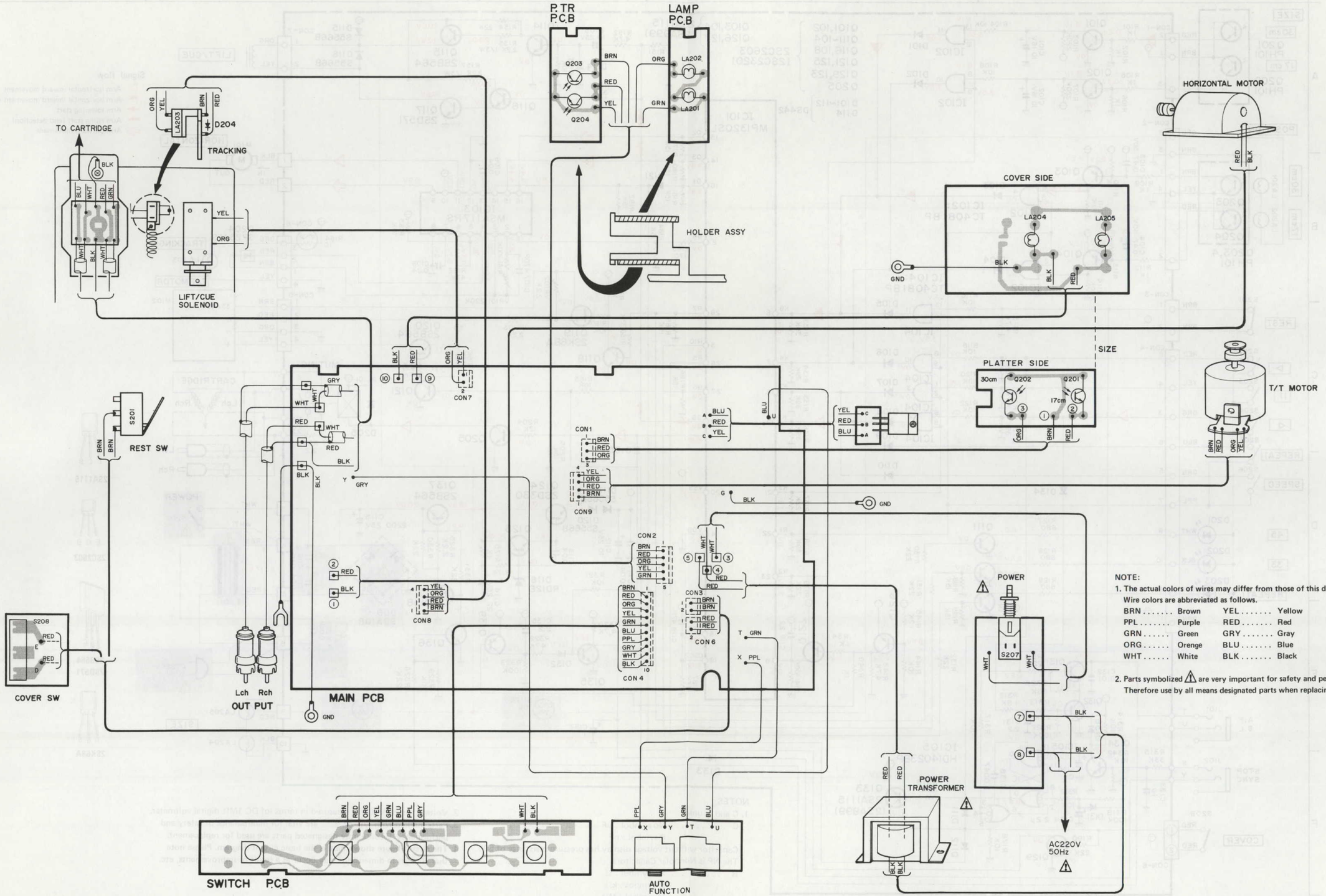
IC105 : HD14023BP







WIRING DIAGRAM



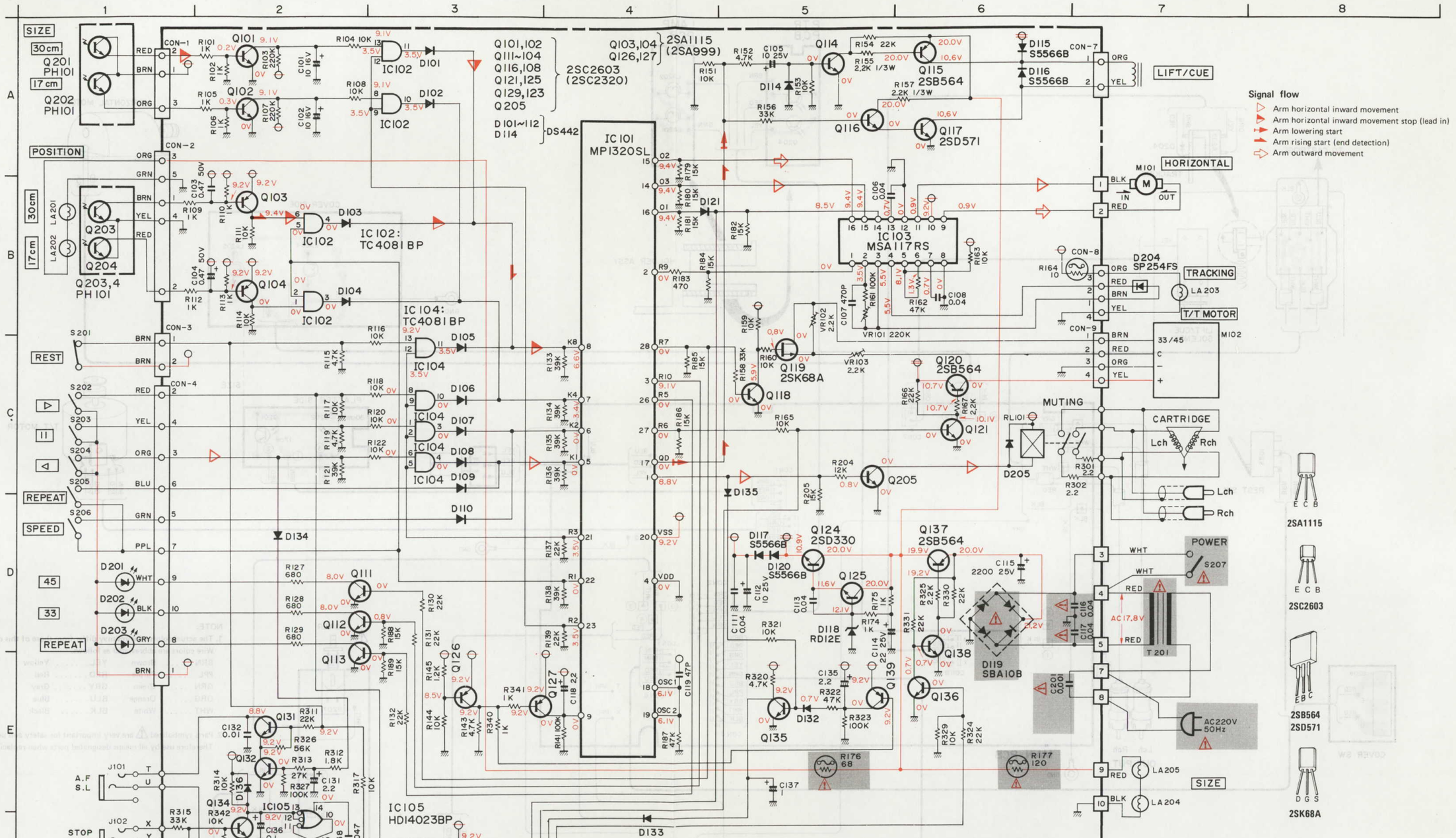
NOTE:

1. The actual colors of wires may differ from those of this diagram.
   Wire colors are abbreviated as follows.

BRN	Brown	YEL	Yellow
PPL	Purple	RED	Red
GRN	Green	GRY	Gray
ORG	Orenge	BLU	Blue
WHT	White	BLK	Black

2. Parts symbolized ⚠ are very important for safety and performance.
   Therefore use by all means designated parts when replacing.

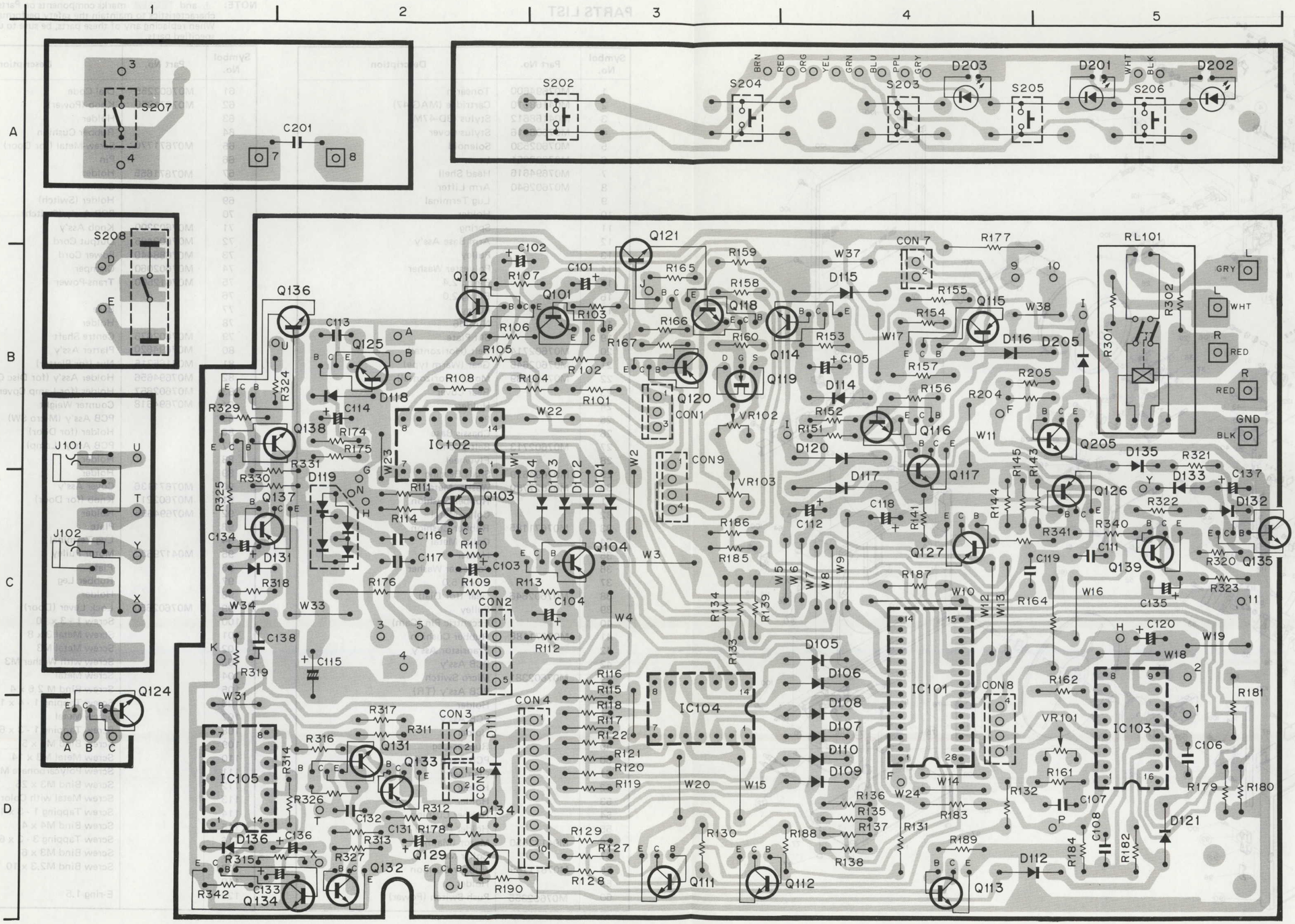
SCHEMATIC DIAGRAM



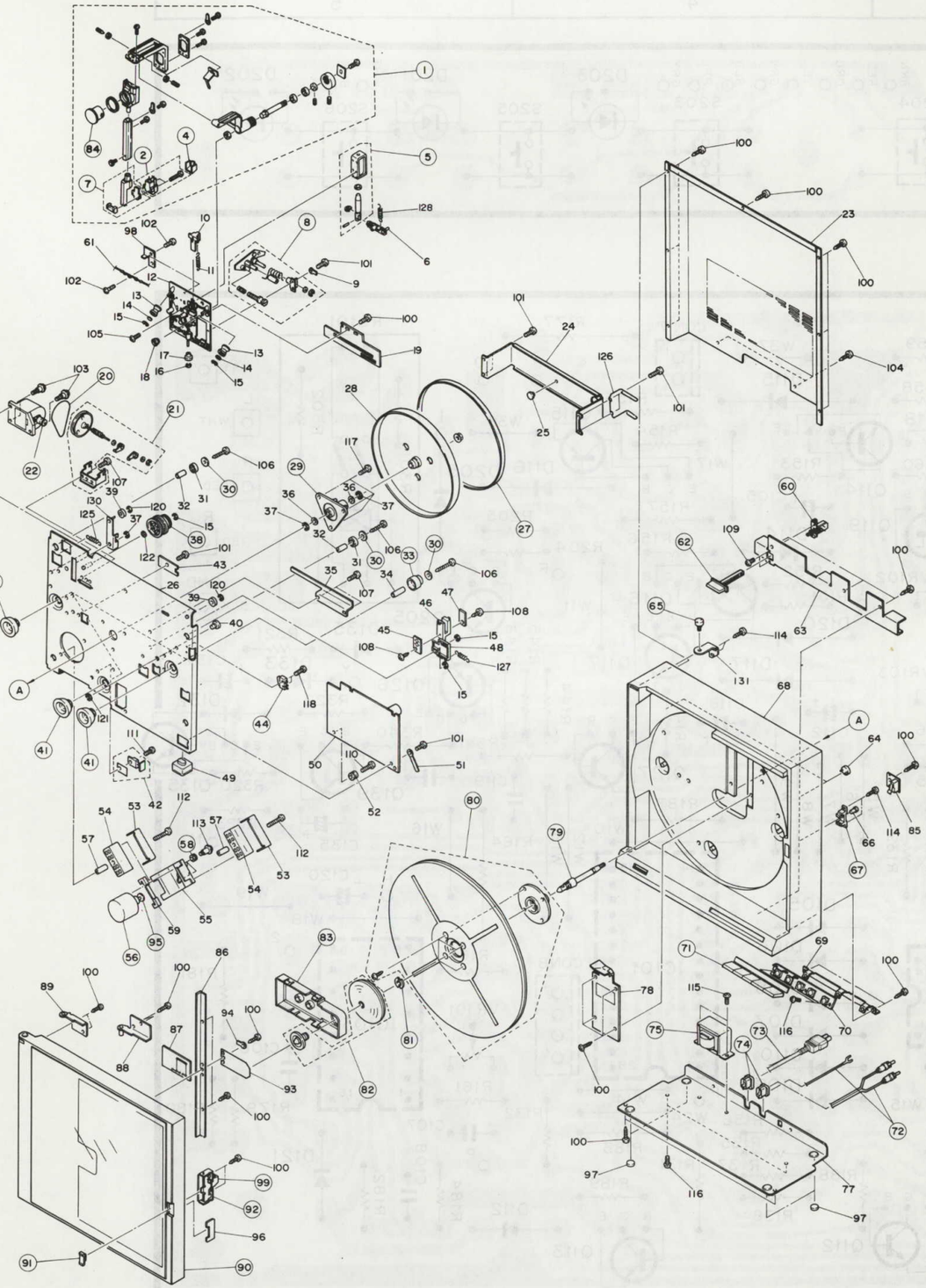
NOTES:

1. C and R unit
   - C ..... No symbol : μF, P symbol : pF
   - Capacitor without voltage display has pressure resistance of 50V.
   - The NP is Nonpolar Capacitors.
   - R ..... No symbol : Ω, K symbol : kΩ, M symbol : MΩ
   - Resistance not designated is 1/4, J(5%).
2. Voltage for all parts are measured in terms iof DC 1MΩ digital voltmeter.
3. Parts marked with ⚠ or ▬ are vital for maintenance of safety and performance. Be sure only designated parts are used for replacement.
4. The circuit figure shown here is the basic circuit diagram. Please note that changes in dimensions may occur as a result of improvements, etc.

PRINTED CIRCUIT BOARDS



EXPLODED VIEW OF CABINET



PARTS LIST

NOTE: ⚠ and ▭ marks components on Parts list have special characteristics to maintain the safety performance of this unit. When replacing any of these parts, be sure to use only those specified parts.

Symbol No.	Part No.	Description
1	M07694600	Tonearm
2	M04168610	Cartridge (MAG-47)
3	M04168612	Stylus (3D-47M)
4	M07508616	Stylus Cover
5	M07602530	Solenoid
6	M07602651	Lever
7	M07694616	Head Shell
8	M07602640	Arm Lifter
9		Lug Terminal
10		Holder
11		Spring
12		Arm Base Ass'y
13		Pulley
14		Polyester Washer
15		E-ring 2.4
16		E-ring 2.0
17		Pulley
18		Nut M6
19		Slit Plate
20	M07602714	Belt (Horizontal)
21	M07602645	Gear (Warm type)
22	M07469639	Motor (Horizontal)
23		Rear Cover
24		Holder
25		Pin
26		Chassis Base
27	M07602713	Belt (Main)
28		Flywheel
29	M07694679	Shaft Bearing
30	M07527780	Washer Metal
31		Rubber Cushion
32		Collar Metal
33	M07671185	Rubber Cushion
34		Collar Metal
35		Holder
36		Polyester Washer
37		E-ring 5.0
38	M07602646	Gear (for Dial)
39		Pulley
40		Eccentric Pin (Cam)
41	M07671188	Rubber Cushion
42		Transistor Ass'y
43		PCB Ass'y
44	M07602381	Micro Switch
45		PCB Ass'y (TR)
46		Holder
47		PCB Ass'y
48		Holder
49		Rubber-Leg
50		PCB Ass'y (Main)
51		Clamper
52		Holder
53		Holder
54		Rubber Cushion
55		Holder (Motor)
56	M04172550	Motor (Main)
57		Collar Metal
58	M07671189	Rubber Cushion
59		Holder
60	M07602355	Push Switch (Power)

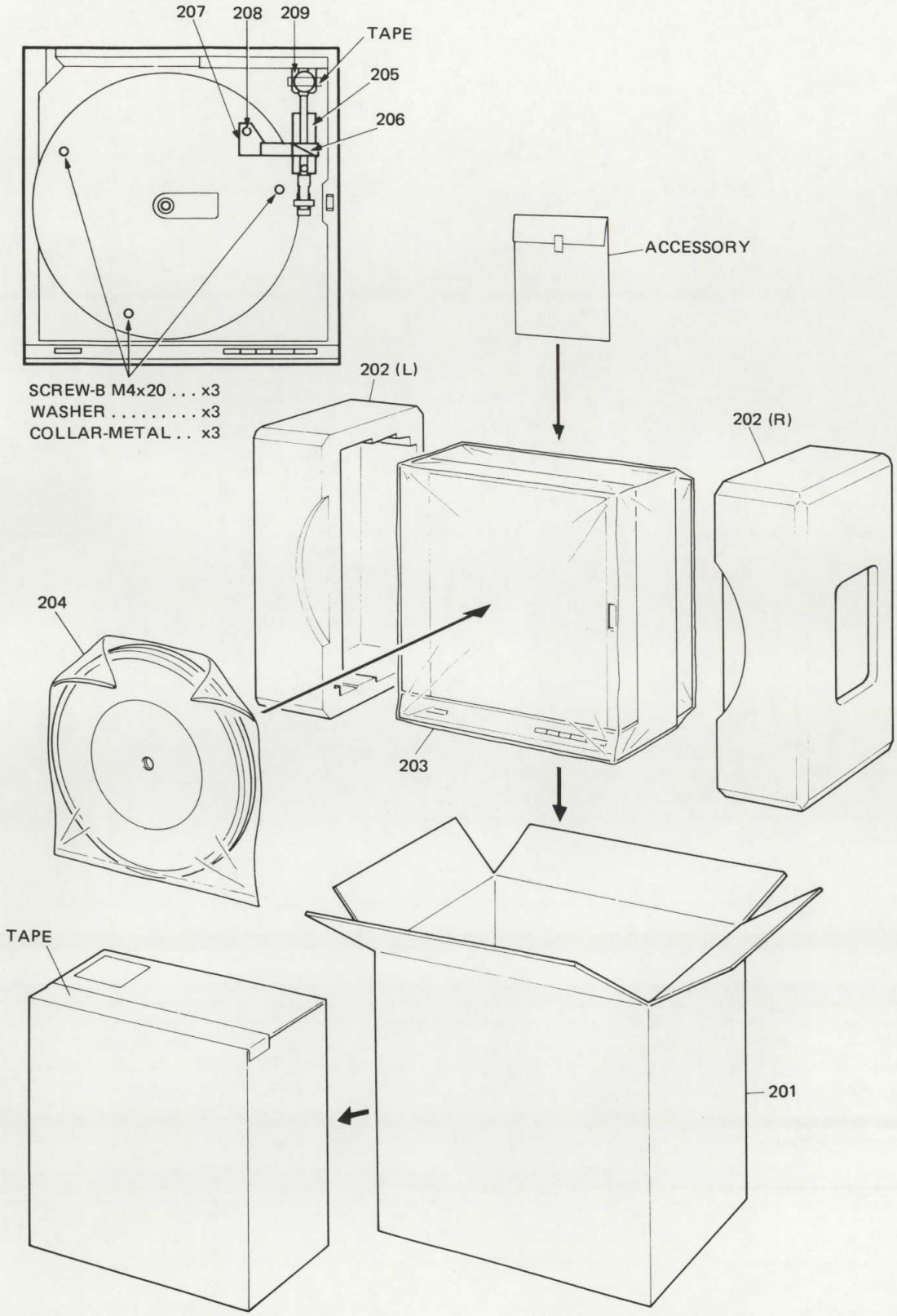
Symbol No.	Part No.	Description
61	M07602255	Dial Code
62	M07671200	Knob (Power)
63		Holder
64		Rubber Cushion
65	M07671770	Screw-Metal (for Door)
66		Pin
67	M07671655	Holder
68		Cabinet
69		Holder (Switch)
70		PCB Ass'y (Switch)
71	M07602200	Knob Ass'y
72	M07602495	Output Cord
73	M07688440	Power Cord
74	M07602060	Clamper
75	M07612500	Trans-Power
76		
77		Base
78		Holder
79	M07602675	Centre Shaft
80	M07694620	Platter Ass'y
81	M04165715	Nut (for Platter)
82	M07694656	Holder Ass'y (for Disc Clamp)
83	M07602657	Holder (for Lamp Cover)
84	M07694618	Counter Weight
85		PCB Ass'y (Micro SW)
86		Holder (for Door)
87		PCB Ass'y (Lamp)
88		Holder
89		Holder
90	M07671136	Cover Ass'y
91	M07602211	Knob (for Door)
92	M07694655	Holder
93		Plate
94		Lug Terminal
95	M04179632	Motor Pulley
96		Plate
97		Rubber Leg
98		Holder
99	M07602650	Lock Lever (Door)
100		Screw 1 - 3 x 10
101		Screw Metal 3 x 8
102		Screw Metal M3
103		Screw with Washer M3
104		Screw Metal
105		Screw Bind M 2.6 x 4
106		Screw Tapping 1 - 4 x 12
107		Screw Metal
108		Screw Tapping 1 - 3 x 6
109		Screw Bind M3 x 5
110		Screw Metal M3 x 14
111		Screw Polycarbonate M3 x 6
112		Screw Bind M3 x 25
113		Screw Metal with Color M2.6
114		Screw Tapping 1 - 3 x 12
115		Screw Bind M4 x 4
116		Screw Tapping 3 - 3 x 6
117		Screw Bind M3 x 6
118		Screw Bind M2.3 x 10
119		
120		E-ring 1.5

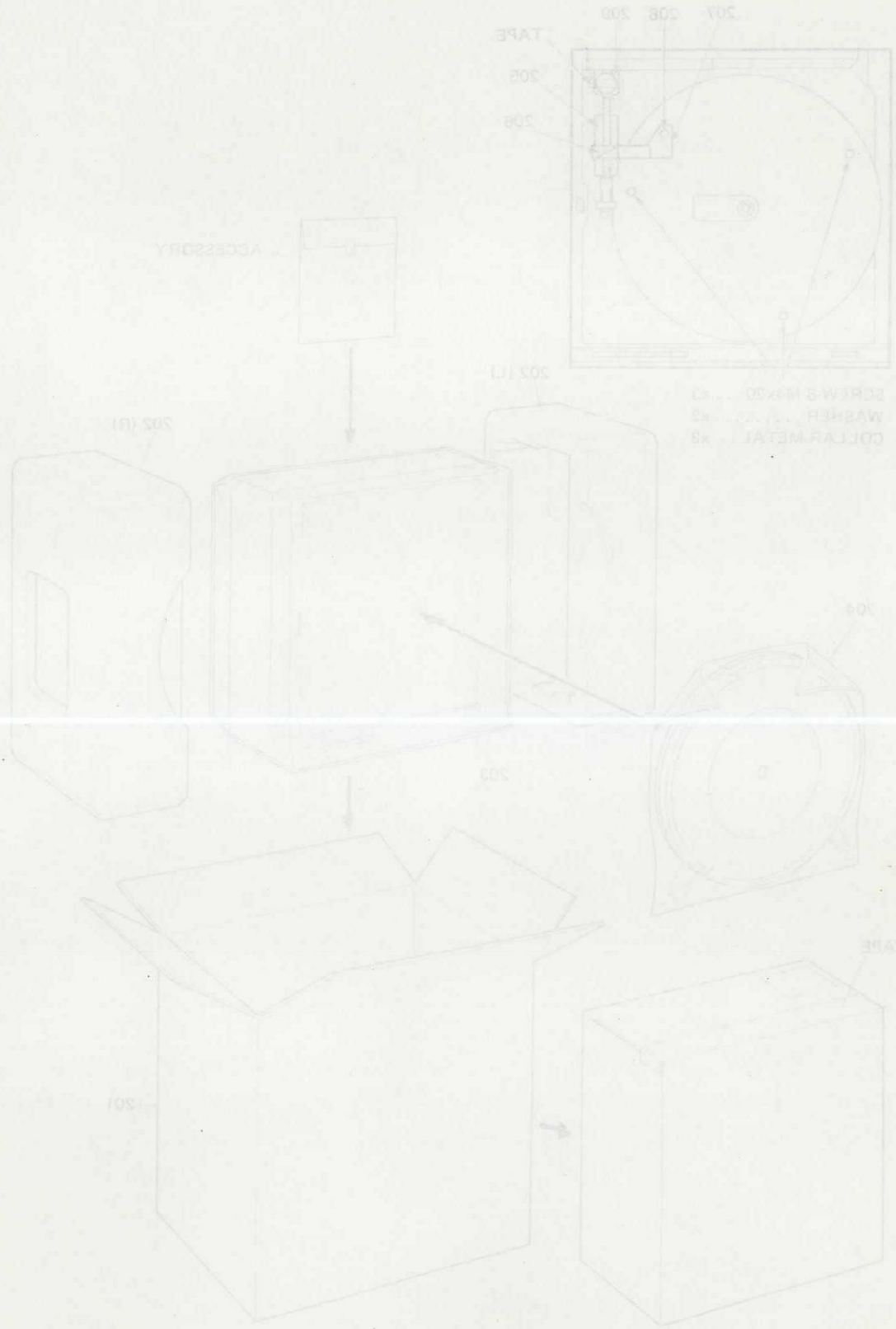
Symbol No.	Part No.	Description
121		BE-ring 5.0
122		Polyester Washer 3.1φ
123		—
124		—
125		Spring
126		Spring
127		Spring
128		Spring
129		
130		Lever
131		Holder

Symbol No.	Part No.	Description
		Diodes
D101	M07556320	DS442
D102	M07556320	DS442
D103	M07556320	DS442
D104	M07556320	DS442
D105	M07556320	DS442
D106	M07556320	DS442
D107	M07556320	DS442
D108	M07556320	DS442
D109	M07556320	DS442
D110	M07556320	DS442
D111	M07556320	DS442
D112	M07556320	DS442
D114	M07556320	DS442
D115	M05255320	S5566B
D116	M05255320	S5566B
D117	M05255320	S5566B
D118	M05232328	RD12EB3
D119	M05223320	SBA10B
D120	M05255320	S5566B
D201	M07602325	SG238D (GRN)
D202	M07602325	SG238D (GRN)
D203	M07602326	SR538D (RED)
D204	M07297320	SP254FS
		ICs
IC101	M07602311	MP1320SL
IC102	M07602310	TC4081BP
IC103	M07527344	MSA117RS
IC104	M07602310	TC4081BP
IC105	M07671310	HD14023BP
		Transistors
Q101	M07390303	2SC2603
Q102	M07390303	2SC2603
Q103	M07390304	2SA999 (2SA1115)
Q104	M07390304	2SA999 (2SA1115)
Q111	M07390303	2SC2603
Q112	M07390303	2SC2603
Q113	M07390303	2SC2603
Q114	M07390303	2SC2603
Q115	M05147312	2SB564
Q116	M07390303	2SC2603
Q117	M07228303	2SD571
Q118	M07390303	2SC2603
Q119	M07139304	2SK68A
Q120	M05147312	2SB564
Q121	M07390303	2SC2603
Q124	M05205310	2SD330
Q125	M07390303	2SC2603
Q126	M07390304	2SA999 (2SA1115)
Q127	M07390304	2SA999 (2SA1115)
Q128	M07228303	2SD571
Q129	M07390303	2SC2603

Symbol No.	Part No.	Description
Q201	M07137303	PH101
Q202	M07137303	PH101
Q203	M07137303	PH101
Q204	M07137303	PH101
Q129	M07390303	2SC2603
Q131	M07390303	2SC2603
Q132	M07390303	2SC2603
Q133	M07390304	2SA999 (2SA1115)
Q134	M07390303	2SC2603
		Electronical Parts
LA201	M07374251	Lamp-12V 0.05A
LA202	M07374251	Lamp-12V 0.05A
LA203	M07374251	Lamp-12V 0.05A
LA204	M07374251	Lamp-12V 0.05A
LA205	M07374251	Lamp-12V 0.05A
M101	M07469639	Motor (Horizontal)
M102	M04172550	Motor (Main)
S201	M07602381	SW-Micro (Rest)
S202	M07445660	SW-Push (Stop)
S203	M07445660	SW-Push (Lift/cue)
S204	M07445660	SW-Push (Start)
S205	M07445660	SW-Push (Repeat)
S206	M07345660	SW-Push (Speed)
S207	M07602355	SW-Push (Power) ⚠
S208	M07602380	SW-Micro (for Cover)
RL101	M07236465	Relay
T201	M07612550	Trans-Power ⚠
VR101	M05104360	VR-Semi B220K
VR102	M04139436	VR-Semi B2.2K
VR103	M04139436	VR-Semi B2.2K
J101	M07671475	Jack (Auto Func, S.L)
J102	M07671476	Jack (Stop, Sync.)
		Packing Materials, etc.
201	M07694900	Packing Box
202	M07671910	Cushion-Mold (L, R set)
203	M07602930	Packing Bag (Main)
204	M07602931	Packing Bag (Platter)
205	M07602911	Cushion-Mold (Tone Arm)
206	M07602912	Cover (Tone Arm Cushion)
207	M07611659	Clamper (for Tone Arm)
	M07213777	Screw B M4 x 20 (Platter Fastening)
	M07527780	Washer (Platter Fastening)
	M07602777	Collar-Metal (Platter Fastening)
	M07695940	Instruction Booklet
	M04165013	Spanner (Platter Eject)
	M04165725	Shade (LP)
	M04165726	Shade (EP)
	M07445603	Adaptor (EP)
	M07602676	Shaft (for Platter Remove)
	M07671495	Lead (Auto Function)
	M07611770	T-Screw (Tone Arm Fasting)
	M07694915	Cushion-PL (Balance Weight)

PACKING INSTRUCTIONS





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