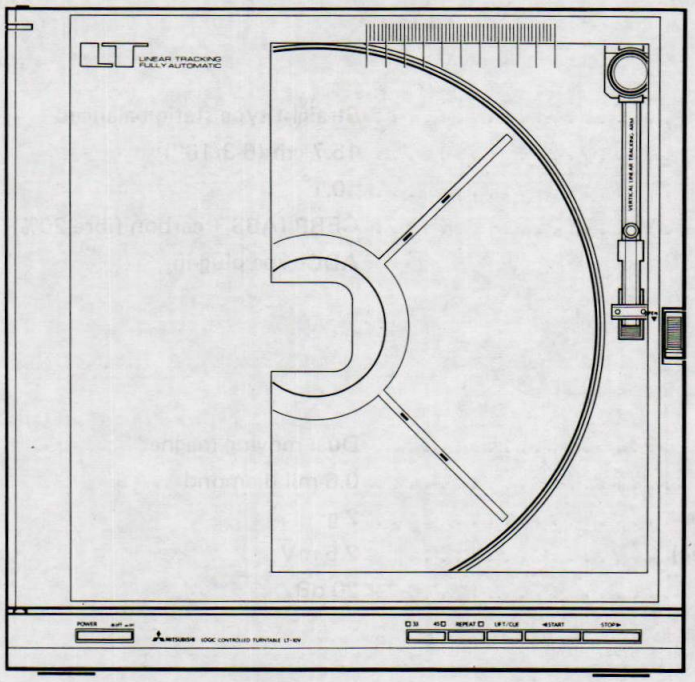
MITSUBISHI
AUDIO SYSTEMS

SERVICE MANUAL

TURNTABLE

MODEL LT-10V



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	14 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 actuator of REST switch to put the switch into the ON state. (See Fig. 1)

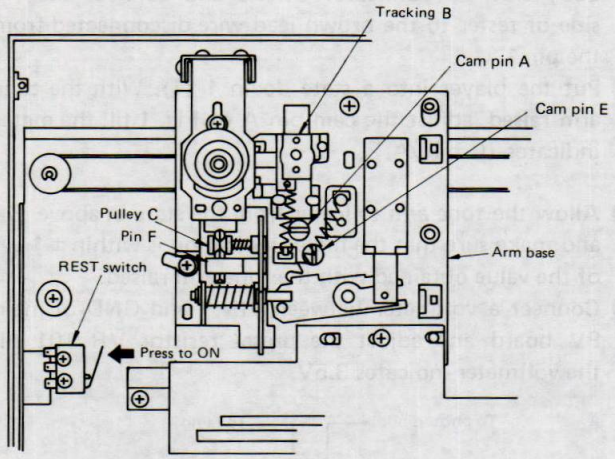


Fig. 1

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.

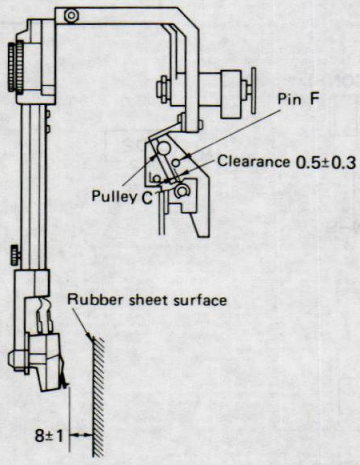


Fig. 2

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 (M3 x 5) fixing the main weight by using a 1 - 5 mm hexagonal wrench. Turn the main weight untill perpendicular.
   After adjustment, tighten hexagon screw of main weight. Be sure to lock the screw.

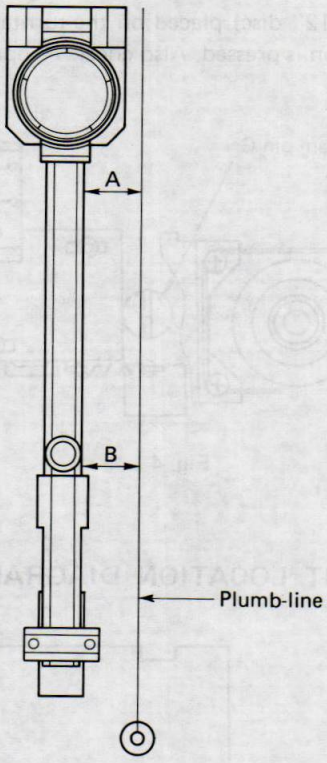


Fig. 3

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 of player while keeping other components in the actual operation state.
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.

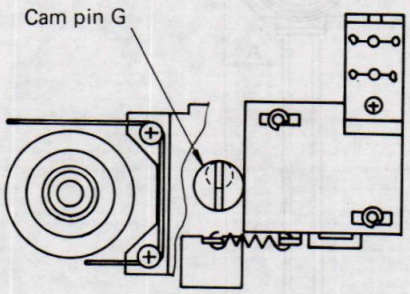


Fig. 4

6. TRACKING SERVO ADJUSTMENT

1) This adjustment should be make 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 (–) lead of a Maltimeter to pin 1 (main body side) of connector CON-8 and connect the (+) side of tester to the brown lead wire disconnected from the pin 1.
5) Put the player into a state do in 1 (1). With the tone arm raised, 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 PV board and adjust the preset resistor VR 101 till the voltmeter indicates 3.5V.

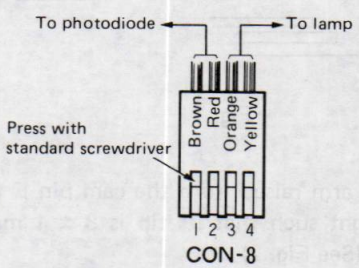


Fig. 5

ADJUSTMENT LOCATION DIAGRAM

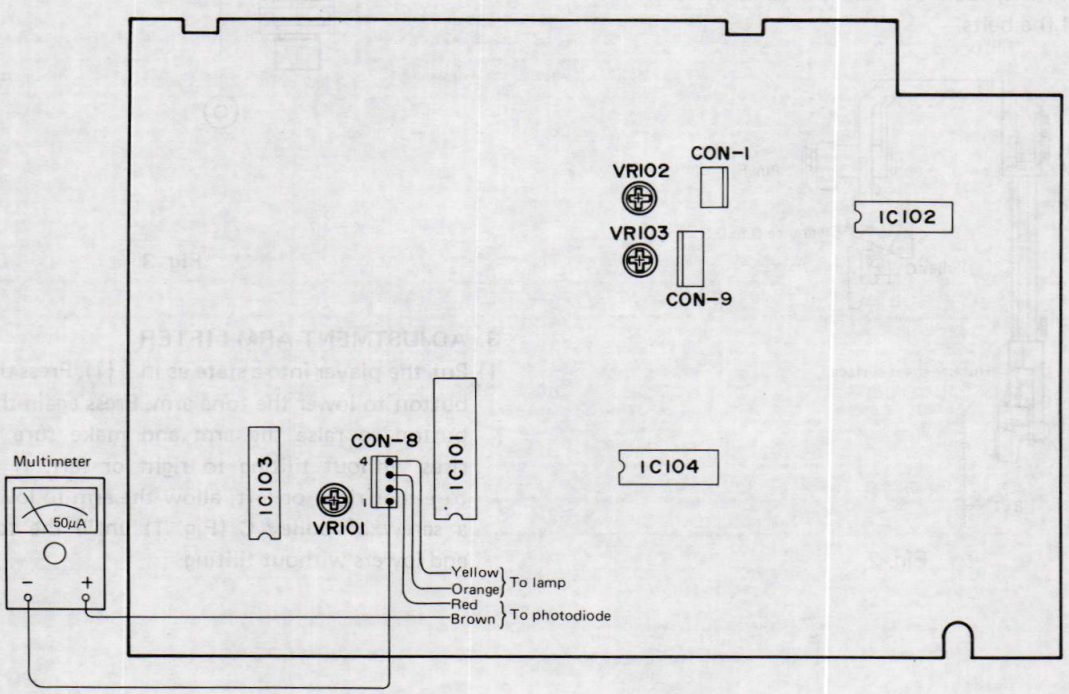


Fig. 6

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 adjust the player speed to 33 rpm.
3) Play back 3 KHz of test record and adjust the preset resistor VR 103 for 3020Hz.
4) Set the player speed to 45 rpm. Play back as in the case of 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)

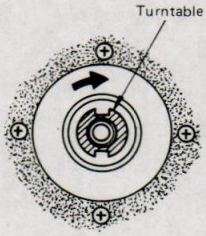


Fig. 7

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

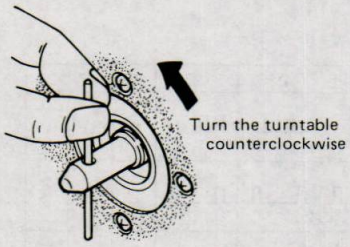


Fig. 8

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.

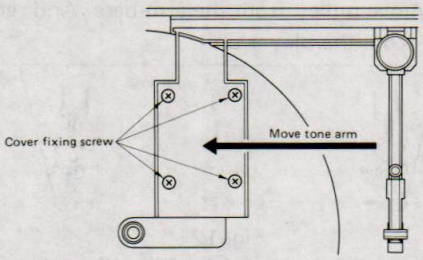


Fig. 9

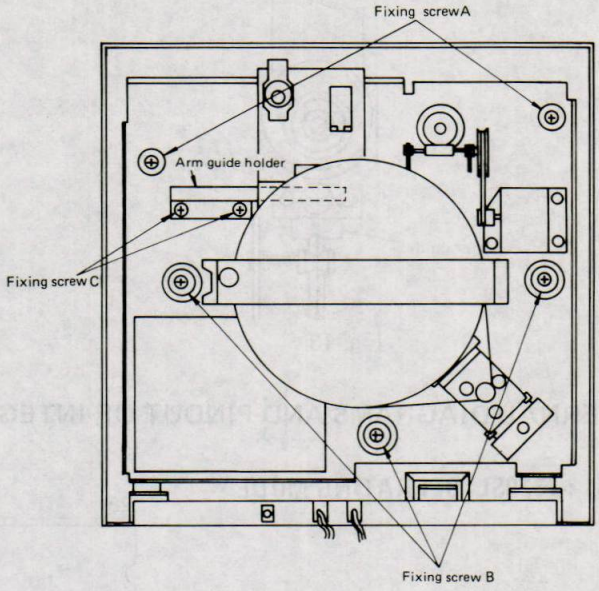


Fig. 10

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.

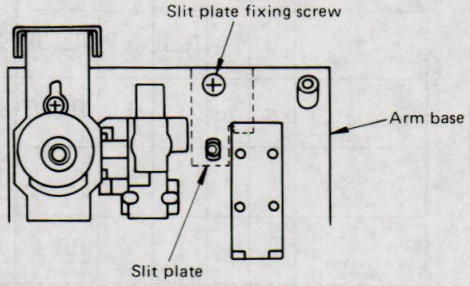


Fig. 11

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.

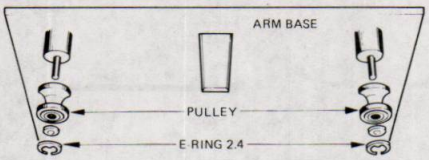


Fig. 12

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

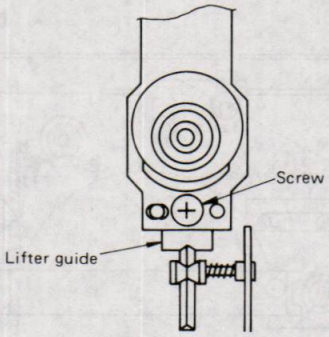


Fig. 13

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

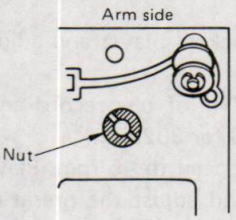
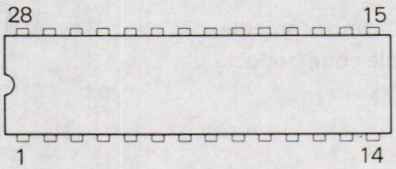


Fig. 14

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.

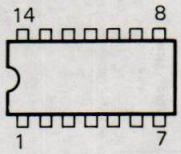
INTERNAL DIAGRAMS AND PINOUT OF INTEGRATED CIRCUITS

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

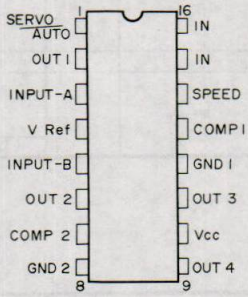
IC102 : TC4081BP OPERATING MODE

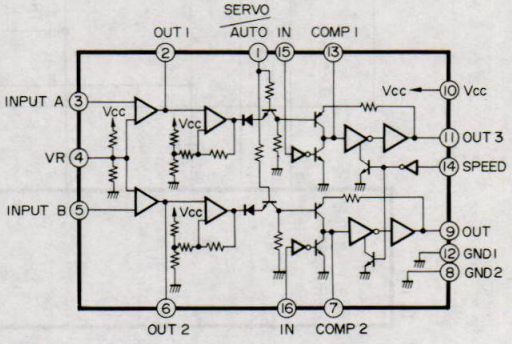


Pin No. / Actual	1	2	3	4	5	6	8	9	10	11	12	13
No Disk S204 ◁	L→H (17 Groove)	10ms	10ms	10ms	10ms	L→H	L		L	L		L
30cm Disk S204 ◁ Start	L	45ms	L	45ms	45ms	L→H	H	45ms	45ms	45ms	45ms	H
17cm Disk S204 ◁ Start	H (17 Groove)	45ms	45ms	45ms	45ms	L→H	H	45ms	45ms	L	45ms	L

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

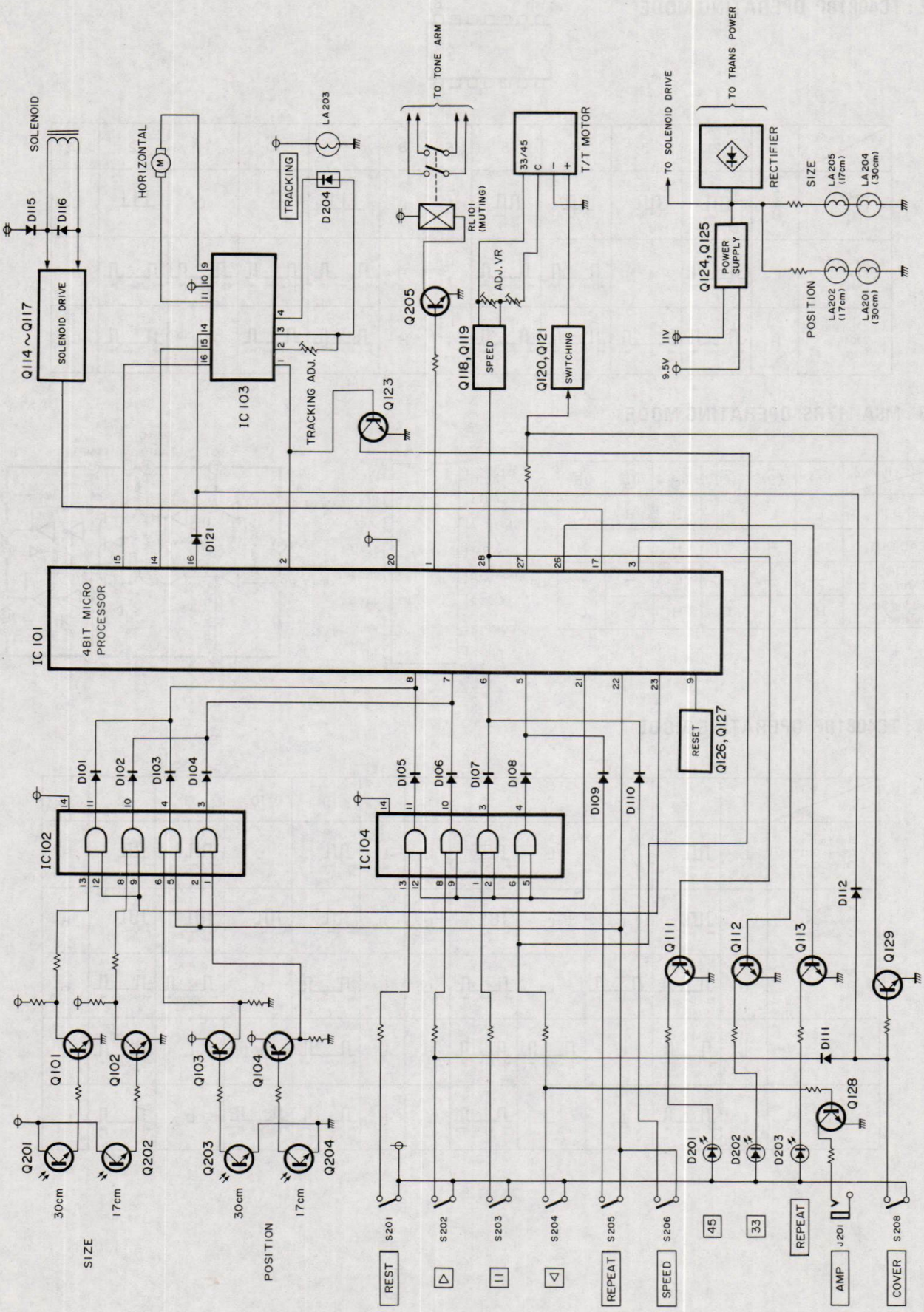




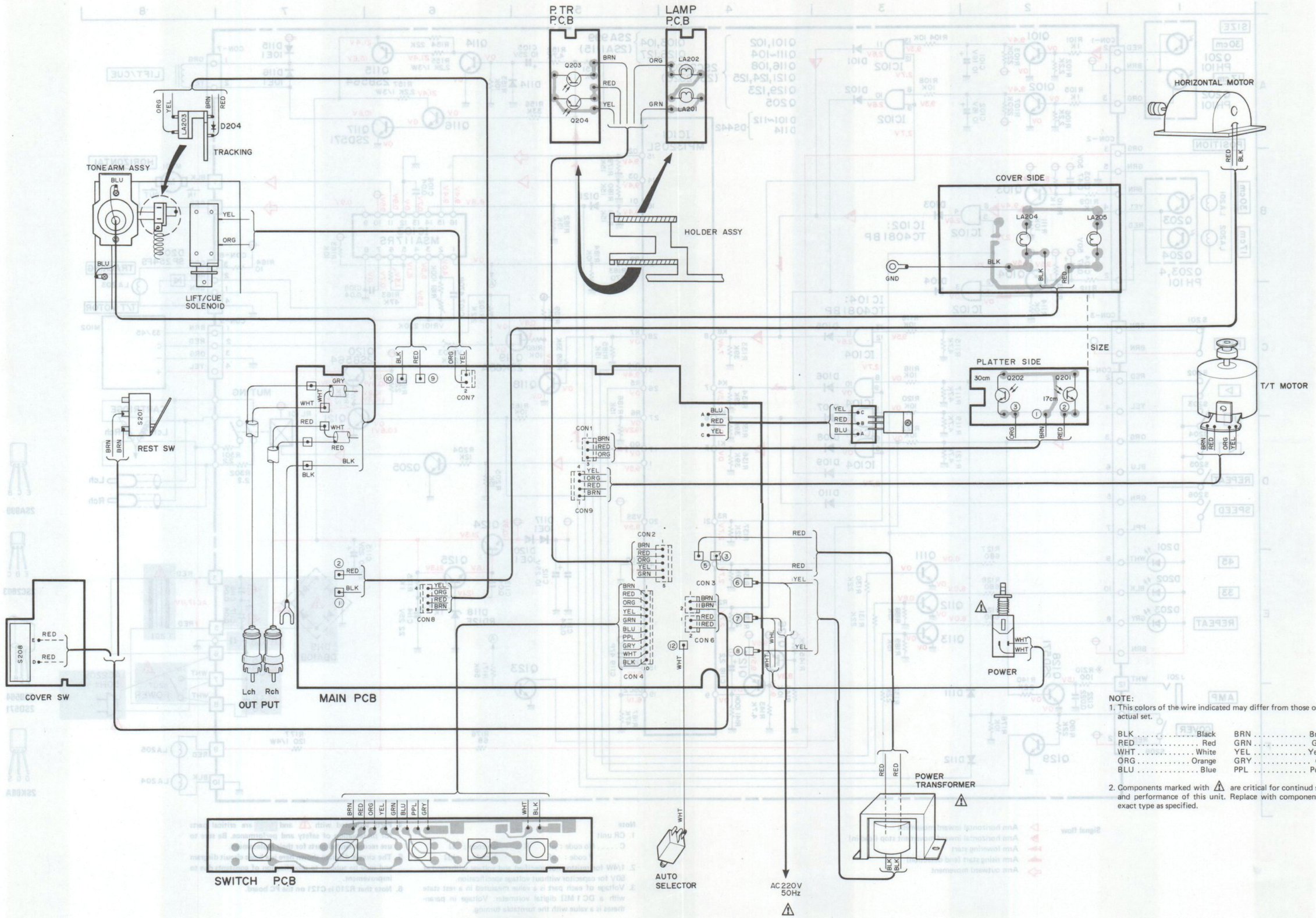
IC104 : TC4081BP OPERATING MODE

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

BLOCK DIAGRAM



WIRING DIAGRAM



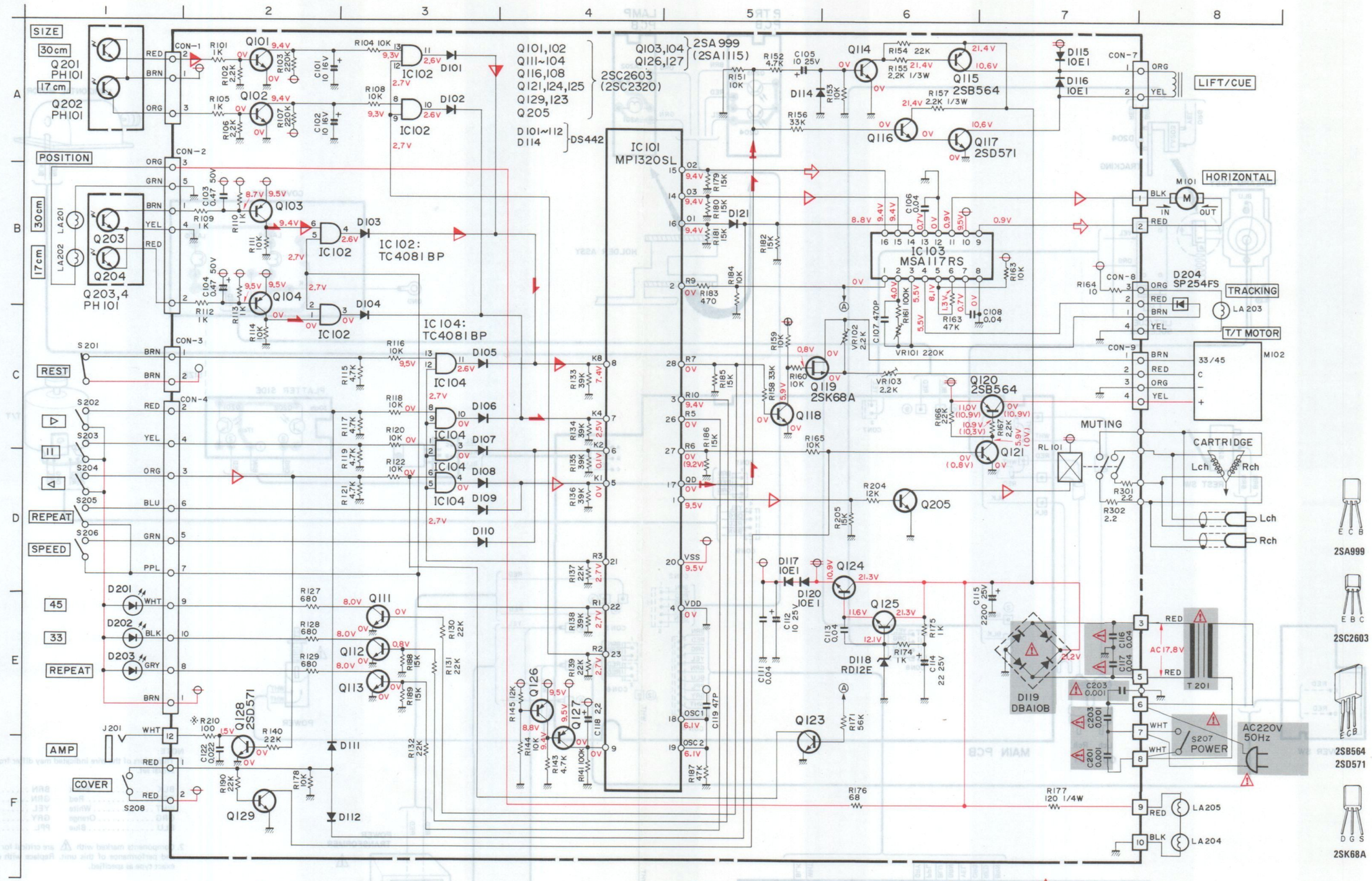
NOTE:

1. This colors of the wire indicated may differ from those of the actual set.

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

2. Components marked with ⚠ are critical for continud safty and performance of this unit. Replace with components of exact type as specified.

SCHEMATIC DIAGRAM



Signal flow

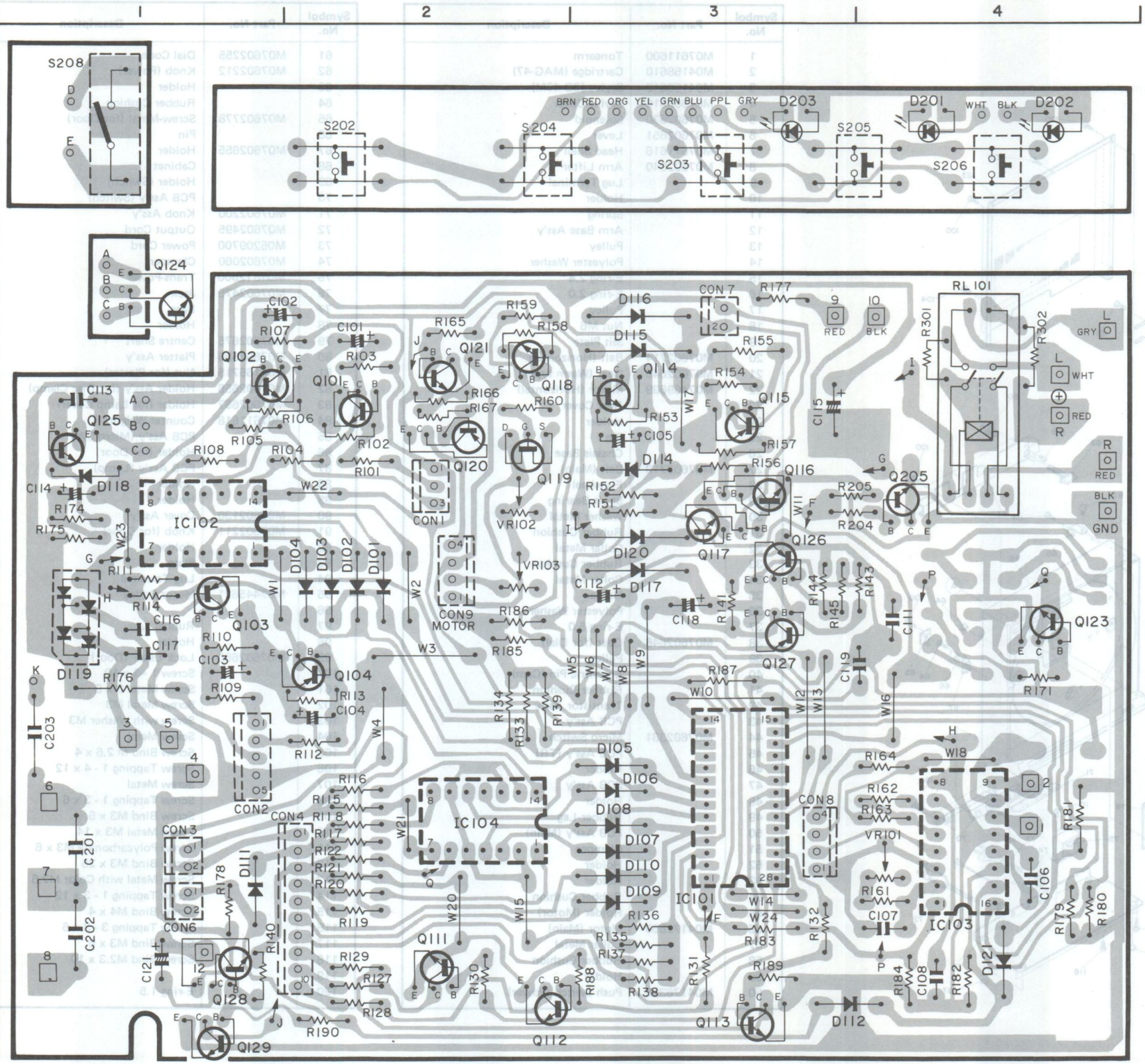
- Arm horizontal inward movement
- Arm horizontal inward movement stop (lead-in)
- Arm lowering start
- Arm rising start (end detection)
- Arm outward movement

Note

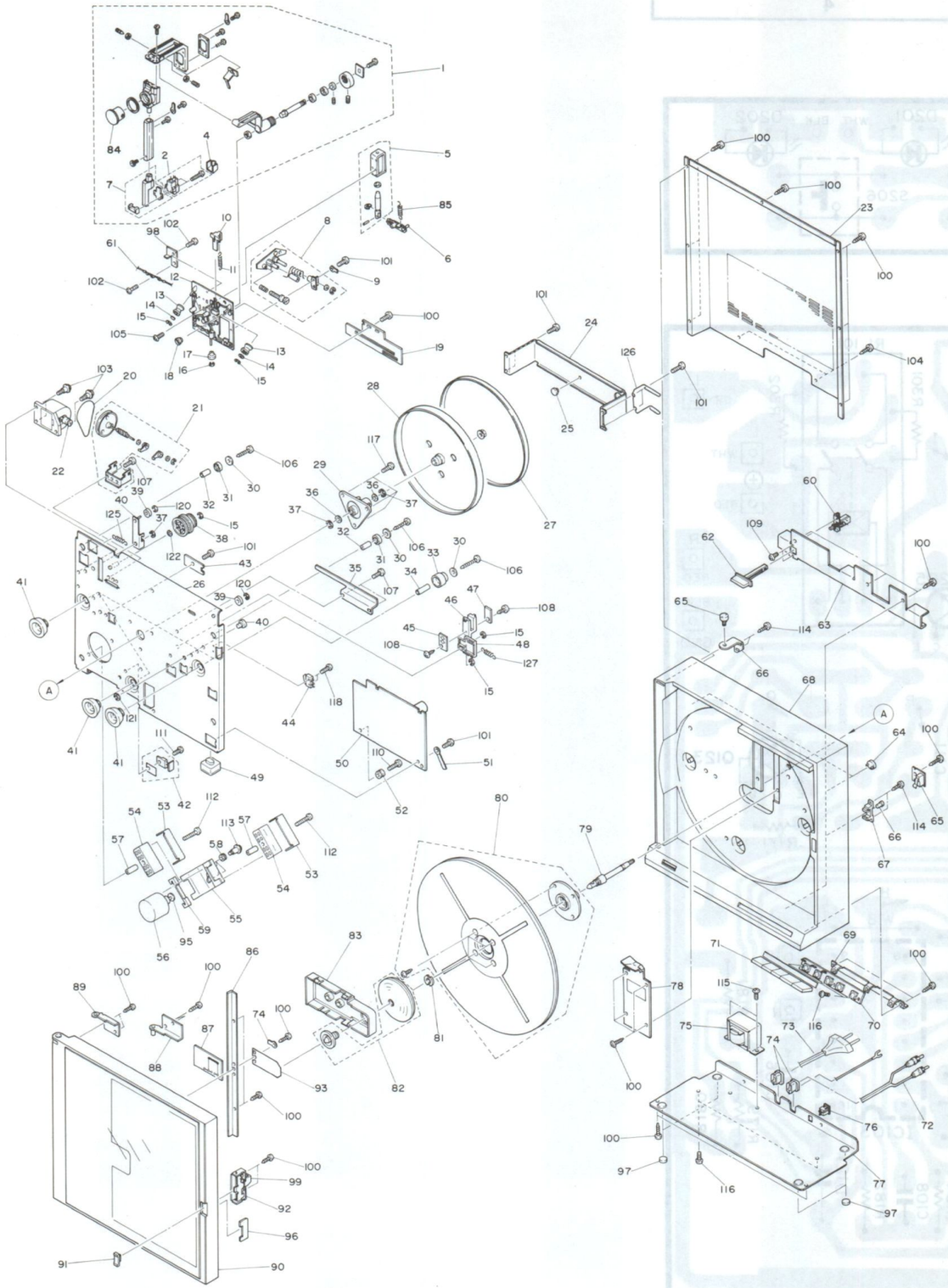
1. CR unit
   C . . . . . No code : μF P code : pF
   R . . . . . No code : Ω k code : kΩ
2. 1/4W for resistor not specified and voltage withstand at 50V for capacitor without voltage specification.
3. Voltage of each part is a value measured in a rest state with a DC 1 MΩ digital voltmeter. Voltage in parantheses is a value with the turntable turning.
4. Parts indicated with ⚠ and ▭ are critical parts for preservation of safety and performance. Be sure to use recommended parts for their replacement.
5. The circuit diagram shown here is a basic circuit diagram and may be subject to modification of constants due to improvement.
6. Note that R210 is C121 on the PC board.

LT-10V	LT-10V

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	M07611600	Tonearm
2	M04168610	Cartridge (MAG-47)
3	M04168612	Stylus (3D-47M)
4	M07508616	Stylus Cover
5	M07602530	Solenoid
6	M07602651	Lever
7	M07611616	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		Shaft Bearing
30		Washer Metal
31		Rubber Cushion
32		Collar Metal
33		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		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		Rubber Cushion
59		Holder
60	M04176355	Push Switch (Power)

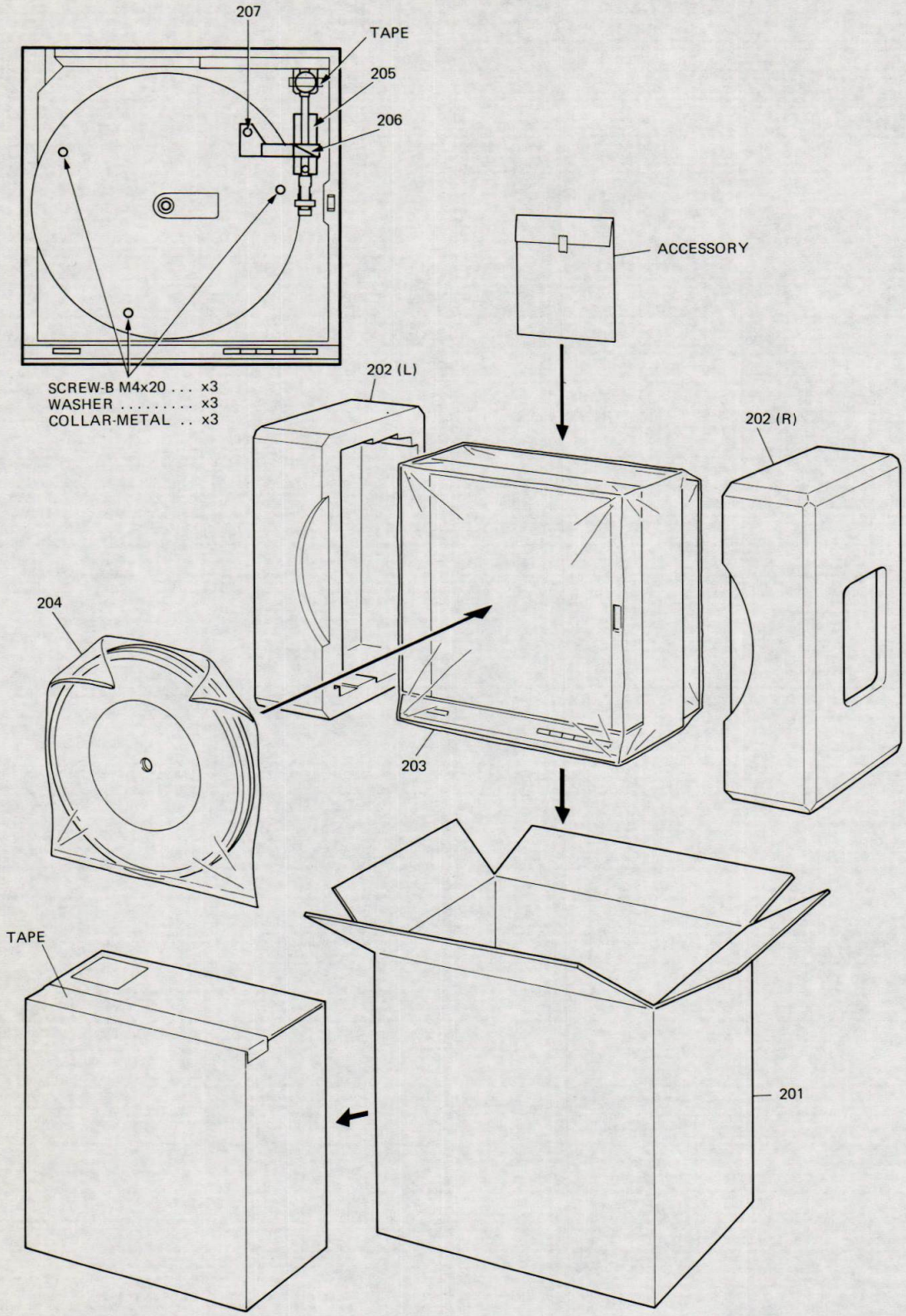
Symbol No.	Part No.	Description
61	M07602255	Dial Code
62	M07602212	Knob (Power)
63		Holder
64		Rubber Cushion
65	M07602778	Screw-Metal (for Door)
66		Pin
67	M07602655	Holder
68		Cabinet
69		Holder (Switch)
70		PCB Ass'y (Switch)
71	M07602200	Knob Ass'y
72	M07602495	Output Cord
73	M05209700	Power Cord
74	M07602060	Clamper
75	M07612500	Trans-Power
76	M07602475	Jack
77		Base
78		Holder
79	M07602675	Centre Shaft
80	M07602620	Platter Ass'y
81	M04165715	Nut (for Platter)
82	M07602656	Holder Ass'y (for Disc Clamp)
83	M07602657	Holder (for Lamp Cover)
84	M07611618	Counter Weight
85		PCB Ass'y (Micro SW)
86		Holder (for Door)
87		PCB Ass'y (Lamp)
88		Holder
89		Holder
90	M07602130	Cover Ass'y
91	M07602211	Knob (for Door)
92		Holder
93		Plate
94		Lug Terminal
95	M07445621	Motor Pulley
96		
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

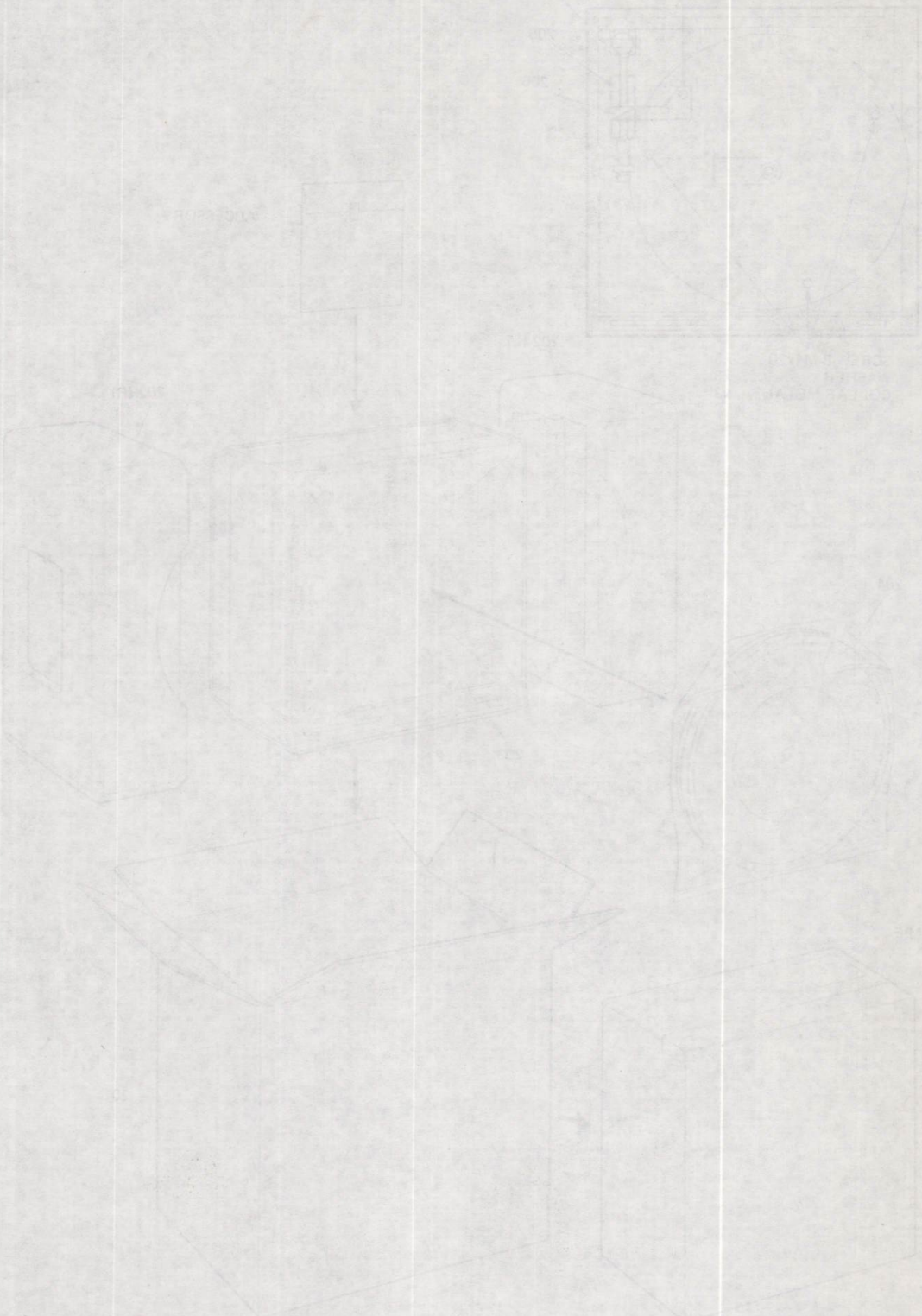
Symbol No.	Part No.	Description
121		BE-ring 5.0
122		Polyester Washer 3.1ϕ
123		—
124		—
125		Spring
126		Spring
127		Spring
128		
129		
130		

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	M07228321	10E1
D116	M07228321	10E1
D117	M07228321	10E1
D118	M05232328	RD12EB3
D119	M05223320	DBA10B
D120	M07228321	10E1
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
		Transistors
Q101	M07390303	2SC2603
Q102	M07390303	2SC2603
Q103	M07390304	2SA999
Q104	M07390304	2SA999
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	M07390303	2SC2603
Q125	M07390303	2SC2603
Q126	M07390304	2SA999
Q127	M07390304	2SA999
Q128	M07228303	2SD571
Q129	M07390303	2SC2603

Symbol No.	Part No.	Description
Q201	M07137303	PH101
Q202	M07137303	PH101
Q203	M07137303	PH101
Q204	M07137303	PH101
	Electronical Parts	
J201	M07602475	Jack (Auto Select)
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	M04176355	SW-Push (Power) ⚠
S208	M07602380	SW-Micro (for Cover)
RL101	M07236465	Relay
T201	M07623500	Trans-Power ⚠
VR101	M05104360	VR-Semi B220K
VR102	M04139436	VR-Semi B2.2K
VR103	M04139436	VR-Semi B2.2K
	Packing Materials, etc.	
201	M07612900	Packing Box
202	M07602910	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)
	M07602060	Clamper (Power/Output Cord)
	M07613940	Instruction Booklet
	M07613945	Card (Guarantee)
	M04165013	Spanner (Platter Eject)
	M04165725	Shade (LP)
	M04165726	Shade (EP)
	M07445603	Adaptor (EP)

PACKING INSTRUCTIONS





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