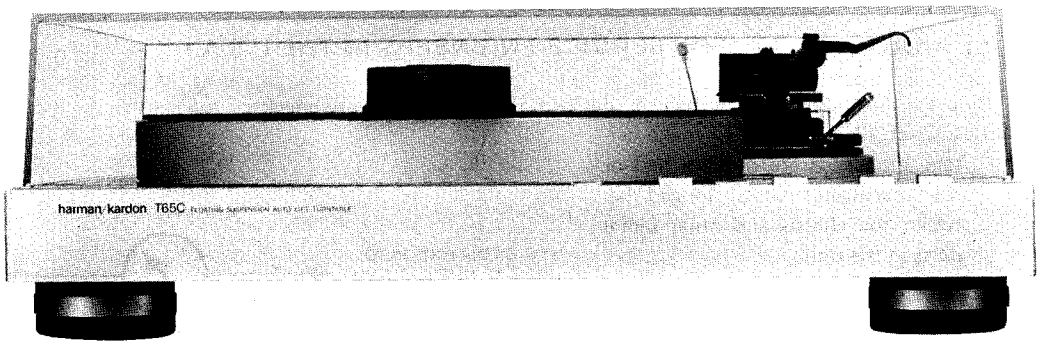
The Harman Kardon Model T65C

Manual No. 78A

FLOATING SUSPENSION AUTO LIFT TURNTABLE

T65C

Technical Manual



harman/kardon
240 CROSSWAYS PARK WEST, WOODBURY, N.Y. 11797
1112-H15278A2 P-08849 1850 PRINTED IN JAPAN

SPECIFICATIONS

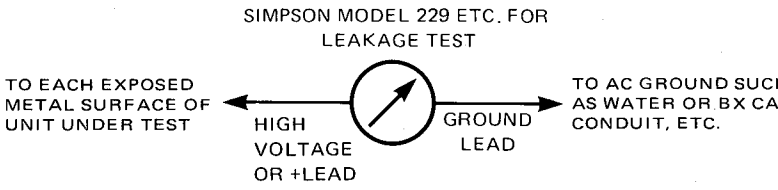
Wow & Flutter (WRMS)	0.025%
Rumble (DIN-B WTD)	–70dB, DIN 45544 record reference
Pitch Adjustable Range	±4%
Tonearm	
Effective Tonearm Mass	9.5g (plus the mass of the cartridge used)
Stylus Overhang	18 mm
Offset Angle	25.5°
Effective Length	216 mm
Tracking Error	±2 degrees
Phono Capacitance	70/170/270pF
Tracking Force	0 ~ 3 grams
Acceptable Weight of Cartridge	4.5 ~ 13 g
Dimensions (W x H x D)	17-1/2"x5-3/4"x15-1/ (443x145x384 mm)
Weight	17 lbs. 10 oz. (8 kg)
Power Supply	
U.S.A. and Canada models	AC120V, 60Hz
General model	AC110-120V/220-240 50/60Hz
Power Consumption	
U.S.A. and Canada models	8W
General model	10W

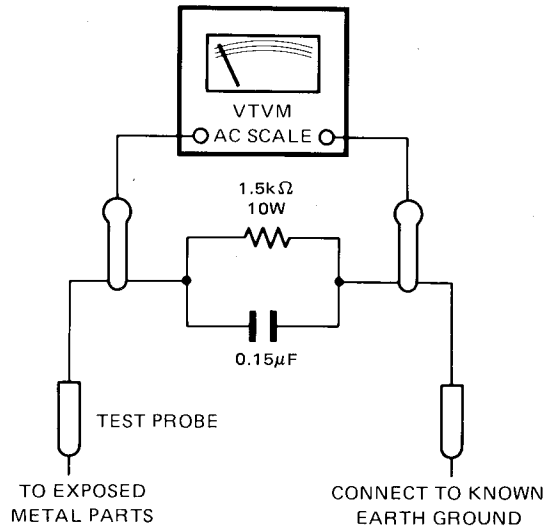
Specifications and components subject to change without noti
Overall performance will be maintained or improved.

LEAKAGE TEST (FOR SERVICE ENGINEERS IN THE U.S.A.)

Before returning the unit to the user, perform the following safety checks:

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the unit.
2. Be sure that any protective devices such as nonmetallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators, etc. which were removed for servicing are properly reinstalled.
3. Be sure that no shock hazard exists; check for leakage current using Simpson Model 229 Leakage Tester, standard equipment item No. 21641, RCA Model WT540A or use alternate method as follows:
   Plug the power cord directly into a 120-volt AC receptacle (do not use an Isolation Transformer for this test). Using two clip leads, connect a 1500 Ohm, 10-watt resistor paralleled by a 0.15μF capacitor, in series with all exposed metal cabinet parts and a known earth ground, such as a water pipe or conduit. Use a VTVM or VOM with 1000 Ohms per volt, or higher, sensitivity to measure the AC voltage drop across the resistor. (See Diagram.) Move the resistor connection to each exposed metal part having a return path to the chassis (antenna, metal, cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor. (This test should be performed with the power switch in both the On and Off positions.)





A reading of 0.35 volt RMS or more is excessive and indicates a potential shock hazard which must be corrected befo returning the unit to the owner.

DISASSEMBLY PROCEDURES (REFER TO PAGES 6, 7 AND 13)

NOTE: Before disassembling the unit, remove the platter, platter mat, counterweight and headshell with cartridge, and securely tie the arm to the armrest with string, etc. Then gently turn the unit upside down and place it on cloths, etc. piled up on both sides to protect the arm and cabinet from damage.

1 CABINET BOTTOM ASSEMBLY (102) REMOVAL

Remove a screw Ⓐ and 10 screws Ⓑ and remove the Cabinet Bottom Assembly (102).

* Toothed washer is attached to the screw Ⓐ .

2 FRONT PANEL ASSEMBLY (103) REMOVAL

1. Remove the Cabinet Bottom Assembly (102). (Refer to step 1 .)
2. Remove 6 screws Ⓒ and remove the Bracket (184) with PCB-3 and PCB-7 by pulling the Front Panel Assembly (103) slightly forward then remove the Front Panel Assembly.

3 PICK-UP ASSEMBLY (129) REMOVAL

1. Remove the Cabinet Bottom Assembly (102). (Refer to step 1 .)
2. Unsolder the lead wires connected to the Solenoid (L1) on Pick-up Assembly (129) from Photo Transistor P.C.Board (PCB-6), and unsolder the lead wires connected to the Capacitance Trim Selector P.C. Board (PCB-4).
3. Loosen screw Ⓓ and remove the Lever Assembly (107).
4. Remove 3 screws Ⓔ and remove the Pick-up Assembly (129) with the Capacitance Trim Selector P.C.Board (PCB-4).
5. Pull out the Cap. Trim Knob (139/140).
6. Remove the Nut Ⓕ . (Fit a narrow tipped tool such as radio pliers into the groove of the nut and turn it counterclockwise.)
7. Separate Capacitance Trim Selector P.C.Board (PCB-4) from the Pick-up Assembly (129).

4 CHASSIS ASSEMBLY (105) REMOVAL

1. Remove the Pick-up Assembly (129). (Refer to step 3 .)
2. Remove 4 screws Ⓖ and remove the LED P.C.Board (PCB-5), Photo Transistor P.C.Board (PCB-6) and Microswitch (SW1).
3. Remove LUG2 from the Center Spindle Assembly (273). Then remove 3 screws Ⓗ and remove the Center Spindle Assembly from the Chassis Assembly (105).
4. Remove 2 screws Ⓘ and remove the Balancer (297) from the Chassis Assembly (105).
5. Unsolder the lead wire connected to the LUG1 on the Chassis Assembly (105) and remove a screw Ⓙ mounting LUG1 and remove it.
6. Remove 3 nuts Ⓚ and remove the Chassis Assembly (105) by turning the Special Screws Ⓛ clockwise.

5 MOTOR (MO1) REMOVAL

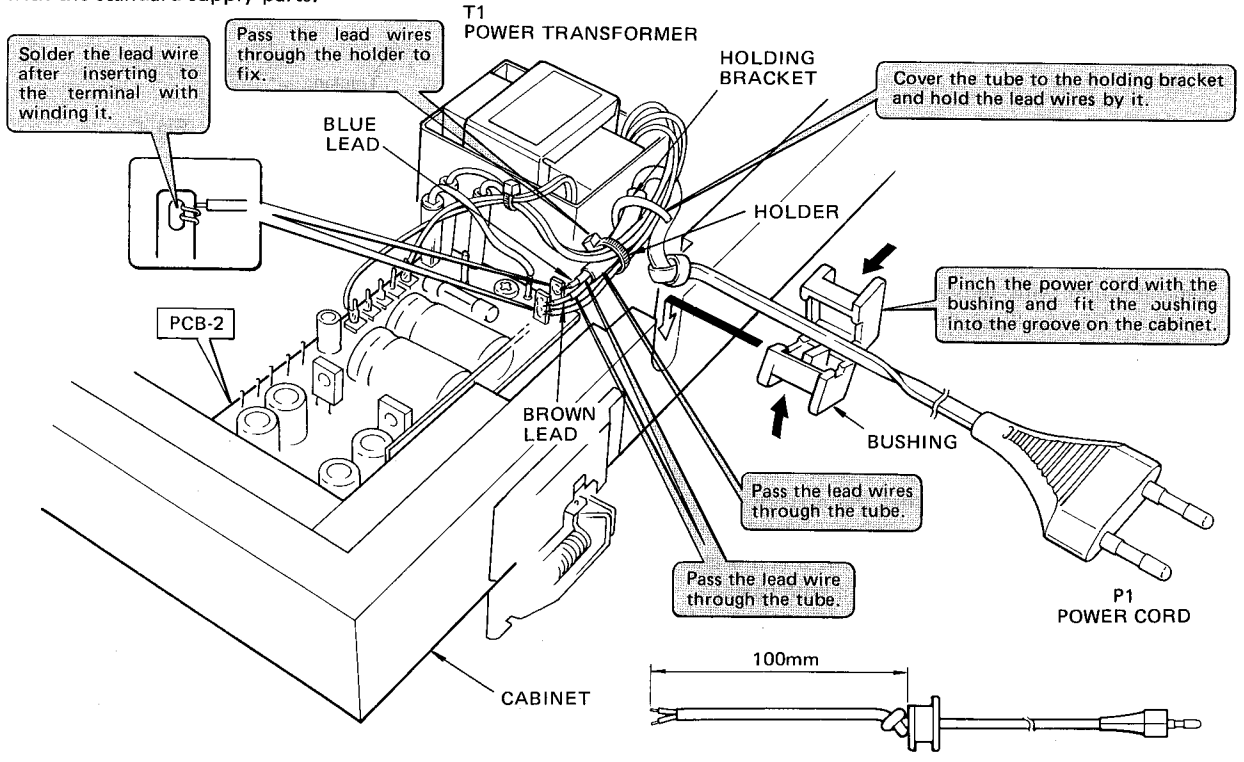
1. Remove the Cabinet Bottom Assembly (102). (Refer to step 1 .)
2. Unsolder the lead wires connected to the Motor Assembly (MO1), and disconnect the connector (LCN3) from Motor Assembly (MO1).
3. Loosen screw Ⓜ and remove the Motor Pulley (275).
4. Remove 3 screws Ⓝ and remove the Motor Assembly (MO1).

6 POWER TRANSFORMER (T1) REMOVAL

1. Remove the Cabinet Bottom Assembly (102). (Refer to step 1 .)
2. Unsolder the lead wires connected to Power Supply P.C.Board (PCB-2) from Power Transformer (T1).
3. Remove 2 screws Ⓞ and remove the Power Transformer (T1).

POWER CORD REPLACEMENT(FOR SERVICE ENGINEERS OTHER THAN NORTH AMERICA)

In order to prevent fire or shock hazard when replacing the power cord, follow the procedure below to replace the parts with the standard supply parts.



CARTRIDGE REPLACEMENT INSTRUCTION

Only use cartridges in the headshell provided. Be sure to use a cartridge weighting 4.5 to 13 grams.

1. Release the tonearm clamp and lift the tonearm gently.
2. Loosen the headshell clamp and gently pull the headshell with cartridge. (See Fig. A.)
3. Disconnect the 4 leads from cartridge pins using a tweezers and then loosen the retaining screws so that the cartridge comes out.
4. Replace the leads onto the new cartridge. Refer to Fig. B for correct placement of leads.
5. When all leads are connected properly, install cartridge to the headshell as shown in the Fig. B.
6. Temporarily tighten the retaining screw to hold the cartridge.
7. Insert the headshell with the cartridge fully into the tonearm and then tighten the headshell clamp.

When cartridge is replaced with new one, it is necessary to adjust the Overhang and Tracking angle.

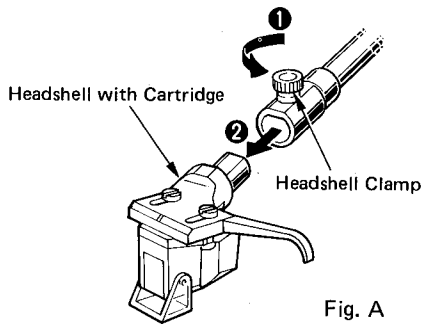


Fig. A

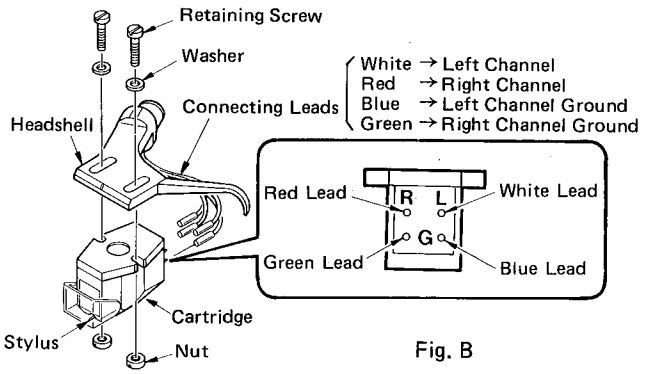


Fig. B

- **Overhang Adjustment**

1. Place the accessory tracking angle gauge on the center spindle and raise the flap.
2. Be sure to remove the stylus guard when adjusting the overhang.
3. Move the tonearm directly over the center spindle. Line up the raised flap on the gauge with the center spindle and the tonearm base. Gently move the cartridge backward or forward in the headshell so that the stylus-tip lines up with the corner of the flap.

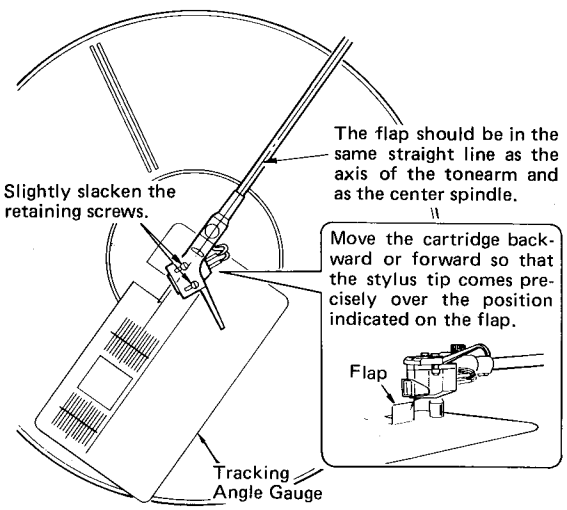


Fig. C

- **Tracking Angle Adjustment**

1. Check to be sure that the overhang adjustment has been completed.
2. Now move the tracking angle gauge until it is in the same position with respect to the tonearm as that shown in Fig. D. Place the stylus over the tracking angle setting point while keeping stylus guard attached.
3. Without changing the stylus position, turn the cartridge so that its front edge is parallel with the lines on the gauge.
4. Now move the gauge so that it is in the position shown in Fig. E and check that the cartridge is still parallel with the parallel lines as it was in step 3 above. If it is not parallel, then repeat steps 3 and 4 alternately until the cartridge is parallel in both cases.
5. When the above adjustment is completed, then fully tighten the screws that attach the cartridge to the headshell.

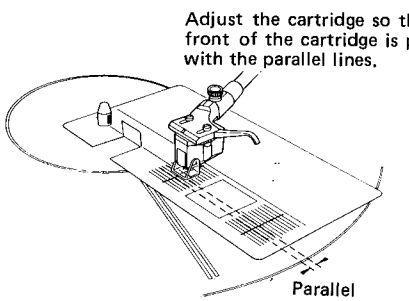


Fig. D

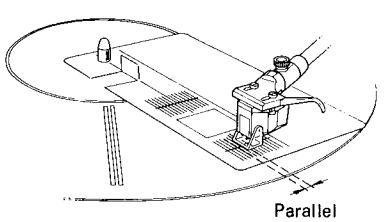


Fig. E

ALIGNMENT PROCEDURES

■ SUSPENSION ADJUSTMENT

***Conditions**

1. Make sure to install the platter, rubber platter mat and disc stabilizer.
   (It is not necessary for you to hang the drive belt between the platter and motor pulley.)
2. Install the cartridge and counter weight to the tonearm. (Set the tracking force to about 2g.)
   Secure the tonearm with the tonearm clamp so that it does not move.
3. Be sure that the power is off.

● ADJUSTMENT

1. Adjust so that the space between platter and surface of cabinet is 4mm ±0.2mm by turning screws ❶ to ❸ as shown in the Fig.1.
   (Turning these screws clockwise moves the platter down and turning them counterclockwise moves it up.)
2. After adjustments, confirm that the platter moves up and down in the well-balanced condition even if the platter is pressed down in the cabinet.

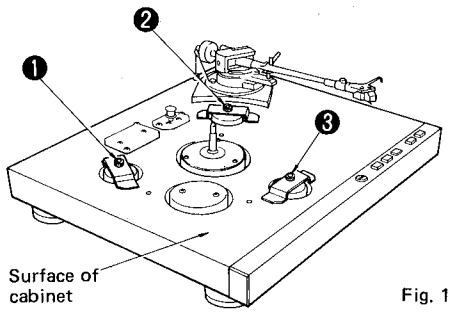


Fig. 1

■ DISC END DETECTION POSITION ADJUSTMENT

***Conditions**

Be sure not to hang the drive belt between platter and motor pulley.
Quartz Lock Switch . . . . . ON (button in)
Lift Switch . . . . . auto

● LP POSITION ADJUSTMENT

1. Depress the 33-speed button.
2. Lower the cue lever. (Arm Lifter is set to the low position.)
3. Adjust the adjustment screw so that the stylus of cartridge detects the disc end position between 111.94mm ~ 107.2mm from the center of spindle.

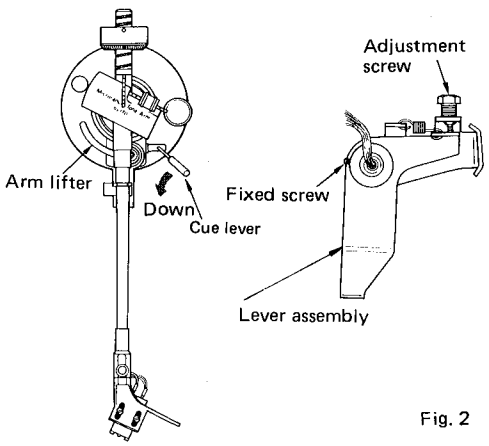


Fig. 2

● EP POSITION ADJUSTMENT

1. Depress the 45-speed button.
2. Lower the cue lever. (Arm Lifter is set to the low position.)
3. Adjust the adjustment screw so that the stylus of cartridge detects the disc end position between 102.74mm ~ 98.4mm from the center of spindle.

NOTE:

1. Turn the adjustment screw clockwise for slower lift-up and counterclockwise for faster lift-up.
2. If it is not within the rate, assumedly, it result from the attached position of lever assembly. Try to change the attaching position by loosing the fixed screw.
3. When the disc end position is detected, the motor revolution stops, and arm lifter is raised.
   If you are going to start it again, place the tonearm on armrest once.

■ MOTOR R.P.M. ADJUSTMENT

*** Instruments**

Frequency Counter

*** Conditions**

1. Be sure that the drive belt between platter and motor pulley is hang.
2. Flip the cue lever forward to lift the tonearm up.

● ADJUSTMENT

1. Depress the 33-speed button.
2. Set the quartz lock button so that it is in the up position. (In this state, the quartz lock indicator will not light even when the platter rotates.)
3. Set the speed control knob to the center position.
4. Connect the frequency counter to TP1 (+) and TP2 (−). (Refer to PCB-1 on page 13.)
5. Move tonearm over the platter, and rotate the platter.
6. Adjust VR101 so that the frequency becomes 124.8 kHz.

NOTE: Be sure to use the insulated screwdriver for adjustment.

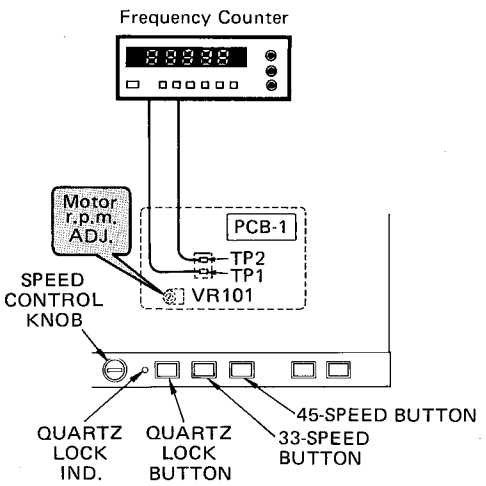
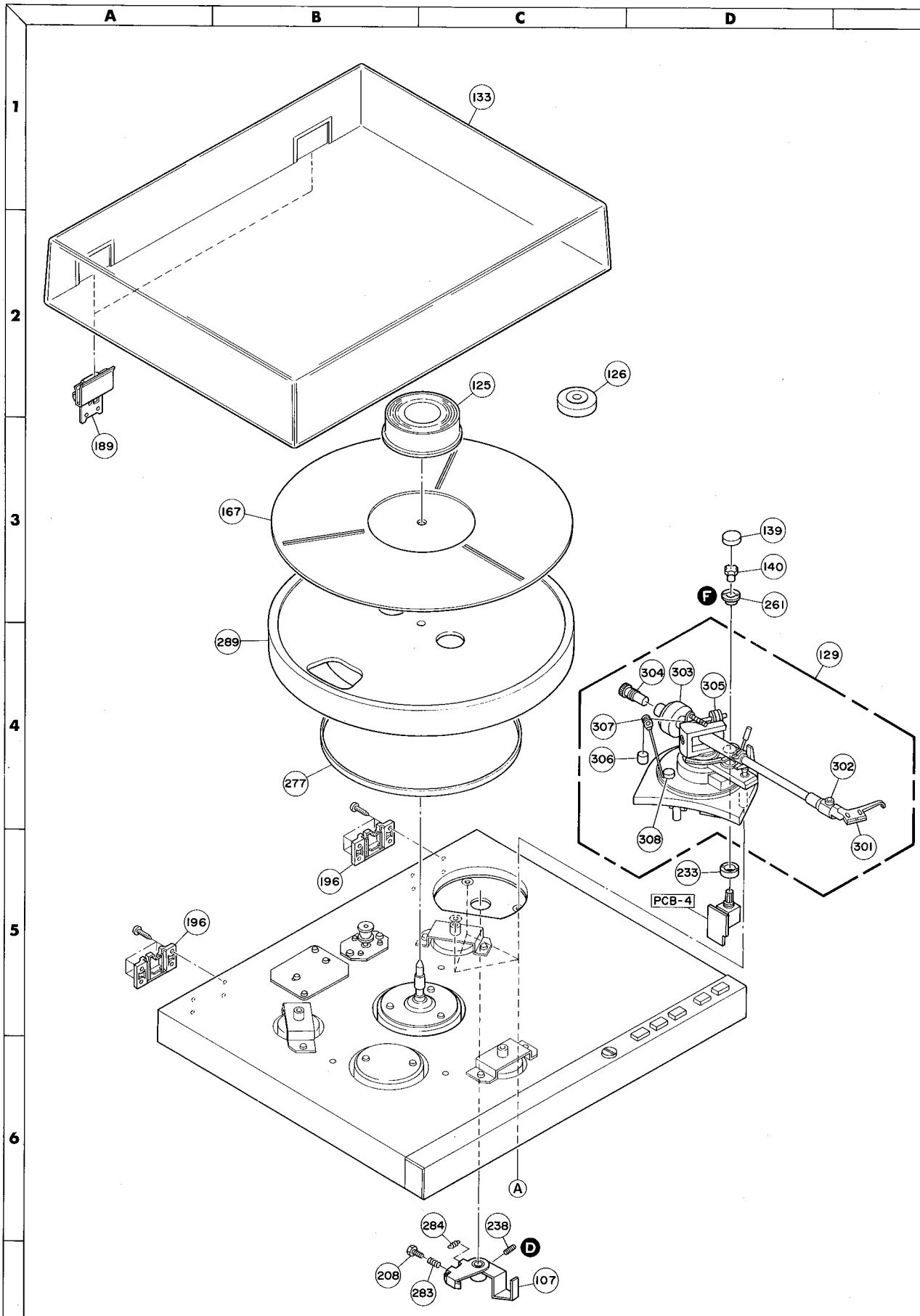
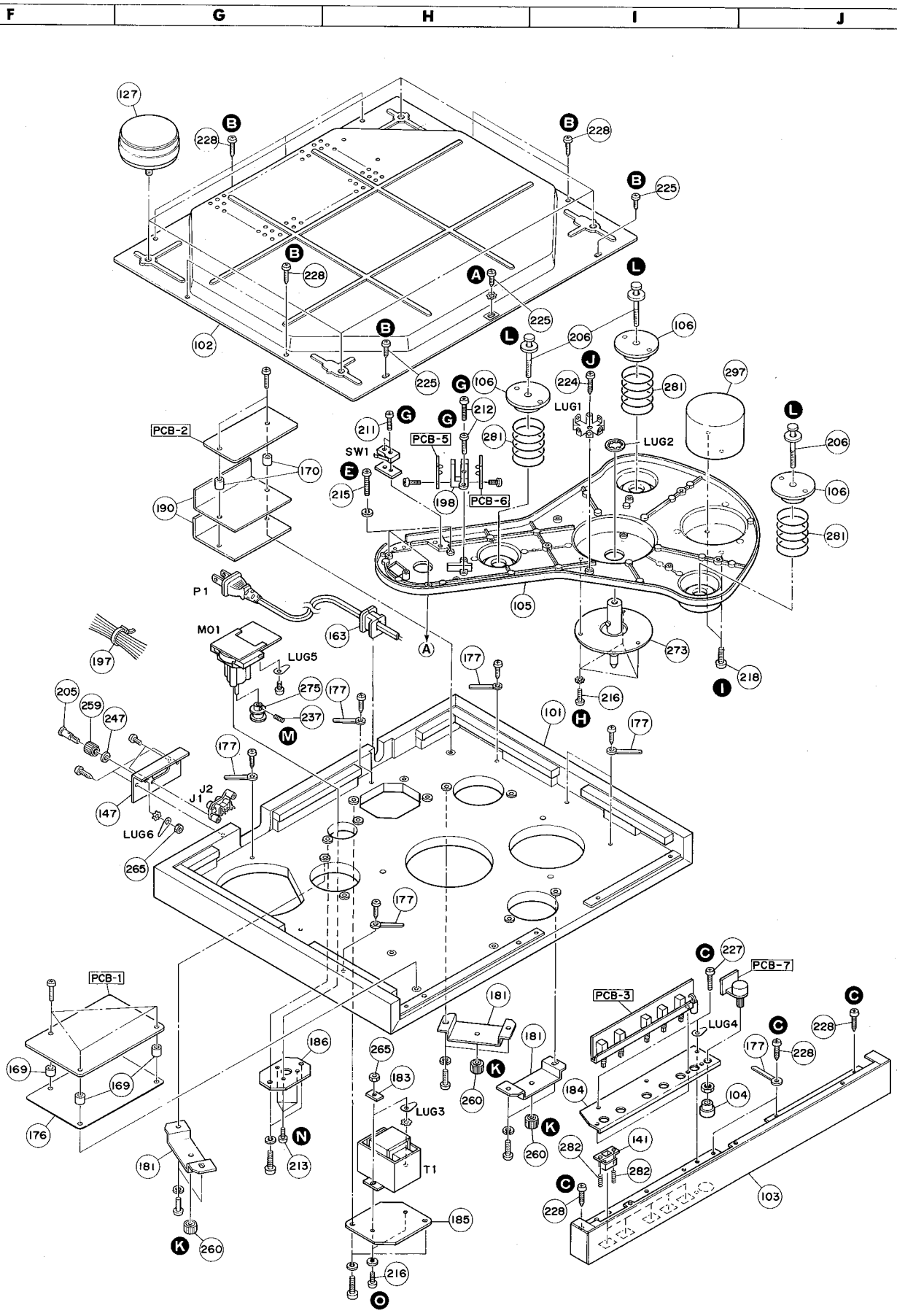


Fig. 3

GENERAL UNIT EXPLODED VIEW




F
G
H
I
J
1
2
3
4
5
6
7
127
228
225
102
106
206
281
297
224
LUG1
LUG2
211
212
SW1
215
198
PCB-2
PCB-5
PCB-6
170
190
P1
163
105
273
218
216
101
M01
LUG5
275
237
177
197
205
259
247
147
J2
J1
LUG6
265
PCB-1
169
176
186
183
LUG3
T1
185
213
260
181
PCB-3
PCB-7
227
LUG4
184
104
141
282
103

GENERAL UNIT PARTS LIST

Ref. No.	Part No.	Description
101	A415-T65CA	Cabinet Assembly (for U.S.A. and Canada models)
"	A415-T65CC	Cabinet Assembly (for General model)
"	A415-T65CD	Cabinet Assembly (for General model Military version)
102	A424-T65CA	Cabinet Bottom Assembly (for U.S.A. model)
"	A424-T65CB	Cabinet Bottom Assembly (for Canada model)
"	A424-T65CC	Cabinet Bottom Assembly (for General model)
103	A443-T65CA	Front Panel Assembly
104	A634-T65CA	Knob Assembly, Speed Control
105	B211-T65CA	Chassis Assembly (for U.S.A. and Canada models)
"	B211-T65CC	Chassis Assembly (for General model)
106	B219-T65CA	Bracket Assembly, Spring Hold
107	B672-T65CA	Lever Assembly, Auto-up
108	B219-T65CA	Bracket Assembly, Spring Hold
125	1161-00101	Disc Stabilizer
126	1362-7007	45 R.P.M. Adaptor
127	1319-0147	Foot
129	1371-717	Pick-up Assembly (w/L1)
133	1472-01301	Dust Cover
139	1634-05001	Knob, Cap. Trim
140	1355-7040	Knob Base, Cap. Trim
141	1660-00201	Push Button, Quartz Lock, 33/45 Speed, Lift, Cut
147	1724-02601	Indication Plate
163	2114-71264	Bushing, Power Cord (for U.S.A. and Canada models)
"	2114-71270	Bushing, Power Cord (for General model)
167	2115-00101	Platter Mat
169	2132-01401	Spacer
170	2132-7016	Spacer
176	2216-7134	Shield Plate
177	2218-7001	Holding Bracket
181	2219-7865	Bracket
183	2219-7359	Bracket
184	2219-8003	Bracket
185	2219-8004	Bracket
186	2219-8005	Bracket
189	2221-7120	Hinge
190	2224-7074	Insulator
196	2240-7194	Holder
197	2240-7120	Holder
198	2240-7227	Holder
205	2310-7015	Special Screw, GND
206	2310-7020	Special Screw
208	2316-300829	Hexagon-head Screw
211	2327-231029	Screw (+) (2.3X10 mm)
212	2327-300629	Screw (+) (3X6 mm)
213	2327-300649	Screw (+) (3X6 mm)
215	2327-301229	Screw (+) (3X12 mm)
216	2327-301249	Screw (+) (3X12 mm)
218	2327-401449	Screw (+) (4X14 mm)
224	2347-300822	Self-tapping Screw (+) (3X8 mm)
225	2347-300842	Self-tapping Screw (+) (3X8 mm)
227	2347-301022	Self-tapping Screw (+) (3X10 mm)
228	2347-301241	Self-tapping Screw (+) (3X12 mm)
233	2360-7010	Special Boss
237	2371-260429	Set Screw, Motor Pulley
238	2374-30042D9	Set Screw, Lever Assembly
247	2410-7005	Special Washer
259	2440-7011	Special Nut, GND
260	2440-64	Specail Nut
261	2440-7020	Special Nut
265	2446-30229	Hexagon-head Nut
273	2601-7108	Center Spindle Assembly
275	2618-7005	Motor Pulley
277	2642-02701	Drive Belt
281	2651-2101701	Spring
282	2651-2101702	Spring
283	2651-2101116	Spring
284	2651-110331	Spring
289	2665-715	Platter
297	2691-7001	Balancer
301	MA-1699	Headshell
302	MC-3752	Headshell Clamp
303	MC-6262	Counterweight

Ref. No.	Part No.	Description
304	MC-6112	Sub-counterweight
305	MC-6116	Lateral Balancer
306	MC-6129	Anti-skating Weight with Wire
307	MC-6263	Anti-skating Wire Holder
308	MC-6128	Set Screw

ELECTRICAL PARTS LIST

CHASSIS MISCELLANEOUS

⚠P1	4161-7187	Power Cord (for U.S.A. model)
⚠ "	4161-71151	Power Cord (for Canada model)
⚠ "	4161-7256	Power Cord (for General model)
⚠T1	5584-701483	Power Transformer (for U.S.A. and Canada models)
⚠ "	5584-702483	Power Transformer (for General model)
MO1	4311-1A159	Motor Assembly
⚠SW1	4431-A017128	Microswitch, Rest
J1/2	4482-7127	2-Pin Jack, Output
⚠F1	5732-801031	Fuse, 800mA, 125V (for U.S.A. and Canada models)
⚠ "	5732-501030	Fuse, T500mA, 250V (for General model)
L1	N.A. Separately	Solenoid, Auto-lift (Part of Pick-up Assembly)
LCN1	4163-701116	Connector with Lead Wire, 6 Pos.
LCN2	4163-701115	Connector with Lead Wire, 7 Pos.
LCN3	4163-701117	Connector with Lead Wire, 4 Pos.
LUG1	4211-5006	Lug Terminal
LUG2	2467-1406	Lug Terminal
LUG3, 4, 5, 6	4211-5005	Lug Terminal

PCB-1 MOTOR CONTROL P.C. BOARD

RESISTORS

R101	5174-823381	82kΩ, ±1%, 1/4W, Metal
R102	5174-104381	100kΩ, ±1%, 1/4W, Metal
R106	5174-474381	470kΩ, ±1%, 1/4W, Metal
R107	5174-562381	5.6kΩ, ±1%, 1/4W, Metal
R119	5174-393381	39kΩ, ±1%, 1/4W, Metal

CONTROL

VR101	5101-1031926	10kΩ

CAPACITORS

C101, 114	5345-474F041	0.47μF, ±20%, 50V, Electrolytic
C104, 108	5345-476C041	47μF, ±20%, 16V, Electrolytic
C105	5345-107C041	100μF, ±20%, 16V, Electrolytic
C106	5345-227C041	220μF, ±20%, 16V, Electrolytic
C109	5345-107C041	100μF, ±20%, 16V, Electrolytic
C110	5345-225F0952	2.2μF, ±20%, 50V, Electrolytic
C113	5345-225F041	2.2μF, ±20%, 50V, Electrolytic
C201	5345-106C041	10μF, ±20%, 16V, Electrolytic
C202	5345-475F0952	4.7μF, ±20%, 50V, Electrolytic
C203	5345-475F041	4.7μF,± 20%, 50V, Electrolytic

INTEGRATED CIRCUIT

IC101	5654-TC9142P	TC9142P
IC102	5654-TC4069BP	TC4069UBP

TRANSISTORS

Q101, 102, 103, 104, 105, 201, 203	5613-2603(E)	2SC2603(E) or 2SC2603(F)
Q106	5611-1115(E)	2SA1115(E) or 2SA1115(F)
Q202	5613-3246(H)	2SC3246(H)

DIODES

D101	5635-HZ9B3L	Zener, HZ9B3L
D102, 201	5631-1S2473	1S2473
D202	5632-1SR35-10	1SR35-100

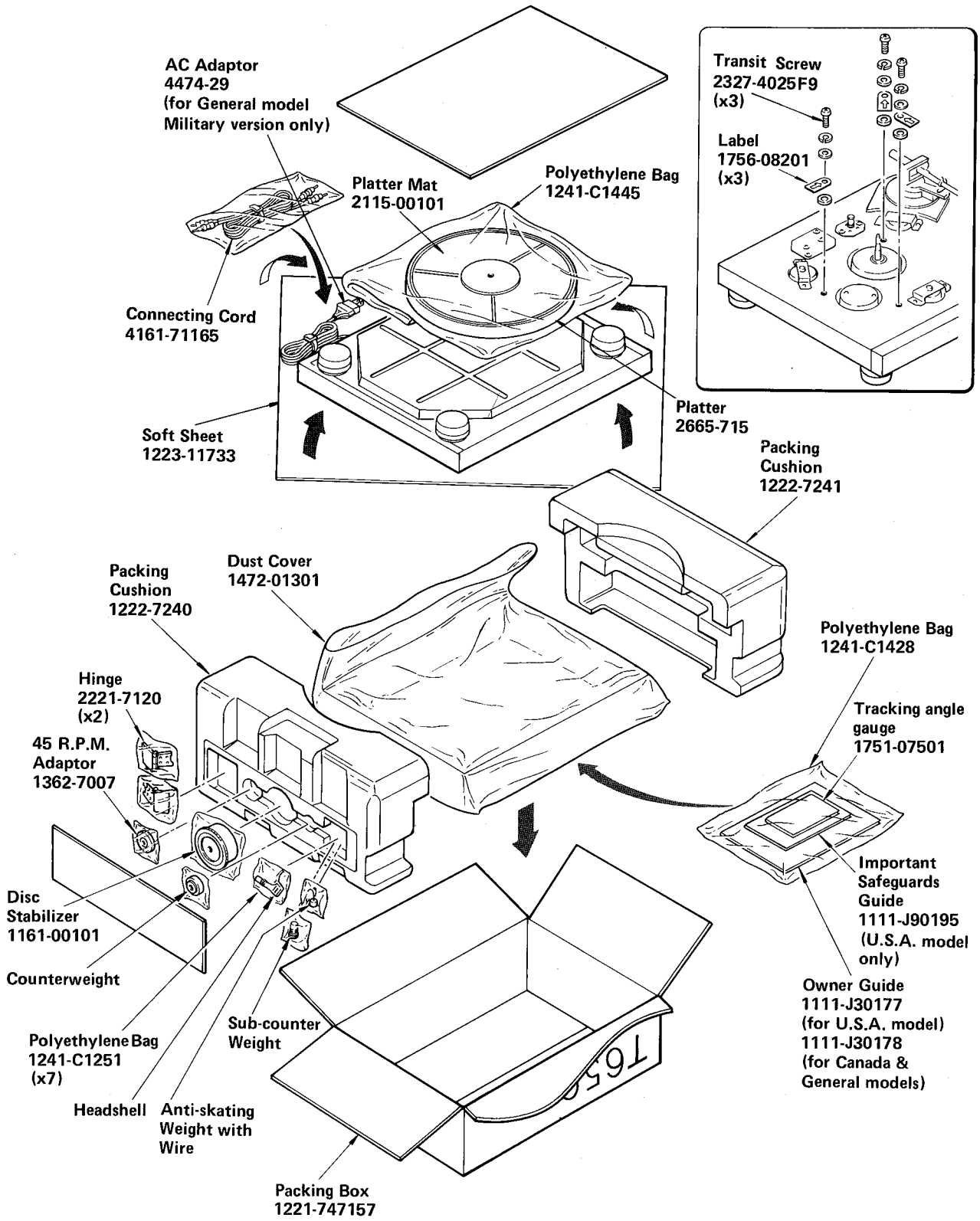
MISCELLANEOUS

X101	5691-03993623	Crystal, Osc.
SCR201	5661-03P05M	Thyristor, 03P05M
CN1	4443-064116	Connector, 6 Pos.
CN2	4443-074116	Connector, 7 Pos.

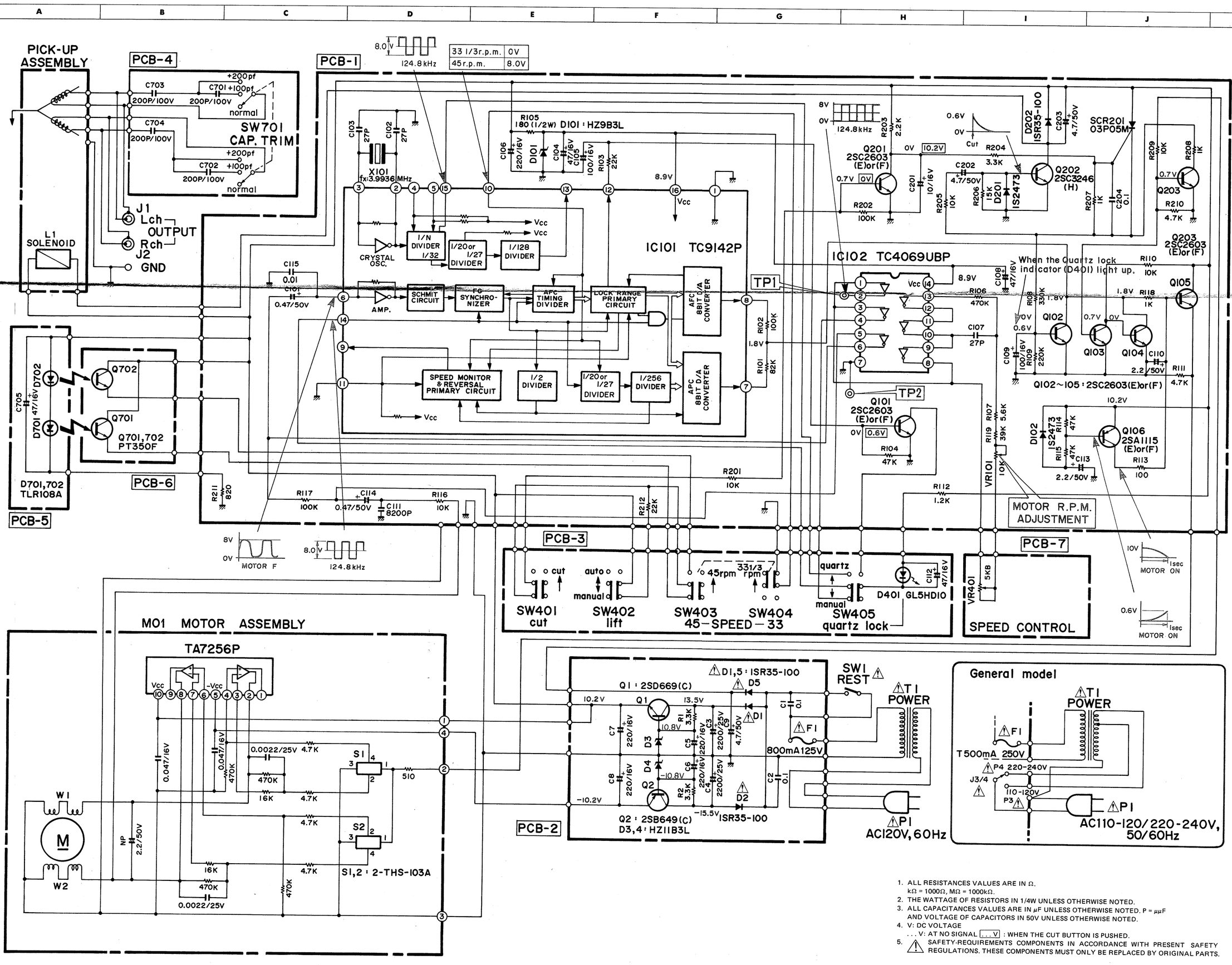
Ref. No.	Part No.	Description
	PCB-2 POWER SUPPLY P.C. BOARD	
	CAPACITORS	
C3, 4	5345-228D041	2200μF, ±20%, 25V, Electrolytic
C5, 6, 7, 8	5345-227C041	220μF, ±20%, 16V, Electrolytic
C9	5345-475F041	4.7μF, ±20%, 50V, Electrolytic
	TRANSISTORS	
Q1	5614-669(C)	2SD669(C)
Q2	5612-649(C)	2SB649(C)
	DIODES	
⚠ D1, 2, 5	5632-1SR35-10	1SR35-100
D3, 4	5635-HZ11B3L	Zener, HZ11B3L
	MISCELLANEOUS	
⚠ P3/4	4442-2	Connector (General model only)
⚠ J3/4	D443-T55CA	Connector with Lead Wire (General model only)
	4472-0131	Fuse Holder (X2)
	PCB-3 CONTROL SWITCHES P.C. BOARD	
	CAPACITOR	
C112	5345-476C041	47μF, ±20%, 16V, Electrolytic
	DIODE	
D401	5637-GL5HD10	L.E.D., GL5HD10, Quartz Lock Indicator
	MISCELLANEOUS	
SW401, 402, 403, 404, 405	4431-05107154	Push Switch, Cut, Lift, 45/33 Speed, Quartz Lock
	PCB-4 CAPACITANCE TRIM SELECTOR P.C. BOARD	
	CAPACITORS	
C701, 702, 703, 704	5359-2015851	200pF, ±5%, 100V, Polypropylene
	MISCELLANEOUS	
SW701	4411-203722	Rotary Switch, Cap. Trim
	PCB-5 LED P.C. BOARD	
	CAPACITOR	
C705	5345-476C0951	47μF, ±20%, 16V, Electrolytic
	DIODE	
D701, 702	5637-TLR108A	L.E.D., TLR108A
	PCB-6 PHOTO TRANSISTOR P.C. BOARD	
Q701, 702	5621-PT350F	Photo Transistor, PT350F
	PCB-7 SPEED CONTROL P.C. BOARD	
VR401	5113-50273136	5kΩB, Speed Control

⚠ SAFETY RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

PACKAGE

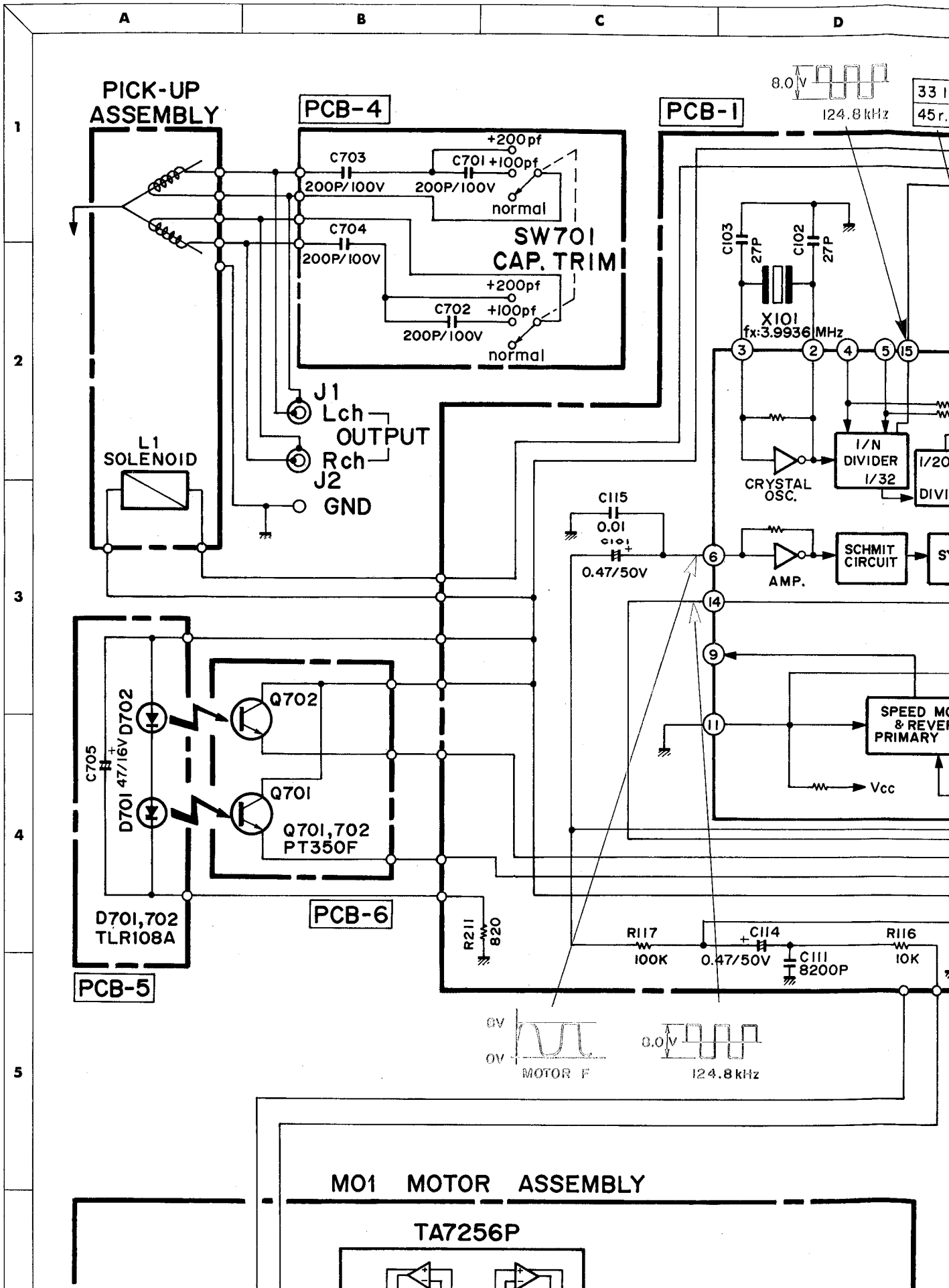

AC Adaptor
4474-29
(for General model
Military version only)
Platter Mat
2115-00101
Polyethylene Bag
1241-C1445
Transit Screw
2327-4025F9
(x3)
Label
1756-08201
(x3)
Connecting Cord
4161-71165
Soft Sheet
1223-11733
Platter
2665-715
Packing
Cushion
1222-7241
Packing
Cushion
1222-7240
Dust Cover
1472-01301
Polyethylene Bag
1241-C1428
Hinge
2221-7120
(x2)
45 R.P.M.
Adaptor
1362-7007
Tracking angle
gauge
1751-07501
Disc
Stabilizer
1161-00101
Counterweight
Important
Safeguards
Guide
1111-J90195
(U.S.A. model
only)
Owner Guide
1111-J30177
(for U.S.A. model)
1111-J30178
(for Canada &
General models)
Polyethylene Bag
1241-C1251
(x7)
Sub-counter
Weight
Headshell
Anti-skating
Weight with
Wire
Packing Box
1221-747157

SCHEMATIC DIAGRAM



1. ALL RESISTANCES VALUES ARE IN Ω.
   kΩ = 1000Ω, MΩ = 1000kΩ.
2. THE WATTAGE OF RESISTORS IN 1/4W UNLESS OTHERWISE NOTED.
3. ALL CAPACITANCES VALUES ARE IN μF UNLESS OTHERWISE NOTED. P = μμF AND VOLTAGE OF CAPACITORS IN 50V UNLESS OTHERWISE NOTED.
4. V: DC VOLTAGE
   . . . V: AT NO SIGNAL [. . . V] : WHEN THE CUT BUTTON IS PUSHED.
5. ⚠ SAFETY-REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS. THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

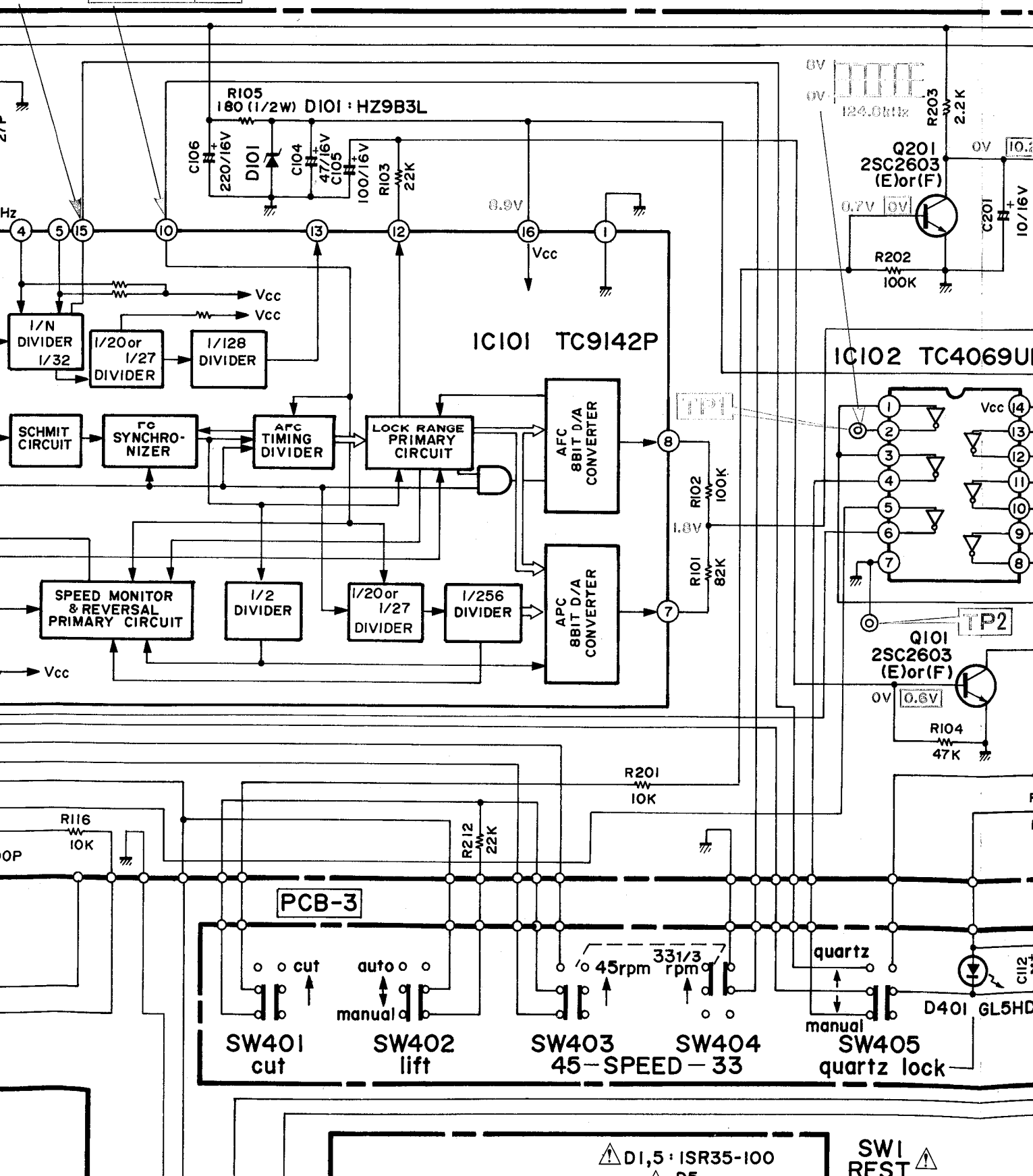
SCHEMATIC DIAGRAM



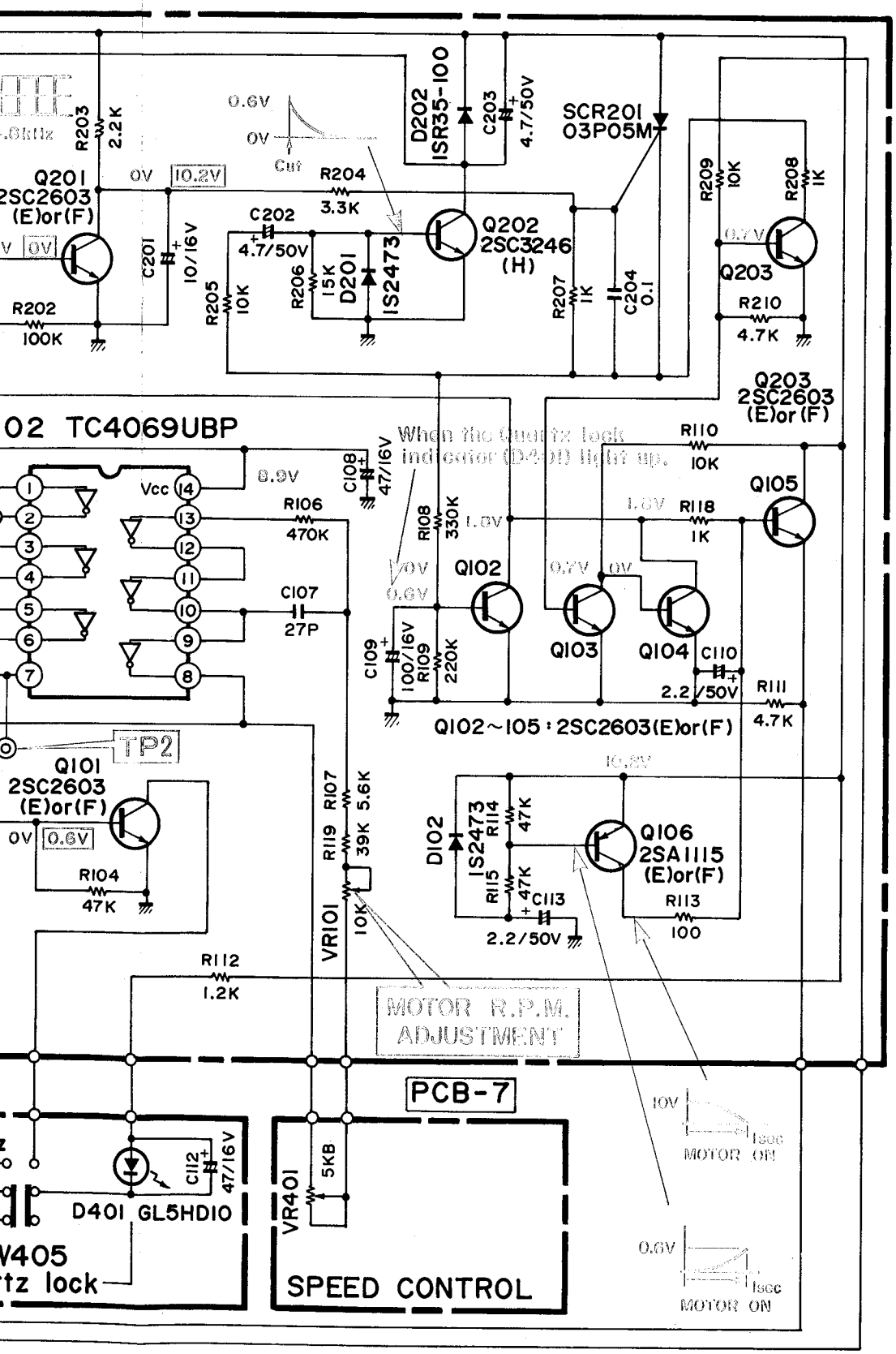
D	E	F	G	H

33 1/3r.p.m.	0V
45r.p.m.	8.0V

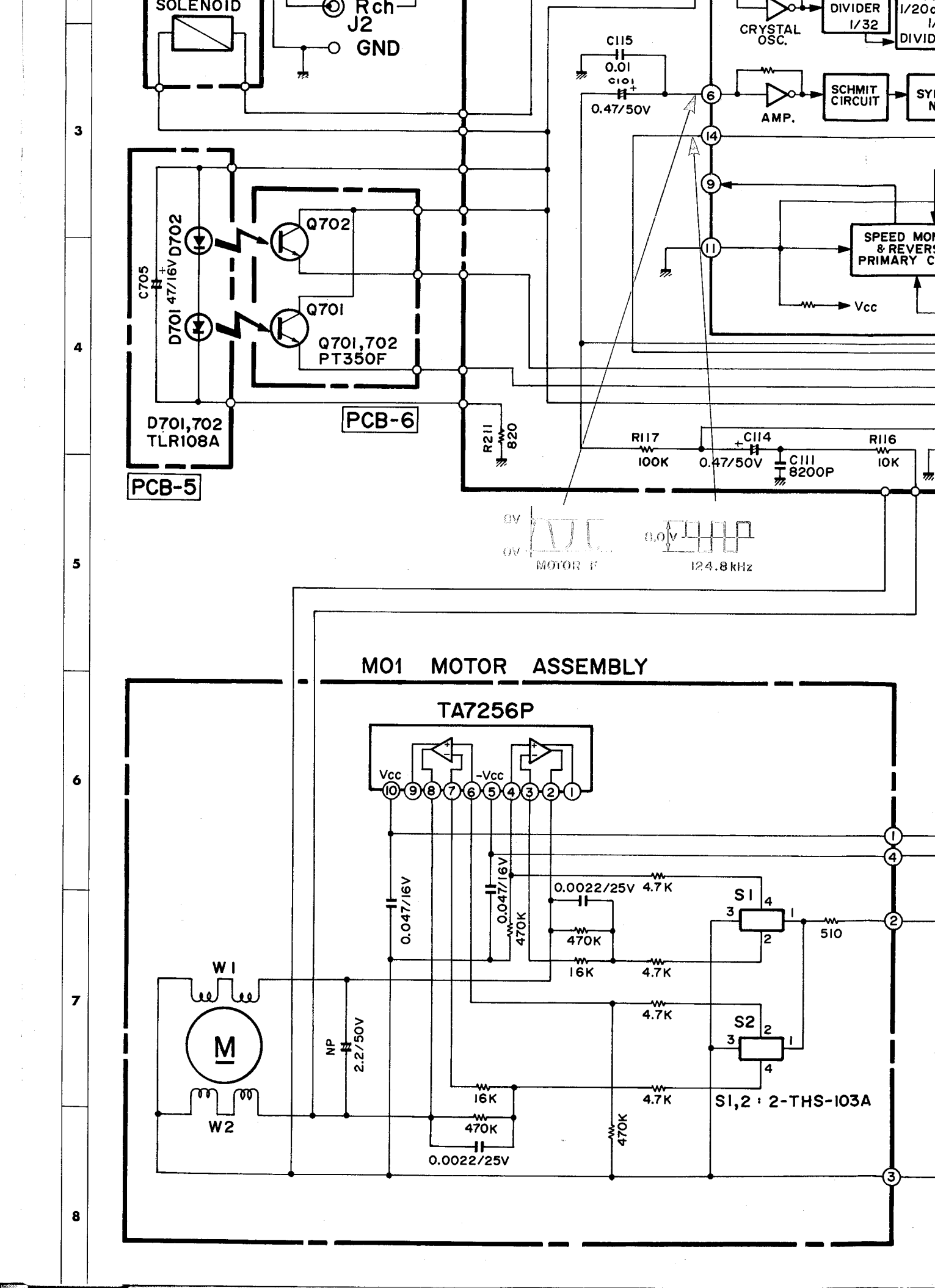
24.8kHz

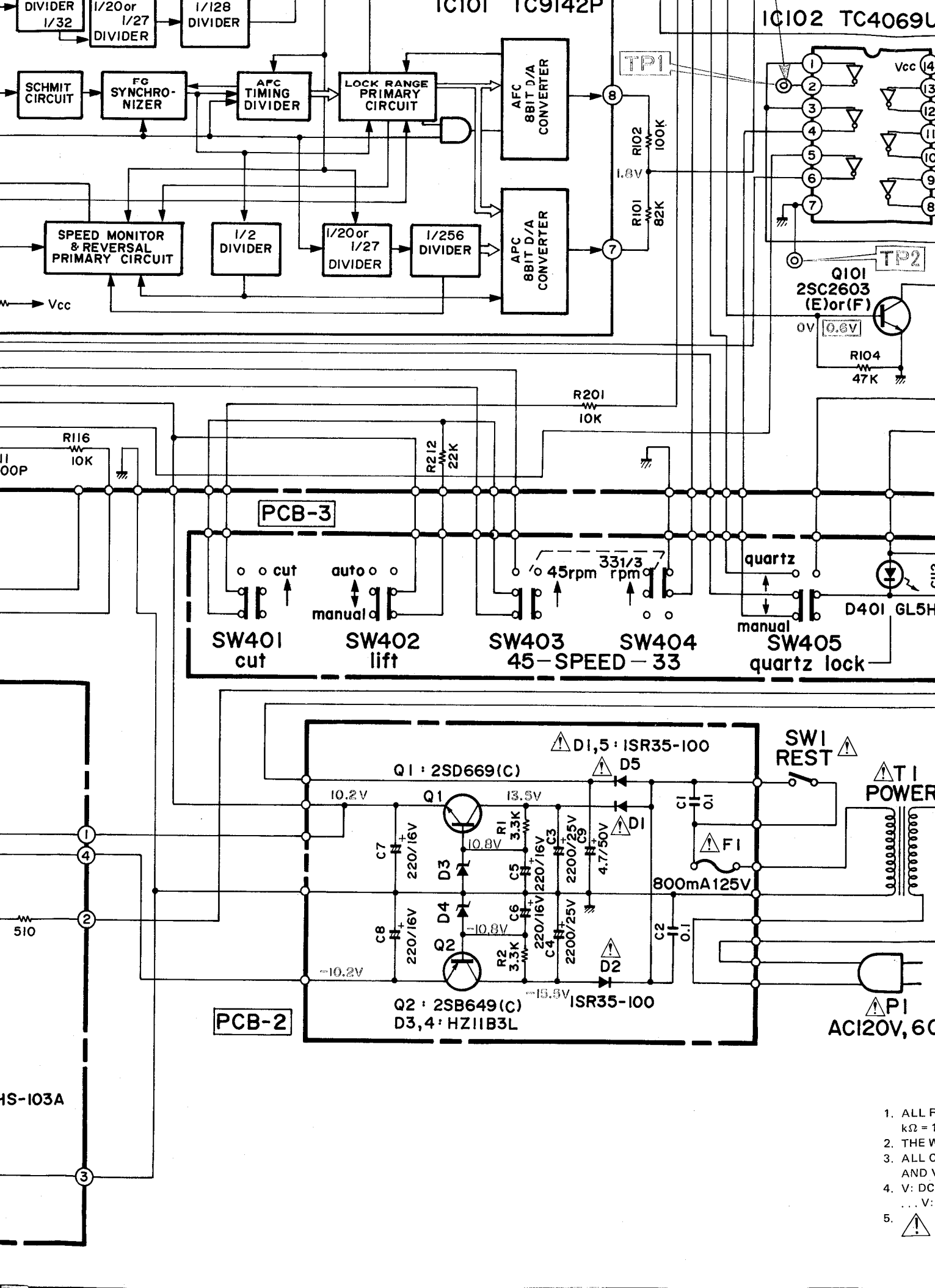


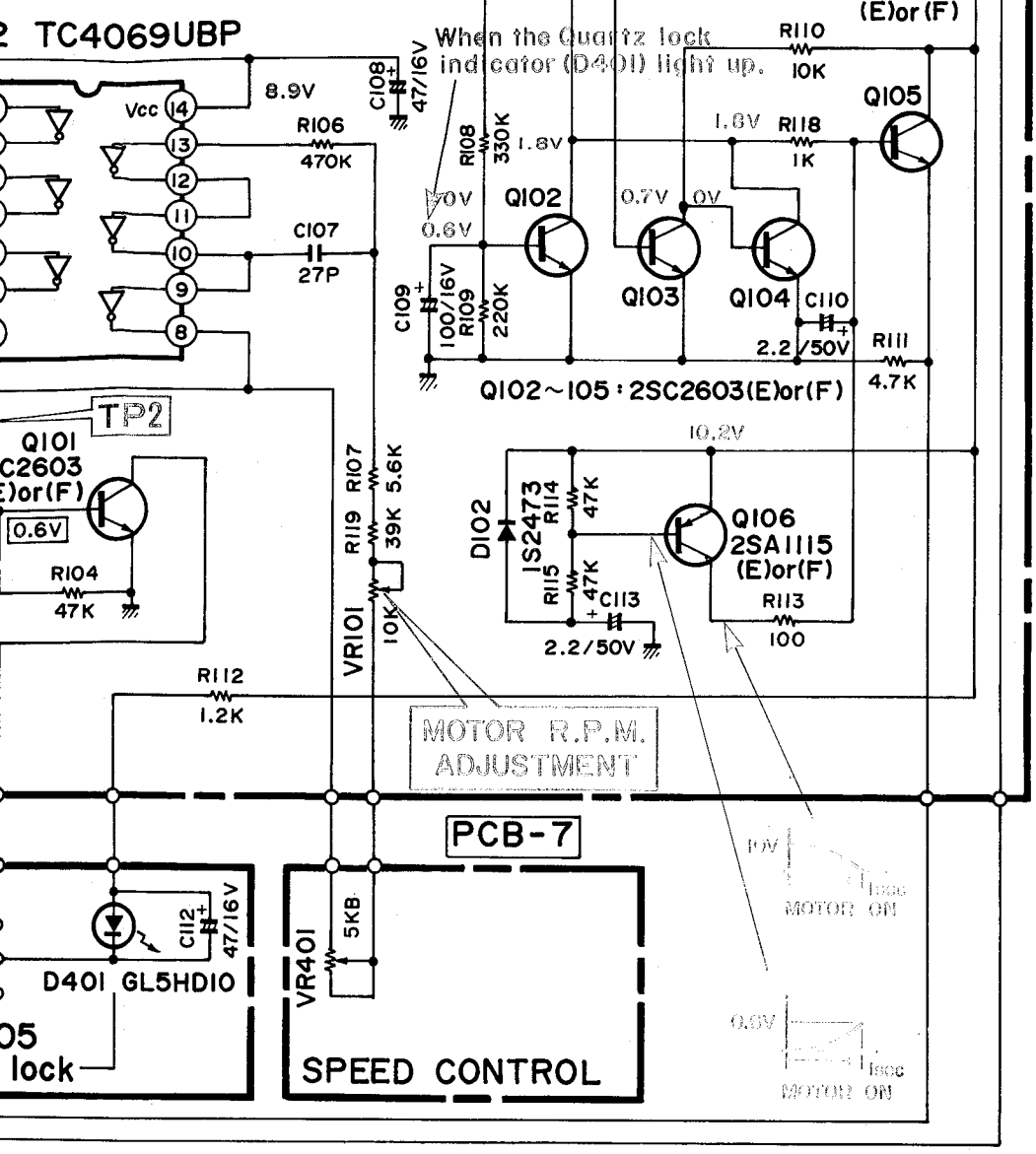
H	I	J	K

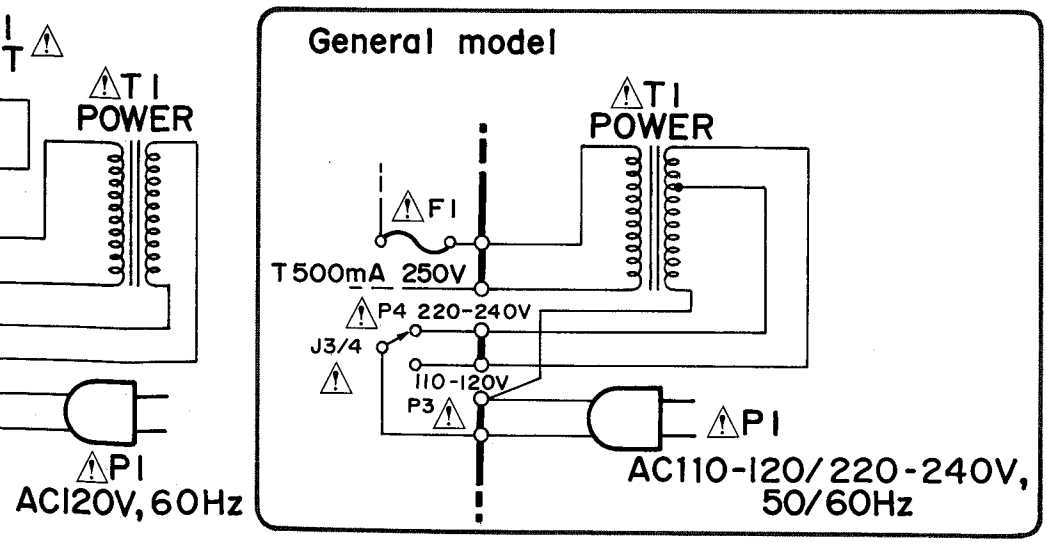


General model


SOLENOID
Rch
J2
GND
C115
0.01
C101
0.47/50V
CRYSTAL OSC.
DIVIDER 1/32
AMP.
SCHMIT CIRCUIT
SPEED MON & REVERS PRIMARY C
Vcc
Q702
Q701
Q701,702 PT350F
C705 47/16V
D701
D702
D701,702 TLR108A
PCB-5
PCB-6
R211 820
R117 100K
C114 0.47/50V
C111 8200P
R116 10K
9V
0V
MOTOR F
8.0V
124.8kHz
M01 MOTOR ASSEMBLY
TA7256P
Vcc
-Vcc
0.047/16V
0.0022/25V
4.7K
470K
16K
S1
S2
510
W1
W2
M
NP
2.2/50V
S1,2 : 2-THS-103A


IC101 TC9142P
IC102 TC4069U
1/32 DIVIDER
1/20or 1/27 DIVIDER
1/128 DIVIDER
SCHMIT CIRCUIT
FG SYNCHRO-NIZER
AFC TIMING DIVIDER
LOCK RANGE PRIMARY CIRCUIT
AFC 8BIT D/A CONVERTER
APC 8BIT D/A CONVERTER
SPEED MONITOR & REVERSAL PRIMARY CIRCUIT
1/2 DIVIDER
1/20or 1/27 DIVIDER
1/256 DIVIDER
Vcc
TP1
TP2
R102 100K
R101 82K
1.8V
Q101 2SC2603 (E)or(F)
0V
0.6V
R104 47K
R201 10K
R116 10K
R212 22K
PCB-3
cut
auto
manual
45rpm
33 1/3 rpm
quartz
manual
D401 GL5H
SW401 cut
SW402 lift
SW403 45-SPEED-33
SW404
SW405 quartz lock
D1,5 : ISR35-100
Q1 : 2SD669(C)
D5
SW1 REST
T1 POWER
10.2V
Q1
13.5V
10.8V
R1 3.3K
C7 220/16V
D3
C5 220/16V
C3 2200/25V
C9 4.7/50V
D1
C1 0.1
F1
800mA125V
D4
C6 220/16V
C8 220/16V
-10.8V
Q2
R2 3.3K
C4 2200/25V
D2
C2 0.1
-10.2V
-15.5V
ISR35-100
Q2 : 2SB649(C)
D3,4 : HZ11B3L
PCB-2
P1
AC120V, 60
510
HS-103A
1. ALL R
kΩ = 1
2. THE W
3. ALL C
AND V
4. V: DC
... V:
5.





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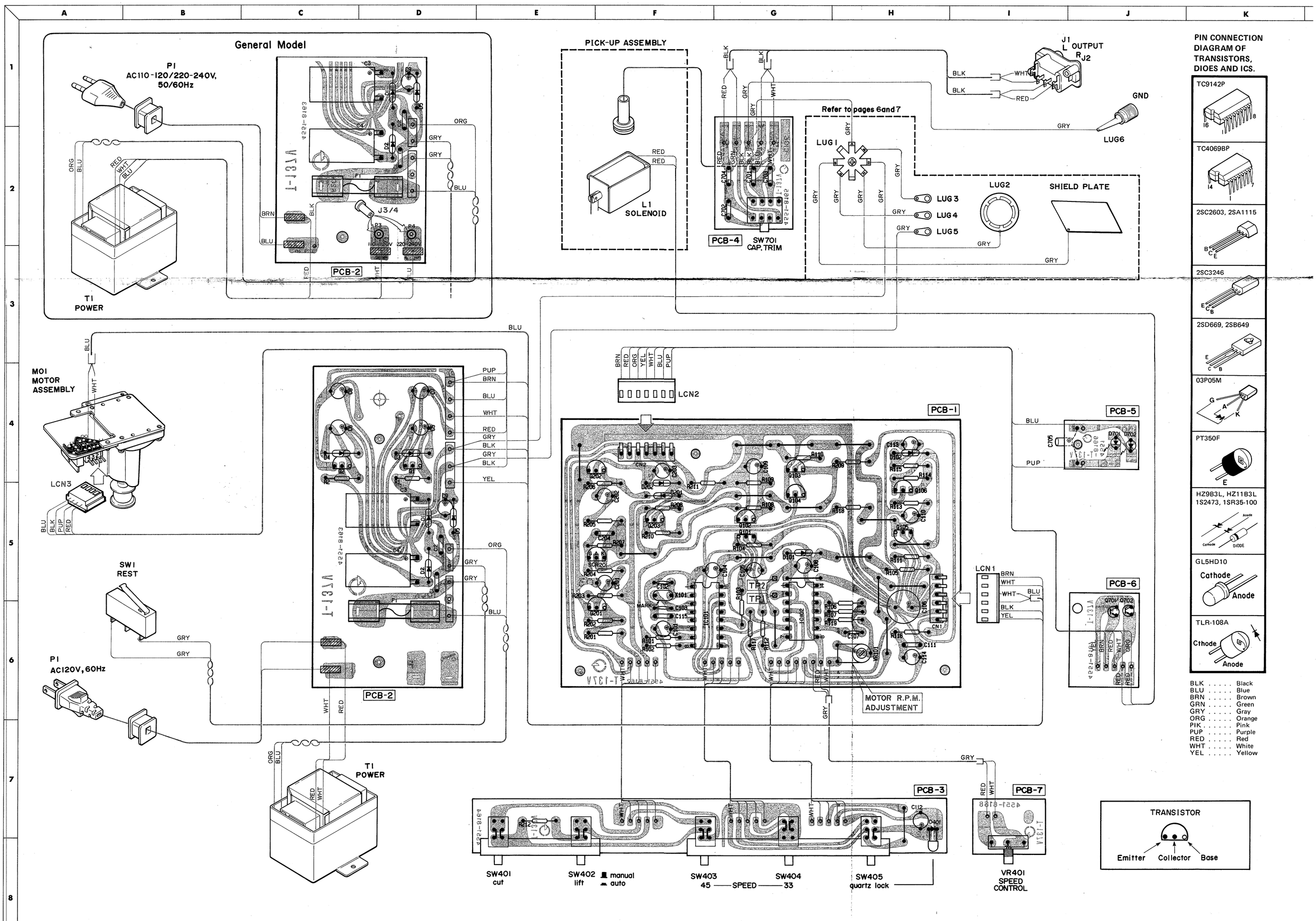
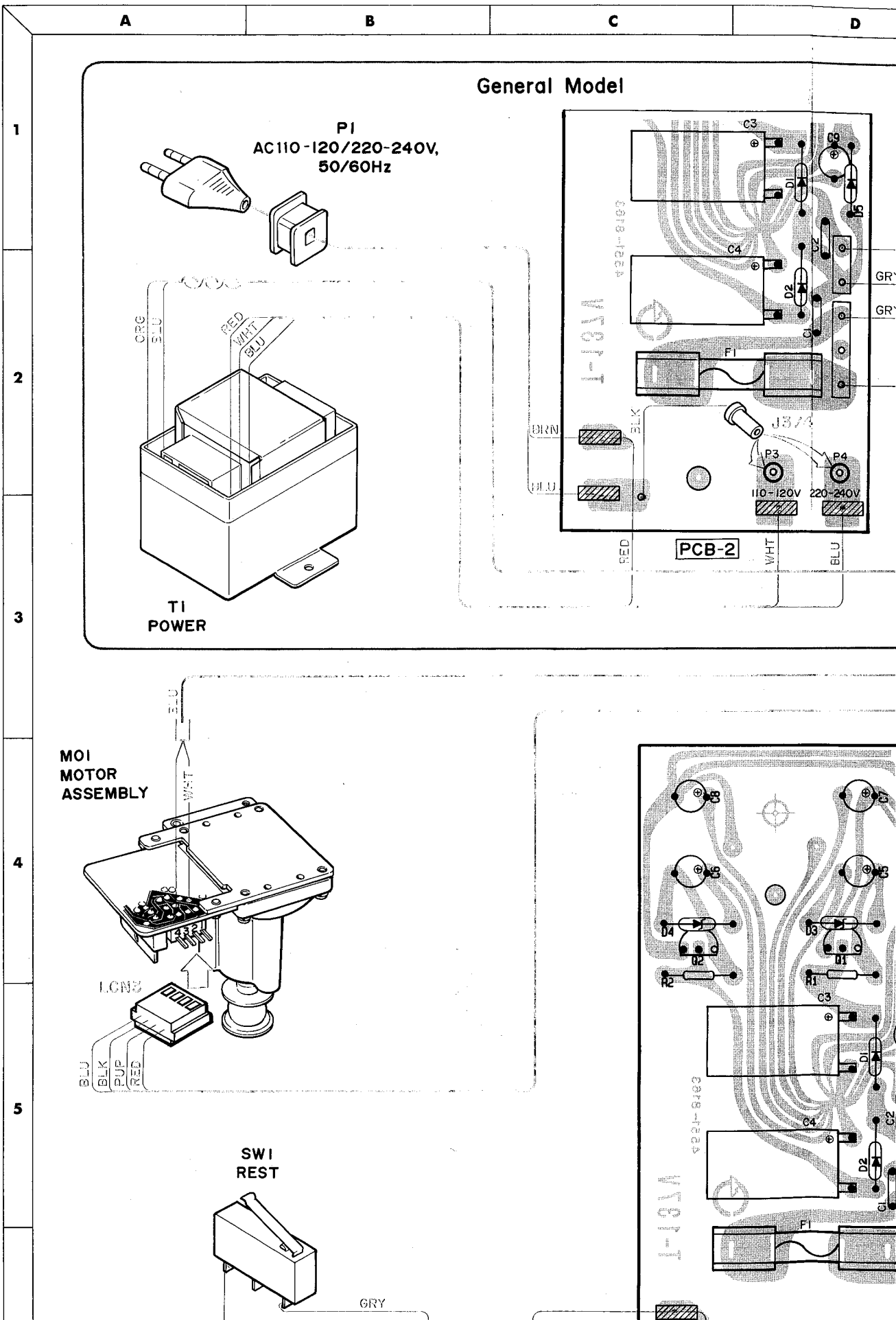
WIRING DIAGRAM



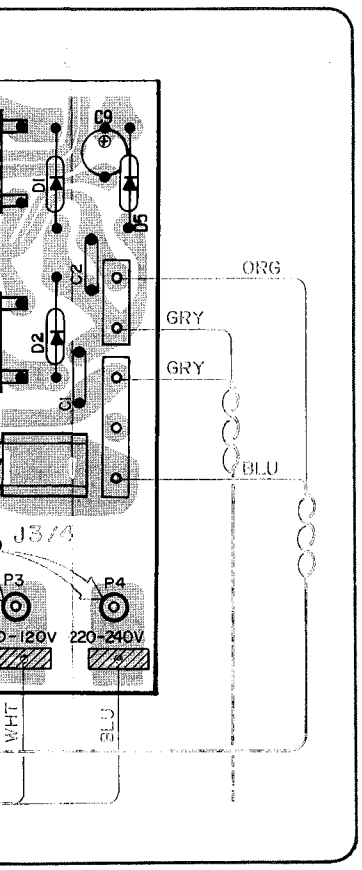
PIN CONNECTION DIAGRAM OF TRANSISTORS, DIOES AND ICS.

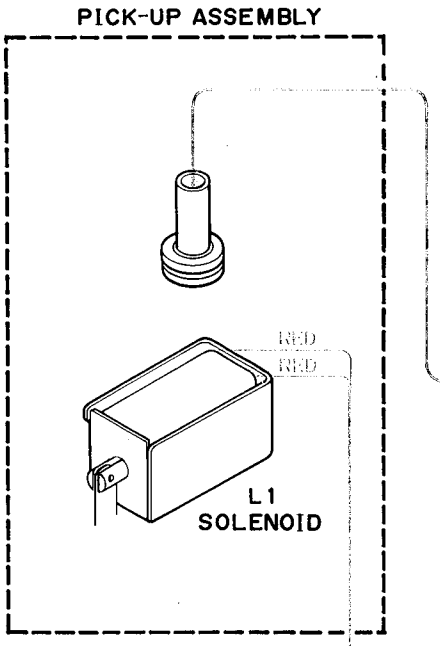
BLK . . . . . Black
BLU . . . . . Blue
BRN . . . . . Brown
GRN . . . . . Green
GRY . . . . . Gray
ORG . . . . . Orange
PIK . . . . . Pink
PUP . . . . . Purple
RED . . . . . Red
WHT . . . . . White
YEL . . . . . Yellow

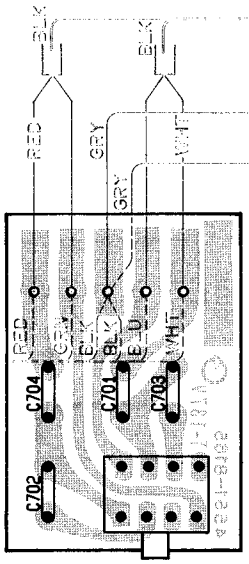
WIRING DIAGRAM

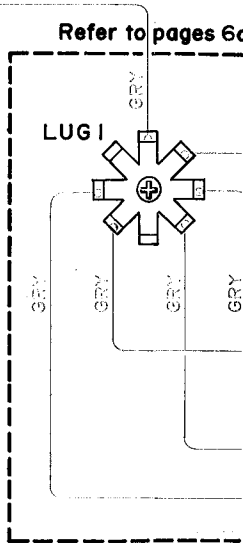


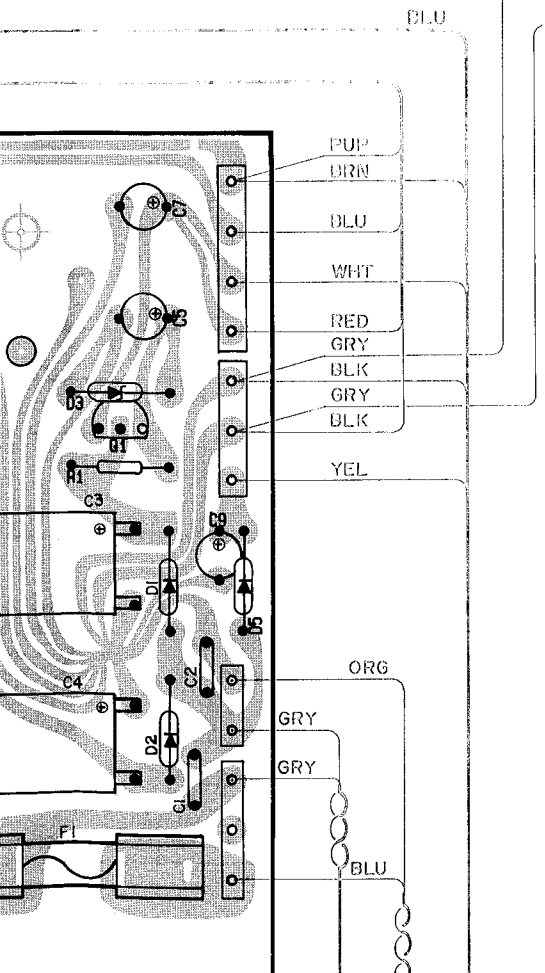
D	E	F	G

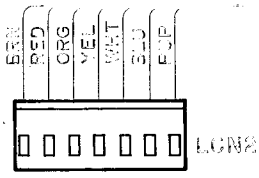

C9
D1
C5
C2
D2
C1
ORG
GRY
GRY
BLU
J3/4
P3
P4
0-120V
220-240V
WHT
BLU

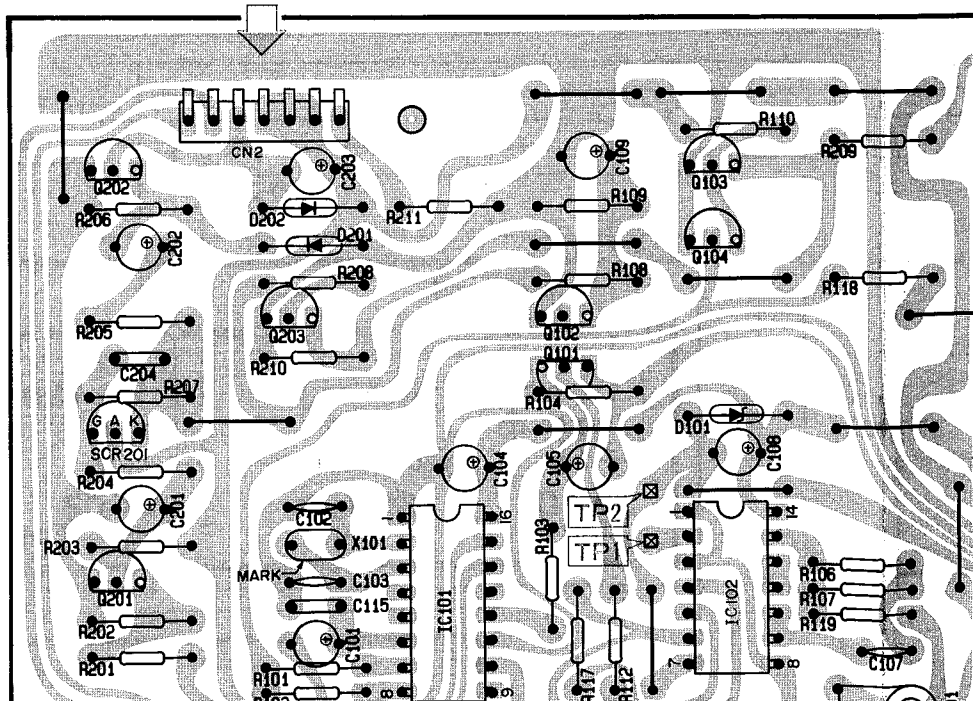

PICK-UP ASSEMBLY
RED
RED
L1
SOLENOID

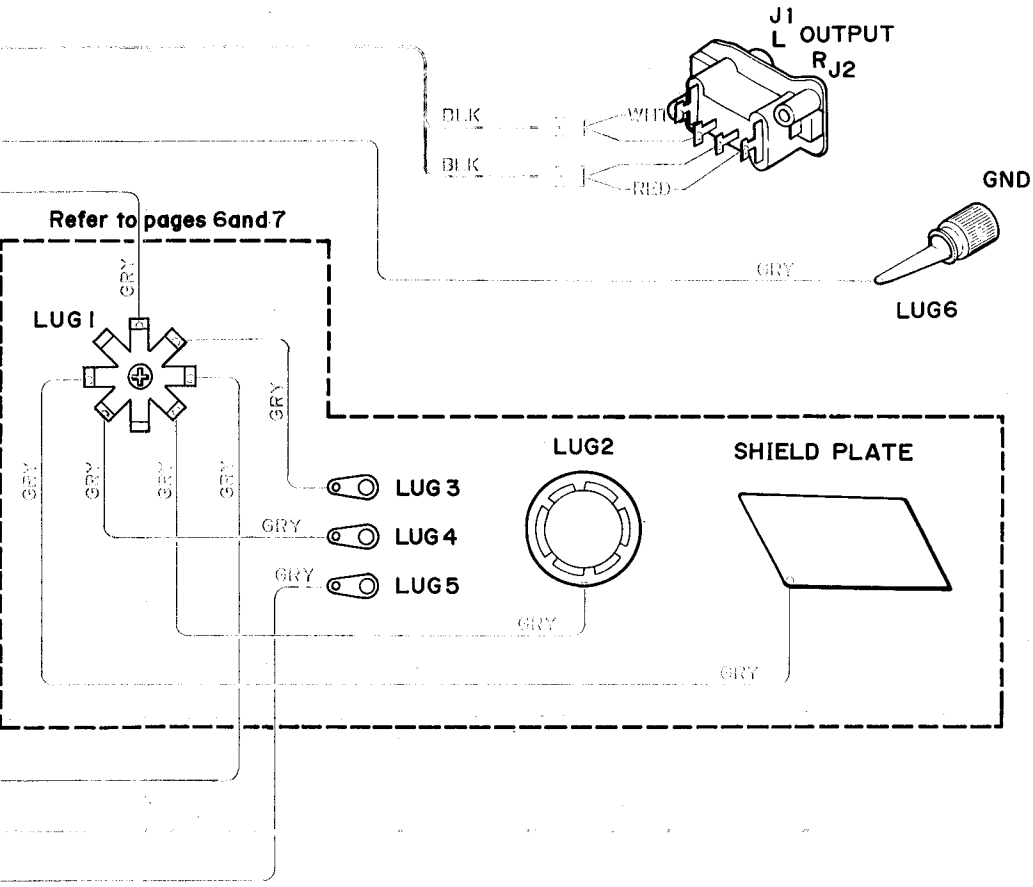

BLK
BLK
RED
GRY
GRY
WHT
C704
C701
C709
C702
PCB-4
SW701
CAP. TRIM


Refer to pages 6d
LUG I
GRY
GRY
GRY
GRY


BLU
PUR
BRN
BLU
WHT
RED
GRY
BLK
GRY
BLK
YEL
C3
C9
D1
C5
C2
D2
C1
C4
F1
ORG
GRY
GRY
BLU

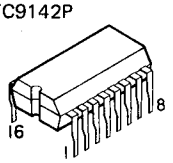

BRN
RED
ORG
YEL
WHT
BLU
PUR
LCN2


CN2
Q202
R206
C202
D202
C203
R211
D201
R208
Q203
R210
R205
C204
R207
SCR201
R204
C201
R203
Q201
R202
R201
C102
X101
MARK
C103
C115
C101
R101
IC101
C104
C105
TP2
TP1
R103
R112
R117
IC102
R110
R209
Q103
C106
R109
Q104
R108
Q102
Q101
R104
D101
R118
R106
R107
R119
C107

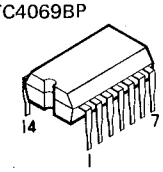


PIN CONNECTION DIAGRAM OF TRANSISTORS, DIOES AND ICS.

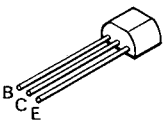
TC9142P



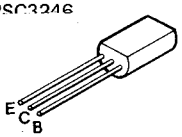
TC4069BP



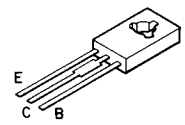
2SC2603, 2SA1115



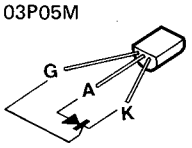
2SC3246



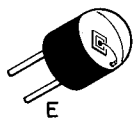
2SD669, 2SB649



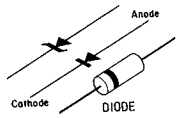
03P05M



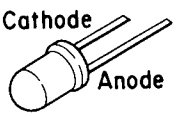
PT350F



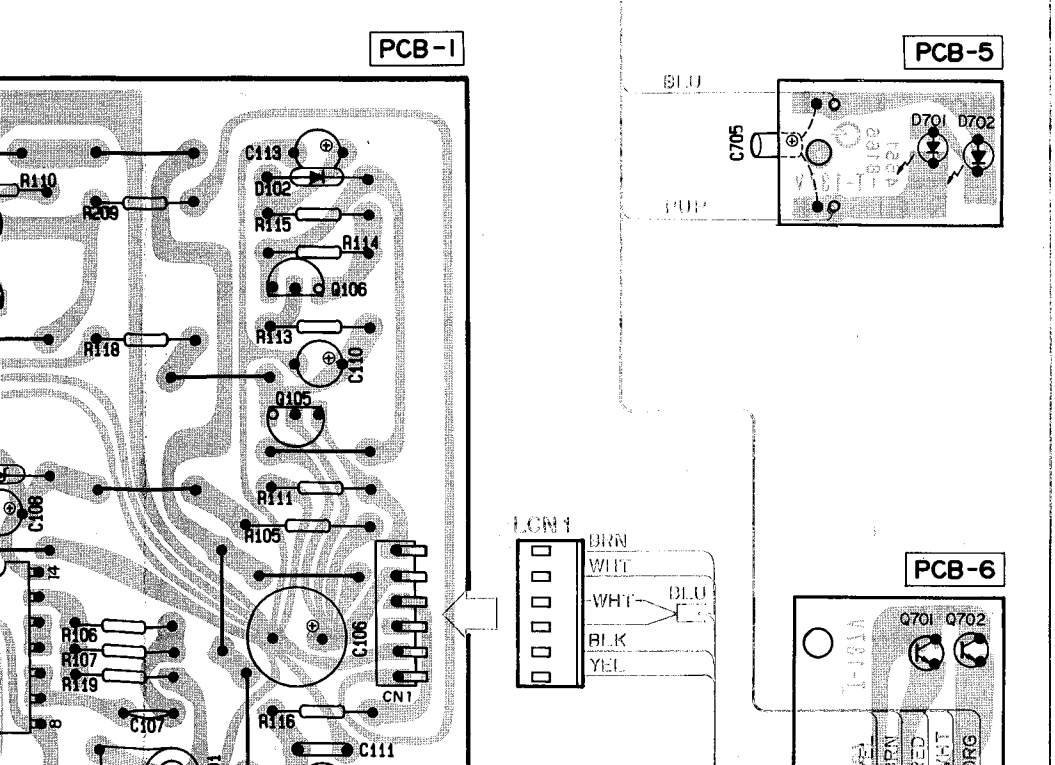
HZ9B3L, HZ11B3L
1S2473, 1SR35-100

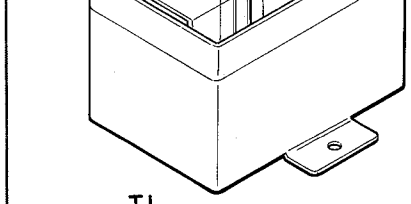


GL5HD10

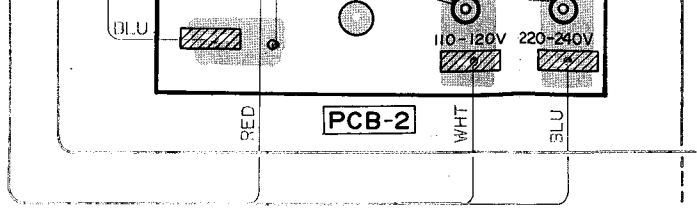


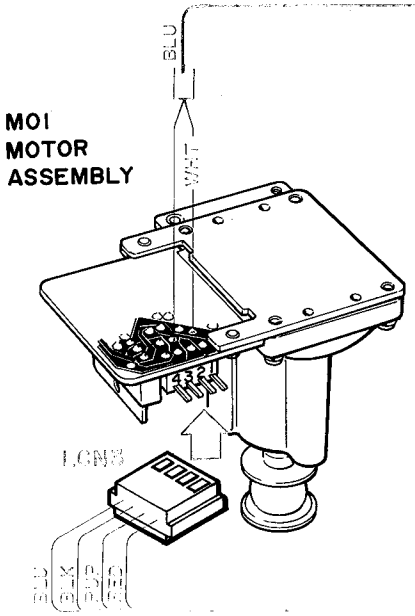
TLR-108A

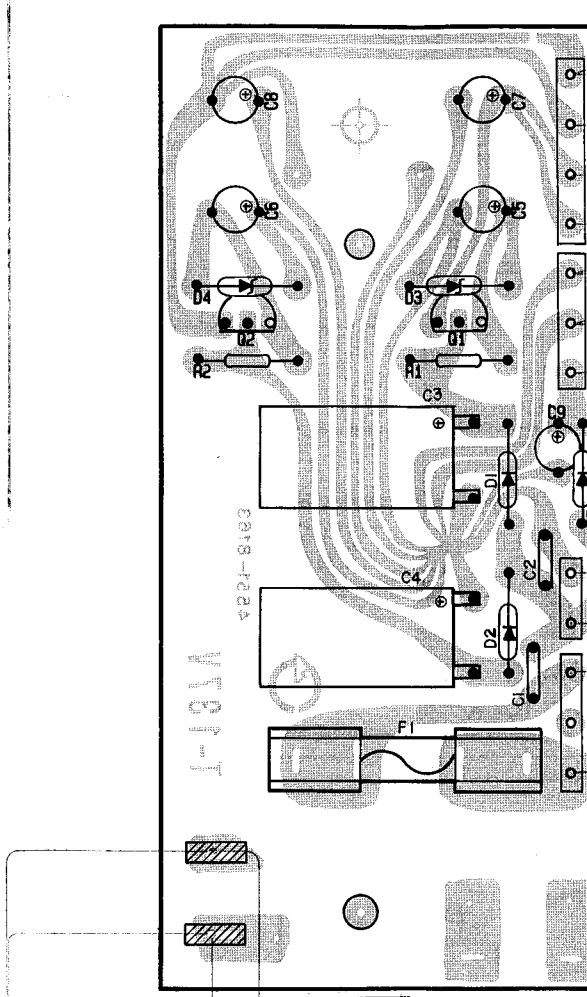




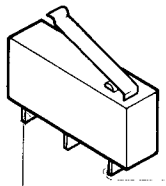
T1
POWER





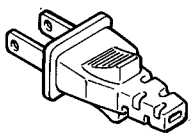


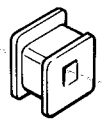
SW1
REST



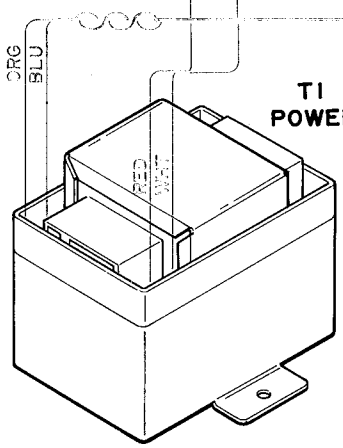
GRY
GRY

P1
AC120V, 60Hz

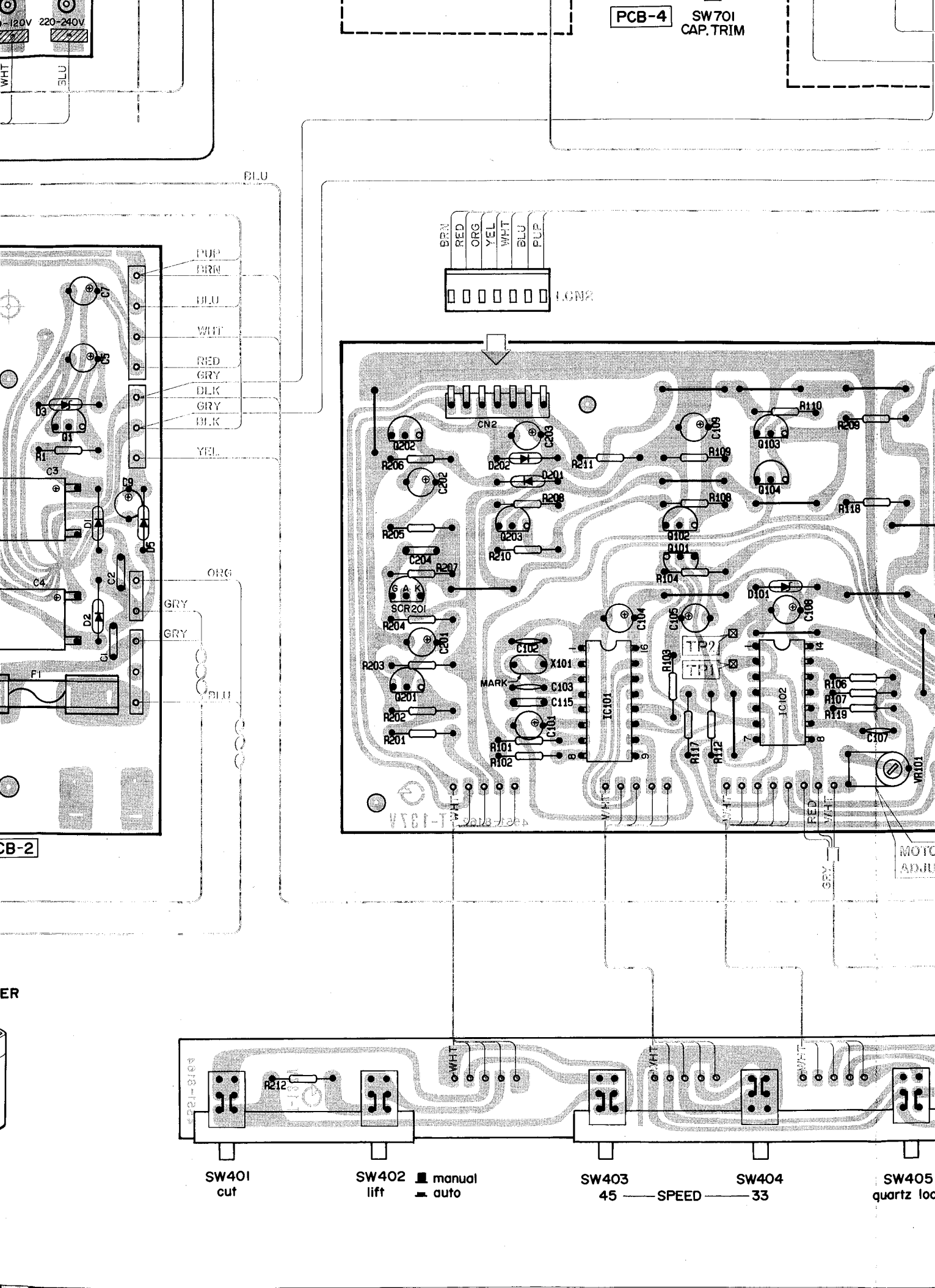


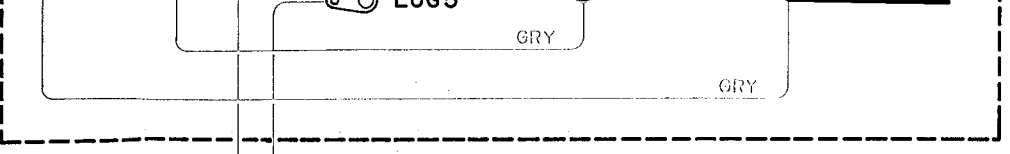


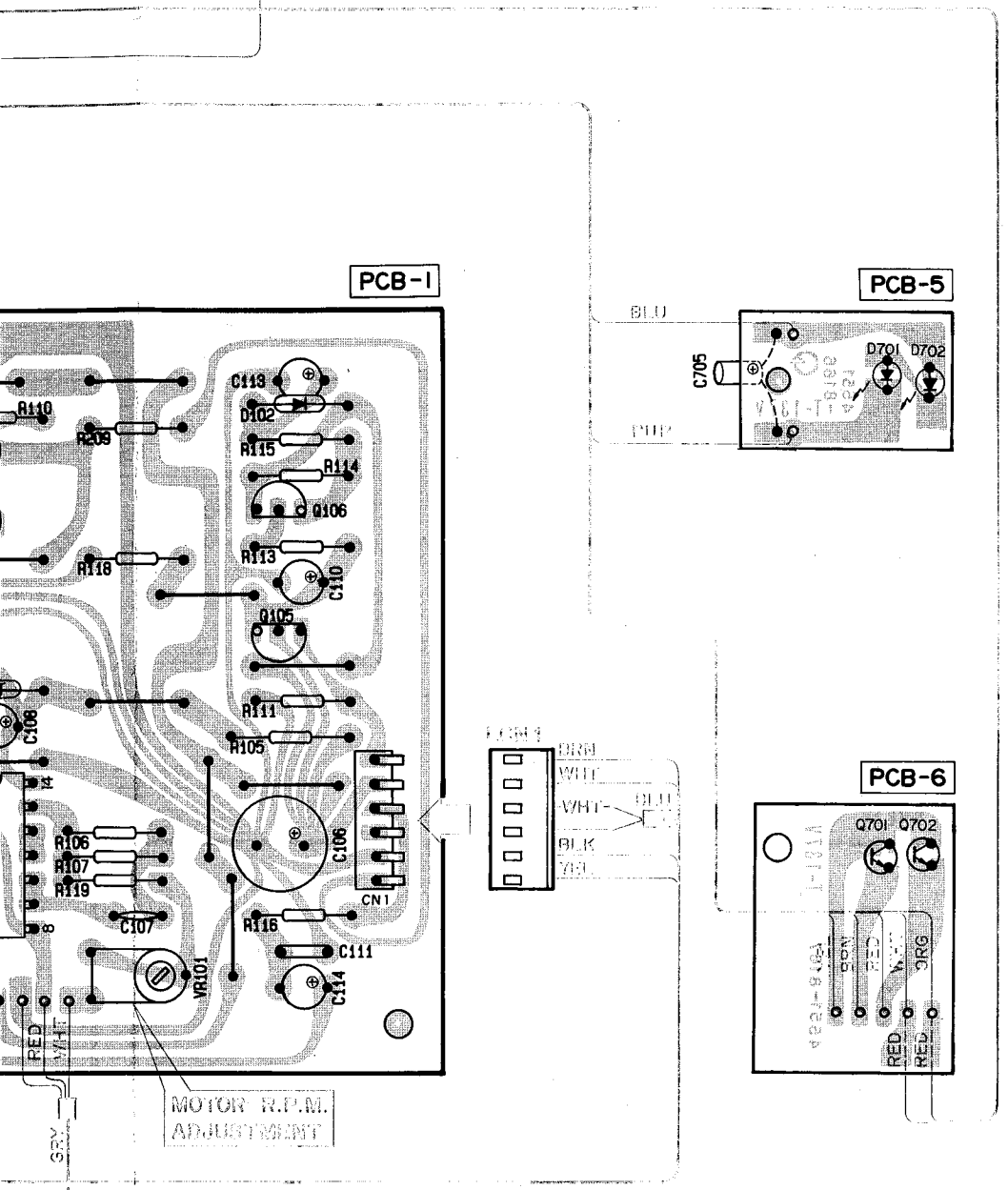
WHT
RED

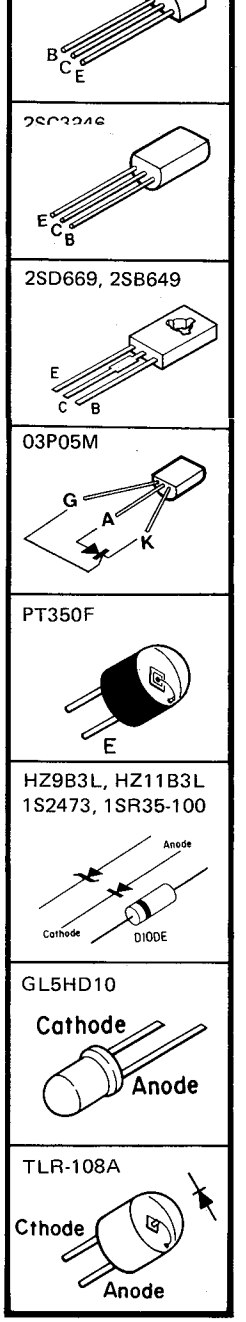


T1
POWER


PCB-4
SW701
CAP. TRIM
220-240V
WHT
BLU
BLU
PUP
BRN
BLU
WHT
RED
GRY
BLK
GRY
BLK
YEL
ORG
GRY
GRY
BLU
CB-2
BRN
RED
ORG
YEL
WHT
BLU
PUP
CN2
SCR201
MARK
X101
TP2
TP1
IC101
IC102
VR101
SW401
cut
SW402
lift
manual
auto
SW403
45
SPEED
SW404
33
SW405







BLK . . . . . Black
BLU . . . . . Blue
BRN . . . . . Brown
GRN . . . . . Green
GRY . . . . . Gray
ORG . . . . . Orange
PIK . . . . . Pink
PUP . . . . . Purple
RED . . . . . Red
WHT . . . . . White
YEL . . . . . Yellow