

652

PS-X600

*US Model
Canadian Model
AEP Model
UK Model
E Model*

SOUND SERVICE CENTER
1000 W. 10th St. #100
Minneapolis, MN 55401
Tel: 612-338-1111



STEREO TURNTABLE SYSTEM

SPECIFICATIONS


Turntable

Platter	32 cm (12 ⁵ / ₈ in.), aluminum-alloy diecast
Motor	Linear BSL (brushless and slotless) motor
Drive system	Direct drive
Control system	Quartz lock control, magnedisc servo control system
Speed	33 ¹ / ₃ rpm, 45 rpm
Starting characteristics	Comes to nominal speed within a half revolution (33 ¹ / ₃ rpm)
Wow and flutter	0.015 (WRMS)* 0.025% (WRMS) ±0.03% (DIN)

Signal-to-noise ratio	78 dB (DIN-B)
Load characteristics	0% up to 150 g stylus force (at lead-in groove of a record)
Speed deviation	Within ±0.003%
Automatic system	Lead-in, return, reject, repeat, record size selection, anti-skating


Tonearm

Type	Electronic tonearm
Pivot-to-stylus length	216.5 mm (8 ⁵ / ₈ in.)
Overall arm length	295 mm (11 ⁵ / ₈ in.)
Overhang	16.5 mm (2 ¹ / ₃₂ in.)
Tracking error	+3°, -1°
Stylus force adjustment range	0 - 3 g
Cartridge shell weight	5 g
Cartridge weight range (including supplied cartridge shell)	7.5 - 12.5 g 12 - 17 g (with extra weight)

SAFETY-RELATED COMPONENT WARNING!!
COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

- Continued on page 2 -

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE  SUR LES DIAGRAMMES SCHEMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.



SONY[®]

SERVICE MANUAL

PS-X600

General

Power requirements US, Canadian Model: 120 V ac, 60 Hz
AEP Model: 220 V ac, 50/60 Hz
UK Model: 240 V ac, 50/60 Hz
E Model: 110-120 or 220-240 V ac
adjustable 50/60 Hz

Power consumption 16 W

Dimensions Approx. 430 × 120 × 385 mm (w/h/d)
(17 × 4³/₄ × 15³/₄ in.)

Weight including projecting parts and controls
Approx. 8.5 kg (18 lbs 12 oz), net
Approx. 10 kg (22 lbs 1 oz), in shipping
carton

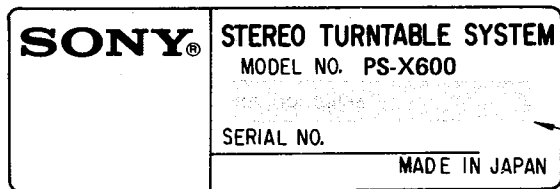
* This new measuring method concerns only the turntable assembly, including the platter. It excludes wow and flutter caused by the tonearm, the cartridge, or the record. Measured by obtaining signal from magnetic pickup head.

Cartridge (AEP, E model)

Type Moving-magnet
Frequency response 10 – 30,000 Hz
Channel separation 25 dB at 1 kHz
Output voltage 3 mV at 1 kHz, 5 cm/sec, 45°
Load impedance 50 kΩ – 100 kΩ
Tracking force 1.0 – 2.0 g (1.5 g recommended)
Stylus Sony ND-200E
Weight 3.4 g

MODEL IDENTIFICATION

– Specification Label –



US, Canadian model:
AC 120 V 60 Hz 16 W

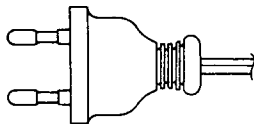
AEP model:
AC 220 V ~ 50/60 Hz 16 W

UK model:
AC 240 V ~ 50/60 Hz 16 W

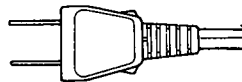
E model:
AC 110 – 120, 220 – 240 V ~ 50/60 Hz 16 W

– Power Cord –

E1 model: euro-plug 1-555-734-21



E2 model: parallel-blade plug 1-551-473-31

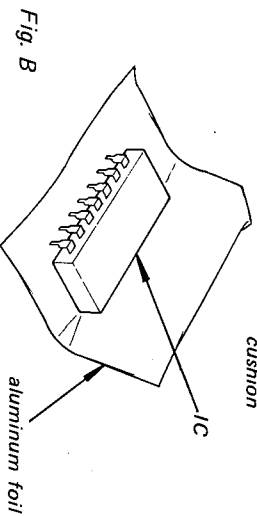
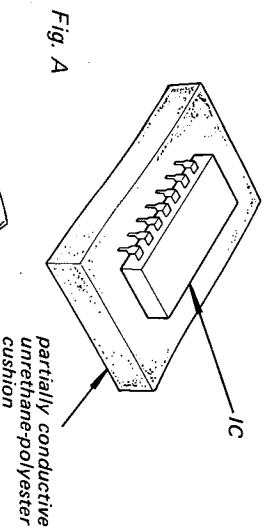


SERVICING NOTES
Handling Precautions for MOS ICs

Generally, the insulation resistance of the oxide layer in MOS IC structures is very high, and the oxide layer is very thin. Because of this, it is possible that the static voltages usually present on clothes and the human body will be enough to generate a potential difference across the insulator, high enough to cause a breakdown of the insulating layer.
 The following precautions should be taken while handling these ICs.
 (Particular care should be taken under conditions of low humidity.)

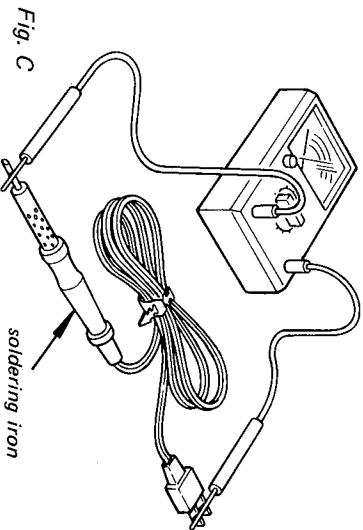
Precautions in Replacing MOS ICs

1. Store new ICs by inserting them into a urethane-polyester cushion (which is somewhat conductive), or wrapping it in aluminum foil, so that all the pins are at the same potential. (The ICs should be stored in that manner until mounted on the circuit board.)



2. Check the soldering iron for possible power-line leakage current. Make sure that there is no leakage path by connecting an ohmmeter to the tip of the soldering iron and the plug as shown in Fig. C. If there is a leakage path, use some other soldering iron.

VOM
 (52 x 10,000 range)



3. Equalize any potential difference between the clothes, the tools in use, the work bench, the set being worked on, and the packaged IC by touching them all in succession with the hands or a conductive wire or tool.

4. The following are effective methods for handling ICs that remove the potential difference across the oxide layer.
 - Use a paper clip modified by soldering in a wire braid insert.

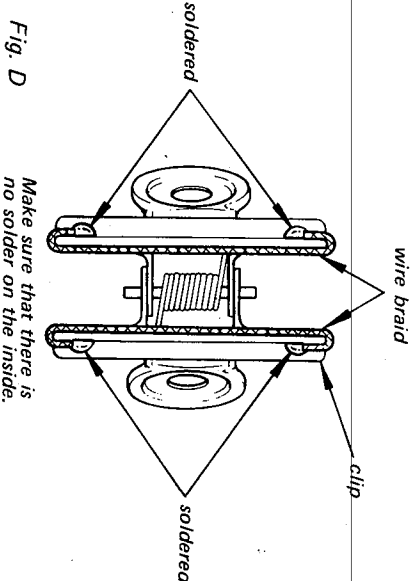


Fig. D Make sure that there is no solder on the inside.

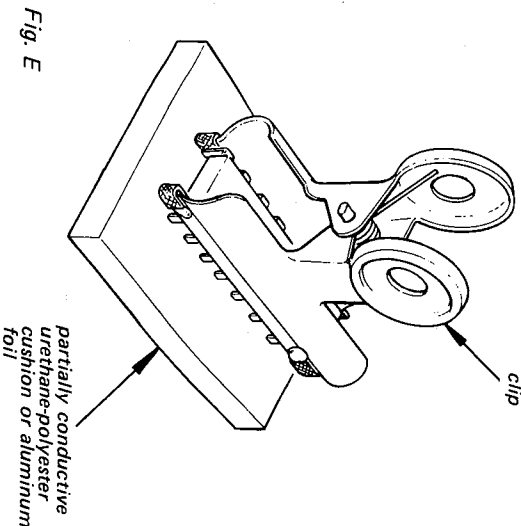


Fig. E

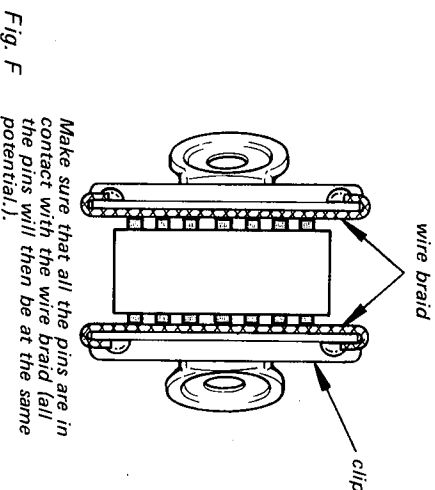


Fig. F

- Take a short length of fine bare wire and wind it around the IC so that it shorts all the pins of the IC, while it is still in the urethane-polyester cushion or aluminum foil. This ensures that all the pins are at the same potential.

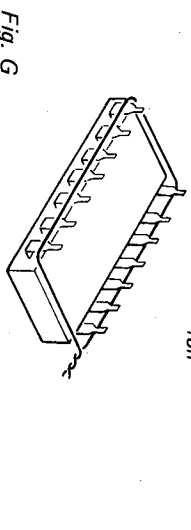
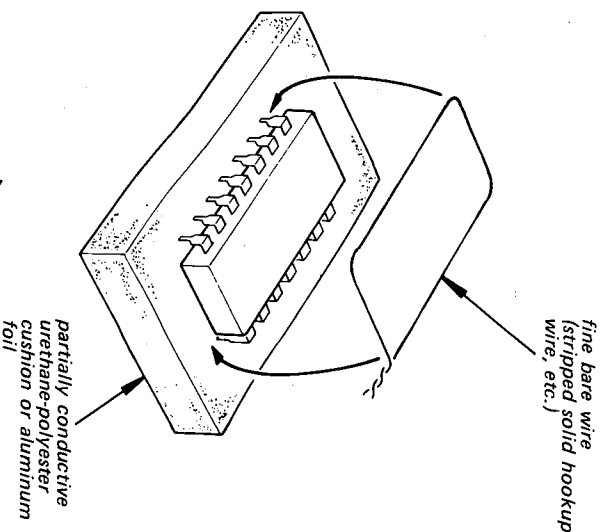


Fig. G

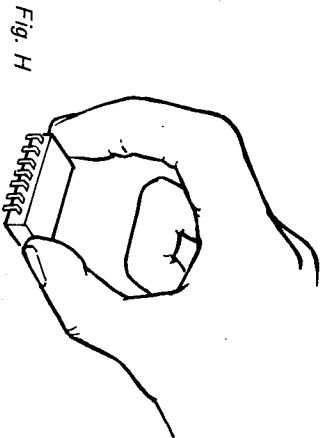


Fig. H

Method of Mounting

Insert the IC while holding it with the modified clip, and solder all the pins with the clip still shorting the pins. (Similarly, solder all the pins while the bare shorting wire is still wound around them.) Remove the clip or the bare shorting wire only after all the pins have been soldered.

Precaution while Checking C-MOS ICs
 The C-MOS ICs (Complementary MOS) are MOS ICs that have their output sections made up of N-channel and P-channel push-pull stages to increase their speed of operation. If the output terminal of these ICs comes into contact with B+ or B- voltage, then the FET which is ON at that time will either become shorted or open.
 This is valid for all the output sections that are connected together by the interconnections. Even the circuits that are physically separated (and not on the same board) can be destroyed simultaneously.

Example:

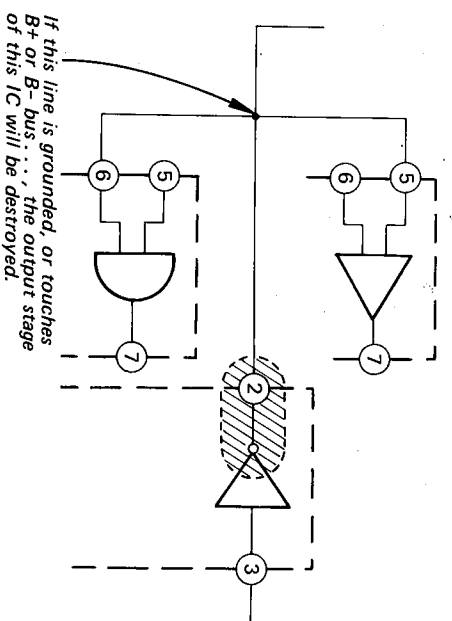
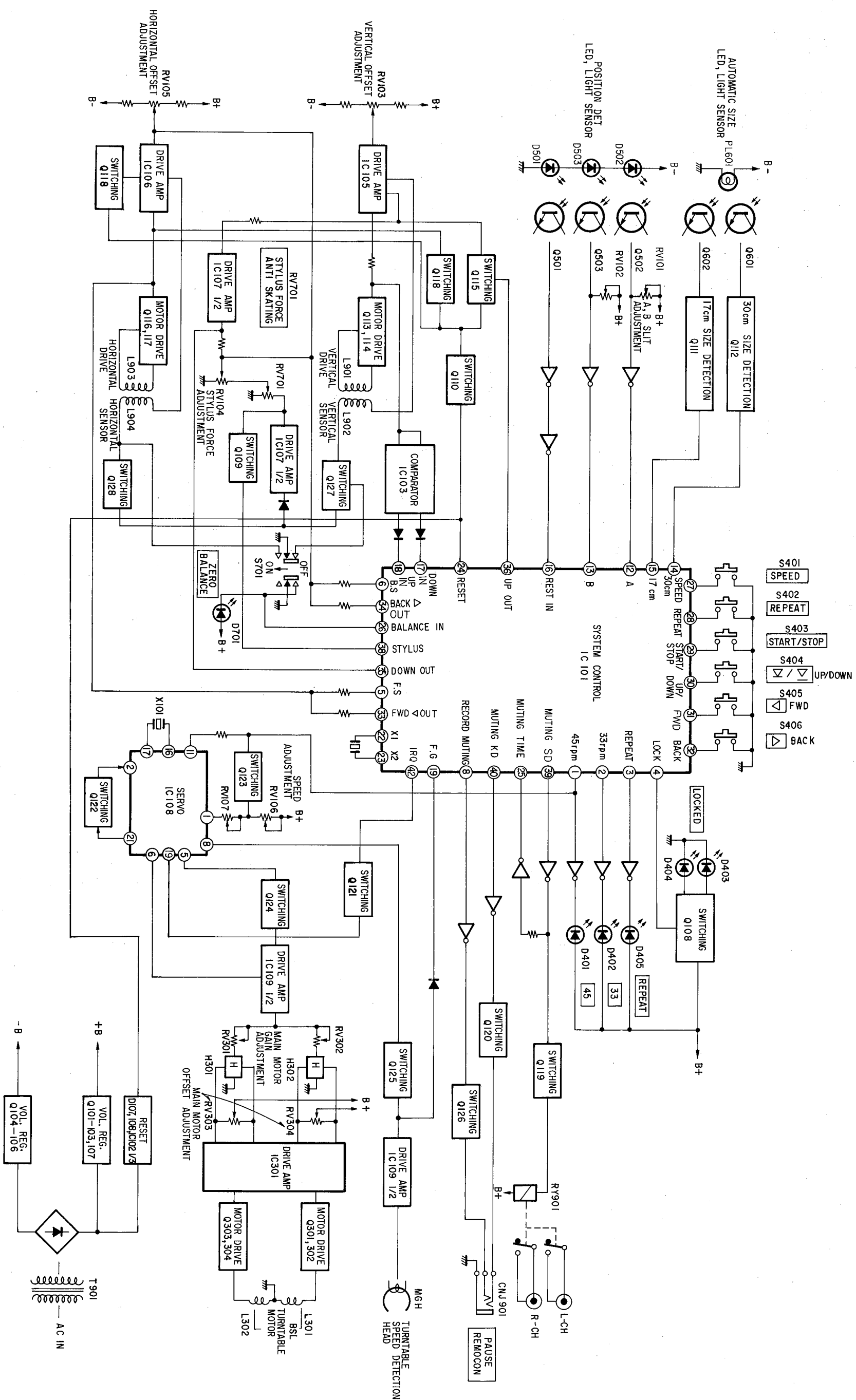


Fig. I

SECTION 1
OUTLINE

1-1. BLOCK DIAGRAM



1-2. CIRCUIT DESCRIPTION

1. When the POWER Switch is Turned on (See Fig. 1):

The waveform shaper, consisting of IC102, turns the voltage at terminal ②4 of IC101 to low level "0" in half a second when C109 is charged with B+ power. As a result, IC101 is reset.

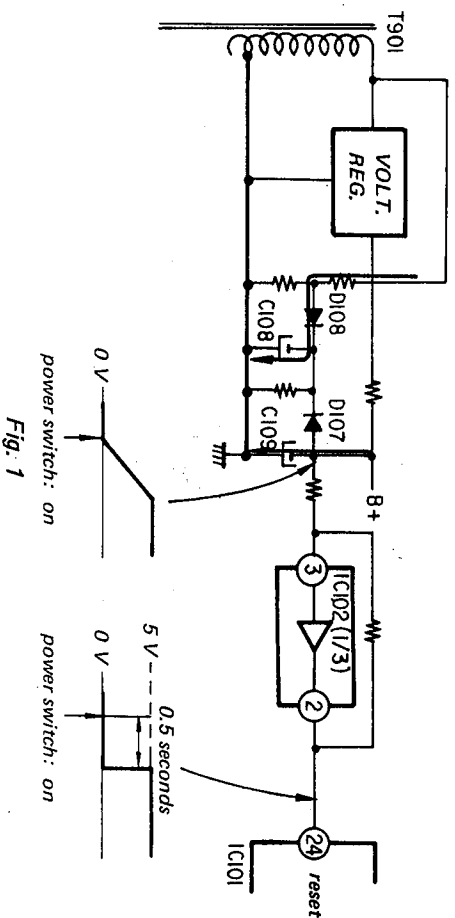


Fig. 1

This means the microprocessor (IC101) does not operate for 0.5 seconds after the power switch is turned on.

Also, buttons can be effectively pressed after it is assured that the tonearm has been on the arm rest for about 0.5 seconds.

2. Circuit for Tonearm's Horizontal Movement (See Fig. 2):

▷ : FWD

When S405 (▷ : FWD) is depressed, the voltage at terminal ③3 of IC101 becomes high "1". This swings the voltage at terminal ③ of IC106 positive and the output of the terminal ① goes positive. This turns Q116 on and current passes through L903 (lifter drive coil) in direction "A", thus moving the tonearm forward.

◁ : BACK

When S406 (◁ : BACK) is depressed, the voltage at terminal ③4 of IC101 becomes high "1". A negative voltage appears at terminal ① of IC106 turning Q117 on. Since Q117 is on, current passes through L903 in direction "B", thus moving the tonearm backwards.

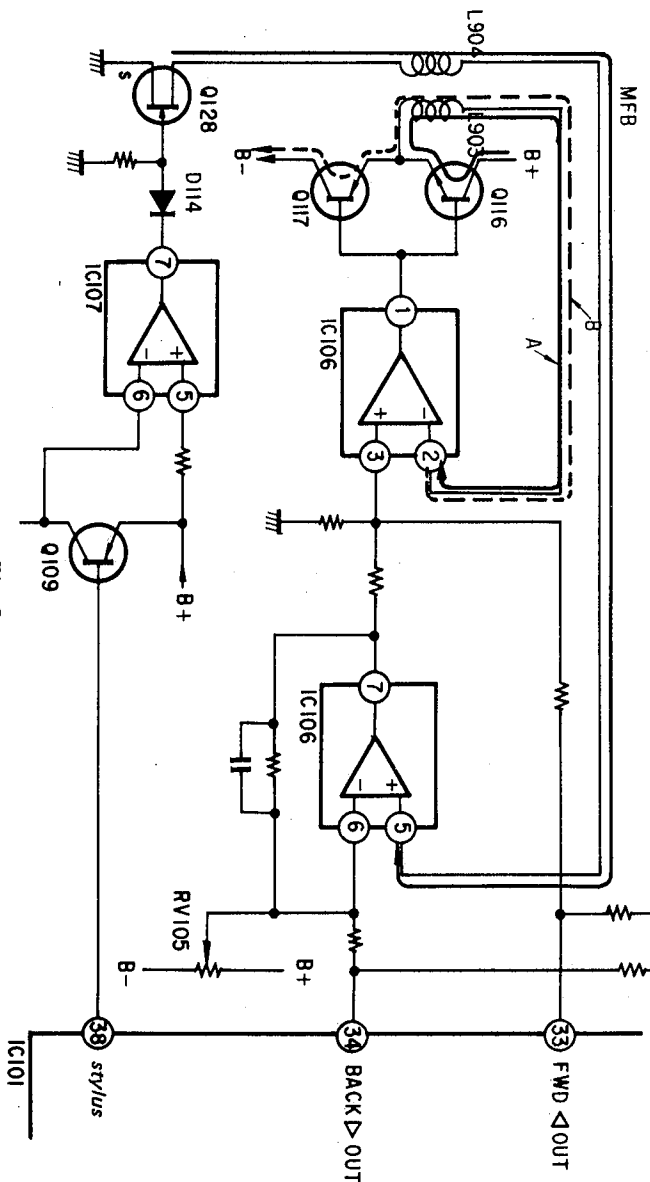


Fig. 2

3. Tonearm Lifting Circuit (See Fig. 3):

Turning the power switch on raises the arm lifter.

▽ : UP

When the power switch is turned on or when S404 is depressed with the tonearm at DOWN position, the voltage at terminal ③6 of IC101 becomes high "1". A positive voltage appears at terminal ① of IC105. Then Q113 is on and current passes through L901 (vertical drive coil) in direction "A" thus raising the arm lifter.

◻ : DOWN

When S404 is depressed with the tonearm at "UP" position, the voltage at terminal ③5 becomes low "0" and the voltage at terminal ③5 becomes high "1" and becomes low "0" when the tip of the stylus touches the disk. This turns the voltage at terminal ① of IC105 negative and Q114 is on and current passes through L901 in direction "B" thus lowering the arm lifter.

The voltage at terminal ③8 of IC101 becomes low "0", turning Q109 on and B+ voltage from the collector of Q109 is applied to terminal ② of IC107 via RV701 and RV104. Then the voltage at terminal

① of IC107 becomes low "0" and a negative voltage appears at terminal ① of IC105. Thus Q114 turns on and current passes through L901 in direction "B" applying a stylus force.

IC103 compares signals from L902 (vertical sensor coil) to input information into IC101 whether the tip of stylus finishes lowering or rising.

Owing to L902, high level "1" is applied to terminals ②, ⑤ of IC103 when the stylus finishes lowering and low level "0" is applied when it finishes rising.

Owing to D109, 110 high level "1" is applied to terminal ①7 when stylus is lowering and so to terminal ①8 when stylus is rising. IC101 makes command of applying stylus-force or stopping it, muting on or off.

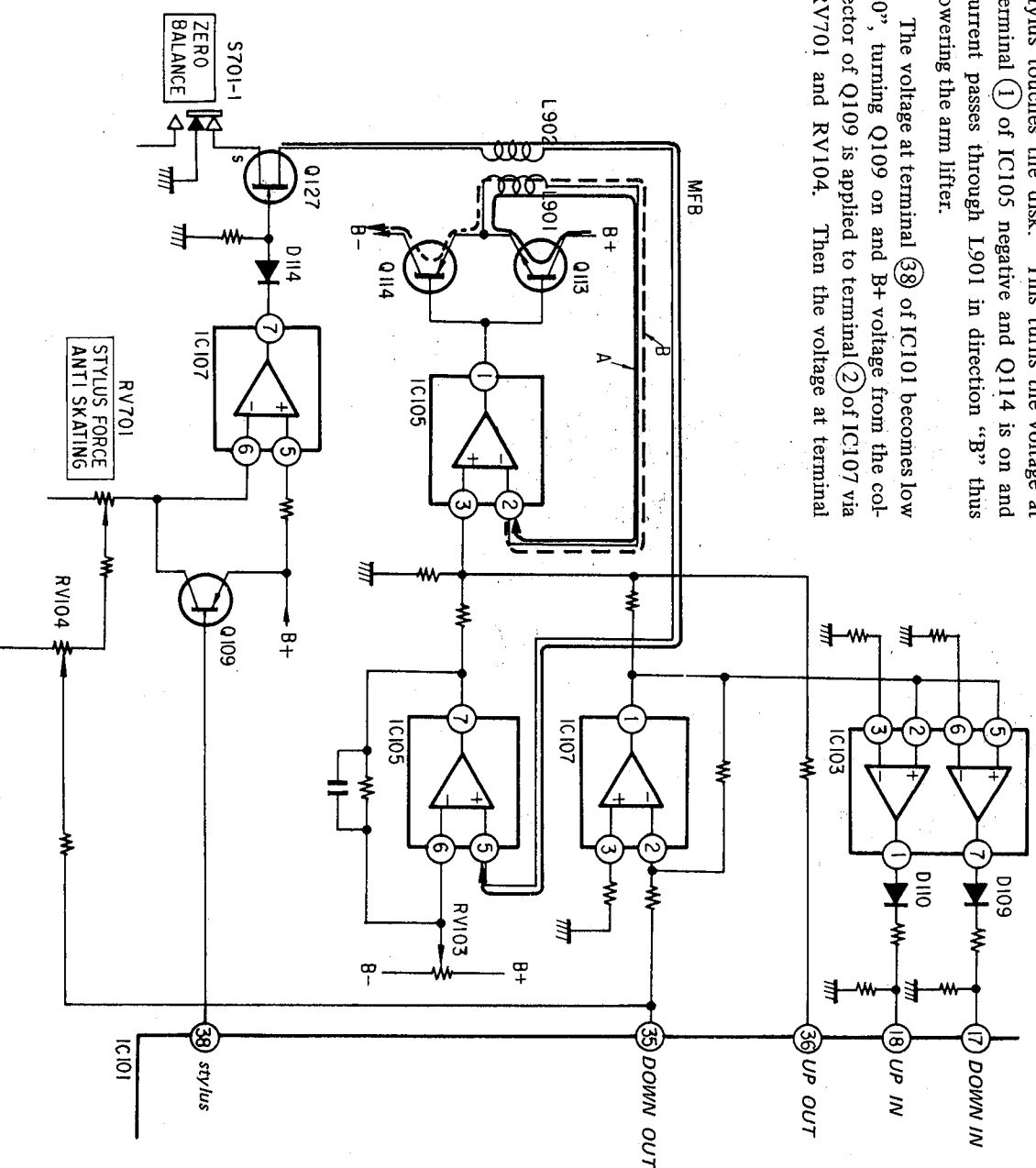


Fig. 3

4. Automatic D

As long as from PL601 pa and switches ph

The outputs ①5 of IC101 + the disk size.

IC101	No disk
	17 cm
	30 cm

Drop-point and

When S403 tonearm moves

The present determined by rotating with th

The end of slits of the mov the tonearm ret

Slits are cor by D502 and

If the light fro on Q502 (Q50: are fed to the

where the wave! are applied to t

Also, wheth or backward is of the signals fir

) does not
 1 after it is
 e arm rest
 switch is

3. Tonarm Lifting Circuit (See Fig. 3):

Turning the power switch on raises the arm lifter.
 [∇ : UP]

When the power switch is turned on or when S404 is depressed with the tonearm at DOWN position, the voltage at terminal (36) of IC101 becomes high "1". A positive voltage appears at terminal (1) of IC105. Then Q113 is on and current passes through L901 (vertical drive coil) in direction "A" thus raising the arm lifter.

[∇ : DOWN]

When S404 is depressed with the tonearm at "UP" position, the voltage at terminal (36) becomes low "0" and the voltage at terminal (35) becomes high "1" and becomes low "0" when the tip of the stylus touches the disk. This turns the voltage at terminal (1) of IC105 negative and Q114 is on and current passes through L901 in direction "B" thus lowering the arm lifter.

The voltage at terminal (38) of IC101 becomes low "0", turning Q109 on and B+ voltage from the collector of Q109 is applied to terminal (2) of IC107 via RV701 and RV104. Then the voltage at terminal

(1) of IC107 becomes low "0" and a negative voltage appears at terminal (1) of IC105. Thus Q114 turns on and current passes through L901 in direction "B" applying a stylus force.

IC103 compares signals from L902 (vertical sensor coil) to input information into IC101 whether the tip of stylus finishes lowering or rising.

Owing to L902, high level "1" is applied to terminals (2) (5) of IC103 when the stylus finishes lowering and low level "0" is applied when it finishes rising.

Owing to D109, 110 high level "1" is applied to terminal (17) when stylus is lowering and so to terminal (18) when stylus is rising. IC101 makes command of applying stylus force or stopping it, muting on or off.

4. Automatic Disk Size Detector (See Fig. 4):

As long as the turntable is rotating, the light from PL601 passes through the prism on the frame and switches phototransistors Q601, 602.

The outputs of Q601, 602 are fed to terminal (14), (15) of IC101 to be used for automatic detection of the disk size.

IC101	terminal (14)	terminal (15)
No disk	Signal occurs.	Signal occurs.
17 cm	Signal occurs.	0 V
30 cm	0 V	0 V

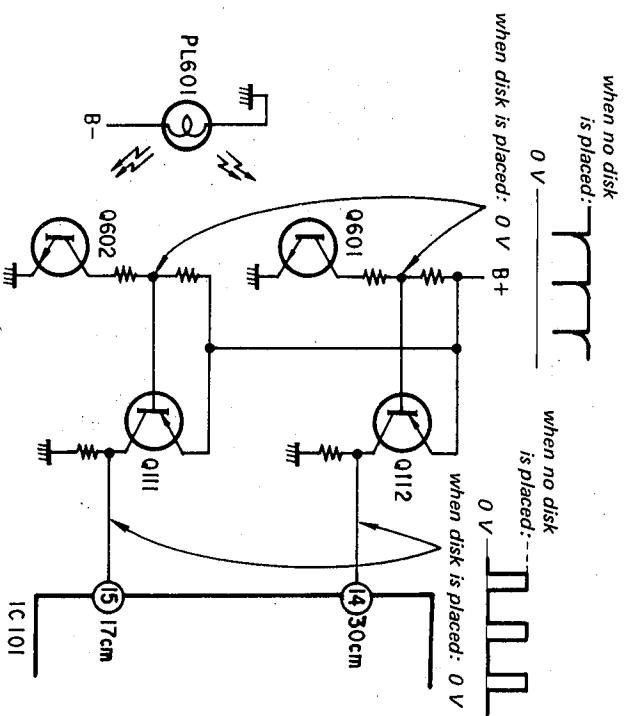


Fig. 4

Drop-point and End Detection (See Figs. 5 and 6):

When S403 (START/STOP) is turned on, the tonearm moves toward the disk.

The presence of a drop-point on the disk is determined by counting slits of the movable shutter rotating with the tonearm.

The end of a disk is also detected by counting slits of the movable shutter. After detecting the end, the tonearm returns.

Slits are counted as follows. The light emitted by D502 and D503 strike on the movable shutter. If the light from D502 (D503) passes a slit, it turns on Q502 (Q503). The outputs of Q502 and Q503 are fed to the Schmitt circuit consisting of IC102, where the waveforms are shaped. The shaped outputs are applied to terminals (12) and (13) of IC101.

Also, whether the tonearm is moving forward or backward is determined by comparing the phases of the signals from terminals (12) and (13) of IC101.

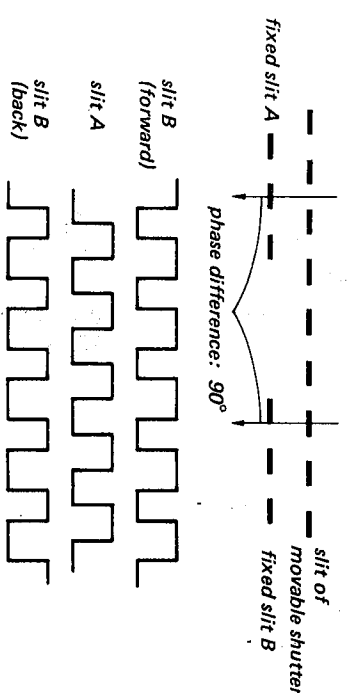


Fig. 5

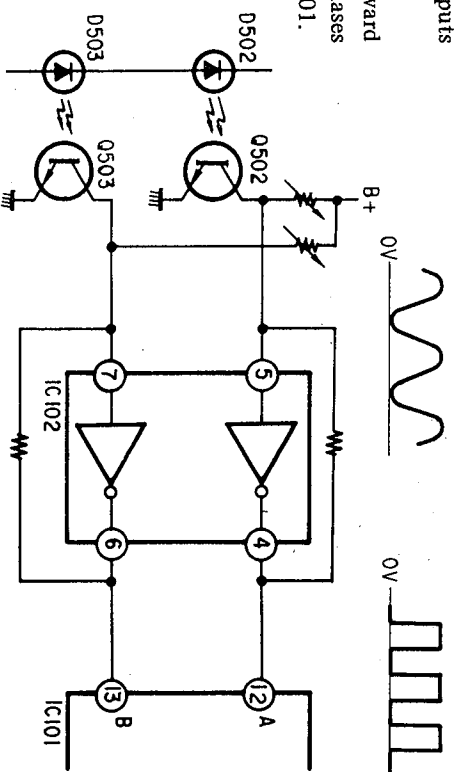


Fig. 6

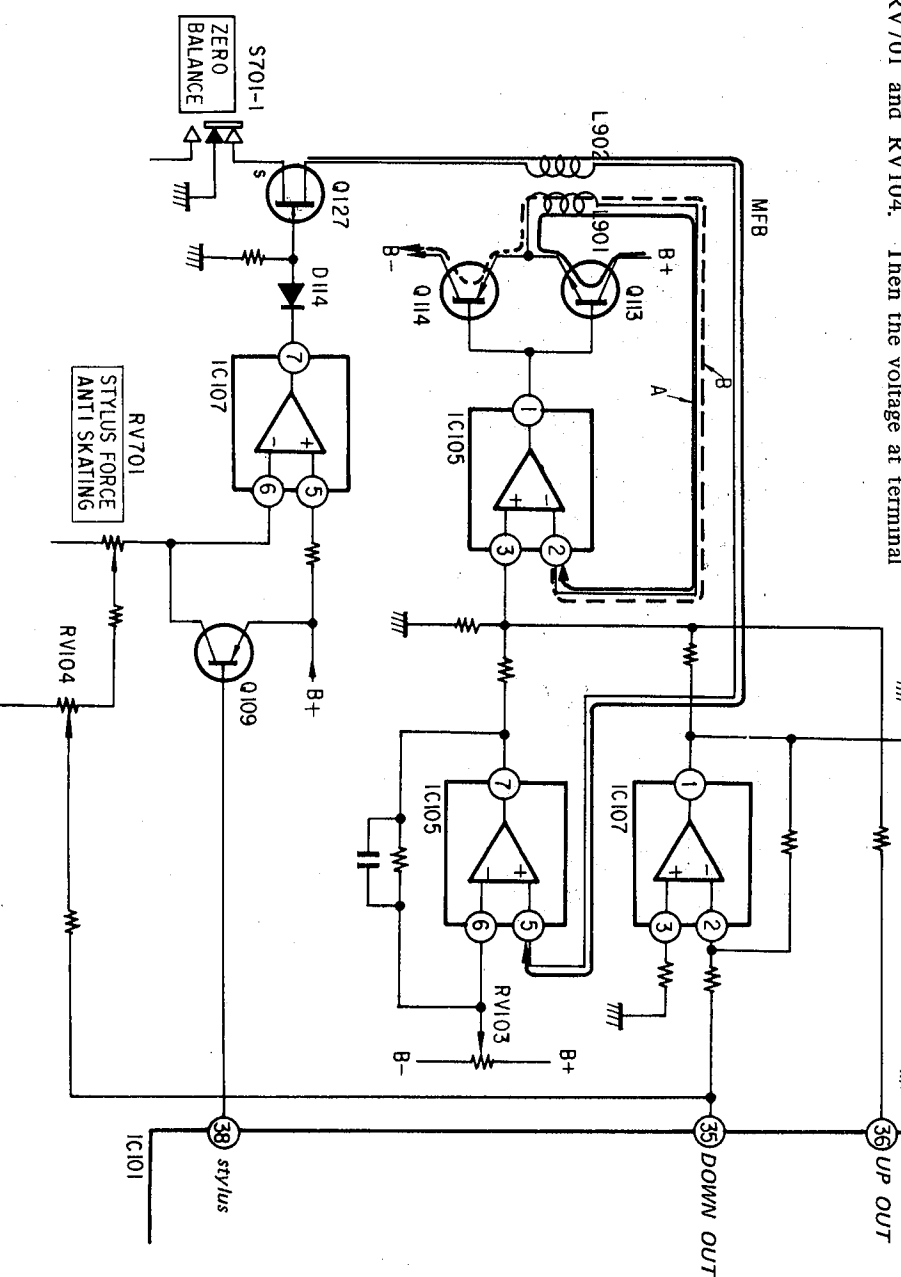
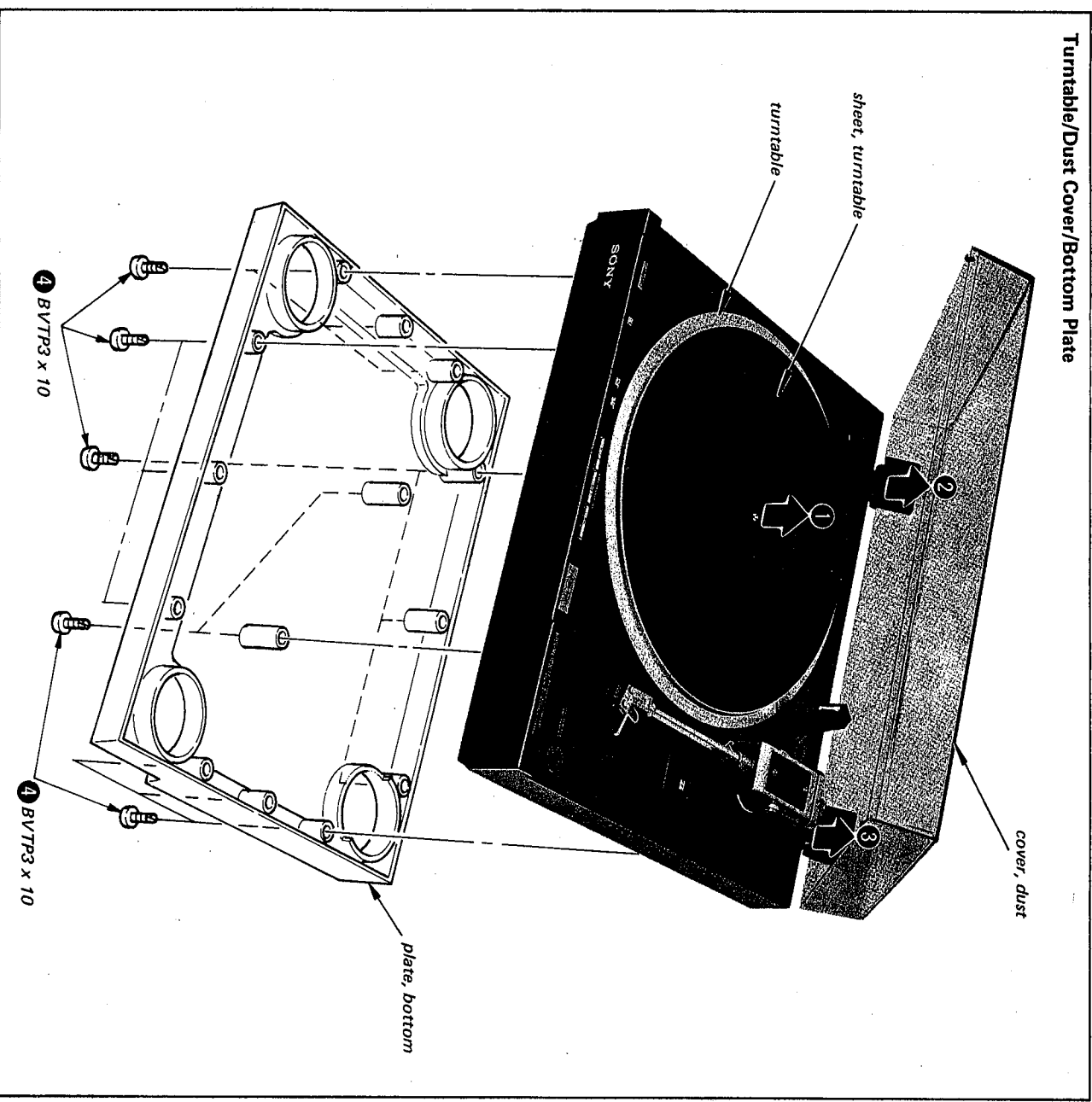


Fig. 3

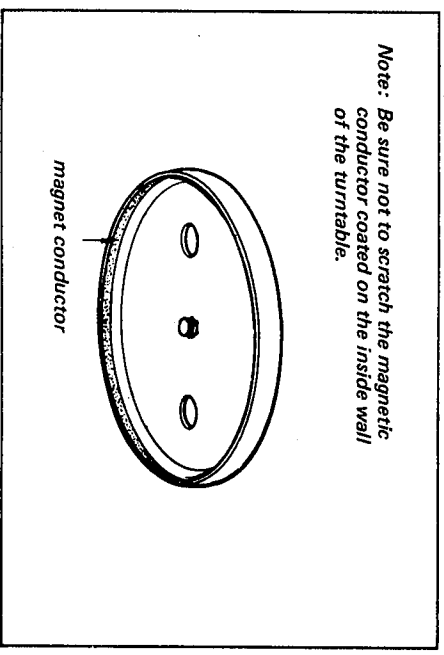
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

Turntable/Dust Cover/Bottom Plate

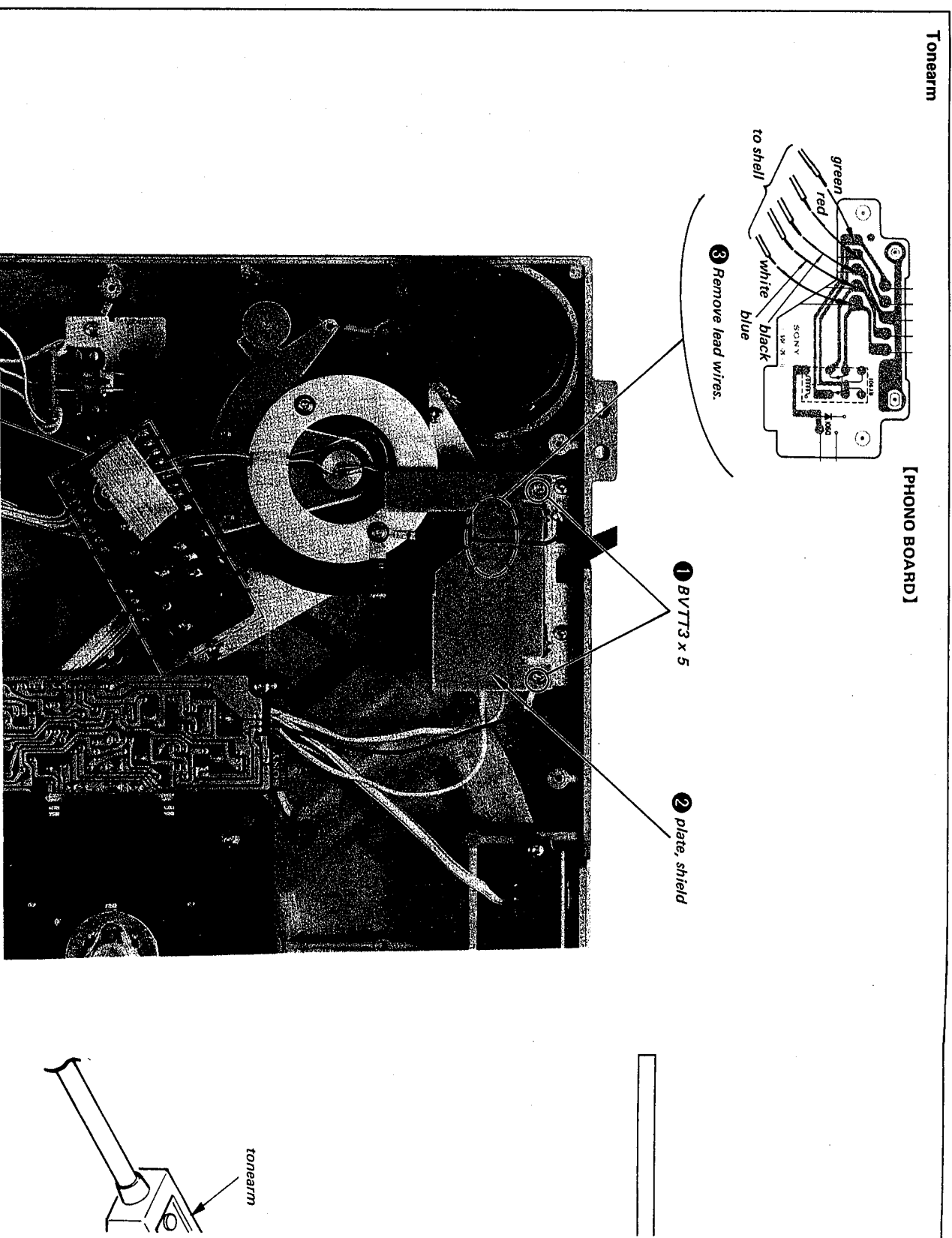


Note: Be sure not to scratch the magnetic conductor coated on the inside wall of the turntable.



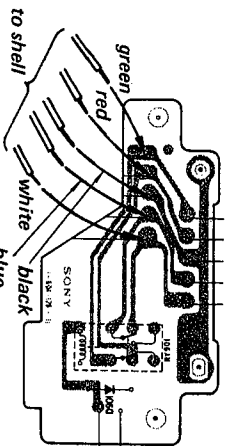
Tonearm

[PHONO BOARD]

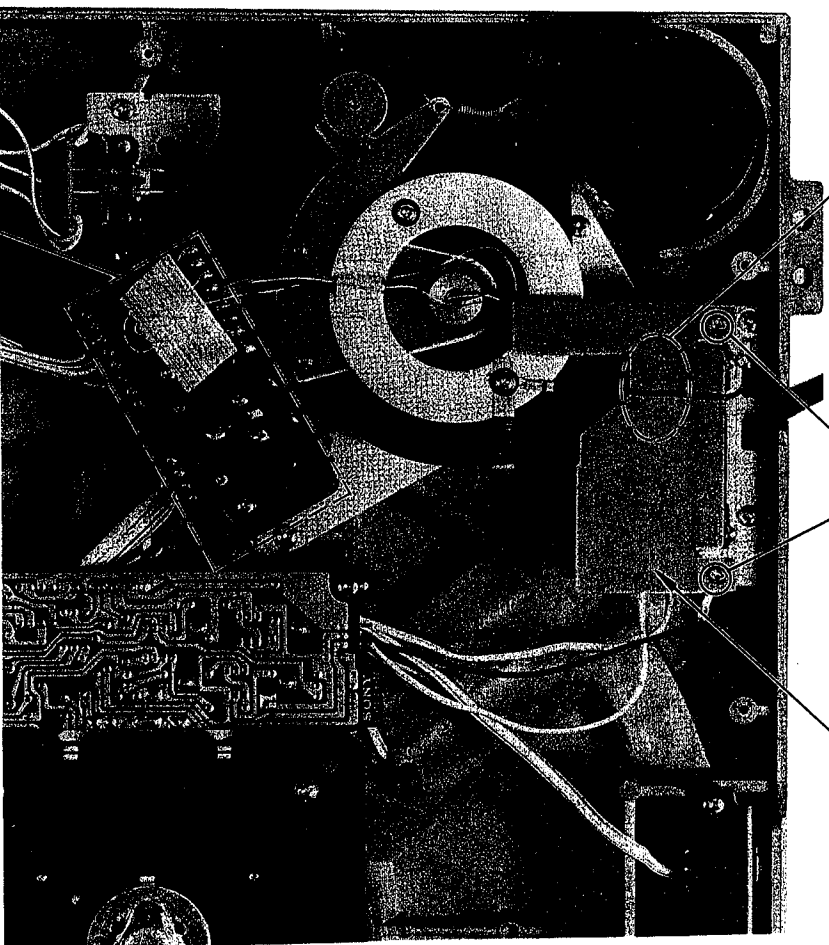


Tonearm

[PHONO BOARD]



3 Remove lead wires.

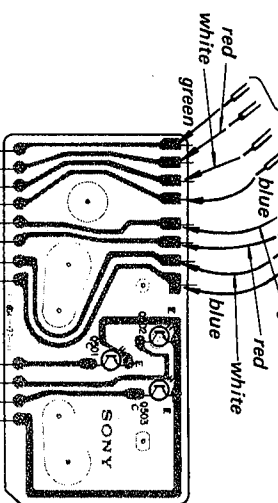


1 BVTT3 x 5

2 plate, shield

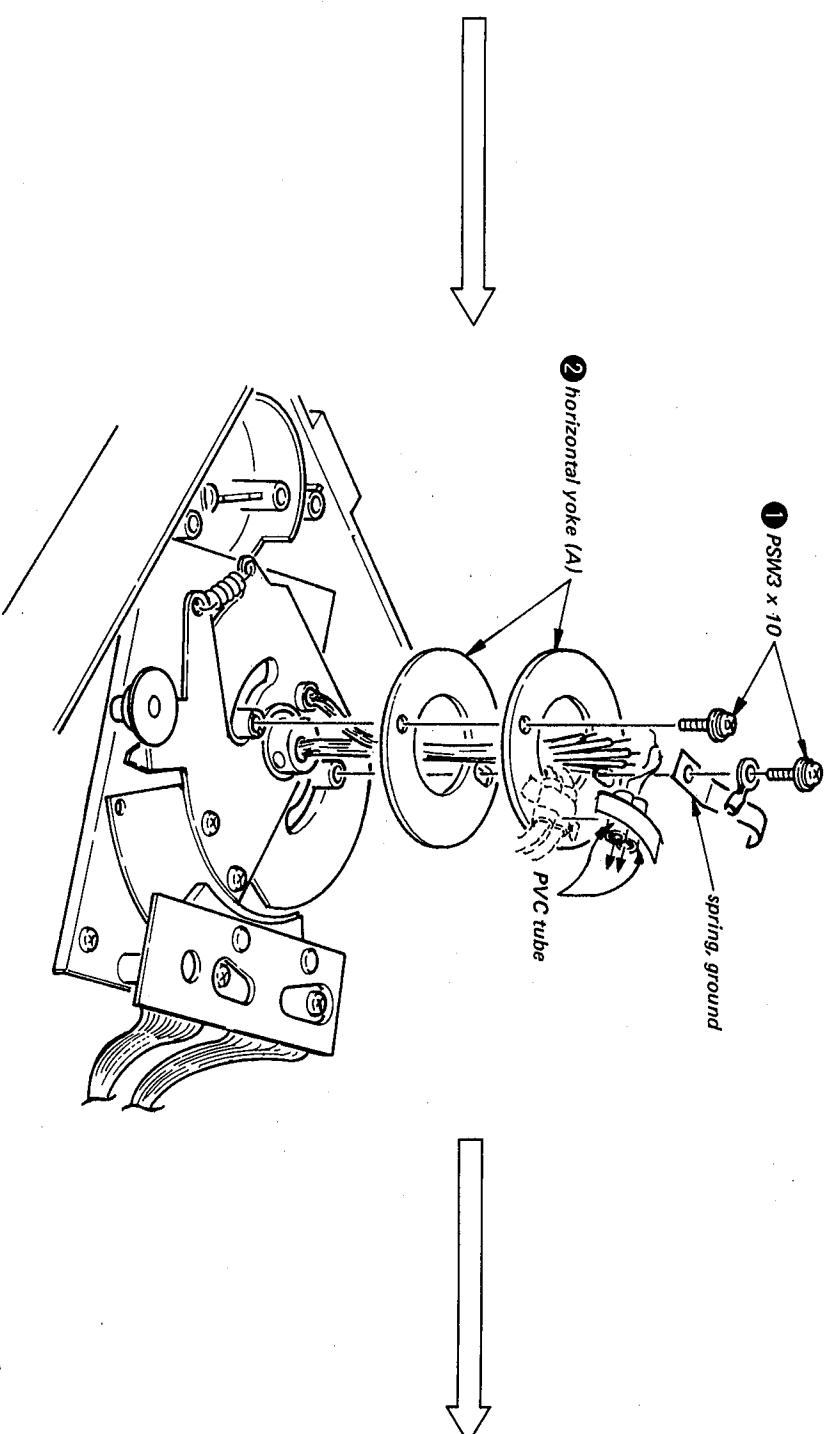
to vertical coil

to horizontal motor coil



4 Remove lead wires.

POSITION-DETECTION LIGHT SENSOR BOARD

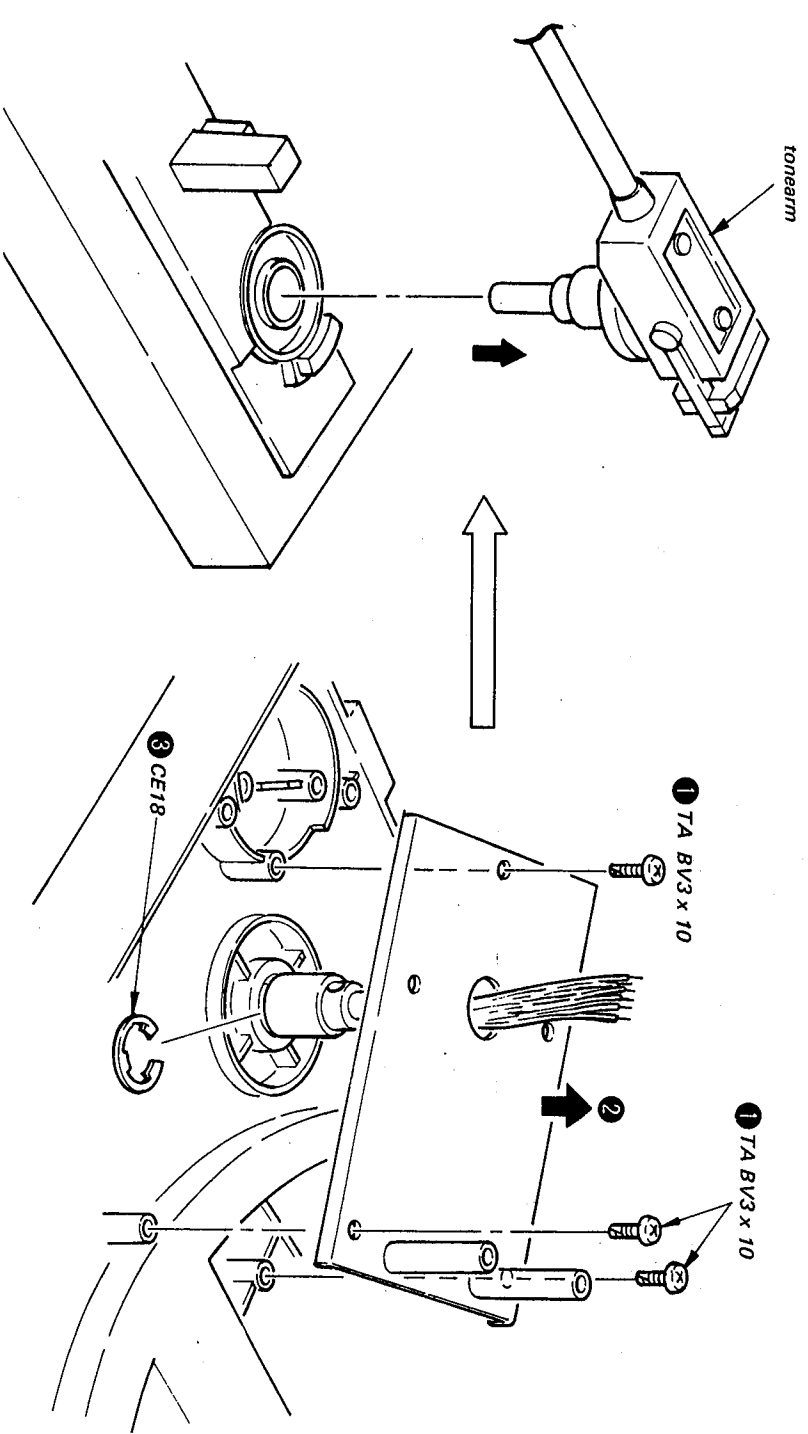


1 PSW3 x 10

2 horizontal yoke (A)

PVC tube

spring, ground

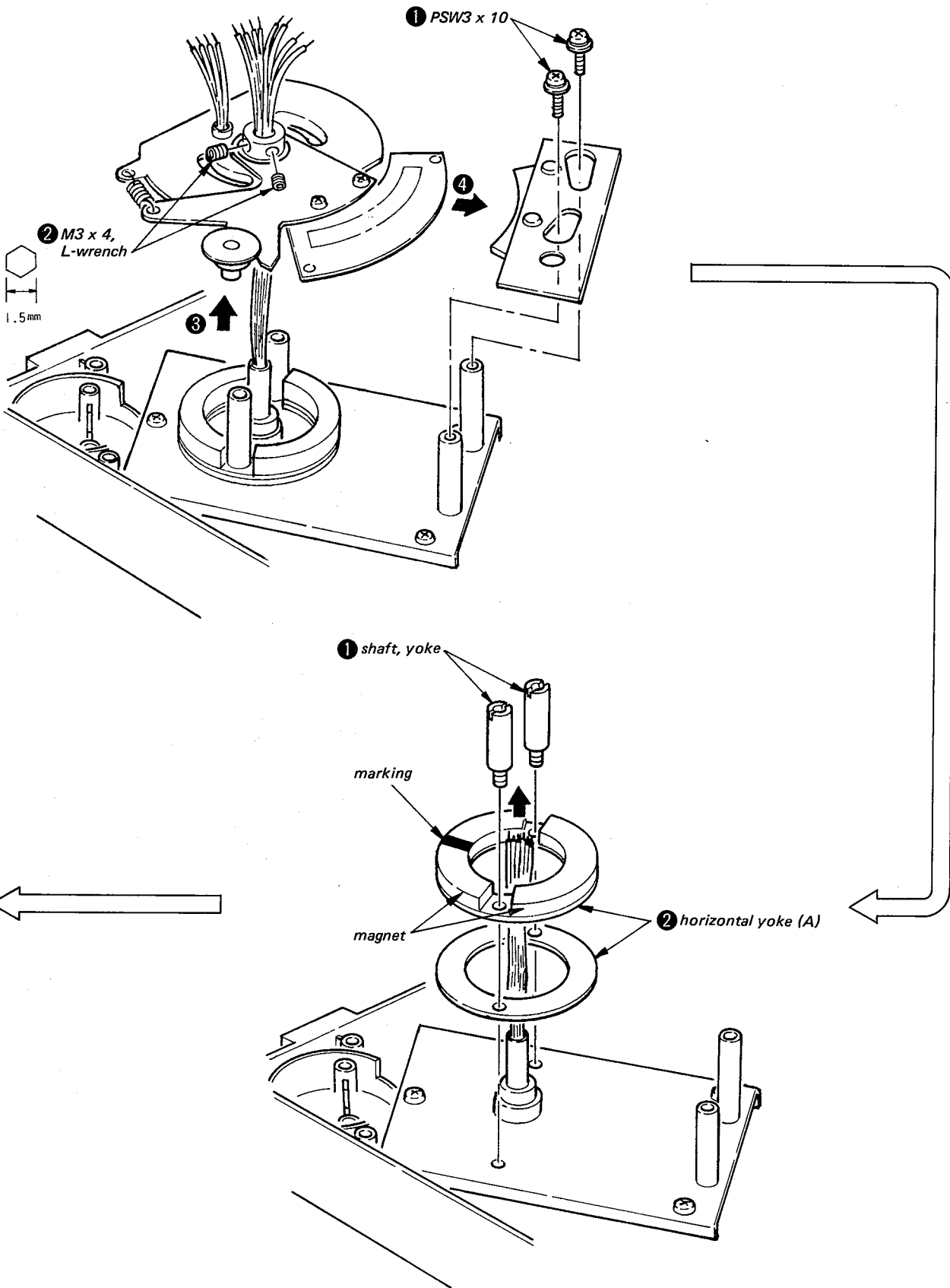


tonearm

1 TA BV3 x 10

1 TA BV3 x 10

3 CE18

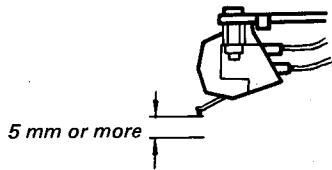


SECTION 3 ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENTS

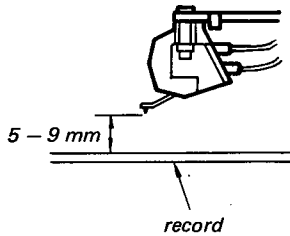
Vertical-sensitivity Adjustment

1. Perform the longitudinal adjustment.
2. Adjust the pivot bearings and the pivot-locking nuts so that the tonearm sinks more than 5 mm (7/32 inches) when the 40 mg weight is placed on the head shell, and the tonearm is in a horizontally balanced position when the weight is removed.

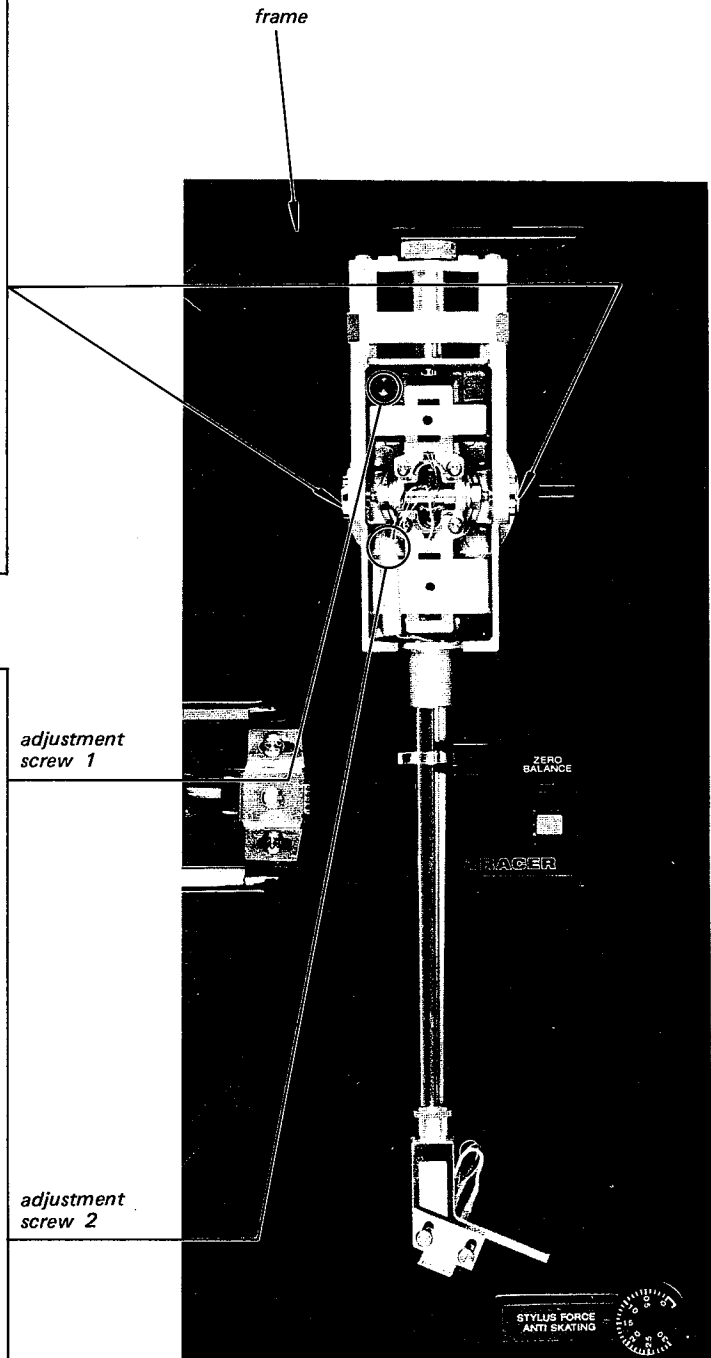
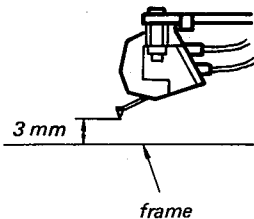


Stylus Height Adjustment

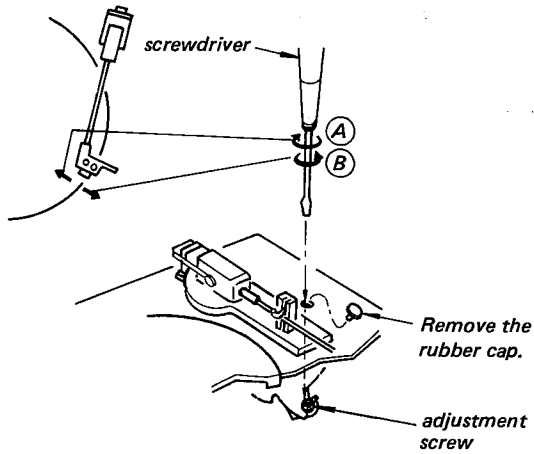
1. Bring the tonearm above the record. Lift the cueing lever up and adjust the adjustment screw 1 so that the clearance between the stylus tip and the record is 5 – 9 mm (7/32 – 3/8").



2. Lower the tonearm by pressing UP/DOWN button and adjust the adjustment screw 2 so that the clearance between the stylus tip and the frame is 3 mm (1/8").



Stylus Drop-point Adjustment



1. Set the record size selector lever to the 30 (12") position and make sure that the stylus drops on the specified point of the test record.

test record: YFSC-16

Record size selector lever position	Count of drop-point
30 (12")	4 to 16
25 (10")	6 to 24
17 (7")	7 to 25

2. If necessary, insert the screwdriver into the hole and adjust the drop-point by turning the adjustment screw.

To change the drop-point inward:

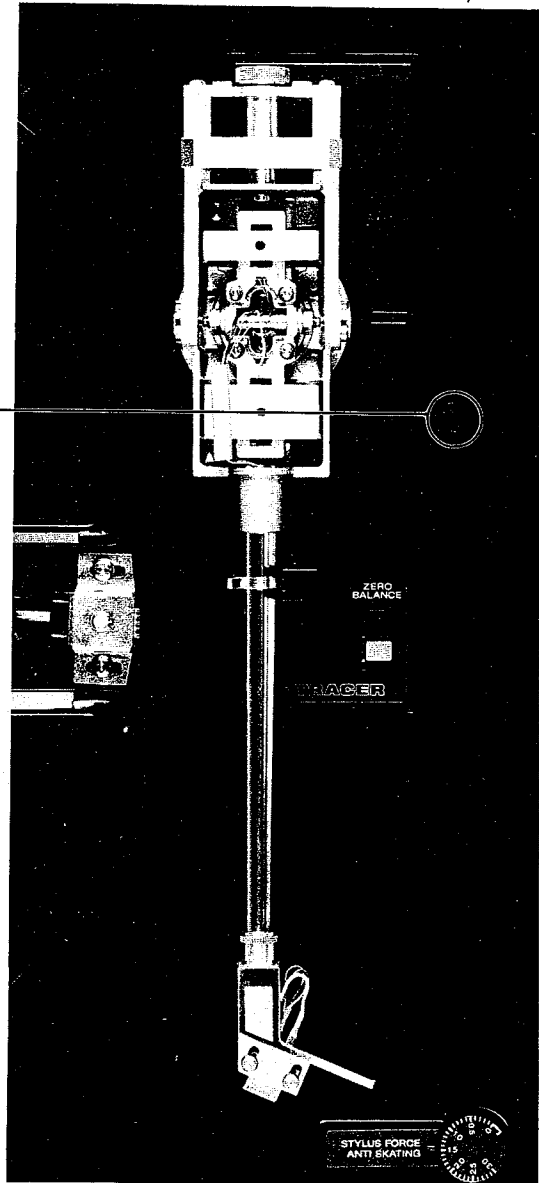
Turn the adjustment screw slightly clockwise (A).

To change the drop-point outward:

Turn the adjustment screw slightly counterclockwise (B).

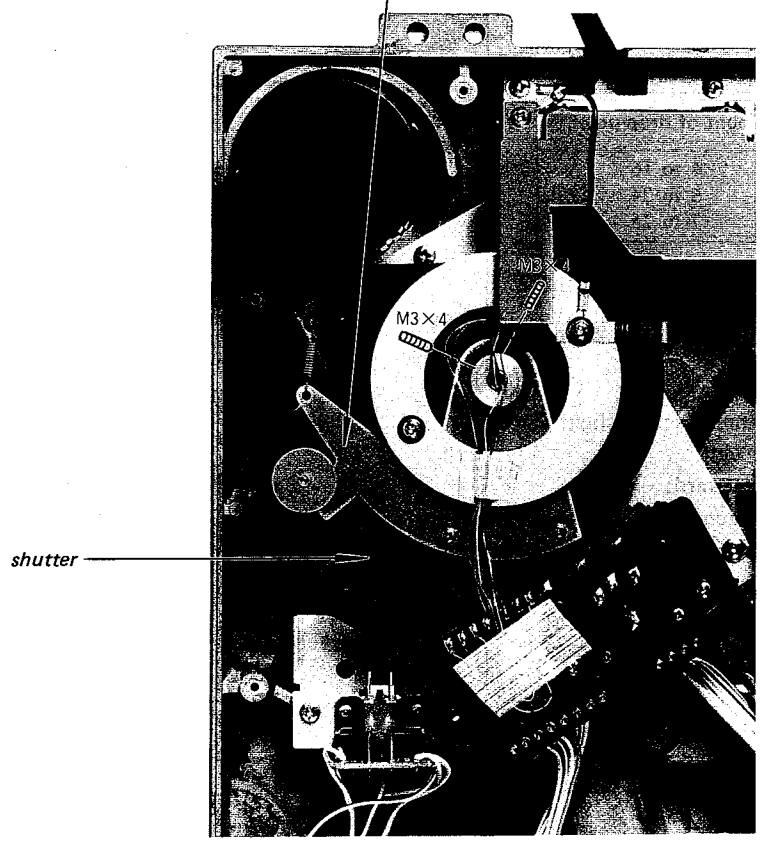
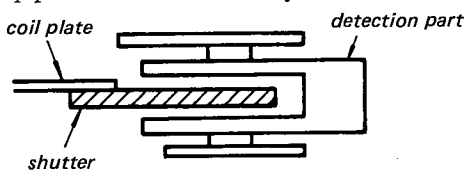
3. Once it is properly adjusted with a 30 cm (12") record, the drop-point will be correct for both 17 cm (7") and 25 cm (10") records.

Note: The stylus drop-point changes about 12 mm (½") by one turn of the adjustment screw.



Coil Plate Position Adjustment

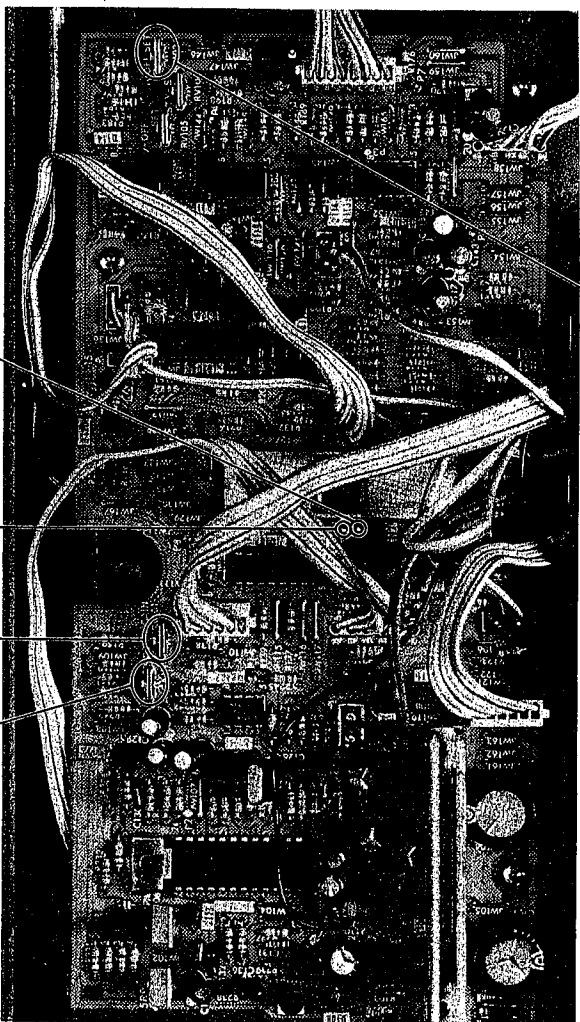
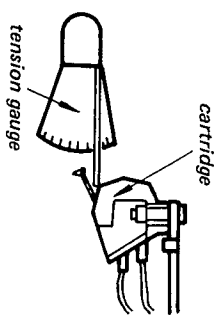
1. Adjust the coil plate position so that the movable shutter does not touch the detection part when the arm pipe is moved horizontally.



3-2. ELECTRICAL ADJUSTMENTS

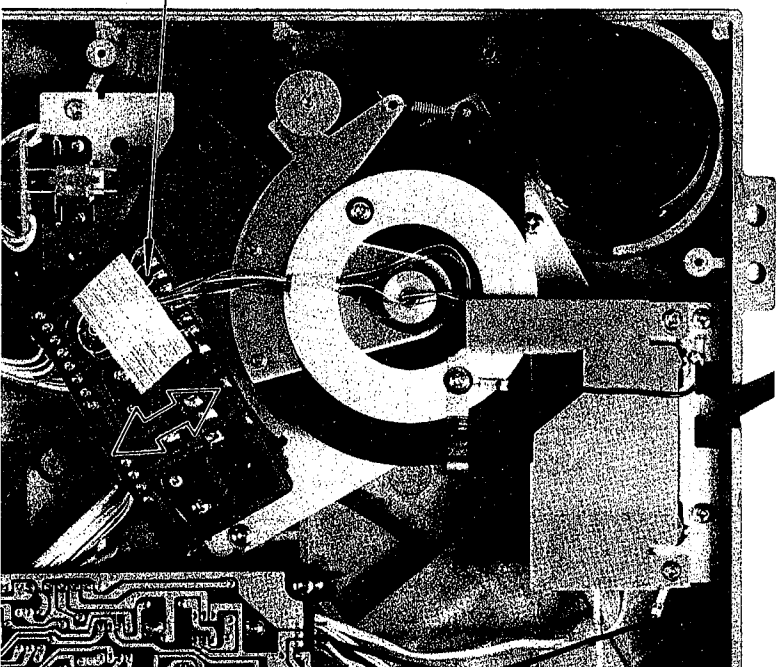
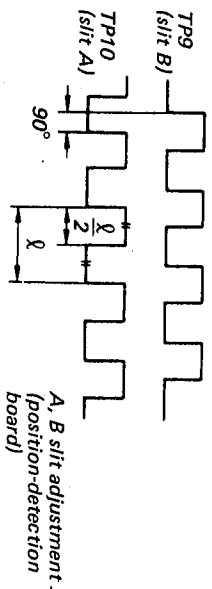
Stylus Force Adjustment

1. Set the STYLUS FORCE control to 1.5 g.
2. Adjust RV104 so that the tension gauge reads 1.5 g.
3. Set the STYLUS FORCE control to 3 g. Confirm that the tension gauge indicates 3 g.



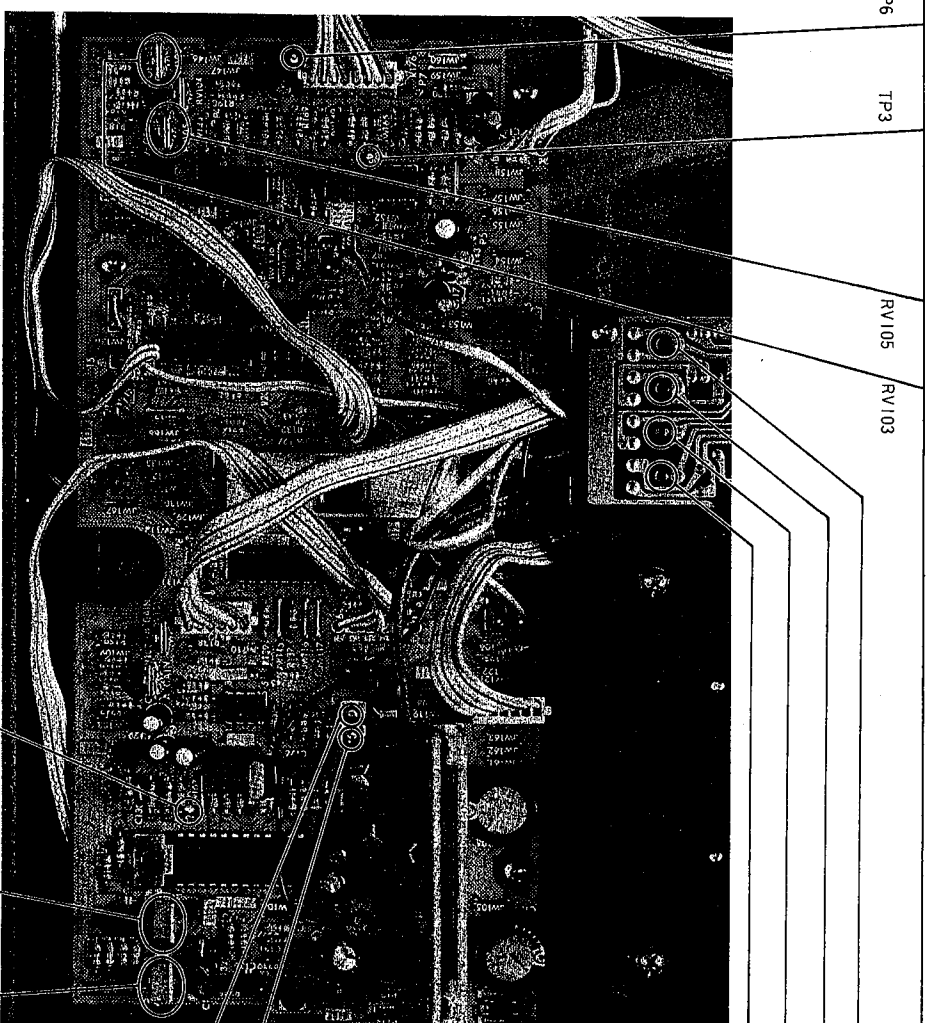
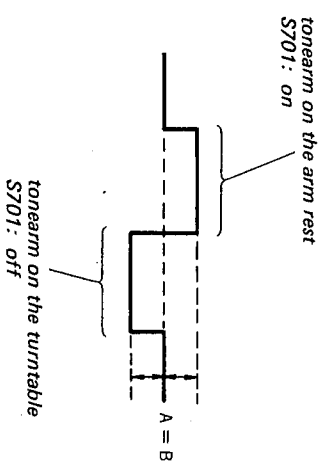
Slit A and B Adjustments

1. Connect a dual-trace oscilloscope to TP9 (for slit B) and TP10 (for slit A).
2. Push the ARM TRANSPORT button <(forward) or >(back) and swing the tonearm.
3. During the tonearm swinging, adjust RV102 (slit B) and RV101 (slit A) to obtain the square waves as shown below.
4. Push the ARM TRANSPORT button <(forward) or >(back) and swing the tonearm.
5. Move the position-detecting board for the phase difference shown below.



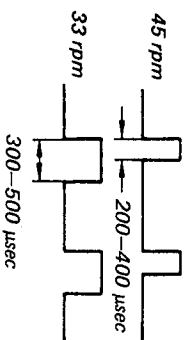
Tonearm Horizontal/Vertical Motor Offset Adjustment

- A) Vertical Adjustment**
1. Secure the tonearm on the arm rest.
 2. Turn S701 (ZERO BALANCE) on.
 3. Connect an oscilloscope to TP3 and adjust RV103 to obtain 0 V.
- B) Horizontal Adjustment**
1. Connect an oscilloscope to TP6.
 2. Secure the tonearm on the arm rest and adjust RV105 to make A and B equal as shown on the right.



Speed Adjustment

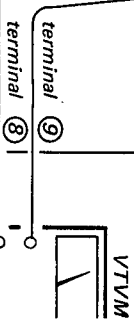
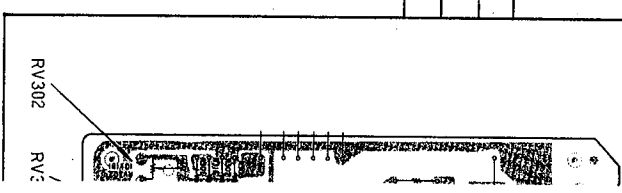
1. Set the SPEED to 45 rpm.
2. Connect an oscilloscope to TP2.
3. Adjust RV107 for a waveform as shown on the right.
4. Set the SPEED to 33 rpm.
5. Adjust RV106 for a waveform as shown on the right.



6. Confirm that the LOCKED indication is lighting up.

Turntable Motor

1. Make an...
2. Connect a...
3. Set the SP...
4. Throw th...
5. Throw th...



- Speed detecti**
1. Set the SP
 2. Connect a
 3. Push the
 4. Adjust the
- Note: The V and than

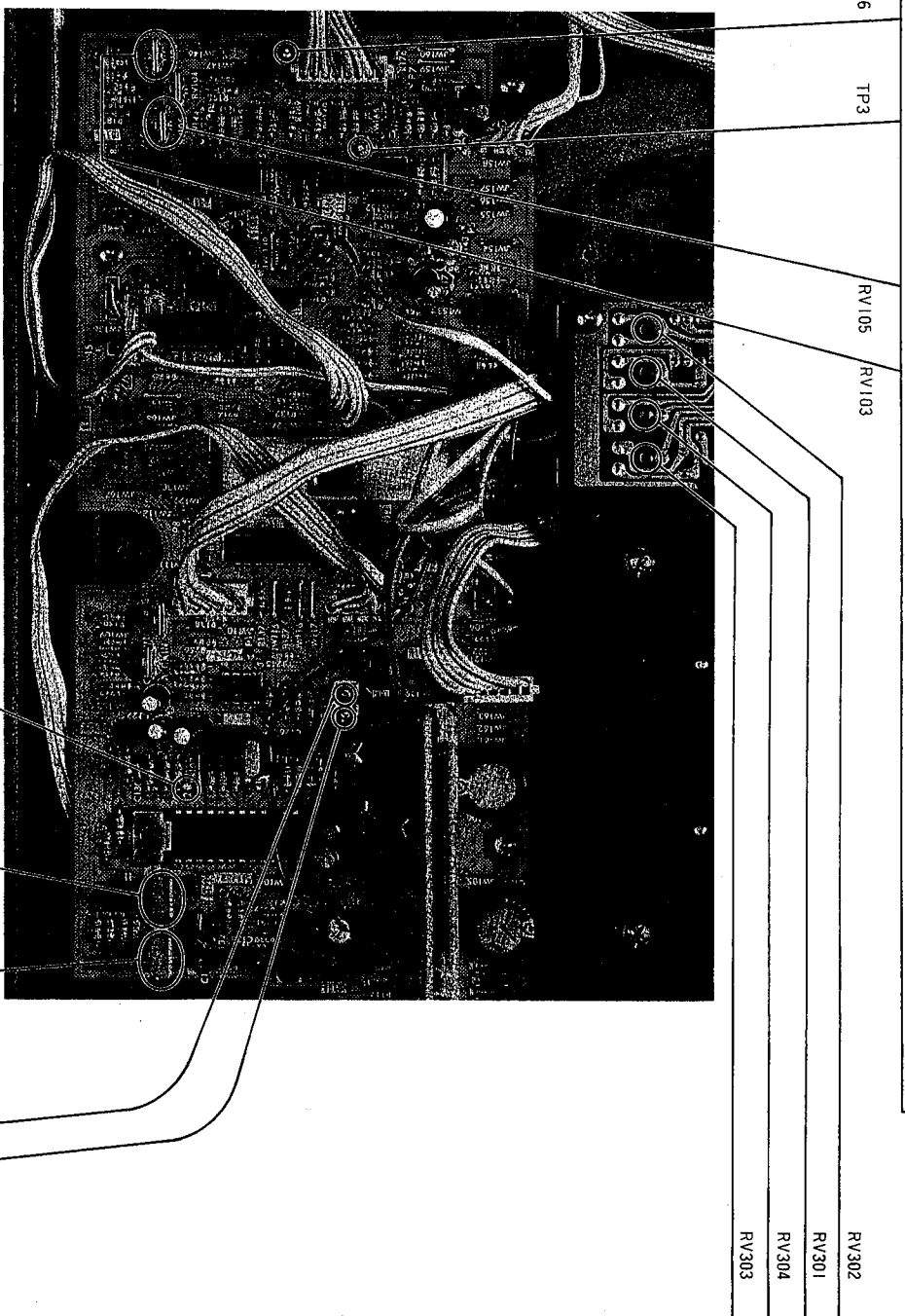
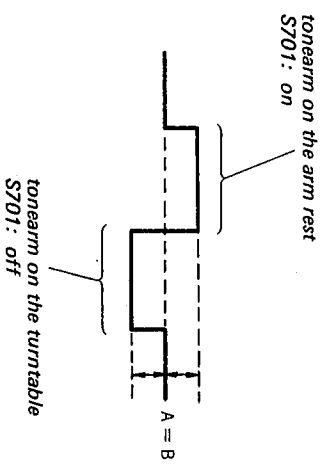
Tonearm Horizontal/Vertical Motor Offset Adjustment

A) Vertical Adjustment

1. Secure the tonearm on the arm rest.
2. Turn S701 (ZERO BALANCE) on.
3. Connect an oscilloscope to TP3 and adjust RV103 to obtain 0 V.

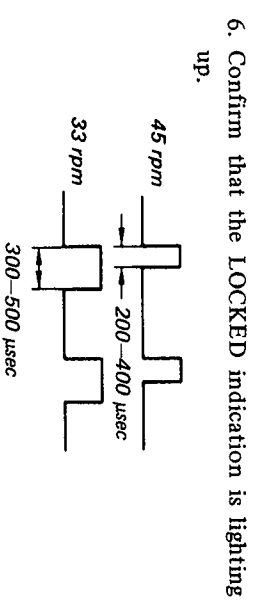
B) Horizontal Adjustment

1. Connect an oscilloscope to TP6.
2. Secure the tonearm on the arm rest and adjust RV105 to make A and B equal as shown on the right.



Speed Adjustment

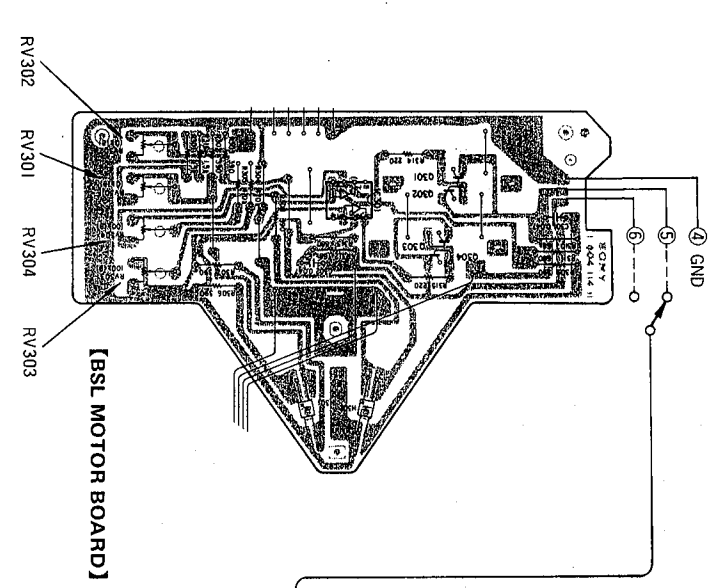
1. Set the SPEED to 45 rpm.
2. Connect an oscilloscope to TP2.
3. Adjust RV107 for a waveform as shown on the right.
4. Set the SPEED to 33 rpm.
5. Adjust RV106 for a waveform as shown on the right.



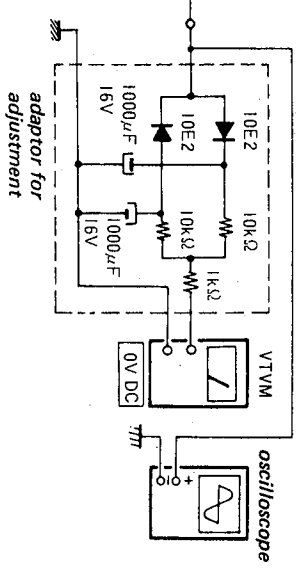
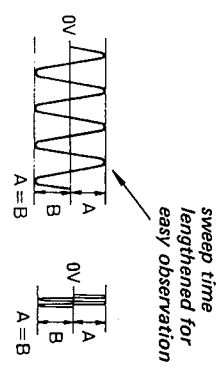
6. Confirm that the LOCKED indication is lighting up.

Turntable Motor Adjustment

1. Make an adaptor for adjustment as shown below.
2. Connect a VTVM and an oscilloscope as shown.
3. Set the SPEED to 33 rpm.
4. Throw the switch to terminal ⑤ and adjust RV302 for a 4 Vp-p reading on the oscilloscope.
5. Throw the switch to terminal ⑥ and adjust RV301 for a 4 Vp-p reading on the oscilloscope.



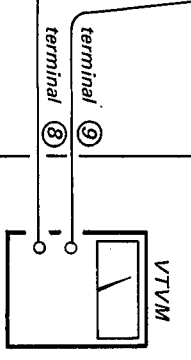
6. Throw the switch to terminal ⑤ and adjust RV304 for a 0 V dc reading on the VTVM or for a waveform as shown below.
7. Throw the switch to terminal ⑥ and adjust RV303 for a 0 V dc reading on the VTVM or for a waveform as shown below.



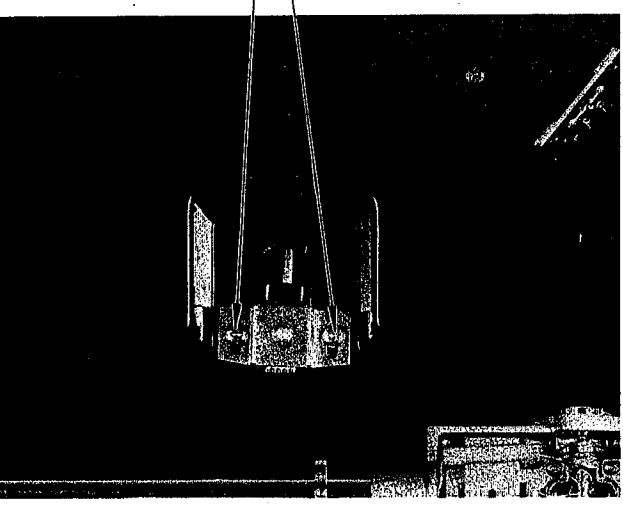
Speed-detecting Head Output Level Adjustment

1. Set the SPEED to 33 rpm.
2. Connect a VTVM as shown below.
3. Push the START/STOP button to rotate the turntable.
4. Adjust the position of the speed-detecting head so that the VTVM reading is 20 mV ac to 50 mV ac.

Note: The clearance between the magnet coated rim and the speed-detecting head should be more than 0.3 mm.



adjustment screws

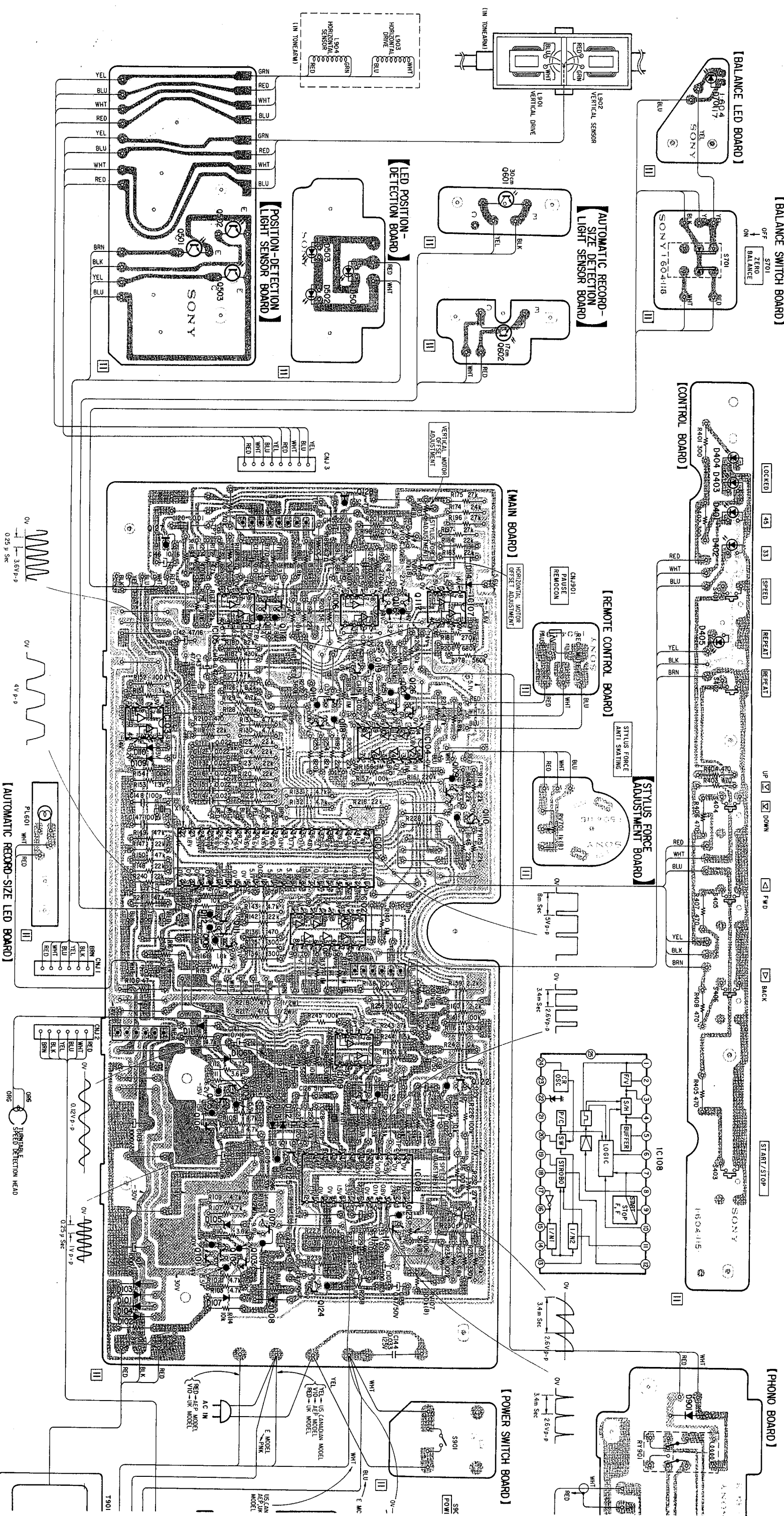


DIAGRAMS

4-1. MOUNTING DIAGRAM

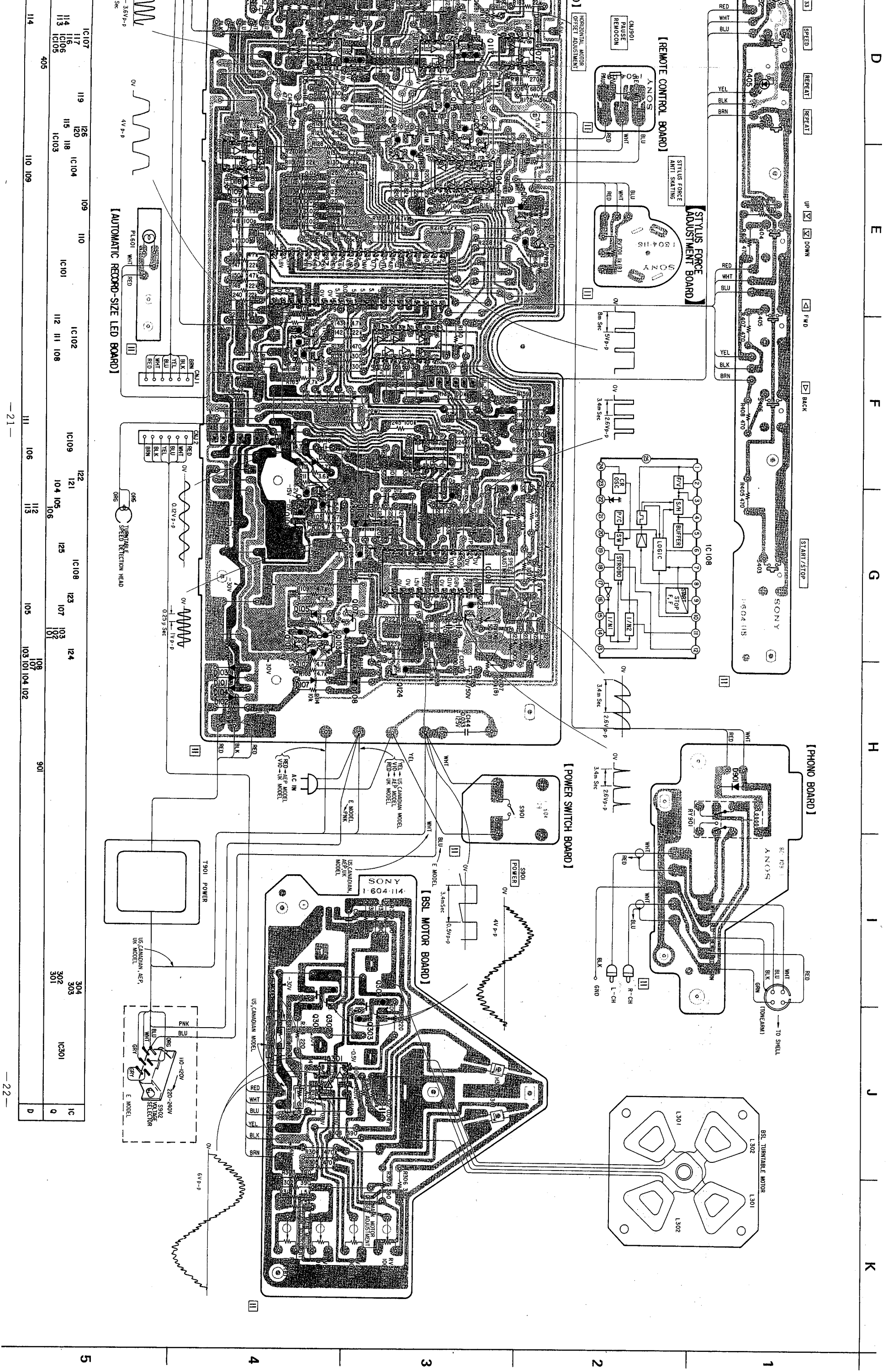
SEMICONDUCTOR LEAD LAYOUTS and NOTE: See page 26.

A B C D E F G H

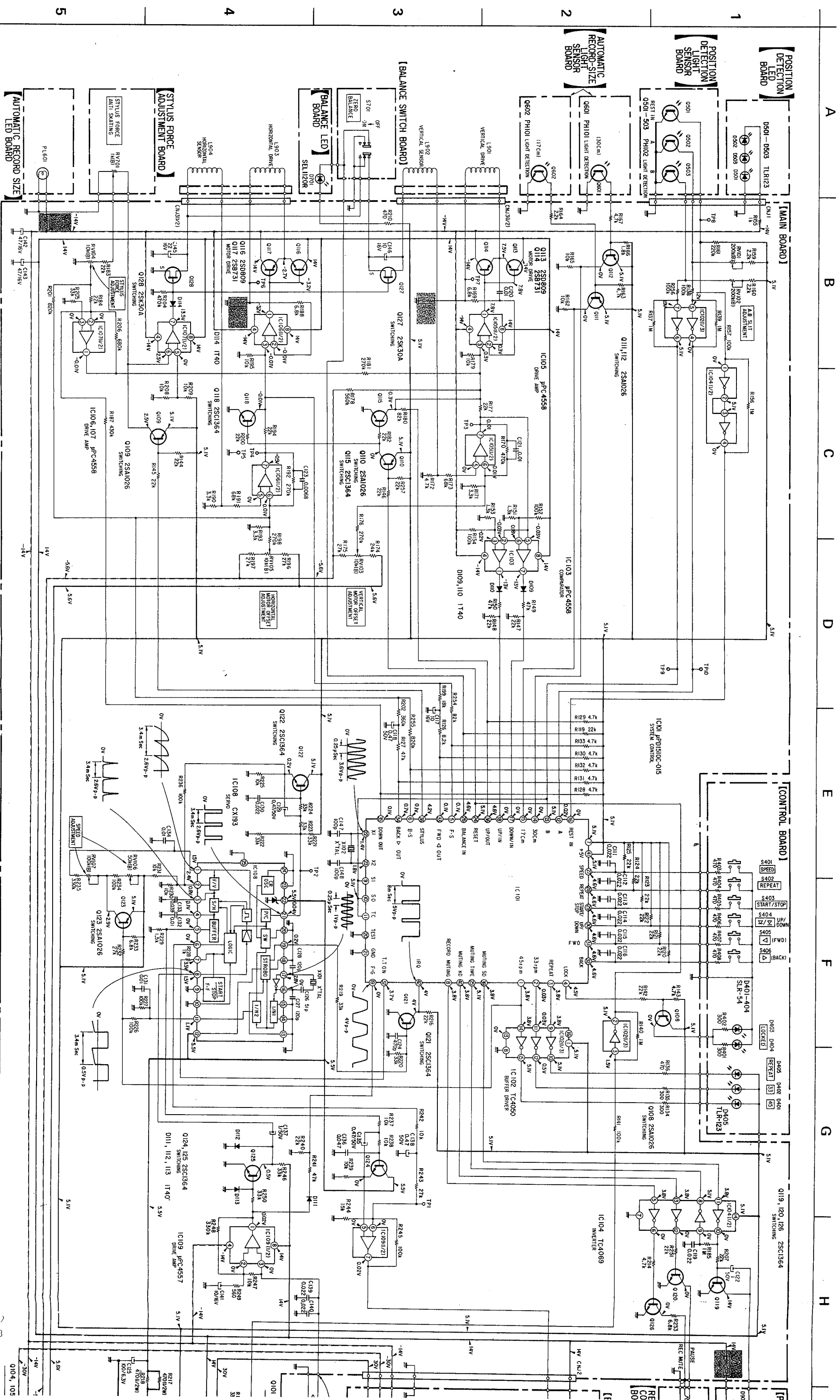


IC	601	602	IC107	119	126	110	IC101	IC102	IC109	122	IC108	123	105	108	901
Q	502	503	IC106	115	118	IC104	112	111	108	121	124	107	103	104	
D	501	502	IC105	114	IC103	110	109	110	106	104	105	106	105	107	104
	503	502	405	402	403	401	402	114	109	111	106	112	113	103	101
			128	127	128	127	114	109	110	106	112	113	103	101	104

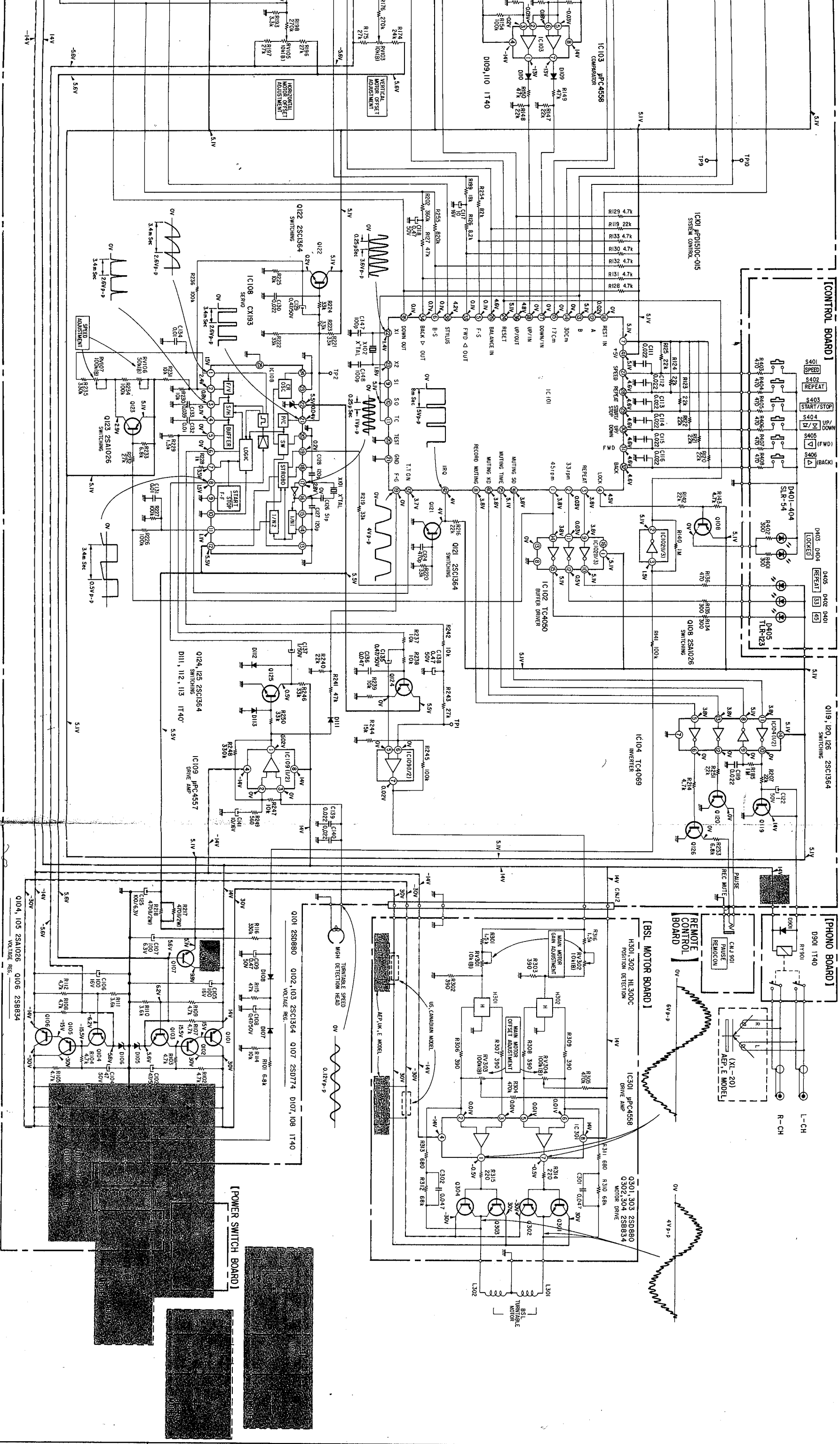
PS-X600 PS-X600



IC107	119	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400
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D E F G H I J K



5 4 3 2 1

SECTION 5

EXPLODED VIEWS

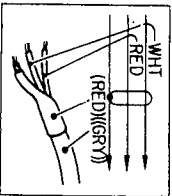
5-2.

- Items marked "A" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (-) = slotted head
- (DOT) shows the number of coils in spring.

Note: The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque **A** sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: (For MOUNTING DIAGRAM)
 • Color code of sleeving over the end of the jacket.



- : parts extracted from the component side.
- : B + pattern
- : B - pattern

Note: (For SCHEMATIC DIAGRAM)

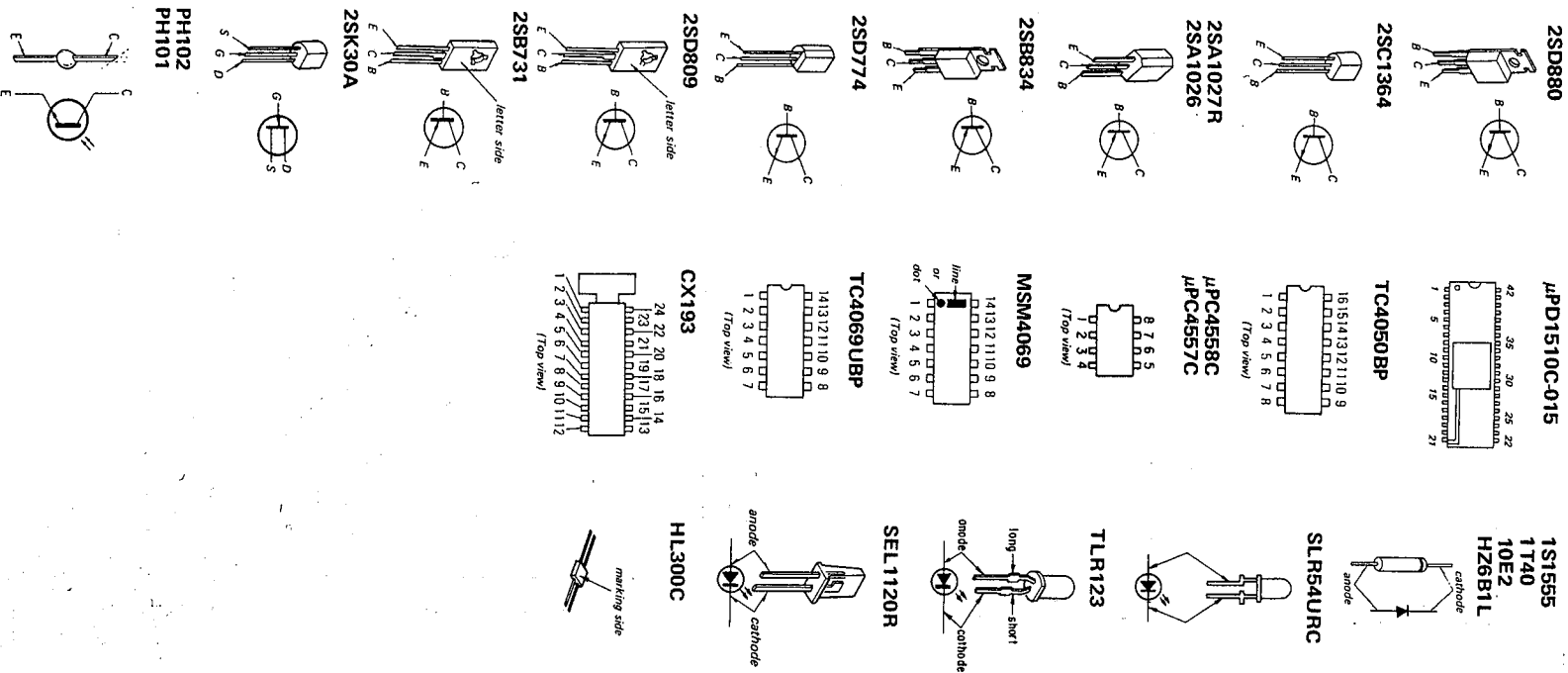
- All capacitors are in μF unless otherwise noted. pF : μF 50WV or less are not indicated except for electrolytics and tantalums.
- : fusible resistor.
- : panel designation.
- : adjustment for repair.
- : B+ bus.
- : B- bus.
- Waveforms and their voltage readings are taken with an oscilloscope.
- turntable motor: OFF, 33 rpm
- tonearm: rested on tonearm rest
- tonearm lifter: upped
- servo amp circuit: when turntable motor is turning
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (20 k Ω /V).
- Voltage variations may be noted due to normal production tolerances.
- Switch

Ref. No.	Switch	Position
S401	SPEED	OFF
S402	REPEAT	OFF
S403	START/STOP	OFF
S404	∇ / ∇ (UP/DOWN)	OFF
S405	∇ (FWD)	OFF
S406	∇ (BACK)	OFF
S701	ZERO BALANCE	OFF
S901	POWER	OFF
S902 (model E)	VOLTAGE SELECTOR	110-120 V

Note: The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

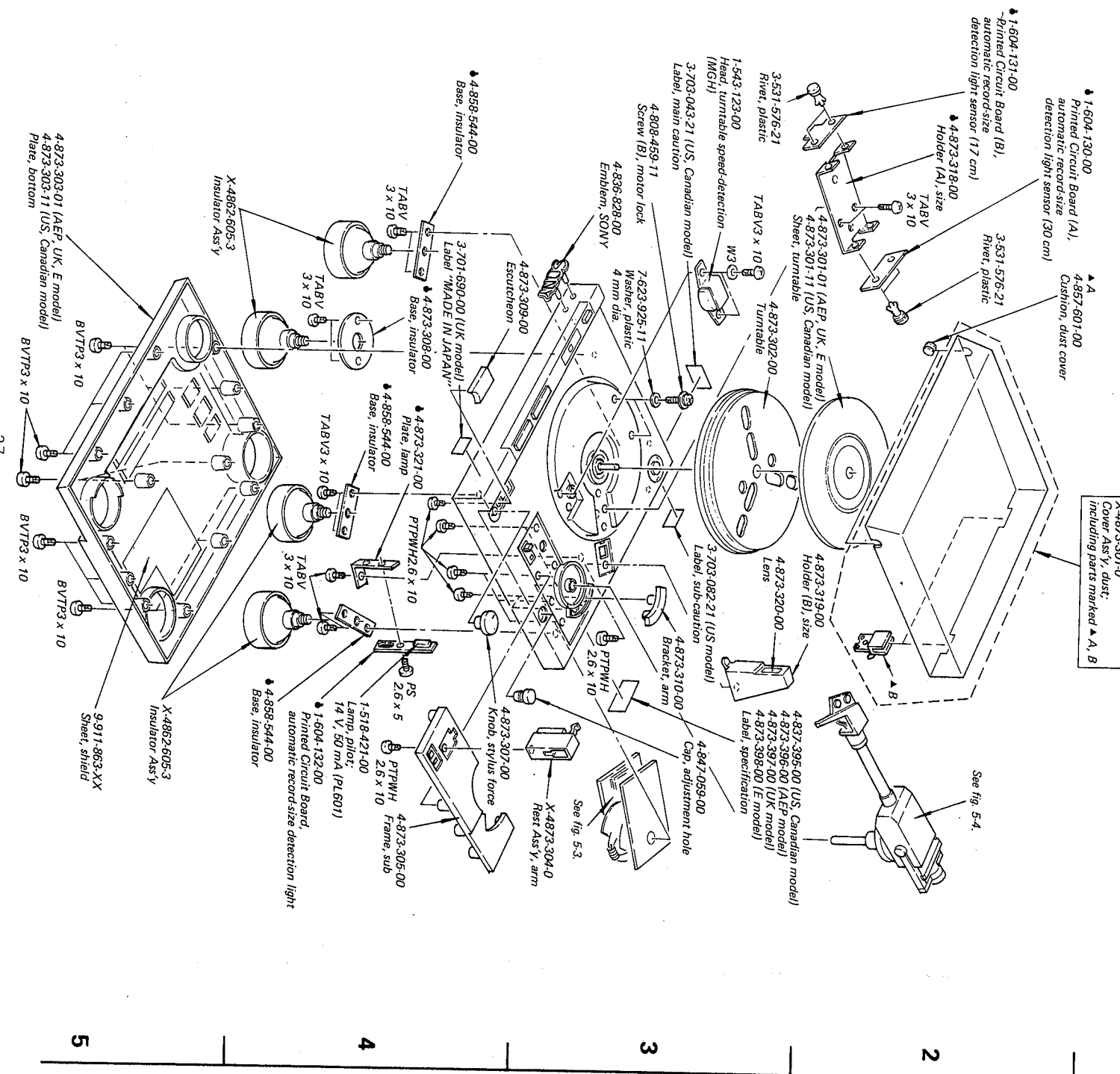
Note: Les composants identifiés par une trame et une marque **A** sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Semiconductor Lead Layouts



5-1.

A B C



27

5

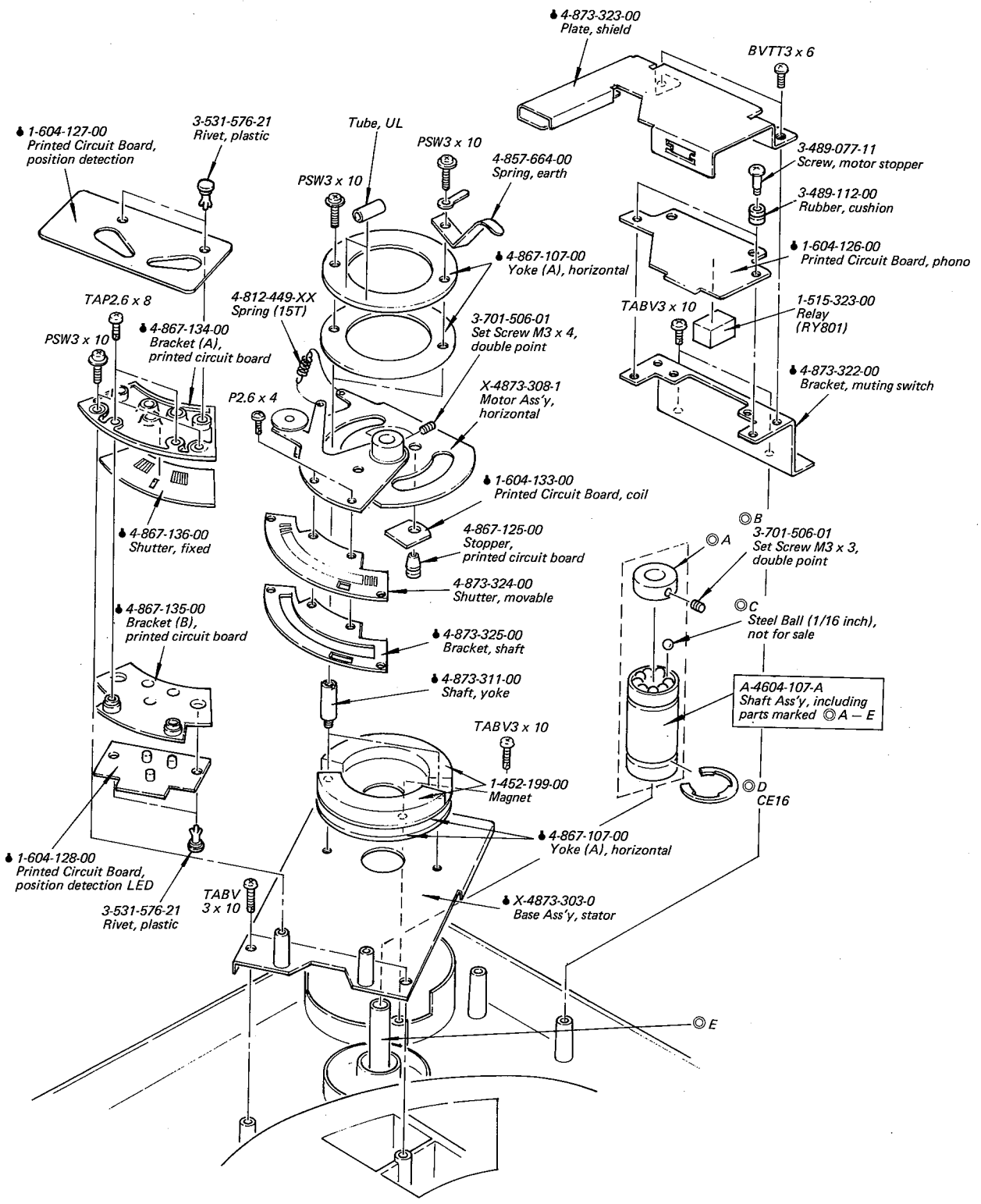
5-3.

A

B

C

1
2
3
4
5



SECTION 6
ELECTRICAL PARTS LIST

• Items marked "A" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

Note: The components identified by shading and mark A are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque A sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No. Part No. Description

SEMICONDUCTORS

Transistors

Q101	8-729-288-02	2SD880
Q102, 103	8-729-663-47	2SC1364
Q104, 105	8-729-612-77	2SA1027R
Q106	8-729-283-41	2SB834
Q107	8-729-177-43	2SD774

Q108-112	8-729-612-77	2SA1027R
Q113	8-729-180-93	2SD809
Q114	8-729-173-13	2SB731
Q115	8-729-663-47	2SC1364
Q116	8-729-180-93	2SD809

Q117	8-729-173-13	2SB731
Q118-122	8-729-663-47	2SC1364
Q123	8-729-612-77	2SA1027R
Q124-126	8-729-663-47	2SC1364
Q127, 128	8-729-203-04	2SK30A

Q301	8-729-288-02	2SD880
Q302	8-729-283-41	2SB834
Q303	8-729-288-02	2SD880
Q304	8-729-283-41	2SB834
Q501-503	8-729-101-02	PH102
Q601, 602	8-729-101-01	PH101

ICs

IC101	8-759-115-15	μPD1510C-015
IC102	8-759-240-50	TC4050BP
IC103	8-759-145-58	μPC4558C
IC104	8-759-904-69	MSM4069
IC105-107	8-759-145-58	μPC4558C
IC108	8-751-930-00	CX193
IC109	8-759-145-57	μPC4557C
IC301	8-759-145-58	μPC4558C

Diodes

D101-104	8-719-200-02	10E2
D105, 106	8-719-910-64	HZ6B1L
D107-114	8-719-815-55	1S1555

Ref. No. Part No. Description

D401-404	8-719-905-40	SLR34URC
D405	8-719-812-31	TLR123
D501-503	8-719-311-20	SEL1120R
D701	8-719-815-55	1S1555
D901	8-719-903-00	HL300C

CAPACITORS

All capacitors are in μF. 50 V or less are not indicated. Common capacitors are omitted. Refer to the lists on pages 33 and 34 for their part numbers.

C101, 103	1-123-349-00	1,000	35 V	electrolytic
	1-161-744-00	0.01	400 V	ceramic
C144	1-161-749-00	0.01	125 V	ceramic (US, Canadian model)

RESISTORS

All resistors are in ohm. Common 1/2 W carbon resistors are omitted. Refer to the list on page 35 for their part numbers.

R106	1-217-395-00	47	1/4 W	fusible
R113	1-206-482-00	62	2 W	metal oxide
R168, 189	1-212-849-00	4.7	1/4 W	fusible (nonflammable)
R203	1-212-875-00	56	1/4 W	fusible
R317, 318	1-212-849-00	4.7	1/4 W	fusible (nonflammable) (AEP, UK, E model)

RV101, 102	1-226-435-00	200 k	adjustable
RV103-105	1-226-431-00	10 k	adjustable
RV106	1-224-661-00	50 k	adjustable
RV107	1-226-938-00	100 k	adjustable
RV301, 302	1-226-236-00	10 k	adjustable
RV303, 304	1-226-239-00	100 k	adjustable
RV701	1-228-008-00	1 k	variable

MISCELLANEOUS

L101, 102	1-407-157-XX	Coil, microinductor, 10 μH
L301, 302	1-462-161-00	Coil, motor
L901	1-454-269-00	Solenoid
L902	1-454-268-00	Solenoid

Ref. No. Part No. Description

MGH	1-543-123-00	Head, turntable speed-detection
PL601	1-518-421-00	Lamp 14 V 50 mA

S401-406	1-553-580-00	Switch, keyboard
S701	1-552-233-00	Switch, ZERO BALANCE

S901	1-553-319-00	Switch, pushbutton, POWER (US, Canadian model)
	1-553-318-00	Switch, pushbutton, POWER (AEP, UK, E model)

S902	1-552-535-00	Voltage Selector (E model)
------	--------------	----------------------------

T901	1-446-955-00	Transformer, power (E model)
	1-446-956-00	Transformer, power (US, Canadian model)

RY801	1-515-323-00	Relay
X101	1-527-380-00	Crystal
	1-527-380-21	Crystal
X102	1-527-802-00	Crystal, ceramic

	1-452-199-00	Magnet
	1-452-222-00	Magnet
	1-452-223-00	Magnet

	1-534-817-31	Cord, power (AEP model)
	1-534-986-XX	Cord, power (US, Canadian model)
	1-551-473-31	Cord, power (E2 model)
	1-551-884-41	Cord, power (UK model)
	1-555-666-00	Cord with plug
	1-555-734-21	Cord, power (E1 model)
	1-561-551-00	Connector, neck cylinder

COMPLETE CIRCUIT BOARDS

	A-4619-167-A	Main (US, Canadian model)
	A-4619-168-A	Main (AEP, UK, E model)

PRINTED CIRCUIT BOARDS

	1-604-114-00	BSL motor
	1-604-115-00	Control
	1-604-116-00	Stylus Force Adjustment
	1-604-117-00	Balance LED
	1-604-118-00	Balance SW
	1-604-119-00	Remote Control

Part No. Description

	1-604-126-00	Phono
	1-604-127-00	Position Detection Light Sensor
	1-604-128-00	Position Detection LED
	1-604-130-00	Automatic Record Size Detection
	1-604-131-00	Light Sensor (A)
	1-604-132-00	Automatic Record Size Detection Light Sensor (B)
	1-604-133-00	Automatic Record Size LED Coil

ACCESSORIES & PACKING MATERIALS

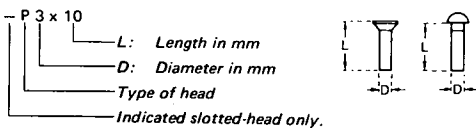
Part No.	Description
X-4869-912-0	Head Shell Ass'y
X-4869-915-0	Screw Ass'y, cartridge (US, Canadian model)
1-555-463-00	Connector with lead wires
3-701-616-00	Bag, polyethylene
3-701-630-00	Bag, polyethylene
3-701-806-00	Adaptor 45 rpm
3-783-448-21	Manual, instruction
3-795-096-11	Card, caution on zero balance
4-815-655-02	Nut (A), cartridge
4-838-319-00	Screw (B), cartridge (US, Canadian, UK, E model)
4-841-044-00	Washer, cartridge (US, Canadian, UK, E model)
4-847-314-00	Bag, polyethylene
4-869-962-00	Adjustor, drop point
4-873-301-11	Sheet, turntable (US, Canadian model)
4-873-302-00	Turntable
4-873-306-00	Sub-weight
4-873-386-00	Cushion, right
4-873-387-00	Cushion, left
4-873-388-00	Boxes, accessories
4-873-390-00	Holder, turntable
4-873-391-00	Plate, protection
4-873-392-00	Cushion, tonearm
4-873-400-00	Carton, individual

1/4 WATT CARBON RESISTORS

Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-476-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-477-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-478-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-479-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-480-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-481-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-482-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-483-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-484-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-485-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-486-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-487-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

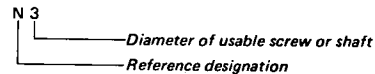
HARDWARE NOMENCLATURE

Screw:



Indicated slotted-head only.
Unless otherwise indicated, it means cross-recessed head (Phillips type).

Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	

