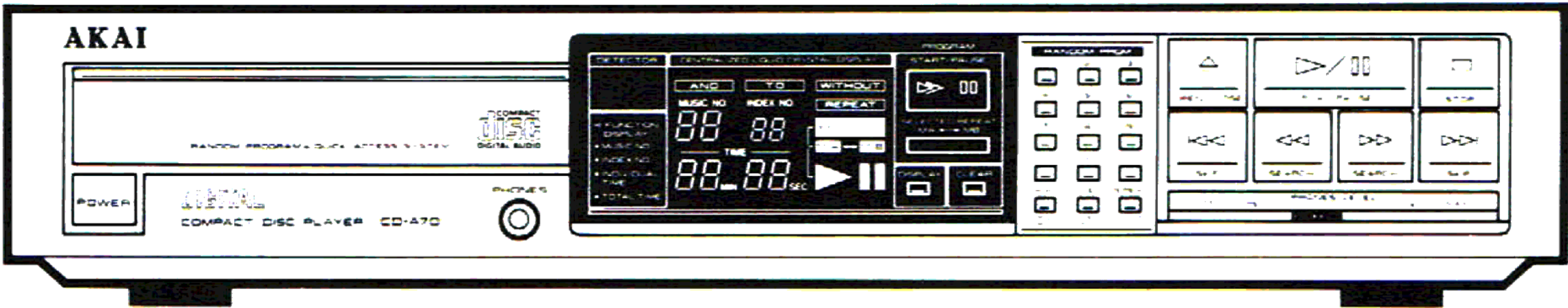


AKAI SERVICE MANUAL



COMPACT DISC PLAYER MODEL CD-A70

SPECIFICATIONS

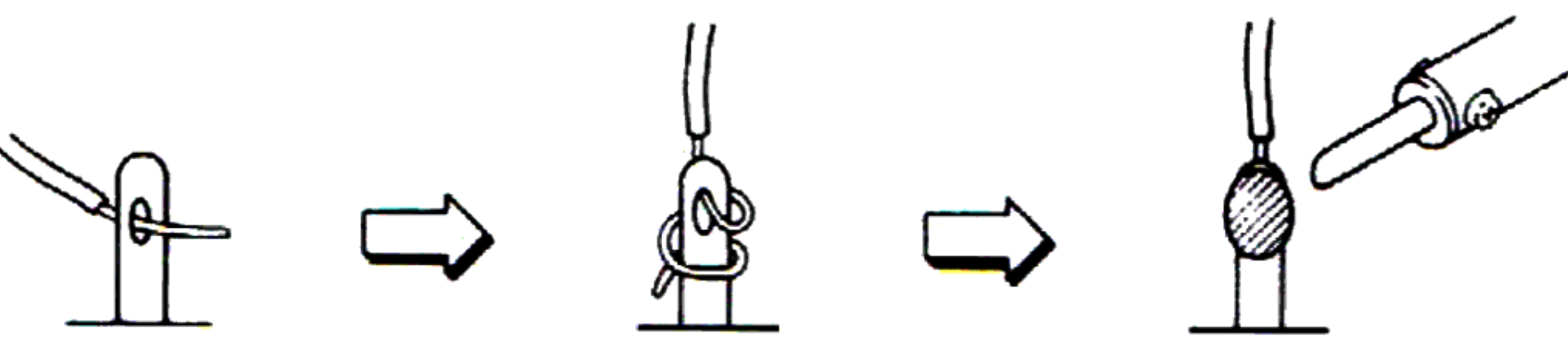
Type	Optical
Pick-up System	3 beam semi-conductor laser
Filter	Accurate 80th Digital filter and accurate 7th analogue filter
Channel	2 channel
Sampling frequency	44.1 kHz
Frequency response	5 Hz to 20 kHz
Dynamic range	95 dB
S/N	95 dB
T.H.D.	0.003% (1 kHz)
Channel separation	90 dB (1 kHz)
Wow & Flutter	Below measurable limits
Line output level	2V
Dimensions	440 (W) x 79 (H) x 260 (D) mm (17.3 x 3.1 x 10.2 inches)
Weight	3.9 kg (8.6 lbs)

* For improvement purposes, specifications and design are subject to change without notice.

★SAFETY INSTRUCTIONS

PRECAUTIONS DURING SERVICING

- 1. Parts identified by the Δ symbol parts are critical for safety. Replace only with parts number specified.
- 2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation.
These must also be replaced only with specified replacements.
Examples: RF converters, tuner units, antenna selector switches, RF cables, noise blocking capacitors, noise blocking filters, etc.
- 3. Use specified internal wiring. Note especially:
 - 1) Wires covered with PVC tubing
 - 2) Double insulated wires
 - 3) High voltage leads
- 4. Use specified insulating materials for hazardous live parts. Note especially:
 - 1) Insulation Tape
 - 2) PVC tubing
 - 3) Spacers (Insulating Barriers)
 - 4) Insulation sheets for transistors
 - 5) Plastic screws for fixing microswitch (especially in turntable)
- 5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.), wrap ends of wires securely about the terminals before soldering.



- 6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).

- 7. Check that replaced wires do not contact sharp edged or pointed parts.
- 8. Also check areas surrounding repaired locatoins.
- 9. Use care that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

SAFETY CHECK AFTER SERVICING

Confirm the specified insulation resistance between power cord plug prongs and externally exposed parts of the set is greater than 10 M ohms. but for equipment with external antenna terminals (tuner, receiver, etc.) and is intended for [C] or [A], specified insulation resistance should be headphone jacks line-in-out jacks etc. more than 2.2 M ohms (ground terminals, microphone jacks).

★INFORMATION

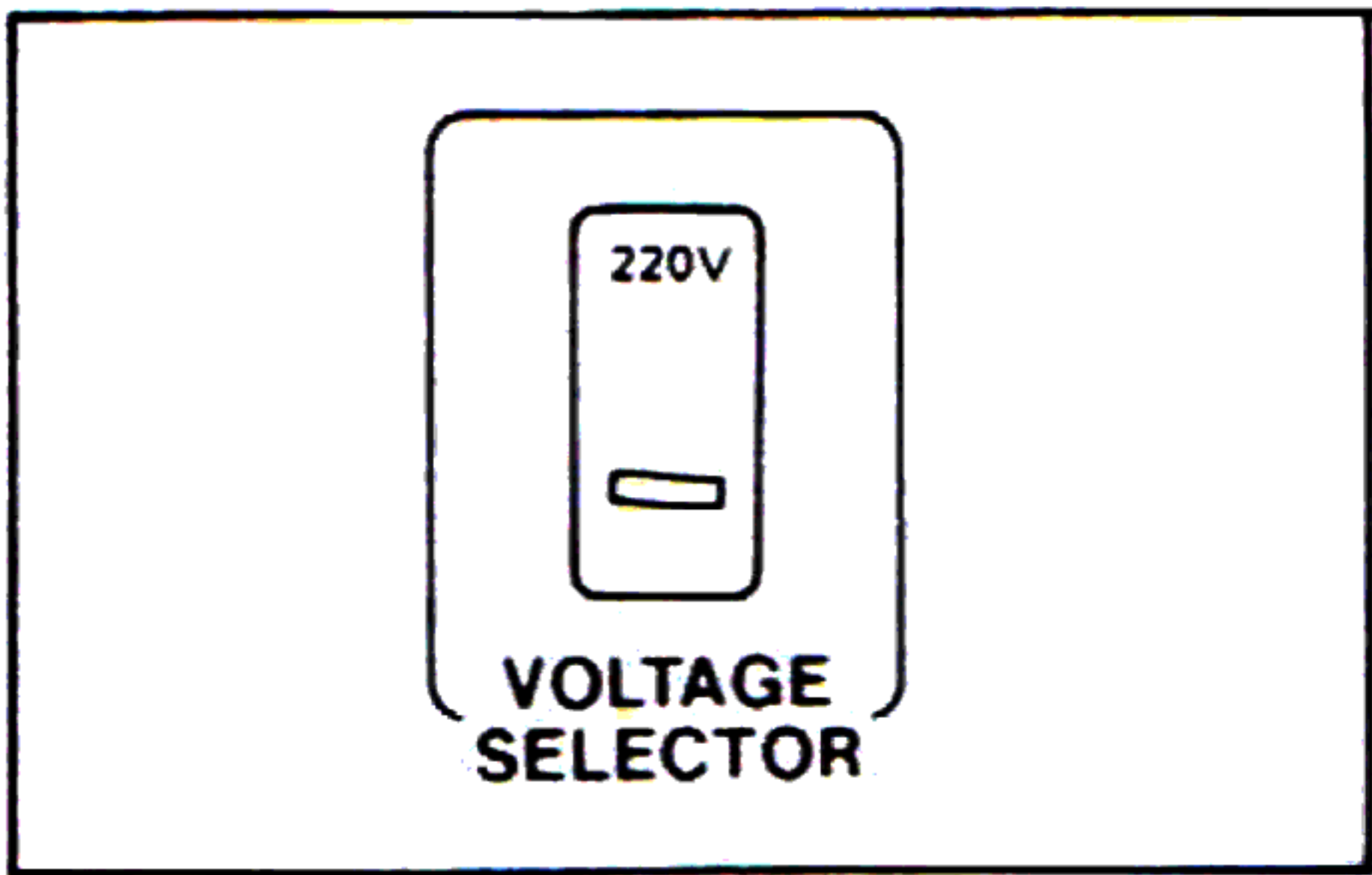
SYMBOLS FOR PRIMARY DESTINATION

Alphabet indicates the destination of the units as listed below.

Symbols	Principal Destinations
[A]	USA
[B]	UK
[C]	Canada
[E]	Europe (except UK)
[J]	Japan
[S]	Australia
[V]	W. Germany only
[U]	Universal Area
[Y*]	Custom version

VOLTAGE CONVERSION ([U] Model only)

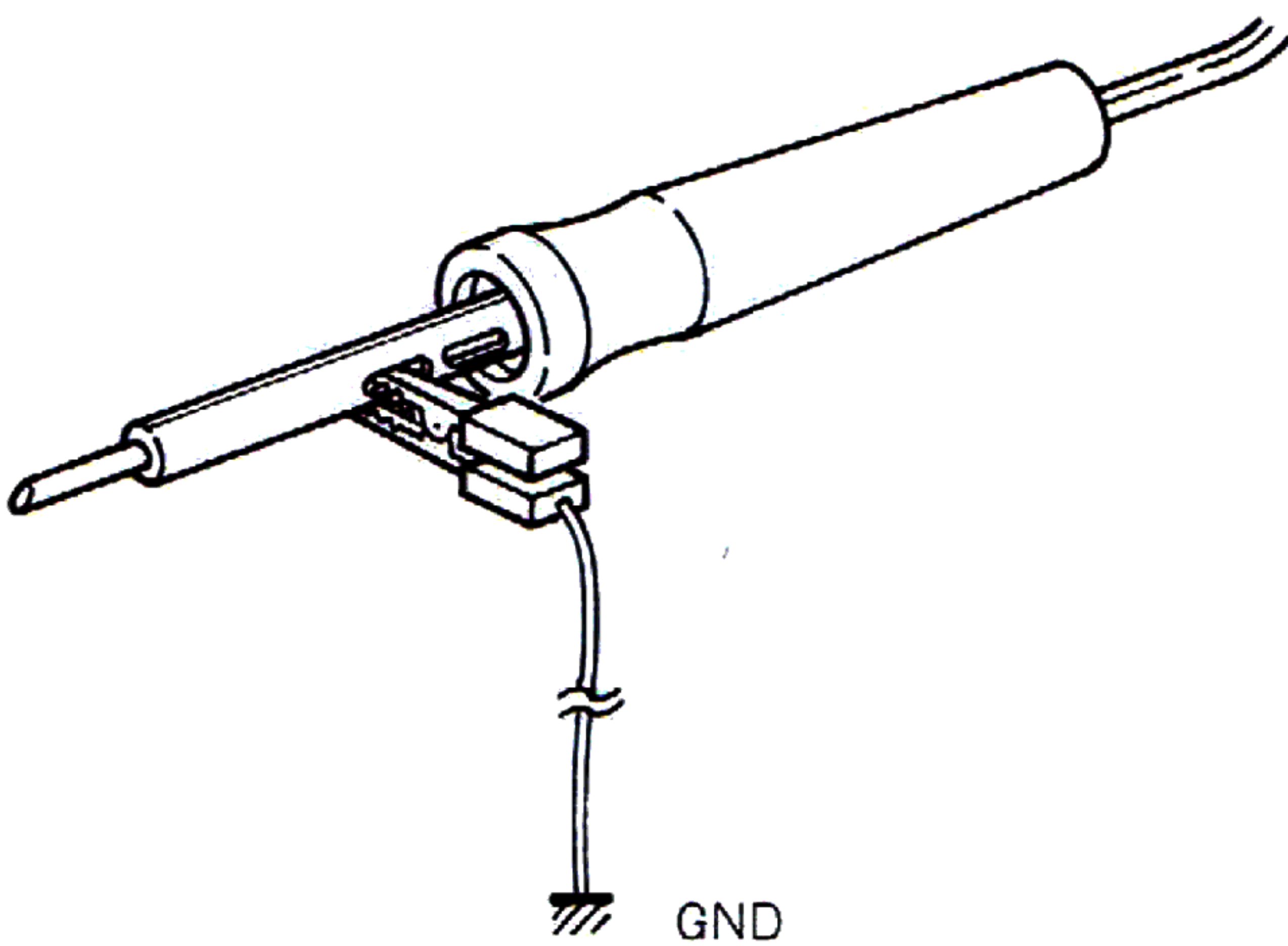
Befor connecting the power cord. SET the VOLTAGE SELECTOR located on the rear panel with a screwdriver so that the correct voltage is indicated.



PRECAUTIONS IN REPAIRING

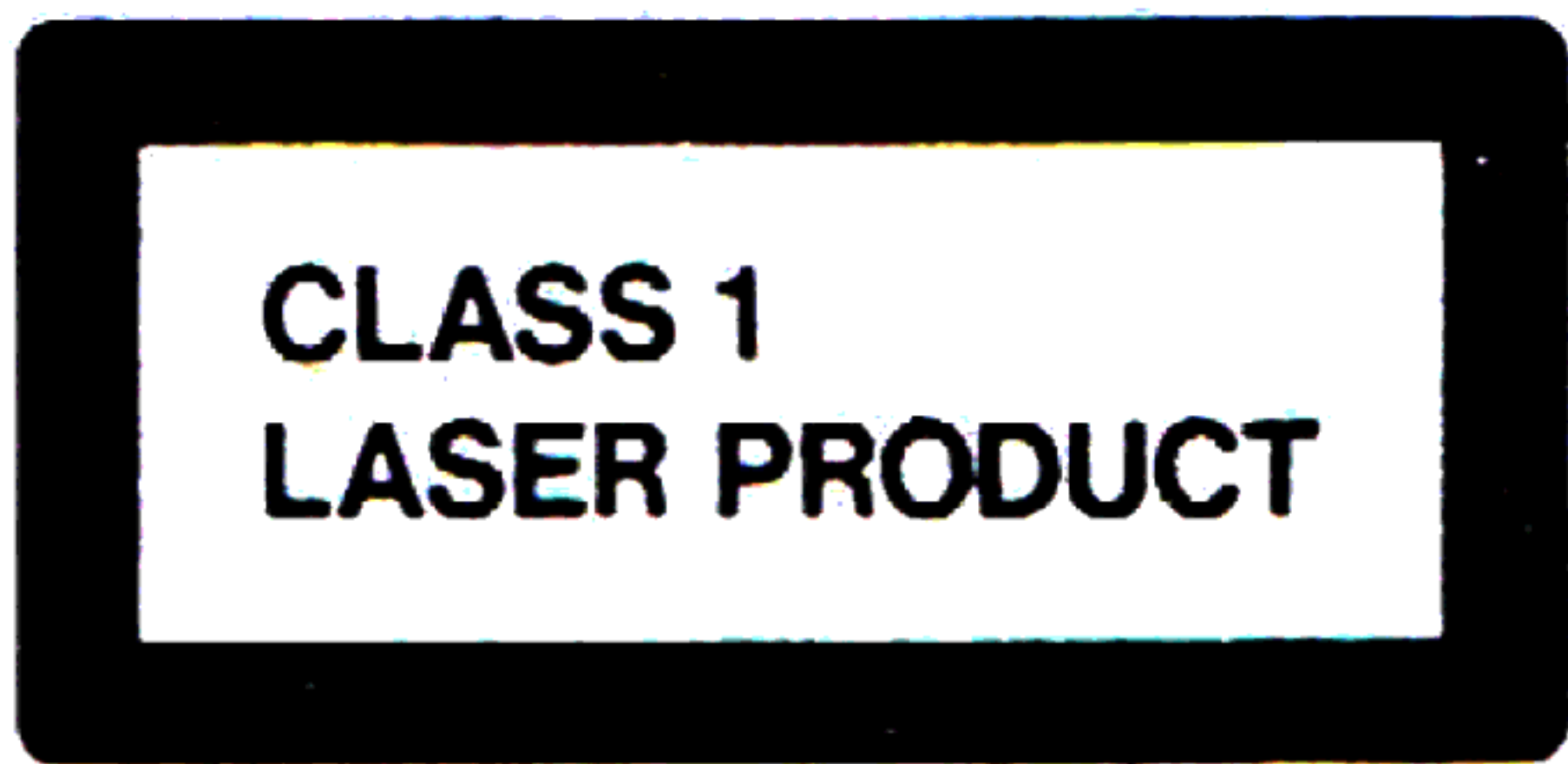
When repairing or adjusting the unit, please note the following points.

- 1. Do not put excessive pressure on the mechanical part (operation part), including the pick-up block, as extremely high mechanical precision is required in these parts.
- 2. When the base is removed for repair or adjustment, make sure that there are no metal objects in the narrow gap between the P.C board or the mecha parts and the base.
- 3. The Micro-Computer (M50745-417SP, HD6805SD) and the CD signal processing ICs (CX20108, CX20109, CX20152, CX23035, AK-80 and SRM2016C15) can be damaged by static electricity or leakage from a soldering iron during repairing. While soldering, please take the precautions against leakage as in the illustration below.

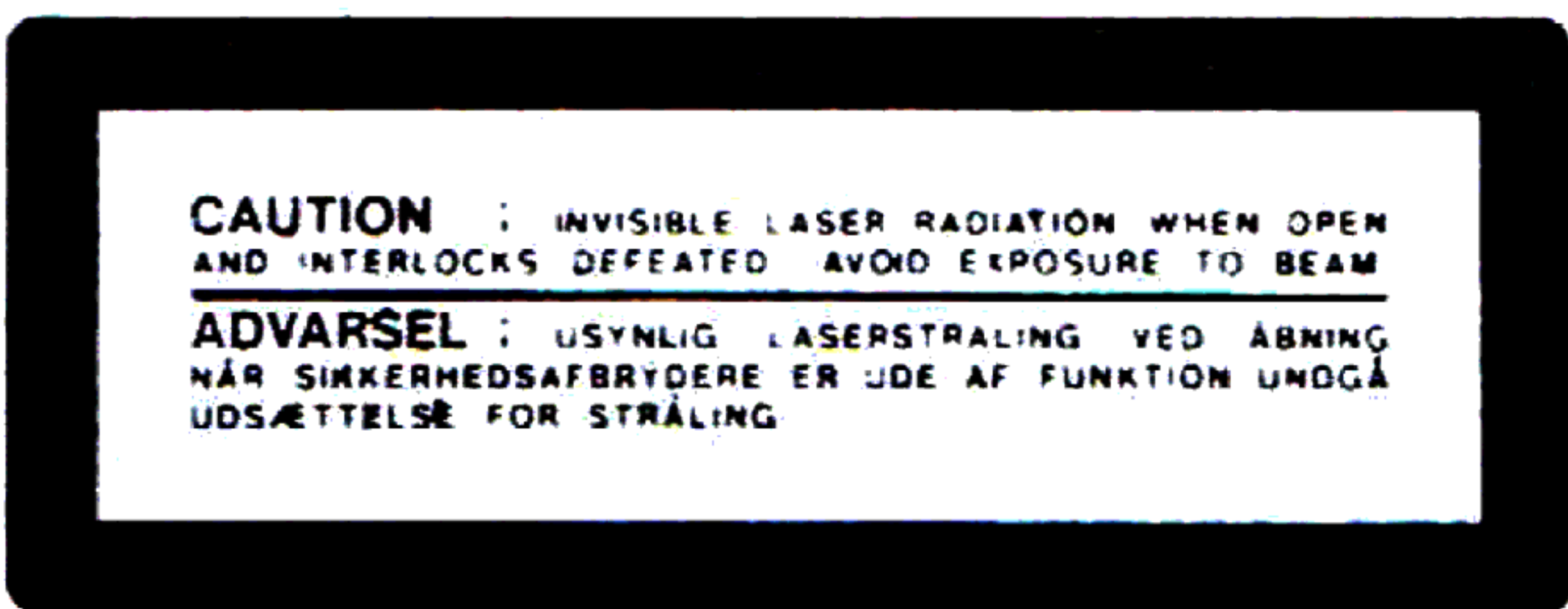


- 4. Do not loosen any screws in the pick-up block.
When handling the Pick-up block, please refer to the points to NOTE when replacing the pick-up block.
- 5. Keep safety for hazardous invisible Laser Radiation, DO NOT watch the Laser Beam (objective Lens) Directly.
- 6. Models for the same countries, Laser Warning Labels are afixed on the unit and inside of the unit, as shown below.
Read it carefully for your safety, when repairing or adjusting the unit.

[DENMARK]



A Label affixed on the unit

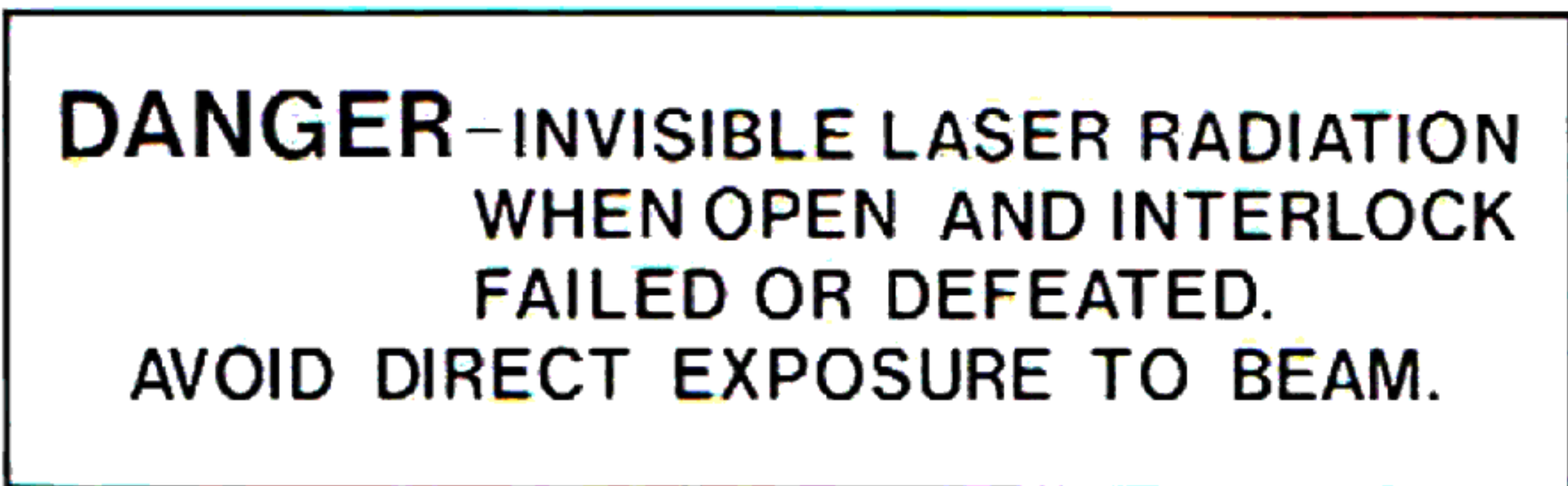


A1 A Label affixed inside of the unit

[USA]



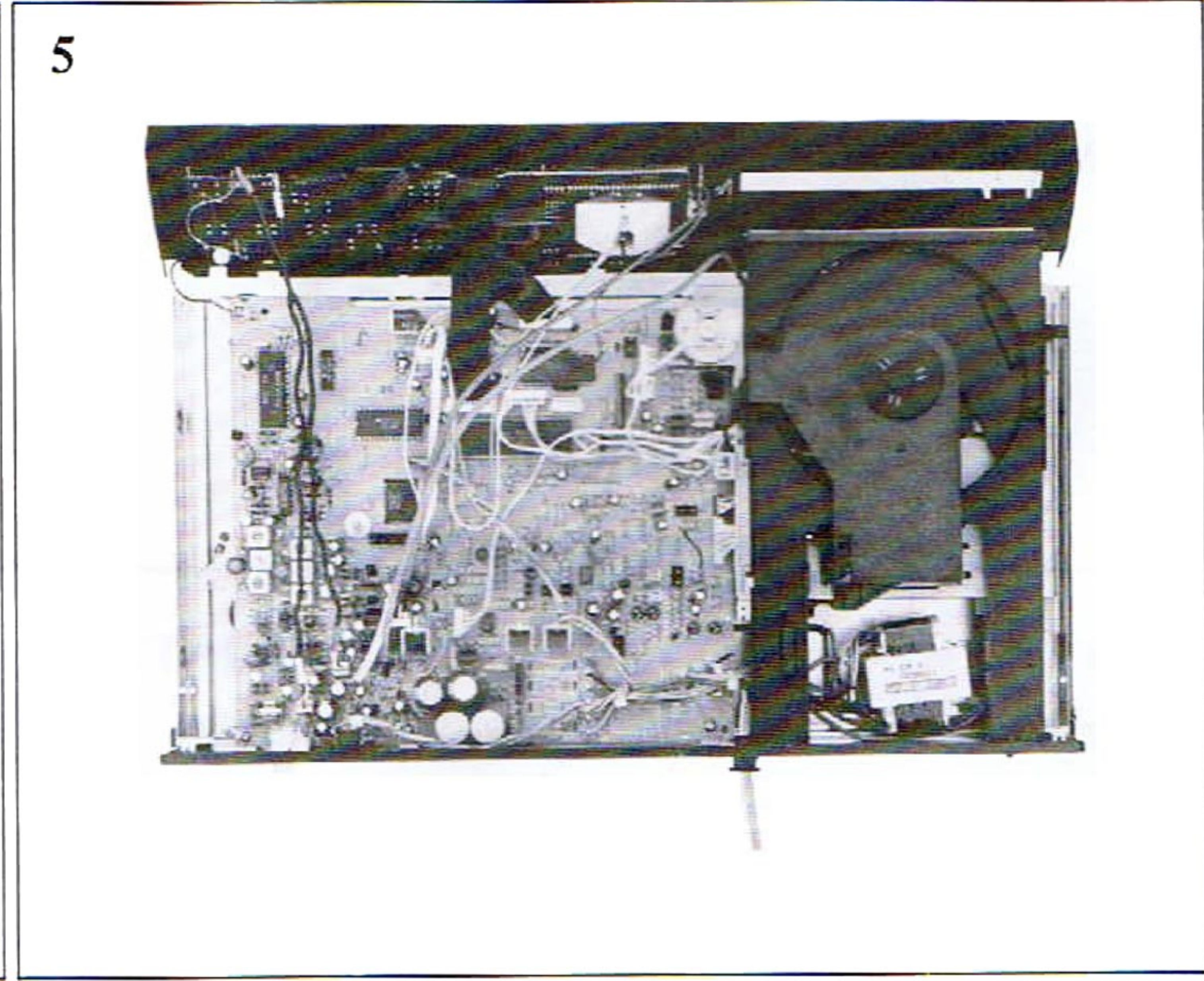
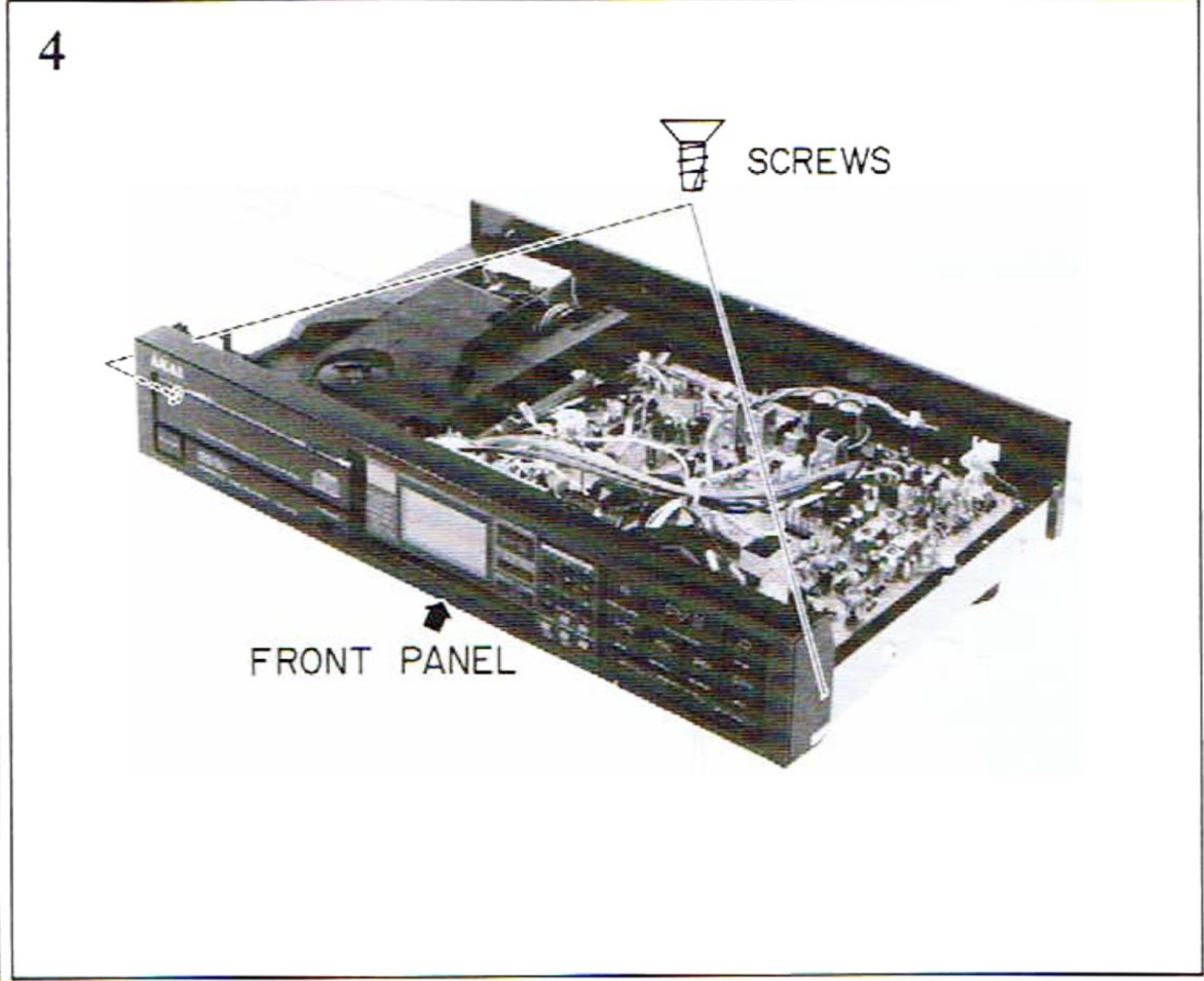
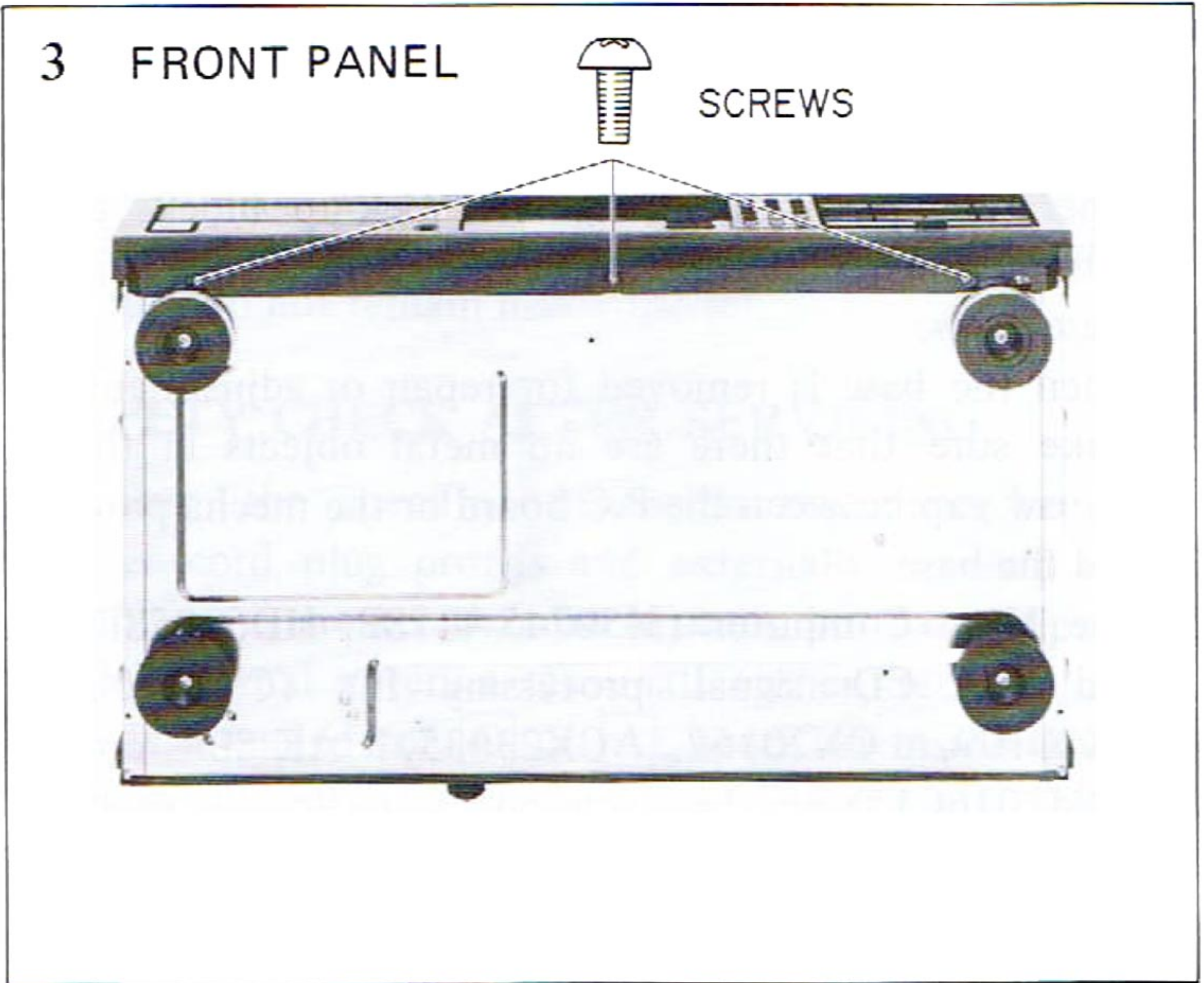
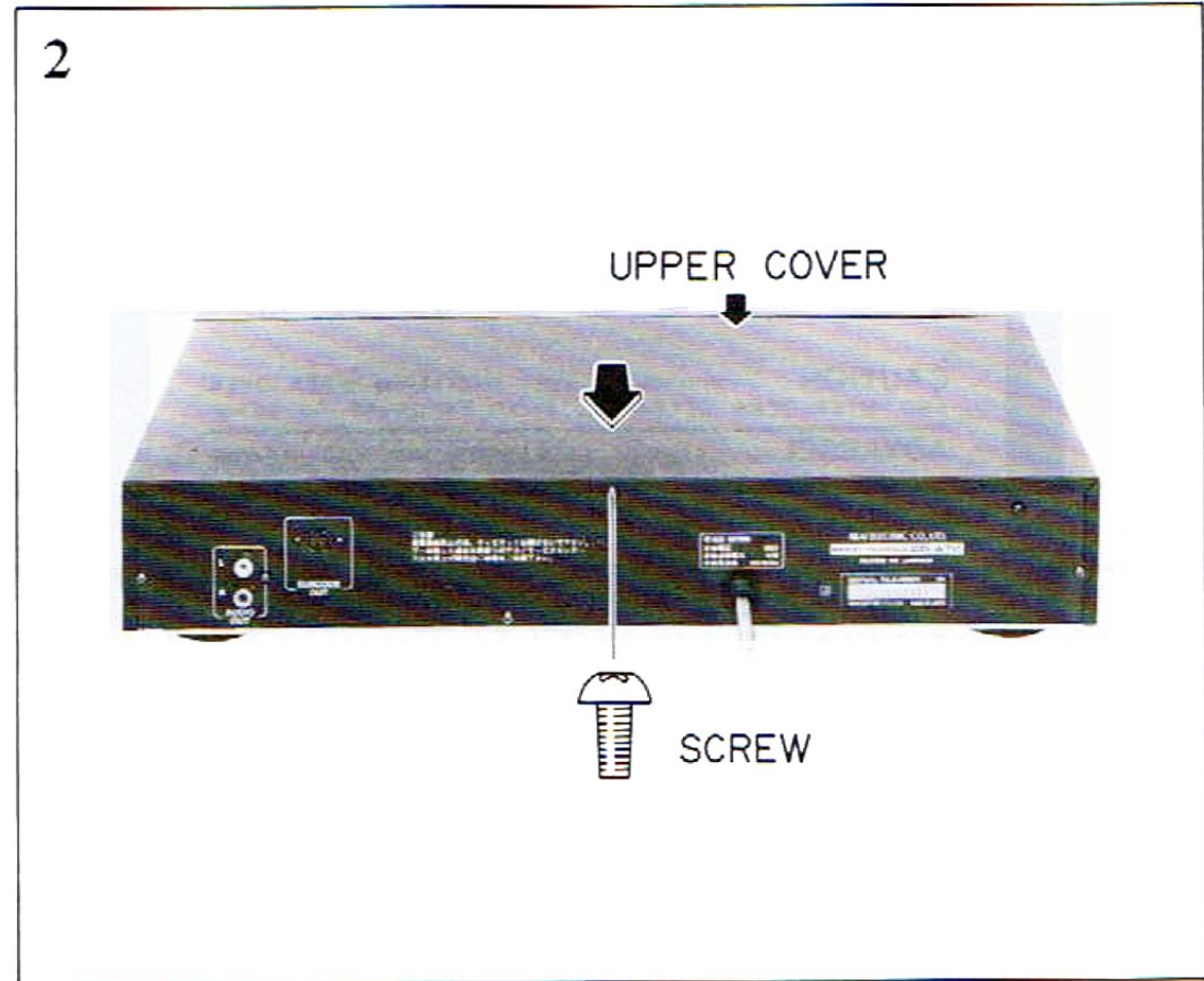
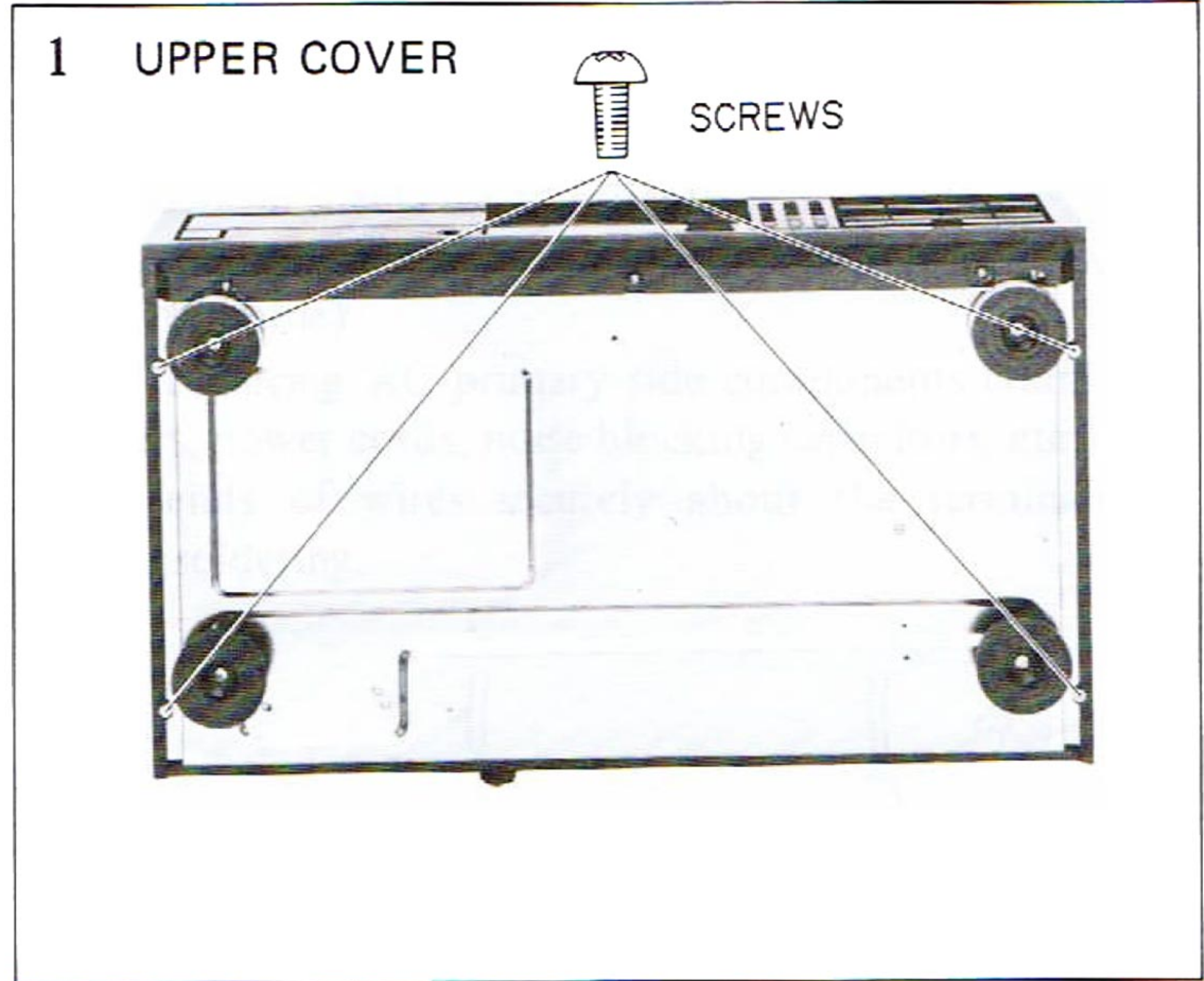
A Label affixed on the unit



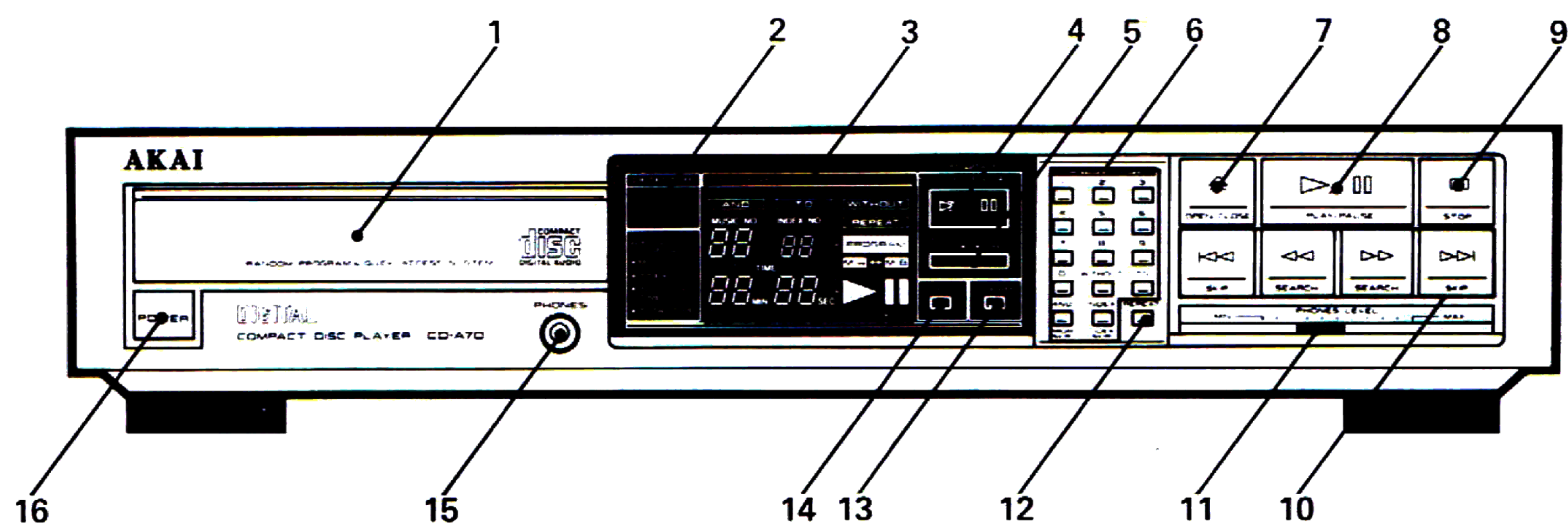
A1 A Label affixed inside of the unit

I. DISMANTLING OF UNIT

In case of trouble, etc. necessitating dismantling, please dismantle in the order shown in the photographs. Reassemble in reverse order.



II. CONTROLS



1. Plattenlade
Hält die CD-Platte

2. Fenster für den Fernbedienungs Signalempfang (DETECTOR).

3. Flüssigkristall-Display
Zeigt die jeweilige Betriebsart an.

4. Abspiel/Pausentaste (PROGRAM START/PAUSE)
Zum Starten der Wiedergabe.

5. MA-MB-Taste (SELECTED REPEAT)
Zur Einspeicherung zweier Punkte für wiederholte Wiedergabe eines bestimmten Plattenabschnitts.

6. Tasten für Wiedergabe- Programmierung (RANDOM PROGRAM).

7. Öffnen/Schließen-Taste (OPEN/CLOSE ▲)
Zum Entnehmen und Einlegen von CD-Platten.

8. Abspiel/Pausentaste (PLAY/PAUSE ► / ||)
Zur Aktivierung der Wiedergabe bzw. Pause.

9. Stopptaste (STOP ■)
Zur Beendigung der CD-Wiedergabe.

10. Suchlauf Tasten
Mit diesen Tasten läßt sich manueller Suchlauf, Titel-Suchlauf und Untertitel-Suchlauf durchführen.

11. Kopfhörer-Pegelregler (PHONES LEVEL).
Für die Regelung der Abgabelaufstärke bzw. Kopfhörerlautstärke.

12. Wiederholtaste (REPEAT)
Für wiederholte Wiedergabe.

13. Löschtaste (CLEAR)
Zum Löschen der wiederholten Wiedergabe eines Abschnitts.

14. Anzeigewahl-Taste (DISPLAY TIME).
Für die Wahl der Zeitanzeige.

15. Kopfhörerbuchse (PHONES).
Zum Hören über Kopfhörer.

16. Netzschalter (POWER)
Zum Ein- und Ausschalten des Akai CD-A70.
1. Diskschuiif
Bevat de kompakt disk.

2. Venster voor de afstandsbediening (DETECTOR).
Houd dit venster voor de afstandsbediening schoon.

3. LC-display
Toont wat de funktie van de Akai CD-A70 is.

4. Programma start/pauze-toets (PROGRAM START/PAUSE)
Om weergave te starten

5. MA-MB toets (SELECTED REPEAT)
Voor vastleggen van 2-punts herhaling en geselecteerde herhalingsweergave.

6. Direkte weergave (RANDOM PROGRAM) programmerings-toetsen

7. Open/sluit-toets (OPEN/CLOSE ▲)
Voor uitwerpen en laden van de kompakt disk.

8. Weergave/pauze-toets (PLAY/PAUSE ► / ||)
Voor starten en tijdelijk onderbreken van de weergave.

9. STOP-toets (■)
Voor beëindigen van de weergave.

10. Zoektoetsen
Gebruik deze toetsen voor opzoeken met de hand, opsporen en index-opsporing.

11. Hoofdtelefoonniveauregelaars (PHONES LEVEL)
Regelaars voor de uitgang van de toets hoofdtelefoon (PHONES OUTPUT)

12. Herhalingstoets (REPEAT)
Gebruik voor herhalingsweergave.

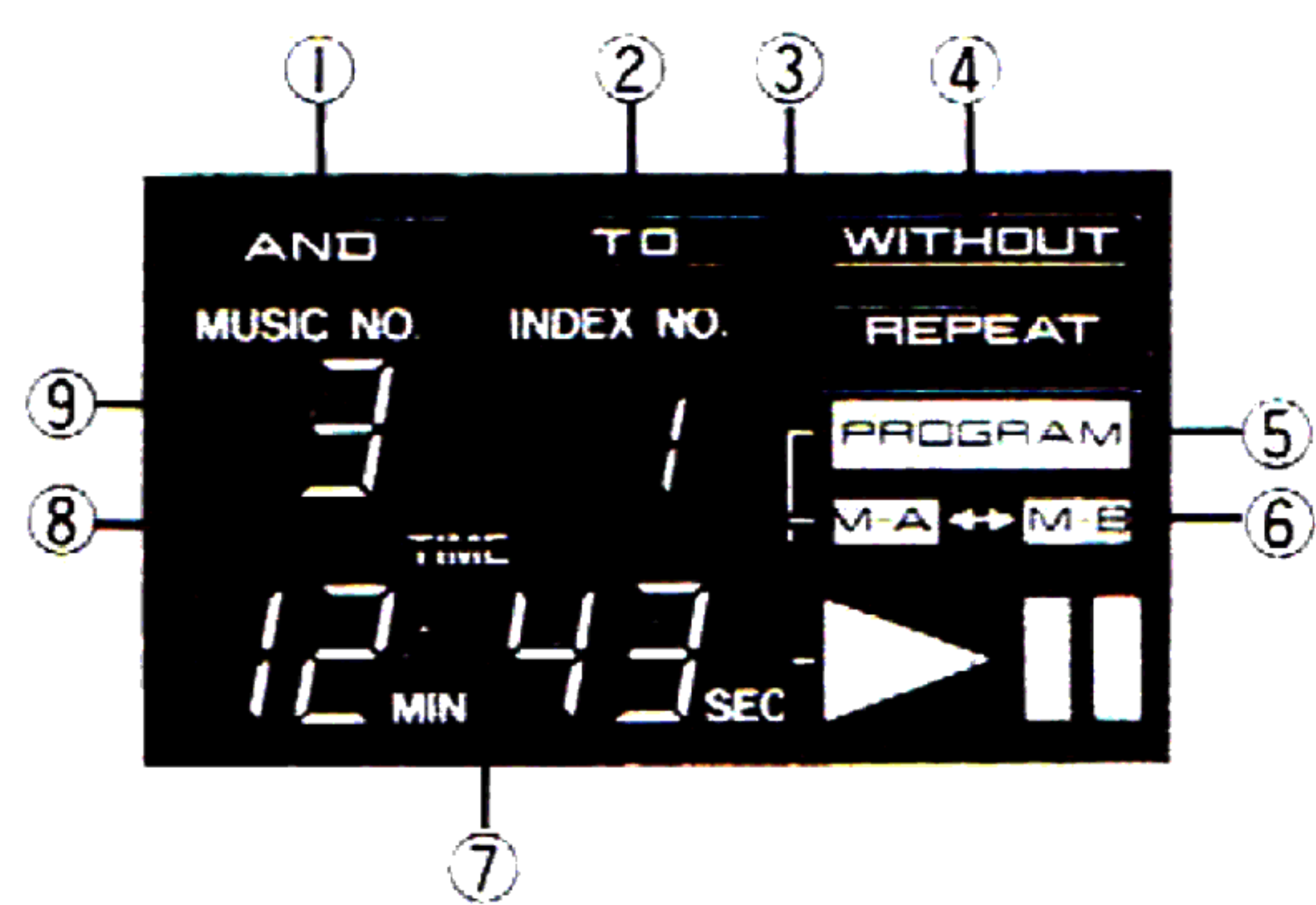
13. Wistoets (CLEAR)
Voor annuleren van vastgelegde MA- MB en direkte programma's.

14. Display-keuze toets (DISPLAY)
Om de filddisplayfunctie te kiezen.

15. Hoofdtelefoonaansluiting (PHONES)
Voor meeluisteren via de hoofdtelefoon

16. Netschakelaar (POWER)
Om de Akai CD-A70 in en uit te schakelen.

Flüssigkristall-Display
LC-display (Vloeibare kristaldisplay)



1. Und-Anzeige (AND)

2. Bis-Anzeige (TO)

3. Wiederholanzeige (REPEAT)

4. Ohne-Anzeige (WITHOUT)

5. Programmanzeige (PROGRAM)

6. Gesamttitel-Anzeige (TOTAL)

7. Anzeige der vergangenen Spielzeit. Umschaltbar zwischen Restzeit der gesamten CD und Restzeit einzelner Titel.

8. Untertitelnummer-Anzeige (INDEX NO.)

9. Titelnnummer-Anzeige (MUSIC NO.)
1. AND-display

2. TO-display

3. Herhalingsdisplay (REPEAT)

4. Zonder-display (WITHOUT)

5. Programmadisplay (PROGRAM)

6. Geselecteerde weergavedisplay

7. Display voor verstreken tijd (TIME – MIN/SEC). Schakelt over van totale tijd naar individuele tijd.

8. Indexnummerdisplay (INDEX NO)

9. Passagenummerdisplay (MUSIC NO)

III. PRINCIPAL PARTS LOCATION

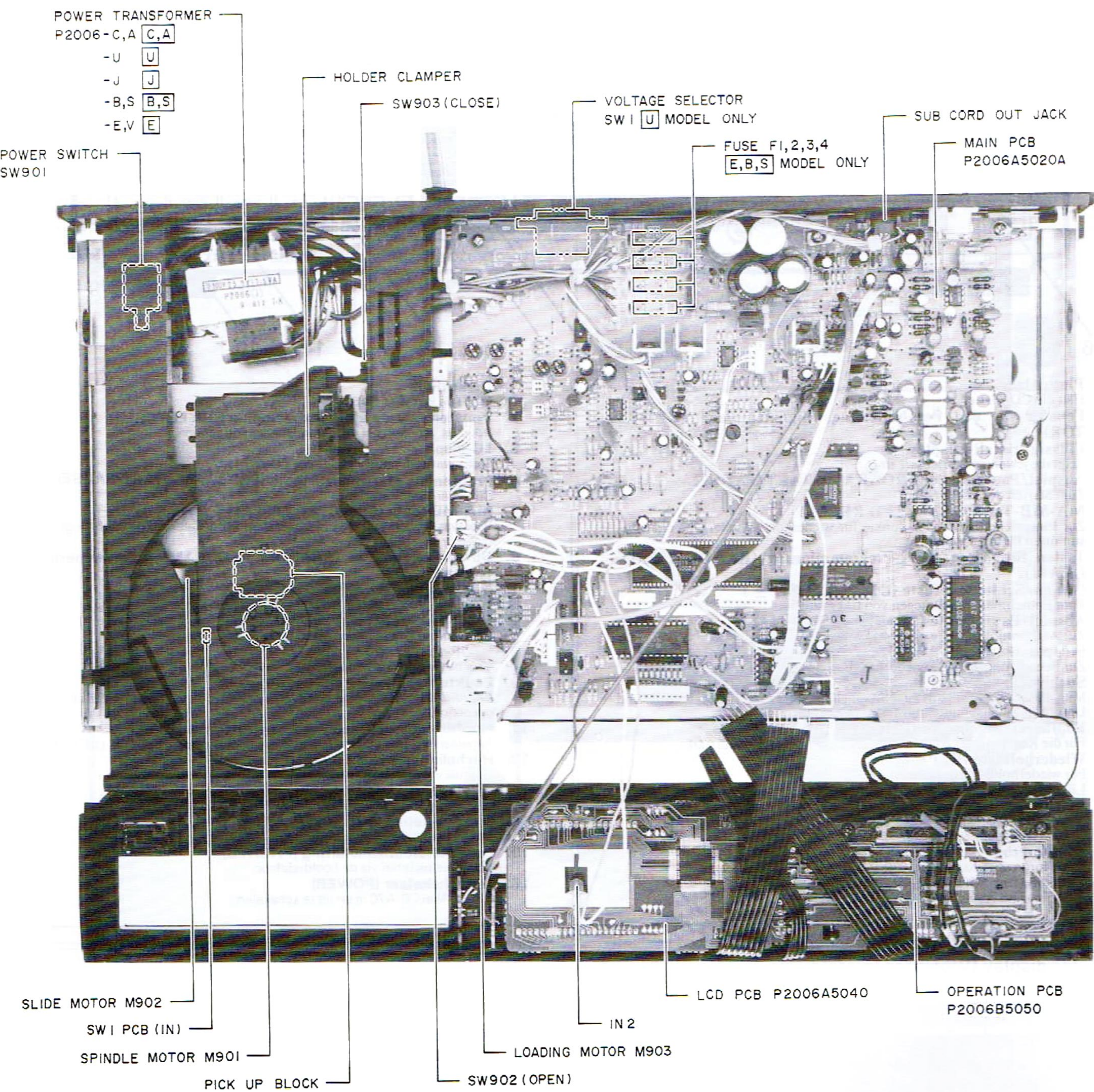


Fig. 3-1

IV. REPLACEMENT OF THE PICK-UP BLOCK

4-1. PRECAUTIONS, WHEN REPLACING THE PICK-UP BLOCK

NOTE: For your safety from hazardous invisible Laser Radiation, replace only with pick-up block. Do not try to repair or the any adjustment.

- 1) The LD (Laser Diode) fixed on the pick-up block P.C board can be damaged by static electricity or leakage from a soldering iron. Do not touch the P.C board of the pick-up block, or use a tester to check if the electricity is on. When soldering, make sure that precautions are taken to prevent leakage from the soldering iron.
- 2) Avoid scratches, dirt or dust on the lens of the pick-up caused by touching with the fingers.
- 3) When connection or disconnection the Black connector (P1), make sure that the P.C board is shorted circuit as shown Fig. 4-1.
Do not turn the electricity "ON" while it remains shorted-circuited.

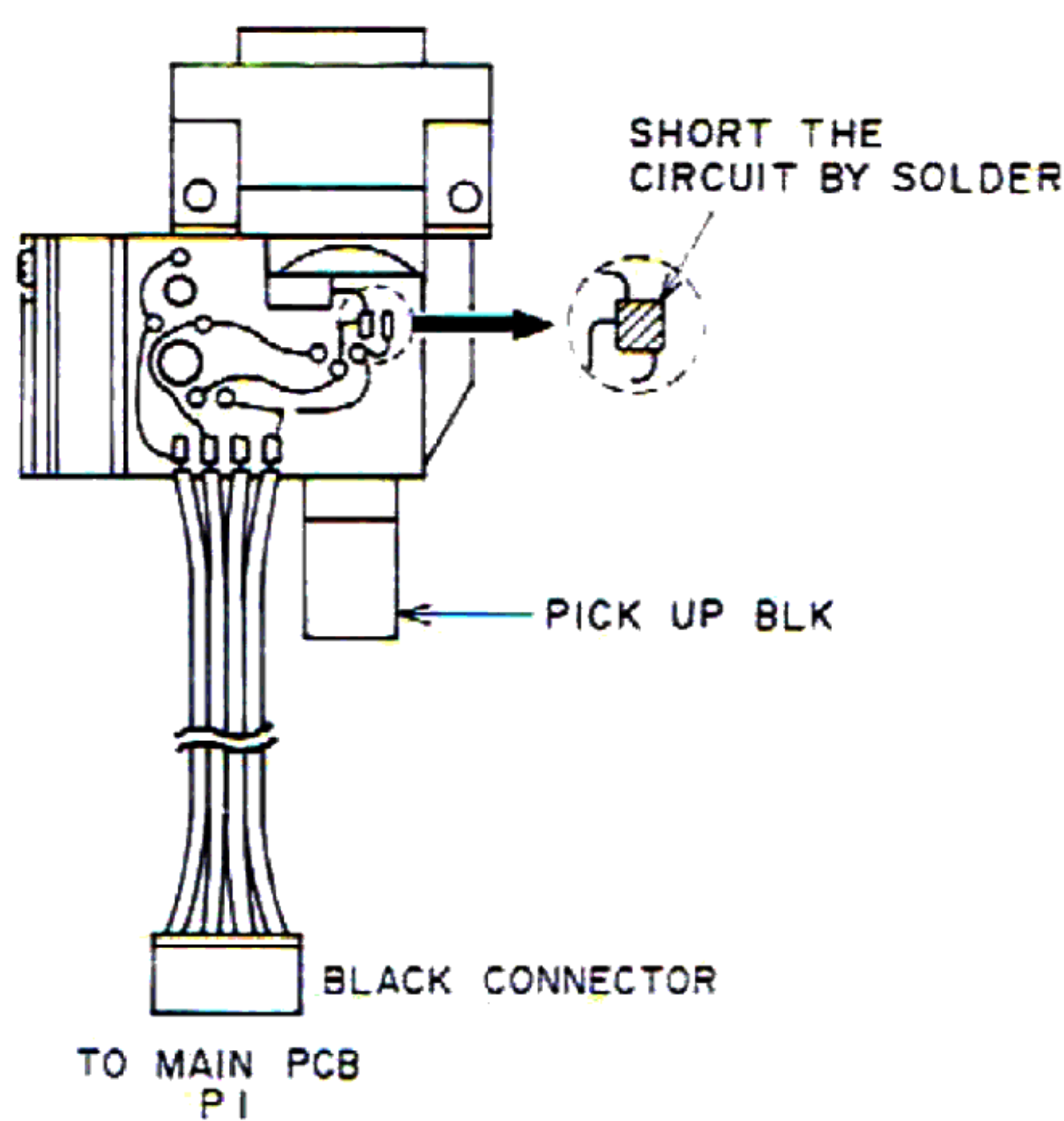


Fig. 4-1

4-2. PROCEDURES FOR CHANGING THE PICK-UP BLOCK

NOTE: Keep your safety from hazardous invisible Laser Radiation, Make sure that the Power switch is OFF when removing the disc clamber.

- 1) Remove the upper cover and the Front Panel and turn the power on. Depress the OPEN/CLOSE button to open the disk tray. Then turn the power off.
- 2) Remove four Mecha chassis fixing screws (A). (Refer to Fig. 4-2)
- 3) Short the pick-up P.C board with solder. (Refer to Fig. 4-1)
- 4) Loosen two pick-up fixing screws (B), remove the pick-up gear. (Refer to Fig. 4-3)
- 5) Remove the three connectors on the pick-up block: P1, 2, and 4.
- 6) Move the disk clamber.
- 7) When the four screws (A), (B), (C) and (D), for the metal fittings of the pick-up guide rail are removed, the pick-up block guid rail can be removed. (Refer to Fig. 4-4)

* Before connecting the connector P1 to MAIN PCB, Confirm that the abnormal DC voltages are not appeared at emitter of TR10 and TR12.

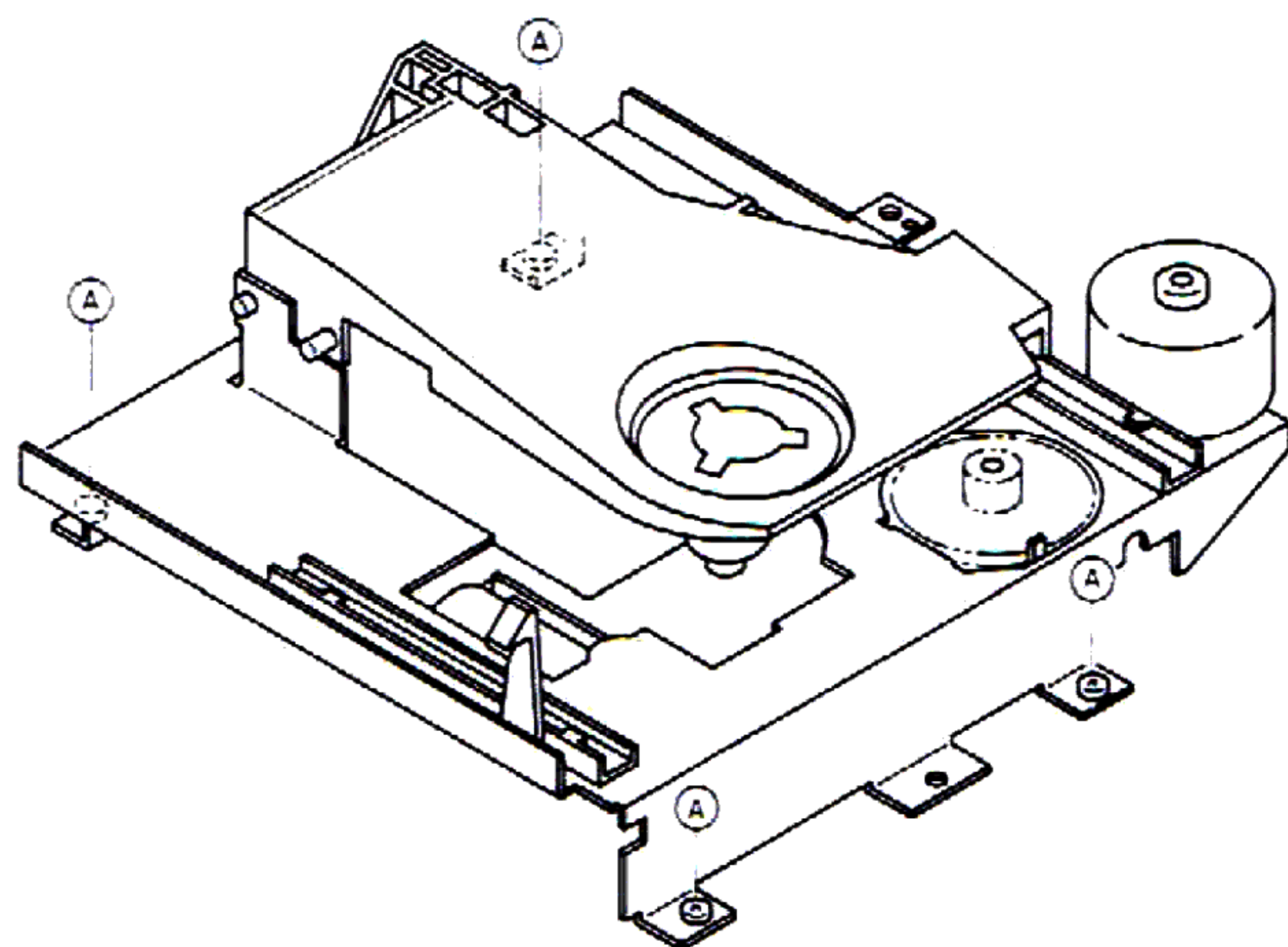


Fig. 4-2

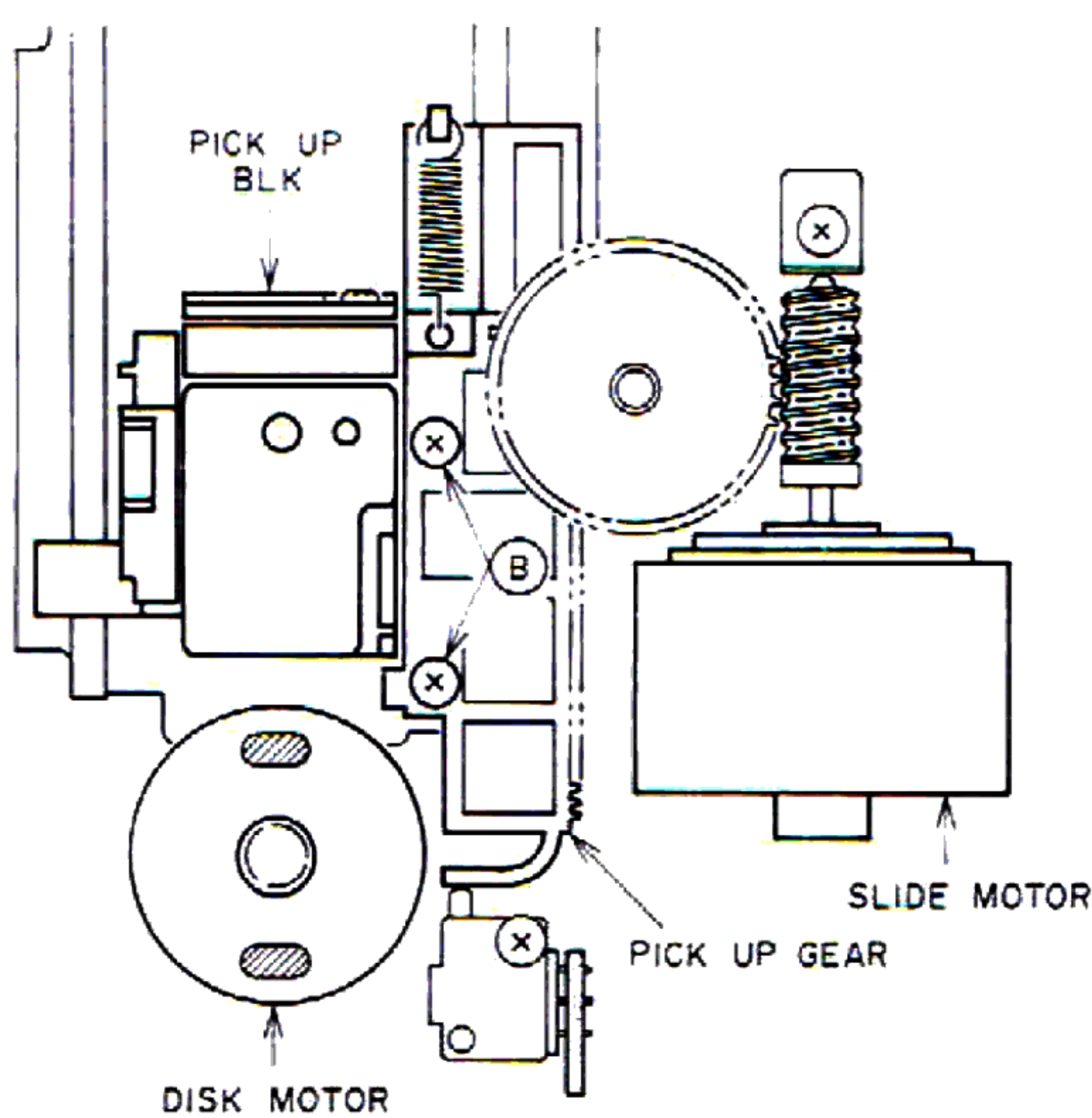


Fig. 4-3

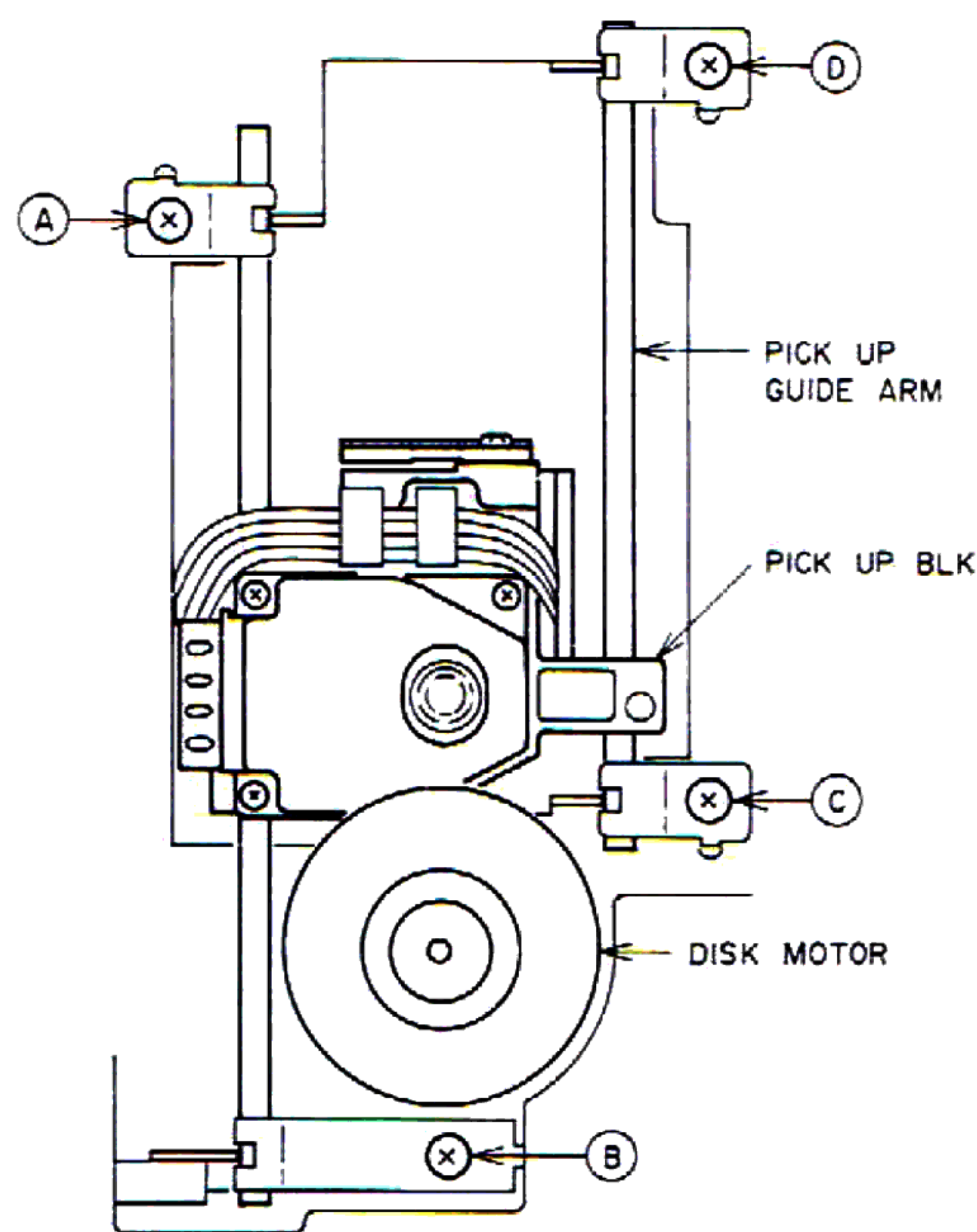


Fig. 4-4

V. REPLACEMENT OF SPINDLE MOTOR

The turntable of the spindle motor has been pressed-in and they can not be replaced individually. When replacing the turntable or the spindle motor, replace the following parts as a set.

PARTS NO.	DESCRIPTION
BM-361225	MOTOR (SPINDLE)
MZ-362964	TURNTABLE
ZS-624870	HEXAGON SET SCREW

5-1. REMOVE AND ASSEMBLE SPINDLE MOTOR

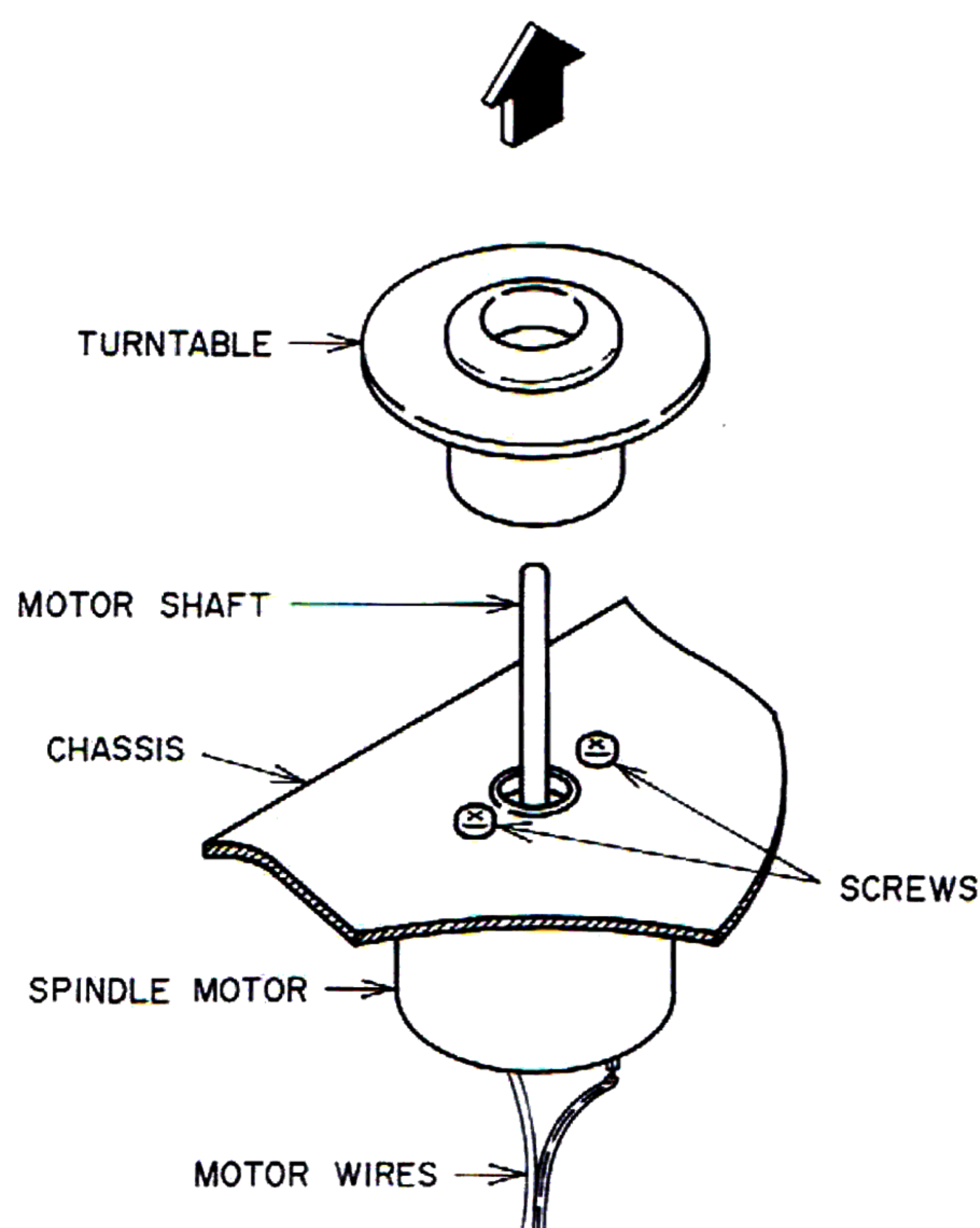


Fig. 5-1

- 1) Pull out the turntable from the spindle motor.
- 2) Remove two screws.
- 3) Unsolder two spindle motor wires.
- 4) Solder two wires to the new spindle motor.
- 5) Put the new spindle motor on to the chassis with two screws.
- 6) Put the new turntable on to the motor shaft and adjust the turntable so that the height of the turntable from chassis becomes 20 mm or its clearance from chassis becomes 4 mm as shown in Fig. 5-2.

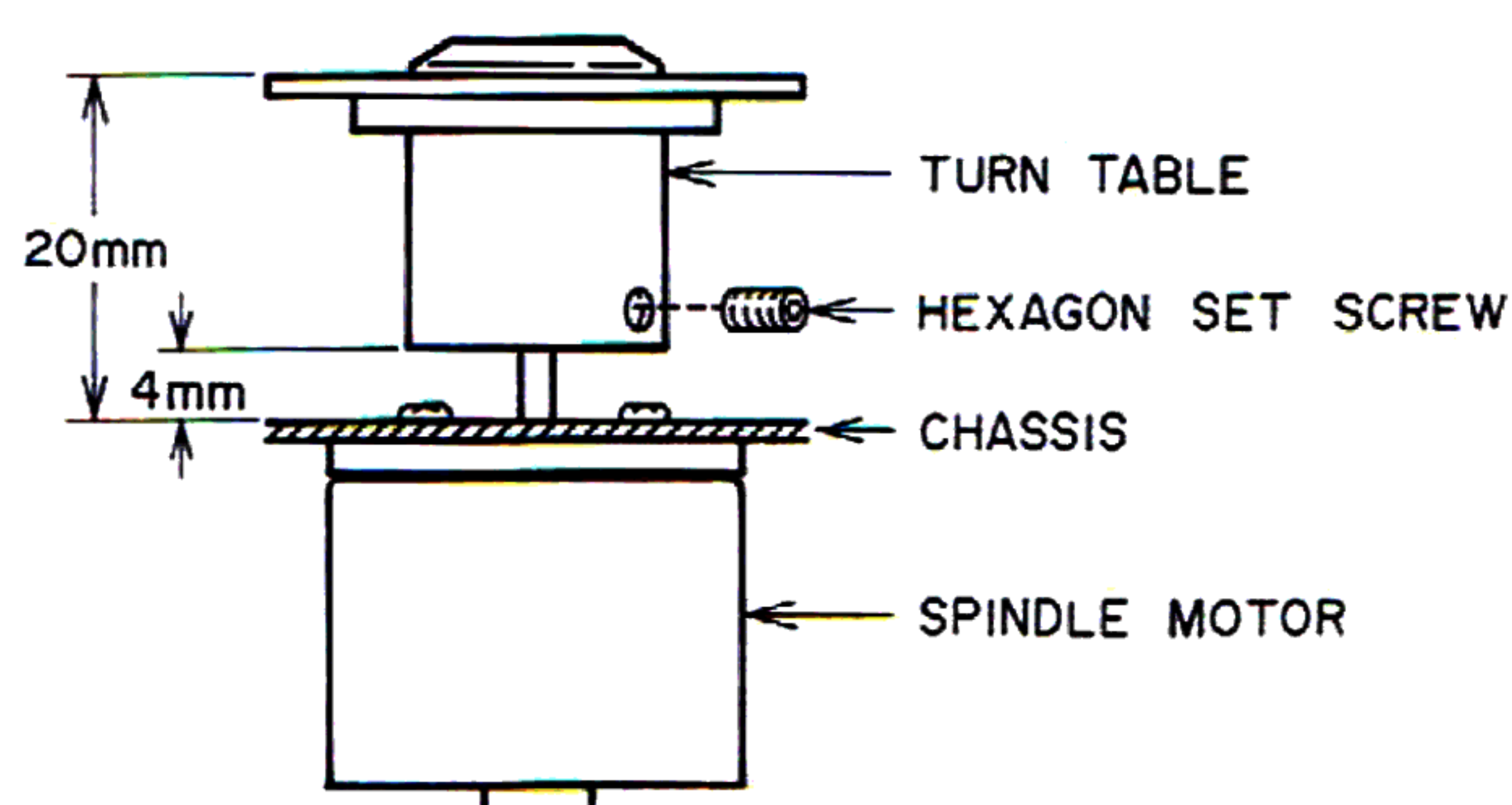


Fig. 5-2

VI. ADJUSTMENT

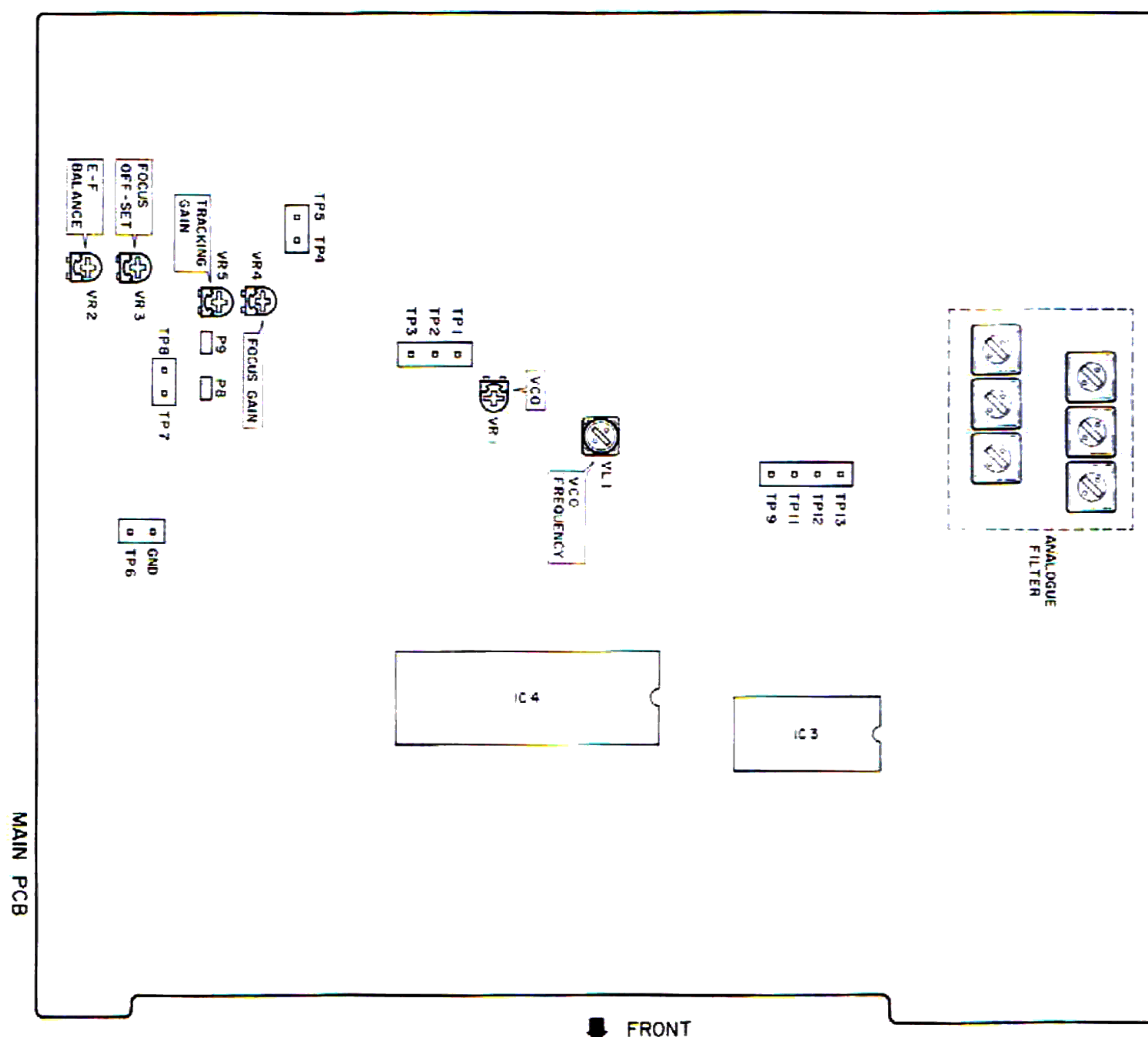


Fig. 6-1 Adjustment Points

6-1. ADJUSTMENT WHEN CHANGING THE PICK-UP

Change the pick-up, following the procedures in the item IV, and when replacement is complete turn the short terminal of the LD (Laser Diode) to open.

6-1-1. OPTICAL AXIS ADJUSTMENT

If the mechanical eccentricity is large when fixing the pick-up tracking errors become large. This in turn interferes with the tracking servo, so optical axis adjustment is necessary.

- 1) Disconnect P8 on the Main P.C board (to turn the tracking servo off).
- 2) Connect an oscilloscope to TP7 on the Main P.C board.
- 3) Place the normal music disc, then play back the first music on it and observe the waveform of TP7.
- 4) Turn the adjustment screw (A) by degrees (Refer to Fig. 6-2) as waveform of TP7 will become maximum.

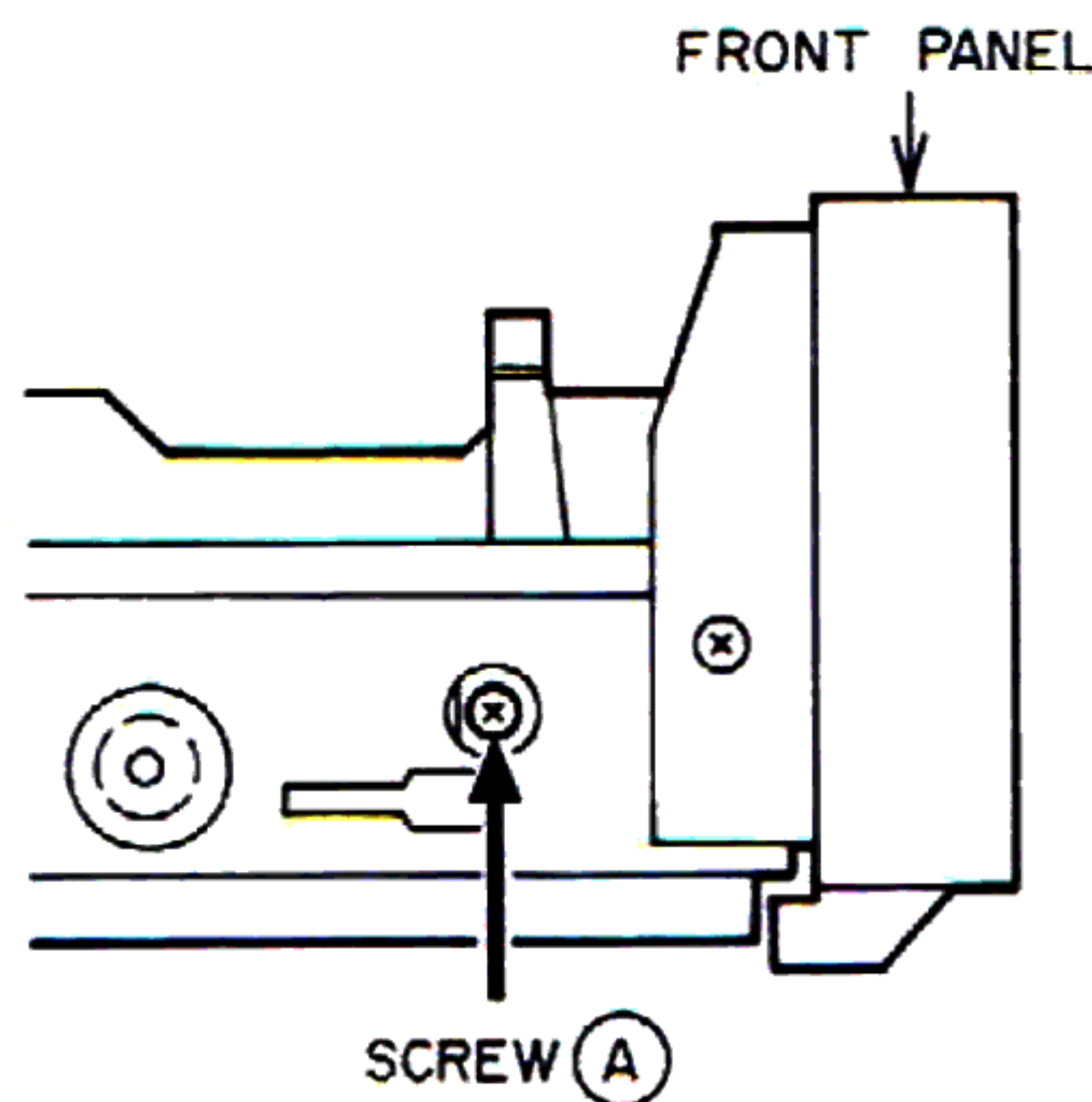


Fig. 6-2

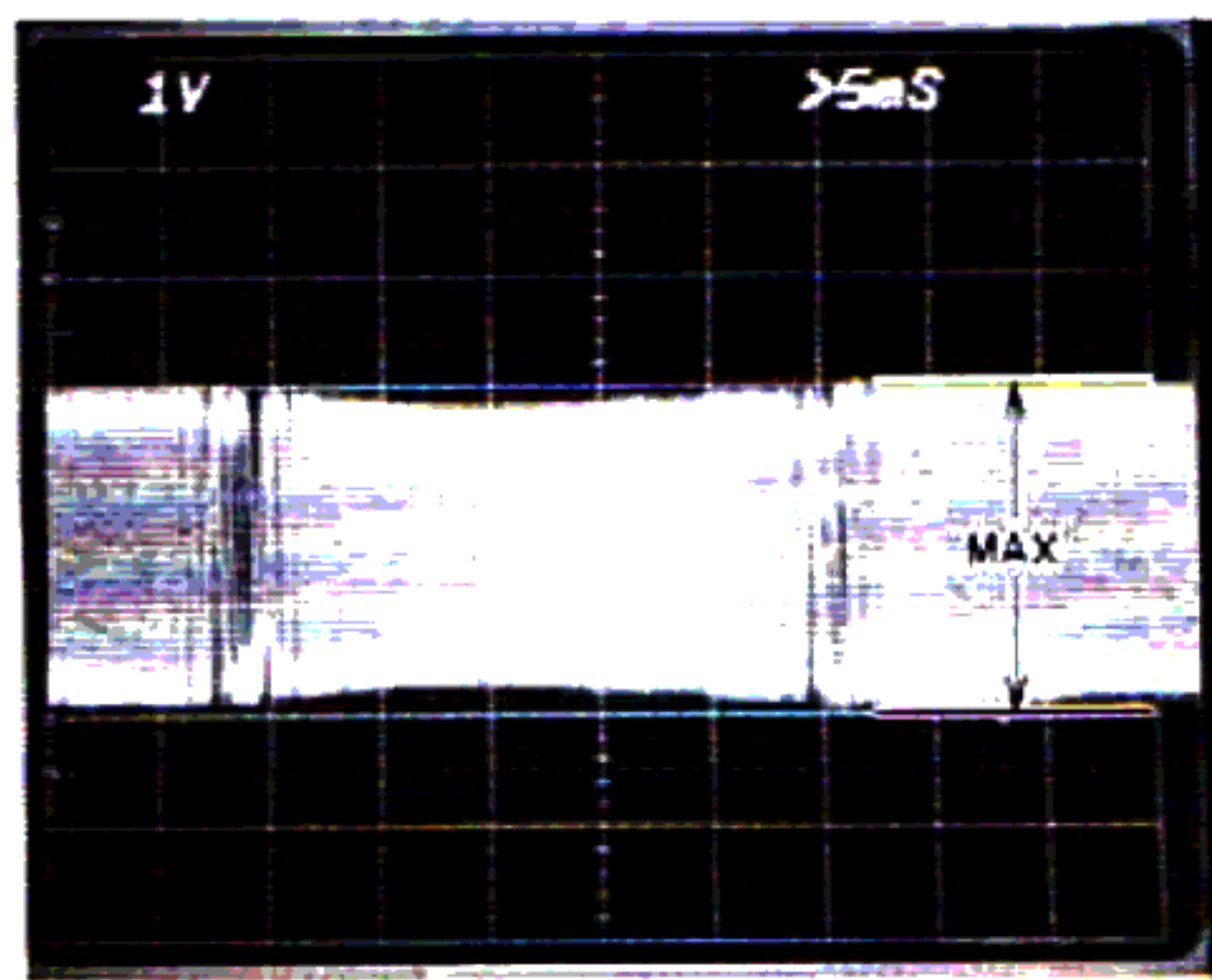


Fig. 6-3

6-1-2. READJUSTMENT OF E-F BALANCE

When the pick-up is changed, E-F balance adjustment must be performed. Refer to item 6-2-3 for adjustment.

6-1-3. CHECKING THE ELECTRIC CURRENT OF THE LASER

The electric current of the laser is indicated on the labels on the pick-up as shown Fig. 6-4.

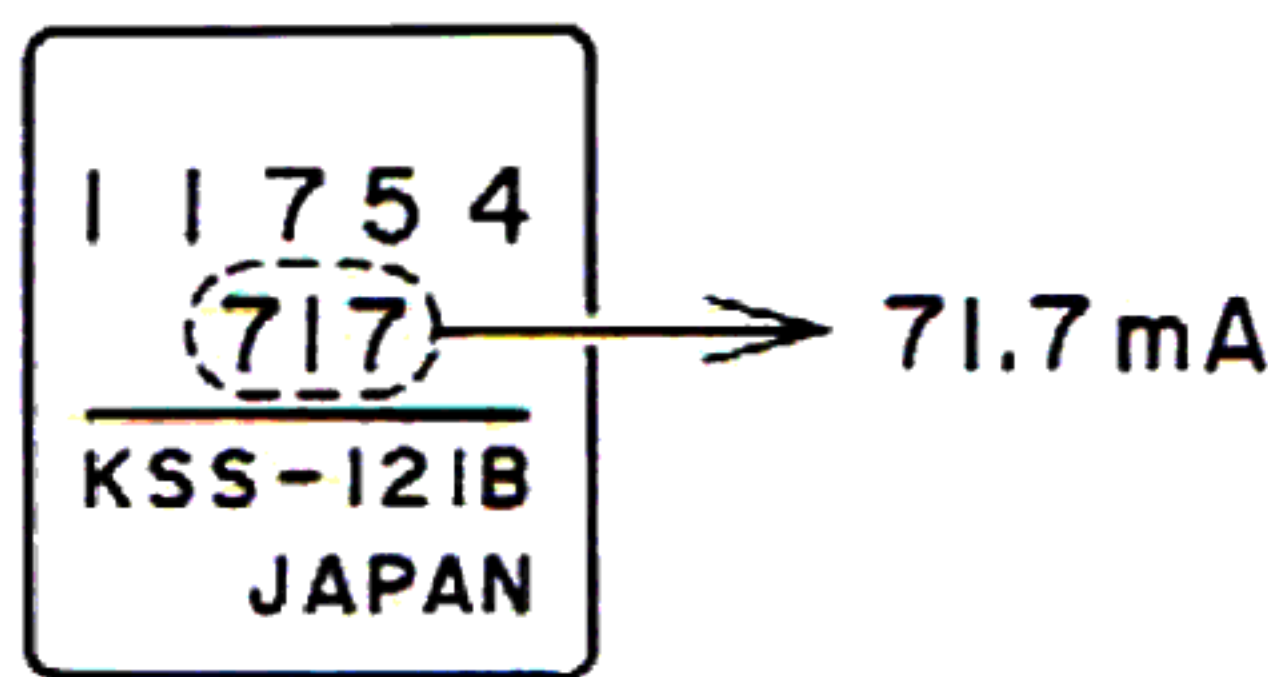


Fig. 6-4

- 1) Connect the Milli-Voltmeter between TP4 and TP5 on the Main P.C board and measure the voltage.

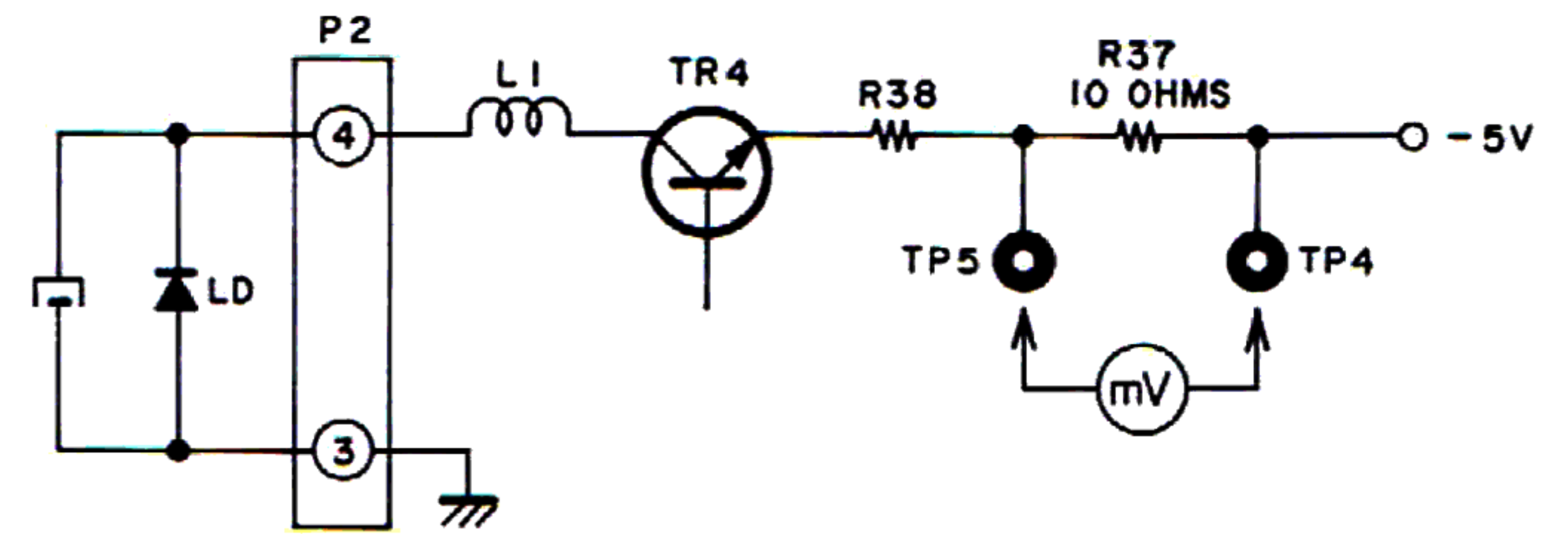


Fig. 6-5

- 2) Calculate the electric current of the laser from the voltage measured and check that is within ± 4 mA of the recommended value.
Electric current of the laser = Voltage measured \div 10.
If the electric current of the laser exceeds ± 4 mA of the recommended value, changed the pick-up again.

6-1-4. APC (AUTOMATIC POWER CONTROL) CIRCUITRY

This is a servo circuit to maintain the LD (Laser diode) power of the pick-up. The LD power has been adjusted by VR1 at manufacture. Keep safety from hazardous invisible laser Radiation, DO NOT TOUCH THIS VR1.

6-2. SERVO ADJUSTMENT

Servo adjustment is an adjustment to the control circuitry for accurate and safe disc play back. When adjusting use a SONY TYPE 3 (No. YEDS 7) or PHILIPS (No. 410056-2 or 400079-2) as a test disc.

6-2-1. VCD FREQUENCY ADJUSTMENT

- 1) Connect a short wire between TP2 and TP1 (GND).
- 2) Connect a Frequency counter to TP9 and GND.
- 3) Adjust VL1 so that the frequency is $7,350 \pm 10$ Hz.

6-2-2. PLL VCO ADJUSTMENT

- 1) Connect an oscilloscope to TP13 on the Main P.C board.
- 2) Insert the SONY TEST DISC TYPE-3, then depress the OPEN/CLOSE button to close the Disc tray.
- 3) The total music number selections on the test disc will be displayed on the LC display.
- 4) Play back the test disc and adjust VR1 so that the error flags are not appeared (or minimum error flags) at TP13.



Fig. 6-6

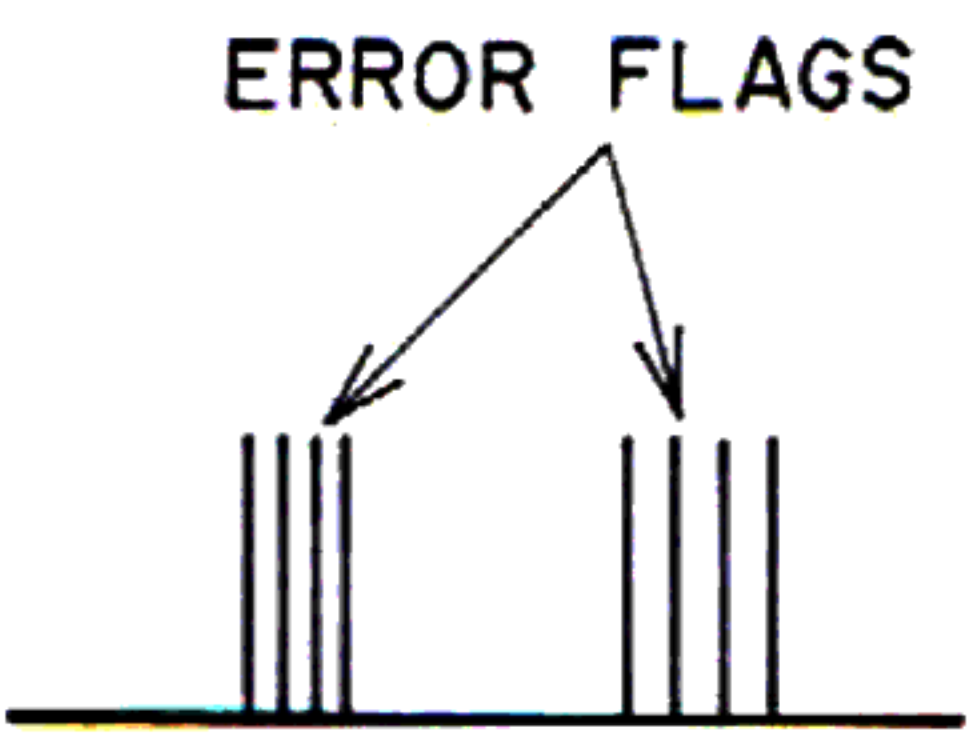


Fig. 6-7

6-2-3. E-F BALANCE ADJUSTMENT

This is to adjust the output balance of diodes **E** and **F** for tracking error detection.
When changing the pick-up adjusting the tracking constancy, this must be checked and adjusted.

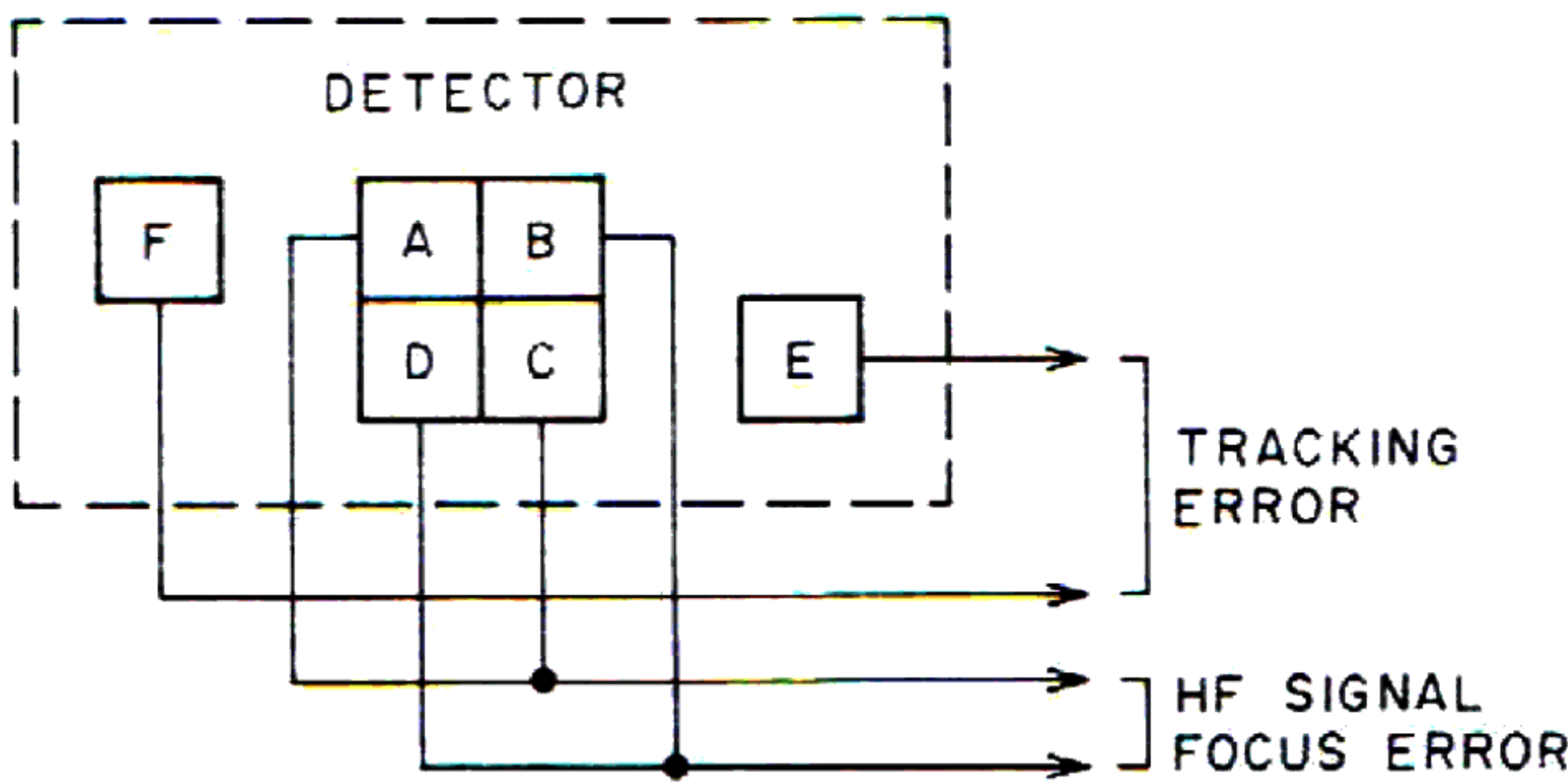


Fig. 6-8

- 1) Connect the oscilloscope to TP7 on the Main P.C board and GND.
- 2) Insert the music disc and depress the OPEN/CLOSE button to close the disc tray.
- 3) Extract the short plug (P8) on the Main P.C board.
- 4) Adjust the VR2 for E-F balance so that the Ground level is center of the waveform.

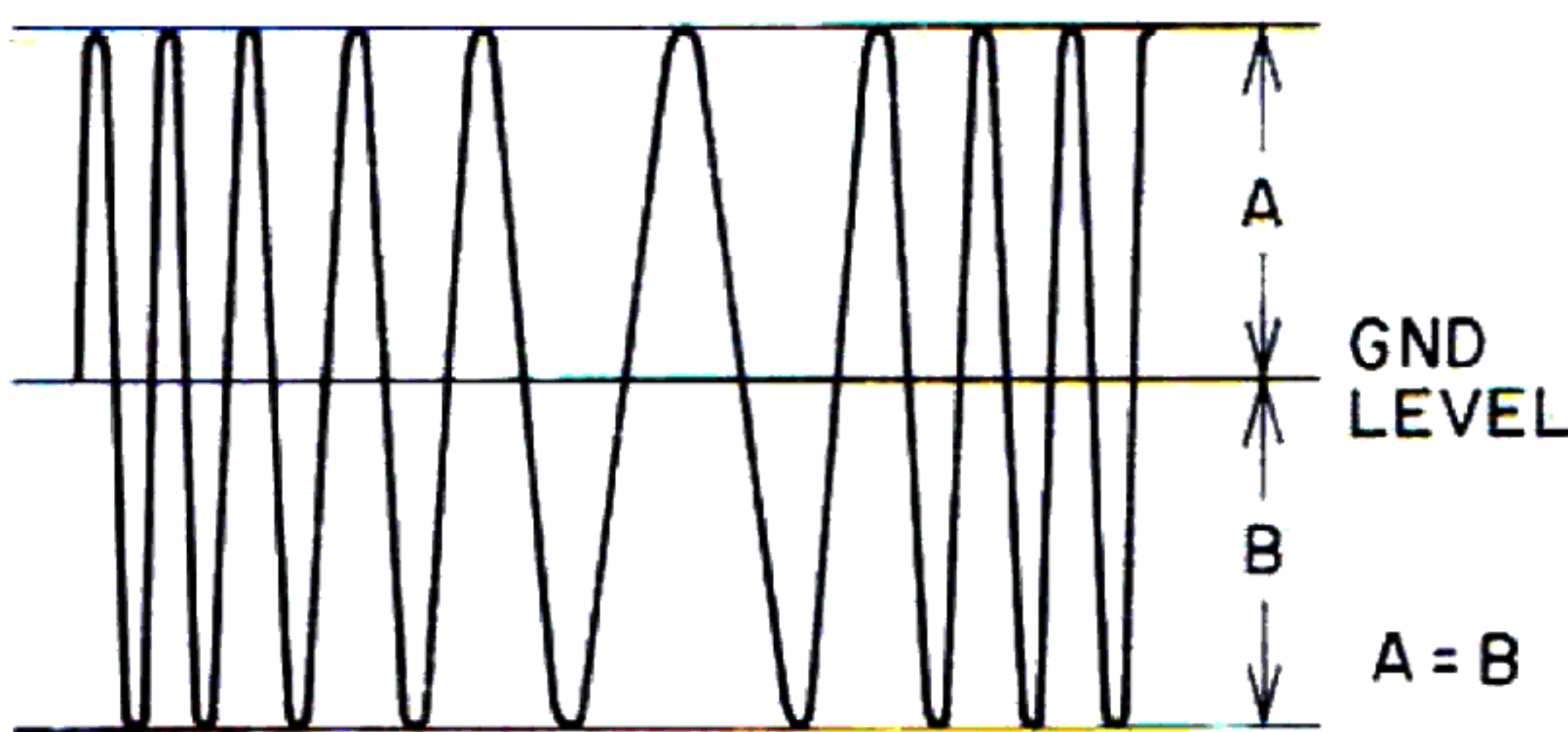


Fig. 6-9

6-2-4. FOCUS GAIN ADJUSTMENT

- 1) Connect an oscilloscope between P4-Pin ① terminal on the Main P.C board and GND, and measure the voltage on the focus coil.
- 2) Play back the test disc and adjust VR4 so that the tracking coil voltage is 500 to 600 mVp-p.

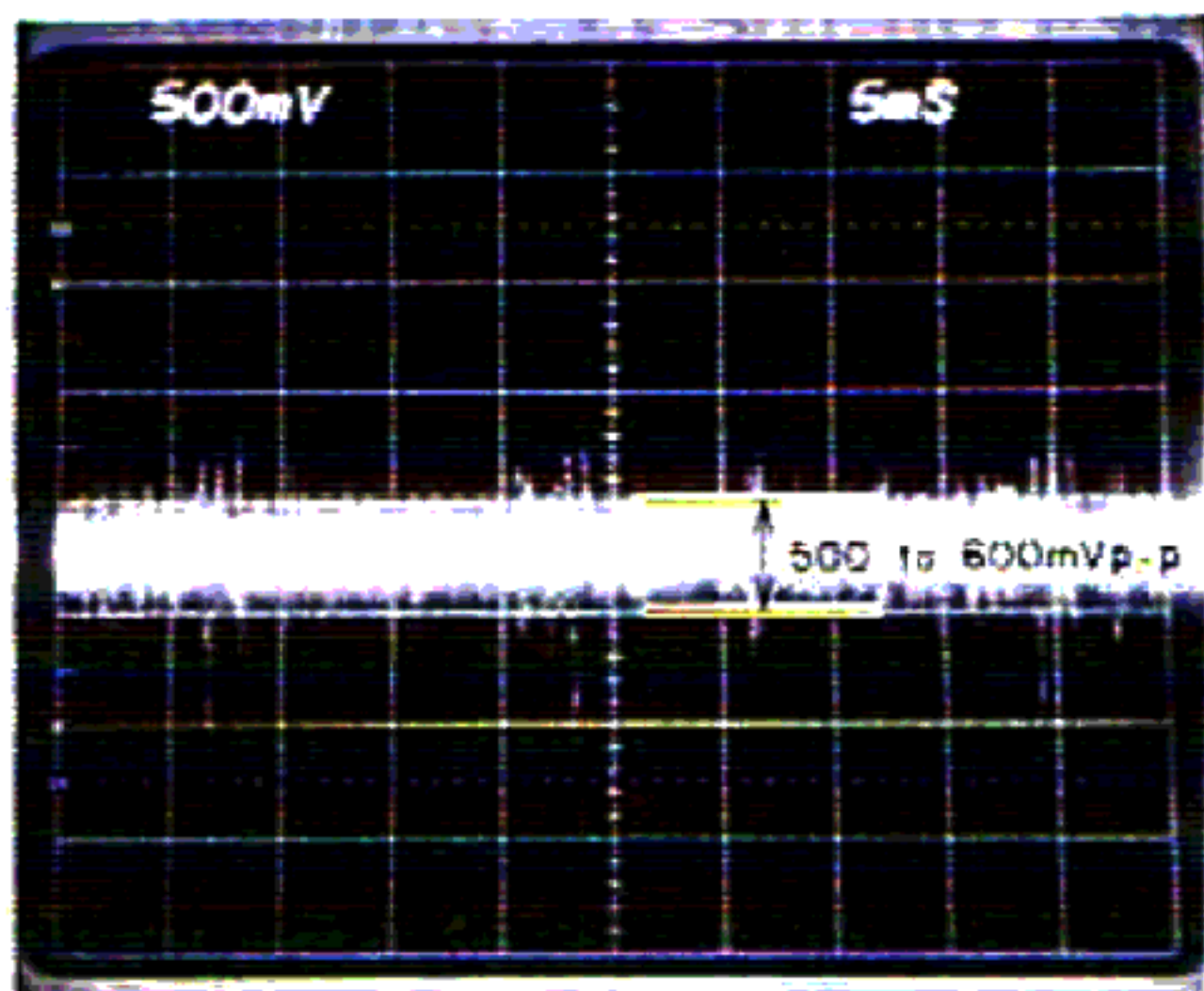


Fig. 6-10

6-2-5. TRACKING GAIN ADJUSTMENT

- 1) Connect the oscilloscope between P4-Pin ③ terminal on the Main P.C board and GND, and measure the voltage on the tracking coil.
- 2) Play back the test disc and adjust VR5 so that the tracking coil voltage is 1.8 to 2.2 Vp-p.

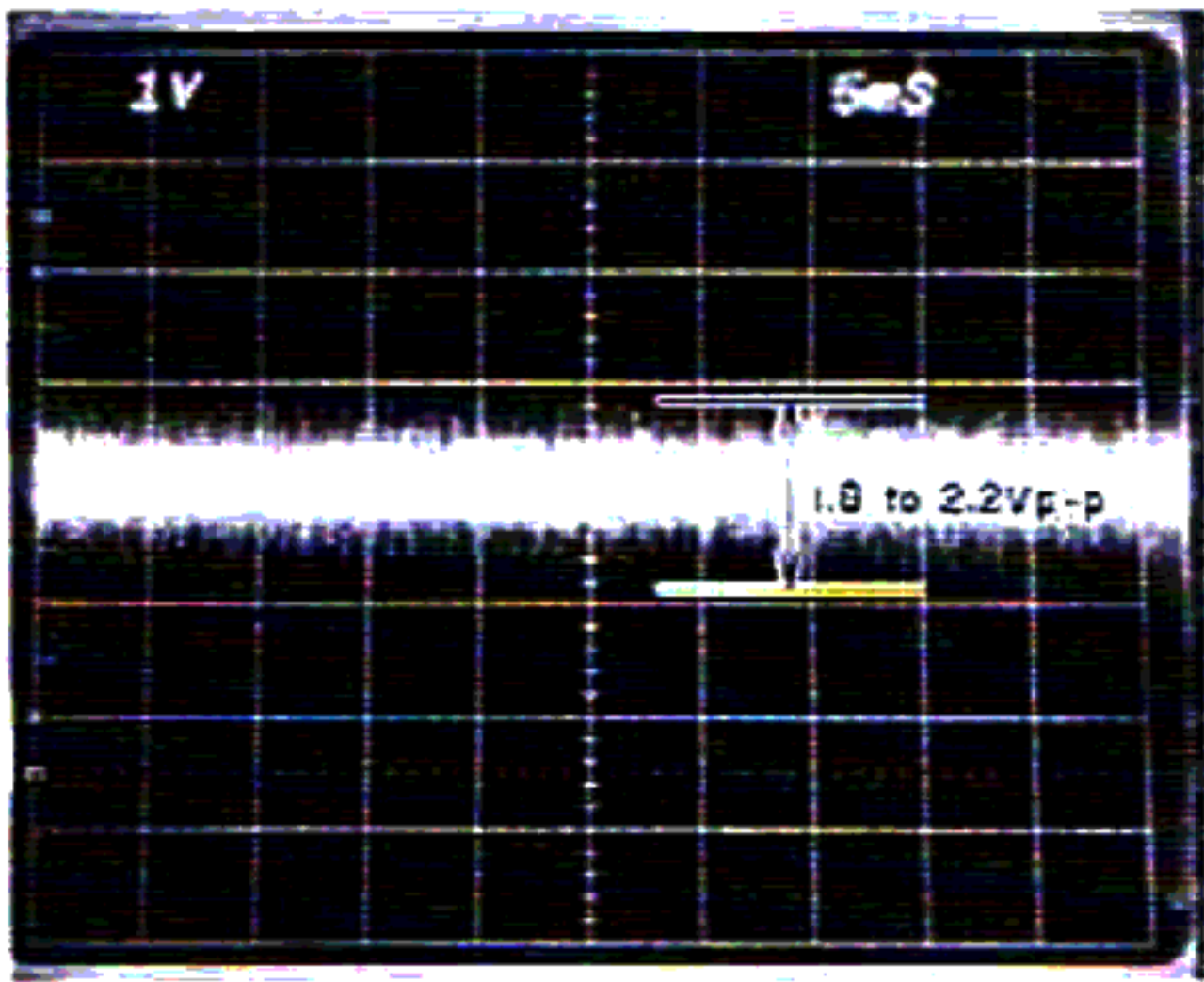


Fig. 6-11

Reference: If the sound jumps when the machine is lightly jolted, this means the tracking Gain is small.
If a disc with a scratch of 600μ is played and the sound jumps, this means the tracking Gain is large.
Philips No. 40079-2 TNO 6, 01' 05'' up till TNO 7, 00' 02''.

6-2-6. FOCUS OFF-SET ADJUSTMENT

- 1) Connect the oscilloscope to TP6 and TP8 on the Main P.C board.
TP6 eye pattern waveform
TP8 focus error signal
- 2) Play back the TNO. 17 of PHILIPS TEST DISC and adjust the VR3 so that the noise level is at minimum.

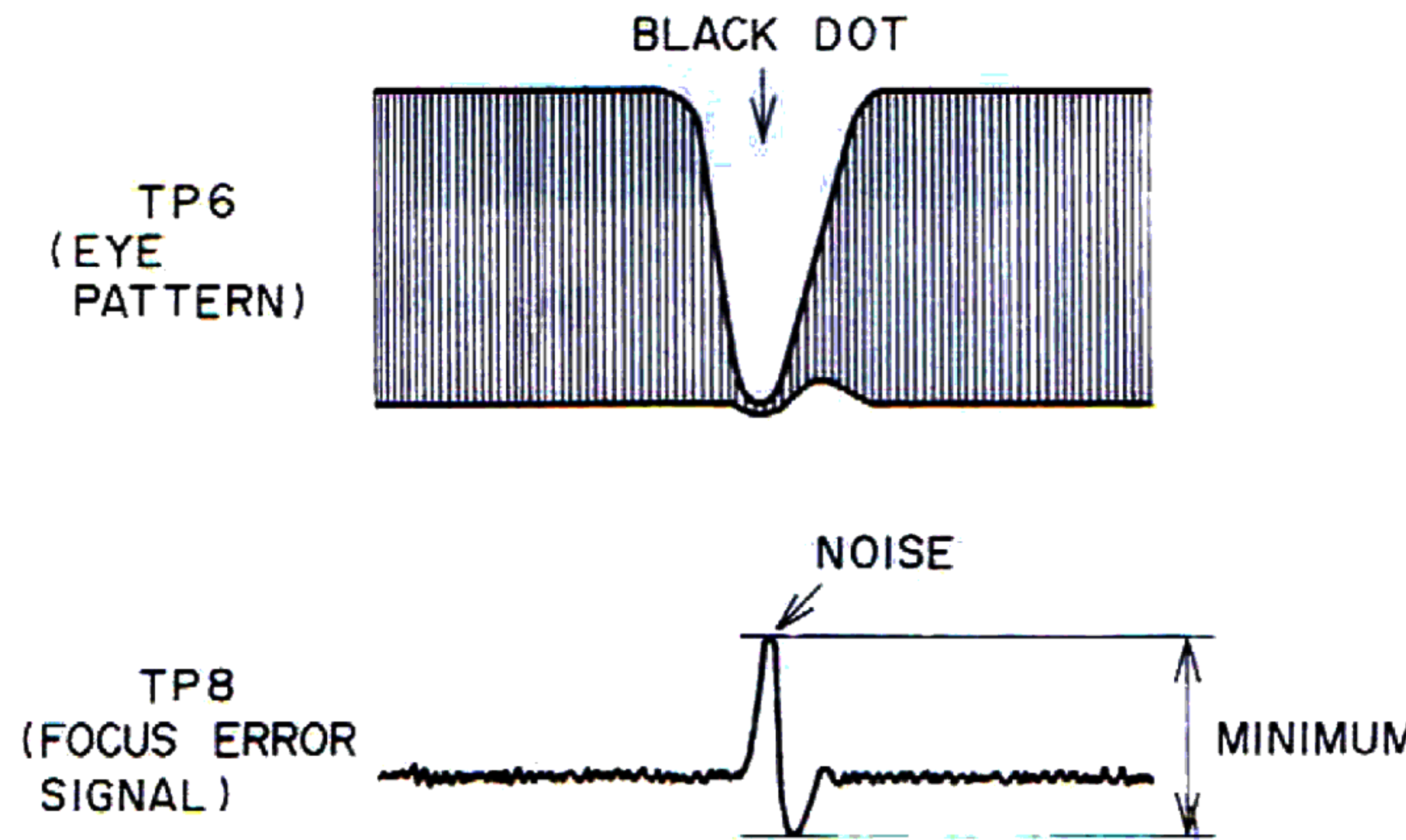


Fig. 6-12

VII. PARTS LIST

ATTENTION

- 1. When placing an order for parts, be sure to list Part No., Model No. and the description of each part. Otherwise, the non-delivery of the part or the delivery of a wrong part may result.
- 2. Please make sure that Part No. is correct when ordering.
If not, a part different from the one you ordered may be delivered.
- 3. Since the parts shown in Parts List of Preliminary Service Manual may have been the subject of changes, please use this Parts List for all future reference.

HOW TO USE THIS PARTS LIST

- 1. This Parts List lists those parts which are considered necessary for repairs. Other common parts, such as resistors and capacitors, are listed in the "Common List for Service Parts" from which these parts should be selected and stocked.
- 2. The Recommended Spare Parts List shows those parts in the Parts List which are considered particularly important for service.
- 3. Parts not shown in the Parts List and "Common List for Service Parts" will not in principle be supplied.
- 4. How to read the Parts List.

a) Mechanism Block

b) PC Board

2. HEAD BASE BLOCK

REF. NO.	PART NO.	DESCRIPTION
2-1x	BH-T2023A320A	HEAD BASE BLOCK
2-2	HP-H2206A010A	HEAD R/P PR4-8FU C
2-3	ZS-477876	PAN20x03STL CMT
2-4	ZS-536488	BID20x08STL CMT
2-5	ZG-402895	SP CS ANGLE ADJUST

- SP (Service Parts) Classification
- A small "x" indicates that this part is not shown in the Photo or Illustration.
- This number corresponds with the individual parts index number in that figure.
- This number corresponds with the Figure Number.

6. MAIN PC BOARD

REF. NO.	PART NO.	DESCRIPTION
6-IC1	EI-324536	IC HD14049BP
6-IC2	EI-336801	IC MB8841-564M
6-C1A	EC-338399	C MMY V 223M 250AC [U,E,B,S]
6-C1B	EC-350949	C MMY V 223M 250DC [J]
6-C1C	EC-338397	C MMY V 223M 125AC [C,A]
6-X1	EI-318384	OSC X'TAL NC-18C

- Symbols for primary destination
 - [A]: AAL(U.S.A.) [S]: SAA(Australia)
 - [B]: BEAB(England) [U]: U/T(Universal Area)
 - [C]: CSA(Canada) [V]: VDE(W. Germany)
 - [E]: CEE(Europe) [Y]: Custom Version
 - [J]: JPN(Japan)
- SP (Service Parts) Classification
- These reference symbols correspond with component symbols in the Schematic Diagrams.

The available PC Board Blocks are listed separately.

- 5. When Part No. is known, Parts Index at end of Parts List can be used to locate where that part is shown in Parts List by its Reference No. listed at right of Part No.

WARNING

△ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURE'S RECOMMENDED PARTS

AVERTISSEMENT

△ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT

RECOMMENDED SPARE PARTS LIST

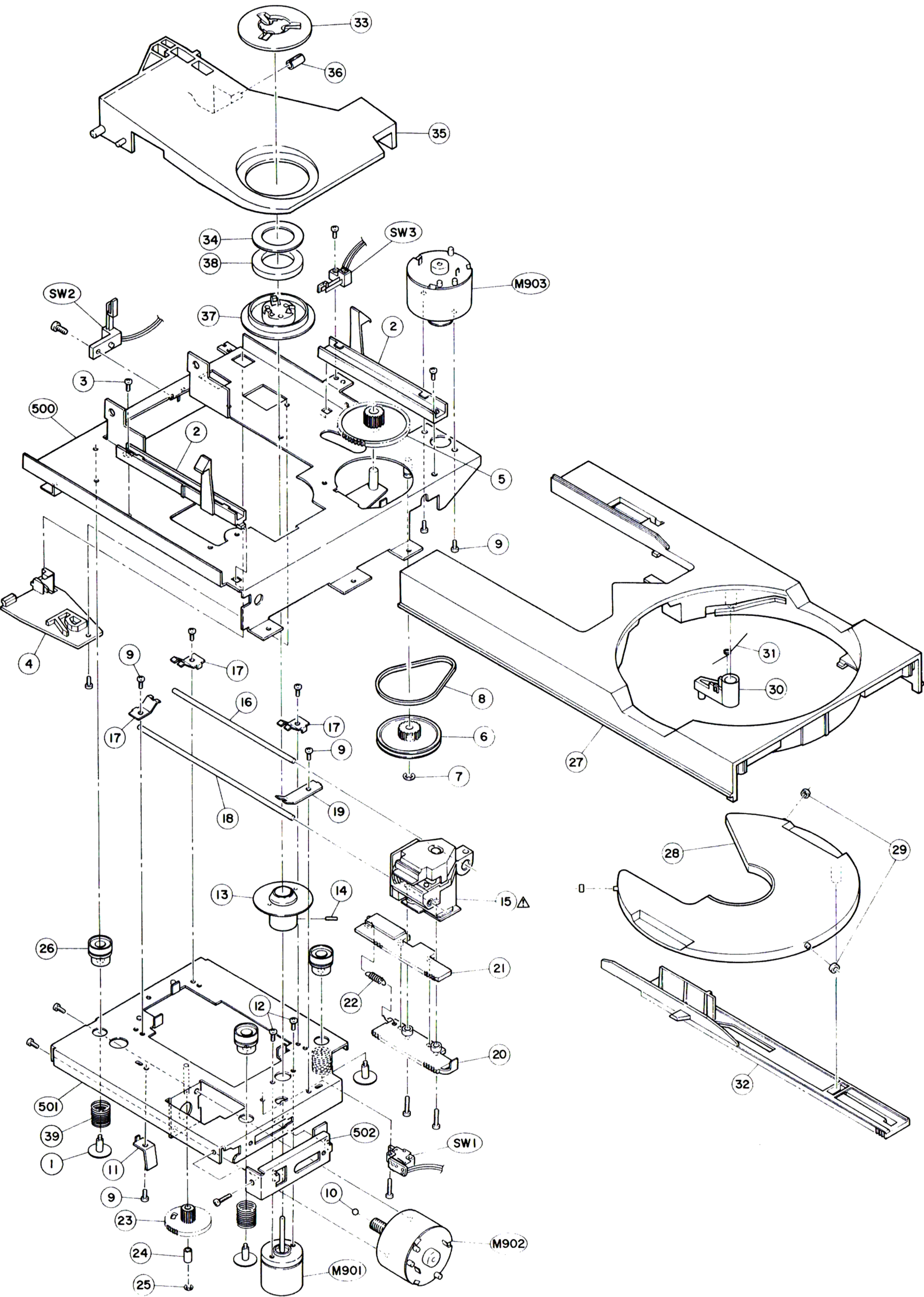
We suggest you to stock the following Recommended Spare Part items listed below since they can cover most of the routine service.

NO.	PART NO.	DESCRIPTION
1	BM-P2005A110A	LOADING MOTOR BLK CD-M515
2	BM-P2005A140A	SLIDE MOTOR BLK CD-M515
3	BM-361225	SPINDLE MOTOR RF-310TB-11400
4	BO-359294	△ PICK UP KSS-121B
5	N BT-362940	TRANS POWER P2006 (A,C)
6	N BT-362942	TRANS POWER P2006 (B,S)
7	N BT-362941	TRANS POWER P2006 (E,V)
8	N BT-362939	TRANS POWER P2006 (J)
9	N BT-362938	TRANS POWER P2006 (U)
10	ED-361055	△ D SILICON DS135E-UB1
11	ED-322238	△ D SILICON 1B4B41 100/1.0A
12	N ED-365963	△ D SILICON 10DF1 FE-2 100/1.0A
13	ED-714631	D LED TLN105A
14	ED-360409	D PHOT PN323B
15	ED-718039	D SILICON DAN201
16	ED-344280	D SILICON H GMA-01-FY2 F05
17	ED-353692	D VARACTER SVC321 C,D DOUBLE
18	ED-316389	D ZENER H HZ11 A2
19	ED-319176	D ZENER H HZ12 A3
20	ED-331617	D ZENER H HZ6 A3
21	ED-300035	D ZENER H HZ6 B3
22	EF-355385	△ FUSE BET T 315MA 250V [B]
23	EF-358974	△ FUSE BET T 630MA 250V [B]
24	EF-695766	△ FUSE SEMKO T 315MA 250V [E,S]
25	EF-601942	△ FUSE SEMKO T 630MA 250V [E,S]
26	N EI-365957	△ IC M528L05
27	EI-315243	△ IC TA78005AP
28	N EI-362977	△ IC TA79005
29	N EI-362973	IC AK-80
30	EI-330352	IC BA6109
31	EI-361234	IC CX20108
32	EI-361233	IC CX20109
33	N EI-362974	IC CX20152
34	EI-361232	IC CX23035
35	N EI-362975	IC HD6805SO
36	EI-356370	IC LA7224
37	EI-361230	IC LC7580
38	EI-355863	IC MB84053B
39	N EI-366361	IC M50745-417SP
40	EI-337228	IC M5218L
41	EI-349719	IC M5218P
42	EI-362588	IC M5238P
43	EI-355904	IC M74LS04P [HD74LS04P]
44	EI-365187	IC SRM2016C15
45	EI-304657	IC TC4011BP
46	EI-362444	IC μPC4072C
47	EI-749983	IC μPD1943G
48	EI-349372	OSC CE CSA4.00MG 4MHZ
49	EI-749984	OSC CE KBR455BAT
50	N EI-362979	OSC X'TAL P2006 67.7376MHZ
51	N EL-362989	PL LEAD 14.0V 100MA
52	N EM-362988	IND LC LCD-9428P
53	N EO-362980	COIL VARI 1 P2006
54	EQ-348929	RELAY SIGNAL G5A-232P 2TR 12V
55	ER-318647	R FUSE ERD2FC S10 1/4W 4R7J
56	ES-357876	△ SW PUSH A2B-1A [C,A]
57	ES-357947	△ SW PUSH A2B-1A [U,J,E,B,S]
58	ES-362933	SW LEAF MSW-1294NBK
59	ES-344257	SW LEAF MSW-1418L 01-1 NO
60	ES-344274	SW SELECTOR HXW0244-01-060 01-4
61	ES-355842	SW SLIDE SSCTP1026A 01-2
62	ES-349474	SW TACT SKHHAM004A
63	ET-354897	TR FET 2SK170 BL,GR,V
64	ET-354882	TR FET 2SK170 GR
65	ET-308472	TR 2SA1115 E,F,G F05
66	ET-348829	TR 2SA1209 S,T
67	ET-352726	TR 2SA1392 T,U

NO.	PART NO.	DESCRIPTION
68	ET-322698	TR 2SB632K E,F
69	ET-318237	TR 2SB764 E,F
70	ET-308141	TR 2SC2603 G F05
71	ET-348831	TR 2SC2911 S,T
72	ET-349081	TR 2SC3383 S,T
73	ET-338565	TR 2SD1302 R,S
74	ET-318603	TR 1SD545NP F
75	ET-310148	TR 2SD612K E,F
76	ET-200986	TR 2SD863-V8 F
77	EV-358829	R S-FIX H RH0615CJ4J 3P 223
78	EV-356583	R S-FIX H RH0615CN3J 3P 332
79	EV-356577	R S-FIX H RH0615C14J 3P 103
80	EV-357619	R S-FIX H RH0615C15J 3P 104
81	N EV-362997	VR SLIDE RSGA2 S4528
82	MB-362932	BELT LOADING
83	MR-352158	PULLEY GEAR
84	MZ-359769	GEAR LOADING
85	MZ-359760	GEAR PICK UP (A)
86	MZ-359761	GEAR PICK UP (B)
87	MZ-359839	GEAR RACK
88	MZ-359762	GEAR WHEEL (A)
89	MZ-359767	HOLDER RAIL
90	MZ-362964	TURN TABLE CD

“NOTE” N: New Parts

MECHA BLOCK



1. MECHA BLOCK

REF. NO.	PART NO.	DESCRIPTION
1-1	ZS-366253	SCREW (B)
1-2	MZ-359767	HOLDER RAIL
1-3	ZS-432843	PAN26×04STL CMT
1-4	MZ-359768	STOPPER TRAY
1-5	MZ-359769	GEAR LOADING
1-6	MR-352158	PULLEY GEAR
1-7	ZW-357164	RING E 230SUP CMT
1-8	MB-362932	BELT LOADING
1-9	ZS-592378	PAN26×03STL CMT
1-10	MV-368886	BALL 300STL
1-11	ZG-351817	SP PLATE THRUST
1-12	ZS-608095	PAN20×05STL CMT
*1-13	MZ-362964	TURN TABLE CD
*1-14	ZS-624870	6SET20×040SCM PKR HP
1-15	BO-359294	△ PICK UP KSS-121B
1-16	MS-359759	SHAFT SUB
1-17	MZ-351814	HOLDER SHAFT (A)
1-18	MS-351813A	SHAFT (A)
1-19	MZ-359836	HOLDER SHAFT (B)
1-20	MZ-359760	GEAR PICK UP (A)
1-21	MZ-359761	GEAR PICK UP (B)
1-22	ZG-357808	SP T6-03.2/0.29-11.2 T6-059
1-23	MZ-359762	GEAR WHEEL (A)
1-24	TC-676844	SPACER 3×6
1-25	ZW-270088	RING E190SUP CMT
1-26	MB-363112	CUSHION RUBBER (B)
1-27	SC-361087	COVER DISC TRAY
1-28	SZ-359775	HOLDER DISC
1-29	MR-345158	ROLLER
1-30	ML-359833	LEVER LOCK
1-31	ZG-359830	SP TORSION LEVER
1-32	MZ-359839	GEAR RACK
1-33	SC-359770	CAP CLAMP
1-34	MZ-361943	PLATE
1-35	MZ-359837	HOLDER CLAMPER
1-36	MH-639281	SPACER 3×8
1-37	MZ-359766	CLAMPER
1-38	MZ-362855	MAGNET FM27×17×3
1-39	ZG-366252	SP PUSH CUSHION
1-M901	BM-361225	SPINDLE MOTOR RF-310TB-11400
1-M902	BM-P2005A140A	SLIDE MOTOR BLK CD-M515
1-M903	BM-P2005A110A	LOADING MOTOR BLK CD-M515
1-SW1	ES-355842	SW SLIDE SSCTP1026A 01-2
1-SW2	ES-362933	SW LEAF MSW-1294NBK
1-SW3	ES-344257	SW LEAF MSW-1418L 01-1 NO

NOTE: The parts reference numbered here except the ones in 500's are normally stocked for replacement purpose. The rest of the parts shown in this manual are not stocked since they are seldom required for routine service.

NOTE *: When repairing 1-M901 (SPINDLE MOTOR) or 1-13 (TURN TABLE CD), replace the following items as a set.

- 1-M901 (SPINDLE MOTOR)
- 1-13 (TURN TABLE CD)
- 1-14 (6 SET20×040SCM PKP HP)

2. PC BOARD BLOCK

REF. NO.	PART NO.	DESCRIPTION
2-1	BA-P2006A020B	PC MAIN BLK CD-A70 [J]
2-1A	BA-P2006A020A	PC MAIN BLK CD-A70 [U]
2-1B	BA-P2006A020C	PC MAIN BLK CD-A70 [C,A]
2-1C	BA-P2006A020D	PC MAIN BLK CD-A70 [E,S]
2-1D	BA-P2006A020E	PC MAIN BLK CD-A70 [B]
2-1E	BA-P2006A020F	PC MAIN BLK CD-A70 [V]

NOTE: PC MAIN BLK consists of following PC BOARDS.

- MAIN PC BOARD
- HEAD PHONE PC BOARD
- DETECTOR PC BOARD

3. MAIN PC BOARD

REF. NO.	PART NO.	DESCRIPTION
MAIN PC BOARD		
3-IC1	EI-361232	IC CX23035
3-IC2	EI-361234	IC CX20108
3-IC3	EI-365187	IC SRM2016C15
3-IC4	EI-366361	IC M50745-417SP
3-IC5	EI-362973	IC AK-80
3-IC6	EI-362974	IC CX20152
3-IC7	EI-355863	IC MB84053B
3-IC8	EI-362975	IC HD6805SO
3-IC9	EI-330352	IC BA6109
3-IC10	EI-361233	IC CX20109
3-IC11,12	EI-362444	IC μPC4072C
3-IC13	EI-365957	△ IC M528L05
3-IC14	EI-315243	△ IC TA78005AP
3-IC15,16	EI-362977	△ IC TA79005
3-IC17	EI-349719	IC M5218P
3-IC18	EI-304657	IC TC4011BP
3-IC19to21	EI-362588	IC M5238P
3-IC22	EI-337228	IC M5218L
3-IC23	EI-356370	IC LA7224
3-IC24	EI-355904	IC M74LS04P [HD74LS04P]
3-TR1	ET-310148	TR 2SD612K E,F
3-TR2	ET-322598	TR 2SB632K E,F
3-TR3	ET-308141	TR 2SC2603 G F05
3-TR4	ET-200986	TR 2SD863-V8 F
3-TR5to8	ET-308141	TR 2SC2603 G F05
3-TR10	ET-318237	TR 2SB764 E,F
3-TR11	ET-310148	TR 2SD612K E,F
3-TR12	ET-322598	TR 2SB632K E,F
3-TR13	ET-310148	TR 2SD612K E,F
3-TR14	ET-200986	TR 2SD863-V8 F
3-TR15	ET-318237	TR 2SB764 E,F
3-TR16	ET-308141	TR 2SC2603 G F05
3-TR17	ET-308472	TR 2SA1115 E,F,G F05
3-TR18	ET-308141	TR 2SC2603 G F05
3-TR19	ET-308472	TR 2SA1115 E,F,G F05
3-TR21	ET-354897	TR FET 2SK170 BL,GR,V
3-TR22	ET-338565	TR 2SD1302 R,S
3-TR24	ET-308472	TR 2SA1115 E,F,G F05
3-TR25	ET-308141	△ TR 2SC2603 G F05
3-TR26to28	ET-308141	TR 2SC2603 G F05
3-TR29	ET-348829	△ TR 2SA1209 S,T
3-TR30	ET-348831	△ TR 2SC2911 S,T
3-TR31	ET-352726	TR 2SA1392 T,U
3-TR32	ET-349081	TR 2SC3383 S,T
3-TR33	ET-310148	△ TR 2SD612K E,F
3-TR34	ET-354882	TR FET 2SK170 GR
3-TR35	ET-349081	TR 2SC3383 S,T
3-TR36	ET-354414	TR DTC144ES

REF. NO.	PART NO.	DESCRIPTION
3-D1	ED-353692	D VARACTER SVC321 C,D DOUBLE
3-D2	ED-353692	D VARACTER SVC321 C,D DOUBLE
3-D3	ED-331617	D ZENER H HZ6 A3
3-D4	ED-344280	D SILICON H GMA-01-FY2 F05
3-D5	ED-300035	D ZENER H HZ6 B3
3-D6to10	ED-344280	D SILICON H GMA-01-FY2 F05
3-D11	ED-316389	D ZENER H HZ11 A2
3-D12	ED-322238	△ D SILICON 1B4B41 100/1.0A
3-D14,15	ED-361055	△ D SILICON DS135E-UB1
3-D16	ED-319176	D ZENER H HZ12 A3
3-D17	ED-319176	D ZENER H HZ12 A3
3-D18to22	ED-344280	D SILICON H GMA-01-FY2 F05
3-D23to26	ED-365963	△ D SILICON 10DF1 FE-2 100/1.0A
3-D27	ED-319176	D ZENER H HZ12 A3
3-D28	ED-344280	D SILICON H GMA-01-FY2 F05
3-RL1	EQ-348929	RELAY SIGNAL G5A-232P 2TR 12V
3-VS1	ES-344274	△ SW SELECTOR HXW0244-01-060 01-4
3-VR1	EV-356583	R S-FIX H RH0615CN3J 3P 332
3-VR2,3	EV-357619	R S-FIX H RH0615C15J 3P 104
3-VR4	EV-356577	R S-FIX H RH0615C14J 3P 103
3-VR5	EV-358829	R S-FIX H RH0615CJ4J 3P 223
3-VL1	EO-361227	COIL VARI 1 A119AN-16737Z
3-L1	EO-362980	COIL VARI 1 P2006
3-L2	EO-345913	COIL FIX 1 LSL03KH 100K
3-L3	EO-330719	COIL FIX1 187LY-103K 103K
3-L4	EO-365954	COIL VARI 1 25-5554-43
3-L5	EO-365955	COIL VARI 1 25-5555-43
3-L6	EO-365956	COIL VARI 1 25-5556-43
3-X2	EI-349372	OSC CE CSA4.00MG 4MHZ
3-X4	EI-362979	OSC X'TAL P2006 67.7376MHZ
3-IB1	EH-347437	COMP R EXB-P88194K
3-IB2	EH-343420	COMP R EXB-P84104K
3-FR1	ER-348272	△ R FUSE ERD2FC S10 1/4W 12R0G
3-FR2	ER-318647	△ R FUSE ERD2FC S10 1/4W 4R7J
3-R105	ER-338184	R MF H 1/4W 152J
3-R106	ER-350688	R MF H 1/4W 222J
3-R107	ER-309817	R MF V 1/4W 3302F
3-R108	ER-338590	R MF V 1/4W 1802F
3-R109	ER-309804	R MF V 1/4W 3901F
3-R110	ER-337864	R MF H 1/4W 822J
3-R111	ER-338590	R MF V 1/4W 1802F
3-R112,113	ER-309801	R MF V 1/4W 3301F
3-R114	ER-349594	R MF H 1/4W 102J
3-R115	ER-302156	R MF H 1/4W 472J
3-R116	ER-354581	R MF V 1/4W 2703F
3-R117	ER-338187	R MF H 1/4W 153J
3-R118	ER-338183	R MF H 1/4W 104J
3-R121	ER-309814	R MF V 1/4W 1002F
3-R122	ER-317894	R MF H F10 1/4W 2200F
3-R145,146	ER-337863	R MF H 1/4W 101J
3-R150to154	ER-333013	R OMF H S20 FS 2W 3R9J
3-R163,164	ER-347959	R MF H 1/4W 561J
3-R165,166	ER-352418	R MF H F10 1/4W 6R20F
3-C31	EC-305428	C TT V D 3R3M 10DC
3-C43	EC-307684	C EC V F05 NP SM R47M 50DC
3-C77	EC-346690	C STY V S05 CQFS 222J 250DC
3-C79	EC-362234	C STY V S05 CQ09S2B 221J 125DC
3-C80	EC-355730	C PP V F05 PP 182J 50DC
3-C81	EC-347371	C MC V F05 FE92 180J 500DC
3-C84	EC-365182	C STY V S05 CQ09S2B 431J 125DC
3-C85,86	EC-315967	C EC V CUT SM 332M 16.0DC
3-C87,88	EC-362464	C EC V CUT AS1 222M 25.0DC
3-C100	EC-320548	△ C CE V F 103Z 250AC [U,J]
3-C100A	EC-338411	△ C CE V FZ 103P 400AC [C,A,E,B,S]
3-C102	EC-347093	C PP V F05 PP 331J 50DC
3-C103	EC-357825	C PP V F05 PP 122J 50DC

REF. NO.	PART NO.	DESCRIPTION
3-C104	EC-362734	C STY V S05 CQ09S2B 222J 125DC
3-P5	EJ-362983	PIN J P2006 [J]
3-P5A	EJ-337424	PIN J AJC-034-ABB P 2P [EXCEPT J]
3-J1	EJ-362303	DIN J TPX3204-01-030 8P
ASSEMBLY BLOCK		
3-F1	EF-601942	⚠ FUSE SEMKO T 630MA 250V [E,X]
3-F1A	EF-358974	⚠ FUSE BET T 630MA 250V[B]
3-F2	EF-601942	⚠ FUSE SEMKO T 630MA 250V [E,S]
3-F2A	EF-358974	⚠ FUSE BET T 630MA 250V[B]
3-F3	EF-695766	⚠ FUSE SEMKO T 315MA 250V [E,S]
3-F3A	EF-355385	⚠ FUSE BET T 315MA 250V[B]
3-F4	EF-695766	⚠ FUSE SEMKO T 315MA 250V [E,S]
3-F4A	EF-355385	⚠ FUSE BET T 315MA 250V[B]

3A. SUB CODE PC BOARD (V ONLY)

REF. NO.	PART NO.	DESCRIPTION
3A-L1	EO-669273	COIL FIX 2 FL5R200 180
3A-L2	EO-669273	COIL FIX 2 FL5R200 180
3A-L3	EO-669273	COIL FIX 2 FL5R200 180
3A-L4	EO-669273	COIL FIX 2 FL5R200 180
3A-L5	EO-669273	COIL FIX 2 FL5R200 180
3A-L6	EO-669273	COIL FIX 2 FL5R200 180
3A-L7	EO-669273	COIL FIX 2 FL5R200 180
3A-L8	EO-669273	COIL FIX 2 FL5R200 180

4. OPERATION PC BOARD

REF. NO.	PART NO.	DESCRIPTION
4-TS1to26	ES-349474	SW TACT SKHHAM004A
4-VR101	EV-362997	VR SLIDE RSGA2 S4528

5. HEAD PHONE PC BOARD

REF. NO.	PART NO.	DESCRIPTION
5-J101	EJ-355012	PHONE J 3P HLJ0541-010 6.3

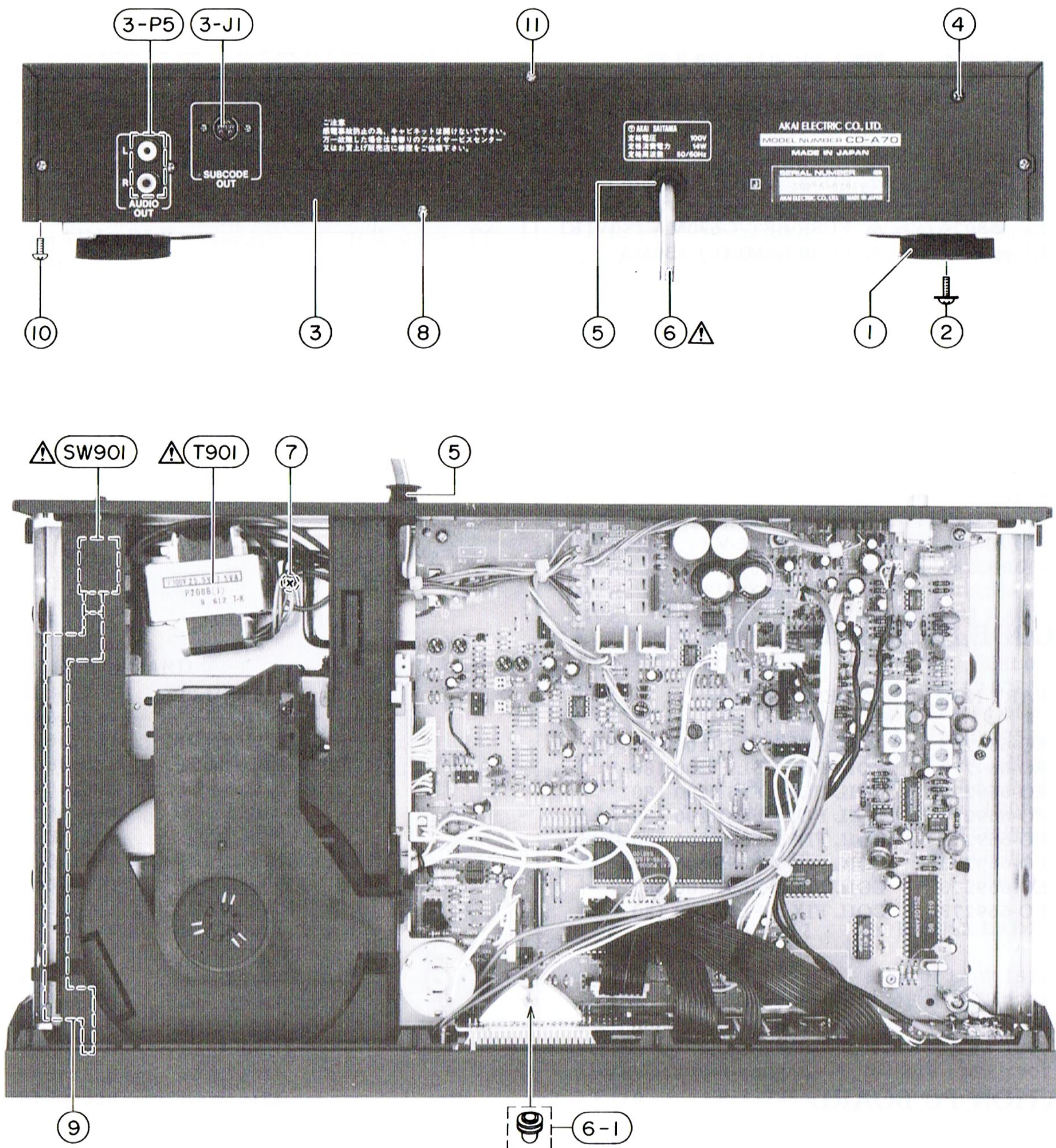
6. LCD PC BOARD

REF. NO.	PART NO.	DESCRIPTION
6-IC101	EI-361230	IC LC7580
6-IN1	EM-362988	IND LC LCD-9428P
6-IN2	EL-362989	PL LEAD 14.0V 100MA
6-1	EZ-361808	HOLDER LAMP EQ-300-42101A (WHITE)

7. DETECTOR PC BOARD

REF. NO.	PART NO.	DESCRIPTION
7-D101	ED-360409	D PHOT PN323B

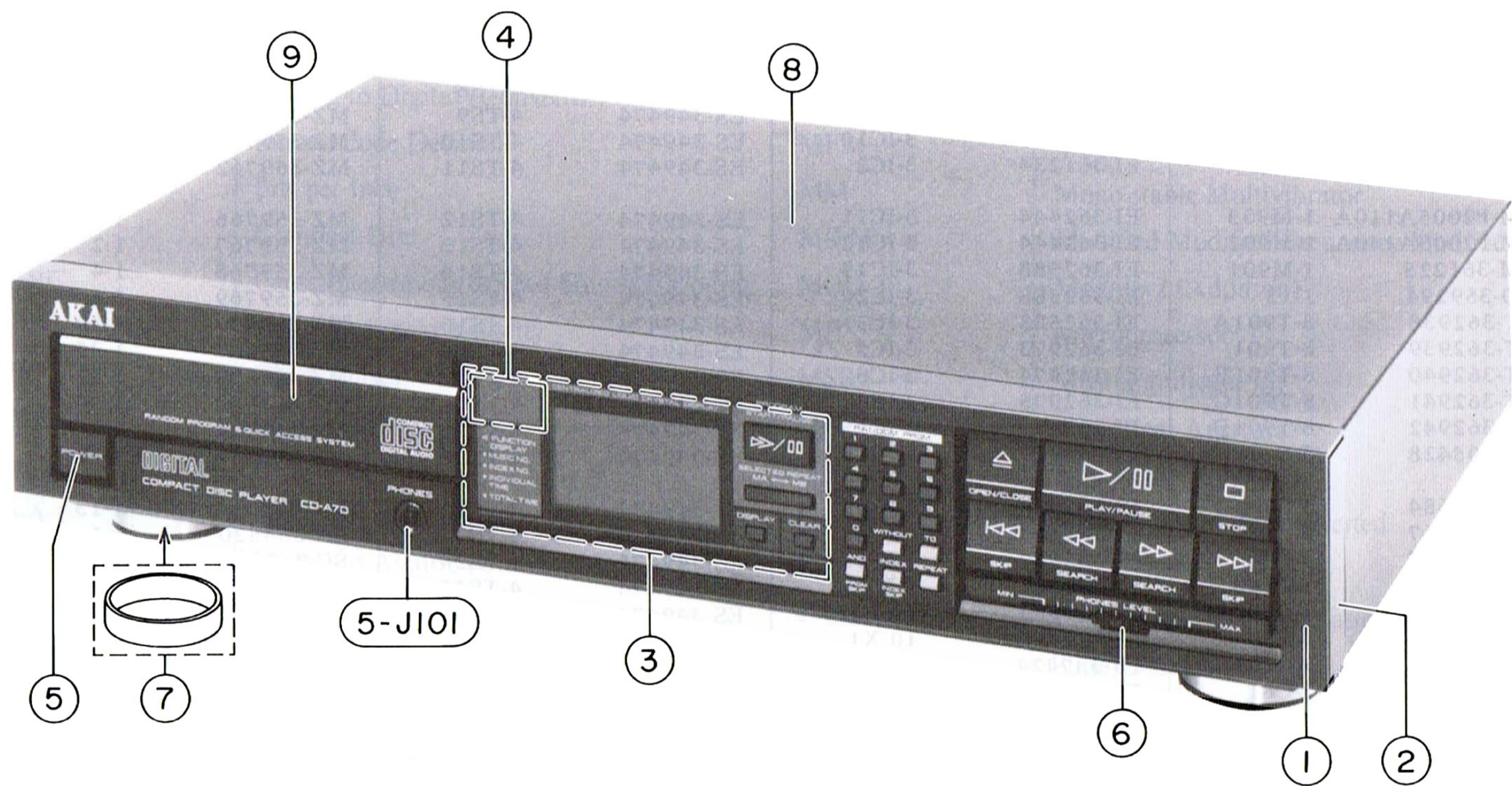
ASSEMBLY BLOCK



8. ASSEMBLY BLOCK

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
ASSEMBLY BLOCK					
8-1	SA-364520	INSULATOR CD	8-7	ZS-304022	ST PAN40×06STL CMT [TRANS POWER FIX]
8-2	ZS-369042	SCREW Y2358	8-8	ZS-366240	T2BR30×06STL BNI PROJECTION
8-3	SP-362614G	PANEL REAR CD-A70 [J]	8-9	MZ-362601	JOINT POWER
8-3A	SP-362614F	PANEL REAR CD-A70 [U]	8-10	ZS-341989	ST CTS30×06STL CMT [COVER UPPER FIX]
8-3B	SP-362614H	PANEL REAR CD-A70 [A,C]	8-11	ZS-463353	T2BR30×08STL BNI [COVER UPPER FIX]
8-3C	SP-362614J	PANEL REAR CD-A70 [E]	8-T901	BT-362939	△ TRANS POWER P2006 [J]
8-3D	SP-362614K	PANEL REAR CD-A70 [B,S]	8-T901A	BT-362938	△ TRANS POWER P2006 [U]
8-3E	SP-362614U	PANEL REAR CD-A70 [V]	8-T901B	BT-362940	△ TRANS POWER P2006 [A,C]
8-4	ZS-354403	ST BR30×08STL BNI	8-T901C	BT-362941	△ TRANS POWER P2006 [E,V]
8-5	EZ-361283	STRAIN RELIEF SR-5N-5 [J]	8-T901D	BT-362942	△ TRANS POWER P2006 [B,S]
8-6	EW-361248	△ AC CORD 2CORES KP-210 BL [J]	8-SW901	ES-357947	△ SW PUSH A2B-1A [U,J,E,B,S]
8-6A	EW-363659	△ AC CORD 200 0129AVFF B070 A U/T [U]	8-SW901A	ES-357876	△ SW PUSH A2B-1A [C,A]
8-6B	EW-363801	△ AC CORD 200 0238PSPT1 B070 A UC [C,A]	8-SW901A	ES-357876	△ SW PUSH A2B-1A [C,A]
8-6C	EW-363672	△ AC CORD 200 0364 LCFL B070 A EV [E]	MAIN PC BOARD		
8-6D	EW-363684	△ AC CORD 200 LCFL B070 A B [B]	3-P5	EJ-362983	PIN J P2006 [J]
8-6E	EW-363698	△ AC CORD 200 0436 LCFL B070 A S [S]	3-P5A	EJ-337424	PIN J AJC-034-ABB P 2P [EXCEPT J]
			3-J1	EJ-362303	DIN J TPX3204-01-030 8P

FINAL ASSEMBLY BLOCK



9. FINAL ASSEMBLY BLOCK

REF. NO.	PART NO.	DESCRIPTION
FINAL ASSEMBLY BLOCK		
9-1	SC-362743A	COVER FRONT PANEL
9-1-B	SC-362743B	COVER FRONT PANEL-B
9-2	BD-B365255-A	PANEL FRONT PART
9-2-B	BD-B365256-A	PANEL FRONT-B PART
9-3	SZ-362749	WINDOW LCD
9-4	SZ-361424	PLATE REMOCON
9-5	SK-362609A	KNOB POWER
9-5-B	SK-362609B	KNOB POWER-B
9-6	SK-355248A	KNOB SLIDE
9-6-B	SK-355248B	KNOB SLIDE-B
9-7	SZ-364521	CAP INSULATOR
9-8	SP-362613C	COVER UPPER 2
9-8-B	SP-362613D	COVER UPPER 2-B
9-9	SP-362611A	PANEL TRAY CD-A30(J) [J]
9-9A	SP-362611C	PANEL TRAY CD-A30[EXCEPT J]
9-9-B	SP-362611B	PANEL TRAY CD-A30(J)-B [J]
9-9A-B	SP-362611D	PANEL TRAY CD-A30-B [EXCEPT J]
9-10x	ZS-350934	PT BR30x08STL BNI [PANEL TRAY FIX]
HEAD PHONE PC BOARD		
5-J101	EJ-355012	PHONE J 3P HLJ0541-010 6.3

SYMBOL FOR COLOR VARIATION

Non : Standard Color
-B : Black

10. REMOTE CONTROL UNIT RC-700

REF. NO.	PART NO.	DESCRIPTION
10-1	AX-363094	REMOCON RC-700-S WIRELESS (T)
10-1-B	AX-363095	REMOCON RC-700-B WIRELESS(T)
10-IC1	EI-749983	IC μ PD1943G
10-TR1	ET-318603	TR 2SD545NP F (2SD1469)
10-D1	ED-714631	D LED TLN105A
10-D2	ED-714631	D LED TLN105A
10-D3	ED-718039	D SILICON DAN201
10-D4	ED-718039	D SILICON DAN201
10-X1	EI-749984	OSC CE KBR455BAT

INDEX

PART NO.	REF. NO.	PART NO.	REF. NO.	PART NO.	REF. NO.	PART NO.	REF. NO.
AX-363094	10-1	EI-337228	3-IC22	ES-349474	4-TS2	ML-359833	1-30
AX-363095	10-1-B	EI-349372	3-X2	ES-349474	4-TS3	MR-345158	1-29
BA-P2006A020A	2-1A	EI-349719	3-IC17	ES-349474	4-TS4	MR-352158	1-6
BA-P2006A020B	2-1	EI-355863	3-IC7	ES-349474	4-TS5	MS-351813A	1-18
BA-P2006A020C	2-1B	EI-355904	3-IC24	ES-349474	4-TS6	MS-359759	1-16
BA-P2006A020D	2-1C	EI-356370	3-IC23	ES-349474	4-TS7	MV-368886	1-10
BA-P2006A020E	2-1D	EI-361230	6-IC101	ES-349474	4-TS8	MZ-351814	1-17
BA-P2006A020F	2-1E	EI-361232	3-IC1	ES-349474	4-TS9	MZ-359760	1-20
BD-B365255-A	9-2	EI-361233	3-IC10	ES-349474	4-TS10	MZ-359761	1-21
BD-B365256-A	9-2-B	EI-361234	3-IC2	ES-349474	4-TS11	MZ-359762	1-23
BM-P2005A110A	1-M903	EI-362444	3-IC11	ES-349474	4-TS12	MZ-359766	1-37
BM-P2005A140A	1-M902	EI-362444	3-IC12	ES-349474	4-TS13	MZ-359767	1-2
BM-361225	1-M901	EI-362588	3-IC19	ES-349474	4-TS14	MZ-359768	1-4
BO-359294	1-15	EI-362588	3-IC20	ES-349474	4-TS15	MZ-359769	1-5
BT-362938	8-T901A	EI-362588	3-IC21	ES-349474	4-TS16	MZ-359836	1-19
BT-362939	8-T901	EI-362973	3-IC5	ES-349474	4-TS17	MZ-359837	1-35
BT-362940	8-T901B	EI-362974	3-IC6	ES-349474	4-TS18	MZ-359839	1-32
BT-362941	8-T901C	EI-362975	3-IC8	ES-349474	4-TS19	MZ-361943	1-34
BT-362942	8-T901D	EI-362977	3-IC15	ES-349474	4-TS20	MZ-362601	8-9
EC-305428	3-C31	EI-362977	3-IC16	ES-349474	4-TS21	MZ-362855	1-38
EC-307684	3-C43	EI-362979	3-X4	ES-349474	4-TS22	MZ-362964	1-13
EC-315967	3-C85	EI-365187	3-IC3	ES-349474	4-TS23	SA-364520	8-1
EC-315967	3-C86	EI-365957	3-IC13	ES-349474	4-TS24	SC-359770	1-33
EC-320548	3-C100	EI-366361	3-IC4	ES-349474	4-TS25	SC-361087	1-27
EC-338411	3-C100A	EI-749983	10-IC1	ES-349474	4-TS26	SC-362743A	9-1
EC-346690	3-C77	EI-749984	10-X1	ES-355842	1-SW1	SC-362743B	9-1-B
EC-347093	3-C102	EJ-337424	3-P5A	ES-357876	8-SW901A	SK-355248A	9-6
EC-347371	3-C81	EJ-355012	5-J101	ES-357947	8-SW901	SK-355248B	9-6-B
EC-355730	3-C80	EJ-362303	3-J1	ES-362933	1-SW2	SK-362609A	9-5
EC-357825	3-C103	EJ-362983	3-P5	ET-200986	3-TR4	SK-362609B	9-5-B
EC-362234	3-C79	EL-362989	6-IN2	ET-200986	3-TR14	SP-362611A	9-9
EC-362464	3-C87	EM-362988	6-IN1	ET-308141	3-TR3	SP-362611B	9-9-B
EC-362464	3-C88	EO-330719	3-L3	ET-308141	3-TR5	SP-362611C	9-9A
EC-362734	3-C104	EO-345913	3-L2	ET-308141	3-TR6	SP-362611D	9-9A-B
EC-365182	3-C84	EO-361227	3-VL1	ET-308141	3-TR7	SP-362613C	9-8
ED-300035	3-D5	EO-365954	3-L4	ET-308141	3-TR8	SP-362613D	9-8-B
ED-316389	3-D11	EO-365955	3-L5	ET-308141	3-TR16	SP-362614F	8-3A
ED-319176	3-D16	EO-365956	3-L6	ET-308141	3-TR18	SP-362614G	8-3
ED-319176	3-D17	EO-669273	3A-L1	ET-308141	3-TR26	SP-362614H	8-3B
ED-319176	3-D27	EO-669273	3A-L2	ET-308141	3-TR25	SP-362614J	8-3C
ED-322238	3-D12	EO-669273	3A-L3	ET-308141	3-TR27	SP-362614K	8-3D
ED-331617	3-D3	EO-669273	3A-L4	ET-308141	3-TR28	SP-362614U	8-3E
ED-344280	3-D4	EO-669273	3A-L5	ET-308472	3-TR17	SZ-359775	1-28
ED-344280	3-D6	EO-669273	3A-L6	ET-308472	3-TR19	SZ-361424	9-4
ED-344280	3-D7	EO-669273	3A-L7	ET-308472	3-TR24	SZ-362749	9-3
ED-344280	3-D8	EO-669273	3A-L8	ET-310148	3-TR1	SZ-364521	9-7
ED-344280	3-D9	EQ-348929	3-RL1	ET-310148	3-TR11	TC-676844	1-24
ED-344280	3-D10	EO-362980	3-L1	ET-310148	3-TR13	ZG-351817	1-11
ED-344280	3-D18	ER-302156	3-R115	ET-310148	3-TR33	ZG-357808	1-22
ED-344280	3-D19	ER-309801	3-R112	ET-318237	3-TR10	ZG-359830	1-31
ED-344280	3-D20	ER-309801	3-R113	ET-318237	3-TR15	ZG-366252	1-39
ED-344280	3-D21	ER-309804	3-R109	ET-318603	10-TR1	ZS-304022	8-7
ED-344280	3-D22	ER-309814	3-R121	ET-322598	3-TR2	ZS-341989	8-10
ED-344280	3-D28	ER-309817	3-R107	ET-322598	3-TR12	ZS-350934	9-10x
ED-353692	3-D1	ER-317894	3-R122	ET-338565	3-TR22	ZS-354403	8-4
ED-353692	3-D2	ER-318647	3-FR2	ET-348829	3-TR29	ZS-366240	8-8
ED-360409	7-D101	ER-333013	3-R152	ET-348831	3-TR30	ZS-366253	1-1
ED-361055	3-D14	ER-333013	3-R153	ET-349081	3-TR32	ZS-369042	8-2
ED-361055	3-D15	ER-333013	3-R154	ET-349081	3-TR35	ZS-432843	1-3
ED-365963	3-D23	ER-333013	3-R150	ET-352726	3-TR31	ZS-463353	8-11
ED-365963	3-D24	ER-333013	3-R151	ET-354414	3-TR36	ZS-592378	1-9
ED-365963	3-D25	ER-337863	3-R145	ET-354882	3-TR34	ZS-608095	1-12
ED-365963	3-D26	ER-337863	3-R146	ET-354897	3-TR21	ZS-624870	1-14
ED-714631	10-D1	ER-337864	3-R110	EV-356577	3-VR4	ZW-270088	1-25
ED-714631	10-D2	ER-338183	3-R118	EV-356583	3-VR1	ZW-357164	1-7
ED-718039	10-D3	ER-338184	3-R105	EV-357619	3-VR2		
ED-718039	10-D4	ER-338187	3-R117	EV-357619	3-VR3		
EF-355385	3-F3A	ER-338590	3-R108	EV-358829	3-VR5		
EF-355385	3-F4A	ER-338590	3-R111	EV-362997	4-VR101		
EF-358974	3-F1A	ER-346954	3-R114	EW-361248	8-6		
EF-358974	3-F2A	ER-347959	3-R163	EW-363659	8-6A		
EF-601942	3-F1	ER-347959	3-R164	EW-363672	8-6C		
EF-601942	3-F2	ER-348272	3-FR1	EW-363684	8-6D		
EF-695766	3-F3	ER-350688	3-R106	EW-363698	8-6E		
EF-695766	3-F4	ER-352418	3-R165	EW-363801	8-6B		
EH-343420	3-IB2	ER-352418	3-R166	EZ-361283	8-5		
EH-347437	3-IB1	ER-354581	3-R116	EZ-361808	6-1		
EI-304657	3-IC18	ES-344257	1-SW3	MB-362932	1-8		
EI-315243	3-IC14	ES-344274	3-VS1	MB-363112	1-26		
EI-330352	3-IC9	ES-349474	4-TS1	MH-639281	1-36		

ABBREVIATIONS (COMPACT DISC)

ABBREVIATION	EXPLANATION	ABBREVIATION	EXPLANATION
A-D	Analog to Digital (Convertor)	Mb	Mega Bits
ADC	Analog to Digital (Convertor)	MDA	Motor Drive Amplifier
BCD	Binary Code Decimal	MFM	Modified Frequency Modulation
BPI	Bits per Inch	MM	Mono-stable Multivibrator
CD	Compact Disc	M-FM	Modified Modified Frequency Modulation
CIRC	Cross Interleaving & Reed Solomon Coding	MOD 2	Modulo 2 (Addition)
CLV	Constant Linear Velocity	MP	Microprocessor
CP	Clock Pulses	MSB	Most Significant Bit
CRCC	Cyclic Redundancy Check Codes	NA	Numerical Aperture
D Level	Decision Level	NRZ	Non Return to Zero
D-A	Digital to Analog (Convertor)	NRZ-1	Non Return to Zero Inverted
DAC	Digital to Analog (Convertor)	P	Parity Data
DAD	Digital Audio Disc	PAM	Pulse Amplitude Modulation
DEM	Dynamic Element Matching	PCM	Pulse Code Modulation
DPD	Differential Phase Detection	PD	Phase Detector
DSV	Digital Sum Value	PE	Phase Encode
EFM	Eight to fourteen Modulation	PLL	Phase Locked Loop
EX-OR	EXclusive OR	PNM	Pulse Number Modulation
FCI	Flux Changes per Inch	PPM	Pulse Phase Modulation
FIR	Finite Impulse Response	PWM	Pulse Width Modulation
FP	Front Pulse	Q	Parity Data
FPG	Front Pulse Gate	R,R ₁ ,R ₂ etc	Data for Right Channel
f	Frequency of Sampling	RAM	Random Access Memory
GF	Galois Field	RPG	Rear Pulse Gate
H&V(Parity)	Horizontal & Vartical	SCOOP	Self Coupled Optical Pick-up
IIR	Infinite Impulse Response	S&H	Sample & Hold
kb	Kilo Bits	S/N	Signal to Noise Ratio
L,L ₁ ,L ₂ etc	Data for Left Channel	SSG	Standerd Signal Generator
LPF	Low Pass Filter	SYS CON	SYStem CONtrol
LSB	Least Significant Bit		

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