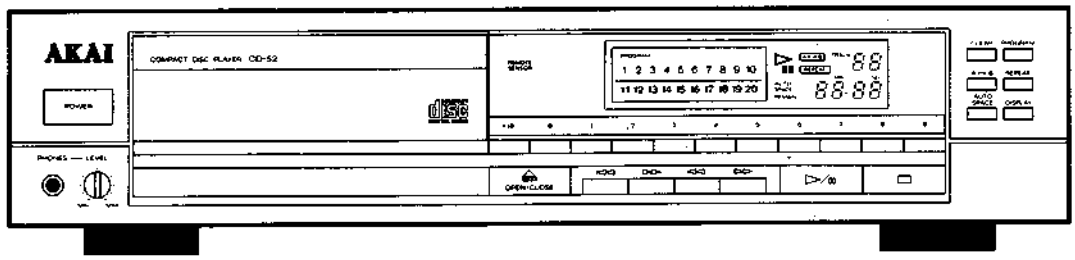
AKAI SERVICE MANUAL



COMPACT DISC PLAYER
MODEL CD-52

COMPACT disc DIGITAL AUDIO

SPECIFICATIONS

System	Compact disc player
Pick-up system	3 beam Laser pick up
Sampling frequency	44.1 kHz
Digital filter	16 bit, 4 times over sampling
D/A converter	16 bit linear
Error correction system	Cross Interleave Reed Solomon
Number of channels	2 channels (Stereo)
Frequency response	5 Hz to 20 kHz ± 0.5 dB
Dynamic range	92 dB or more
S/N	106 dB or more
Total harmonic distortion	0.004% or less
Wow & flutter	Less than measurable limits
Analog output level	2V (0 dB)
Digital output level/ Impedance	0.5 Vp-p/75 ohms
Headphone output level/ Impedance	28 mW/32 ohms
Power requirements	120 V, 60 Hz for USA & Canada 220 V, 50 Hz for Europe except UK 240 V, 50 Hz for UK & Australia 110V – 120 V/220 V – 240V, 50 Hz/60 Hz convertible for other countries
Dimensions	425 (W) × 98 (H) × 330 (D) mm (16.7 × 3.9 × 13.0 inches)
Weight	4.5 kg (9.9 lbs)

Wireless remote control transmitter (RC-C52)

System	Infrared ray
Dry battery	R6 (UM-3 SUM-3, AA or equivalent size) × 2, DC 3V

Standard accessories

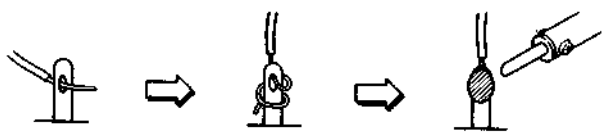
Operators manual	1
Connection cord	1
Remote control unit (RC-C52)	1
Batteries for remote control unit	2

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

★ SAFETY INSTRUCTIONS

PRECAUTIONS DURING SERVICING

1. Parts identified by the (*) symbol 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 locations.
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

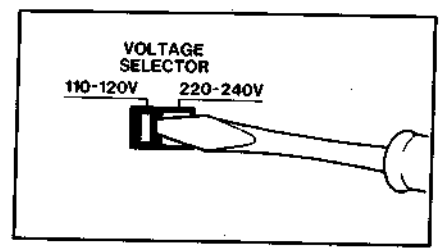
SYMBOLS FOR PRIMARY DESTINATION

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)

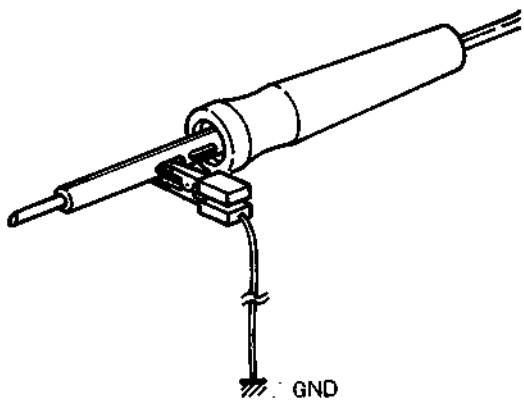
Before connecting the power cord, SET the VOLTAGE SELECTOR located on the bottom plate with a screwdriver so that the correct voltage is indicated.



PRECAUTIONS IN REPAIRING

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

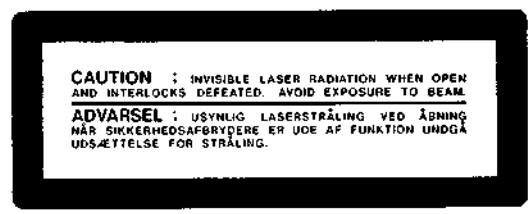
1. Do not put excessive pressure on the mechanical part (operation part), including the pick-up block, as extremely high mechanical precision is required in these parts.
2. When the base is removed for repair or adjustment, make sure that there are no metal objects in the narrow gap between the P.C board or the mecha parts and the base.
3. The Micro-Computer and the CD signal processing ICs 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 from hazardous invisible Laser Radiation. DO NOT watch the Laser Beam (Objective Lens) directly.
6. Models for the same countries, Laser Warning Labels are affixed on the unit and inside of the unit, as shown below. Read it carefully for your safety, when repairing or adjusting the unit.

[DENMARK and U.K]

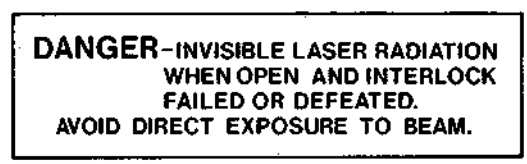
A Label affixed on the Rear panel of the unit.



A Label affixed on the Disc clamper inside of the unit.

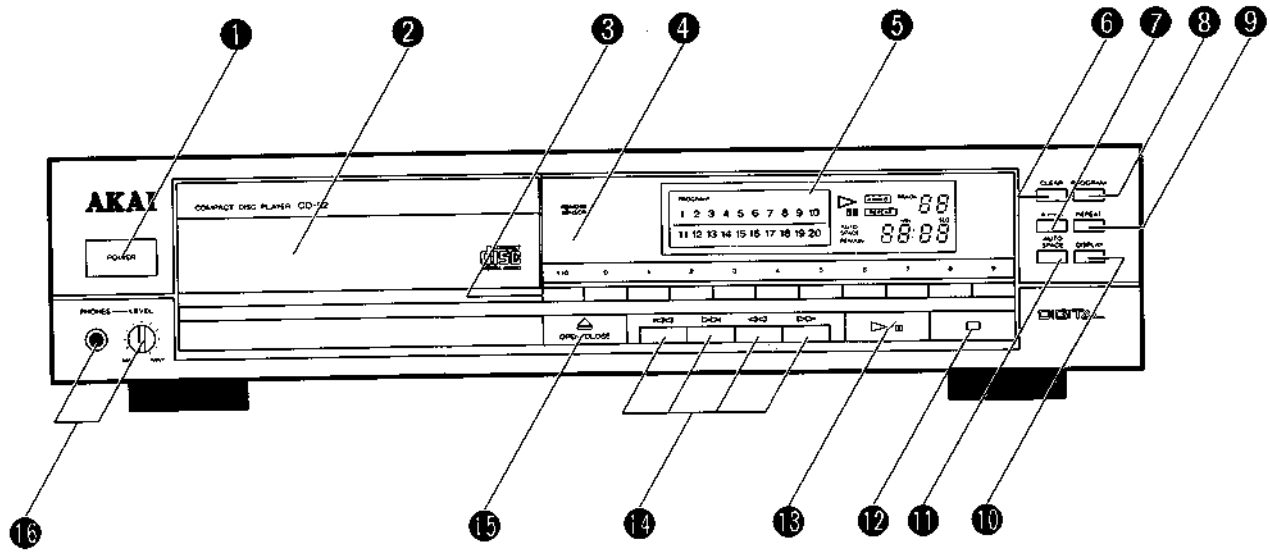
[U.S.A]

A Label printed on the Rear panel of the unit.



A Label affixed on the Disc clamper inside of the unit.

1. CONTROLS



❶ POWER Button
To turn the power on and off.

❷ Disc Drawer
Load a compact disc here.

❸ Numeric Buttons (10+ and 0 to 9)
For direct search of the track you wish to playback and for programming for random program playback.

❹ REMOTE SENSOR Window
For reception of the remote control signal.
Keep away from strong light and direct sunlight as this will interfere with the remote control function.

❺ FL (Fluorescent) Display
Tells you what the CD player is doing.

❻ CLEAR Button
To cancel all the programmed tracks of the random program or to cancel A ⟷ B repeat playback.

❼ A ⟷ B Button
For repeat playback of a specific section of the CD.

❽ PROGRAM Button
For random program playback.

❾ REPEAT Button
For repeat playback of all the tracks or the random program.

❿ DISPLAY Button
To switch between the remaining playback time display and the elapsed playback time display.

⓫ AUTO SPACE Button
To set the blank intervals between tracks to a specific time (approximately 4 seconds) for uniformity during random program playback.

⓬ □ STOP Button
To stop playback.

⓭ ▷/▯▯ PLAY/PAUSE Button
To start and stop playback temporarily.

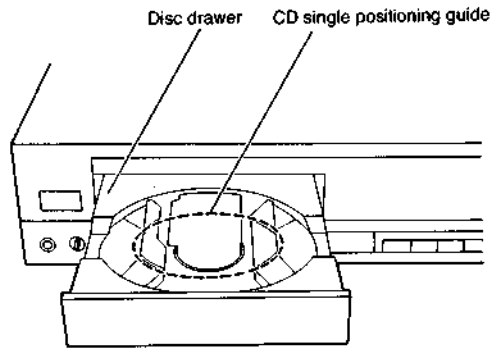
⓮ ⏮ / ⏭ and ◁◁ / ▷▷ Search Buttons
◁◁ / ▷▷ Buttons
For manual search during playback.
⏮ / ⏭ Buttons
To skip tracks during playback.

⓯ ⏏ OPEN/CLOSE Button
To open and close the disc drawer.

⓰ PHONES Jack and LEVEL Control
For headphone listening.

About the disc drawer

The disc drawer of this CD player is capable of holding a CD single (8cm diameter CD) for playback.
Place the CD single on the center of the disc drawer as shown in the following illustration.



FL (Fluorescent) Display

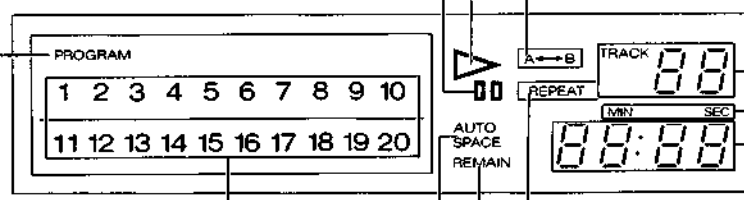
▷ Play Indicator
Tells you the CD player is in the playback mode.

PROGRAM Indicator
Tells you the random program system is engaged.

A ⟷ B Indicator
Tells you the CD player is in the A ⟷ B (2 point) repeat playback mode.

▯▯ Pause Indicator
Tells you the CD player is in the pause mode.

TRACK Display
Tells you which track is being played back or which track has been selected.



Music Calendar Display (1 to 20)
Displays all tracks contained on the loaded CD. Also displays the programmed tracks during random program playback.

REPEAT Indicator
Tells you the CD player is in the repeat playback mode.

Digital Display
Shows elapsed playback time, remaining time or index number during index search playback.

AUTO SPACE Indicator
Tells you the CD player is in the auto space playback mode.

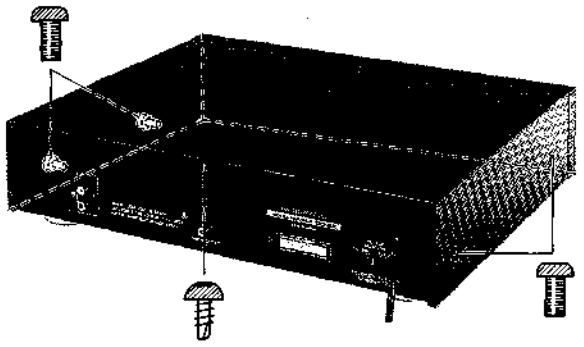
MIN and SEC Indicators
Displays minutes and seconds of the remaining playback time or elapsed time of playback.

REMAIN (Remaining) Indicator
Tells you the remaining playback time of the loaded CD.

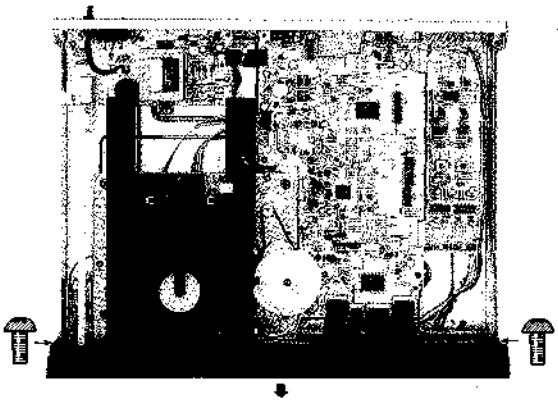
II. DISASSEMBLY

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

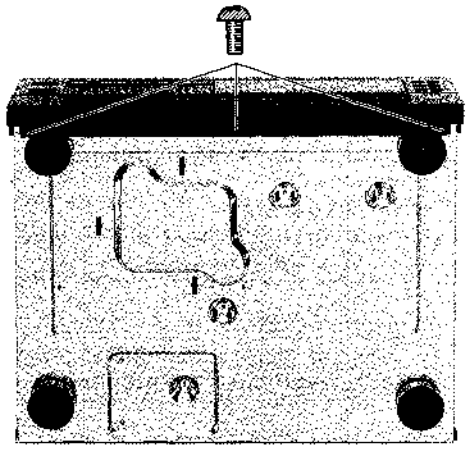
1. Removal of Upper Cover



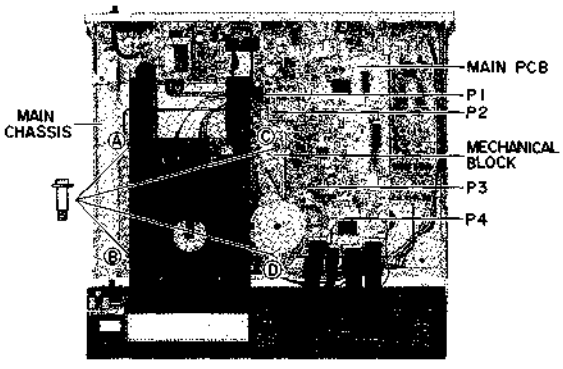
3.



2. Removal of Front Panel



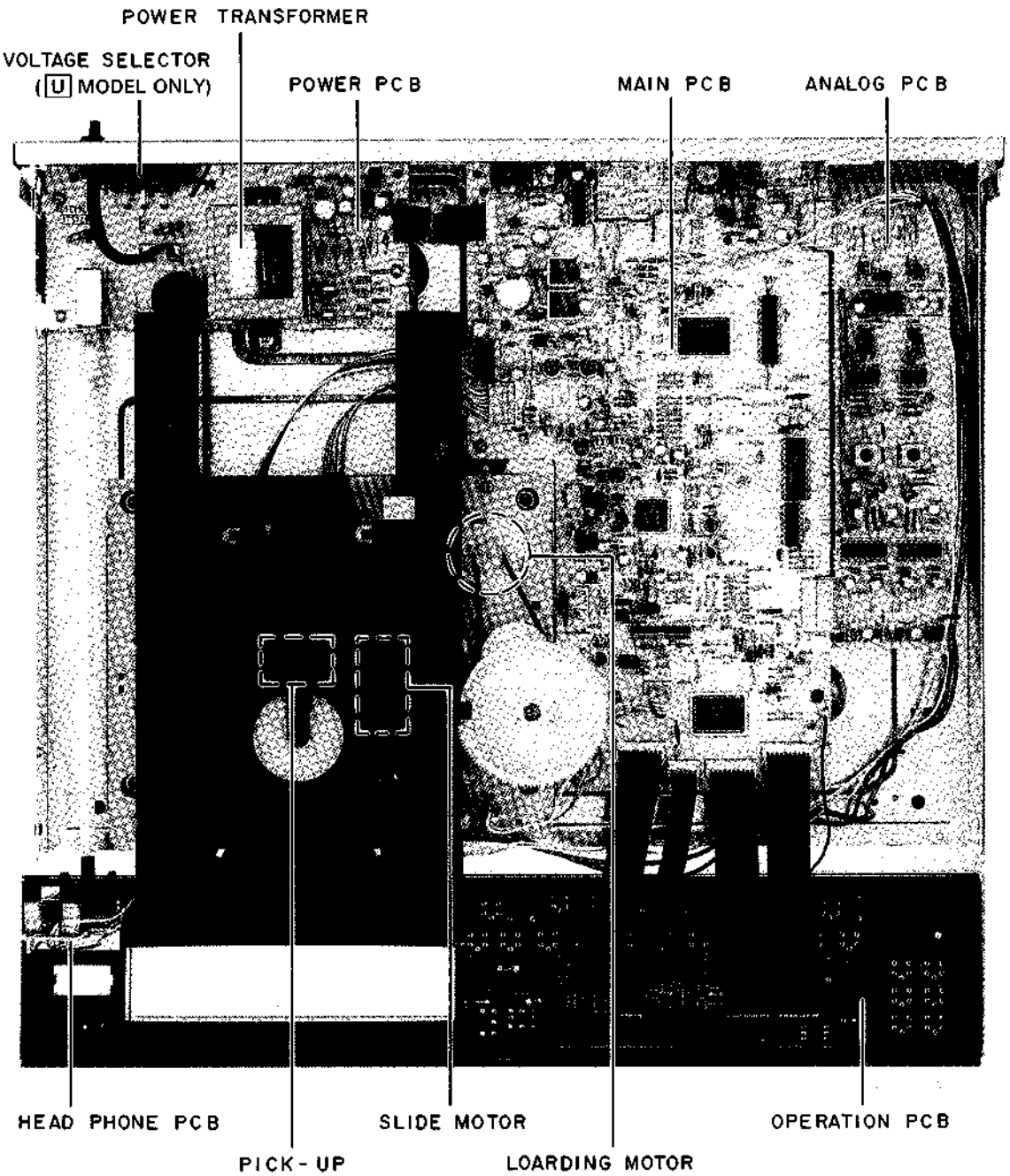
4. Removal of Mecha Block



Remove the fixing screws and connectors P1 to P4.
*See NOTE.

* NOTE:
When disconnecting or connecting the connectors P1 and P2, make sure that the P.C. Board (On the PICK-UP BLOCK) has to be shorted circuit. (Refer to IV. REPLACEMENT OF PICK-UP BLOCK)

III. PRINCIPAL PARTS LOCATION



IV. REPLACEMENT OF PICK-UP BLOCK AND MOTORS

NOTE: Keep your safety from hazardous invisible Laser Radiation. Make sure that the power switch is OFF, when removing the DISC CLAMPER.

4-1. REMOVAL OF THE DISC CLAMPER (Refer to Fig. 4-1)

1) Turn the LOADING CAM GEAR to counter-clockwise, then open the DISC TRAY (①).
2) Pull up the DISC CLAMPER slightly (②), at the same time move the DISC CLAMPER (③ direction), then remove the DISC CLAMPER.

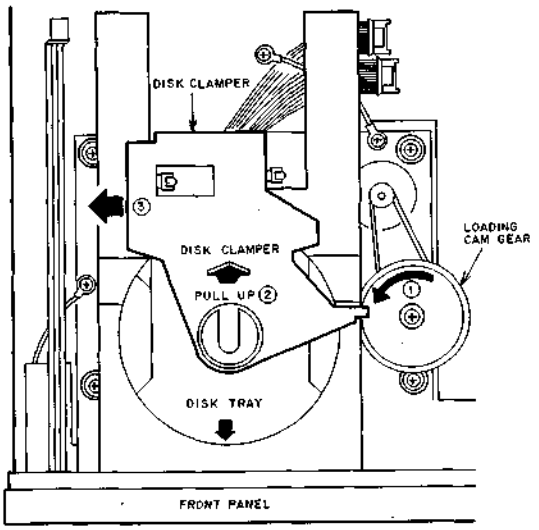


Fig. 4-1

4-2. PRECAUTION, WHEN REPLACING THE PICK-UP BLOCK

When connecting or disconnecting the connectors P1 and P2, make sure that the P.C. Board (on the PICK-UP Block) has to be shorted circuit as shown in Fig. 4-2.
Do not turn the electricity "ON" while it remain shorted circuit.

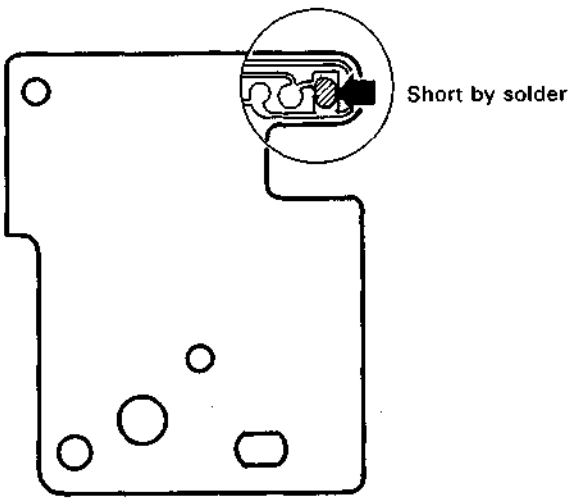


Fig. 4-2

4-3 REPLACEMENT OF THE PICK-UP BLOCK (Refer to Fig. 4-3)

1) Open the disc tray and disconnect the connectors P1 and P2 on the pick-up block.
2) Push the Ⓐ part in a ← direction, at the same time, push the Ⓑ part (shaft) in a ← direction, then remove the PICK-UP BLOCK.
3) Reassemble in reverse order.

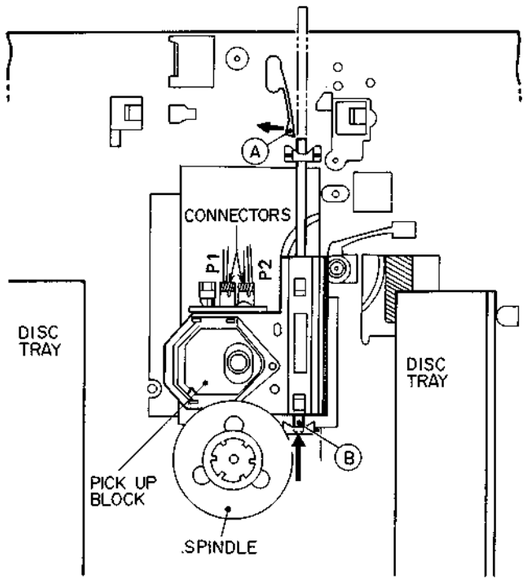


Fig. 4-3

4.4 REPLACEMENT OF THE SPINDLE MOTOR (Refer to Fig 4-4 and Fig. 4-5)

1) Turn the GEAR HOLD LEVER Ⓐ counter-clockwise, then pull out the SLIDE GEAR (Fig. 4-4)
2) Move the PICK-UP BLOCK to opposite from the SPINDLE MOTOR (→ direction). (Fig. 4-5)
3) Turn the TURN TABLE so that the screw peep through the TURN TABLE (Fig. 4-5)
4) Remove the screws through into the TURN TABLE, then remove the SPINDLE MOTOR.
5) Reassemble in reverse order.

4-5. REPLACEMENT OF THE LOADING MOTOR (Refer to Fig. 4-4)

1) Remove the LOADING BELT from the LOADING MOTOR.
2) Extend motor holders Ⓒ, at the same time push the LOADING MOTOR from pulley side, then remove the LOADING MOTOR.
3) Reassemble just push in the LOADING MOTOR and put the LOADING BELT.

4-6. REPLACEMENT OF THE SLIDE MOTOR (Refer to Fig. 4-4)

1) Turn the MOTOR HOLD LEVER Ⓑ clockwise, then pull out the SLIDE MOTOR.
2) Reassemble in reverse order.

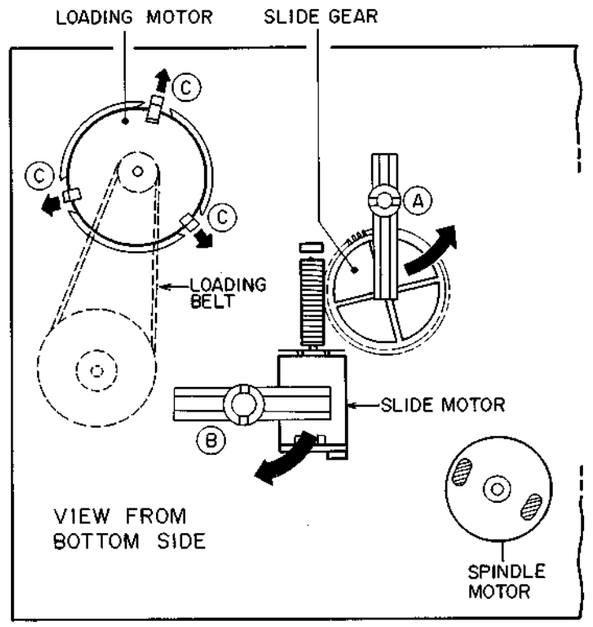


Fig. 4-4

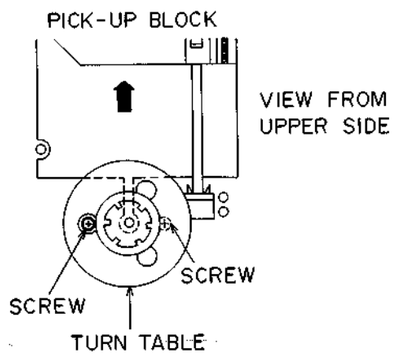


Fig. 4-5

V. ADJUSTMENT

ABOUT THE TEST MODE

- This test mode is used for the adjustment or check.
- Turn on the power while pressing the 0, 1 and 2 key switches on the FRONT PANEL, then machine set to the TEST MODE.
- Indication of the FRONT PANEL is "0 ES:-0" when TEST MODE.
- When change the TEST MODE number, press the ⏭ key switch on the FRONT PANEL.
- When press the STOP key switch, TEST MODE number return to "0 ES:-0".
- When release from test mode, turn the power off.

TEST MODE OPERATION, DISPLAY AND FUNCTION

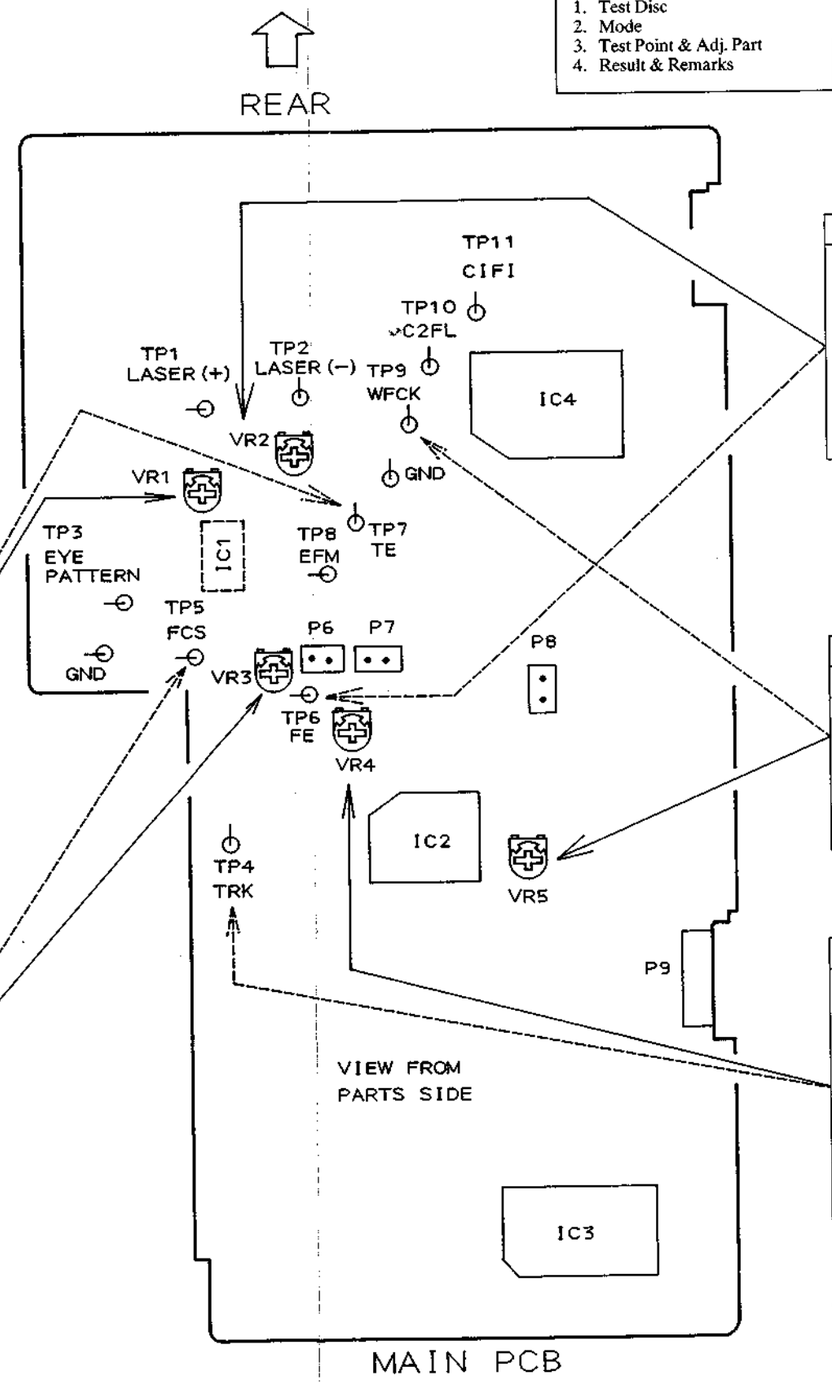
OPERATION	DISPLAY	FUNCTION
POWER OR STOP	0 ES:-0	LASER OFF ALL SERVO OFF
FS ⏭	1 ES:-1	LASER ON
FS ⏭	2 ES:-2	FOCUS SERVO ON
FS ⏭	3 ES:-3	SPINDLE MOTOR ON AUDIO MUTE OFF*
FS ⏭	4 ES:-4	TRACKING SERVO ON SLIDE SERVO ON

* This function activated only Focus ok (Focus servo ok)

STEP	ADJUSTMENT ITEM
1.	Test Disc
2.	Mode
3.	Test Point & Adj. Part
4.	Result & Remarks

ADJ. PART

TEST POINT

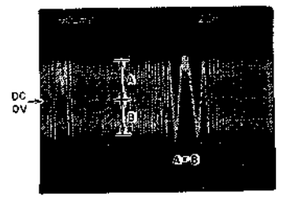


2 FOCUS OFF-SET

1. Test Disc 5A (AT-751330)
2. Test mode 2 and 0
3. Conncet a Digital Voltmeter between TP6 (FE) and GND. Check the voltage A at Test mode 2.
4. VR2
5. Press STOP key. And adjust voltage B by VR2, so that the voltage B is same as voltage A at Test mode 0.
   * Confirm while test mode 2. Creaky noise from pick up, when turn the compact disc by finger.

3 E-F BALANCE

1. Test Disc 5A (AT-751330)
2. Test mode 3.
3. Connect an Oscilloscope between TP7 (TE) and GND.
4. VR1
5. A = B (DC Range)

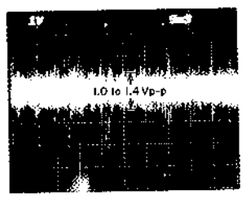


1 PLL FREQUENCY

1. ——
2. Power ON
3. Connect a Frequency Counter between TP9 (WFCK) and GND. Disconnect a short connector P14.
4. VR5
5. 7,350±10Hz
   * Connect a short connector P14 after this adjustment.

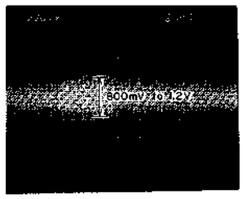
4 FOCUS SERVO GAIN

1. Test Disc 5A (AT-751330)
2. Disc play.
3. Connect an Oscilloscope between TP5 (FCS) and GND.
4. VR3
5. 1.0V ~ 1.4VP-P



5 TRACKING SERVO GAIN

1. Test Disc 5A (AT-751330)
2. Disc play
3. Connect an Oscilloscope between TP4 (TRK) and GND.
4. VR4
5. 800mV~1.2VP-P



VI. 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

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

- ZG-402895: SP (Service Parts) Classification
- 2-1x: A small "x" indicates that this part is not shown in the Photo or Illustration.
- 2-5: This number corresponds with the individual parts index number in that figure.
- 2-1x: This number corresponds with the Figure Number.

b) PC Board

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

- [C,A]: 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)
- EI-318384: SP (Service Parts) Classification
- 6-X1: 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 RECOMMANDÉES PAR LE FABRICANT.

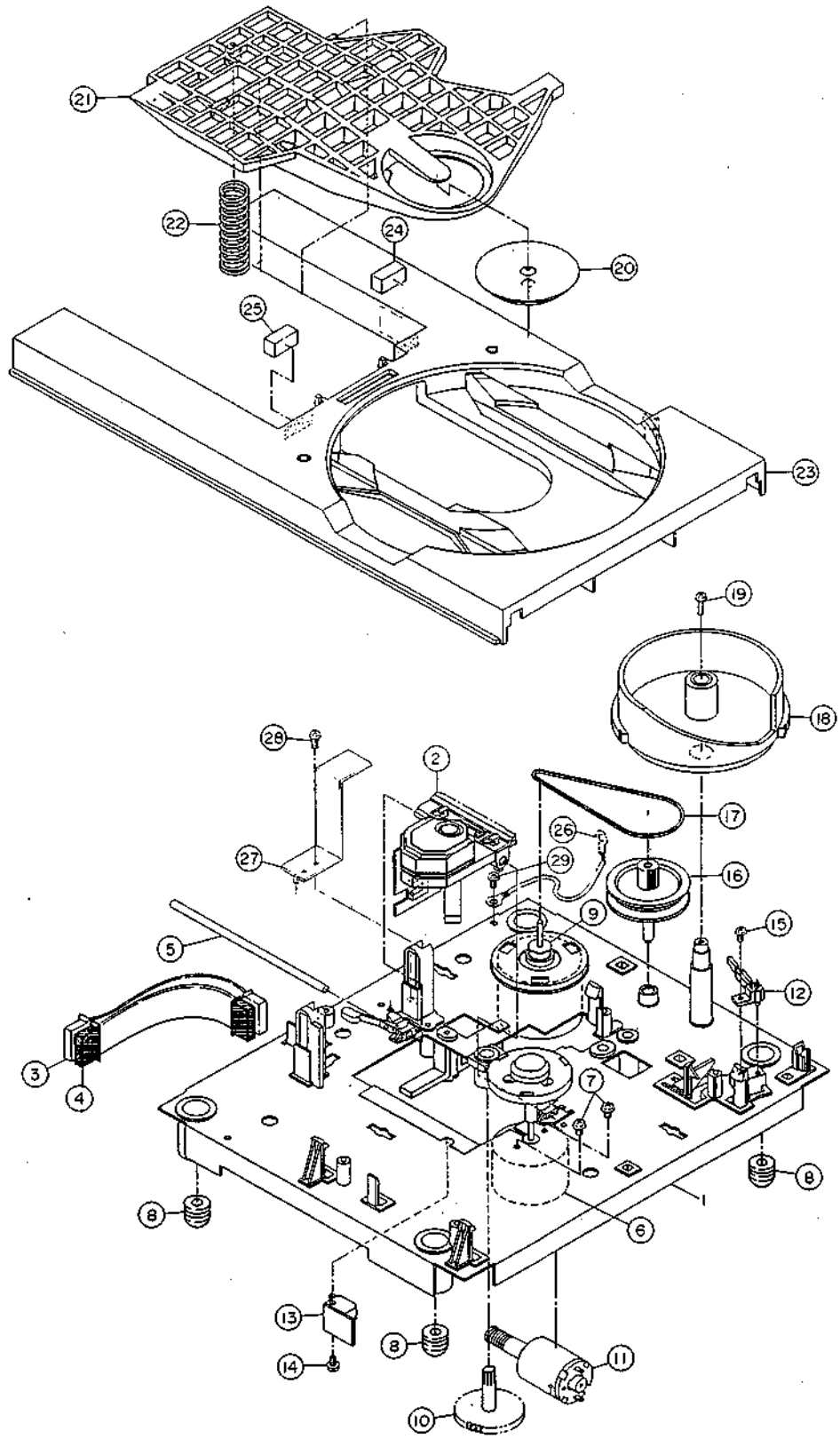
1. RECOMMENDED SPARE PARTS

Ref. No.	Part No.	Description
1	BB-P2036A060A	MECHA BLK CD-32
2	BM-B328441X1	SC MOTOR LOADING PART [LOADING MOTOR]
3	BM-B371552X1	SC MOTOR SLIDE PART [SLIDE MOTOR]
4	BM-B372237X1	SC MOTOR SPINDLE PART [SPINDLE MOTOR]
5	BO-368598	PICK UP KSS-150A
6	*BT-381517J	TRANS POW P2037(A,C) [C,A]
7	*BT-381519J	TRANS POW P2037(B,S) [B,S]
8	*BT-381518J	TRANS POW P2037(E,V) [E,V]
9	*BT-381516J	TRANS POW P2037(U) [U]
10	BT-368261	TRANS PULSE TC-1027-04
11	ED-360409	D PHOTO PN323B
12	ED-344280	D SILICON H GMA-01-FY2 F05
13	ED-624903	D SILICON H 1S2473
14	*ED-330622	D SILICON 1SR35A-100 100/1.0A
15	ED-346619	D ZENER H HZ27 1
16	ED-337265	D ZENER H HZ6 C2
17	ED-346529	D ZENER H HZ6C2L
18	ED-302295	D ZENER H HZ7 C3
19	*EF-358974	FUSE BET T 250V 630MA [B]
20	*EF-601942	FUSE SEMKO T 250V 630MA [E,V,S]
21	*EF-309388	FUSE TSC A 250V 800MA [U]
22	*EF-309391	FUSE TSC 125V 800MA [C,A]
23	EI-330352	IC BA6109
24	EI-368608	IC CXA1081
25	EI-368609	IC CXA1082A
26	EI-381282J	IC CXD-1162P
27	EI-368610	IC CXD1135Q
28	EI-382235J	IC CXP5058H-096Q
29	EI-368611	IC LC3517AS-15
30	EI-360037	IC TC74HC00P
31	EI-360039	IC TC74HC08P
32	EI-367271	IC UPC1490HA
33	*EI-377101	IC UPC7805HF
34	*EI-381514J	IC UPC7905HF
35	EM-381523J	IND FL 6-BT-111GK
36	*EO-338409	COIL LF FK0B160MH02 250UH
37	ES-368603	SW LEAF MSW-1585 [OPEN/CLOSE SW]
38	*ES-371104	SW PUSH SDDLD1082A 01-1 [POWER SW]
39	ES-355842	SW SLIDE SSCTP1026A 1-01-02S [INNER SW]
40	*ES-349464	SW SLIDE 00120319 01-2 [U] [VOLTAGE SELECTOR]
41	ES-373381	SW TACT SKHHPP [0]
42	*ET-345626	TR 2SA1248 S,T
43	ET-353899	TR 2SA1317 S,T,U
44	ET-366365	TR 2SB1185 E,F
45	ET-322598	TR 2SB632K E,F
46	ET-318237	TR 2SB764 E,F
47	*ET-345625	TR 2SC3116 S,T
48	ET-360067	TR 2SC3330 T,U F05
49	ET-366581	TR 2SD1762 E,F
50	ET-310148	TR 2SD612K E,F
51	ET-200986	TR 2SD863-V8 F
52	MB-368590J1	BELT LOADING
53	MZ-374138	CAM GEAR LOADING
54	MZ-368349	GEAR WORM WHEEL

2. MECHA BLOCK

Ref. No.	Part No.	Description
2	BO-368598	PICK UP KSS-150A
3	EW-368599	WIRE ASSY OT-M1 PU1 8P
4	EW-368600	WIRE ASSY OT-M1 PU2 8P
5	MS-368348	SHAFT
6	BM-B372237X1	SC MOTOR SPINDLE PART [SPINDLE MOTOR]
7	ZS-367463	PAN20X025STL CMT
8	MB-368350	CUSHION RUBBER
9	BM-B328441X1	SC MOTOR LOADING PART [LOADING MOTOR]
10	MZ-368349	GEAR WORM WHEEL
11	BM-B371552X1	SC MOTOR SLIDE PART [SLIDE MOTOR]
12	ES-368603	SW LEAF MSW-1585 [OPEN/CLOSE SW]
13	ES-355842	SW SLIDE SSCTP1026A 1-01-02S [INNER SW]
14	ZS-536488	BID20X08STL CMT
15	ZS-343082	PT BR 26X08STL CMT
16	MR-374137J1	PULLEY GEAR
17	MB-368590J1	BELT LOADING
18	MZ-374138	CAM GEAR LOADING
19	ZS-365391	PT BR30X08STL CMT C080
20	MZ-368347	CLAMPER
21	SZ-374136J1	HOLDER CLAMPER
22	ZG-368591J1	SP PUSH CLAMP
23	SC-382692J	DISK TRAY S PART
24	MB-377975	STOPPER RUBBER
25	MB-378827J	STOPPER RUBBER(B)
26	ZW-562476	EL30BRS TIN 8L
27	MZ-378828J	ANGLE TRAY
28	ZS-432843	PAN26X04STL CMT
29	ZS-342001	ST BR30X06STL NI3

MECHA BLOCK



NOTE:
Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

3. P.C BOARD BLOCK

Ref. No.	Part No.	Description
1A	BA-P2037A020A	PC(#) MAIN BLK CD-52(U) [U,C,A]
1B	BA-P2037A020B	PC(#) MAIN BLK CD-52(E) [E,B,S]
1C	BA-P2037A020C	PC(#) MAIN BLK CD-52(V) [V]
2	BA-P2037A030A	PC(#) ANALOG BLK CD-52(U)
3	BA-P2037A040A	PC OPERATION BLK CD-52(U)

PC (#) ANALOG BLK CONSISTS OF FOLLOWING P.C BOARD.
* ANALOG P.C BOARD
* HEADPHONE P.C BOARD

4. MAIN P.C BOARD

Ref. No.	Part No.	Description
D1	ED-346529	D ZENER H HZ6C2L
D2	ED-346529	D ZENER H HZ6C2L
D3	ED-624903	D SILICON H 1S2473
D9	ED-344280	D SILICON H GMA-01-FY2 F05
D5	ED-346603	D ZENER H HZ6 A1
D6	ED-624903	D SILICON H 1S2473
D7	ED-344280	D SILICON H GMA-01-FY2 F05
D8	ED-624903	D SILICON H 1S2473
D9	ED-344280	D SILICON H GMA-01-FY2 F05
D10	ED-344280	D SILICON H GMA-01-FY2 F05
D11	ED-624903	D SILICON H 1S2473
D12	ED-344280	D SILICON H GMA-01-FY2 F05
D13	ED-344280	D SILICON H GMA-01-FY2 F05
D14	ED-337265	D ZENER H HZ6 C2
IC1	EI-368608	IC CXA1081
IC2	EI-368609	IC CXA1082A
IC3	EI-382235J	IC CXP5058H-096Q
IC4	EI-368610	IC CXD1135Q
IC5	EI-368611	IC LC3517AS-15
IC6	EI-360039	IC TC74HC08P
IC7	EI-381282J	IC CXD-1162P
IC8	EI-360037	IC TC74HC00P
IC9	EI-330352	IC BA6109
IC10	*EI-377101	IC UPC7805HF
IC11	*EI-381514J	IC UPC7905HF
J9	EJ-382473J	PIN J YKC21-0296 2P [LINE OUT]
J10	EJ-376482	PIN J YKB11-0422 1P [DIGITAL OUT]
L1	EO-351861	COIL FIX 1 LAL02 F05 100J
L2	EO-351861	COIL FIX 1 LAL02 F05 100J
L3	EH-382267J	FILTER EMI FBA04HA600VS-00
L4	EO-345913	COIL FIX 1 LAL03KH 100K
PT1	BT-368261	TRANS PULSE TC-1027-04
R77	ER-382474J	R OMF H S10 FS 1/2W 1R2J
TR1	*ET-345625	TR 2SC3116 S,T
TR2	*ET-345626	TR 2SA1248 S,T
TR4	ET-310148	TR 2SD612K E,F
TR5	ET-322598	TR 2SB632K E,F
TR5	ET-360067	TR 2SC3330 T,U F05
TR6	ET-353899	TR 2SA1317 S,T,U
TR7	*ET-360067	TR 2SC3330 T,U F05
TR8	ET-360067	TR 2SC3330 T,U F05
TR9	ET-353899	TR 2SA1317 S,T,U
TR10	ET-360067	TR 2SC3330 T,U F05
TR11	ET-200986	TR 2SD863-V8 F
TR12	ET-318237	TR 2SB764 E,F
TR13	ET-310148	TR 2SD612K E,F
TR14	ET-322598	TR 2SB632K E,F
TR15	ET-366581	TR 2SD1762 E,F
TR16	ET-322598	TR 2SB632K E,F
TR17	ET-366581	TR 2SD1762 E,F
TR18	ET-366365	TR 2SB1185 E,F
TR19	ET-360067	TR 2SC3330 T,U F05
TR20	ET-318237	TR 2SB764 E,F
TR21	ET-353899	TR 2SA1317 S,T,U
VR1	EV-358829	R S-FIX H RH0615C 0.10W 223
VR2	EV-358829	R S-FIX H RH0615C 0.10W 223
VR3	EV-358829	R S-FIX H RH0615C 0.10W 223
VR4	EV-358829	R S-FIX H RH0615C 0.10W 223
VR5	EV-371279	R S-FIX H VM6CKPVB 0.30W 102
X1	EI-374176	OSC X'TAL AT-51 16.9344MHZ

5. ANALOG P.C BOARD

Ref. No.	Part No.	Description
FL201	EO-378920J	COIL VARI 1 25-5721-13
IC201	EI-368612	IC PCM56P
IC202	EI-349719	IC M5218P
TR201	ET-349081	TR 2SC3383 S,T
TR202	ET-349081	TR 2SC3383 S,T
TR203	ET-308472	TR 2SA1115 E,F,G F05
TR204	ET-308472	TR 2SA1115 E,F,G F05
TR205	ET-360067	TR 2SC3330 T,U F05

6. HEADPHONE P.C BOARD

Ref. No.	Part No.	Description
FL301	EH-382267J	FILTER EMI FBA04HA600VS-00
IC301	EI-349719	IC M5218P
J301	EJ-380297J	PHONE J 3P HLJ0540-410 GP 6.3 [HEADPHONE]
TR301	ET-338324	TR 2SD1012-V H F05
VR301	EV-378175	VR ROTARY RK0971220 B203X2 [HEADPHONE LEVEL]

7. OPERATION P.C BOARD

Ref. No.	Part No.	Description
FL1	EM-381523J	IND FL 6-BT-111GK
TS1	ES-373381	SW TACT SKHHPP [0]
TS2	ES-373381	SW TACT SKHHPP [1]
TS3	ES-373381	SW TACT SKHHPP [2]
TS4	ES-373381	SW TACT SKHHPP [3]
TS5	ES-373381	SW TACT SKHHPP [4]
TS6	ES-373381	SW TACT SKHHPP [5]
TS7	ES-373381	SW TACT SKHHPP [6]
TS8	ES-373381	SW TACT SKHHPP [7]
TS9	ES-373381	SW TACT SKHHPP [8]
TS10	ES-373381	SW TACT SKHHPP [9]
TS11	ES-373381	SW TACT SKHHPP [PLAY/PAUSE]
TS12	ES-373381	SW TACT SKHHPP [STOP]
TS13	ES-373381	SW TACT SKHHPP [FORWARD SKIP]

Ref. No.	Part No.	Description
TS14	ES-373381	SW TACT SKHHPP [REVERSW SKIP]
TS15	ES-373381	SW TACT SKHHPP [FORWARD SERCH]
TS16	ES-373381	SW TACT SKHHPP [REVERSE SERCH]
TS17	ES-373381	SW TACT SKHHPP [OPEN/CLOSE]
TS18	ES-373381	SW TACT SKHHPP [REPEAT]
TS19	ES-373381	SW TACT SKHHPP [PROGRAM]
TS20	ES-373381	SW TACT SKHHPP [DISPLAY]
TS21	ES-373381	SW TACT SKHHPP [+10]
TS22	ES-373381	SW TACT SKHHPP [A-B]
TS23	ES-373381	SW TACT SKHHPP [AUTO SPACE]
TS24	ES-373381	SW TACT SKHHPP [CLEAR]

Ref. No.	Part No.	Description
F2A	*EF-309388	FUSE TSC A 250V 800MA [U]
F1B	*EF-309391	FUSE TSC 125V 800MA [C,A]
F2B	*EF-309391	FUSE TSC 125V 800MA [C,A]
F1C	*EF-601942	FUSE SEMKO T 250V 630MA [E,V,S]
F2C	*EF-601942	FUSE SEMKO T 250V 630MA [E,V,S]
F1D	*EF-358974	FUSE BET T 250V 630MA [B]
F2D	*EF-358974	FUSE BET T 250V 630MA [B]

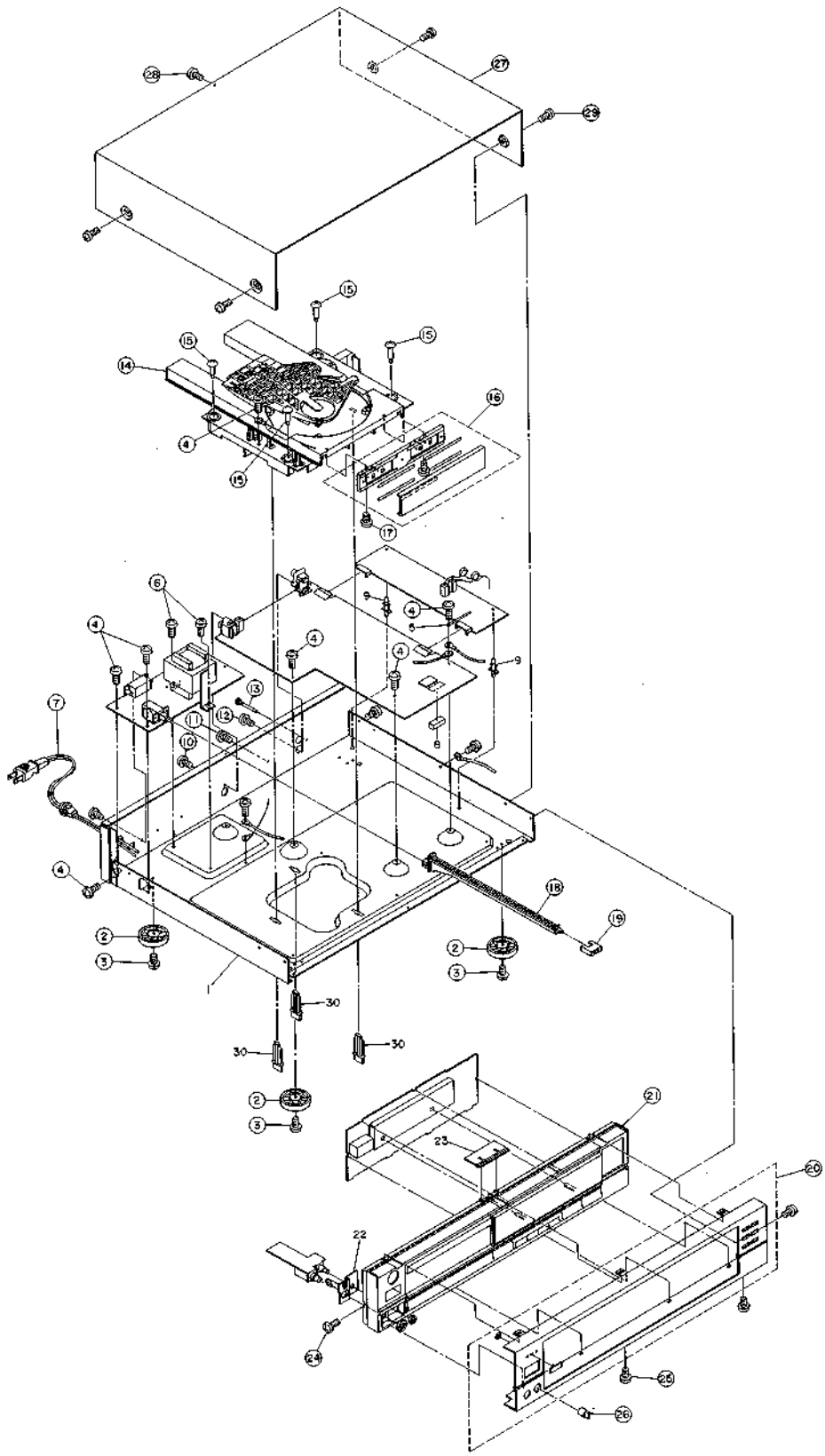
8. SENSOR C P.C BOARD

Ref. No.	Part No.	Description
D1	ED-360409	D PHOTO PN323B
IC1	EI-367271	IC UPC1490HA

9. POWER SUPPLY P.C BOARD

Ref. No.	Part No.	Description
C6A	*EC-338496	C CE V FZ 472P 400AC [U,C,A]
C6B	*EC-367928	C MMY V XE 103M 250AC [E,V,B,S]
C7	*EC-338496	C CE V FZ 472P 400AC
D1	*ED-330622	D SILICON 1SR35A-100 100/1.0A
D2	*ED-330622	D SILICON 1SR35A-100 100/1.0A
D3	*ED-330622	D SILICON 1SR35A-100 100/1.0A
D4	*ED-330622	D SILICON 1SR35A-100 100/1.0A
D5	*ED-330622	D SILICON 1SR35A-100 100/1.0A
D6	*ED-330622	D SILICON 1SR35A-100 100/1.0A
D7	*ED-330622	D SILICON 1SR35A-100 100/1.0A
D8	*ED-330622	D SILICON 1SR35A-100 100/1.0A
D9	*ED-330622	D SILICON 1SR35A-100 100/1.0A
D10	ED-346619	D ZENER H HZ27 1
D11	ED-302295	D ZENER H HZ7 C3
D12	*ED-330622	D SILICON 1SR35A-100 100/1.0A
SW1	*ES-371104	SW PUSH SDDLD1082A 01-1 [POWER SW]
TR1	ET-318237	TR 2SB764 E,F
VS1	*ES-349464	SW SLIDE 00120319 01-2 [U] [VOLTAGE SELECTOR]
T1A	*BT-381516J	TRANS POW P2037(U) [U]
T1B	*BT-381517J	TRANS POW P2037(A,C) [C,A]
T1C	*BT-381518J	TRANS POW P2037(E,V) [E,V]
T1D	*BT-381519J	TRANS POW P2037(B,S) [B,S]
FL1	*EQ-338409	COIL LF FKOB160MH02 250UH
F1A	*EF-309388	FUSE TSC A 250V 800MA [U]

FINAL ASSEMBLY BLOCK



NOTE:
Parts will not be supplied if they are not listed in the parts list even if they appear on the assembling illustrations with reference No.

10. FINAL ASSEMBLY BLOCK

Ref. No.	Part No.	Description
2	SA-379375	FOOT(N)
3	ZS-352133	ST BR30X10STL CMT
4	ZS-342001	ST BR30X06STL NI3
6	ZS-313796	ST BID40X06STL CMT
7A	*EW-363658	AC CORD 200 0129AVFF B100 A U/ [U]
7B	*EW-363621	AC CORD200 0238 SPT1 B100 A UC [C,A]
7C	*EW-363671	AC CORD 200 0364 LCFL B100 A E [E,V]
7D	*EW-363683	AC CORD 200 LCFL B100 A B [B]
7E	*EW-363697	AC CORD 200 0436 LCFL B100 A S [S]
10	ZS-350934	PT BR30X08STL BNI
11	ZS-308673	T2PAN30X20STL NI3 GUIDE
12	ZS-366385	T2BR30X08STL BNI PROJECTION
13	ZS-308673	T2PAN30X20STL NI3 GUIDE
14	BB-P2036A060A	MECHA BLK CD-32
15	ZS-378163	SCREW GRADUATED
16-B	SP-381496J	PANEL TRAY CD-52-B PART
16-G	SP-381499J	PANEL TRAY CD-52-G PART
17	ZS-351204	PT BR30X06STL BNI
18	MZ-378144	JOINT POW
19-B	SK-373236B	KNOB POWER-B
19-G	SK-373236A	KNOB POWER-G
20-B	SP-381077J	PANRL FRONT CD-52-B PART
20-G	SP-381078J	PANRL FRONT CD-52-G PART
21-B	BD-P2037A060A	ESCUTCHEON FRONT BLK CD-52-B
21-G	BD-P2037A060B	ESCUTCHEON FRONT BLK CD-52-G
24	ZS-345107	ST BR30X08STL NI3
25	ZS-365759	CT BR30X08STL BZN PROJECTION
26-B	SK-377733	KNOB VOL B
26-G	SK-379924J	KNOB VOL G
27-B	SP-378157	COVER UPPER B
27-G	SP-379925J	COVER UPPER G
28	ZS-365759	CT BR30X08STL BZN PROJECTION
29-B	ZS-378749J	ST BID40X06STL BNI EARTH LOCK
29-G	ZS-382870J	ST BID40X06STL NI3 EARTH LOCK

11. ACCESARY

Ref. No.	Part No.	Description
1	EW-344151	CORD RR-61A PINX2-PINX2
2	AX-381500J	REMOCON RC-C52 WIRELESS T

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ABBREVIATIONS (COMPACT DISC)

ABBREVIATION	EXPLANATION	ABBREVIATION	EXPLANATION
A-D	Analog to Digital (Convertor)	LSB	Least Significant Bit
ADC	Analog to Digital (Convertor)	Mb	Mega Bits
BCD	Binary Code Decimal	MDA	Motor Drive Amplifier
BPI	Bits per Inch	MFM	Modified Frequency Modulation
CD	Compact Disc	MM	Mono-stable Multivibrator
CIRC	Cross Interleaving & Reed Solomon Coding	M^2FM	Modified Modified Frequency Modulation
CLV	Constant Linear Velocity	MOD2	Modulo 2 (Addition)
CP	Clock Pulses	MP	Microprocessor
CRCC	Cyclic Redundancy Check Codes	MSB	Most Significant Bit
		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 & Vertical	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	Standard Signal Generator
LPF	Low Pass Filter	SYS CON	SYStem CONtrol

AKAI

MODEL CD-52

SCHEMATIC DIAGRAM AND PC BOARDS

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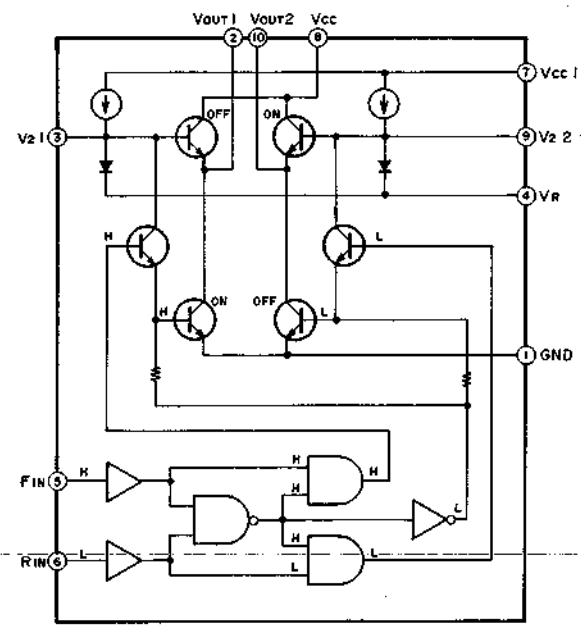

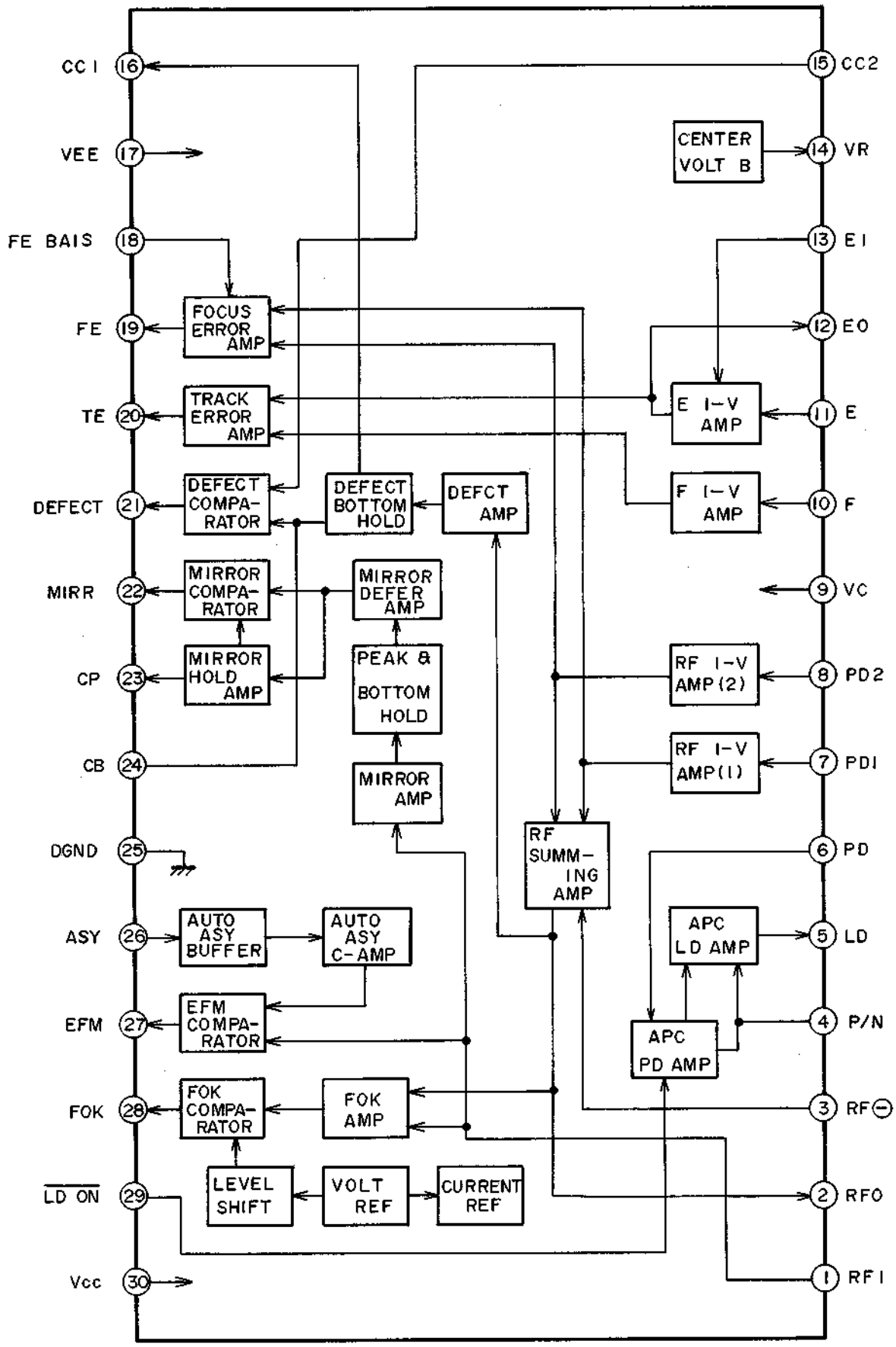
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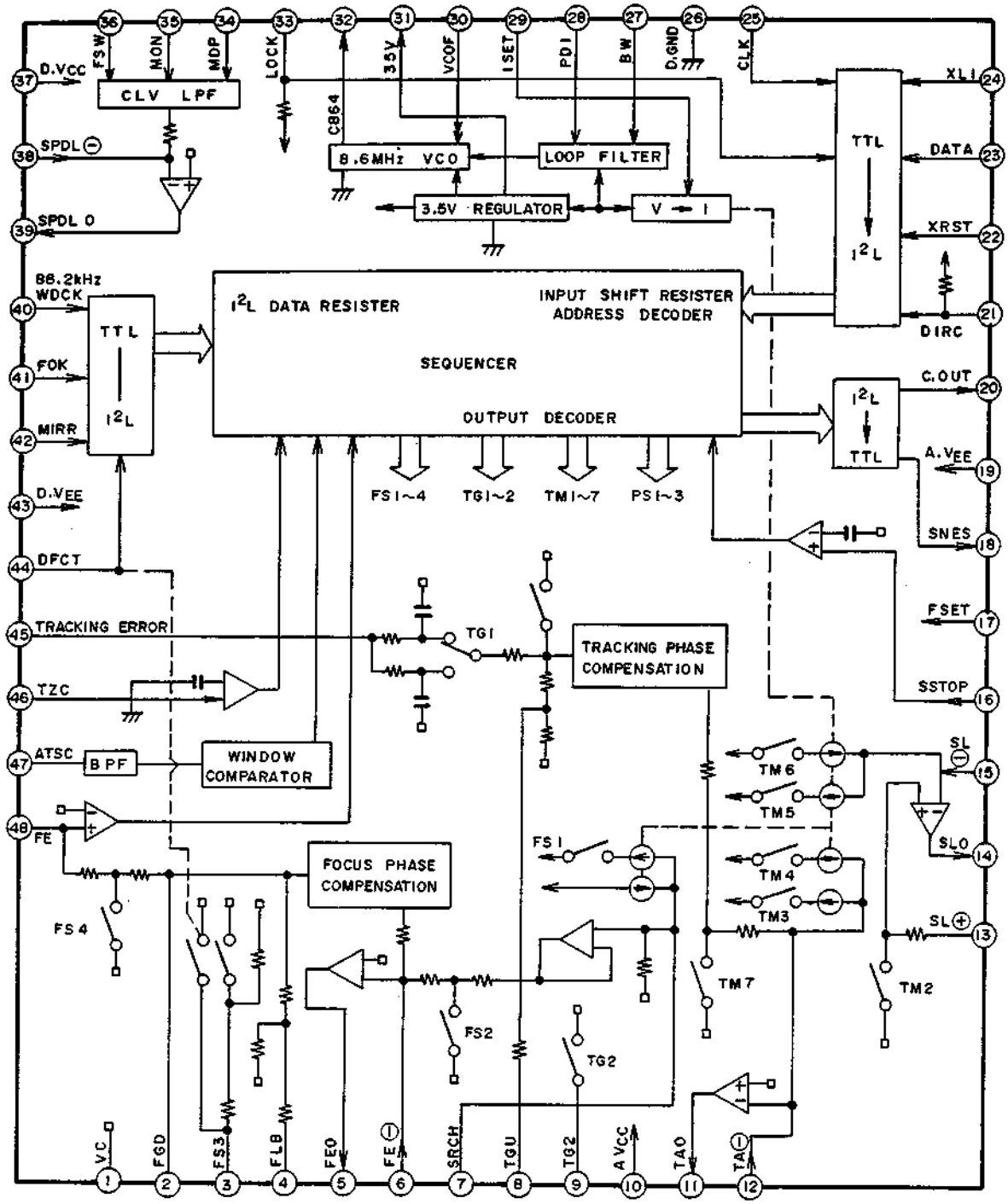
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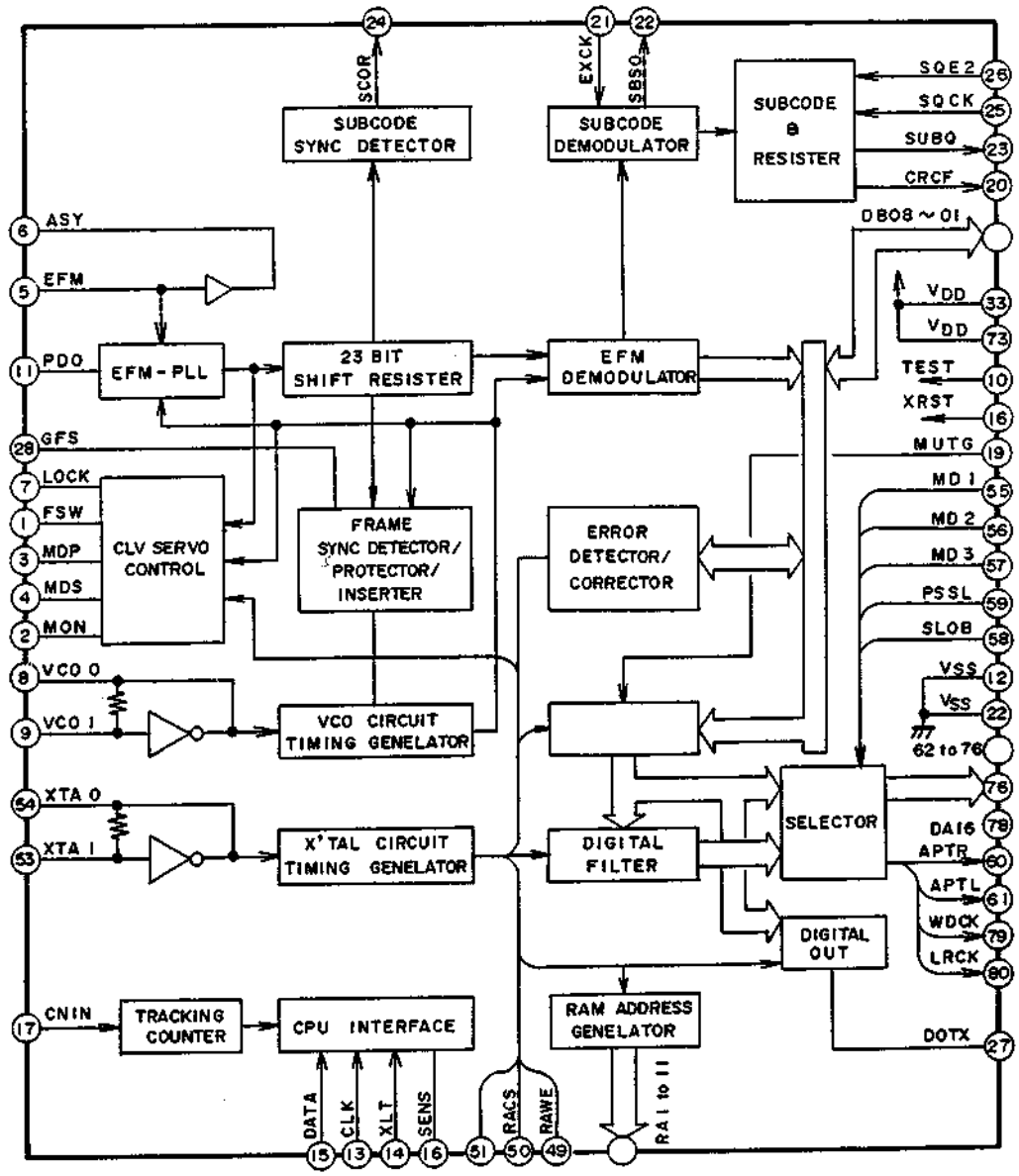
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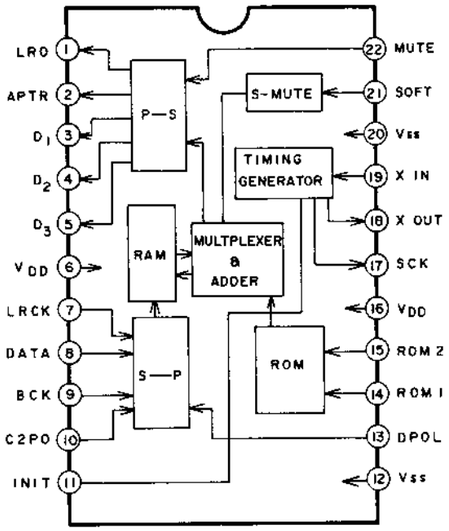
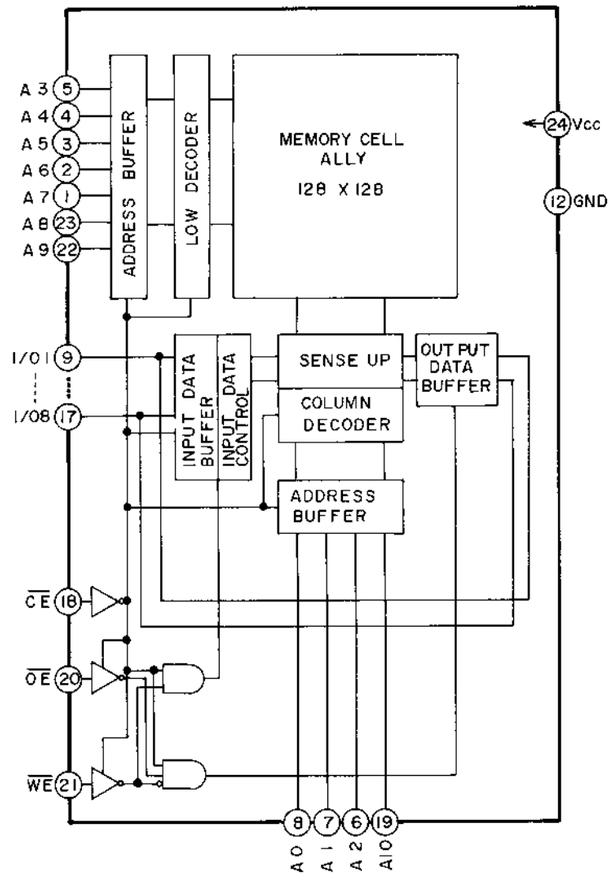
TRACKING COUNTER
CPU INTERFACE
RAM ADDRESS GENELATOR
DOTX
DATA
CLK
XLT
SENS
RACS
RAWE
RA1 to 11

CXD1162P

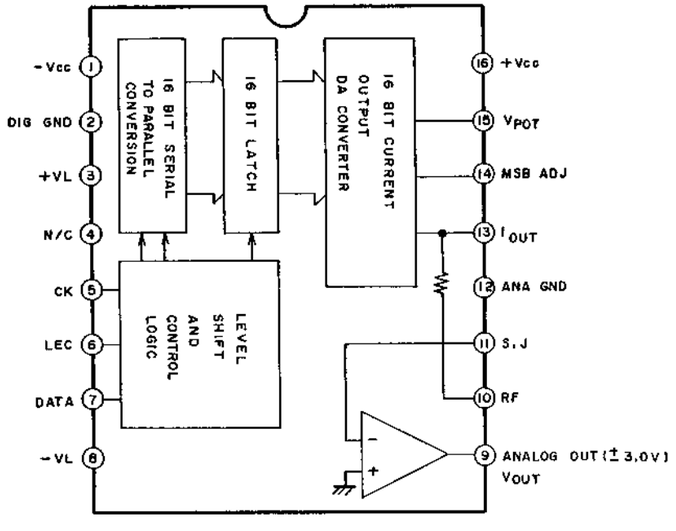


NO.	SYMBOL	I/O	FUNCTION
1	LRO	O	LRCK OUT (4fs)
2	APTR	O	R-Channel Aperture Clock
3	D1	O	BCK OUT (4fs)
4	D2	O	DATA OUT (4fs)
5	D3	O	WCK OUT
6	VDD	-	+B (+5V)
7	LRCK	I	LRCK IN
8	DATA	I	16 bit ×2 SERIAL DATA IN (2's Complementary)
9	BCK	I	BCK IN
10	C2P0	I	Error Flag IN
11	INIT	I	Power ON RESET IN ("L" RESET)
12	Vss	-	-B (OV)
13	DPOL	I	INPUT DATA INVERT
14	ROM1	I	83rd Order Filter ROM Select
15	ROM2	I	21st Order Filter ROM Select
16	VDD	-	+B (+5V)
17	SCK	O	System Clock OUT (384 fs) for External IC
18	XOUT	O	X'tal OSC OUT (384fs)
19	XIN	I	X'tal OSC IN (384fs)
20	Vss	-	-B (OV)
21	SOFT	I	SOFT Muting ON/OFF ("H" Mute)
22	MUTE	I	Set OUTPUT to "0" or OFF-SET Level ("H" Active)

LC3517AS-15



PCM56P



D/A OUT

LFP OUT

IC 201 PCM56P

16BIT SERIAL/PARALLEL CONV

16BIT LATCH

16BIT CURRENT OUTPUT DAC

V POT

MSB ADJ

I. OUT

SJ

RF

V.OUT

I→V AMP

16BIT D/A CONVERTER

FROM MAIN PCB

DCLK-L

LATCH

DATA

DCLK-R

CLOCK

LEVEL SHIFT CONTROL LOGIC

FL201 R204 C210

L.P.F

IC202 2/2

AMP

IC202 1/2

BUFFER

C214 0.036

R209 430

R210 1M

TR201

EMPHASIS ON/OFF

"H" ON

L CHANNEL

L CH

TR202

MUTE

LEFT

LINE OUT

PHONES LEVEL

VR301

IC301 1/2

H.P AMP

TR301

IC301 2/2

TR301b

LCH

RCH

PHONES

R CH

SAME AS L CH

RIGHT

TR202b

HEAD PHONE PCB

TR203

FROM MAIN PCB IC (35)

EMPHASIS

"L" ON

TR204

+5V

TR205

FROM MAIN PCB TR21

MUTE

MUTE "H" ACTIVE

ANALOGUE PCB

CD-52
ANALOG
BLOCK DIAGRAM
NO.2-1 P203714D

CD-52

EYE PATTERN

EFM

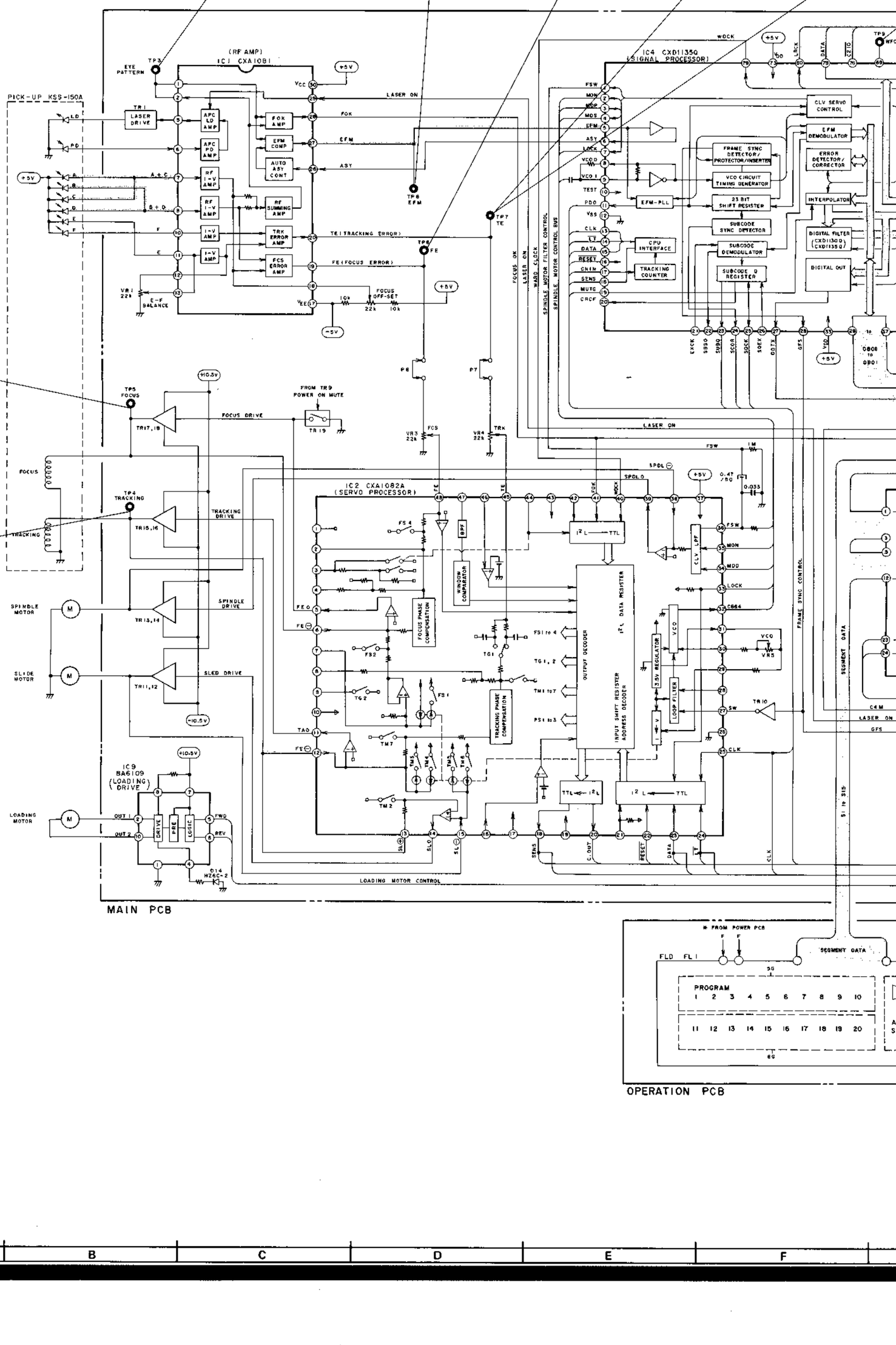
FOCUS ERROR

TRACKING ERROR

TRACKING ERROR WITHOUT P7

FOCUS SERVO

TRACKING SERVO



TRACKING ERROR

TRACKING ERROR WITHOUT P7

PLL

ERROR FLAG

IC4 CXD1135Q (SIGNAL PROCESSOR)

IC7 CXD-1162P

DIGITAL DATA OUT

DIGITAL OUTPUT

IC5 LC3517AS-15 (16K BIT RAM)

IC8 TC74HC00P

IC6 TC74HC

IC3 CXP5058H-0750 (4 bit MICRO-COMPUTER)

IC 10 +5V REGULATOR

IC 11 -5V REGULATOR

TO ANALOG PCB

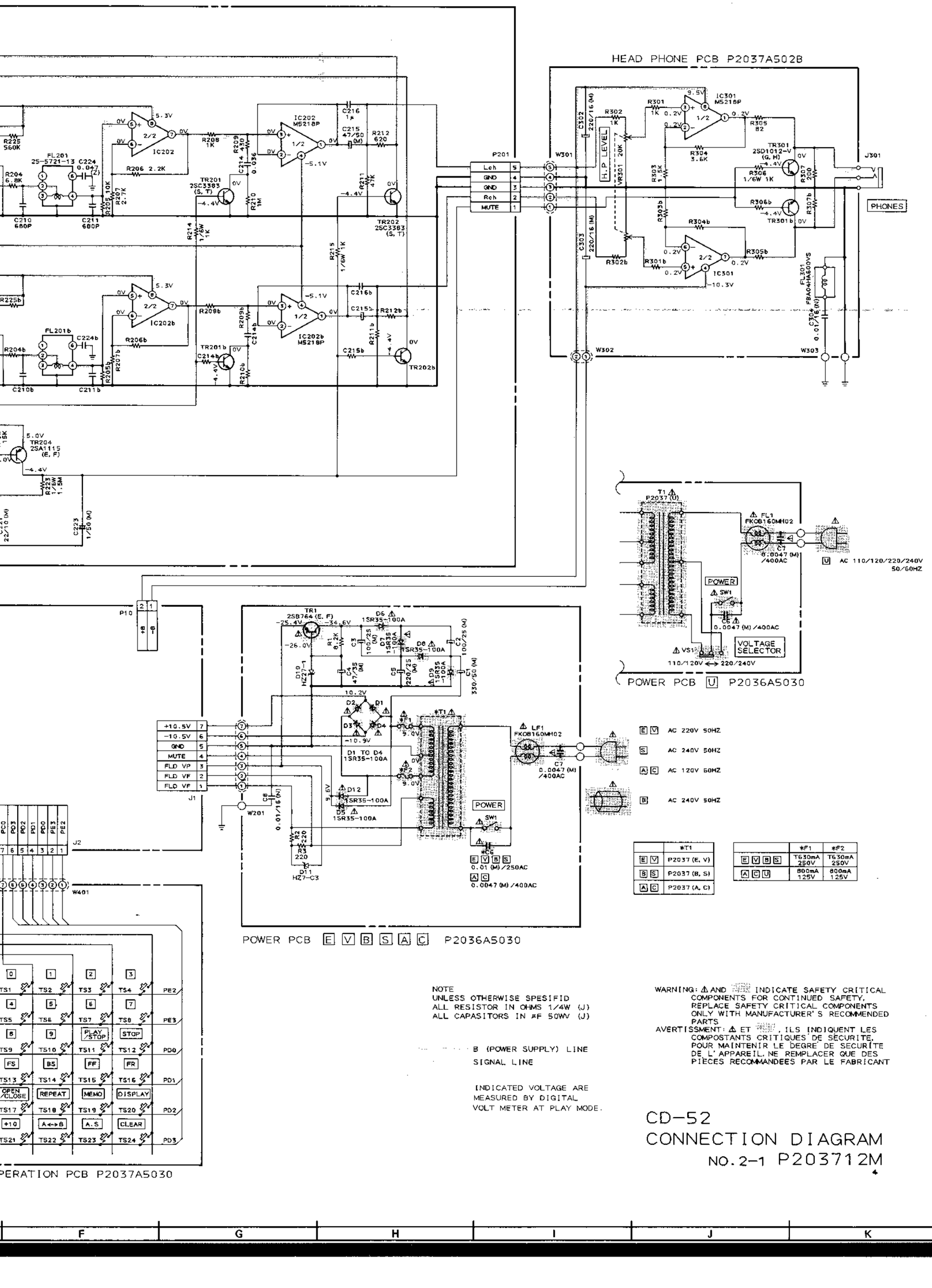
TO HEADPHONE PCB

FROM POWER PCB

OPERATION PCB

MECHA BLK

CD-52 MAIN BLOCK DIAGRAM NO.2-2 P203715D



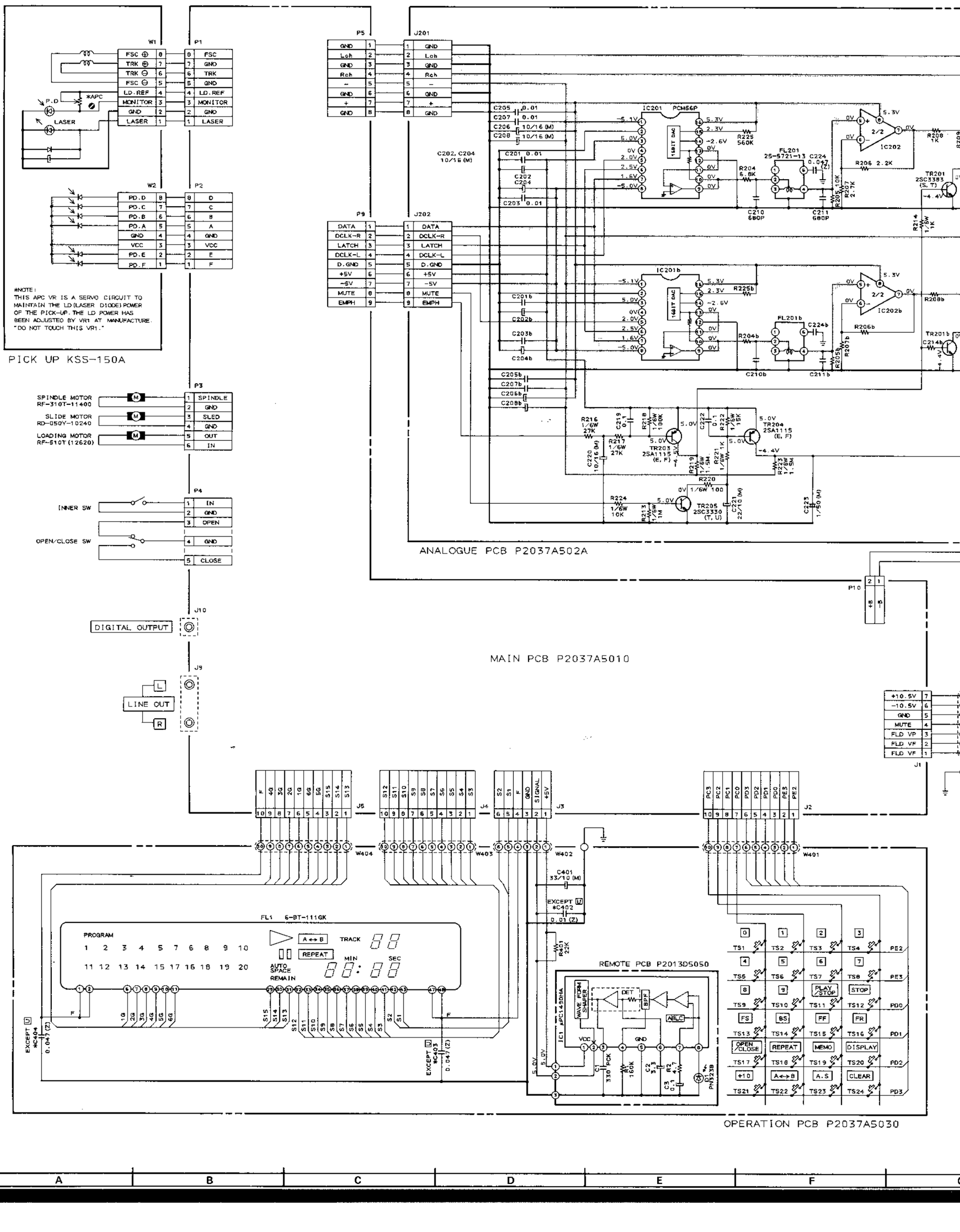
NOTE
UNLESS OTHERWISE SPESIFID
ALL RESISTOR IN OHMS 1/4W (J)
ALL CAPASITORS IN μF 50WV (J)

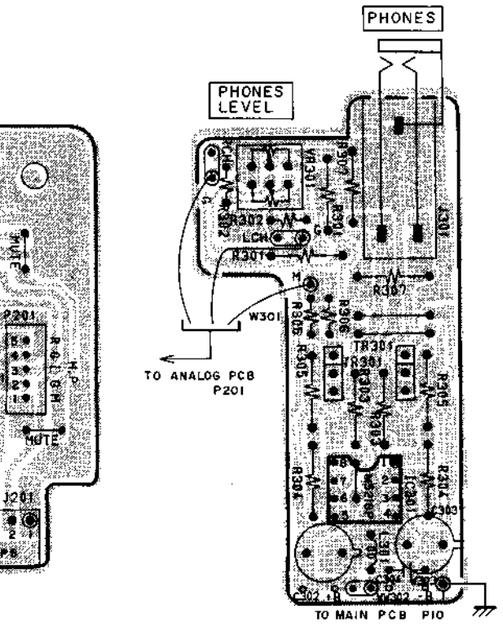
B (POWER SUPPLY) LINE
SIGNAL LINE

INDICATED VOLTAGE ARE MEASURED BY DIGITAL VOLT METER AT PLAY MODE.

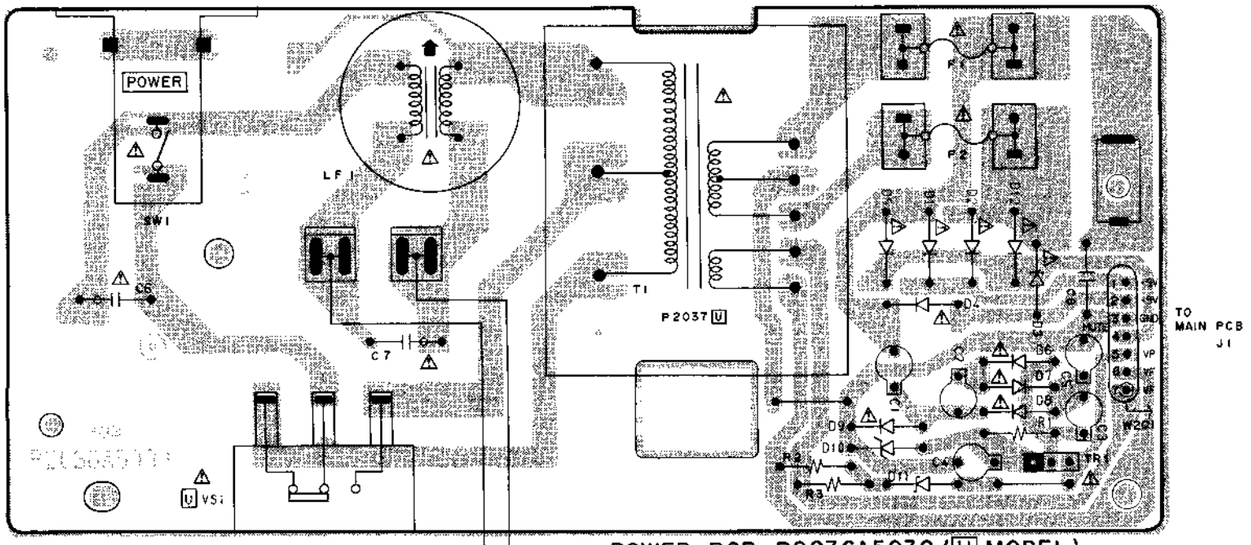
WARNING: ⚠ AND ▨ INDICATE SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS
AVERTISSMENT: ⚠ ET ▨, ILS INDIQUENT LES COMPOSTANTS CRITIQUES DE SECURITE, POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL, NE REMPLACER QUE DES PIECES RECOMMANDEES PAR LE FABRICANT

CD-52
CONNECTION DIAGRAM
NO.2-1 P203712M

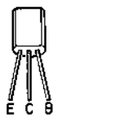

W1
P1
FSC ⊕ 8
TRK ⊕ 7
TRK ⊖ 6
FSC ⊖ 5
LD.REF 4
MONITOR 3
GND 2
LASER 1
P.D
*APC
LASER
W2
P2
PD.D 8
PD.C 7
PD.B 6
PD.A 5
GND 4
VCC 3
PD.E 2
PD.F 1
*NOTE:
THIS APC VR IS A SERVO CIRCUIT TO MAINTAIN THE LD(LASER DIODE) POWER OF THE PICK-UP. THE LD POWER HAS BEEN ADJUSTED BY VR1 AT MANUFACTURE. "DO NOT TOUCH THIS VR1."
PICK UP KSS-150A
P3
SPINDLE MOTOR RF-310T-11400
SLIDE MOTOR RD-050Y-10240
LOADING MOTOR RF-510T(12620)
P4
INNER SW
OPEN/CLOSE SW
J10
DIGITAL OUTPUT
J9
LINE OUT
P5
J201
GND Lch Lch GND Rch Rch – – GND + + GND
P9
J202
DATA DCLK-R LATCH DCLK-L D.GND +5V -5V MUTE EMPH
IC201 PCM56P
IC202
IC201b
IC202b
TR201 2SC3383 (S, T)
TR203 2SA1115 (E, F)
TR204 2SA1115 (E, F)
TR205 2SC3330 (T, U)
FL201 25-5721-13
ANALOGUE PCB P2037A502A
P10
+B –B
MAIN PCB P2037A5010
+10.5V –10.5V GND MUTE FLD VP FLD VF FLD VF
J1
J6 J5 J4 J3 J2
W404 W403 W402 W401
FL1 6-BT-111GK
PROGRAM
TRACK
REPEAT
AUTO SPACE REMAIN
MIN SEC
REMOTE PCB P2013D5050
IC1 μPC1490HA
OPEN/CLOSE REPEAT MEMO DISPLAY A↔B A.S CLEAR +10 PLAY/STOP STOP FS BS FF FR
OPERATION PCB P2037A5030



HEAD PHONE PCB
P2037A502B



POWER PCB P2036A5030 (U MODEL)



2SB764

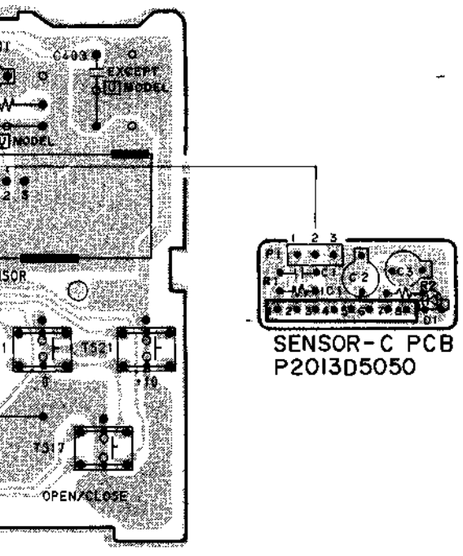
B = PNP TRANSISTOR

220~240V — 110~120V
VOLTAGE SELECTOR

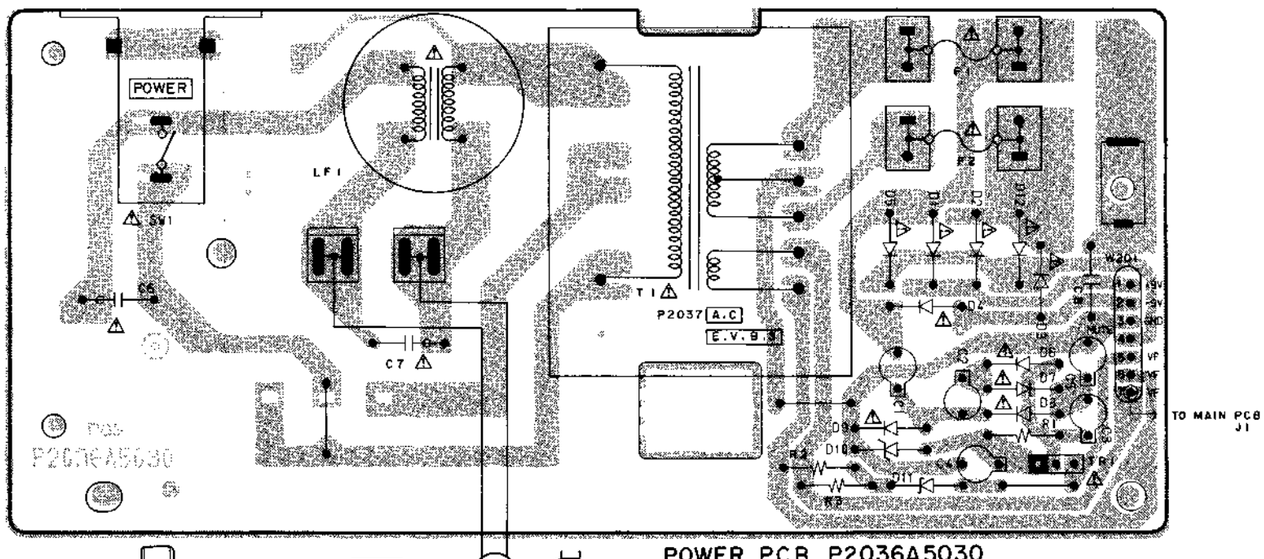
U
AC110 / 120 / 220 / 240V
50/60Hz

WARNING: ⚠INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

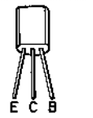
AVERTISSEMENT: ⚠IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT



SENSOR-C PCB
P2013D5050



POWER PCB P2036A5030
(A.C , E.V.B.S) MODEL



2SB764

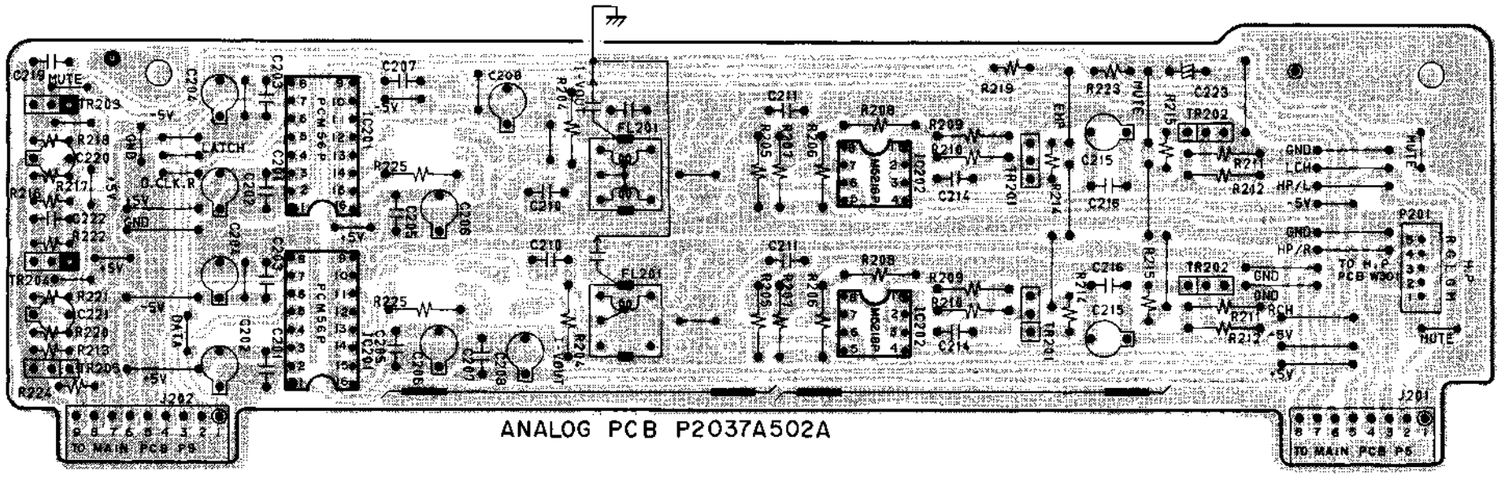
B = PNP TRANSISTOR

E.V
AC220V/50Hz

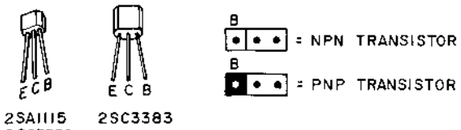
S
AC240V/50Hz

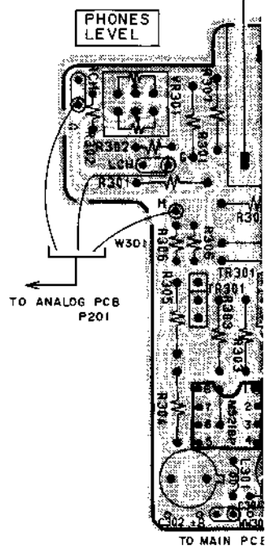
A.C
AC120V/60Hz

B
AC240V/50Hz

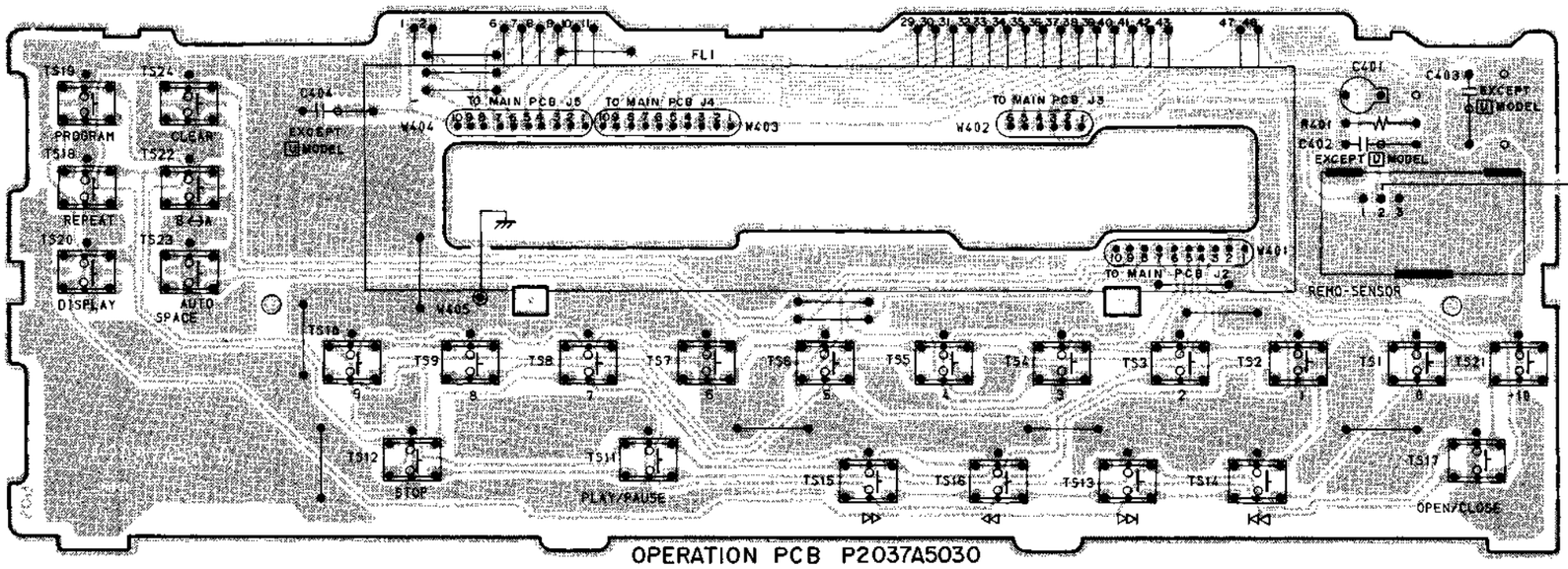


ANALOG PCB P2037A502A

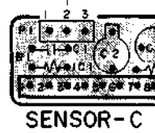




HEAD PHONE PC
P2037A502B



OPERATION PCB P2037A5030



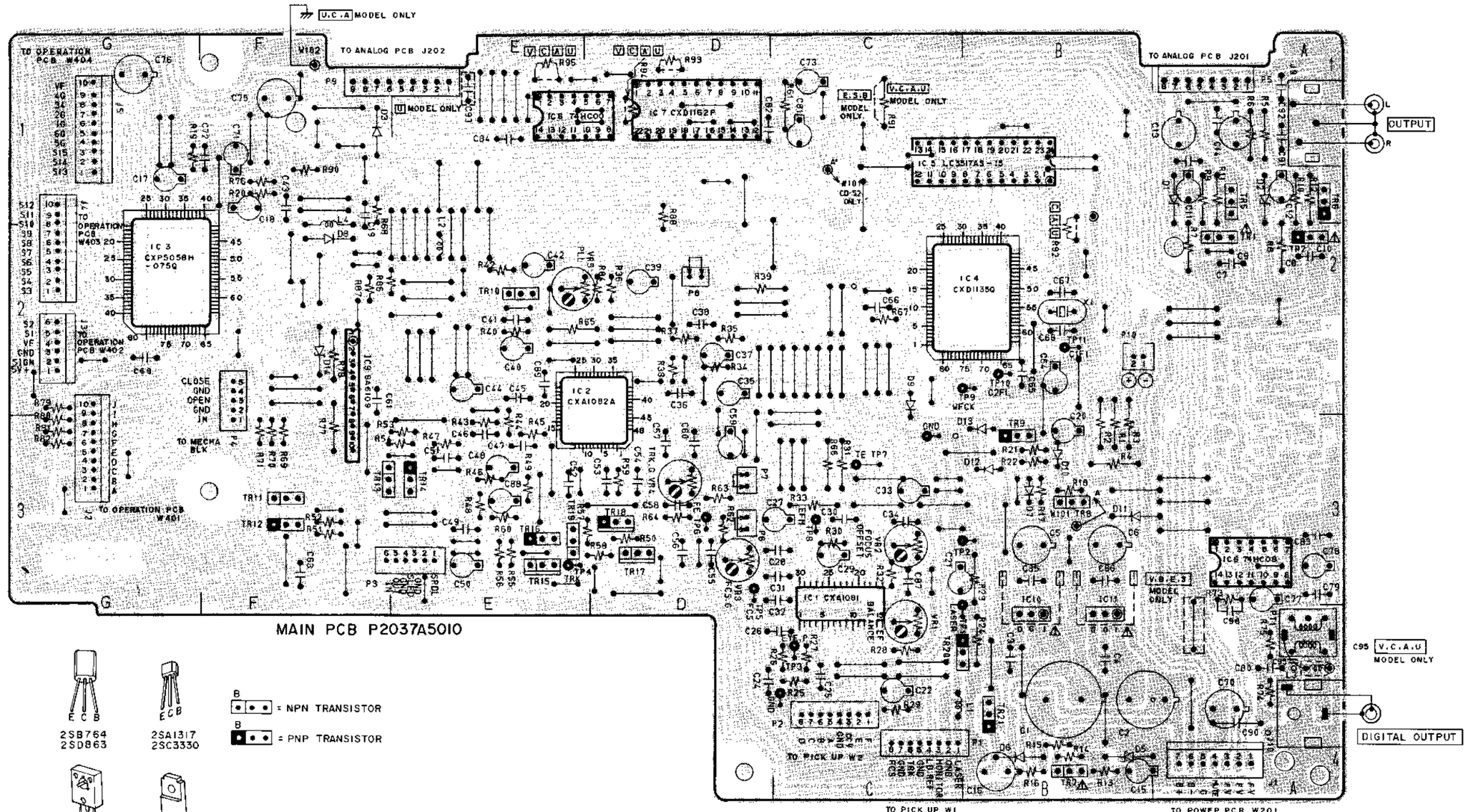
SENSOR-C
P2013D505

LOCATION OF COMPONENTS

IC'S
IC1.....C3,4
IC2.....D2,3
IC3.....G2
IC4.....B2,c2
IC5.....B1,c1
IC6.....A3
IC7.....D1
IC8.....D1,E1
IC9.....F2
IC10,11..B4

TRANSISTORS
TR1,2....A2
TR5,6....A1
TR8,9....B3
TR10.....E2
TR11,12..F3
TR13.....F3
TR14,15..E3
TR16,19..E3
TR17,18..D3
TR20,21..B4

CONNECTORS
P1,2.....C1
P3.......E3
P4.......F2
P5.......A1
P6,7.....D3
P8.......D2
P9.......E1,F1
P10......B2
J1.......A4
J2.......G3
J3,4.....G2
J5.......G1
J9.......A1
J10......A4



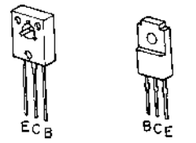
MAIN PCB P2037A5010

2SB764
2SD863

2SA1317
2SC3330

B = NPN TRANSISTOR

B = PNP TRANSISTOR



2SA1248
2SB632K
2SC612K
2SC3116

2SB1185
2SD1762

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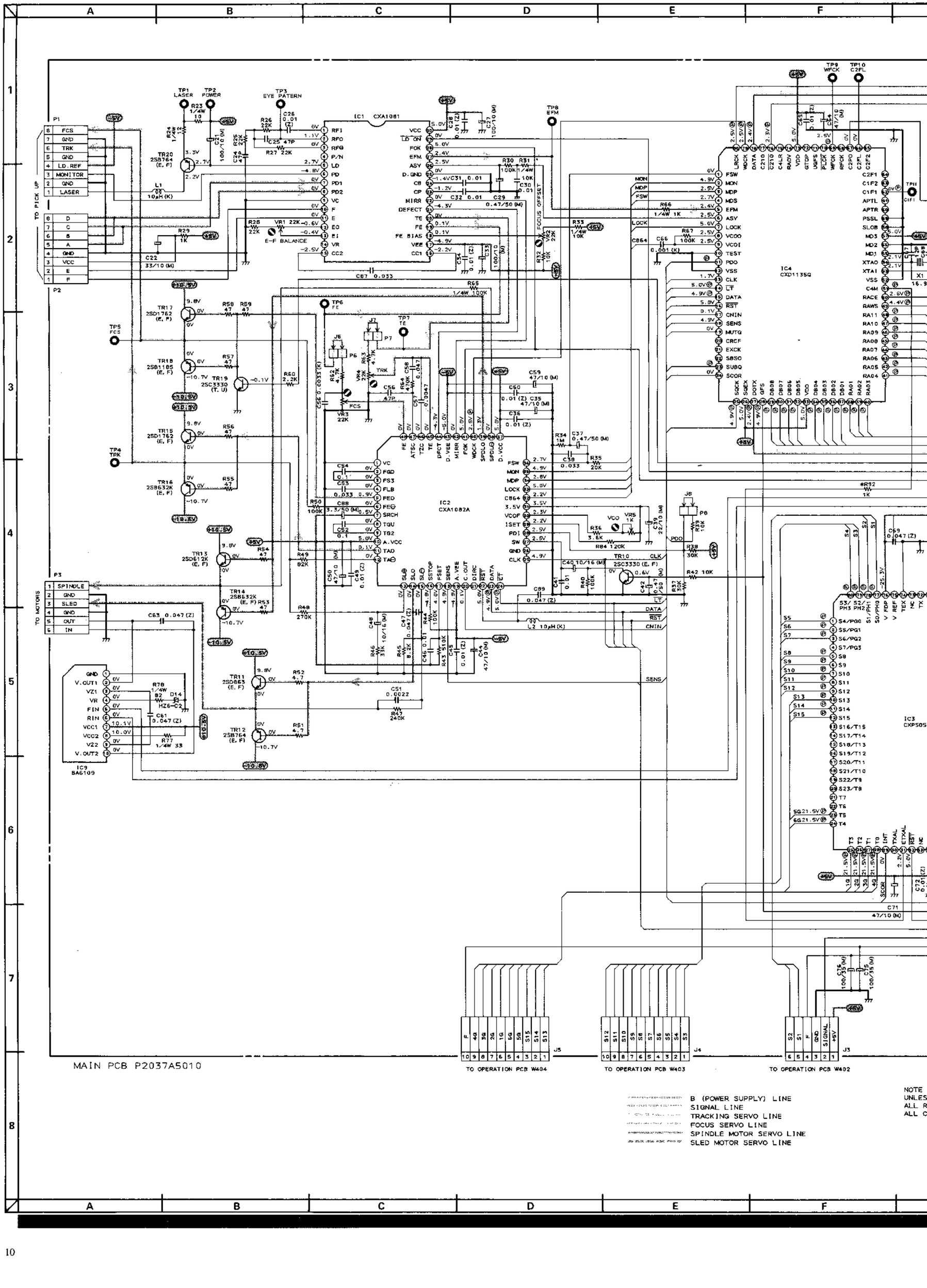
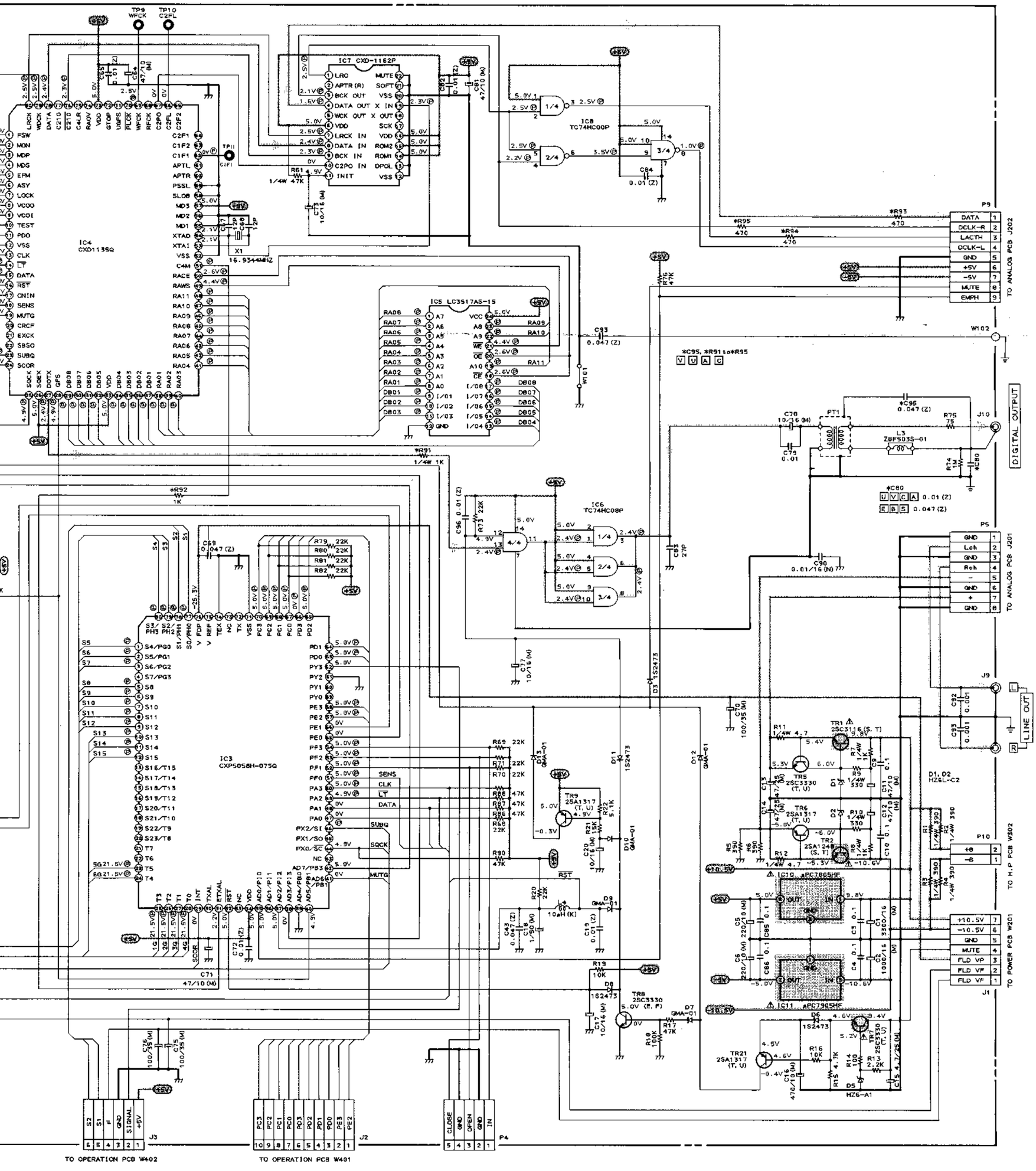

A
B
C
D
E
F
1
2
3
4
5
6
7
8
P1
P2
P3
TO PICK UP
TO MOTORS
IC1 CXA1081
IC2 CXA1082A
IC4 CXD1135Q
IC9 BA6109
TR10 2SC3330 (E, F)
TR11 2SD863 (E, F)
TR12 2SB764 (E, F)
TR13 2SD612K (E, F)
TR14 2SB632K (E, F)
TR15 2SD1762 (E, F)
TR16 2SB632K (E, F)
TR17 2SD1762 (E, F)
TR18 2SB1185 (E, F)
TR19 2SC3330 (T, U)
TR20 2SB764 (E, F)
E-F BALANCE
FOCUS OFFSET
TRK
FCS
SENS
MAIN PCB P2037A5010
TO OPERATION PCB W404
TO OPERATION PCB W403
TO OPERATION PCB W402
B (POWER SUPPLY) LINE
SIGNAL LINE
TRACKING SERVO LINE
FOCUS SERVO LINE
SPINDLE MOTOR SERVO LINE
SLED MOTOR SERVO LINE



(OWER SUPPLY) LINE
AL LINE
KING SERVO LINE
S SERVO LINE
DLE MOTOR SERVO LINE
MOTOR SERVO LINE

NOTE
UNLESS OTHERWISE SPESIFID
ALL RESISTOR IN OHMS 1/6W (J)
ALL CAPASITORS IN μF 50WV (J)

WARNING: ⚠ AND ▨ INDICATE SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS
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CD-52
MAIN PCB
SCHEMATIC DIAGRAM
NO.2-2 P203713M
5