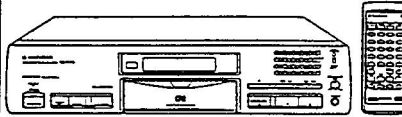


Service Manual

PIONEER®
The Art of Entertainment



COMPACT DISC PLAYER

PD-S602

PD-S602 HAS THE FOLLOWING:

| Type | Power Requirement | Remarks |
|-------|-------------------|---------|
| WEMXK | AC220 – 240V | |
| WBXK | AC220 – 240V | |

- This manual is applicable to PD-S602/WEMXK and WBXK.

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1. SAFETY INFORMATION



This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5). When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.



NOTICE

(FOR CANADIAN MODEL ONLY)

Fuse symbols  (fast operating fuse) and/or  (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE

(POUR MODÈLE CANADIEN SEULEMENT)

Les symboles de fusible  (fusible de type rapide) et/ou  (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

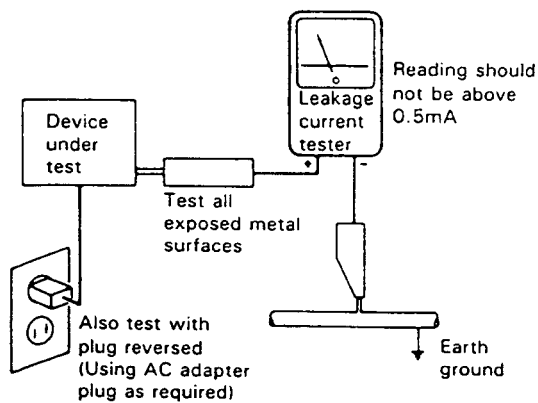
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a Δ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.


Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

(FOR EUROPEAN MODEL ONLY)

VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

ADVERSEL:
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSÆTTELSE FOR STRÅLING.

VARNING!
OSYNLIG LASERSTRÅLING NÅR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.




LASER
Kuva 1
Lasersäteilyn varoituserkki

WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1. SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

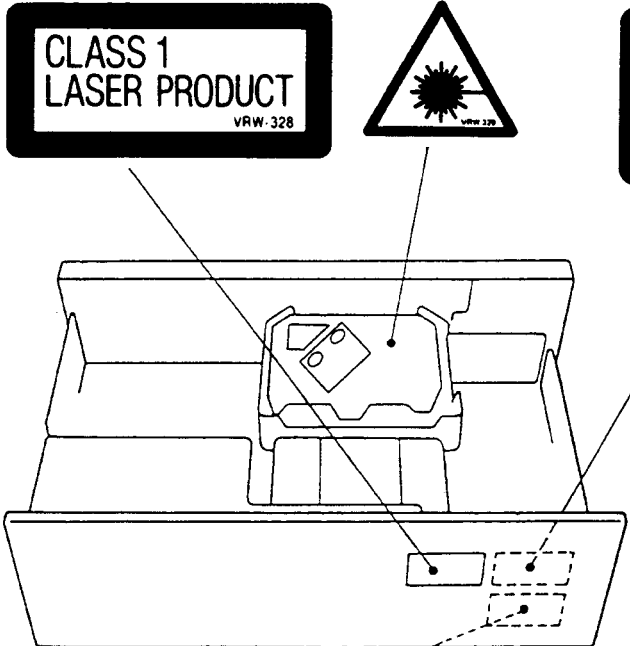
LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm




LASER
Picture 1
Warning sign for laser radiation

LABEL CHECK

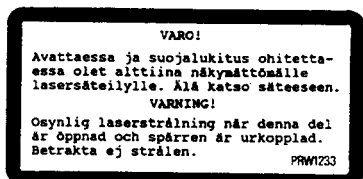
WBXK and WEMXK types



CLASS 1 LASER PRODUCT
VRW-328



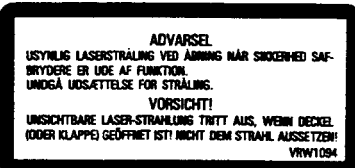
WEMXK type



Additional Laser Caution

- Laser Interlock Mechanism**
The position of the switch (S601) for detecting loading completion is detected by the system microprocessor, and the design prevents laser diode oscillation when the switch (S601) is not in CLMP terminal side (when the mechanism is not clamped and CLMP signal is high level). Thus, the interlock will no longer function if the switch (S601) is deliberately set to CLMP terminal side (if CLMP signal is low level).
In the test mode* the interlock mechanism will not function.
Laser diode oscillation will continue, if pin 1 of M51593FP (IC101) on the preamplifier board loaded on pickup assembly are connected to GND, or pin 19 is connected to low level (ON), or else the terminals of Q101 are shorted to each other (fault condition).
- When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.

WEMXK type



CAUTION
INVISIBLE LASER RADIATION WHEN OPEN, AVOID EXPOSURE TO BEAM
PRW1018

WBXK type

ADVARSEL
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VORSICHT!
UNSICHTBARE LASERSTRÅLUNG TRITZ AUS, WEHN DECKEL (ODER KLAPPE) GEÖFFNET IST! NICHT DEM STRAHL AUSSETZEN!
VRW1094

* Refer to page 26.

2. EXPLODED VIEWS, PACKING AND PARTS LIST

2.1 EXTERIOR

NOTES:

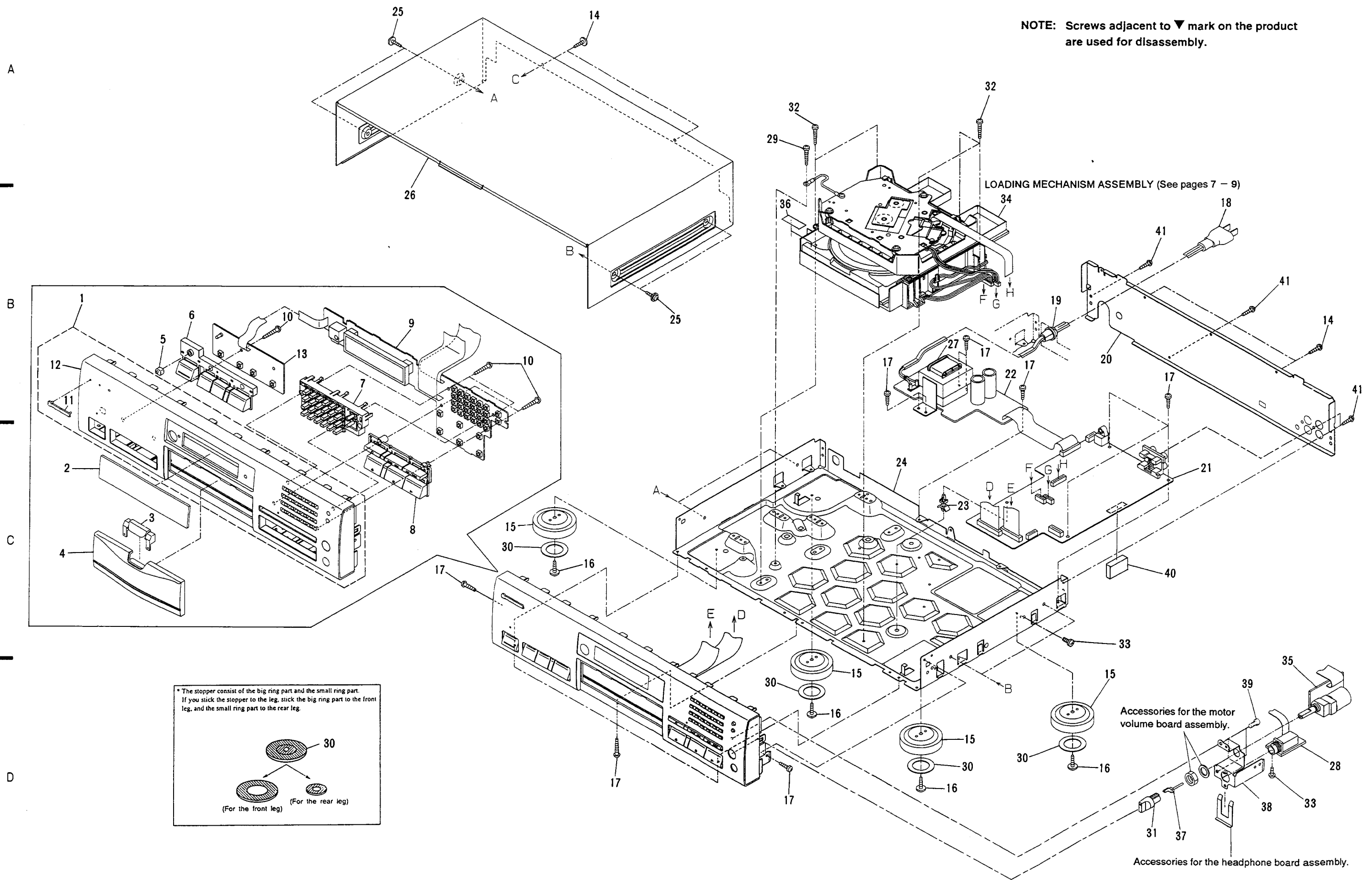
- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Parts List

| Mark | No. | Description | Part No. | Mark | No. | Description | Part No. |
|----------|-----|----------------------------|--------------|------|-----|-----------------|--------------|
| | 1 | Function panel assembly | PEA1262 | | 36 | Caution label | PRW1244 |
| | 2 | Display window | PAM1625 | | 37 | H. P. Lens | PNW2157 |
| | 3 | Tray lens | PNW2242 | NSP | 38 | Headphone angle | PNB1434 |
| | 4 | Tray name plate | PNW2244 | | 39 | Screw | PPZ30P050FMC |
| | 5 | LED lens | PNW2019 | NSP | 40 | Spacer A | PEB1228 |
| | 6 | Power button | PAC1712 | | 41 | Screw | BBT30P080FCC |
| | 7 | 26key | PAC1715 | | | | |
| | 8 | Function button | PAC1713 | | | | |
| | 9 | FUNCTION board assembly | PWZ2489 | | | | |
| | 10 | Screw | PPZ30P150FMC | | | | |
| | 11 | PIONEER badge | PAM1608 | | | | |
| | 12 | Function panel | PNW2246 | | | | |
| NSP | 13 | SW board assembly | PWZ2490 | | | | |
| | 14 | Screw | BBZ30P080FCC | | | | |
| | 15 | Insulator | PNW1263 | | | | |
| | 16 | Screw | IBZ30P100FCC | | | | |
| | 17 | Screw | BBZ30P060FCC | | | | |
| Δ | 18 | AC power cord (WEMXK type) | PDG1003 | | | | |
| Δ | 18 | AC power cord (WBXK type) | VDG1051 | | | | |
| Δ | 19 | Strain relief | CM - 22B | | | | |
| NSP | 20 | Rear base (WEMXK type) | PNA1925 | | | | |
| NSP | 20 | Rear base (WBXK type) | PNA1966 | | | | |
| Δ | 21 | MAIN board assembly | PWZ2480 | | | | |
| Δ | 22 | SERVO TRANS board assembly | PWZ2492 | | | | |
| NSP | 23 | PCB holder | PNW2100 | | | | |
| NSP | 24 | Under base | PNA1912 | | | | |
| | 25 | Screw | FBT40P080FZK | | | | |
| | 26 | Bonnet | PYY1162 | | | | |
| Δ | 27 | Power transformer | PTT1236 | | | | |
| NSP | 28 | HEADPHONE board assembly | PWZ2481 | | | | |
| | 29 | Screw | PDZ30P050FMC | | | | |
| | 30 | Stopper | PNM1070 | | | | |
| | 31 | Knob C | RAC1608 | | | | |
| | 32 | Screw | BSZ30P070FMC | | | | |
| | 33 | Screw | IBZ30P060FCC | | | | |
| NSP | 34 | Loading mechanism assembly | PXA1509 | | | | |
| NSP | 35 | Motor VR board assembly | PWZ2482 | | | | |

Exterior

NOTE: Screws adjacent to ▼ mark on the product are used for disassembly.



* The stopper consist of the big ring part and the small ring part.
 If you stick the stopper to the leg, stick the big ring part to the front leg, and the small ring part to the rear leg.

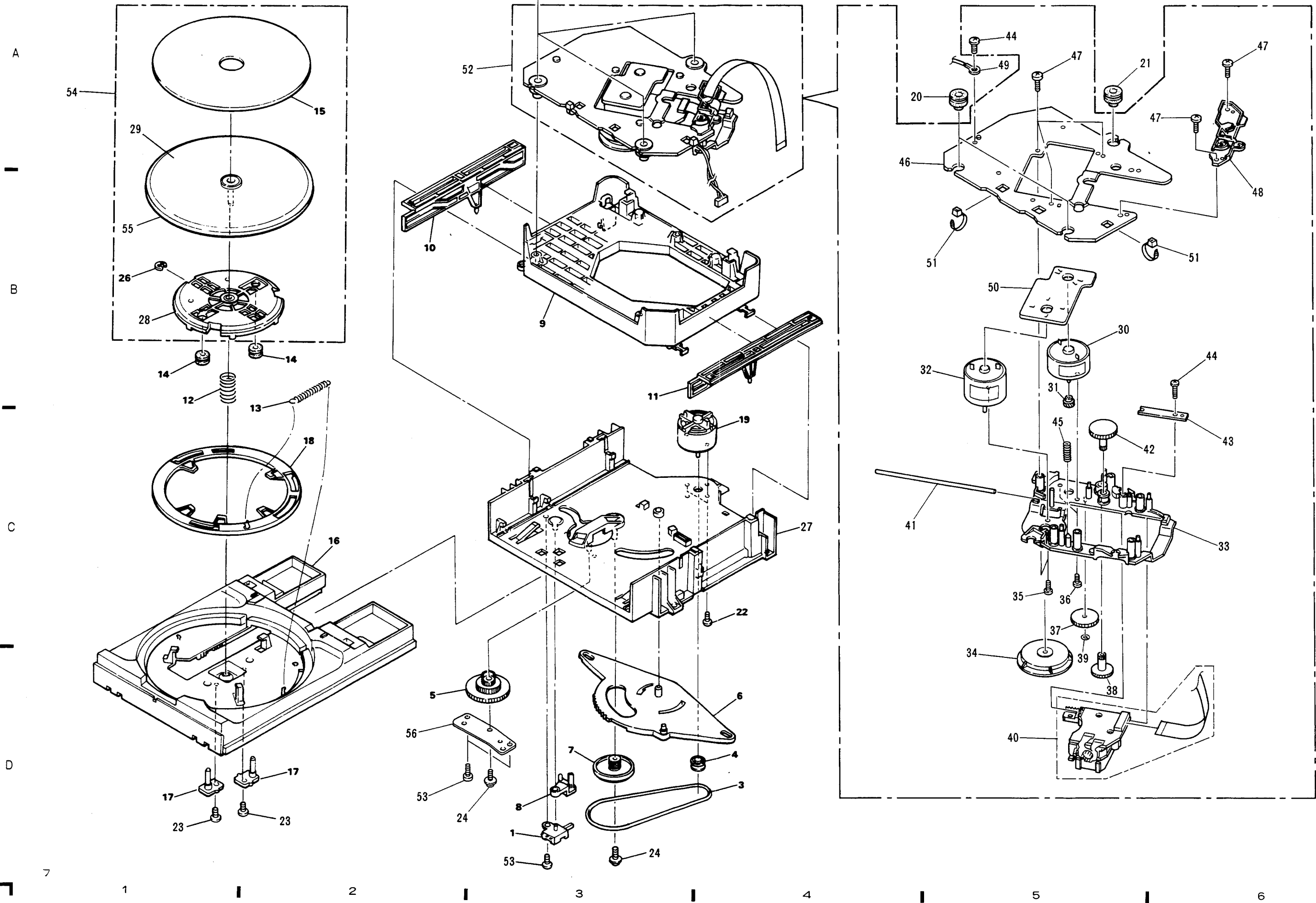
(For the front leg) (For the rear leg)

LOADING MECHANISM ASSEMBLY (See pages 7 - 9)

Accessories for the motor volume board assembly.

Accessories for the headphone board assembly.

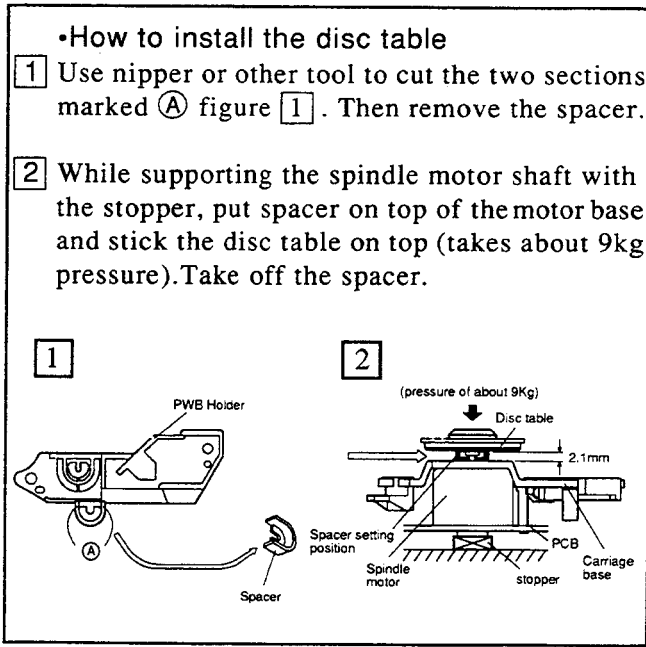
2.2 LOADING MECHANISM ASSEMBLY



Parts List

| Mark | No. | Description | Part No. |
|------|-----|--|--------------|
| | 1 | Lever switch (S601) | DSK1003 |
| | 2 | Screw (steel) | PBA1027 |
| | 3 | Rubber belt | PEB1186 |
| | 4 | Motror pulley | PNW1634 |
| | 5 | Drive gear | PNW1996 |
| | 6 | Synchro lever | PNW2168 |
| | 7 | Gear pulley | PNW1998 |
| | 8 | SW head | PNW1999 |
| | 9 | Float base | PNW2000 |
| | 10 | Left cam | PNW2001 |
| | 11 | Right cam | PNW2002 |
| | 12 | Compression spring | PBH1120 |
| | 13 | Tention spring | PBH1121 |
| | 14 | Float (rubber) | PEB1014 |
| | 15 | Table rubber sheet | PEB1181 |
| | 16 | Tray | PNW2003 |
| | 17 | Table guide | PNW2004 |
| | 18 | Lock plate | PNW2005 |
| | 19 | DC motor (LOADING) | PXM1010 |
| | 20 | Rubber bush | PEB1031 |
| | 21 | Rubber bush | PEB1170 |
| | 22 | Screw | BMZ26P040FMC |
| | 23 | Screw | IPZ26P060FCU |
| | 24 | Screw | IPZ20P080FMC |
| | 25 | | |
| | 26 | Washer | YE20S |
| NSP | 27 | Loading base | PNW1995 |
| NSP | 28 | Table bearing assembly | PXA1383 |
| NSP | 29 | Turn table (AL) | PNR1035 |
| | 30 | DC motor (CARRIAGE) | PXM1027 |
| | 31 | Pinion gear | PNW2055 |
| | 32 | DC motor assembly (SPINDLE) (with oil) | PEA1236 |
| | 33 | Carriage base | PNW2058 |
| | 34 | Disc table | PNW1067 |
| | 35 | Screw | JFZ20P030FNI |
| | 36 | Screw | JFZ17P025FZK |
| | 37 | Gear 3 | PNW2054 |
| | 38 | Gear 2 | PNW2053 |
| | 39 | Washer | WT12D032D025 |
| | 40 | Pickup assembly | PEA1179 |
| | 41 | Guide bar | PLA1094 |
| | 42 | Gear 1 | PNW2052 |
| NSP | 43 | Gear stopper | PNB1303 |
| | 44 | Screw | BPZ20P060FMC |
| | 45 | Spring | PBH1132 |
| NSP | 46 | Mechanism base | PNB1431 |
| | 47 | Screw | BPZ20P100FMC |
| | 48 | PWB holder | PNW2057 |
| NSP | 49 | Earth lead unit | XDF - 503 |
| NSP | 50 | Mechanism board assembly | PWX1192 |

| Mark | No. | Description | Part No. |
|------|-----|--------------------------|--------------|
| NSP | 51 | Cord clamber | PEC - 107 |
| NSP | 52 | Servo mechanism assembly | PXA1479 |
| | 53 | Screw | BPZ26P060FMC |
| | 54 | Turn table assembly | PEA1165 |
| NSP | 55 | Table base assembly | PXA1382 |
| | 56 | Shaft holder | PNB1382 |

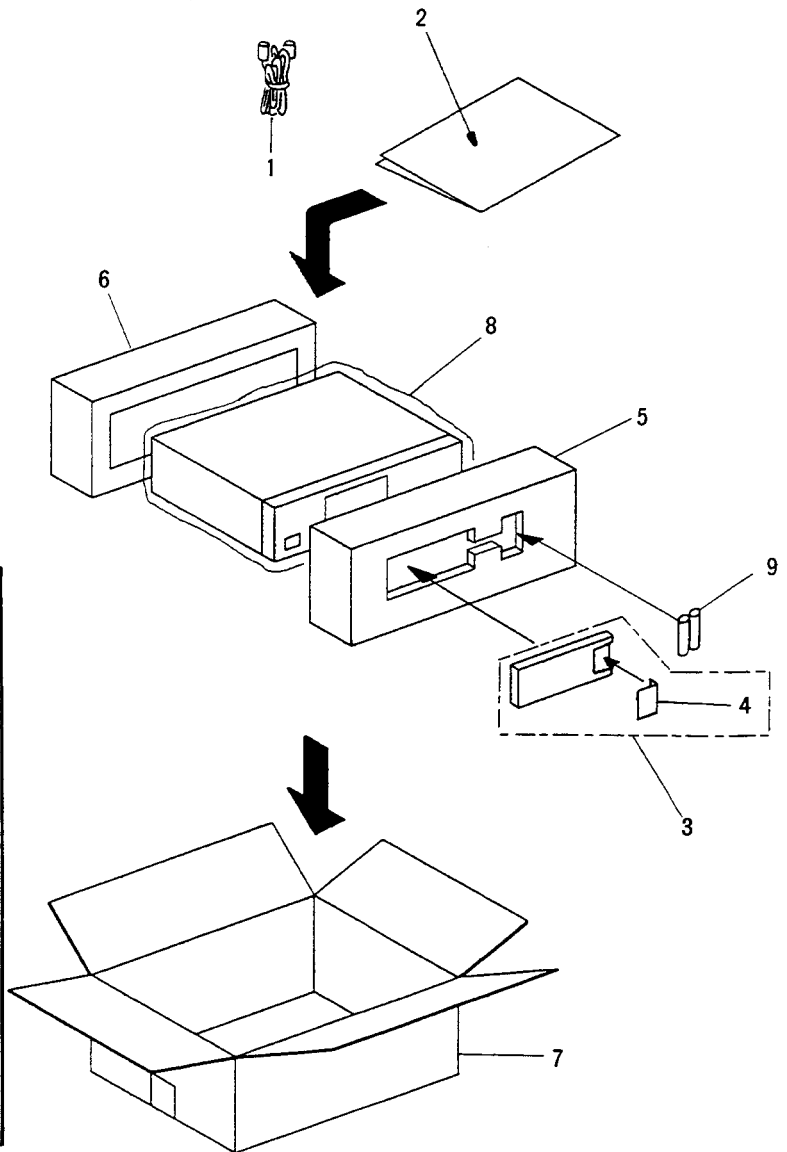


2.3 PACKING

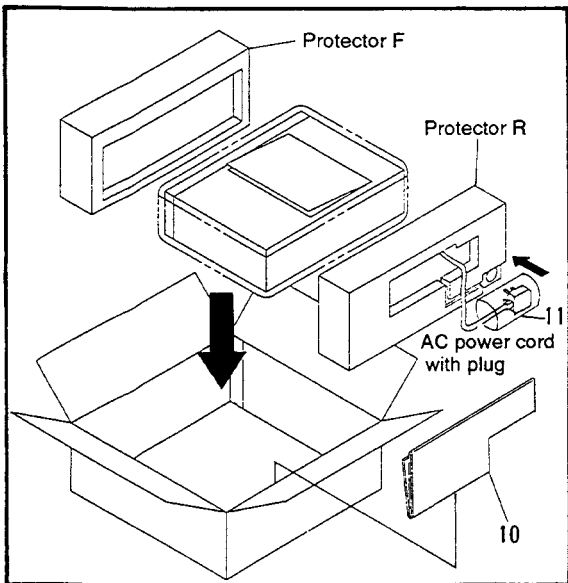
Parts List

| Mark | No. | Description | Part No. |
|------|-----|--|-----------|
| | 1 | Cord with pin plug | PDE1109 |
| | 2 | Operating instructions (WEMXK type) (English/French/German/Italian /Dutch/Swedish/Spanish/Portuguese) | PRE1173 |
| | 2 | Operating instructions (WBXK type) (English) | PRB1191 |
| | 3 | Remote control unit | PWW1060 |
| | 4 | Battery lid | PZN1001 |
| | 5 | Protector F | PHA1237 |
| | 6 | Protector R (WEMXK type) | PHA1261 |
| | 6 | Protector R (WBXK type) | PHA1259 |
| | 7 | CD packing case (WEMXK type) | PHG1873 |
| | 7 | CD packing case (WBXK type) | PHG1933 |
| | 8 | Sheet | Z23 - 007 |
| NSP | 9 | Battery (R03, AAA) | VEM - 022 |
| | 10 | Spacer (WBXK type only) | PHC1078 |
| | 11 | Vinyl bag (WBXK type only) | Z21 - 013 |

● For WEMXK type



● For WBXK type



3. PCB PARTS LIST

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

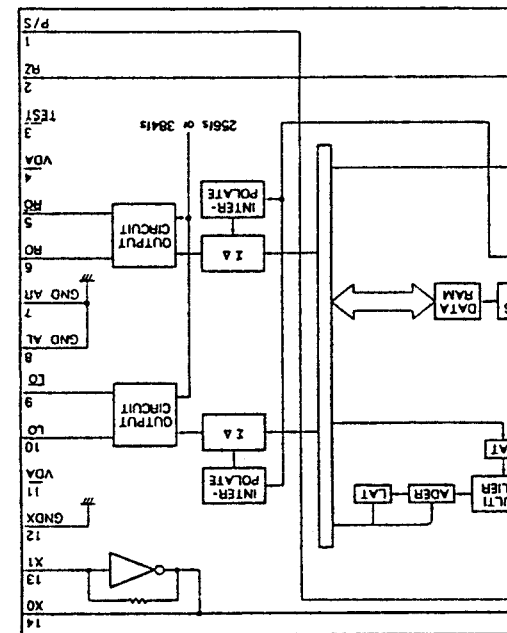
Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 Ω \rightarrow 56 \times 10¹ \rightarrow 561 RD1/8PM $\boxed{5} \boxed{6} \boxed{1} \boxed{J}$
 47k Ω \rightarrow 47 \times 10³ \rightarrow 473 RD1/4PS $\boxed{4} \boxed{7} \boxed{3} \boxed{J}$
 0.5 Ω \rightarrow 0R5 RN2H $\boxed{0} \boxed{R} \boxed{5} \boxed{K}$
 1 Ω \rightarrow 010 RS1P $\boxed{0} \boxed{1} \boxed{0} \boxed{K}$

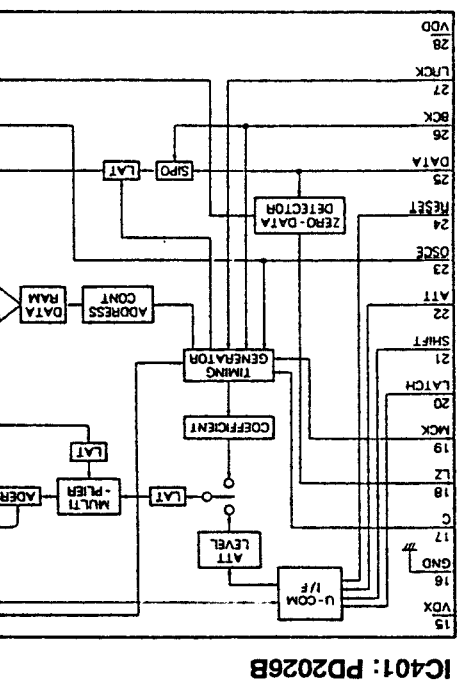
Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω \rightarrow 562 \times 10¹ \rightarrow 5621 RN1/4PC $\boxed{5} \boxed{6} \boxed{2} \boxed{1} \boxed{F}$

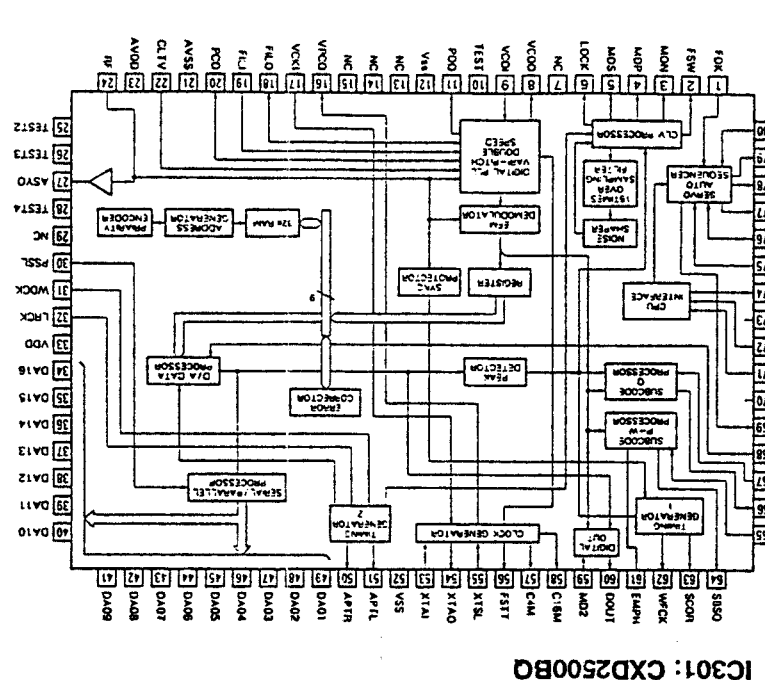
| Mark | No. | Description | Part No. | Mark | No. | Description | Part No. |
|----------------------------|-----|-----------------------------------|--------------|--|-----|---|----------|
| LIST OF ASSEMBLIES | | | | C211, C212, C216, C217 | | CEAS330M16 | |
| NSP Δ | | MOTHER BOARD ASSEMBLY | PWM1761 | C433, C434 | | CEAS470M50 | |
| Δ | | MAIN BOARD ASSEMBLY | PWZ2480 | C302, C322, C351 | | CEAS471M6R3 | |
| NSP | | HEADPHONE BOARD ASSEMBLY | PWZ2481 | C160, C162, C451, C452 | | CEAS4R7M50 | |
| NSP | | MOTOR VR BOARD ASSEMBLY | PWZ2482 | C309 | | CEASR47M50 | |
| NSP Δ | | SUB BOARD ASSEMBLY | PWX1275 | C413-C416 | | CFTXA104J50 | |
| Δ | | FUNCTION BOARD ASSEMBLY | PWZ2489 | C441-C444 | | CFTXA152J50 | |
| NSP | | SW BOARD ASSEMBLY | PWZ2490 | C406, C407 | | CFTXA471J50 | |
| Δ | | SERVO TRANS BOARD ASSEMBLY | PWZ2492 | C152, C161, C321 | | CFTYA104J50 | |
| NSP | | MECHANISM BOARD ASSEMBLY | PWX1192 | C157, C164, C169, C308 | | CGCYX103K25 | |
| MAIN BOARD ASSEMBLY | | | | C158, C159, C163, C230, C301 | | CGCYX104K25 | |
| SEMICONDUCTORS | | | | C156, C168 | | CGCYX333K25 | |
| | | IC151 | CXA1372Q | C307, C354 | | CGCYX473K25 | |
| | | IC301 | CXD2500BQ | C306 | | CKCYB152K50 | |
| Δ | | IC201, IC202 | LA6520 | C155 | | CKCYB182K50 | |
| | | IC421 | LM2940CT-5.0 | C218 | | CKCYB272K50 | |
| | | IC406 | M5218AP | C170 | | CKCYB332K50 | |
| | | IC405 | NJM5532DD | C171, C172 | | CKCYB472K50 | |
| | | IC401 | PD2026B | C167, C205, C210, C215, C219, C303, C352, C353, C461 | | CKCYF103Z50 | |
| | | IC351 | PD4457A | RESISTORS | | | |
| | | Q391 | 2SC1740S | VR151, VR152 (22K) | | RCP1046 | |
| | | Q403, Q404, Q453, Q454 | 2SD2144S | OTHER RESISTORS | | RD1/6PM $\square \square \square \square \square \square \square \square \square \square$ | |
| | | Q451, Q452 | DTA124ES | OTHERS | | | |
| | | Q322, Q405, Q455, Q456 | DTC124ES | CN131 CONNECTOR (12P) | | 12FM-1.0BT | |
| | | D218, D351, D395-D397, D451-D454 | 1SS254 | JA393 MINI JACK | | PKN1005 | |
| COILS | | | | JA301 OPTICAL OUTPUT JACK | | TOTX178 | |
| | | L301, L321, L395, L396, L415-L417 | LAU010K | PIN JACK (4P) | | DKB1016 | |
| CAPACITORS | | | | X401 CRYSTAL RESONATOR (16.9344MHz) | | PSS1008 | |
| | | C435-C438 | CCCCH050C50 | X351 CERAMIC RESONATOR (4.19MHz) | | VSS1014 | |
| | | C403 | CCCCH120J50 | HEADPHONE BOARD ASSEMBLY | | | |
| | | C404 | CCCCH220J50 | COILS | | | |
| | | C429, C430 | CCCCH390J50 | L501-L503 | | LAU010K | |
| | | C151, C153 | CEAS101M10 | CAPACITORS | | | |
| | | C431, C432 | CEAS101M25 | C501, C502 | | CKCYF103Z50 | |
| | | C405 | CEAS102M16 | | | | |



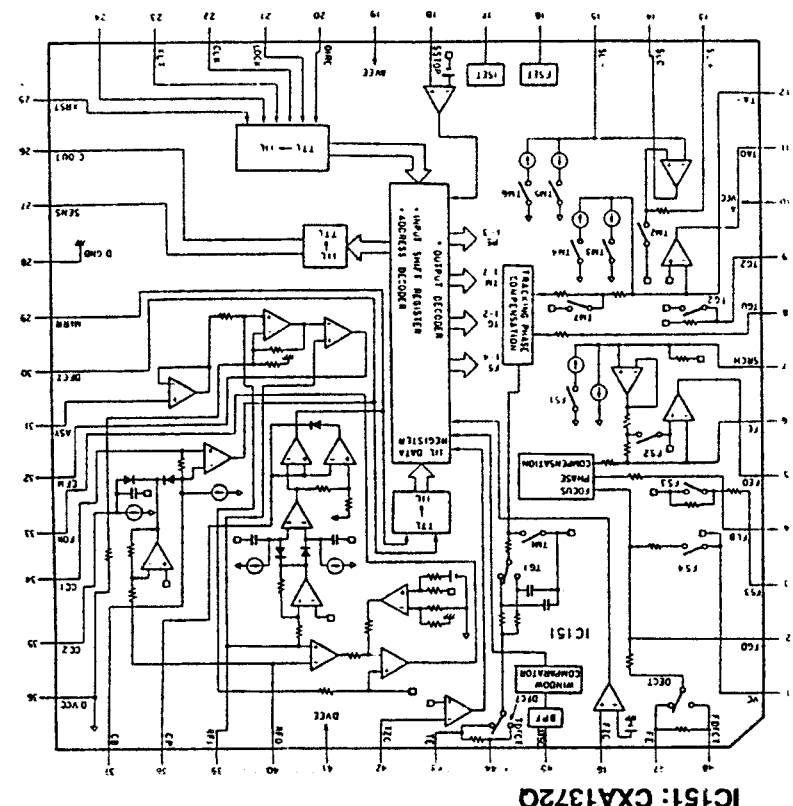
| Mark | No. | Description | Part No. |
|------------------------------------|---|-------------------|---|
| | C503 | | CKCYF473Z50 |
| OTHERS | | | |
| | JA501 | HEADPHONE JACK | PKN1001 |
| MOTOR VOLUME BOARD ASSEMBLY | | | |
| CAPACITORS | | | |
| | C510 | | CKPUYF103Z25 |
| RESISTORS | | | |
| | VR501 (20KB) | | PCS1010 |
| FUNCTION BOARD ASSEMBLY | | | |
| SEMICONDUCTORS | | | |
| | D701-D710 | | 1SS254 |
| SWITCHES | | | |
| | S701-S704, S706, S708, S709, S712-S725, S728-S738 | | PSG1006 |
| COILS | | | |
| | L701, L702 | | LAU010K |
| RESISTORS | | | |
| | ALL RESISTORS | | RD1/6PM $\square \square \square \square \square \square \square \square \square \square$ |
| OTHERS | | | |
| | V701 | FL INDICATOR TUBE | PEL1073 |
| | | REMOTE SENSOR | SBX1610 |
| SW BOARD ASSEMBLY | | | |
| SEMICONDUCTORS | | | |
| | D751 | | PCX1019 |
| SWITCHES | | | |
| | S751-S754 | | PSG1006 |
| SERVO TRANS BOARD ASSEMBLY | | | |
| SEMICONDUCTORS | | | |
| Δ | IC31 | | ICP-N10 |
| Δ | IC22 | | NJM79L05A |
| Δ | IC20 | | PQ05RR12 |
| Δ | D11-D14, D52 | | 11ES2 |
| | D54 | | MTZJ18B/C |
| CAPACITORS | | | |
| | C52 | | CEAS101M35 |
| | C27, C28 | | CEAS471M6R3 |
| | C25, C26 | | CEAS472M16 |
| | C11-C13, C15, C16 | | CKCYF103Z50 |
| RESISTORS | | | |
| | ALL RESISTORS | | RD1/6PM $\square \square \square \square \square \square \square \square \square \square$ |
| OTHERS | | | |
| Δ | TERMINAL | | RKC-061 |
| MECHANISM BOARD ASSEMBLY | | | |
| SWITCHES | | | |
| | S610 | | DSG1016 |



IC401: PD2026B



IC301: CXD2500BQ



IC151: CXA1372Q

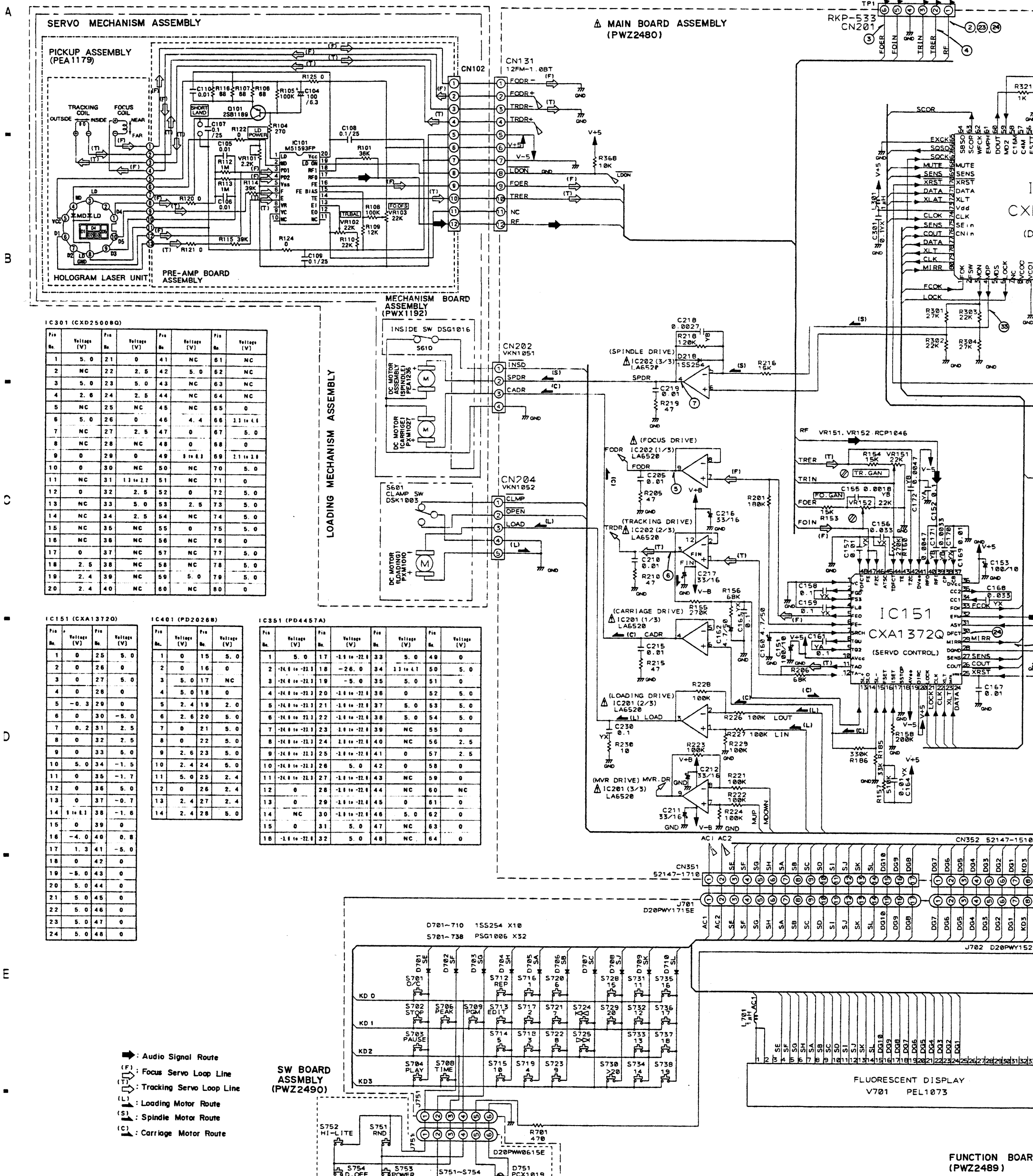
PD-S602

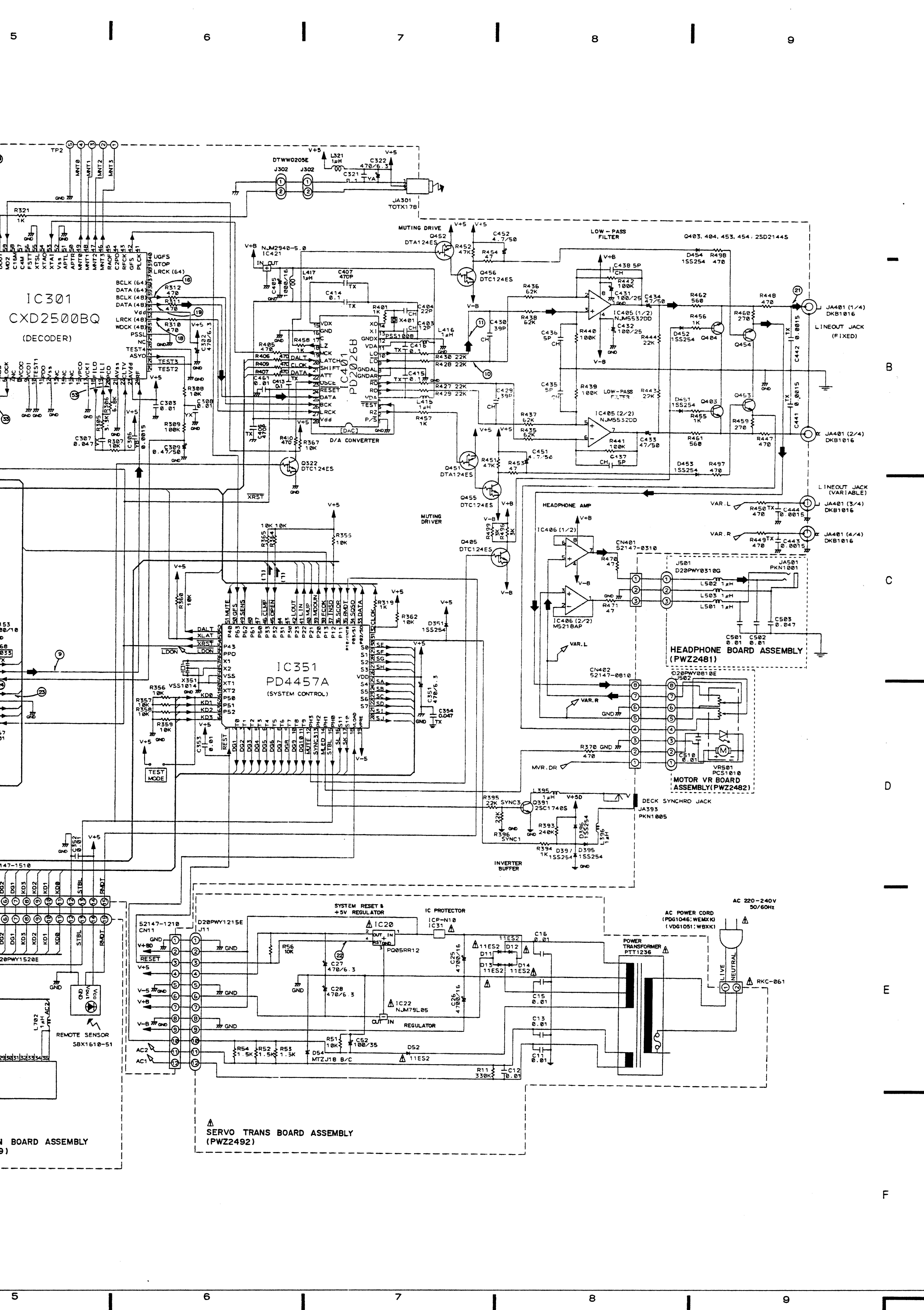
4. SCHEMATIC AND PCB CONNECTION DIAGRAMS

- Note:** Type 4
- When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".
 - Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.
 - RESISTORS:**
Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
 - CAPACITORS:**
Unit: p:pF or μF unless otherwise noted.
Ratings: capacitor (μF)/ voltage (V) unless otherwise noted.
Rated voltage: 50V except for electrolytic capacitors.
 - COILS:**
Unit: m:mH or μH unless otherwise noted.
 - VOLTAGE AND CURRENT:**
□ : DC voltage (V) in PLAY mode unless otherwise noted.
↻ mA or - mA : DC current in PLAY mode unless otherwise noted.
Value in () is DC current in STOP mode.
 - OTHERS:**
 - → : Signal route.
 - ⊙ : Adjusting point.
 - ▼ : Measurement point.
 - Δ : The Δ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
 - SWITCHES** (Underline indicates switch position):
FUNCTION BOARD ASSEMBLY
S701 : O/C
S702 : STOP
S703 : PAUSE
S704 : PLAY
S706 : PEAK
S708 : TIME
S709 : PGM
S712 : REP
S713 : EDIT
S714 : 5
S715 : 10
S716 : 1
S717 : 2
S718 : 3
S719 : 4
S720 : 6
S721 : 7
S722 : 8
S723 : 9
S724 : (underlined)
S725 :
S728 : 15
S729 : 20
S730 : > 20
S731 : 11
S732 : 12
S733 : 13
S734 : 14
S735 : 16
S736 : 17
S737 : 18
S738 : 19

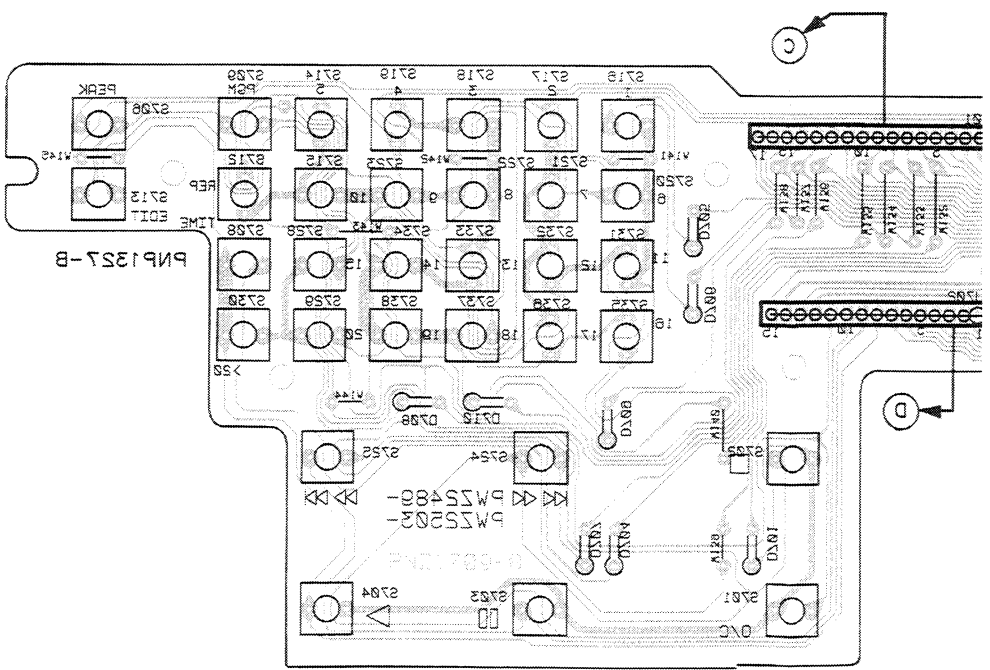
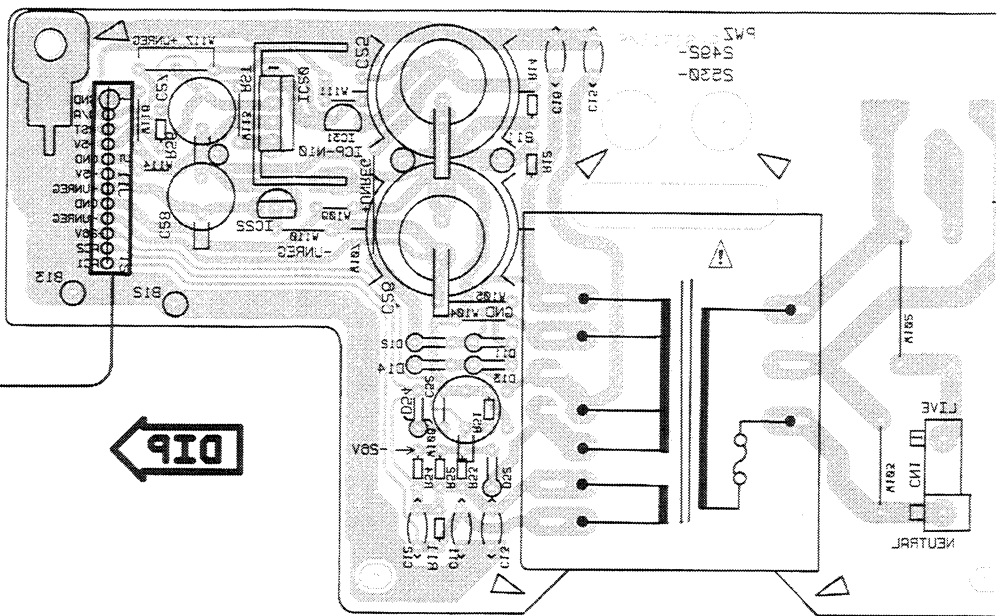
SW BOARD ASSEMBLY
S751 : RND
S752 : HI - LITE
S753 : POWER
S754 : D. OFF

4.1 SCHEMATIC DIAGRAM



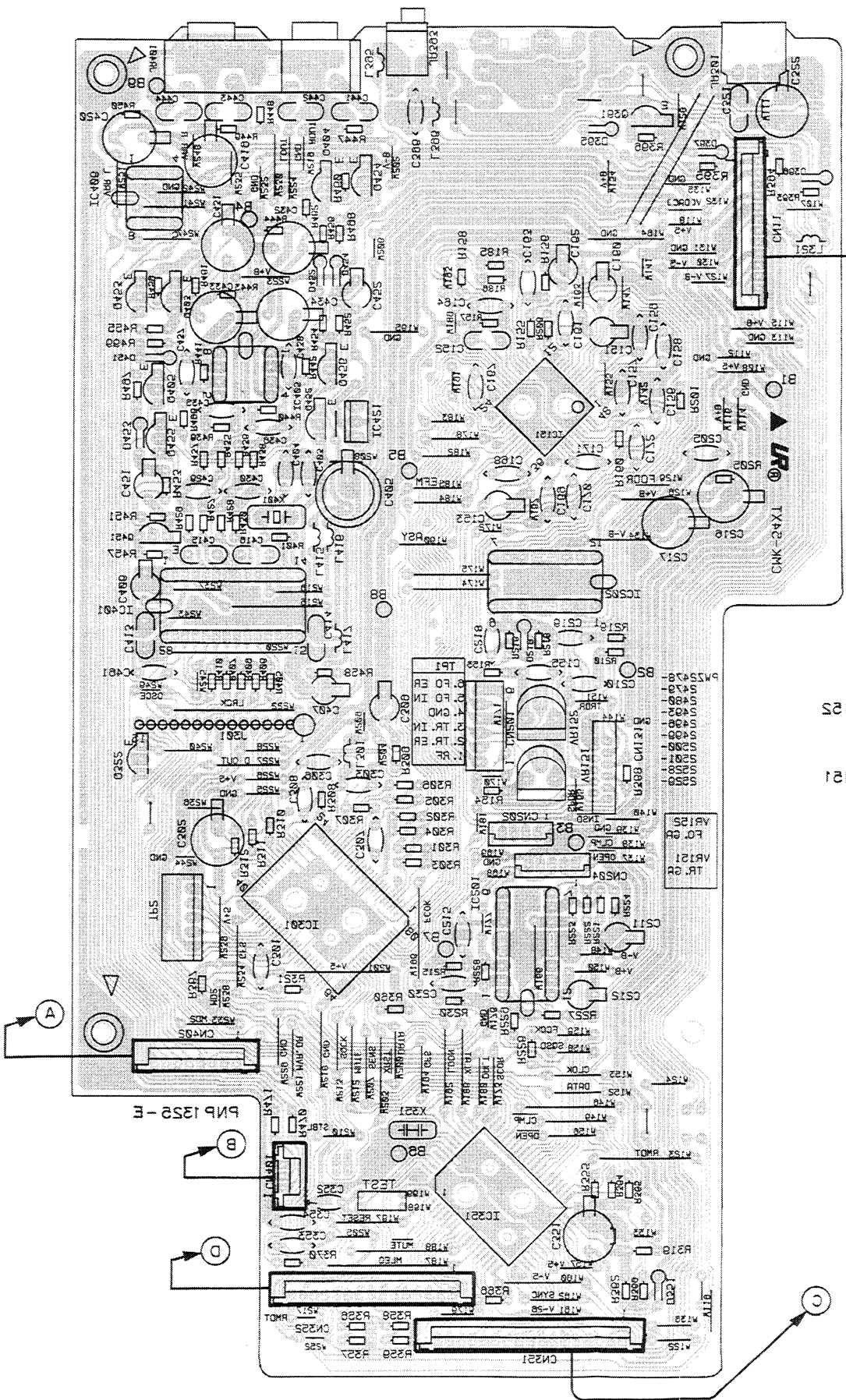


C TRANS BOARD ASSEMBLY



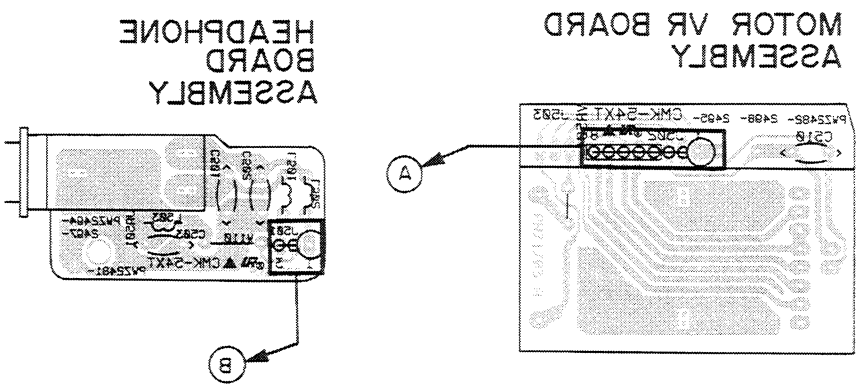
- IC321
- IC301
- IC401
- IC402
- IC403
- IC404
- IC408
- IC451
- VR151
- VR152

MAIN BOARD ASSEMBLY



4.2 PCB CONNECTION DIAGRAM

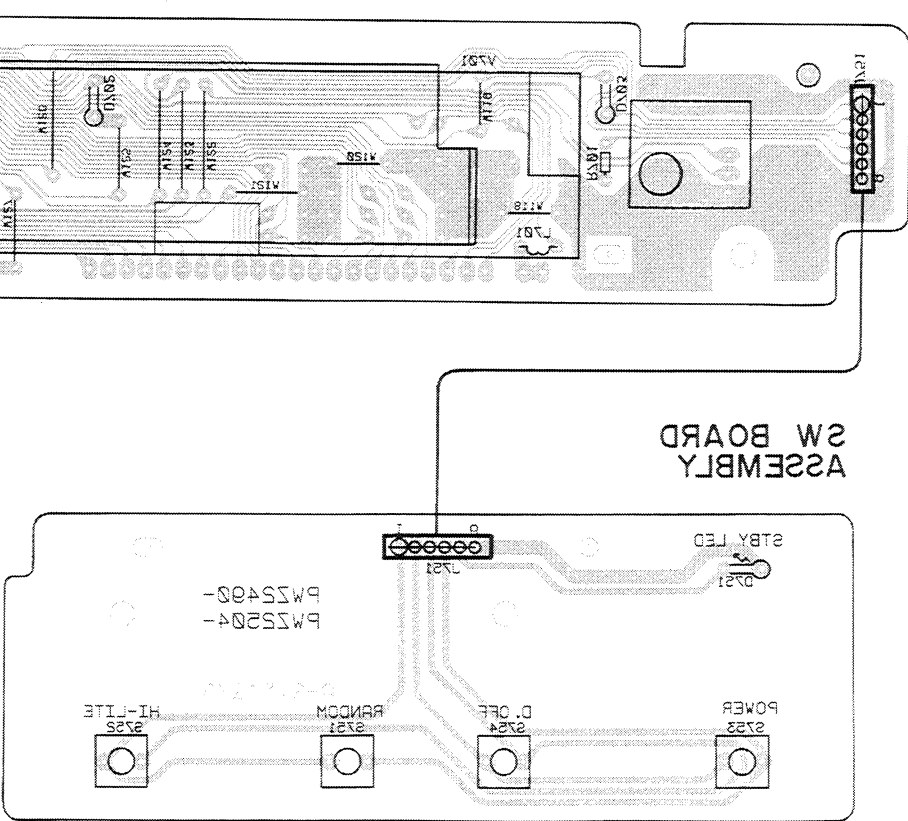
• View from soldering side



A

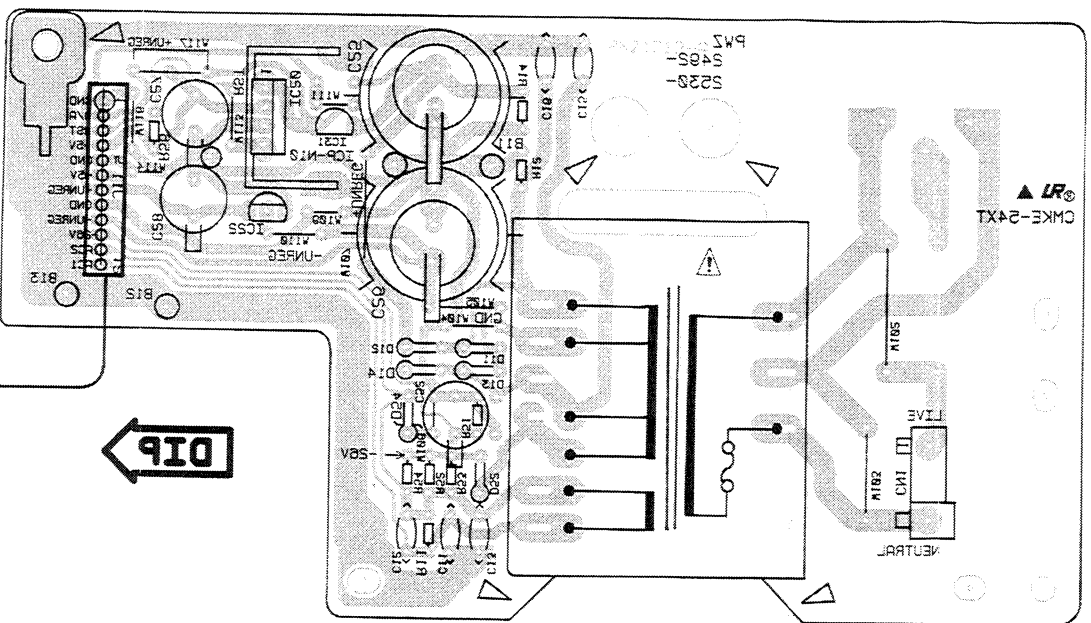
B

FUNCTION BOARD ASSEMBLY



D

SERVO TRANS BOARD ASSEMBLY



Q321

Q404

IC408

Q423

Q403

Q426

IC402

Q402

Q422

IC421

Q421

Q421

IC505 IC401

VR125

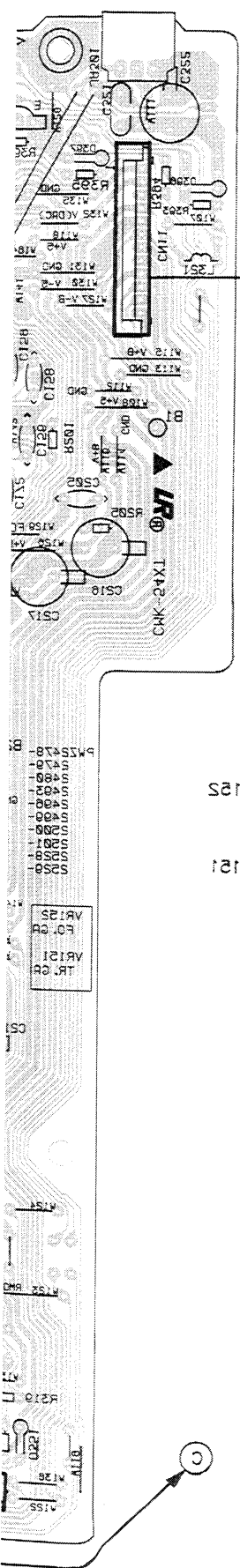
Q355

VR121

IC301

IC321

MAIN BOARD



e

e

2

2

4

4

3

3

5

5

1

1

4.2 PCB CONNECTION DIAGRAM

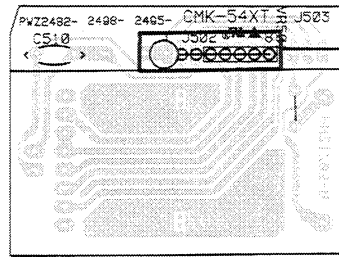
- View from component side

SERVO TRANS BOARD ASSEMBLY

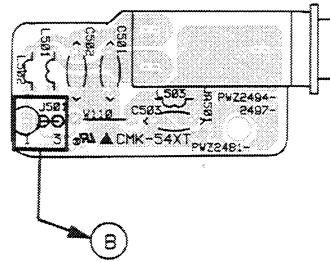
MAIN BOARD ASS

A

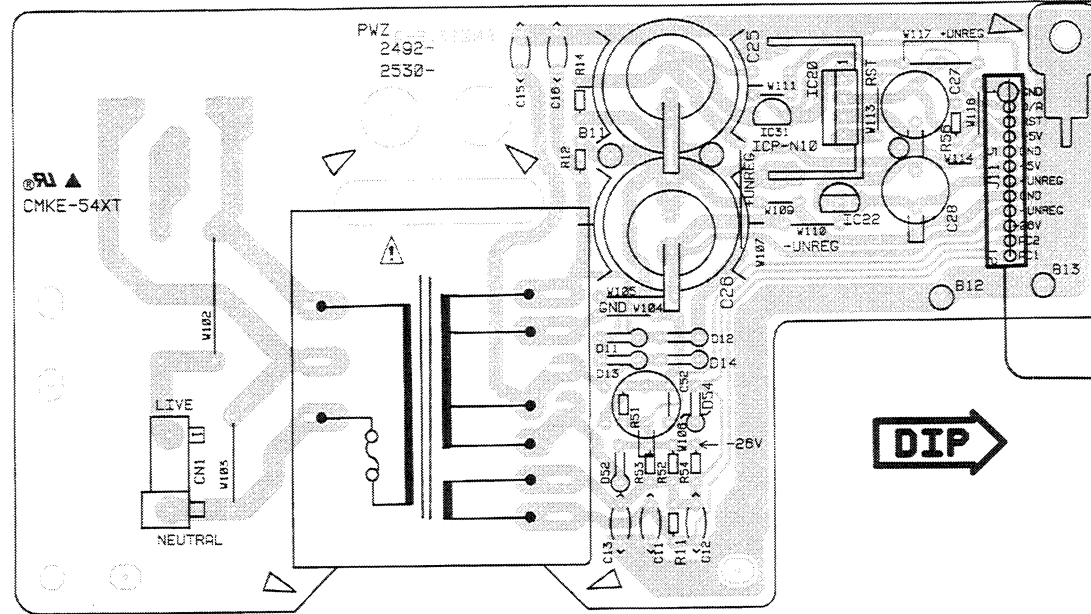
MOTOR VR BOARD ASSEMBLY



HEADPHONE BOARD ASSEMBLY

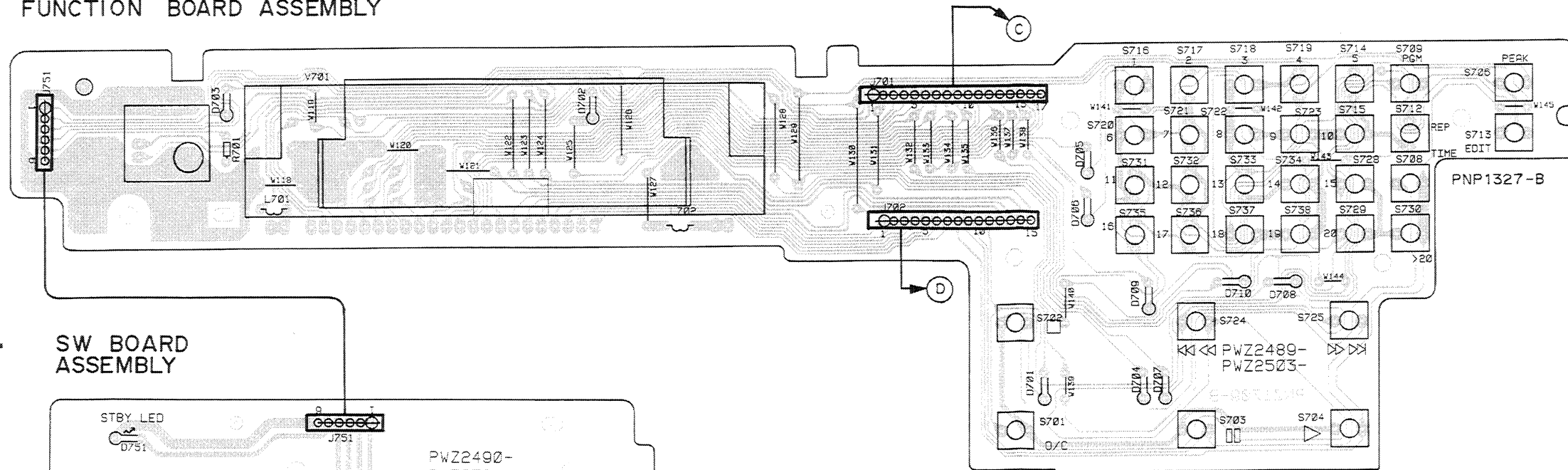


B

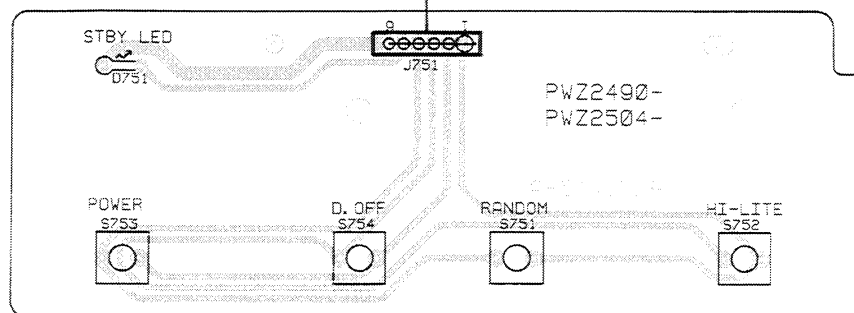


DIP

FUNCTION BOARD ASSEMBLY

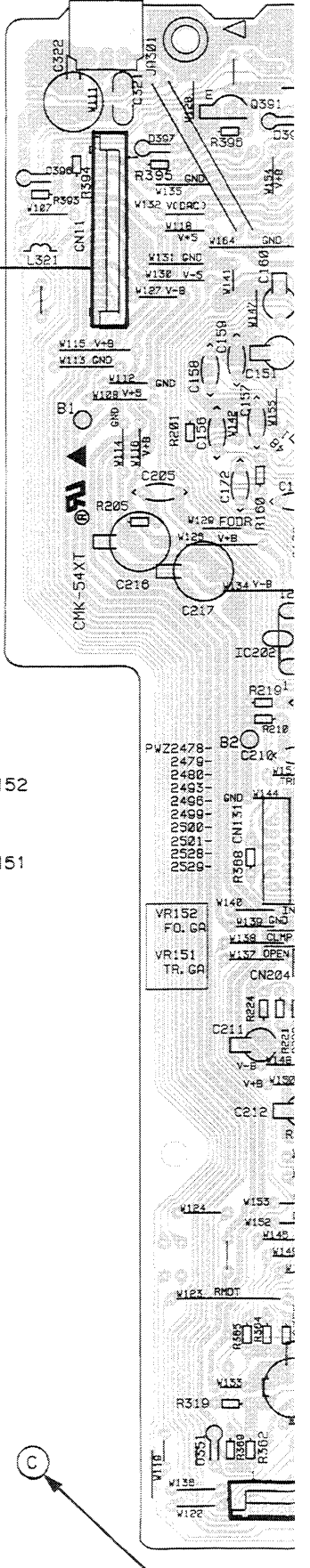


SW BOARD ASSEMBLY



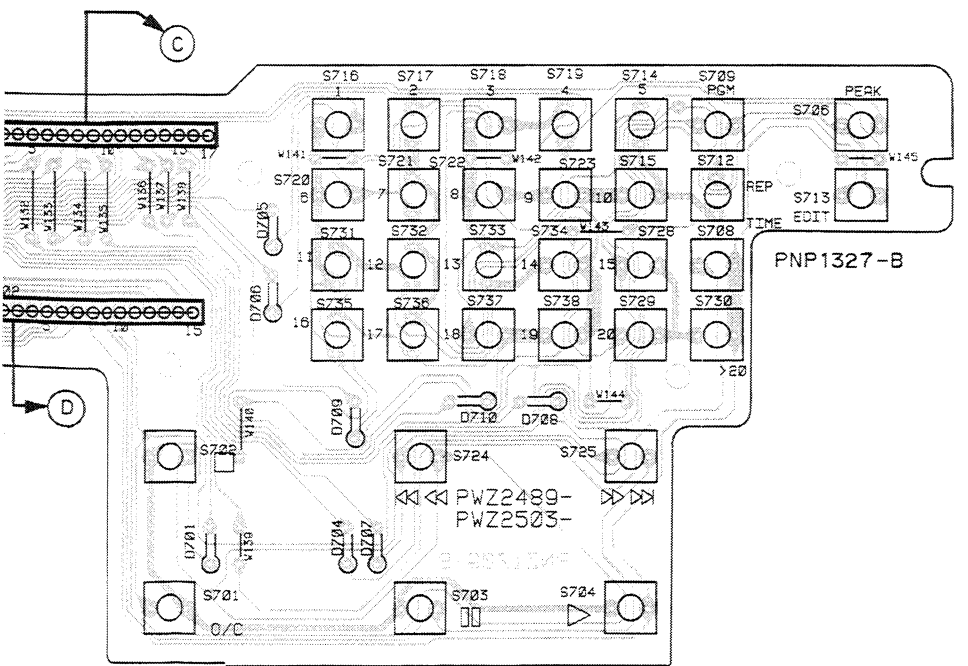
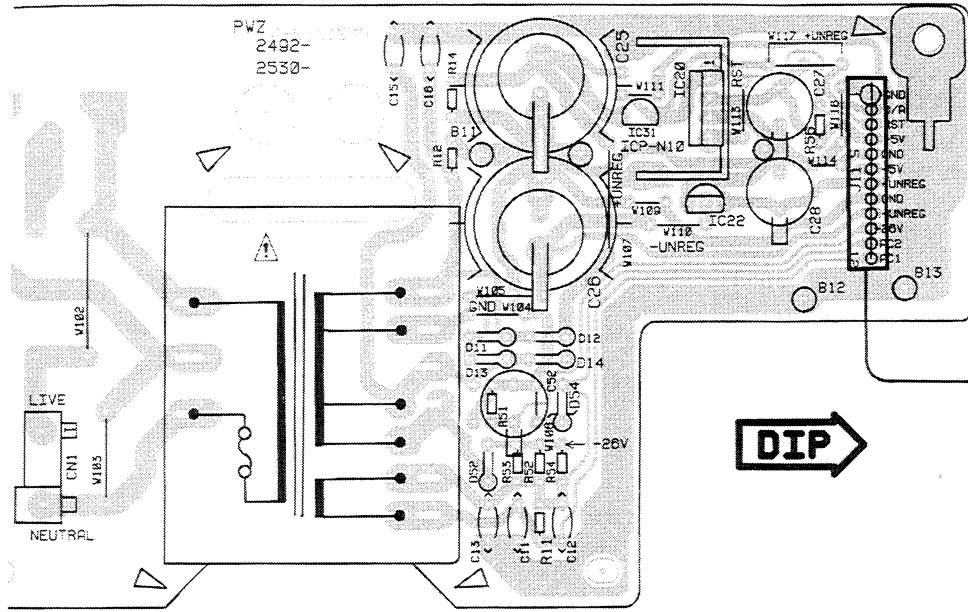
D

- Q391
- Q454
- Q404
- IC406
- Q453
- Q403
- Q456
- IC405
- Q405
- Q452
- Q455
- Q451
- IC202
- IC401
- VR152
- Q322
- VR151
- IC301
- IC201
- IC351

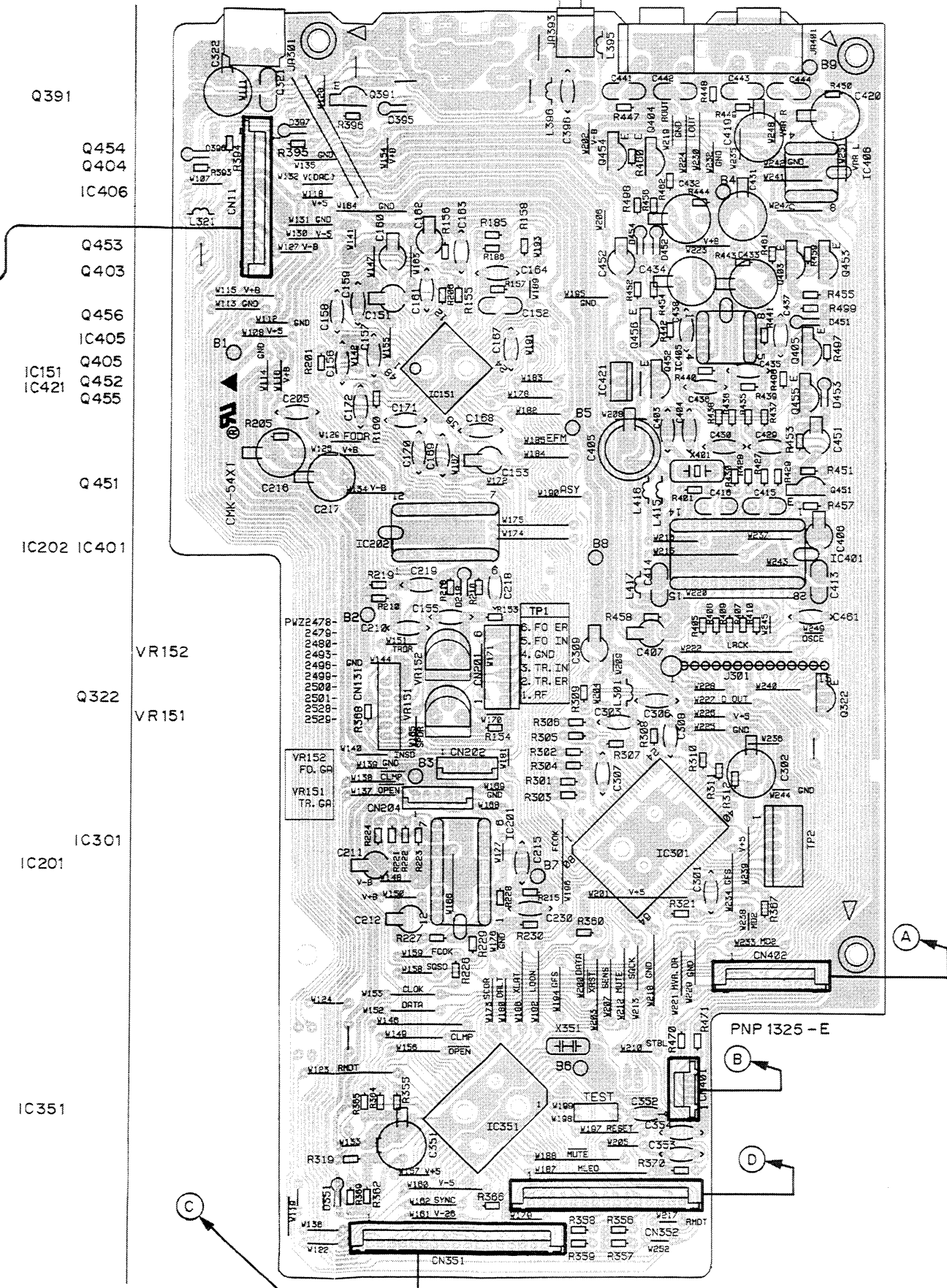


C

TRANS BOARD ASSEMBLY



MAIN BOARD ASSEMBLY



| PC.B. pattern diagram indication | Corresponding part symbol | Part name |
|----------------------------------|---------------------------|--|
| | | Transistor |
| | | FET |
| | | Diode |
| | | Zener diode |
| | | LED |
| | | Varactor |
| | | Tact switch |
| | | Inductor |
| | | Coil |
| | | Transformer |
| | | Filter |
| | | Ceramic capacitor |
| | | Mylar capacitor |
| | | Styrol capacitor |
| | | Electrolytic capacitor (Non polarized) |
| | | Electrolytic capacitor (Noiseless) |
| | | Electrolytic capacitor (Polarized) |
| | | Electrolytic capacitor (Polarized) |
| | | Power capacitor |
| | | Semi-fixed resistor |
| | | Resistor array |
| | | Resistor |
| | | Resonator |
| | | Thermistor |

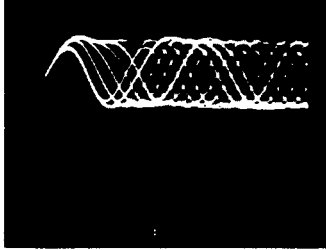
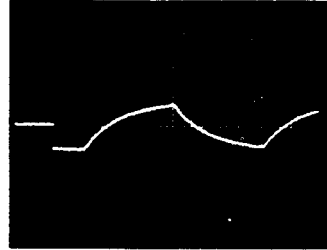


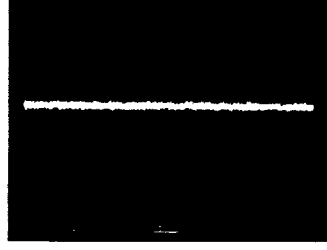
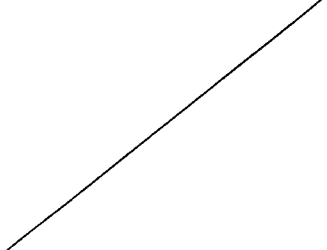
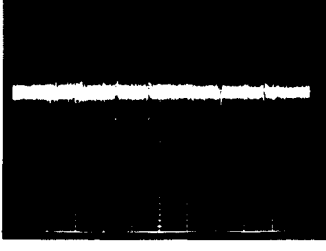
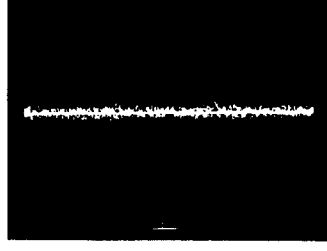
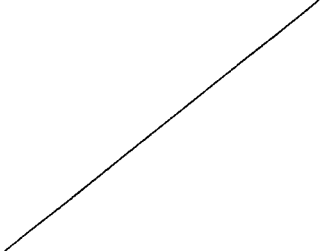
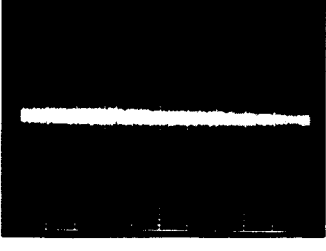
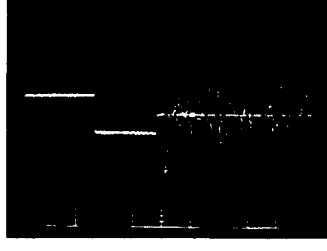
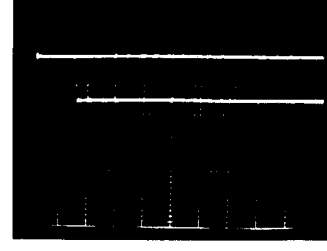
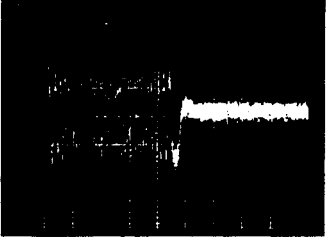
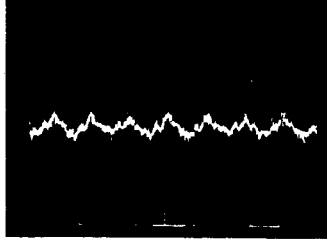
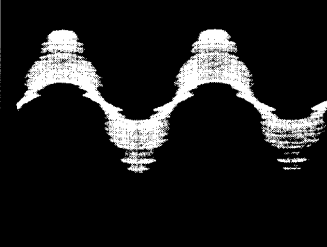
1 This PC.B. connection diagram is viewed from the parts mounted side.
 2 The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
 3 The capacitor terminal marked with ⊕ shows negative terminal.
 4 The diode marked with ⊕ shows cathode side.
 5 The transistor terminal marked with ⊕ shows emitter.

● WAVEFORMS

Note: The encircled numbers denote measuring points in the schematic diagram.

*1 50T - JUMP: After switching to the pause mode, press the manual search key.

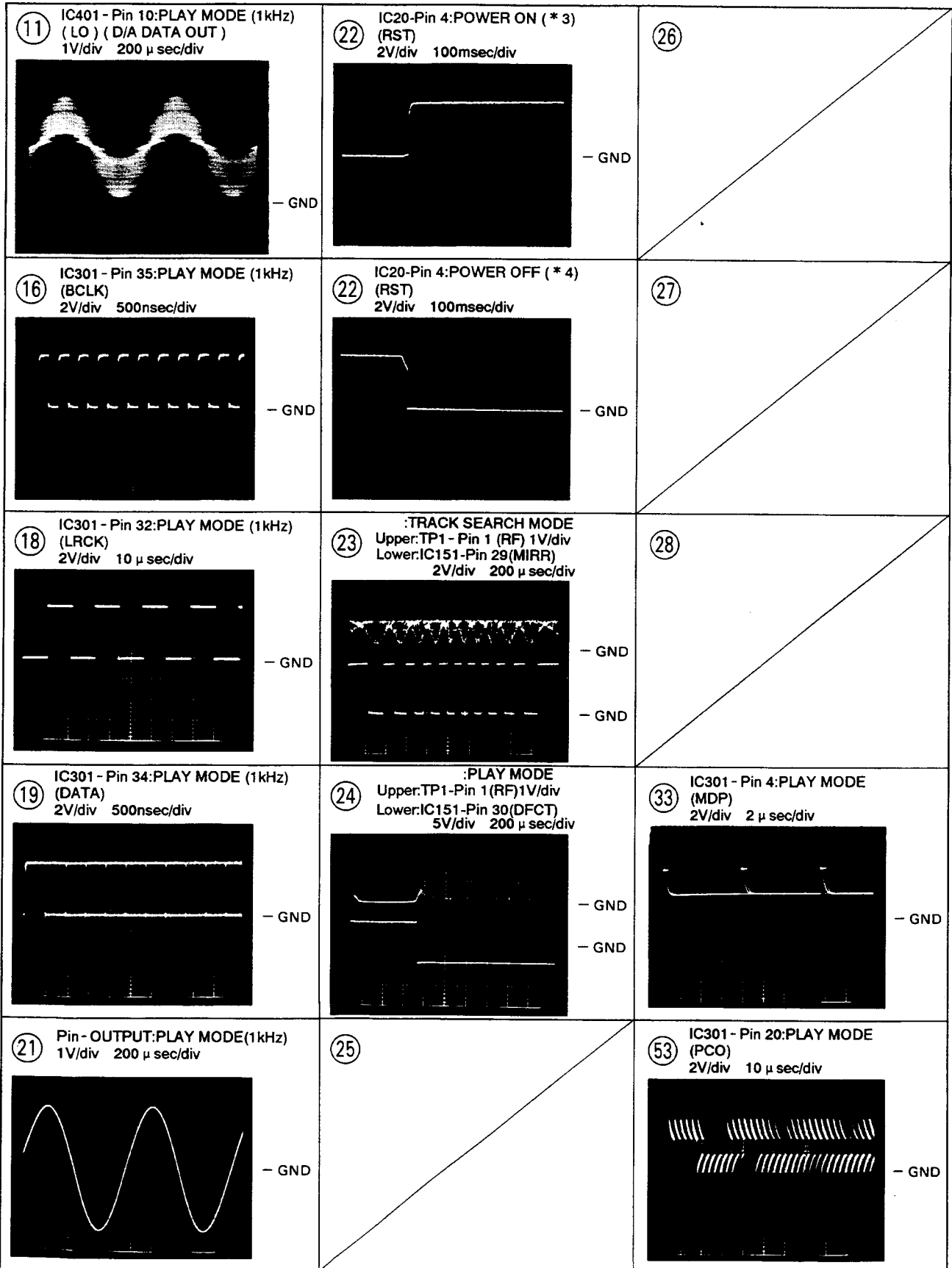
*2 FOCUS - IN: Press the key without loading a disc.

| | | |
|--|--|--|
| <p>② TP1 - Pin 1: PLAY MODE (RF) 500mV/div 500nsec/div</p>  <p>- GND</p> | <p>⑤ IC202 - Pin 9: FOCUS-IN (*2) MODE (FODR) 1V/div 200msec/div</p>  <p>- GND</p> | <p>⑦ IC202 - Pin 4: TRACK SEARCH MODE (SPDR) 2V/div 50msec/div</p>  <p>- GND</p> |
| <p>② TP1 - Pin 1: TRACK SEARCH MODE (RF) 500mV/div 200 μ sec/div</p>  <p>- GND</p> | <p>⑤ IC202 - Pin 9: PLAY MODE (FODR) 1V/div 1msec/div</p>  <p>- GND</p> | <p>⑧</p>  |
| <p>③ TP1 - Pin 6: PLAY MODE (FOER) 100mV/div 10msec/div</p>  <p>- GND</p> | <p>⑥ IC202 - Pin 3: PLAY MODE (TRDR) 500mV/div 1msec/div</p>  <p>- GND</p> | <p>⑧</p>  |
| <p>④ TP1 - Pin 2: PLAY MODE (TRER) 1V/div 10msec/div</p>  <p>- GND</p> | <p>⑥ IC202 - Pin 3: 50T - JUMP (*1) MODE (TRDR) 500mV/div 1msec/div</p>  <p>- GND</p> | <p>⑨ IC151 - Pin 32: PLAY MODE (EFM) 2V/div 500nsec/div</p>  <p>- GND</p> |
| <p>④ TP1 - Pin 2: 50T - JUMP (*1) MODE (TRER) 1V/div 1msec/div</p>  <p>- GND</p> | <p>⑦ IC202 - Pin 4: PLAY MODE (SPDR) 1V/div 50msec/div</p>  <p>- GND</p> | <p>⑩ IC401 - Pin 9: PLAY MODE (1kHz) (LO) (D/A DATA OUT) 1V/div 200 μ sec/div</p>  <p>- GND</p> |

PD-S602

*3 POWER ON : Plug AC cord into AC wall socket.

*4 POWER OFF: Unplug AC cord from AC wall socket.



5. ADJUSTMENTS

5.1. Adjustment Methods

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pickup or the circuitry. Adjust correctly following the adjustment procedure.

● Adjustment Items/Verification Items and Order

If the specified values cannot be obtained or no adjustment is possible by performing the verifications or adjustments described in steps 1 – 4, the pickup block may be defective.

| Step | Item | Test Point | Adjustment Location |
|------|--|---|---|
| 1 | Focus offset verification | TP1, Pin 6(FCS. ERR) | None |
| 2 | Tracking error balance verification | TP1, Pin 2(TRK. ERR) | None |
| 3 | Pickup radial/tangential direction tilt adjustment | TP1, Pin 1 (RF) | Radial tilt adjustment screw, Tangential tilt adjustment screw |
| 4 | RF level verification | TP1, Pin 1 (RF) | None |
| 5 | Focus servo loop gain adjustment | TP1, Pin 5(FCS. IN) TP1, Pin 6(FCS. ERR) | VR152(FCS. GAN) |
| 6 | Tracking servo loop gain adjustment | TP1, Pin 3(TRK. IN) TP1, Pin 2(TRK. ERR) | VR151 (TRK. GAN) |

● Abbreviation table

FCS. ERR :Focus Error
 TRK. ERR :Tracking Error
 FCS GAN :Focus Gain
 TRK GAN :Tracking Gain
 FCS. IN :Focus In
 TRK. IN :Tracking In

● Measuring Instruments and Tools

1. Dual trace oscilloscope (10:1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS - 7)
4. Low pass filter ($39k\Omega$ +0.001 μF)
5. Resistor (100 k Ω)
6. Standard tools

● **Test Point and Adjustment Variable Resistor Positions**

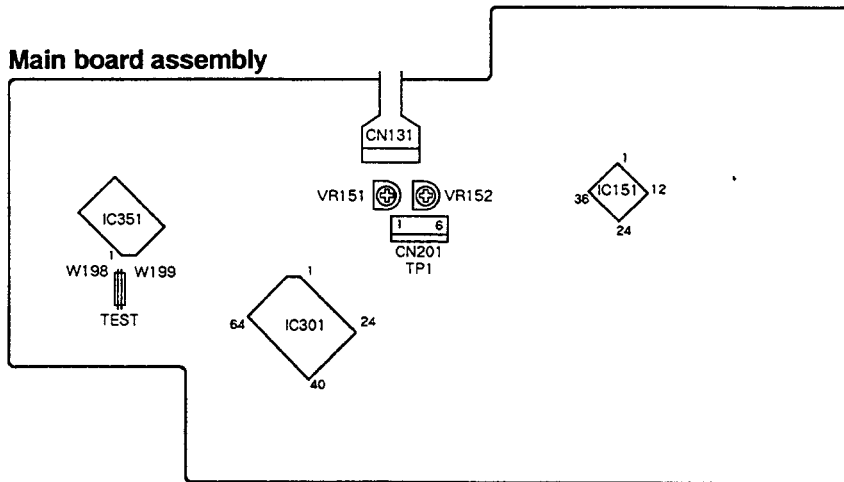


Figure 1. Adjustment Locations

● **Notes**

1. Use a 10:1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10:1 probe is used.

● **Test Mode**

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

[Setting these models to test mode]

How to set this model into test mode.

1. Unplug the power cord from the AC wall socket.
2. Short the test mode jumper wires. (See Figure 1.)
3. Plug the power cord into AC wall socket.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1 – 3.





[Release from test mode]

Here is the procedure for releasing the test mode:

1. Press the STOP key and stop all operations.
2. Unplug the power cord from the AC wall socket.

[Operations of the keys in test mode]

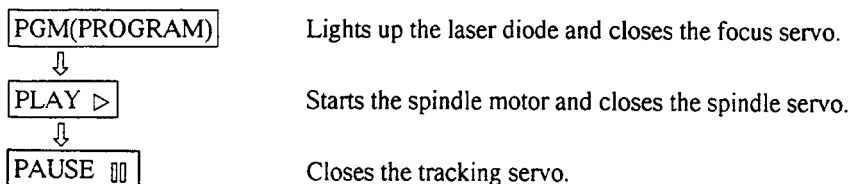
| Code | Key Name | Function in Test Mode | Explanation |
|------|------------------|---------------------------|---|
| | PGM (PROGRAM) | Focus servo close | <p>The laser diode is lit up and the focus actuator is lifted up, then lowered slowly and the focus servo is closed at the point where the objective lens is focused on the disc.</p> <p>With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo.</p> <p>If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled up, then the actuator is lowered and raised three times and returned to its original position.</p> |
| ▷ | PLAY | Spindle servo ON | <p>Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop.</p> <p>Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed.</p> <p>If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom is occurred.</p> |
| ⏸ | PAUSE | Tracking servo close/open | <p>Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal.</p> <p>If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem.</p> <p>This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.</p> |

| Code | Key Name | Function In Test Mode | Explanation |
|---|------------------------------------|--------------------------------|--|
|  | TRACK / MANUAL SEARCH REV | Carriage reverse (inwards) | Moves the pickup position toward the inner diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation. |
|  | TRACK / MANUAL SEARCH FWD | Carriage forward (outwards) | Moves the pickup position toward the outer diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation. |
|  | STOP | Stop | Initializes and the disc rotation stops. The pickup and disc remain where they are when this key is pressed. |
|  | OPEN/CLOSE | Disc tray open/close | Open/close the disc tray. This key is a toggle key and open/close tray alternately. Pressing this key when the disc is turning stops the disc, then opens the tray. This key operation does not affect the position of the pickup. |

[How to play back a disc in test mode]

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.

Here is the key operation sequence for playing back a disc in test mode.



Wait at least 2-3 seconds between each of these operations.

1. Focus Offset Verification

| | | | |
|--|--|---|--|
| ● Objective | Verify the DC offset for the focus error amp. | | |
| ● Symptom when out of adjustment | The model does not focus in and the RF signal is dirty. | | |
| ● Measurement instrument connections | Connect the oscilloscope to TP1, Pin 6 (FCS. ERR) [Settings] 5 mV/division 10 ms/division DC mode | ● Player state ● Adjustment location ● Disc | Test mode, stopped (just the Power switch on) None None needed |
| [Procedure] Verify the DC voltage at TP1, Pin 6 (FCS. ERR) is 0 ± 50 mV. | | | |

Note : If the specified values cannot be obtained or no adjustment is possible by performing the verifications or adjustments described in adjustment items 1 – 4, the pickup block may be defective.

2. Tracking Error Balance Verification

| | | | |
|--|---|---|--|
| ● Objective | To verify that there is no variation in the sensitivity of the tracking photo diode. | | |
| ● Symptom when out of adjustment | Play does not start or track search is impossible. | | |
| ● Measurement instrument connections | Connect the oscilloscope to TP1, Pin 2 (TRK. ERR). This connection may be via a low pass filter. [Settings] 50 mV/division 5 ms/division DC mode | ● Player state ● Adjustment location ● Disc | Test mode, focus and spindle servos closed and tracking servo open None YEDS-7 |
| [Procedure] <ol style="list-style-type: none"> 1. Move the pickup to midway across the disc (R=35 mm) with the TRACK/MANUAL SEARCH FWD $\triangleright \triangleright \cdot \triangleright \triangleright$ or REV $\triangleleft \triangleleft \cdot \triangleleft \triangleleft$ key. 2. Press the PGM (PROGRAM) key, then the PLAY \triangleright key in that order to close the focus servo then the spindle servo. 3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode. 4. Supposing that the positive amplitude of the tracking error signal at TP1, pin 2 (TRK ERR) is (A) and the negative amplitude is (B), the following expression is satisfied. | | | |
| When $A \geq B$, $\frac{A-B}{C} \times \frac{1}{2} \leq 0.1$ When $A < B$, $\frac{B-A}{C} \times \frac{1}{2} \leq 0.1$ | <p>When there is a DC component</p> <p>When there is no DC component</p> | | |

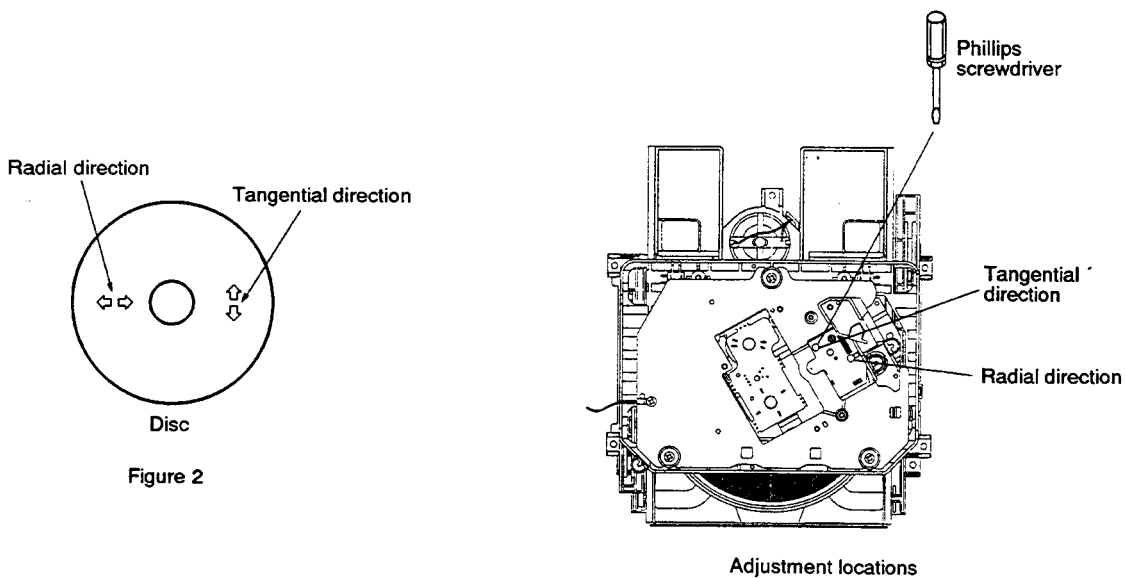
3. Pickup Radial/Tangential Tilt Adjustment

| | | | |
|--|---|---|--|
| <ul style="list-style-type: none"> ● Objective | To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals. | | |
| <ul style="list-style-type: none"> ● Symptom when out of adjustment | Sound broken; some discs can be played but not others. | | |
| <ul style="list-style-type: none"> ● Measurement instrument connections | Connect the oscilloscope to TPI, Pin 1 (RF). [Settings] 20 mV/division 200 ns/division AC mode | <ul style="list-style-type: none"> ● Player state | Test mode, play |
| | | <ul style="list-style-type: none"> ● Adjustment location | Pickup radial tilt adjustment screw and tangential tilt adjustment screw |
| | | <ul style="list-style-type: none"> ● Disc | YEDS-7 |

[Procedure]

1. Press the TRACK / MANUAL SEARCH FWD $\triangleright\triangleright$. $\triangleright\triangleright$ or REV $\triangleleft\triangleleft$. $\triangleleft\triangleleft$ key to move the pickup to halfway across the disc (R=35mm).
Press the PGM (PROGRAM) key, the PLAY \triangleright key and PAUSE $\square\square$ key in that order to close the respective servos and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 3).
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.
5. When the adjustment is completed, lock the radial and tangential adjustment screw.

Note:Radial and tangential mean the directions relative to the disc shown in Figure 2.



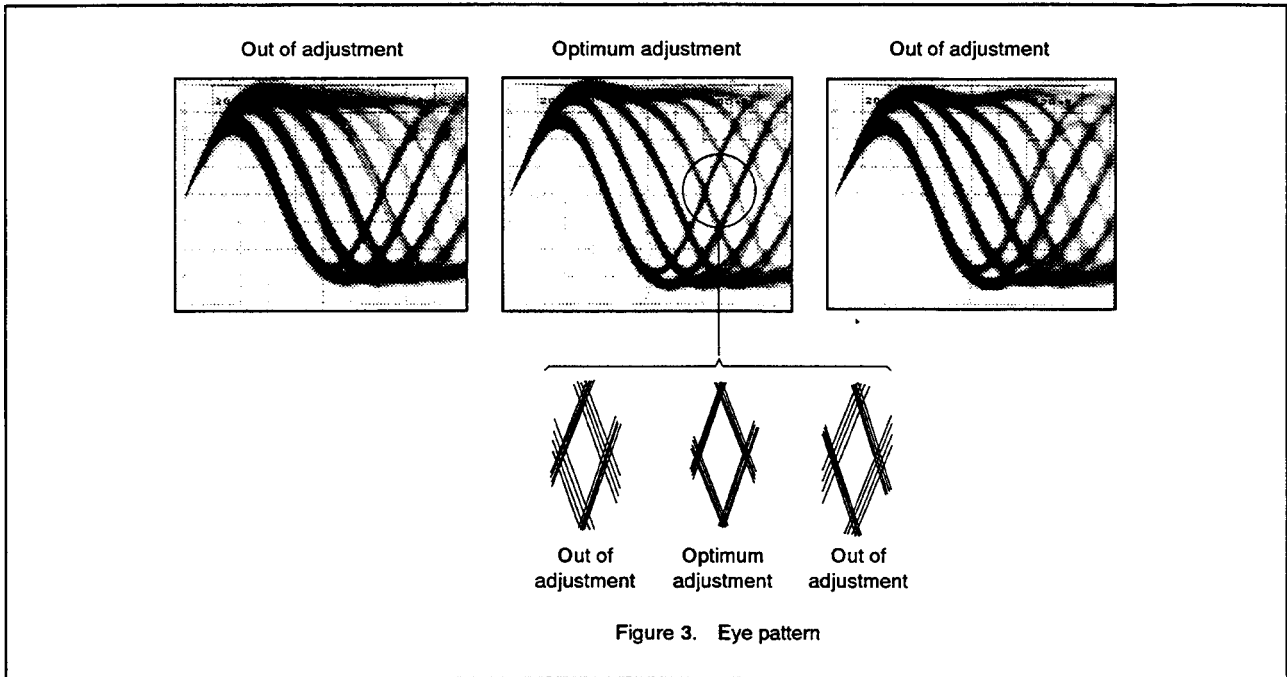


Figure 3. Eye pattern

4. RF Level Verification

| | | | |
|---|--|-----------------------|-----------------|
| ● Objective | To verify the playback RF signal amplitude | | |
| ● Symptom when out of adjustment | No play or no search | | |
| ● Measurement instrument connections | Connect the oscilloscope to TPI, Pin 1 (RF). | ● Player state | Test mode, play |
| | [Settings] 50 mV/division 10 ms/division AC mode | ● Adjustment location | None |
| | | ● Disc | YEDS-7 |
| [Procedure] | | | |
| <ol style="list-style-type: none"> 1. Move the pickup to midway across the disc (R=35 mm) with the TRACK/MANUAL SEARCH FWD \gg · \gg or REV \ll · \ll key, then press the PGM (PROGRAM) key, the PLAY \triangleright key and PAUSE \square key in that order to close the respective servos and put the player into play mode. 2. Verify the RF signal amplitude is $1.2 V_{p-p} \pm 0.2 V$. | | | |

5. Focus Servo Loop Gain Adjustment

| | | | |
|--------------------------------------|--|-----------------------|------------------|
| ● Objective | To optimize the focus servo loop gain. | | |
| ● Symptom when out of adjustment | Playback does not start or focus actuator noisy. | | |
| ● Measurement instrument connections | See figure 4. [Settings] CH1 CH2 20 mV/division 5 mV/division X-Y mode | ● Player state | Test mode, play |
| | | ● Adjustment location | VR152 (FCS. GAN) |
| | | ● Disc | YEDS-7 |

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the TRACK / MANUAL SEARCH FWD $\triangleright \triangleright \cdot \triangleright \triangleright$ or REV $\triangleleft \triangleleft \cdot \triangleleft \triangleleft$ key to move the pickup to halfway across the disc (R=35 mm), then press the PGM (PROGRAM) key, the PLAY \triangleright key and the PAUSE $\square \square$ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR152 (FCS. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

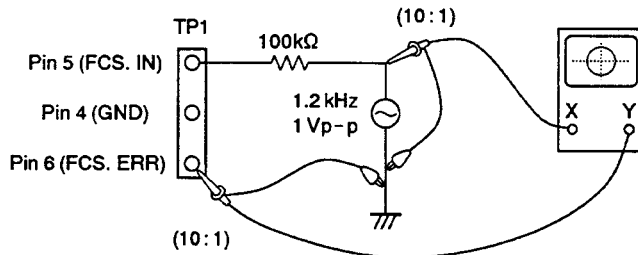
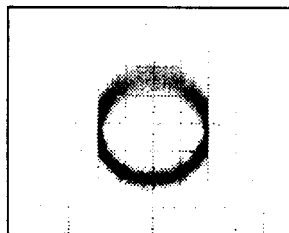


Figure 4

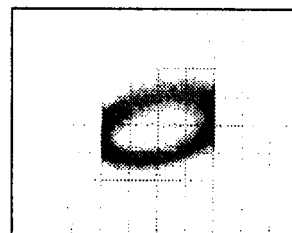
Focus Gain Adjustment



Higher gain



Optimum gain



Lower gain

6. Tracking Servo Loop Gain Adjustment

| | | | |
|--------------------------------------|--|-----------------------|------------------|
| ● Objective | To optimize the tracking servo loop gain. | | |
| ● Symptom when out of adjustment | Playback does not start, during searches the actuator is noisy, or tracks are skipped. | | |
| ● Measurement instrument connections | See Figure 5. | ● Player state | Test mode, play |
| | [Settings] CH1 CH2 50 mV/division 20 mV/division X - Y mode | ● Adjustment location | VR151 (TRK. GAN) |
| | | ● Disc | YEDS-7 |

[Procedure]

1. Set the AF generator output to 1.2 kHz and 2 Vp-p.
2. Press the TRACK/MANUAL SEARCH FWD ▷▷ · ▷▷ or REV ◁◁ · ◁◁ key to move the pickup to halfway across the disc (R=35 mm), then press the PGM (PROGRAM) key, the PLAY ▷ key and the PAUSE ◻◻ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR151 (TRK. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

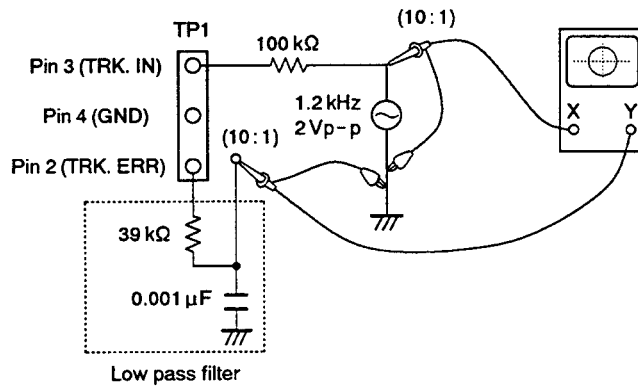
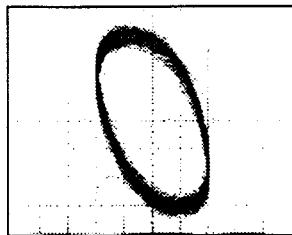
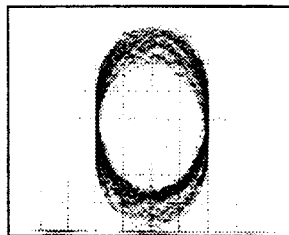


Figure 5

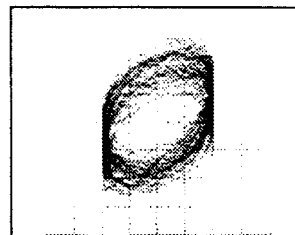
Tracking Gain Adjustment



Higher gain

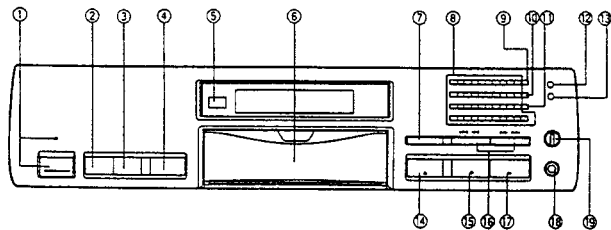


Optimum gain



Lower gain

6. PANEL FACILITIES



- ① **POWER STANDBY/ON switch and STANDBY indicator**
- ② **DISPLAY OFF button**
- ③ **RANDOM button**
- ④ **HI-LITE SCAN button**
- ⑤ **Remote sensor**
Receives the signal from the remote control unit.
- ⑥ **Disc tray**
- ⑦ **Stop button (■)**
- ⑧ **Digit buttons : (1 - 20, >20)**
- ⑨ **PGM (Program) button**
- ⑩ **REPEAT button**
- ⑪ **TIME button**
- ⑫ **PEAK SEARCH button**
- ⑬ **COMPU/AUTO EDIT button**
(•COMPU/••AUTO)
- ⑭ **OPEN/CLOSE button (▲)**
- ⑮ **Pause button (II)**
- ⑯ **Track/Manual search buttons**
(←←← / ← / → / →→→)
- ⑰ **Play button (▶)**
- ⑱ **Headphones jack (PHONES)**
- ⑲ **Headphones/line volume control (PHONES/ LINE LEVEL)**

7. SPECIFICATIONS

1. General

| | |
|-----------------------------|-----------------------------------|
| Type | Compact disc digital audio system |
| Power requirements | AC 220 - 240 V, 50/60 Hz |
| Power consumption | 15 W |
| Operating temperature | +5°C - +35°C |
| Weight | 3.9 kg |

2. Audio section

| | |
|---------------------------|---|
| Frequency response | 2 Hz - 20 kHz |
| S/N ratio | 108 dB or more (EIAJ) |
| Dynamic range | 96 dB or more (EIAJ) |
| Harmonic distortion | 0.0028% or less (EIAJ) |
| Output voltage | 2.0 V |
| Wow and flutter | Limit of measurement (±0.001% W.PEAK) or less (EIAJ) |
| Channels | 2-channel (stereo) |

3. Output terminal

Audio line output jacks (VARIABLE)
 Audio line output jacks (FIXED)
 Optical digital output jack
 CD-DECK SYNCHRO jack
 Headphone jack (with motor drive volume control)

4. Functions

Basic operation buttons
 • PLAY, PAUSE, STOP

Search function
 • Direct play
 • Track search
 • Manual search

Hi-Lite scan

Programming
 • Maximum 24 steps
 • Pause
 • Program clear (single track or all tracks)

Repeat functions
 • 1 track repeat
 • All tracks repeat
 • Program play repeat
 • Random play repeat

Random play (repeat also available)

Switching display
 Time consumed, remaining time (track/disc), and total time

Timer start

Peak search

Compu/Auto program editing
 Selects the tracks within the specified time.

Display off

5. Accessories

| | |
|------------------------------------|---|
| • Remote control unit | 1 |
| • Size AAA/R03/dry batteries | 2 |
| • Output cable | 1 |
| • Operating instructions | 1 |

NOTE:

Specifications and design subject to possible modification without notice, due to improvements.