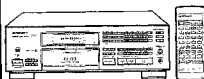


# Service Manual



ORDER NO.  
ARP2228

## COMPACT DISC PLAYER

# PD-31

## PD-8700 PD-8700-S

## PD-7700 PD-7700-S

PD-31, PD-8700, PD-8700-S, PD-7700 AND PD-7700-S HAVE THE FOLLOWING :

| Type | Model |         |           |         |           | Power Requirement                        | Remarks |
|------|-------|---------|-----------|---------|-----------|------------------------------------------|---------|
|      | PD-31 | PD-8700 | PD-8700-S | PD-7700 | PD-7700-S |                                          |         |
| KU   | ○     | —       | —         | ○       | —         | AC120V only                              |         |
| KC   | —     | —       | —         | ○       | —         | AC120V only                              |         |
| HEM  | —     | ○       | —         | —       | —         | AC220-230V, AC230-240V(switchable)*      |         |
| HB   | —     | ○       | —         | ○       | —         | AC220-230V, AC230-240V(switchable)*      |         |
| SD   | —     | ○       | —         | ○       | —         | AC110V, 120-127V, 220V, 240V(switchable) |         |
| HEWM | —     | —       | ○         | —       | ○         | AC220-230V, AC230-240V(switchable)*      |         |
| HPW  | —     | —       | —         | ○       | —         | AC220-230V, AC230-240V(switchable)*      |         |

\* : Change the primary wiring of the power transformer.

- This manual is applicable to the PD-31/KU, PD-8700/HEM, HB, SD, PD-8700-S/HEWM, PD-7700/KU, KC, HEM, HB, SD, HPW and PD-7700-S/HEWM types.
- As to the PD-8700/HEM, HB, SD AND PD-8700-S/HEWM types, refer to page 81.
- As to the PD-7700/KU, KC, HEM, HB, SD, HPW and PD-7700-S/HEWM types, refer to page 83.
- Ce manuel pour le service comprend les explications de réglage en français.
- Este manual de servicio trata del método ajuste escrito en español.

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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.

## 1. SAFETY INFORMATION

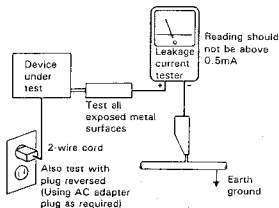
(FOR USA MODEL ONLY)

### 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  $\Delta$  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 ALTHIINA  
NAKYMATTOMALLE LASERSÄTELYLLE.  
ÄLÄ KATSO SÄTEESEEN.

**ADVARSEL:**  
USYNLIG LASERSTRÅLING VED ÅBNING  
NÅR SIKKERHEDSÅBRYDERE ER UDE AF  
FUNKTION UNDGA UDSÆTTELSE FOR  
STRÅLING.

**VARNING!**  
OSYNLIG LASERSTRÅLING NÅR DENNA  
DEL ÄR ÖPPNAD OCH SPÄRREN  
ÄR URKOPPLAD. BETRÄKTA 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.



LASER  
Picture 1  
Warning sign for  
laser radiation

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

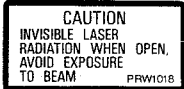
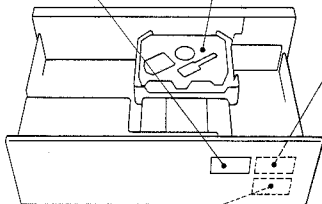
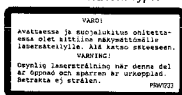
**LASER DIODE CHARACTERISTICS**  
MAXIMUM OUTPUT POWER: 5 mw  
WAVELENGTH: 780-785 nm

**LABEL CHECK**

**HB, HEM and HEWM types**



**HEM and HEWM types**



**HEM and HEWM types**

**HB type**

**Additional Laser Caution**

**1. Laser Interlock Mechanism**

The ON/OFF (ON: low level, OFF: high level) status of the LPS1 (S601) and LPS2 (S602) switches for detecting the loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when both switches LPS1 and LPS2 are not ON (low level) (clamped state). Thus, interlock will no longer function if switches LPS1 (S601) and LPS2 (S602) are deliberately shorted. Also, in the test mode\*, the interlock mechanism does not operate too. Laser diode oscillation will continue if pins 2 and 3 of CXA14715 (IC101) are connected to ground or pin 20 is connected to high level (ON) or the terminals of Q101 are shorted to each other (fault condition).

**2. When the cover is opened with the servo mechanism block removed to be turned over, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 or higher laser beam.**

\* Refer to page 36.

## 2. EXPLODED VIEWS AND PARTS LIST

### NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The  $\Delta$  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.

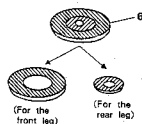
### 2.1 EXTERIOR

#### Parts List of Exterior

| Mark       | No. | Description                  | Parts No.    | Mark | No. | Description                | Parts No. |
|------------|-----|------------------------------|--------------|------|-----|----------------------------|-----------|
| $\Delta$ ● | 1   | Mother board assembly        | PWM1448      |      | 101 | Name plate (ABS)           |           |
| $\Delta$   | 2   | Strain relief                | CM-22C       |      | 102 | SW board assembly          |           |
|            | 3   | AC power cord                | PDG1015      |      | 103 | Under base                 |           |
| $\Delta$   | 4   | Power transformer S (AC120V) | PTT1179      |      | 104 | Audio angle                |           |
| $\Delta$   | 5   | Power transformer A (AC120V) | PTT1183      |      | 105 | Rear base                  |           |
|            | 6   | Stopper                      | PNM1134      |      | 106 | Headphone angle            |           |
|            | 7   | Insulator                    | PNW2020      |      | 107 | Spacer                     |           |
|            | 8   | Cord clasper                 | RNH-184      |      | 108 | Loading mechanism assembly |           |
|            | 9   | Power button                 | PAC1569      |      | 109 | Front panel                |           |
|            | 10  | Select button                | PAC1570      |      | 110 | Headphone board assembly   |           |
|            | 11  | Play button                  | PAC1571      |      | 111 | Jack board assembly        |           |
|            | 12  | Search button                | PAC1572      |      | 112 | S trans board assembly     |           |
|            | 13  | Display window               | PAM1503      |      | 113 | A trans board assembly     |           |
|            | 14  | Control panel                | PNW1948      |      |     |                            |           |
|            | 15  | Tray lens                    | PNW1950      |      |     |                            |           |
|            | 16  | LED lens                     | PNW2019      |      |     |                            |           |
|            | 17  | Tray panel                   | PNW2025      |      |     |                            |           |
|            | 18  | Slide knob                   | RAC1428      |      |     |                            |           |
|            | 19  | Knob C                       | RAC1608      |      |     |                            |           |
|            | 20  | BIAS lens                    | RNK1674      |      |     |                            |           |
|            | 21  | Front panel assembly         | PEA1164      |      |     |                            |           |
|            | 22  | Beonet                       | PYY1148      |      |     |                            |           |
| ●          | 23  | Audio board assembly         | PWZ2118      |      |     |                            |           |
| ●          | 24  | Operate board assembly       | PWZ2112      |      |     |                            |           |
|            | 25  | Screw                        | BBT30P080FZK |      |     |                            |           |
|            | 26  | Screw                        | BBZ30P060FMC |      |     |                            |           |
|            | 27  | Screw                        | BBZ30P080FCC |      |     |                            |           |
|            | 28  | Screw                        | BBZ30P080FCC |      |     |                            |           |
|            | 29  | Screw                        | BBZ30P120FMC |      |     |                            |           |
|            | 30  | Screw                        | BBZ30P120FMC |      |     |                            |           |
|            | 31  | Screw                        | FBT40P080FZK |      |     |                            |           |
|            | 32  | Screw                        | IBZ30P060FCC |      |     |                            |           |
|            | 33  | Screw                        | IBZ30P080FCC |      |     |                            |           |
|            | 34  | Screw                        | IBZ30P150FCC |      |     |                            |           |
|            | 35  | Screw                        | PDZ30P060FCC |      |     |                            |           |

\* 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.





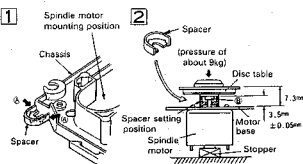


## Parts List of Mechanism section

| Mark | No. | Description                 | Parts No.    | Mark | No. | Description              | Parts No. |
|------|-----|-----------------------------|--------------|------|-----|--------------------------|-----------|
|      | 1   | Lever switch                | DSK1003      |      | 101 | Shaft holder             |           |
|      | 2   | Screw(steel)                | PBA1027      |      | 102 | Loading base             |           |
|      | 3   | Rubber belt                 | PEB1186      |      | 103 | Table bearings assembly  |           |
|      | 4   | Motor pulley                | PNW1634      |      | 104 | Servo mechanism assembly |           |
|      | 5   | Drive gear                  | PNW1996      |      | 105 | Earth lead unit(300V)    |           |
|      | 6   | Timing lever                | PNW1997      |      | 106 | Motor base               |           |
|      | 7   | Gear pulley                 | PNW1998      |      | 107 | Mechanism base           |           |
|      | 8   | SW head                     | PNW1999      |      | 108 | Mechanism chassis        |           |
|      | 9   | Float base                  | PNW2000      |      | 109 | Clamper                  |           |
|      | 10  | Left cam                    | PNW2001      |      | 110 | Connector assembly       |           |
|      | 11  | Right cam                   | PNW2002      |      | 111 | Turn table(AL)           |           |
|      | 12  | Compression spring          | PBH1120      |      |     |                          |           |
|      | 13  | Tention spring              | PBH1121      |      |     |                          |           |
|      | 14  | Float(rubber)               | PEB1014      |      |     |                          |           |
|      | 15  | Table rubber sheet          | PEB1181      |      |     |                          |           |
|      | 16  | Trey                        | PNW2003      |      |     |                          |           |
|      | 17  | Table guide                 | PNW2004      |      |     |                          |           |
|      | 18  | Lock plate                  | PNW2005      |      |     |                          |           |
|      | 19  | DC motor(0.75W)             | PXM1010      |      |     |                          |           |
|      | 20  | Rubber bush                 | PEB1031      |      |     |                          |           |
|      | 21  | Rubber bush                 | PEB1170      |      |     |                          |           |
|      | 22  | Screw                       | BMZ26P040FMC |      |     |                          |           |
|      | 23  | Screw                       | BPZ26P060FMC |      |     |                          |           |
|      | 24  | Screw                       | BPZ26P060FMC |      |     |                          |           |
|      | 25  | Screw                       | IPZ20P080FMC |      |     |                          |           |
|      | 26  | Stop ring                   | YE20S        |      |     |                          |           |
|      | 27  | Turn table assembly         | PEA1165      |      |     |                          |           |
|      | 29  | Push switch                 | DSG1014      |      |     |                          |           |
|      | 30  | Spring                      | PBH1009      |      |     |                          |           |
|      | 31  | Spring                      | PBH1084      |      |     |                          |           |
|      | 32  | Plate spring                | PBK1057      |      |     |                          |           |
|      | 33  | Belt(square)                | PEB1072      |      |     |                          |           |
|      | 34  | Screw                       | PLA1003      |      |     |                          |           |
|      | 35  | Guide bar                   | PLA1071      |      |     |                          |           |
|      | 36  | Pulley                      | PNW1066      |      |     |                          |           |
|      | 37  | Half nut                    | PNW1605      |      |     |                          |           |
|      | 38  | Motor pulley                | PNW1634      |      |     |                          |           |
|      | 39  | Screw                       | PBZ30P080FMC |      |     |                          |           |
|      | 40  | DC motor(1.7W)              | PXM1013      |      |     |                          |           |
|      | 41  | Screw                       | BPZ20P080FZK |      |     |                          |           |
|      | 42  | Screw                       | JFZ20P025FMC |      |     |                          |           |
|      | 43  | Screw                       | PBZ30P060FMC |      |     |                          |           |
|      | 44  | Screw                       | PMZ20P030FMC |      |     |                          |           |
|      | 45  | Pick up assembly            | PEA1030      |      |     |                          |           |
|      | 46  | DC motor assembly(With oil) | PEA1156      |      |     |                          |           |
|      | 47  | Semi-fixed VR(3.3K)         | PCP1008      |      |     |                          |           |
|      | 48  | Caution label               | PRW1244      |      |     |                          |           |
|      | 49  | Disc table                  | PNW1067      |      |     |                          |           |

## • How to install the disc table

- 1 Use nippers or other tool to cut the two sections marked ① in figure 11. Then remove the spacer.
- 2 While supporting the spindle motor shaft with the stopper, put spacer on top of the motor base (angled so it doesn't touch section ②), and stick the disc table on top (takes about 9kg pressure). Take off the spacer.



## 2.3 REMOVE THE TRAY PANEL AND THE TRAY LENS

Hold the tray panel with your hands as the figure shown right, and grasp the tray with your thumbs and then lift the tray panel up while pulling it toward you with the other fingers. (Figs. 1 and 2)

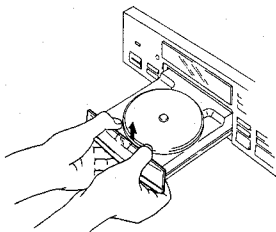


Fig. 1

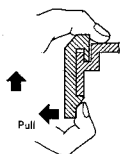


Fig. 2

## 2.4 INSTALL THE TRAY PANEL AND THE TRAY LENS

Align the tray panel with the grooves located at both edges of the tray while holding the tray lens with your fingers, and then press it down till it stops. (Fig. 3)

Hold the tray panel and the tray as shown in Fig. 4 and slide them down till you hear a click sound while pressing strongly with your thumbs. (Figs. 4 and 5)

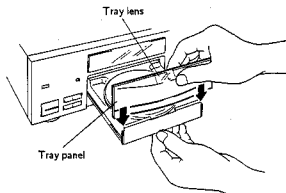


Fig. 3

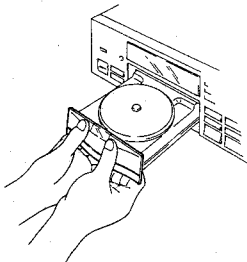


Fig. 4

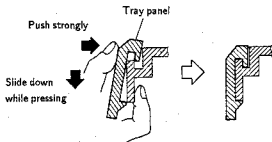


Fig. 5

### 3. P.C.B.'s PARTS LIST

#### NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "⊗" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The  $\Delta$  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.
- 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%).

|      |                      |     |         |   |   |   |   |
|------|----------------------|-----|---------|---|---|---|---|
| 560Ω | 56 × 10 <sup>3</sup> | 561 | RD1/4PS | 5 | 6 | 1 | J |
| 47kΩ | 47 × 10 <sup>3</sup> | 473 | RD1/4PS | 4 | 7 | 3 | J |
| 0.5Ω | 0R5                  |     | RD2H    | 0 | R | 5 | K |
| 1Ω   | 010                  |     | RD1P    | 0 | 1 | 0 | K |

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

|        |                       |      |         |   |   |   |   |   |
|--------|-----------------------|------|---------|---|---|---|---|---|
| 5.62kΩ | 562 × 10 <sup>3</sup> | 5621 | RD1/4SR | 5 | 6 | 2 | 1 | F |
|--------|-----------------------|------|---------|---|---|---|---|---|

| Mark                                                     | No.          | Description          | Parts No.   | Mark             | No.                  | Description  | Parts No. |
|----------------------------------------------------------|--------------|----------------------|-------------|------------------|----------------------|--------------|-----------|
| <b>◎MOTHER BOARD ASSEMBLY</b>                            |              |                      |             |                  |                      |              |           |
| (PWM1448 : PD-31/KU type)                                |              |                      |             |                  |                      |              |           |
| (PWM1449 : PD-8700/HEM, HB, SD and PD-8700-S/HEWM types) |              |                      |             |                  |                      |              |           |
| <b>SEMICONDUCTORS</b>                                    |              |                      |             |                  |                      |              |           |
| $\Delta$                                                 | IC20         | REGULATOR IC         | M5298P      | C104             | ELECTR.CAPACITOR     | CEAS101M10   |           |
|                                                          | IC101        | PRE AMP IC           | CXA1471S    | C110             | CERAMIC CAPACITOR    | CKCYF103Z50  |           |
|                                                          | IC151        | SERVO IC             | CXA1372S    | C151-C153        | ELECTR.CAPACITOR     | CEAS101M10   |           |
| $\Delta$                                                 | IC201, IC202 | POWER OP-AMP, IC     | LA6520      | C155             | CERAMIC CAPACITOR    | CKCYB182K50  |           |
|                                                          | IC301        | EFM DEMODULATION IC  | CXD2500AQ   | C156             | CERAMIC CAPACITOR    | CGCYX333K25  |           |
|                                                          | Q101         | TRANSISTOR           | 2SA854S     | C157             | CERAMIC CAPACITOR    | CGCYX103K25  |           |
|                                                          | Q321, Q351   | TRANSISTOR           | DTC124ES    | C158, C159       | CERAMIC CAPACITOR    | CGCYX104K25  |           |
|                                                          | Q391         | TRANSISTOR           | 2SC1740S    | C160             | ELECTR. CAPACITOR    | CEAS4R7M50   |           |
|                                                          | Q406         | TRANSISTOR           | DTA124ES    | C161             | CERAMIC CAPACITOR    | CGCYX104K25  |           |
|                                                          |              |                      |             | C162             | ELECTR.CAPACITOR     | CEAS010M50   |           |
| $\Delta$                                                 | D11-D14, D52 | DIODE                | 11ES2       | C163             | CERAMIC CAPACITOR    | CGCYX104K25  |           |
|                                                          | D84          | ZENNER DIODE         | MTZJ18B     | C164             | CERAMIC CAPACITOR    | CGCYX103K25  |           |
|                                                          | D301         | DIODE                | 1SS254      | C167             | CERAMIC CAPACITOR    | CKCYF103Z50  |           |
|                                                          | D391-D394    | DIODE(PWM1448 only)  | 1SS254      | C168             | CERAMIC CAPACITOR    | CGCYX333K25  |           |
|                                                          | D395-D397    | DIODE                | 1SS254      | C169             | CERAMIC CAPACITOR    | CGCYX103K25  |           |
| <b>COILS</b>                                             |              |                      |             | C170             | CERAMIC CAPACITOR    | CKCYB332K50  |           |
|                                                          | L391, L392   | AXIAL INDUCTOR       | LAUR22K     | C171, C172       | CERAMIC CAPACITOR    | CKCYB472K50  |           |
|                                                          | L393, L394   | AXIAL INDUCTOR       | LAU010K     | C202, C207       | CERAMIC CAPACITOR    | CKCYF103Z50  |           |
| <b>CAPACITORS</b>                                        |              |                      |             | C212             | CERAMIC CAPACITOR    | CKCYB272K50  |           |
|                                                          | C11, C13     | CERAMIC CAPACITOR    | CKCYF103Z50 | C216, C217       | ELECTR.CAPACITOR     | CEAS330M16   |           |
|                                                          | C15, C16     | CERAMIC CAPACITOR    | CKCYF103Z50 | C301             | CERAMIC CAPACITOR    | CGCYX104K25  |           |
|                                                          | C25          | ELECTR. CAPACITOR    | CEAS332M16  | C302             | ELECTROLYTIC CAPACIT | CEAS4710M6R3 |           |
|                                                          | C26          | ELECTR. CAPACITOR    | CEAS222M16  | C306             | CERAMIC CAPACITOR    | CKCYB152K50  |           |
|                                                          | C27          | ELECTROLYTIC CAPACIT | CEAS471M6R3 | C307             | CERAMIC CAPACITOR    | CGCYX473K25  |           |
|                                                          | C28          | ELECTR. CAPACITOR    | CEAS101M10  | C308             | CERAMIC CAPACITOR    | CGCYX103K25  |           |
|                                                          | C52          | ELECTR. CAPACITOR    | CEAS101M35  | C309             | ELECTR.CAPACITOR     | CEAS4R7M50   |           |
|                                                          | C60          | ELECTR. CAPACITOR    | CEAS010M50  | C310             | CERAMIC CAPACITOR    | CKCYF103Z50  |           |
|                                                          | C101, C102   | ELECTR.CAPACITOR     | CEAS101M10  | C321             | CERAMIC CAPACITOR    | CGCYX104K25  |           |
|                                                          | C103         | CERAMIC CAPACITOR    | COCCB200J50 | C324             | CERAMIC CAPACITOR    | CKCYF103Z50  |           |
|                                                          |              |                      |             | C361             | CERAMIC CAPACITOR    | CKCYF103Z50  |           |
|                                                          |              |                      |             | C362             | CERAMIC CAPACITOR    | CKCYB102K50  |           |
|                                                          |              |                      |             | C397             | CERAMIC CAPACITOR    | CKCYF103Z50  |           |
|                                                          |              |                      |             | <b>RESISTORS</b> |                      |              |           |
|                                                          |              |                      |             | VR102            | VR                   | VRTB6VS223   |           |
|                                                          |              |                      |             | VR103            | VR                   | VRTB6VS102   |           |
|                                                          |              |                      |             | VR151, VR152     | VR                   | VRTB6VS223   |           |
|                                                          |              |                      |             | Other resistors  |                      | RD1/6PM      | □□□□      |

| Mark No.      | Description         | Parts No.      |
|---------------|---------------------|----------------|
| <b>OTHERS</b> |                     |                |
| CN101         | CONNECTOR           | 52045-1610     |
| CN404         | CONNECTOR(7P)       | KPC7           |
| JA301         | OPTICAL OUTPUT JACK | TOTX178        |
| JA391, JA392  | JACK/12V            | PKN1004        |
|               |                     | (PWM1448 only) |
| JA393         | JACK                | PKN1005        |

# ●OPERATE BOARD ASSEMBLY (PWZ2112)

|                       |                   |          |
|-----------------------|-------------------|----------|
| <b>SEMICONDUCTORS</b> |                   |          |
| IC701                 | MICROCOMPUTER, IC | PD4329A  |
| Q801, Q802            | TRANSISTOR        | 2SD2144S |
| Q803, Q804            | TRANSISTOR        | 2SB1296  |
| Q805, Q806            | TRANSISTOR        | 2SD2144S |
| Q807, Q808            | TRANSISTOR        | DTA124ES |
| Q810                  | TRANSISTOR        | DTC124ES |
| D701-D714             | DIODE             | 1SS254   |

## **SWITCHES**

|                                                                                                                                                                             |        |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------|
| S701-S742                                                                                                                                                                   | SWITCH | PSG1006 |
| 1-20, PGM, DELETE, CHECK,<br>CLEAR, >20, RESERVE, REPEAT,<br>TIME, RND, PEAK SEARCH, O/L,<br>HI LITE SCAN, AUTO SPACE,<br>COMPU, TIME FADE, ♪, ♫, ♬, ♯,<br>STOP(□), PLAY(>) |        |         |

## **CAPACITORS**

|           |                   |              |
|-----------|-------------------|--------------|
| C701      | ELECTR. CAPACITOR | CEAS330M16   |
| C702-C714 | AXIAL CAPACITOR   | CKPUYB221K50 |

## **RESISTORS**

All resistors RD1/6PM□□□□

## **OTHERS**

|      |                   |         |
|------|-------------------|---------|
|      | PHOTO SENSOR UNIT | GP1U50X |
| V701 | FL INDICATOR TUBE | PEL1057 |
| X701 | CERAMIC RESONATOR | VSS1014 |

## **SW BOARD ASSEMBLY**

|                       |     |         |
|-----------------------|-----|---------|
| <b>SEMICONDUCTORS</b> |     |         |
| D715                  | LED | PCX1018 |

## **SWITCHES**

|                                                             |        |         |
|-------------------------------------------------------------|--------|---------|
| S743-S748                                                   | SWITCH | PSG1006 |
| ON/STN BY, FADE IN(↗),<br>FADE OUT(↘), ←, →,<br>DISPLAY OFF |        |         |

|      |  |         |
|------|--|---------|
| S749 |  | RSH1017 |
|------|--|---------|

## **RESISTORS**

|      |                      |             |
|------|----------------------|-------------|
| R710 | CARBON FILM RESISTOR | RD1/6PM103J |
|------|----------------------|-------------|

## **HEADPHONE BOARD ASSEMBLY**

|                       |            |         |
|-----------------------|------------|---------|
| <b>SEMICONDUCTORS</b> |            |         |
| IC501                 | OP-AMP, IC | M5218AL |

| Mark No.          | Description                          | Parts No.   |
|-------------------|--------------------------------------|-------------|
| <b>CAPACITORS</b> |                                      |             |
| C803, C804        | CERAMIC CAPACITOR                    | CKCYF103Z50 |
| <b>RESISTORS</b>  |                                      |             |
| VR501             | VARIABLE RESISTOR<br>WITH MOTOR 20KB | PCS1006     |
| Other resistors   |                                      | RD1/6PM□□□□ |

## **JACK BOARD ASSEMBLY**

|              |                |         |
|--------------|----------------|---------|
| <b>COILS</b> |                |         |
| L501-L503    | AXIAL INDUCTOR | LAU010K |

|                   |                   |             |
|-------------------|-------------------|-------------|
| <b>CAPACITORS</b> |                   |             |
| C805-C807         | CERAMIC CAPACITOR | CKCYF103Z50 |

## **OTHERS**

|       |      |         |
|-------|------|---------|
| JA501 | JACK | PKN1001 |
|-------|------|---------|

# ●AUDIO BOARD ASSEMBLY (PWZ2118)

|                       |                   |             |
|-----------------------|-------------------|-------------|
| <b>SEMICONDUCTORS</b> |                   |             |
| IC801, IC802          | D/A CONVERTER, IC | PD2026A     |
| IC803                 | LOGIC IC          | TC74HCU04AP |
| IC808, IC809          | OP-AMP IC         | NJM5532DD   |
| IC901                 | REGULATOR IC      | NJM78L12A   |
| IC902                 | REGULATOR IC      | NJM79L12A   |
| IC903                 | REGULATOR IC      | NJM7805FA   |

|                 |       |        |
|-----------------|-------|--------|
| D802-D804, D806 | DIODE | 1SS254 |
| D901-D906       | DIODE | 11ES2  |

## **CAPACITORS**

|            |                      |             |
|------------|----------------------|-------------|
| C801, C802 | CERAMIC CAPACITOR    | CCCCH120J50 |
| C805, C807 | AUDIO FILM CAPACITOR | CFTXA104J50 |
| C809, C811 | AUDIO FILM CAPACITOR | CFTXA104J50 |
| C812, C813 | CERAMIC CAPACITOR    | CCCCH390J50 |
| C819, C820 | CERAMIC CAPACITOR    | CCCCH390J50 |

|            |                       |             |
|------------|-----------------------|-------------|
| C821       | AUDIO FILM CAPACITOR  | CFTXA681J50 |
| C822       | AUDIO FILM CAPACITOR  | CFTXA562J50 |
| C824       | ELECTR. CAPACITOR     | CEAS470M50  |
| C825       | PL. STYRENE CAPACITOR | CQSA102J50  |
| C828, C830 | AUDIO FILM CAPACITOR  | CFTXA104J50 |

|            |                      |             |
|------------|----------------------|-------------|
| C832, C834 | AUDIO FILM CAPACITOR | CFTXA104J50 |
| C835, C836 | CERAMIC CAPACITOR    | CCCCH390J50 |
| C839, C840 | CERAMIC CAPACITOR    | CCCCH390J50 |
| C841       | AUDIO FILM CAPACITOR | CFTXA562J50 |
| C842       | AUDIO FILM CAPACITOR | CFTXA681J50 |

|            |                       |             |
|------------|-----------------------|-------------|
| C843       | ELECTR. CAPACITOR     | CEAS470M50  |
| C844-C846  | PL. STYRENE CAPACITOR | CQSA102J50  |
| C860, C861 | ELECTR. CAPACITOR     | CEAS330M16  |
| C863, C864 | CERAMIC CAPACITOR     | CKCYF103Z50 |
| C870       | ELECTROLYTIC CAPACIT  | CEAS471M6R3 |

|            |                   |             |
|------------|-------------------|-------------|
| C901, C902 | ELECTR. CAPACITOR | CEAS102M25  |
| C903, C904 | ELECTR. CAPACITOR | CEAS471M16  |
| C905       | ELECTR. CAPACITOR | CEAS332M16  |
| C906       | ELECTR. CAPACITOR | CEAS102M16  |
| C914-C919  | CERAMIC CAPACITOR | CKCYF103Z50 |

| Mark | No. | Description | Parts No. |
|------|-----|-------------|-----------|
|------|-----|-------------|-----------|

# RESISTORS

All resistors

RD1/6PM□□□J

# OTHERS

CN801 CONNECTOR(8P)

KPC9

JA801 JACK

PKB1010

JA802 JACK

PKB1010

X801 XTAL RES (OSC)

PSS1006

# S. TRANS BOARD ASSEMBLY

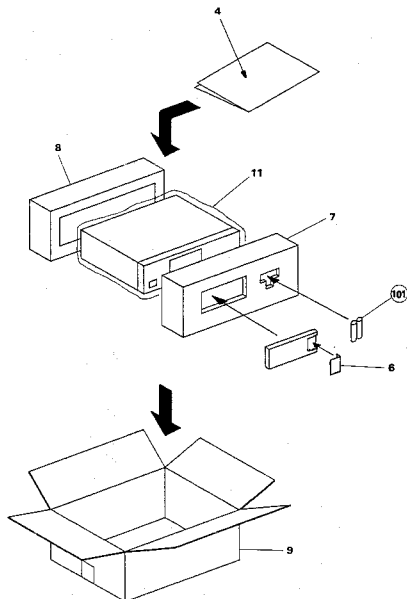
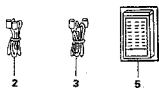
No electrical parts are supplied this assembly.

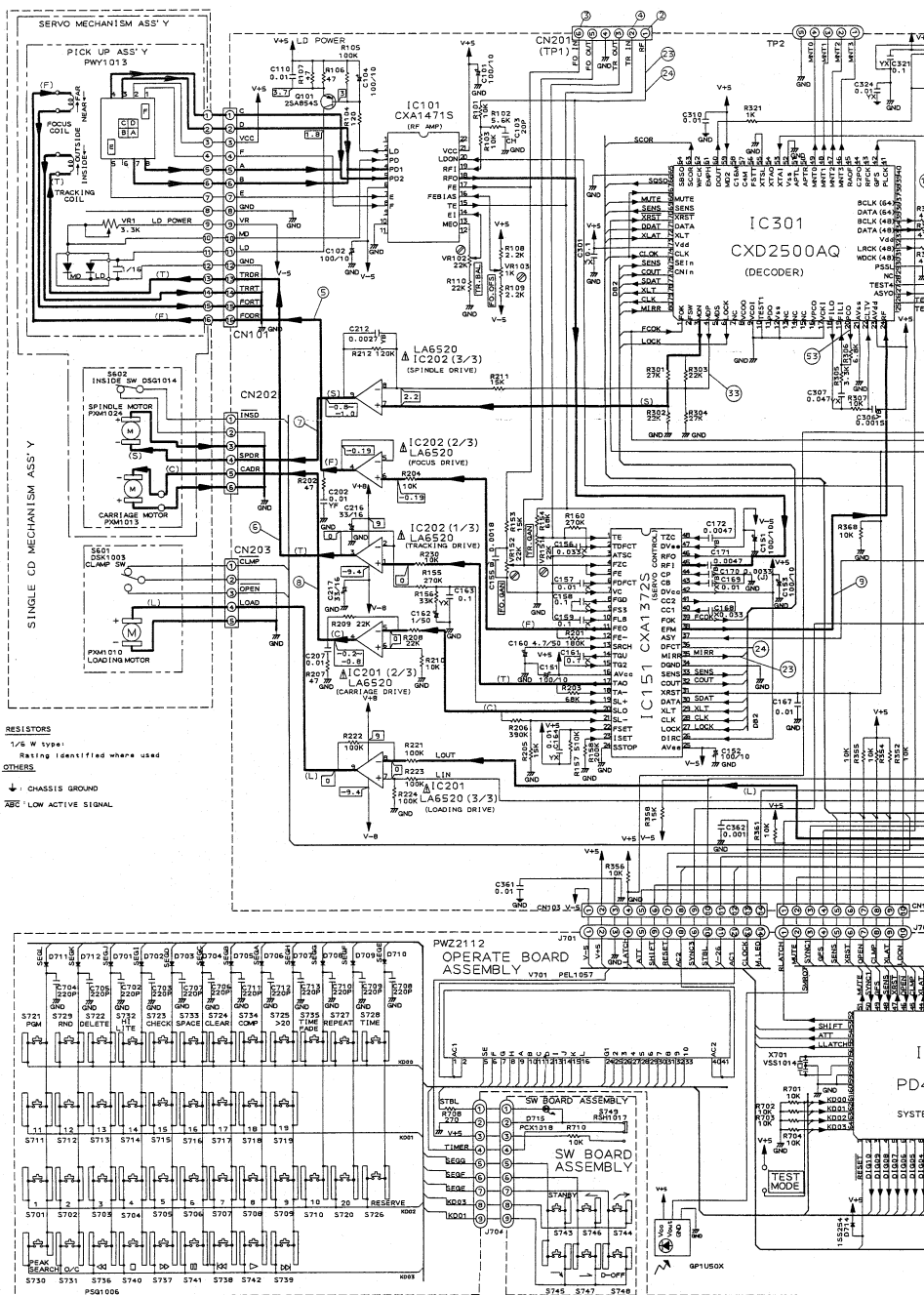
# A. TRANS BOARD ASSEMBLY

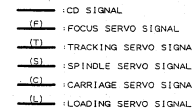
No electrical parts are supplied this assembly.

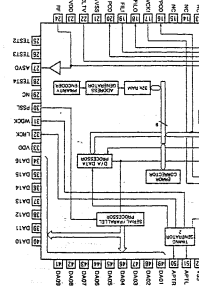
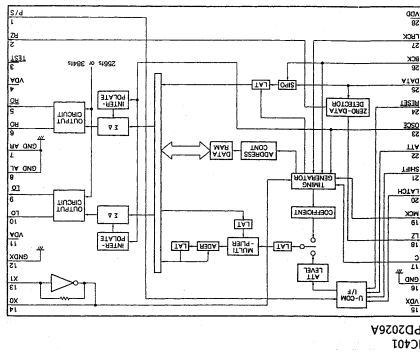
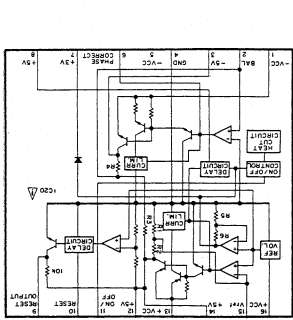
## 4. PACKING

| Mark | No.   | Description                         | Parts No. |
|------|-------|-------------------------------------|-----------|
| 1    | ..... |                                     |           |
| 2    |       | Cord with plug(mini plug)           | PDE-319   |
| 3    |       | Cord with plug                      | PDE1001   |
| 4    |       | Operating instructions<br>(English) | PRB1151   |
| 5    |       | Remote control unit<br>(CU-PD053)   | PWW1069   |
| 6    |       | Battery lid                         | PZN1001   |
| 7    |       | Styrol protector F                  | PHA1163   |
| 8    |       | Styrol protector R                  | PHA1164   |
| 9    |       | CD Packing case                     | PHG1679   |
| 10   | ..... |                                     |           |
| 11   |       | Sheet                               | Z23-007   |
| 101  |       | Mangan battery(R03, AAA)            |           |







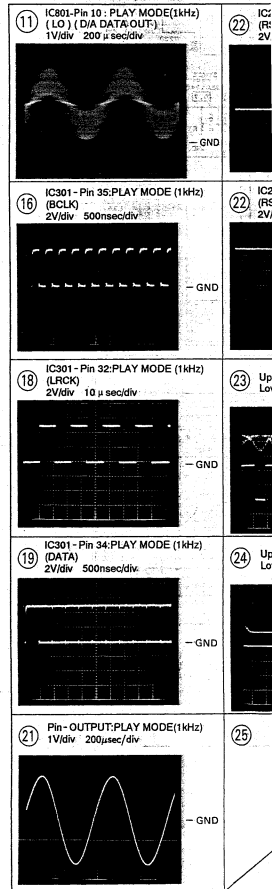
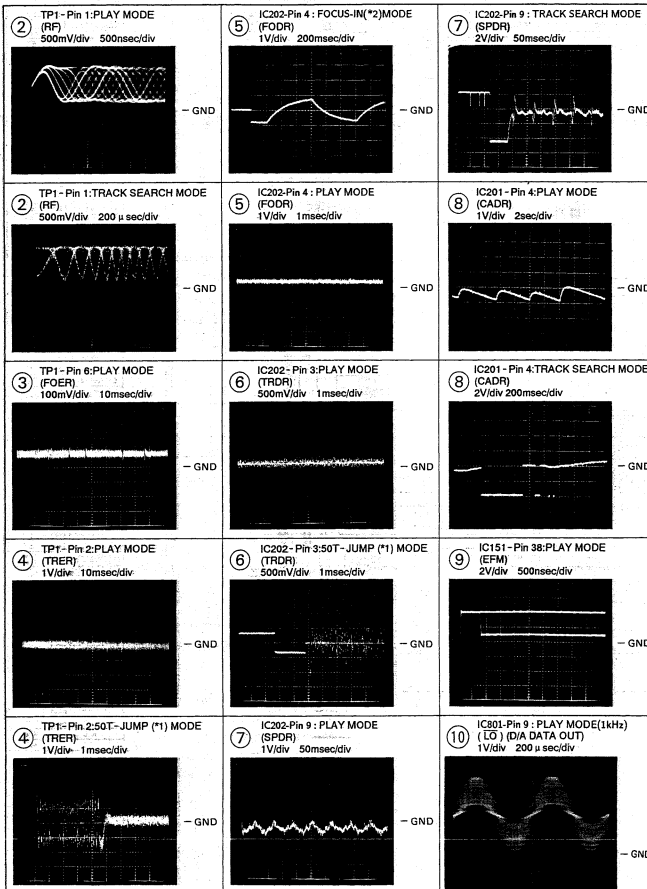


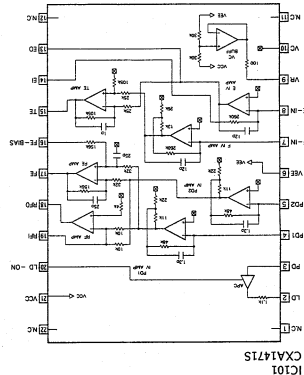
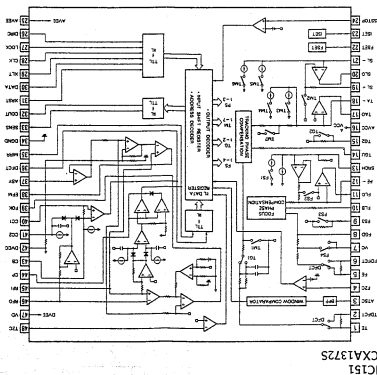
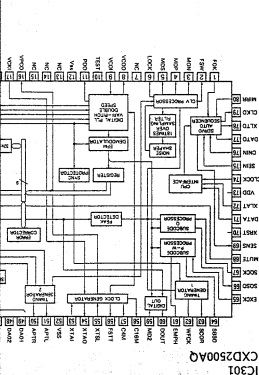
## 5. SCHEMATIC DIAGRAM AND P.C.BOARDS CONNECTION DIAGRAM

### 5.1 Wave Forms

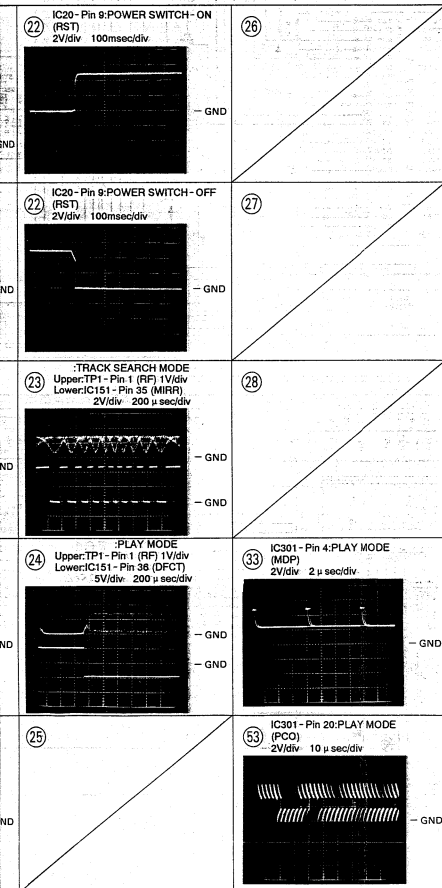
Note: The encircled numbers denote measuring in the schematic diagram.

\*1 50T - JUMP: After switching to the pause mode, press the manual search key.  
\*2 FOCUS - IN: Press the key without loading a disc.





# ● IC BLOCK DIAGRAM



- RESISTORS:**  
Indicated in  $R$ , 1/4W, 1/6W and 1/8W,  $\pm 5\%$  tolerance unless otherwise noted  
k;  $k\Omega$ , M;  $M\Omega$ , (F);  $\pm 1\%$ , (G);  $\pm 2\%$ , (K);  $\pm 10\%$ , (M);  $\pm 20\%$  tolerance.
- CAPACITORS:**  
Indicated in capacity ( $\mu F$ )/voltage(V) unless otherwise noted p;  $\mu F$ . Indication without voltage is 50V except electrolytic capacitor.
- VOLTAGE, CURRENT:**  

DC voltage (V) at play state.

DC current at play state.

Value in ( ) is DC current at stop state.
- OTHERS:**
  - Signal route.
  - Adjusting point.

The  $\Delta$  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.

Marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.
- SWITCHES:** (The underlined indicates the switch position)  
 SWITCH BOARD ASSEMBLY  
 S743: POWER ON-OFF  
 OPERATE BOARD ASSEMBLY  
 S701: 1  
 S702: 2  
 S703: 3  
 S704: 4  
 S705: 5  
 S706: 6  
 S707: 7  
 S708: 8  
 S709: 9  
 S710: 10  
 S711: 11  
 S712: 12  
 S713: 13  
 S714: 14  
 S715: 15  
 S716: 16  
 S717: 17  
 S718: 18  
 S719: 19  
 S720: 20  
 S721: PGM  
 S722: DELETE  
 S723: CHECK  
 S724: CLEAR  
 S725: >20  
 S726: RESERVE  
 S727: REPEAT  
 S728: TIME  
 S729: RND  
 S730: PEAK SEARCH  
 S731: O/L  
 S732: HI LITE SCAN  
 S733: AUTO SPACE  
 S734: COMPU  
 S735: TIME FADE  
 S736:  $\Delta$  MANUAL SEARCH  
 S737: IN  
 S738:  $\Delta$  TRACK SEARCH  
 S739: IN  
 S740: STOP  
 S741: PAUSE  
 S742: PLAY  
 S743: ON/STN BY  
 S744: FADE IN  
 S745: FADE OUT  
 S746: INDEX  
 S747: INDEX  
 S748: DISPLAY OFF

## Line Voltage Selection (For HB, HEM and HEWM types)

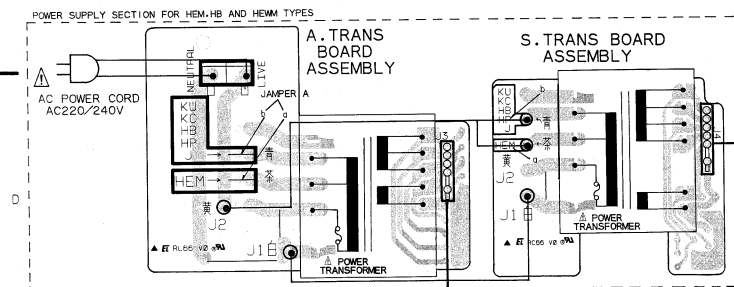
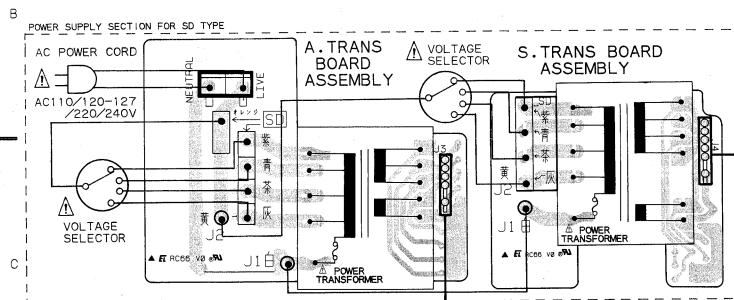
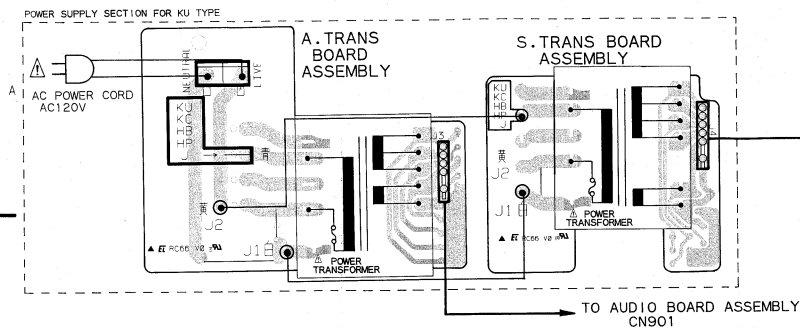
Line voltage can be changed with the following steps.

- Disconnect the AC power cord.
- Remove the top cover.
- Change the position of the jumper wire A as follows

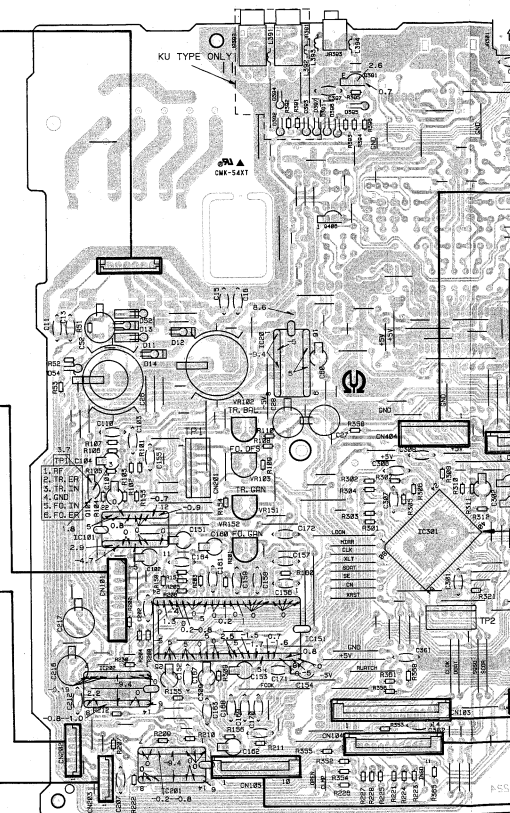
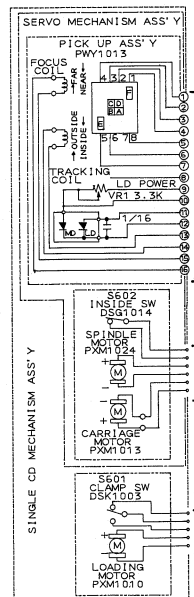
| Voltage | Jumper wire A position |
|---------|------------------------|
| 220V    | a                      |
| 240V    | b                      |

- Stick the line voltage label on the rear panel.

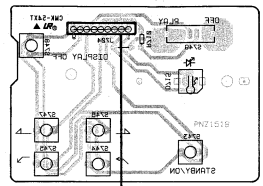
| Parts No. | Description |
|-----------|-------------|
| AXX-193   | 220V label  |
| AXX-192   | 240V label  |



MOTHER BOARD ASSEMBLY  
(PWM1448:KU TYPE)  
(PWM1449:HEM,HB,SD AND HEWM TYPES)

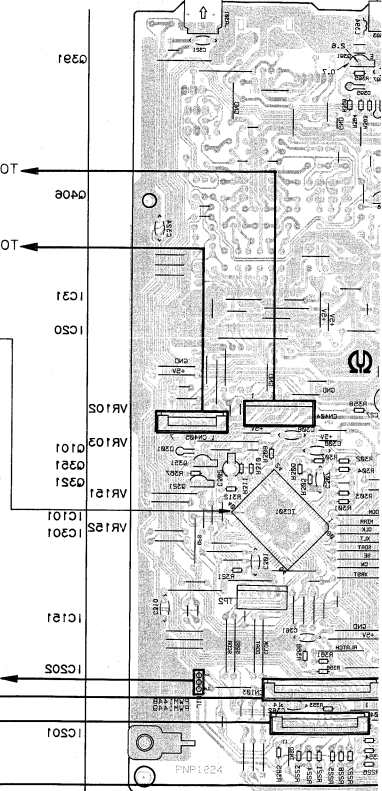




[illegible]

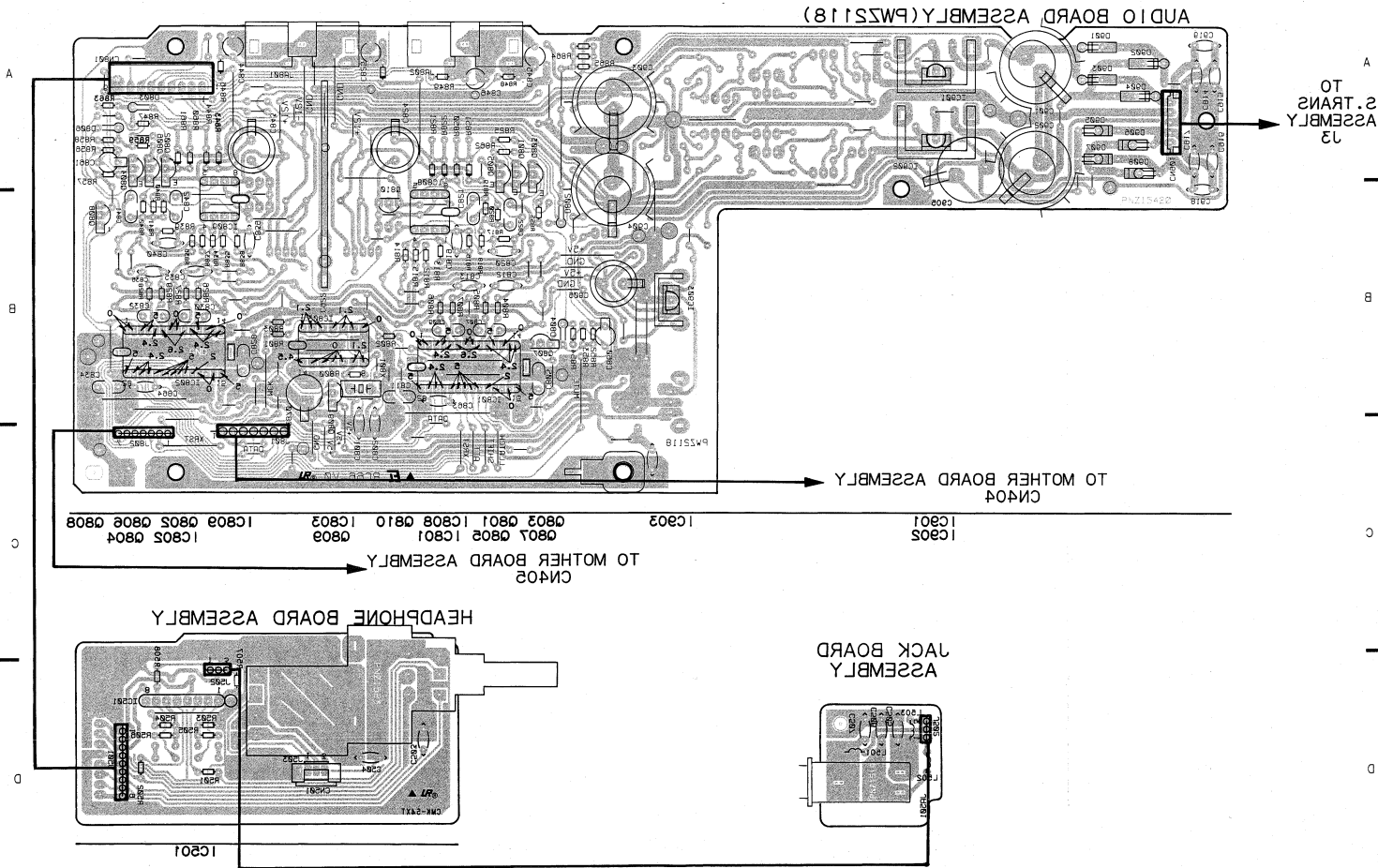
TO AUDIO BOARD  
ASSEMBLY  
J801

TO AUDIO BOARD  
ASSEMBLY  
J802



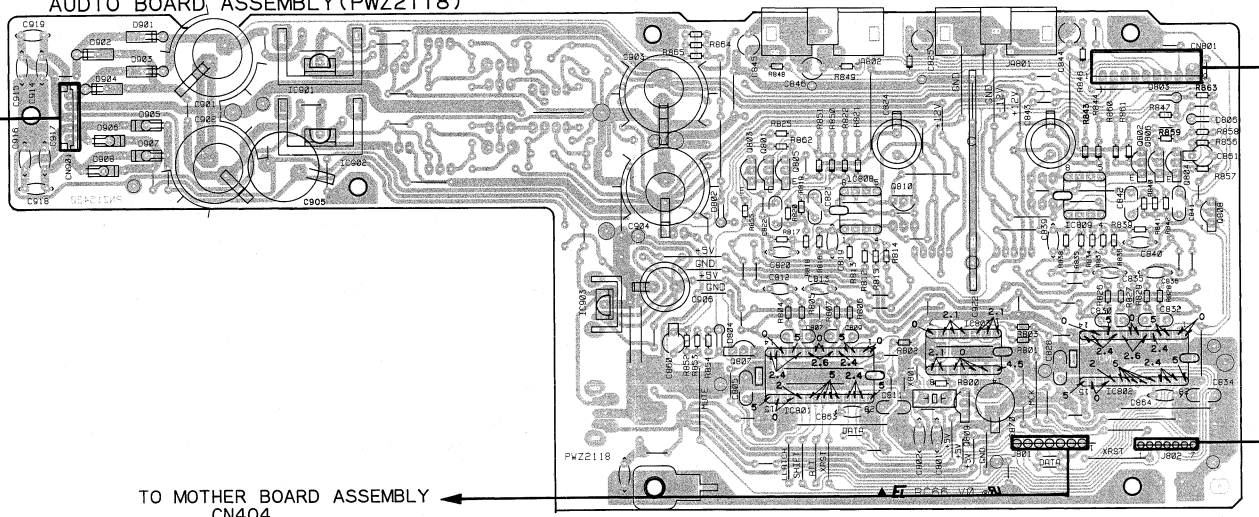


This P.C.B. connection diagram is viewed from the foil side.

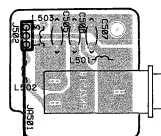


# AUDIO BOARD ASSEMBLY (PWZ2118)

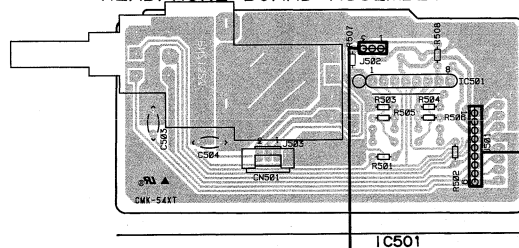
A  
TO  
S. TRANS  
ASSEMBLY  
J3

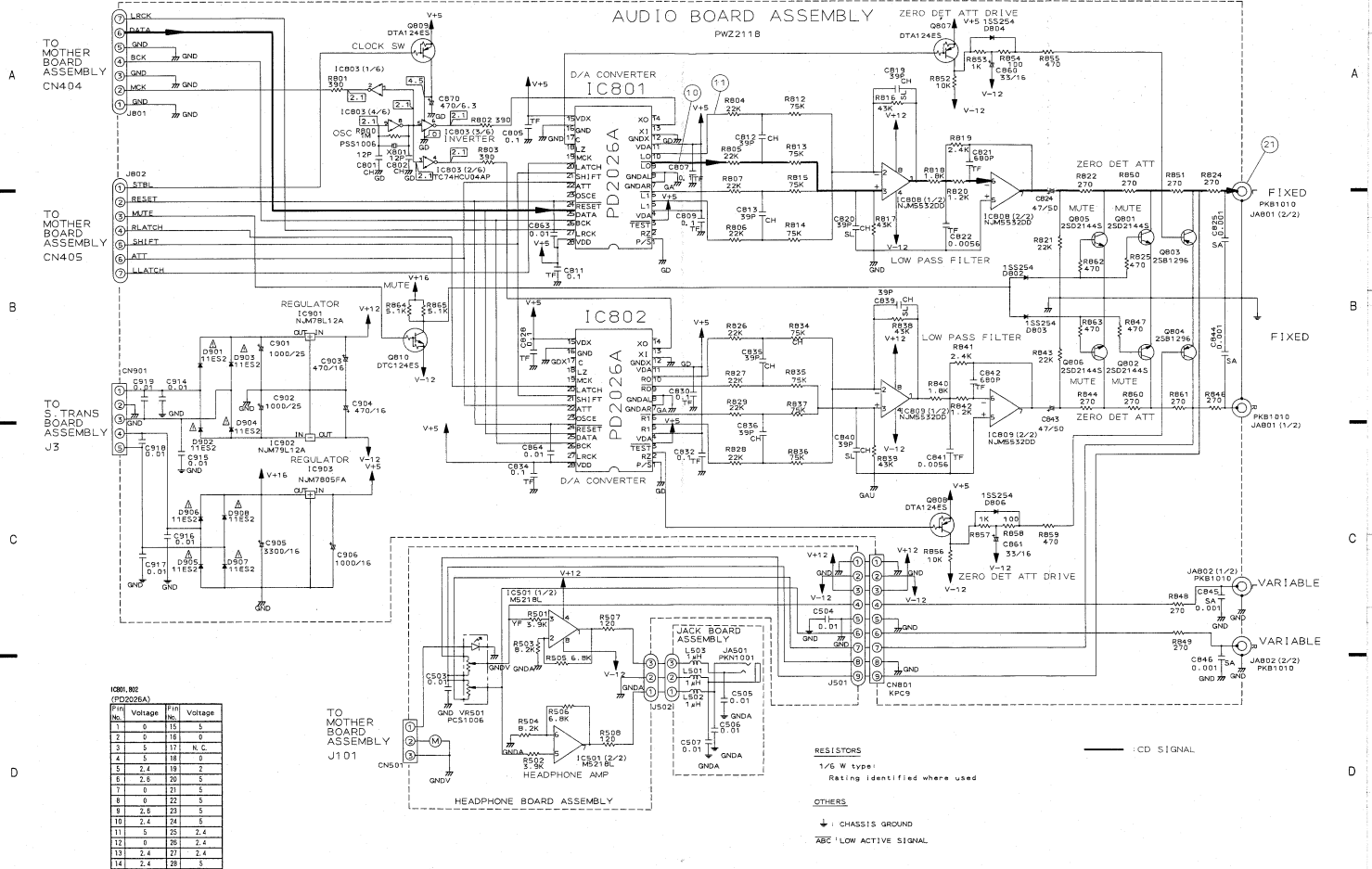


## JACK BOARD ASSEMBLY



## HEADPHONE BOARD ASSEMBLY





IC801 (1/2) (PD2202A)

| Pin | Voltage | Pin | Voltage |
|-----|---------|-----|---------|
| 1   | 0       | 15  | 5       |
| 2   | 0       | 16  | 5       |
| 3   | 5       | 17  | 5       |
| 4   | 5       | 18  | 5       |
| 5   | 2.4     | 19  | 2       |
| 6   | 2.6     | 20  | 5       |
| 7   | 0       | 21  | 5       |
| 8   | 0       | 22  | 5       |
| 9   | 2.6     | 23  | 5       |
| 10  | 2.4     | 24  | 5       |
| 11  | 5       | 25  | 2.4     |
| 12  | 0       | 26  | 2.4     |
| 13  | 2.4     | 27  | 2.4     |
| 14  | 2.4     | 28  | 5       |

## 6. ADJUSTMENTS

### 6.1 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

| Step | Item                                               | Test point                                  | Adjustment location                                               |
|------|----------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------|
| 1    | Focus offset adjustment                            | TP1, Pin 6(FCS. ERR)                        | VR103(FCS. OFS)                                                   |
| 2    | Grating adjustment                                 | TP1, Pin 2(TRK. ERR)                        | Grating adjustment slit                                           |
| 3    | Tracking error balance adjustment                  | TP1, Pin 2(TRK. ERR)                        | VR102(TRK. BAL.)                                                  |
| 4    | Pickup radial/tangential direction tilt adjustment | TP1, Pin 1(RF)                              | Radial tilt adjustment screw,<br>Tangential tilt adjustment screw |
| 5    | RF level adjustment                                | TP1, Pin 1(RF)                              | VR1(RF level)                                                     |
| 6    | Focus servo loop gain adjustment                   | TP1, Pin 5(FCS. IN)<br>TP1, Pin 6(FCS. ERR) | VR152(FCS. GAN)                                                   |
| 7    | Tracking servo loop gain adjustment                | TP1, Pin 3(TRK. IN)<br>TP1, Pin 2(TRK. ERR) | VR151(TRK. GAN)                                                   |
| 8    | Focus error signal verification                    | TP1, Pin 6(FCS. ERR)                        | _____                                                             |

#### ● Abbreviation table

|          |                   |
|----------|-------------------|
| FCS. ERR | :Focus Error      |
| FCS. OFS | :Focus Offset     |
| TRK. ERR | :Tracking Error   |
| TRK. BAL | :Tracking Balance |
| 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. 12-cm disc (with at least about 70 minutes recording)
5. Low-pass filter ( $39\text{ k}\Omega + 0.001\text{ }\mu\text{F}$ )
6. Resistor (100 k $\Omega$ )
7. Hexagonal wrench (M3 mm)
8. Standard tools

#### ● Test point and adjustment variable resistor positions

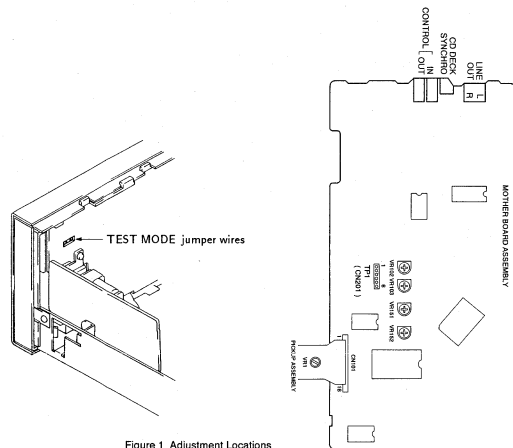


Figure 1 Adjustment Locations

#### ● 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 socket.
2. Short the test mode jumper wires. (See Figure 1.)
3. Plug the power cord back into the AC 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 socket.

**[Operations of the keys in test mode]**

| Code | Key name | Function in test mode     | Explanation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------|----------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | PROGRAM  | Focus servo close         | <p>The laser diode is lit up and the focus actuator is lowered, then raised 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 down, then the actuator is raised and lowered twice 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                                                                                                                                                                                                                                                                                                        |
|------|----------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ◀◀   | MANUAL<br>SEARCH REV | Carriage reverse<br>(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. |
| ▶▶   | MANUAL<br>SEARCH FWD | Carriage forward<br>(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                           | Switches off all the servos and initialized. The pickup remains where it was when this key was 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.

**PROGRAM**

Lights up the laser diode and closes the focus servo.



**PLAY ▷**

Starts the spindle motor and closes the spindle servo.



**PAUSE ||**

Closes the tracking servo.

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

## 1. Focus Offset Adjustment

|                                                                                                         |                                                                                                                |                                                                                                                 |                                                                                             |
|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>● Objective</li> <li>● Symptom when out of adjustment</li> </ul> | Sets the DC offset for the focus error amp.<br><br>The model does not focus in and the RF signal is dirty.     |                                                                                                                 |                                                                                             |
| <ul style="list-style-type: none"> <li>● Measurement instrument connections</li> </ul>                  | Connect the oscilloscope to TP1, Pin 6 (FCS. ERR)<br><br>[Settings] 5 mV/division<br>10 ms/division<br>DC mode | <ul style="list-style-type: none"> <li>● Player state</li> <li>● Adjustment location</li> <li>● Disc</li> </ul> | Test mode, stopped<br>(just the Power switch on)<br><br>VR103 (FCS. OFS)<br><br>None needed |

## [Procedure]

Adjust VR103 (FCS. OFS) so that the DC voltage at TP1, Pin 6 (FCS. ERR) is  $-150 \pm 50$  mV.

## 2. Grating Adjustment

|                                      |                                                                                            |                       |                                                                    |
|--------------------------------------|--------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------|
| ● Objective                          | To align the tracking error generation laser beam spots to the optimum angle on the track. |                       |                                                                    |
| ● Symptom when out of adjustment     | Play does not start, track search is impossible, tracks are skipped.                       |                       |                                                                    |
| ● Measurement instrument connections | Connect the oscilloscope to TP1, Pin 2 (TRK. ERR) via a low pass filter.<br>(See Figure 2) | ● Player state        | Test mode, focus and spindle servos closed and tracking servo open |
|                                      | [Settings] 50 mV/division<br>5 ms/division<br>DC mode                                      | ● Adjustment location | Pickup grating adjustment slit                                     |
|                                      |                                                                                            | ● Disc                | 12 - cm disc.<br>(YEDS-7 can not be used.)                         |

### [Procedure]

1. Move the pickup to the outer edge of the disc with the MANUAL SEARCH FWD  $\triangleright$  or REV  $\triangleleft$  key.
2. Press the PROGRAM key, then the PLAY  $\triangleright$  key in that order to close the focus servo then the spindle servo.
3. Insert an ordinary screwdriver into the grating adjustment slit and adjust the grating to find the null point. For more details, see the next page.
4. If you slowly turn the screwdriver clockwise from the null point, the amplitude of the wave gradually increases, then if you continue turning the screwdriver, the amplitude of the wave becomes smaller again. Turn the screwdriver clockwise from the null point and set the grating to the first point where the wave amplitude reaches its maximum.

**Reference :** Figure 3 shows the relation between the angle of the tracking beam with the track and the waveform.

**Note :** The amplitude of the tracking error signal is about 3 Vp-p (when a  $39\text{ k}\Omega + 0.001\text{ }\mu\text{F}$  low pass filter is used). If this amplitude is extremely small (2 Vp-p or less), the objective lens or the pickup malfunction may be the cause. If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, the grating is not adjusted to the optimum point, so adjust it again.

5. Return the pickup to more or less midway across the disc with the MANUAL SEARCH REV  $\triangleleft$  key, press the PAUSE key and double check that the track number and elapsed time are displayed on the front panel. If they are not displayed at this time or the elapsed time changes irregularly, double check the null point and adjust the grating again.

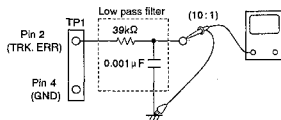
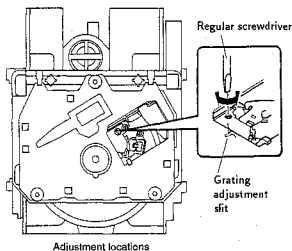


Figure 2



### [How to find the null point]

When you insert the regular screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP1, Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which the envelope of the waveform is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Figure 3.)

This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

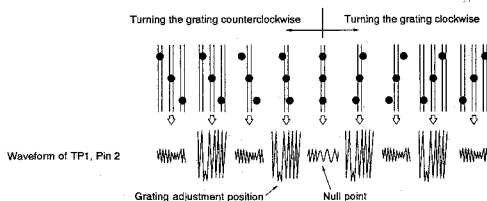
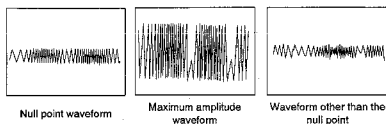


Figure 3

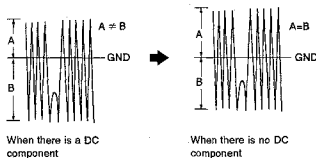


### 3. Tracking Error Balance Adjustment

|                                      |                                                                                                  |                       |                                                                    |
|--------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------|
| ● Objective                          | To correct for the variation in the sensitivity of the tracking photodiode.                      |                       |                                                                    |
| ● 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. | ● Player state        | Test mode, focus and spindle servos closed and tracking servo open |
|                                      | [Settings] 50 mV/division<br>5 ms/division<br>DC mode                                            | ● Adjustment location | VR102 (TRK. BAL)                                                   |
|                                      |                                                                                                  | ● Disc                | YEDS-7                                                             |

#### [Procedure]

1. Move the pickup to midway across the disc (R=35 mm) with the MANUAL SEARCH FWD  $\triangleright\triangleright$  or REV  $\triangleleft\triangleleft$  key.
2. Press the 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. Adjust VR102 (TRK. BAL) so that the positive amplitude and negative amplitude of the tracking error signal at TP1, Pin 2 (TRK. ERR) are the same (in other words, so that there is no DC component).



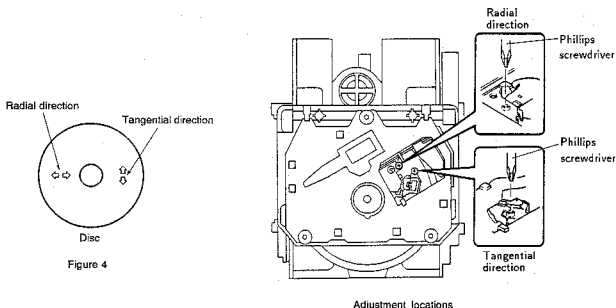
## 4. Pickup Radial/Tangential Tilt Adjustment

|                                      |                                                                                                                                                               |                                                           |                                                                                                                                                   |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| ● 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. |                                                           |                                                                                                                                                   |
| ● Symptom when out of adjustment     | Sound broken; some discs can be played but not others.                                                                                                        |                                                           |                                                                                                                                                   |
| ● Measurement instrument connections | Connect the oscilloscope to TP1, Pin 1 (RF).<br><br>[Settings] 20 mV/division<br>200 ns/division<br>AC mode                                                   | ● Player state<br><br>● Adjustment location<br><br>● Disc | Test mode, play<br><br>Pickup radial tilt adjustment screw and tangential tilt adjustment screw<br><br>12 - cm disc.<br>(YEDS-7 can not be used.) |

## [Procedure]

1. Press the MANUAL SEARCH FWD >> or REV << key so that the radial / tangential tilt screws can be adjusted. Press the PROGRAM key, the PLAY > key, then the PAUSE || key in that order to close the focus servo then the spindle servo 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 5).
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.

**Note:** Radial and tangential mean the directions relative to the disc shown in Figure 4.



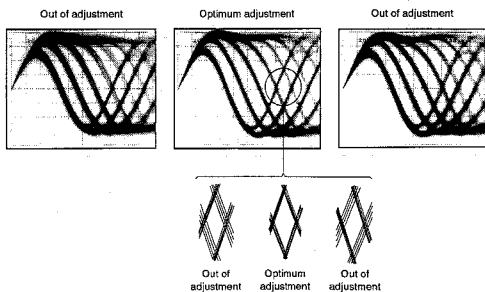


Figure 5 Eye pattern

## 5. RF Level Adjustment

|                                      |                                                        |                                     |                                |
|--------------------------------------|--------------------------------------------------------|-------------------------------------|--------------------------------|
| ● Objective                          | To optimize the playback RF signal amplitude           |                                     |                                |
| ● Symptom when out of adjustment     | No play or no search                                   |                                     |                                |
| ● Measurement instrument connections | Connect the oscilloscope to TP1, Pin 1 (RF).           | ● Player state                      | Test mode, play                |
|                                      | [Settings] 50 mV/division<br>10 ms/division<br>AC mode | ● Adjustment location<br><br>● Disc | VR1(laser power)<br><br>YEDS-7 |

## [Procedure]

1. Move the pickup to midway across the disc ( $R=35\text{ mm}$ ) with the MANUAL SEARCH FWD  $\triangleright\triangleright$  or REV  $\triangleleft\triangleleft$  key, then press the PROGRAM key, then the PLAY  $\triangleright$  key in that order to close the respective servos and put the player into play mode.
2. Adjust VR1 (laser power) so that the RF signal amplitude is  $1.2\text{ Vp-p} \pm 0.1\text{ V}$ .

## 6. 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 6.                                         | ● Player state        | Test mode, play  |
|                                      | [Settings]                                            | ● Adjustment location | VR152 (FCS. GAN) |
|                                      | CH1 CH2<br>20 mV/division 5 mV/division<br>X - Y mode | ● Disc                | YEDS-7           |

### [Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the MANUAL SEARCH FWD  $\triangleright$  or REV  $\triangleleft$  key to move the pickup to halfway across the disc (R=35 mm), then press the PROGRAM key, the PLAY  $\triangleright$  key, then the PAUSE  $\square$  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.

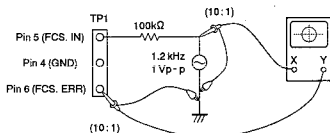
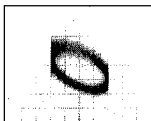
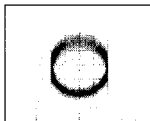


Figure 6

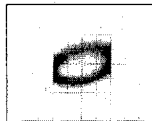
### Focus Gain Adjustment



Higher gain



Optimum gain



Lower gain

## 7. 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 7.                                                                          | ● Player state                                                | Test mode, play |
|                                      | [Settings]<br>CH1<br>50 mV/division<br>CH2<br>50 mV/division<br>X-Y mode               | ● Adjustment location<br>VR151 (TRK. GAN)<br>● Disc<br>YEDS-7 |                 |

## [Procedure]

1. Set the AF generator output to 1.2 kHz and 2 V<sub>p-p</sub>.
2. Press the MANUAL SEARCH FWD ▷▷ or REV ◁◁ key to move the pickup to halfway across the disc (R=35 mm), then press the PROGRAM key, the PLAY ▷ key, then 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.

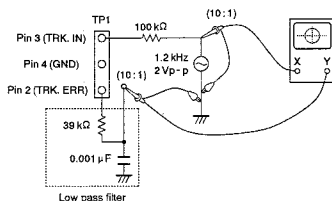
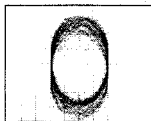


Figure 7

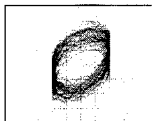
## Tracking Gain Adjustment



Higher gain



Optimum gain



Lower gain

## 8. Focus Error Signal (Focus S Curve) Verification

|                                      |                                                                                                                                                                                                                                                                       |                                                           |                                           |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------|
| ● Objective                          | To judge whether the pickup is ok or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the waveform for the focus error signal. |                                                           |                                           |
| ● Symptom when out of adjustment     |                                                                                                                                                                                                                                                                       |                                                           |                                           |
| ● Measurement instrument connections | Connect the oscilloscope to TP1, Pin 6 (FCS. ERR).<br><br>[Settings] 100 mV/division<br>5 ms/division<br>DC mode                                                                                                                                                      | ● Player state<br><br>● Adjustment location<br><br>● Disc | Test mode, stop<br><br>None<br><br>YEDS-7 |

## [Procedure]

1. Connect TP1 Pin 5 to ground.
2. Mount the disc.
3. While watching the oscilloscope screen, press the PROGRAM key and observe the waveform in Figure 8 for a moment. Verify that the amplitude is at least 2.5 Vp-p and that the positive and negative amplitude are about equal. Since the waveform is only output for a moment when the PROGRAM key is pressed, press this key over and over until you have checked the waveform.

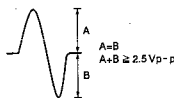


Figure 8

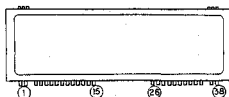
## [Judging the pickup]

Do not judge the pickup until all the adjustments have been made correctly. In the following cases, there may be something wrong with the pickup.

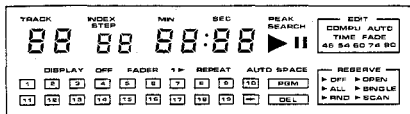
1. The tracking error signal amplitude is extremely small (less than 2 Vp-p).
2. The focus error signal amplitude is extremely small (less than 2.5 Vp-p).
3. The positive and negative amplitudes of the focus error signal are extremely asymmetrical (2 : 1 ratio or more).
4. The RF signal is too small (less than 0.8 Vp-p) and even if VR1 (laser power) is adjusted, the RF signal can not be brought up to the standard level.

## 7. FL INFORMATION

## EXTERNAL VIEWS

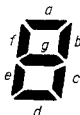


## DISPLAY PATTERN ANODE GRID ASSIGNMENT



## ANODE GRID ASSIGNMENT AND PIN ASSIGNMENT

|   | G1    | G2      | G3    | G4    | G5  | G6     | G7         | G8         | G9          | G10 |
|---|-------|---------|-------|-------|-----|--------|------------|------------|-------------|-----|
| a | a     | a       | a     | a     | a   | a      | a          |            | ▶           | a   |
| b | b     | b       | b     | b     | b   | b      | b          | SCAN       |             | b   |
| c | c     | c       | c     | c     | c   | c      | c          | ▶ OPEN     | 54          | c   |
| d | d     | d       | d     | d     | d   | d      | d          | reserve    | 46          | d   |
| e | e     | e       | e     | e     | e   | e      | e          | ▶ (single) | 60          | e   |
| f | f     | f       | f     | f     | f   | f      | f          | ▶ (scan)   | 90          | f   |
| g | g     | g       | g     | g     | g   | g      | g          | SINGLE     | 74          | g   |
| h |       | DISPLAY | OFF   | FADER | 1 ▶ | REPEAT | AUTO SPACE | ▶ OFF      | TIME FADE   |     |
| i | 1     | 2       | 4     | 5     | 7   | 8      | 10         | ▶ (ALL)    | AUTO        |     |
| j | TRACK | 3       | STEP  | 6     |     | 9      | PGM        | ALL        | EDIT        | :   |
| k |       | 12      | INDEX | 15    | MIN | 18     | ▶          | ▶ (RND)    | PEAK SEARCH | SEC |
| l | 11    | 13      | 14    | 16    | 17  | 19     | DEL        | RND        | COMPU       |     |



## PIN ASSIGNMENT

| Pin No.    | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9   | 10 | 11 | 12 | 13 |
|------------|----|----|----|----|----|----|----|----|-----|----|----|----|----|
| Assignment | F  | F  | NP | e  | f  | g  | h  | a  | b   | c  | d  | i  | j  |
| Pin No.    | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22  | 23 | 24 | 25 | 26 |
| Assignment | k  | l  | NP | NP | NP | NP | NP | NP | NP  | NP | NP | NP | G1 |
| Pin No.    | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35  | 36 | 37 | 38 |    |
| Assignment | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | NP | F  | F  |    |

F: Filament

G1-G10: Grid

a-l: Anode

NP: No pin

## 8. FOR PD-8700/HEM, HB, SD AND PD-8700-S/HEWM TYPES

### NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ▲ 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.

### CONTRAST OF MISCELLANEOUS PARTS

The PD-8700/HEM, HB, SD and PD-8700-S/HEWM types are the same as the PD-31/KU type with the exception of the following sections.

| Mark | Symbol & Description                               | Part No.   |              |             |             |                 | Remarks     |
|------|----------------------------------------------------|------------|--------------|-------------|-------------|-----------------|-------------|
|      |                                                    | PD-31/KU   | PD-8700 /HEM | PD-8700 /HB | PD-8700 /SD | PD-8700-S /HEWM |             |
| ▲●   | Mother board assembly                              | PWM1448    | PWM1449      | PWM1449     | PWM1449     | PWM1449         | *1          |
| ▲    | S trans board assembly                             | Non supply | Non supply   | Non supply  | Non supply  | Non supply      | *2          |
| ▲    | A trans board assembly                             | Non supply | Non supply   | Non supply  | Non supply  | Non supply      | *2          |
| ▲    | AC power cord                                      | PDG1015    | PDG1003      | PDG1036     | PDG1013     | PDG1003         |             |
| ▲    | Power transformer S(AC120V)                        | PTT1179    |              |             |             |                 |             |
| ▲    | Power transformer S(AC220,240V)                    |            | PTT1178      | PTT1178     |             | PTT1178         |             |
| ▲    | Power transformer S<br>(AC110, 120-127, 220, 240V) |            |              |             | PTT1181     |                 |             |
| ▲    | Power transformer A(AC120V)                        | PTT1183    |              |             |             |                 |             |
| ▲    | Power transformer A(AC220,240V)                    |            | PTT1182      | PTT1182     |             | PTT1182         |             |
| ▲    | Power transformer A<br>(AC110, 120-127, 220, 240V) |            |              |             | PTT1185     |                 |             |
| ▲    | Voltage selector                                   |            |              |             | PSB1002     |                 |             |
| ▲    | Strain relief                                      | CM-22C     | CM-22B       | CM-22B      | CM-22B      | CM-22B          |             |
| ▲    | Cord with plug (mini plug)                         | PDE-319    |              |             |             |                 |             |
|      | Front panel assembly                               | PEA1164    | PEA1132      | PEA1132     | PEA1132     | PEA1152         |             |
|      | Control panel                                      | PNW1948    | PNW1948      | PNW1948     | PNW1948     | PNW2009         |             |
|      | Power button                                       | PAC1569    | PAC1569      | PAC1569     | PAC1569     | PAC1590         |             |
|      | Select button                                      | PAC1570    | PAC1570      | PAC1570     | PAC1570     | PAC1591         |             |
|      | Play button                                        | PAC1571    | PAC1571      | PAC1571     | PAC1571     | PAC1592         |             |
|      | Search button                                      | PAC1572    | PAC1572      | PAC1572     | PAC1572     | PAC1593         |             |
|      | Headphone knob S                                   |            |              |             |             | PAC1597         |             |
|      | Knob C                                             | RAC1608    | RAC1608      | RAC1608     | RAC1608     |                 |             |
|      | Slide knob                                         | RAC1428    | RAC1428      | RAC1428     | RAC1428     | PAC1599         |             |
|      | Tray panel                                         | PNW2025    | PNW1949      | PNW1949     | PNW1949     | PNW2011         |             |
|      | Display window                                     | PAM1503    | PAM1488      | PAM1488     | PAM1503     | PAM1488         |             |
|      | Bonnet                                             | PYY1148    | PYY1148      | PYY1148     | PYY1148     | PYY1154         |             |
|      | CD packing case                                    | PHG1679    | PHG1678      | PHG1678     | PHG1678     | PHG1680         | For packing |

\*1: As to the parts list of the Mother board assembly, refer to page 12.

\*2: These assemblies are the same as the PD-31/KU type for the service supply parts.

| Mark | Symbol & Description                                                            | Part No. |              |             |             |                 | Remarks |
|------|---------------------------------------------------------------------------------|----------|--------------|-------------|-------------|-----------------|---------|
|      |                                                                                 | PD-31/KU | PD-8700 /HEM | PD-8700 /HB | PD-8700 /SD | PD-8700-S /HEWM |         |
|      | Operating instructions(English)                                                 | PRB1151  |              | PRB1139     | PRB1139     |                 |         |
|      | Operating instructions<br>(English/French)                                      |          | PRE1142      |             |             |                 |         |
|      | Operating instructions<br>(German/Italian/Dutch/Swedish<br>/Spanish/Portuguese) |          | PRF1042      |             |             | PRF1042         |         |
|      | Operating instructions<br>(Spanish)                                             |          |              |             | PRC1035     |                 |         |

## 9. FOR PD-7700/KU, KC, HEM, HB, SD, HPW AND PD-7700-S/HEWM TYPES

### 9.1 CONTRAST OF MISCELLANEOUS PARTS

#### NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- 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.

The PD-7700/KU, KC, HEM, HB, SD, HPW and PD-7700-S/HEWM types are the same as the PD-31/KU type with the exception of the following sections.

| Mark | Symbol & Description                                                        | Part No.   |            |            |             |            |            |             |                |  |  | Remarks |
|------|-----------------------------------------------------------------------------|------------|------------|------------|-------------|------------|------------|-------------|----------------|--|--|---------|
|      |                                                                             | PD-31/KU   | PD-7700/KU | PD-7700/KC | PD-7700/HEM | PD-7700/HB | PD-7700/SD | PD-7700/HPW | PD-7700-S/HEWM |  |  |         |
| Δ●   | Mother board assembly                                                       | PWM1448    | PWM1444    | PWM1444    | PWM1445     | PWM1445    | PWM1447    | PWM1444     | PWM1445        |  |  |         |
| Δ●   | Audio board assembly                                                        | PWZ2118    | .....      | .....      | .....       | .....      | .....      | .....       | .....          |  |  |         |
| Δ    | S trans board assembly                                                      | Non supply | .....      | .....      | .....       | .....      | .....      | .....       | .....          |  |  |         |
| Δ    | A trans board assembly                                                      | Non supply | .....      | .....      | .....       | .....      | .....      | .....       | .....          |  |  |         |
| Δ●   | Operate board assembly                                                      | PWZ2112    | PWZ2111    | PWZ2111    | PWZ2111     | PWZ2111    | PWZ2111    | PWZ2111     | PWZ2111        |  |  |         |
| Δ    | SW board assembly                                                           | Non supply | Non supply | Non supply | Non supply  | Non supply | Non supply | Non supply  | Non supply     |  |  |         |
| Δ    | Headphone board assembly                                                    | Non supply | Non supply | Non supply | Non supply  | Non supply | Non supply | Non supply  | Non supply     |  |  |         |
| Δ    | Jack board assembly                                                         | Non supply | Non supply | Non supply | Non supply  | Non supply | Non supply | Non supply  | Non supply     |  |  |         |
| Δ    | Voltage selector                                                            | .....      | .....      | .....      | .....       | .....      | PSB1002    | .....       | .....          |  |  |         |
| Δ    | Power transformer S(AC120V)                                                 | PTT1179    | PTT1179    | PTT1179    | .....       | .....      | .....      | .....       | .....          |  |  |         |
| Δ    | Power transformer S(AC220-240V)                                             | .....      | .....      | .....      | PTT1178     | PTT1178    | .....      | PTT1178     | PTT1178        |  |  |         |
| Δ    | Power transformer S(AC110, 120-127, 220, 240V)                              | .....      | .....      | .....      | .....       | PTT1181    | .....      | .....       | .....          |  |  |         |
| Δ    | Power transformer A(AC120V)                                                 | FTT1183    | .....      | .....      | .....       | .....      | .....      | .....       | .....          |  |  |         |
| Δ    | AC power cord                                                               | PDG1015    | PDG1015    | PDG1015    | PDG1003     | PDG1036    | PDG1013    | PDG1006     | PDG1003        |  |  |         |
| Δ    | Strala relief                                                               | CM-22C     | CM-22C     | CM-22C     | CM-22B      | CM-22B     | CM-22B     | CM-22B      | CM-22B         |  |  |         |
| Δ    | Front panel assembly                                                        | PEA1164    | PEA1133    | PEA1133    | PEA1133     | PEA1133    | PEA1133    | PEA1133     | PEA1153        |  |  |         |
| Δ    | Control panel                                                               | PNW1948    | PNW1948    | PNW1948    | PNW1948     | PNW1948    | PNW1948    | PNW1948     | PNW2009        |  |  |         |
| Δ    | Power button                                                                | PAC1569    | PAC1569    | PAC1569    | PAC1569     | PAC1569    | PAC1569    | PAC1569     | PAC1590        |  |  |         |
| Δ    | Select button                                                               | PAC1570    | PAC1570    | PAC1570    | PAC1570     | PAC1570    | PAC1570    | PAC1570     | PAC1591        |  |  |         |
| Δ    | Play button                                                                 | PAC1571    | PAC1571    | PAC1571    | PAC1571     | PAC1571    | PAC1571    | PAC1571     | PAC1592        |  |  |         |
| Δ    | Search button                                                               | PAC1572    | .....      | .....      | .....       | .....      | .....      | .....       | .....          |  |  |         |
| Δ    | Headphone knob                                                              | .....      | PAC1600    | PAC1600    | PAC1600     | PAC1600    | PAC1600    | PAC1600     | PAC1601        |  |  |         |
| Δ    | Slide knob                                                                  | RAC1428    | .....      | .....      | .....       | .....      | .....      | .....       | .....          |  |  |         |
| Δ    | Knob C                                                                      | RAC1608    | .....      | .....      | .....       | .....      | .....      | .....       | .....          |  |  |         |
| Δ    | Display window                                                              | PAM1503    | PAM1503    | PAM1503    | PAM1488     | PAM1488    | PAM1503    | PAM1503     | PAM1488        |  |  |         |
| Δ    | Cord with plug (mini plug)                                                  | PDE-319    | .....      | .....      | .....       | .....      | .....      | .....       | .....          |  |  |         |
| Δ    | Tray panel                                                                  | PNW2025    | PNW1949    | PNW1949    | PNW1949     | PNW1949    | PNW1949    | PNW1949     | PNW2011        |  |  |         |
| Δ    | Bracket                                                                     | PYY1148    | PYY1148    | PYY1148    | PYY1148     | PYY1148    | PYY1148    | PYY1148     | PYY1154        |  |  |         |
| Δ    | CD packing case                                                             | PHG1679    | PHG1683    | PHG1683    | PHG1681     | PHG1681    | PHG1681    | PHG1681     | PHG1682        |  |  |         |
| Δ    | Stopper                                                                     | PNM1134    | PNM1070    | PNM1070    | PNM1070     | PNM1070    | PNM1070    | PNM1070     | PNM1070        |  |  |         |
| Δ    | Insulator                                                                   | PNW2020    | VNK1095    | VNK1095    | VNK1095     | VNK1095    | VNK1095    | VNK1095     | VNK1095        |  |  |         |
| Δ    | Cord clasper                                                                | RNH-184    | .....      | .....      | .....       | .....      | .....      | .....       | .....          |  |  |         |
| Δ    | BIAS lens                                                                   | RNK1674    | .....      | .....      | .....       | .....      | .....      | .....       | .....          |  |  |         |
| Δ    | Operating instructions(English)                                             | PRB1151    | PRB1139    | .....      | .....       | PRB1139    | PRB1139    | PRB1139     | .....          |  |  |         |
| Δ    | Operating instructions(English/French)                                      | .....      | .....      | PRE1142    | PRE1142     | .....      | .....      | .....       | PRF1042        |  |  |         |
| Δ    | Operating instructions<br>(German/Italian/Dutch/Swedish/Spanish/Portuguese) | .....      | .....      | .....      | PRE1042     | .....      | .....      | .....       | .....          |  |  |         |
| Δ    | Operating instructions(Spanish)                                             | .....      | .....      | .....      | .....       | .....      | PRC1035    | .....       | .....          |  |  |         |

For Packing

## 9.2 P.C.B.'s PARTS LIST

### NOTES:

- Parts without part number cannot be supplied.
- Parts marked with "Ⓢ" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The  $\Delta$  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.
- 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%).

|      |                      |     |             |
|------|----------------------|-----|-------------|
| 560Ω | 56 × 10 <sup>3</sup> | 561 | RD1/4PS561J |
| 47kΩ | 47 × 10 <sup>3</sup> | 473 | RD1/4PS473J |
| 0.5Ω | 0R5                  |     | RD2H0R5K    |
| 1Ω   | 010                  |     | RD1P010K    |

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

|        |                       |      |              |
|--------|-----------------------|------|--------------|
| 5.62kΩ | 562 × 10 <sup>3</sup> | 5621 | RD1/4SR5621F |
|--------|-----------------------|------|--------------|

| Mark                                                | No. | Description               | Parts No. | Mark              | No. | Description          | Parts No.   |
|-----------------------------------------------------|-----|---------------------------|-----------|-------------------|-----|----------------------|-------------|
| <b>●MOTHER BOARD ASSEMBLY</b>                       |     |                           |           | <b>COILS</b>      |     |                      |             |
| (PWM1444: PD-7700/KU, KC and HPW types)             |     |                           |           | L383              |     | AXIAL INDUCTOR       | LAU010K     |
| (PWM1445: PD-7700/HEM, HB and PD-7700-S/HEWM types) |     |                           |           | L394              |     | AXIAL INDUCTOR       | LAU010K     |
| (PWM1447: PD-7700/SD type)                          |     |                           |           | <b>CAPACITORS</b> |     |                      |             |
| <b>SEMICONDUCTORS</b>                               |     |                           |           | C11, C13          |     | CERAMIC CAPACITOR    | CKCYF103Z50 |
| △ IC20                                              |     | REGULATOR IC              | M5298P    | C15, C16          |     | CERAMIC CAPACITOR    | CKCYF103Z50 |
| IC21                                                |     | REGULATOR IC              | NJM78L06A | C25               |     | ELECTROLYTIC CAPACIT | CEAS472M16  |
| IC22                                                |     | REGULATOR IC              | NJM79L06A | C26               |     | ELECTR. CAPACITOR    | CEAS222M16  |
| IC23                                                |     | REGULATOR IC              | NJM7805FA | C27               |     | ELECTROLYTIC CAPACIT | CEAS471M6R3 |
| △ IC31                                              |     | IC(PWM1445, PWM1447 only) | ICP-N10   | C28               |     | ELECTR. CAPACITOR    | CEAS101M30  |
| IC101                                               |     | PRE AMP IC                | CXA1471S  | C52               |     | ELECTR. CAPACITOR    | CEAS101M35  |
| IC151                                               |     | SERVO IC                  | CXA1372S  | C60               |     | ELECTR. CAPACITOR    | CEAS010M50  |
| △ IC201, IC202                                      |     | POWER OP-AMP IC           | LA6520    | C61, C62          |     | ELECTR. CAPACITOR    | CEAS101M16  |
| IC301                                               |     | EFM DEMODULATION IC       | CXD2500AQ | C63               |     | ELECTR. CAPACITOR    | CEAS102M16  |
| IC401                                               |     | D/A CONVERTER, IC         | PD2026A   | C101, C102        |     | ELECTR. CAPACITOR    | CEAS101M10  |
| IC402                                               |     | OP-AMP IC                 | M5238PF   | C103              |     | CERAMIC CAPACITOR    | CGCCH200J30 |
| IC402                                               |     | OP-AMP IC                 | NJM5532DD | C104              |     | ELECTR. CAPACITOR    | CEAS101M10  |
|                                                     |     | (PWM1444, PWM1447 only)   |           | C110              |     | CERAMIC CAPACITOR    | CKCYF103Z50 |
|                                                     |     | (PWM1445 only)            |           | C151-C153         |     | ELECTR. CAPACITOR    | CEAS101M10  |
| Q101                                                |     | TRANSISTOR                | 2SA854S   | C155              |     | CERAMIC CAPACITOR    | CKCYB182K50 |
| Q321, Q351                                          |     | TRANSISTOR                | DTC124ES  | C156              |     | CERAMIC CAPACITOR    | CGCYX333K25 |
| Q391                                                |     | TRANSISTOR                | 2SC1740S  | C157              |     | CERAMIC CAPACITOR    | CGCYX103K25 |
| Q401-Q404                                           |     | TRANSISTOR                | 2SD2144S  | C158, C169        |     | CERAMIC CAPACITOR    | CGCYX104K25 |
| Q405                                                |     | TRANSISTOR                | DTC124ES  | C160              |     | ELECTR. CAPACITOR    | CEAS4R7M50  |
| Q406                                                |     | TRANSISTOR                | DTA124ES  | C161              |     | CERAMIC CAPACITOR    | CGCYX104K25 |
| Q451, Q452                                          |     | TRANSISTOR                | DTA124ES  | C162              |     | ELECTR. CAPACITOR    | CEAS010M50  |
| Q453, Q454                                          |     | TRANSISTOR                | 2SB1296   | C163              |     | CERAMIC CAPACITOR    | CGCYX104K25 |
| △ D11-D14, D52                                      |     | DIODE                     | 11ES2     | C164              |     | CERAMIC CAPACITOR    | CGCYX103K25 |
| D54                                                 |     | ZENNER DIODE              | MTZJ18B   | C167              |     | CERAMIC CAPACITOR    | CKCYF103Z50 |
| D301                                                |     | DIODE                     | 1SS254    | C168              |     | CERAMIC CAPACITOR    | CGCYX333K25 |
| D391-D394                                           |     | DIODE(PWM1444 only)       | 1SS254    | C169              |     | CERAMIC CAPACITOR    | CGCYX103K25 |
| D395-D397                                           |     | DIODE                     | 1SS254    | C170              |     | CERAMIC CAPACITOR    | CKCYB332K50 |
|                                                     |     |                           |           | C171, C172        |     | CERAMIC CAPACITOR    | CKCYB472K50 |
|                                                     |     |                           |           | C202, C207        |     | CERAMIC CAPACITOR    | CKCYF103Z50 |
| D451, D452                                          |     | DIODE                     | 1SS254    |                   |     |                      |             |

| Mark | No.        | Description                         | Parts No.   |
|------|------------|-------------------------------------|-------------|
|      | C212       | CERAMIC CAPACITOR                   | CKCYB272K50 |
|      | C216, C217 | ELECTR. CAPACITOR                   | CEAS330M16  |
|      | C301       | CERAMIC CAPACITOR                   | CGCYX104K25 |
|      | C302       | ELECTROLYTIC CAPACIT                | CEAS471M6R3 |
|      | C306       | CERAMIC CAPACITOR                   | CKCYB162K50 |
|      | C307       | CERAMIC CAPACITOR                   | CGCYX473K25 |
|      | C308       | CERAMIC CAPACITOR                   | CGCYX103K25 |
|      | C309       | ELECTR. CAPACITOR                   | CEASR47M50  |
|      | C321       | CERAMIC CAPACITOR                   | CGCYX104K25 |
|      | C324       | CERAMIC CAPACITOR                   | CKCYF103Z50 |
|      | C361       | CERAMIC CAPACITOR                   | CKCYF103Z50 |
|      | C362       | CERAMIC CAPACITOR                   | CKCYB102K50 |
|      | C391, C392 | CERAMIC CAPACITOR<br>(PWM1444 only) | CCCSL101J50 |
|      | C393, C394 | CERAMIC CAPACITOR                   | CKCYF103Z50 |
|      | C395       | CERAMIC CAPACITOR<br>(PWM1444 only) | CKCYF103Z50 |
|      | C397       | CERAMIC CAPACITOR                   | CKCYF103Z50 |
|      | C403       | CERAMIC CAPACITOR                   | CCCHC220J50 |
|      | C404       | CERAMIC CAPACITOR                   | CCCHC120J50 |
|      | C413-C416  | AUDIO FILM CAPACITOR                | CFTXA104J50 |
|      | C429, C430 | CERAMIC CAPACITOR                   | CCCHC390J50 |
|      | C431, C432 | ELECTR. CAPACITOR                   | CEAS330M16  |
|      | C433, C434 | ELECTR. CAPACITOR                   | CEAS470M50  |
|      | C435-C438  | CERAMIC CAPACITOR                   | CCCHC390J50 |
|      | C441, C442 | PL. STYRENE CAPACITOR               | CQSA102J50  |
|      | C451, C452 | ELECTR. CAPACITOR                   | CEAS330M16  |
|      | C453       | CERAMIC CAPACITOR                   | CKCYF103Z50 |

#### RESISTORS

|       |                                        |             |
|-------|----------------------------------------|-------------|
| VR102 | VR                                     | VRTB6VS223  |
| VR103 | VR                                     | VRTB6VS102  |
| VR151 | VR                                     | VRTB6VS223  |
| VR152 | VR                                     | VRTB6VS223  |
| R391  | CARBON FILM RESISTOR<br>(PWM1444 only) | RD1/6PM244J |
| R392  | CARBON FILM RESISTOR<br>(PWM1444 only) | RD1/6PM102J |
|       | Other resistors                        | RD1/6PM□□□□ |

#### OTHERS

|       |                         |            |
|-------|-------------------------|------------|
| CN101 | CONNECTOR               | 52045-1610 |
| JA301 | OPTICAL OUTPUT JACK     | TOTX178    |
| JA391 | JACK /12V(PWM1444 only) | PKN1004    |
| JA392 | JACK /12V(PWM1444 only) | PKN1004    |
| JA393 | JACK (mini)             | PKN1005    |
| JA401 | JACK (2P)               | PKB1009    |
| X401  | XTAL RES (OSC)          | PSS1006    |

| Mark                                     | No. | Description | Parts No. |
|------------------------------------------|-----|-------------|-----------|
| <b>●OPERATE BOARD ASSEMBLY (PWZ2111)</b> |     |             |           |

#### SEMICONDUCTORS

|           |                   |         |
|-----------|-------------------|---------|
| IC701     | MICROCOMPUTER, IC | PD4336A |
| D701-D714 | DIODE             | 1SS254  |

#### SWITCHES

|                                                                                                                                                                                 |        |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------|
| S701-S742                                                                                                                                                                       | SWITCH | PSG1006 |
| 1-20, PGM, DELETE, CHECK,<br>CLEAR, >20, RESERVE, REPEAT,<br>TIME, RND, PEAK SEARCH, O/L,<br>HI LITE SCAN, AUTO SPACE,<br>COMPU, TIME FADE, <4, >4, K4, M4,<br>STOP(□), PLAY(>) |        |         |

#### CAPACITORS

|           |                   |              |
|-----------|-------------------|--------------|
| C701      | ELECTR. CAPACITOR | CEAS330M16   |
| C702-C714 | AXIAL CAPACITOR   | CKPUYB221K50 |

#### RESISTORS

|               |              |
|---------------|--------------|
| All resistors | RD1/6PM□□□□J |
|---------------|--------------|

#### OTHERS

|      |                   |         |
|------|-------------------|---------|
| V701 | FL INDICATOR TUBE | PEL1057 |
| X701 | CERAMIC RESONATOR | VSS1014 |
|      | PHOTO SENSOR UNIT | GP1U50X |

#### SW BOARD ASSEMBLY

#### SEMICONDUCTORS

|      |     |         |
|------|-----|---------|
| D715 | LED | PCX1018 |
|------|-----|---------|

#### SWITCHES

|      |                       |         |
|------|-----------------------|---------|
| S743 | SWITCH<br>(ON/STN BY) | PSG1006 |
|------|-----------------------|---------|

#### HEADPHONE BOARD ASSEMBLY

#### SEMICONDUCTORS

|       |            |         |
|-------|------------|---------|
| IC501 | OP-AMP, IC | M5218AL |
|-------|------------|---------|

#### COILS

|           |                |         |
|-----------|----------------|---------|
| L501-L505 | AXIAL INDUCTOR | LAU010K |
|-----------|----------------|---------|

#### CAPACITORS

|            |                   |             |
|------------|-------------------|-------------|
| C501, C502 | ELECTR. CAPACITOR | CEAS330M16  |
| C505-C507  | CERAMIC CAPACITOR | CKCYF103Z50 |

#### RESISTORS

|       |                   |              |
|-------|-------------------|--------------|
| VR501 | VARIABLE RESISTOR | PCS1002      |
|       | Other resistors   | RD1/6PM□□□□J |

#### OTHERS

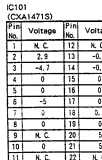
|       |      |         |
|-------|------|---------|
| JA501 | JACK | RKN2001 |
|-------|------|---------|

A

B

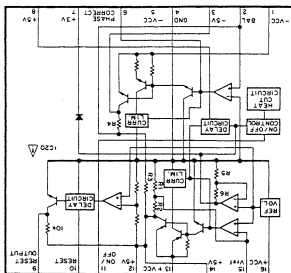
C



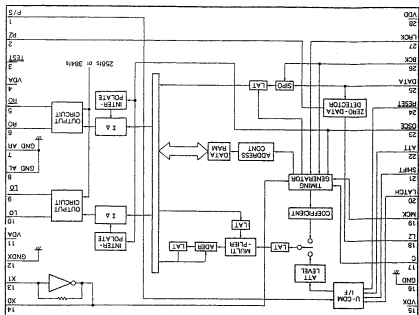


| ICP1      |               |        |           |
|-----------|---------------|--------|-----------|
| POTENTIAL |               |        |           |
| No        | Voltage       | Pin No | Voltage   |
| 1         | 5.0           | 23     | 5.0       |
| 2         | -24. -24.3    | 24     | 2.2 - 4.7 |
| 3         | -24. -24.3    | 25     | 5.0       |
| 4         | -24. -24.3    | 36     | 0         |
| 5         | -24. -24.3    | 37     | 5.0       |
| 6         | -24. -24.3    | 38     | 5.0       |
| 7         | -24. -24.3    | 39     | 0         |
| 8         | -24. -24.3    | 40     | 0         |
| 9         | -24. -24.3    | 41     | 0         |
| 10        | -24. -24.3    | 42     | 0         |
| 11        | -24. -24.3    | 43     | 5.0       |
| 12        | 0             | 44     | 5.0       |
| 13        | 5.0           | 45     | 0         |
| 14        | 3             | 46     | 5.0       |
| 15        | 4.9           | 47     | 5.0       |
| 16        | -27.5 - -27.8 | 48     | 2.1 - 3   |
| 17        | -26.0         | 49     | 5.0       |
| 18        | 5.0           | 50     | 5.0       |
| 19        | -11.7 - -11.8 | 52     | 5.0       |
| 20        | 5.6           | 53     | 5.0       |
| 21        | -15.2 - -15.5 | 54     | 5.0       |
| 22        | -3.4 - -4.4   | 55     | 5.0       |
| 23        | -4.6 - -6.0   | 56     | 2.5       |
| 24        | -6.8 - -8.8   | 57     | 2.5       |
| 25        | 5.0           | 58     | 0         |
| 26        | 5.1           | 59     | 0         |
| 27        | -1.2 - -1.6   | 60     | 5.0       |
| 28        | -12.5 - -15.4 | 61     | 0         |
| 29        | -12.5 - -17.1 | 62     | 0         |
| 30        | 5.0           | 63     | 5.0       |
| 31        | 0             | 64     | 0         |
| 32        | 5.0           | 64     | 0         |

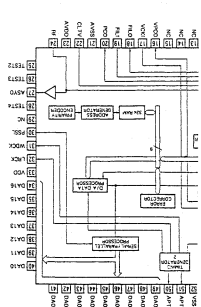
| PIN<br>No. | Voltage | PIN<br>No. | Voltage |
|------------|---------|------------|---------|
| 1          | 0       | 15         | S       |
| 2          | 0       | 16         | 0       |
| 3          | S       | 17         | N.C.    |
| 4          | S       | 18         | 0       |
| 5          | 2.4     | 19         | 2       |
| 6          | 2.6     | 20         | S       |
| 7          | 0       | 21         | S       |
| 8          | 0       | 22         | S       |
| 9          | 2.6     | 23         | S       |
| 10         | 2.4     | 24         | S       |
| 11         | S       | 25         | 2.4     |
| 12         | 0       | 26         | 2.4     |
| 13         | 2.4     | 27         | 2.4     |
| 14         | 2.4     | 28         | S       |



MC5298P



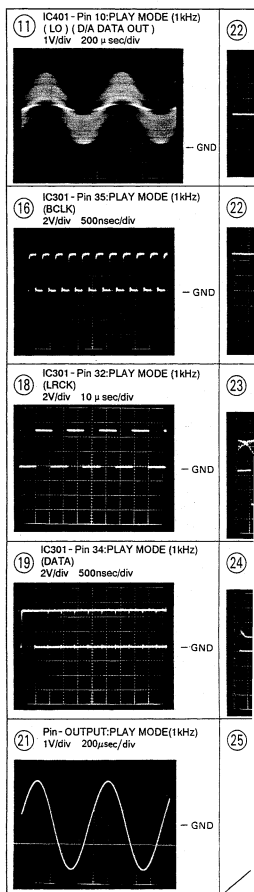
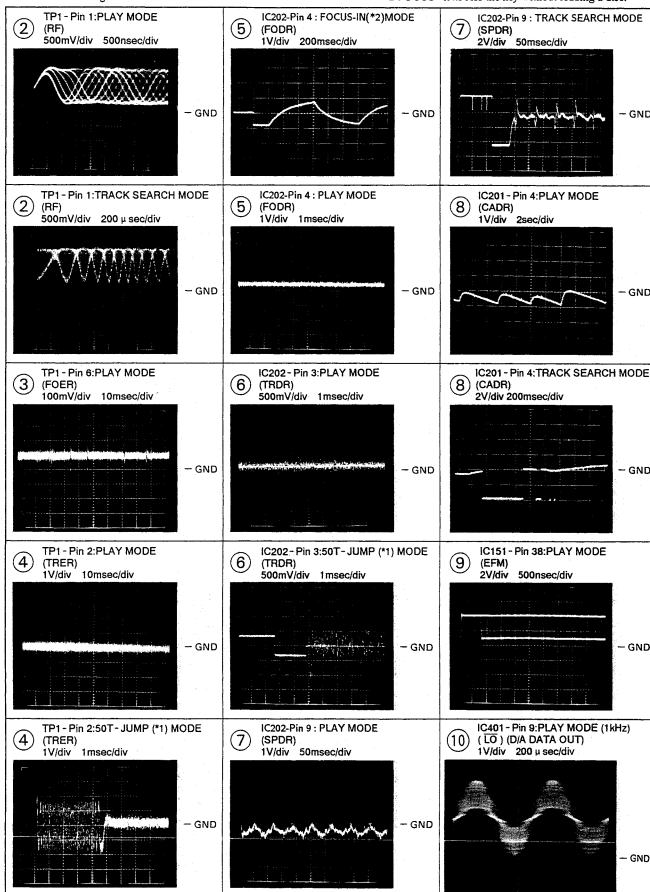
PD206A

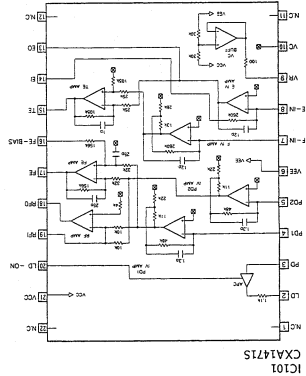
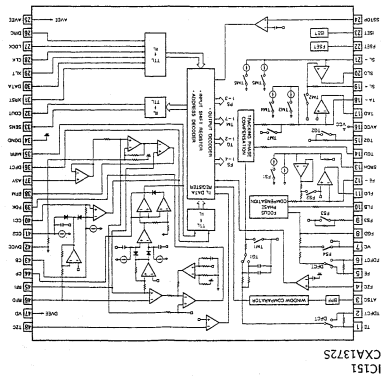
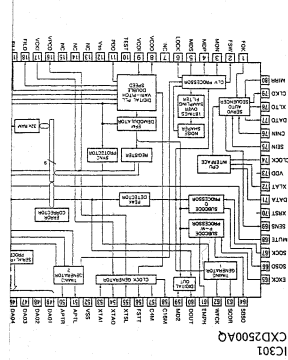


### 9.3 WAVEFORMS

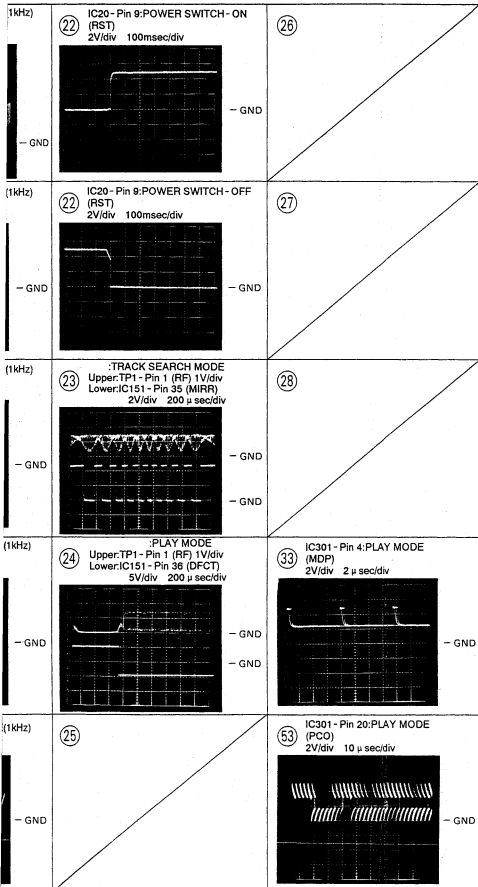
Note: The encircled numbers denote measuring in the schematic diagram.

\*1.50T-JUMP: After switching to the pause mode, press the manual search key.  
 \*2.FOCUS-IN: Press the key without loading a disc.





- IC BLOCK DIAGRAM



- 1. RESISTORS :**  
Indicated in  $R\ 1/4W, 1/8W$  and  $1/8W, \pm 5\%$  tolerance unless otherwise noted  
k;  $k/2M; M/2(F); \pm 1\%; (G); \pm 2\%; (K); \pm 10\%; (M); \pm 20\%$  tolerance.
- 2. CAPACITORS :**  
Indicated in capacity ( $\mu F$ )/voltage(V) unless otherwise noted p: pF. Indication without voltage is 50V except electrolytic capacitor.
- 3. VOLTAGE, CURRENT :**  
□ : DC voltage (V) at play state.  
 : DC current at play state.  
Value in ( ) is DC current at stop state.

4. OTHERS :
- ➔ : Signal route.
  - ⊗ : Adjusting point
- The  $\Delta$  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.
- ※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. SWITCHES : (The underlined indicates the switch position)  
SWITCH BOARD ASSEMBLY  
S743 : POWER ON-OFF

## OPERATE BOARD ASSEMBLY

```

5701: 1
5702: 2
5703: 3
5704: 4
5705: 5
5706: 6
5707: 7
5708: 8
5709: 9
5710: 10
5711: 11
5712: 12
5713: 13
5714: 14
5715: 15
5716: 16
5717: 17
5718: 18
5719: 19
5720: 20
5721: PGM
5722: DELETE

5723: CHECK
5724: CLEAR
5725: > 20
5726: RESERVE
5727: REPEAT
5728: TIME
5729: RNO
5730: PEAK SEARCH
5731: O/L
5732: HI/LUTE SCAN
5733: AUTO SPACE
5734: COMPU
5735: TIME FADE ]EDIT
5736: < ] MANUAL SEARCH
5737: < ]
5738: < ] TRACK SEARCH
5739: < ]
5740: STOP(□)
5741: PAUSE(⏸)
5742: PLAY(▶)
5743: ON/STN BY)

```

**Line Voltage Selection (For HB,HEM, HPW and HEWM types)**

Line voltage can be changed with the following steps.

1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the position of the jumper wire A as follows

| Voltage | Jumper wire A position |
|---------|------------------------|
| 220V    | a                      |
| 240V    | b                      |

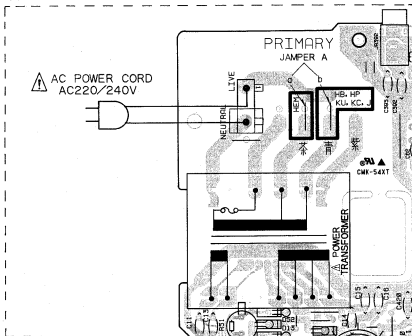
4. Stick the line voltage label on the rear panel.

| Parts No. | Description |
|-----------|-------------|
| AXX-193   | 220V label  |
| AXX-192   | 240V label  |

# 9.5 P.C. BOARDS CONNECTION DIAGRAM

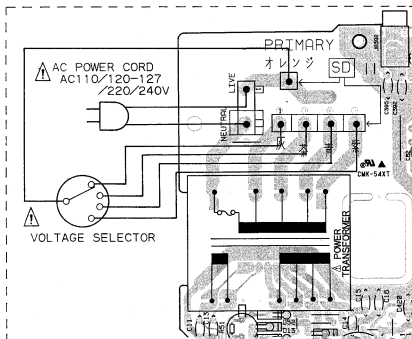
A

POWER SUPPLY SECTION FOR HEM, HB, HPW AND HEWM TYPES



C

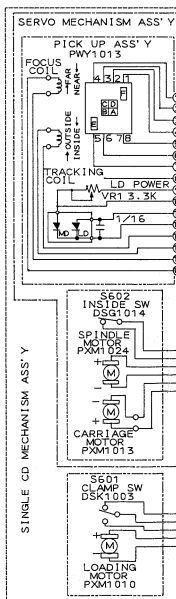
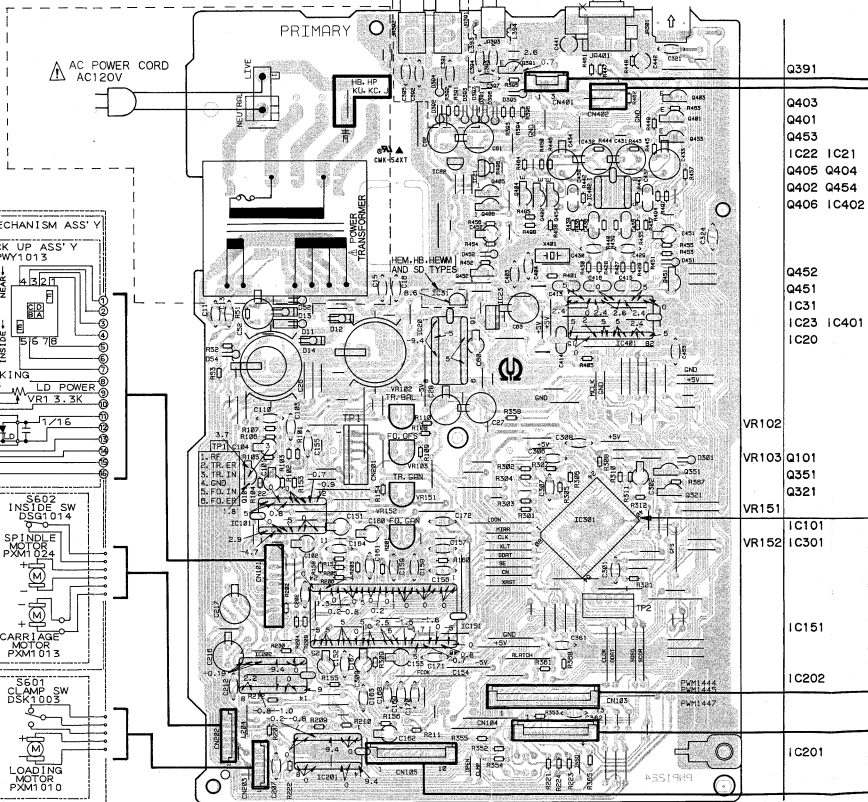
POWER SUPPLY SECTION FOR SD TYPE



D

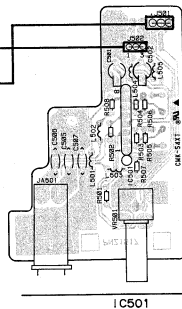
MOTHER BOARD ASSEMBLY  
(PWM1444:KU,KC AND HPW TYPES)  
(PWM1445:HEM,HB AND HEWM TYPES)  
(PWM1447:SD TYPE)

POWER SUPPLY SECTION FOR KU AND KC TYPES

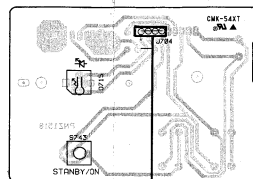


- Q391
- Q403
- Q401
- Q453
- IC22 IC21
- Q405 Q404
- Q402 Q454
- Q406 IC402
- Q452
- Q451
- IC31
- IC23 IC401
- IC20
- VR102
- VR103 Q101
- Q351
- Q321
- VR151
- IC101
- VR152 IC301
- IC151
- IC202
- IC201

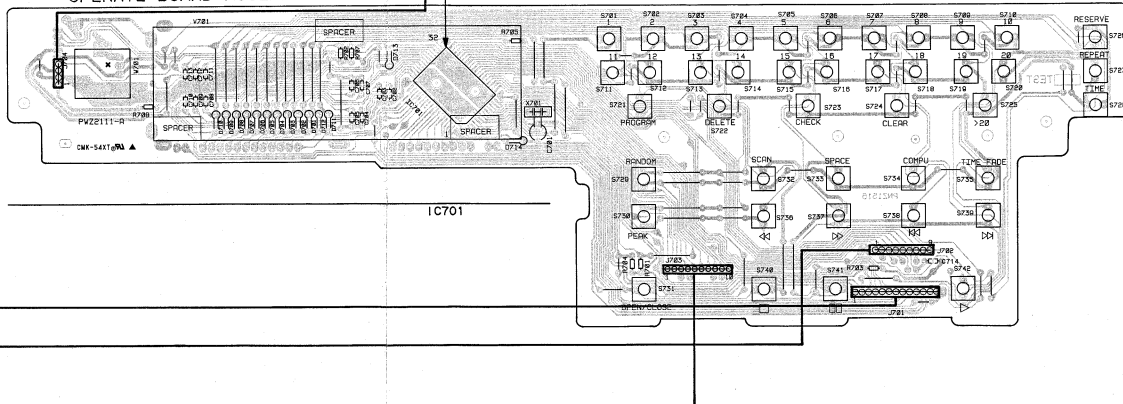
# HEADPHONE BOARD ASSEMBLY



# SW BOARD ASSEMBLY



# OPERATE BOARD ASSEMBLY(PWZ2111)



IC501  
(CONTINUED)

| Pin | Value   | Pin | Value   |
|-----|---------|-----|---------|
| 1   | S       | 41  | R.C.    |
| 2   | R.C.    | 42  | S       |
| 3   | S       | 43  | R.C.    |
| 4   | 2.5     | 44  | R.C.    |
| 5   | R.C.    | 45  | R.C.    |
| 6   | S       | 46  | 4.4     |
| 7   | R.C.    | 47  | 0       |
| 8   | R.C.    | 48  | 0       |
| 9   | 40 0-3  | 49  | 0-3     |
| 10  | 0       | 50  | R.C.    |
| 11  | R.C.    | 51  | R.C.    |
| 12  | 0       | 52  | 0       |
| 13  | R.C.    | 53  | 2.5     |
| 14  | R.C.    | 54  | R.C.    |
| 15  | R.C.    | 55  | 0       |
| 16  | R.C.    | 56  | R.C.    |
| 17  | S       | 57  | R.C.    |
| 18  | 2.5     | 58  | R.C.    |
| 19  | 2.4     | 59  | 0       |
| 20  | 2.4     | 60  | 0       |
| 21  | 0       | 61  | R.C.    |
| 22  | 2.5     | 62  | R.C.    |
| 23  | S       | 63  | R.C.    |
| 24  | 2.5     | 64  | R.C.    |
| 25  | R.C.    | 65  | 0       |
| 26  | 0       | 66  | 3.3-4.8 |
| 27  | 2.5     | 67  | S       |
| 28  | R.C.    | 68  | 0       |
| 29  | 0       | 69  | 2.1-3   |
| 30  | R.C.    | 70  | S       |
| 31  | 1.5-2.2 | 71  | S       |
| 32  | 2.5     | 72  | S       |
| 33  | S       | 73  | S       |
| 34  | 2.5     | 74  | S       |
| 35  | R.C.    | 75  | S       |
| 36  | R.C.    | 76  | S       |
| 37  | R.C.    | 77  | S       |
| 38  | R.C.    | 78  | S       |
| 39  | R.C.    | 79  | S       |
| 40  | R.C.    | 80  | 0       |

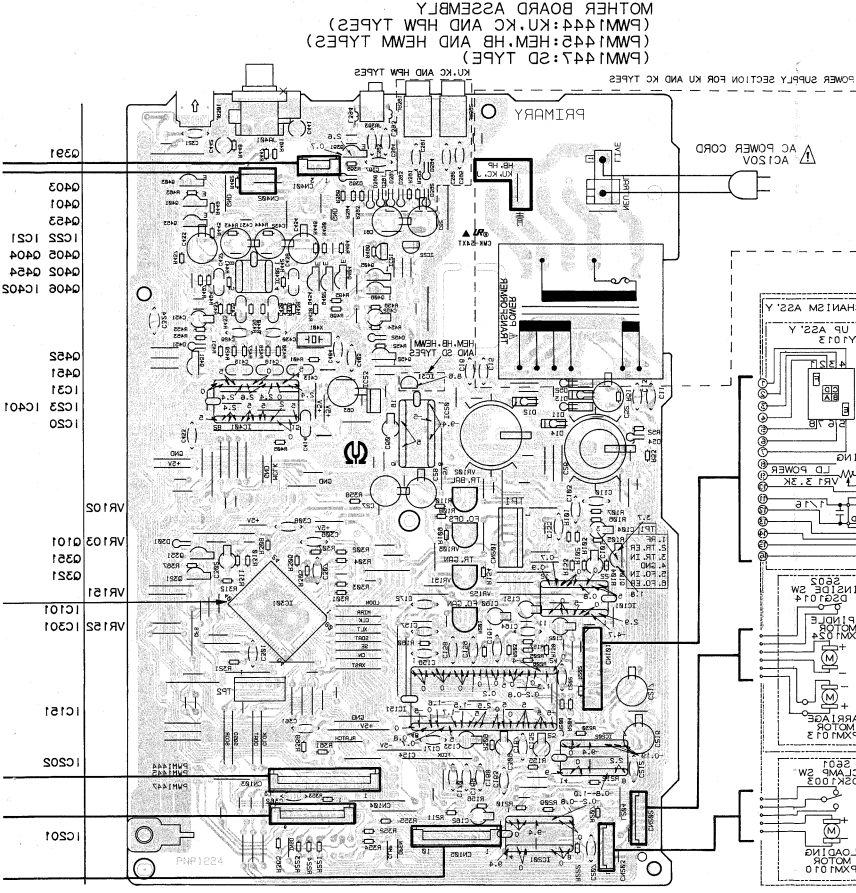
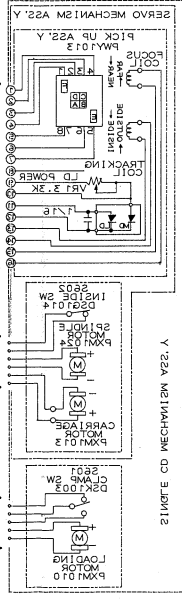
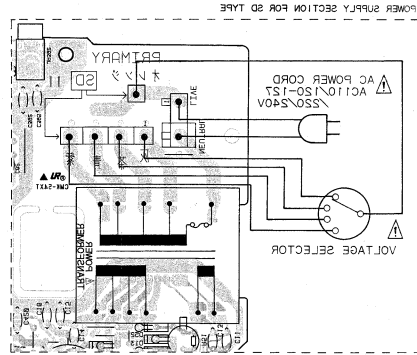
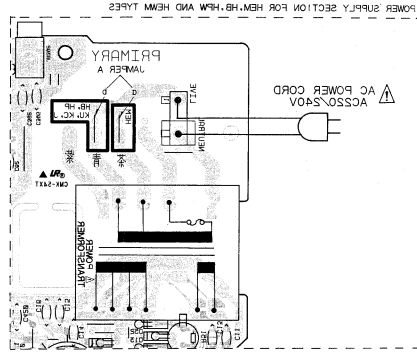
IC501  
(PUSHES)

| Pin | Value     | Pin | Value   |
|-----|-----------|-----|---------|
| 1   | 5.0       | 33  | 5.0     |
| 2   | 24-26.3   | 34  | 3.3-4.3 |
| 3   | 24-26.3   | 35  | 5.0     |
| 4   | 24-26.3   | 36  | 0       |
| 5   | 24-26.3   | 37  | 5.0     |
| 6   | 24-26.3   | 38  | 5.0     |
| 7   | 24-26.3   | 39  | 0       |
| 8   | 24-26.3   | 40  | 0       |
| 9   | 24-26.3   | 41  | 0       |
| 10  | 24-26.3   | 42  | 0       |
| 11  | 24-26.3   | 43  | 5.0     |
| 12  | 0         | 44  | 5.0     |
| 13  | 5.0       | 45  | 5.0     |
| 14  | 0         | 46  | 5.0     |
| 15  | 4.9       | 47  | 5.0     |
| 16  | 25.5-10.8 | 48  | 2.1-3   |
| 17  | -1.0      | 49  | 5.0     |
| 18  | -26.0     | 50  | 5.0     |
| 19  | -5.0      | 51  | 0       |
| 20  | 31.6-11.8 | 52  | 5.0     |
| 21  | -1.8      | 53  | 5.0     |
| 22  | 25.5-10.5 | 54  | 5.0     |
| 23  | 3.4-4.4   | 55  | 5.0     |
| 24  | 4.0-1.0   | 56  | 2.5     |
| 25  | -6.8-6.8  | 57  | 2.5     |
| 26  | 5.0       | 58  | 0       |
| 27  | -1.5      | 59  | 0       |
| 28  | 1.2-1.6   | 60  | 5.0     |
| 29  | 25.5-10.4 | 61  | 0       |
| 30  | -11.1     | 62  | 0       |
| 31  | 0         | 63  | 0       |
| 32  | 5.0       | 64  | 0       |

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

- This P.C.B. connection diagram is viewed from the parts mounted side.
- 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.
- The capacitor terminal marked with shows negative terminal.
- The diode marked with G shows cathode side.
- The transistor terminal marked with shows emitter.

9.5 P.C. BOARDS CONNECTION DIAGRAM



This P.C.B. connection diagram is viewed from the foil side.

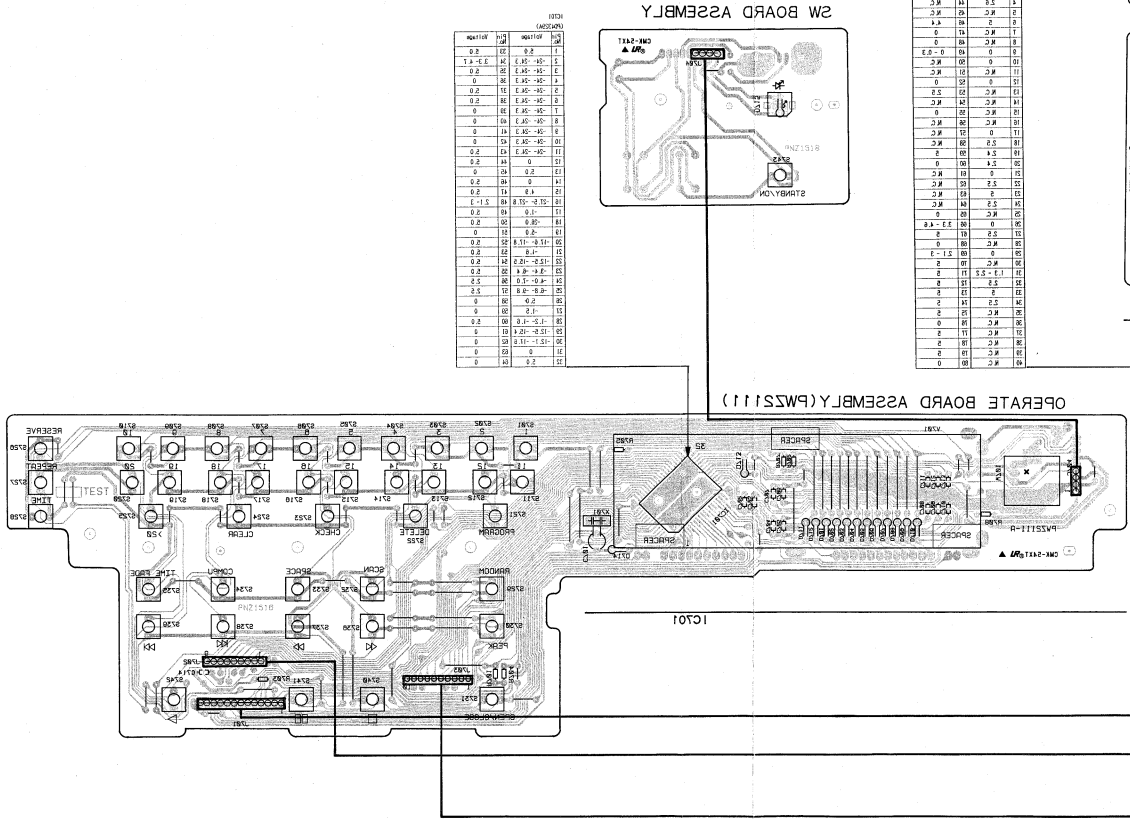
A

B

C

D

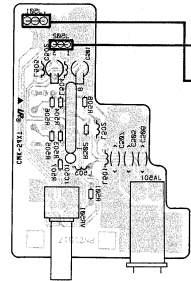
L



| TEST POINT | TEST POINT | TEST POINT |
|------------|------------|------------|
| 1          | 2          | 3          |
| 4          | 5          | 6          |
| 7          | 8          | 9          |
| 10         | 11         | 12         |
| 13         | 14         | 15         |
| 16         | 17         | 18         |
| 19         | 20         | 21         |
| 22         | 23         | 24         |
| 25         | 26         | 27         |
| 28         | 29         | 30         |
| 31         | 32         | 33         |
| 34         | 35         | 36         |
| 37         | 38         | 39         |
| 40         | 41         | 42         |
| 43         | 44         | 45         |
| 46         | 47         | 48         |
| 49         | 50         | 51         |
| 52         | 53         | 54         |
| 55         | 56         | 57         |
| 58         | 59         | 60         |
| 61         | 62         | 63         |
| 64         | 65         | 66         |
| 67         | 68         | 69         |
| 70         | 71         | 72         |
| 73         | 74         | 75         |
| 76         | 77         | 78         |
| 79         | 80         | 81         |
| 82         | 83         | 84         |
| 85         | 86         | 87         |
| 88         | 89         | 90         |
| 91         | 92         | 93         |
| 94         | 95         | 96         |
| 97         | 98         | 99         |
| 100        | 101        | 102        |

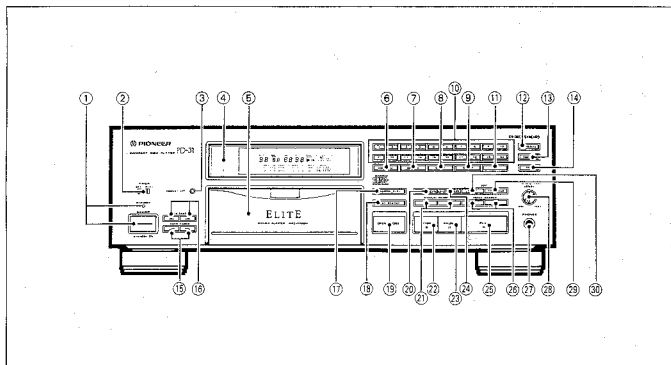
| TEST POINT | TEST POINT | TEST POINT |
|------------|------------|------------|
| 1          | 2          | 3          |
| 4          | 5          | 6          |
| 7          | 8          | 9          |
| 10         | 11         | 12         |
| 13         | 14         | 15         |
| 16         | 17         | 18         |
| 19         | 20         | 21         |
| 22         | 23         | 24         |
| 25         | 26         | 27         |
| 28         | 29         | 30         |
| 31         | 32         | 33         |
| 34         | 35         | 36         |
| 37         | 38         | 39         |
| 40         | 41         | 42         |
| 43         | 44         | 45         |
| 46         | 47         | 48         |
| 49         | 50         | 51         |
| 52         | 53         | 54         |
| 55         | 56         | 57         |
| 58         | 59         | 60         |
| 61         | 62         | 63         |
| 64         | 65         | 66         |
| 67         | 68         | 69         |
| 70         | 71         | 72         |
| 73         | 74         | 75         |
| 76         | 77         | 78         |
| 79         | 80         | 81         |
| 82         | 83         | 84         |
| 85         | 86         | 87         |
| 88         | 89         | 90         |
| 91         | 92         | 93         |
| 94         | 95         | 96         |
| 97         | 98         | 99         |
| 100        | 101        | 102        |

HEADPHONE BOARD ASSEMBLY



- IC501
- IC502
- IC503
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## 10. PANEL FACILITIES

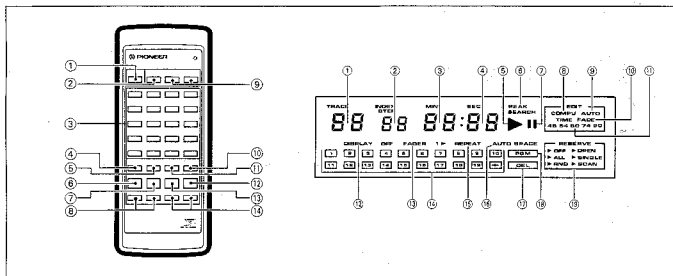


## FRONT PANEL

- ① **POWER STANDBY/ON switch and indicator**  
Press this switch to turn the power on. The unit will set to the standby mode and the STANDBY indicator will light.

- ② **TIMER OFF/PLAY switch**  
③ **DISPLAY OFF button**  
④ **Remote sensor**  
⑤ **Disc tray**  
⑥ **PROGRAM button**  
⑦ **DELETE button**  
⑧ **CHECK button**  
⑨ **CLEAR button**  
⑩ **Track number buttons (1—20)**  
⑪ **> 20 button**  
⑫ **RESEVRE button**  
⑬ **REPEAT button**  
⑭ **TIME button**  
⑮ **AUTO FADER buttons (—, —)**  
⑯ **INDEX SEARCH buttons (←, →)**  
⑰ **RANDOM PLAY button**  
⑱ **PEAK SEARCH button**  
⑲ **OPEN/CLOSE button**  
⑳ **HI-LITE SCAN button**

- ㉑ **MANUAL SEARCH buttons (◀, ▶)**  
㉒ **STOP button (■)**  
㉓ **PAUSE button (⏸)**  
㉔ **AUTO SPACE button**  
㉕ **PLAY button (▶)**  
㉖ **TRACK SEARCH buttons (◀◀, ▶▶)**  
㉗ **Headphones jack (PHONES)**  
㉘ **Headphones/line volume control (PHONES/LINE LEVEL)**  
㉙ **TIME FADE EDIT button**  
㉚ **Program edit button (EDIT)**  
    (■ COMPU/■ AUTO)



### REMOTE CONTROL UNIT

Buttons listed here but not accompanied with explanations have the same functions as the corresponding front panel buttons.

- ① POWER button
- ② OPEN/CLOSE button
- ③ Track number buttons (1—20)
- ④ HI-LITE SCAN button
- ⑤ RESERVE button
- ⑥ RANDOM PLAY button
- ⑦ STOP button (■)
- ⑧ Manual search buttons (MANUAL ◀◀, ▶▶)
- ⑨ OUTPUT LEVEL buttons (—, +)
- ⑩ > 20 button
- ⑪ PROGRAM button
- ⑫ PLAY button (▶)
- ⑬ PAUSE button (||)
- ⑭ Track search buttons (TRACK ◀◀, ▶▶)

### DISPLAY

- ① Displays track numbers (01—99) during playback or track search.
- ② Displays index numbers (sub-divisions of tracks); during program input, indicates program steps.
- ③ Displays track playing time and remaining time (minutes).
- ④ Displays track playing time and remaining time (seconds).
- ⑤ Lights during playback.
- ⑥ Lights when peak volume levels on the disc are detected.
- ⑦ Lights during playback pause.
- ⑧ Lights during use of computer allocated program editing or auto program editing.
- ⑨ Lights during auto program editing.
- ⑩ Lights during time fade editing.
- ⑪ Indicates the editing time.
- ⑫ Lights when display is in OFF mode.
- ⑬ Lights during operation of fade function.
- ⑭ Calendar display. Lighted numbers indicate total number of tracks on the disc (during program input and program playback, indicates programmed tracks). When a track completes playback, the corresponding lighted number goes out. Arrow mark (➡) lights for tracks higher than "19".
- ⑮ Lights during repeat playback. (During single-track repeat, the [1▶] indicator also lights).
- ⑯ Lights during auto space.
- ⑰ Lights during delete mode.
- ⑱ Lights during program mode.
- ⑲ When "reserve" function is activated, these indicators light in correspondence to the reserved functions (OFF, OPEN, ALL, SINGLE, RND, SCAN).

## 11. SPECIFICATIONS

### 1. General

|                             |                                                                          |
|-----------------------------|--------------------------------------------------------------------------|
| Type .....                  | Compact disc digital audio system                                        |
| Usable discs .....          | Compact Disc                                                             |
| Power requirements .....    | AC 120V, 60Hz                                                            |
| Power consumption .....     | 18W                                                                      |
| Operating temperature ..... | +5°C – +35°C<br>(+41°F – +95°F)                                          |
| Weight .....                | 5.0kg (11lb)                                                             |
| External dimensions .....   | 420(W) × 274(D) × 135(H)mm<br>16.9 / 16(W) × 10.13/16(D) × 5.5/16(H) in. |

### 2. Audio section

|                                 |                                                          |
|---------------------------------|----------------------------------------------------------|
| Frequency response .....        | 2Hz – 20kHz ±0.5dB                                       |
| S/N .....                       | 108dB or more (EIAJ)                                     |
| Dynamic range .....             | 97dB or more (EIAJ)                                      |
| Channel separation .....        | 102dB or more (EIAJ)                                     |
| Total harmonic distortion ..... | 0.0022% or less (EIAJ)                                   |
| Wow and flutter .....           | Limit of measurement<br>[±0.001% W. PEAK] or less (EIAJ) |
| Number of channels .....        | 2 channels (stereo)                                      |

### 3. Output terminal

- Audio line output terminals (FIXED)
- Audio line output terminals (VARIABLE)
- CD-DECK SYNCHRO terminal
- Headphone jack (with motor drive volume control)
- Optical digital output terminal
- Control input/output terminals

### 4. Functions

- Play
- Pause
- Stop
- Auto space
- Manual search
- Track search
- Index search
- Peak search
- Hi-lite scan
- Direct selection

- Single track repeat
- All track repeat
- Programmed repeat
- Delete repeat
- Random play repeat
- Programmed random play repeat
- Delete play repeat random
- Programmed playback (up to 24 tracks)
- Delete playback
- Pause program
- Program check
- Program correction
- Program clear
- Auto program edit
- Compu program edit
- Time fade edit
- Digital level control
- Random play
- Programmed random play
- Delete random play
- Fade in/fade out
- Time location
- Reserve
- Display off
- Program hold
- Level hold
- Timer start
- CD-deck synchro

### 5. Accessories

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

#### NOTE:

The specifications and design of this product are subject to change without notice, due to improvements.

