

# Service Manual

 **PIONEER**  
The Art of Entertainment

PION-03376



ORDER NO.  
ARP2298

## COMPACT DISC PLAYER

# PD-75

### PD-75 HAS THE FOLLOWING :

| Type  | Power Requirement                               | Remarks |
|-------|---|---------|
| KU/CA | AC 120 V only                                   |         |
| HEM   | AC 220 V-230 V, AC 230-240 V(switchable)*       |         |
| SD    | AC 110 V, 120 V-127 V, 220 V, 240 V(switchable) |         |

\* Change the connection of the power transformer's primary wiring.

- This manual is applicable to PD-75/KU/CA, HEM and SD types.
- As to the HEM and SD types, refer to page 87.
- 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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FI JUNE 1991

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

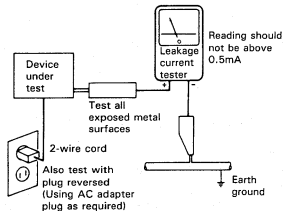
(FOR USA MODEL ONLY)

### 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 ALTTIINA  
NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE.  
ÄLÄ KATSO SÄTEESEEN.

## ADVERSEL:

USYNLIG LASERSTRÅLING VED ÅBNING  
NÅR SIKKERHEDSAFBRYDERE ER UDE AF  
FUNKTION UDGÅ UDSÆTTELSE FOR  
STRÅLING.

## VARNING!

OSYNLIG LASERSTRÅLING NÅR DENNA  
DEL ÄR ÖPPNAD OCH SPÄRREN  
ÄR URKOPPLAD. BETRakta EJ STRÅLEN.



LASER  
Kuva 1  
Lasersäteilyn  
varoituserkki

## WARNING!

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



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

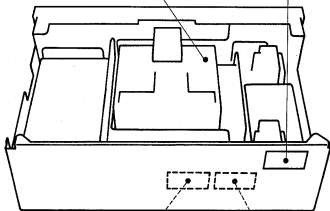
## LABEL CHECK

## HEM type



CLASS 1  
LASER PRODUCT

VRW-328



ADVARSEL:  
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UDGÅ UDSÆTTELSE FOR STRÅLING.  
VORSICHT!  
UNSICHTBARE LASERSTRÅLUNG TRITT AUS, WENN DECKEL ODER KLAPPE GEÖFFNET IST NICHT ODER STRAHLEN AUSGEZEIGT.  
VRW1004

VARO!  
Avatessa ja suojelukitus ohitettaessa olet alttiina näkyttömälle lasersäteilylle. Älä katso säteeseen.  
VARNING!  
Osynlig laserstråling når denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.  
PRW1023

## HEM type

## Additional Laser Caution

## 1. Laser Interlock mechanism

The ON/OFF status of the clamp switch (S 102) for detecting loading completion is detected by the system microprocessor, and the design prevents laser diode oscillation when the clamp switch is OFF.

Thus, the interlock will no longer function if the clamp switch (S 102) is deliberately shorted.

In the test mode the interlock mechanism will not function (refer to page 39).

Laser diode oscillation will continue if pin 4, 5, or 29 of CXA 1081 S(IC 1) is connected to ground or the terminals of Q 304 are shorted each other (fault condition).

## 2. If the fault condition described in 1 is induced with the

cover removed and the objective lens extending past the outer circumference of the disc clamper diameter, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 or higher laser beam.

## 2. EXPLODED VIEWS AND PARTS LIST

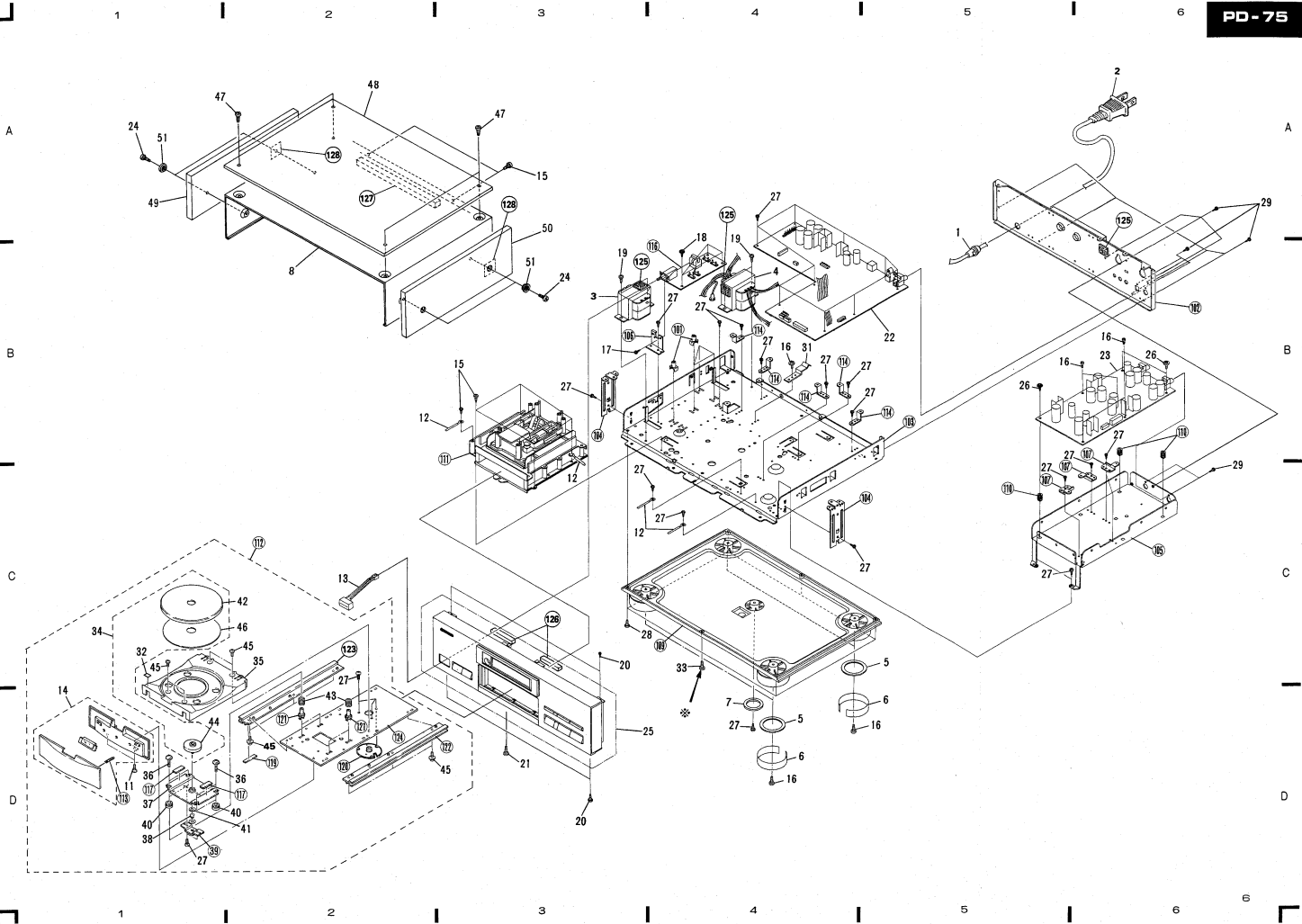
### NOTES:

- 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

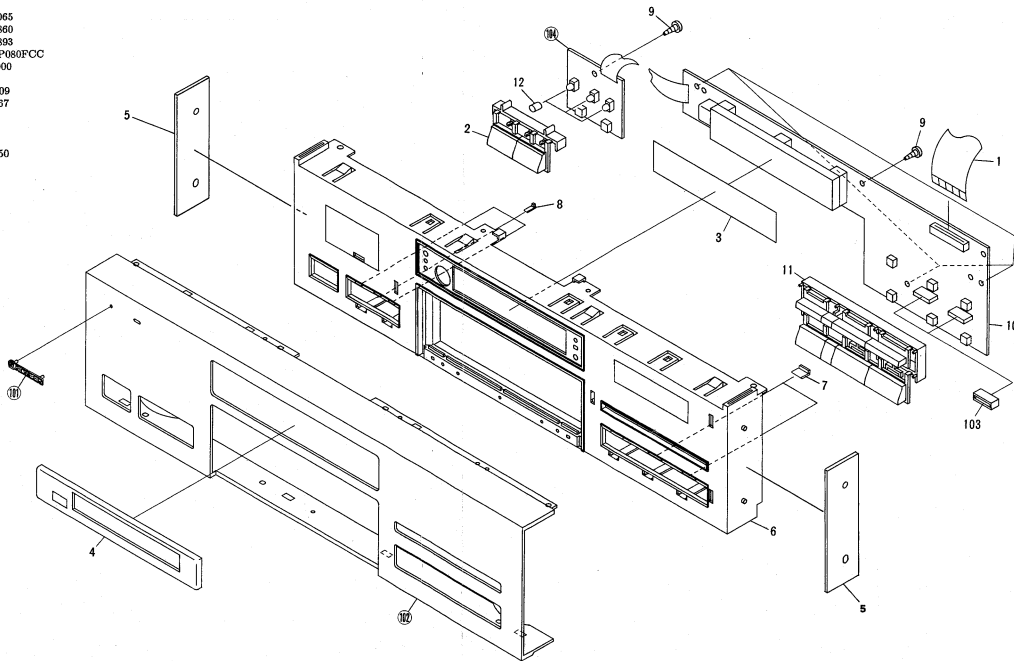
| Mark     | No. | Description             | Parts No.    | Mark | No. | Description               | Parts No.    |
|----------|-----|-------------------------|--------------|------|-----|---------------------------|--------------|
|          | 1   | Strain relief           | CM-22C       |      | 41  | E-ring                    | YE30FUC      |
| $\Delta$ | 2   | AC power cord           | PDG1015      |      | 42  | Turntable                 | PAN1203      |
| $\Delta$ | 3   | Power transformer(16VA) | PTT1166      |      | 43  | Floating spring           | PBH1092      |
| $\Delta$ | 4   | Power transformer(17VA) | PTT1162      |      | 44  | Rotor assembly            | PXA1392      |
|          | 5   | Stopper                 | PNM1095      |      | 45  | Screw                     | BBZ30P060FCC |
|          | 6   | Tape                    | PNM1099      |      | 46  | TT sheet                  | PNM1125      |
|          | 7   | Stopper                 | PNM1107      |      | 47  | SH screw                  | PBA1033      |
|          | 8   | Bonnet                  | PEA1168      |      | 48  | Top panel                 | PAN1123      |
|          | 9   | • • • • •               |              |      | 49  | Side board (L)            | PMM1039      |
|          | 10  | • • • • •               |              |      | 50  | Side board (R)            | PMM1040      |
|          | 11  | Screw                   | IBZ30P060FCC |      | 51  | Wood collar               | PNW1238      |
|          | 12  | Cord clamber            | RNH-184      |      |     |                           |              |
|          | 13  | Power button            | PAC1539      |      | 101 | PCB mould                 |              |
|          | 14  | Tray plate (A) assembly | PXA1395      |      | 102 | Rear base                 |              |
|          | 15  | Screw                   | BBZ30P080FCC |      | 103 | Under base                |              |
|          | 16  | Screw                   | IBZ30P060FCC |      | 104 | Side angle                |              |
|          | 17  | Screw                   | PMZ30P060FCU |      | 105 | Shield plate              |              |
|          | 18  | Screw                   | IBZ30P180FMC |      | 106 | Switch angle              |              |
|          | 19  | Screw                   | BBZ40P060FCC |      | 107 | Angle (B)                 |              |
|          | 20  | Screw                   | BBT30P080FCC |      | 108 | • • • • •                 |              |
|          | 21  | Screw                   | PDZ30P050FCC |      | 109 | Base                      |              |
| ⊗        | 22  | MAIN BOARD assembly     | PWZ1983      |      | 110 | PCB spacer                |              |
| ⊗        | 23  | ANALOG BOARD assembly   | PWM1364      |      | 111 | Single mechanism assembly |              |
|          | 24  | Screw                   | PBA1038      |      | 112 | Tray assembly             |              |
|          | 25  | Front panel assembly    | PEA1177      |      | 113 | Plate spring              |              |
|          | 26  | Screw                   | IBZ30P150FCU |      | 114 | Board angle               |              |
|          | 27  | Screw                   | IBZ30P060FCC |      | 115 | • • • • •                 |              |
|          | 28  | Screw                   | BBZ30P140FCC |      | 116 | PRIMARY BOARD assembly    |              |
|          | 29  | Screw                   | BBZ30P080FCC |      | 117 | Stopper rubber            |              |
|          | 30  | • • • • •               |              |      | 118 | • • • • •                 |              |
|          | 31  | Ground plate            | PBK1090      |      | 119 | Stopper tape              |              |
|          | 32  | Caution label           | PRW1244      |      | 120 | Tray locker               |              |
|          | 33  | Screw                   | BBZ30P160FZK |      | 121 | Collar                    |              |
|          | 34  | Turntable assembly      | PEA1159      |      | 122 | Slide guide               |              |
|          | 35  | Over tray               | PNW1871      |      | 123 | Rack                      |              |
|          | 36  | Floating screw          | PBA1064      |      | 124 | Tray                      |              |
|          | 37  | Spindle base assembly   | PXA1405      |      | 125 | Binder holder             |              |
|          | 38  | Receptacle              | VNL-268      |      | 126 | Spacer                    |              |
|          | 39  | Stopper                 |              |      | 127 | Bonnet spacer             |              |
|          | 40  | Damper rubber           | PEB1146      |      | 128 | Wood spacer               |              |



2.2 FRONT PANEL SECTION

Parts List of Front Panel section

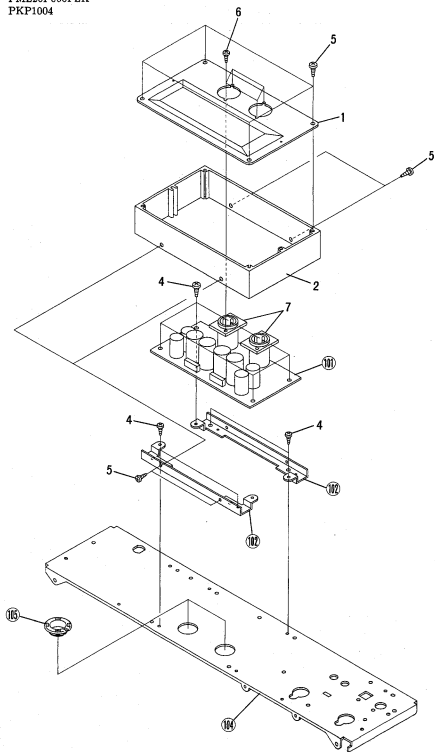
| Mark | No. | Description               | Parts No.    |
|------|-----|---------------------------|--------------|
| △    | 1   | 25P shield F.F.C          | PDD1096      |
|      | 2   | Digital burton            | PAC1530      |
|      | 3   | FL sheet                  | PAM1290      |
|      | 4   | Display window(A)         | PAM1515      |
|      | 5   | Side sash                 | PAN1220      |
|      | 6   | Function panel            | PNW2065      |
|      | 7   | Lens(L)                   | PNW1860      |
|      | 8   | Lens(S)                   | PNW1893      |
|      | 9   | Screw                     | BBZ26P080FCC |
| ●    | 10  | FUNCTION A BOARD assembly | PWZ2000      |
|      | 11  | Function button           | PAC1609      |
|      | 12  | LED cover (S)             | PEB1167      |
|      | 101 | Name plate                |              |
|      | 102 | Front panel               |              |
|      | 103 | LED cover                 | PEB1150      |
|      | 104 | FUNCTION B BOARD assembly |              |



## 2.3 REAR PANEL SECTION

## Parts List of Rear Panel section

| Mark | No. | Description            | Parts No.    |
|------|-----|------------------------|--------------|
|      | 1   | Balance cover          | PAT1004      |
|      | 2   | Balance case           | PNS1019      |
|      | 3   | .....                  |              |
| A    | 4   | Screw                  | BBZ30P080FCC |
|      | 5   | Screw                  | BBT30P080FZK |
|      | 6   | Screw                  | PMZ26P060FZK |
|      | 7   | 3P receptacle          | PKP1004      |
|      | 101 | BALANCE BOARD assembly |              |
|      | 102 | Balance angle          |              |
|      | 103 | .....                  |              |
|      | 104 | Rear base              |              |
|      | 105 | Edge cover             |              |



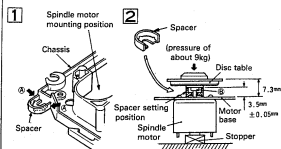
## 2.4 MECHANISM SECTION

### Parts List of Mechanism section

| Mark | No. | Description          | Parts No.    | Mark | No. | Description              | Parts No.    |
|------|-----|----------------------|--------------|------|-----|--------------------------|--------------|
|      | 1   | Lever switch         | DSK1003      |      | 51  | Ground plate             | PDF1087      |
|      | 2   | Floating screw       | PBA1064      |      | 52  | Washer                   | WT32D080D050 |
|      | 3   | Floating spring (A)  | PBH1098      |      | 53  | Washer                   | PMA26P040FCU |
|      | 4   | Floating spring (B)  | PBH1099      |      | 54  | Screw                    | BPZ26P060FCU |
|      | 5   | Bias spring          | PHB1112      |      | 55  | Screw                    | BPZ26P060FMC |
|      | 6   | Floating spring (C)  | PHB1113      |      | 56  | Screw                    | WT31D054D013 |
|      | 7   | Floating spring (D)  | PHB1114      |      | 57  | Washer                   | IBZ30P060FCC |
|      | 8   | Belt                 | PEB1138      |      | 58  | Screw                    | ZMD30H040FBT |
|      | 9   | Dumper rubber        | PEB1146      |      | 59  | Screw                    | ZMD30P060FCC |
|      | 10  | Stopper rubber       | PEB1085      |      | 60  | Screw                    | PDZ30P060FCC |
|      | 11  | Screw                | PMZ30P350FCU |      | 101 | Roller                   |              |
|      | 12  | Roller               | PNW2037      |      | 102 | Blind sheet              |              |
|      | 13  | Blind sheet          | PNW1097      |      | 103 | Felt                     |              |
|      | 14  | Gear                 | PNW1097      |      | 104 | Synchro gear axis        |              |
|      | 15  | Motor pulley         | PNW1643      |      | 105 | Gear angle               |              |
|      | 16  | Cam                  | PNW1816      |      | 106 | Mechanism deck           |              |
|      | 17  | Synchro gear         | PNW1817      |      | 107 | Bottom plate             |              |
|      | 18  | Gear pulley          | PNW1870      |      | 108 | Base plate               |              |
|      | 19  | Single gear          | PNW1878      |      | 109 | Collar                   |              |
|      | 20  | Lock plate           | PNW2013      |      | 110 | U guide                  |              |
|      | 21  | Loading base (L)     | PNW2050      |      | 111 | Servo mechanism assembly |              |
|      | 22  | Loading base (R)     | PNW2051      |      | 112 | Collar                   |              |
|      | 23  | DC motor             | PXM1010      |      | 113 | Cushion rubber (2.5)     |              |
|      | 24  | Cord clasper         | RNH-184      |      | 114 | Magnet                   |              |
|      | 25  | Screw                | PBA1024      |      | 115 | Side yoke                |              |
|      | 26  | Adjustment screw     | PBA1054      |      | 116 | Center yoke              |              |
|      | 27  | Lever spring         | PBH1028      |      | 117 | Vinyl Sheet              |              |
|      | 28  | Axis spring          | PBH1029      |      | 118 | Tape                     |              |
|      | 29  | Adjustment spring    | PBK1021      |      | 119 | Flexible cable           |              |
|      | 30  | Rivet                | PBM-015      |      | 120 | Carriage                 |              |
|      | 31  | Stopper rubber       | PEB1035      |      | 121 | Bobbin (A)               |              |
|      | 32  | Rubber               | PEB1048      |      | 122 | Bobbin (B)               |              |
|      | 33  | Guide bar            | PLA1026      |      | 123 | Mechanism base unit      |              |
|      | 34  | Axis                 | PLA1027      |      | 124 | Binder                   |              |
|      | 35  | Disk table           | PLA1088      |      |     |                          |              |
|      | 36  | Roller               | PLM1001      |      |     |                          |              |
|      | 37  | Adjustment lever     | PNB1048      |      |     |                          |              |
|      | 38  | Spindle motor        | PXM1026      |      |     |                          |              |
|      | 39  | Pick up assembly     | PWY1004      |      |     |                          |              |
|      | 40  | Screw                | BBZ30P060FCC |      |     |                          |              |
|      | 41  | Screw                | IBZ30P080FCC |      |     |                          |              |
|      | 42  | Screw                | PMZ26P030FCU |      |     |                          |              |
|      | 43  | Screw                | PMZ26P060FCU |      |     |                          |              |
|      | 44  | Screw                | PMZ30P080FCU |      |     |                          |              |
|      | 45  | Screw                | PMZ30P160FCU |      |     |                          |              |
|      | 46  | Washer               | WS30FMC      |      |     |                          |              |
|      | 47  | Washer               | WT26D047D025 |      |     |                          |              |
|      | 48  | Screw                | ZMD30H040FBT |      |     |                          |              |
|      | 49  | Drive unit           | PYY1038      |      |     |                          |              |
|      | 50  | Speed detection unit | PYY1039      |      |     |                          |              |

#### • How to install the disc table

- 1 Use nippers or other tool to cut the two sections marked ④ in figure 1. 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 ④), and stick the disc table on top (takes about 9kg pressure). Take off the spacer.





A

| Pin No. | Pin Voltage | Pin No. | Pin Voltage | Pin No. | Pin Voltage | Pin No. | Pin Voltage |
|---------|-------------|---------|-------------|---------|-------------|---------|-------------|
| 1       | 0.3-0.4     | 17      | 5           | 33      | 1.3         | 49      | -2.0-9      |
| 2       | 0           | 18      | 5           | 34      | 4.9         | 50      | -2.0-9      |
| 3       | 4.9         | 19      | 5           | 35      | 4.9         | 51      | -2.0-9      |
| 4       | 4.9         | 20      | 5           | 36      | 1.3         | 52      | -2.0-9      |
| 5       | 5.1         | 21      | 5           | 37      | 1.3         | 53      | -2.0-9      |
| 6       | 0           | 22      | 5           | 38      | 5           | 54      | -2.0-9      |
| 7       | 0.3-0.4     | 23      | 5           | 39      | -2.4        | 55      | -2.0-9      |
| 8       | 0           | 24      | 0           | 40      | -2.1        | 56      | -2.0-9      |
| 9       | 0           | 25      | 0           | 41      | 5.1         | 57      | -2.6        |
| 10      | 0           | 26      | 0           | 42      | 0.6         | 58      | 0           |
| 11      | 0           | 27      | 0           | 43      | 5           | 59      | 0           |
| 12      | 0           | 28      | 5           | 44      | -2.4        | 60      | 2.3         |
| 13      | 0           | 29      | 5           | 45      | 1.6         | 61      | 2.2         |
| 14      | 0           | 30      | 0           | 46      | -2.3        | 62      | 5           |
| 15      | 0           | 31      | 0           | 47      | -2.0        | 63      | 5           |
| 16      | 5           | 32      | 0           | 48      | -2.0        | 64      | 5           |

| Pin No. | Pin Voltage | Pin No. | Pin Voltage | Pin No. | Pin Voltage | Pin No. | Pin Voltage |
|---------|-------------|---------|-------------|---------|-------------|---------|-------------|
| 0       | 0           | 17      | 0           | 33      | 5           | 49      | 0.2-0.3     |
| 1       | 0           | 18      | 0           | 34      | 5           | 50      | 0           |
| 2       | 1.9         | 19      | 5           | 35      | 0           | 51      | 0           |
| 3       | 0           | 20      | 0           | 36      | 5           | 52      | 0           |
| 4       | 0           | 21      | 0           | 37      | 5           | 53      | 0           |
| 5       | 2.9         | 22      | 0           | 38      | 5           | 54      | 0           |
| 6       | 0           | 23      | 4.9         | 39      | 0           | 55      | 0           |
| 7       | 0           | 24      | 0           | 40      | 0           | 56      | 0           |
| 8       | 0           | 25      | 0           | 41      | 0.3-0.4     | 57      | 0           |
| 9       | 0           | 26      | 0           | 42      | 0           | 58      | 0           |
| 10      | 0           | 27      | 0           | 43      | 0           | 59      | 0           |
| 11      | 0           | 28      | 0           | 44      | 0           | 60      | 0           |
| 12      | 0           | 29      | 0           | 45      | 0           | 61      | 0           |
| 13      | 0           | 30      | 4.9         | 46      | 0           | 62      | 0           |
| 14      | 0           | 31      | 0           | 47      | 0           | 63      | 0           |
| 15      | 0           | 32      | 0           | 48      | 5           | 64      | 2.5         |

1 C A 01 (P D G 0 3 6)

P D 3 1 7 9 B)

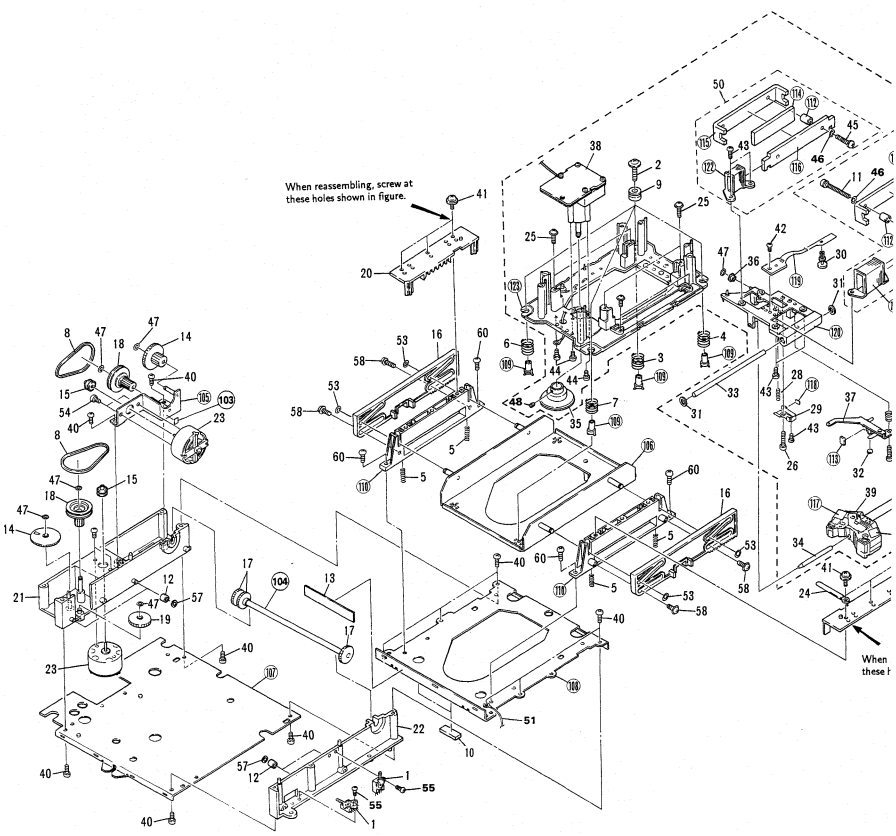
B

C

D

E

F



• TERMINAL VOLTAGES

| Pin No. | Pin Voltage | Pin No. | Pin Voltage |
|---------|-------------|---------|-------------|
| 1       | 1.6         | 3       | 1.8         |
| 2       | 1.3         | 4       | 1.9         |
| 3       | 2.1         | 5       | 2.0         |
| 4       | 2.8         | 6       | 2.8         |
| 5       | 2.5         | 7       | 2.2         |
| 6       | 2.1         | 8       | 2.3         |
| 7       | 2.0         | 9       | 2.4         |
| 8       | 2.1         | 10      | 2.5         |
| 9       | 2.2         | 11      | 2.6         |
| 10      | 2.4         | 12      | 2.7         |
| 11      | 2.5         | 13      | 2.8         |
| 12      | 2.6         | 14      | 2.9         |
| 13      | 2.7         | 15      | 3.0         |
| 14      | 2.8         |         |             |
| 15      | 3.0         |         |             |

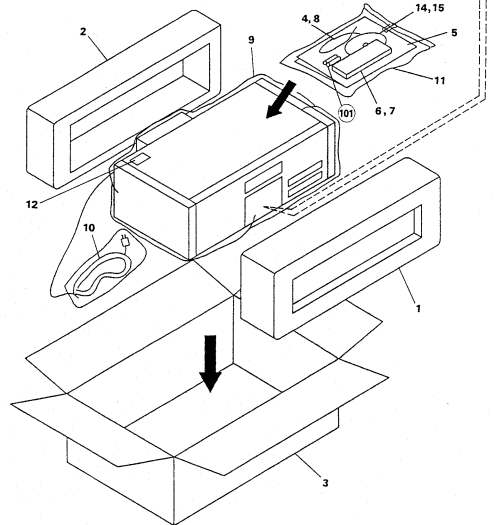
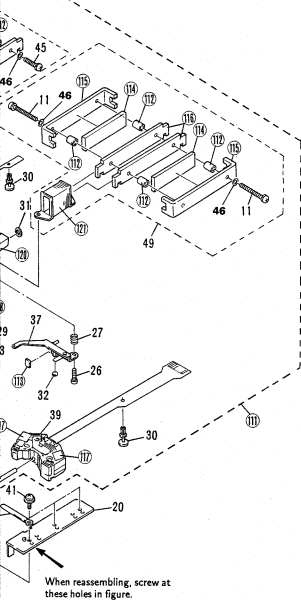
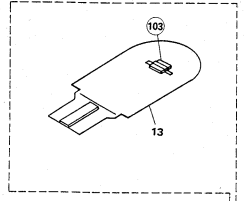
| Pin No. | Pin Voltage | Pin No. | Pin Voltage |
|---------|-------------|---------|-------------|
| 1       | 1.5         | 3       | 1.7         |
| 2       | 1.8         | 4       | 1.9         |
| 3       | 2.0         | 5       | 2.0         |
| 4       | 2.2         | 6       | 2.8         |
| 5       | 2.5         | 7       | 2.2         |
| 6       | 2.1         | 8       | 2.3         |
| 7       | 2.0         | 9       | 2.4         |
| 8       | 2.1         | 10      | 2.5         |
| 9       | 2.2         | 11      | 2.6         |
| 10      | 2.4         | 12      | 2.7         |
| 11      | 2.5         | 13      | 2.8         |
| 12      | 2.6         | 14      | 2.9         |
| 13      | 2.7         | 15      | 3.0         |
| 14      | 2.8         |         |             |
| 15      | 3.0         |         |             |

| Pin No. | Pin Voltage | Pin No. | Pin Voltage |
|---------|-------------|---------|-------------|
| 1       | 1.7         | 3       | 1.9         |
| 2       | 2.0         | 4       | 2.1         |
| 3       | 2.2         | 5       | 2.2         |
| 4       | 2.4         | 6       | 2.8         |
| 5       | 2.5         | 7       | 2.2         |
| 6       | 2.1         | 8       | 2.3         |
| 7       | 2.0         | 9       | 2.4         |
| 8       | 2.1         | 10      | 2.5         |
| 9       | 2.2         | 11      | 2.6         |
| 10      | 2.4         | 12      | 2.7         |
| 11      | 2.5         | 13      | 2.8         |
| 12      | 2.6         | 14      | 2.9         |
| 13      | 2.7         | 15      | 3.0         |
| 14      | 2.8         |         |             |
| 15      | 3.0         |         |             |

| Pin No. | Pin Voltage | Pin No. | Pin Voltage |
|---------|-------------|---------|-------------|
| 1       | 1.7         | 3       | 1.9         |
| 2       | 2.0         | 4       | 2.1         |
| 3       | 2.2         | 5       | 2.2         |
| 4       | 2.4         | 6       | 2.8         |
| 5       | 2.5         | 7       | 2.2         |
| 6       | 2.1         | 8       | 2.3         |
| 7       | 2.0         | 9       | 2.4         |
| 8       | 2.1         | 10      | 2.5         |
| 9       | 2.2         | 11      | 2.6         |
| 10      | 2.4         | 12      | 2.7         |
| 11      | 2.5         | 13      | 2.8         |
| 12      | 2.6         | 14      | 2.9         |
| 13      | 2.7         | 15      | 3.0         |
| 14      | 2.8         |         |             |
| 15      | 3.0         |         |             |

3. PACKING

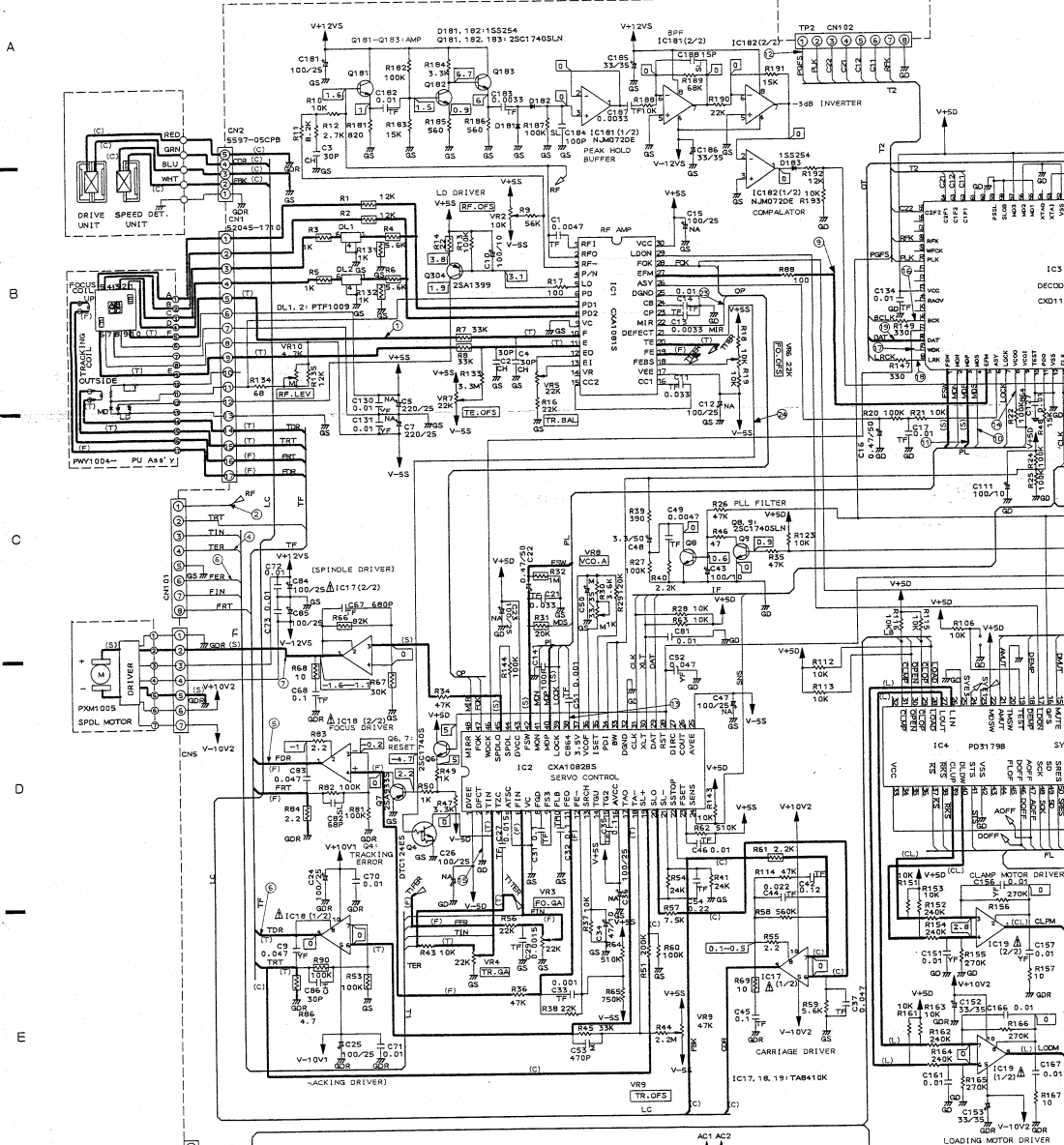
- | Mark No. | Description                             | Parts No. |
|----------|---|-----------|
| 1        | Protector (F)                           | PHA1171   |
| 2        | Protector (R)                           | PHA1172   |
| 3        | CD packing case                         | PHG1676   |
| 4        | Cord with plug (pin plug)               | PDE1003   |
| 5        | Operating instruction (English, French) | PRE1149   |
| 6        | Remote control unit                     | PWW1657   |
| 7        | Battery cover                           | PZN1001   |
| 8        | Cord with plug (mini plug)              | PDE-319   |
| 9        | Mirror mat                              | VHL-087   |
| 10       | Vinyl pouch                             | Z21-013   |
| 11       | Vinyl pouch                             | Z21-038   |
| 12       | Caution label                           | PRW1246   |
| 13       | Sheet                                   | PRW1245   |
| 14       | Turntable sheet assembly                | PEA1174   |
| 15       | Turntable sheet                         | PEB1187   |
| 101      | Battery                                 |           |
| 103      | Rubber spacer                           |           |



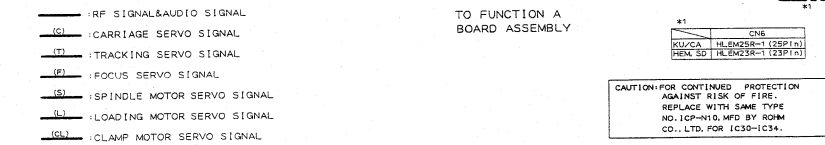
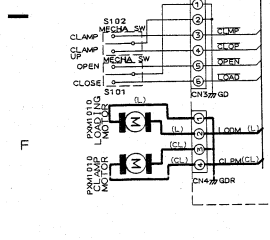
When reassembling, screw at these holes in figure.

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

## 4.1 MAIN BOARD (PWZ 1983), PRIMARY BOARD, FUNCTION A BOARD(PWZ 2000), AND FUNCTION B BOARD ASSEMBLIES



MAIN BOARD ASSEMBLY  
 PWZ1983 (KU/CA)  
 PWZ1994 (HEM, SD)



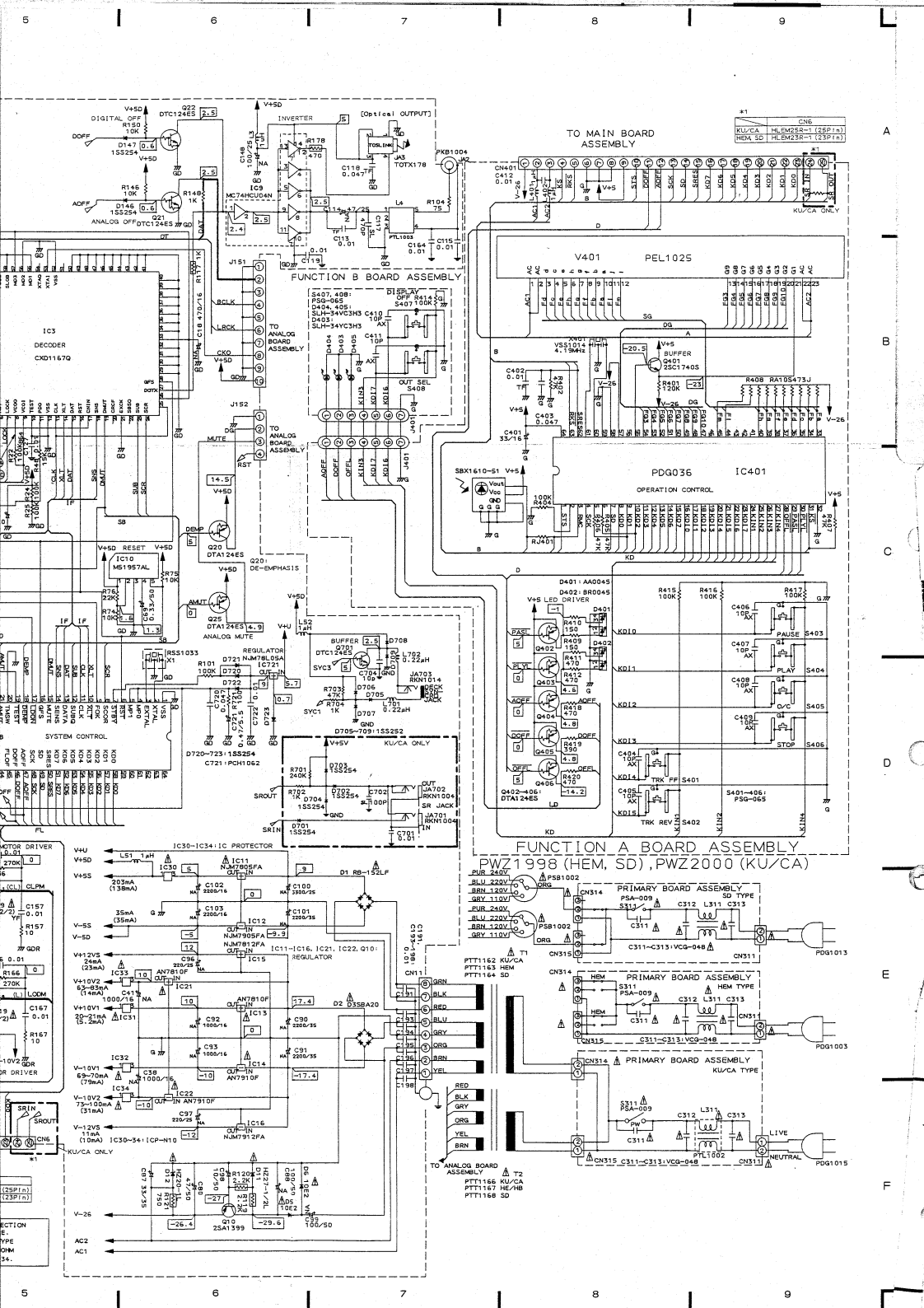


Table with 2 columns: Part Number and Description. Includes components like HLU/CA, HLEM582-1 (23P1A), HEM 32-1 (23P1A).

TO MAIN BOARD ASSEMBLY

FUNCTION B BOARD ASSEMBLY

V401 PEL1025

PDG036 IC401 OPERATION CONTROL

FUNCTION A BOARD ASSEMBLY PWZ1998 (HEM, SD), PWZ2000 (KU/CA)

PRIMARY BOARD ASSEMBLY PSA-009 SD TYPE

PRIMARY BOARD ASSEMBLY HEM TYPE

PRIMARY BOARD ASSEMBLY HEM TYPE

TO ANALOG BOARD ASSEMBLY

Vertical labels A, B, C, D, E, F along the right edge of the page.

#3

IC3 (CX18038)

| Pin | Voltage | Pin | Voltage |   |
|-----|---------|-----|---------|---|
| 1   | 0       | 16  | -5      |   |
| 2   | 1       | 17  | -5      |   |
| 3   | 0       | 18  | 0       |   |
| 4   | 2       | 19  | 0       |   |
| 5   | 0       | 20  | 0       |   |
| 6   | -4      | 21  | -4      |   |
| 7   | 0       | 22  | 0       |   |
| 8   | 0       | 23  | -1      |   |
| 9   | 0       | 24  | -1      |   |
| 10  | 0       | 25  | 0       |   |
| 11  | 0       | 26  | 2.5     |   |
| 12  | -1      | 27  | 2.4     |   |
| 13  | -1      | 28  | 5       |   |
| 14  | 0       | 29  | 0       |   |
| 15  | -3      | 1   | 39      | 5 |

#4

IC2 (CX16028B)

| Pin | Voltage | Pin | Voltage |
|-----|---------|-----|---------|
| 1   | -5      | 15  | -5      |
| 2   | 0       | 16  | 0       |
| 3   | 0       | 17  | 1.5     |
| 4   | 0       | 18  | 3       |
| 5   | 0       | 19  | 5       |
| 6   | 0       | 20  | 5       |
| 7   | 0       | 21  | 5       |
| 8   | 0       | 22  | 5       |
| 9   | 0       | 23  | 2.5     |
| 10  | 0       | 24  | 2.5     |
| 11  | 0       | 25  | 2.5     |
| 12  | 0       | 26  | 2.5     |
| 13  | 0       | 27  | 2.5     |
| 14  | 0       | 28  | 2.5     |
| 15  | 0       | 29  | 2.5     |
| 16  | 0       | 30  | 2.5     |
| 17  | 0       | 31  | 2.5     |
| 18  | 0       | 32  | 2.5     |
| 19  | 0       | 33  | 2.5     |
| 20  | 0       | 34  | 2.5     |
| 21  | 0       | 35  | 2.5     |
| 22  | 0       | 36  | 2.5     |
| 23  | 0       | 37  | 2.5     |
| 24  | 0       | 38  | 2.5     |
| 25  | 0       | 39  | 2.5     |
| 26  | 0       | 40  | 2.5     |

#5

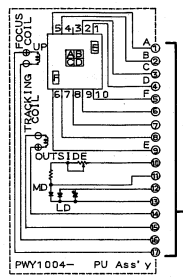
IC3 (CX211740)

| Pin | Voltage | Pin | Voltage | Pin | Voltage | Pin | Voltage |
|-----|---------|-----|---------|-----|---------|-----|---------|
| 1   | 2.5     | 11  | 0       | 41  | 0       | 51  | 1.5     |
| 2   | 2       | 12  | 0.15    | 42  | 0       | 52  | 0       |
| 3   | 2.5     | 13  | 0       | 43  | 0       | 53  | 0       |
| 4   | 2       | 14  | 0       | 44  | 0       | 54  | 0       |
| 5   | 2       | 15  | 0       | 45  | 0       | 55  | 0       |
| 6   | 2.5     | 16  | 0       | 46  | 0       | 56  | 0       |
| 7   | 2.7     | 17  | 0       | 47  | 0       | 57  | 0       |
| 8   | 2       | 18  | 0       | 48  | 0       | 58  | 2.5     |
| 9   | 2       | 19  | 0       | 49  | 0       | 59  | 2.5     |
| 10  | 2.5     | 20  | 0       | 50  | 0       | 60  | 2.5     |
| 11  | 1       | 31  | 0       | 51  | 2.9     | 71  | 5       |
| 12  | 0       | 32  | 0       | 52  | 0       | 72  | 0       |
| 13  | 0       | 33  | 0       | 53  | 2.5     | 73  | 5       |
| 14  | 3       | 34  | 0       | 54  | 2.5     | 74  | 0       |
| 15  | 3       | 35  | 0       | 55  | 0       | 75  | 1.4     |
| 16  | 3       | 36  | 0       | 56  | 0       | 76  | 2.0     |
| 17  | 0       | 37  | 0       | 57  | 0       | 77  | 2.0     |
| 18  | 3       | 38  | 0       | 58  | 0       | 78  | 2.5     |
| 19  | 0       | 39  | 0       | 59  | 0       | 79  | 0       |
| 20  | 3       | 40  | 0       | 60  | 1.3     | 80  | 3.5     |

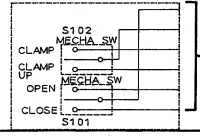
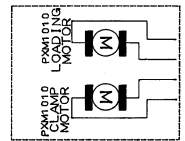
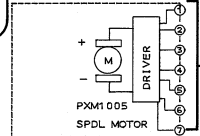
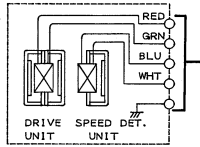
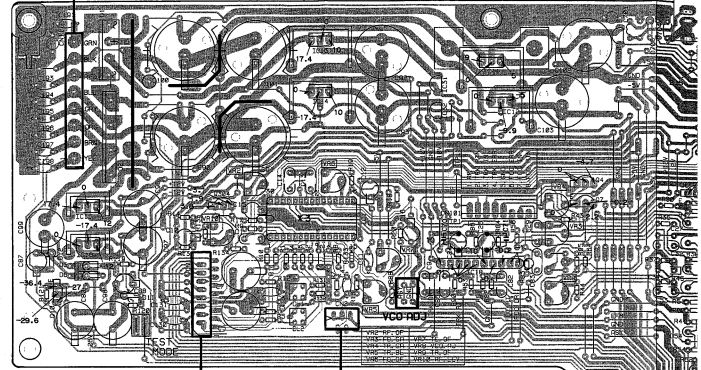
#6

IC4 (PD31700)

| Pin | Voltage | Pin | Voltage | Pin | Voltage | Pin | Voltage |
|-----|---------|-----|---------|-----|---------|-----|---------|
| 1   | 0       | 17  | 0       | 33  | 5       | 49  | 0.2-0.3 |
| 2   | 1.5     | 18  | 0       | 34  | 5       | 50  | 0       |
| 3   | 2       | 19  | 0       | 35  | 5       | 51  | 0       |
| 4   | 0       | 20  | 0       | 36  | 5       | 52  | 0       |
| 5   | 2       | 21  | 0       | 37  | 5       | 53  | 0       |
| 6   | 5       | 22  | 0       | 38  | 5       | 54  | 0       |
| 7   | 5       | 23  | 0       | 39  | 0       | 55  | 0       |
| 8   | 0       | 24  | 0       | 40  | 5       | 56  | 0       |
| 9   | 0       | 25  | 0       | 41  | 0.3-0.4 | 57  | 0       |
| 10  | 0       | 26  | 0       | 42  | 5       | 58  | 0       |
| 11  | 0       | 27  | 0       | 43  | 5       | 59  | 0       |
| 12  | 0       | 28  | 0       | 44  | 5       | 60  | 0       |
| 13  | 0       | 29  | 0       | 45  | 0       | 61  | 0       |
| 14  | 0       | 30  | 0       | 46  | 5       | 62  | 0       |
| 15  | 0       | 31  | 0       | 47  | 0       | 63  | 0       |
| 16  | 5       | 32  | 0       | 48  | 5       | 64  | 0       |



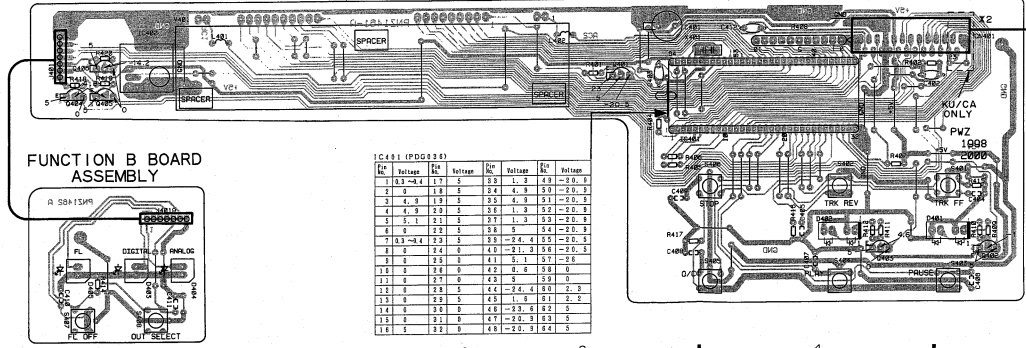
MAIN BOARD ASSEMBLY  
(PWZ1983:KU/CA TYPE)  
(PWZ1994:HEM AND SD TYPES)



X2

| Pin | Signal |
|-----|--------|
| 1   | KU/CA  |
| 2   | HEM,SD |

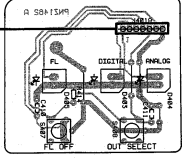
FUNCTION A BOARD ASSEMBLY  
(PWZ2000:KU/CA TYPE)  
(PWZ1998:HEM AND SD TYPES)

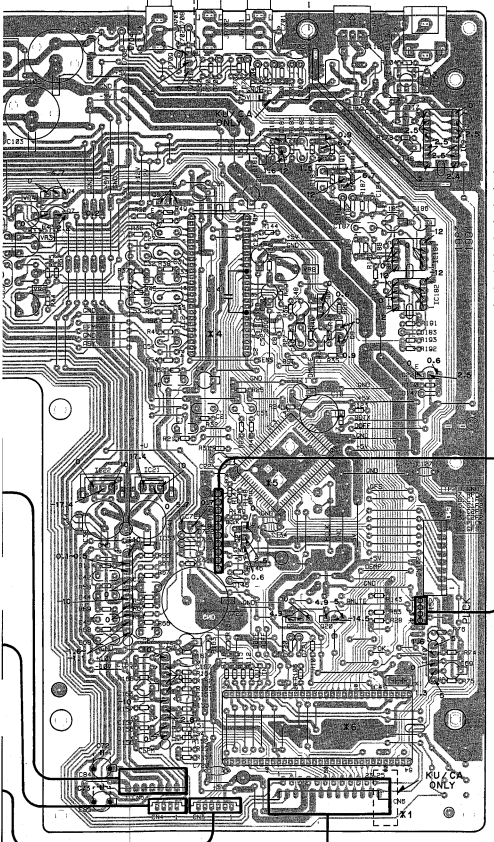


IC601 (PD00301)

| Pin | Voltage | Pin | Voltage | Pin | Voltage | Pin | Voltage |
|-----|---------|-----|---------|-----|---------|-----|---------|
| 1   | 1.8     | 4   | 1.5     | 13  | 1.3     | 43  | -0.1    |
| 2   | 0       | 18  | 5       | 24  | 4.9     | 50  | -0.3    |
| 3   | 2.5     | 19  | 5       | 25  | 4.9     | 51  | -0.3    |
| 4   | 0       | 20  | 5       | 26  | 1.3     | 52  | -0.3    |
| 5   | 1       | 21  | 5       | 27  | 1.3     | 53  | -0.3    |
| 6   | 0       | 22  | 5       | 28  | 5       | 54  | -0.3    |
| 7   | 0.3     | 23  | 3       | 29  | -24     | 4.0 | -0.3    |
| 8   | 0       | 24  | 0       | 30  | -21.3   | 56  | -0.3    |
| 9   | 0       | 25  | 0       | 31  | 5       | 57  | -0.3    |
| 10  | 0       | 26  | 0       | 32  | 0       | 58  | 0       |
| 11  | 0       | 27  | 0       | 33  | 0       | 59  | 0       |
| 12  | 0       | 28  | 5       | 34  | -24     | 4   | 0       |
| 13  | 0       | 29  | 5       | 35  | 1.8     | 4   | 0       |
| 14  | 0       | 30  | 5       | 36  | 4.8     | 10  | 0       |
| 15  | 0       | 31  | 0       | 37  | -20.3   | 6   | 5       |
| 16  | 1       | 32  | 0       | 38  | -20.5   | 4   | 5       |

FUNCTION B BOARD ASSEMBLY





- IC13 IC30
- IC11 Q701
- IC31
- IC14
- IC32 IC12
- IC9
- Q181 Q182
- VR6
- VR2
- VR4 Q183
- Q4 Q6
- VR10 Q304 Q7
- VR3 IC15 IC1
- VR7 IC16 IC181
- VR8 IC18
- VR5 IC2 IC182
- VR9 Q8

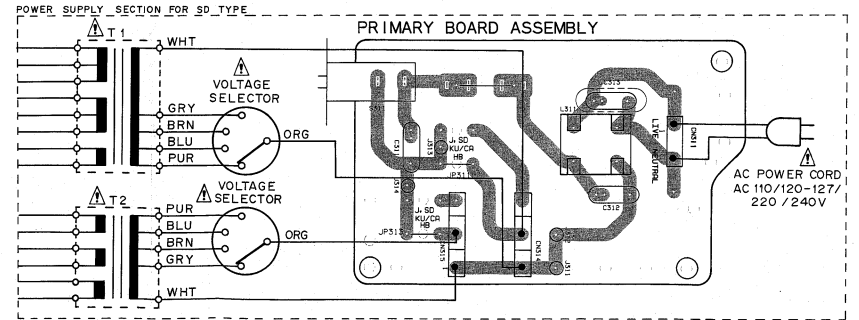
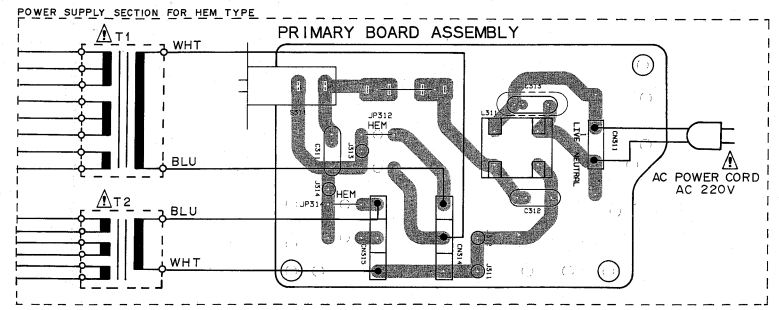
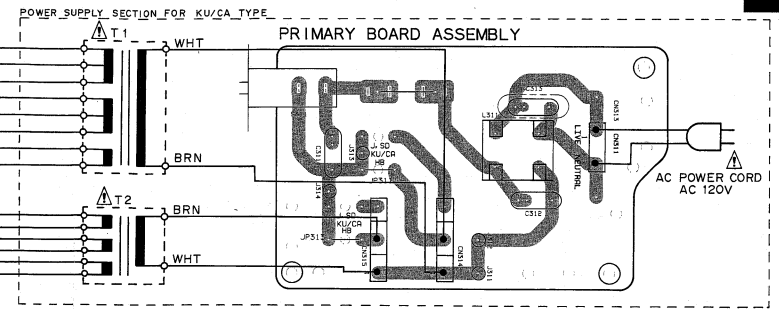
TO ANALOG BOARD ASSEMBLY

TO ANALOG BOARD ASSEMBLY

- IC3
- IC22 IC21
- IC34 IC721
- Q21
- IC33
- IC17
- Q25 Q20
- IC10
- IC19
- IC4

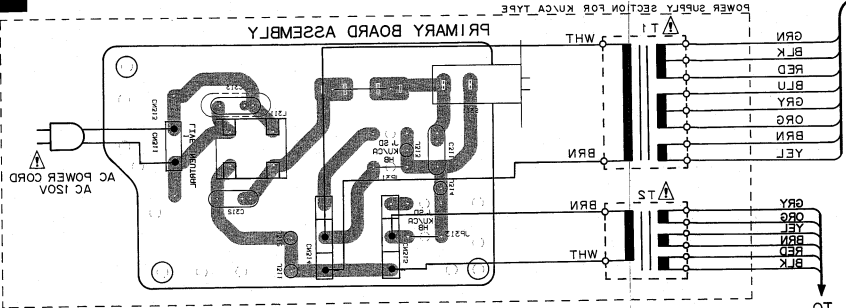
x 1

| CN6     |         |
|---------|---------|
| KU/CA   | 25p/ins |
| HEM, SD | 23p/ins |

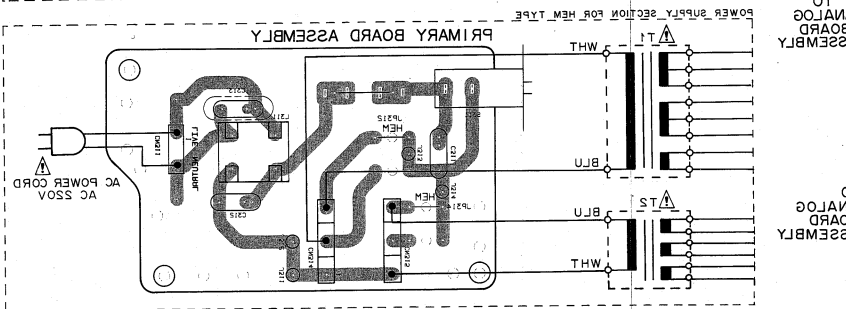


A  
B  
C  
D

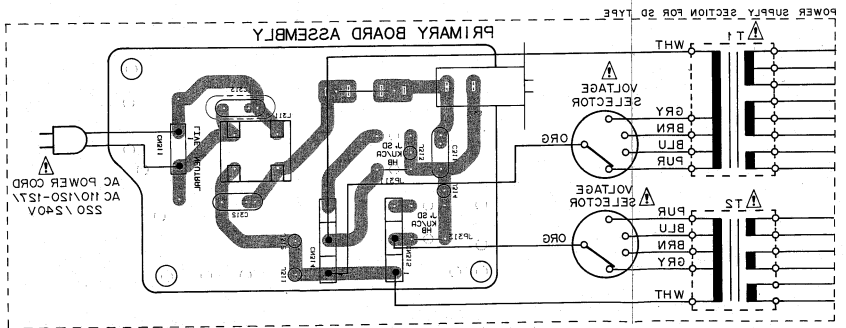
A



B



C



D

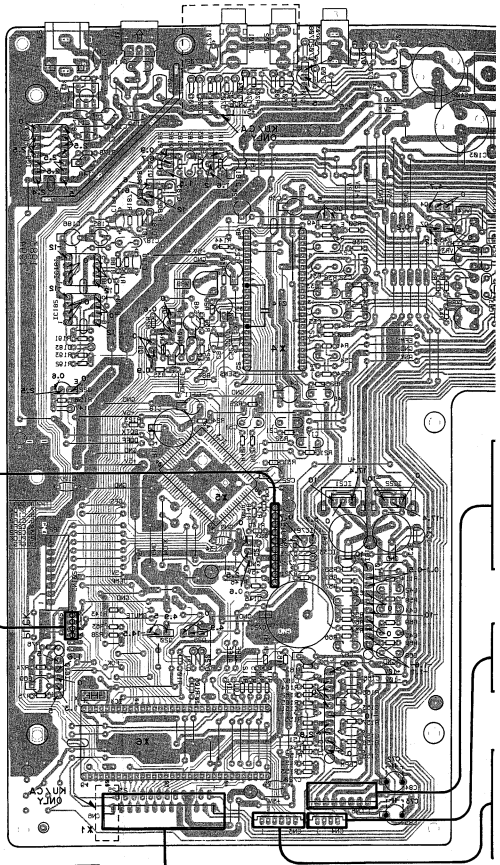
GRN  
BLK  
RED  
BLU  
GRY  
ORG  
BRN  
YEL  
WHT

TO ANALOG BOARD ASSEMBLY

TO ANALOG BOARD ASSEMBLY

| HEM 20 | S3pins | KUNJA | S4pins | CNE |
|--------|--------|-------|--------|-----|
|        |        |       |        |     |

- VR9 010
- VR8 018
- VR7 016
- VR6 014
- VR5 012
- VR4 008
- VR3 004
- VR2 004
- VR1 004
- Q3
- Q25
- Q33
- Q34
- Q35
- Q36
- Q37
- Q38
- Q39
- Q40
- Q41
- Q42
- Q43
- Q44
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- Q97
- Q98
- Q99
- Q100







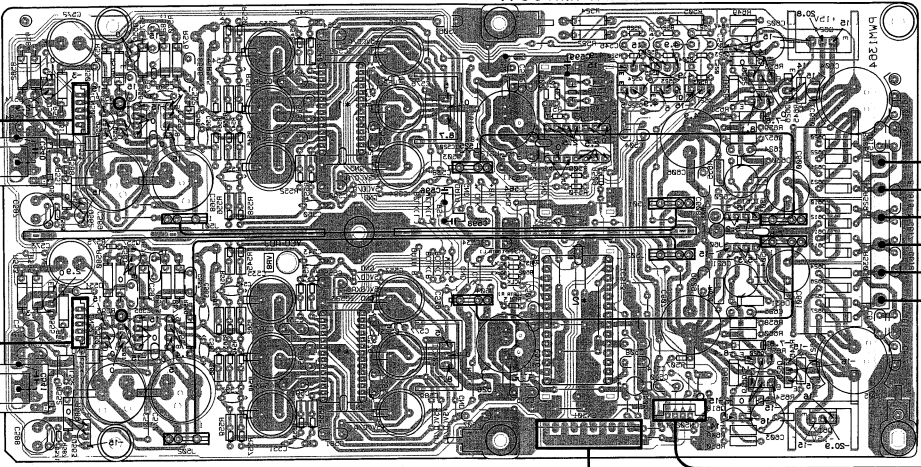
4. ANALOG BOARD (P/WM 1364) AND  
BALANCE BOARD ASSEMBLIES

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

TO POWER TRANSFORMER

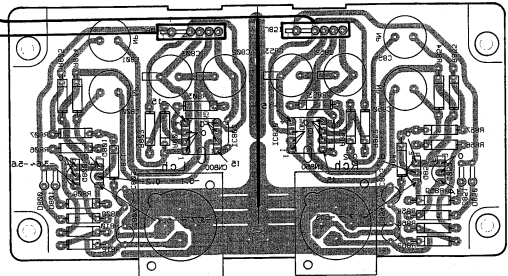
- YEL
- BRN
- RED
- BLK
- GRY
- ORG

TO MAIN BOARD ASSEMBLY



TO MAIN BOARD ASSEMBLY  
 0817 0818 0819  
 0821 0822 0823 0824  
 0825 0826 0827 0828 0829  
 0830 0831 0832 0833 0834  
 0835 0836 0837 0838 0839  
 0840 0841 0842 0843 0844  
 0845 0846 0847 0848 0849  
 0850 0851 0852 0853 0854  
 0855 0856 0857 0858 0859  
 0860 0861 0862 0863 0864  
 0865 0866 0867 0868 0869  
 0870 0871 0872 0873 0874  
 0875 0876 0877 0878 0879  
 0880 0881 0882 0883 0884  
 0885 0886 0887 0888 0889  
 0890 0891 0892 0893 0894  
 0895 0896 0897 0898 0899  
 0900 0901 0902 0903 0904

BALANCE BOARD ASSEMBLY



0880 0881 0882 0883 0884  
 0885 0886 0887 0888 0889  
 0890 0891 0892 0893 0894

1\*

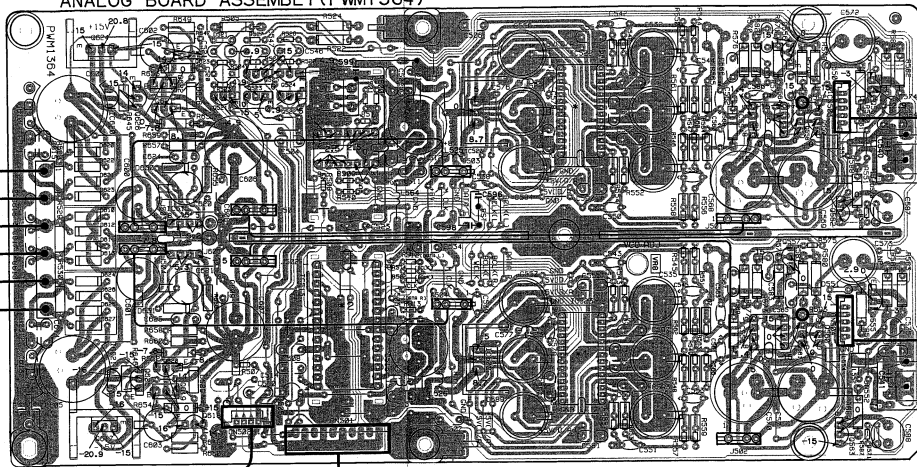
| IC | PCB  | IC | PCB  |
|----|------|----|------|
| 1  | 0817 | 1  | 0817 |
| 2  | 0818 | 2  | 0818 |
| 3  | 0819 | 3  | 0819 |
| 4  | 0821 | 4  | 0821 |
| 5  | 0822 | 5  | 0822 |
| 6  | 0823 | 6  | 0823 |
| 7  | 0824 | 7  | 0824 |
| 8  | 0825 | 8  | 0825 |
| 9  | 0826 | 9  | 0826 |
| 10 | 0827 | 10 | 0827 |
| 11 | 0828 | 11 | 0828 |
| 12 | 0829 | 12 | 0829 |
| 13 | 0830 | 13 | 0830 |
| 14 | 0831 | 14 | 0831 |
| 15 | 0832 | 15 | 0832 |
| 16 | 0833 | 16 | 0833 |
| 17 | 0834 | 17 | 0834 |
| 18 | 0835 | 18 | 0835 |
| 19 | 0836 | 19 | 0836 |
| 20 | 0837 | 20 | 0837 |
| 21 | 0838 | 21 | 0838 |
| 22 | 0839 | 22 | 0839 |
| 23 | 0840 | 23 | 0840 |
| 24 | 0841 | 24 | 0841 |
| 25 | 0842 | 25 | 0842 |
| 26 | 0843 | 26 | 0843 |
| 27 | 0844 | 27 | 0844 |
| 28 | 0845 | 28 | 0845 |
| 29 | 0846 | 29 | 0846 |
| 30 | 0847 | 30 | 0847 |
| 31 | 0848 | 31 | 0848 |
| 32 | 0849 | 32 | 0849 |
| 33 | 0850 | 33 | 0850 |
| 34 | 0851 | 34 | 0851 |
| 35 | 0852 | 35 | 0852 |
| 36 | 0853 | 36 | 0853 |
| 37 | 0854 | 37 | 0854 |
| 38 | 0855 | 38 | 0855 |
| 39 | 0856 | 39 | 0856 |
| 40 | 0857 | 40 | 0857 |
| 41 | 0858 | 41 | 0858 |
| 42 | 0859 | 42 | 0859 |
| 43 | 0860 | 43 | 0860 |
| 44 | 0861 | 44 | 0861 |
| 45 | 0862 | 45 | 0862 |
| 46 | 0863 | 46 | 0863 |
| 47 | 0864 | 47 | 0864 |
| 48 | 0865 | 48 | 0865 |
| 49 | 0866 | 49 | 0866 |
| 50 | 0867 | 50 | 0867 |
| 51 | 0868 | 51 | 0868 |
| 52 | 0869 | 52 | 0869 |
| 53 | 0870 | 53 | 0870 |
| 54 | 0871 | 54 | 0871 |
| 55 | 0872 | 55 | 0872 |
| 56 | 0873 | 56 | 0873 |
| 57 | 0874 | 57 | 0874 |
| 58 | 0875 | 58 | 0875 |
| 59 | 0876 | 59 | 0876 |
| 60 | 0877 | 60 | 0877 |
| 61 | 0878 | 61 | 0878 |
| 62 | 0879 | 62 | 0879 |
| 63 | 0880 | 63 | 0880 |
| 64 | 0881 | 64 | 0881 |
| 65 | 0882 | 65 | 0882 |
| 66 | 0883 | 66 | 0883 |
| 67 | 0884 | 67 | 0884 |
| 68 | 0885 | 68 | 0885 |
| 69 | 0886 | 69 | 0886 |
| 70 | 0887 | 70 | 0887 |
| 71 | 0888 | 71 | 0888 |
| 72 | 0889 | 72 | 0889 |
| 73 | 0890 | 73 | 0890 |
| 74 | 0891 | 74 | 0891 |
| 75 | 0892 | 75 | 0892 |
| 76 | 0893 | 76 | 0893 |
| 77 | 0894 | 77 | 0894 |
| 78 | 0895 | 78 | 0895 |
| 79 | 0896 | 79 | 0896 |
| 80 | 0897 | 80 | 0897 |
| 81 | 0898 | 81 | 0898 |
| 82 | 0899 | 82 | 0899 |
| 83 | 0900 | 83 | 0900 |
| 84 | 0901 | 84 | 0901 |
| 85 | 0902 | 85 | 0902 |
| 86 | 0903 | 86 | 0903 |
| 87 | 0904 | 87 | 0904 |

5\*

| IC | PCB  | IC | PCB  |
|----|------|----|------|
| 1  | 0817 | 1  | 0817 |
| 2  | 0818 | 2  | 0818 |
| 3  | 0819 | 3  | 0819 |
| 4  | 0821 | 4  | 0821 |
| 5  | 0822 | 5  | 0822 |
| 6  | 0823 | 6  | 0823 |
| 7  | 0824 | 7  | 0824 |
| 8  | 0825 | 8  | 0825 |
| 9  | 0826 | 9  | 0826 |
| 10 | 0827 | 10 | 0827 |
| 11 | 0828 | 11 | 0828 |
| 12 | 0829 | 12 | 0829 |
| 13 | 0830 | 13 | 0830 |
| 14 | 0831 | 14 | 0831 |
| 15 | 0832 | 15 | 0832 |
| 16 | 0833 | 16 | 0833 |
| 17 | 0834 | 17 | 0834 |
| 18 | 0835 | 18 | 0835 |
| 19 | 0836 | 19 | 0836 |
| 20 | 0837 | 20 | 0837 |
| 21 | 0838 | 21 | 0838 |
| 22 | 0839 | 22 | 0839 |
| 23 | 0840 | 23 | 0840 |
| 24 | 0841 | 24 | 0841 |
| 25 | 0842 | 25 | 0842 |
| 26 | 0843 | 26 | 0843 |
| 27 | 0844 | 27 | 0844 |
| 28 | 0845 | 28 | 0845 |
| 29 | 0846 | 29 | 0846 |
| 30 | 0847 | 30 | 0847 |
| 31 | 0848 | 31 | 0848 |
| 32 | 0849 | 32 | 0849 |
| 33 | 0850 | 33 | 0850 |
| 34 | 0851 | 34 | 0851 |
| 35 | 0852 | 35 | 0852 |
| 36 | 0853 | 36 | 0853 |
| 37 | 0854 | 37 | 0854 |
| 38 | 0855 | 38 | 0855 |
| 39 | 0856 | 39 | 0856 |
| 40 | 0857 | 40 | 0857 |
| 41 | 0858 | 41 | 0858 |
| 42 | 0859 | 42 | 0859 |
| 43 | 0860 | 43 | 0860 |
| 44 | 0861 | 44 | 0861 |
| 45 | 0862 | 45 | 0862 |
| 46 | 0863 | 46 | 0863 |
| 47 | 0864 | 47 | 0864 |
| 48 | 0865 | 48 | 0865 |
| 49 | 0866 | 49 | 0866 |
| 50 | 0867 | 50 | 0867 |
| 51 | 0868 | 51 | 0868 |
| 52 | 0869 | 52 | 0869 |
| 53 | 0870 | 53 | 0870 |
| 54 | 0871 | 54 | 0871 |
| 55 | 0872 | 55 | 0872 |
| 56 | 0873 | 56 | 0873 |
| 57 | 0874 | 57 | 0874 |
| 58 | 0875 | 58 | 0875 |
| 59 | 0876 | 59 | 0876 |
| 60 | 0877 | 60 | 0877 |
| 61 | 0878 | 61 | 0878 |
| 62 | 0879 | 62 | 0879 |
| 63 | 0880 | 63 | 0880 |
| 64 | 0881 | 64 | 0881 |
| 65 | 0882 | 65 | 0882 |
| 66 | 0883 | 66 | 0883 |
| 67 | 0884 | 67 | 0884 |
| 68 | 0885 | 68 | 0885 |
| 69 | 0886 | 69 | 0886 |
| 70 | 0887 | 70 | 0887 |
| 71 | 0888 | 71 | 0888 |
| 72 | 0889 | 72 | 0889 |
| 73 | 0890 | 73 | 0890 |
| 74 | 0891 | 74 | 0891 |
| 75 | 0892 | 75 | 0892 |
| 76 | 0893 | 76 | 0893 |
| 77 | 0894 | 77 | 0894 |
| 78 | 0895 | 78 | 0895 |
| 79 | 0896 | 79 | 0896 |
| 80 | 0897 | 80 | 0897 |
| 81 | 0898 | 81 | 0898 |
| 82 | 0899 | 82 | 0899 |
| 83 | 090  |    |      |

4.2 ANALOG BOARD(PWM 1364) AND BALANCE BOARD ASSEMBLIES

ANALOG BOARD ASSEMBLY (PWM1364)



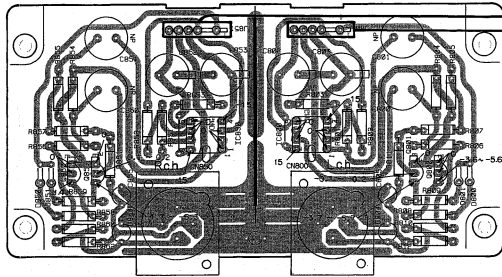
TO POWER TRANSFORMER

- ORG
- GRY
- BLK
- RED
- BRN
- YEL

TO MAIN BOARD ASSEMBLY

- |       |      |      |       |      |       |       |       |       |       |      |      |      |
|-------|------|------|-------|------|-------|-------|-------|-------|-------|------|------|------|
| Q624  | Q622 | Q623 | Q525  | Q524 | IC512 | IC501 | IC522 | IC554 | Q556  | Q559 | Q554 |      |
| IC620 | Q626 | Q621 | Q521  | Q523 | Q522  | IC513 | IC502 | IC523 | IC555 | Q557 | Q560 | Q555 |
| IC621 | Q625 | Q620 | IC615 |      |       |       |       |       | Q558  | Q562 |      |      |
| Q617  | Q619 | Q618 |       |      |       |       |       |       | Q561  | Q563 |      |      |

BALANCE BOARD ASSEMBLY



- |      |      |       |       |      |      |
|------|------|-------|-------|------|------|
| Q850 | Q851 | IC850 | IC800 | Q801 | Q800 |
|------|------|-------|-------|------|------|

\*1 IC522, IC523 (PDR28A)

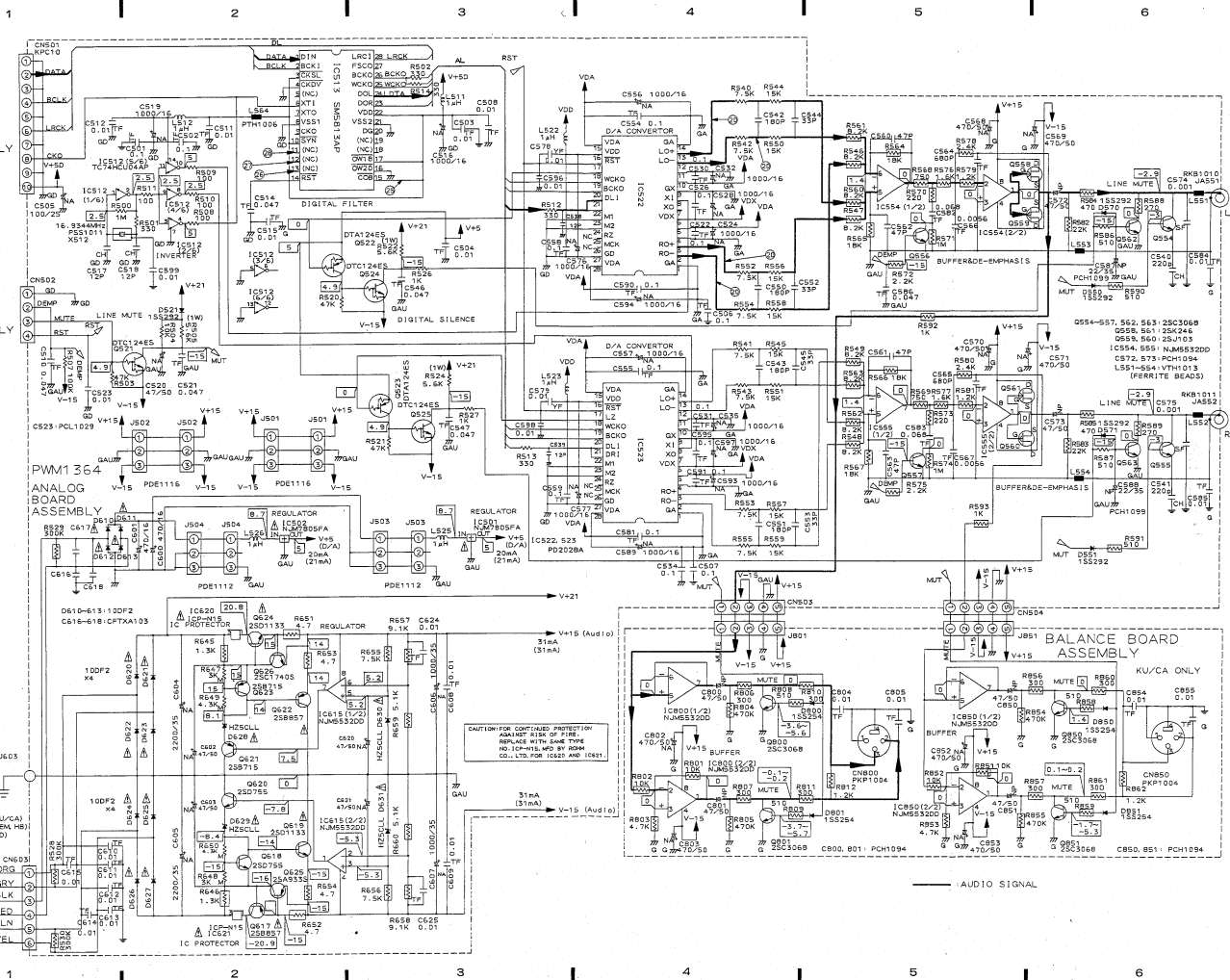
| Pin | Voltage | Pin | Voltage |
|-----|---------|-----|---------|
| 1   | 0       | 15  | 5       |
| 2   | 0       | 16  | 5       |
| 3   | 0       | 17  | 5       |
| 4   | 0       | 18  | 0       |
| 5   | 0       | 19  | 0       |
| 6   | 0       | 20  | 2.4     |
| 7   | 0       | 21  | 0       |
| 8   | 0       | 22  | 0       |
| 9   | 0       | 23  | 0       |
| 10  | 0       | 24  | 0       |
| 11  | 0       | 25  | 3.2     |
| 12  | 0       | 26  | 2.5     |
| 13  | 0       | 27  | 0       |
| 14  | 0       | 28  | 5       |

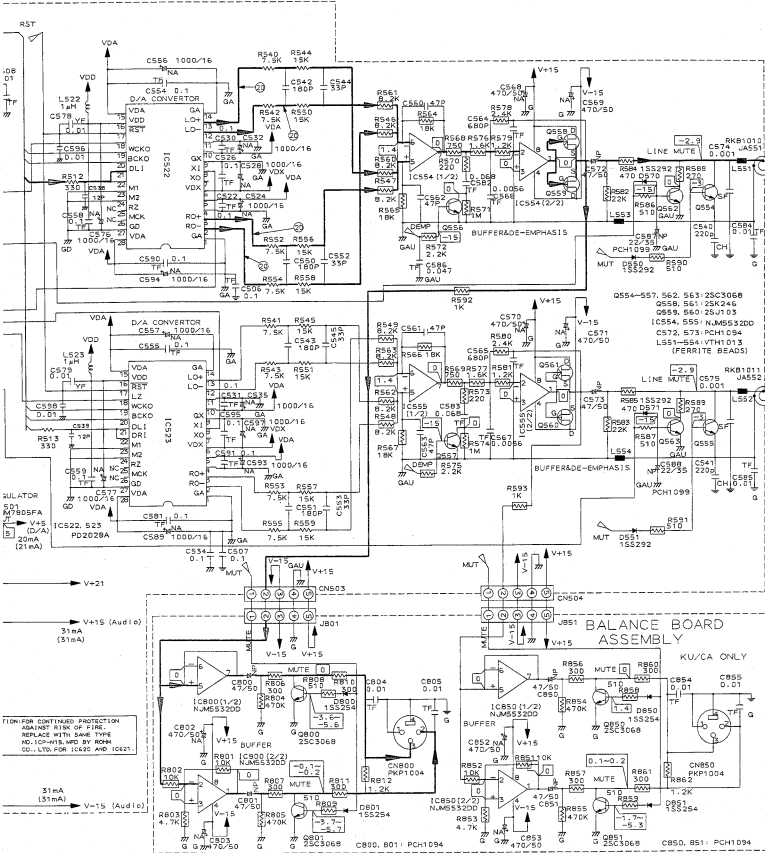
\*2 IC512 (SMS13AP)

| Pin | Voltage | Pin | Voltage |
|-----|---------|-----|---------|
| 1   | 2.5     | 15  | 5       |
| 2   | 2.4     | 16  | 0       |
| 3   | 0       | 17  | 5       |
| 4   | 0       | 18  | 0       |
| 5   | 0       | 19  | 0       |
| 6   | 2.4     | 20  | 2.4     |
| 7   | 0       | 21  | 0       |
| 8   | 0       | 22  | 5       |
| 9   | 2.2     | 23  | 1.9     |
| 10  | 0       | 24  | 1.9     |
| 11  | 0       | 25  | 3.1     |
| 12  | 0       | 26  | 2.1     |
| 13  | 0       | 27  | 2.5     |
| 14  | 4.8     | 28  | 2.5     |

| PCB pattern diagram | Component part symbol | Part name   | PCB pattern diagram | Component part symbol | Part name   |
|---------------------|-----------------------|-------------|---------------------|-----------------------|-------------|
|                     |                       | Capacitor   |                     |                       | Capacitor   |
|                     |                       | Resistor    |                     |                       | Resistor    |
|                     |                       | Diode       |                     |                       | Diode       |
|                     |                       | Zener diode |                     |                       | Zener diode |
|                     |                       | LED         |                     |                       | LED         |
|                     |                       | Transistor  |                     |                       | Transistor  |
|                     |                       | Test switch |                     |                       | Test switch |
|                     |                       | Inductor    |                     |                       | Inductor    |
|                     |                       | Coil        |                     |                       | Coil        |
|                     |                       | Transformer |                     |                       | Transformer |
|                     |                       | Filter      |                     |                       | Filter      |

1. This PCB correction diagram is shown here for your reference only.
2. The area which has been reserved on the Board can be replaced with those shown with the corresponding wiring symbols based on the above table.
3. The resistor terminal marked with  $\ominus$  shows negative terminal.
4. The diode marked with  $\ominus$  shows cathode side.
5. The transistor terminal marked with  $\ominus$  shows emitter.





- RESISTORS:**  
Indicated in *D*, *1/4W*, *1/8W* and *1/10W*. ±5% tolerance unless otherwise noted; k: kΩ, M: MΩ, (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% tolerance.
- CAPACITORS:**  
Indicated in capacity (μF)/voltage(V) unless otherwise noted; p: pF. Indication without voltage is 50 V except electrolytic capacitor.
- VOLTAGE CURRENT:**  
□: DC voltage (V) at play state.  
◊mA: 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)  
**PRIMARY BOARD ASSEMBLY**  
S311 POWER

- FUNCTION A BOARD ASSEMBLY**  
S401 TRACK SEARCH  
S402 PAUSE  
S403 PLAY  
S404 OPEN/CLOSE(Δ)  
S406 STOP
- FUNCTION B BOARD ASSEMBLY**  
S407 DISPLAY OFF  
S408 OUTPUT

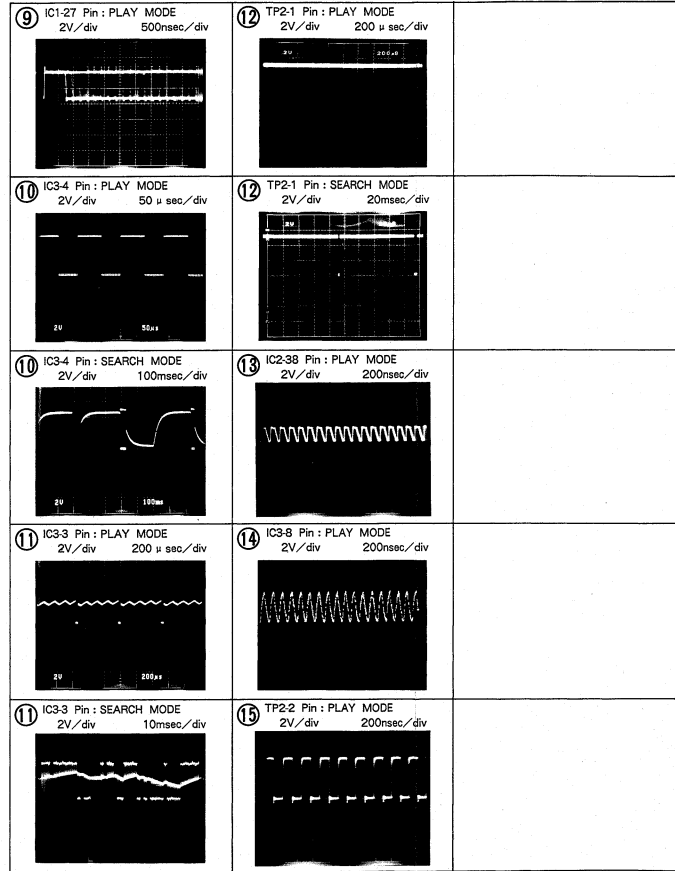
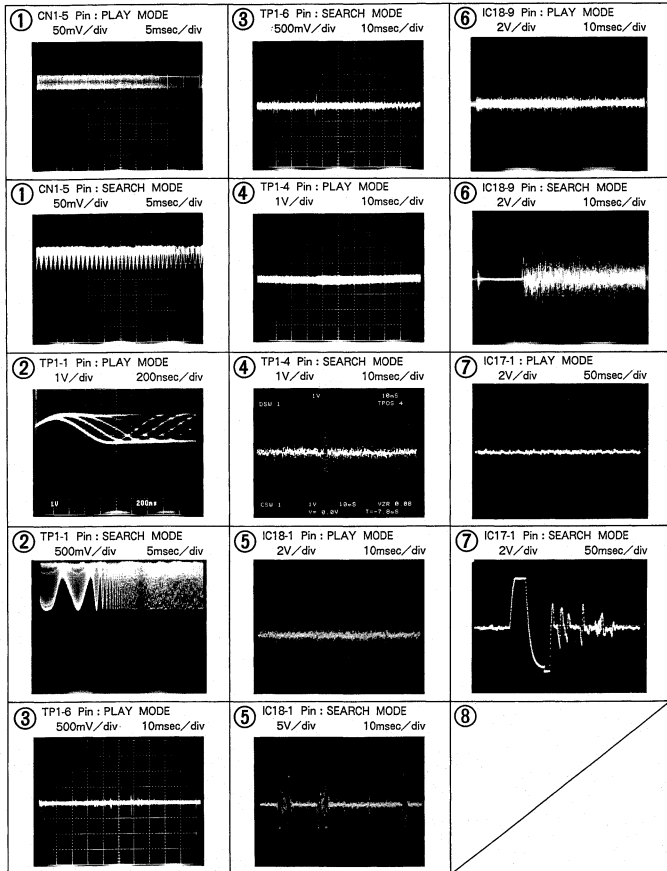
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE WITH SAME TYPE AND RATING. DO NOT USE FOR IC855 AND IC857!

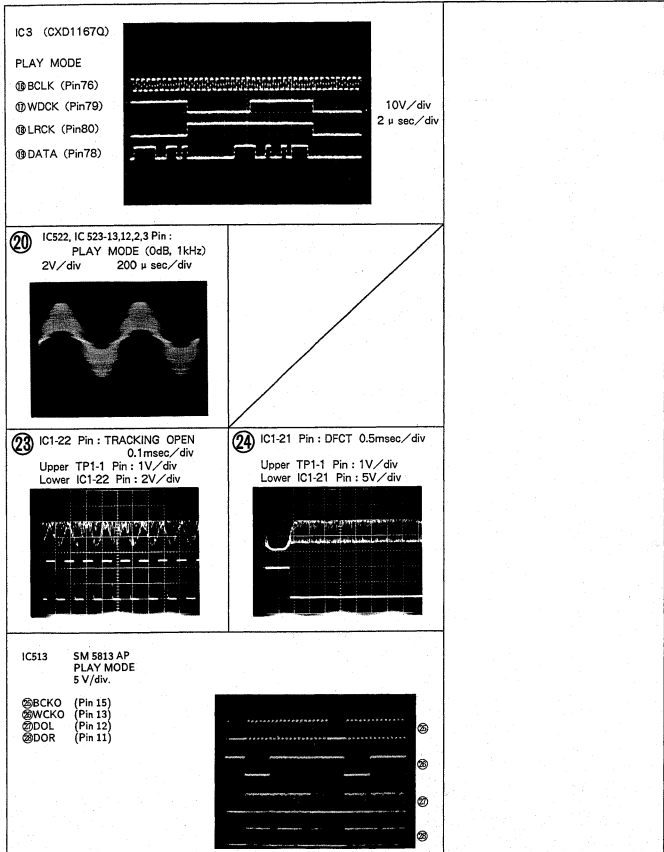
31mA (31mA) V+15 (Audio I)  
31mA (31mA) V-15 (Audio I)

— AUDIO SIGNAL

4.3 WAVEFORMS

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





## 5. 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%).

|   |             |
|---|-------------|
| 560 $\Omega$ 56 $\times 10^1$ 561 ..... | RD1/APS567J |
| 47k $\Omega$ 47 $\times 10^3$ 473 ..... | RD1/APS473J |
| 0.5 $\Omega$ 0R5 .....                  | RD2H0R5K    |
| 1 $\Omega$ 010 .....                    | RD1P010K    |

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

|   |              |
|---|--------------|
| 5.62k $\Omega$ 562 $\times 10^3$ 5621 ..... | RD1/4SR5621F |
|---|--------------|

| Mark                                    | No.          | Description       | Parts No.  | Mark                     | No.                  | Description  | Parts No. |
|---|--------------|-------------------|------------|--------------------------|----------------------|--------------|-----------|
| <b>●ANALOG BOARD ASSEMBLY (PWW1364)</b> |              |                   |            | <b>COILS AND FILTERS</b> |                      |              |           |
| <b>SEMICONDUCTORS</b>                   |              |                   |            | <b>CAPACITORS</b>        |                      |              |           |
|   | IC501, IC502 | REGULATOR IC      | NJM7805FA  | L511, L512               | AXIAL INDUCTOR       | LAU010K      |           |
|   | IC512        | LOGIC IC          | TC74HC04AP | L522, L523               | AXIAL INDUCTOR       | LAU010K      |           |
|   | IC513        | IC                | SM5813AP   | L526, L527               | AXIAL INDUCTOR       | LAU010K      |           |
|   | IC522, IC523 | D/A CONVERTER, IC | PD2028A    | L551, L554               | FERRITE BEADS        | VTH1013      |           |
|   | IC554, IC555 | OP-AMP IC         | NJM5532DD  | L564                     |                      | PTH1006      |           |
|   | IC615        | OP-AMP IC         | NJM5532DD  | C501, C502               | AUDIO FILM CAPACITOR | CFTXA104J50  |           |
| $\Delta$                                | IC620, IC621 | IC PROTECTOR      | ICP-N15    | C503, C504               | AUDIO FILM CAPACITOR | CFTXA103J50  |           |
|   | Q521         | TRANSISTOR        | DTC124ES   | C505                     | ELECTROLYTIC CAPACIT | CENA101M25   |           |
|   | Q522, Q523   | TRANSISTOR        | DTA124ES   | C506, C507               | AUDIO FILM CAPACITOR | CFTXA104J50  |           |
|   | Q524, Q525   | TRANSISTOR        | DTC124ES   | C508                     | AUDIO FILM CAPACITOR | CFTXA103J50  |           |
|   | Q554-Q557    | TRANSISTOR        | 2SC3068    | C510                     | AUDIO FILM CAPACITOR | CFTXA473J50  |           |
|   | Q558         | TRANSISTOR        | 2SK246     | C511, C512               | AUDIO FILM CAPACITOR | CFTXA103J50  |           |
|   | Q559, Q560   | FET               | 2SJ103     | C514                     | AUDIO FILM CAPACITOR | CFTXA473J50  |           |
|   | Q561         | TRANSISTOR        | 2SK246     | C515                     | AUDIO FILM CAPACITOR | CFTXA103J50  |           |
|   | Q562, Q563   | TRANSISTOR        | 2SC3068    | C516                     | ELECTROLYTIC CAPACIT | CENA102M16   |           |
| $\Delta$                                | Q617         | TRANSISTOR        | 2SB857     | C517, C518               | CERAMIC CAPACITOR    | CCCCH120J50  |           |
|   | Q618         | TRANSISTOR        | 2SD756     | C519                     | ELECTROLYTIC CAPACIT | CENA102M16   |           |
| $\Delta$                                | Q619         | POWER TRANSISTOR  | 2SD1133    | C520                     | ELECTROLYTIC CAPACIT | CENA470M50   |           |
|   | Q620         | TRANSISTOR        | 2SD755     | C521                     | AUDIO FILM CAPACITOR | CFTXA473J50  |           |
| $\Delta$                                | Q621         | TRANSISTOR        | 2SB715     | C522                     | AUDIO FILM CAPACITOR | CFTXA104J50  |           |
|   | Q622         | TRANSISTOR        | 2SB857     | C523                     | CERAMIC CAPACITOR    | PCL1025      |           |
|   | Q623         | TRANSISTOR        | 2SB715     | C524                     | ELECTROLYTIC CAPACIT | CENA102M16   |           |
| $\Delta$                                | Q624         | POWER TRANSISTOR  | 2SD1133    | C526                     | AUDIO FILM CAPACITOR | CFTXA104J50  |           |
|   | Q625         | TRANSISTOR        | 2SA933S    | C528                     | ELECTROLYTIC CAPACIT | CENA102M16   |           |
|   | Q626         | TRANSISTOR        | 2SC1740S   | C530, C531               | AUDIO FILM CAPACITOR | CFTXA104J50  |           |
|   | D521         | DIODE             | 1S8292     | C532                     | ELECTROLYTIC CAPACIT | CENA102M16   |           |
|   | D550, D551   | DIODE             | 1S8292     | C534                     | AUDIO FILM CAPACITOR | CFTXA104J50  |           |
|   | D570, D571   | DIODE             | 1S8292     | C535                     | ELECTROLYTIC CAPACIT | CENA102M16   |           |
| $\Delta$                                | D610-D613    | DIODE             | 10DF2      | C538, C539               | CERAMIC CAPACITOR    | CCCCH120J50  |           |
| $\Delta$                                | D620-D627    | DIODE             | 10DF2      | C540, C541               | CERAMIC CAPACITOR    | CDCDCH221J50 |           |
| $\Delta$                                | D628-D631    | ZENER DIODE       | HZ5CLL     | C542, C543               | MICA CAPACITOR       | CMA181J500   |           |
|   |              |                   |            | C544, C545               | MICA CAPACITOR       | CMA330J500   |           |
|   |              |                   |            | C546, C547               | AUDIO FILM CAPACITOR | CFTXA473J50  |           |
|   |              |                   |            | C550, C551               | MICA CAPACITOR       | CMA181J500   |           |
|   |              |                   |            | C552, C553               | MICA CAPACITOR       | CMA330J500   |           |

| Mark No.   | Description          | Parts No.   |
|------------|----------------------|-------------|
| C354, C555 | AUDIO FILM CAPACITOR | CFTXA104J50 |
| C566, C567 | ELECTROLYTIC CAPACIT | CENA102M16  |
| C538, C559 | AUDIO FILM CAPACITOR | CFTXA104J50 |
| C560, C563 | MICA CAPACITOR       | CMA4703500  |
| C564, C565 |                      | CFTXA681J50 |
| C566, C567 |                      | CFTXA562J50 |
| C568, C571 | ELECTROLYTIC CAPACIT | CENA471M50  |
| C572, C573 | ELECTROLYTIC CAPACIT | PCH1094     |
| C574, C575 | PL-STYRENE CAPACITOR | CQSF102J50  |
| C576, C577 | ELECTROLYTIC CAPACIT | CENA102M16  |
| C578, C579 | AUDIO FILM CAPACITOR | CFTXA103J50 |
| C581       | AUDIO FILM CAPACITOR | CFTXA104J50 |
| C582, C583 | AUDIO FILM CAPACITOR | CFTXA683J50 |
| C584, C585 | AUDIO FILM CAPACITOR | CFTXA103J50 |
| C586       | AUDIO FILM CAPACITOR | CFTXA473J50 |
| C587, C588 | ELECTR. CAPACITOR    | PCH1099     |
| C589       | ELECTROLYTIC CAPACIT | CENA102M16  |
| C590, C591 | AUDIO FILM CAPACITOR | CFTXA104J50 |
| C593, C594 | ELECTROLYTIC CAPACIT | CENA102M16  |
| C595       | AUDIO FILM CAPACITOR | CFTXA104J50 |
| C596       | CERAMIC CAPACITOR    | CKDYF103Z50 |
| C597       | ELECTROLYTIC CAPACIT | CENA102M16  |
| C598       | CERAMIC CAPACITOR    | CKDYF103Z50 |
| C599       | AUDIO FILM CAPACITOR | CFTXA103J50 |
| C600, C601 | ELECTROLYTIC CAPACIT | CENA471M16  |
| C602, C603 | ELECTROLYTIC CAPACIT | CENA470M50  |
| C604, C605 | ELECTR. CAPACITOR    | PCH1102     |
| C606, C607 | ELECTROLYTIC CAPACIT | CENA102M35  |
| C608, C618 | AUDIO FILM CAPACITOR | CFTXA103J50 |
| C620, C621 | ELECTROLYTIC CAPACIT | CENA470M50  |
| C624, C625 | AUDIO FILM CAPACITOR | CFTXA103J50 |

**RESISTORS**

|                 |                      |              |
|-----------------|----------------------|--------------|
| R505, R522      | METAL OXIDE RESISTOR | RS1LMF562J   |
| R524            | METAL OXIDE RESISTOR | RS1LMF562J   |
| R528, R530      | CARBON FILM RESISTOR | RDR1/4PM304J |
| R540, R567      | CARBON FILM RESISTOR | RDR1/4PM□□□□ |
| R568, R671      | CARBON FILM RESISTOR | RDM1/2P□□□□  |
| R573, R574      | CARBON FILM RESISTOR | RDM1/2P□□□□  |
| R576, R585      | CARBON FILM RESISTOR | RDM1/2P□□□□  |
| R588, R589      | CARBON FILM RESISTOR | RDM1/2P271J  |
| R590, R593      | CARBON FILM RESISTOR | RDM1/2P□□□□  |
| R645, R646      | CARBON FILM RESISTOR | RDR1/4PM132J |
| R647, R650      | METALFILM RESISTER   | RN1/4PQ□□□□F |
| R651, R654      | CARBON FILM RESISTOR | RDR1/2PM4R7J |
| R655, R680      | CARBON FILM RESISTOR | RDR1/4PM□□□□ |
| Other resistors |                      | RDL/6PM□□□□  |

**OTHERS**

|       |                |              |
|-------|----------------|--------------|
| CN501 | CONNECTOR(10P) | KPC10        |
| JA551 | 1P PIN JACK(W) | RKB1010      |
| JA552 | 1P PIN JACK(R) | RKB1011      |
| X512  | XTAL RES (OSC) | PSS1011      |
| SCREW |                | IBZ30P100FCC |

**MAIN BOARD ASSEMBLY (PWZ1983)**

**SEMICONDUCTORS**

|              |                     |            |
|--------------|---------------------|------------|
| IC1          | PRE AMP IC          | CXA1081S   |
| IC2          | SERVO CONTROL IC    | CXA1082B5  |
| IC3          | EPM DEMODULATION IC | CXD1167Q   |
| IC4          | MICROCOMPUTER, IC   | FD3179B    |
| IC9          | IC                  | MC74HC04N  |
| IC10         | SYSTEM RESET IC     | M51957AL   |
| IC11         | REGULATOR IC        | NJM7805FA  |
| IC12         | REGULATOR IC        | NJM7905FA  |
| IC13         | REGULATOR IC        | AN7810P    |
| IC14         | REGULATOR IC        | AN7910P    |
| IC15         | REGULATOR IC        | NJM7812FA  |
| IC16         | REGULATOR IC        | NJM7912FA  |
| IC17-IC19    | POWER OP-AMP        | TA8410K    |
| IC21         | REGULATOR IC        | AN7810P    |
| IC22         | REGULATOR IC        | AN7910P    |
| IC30-IC34    | IC PROTECTOR        | ICP-N10    |
| IC181, IC182 | IC                  | NJM5072DE  |
| IC721        | REGULATOR IC        | NJM78L05A  |
| Q4           | TRANSISTOR          | DTC124ES   |
| Q6           | TRANSISTOR          | 2SC1740S   |
| Q7           | TRANSISTOR          | 2SA938S    |
| Q8, Q9       | TRANSISTOR          | 2SC1740SLN |
| Q10          | TRANSISTOR          | 2SA1399    |
| Q20          | TRANSISTOR          | DTA124ES   |
| Q21, Q22     | TRANSISTOR          | DTC124ES   |
| Q25          | TRANSISTOR          | DTA124ES   |
| Q181-Q183    | TRANSISTOR          | 2SC1740SLN |
| Q304         | TRANSISTOR          | 2SA1399    |
| Q701         | TRANSISTOR          | DTC124ES   |

|        |             |           |
|--------|-------------|-----------|
| D1     |             | RB-152LP  |
| D2     |             | D3SBA20   |
| D5, D6 | DIODE       | 10E2      |
| D11    | ZENER DIODE | HZ27-1/2L |
| D12    | ZENER DIODE | HZ20-1L   |

|            |       |        |
|------------|-------|--------|
| D140, D147 | DIODE | 1SS254 |
| D181, D183 | DIODE | 1SS254 |
| D701-D709  | DIODE | 1SS254 |
| D720-D728  | DIODE | 1SS254 |

**COILS AND FILTERS**

|            |                 |         |
|------------|-----------------|---------|
| DL1, DL2   | FILTER          | PTF1009 |
| L3         | RADIAL INDUCTOR | LRA010K |
| L4         | COIL            | PTI1003 |
| L51, L52   | AXIAL INDUCTOR  | LAU010K |
| L701, L702 | AXIAL COIL      | LAUR22K |

**CAPACITORS**

|        |                      |             |
|--------|----------------------|-------------|
| C1     | AUDIO FILM CAPACITOR | CFTXA472J50 |
| C2-C4  | CERAMIC CAPACITOR    | CC0CH300J50 |
| C5, C7 | ELECTROLYTIC CAPACIT | CENA471M25  |
| C9     | CERAMIC CAPACITOR    | CCGYF473Z25 |
| C10    | ELECTR. CAPACITOR    | CEAS101M10  |





| Mark No. | Description             | Parts No. |
|----------|-------------------------|-----------|
|          | ON6 CONNECTOR           | HLEM26R   |
|          | JA2 JACK                | PKB1004   |
|          | JA3 OPTICAL OUTPUT JACK | TOTX178   |
|          | JA701 JACK              | RKN1004   |
|          | JA702 JACK              | RKN1004   |
|          | JA703 JACK              | RKN1014   |
|          | X1 CERAMIC RESONATOR    | RSS1033   |

**PRIMARY BOARD ASSEMBLY**

**SWITCH**

|                       |         |
|-----------------------|---------|
| △ S811 SWITCH (POWER) | PSA-009 |
|-----------------------|---------|

**FILTER**

|               |         |
|---------------|---------|
| △ L311 FILTER | PTL1002 |
|---------------|---------|

**CAPACITORS**

|                                 |         |
|---------------------------------|---------|
| △ C311-C313 CAPACITOR (CERAMIC) | VCG-048 |
|---------------------------------|---------|

**FUNCTION B BOARD ASSEMBLY**

**SEMICONDUCTORS**

|                |             |
|----------------|-------------|
| D403 LED       | SLH-34YC3H3 |
| D404, D405 LED | SLH-34VC3H3 |

**SWITCHES**

|  |         |
|--|---------|
| S407, S408 SWITCH<br>(DISPLAY OFF, OUTPUT) | PSG-065 |
|--|---------|

**CAPACITORS**

|                             |              |
|-----------------------------|--------------|
| C410, C411 AXIAL CERAMIC C. | CCPUCH100J50 |
|-----------------------------|--------------|

**RESISTOR**

|                           |             |
|---------------------------|-------------|
| R414 CARBON FILM RESISTOR | RD1/6PM104J |
|---------------------------|-------------|

**●FUNCTION A BOARD ASSEMBLY (PWZ2000)**

**SEMICONDUCTORS**

|                      |          |
|----------------------|----------|
| IC401 FL MCU         | PDG036   |
| Q401 TRANSISTOR      | 2SC1740S |
| Q402-Q406 TRANSISTOR | DTA124ES |

|          |        |
|----------|--------|
| D401 LED | AA0045 |
| D402 LED | BR0045 |

**SWITCHES**

|  |         |
|--|---------|
| S401-S406 SWITCH<br>(TRK FF, TRK REV, PAUSE)<br>(PLAY, OPEN/CLOSE, STOP) | PSG-065 |
|--|---------|

**COILS**

|                     |         |
|---------------------|---------|
| L401 AXIAL INDUCTOR | LAU01GK |
| L402 AXIAL INDUCTOR | LAU01GK |

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

**CAPACITORS**

|                            |              |
|----------------------------|--------------|
| C401 ELECTROLYTIC CAPACIT  | CEJA330M16   |
| C402 AUDIO FILM CAPACITOR  | CFTXA103J50  |
| C403 CERAMIC CAPACITOR     | CGCYF473Z25  |
| C404-C409 AXIAL CERAMIC C. | CCPUCH100J50 |
| C412 CERAMIC CAPACITOR     | CKCYF103Z50  |

**RESISTORS**

|                           |           |
|---------------------------|-----------|
| R408 RESISTOR ARRAY (47K) | RA10S473J |
|---------------------------|-----------|

Other resistors

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

**OTHERS**

|                        |         |
|------------------------|---------|
| CN401 CONNECTOR        | HLEM26R |
| V401 FL TUBE           | PEL1025 |
| X401 CERAMIC RESONATOR | VSS1014 |
| REMOTE SENSOR          | SBX1610 |

**BALANCE BOARD ASSEMBLY**

**SEMICONDUCTORS**

|                        |           |
|------------------------|-----------|
| IC800, IC850 OP-AMP IC | NJM5532DD |
|------------------------|-----------|

|                       |         |
|-----------------------|---------|
| Q800, Q801 TRANSISTOR | 2SC3068 |
| Q850, Q851 TRANSISTOR | 2SC3068 |

|                  |        |
|------------------|--------|
| D800, D801 DIODE | 1SS254 |
| D850, D851 DIODE | 1SS254 |

**CAPACITORS**

|                                 |             |
|---------------------------------|-------------|
| C800, C801 ELECTROLYTIC CAPACIT | PCH1094     |
| C802, C803 ELECTROLYTIC CAPACIT | CENA471M35  |
| C804, C805 AUDIO FILM CAPACITOR | CFTXA103J50 |
| C850, C851 ELECTROLYTIC CAPACIT | PCH1094     |
| C852, C853 ELECTROLYTIC CAPACIT | CENA471M35  |

|                                 |             |
|---------------------------------|-------------|
| C854, C855 AUDIO FILM CAPACITOR | CFTXA103J50 |
|---------------------------------|-------------|

**RESISTORS**

|                                 |          |       |
|---------------------------------|----------|-------|
| R801-R807 CARBON FILM RESISTOR  | RDM1/2P  | □□□□J |
| R808, R809 CARBON FILM RESISTOR | RDR1/4PM | 511J  |
| R810-R812 CARBON FILM RESISTOR  | RDM1/2P  | □□□□J |
| R851-R857 CARBON FILM RESISTOR  | RDM1/2P  | □□□□J |
| R858, R859 CARBON FILM RESISTOR | RDR1/4PM | 511J  |

|                                |         |       |
|--------------------------------|---------|-------|
| R860-R862 CARBON FILM RESISTOR | RDM1/2P | □□□□J |
|--------------------------------|---------|-------|

## 6. ADJUSTMENTS

Perform the following adjustments in the indicated order.

### ● Adjustments

1. Tracking error offset, focus error offset and RF offset adjustment.
2. Tracking return offset adjustment.
3. Focus lock and spindle lock check.
4. Grating adjustment.
5. Tracking balance adjustment.
6. Tangential adjustment
7. Radial adjustment
8. RF level check
9. Focus gain adjustment
10. Tracking gain adjustment
11. VCO free-running frequency adjustment
12. Method of focus error check

### ● Measuring Devices

1. Dual-trace oscilloscope
2. Light power meter
3. YEDS-7 test disc
4. Focus and tracking adjustment filter
5. Loop gain adjustment band-pass filter
6. Signal generator
7. Grating driver
8. General-use tools
9. Commercial available disc (8 cm and 12 cm)
10. Hex. wrenchdriver (GGK 1002, 1.5 mm)

### ● About the test mode

#### How to activate and release the test mode

- ① To activate the test mode, turn ON the power switch with the test mode jumper short-circuited.
- ② The test mode is released by turning the power switch OFF.

The functions of the keys in the test mode are outlined in Table 1.

### ● Adjustment Volume Name

- VR2: RF offset (RF. OF)
- VR3: Focus gain (FO. GA)
- VR4: Tracking gain (TR. GA)
- VR5: Tracking balance (TR. BL)
- VR6: Focus error offset (FO. OF)
- VR7: Tracking error offset (TE. OF)
- VR8: VCO frequency counter (VCOA)
- VR9: Tracking return offset (TR. OF)
- VR10: RF level (RF.LEV)

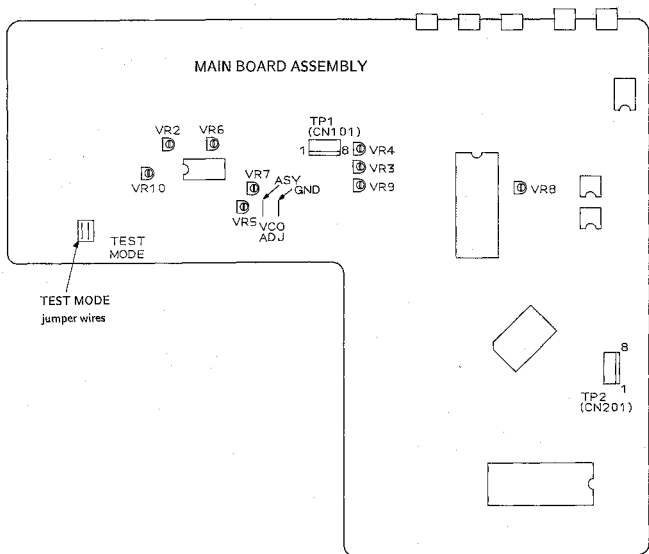
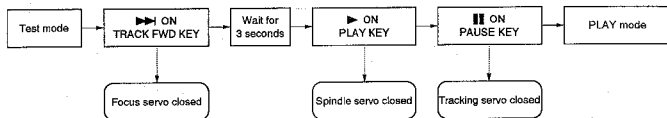


Fig.1 Adjusting point

In the test mode, closing and opening of servos is performed independently. Therefore, to set the play mode the servos have to be closed in (serial) sequence. Remember that in the test mode the play mode can't be set simply by pressing PAUSE (||) key.

For example, to set the play mode from the stop mode, press the following keys in the indicated order.



\* In the test mode, servos keep a serial sequence.

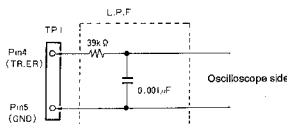
#### ● Function of Each Key in the Test Mode

| Symbol | Key name   | Function during test mode  | Description  |
|--------|------------|----------------------------|--|
| ▶▶     | TRACK FWD  | Focus servo close          | Lights the laser diode and sets the focus actuator UP/DOWN to close the focus servo.   |
| ▶      | PLAY       | Spindle servo close        | After kicking the spindle motor, it closes the servo in the CLV-H mode.  |
|        | PAUSE      | Tracking servo close/open  | Performs a toggle operation. When pressed, the tracking servo is closed and the unit enters the play mode (the focus servo and spindle servo should be already closed). At this time the PAUSE indicator lights. If pressed again, the tracking servo opens. |
|        | OUTPUT     | Carriage reverse (inward)  | Moves the carriage inwards at high (approx. 1 cm/s) speed. Since there is no safety device to stop the carriage, be sure to stop it manually in time.  |
|        | DISPLAY    | Carriage forward (outward) | Moves the carriage outwards at high (approx. 1 cm/s) speed. Since there is no safety device to stop the carriage, be sure to stop it manually in time.   |
| ■      | STOP       | Stop                       | Stops all servos and returns the unit to the initial condition.  |
| ▲      | OPEN/CLOSE | (Disc tray) open/close     | Opens and closes the disc tray. However, the pickup does not return to the rest position when the tray is opened. It does not move either when the tray is closed.   |

Table 1.

| Step No. | Oscilloscope setting  |                    | Test points                  | Adjusting points | Check items/ adjustment specifications | Adjustment procedure   |
|----------|---|--------------------|------------------------------|------------------|--|--|
|          | V   | H                  |                              |                  |  |  |
| 1        | <b>Tracking error offset, focus error offset and RF offset adjustment</b> |                    |                              |                  |  |  |
|          |   | TP1                | TP1 Pin 4 (TR, ER)           | VR7 (TE, OF)     | 0V $\pm$ 50 mV                         | <ul style="list-style-type: none"> <li>● Set the test mode. (*)</li> <li>● Adjust VR7 (TE, OF: tracking error offset) so that the voltage at Pin 4 (TE: tracking error) of TP1 becomes 0V <math>\pm</math> 50 mV.</li> <li>● Adjust VR6 (FO, OF: focus error offset) so that the voltage at Pin 6 (FO, ER: focus error) of TP1 becomes 0V <math>\pm</math> 50 mV.</li> <li>● Adjust VR2 (RF, OF: RF offset) so that RF output voltage at Pin 1 of TP 1 becomes 100 mV <math>\pm</math> 50 mV.</li> </ul>   |
|          |   | TP1                | TP1 Pin 6 (FO, ER)           | VR6 (FO,OF)      | 0V $\pm$ 50 mV                         |  |
|          |   | TP301              | TP 1 Pin 1 (RF)              | VR2 (RF, OF)     | 100 mV $\pm$ 50 mV                     |  |
| 2        | <b>Tracking return offset adjustment</b>                                  |                    |                              |                  |  |  |
|          |   | TP1                | TP1 Pin 2 (TR, RT)           | VR9 (TR, OF)     | 0V $\pm$ 10 mV                         | <ul style="list-style-type: none"> <li>● Set the test mode. (*)</li> <li>● Adjust VR9 (TR, OF: tracking return offset) so that the voltage at Pin 2 TR, RT (tracking return) of TP1 becomes 0V <math>\pm</math> 10 mV.</li> </ul>  |
| 3        | <b>Focus lock and spindle lock check</b>                                  |                    |                              |                  |  |  |
|          | V<br>0.5V/div   | H<br>100 msec /div | TP 1<br>Pin 1<br>(RF output) |                  | RF output<br><br>Clockwise rotation    | <ul style="list-style-type: none"> <li>● Load the disc.</li> <li>● Set the test mode. (*)</li> <li>● Move the pickup close to the center of the disc using DISPLAY Key. Be sure to perform this operation.</li> <li>● Observe Pin 1 RF (RF output) of TP 1 with an oscilloscope and confirm that RF signal is output after pressing TRACK FWD key (▶▶1).</li> <li>● Press PLAY key (▶) and confirm that the disc rotates clockwise at approx. normal speed (about 300 rpm around the center of the disc), without running wildly or in reverse direction.</li> </ul> |

\* See page 39.

| Step No. | Oscilloscope setting   |          | Test points       | Adjusting points | Check items/ adjustment specifications | Adjustment procedure  |
|----------|--|----------|-------------------|------------------|--|---|
|          | V  | H        |                   |                  |  |   |
| 4-1      | Grating adjustment (1) (with an 8 cm disc)   |          |                   |                  |  |   |
|          | 1V/div   | 5 ms/div | TP1 Pin 4 (TR.ER) | Grating          | Null point                             | <ul style="list-style-type: none"> <li>● This adjustment can be performed with an 8 cm disc having pits over a 75 mm in diameter.</li> <li>● Load the disc. (8 cm)</li> <li>● Set the test mode. (†)</li> <li>● Press TRACK FWD (▶▶) and PLAY (▶) keys in that order to close the focus and spindle servos (the tracking servo is open state.)</li> <li>● Press DISPLAY key and move the pickup to the outer track of the 8 cm disc. When moving the pickup, it is possible to insert a slotted screwdriver in the grating adjustment plate slot from above the unit. (Fig. 3.)</li> <li>● Observe the waveform at Pin 4 TR. ER (tracking error) of TP1 with an oscilloscope and at this time, insert cut off 4 kHz low-pass filter (Fig. 2).</li> <li>● Insert the tracking driver in the adjustment slot and turn it so as to find out the null point (Photo-1).</li> </ul> |
|          |  <p style="text-align: center;">Fig. 2.</p> |          |                   |                  |  |   |

\* See page 39.

| Step No. | Oscilloscope setting   |          | Test points        | Adjusting points | Check items/ adjustment specifications | Adjustment procedure  |
|----------|--|----------|--------------------|------------------|--|---|
|          | V  | H        |                    |                  |  |   |
| 4-2      | Grating adjustment (2) (with an 12 cm disc playing more than 60 minutes) |          |                    |                  |  |   |
|          | 1V/div   | 5 ms/div | TP1 Pin 4 (TR. ER) | Grating          | Null point                             | <ul style="list-style-type: none"> <li>● Load the disc (playing more than 60 minutes).</li> <li>● Set the test mode. (*)</li> <li>● Press TRACK FWD (▶▶) and PLAY (▶) keys in that order to close the focus and spindle servos (the tracking servo is open state).</li> <li>● Press DISPLAY key and move the pickup to the outer track of the disc. When moving the pickup, it is possible to insert a slotted screwdriver in the grating adjustment plate slot from above the unit. (Fig. 3.)</li> <li>● Observe the waveform at Pin 4 TR. ER (tracking error) of TP1 with an oscilloscope and at this time, insert cut off 4 kHz low-pass filter. (Fig. 2.)</li> <li>● Insert the tracking driver in the adjustment slot and turn it so as to find out the null point (Photo-1).</li> </ul> |
|          |  |          |                    | Grating          | Maximum amplitude                      | <ul style="list-style-type: none"> <li>● Turn the grating driver slowly clockwise from the null point and set to at the first point where the waveform amplitude (tracking error signal) is maximum. (See photo-2)</li> </ul>   |

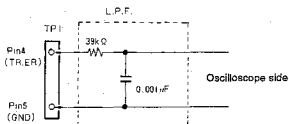


Fig. 2.

\* See page 39.



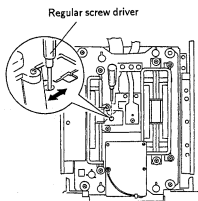


Fig. 3. Grating Adjustment

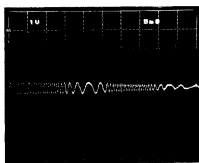


Photo-1 Null point

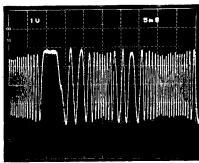


Photo-2 Maximum amplitude

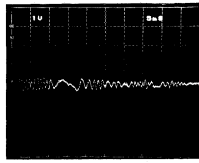
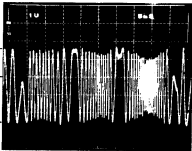
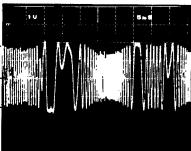


Photo-3 Out of null point

| Step No. | Oscilloscope setting  |            | Test points        | Adjusting points | Check items/ adjustment specifications  | Adjustment procedure  |
|----------|---|------------|--------------------|------------------|---|---|
|          | V   | H          |                    |                  |   |   |
| 5        | <b>Tracking balance adjustment</b>  |            |                    |                  |   |   |
|          | 0.5V/div  | 5 msec/div | TP1 Pin 4 (TR. ER) | VR5 (TR. BL)     |   | <ul style="list-style-type: none"> <li>● Load the disc.</li> <li>● Set the test mode. (*)</li> <li>● Press DISPLAY key and move carriage close to the center track of the disc.</li> <li>● Press TRACK FWD (▶▶) and PLAY (▶) keys in that order to turn the disc.</li> <li>● Observe Pin 4 TR. ER (tracking error) of TP1 with an oscilloscope. And adjust VR5 TR. BL (tracking balance) so as to remove DC elements from the tracking error waveform.</li> </ul> |
|          |  |            | A=B                |                  |  |   |
|          | Photo-6   |            | Photo-7            |                  |   |   |

\* See page 39.

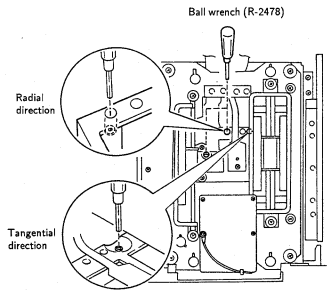
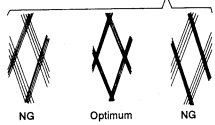
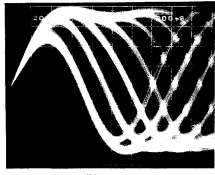
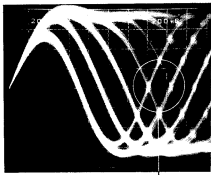
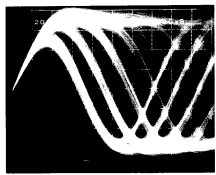
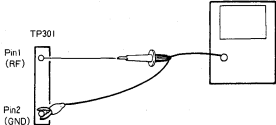


Fig. 4. Tangential Adjustment



| Step No. | Oscilloscope setting         |   | Test points            | Adjusting points            | Check items/ adjustment specifications | Adjustment procedure   |
|----------|------------------------------|---|------------------------|-----------------------------|--|--|
|          | V                            | H |                        |                             |  |  |
| 6        | <b>Tangential adjustment</b> |   |                        |                             |  |  |
|          |                              |   | TP 1 Pin 1 (RF output) | Tangential adjustment screw | Eye pattern optimum point              | <ul style="list-style-type: none"> <li>● Load the disc.</li> <li>● Set the test mode. (*)</li> <li>● Press DISPLAY key and move the pickup to the center track of the disc (set it to such a location that the tangential screw can be seen from above the servo mechanism. (See fig. 4.)</li> <li>● Press TRACK FWD (▶▶), PLAY (▶) and PAUSE (■) keys in that order to close all servos. (Pause indicator lights.)</li> <li>● Observe Pin 1 RF (RF output) of TP 1 with an oscilloscope and adjust the tangential screw so that the eye pattern becomes clear. (Fig. 4.)</li> <li>● The adjustment point is located around the middle location between the point where the eye pattern becomes blurred when turning the tangential screw clockwise and the point where the eye pattern becomes blurred when turning the adjustment screw counterclockwise.</li> </ul> <p>Observe the overall clearness of the waveform and one of the diamond shapes in the eye pattern (photo-9). Optimum adjustment is attained at the point where diamond shape lines are relatively thin.</p> |
|          |                              |   |                        |                             |  |  <p style="text-align: center;">Fig. 5</p>  |

\* See page 39.

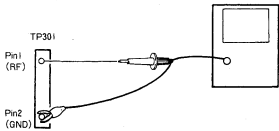
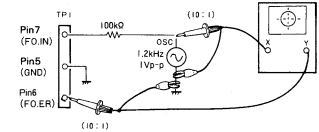
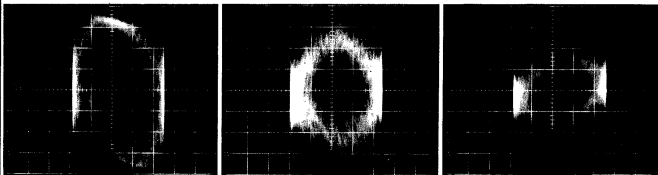
| Step No. | Oscilloscope setting |   | Test points               | Adjusting points              | Check items/ adjustment specifications | Adjustment procedure  |
|----------|----------------------|---|---------------------------|-------------------------------|--|---|
|          | V                    | H |                           |                               |  |   |
| 7        | Radial adjustment    |   |                           |                               |  | <ul style="list-style-type: none"> <li>● Load the disc.</li> <li>● Set the test mode. (*)</li> <li>● Press DISPLAY key and move the pickup to the center track of the disc (set it to such a location that the tangential screw can be seen from above the servo mechanism. (See fig. 4.)</li> <li>● Press TRACK FWD (▶▶), PLAY (▶) and PAUSE (⏸) keys in that order to close all servos. (Pause indicator lights.)</li> <li>● Observe Pin 1 RF (RF output) of TP 1 with an oscilloscope and adjust the tangential screw so that the eye pattern becomes clear. (Fig. 4.)</li> <li>● The adjustment point is located around the middle location between the point where the eye pattern becomes blurred when turning the tangential screw clockwise and the point where the eye pattern becomes blurred when turning the adjustment screw counterclockwise.</li> </ul> <p>Observe the overall clearness of the waveform and one of the diamond shapes in the eye pattern (photo-9). Optimum adjustment is attained at the point where diamond shape lines are relatively thin.</p> <ul style="list-style-type: none"> <li>● Perform the tangential and radial adjustments alternately two or more times.</li> </ul> |
|          |                      |   | TP 1 Pin 1<br>(RF output) | Radial<br>adjustment<br>screw | Eye pattern<br>optimum point           |  <p>The diagram shows a test point labeled TP301. It has two pins: Pin1 (RF) and Pin2 (GND). A probe is connected to Pin1, and another probe is connected to Pin2. The probes are connected to an oscilloscope, which is represented by a rectangular box with a screen.</p>   |

Fig. 5

\* See page 39.

| Step No. | Oscilloscope setting  |   | Test points     | Adjusting points | Check items/ adjustment specifications                    | Adjustment procedure  |
|----------|-----------------------|---|-----------------|------------------|---|---|
|          | V                     | H |                 |                  |   |   |
| 8        | <b>RF level check</b> |   |                 |                  |   |   |
|          |                       |   | TP 1 Pin 1 (RF) | Check            | 1.5V $\begin{smallmatrix} +0.2V \\ -0V \end{smallmatrix}$ | <ul style="list-style-type: none"> <li>● Set the test mode. (*)</li> <li>● Connect the probe of the oscilloscope to Pin 1 RF (RF output) of TP 1 .</li> <li>● Play back the disc, measure the RF waveform p-p voltage and confirm that it becomes 1.5V <math>\begin{smallmatrix} +0.2V \\ -0V \end{smallmatrix}</math> .</li> <li>● Adjust VR 10 if the voltage does not become 1.5V <math>\begin{smallmatrix} +0.2V \\ -0V \end{smallmatrix}</math> .</li> </ul> |
|          |                       |   | TP 1 Pin 1 (RF) | VR 10            | 1.5V $\begin{smallmatrix} +0.2V \\ -0V \end{smallmatrix}$ |   |

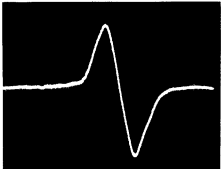
\* See page 39.

| Step No.   | Oscilloscope setting  |                          | Test points  | Adjusting points | Check items/ adjustment specifications | Adjustment procedure   |
|--|---|--------------------------|--|------------------|--|--|
|  | V   | H                        |  |                  |  |  |
| 9  | <b>Focus gain adjustment</b>  |                          |  |                  |  |  |
|  | CH1 (X) , CH2 (Y)<br>20 mV/div, 5 mV/div<br>(probe 10:1)                          |                          | X axis:<br>TP1 Pin 5<br>(FO. IN)<br>Y axis:<br>TP1 Pin 6<br>(FO. ER) | VR3<br>(FO. GA)  | Phase difference<br>90°                | <ul style="list-style-type: none"> <li>● With the power off, connect the oscilloscope and the oscillator as shown in Fig. 6.</li> <li>● Set the normal playback mode.</li> <li>● Turn the oscillators power on and set it to output a 1.2 kHz, 1 Vp-p signal.</li> </ul> <p><b>Note:</b> (Some oscillators output DC when turned ON. In that case, connect the oscillator after turning it on.)</p> <ul style="list-style-type: none"> <li>● Adjust VR3 FO. GA (focus gain) so that the resurge waveform on an oscilloscope becomes a horizontal circle (phase difference 90°).</li> </ul> |
|  |  |                          |  |                  |  | Fig. 6.  |
|  |   |                          |  |                  |  |  |
| High gain<br>Photo-11  |   | Optimum gain<br>Photo-12 |  |                  | Low gain<br>Photo-13                   |  |

| Step No. | Oscilloscope setting                                    |                              | Test points  | Adjusting points | Check items/ adjustment specifications | Adjustment procedure  |
|----------|---|------------------------------|--|------------------|--|---|
|          | V   | H                            |  |                  |  |   |
| 10       | <b>Tracking gain adjustment</b>                         |                              |  |                  |  |   |
|          | CH1 (X), CH2 (Y)<br>50 mV/div, 5 mV/div<br>(Probe 10:1) |                              | X axis:<br>TP1 Pin 3<br>(TR. IN)<br>Y axis:<br>TP1 Pin 2<br>(TR. ER) | VR4<br>(TR. GA)  | Phase difference<br>90°                | <ul style="list-style-type: none"> <li>● With the power off, connect the oscilloscope and the oscillator as shown in Fig. 7.</li> <li>● Set the normal playback mode.</li> <li>● Turn the oscillators power on and set it to output a 1 kHz, 2 Vp-p signal.</li> </ul> <p><b>Note:</b> (Some oscillators output DC when turned on. In that case, connect the oscillator after turning it on.)</p> <ul style="list-style-type: none"> <li>● Adjust VR4 TR. GA (tracking gain) so that the resurge waveform on an oscilloscope becomes a horizontal circle (phase difference 90°).</li> </ul> |
|          |   |                              |  |                  | <p>Fig. 7.</p>                         |   |
|          | <br>High gain<br>Photo-14                               | <br>Optimum gain<br>Photo-15 | <br>Low gain<br>Photo-16   |                  |  |   |
| 11       | <b>VCO free-running frequency adjustment</b>            |                              |  |                  |  |   |
|          |   |                              | TP 2 Pin 2   |                  | Frequency<br>4.275 MHz ±<br>0.025 MHz  | <ul style="list-style-type: none"> <li>● Set the test mode. (*)</li> <li>● Short the ASY and GND jumpers by using a slotted screw driver or similar.</li> <li>● Connect the frequency counter (10 MHz range) to Pin 2 of TP 2.</li> <li>● Adjust VR8 (VCO. A) so that the frequency counter reads 4.275 MHz ± 0.025 MHz.</li> </ul> <p><b>Note:</b> Adjust with the stop mode.</p>  |

\* See page 39.



| Step No.  | Oscilloscope setting     |          | Test points        | Adjusting points | Check items/ adjustment specifications | Adjustment procedure   |
|---|--------------------------|----------|--------------------|------------------|--|--|
|   | V                        | H        |                    |                  |  |  |
| 12  | <b>Focus error check</b> |          |                    |                  |  |  |
|   | 1V/div                   | 2 ms/div | TP1 Pin 6 (FO, ER) | Check            | Waveform                               | <ul style="list-style-type: none"> <li>● Set the test mode. (*)</li> <li>● Connect Pin 7 FO, IN (focus in) of TP1 to GND.</li> <li>● Press TRACK FWD key and check the waveform on Pin 6 FO, ER (focus error) of TP1 with the oscilloscope.</li> </ul> |
|  <p style="text-align: center;">Focus error<br/>Photo-17</p> |                          |          |                    |                  |  |  |

\* See page 39.

## 6. RÉGLAGES

Effectuer les réglages suivants dans l'ordre indiqué.

### ● Réglages

- Réglage du décalage d'erreur d'alignement, du décalage d'erreur de mise au point et du décalage RF (fréquence radio).
- Réglage du décalage de retour d'alignement.
- Contrôle du verrouillage de mise au point et du verrouillage d'axe.
- Réglage du filtre.
- Réglage de l'équilibre d'alignement.
- Réglage tangentiel.
- Réglage radial.
- Contrôle du niveau RF (fréquence radio)
- Réglage du gain de mise au point
- Réglage du gain d'alignement
- Réglage de la fréquence de relaxation du VCO (oscillateur à fréquence réglée par variation de tension)
- Méthode de contrôle d'erreur de mise au point

### ● Appareils de Mesure

- Oscilloscope à double trace
- Indicateur de puissance lumineuse
- Disc d'essai YEDS-7
- Filtre de réglage de mise au point et d'alignement
- Filtre passe-bande de réglage de gain de boucle
- Générateur de signal
- Excitateur de filtre
- Outils à usage général
- Disc disponible dans le commerce (8 cm et 12 cm)
- Clé hex. (GGK 1002, 1.5 mm)

### ● Apropos du mode d'essai

#### Mise en/hors service du mode d'essai

- Pour activer le mode d'essai, mettre l'interrupteur d'alimentation sous tension en court-circuitant le cavalier de mode d'essai.
- Le mode d'essai est annulé en ramenant l'interrupteur d'alimentation sur OFF.

Les fonctions des touches en mode d'essai sont décrites au

Tableau 1.

### ● Nom des Résistances Variables de Réglage

- VR2: Décalage RF (RF. OF)  
 VR3: Gain de mise au point (FO. GA)  
 VR4: Gain d'alignement (TR. GA)  
 VR5: Equilibre d'alignement (TR. BL)  
 VR6: Décalage d'erreur de mise au point (FO. OF)  
 VR7: Décalage d'erreur d'alignement (TE. OF)  
 VR8: Compteur de fréquence VCO (VCOA)  
 VR9: Décalage de retour d'alignement (TR. OF)  
 VR 10: Niveau RF (RF.LEV)

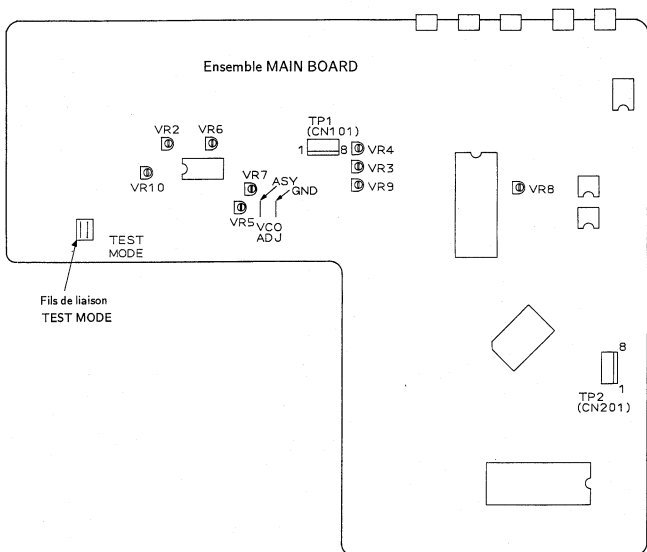
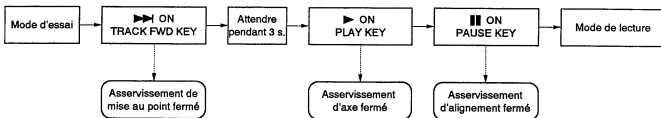


Fig.1 Points de réglage

Dans le mode d'essai, l'ouverture et la fermeture des circuits d'asservissement sont effectuées indépendamment. Par conséquent, pour régler le mode de lecture, les asservissements doivent être fermés l'un après l'autre (en série). Ne pas oublier que, dans le mode d'essai, le mode de lecture ne peut pas être réglé simplement en appuyant sur la touche PAUSE (||).

Par exemple, pour régler le mode de lecture à partir du mode d'arrêt, appuyer sur les touches suivantes dans l'ordre indiqué.



\* Dans le mode d'essai, les asservissements restent en séquence sérielle.

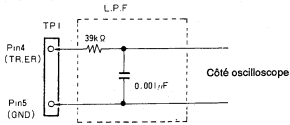
● Fonction de Chaque Touche dans le Mode D'essai

| Symbole | Touche     | Fonction en mode d'essai                        | Explication  |
|---------|------------|---|--|
| ▶▶      | TRACK FWD  | Fermeture asservissement de mise au point       | Fait s'allumer la diode laser et déplace le dispositif de commande de mise au point dans le sens vertical pour fermer l'asservissement de mise au point.   |
| ▶       | PLAY       | Fermeture asservissement d'axe                  | Après le démarrage du moteur d'axe, ferme l'asservissement dans le mode CLV-H.   |
|         | PAUSE      | Fermeture/ouverture asservissement d'alignement | Exécute une opération de bascule. Quand elle est enfoncée, l'asservissement d'alignement est fermé et l'appareil passe dans le mode de lecture (les asservissements de mise au point et d'axe doivent déjà être fermés). A ce moment-là le témoin de PAUSE s'allume. Si elle est de nouveau enfoncée, l'asservissement d'alignement s'ouvre. |
|         | OUTPUT     | Retour du chariot (vers l'intérieur)            | Déplace le chariot vers l'intérieur à grande vitesse (approx. 1 cm/s.). Comme il n'y a pas de dispositif de sécurité pour arrêter le chariot, il faut donc l'arrêter manuellement à temps.   |
|         | DISPLAY    | Avance du chariot (vers l'extérieur)            | Déplace le chariot vers l'extérieur à grande vitesse (approx. 1 cm/s.). Comme il n'y a pas de dispositif de sécurité pour arrêter le chariot, il faut donc l'arrêter manuellement à temps.   |
| ■       | STOP       | Arrêt   | Arrête tous les asservissements et ramène l'appareil à sa condition initiale.  |
| ▲       | OPEN/CLOSE | Ouverture/fermeture du plateau de disc          | Ouvre et ferme le plateau de disc. Le capteur ne revient cependant pas à la position d'arrêt quand le plateau est ouvert. Il ne se déplace pas non plus quand le plateau est fermé.  |

Tableau 1.

| Etape No. | Réglage de l'oscilloscope   |                   | Points d'essai              | Points de réglage | Éléments contrôlés/ spécifications de réglage                     | Procédure de réglage   |
|-----------|---|-------------------|-----------------------------|-------------------|---|--|
|           | V   | H                 |                             |                   |   |  |
| <b>1</b>  | <b>Réglage du décalage d'erreur d'alignement, du décalage d'erreur de mise au point et du décalage RF (fréquence radio)</b> |                   |                             |                   |   |  |
|           |   | TP1               | TP1 Pin 4 (TR. ER)          | VR7 (TE. OF)      | 0V ± 50 mV  | <ul style="list-style-type: none"> <li>● Régler le mode d'essai. (*)</li> <li>● Ajuster VR7 (TE. OF: décalage d'erreur d'alignement) afin que la tension à la broche 4 (TE: erreur d'alignement) de TP1 devienne 0V ± 50 mV.</li> <li>● Ajuster VR6 (FO. OF: décalage d'erreur de mise au point) afin que la tension à la broche 6 (FO. ER: erreur de mise au point) de TP1 devienne 0V ± 50 mV.</li> <li>● Ajuster VR2 (RF. OF: décalage RF) afin que la tension à la broche 1 de TP1 devienne 100 mV ± 50 mV.</li> </ul>   |
|           |   | TP1               | TP1 Pin 6 (FO. ER)          | VR6 (FO. OF)      | 0V ± 50 mV  |  |
|           |   | TP301             | TP1 Pin 1 (RF)              | VR2 (RF. OF)      | 100 mV ± 50 mV  |  |
| <b>2</b>  | <b>Réglage du décalage de retour d'alignement</b>   |                   |                             |                   |   |  |
|           |   | TP1               | TP1 Pin 2 (TR. RT)          | VR9 (TR. OF)      | 0V ± 10 mV  | <ul style="list-style-type: none"> <li>● Régler le mode d'essai. (*)</li> <li>● Ajuster VR9 (TR. OF: décalage de retour d'alignement) afin que la tension à la broche 2 (TR. RT: retour d'alignement) de TP1 devienne 0V ± 10 mV.</li> </ul>   |
| <b>3</b>  | <b>Contrôle du verrouillage de mise au point et du verrouillage d'axe</b>   |                   |                             |                   |   |  |
|           | V<br>0,5V/div   | H<br>100 msec/div | TP1<br>Pin 1<br>(Sortie RF) |                   | Sortie RF<br><br>Rotation dans le sens des aiguilles d'une montre | <ul style="list-style-type: none"> <li>● Charger le disc.</li> <li>● Régler le mode d'essai. (*)</li> <li>● Amener le capteur près du centre du disc en utilisant la touche DISPLAY. Toujours effectuer cette opération.</li> <li>● Observer la sortie RF à la broche 1 de TP1 avec un oscilloscope et confirmer que le signal RF est sorti lorsque la touche TRACK FWD (▶▶) est enfoncée.</li> <li>● Appuyer sur la touche PLAY (▶) et confirmer que le disc tourne dans le sens des aiguilles d'une montre à approximativement la vitesse normale (environ 300 tr/mn près du centre du disc), sans qu'il tourne irrégulièrement ou en sens inverse.</li> </ul> |

\* Voir page 54.

| Etape No. | Réglage de l'oscilloscope  |          | Points d'essai     | Points de réglage | Éléments contrôlés/spécifications de réglage | Procédure de réglage  |
|-----------|--|----------|--------------------|-------------------|--|---|
|           | V  | H        |                    |                   |  |   |
| 4-1       | <b>Réglage du filtre (1) (avec un disc de 8 cm)</b>  |          |                    |                   |  |   |
|           | 1V/div   | 5 ms/div | TP1 Pin 4 (TR. ER) | Filtre            | Point nul                                    | <ul style="list-style-type: none"> <li>● Ce réglage peut être effectué avec un disc de 8 cm ayant des microcuvettes sur un rayon supérieur à 75 mm.</li> <li>● Charger le disc. (8 cm)</li> <li>● Régler le mode d'essai. (*)</li> <li>● Appuyer sur les touches TRACK FWD (▶) et PLAY (▶) dans cet ordre pour fermer les asservissements de mise au point et d'axe (l'asservissement d'alignement est en état ouvert).</li> <li>● Appuyer sur la touche DISPLAY. et amener le capteur sur la piste extérieure du disc de 8 cm. Lors du déplacement du capteur, il est possible d'insérer un tournevis dans la fente de la plaque de réglage du filtre depuis le haut de l'appareil. (Fig. 3).</li> <li>● Observer la forme d'onde à la broche 4 (TR. ER: erreur d'alignement) de TP1 avec un oscilloscope et à ce moment-là, insérer un filtre passe-bas de coupure 4 kHz (Fig. 2).</li> <li>● Insérer le tournevis d'alignement dans la fente de réglage et le tourner afin de trouver le point nul (Photo-1).</li> </ul> |
|           |  <p style="text-align: center;">Fig. 2.</p> |          |                    |                   |  |   |

\* Voir page 54.

| Etape No. | Réglage de l'oscilloscope   |          | Points d'essai     | Points de réglage | Éléments contrôlés/spécifications de réglage | Procédure de réglage  |
|-----------|---|----------|--------------------|-------------------|--|---|
|           | V   | H        |                    |                   |  |   |
| 4-2       | <b>Réglage du filtre (2) (avec un disc de 12 cm dont la durée de lecture est supérieure à 60 minutes)</b> |          |                    |                   |  |   |
|           | 1V/div  | 5 ms/div | TP1 Pin 4 (TR. ER) | Filtre            | Point nul                                    | <ul style="list-style-type: none"> <li>● Charger le disc. (durée de lecture supérieure à 60 minutes).</li> <li>● Régler le mode d'essai. (*)</li> <li>● Appuyer sur les touches TRACK FWD (▶▶) et PLAY (▶) dans cet ordre pour fermer les asservissements de mise au point et d'axe (l'asservissement d'alignement est en état ouvert).</li> <li>● Appuyer sur la touche DISPLAY et amener le capteur sur la piste extérieure du disc. Lors du déplacement du capteur, il est possible d'insérer un tournevis dans la fente de la plaque de réglage du filtre depuis le haut de l'appareil. (Fig. 3).</li> <li>● Observer la forme d'onde à la broche 4 (TR. ER: erreur d'alignement) de TP1 avec un oscilloscope et à ce moment-à, insérer un filtre passe-bas de coupure 4 kHz (Fig. 2).</li> <li>● Insérer le tournevis d'alignement dans la fente de réglage et le tourner afin de trouver le point nul (Photo-1).</li> </ul> |
|           |   |          |                    |                   |  | <ul style="list-style-type: none"> <li>● Tourner lentement l'excitateur de filtre dans le sens des aiguilles d'une montre à partir du point nul et le régler au premier point où l'amplitude de la forme d'onde (signal d'erreur d'alignement) est maximum. (Voir photo-2).</li> </ul>  |
|           |   |          |                    | Filtre            | Amplitude maximum                            |   |

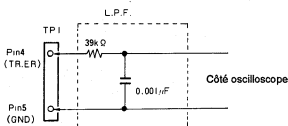


Fig. 2.

\* Voir page 54.

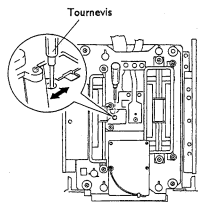


Fig. 3. Réglage du Filtre

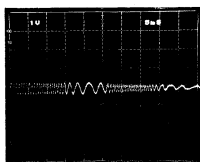


Photo-1 Point nul

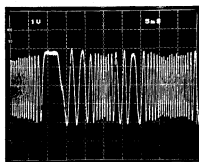


Photo-2 Amplitude maximum

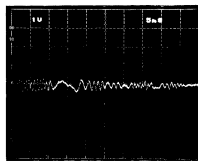
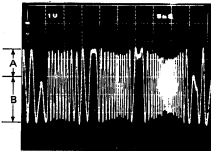



Photo-3 Hors du point nul



| Etape No. | Réglage de l'oscilloscope   |            | Points d'essai        | Points de réglage | Éléments contrôlés/spécifications de réglage                                      | Procédure de réglage   |
|-----------|---|------------|-----------------------|-------------------|---|--|
|           | V   | H          |                       |                   |   |  |
| 5         | <b>Réglage de l'équilibre d'alignement</b>  |            |                       |                   |   |  |
|           | 0.5V/div  | 5 msec/div | TP1 Pin 4<br>(TR. ER) | VR5<br>(TR. BL)   |   | <ul style="list-style-type: none"> <li>● Charger le disc.</li> <li>● Régler le mode d'essai. (*)</li> <li>● Appuyer sur la touche DISPLAY et amener le chariot près de la piste centrale du disc.</li> <li>● Appuyer sur les touches TRACK FWD (▶) et PLAY (▶) dans cet ordre pour faire tourner le disc.</li> <li>● Observer la forme d'onde à la broche 4 (TR. ER: erreur d'alignement) de TP1 avec un oscilloscope. Et régler VR5 (TR. BL: équilibre d'alignement) afin d'éliminer les éléments CC de la forme d'onde d'erreur d'alignement.</li> </ul> |
|           |  |            | A=B                   | ➔                 |  |  |
|           | Photo-6   |            |                       |                   | Photo-7   |  |

\* Voir page 54.

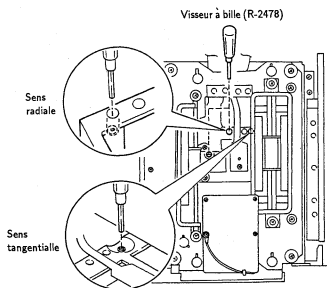


Fig. 4. Réglage Tangentiel

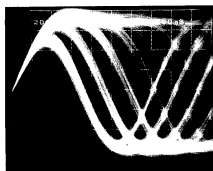


Photo-8

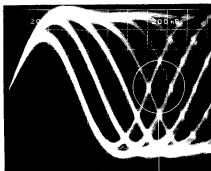


Photo-9  
Pièce à observer

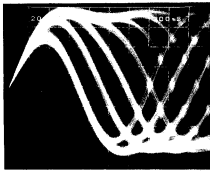
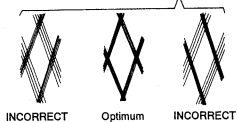
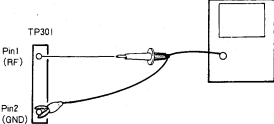


Photo-10



| Etape No. | Réglage de l'oscilloscope |   | Points d'essai         | Points de réglage         | Éléments contrôlés/spécifications de réglage | Procédure de réglage  |
|-----------|---------------------------|---|------------------------|---------------------------|--|---|
|           | V                         | H |                        |                           |  |   |
| 6         | Réglage tangentiel        |   |                        |                           |  | <ul style="list-style-type: none"> <li>● Charger le disc.</li> <li>● Régler le mode d'essai. (*)</li> <li>● Appuyer sur la touche DISPLAY et amener le capteur à la piste centrale du disc. (Le placer à un endroit où la vis tangentielle peut être vue depuis le haut du mécanisme d'asservissement. (Voir Fig. 4.).</li> <li>● Appuyer sur les touches TRACK FWD (▶▶), PLAY (▶) et PAUSE (  ) dans cet ordre pour fermer tous les asservissements. (Le témoin de pause s'allume).</li> <li>● Observer la sortie RF broche 1 de TP 1 avec un oscilloscope et régler la vis tangentielle afin que la mire devienne claire. (Fig. 4.).</li> <li>● Le point de réglage est situé vers la position médiane entre le point où la mire devient floue lorsque la vis tangentielle est tournée dans le sens des aiguilles d'une montre et le point où la mire devient floue lorsque la vis de réglage est tournée dans le sens inverse.</li> </ul> <p>Observer la netteté d'ensemble de la forme d'onde et une des formes en diamant dans la mire (Photo-9). Le réglage optimum est obtenu au point où les lignes de la forme en diamant sont relativement fines.</p> |
|           |                           |   | TP 1 Pin 1 (Sortie RF) | Vis de réglage tangentiel | Point optimum de mire                        |  <p style="text-align: center;">Fig. 5</p>   |

\* Voir page 54.

| Etape No. | Réglage de l'oscilloscope |   | Points d'essai         | Points de réglage     | Eléments contrôlés/spécifications de réglage | Procédure de réglage  |
|-----------|---------------------------|---|------------------------|-----------------------|--|---|
|           | V                         | H |                        |                       |  |   |
| 7         | Réglage radial            |   | TP 1 Pin 1 (Sortie RF) | Vis de réglage radial | Point optimum de mire                        | <ul style="list-style-type: none"> <li>● Charger le disc.</li> <li>● Régler le mode d'essai. (*)</li> <li>● Appuyer sur la touche DISPLAY et amener le capteur à la piste centrale du disc. (Le placer à un endroit où la vis radiale peut être vue depuis le haut du mécanisme d'asservissement. (Voir Fig. 5).</li> <li>● Appuyer sur les touches TRACK FWD (▶▶), PLAY (▶) et PAUSE (■) dans cet ordre pour fermer tous les asservissements. (Le témoin de pause s'allume).</li> <li>● Observer la sortie RF broche 1 de TP 1 avec un oscilloscope et régler la vis radiale afin que la mire devienne claire. (Fig. 4.).</li> <li>● Le point de réglage est situé vers la position médiane entre le point où la mire devient floue lorsque la vis radiale est tournée dans le sens des aiguilles d'une montre et le point où la mire devient floue lorsque la vis de réglage est tournée dans le sens inverse. Observer la netteté d'ensemble de la forme d'onde et une des formes en diamant dans la mire (Photo-9). Le réglage optimum est obtenu au point où les lignes de la forme en diamant sont relativement fines.</li> <li>● Effectuer alternativement, deux fois ou plus, les réglages tangentiel et radial.</li> </ul> |

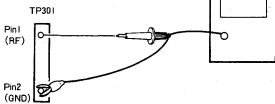


Fig. 5

\* Voir page 54.

| Etape No. | Réglage de l'oscilloscope                      |   | Points d'essai  | Points de réglage | Éléments contrôlés/ spécifications de réglage             | Procédure de réglage   |
|-----------|--|---|-----------------|-------------------|---|--|
|           | V  | H |                 |                   |   |  |
| <b>8</b>  | <b>Contrôle du niveau RF (fréquence radio)</b> |   |                 |                   |   |  |
|           |  |   | TP 1 Pin 1 (RF) | Contrôle          | 1,5V $\begin{smallmatrix} +0,2V \\ -0V \end{smallmatrix}$ | <ul style="list-style-type: none"> <li>● Régler le mode d'essai. (*)</li> <li>● Connecter la sonde de l'oscilloscope à la sortie RF broche 1 de TP 1 .</li> <li>● Reproduire le disc, mesurer la tension c-c de la forme d'onde RF et confirmer qu'elle devient 1,5V <math>\begin{smallmatrix} +0,2V \\ -0V \end{smallmatrix}</math> .</li> <li>● Ajuster VR 10 si la tension ne devient pas 1,5V <math>\begin{smallmatrix} +0,2V \\ -0V \end{smallmatrix}</math> .</li> </ul> |
|           |  |   | TP 1 Pin 1 (RF) | VR 10             | 1,5V $\begin{smallmatrix} +0,2V \\ -0V \end{smallmatrix}$ |  |

\* Voir page 54.

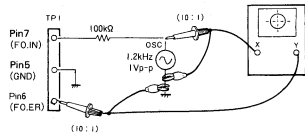
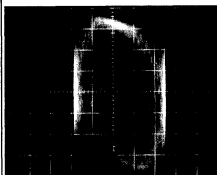
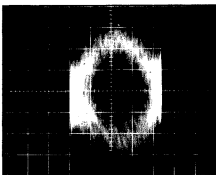
| Etape No. | Réglage de l'oscilloscope                                |   | Points d'essai   | Points de réglage | Éléments contrôlés/ spécifications de réglage | Procédure de réglage  |
|-----------|--|---|--|-------------------|---|---|
|           | V  | H |  |                   |   |   |
| 9         | Réglage du gain de mise au point                         |   |  |                   |   | <ul style="list-style-type: none"> <li>● L'alimentation étant coupée, connecter l'oscilloscope et l'oscillateur comme indiqué sur la Fig. 6.</li> <li>● Régler le mode de lecture normal.</li> <li>● Mettre l'oscillateur sous tension et le régler pour sortir un signal 1 Vc-c, 1,2 kHz.</li> </ul> <p><b>Remarque:</b> (Certains oscillateurs sortent CC lorsqu'ils sont mis sous tension. Dans ce cas, connecter l'oscillateur après l'avoir mis sous tension).</p> <ul style="list-style-type: none"> <li>● Ajuster VR3 (FO. GA: gain de mise au point) afin que la forme d'onde de choc sur l'oscilloscope devienne un cercle horizontal (différence de phase 90° ).</li> </ul> |
|           | CH1 (X) , CH2 (Y)<br>20 mV/div, 5 mV/div<br>(Sonde 10:1) |   | Axe X:<br>TP1 Pin 5<br>(FO. IN)<br>Axe Y:<br>TP1 Pin 6<br>(FO. ER) | VR3<br>(FO. GA)   | Différence de phase 90°                       |    |

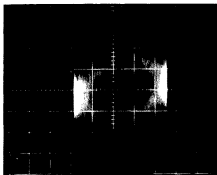
Fig. 6.



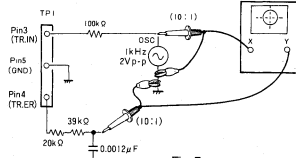
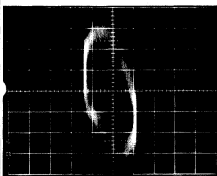
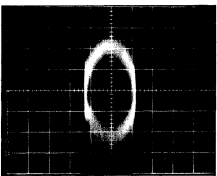
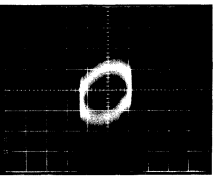
Gain élevé  
Photo-11



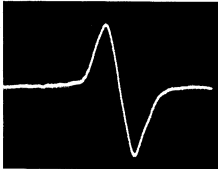
Gain optimum  
Photo-12



Gain faible  
Photo-13

| Etape No. | Réglage de l'oscilloscope   |  | Points d'essai   | Points de réglage | Éléments contrôlés/ spécifications de réglage | Procédure de réglage  |
|-----------|---|--|--|-------------------|---|---|
|           | V   | H  |  |                   |   |   |
| 10        | <b>Réglage du gain d'alignement</b>   |  |  |                   |   |   |
|           | CH1 (X), CH2 (Y)<br>50 mV/div, 5 mV/div<br>(Sonde 10:1)   |  | Axe X:<br>TP1 Pin 3<br>(TR. IN)<br>Axe Y:<br>TP1 Pin 2<br>(TR. ER)                 | VR4<br>(TR. GA)   | Différence de phase 90°                       | <ul style="list-style-type: none"> <li>● L'alimentation étant coupée, connecter l'oscilloscope et l'oscillateur comme indiqué sur la Fig. 7.</li> <li>● Régler le mode de lecture normal.</li> <li>● Mettre l'oscillateur sous tension et le régler pour sortir un signal 2 Vc-c, 1 kHz.</li> <li><b>Remarque:</b> (Certains oscillateurs sortent CC lorsqu'ils sont mis sous tension. Dans ce cas, connecter l'oscillateur après l'avoir mis sous tension).</li> <li>● Ajuster VR4 (TR. GA: gain d'alignement) afin que la forme d'onde de choc sur l'oscilloscope devienne un cercle horizontal (différence de phase 90°).</li> </ul> |
|           |   |  |  |                   |   |  <p>Fig. 7.</p>  |
|           |                             |  |  |                   |   |   |
|           | Gain élevé<br>Photo-14  | Gain optimum<br>Photo-15   | Gain faible<br>Photo-16  |                   |   |   |
| 11        | <b>Réglage de la fréquence de relaxation du VCO (oscillateur à fréquence réglée par variation de tension)</b> |  |  |                   |   |   |
|           |   |  | TP 2 Pin 2   |                   | Fréquence<br>4,275 MHz ±<br>0,025 MHz         | <ul style="list-style-type: none"> <li>● Régler le mode d'essai. (*)</li> <li>● Coupler ASY et les fils GND en utilisant un tournevis à fente ou objet similaire.</li> <li>● Connecter le fréquencemètre (gamme 10 MHz) à la broche 2 de TP 2.</li> <li>● Ajuster VR8 (VCO. A) afin que le fréquencemètre indique 4,275 MHz ± 0,025 MHz.</li> <li><b>Remarque:</b> Ajuster dans le mode d'arrêt.</li> </ul>   |

\* Voir page 54.  
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| Etape No.   | Réglage de l'oscilloscope                 |          | Points d'essai     | Points de réglage | Eléments contrôlés/ spécifications de réglage | Procédure de réglage   |
|---|---|----------|--------------------|-------------------|---|--|
|   | V   | H        |                    |                   |   |  |
| <b>12</b>   | <b>Contrôle d'erreur de mise au point</b> |          |                    |                   |   |  |
|   | 1V/div                                    | 2 ms/div | TP1 Pin 6 (FO. ER) | Contrôle          | Forme d'onde                                  | <ul style="list-style-type: none"> <li>● Régler le mode d'essai. (*)</li> <li>● Connecter la broche 7 FO. IN (entrée de mise au point) de TP1 à GND.</li> <li>● Appuyer sur la touche TRACK FWD et contrôler la forme d'onde à la broche 6 FO. ER (erreur de mise au point) de TP1 avec l'oscilloscope.</li> </ul> |
|  <p>Erreur de mise au point<br/>Photo-17</p> |   |          |                    |                   |   |  |

\* Voir page 54.



## 6. AJUSTES

Realice los siguientes ajustes en el orden indicado:

### ● Ajustes

1. Ajuste de compensación del error de seguimiento, del error de foco y de RF
2. Ajuste de compensación del retorno de seguimiento
3. Comprobación de la sincronización del foco y del eje
4. Ajuste de la rejilla
5. Ajuste del equilibrio del seguimiento
6. Ajuste tangencial
7. Ajuste radial
8. Comprobación del nivel de RF
9. Ajuste de la ganancia de foco
10. Ajuste de la ganancia de seguimiento
11. Ajuste de la frecuencia propia del VCO (oscilador controlado por tensión)
12. Método de comprobación del error de foco

### ● Dispositivos de Medición

1. Osciloscopio de doble trazo
2. Medidor de potencia lumínica
3. Disco de prueba YEDS-7
4. Filtro de ajuste de foco y seguimiento
5. Filtro de paso de banda para el ajuste de la ganancia de bucle.
6. Generador de señales
7. Destornillador de la rejilla
8. Herramientas de uso general
9. Disco disponible comercialmente (de 8 cm y de 12 cm)
10. Llave hex.(GGK 1002, 1.5 mm)

### ● Modo de prueba

#### Activación y desactivación del modo de prueba

- ① Para activar el modo de prueba, ponga en ON el interruptor de alimentación con el puente del modo de prueba cortocircuitado.
- ② El modo de prueba se desactivará poniendo el interruptor de alimentación en OFF.

Las funciones de las teclas en el modo de prueba se describen en la tabla 1.

### ● Descripción de los Resistores Variables Empleados para el Ajuste

- VR2: Compensación de RF (RF. OF)  
 VR3: Ganancia de foco (FO. GA)  
 VR4: Ganancia de seguimiento (TR. GA)  
 VR5: Equilibrio de seguimiento (TR. BL)  
 VR6: Compensación del error de foco (FO. OF)  
 VR7: Compensación del error de seguimiento (TE. OF)  
 VR8: Contador de frecuencias del oscilador controlado por tensión (VCOA)  
 VR9: Compensación del retorno de seguimiento (TR. OF)  
 VR10: Nivel de RF (RF.LEV)

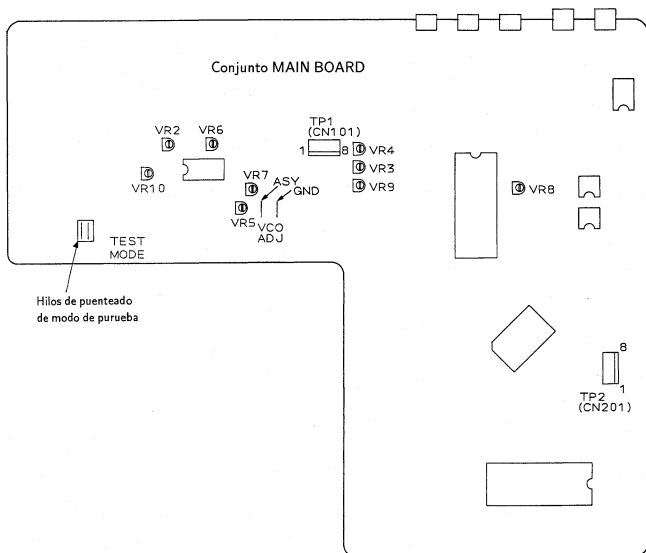
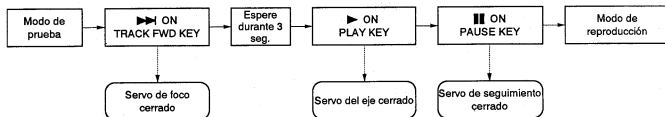


Fig.1 Punt de ajuste

En el modo de prueba, la apertura y cerrado de los servos se efectúa independientemente. Por lo tanto, para establecer el modo de reproducción se deben cerrar los servos en orden serial. Recuerde que en el modo de prueba no se puede establecer el modo de reproducción pulsando simplemente la tecla PAUSE (||).

Por ejemplo, para establecer el modo de reproducción partiendo del modo de parada pulse las teclas siguientes en el orden indicado.



\* En el modo de prueba los servos siguen un orden serial.

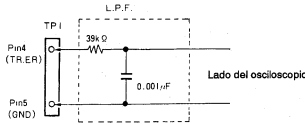
#### ● Función de Cada Tecla en el Modo de Prueba

| Símbolo | Tecla      | Función durante el modo de prueba                | Explicación   |
|---------|------------|--|---|
| ▶▶      | TRACK FWD  | Cerrar el servo del foco                         | Enciende el diodo laser y mueve el actuador del foco en dirección vertical para cerrar el servo del foco.   |
| ▶       | PLAY       | Cerrar el servo del eje                          | Después de arrancar el motor del eje, cierra el servo en el modo CLV-H.   |
|         | PAUSE      | Abrir/cerrar el servo de seguimiento             | Ejecuta una conmutación. Al pulsar esta tecla se cierra el servo de seguimiento y la unidad entra en el modo de reproducción (los servos del foco y del eje deben estar cerrados previamente). En ese momento se enciende el indicador PAUSE. Si se la pulsa nuevamente, se abre el servo de seguimiento. |
|         | OUTPUT     | Movimiento en retroceso (hacia dentro) del carro | Mueve el carro hacia dentro a alta velocidad (aprox. 1 cm/seg.). Dado que no existe un dispositivo de seguridad que detenga el carro, asegúrese de detenerlo manualmente a tiempo.  |
|         | DISPLAY    | Movimiento en avance (hacia fuera) del carro     | Mueve el carro hacia fuera a alta velocidad (aprox. 1 cm/seg.). Dado que no existe un dispositivo de seguridad que detenga el carro, asegúrese de detenerlo manualmente a tiempo.   |
| ■       | STOP       | Parada   | Detiene todos los servos y hace que la unidad vuelva a su estado inicial.   |
| ▲       | OPEN/CLOSE | Abrir/cerrar la bandeja del disco                | Abre y cierra la bandeja del disco. Sin embargo, el lector no vuelve a la posición de reposo cuando se abre la bandeja y tampoco se mueve al cerrarse la bandeja.   |

Tabla 1.

| Paso     | Margen del osciloscopio   |                       | Puntos de prueba                | Puntos de ajuste | Item a probar/Especif. de ajuste                   | Procedimiento de ajuste  |
|----------|---|-----------------------|---------------------------------|------------------|--|--|
|          | V   | H                     |                                 |                  |  |  |
| <b>1</b> | <b>Ajuste de compensación del error de seguimiento, del error de foco y de RF</b> |                       |                                 |                  |  |  |
|          |   | TP1                   | TP1 Pin 4<br>(TR. ER)           | VR7<br>(TE. OF)  | 0V ± 50 mV   | <ul style="list-style-type: none"> <li>● Establezca el modo de prueba. (*)</li> <li>● Ajuste VR7 (TE. OF: compensación del error de seguimiento) de forma que la tensión en el contacto 4 (TE: error de seguimiento) de TP1 sea 0V ± 50 mV.</li> <li>● Ajuste VR6 (FO. OF: compensación del error de foco) de forma que la tensión en el contacto 6 (FO. ER: error de foco) de TP1 sea 0V ± 50 mV.</li> <li>● Ajuste VR2 (RF. OF: compensación de RF) de forma que la tensión de salida de RF en el contacto 1 de TP1 sea 100 mV ± 50 mV.</li> </ul>   |
|          |   | TP1                   | TP1 Pin 6<br>(FO. ER)           | VR6<br>(FO. OF)  | 0V ± 50 mV   |  |
|          |   | TP301                 | TP 1 Pin 1<br>(RF)              | VR2<br>(RF. OF)  | 100 mV ± 50 mV                                     |  |
| <b>2</b> | <b>Ajuste de compensación del retorno de seguimiento</b>                          |                       |                                 |                  |  |  |
|          |   | TP1                   | TP1 Pin 2<br>(TR. RT)           | VR9<br>(TR. OF)  | 0V ± 10 mV   | <ul style="list-style-type: none"> <li>● Establezca el modo de prueba. (*)</li> <li>● Ajuste VR9 (TR. OF: compensación del retorno de seguimiento) de forma que la tensión en el contacto 2 (TR. RT: retorno de seguimiento) de TP1 sea 0V ± 10 mV.</li> </ul>   |
| <b>3</b> | <b>Comprobación de la sincronización del foco y del eje</b>                       |                       |                                 |                  |  |  |
|          | V<br>0.5V/div   | H<br>100 msec<br>/div | TP 1<br>Pin 1<br>(Salida de RF) |                  | Salida de RF<br><br>Rotación en<br>sentido horario | <ul style="list-style-type: none"> <li>● Cargue el disco.</li> <li>● Establezca el modo de prueba. (*)</li> <li>● Aproxime el lector al centro del disco usando la tecla DISPLAY.</li> <li>● Asegúrese de efectuar esta operación.</li> <li>● Observe la salida de RF por el contacto 1 de TP1 con un osciloscopio y confirme que la señal de RF sea emitida al pulsar la tecla TRACK FWD (▶▶).</li> <li>● Pulse la tecla PLAY (▶) y confirme que el disco gira en sentido horario a aproximadamente la velocidad normal (unos 300 rpm por estar el lector cerca del centro del disco) sin que corra descontroladamente o en dirección inversa.</li> </ul> |

\* Vea la página 69.

| Paso   | Margen del osciloscopio                                |          | Puntos de prueba   | Puntos de ajuste | Item a probar/Especif. de ajuste | Procedimiento de ajuste  |
|--|--|----------|--------------------|------------------|----------------------------------|--|
|  | V  | H        |                    |                  |                                  |  |
| 4-1  | <b>Ajuste de la rejilla (1) (con un disco de 8 cm)</b> |          |                    |                  |                                  |  |
|  | 1V/div   | 5 ms/div | TP1 Pin 4 (TR. ER) | Rejilla          | Punto nulo                       | <ul style="list-style-type: none"> <li>● Este ajuste puede realizarse utilizando un disco de 8 cm con hoyos sobre un diámetro de 75 mm.</li> <li>● Cargue el disco. (8 cm)</li> <li>● Establezca el modo de prueba. (*)</li> <li>● Pulse las teclas TRACK FWD (▶▶) y PLAY (▶) en este orden para cerrar los servos del foco y del eje (el servo de seguimiento estará abierto).</li> <li>● Pulse la tecla DISPLAY y mueva el lector a la pista externa del disco de 8 cm. Cuando mueva el lector, será posible introducir un destornillador en la ranura de la placa de ajuste de la rejilla desde la parte de arriba de la unidad. (Fig. 3)</li> <li>● Observe la forma de la onda por el contacto 4 (TR. ER: error de seguimiento) de TP1 con un osciloscopio y, en ese momento, introduzca un filtro de corte pasabajos de 4 kHz. (Fig. 2)</li> <li>● Introduzca el destornillador de seguimiento en la ranura de ajuste y gírelo de forma que encuentre el punto nulo (Foto-1).</li> </ul> |
|  <p style="text-align: center;">Fig. 2.</p> |  |          |                    |                  |                                  |  |

\* Vea la página 69.

| Paso | Margen del osciloscopio   |          | Puntos de prueba   | Puntos de ajuste | Item a probar/Especif. de ajuste | Procedimiento de ajuste  |
|------|---|----------|--------------------|------------------|----------------------------------|--|
|      | V   | H        |                    |                  |                                  |  |
| 4-2  | <b>Ajuste de la rejilla (2) (con un disco de 12 cm reproduciendo durante más de 60 minutos)</b> |          |                    |                  |                                  |  |
|      | 1V/div  | 5 ms/div | TP1 Pin 4 (TR. ER) | Rejilla          | Punto nulo                       | <ul style="list-style-type: none"> <li>● Cargue el disco (reproduciendo durante más de 60 minutos).</li> <li>● Establezca el modo de prueba. (*)</li> <li>● Pulse las teclas TRACK FWD (▶▶▶) y PLAY (▶) en este orden para cerrar los servos del foco y del eje (el servo de seguimiento estará abierto).</li> <li>● Pulse la tecla DISPLAY y mueva el lector a la pista externa del disco. Cuando mueva el lector, será posible introducir un destornillador en la ranura de la placa de ajuste de la rejilla desde la parte de arriba de la unidad. (Fig. 3)</li> <li>● Observe la forma de la onda por el contacto 4 (TR. ER: error de seguimiento) de TP1 con un osciloscopio y, en ese momento, introduzca un filtro de corte pasabajos de 4 kHz. (Fig. 2)</li> <li>● Introduzca el destornillador de seguimiento en la ranura de ajuste y gírelo de forma que encuentre el punto nulo. (Foto-1)</li> </ul> |
|      |   |          |                    | Rejilla          | Amplitud máxima                  | <ul style="list-style-type: none"> <li>● Gire el destornillador de la rejilla lentamente en sentido antihorario a partir del punto nulo y deténgase en el primer punto donde la amplitud de la onda (señal de error de seguimiento) sea máxima. (Vea Foto-2)</li> </ul>  |

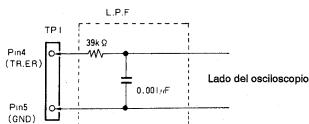


Fig. 2.

\* Vea la página 69.

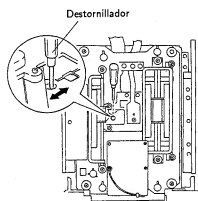


Fig. 3. Ajuste de la Rejilla

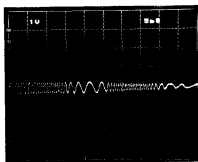


Foto-1 Punto nulo

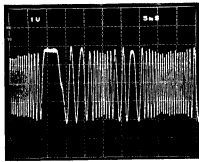


Foto-2 Amplitud máxima

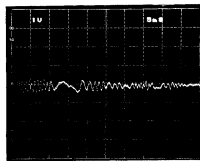
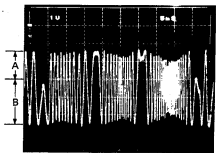
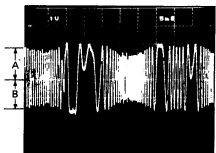


Foto-3 Fuera del punto nulo

| Paso | Margen del osciloscopio   |            | Puntos de prueba      | Puntos de ajuste  | Item a probar/Especif. de ajuste | Procedimiento de ajuste  |
|------|---|------------|-----------------------|---|----------------------------------|--|
|      | V   | H          |                       |   |                                  |  |
| 5    | <b>Ajuste del equilibrio del seguimiento</b>                                      |            |                       |   |                                  |  |
|      | 0,5V/div  | 5 msec/div | TP1 Pin 4<br>(TR. ER) | VR5<br>(TR. BL)   |                                  | <ul style="list-style-type: none"> <li>● Cargue el disco</li> <li>● Establezca el modo de prueba. (*)</li> <li>● Pulse la tecla DISPLAY y mueva el carro hasta cerca de la pista central del disco.</li> <li>● Pulse las teclas TRACK FWD (▶▶) y PLAY (▶) en ese orden para hacer girar el disco.</li> <li>● Observe la forma de la onda por el contacto 4 (TR. ER: error de seguimiento) de TP1 con un osciloscopio y ajuste el VR5 (TR. BL: equilibrio de seguimiento) de forma que desaparezcan los elementos de CC de la onda del error de seguimiento.</li> </ul> |
|      |  |            | ➔                     |  |                                  |  |
|      | Foto-6  |            | Foto-7                |   |                                  |  |

\* Vea la página 69.



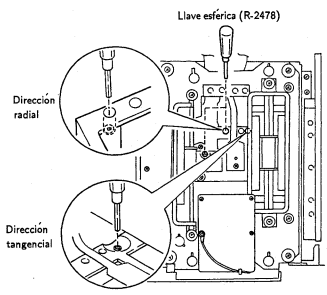
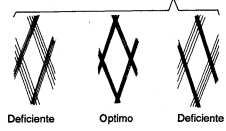
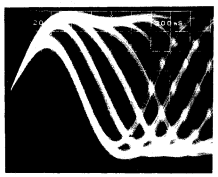
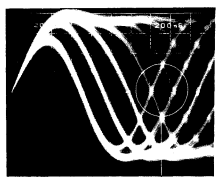
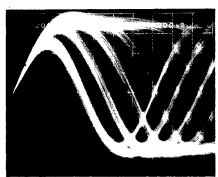


Fig. 4. Ajuste Tangencial



| Paso | Margen del osciloscopio |   | Puntos de prueba          | Puntos de ajuste              | Item a probar/Especif. de ajuste  | Procedimiento de ajuste   |
|------|-------------------------|---|---------------------------|-------------------------------|-----------------------------------|---|
|      | V                       | H |                           |                               |                                   |   |
| 6    | Ajuste tangencial       |   | TP 1 Pin 1 (Salida de RF) | Tornillo de ajuste tangencial | Punto óptimo de la figura del ojo | <ul style="list-style-type: none"> <li>● Cargue el disco.</li> <li>● Establezca el modo de prueba. (*)</li> <li>● Pulse la tecla DISPLAY y mueva el lector a la pista central del disco (colóquelo en un lugar tal que el tornillo de ajuste tangencial pueda verse desde arriba del servomecanismo. (Vea la Fig. 4)</li> <li>● Pulse las teclas TRACK FWD (▶▶), PLAY (▶) y PAUSE (■) en este orden para cerrar todos los servos. (Se enciende el indicador de pausa).</li> <li>● Observe la salida de RF por el contacto 1 de TP 1 con un osciloscopio y ajuste el tornillo tangencial de forma que la figura del ojo se vea claramente. (Fig. 4)</li> <li>● El punto de ajuste se encuentra cerca del punto medio entre el punto donde la figura del ojo se enturbia al girar el tornillo tangencial en sentido horario y el punto donde la figura del ojo se enturbia al girar el tornillo de ajuste en sentido antihorario. Observe la claridad general de la onda y una de las figuras del diamante en la figura del ojo (foto-Ø). El ajuste óptimo se obtiene donde las líneas de la figura del diamante son relativamente delgadas.</li> </ul> |

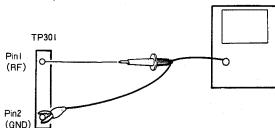
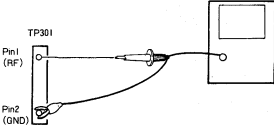


Fig. 5

\* Vea la página 69.

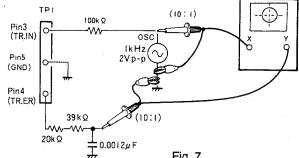
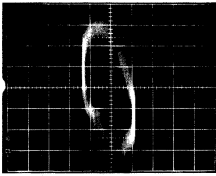
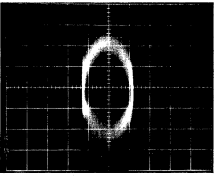
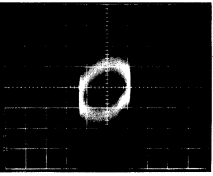
| Paso | Margen del osciloscopio |   | Puntos de prueba          | Puntos de ajuste          | Item a probar/Especif. de ajuste  | Procedimiento de ajuste   |
|------|-------------------------|---|---------------------------|---------------------------|-----------------------------------|---|
|      | V                       | H |                           |                           |                                   |   |
| 7    | Ajuste radial           |   |                           |                           |                                   | <ul style="list-style-type: none"> <li>● Cargue el disco.</li> <li>● Establezca el modo de prueba. (*)</li> <li>● Pulse la tecla DISPLAY y mueva el lector a la pista central del disco (colóquelo en un lugar tal que el tornillo de ajuste tangencial pueda verse desde arriba del servomecanismo. (Vea la Fig. 5)</li> <li>● Pulse las teclas TRACK FWD (▶▶▶), PLAY (▶) y PAUSE (▣▣▣) en este orden para cerrar todos los servos. (Se enciende el indicador de pausa).</li> <li>● Observe la salida de RF por el contacto 1 de TP 1 con un osciloscopio y ajuste el tornillo radial de forma que la figura del ojo se vea claramente. (Fig. 4)</li> <li>● El punto de ajuste se encuentra cerca del punto medio entre el punto donde la figura del ojo se enturbia al girar el tornillo radial en sentido horario y el punto donde la figura del ojo se enturbia al girar el tornillo de ajuste en sentido antihorario. Observe la claridad general de la onda y una de las figuras del diamante en la figura del ojo (foto-9). El ajuste óptimo se obtiene donde las líneas de la figura del diamante son relativamente delgadas.</li> <li>● Efectúe los ajustes tangencial y radial alternativamente dos o más veces.</li> </ul> |
|      |                         |   | TP 1 Pin 1 (Salida de RF) | Tornillo de ajuste radial | Punto óptimo de la figura del ojo |  <p style="text-align: center;">Fig. 5</p>  |

\* Vea la página 69.

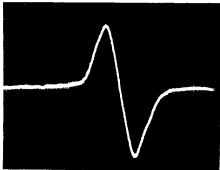
| Paso | Margen del osciloscopio             |   | Puntos de prueba | Puntos de ajuste | Item a probar/Especif. de ajuste                          | Procedimiento de ajuste  |
|------|-------------------------------------|---|------------------|------------------|---|--|
|      | V                                   | H |                  |                  |   |  |
| 8    | <b>Comprobación del nivel de RF</b> |   |                  |                  |   |  |
|      |                                     |   | TP 1 Pin 1 (RF)  | Comprobación     | 1.5V $\begin{smallmatrix} +0.2V \\ -0V \end{smallmatrix}$ | <ul style="list-style-type: none"> <li>● Establezca el modo de prueba. (*)</li> <li>● Conecte la sonda del osciloscopio al contacto 1 (salida de RF) de TP 1.</li> <li>● Reproduzca el disco, mida la tensión p-p de la onda de RF y confirme que sea 1.5V <math>\begin{smallmatrix} +0.2V \\ -0V \end{smallmatrix}</math>.</li> <li>● Ajuste VR 10 si la tensión no es 1.5V <math>\begin{smallmatrix} +0.2V \\ -0V \end{smallmatrix}</math>.</li> </ul> |
|      |                                     |   | TP 1 Pin 1 (RF)  | VR 10            | 1.5V $\begin{smallmatrix} +0.2V \\ -0V \end{smallmatrix}$ |  |

\* Vea la página 69.

| Paso | Margen del osciloscopio                                  |   | Puntos de prueba   | Puntos de ajuste | Item a probar/Especif. de ajuste | Procedimiento de ajuste  |
|------|--|---|--|------------------|----------------------------------|--|
|      | V  | H |  |                  |                                  |  |
| 9    | <b>Ajuste de la ganancia de foco</b>                     |   |  |                  |                                  |  |
|      | CH1 (X) . CH2 (Y)<br>20 mV/div, 5 mV/div<br>(Sonda 10:1) |   | Eje X:<br>TP1 Pin 5<br>(FO. IN)<br>Eje Y:<br>TP1 Pin 6<br>(FO. ER) | VR3<br>(FO. GA)  | Diferencia de fase de 90°        | <ul style="list-style-type: none"> <li>● Con la unidad apagada, conecte el osciloscopio y el oscilador como muestra la Fig. 6.</li> <li>● Establezca el modo de reproducción normal.</li> <li>● Encienda el oscilador y ajústelo para que emita una señal de 1,2 kHz, 1 Vp-p.</li> </ul> <p><b>Nota:</b> Algunos osciladores emiten CC al ser encendidos. En este caso, encienda el oscilador antes de conectarlo.</p> <ul style="list-style-type: none"> <li>● Ajuste VR3 (FO. GA: ganancia de foco) de forma que la onda de resurgimiento en el osciloscopio se convierta en un círculo horizontal (diferencia de fase de 90°).</li> </ul> |
|      |  |   |  |                  |                                  |  |
|      | Fig. 6.  |   |  |                  |                                  |  |
|      |  |   |  |                  |                                  |  |
|      | Alta ganancia<br>Foto-11                                 |   | Ganancia óptima<br>Foto-12   |                  | Baja ganancia<br>Foto-13         |  |

| Paso | Margen del osciloscopio  |   | Puntos de prueba   | Puntos de ajuste | Item a probar/Especif. de ajuste       | Procedimiento de ajuste  |
|------|--|---|--|------------------|--|--|
|      | V  | H |  |                  |  |  |
| 10   | <b>Ajuste de la ganancia de seguimiento</b>  |   |  |                  |  |  |
|      | CH1 (X), CH2 (Y)<br>50 mV/div, 5 mV/div<br>(Sonda 10:1)                            |   | Eje X:<br>TP1 Pin 3<br>(TR. IN)<br>Eje Y:<br>TP1 Pin 2<br>(TR. ER) | VR4<br>(TR. GA)  | Diferencia de fase de 90°              | <ul style="list-style-type: none"> <li>● Con la unidad apagada, conecte el osciloscopio y el oscilador como muestra la Fig. 7.</li> <li>● Establezca el modo de reproducción normal.</li> <li>● Encienda el oscilador y ajústelo para que emita una señal de 1 kHz, 2 Vp-p.</li> </ul> <p><b>Nota:</b> Algunos osciladores emiten CC al ser encendidos. En este caso, encienda el oscilador antes de conectarlo.</p> <ul style="list-style-type: none"> <li>● Ajuste VR4 (TR. GA: ganancia de seguimiento) de forma que la onda de resurgimiento en el osciloscopio se convierta en un círculo horizontal (diferencia de fase de 90°).</li> </ul>  <p style="text-align: center;">Fig. 7.</p> |
|      |   |   |  |                  |  |  |
|      | Alta ganancia<br>Foto-14   |   |  |                  |  |  |
|      |  |   |  |                  |  |  |
|      | Ganancia óptima<br>Foto-15   |   |  |                  |  |  |
|      |  |   |  |                  |  |  |
|      | Baja ganancia<br>Foto-16   |   |  |                  |  |  |
| 11   | <b>Ajuste de la frecuencia propia del oscilador controlado por tensión</b>         |   |  |                  |  |  |
|      |  |   | TP 2 Pin 2   |                  | Frecuencia<br>4,275 MHz ±<br>0,025 MHz | <ul style="list-style-type: none"> <li>● Establezca el modo de prueba. (*)</li> <li>● Ponga en derivación los puentes del ASY y GND empleando un destornillador de cabeza ranurada u otra herramienta similar.</li> <li>● Conecte el contador de frecuencias (margen de 10 MHz) al contacto 2 de TP 2.</li> <li>● Ajuste VR8 (VCO. A) de forma que en el contador de frecuencias se lea 4,275 MHz ± 0,025 MHz.</li> </ul> <p><b>Nota:</b> Ajuste con la unidad en el modo de parada</p>  |

\* Vea la página 69.

| Paso | Margen del osciloscopio               |          | Puntos de prueba   | Puntos de ajuste | Item a probar/Especif. de ajuste | Procedimiento de ajuste  |
|------|---------------------------------------|----------|--------------------|------------------|----------------------------------|--|
|      | V                                     | H        |                    |                  |                                  |  |
| 12   | <b>Comprobación del error de foco</b> |          |                    |                  |                                  |  |
|      | 1V/div                                | 2 ms/div | TP1 Pin 6 (FO. ER) | Comprobación     | Forma de onda                    | <ul style="list-style-type: none"> <li>● Establezca el modo de prueba. (*)</li> <li>● Conecte a tierra el contacto 7 (FO. IN: entrada de foco) de TP1.</li> <li>● Pulse la tecla TRACK FWD y compruebe la forma de la onda en el contacto 6 (FO. ER: error de foco) de TP1 con un osciloscopio.</li> </ul> |
|      |                                       |          |                    |                  |                                  |   |
|      |                                       |          |                    |                  |                                  | Error de foco<br>Foto-17   |

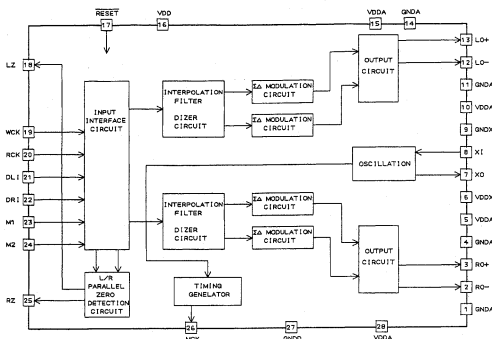
\* Vea la página 69.

## 7. IC INFORMATION

## ■ PD2028A

D/A Converter

## ● Block Diagram



## ● Pin Function

| No. | Pin name | I/O | Function                                   |
|-----|----------|-----|--|
| 1   | GND A    | —   | GND terminal of D/A converter (RO-).       |
| 2   | RO-      | O   | Data output for R ch.                      |
| 3   | RO+      | O   | Data output for R ch.                      |
| 4   | GND A    | —   | GND terminal of D/A converter (RO+).       |
| 5   | VDD A    | —   | Power supply input of D/A converter (RO+). |
| 6   | VDD X    | —   | Power supply input of Oscillator.          |
| 7   | XO       | O   | Terminals for crystal oscillator.          |
| 8   | XI       | I   | Generate system clock.                     |
| 9   | GND X    | —   | GND terminal of Oscillator.                |
| 10  | VDD A    | —   | Power supply input of D/A converter (LO-). |
| 11  | GND A    | —   | GND terminal of D/A converter (LO-).       |
| 12  | LO-      | O   | Data output for L ch.                      |
| 13  | LO+      | O   | Data output for L ch.                      |
| 14  | GND A    | —   | GND terminal of D/A converter (LO+).       |

| No. | Pin name | I/O | Function  |
|-----|----------|-----|---|
| 15  | VDD A    | —   | Power supply input of D/A converter (LO+).                  |
| 16  | VDD      | —   | Power supply input of logic circuit.                        |
| 17  | RESET    | I   | Reset terminal. When "L", reset the $\Sigma\Delta$ circuit. |
| 18  | LZ       | O   | Digital-Zero output for L ch.                               |
| 19  | WCK      | I   | Word clock input  |
| 20  | BCK      | I   | Bit clock input   |
| 21  | DLI      | I   | Data input for L ch.  |
| 22  | DRI      | I   | Data input for R ch.  |
| 23  | M1       | I   | Mode select input 1.( *1)                                   |
| 24  | M2       | I   | Mode select input 2.( *1)                                   |
| 25  | RZ       | O   | Digital-Zero output for R ch.                               |
| 26  | MCK      | O   | System clock output   |
| 27  | GND D    | —   | GND terminal of logic circuit.                              |
| 28  | VDD A    | —   | Power supply input of D/A converter (RO-).                  |

\*1: Selection of input data.


| M1(23pin) | M2(24pin) | MCK(26pin) output | OSR   | Input bit rate | Applicable digital filter |
|-----------|-----------|-------------------|-------|----------------|---------------------------|
| 0         | 0         | 384fs             | 384fs | 20             | NPC SM5803/13/40          |
| 0         | 1         | 256fs             | 512fs | 20             | NPC SM5803/13/40          |
| 1         | 0         | 256fs             | 256fs | 20             | NPC SM5803/13/40          |
| 1         | 1         | 384fs             | 384fs | 18             | SONY CXD1244/2550         |







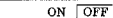
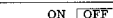
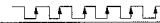
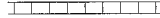


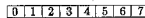
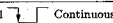


### PD3179B

Microcomputer

#### ● Pin Function

| No. | Symbol                   | Pin name                 | I/O | Reset | Function   |
|-----|--------------------------|--------------------------|-----|-------|--|
| 1   | V <sub>SS</sub>          | —                        | —   | —     | GND  |
| 2   | XTAL                     | —                        | —   | —     | Internal clock circuit input.  |
| 3   | EXTAL                    | —                        | —   | —     | Internal clock circuit input.  |
| 4   | MP0                      | —                        | I   | —     | +5V  |
| 5   | MP1                      | —                        | I   | —     | +5V  |
| 6   | $\overline{\text{RES}}$  | —                        | I   | —     | Reset input for CPU <span style="float:right">RESET RUN</span>   |
| 7   | $\overline{\text{STBY}}$ | —                        | I   | —     | Standby input for CPU <span style="float:right">STANDBY RUN</span>   |
| 8   | $\overline{\text{NMI}}$  | SCOR                     | I   | —     | Sub code sync input <span style="float:right">SYNC</span>  |
| 9   | P20                      | FOK                      | I   | —     | Focus OK <span style="float:right">NG OK</span>  |
| 10  | P21                      | $\overline{\text{XLT}}$  | O   | H     | LSI data execute control pulse <span style="float:right">EXEC</span>   |
| 11  | SCLK                     | CLK                      | O   | H     | Serial transmit clock                 |
| 12  | Rx                       | SUBQ                     | I   | —     | Sub code Q data input  |
| 13  | Tx                       | DATA                     | O   | H     | Serial data output <span style="float:right">0 1 2 3 4 5 6 7</span>  |
| 14  | P25                      | SENS                     | I   | —     | LSI running state. Multi mode input  |
| 15  | P26                      | MUTE                     | O   | H     | Muting out (Digital block) <span style="float:right">OFF ON</span>   |
| 16  | P27                      | GFS                      | I   | —     | Frame sync lock <span style="float:right">NG LOCK</span>   |
| 17  | P50                      | $\overline{\text{LDON}}$ | O   | H     | Laser diode On/Off <span style="float:right">ON OFF</span>   |
| 18  | P51                      | $\overline{\text{DEMP}}$ | O   | H     | De-emphasis On/Off <span style="float:right">ON OFF</span>   |
| 19  | P52                      | $\overline{\text{TEST}}$ | I   | —     | Test mode select input <span style="float:right">TEST NORMAL</span>  |
| 20  | P53                      | TMSW                     | I   | —     | Timer play switch <span style="float:right">YES NO</span>  |
| 21  | P54                      | AMUTE                    | O   | H     | Muting out (Analog block) <span style="float:right">OFF ON</span>  |
| 22  | P55                      | MDSW                     | I   | —     | Model select switch <span style="float:right">With FADE No FADE</span>   |
| 23  | P56                      | SYC1                     | I   | —     | Deck-Synchro input port(Pulled-up when not used)   |
| 24  | P57                      | SYC3                     | O   | L     | Deck-Synchro output port(Open when not used)   |
| 25  | P60                      | Not used                 | I   | —     | GND  |
| 26  | P61                      | LIN                      | O   | L     | Disc tray loading IN/OUT output <span style="float:right">Free Brake IN</span><br><span style="float:right">OUT</span> |
| 27  | P62                      | LOUT                     | O   | L     |  |
| 28  | P63                      | LOAD                     | I   | —     | Loading complete <span style="float:right">LOAD-IN NOT</span>  |
| 29  | P64                      | $\overline{\text{CLOP}}$ | I   | —     | Clamp up complete <span style="float:right">CLAMP-UP NOT</span>  |
| 30  | P65                      | $\overline{\text{OPEN}}$ | I   | —     | Open complete <span style="float:right">OPEN NOT</span>  |
| 31  | P66                      | $\overline{\text{CLMP}}$ | I   | —     | Clamp complete <span style="float:right">CLAMP NOT</span>  |
| 32  | P67                      | Not used                 | O   | L     | (OPEN)   |

| No. | Symbol          | Pin name          | I/O | Reset | Function  |
|-----|-----------------|-------------------|-----|-------|---|
| 33  | V <sub>cc</sub> | -                 | -   | -     | +5V   |
| 34  | P47             | Not used          | O   | L     | (Open)  |
| 35  | P46             | Not used          | O   | L     | (Open)  |
| 36  | P45             | Not used          | O   | L     | (Open)  |
| 37  | P44             | $\overline{KS}$   | I   | -     | Key strobe input from front panel                                      |
| 38  | P43             | $\overline{RKS}$  | I   | -     | Key strobe input from remote controller                                |
| 39  | P42             | CLUP              | O   | L     | Disc clamp Up/Down output    |
| 40  | P41             | CLDW              | O   | L     |    |
| 41  | P40             | STS               | I   | -     | Input for display data transmit enable                                 |
| 42  | V <sub>ss</sub> | -                 | -   | -     | GND   |
| 43  | P17             | Not used          | O   | L     | (Open)  |
| 44  | P16             | Not used          | O   | L     | (Open)  |
| 45  | P15             | FLOF              | O   | H     | FL display on/off    |
| 46  | P14             | $\overline{DOFF}$ | O   | H     | Digital output status    |
| 47  | P13             | $\overline{AOFF}$ | O   | H     | Analog output status   |
| 48  | P12             | SCK               | O   | H     | Serial transmit clock for display data                                 |
| 49  | P11             | SD                | O   | H     | Serial display data output   |
| 50  | P10             | SRES              | O   | L     | Reset output for key display microcomputer                             |
| 51  | P37             | KD7               | I   | -     | Key code input from front panel and remote controller (MSB)   |
| 52  | P36             | KD6               | I   | -     |   |
| 53  | P35             | KD5               | I   | -     |   |
| 54  | P34             | KD4               | I   | -     |   |
| 55  | P33             | KD3               | I   | -     |   |
| 56  | P32             | KD2               | I   | -     |   |
| 57  | P31             | KD1               | I   | -     |   |
| 58  | P30             | KD0               | I   | -     | Key code input from front panel and remote controller (LSB)   |
| 59  | P74             | Not used          | O   | L     | (Open)  |
| 60  | P73             | Not used          | O   | L     | (Open)  |
| 61  | P72             | $\overline{DLAT}$ | O   | H     | ATT level data latch pulse *1                                        |
| 62  | P71             | DDAT              | O   | H     | ATT level data serial output *1                                      |
| 63  | P70             | DCLK              | O   | H     | ATT level data serial transmit clock *1  Continuous 8 pulses output. |
| 64  | E               | -                 | O   | -     | (Open)  |

\*1: Pins 61 to 63 are connected to digital filter IC(SM5840) when it is used.

## 8. FOR HEM AND SD TYPES

### • 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-75/HEM and SD types are the same as the PD-75/KU/CA type with the exception of the following sections.

| Mark | Symbol & Description  | Part No.   |            |            | Remarks     |
|------|---|------------|------------|------------|-------------|
|      |   | KU/CA      | HEM        | SD         |             |
| Δ⊙   | MAIN BOARD assembly   | PWZ1983    | PWZ1994    | PWZ1994    |             |
| Δ    | PRIMARY BOARD assembly  | Non supply | Non supply | Non supply |             |
| ⊙    | BALANCE BOARD assembly  | Non supply | .....      | .....      |             |
|      | FUNCTION A BOARD assembly   | PWZ2000    | PWZ1998    | PWZ1998    |             |
| Δ    | AC power cord   | PDG1015    | PDG1003    | PDG1013    | For Packing |
| Δ    | Voltage selector  | .....      | .....      | PSB1002    |             |
| Δ    | Power transformer(17VA)   | PTT1162    | PTT1163    | PTT1164    |             |
| Δ    | Power transformer(8VA)  | PTT1166    | PTT1167    | PTT1168    |             |
| Δ    | Strain relief   | CM-22C     | CM-22B     | CM-22B     |             |
|      | 25P F.F.C/30V   | PDD1096    | .....      | .....      |             |
|      | 23P F.F.C/30V   | .....      | PDD1069    | PDD1069    |             |
|      | 3P receptacle   | PKP1004    | .....      | .....      |             |
|      | Balance case  | PNS1019    | .....      | .....      |             |
|      | Balance cover   | PAT1004    | .....      | .....      |             |
|      | Bonnet  | PEA1168    | PYY1071    | PYY1071    |             |
|      | CD packing case   | PHG1676    | PHG1671    | PHG1671    |             |
|      | Cord with plug(mini plug)   | FDE-319    | .....      | .....      |             |
|      | FL sheet  | PAM1290    | PAM1251    | PAM1290    |             |
|      | Front panel assembly  | PEA1177    | PEA1178    | PEA1178    |             |
|      | Spacer  | PNM1138    | .....      | .....      |             |
|      | UL Caution  | PRW1250    | .....      | .....      |             |
|      | Operating instructions<br>(German/Italian/Dutch/Swedish<br>/Spanish/Portuguese) | .....      | PRF1048    | .....      |             |

**MAIN BOARD ASSEMBLY(PWZ1994)**

The MAIN BOARD assembly (PWZ1994) is the same as the MAIN BOARD assembly (PWZ1983) with the exception of the following sections.

| Mark | Symbol & Description | Part No.    |         | Remarks |
|------|----------------------|-------------|---------|---------|
|      |                      | PWZ1983     | PWZ1994 |         |
|      | D701-D704            | 1SS254      | .....   |         |
|      | C701                 | CKCYF103Z50 | .....   |         |
|      | C702                 | CCCSL101J50 | .....   |         |
|      | R701                 | RD1/6PM244J | .....   |         |
|      | R702                 | RD1/6PM102J | .....   |         |
|      | CN6                  | HLEM25R     | HLEM23R |         |
|      | JA701, JA702         | RKN1004     | .....   |         |

**PRIMARY BOARD ASSEMBLY**

The PRIMARY BOARD assemblies of PD-75/HEM and SD are the same as the PRIMARY BOARD assembly of PD-75/KU/CA with the exception of the following sections.

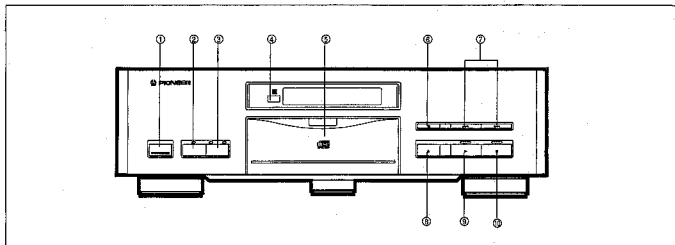
| Mark | Symbol & Description | Part No. |            | Remarks |
|------|----------------------|----------|------------|---------|
|      |                      | KU/CA    | HEM and SD |         |
|      | Capacitor sleeve     | .....    | REC-207    |         |

**FUNCTION A BOARD ASSEMBLY(PWZ1998)**

The FUNCTION A BOARD assembly (PWZ1998) is the same as the FUNCTION A BOARD assembly (PWZ2000) with the exception of the following sections.

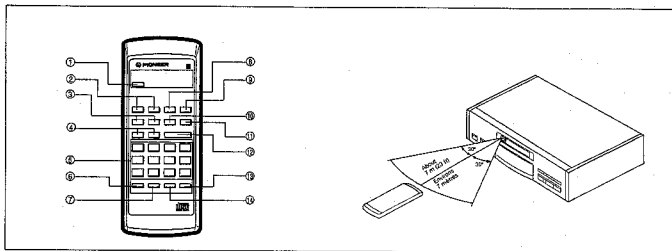
| Mark | Symbol & Description | Part No.    |             | Remarks |
|------|----------------------|-------------|-------------|---------|
|      |                      | PWZ2000     | PWZ1998     |         |
|      | R418, R420           | RD1/6PM471J | RD1/6PM331J |         |
|      | R419                 | RD1/6PM391J | RD1/6PM331J |         |
|      | CN401                | HLEM25R     | HLEM23R     |         |

## 9. PANEL FACILITIES



### FRONT PANEL

- ① POWER switch
- ② DISPLAY button and OFF indicator
- ③ OUTPUT button and DIGITAL/ANALOG indicators
- ④ Remote sensor  
Receives the signal from the remote control unit.
- ⑤ Disc tray
- ⑥ STOP button (■)
- ⑦ TRACK search buttons (◀◀/▶▶)
- ⑧ OPEN/CLOSE button (▲)
- ⑨ PLAY button (▶) and indicator
- ⑩ PAUSE button (⏸) and indicator



### REMOTE CONTROL UNIT

Remote control buttons with the same names or marks as buttons on the front panel of the player control the same operations as the corresponding front panel buttons.

- ① OPEN/CLOSE button (▲)
- ② INDEX buttons (←/→)
- ③ MANUAL search buttons (◀/▶)
- ④ TRACK search buttons (◀◀/▶▶)
- ⑤ Track number/Digit buttons (1-10, +10, ≧ 20)
- ⑥ PGM (Program) button
- ⑦ CHECK button
- ⑧ REPEAT button
- ⑨ RANDOM PLAY button
- ⑩ PAUSE button (⏸)
- ⑪ STOP button (■)
- ⑫ PLAY button (▶)
- ⑬ TIME button
- ⑭ CLEAR button

### REMOTE CONTROL OPERATIONS

When operating the remote control unit, point the unit's infrared signal transmitter at the remote control receiver (REMOTE SENSOR) on the front panel of the player. The remote control unit can be used within a range of about 7 meters (23 feet) from the remote sensor, and within angles of up to about 30 degrees.

#### NOTE:

If the remote control sensor window is in a position where it receives strong light such as sunlight or fluorescent light, control may not be possible.

## 10. SPECIFICATIONS

### 1. General

|                                  |   |
|----------------------------------|---|
| Type .....                       | Compact disc digital audio system                                     |
| Power requirements               |   |
| European model .....             | AC 220 - 230 V, 50/60 Hz  |
| U.K. and Australian models ..... | AC 230 - 240 V, 60 Hz   |
| U.S. and Canadian models .....   | AC 120 V, 60 Hz   |
| Other models .....               | AC 110/120 - 127/220/240 V (Switchable),<br>50/60 Hz                  |
| Power consumption .....          | 30 W  |
| Operating temperature .....      | +5°C - +35°C<br>+41°F - +95°F   |
| Weight .....                     | 12.0 kg (26 lb, 7 oz)   |
| External dimensions .....        | 459(W) X 330(D) X 130(H) mm<br>18-1/16(W) X 13(D) X 5-2/16(H) in      |
| U.S. and Canadian models .....   | 459(W) X 360(D) X 130(H) mm<br>18-1/16(W) X 14-3/16(D) X 5-2/16(H) in |

### 2. Audio section

|  |   |
|--|---|
| Frequency response .....   | 2 Hz - 20 kHz   |
| S/N ratio .....  | 112 dB or more (EIAJ)                                   |
| Dynamic range .....  | 98 dB or more (EIAJ)                                    |
| Channel separation .....   | 108 dB or more (EIAJ)                                   |
| Harmonic distortion .....  | 0.0018% or less (EIAJ)                                  |
| Output voltage .....   | 2.0V  |
| Wow and flutter .....  | Limit of measurement<br>(±0.001% W.PEAK) or less (EIAJ) |
| Channels .....   | 2-channel (stereo)                                      |
| Balanced type audio line out<br>(U.S. and Canadian models) ..... | 2V (600 Ω)  |

### 3. Output terminal

|   |  |
|---|--|
| Unbalanced type audio line output jacks                               |  |
| Balanced type audio line output jacks (U.S. and Canadian models only) |  |
| Optical and coaxial digital output jacks                              |  |
| Control input/output jacks (U.S. and Canadian models only)            |  |
| CD-DECK SYNCHRO jack  |  |

### 4. Functions

Basic operation buttons

- PLAY, PAUSE, STOP

Search function

- Direct play
- Track search
- Manual search
- Index search
- Time location

Programming

- Maximum 24 steps
- Pause
- Program check/correction
- Program clear (single track or all tracks)

Repeat functions

- 1 track repeat
- All tracks repeat
- Program play repeat
- Random play repeat
- Program random play repeat

Random play (repeat also available)

Switching display

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

Timer start

### 5. Accessories

|  |   |
|--|---|
| ● Remote control unit .....                          | 1 |
| ● Size AAA/R03/dry batteries .....                   | 2 |
| ● Turntable sheet .....                              | 1 |
| ● Control cord (U.S. and Canadian models only) ..... | 1 |
| ● Output cable .....                                 | 1 |
| ● Operating instructions .....                       | 1 |

#### NOTE:

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