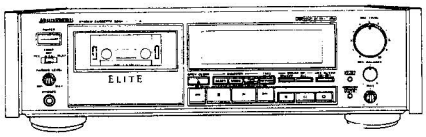
PIONEER®
The future of sound and vision.

# Service Manual



ORDER NO.
ARP1656

## STEREO CASSETTE DECK

# CT-91

• This manual is applicable to the CT−91/KU/CA type.

## CONTENTS

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SA SEPT. 1988 Printed in Japan

# 1. SPECIFICATIONS

Systems . . . . . 4 track, 2-channel stereo
Heads . . . . . Laser amorphous playback head/
Hard parmalloy recording head combination × 1
Erasing head:(Ferrite head) × 1
Motors . . . . . DC servo capstan motor × 1
DC reel motor × 1
DC auxiliary motor × 1
Wow & Flutter . . . . . 0.022%(WRMS)
±0.052%(DIN)
Fast winding time . . . . . Approximately 80 seconds
(C-60 tape)
Frequency response (−20 dB recording)
Metal tape . . . . . 20 Hz to 23,000 Hz
Chrome tape . . . . . 20 Hz to 21,000 Hz
Normal tape . . . . . 20 Hz to 21,000 Hz
Signal-to-noise ratio
DOLBY NR OFF . . . . . More than 60 dB
Noise Reduction Effect
DOLBY NR B type ON . . . . More than 10 dB (at 5 kHz)
DOLBY NR C type ON . . . . More than 19 dB (at 5 kHz)
Harmonic distortion . . . . . No more than 0.6% (0 dB)
Input . . . . . LINE: 67 mV
(Input impedance: 50 kΩ)
Output . . . . . LINE: 316 mV
(Output impedance: 1.4 kΩ)
Headphones: 0.8 mW
(Load impedance 8Ω VR Max.)

## Subfunctions

- 3-mode counter (4-digit electronic counter)
- Auto Tape Loose Canceller function
- Meter range selection (WIDE/EXPAND)
- Auto Monitor function (TAPE/SOURCE auto selection)
- Auto Meter Warning zone Selector
- Power Eject (OPEN/CLOSE)
- Music Search (over ±15 selections)
- Tape Return/Return play
- Headphones jack (with volume control)
- Bias control
- MPX filter
- Auto Space Recording Mute
- Auto Tape Selector
- Playback/Recording timer start function
- Dolby Noise Reduction (B Type/C Type)
- Dolby HX Pro system
- FL Level Meter Peak-hold function (15 + 1 segments)
- System remote control available

## Miscellaneous

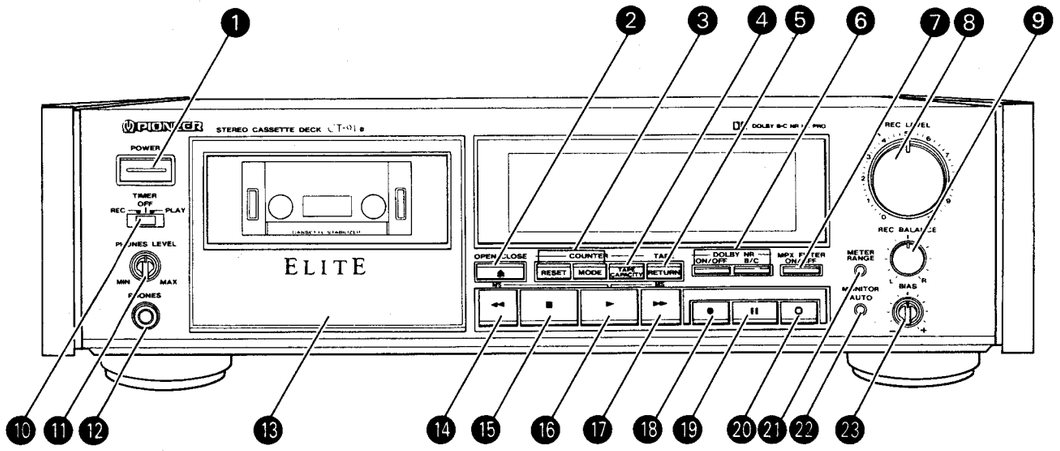
Power Requirements
U.S., Canadian models . . . . . AC 120V, 60 Hz
Power Consumption
U.S., Canadian models . . . . . 25W
Dimensions . . . . . 457(W) × 133.5(H) × 372(D) mm
18(W) × 5-1/4(H) × 14-5/8(D) in
Weight (without package) . . . . . 10.8 kg (23 lb 13 oz)

## Accessories

Operating instructions . . . . . 1
Connecting cords . . . . . 2
Control cord . . . . . 1

***NOTE:***
*Specifications and design subject to possible modifications without notice, due to improvements.*

# 2. PANEL FACILITIES




### ❶ POWER switch

Turn the power on.

After the power is turned on, the dotted lines in the level meter flash for approximately 4 seconds until the circuits of the unit have stabilized. The unit will not operate during this time even if one of the operation buttons is pressed.

### ❷ Cassette door OPEN/CLOSE button

***NOTE:***

*If the cassette door is closed while the unit is turned OFF, and the power is then turned ON, the cassette door may open and close after pressing one of the operation buttons. This occurs when the microprocessor resets the door mechanism to its initial state and does not indicate any malfunctioning of the unit.*

### ❸ COUNTER selectors

**RESET:**

Resets the counter indication to "0000".

**MODE:**

Each time this button is pressed, one of the following three modes is set in sequence.

- Normal tape counter
- Time counter (displays the elapsed playback or recording time)
- Remaining time counter (displays the remaining time of the tape)

### ❹ TAPE CAPACITY selector

To indicate the correct time value in the remaining time counter mode, this selector must be set in accordance with the tape used.

→ C90 → C80L → C60 → C46L →

### ❺ TAPE RETURN button

This button is used in the tape counter mode to fast forward or rewind the tape to a point near the counter reading "0000".

### ❻ DOLBY NR selectors

**ON/OFF:**

Used to turn the Dolby NR system circuits ON or OFF.

**B/C:**

With the ON/OFF switch in the ON position, Dolby NR B or C can be selected with this switch.

### ❼ MPX FILTER switch

This switch is effective only during recording with Dolby NR.

### ❽ REC LEVEL control

### ❾ REC BALANCE control

### ❿ TIMER mode selector

**REC:**

Set to this position for timer recording.

**PLAY:**

Set to this position for timer playback.

**OFF:**

When the timer is not to be used, set the selector to this position. (Normally leave the selector in this position.)

### ⓫ PHONES LEVEL control

### ⓬ PHONES jack

### ⓭ Cassette door

### ⓮ Rewind (◄◄) button

Press this button to rewind the tape. When the button is pressed during playback, the tape rewinds to the beginning of the current selection, and playback starts. If the button is pressed twice, the tape rewinds to the selection before the current selection.

### ⓯ Stop ( ■ ) button

### ⓰ Play (►) button

### ⓱ Fast forward (►►) button

Press this button to fast forward the tape. When the button is pressed during playback, the tape advances to the beginning of the next selection, and playback starts. If the button is pressed twice, the tape advances to the selection after the next selection.

### ⓲ Recording ( ● ) button

When this button is pressed, the unit is set to one-touch recording pause (recording standby mode). Press the PAUSE button to start recording.

### ⓳ Pause ( ▮▮ ) button

The tape transport can be momentarily stopped by pressing this button during recording or playback. Press the button again to restart operation. The button does not operate during fast forward or rewind.

### ⓴ Record muting ( O ) button

Press this button to create an unrecorded space during recording.

### ㉑ METER RANGE selector

Selects WIDE or EXPAND as scale range for the level meter.

### ㉒ MONITOR selector

For monitoring the sound during recording, this switch can be used to switch between source sound and just recorded sound.

### ㉓ Rec BIAS control

It is possible to adjust the bias according to the tape used and the source to be recorded.



**OPERATING DISP**

**① Counter**

- The counter has
- When the cassett is displayed.
- During music sear

**② TAPE RETURN**

Lights up during tap

**③ Tape transport**

◄◄ : Lights up wh

► : Lights up du pause and r

►► : Lights up wh

▮▮ : Lights up in

**④ MUTE**

Flashes and lights d

**⑤ REC**

Lights up during rec

**⑥ Warning zone**

Changes according t meter range.

**⑦ Monitor source**

TAPE: Recorded

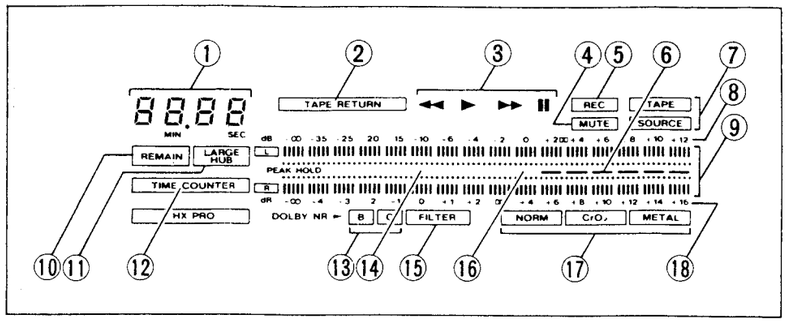
SOURCE:Original so

**⑧ Scale for WIDE**

ding, this switch can be
nd just recorded sound.

ıg to the tape used and

## OPERATING DISPLAY




**① Counter**
- The counter has three display modes.
- When the cassette door is opened, the message "OPEN" is displayed.
- During music search the number of selections is displayed.

**② TAPE RETURN**
Lights up during tape return operation.

**③ Tape transport modes**
◄◄ : Lights up when rewinding the tape.
► : Lights up during playback, playback pause, recording pause and recording. Flashes during music search.
►► : Lights up when fast forwarding the tape.
▮▮ : Lights up in the pause mode.

**④ MUTE**
Flashes and lights during recording mute operation.

**⑤ REC**
Lights up during recording.

**⑥ Warning zone**
Changes according to the type of tape used and to the selected meter range.

**⑦ Monitor source**
TAPE: Recorded sound
SOURCE: Original source sound

**⑧ Scale for WIDE range**

**⑨ Level**
L: Left channel
R: Right channel

The DOLBY mark indicates the reference level for the Dolby NR system.

**⑩ REMAIN**
Lights up when the remaining time counter mode is selected.

**⑪ LARGE HUB**
Lights up when the TAPE CAPACITY selector is pressed in the remaining time counter mode, and the Large Hub mode is set.

**⑫ TIME COUNTER**
Lights up in the time counter mode.

**⑬ DOLBY NR B/C**
Indicates the selected Dolby Noise Reduction system, B or C.

**⑭ 0 dB position for EXPAND range**

**⑮ MPX FILTER**
Lights up when the MPX FILTER switch is pressed while the Dolby NR system is ON.

**⑯ 0 dB position for WIDE range**

**⑰ Tape type**
The unit will automatically detect and display the tape type (NORMAL/$CrO_2$/METAL) of the cassette inserted. When no tape is inserted, METAL is displayed.

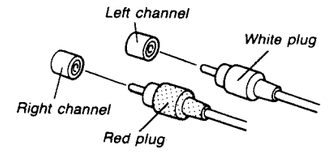
**⑱ Scale for EXPAND range**





## • Connections

### Connection of input and output cords
- The cords to be used have white and red pin plugs.
- Connect white plugs to the left channel (L), and red plugs to the right channel (R), making sure that the colors match. Take particular care to insert the plugs all the way in.

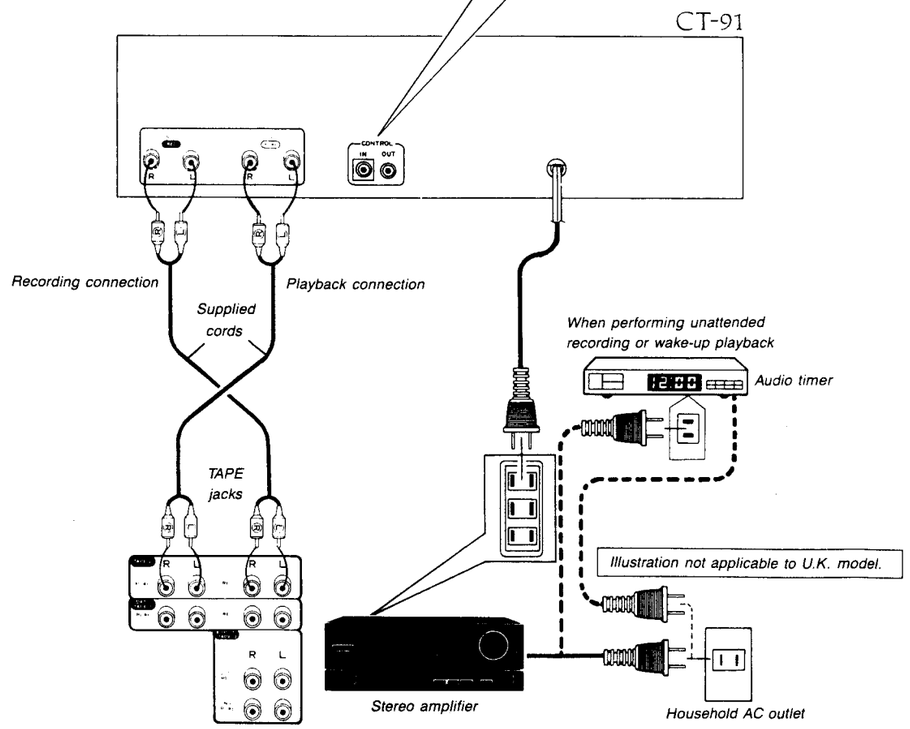



### Connection to an audio timer
For details on the connection to an audio timer, refer to the instruction manual of the audio timer.

**(Not provided in the European model.)**

### CONTROL IN jack
Connect this jack to the CONTROL OUT jack of a component equipped with the Pioneer System Remote Control (bearing the SR mark) using the supplied mini-plug cord, and you will be able to operate the component using the system remote control.

### CONTROL OUT jack
Intermediary output of remote control signals from the above input jack. Connect it to the CONTROL IN jack of another component compatible with the Pioneer System Remote Control.



# 3. EXPLODED VIEWS AND PARTS LIST

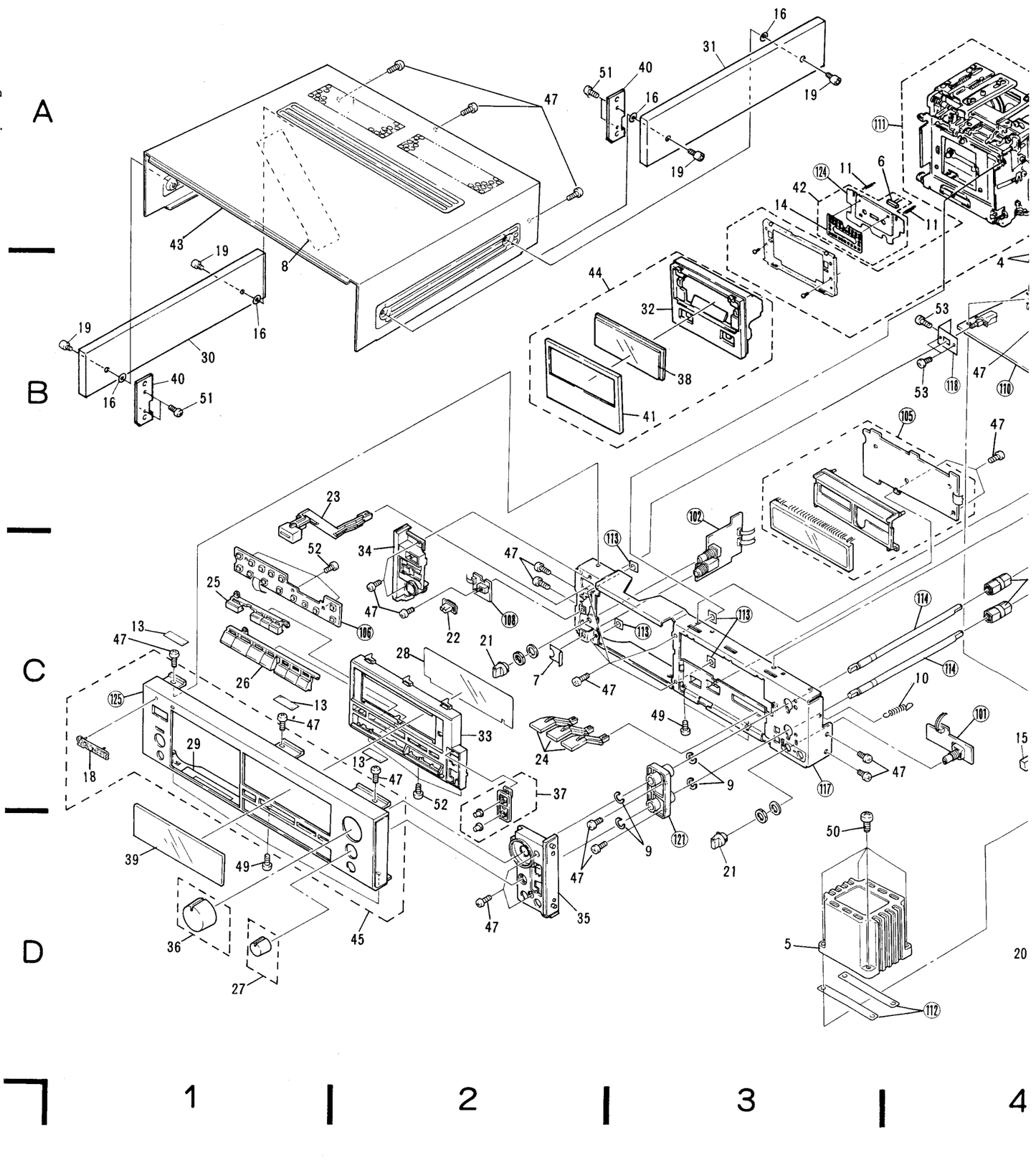
NOTES :
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the impotance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

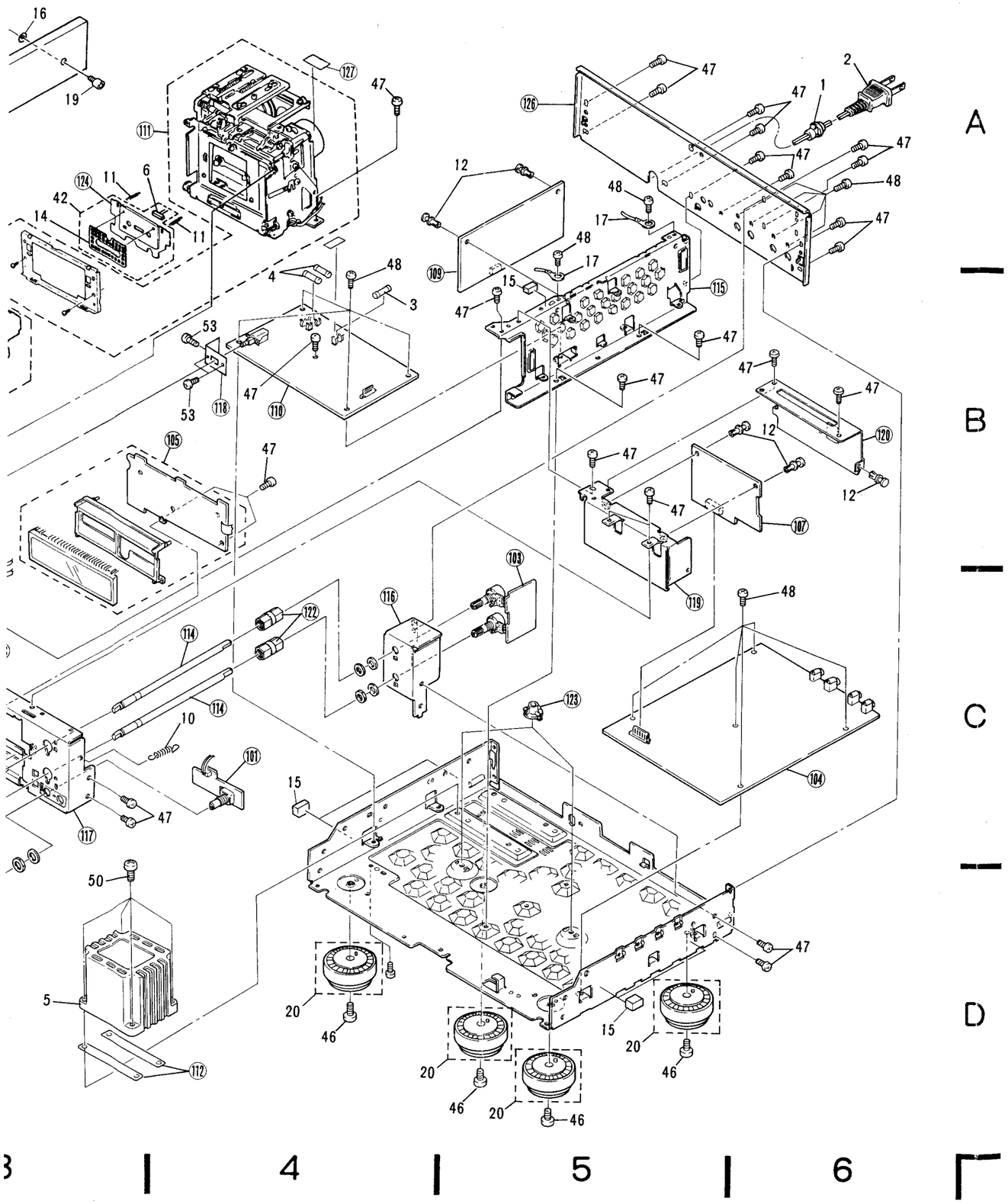
## 3.1 EXTERIOR

### Parts List of Exterior

| Mark | No. | Part No. | Description |
|---|---|---|---|
| ⚠ | 1 | CM−22C | Strain relief |
| ⚠ | 2 | PDG1015 | AC power cord |
| ⚠ | 3 | REK−074 | Fuse (FU103 1.6A/125V) |
| ⚠ | 4 | REK−080 | Fuse (FU101,FU102 1A/125V) |
| ⚠ | 5 | RTT1060 | Power transformer (T1) |
| | 6 | SLF−401C | Diode (D11) |
| | 7 | DBK−106 | Mounting plate |
| | 8 | PNB1109 | Absorber B |
| | 9 | RBF1019 | Washer |
| | 10 | RBH1150 | Spring |
| | 11 | RBL−059 | Cassette plate spring |
| | 12 | RBM−014 | Nylon rivet (3.5×5.5) |
| | 13 | REB−223 | Cover cushion (D) |
| | 14 | REB1038 | Stabilizer B |
| | 15 | REB1057 | Rubber spacer (A) |
| | 16 | REC1008 | Wood spacer |
| | 17 | RNH−184 | Cord clamper |
| | 18 | AAM1001 | Name plate |
| | 19 | ABA1023 | Screw |
| | 20 | AMR1159 | Leg assembly |
| | 21 | PAC1208 | Knob (PHONES LEVEL, BIAS) |
| | 22 | RAC−668 | Knob A (TIMER) |
| | 23 | RAC1203 | Button (POWER) |
| | 24 | RAC1204 | Button (DOLBY, MPX) |
| | 25 | RAC1205 | Button (COUNTER) |
| | 26 | RAC1206 | Button (CONTROL) |
| | 27 | RAC1262 | VR knob B(REC BALANCE) |
| | 28 | RAH1369 | FL filter |
| | 29 | RAP1003 | Under escutcheon |
| | 30 | RMS1007 | Side wood (L) |
| | 31 | RMS1008 | Side wood (R) |
| | 32 | RNK1284 | Door |
| | 33 | RNK1285 | Button holder |
| | 34 | RNK1411 | Side mold (L) |
| | 35 | RNK1412 | Side mold (R) |
| | 36 | RXA1158 | VR knob assembly (A) |
| | 37 | RXA1160 | Button assembly (MONITOR) |
| | 38 | RAH1197 | Door lens |
| | 39 | RAH1198 | FL panel |
| | 40 | RAH1368 | Side panel |
| | 41 | RAH1371 | Door panel |
| | 42 | RXX1064 | Cassette plate assembly |
| | 43 | RXX1128 | Bonnet |
| | 44 | RXX1129 | Door assembly |
| | 45 | RXX1130 | Front panel assembly |
| | 46 | BBZ40P080FCC | Screw |
| | 47 | BBZ30P060FCC | Screw |
| | 48 | IBZ30P080FCC | Screw |
| | 49 | BBT30P080FZK | Screw |
| | 50 | BBZ40P160FCC | Screw |
| | 51 | PYC30P100FMC | Screw |
| | 52 | BBZ26P080FZK | Screw |
| | 53 | PMA30P060FCU | Screw |
| | 101 | | BIAS VR unit |
| | 102 | | Headphone unit |
| | 103 | | INPUT VR unit |
| | 104 | | Amp unit |
| | 105 | | FL unit |
| | 106 | | Switch unit |
| | 107 | | OSC.HX unit |
| | 108 | | Timer unit |
| | 109 | | Control unit |
| | 110 | | Power supply unit |
| | 111 | | Tape mechanism unit |
| | 112 | | Power transformer sheet |
| | 113 | | Tape mechanism sheet |
| | 114 | | VR rod |
| | 115 | | Center stay |
| | 116 | | VR holder |
| | 117 | | Panel stay |
| | 118 | | PS holder |
| | 119 | | P.C.B holder |
| | 120 | | Shield plate |
| | 121 | | VR rod guide |
| | 122 | | Joint |
| | 123 | | P.C.B stud |
| | 124 | | Cassette plate |
| | 125 | | Front panel |
| | 126 | | Rear panel |
| | 127 | | Motor lavel |

Exterior





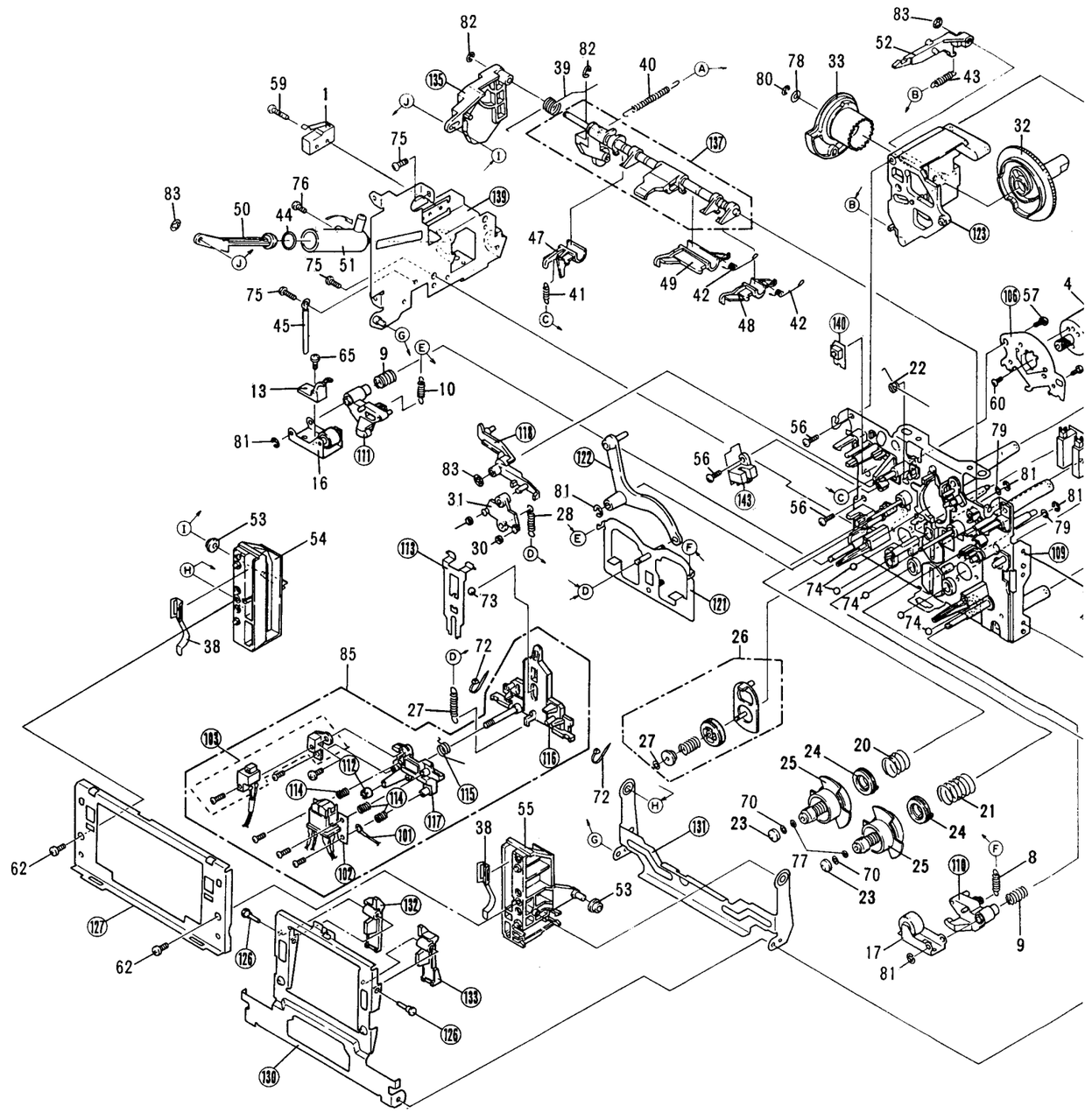

## 3.2 Parts List of Mechanism Unit

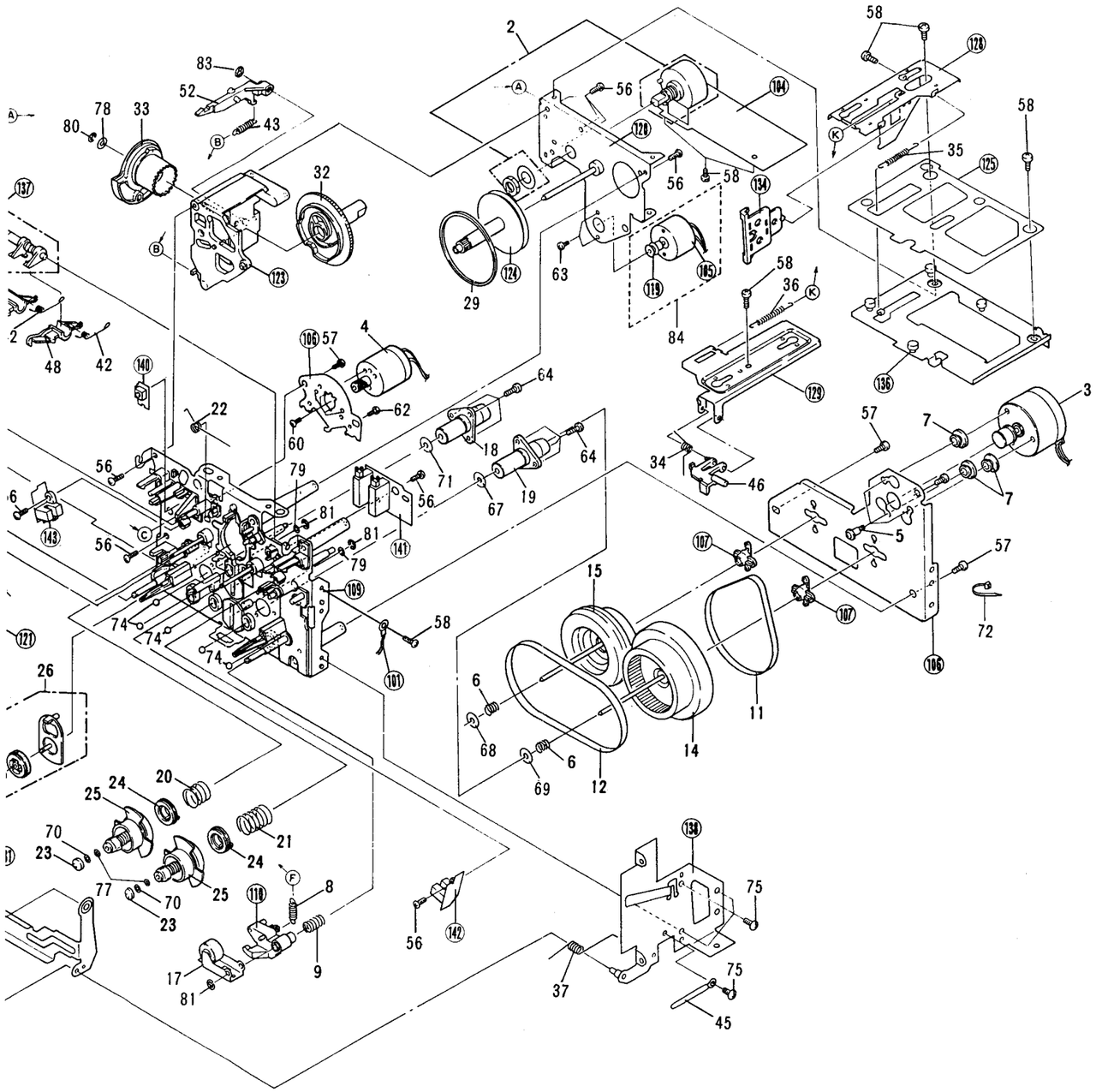
| Mark | No. | Part No. | Description |
|---|---|---|---|
| | 1 | RSF−031 | Micro switch |
| | 2 | RSX−059 | Rotary encoder |
| | 3 | RXM1016 | Capstan motor assembly |
| | 4 | RXM1018 | Reel motor assembly |
| | 5 | RBA−064 | Step screw |
| | 6 | RBL−044 | Thrust spring |
| | 7 | REB−408 | Rubber cushion |
| | 8 | RBL−028 | Pinch spring |
| | 9 | RBL−030 | Pinch thrust spring |
| | 10 | RBL−098 | Pinch spring (SUB) |
| | 11 | REB1073 | Capstan belt |
| | 12 | REB1074 | Capstan belt (A) |
| | 13 | RNL−016 | Tape guide |
| | 14 | RXA1235 | Flywheel assembly |
| | 15 | RXA1236 | Flywheel assembly (SUB) |
| | 16 | RXA1238 | Pinch roller (A) assembly |
| | 17 | RXA1240 | Pinch roller (R) assembly |
| | 18 | RXB−362 | Metal holder assembly (A) |
| | 19 | RXB−466 | Metal holder assembly (B) |
| | 20 | RBL−031 | BT spring (A) |
| | 21 | RBL−032 | BT spring (B) |
| | 22 | RBL−033 | Idler pressure spring |
| | 23 | RNK−815 | Reel shaft cap (B) |
| | 24 | RXB−751 | BT disc assembly |
| | 25 | RXB−874 | Reel base assembly |
| | 26 | RXB−875 | Take−up idler assembly |
| | 27 | RBL−037 | Head base spring |
| | 28 | RBL−038 | Brake spring |
| | 29 | REB−502 | Drive belt |
| | 30 | REB−511 | Brake shoe |
| | 31 | RNL−723 | Brake |
| | 32 | RNL−729 | Cam gear |
| | 33 | RXB−884 | Side cam gear assembly |
| | 34 | RBH1136 | Arm shock−absord spring |
| | 35 | RBH1137 | Plate (A) return spring |
| | 36 | RBH1138 | Plate (B) return spring |
| | 37 | RBH1142 | Frame return spring |
| | 38 | RBL−027 | Poket spring (A) |
| | 39 | RBL−039 | Eject spring |
| | 40 | RBL−040 | Half pressure spring |
| | 41 | RBL−041 | Rec arm spring |
| | 42 | RBL−042 | Detect arm spring |
| | 43 | RBL−043 | Lock lever spring |
| | 44 | REB−447 | O ring |
| | 45 | RNH−184 | Cord clamper |
| | 46 | RNK1297 | Arm |
| | 47 | RNL−733 | Rec detect arm |
| | 48 | RNL−734 | $CrO_2$ detect arm |
| | 49 | RNL−735 | Metal detect arm |
| | 50 | RNL−739 | Piston |
| | 51 | RNL−740 | Cylinder |
| | 52 | RNL−741 | Lock lever |
| | 53 | RNL−742 | Collar |
| | 54 | RNL−849 | Pocket (L) |
| | 55 | RNL−850 | Pocket (R) |

| Mark | No. | Part No. | Description |
|---|---|---|---|
| | 56 | BBZ26P080FZK | Screw |
| | 57 | BBZ30P080FZK | Screw |
| | 58 | BCZ30P060FMC | Screw |
| | 59 | BMZ23P100FZK | Screw |
| | 60 | BMZ26P030FZK | Screw |
| | 61 | ..... | |
| | 62 | BMZ30P080FZK | Screw |
| | 63 | JGZ20P025FMC | Screw |
| | 64 | PMA26P050FZK | Screw |
| | 65 | PMA26P060FZK | Screw |
| | 66 | PMZ20P080FZK | Screw |
| | 67 | RBF−030 | Oil stopper |
| | 68 | RBF−069 | Thrust washer (A) |
| | 69 | RBF−070 | Thrust washer (B) |
| | 70 | RBF−076 | Slider washer |
| | 71 | RBF−077 | Oil stopper |
| | 72 | REC−371 | Binder |
| | 73 | REF−022 | Steel ball (ϕ 3) |
| | 74 | REF−023 | Steel ball (ϕ 4) |
| | 75 | VCT30P060FZK | Screw |
| | 76 | VCZ26P080FMC | Screw |
| | 77 | WA21D040D013 | Washer |
| | 78 | WA26N070W040 | Washer |
| | 79 | WA32D080D050 | Washer |
| | 80 | YE20FUC | E ring |
| | 81 | YE25FUC | E ring |
| | 82 | YE30FUC | E ring |
| | 83 | YS24FBT | Washer |
| | 84 | RXX1055 | Power motor assembly |
| | 85 | RXX1158 | Head base assembly |
| | 101 | | Earth lead wire assembly |
| | 102 | | R/P head |
| | 103 | | Erase head assembly |
| | 104 | | Connector unit |
| | 105 | | Power motor |
| | 106 | | Reel motor mounting plate |
| | 107 | | Flywheel holder |
| | 108 | | Thrust holder |
| | 109 | | Mechanism chassis assembly |
| | 110 | | Pressure arm (R) |
| | 111 | | Pressure arm (L) |
| | 112 | | Adjustment nut |
| | 113 | | Head base pressure spring |
| | 114 | | Head adjust spring (C) |
| | 115 | | Hight spring |
| | 116 | | Head base |
| | 117 | | Sub head base |
| | 118 | | Brake lever |
| | 119 | | First pulley |
| | 120 | | Gear chassis assembly |
| | 121 | | Pinch base assembly |
| | 122 | | Pinch lever assembly |
| | 123 | | Gear base assembly |
| | 124 | | Second pulley assembly |
| | 125 | | Absorber |

| Mark | No. | Part No. | Description |
|---|---|---|---|
| | 126 | | Cassette clamp shaft |
| | 127 | | Pocket frame |
| | 128 | | Plate (A) |
| | 129 | | Plate (B) |
| | 130 | | Frame |
| | 131 | | Door arm |
| | 132 | | Cassette clamper (L) |
| | 133 | | Cassette clamper (R) |
| | 134 | | Side plate |
| | 135 | | Eject lever |
| | 136 | | Top frame assembly |
| | 137 | | Shift sharft assembly |
| | 138 | | Door frame (R) assembly |
| | 139 | | Door frame (L) assembly |
| | 140 | | Rec switch unit |
| | 141 | | Tape selector unit |
| | 142 | | Sensor unit (A) |
| | 143 | | Sensor unit (B) |

## Mechanism Unit

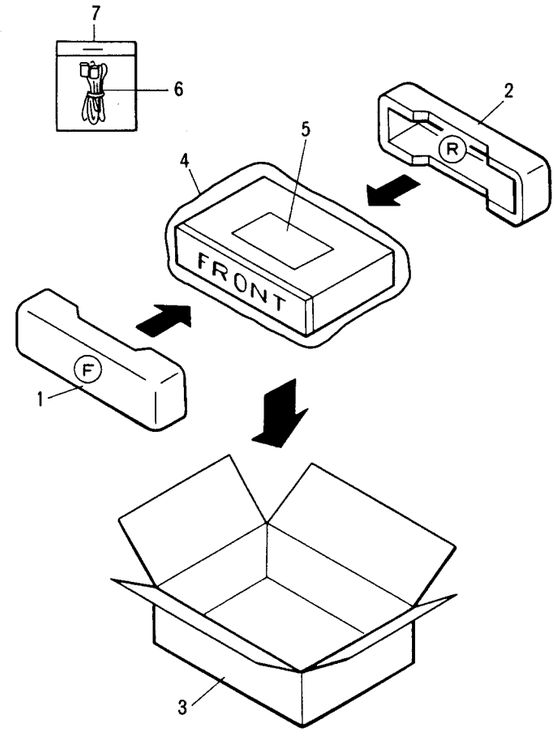




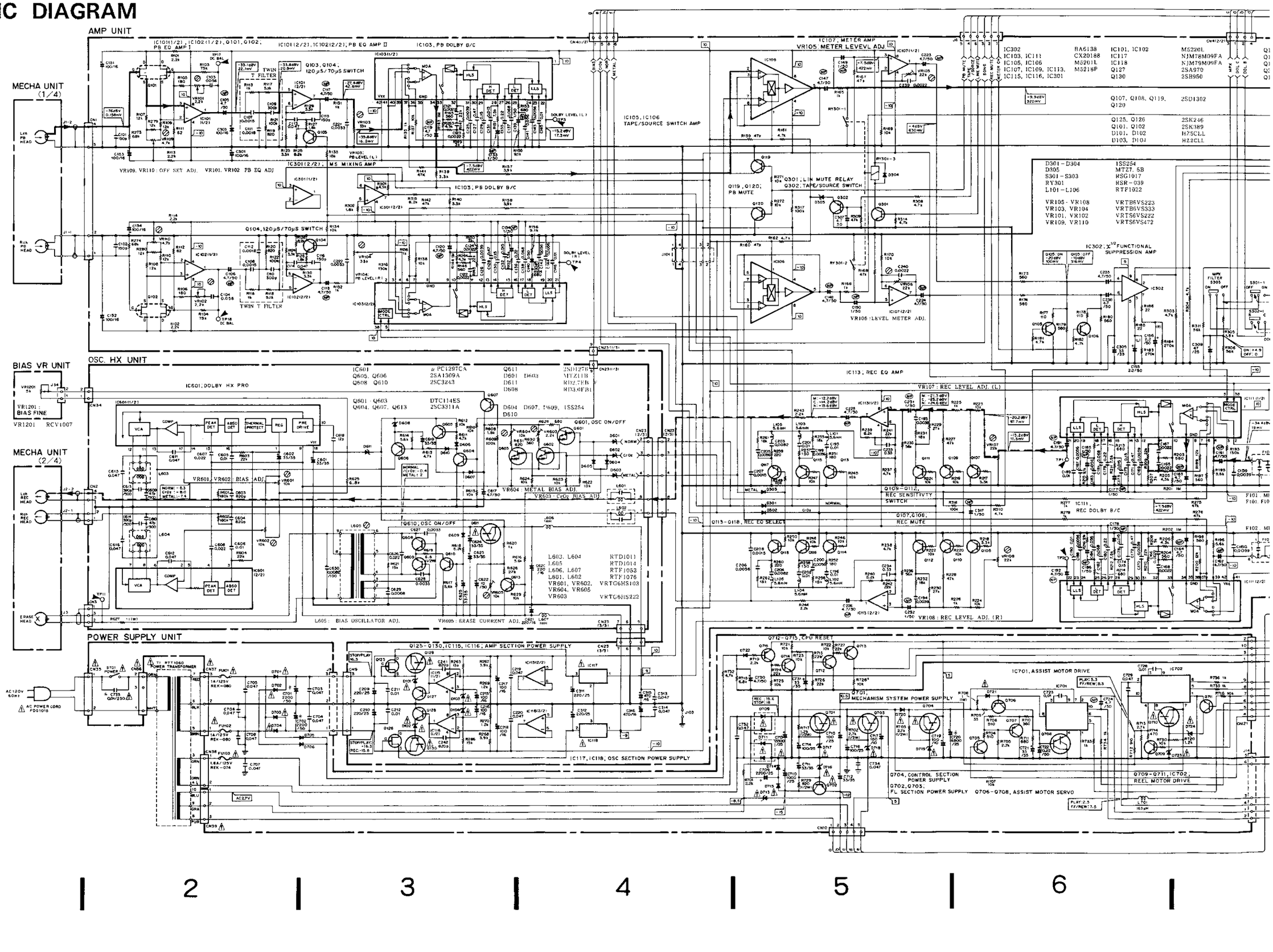

# 4. PACKING

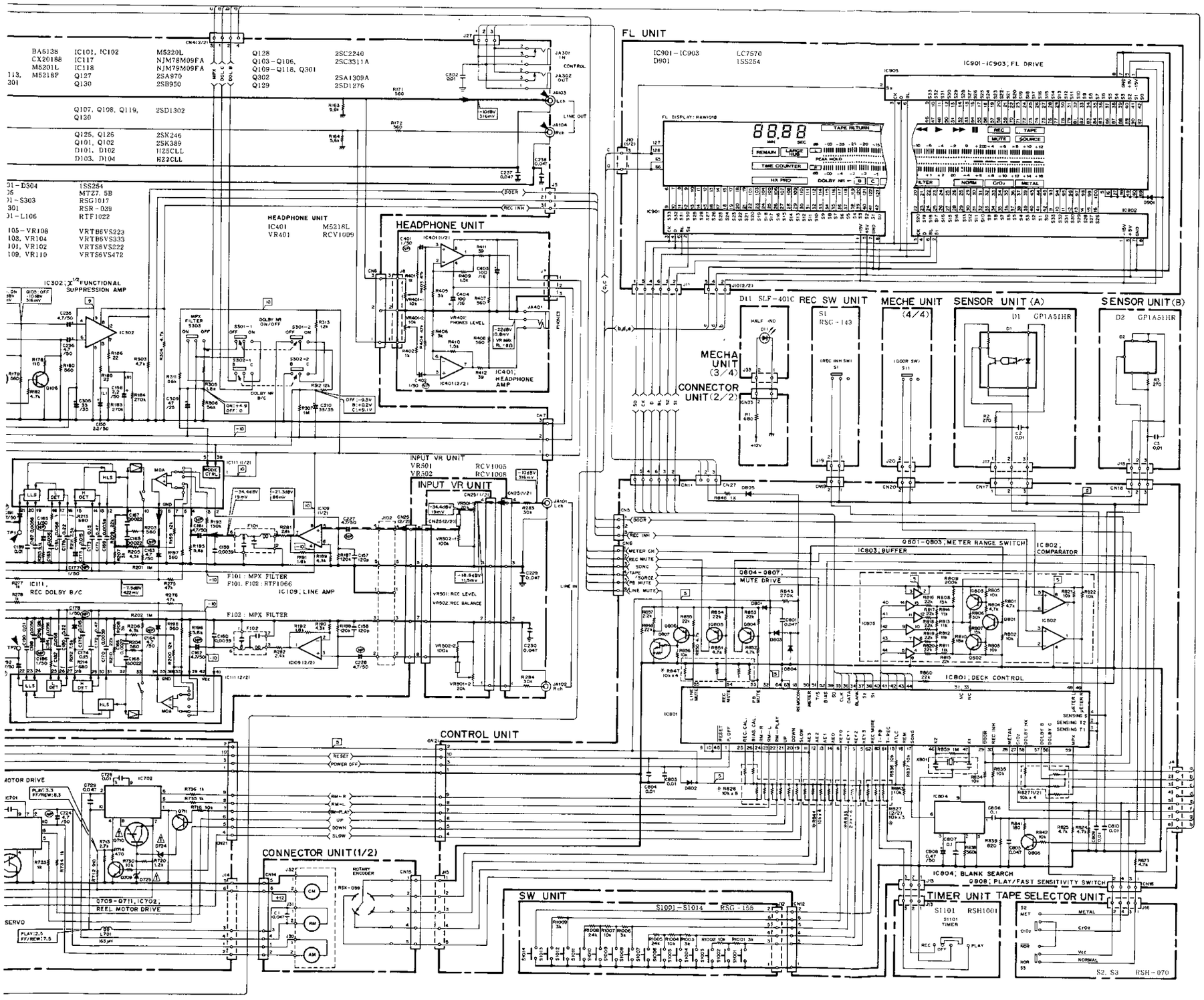
## Parts rist

| Mark | No. | Part No. | Description |
|---|---|---|---|
| | 1 | RHA1029 | Pad (F) |
| | 2 | RHA1030 | Pad (R) |
| | 3 | RHG1082 | Packing case |
| | 4 | RHX−034 | Packing sheet |
| | 5 | RRB1030 | Operating instructions (English) |
| | 6 | PDE−319 | Connect cord |
| | 7 | RDE1013 | Connect cord assembly |



# 5. SCHEMATIC DIAGRAM






| | | | | |
|---|---|---|---|---|
| BA6138 | IC101, IC102 | M5220L | Q128 | 2SC2240 |
| CX20188 | IC117 | NJM78M09FA | Q103 – Q106, | 2SC3311A |
| M5201L | IC118 | NJM79M09FA | Q109 – Q118, Q301 | |
| 113, M5218P | Q127 | 2SA970 | Q302 | 2SA1309A |
| 301 | Q130 | 2SB950 | Q129 | 2SD1276 |
| | Q107, Q108, Q119, Q120 | 2SD1302 | | |
| | Q125, Q126 | 2SK246 | | |
| | Q101, Q102 | 2SK389 | | |
| | D101, D102 | HZ5CLL | | |
| | D103, D104 | HZ2CLL | | |
| 31 – D304 | 1SS254 | | | |
| 05 | MT27.5B | | | |
| 01 – S303 | RSG1017 | | | |
| 301 | RSR-039 | | | |
| 01 – L106 | RTF1022 | | | |
| 105 – VR108 | VRTB6VS223 | | | |
| 103, VR104 | VRTB6VS333 | | | |
| 101, VR102 | VRTS6VS222 | | | |
| 109, VR110 | VRTS6VS472 | | | |

**POWER SUPPLY UNIT**

| | |
|---|---|
| IC701, IC702 | BA6109 |
| Q702 | 2SA1283 |
| Q706, Q707, Q713, Q715 | 2SA1309A |
| Q708 | 2SA936 |
| Q705, Q709, Q711, Q712, Q714 | 2SC3311A |
| Q701, Q703, Q704, Q710 | 2SD1276 |
| D723 | MTZ10C |
| D716 | MTZ13B |
| D718, D719 | MTZ6.2B |
| D724 | MTZ6.8C |
| D713 | RD2.7EB1 |
| D709 | 1B2C1 – LC2 |
| D711 | 1B2Z1 – LC2 |
| D714, D715, D720, D721 | 1SR35 – 100A |
| D705, D706, D722 | 1SS254 |
| D701 – D704 | 10DF2FA9 |
| D717 | MTZ12B |
| S701 | RSA 063 |
| L701 | RTF1075 |
| C733 | VCG – 044 |
| C701, C702 | RCH1021 |
| C720 | RCH1010 |

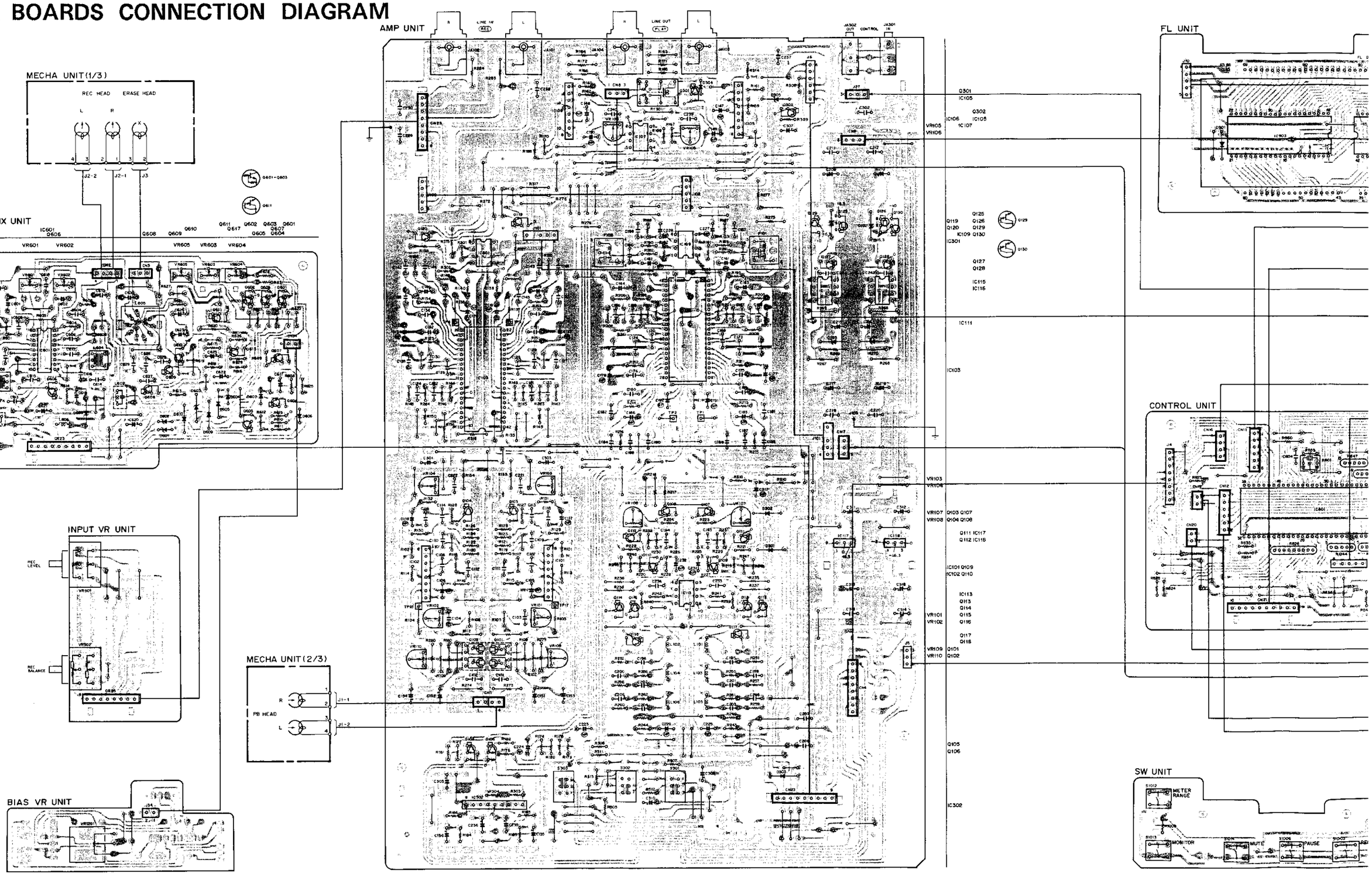
**CONTROL UNIT**

| | |
|---|---|
| IC804 | BA335 |
| IC802 | M5233L |
| IC801 | PD4148B |
| IC803 | μPD4050BC |
| Q803 – Q806 | 2SA1309A |
| Q807 | DTC143ES |
| Q801, Q802 | 2SC3311A |
| Q808 | 2SD1302 |
| D801 – D805 | 1SS254 |
| R826 | DCN1009 |
| R844, R847 | RCX1008 |
| R833 | RCX1009 |
| R827 | RCX1010 |
| X801 | VSS1014 |

1. RESISTORS:
   Indicated in Ω, 1/4W, 1/6W and 1/8W; ±5% tolerance unless otherwise noted k: kΩ, M: MΩ, (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% tolerance
2. CAPACITORS:
   Indicated in capacity (μF)/voltage (V) unless otherwise noted p: pF
   Indication without voltage is 50V except electrolytic capacitor
3. VOLTAGE, CURRENT:
   [ ] : DC voltage (V) at no input signal Value in { } is DC voltage at rated power
4. SWITCHES
   The underlined indicates the switch position
   **AMP UNIT**
   S301 : DOLBY NR ON – OFF
   S302 : DOLBY NR B – C
   S303 : MPX FILTER ON – OFF
   **SW UNIT**
   S1001 : STOP ■
   S1002 : REW ◀◀
   S1003 : REC ●
   S1004 : OPEN/CLOSE ▲
   S1005 : FF ▶▶
   S1006 : PAUSE ▮▮
   S1007 : TAPE RETURN
   S1008 : PLAY ▶
   S1009 : COUNTER RESET
   S1010 : COUNTER MODE
   S1011 : HUB
   S1012 : METER RANGE
   S1013 : MONITOR AUTO
   S1014 : REC MUTE ○
   **TAPE SELECTOR SELECTOR UNIT**
   S2 : TAPE SELECT METAL – CrO2
   S3 : TAPE SELECT NORMAL – NORMAL
   **TIMER UNIT**
   S1101 : TIMER REC – OFF – PLAY
   **REC SW UNIT**
   S1 : REC INH OFF – ON
   **MECHA UNIT**
   S011 : DOOR CLOSE – OPEN
   **POWER SUPPLY UNIT**
   S701 : POWER ON – OFF
5. OTHERS:
   ➡ : Signal route.
   Ⓐ : Adjusting point
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
   ※ marked capacitors and resistors have parts numbers.

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

# 6. P.C. BOARDS CONNECTION DIAGRAM



FL UNIT

POWER SUPPLY UNIT

CONTROL UNIT

CONNECTOR UNIT

MECHA UNIT (3/3)

TIMER UNIT

HEADPHONE UNIT

TAPE SELECTOR UNIT

SENSOR UNIT (A)

REC SW UNIT

SENSOR UNIT(B)

AC POWER CORD

AC120V 60Hz

T1 POWER TRANSFORMER

D11 HALF IND

ROTARY ENCODER

S11 DOOR SW

Q701

Q703

Q704

Q705, Q710

Q706

Q702

Q710

IC701

IC702

Q709

Q706 Q713

Q708 Q715

Q707 Q712

Q711 Q705 Q714

Q807

IC801 Q804

Q807

Q805

Q806 IC802

Q808 IC803

IC804

Q803

Q801

Q802

7 8 9 10 11 12

A B C D

# 7. ELECTRICAL 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 ⚠ mark found on some component parts indicates the impotance 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 Ω · 56×10¹ 561 ····· RD1/4PS 5 6 1 J
47k Ω 47×10³ 473 ····· RD1/4PS 4 7 3 J
0.5 Ω 0R5 ····· RN2H 0 R 5 K
1 Ω 010 ····· RS1P 0 1 0 K

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

5.62k Ω 562×10¹ 5621 ····· RN1/4SR 5 6 2 1 F

## Miscellaneous Parts

### P. C. BOARD Parts

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | FL unit | |
| | Switch unit | |
| | OSC.HX unit | |
| | Timer unit | |
| | Control unit | |
| | Power supply unit | |
| | BIAS VR unit | |
| | Headphone unit | |
| | INPUT VR unit | |
| | Amp unit | |
| | REC switch unit | |
| | TAPE SELECTOR unit | |
| | CONNECTOR unit | |
| | SENSOR unit (A) | |
| | SENSOR unit (B) | |

### OTHERS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| ⚠ | CM-22C | Strain relief |
| ⚠ | PDG1015 | AC power cord |
| ⚠ | REK-074 | Fuse (1.6A) |
| ⚠ | REK-080 | Fuse (1A) |
| ⚠ | RTT1060 | Power transeformer |
| | SLF-401C | Diode |
| | RSF-031 | Microswitch |
| | RSX-059 | Rotary encorder |
| | RXM1016 | Capstan motor assembly |
| | RXM1018 | Rell motor assembly |
| | RXX1055 | Power motor assembly |
| | RXX1158 | HEAD BASE assembly |

## FL Unit

### SEMICONDUCTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | IC901-IC903 | LC7570 |
| | D901 | 1SS254 |

### OTHER

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | FLUORESCENT TUBE | RAW1018 |

## Switch Unit

### SWITCHES

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | S1001-1014 Tact switch (■, ◂◂, ●, ▲, ▸▸, ❚❚, TAPE RETURN, ▸, COUNTER RRESET, COUNTERMODE, TAPE CAPACITY, METER RANGE, MONITOR, ⏻) | RSG-155 |

### RESISTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | All resistors | RD1/8PM□□□J |

## OSC.HX Unit

### SEMICONDUCTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | IC601 | μ PC1297CA |
| | Q601-Q603 | DTC114ES |
| | Q605, Q606 | 2SA1309A |
| | Q608-Q610 | 2SC3243 |
| | Q604, Q607, Q613 | 2SC3311A |
| | Q611 | 2SD1276 |
| | D601-D603 | MTZ11B |
| | D611 | RD2.7EB |
| | D608 | RD3.0FB1 |
| | D604-D607, D609, D610 | 1SS254 |

### COILS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | L603, L604 Step-up coil | RTD1011 |
| | L605 OSC coil | RTD1014 |
| | L606, L607 Line coil | RTF1053 |
| | L601, L602 Trap coil | RTF1076 |

### CAPACITORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | C618 | CCCCH120J50 |
| | C609, C610 | CCCSL470K500 |
| | C622 | CEAS100M50 |
| | C620, C621 | CEAS221M16 |
| | C601, C602, C619, C623-C625 | CEAS330M35 |
| | C617 | CEAS4R7M50 |
| | C607, C608, C626 | CFTXA223J50 |
| | C627, C628 | CFTXA332J50 |
| | C629 | CFTXA682J50 |
| | C605, C606 | CGCYX103K25 |
| | C615, C616 | CGCYX473K25 |
| | C613, C614 | CKCYB391J500 |
| | C611, C612 | CKCYF473Z50 |
| | C603, C604 | CKPUYB821K50 |
| | C630 | CQPA822J100 |

### RESISTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | VR601, VR602, VR604, VR605 Semi-fixed resistor (10k) | VRTG6HS103 |
| | VR603 Semi-fixed resistor (2.2k) | VRTG6HS222 |
| | R627 | RS1LMF010J |
| | R619 | RD1/2PMF6R8J |
| | R603, R620 | RD1/4PM□□□J |
| | Other resistors | RD1/8PM□□□J |

### OTHER

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | CN23 | W-D2509 |

## Timer Unit

### SWITCH

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | S1101 Slide switch (TIMER REC-OFF-PLAY) | RSH1001 |

## Control Unit

### SEMICONDUCTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | IC804 | BA335 |
| | IC802 | M5233L |
| | IC801 | PD4148B |
| | IC803 | μ PD4050BC |
| | Q807 | DTC143ES |
| | Q803-Q806 | 2SA1309A |
| | Q801, Q802 | 2SC3311A |
| | Q808 | 2SD1302 |
| | D801-D805 | 1SS254 |

### CAPACITORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | C808 | CEASR47M50 |
| | C806, C807 | CGCYX104K25 |
| | C805 | CGCYX473K25 |
| | C803, C804, C809, C810 | CKCYF103Z50 |
| | C801 | CKCYF473Z50 |

### RESISTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | R826 Resistor array (10k×8) | DCN1009 |
| | R844, R847 Resistor array (10k×4) | RCX1008 |
| | R833 Resistor array (22k×4) | RCX1009 |
| | R827 Resistor array (10k×7) | RCX1010 |
| | R836, R837, R846 | RD1/4PM□□□J |
| | R806-R820 | RN1/2PQ□□□□F |
| | Other resistors | RD1/8□□□J |

### OTHERS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | CN21 | W-D2510 |
| | X801 CERAMIC RESONATOR | VSS1014 |

## Power Supply Unit

### SEMICONDUCTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | IC701, IC702 | BA6109 |
| ⚠ | Q702 | 2SA1283 |
| | Q706, Q707, Q713, Q715 | 2SA1309A |
| | Q708 | 2SA936 |
| | Q705, Q709, Q711, Q712, Q714 | 2SC3311A |
| ⚠ | Q701, Q703, Q704, Q710 | 2SD1276 |
| ⚠ | D723 | MTZ10C |
| ⚠ | D717 | MTZ12B |
| ⚠ | D716 | MTZ13B |
| ⚠ | D718, D719 | MTZ6.2B |
| ⚠ | D724 | MTZ6.8C |
| ⚠ | D713 | RD2.7EB1 |
| ⚠ | D709 | 1B2C1-LC2 |
| ⚠ | D711 | 1B2Z1-LC2 |
| ⚠ | D714, D715, D720, D721 | 1SR35-100A |
| | D705, D706, D722 | 1SS254 |
| ⚠ | D701-D704 | 10DF2FA9 |

### SWITCH

| Mark | Symbol & |
|---|---|
| ⚠ | S701 Power |

### COIL

| Mark | Symbol & |
|---|---|
| | L701 Line coi |

### CAPACITORS

| Mark | Symbol & |
|---|---|
| | C724 |
| | C722 |
| | C717, C719 |
| | C714-C716 |
| | C710 |
| | C709 |
| | C711, C712, C |
| | C713 |
| | C730 |
| | C723, C728 |
| | C703-C708, C |
| | C720 (6800 μ |
| | C701, C702 (2 |
| ⚠ | C733 (0.01 μ F |

### RESISTORS

| Mark | Symbol & |
|---|---|
| | R708 |
| | R702, R703, R |
| | R701, R709, R |
| | R732-R736 |
| | Other resistor |

### OTHER

| Mark | Symbol & |
|---|---|
| | CN21 |

## BIAS VR Unit

### RESISTOR

| Mark | Symbol & |
|---|---|
| | VR1201 Variab (5k-E |

## Headphone Unit

### SEMICONDUCTOR

| Mark | Symbol & |
|---|---|
| | IC401 |

| Part No. |
|---|
| :35 |
| :33L |
| :148B |
| D4050BC |
| :143ES |
| .1309A |
| 3311A |
| 1302 |
| 254 |

| Part No. |
|---|
| .SR47M50 |
| :YX104K25 |
| :YX473K25 |
| :YF103Z50 |
| :YF473Z50 |

| Part No. |
|---|
| J1009 |
| :1008 |
| ¼PM□□□J |
| ¼PQ□□□□F |
| ⅙□□□J |

| Part No. |
|---|
| D2510 |
| :1014 |

| Part No. |
|---|
| 5109 |
| .1283 |
| .1309A |
| .936 |
| :3311A |
| )1276 |
| Z10C |
| Z12B |
| Z13B |
| Z6.2B |
| Z6.8C |
| 2.7EB1 |
| :C1－LC2 |
| :Z1－LC2 |
| 135－100A |
| :254 |
| )F2FA9 |

## SWITCH

| Mark | Symbol & Description | Part No. |
|---|---|---|
| ⚠ | S701 Power switch | RSA－063 |

## COIL

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | L701 Line coil | RTF1075 |

## CAPACITORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | C724 | CEANP4R7M50 |
| | C722 | CEASR22M50 |
| | C717, C719 | CEAS101M10 |
| | C714－C716 | CEAS101M25 |
| | C710 | CEAS102M25 |
| | C709 | CEAS222M25 |
| | C711, C712, C721, C731 | CEAS330M35 |
| | C713 | CEAS332M25 |
| | C730 | CEAS4R7M50 |
| | C723, C728 | CKCYF103Z50 |
| | C703－C708, C729, C732, C734 | CKCYF473Z50 |
| | C720 (6800 μ F／25V) | RCH1010 |
| | C701, C702 (2200 μ F／50V) | RCH1021 |
| ⚠ | C733 (0.01 μ F／250V) | VCG－044 |

## RESISTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | R708 | RS1LMF010J |
| | R702, R703, R717, R729 | RD½PMF□□□J |
| | R701, R709, R712－R714, R732－R736 | RD¼PM□□□J |
| | Other resistor | RD⅙PM□□□J |

## OTHER

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | CN21 | W－P9810 |

# BIAS VR Unit

## RESISTOR

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | VR1201 Variable resistor (5k－B) (BIAS) | RCV1007 |

# Headphone Unit

## SEMICONDUCTOR

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | IC401 | M5218L |

## CAPACITORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | C401, C402 | CEYANP010M50 |
| | C403, C404 | CEZA101M16 |
| | C405 | CGCYX473K25 |

## RESISTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | VR401 Variable resistor (10k－B) (PHONES LEVEL) | RCV1009 |
| | Other resistors | RD¼PM□□□J |

## OTHER

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | JA401 (PHONES) | RKN1002 |

# INPUT VR Unit

## RESISTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | VR501 Variable resistor (20k－B) (REC LEVEL) | RCV1005 |
| | VR502 Variable resistor (100k－MN) (REC BALANCE) | RCV1008 |

## OTHER

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | CN25 | W－D2508 |

# Amp Unit

## SEMICONDUCTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | IC302 | BA6138 |
| | IC103, IC111 | CX20188 |
| | IC105, IC106 | M5201L |
| | IC107, IC109, IC113, IC115, IC116, IC301 | M5218P |
| | IC101, IC102 | M5220L |
| ⚠ | IC117 | NJM78M09FA |
| ⚠ | IC118 | NJM79M09FA |
| | Q302 | 2SA1309A |
| | Q127 | 2SA970 |
| ⚠ | Q130 | 2SB950 |
| | Q128 | 2SC2240 |
| | Q103－Q106, Q109－Q118, Q301 | 2SC3311A |
| ⚠ | Q129 | 2SD1276 |
| | Q107, Q108, Q119, Q120 | 2SD1302 |
| | Q125, Q126 | 2SK246 |
| | Q101, Q102 | 2SK389 |
| ⚠ | D103, D104 | HZ2CLL |
| ⚠ | D101, D102 | HZ5CLL |
| | D305 | MTZ7.5B |
| | D301－D304 | 1SS254 |

## SWITCHES

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | S301－S303 Push switch (MPX FILTER, DOLBY B／C, DOLBY ON－OFF) | RSG1017 |
| | RY301 Relay | RSR－039 |

## CAPACITORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | C133, C134, C139, C140, C177, C178, C185, C186, C317 | CEANP010M50 |
| | C155, C156 | CEAS2R2M50 |
| | C311, C312 | CEAS221M25 |
| | C305, C310 | CEAS330M35 |
| | C235, C236, C307 | CEAS4R7M50 |
| | C309 | CEAS470M25 |
| | C315, C316 | CEAS471M16 |
| | C149, C150, C231, C232 | CEYANP010M50 |
| | C105, C106, C117－C120, C147, C148, C161－C164, C191, C192, C223－C228 | CEYANP4R7M50 |
| | C151－C154, C215－C218, C301, C303 | CEZA101M16 |
| | C209, C210 | CEZA221M25 |
| | C145, C146, C189, C190, C195, C196, C201, C202 | CFTXA103J50 |
| | C107, C108, C207, C208 | CFTXA152J50 |
| | C131, C132, C175, C176 | CFTXA153J50 |
| | C129, C130, C173, C174 | CFTXA154J50 |
| | C111, C112 | CFTXA182J50 |
| | C121－C124, C165－C168, C239, C240 | CFTXA222J50 |
| | C135, C136, C179, C180 | CFTXA224J50 |
| | C221, C222 | CFTXA332J50 |
| | C233, C234 | CFTXA334J50 |
| | C125, C126, C159, C160, C169, C170, C193, C194 | CFTXA392J50 |
| | C113, C114 | CFTXA473J50 |
| | C127, C128, C171, C172 | CFTXA474J50 |
| | C143, C144, C187, C188, C199, C200, C205, C206 | CFTXA562J50 |
| | C103, C104, C141, C142, C183, C184 | CFTXA563J50 |
| | C137, C138, C181, C182 | CFTXA683J50 |
| | C203, C204 | CFTXA822J50 |
| | C219, C220, C229, C230, C237, C238, C313, C314 | CGCYX473K25 |
| | C211, C212, C302 | CKCYF103Z50 |
| | C157, C158 | CKPUYB121K50 |
| | C115, C116 | CKPUYB151K50 |
| | C241, C242 | CKPUYB821K50 |
| | C101, C102 | CQSF151J50 |
| | C109, C110 | CQSF301J50 |

## COIL・FILTER

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | L101－L106 Coil (5.6mH) | RTF1022 |
| | F101, F102 MPX filter | RTF1066 |

## RESISTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | VR105－VR108 Semi－fixed resistor (22k) | VRTB6VS223 |
| | VR103, VR104 Semi－fixed resistor (33k) | VRTB6VS333 |
| | VR101, VR102 Semi－fixed resistor (2.2k) | VRTS6VS222 |
| | VR109, VR110 Semi－fixed resistor (4.7k) | VRTS6VS472 |
| | R115－R120 | RDF¼PU□□□J |
| | R103, R104, R107－R112, R273, R274, R279, R280, R283, R284 | RDR¼PM□□□J |
| | R133－R138, R157, R158, R163－R166, R171, R172, R193, R217, R218, R235－R238, R267－R272, R275－R278, R310, R315－R317 | RD¼PM□□□J |
| | Other resistors | RD⅛PM□□□J |

## OTHERS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | JA101, JA103 1P Pinjack (W) (Lch, LINE IN／OUT) | RKB1010 |
| | JA102, JA104 1P Pinjack (L) (Rch, LINE IN／OUT) | RKB1011 |
| | JA301, JA302 (REMOTE CONTROL JACK) | RKN1004 |
| | CN25 Connector | W－P9808 |
| | CN23 Connector | W－P9809 |

# REC switch unit

## SWITCH

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | S1 Tact switch | RSG－143 |

# TAPE SELECTOR unit

## SWITCH

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | S2, S3 Slide switch | RSH－070 |

# CONNECTOR unit

## CAPACITORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | C1 | CKCYF473Z50 |

### RESISTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | R1 | RD¼PM681J |

## SENSOR unit (A)

### SEMICONDUCTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | D1 | GP1A51HR |

### CAPACITORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | C2 | CKPUYY103N16 |

### RESISTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | R2 | RD⅙PM271J |

## SENSOR unit (B)

### SEMICONDUCTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | D2 | GP1A51HR |

### CAPACITORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | C3 | CKPUYY103N16 |

### RESISTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | R3 | RD⅙PM271J |

# 8. ADJUSTMENTS

## 8.1. MECHANISM RELATED ADJUSTMENT

1. Tape running and azimuth adjustment

| No. | Mode | Adjustment Location | Specifications |
|---|---|---|---|
| 1 | | | Insert half mirror in side A (set screws at front). |
| 2 | PLAY | Height adjustment nut (Refer to Fig. 1.) | Playback the above tape and adjust so that there is no curling of the tape in the guide section of the head. (Refer to Fig. 2.) |
| 3 | PLAY | Azimuth adjustment screw (Refer to Fig. 1.) | Playback test tape STD-331B and adjust so that the 10 kHz output level is maximum and also so that there is no phase difference between L-ch and R-ch. |
| 4 | Check Item 2 above again and adjust again if it dnes not satisfy the specifications. (Be sure to adjust Item 3 when Item 2 is adjusted.) | | |

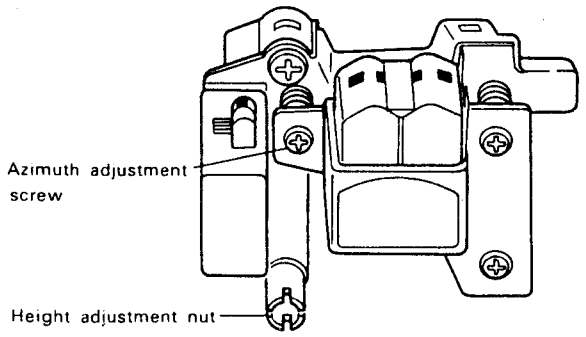



Fig. 1.

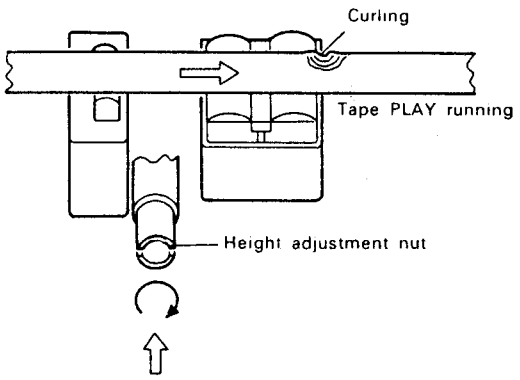



Fig. 2.

2. Tape Speed Adjustment

| Mode | Adjustment Location | Specifications |
|---|---|---|
| PLAY | Capstan motor adjustment hole (Refer to Fig. 3.) | Adjust so that the playback frequency is 3015±5 Hz at the beginning of winding of test tape STD-301. |
| PLAY | | Playback test tape STD-301 again and confirm that the above specifications are satisfied. |

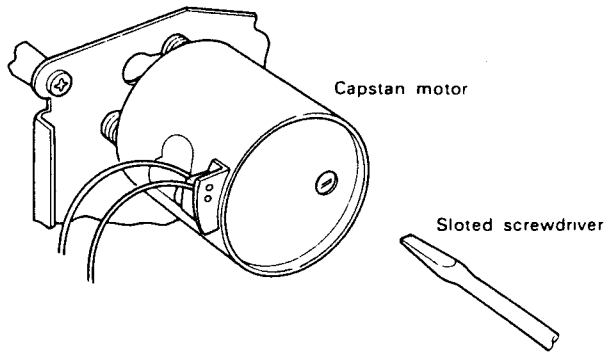



Fig. 3.

3. Adjustment of Air Damper

| Adjustment Location | Specifications |
|---|---|
| Cylinder adjustment screw (Refer to Fig. 4.) | Make sure that the door opens smoothly, there is no two-stage motion, and that there is no bounding when it opens completely. (Perform with no cassette half inserted.) |

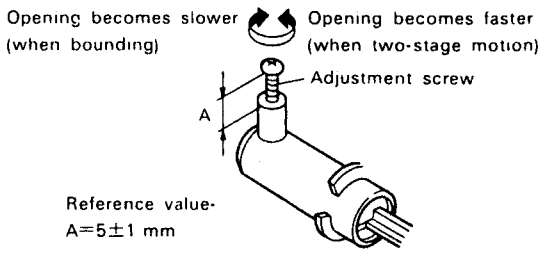



Fig. 4.

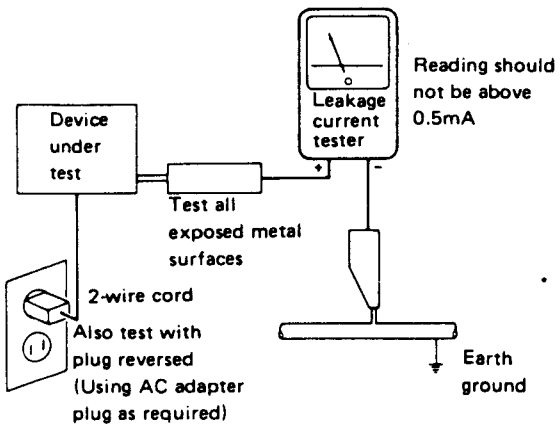
# 9. SAFETY INFORMATION

## 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 ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which dose 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.

# RECORDING SECTION

## 1. Bias Oscillator Adjustment

| No. | Mode | Input signal & test tape | Adjustment location | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|
| 1. | REC | Load the STD-610 test tape with no input signal. | L605 | TP. 11 | 106 kHz ± 300 Hz | |

## 2. Erase Current Adjustment

| No. | Mode | Input signal & test tape | Adjustment location | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|
| 1. | REC | Load the STD-610 test tape with no input signal. | VR605 | TP. 11 | 170 mV AC | |

## 3. Recording Bias Adjustment

3-1. Overbias Adjustment

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1. | REC/ PAUSE | Apply a 6.3 kHz/ − 10 dBv (− 10VU meter reading) signal to the Line input terminals and insert STD-630. | — | | LINE OUT L, R terminals | — | | |
| 2. | REC →PLAY | Record and play back the 6.3 kHz signal at − 10 dBv input level. | NOR | VR601 (L) | | NOR | 3.0 dB overbias | Turn control clockwise past the peak to assure proper overbias value. |
| | | | | VR602 (R) | | | | |
| 3. | | Record the 6.3 kHz/ − 10 dBv signal on STD-620 and play back. | $CrO_2$ | VR603 (L/R) | | $CrO_2$ | 2.5 dB overbias | |
| 4. | | Record the 6.3kHz/ − 10 dBv signal on STD-610 and play back. | METAL | VR604 (L/R) | | METAL | 1.0 dB overbias | |
| 5. | Turn control clockwise past the peak to assure proper overbias value. | | | | | | | |

3-2. Frequency Response Adjustment

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|
| 1. | REC/ PAUSE | Apply a 10 kHz/315 Hz/ − 20 dBv signal to the Line input terminals and insert STD-630. | — | | LINE OUT L, R terminals | — | |
| 2. | REC →PLAY | Record and play back the 315 Hz signal and a 10 kHz signal at − 20 dBv input level. | NOR | VR601 (L) | | Record and play back repeatedly, comparing the 315 Hz and 10 kHz playback levels, and adjust to + 1.5 ± 0.5 dB. | |
| | | | | VR602 (R) | | | |
| 3. | | Record the 10 kHz/ 315 Hz, − 20 dBv signal on STD-620 and play back. | $CrO_2$ | VR603 (L/R) | | + 0.5 ± 1.0 dB | |
| 4. | | Record the 10 kHz/ 315 Hz, − 20 dBv signal on STD-610 and play back. | METAL | VR604 (L/R) | | + 0.5 ± 1.0 dB | |
| 5. | Check distortion value after adjustment is completed and confirm that there is no underbias. | | | | | | |

## 4. Recording Level Adjustment

| No. | Mode | Input signal & test tape | Adjustment location | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|
| 1. | STOP | Set the TAPE SELECTOR switch to the NORM position. | | | | |
| 2. | REC PAUSE | Apply a 315 Hz/0 dBv signal to the line Input terminals, load the STD-630 test tape. | Rec Level control volume | TP. 1 (Lch)<br>TP. 2 (Rch) | − 15.2 dBv | |
| 3. | STOP | Set the DOLBY NR switch to the ON position. (DOLBY B) | | | | |
| 4. | REC/ PLAY | Record the above signal onto the STD-630 test tape, and playback. | VR107 (Lch)<br>VR108 (Lch) | TP. 3 (Lch)<br>TP. 4 (Rch) | Repeatedly record, playback and adjust so that the playback signal level becomes − 14.6 dB. | |
| 5. | STOP | Set the TAPE SELECTOR switch to the $CrO_2$ position. | | | | |
| 6. | REC/ PLAY | Record the above signal onto the STD-620 test tape, and playback. | Check | TP. 3 (Lch)<br>TP. 4 (Rch) | − 14.6 dBv $^{+0.9}_{-2.1}$ dB | |
| 7. | STOP | Set the TAPE SELECTOR switch to the METAL position. | | | | |
| 8. | REC/ PLAY | Record the above signal onto the STD-610 test tape, and playback. | Check | TP. 3 (Lch)<br>TP. 4 (Rch) | − 14.6 dBv $^{+0.9}_{-2.1}$ dB | |

## 5. Level Meter Adjustment

| No. | Mode | Input signal & test tape | Adjustment location | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|
| 1. | REC PAUSE | Apply a 315 Hz/− 10 dBv (316 mV) signal to the Line Input terminals. | VR105 (Lch)<br>VR106 (Rch) | TP. 1 (Lch)<br>TP. 2 (Rch) | Check that the level meters "0 dB" light up within − 15.2 dBv ± 1.0 dB of the signal output level. | |

## 6. DC Balance Adjustment

| No. | Mode | Input signal & test tape | Adjustment location | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|
| 1. | | | VR109 (Lch)<br>VR110 (Rch) | TP17 (Lch)<br>TP18 (Rch) | 0V ± 0.2V | |

## PLAYBACK SECTION

### 1. Head Azimuth Adjustment

• Turn VR103, VR104 to mechanical center positions.

| No. | Mode | Input signal & test tape | Adjustment location | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|
| 1. | PLAY | Play the 10 kHz/−20 dB section of STD-331B test tape. | Head azimuth adjustment screw. (See Fig. 8-2) | LINE OUT | Maximum playback signal level. | |
| 2. | STOP | Lock the screw with screw lock after completing adjustment. | | | | |

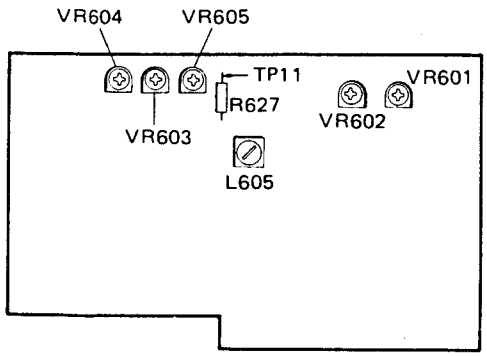
### 2. Playback Equalizer Adjustment

| No. | Mode | Input signal & test tape | Adjustment location | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|
| 1. | PLAY | Play the 315 Hz and 6.3 kHz/−20 dB portion of the STD-331B test tape. | VR101 (Lch) VR102 (Rch) | LINE OUT | Adjust the 10 kHz level to 0.5 dB ±0.5 dB in respect to the 315 Hz playback level. | |

### 3. Playback level Adjustment

• This adjustment determines the DOLBY NR level, and must be performed with great care.

| No. | Mode | Input signal & test tape | Adjustment location | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|
| 1. | PLAY | Play the 315 Hz/0 dB section of the STD-331B test tape. | VR103 (Lch) VR104 (Rch) | TP. 3 (Lch) TP. 4 (Rch) | −15.2 dBv | |



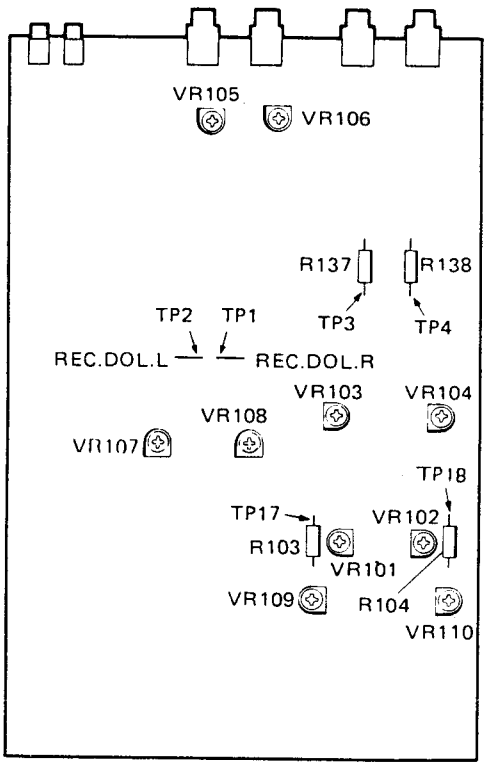




Fig. 8-4. Adjustment locations

## 8.2 ELECTRICAL ADJUSTMENTS

### Adjustment Conditions

1. The mechanical adjustments must be completed first.
2. The head must be cleaned and demagnetized.
3. Turn power on allow the deck to warm up for at least a few minutes before commencing any electrical adjustments.
4. The reference signal is 0dBv=1Vrms.
5. Connect a 50 kilo-ohm (or between 47 to 52 kilo-ohm) load resistance to the OUTPUT terminals.
6. Unless otherwise specified, the switches listed below are left in the positions indicated.
   DOLBY NR : OFF
   TAPE SELECTOR : NORM

### Test Tapes

STD-331B : Playback adjustments (See Fig. 8-1)
STD-630 : NORMAL blank tape
STD-620 : $CrO_2$ blank tape
STD-610 : METAL blank tape

### List of Adjustments

#### Playback sections

1. Head azimuth adjustment.
2. Playback equalizer adjustment.
3. Playback level adjustment.

#### Recording sections

1. Bias oscillator adjustment.
2. Erase current adjustment.
3. Recording bias adjustment.
4. Recording level adjustment.
5. Level meter check.
6. DC balance adjustment.

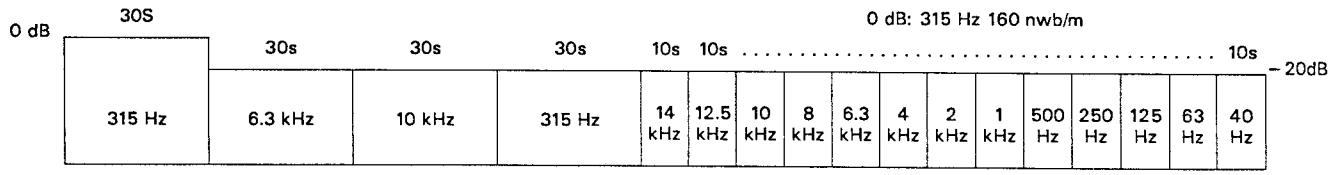



Fig. 8-1. Constants of the test tape STD-331B

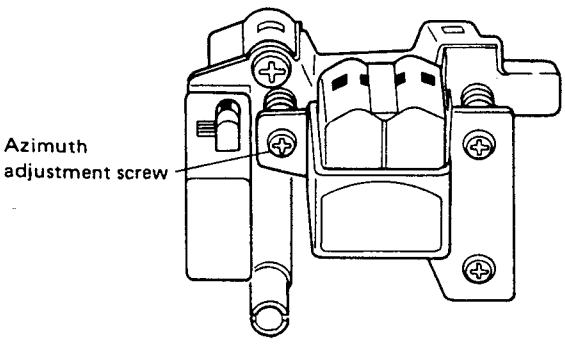



Fig. 8-2. Head azimuth adjustment

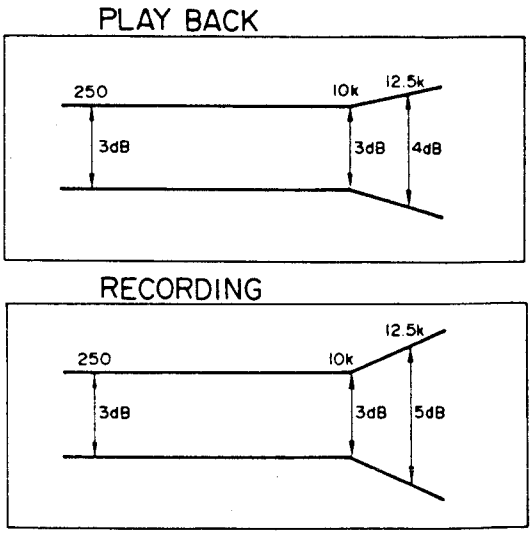



Fig. 8-3. Allowable playback frequency response zone