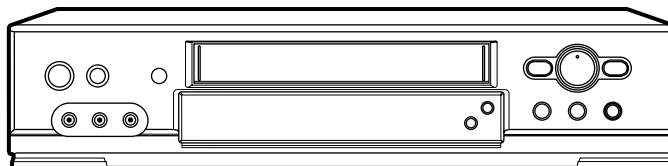




# Service Manual

VIDEO CASSETTE RECORDER

**S VHS**

**MODEL  
HS-U748**

Only cassettes marked S-VHS or VHS can be used with this video cassette recorder.

## SPECIFICATIONS

|                               |                                                                                                |                                           |                                                          |
|-------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------------|
| <b>Tape Format</b>            | : S-VHS/VHS 1/2" high-density video cassette tape                                              | <b>Video Input</b>                        | : 0.5 to 2.0 V(p-p), 75 $\Omega$ unbalanced RCA pin Jack |
| <b>Power Source</b>           | : 120 V AC ; 60 Hz                                                                             | <b>Audio Input</b>                        | : 346 mV(rms), 47 k $\Omega$ unbalanced RCA pin Jack     |
| <b>Power Consumption</b>      | : Approx. 21 W (standby 2.9 W)                                                                 | <b>Video Output</b>                       | : 1.0 V(p-p), 75 $\Omega$ unbalanced RCA pin Jack        |
| <b>Video Signal System</b>    | : EIA standard ; NTSC color                                                                    | <b>Audio Output</b>                       | : 346 mV(rms), 1 k $\Omega$ unbalanced RCA pin Jack      |
| <b>Video Recording System</b> | : S-VHS standard                                                                               | <b>Tuner</b>                              | <b>VHF</b> : 54 to 88 MHz, 174 to 216 MHz                |
| <b>Luminance</b>              | : Frequency modulation recording                                                               | <b>UHF</b> : 470 to 806 MHz               |                                                          |
| <b>Color Signal</b>           | : Low frequency conversion sub-carrier phase shift recording                                   | <b>CATV</b> : 54 to 88 MHz, 90 to 804 MHz |                                                          |
| <b>Hi-Fi Audio</b>            | : VHS standard                                                                                 | <b>Operating Temperature</b>              | : 41 °F to 104 °F                                        |
| <b>Recording System</b>       | : Azimuth helical scanning system                                                              | <b>Relative Humidity</b>                  | : 30 % to 80 %                                           |
| <b>Linear Audio Track</b>     | : 1 track                                                                                      | <b>RF Channel Output</b>                  | : Channel 3 or 4 switchable                              |
| <b>Tape Speed</b>             | : 1-5/16 i.p.s (standard play)<br>7/16 i.p.s (extended play)                                   | <b>Weight</b>                             | : Approx. 8.0 lbs (3.6 kg)                               |
| <b>Maximum Recording</b>      | : 120 min. with T-120 video cassette (SP mode)<br>360 min. with T-120 video cassette (EP mode) | <b>Dimensions</b>                         | : 16.7"(W) $\times$ 3.7"(H) $\times$ 11.9"(D)            |
| <b>Heads: Video</b>           | : 4 rotary heads                                                                               | <b>Timer Program Capacity</b>             | : 1 month programmable / 8 programs                      |
| <b>Hi-Fi Audio</b>            | : 2 rotary heads                                                                               | <b>Deck</b>                               | : $\alpha$ Deck                                          |
| <b>Audio/Control</b>          | : 1 stationary head                                                                            |                                           |                                                          |
| <b>Erase</b>                  | : 1 full track head                                                                            |                                           |                                                          |

- Weight and dimensions shown are approximate.
- Design and specifications are subject to change without notice.

**MITSUBISHI DIGITAL ELECTRONICS AMERICA, INC.**

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# GLOSSARY OF ABBREVIATIONS

|                 |                                        |                |                                                 |
|-----------------|----------------------------------------|----------------|-------------------------------------------------|
| <b>A/C</b>      | : Audio/Control                        | <b>JSTCLK</b>  | : Just Clock                                    |
| <b>A-PB</b>     | : Audio Play Back                      | <b>LIN-IN</b>  | : Linear Audio In                               |
| <b>A-REC</b>    | : Audio Recording                      | <b>LIN-OUT</b> | : Linear Audio Out                              |
| <b>AE</b>       | : Audio Erase                          | <b>LMUTE</b>   | : Linear Mute                                   |
| <b>AENV</b>     | : Audio Envelope                       | <b>LP</b>      | : Long Play                                     |
| <b>AFC</b>      | : Automatic Frequency Control          | <b>MOD</b>     | : Modulator                                     |
| <b>AFF</b>      | : Audio Flip Flop                      | <b>MOTORV</b>  | : Motor Voltage                                 |
| <b>AFTV</b>     | : Auto Fine Tuning Voltage             | <b>NL</b>      | : Non Linear                                    |
| <b>ALC</b>      | : Automatic Level Control              | <b>OSC</b>     | : Oscillator                                    |
| <b>AMODE</b>    | : Audio Mode                           | <b>PB</b>      | : Play Back                                     |
| <b>AMPC</b>     | : Amplifier Alternating Current Ground | <b>PC</b>      | : Position Control                              |
| <b>APC</b>      | : Automatic Phase Control              | <b>PCB</b>     | : Printed Circuit Board                         |
| <b>ATFN</b>     | : Auto Fine                            | <b>PG</b>      | : Pulse Generator                               |
| <b>ATT</b>      | : Attenuator                           | <b>PLL</b>     | : Phase Locked Loop                             |
| <b>BLMUTE</b>   | : Blue Back Mute                       | <b>PRT</b>     | : Protect                                       |
| <b>C/N</b>      | : Carrier/Noise Ratio                  | <b>PSAVE</b>   | : Power Save                                    |
| <b>CCD</b>      | : Charge Coupled Device                | <b>PSLED</b>   | : Power Save Light Emitting Diode               |
| <b>CG-CS</b>    | : Character Generator-Chip Slect       | <b>PSYNC</b>   | : Pretended Vertical Synchronizing Signal       |
| <b>CHSW</b>     | : Channel Switch                       | <b>PWSV</b>    | : Power Save                                    |
| <b>CLKSEL</b>   | : Clock Select                         | <b>PWV</b>     | : ON/OFF Command to supply B + Power            |
| <b>CNTR</b>     | : Counter                              | <b>QH</b>      | : Cue Horizontal Signal                         |
| <b>COM</b>      | : Comparator                           | <b>QV</b>      | : Cue Vertical Signal                           |
| <b>CONV SW</b>  | : Converter Switch                     | <b>REC</b>     | : Recording                                     |
| <b>CP-FG</b>    | : Capstan-Frequency Generator          | <b>REC2</b>    | : Record Command for the PB/REC Control Circuit |
| <b>CP-REV</b>   | : Capstan-Reverse                      | <b>RECPBC</b>  | : Record/Play Back Chroma Signal                |
| <b>CPMOTORV</b> | : Capstan Motor Voltage                | <b>RES</b>     | : Reset                                         |
| <b>CROT</b>     | : Chroma Rotation                      | <b>RESPCM</b>  | : Reset Pulse Code Modulation                   |
| <b>CSYNC</b>    | : Composite Synchronizing Signal       | <b>REW</b>     | : Rewind                                        |
| <b>CTL</b>      | : Control                              | <b>RIS</b>     | : Record Inhibit Switch                         |
| <b>D.E.</b>     | : Detail Enhancer                      | <b>RMSDET</b>  | : Root Mean Square Detector                     |
| <b>D-FF</b>     | : Drum Flip Flop                       | <b>RXD</b>     | : Read X Data                                   |
| <b>DEMOD</b>    | : Demodulator                          | <b>SAPIND</b>  | : SAP carrier detect Indicator                  |
| <b>DET</b>      | : Detector                             | <b>SCLK</b>    | : Serial Clock                                  |
| <b>DLY</b>      | : Delay                                | <b>SCR</b>     | : Scramble                                      |
| <b>DOC</b>      | : Drop Out Compensator                 | <b>SI</b>      | : Serial control data Input                     |
| <b>DOCSTOP</b>  | : Drop Out Control Stop                | <b>SLD</b>     | : Side Lock Detector                            |
| <b>DR-FG</b>    | : Drum-Frequency Generator             | <b>SP</b>      | : Standard Play                                 |
| <b>DR-OUT</b>   | : Drum Control Out                     | <b>SS</b>      | : Start Sensor                                  |
| <b>DR-PG</b>    | : Drum-Phase Generator                 | <b>SSVSYNC</b> | : Speed Search Vertical Synchronizing Signal    |
| <b>EE</b>       | : Electronic-Electronic                | <b>STRB</b>    | : Strobe                                        |
| <b>EMPH</b>     | : Emphasis                             | <b>SU-SENS</b> | : Supply Reel Sensor                            |
| <b>EP</b>       | : Extended Play                        | <b>TSREC</b>   | : Tape Simulate Recording                       |
| <b>EQ</b>       | : Equalizer                            | <b>TSSW</b>    | : Tape Simulator Switch                         |
| <b>ES</b>       | : End Sensor                           | <b>TU-SENS</b> | : Take Up Reel Sensor                           |
| <b>FBC</b>      | : Feed Back Clamp                      | <b>V-REF</b>   | : Voltage Reference                             |
| <b>FE</b>       | : Full Erase                           | <b>VBUSY</b>   | : VSET Busy                                     |
| <b>FF</b>       | : Fast Forward                         | <b>VCA</b>     | : Voltage Control Amplifier                     |
| <b>FG</b>       | : Frequency Generator                  | <b>VCO</b>     | : Voltage Controlled Oscillator                 |
| <b>FLDCS</b>    | : Fluorescent Tube Driver Chip Slect   | <b>VENV</b>    | : Video Envelope                                |
| <b>FM</b>       | : Frequency Modulation                 | <b>VSETCLK</b> | : VSET Clock                                    |
| <b>FSC</b>      | : Frequency of Color Subcarrier        | <b>VSETCS</b>  | : VSET Chip Select                              |
| <b>G</b>        | : Ground                               | <b>YNR</b>     | : Y(Luminance) Signal Noise Reduction           |
| <b>HASW</b>     | : Head Amplifier Switch                |                |                                                 |
| <b>HFR400</b>   | : Hi-Fast Forward/Rewind 400           |                |                                                 |
| <b>HFRSS</b>    | : Hi-Fast Forward/Reverse Speed Search |                |                                                 |
| <b>HSYNC</b>    | : Horizontal Synchronizing Signal      |                |                                                 |
| <b>I-LIMIT</b>  | : I(Current)-Limiter                   |                |                                                 |

# SAFETY PRECAUTIONS

## INTRODUCTION

This manual provides service information for the adjustments of mechanical and electrical operations.

Due to design modifications, the servicing procedures and data given in this manual are subject to possible change without prior notice.

**WARNING :** Many of the programs broadcast by television stations are protected by copyright and Federal law imposes strict penalties for copyright infringement. Some motion picture companies have taken the position that home recording for noncommercial purposes is an infringement of their copyrights. Until the courts have ruled on the proper interpretation of the law as applied to home video recording, this equipment, if used to record copyrighted material, should be operated at the user's own risk.

**WARNING :**  
**TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.**  
This video cassette recorder should be used with AC 120V, 60Hz only.

## SAFETY NOTICE

Before returning VCR to the customer a safety check of the entire VCR should be made. The service technician must be sure that no protective device built into the instrument by the manufacturer has become defective or inadvertently damaged during servicing. Observe all caution and safety related notes located on or inside the VCR cabinet.

**WARNING :** Alterations of the design or circuitry of this VCR should not be made. Any design alterations or additions, such as circuit modifications, auxiliary speaker jacks, switches, grounding, active or passive circuitry, etc., or use of unauthorized camera, cables, accessories, etc. may alter the safety characteristics of this VCR and potentially create a hazardous situation for the user. Any design alterations or unauthorized additions will invalidate the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting from them. Do not lubricate any motors. When reassembling the VCR, always be certain that all the protective devices are put back in place, such as non-metallic control knobs, shield plates, etc. When service is required, observe the original lead dress. Components that show evidence of overheating or other electrical or mechanical damage should be replaced.



**WARNING :** Replace with same type 1.6A, 125V FUSE.

## LEAKAGE CURRENT CHECK

Before returning the VCR to the customer, it is recommended the leakage current be measured by the following methods.

### 1. Cold Check

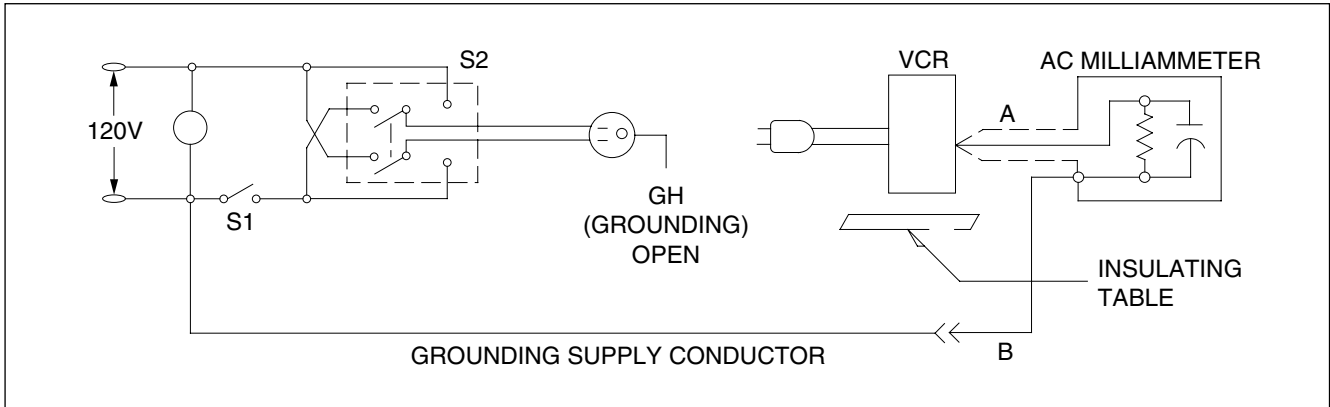
With the AC plug removed from the 120V AC source, place a jumper across the two AC plug prongs. Turn the AC switch on. Using an ohmmeter, connect one lead to the jumpered AC plug and touch the other lead to each exposed metal part (metal cabinet, screwheads, metal overlays, control shafts, etc.), particularly any exposed metal part having a return path to the chassis. Exposed metal parts having a return path to the chassis should have a minimum resistance reading of 1 MΩ. Any resistance below this value indicates an abnormality which requires corrective action. Exposed metal parts not having a return path to the chassis will indicate an open circuit.

## 2. Hot Check

The test sequence, with reference to the measuring circuit in the figure is as follows:

- (1) With switch S1 open, connect the VCR to the measuring circuit. Immediately after connection, measure the leakage current using both positions of switch S2 and with the switching devices in the VCR in all of their operating positions.

- (2) Close switch S1, energizing the VCR, and immediately after closing the switch, measure leakage current using both positions of switch S2, and with the switching devices in the VCR in all of their operating positions. Repeat the current measurements of items (1) and (2) after the VCR has reached thermal stabilization. The leakage current should not be more than 0.5 mA.



### AC Leakage Test

Avoid shock hazards. Do not connect this VCR to a TV antenna, cable or accessory that exhibits excessive leakage currents. If available, the television instrument or cable to which this VCR is connected should have the antenna cold check and leakage current hot check performed.

## PRECAUTIONS

### Handling and storage

- Avoid using the VCR in the following places:
  - extremely hot, cold or humid places,
  - dusty places,
  - near appliances generating strong magnetic fields,
  - places subject to vibration,
  - poorly ventilated areas.
- Be careful of moisture condensation.
- If you pour a cold liquid into a glass, water vapor in the air will condense on the surface of the glass. This is called moisture condensation.
- Moisture condensation on the head drum, one of the most critical parts of the VCR, will cause damage to the tape.
- The VCR is equipped with a moisture condensation prevention circuit. This circuit operates only when the unit is attached to an AC outlet.
- Handle the VCR carefully.
- Do not block the ventilation openings.
- Do not place anything heavy on the recorder.
- Do not place liquids on the top cover of the recorder.
- Use the Recorder in horizontal (flat) position only.
- Avoid violent shocks to the recorder during packing and transportation.
- Before packing, be sure to remove the cassette from the recorder.

# CONNECTION

## Connecting separate antennas (UHF/VHF)

### Connecting the Television

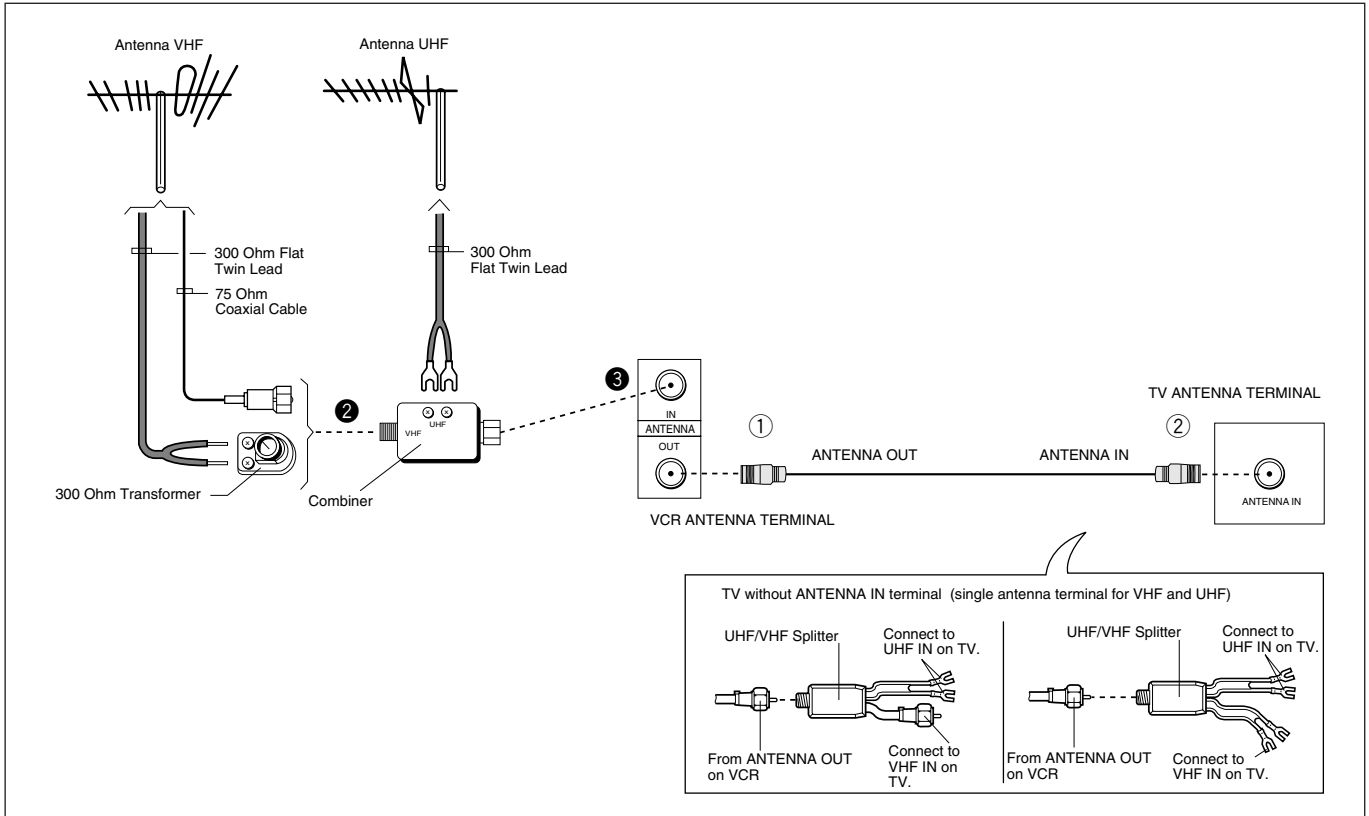
To connect separate UHF/VHF antennas to the VCR:

1. Disconnect the antennas from the back of your TV.
2. Connect the antenna leads to the combiner.
3. Screw or push the combiner onto the ANTENNA terminal on the VCR labeled ANTENNA IN.
4. When you are finished, refer to "Connecting the Television" to complete your connections.

Now that you've completed the antenna connections to your VCR, you're ready to connect the VCR to the TV.

Because every television is different (especially older model TVs), your VCR may need to be connected in a variety of ways. See the Owner's Manual for Instruction Information ON:

- Determining if you need a splitter,
- Connecting TVs with audio and video inputs.



## Connecting a regular TV to the VCR

Before connecting the VCR to the TV, complete the cable or antenna connections to the VCR. (If you have not already done so.)

To connect a regular TV to the VCR:

1. Take the black cable that is supplied with your VCR (called a coaxial cable) and connect it to the ANTENNA terminal on the VCR labeled ANTENNA OUT.
2. Connect the other end of this cable to the terminal on your TV labeled ANTENNA IN. (This terminal may also be labeled VHF IN.) If you have an older TV without this kind of terminal, you will have to use a splitter and then connect the splitter to the television.

# WARNING

Use the specified batteries.

Batteries of wrong type can lead to explosion.

Be sure to replace with batteries of the same type or equivalent batteries. Use the parts specified in the circuit diagram or parts list.

Confirm that the batteries are placed with their positive (+) and negative (-) in the correct position.

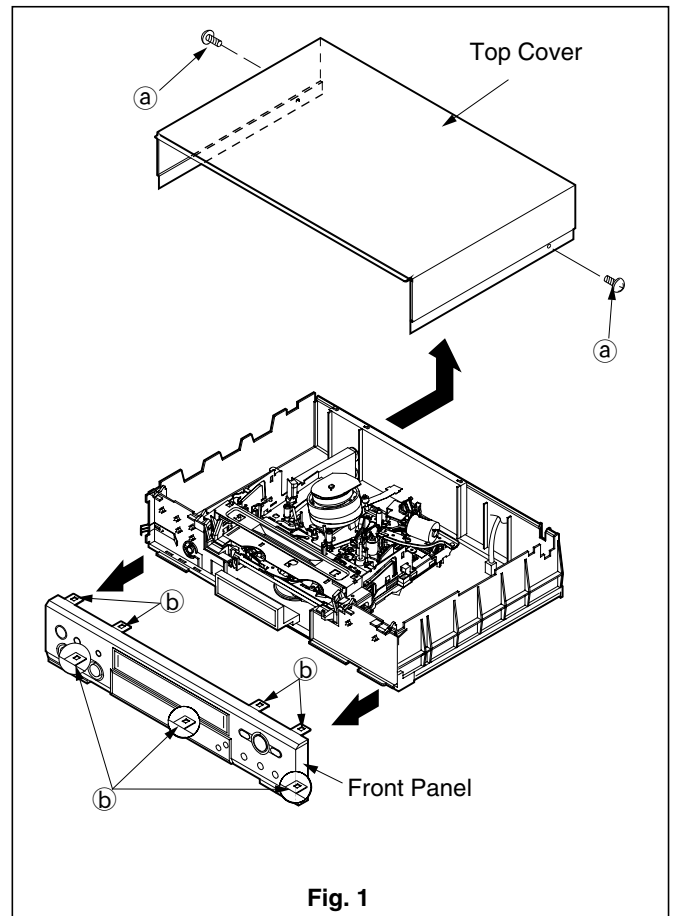
# DISASSEMBLY

## 1. Removal of Top Cover

1. Remove the two Top Cover fastening screws (a) shown in Fig. 1 and remove the Top Cover in the direction shown by arrow.

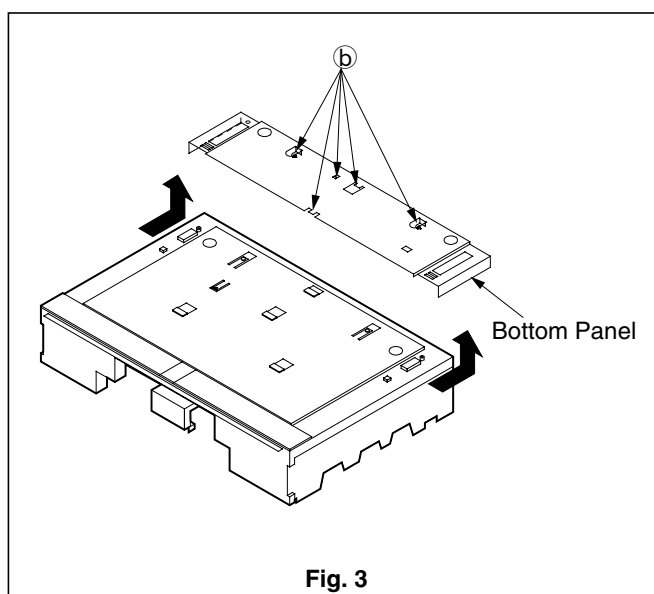
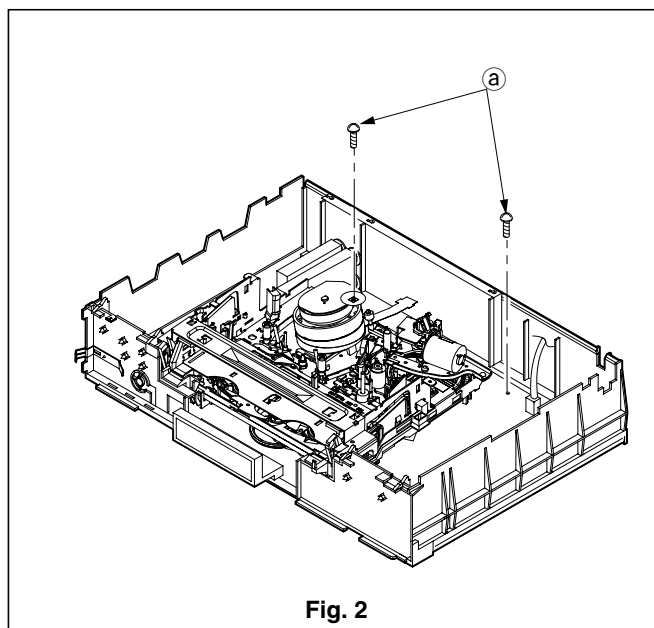
## 2. Removal of Front Panel

1. Remove the Top Cover.  
(Refer to Para. 1 of the DISASSEMBLY.)
2. Unfasten the seven catches (b) shown in Fig. 1 and remove the Front Panel in the direction shown by arrows.



### 3. Removal of Bottom Panel

1. Remove the two fastening screws (a) shown in Fig. 2.
2. Turn the set upside down as shown in Fig. 3.
3. Slide the Bottom Panel backward to remove it, taking care of the five catches (b).



## 4. Removal of DECK ASSY

1. Remove the Top Cover.  
(Refer to Para. 1 of the DISASSEMBLY.)
2. Remove the Front Panel.  
(Refer to Para. 2 of the DISASSEMBLY.)
3. Short-circuit the cathode side of D927 and the GND of the DECK ASSY using the jig shown below.

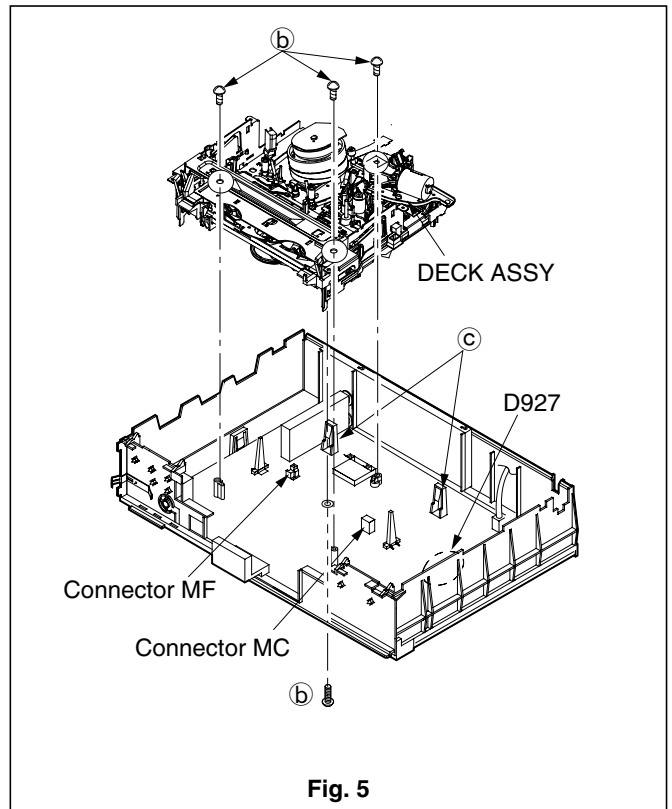
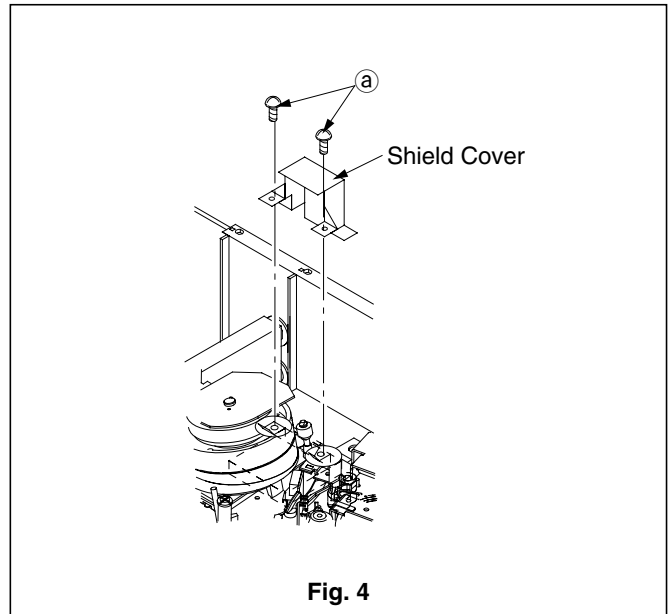
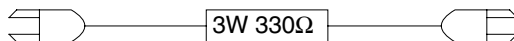
**Note:** The CAPSTAN MOTOR may be damaged without above short circuit.

4. Remove the two screws (a) shown in Fig. 4 and raise the Shield Cover to remove it.
5. Remove the four screws (b) shown in Fig. 5.
6. Disconnect the Connectors MA, MD, MH and ML.
7. Release the two catches (c) shown in Fig.5 and raise the DECK ASSY to remove it.

**Note1:** Remove the DECK ASSY paying attention to the Connectors MC and MF under it.

**Note2:** Short-circuit the cathode side of D927 and the Shield Case using the jig shown below before attaching the DECK ASSY.

**Jig (Part No. : 859C548O10)**



# HOW TO EXECUTE CIRCUIT BOARD SERVICE

**CAUTION:** BEFORE ATTEMPTING TO REMOVE OR REPAIR ANY PCB, UNPLUG THE POWER CORD FROM THE A.C. SOURCE.

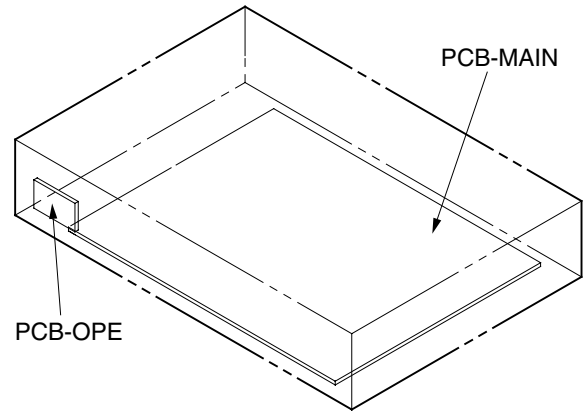
## LOCATION OF PRINTED CIRCUIT BOARDS

**Note :**

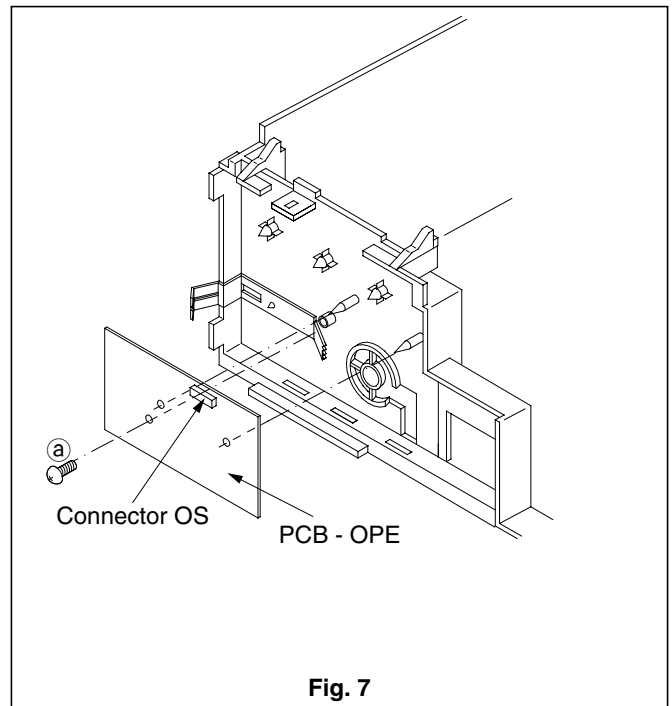
- Take caution when removing flat cables to prevent any contact problem.
- Connect and disconnect the flat cables at right angles to the connector and make sure that it is completely secured.
- After servicing the PCB, restore the flat cable and leads to their former state.

### 1. PCB-OPE

1. Remove the Top Cover.  
(Refer to Para. 1 of the DISASSEMBLY.)
2. Remove the Front Panel.  
(Refer to Para. 2 of the DISASSEMBLY.)
3. Unfasten the fastening screw (a) and remove the PCB-OPE as shown in Fig. 7.



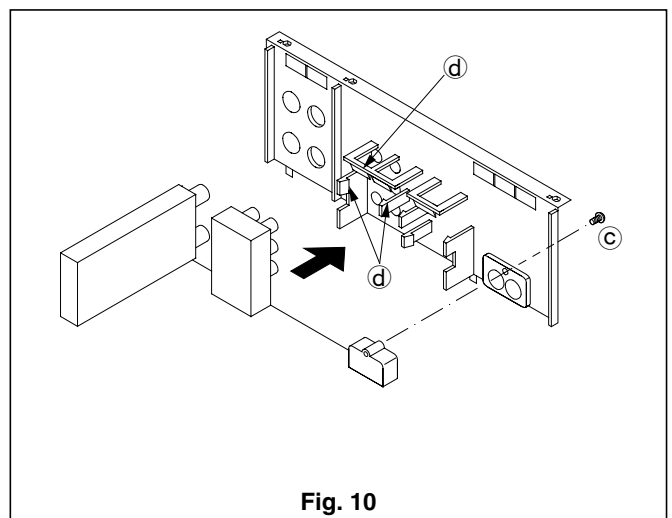
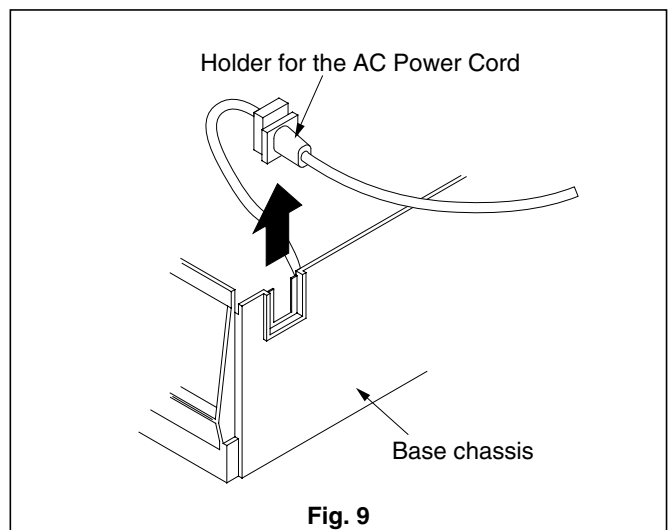
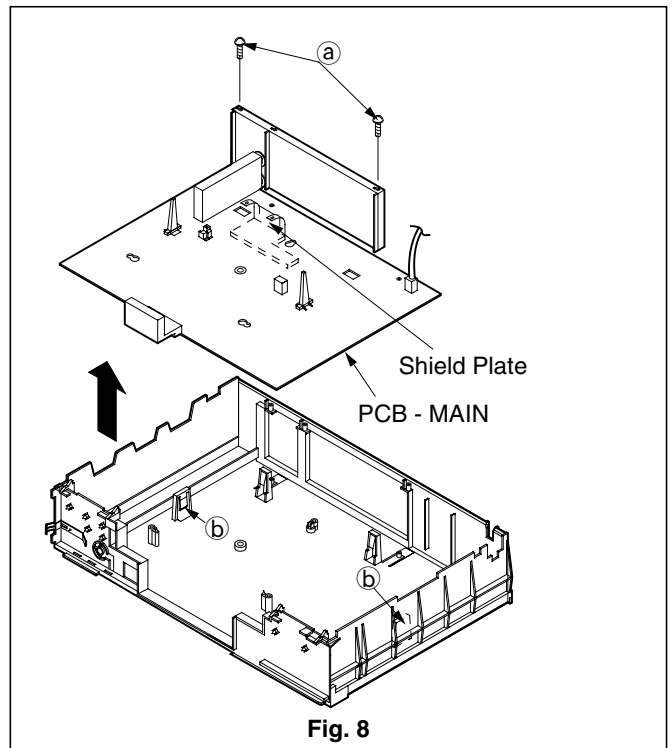
**Fig. 6**



**Fig. 7**

## 2. PCB-MAIN

1. Remove the Bottom Panel.  
(Refer to Para. 3 of the DISASSEMBLY.)
2. Remove the DECK ASSY.  
(Refer to Para. 4 of the DISASSEMBLY.)
3. Remove the two screws (a) shown in Fig. 8.
4. Remove the Holder for the AC Power Cord from the Base Chassis shown in Fig. 9.
5. Release the two fastening catches (b) shown in Fig. 8. Raise the PCB-MAIN to remove it.
6. Unfasten the fastening one screws (c) shown in Fig.10 and remove the Antenna Cover.
7. Raise the three fastening catches (d) shown in Fig.10 and remove the Antenna Cover.



### ■ Service of PCB

#### • Head Amp block

1. Unsolder the four soldering points of the Shield Case shown in Fig. 8 and remove it.

**Note:** Before checking the operation, mount the Shield Case and the Shield Plate on the original position. If not provided, beat or picture disturbance may appear.

# CHIP PARTS REPLACEMENT

## CHIP PARTS REPLACEMENT

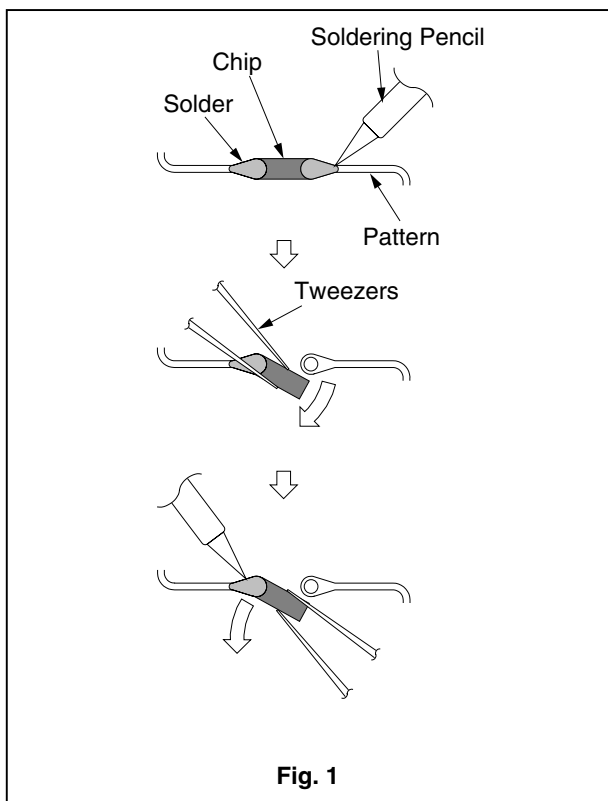
Some resistors, shorting jumpers ( $0\Omega$  resistor), ceramic capacitors, transistors and diodes are chip parts. When replacing these parts, note the following cautions.

### Cautions :

- Use fine tipped, well insulated soldering pencil (iron), about 30 watts, and tweezers.
- Melt the solder and remove the Chip Parts carefully not to tear off the copper foil of the printed circuit board.
- Discard removed chips ; do not reuse them.
- Do not apply heat for more than 3 seconds to new Chip Parts.
- Avoid using a rubbing stroke when soldering.
- Take care not to scratch, or damage the Chip Parts when soldering.
- Supplementary cementing is not required.

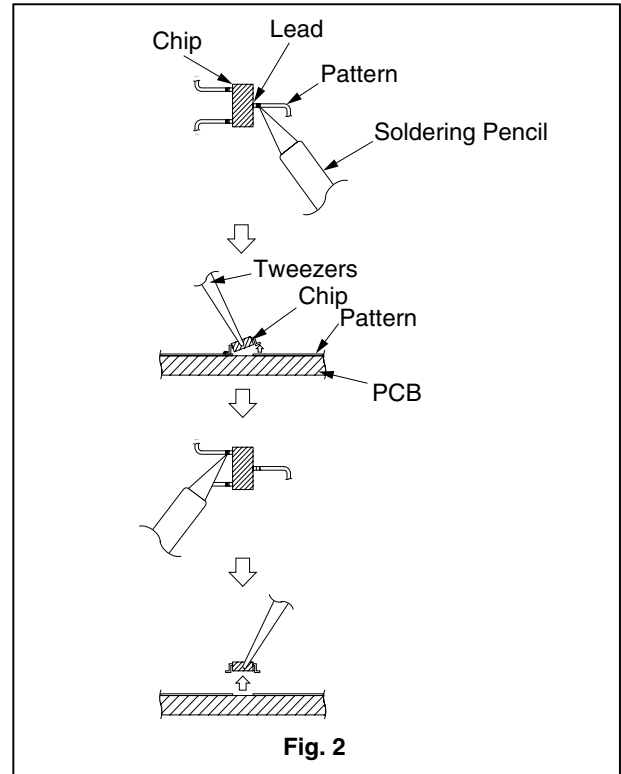
## 1. Removal of Chip Parts (Resistors, capacitors, etc.)

- Grasp the part with tweezers. Melt the solder at both sides alternately, remove one side of the part with a twisting motion.
- Melt the solder at the other side and remove the part.



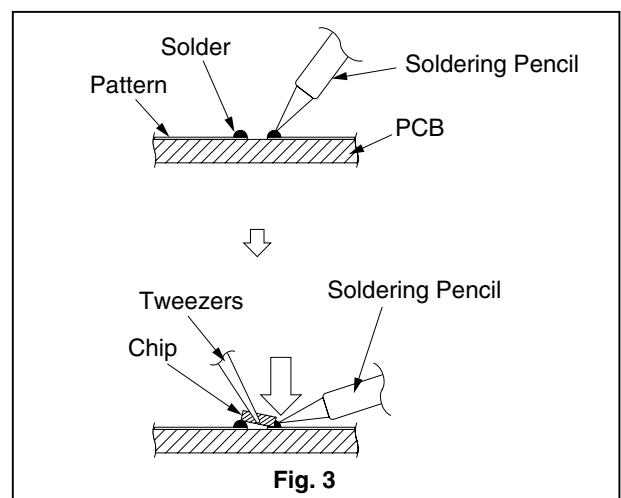
## 2. Removal of Chip Parts (Transistors)

- Melt the solder of one lead. Lift the side of that lead upward.
- Simultaneously melt the solder of the two remaining leads and lift the part from the PCB.



## 3. Replacement

- Presolder the contact points of the circuit pattern.
- Press the part downward with tweezers and apply the soldering pencil as shown in Fig. 3.



# MECHANICAL ADJUSTMENT AND REPLACEMENT

## 1. DECK Cleaning

The following Parts require cleaning whenever serviced in order to maintain satisfactory performance.

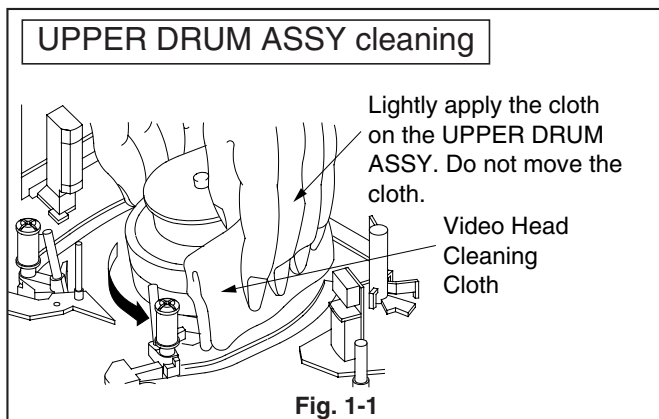
### 1-1. VIDEO HEAD

1. Clean the VIDEO HEAD according to the following method. Dust and other foreign objects on the VIDEO HEAD disturb the normal PLAYBACK picture. To clean the VIDEO HEAD, hold a VIDEO HEAD cleaning cloth dampened with alcohol against the DRUM and slowly turn the DRUM counter-clockwise.

**Note :** Do not directly touch the HEADS installed to the UPPER DRUM ASSY. The HEADS are very hard but brittle to shock (especially to shock in the vertical direction) and easily breakable.

Never apply force to it in the vertical direction.

2. Allow the residual alcohol to dry thoroughly before running a tape. The residual alcohol on the HEADs may damage the tape if not dried completely.



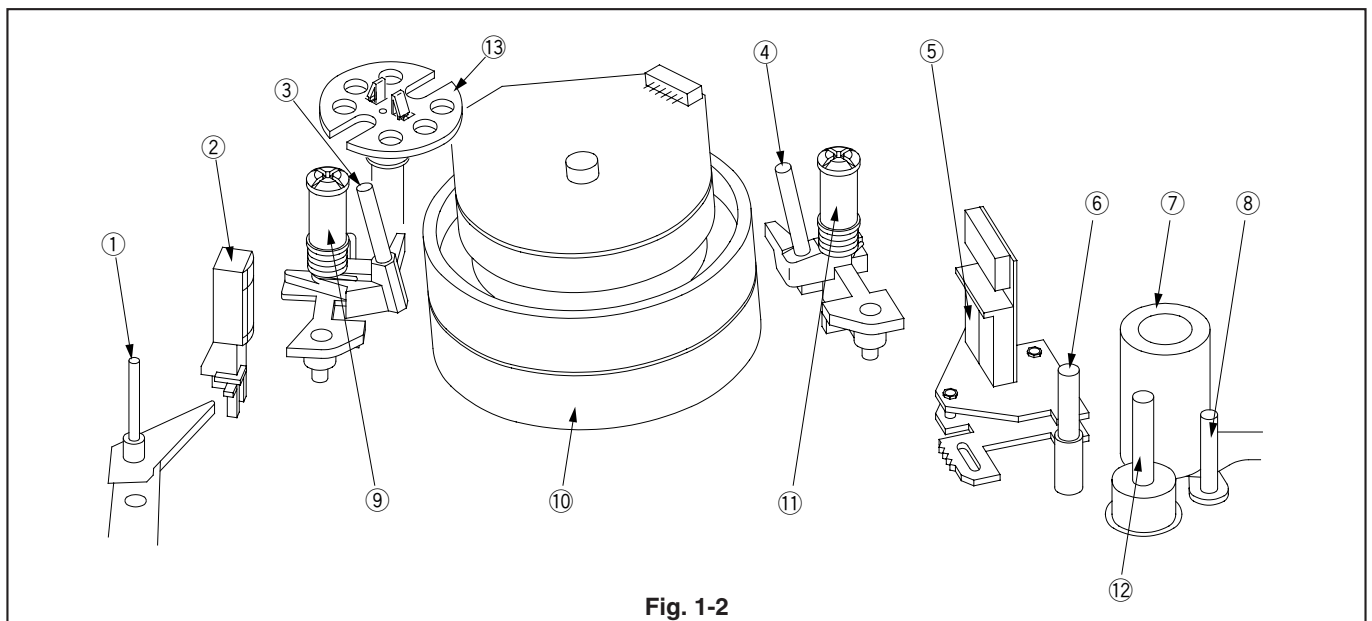
### 1-2. Tape Running System

Clean the following Parts of the Tape Running System.

1. TENSION PIN
  2. F/E HEAD
  3. SLANT POLE (SP)
  4. SLANT POLE (TU)
  5. A/C HEAD
  6. GUIDE POLE (TU)
  7. PINCH ROLLER
  8. GUIDE PIN (TU)
  9. GUIDE ROLLER (SP)
  10. UPPER / LOWER DRUM ASSY
  11. GUIDE ROLLER (TU)
  12. CAPSTAN SHAFT
  13. IMPEDANCE UNIT (SP)
1. Clean the Tape Running System, using a piece of gauze dampened with alcohol, except for the GUIDE ROLLER (SP), GUIDE ROLLER (TU), and PINCH ROLLER which require to be cleaned with a piece of dry gauze.
  2. Allow the residual alcohol to dry thoroughly before running the tape. The residual alcohol on the SYSTEM may damage the tape if not dried completely.

### 1-3. REEL DISK Drive System

1. Clean the BRAKE side and REEL BELT of the REEL DISK Drive System.
2. Clean the REEL DISK Drive System, using a piece of gauze dampened with alcohol, except for the REEL BELT which requires cleaning with a piece of dry gauze.
3. Allow the residual alcohol to dry thoroughly before operation.



## 2. Replacement of Major Parts

### 2-1. CLEANING ARM, FELT RING

SET POSITION : Normal

#### (Removal)

1. Release the two catches (a) of the CLEANING ARM shown in the Fig. 2-1 to remove the CLEANING ARM.
2. Release the two catches (b) of the CLEANING ARM shown in the Fig. 2-1 to remove the FELT RING.

#### (Installation)

1. Install the FELT RING shown in the Fig. 2-1 to the CLEANING ARM.
2. Install the CLEANING ARM shown in the Fig. 2-1.

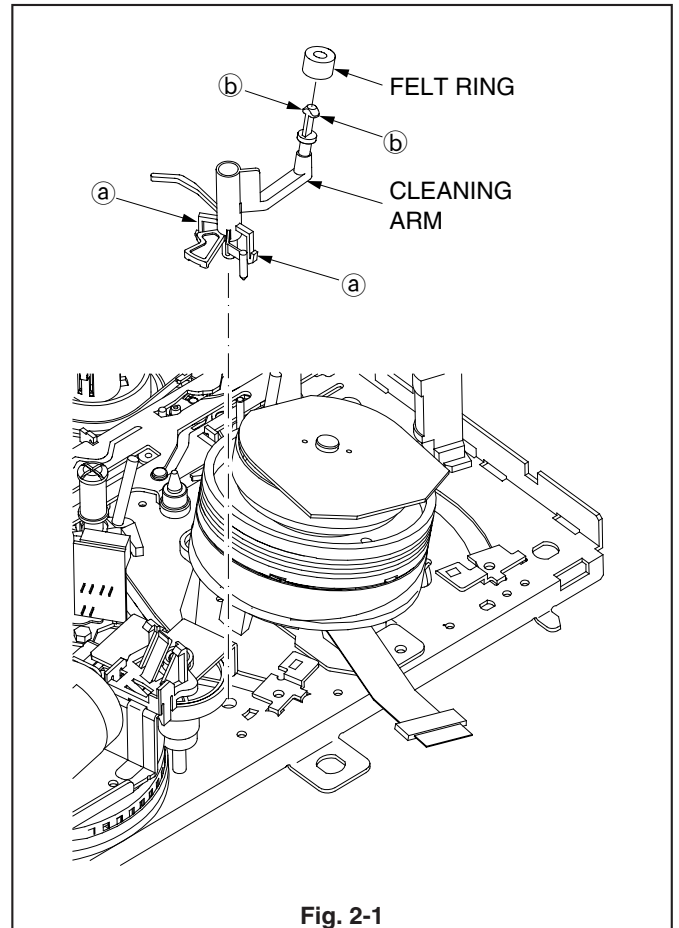


Fig. 2-1

### 2-2. STAY PLATE

SET POSITION : Normal

#### (Removal)

1. Remove the two screws (a) fastening the STAY PLATE shown in the Fig. 2-2 to remove the STAY PLATE.

#### (Installation)

1. Install the STAY PLATE shown in the Fig. 2-2.

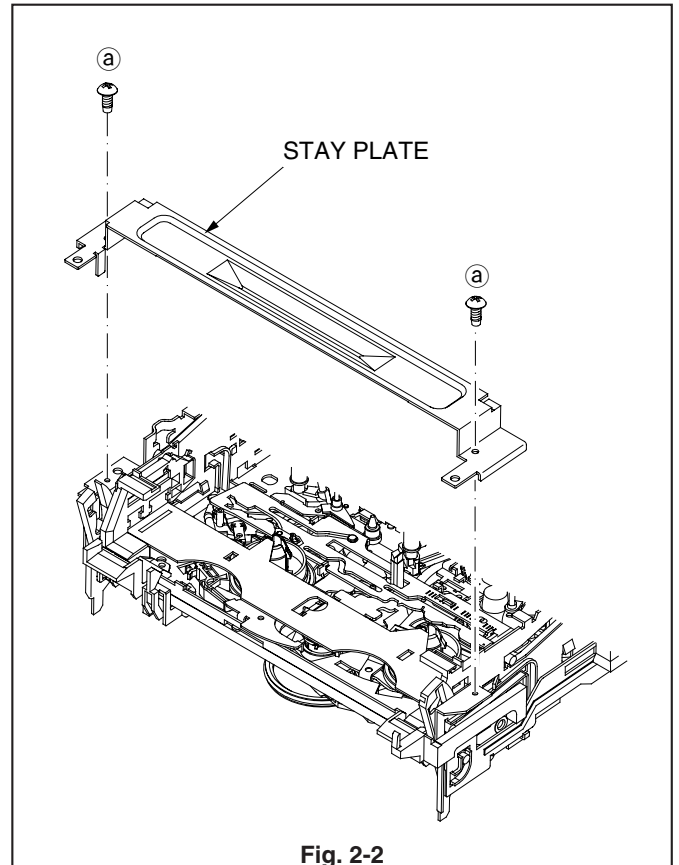


Fig. 2-2

## 2-3. BOTTOM ASSY

**SET POSITION :** Normal

Remove the following part before replacing the BOTTOM ASSY. Refer to the corresponding item to install it.

- STAY PLATE (Item 2-2)

### (Removal)

1. Move the WORM WHEEL in the Fig. 2-3-1 in the direction shown by the arrow (A). And match the Boss (a) of the BOTTOM ASSY with the Hole in the MAIN PLATE ASSY.
2. Lift the BOTTOM ASSY in the Fig. 2-3-1 in the direction shown by the arrow (B) and pull it out in the direction shown by the arrow (C).

### (Installation)

1. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the Grooves of the MAIN PLATE ASSY shown in the Fig. 2-3-2.
2. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the Bosses of the BOTTOM ASSY shown in the Fig. 2-3-2.
3. Rotate the WORM WHEEL shown in the Fig. 2-3-1 so that the ARM (SP) stands vertically.
4. Insert the Boss (b) of the BOTTOM ASSY shown in the Fig. 2-3-2 in the Upper Groove of the MAIN PLATE and the Boss (c) in the Lower Groove.
5. Insert the Boss (d) of the BOTTOM ASSY to the Upper Groove through the Hole in the MAIN PLATE ASSY shown in the Fig. 2-3-1 and the Boss (e) to the Lower Groove through the slot in the ARM (SP).

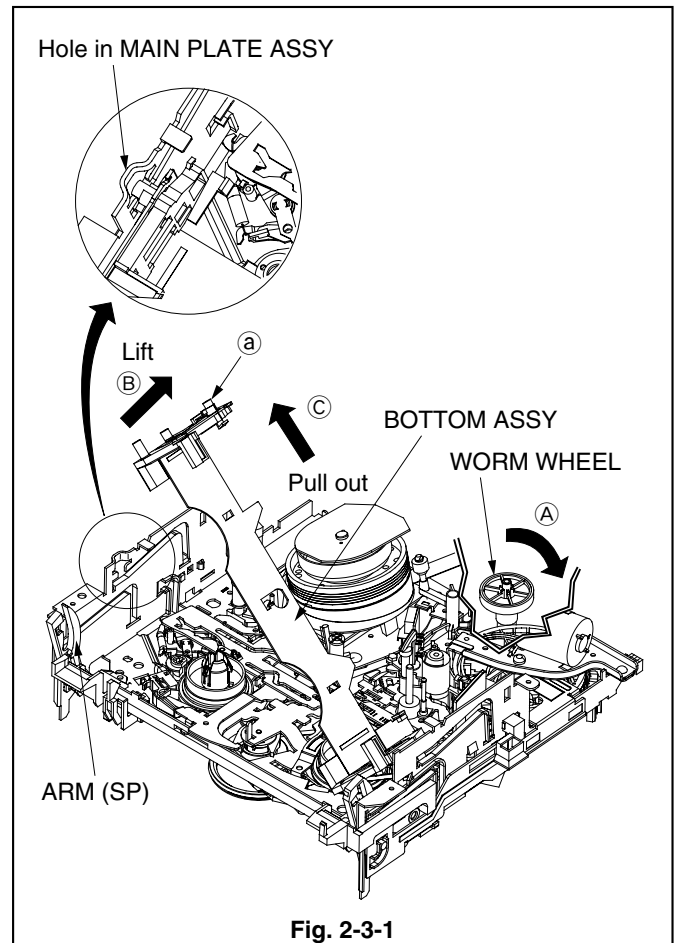


Fig. 2-3-1

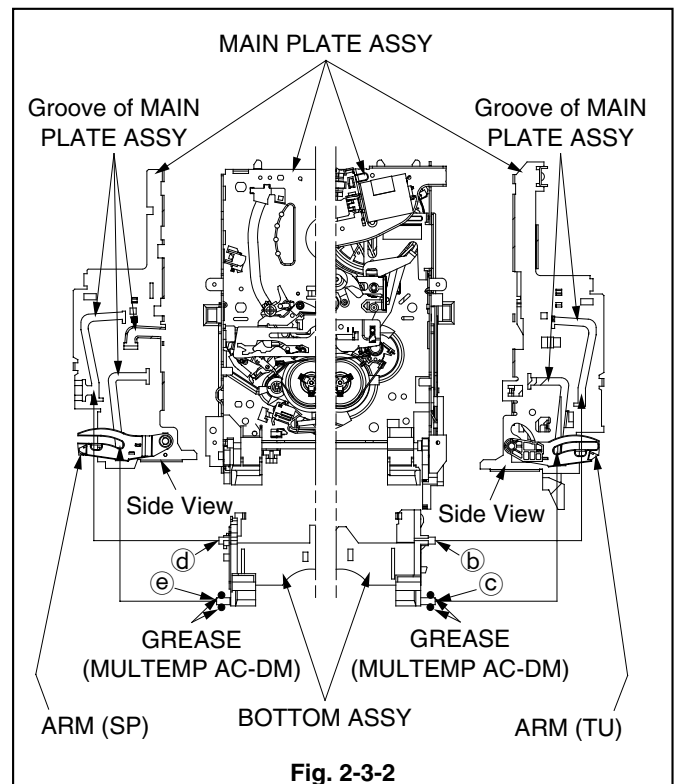


Fig. 2-3-2

## 2-4. INSERT GUIDE (TU)

**SET POSITION :** Normal

Remove the following parts before replacing the INSERT GUIDE (TU). Refer to the corresponding items to install them.

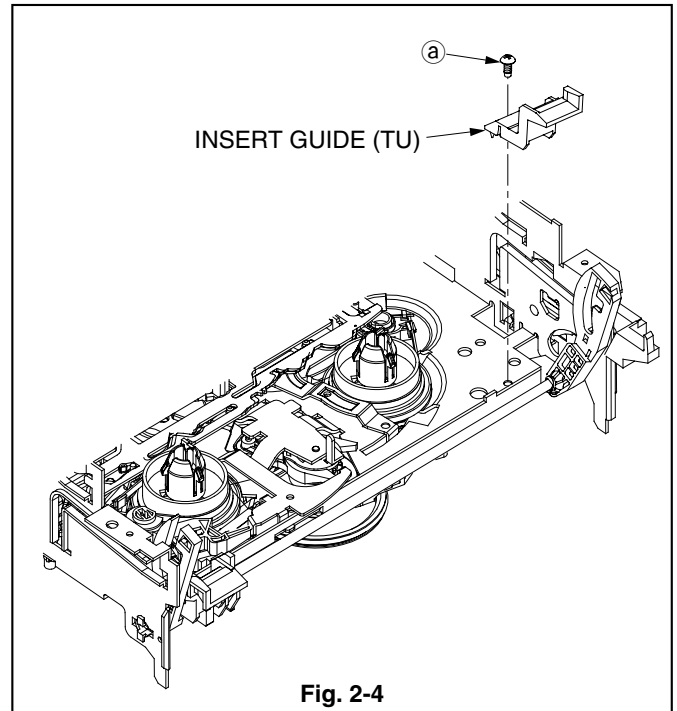
- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)

### (Removal)

1. Remove the screw (a) fastening the INSERT GUIDE (TU) shown in the Fig. 2-4 to remove the INSERT GUIDE (TU).

### (Installation)

1. Install the INSERT GUIDE (TU) shown in the Fig. 2-4.



## 2-5. INSERT GUIDE (SP)

**SET POSITION :** Normal

Remove the following parts before replacing the INSERT GUIDE (SP). Refer to the corresponding items to install them.

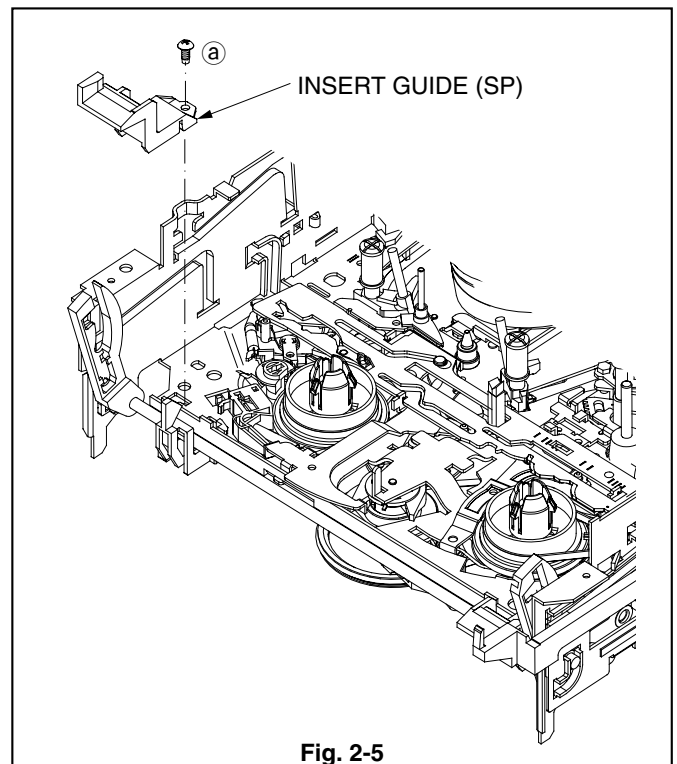
- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)

### (Removal)

1. Remove the screw (a) fastening the INSERT GUIDE (SP) shown in the Fig. 2-5 to remove the INSERT GUIDE (SP).

### (Installation)

1. Install the INSERT GUIDE (SP) shown in the Fig. 2-5.



## 2-6. REC HOLDER, REC LEVER, REC SPRING

**SET POSITION :** Upside down

### (Removal)

1. Remove the screw (a) fastening the REC HOLDER shown in the Fig. 2-6 to remove the REC HOLDER.
2. Release the REC SPRING shown in the Fig. 2-6 from the catch (b) of the REC HOLDER to remove the REC LEVER.
3. Release the two catches (c) of the REC LEVER shown in the Fig. 2-6 to remove the REC SPRING.

### (Installation)

1. Install the REC SPRING shown in the Fig. 2-6 to the REC LEVER and hook the REC SPRING to the catches (c).
2. Install the REC LEVER shown in the Fig. 2-6 to the REC HOLDER.
3. Hook the REC SPRING shown in the Fig. 2-6 to the catch (b).
4. Install the REC HOLDER shown in the Fig. 2-6.

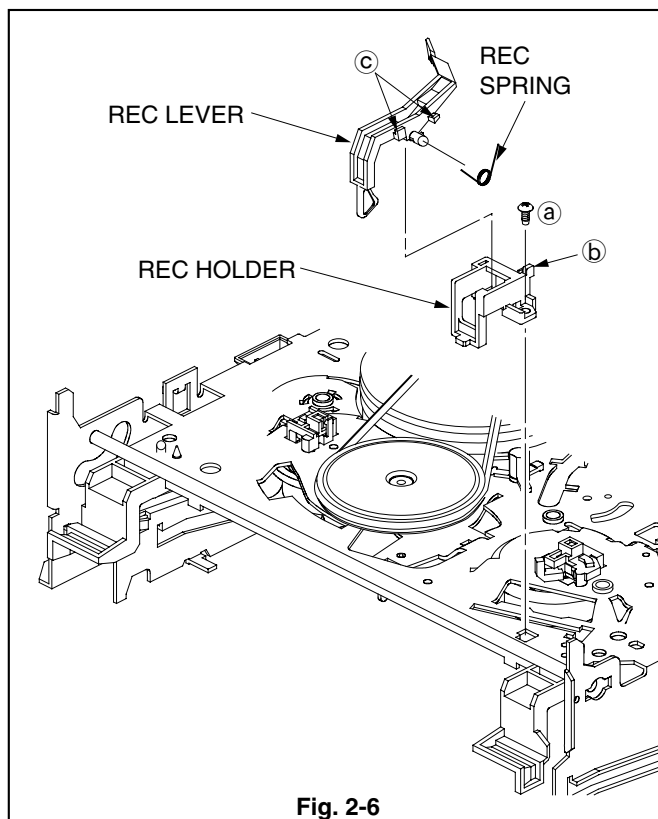


Fig. 2-6

## 2-7. F/L ARM ASSY, F/L BEARING

**SET POSITION :** Normal

Remove the following parts before replacing the F/L ARM ASSY, F/L BEARING. Refer to the corresponding items to install them.

- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)
- INSERT GUIDE (TU) (Item 2-4)
- INSERT GUIDE (SP) (Item 2-5)
- REC HOLDER (Item 2-5)

### (Removal)

1. Release the catch (a) of the F/L BEARING shown in the Fig. 2-7 and pull out the F/L ARM ASSY in the direction shown by the arrow (A).

**Note :** Do not pull the F/L ARM by force because it may break the catch (a) of the F/L BEARING.

2. Release the catch (b) of the F/L BEARING shown in the Fig. 2-7 and rotate the F/L BEARING by 90 degrees to remove it.

### (Installation)

1. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the Groove of the MAIN PLATE ASSY shown in the Fig. 2-7.
2. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the Boss of the ARM (SP) shown in the Fig. 2-7.
3. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the Bosses of the ARM (TU) shown in the Fig. 2-7.
4. Install the F/L BEARING shown in the Fig. 2-7.
5. Insert the Boss (c) of the F/L ARM ASSY shown in the Fig. 2-7 into the Groove (d) of the MAIN PLATE ASSY to install the F/L ARM ASSY.

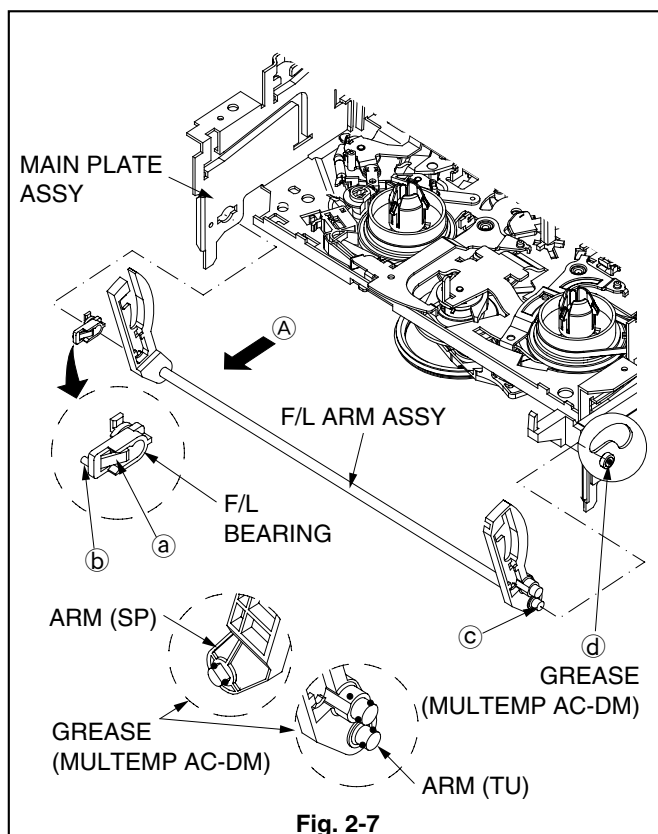


Fig. 2-7

## 2-8. A/C HEAD UNIT

**SET POSITION :** Normal

### (Removal)

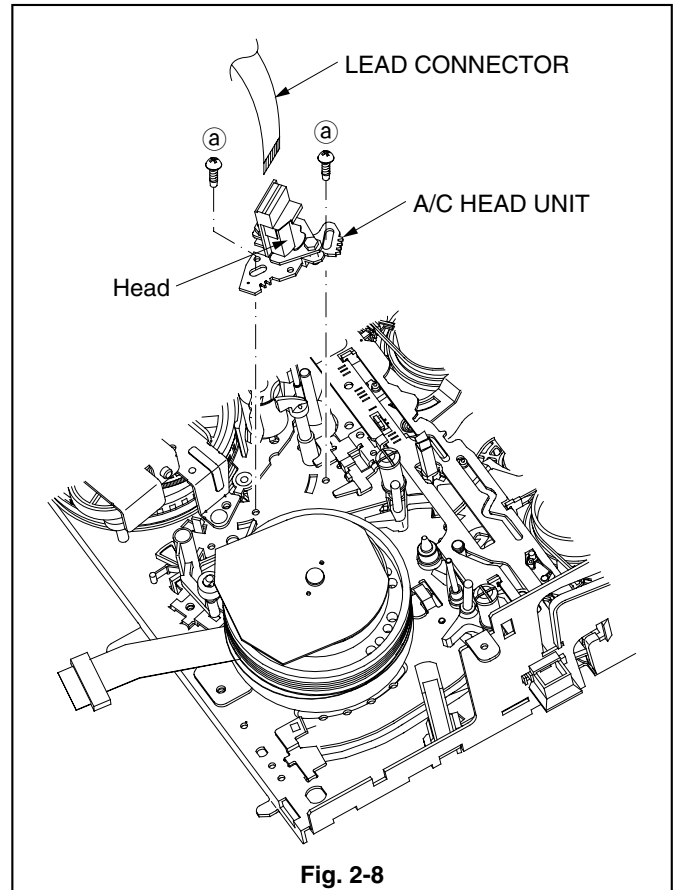
1. Remove the LEAD CONNECTOR of the A/C HEAD UNIT shown in the Fig. 2-8.
2. Remove the two screws (a) fastening the A/C HEAD UNIT shown in the Fig. 2-8 to remove the A/C HEAD UNIT.

### (Installation)

1. Install the A/C HEAD UNIT shown in the Fig. 2-8.

**Note :** Never touch the Head of the A/C HEAD UNIT shown in the Fig. 2-8. Clean the dirt on the Head with alcohol if necessary.

2. Install the LEAD CONNECTOR of the A/C HEAD UNIT shown in the Fig. 2-8.
3. Perform the Item 3-3. "A/C HEAD Adjustment" and Item 3-4. "Phase Adjustment" of the "Interchangeability Adjustment of the Mechanism".



## 2-9. F/E HEAD

**SET POSITION :** Normal

### (Removal)

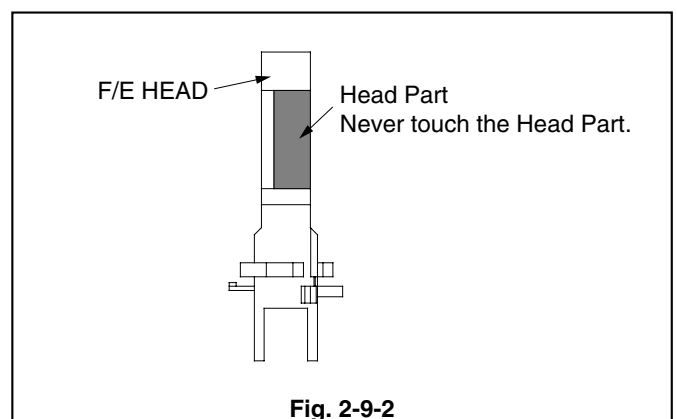
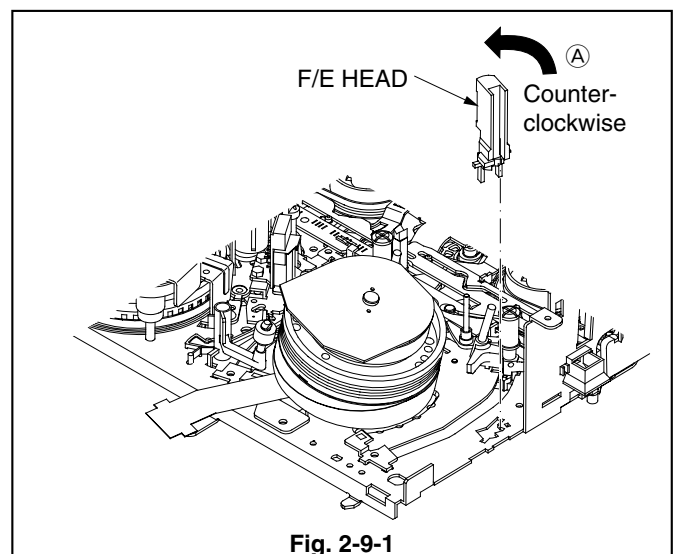
1. Lift the F/E HEAD shown in the Fig. 2-9-1 in the direction by the arrow (A) to remove it.

**Note :** Be sure to replace the removed F/E HEAD with a new one.

### (Installation)

1. Install the F/E HEAD shown in the Fig. 2-9-1.

**Note :** Never touch the Head shown in the Fig. 2-9-2. Clean it with alcohol if necessary.



## 2-10.SENSOR COVER (TU)

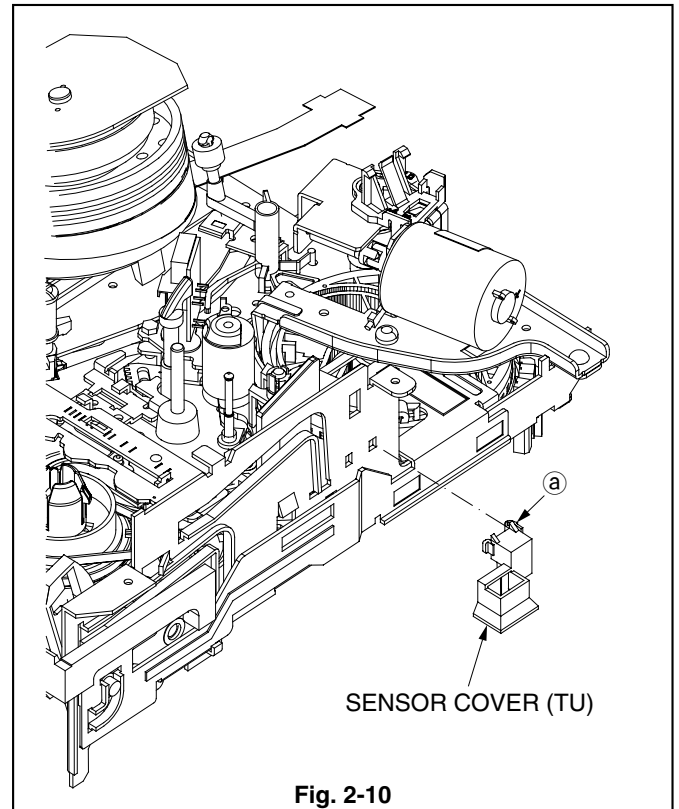
**SET POSITION** : Normal

### (Removal)

1. Release the catch (a) of the SENSOR COVER (TU) shown in the Fig. 2-10 to remove the SENSOR COVER (TU).

### (Installation)

1. Install the SENSOR COVER (TU) shown in the Fig. 2-10.



**Fig. 2-10**

## 2-11. SENSOR COVER (SP)

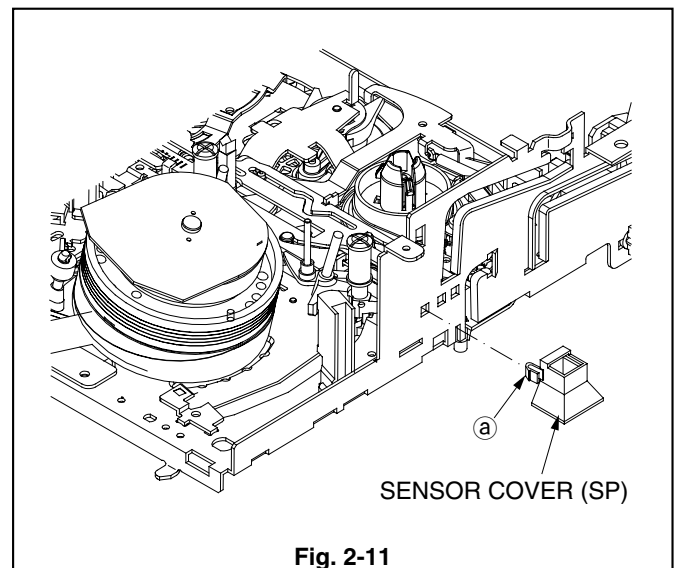
**SET POSITION** : Normal

### (Removal)

1. Remove the catch (a) of the SENSOR COVER (SP) shown in the Fig. 2-11 to remove the SENSOR COVER (SP).

### (Installation)

1. Install the SENSOR COVER (SP) shown in the Fig. 2-11.



**Fig. 2-11**

## 2-12.REV UNIT (TU), REV UNIT (SP)

**SET POSITION :** Upside down

### (Removal)

1. Release the two catches (a) of the REV UNIT (TU) shown in the Fig. 2-12 to remove the REV UNIT (TU).
2. Release the two catches (b) of the REV UNIT (SP) shown in the Fig. 2-12 to remove the REV UNIT (SP).

### (Installation)

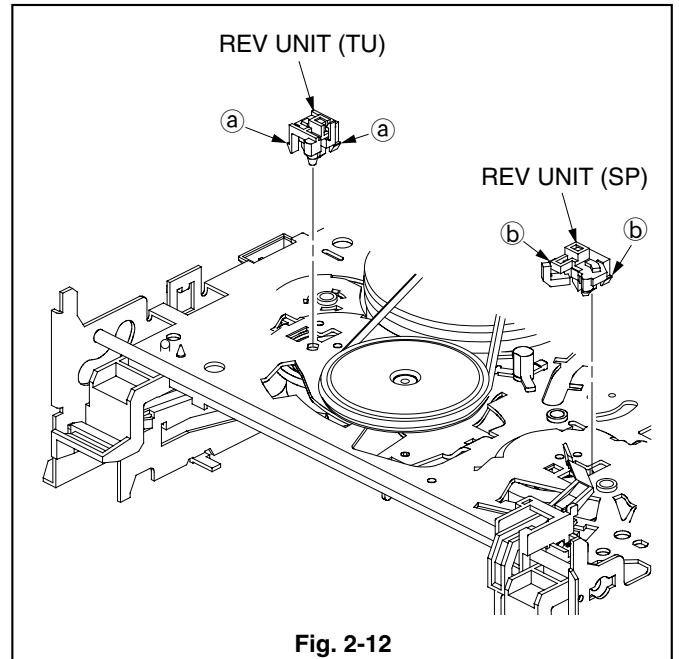
1. Clean the dirt on the transparent part of the REV UNIT (TU) with a VIDEO HEAD cleaning cloth.

**Note :** Never use solvent such as alcohol to clean the REV UNIT (TU).

2. Install the REV UNIT (TU) shown in the Fig. 2-12.
3. Clean the dirt on the transparent part of the REV UNIT (SP) with a VIDEO HEAD cleaning cloth.

**Note :** Never use solvent such as alcohol to clean the REV UNIT (SP).

4. Install the REV UNIT (SP) shown in the Fig. 2-12.



**Fig. 2-12**

## 2-13.MODE POSITION UNIT

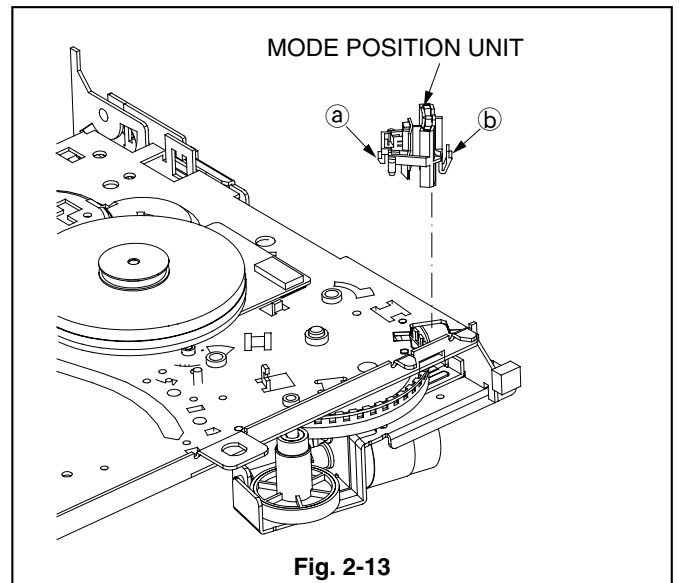
**SET POSITION:** Upside down

### (Removal)

1. Release the two catches (a, b) of the MODE POSITION UNIT shown in the Fig. 2-13 to remove the MODE POSITION UNIT.

### (Installation)

1. Install the catch (b) of the MODE POSITION UNIT shown in the Fig. 2-13.
2. Install the catch (a) of the MODE POSITION UNIT shown in the Fig. 2-13.



**Fig. 2-13**

## 2-14. REEL BELT, PULLEY BUSH, THRUST WASHER, BELT PULLEY, SHIFT SLIDER, PULLEY GEAR ASSY, SLIP GEAR, SLIP SPRING, SLIP 2 WASHER, THRUST WASHER, SLIP ADJUSTER, IDLER 2 UNIT

**SET POSITION :** Upside down

### (Removal)

1. Remove the REEL BELT shown in the Fig. 2-14-1.
2. Move the SHIFT SLIDER in the Fig. 2-14-1 in the direction shown of the arrow (A) to remove the SHIFT SLIDER from the SHIFT LEVER.
3. Release the two catches (a) of the PULLEY BUSH shown in the Fig. 2-14-1 to remove the PULLEY BUSH.

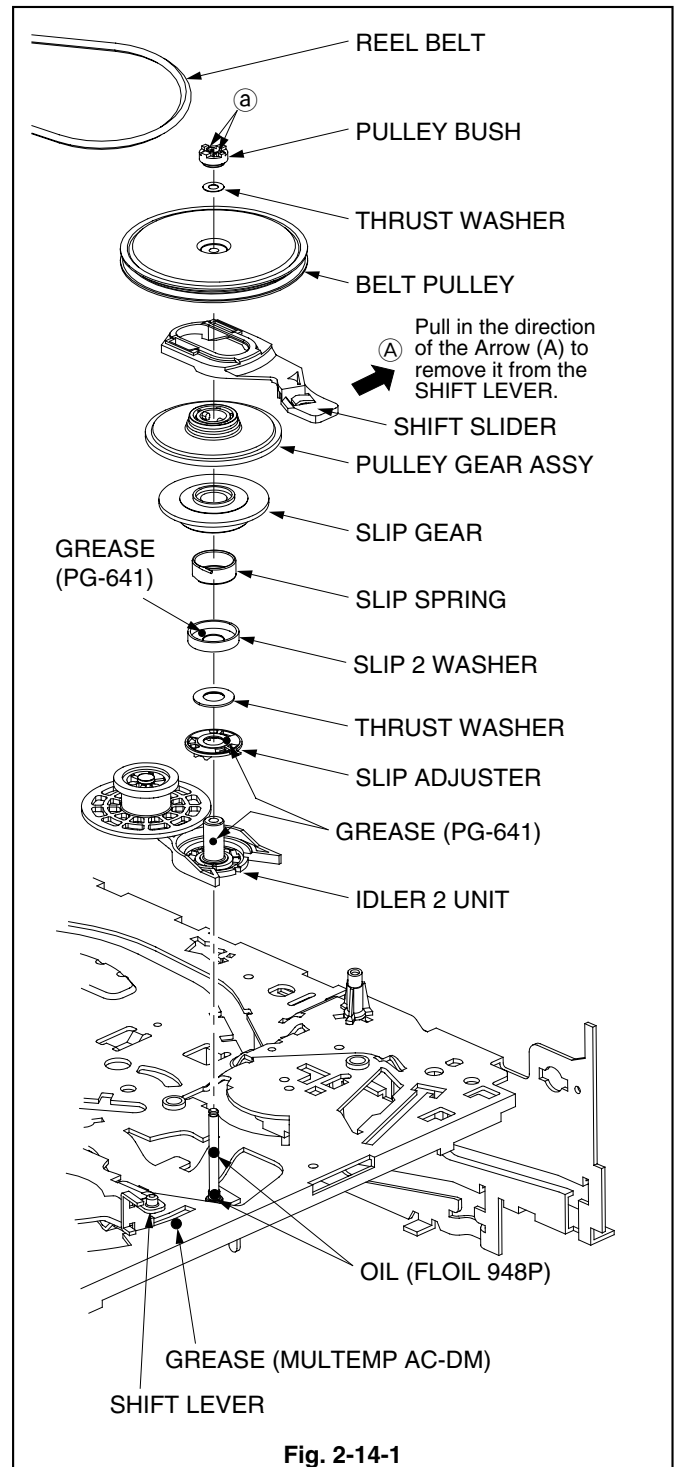
**Note :** Be sure to replace the removed PULLEY BUSH with a new one.

4. Remove the units from the THRUST WASHER to IDLER 2 UNIT shown in the Fig. 2-14-1.

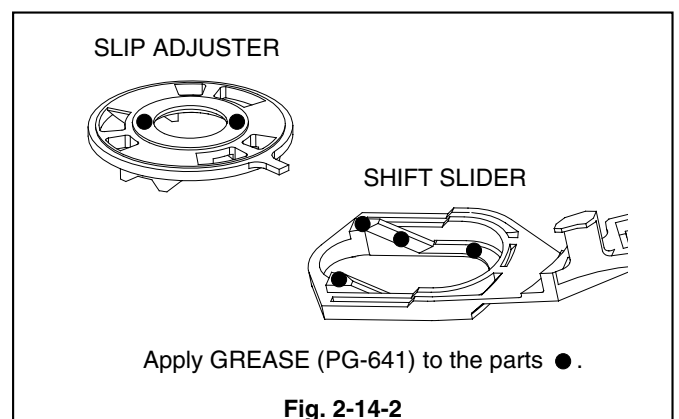
### (Installation)

**Note :** Be careful so that GREASE and OIL does not adhere on the Felt Side of the PULLEY GEAR ASSY or the Grooved Side of the SLIP GEAR shown in the Fig. 2-14-4.

1. Apply OIL (FLOIL 948P) [859D154O20] to the SHAFT for the IDLER 2 UNIT shown in the Fig. 2-14-1.
2. Apply GREASE (PG-641) [859D055O30] to the parts on the IDLER 2 UNIT specified in the Fig. 2-14-1.
3. Apply GREASE (MULTEMP AC-DM) [859D055O90] to the parts on the MAIN PLATE ASSY specified in the Fig. 2-14-1.
4. Apply GREASE (PG-641) [859D055O30] to the parts on the new SHIFT SLIDER specified in the Fig. 2-14-2.
5. Apply GREASE (PG-641) [859D055O30] to the parts on the new SLIP ADJUSTER specified in the Fig. 2-14-2.
6. Apply GREASE (PG-641) [859D055O30] to the parts on the new BELT PULLEY specified in the Fig. 2-14-3.
7. Install the IDLER 2 UNIT shown in the Fig. 2-14-1.
8. Install the SLIP ADJUSTER shown in the Fig. 2-14-3, matching the Lug of the SLIP ADJUSTER with the Center Notch of the IDLER 2 UNIT.



**Fig. 2-14-1**



**Fig. 2-14-2**

9. Install the units from the SLIP 2 WASHER to REEL BELT shown in the Fig. 2-14-1.

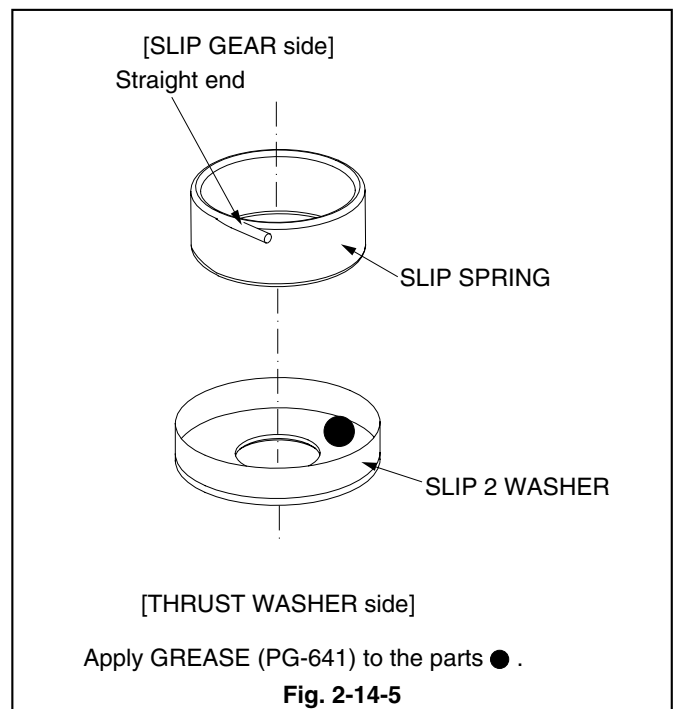
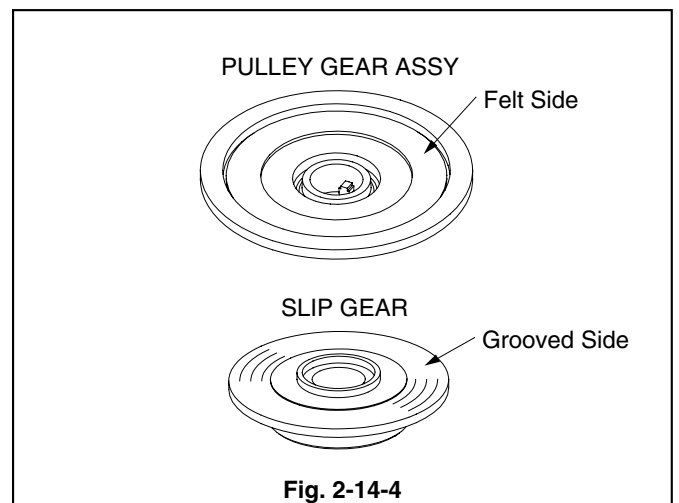
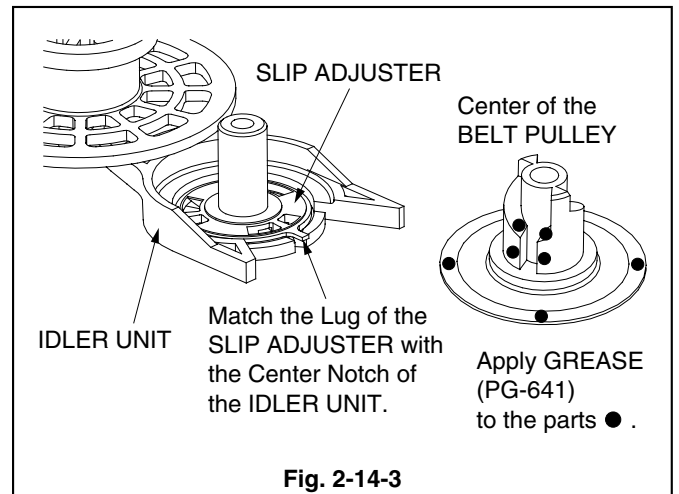
**Note1** : Be sure to replace the removed PULLEY BUSH with a new one.

**Note2** : Attach the SLIP SPRING with its straight end facing the SLIP GEAR side.

**Note3** : Attach the SLIP 2 WASHER with its position set as shown in the Fig. 2-14-5.

**Note4** : Apply GREASE (PG-641) [859D055O30] to the part on the SLIP 2 WASHER specified in the Fig. 2-14-5.

10. Install the SHIFT SLIDER to the SHIFT LEVER shown in the Fig. 2-14-1.



## 2-15. CAPSTAN BRAKE SPRING, CAPSTAN BRAKE ASSY

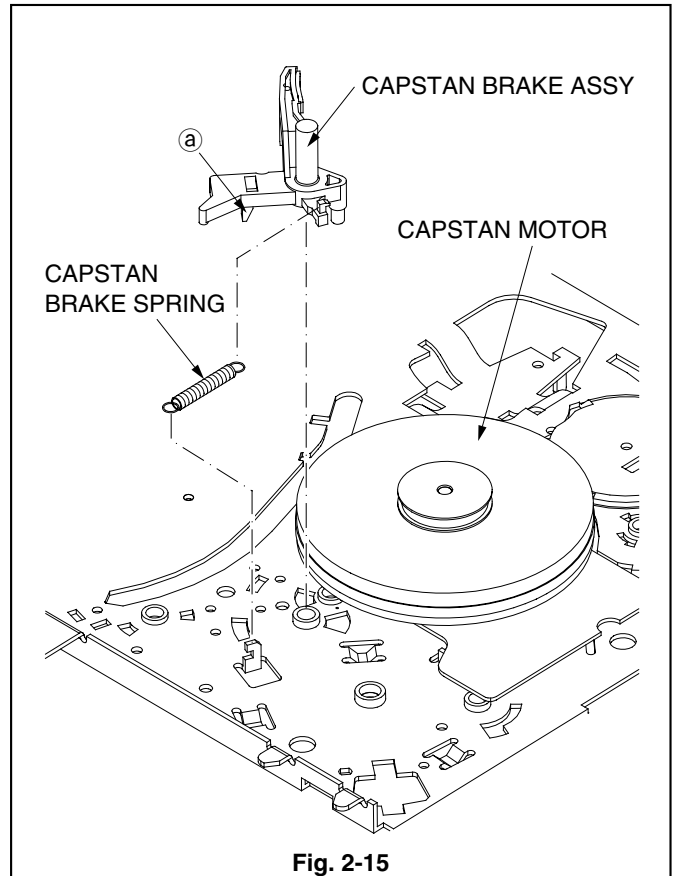
**SET POSITION :** Upside down

### (Removal)

1. Remove the CAPSTAN BRAKE SPRING shown in the Fig. 2-15.
2. Remove the catch (a) of the CAPSTAN BRAKE ASSY shown in the Fig. 2-15 to remove the CAPSTAN BRAKE ASSY.

### (Installation)

1. Install the CAPSTAN BRAKE ASSY shown in the Fig. 2-15.
2. Install the CAPSTAN BRAKE SPRING shown in the Fig. 2-15.



**Fig. 2-15**

## 2-16.FC HOLDER, MOTOR HOLDER, LOADING WORM, LOADING MOTOR ASSY, WORM WHEEL

**SET POSITION :** Normal

### (Removal)

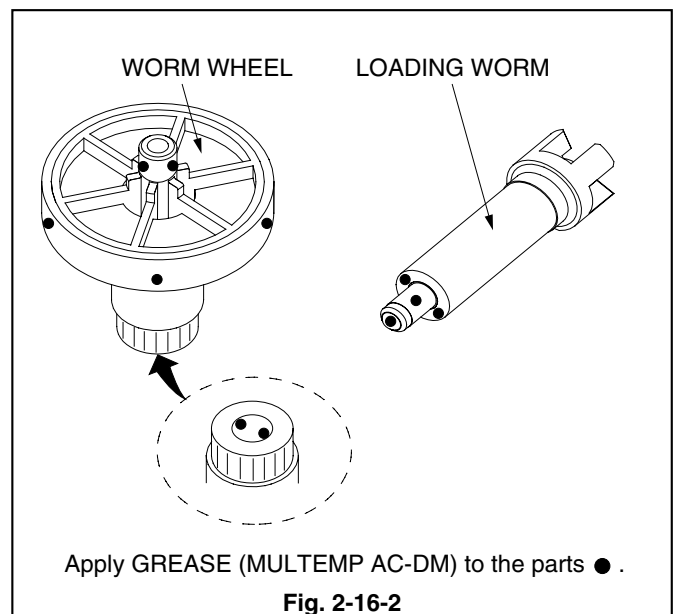
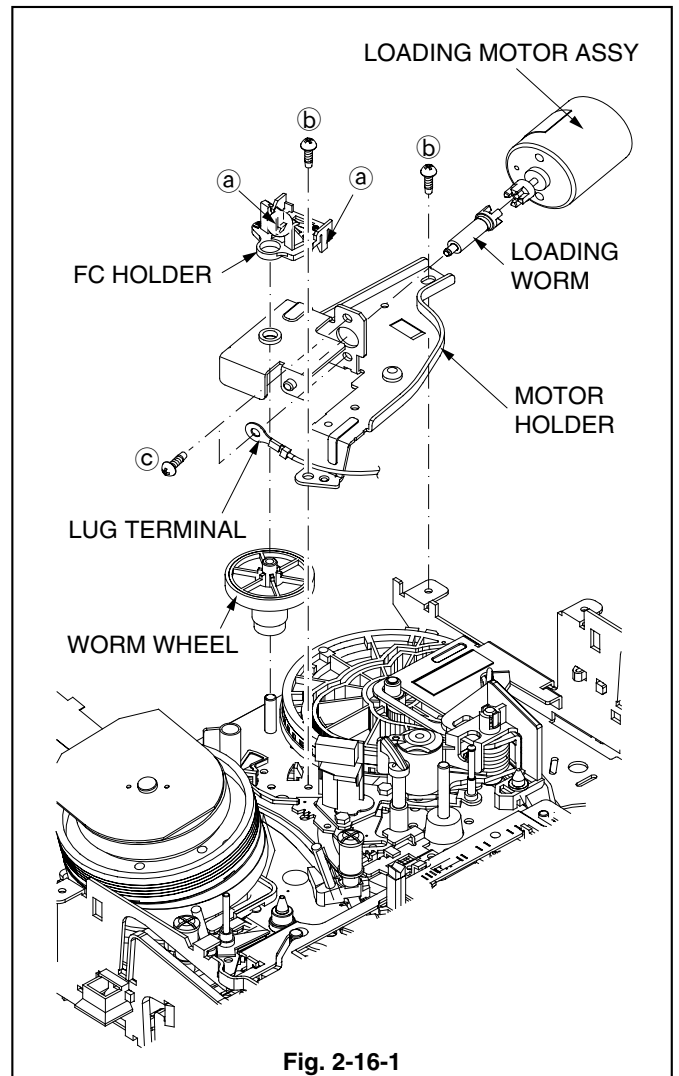
1. Release the two catches (a) of the FC HOLDER shown in the Fig. 2-16-1 to remove the FC HOLDER.
2. Remove the two screws (b) fastening the MOTOR HOLDER shown in the Fig. 2-16-1 to remove the MOTOR HOLDER.
3. Remove the two screws (c) fastening the LOADING MOTOR ASSY shown in the Fig. 2-16-1 to remove the LOADING MOTOR ASSY and LOADING WORM.
4. Remove the WORM WHEEL.

### (Installation)

1. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the LOADING WORM shown in the Fig. 2-16-2.
2. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the WORM WHEEL shown in the Fig. 2-16-2.
3. Install the WORM WHEEL.
4. Install the LOADING WORM, LOADING MOTOR ASSY to the MOTOR HOLDER.

**Note :** Tighten the screw (c) shown in the Fig. 2-16-1 after putting the LUG TERMINAL on the screw.

5. Install the MOTOR HOLDER.
6. Install the FC HOLDER.



## 2-17. PINCH ARM CAP, PINCH ASSY

**SET POSITION :** Normal

### (Removal)

1. Release the two catches (a) of the PINCH ARM CAP shown in the Fig. 2-17 to remove the PINCH ARM CAP.
2. Remove the PINCH ASSY shown in the Fig. 2-17.

### (Installation)

1. Insert Part (A) of the PINCH ASSY shown in the Fig. 2-17 in the most external groove of the MAIN CAM.
2. Install the PINCH ARM CAP matching the Part (B) of the PINCH ARM CAP with the Rib of the MAIN PLATE ASSY.

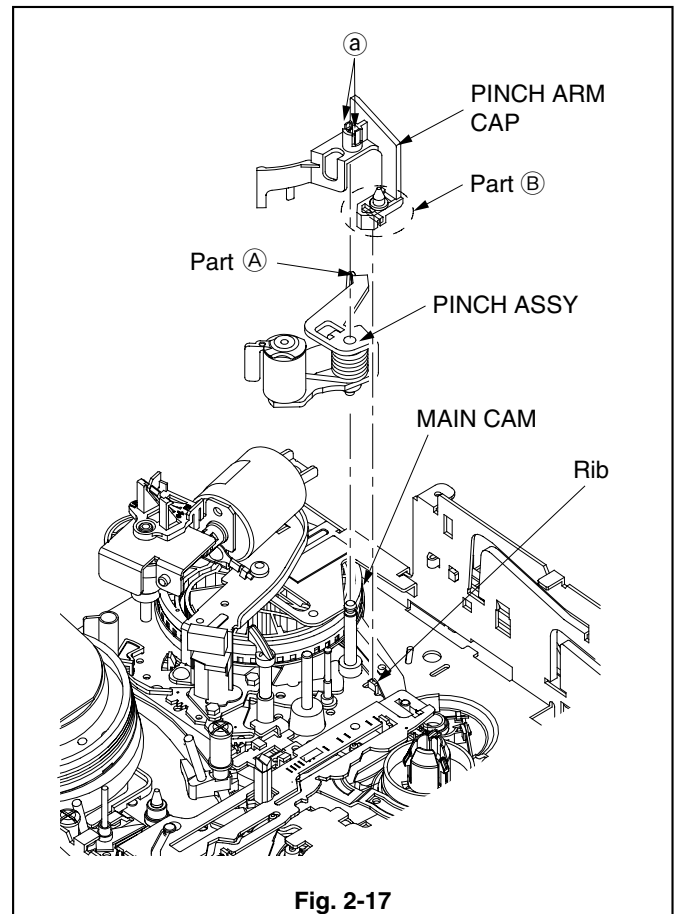


Fig. 2-17

## 2-18. F/L PLATE, DOOR ARM

**SET POSITION :** Normal

Remove the following parts before replacing the F/L PLATE, DOOR ARM. Refer to the corresponding items to install them.

- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)
- SENSOR COVER (TU) (Item 2-10)
- MOTOR HOLDER (Item 2-16)
- PINCH ARM CAP (Item 2-17)
- PINCH ASSY (Item 2-17)

### (Removal)

1. Slightly lift the back of the F/L PLATE (MAIN CAM side) shown in the Fig. 2-18-1 to remove the F/L PLATE.
2. Remove the DOOR ARM.

### (Installation)

1. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the points on the new F/L PLATE specified in the Fig. 2-18-1.
2. Apply GREASE (MOLYKOTE G PASTE) [859D055O50] to the points on the new F/L PLATE specified in the Fig. 2-18-1.

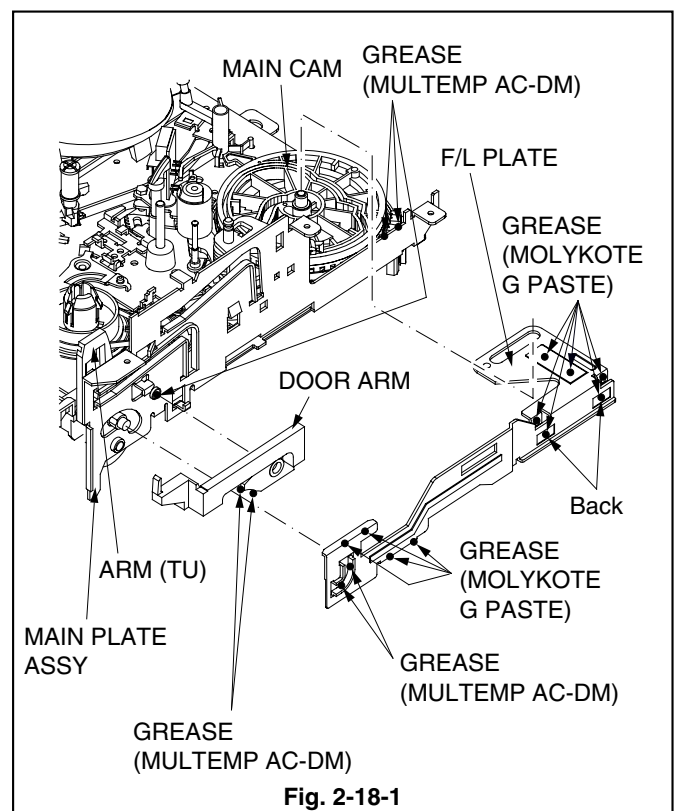


Fig. 2-18-1

3. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the points on the MAIN PLATE ASSY specified in the Fig. 2-18-1.
4. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the points on the DOOR ARM specified in the Fig. 2-18-1.
5. Install the DOOR ARM.
6. Match the Hole in the MAIN CAM with the Hole in the MAIN PLATE ASSY shown in the Fig. 2-18-2.
7. Install the F/L PLATE shown in the Fig. 2-18-1 from the front side (ARM (TU) side).
8. Insert the Boss of the F/L PLATE shown in the Fig. 2-18-2 into the Groove of the MAIN CAM.

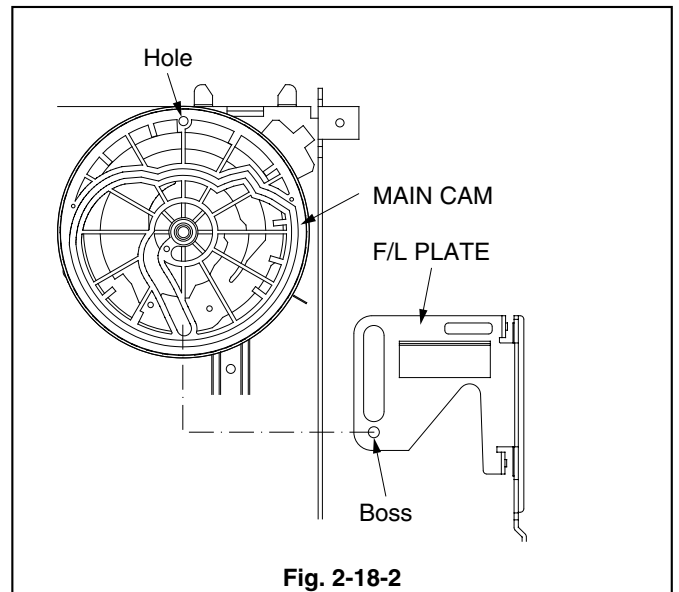


Fig. 2-18-2

## 2-19. BRAKE CAM PLATE

**SET POSITION :** Normal

Remove the following parts before replacing the BRAKE CAM PLATE. Refer to the corresponding items to install them.

- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)
- MOTOR HOLDER (Item 2-16)
- PINCH ARM CAP (Item 2-17)
- PINCH ASSY (Item 2-17)

### (Removal)

1. Rotate the MAIN CAM in the Fig. 2-19-1 in the direction shown by the arrow (A). And move the BRAKE CAM PLATE so that the three catches (a) of the MAIN PLATE ASSY can be released.
2. Remove the BRAKE CAM PLATE.

### (Installation)

1. Apply GREASE (MOLYKOTE G PASTE) [859D055O50] to the points on the BRAKE CAM PLATE specified in the Fig. 2-19-2.
2. Hook the BRAKE SPRING shown in the Fig. 2-19-3 to the catch of the BRAKE (TU).
3. Install the BRAKE CAM PLATE, inserting the six Guide Pins (b) shown in the Fig. 2-19-1 into the slits of the BRAKE CAM PLATE.
4. Move the BRAKE SPRING in the Fig. 2-19-3 in the direction of the arrow (C) to release the Catch of the BRAKE (TU) and insert the BRAKE SPRING under the Catch.
5. Rotate the MAIN CAM shown in the Fig. 2-19-1 in the direction shown of the arrow (B). And move the BRAKE CAM PLATE to hook it to the three catches (a) of the MAIN PLATE ASSY.

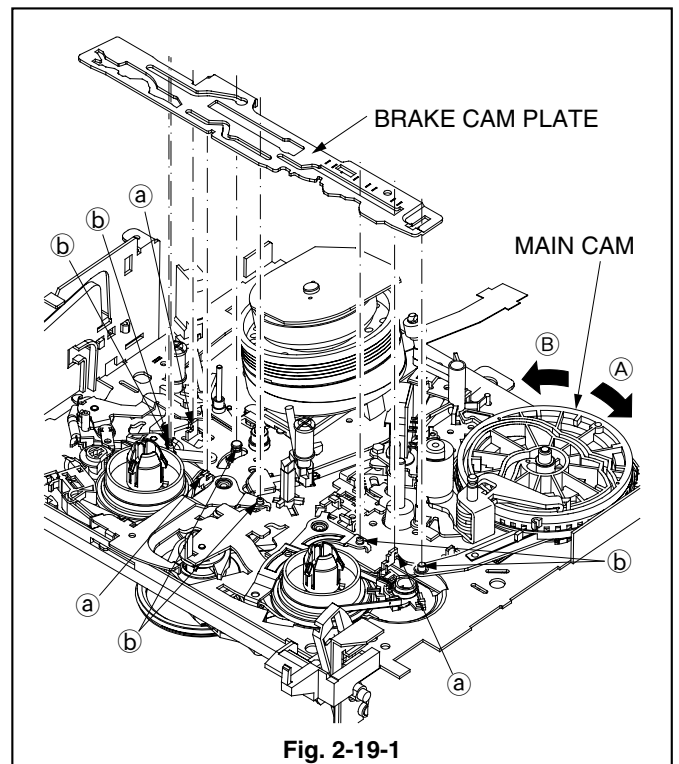


Fig. 2-19-1

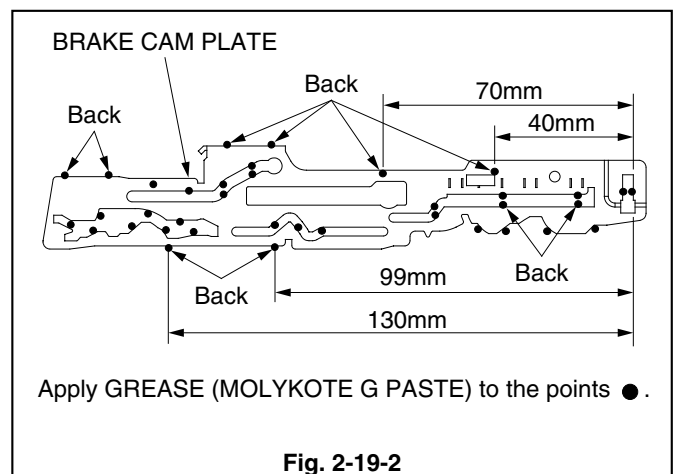
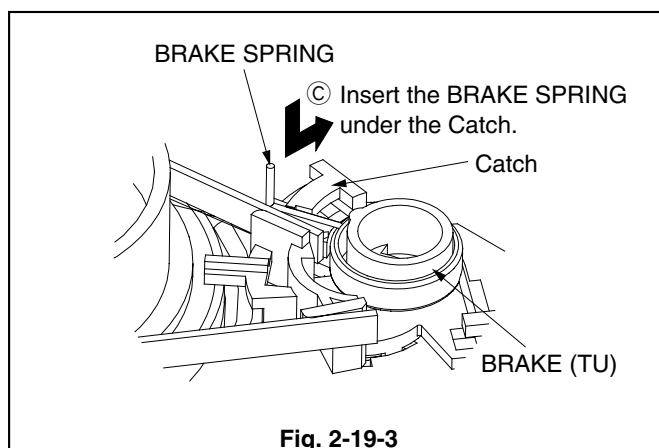


Fig. 2-19-2



## 2-20. GUIDE LAMP

### SET POSITION : Normal

Remove the following parts before replacing the GUIDE LAMP. Refer to the corresponding items to install them.

- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)
- MOTOR HOLDER (Item 2-16)
- PINCH ARM CAP (Item 2-17)
- PINCH ASSY (Item 2-17)
- BRAKE CAM PLATE (Item 2-19)

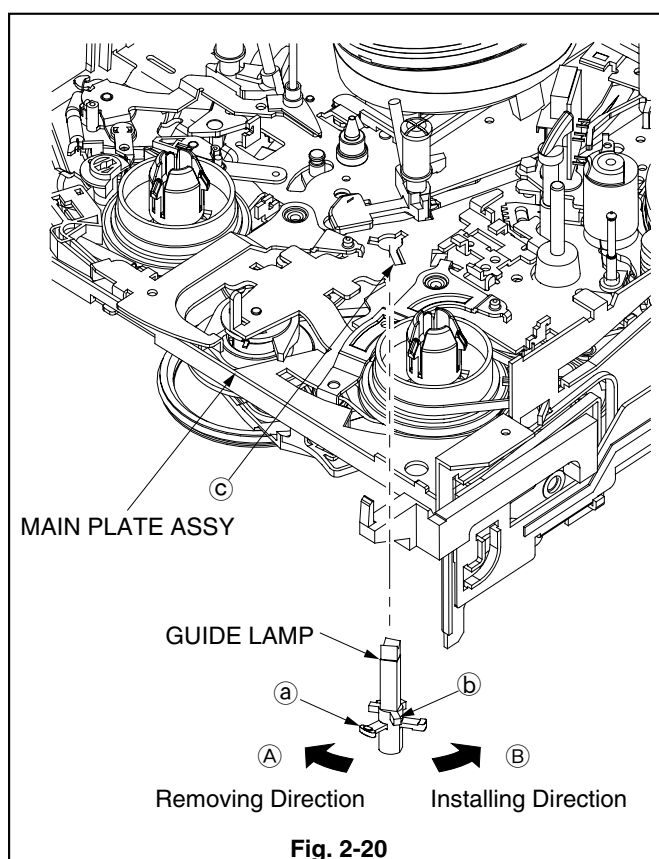
### (Removal)

1. Release the catch (Ⓐ) of the GUIDE LAMP shown in the Fig. 2-20.
2. Rotate the GUIDE LAMP in the direction shown by the arrow Ⓐ (counterclockwise, when viewed from the bottom) to match the longest slit (Ⓒ) of the MAIN PLATE ASSY with the longest arm (Ⓑ) of the GUIDE LAMP shown in the Fig. 2-20. Pull it out downward to remove it.

### (Installation)

1. Clean the dirt on the GUIDE LAMP with a VIDEO HEAD cleaning cloth.
- Note:** Never use solvent such as alcohol to clean the GUIDE LAMP.
2. Insert the GUIDE LAMP in the Fig. 2-20, matching the longest arm (Ⓑ) of the GUIDE LAMP with the longest slit (Ⓒ) of the MAIN PLATE ASSY.
  3. Rotate the GUIDE LAMP in the direction shown by the arrow Ⓑ (clockwise, when viewed from the bottom) to match the arm (Ⓐ) of the GUIDE LAMP shown in the Fig. 2-20 with the longest slit (Ⓒ) of the MAIN PLATE ASSY.

**Note :** Clean the dirt on the GUIDE LAMP with a VIDEO HEAD cleaning cloth if necessary.



## 2-21.MAIN CAM, GUIDE ARM (TU), BRAKE LEVER, LB PIN

**SET POSITION** : Normal

Remove the following parts before replacing the MAIN CAM, GUIDE ARM (TU), BRAKE LEVER. Refer to the corresponding items to install them.

- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)
- SENSOR COVER (TU) (Item 2-10)
- MOTOR HOLDER (Item 2-16)
- WORM WHEEL (Item 2-16)
- PINCH ARM CAP (Item 2-17)
- PINCH ASSY (Item 2-17)
- F/L PLATE (Item 2-18)

### (Removal)

1. Remove the MAIN CAM shown in the Fig. 2-21-1.
2. Remove the GUIDE ARM (TU) shown in the Fig. 2-21-1.
3. Move the BRAKE LEVER in the Fig. 2-21-1 in the direction shown by the arrow (A) and release the catch (a) to remove the BRAKE LEVER.
4. Remove the LB PIN shown in the Fig. 2-21-1.

### (Installation)

1. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the points on the new GUIDE ARM (TU) specified in the Fig. 2-21-1.
2. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the points on the MAIN PLATE ASSY specified in the Fig. 2-21-1.
3. Install the GUIDE ARM (TU), matching the Hole in the GUIDE ARM (TU) shown in the Fig. 2-21-2 with the Hole in the MAIN PLATE ASSY.

**Note** : Install the GUIDE ARM (TU) so that the Part specified with the Oblique Lines of the GUIDE ARM (TU) will be under the SHAFT FLANGE of the PINCH ASSY.

4. Install the BRAKE LEVER shown in the Fig. 2-21-2 so that the Hole in the BRAKE LEVER overlaps the Hole in the MAIN PLATE ASSY.
5. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the points on the new MAIN CAM specified in the Fig. 2-21-3.
6. Install the MAIN CAM so that the Hole in the MAIN CAM shown in the Fig. 2-21-2 overlaps with the Hole in the MAIN PLATE ASSY.

**Note** : Install the MAIN CAM inserting the Pins of the CAPSTAN BRAKE ASSY, GUIDE ARM (TU), BRAKE LEVER into the Grooves on the back of the MAIN CAM for sure.

Be careful that GREASE does not adhere on the Wall when applying GREASE to the most external circle on the back of the MAIN CAM (4 parts) shown in the Fig. 2-21-3.

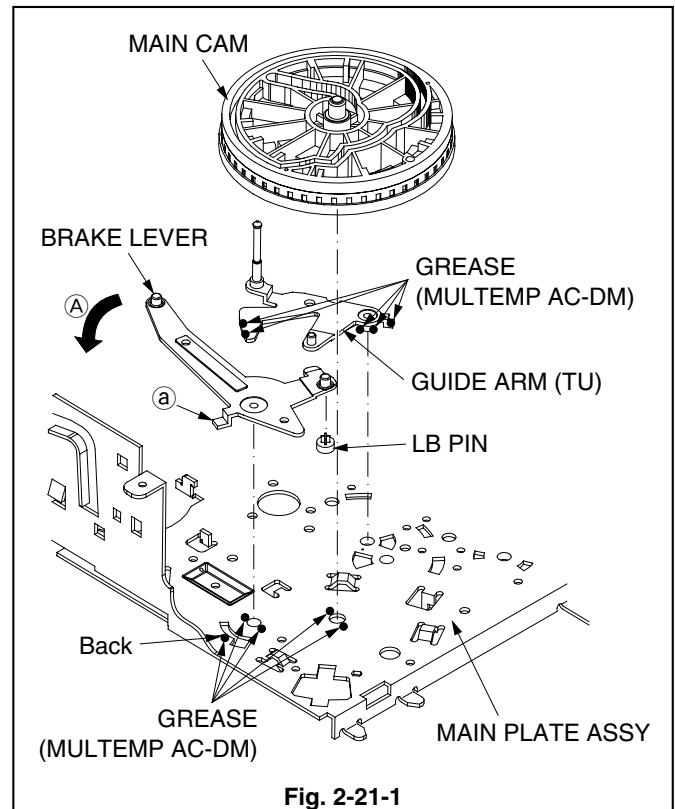


Fig. 2-21-1

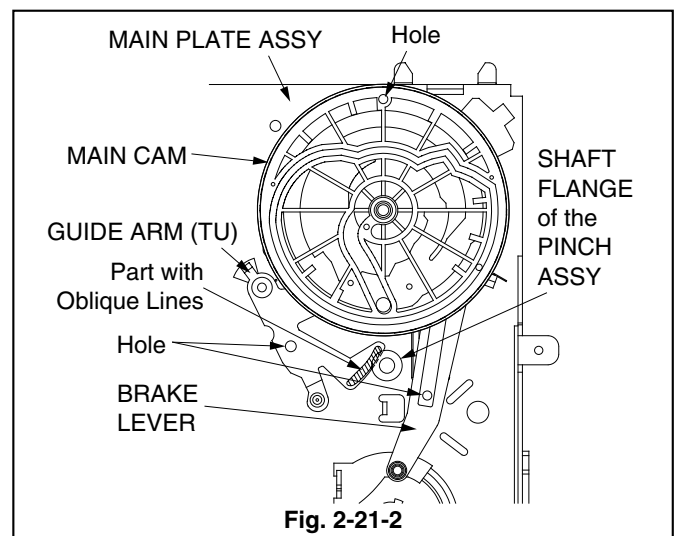


Fig. 2-21-2

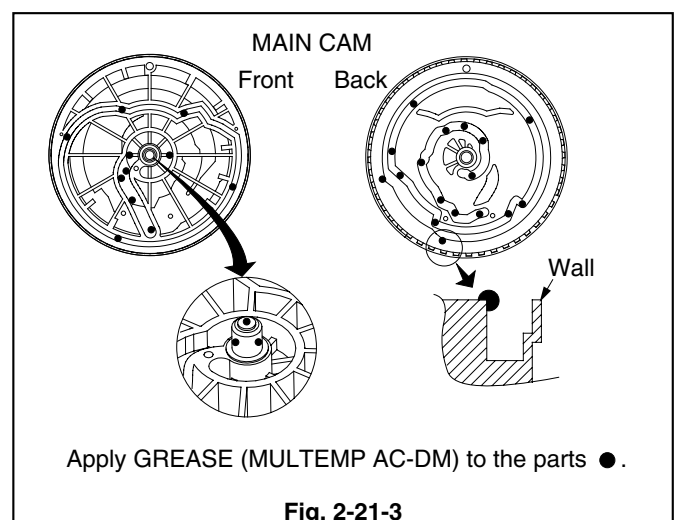


Fig. 2-21-3

## 2-22. L/D LOCK LEVER

**SET POSITION :** Normal

Remove the following parts before replacing the L/D LOCK LEVER. Refer to the corresponding items to install them.

- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)
- MOTOR HOLDER (Item 2-16)
- PINCH ARM CAP (Item 2-17)
- PINCH ASSY (Item 2-17)
- BRAKE CAM PLATE (Item 2-19)

### (Removal)

1. Remove the L/D LOCK LEVER shown in the Fig. 2-22.

### (Installation)

1. Install the L/D LOCK LEVER shown in Fig. 2-22.

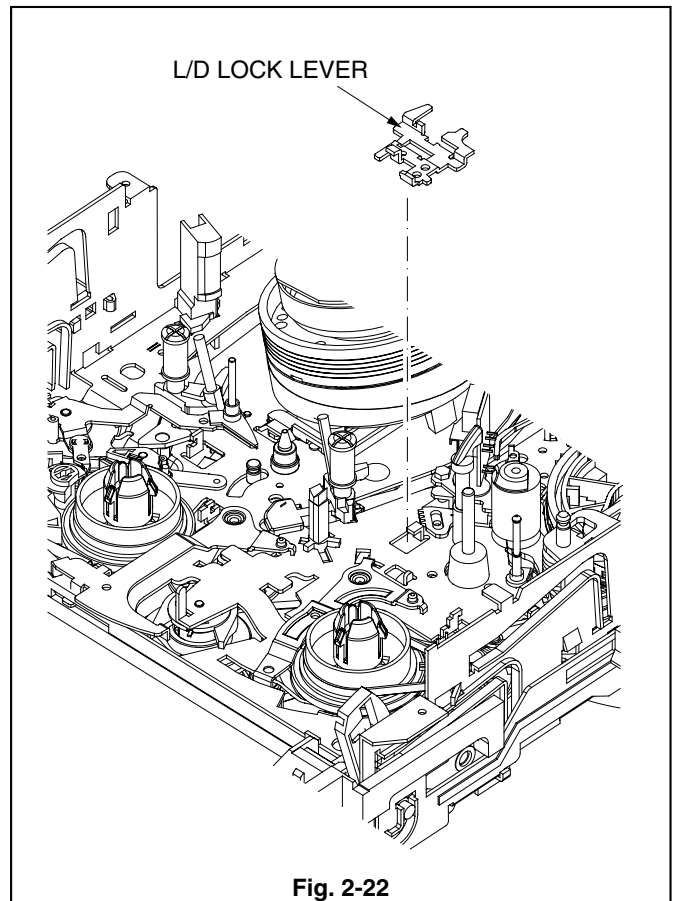


Fig. 2-22

## 2-23. BRAKE BELT (SP), BELT HOLDER

**SET POSITION :** Normal

Remove the following parts before replacing the BRAKE BELT (SP), BELT HOLDER. Refer to the corresponding items to install them.

- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)

### (Removal)

1. Lift the BRAKE BELT (SP) shown in the Fig. 2-23 to remove it from the REEL DISK (SP side).
2. Release the BRAKE BELT (SP) from the catch (a) of the BELT LEVER shown in the Fig. 2-23.
3. Release the two catches (b) of the BELT HOLDER shown in the Fig. 2-23 and separate the BELT HOLDER from the BRAKE BELT (SP).
4. Release the catch (c) of the BELT HOLDER shown in the Fig. 2-23 to remove the BRAKE BELT (SP).

### (Installation)

**Note :** Install the BRAKE BELT (SP) so that its Felt Side touches the REEL DISK (SP side). GREASE applied to the BRAKE CAM PLATE and MAIN PLATE ASSY should not adhere on the Felt Side of the BRAKE BELT (SP).

1. Install the BRAKE BELT (SP) shown in the Fig. 2-23 to the catch (c) of the BELT HOLDER.
2. Install the BELT HOLDER shown in the Fig. 2-23.
3. Install the BRAKE BELT (SP) shown in the Fig. 2-23 to the catch (a) of the BELT LEVER.
4. Hook the BRAKE BELT (SP) shown in the Fig. 2-23 to the REEL DISK (SP side).

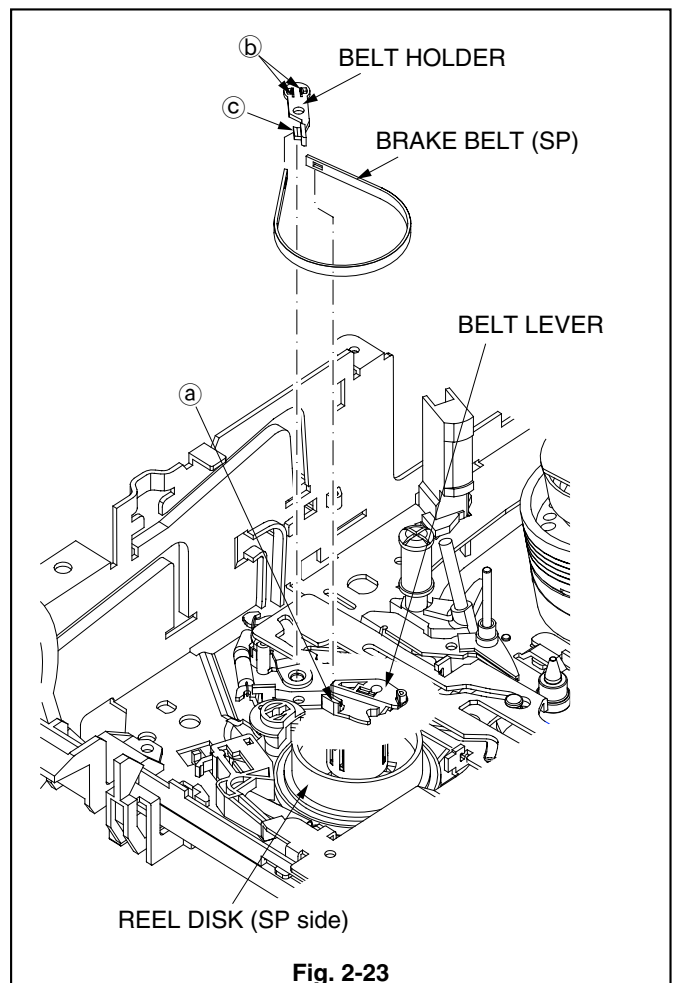


Fig. 2-23

## 2-24. BELT LEVER, BELT ADJUSTER

**SET POSITION :** Normal

Remove the following parts before replacing the BELT LEVER, BELT ADJUSTER. Refer to the corresponding items to install them.

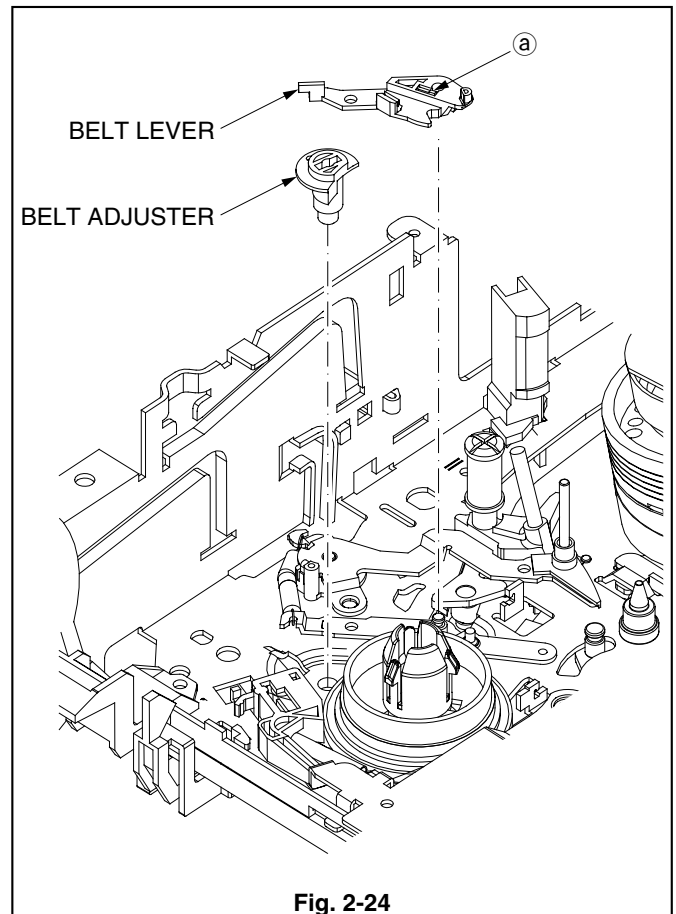
- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)
- MOTOR HOLDER (Item 2-16)
- PINCH ARM CAP (Item 2-17)
- PINCH ASSY (Item 2-17)
- BRAKE CAM PLATE (Item 2-19)
- BRAKE BELT (SP) (Item 2-23)
- BELT HOLDER (Item 2-23)

### (Removal)

1. Release the catch (Ⓐ) of the BELT LEVER shown in the Fig. 2-24 to remove the BELT LEVER.
2. Remove the BELT ADJUSTER shown in the Fig. 2-24.

### (Installation)

1. Install the BELT ADJUSTER shown in the Fig. 2-24.
2. Install the BELT LEVER shown in the Fig. 2-24.



## 2-25 TENSION ARM, TENSION LEVER, TENSION SPRING, TENS AXIS HOLDER, REEL DISK (SP side)

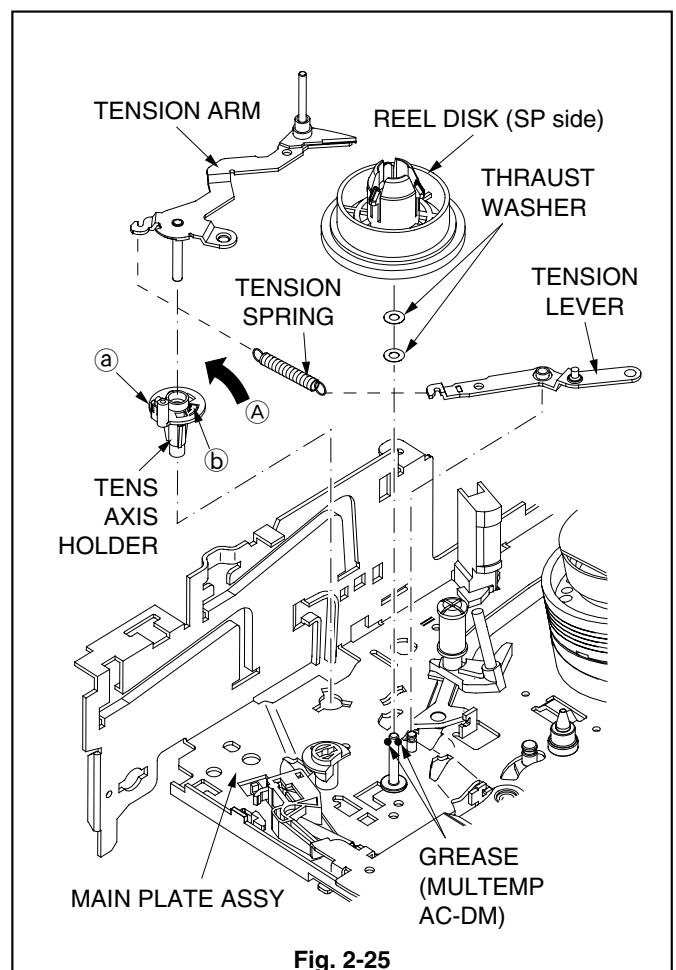
**SET POSITION :** Normal

Remove the following parts before performing this item. Refer to the corresponding items to install them.

- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)
- MOTOR HOLDER (Item 2-16)
- PINCH ARM CAP (Item 2-17)
- PINCH ASSY (Item 2-17)
- BRAKE CAM PLATE (Item 2-19)
- BRAKE BELT (SP) (Item 2-23)
- BELT HOLDER (Item 2-23)
- BELT LEVER (Item 2-24)

### (Removal)

1. Remove the TENSION SPRING shown in the Fig. 2-25.
2. Release the catch (Ⓐ) of the TENS AXIS HOLDER shown in the Fig. 2-25 to remove the TENSION ARM.
3. Remove the TENSION LEVER shown in the Fig. 2-25.
4. Release the catch (Ⓑ) of the TENS AXIS HOLDER shown in the Fig. 2-25. Move the TENS AXIS HOLDER in the direction shown by the arrow Ⓐ to remove it.
5. Remove the REEL DISK (SP side).



### (Installation)

1. Apply OIL (FLOIL 948P) [859D154O20] to the parts on the MAIN PLATE ASSY specified in the Fig. 2-25.
2. Install the REEL DISK (SP side).
3. Install the TENS AXIS HOLDER.

**Note :** Install the TENS AXIS HOLDER so that the catch (a) for the TENSION ARM will be positioned on the front (F/L ARM ASSY side).

4. Install the TENSION LEVER.
5. Install the TENSION ARM.
6. Install the TENSION SPRING.

**Note :** Install the longer hook of the TENSION SPRING to the TENSION ARM.

## 2-26. BRAKE BELT (TU)

**SET POSITION :** Normal

Remove the following parts before replacing the BRAKE BELT. Refer to the corresponding items to install them.

- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)

### (Removal)

1. Lift the BRAKE BELT (TU) shown in the Fig. 2-26 to remove it from the REEL DISK (TU side).
2. Release the two catches (a) of the BRAKE (TU) shown in the Fig. 2-26 to remove the BRAKE BELT (TU).

### (Installation)

1. Install the BRAKE BELT (TU) shown in the Fig. 2-26 to the BRAKE (TU).
2. Hook the BRAKE BELT (TU) shown in the Fig. 2-26 to the REEL DISK (TU side).

**Note :** Install the BRAKE BELT (TU) so that its Felt Side touches the REEL DISK (TU side).

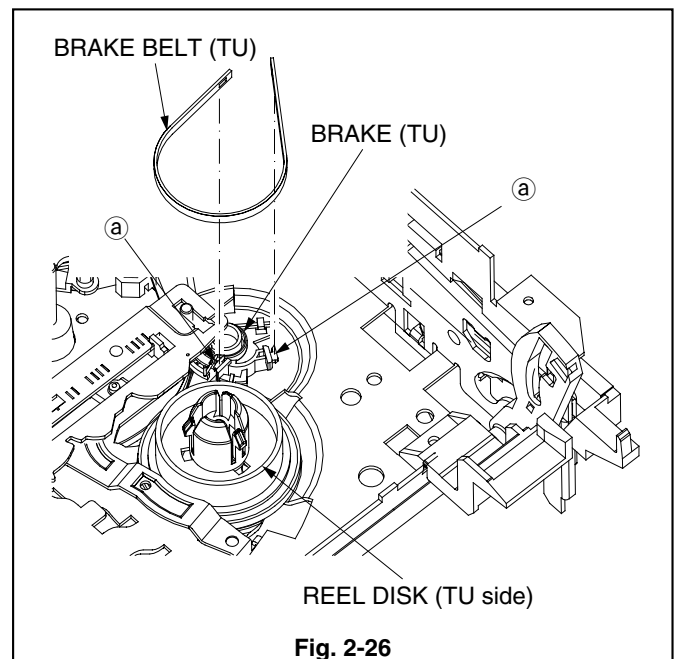


Fig. 2-26

## 2-27. BRAKE (TU), REEL DISK (TU side)

**SET POSITION :** Normal

Remove the following parts before replacing the BRAKE (TU), REEL DISK (TU side). Refer to the corresponding items to install them.

- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)
- MOTOR HOLDER (Item 2-16)
- PINCH ARM CAP (Item 2-17)
- PINCH ASSY (Item 2-17)
- BRAKE CAM PLATE (Item 2-19)

### (Removal)

1. Move the BRAKE (TU) in the Fig. 2-27 in the direction shown by the arrow (A) to remove it.
2. Remove the BRAKE BELT (TU) from the BRAKE (TU).
3. Remove the REEL DISK (TU).

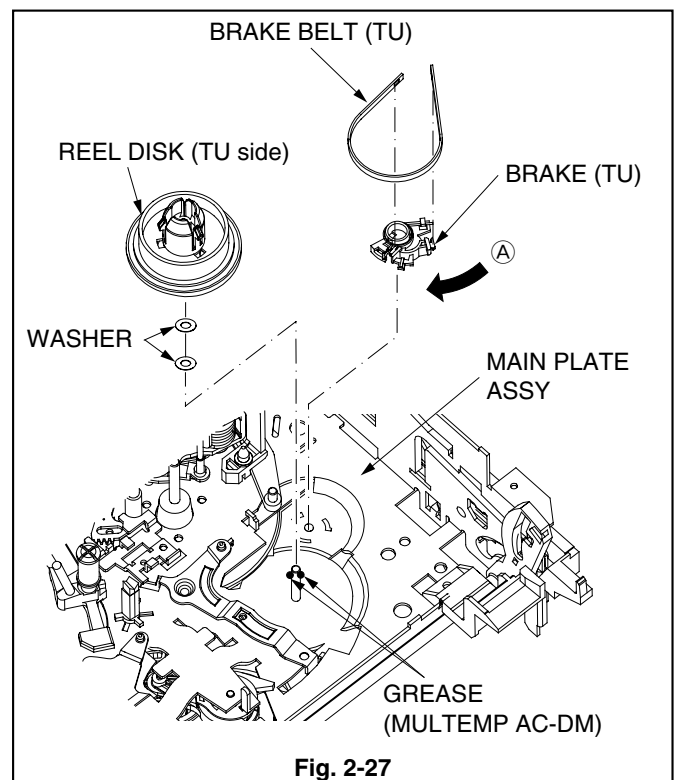


Fig. 2-27

### (Installation)

**Note :** Install the BRAKE BELT (TU) so that its Felt Side touches the REEL DISK (TU side).

The GREASE applied to the BRAKE CAM PLATE and the MAIN PLATE ASSY should not adhere on the Felt Side of the BRAKE BELT (SP).

1. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the parts on the MAIN PLATE ASSY specified in the Fig. 2-27.
2. Install the REEL DISK (TU side).
3. Install the BRAKE BELT (TU) to the BRAKE (TU).
4. Install the BRAKE (TU).
5. Hook the BRAKE BELT (TU) to the REEL DISK (TU side).

## 2-28.SHIFT LEVER

**SET POSITION :** Normal

Remove the following parts before replacing the SHIFT LEVER. Refer to the corresponding items to install them.

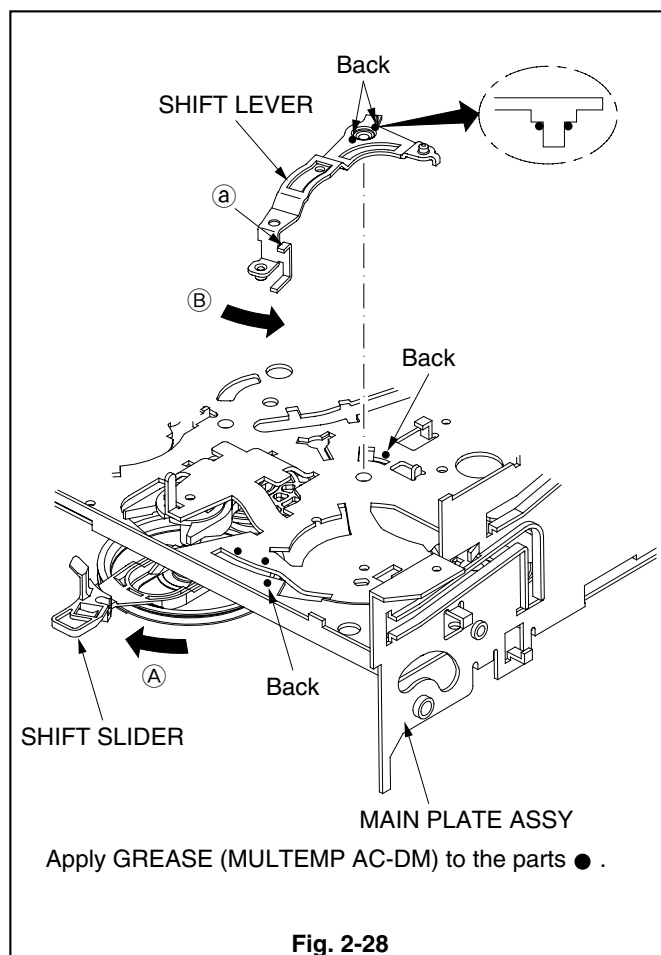
- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)
- MOTOR HOLDER (Item 2-16)
- PINCH ARM CAP (Item 2-17)
- PINCH ASSY (Item 2-17)
- BRAKE CAM PLATE (Item 2-19)
- BRAKE (TU) (Item 2-27)
- REEL DISK (TU side) (Item 2-27)

### (Removal)

1. Move the SHIFT SLIDER in the Fig. 2-28 in the direction shown by the arrow (A) to release it from the SHIFT LEVER.
2. Move the SHIFT LEVER in the Fig. 2-28 in the direction shown by the arrow (B) to remove it.

### (Installation)

1. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the parts on the new SHIFT LEVER specified in the Fig. 2-28.
2. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the parts on the MAIN PLATE ASSY specified in the Fig. 2-28.
3. Install the SHIFT LEVER so that its Part (a) shown in the Fig. 2-28 will be positioned under the MAIN PLATE ASSY.
4. Install the SHIFT SLIDER to the SHIFT LEVER.



## 2-29.CHARGE SPRING, SWING LEVER, CHARGE ASSY

**SET POSITION :** Normal

Remove the following parts before replacing the CHARGE SPRING, SWING LEVER, CHARGE ASSY. Refer to the corresponding items to install them.

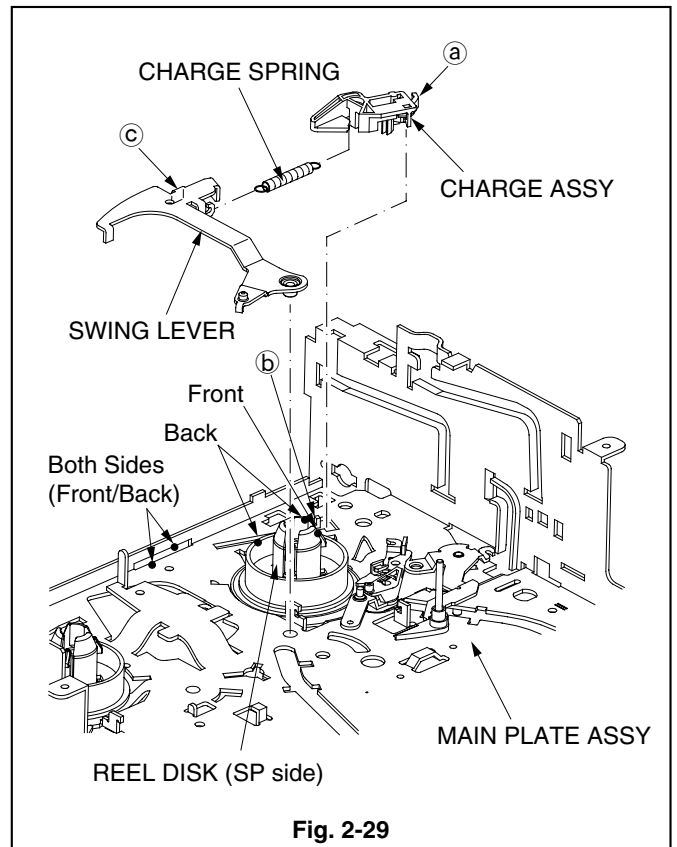
- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)
- MOTOR HOLDER (Item 2-16)
- PINCH ARM CAP (Item 2-17)
- PINCH ASSY (Item 2-17)
- BRAKE CAM PLATE (Item 2-19)

### (Removal)

1. Remove the CHARGE SPRING shown in the Fig. 2-29 from the SWING LEVER.
2. Remove the SWING LEVER shown in the Fig. 2-29.
3. Release the Part ① of the CHARGE ASSY shown in the Fig. 2-29 from the Part ② of the MAIN PLATE ASSY to remove the CHARGE ASSY.

### (Installation)

1. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the parts on the MAIN PLATE ASSY specified in the Fig. 2-29.
2. Install the CHARGE ASSY.
3. Install the SWING LEVER inserting the Part ③ of the SWING LEVER in the Fig. 2-29 into the groove in the MAIN PLATE ASSY.
4. Install the CHARGE SPRING to the SWING LEVER.



## 2-30.LOADING ARM ASSY (SP), LOADING ARM ASSY (TU)

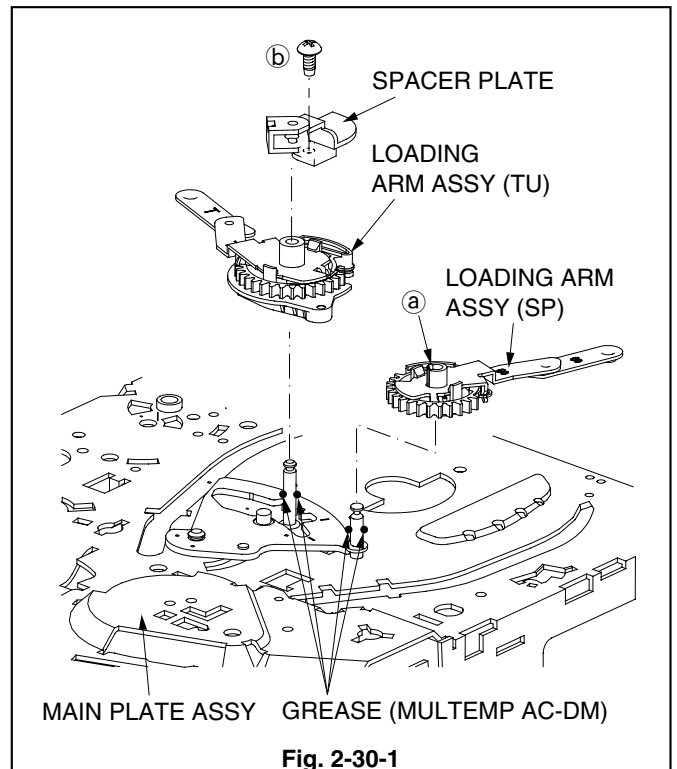
**SET POSITION :** Upside down

### (Removal)

1. Release the catch (①) of the LOADING ARM ASSY (SP) shown in the Fig. 2-30-1 to remove the LOADING ARM ASSY (SP).

**Note :** Be sure to replace the removed LOADING ARM ASSY (SP) with a new one.

2. Remove the screw (②) fastening the SPACER PLATE shown in the Fig. 2-30-1 to remove the SPACER PLATE.
3. Remove the LOADING ARM ASSY (TU) shown in the Fig. 2-30-1.



### (Installation)

1. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the parts on the MAIN PLATE ASSY specified in the Fig. 2-30-1.
2. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the parts on the LOADING ARM ASSY (TU) specified in the Fig. 2-30-2.
3. Install the LOADING ARM ASSY (SP) and LOADING ARM ASSY (TU) so that the Marks on the both UNITS face each other, as shown in the Fig. 2-30-3.

**Note :** Be sure to replace the removed LOADING ARM ASSY (SP) with a new one.

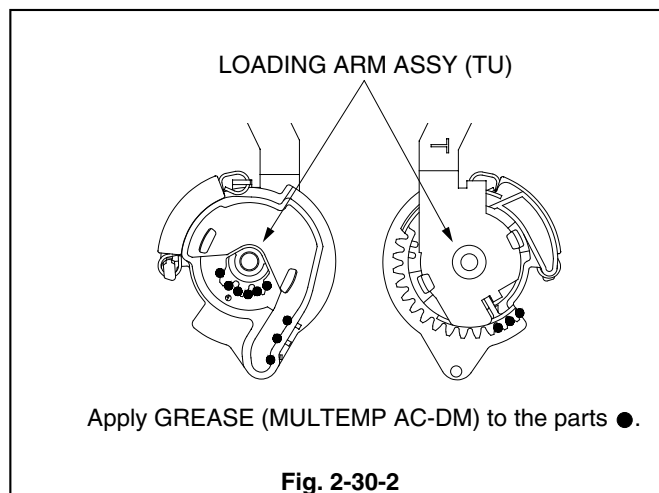


Fig. 2-30-2

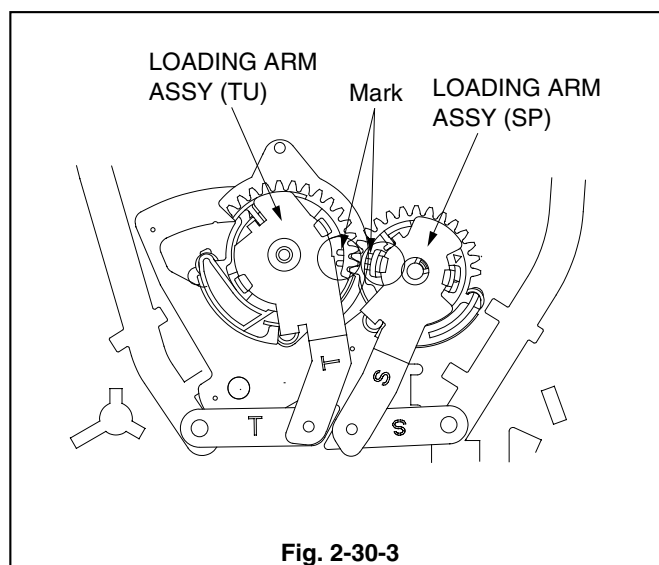


Fig. 2-30-3

## 2-31. A/L LEVER

**SET POSITION:** Upside down

Remove the following parts before replacing the A/L LEVER. Refer to the corresponding items to install them.

- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)
- MOTOR HOLDER (Item 2-16)
- PINCH ARM CAP (Item 2-17)
- PINCH ASSY (Item 2-17)
- BRAKE CAM PLATE (Item 2-19)
- LOADING ARM ASSY (SP) (Item 2-30)
- LOADING ARM ASSY (TU) (Item 2-30)

### (Removal)

1. Remove the CUT WASHER and WASHER shown in the Fig. 2-31-1. Then, remove the A/L LEVER.

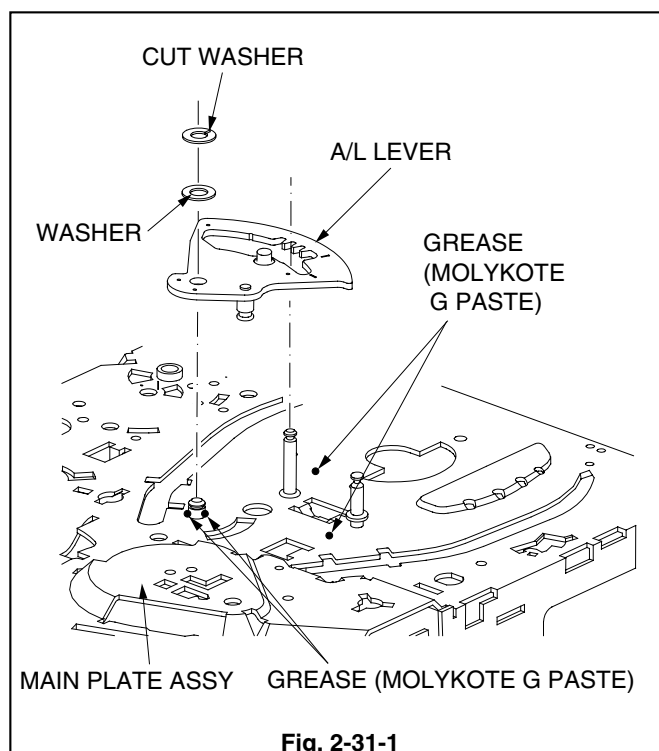


Fig. 2-31-1

## (Installation)

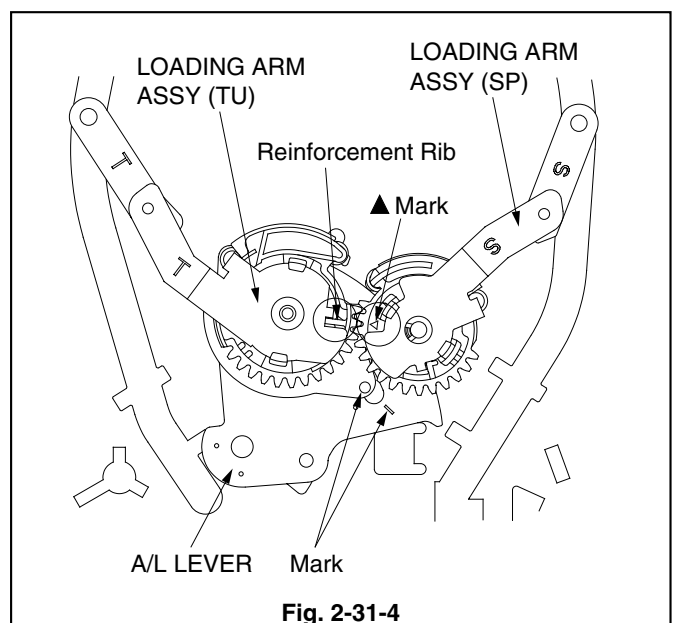
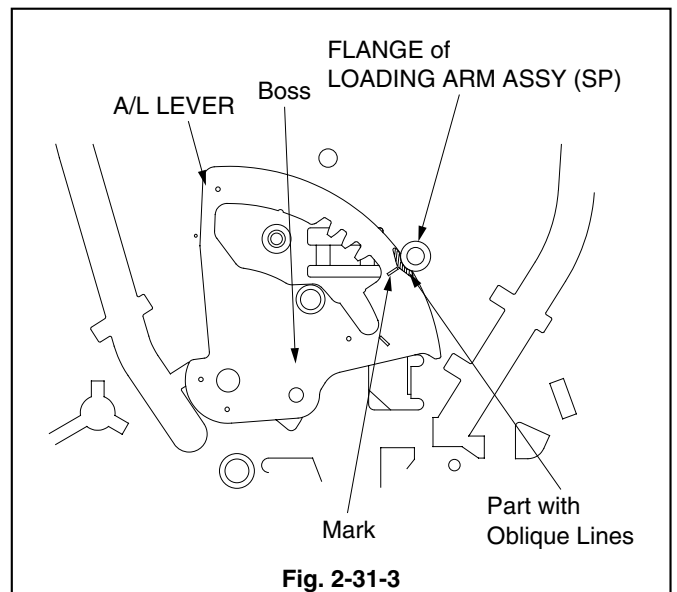
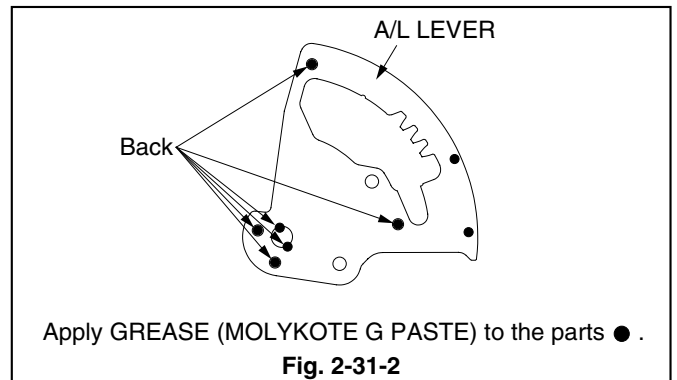
**Note :** Install the LOADING ARM ASSY (TU) and LOADING ARM ASSY (SP), according to the following procedure, after installing the A/L LEVER.

1. Apply GREASE (MOLYKOTE G PASTE) [859D055O50] to the parts on the MAIN PLATE ASSY specified in the Fig. 2-31-1.
2. Apply GREASE (MOLYKOTE G PASTE) [859D055O50] to the parts on the A/L LEVER specified in the Fig. 2-31-2.
3. Install the A/L LEVER so that the Mark on the A/L LEVER faces to the FLANGE of the LOADING ARM ASSY (SP), as shown in the Fig. 2-31-3.

**Note :** The Part specified with Oblique Lines on the A/L LEVER should be under the FLANGE of the LOADING ARM ASSY (SP).

4. Install the LOADING ARM ASSY (TU) so that the Marks on the LOADING ARM ASSY (TU) and on the A/L LEVER will face each other, as shown in the Fig. 2-31-4.
5. Install the LOADING ARM ASSY (SP) so that the ▲ mark on the LOADING ARM ASSY (SP) and the Reinforcement Rib of the LOADING ARM ASSY (TU) will face each other, as shown in the Fig. 2-31-4.

**Note :** Be sure to replace the removed LOADING ARM ASSY (SP) with a new one.



## 2-32. TAPE GUIDE ASSY (SP), TAPE GUIDE ASSY (TU)

**SET POSITION** : Normal

Remove the following parts before replacing the TAPE GUIDE ASSY (SP), (TU). Refer to the corresponding items to install them.

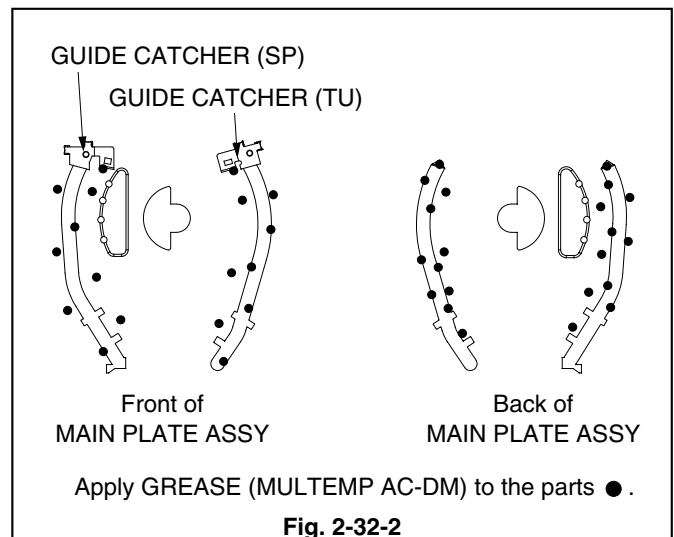
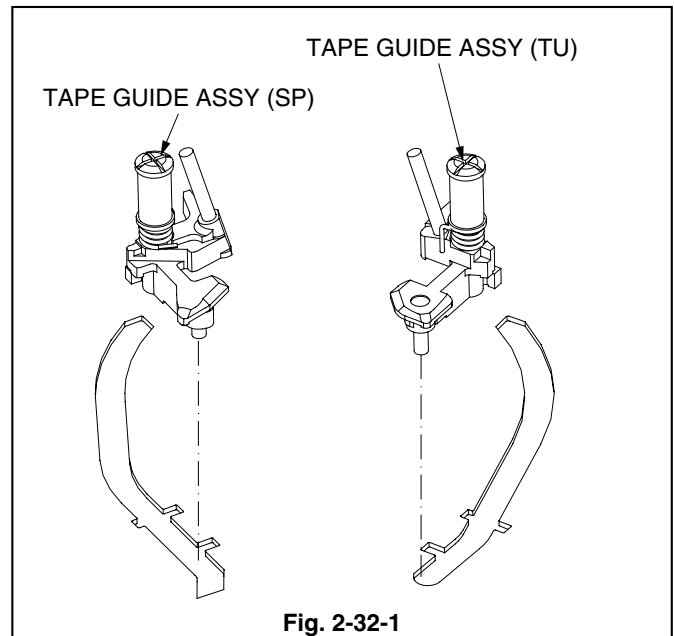
- STAY PLATE (Item 2-2)
- BOTTOM ASSY (Item 2-3)
- MOTOR HOLDER (Item 2-16)
- PINCH ARM CAP (Item 2-17)
- PINCH ASSY (Item 2-17)
- BRAKE CAM PLATE (Item 2-19)
- BRAKE BELT (SP) (Item 2-23)
- BELT HOLDER (Item 2-23)
- BELT LEVER (Item 2-24)
- TENSION ARM (Item 2-25)

### (Removal)

1. Loosen the TAPE GUIDE ASSY (SP) shown in the Fig. 2-32-1 (turn it fully in the Unloading direction) to remove it.
2. Loosen the TAPE GUIDE ASSY (TU) shown in the Fig. 2-32-1 (turn it fully in the Unloading direction) to remove it.

### (Installation)

1. Apply GREASE (MULTEMP AC-DM)[859D055O90] to the parts on the MAIN PLATE ASSY specified in the Fig. 2-32-2.
2. Install the TAPE GUIDE ASSY (SP) shown in the Fig. 2-32-1.
3. Install the TAPE GUIDE ASSY (TU) shown in the Fig. 2-32-1.
4. Perform the Item 3-2-1. "GUIDE ROLLER Check" to the Item 3-2-5. "Flatness Check of FM Waveform" of the "Interchangeability Adjustment of the Mechanism".



## 2-33.DRUM CLAMPER, DRUM ASSY

**SET POSITION :** Normal

### (Removal)

1. Disconnect the LEAD CONNECTOR of the DRUM ASSY shown in the Fig. 2-33-1.
2. Remove the two screws (a, b) fastening the DRUM CLAMPER shown in the Fig. 2-33-1 to remove the DRUM ASSY with the DRUM CLAMPER.
3. Rotate the DRUM CLAMPER in the Fig. 2-33-2 in the direction shown by the arrow (A) to remove it from the DRUM ASSY.

### (Installation)

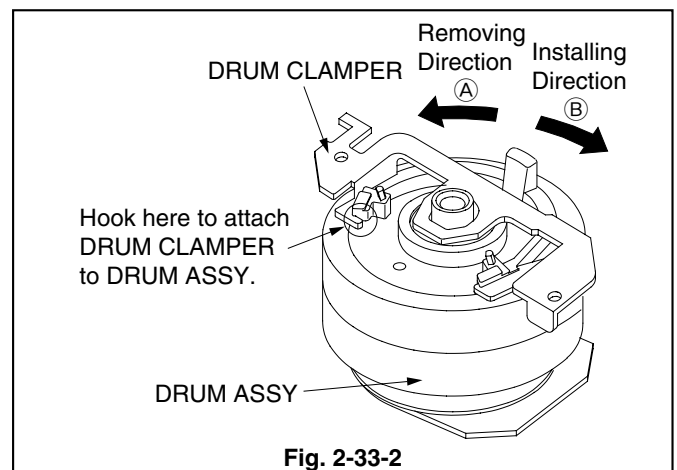
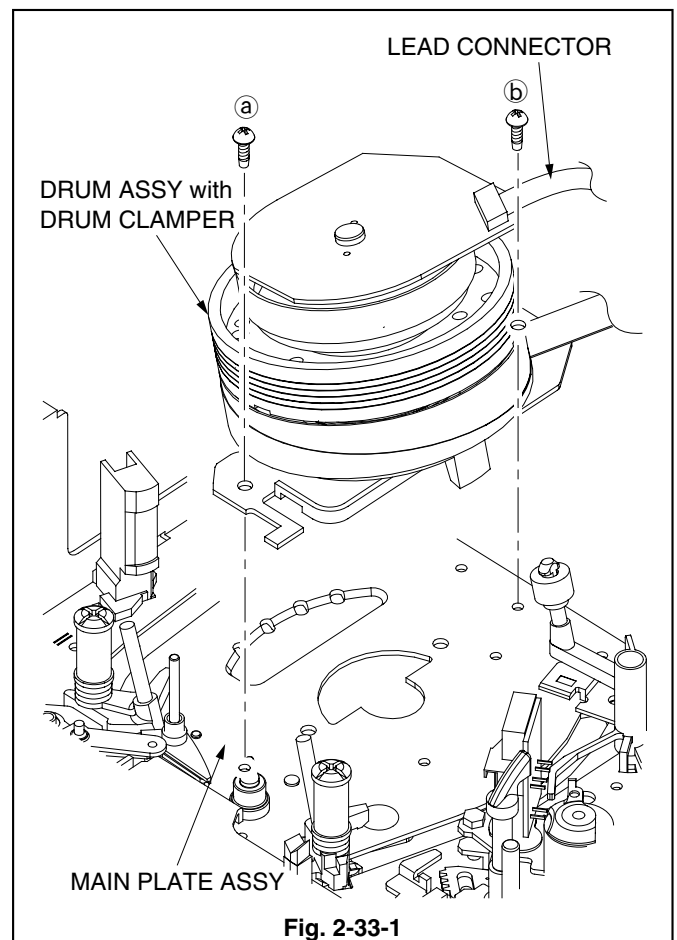
1. Install the DRUM CLAMPER in the Fig. 2-33-2 to the DRUM ASSY by rotating it in the direction shown of the arrow (B).
2. Hook the Catch of the DRUM CLAMPER shown in the Fig. 2-33-3 to the Reference Pin.
3. Fasten the screw (b) while pushing the Part (A) in the direction shown by the arrow (C) (clockwise when viewed from the top) as shown in the Fig. 2-33-3.

**Note :** Confirm at this time that the Catch of the DRUM CLAMPER touches the side of the Reference Pin.

4. Fasten the screw (a) shown in the Fig. 2-33-3.

**Note :** Confirm at this time that the Catch of the DRUM CLAMPER touches the side of the Reference Pin.

5. Connect the LEAD CONNECTOR of the DRUM ASSY with the DRUM CLAMPER shown in the Fig. 2-33-1.
6. Connect the LEAD CONNECTOR of the DRUM ASSY shown in the Fig. 2-33-1.
7. Perform the Item "PLAYBACK Switching Point" of the "Circuit Adjustment" in this service manual.
8. Perform the Item "Interchangeability Adjustment of the Mechanism".
9. Clean the DRUM ASSY shown in the Fig. 2-33-1 with alcohol.



## 2-34.DRUM MOTOR STATOR, BRUSH SPRING, SPACER, ROTOR CASE, END RING, BRUSH, UPPER DRUM ASSY

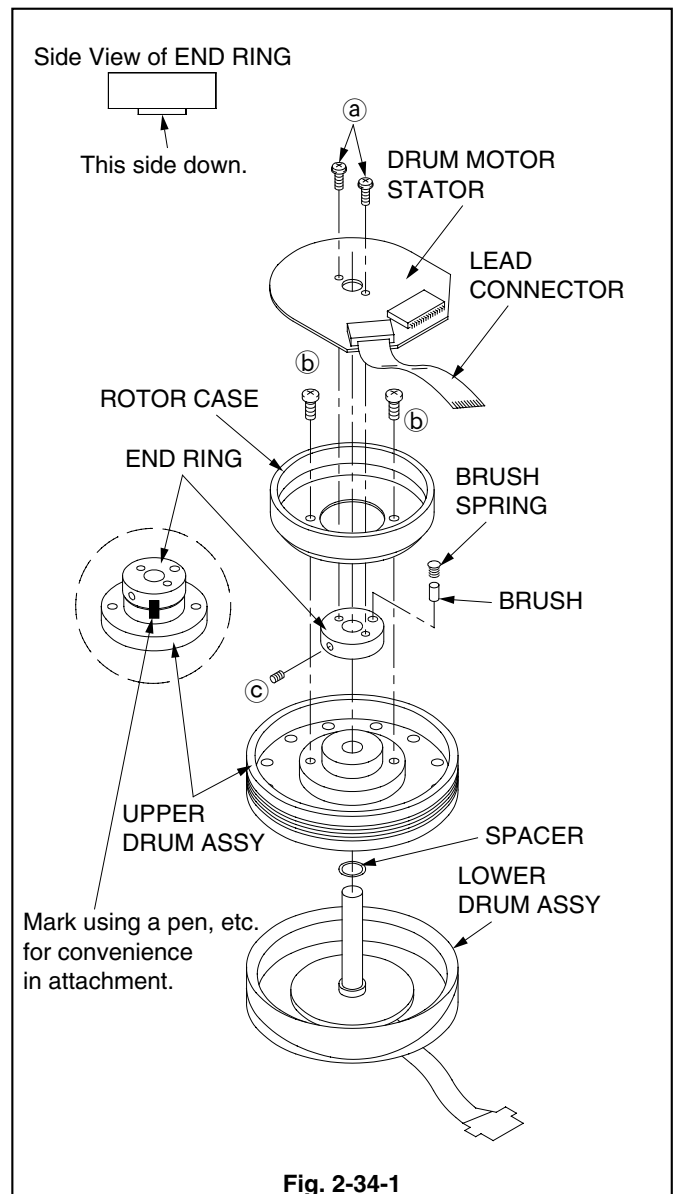
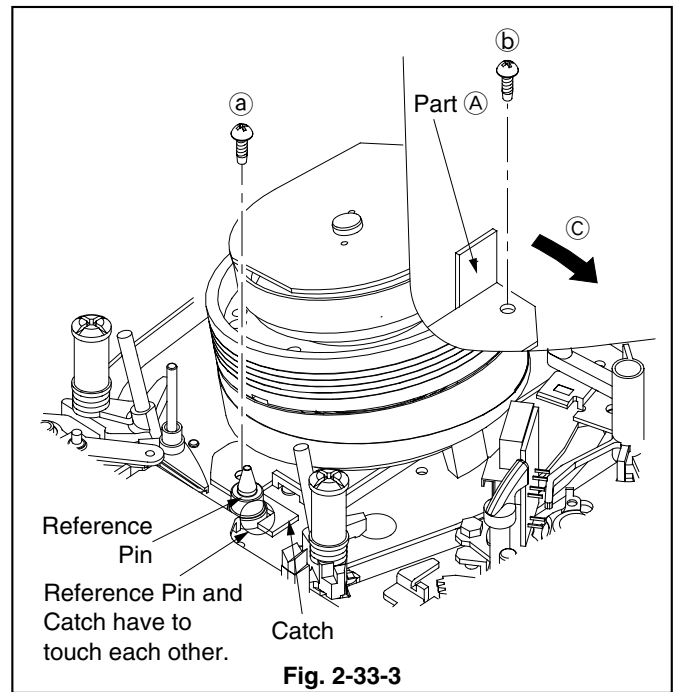
SET POSITION : Normal

### (Removal)

1. Disconnect the LEAD CONNECTOR of the DRUM ASSY shown in the Fig. 2-34-1.
2. Remove the two screws (a) fastening the DRUM MOTOR STATOR shown in the Fig. 2-34-1 to remove the DRUM MOTOR STATOR.
3. Remove the two screws (b) fastening the ROTOR CASE shown in the Fig. 2-34-1 to remove the ROTOR CASE.

**Note :** Mark on the END RING and UPPER DRUM ASSY shown in the Fig. 2-34-1 using a pen, etc. for convenience in installing them.

4. Loosen the hexagon screw (c) fastening the END RING shown in the Fig. 2-34-1 to remove the END RING.
5. Remove the BRUSH SPRING shown in the Fig. 2-34-1.
6. Remove the BRUSH shown in the Fig. 2-34-1.
7. Remove the UPPER DRUM ASSY shown in the Fig. 2-34-1.
8. Remove the SPACER shown in the Fig. 2-34-1.

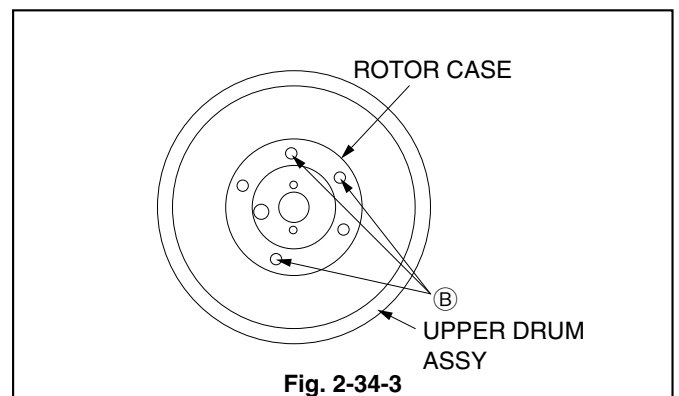
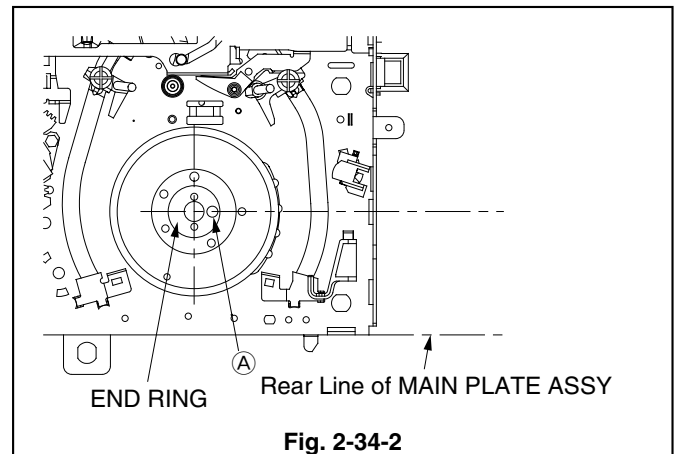


### (Installation)

1. Install the SPACER shown in the Fig. 2-34-1.

**Note :** Be sure to use the new SPACER packed with the new UPPER DRUM ASSY.

2. Install the UPPER DRUM ASSY shown in the Fig. 2-34-1.
3. Install the END RING so that the reference hole (A) of the END RING shown in the Fig. 2-34-2 will be placed in parallel with the Rear Line of the MAIN PLATE ASSY. (The reference hole (A) should be on the right when viewed from the bottom.)
4. Apply the screw-sealing agent to the hexagon screw (C) fastening the END RING shown in the Fig. 2-34-1.
5. Install the ROTOR CASE shown in the Fig. 2-34-3, matching its Holes with the three reference holes (B) of the UPPER DRUM ASSY.
6. Install the BRUSH shown in the Fig. 2-34-1.
7. Install the BRUSH SPRING shown in the Fig. 2-34-1.
8. Install the DRUM MOTOR STATOR shown in the Fig. 2-34-1.
9. Connect the LEAD CONNECTOR of the DRUM ASSY shown in the Fig. 2-34-1.
10. Perform the Item "PLAYBACK Switching Point" adjustment.
11. Perform the Item "Interchangeability Adjustment of the Mechanism".
12. Clean the DRUM ASSY with alcohol.



## 2-35. CAPSTAN MOTOR

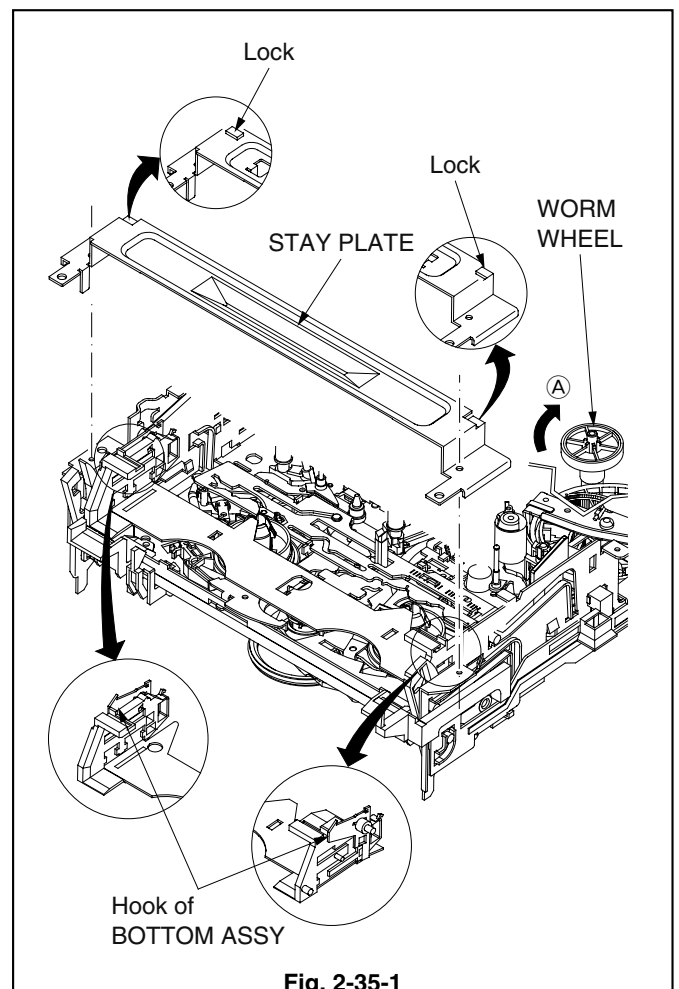
**SET POSITION :** Normal

Remove the following part before replacing the CAPSTAN MOTOR. Refer to the corresponding item to install it.

- REEL BELT (Item 2-14.)

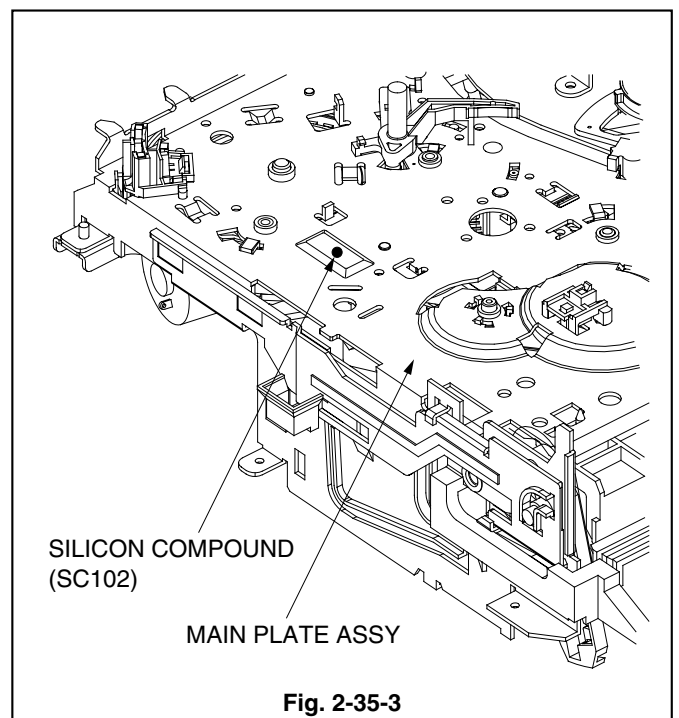
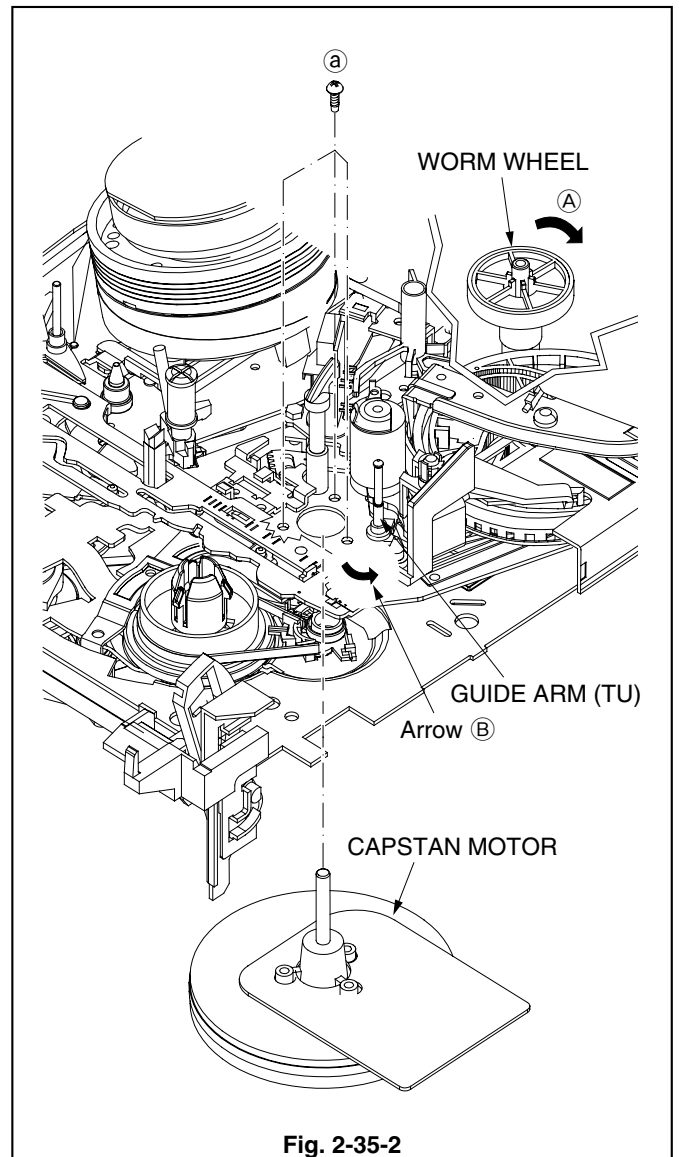
### (Removal)

1. Rotate the WORM WHEEL in the Fig. 2-35-1 in the direction shown by the arrow (A) to release the Hooks of the BOTTOM ASSY from the Locks of the STAY PLATE.
2. Rotate the WORM WHEEL in the Fig. 2-35-2 in the direction shown by the arrow (A) so that the GUIDE ARM (TU) moves in the direction of arrow (B) and expose the three screws (a) fastening the CAPSTAN MOTOR.
3. Remove the three screws (a) fastening the CAPSTAN MOTOR shown in the Fig. 2-35-2 to remove the CAPSTAN MOTOR.



**(Installation)**

1. Apply SILICON COMPOUND (SC102) [859D164O10] to the parts on the MAIN PLATE ASSY specified in the Fig. 2-35-3.
2. Install the CAPSTAN MOTOR.



## 2-36.IMPEDANCE UNIT (SP), FLYWHEEL (SP)

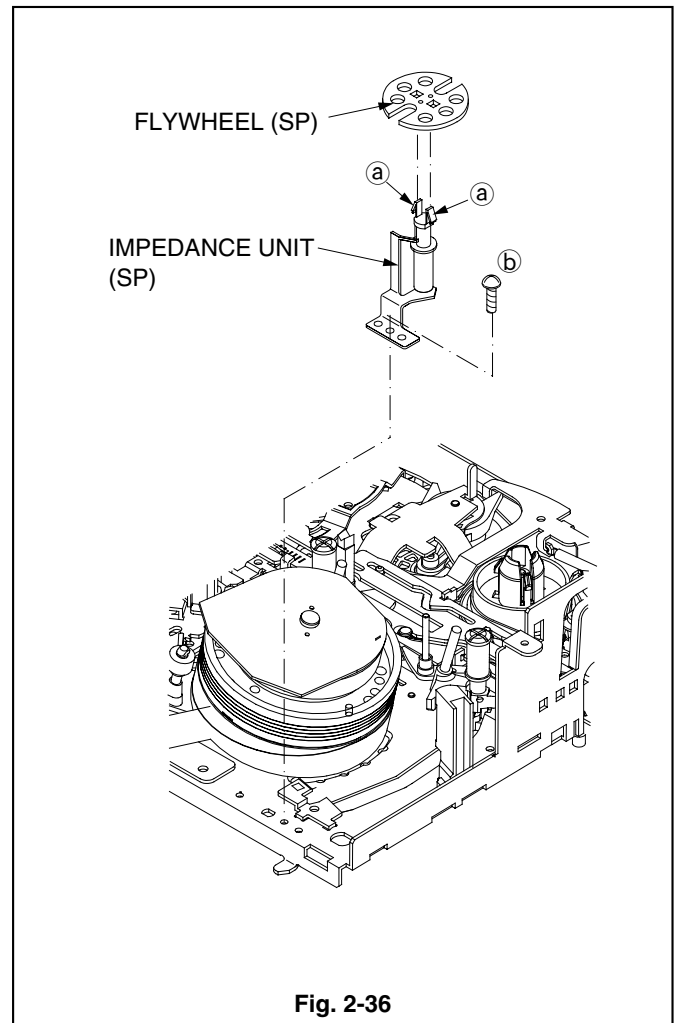
**SET POSITION :** Normal

### (Removal)

1. Unfasten the two catches (a) on the IMPEDANCE UNIT (SP) shown in Fig. 2-36, and remove the FLYWHEEL (SP).
2. Remove the screw (b) on the IMPEDANCE UNIT (SP) shown in Fig. 2-36, and remove the IMPEDANCE UNIT (SP).

### (Installation)

1. Install the IMPEDANCE UNIT (SP) shown in Fig. 2-36.
2. Install the FLYWHEEL (SP) shown in Fig. 2-36.



**Fig. 2-36**

## 2-37.SSW HOLDER, SSW SLIDER

**SET POSITION :** Upside down

To access the SSW UNIT, remove the following parts :

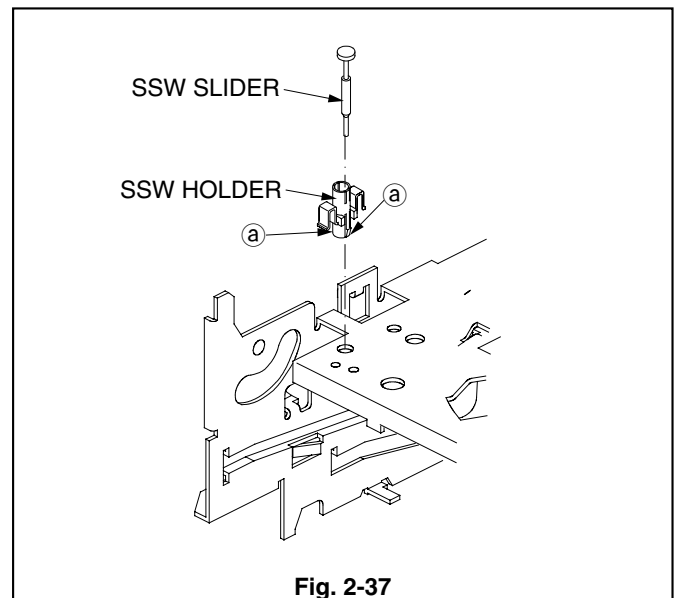
- STAY PLATE (Para. 2-2)
- BOTTOM ASSY (Para. 2-3)

### (Removal)

1. Remove the SSW SLIDER shown in the Fig. 2-37 .
2. Unfasten the two catches (a) shown in Fig. 2-37, and remove the SSW HOLDER.

### (Installation)

1. Install the SSW HOLDER shown in Fig. 2-37.
2. Install the SSW SLIDER shown in Fig. 2-37.



**Fig. 2-37**

### 3. Interchangeability Adjustment of the Mechanism

**Note 1 :** Tracking may need to be preset during interchangeability adjustment of the mechanism. Digital tracking is preset by short circuiting TP5A and TP5B on the PCB-MAIN.

**Note 2 :** The adjustments are performed in the PLAYBACK mode, using the staircase signal of an alignment tape, unless otherwise specified. Connect an oscilloscope to TP2A and externally trigger from TP2H.

#### 3-1. Adjustment of BACK TENSION and TENSION POLE's Position

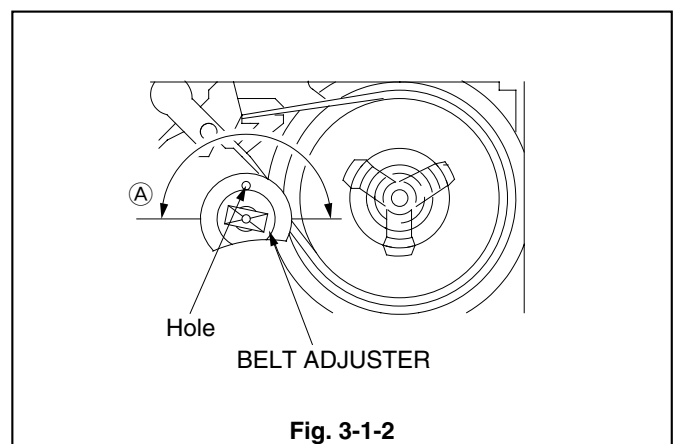
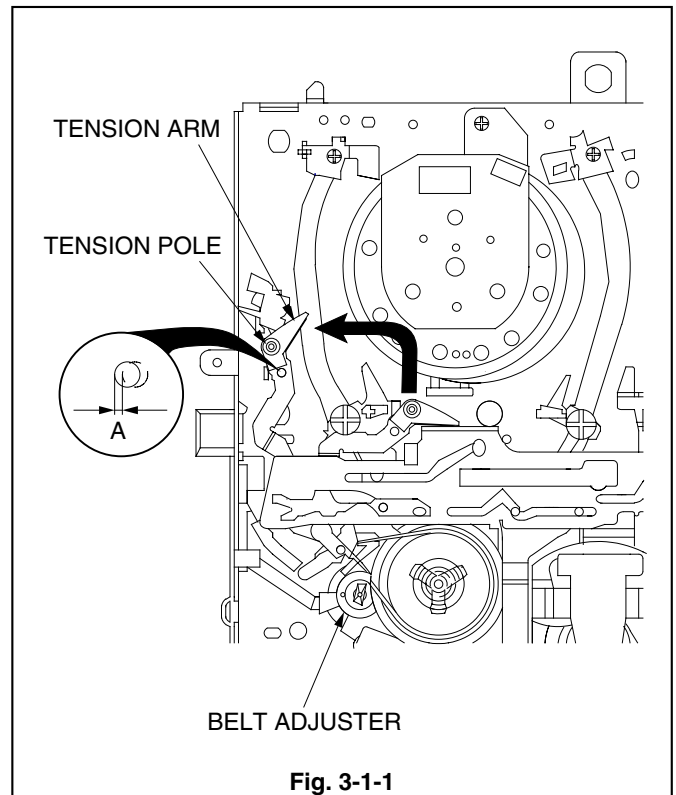
Run a Blank Tape for several minutes to break in the REEL DISKS and the Tape Running System before the adjustment.

1. Play back a dummy Tape.
2. Confirm that "A", the distance between the Holes in the TENSION ARM and the MAIN PLATE ASSY shown in the Fig. 3-1-1, is  $0.6 \pm 0.5\text{mm}$ .
3. If "A" is not  $0.6 \pm 0.5\text{mm}$ , move the Hole in the BELT ADJUSTER in the Fig. 3-1-2 within the range shown by the arrow (A) to set "A" at  $0.6 \pm 0.5\text{mm}$ .
4. Set the BACK TENSION measuring jig (Code: 859C345O80) and play-back the tape.
5. Confirm that "A" shown in the Fig. 3-1-1 is  $0.0 \pm 0.5\text{mm}$ .
6. If "A" is not  $0.0 \pm 0.5\text{mm}$  at step 5, repeat the adjustment from step 1.
7. Confirm that the indicated value of the BACK TENSION measuring jig is within  $55 \pm 6\text{g/cm}$ .

**Note 1 :** Check the indicated value of the BACK TENSION measuring jig when the tape running condition becomes steady.

**Note 2 :** Replace the TENSION SPRING if the indicated value exceeds the specified value.

8. While the tape is running steadily, check visually that the vibration range of the TENSION POLE is 1mm or less. If the vibration range exceeds 1mm, replace the REEL DISK.



## 3-2. Check and Adjustment of the FM Envelope

### 3-2-1. GUIDE ROLLER Adjustment check

1. Play back an alignment tape (NM6KE2 : 859C339O90).
2. Preset the tracking.
3. Confirm that the FM Waveform is flat such as in (A).
4. Perform the Item 3-2-2. "Height Adjustment of GUIDE ROLLER (SP)" if the leading edge (the DRUM entry side) of the FM Waveform is not flat (Waveform (B) or (C)). Perform the Item 3-2-3. "Height Adjustment of GUIDE ROLLER (TU)" if the trailing edge (the DRUM exit side) of the FM Waveform is not flat (Waveform (D) or (E)).

### 3-2-2. Height Adjustment of GUIDE ROLLER (SP)

1. Loosen the height adjustment screw at the top of the GUIDE ROLLER (SP) so that the GUIDE ROLLER (SP) will rotate smoothly.
2. Observe the leading edge (DRUM entry side) of the FM Waveform. If it looks like (B), the GUIDE ROLLER may be set too low. If it looks like (C), the GUIDE ROLLER may be set too high. To adjust it, turn the height adjustment screw at the top of the GUIDE ROLLER (SP) so that the FM Waveform becomes flat such as in (A).
  - Turn the screw counter-clockwise if the position of the GUIDE ROLLER is lower than specified.
  - Turn the screw clockwise if the position of the GUIDE ROLLER is higher than specified.
3. Perform the Item 3-2-4. "Coarse Adjustment of Phase".

### 3-2-3. Height Adjustment of GUIDE ROLLER (TU)

1. Loosen the height adjustment screw at the top of the GUIDE ROLLER (TU) so that the GUIDE ROLLER (TU) will rotate smoothly.
2. Observe the trailing edge (DRUM exit side) of the FM Waveform. If it looks like (D), the GUIDE ROLLER may be set too low. If it looks like (E), the GUIDE ROLLER may be set too high. To adjust it, turn the height adjustment screw at the top of the GUIDE ROLLER (TU) so that the FM Waveform becomes flat as in (A).
  - Turn the screw counter-clockwise if the position of the GUIDE ROLLER is too low.
  - Turn the screw clockwise if the position of the GUIDE ROLLER is too high.
3. Perform the Item 3-2-4. "Coarse Adjustment of Phase".

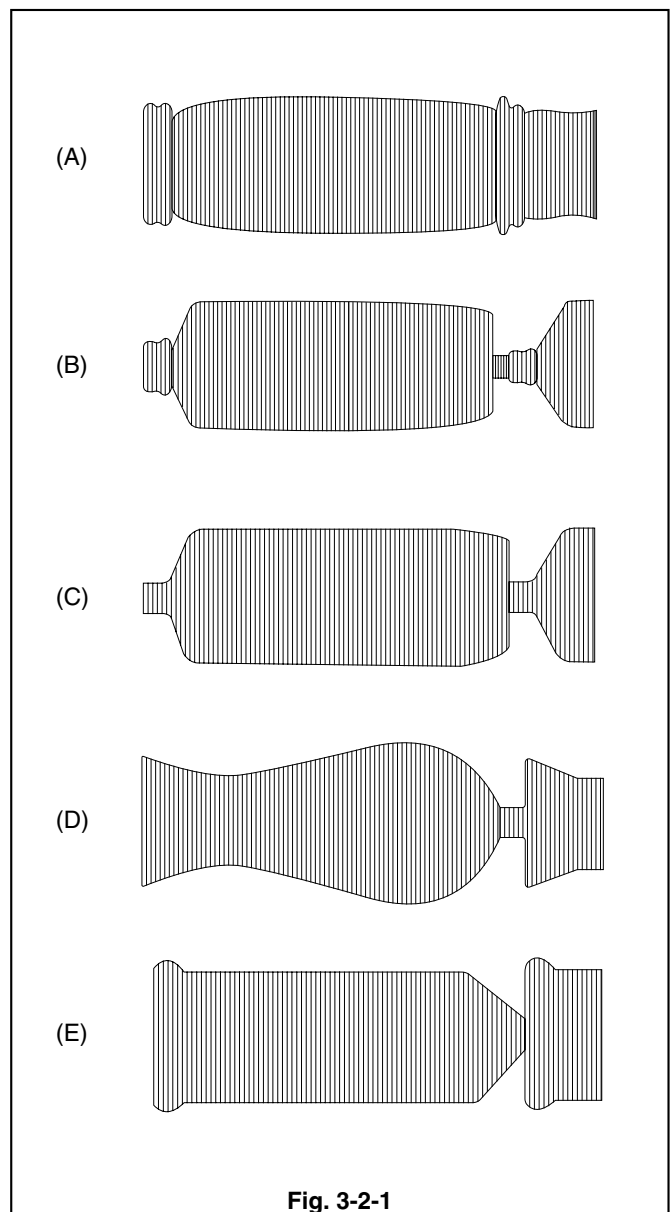


Fig. 3-2-1

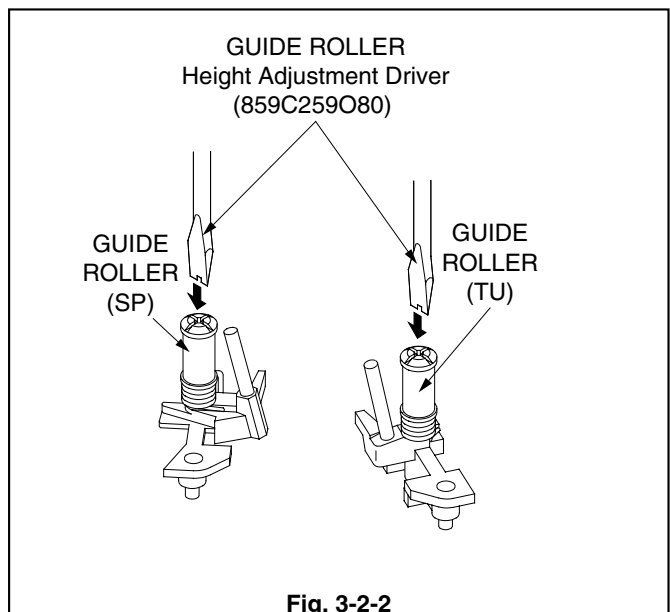


Fig. 3-2-2

### 3-2-4. Coarse Adjustment of Phase

1. Play back an alignment tape (NM6KE2 : 859C339O90).
2. Preset the tracking.
3. Observe the FM Waveform after performing Item 3-2-1. "GUIDE ROLLER Check".
4. If the amplitude level of the FM Waveform is low as in (F) in Fig. 3-2-4, set it at the maximum level as in (G), according to the following procedure. Loosen the Screws D and E and insert a screw driver (+) into the Hole in the MAIN PLATE ASSY (Part A). Then, move the A/C PLATE to the right and left to set the amplitude level to maximum.
5. Tighten the Screws D and E.

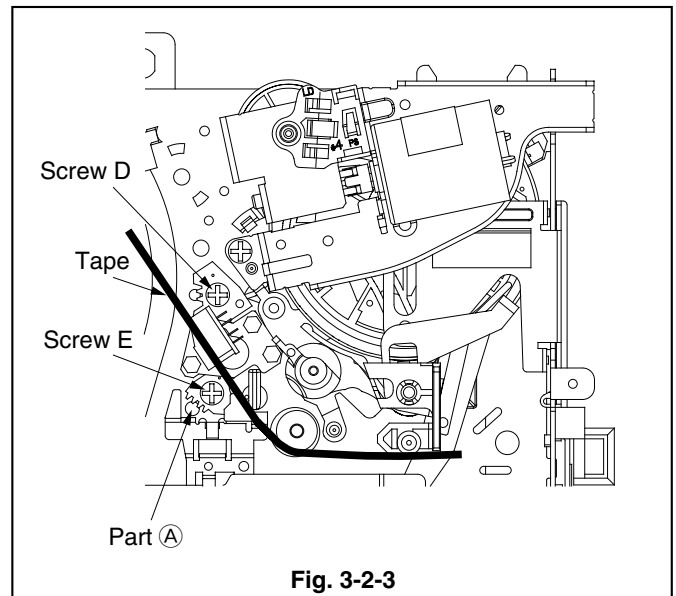


Fig. 3-2-3

### 3-2-5. Flatness Check of FM Waveform

1. Play back an alignment tape (NM6KE2 : 859C339O90).
2. Adjust the tracking and confirm that the amplitude of the FM signal remains flat.

**Note :** Adjust the tracking manually, according to the following procedure.

- Turn the Shuttle Ring of the product during PLAYBACK for manual tracking adjustment.
- Press the 3DSP button to switch the tracking adjustment from "Manual" to "Auto".

3. Adjust the tracking so that the amplitude level of the FM Waveform will be at the maximum. Set the oscilloscope so that the amplitude level of the FM Waveform is 5 divisions on the oscilloscope.
4. Adjust the tracking so that the peak of the FM Output Waveform is 4 divisions. Confirm that the FM Waveforms (B), (C), (D) and (E) are within the range of the specified values in the Fig. 3-2-5.
5. If the Waveforms are out of the specified values in step 4, repeat the Item 3-2. "Check and Adjustment of FM Envelope" from the beginning.

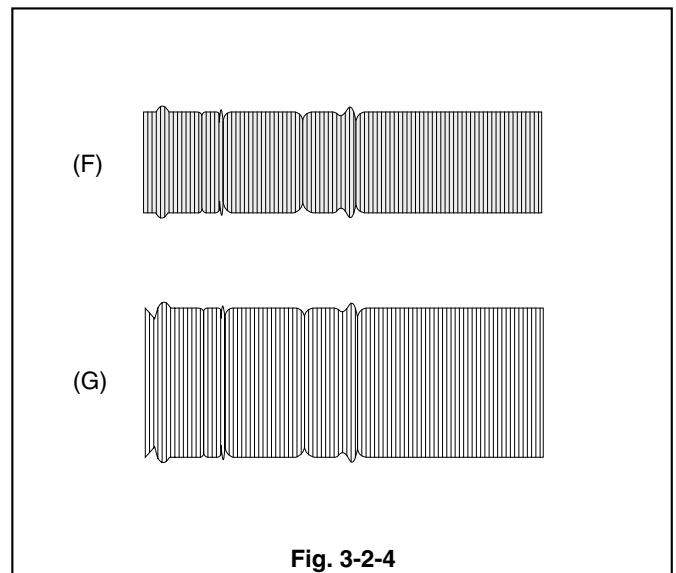


Fig. 3-2-4

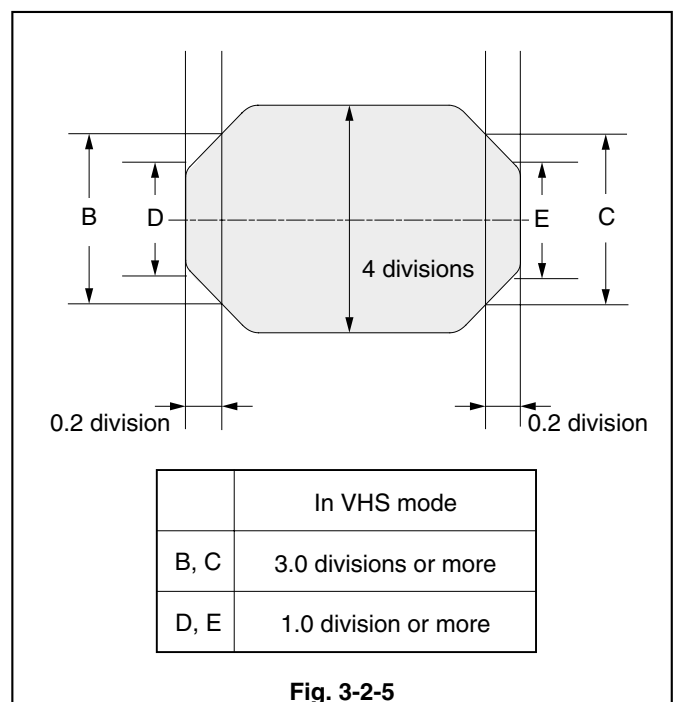
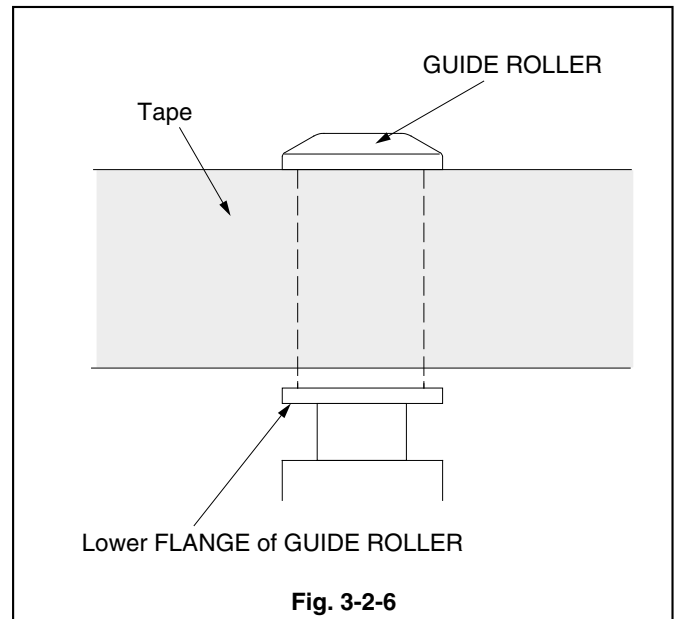


Fig. 3-2-5

### 3-2-6. Tape Running Condition at the GUIDE ROLLERS (Check 1)

1. Play back an Alignment Tape.  
[NM6KE2: 859C339O90]
2. Confirm visually that there is a space between the Tape and the Lower FLANGE of the GUIDE ROLLER (SP) and the GUIDE ROLLER (TU).
3. If there is no space in step 2, replace the TAPE GUIDE ASSY (SP) and TAPE GUIDE ASSY (TU), according to the Item 2-32. "TAPE GUIDE ASSY (SP), TAPE GUIDE ASSY (TU)".
4. Alternately load and unload the tape several times and confirm that the FM Waveform remains flat.
5. If the flatness is affected, check the position of the A/C HEAD. If it is installed incorrectly, correct it according to the Item 2-8. "A/C HEAD UNIT" and repeat Item 3-2-4. "Coarse Adjustment of Phase".



### 3-2-7. Tape Running Condition at the GUIDE ROLLERS (Check 2)

1. Play back an alignment tape (NM6KE2 : 859C339O90).
2. Check that the FM Waveform is quickly restored to the previous level, after lightly pressing and releasing the tops of the GUIDE ROLLER (SP) and GUIDE ROLLER (TU).
3. If the FM Waveform is not restored immediately, replace the TAPE GUIDE ASSY (SP) and TAPE GUIDE ASSY (TU) according to the Item 2-32. "TAPE GUIDE ASSY (SP), TAPE GUIDE ASSY (TU)".

### 3-3. A/C HEAD Adjustment

#### 3-3-1. Slant Adjustment of A/C HEAD

1. Play back a blank tape.
2. Slowly turn the slant adjustment Screw C shown in the Fig. 3-3-1 counter-clockwise to slightly crease the bottom of the tape at the Lower FLANGE of the GUIDE POLE (TU).
3. Slowly return the slant adjustment Screw C to remove the crease.
4. Slowly turn the slant adjustment Screw C counter-clockwise again and stop just before the tape is creased.

#### 3-3-2. Azimuth and Height Adjustment of A/C HEAD

1. If the height of the CONTROL HEAD is shifted from the specified value in the Fig. 3-3-2, adjust it with the Height Adjustment Screws A, B and C shown in the Fig. 3-3-1.
2. After adjustment with the Screws A, B or C, repeat the Item 3-3-1. "Slant Adjustment of A/C HEAD".
3. Connect the oscilloscope to the audio output terminal.
4. Play back an alignment tape (NM6KE2 : 859C339O90).
5. Turn the Azimuth Adjustment Screw B in the Fig. 3-3-1 to set the audio output level in the Fig. 3-3-1 at the maximum. After the adjustment, remove the screw driver and confirm that the audio output level is 4.6 divisions or more when the maximum audio output level is set to 5. If the audio output level is less than 4.6, repeat steps 1 ~ 5.
6. Push the A/C HEAD to the right and left (in the direction of A-A' in the Fig. 3-3-1) and release it. And confirm that the audio output level does not change. (Do not push the A/C HEAD until the audio output level is reduced to 3/4 or less of its maximum level.)
7. Confirm that changes in the audio output level are 2dB or less in the PLAYBACK mode.
8. If the change in the audio output level exceeds 2dB, repeat the Item 3-3-1. "Slant Adjustment of A/C HEAD".
9. If the above procedure steps 1 ~ 8 proves to be unsatisfactory, replace the TAPE GUIDE ASSY (SP) and the TAPE GUIDE ASSY (TU), according to the Item 2-32. "TAPE GUIDE ASSY (SP), TAPE GUIDE ASSY (TU)".

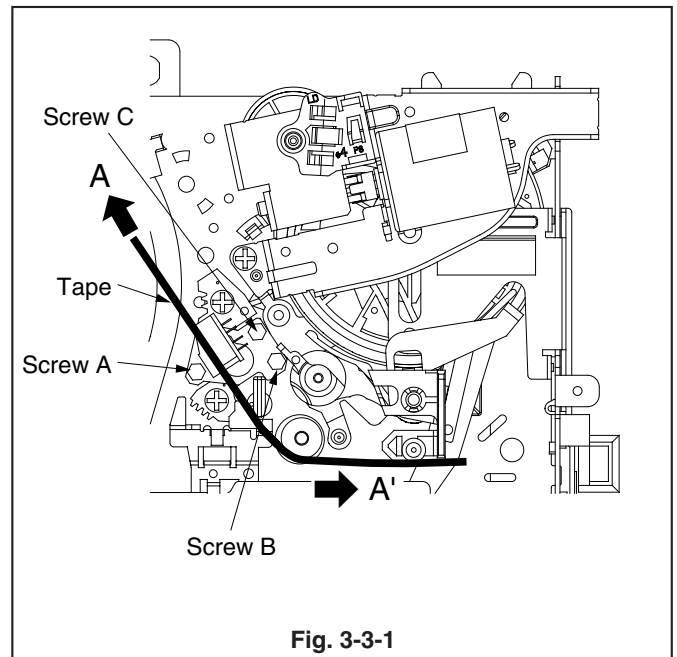


Fig. 3-3-1

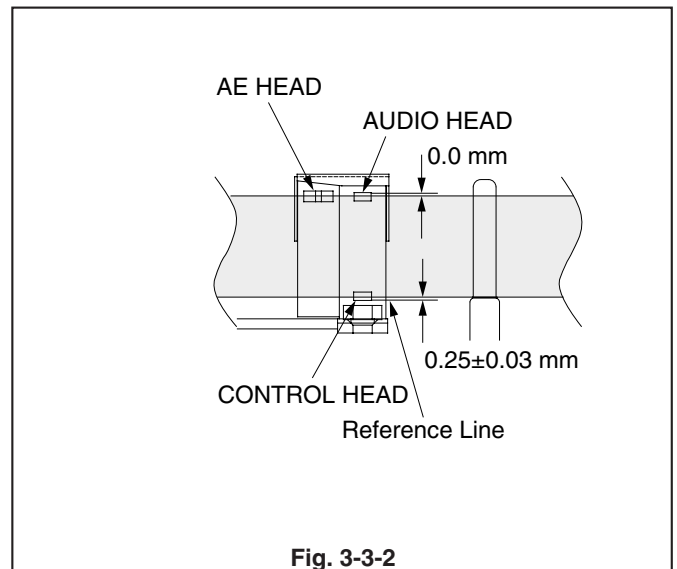


Fig. 3-3-2

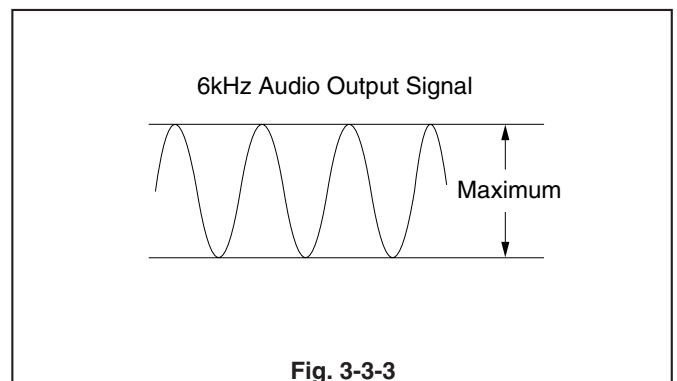


Fig. 3-3-3

### 3-4. Phase Adjustment

1. Play back an alignment tape (NM3KE6 : 859C339O50).
2. Preset the tracking.
3. Loosen the Screws D and E shown in the Fig. 3-4-1. Insert a screw driver (+) into the Hole in the MAIN PLATE ASSY (Part A) and move the A/C PLATE to the right and left to set the amplitude level of the FM Waveform to maximum.
4. Tighten the Screws D and E.
5. Play back an alignment tape [NMX : 859C568O60].
6. Confirm the Missing Portions of the FM Waveform and Audio Waveform are as shown in the Fig. 3-4-2.
7. If the Missing Portions differ from the Fig. 3-4-2, repeat the procedure 3.
8. Adjust the tracking so that the amplitude level of the FM Waveform will be at the maximum. And set the oscilloscope so that the Waveform will be 5 divisions of the oscilloscope.
9. Preset the tracking.
10. Confirm that the FM Waveform on the oscilloscope is 4.8 divisions or more.
11. If the FM Waveform is below 4.8 divisions, preset the tracking and repeat steps 3~10.
12. Push the A/C HEAD to the right and left (in the direction of A-A' in the Fig. 3-4-1) and release it. Confirm that the amplitude of the FM Waveform does not change, compared to before the A/C HEAD was shifted.
13. If the amplitude level of the FM Waveform changes, check the set position of the A/C HEAD. If the A/C HEAD is installed incorrectly, correct the position according to the Item 2-8. "A/C HEAD UNIT" and 3-3. "A/C HEAD Adjustment", and then repeat this item from the beginning.
14. Alternately load and unload the tape several times. Confirm that the amplitude of the FM Waveform does not change.

### 3-5. Tape wrinkle check

1. Confirm that there is no wrinkle at the lower edge of GUIDE POLE(TU) in PB/FS mode with T-160 tape beginning and ending.
2. Confirm that there is no wrinkle at the upper edge of GUIDE POLE(TU) in RS mode with T-160 tape beginning and ending.

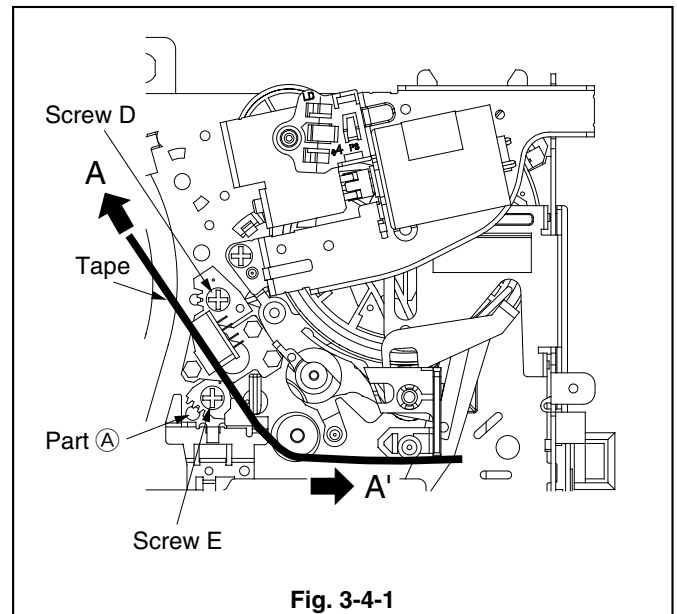


Fig. 3-4-1

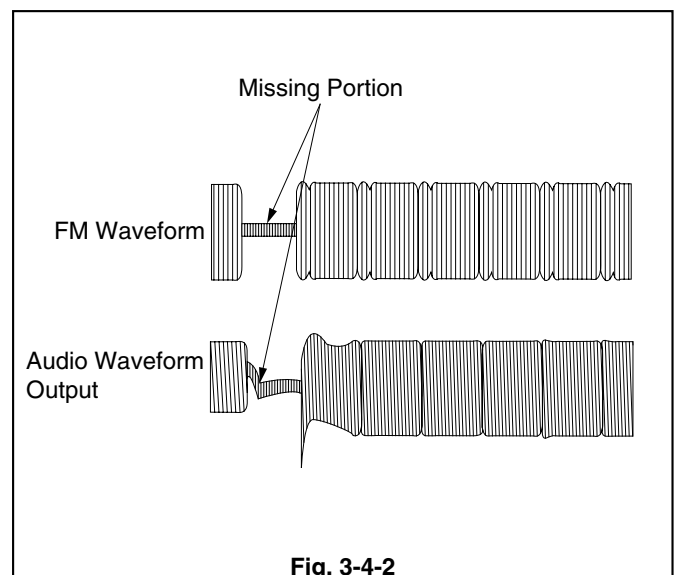


Fig. 3-4-2

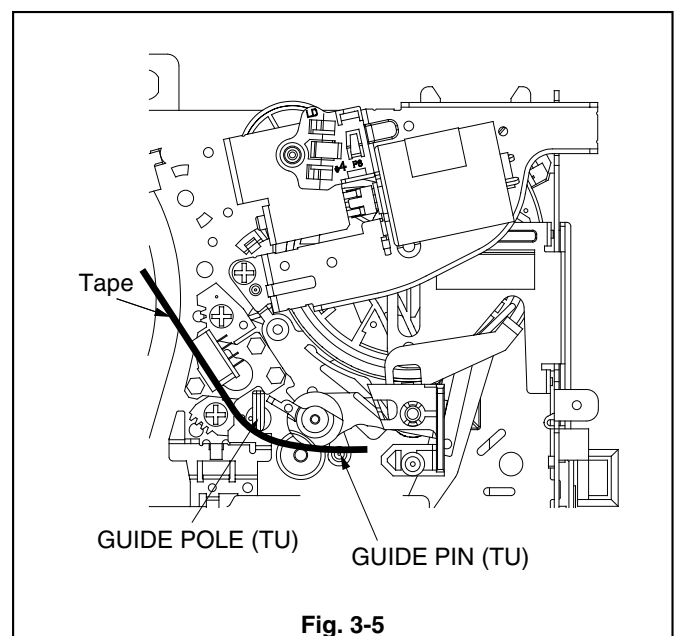
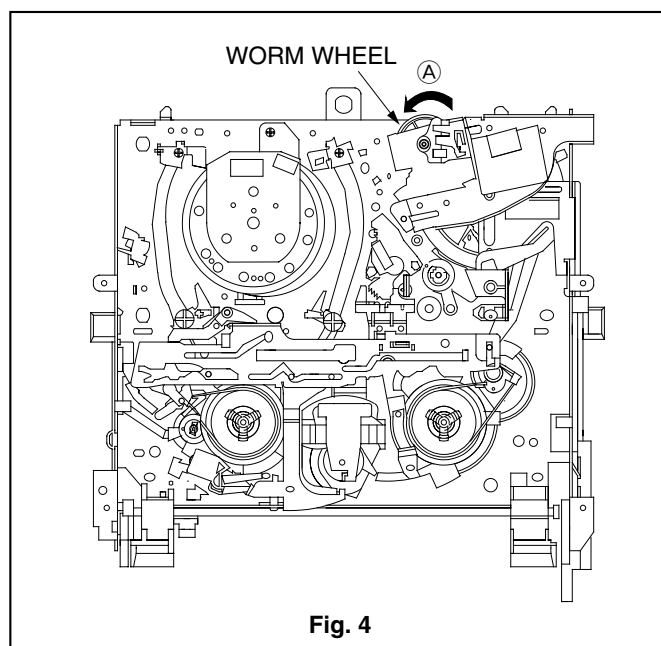


Fig. 3-5

#### 4. Servicing for Tape Jam during the Loading Process

1. Remove the tape if the mechanism part is locked due tangled tape.
2. Rotate the WORM WHEEL of the LOADING MOTOR ASSY shown in the Fig. 4 in the direction of the arrow ① to eject the cassette tape.



## SERVICE CAN BE EXECUTED WITH THE EE PICTURE DISPLAYED

1. Short-circuit the cathode side of D927 and the GND of the DECK ASSY using the jig shown in Fig. 2.
2. Remove the DECK ASSY.
3. Connect TP5X and TP5Y with a jumper

**Note1:** Short-circuit the test points before turning on the power.

**Note2:** Short-circuit the Shield Case and the cathode side of D927 using the jig shown in Fig. 2 before attaching the DECK ASSY.

PCB-MAIN (Component side)

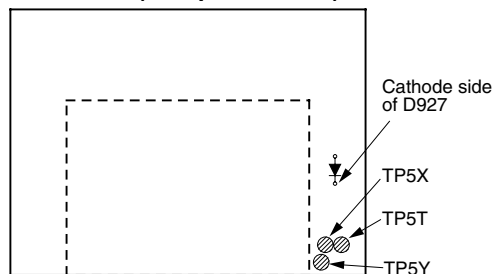


Fig. 1

Jig (Part No. : 859C548O10)

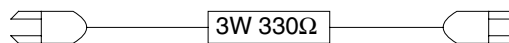


Fig. 2

## DECK OPERATION CHECK

Check the DECK position and the operation of the Tape Running System, according to the following procedure.

1. Short-circuit TP5T and TP5Y shown in the Fig. 1.
2. Initialize the E<sup>2</sup>PROM.
3. Check the operation of the Tape Running System by pressing the FF button, REW button on the PCB-MAIN.  
FF button : For forward rotation of the CAPSTAN MOTOR  
REW button : For reverse rotation of the CAPSTAN MOTOR
4. Check the DECK position by pressing the CH-UP button, CH-DOWN button on the PCB-MAIN.  
CH-UP button : DECK operation in the Loading direction  
CH-DOWN button : DECK operation in the Unloading direction

# HOW TO INITIALIZE THE E<sup>2</sup>PROM

A replacement E<sup>2</sup>PROM is not initialized before shipping, so the E<sup>2</sup>PROM must be initialized when replaced.

Initialize the E<sup>2</sup>PROM by following the steps below.

1. Press and hold the POWER button on the set for 8 seconds.
2. E<sup>2</sup>PROM initial setting is completed.

# WHEN REPLACING IC5A0

When replacing IC5A0, be sure to press the RESET button after turning on the power.

# ELECTRICAL ADJUSTMENTS

Perform only the alignments required. If proper equipment is not available, do not attempt an alignment.

## PRE-ADJUSTMENT SETTINGS

- Set the PerfectTape™ to “MANUAL” mode.

## TEST EQUIPMENT

- Miscellaneous electrical tools
- Oscilloscope (10:1 probe unless 1:1 specified.)

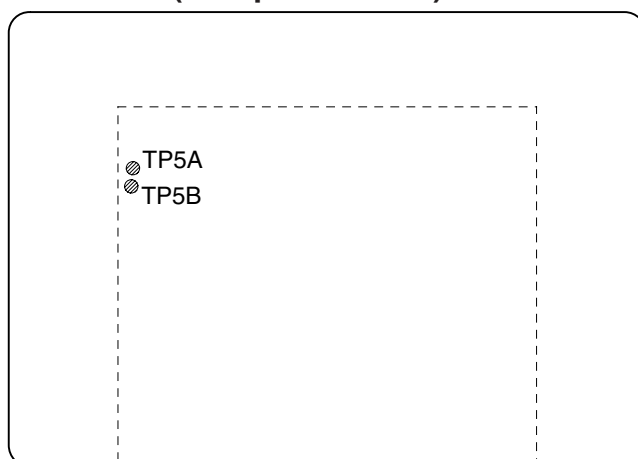
## ALIGNMENT TAPES

- |                                                                             |                                                               |
|-----------------------------------------------------------------------------|---------------------------------------------------------------|
| • NS1.....Part No.859C339O00<br>Stair step, Color Bars, RF, 1kHz audio (SP) | • NM3KE6.....Part No.859C339O50<br>Monoscope, 3kHz audio (EP) |
| • NM6KE2.....Part No.859C339O90<br>Monoscope, 6kHz audio (SP)               | • NMX.....Part No.859C568O60<br>Monoscope, 3kHz audio (SP)    |
| • NC1KS.....Part No.859C339O80<br>Color Bars, 1kHz audio (SP)               |                                                               |

## LOCATIONS

PCB-MAIN (Component side)

REAR

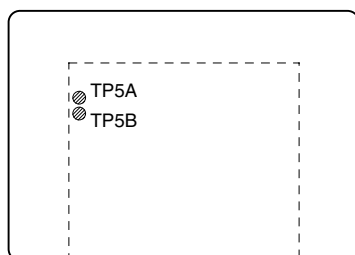


|                                                         |                                                                                                                                                                        |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>[ Servo circuit ]</b><br>1. Playback Switching Point | <b>Adjustment purpose</b> Video switch over timing during playback.<br><br><b>Symptom when incorrectly adjusted</b> Switching noise or jitter in the playback picture. |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Measuring instrument and condition |     | VCR set up condition |                                    |
|------------------------------------|-----|----------------------|------------------------------------|
|                                    | --- | <b>Input signal</b>  | ---                                |
| <b>Test point</b>                  | --- | <b>Using tape</b>    | Alignment Tape ( NS1, stair step ) |
| <b>EXT trigger</b>                 | --- | <b>VCR condition</b> | Playback                           |
| <b>Measurement range</b>           | --- | <b>Using Jig</b>     | ---                                |

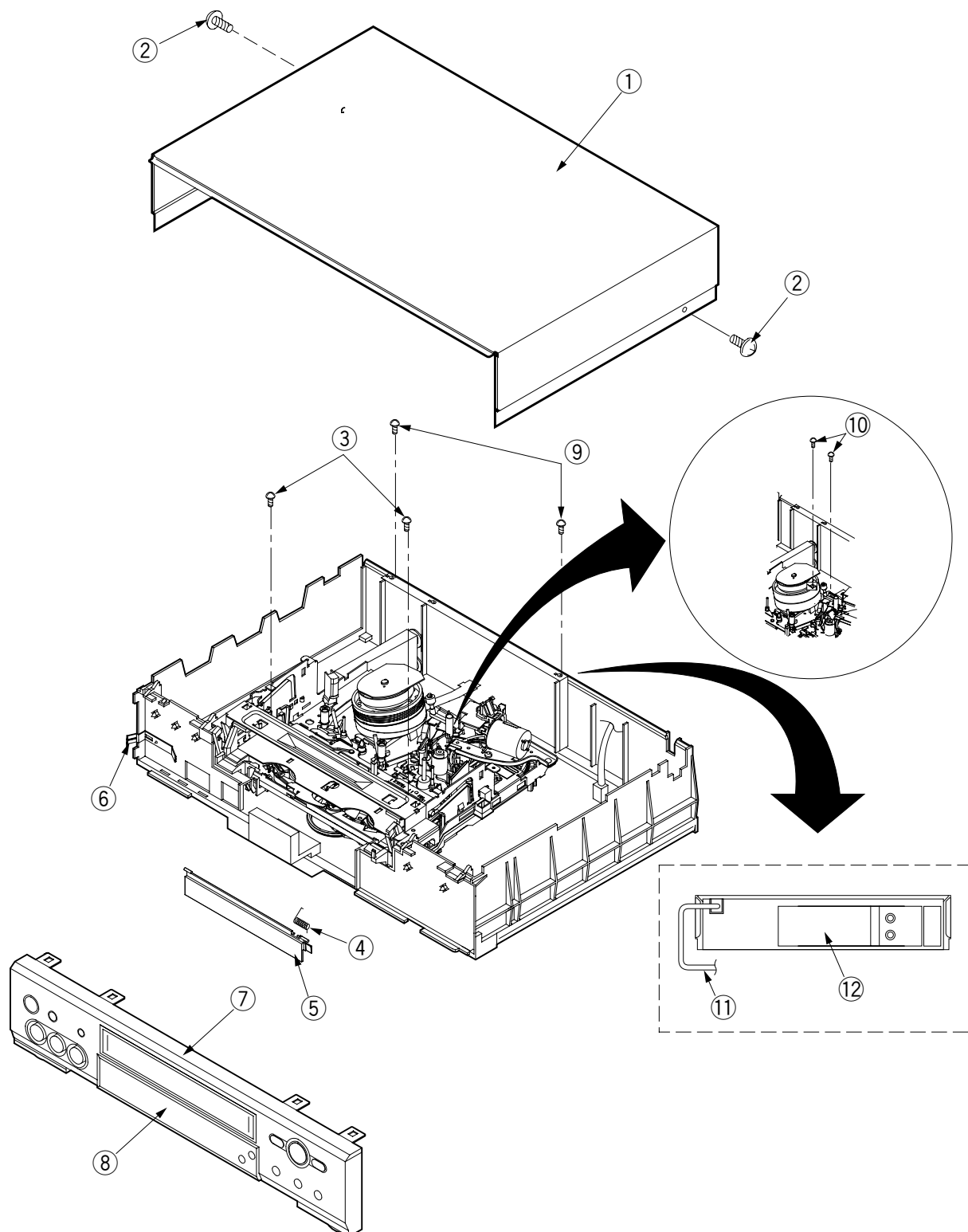
1. Play back an Alignment Tape. (NS1, stair step)
2. Short-circuit TP5A to TP5B.
3. Push the CHANNEL-UP, DOWN buttons at the same time.  
(The adjustment will finish in about six seconds.)
4. Open-circuit TP5A to TP5B.

#### PCB-MAIN (Component side)



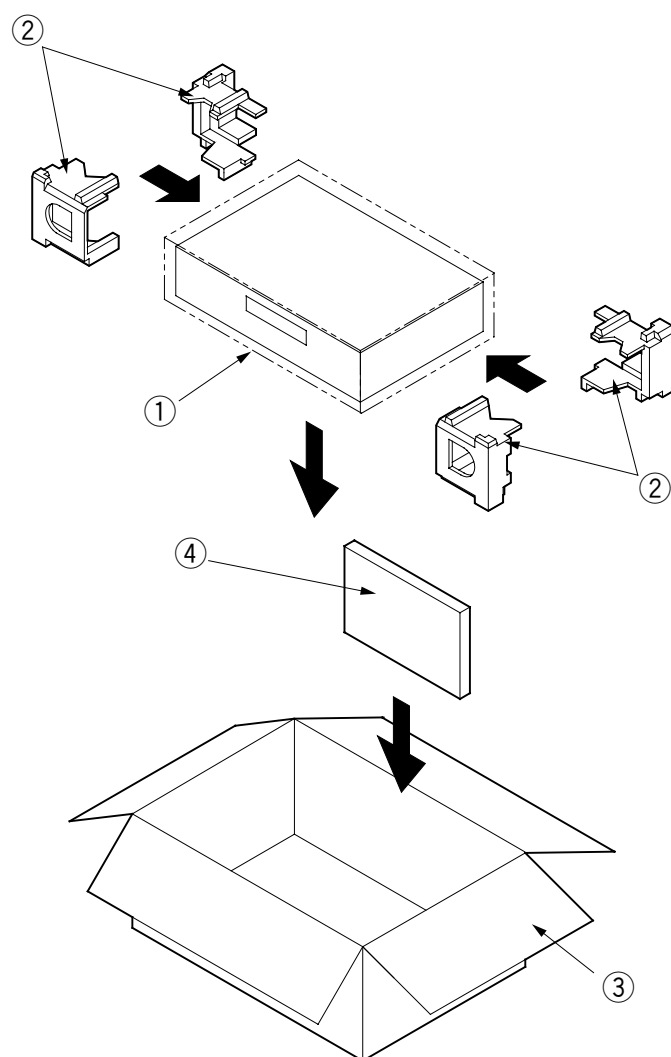
# PARTS LIST

## 1. CABINET ASSEMBLY

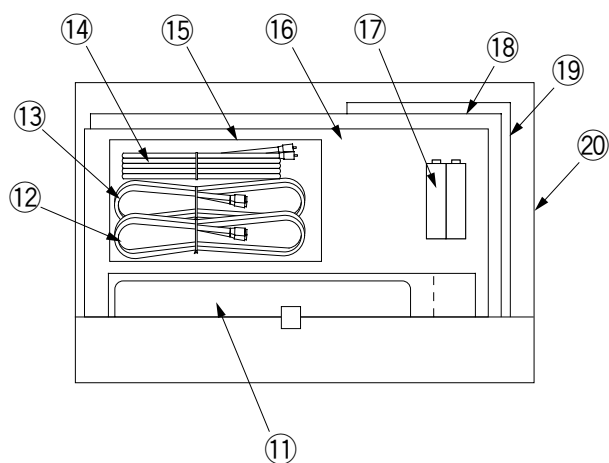


| ITEM NO.         | PARTS NO.  | PARTS NAME         | DESCRIPTION      |
|------------------|------------|--------------------|------------------|
| CABINET ASSEMBLY |            |                    |                  |
| 1                | 968C049O03 | TOP COVER ASSY     |                  |
| 2                | 669D501O30 | SCREW              | 3 × 10           |
| 3                | 669D221O40 | SCREW              | 4 × 12 46LA005   |
| 4                | 572D385O10 | F/L SPRING         |                  |
| 5                | 752C668O40 | CASSETTE DOOR ASSY |                  |
| 6                | 573D078O10 | FRONT EARTH SPRING |                  |
| 7                | 701B440O30 | FRONT UNIT         |                  |
| 8                | 752C670O70 | TIMER PANEL        |                  |
| 9                | 669D500O30 | SCREW              | 3 × 10           |
| 10               | 669D229O90 | SCREW              | M3.0 × 4 46LA005 |
| 11               | 246C324O10 | AC POWER CORD      |                  |
| 12               | 761B371O70 | ANTENNA COVER      |                  |

## 2. PACKING PARTS

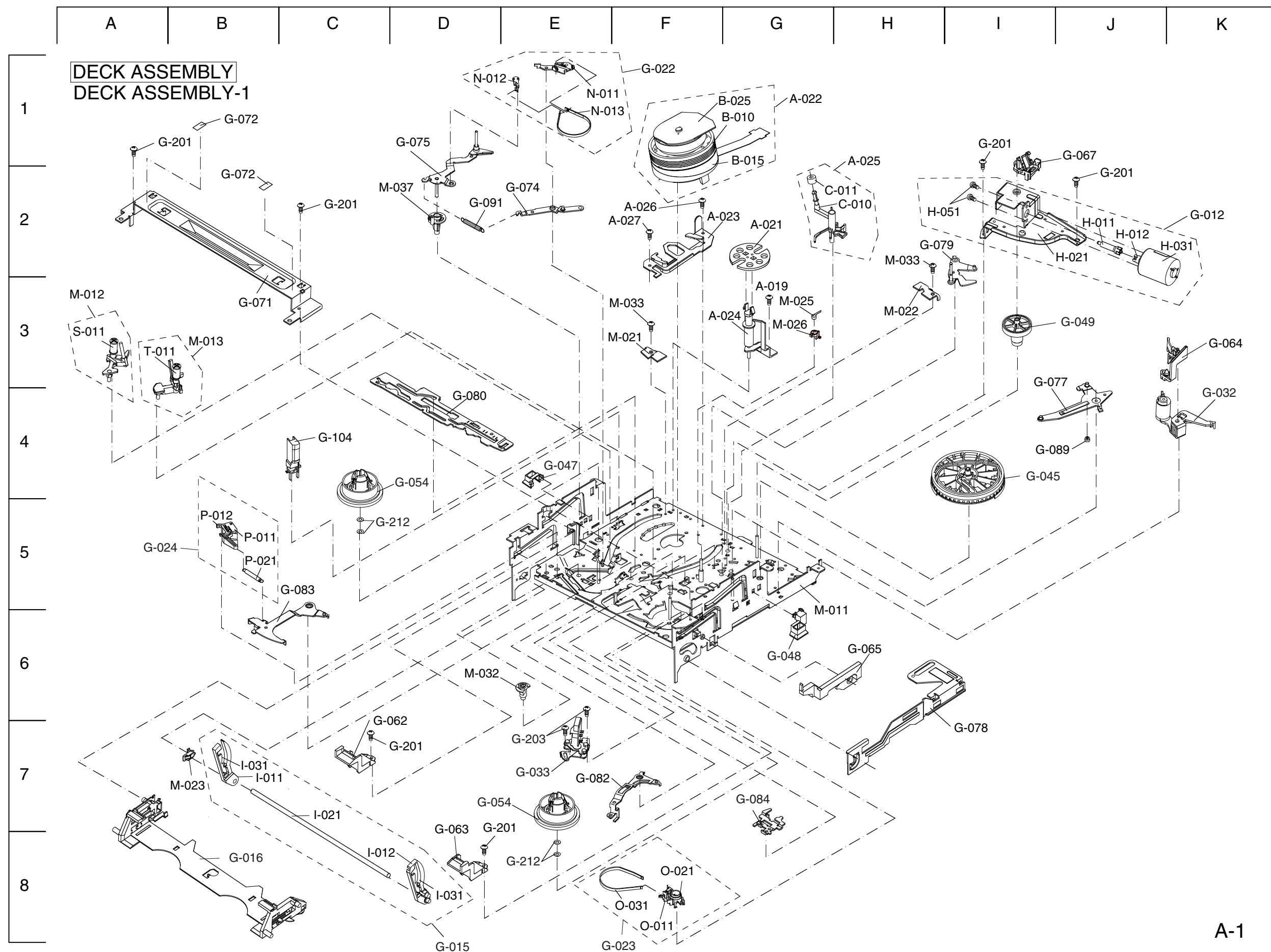


## ACCESSORY



| ITEM NO.      | PARTS NO.  | PARTS NAME        | DESCRIPTION              |
|---------------|------------|-------------------|--------------------------|
| PACKING PARTS |            |                   |                          |
| 1             | 831D190O30 | PACKING SHEET     | 800X800                  |
| 2             | 803A585O10 | CUSHION           |                          |
| 3             | 802B827O20 | PACKING CASE      |                          |
| 4             | -----      | ACCESSORY         |                          |
| ACCESSORY     |            |                   |                          |
| 11            | 939P755O20 | REMOTE HAND UNIT  | S-S1.5M<br>2P R&W L=1.5M |
| 12            | 243C273O10 | CABLE             |                          |
| 13            | 243C274O10 | Y/C CABLE         |                          |
| 14            | 242C938O10 | PHONO CABLE       |                          |
| 15            | -----      | UNIT ANT ADAPTER  |                          |
| 16            | -----      | ACCESSORY BOARD   |                          |
| 17            | -----      | BATTERY           |                          |
| 18            | 872C246O40 | INSTRUCTION BOOK  |                          |
| 19            | -----      | REGISTRATION CARD |                          |
| 20            | 831D337O10 | PACKING BAG       |                          |

# DECK ASSEMBLY



DECK ASSEMBLY-1

\* Settled Service Parts

| ITEM  | PARTS NO.  | * | ADDRESS |     | PARTS NAME          | DESCRIPTION | Qt. |
|-------|------------|---|---------|-----|---------------------|-------------|-----|
| A-019 | 669D224O90 | ○ | G-3     |     | SCREW               | 2.6 × 5     | 1   |
| A-021 | 597D568O10 |   | G-2     |     | FLYWHEEL (SP)       |             | 1   |
| A-022 | 948B404O09 |   | G-1     |     | DRUM ASSY           |             | 1   |
| A-023 | 592B552O10 |   | F-2     |     | DRUM CLAMPER        |             | 1   |
| A-024 | 594C306O10 |   | F-3     |     | IMPEDANCE UNIT (SP) |             | 1   |
| A-025 | 927D027O01 |   | H-2     |     | CLEANING ASSY       |             | 1   |
| A-026 | 669D556O10 | ○ | F-2     |     | SCREW               | 2.6 × 4     | 1   |
| A-027 | 669D556O10 | ○ | F-2     |     | SCREW               | 2.6 × 4     | 1   |
| B-010 | 925B115O15 | ○ | G-1     |     | UPPER DRUM ASSY     |             | 1   |
| B-015 | 927B955O05 | ○ | G-1     |     | LOWER DRUM ASSY     |             | 1   |
| B-025 | 288P158O30 | ○ | G-1     |     | DRUM MOTOR          |             | 1   |
| C-010 | 641B903O10 | ○ | G-2     |     | CLEANING ARM        |             | 1   |
| C-011 | 554D104O20 | ○ | H-2     |     | FELT RING           |             | 1   |
| G-012 | 928D472O11 | ○ | K-2     |     | LOADING MOTOR ASSY  |             | 1   |
| G-015 | 948D088O03 |   | D-8     |     | F/L ARM ASSY        |             | 1   |
| G-016 | 948B406O03 | ○ | B-8     |     | F/L BOTTOM ASSY     |             | 1   |
| G-022 | 948D095O01 |   | F-1     |     | TENSION BELT ASSY   |             | 1   |
| G-023 | 948D096O01 |   | F-8     |     | BRAKE ASSY (TU)     |             | 1   |
| G-024 | 948D097O02 | ○ | A-5     |     | CHARGE ASSY         |             | 1   |
| G-032 | 594C260O40 | ○ | K-4     |     | PINCH ASSY          |             | 1   |
| G-033 | 460C007O10 | ○ | E-7     |     | A/C HEAD UNIT       |             | 1   |
| G-045 | 621C769O20 | ○ | I-4     |     | MAIN CAM            |             | 1   |
| G-047 | 621C783O10 | ○ | E-4     |     | SENDER COVER (SP)   | SUPPLY      | 1   |
| G-048 | 621C784O10 | ○ | G-6     |     | SENDER COVER (TU)   | TAKE UP     | 1   |
| G-049 | 621C794O10 | ○ | J-3     |     | WROM WHEEL          |             | 1   |
| G-054 | 640C181O20 | ○ | D-4     | D-7 | REEL DISK           |             | 2   |
| G-062 | 621C789O10 | ○ | C-6     |     | INSERT GUIDE (SP)   | SUPPLY      | 1   |
| G-063 | 621C790O10 | ○ | D-7     |     | INSERT GUIDE (TU)   | TAKE UP     | 1   |
| G-064 | 641B902O10 | ○ | K-3     |     | PINCH ARM CAP       |             | 1   |
| G-065 | 641B908O10 | ○ | H-6     |     | DOOR ARM            |             | 1   |
| G-067 | 621C804O10 |   | J-1     |     | FC HOLDER           |             | 1   |
| G-071 | 592B549O10 | ○ | B-3     |     | STAY PLATE          |             | 1   |
| G-072 | 640D852O20 |   | B-1     | B-2 | SPACER              |             | 2   |
| G-074 | 594C217O10 | ○ | E-2     |     | TENSION LEVER       |             | 1   |
| G-075 | 594C218O10 | ○ | D-1     |     | TENSION ARM         |             | 1   |
| G-077 | 594C222O10 | ○ | I-3     |     | BRAKE LEVER         |             | 1   |
| G-078 | 594C223O10 | ○ | I-6     |     | F/L PLATE           |             | 1   |
| G-079 | 594C224O20 | ○ | H-2     |     | GUIDE ARM (TU)      |             | 1   |
| G-080 | 594C225O30 | ○ | D-4     |     | BRAKE CAM PLATE     |             | 1   |
| G-082 | 594C229O10 | ○ | E-7     |     | SHIFT LEVER         |             | 1   |
| G-083 | 594C230O10 | ○ | C-5     |     | SWING LEVER         |             | 1   |
| G-084 | 597D866O10 | ○ | G-7     |     | L/D LOCK LEVER      |             | 1   |
| G-089 | 622D829O10 | ○ | I-4     |     | LB PIN              |             | 1   |
| G-091 | 572D974O10 | ○ | D-2     |     | TENSION SPRING      |             | 1   |
| G-104 | 460D018O10 | ○ | C-4     |     | F/E HEAD            |             | 1   |
| G-201 | 669D224O90 | ○ | A-1     | C-2 | SCREW               | 2.6×5       | 6   |
|       |            |   | D-7     | I-1 |                     |             |     |
|       |            |   | J-2     |     |                     |             |     |
| G-203 | 669D476O30 | ○ | E-7     |     | SCREW               | 2.6×6       | 2   |
| G-212 | 552C017O30 | ○ | C-5     | E-8 | THRUST WASHER       | 2.5×6×0.13  | 4   |
| H-011 | 621C758O10 | ○ | J-2     |     | LOADING WORM        |             | 1   |
| H-012 | 622D788O10 |   | J-2     |     | COUPLING WORM       |             | 1   |
| H-021 | 594C216O10 |   | J-2     |     | MOTOR HOLDER        |             | 1   |
| H-031 | 288P090O10 |   | J-2     |     | LOADING MOTOR       |             | 1   |

DECK ASSEMBLY-1

\* Settled Service Parts

| ITEM  | PARTS NO.  | * | ADDRESS |     | PARTS NAME           | DESCRIPTION | Qt. |
|-------|------------|---|---------|-----|----------------------|-------------|-----|
| H-051 | 669D173O80 | ○ | H-2     |     | SCREW                | M3×0.5-4    | 2   |
| I-011 | 641B913O10 | ○ | B-7     |     | ARM (SP)             |             | 1   |
| I-012 | 641B911O20 | ○ | C-8     |     | ARM (TU)             |             | 1   |
| I-021 | 631D823O10 | ○ | C-7     |     | F/L SHAFT            |             | 1   |
| I-031 | 573D004O10 | ○ | B-7     | D-8 | ARM SPRING           |             | 2   |
| M-011 | 948B403O01 |   | G-5     |     | MAIN PLATE ASSY      |             | 1   |
| M-012 | 948D084O01 | ○ | A-3     |     | TAPE GUIDE ASSY (SP) | SUPPLY      | 1   |
| M-013 | 948D086O01 | ○ | B-3     |     | TAPE GUIDE ASSY (TU) | TAKE UP     | 1   |
| M-021 | 594C258O01 |   | F-3     |     | GUIDE CATCHER (SP)   | SUPPLY      | 1   |
| M-022 | 594C259O01 |   | H-3     |     | GUIDE CATCHER (TU)   | TAKE UP     | 1   |
| M-023 | 622D799O10 | ○ | B-7     |     | F/L BEARING          |             | 1   |
| M-025 | 622D820O10 | ○ | G-3     |     | GUIDE PIN COVER      |             | 1   |
| M-026 | 621C944O10 | ○ | G-3     |     | GUIDE PIN COVER 2    |             | 1   |
| M-032 | 622D791O10 | ○ | D-6     |     | BELT ADJUSTER        |             | 1   |
| M-033 | 669D224O90 | ○ | F-3     | H-2 | SCREW                | M2.6×5      | 2   |
| M-037 | 622D792O10 | ○ | C-2     |     | TENS AXIS HOLDER     |             | 1   |
| S-011 | 522B061O10 | ○ | A-3     |     | GUIDE ROLLER (SP)    | SUPPLY      | 1   |
| T-011 | 522B061O10 | ○ | B-3     |     | GUIDE ROLLER (TU)    | TAKE UP     | 1   |
| N-011 | 621C759O10 | ○ | E-1     |     | BELT LEVER           |             | 1   |
| N-012 | 622D790O10 | ○ | D-1     |     | BELT HOLDER          |             | 1   |
| N-013 | 554D103O10 | ○ | E-1     |     | BRAKE BELT (SP)      |             | 1   |
| O-011 | 621C760O10 | ○ | F-8     |     | BRAKE (TU)           |             | 1   |
| O-021 | 572D975O10 | ○ | F-8     |     | BRAKE SPRING         |             | 1   |
| O-031 | 554D103O10 | ○ | F-8     |     | BRAKE BELT (TU)      |             | 1   |
| P-011 | 640C187O10 |   | B-5     |     | CHARGE BASE          |             | 1   |
| P-012 | 640C188O20 |   | B-5     |     | CHARGE TIP           |             | 1   |
| P-021 | 572D983O20 |   | B-5     |     | CHARGE SPRING        |             | 1   |

| A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|
|---|---|---|---|---|---|---|---|---|

DECK ASSEMBLY  
DECK ASSEMBLY-2

1

2

3

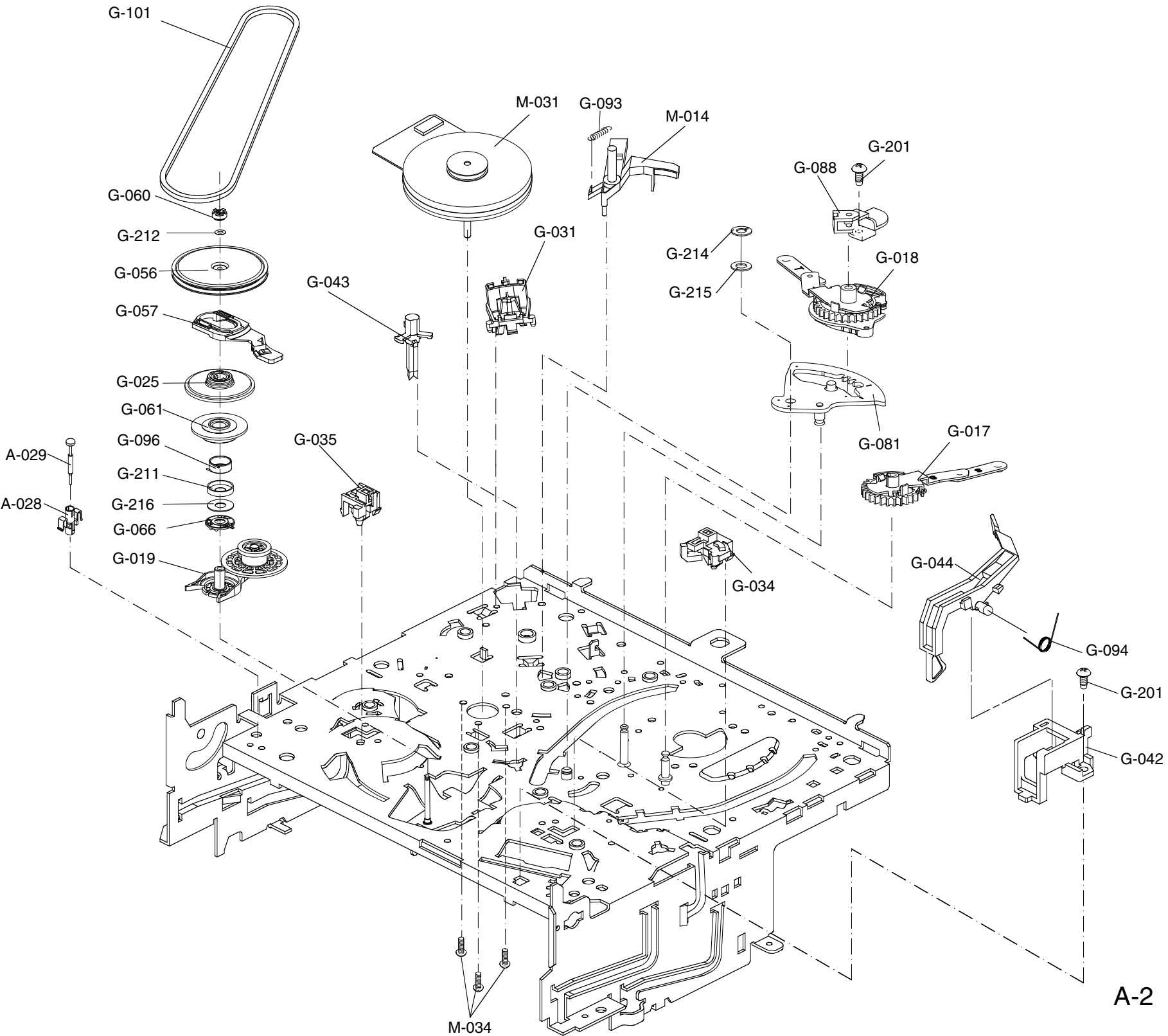
4

5

6

7

8



A-2

## DECK ASSEMBLY-2

\* Settled Service Parts

| ITEM  | PARTS NO.  | * | ADDRESS | PARTS NAME            | DESCRIPTION | Qt. |
|-------|------------|---|---------|-----------------------|-------------|-----|
| A-028 | 621C810O10 |   | A-5     | SSW HOLDER            |             | 1   |
| A-029 | 622D837O10 |   | A-4     | SSW SLIDER            |             | 1   |
| G-017 | 948D089O01 | ○ | H-4     | LOADING ARM ASSY (SP) | SUPPLY      | 1   |
| G-018 | 948D090O01 | ○ | G-3     | LOADING ARM ASSY (TU) | TAKE UP     | 1   |
| G-019 | 622D916O10 | ○ | B-5     | IDLER 2 UNIT          |             | 1   |
| G-025 | 948D098O03 | ○ | B-4     | PULLEY GEAR ASSY      |             | 1   |
| G-031 | 622D800O10 | ○ | E-3     | MODE POSITION UNIT    |             | 1   |
| G-034 | 622D801O10 | ○ | F-5     | REV UNIT (SP)         | SUPPLY      | 1   |
| G-035 | 622D802O10 | ○ | C-4     | REV UNIT (TU)         | TAKE UP     | 1   |
| G-042 | 621C807O10 |   | I-6     | REC HOLDER            |             | 1   |
| G-043 | 621C765O10 | ○ | C-3     | LAMP GUIDE            |             | 1   |
| G-044 | 621C766O20 | ○ | H-5     | REC LEVER             |             | 1   |
| G-056 | 640C185O30 | ○ | B-3     | BELT PULLEY           |             | 1   |
| G-057 | 640C186O10 | ○ | B-3     | SHIFT SLIDER          |             | 1   |
| G-060 | 640D948O10 | ○ | B-2     | PULLEY BUSH           |             | 1   |
| G-061 | 640D949O10 | ○ | B-4     | SLIP GEAR             |             | 1   |
| G-066 | 640C189O20 | ○ | B-5     | SLIP ADJUSTER         |             | 1   |
| G-081 | 594C228O10 | ○ | G-4     | A/L LEVER             |             | 1   |
| G-088 | 594C304O10 | ○ | G-2     | SPACER PLATE          |             | 1   |
| G-093 | 572D976O10 | ○ | E-2     | CAPSTAN BRAKE SPRING  |             | 1   |
| G-094 | 572D977O10 | ○ | I-6     | REC SPRING            |             | 1   |
| G-096 | 573D073O10 | ○ | B-4     | SLIP SPRING 2         |             | 1   |
| G-101 | 521D102O10 | ○ | B-1     | REEL BELT             |             | 1   |
| G-201 | 669D224O90 | ○ | G-2     | SCREW                 | 2.6×5       | 2   |
| G-211 | 597D997O10 | ○ | B-4     | SLIP 2 WASHER         |             | 1   |
| G-212 | 552C017O30 | ○ | B-3     | THRUST WASHER         | 2.5×6×0.13  | 1   |
| G-214 | 552C022O10 |   | F-3     | CUT WASHER            | 4.0×8.0×0.5 | 1   |
| G-215 | 680P140O10 |   | F-3     | WASHER                |             | 1   |
| G-216 | 552C012O50 |   | B-5     | THRUST WASHER         | 5.6×9.5×0.2 | 1   |
| M-014 | 948D094O01 | ○ | F-2     | CAPSTAN BRAKE ASSY    |             | 1   |
| M-031 | 288P213O30 | ○ | E-2     | CAPSTAN MOTOR         |             | 1   |
| M-034 | 669D285O10 |   | D-8     | SCREW                 | M2.6×6      | 3   |

### 3. ELECTRICAL PARTS

| SYMBOL No.                 | PARTS No.  | PARTS NAME      | DESCRIPTION    | SYMBOL No.    | PARTS No.  | PARTS NAME           | DESCRIPTION   |
|----------------------------|------------|-----------------|----------------|---------------|------------|----------------------|---------------|
| <b>INTEGRATED CIRCUITS</b> |            |                 |                | Q3A0          | 261P065O30 | CHIP TRANSISTOR      | DTA124EKA     |
| IC2A0                      | 270P881O10 | IC              | HA118421BSNF   | Q3A2          | 260P818O30 | CHIP TRANSISTOR      | 2SC2412K-S    |
| IC2A1                      | 270P882O10 | IC              | MM1501XNRE     | Q3L0          | 261P067O30 | CHIP TRANSISTOR      | DTC124EKA     |
| IC2A3                      | 270P882O10 | IC              | MM1501XNRE     | Q5A3          | 260P802O20 | CHIP TRANSISTOR      | 2SA1235-F     |
| IC2000                     | 275P704O10 | MOS IC          | TC90A80N       | Q5A5          | 260P818O30 | CHIP TRANSISTOR      | 2SC2412K-S    |
| IC3A0                      | 275P410O10 | IC              | AN3662FBP      | Q5B1          | 261P066O10 | CHIP TRANSISTOR      | 2SA1037AK     |
| IC5A0                      | 275P635O10 | MOS IC          | M37760MCH4A1GP | Q5B4          | 260P804O30 | CHIP TRANSISTOR      | 2SC3052-G     |
| IC5A1                      | 274D103O10 | MOS IC          |                | Q5L0          | 260P818O30 | CHIP TRANSISTOR      | 2SC2412K-S    |
| IC5A4                      | 272P235O10 | IC              | TA7291S        | Q5P1          | 261P067O30 | CHIP TRANSISTOR      | DTC124EKA     |
| IC6A0                      | 272P765O10 | IC              | M52052FP       | Q5P2          | 261P067O30 | CHIP TRANSISTOR      | DTC124EKA     |
| IC6A1                      | 272P325O40 | IC              | NJM2535M       | Q6A0          | 261P066O10 | CHIP TRANSISTOR      | 2SA1037AK     |
| IC6A2                      | 270P787O10 | IC              | NJM2534M       | Q6B0          | 261P066O10 | CHIP TRANSISTOR      | 2SA1037AK     |
| IC6A3                      | 270P883O10 | IC              | MM1503XNRE     | Q6B1          | 260P818O30 | CHIP TRANSISTOR      | 2SC2412K-S    |
| IC6A4                      | 272P325O40 | IC              | NJM2535M       | Q6C0          | 261P066O10 | CHIP TRANSISTOR      | 2SA1037AK     |
| IC6J0                      | 272P278O10 | IC              | LA7213         | Q6C1          | 260P818O30 | CHIP TRANSISTOR      | 2SC2412K-S    |
| IC8A0                      | 275P701O10 | MOS IC          | PT6958         | Q6C2          | 261P066O10 | CHIP TRANSISTOR      | 2SA1037AK     |
| IC901                      | 272P500O20 | IC              | HA17431PA      | Q6C3          | 261P066O10 | CHIP TRANSISTOR      | 2SA1037AK     |
| <b>TRANSISTORS</b>         |            |                 |                | Q6C4          | 261P066O10 | CHIP TRANSISTOR      | 2SA1037AK     |
| Q102                       | 261P066O10 | CHIP TRANSISTOR | 2SA1037AK      | Q6C5          | 261P066O10 | CHIP TRANSISTOR      | 2SA1037AK     |
| Q2A0                       | 261P066O10 | CHIP TRANSISTOR | 2SA1037AK      | Q6C6          | 261P066O10 | CHIP TRANSISTOR      | 2SA1037AK     |
| Q2A1                       | 260P818O30 | CHIP TRANSISTOR | 2SC2412K-S     | Q6C7          | 260P818O30 | CHIP TRANSISTOR      | 2SC2412K-S    |
| Q2A2                       | 261P066O10 | CHIP TRANSISTOR | 2SA1037AK      | Q6C8          | 260P818O30 | CHIP TRANSISTOR      | 2SC2412K-S    |
| Q2A3                       | 261P067O30 | CHIP TRANSISTOR | DTC124EKA      | Q6C9          | 261P066O10 | CHIP TRANSISTOR      | 2SA1037AK     |
| Q2A4                       | 261P067O30 | CHIP TRANSISTOR | DTC124EKA      | Q6D0          | 260P818O30 | CHIP TRANSISTOR      | 2SC2412K-S    |
| Q2A5                       | 261P067O30 | CHIP TRANSISTOR | DTC124EKA      | Q6D1          | 260P818O30 | CHIP TRANSISTOR      | 2SC2412K-S    |
| Q2A6                       | 260P818O30 | CHIP TRANSISTOR | 2SC2412K-S     | Q6D2          | 261P065O30 | CHIP TRANSISTOR      | DTA124EKA     |
| Q2A7                       | 261P066O10 | CHIP TRANSISTOR | 2SA1037AK      | Q6D3          | 261P067O30 | CHIP TRANSISTOR      | DTC124EKA     |
| Q2A8                       | 261P066O10 | CHIP TRANSISTOR | 2SA1037AK      | Q6D4          | 261P067O30 | CHIP TRANSISTOR      | DTC124EKA     |
| Q2A9                       | 261P066O10 | CHIP TRANSISTOR | 2SA1037AK      | Q6D5          | 261P067O30 | CHIP TRANSISTOR      | DTC124EKA     |
| Q2B0                       | 260P818O30 | CHIP TRANSISTOR | 2SC2412K-S     | Q6D6          | 261P065O30 | CHIP TRANSISTOR      | DTA124EKA     |
| Q2B1                       | 260P818O30 | CHIP TRANSISTOR | 2SC2412K-S     | Q6J0          | 260P818O30 | CHIP TRANSISTOR      | 2SC2412K-S    |
| Q2B2                       | 261P066O10 | CHIP TRANSISTOR | 2SA1037AK      | Q6J1          | 261P066O10 | CHIP TRANSISTOR      | 2SA1037AK     |
| Q2B5                       | 261P067O30 | CHIP TRANSISTOR | DTC124EKA      | Q6J2          | 260P818O30 | CHIP TRANSISTOR      | 2SC2412K-S    |
| Q2B8                       | 260P818O30 | CHIP TRANSISTOR | 2SC2412K-S     | Q6J3          | 261P066O10 | CHIP TRANSISTOR      | 2SA1037AK     |
| Q2000                      | 260P818O30 | CHIP TRANSISTOR | 2SC2412K-S     | Q901          | 261P035O20 | TRANSISTOR           | 2SC5130       |
| Q2001                      | 260P818O30 | CHIP TRANSISTOR | 2SC2412K-S     | Q903          | 260P629O60 | TRANSISTOR           | 2SC3331-T     |
| Q2002                      | 260P818O30 | CHIP TRANSISTOR | 2SC2412K-S     | Q904          | 260P562O40 | TRANSISTOR           | 2SA952-K      |
| Q2003                      | 261P066O10 | CHIP TRANSISTOR | 2SA1037AK      | Q905          | 260P559O50 | TRANSISTOR           | 2SC1740S-E    |
| Q2004                      | 260P818O30 | CHIP TRANSISTOR | 2SC2412K-S     | Q906          | 260P630O10 | TRANSISTOR           | 2SD2012       |
| Q2005                      | 260P818O30 | CHIP TRANSISTOR | 2SC2412K-S     | Q907          | 260P559O50 | TRANSISTOR           | 2SC1740S-E    |
| Q2006                      | 260P818O30 | CHIP TRANSISTOR | 2SC2412K-S     | Q909          | 260P559O50 | TRANSISTOR           | 2SC1740S-E    |
| Q2007                      | 260P818O30 | CHIP TRANSISTOR | 2SC2412K-S     | Q910          | 260C560O10 | TRANSISTOR           | 2SA933S-R,S   |
| Q2008                      | 261P067O30 | CHIP TRANSISTOR | DTC124EKA      | Q919          | 261P036O10 | TRANSISTOR           | 2SB1548       |
| Q2009                      | 261P067O30 | CHIP TRANSISTOR | DTC124EKA      | Q920          | 260P559O50 | TRANSISTOR           | 2SC1740S-E    |
| Q2010                      | 261P067O30 | CHIP TRANSISTOR | DTC124EKA      | <b>DIODES</b> |            |                      |               |
| Q2012                      | 260P818O30 | CHIP TRANSISTOR | 2SC2412K-S     | D3A2          | 264P568O30 | DIODE                | 1SS254        |
| Q2013                      | 261P066O10 | CHIP TRANSISTOR | 2SA1037AK      | D5A0          | 264P568O30 | DIODE                | 1SS254        |
| Q2014                      | 260P818O30 | CHIP TRANSISTOR | 2SC2412K-S     | D5A2          | 264P568O30 | DIODE                | 1SS254        |
| Q351                       | 261P056O10 | TRANSISTOR      | 2SD734F        | D5A9          | 264P795O20 | LIGHT EMITTING DIODE | SID1050CMMTP5 |
| Q352                       | 260P629O60 | TRANSISTOR      | 2SC3331-T      | D5B4          | 264P795O20 | LIGHT EMITTING DIODE | SID1050CMMTP5 |
| Q353                       | 260P629O60 | TRANSISTOR      | 2SC3331-T      | D5B5          | 264P795O20 | LIGHT EMITTING DIODE | SID1050CMMTP5 |
| Q354                       | 261P065O30 | CHIP TRANSISTOR | DTA124EKA      | D5C0          | 264P795O20 | LIGHT EMITTING DIODE | SID1050CMMTP5 |
| Q355                       | 260P562O40 | TRANSISTOR      | 2SA952-K       | D5D0          | 264P342O70 | DIODE                | HZ4C2         |
| Q356                       | 261P067O30 | CHIP TRANSISTOR | DTC124EKA      | D5R0          | 264P568O30 | DIODE                | 1SS254        |
|                            |            |                 |                | D8A4          | 264P568O30 | DIODE                | 1SS254        |
|                            |            |                 |                | D8A5          | 264P568O30 | DIODE                | 1SS254        |

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| SYMBOL No. | PARTS No.  | PARTS NAME          | DESCRIPTION   | SYMBOL No. | PARTS No.  | PARTS NAME          | DESCRIPTION   |
|------------|------------|---------------------|---------------|------------|------------|---------------------|---------------|
| R2C5       | 103P503O10 | CHIP RESISTOR       | 1/16W 3.3kΩ-J | R357       | 103P503O30 | CHIP RESISTOR       | 1/16W 4.7kΩ-J |
| R2C8       | 103P491O50 | CHIP METAL RESISTOR | 1/16W 390Ω-F  | R358       | 103P503O30 | CHIP RESISTOR       | 1/16W 4.7kΩ-J |
| R2C9       | 103P491O90 | CHIP METAL RESISTOR | 1/16W 560Ω-F  | R365       | 103P500O90 | CHIP RESISTOR       | 1/20W 47Ω-J   |
| R2D0       | 103P502O70 | CHIP RESISTOR       | 1/16W 1.5kΩ-J | R366       | 103P503O30 | CHIP RESISTOR       | 1/16W 4.7kΩ-J |
| R2D1       | 103P501O30 | CHIP RESISTOR       | 1/16W 100Ω-J  |            |            |                     |               |
|            |            |                     |               | R367       | 103P508O40 | CHIP RESISTOR       | 1/16W 2.2Ω-K  |
| R2D3       | 103P502O90 | CHIP RESISTOR       | 1/16W 2.2kΩ-J | R368       | 103P503O20 | CHIP RESISTOR       | 1/16W 3.9kΩ-J |
| R2D4       | 103P502O90 | CHIP RESISTOR       | 1/16W 2.2kΩ-J | R3A2       | 103P503O10 | CHIP RESISTOR       | 1/16W 3.3kΩ-J |
| R2D5       | 103P502O90 | CHIP RESISTOR       | 1/16W 2.2kΩ-J | R3A3       | 103P502O30 | CHIP RESISTOR       | 1/16W 680Ω-J  |
| R2E8       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R3A4       | 103P503O50 | CHIP RESISTOR       | 1/16W 6.8kΩ-J |
| R2F0       | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)   |            |            |                     |               |
|            |            |                     |               | R3A8       | 103P505O60 | CHIP RESISTOR       | 1/16W 390kΩ-J |
| R2F4       | 103P494O40 | CHIP METAL RESISTOR | 1/16W 6.2kΩ-F | R3A9       | 103P494O40 | CHIP METAL RESISTOR | 1/16W 6.2kΩ-F |
| R2F5       | 103P494O30 | CHIP METAL RESISTOR | 1/16W 5.6kΩ-F | R3B0       | 103P504O50 | CHIP RESISTOR       | 1/16W 47kΩ-J  |
| R2F7       | 103P495O50 | CHIP METAL RESISTOR | 1/16W 18kΩ-F  | R3B1       | 103P494O40 | CHIP METAL RESISTOR | 1/16W 6.2kΩ-F |
| R2F9       | 103P505O00 | CHIP RESISTOR       | 1/16W 120kΩ-J | R3B2       | 103P504O50 | CHIP RESISTOR       | 1/16W 47kΩ-J  |
| R2001      | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   |            |            |                     |               |
|            |            |                     |               | R3B3       | 103P503O60 | CHIP RESISTOR       | 1/16W 8.2kΩ-J |
| R2002      | 103P492O50 | CHIP METAL RESISTOR | 1/16W 1kΩ-F   | R3B4       | 103P504O30 | CHIP RESISTOR       | 1/16W 33kΩ-J  |
| R2003      | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R3C1       | 103P504O50 | CHIP RESISTOR       | 1/16W 47kΩ-J  |
| R2004      | 103P492O90 | CHIP RESISTOR       | 1/16W 1.5kΩ-F | R3C2       | 103P504O50 | CHIP RESISTOR       | 1/16W 47kΩ-J  |
| R2006      | 103P502O30 | CHIP RESISTOR       | 1/16W 680Ω-J  | R3C3       | 103P494O40 | CHIP METAL RESISTOR | 1/16W 6.2kΩ-F |
| R2007      | 103P501O70 | CHIP RESISTOR       | 1/16W 220Ω-J  |            |            |                     |               |
|            |            |                     |               | R3C4       | 103P504O50 | CHIP RESISTOR       | 1/16W 47kΩ-J  |
| R2008      | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R3C5       | 103P494O40 | CHIP METAL RESISTOR | 1/16W 6.2kΩ-F |
| R2009      | 103P491O30 | CHIP METAL RESISTOR | 1/16W 330Ω-F  | R3C6       | 103P504O50 | CHIP RESISTOR       | 1/16W 47kΩ-J  |
| R2010      | 103P501O70 | CHIP RESISTOR       | 1/16W 220Ω-J  | R3F0       | 103P503O10 | CHIP RESISTOR       | 1/16W 3.3kΩ-J |
| R2012      | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R3L0       | 103P503O00 | CHIP RESISTOR       | 1/16W 2.7kΩ-J |
| R2013      | 103P492O70 | CHIP METAL RESISTOR | 1/16W 1.2kΩ-F |            |            |                     |               |
|            |            |                     |               | R5A1       | 103P504O00 | CHIP RESISTOR       | 1/16W 18kΩ-J  |
| R2014      | 103P493O70 | CHIP METAL RESISTOR | 1/16W 3.3kΩ-F | R5A3       | 103P504O00 | CHIP RESISTOR       | 1/16W 18kΩ-J  |
| R2015      | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R5A8       | 103P501O70 | CHIP RESISTOR       | 1/16W 220Ω-J  |
| R2017      | 103P503O70 | CHIP RESISTOR       | 1/16W 10kΩ-J  | R5A9       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   |
| R2018      | 103P501O30 | CHIP RESISTOR       | 1/16W 100Ω-J  | R5B0       | 103P502O80 | CHIP RESISTOR       | 1/16W 1.8kΩ-J |
| R2019      | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   |            |            |                     |               |
|            |            |                     |               | R5B2       | 103P502O20 | CHIP RESISTOR       | 1/16W 560Ω-J  |
| R2020      | 103P491O50 | CHIP METAL RESISTOR | 1/16W 390Ω-F  | R5B3       | 103P503O70 | CHIP RESISTOR       | 1/16W 10kΩ-J  |
| R2021      | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R5B5       | 103P505O30 | CHIP RESISTOR       | 1/16W 220kΩ-J |
| R2024      | 103P492O10 | CHIP METAL RESISTOR | 1/16W 680Ω-F  | R5B8       | 103P505O00 | CHIP RESISTOR       | 1/16W 120kΩ-J |
| R2025      | 103P492O20 | CHIP METAL RESISTOR | 1/16W 750Ω-F  | R5B9       | 103P505O00 | CHIP RESISTOR       | 1/16W 120kΩ-J |
| R2026      | 103P492O70 | CHIP METAL RESISTOR | 1/16W 1.2kΩ-F |            |            |                     |               |
|            |            |                     |               | R5C0       | 103P505O00 | CHIP RESISTOR       | 1/16W 120kΩ-J |
| R2027      | 103P491O70 | CHIP METAL RESISTOR | 1/16W 470Ω-F  | R5C1       | 103P501O90 | CHIP RESISTOR       | 1/16W 330Ω-J  |
| R2028      | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R5C6       | 103P501O70 | CHIP RESISTOR       | 1/16W 220Ω-J  |
| R2029      | 103P491O50 | CHIP METAL RESISTOR | 1/16W 390Ω-F  | R5D4       | 103P505O30 | CHIP RESISTOR       | 1/16W 220kΩ-J |
| R2031      | 103P502O20 | CHIP RESISTOR       | 1/16W 560Ω-J  | R5D5       | 103P506O10 | CHIP RESISTOR       | 1/16W 1MΩ-J   |
| R2032      | 103P503O90 | CHIP RESISTOR       | 1/16W 15kΩ-J  |            |            |                     |               |
|            |            |                     |               | R5D6       | 103P505O70 | CHIP RESISTOR       | 1/16W 470kΩ-J |
| R2033      | 103P503O70 | CHIP RESISTOR       | 1/16W 10kΩ-J  | R5D7       | 103P503O70 | CHIP RESISTOR       | 1/16W 10kΩ-J  |
| R2034      | 103P501O30 | CHIP RESISTOR       | 1/16W 100Ω-J  | R5D9       | 103P503O40 | CHIP RESISTOR       | 1/16W 5.6kΩ-J |
| R2035      | 103P493O50 | CHIP METAL RESISTOR | 1/16W 2.7kΩ-F | R5E0       | 103P503O20 | CHIP RESISTOR       | 1/16W 3.9kΩ-J |
| R2051      | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)   | R5E1       | 103P503O60 | CHIP RESISTOR       | 1/16W 8.2kΩ-J |
| R2053      | 103P491O30 | CHIP METAL RESISTOR | 1/16W 330Ω-F  |            |            |                     |               |
|            |            |                     |               | R5E2       | 103P504O90 | CHIP RESISTOR       | 1/16W 100kΩ-J |
| R2055      | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)   | R5E5       | 103P502O40 | CHIP RESISTOR       | 1/16W 820Ω-J  |
| R2056      | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)   | R5E7       | 103P503O70 | CHIP RESISTOR       | 1/16W 10kΩ-J  |
| R300       | 103P504O20 | CHIP RESISTOR       | 1/16W 27kΩ-J  | R5F7       | 103P503O00 | CHIP RESISTOR       | 1/16W 2.7kΩ-J |
| R301       | 103P503O80 | CHIP RESISTOR       | 1/16W 12kΩ-J  | R5F8       | 103P503O00 | CHIP RESISTOR       | 1/16W 2.7kΩ-J |
| R302       | 103P505O50 | CHIP RESISTOR       | 1/16W 330kΩ-J |            |            |                     |               |
|            |            |                     |               | R5G1       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   |
| R304       | 103P490O80 | CHIP METAL RESISTOR | 1/16W 200Ω-F  | R5G5       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   |
| R305       | 103P503O70 | CHIP RESISTOR       | 1/16W 10kΩ-J  | R5G6       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   |
| R306       | 103P504O10 | CHIP RESISTOR       | 1/16W 22kΩ-J  | R5G7       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   |
| R308       | 103P496O60 | CHIP METAL RESISTOR | 1/16W 51kΩ-F  | R5G8       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   |
| R351       | 103P503O70 | CHIP RESISTOR       | 1/16W 10kΩ-J  |            |            |                     |               |
|            |            |                     |               | R5G9       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   |
| R352       | 103P503O30 | CHIP RESISTOR       | 1/16W 4.7kΩ-J | R5L0       | 103P505O30 | CHIP RESISTOR       | 1/16W 220kΩ-J |
|            |            |                     |               | R5L2       | 103P503O30 | CHIP RESISTOR       | 1/16W 4.7kΩ-J |

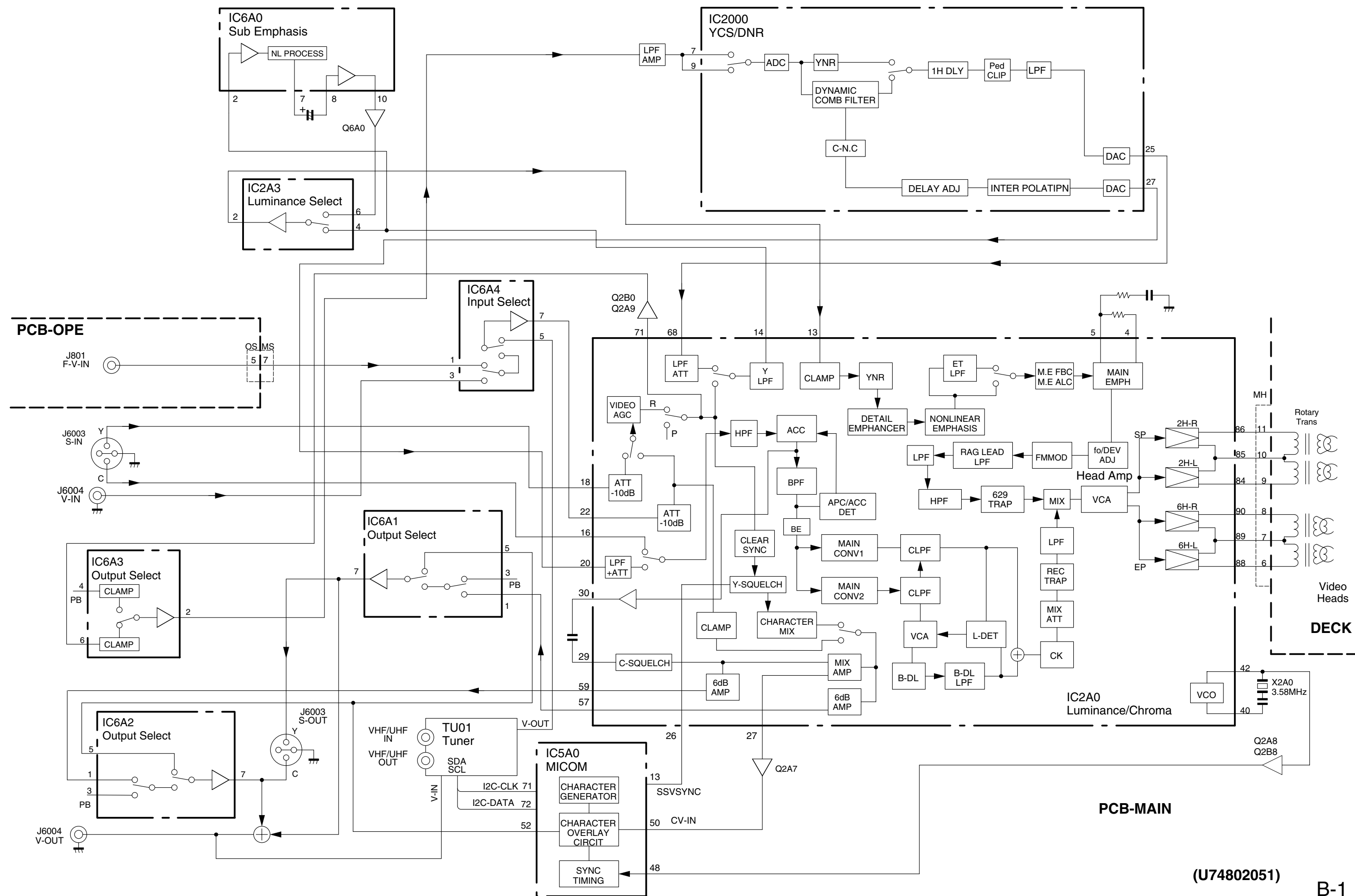
| SYMBOL No. | PARTS No.  | PARTS NAME          | DESCRIPTION   | SYMBOL No. | PARTS No.  | PARTS NAME          | DESCRIPTION   |
|------------|------------|---------------------|---------------|------------|------------|---------------------|---------------|
| R5L4       | 103P504O90 | CHIP RESISTOR       | 1/16W 100kΩ-J | R6E6       | 103P502O30 | CHIP RESISTOR       | 1/16W 680Ω-J  |
| R5P0       | 103P502O70 | CHIP RESISTOR       | 1/16W 1.5kΩ-J | R6E7       | 103P504O30 | CHIP RESISTOR       | 1/16W 33kΩ-J  |
| R5P1       | 103P502O10 | CHIP RESISTOR       | 1/16W 470Ω-J  | R6E8       | 103P492O60 | CHIP METAL RESISTOR | 1/16W 1.1kΩ-F |
| R5P2       | 103P506O10 | CHIP RESISTOR       | 1/16W 1MΩ-J   | R6E9       | 103P503O40 | CHIP RESISTOR       | 1/16W 5.6kΩ-J |
| R5P6       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R6F0       | 103P502O80 | CHIP RESISTOR       | 1/16W 1.8kΩ-J |
| R5R1       | 103P493O50 | CHIP METAL RESISTOR | 1/16W 2.7kΩ-F | R6F1       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   |
| R5R2       | 103P502O60 | CHIP RESISTOR       | 1/16W 1.2kΩ-J | R6F2       | 103P503O20 | CHIP RESISTOR       | 1/16W 3.9kΩ-J |
| R5R3       | 103P503O90 | CHIP RESISTOR       | 1/16W 15kΩ-J  | R6F3       | 103P503O90 | CHIP RESISTOR       | 1/16W 15kΩ-J  |
| R5R6       | 103P493O30 | CHIP METAL RESISTOR | 1/16W 2.2kΩ-F | R6F5       | 103P509O90 | CHIP RESISTOR       | 1/16W 75Ω-J   |
| R5R9       | 103P494O80 | CHIP METAL RESISTOR | 1/16W 9.1kΩ-F | R6F6       | 103P509O90 | CHIP RESISTOR       | 1/16W 75Ω-J   |
| R5S0       | 103P504O30 | CHIP RESISTOR       | 1/16W 33kΩ-J  | R6F7       | 103P509O90 | CHIP RESISTOR       | 1/16W 75Ω-J   |
| R5S3       | 103P503O90 | CHIP RESISTOR       | 1/16W 15kΩ-J  | R6F8       | 103P501O90 | CHIP RESISTOR       | 1/16W 330Ω-J  |
| R5S4       | 103P504O40 | CHIP RESISTOR       | 1/16W 39kΩ-J  | R6F9       | 103P501O90 | CHIP RESISTOR       | 1/16W 330Ω-J  |
| R5S6       | 103P503O10 | CHIP RESISTOR       | 1/16W 3.3kΩ-J | R6G0       | 103P500O80 | CHIP RESISTOR       | 1/16W 39Ω-J   |
| R5S8       | 103P493O70 | CHIP METAL RESISTOR | 1/16W 3.3kΩ-F | R6G1       | 103P500O80 | CHIP RESISTOR       | 1/16W 39Ω-J   |
| R5T5       | 103P504O30 | CHIP RESISTOR       | 1/16W 33kΩ-J  | R6G2       | 103P509O90 | CHIP RESISTOR       | 1/16W 75Ω-J   |
| R5T6       | 103P504O30 | CHIP RESISTOR       | 1/16W 33kΩ-J  | R6G3       | 103P509O90 | CHIP RESISTOR       | 1/16W 75Ω-J   |
| R5W1       | 103P504O30 | CHIP RESISTOR       | 1/16W 33kΩ-J  | R6G4       | 103P509O90 | CHIP RESISTOR       | 1/16W 75Ω-J   |
| R5X8       | 103P501O30 | CHIP RESISTOR       | 1/16W 100Ω-J  | R6G5       | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)   |
| R5X9       | 103P501O30 | CHIP RESISTOR       | 1/16W 100Ω-J  | R6G6       | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)   |
| R6A0       | 103P493O10 | CHIP METAL RESISTOR | 1/16W 1.8kΩ-F | R6H0       | 103P503O10 | CHIP RESISTOR       | 1/16W 3.3kΩ-J |
| R6A1       | 103P493O00 | CHIP METAL RESISTOR | 1/16W 1.6kΩ-F | R6H1       | 103P503O10 | CHIP RESISTOR       | 1/16W 3.3kΩ-J |
| R6A2       | 103P502O80 | CHIP RESISTOR       | 1/16W 1.8kΩ-J | R6H2       | 103P502O30 | CHIP RESISTOR       | 1/16W 680Ω-J  |
| R6A3       | 103P493O70 | CHIP METAL RESISTOR | 1/16W 3.3kΩ-F | R6H4       | 103P502O30 | CHIP RESISTOR       | 1/16W 680Ω-J  |
| R6A4       | 103P491O70 | CHIP METAL RESISTOR | 1/16W 470Ω-F  | R6J1       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   |
| R6A5       | 103P493O70 | CHIP METAL RESISTOR | 1/16W 3.3kΩ-F | R6J2       | 103P491O90 | CHIP METAL RESISTOR | 1/16W 560Ω-F  |
| R6A6       | 103P492O90 | CHIP RESISTOR       | 1/16W 1.5kΩ-F | R6J3       | 103P492O30 | CHIP METAL RESISTOR | 1/16W 820Ω-F  |
| R6A7       | 103P492O50 | CHIP METAL RESISTOR | 1/16W 1kΩ-F   | R6J4       | 103P501O90 | CHIP RESISTOR       | 1/16W 330Ω-J  |
| R6A8       | 103P492O50 | CHIP METAL RESISTOR | 1/16W 1kΩ-F   | R6J5       | 103P505O30 | CHIP RESISTOR       | 1/16W 220kΩ-J |
| R6A9       | 103P492O50 | CHIP METAL RESISTOR | 1/16W 1kΩ-F   | R6J6       | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)   |
| R6B0       | 103P491O70 | CHIP METAL RESISTOR | 1/16W 470Ω-F  | R6J7       | 103P503O70 | CHIP RESISTOR       | 1/16W 10kΩ-J  |
| R6B1       | 103P493O70 | CHIP METAL RESISTOR | 1/16W 3.3kΩ-F | R6J8       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   |
| R6B2       | 103P492O50 | CHIP METAL RESISTOR | 1/16W 1kΩ-F   | R6J9       | 103P501O70 | CHIP RESISTOR       | 1/16W 220Ω-J  |
| R6B3       | 103P492O90 | CHIP RESISTOR       | 1/16W 1.5kΩ-F | R6K0       | 103P501O70 | CHIP RESISTOR       | 1/16W 220Ω-J  |
| R6B4       | 103P492O50 | CHIP METAL RESISTOR | 1/16W 1kΩ-F   | R6K1       | 103P491O90 | CHIP METAL RESISTOR | 1/16W 560Ω-F  |
| R6B5       | 103P493O70 | CHIP METAL RESISTOR | 1/16W 3.3kΩ-F | R6K2       | 103P492O00 | CHIP RESISTOR       | 1/16W 620Ω-F  |
| R6B6       | 103P490O70 | CHIP METAL RESISTOR | 1/16W 180Ω-F  | R6K3       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   |
| R6B7       | 103P492O30 | CHIP METAL RESISTOR | 1/16W 820Ω-F  | R6K4       | 103P506O10 | CHIP RESISTOR       | 1/16W 1MΩ-J   |
| R6C1       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R6K5       | 103P506O10 | CHIP RESISTOR       | 1/16W 1MΩ-J   |
| R6C2       | 103P501O90 | CHIP RESISTOR       | 1/16W 330Ω-J  | R6K6       | 103P503O60 | CHIP RESISTOR       | 1/16W 8.2kΩ-J |
| R6C3       | 103P502O90 | CHIP RESISTOR       | 1/16W 2.2kΩ-J | R6K9       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   |
| R6C4       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R8A0       | 103P504O30 | CHIP RESISTOR       | 1/16W 33kΩ-J  |
| R6C5       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R8A1       | 103P504O30 | CHIP RESISTOR       | 1/16W 33kΩ-J  |
| R6C6       | 103P504O30 | CHIP RESISTOR       | 1/16W 33kΩ-J  | R8A2       | 103P504O30 | CHIP RESISTOR       | 1/16W 33kΩ-J  |
| R6C7       | 103P504O20 | CHIP RESISTOR       | 1/16W 27kΩ-J  | R8A3       | 103P504O30 | CHIP RESISTOR       | 1/16W 33kΩ-J  |
| R6C8       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R8A4       | 103P503O70 | CHIP RESISTOR       | 1/16W 10kΩ-J  |
| R6C9       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R8A5       | 103P504O50 | CHIP RESISTOR       | 1/16W 47kΩ-J  |
| R6D0       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R8E0       | 103P401O00 | CHIP RESISTOR       | 1/10W 56Ω-J   |
| R6D1       | 103P502O40 | CHIP RESISTOR       | 1/16W 820Ω-J  | R8E1       | 103P401O00 | CHIP RESISTOR       | 1/10W 56Ω-J   |
| R6D2       | 103P501O70 | CHIP RESISTOR       | 1/16W 220Ω-J  | R8E2       | 103P401O00 | CHIP RESISTOR       | 1/10W 56Ω-J   |
| R6D3       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R8E3       | 103P401O00 | CHIP RESISTOR       | 1/10W 56Ω-J   |
| R6D4       | 103P501O70 | CHIP RESISTOR       | 1/16W 220Ω-J  | R8E4       | 103P401O00 | CHIP RESISTOR       | 1/10W 56Ω-J   |
| R6D5       | 103P502O50 | CHIP RESISTOR       | 1/16W 1kΩ-J   | R8E5       | 103P401O00 | CHIP RESISTOR       | 1/10W 56Ω-J   |
| R6D9       | 103P501O30 | CHIP RESISTOR       | 1/16W 100Ω-J  | R8E6       | 103P401O00 | CHIP RESISTOR       | 1/10W 56Ω-J   |
| R6E1       | 103P501O30 | CHIP RESISTOR       | 1/16W 100Ω-J  | R8E7       | 103P401O00 | CHIP RESISTOR       | 1/10W 56Ω-J   |
| R6E4       | 103P492O50 | CHIP METAL RESISTOR | 1/16W 1kΩ-F   | R8E8       | 103P401O00 | CHIP RESISTOR       | 1/10W 56Ω-J   |
| R6E5       | 103P492O50 | CHIP METAL RESISTOR | 1/16W 1kΩ-F   |            |            |                     |               |

| SYMBOL No.                     | PARTS No.  | PARTS NAME          | DESCRIPTION        | SYMBOL No. | PARTS No.  | PARTS NAME             | DESCRIPTION        |
|--------------------------------|------------|---------------------|--------------------|------------|------------|------------------------|--------------------|
| R8E9                           | 103P401O00 | CHIP RESISTOR       | 1/10W 56Ω-J        | C2F3       | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
| R910                           | 103P503O70 | CHIP RESISTOR       | 1/16W 10kΩ-J       | C2F7       | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
| R911                           | 103P492O70 | CHIP METAL RESISTOR | 1/16W 1.2kΩ-F      |            |            |                        |                    |
| R916                           | 103P491O90 | CHIP METAL RESISTOR | 1/16W 560Ω-F       | C2G0       | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
|                                |            |                     |                    | C2G3       | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
| R917                           | 103P491O60 | CHIP METAL RESISTOR | 1/16W 430Ω-F       | C2G4       | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
| R918                           | 103P503O70 | CHIP RESISTOR       | 1/16W 10kΩ-J       | C2G5       | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
| R919                           | 103P504O80 | CHIP RESISTOR       | 1/16W 82kΩ-J       | C2G6       | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
| R925                           | 103P502O90 | CHIP RESISTOR       | 1/16W 2.2kΩ-J      |            |            |                        |                    |
| R943                           | 103P503O70 | CHIP RESISTOR       | 1/16W 10kΩ-J       | C2G7       | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
|                                |            |                     |                    | C2G8       | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
| R9L1                           | 103P505O50 | CHIP RESISTOR       | 1/16W 330kΩ-J      | C2G9       | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
| RJ01                           | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)        | C2H0       | 141P140O90 | CHIP CAPACITOR         | B50V 1000pF-K      |
| RJ03                           | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)        | C2H3       | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
| RJ04                           | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)        |            |            |                        |                    |
| RJ05                           | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)        | C2H4       | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K      |
|                                |            |                     |                    | C2H8       | 141P140O90 | CHIP CAPACITOR         | B50V 1000pF-K      |
| RJ06                           | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)        | C2K0       | 141P143O30 | CHIP CAPACITOR         | B16V 0.1μF-K       |
| RJ07                           | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)        | C2K1       | 154P342O50 | CHIP CAPACITOR         | CH50V 39pF-J       |
| RJ08                           | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)        | C2001      | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K      |
| RJ09                           | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)        |            |            |                        |                    |
| RJ10                           | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)        | C2003      | 154P342O30 | CHIP CAPACITOR         | CH50V 33pF-J       |
|                                |            |                     |                    | C2004      | 154P343O10 | CHIP CAPACITOR         | CH50V 68pF-J       |
| RJ11                           | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)        | C2006      | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K      |
| RJ12                           | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)        | C2008      | 154P343O10 | CHIP CAPACITOR         | CH50V 68pF-J       |
| RJ16                           | 103P509O50 | CHIP RESISTOR       | 0Ω (RM1608)        | C2010      | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K      |
| <b>CAPACITORS AND TRIMMERS</b> |            |                     |                    |            |            |                        |                    |
| C103                           | 141P142O50 | CHIP CAPACITOR      | B25V/16V 0.022μF-K | C2012      | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
| C2A0                           | 141P142O10 | CHIP CAPACITOR      | B25V 0.01μF-K      | C2013      | 154P344O30 | CHIP CAPACITOR         | CH50V 220pF-J      |
| C2A2                           | 141P143O30 | CHIP CAPACITOR      | B16V 0.1μF-K       | C2014      | 154P344O90 | CHIP CAPACITOR         | CH25V 390pF-J      |
| C2A3                           | 154P343O50 | CHIP CAPACITOR      | CH50V 100pF-J      | C2015      | 154P340O70 | CHIP CAPACITOR         | CH50V 6pF-C        |
| C2A5                           | 154P341O90 | CHIP CAPACITOR      | CH50V 22pF-J       | C2016      | 154P343O10 | CHIP CAPACITOR         | CH50V 68pF-J       |
|                                |            |                     |                    |            |            |                        |                    |
| C2A6                           | 154P340O50 | CHIP CAPACITOR      | CH50V 4pF-C        | C2017      | 154P343O10 | CHIP CAPACITOR         | CH50V 68pF-J       |
| C2A7                           | 141P144O20 | CHIP CAPACITOR      | F16V 0.1μF-Z       | C2018      | 154P342O30 | CHIP CAPACITOR         | CH50V 33pF-J       |
| C2A8                           | 141P144O20 | CHIP CAPACITOR      | F16V 0.1μF-Z       | C2019      | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
| C2A9                           | 141P144O20 | CHIP CAPACITOR      | F16V 0.1μF-Z       | C2021      | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K      |
| C2B0                           | 154P343O90 | CHIP CAPACITOR      | CH50V 150pF-J      | C2022      | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K      |
|                                |            |                     |                    |            |            |                        |                    |
| C2B1                           | 141P143O30 | CHIP CAPACITOR      | B16V 0.1μF-K       | C2023      | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K      |
| C2B2                           | 154P342O10 | CHIP CAPACITOR      | CH50V 27pF-J       | C2024      | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K      |
| C2B3                           | 154P341O30 | CHIP CAPACITOR      | CH50V 12pF-J       | C2026      | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
| C2B4                           | 141P143O30 | CHIP CAPACITOR      | B16V 0.1μF-K       | C2027      | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K      |
| C2B5                           | 154P342O10 | CHIP CAPACITOR      | CH50V 27pF-J       | C2028      | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
|                                |            |                     |                    |            |            |                        |                    |
| C2C0                           | 141P142O50 | CHIP CAPACITOR      | B25V/16V 0.022μF-K | C2029      | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K      |
| C2C1                           | 154P343O30 | CHIP CAPACITOR      | CH50V 82pF-J       | C2030      | 154P345O50 | CHIP CAPACITOR         | CH25V 680pF-J      |
| C2C2                           | 141P142O10 | CHIP CAPACITOR      | B25V 0.01μF-K      | C2032      | 141P143O30 | CHIP CAPACITOR         | B16V 0.1μF-K       |
| C2C3                           | 141P143O30 | CHIP CAPACITOR      | B16V 0.1μF-K       | C2033      | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K      |
| C2C4                           | 141P143O30 | CHIP CAPACITOR      | B16V 0.1μF-K       | C2036      | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
|                                |            |                     |                    |            |            |                        |                    |
| C2C5                           | 141P144O20 | CHIP CAPACITOR      | F16V 0.1μF-Z       | C2038      | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
| C2C6                           | 141P142O10 | CHIP CAPACITOR      | B25V 0.01μF-K      | C2041      | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K      |
| C2C9                           | 141P142O10 | CHIP CAPACITOR      | B25V 0.01μF-K      | C304       | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K      |
| C2D0                           | 141P142O10 | CHIP CAPACITOR      | B25V 0.01μF-K      | C306       | 141P139O70 | CHIP CAPACITOR         | B16V 0.22μF-K      |
| C2D3                           | 141P143O30 | CHIP CAPACITOR      | B16V 0.1μF-K       | C308       | 141P141O60 | CHIP CAPACITOR         | B50V 3900pF-K      |
|                                |            |                     |                    |            |            |                        |                    |
| C2D5                           | 141P144O20 | CHIP CAPACITOR      | F16V 0.1μF-Z       | C309       | 141P140O80 | CHIP CAPACITOR         | B50V 820pF-K       |
| C2D6                           | 141P143O30 | CHIP CAPACITOR      | B16V 0.1μF-K       | C312       | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z       |
| C2D9                           | 141P142O10 | CHIP CAPACITOR      | B25V 0.01μF-K      | C350       | 141P140O10 | CHIP CAPACITOR         | B50V 220pF-K       |
| C2E1                           | 154P340O70 | CHIP CAPACITOR      | CH50V 6pF-C        | C357       | 141P142O50 | CHIP CAPACITOR         | B25V/16V 0.022μF-K |
| C2E2                           | 141P144O20 | CHIP CAPACITOR      | F16V 0.1μF-Z       | C358       | 141P141O70 | CHIP CAPACITOR         | B50V 4700pF-K      |
|                                |            |                     |                    |            |            |                        |                    |
| C2E4                           | 141P142O50 | CHIP CAPACITOR      | B25V/16V 0.022μF-K | C379       | 181P212O60 | ELECTROLYTIC CAPACITOR | 04W 16V 47μF-M     |
| C2E7                           | 141P141O70 | CHIP CAPACITOR      | B50V 4700pF-K      | C3A7       | 141P143O30 | CHIP CAPACITOR         | B16V 0.1μF-K       |
| C2E8                           | 141P142O70 | CHIP CAPACITOR      | B25V/16V 0.033μF-K | C3A9       | 141P139O70 | CHIP CAPACITOR         | B16V 0.22μF-K      |
|                                |            |                     |                    | C3B0       | 141P139O70 | CHIP CAPACITOR         | B16V 0.22μF-K      |
|                                |            |                     |                    | C3B6       | 141P143O30 | CHIP CAPACITOR         | B16V 0.1μF-K       |

| SYMBOL No. | PARTS No.  | PARTS NAME                 | DESCRIPTION        | SYMBOL No.      | PARTS No.  | PARTS NAME             | DESCRIPTION         |
|------------|------------|----------------------------|--------------------|-----------------|------------|------------------------|---------------------|
| C3B8       | 141P143O30 | CHIP CAPACITOR             | B16V 0.1μF-K       | C6A7            | 154P344O50 | CHIP CAPACITOR         | CH25V 270pF-J       |
| C3B9       | 141P143O30 | CHIP CAPACITOR             | B16V 0.1μF-K       | C6A8            | 154P343O90 | CHIP CAPACITOR         | CH50V 150pF-J       |
| C3C0       | 141P143O30 | CHIP CAPACITOR             | B16V 0.1μF-K       | C6A9            | 154P343O30 | CHIP CAPACITOR         | CH50V 82pF-J        |
| C3C8       | 141P143O30 | CHIP CAPACITOR             | B16V 0.1μF-K       | C6B0            | 154P344O50 | CHIP CAPACITOR         | CH25V 270pF-J       |
| C3E4       | 141P143O80 | CHIP CAPACITOR             | F50V 0.01μF-Z      | C6B1            | 154P343O30 | CHIP CAPACITOR         | CH50V 82pF-J        |
| C3F2       | 141P142O50 | CHIP CAPACITOR             | B25V/16V 0.022μF-K | C6B2            | 154P344O50 | CHIP CAPACITOR         | CH25V 270pF-J       |
| C3F4       | 141P143O30 | CHIP CAPACITOR             | B16V 0.1μF-K       | C6B3            | 154P344O50 | CHIP CAPACITOR         | CH25V 270pF-J       |
| C3F5       | 141P143O80 | CHIP CAPACITOR             | F50V 0.01μF-Z      | C6B4            | 154P344O30 | CHIP CAPACITOR         | CH50V 220pF-J       |
| C3G1       | 141P143O80 | CHIP CAPACITOR             | F50V 0.01μF-Z      | C6C1            | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z        |
| C3G3       | 141P143O80 | CHIP CAPACITOR             | F50V 0.01μF-Z      | C6C2            | 154P342O90 | CHIP CAPACITOR         | CH50V 56pF-J        |
| C3J0       | 141P143O30 | CHIP CAPACITOR             | B16V 0.1μF-K       | C6C3            | 154P341O70 | CHIP CAPACITOR         | CH50V 18pF-J        |
| C3J1       | 141P143O30 | CHIP CAPACITOR             | B16V 0.1μF-K       | C6C6            | 154P342O10 | CHIP CAPACITOR         | CH50V 27pF-J        |
| C3J2       | 141P143O30 | CHIP CAPACITOR             | B16V 0.1μF-K       | C6C7            | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K       |
| C3J3       | 141P142O10 | CHIP CAPACITOR             | B25V 0.01μF-K      | C6C8            | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K       |
| C3J4       | 141P142O10 | CHIP CAPACITOR             | B25V 0.01μF-K      | C6C9            | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K       |
| C3J6       | 141P142O30 | CHIP CAPACITOR             | B25V/16V 0.015μF-K | C6D0            | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z        |
| C3J7       | 141P142O30 | CHIP CAPACITOR             | B25V/16V 0.015μF-K | C6D3            | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K       |
| C3L0       | 141P142O90 | CHIP CAPACITOR             | B25V/16V 0.047μF-K | C6D4            | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K       |
| C5A0       | 189P197O20 | ELE DOUBLE LAYER CAPACITOR | FM0H473Z           | C6D5            | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z        |
| C5A6       | 141P143O80 | CHIP CAPACITOR             | F50V 0.01μF-Z      | C6D8            | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z        |
| C5A7       | 141P143O80 | CHIP CAPACITOR             | F50V 0.01μF-Z      | C6E2            | 181P352O70 | ELECTROLYTIC CAPACITOR | 04W 16V 470μF-M     |
| C5B5       | 141P143O80 | CHIP CAPACITOR             | F50V 0.01μF-Z      | C6E4            | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z        |
| C5B6       | 154P341O70 | CHIP CAPACITOR             | CH50V 18pF-J       | C6E5            | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K       |
| C5B7       | 154P341O50 | CHIP CAPACITOR             | CH50V 15pF-J       | C6E7            | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z        |
| C5B8       | 154P341O70 | CHIP CAPACITOR             | CH50V 18pF-J       | C6E9            | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z        |
| C5B9       | 154P341O70 | CHIP CAPACITOR             | CH50V 18pF-J       | C6F2            | 181P350O60 | ELECTROLYTIC CAPACITOR | CE04W 6.3V 1000μF-M |
| C5C0       | 141P142O10 | CHIP CAPACITOR             | B25V 0.01μF-K      | C6F3            | 141P142O10 | CHIP CAPACITOR         | B25V 0.01μF-K       |
| C5C1       | 154P342O70 | CHIP CAPACITOR             | CH50V 47pF-J       | C6F4            | 181P350O60 | ELECTROLYTIC CAPACITOR | CE04W 6.3V 1000μF-M |
| C5C9       | 141P142O10 | CHIP CAPACITOR             | B25V 0.01μF-K      | C6F5            | 154P342O30 | CHIP CAPACITOR         | CH50V 33pF-J        |
| C5D2       | 141P141O70 | CHIP CAPACITOR             | B50V 4700pF-K      | C6G1            | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z        |
| C5D3       | 141P142O10 | CHIP CAPACITOR             | B25V 0.01μF-K      | C6J0            | 141P144O20 | CHIP CAPACITOR         | F16V 0.1μF-Z        |
| C5D4       | 141P143O80 | CHIP CAPACITOR             | F50V 0.01μF-Z      | C6J1            | 154P344O10 | CHIP CAPACITOR         | CH50V 180pF-J       |
| C5E0       | 141P143O90 | CHIP CAPACITOR             | F50V 0.022μF-Z     | C6J3            | 154P343O50 | CHIP CAPACITOR         | CH50V 100pF-J       |
| C5E2       | 141P140O90 | CHIP CAPACITOR             | B50V 1000pF-K      | C901            | 189P193O30 | C-M-P-AC               | AC125V 0.068μF-M    |
| C5E3       | 154P343O90 | CHIP CAPACITOR             | CH50V 150pF-J      | C902            | 189P193O30 | C-M-P-AC               | AC125V 0.068μF-M    |
| C5E4       | 141P143O30 | CHIP CAPACITOR             | B16V 0.1μF-K       | C907            | 181P355O50 | ELECTROLYTIC CAPACITOR | 04W 50V 10μF-M      |
| C5E5       | 141P140O60 | CHIP CAPACITOR             | B50V 560pF-K       | C908            | 189P215O90 | AC CERAMIC CAPACITOR   | AC250V E2200pF-M    |
| C5E6       | 141P143O30 | CHIP CAPACITOR             | B16V 0.1μF-K       | C915            | 181P355O10 | ELECTROLYTIC CAPACITOR | 04W 50V 1μF-M       |
| C5J9       | 141P143O90 | CHIP CAPACITOR             | F50V 0.022μF-Z     | C918            | 181P355O60 | ELECTROLYTIC CAPACITOR | 04W 50V 22μF-M      |
| C5L0       | 141P142O90 | CHIP CAPACITOR             | B25V/16V 0.047μF-K | C921            | 181P350O40 | ELECTROLYTIC CAPACITOR | 6.3V 330μF-M        |
| C5R1       | 141P140O80 | CHIP CAPACITOR             | B50V 820pF-K       | C926            | 181P352O30 | ELECTROLYTIC CAPACITOR | 16V 47μF-M          |
| C5S0       | 141P141O70 | CHIP CAPACITOR             | B50V 4700pF-K      | C927            | 181P352O30 | ELECTROLYTIC CAPACITOR | 16V 47μF-M          |
| C5S1       | 141P142O20 | CHIP CAPACITOR             | B25V/16V 0.012μF-K | C929            | 181P352O80 | ELECTROLYTIC CAPACITOR | 04W 16V 1000μF-M    |
| C5S3       | 141P143O00 | CHIP CAPACITOR             | B25/16V 0.056μF-K  | C936            | 181P351O50 | ELECTROLYTIC CAPACITOR | 10V 220μF-M         |
| C5S4       | 141P143O00 | CHIP CAPACITOR             | B25/16V 0.056μF-K  | C9Y1            | 189P215O90 | AC CERAMIC CAPACITOR   | AC250V E2200pF-M    |
| C5S5       | 141P140O90 | CHIP CAPACITOR             | B50V 1000pF-K      | C9Y2            | 189P215O90 | AC CERAMIC CAPACITOR   | AC250V E2200pF-M    |
| C5S6       | 141P141O30 | CHIP CAPACITOR             | B50V 2200pF-K      | <b>SWITCHES</b> |            |                        |                     |
| C5S9       | 141P143O30 | CHIP CAPACITOR             | B16V 0.1μF-K       | S5B1            | 432P166O10 | KEY BOARD SWITCH       | RESET               |
| C5T5       | 141P142O10 | CHIP CAPACITOR             | B25V 0.01μF-K      | S5S0            | 439P045O10 | SWITCH                 | S-SW MPU10184MLBO   |
| C5T6       | 141P142O10 | CHIP CAPACITOR             | B25V 0.01μF-K      | S810            | 432P203O30 | KEY BOARD SWITCH       | EJECT               |
| C5U0       | 141P142O10 | CHIP CAPACITOR             | B25V 0.01μF-K      | S811            | 432P203O30 | KEY BOARD SWITCH       | POWER               |
| C5U1       | 141P142O10 | CHIP CAPACITOR             | B25V 0.01μF-K      | S812            | 432P203O30 | KEY BOARD SWITCH       | SP/EP               |
| C5V2       | 154P342O90 | CHIP CAPACITOR             | CH50V 56pF-J       | S8A0            | 432P203O30 | KEY BOARD SWITCH       | REC                 |
| C6A4       | 141P144O20 | CHIP CAPACITOR             | F16V 0.1μF-Z       | S8A1            | 432P203O30 | KEY BOARD SWITCH       | FF                  |
| C6A5       | 181P210O60 | ELECTROLYTIC CAPACITOR     | 04W 6.3V 330μF-M   | S8A2            | 432P203O30 | KEY BOARD SWITCH       | PAUSE               |
| C6A6       | 154P344O50 | CHIP CAPACITOR             | CH25V 270pF-J      | S8A3            | 432P203O30 | KEY BOARD SWITCH       | PB                  |

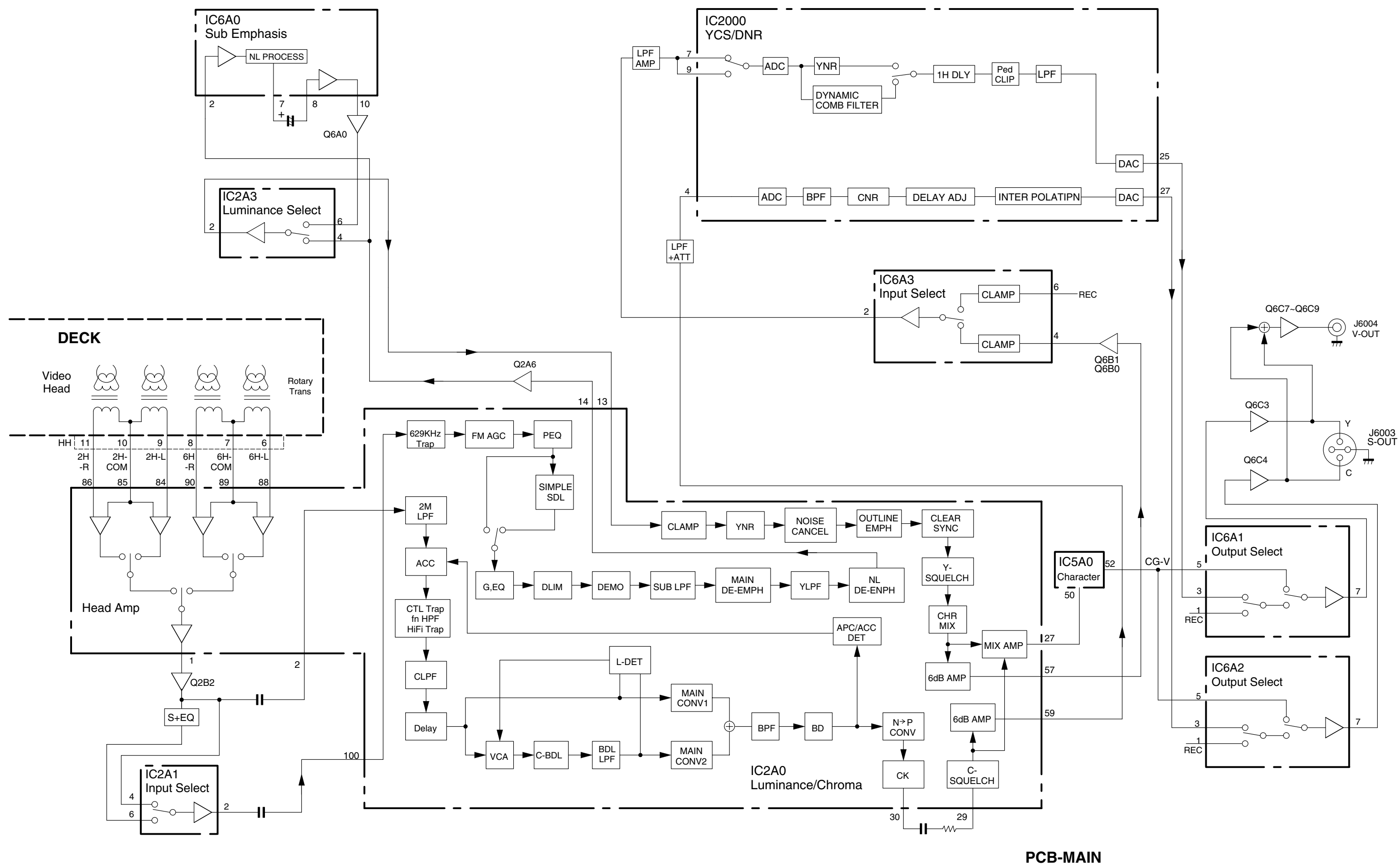
| SYMBOL No.                          | PARTS No.  | PARTS NAME        | DESCRIPTION        | SYMBOL No. | PARTS No. | PARTS NAME | DESCRIPTION |
|-------------------------------------|------------|-------------------|--------------------|------------|-----------|------------|-------------|
| S8A4                                | 432P203O30 | KEY BOARD SWITCH  | STOP               |            |           |            |             |
| S8A5                                | 432P203O30 | KEY BOARD SWITCH  | REW                |            |           |            |             |
| S8A6                                | 432P203O30 | KEY BOARD SWITCH  | CH-UP              |            |           |            |             |
| S8A7                                | 432P203O30 | KEY BOARD SWITCH  | CH-DN              |            |           |            |             |
| <b>MISCELLANEOUS</b>                |            |                   |                    |            |           |            |             |
|                                     | 243C156O20 | CARD LEAD WIRE    | (MS OS) 11P L=100  |            |           |            |             |
|                                     | 243C193O30 | CARD LEAD WIRE    | (MD DD) 7PIN L=120 |            |           |            |             |
|                                     | 243C193O50 | CARD LEAD WIRE    | (MA DA) 7PIN L=160 |            |           |            |             |
|                                     | 440B134O10 | PIN JACK BOARD    | (J6004) 6PIN       |            |           |            |             |
|                                     | 451C227O20 | RCA PIN JACK      | (J803) RED         |            |           |            |             |
|                                     | 451C227O30 | RCA PIN JACK      | (J802) WHITE       |            |           |            |             |
|                                     | 451C234O20 | RCA PIN JACK      | (J801)             |            |           |            |             |
|                                     | 621C525O10 | LED HOLDER        | (D5B4)             |            |           |            |             |
|                                     | 621C527O10 | PHOTO HOLDER      | (Q5A2)             |            |           |            |             |
|                                     | 621C564O10 | LED HOLDER R      | (Q5A1)             |            |           |            |             |
|                                     | 621C564O10 | LED HOLDER R      | (Q5A0)             |            |           |            |             |
| F901                                | 283D130O30 | FUSE              | S1.6A 125V         |            |           |            |             |
| PC901                               | 268D024O30 | PHOTO COUPLER     | ON3131-R           |            |           |            |             |
| Q5A0                                | 268P076O20 | PHOTO TRANSISTOR  | SPS-1119C-BC-T     |            |           |            |             |
| Q5A1                                | 268P076O20 | PHOTO TRANSISTOR  | SPS-1119C-BC-T     |            |           |            |             |
| Q5A2                                | 268P076O20 | PHOTO TRANSISTOR  | SPS-1119C-BC-T     |            |           |            |             |
| Q5A6                                | 268P092O10 | PHOTO TRANSISTOR  | PT492FK1           |            |           |            |             |
| Q5A7                                | 268P092O10 | PHOTO TRANSISTOR  | PT492FK1           |            |           |            |             |
| Q5A8                                | 268P076O20 | PHOTO TRANSISTOR  | SPS-1119C-BC-T     |            |           |            |             |
| Q5A9                                | 268P076O20 | PHOTO TRANSISTOR  | SPS-1119C-BC-T     |            |           |            |             |
| Q5B0                                | 268P076O20 | PHOTO TRANSISTOR  | SPS-1119C-BC-T     |            |           |            |             |
| RV901                               | 265P100O20 | VARISTOR          | ERZV10D271CS       |            |           |            |             |
| TU01                                | 295P515O10 | TUNER             | VD025AW            |            |           |            |             |
| V8A0                                | 262P067O10 | LED DISPLAY       |                    |            |           |            |             |
| X2A0                                | 285P412O10 | CRYSTAL RESONATOR | 3.57955MHz         |            |           |            |             |
| X5A0                                | 285P054O10 | CRYSTAL RESONATOR | 32.768kHz          |            |           |            |             |
| X5A1                                | 285P368O40 | CRYSTAL RESONATOR | 12.000MHz          |            |           |            |             |
| Z5A0                                | 939P713O30 | PREAMP UNIT       | TSOP1833XG1        |            |           |            |             |
| <b>PRINTED CIRCUIT BOARD ASSY'S</b> |            |                   |                    |            |           |            |             |
|                                     | 925B145O01 | MAIN PCB ASSY     |                    |            |           |            |             |
|                                     | 927C332O01 | OPE PCB ASSY      |                    |            |           |            |             |

# Luminance Record, Chroma Record HS-U748

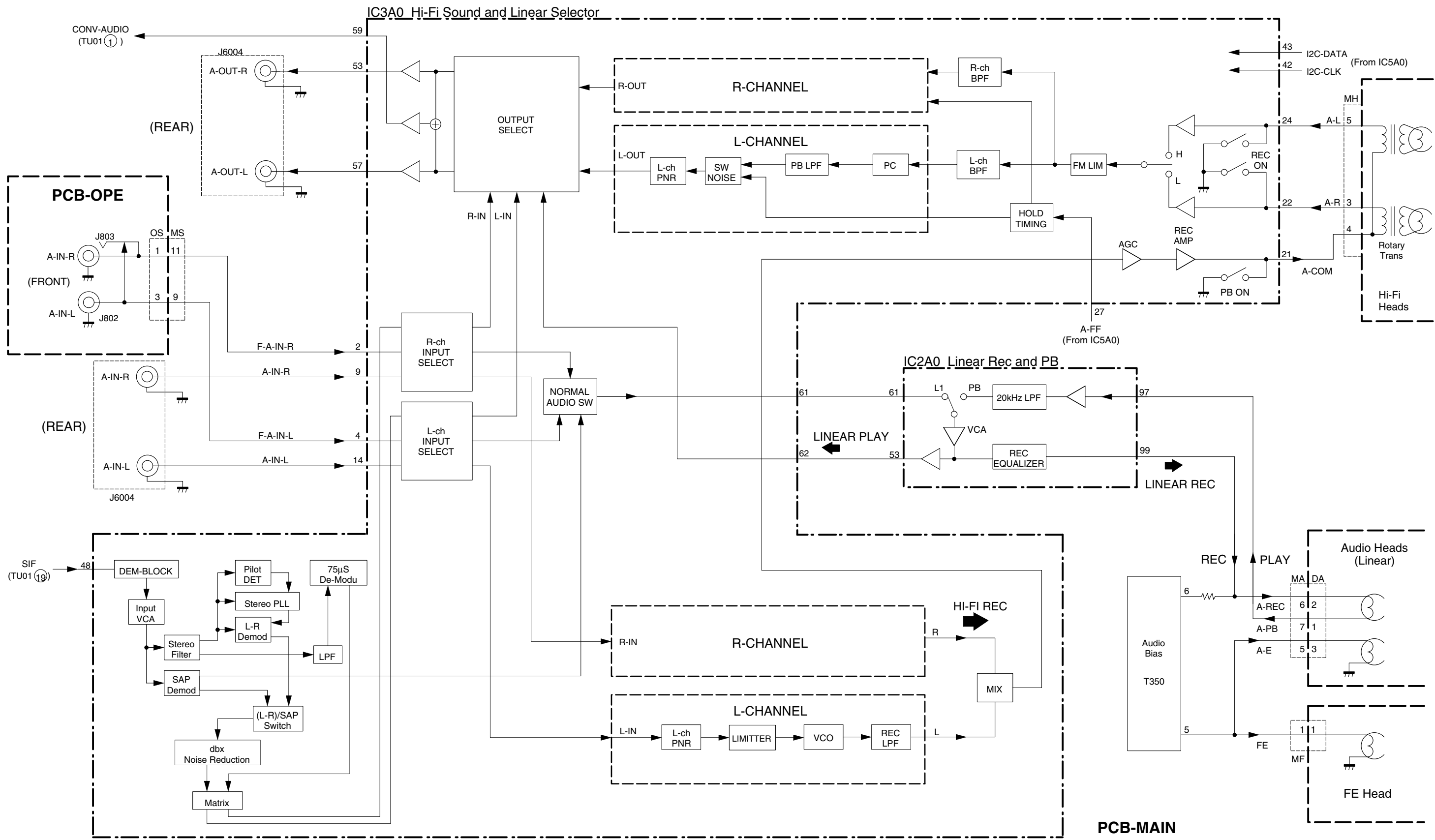


(U74802051)

# Luminance Playback, Chroma Playback HS-U748

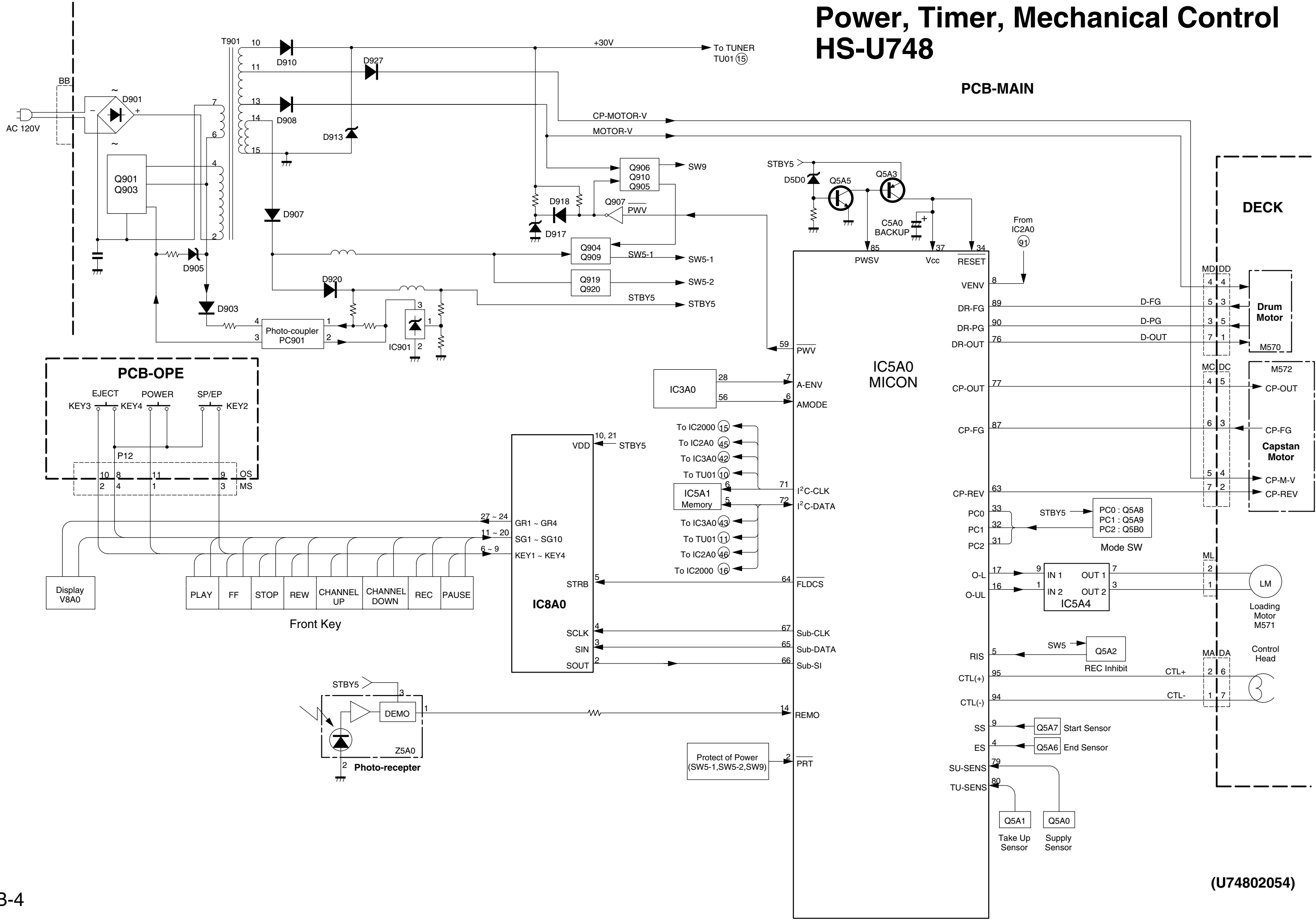


# Hi-Fi and Linear Sound HS-U748



(U74802053)

# Power, Timer, Mechanical Control HS-U748



**PCB-INTERCONNECT**

**COMPONENTS:**

- DECK
  - DRUM HEAD: 2H-R, 2H-L, 6H-R, 6H-L, A-R, A-L
  - AC HEAD: A-PB, A-REC, A-E, AE, CTL, CTL+, CTL-, GND, G12, I-LIMIT, CPMOTORV, CPGF, CPREV, SW5-1
  - FE HEAD: FE, FE-G
- MOTORS
  - DRUM MOTOR: SW5-1, GND, DPG, MOTORV, DFG, G12, DOUT
  - CAPSTAN MOTOR: GND, G12, I-LIMIT, CPMOTORV, CPGF, CPREV, SW5-1
  - LOADING MOTOR: L-MOTOR
- PCB-MAIN
  - POWER: SW5-1, GND, DPG, MOTORV, DFG, G12, DOUT
  - HIFI/TUNER: CTL-, CTL+, GND, A-E, A-REC, A-PB
  - TIMER/OPEKEY: SW5-1, CPREV, CPGF, CPMOTORV, CPMOTOR, I-LIMIT, G12, GND
  - S-SUB: SW5-1, GND, DPG, MOTORV, DFG, G12, DOUT
  - YCS: SW5-1, GND, DPG, MOTORV, DFG, G12, DOUT
  - CONTROL: SW5-1, GND, DPG, MOTORV, DFG, G12, DOUT
- PCB-SUB
  - SW5-1, GND, DPG, MOTORV, DFG, G12, DOUT
- PCB-YCS
  - SW5-1, GND, DPG, MOTORV, DFG, G12, DOUT
- PCB-TIMER/OPEKEY
  - SW5-1, GND, DPG, MOTORV, DFG, G12, DOUT

**PCB-MAIN**

**POWER**

**HIFI/TUNER**

**TIMER/OPEKEY**

**S-SUB**

**YCS**

**Y/C/A**

**CONTROL**

E

F

G

NOTE

1. Each voltage should be within  $\pm 20\%$  of the DC voltages measured with a digital voltmeter.
2. The voltages parenthesised on 2H recording mode.  
While those without parenthesised on 2H play back mode.
3. Waveforms were taken with standard color bar signal.
4. TP6A, etc. show Test Points.
5. Capacitors

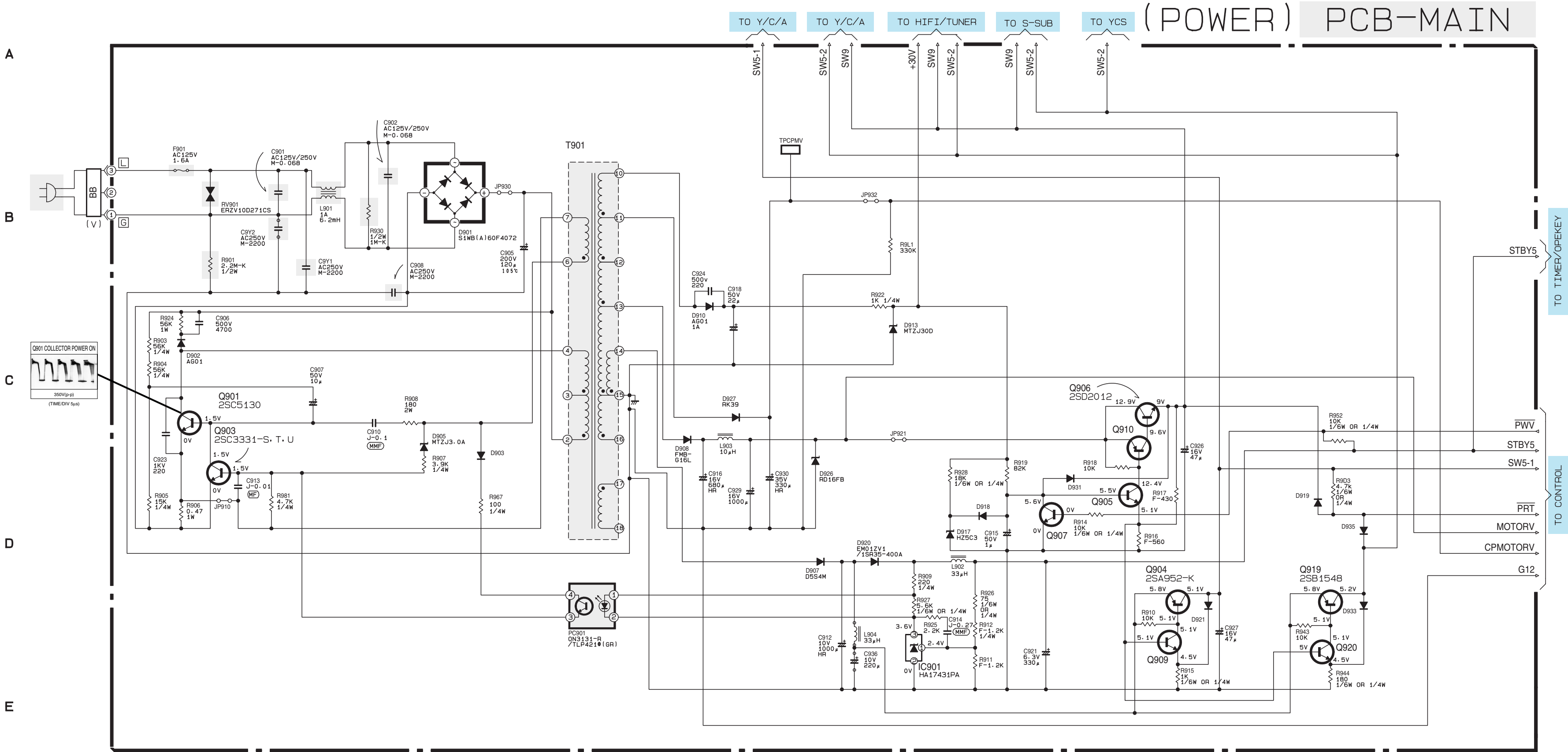
| 6. Resistors |                                                                                                 |                                                                                                                     |                                                                                                                                                                                                                               |
|--------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value        | Not indicated = $\Omega$<br>K = k $\Omega$ (1000 $\Omega$ )<br>M = M $\Omega$ (1000k $\Omega$ ) |                                                                                                                     |                                                                                                                                                                                                                               |
| Wattage      | Parts except for chips                                                                          | Not indicated = 1/4W or 1/6W                                                                                        |                                                                                                                                                                                                                               |
|              | Chips                                                                                           | Not indicated = 1/10W                                                                                               |                                                                                                                                                                                                                               |
| Tolerance    | Not indicated = $\pm 5\%$<br>D = $\pm 0.5\%$ J = $\pm 5\%$<br>F = $\pm 1\%$ K = $\pm 10\%$      |                                                                                                                     |                                                                                                                                                                                                                               |
| Sort         | I                                                                                               | Parts except for chips<br><br> | : Carbon resistor<br>: Fixed composition resistor<br>: Metal oxide film resistor (type B)<br>: Cemented resistor<br>: Wire wound resistor<br>: Metal film resistor<br>: Metal plate cement resistor<br>: Metal liner resistor |
|              | II                                                                                              | Chips                                                                                                               | Not indicated : Chip resistor                                                                                                                                                                                                 |

7. This is basic schematic diagram.  
Some sets may be subject to modification according to engineering improvement.

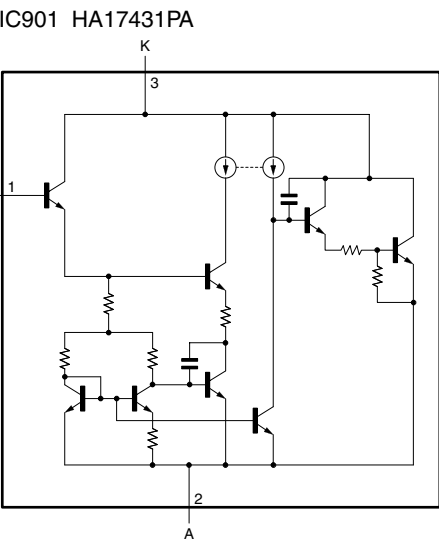
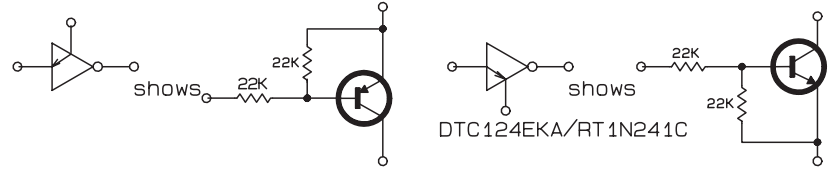
8. Correspondence of the units in the Schematic Diagrams to the SI units.

|       | Schematic Diagram | SI |
|-------|-------------------|----|
| Kilo  | K                 | k  |
| Hertz | HZ                | Hz |
| Pico  | P                 | p  |

HS-U748



NOTE  
UNLESS OTHERWISE SPECIFIED DTA124EKA/RT1P241C  
ALL RESISTORS ARE 1/16W  
ALL DIODES ARE 1SS254/1SS133  
ALL NPN TRANSISTORS ARE 2SC5395-G/2SC1740S-E  
ALL PNP TRANSISTORS ARE 2SA1993-E-F/2SA933S-R, S



# (HIFI/TUNER) PCB-MAIN

A

B

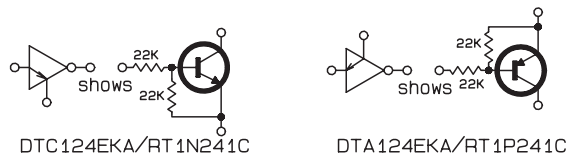
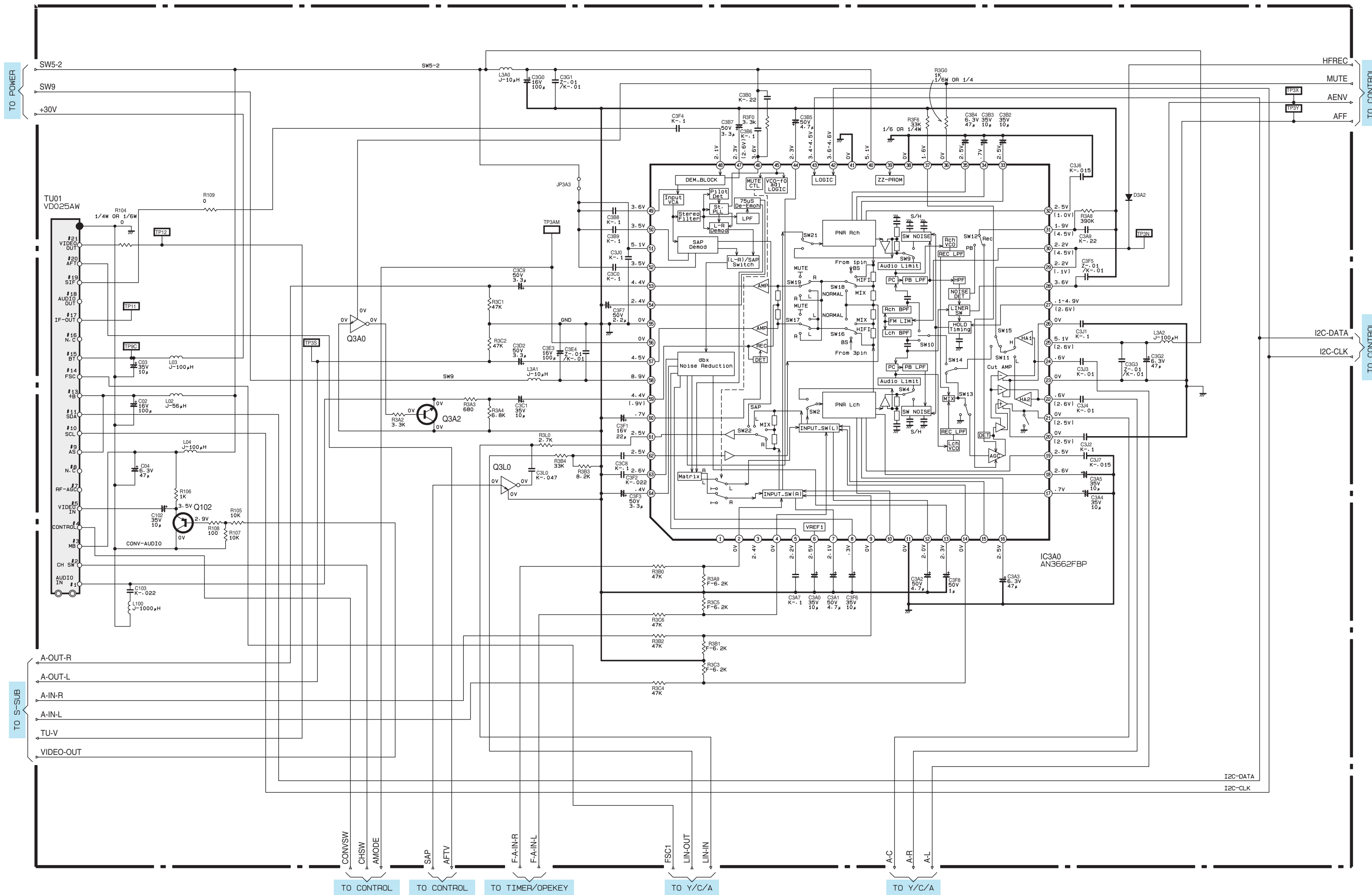
C

D

E

F

G



Note:  
Unless otherwise specified.  
All PNP transistors are 2SA1037AK-R-S  
All NPN transistors are 2SC2412K-R-S/2SD601AI-R-S  
All diodes are 1SS254/1SS133  
All resistors are 1/16W  
All PNP digital transistors are DTA124EKA/RT1P241C  
All NPN digital transistors are DTC124EKA/RT1N241C

(TIMER/OPEKEY) PCB-MAIN

A

B

C

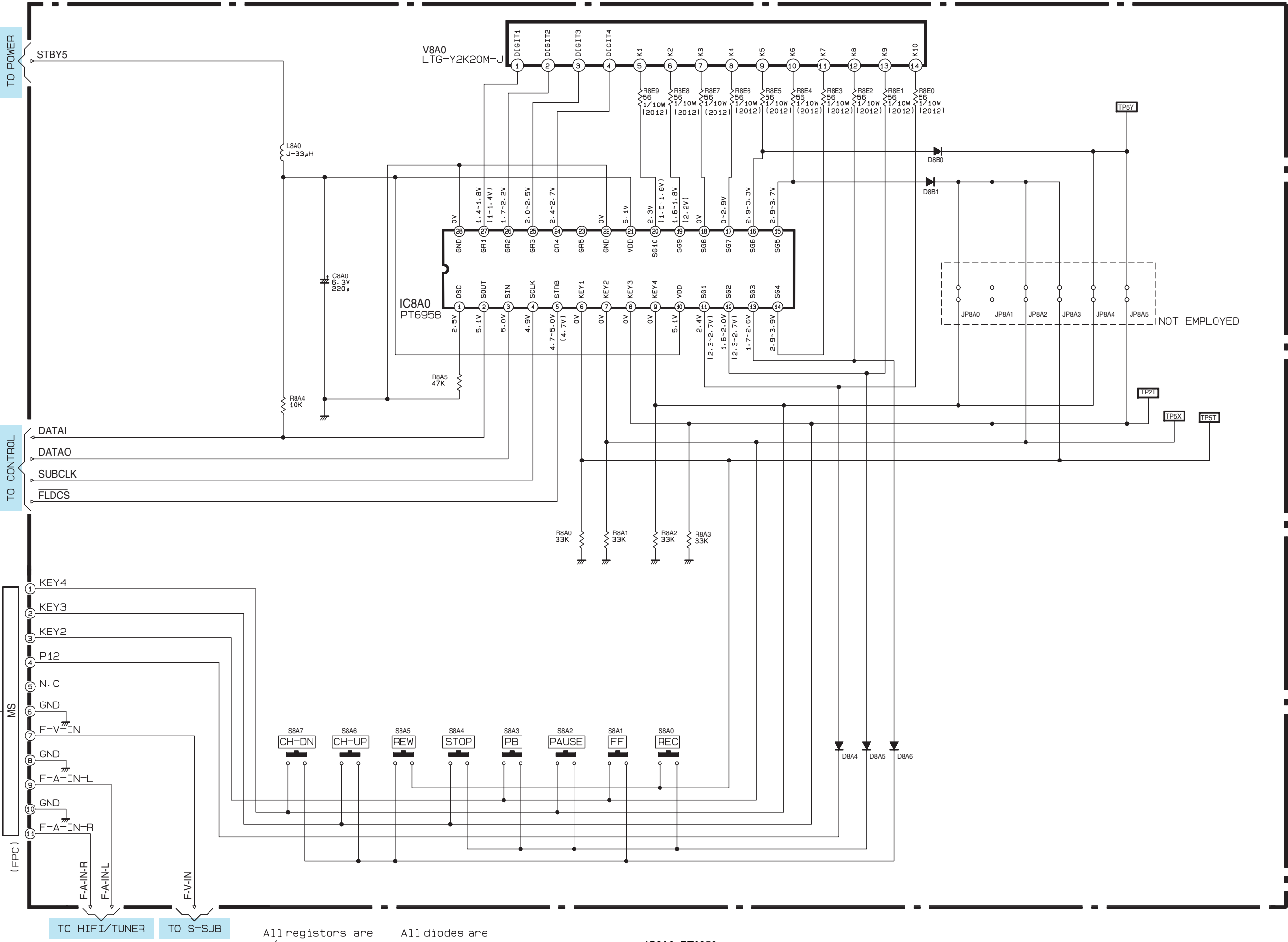
D

E

F

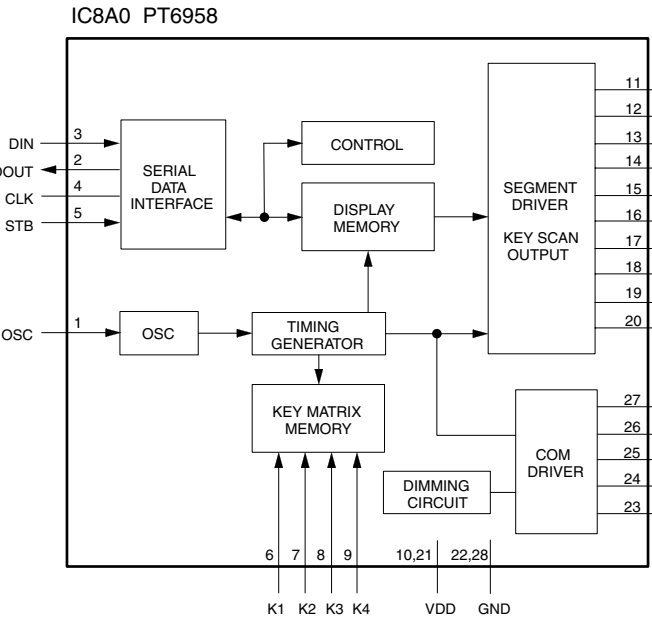
G

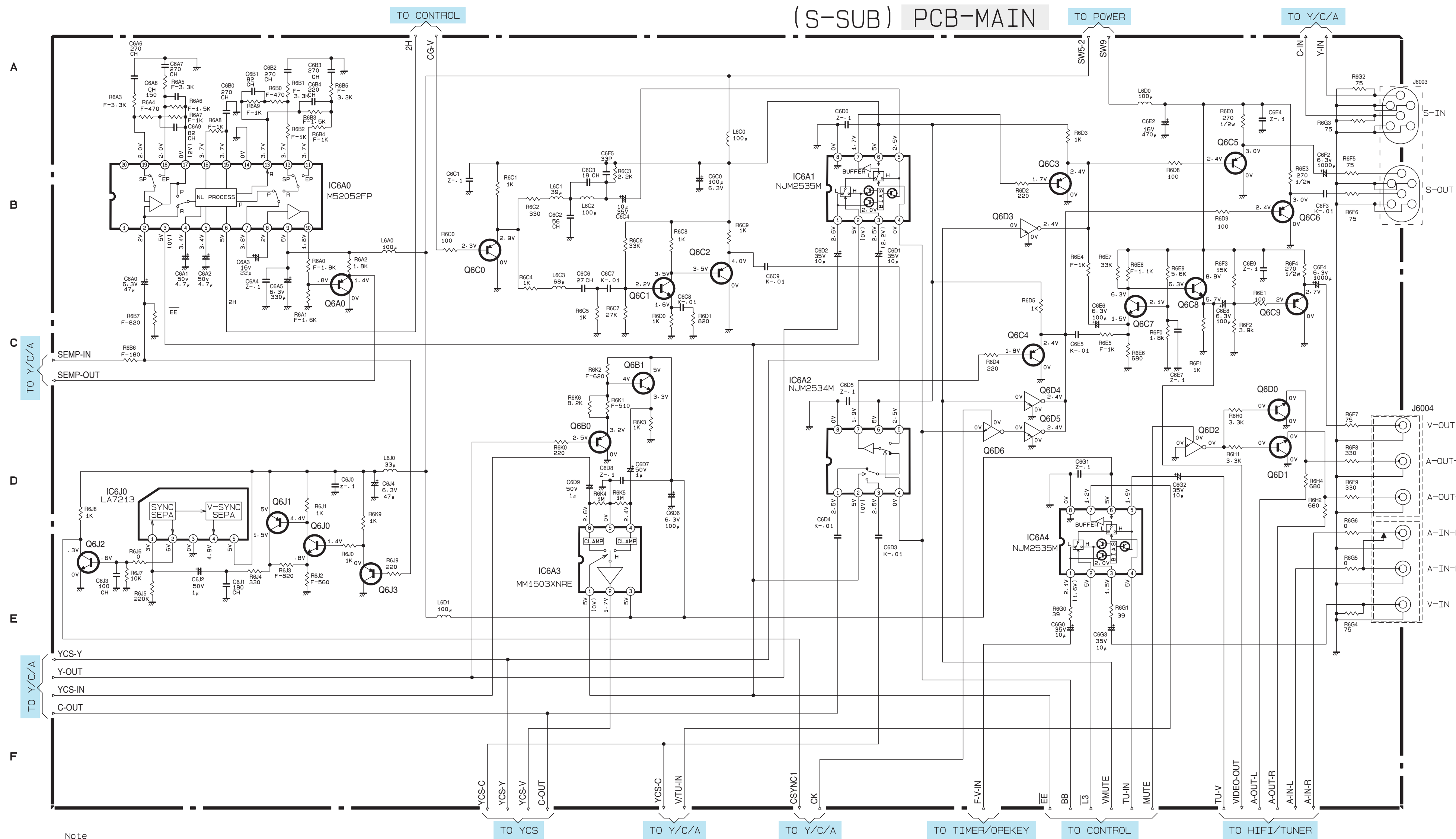
PCB-OPE



All registers are 1/16W unless otherwise specified.

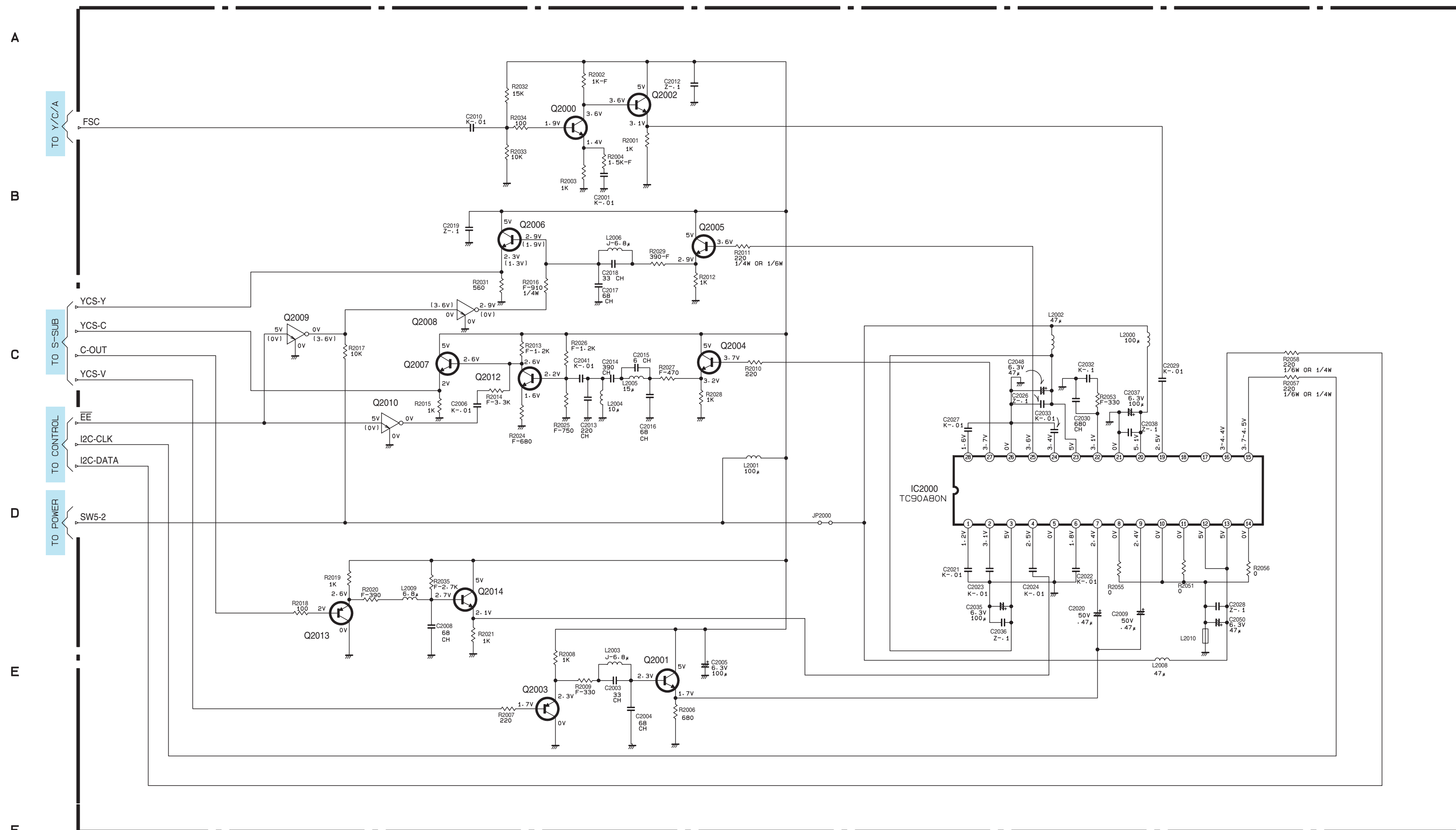
All diodes are 1SS254 unless otherwise specified.





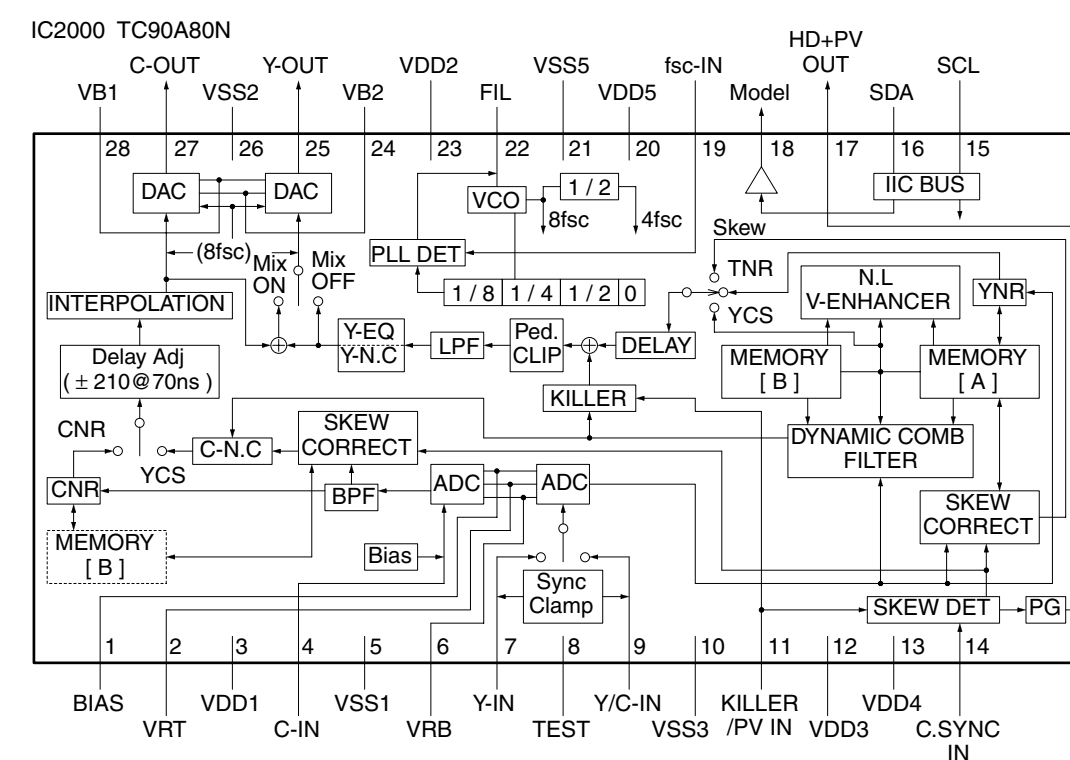
Note  
All resistors are 1/16W.  
All PNP transistors are 2SA1037AK-R,S  
All NPN transistors are 2SC2412K-R,S/2SD601AI-R,S  
All PNP digital transistors are DTA124EKA/RT1P241C  
All NPN digital transistors are DTC124EKA/RT1N241C

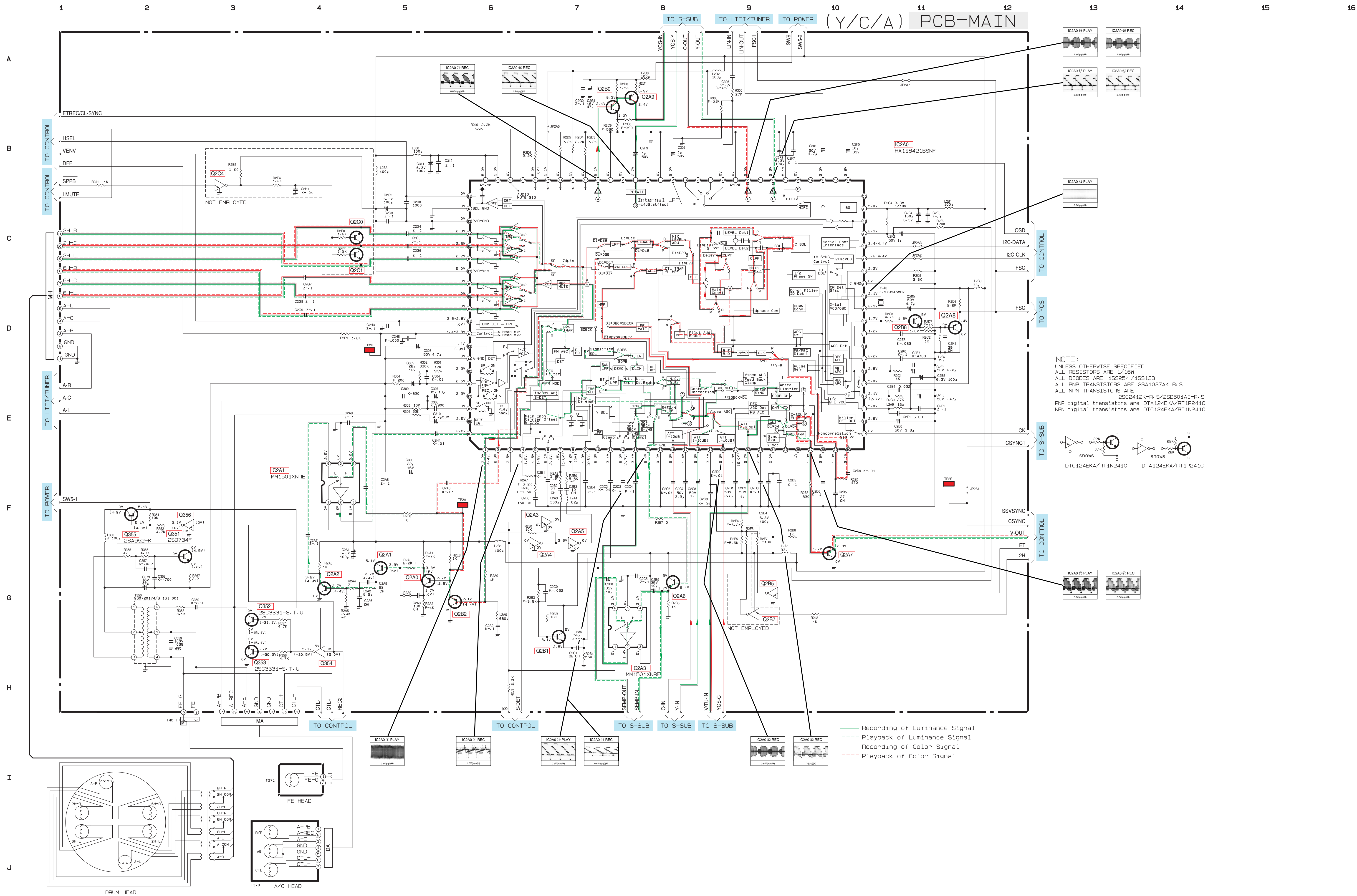
( YCS ) PCB-MAIN

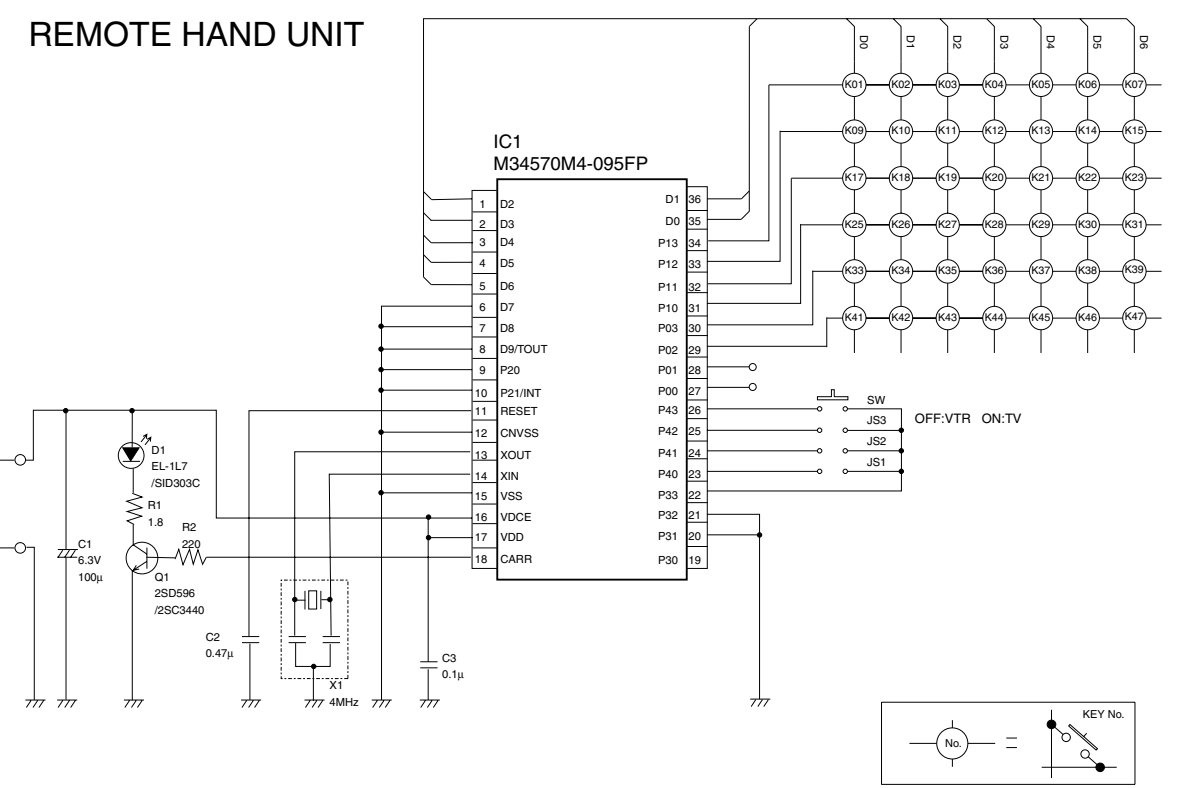
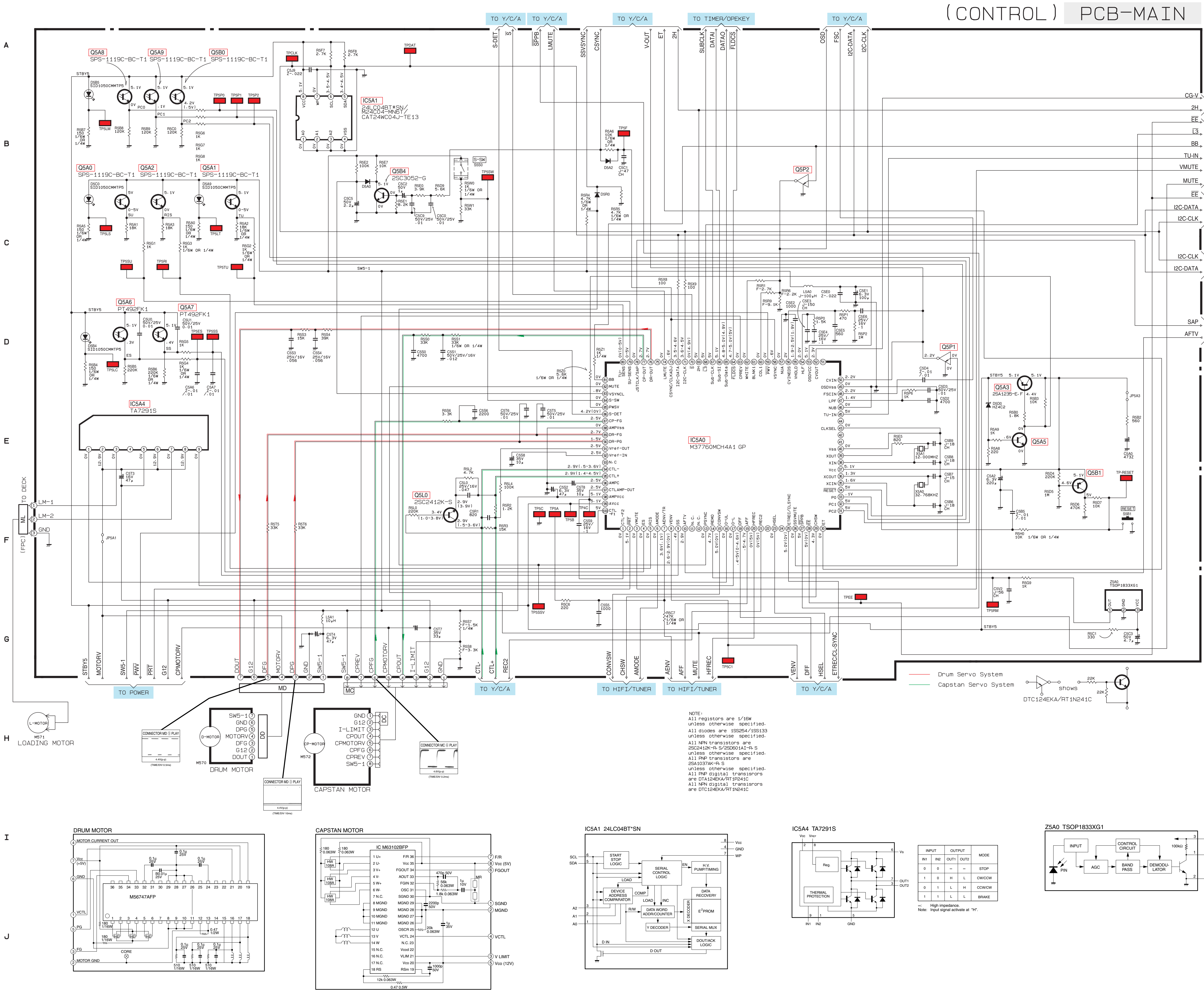


Note : Unless otherwise specified

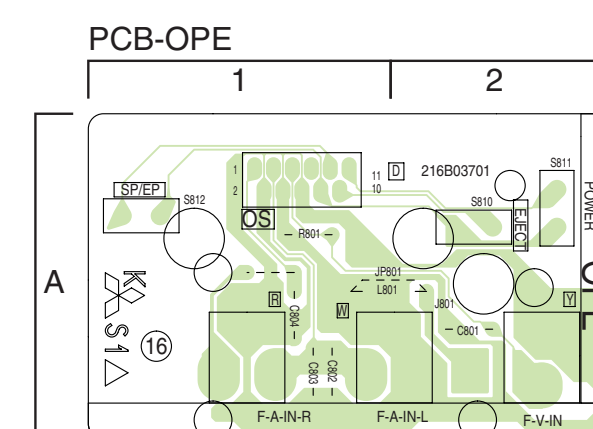
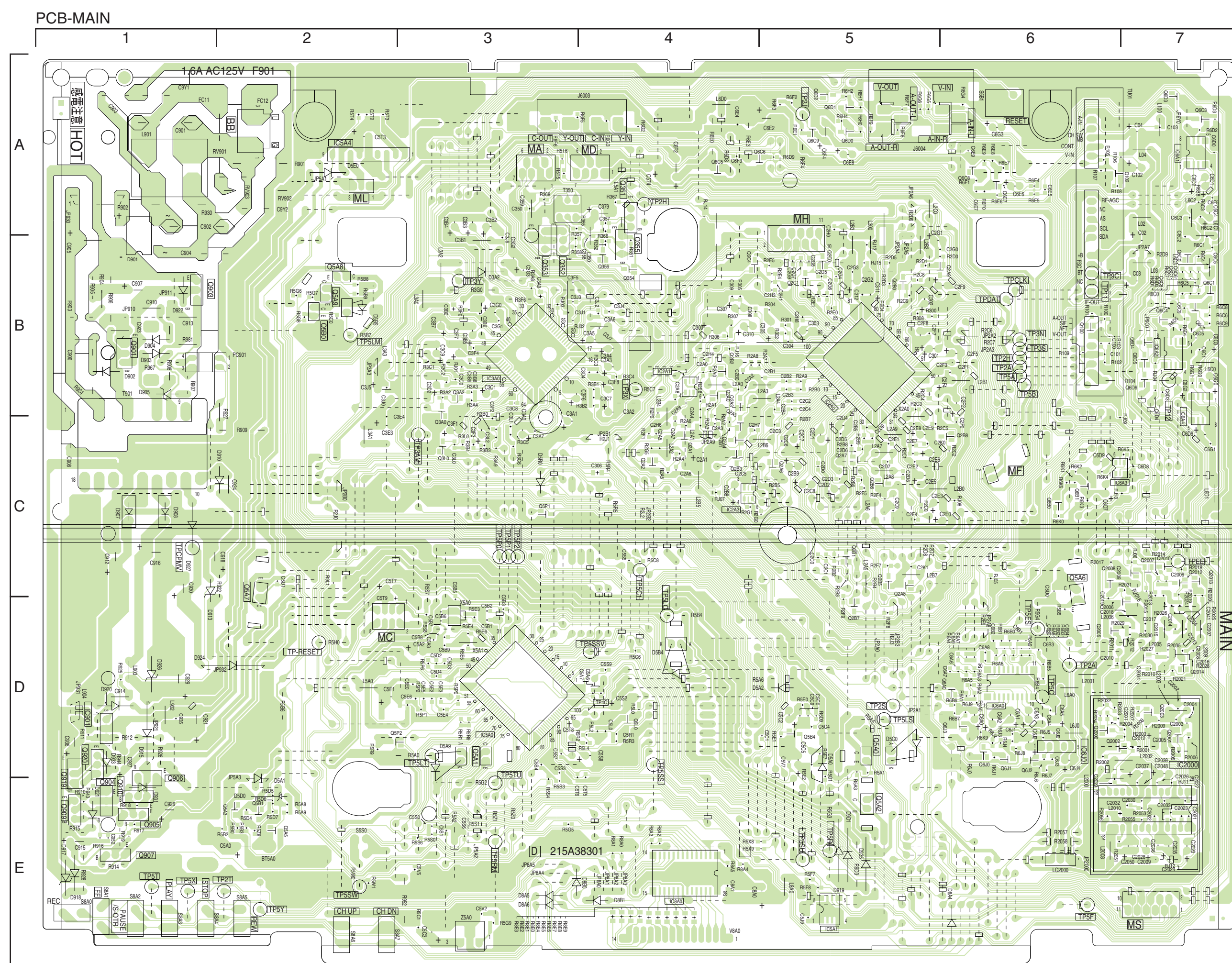
- A11 PNP transistors are 2SA1037AK-R.S
- A11 NPN transistors are 2SC2412K-R.S/2SD601AI-R.S
- A11 PNP digital transistors are DTA124EKA/RT1P241C
- A11 NPN digital transistors are DTC124EKA/RT1N241C
- A11 diodes are 1S5254/1S5133
- A11 resistors are 1/16W







| KEY NO. | FUNCTION      | KEY NO. | FUNCTION    |
|---------|---------------|---------|-------------|
| K01     | VCR POWER     | K25     | REC         |
| K02     | EJECT         | K26     | REW         |
| K03     | CH A          | K27     | PAUSE       |
| K04     | CH V          | K28     | STOP        |
| K05     | VOL V         | K29     | DISPLAY     |
| K06     | VOL A         | K30     | FF          |
| K07     | TV POWER      | K31     | X2          |
| K08     |               | K32     | AUDIO/VIDEO |
| K09     | 1             | K33     | CANCEL      |
| K10     | 4             | K34     | INDEX       |
| K11     | 5             | K35     | INDEX       |
| K12     | 2             | K36     | ADJ +       |
| K13     | 6             | K37     | INDEX +     |
| K14     | 3             | K38     | ENTER       |
| K15     | MUTE          | K39     | MENU        |
| K16     |               | K40     |             |
| K17     | 7             | K41     | VCR/TV      |
| K18     | QUICK PROGRAM | K42     |             |
| K19     | PLAY          | K43     |             |
| K20     | 8             | K44     | ADJ -       |
| K21     | 10            | K45     |             |
| K22     | 9             | K46     |             |
| K23     | INPUT         | K47     | SP/EP       |
| K24     |               | K48     |             |

[illegible]