

# TC-K333ESA/K990ES

## SERVICE MANUAL

*AEP Model*  
TC-K990ES

*E Model*  
TC-K333ESA



\* Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.

"DOLBY", the double-D symbol  and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

### SPECIFICATIONS

Recording system 4-track 2-channel stereo  
Fast winding time Approx. 90 sec. (with Sony C-60 cassette)  
Bias AC bias  
Heads Erasing head × 1 (S&F head)  
Recording head × 1 (LA head)  
Playback head × 1 (LA head)  
Motors Capstan motor × 1  
(direct-drive linear torque BSL motor)  
Reel motor × 1 (DC motor)

Signal-to-noise ratio (at peak level)

Cassette (Dolby NR OFF)	Type IV (Sony Metal-S)	Type II (Sony UX-S)	Type I (Sony HF-S)
	61 dB	59 dB	57 dB

Measured at peak level weighted without NR. The S/N is improved by about 15 dB at 500 Hz and by about 20 dB about 1 kHz with Dolby-C NR on, and by 5 dB at 1 kHz and by 10 dB about 5 kHz with Dolby-B NR on.

Harmonic distortion 1.3% (with Sony Metal-S 250 nWb/m, 315 Hz, 3rd H.D.)

Frequency response (Dolby NR OFF)

Type IV cassette (Sony Metal-S)	15 - 22,000 Hz (±3 dB, IEC) 15 - 16,000 Hz [±3 dB (-4dB recording)]
Type II cassette (Sony UX-S)	15 - 20,000 Hz (±3 dB, IEC)
Type I cassette (Sony HF-S)	15 - 18,000 Hz (±3 dB, IEC)

Wow and flutter ± 0.04% W.Peak (IEC)  
0.022% W.RMS (NAB)  
± 0.065% W.Peak (DIN)

Inputs

Line inputs (phono jacks)	Sensitivity	0.16 V
	Input impedance	47 k ohms
CD DIRECT INPUT	Input impedance	47 k ohms

Model Name Using Similar Mechanism	TC-K333ESG
Tape Transport Mechanism Type	TCM-200D10

Outputs

Line outputs (phono jacks)	Rated output level	0.5 V at a load impedance of 47 k ohms
	Load impedance	Over 10 k ohms
Headphones (stereo phone jack)	Output level	0 - 3 mW at a load impedance of 32 ohms

General

Power requirements

AEP model:  
220 - 230 V AC, (or 240 V AC  
adjustable by Sony personnel),  
50/60 Hz

E model:  
120, 220, or 240 V AC adjustable,  
50/60 Hz

Power consumption  
Dimensions

31 W  
Approx. 470 × 140 × 380 mm (w/h/d)  
(18<sup>5</sup>/<sub>16</sub> × 5<sup>5</sup>/<sub>16</sub> × 15 inches)  
including projecting parts and controls  
Approx. 12.0 kg (26 lbs 8 oz)  
Model for other countries: Approx. 11.2 kg

Weight

Supplied accessories

Audio connecting cords (2)  
Screws (8)  
Wireless remote commander (1)\*  
Sony SUM-3(NS) batteries (2)\*

\* Not supplied with model for European countries

Design and specifications are subject to change without notice.

Note

This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

STEREO CASSETTE DECK  
**SONY**®

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SERVICING NOTE

Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

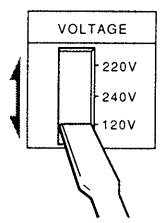
TC-K333ESA Model

Checking the Operating Voltage

- Before operating the unit, be sure that the operating voltage of your unit is identical with that of your local power supply.



Where purchased	Operating voltage
European countries	220 - 230 V AC, 50/60 Hz
Other countries	120, 220 or 240 V AC adjustable, 50/60 Hz A voltage selector is located on the rear panel. If the selector must be reset, <b>disconnect the AC power cord</b> and set the selector to the appropriate voltage.

VOLTAGE selector



The diagram shows a rectangular switch labeled 'VOLTAGE' with three vertical positions: 220V, 240V, and 120V. A hand is shown sliding the switch from the 220V position down to the 120V position. A double-headed vertical arrow is to the left of the switch, indicating it can move up and down.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

**For higher quality recording/playback**

- **The Dolby HX PRO\* system** which improves the linearity of the tape's high-range response during recording.
- **Bias and recording level calibration** which ensures optimum recording conditions to bring out the best in every tape.
- **Three-head system (separate recording, playback and erase heads)** which allows you to instantly check the recorded sound while recording is in progress.
- **Ceramic cassette holder** for improved stability of tape running during playback and recording.
- **Professional-level deck design** for high mechanical stability and maximum performance.

**For your convenience**

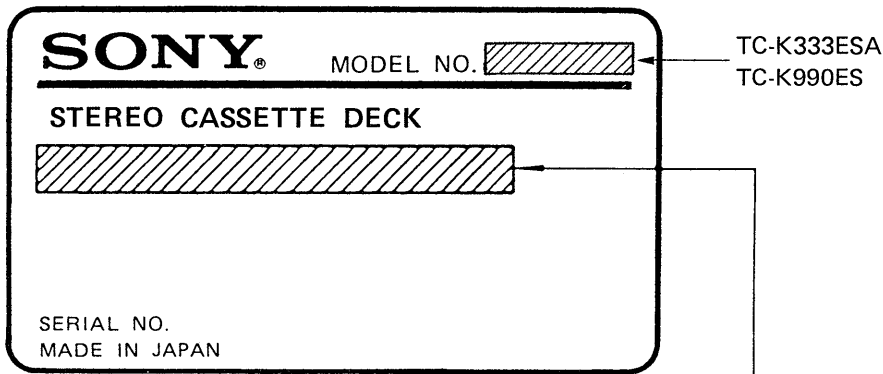
- **The AMS and Memory Play functions** which provide easy access to a desired selection.
- **Timer-activated playback and recording** through the use of an optional timer.

**For easier operation**

- **Easy-to-read linear counter** which shows the elapsed recording or playing time.

**MODEL IDENTIFICATION**

—Specification Label—



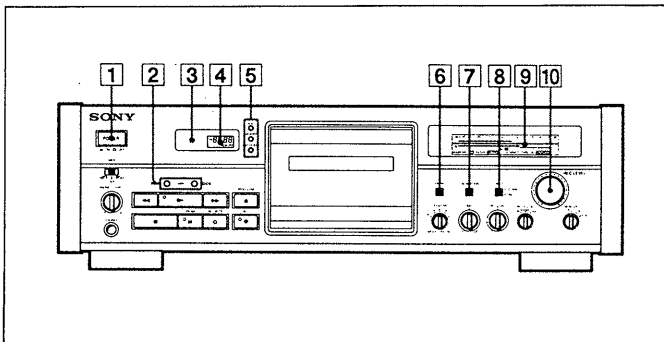
AEP, Germany Model: AC: 220–230V ~ 50/60Hz

E Model: AC: 120, 220–240V ~ 50/60Hz

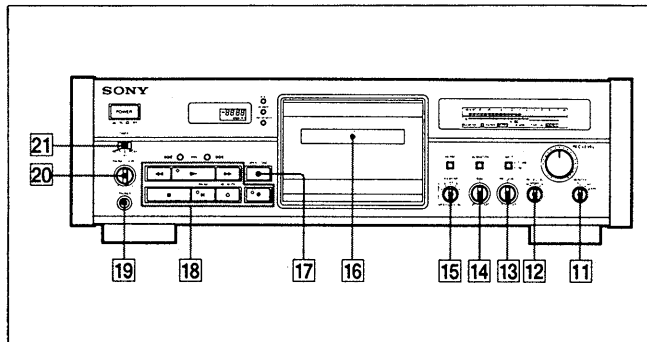
## SECTION 1 GENERAL

This section is extracted from instruction manual.

### Identifying the Parts





### Identifying the Parts



#### Front Panel

For details, refer to the page number indicated in parenthesis .









- 1 POWER switch
- 2 AMS (Automatic Music Sensor) buttons (24)
- 3 Remote control sensor  
You can remotely control this cassette deck with:
  - The supplied remote commander.
  - A remote commander that came with a Sony amplifier or receiver if it has the  mark and cassette deck control capability.
  - An optional Sony remote commander with the  mark and cassette deck control capability.
- 4 LINEAR COUNTER (28)
- 5 Counter buttons  
RESET button (28)  
MEMORY button (26, 28)  
DISPLAY MODE button (20)
- 6 Dolby HX PRO button (48)
- 7 CALIBRATION button (42)
- 8 INPUT button (30)
- 9 PEAK PROGRAM METER (34)
- 10 REC (recording) LEVEL control (30, 34)

(Continued on next page.)

#### Front Panel

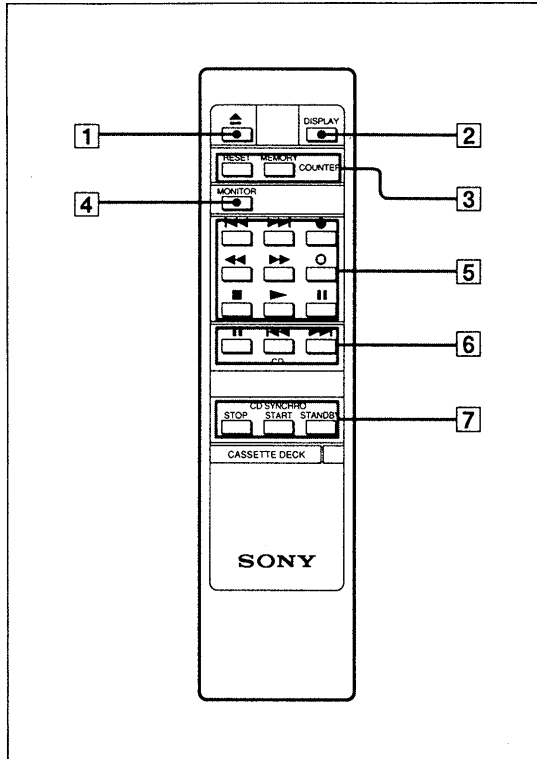
For details, refer to the page number indicated in parenthesis .

(Continued from previous page.)

- 11 MONITOR switch (36)
- 12 REC EQ CAL (recording equalizing calibration) switch (LOW, NORMAL, HIGH) (44)
- 13 REC (recording) LEVEL control for calibration (38, 42)
- 14 BIAS control (38, 42)
- 15 DOLBY NR (noise reduction) /MPX FILTER switch (20, 30)
- 16 Cassette holder
- 17  OPEN/CLOSE button
- 18 Tape operation buttons and indicators
  -  (rewind) button
  -  (stop) button
  -  (play) button and indicator
  -  (fast-forward) button
  -  REC (recording) button and indicator
  -  PAUSE button and indicator
  -  REC MUTE (record muting) button (50)
- 19 PHONES jack (stereo phone jack) (22)
- 20 PHONE (headphones) LEVEL control
- 21 TIMER switch (54)

## Identifying the Parts

(Except for European model)



## REMOTE Commander

The controls on the REMOTE commander are identical in function and operation to those with the same name on the main unit.

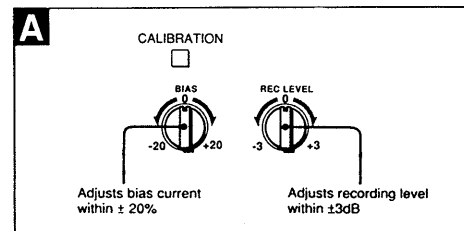
For details, refer to the page number indicated in (parenthesis).

- 1 ▲ (open/close) button
- 2 DISPLAY button
- 3 Counter buttons
- 4 MONITOR button
- 5 Tape operation buttons
- 6 CD (Compact Disc) buttons  
for controlling Sony CD players
- II (pause) button
- ◀▶ buttons for locating selections sequentially
- 7 CD SYNCHRO buttons  
for synchronized recording with a Sony CD player

## Making an Optimum Recording

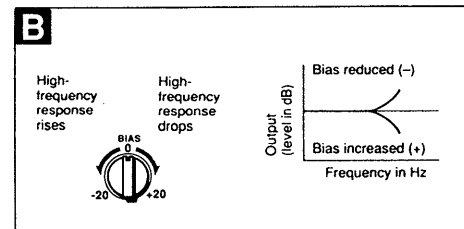
### Bias and Recording Level Calibration

There are many different types of cassettes on the market, each with varying magnetic properties. Although your unit is equipped with the ATS (Automatic Tape Selection) system which sets the appropriate equalization characteristics and bias current for each tape type, an additional calibration adjustment can often produce even better results. Use the bias current and recording level calibration function to obtain the optimum recording conditions for your tape.



### Bias calibration

Choosing the optimum bias current for a tape ensures minimum distortion and flat frequency response. Lowering the bias current boosts high-frequency response, but also results in higher distortion. Raising the bias, on the other hand, reduces distortion, but also dampens high-frequency response. Optimum bias is thus obtained when the bias current and high-frequency response are well balanced.

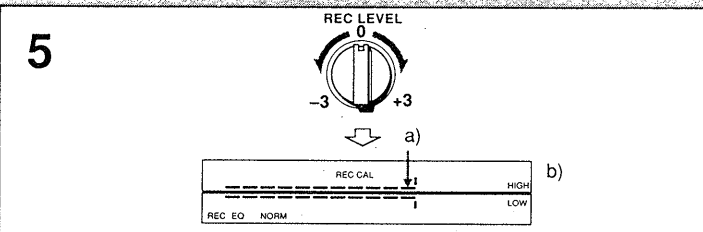
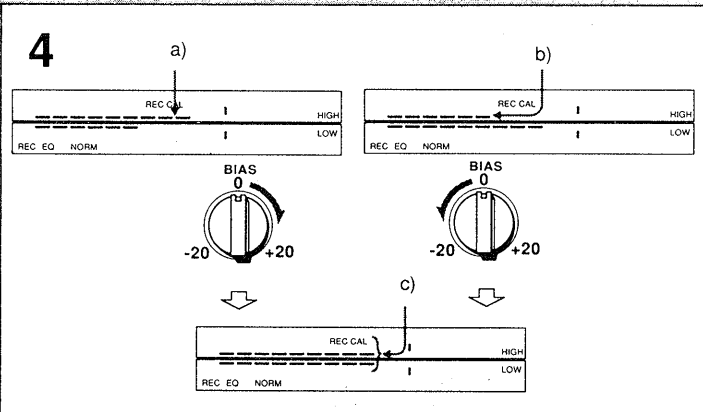
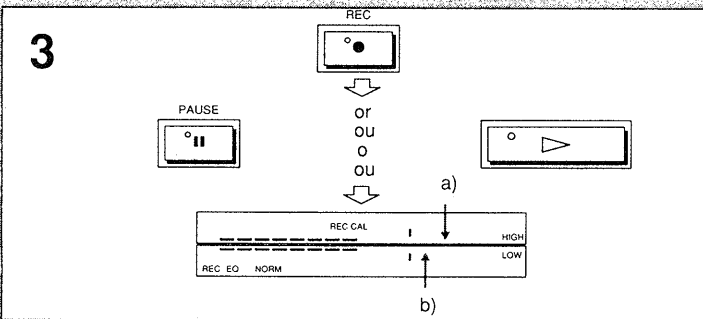
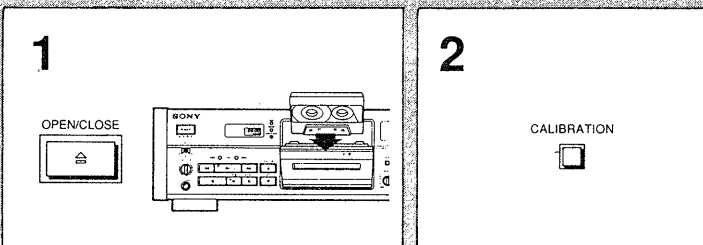
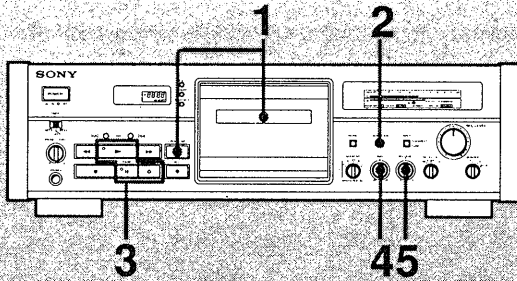


- If the bias current is higher or lower than the optimum setting for a certain tape, the frequency response changes as shown in the Chart in Fig. B. Changing the bias can thus be used to tailor the response to your liking, for example by slightly emphasizing the upper or lower end.
- The frequency response of metal tapes is much less affected by changes in the bias current than other tape types. With some tapes, the adjustment range of this deck ( $\pm 20\%$ ) may therefore not be sufficient to cover every possible requirement.

### Recording level calibration

Even when the recording level is adjusted correctly, using a tape with low sensitivity will result in a low playback level. The REC LEVEL calibration control allows you to compensate for sensitivity differences among tapes to equalize both recording and playback levels. This is especially important when using the Dolby NR system, since it is most effective when recording and playback levels are the same.

## Making an Optimum Recording



- 1 Insert the cassette to be used for recording.
- 2 Press CALIBRATION.
- 3 Press ●, then || or ► to activate the recording test tone.

- a) Playback level for an 8-kHz signal
- b) Playback level for a 400-Hz signal

**Note**

- The sound cannot be monitored during the calibration operation.
- It takes 2 to 3 seconds for the test tone level to stabilize.

- 4 Adjust BIAS until both meters indicate equal playback levels.

- a) A high reading on the upper meter indicates a low bias current.
- b) A low reading on the upper meter indicates a high bias current.
- c) An equal reading on both meters indicates the optimum bias current condition.

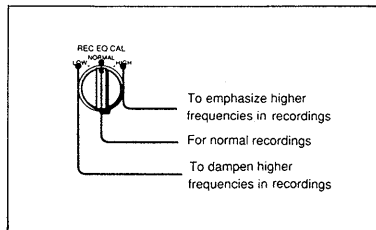
- 5 Adjust REC LEVEL CALIBRATION until both meters reach the recommended level (REC CAL).

- a) Recommended level
- b) The bias current is now adjusted to the optimum level and the tape sensitivity compensation has been set. Press ■, then set CALIBRATION to OFF. Rewind the tape and start the actual recording.

## Making an Optimum Recording

### Recording Equalization Calibration

Although bias current and equalization are automatically set by the Automatic Tape Selection (ATS) function for the tape being used, you can use the REC EQ CAL switch to change the recording characteristics according to the nature of the source material or to compensate for the particular characteristics of the tape.



### Bias Calibration Recording

Use the REC EQ CAL switch in conjunction with the BIAS control to modify bands of sound and record according to the tape's characteristics.

- When recording music which has strong middle and low frequencies**  
 Set the bias at flat with the REC EQ CAL switch set in the HIGH position to increase the bias current.  
 Adjust the BIAS control so that the HIGH and LOW meters indicate equal readings.
- When recording music which has strong high frequencies**  
 Set the bias at flat with the REC EQ CAL switch set in the LOW position to decrease the bias current.  
 Adjust the BIAS control so that the HIGH and LOW meters indicate equal readings.

### Note

With metal tape, because the amount of frequency characteristic modulation is not in proportion to that of the bias, the optimum bias current may not be obtained using the methods above.

### Another use of the REC EQ CAL switch

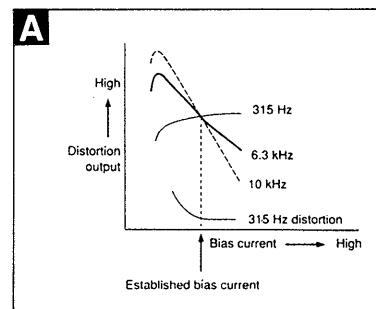
When using special tapes, adjusting the BIAS control with the REC EQ CAL switch set in the NORMAL position may not result in equal readings on the HIGH and LOW meters. If this occurs, adjust the BIAS control after setting the REC EQ CAL switch to HIGH or LOW.

## Recording

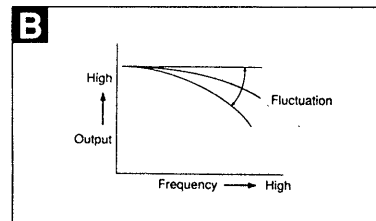
### What is the Dolby HX PRO System?

The Dolby HX PRO system provides improved linearity in high-range frequency response during recording. Tapes recorded with this system retain the same high quality even when played back on other tape decks.

As shown in Fig. **A**, characteristics such as output level and distortion differ widely according to the bias (high-frequency) current.



In conventional systems (see Fig. **B**), the bias current is susceptible to variations in certain recording signals which may cause fluctuations in frequency response, distortion, or other unwanted characteristics.

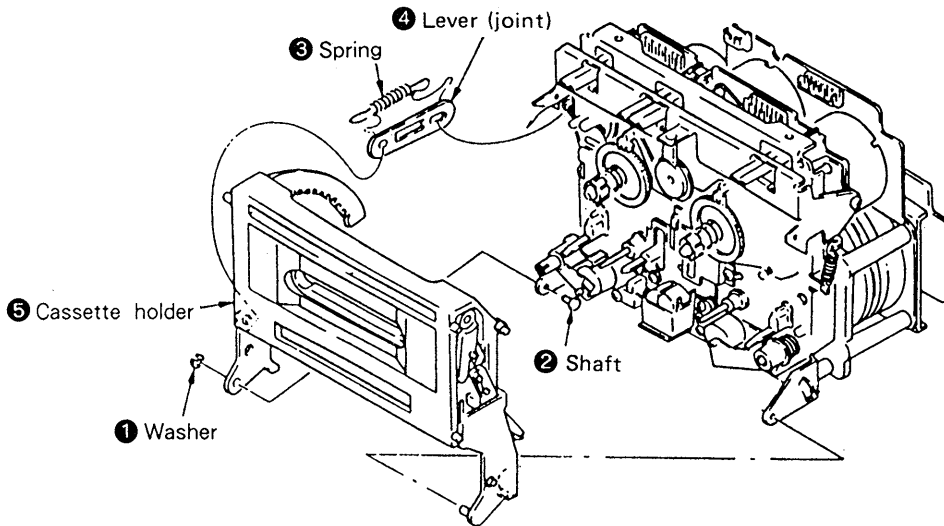


With the Dolby HX PRO system, the effective bias amount added to the bias current is controlled in millisecond units to greatly reduce distortion, improving linearity in high-range response and ensuring high-intensity recording with minimal distortion and noise.

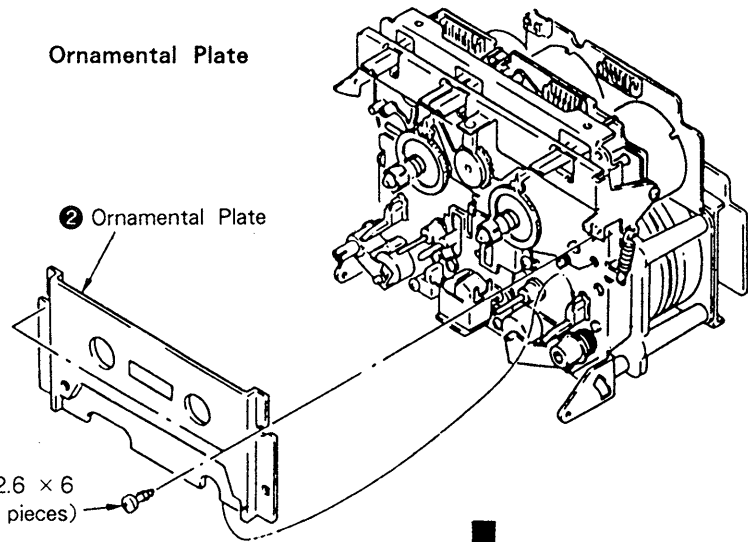
## SECTION 2 DISASSEMBLY

**Note:** Follow the disassembly procedure in the numerical order given.

### Cassette Holder

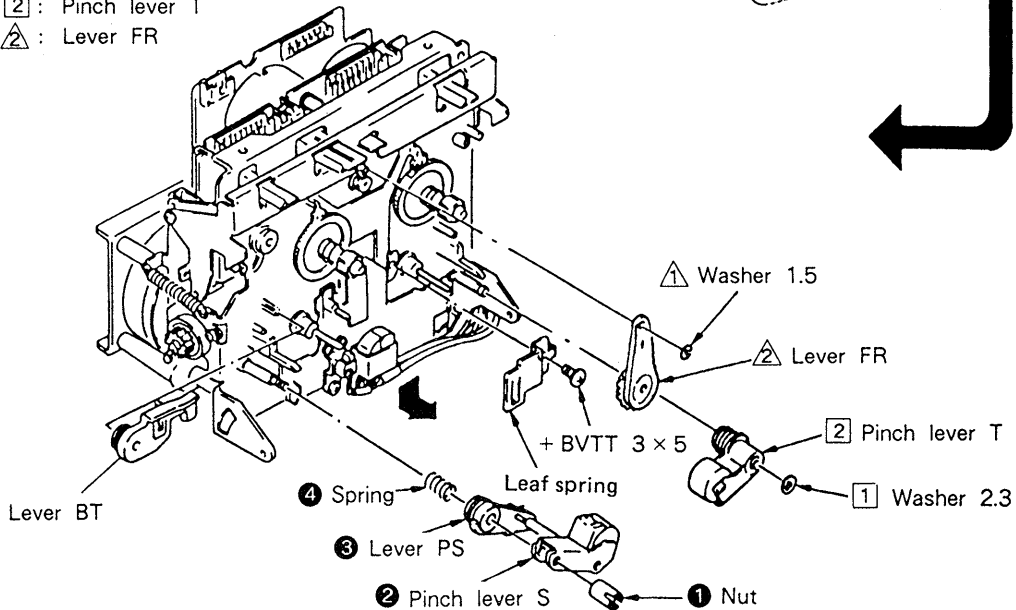


### Ornamental Plate



### Pinch Lever/Lever FR

- ①-④ : Pinch lever S
- ① and ② : Pinch lever T
- △ and △ : Lever FR





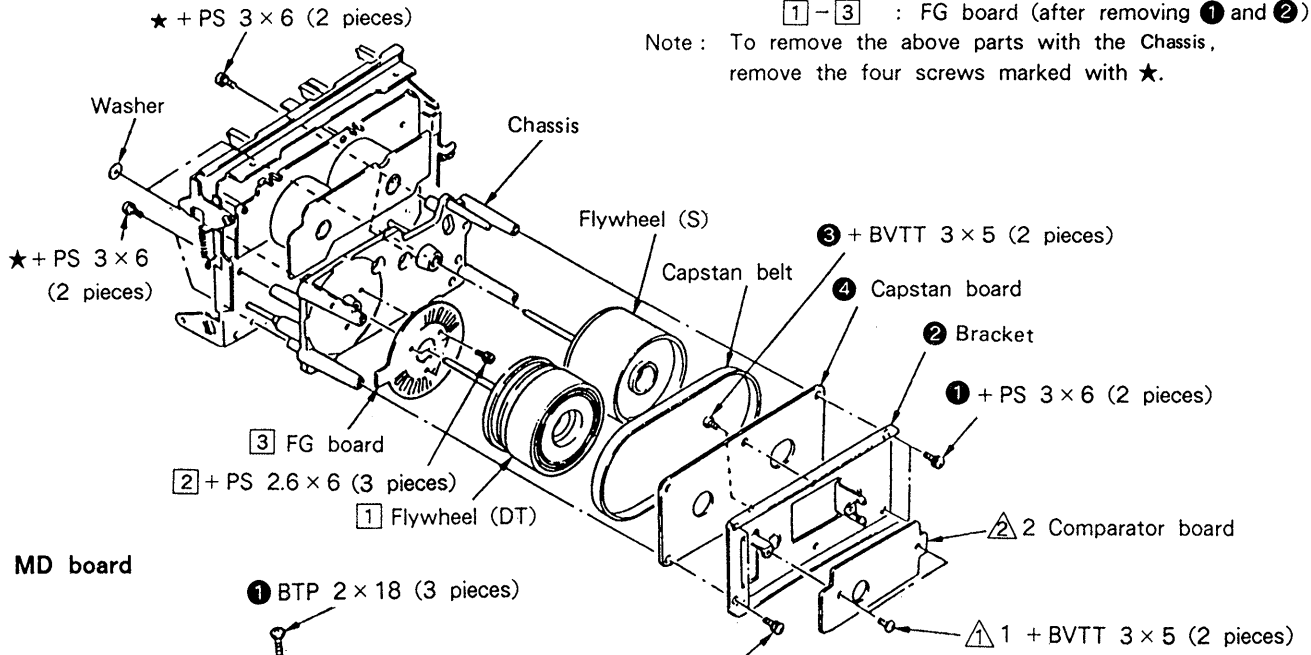
Comparator Board/Capstan Board/Flywheel/FG Board

△ and △ : Comparator board

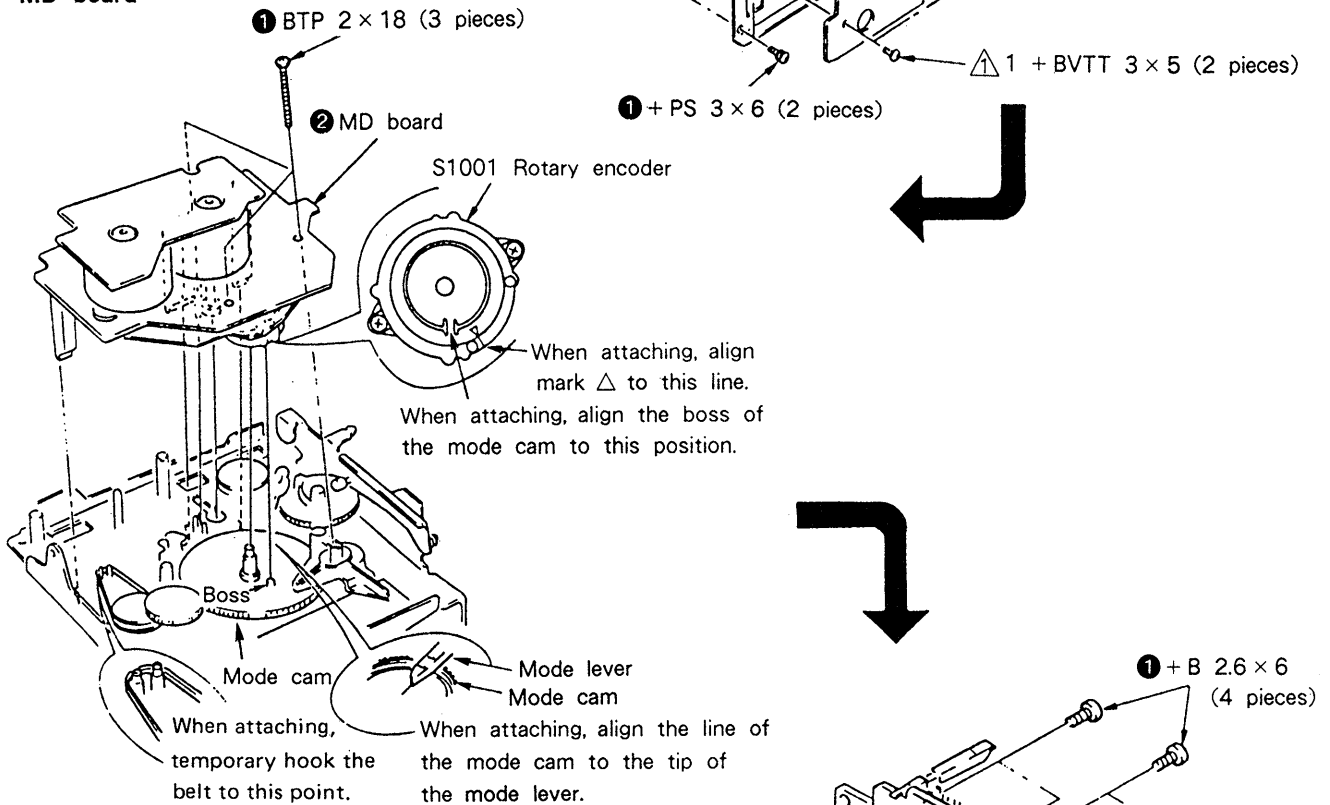
① - ④ : Capstan board

① - ③ : FG board (after removing ① and ②)

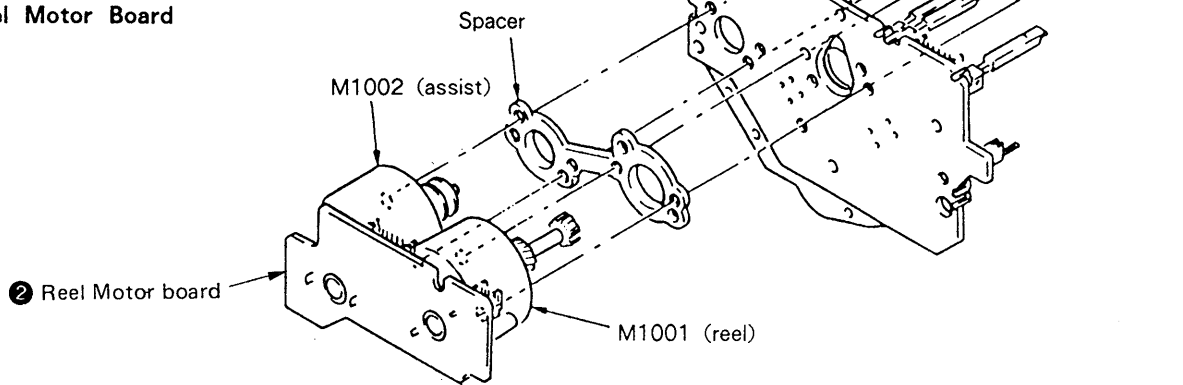
Note : To remove the above parts with the Chassis, remove the four screws marked with ★.



MD board



Reel Motor Board



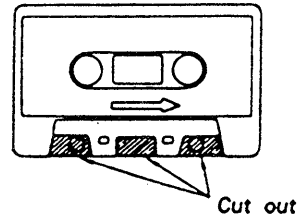
## SECTION 3 ADJUSTMENTS

### 3-1. MECHANICAL ADJUSTMENTS

#### PRECAUTION

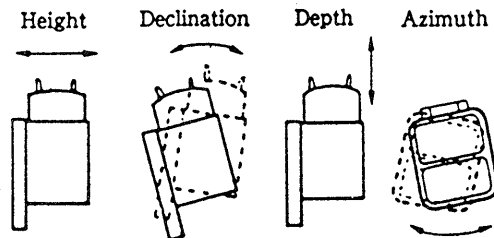
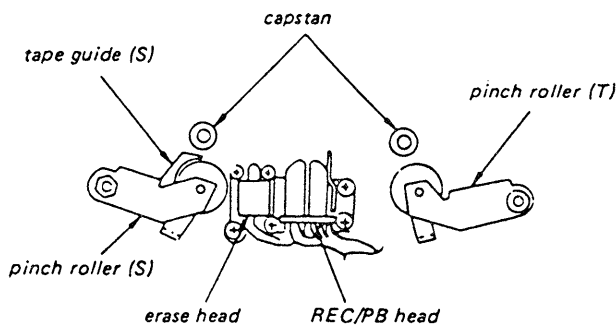
1. Clean the following parts with a denatured alcohol-moistened swab:
 

record/playback head	pinch roller
erase head	rubber belts
capstan	idlers
2. Demagnetize the record/playback and erase head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.



2. Phillips screwdriver (medium-size):  
For the head adjustment screws
- Blade-type screwdriver (large-size):  
For the supply pinch roller adjustment screws
3. Pen light
4. WS-48B(3 kHz, 0 dB)
5. P-4-A100(10kHz, -10dB)

Definition of Terms: The figures are of a record/playback head.



#### Tape Path Adjustment

•Refer to Adjustment Position on page 12.

**Note:**When using the adjustment methods for other than replacement reasons, please do not tamper unnecessary with the adjustment screws or the erasehead because either the supply pinch roller guide or the record/playback head will be made the standard tape paths. Moreover, when it is necessary to adjust and replace two or more of any of the heads and/or pinch rollers, replace them one by one, completely taking out first tape path, and then replacing second one.

#### Preparation:

1. Mirror cassette CQ009C 8-909-708-01  
(or CQ012C 8-909-708-02)

If one does not have this, cut out the sections of a 120-minute cassette shell as indicated below and use that cassette.

#### Adjustment method:

##### Supply Pinch Roller

**Note:** Only perform this adjustment when the supply pinch roller is to be replaced.

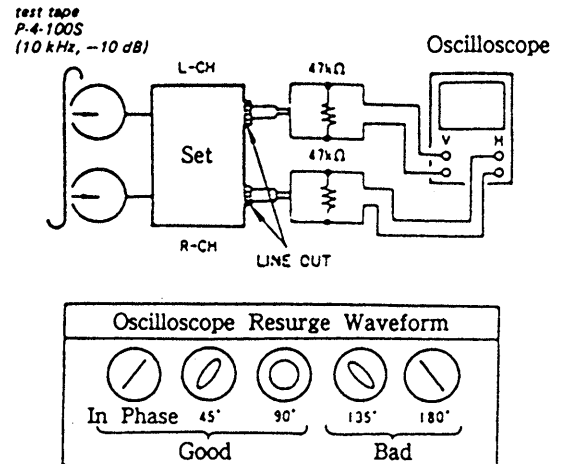
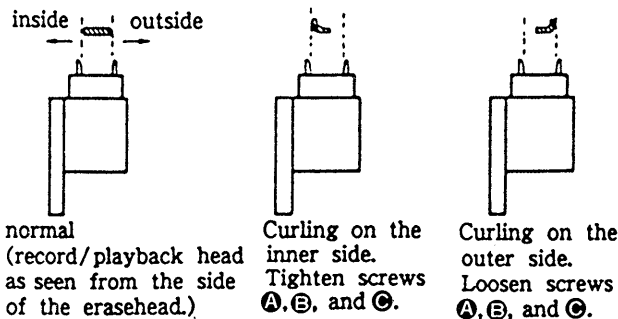
1. Insert the mirror cassette and put the unit in record/playback mode.
2. Check to see whether the tape is curling at the record/playback head guide or the pinch roller guide.  
If it is curling, remove the curl by adjusting the **(A)** tape curl adjustment screw. Then, check that the tape is running past the middle of the erasehead.

##### Record/playback Head

**Note:** Only perform this adjustment when the record/playback head is to be replaced.

1. Insert the mirror cassette and put the unit in record/playback mode.
2. **(Height Adjustment)** Check to see if the tape is curling at the tape guide of the head. If it is curling, tighten screws **(A)**, **(B)**, and **(C)**, respectively by the same angle, moving the head so that it remains at the same angle throughout the

procedure, If it curls on the bottom side of the mirror cassette (actually the inner side), tighten all the screws equally; but loosen them if the tape begins to curl on the top side(other side).



3. **(Declination Adjustment)** While in the record/playback position, set the back tension to 0 (wind the supply reel with something thin like a pencil in counterclockwise direction) and make sure there is no curling or shifting (shifting up/shifting down) at the guide of the record/playback head. Because shifting can only occur due to a difference in the width of the tape and that of the tape guides (curling will otherwise occur), it is necessary to pay close attention since it can be easily overlooked.

When there is a shift, tighten screws **B** and **C** equally and change the declination of the head. If the tape is shifting up, tighten the screws, and if it is shifting down, loosen them.

4. Repeat the adjustments in steps 2 and 3 and fine adjust the height and the declination.

5. **(Preliminary Azimuth Adjustment)**

After demagnetizing and cleaning the adjustment head, play back WS-48B (3kHz, 0dB).

Turn screw **C** so that the reading on the level meter of the unit or that of the level meter connected to LINE OUT is maximized.

If the screw is turned at least half a revolution, repeat the adjustments from step 1.

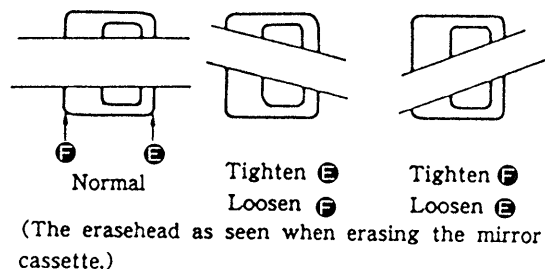
6. **(Tape Path Check)** Connect the oscilloscope to LINE OUT and play back P-4-A100 (10kHz, -10dB) to display a resurge waveform. After 20 seconds of record/playback (after the tension within the loop has been increased sufficiently), make sure the variation in the resurge is within  $\pm 90$  degrees (within  $\pm 45$  degrees is desired).

If the variation is greater than this, it is because the declination and/or the height adjustment is not perfect. Repeat the adjustment from step 1.

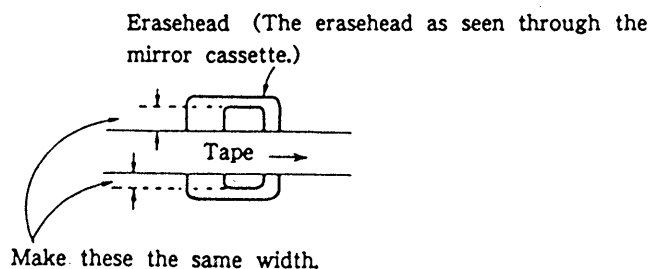
**Erasehead**

**Note:** Only perform this adjustment when the erasehead is to be replaced.

1. Insert the mirror cassette and put the unit in record/playback mode.
2. **(Azimuth Adjustment)** Adjust the azimuth of the erasehead by adjusting screws **E** and **F** so that the runs as evenly as possible.



3. **(Height adjustment)** Turn screws **D**, **E**, and **F** all by the same angle so that the portions of the erasehead visible at top and bottom are nearly of equal width. If the width at the top is greater, tighten the screws; if the width at the bottom is greater, loosen the screws.



4. **(Declination Adjustment)** Leaving it in the playback position, put the back tension to 0 and make certain the erasehead part and supply pinch roller guide part do not shift. If there is a shift, turn the screw **Ⓓ** and change the declination. Looking at it using the mirror cassette, if the tape shifts up, tighten the screw, and if it shifts down, loosen the screw.
5. Repeat the adjustments beginning with step 2 and fine adjust the height and declination. And make sure the tape does not curl up on the pinch roller guide or the guide part of the record/playback head.
6. **(Depth Adjustment)** In order to make the entire head play the tape smoothly, and to make sure the depth of the erasehead is neither too shallow nor too deep, loosen screw **Ⓒ** a bit.

**Pinch Roller Pressing Force Measurement**

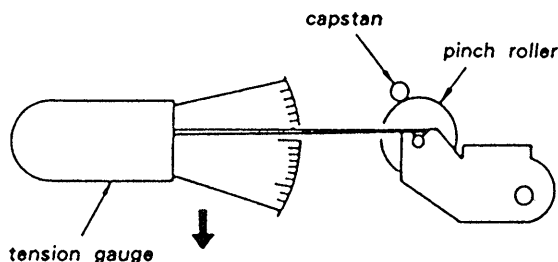
Mode: playback

Hook needle of the tension gauge to the pinch roller shaft and push back pinch roller to detach it from capstan. Then, return it gradually to capstan and read the gauge when the pinch roller begins turning.

**Standard Limits:**

Tape-up side: 270 – 350 g(9.5 – 12oz)

Supply side: 180 – 280g(6.4 – 9.9oz)



**Torque Adjustment and Measurement**

1. Insert a tape for torque measurement, CQ-102C, and put the set to PLAY mode. Adjust RV801 so that the reading of the torque meter is  $40 \pm 5g \cdot cm$ .
2. After the adjustment, measure the back-tension and the FF/REW torque and check that the following specifications are satisfied.

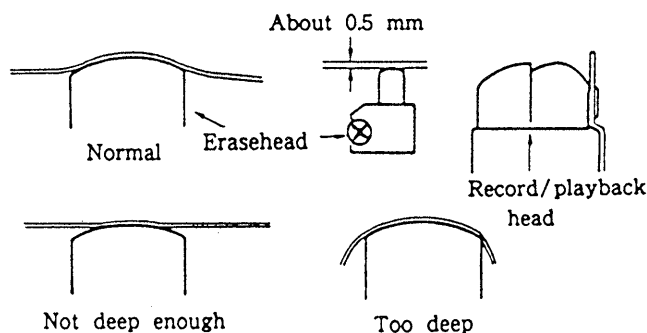
Torque	Torque Meter	Reading
FWD	CQ102C	30 – 60g·cm (0.42 – 0.83oz·inch)
FWD Back tension	CQ-102C	7 – 11g·cm (0.09 ± 0.015oz·inch)
FF/REW	CQ-201B	65 – 90g·cm (0.90 – 1.25oz·inch)

**3-2. ELECTRICAL ADJUSTMENTS**

**Note:** The adjustment should be performed in the order given in this service manual.

The adjustment should be performed for both L-CH and R-CH.

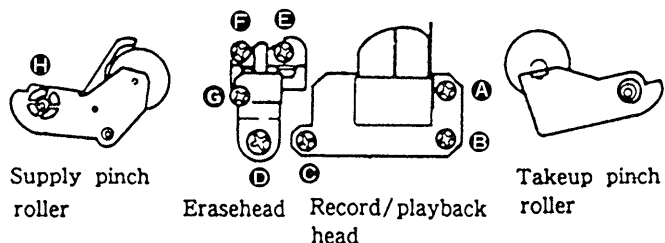
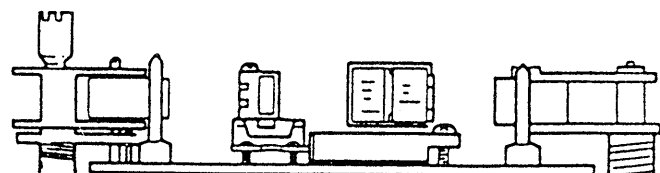
- Simultaneous REC/PB Mode:  
Input the signals to LINE IN terminal and set to REC mode. Set the monitor switch to TAPE, and monitor the recorded signal from LINE OUT terminal.
- Switch Position:  
DOLBY NR ..... OFF  
TIMER ..... OFF  
MONITOR ..... TAPE  
HX PRO ..... OFF  
CALIBRATION ..... OFF  
CD DIRECT ..... OFF  
BIAS ..... CENTER CLICK  
REC LEVEL ..... CENTER CLICK



**Check**

1. Check to make sure that there are no curls or shifts throughout the whole tape path and that the tape runs smoothly.
2. Reapply the locking compound to the adjusted screws. (The locking compound should only be applied to screw **Ⓒ** after the azimuth has been adjusted.)

**Adjustment Position:** As seen from the cassette, side (top) and MD as seen head on (bottom).



● Standard Record:

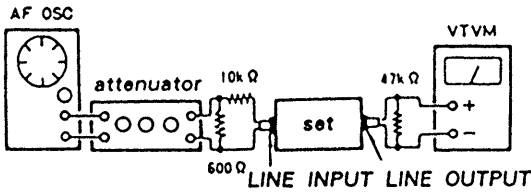
Deliver the standard input signal level to the input jack and set the REC LEVEL control to obtain the standard output signal level.

Standard Input Level

Input Terminal	LINE IN
source impedance	10kΩ
input level	0.25 V (-10dB)

Standard Output Level

Output Terminal	LINE OUT
load impedance	47kΩ
output level	0.44 V (-5dB)

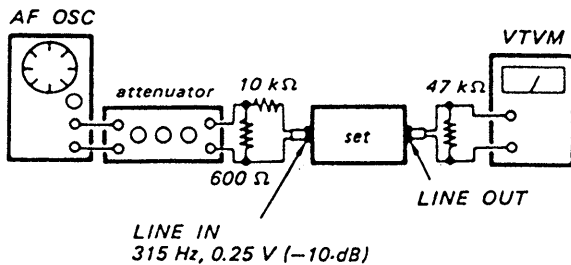


**MPX FILTER Check**

Setting: DOLBY switch: OFF  
MPX FILTER switch: OFF

**Procedure:**

1. Mode: stop



2. Apply 315Hz, 0.25V(-10dB) signal and adjust REC LEVEL(RV501) control so that the LINE OUT level is 0.44V(-5dB).
3. Apply 19kHz 0.25V(-10dB) signal and confirm that the LINE OUT level is 0.013V(-35dB) or less.

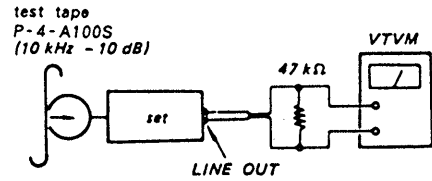
**Adjustment Limits:**

DOLBY NR switch: B or C  
MPX FILTER switch: Line output level when ON.  
315Hz: Within 0.49 to 0.39V(within -4dB to -6dB)  
19kHz: 0.013V(-35dB) or less.

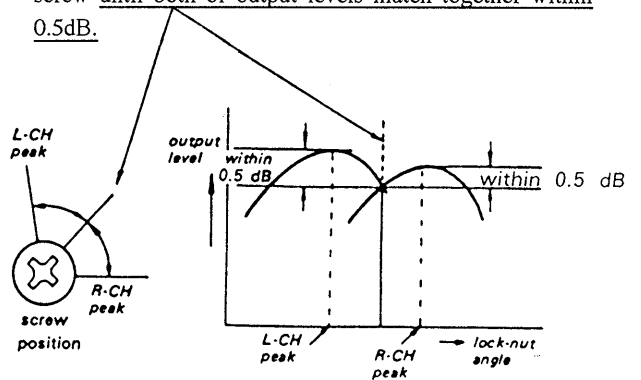
**Record/Playback Head Azimuth Adjustment**

**Procedure:**

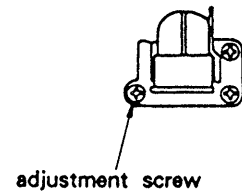
1. Mode: playback



2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 0.5dB.



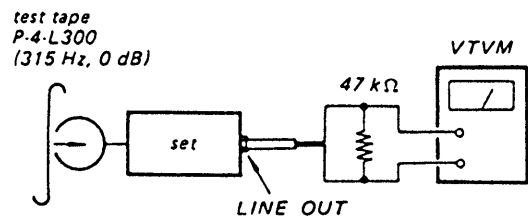
**Adjustment Location:**



**Playback Level Adjustment**

**Procedure:**

- Mode: playback



Adjust RV101(L-CH) and RV201(R-CH) to obtain the specified LINE OUT level.

**Adjustment Limits:**

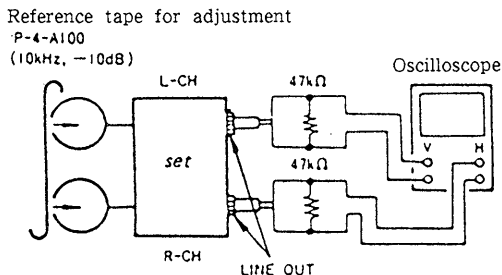
LINE OUT level: 0.301 to 0.338V  
(-8.2 to -7.2dB)

Level difference between channels:  
less than 0.5dB

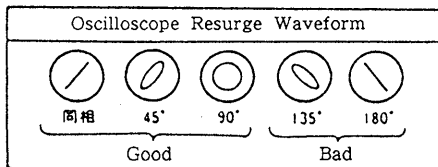
Check that the LINE OUT level does not change in playback mode while changing the mode from playback to stop several times.

**3. Phase check**

- Play mode -



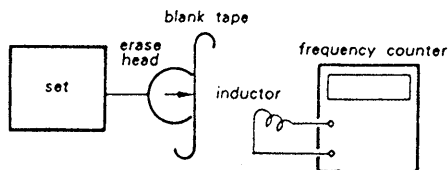
4. Check that the phase difference between L-ch and R-ch is within 0 ~ ( same to 90° )



**Bias OSC Frequency Adjustment**

**Procedure:**

1. Record mode



1. Connect the frequency counter to the inductor which functions at 10mH.(When the inductor is a closed magnetic circuit, redesign the inductor to be an open magnetic circuit.)
2. Remove the cassette lid, insert the cassette, and put the unit into REC mode.

3. Move the inductor from the side in close to the erase head to check the value of the bias.
4. Adjust CP501 so that the reading on the frequency counter is 105kHz ± 1kHz.

**Bias current adjustment**

1. Set the HX PRO switch to ON and insert the METAL tape.
2. Set RV104, RV204, RV105, RV205, RV106, and RV206 to be in the center position.
3. Connect a digital voltmeter to CNE504(between 2-1 and 2-3) and adjust the adjustment cores of T101 and T201 so that the voltage is minimized.

**CrO<sub>2</sub> Bias and Record Level Adjustment**

**Note:** This adjustment should be made before Record Bias Adjustment.

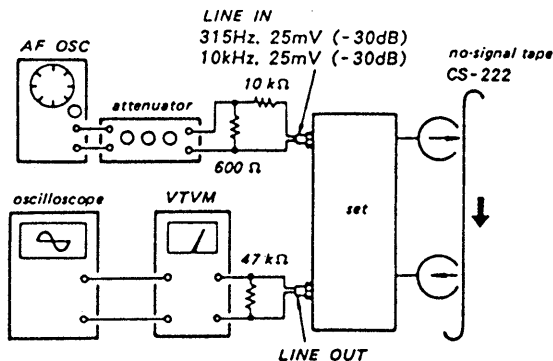
**Setting:**

REC LEVEL knob: standard record position.  
(See page 12.)

HX PRO switch: ON

**Procedure:**

1. Mode: simultaneous REC/PB



2. Adjust RV106(L-CH) and RV206(R-CH) so that the playback output level of 10kHz signal is 0.3dB -0.3dB with respect to that 315Hz. ••• Record Bias Adjustment.
3. Adjust RV102(L-CH) and RV202(R-CH) so that the playback output level of 315Hz is -25.3dB to -24.7dB. ••• Record Level Adjustment.

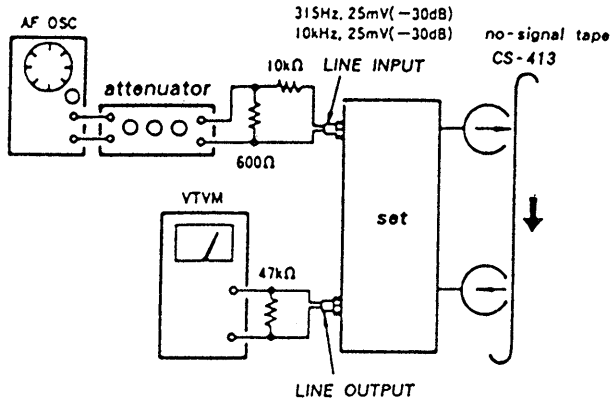
**Metal Bias Adjustment**

**Setting:**

REC LEVEL knob: standard record position.  
(See page 12.)

**Procedure:**

1. Mode: simultaneous REC/PB



2. Adjust RV510(L-CH) and RV205(R-CH) so that the difference between the playback output at 315Hz and that of 10kHz in R-CH is within 0.5dB to -0.5dB.

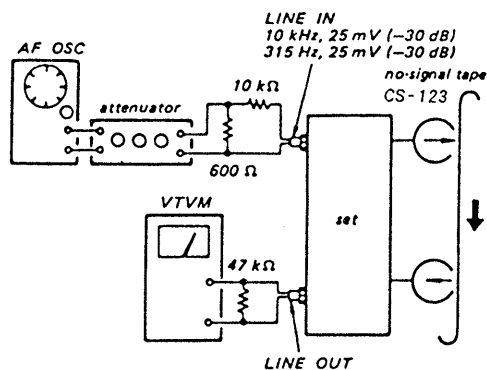
**Normal Bias Adjustment**

**Setting:**

REC LEVEL knob: standard record position.  
(See page 12.)

**Procedure:**

1. Mode: simultaneous REC/PB



2. Set the HXPRO switch to ON.

3. Adjust RV103(L-CH) and RV203(R-CH) so that the difference between the playback output at 315Hz and that of 10kHz in R-CH is within 0.5dB to -0.5dB.

4. Set the HXPRO switch to OFF.

5. Adjust RV104(L-CH) and RV204(R-CH) so that the difference between the playback output at 10kHz when the HXPRO is ON and that of 10kHz when ON is within 0.5dB to -0.5dB.

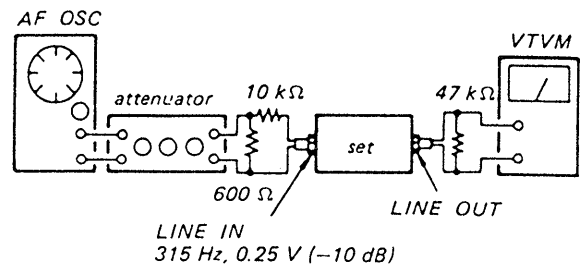
**Meter Level Adjustment**

**Setting:**

REC LEVEL knob: standard record position.  
(See page 12.)

**Procedure:**

1. Stop mode



2. Adjust RV107(L-CH) and RV207(R-CH) so that a reading of the meter is set to 0VU and the lamp is lit.

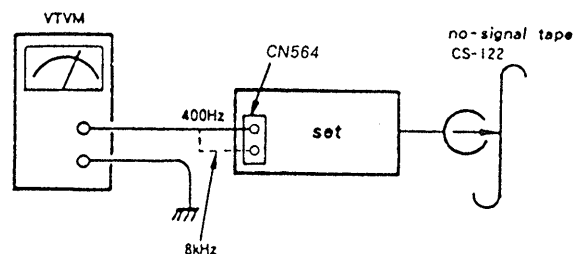
3. Adjust REC level so that the LINE OUT level is set to +10dB and check that all the lamps are lit.

**Calibration OSC and Calibration Meter Adjustment**

Setting: CALIBRATION switch: ON

**Procedure(OSC OUT LEVEL):**

1. Mode: record(no-signal(LINE INPUT))

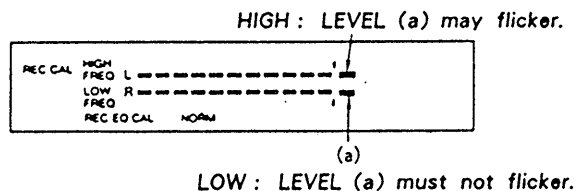


2. Adjust RV504 so that a check-point level at 400Hz is +10dB.
3. Adjust RV503 so that a check-point level at 8kHz is +10dB.

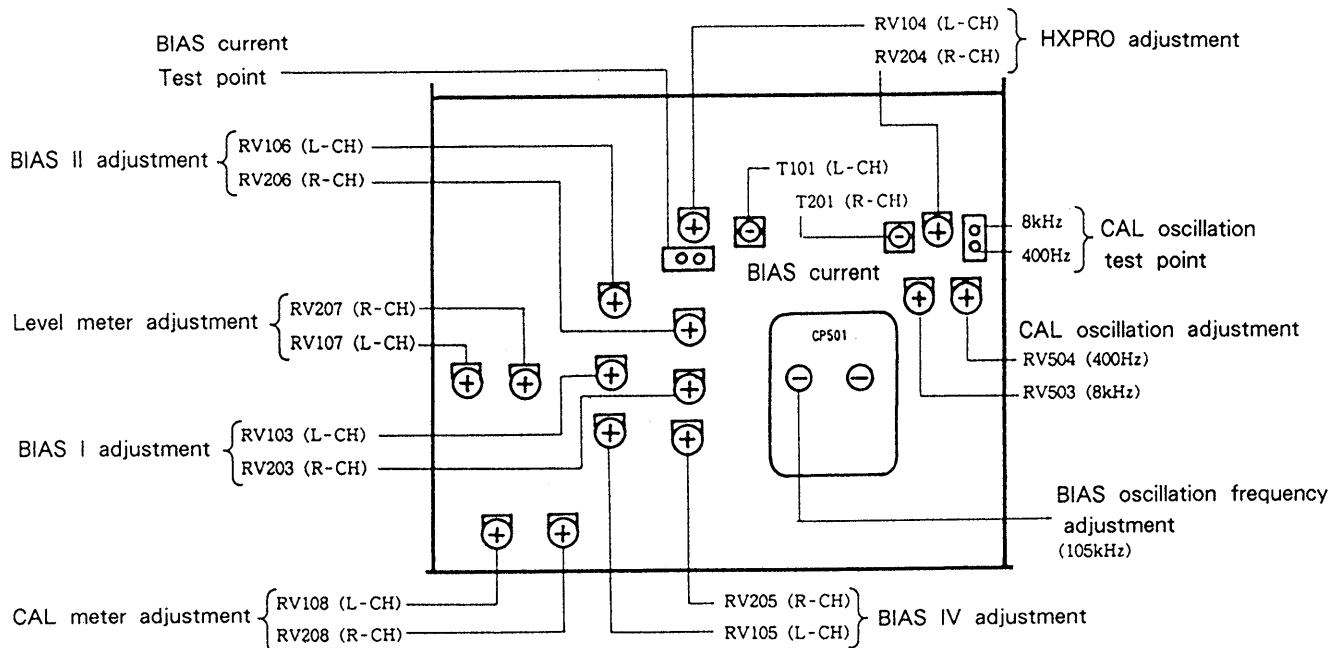
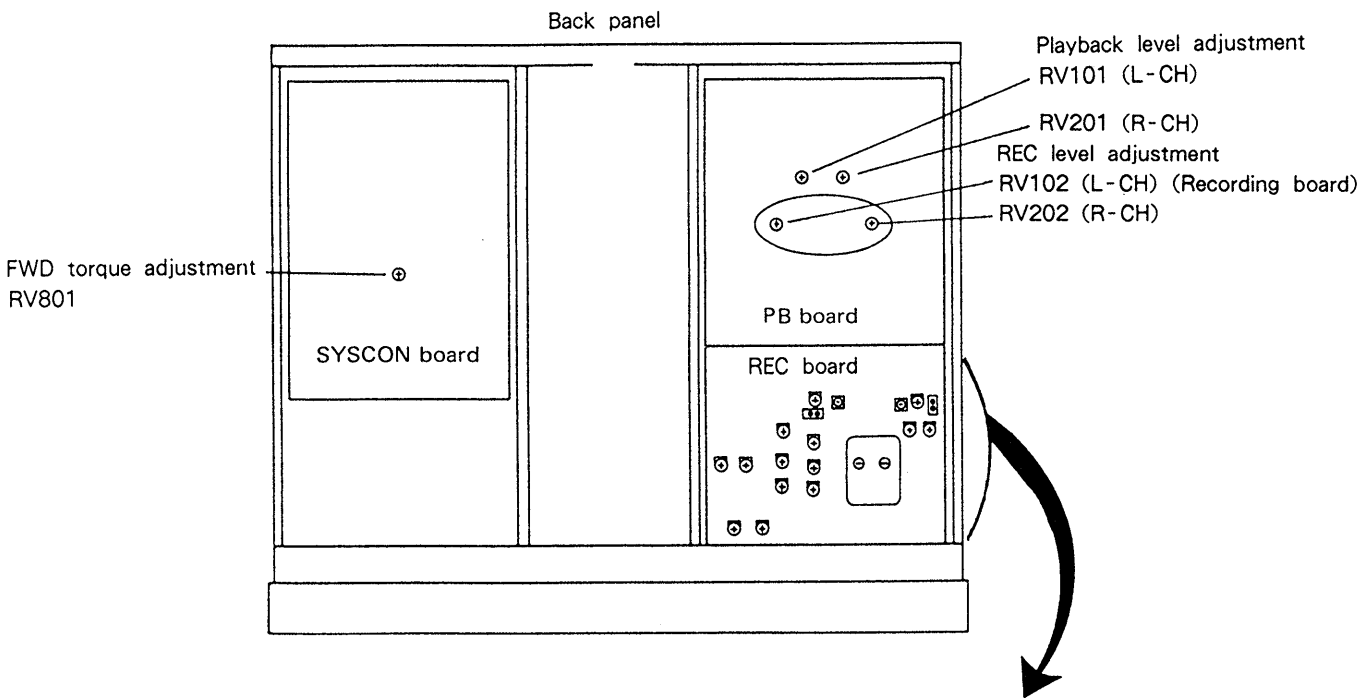
2. Preset RV108(Low)so that segment(a)in LOW FREQ CAL LEVEL meter lights. Then adjust RV204 to the point where segment (a)goes out.

**Procedure(CAL METER ADJ):**

1. Put the set in record mode and adjust RV208(HIGH)so that HIGH FREQ segments in the CAL LEVEL meter light thoroughly up to 0VU as shown in the figure below. Segment(a)may flicker.



**Location Diagram of the Adjustment Parts**





## SECTION 4 DIAGRAMS

### 4-1-1. IC502, 505 (CX20188) PIN FUNCTIONS

An electronic switch circuit for the operation mode control is included. Controls are performed by adding direct current voltages VH, VM, and VL to Dolby OFF/B/C and calibration/REC/Playback terminals.

CX20188	Pin name	Description
Pin No.		
1.	Vcc	Positive power supply terminal.
2, 41.	REC IN	Recording input terminal.
3.	I REF	Reference current input terminal.
4, 39.	PB IN	Playback input terminal.
5.	CAL/REC/PB	Calibration/recording/playback select terminal
6, 37.	PB FB	Playback feedback terminal.
7, 36.	REC FB	Recording feedback terminal.
8, 35.	GND	GND terminal.
9, 34.	LINE OUT	Line output (decode output) terminal.
10, 33.	SSK	Spectral skewing switch terminal.
11, 32.	VF IN	Encode circuit input terminal.
12, 31.	HPF H	HLS high-pass filter terminal.
13, 30.	TCH 2	HLS detector time constant terminal 2.
14, 29.	TCH 1	HLS detector time constant terminal 1.
15, 28.	WT H	HLS encoder error reduction terminal.
16, 27.	TCL 2	LLS detector time constant terminal 2.
17, 26.	TCL 1	LLS detector time constant terminal 1.
18, 25.	WT L	LLS encoder error reduction terminal.
19, 24.	HPF L	LLS high-pass filter terminal.
20, 23.	ANT S	Anti-saturation terminal.
21, 22.	REC OUT	Recording output (encode output) terminal.
38.	OFF/B/C	Dolby NR off/B type/C type select terminal.
40.	CAL IN	Calibration input terminal.
42.	Vee	Negative power supply terminal.

MODE	VOLT
VH	3 to 9.9V
VH	-0.7 to 0.7V
VL	-9.9 to -3

4-1-2. IC601 (M50940-313SP) PIN FUNCTIONS

Level meter display of 24-segment fluorescent display, etc., are performed by receiving direction from the master microcomputer (IC801).

Pin No.	Pin name	I/O	Description
1.	Vref	I	A/D input-port reference voltage input(+5V)
2.	$\phi$ L	I	Not used. (Connected to +5V)
3.	$\phi$ R	I	Not used. (Connected to +5V)
4.	DATA	I	Data input from the master microcomputer(IC801)(analog)
5.~6.	ADE1~ADRO	I	Data input from the master microcomputer(IC801)(analog)
7.	KEY	I	Not used. (Connected to +5V)
8.	LEVEL L	I	Level meter L-CH input(analog) from the meter amplifier(IC514)
9.	LEVEL R	I	Level meter R-CH input(analog) from the meter amplifier(IC514)
10.~13.	$\overline{\text{GRID6}}\sim\overline{\text{GRID3}}$	0	Not used.
14.~15.	$\overline{\text{GRID2}}\sim\overline{\text{GRID1}}$	0	Fluorescent display grid output
16.	$\overline{\text{CO0}}$	0	Not used.
17.	PLAY	0	Not used. (Connected to pin ⑩.)
18.	$\overline{\text{PLAY}}$	0	Not used.
19.	$\overline{\text{PAUSE}}$	0	Not used.
20.	$\overline{\text{REC}}$	0	Not used.
21.	$\overline{\text{TAPE}}$	0	Fluorescent display segment output("TAPE" displayed). "L": TAPE displayed. "H": SOURCE displayed.
22.	$\overline{\text{OVER LEVEL}}$	0	Fluorescent display segment output("OVER LEVEL" displayed). It is displayed when "L".
23.	TYPE I	0	Fluorescent display segment output("TYPE I" displayed). It is displayed when "L".
24.	$\overline{\text{TYPE II}}$	0	Fluorescent display segment output("TYPE II" displayed). It is displayed when "L".
25.	$\overline{\text{TYPE IV}}$	0	Fluorescent display segment output("TYPE III" displayed). It is displayed when "L".
26.	CVss	-	Power supply terminal(GND)
27.	$\overline{\text{RESET}}$	I	Reset input
28.	XIN	I	Clock input(4MHz)
29.	XOUT	0	Clock outupt.
30.	XCIN	-	Not used. (Connected to GND)
31.	XCOU	-	Not used.
32.	Vss	-	Power supply terminal(GND)
33.	$\Phi$	0	Not used.
34.	VER	I	Version switching input(Always set to "L")
35.	$\overline{\text{TEST}}$	I	Test mode input. "L": All the lamps of the meter are lit.
36.	CAL	I	Calibration switch(S602) input. "L": CAL mode. "H": Normal mode.
37.	IN	I	Not used. (Connected to GND.)
38.	VP	I	Fluorescent display segment output's pull-down power supply terminal(-22V)
39.~62.	S23~S0	0	Fluorescent display segment output(meter display)
63.	AVcc	-	Power supply terminal(+5V)
64.	Vcc	-	Power supply terminal(+5V)

## 4-1-3. IC801 (M50964-226SP) PIN FUNCTIONS

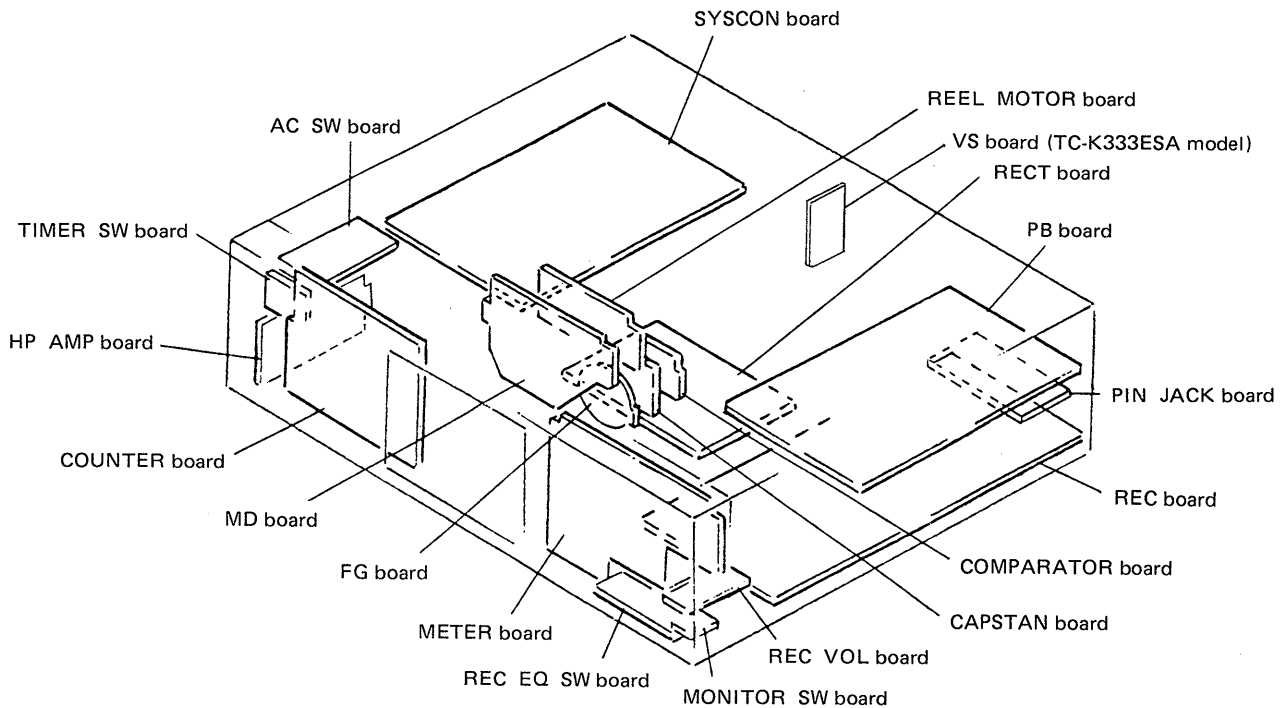
Pin No.	Pin name	I/O	Description
1.	VCC	-	Power supply: +5V.
2.	AV <sub>SS</sub>	-	Power supply: GND.
3.	Vref	I	A/D port reference voltage input.
4.	DATA	O	Data output (Analog) to Display Microcomputer.
5.	PWM	-	Not used for this model.
6.	ADDRO	O	Data output to Display Microcomputer (IC601).
7.	REC	O	REC LED output.
8.	PAUSE	O	PAUSE LED output.
9.	PLAY	O	PLAY LED output.
10.	AD7	I	Key input. 0V= ▲ , 1V= ■ , 2V= ◀ , 3V= ▶ , 4V= ●
11.	AD6	I	Key input. 0V= ► , 1V= ◻ , 2V= ◄◄ , 3V= ◄◄◄ , 4V= ○
12.	AD5	I	Key input. 0V=RESET , 1V=MEMORY , 2V=DISPLAY MODE
13.	TIMER SW	I	Timer switch input (Analog). 0V=REC , 1V=PLAY , 2V=OFF.
14.	T-PULS	I	Take-up reel base sensor input.
15.	S-PULS	I	Supply reel base sensor input.
16.	COUNT 0	I	Not used for this model (Connected to GND).
17.	-	-	Not used for this model (Connected to GND).
18.	RSTOUT	O	Reset output to counter Microcomputer (IC881).
19.	S-CLOCK	O	Shift clock output (250kHz) to Counter Microcomputer (IC881).
20.	S-OUT	O	Serial data output to Counter Microcomputer (IC881).
21.	S-IN	I	Not used for this model (Connected to S-OUT).
22.	SIRCS-L	I	SIRCS phase input.
23.	SIRCS-E	I	SIRCS negative phase input.
24.	POW-OUT	O	Not used for this model (Connected to GND).
25.	POWER IN	I	Power down detection input.
26.	INT1	I	Power down detection input.
27.	CN V <sub>SS</sub>	-	Power supply: GND.
28.	RESET	I	Reset input.
29.	XIN	I	Clock input (4MHz).
30.	XOUT	O	Clock output (4MHz).
31.	φ OUT	-	Not used for this model.
32.	V <sub>SS</sub>	-	Power supply: GND.
33.	PAT3	I	Rotary encoder input to detect the position of the head base of the mechanical block.
34.	PAT2	I	Rotary encoder input to detect the position of the head base of the mechanical block.
35.	PAT1	I	Rotary encoder input to detect the position of the head base of the mechanical block.
36.	PATO	I	Rotary encoder input to detect the position of the head base of the mechanical block.
37.	OPEN SW	I	OPEN switch input of the mechanical block.
38.	CLOSE SW	I	CLOSE switch input of the mechanical block.
39.	DOOR SW	I	DOOR switch input of the mechanical block.
40.	REC SW	I	REC switch input of the mechanical block.
41.	70 μ SW	I	70 μ switch input of the mechanical block.
42.	HALF SW	I	HALF switch.
43.	METAL SW	I	METAL switch.
44.	-	-	Not used for this model (Connected to GND).
45.	CAM DOWN	O	Head base DOWN output of the mechanical block.
46.	CAM UP	O	Head base UP output of the mechanical block.
47.	M-FWD	O	Reel motor rotate with FWD.
48.	M-REV	O	Reel motor rotate with REV.
49.	M-PLAY	O	Reel motor rotate at PLAY speed.
50.	M-FAST	O	Reel motor rotate at FF/REW speed.
51.	BIAS	O	Bias oscillation on and off control.
52.	REC MUTE	O	REC MUTE control output.
53.	MONITOR OUT	O	MONITOR switch output.
54.	LINE MUTE	O	Line mute control output.
55.	-	-	Not used for this model (Connected to GND).
56.	AMS MODE	O	AMS switch output.
57.	TYPE I	O	REC equalizer change output.
58.	TYPE II	O	REC equalizer change output.
59.	TYPE IV	O	REC equalizer change output.
60.	AMS SIG	I	AMS signal input. No song detected=Low. Song detected=High.
61.	SOURCE SW	I	MONITOR switch input.
62.	TAPE SW	I	MONITOR switch input.
63.	CAL SW	I	CALIBRATION switch input.
64.	ADDR1	O	Data output to Display Microcomputer.

## 4-1-4. IC881 (HD404240A31S) PIN FUNCTIONS

Fluorescent dynamic display is performed by receiving count data from the master microcomputer (IC801)

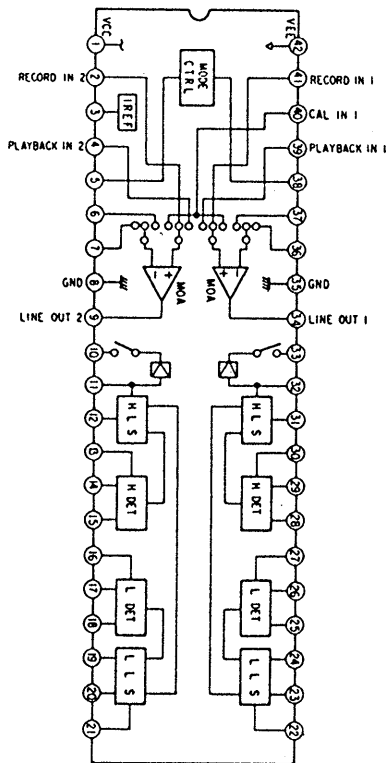
Pin No.	Pin name	I/O	Description
1.	G3	0	Fluorescent display grid output
2.	G4	0	Fluorescent display grid output
3.	dot	0	Fluorescent display segment output
4.	P DWN	I	Pull-down power supply terminal for fluorescent display segment output (-22V)
5. ~11.	g~a	0	Fluorescent display segment output
12.	-	-	Not used.
13. ~16.	DIM1~DIM4	I	Dimmer input (Pins ⑭ and ⑯ are "H". Others are opened and fixed: Blanking time 550usec; grid ON time 450usec.)
17. ~20.	-	-	Not used.
21.	Vcc	-	Power supply terminal (+5V)
22.	SCK	I	Shift clock input (250kHz) from the master microcomputer (IC801)
23.	SI	I	Serial data input (Data are sent by 1 byte every 6msec.) from the master microcomputer (IC801)
24. ~25.	-	-	Not used.
26.	RESET	I	Reset input from the master microcomputer (IC801). Reset when "H".
27.	$\overline{\text{TEST}}$	I	Connected to +5V.
28.	OSC1	I	Clock input (4MHz)
29.	OSC2	I	Clock input (4MHz)
30.	GND	-	Power supply terminal (GND)
31. ~34.	-	-	Not used.
35.	MLED	0	Not used. (Connected to +5V)
36. ~40.	-	-	Not used.
41.	G2	0	Fluorescent display grid output
42.	G1	0	Fluorescent display grid output

## 4-2. CIRCUIT BOARDS LOCATION

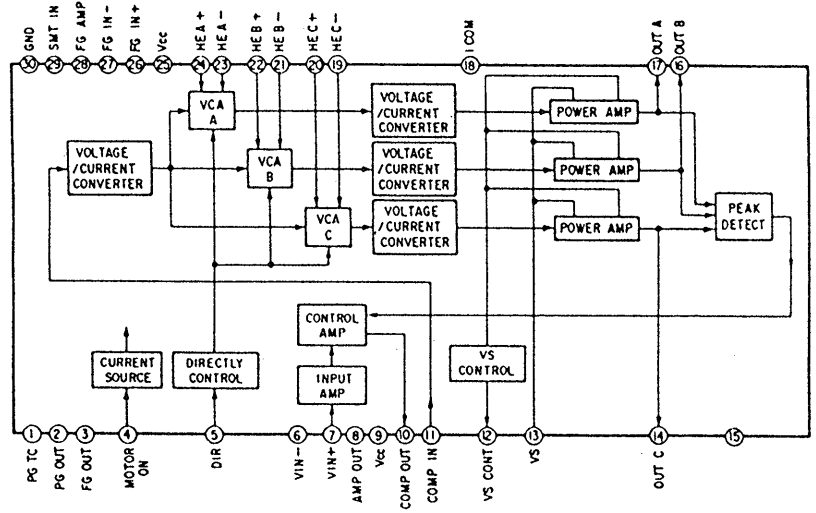


4.3. IC BLOCK DIAGRAMS

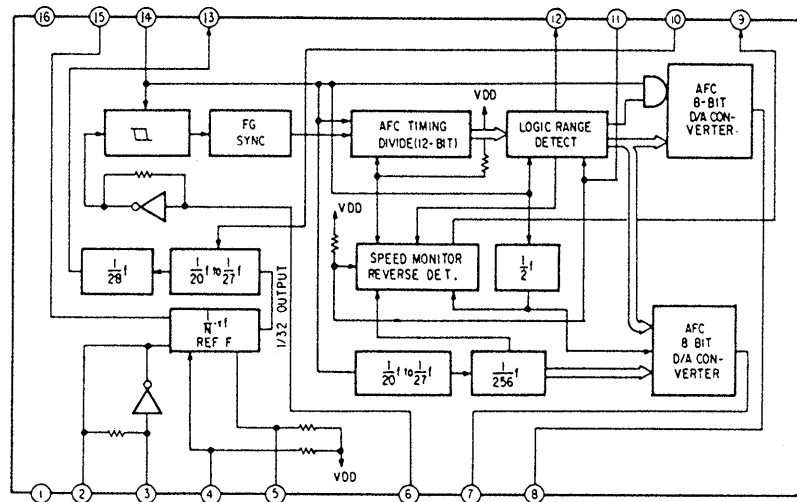
IC502, 505 CX20188



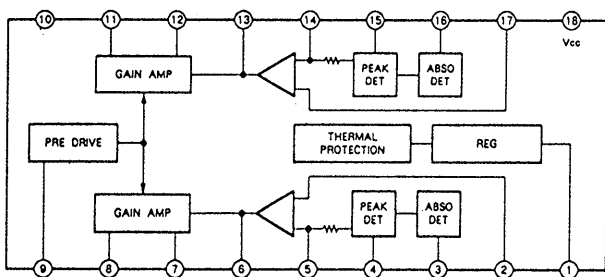
IC902 CX20174



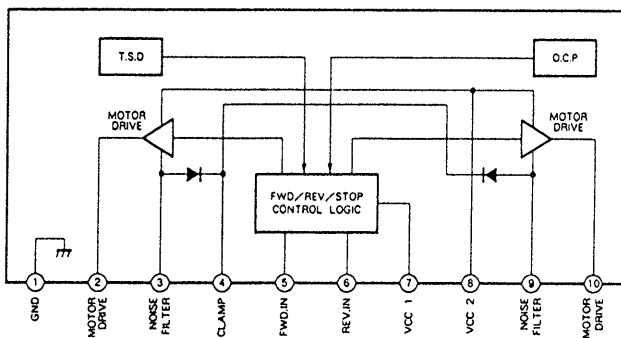
IC952 TC9142P



IC508 μPC1297CA

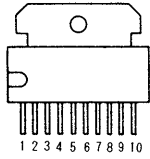


IC802 BA6219B  
IC803 LB1641

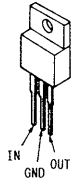


4-4. SEMICONDUCTOR LEAD LAYOUTS

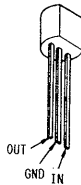
BA6219B  
LB1641



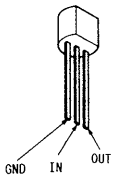
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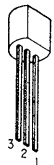
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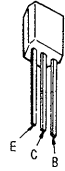
NJM79L12A



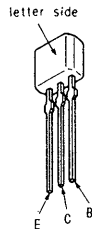
RC78L12L



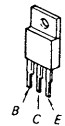
DTA114ES  
DTA144ES  
DTC114ES  
DTC124ES  
DTC143TS  
2SC2603-EF



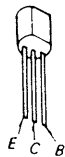
DTC144ES  
2SA1175-HFE  
2SC3623A-LK  
2SD1020-HFE



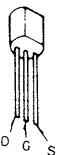
2SA985A  
2SB1094-LK  
2SC2275A  
2SD2012



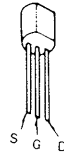
2SB646C  
2SB1116A-L  
2SC945-P  
2SC1815-GR  
2SD756



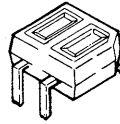
2SK170



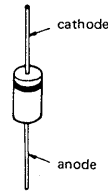
2SK246-GR2



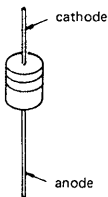
GP2S22B



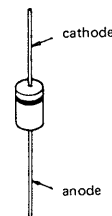
HZ6B2L  
HZ12B2L  
1N4148M  
10E2N



RD5.1JS-B1  
HZS6C1L  
HZS6C3L  
UZL-6M2  
UZL-24L  
1SS202-1



30DF2

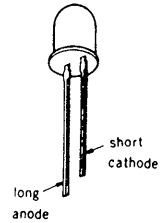


SEL4214S

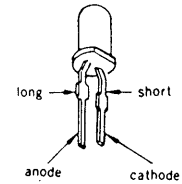


1, Anode  
2, Cathode

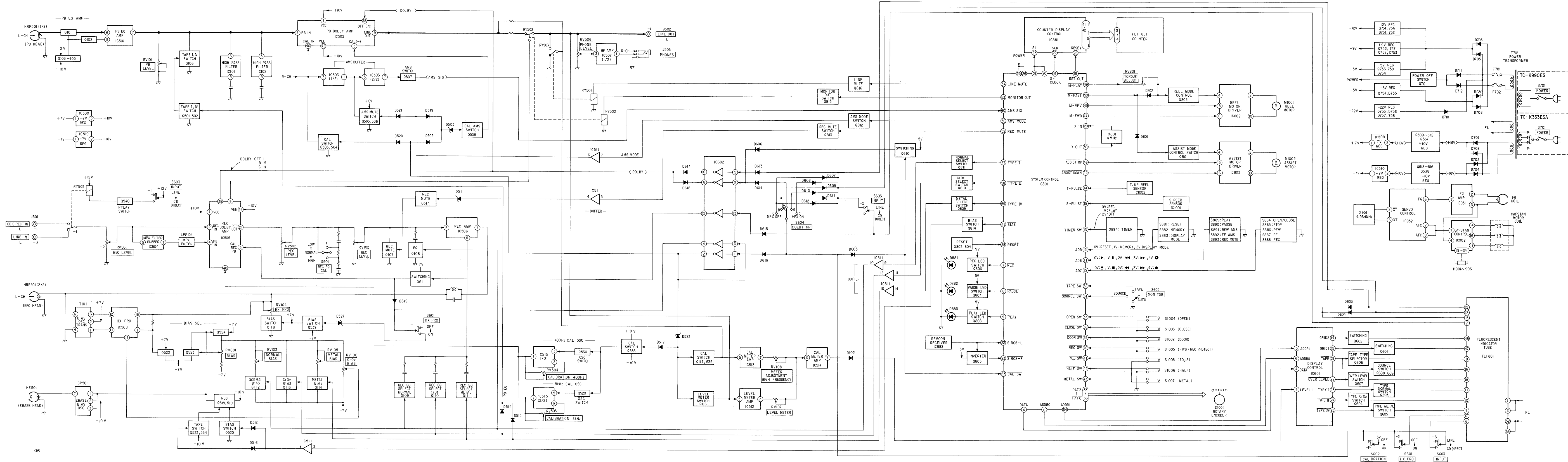
SEL4414E-C

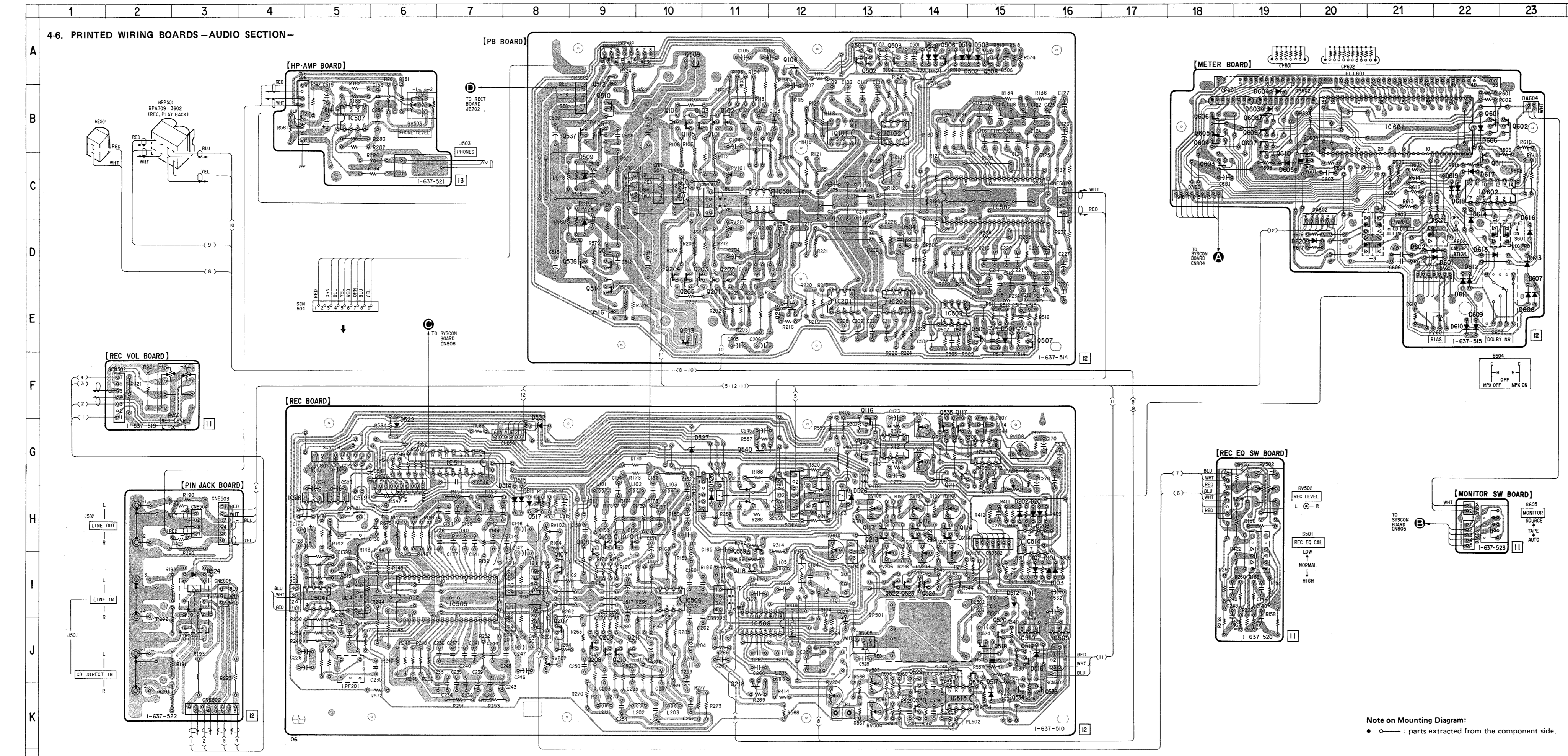


SEL4814A-CD

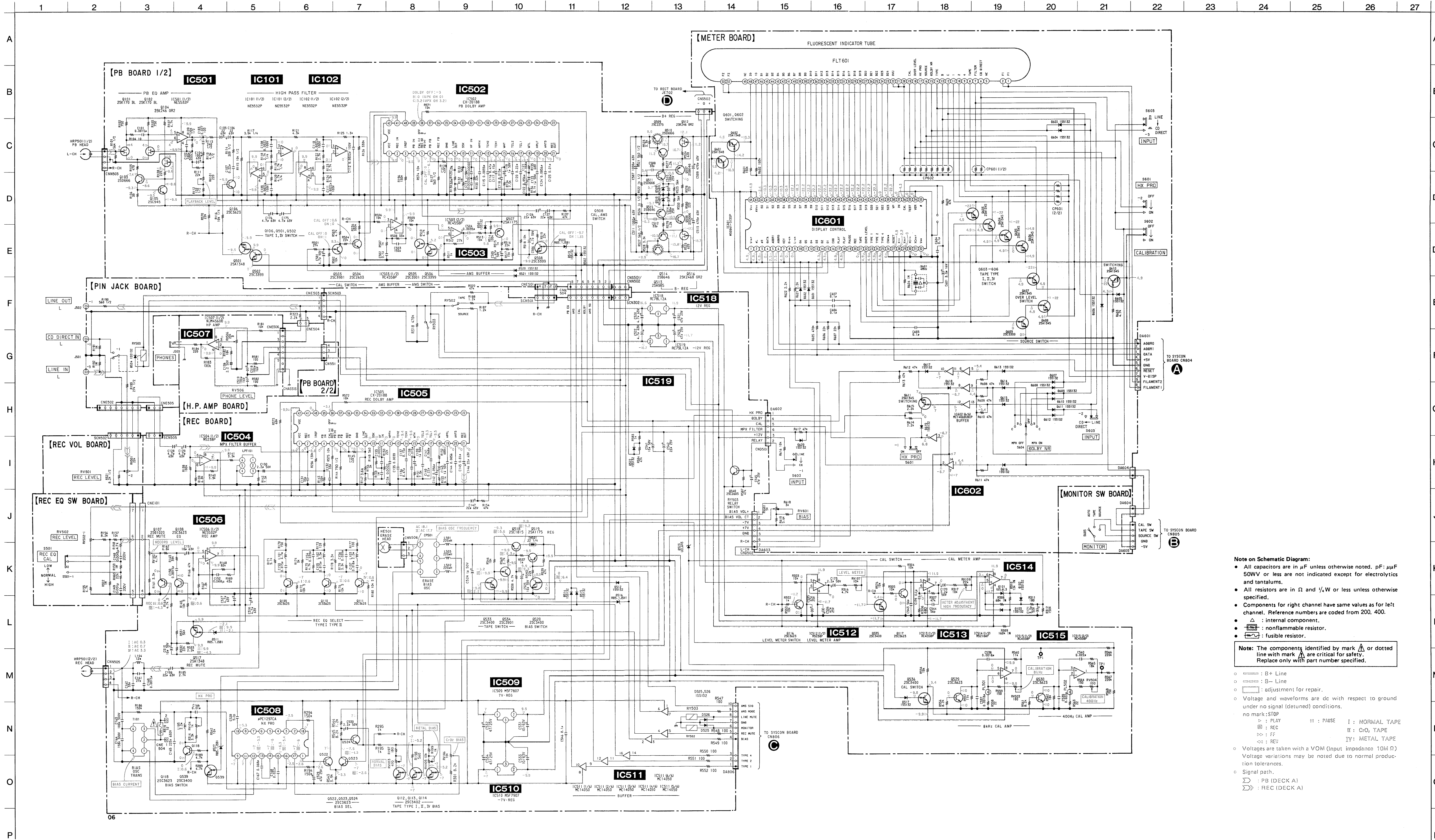


4-5. BLOCK DIAGRAM









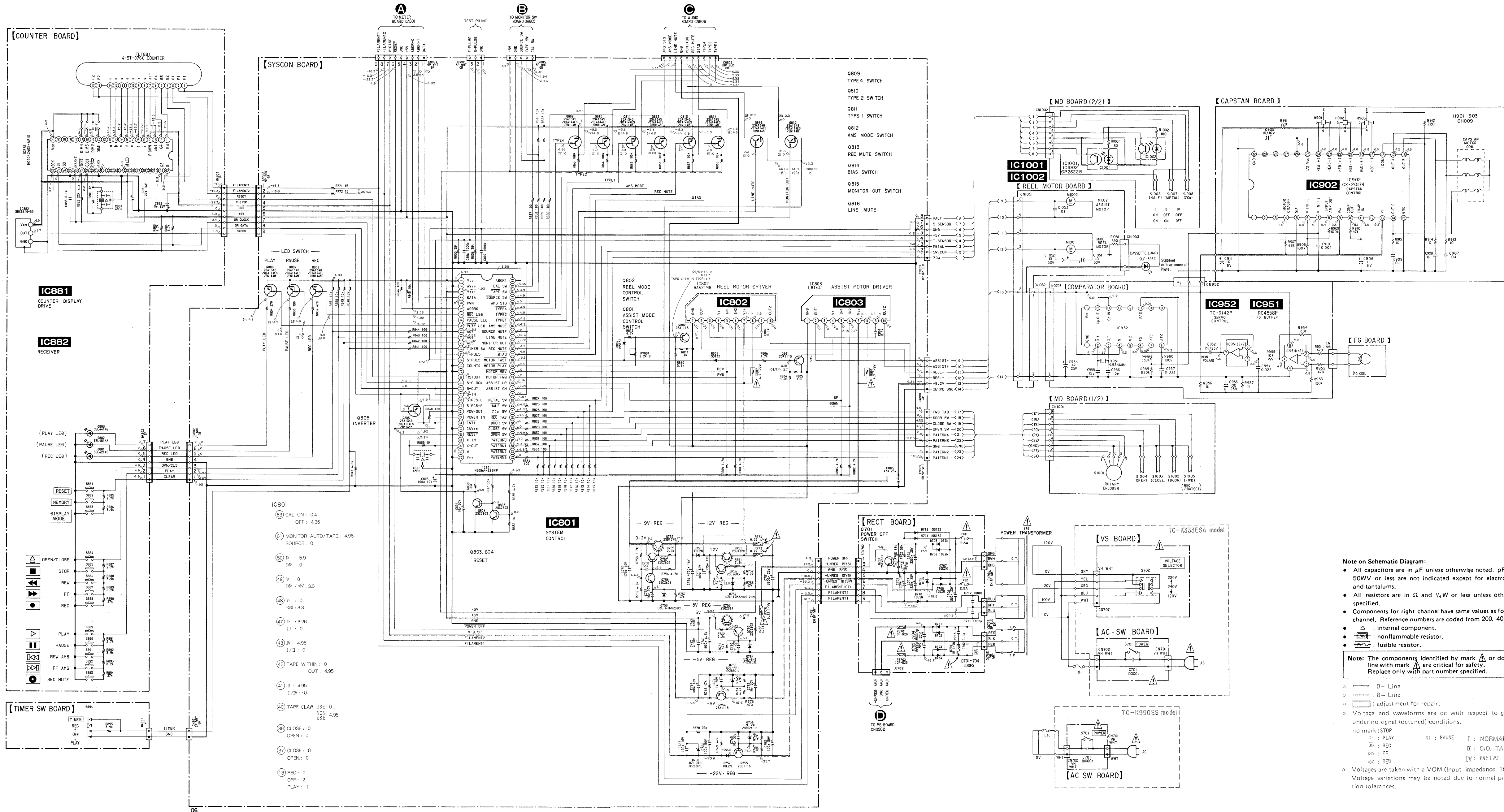
**Note on Schematic Diagram:**

- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$ :  $\mu\text{F}$  500W or less are not indicated except for electrolytics and tantalums.
- All resistors are in  $\Omega$  and  $\frac{1}{2}W$  or less unless otherwise specified.
- Components for right channel have same values as for left channel. Reference numbers are coded from 200, 400.
- $\Delta$  : internal component.
- $\square$  : nonflammable resistor.
- $\text{---}/\text{---}$  : fusible resistor.

**Note: The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.**

- : B+ Line
- : B- Line
- : adjustment for repair.
- : Voltage and waveforms are dc with respect to ground under no signal (detuned) conditions.
- no mark : STOP
- : PLAY
- : REC
- : FF
- : REV
- : PAUSE
- : C-G, TAPE
- : METAL TAPE
- : Voltages are taken with a VOM (input impedance 10M  $\Omega$ )
- : Voltage variations may be noted due to normal production tolerances.
- : Signal path.
- : PB (DECK A)
- : REC (DECK A)

4-8. SCHEMATIC DIAGRAM - SYSCON SECTION -



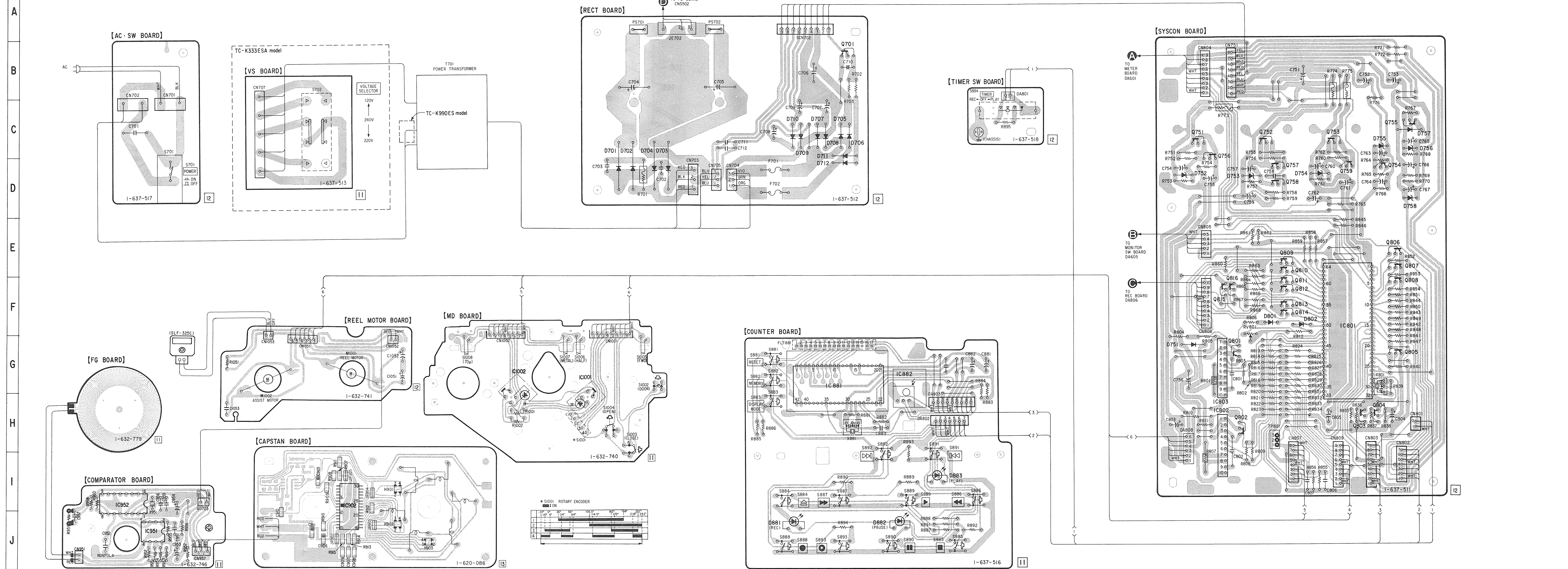
**Note on Schematic Diagram:**

- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$ :  $\mu\text{F}$  50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in  $\Omega$  and  $\frac{1}{2}\text{W}$  or less unless otherwise specified.
- Components for right channel have same values as for left channel. Reference numbers are coded from 200, 400.
- $\Delta$ : internal component.
- $\square$ : nonflammable resistor.
- $\text{---}$ : fusible resistor.

**Note:** The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

$\circ$  : B+ Line  
 $\square$  : B- Line  
 $\square$  : adjustment for repair.  
 $\square$  : Voltage and waveforms are dc with respect to ground under no signal (detuned) conditions.  
 no mark : STOP  
 $\square$  : PLAY  
 $\square$  : REC  
 $\square$  : FF  
 $\square$  : REV  
 $\square$  : PAUSE  
 $\square$  : I : NORMAL TAPE  
 $\square$  : II : C-0, TAPE  
 $\square$  : III : METAL TAPE  
 Voltages are taken with a VOM (input impedance 10M  $\Omega$ )  
 Voltage variations may be noted due to normal production tolerances.

4-9. PRINTED WIRING BOARDS - SYSCON SECTION -



● Semiconductor Location

Ref. No.	Location
D701	D-11
D702	D-11
D703	D-12
D704	D-11
D705	C-15
D706	C-15
D707	C-14
D708	C-14
D709	C-14
D710	C-14
D711	C-15
D712	D-15
D751	G-20
D752	D-20
D753	D-22
D754	D-23
D755	C-24
D756	C-24
D757	C-24
D758	D-24
D801	F-22
D802	F-22
D803	J-14
D882	J-15
D883	I-16
IC801	F-23
IC802	H-21
IC803	G-21
IC881	G-14
IC882	G-16
IC902	I-6
IC951	J-3
IC952	I-2
IC1001	G-10
IC1002	G-9
Q701	B-15
Q751	C-21
Q752	C-22
Q753	C-23
Q754	D-24
Q755	C-24
Q756	C-21
Q757	D-22
Q758	D-22
Q759	D-23
Q801	G-21
Q802	H-21
Q803	H-23
Q804	H-24
Q805	G-24
Q806	E-24
Q807	E-24
Q808	F-24
Q809	E-22
Q810	E-22
Q811	F-22
Q812	F-22
Q813	F-22
Q814	F-22
Q815	F-21
Q816	F-21

Note on Mounting Diagram:  
 ● ○ : parts extracted from the component side.



## SECTION 5 EXPLODED VIEWS

**NOTE:**

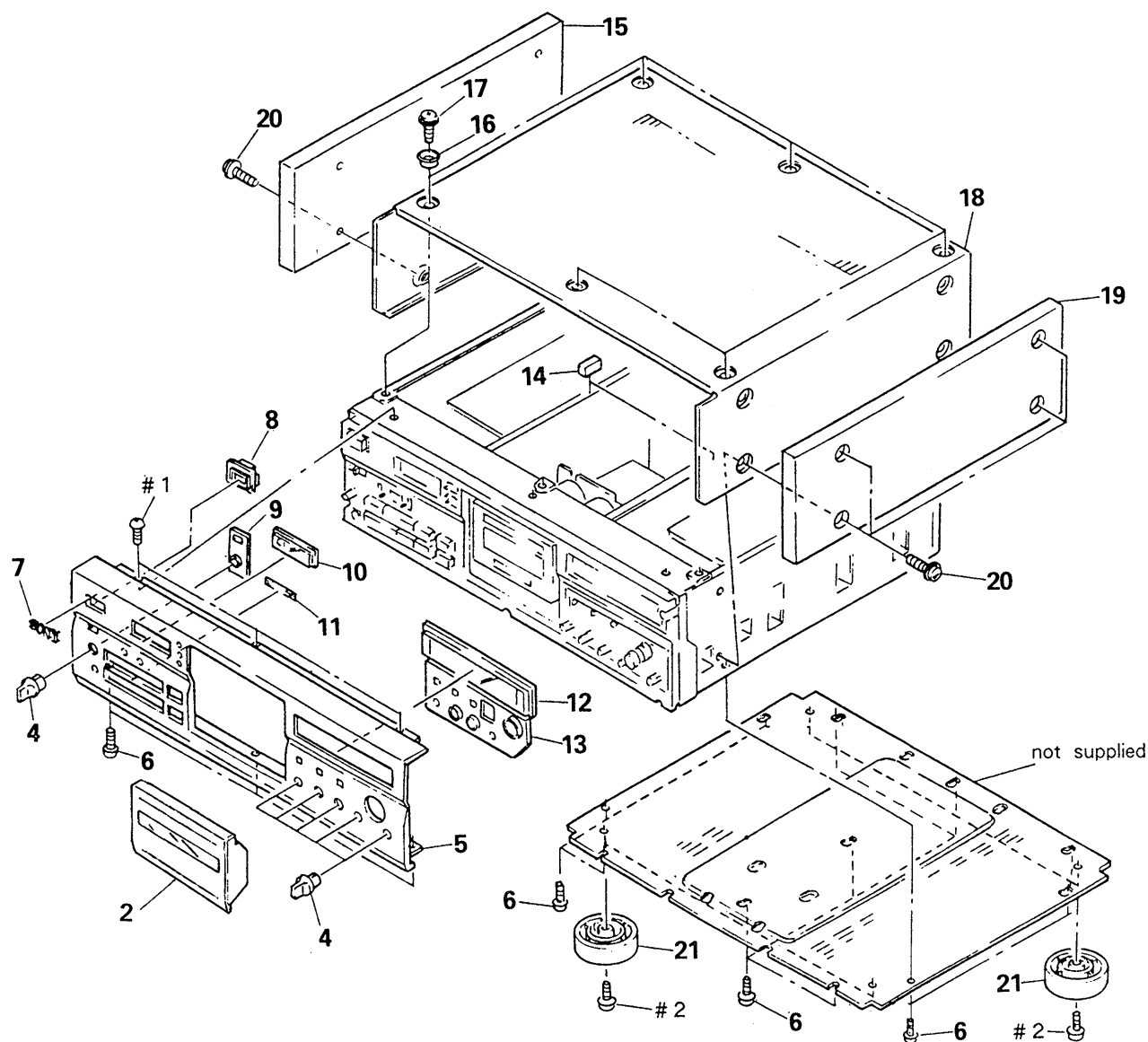
- -XX,-X mean standardized parts, so they may have some difference from original one.
- Color indication of Appearance Parts.  
Example:  
KNOB,BALANCE (WHITE) ... (RED)

↑                    ↑  
Parts                Cabinet's  
Color                Color

- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

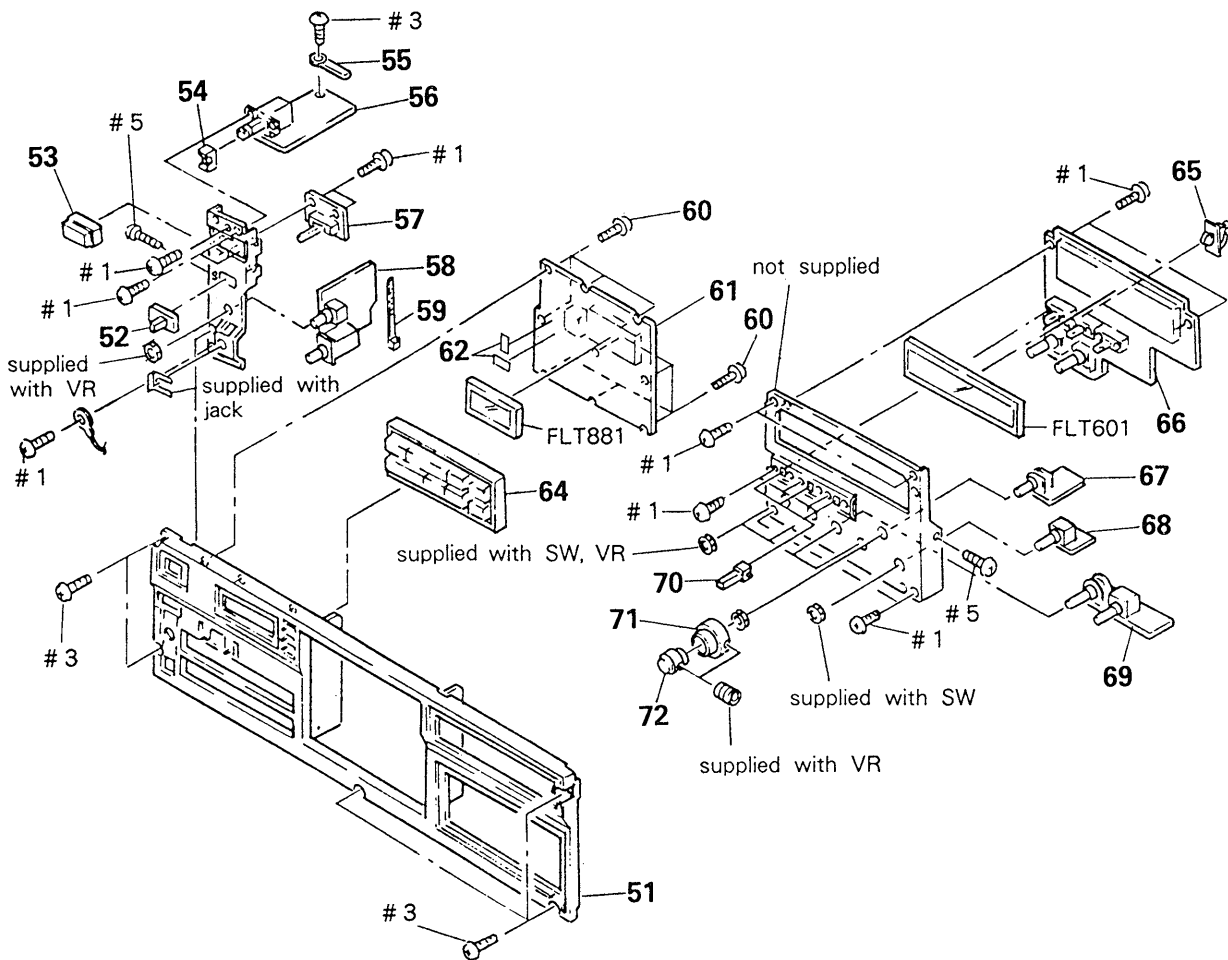
The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

### 5-1. OVERALL SECTION



Ref. No.	Part No.	Description	Remark
2	X-3363-875-1	LID ASSY (A), CASSETTE (K333)	
2	X-3365-081-1	LID ASSY, CASSETTE (K990ES:BLACK)	
2	X-3365-082-1	LID ASSY, CASSETTE (K990ES:GOLD)	
4	X-3362-818-1	KNOB (DIA. 12) ASSY (B), FLAT (BLACK)	
4	X-3363-490-1	KNOB (DIA. 12) ASSY (B), FLAT (GOLD)	
5	3-373-923-01	PANEL, FRONT (K333)	
5	3-373-923-41	PANEL, FRONT (K990ES:GOLD)	
5	3-373-923-51	PANEL, FRONT (K990ES:BLACK)	
6	3-703-685-21	SCREW (+BV 3X8)	
7	4-908-848-01	EMBLEM, SONY (BLACK)	
7	4-908-848-21	EMBLEM, SONY (GOLD)	
8	4-908-044-11	ESCUTCHEON, POWER KNOB (BLACK)	
8	4-908-044-21	ESCUTCHEON, POWER KNOB (GOLD)	
9	3-364-444-01	ESCUTCHEON (L) (BLACK)	
9	3-364-444-11	ESCUTCHEON (L) (GOLD)	
10	3-364-442-01	WINDOW, COUNTER (K333)	
10	3-364-442-11	WINDOW, COUNTER (K990ES:BLACK)	
10	3-364-442-21	WINDOW, COUNTER (K990ES:GOLD)	
11	3-831-441-XX	PAPER, INTERCEPTION	
12	3-364-443-01	WINDOW, METER (BLACK)	
12	3-364-443-11	WINDOW, METER (GOLD)	
13	3-364-447-01	ESCUTCHEON (R) (BLACK)	
13	3-364-447-11	ESCUTCHEON (R) (GOLD)	
14	9-911-842-XX	CUSHION (S)	
15	X-3304-959-1	PANEL (LEFT) ASSY, SIDE (K333/K990ES:AEP:BLACK)	
15	X-3304-969-1	PANEL (LEFT) ASSY, SIDE (K990ES:Germany:BLACK)	
15	X-3363-492-2	PANEL (LEFT) ASSY, SIDE (K990ES:GOLD)	
16	4-923-474-01	RING, ORNAMENTAL (BLACK)	
16	4-923-474-11	RING, ORNAMENTAL (GOLD)	
17	3-704-366-01	SCREW (CASE) (M3X8) (BLACK)	
17	3-704-366-11	SCREW (CASE) (M3X8) (GOLD)	
* 18	3-350-489-11	CASE (BLACK)	
* 18	3-350-489-21	CASE (GOLD)	
19	X-3304-960-1	PANEL (RIGHT) ASSY, SIDE (K333/K990ES:AEP:BLACK)	
19	X-3304-970-1	PANEL (RIGHT) ASSY, SIDE (K990ES:Germany:BLACK)	
19	X-3363-493-2	PANEL (RIGHT) ASSY, SIDE (K990ES:GOLD)	
20	4-885-979-11	SCREW (4X25)	
21	X-3304-944-1	FOOT ASSY (BLACK)	
21	X-3363-489-1	FOOT ASSY (GOLD)	

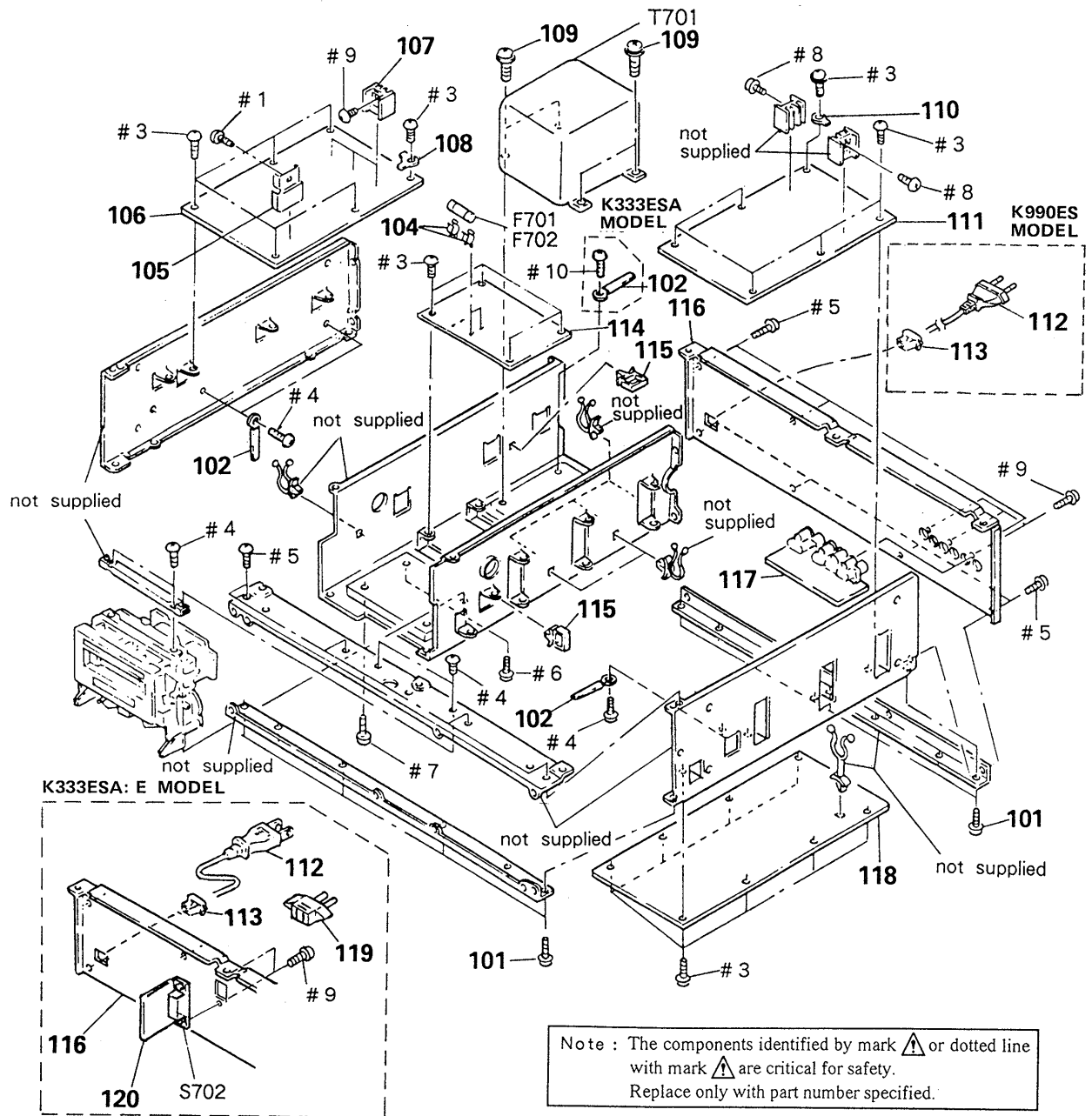
## 5-2. FRONT PANEL SECTION



Ref.No.	Part No.	Description	Remark
* 51	3-364-474-01	PANEL (BASE) (BLACK)	
51	3-364-474-12	PANEL (BASE) (GOLD)	
52	4-922-518-11	KNOB (TIMER) (BLACK)	
52	4-922-518-62	KNOB (TIMER) (GOLD)	
53	4-908-046-01	KNOB, SQUARE (BLACK)	
53	4-908-046-81	KNOB, SQUARE (GOLD)	
54	4-864-307-00	RING	
55	3-703-150-11	STOPPER, WIRING	
* 56	1-637-517-11	AC SW BOARD	
* 57	1-637-518-11	TIMER SW BOARD	
* 58	1-637-521-11	H.P. AMP BOARD	
59	3-655-653-21	BAND (TAITON), BINDING	
60	4-928-635-01	SCREW, +BV (2.6X8) TAPPING	
61	* 1-637-516-11	COUNTER BOARD	
62	3-831-441-XX	PAPER, INTERCEPTION	

Ref.No.	Part No.	Description	Remark
64	X-3362-327-1	BUTTON ASSY (BLACK)	
64	X-3363-491-1	BUTTON ASSY (GOLD)	
65	2-132-434-01	CLIP, WIRE	
* 66	A-2006-652-A	METER BOARD, COMPLETE	
* 67	1-637-519-11	REC VOL BOARD	
* 68	1-637-523-11	MONITOR SW BOARD	
* 69	1-637-520-11	REC EQ SW BOARD	
70	3-364-441-01	BUTTON (BLACK)	
70	3-364-441-11	BUTTON (GOLD)	
71	3-364-440-01	KNOB (L) (BLACK)	
71	3-364-440-11	KNOB (L) (GOLD)	
72	3-364-439-01	KNOB (R) (BLACK)	
72	3-364-439-11	KNOB (R) (GOLD)	
FLT601	1-519-629-11	INDICATOR TUBE, FLUORESCENT	
FLT881	1-519-630-11	INDICATOR TUBE, FLUORESCENT	

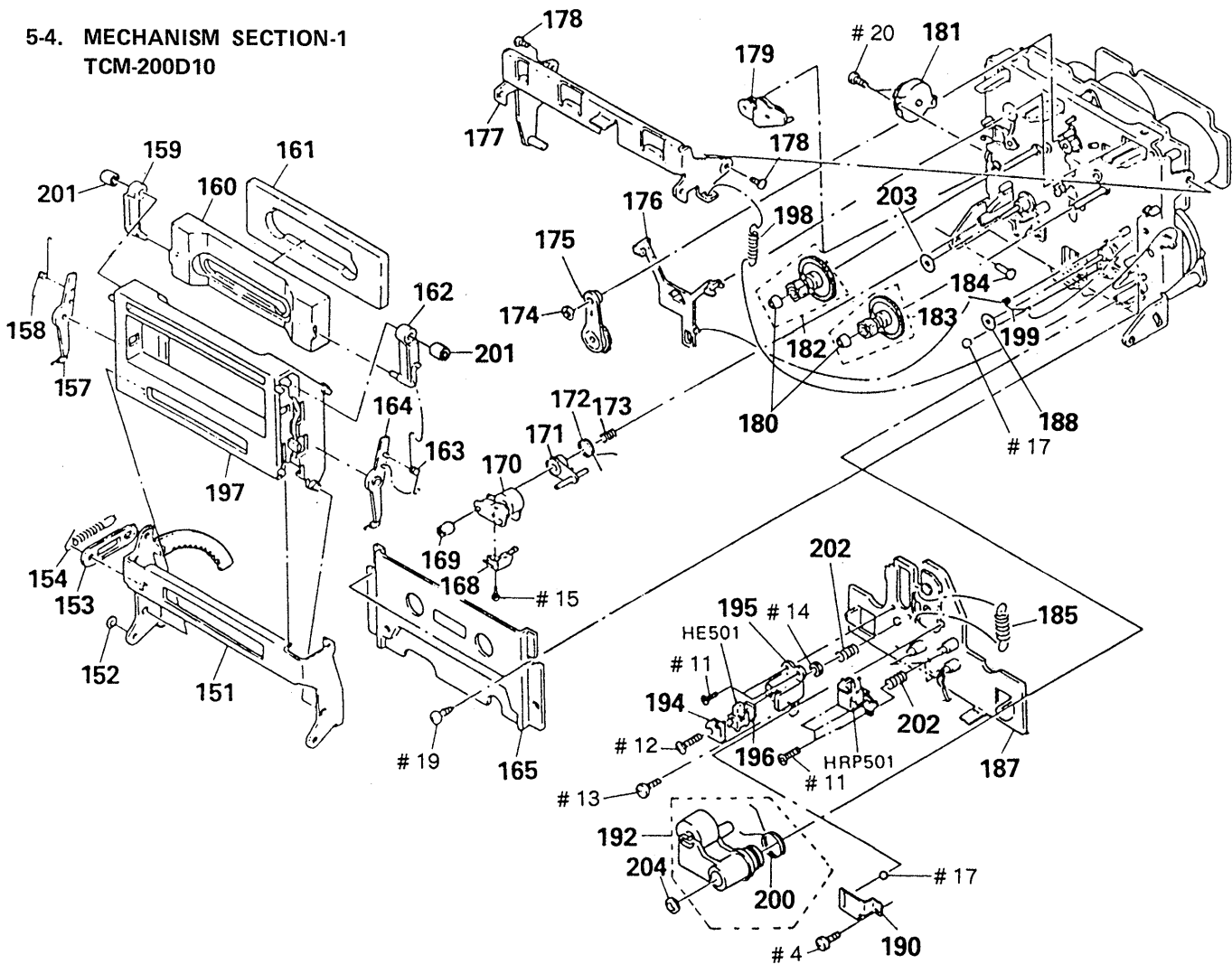
### 5-3. CHASSIS SECTION



Note : The components identified by mark ▲ or dotted line with mark ▲ are critical for safety. Replace only with part number specified.

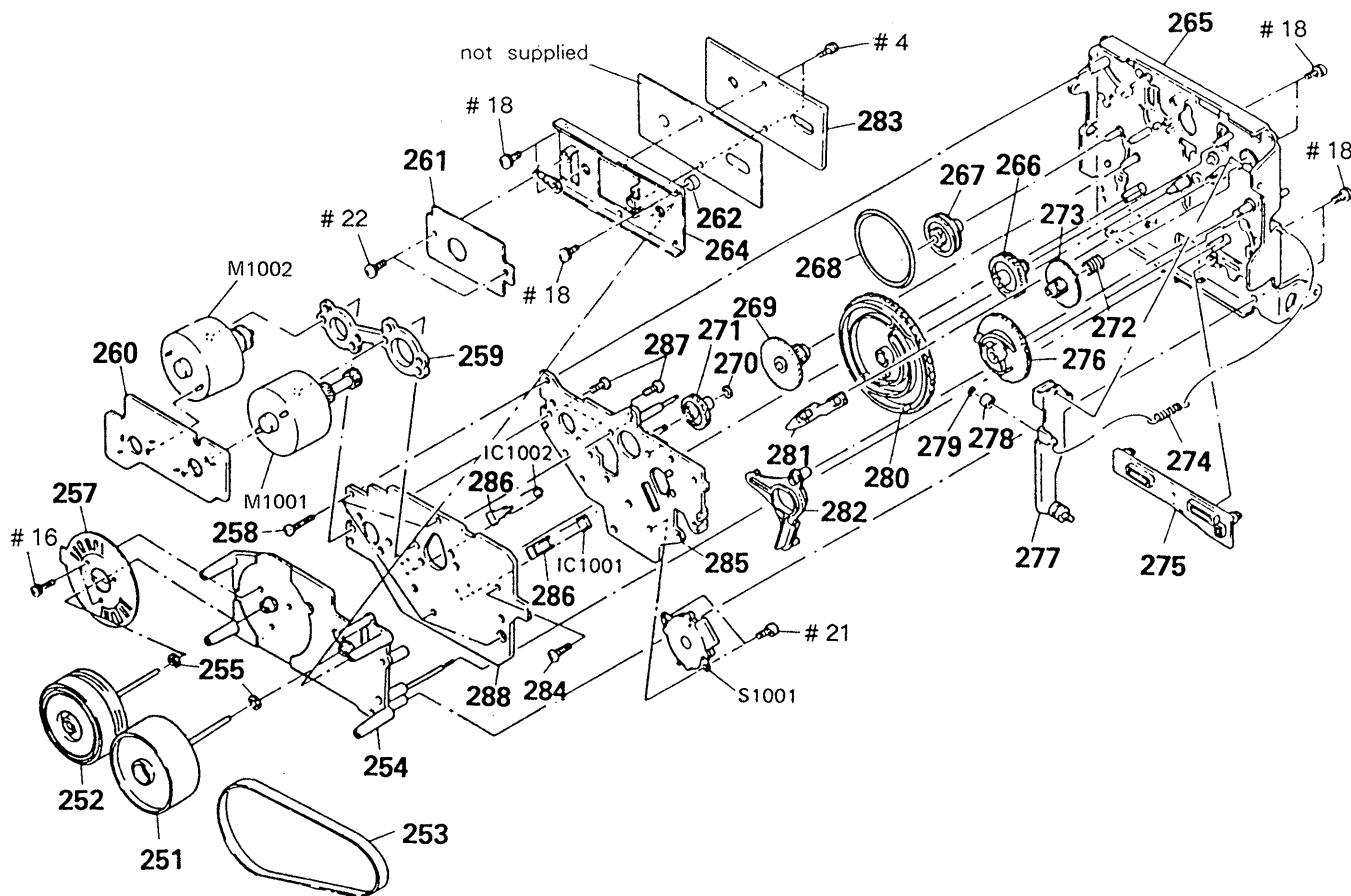
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	3-703-685-21	SCREW (+BV 3X8)		* 114	1-637-512-11	RECT. BOARD	
102	3-703-150-11	STOPPER, WIRING		* 115	3-329-937-02	CLIP, WIRE	
* 104	1-533-213-31	HOLDER, FUSE		* 116	3-350-482-51	PANEL, BACK (K990ES:BLACK)	
* 105	3-356-925-01	HEAT SINK		* 116	3-350-482-63	PANEL, BACK (K333ESA)	
* 106	A-2006-650-A	SYSCON BOARD, COMPLETE		* 116	3-350-482-71	PANEL, BACK (K990ES:GOLD)	
* 107	4-363-146-21	HEAT SINK, V. OUT		* 117	1-637-522-11	PIN JACK BOARD	
* 108	3-346-266-12	PLATE, GROUND		* 118	A-2006-640-A	REC BOARD, COMPLETE	
109	4-820-330-31	SCREW (K990ES)		▲ 119	1-569-007-11	ADAPTER, CONVERSION 2P (K333ESA)	
109	4-886-821-11	SCREW, S TIGHT, +PTTWH 3X6 (K333ESA)		▲ F701	1-532-286-00	FUSE, TIME-LAG (2.5A)	
* 110	3-346-266-21	PLATE, GROUND		▲ F702	1-532-286-00	FUSE, TIME-LAG (2.5A)	
* 111	A-2006-641-A	PB BOARD, COMPLETE		▲ S702	1-572-009-11	SELECTOR, VOLTAGE (VOLTAGE SELECTOR)	
▲ 112	1-559-297-31	CORD, POWER (K333ESA)		▲ T701	1-450-451-11	TRANSFORMER, POWER (K990ES)	
▲ 112	1-574-383-11	CORD, POWER (K990ES)		▲ T701	1-450-453-11	TRANSFORMER, POWER (K333ESA)	
* 113	3-703-244-00	BUSHING (2104), CORD (K990ES)					
113	4-916-783-01	BUSHING, CORD (K333ESA)					

5.4. MECHANISM SECTION-1  
TCM-200D10



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
151	X-3362-671-1	HOLDER (BG) ASSY, CASSETTE		179	X-3356-623-1	LEVER (BT) ASSY	
152	3-558-708-21	WASHER, STOPPER		180	3-362-308-01	CAP (REEL)	
* 153	3-356-717-01	LEVER (JOINT)		181	3-319-224-41	DAMPER, SMALL	
154	3-356-626-01	SPRING, TENSION		182	X-3356-629-1	GEAR (S) ASSY	
157	3-356-932-01	LEVER (LA)		183	X-3356-627-1	GEAR (T) ASSY	
158	3-356-927-01	SPRING (LEFT), TORSION		184	3-356-710-01	SHAFT (LEFT) (CASSETTE HOLDER)	
159	3-356-933-01	LEVER (LB)		185	3-356-658-01	SPRING (LIMITER H), TENSION	
160	3-356-928-01	PLATE (A), ORNAMENTAL		* 187	X-3362-199-1	SLIDER (HEAD CHASSIS D) ASSY	
* 161	3-356-929-01	ABSORBENT, VIBRATION		188	3-332-763-01	RING, OIL RESERVOIR	
162	3-356-931-01	LEVER (RB)		190	3-356-656-01	SPRING (HEAD PC BOARD), LEAF	
163	3-356-926-01	SPRING (RIGHT), TORSION		192	X-3356-620-1	LEVER (PINCH LEVER T) ASSY	
164	3-356-930-01	LEVER (RA)		194	3-318-433-01	SPRING	
165	X-3356-613-1	PLATE ASSY, ORNAMENTAL		* 195	3-576-977-00	BRACKET, E. HEAD	
168	3-564-138-00	GUIDE (S), TAPE		* 196	1-608-268-00	PC BOARD, ERASE HEAD	
169	3-356-652-01	NUT (PINCH LEVER S)		197	X-3365-065-1	HOLDER ASSY, CASSETTE	
170	X-3356-621-1	LEVER (PINCH LEVER S) ASSY		198	3-376-854-01	SPRING, TENSION	
171	3-356-660-01	LEVER (PS)		199	3-356-619-01	SPRING (B), TORSION	
172	3-356-661-01	SPRING (PINCH LEVER S), TORSION		200	3-356-672-01	SPRING (PINCH LEVER T), TORSION	
173	3-356-657-01	SPRING (PS), COMPRESSION		201	3-356-946-01	BUSHING	
174	3-669-465-00	WASHER (1.5), STOPPER		202	3-564-121-00	SPRING, COMPRESSION	
175	X-3356-641-1	LEVER (FR2) ASSY		203	3-356-713-01	WASHER	
176	3-356-614-01	SLIDER (BRAKE)		204	3-669-596-00	WASHER (2.3), STOPPER	
* 177	X-3356-608-1	LEVER (LIFTER) ASSY		HE501	1-543-836-11	HEAD, MAGNETIC (ERASE)	
178	3-356-601-11	SCREW, STEP		HRP501	1-543-684-21	HEAD, MAGNETIC (REC/PB)	

5-5. MECHANISM SECTION-2  
TCM-200D10



Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
251	X-3362-284-1	FLYWHEEL (S2.3) ASSY		274	3-356-625-01	SPRING, TENSION	
252	X-3356-619-1	FLYWHEEL (DT) ASSY		275	3-356-653-01	SLIDER (PAUSE)	
253	3-364-600-01	BELT (CAPSTAN)		276	3-356-616-01	GEAR (LOADING CAM)	
254	X-3362-281-1	CHASSIS ASSY		* 277	X-3356-606-1	LEVER (LOADING) ASSY	
255	3-356-705-31	WASHER (CAPSTAN)		278	3-356-630-01	ROLLER (LOADING)	
257	1-632-779-11	PC BOARD, FG		279	3-558-708-11	WASHER, STOPPER	
258	3-355-801-01	SCREW (BTP 2X18)		280	3-356-654-01	GEAR (MODE CAM C)	
* 259	3-356-628-01	SPACER (MOTOR)		281	3-356-617-01	LEVER (SELECTION)	
* 260	1-632-741-11	REEL MOTOR BOARD		282	3-356-613-01	LEVER (MODE)	
* 261	1-632-746-11	COMPARATOR BOARD		283	A-2006-154-A	CAPSTAN BOARD, COMPLETE	
262	3-364-135-01	RETAINER (S), THRUST		284	3-356-707-01	SCREW (+PTPW 2X25)	
* 264	X-3362-282-1	BRACKET (THRUST RETAINER) ASSY		* 285	X-3356-616-1	BRACKET (MOTOR D) ASSY	
265	X-3356-622-1	CHASSIS (C) ASSY, MECHANICAL		286	3-356-631-01	HOLDER (SENSOR)	
266	3-356-703-01	GEAR (COMMUNICATION C)		287	3-363-804-01	SCREW (+P 2.6X6.5)	
267	3-356-607-01	PULLEY (MODE)		* 288	1-632-740-11	MD BOARD	
268	3-356-603-01	BELT (MODE)		IC1001	8-749-920-97	IC PHOTO GP2S22B	
269	3-356-606-01	GEAR (MODE)		IC1002	8-749-920-97	IC PHOTO GP2S22B	
270	3-669-465-11	WASHER (1.5), STOPPER		M1001	X-3356-638-1	MOTOR (REEL R) ASSY	
271	3-356-702-01	GEAR (COMMUNICATION B)		M1002	X-3356-604-1	MOTOR (ASSIST) ASSY	
272	3-356-605-01	SPRING, COMPRESSION		S1001	1-466-238-11	ENCODER, ROTARY	
273	3-356-609-01	GEAR (LOADING)					





**SECTION 6 ELECTRICAL PARTS LIST**

**NOTE:**

- Due to standardization, replacements in the parts list may be different from the part specified in the diagrams or the components used on the set.
- -XX,-X mean standardized parts, so they may have some difference from original one.
- RESISTORS  
All resistors are in ohms  
METAL : Metal-film resistor  
METAL OXIDE : Metal Oxide-film resistor  
F : nonflammable

- Items marked " \* " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS  
In each case, u :  $\mu$ , for example :  
uA... :  $\mu$ A..., uPA... :  $\mu$ PA...,  
uPB... :  $\mu$ PB..., uPC... :  $\mu$ PC...,  
uPD... :  $\mu$ PD...
- CAPACITORS  
uF :  $\mu$ F
- COILS  
uH :  $\mu$ H

The components identified by mark  or dotted line with mark  are critical for safety.  
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref. No.	Part No.	Description	Remark
*	1-637-517-11	AC SW BOARD ***** < CAPACITOR >	
• C701	1-161-744-00	CERAMIC 0.01uF	400V < CONNECTOR >
* CN701	1-564-321-00	PIN, CONNECTOR 2P	
* CN702	1-564-321-00	PIN, CONNECTOR 2P < SWITCH >	
• S701	1-572-267-21	SWITCH, PUSH (AC POWER)(1 KEY) (POWER) ***** A-2006-154-A CAPSTAN BOARD, COMPLETE ***** < CAPACITOR >	
C905	1-124-779-00	ELECT CHIP 10uF	20% 16V
C906	1-135-091-00	TANTALUM CHIP 1uF	20% 16V
C907	1-163-077-00	CERAMIC CHIP 0.1uF	10% 25V
C908	1-163-077-00	CERAMIC CHIP 0.1uF	10% 25V
C909	1-163-077-00	CERAMIC CHIP 0.1uF	10% 25V
C910	1-163-205-00	CERAMIC CHIP 0.001uF	5% 50V
C911	1-124-779-00	ELECT CHIP 10uF	20% 16V < HOLE ELEMENT >
H901	8-719-403-79	DIODE OH009	
H902	8-719-403-79	DIODE OH009	
H903	8-719-403-79	DIODE OH009 < IC >	
IC902	8-752-017-40	IC CX20174 < RESISTOR >	
R907	1-216-242-00	METAL GLAZE 68K 5%	1/8W
R908	1-216-246-00	METAL GLAZE 100K 5%	1/8W
R909	1-216-246-00	METAL GLAZE 100K 5%	1/8W

Ref. No.	Part No.	Description	Remark
R910	1-216-238-00	METAL GLAZE 47K 5%	1/8W
R911	1-216-182-00	METAL GLAZE 220 5%	1/8W
R912	1-216-182-00	METAL GLAZE 220 5%	1/8W
R913	1-216-150-00	METAL GLAZE 10 5%	1/8W
R914	1-216-150-00	METAL GLAZE 10 5%	1/8W
R915	1-216-150-00	METAL GLAZE 10 5%	1/8W
*****			
*	1-632-746-11	COMPARATOR BOARD ***** < CAPACITOR >	
C951	1-136-157-00	FILM 0.022uF	5% 50V
C952	1-124-282-00	ELECT (N. P.) 22uF	20% 25V
C953	1-124-478-11	ELECT 100uF	20% 25V
C954	1-124-477-11	ELECT 47uF	20% 25V
C955	1-162-203-31	CERAMIC 15PF	5% 50V
C956	1-162-203-31	CERAMIC 15PF	5% 50V
C957	1-136-159-00	FILM 0.033uF	5% 50V < CONNECTOR >
* CN951	1-564-718-11	PIN, CONNECTOR (SMALL TYPE) 2P	
* CN952	1-564-518-11	PLUG, CONNECTOR 3P < IC >	
IC951	8-759-945-58	IC RC4558P	
IC952	8-759-201-58	IC TC9142P < RESISTOR >	
R951	1-249-413-11	CARBON 470 5%	1/4W
R952	1-249-413-11	CARBON 470 5%	1/4W
R953	1-247-881-00	CARBON 120K 5%	1/4W
R954	1-247-881-00	CARBON 120K 5%	1/4W
R955	1-249-429-11	CARBON 10K 5%	1/4W
R956	1-249-417-11	CARBON 1K 5%	1/4W
R957	1-249-417-11	CARBON 1K 5%	1/4W
R958	1-247-891-00	CARBON 330K 5%	1/4W
R959	1-247-901-11	CARBON 820K 5%	1/4W
R960	1-249-441-11	CARBON 100K 5%	1/4W

**COMPARATOR****COUNTER****HP AMP****MD**

Ref. No.	Part No.	Description	Remark
		< VIBRATOR >	
X951	1-577-615-11	VIBRATOR, CRYSTAL (4.934MHz)	
*****			
*	1-637-516-11	COUNTER BOARD	
		*****	
		< CAPACITOR >	
C881	1-124-234-00	ELECT	22uF 20% 16V
C882	1-126-096-11	ELECT	10uF 20% 35V
C883	1-164-159-11	CERAMIC	0.1uF 50V
		< DIODE >	
D881	8-719-304-32	LED	SEL4214S
D882	8-719-312-65	LED	SEL4814A-CD
D883	8-719-304-37	LED	SEL4414E-C
		< FLUORESCENT INDICATOR >	
FLT881	1-519-630-11	INDICATOR TUBE, FLUORESCENT	
		< IC >	
IC881	8-759-322-98	IC	HD404240A31S
IC882	8-741-100-48	IC	SBX1610-59
		< RESISTOR >	
R881	1-247-903-00	CARBON	1M 5% 1/4W
R882	1-249-433-11	CARBON	22K 5% 1/4W
R883	1-249-425-11	CARBON	4.7K 5% 1/4W
R884	1-249-425-11	CARBON	4.7K 5% 1/4W
R885	1-249-422-11	CARBON	2.7K 5% 1/4W
R886	1-249-424-11	CARBON	3.9K 5% 1/4W
R887	1-249-422-11	CARBON	2.7K 5% 1/4W
R888	1-249-424-11	CARBON	3.9K 5% 1/4W
R889	1-249-428-11	CARBON	8.2K 5% 1/4W
R890	1-249-434-11	CARBON	27K 5% 1/4W
R891	1-249-422-11	CARBON	2.7K 5% 1/4W
R892	1-249-424-11	CARBON	3.9K 5% 1/4W
R893	1-249-428-11	CARBON	8.2K 5% 1/4W
R894	1-249-434-11	CARBON	27K 5% 1/4W
		< SWITCH >	
S881	1-554-303-21	SWITCH, TACTILE (RESET)	
S882	1-554-303-21	SWITCH, TACTILE (MEMORY)	
S883	1-554-303-21	SWITCH, TACTILE (DISPLAY MODE)	
S884	1-554-303-21	SWITCH, TACTILE (OPEN/CLOSE)	
S885	1-554-303-21	SWITCH, TACTILE (■)	
S886	1-554-303-21	SWITCH, TACTILE (◀)	
S887	1-554-303-21	SWITCH, TACTILE (▶)	

Ref. No.	Part No.	Description	Remark
S888	1-554-303-21	SWITCH, TACTILE (REC)	
S889	1-554-303-21	SWITCH, TACTILE (▶)	
S890	1-554-303-21	SWITCH, TACTILE (PAUSE)	
S891	1-554-303-21	SWITCH, TACTILE (AMS ◀)	
S892	1-554-303-21	SWITCH, TACTILE (AMS ▶)	
S893	1-554-303-21	SWITCH, TACTILE (REC MUTE)	
		< VIBRATOR >	
X881	1-577-358-21	VIBRATOR, CERAMIC (4MHz)	
*****			
*	1-637-521-11	H. P. AMP BOARD	
		*****	
		< CAPACITOR >	
C158	1-124-767-00	ELECT	2.2uF 20% 50V
C258	1-124-767-00	ELECT	2.2uF 20% 50V
C518	1-124-122-11	ELECT	100uF 20% 50V
C519	1-124-122-11	ELECT	100uF 20% 50V
		< IC >	
IC507	8-759-981-96	IC	RC4560D
		< JACK >	
J503	1-507-796-71	JACK (PHONES)	
		< RESISTOR >	
R181	1-247-725-11	CARBON	10K 5% 1/4W
R182	1-249-461-11	CARBON	18K 5% 1/4W
R183	1-249-603-11	CARBON	130K 5% 1/4W
R184	1-247-704-11	CARBON	220 5% 1/4W
R281	1-247-725-11	CARBON	10K 5% 1/4W
R282	1-249-461-11	CARBON	18K 5% 1/4W
R283	1-249-603-11	CARBON	130K 5% 1/4W
R284	1-247-704-11	CARBON	220 5% 1/4W
R581	1-247-700-11	CARBON	100 5% 1/4W
R582	1-247-700-11	CARBON	100 5% 1/4W
*****			
*	1-632-740-11	MD BOARD	
		*****	
	3-356-631-01	HOLDER (SENSOR)	
		< CONNECTOR >	
CN1001	1-506-615-11	PIN, CONNECTOR 9P	
CN1002	1-564-501-11	PIN, CONNECTOR 8P	

# MD METER

Ref.No.	Part No.	Description	Remark		
< IC >					
IC1001	8-749-920-97	IC PHOTO GP2S22B			
IC1002	8-749-920-97	IC PHOTO GP2S22B			
< RESISTOR >					
R1001	1-249-408-11	CARBON	180	5%	1/4W
R1002	1-249-408-11	CARBON	180	5%	1/4W
< SWITCH >					
S1001	1-466-238-11	ENCODER, ROTARY			
S1002	1-570-953-11	SWITCH, PUSH (1 KEY) (DOOR)			
S1003	1-571-958-11	SWITCH, PUSH (1 KEY) (CLOSE)			
S1004	1-572-126-11	SWITCH, PUSH (1 KEY) (OPEN)			
S1005	1-572-125-11	SWITCH, LEAF (FWD)			
S1006	1-572-202-11	SWITCH, LEAF (HALF)			
S1007	1-572-125-11	SWITCH, LEAF (METAL)			
S1008	1-572-125-11	SWITCH, LEAF (70u)			
< TERMINAL >					
* TB1001	1-694-018-11	TERMINAL (5P)			
*****					
* A-2006-652-A	METER BOARD, COMPLETE				
*****					
< CAPACITOR >					
C601	1-131-368-00	TANTALUM	3.3uF	10%	16V
C603	1-164-159-11	CERAMIC	0.1uF		50V
C604	1-164-159-11	CERAMIC	0.1uF		50V
C606	1-164-159-11	CERAMIC	0.1uF		50V
C607	1-164-159-11	CERAMIC	0.1uF		50V
< COMPOSITION CIRCUIT BLOCK >					
CP601	1-232-881-11	COMPOSITION CIRCUIT BLOCK			
CP602	1-236-985-11	COMPOSITION CIRCUIT BLOCK			
< DIODE >					
D601	8-719-987-63	DIODE 1N4148M			
D602	8-719-987-63	DIODE 1N4148M			
D603	8-719-987-63	DIODE 1N4148M			
D604	8-719-987-63	DIODE 1N4148M			
D605	8-719-987-63	DIODE 1N4148M			
D606	8-719-987-63	DIODE 1N4148M			
D607	8-719-987-63	DIODE 1N4148M			
D608	8-719-987-63	DIODE 1N4148M			
D609	8-719-987-63	DIODE 1N4148M			
D610	8-719-987-63	DIODE 1N4148M			
D611	8-719-987-63	DIODE 1N4148M			

Ref.No.	Part No.	Description	Remark		
D612	8-719-987-63	DIODE 1N4148M			
D613	8-719-987-63	DIODE 1N4148M			
D614	8-719-987-63	DIODE 1N4148M			
D615	8-719-987-63	DIODE 1N4148M			
D616	8-719-987-63	DIODE 1N4148M			
D617	8-719-987-63	DIODE 1N4148M			
D618	8-719-987-63	DIODE 1N4148M			
D619	8-719-987-63	DIODE 1N4148M			
D620	8-719-987-63	DIODE 1N4148M			
< FLUORESCENT INDICATOR >					
FLT601	1-519-629-11	INDICATOR TUBE, FLUORESCENT			
< IC >					
IC601	8-759-635-68	IC M50940-313SP			
IC602	8-759-240-69	IC TC4069UBP			
< TRANSISTOR >					
Q601	8-729-900-61	TRANSISTOR DTA114ES			
Q602	8-729-900-61	TRANSISTOR DTA114ES			
Q603	8-729-900-65	TRANSISTOR DTA144ES			
Q604	8-729-900-65	TRANSISTOR DTA144ES			
Q605	8-729-900-65	TRANSISTOR DTA144ES			
Q606	8-729-900-65	TRANSISTOR DTA144ES			
Q607	8-729-900-65	TRANSISTOR DTA144ES			
Q608	8-729-900-65	TRANSISTOR DTA144ES			
Q609	8-729-900-89	TRANSISTOR DTC144ES			
Q610	8-729-900-65	TRANSISTOR DTA144ES			
Q611	8-729-900-65	TRANSISTOR DTA144ES			
< RESISTOR >					
R601	1-249-441-11	CARBON	100K	5%	1/4W
R602	1-249-441-11	CARBON	100K	5%	1/4W
R603	1-249-425-11	CARBON	4.7K	5%	1/4W
R604	1-247-903-00	CARBON	1M	5%	1/4W
R605	1-247-895-00	CARBON	470K	5%	1/4W
R606	1-249-433-11	CARBON	22K	5%	1/4W
R607	1-249-433-11	CARBON	22K	5%	1/4W
R608	1-249-437-11	CARBON	47K	5%	1/4W
R609	1-249-437-11	CARBON	47K	5%	1/4W
R610	1-249-437-11	CARBON	47K	5%	1/4W
R611	1-249-437-11	CARBON	47K	5%	1/4W
R612	1-249-437-11	CARBON	47K	5%	1/4W
R613	1-249-437-11	CARBON	47K	5%	1/4W
R614	1-249-421-11	CARBON	2.2K	5%	1/4W
R615	1-249-421-11	CARBON	2.2K	5%	1/4W
R616	1-249-429-11	CARBON	10K	5%	1/4W
R617	1-249-437-11	CARBON	47K	5%	1/4W

METER

MONITOR SW

PB

Ref.No.	Part No.	Description	Remark		
R618	1-247-842-11	CARBON	3K	5%	1/4W
R619	1-249-426-11	CARBON	5.6K	5%	1/4W
R620	1-249-437-11	CARBON	47K	5%	1/4W
R621	1-249-421-11	CARBON	2.2K	5%	1/4W
R622	1-249-421-11	CARBON	2.2K	5%	1/4W
< VARIABLE RESISTOR >					
RV601	1-241-335-11	RES, VAR , CARBON 5K (BIAS)			
< SWITCH >					
S601	1-572-339-11	SWITCH, PUSH (1 KEY) (HX PRO)			
S602	1-572-339-11	SWITCH, PUSH (1 KEY) (CALIBRATION)			
S603	1-554-833-11	SWITCH, PUSH (1 KEY) (INPUT)			
S604	1-572-588-11	SWITCH, ROTARY (DOLBY NR)			
< VIBRATOR >					
X601	1-577-358-21	VIBRATOR, CERAMIC (4MHZ)			
*****					
*	1-637-523-11	MONITOR SW BOARD			
*****					
< SWITCH >					
S605	1-572-590-11	SWITCH, ROTARY (MONITOR)			
*****					
*	A-2006-641-A	PB BOARD, COMPLETE			
*****					
*	3-346-266-21	PLATE, GROUND			
< CAPACITOR >					
C101	1-136-252-00	FILM	0.0015uF	5%	100V
C102	1-107-169-00	MICA	100PF	5%	500V
C103	1-130-893-00	FILM	0.027uF	3%	100V
C104	1-124-130-00	ELECT	100uF	20%	63V
C105	1-124-929-11	ELECT	22uF	20%	100V
C106	1-124-929-11	ELECT	22uF	20%	100V
C107	1-136-169-00	FILM	0.22uF	5%	50V
C108	1-136-230-00	FILM	0.0022uF	5%	100V
C109	1-136-230-00	FILM	0.0022uF	5%	100V
C110	1-136-230-00	FILM	0.0022uF	5%	100V
C111	1-136-230-00	FILM	0.0022uF	5%	100V
C112	1-136-230-00	FILM	0.0022uF	5%	100V
C113	1-130-475-00	MYLAR	0.0022uF	5%	50V
C114	1-130-475-00	MYLAR	0.0022uF	5%	50V
C115	1-130-478-00	MYLAR	0.0039uF	5%	50V
C116	1-136-173-00	FILM	0.47uF	5%	50V
C117	1-136-167-00	FILM	0.15uF	5%	50V

Ref.No.	Part No.	Description	Remark		
C118	1-136-155-00	FILM	0.015uF	5%	50V
C119	1-123-380-00	ELECT	1uF	20%	50V
C120	1-136-169-00	FILM	0.22uF	5%	50V
C121	1-136-163-00	FILM	0.068uF	5%	50V
C122	1-136-162-00	FILM	0.056uF	5%	50V
C123	1-123-380-00	ELECT	1uF	20%	50V
C124	1-130-480-00	MYLAR	0.0056uF	5%	50V
C125	1-136-153-00	FILM	0.01uF	5%	50V
C126	1-124-929-11	ELECT	22uF	20%	100V
C127	1-124-929-11	ELECT	22uF	20%	100V
C175	1-123-369-00	ELECT	4.7uF	20%	63V
C176	1-123-369-00	ELECT	4.7uF	20%	63V
C201	1-136-252-00	FILM	0.0015uF	5%	100V
C202	1-107-169-00	MICA	100PF	5%	500V
C203	1-130-893-00	FILM	0.027uF	3%	100V
C204	1-124-130-00	ELECT	100uF	20%	63V
C205	1-124-929-11	ELECT	22uF	20%	100V
C206	1-124-929-11	ELECT	22uF	20%	100V
C207	1-136-169-00	FILM	0.22uF	5%	50V
C208	1-136-230-00	FILM	0.0022uF	5%	100V
C209	1-136-230-00	FILM	0.0022uF	5%	100V
C210	1-136-230-00	FILM	0.0022uF	5%	100V
C211	1-136-230-00	FILM	0.0022uF	5%	100V
C212	1-136-230-00	FILM	0.0022uF	5%	100V
C213	1-130-475-00	MYLAR	0.0022uF	5%	50V
C214	1-130-475-00	MYLAR	0.0022uF	5%	50V
C215	1-130-478-00	MYLAR	0.0039uF	5%	50V
C216	1-136-173-00	FILM	0.47uF	5%	50V
C217	1-136-167-00	FILM	0.15uF	5%	50V
C218	1-136-155-00	FILM	0.015uF	5%	50V
C219	1-123-380-00	ELECT	1uF	20%	50V
C220	1-136-169-00	FILM	0.22uF	5%	50V
C221	1-136-163-00	FILM	0.068uF	5%	50V
C222	1-136-162-00	FILM	0.056uF	5%	50V
C223	1-123-380-00	ELECT	1uF	20%	50V
C224	1-130-480-00	MYLAR	0.0056uF	5%	50V
C225	1-136-153-00	FILM	0.01uF	5%	50V
C226	1-124-929-11	ELECT	22uF	20%	100V
C227	1-124-929-11	ELECT	22uF	20%	100V
C275	1-123-369-00	ELECT	4.7uF	20%	63V
C276	1-123-369-00	ELECT	4.7uF	20%	63V
C501	1-124-927-11	ELECT	4.7uF	20%	100V
C502	1-136-165-00	FILM	0.1uF	5%	50V
C503	1-162-284-31	CERAMIC	150PF	10%	50V
C504	1-130-478-00	MYLAR	0.0039uF	5%	50V
C505	1-124-902-00	ELECT	0.47uF	20%	50V
C506	1-124-927-11	ELECT	4.7uF	20%	100V
C507	1-124-922-11	ELECT	1000uF	20%	63V
C508	1-107-159-00	MICA	33PF	5%	500V

PB

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
C509	1-126-066-11	ELECT	470uF 20% 63V	Q501	8-729-900-61	TRANSISTOR	DTA114ES
C510	1-124-122-11	ELECT	100uF 20% 50V	Q502	8-729-900-89	TRANSISTOR	DTC144ES
C511	1-124-922-11	ELECT	1000uF 20% 63V	Q503	8-729-900-74	TRANSISTOR	DTC143TS
C512	1-107-159-00	MICA	33PF 5% 500V	Q504	8-729-620-05	TRANSISTOR	2SC2603-EF
C513	1-126-066-11	ELECT	470uF 20% 63V	Q505	8-729-900-74	TRANSISTOR	DTC143TS
C514	1-124-122-11	ELECT	100uF 20% 50V	Q506	8-729-900-89	TRANSISTOR	DTC144ES
< CONNECTOR >				Q507	8-729-119-76	TRANSISTOR	2SA1175-HFE
CNE501	1-564-507-11	PLUG, CONNECTOR	4P	Q508	8-729-900-89	TRANSISTOR	DTC144ES
* CNN501	1-560-062-00	PIN, CONNECTOR	4P	Q509	8-729-107-53	TRANSISTOR	2SC2275A
* CNN502	1-560-062-00	PIN, CONNECTOR	4P	Q510	8-729-375-61	TRANSISTOR	2SD756
* CNN503	1-560-062-00	PIN, CONNECTOR	4P	Q511	8-729-375-61	TRANSISTOR	2SD756
* CNN504	1-560-065-00	PIN, CONNECTOR	8P	Q512	8-729-201-56	TRANSISTOR	2SK246-GR2
CNS501	1-564-104-00	PIN, CONNECTOR	3P	Q513	8-729-141-10	TRANSISTOR	2SA985A
CNS502	1-564-104-00	PIN, CONNECTOR	3P	Q514	8-729-364-62	TRANSISTOR	2SB646C
< DIODE >				Q515	8-729-364-62	TRANSISTOR	2SB646C
D501	8-719-987-63	DIODE	1N4148M	Q516	8-729-201-56	TRANSISTOR	2SK246-GR2
D502	8-719-987-63	DIODE	1N4148M	Q537	8-729-364-62	TRANSISTOR	2SB646C
D503	8-719-114-29	DIODE	RD5.1JS-B1	Q538	8-729-375-61	TRANSISTOR	2SD756
D509	8-719-910-65	DIODE	HZ6B2L	< RESISTOR >			
D510	8-719-910-65	DIODE	HZ6B2L	R101	1-249-844-11	CARBON	56K 5% 1/2W
D519	8-719-987-63	DIODE	1N4148M	R102	1-247-128-00	CARBON	750 5% 1/4W
D520	8-719-987-63	DIODE	1N4148M	R103	1-247-128-00	CARBON	750 5% 1/4W
D521	8-719-987-63	DIODE	1N4148M	R104	1-249-504-11	CARBON	10 5% 1/4W
< IC >				R105	1-247-708-11	CARBON	470 5% 1/4W
IC101	8-759-900-72	IC	NE5532P	R106	1-249-518-11	CARBON	39 5% 1/4W
IC102	8-759-900-72	IC	NE5532P	R107	1-247-721-11	CARBON	4.7K 5% 1/4W
IC201	8-759-900-72	IC	NE5532P	R108	1-247-704-11	CARBON	220 5% 1/4W
IC202	8-759-900-72	IC	NE5532P	R109	1-249-723-11	CARBON	120K 5% 1/2W
IC501	8-759-900-72	IC	NE5532P	R110	1-247-255-00	CARBON	4.3K 5% 1/2W
IC502	8-752-018-80	IC	CX20188	R111	1-249-462-11	CARBON	22K 5% 1/4W
IC503	8-759-945-58	IC	RC4558P	R112	1-247-740-11	CARBON	120 5% 1/2W
< TRANSISTOR >				R113	1-249-658-11	CARBON	240 5% 1/2W
Q101	8-729-217-03	TRANSISTOR	2SK170	R114	1-214-851-00	METAL	300 1% 1/2W
Q102	8-729-217-03	TRANSISTOR	2SK170	R115	1-247-764-11	CARBON	10K 5% 1/2W
Q103	8-729-375-61	TRANSISTOR	2SD756	R116	1-249-429-11	CARBON	10K 5% 1/4W
Q104	8-729-201-56	TRANSISTOR	2SK246-GR2	R117	1-247-720-11	CARBON	3.9K 5% 1/4W
Q105	8-729-194-57	TRANSISTOR	2SC945-P	R118	1-247-718-11	CARBON	2.7K 5% 1/4W
Q106	8-729-141-30	TRANSISTOR	2SC3623A-LK	R119	1-247-718-11	CARBON	2.7K 5% 1/4W
Q201	8-729-217-03	TRANSISTOR	2SK170	R120	1-247-721-11	CARBON	4.7K 5% 1/4W
Q202	8-729-217-03	TRANSISTOR	2SK170	R121	1-247-146-00	CARBON	4.3K 5% 1/4W
Q203	8-729-375-61	TRANSISTOR	2SD756	R122	1-247-718-11	CARBON	2.7K 5% 1/4W
Q204	8-729-201-56	TRANSISTOR	2SK246-GR2	R123	1-247-718-11	CARBON	2.7K 5% 1/4W
Q205	8-729-194-57	TRANSISTOR	2SC945-P	R124	1-247-719-11	CARBON	3.3K 5% 1/4W
Q206	8-729-141-30	TRANSISTOR	2SC3623A-LK	R125	1-249-926-11	CARBON	1.3K 5% 1/4W
				R126	1-247-891-00	CARBON	330K 5% 1/4W
				R127	1-247-749-11	CARBON	560 5% 1/2W
				R128	1-247-764-11	CARBON	10K 5% 1/2W
				R129	1-247-142-00	CARBON	3K 5% 1/4W

**PB**

**PIN JACK**

Ref. No.	Part No.	Description	Remark
R130	1-249-565-11	CARBON	3.6K 5% 1/4W
R131	1-247-710-11	CARBON	560 5% 1/4W
R132	1-246-545-00	CARBON	1M 5% 1/4W
R133	1-249-462-11	CARBON	22K 5% 1/4W
R134	1-247-152-00	CARBON	7.5K 5% 1/4W
R135	1-247-711-11	CARBON	680 5% 1/4W
R136	1-247-154-00	CARBON	9.1K 5% 1/4W
R137	1-249-465-11	CARBON	47K 5% 1/4W
R196	1-215-472-00	METAL	130K 1% 1/6W
R201	1-249-844-11	CARBON	56K 5% 1/2W
R202	1-247-128-00	CARBON	750 5% 1/4W
R203	1-247-128-00	CARBON	750 5% 1/4W
R204	1-249-504-11	CARBON	10 5% 1/4W
R205	1-247-708-11	CARBON	470 5% 1/4W
R206	1-249-518-11	CARBON	39 5% 1/4W
R207	1-247-721-11	CARBON	4.7K 5% 1/4W
R208	1-247-704-11	CARBON	220 5% 1/4W
R209	1-249-723-11	CARBON	120K 5% 1/2W
R210	1-247-255-00	CARBON	4.3K 5% 1/2W
R211	1-249-462-11	CARBON	22K 5% 1/4W
R212	1-247-740-11	CARBON	120 5% 1/2W
R213	1-249-658-11	CARBON	240 5% 1/2W
R214	1-214-851-00	METAL	300 1% 1/2W
R215	1-247-764-11	CARBON	10K 5% 1/2W
R216	1-249-429-11	CARBON	10K 5% 1/4W
R217	1-247-720-11	CARBON	3.9K 5% 1/4W
R218	1-247-718-11	CARBON	2.7K 5% 1/4W
R219	1-247-718-11	CARBON	2.7K 5% 1/4W
R220	1-247-721-11	CARBON	4.7K 5% 1/4W
R221	1-247-146-00	CARBON	4.3K 5% 1/4W
R222	1-247-718-11	CARBON	2.7K 5% 1/4W
R223	1-247-718-11	CARBON	2.7K 5% 1/4W
R224	1-247-719-11	CARBON	3.3K 5% 1/4W
R225	1-249-926-11	CARBON	1.3K 5% 1/4W
R226	1-247-891-00	CARBON	330K 5% 1/4W
R227	1-247-749-11	CARBON	560 5% 1/2W
R228	1-247-764-11	CARBON	10K 5% 1/2W
R229	1-247-142-00	CARBON	3K 5% 1/4W
R230	1-249-565-11	CARBON	3.6K 5% 1/4W
R231	1-247-710-11	CARBON	560 5% 1/4W
R232	1-246-545-00	CARBON	1.0M 5% 1/4W
R233	1-249-462-11	CARBON	22K 5% 1/4W
R234	1-247-152-00	CARBON	7.5K 5% 1/4W
R235	1-247-711-11	CARBON	680 5% 1/4W
R236	1-247-154-00	CARBON	9.1K 5% 1/4W
R237	1-249-465-11	CARBON	47K 5% 1/4W
R501	1-249-434-11	CARBON	27K 5% 1/4W
R502	1-249-429-11	CARBON	10K 5% 1/4W
R503	1-249-425-11	CARBON	4.7K 5% 1/4W

Ref. No.	Part No.	Description	Remark
R504	1-249-433-11	CARBON	22K 5% 1/4W
R506	1-249-429-11	CARBON	10K 5% 1/4W
R507	1-249-417-11	CARBON	1K 5% 1/4W
R508	1-249-435-11	CARBON	33K 5% 1/4W
R509	1-249-429-11	CARBON	10K 5% 1/4W
R510	1-249-425-11	CARBON	4.7K 5% 1/4W
R511	1-249-417-11	CARBON	1K 5% 1/4W
R512	1-249-434-11	CARBON	27K 5% 1/4W
R513	1-249-429-11	CARBON	10K 5% 1/4W
R514	1-249-441-11	CARBON	100K 5% 1/4W
R515	1-249-417-11	CARBON	1K 5% 1/4W
R516	1-249-433-11	CARBON	22K 5% 1/4W
R517	1-249-431-11	CARBON	15K 5% 1/4W
R521	1-247-749-11	CARBON	560 5% 1/2W
R522	1-249-673-11	CARBON	1K 5% 1/2W
R523	1-247-719-11	CARBON	3.3K 5% 1/4W
R524	1-249-547-11	CARBON	620 5% 1/4W
R525	1-249-466-11	CARBON	56K 5% 1/4W
R526	1-249-673-11	CARBON	1K 5% 1/2W
R527	1-247-749-11	CARBON	560 5% 1/2W
R528	1-247-719-11	CARBON	3.3K 5% 1/4W
R529	1-249-547-11	CARBON	620 5% 1/4W
R530	1-249-466-11	CARBON	56K 5% 1/4W
R570	1-249-433-11	CARBON	22K 5% 1/4W
R571	1-249-429-11	CARBON	10K 5% 1/4W
R574	1-249-429-11	CARBON	10K 5% 1/4W
R577	1-247-714-11	CARBON	1.2K 5% 1/4W
R578	1-247-704-11	CARBON	220 5% 1/4W
R579	1-247-714-11	CARBON	1.2K 5% 1/4W
R580	1-247-704-11	CARBON	220 5% 1/4W
R518	1-249-429-11	CARBON	10K 5% 1/4W
R519	1-249-433-11	CARBON	22K 5% 1/4W
< VARIABLE RESISTOR >			
RV101	1-224-550-21	RES, ADJ, METAL GLAZE 220	
RV201	1-224-550-21	RES, ADJ, METAL GLAZE 220	
*****			
*	1-637-522-11	PIN JACK BOARD	*****
< CONNECTOR >			
*	CNE502	1-564-511-11 PLUG, CONNECTOR 8P	
*	CNE503	1-564-509-11 PLUG, CONNECTOR 6P	
*	CNE504	1-564-507-11 PLUG, CONNECTOR 4P	
*	CNE505	1-564-506-11 PLUG, CONNECTOR 3P	
< DIODE >			
D524	8-719-987-63	DIODE 1N4148M	

**PIN JACK**

**REC**

Ref.No.	Part No.	Description	Remark		
< JACK >					
* J501	1-569-186-11	JACK, PIN 4P (CD DIRECT IN/LINE IN)			
* J502	1-568-250-21	JACK, PIN 2P (LINE OUT)			
< RESISTOR >					
R190	1-247-749-11	CARBON	560	5%	1/2W
R191	1-246-545-00	CARBON	1M	5%	1/4W
R192	1-246-545-00	CARBON	1M	5%	1/4W
R193	1-249-490-11	CARBON	27K	5%	1/2W
R290	1-247-749-11	CARBON	560	5%	1/2W
R291	1-246-545-00	CARBON	1.0M	5%	1/4W
R292	1-246-545-00	CARBON	1.0M	5%	1/4W
R293	1-249-490-11	CARBON	27K	5%	1/2W
R323	1-259-436-11	CARBON	2.2K	5%	1/6W
R423	1-259-436-11	CARBON	2.2K	5%	1/6W
< RELAY >					
RY503	1-515-803-11	RELAY			
*****					
*	A-2006-640-A	REC BOARD, COMPLETE			
*****					
< CAPACITOR >					
C128	1-123-369-00	ELECT	4.7uF	20%	63V
C129	1-123-369-00	ELECT	4.7uF	20%	63V
C130	1-124-767-00	ELECT	2.2uF	20%	50V
C131	1-107-159-00	MICA	33PF	5%	500V
C132	1-107-159-00	MICA	33PF	5%	500V
C133	1-130-475-00	MYLAR	0.0022uF	5%	50V
C134	1-130-475-00	MYLAR	0.0022uF	5%	50V
C135	1-130-478-00	MYLAR	0.0039uF	5%	50V
C136	1-136-173-00	FILM	0.47uF	5%	50V
C137	1-136-167-00	FILM	0.15uF	5%	50V
C138	1-136-155-00	FILM	0.015uF	5%	50V
C139	1-123-380-00	ELECT	1uF	20%	50V
C140	1-136-169-00	FILM	0.22uF	5%	50V
C141	1-136-163-00	FILM	0.068uF	5%	50V
C142	1-136-162-00	FILM	0.056uF	5%	50V
C143	1-123-380-00	ELECT	1uF	20%	50V
C144	1-130-480-00	MYLAR	0.0056uF	5%	50V
C145	1-136-153-00	FILM	0.01uF	5%	50V
C146	1-124-929-11	ELECT	22uF	20%	100V
C147	1-124-929-11	ELECT	22uF	20%	100V
C150	1-136-252-00	FILM	0.0015uF	5%	100V
C151	1-124-915-11	ELECT	10uF	20%	63V
C152	1-136-163-00	FILM	0.068uF	5%	50V
C153	1-130-485-00	MYLAR	0.015uF	5%	50V
C154	1-136-160-00	FILM	0.039uF	5%	50V

Ref.No.	Part No.	Description	Remark		
C155	1-130-485-00	MYLAR	0.015uF	5%	50V
C156	1-136-160-00	FILM	0.039uF	5%	50V
C157	1-130-486-00	MYLAR	0.018uF	10%	50V
C159	1-124-929-11	ELECT	22uF	20%	100V
C160	1-136-252-00	FILM	0.0015uF	5%	100V
C161	1-107-157-00	MICA	27PF	5%	500V
C162	1-107-159-00	MICA	33PF	5%	500V
C163	1-107-169-00	MICA	100PF	5%	500V
C164	1-109-627-00	MICA	150PF	2%	500V
C165	1-109-621-00	MICA	220PF	1%	500V
C166	1-136-153-00	FILM	0.01uF	5%	50V
C167	1-136-163-00	FILM	0.068uF	5%	50V
C168	1-136-157-00	FILM	0.022uF	5%	50V
C170	1-124-925-11	ELECT	2.2uF	20%	100V
C171	1-123-382-00	ELECT	3.3uF	20%	100V
C173	1-124-925-11	ELECT	2.2uF	20%	100V
C174	1-136-165-00	FILM	0.1uF	5%	50V
C228	1-123-369-00	ELECT	4.7uF	20%	63V
C229	1-123-369-00	ELECT	4.7uF	20%	63V
C230	1-124-767-00	ELECT	2.2uF	20%	50V
C231	1-107-159-00	MICA	33PF	5%	500V
C232	1-107-159-00	MICA	33PF	5%	500V
C233	1-130-475-00	MYLAR	0.0022uF	5%	50V
C234	1-130-475-00	MYLAR	0.0022uF	5%	50V
C235	1-130-478-00	MYLAR	0.0039uF	5%	50V
C236	1-136-173-00	FILM	0.47uF	5%	50V
C237	1-136-167-00	FILM	0.15uF	5%	50V
C238	1-136-155-00	FILM	0.015uF	5%	50V
C239	1-123-380-00	ELECT	1uF	20%	50V
C240	1-136-169-00	FILM	0.22uF	5%	50V
C241	1-136-163-00	FILM	0.068uF	5%	50V
C242	1-136-162-00	FILM	0.056uF	5%	50V
C243	1-123-380-00	ELECT	1uF	20%	50V
C244	1-130-480-00	MYLAR	0.0056uF	5%	50V
C245	1-136-153-00	FILM	0.01uF	5%	50V
C246	1-124-929-11	ELECT	22uF	20%	100V
C247	1-124-929-11	ELECT	22uF	20%	100V
C250	1-136-252-00	FILM	0.0015uF	5%	100V
C251	1-124-915-11	ELECT	10uF	20%	63V
C252	1-136-163-00	FILM	0.068uF	5%	50V
C253	1-130-485-00	MYLAR	0.015uF	5%	50V
C254	1-136-160-00	FILM	0.039uF	5%	50V
C255	1-130-485-00	MYLAR	0.015uF	5%	50V
C256	1-136-160-00	FILM	0.039uF	5%	50V
C257	1-130-486-00	MYLAR	0.018uF	10%	50V
C259	1-124-929-11	ELECT	22uF	20%	100V
C260	1-136-252-00	FILM	0.0015uF	5%	100V
C261	1-107-157-00	MICA	27PF	5%	500V
C262	1-107-159-00	MICA	33PF	5%	500V

REC

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
C263	1-107-169-00	MICA	100PF 5% 500V			< COMPOSITION CIRCUIT BLOCK >	
C264	1-109-627-00	MICA	150PF 2% 500V				
C265	1-109-621-00	MICA	220PF 1% 500V				
C266	1-136-153-00	FILM	0.01uF 5% 50V	CP501	1-466-252-11	OSCILLATION UNIT, BIAS	
C267	1-136-163-00	FILM	0.068uF 5% 50V			< DIODE >	
C268	1-136-157-00	FILM	0.022uF 5% 50V	D101	8-719-000-60	DIODE UZL-6M2	
C270	1-124-925-11	ELECT	2.2uF 20% 100V	D102	8-719-987-63	DIODE 1N4148M	
C271	1-123-382-00	ELECT	3.3uF 20% 100V	D103	8-719-987-63	DIODE 1N4148M	
C272	1-161-375-00	CERAMIC	0.0022uF 20% 50V	D201	8-719-000-60	DIODE UZL-6M2	
C273	1-124-925-11	ELECT	2.2uF 20% 100V	D202	8-719-987-63	DIODE 1N4148M	
C515	1-124-907-11	ELECT	10uF 20% 50V	D203	8-719-987-63	DIODE 1N4148M	
C516	1-123-369-00	ELECT	4.7uF 20% 63V	D511	8-719-114-29	DIODE RD5.1JS-B1	
C517	1-123-369-00	ELECT	4.7uF 20% 63V	D512	8-719-987-63	DIODE 1N4148M	
C520	1-123-369-00	ELECT	4.7uF 20% 63V	D514	8-719-987-63	DIODE 1N4148M	
C521	1-124-477-11	ELECT	47uF 20% 25V	D515	8-719-987-63	DIODE 1N4148M	
C522	1-123-369-00	ELECT	4.7uF 20% 63V	D516	8-719-114-29	DIODE RD5.1JS-B1	
C523	1-124-477-11	ELECT	47uF 20% 25V	D517	8-719-987-63	DIODE 1N4148M	
C524	1-124-903-11	ELECT	1uF 20% 50V	D522	8-719-987-63	DIODE 1N4148M	
C525	1-124-907-11	ELECT	10uF 20% 50V	D523	8-719-933-41	DIODE HZS6C3L	
C528	1-107-026-00	MICA	5.1PF 500V	D525	8-719-987-63	DIODE 1N4148M	
C529	1-124-477-11	ELECT	47uF 20% 25V	D526	8-719-987-63	DIODE 1N4148M	
C530	1-124-925-11	ELECT	2.2uF 20% 100V	D527	8-719-114-29	DIODE RD5.1JS-B1	
C531	1-124-915-11	ELECT	10uF 20% 63V			< IC >	
C532	1-124-477-11	ELECT	47uF 20% 25V	IC504	8-759-602-83	IC M5238P	
C533	1-124-915-11	ELECT	10uF 20% 63V	IC505	8-752-018-80	IC CX20188	
C534	1-124-477-11	ELECT	47uF 20% 25V	IC506	8-759-900-72	IC NE5532P	
C535	1-124-477-11	ELECT	47uF 20% 25V	IC508	8-759-106-56	IC uPC1297CA	
C536	1-124-477-11	ELECT	47uF 20% 25V	IC509	8-759-604-86	IC M5F7807	
C537	1-130-474-00	MYLAR	0.0018uF 5% 50V	IC510	8-759-604-90	IC M5F7907	
C538	1-130-474-00	MYLAR	0.0018uF 5% 50V	IC511	8-759-240-50	IC TC4050BP	
C539	1-136-157-00	FILM	0.022uF 5% 50V	IC512	8-759-602-83	IC M5238P	
C540	1-136-157-00	FILM	0.022uF 5% 50V	IC513	8-759-945-58	IC RC4558P	
C541	1-124-907-11	ELECT	10uF 20% 50V	IC514	8-759-634-51	IC M5218AP	
C542	1-126-233-11	ELECT	22uF 20% 50V	IC515	8-759-945-58	IC RC4558P	
C543	1-162-217-31	CERAMIC	56PF 5% 50V	IC518	8-759-982-26	IC RC78L12A	
C544	1-162-217-31	CERAMIC	56PF 5% 50V	IC519	8-759-982-48	IC NJM79L12A	
C545	1-124-477-11	ELECT	47uF 20% 25V			< COIL >	
C546	1-164-159-11	CERAMIC	0.1uF 50V	L101	1-408-920-00	INDUCTOR 4.7mH	
		< CONNECTOR >		L102	1-408-918-11	INDUCTOR 3.3mH	
* CND501	1-564-340-00	PIN, CONNECTOR 6P		L103	1-408-916-11	INDUCTOR 2.2mH	
* CND502	1-564-341-11	PIN, CONNECTOR 7P		L104	1-408-925-11	INDUCTOR 12mH	
* CNE101	1-564-507-11	PLUG, CONNECTOR 4P		L105	1-408-916-11	INDUCTOR 2.2mH	
* CNE201	1-564-507-11	PLUG, CONNECTOR 4P		L201	1-408-920-00	INDUCTOR 4.7mH	
* CNN505	1-560-062-00	PIN, CONNECTOR 4P		L202	1-408-918-11	INDUCTOR 3.3mH	
* CNN506	1-560-061-00	PIN, CONNECTOR 3P		L203	1-408-916-11	INDUCTOR 2.2mH	
				L204	1-408-925-11	INDUCTOR 12mH	
				L205	1-408-916-11	INDUCTOR 2.2mH	



REC

Ref.No.	Part No.	Description	Remark
L501	1-410-525-11	INDUCTOR 220uH	
L502	1-410-525-11	INDUCTOR 220uH	
L503	1-410-525-11	INDUCTOR 220uH	
< FILTER >			
LPF101	1-236-087-11	FILTER, LOW PASS	
LPF201	1-236-087-11	FILTER, LOW PASS	
< PILOT LAMP >			
PL501	1-518-471-31	LAMP, PILOT	
PL502	1-518-471-31	LAMP, PILOT	
< TRANSISTOR >			
Q107	8-729-142-25	TRANSISTOR 2SD1020-HFE	
Q108	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q109	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q110	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q111	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q112	8-729-900-80	TRANSISTOR DTC114ES	
Q113	8-729-900-80	TRANSISTOR DTC114ES	
Q114	8-729-900-80	TRANSISTOR DTC114ES	
Q116	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q117	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q118	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q207	8-729-142-25	TRANSISTOR 2SD1020-HFE	
Q208	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q209	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q210	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q211	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q212	8-729-900-80	TRANSISTOR DTC114ES	
Q213	8-729-900-80	TRANSISTOR DTC114ES	
Q214	8-729-900-80	TRANSISTOR DTC114ES	
Q216	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q217	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q218	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q517	8-729-900-61	TRANSISTOR DTA114ES	
Q518	8-729-281-53	TRANSISTOR 2SC1815-GR	
Q519	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q520	8-729-900-36	TRANSISTOR DTC124ES	
Q522	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q523	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q524	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q529	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q530	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q533	8-729-900-36	TRANSISTOR DTC124ES	
Q534	8-729-900-74	TRANSISTOR DTC143TS	
Q535	8-729-900-36	TRANSISTOR DTC124ES	
Q536	8-729-900-36	TRANSISTOR DTC124ES	

Ref.No.	Part No.	Description	Remark
Q539	8-729-900-36	TRANSISTOR DTC124ES	
Q540	8-729-620-05	TRANSISTOR 2SC2603-EF	
< RESISTOR >			
R138	1-249-469-11	CARBON 100K 5% 1/4W	
R139	1-247-723-11	CARBON 6.8K 5% 1/4W	
R140	1-247-720-11	CARBON 3.9K 5% 1/4W	
R141	1-247-719-11	CARBON 3.3K 5% 1/4W	
R142	1-247-152-00	CARBON 7.5K 5% 1/4W	
R143	1-249-469-11	CARBON 100K 5% 1/4W	
R144	1-249-799-11	CARBON 750 5% 1/2W	
R145	1-247-764-11	CARBON 10K 5% 1/2W	
R146	1-247-142-00	CARBON 3K 5% 1/4W	
R147	1-249-565-11	CARBON 3.6K 5% 1/4W	
R148	1-247-710-11	CARBON 560 5% 1/4W	
R149	1-246-545-00	CARBON 1M 5% 1/4W	
R150	1-249-462-11	CARBON 22K 5% 1/4W	
R151	1-247-152-00	CARBON 7.5K 5% 1/4W	
R152	1-247-711-11	CARBON 680 5% 1/4W	
R153	1-247-154-00	CARBON 9.1K 5% 1/4W	
R154	1-249-465-11	CARBON 47K 5% 1/4W	
R161	1-247-719-11	CARBON 3.3K 5% 1/4W	
R162	1-247-723-11	CARBON 6.8K 5% 1/4W	
R163	1-249-590-11	CARBON 39K 5% 1/4W	
R164	1-249-425-11	CARBON 4.7K 5% 1/4W	
R165	1-249-429-11	CARBON 10K 5% 1/4W	
R166	1-249-465-11	CARBON 47K 5% 1/4W	
R167	1-247-716-11	CARBON 1.8K 5% 1/4W	
R168	1-249-598-11	CARBON 82K 5% 1/4W	
R169	1-259-467-11	CARBON 43K 5% 1/4W	
R170	1-247-702-11	CARBON 150 5% 1/4W	
R171	1-247-154-00	CARBON 9.1K 5% 1/4W	
R172	1-249-429-11	CARBON 10K 5% 1/4W	
R173	1-247-701-11	CARBON 120 5% 1/4W	
R174	1-247-142-00	CARBON 3K 5% 1/4W	
R175	1-247-721-11	CARBON 4.7K 5% 1/4W	
R176	1-249-429-11	CARBON 10K 5% 1/4W	
R177	1-247-700-11	CARBON 100 5% 1/4W	
R178	1-247-719-11	CARBON 3.3K 5% 1/4W	
R179	1-247-719-11	CARBON 3.3K 5% 1/4W	
R180	1-249-429-11	CARBON 10K 5% 1/4W	
R185	1-247-718-11	CARBON 2.7K 5% 1/4W	
R186	1-247-883-00	CARBON 150K 5% 1/4W	
R187	1-247-714-11	CARBON 1.2K 5% 1/4W	
R188	1-247-714-11	CARBON 1.2K 5% 1/4W	
R189	1-249-425-11	CARBON 4.7K 5% 1/4W	
R194	1-247-883-00	CARBON 150K 5% 1/4W	
R195	1-249-417-11	CARBON 1K 5% 1/4W	
R197	1-249-408-11	CARBON 180 5% 1/4W	

REC

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
R198	1-249-414-11	CARBON	560	5%	1/4W	R299	1-249-417-11	CARBON	1K	5%	1/4W
R199	1-249-417-11	CARBON	1K	5%	1/4W	R301	1-249-428-11	CARBON	8.2K	5%	1/4W
R238	1-249-469-11	CARBON	100K	5%	1/4W	R302	1-249-417-11	CARBON	1K	5%	1/4W
R239	1-247-723-11	CARBON	6.8K	5%	1/4W	R303	1-247-725-11	CARBON	10K	5%	1/4W
R240	1-247-720-11	CARBON	3.9K	5%	1/4W	R304	1-249-429-11	CARBON	10K	5%	1/4W
R241	1-247-719-11	CARBON	3.3K	5%	1/4W	R305	1-249-429-11	CARBON	10K	5%	1/4W
R242	1-247-152-00	CARBON	7.5K	5%	1/4W	R306	1-249-415-11	CARBON	680	5%	1/4W
R243	1-249-469-11	CARBON	100K	5%	1/4W	R307	1-249-437-11	CARBON	47K	5%	1/4W
R244	1-249-799-11	CARBON	750	5%	1/2W	R308	1-215-465-00	METAL	68K	1%	1/6W
R245	1-247-764-11	CARBON	10K	5%	1/2W	R309	1-215-474-00	METAL	160K	1%	1/6W
R246	1-247-142-00	CARBON	3K	5%	1/4W	R310	1-215-448-00	METAL	13K	1%	1/6W
R247	1-249-565-11	CARBON	3.6K	5%	1/4W	R311	1-249-408-11	CARBON	180	5%	1/4W
R248	1-247-710-11	CARBON	560	5%	1/4W	R312	1-247-883-00	CARBON	150K	5%	1/4W
R249	1-246-545-00	CARBON	1.0M	5%	1/4W	R314	1-249-423-11	CARBON	3.3K	5%	1/4W
R250	1-249-462-11	CARBON	22K	5%	1/4W	R316	1-249-425-11	CARBON	4.7K	5%	1/4W
R251	1-247-152-00	CARBON	7.5K	5%	1/4W	R317	1-249-429-11	CARBON	10K	5%	1/4W
R252	1-247-711-11	CARBON	680	5%	1/4W	R318	1-249-616-11	CARBON	470K	5%	1/4W
R253	1-247-154-00	CARBON	9.1K	5%	1/4W	△ R319	1-212-857-00	FUSIBLE	10	5%	1/4W F
R254	1-249-465-11	CARBON	47K	5%	1/4W	R320	1-249-465-11	CARBON	47K	5%	1/4W
R261	1-247-719-11	CARBON	3.3K	5%	1/4W	R401	1-249-428-11	CARBON	8.2K	5%	1/4W
R262	1-247-723-11	CARBON	6.8K	5%	1/4W	R402	1-249-417-11	CARBON	1K	5%	1/4W
R263	1-249-590-11	CARBON	39K	5%	1/4W	R403	1-247-725-11	CARBON	10K	5%	1/4W
R264	1-249-425-11	CARBON	4.7K	5%	1/4W	R404	1-249-429-11	CARBON	10K	5%	1/4W
R265	1-249-429-11	CARBON	10K	5%	1/4W	R405	1-249-429-11	CARBON	10K	5%	1/4W
R266	1-249-465-11	CARBON	47K	5%	1/4W	R406	1-249-415-11	CARBON	680	5%	1/4W
R267	1-247-716-11	CARBON	1.8K	5%	1/4W	R407	1-249-437-11	CARBON	47K	5%	1/4W
R268	1-249-598-11	CARBON	82K	5%	1/4W	R408	1-215-465-00	METAL	68K	1%	1/6W
R269	1-259-467-11	CARBON	43K	5%	1/4W	R409	1-215-474-00	METAL	160K	1%	1/6W
R270	1-247-702-11	CARBON	150	5%	1/4W	R410	1-215-448-00	METAL	13K	1%	1/6W
R271	1-247-154-00	CARBON	9.1K	5%	1/4W	R411	1-249-408-11	CARBON	180	5%	1/4W
R272	1-249-429-11	CARBON	10K	5%	1/4W	R412	1-247-883-00	CARBON	150K	5%	1/4W
R273	1-247-701-11	CARBON	120	5%	1/4W	R414	1-249-423-11	CARBON	3.3K	5%	1/4W
R274	1-247-142-00	CARBON	3K	5%	1/4W	R416	1-249-425-11	CARBON	4.7K	5%	1/4W
R275	1-247-721-11	CARBON	4.7K	5%	1/4W	R417	1-249-429-11	CARBON	10K	5%	1/4W
R276	1-249-429-11	CARBON	10K	5%	1/4W	R418	1-249-616-11	CARBON	470K	5%	1/4W
R277	1-247-700-11	CARBON	100	5%	1/4W	△ R419	1-212-857-00	FUSIBLE	10	5%	1/4W F
R278	1-247-719-11	CARBON	3.3K	5%	1/4W	R420	1-249-465-11	CARBON	47K	5%	1/4W
R279	1-247-719-11	CARBON	3.3K	5%	1/4W	R531	1-249-438-11	CARBON	56K	5%	1/4W
R280	1-249-429-11	CARBON	10K	5%	1/4W	R532	1-249-433-11	CARBON	22K	5%	1/4W
R285	1-247-718-11	CARBON	2.7K	5%	1/4W	R533	1-249-421-11	CARBON	2.2K	5%	1/4W
R286	1-247-883-00	CARBON	150K	5%	1/4W	R537	1-249-417-11	CARBON	1K	5%	1/4W
R287	1-247-714-11	CARBON	1.2K	5%	1/4W	R538	1-249-425-11	CARBON	4.7K	5%	1/4W
R288	1-247-714-11	CARBON	1.2K	5%	1/4W	R539	1-249-437-11	CARBON	47K	5%	1/4W
R289	1-249-425-11	CARBON	4.7K	5%	1/4W	R540	1-249-433-11	CARBON	22K	5%	1/4W
R294	1-247-883-00	CARBON	150K	5%	1/4W	R542	1-249-429-11	CARBON	10K	5%	1/4W
R295	1-249-417-11	CARBON	1K	5%	1/4W	R543	1-249-424-11	CARBON	3.9K	5%	1/4W
R296	1-215-472-00	METAL	130K	1%	1/6W	R544	1-249-418-11	CARBON	1.2K	5%	1/4W
R297	1-249-408-11	CARBON	180	5%	1/4W	R545	1-249-428-11	CARBON	8.2K	5%	1/4W
R298	1-249-414-11	CARBON	560	5%	1/4W	R546	1-249-429-11	CARBON	10K	5%	1/4W

Note : The components identified by mark △ or dotted line with mark △ are critical for safety.  
Replace only with part number specified.

REC

REC EQ SW

Ref.No.	Part No.	Description	Remark
R547	1-249-405-11	CARBON	100 5% 1/4W
R548	1-249-405-11	CARBON	100 5% 1/4W
R549	1-249-405-11	CARBON	100 5% 1/4W
R550	1-249-405-11	CARBON	100 5% 1/4W
R551	1-249-405-11	CARBON	100 5% 1/4W
R552	1-249-405-11	CARBON	100 5% 1/4W
R553	1-249-429-11	CARBON	10K 5% 1/4W
R554	1-249-429-11	CARBON	10K 5% 1/4W
R556	1-249-428-11	CARBON	8.2K 5% 1/4W
R557	1-247-856-00	CARBON	11K 5% 1/4W
R558	1-249-397-11	CARBON	22 5% 1/4W
R559	1-249-407-11	CARBON	150 5% 1/4W
R560	1-247-856-00	CARBON	11K 5% 1/4W
R561	1-249-428-11	CARBON	8.2K 5% 1/4W
R562	1-249-432-11	CARBON	18K 5% 1/4W
R563	1-249-397-11	CARBON	22 5% 1/4W
R564	1-249-407-11	CARBON	150 5% 1/4W
R565	1-249-432-11	CARBON	18K 5% 1/4W
R566	1-247-887-00	CARBON	220K 5% 1/4W
R567	1-247-887-00	CARBON	220K 5% 1/4W
R568	1-249-407-11	CARBON	150 5% 1/4W
R569	1-249-422-11	CARBON	2.7K 5% 1/4W
R572	1-249-429-11	CARBON	10K 5% 1/4W
R573	1-249-439-11	CARBON	68K 5% 1/4W
R575	1-249-429-11	CARBON	10K 5% 1/4W
R576	1-249-429-11	CARBON	10K 5% 1/4W
R583	1-249-417-11	CARBON	1K 5% 1/4W
R584	1-249-437-11	CARBON	47K 5% 1/4W
R587	1-249-437-11	CARBON	47K 5% 1/4W
< VARIABLE RESISTOR >			
RV102	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K
RV103	1-238-011-11	RES, ADJ, CARBON	470
RV104	1-238-597-11	RES, ADJ, CARBON	1K
RV105	1-238-600-11	RES, ADJ, CARBON	10K
RV106	1-238-600-11	RES, ADJ, CARBON	10K
RV107	1-238-600-11	RES, ADJ, CARBON	10K
RV108	1-238-601-11	RES, ADJ, CARBON	22K
RV202	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K
RV203	1-238-011-11	RES, ADJ, CARBON	470
RV204	1-238-597-11	RES, ADJ, CARBON	1K
RV205	1-238-600-11	RES, ADJ, CARBON	10K
RV206	1-238-600-11	RES, ADJ, CARBON	10K
RV207	1-238-600-11	RES, ADJ, CARBON	10K
RV208	1-238-601-11	RES, ADJ, CARBON	22K
RV503	1-241-231-11	RES, ADJ, CARBON	100
RV504	1-241-231-11	RES, ADJ, CARBON	100

Ref.No.	Part No.	Description	Remark
< RELAY >			
RY502	1-515-803-11	RELAY	
RY503	1-515-614-11	RELAY	
< TRANSFORMER >			
T101	1-433-361-11	TRANSFORMER, BIAS OSCILLATION	
T201	1-433-361-11	TRANSFORMER, BIAS OSCILLATION	
< THERMISTOR >			
TH501	1-202-855-00	THERMISTOR, POSITIVE	
< TEST PIN >			
* TP1	1-535-115-00	TERMINAL	
*****			
* 1-637-520-11	REC EQ SW BOARD		
*****			
< CAPACITOR >			
C148	1-106-347-00	MYLAR	1500PF 5% 200V
C149	1-106-343-00	MYLAR	1000PF 5% 200V
C248	1-106-347-00	MYLAR	1500PF 5% 200V
C249	1-106-343-00	MYLAR	1000PF 5% 200V
< RESISTOR >			
R155	1-247-721-11	CARBON	4.7K 5% 1/4W
R156	1-247-152-00	CARBON	8.2K 5% 1/4W
R157	1-247-725-11	CARBON	10K 5% 1/4W
R158	1-247-721-11	CARBON	4.7K 5% 1/4W
R159	1-259-500-11	CARBON	1M 5% 1/6W
R160	1-249-462-11	CARBON	22K 5% 1/4W
R255	1-247-721-11	CARBON	4.7K 5% 1/4W
R256	1-247-152-00	CARBON	8.2K 5% 1/4W
R257	1-247-725-11	CARBON	10K 5% 1/4W
R258	1-247-721-11	CARBON	4.7K 5% 1/4W
R259	1-259-500-11	CARBON	1M 5% 1/6W
R260	1-249-462-11	CARBON	22K 5% 1/4W
R322	1-259-500-11	CARBON	1M 5% 1/6W
R422	1-259-500-11	CARBON	1M 5% 1/6W
< VARIABLE RESISTOR >			
RV502	1-238-840-11	RES, VAR, CARBON	5K/5K (REC LEVEL)
< SWITCH >			
S501	1-572-589-11	SWITCH, ROTARY (REC EQ CAL)	
*****			

**REC VOL**

**RECT**

**REEL MOTOR**

**SYSCON**

Ref. No.	Part No.	Description	Remark
*	1-637-519-11	REC VOL BOARD *****	
		< RESISTOR >	
R321	1-249-824-11	CARBON 8.2K 5%	1/2W
R421	1-249-824-11	CARBON 8.2K 5%	1/2W
		< VARIABLE RESISTOR >	
RV501	1-241-336-11	RES, VAR, CARBON 20K/20K (REC LEVEL)	
*****			
*	1-637-512-11	RECT. BOARD *****	
		< CAPACITOR >	
C702	1-136-165-00	FILM 0.1uF 5%	50V
C703	1-136-177-00	FILM 1uF 5%	50V
C704	1-126-982-11	ELECT 5600uF 20%	35V
C705	1-126-982-11	ELECT 5600uF 20%	35V
C706	1-124-636-00	ELECT 3300uF 20%	25V
C707	1-124-120-11	ELECT 220uF 20%	25V
C708	1-124-479-11	ELECT 330uF 20%	25V
C709	1-124-911-11	ELECT 220uF 20%	50V
C710	1-124-767-00	ELECT 2.2uF 20%	50V
C711	1-162-294-31	CERAMIC 0.001uF 10%	50V
C712	1-162-294-31	CERAMIC 0.001uF 10%	50V
		< CONNECTOR >	
* CN703	1-564-104-00	PIN, CONNECTOR (B3P-VH) 3P	
* CN704	1-564-506-11	PLUG, CONNECTOR 3P	
* CN705	1-564-506-11	PLUG, CONNECTOR 3P	
		< DIODE >	
D701	8-719-230-02	DIODE 30DF2	
D702	8-719-230-02	DIODE 30DF2	
D703	8-719-230-02	DIODE 30DF2	
D704	8-719-230-02	DIODE 30DF2	
D705	8-719-200-77	DIODE 10E2N	
D706	8-719-200-77	DIODE 10E2N	
D707	8-719-200-77	DIODE 10E2N	
D708	8-719-200-77	DIODE 10E2N	
D709	8-719-200-77	DIODE 10E2N	
D710	8-719-200-77	DIODE 10E2N	
D711	8-719-987-63	DIODE 1N4148M	
D712	8-719-987-63	DIODE 1N4148M	
		< IC LINK >	

△ PS701 1-532-685-00 LINK, IC

Ref. No.	Part No.	Description	Remark
△ PS702	1-532-685-00	LINK, IC	
		< TRANSISTOR >	
Q701	8-729-620-05	TRANSISTOR 2SC2603-EF	
		< RESISTOR >	
R701	1-212-861-11	FUSIBLE 15 5%	1/4W F
R702	1-249-436-11	CARBON 39K 5%	1/4W
R703	1-249-439-11	CARBON 68K 5%	1/4W
*****			
*	1-632-741-11	REEL MOTOR BOARD *****	
		< CAPACITOR >	
C1051	1-124-907-11	ELECT 10uF 20%	50V
C1052	1-124-907-11	ELECT 10uF 20%	50V
C1053	1-164-159-11	CERAMIC 0.1uF	50V
		< CONNECTOR >	
* CN1051	1-564-499-11	PIN, CONNECTOR 6P	
* CN1052	1-564-718-11	PIN, CONNECTOR (SMALL TYPE) 2P	
* CN1053	1-564-718-11	PIN, CONNECTOR (SMALL TYPE) 2P	
		< RESISTOR >	
R1051	1-249-412-11	CARBON 390 5%	1/4W
*****			
*	A-2006-650-A	SYSCON BOARD, COMPLETE *****	
		< CAPACITOR >	
C751	1-124-636-00	ELECT 3300uF 20%	25V
C752	1-124-907-11	ELECT 10uF 20%	50V
C753	1-124-122-11	ELECT 100uF 20%	50V
C754	1-124-927-11	ELECT 4.7uF 20%	100V
C755	1-126-101-11	ELECT 100uF 20%	16V
C756	1-124-898-11	ELECT 4700uF 20%	16V
C757	1-124-907-11	ELECT 10uF 20%	50V
C758	1-162-211-31	CERAMIC 33PF 5%	50V
C759	1-124-472-11	ELECT 470uF 20%	10V
C760	1-124-903-11	ELECT 1uF 20%	50V
C761	1-124-471-00	ELECT 1000uF 20%	6.3V
C762	1-124-903-11	ELECT 1uF 20%	50V
C763	1-124-903-11	ELECT 1uF 20%	50V
C764	1-124-443-00	ELECT 100uF 20%	10V
C765	1-124-907-11	ELECT 10uF 20%	50V
C766	1-124-122-11	ELECT 100uF 20%	50V
C767	1-124-443-00	ELECT 100uF 20%	10V

Note : The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

**SYSCON**

Ref. No.	Part No.	Description	Remark
C801	1-164-159-11	CERAMIC 0.1uF	50V
C802	1-164-159-11	CERAMIC 0.1uF	50V
C803	1-124-477-11	ELECT 47uF	20% 25V
C804	1-124-907-11	ELECT 10uF	20% 50V
C805	1-124-443-00	ELECT 100uF	20% 10V
C806	1-162-294-31	CERAMIC 0.001uF	10% 50V
C807	1-162-294-31	CERAMIC 0.001uF	10% 50V

< CONNECTOR >

* CN751	1-564-511-11	PLUG, CONNECTOR 8P
* CN801	1-564-336-00	PIN, CONNECTOR 2P
* CN802	1-564-341-11	PIN, CONNECTOR 7P
* CN803	1-506-503-71	PIN, CONNECTOR 9P
* CN804	1-506-503-11	PIN, CONNECTOR 9P
* CN805	1-564-339-00	PIN, CONNECTOR 5P
* CN806	1-564-666-11	PIN, CONNECTOR 10P
* CN807	1-564-342-61	PIN, CONNECTOR 8P
* CN809	1-506-503-11	PIN, CONNECTOR 9P

< DIODE >

D751	8-719-200-77	DIODE 10E2N
D752	8-719-910-25	DIODE HZ12B2L
D753	8-719-933-39	DIODE HZS6C1L
D754	8-719-933-41	DIODE HZS6C3L
D755	8-719-933-39	DIODE HZS6C1L
D756	8-719-002-33	DIODE UZL-24L
D757	8-719-200-77	DIODE 10E2N
D758	8-719-933-39	DIODE HZS6C1L
D801	8-719-987-63	DIODE 1N4148M
D802	8-719-987-63	DIODE 1N4148M

< IC >

IC801	8-759-635-69	IC M50964-226SP
IC802	8-759-973-95	IC BA6219B
IC803	8-759-822-09	IC LB1641

< TRANSISTOR >

Q751	8-729-141-83	TRANSISTOR 2SB1094-LK
Q752	8-729-141-83	TRANSISTOR 2SB1094-LK
Q753	8-729-209-15	TRANSISTOR 2SD2012
Q754	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q755	8-729-140-04	TRANSISTOR 2SB1116A-L
Q756	8-729-620-05	TRANSISTOR 2SC2603-EF
Q757	8-729-620-05	TRANSISTOR 2SC2603-EF
Q758	8-729-620-05	TRANSISTOR 2SC2603-EF
Q759	8-729-620-05	TRANSISTOR 2SC2603-EF
Q801	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q802	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q803	8-729-620-05	TRANSISTOR 2SC2603-EF

Ref. No.	Part No.	Description	Remark
Q804	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q805	8-729-900-61	TRANSISTOR DTA114ES	
Q806	8-729-900-61	TRANSISTOR DTA114ES	
Q807	8-729-900-61	TRANSISTOR DTA114ES	
Q808	8-729-900-61	TRANSISTOR DTA114ES	
Q809	8-729-900-65	TRANSISTOR DTA144ES	
Q810	8-729-900-65	TRANSISTOR DTA144ES	
Q811	8-729-900-65	TRANSISTOR DTA144ES	
Q812	8-729-900-65	TRANSISTOR DTA144ES	
Q813	8-729-900-65	TRANSISTOR DTA144ES	
Q814	8-729-900-65	TRANSISTOR DTA144ES	
Q815	8-729-900-61	TRANSISTOR DTA114ES	
Q816	8-729-900-61	TRANSISTOR DTA114ES	

< RESISTOR >

R751	1-249-421-11	CARBON 2.2K 5%	1/4W
R752	1-249-425-11	CARBON 4.7K 5%	1/4W
R753	1-249-437-11	CARBON 47K 5%	1/4W
R754	1-249-437-11	CARBON 47K 5%	1/4W
R755	1-249-421-11	CARBON 2.2K 5%	1/4W
R756	1-249-425-11	CARBON 4.7K 5%	1/4W
R757	1-249-437-11	CARBON 47K 5%	1/4W
R758	1-249-422-11	CARBON 2.7K 5%	1/4W
R759	1-249-427-11	CARBON 6.8K 5%	1/4W
R760	1-249-425-11	CARBON 4.7K 5%	1/4W
R761	1-249-437-11	CARBON 47K 5%	1/4W
R762	1-249-421-11	CARBON 2.2K 5%	1/4W
R763	1-249-441-11	CARBON 100K 5%	1/4W
R764	1-249-425-11	CARBON 4.7K 5%	1/4W
R765	1-249-437-11	CARBON 47K 5%	1/4W
R766	1-249-437-11	CARBON 47K 5%	1/4W
R767	1-249-429-11	CARBON 10K 5%	1/4W
R768	1-249-437-11	CARBON 47K 5%	1/4W
R769	1-249-437-11	CARBON 47K 5%	1/4W
R770	1-249-433-11	CARBON 22K 5%	1/4W
R771	1-249-395-11	CARBON 15 5%	1/4W
R772	1-249-395-11	CARBON 15 5%	1/4W
⚠ R773	1-219-136-11	FUSIBLE 0.22 10%	1/4W
⚠ R774	1-219-136-11	FUSIBLE 0.22 10%	1/4W
⚠ R775	1-219-136-11	FUSIBLE 0.22 10%	1/4W
R776	1-249-413-11	CARBON 470 5%	1/4W
⚠ R801	1-249-482-11	CARBON 4.7 5%	1/2W F
R802	1-249-425-11	CARBON 4.7K 5%	1/4W
R803	1-249-425-11	CARBON 4.7K 5%	1/4W
R804	1-249-426-11	CARBON 5.6K 5%	1/4W
R805	1-247-856-00	CARBON 11K 5%	1/4W
R806	1-249-425-11	CARBON 4.7K 5%	1/4W
⚠ R807	1-249-482-11	CARBON 4.7 5%	1/2W F
R808	1-249-425-11	CARBON 4.7K 5%	1/4W

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.  
Replace only with part number specified.

**SYSCON**

**TIMER SW**

**VS**

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R809	1-249-425-11	CARBON	4.7K 5% 1/4W	R858	1-249-405-11	CARBON	100 5% 1/4W
R810	1-249-426-11	CARBON	5.6K 5% 1/4W	R859	1-249-405-11	CARBON	100 5% 1/4W
R811	1-249-429-11	CARBON	10K 5% 1/4W	R860	1-249-405-11	CARBON	100 5% 1/4W
R812	1-249-425-11	CARBON	4.7K 5% 1/4W	R861	1-249-429-11	CARBON	10K 5% 1/4W
R813	1-249-429-11	CARBON	10K 5% 1/4W	R862	1-249-429-11	CARBON	10K 5% 1/4W
R814	1-249-429-11	CARBON	10K 5% 1/4W	R863	1-249-441-11	CARBON	100K 5% 1/4W
R815	1-249-429-11	CARBON	10K 5% 1/4W	R864	1-249-441-11	CARBON	100K 5% 1/4W
R816	1-249-429-11	CARBON	10K 5% 1/4W	R865	1-249-441-11	CARBON	100K 5% 1/4W
R817	1-249-429-11	CARBON	10K 5% 1/4W	R866	1-249-441-11	CARBON	100K 5% 1/4W
R818	1-249-429-11	CARBON	10K 5% 1/4W	R867	1-249-441-11	CARBON	100K 5% 1/4W
R819	1-249-429-11	CARBON	10K 5% 1/4W	R868	1-249-441-11	CARBON	100K 5% 1/4W
R820	1-249-429-11	CARBON	10K 5% 1/4W			< VARIABLE RESISTOR >	
R821	1-249-429-11	CARBON	10K 5% 1/4W	RV801	1-238-598-11	RES, ADJ, CARBON 2.2K	
R822	1-249-429-11	CARBON	10K 5% 1/4W			< TEST PIN >	
R823	1-249-429-11	CARBON	10K 5% 1/4W	* TP801	1-564-337-00	PIN, CONNECTOR 3P (TEST POINT)	
R824	1-249-405-11	CARBON	100 5% 1/4W			< VIBRATOR >	
R825	1-249-405-11	CARBON	100 5% 1/4W	X801	1-577-358-21	VIBRATOR, CERAMIC (4MHz)	
R826	1-249-405-11	CARBON	100 5% 1/4W	*****			
R827	1-249-405-11	CARBON	100 5% 1/4W	* 1-637-518-11	TIMER SW BOARD		
R828	1-249-405-11	CARBON	100 5% 1/4W	*****			
R829	1-249-405-11	CARBON	100 5% 1/4W			< RESISTOR >	
R830	1-249-405-11	CARBON	100 5% 1/4W	R895	1-249-424-11	CARBON	3.9K 5% 1/4W
R831	1-249-405-11	CARBON	100 5% 1/4W			< SWITCH >	
R832	1-249-405-11	CARBON	100 5% 1/4W	S894	1-570-903-11	SWITCH, SLIDE (TIMER)	
R833	1-249-405-11	CARBON	100 5% 1/4W	*****			
R834	1-249-405-11	CARBON	100 5% 1/4W	* 1-637-513-11	VS. BOARD (K333ESA)		
R835	1-249-425-11	CARBON	4.7K 5% 1/4W	*****			
R836	1-249-417-11	CARBON	1K 5% 1/4W			< CONNECTOR >	
R837	1-249-435-11	CARBON	33K 5% 1/4W	* CN707	1-580-618-11	PIN, CONNECTOR 5P (K333ESA)	
R838	1-249-435-11	CARBON	33K 5% 1/4W			< SWITCH >	
R839	1-247-903-00	CARBON	1M 5% 1/4W	△ S702	1-572-009-11	SELECTOR, VOLTAGE (VOLTAGE SELECTOR)	
R840	1-249-429-11	CARBON	10K 5% 1/4W			(K333ESA)	
R841	1-249-405-11	CARBON	100 5% 1/4W	*****			
R842	1-249-405-11	CARBON	100 5% 1/4W			MISCELLANEOUS	
R843	1-249-405-11	CARBON	100 5% 1/4W			*****	
R844	1-249-405-11	CARBON	100 5% 1/4W	* 104	1-533-213-31	HOLDER, FUSE	
R845	1-249-429-11	CARBON	10K 5% 1/4W	△ 112	1-559-297-31	CORD, POWER (K333ESA)	
R846	1-249-429-11	CARBON	10K 5% 1/4W	△ 112	1-574-383-11	CORD, POWER (K990ES)	
R847	1-249-427-11	CARBON	6.8K 5% 1/4W				
R848	1-249-429-11	CARBON	10K 5% 1/4W				
R849	1-249-429-11	CARBON	10K 5% 1/4W				
R850	1-249-429-11	CARBON	10K 5% 1/4W				
R851	1-249-429-11	CARBON	10K 5% 1/4W				
R852	1-249-413-11	CARBON	470 5% 1/4W				
R853	1-249-412-11	CARBON	390 5% 1/4W				
R854	1-249-410-11	CARBON	270 5% 1/4W				
R855	1-249-436-11	CARBON	39K 5% 1/4W				
R856	1-249-436-11	CARBON	39K 5% 1/4W				
R857	1-249-405-11	CARBON	100 5% 1/4W				

Note : The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description	Remark
△	119	1-569-007-11 ADAPTER, CONVERSION 2P (K333ESA)	
*	196	1-608-268-00 PC BOARD, ERASE HEAD	
	257	1-632-779-11 PC BOARD, FG	
△	F701	1-532-286-00 FUSE, TIME-LAG (2.5A)	
△	F702	1-532-286-00 FUSE, TIME-LAG (2.5A)	
	HE501	1-543-836-11 HEAD, MAGNETIC (ERASE)	
	HRP501	1-543-684-21 HEAD, MAGNETIC (REC/PB)	
△	T701	1-450-451-11 TRANSFORMER, POWER (K990ES)	
△	T701	1-450-453-11 TRANSFORMER, POWER (K333ESA)	
	M1001	X-3356-638-1 MOTOR (REEL R) ASSY	
	M1002	X-3356-604-1 MOTOR (ASSIST) ASSY	

Ref.No.	Part No.	Description	Remark
	#11	7-621-772-10 SCREW +B 2X4	
	#12	7-621-772-70 SCREW +B 2X14	
	#13	7-621-775-10 SCREW +B 2.6X6	
	#14	7-622-205-05 NUT M2 TYPE2	
	#15	7-628-253-00 SCREW +PS 2X4	
	#16	7-628-254-10 SCREW +PS 2.6X6	
	#17	7-671-154-01 STENLESS BALL	
	#18	7-682-648-09 SCREW +PS 3X8	
	#19	7-685-133-19 SCREW +BTP 2.6X6 TYPE2 N-S	
	#20	7-621-255-20 SCREW +BVTT 2X4 (S)	
	#21	7-621-255-35 SCREW +BVTT 2X5 (S)	
	#22	7-685-646-79 SCREW +BVTP 3X8 TYPE2 IT-3	

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ACCESSORIES & PACKING MATERIALS

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- 1-465-314-11 REMOTE COMMANDER (RM-J701) (K333ESA)
- 1-558-271-11 CORD, CONNECTION
- 1-558-271-11 CORD, CONNECTION
- 2-181-754-01 COVER, BATTERY (RM-J701) (K333ESA)
- \* 3-350-465-01 CUSHION

- \* 3-376-444-01 INDIVIDUAL CARTON (K990ES)
- \* 3-376-445-01 INDIVIDUAL CARTON (K333ESA)

- 3-754-180-11 MANUAL, INSTRUCTION (K333ESA/K990ES:AEP)  
(ENGLISH, FRENCH, SPANISH, PORTUGUESE)
- 3-754-180-41 MANUAL, INSTRUCTION (K990ES)  
(GERMAN, DUTCH, SWEDISH, ITALIAN)

- 3-793-481-13 INSTRUCTION
- 4-847-802-00 SCREW

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HARDWARE LIST

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- #1 7-682-547-04 SCREW +BVTT 3X6 (S)
- #2 7-682-562-09 SCREW +BVTT 4X10 (S)
- #3 7-682-548-04 SCREW, TIGHT, S
- #4 7-685-870-01 SCREW +BVTT 3X5 (S)
- #5 7-682-547-09 SCREW +BV 3X6, S TIGHT
- #6 7-685-645-79 SCREW +BVTP 3X6 TYPE2 SLIT
- #7 7-682-549-04 SCREW +BVTT 3X10 (S)
- #8 7-682-147-15 SCREW, TR
- #9 7-685-647-79 SCREW +BVTP 3X10 TYPE2 N-S
- #10 7-682-560-04 SCREW +BVTT 4X6 (S)

Note : The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.