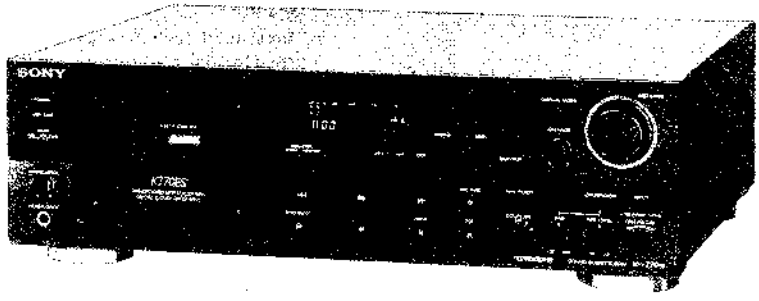
TC-K770ES

SERVICE MANUAL

AEP Model



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.

Model Name Using Similar Mecanism	TC-K970ES
Tape Transport Mechanism Type	TCM-200D6

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 (Permalloy head)
Playback head × 1 (Permalloy head)
Motors — Capstan motor × 1 (direct drive linear torque BSL motor)
Reel motor × 1 (DC motor)
DC motor × 1

Signal-to-noise ratio (at peak level)

Dolby NR switch / Cassette	OFF	B-Type ON	C-Type ON
Type IV (Sony METAL-S)	61 dB	70 dB	76 dB
Type II (Sony UX-S)	59 dB	68 dB	74 dB
Type I (Sony HF-S)	57 dB	66 dB	72 dB

Total harmonic distortion 1.0% (with Sony METAL-S cassettes)

Frequency response (DOLBY NR OFF)

Type IV cassette (Sony METAL-S)	20 - 21,000 Hz (±3 dB, IEC) 20 - 16,000 Hz [±3 dB 0VU recording]
Type II cassette (Sony UX-S)	20 - 19,000 Hz (±3 dB, IEC)
Type I cassette (Sony HF-S)	20 - 17,000 Hz (±3 dB, IEC)

Wow and flutter — ±0.05% W.Peak (IEC)
0.025% WRMS (NAB)
±0.07% W.Peak (DIN)

Inputs

Line inputs (phono jacks) CD DIRECT INPUT	Sensitivity	77.5 mV
	Input impedance	47 k ohms

Outputs

Line outputs (phono jacks)	Rated output level	0.44 V at a load impedance of 47 k ohms
	Load impedance	Over 10 k ohms
Headphones (stereo phone jack)	Output level	0 - 2.5 mW at a load impedance of 32 ohms

General

Power requirements — 220 - 230 V AC, (or 240 V AC adjustable by Sony personnel), 50/60Hz
Power consumption — 23 W
Dimensions — Approx. 430 × 135× 350 mm (w/h/d) (17 × 5⅜ × 13⅞ inches) including projecting parts and controls
Weight — Approx. 6.7 kg (14 lbs 13 oz)

Supplied accessory — Audio connecting cord (2)

Design and specifications subject to change without notice.

STEREO CASSETTE DECK

SONY

TABLE OF CONTENTS

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.

Features

For higher quality recording/playback

- **The Dolby HX PRO* system** which improves the linearity of the tape's high-range response during recording.
- **B and C type Dolby NR* systems** which reduce tape noise.
- **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.

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.

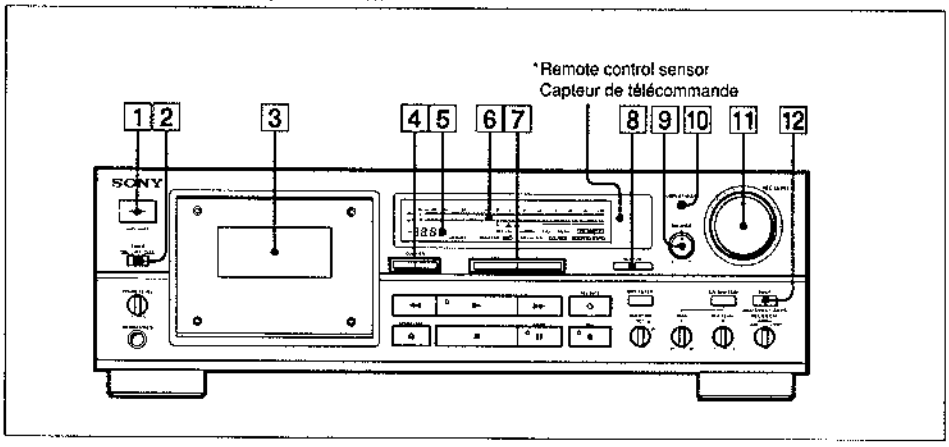
For easier operation

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

SECTION 1
GENERAL

This section is extracted from instraction manual.

Identification of Front Panel Parts



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

1 **POWER switch**

2 **TIMER switch** ㊺

3 **Cassette holder**

4 **Counter buttons**
RESET button ㉜
MEMORY button ㉜ ㉝

5 **LINEAR COUNTER** ㊽

6 **PEAK PROGRAM METER** ㊾

7 **AMS (Automatic Music Sensor) buttons** ㊿

*** Remote control sensor**
You can remotely control this cassette deck with:
— 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.

8 **MONITOR button** ㊸

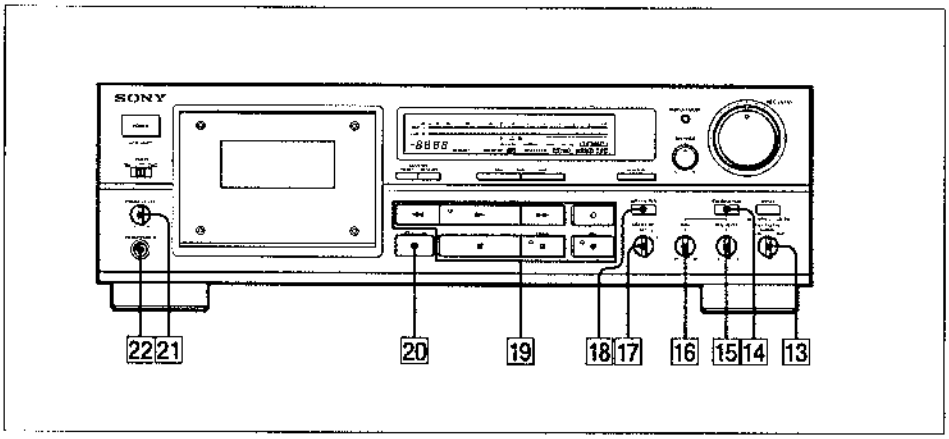
9 **BALANCE control** ㊼

10 **DISPLAY MODE button** ㊽

11 **REC (recording) LEVEL control** ㊼ ㊾

12 **INPUT button** ㊹

(Continued on next page.)



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

(Continued from previous page.)

13 **REC EQ CAL (recording equalizing calibration) switch (LOW, NORMAL, HIGH)** ㊻

14 **CALIBRATION button** ㊽

15 **REC (recording) LEVEL control for calibration** ㊽ ㊾

16 **BIAS control** ㊽ ㊾

17 **DOLBY NR (noise reduction) switch** ㊼ ㊽

18 **MPX FILTER button** ㊽

19 **Tape operation buttons and indicators**
◄◄ (rewind) button
► (play) button and indicator
■ (stop) button
►► (fast-forward) button
O REC MUTE (record muting) button ㊸
II PAUSE button and indicator
● REC (recording) button and indicator

20 **≙ OPEN/CLOSE button**

21 **PHONE (headphones) LEVEL control**

22 **HEADPHONES jack (stereo phone jack)** ㊶

Recording

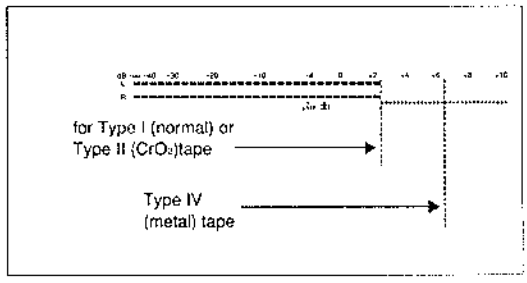
Recording FM Broadcasts with the Dolby NR System

When recording FM broadcasts with the DOLBY NR system, set the MPX FILTER button to ON (the "FILTER" indicator appears).
The MPX filter eliminates remnants of the 19-kHz stereo carrier and 38-kHz subcarrier signals which may impair the operation of the DOLBY NR system. Be sure that the Dolby NR button is turned on since the MPX filter will not function otherwise. During recording with the Dolby NR system, use this button only if the tuner is not equipped with its own MPX filter or the equipped filter does not function effectively.

Adjusting the Recording Level

The optimum recording level, which differs according to the tape type, is indicated on the PEAK PROGRAM METER for each tape type.
Adjust the REC LEVEL control as high as possible without exceeding the recommended range for the tape type being used.

Recommended maximum PEAK PROGRAM METER reading



Tips on recording level adjustment

- If the recording level setting is too high, the recording will be distorted; if it is too low, the tape will produce a hissing sound. Therefore, the recording level should be set as high as possible without causing distortion.
- If the program source to be recorded has many high frequency signals, set the level to a relatively low position.

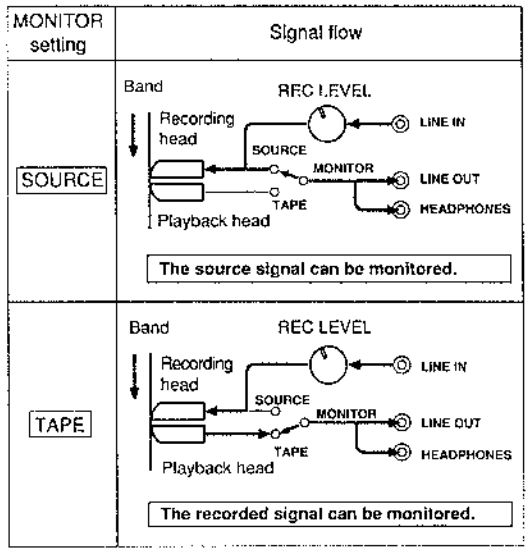
Monitoring the Recorded Sound

As this unit has three separate heads for recording, playback and erasure, you can check the quality of a recorded sound by comparing it with the input source signal.

To listen to the input source signal, set the MONITOR button to SOURCE.
To listen to the sound recorded on the tape, set the MONITOR button to TAPE.

While recording, use this monitoring function to check that there is no distortion due to excessive level settings or sound degradation due to head contamination.

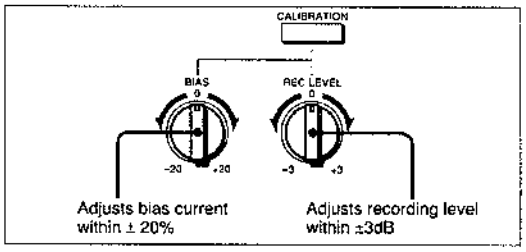
MONITOR button setting and signal flow



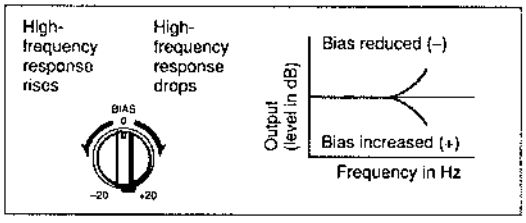
Making an Optimum Recording According to the Tape Type

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.



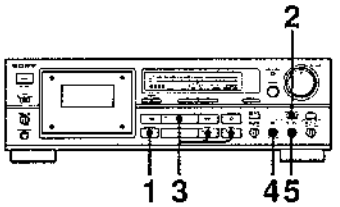
Bias calibration
Choosing the optimum bias current for a tape ensures minimum distortion and flat frequency response. Lowering the bias current boosts high-frequency response, but also results in higher distortion. Raising the bias, on the other hand, reduces distortion, but also dampens high-frequency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



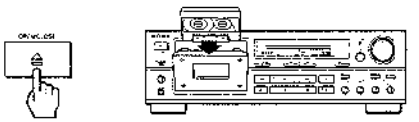
- If the bias current is higher or lower than the optimum setting for a certain tape, the frequency response changes as shown in the chart above. Changing the bias can thus be used to tailor the response to your liking, for example by slightly emphasizing the upper or lower end.
- The frequency response 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 (±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.

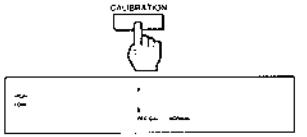
Making an Optimum Recording According to the Tape Type



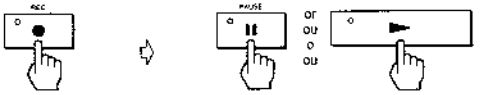
1 Insert the cassette to be used for recording.

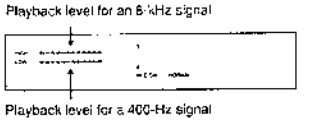


2 Press CALIBRATION.



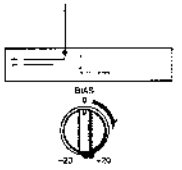
3 Activate the recording test tones.



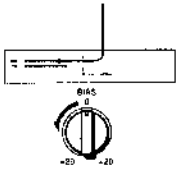


4 Adjust BIAS until both meters indicate equal playback levels.

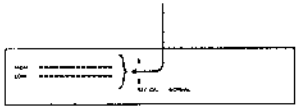
A high reading on the upper meter indicates a low bias current.



A low reading on the upper meter indicates a high bias current.

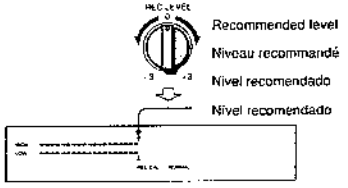


An equal reading on both meters indicates the optimum bias current condition.



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

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.



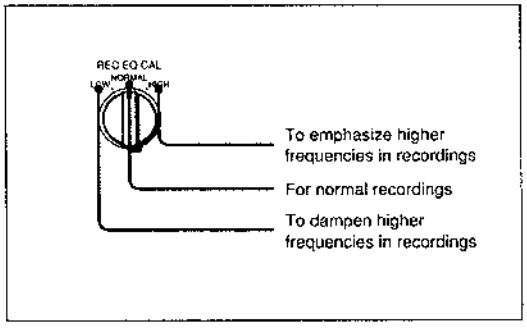
Note

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

Making an Optimum Recording According to the Tape Type

Recording Equalization Calibration

Although bias currrent 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
To modify bands of sound as required, use the REC EQ CAL switch in conjunction with bias calibration, which enables you to 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 BIAS 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 BIAS so that the HIGH and LOW meters indicate equal readings.

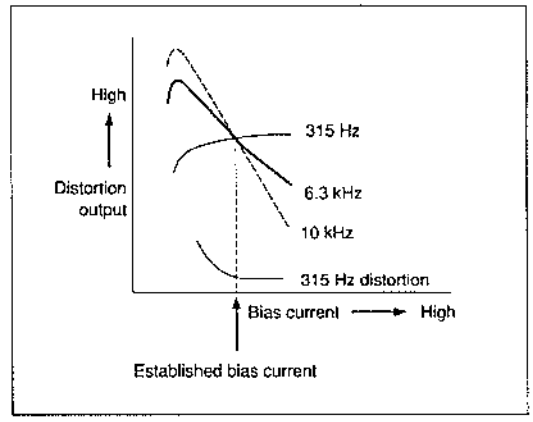
Note
With metal tape, because the amount of frequency characteristic modulation is not in proportion to that of the bias, the optimum bias current may not be obtained using the methods above.

Another use of the REC EQ CAL switch
When using a special tape, the BIAS control with the REC EQ CAL switch set in the NORMAL position may not cause the HIGH and LOW meters to indicate equal readings. If this occurs, adjust the BIAS control after setting the REC EQ CAL switch to HIGH or LOW.

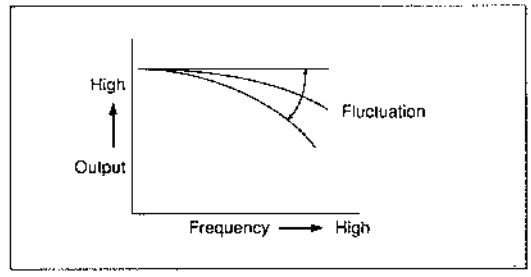
Recording

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 above, characteristics such as output level and distortion differ widely according to the bias (high-frequency) current. In conventional systems, the bias current is susceptible to variations in certain recording signals (see diagram below) which may cause fluctuations in frequency response, distortion, or other unwanted characteristics.

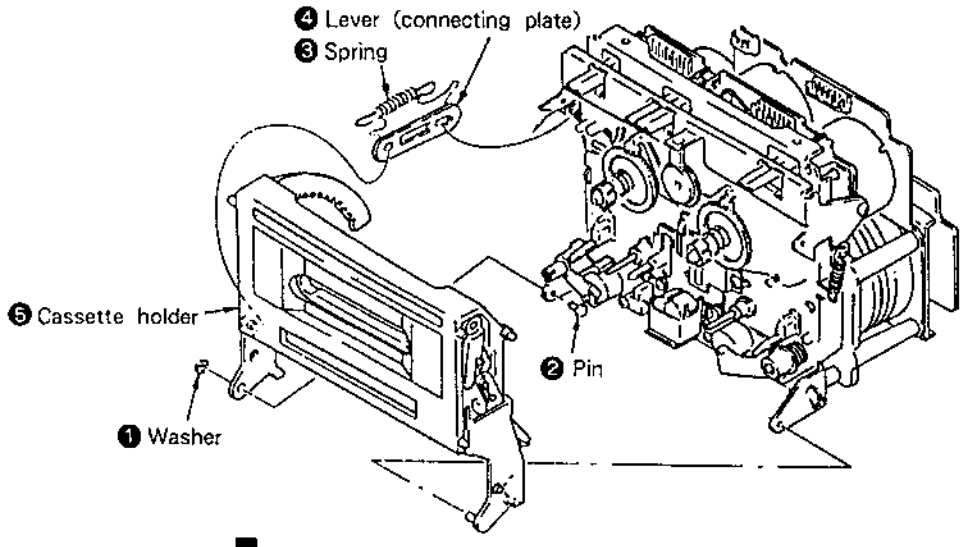


With the Dolby HX PRO system, the effective bias amount added to the bias current is controlled in millisecond units to greatly reduce distortion, improving linearity in high-range response and ensuring high-intensity recording with minimal distortion and noise.

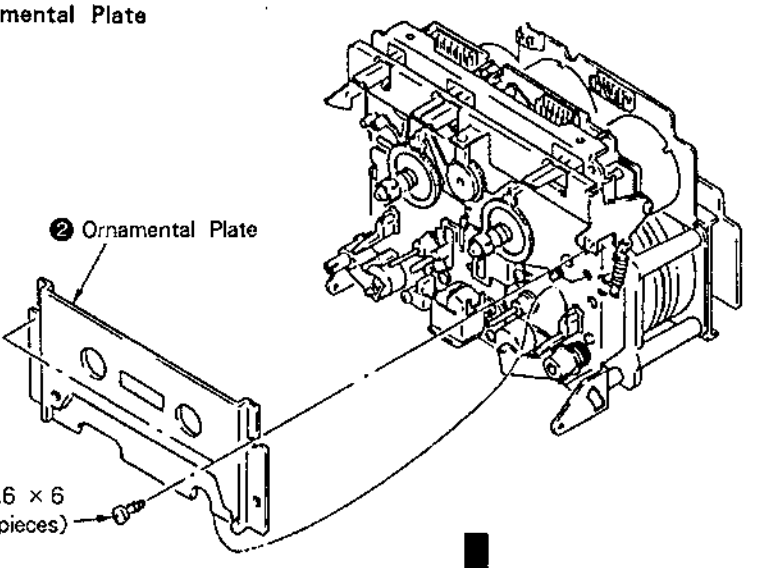
SECTION 2
DISASSEMBLY

• If the parts are marked with the numbers ❶, etc., remove them in the order of the number.

Cassette Holder

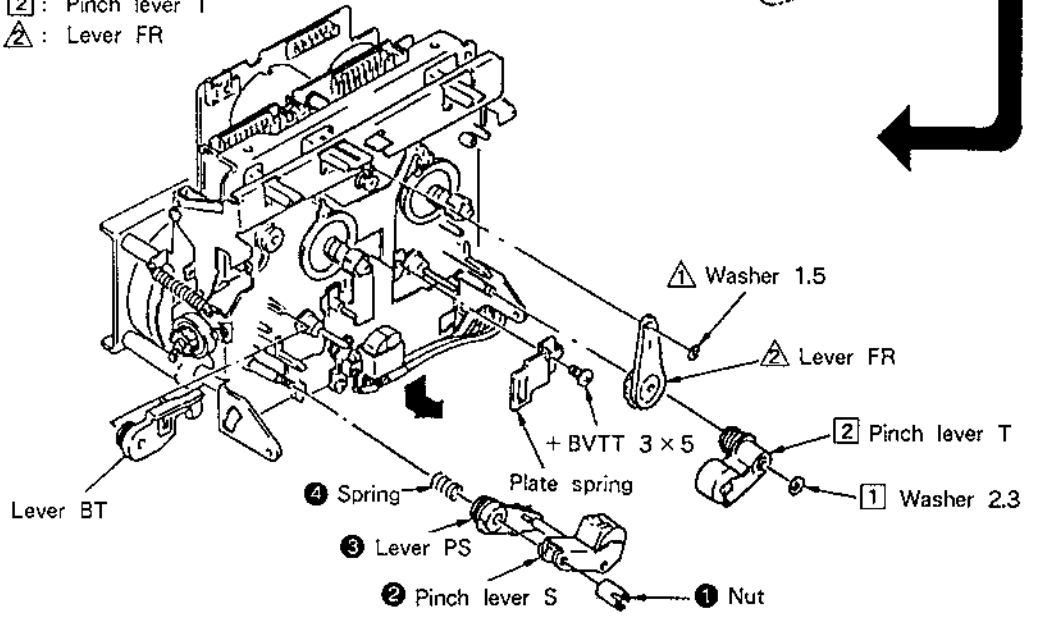


Ornamental Plate



Pinch Lever/Lever FR

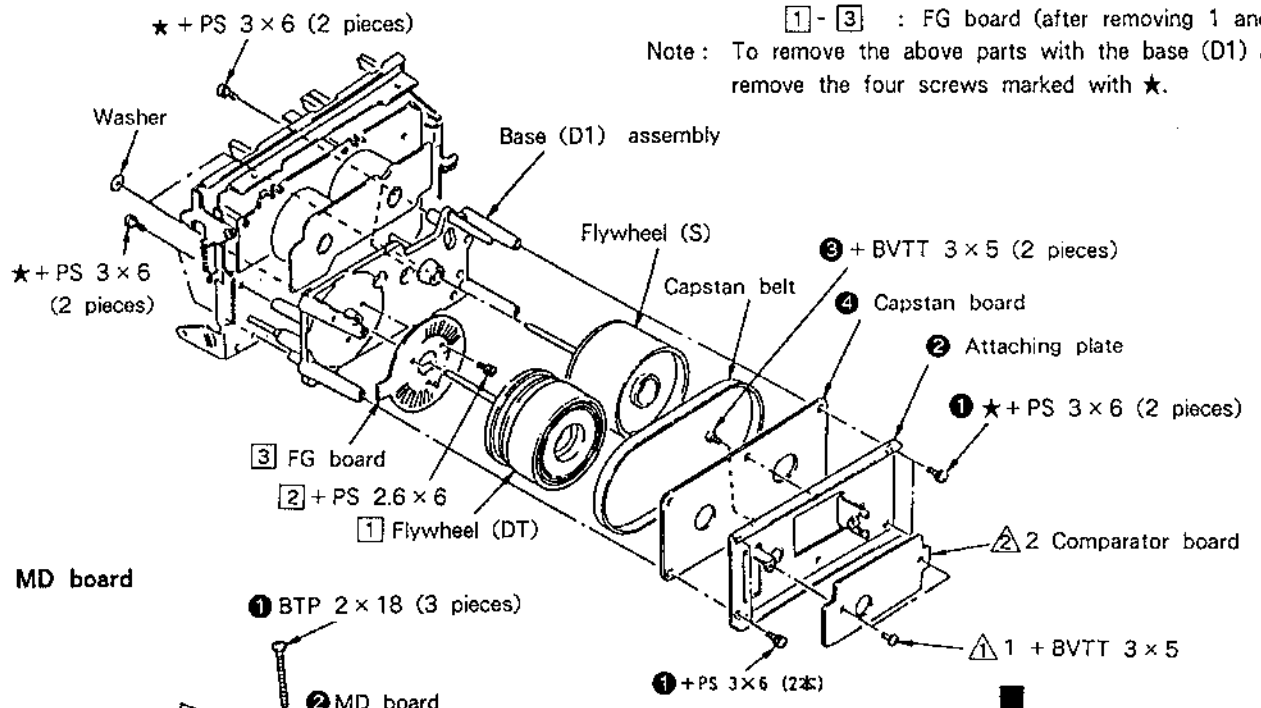
❶ - ❹ : Pinch lever S
[1] and [2] : Pinch lever T
⚠1 and ⚠2 : Lever FR



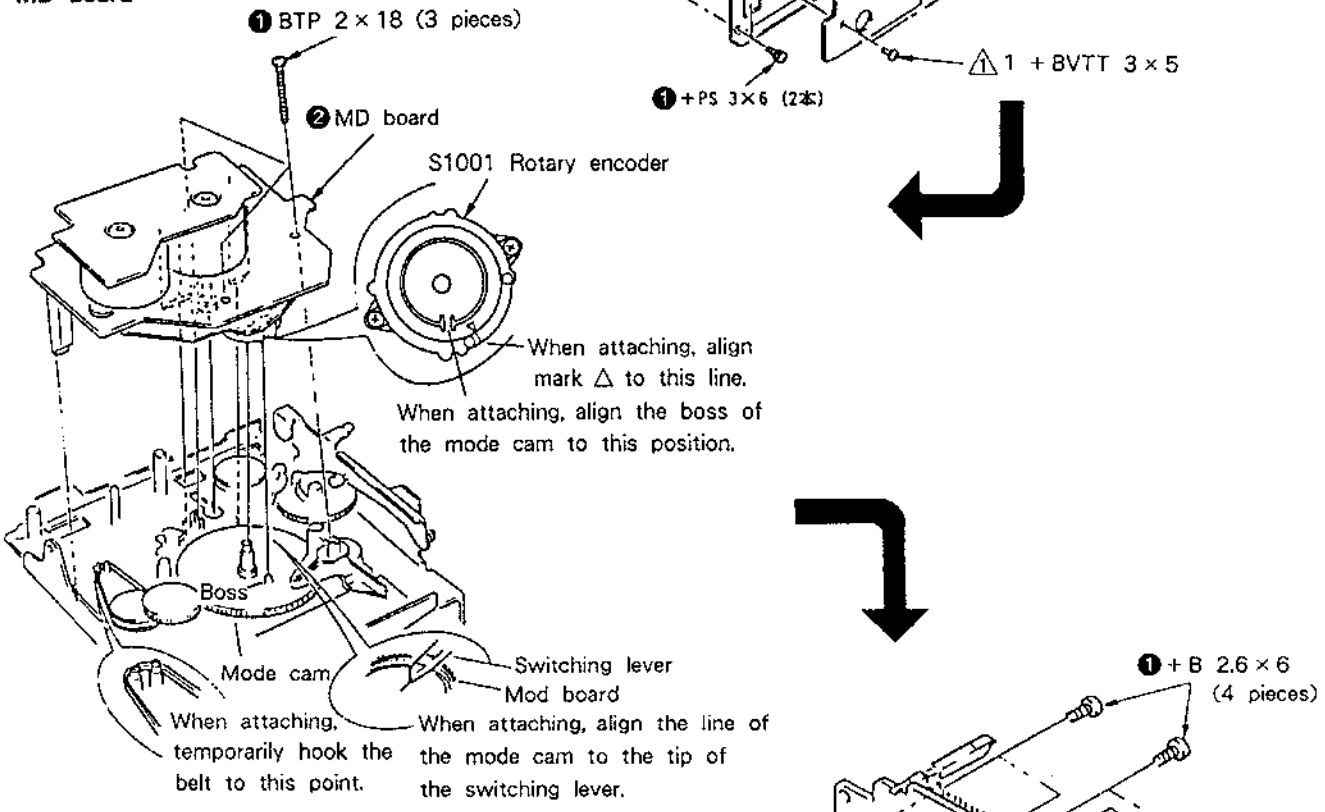
Comparator Board/Capstan Board/Flywheel/FG Board

△1 and △2 : Comparator board
❶ - ❹ : Capstan board
[1] - [3] : FG board (after removing 1 and 2)

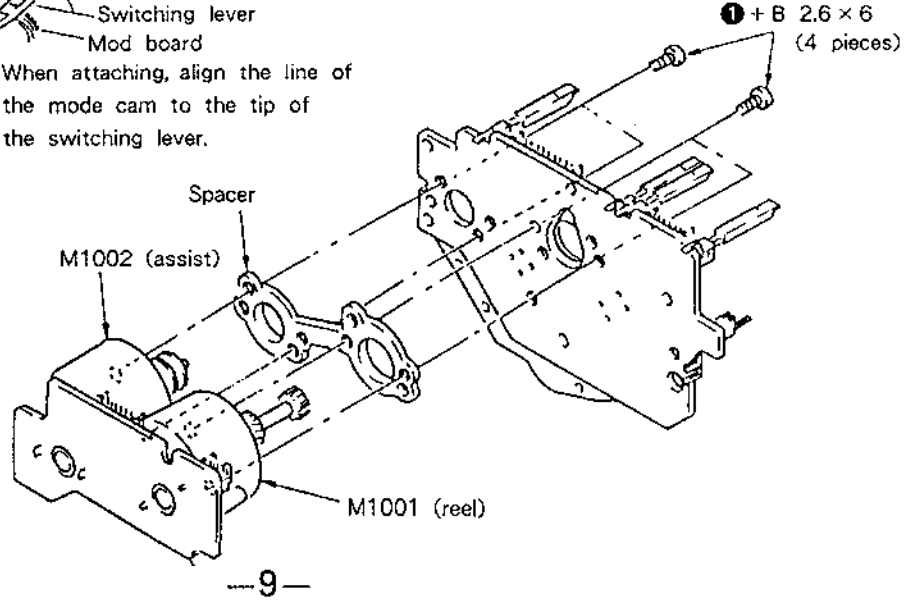
Note : To remove the above parts with the base (D1) assembly, remove the four screws marked with ★.



MD board



Reel Motor Board



SECTION 3
ADJUSTMENTS

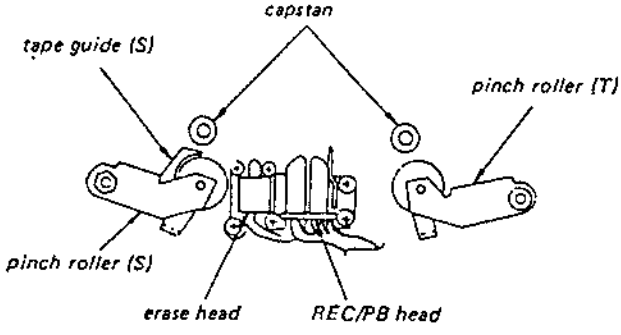
3-1. MECHANICAL ADJUSTMENTS

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.



Tape Path Adjustment

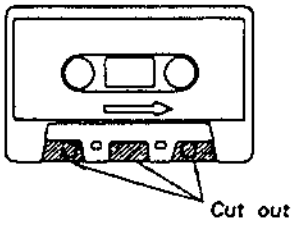
• Refer to Adjustment Position on page 12.

Note : When using the adjustment methods for other than replacement reasons, please do not tamper unnecessarily 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 the first tape path, and then replacing the second one.

Preparation :

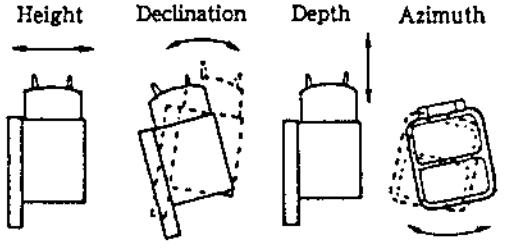
1. Mirror cassette CQ009C 8-909-708-01
   (or CQ012C 8-909-708-02)

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



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 (10 kHz, -10 dB)

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



Adjustment Method :

Supply Pinch Roller

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

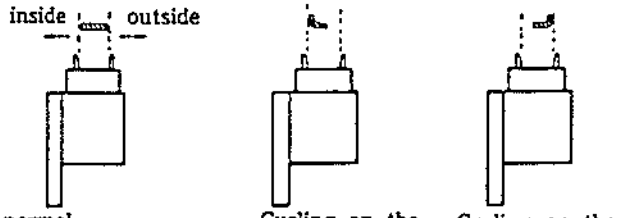
1. Insert the mirror cassette and put the unit in record/playback mode.
2. Check to see whether the tape is curling at the record/playback head guide or the pinch roller guide.
   If it is curling, remove the curl by adjusting the ⑤ tape curl adjustment screw. Then, check that the tape is running past the middle of the erasehead.

Record/playback Head

Note : Only perfom 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 ⑧, ⑨, and ⑩, 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 (outer side).



normal (record/playback head as seen from the side of the erasehead.)

Curling on the inner side. Tighten screws Ⓐ, Ⓑ, and Ⓒ.

Curling on the outer side. Loosen screws Ⓐ, Ⓑ, and Ⓒ.

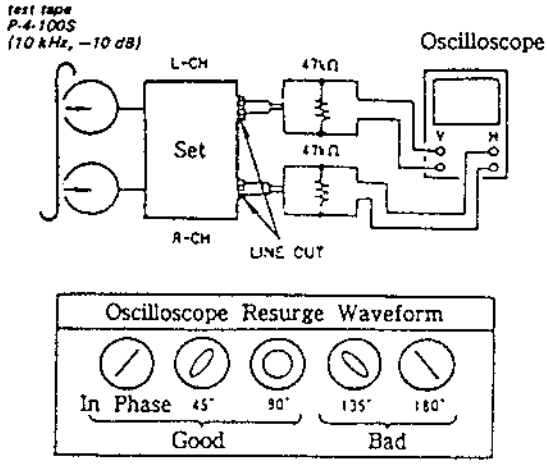
3. (**Declination Adjustment**) While in the record/playback position, set the back tension to 0 (wind the supply reel with something thin like a pencil in a counterclockwise direction) and make sure there is no curling or shifting (shifting up/shifting down) at the guide of the record/playback head.

   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 Ⓑ and Ⓒ 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 (3 kHz, 0 dB).
   Turn screw Ⓒ 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.

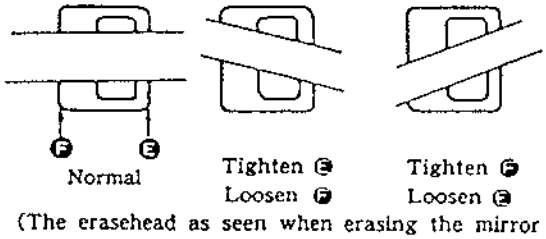
6. (**Tape Path Check**) Connect the oscilloscope to LINE OUT and play back P-4-A100 (10 kHz, -10 dB) to display a resurge waveform. After 20 seconds of record/playback (after the tension within the loop has been increased sufficiently), make sure the variation in the resurge is within ± 90 degrees (within ± 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 adjustments from step 1.



Erasehead

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

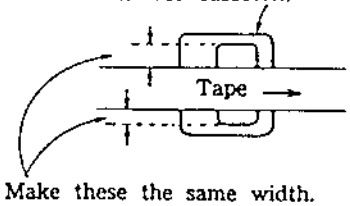
1. Insert the mirror cassette and put the unit in record/playback mode.
2. (**Azimuth Adjustment**) Adjust the azimuth of the erasehead by adjusting screws Ⓑ and Ⓕ so that the tape runs as evenly as possible.



(The erasehead as seen when erasing the mirror cassette.)

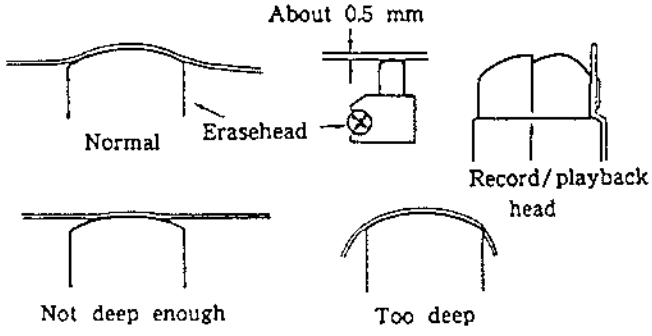
3. (**Height adjustment**) Turn screws Ⓐ, Ⓑ, and Ⓕ all by the same angle so that the portions of the erasehead visible at top and bottom are nearly of equal width. If the width at the top is greater, tighten the screws ; if the width at the bottom is greater, loosen the screws.

Erasehead (The erasehead as seen through the mirror cassette.)



Make these the same width.

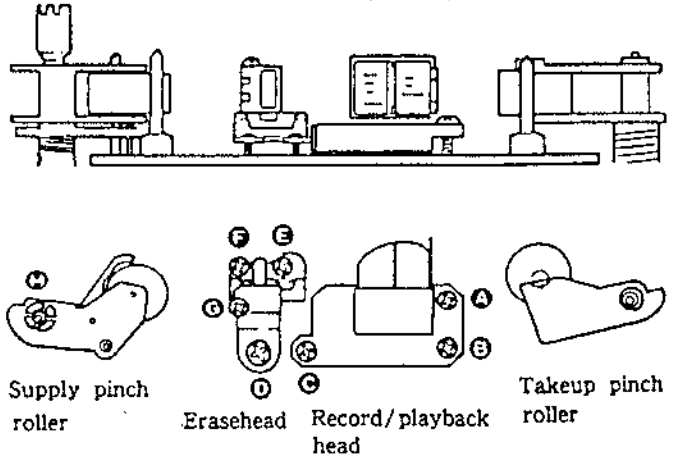
4. (**Declination Adjustment**) Leaving it in the playback position, put the back tension to 0 and make certain the erasehead part and supply pinch roller guide part do not shift. If there is a shift, turn the screw ⓑ and change the declination. Looking at it using the mirror cassette, if the tape shifts 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.



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).



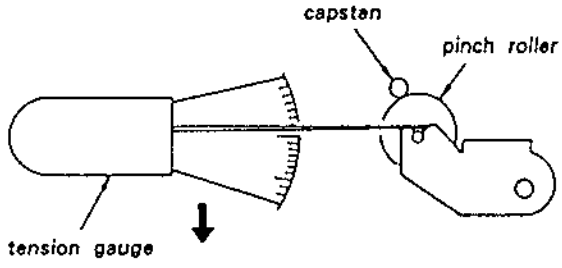
Pinch Roller Pressing Force Measurement

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 turnning.

Standard Limits :

Tape-up side : 270 – 350g (9.5 – 12oz)
Supply side : 180 – 280g (6.4 – 9.9oz)



3-2. ELECTRICAL ADJUSTMENTS

Note: The adjustment should be performed in the order given in this service manual.
The adjustments should be performed for both L-CH and R-CH.

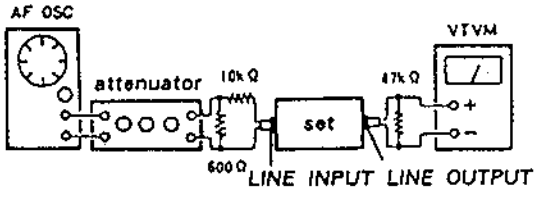
- Simultaneous REC/PB Mode:
  Input the signals to LINE IN terminal and set to REC mode. Set the monitor switch to TAPE, and monitor the recorded signal from LINE OUT terminal.
- Switch Position:
  DOLBY NR ..... OFF
  TIMER ..... OFF
  MONITOR ..... TAPE
  HX PRO ..... OFF
  CALIBRATION ..... OFF
  CD DIRECT ..... OFF
  BIAS ..... CENTER CLICK
  REC LEVEL ..... CENTER CLICK
- 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	10 kΩ
input level	0.25 V (−10 dB)

Standard Output Level

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



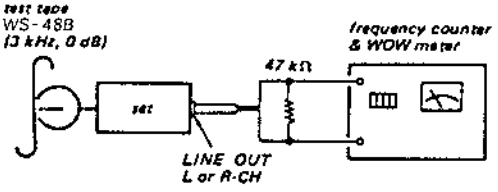
Torque Adjustment and Measurement

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 ± 3g.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	CQ-102C	35 – 45g•cm (0.49 – 0.62oz•inch)
FWD Back tension	CQ-102C	7 – 11g•cm (0.097 – 0.15oz•inch)
FF/REW	CQ-201B	65 – 90g•cm (0.9 – 1.4oz•inch)

Tape Speed/WOW Check

Procedure:



1. Measure the output frequency and the WOW value while playing back the tape top of the test tape.
2. Turn over the test tape, measure the output frequency and the WOW value, and check the difference from the values of the step 1.

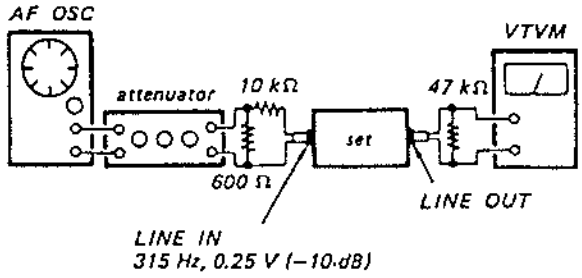
Adjustment Limits :
TAPE SPEED deviation : within 2,985 to 3,015Hz
WOW (WRMS) : 0.05% or less

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 (RV502) 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.

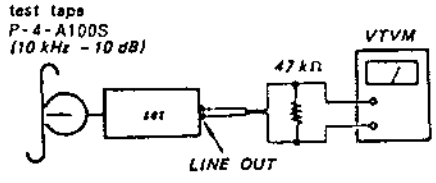
Adjustment Limits :

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

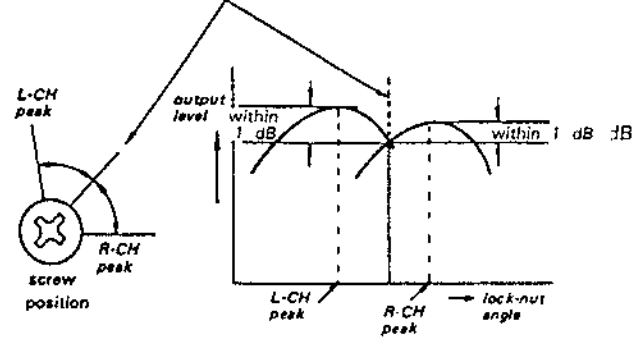
Record/Playback Head Azimuth Adjustment

Procedure :

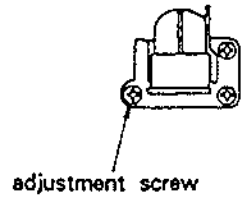
1. Mode : playback



2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until doth of output levels match together within 1dB.



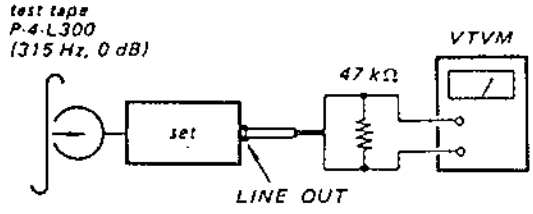
Adjustment Location :



Playback Level Adjustment

Procedure:

1. Mode : playback



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

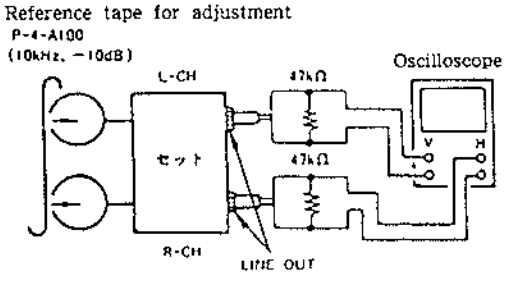
Adjustment Limits :

LINE OUT level : 0.42 to 0.46 V
(−5.5 to −4.5 dB)
Level difference between channels :
less than 0.5 dB

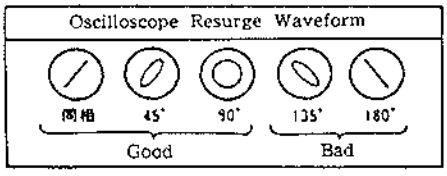
Check that the LINE OUT level does not change in playback mode while changing the mode from playback to stop several times.

3. Phase check

− Play mode −

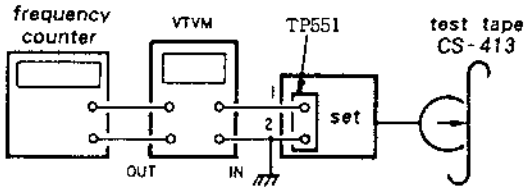


4. Check that the phase difference between L-ch and R-ch is within 0 ~ (same to 90°).



Erase Current Adjustment

1. Mode : record



2. Adjust RV553 so that the reading on VTVM is 110mV (erase current = 110mA).
3. And then confirm that the reading on the frequency counter is 160kHz.

Adjustment Limits :

Erase current : 105mA to 110mA
Frequency : 160 ± 6kHz

Bias Current Adjustment

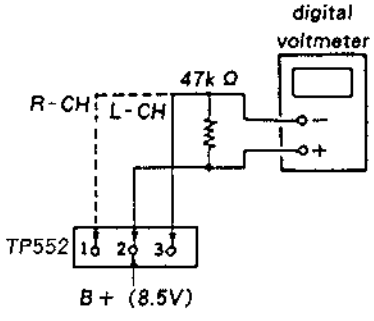
Note : This adjustment should be made before Record Bias Adjustment.

Procedure :

1. Preset RV303 (L-CH) and RV403 (R-CH) and RV554 in the center position, and record with no signal.
2. Adjust T401 (L-CH) and T301 (R-CH) for minimum readings on the digital voltmeter.

Adjustment Limits :

120mV or less. (reference)



CrO_2 Bias and Record Level Adjustment

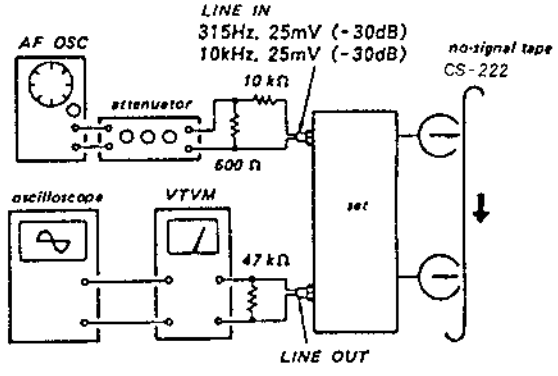
Note : This adjustment should be made before Record Bias Adjustment.

Setting:

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

Procedure:

1. Mode: simultaneous REC/PB



2. Adjust RV403 (L-CH) and RV303 (R-CH) so that the playback output level of 10kHz signal is 0.3dB − 0.3dB with respect to that of 315Hz. • • • Record Bias Adjustment.
3. Adjust RV401 (L-CH) and RV301 (R-CH) so that the playback output level of 315kHz is − 25.3dB to − 24.7dB. • • • Record Level Adjustment.

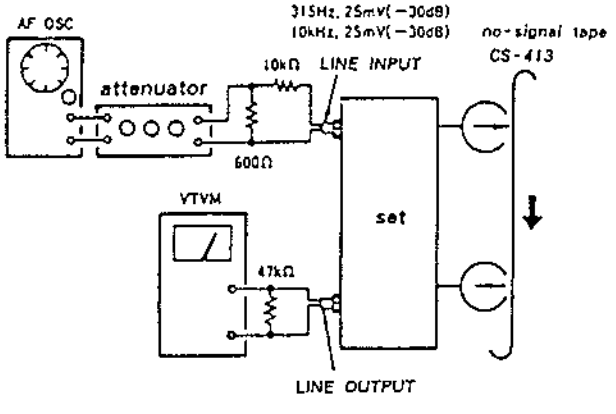
Metal Bias Adjustment

Setting :

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

Procedure :

1. Mode : simultaneous REC/PB



2. Adjust RV554 so that the difference between the playback output at 315Hz and that of 10kHz in R-CH is within 0.3 dB to − 0.3dB.

Normal Bias Adjustment

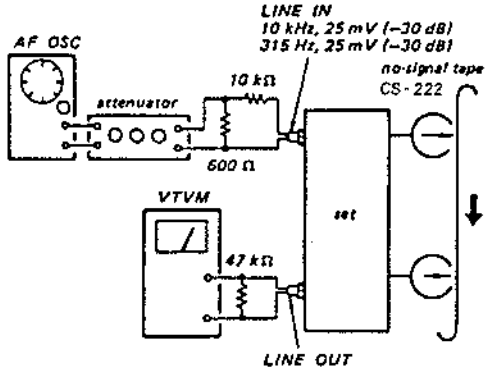
Setting:

REC LEVEL knob: standard record position

(See page 12.)

Procedure:

1. Mode: simultaneous REC/PB



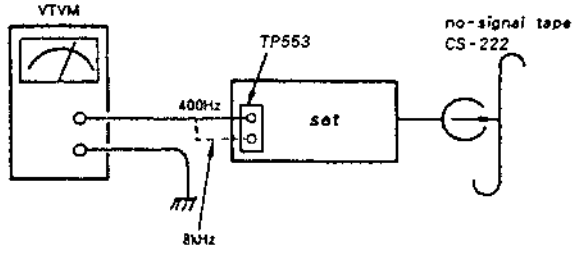
2. Adjust RV302 (L-CH) and RV402 (R-CH) so that the difference between the playback output at 315Hz and that of 10kHz in R-CH is within 0.3dB to −0.3dB.
3. Set the HXPRO switch to OFF.
4. Adjust RV104 (L-CH) and RV204 (R-CH) so that the difference between the playback output at 10kHz when the HXPRO is ON and that of 10kHz when ON is within 0.5dB to −0.5dB.

Calibration OSC and Calibration Meter Adjustment

Setting : CALBRATION switch : ON

Procedure (OSC OUT LEVEL) :

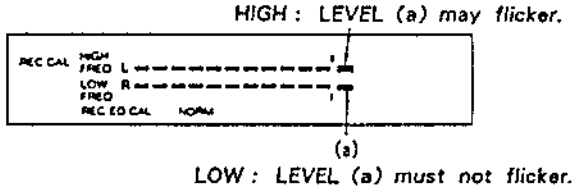
1. Mode : record (no-signal (LINE INPUT))



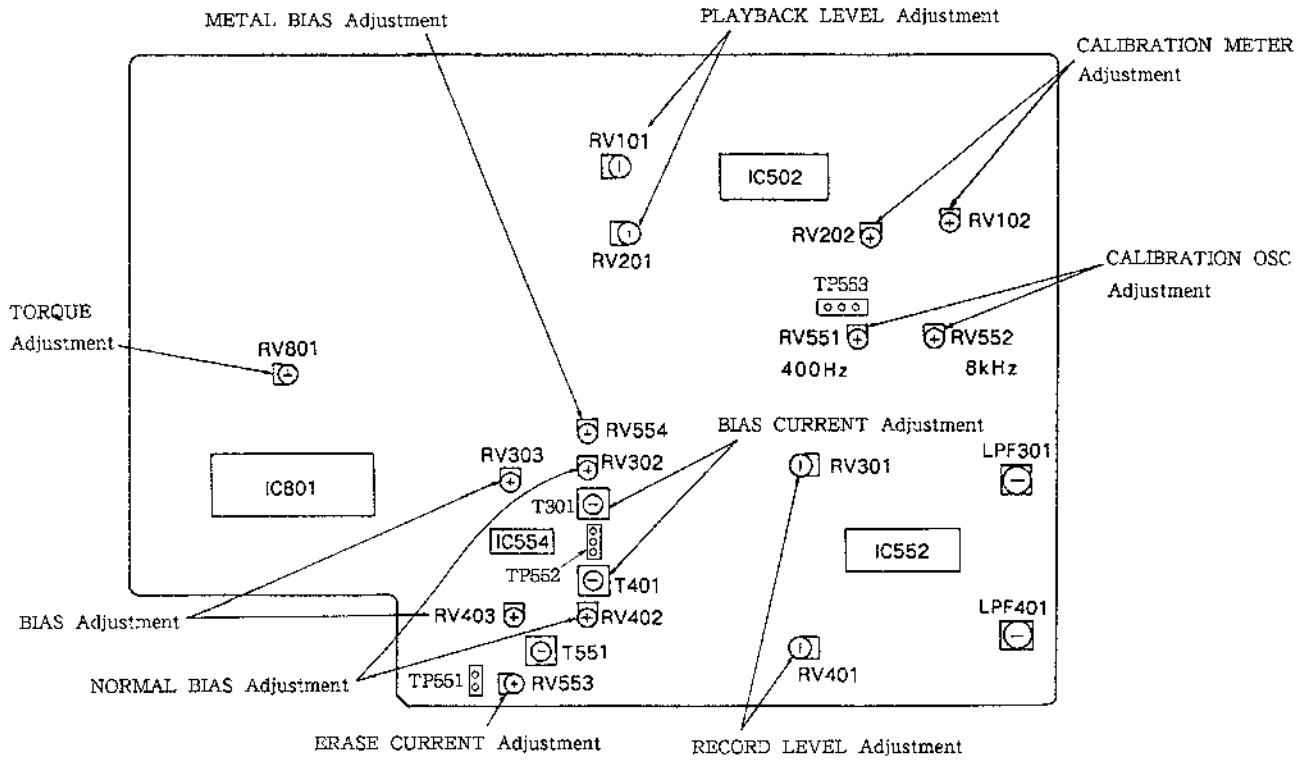
2. Adjust RV551 so that a check-point level at 400Hz is 95dB to 10.5dB.
3. Adjust RV552 so that a check-point level at 8kHz is 9.5dB to 10.5dB.

Procedure (CAL METER ADJ) :

1. Put the set in record mode and adjust RV202 (HIGH) so that HIGH FREQ segments in the CAL LEVEL meter light thoroughly up to 0 VU as shown in the figure below. Segment (a) may flicker.
2. Preset RV102 (LOW) so that segment (a) in LOW FREQ CAL LEVEL meter lights. Then adjust RV102 to the point where segment (a) goes out.



Adjustment Location : MAIN (A) BOARD (COMPONENT SIDE)



SECTION 4
DIAGRAMS

4-1. DESCRIPTION ON IC

IC502, IC552 (CX20188)

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 No.	Pin name	Description
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.

IC901 (M50940 - 313SP)

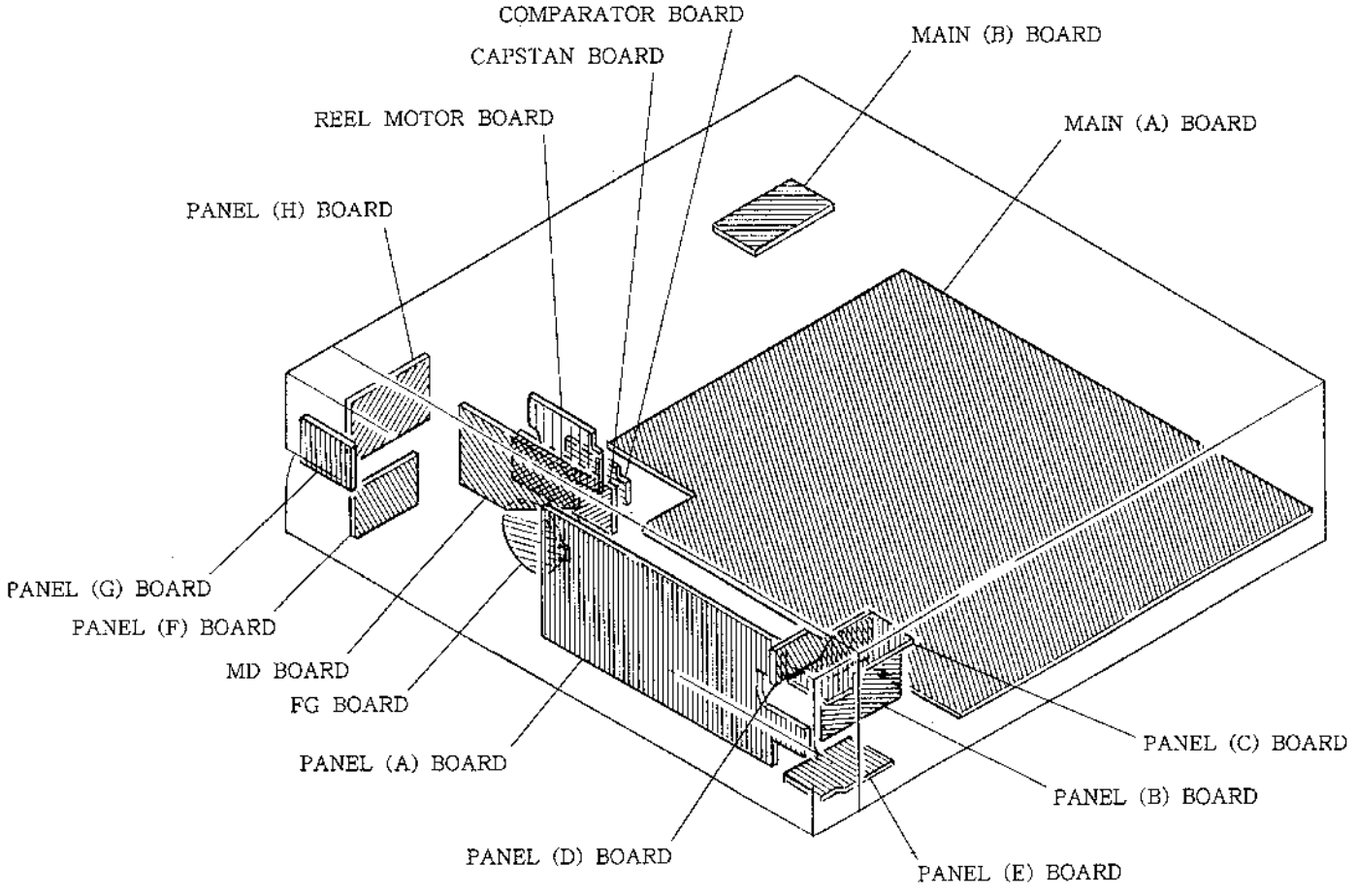
Level meter display of 24-segment fluorescent display, etc., are performed by receiving direction from the master microcomputer (IC801).

Pin No.	Pin name	I/O	Description
1.	Vref	I	A/D input-port reference voltage input(+5V)
2.	ϕL	I	Not used. (Connected to +5V)
3.	ϕR	I	Not used. (Connected to +5V)
4.	DATA	I	Data input from the master microcomputer(IC801)(analog)
5. ~6.	ADR1~ADR0	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.	$\overline{\text{GRID6}}$~$\overline{\text{GRID3}}$	O	Not used.
14. ~15.	$\overline{\text{GRID2}}$~$\overline{\text{GRID1}}$	O	Fluorescent display grid output
16.	$\overline{\text{COO}}$	O	Not used.
17.	$\overline{\text{PLAY}}$	O	Not used. (Connected to pin ⑱.)
18.	$\overline{\text{PLAY}}$	O	Not used.
19.	$\overline{\text{PAUSE}}$	O	Not used.
20.	$\overline{\text{REC}}$	O	Not used.
21.	$\overline{\text{TAPE}}$	O	Fluorescent display segment output("TAPE" displayed). "L": TAPE displayed. "H": SOURCE displayed.
22.	$\overline{\text{OVER LEVEL}}$	O	Fluorescent display segment output("OVER LEVEL" displayed). It is displayed when "L".
23.	TYPE I	O	Fluorescent display segment output("TYPE I" displayed). It is displayed when "L".
24.	$\overline{\text{TYPE II}}$	O	Fluorescent display segment output("TYPE II" displayed). It is displayed when "L".
25.	$\overline{\text{TYPE IV}}$	O	Fluorescent display segment output("TYPE III" displayed). It is displayed when "L".
26.	CNVss	-	Power supply terminal(GND)
27.	$\overline{\text{RESET}}$	I	Reset input
28.	XIN	I	Clock input(4MHz)
29.	XOUT	O	Clock outupt.
30.	XCIN	-	Not used. (Connected to GND)
31.	XCOUT	-	Not used.
32.	Vss	-	Power supply terminal(GND)
33.	Φ	O	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	O	Fluorescent display segment output(meter display)
63.	AVcc	-	Power supply terminal(+5V)
64.	Vcc	-	Power supply terminal(+5V)

IC801 (M50964-226SP)

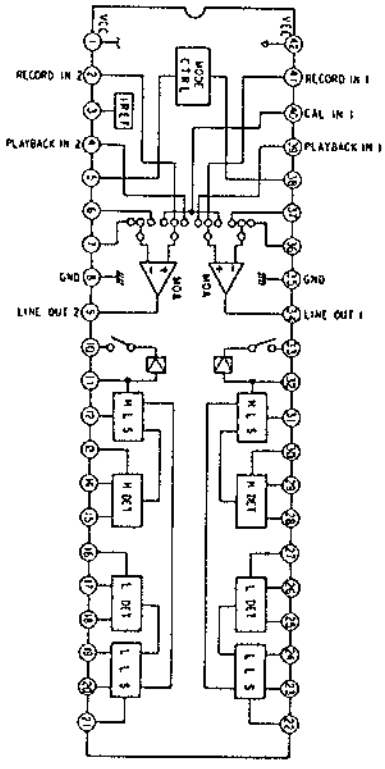
Pin No.	Pin name	I/O	Description
1.	VCC		Power supply: +5V.
2.	AVss		Analog GND.
3.	Vref	I	A/D port reference voltage input.
4.	DA		Not used for this model.
5.	PWM		Not used for this model.
6.	P.OFF		Not used for this model. Connected to GND.
7.	$\overline{\text{LED}}$	O	PAUSE LED output.
8.	$\overline{\text{LED}}$	O	REC LED output.
9.	$\overline{\text{LED}}$	O	PLAY LED output.
10.	AD1	I	Key input. 0V=⏏, 1V=■, 2V=◀◀, 3V=▶▶, 4V=●.
11.	AD2	I	Key input. 0V=▶, 1V=❙❙, 2V=⏮, 3V=⏭, 4V=○.
12.	AMS SIG	I	AMS signal input. No song detected = Low. Song detected = High.
13.	AD4	I	Key input. 2V = DISPLAY. 3V = MONITOR.
14.	CODE	I	Remote control category select switch.
15.	ALB		Connected to 5V.
16.	ϕR	I	Take-up reel base sensor input.
17.	ϕL	I	Supply reel base sensor input.
18.	C RESET		Model select input. Connected to GND.
19.	C MEMORY		Model select input. Connected to GND.
20.	COO		Not used for this model.
21.	POWER IN	I	Power on and off detection.
22.	SIRW	I	SIRCS phase input.
23.	$\overline{\text{SIRE}}$	I	SIRCS reverse phase input.
24.	$\overline{\text{T-REC}}$	I	Timer REC switch input.
25.	$\overline{\text{T-PLAY}}$	I	Timer PLAY switch input.
26.	$\overline{\text{INT}}$	I	External interruption input. Interruption process is performed when the power is on or off.
27.	Vss		GND.
28.	$\overline{\text{RESET}}$	I	Reset input.
29.	XIN	I	Clock input (4 MHz).
30.	XOUT	O	Clock output (4 MHz).
31.	ϕout		Not used for this model.
32.	Vss		GND.
33.	$\overline{\text{C1}}$	I	Rotary encoder input to detect the position of the head base of the mechanical block.
34.	$\overline{\text{C2}}$	I	Rotary encoder input to detect the position of the head base of the mechanical block.
35.	$\overline{\text{C3}}$	I	Rotary encoder input to detect the position of the head base of the mechanical block.
36.	$\overline{\text{C4}}$	I	Rotary encoder input to detect the position of the head base of the mechanical block.
37.	$\overline{\text{OPEN SW}}$	I	OPEN switch input of the mechanical block.
38.	$\overline{\text{CLOSE SW}}$	I	CLOSE switch input of the mechanical block.
39.	$\overline{\text{DOOR SW}}$	I	DOOR switch input of the mechanical block.
40.	$\overline{\text{REC SW}}$	I	REC switch input of the mechanical block.
41.	M PLAY	O	Reel motor rotates at PLAY speed.
42.	M FAST	O	Reel motor rotates at FF/REW speed.
43.	M FWD	O	Reel motor rotates.
44.	M REV	O	Reel motor rotates in reverse.
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.	C OFF	O	Counter light-off output
48.	M OFF	O	Meter light-off output
49.	BIAS	O	Bias oscillation on and off control
50.	$\overline{\text{R MT}}$	O	REC MUTE.
51.	$\overline{\text{M MT}}$		Not used for this model.
52.	$\overline{\text{T MT}}$	O	Tape MUTE. Goes to low when the tape is being played.
53.	$\overline{\text{S MT}}$	O	Source MUTE. Goes to low three seconds after the power is on.
54.	AMS	O	AMS switch output. Goes to low when AMS is being used.
55.	MONITOR		Not used for this model. Connected to GND.
56.	$\overline{\text{HALF}}$		Not used for this model. Connected to GND.
57.	DAT3	O	Outputs parallel data for the counter display.
58.	DAT2	O	Outputs parallel data for the counter display.
59.	DAT1	O	Outputs parallel data for the counter display.
60.	DAT0	O	Outputs parallel data for the counter display.
61.	DATD	O	Outputs parallel data for the counter display.
62.	CLK	O	Clock output to transmit the parallel data.
63.	LATCH	O	Output for latching the transmitted data.
64.	CAL IN	I	CAL switch input.

4-2. CIRCUIT BOARDS LOCATION

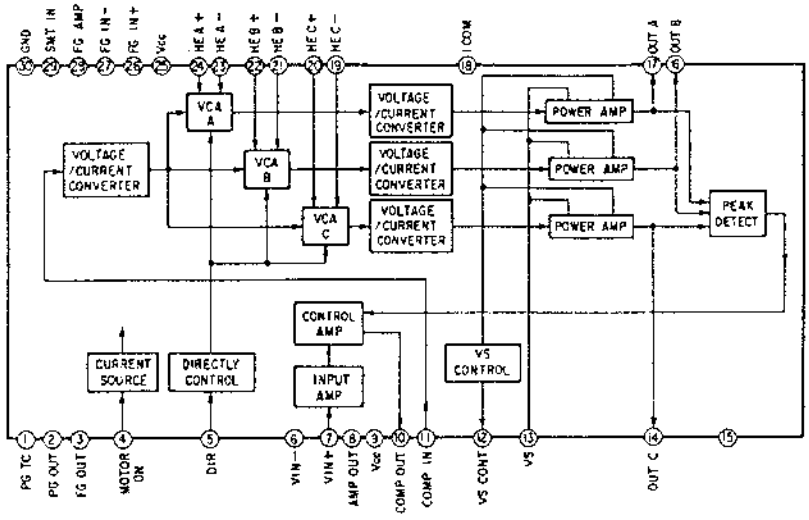


4-3. IC BLOCK DIAGRAMS

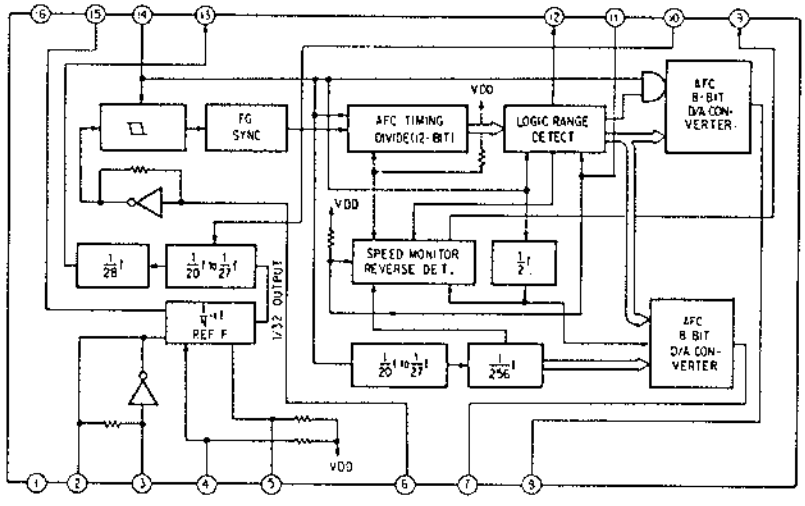
IC502, 552 CX20188



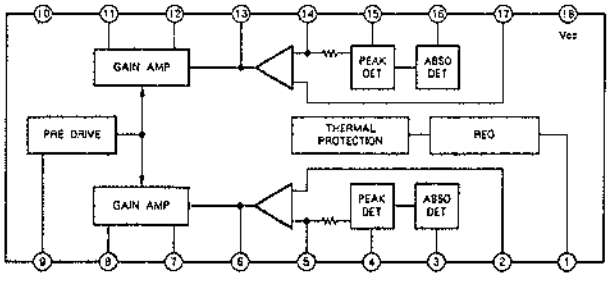
IC902 CX20174



IC952 TC-9142P

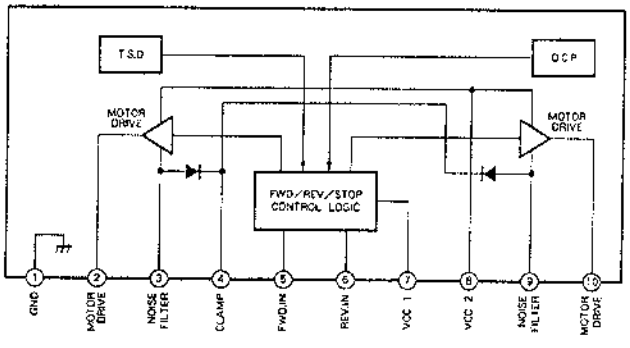


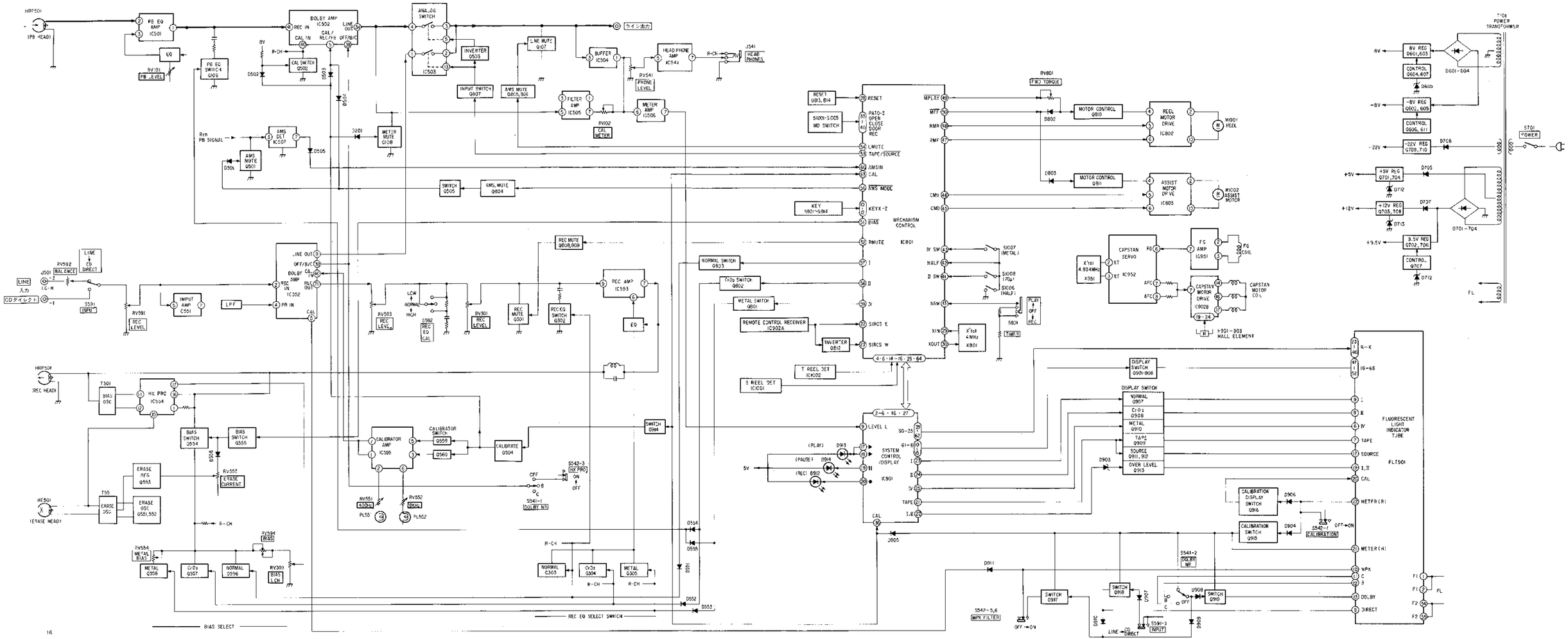
IC554 μPC1297CA



IC802 BA6219B

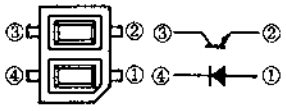
IC803 LB1641



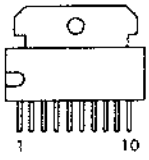

HRP501
IPB HEAD
PB EQ AMP IC501
EQ
RV101 PB LEVEL
PB EQ SWITCH Q108
DOLBY AMP IC502
REC IN
CAL IN
CAL/REC/PB
OFF/B/C
LINE OUT
CAL SWITCH Q502
D502
D503
D504
ANALOG SWITCH IC503
INVERTER Q503
LINE MUTE Q107
BUFFER IC504
HEADPHONE AMP IC541
RV541 PHONE LEVEL
R-CH
J541 HEAD PHONES
INPUT SWITCH Q807
AMS MUTE Q805,806
FILTER AMP IC505
METER AMP IC506
RV102 CAL METER
Rch PB SIGNAL
AMS DET IC507
AMS MUTE Q501
D501
D505
D201
METER MUTE Q108
SWITCH Q505
AMS, MUTE Q804
RESET Q83, 814
S1001-S1005 MD SWITCH
KEY S901-S914
MECHANISM CONTROL
IC801
RV801 REV TORQUE
MOTOR CONTROL Q810
D802
REEL MOTOR DRIVE IC802
W1001 REEL
D803
MOTOR CONTROL Q811
ASSIST MOTOR DRIVE IC803
M1002 ASSIST MOTOR
X'tal 4.9344MHz X951
CAPSTAN SERVO IC952
FG AMP IC951
FG COIL
CAPSTAN MOTOR DRIVE IC902B
CAPSTAN MOTOR COIL
H901-903 HALL ELEMENT
S804 TAPE
PLAY OFF REC
X'tal 4MHz X801
S1007 (METAL)
S1008 (TAPE)
S1006 (HALF)
T701 POWER TRANSFORMER
8V REG D601,603
CONTROL D604,607
D601-D604
D605
-8V REG D602, 605
CONTROL D606, 611
-22V REG D709, 710
D706
+5V REG D701, 704
D712
+12V REG D703, 708
D707
D713
D701-704
9.5V REG D702, 706
CONTRO. Q707
D712
S701 POWER
FL
LINE 入力
CD ダイレクト
J501
RV592 BALANCE
S591 INPUT
REC LEVEL
IMPUT AMP C551
LPF
REC MUTE Q808,809
REC AMP IC553
REC EQ SWITCH Q302
REC MUTE Q301
RV583 REC LEVEL
RV301 REC LEVEL
S592 REC EQ CAL
LOW NORMAL HIGH
EQ
NORMAL SWITCH Q803
CrO2 SWITCH Q802
METAL SWITCH Q801
REMOTE CONTROL RECEIVER IC902A
INVERTER Q812
SIRCS E
SIRCS W
T. REEL DET IC1002
S. REEL DET IC1001
4-6-14-16-25-64
2-6-16-27
LEVEL L
SD-23
G1-6
I
II
IV
TAPE
I, II
CAL
IC901
SYSTEM CONTROL /DISPLAY
(PLAY) D913
(PAUSE) D914
(REC) D912
5V
D915
DISPLAY SWITCH Q901-906
DISPLAY SWITCH
NORMAL Q907
CrO2 Q908
METAL Q910
TAPE Q909
SOURCE Q911, 912
OVER LEVEL Q913
D903
FLUORESCENT LIGHT INDICATOR TUBE
FLT501
R-K
G-6
I
II
IV
TAPE
SOURCE
I, II
CAL
METER (R)
METER (L)
MPX
C
B
DOLBY
DIRECT
CALIBRATION DISPLAY SWITCH Q916
CALIBRATION SWITCH Q915
D906
D904
S542-1 CALIBRATION
OFF→ON
S542-2 DOLBY NR
D911
SWITCH Q917
SWITCH Q918
SWITCH Q919
D907
D908
D909
D910
S542-5,6 MPX FILTER
OFF→ON
S591-3 INPUT
LINE→CD DIRECT
HRP502
REC HEAD
T304
BIAS OSC
HX PRO IC504
BIAS SWITCH Q554
BIAS SWITCH Q555
D556
RV553 ERASE CURRENT
ERASE HFC Q553
ERASE OSC Q551, 552
T551
HF501
ERASE HEAD
R-CH
RV554 METAL BIAS
RV584 BIAS
METAL Q558
CrO2 Q557
NORMAL Q556
RV301 BIAS L.CH
CALIBRATOR AMP IC555
CALIBRATOR SWITCH Q559
Q560
CALIBRATE Q504
RV551 400Hz
RV552 8KHz
PL551
PL552
S542-3 HX PRO ON OFF
S541-1 DOLBY NR
D554
D555
D551
D552
D553
NORMAL Q305
CrO2 Q304
METAL Q305
M-CH
R-CH
BIAS SELECT
REC EQ SELECT SWITCH
SAME AS R-CH

4-5. SEMICONDUCTOR LEAD LAYOUTS

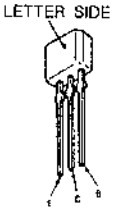
GP2S22B



LB1641

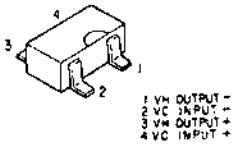


BNIL3Z-P
2SA1175-HFE



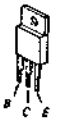
DTA114ES
DTA144ES
DTC114ES
DTC144ES
2SC2603-EF

OH009



2SA1409-LK
2SB1116A-L
2SC945-Q

2SB1094-LK
2SD1585-LK



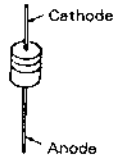
2SD756

2SD1312-K

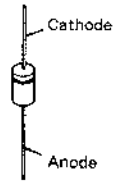
2SK170-BL

2SK246-GR

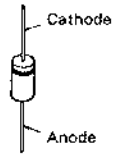
HZS6C3L
HZS9B2L
UZP-8.2BB
ISS120



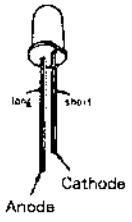
30DF2



10E2N



SEL1210S
SEL1210S-C
SEL1910A-C



4-6. PRINTED WIRING BOARDS – MAIN SECTION –

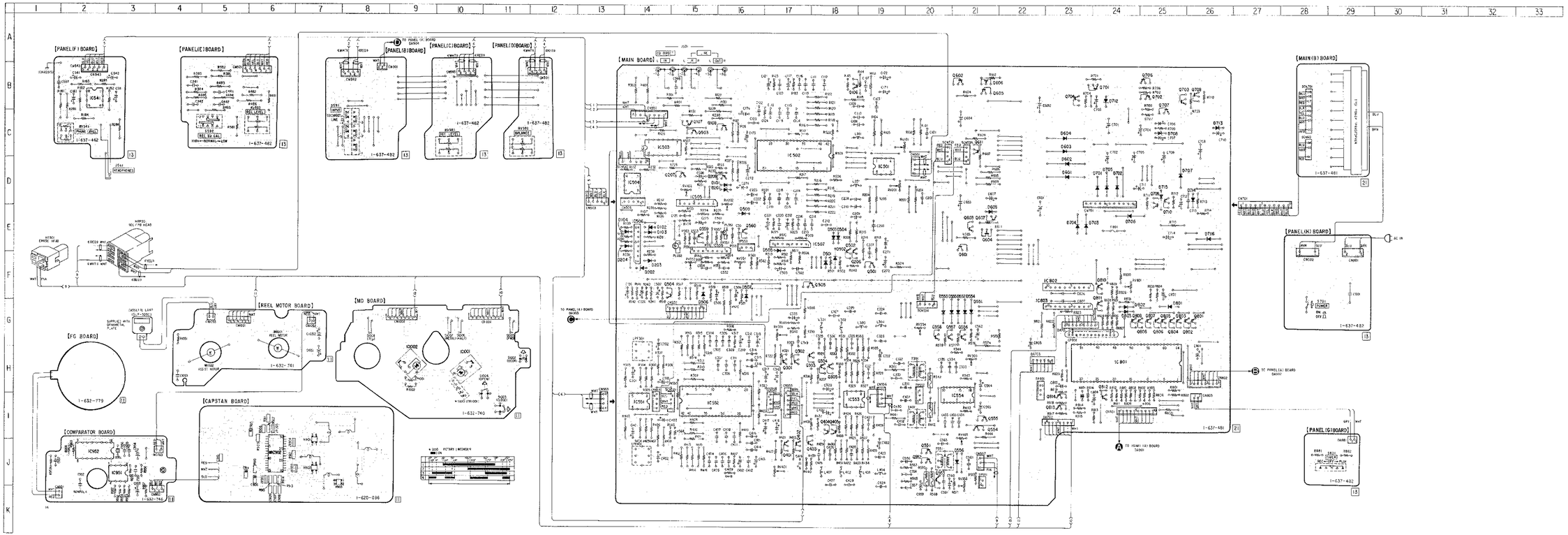
• See page 21 for Circuit Boards Location. • See page 26 for Semiconductor Lead Layouts.

• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D101	D-16	Q105	B-20
D102	E-14	Q106	B-18
D103	E-14	Q107	C-15
D104	E-13	Q108	C-15
D201	D-16	Q201	E-19
D202	H-14	Q202	E-19
D203	F-14	Q203	E-20
D204	E-13	Q204	E-20
D501	F-18	Q205	E-20
D502	F-18	Q206	F-18
D503	E-18	Q207	D-15
D504	E-18	Q208	D-16
D505	F-17	Q301	H-17
D506	F-15	Q302	H-17
D507	F-16	Q303	H-17
D508	F-14	Q304	H-18
D509	E-16	Q305	H-18
D551	G-21	Q306	H-19
D552	G-21	Q401	J-17
D553	G-20	Q402	J-17
D554	G-21	Q403	J-17
D555	G-20	Q404	I-18
D556	J-21	Q405	I-18
D601	D-23	Q406	I-19
D602	D-23	Q501	F-19
D603	C-23	Q502	F-18
D604	C-23	Q503	C-15
D605	E-21	Q504	H-14
D701	D-24	Q505	F-17
D702	D-24	Q551	J-20
D703	E-23	Q552	J-20
D704	E-23	Q553	J-20
D705	D-24	Q554	I-21
D706	E-24	Q555	I-21
D707	D-25	Q556	G-21
D708	B-25	Q557	G-20
D712	B-24	Q558	G-20
D713	C-26	Q559	E-15
D714	D-26	Q560	E-16
D715	D-25	Q601	E-21
D716	E-26	Q602	B-21
D801	G-25	Q603	E-21
D802	G-24	Q604	E-21
D803	G-24	Q605	B-21
		Q606	B-21
IC501	D-19	Q607	E-21
IC502	C-17	Q611	C-21
IC503	D-14	Q701	B-23
IC504	D-14	Q702	B-24
IC505	D-15	Q703	B-25
IC506	E-14	Q704	B-23
IC507	E-17	Q706	B-24
IC541	B-2	Q707	B-25
IC551	I-14	Q708	B-26
IC552	I-15	Q709	D-25
IC553	I-18	Q710	D-25
IC554	I-21	Q801	G-26
IC555	E-15	Q802	G-25
IC801	H-24	Q803	G-25
IC802	F-23	Q804	G-25
IC803	G-23	Q805	G-25
IC902A	J-6	Q806	G-25
IC951	J-3	Q807	G-25
IC952	J-2	Q808	G-24
IC1001	H-10	Q809	G-24
IC1002	H-9	Q810	F-24
		Q811	G-24
Q101	B-20	Q812	I-24
Q102	B-19	Q813	I-23
Q103	B-20	Q814	I-23
Q104	B-20		

Note on Mounting Diagram:

- ○—— : parts extracted from the component side.
- ■ : parts mounted on the conductor side.



4-7. SCHEMATIC DIAGRAM – MAIN SECTION – • See page 22 for IC Block Diagrams.

Note on Schematic Diagram:

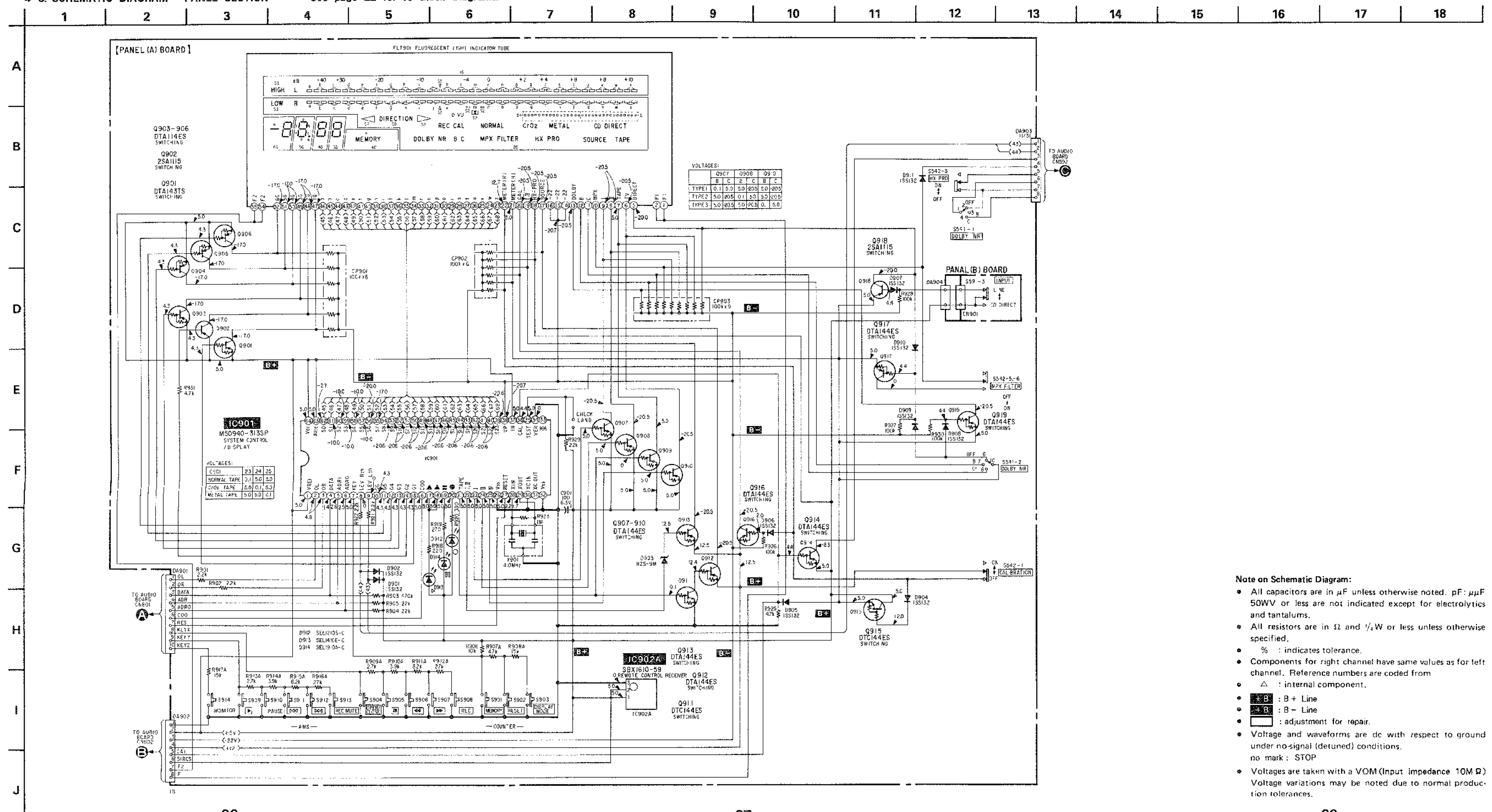
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- % : indicates tolerance.
- Components for right channel have same values as for left channel. Reference numbers are coded from 200.
- △ : internal component.
- [symbol] : nonflammable resistor.
- [symbol] : fusible resistor.

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

- +B : B+ Line
- +B : B− Line
- [ ] : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : STOP
- Voltages are taken with a VOM (Input impedance 10M Ω) Voltage variations may be noted due to normal production tolerances.
- Signal path.
  - ⊳ : PB
  - ⊳⊳ : REC

4-8. SCHEMATIC DIAGRAM – PANEL SECTION –

• See page 22 for IC Block Diagrams.

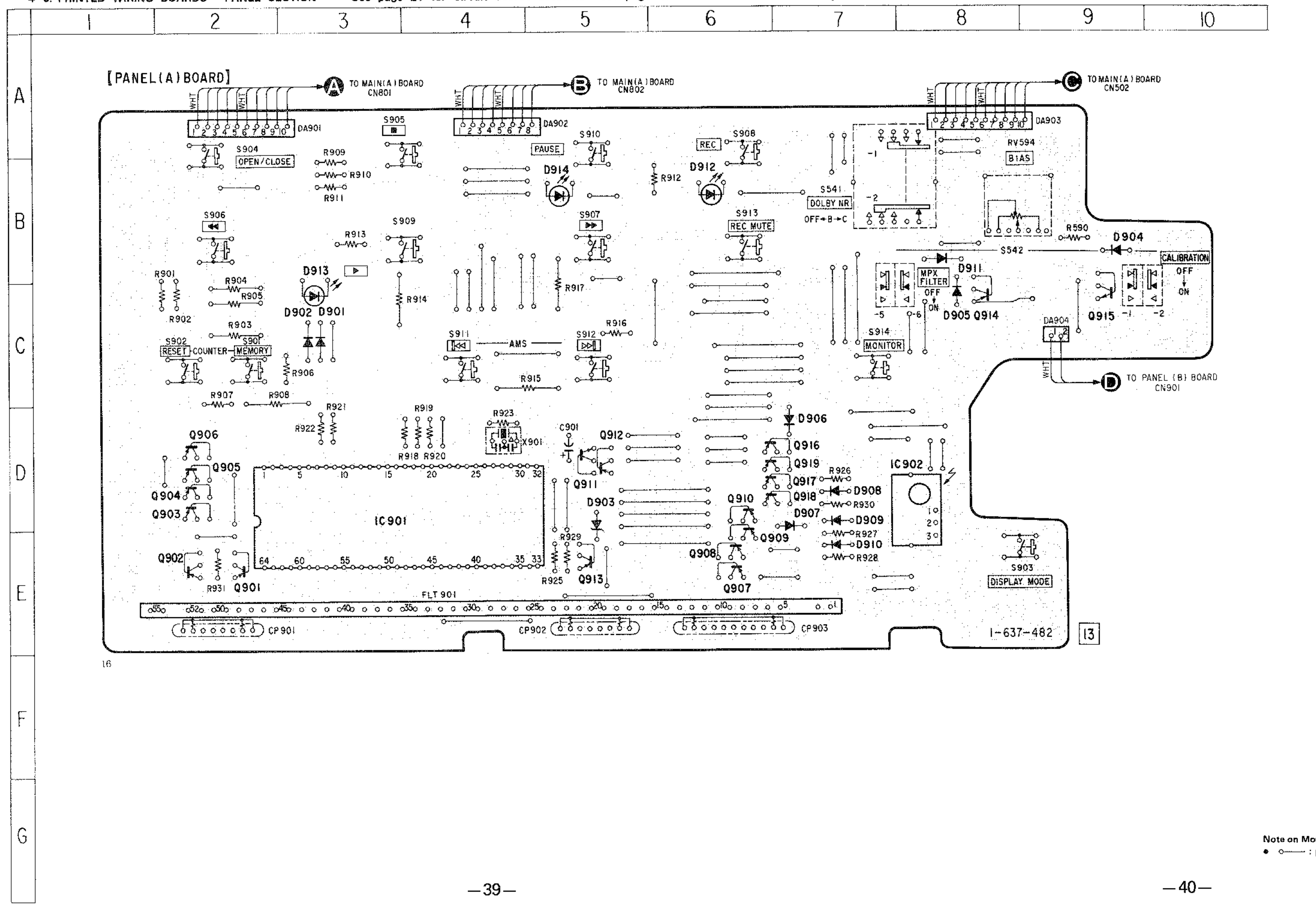


Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- % : indicates tolerance.
- Components for right channel have same values as for left channel. Reference numbers are coded from
- △ : internal component.
- +B : B + Line
- +B : B – Line
- ▭ : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : STOP
- Voltages are taken with a VOM (Input impedance 10M Ω) Voltage variations may be noted due to normal production tolerances.

4-9. PRINTED WIRING BOARDS – PANEL SECTION –

• See page 21 for Circuit Boards Location. • See page 26 for Semiconductor Lead Layouts.



• Semiconductor Location

Ref. No.	Location
D901	C-3
D902	C-3
D903	D-5
D904	B-9
D905	C-8
D906	D-7
D907	D-7
D908	D-7
D909	D-7
D910	E-7
D911	B-8
D912	B-6
D913	C-3
D914	B-5
IC901	D-3
IC902B	D-8
Q901	E-2
Q902	E-2
Q903	D-2
Q904	D-2
Q905	D-2
Q906	D-2
Q907	E-6
Q908	E-6
Q909	E-6
Q910	D-6
Q911	D-5
Q912	D-5
Q913	E-5
Q914	C-8
Q915	C-9
Q916	D-7
Q917	D-7
Q918	D-7
Q919	D-7

Note on Mounting Diagram:

- ○— : parts extracted from the component side.

SECTION 5
EXPLODED VIEWS

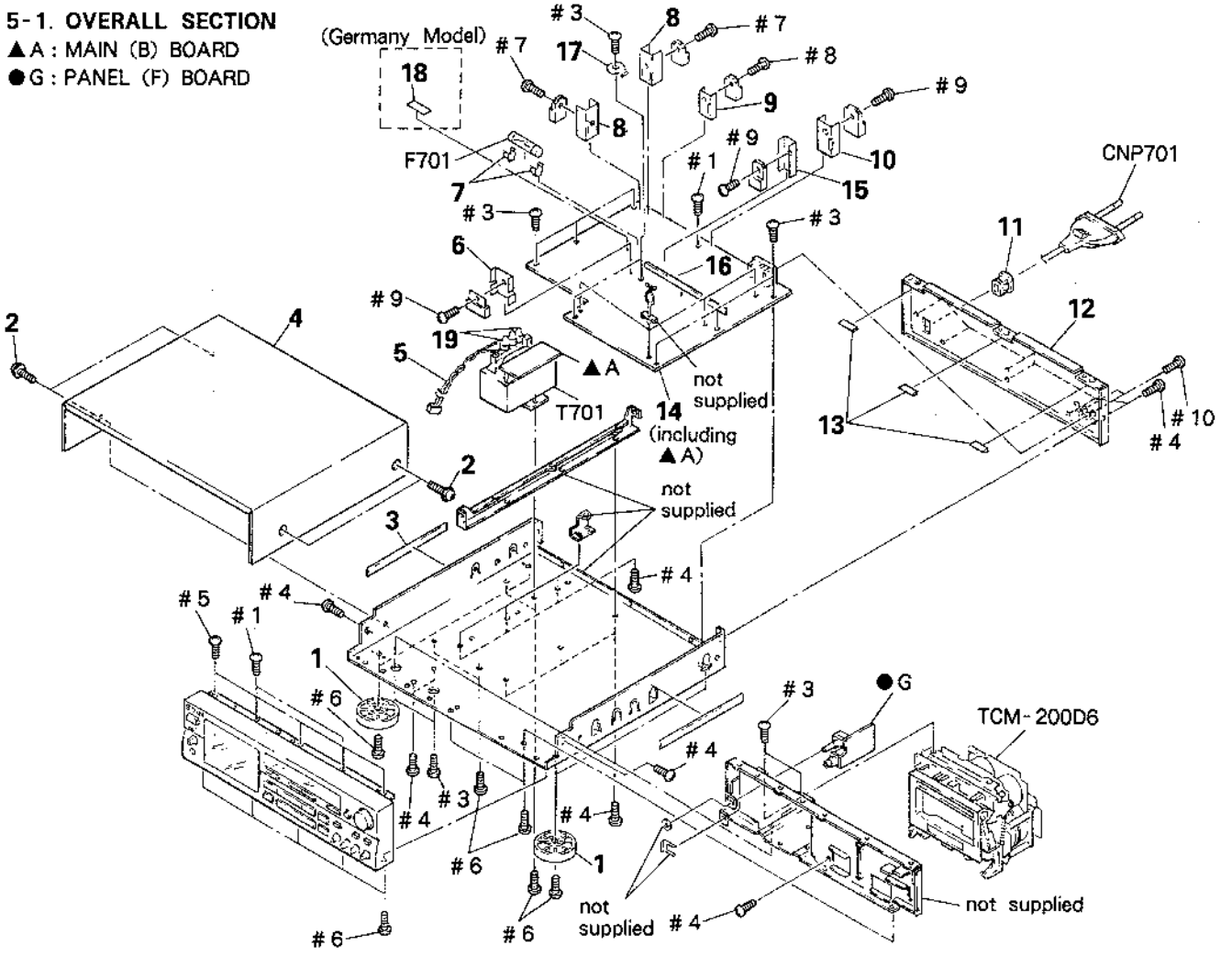
NOTE :

- – XX, – X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts
  Example :
  KNOB, BALANCE (WHITE)...(RED)
  ↑ Parts color ↑ Cabinet's 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

▲A : MAIN (B) BOARD
●G : PANEL (F) BOARD

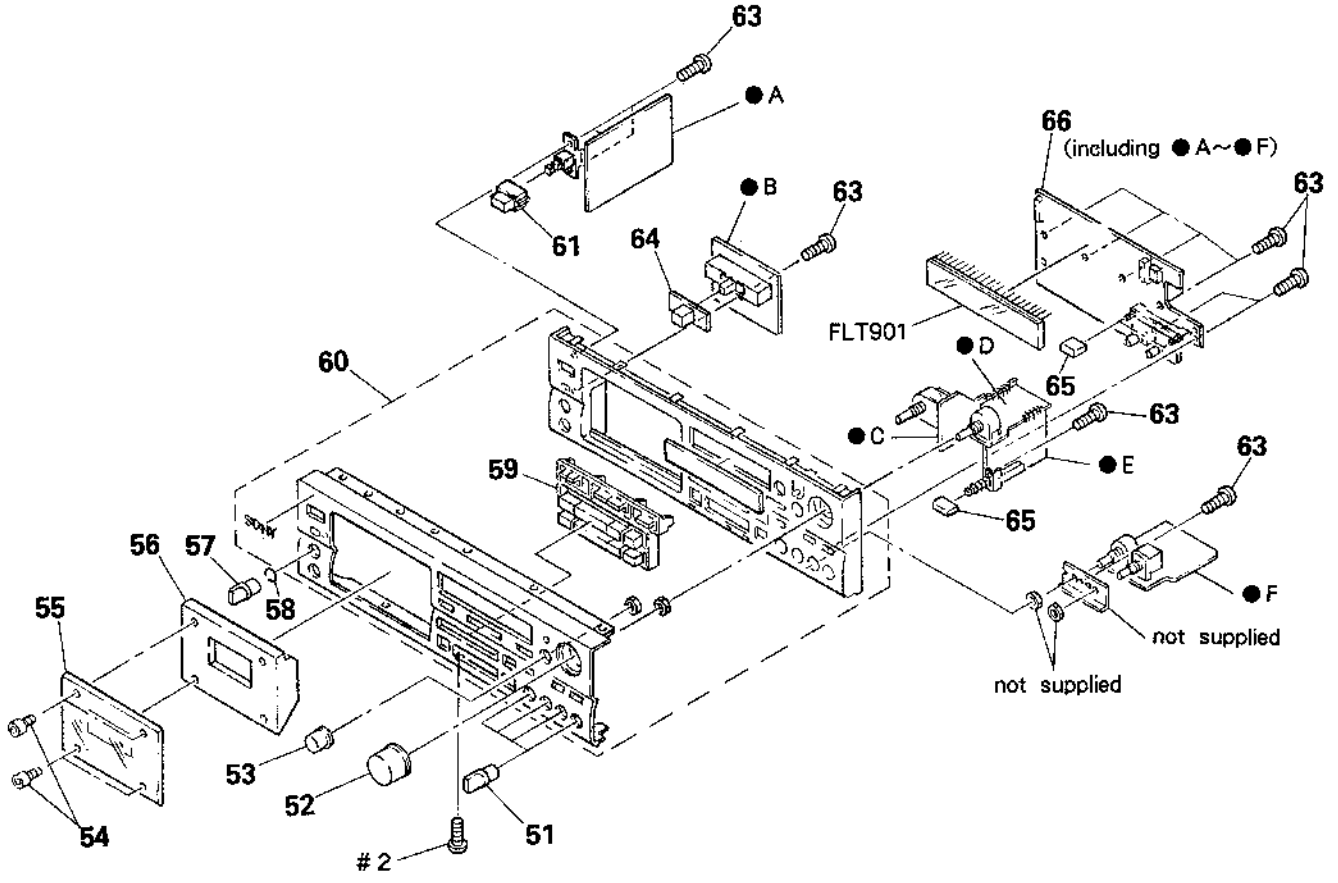


Ref. No.	Part No.	Description	Remark
1	X-3304-944-1	FOOT ASSY	
2	3-704-366-01	SCREW (CASE) (M3X8)	
3	* 3-657-780-00	CUSHION	
4	4-925-039-61	CASE	
5	* 1-590-321-51	LEAD (WITH CONNECTOR)	
6	* 3-356-925-01	HEAT SINK	
7	* 1-533-213-31	HOLDER, FUSE	
8	4-902-345-01	HEAT SINK	
9	* 3-309-144-21	HEAT SINK	
10	* 4-880-403-11	HEAT SINK	
11	* 3-703-244-00	BUSHING (2104), CORD	

Ref. No.	Part No.	Description	Remark
12	* 3-350-460-81	PANEL, BACK (AEP)	
	* 3-350-460-91	PANEL, BACK (Germany)	
13	3-831-441-XX	CUSHION, SPEAKER	
14	* A-2006-514-A	MAIN BOARD	
15	* 4-880-403-21	HEAT SINK	
16	* 1-560-242-91	BUS BAR 10P	
17	4-870-539-00	PLATE, GROUND	
18	3-701-947-12	CABEL (T1.25A), FUSE (Germany)	
19	* 4-912-962-01	COVER (1P), TERMINAL	
CNP701	1-575-651-11	CORD, POWER	
F701	1-532-285-00	FUSE, TIME-LAG	
T701	1-450-512-11	TRANSFORMER, POWER	

5-2. PANEL SECTION

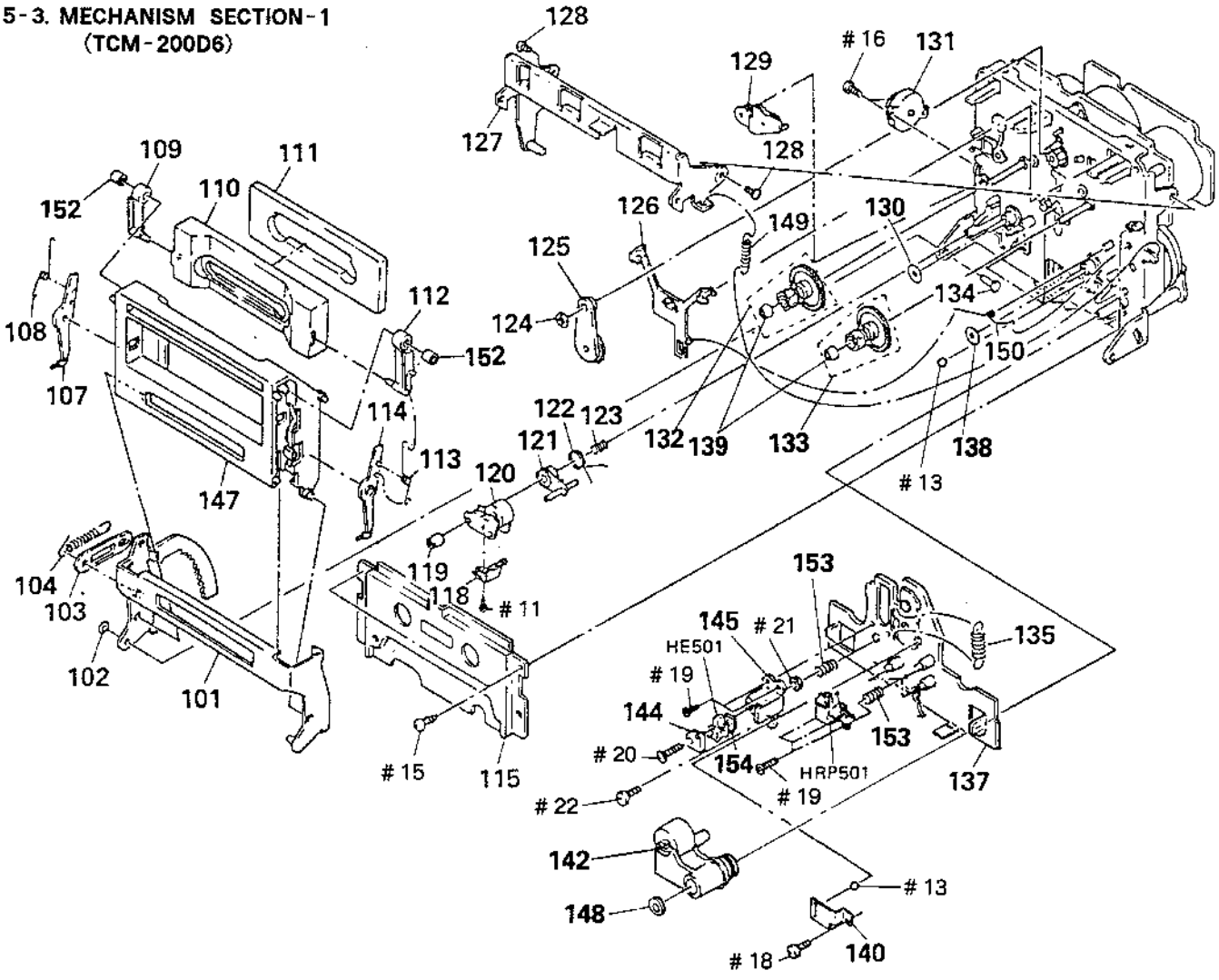
- ● A : PANEL (H)
- ● B : PANEL (G)
- ● C : PANEL (D)
- ● D : PANEL (C)
- ● E : PANEL (B)
- ● F : PANEL (E)



Ref. No.	Part No.	Description	Remark
51	X-3362-818-1	KNOB (DIA.12) ASSY (B), SQUARE	
52	X-3362-289-1	KNOB (VOL) ASSY	
53	3-364-173-01	KNOB (BAL)	
54	3-356-942-01	SCREW (2.6X6), TAPPING	
55	3-364-177-21	WINDOW (CASSETTE)	
56	3-356-923-01	LID, CASSETTE	
57	3-354-931-01	KNOB (DIA.10)	
58	3-354-981-01	SPRING (SUS), RING	

Ref. No.	Part No.	Description	Remark
59	X-3362-290-1	BUTTON (BLOCK) ASSY	
60	A-2003-827-A	PANEL ASSY, FRONT	
61	3-354-912-01	KNOB, POWER	
63	4-928-635-01	SCREW, +BV (2.6X8) TAPPING	
64	4-922-518-01	KNOB (TIMER)	
65	3-364-165-01	BUTTON (14X5)	
66	* A-2006-515-A	PANEL BOARD	
FLT901	1-519-560-11	INDICATOR TUBE, FLUORESCENT	

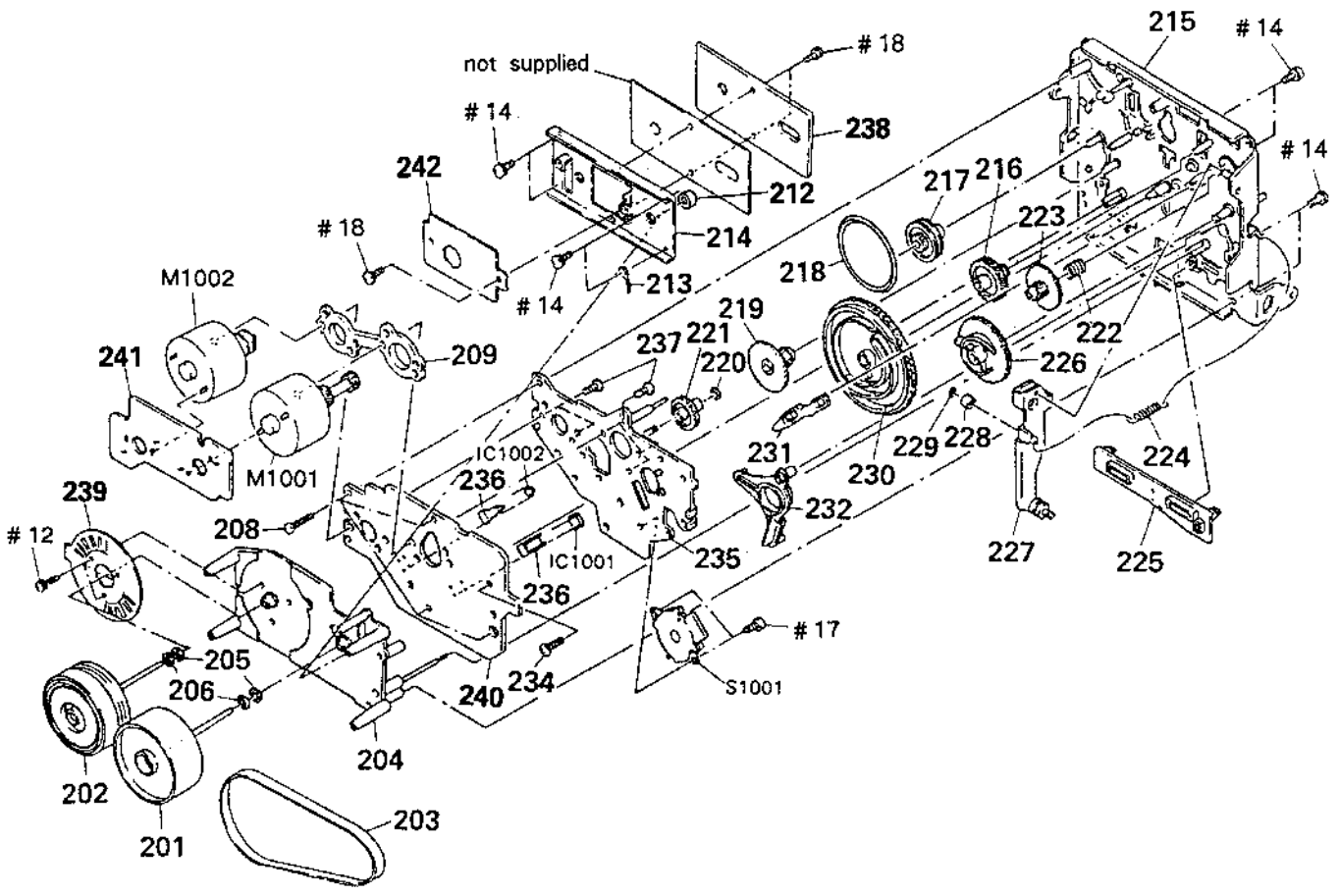
5-3. MECHANISM SECTION-1 (TCM-200D6)



Ref. No.	Part No.	Description	Remark
101	X-3362-671-1	HOLDER (BG) ASSY, CASSETTE	
102	3-558-708-21	WASHER, STOPPER	
103	* 3-356-717-01	LEVER (JOINT)	
104	3-356-626-01	SPRING, TENSION	
107	3-356-932-01	LEVER (LA)	
108	3-356-927-01	SPRING (LEFT), TORSION	
109	3-356-933-01	LEVER (LB)	
110	3-356-928-01	PLATE (A), ORNAMENTAL	
111	3-356-731-01	ABSORBENT, VIBRATION	
112	3-356-931-01	LEVER (RB)	
113	3-356-926-01	SPRING (RIGHT), TORSION	
114	3-356-930-01	LEVER (RA)	
115	X-3356-613-1	PLATE ASSY, ORNAMENTAL	
118	3-564-138-00	GUIDE (S), TAPE	
119	3-356-652-01	NUT (PINCH LEVER S)	
120	X-3356-621-1	LEVER (PINCH LEVER S) ASSY	
121	3-356-660-01	LEVER (PS)	
122	3-356-661-01	SPRING (PINCH LEVER S), TORSION	
123	3-356-657-01	SPRING (PS), COMPRESSION	
124	3-669-465-00	WASHER (1.5), STOPPER	
125	X-3356-641-1	LEVER (FR2) ASSY	
126	3-356-614-01	SLIDER (BRAKE)	
127	* X-3356-608-1	LEVER (LIFTER) ASSY	
128	3-356-601-11	SCREW, STEP	
129	X-3356-623-1	LEVER (BT) ASSY	

Ref. No.	Part No.	Description	Remark
130	3-356-713-01	WASHER	
131	3-319-224-31	DAMPER, SMALL	
132	X-3356-629-1	GEAR (S) ASSY	
133	X-3356-627-1	GEAR (T) ASSY	
134	3-356-710-01	SHAFT (LEFT) (CASSETTE HOLDER)	
135	3-356-658-01	SPRING (LIMITER H), TENSION	
137	* X-3362-199-1	SLIDER (HEAD CHASSIS D) ASSY	
138	3-332-763-01	RING, OIL RESERVOIR	
139	3-362-308-01	CAP (REEL)	
140	3-356-656-01	SPRING (HEAD PC BOARD), LEAF	
142	X-3356-620-1	LEVER (PINCH LEVER T) ASSY	
144	3-318-433-01	SPRING	
145	* 3-576-977-00	BRACKET, E HEAD	
147	X-3356-611-1	HOLDER (A) ASSY, CASSETTE	
148	3-669-596-00	WASHER (2.3), STOPPER	
149	3-356-625-01	SPRING, TENSION	
150	3-356-619-01	SPRING (B), TORSION	
152	3-356-946-01	BUSHING	
153	3-564-121-00	SPRING, COMPRESSION	
154	* 1-608-268-00	ERASE HEAD BOARD	
HE501	1-543-358-11	HEAD, MAGNETIC (ERASE)	
HRP501	1-543-742-11	HEAD, MAGNETIC (RECORD/PLAYBACK)	

5-4. MECHANISM SECTION-2 (TCM-200D6)



Ref. No.	Part No.	Description	Remark
201	X-3362-284-1	FLYWHEEL (S2.3) ASSY	
202	X-3356-619-1	FLYWHEEL (DT) ASSY	
203	3-364-600-01	BELT (CAPSTAN)	
204	X-3362-281-1	CHASSIS (D2.3) ASSY	
205	3-356-705-31	WASHER (CAPSTAN)	
206	3-356-705-21	WASHER (CAPSTAN)	
208	3-355-801-01	SCREW (BTP 2X18)	
209	* 3-356-628-01	SPACER (MOTOR)	
212	3-364-135-01	RETAINER (S), THRUST	
213	* 3-701-822-00	HOLDER, WIRE	
214	* X-3362-282-1	BRACKET (THRUST RETAINER) ASSY	
215	X-3356-622-1	CHASSIS (C) ASSY, MECHANICAL	
216	3-356-703-01	GEAR (COMMUNICATION C)	
217	3-356-607-01	PULLEY (MODE)	
218	3-356-603-01	BELT (MODE)	
219	3-356-606-01	GEAR (MODE)	
220	3-669-465-11	WASHER (1.5), STOPPER	
221	3-356-702-01	GEAR (COMMUNICATION B)	
222	3-356-605-01	SPRING, COMPRESSION	
223	3-356-609-01	GEAR (LOADING)	
224	3-356-624-01	SPRING, TENSION	

Ref. No.	Part No.	Description	Remark
225	3-356-653-01	SLIDER (PAUSE)	
226	3-356-616-01	GEAR (LOADING CAM)	
227	* X-3356-606-1	LEVER (LOADING) ASSY	
228	3-356-630-01	ROLLER (LOADING)	
229	3-558-708-11	WASHER, STOPPER	
230	3-356-654-01	GEAR (MODE CAM C)	
231	3-356-617-01	LEVER (SELECTION)	
232	3-356-613-01	LEVER (MODE)	
234	3-355-707-01	SCREW (+PTPWH 2X25)	
235	* X-3356-616-4	BRACKET (MOTOR D) ASSY	
236	3-356-631-01	HOLDER(SENSOR)	
237	3-363-804-01	SCREW (+P 2.6X6.5)	
238	A-2006-154-A	CAPSTAN C.O.C BOARD	
239	1-632-779-11	PC BOARD, FG	
240	* 1-632-740-11	MD BOARD	
241	* 1-632-741-11	REAL MOTOR BOARD	
242	* 1-632-745-11	COMPARATOR BOARD	
M1001	X-3356-638-1	MOTOR (REEL R) ASSY	
M1002	X-3356-604-1	MOTOR (ASSIST) ASSY	
S1001	1-466-238-11	ENCODER, ROTARY	

SECTION 6
ELECTRICAL PARTS LIST

CAPSTAN C.O.C
COMPARATOR MD

NOTE :

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.

- Due to standardization, replacements in the parts list may be defferent from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the 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 : μ, for example :
  uA... : μA... , uPA... , μPA... ,
  uPB... , μPB... , uPC... , μPC... ,
  uPD..., μPD...
- CAPACITORS :
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description				Remark
	A-2006-154-A	CAPSTAN C.O.C BOARD				
		**********				
	1-216-296-00	METAL CHIP	0	5%	1/8W	
		(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	
		(IC)				
IC902	8-752-017-40	IC CX20174-T1				
		(TRANSISTOR)				
H901	8-719-403-79	OH009-TW				
H902	8-719-403-79	OH009-TW				
H903	8-719-403-79	OH009-TW				
		(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	
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	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	

Ref. No.	Part No.	Description				Remark
		(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	
		(CRYSTAL)				
X951	1-577-615-11	VIBRATOR, CRYSTAL(4.934MHz)				
**********						
	* 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				
TB1001	* 1-569-066-11	PIN, CONNECTOR 5P				
		(IC)				
IC1001	8-749-920-97	IC PHOTO REFLECTOR GP2S22B				
IC1002	8-749-920-97	IC PHOTO REFLECTOR GP2S22B				
		(RESISTOR)				
R1001	1-249-408-11	CARBON	180	5%	1/4W	
R1002	1-249-408-11	CARBON	180	5%	1/4W	

MD MAIN

Ref. No.	Part No.	Description				Remark
		(SWITCH)				
S1002	1-570-953-11	SWITCH, PUSH(1 KEY)				
S1003	1-571-958-11	SWITCH, PUSH(1 KEY)				
S1004	1-572-126-11	SWITCH, PUSH(1 KEY)				
S1005	1-572-125-11	SWITCH, LEAF				
S1006	1-572-202-11	SWITCH, LEAF				
S1007	1-572-125-11	SWITCH, LEAF				
S1008	1-572-125-11	SWITCH, LEAF				
**********						
	* A-2006-514-A	MAIN BOARD				
		**********				
	* 1-533-213-31	HOLDER, FUSE				
	* 1-560-242-91	BUS BAR 10P				
	7-682-147-15	SCREW, TR				
	4-902-345-01	HEAT SINK				
	* 3-309-144-21	HEAT SINK				
	* 3-356-925-01	HEAT SINK				
	4-870-539-00	PLATE, GROUND				
	* 4-880-403-11	HEAT SINK				
	7-682-548-09	SCREW +B 3X8				
	7-682-547-04	SCREW +BVTT 3X6(S)				
		(CAPACITOR)				
C101	1-110-340-11	MYLAR	270PF	5%	50V	
C103	1-136-157-00	FILM	0.022uF	5%	50V	
C107	1-136-159-00	FILM	0.033uF	5%	50V	
C108	1-102-966-00	CERAMIC	43PF	5%	50V	
C109	1-130-474-00	MYLAR	0.0018uF	5%	50V	
C110	1-130-474-00	MYLAR	0.0018uF	5%	50V	
C111	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C112	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C113	1-130-478-00	MYLAR	0.0039uF	5%	50V	
C114	1-136-173-00	FILM	0.47uF	5%	50V	
C115	1-136-167-00	FILM	0.15uF	5%	50V	
C116	1-136-155-00	FILM	0.015uF	5%	50V	
C117	1-124-903-11	ELECT	1uF	20%	50V	
C118	1-136-169-00	FILM	0.22uF	5%	50V	
C119	1-136-163-00	FILM	0.068uF	5%	50V	
C120	1-136-162-00	FILM	0.056uF	5%	50V	
C121	1-124-903-11	ELECT	1uF	20%	50V	
C122	1-130-480-00	MYLAR	0.0056uF	5%	50V	
C123	1-136-153-00	FILM	0.01uF	5%	50V	
C125	1-136-165-00	FILM	0.1uF	5%	50V	
C126	1-123-382-00	ELECT	3.3uF	20%	100V	
C171	1-126-049-11	ELECT	22uF	20%	50V	
C172	1-126-049-11	ELECT	22uF	20%	50V	
C173	1-126-049-11	ELECT	22uF	20%	50V	
C174	1-126-049-11	ELECT	22uF	20%	50V	
C201	1-110-340-11	MYLAR	270PF	5%	50V	
C203	1-136-157-00	FILM	0.022uF	5%	50V	
C207	1-136-159-00	FILM	0.033uF	5%	50V	
C208	1-102-966-00	CERAMIC	43PF	5%	50V	
C209	1-130-474-00	MYLAR	0.0018uF	5%	50V	
C210	1-130-474-00	MYLAR	0.0018uF	5%	50V	
C211	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C212	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C213	1-130-478-00	MYLAR	0.0039uF	5%	50V	
C214	1-136-173-00	FILM	0.47uF	5%	50V	

Ref. No.	Part No.	Description				Remark
C215	1-136-167-00	FILM	0.15uF	5%	50V	
C216	1-136-155-00	FILM	0.015uF	5%	50V	
C217	1-124-903-11	ELECT	1uF	20%	50V	
C218	1-136-169-00	FILM	0.22uF	5%	50V	
C219	1-136-163-00	FILM	0.068uF	5%	50V	
C220	1-136-162-00	FILM	0.056uF	5%	50V	
C221	1-124-903-11	ELECT	1uF	20%	50V	
C222	1-130-480-00	MYLAR	0.0056uF	5%	50V	
C223	1-136-153-00	FILM	0.01uF	5%	50V	
C225	1-124-925-11	ELECT	2.2uF	20%	100V	
C226	1-123-382-00	ELECT	3.3uF	20%	100V	
C271	1-126-049-11	ELECT	22uF	20%	50V	
C272	1-126-049-11	ELECT	22uF	20%	50V	
C273	1-126-049-11	ELECT	22uF	20%	50V	
C274	1-126-049-11	ELECT	22uF	20%	50V	
C301	1-126-163-11	ELECT	4.7uF	20%	50V	
C302	1-126-163-11	ELECT	4.7uF	20%	50V	
C303	1-126-163-11	ELECT	4.7uF	20%	50V	
C304	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C305	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C306	1-130-478-00	MYLAR	0.0039uF	5%	50V	
C307	1-136-173-00	FILM	0.47uF	5%	50V	
C308	1-136-167-00	FILM	0.15uF	5%	50V	
C309	1-136-155-00	FILM	0.015uF	5%	50V	
C310	1-124-903-11	ELECT	1uF	20%	50V	
C311	1-136-169-00	FILM	0.22uF	5%	50V	
C312	1-136-162-00	FILM	0.056uF	5%	50V	
C313	1-124-903-11	ELECT	1uF	20%	50V	
C314	1-136-163-00	FILM	0.068uF	5%	50V	
C315	1-130-480-00	MYLAR	0.0056uF	5%	50V	
C316	1-136-153-00	FILM	0.01uF	5%	50V	
C317	1-126-059-11	ELECT	10uF	20%	50V	
C318	1-126-059-11	ELECT	10uF	20%	50V	
C319	1-130-474-00	MYLAR	0.0018uF	5%	50V	
C320	1-126-059-11	ELECT	10uF	20%	50V	
C321	1-136-161-00	FILM	0.047uF	5%	50V	
C322	1-126-049-11	ELECT	22uF	20%	50V	
C323	1-110-338-51	MYLAR	180PF	5%	50V	
C324	1-136-935-11	FILM	22PF	5%	630V	
C325	1-136-155-00	FILM	0.015uF	5%	50V	
C326	1-136-155-00	FILM	0.015uF	5%	50V	
C327	1-136-156-00	FILM	0.018uF	5%	50V	
C328	1-136-155-00	FILM	0.015uF	5%	50V	
C329	1-136-156-00	FILM	0.018uF	5%	50V	
C330	1-136-433-11	FILM	100PF	5%	630V	
C331	1-136-803-11	FILM	560PF	5%	630V	
C332	1-130-468-00	MYLAR	560PF	5%	50V	
C333	1-136-153-00	FILM	0.01uF	5%	50V	
C334	1-136-157-00	FILM	0.022uF	5%	50V	
C335	1-136-165-00	FILM	0.1uF	5%	50V	
C401	1-126-163-11	ELECT	4.7uF	20%	50V	
C402	1-126-163-11	ELECT	4.7uF	20%	50V	
C403	1-126-163-11	ELECT	4.7uF	20%	50V	
C404	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C405	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C406	1-130-478-00	MYLAR	0.0039uF	5%	50V	
C407	1-136-173-00	FILM	0.47uF	5%	50V	
C408	1-136-167-00	FILM	0.15uF	5%	50V	
C409	1-136-155-00	FILM	0.015uF	5%	50V	
C410	1-124-903-11	ELECT	1uF	20%	50V	

Ref. No.	Part No.	Description				Remark
C411	1-136-169-00	FILM	0.22uF	5%	50V	
C412	1-136-162-00	FILM	0.056uF	5%	50V	
C413	1-124-903-11	ELECT	1uF	20%	50V	
C414	1-136-163-00	FILM	0.068uF	5%	50V	
C415	1-130-480-00	MYLAR	0.0056uF	5%	50V	
C416	1-136-153-00	FILM	0.01uF	5%	50V	
C417	1-126-059-11	ELECT	10uF	20%	50V	
C418	1-126-059-11	ELECT	10uF	20%	50V	
C419	1-130-474-00	MYLAR	0.0018uF	5%	50V	
C420	1-126-059-11	ELECT	10uF	20%	50V	
C421	1-136-161-00	FILM	0.047uF	5%	50V	
C422	1-126-049-11	ELECT	22uF	20%	50V	
C423	1-110-338-51	MYLAR	180PF	5%	50V	
C424	1-136-935-11	FILM	22PF	5%	630V	
C425	1-136-155-00	FILM	0.015uF	5%	50V	
C426	1-136-155-00	FILM	0.015uF	5%	50V	
C427	1-136-156-00	FILM	0.018uF	5%	50V	
C428	1-136-155-00	FILM	0.015uF	5%	50V	
C429	1-136-156-00	FILM	0.018uF	5%	50V	
C430	1-136-433-11	FILM	100PF	5%	630V	
C431	1-136-803-11	FILM	560PF	5%	630V	
C432	1-130-468-00	MYLAR	560PF	5%	50V	
C433	1-136-153-00	FILM	0.01uF	5%	50V	
C434	1-136-157-00	FILM	0.022uF	5%	50V	
C435	1-136-165-00	FILM	0.1uF	5%	50V	
C501	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C502	1-136-165-00	FILM	0.1uF	5%	50V	
C503	1-124-902-00	ELECT	0.47uF	20%	50V	
C505	1-124-907-11	ELECT	10uF	20%	50V	
C506	1-124-925-11	ELECT	2.2uF	20%	100V	
C507	1-124-925-11	ELECT	2.2uF	20%	100V	
C508	1-124-477-11	ELECT	47uF	20%	25V	
C551	1-136-157-00	FILM	0.022uF	5%	50V	
C552	1-136-157-00	FILM	0.022uF	5%	50V	
C553	1-130-474-00	MYLAR	0.0018uF	5%	50V	
C554	1-130-474-00	MYLAR	0.0018uF	5%	50V	
C555	1-124-925-11	ELECT	2.2uF	20%	100V	
C556	1-136-228-11	FILM	0.0012uF	5%	100V	
C557	1-136-233-11	FILM	0.0047uF	5%	100V	
C558	1-136-228-11	FILM	0.0012uF	5%	100V	
C559	1-124-907-11	ELECT	10uF	20%	50V	
C560	1-124-925-11	ELECT	2.2uF	20%	100V	
C561	1-136-559-11	FILM	0.0047uF	5%	630V	
C562	1-124-907-11	ELECT	10uF	20%	50V	
C563	1-107-045-00	MICA	3.9PF		500V	
C564	1-126-059-11	ELECT	10uF	20%	50V	
C565	1-124-477-11	ELECT	47uF	20%	25V	
C591	1-162-282-31	CERAMIC	100PF	10%	50V	
C598	1-161-494-00	CERAMIC	0.022uF		25V	
C601	1-124-636-00	ELECT	3300uF	20%	25V	
C602	1-124-636-00	ELECT	3300uF	20%	25V	
C603	1-124-922-11	ELECT	1000uF	20%	63V	
C604	1-124-922-11	ELECT	1000uF	20%	63V	
C607	1-124-130-00	ELECT	100uF	20%	63V	
C701	1-124-887-00	ELECT	3300uF	20%	16V	
C702	1-124-471-00	ELECT	1000uF	20%	6.3V	
C703	1-124-927-11	ELECT	4.7uF	20%	100V	
C704	1-126-105-11	ELECT	1000uF	20%	35V	
C705	1-124-473-11	ELECT	1000uF	20%	10V	
C706	1-124-927-11	ELECT	4.7uF	20%	100V	

Ref. No.	Part No.	Description				Remark
C707	1-124-927-11	ELECT	4.7uF	20%	100V	
C708	1-126-955-11	ELECT	4700uF	20%	35V	
C709	1-124-556-11	ELECT	2200uF	20%	16V	
C710	1-124-927-11	ELECT	4.7uF	20%	100V	
C711	1-124-122-11	ELECT	100uF	20%	50V	
C712	1-124-477-11	ELECT	47uF	20%	25V	
C713	1-164-159-11	CERAMIC	0.1uF		50V	
C714	1-124-927-11	ELECT	4.7uF	20%	100V	
C801	1-124-443-00	ELECT	100uF	20%	10V	
C802	1-124-472-11	ELECT	470uF	20%	10V	
C803	1-124-477-11	ELECT	47uF	20%	25V	
C804	1-124-927-11	ELECT	4.7uF	20%	100V	
C805	1-124-907-11	ELECT	10uF	20%	50V	
C806	1-164-159-11	CERAMIC	0.1uF		50V	
C807	1-164-159-11	CERAMIC	0.1uF		50V	
		＜ CONNECTOR ＞				
CN501	* 1-560-062-00	PIN, CONNECTOR 4P				
CN502	* 1-564-666-11	PIN, CONNECTOR 10P				
CN503	* 1-560-063-00	PIN, CONNECTOR 5P				
CN551	* 1-564-510-11	PLUG, CONNECTOR 7P				
CN553	* 1-564-507-11	PLUG, CONNECTOR 4P				
CN555	* 1-564-509-11	PLUG, CONNECTOR 6P				
CN556	* 1-560-062-00	PIN, CONNECTOR 4P				
CN557	* 1-560-061-00	PIN, CONNECTOR 3P				
CN701	* 1-564-514-11	PLUG, CONNECTOR 11P				
CN801	* 1-564-666-11	PIN, CONNECTOR 10P				
CN802	* 1-564-342-11	PIN, CONNECTOR 8P				
CN803	* 1-564-338-00	PIN, CONNECTOR 2P				
		＜ COMPOSITION ＞				
CP801	1-236-984-11	COMPOSITION CIRCUIT BLOCK				
		＜ DIODE ＞				
D101	8-719-912-20	DIODE	1SS120			
D102	8-719-000-54	DIODE	UZL-6L3			
D103	8-719-912-20	DIODE	1SS120			
D104	8-719-912-20	DIODE	1SS120			
D201	8-719-912-20	DIODE	1SS120			
D202	8-719-000-54	DIODE	UZL-6L3			
D203	8-719-912-20	DIODE	1SS120			
D204	8-719-912-20	DIODE	1SS120			
D501	8-719-912-20	DIODE	1SS120			
D502	8-719-912-20	DIODE	1SS120			
D503	8-719-912-20	DIODE	1SS120			
D504	8-719-912-20	DIODE	1SS120			
D505	8-719-912-20	DIODE	1SS120			
D506	8-719-912-20	DIODE	1SS120			
D507	8-719-912-20	DIODE	1SS120			
D509	8-719-912-20	DIODE	1SS120			
D551	8-719-912-20	DIODE	1SS120			
D552	8-719-912-20	DIODE	1SS120			
D553	8-719-912-20	DIODE	1SS120			
D554	8-719-912-20	DIODE	1SS120			
D555	8-719-912-20	DIODE	1SS120			
D556	8-719-912-20	DIODE	1SS120			
D601	8-719-230-02	DIODE	30DF2			
D602	8-719-230-02	DIODE	30DF2			
D603	8-719-230-02	DIODE	30DF2			

MAIN

Ref. No.	Part No.	Description	Remark
D604	8-719-230-02	DIODE 30DF2	
D605	8-719-933-41	DIODE HZS6C3L	
D701	8-719-200-77	DIODE 10E2N	
D702	8-719-200-77	DIODE 10E2N	
D703	8-719-200-77	DIODE 10E2N	
D704	8-719-200-77	DIODE 10E2N	
D705	8-719-200-77	DIODE 10E2N	
D706	8-719-200-77	DIODE 10E2N	
D707	8-719-200-77	DIODE 10E2N	
D708	8-719-933-41	DIODE HZS6C3L	
D712	8-719-933-41	DIODE HZS6C3L	
D713	8-719-001-79	DIODE UZL-12H1	
D714	8-719-015-02	DIODE UZP-8.2BB	
D715	8-719-200-77	DIODE 10E2N	
D716	8-719-912-20	DIODE 1SS120	
D801	8-719-200-77	DIODE 10E2N	
D802	8-719-912-20	DIODE 1SS120	
D803	8-719-912-20	DIODE 1SS120	
		(IC)	
IC501	8-759-602-01	IC M5220P	
IC502	8-752-018-80	IC CX20188	
IC503	8-759-000-49	IC MC14066BCP	
IC504	8-759-945-58	IC RC4558P	
IC505	8-759-634-50	IC M5218AL	
IC506	8-759-634-50	IC M5218AL	
IC507	8-759-634-50	IC M5218AL	
IC551	8-759-945-58	IC RC4558P	
IC552	8-752-018-80	IC CX20188	
IC553	8-759-710-59	IC NJM4580D-D	
IC554	8-759-106-56	IC uPC1297CA	
IC555	8-759-634-50	IC M5218AL	
IC801	8-759-635-69	IC M50964-226SP	
IC802	8-759-973-95	IC BA6219B	
IC803	8-759-822-09	IC LB1641	
		(JACK)	
J501	1-565-320-61	JACK, PIN 6P(CD DIRECT/LINE)	
		(COIL)	
L101	1-410-778-11	INDUCTOR 18mH	
L201	1-410-778-11	INDUCTOR 18mH	
L301	1-410-771-11	INDUCTOR 4.7mH	
L302	1-410-769-31	INDUCTOR 3.3mH	
L303	1-410-767-11	INDUCTOR 2.2mH	
L304	1-410-780-11	INDUCTOR 27mH	
L401	1-410-771-11	INDUCTOR 4.7mH	
L402	1-410-769-31	INDUCTOR 3.3mH	
L403	1-410-767-11	INDUCTOR 2.2mH	
L404	1-410-780-11	INDUCTOR 27mH	
		(FILTER)	
LPF301	1-236-087-11	FILTER, LOW PASS	
LPF401	1-236-087-11	FILTER, LOW PASS	
		(PILOT LAMP)	
PL551	1-518-471-31	LAMP, PILOT	
PL552	1-518-471-31	LAMP, PILOT	

Ref. No.	Part No.	Description	Remark
		(TRANSISTOR)	
Q106	8-729-922-37	TRANSISTOR 2SD2144S	
Q107	8-729-922-37	TRANSISTOR 2SD2144S	
Q108	8-729-922-37	TRANSISTOR 2SD2144S	
Q206	8-729-922-37	TRANSISTOR 2SD2144S	
Q207	8-729-922-37	TRANSISTOR 2SD2144S	
Q208	8-729-922-37	TRANSISTOR 2SD2144S	
Q301	8-729-922-37	TRANSISTOR 2SD2144S	
Q302	8-729-922-37	TRANSISTOR 2SD2144S	
Q303	8-729-922-37	TRANSISTOR 2SD2144S	
Q304	8-729-922-37	TRANSISTOR 2SD2144S	
Q305	8-729-922-37	TRANSISTOR 2SD2144S	
Q401	8-729-922-37	TRANSISTOR 2SD2144S	
Q402	8-729-922-37	TRANSISTOR 2SD2144S	
Q403	8-729-922-37	TRANSISTOR 2SD2144S	
Q404	8-729-922-37	TRANSISTOR 2SD2144S	
Q405	8-729-922-37	TRANSISTOR 2SD2144S	
Q501	8-729-922-37	TRANSISTOR 2SD2144S	
Q502	8-729-922-37	TRANSISTOR 2SD2144S	
Q503	8-729-900-89	TRANSISTOR DTC144ES	
Q504	8-729-900-80	TRANSISTOR DTC114ES	
Q505	8-729-900-89	TRANSISTOR DTC144ES	
Q551	8-729-194-57	TRANSISTOR 2SC945-P	
Q552	8-729-194-57	TRANSISTOR 2SC945-P	
Q553	8-729-281-52	TRANSISTOR 2SC1815-Y	
Q554	8-729-900-80	TRANSISTOR DTC114ES	
Q555	8-729-900-61	TRANSISTOR DTA114ES	
Q556	8-729-900-80	TRANSISTOR DTC114ES	
Q557	8-729-900-80	TRANSISTOR DTC114ES	
Q558	8-729-900-80	TRANSISTOR DTC114ES	
Q559	8-729-900-89	TRANSISTOR DTC144ES	
Q560	8-729-900-89	TRANSISTOR DTC144ES	
Q601	8-729-141-89	TRANSISTOR 2SD1585-LK	
Q602	8-729-141-83	TRANSISTOR 2SB1094-LK	
Q603	8-729-922-37	TRANSISTOR 2SD2144S-TP-UVW	
Q604	8-729-224-62	TRANSISTOR 2SK246-GR	
Q605	8-729-141-32	TRANSISTOR 2SA1409-LK	
Q606	8-729-224-62	TRANSISTOR 2SK246-GR	
Q607	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q611	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q701	8-729-111-55	TRANSISTOR 2SD1312-K	
Q702	8-729-111-55	TRANSISTOR 2SD1312-K	
Q703	8-729-111-55	TRANSISTOR 2SD1312-K	
Q704	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q706	8-729-922-37	TRANSISTOR 2SD2144S-TP-UVW	
Q707	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q708	8-729-922-37	TRANSISTOR 2SD2144S-TP-UVW	
Q709	8-729-140-04	TRANSISTOR 2SB1116A-L	
Q710	8-729-141-32	TRANSISTOR 2SA1409-LK	
Q801	8-729-900-65	TRANSISTOR DTA144ES	
Q802	8-729-900-65	TRANSISTOR DTA144ES	
Q803	8-729-900-65	TRANSISTOR DTA144ES	
Q804	8-729-900-65	TRANSISTOR DTA144ES	
Q805	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q806	8-729-900-65	TRANSISTOR DTA144ES	
Q807	8-729-900-65	TRANSISTOR DTA144ES	
Q808	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q809	8-729-900-65	TRANSISTOR DTA144ES	
Q810	8-729-119-76	TRANSISTOR 2SA1175-HFE	

Ref. No.	Part No.	Description				Remark
Q811	8-729-119-76	TRANSISTOR	2SA1175-HFE			
Q812	8-729-900-61	TRANSISTOR	DTA114ES			
Q813	8-729-620-05	TRANSISTOR	2SC2603-EF			
Q814	8-729-620-05	TRANSISTOR	2SC2603-EF			
		(RESISTOR)				
R101	1-249-721-11	CARBON	100K	5%	1/2W	
R102	1-247-740-11	CARBON	120	5%	1/2W	
R104	1-249-724-91	CARBON	130K	5%	1/2W	
R105	1-247-761-11	CARBON	5.6K	5%	1/2W	
R113	1-247-717-11	CARBON	2.2K	5%	1/4W	
R114	1-247-138-00	CARBON	2K	5%	1/4W	
R115	1-247-720-11	CARBON	3.9K	5%	1/4W	
R116	1-247-710-11	CARBON	560	5%	1/4W	
R117	1-247-725-11	CARBON	10K	5%	1/4W	
R118	1-247-148-00	CARBON	5.1K	5%	1/4W	
R119	1-247-718-11	CARBON	2.7K	5%	1/4W	
R120	1-246-545-00	CARBON	1.0M	5%	1/4W	
R121	1-247-710-11	CARBON	560	5%	1/4W	
R122	1-249-462-11	CARBON	22K	5%	1/4W	
R123	1-247-852-11	CARBON	7.5K	5%	1/4W	
R124	1-249-415-11	CARBON	680	5%	1/4W	
R125	1-247-854-11	CARBON	9.1K	5%	1/4W	
R126	1-249-465-11	CARBON	47K	5%	1/4W	
R127	1-249-465-11	CARBON	47K	5%	1/4W	
R128	1-249-681-11	CARBON	2.2K	5%	1/2W	
R129	1-249-673-11	CARBON	1K	5%	1/2W	
R130	1-249-461-11	CARBON	18K	5%	1/4W	
R131	1-249-421-11	CARBON	2.2K	5%	1/4W	
R132	1-249-429-11	CARBON	10K	5%	1/4W	
R133	1-249-433-11	CARBON	22K	5%	1/4W	
R134	1-249-417-11	CARBON	1K	5%	1/4W	
R135	1-249-437-11	CARBON	47K	5%	1/4W	
R136	1-249-427-11	CARBON	6.8K	5%	1/4W	
R137	1-215-444-00	METAL	9.1K	1%	1/6W	
R138	1-215-465-00	METAL	68K	1%	1/6W	
R139	1-215-448-00	METAL	13K	1%	1/6W	
R140	1-215-471-00	METAL	120K	1%	1/6W	
R141	1-249-408-11	CARBON	180	5%	1/4W	
R142	1-247-883-00	CARBON	150K	5%	1/4W	
R143	1-249-429-11	CARBON	10K	5%	1/4W	
R201	1-249-721-11	CARBON	100K	5%	1/2W	
R202	1-247-740-11	CARBON	120	5%	1/2W	
R204	1-249-724-91	CARBON	130K	5%	1/2W	
R205	1-247-761-11	CARBON	5.6K	5%	1/2W	
R213	1-247-717-11	CARBON	2.2K	5%	1/4W	
R214	1-247-138-00	CARBON	2K	5%	1/4W	
R215	1-247-720-11	CARBON	3.9K	5%	1/4W	
R216	1-247-710-11	CARBON	560	5%	1/4W	
R217	1-247-725-11	CARBON	10K	5%	1/4W	
R218	1-247-148-00	CARBON	5.1K	5%	1/4W	
R219	1-247-718-11	CARBON	2.7K	5%	1/4W	
R220	1-246-545-00	CARBON	1.0M	5%	1/4W	
R221	1-247-710-11	CARBON	560	5%	1/4W	
R222	1-249-462-11	CARBON	22K	5%	1/4W	
R223	1-247-852-11	CARBON	7.5K	5%	1/4W	
R224	1-249-415-11	CARBON	680	5%	1/4W	
R225	1-247-854-11	CARBON	9.1K	5%	1/4W	
R226	1-249-465-11	CARBON	47K	5%	1/4W	
R227	1-249-465-11	CARBON	47K	5%	1/4W	

Ref. No.	Part No.	Description				Remark
R228	1-249-681-11	CARBON	2.2K	5%	1/2W	
R229	1-249-673-11	CARBON	1K	5%	1/2W	
R230	1-249-461-11	CARBON	18K	5%	1/4W	
R231	1-249-421-11	CARBON	2.2K	5%	1/4W	
R232	1-249-429-11	CARBON	10K	5%	1/4W	
R233	1-249-433-11	CARBON	22K	5%	1/4W	
R234	1-249-417-11	CARBON	1K	5%	1/4W	
R235	1-249-437-11	CARBON	47K	5%	1/4W	
R236	1-249-427-11	CARBON	6.8K	5%	1/4W	
R237	1-215-444-00	METAL	9.1K	1%	1/6W	
R238	1-215-465-00	METAL	68K	1%	1/6W	
R239	1-215-448-00	METAL	13K	1%	1/6W	
R240	1-215-471-00	METAL	120K	1%	1/6W	
R241	1-249-408-11	CARBON	180	5%	1/4W	
R242	1-247-883-00	CARBON	150K	5%	1/4W	
R243	1-249-429-11	CARBON	10K	5%	1/4W	
R301	1-249-703-11	CARBON	18K	5%	1/2W	
R302	1-249-490-11	CARBON	27K	5%	1/2W	
R303	1-249-469-11	CARBON	100K	5%	1/4W	
R304	1-247-723-11	CARBON	6.8K	5%	1/4W	
R305	1-247-720-11	CARBON	3.9K	5%	1/4W	
R306	1-247-719-11	CARBON	3.3K	5%	1/4W	
R307	1-247-152-00	CARBON	7.5K	5%	1/4W	
R308	1-249-465-11	CARBON	47K	5%	1/4W	
R309	1-249-465-11	CARBON	47K	5%	1/4W	
R310	1-249-543-11	CARBON	430	5%	1/4W	
R311	1-247-725-11	CARBON	10K	5%	1/4W	
R312	1-247-718-11	CARBON	2.7K	5%	1/4W	
R313	1-247-148-00	CARBON	5.1K	5%	1/4W	
R314	1-246-545-00	CARBON	1.0M	5%	1/4W	
R315	1-247-710-11	CARBON	560	5%	1/4W	
R316	1-249-462-11	CARBON	22K	5%	1/4W	
R317	1-247-854-11	CARBON	9.1K	5%	1/4W	
R318	1-247-852-11	CARBON	7.5K	5%	1/4W	
R319	1-249-415-11	CARBON	680	5%	1/4W	
R320	1-249-462-11	CARBON	22K	5%	1/4W	
R321	1-247-719-11	CARBON	3.3K	5%	1/4W	
R322	1-247-723-11	CARBON	6.8K	5%	1/4W	
R323	1-249-462-11	CARBON	22K	5%	1/4W	
R324	1-249-465-11	CARBON	47K	5%	1/4W	
R325	1-247-717-11	CARBON	2.2K	5%	1/4W	
R326	1-249-469-11	CARBON	100K	5%	1/4W	
R327	1-249-593-11	CARBON	51K	5%	1/4W	
R328	1-247-721-11	CARBON	4.7K	5%	1/4W	
R329	1-247-703-11	CARBON	180	5%	1/4W	
R330	1-247-725-11	CARBON	10K	5%	1/4W	
R331	1-247-148-00	CARBON	5.1K	5%	1/4W	
R332	1-247-701-11	CARBON	120	5%	1/4W	
R333	1-247-152-00	CARBON	8.2K	5%	1/4W	
R334	1-247-721-11	CARBON	4.7K	5%	1/4W	
R335	1-247-701-11	CARBON	120	5%	1/4W	
R336	1-249-429-11	CARBON	10K	5%	1/4W	
R337	1-249-429-11	CARBON	10K	5%	1/4W	
R338	1-249-429-11	CARBON	10K	5%	1/4W	
R339	1-249-429-11	CARBON	10K	5%	1/4W	
R340	1-249-421-11	CARBON	2.2K	5%	1/4W	
R341	1-249-604-11	CARBON	150K	5%	1/4W	
R342	⚠1-212-857-00	FUSIBLE	10	5%	1/4W	F
R343	1-249-435-11	CARBON	33K	5%	1/4W	
R344	1-249-426-11	CARBON	5.6K	5%	1/4W	

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

MAIN

Ref. No.	Part No.	Description				Remark
R401	1-249-703-11	CARBON	18K	5%	1/2W	
R402	1-249-490-11	CARBON	27K	5%	1/2W	
R403	1-249-469-11	CARBON	100K	5%	1/4W	
R404	1-247-723-11	CARBON	6.8K	5%	1/4W	
R405	1-247-720-11	CARBON	3.9K	5%	1/4W	
R406	1-247-719-11	CARBON	3.3K	5%	1/4W	
R407	1-247-152-00	CARBON	7.5K	5%	1/4W	
R408	1-249-465-11	CARBON	47K	5%	1/4W	
R409	1-249-465-11	CARBON	47K	5%	1/4W	
R410	1-249-543-11	CARBON	430	5%	1/4W	
R411	1-247-725-11	CARBON	10K	5%	1/4W	
R412	1-247-718-11	CARBON	2.7K	5%	1/4W	
R413	1-247-148-00	CARBON	5.1K	5%	1/4W	
R414	1-246-545-00	CARBON	1.0M	5%	1/4W	
R415	1-247-710-11	CARBON	560	5%	1/4W	
R416	1-249-462-11	CARBON	22K	5%	1/4W	
R417	1-247-854-11	CARBON	9.1K	5%	1/4W	
R418	1-247-852-11	CARBON	7.5K	5%	1/4W	
R419	1-249-415-11	CARBON	680	5%	1/4W	
R420	1-249-462-11	CARBON	22K	5%	1/4W	
R421	1-247-719-11	CARBON	3.3K	5%	1/4W	
R422	1-247-723-11	CARBON	6.8K	5%	1/4W	
R423	1-249-462-11	CARBON	22K	5%	1/4W	
R424	1-249-465-11	CARBON	47K	5%	1/4W	
R425	1-247-717-11	CARBON	2.2K	5%	1/4W	
R426	1-249-469-11	CARBON	100K	5%	1/4W	
R427	1-249-593-11	CARBON	51K	5%	1/4W	
R428	1-247-721-11	CARBON	4.7K	5%	1/4W	
R429	1-247-703-11	CARBON	180	5%	1/4W	
R430	1-247-725-11	CARBON	10K	5%	1/4W	
R431	1-247-148-00	CARBON	5.1K	5%	1/4W	
R432	1-247-701-11	CARBON	120	5%	1/4W	
R433	1-247-152-00	CARBON	8.2K	5%	1/4W	
R434	1-247-720-11	CARBON	3.9K	5%	1/4W	
R434	1-247-721-11	CARBON	4.7K	5%	1/4W	
R435	1-247-701-11	CARBON	120	5%	1/4W	
R436	1-249-429-11	CARBON	10K	5%	1/4W	
R437	1-249-429-11	CARBON	10K	5%	1/4W	
R438	1-249-429-11	CARBON	10K	5%	1/4W	
R439	1-249-429-11	CARBON	10K	5%	1/4W	
R440	1-249-421-11	CARBON	2.2K	5%	1/4W	
R441	1-249-604-11	CARBON	150K	5%	1/4W	
R442	⚠1-212-857-00	FUSIBLE	10	5%	1/4W	F
R443	1-249-435-11	CARBON	33K	5%	1/4W	
R444	1-249-426-11	CARBON	5.6K	5%	1/4W	
R501	1-249-433-11	CARBON	22K	5%	1/4W	
R502	1-249-433-11	CARBON	22K	5%	1/4W	
R503	1-249-469-11	CARBON	100K	5%	1/4W	
R504	1-249-465-11	CARBON	47K	5%	1/4W	
R505	1-215-472-00	METAL	130K	1%	1/6W	
R506	1-249-437-11	CARBON	47K	5%	1/4W	
R507	1-249-433-11	CARBON	22K	5%	1/4W	
R508	1-249-417-11	CARBON	1K	5%	1/4W	
R509	1-247-885-00	CARBON	180K	5%	1/4W	
R510	1-249-433-11	CARBON	22K	5%	1/4W	
R511	1-249-413-11	CARBON	470	5%	1/4W	
R512	1-249-413-11	CARBON	470	5%	1/4W	
R513	1-249-432-11	CARBON	18K	5%	1/4W	
R514	1-249-433-11	CARBON	22K	5%	1/4W	
R515	1-249-437-11	CARBON	47K	5%	1/4W	
R516	1-249-437-11	CARBON	47K	5%	1/4W	
R517	1-249-437-11	CARBON	47K	5%	1/4W	
R518	1-249-429-11	CARBON	10K	5%	1/4W	
R519	1-249-429-11	CARBON	10K	5%	1/4W	
R520	1-249-437-11	CARBON	47K	5%	1/4W	
R521	1-249-429-11	CARBON	10K	5%	1/4W	
R522	1-249-437-11	CARBON	47K	5%	1/4W	
R523	1-249-421-11	CARBON	2.2K	5%	1/4W	
R550	1-215-472-00	METAL	130K	1%	1/6W	
R551	1-249-432-11	CARBON	18K	5%	1/4W	
R552	1-249-433-11	CARBON	22K	5%	1/4W	
R553	1-249-406-11	CARBON	120	5%	1/4W	
R554	1-249-432-11	CARBON	18K	5%	1/4W	
R555	1-249-397-11	CARBON	22	5%	1/4W	
R556	1-247-856-00	CARBON	11K	5%	1/4W	
R557	1-249-429-11	CARBON	10K	5%	1/4W	
R558	1-249-406-11	CARBON	120	5%	1/4W	
R559	1-247-856-00	CARBON	11K	5%	1/4W	
R560	1-249-397-11	CARBON	22	5%	1/4W	
R561	1-247-887-00	CARBON	220K	5%	1/4W	
R562	1-247-887-00	CARBON	220K	5%	1/4W	
R563	1-249-407-11	CARBON	150	5%	1/4W	
R564	1-249-437-11	CARBON	47K	5%	1/4W	
R565	1-249-441-11	CARBON	100K	5%	1/4W	
R566	1-249-421-11	CARBON	2.2K	5%	1/4W	
R567	1-249-440-11	CARBON	82K	5%	1/4W	
R568	1-249-440-11	CARBON	82K	5%	1/4W	
R569	⚠1-212-853-00	FUSIBLE	6.8	5%	1/4W	F
R570	⚠1-212-853-00	FUSIBLE	6.8	5%	1/4W	F
R571	1-249-427-11	CARBON	6.8K	5%	1/4W	
R572	1-249-381-11	CARBON	1	5%	1/4W	
R573	1-249-421-11	CARBON	2.2K	5%	1/4W	
R574	1-249-417-11	CARBON	1K	5%	1/4W	
R576	1-249-413-11	CARBON	470	5%	1/4W	
R577	1-249-417-11	CARBON	1K	5%	1/4W	
R578	1-249-421-11	CARBON	2.2K	5%	1/4W	
R603	1-247-717-11	CARBON	2.2K	5%	1/4W	
R604	1-247-717-11	CARBON	2.2K	5%	1/4W	
R605	1-247-706-11	CARBON	330	5%	1/4W	
R606	1-249-556-11	CARBON	1.5K	5%	1/4W	
R607	1-249-556-11	CARBON	1.5K	5%	1/4W	
R608	1-249-926-11	CARBON	1.3K	5%	1/4W	
R609	1-247-717-11	CARBON	2.2K	5%	1/4W	
R611	1-247-704-11	CARBON	220	5%	1/4W	
R612	1-247-704-11	CARBON	220	5%	1/4W	
R701	1-249-421-11	CARBON	2.2K	5%	1/4W	
R702	1-249-421-11	CARBON	2.2K	5%	1/4W	
R703	1-249-421-11	CARBON	2.2K	5%	1/4W	
R704	1-249-425-11	CARBON	4.7K	5%	1/4W	
R706	1-249-425-11	CARBON	4.7K	5%	1/4W	
R707	1-249-421-11	CARBON	2.2K	5%	1/4W	
R708	1-249-421-11	CARBON	2.2K	5%	1/4W	
R709	1-249-427-11	CARBON	6.8K	5%	1/4W	
R710	1-249-425-11	CARBON	4.7K	5%	1/4W	
R711	1-249-431-11	CARBON	15K	5%	1/4W	
R712	1-249-429-11	CARBON	10K	5%	1/4W	
R713	1-249-441-11	CARBON	100K	5%	1/4W	
R714	1-249-425-11	CARBON	4.7K	5%	1/4W	
R715	1-247-752-11	CARBON	1K	5%	1/2W	
R801	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.

MAIN REAL MOTOR PANEL

Ref. No.	Part No.	Description				Remark
R802	1-249-429-11	CARBON	10K	5%	1/4W	
R803	1-249-440-11	CARBON	82K	5%	1/4W	
R804	1-249-429-11	CARBON	10K	5%	1/4W	
R805	1-249-429-11	CARBON	10K	5%	1/4W	
R806	1-249-429-11	CARBON	10K	5%	1/4W	
R807	1-249-429-11	CARBON	10K	5%	1/4W	
R808	1-249-421-11	CARBON	2.2K	5%	1/4W	
R809	1-249-421-11	CARBON	2.2K	5%	1/4W	
R810	1-249-429-11	CARBON	10K	5%	1/4W	
R811	1-249-435-11	CARBON	33K	5%	1/4W	
R812	1-249-429-11	CARBON	10K	5%	1/4W	
R813	1-249-413-11	CARBON	470	5%	1/4W	
R814	1-249-436-11	CARBON	39K	5%	1/4W	
R815	1-249-436-11	CARBON	39K	5%	1/4W	
R816	1-247-903-00	CARBON	1M	5%	1/4W	
R817	1-249-425-11	CARBON	4.7K	5%	1/4W	
R818	1-249-417-11	CARBON	1K	5%	1/4W	
R819	1-249-435-11	CARBON	33K	5%	1/4W	
R820	1-249-437-11	CARBON	47K	5%	1/4W	
R821	1-249-484-11	CARBON	6.8	5%	1/2W	
R822	1-249-484-11	CARBON	6.8	5%	1/2W	
R823	1-247-854-11	CARBON	9.1K	5%	1/4W	
R824	1-249-425-11	CARBON	4.7K	5%	1/4W	
R825	1-249-425-11	CARBON	4.7K	5%	1/4W	
R826	1-249-425-11	CARBON	4.7K	5%	1/4W	
R827	1-249-425-11	CARBON	4.7K	5%	1/4W	
R828	1-249-426-11	CARBON	5.6K	5%	1/4W	
R829	1-249-429-11	CARBON	10K	5%	1/4W	
R830	1-249-429-11	CARBON	10K	5%	1/4W	
R831	1-249-427-11	CARBON	6.8K	5%	1/4W	
R832	1-249-428-11	CARBON	8.2K	5%	1/4W	
R833	1-249-429-11	CARBON	10K	5%	1/4W	
R834	1-249-429-11	CARBON	10K	5%	1/4W	
R835	1-249-413-11	CARBON	470	5%	1/4W	
		(VARIABLE RESISTOR)				
RV101	1-241-338-11	RES, ADJ, CARBON 200				
RV102	1-238-602-11	RES, ADJ, CARBON 47K				
RV201	1-241-338-11	RES, ADJ, CARBON 200				
RV202	1-238-602-11	RES, ADJ, CARBON 47K				
RV301	1-228-993-00	RES, ADJ, METAL 4.7K				
RV303	1-238-601-11	RES, ADJ, CARBON 22K				
RV401	1-228-993-00	RES, ADJ, METAL 4.7K				
RV403	1-238-601-11	RES, ADJ, CARBON 22K				
RV551	1-238-595-11	RES, ADJ, CARBON 220				
RV552	1-238-595-11	RES, ADJ, CARBON 220				
RV553	1-238-599-11	RES, ADJ, CARBON 4.7K				
RV554	1-238-601-11	RES, ADJ, CARBON 22K				
RV801	1-238-599-11	RES, ADJ, CARBON 4.7K				
		(TRANSFORMER)				
T301	1-433-384-11	TRANSFORMER, BIAS OSCILLATOR				
T401	1-433-384-11	TRANSFORMER, BIAS OSCILLATOR				
T551	1-433-359-11	TRANSFORMER, BIAS OSCILLATION				
		(TEST PIN)				
TP551	* 1-564-505-11	PLUG, CONNECTOR 2P				
TP552	* 1-564-506-11	PLUG, CONNECTOR 3P				
TP553	* 1-564-506-11	PLUG, CONNECTOR 3P				
TP801	* 1-564-506-11	PLUG, CONNECTOR 3P				

Ref. No.	Part No.	Description				Remark
		(CRYSTAL)				
X801	1-577-358-21	VIBRATOR, CERAMIC(4MHz)				
		**********				
	* 1-632-741-11	REAL 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-2006-515-A	PANEL BOARD, COMPLETE				
		**********				
	8-719-933-57	DIODE UZL-9M1-TP				
	8-719-302-46	DIODE SEL1210S-C-TP2				
	8-719-302-45	DIODE SEL1410E-C-TP2				
	8-719-302-79	DIODE SEL1910A-C-TP2				
	8-729-119-76	TRANSISTOR 2SA1175-HFE				
	8-729-115-28	TRANSISTOR 2SA1511-TP				
	8-729-900-61	TRANSISTOR DTA114ES				
	8-729-900-61	TRANSISTOR DTA114ES				
	8-729-900-89	TRANSISTOR DTC144ES				
	8-729-900-89	TRANSISTOR DTC144ES				
		(CAPACITOR)				
C001	1-161-744-00	CERAMIC	0.01uF		400V	
C181	1-126-059-11	ELECT	10uF	20%	50V	
C281	1-126-059-11	ELECT	10uF	20%	50V	
C341	1-130-473-00	MYLAR	0.0015uF	5%	50V	
C342	1-130-471-00	MYLAR	0.001uF	5%	50V	
C441	1-130-473-00	MYLAR	0.0015uF	5%	50V	
C442	1-130-471-00	MYLAR	0.001uF	5%	50V	
C541	1-123-369-00	ELECT	4.7uF	20%	50V	
C542	1-123-369-00	ELECT	4.7uF	20%	50V	
C597	1-161-494-00	CERAMIC	0.022uF		25V	
C901	1-126-177-11	ELECT	100uF	20%	10V	
		(CONNECTOR)				
CN001	* 1-568-226-11	PIN, CONNECTOR 2P				
CN002	1-568-226-11	PIN, CONNECTOR 2P				
CN521	* 1-564-521-11	PLUG, CONNECTOR 6P				
CN543	* 1-560-070-00	BASE POST 5P				
CN591	* 1-564-519-11	PLUG, CONNECTOR 4P				
CN592	* 1-564-519-11	PLUG, CONNECTOR 4P				
CN593	* 1-564-519-11	PLUG, CONNECTOR 4P				
CN901	* 1-564-336-00	PIN, CONNECTOR 2P				

PANEL

Ref. No.	Part No.	Description	Remark
		(COMPOSITION)	
CP901	1-232-881-11	COMPOSITION CIRCUIT BLOCK	
CP902	1-232-881-11	COMPOSITION CIRCUIT BLOCK	
CP903	1-236-985-11	COMPOSITION CIRCUIT BLOCK	
		(DIODE)	
D901	8-719-912-20	DIODE 1SS120	
D902	8-719-912-20	DIODE 1SS120	
D903	8-719-933-57	DIODE HZS9B2L	
D904	8-719-912-20	DIODE 1SS120	
D905	8-719-912-20	DIODE 1SS120	
D906	8-719-912-20	DIODE 1SS120	
D907	8-719-912-20	DIODE 1SS120	
D908	8-719-912-20	DIODE 1SS120	
D909	8-719-912-20	DIODE 1SS120	
D910	8-719-912-20	DIODE 1SS120	
D911	8-719-912-20	DIODE 1SS120	
D912	8-719-302-46	DIODE SEL1210S-C	
D913	8-719-302-45	DIODE SEL1210S	
D914	8-719-302-79	DIODE SEL1910A-C	
		(FILTER)	
FLT901	1-519-560-11	INDICATOR TUBE, FLUORESCENT	
		(IC)	
IC541	8-759-634-51	IC M5218AP	
IC901	8-759-635-68	IC M50940-313SP	
IC902	8-741-100-48	IC SBX1610-59	
		(JACK)	
J541	1-507-796-71	JACK(HEADPHONES)	
		(TRANSISTOR)	
Q901	8-729-115-28	TRANSISTOR BN1L32-K	
Q902	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q903	8-729-900-61	TRANSISTOR DTA114ES	
Q904	8-729-900-61	TRANSISTOR DTA114ES	
Q905	8-729-900-61	TRANSISTOR DTA114ES	
Q906	8-729-900-61	TRANSISTOR DTA114ES	
Q907	8-729-900-65	TRANSISTOR DTA144ES	
Q908	8-729-900-65	TRANSISTOR DTA144ES	
Q909	8-729-900-65	TRANSISTOR DTA144ES	
Q910	8-729-900-65	TRANSISTOR DTA144ES	
Q911	8-729-900-89	TRANSISTOR DTC144ES	
Q912	8-729-900-65	TRANSISTOR DTA144ES	
Q913	8-729-900-65	TRANSISTOR DTA144ES	
Q914	8-729-900-65	TRANSISTOR DTA144ES	
Q915	8-729-900-89	TRANSISTOR DTC144ES	
Q916	8-729-900-65	TRANSISTOR DTA144ES	
Q917	8-729-900-65	TRANSISTOR DTA144ES	
Q918	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q919	8-729-900-65	TRANSISTOR DTA144ES	
		(RESISTOR)	
R181	1-249-429-11	CARBON 10K 5% 1/4W	
R182	1-249-433-11	CARBON 22K 5% 1/4W	
R183	1-249-423-11	CARBON 3.3K 5% 1/4W	
R184	1-247-704-11	CARBON 220 5% 1/4W	

Ref. No.	Part No.	Description	Remark
R281	1-249-429-11	CARBON 10K 5% 1/4W	
R282	1-249-433-11	CARBON 22K 5% 1/4W	
R283	1-249-423-11	CARBON 3.3K 5% 1/4W	
R284	1-247-704-11	CARBON 220 5% 1/4W	
R381	1-247-721-11	CARBON 4.7K 5% 1/4W	
R382	1-247-152-00	CARBON 8.2K 5% 1/4W	
R383	1-247-725-11	CARBON 10K 5% 1/4W	
R384	1-247-721-11	CARBON 4.7K 5% 1/4W	
R385	1-246-545-00	CARBON 1.0M 5% 1/4W	
R386	1-249-462-11	CARBON 22K 5% 1/4W	
R481	1-247-721-11	CARBON 4.7K 5% 1/4W	
R482	1-247-152-00	CARBON 8.2K 5% 1/4W	
R483	1-247-725-11	CARBON 10K 5% 1/4W	
R484	1-247-721-11	CARBON 4.7K 5% 1/4W	
R485	1-246-545-00	CARBON 1.0M 5% 1/4W	
R486	1-249-462-11	CARBON 22K 5% 1/4W	
R590	1-249-429-11	CARBON 10K 5% 1/4W	
R881	1-249-434-11	CARBON 27K 5% 1/4W	
R882	1-249-431-11	CARBON 15K 5% 1/4W	
R901	1-249-421-11	CARBON 2.2K 5% 1/4W	
R902	1-249-421-11	CARBON 2.2K 5% 1/4W	
R903	1-247-895-00	CARBON 470K 5% 1/4W	
R904	1-249-433-11	CARBON 22K 5% 1/4W	
R905	1-249-433-11	CARBON 22K 5% 1/4W	
R906	1-249-429-11	CARBON 10K 5% 1/4W	
R907	1-249-425-11	CARBON 4.7K 5% 1/4W	
R908	1-249-431-11	CARBON 15K 5% 1/4W	
R909	1-249-422-11	CARBON 2.7K 5% 1/4W	
R910	1-249-424-11	CARBON 3.9K 5% 1/4W	
R911	1-249-428-11	CARBON 8.2K 5% 1/4W	
R912	1-249-434-11	CARBON 27K 5% 1/4W	
R913	1-249-422-11	CARBON 2.7K 5% 1/4W	
R914	1-249-424-11	CARBON 3.9K 5% 1/4W	
R915	1-249-428-11	CARBON 8.2K 5% 1/4W	
R916	1-249-434-11	CARBON 27K 5% 1/4W	
R917	1-249-431-11	CARBON 15K 5% 1/4W	
R918	1-249-409-11	CARBON 220 5% 1/4W	
R919	1-249-410-11	CARBON 270 5% 1/4W	
R920	1-249-412-11	CARBON 390 5% 1/4W	
R921	1-249-421-11	CARBON 2.2K 5% 1/4W	
R922	1-249-421-11	CARBON 2.2K 5% 1/4W	
R923	1-247-903-00	CARBON 1M 5% 1/4W	
R925	1-249-425-11	CARBON 4.7K 5% 1/4W	
R926	1-249-441-11	CARBON 100K 5% 1/4W	
R927	1-249-441-11	CARBON 100K 5% 1/4W	
R928	1-249-441-11	CARBON 100K 5% 1/4W	
R929	1-249-433-11	CARBON 22K 5% 1/4W	
R930	1-249-441-11	CARBON 100K 5% 1/4W	
R931	1-249-425-11	CARBON 4.7K 5% 1/4W	
		(VARIABLE RESISTOR)	
RV541	1-241-330-11	RES, VAR, CARBON 20K/20K(PHONE LEVEL)	
RV591	1-238-833-21	RES, VAR, CARBON 20K/20K(REC LEVEL)	
RV592	1-238-687-11	RES, VAR, CARBON 50K/50K(BALANCE)	
RV593	1-241-329-11	RES, VAR, CARBON 5K/5K(REC LEVEL)	
RV594	1-241-328-11	RES, VAR, CARBON 10K/10K(BIAS)	
		(SWITCH)	
S541	1-572-583-11	SWITCH, ROTARY(DOLBY NR)	

Ref. No.	Part No.	Description	Remark
S542	1-572-764-11	SWITCH, PUSH(2 KEY)(CALIBRATION/MPX /MPX FILTER	
S591	1-572-153-11	SWITCH, PUSH (1 KEY)(INPUT)	
S592	1-572-582-11	SWITCH, ROTARY	
S701	1-572-267-51	SWITCH, PUSH(AC POWER)(1 KEY)(POWER)	
S801	1-572-268-11	SWITCH, SLIDE(TIMER)	
S901	1-554-303-21	SWITCH, TACTILE(COUNTER. MEMORY)	
S902	1-554-303-21	SWITCH, TACTILE(COUNTER. RESET)	
S903	1-554-303-21	SWITCH, TACTILE(COUNTER. DISPLAY MODE)	
S904	1-554-303-21	SWITCH, TACTILE(OPEN/CLOSE)	
S905	1-554-303-21	SWITCH, TACTILE(■)	
S906	1-554-303-21	SWITCH, TACTILE(◀◀)	
S907	1-554-303-21	SWITCH, TACTILE(▶▶)	
S908	1-554-303-21	SWITCH, TACTILE(REC)	
S909	1-554-303-21	SWITCH, TACTILE(▶)	
S910	1-554-303-21	SWITCH, TACTILE(PAUSE)	
S911	1-554-303-21	SWITCH, TACTILE(⏮)	
S912	1-554-303-21	SWITCH, TACTILE(⏭)	
S913	1-554-303-21	SWITCH, TACTILE(REC MUTE)	
S914	1-554-303-21	SWITCH, TACTILE(MONITOR)	
		(CRYSTAL)	
X901	1-577-358-21	VIBRATOR, CERAMIC(4MHz)	

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MISCELLANEOUS
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5	* 1-590-321-51	LEAD(WITH CONNECTOR)	
62	1-450-512-11	TRANSFORMER, POWER	
239	1-632-779-11	PC BOARD, FG	
CNP701	1-575-651-11	CORD, POWER	
F701	1-532-285-00	FUSE, TIME-LAG	
HE501	1-543-358-11	HEAD, MAGNETIC(ERASE)	
HRP501	1-543-742-11	HEAD, MAGNETIC(RECORD/PLAYBACK)	
M1001	X-3356-638-1	MOTOR(REEL R) ASSY	
M1002	X-3356-604-1	MOTOR(ASSIST) ASSY	
S1001	1-466-238-11	ENCODER, ROTARY	
T701	1-450-512-11	TRANSFORMER, POWER	

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Ref. No.	Part No.	Description	Remark
		ACCESSORY & PACKING MATERIAL	
		**********	
	1-558-271-11	CORD, CONNECTION	
	* 3-363-900-01	CUSHION	
	* 3-366-699-41	INDIVIDUAL CATRON	
	3-753-346-11	MANUAL, INSTRUCTION(AEP)	
	3-753-346-41	MANUAL, INSTRUCTION	

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HARDWARE LIST

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# 1	7-682-547-09	SCREW +BV 3X6, S TIGHT	
# 2	7-685-133-19	SCREW +BTP 2.6X6 TYPE2 N-2	
# 3	7-682-547-04	SCREW +BVTT 3X6(S)	
# 4	7-682-547-09	SCREW +BVTT 3X6(S)	
# 5	7-682-548-04	SCREW +BVTT 3X8(S)	
# 6	7-682-548-09	SCREW +BVTT 3X8(S)	
# 7	7-682-147-15	SCREW TR	
# 8	7-682-548-01	SCREW +B 3X8	
# 9	7-682-547-04	SCREW +BVTT 3X6(S)	
#10	7-621-849-00	SCREW (BV/RING)	
#11	7-628-253-00	SCREW +PS 2X4	
#12	7-628-254-10	SCREW +PS 2.6X6	
#13	7-671-154-01	STENLESS BALL	
#14	7-682-648-09	SCREW +PS 3X8	
#15	7-685-133-19	SCREW +BTP 2.6X6 TYPE2 N-S	
#16	7-621-255-20	SCREW +BVTT 2X4(S)	
#17	7-621-255-35	SCREW +BVTT 2X5(S)	
#18	7-685-870-01	SCREW +BVTT 3X5(S)	
#19	7-621-255-20	SCREW +P 2X4	
#20	7-621-772-70	SCREW +B 2X14	
#21	7-622-205-05	NUT M2 TYPE2	
#22	7-621-775-10	SCREW +B 2.6X4	

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