

TC-K490

SERVICE MANUAL

AEP Model
UK 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 $\square\square$ and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

Model Name Using Similar Mechanism	NEW
Tape Transport Mechanism Type	TCM-190VB11

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 (SD head) Playback head × 1 (SD head)
Motors	Capstan motor × 1 (DC servo motor) Reel motor × 1 (DC motor)

Signal-to-noise ratio (at peak level)

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

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

Harmonic distortion	0.4% (with Sony Type I, 160 nWb/m 315 Hz, 3rd H.D.)
	1.5% (with Sony Type IV, 250 nWb/m 315 Hz, 3rd H.D.)

Frequency response (DOLBY NR OFF)

Type IV cassette (Sony Metal-S)	30 - 19,000 Hz (± 3 dB, IEC) 30 - 16,000 Hz [± 3 dB (-4dB recording)]
Type II cassette (Sony UX-S)	30 - 18,000 Hz (± 3 dB, IEC)
Type I cassette (Sony HF-S)	30 - 17,000 Hz (± 3 dB, IEC)

Wow and flutter	$\pm 0.13\%$ W.Peak (IEC)
	0.07% W.RMS (NAB)
	$\pm 0.18\%$ W.Peak (DIN)

Inputs

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

Outputs

Line outputs (phono jacks)	Rated output level	0.5 V at a load impedance of 47 k ohms
	Load impedance	Over 10 k ohms
Headphones (stereo phone jack)	Output level	1 mW at a load impedance of 32 ohms

General

Power requirements

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

UK Model :

240 V AC (or 220 V AC adjustable by
Sony personnel), 50/60 Hz

Power consumption
Dimensions

18 W
Approx. 430 × 123 × 300 mm (w/h/d)
(17 × 4⁷/₈ × 11⁷/₈ inches)

Weight

including projecting parts and controls
Approx. 4 kg (8 lbs 14 oz)

Supplied accessories

Audio connecting cords (2)

Optional accessory

Wireless remote control unit RM-J701

Design and specifications are subject to change without notice.

Note

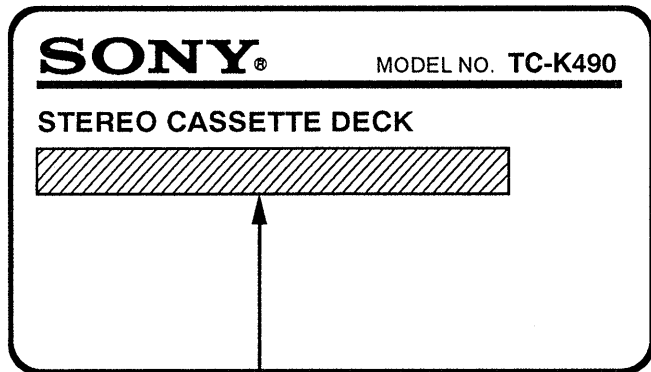
This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

STEREO CASSETTE DECK
SONY[®]

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MODEL IDENTIFICATION
(Specification Label)



AEP model : AC 220-230V~50 / 60Hz
UK model : AC 240V~50 / 60Hz

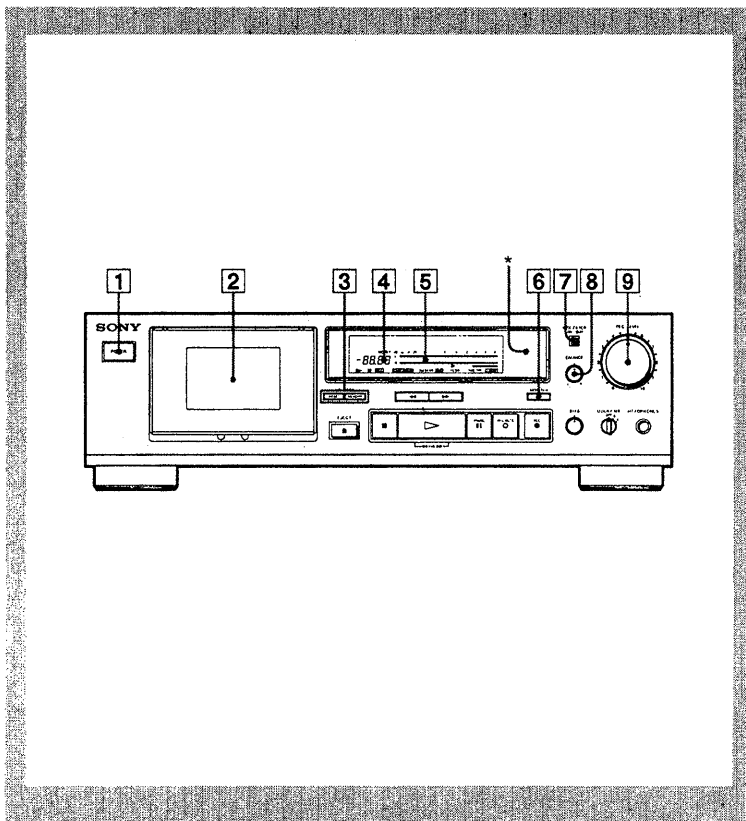
SAFETY-RELATED COMPONENT WARNING!!

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.

SECTION 1 GENERAL

This section is extracted from instruction manual.

1-1. IDENTIFYING THE PARTS





Front Panel

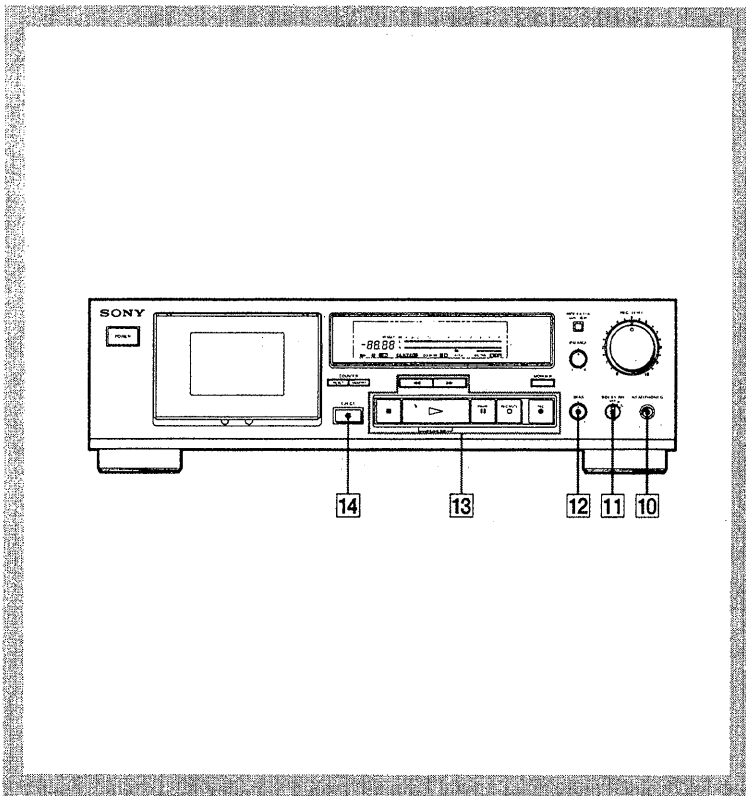
For details, refer to the page number indicated in parenthesis .

- 1 POWER switch
- 2 Cassette holder
- 3 Counter buttons
RESET button
MEMORY button
- 4 LINEAR COUNTER
- 5 PEAK LEVEL METER
- 6 MONITOR button
- 7 MPX FILTER button
- 8 BALANCE control
- 9 REC (recording) LEVEL control

*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.



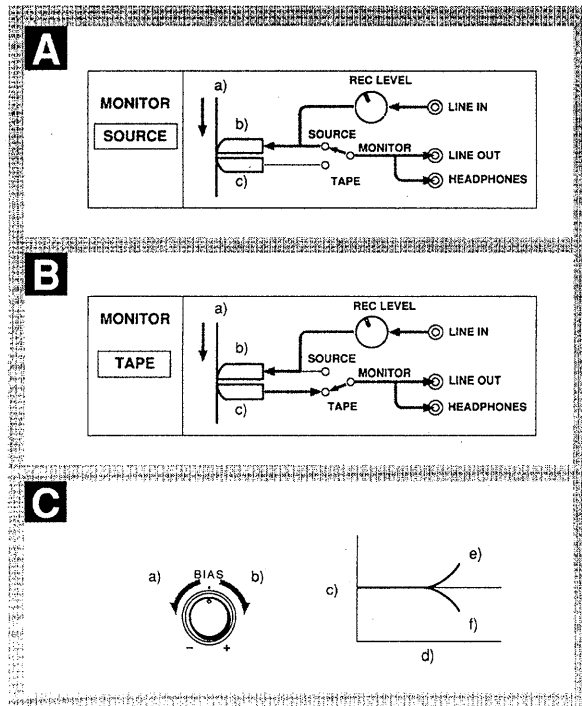
Front Panel

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

(Continued from previous page.)

- 10 HEADPHONES jack (stereo phone jack)
- 11 DOLBY NR (noise reduction) switch
- 12 BIAS control
- 13 Tape operation buttons
 - ◀◀ (rewind) button
 - ▶▶ (fast-forward) button
 - (stop) button
 - ▶ (play) button
- REC (recording) button
- ▬ PAUSE button
- REC MUTE (record muting) button
- 14 ▲ (eject) button

1-2. RECORDING



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 switch to SOURCE.

(Fig. **A**)

To listen to the sound recorded on the tape, set the MONITOR switch to TAPE.

(Fig. **B**)

Fig. **A** and **B** show the MONITOR switch setting and their respective signal flow.

- a) Band
- b) Recording head
- c) Playback head

Comparing the recorded sound with the sound source

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.

Adjusting the Bias According to the Tape Type

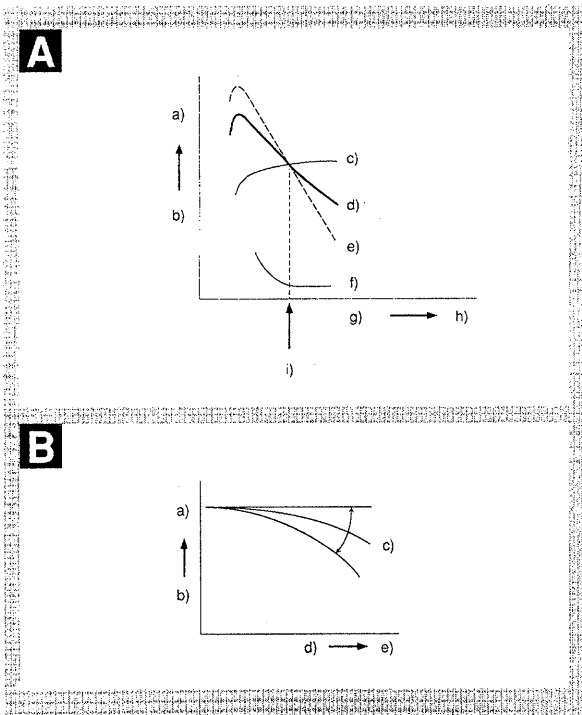
To obtain the optimum frequency response, use the BIAS control to adjust the bias current according to the tape type being used. Reducing the bias boosts high frequencies but increases distortion. Increasing the bias decreases distortion but suppresses high frequencies. Balance the bias according to your listening preference.

Fig. **C** shows the BIAS control and a high-frequency response balance chart.

- a) Bias reduced (high frequencies boosted)
- b) Bias increased (high frequencies suppressed)
- c) Output (level in dB)
- d) Frequency in Hz
- e) Bias reduced (-)
- f) Bias increased (+)

Note

In the case of Type IV cassette tapes, the frequency change for any given bias setting will be minimal.



What is the Dolby HX PRO System?

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

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

Fig. **A**

- a) High
- b) Distortion output
- c) 315 Hz
- d) 6.3 kHz
- e) 10 kHz
- f) 315 Hz distortion
- g) Bias current
- h) High
- i) Established bias current

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

Fig. **B**

- a) High
- b) Output
- c) Fluctuation
- d) Frequency
- e) High

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

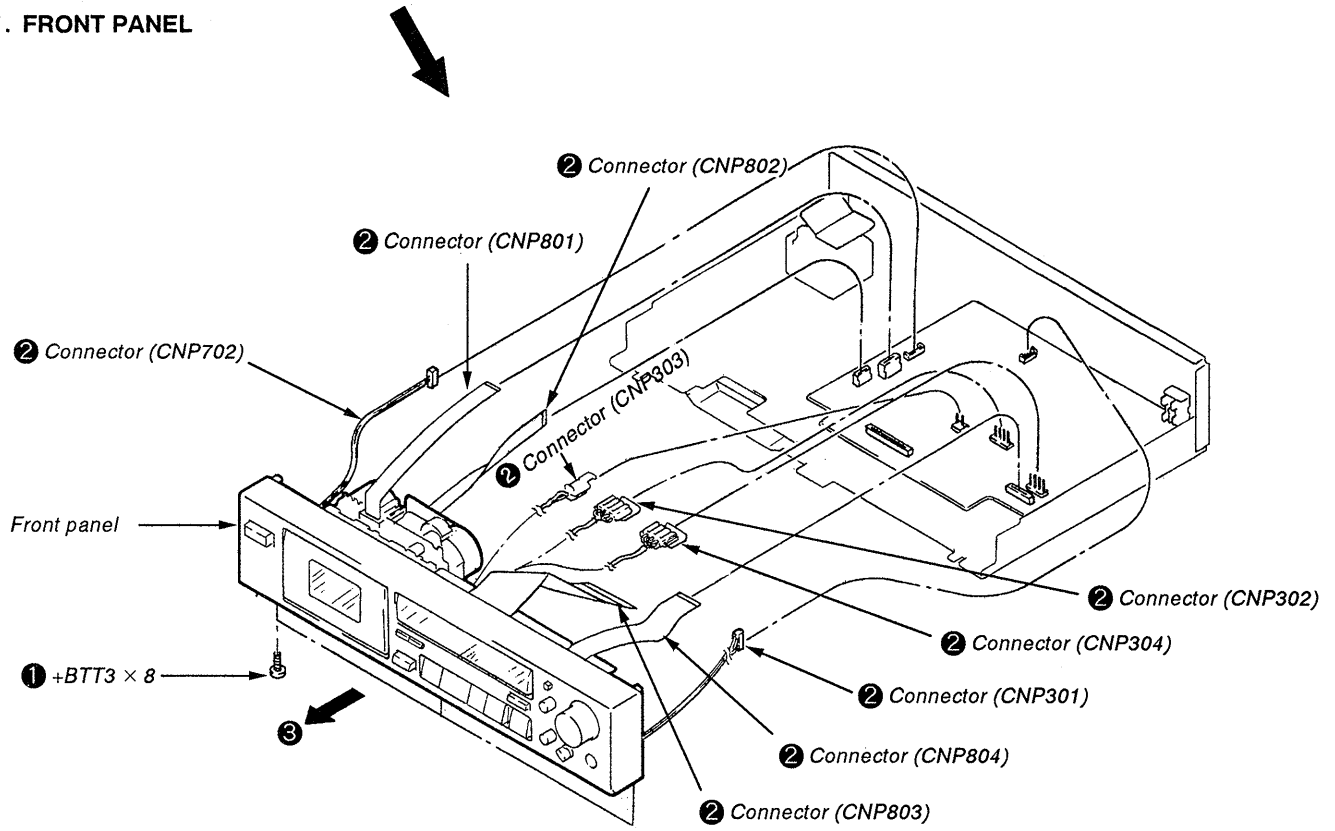
SECTION 2 DISASSEMBLY

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

CASE

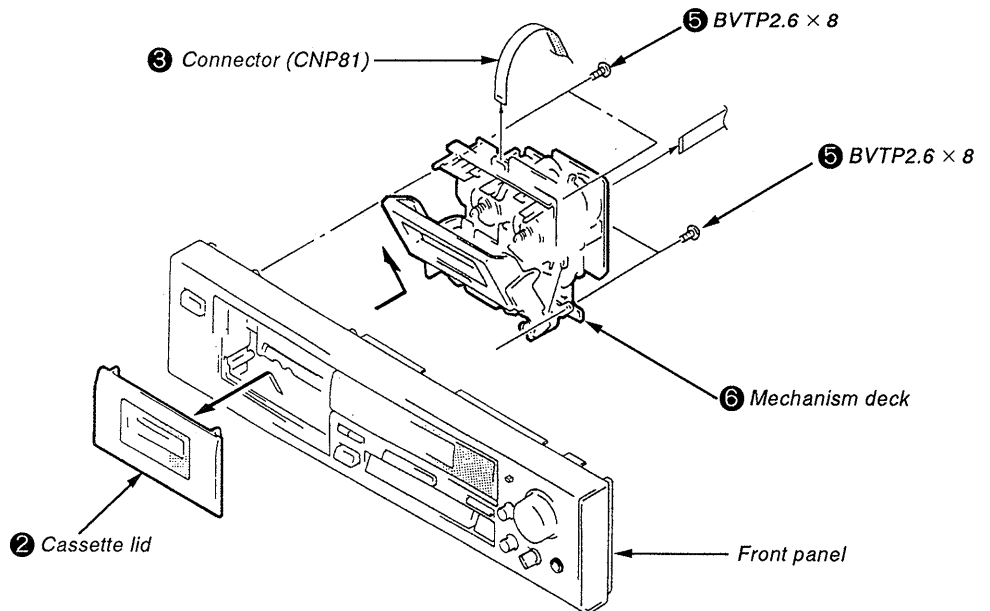
Unscrew the four case attachment screws M3 × 8 and remove the case.

2-1. FRONT PANEL

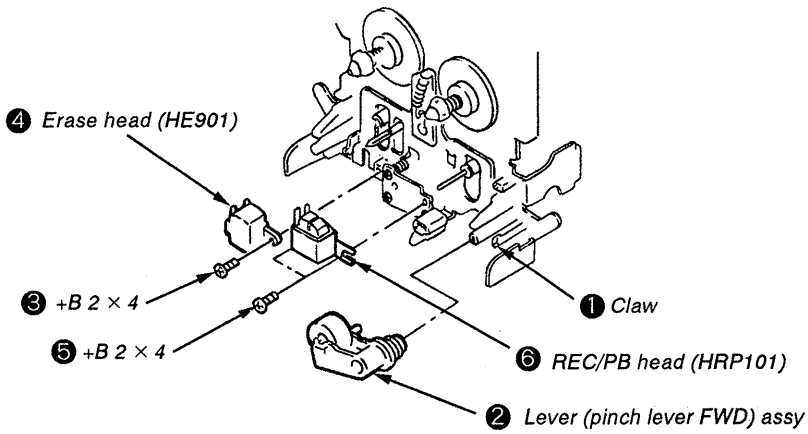


2-2. MECHANISM DECK

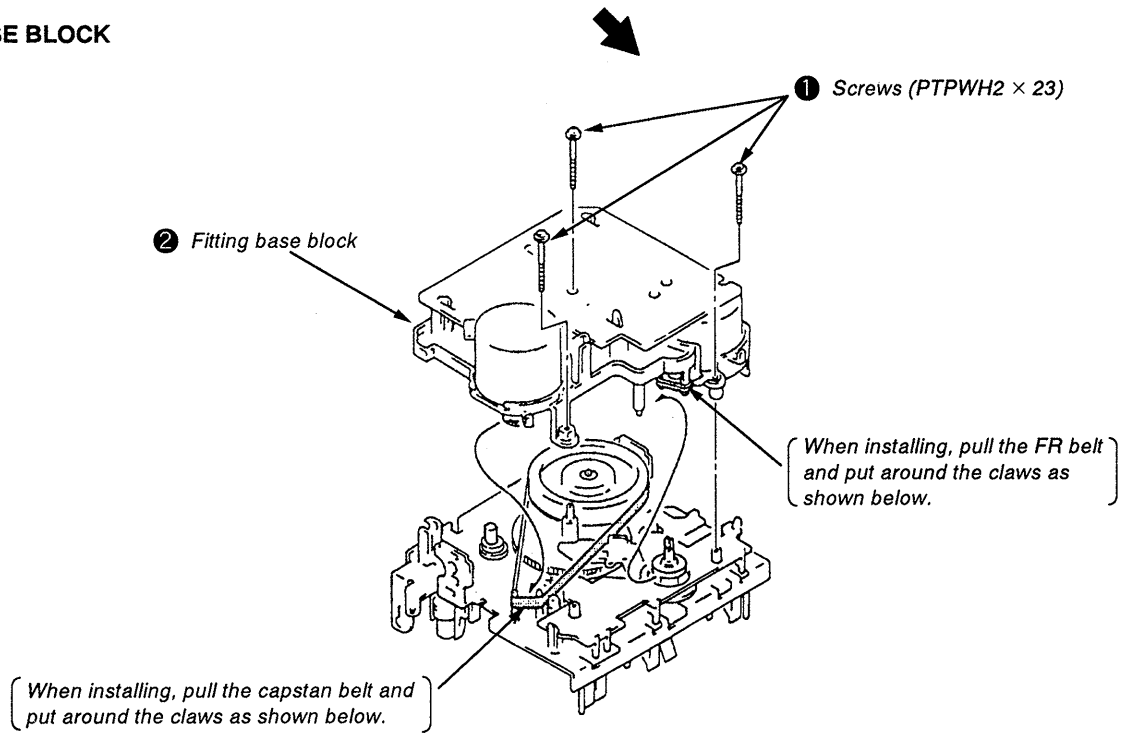
1 Press the eject button.



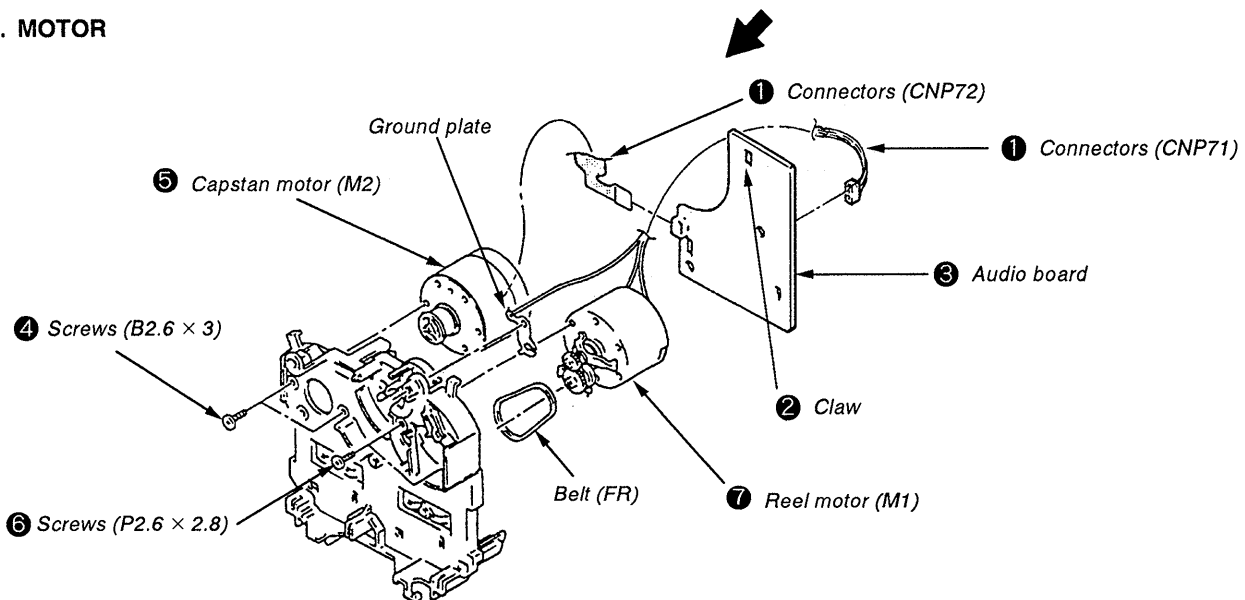
2-3. HEAD



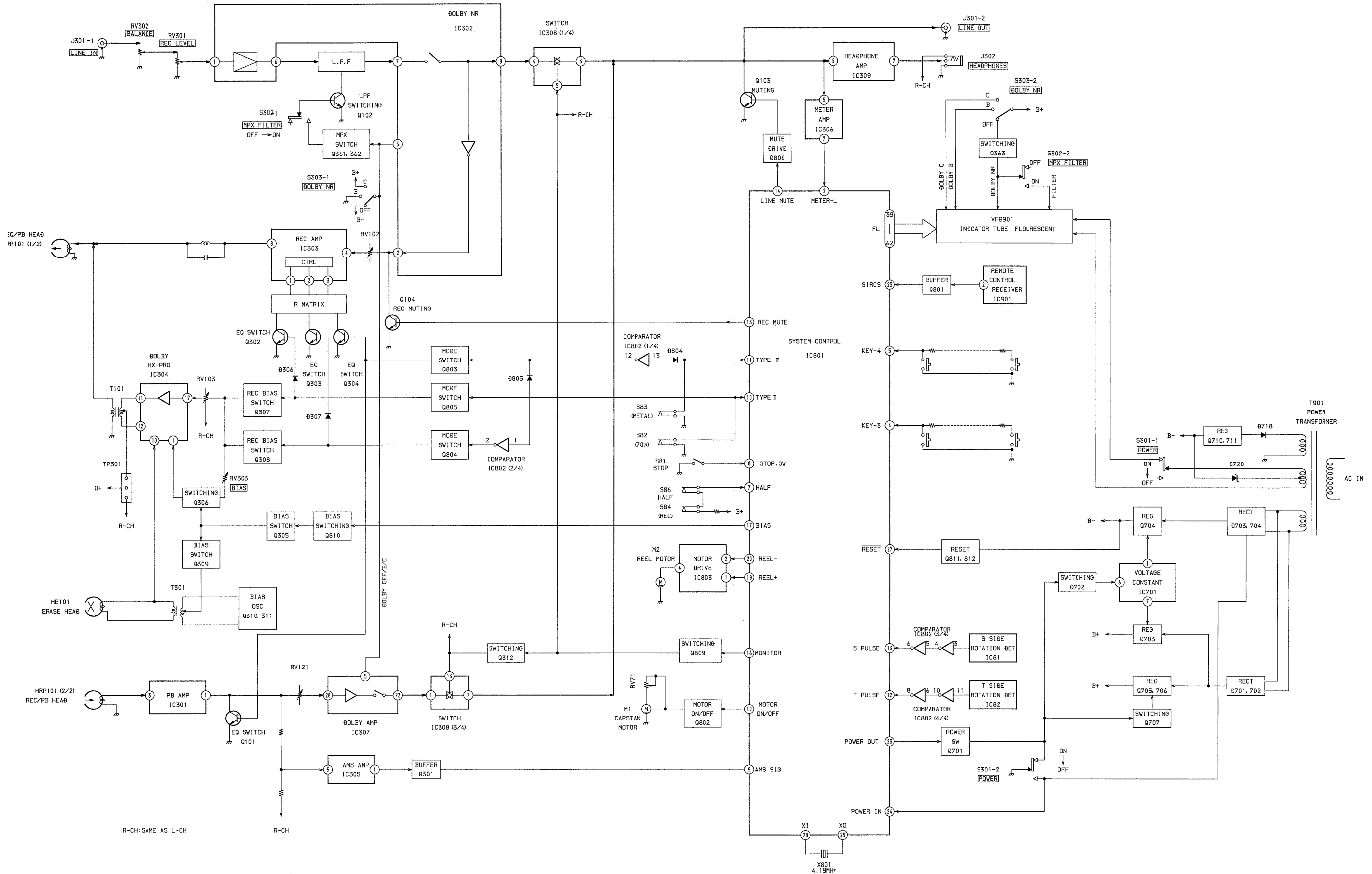
2-4. FITTING BASE BLOCK



2-5. MOTOR



SECTION 3 BLOCK DIAGRAM



SECTION 4 EXPLANATION OF IC TERMINALS

IC801 M50940-398SP

Pin. No.	Terminal name	I/O	Terminal explanation																		
1	VREF	I	A/D reference voltage 5V.																		
2	METER-L	I	Meter level L-CH input terminal.																		
3	METER-R	I	Meter level R-CH input terminal.																		
4	TMSW	I	Test mode selector. "L" : Test mode.																		
5	KEY 4	I	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="text-align: center;">/</td> <td>0(V)</td> <td>1(V)</td> <td>2(V)</td> <td>3(V)</td> <td>4(V)</td> </tr> <tr> <td>KEY 4</td> <td>STOP</td> <td>REW</td> <td>FF</td> <td>REC</td> <td>MUT</td> </tr> <tr> <td>KEY 3</td> <td>PLAY</td> <td>PAS</td> <td>REW</td> <td>MEM</td> <td>MON</td> </tr> </table>	/	0(V)	1(V)	2(V)	3(V)	4(V)	KEY 4	STOP	REW	FF	REC	MUT	KEY 3	PLAY	PAS	REW	MEM	MON
/	0(V)			1(V)	2(V)	3(V)	4(V)														
KEY 4	STOP			REW	FF	REC	MUT														
KEY 3	PLAY	PAS	REW	MEM	MON																
6	KEY 3																				
7	HALF-SW	I	Half pawl input terminal.																		
8	STOP-SW	I	Mechanism stop switch input terminal.																		
9	AMS. SIG	I	AMS signal input terminal.																		
10	TYPE II	I	TYPE II SW input terminal.																		
11	TYPE IV	I	TYPE IV SW input terminal.																		
12	T. PULSE	I	Take up pulse input terminal.																		
13	S. PULSE	I	Supply pulse input terminal.																		
14	LINE-MUT	O	Line Mute ON/OFF. MUTE : 5V																		
15	REC-MUT	O	Recording Mute ON/OFF. MUTE : 5V																		
16	MONITOR	O	Audio mode selector. TAPE : 5V, SOURCE : 5V																		
17	BIAS	O	Bias ON/OFF. ON/OV																		
18	TRG	-	Not used.																		
19	REEL -	O	Reel motor - output. <table border="1" style="display: inline-table; vertical-align: middle; margin-left: 20px;"> <tr> <td>TRG</td> <td>FF</td> <td>PB</td> <td>STOP</td> </tr> <tr> <td>0</td> <td>1</td> <td>IN</td> <td>0</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>	TRG	FF	PB	STOP	0	1	IN	0	1	0	0	0						
TRG	FF	PB		STOP																	
0	1	IN	0																		
1	0	0	0																		
20	REEL +	O	Reel motor + output.																		
21	C. M	O	Capstan motor. ON/OFF, ON : 0V																		
22	-	-	Not used.																		
23	POWER-OUT	O	Power ON/OFF. ON : 0V, OFF : cutoff																		
24	POWER-IN	I	Power OFF. OFF : 0V																		
25	SIRCS	I	Sircs signal input terminal.																		
26	VSS	-	GND.																		
27	RESET	I	Reset signal input. RESET : 0V																		
28	XI	I	System clock input terminal.																		
29	XO	O	System clock output terminal.																		
30	XC1	-	GND.																		
31	XC0	-	Not used.																		
32	G	-	GND.																		
33	-	-	Not used.																		
34	-	-	+ B (5.3V)																		
35	FILTER	-	+ B (5.3V)																		
36	DOLBY. C	-	+ B (5.3V)																		
37	DOLBY. B	-	+ B (5.3V)																		
38	- 21V	I	- 21V																		
39 - 54	SEG a - p	O	FLT segment a - p output terminal.																		
55	SEG s IV	O	FLT segment s/IV output terminal.																		

Pin. No.	Terminal name	I/O	Terminal explanation
56	SEG r II	O	FLT segment r/II output terminal.
57	SEG q I	O	FLT segment q/I output terminal.
58	G5-MODE	O	FLT column Mode.
59	G4-SEC	O	FLT column Sec.
60	G3-MIN	O	FLT column Min.
61	G2-RCH	O	FLT column RCH.
62	G1-LCH	O	FLT column LCH.
63	AVCC	-	Power supply (+5V)
64	VCC	-	Power supply (+5V)

SECTION 5 ADJUSTMENT

5-1. MECHANICAL ADJUSTMENTS

PRECAUTION

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

record/playback/erase head	pinch roller
rubber belts	capstan
idlers	
2. Demagnetize the record/playback head with a head demagnetizer. (Head demagnetizer do not approach for the erase head.)
3. Do not use a magnetized screwdriver for the adjustment.
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.

Torque Measurement

Torque	Torque	Meter reading
Forward	CQ-102C	35 to 60g•cm (0.49 to 0.83oz•inch)
Forward back tension	CQ-102C	2 to 6g•cm (0.027 to 0.08 oz•inch)
FF/REW	CQ-201B	70 to 110g•cm (0.98 to 1.52 oz•inch)

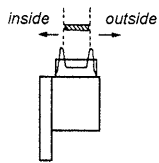
Record/Playback Head Height/Declination Adjustment

Procedures :

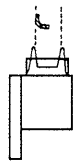
1. Test cassette : CQ-009C
2. Insert the mirror cassette and put the unit in record/Playback mode.

1) Height Adjustment :

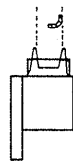
Check to see if the tape is curling at the tape guide of the head. If it is curling, tighten screws **A**, **B** and **C**, respectively by the same angle, moving the head so that it remains at the same angle throughout the procedure. If it curls on the bottom side of the mirror cassette (actually the inner side), tighten all the screws equally ; but loosen them if the tape begins to curl on the top side (outer side).



*Normal
(Record/playback head as seen from the side of the erasehead.)*



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



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

2) Declination Adjustment :

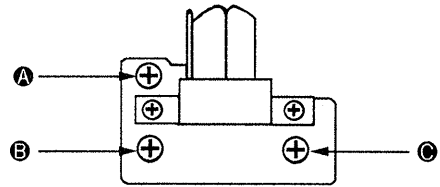
While in the record/playback position, set the back tension to 0 (wind the supply reel with something thin like a pencil in a counterclockwise direction) and make sure there is no curling or shifting (shifting up/shifting down) at the guide of the record/playback head.

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

Repeat the adjustments in steps 1) to 2) and fine adjust the height and the declination.

Adjustment Location : – record/playback head –

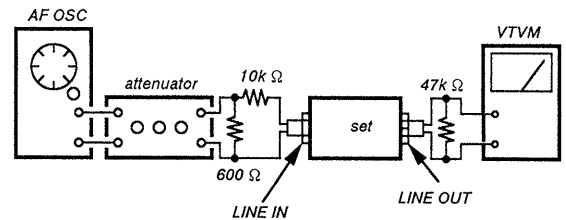


5-2. ELECTRICAL ADJUSTMENTS

PRECAUTION

1. The adjustment should be performed in the publication. (Be sure to make playback adjustment at first.)
2. The adjustments and measurement should be performed for both L-CH and R-CH.
 - Switch position
DOLBY NR switch : OFF
 - Standard record position:
Deliver the standard input signal level to input jack and set the REC LEVEL control to obtain the standard output signal level as follows.

– Record Mode –



Standard Input Level

Input terminal	LINE IN
source impedance	10k Ω
input signal level	0.5V (- 3.8dB)

Standard Output Level

Output terminal	LINE OUT
load impedance	47k Ω
output signal level	0.5V (- 3.8dB)

Test Tape

Tape	Contents	Use
P-4-A100	10kHz, - 10dB	Azimuth Adjustment
P-4-L300	315Hz, 0dB	PB Level Adjustment
WS-48B	3kHz, 0dB	Tape Speed Adjustment

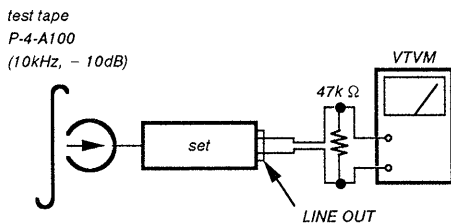
0dB=0.775V

Test Mode

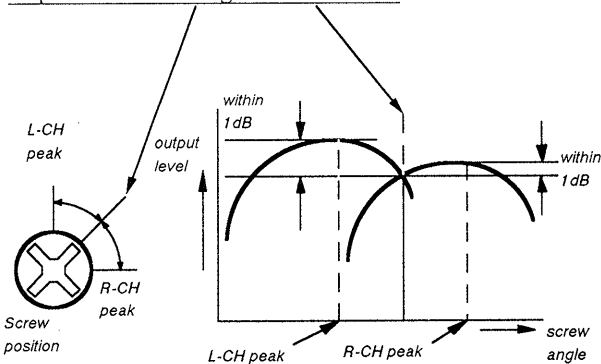
1. Insert a short-circuit plug into TP801 (2P) and turn ON the power switch. (Ground pin ④ of IC801 and turn ON the power switch.)
The FL tube will be fully lit.
2. To release the test mode, remove the short plug and turn off the power switch.
3. Remove the short plug after completion of adjustment.

Record/Playback Head Azimuth Adjustment Procedure :

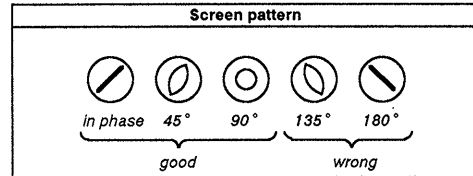
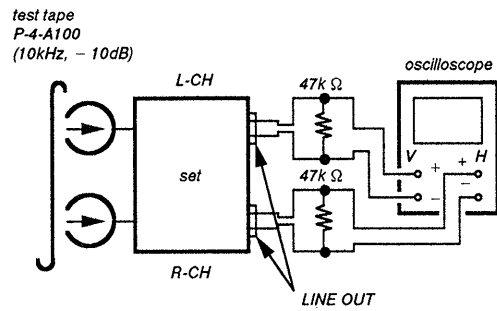
1. Forward playback Mode



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

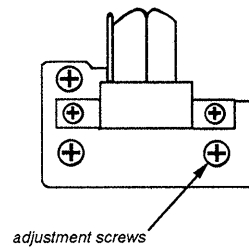


3. Phase check
Playback Mode



4. After the adjustment, lock the adjustment screws with suitable locking compound.

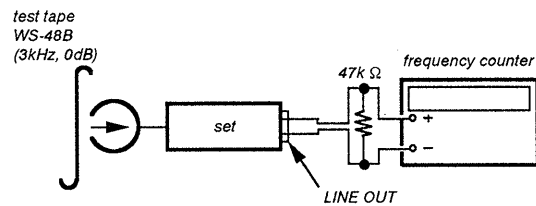
Adjustment Location : - record/playback head -



Tape Speed Adjustment

Procedure :

- Forward Playback Mode -



1. Set to FWD playback mode.
2. Adjust RV71 so that the frequency counter reading becomes $3,000 \pm 15\text{Hz}$.

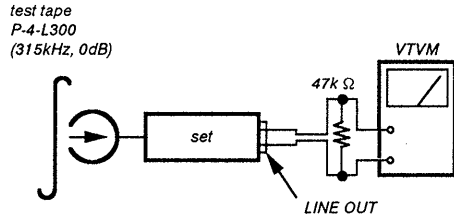
Frequency difference between the beginning and the end of the tape should be within 3%.

Adjustment Location : AUDIO board

Playback Level Adjustment

Procedure :

- Forward Playback Mode –



Adjust RV121 (L-CH) and RV221 (R-CH) so the VTVM reading becomes the adjustment limits below.

Adjustment Value :

LINE OUT level : $-7.7 \pm 0.5\text{dB}$ (0.301 to 0.338V)

Level difference between channels : within 0.5dB

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

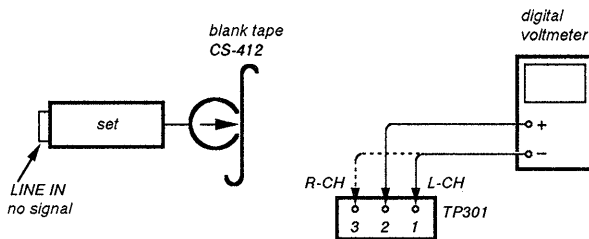
Adjustment Location : MAIN board

Bias Consumption Current Adjustment

This adjustment should be performed when replacing the head assy or the bias oscillating transformer (T101, T201).

Procedure :

- () : R-CH



1. Connect the digital voltmeter to test point TP301
2. Set RV103 (RV203) to mechanical center.
3. Set to FWD record mode.
4. Adjust T101 (T201) so that the digital voltmeter reading becomes minimum.

Adjustment Location : MAIN board

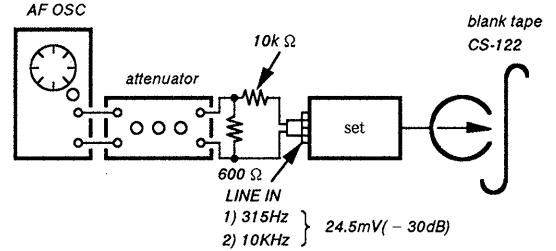
Record Bias Adjustment

Setting :

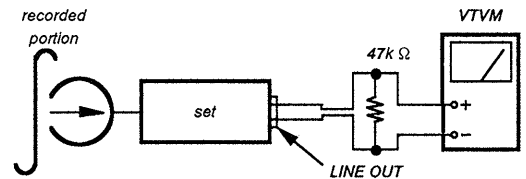
REC LEVEL control : standard record position (Refer to page 11.)

Procedure :

1. Record Mode



2. Playback Mode



Confirm that the 10kHz playback output is $0 \pm 0.3\text{dB}$ relative to the 315Hz output. If necessary, adjust RV103 (L-CH), RV203 (R-CH) and repeat the steps given above.

Adjustment Location : MAIN board

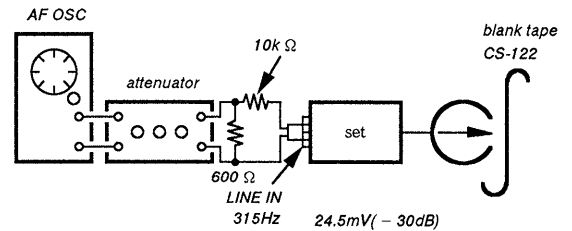
Record Level Adjustment

Setting :

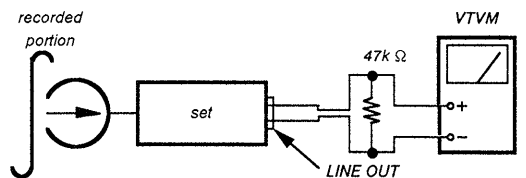
REC LEVEL control : standard record position (Refer to page 11.)

Procedure :

1. Record Mode



2. Playback Mode



Confirm playback the tape recorded become adjustment level as follows.

If necessary, adjust RV102 (L-CH), RV202 (R-CH) and repeat the steps 1 and 2.

Adjustment Value :

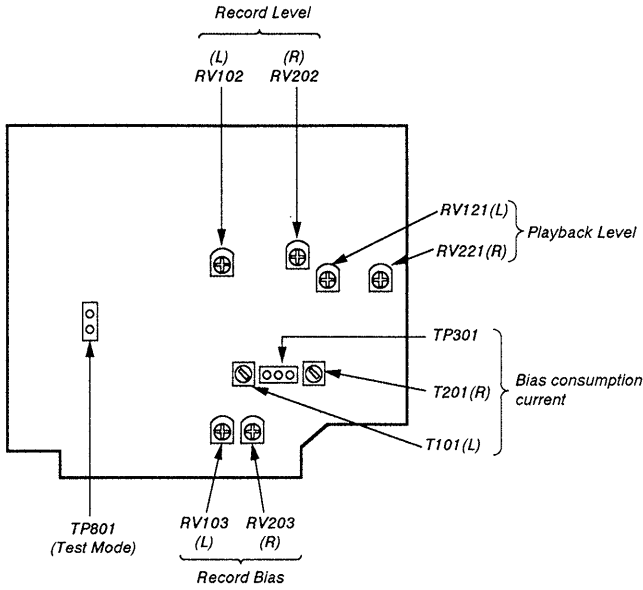
LINE OUT level : $-30 \pm 0.5\text{dB}$ (23.1 to 26.0mV)

Adjustment Location : MAIN board

— Adjustment Parts Location Diagrams —

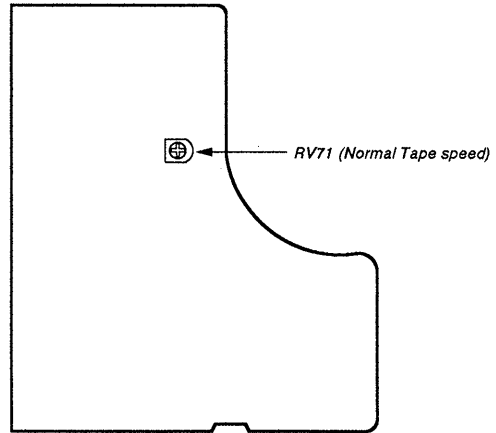
[MAIN BOARD]

(Component Side)



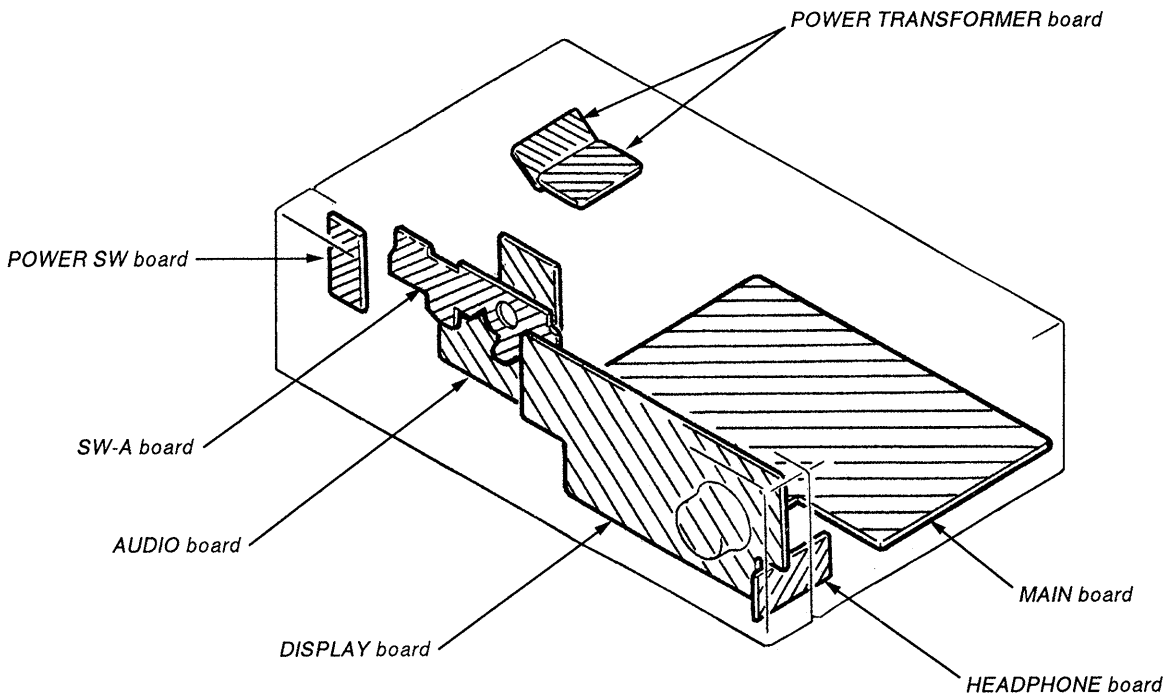
[AUDIO BOARD]

(Component Side)

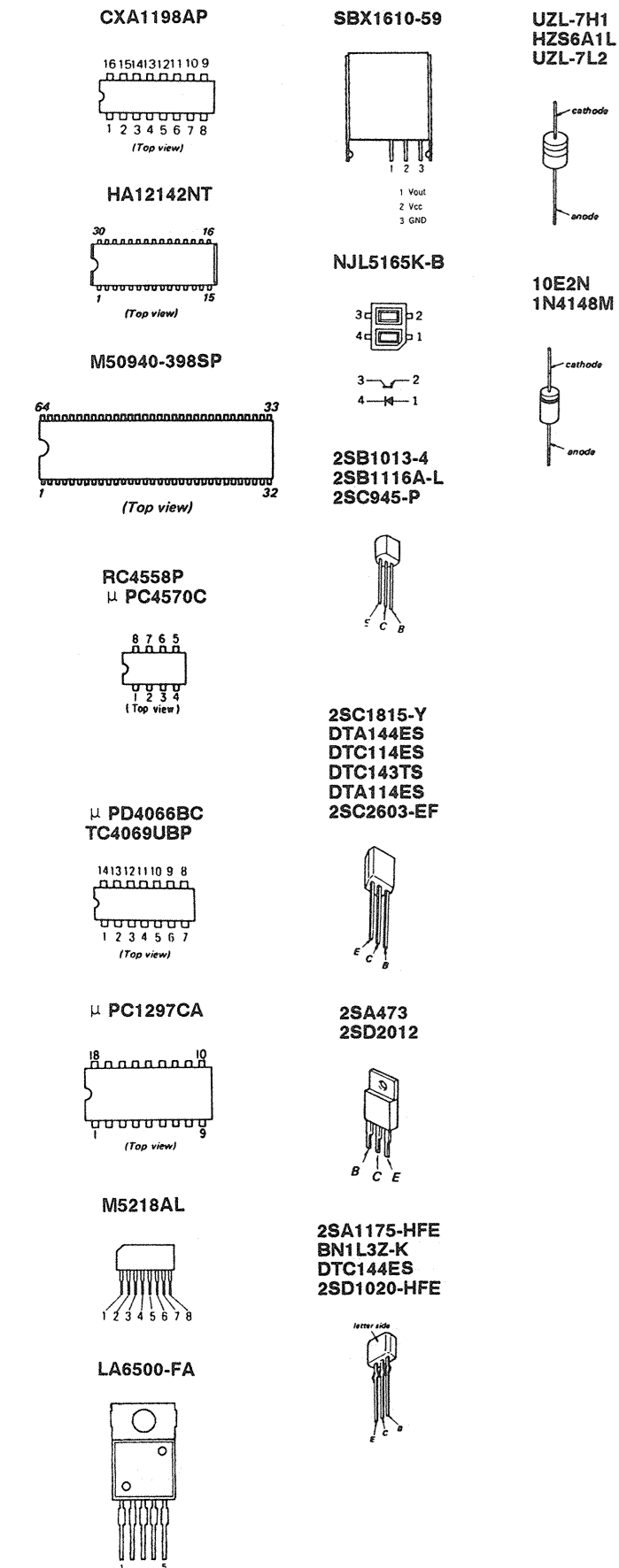


**SECTION 6
DIAGRAMS**

6-1. CIRCUIT BOARDS LOCATION



• Semiconductor Lead Layouts.

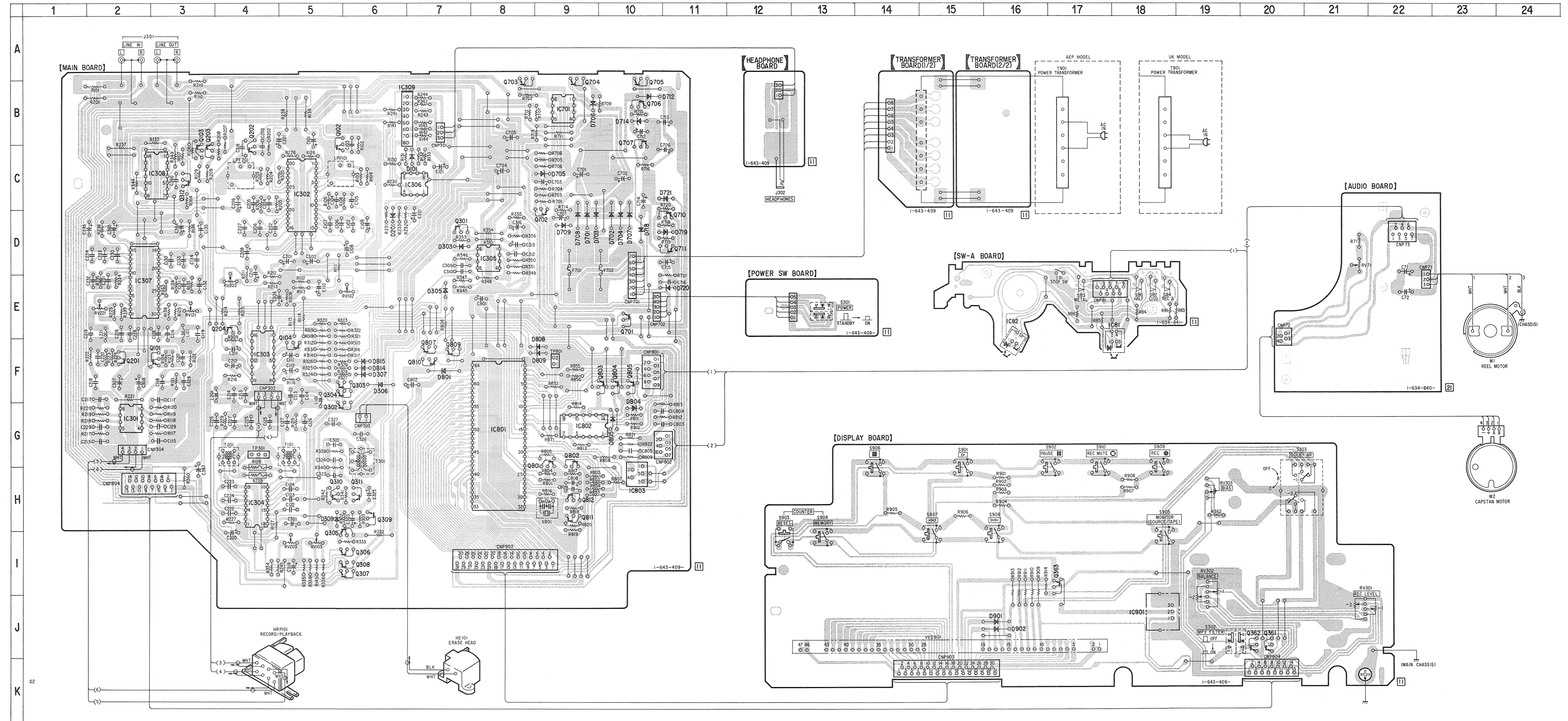


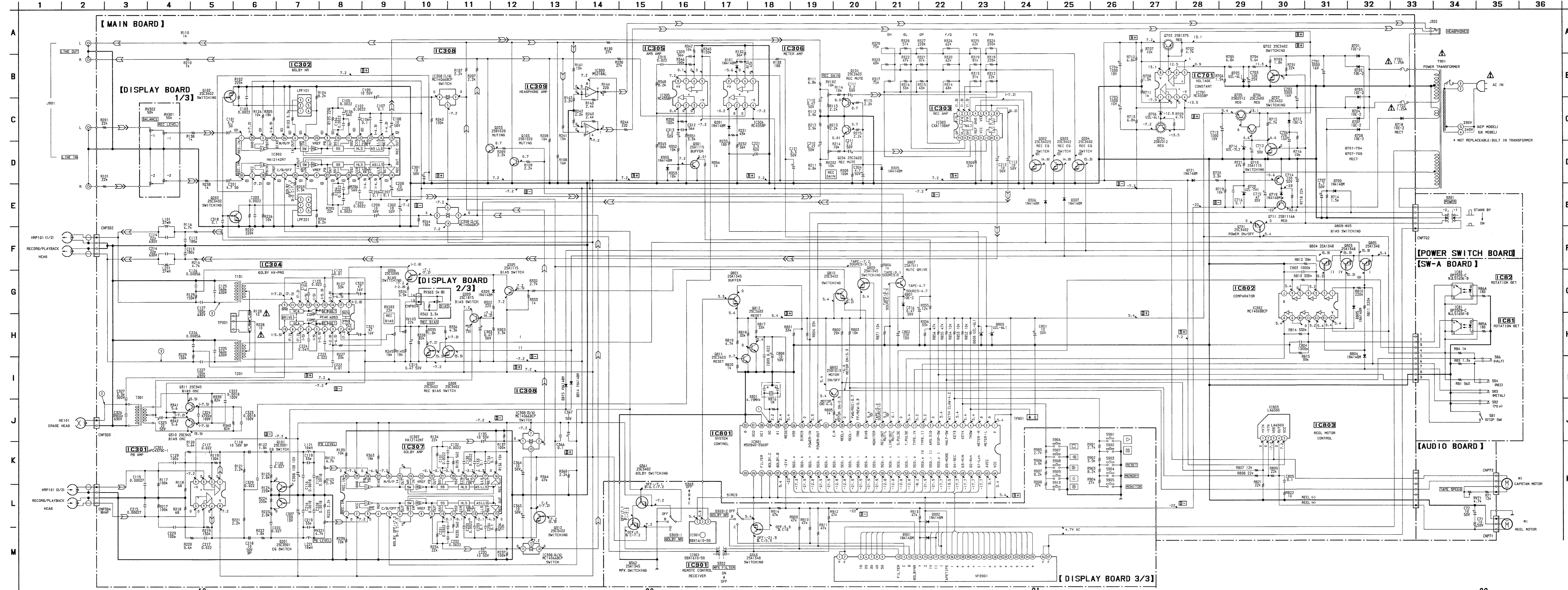
• SEMICONDUCTOR LOCATION

Ref. No.	Location	Ref. No.	Location
D101	C-7	Q101	F-3
D201	D-8	Q102	B-5
D303	D-7	Q103	C-3
D305	E-7	Q104	F-5
D306	F-6	Q201	F-2
D307	F-6	Q202	C-4
D309	H-5	Q203	C-3
D701	D-9	Q204	E-4
D702	D-10	Q301	D-7
D703	D-9	Q302	G-6
D704	D-10	Q303	F-6
D705	C-9	Q304	F-6
D706	B-9	Q305	I-6
D707	D-10	Q306	I-6
D708	D-9	Q307	I-6
D709	D-9	Q308	I-6
D712	B-10	Q309	H-6
D714	B-10	Q310	H-5
D718	D-10	Q311	H-6
D719	D-11	Q312	C-3
D720	E-11	Q361	J-20
D721	C-11	Q362	J-20
D801	F-7	Q363	I-17
D804	G-10	Q701	E-10
D805	G-10	Q702	D-9
D808	F-9	Q703	B-8
D809	F-9	Q704	B-9
D814	F-6	Q705	B-10
D815	F-6	Q706	B-10
D901	J-16	Q707	B-10
D902	J-16	Q710	D-11
IC81	E-18	Q802	G-9
IC82	F-16	Q803	F-10
IC301	G-2	Q804	F-10
IC302	C-5	Q805	F-7
IC303	F-4	Q807	F-7
IC304	H-4	Q809	F-7
IC305	D-8	Q810	F-7
IC306	C-7	Q811	H-9
IC307	E-2	Q812	H-9
IC308	C-3		
IC309	B-7		
IC701	B-9		
IC801	G-8		
IC802	G-9		
IC803	H-10		
IC901	J-18		

Note:

- : parts extracted from the component side.
- : parts mounted on the conductor side.
- ⋯ : Pattern on the side which is seen.





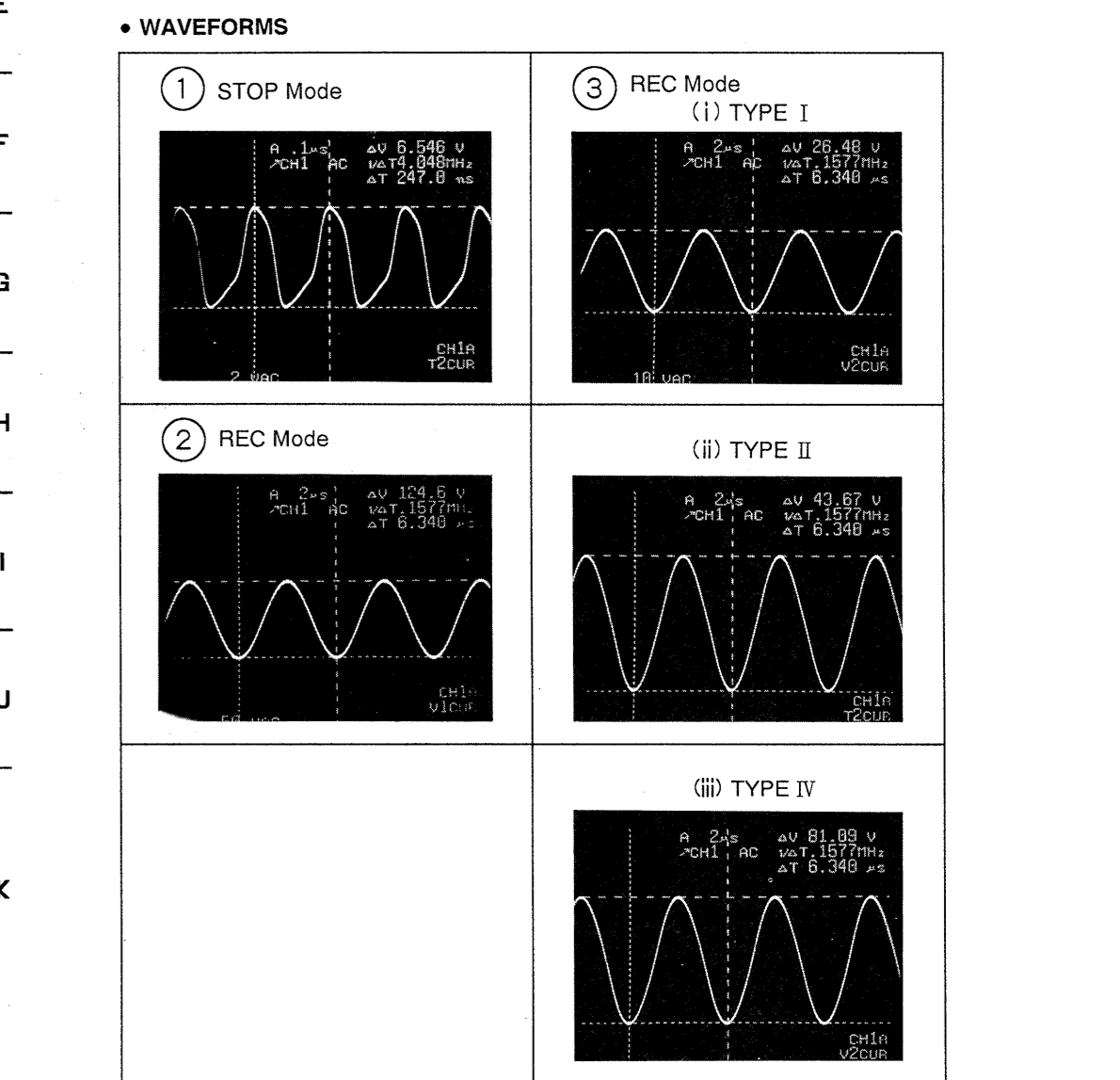
Note :

- All capacitors are in μ F unless otherwise noted. pF, μ F, μ F 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}W$ or less unless otherwise specified.
- % : indicates tolerance.
- Δ : internal component.
- \sim : fusible resistor.

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

Legend:

- $\square +$: B+ Line
- $\square -$: B- Line
- \square : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
- no mark : STOP
- () : REC
- Voltages are taken with a VOM (Input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path:
 - \rightarrow : PB
 - \Rightarrow : REC



SECTION 7 EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Color indication of Appearance Parts
Example:
KNOB, BALANCE (WHITE)... (RED)

↑ Parts color ↑ Cabinet's color

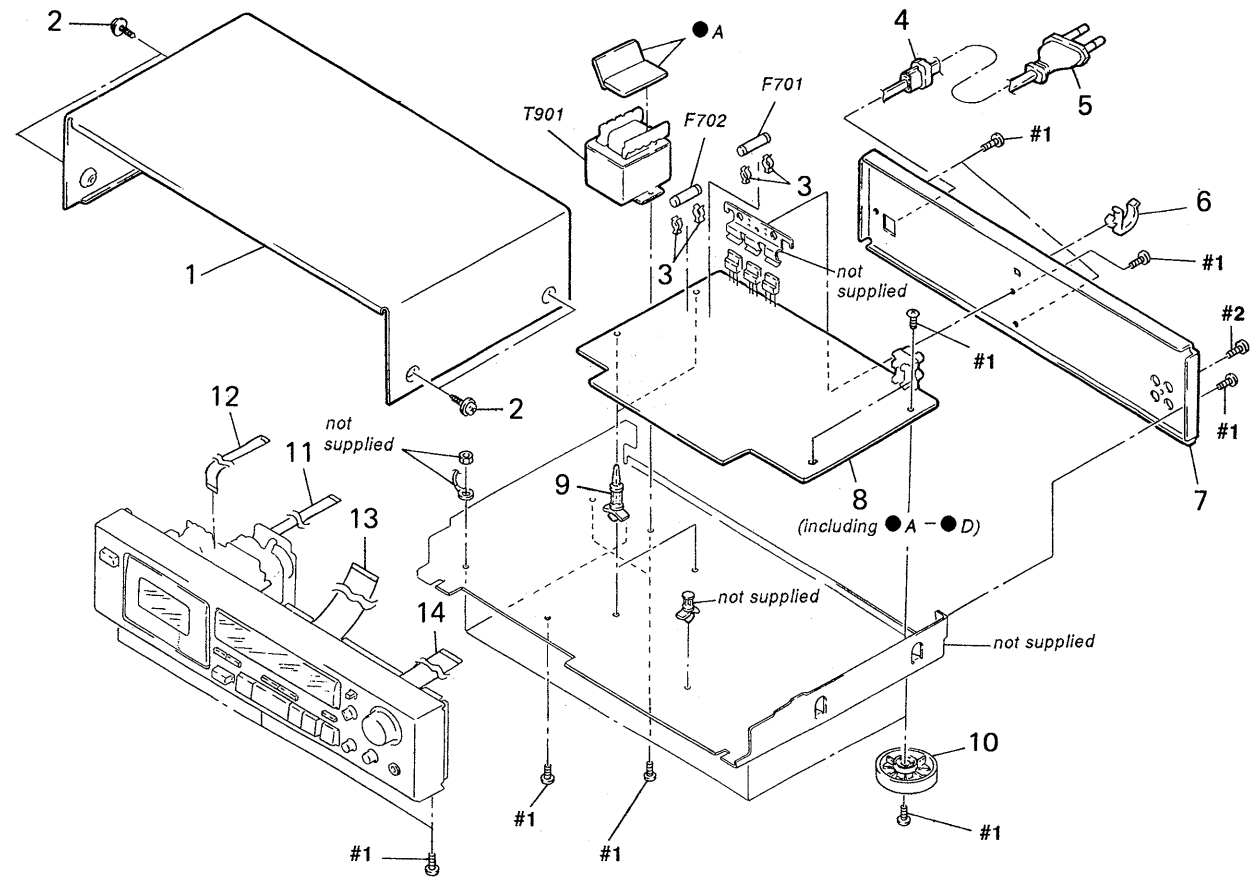
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

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

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

7-1. CHASSIS SECTION

- A : POWER TRANSFORMER board

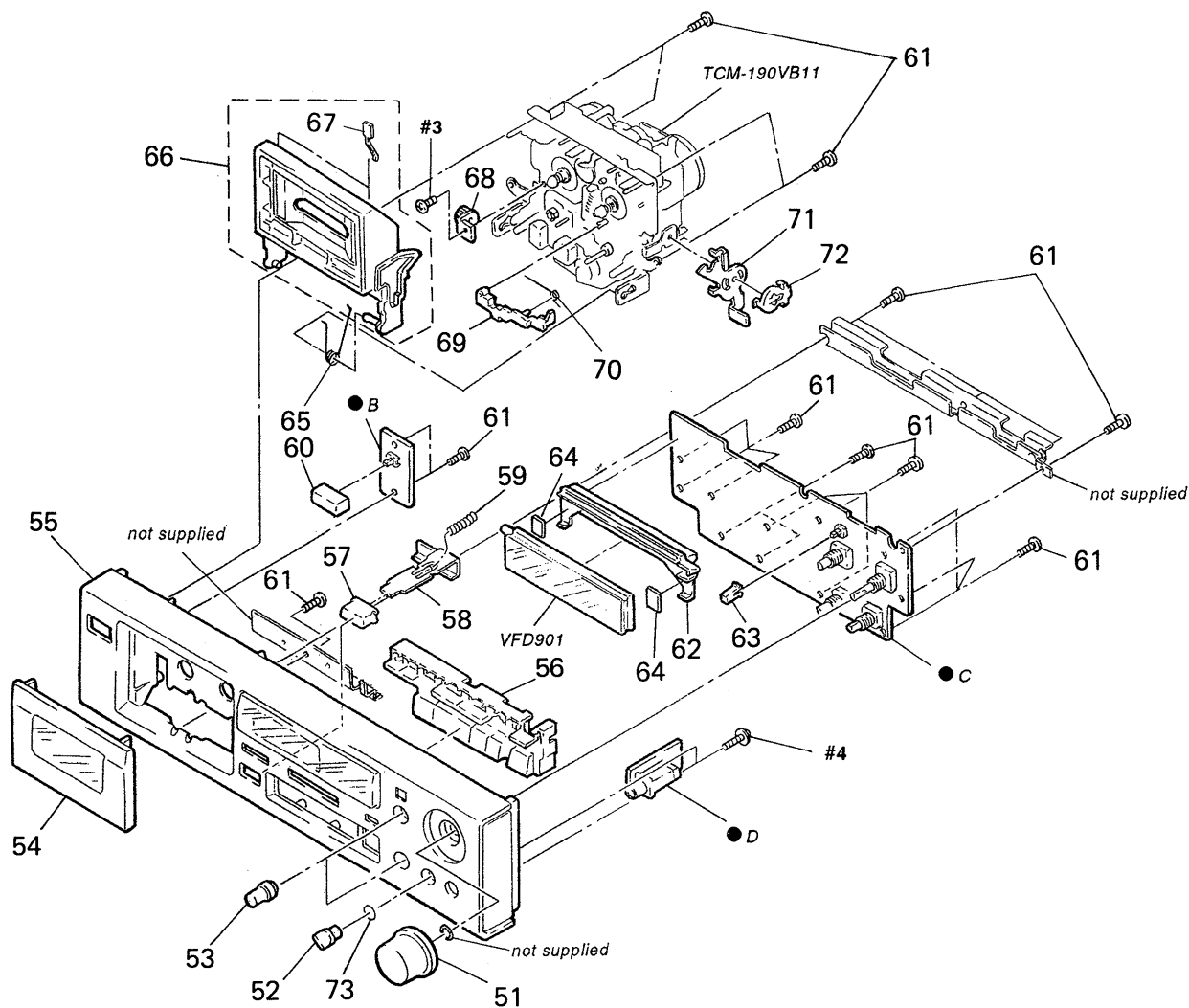


Ref. No.	Part No.	Description	Remark
1	3-332-578-42	CASE	
2	3-704-366-01	SCREW (CASE) (M3X8)	
* 3	1-533-213-31	HOLDER, FUSE	
* 4	3-703-244-00	BUSHING (2104), CORD	
Δ 5	1-555-795-00	CORD, POWER, EULO PLUG (AEP, Germany)	
Δ 5	1-556-035-00	CORD, POWER (UK)	
* 6	4-949-235-01	HOOK	
* 7	3-377-942-01	PANEL, BACK (UK)	
* 7	3-377-942-11	PANEL, BACK (AE1, Germany)	
* 7	3-377-942-21	PANEL, BACK (AE2)	

Ref. No.	Part No.	Description	Remark
* 8	A-2006-782-A	MAIN BOARD, COMPLETE	
* 9	3-346-265-11	HOLDER, PC BOARD	
10	4-943-148-42	FOOT (F58175SW)	
11	1-574-723-11	WIRE, FLAT TYPE (7 CORE)	
* 12	1-575-850-11	WIRE, FLAT TYPE (9 CORE)	
13	1-690-888-11	WIRE, FLAT TYPE (31 CORE)	
14	1-696-168-11	WIRE, FLAT TYPE	
Δ F701	1-532-285-00	FUSE, TIME-LAG (T1.25A)	
Δ F702	1-532-285-00	FUSE, TIME-LAG (T1.25A)	
Δ T901	1-450-860-11	TRANSFORMER, POWER	

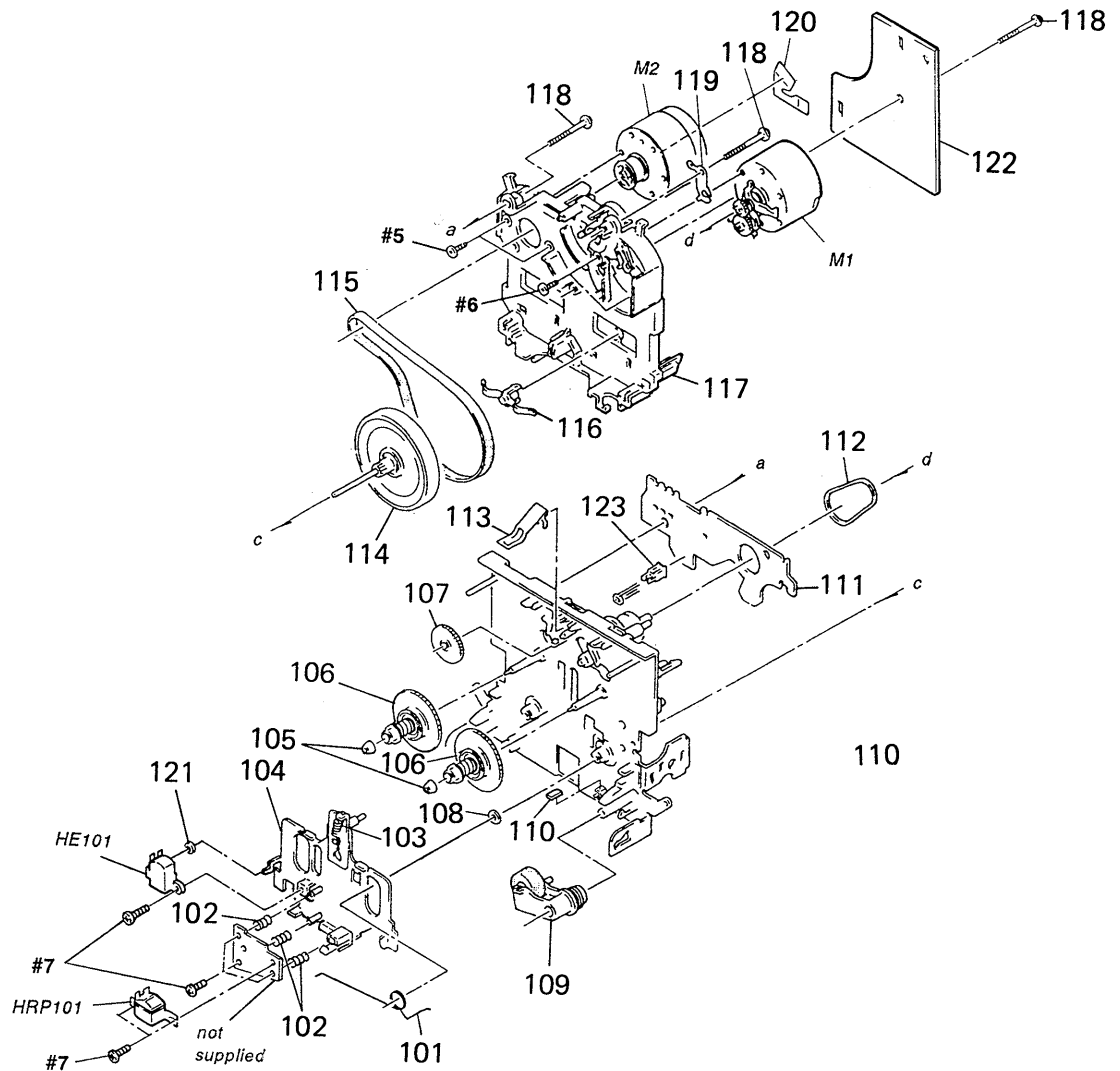
7-2. FRONT PANEL SECTION

- B : POWER SW board
- C : DISPLAY board
- D : HEADPHONE board



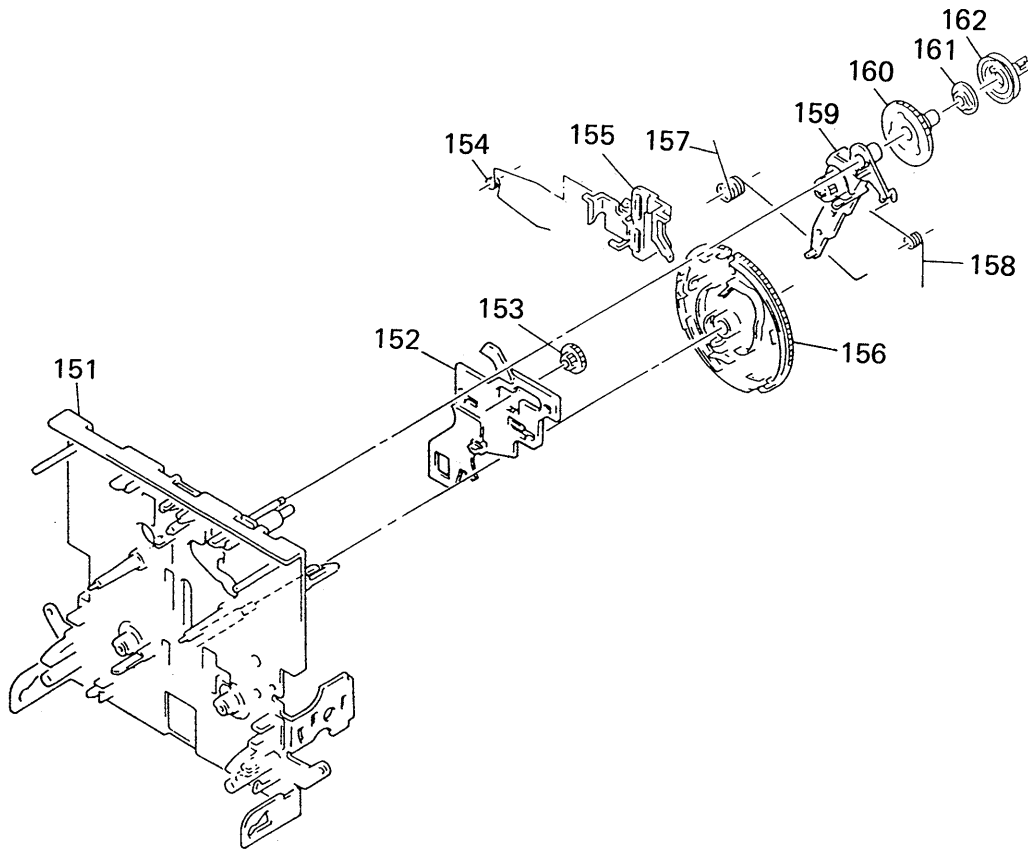
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	3-367-438-11	KNOB (REC)		63	3-380-952-01	BUTTON (5X5)	
52	3-380-950-01	KNOB (VOL)		64	9-911-844-XX	CUSHION	
53	3-367-431-01	KNOB (BAL)		65	3-354-960-01	SPRING (LOADING R), TORSION	
54	X-3365-323-1	LID (3H) ASSY, CASSETTE		66	X-3365-324-1	HOLDER (R) ASSY, CASSETTE	
55	X-3365-325-1	PANEL ASSY, FRONT		67	3-308-823-11	SPRING	
56	3-368-281-51	BUTTON (B)		68	3-354-963-01	DAMPER	
57	3-370-067-01	BUTTON (EJECT)		69	3-354-956-01	LEVER (EJ SAFTY LEVER R)	
* 58	3-370-068-01	SLIDER (EJECT)		70	3-354-962-01	SPRING (EJ SAFTY SPRING R)	
59	3-359-906-01	SPRING, COMPRESSION		* 71	3-354-954-01	LEVER (LOCK LEVER R)	
60	4-922-921-01	BUTTON (POWER)		72	3-354-957-01	JOINT (LOCK LEVER)	
61	4-951-620-01	SCREW (2.6X8), +BVTP		73	3-356-935-01	SPRING	
* 62	4-932-502-01	HOLDER, FL TUBE		VFD901	1-519-657-11	INDICATOR TUBE, FLUORESCENT	

7-3. MECHANISM SECTION 1
(TCM-190VB11)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	3-359-455-01	SPRING, TORSION		115	3-359-467-01	BELT (1 WAY FLAT BELT)	
102	3-356-659-01	SPRING (RPH), COMPRESSION		116	3-575-321-00	RETAINER, THRUST, CAPSTAN	
103	3-363-868-01	SPRING (HEAD CHASSIS), TENSION		* 117	3-359-436-01	BASE (THRUST RETAINER), FITTING	
* 104	X-3365-304-1	SLIDER (HEAD PC BOARD) ASSY		118	3-359-414-01	SCREW (+PTPWH 2X23)	
105	3-362-308-01	CAP (REEL)		119	3-359-450-01	PLATE, GROUND	
106	X-3362-078-1	TABLE ASSY (B), REEL		120	1-638-983-11	PC BOARD, MOTOR FLEXIBLE	
107	3-359-424-01	GEAR (REV GEAR)		121	3-701-437-01	WASHER	
108	3-356-713-01	WASHER		* 122	1-634-840-21	AUDIO BOARD	
109	X-3359-408-1	LEVER (PINCH LEVER FWD) ASSY		123	3-343-419-01	HOLDER (S SENSER A)	
110	3-359-469-01	SPACER		HE101	1-543-673-11	HEAD, MAGNETIC (ERASE)	
* 111	1-634-841-14	SW-A BOARD		HRP101	1-543-733-11	HEAD, MAGNETIC (RECORD/PLAYBACK)	
112	3-359-466-01	BELT (FR), SQUARE		M1	X-3363-501-1	MOTOR ASSY, REEL	
113	3-359-430-01	SPRING (CASSETTE RETAINER), LEAF		M2	X-3359-417-1	MOTOR ASSY, CAPSTAN	
114	X-3364-554-1	FLYWHEEL (FWD) ASSY					

7-4. MECHANISM SECTION 2
(TCM-190VB11)



Ref. No.	Part No.	Description	Remark
151	X-3365-378-1	CHASSIS (ONE) ASSY, MECHANICAL	
* 152	3-359-415-01	SLIDER (TRIGGER SLIDER)	
153	3-359-448-01	GEAR (TRIGGER)	
154	3-359-454-01	SPRING, TORSION	
155	3-359-429-01	SLIDER (BRAKE PLATE)	
156	3-359-420-01	GEAR (CAM GEAR)	

Ref. No.	Part No.	Description	Remark
157	3-359-456-01	SPRING (TRIGGER SPRING), TORSION	
158	3-359-453-01	SPRING (FR ARM), TORSION	
159	X-3359-405-1	LEVER (FR ARM) ASSY	
160	3-359-419-01	GEAR (FR GEAR)	
161	3-359-421-01	CLUTCH (REEL DISK)	
162	3-359-418-01	PULLEY (FR PULLEY)	

**SECTION 8
ELECTRICAL PARTS LIST**

AUDIO

MAIN

NOTE :

- Due to standardization, replacements in the parts list may be different 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..... : μ A....., uPA..... : μ PA.....
uPB..... : μ PB....., uPC..... : μ PC.....
uPD..... : μ PD.....
- CAPACITORS
uF : μ F
- COILS
uH : μ H

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

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

Ref.No.	Part No.	Description	Remark		
	1-634-840-21	AUDIO BOARD *****			
		< CAPACITOR >			
C71	1-124-907-11	ELECT	10uF	20%	50V
C72	1-124-907-11	ELECT	10uF	20%	50V
		< CONNECTOR >			
* CNP72	1-580-411-11	SOCKET, CONNECTOR 4P			
* CNP73	1-568-826-11	SOCKET, CONNECTOR 7P			
		< RESISTOR >			
R71	1-249-430-11	CARBON	12K	5%	1/4W
		< VARIABLE RESISTOR >			
RV71	1-238-599-11	RES, ADJ, CARBON 4.7K (TAPE SPEED)			

*	A-2006-782-A	MAIN BOARD, COMPLETE *****			
*	1-533-213-31	HOLDER, FUSE			
	9-911-844-XX	CUSHION			
*	4-932-502-01	HOLDER, FL TUBE			
		< CAPACITOR >			
C101	1-124-927-11	ELECT	4.7uF	20%	100V
C102	1-130-475-00	MYLAR	0.0022uF	5%	50V
C103	1-161-375-00	CERAMIC	0.0022uF	20%	50V
C104	1-130-475-00	MYLAR	0.0022uF	5%	50V
C105	1-130-475-00	MYLAR	0.0022uF	5%	50V
C106	1-136-165-00	FILM	0.1uF	5%	50V
C107	1-136-165-00	FILM	0.1uF	5%	50V
C108	1-124-907-11	ELECT	10uF	20%	50V

Ref.No.	Part No.	Description	Remark		
C109	1-124-907-11	ELECT	10uF	20%	50V
C110	1-124-902-00	ELECT	0.47uF	20%	50V
C111	1-124-925-11	ELECT	2.2uF	20%	100V
C112	1-124-907-11	ELECT	10uF	20%	50V
C113	1-110-338-51	MYLAR	180PF	5%	50V
C114	1-136-935-11	FILM	22PF	5%	630V
C115	1-110-340-11	MYLAR	270PF	5%	50V
C116	1-130-474-00	MYLAR	0.0018uF	5%	50V
C117	1-136-157-00	FILM	0.022uF	5%	50V
C118	1-126-320-11	ELECT, NONPOLAR	10uF	20%	16V
C119	1-102-518-11	CERAMIC	33PF	5%	50V
C120	1-130-488-00	MYLAR	0.027uF	5%	50V
C121	1-123-382-00	ELECT	3.3uF	20%	100V
C122	1-136-153-00	FILM	0.01uF	5%	50V
C123	1-136-157-00	FILM	0.022uF	5%	50V
C124	1-136-161-00	FILM	0.047uF	5%	50V
C125	1-136-803-11	FILM	560PF	5%	630V
C126	1-130-468-00	MYLAR	560PF	5%	50V
C127	1-136-433-11	FILM	100PF	5%	630V
C128	1-130-474-00	MYLAR	0.0018uF	5%	50V
C129	1-162-282-31	CERAMIC	100PF	10%	50V
C130	1-130-475-00	MYLAR	0.0022uF	5%	50V
C131	1-130-475-00	MYLAR	0.0022uF	5%	50V
C132	1-130-475-00	MYLAR	0.0022uF	5%	50V
C133	1-136-165-00	FILM	0.1uF	5%	50V
C134	1-136-165-00	FILM	0.1uF	5%	50V
C135	1-124-907-11	ELECT	10uF	20%	50V
C201	1-124-927-11	ELECT	4.7uF	20%	100V
C202	1-130-475-00	MYLAR	0.0022uF	5%	50V
C203	1-161-375-00	CERAMIC	0.0022uF	20%	50V
C204	1-130-475-00	MYLAR	0.0022uF	5%	50V
C205	1-130-475-00	MYLAR	0.0022uF	5%	50V
C206	1-136-165-00	FILM	0.1uF	5%	50V
C207	1-136-165-00	FILM	0.1uF	5%	50V

MAIN

Ref.No.	Part No.	Description	Remark		
C208	1-124-907-11	ELECT	10uF	20%	50V
C209	1-124-907-11	ELECT	10uF	20%	50V
C210	1-124-902-00	ELECT	0.47uF	20%	50V
C211	1-124-925-11	ELECT	2.2uF	20%	100V
C212	1-124-907-11	ELECT	10uF	20%	50V
C213	1-110-338-51	MYLAR	180PF	5%	50V
C214	1-136-935-11	FILM	22PF	5%	630V
C215	1-110-340-11	MYLAR	270PF	5%	50V
C216	1-130-474-00	MYLAR	0.0018uF	5%	50V
C217	1-136-157-00	FILM	0.022uF	5%	50V
C218	1-126-320-11	ELECT, NONPOLAR R	10uF	20%	16V
C219	1-102-518-11	CERAMIC	33PF	5%	50V
C220	1-130-488-00	MYLAR	0.027uF	5%	50V
C221	1-123-382-00	ELECT	3.3uF	20%	100V
C222	1-136-153-00	FILM	0.01uF	5%	50V
C223	1-136-157-00	FILM	0.022uF	5%	50V
C224	1-136-161-00	FILM	0.047uF	5%	50V
C225	1-136-803-11	FILM	560PF	5%	630V
C226	1-130-468-00	MYLAR	560PF	5%	50V
C227	1-136-433-11	FILM	100PF	5%	630V
C228	1-130-474-00	MYLAR	0.0018uF	5%	50V
C229	1-162-282-31	CERAMIC	100PF	10%	50V
C230	1-130-475-00	MYLAR	0.0022uF	5%	50V
C231	1-130-475-00	MYLAR	0.0022uF	5%	50V
C232	1-130-475-00	MYLAR	0.0022uF	5%	50V
C233	1-136-165-00	FILM	0.1uF	5%	50V
C234	1-136-165-00	FILM	0.1uF	5%	50V
C235	1-124-907-11	ELECT	10uF	20%	50V
C301	1-124-907-11	ELECT	10uF	20%	50V
C302	1-124-907-11	ELECT	10uF	20%	50V
C303	1-124-902-00	ELECT	0.47uF	20%	50V
C304	1-124-927-11	ELECT	4.7uF	20%	100V
C307	1-124-443-00	ELECT	100uF	20%	10V
C308	1-124-443-00	ELECT	100uF	20%	10V
C309	1-162-217-31	CERAMIC	56PF	5%	50V
C310	1-161-494-00	CERAMIC	0.022uF		25V
C312	1-162-217-31	CERAMIC	56PF	5%	50V
C313	1-124-925-11	ELECT	2.2uF	20%	100V
C316	1-124-902-00	ELECT	0.47uF	20%	50V
C318	1-164-159-11	CERAMIC	0.1uF		50V
C319	1-124-902-00	ELECT	0.47uF	20%	50V
C320	1-124-477-11	ELECT	47uF	20%	25V
C321	1-124-477-11	ELECT	47uF	20%	25V
C322	1-136-253-11	FILM	0.0018uF	5%	100V
C323	1-136-253-11	FILM	0.0018uF	5%	100V
C324	1-136-233-11	FILM	0.0047uF	5%	100V
C325	1-126-233-11	ELECT	22uF	20%	50V
C326	1-136-558-11	FILM	0.0039uF	5%	630V
C327	1-107-045-00	MICA	3.9PF		500V

Ref.No.	Part No.	Description	Remark		
C329	1-161-494-00	CERAMIC	0.022uF		25V
C364	1-124-907-11	ELECT	10uF	20%	50V
C365	1-124-907-11	ELECT	10uF	20%	50V
C366	1-164-159-11	CERAMIC	0.1uF		50V
C367	1-124-903-11	ELECT	1uF	20%	50V
C701	1-126-936-11	ELECT	3300uF	20%	16V
C702	1-126-936-11	ELECT	3300uF	20%	16V
C703	1-124-478-11	ELECT	100uF	20%	25V
C704	1-126-926-11	ELECT	1000uF	20%	10V
C705	1-126-926-11	ELECT	1000uF	20%	10V
C706	1-124-120-11	ELECT	220uF	20%	25V
C707	1-124-927-11	ELECT	4.7uF	20%	100V
C712	1-124-903-11	ELECT	1uF	20%	50V
C713	1-126-926-11	ELECT	1000uF	20%	10V
C714	1-124-122-11	ELECT	100uF	20%	50V
C715	1-124-910-11	ELECT	47uF	20%	50V
C716	1-164-159-11	CERAMIC	0.1uF		50V
C801	1-124-907-11	ELECT	10uF	20%	50V
C802	1-126-176-11	ELECT	220uF	20%	10V
C803	1-162-294-31	CERAMIC	0.001uF	10%	50V
C804	1-162-294-31	CERAMIC	0.001uF	10%	50V
C805	1-164-159-11	CERAMIC	0.1uF		50V
C808	1-124-907-11	ELECT	10uF	20%	50V
C809	1-161-494-00	CERAMIC	0.022uF		25V

< CONNECTOR >

* CNP301	1-564-337-00	PIN, CONNECTOR	3P	
* CNP302	1-560-062-00	PIN, CONNECTOR	4P	
* CNP303	1-560-060-00	PIN, CONNECTOR	2P	
* CNP304	1-560-062-00	PIN, CONNECTOR	4P	
* CNP701	1-564-510-11	PLUG, CONNECTOR	7P	
* CNP702	1-564-339-00	PIN, CONNECTOR	5P	
* CNP801	1-568-828-11	SOCKET, CONNECTOR	9P	
* CNP802	1-568-826-11	SOCKET, CONNECTOR	7P	
* CNP803	1-568-845-11	SOCKET, CONNECTOR	31P	
* CNP804	1-568-834-11	SOCKET, CONNECTOR	15P	
* CNP903	1-568-845-11	SOCKET, CONNECTOR	31P	
* CNP904	1-568-834-11	SOCKET, CONNECTOR	15P	

< DIODE >

D101	8-719-987-63	DIODE	1N4148M	
D201	8-719-987-63	DIODE	1N4148M	
D303	8-719-987-63	DIODE	1N4148M	
D305	8-719-987-63	DIODE	1N4148M	
D306	8-719-987-63	DIODE	1N4148M	
D307	8-719-987-63	DIODE	1N4148M	
D309	8-719-987-63	DIODE	1N4148M	
D701	8-719-200-77	DIODE	10E2N	
D702	8-719-200-77	DIODE	10E2N	

Ref.No.	Part No.	Description	Remark
D703	8-719-200-77	DIODE 10E2N	
D704	8-719-200-77	DIODE 10E2N	
D705	8-719-933-33	DIODE HZS6A1L	
D706	8-719-933-33	DIODE HZS6A1L	
D707	8-719-200-77	DIODE 10E2N	
D708	8-719-200-77	DIODE 10E2N	
D709	8-719-987-63	DIODE 1N4148M	
D712	8-719-200-77	DIODE 10E2N	
D714	8-719-000-78	DIODE UZL-7L2	
D718	8-719-200-77	DIODE 10E2N	
D719	8-719-987-63	DIODE 1N4148M	
D720	8-719-000-93	DIODE UZL-7H1	
D721	8-719-987-63	DIODE 1N4148M	
D801	8-719-200-77	DIODE 10E2N	
D804	8-719-987-63	DIODE 1N4148M	
D805	8-719-987-63	DIODE 1N4148M	
D808	8-719-933-33	DIODE HZS6A1L	
D809	8-719-933-33	DIODE HZS6A1L	
D814	8-719-987-63	DIODE 1N4148M	
D815	8-719-987-63	DIODE 1N4148M	
D901	8-719-987-63	DIODE 1N4148M	
D902	8-719-987-63	DIODE 1N4148M	
< IC >			
IC301	8-759-111-44	IC uPC4570C-1	
IC302	8-759-074-47	IC HA12142NT	
IC303	8-752-060-64	IC CXA1198AP	
IC304	8-759-106-56	IC uPC1297CA	
IC305	8-759-945-58	IC RC4558P	
IC306	8-759-945-58	IC RC4558P	
IC307	8-759-074-47	IC HA12142NT	
IC308	8-759-000-49	IC uPD4066BC	
IC309	8-759-634-50	IC M5218AL	
IC701	8-759-945-58	IC RC4558P	
IC801	8-759-080-84	IC M50940-398SP	
IC802	8-759-240-69	IC TC4069UBP	
IC803	8-759-803-42	IC LA6500-FA	
IC901	8-741-100-48	IC SBX1610-59	
< JACK >			
J301	1-565-258-11	JACK, PIN 4P (LINE IN /OUT)	
J302	1-568-519-41	JACK, LARGE TYPE (HEADPHONES)	
< COIL >			
L101	1-410-780-11	INDUCTOR 27mH	
L121	1-410-778-11	INDUCTOR 18mH	
L201	1-410-780-11	INDUCTOR 27mH	
L221	1-410-778-11	INDUCTOR 18mH	

Ref.No.	Part No.	Description	Remark
< FILTER >			
LPF101	1-231-388-00	FILTER, LOW PASS	
LPF201	1-231-388-00	FILTER, LOW PASS	
< TRANSISTOR >			
Q101	8-729-900-74	TRANSISTOR DTC143TS	
Q102	8-729-900-80	TRANSISTOR DTC114ES	
Q103	8-729-142-25	TRANSISTOR 2SD1020-HFE	
Q104	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q201	8-729-900-74	TRANSISTOR DTC143TS	
Q202	8-729-900-80	TRANSISTOR DTC114ES	
Q203	8-729-142-25	TRANSISTOR 2SD1020-HFE	
Q204	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q301	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q302	8-729-900-80	TRANSISTOR DTC114ES	
Q303	8-729-900-80	TRANSISTOR DTC114ES	
Q304	8-729-900-80	TRANSISTOR DTC114ES	
Q305	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q306	8-729-900-89	TRANSISTOR DTC144ES	
Q307	8-729-900-80	TRANSISTOR DTC114ES	
Q308	8-729-900-80	TRANSISTOR DTC114ES	
Q309	8-729-281-52	TRANSISTOR 2SC1815-Y	
Q310	8-729-194-57	TRANSISTOR 2SC945-P	
Q311	8-729-194-57	TRANSISTOR 2SC945-P	
Q312	8-729-900-80	TRANSISTOR DTC114ES	
Q361	8-729-900-80	TRANSISTOR DTC114ES	
Q362	8-729-900-65	TRANSISTOR DTA144ES	
Q363	8-729-900-61	TRANSISTOR DTA114ES	
Q701	8-729-900-80	TRANSISTOR DTC114ES	
Q702	8-729-900-80	TRANSISTOR DTC114ES	
Q703	8-729-141-83	TRANSISTOR 2SA473	
Q704	8-729-209-15	TRANSISTOR 2SD2012	
Q705	8-729-209-15	TRANSISTOR 2SD2012	
Q706	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q707	8-729-900-80	TRANSISTOR DTC114ES	
Q710	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q711	8-729-140-04	TRANSISTOR 2SB1116A-L	
Q801	8-729-900-65	TRANSISTOR DTA144ES	
Q802	8-729-801-84	TRANSISTOR 2SB1013-4	
Q803	8-729-900-61	TRANSISTOR DTA114ES	
Q804	8-729-900-61	TRANSISTOR DTA114ES	
Q805	8-729-900-61	TRANSISTOR DTA114ES	
Q807	8-729-115-28	TRANSISTOR BN1L3Z-K	
Q809	8-729-900-65	TRANSISTOR DTA144ES	
Q810	8-729-900-80	TRANSISTOR DTC114ES	
Q811	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q812	8-729-620-05	TRANSISTOR 2SC2603-EF	

MAIN

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
		< RESISTOR >					
R101	1-249-433-11	CARBON	22K 5% 1/4W	R204	1-249-428-11	CARBON	8.2K 5% 1/4W
R102	1-247-887-00	CARBON	220K 5% 1/4W	R205	1-249-433-11	CARBON	22K 5% 1/4W
R103	1-249-423-11	CARBON	3.3K 5% 1/4W	R206	1-249-414-11	CARBON	560 5% 1/4W
R104	1-249-428-11	CARBON	8.2K 5% 1/4W	R207	1-249-421-11	CARBON	2.2K 5% 1/4W
R105	1-249-433-11	CARBON	22K 5% 1/4W	R208	1-247-860-11	CARBON	16K 5% 1/4W
R106	1-249-414-11	CARBON	560 5% 1/4W	R209	1-249-421-11	CARBON	2.2K 5% 1/4W
R107	1-249-421-11	CARBON	2.2K 5% 1/4W	R210	1-249-417-11	CARBON	1K 5% 1/4W
R108	1-247-860-11	CARBON	16K 5% 1/4W	R211	1-249-427-11	CARBON	6.8K 5% 1/4W
R109	1-249-421-11	CARBON	2.2K 5% 1/4W	R212	1-249-424-11	CARBON	3.9K 5% 1/4W
R110	1-249-417-11	CARBON	1K 5% 1/4W	R213	1-249-421-11	CARBON	2.2K 5% 1/4W
R111	1-249-427-11	CARBON	6.8K 5% 1/4W	R214	1-249-429-11	CARBON	10K 5% 1/4W
R112	1-249-424-11	CARBON	3.9K 5% 1/4W	R215	1-249-421-11	CARBON	2.2K 5% 1/4W
R113	1-249-421-11	CARBON	2.2K 5% 1/4W	R216	1-249-425-11	CARBON	4.7K 5% 1/4W
R114	1-249-429-11	CARBON	10K 5% 1/4W	R217	1-249-441-11	CARBON	100K 5% 1/4W
R115	1-249-421-11	CARBON	2.2K 5% 1/4W	R218	1-249-403-11	CARBON	68 5% 1/4W
R116	1-249-425-11	CARBON	4.7K 5% 1/4W	R219	1-247-882-11	CARBON	130K 5% 1/4W
R117	1-249-441-11	CARBON	100K 5% 1/4W	R220	1-249-426-11	CARBON	5.6K 5% 1/4W
R118	1-249-403-11	CARBON	68 5% 1/4W	R221	1-249-421-11	CARBON	2.2K 5% 1/4W
R119	1-247-882-11	CARBON	130K 5% 1/4W	R222	1-249-420-11	CARBON	1.8K 5% 1/4W
R120	1-249-426-11	CARBON	5.6K 5% 1/4W	R223	1-247-838-00	CARBON	2K 5% 1/4W
R121	1-249-421-11	CARBON	2.2K 5% 1/4W	R224	1-247-887-00	CARBON	220K 5% 1/4W
R122	1-249-420-11	CARBON	1.8K 5% 1/4W	R225	1-249-421-11	CARBON	2.2K 5% 1/4W
R123	1-247-838-00	CARBON	2K 5% 1/4W	R226	1-249-429-11	CARBON	10K 5% 1/4W
R124	1-247-887-00	CARBON	220K 5% 1/4W	R227	1-249-435-11	CARBON	33K 5% 1/4W
R125	1-249-421-11	CARBON	2.2K 5% 1/4W	△R228	1-219-153-11	FUSIBLE	10 5% 1/4W F
R126	1-249-429-11	CARBON	10K 5% 1/4W	R229	1-247-883-00	CARBON	150K 5% 1/4W
R127	1-249-435-11	CARBON	33K 5% 1/4W	R230	1-249-434-11	CARBON	27K 5% 1/4W
△R128	1-219-153-11	FUSIBLE	10 5% 1/4W F	R231	1-247-870-11	CARBON	43K 5% 1/4W
R129	1-247-883-00	CARBON	150K 5% 1/4W	R232	1-247-868-11	CARBON	36K 5% 1/4W
R130	1-249-434-11	CARBON	27K 5% 1/4W	R233	1-249-408-11	CARBON	180 5% 1/4W
R131	1-247-870-11	CARBON	43K 5% 1/4W	R234	1-249-433-11	CARBON	22K 5% 1/4W
R132	1-247-868-11	CARBON	36K 5% 1/4W	R235	1-249-414-11	CARBON	560 5% 1/4W
R133	1-249-408-11	CARBON	180 5% 1/4W	R236	1-249-429-11	CARBON	10K 5% 1/4W
R134	1-249-433-11	CARBON	22K 5% 1/4W	R237	1-249-441-11	CARBON	100K 5% 1/4W
R135	1-249-414-11	CARBON	560 5% 1/4W	R238	1-249-417-11	CARBON	1K 5% 1/4W
R136	1-249-429-11	CARBON	10K 5% 1/4W	R239	1-249-429-11	CARBON	10K 5% 1/4W
R137	1-249-441-11	CARBON	100K 5% 1/4W	R241	1-249-429-11	CARBON	10K 5% 1/4W
R138	1-249-417-11	CARBON	1K 5% 1/4W	R242	1-249-421-11	CARBON	2.2K 5% 1/4W
R139	1-249-429-11	CARBON	10K 5% 1/4W	R243	1-247-840-00	CARBON	2.4K 5% 1/4W
R141	1-249-429-11	CARBON	10K 5% 1/4W	R244	1-249-409-11	CARBON	220 5% 1/4W
R142	1-249-421-11	CARBON	2.2K 5% 1/4W	R245	1-249-432-11	CARBON	18K 5% 1/4W
R143	1-247-840-00	CARBON	2.4K 5% 1/4W	R302	1-249-409-11	CARBON	220 5% 1/4W
R144	1-249-409-11	CARBON	220 5% 1/4W	R303	1-249-423-11	CARBON	3.3K 5% 1/4W
R145	1-249-432-11	CARBON	18K 5% 1/4W	R305	1-215-451-00	METAL	18K 1% 1/6W
R201	1-249-433-11	CARBON	22K 5% 1/4W	R308	1-249-441-11	CARBON	100K 5% 1/4W
R202	1-247-887-00	CARBON	220K 5% 1/4W	R309	1-247-864-11	CARBON	24K 5% 1/4W
R203	1-249-423-11	CARBON	3.3K 5% 1/4W	R312	1-249-433-11	CARBON	22K 5% 1/4W
				R313	1-247-878-00	CARBON	91K 5% 1/4W
				R314	1-249-439-11	CARBON	68K 5% 1/4W

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			Ref. No.	Part No.	Description	Remark		
R315	1-247-870-11	CARBON	43K	5%	1/4W	R707	1-249-429-11	CARBON	10K	5%	1/4W
R316	1-249-435-11	CARBON	33K	5%	1/4W	R708	1-249-419-11	CARBON	1.5K	5%	1/4W
R317	1-247-876-11	CARBON	75K	5%	1/4W	R709	1-249-425-11	CARBON	4.7K	5%	1/4W
R318	1-247-887-00	CARBON	220K	5%	1/4W	R711	1-249-417-11	CARBON	1K	5%	1/4W
R319	1-247-878-00	CARBON	91K	5%	1/4W	R712	1-249-427-11	CARBON	6.8K	5%	1/4W
R320	1-247-874-11	CARBON	62K	5%	1/4W	R713	1-249-427-11	CARBON	6.8K	5%	1/4W
R321	1-247-878-00	CARBON	91K	5%	1/4W	R714	1-249-419-11	CARBON	1.5K	5%	1/4W
R322	1-249-437-11	CARBON	47K	5%	1/4W	R715	1-249-425-11	CARBON	4.7K	5%	1/4W
R323	1-249-439-11	CARBON	68K	5%	1/4W	R716	1-249-429-11	CARBON	10K	5%	1/4W
R324	1-247-886-11	CARBON	200K	5%	1/4W	R718	1-249-433-11	CARBON	22K	5%	1/4W
R325	1-247-874-11	CARBON	62K	5%	1/4W	R719	1-249-429-11	CARBON	10K	5%	1/4W
R326	1-247-874-11	CARBON	62K	5%	1/4W	R720	1-249-423-11	CARBON	3.3K	5%	1/4W
R327	1-247-887-00	CARBON	220K	5%	1/4W	R721	1-249-437-11	CARBON	47K	5%	1/4W
R328	1-247-872-11	CARBON	51K	5%	1/4W	R801	1-249-435-11	CARBON	33K	5%	1/4W
R329	1-247-876-11	CARBON	75K	5%	1/4W	R802	1-247-862-11	CARBON	20K	5%	1/4W
R332	1-249-422-11	CARBON	2.7K	5%	1/4W	R803	1-249-429-11	CARBON	10K	5%	1/4W
R333	1-249-417-11	CARBON	1K	5%	1/4W	R804	1-249-435-11	CARBON	33K	5%	1/4W
R334	1-249-424-11	CARBON	3.9K	5%	1/4W	R805	1-249-417-11	CARBON	1K	5%	1/4W
R335	1-249-420-11	CARBON	1.8K	5%	1/4W	R806	1-249-417-11	CARBON	1K	5%	1/4W
R336	1-247-846-11	CARBON	4.3K	5%	1/4W	R807	1-249-430-11	CARBON	12K	5%	1/4W
R338	1-247-866-11	CARBON	30K	5%	1/4W	R808	1-249-433-11	CARBON	22K	5%	1/4W
R339	1-249-440-11	CARBON	82K	5%	1/4W	R809	1-249-433-11	CARBON	22K	5%	1/4W
R340	1-249-440-11	CARBON	82K	5%	1/4W	R810	1-247-887-00	CARBON	220K	5%	1/4W
R341	1-249-390-11	CARBON	5.6	5%	1/6W	R811	1-247-887-00	CARBON	220K	5%	1/4W
R342	1-249-390-11	CARBON	5.6	5%	1/6W	R812	1-249-436-11	CARBON	39K	5%	1/4W
R343	1-249-441-11	CARBON	100K	5%	1/4W	R813	1-247-891-00	CARBON	330K	5%	1/4W
R344	1-249-441-11	CARBON	100K	5%	1/4W	R814	1-247-891-00	CARBON	330K	5%	1/4W
R345	1-249-441-11	CARBON	100K	5%	1/4W	R815	1-249-436-11	CARBON	39K	5%	1/4W
R346	1-249-441-11	CARBON	100K	5%	1/4W	R816	1-247-903-00	CARBON	1M	5%	1/4W
R347	1-249-429-11	CARBON	10K	5%	1/4W	R817	1-249-435-11	CARBON	33K	5%	1/4W
R348	1-249-428-11	CARBON	8.2K	5%	1/4W	R818	1-249-435-11	CARBON	33K	5%	1/4W
R349	1-249-441-11	CARBON	100K	5%	1/4W	R819	1-249-425-11	CARBON	4.7K	5%	1/4W
R350	1-249-441-11	CARBON	100K	5%	1/4W	R820	1-249-417-11	CARBON	1K	5%	1/4W
R351	1-249-423-11	CARBON	3.3K	5%	1/4W	R821	1-249-433-11	CARBON	22K	5%	1/4W
R352	1-249-429-11	CARBON	10K	5%	1/4W	R822	1-249-393-11	CARBON	10	5%	1/4W
R353	1-249-429-11	CARBON	10K	5%	1/4W	R852	1-249-429-11	CARBON	10K	5%	1/4W
R354	1-249-417-11	CARBON	1K	5%	1/4W	R853	1-249-429-11	CARBON	10K	5%	1/4W
R355	1-249-430-11	CARBON	12K	5%	1/4W	R854	1-249-429-11	CARBON	10K	5%	1/4W
R356	1-249-435-11	CARBON	33K	5%	1/4W	R855	1-249-437-11	CARBON	47K	5%	1/4W
R360	1-249-421-11	CARBON	2.2K	5%	1/4W	R856	1-249-437-11	CARBON	47K	5%	1/4W
R362	1-249-423-11	CARBON	3.3K	5%	1/4W	R871	1-249-429-11	CARBON	10K	5%	1/4W
R363	1-215-451-00	METAL	18K	1%	1/6W	R901	1-249-422-11	CARBON	2.7K	5%	1/4W
R364	1-249-437-11	CARBON	47K	5%	1/4W	R902	1-249-424-11	CARBON	3.9K	5%	1/4W
R701	1-249-433-11	CARBON	22K	5%	1/4W	R903	1-249-428-11	CARBON	8.2K	5%	1/4W
R702	1-249-425-11	CARBON	4.7K	5%	1/4W	R904	1-249-434-11	CARBON	27K	5%	1/4W
R703	1-249-420-11	CARBON	1.8K	5%	1/4W	R905	1-249-422-11	CARBON	2.7K	5%	1/4W
R704	1-249-426-11	CARBON	5.6K	5%	1/4W	R906	1-249-424-11	CARBON	3.9K	5%	1/4W
R705	1-249-427-11	CARBON	6.8K	5%	1/4W	R907	1-249-428-11	CARBON	8.2K	5%	1/4W
R706	1-249-419-11	CARBON	1.5K	5%	1/4W	R908	1-249-434-11	CARBON	27K	5%	1/4W

MAIN

Ref.No.	Part No.	Description	Remark
R909	1-249-437-11	CARBON 47K 5%	1/4W
R910	1-249-437-11	CARBON 47K 5%	1/4W
R911	1-249-437-11	CARBON 47K 5%	1/4W
R912	1-249-437-11	CARBON 47K 5%	1/4W
R913	1-249-437-11	CARBON 47K 5%	1/4W
R914	1-249-437-11	CARBON 47K 5%	1/4W
< VARIABLE RESISTOR >			
RV102	1-238-600-11	RES, ADJ, CARBON 10K (REC GAIN)	
RV103	1-238-601-11	RES, ADJ, CARBON 22K (REC BIAS)	
RV121	1-238-599-11	RES, ADJ, CARBON 4.7K (PB LEVEL)	
RV202	1-238-600-11	RES, ADJ, CARBON 10K (REC GAIN)	
RV203	1-238-601-11	RES, ADJ, CARBON 22K (REC BIAS)	
RV221	1-238-599-11	RES, ADJ, CARBON 4.7K (PB LEVEL)	
RV301	1-241-524-11	RES, VAR, CARBON 50K/50K (REC LEVEL)	
RV302	1-238-953-11	RES, VAR, CARBON 50K/50K (BALANCE)	
RV303	1-238-952-11	RES, VAR, CARBON 5K (BIAS)	
< SWITCH >			
S301	1-554-118-00	SWITCH, PUSH (1 KEY) (POWER)	
S302	1-554-118-00	SWITCH, PUSH (1 KEY) (MPX FILTER)	
S303	1-692-063-11	SWITCH, ROTARY (DOLBY NR)	
S901	1-554-303-21	SWITCH, TACTILE (>)	
S902	1-554-303-21	SWITCH, TACTILE (PAUSE =)	
S903	1-554-303-21	SWITCH, TACTILE (RESET)	
S904	1-554-303-21	SWITCH, TACTILE (MEMORY)	
S905	1-554-303-21	SWITCH, TACTILE (MONITOR)	
S906	1-554-303-21	SWITCH, TACTILE (■)	
S907	1-554-303-21	SWITCH, TACTILE (<<)	
S908	1-554-303-21	SWITCH, TACTILE (>>)	
S909	1-554-303-21	SWITCH, TACTILE (REC ●)	
S910	1-554-303-21	SWITCH, TACTILE (REC MUTE ○)	
< TRANSFORMER >			
T101	1-433-344-11	TRANSFORMER, BIAS OSCILLATION	
T201	1-433-344-11	TRANSFORMER, BIAS OSCILLATION	
T301	1-433-343-11	TRANSFORMER, BIAS OSCILLATION	
< CONNECTOR >			
* TP301	1-564-506-11	PLUG, CONNECTOR 3P	
* TP801	1-564-505-11	PLUG, CONNECTOR 2P	
< FLUORESCENT INDICATOR >			
VFD901	1-519-657-11	INDICATOR TUBE, FLUORESCENT	
< CRYSTAL >			
X801	1-577-359-21	VIBRATOR, CERAMIC (4.19MHz)	

Ref.No.	Part No.	Description	Remark
*	1-634-841-14	SW-A BOARD *****	
	3-343-419-01	HOLDER (S SENSER A) < CONNECTOR >	
* CNP81	1-568-852-11	SOCKET, CONNECTOR 9P < IC >	
IC81	8-719-710-03	DIODE NJL5165K-B	
IC82	8-719-710-03	DIODE NJL5165K-B	
< RESISTOR >			
R81	1-249-414-11	CARBON 560 5%	1/4W
R83	1-247-834-11	CARBON 1.3K 5%	1/4W
R84	1-249-417-11	CARBON 1K 5%	1/4W
R85	1-249-408-11	CARBON 180 5%	1/4W
R86	1-249-408-11	CARBON 180 5%	1/4W
< SWITCH >			
S81	1-571-958-11	SWITCH, PUSH (1 KEY) (STOP SW)	
S82	1-571-281-21	SWITCH, LEAF (CrO2)	
S83	1-571-281-21	SWITCH, LEAF (METAL)	
S84	1-571-281-21	SWITCH, LEAF (REC)	
S86	1-571-281-21	SWITCH, LEAF (HALF)	

MISCELLANEOUS			

△ 5	1-555-795-00	CORD, POWER, EULO PLUG (AEP, Germany)	
△ 5	1-556-035-00	CORD, POWER (UK)	
11	1-574-723-11	WIRE, FLAT TYPE (7 CORE)	
* 12	1-575-850-11	WIRE, FLAT TYPE (9 CORE)	
13	1-690-888-11	WIRE, FLAT TYPE (31 CORE)	
14	1-696-168-11	WIRE, FLAT TYPE	
120	1-638-983-11	PC BOARD, MOTOR FLEXIBLE	
△ F701	1-532-285-00	FUSE, TIME-LAG (T1.25A)	
△ F702	1-532-285-00	FUSE, TIME-LAG (T1.25A)	
HE101	1-543-673-11	HEAD, MAGNETIC (ERASE)	
HRP101	1-543-733-11	HEAD, MAGNETIC (RECORD/PLAYBACK)	
△ T901	1-450-860-11	TRANSFORMER, POWER	

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

Ref.No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS *****	
	1-558-271-11	CORD, CONNECTION	
	1-558-271-11	CORD, CONNECTION	
*	3-350-830-01	CUSHION	
*	3-376-443-61	INDIVIDUAL CARTON	
	3-755-318-11	MANUAL, INSTRUCTION (AEP, UK) (ENGLISH/FRENCH/SPANISH/PORTUGUESE)	
	3-755-318-41	MANUAL, INSTRUCTION (AEP) (GERMAN/DUTCH/SWEDISH/ITALIAN)	
	3-755-318-51	MANUAL, INSTRUCTION (Germany)(GERMAN)	

HARDWARE LIST

#1	7-682-548-09	SCREW +BVTT 3X8 (S)
#2	7-621-849-00	SCREW (BV/RING)
#3	7-621-773-95	SCREW +BVTT 2.6X6 (S)
#4	7-685-134-19	SCREW (+ PTPWH)(2.6X8)
#5	7-621-775-00	SCREW +B 2.6X3
#6	7-627-556-08	SCREW +P 2.6X2.8
#7	7-621-772-10	SCREW +B 2X4

