

TC-WR97ES/WR870

SERVICE MANUAL

US Model
Canadian Model
E Model
 TC-WR97ES
AEP Model
UK Model
 TC-WR870

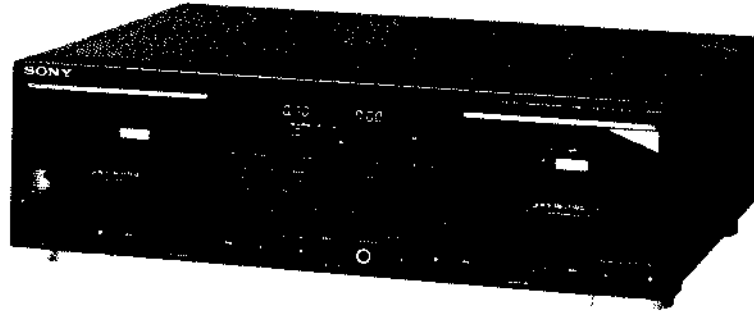


Photo: TC-WR870

Model Name Using Similar Mechanism	TC-WR820
Tape Transport Mechanism Type	TCM-200R4 /200R9

SPECIFICATIONS

Recording system 4-track 2-channel stereo
 Fast winding time Approx. 90 sec. (with Sony C-60 cassette)
 Bias AC bias
 Signal-to-noise ratio (at peak level)

Dolby NR switch Cassette	OFF	B-Type ON	C-Type ON
	Type IV (Sony METAL-SLT)	59 dB	67 dB
Type II (Sony UX-S)	58 dB	66 dB	73 dB
Type I (Sony HF-S)	56 dB	64 dB	71 dB

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

Frequency response (DOLBY NR OFF)

Type IV cassette (Sony METAL-SLT)	20 - 20,000 Hz (± 3 dB, IEC) 30 - 15,000 Hz [± 3 dB (DVU(-4 dB) recording)]
Type II cassette (Sony UX-S)	25 - 17,000 Hz (± 3 dB, IEC)
Type I cassette (Sony HF-S)	25 - 16,000 Hz (± 3 dB, IEC)

Wow and flutter $\pm 0.09\%$ W. Peak (IEC)
 0.06% WRMS (NAB)
 $\pm 0.16\%$ W Peak (DIN)

Inputs

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

Outputs

Line outputs (phono jacks)	Rated output level	0.32 V at a load impedance of 47 k ohms
	Load impedance	Over 10 k ohms
Headphones (stereo phone jack)	Output level	0-1.25 mW at a load impedance of 32 ohms

General

Power requirements

US, Canadian Model:

120 V AC, 60 Hz

AEP, Germany Model:

220 - 230 V AC, 50/60 Hz

UK Model: 240 V AC, 50 Hz

E Model: 120, 220, 240 V AC

adjustable, 50/60 Hz

Power consumption

30 W

Dimensions

Approx. 470 × 135 × 355 mm (w/h/d)
(18 $\frac{1}{8}$ × 5 $\frac{3}{8}$ × 14 inches)

including projecting parts and controls

Approx. 7.5 kg (16 lbs 9 oz)

Weight

Supplied accessory

Audio connecting cords (2)

Design and specifications subject to change without notice.

STEREO CASSETTE DECK
SONY®

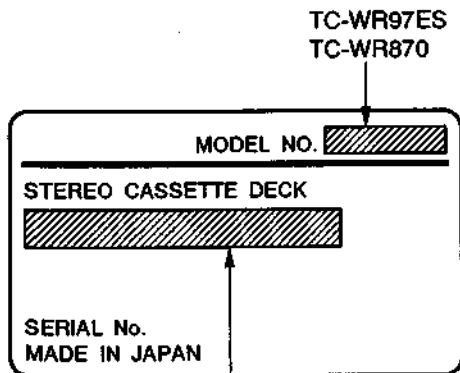


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MODEL IDENTIFICATION

- Specification Label -



US, Canadian Model:	AC: 120V 60Hz 30W
Germany, AEP Models:	AC: 220 - 230V~50/60 Hz
UK Model:	AC: 240 V~50 Hz
E Model:	AC: 120, 220, 240 V~50/60 Hz 30W

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.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

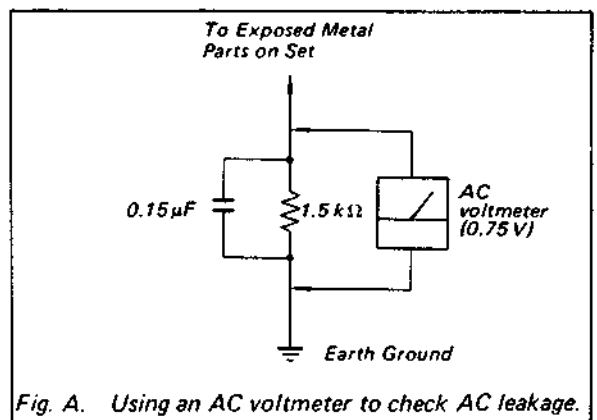



Fig. A. Using an AC voltmeter to check AC leakage.

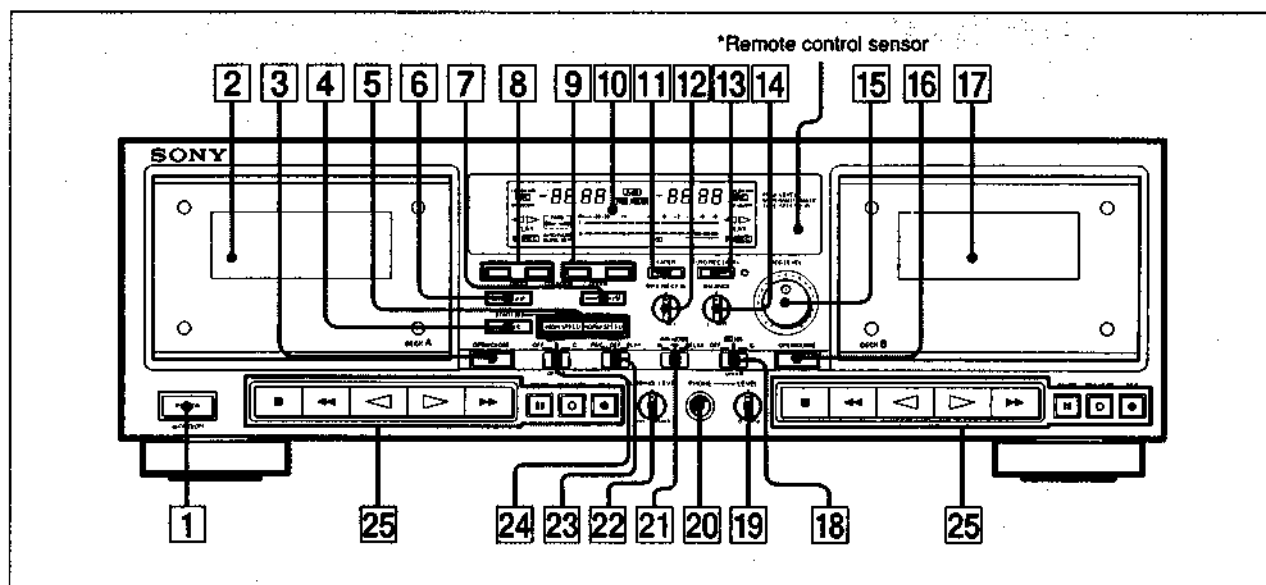
ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE  SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

This section is extracted from instruction manual.

SECTION 1 GENERAL

Identification of Front Panel Parts



For details, refer to the page number indicated in ●

- | | |
|---|---|
| <p>1 POWER switch</p> <p>2 Deck A</p> <p>3 \triangle OPEN/CLOSE button (deck A)</p> <p>4 A+B REC (simultaneous recording) button ●</p> <p>5 SYNCHRO DUBBING buttons ●
HIGH SPEED button
NORM (normal) SPEED button</p> <p>6 BLANK SKIP button ●</p> <p>7 AUTO PAUSE button ●</p> <p>8 COUNTER buttons (deck A) ●
RESET button
MEMORY button</p> <p>9 COUNTER buttons (deck B) ●
RESET button
MEMORY button</p> <p>10 Display panel</p> <p>11 FADER button ●</p> <p>12 BIAS control (deck B) ●</p> <p>13 AUTO REC (automatic recording) LEVEL button and indicator ● ●</p> <p>14 BALANCE control ●</p> <p>15 REC (recording) LEVEL control ● ●</p> <p>16 \triangle OPEN/CLOSE button (deck B)</p> <p>17 Deck B</p> | <p>18 \square NR (Dolby noise reduction) switch (deck B) ● ● ● ● ● ● ● ●</p> <p>19 Headphones LEVEL control ●</p> <p>20 PHONES (headphones) jack (stereo phone jack) ●</p> <p>21 DIR (direction) MODE switch ● ● ● ● ● ● ● ●</p> <p>22 DUBBING LEVEL control ●</p> <p>23 TIMER switch ● ●</p> <p>24 \square NR (Dolby noise reduction) switch (deck A) ● ● ● ● ● ● ● ●</p> <p>25 Tape operation buttons
■ (stop) button
◀◀ (leftward fast winding) (AMS**) button
◀ (reverse play) button
▶ (forward play) button
▶▶ (rightward fast winding) (AMS**) button
 PAUSE button
○ REC MUTE (record muting) button ●
● REC (recording) button</p> |
|---|---|

*Remote control sensor

You can remotely control this cassette deck with:

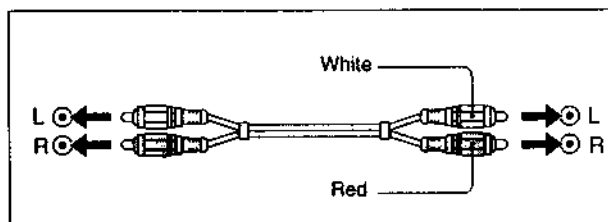
- A remote commander that came with a Sony amplifier or receiver if it has the \square mark and cassette deck control capability.
- Any optional Sony remote commander with the \square mark and cassette deck control capability.

**AMS is an abbreviation for Automatic Music Sensor.

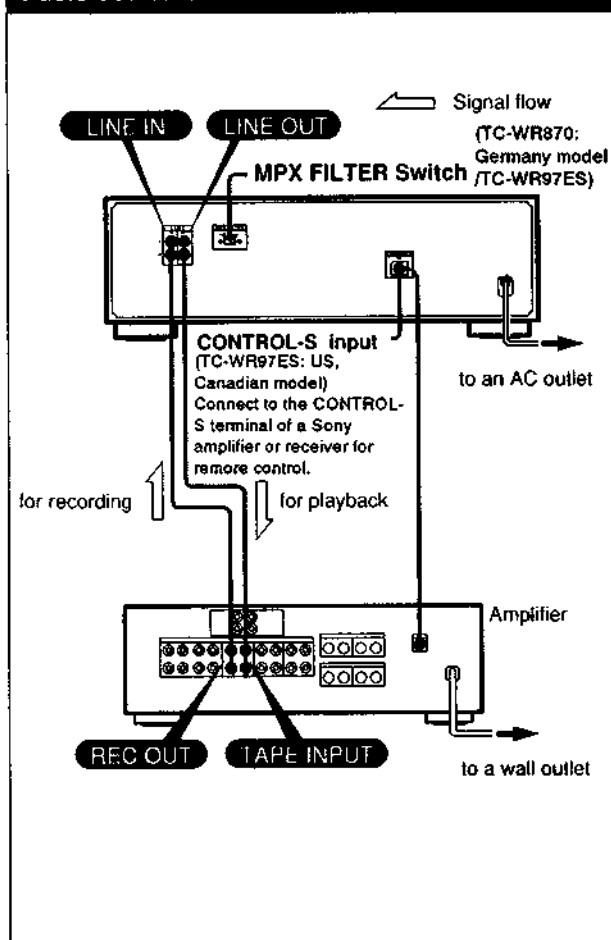
Connections

Notes on Connections

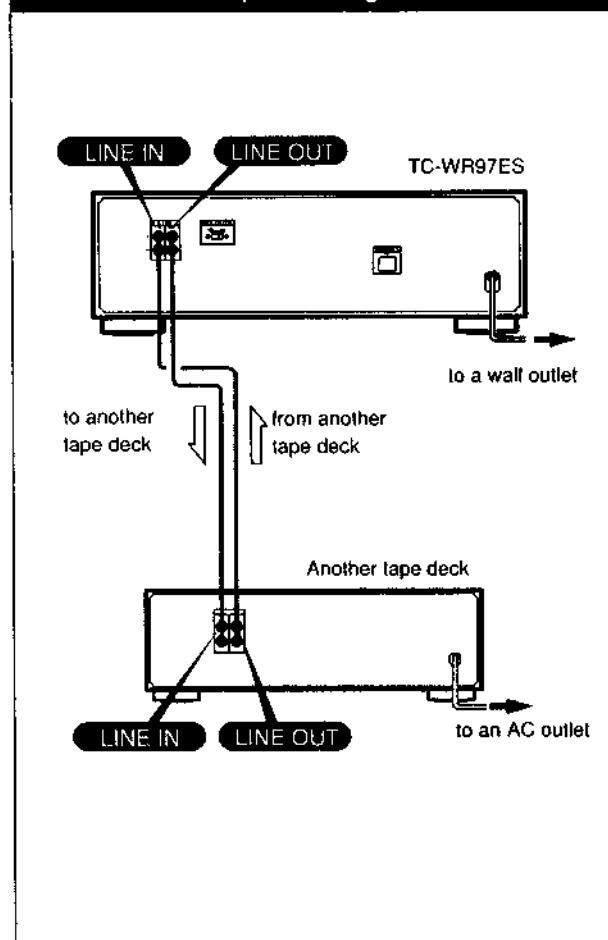
- Turn off the power to all equipment to be connected before making any connection.
- Note that the red plug of the supplied connecting cord is for right-channel (R) connection and the white plug for left-channel (L) connection.
- The connecting cords should be fully inserted into the jacks. A loose connection may cause hum pickup.



Basic Connection



Connection for Tape Dubbing



Note on the CONTROL-S input

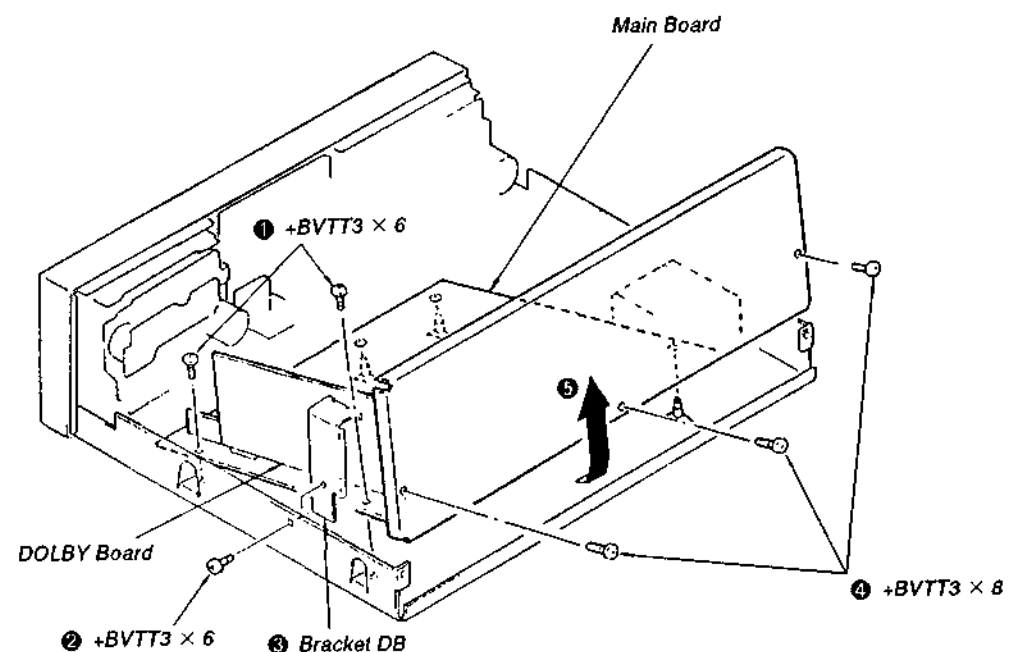
To remote control this unit through a receiver or amplifier, connect the input on this unit to the CONTROL-S output on a Sony receiver or amplifier, with a CONTROL-S cable. When this connection is used, only remote commands sent through the receiver or amplifier will be executed. The remote sensor on this unit will not function.

SECTION 2 DISASSEMBLY

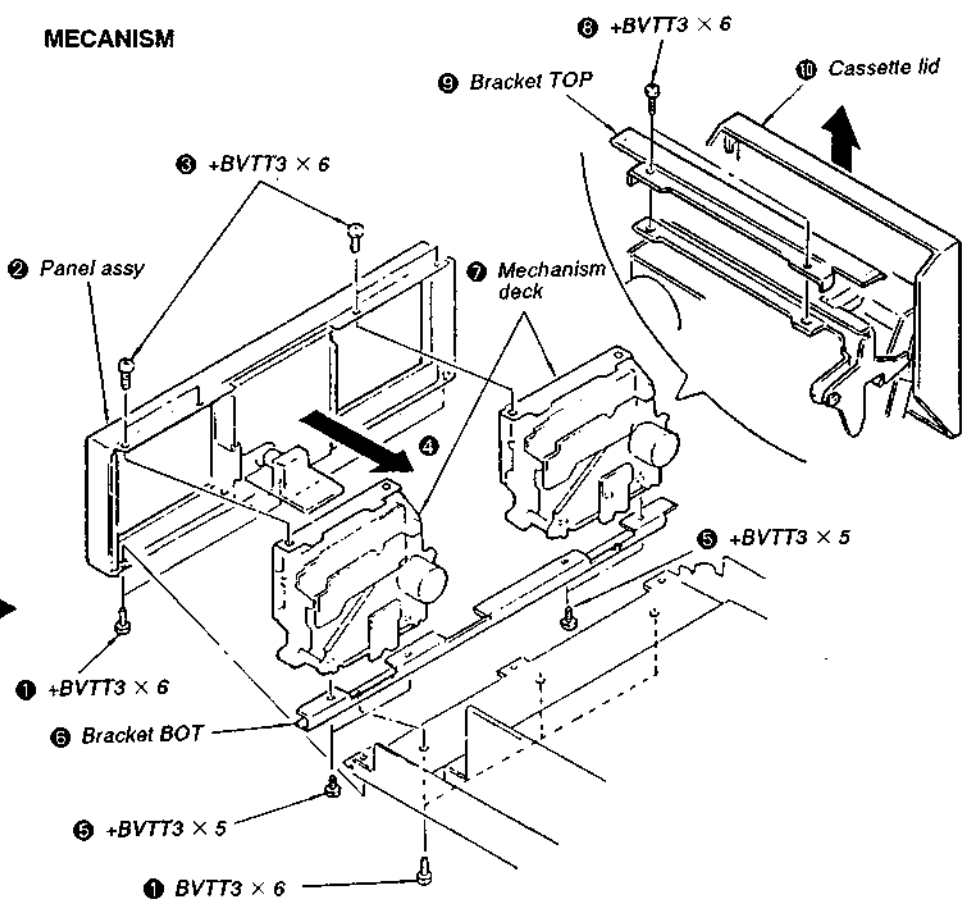
Note: Follow the disassembly procedure in the numerical order given.

Unscrew four screws (M3 × 8) and remove the upper case.

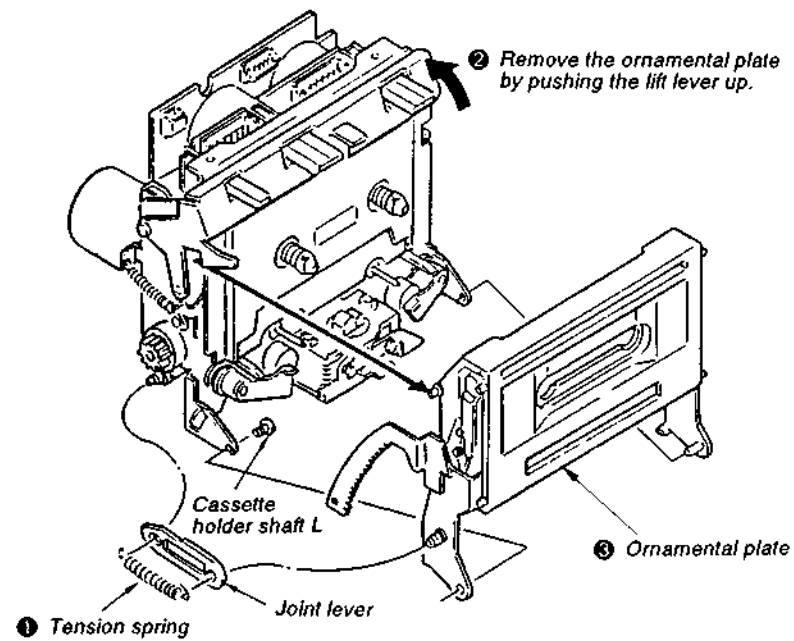
DOLBY BOARD, MAIN BOARD



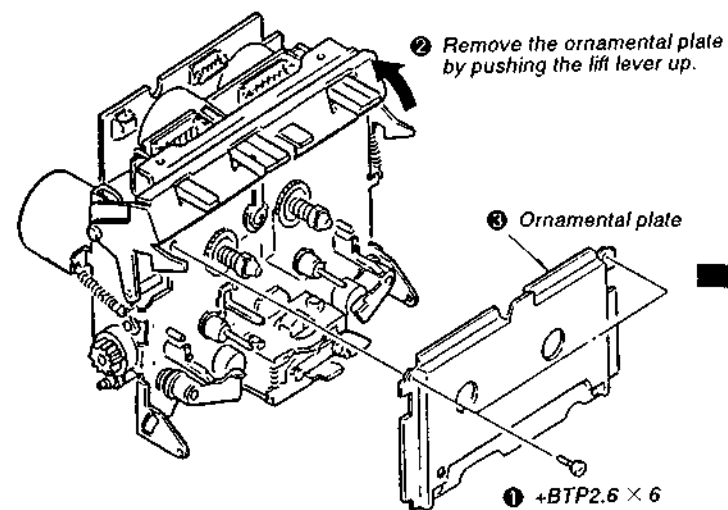
MECANISM



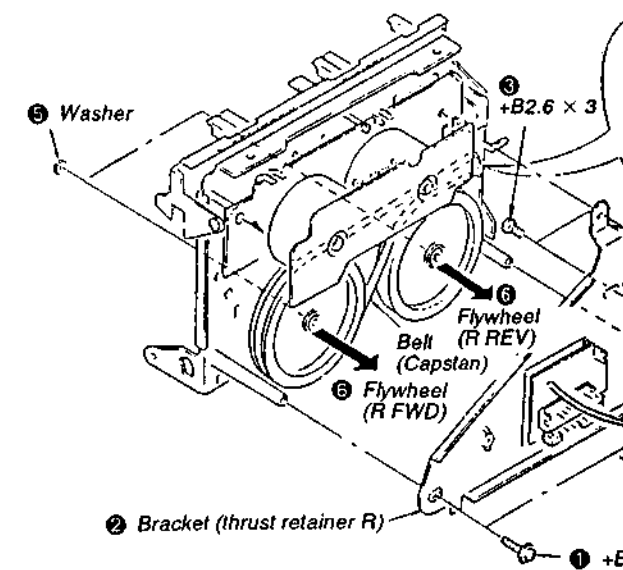
CASSETTE HOLDER



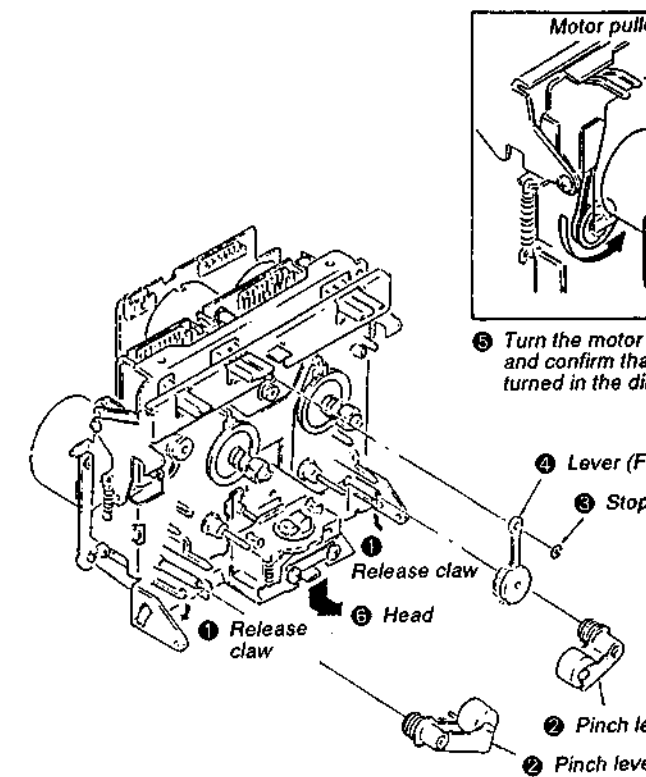
ORNAMENTAL PLATE



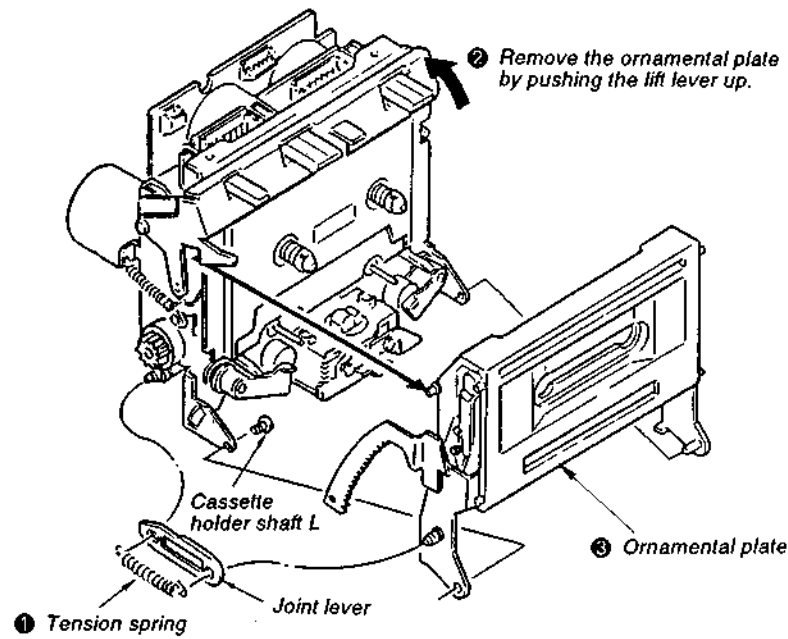
CAPSTAN PLATE, FLYWHEEL



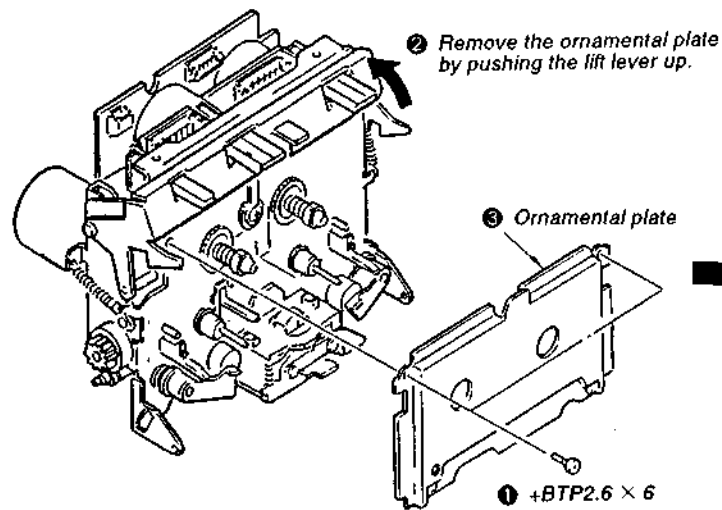
PINCH LEVER, HEAD



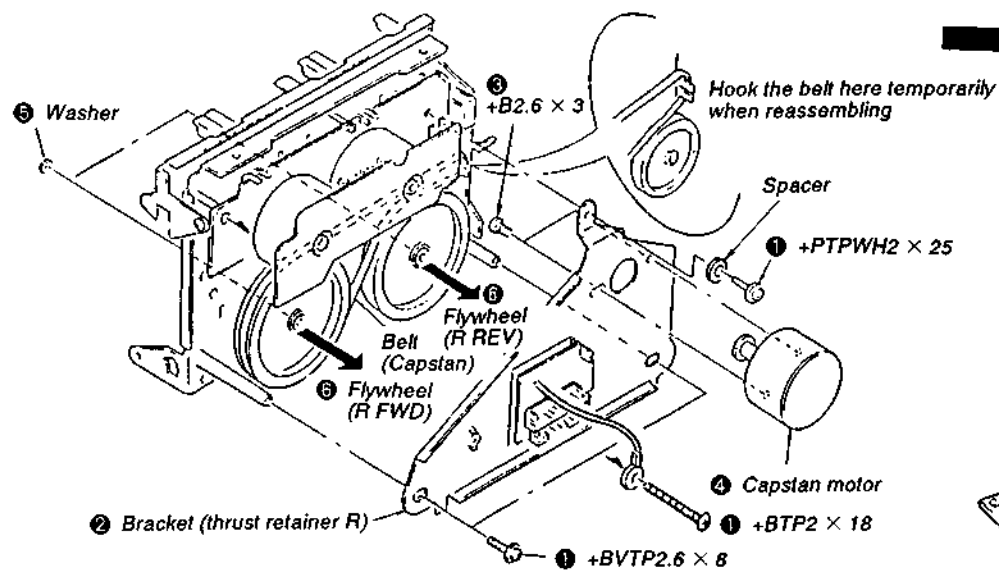
CASSETTE HOLDER



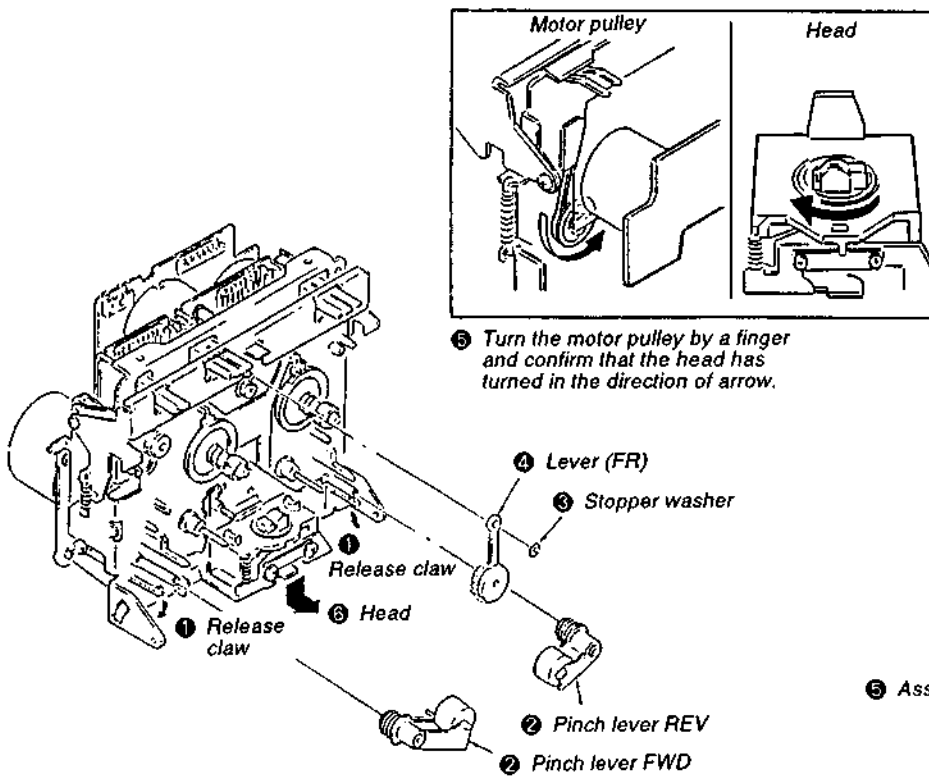
ORNAMENTAL PLATE



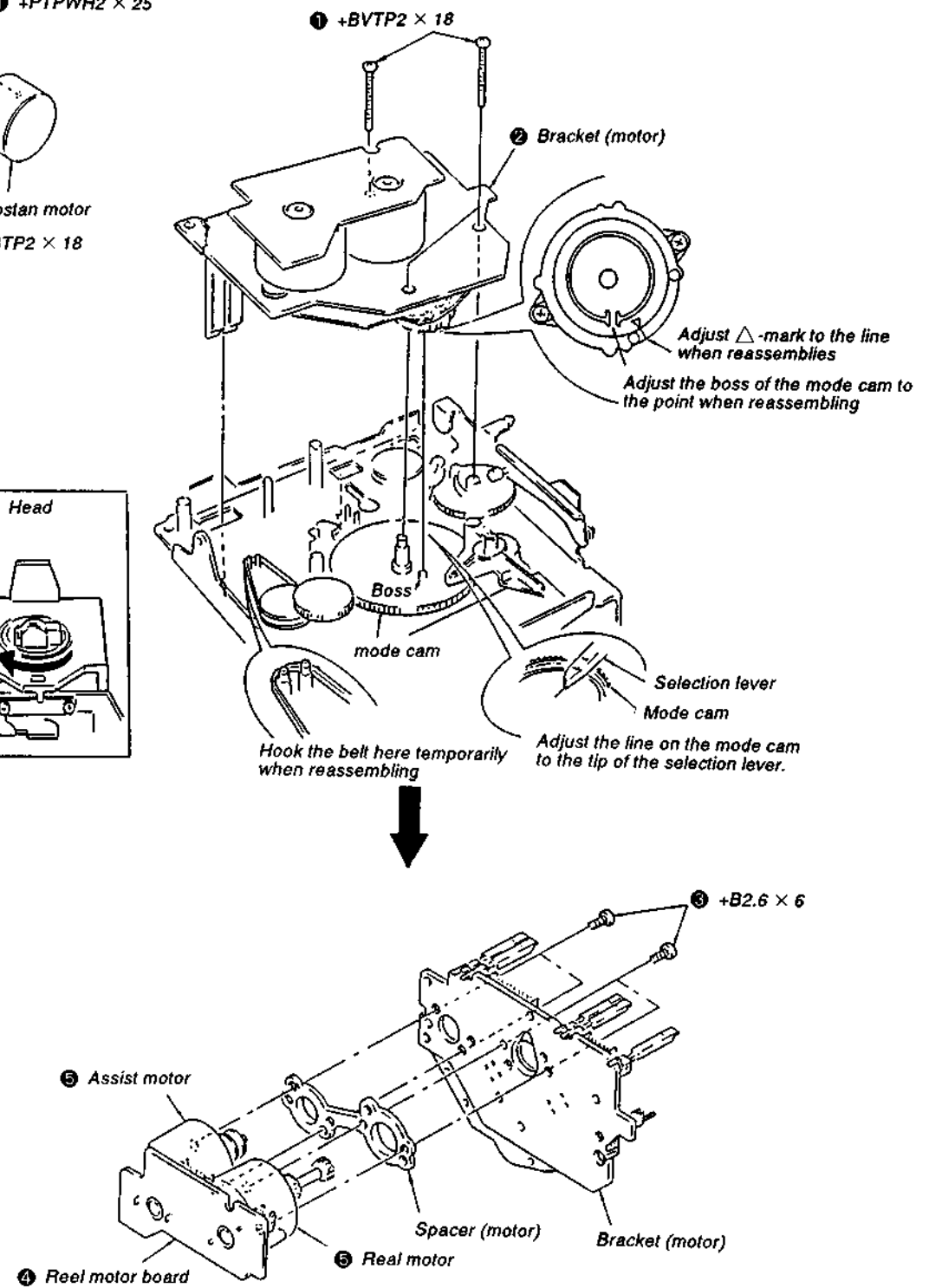
CAPSTAN PLATE, FLYWHEEL



PINCH LEVER, HEAD



REEL AND ASSIST MOTORS



SECTION 3 ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENTS

PRECAUTION

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

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

Torque Measurement

Torque	Torque meter	Meter reading
FWD	CQ-102C	30-60g·cm (0.42-0.83oz·inch)
FWD Back tension	CQ-102C	1-5g·cm (0.014-0.063oz·inch)
REV	CQ-102RC	30-60g·cm (0.42-0.83oz·inch)
REV Back tension	CQ-102RC	1-5g·cm (0.014-0.063oz·inch)
FF, REW	CQ-201B	65-90g·cm (0.90-1.25 oz·inch)

3-2. ELECTRICAL ADJUSTMENT

Note: The adjustment should be performed in the order given in the service manual. As a rule, adjustments about playback should be performed before those about recording. The adjustments should be performed for both L-CH and R-CH.

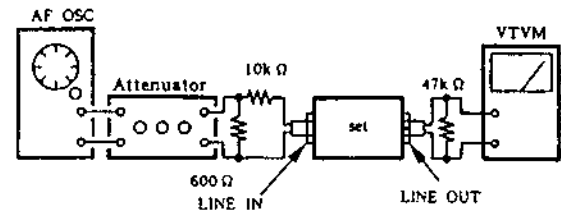
- Switches and controls should be set as follows unless otherwise specified.

DOLBY NR switch	: OFF
DIRECTION switch	: →
TIMER switch	: OFF
MPX FILTER switch (TC-WR97ES)	: OFF

- 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.

—Record Mode—



0 dB = 775mV

Standard Input Level

input terminal	LINE IN
source impedance	10k Ω
input level	0.25V (-10dB)

Standard Output Level

output terminal	LINE OUT
load impedance	47k Ω
output level	0.32V (-7.7 dB)

Test tape

Type	Signal	Used for
P-4-A100	10kHz, -10dB	Azimuth Adjustment
P-4-L300	315Hz, 0dB	PB Level Adjustment
WS-48B	3kHz, 0dB	Tape Speed Adjustment

The set will get into TEST MODE by shorting the pins of TP801 (TEST) on Main board before turning the power on, and TEST MODE functions as follows:

- High speed playback**
Pressing HIGH SPEED (DUBBING) button while playback changes to high speed playback and another press of the button returns the set to normal speed playback.
- Record memory stop**
When starting recording, tape counter is reset to zero and counter memory turned on.

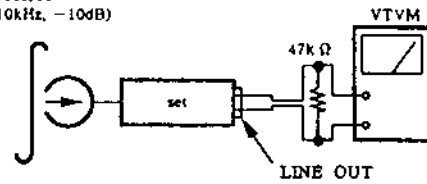
Record/Playback Head Azimuth Adjustment

DECK A DECK B

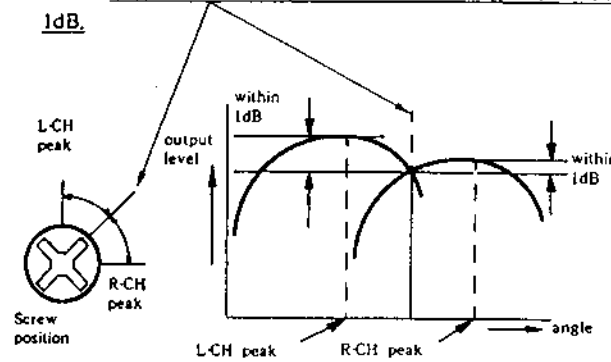
Procedure:

- Mode: FWD playback

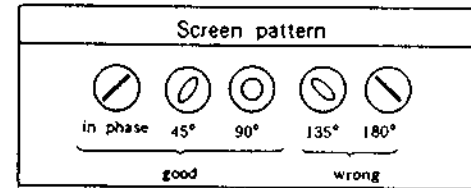
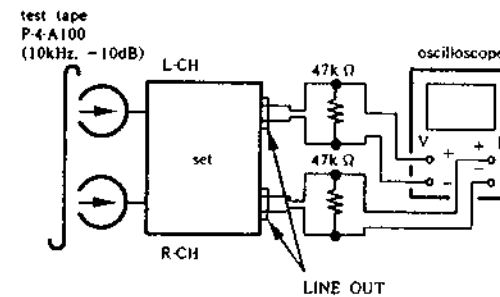
Test tape
P-4-A100
(10kHz, -10dB)



- 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.

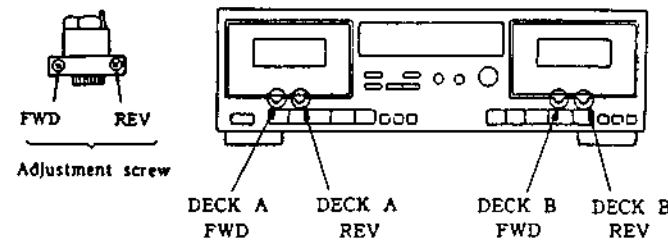


- Phase Check**
Mode: playback



- Set in the REV mode and repeat the step 1-3.
- After the adjustment, lock the screws with locking compound.

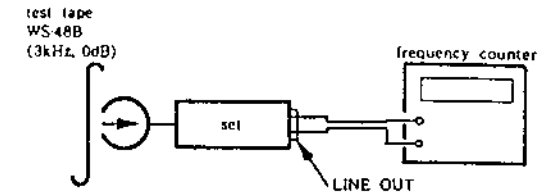
Adjustment Location: Record/Playback head



Tape Speed Adjustment **DECK A DECK B**

Procedure:
Mode: playback

Perform high speed adjustment before normal speed adjustment



(high speed adjustment)

- Short test pin TP801 (TEST) on Main board.
- Set to FWD playback mode.
- Press the HIGH SPEED DUBBING switch.
- Adjust RV871 (DECK A) and RV881 (DECK B) on Main board so that the frequency counter reading becomes 6,000 ± 30Hz.
- After adjustment, disconnect TP801 shorted in step 1.

(normal speed adjustment)

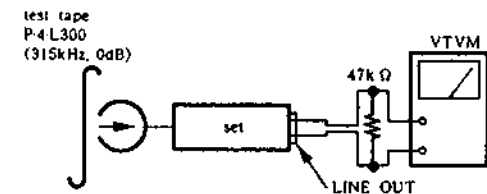
- Set to FWD playback mode.
- Adjust RV872 (DECK A) and RV882 (DECK B) on Main board so that the frequency counter reading becomes 3,000 ± 15Hz.

Frequency difference between the beginning and the end of the tape should be within 5%.
Frequency difference between deck A and deck B should be within 20 Hz (high speed) or 10 Hz (normal speed).

Adjustment Location: Main board

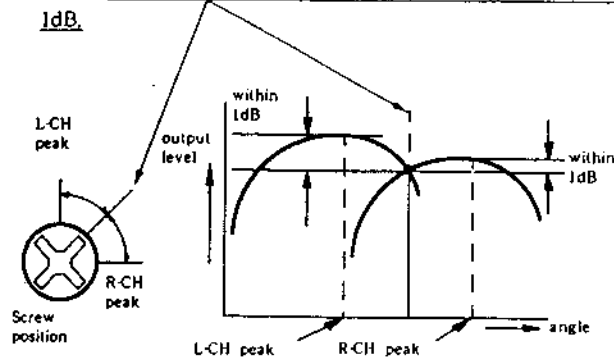
Playback Level Adjustment **DECK A DECK B**

Procedure:
Mode: playback

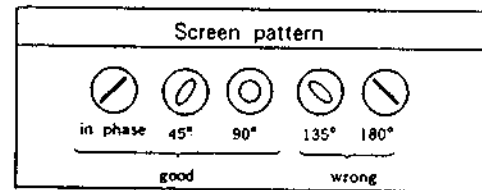
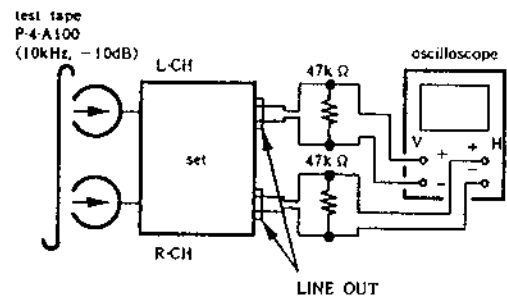


Adjust RV131 (L-ch) and RV231 (R-ch) for DECK A and RV151 (L-ch) and RV251 (R-ch) for DECK B so that the reading on VTVM meets the adjustment limits below.

- 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.

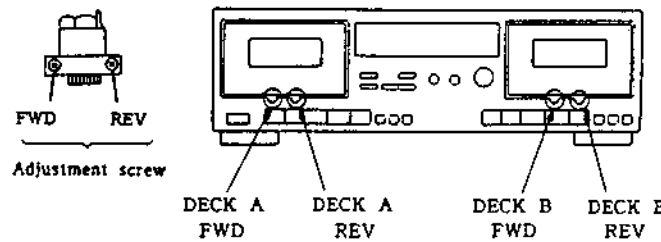


- Phase Check
Mode : playback



- Set in the REV mode and repeat the step 1-3.
- After the adjustment, lock the screws with locking compound.

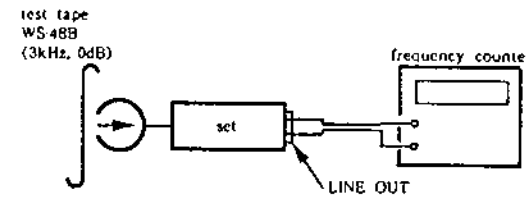
Adjustment Location : Record/Playback head



Tape Speed Adjustment **DECK A** **DECK B**

Procedure :
Mode : playback

Perform high speed adjustment before normal speed adjustment



(high speed adjustment)

- Short test pin TP801 (TEST) on Main board.
- Set to FWD playback mode.
- Press the HIGH SPEED DUBBING switch.
- Adjust RV871 (DECK A) and RV881 (DECK B) on Main board so that the frequency counter reading becomes $6,000 \pm 30\text{Hz}$.
- After adjustment, disconnect TP801 shorted in step 1.

(normal speed adjustment)

- Set to FWD playback mode.
- Adjust RV872 (DECK A) and RV882 (DECK B) on Main board so that the frequency counter reading becomes $3,000 \pm 15\text{Hz}$.

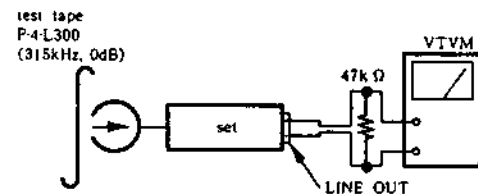
Frequency difference between the beginning and the end of the tape should be within 5%.

Frequency difference between deck A and deck B should be within 20 Hz (high speed) or 10 Hz (normal speed).

Adjustment Location : Main board

Playback Level Adjustment **DECK A** **DECK B**

Procedure :
Mode : playback



Adjust RV131 (L-ch) and RV231 (R-ch) for DECK A and RV151 (L-ch) and RV251 (R-ch) for DECK B so that the reading on VTVM meets the adjustment limits below.

Adjustment Limits :

LINE OUT level: $-7.7 \pm 0.5\text{dB}$ (0.30 - 0.34 V)

Level difference between channels : less than 0.5dB

Check that the LINE OUT level does not change even if Playback and Stop operation is repeated several times.

Adjustment Location : MAIN board

Bias Current Adjustment

Procedure :

- Set RV121 and RV221 (DECK A), RV141 and RV241 (DECK B) to mechanical center and turn the set recording mode.
- Connect digital voltmeter as shown by the following table.
- Adjust the following transformers for the minimum readings on the digital voltmeter.

DECK	Measurement Point	Adjustment	Value
A	L ① and ②, TP521	T121	less than 80 mV
	R ② and ③, TP521	T221	
B	L ① and ②, TP541	T141	
	R ② and ③, TP541	T241	

Adjustment Location : MAIN board

Record Bias Adjustment **DECK A** **DECK B**

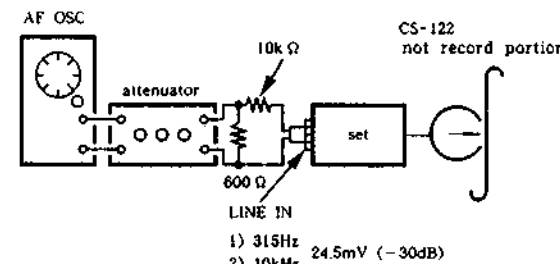
Setting :

REC LEVEL control : standard Record (See page 8.)

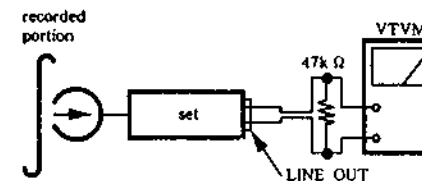
test pin TP801 : short

Procedure :

- Mode : record



- Mode : playback



Playback the signal recorded in step 1.

Confirm that the 10kHz playback output is $0 \pm 0.5\text{dB}$ relative to the 315Hz output. If necessary, adjust RV121 (L-ch) and RV221 (R-ch) for DECK A and RV141 (L-ch) and RV241 (R-ch) for DECK B, and repeat the steps given above.

Adjustment Location : MAIN board

Record Level Adjustment **DECK A** **DECK B**

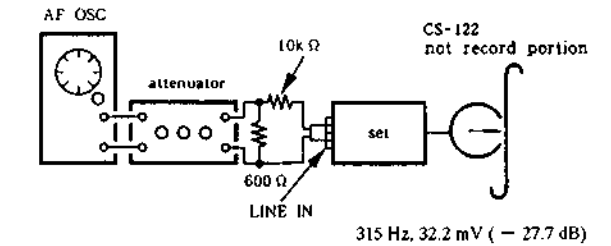
Setting :

REC LEVEL control : Standard Record (See page 8.)

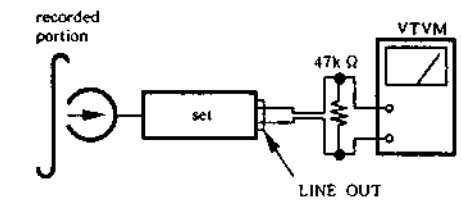
test pin TP801 : short

Procedure :

- Mode : record



- Mode : playback



- Playback the signal recorded in step 1.

Confirm that the signal level is within the adjustment limits below.

If necessary, adjust RV301 (L-ch) and RV401 (R-ch) for DECK A and RV351 (L-ch) and RV451 (R-ch) for DECK B, and repeat the step 1-2.

Adjustment Limits : $-27.7\text{dB} \pm 0.5\text{dB}$ (30.4 - 34.2 mV)

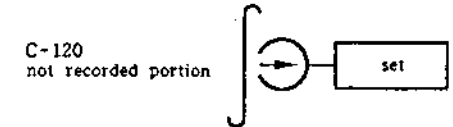
Adjustment Location : Main board (component side)

Quick Reverse Sensitivity Adjustment **DECK A** **DECK B**

Conditions :

DIRECTION MODE switch : \rightleftarrows

Adjustment procedure :

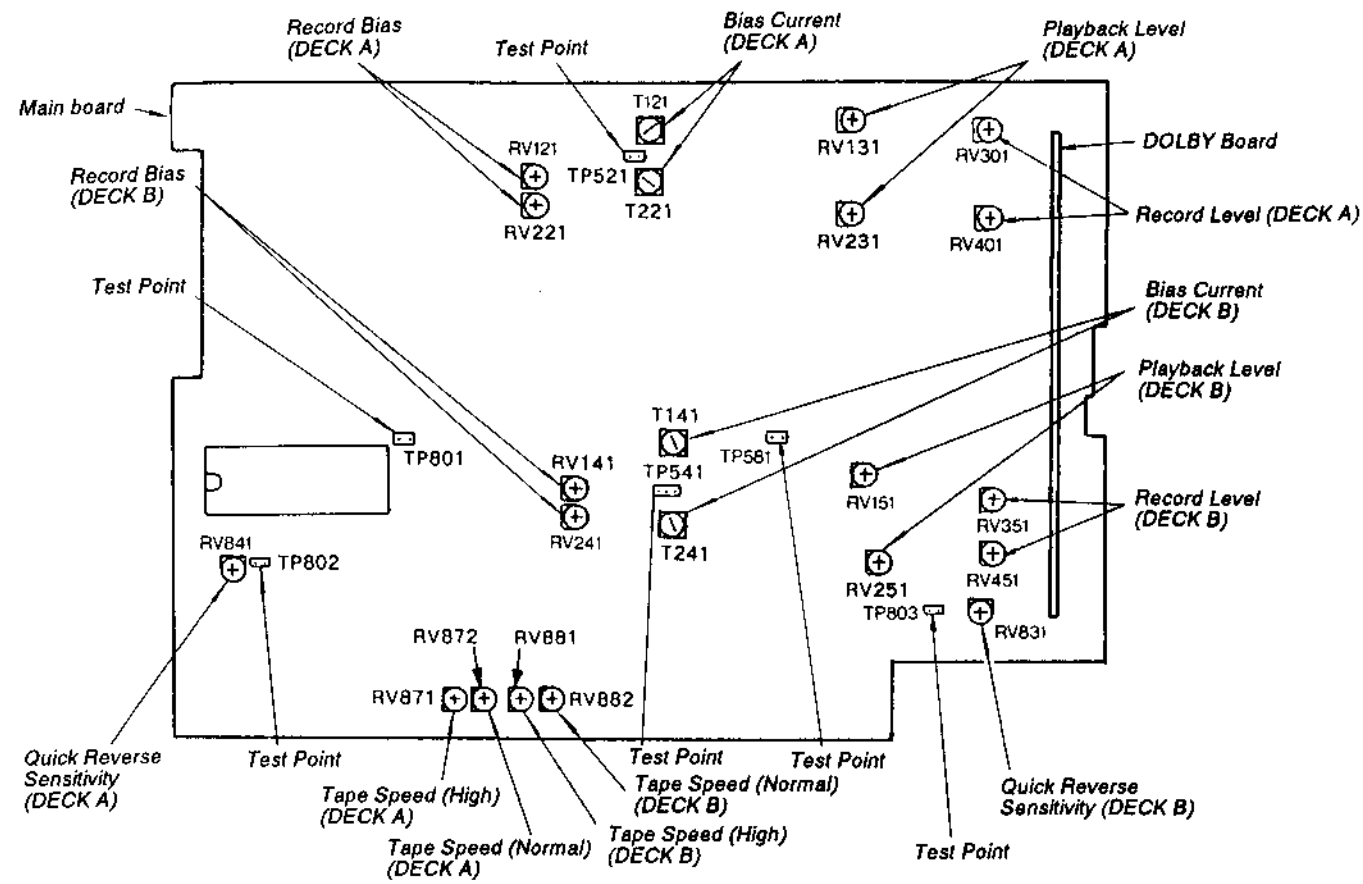


- Connect the digital voltmeter to test point TP802 (DECK A) / TP803 (DECK B).
- Load C-120 tape cassette and playback the leading portion in FWD mode.
- Adjust the RV841 (DECK A), RV831 (DECK B) for $4.5 \pm 0.5\text{V}$ reading on the digital voltmeter.
- Playback C-120 tape cassette in FWD mode again.
- Confirm that the reading on the digital voltmeter is "L" level at the magnetic portion of the tape.
- Confirm that the tape stop around the tape end (border of the leading and the magnetic portions).

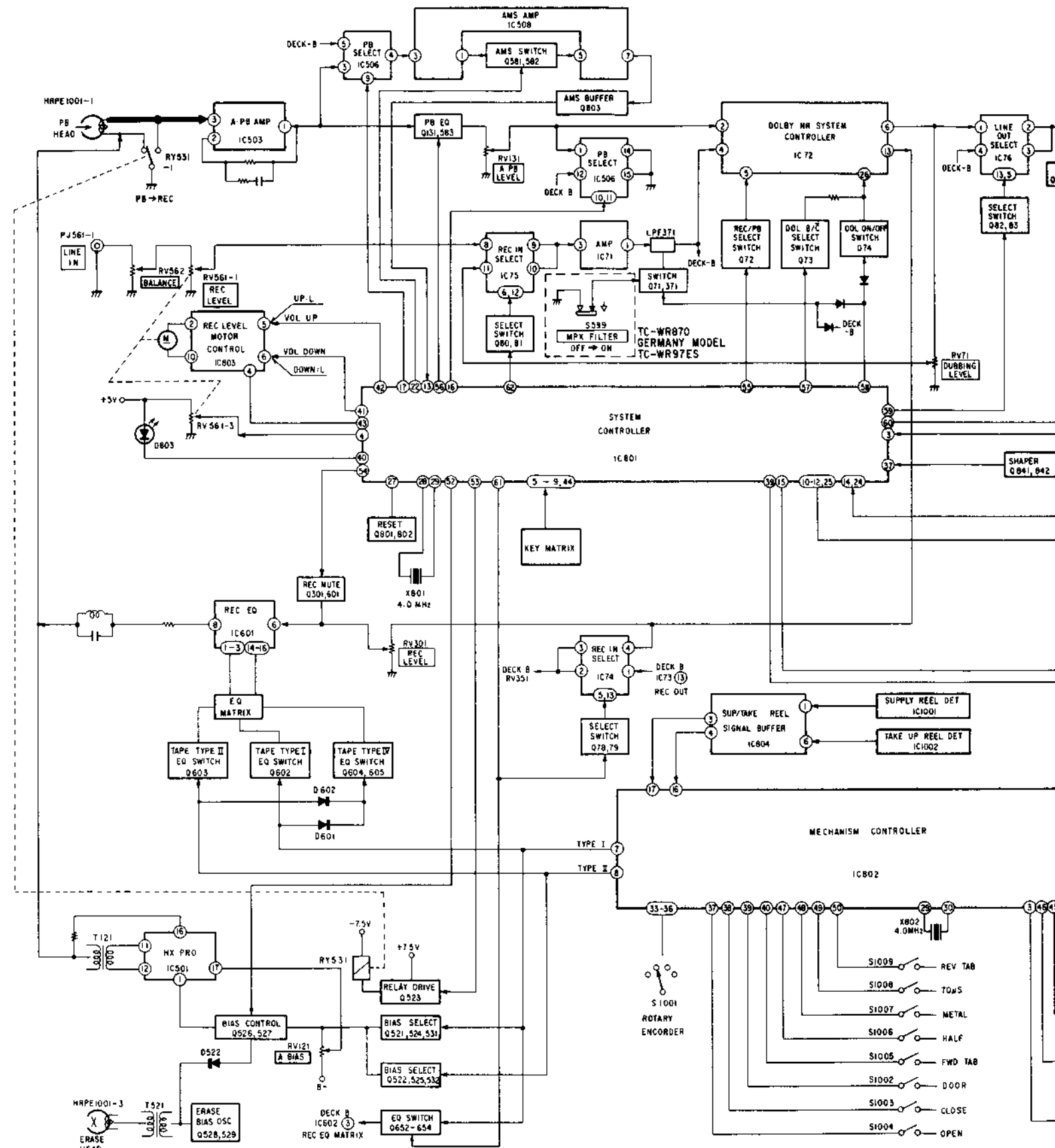
Adjustment Location : MAIN board

SECTION 4 DIAGRAMS

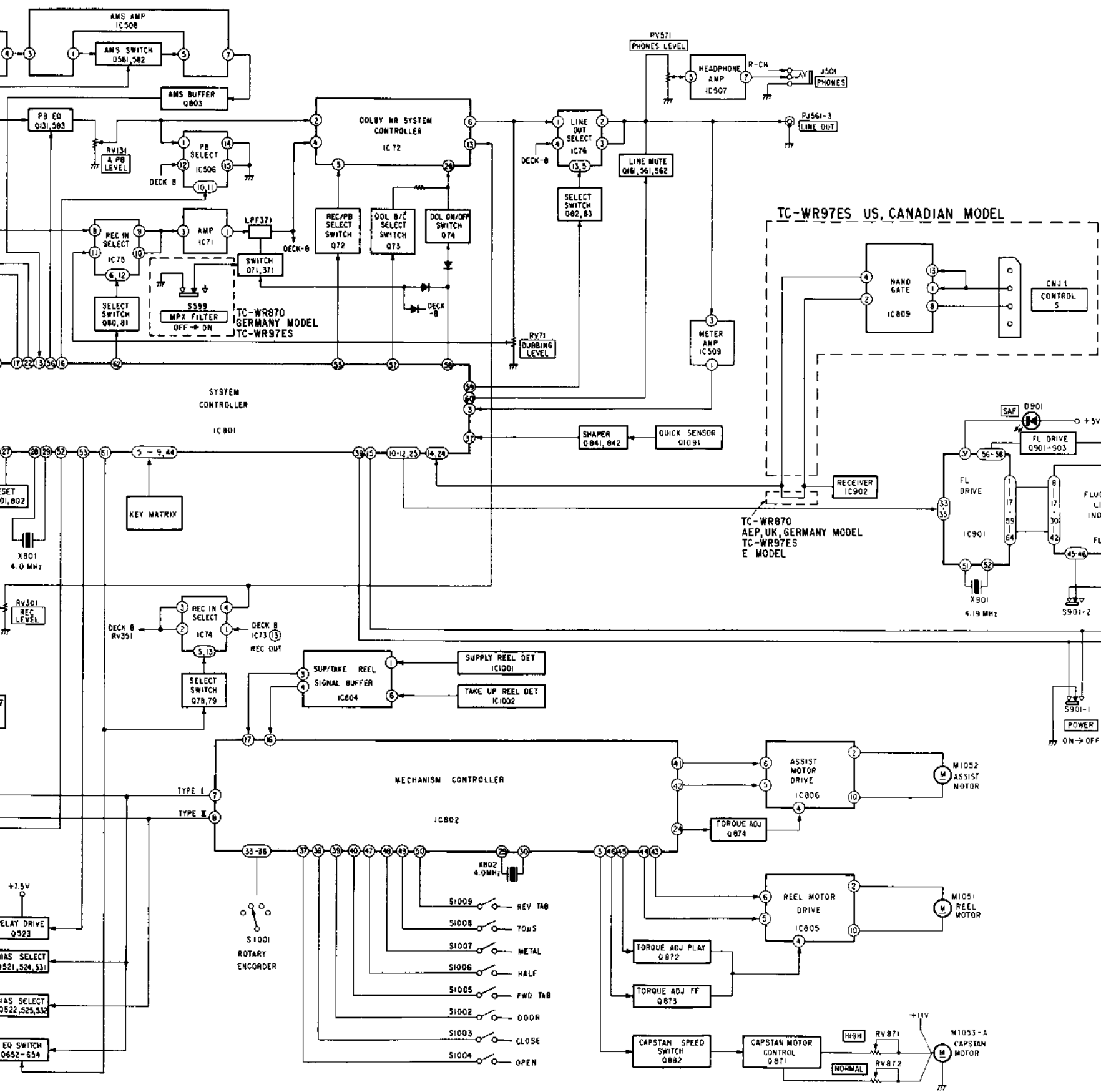
Adjustment Parts Location Diagram



4-1. BLOCK DIAGRAM



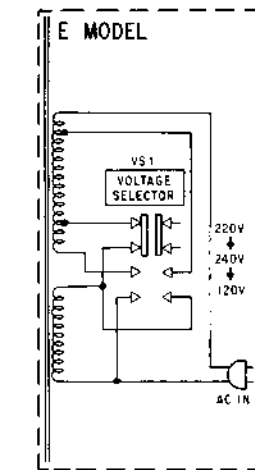
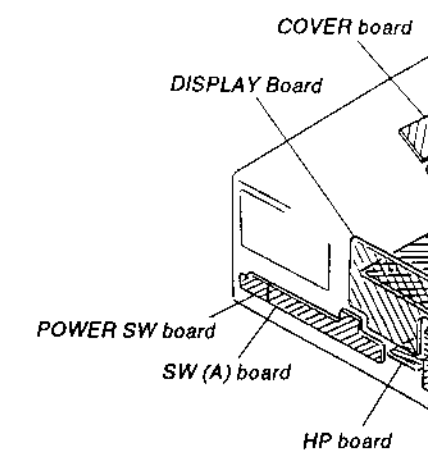
SECTION 4
 DIAGRAMS



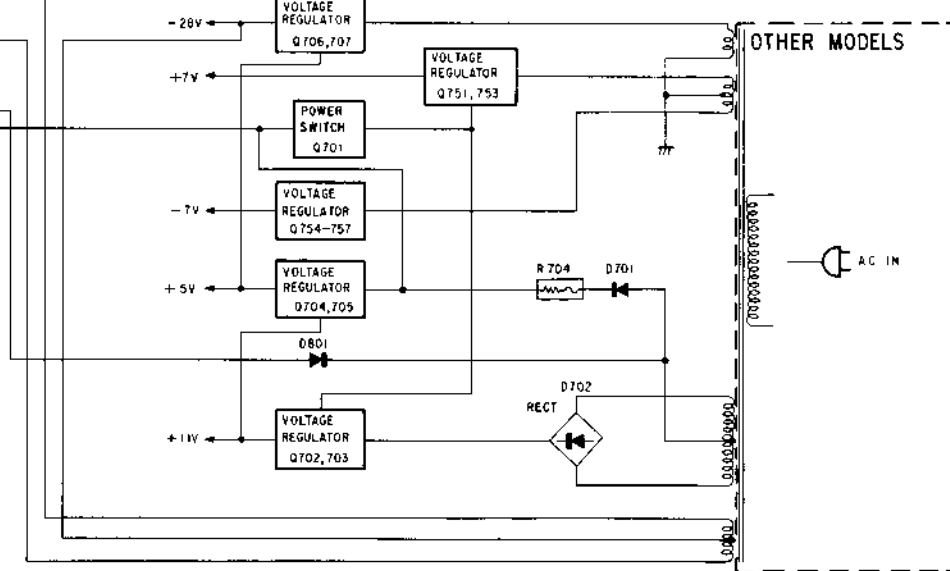
TC-WR97ES US, CANADIAN MODEL

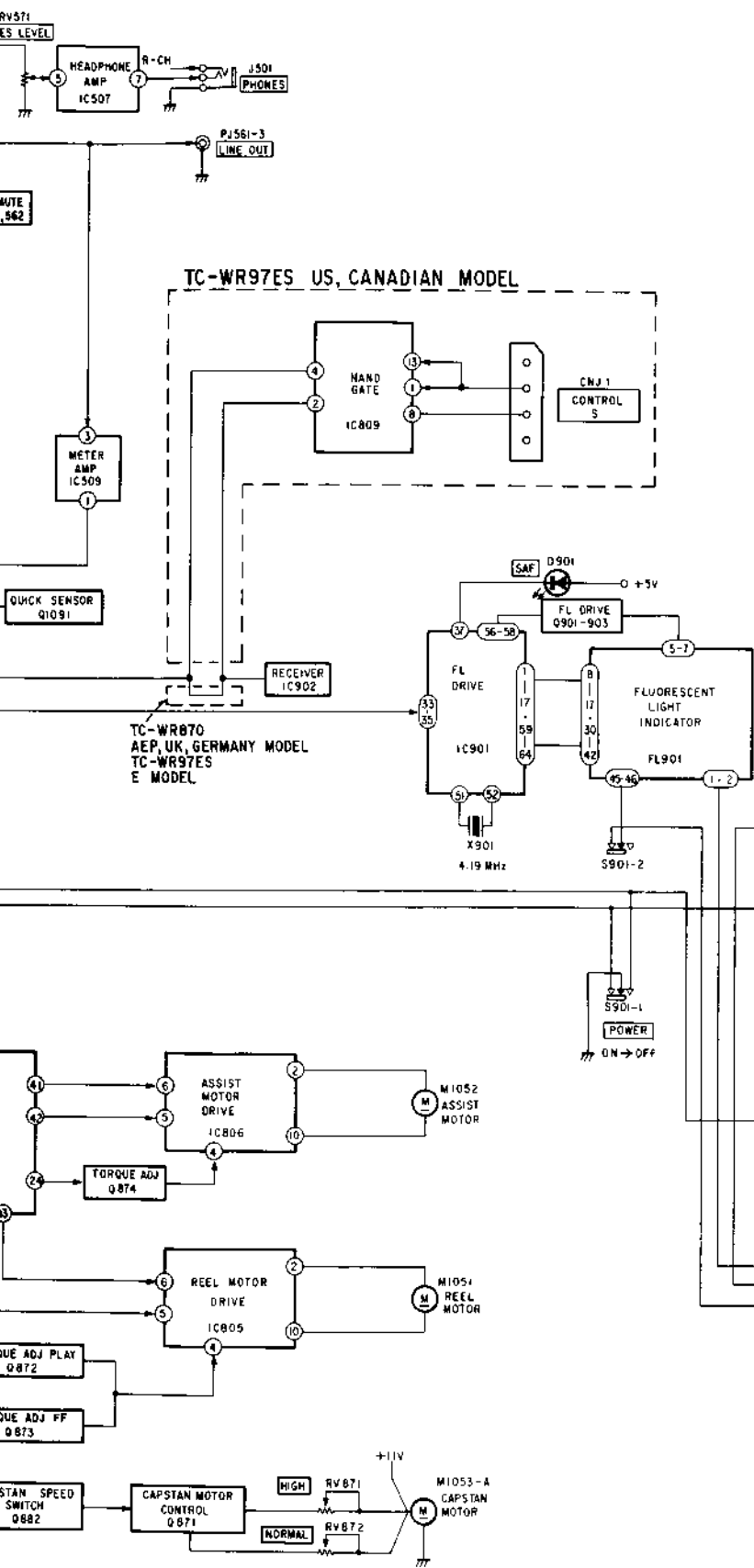
TC-WR870 AEP, UK, GERMANY MODEL
 TC-WR97ES E MODEL

• Circuit Boards Location

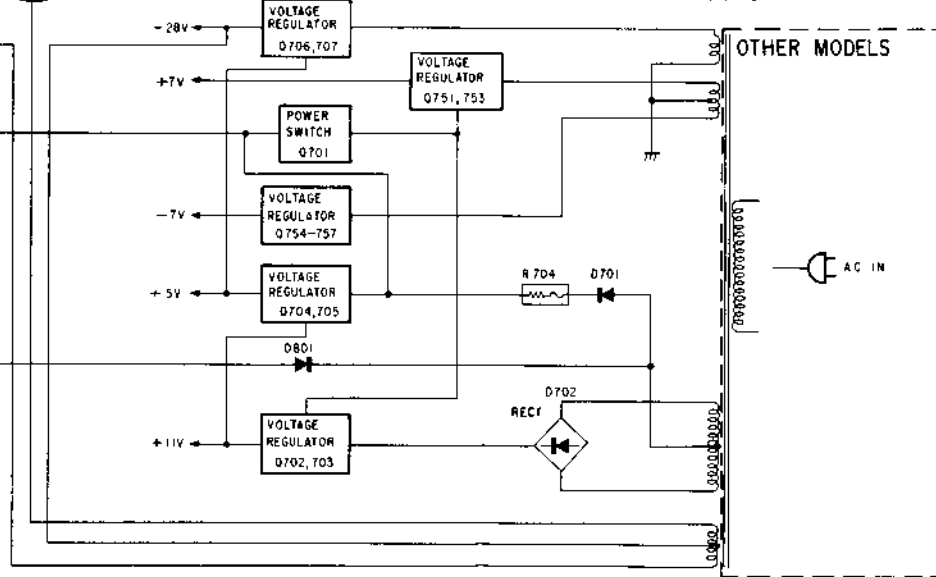
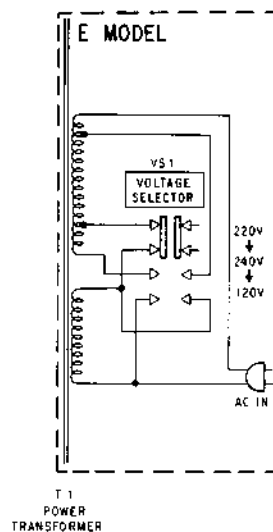
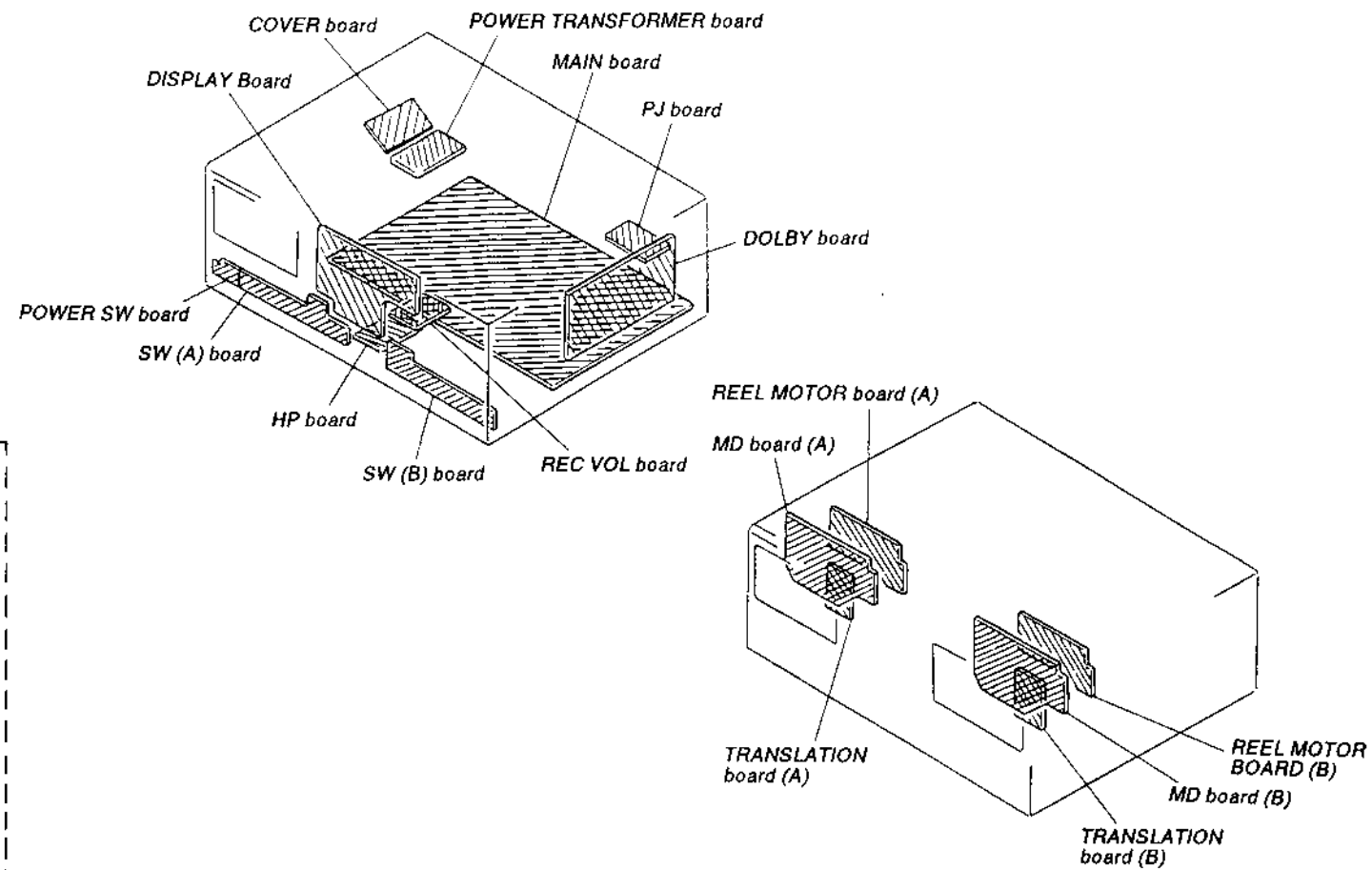


T1 POWER TRANSFORMER





• Circuit Boards Location

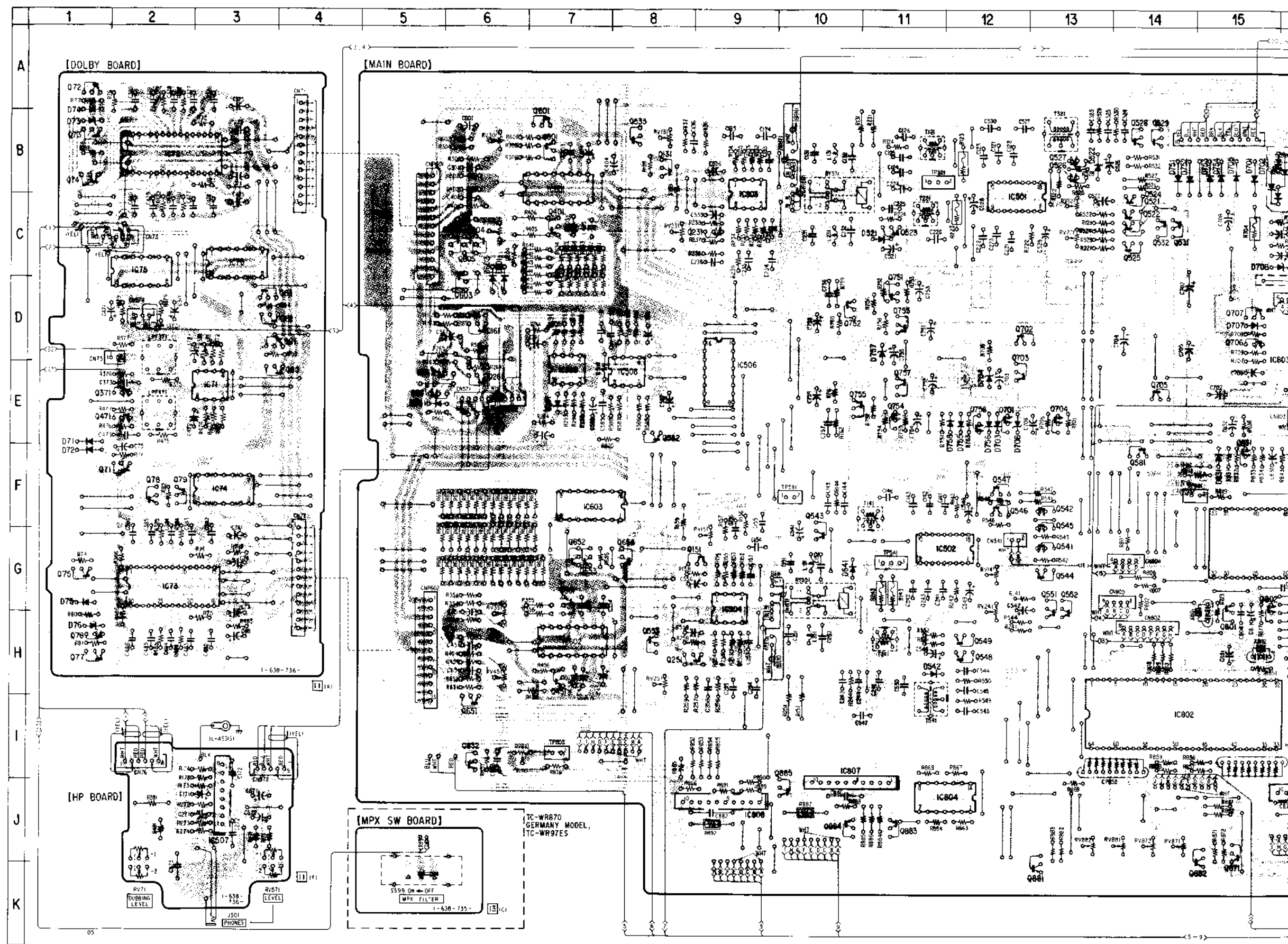


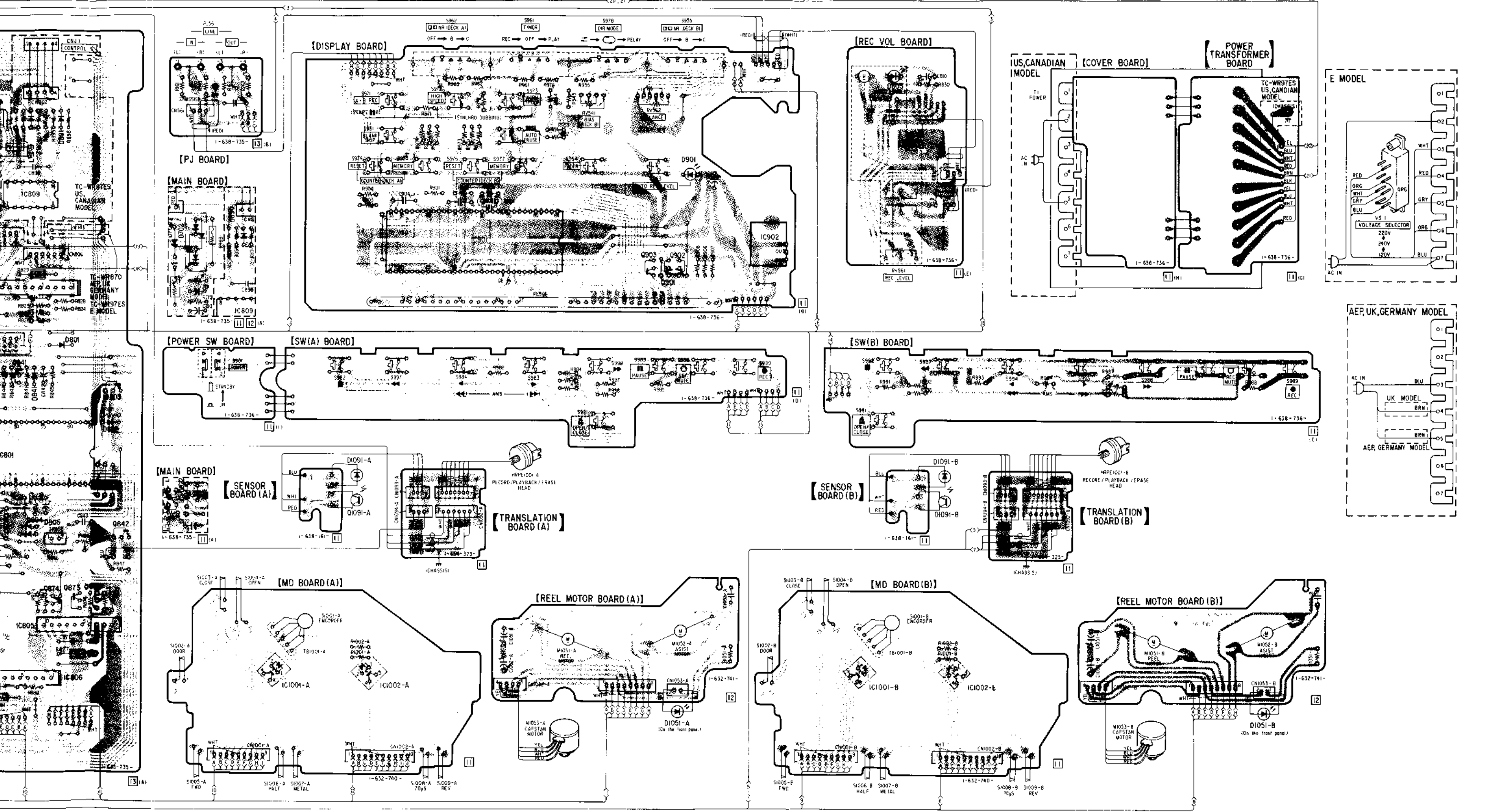
4-2. PRINTED WIRING BOARDS • See Page 15 for Circuit Boards Location, Page 21 for Semiconductor Lead Layouts.

• Semiconductor Location

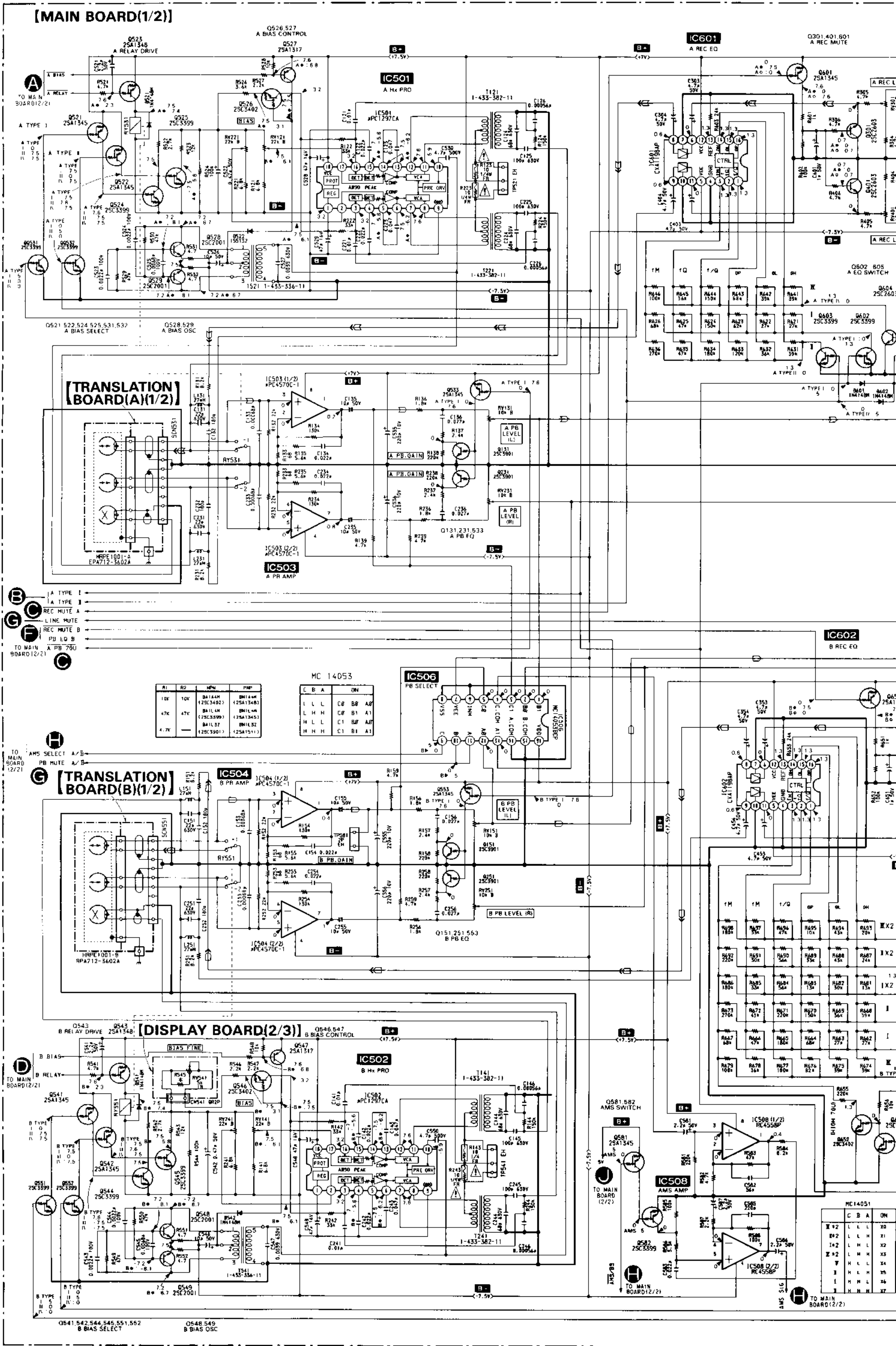
Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
D71	E-1	IC601	B-7	Q544	G-13
D72	F-1	IC602	H-7	Q545	F-13
D73	B-1	IC603	F-7	Q546	F-12
D74	B-1	IC801	G-16	Q547	F-12
D75	G-1	IC802	I-14	Q548	H-12
D76	H-1	IC803	D-16	Q549	H-12
D191	D-7	IC804	J-12	Q551	G-13
D291	E-7	IC805	I-17	Q552	G-13
D521	C-11	IC806	J-16	Q553	H-8
D522	B-13	IC807	J-10	Q561	E-5
D541	G-10	IC808	J-9	Q562	E-5
D542	H-11	IC809	C-16	Q581	F-14
D561	E-5	IC901	D-22	Q582	E-8
D601	D-6	IC902	D-26	Q601	B-7
D602	D-6	IC1001-A	J-19	Q602	C-6
D701	B-15	IC1001-B	J-27	Q603	D-6
D702	B-15	IC1002-A	J-21	Q604	C-6
D703	E-12	IC1002-B	J-28	Q605	C-6
D704	E-12			Q651	I-6
D705	B-15	Q71	F-2	Q652	G-7
D706	E-12	Q72	A-1	Q653	G-7
D707	D-15	Q73	B-1	Q654	G-7
D708	C-15	Q74	B-1	Q701	E-12
D751	B-14	Q75	G-1	Q702	D-12
D752	B-14	Q76	H-1	Q703	E-12
D753	B-15	Q77	H-1	Q704	E-13
D754	B-15	Q78	F-2	Q705	E-14
D755	E-12	Q79	F-2	Q706	D-15
D756	E-12	Q80	E-3	Q707	D-15
D757	D-11	Q81	D-3	Q751	D-11
D758	E-12	Q82	D-3	Q752	D-10
D801	E-16	Q83	D-3	Q753	D-11
D802	F-17	Q131	B-8	Q754	E-11
D804	H-16	Q151	G-9	Q755	E-10
D805	H-16	Q161	D-6	Q756	E-12
D831	F-15	Q231	C-9	Q757	E-11
D841	F-16	Q251	H-8	Q801	G-15
D890	B-16	Q261	E-6	Q802	G-15
D891	B-17	Q301	B-7	Q803	F-17
D901	C-25	Q351	G-7	Q831	F-15
D1051-A	J-25	Q371	E-2	Q832	I-6
D1051-B	J-32	Q401	C-7	Q841	F-16
D1091-A	G-20	Q451	H-7	Q842	H-17
D1091-B	G-28	Q471	E-2	Q871	J-15
		Q521	C-14	Q872	I-17
IC71	E-3	Q522	C-14	Q873	I-17
IC72	B-2	Q523	C-11	Q874	I-16
IC73	G-2	Q524	C-14	Q881	J-13
IC74	F-3	Q525	C-14	Q882	J-15
IC75	C-2	Q526	B-13	Q883	J-11
IC76	C-3	Q527	B-13	Q884	J-10
IC501	C-12	Q528	B-14	Q885	J-10
IC502	G-11	Q529	B-14	Q901	D-25
IC503	B-9	Q531	C-14	Q902	D-25
IC504	G-9	Q532	C-14	Q903	D-24
IC506	E-9	Q533	B-8	Q1091-A	G-20
IC507	J-3	Q541	G-13	Q1091-B	G-28
IC508	E-8	Q542	F-13		
IC509	E-7	Q543	G-10		

Note:
 • ○ : parts extracted from the component side.
 • □ : indicates side identified with part number.





1 2 3 4 5 6 7 8 9 10 11 12



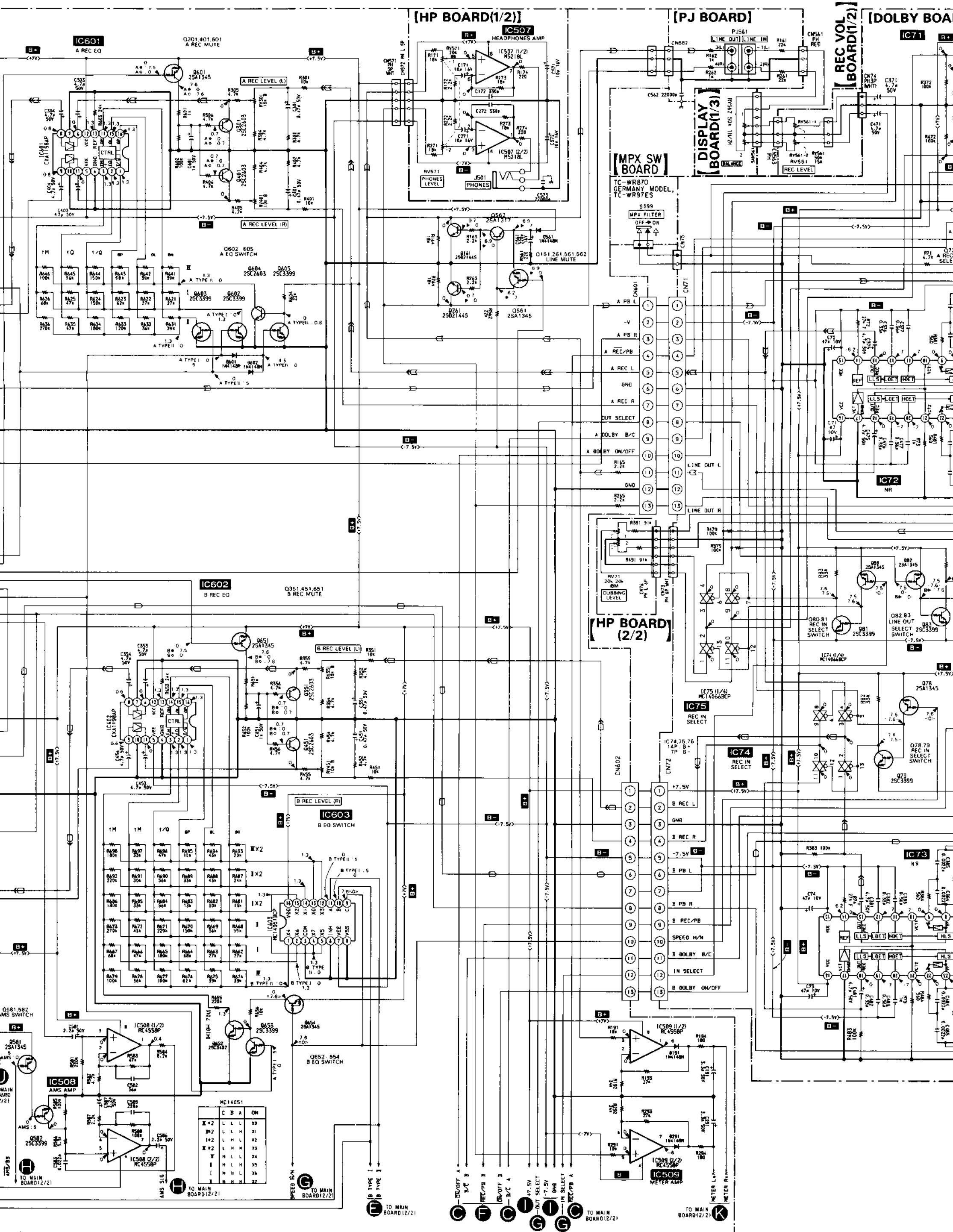
- (A) A TYPE I
- (B) A TYPE II
- (C) REC MUTE A
- (D) LINE MUTE
- (E) REC MUTE B
- (F) PU ED B
- (G) TO MAIN BOARD 12/21
- (H) AMS SELECT A/B
- (I) PB MUTE A/B

R1	R2	NEW	IMP
10K	10K	8A144M (25C3402)	25A134B (25A134B)
47K	47K	8A144M (25C3399)	25A134S (25A134S)
4.7K		8A1437 (25C3901)	25A1513 (25A1513)

C	B	A	DN
L	L	L	C0 B1 A0
L	H	H	C0 B1 A1
H	L	L	C1 B1 A0
H	L	H	C1 B1 A1

	R545
WR870: UK	3K
WR97E: US, CANADIAN	
WR870: AEP, GERMANY	3.6K
WR97E: E	

	C	B	A	DN
X2	L	L	L	X0
X2	L	L	H	X1
X2	L	H	L	X2
X2	L	H	H	X3
I	H	L	L	X4
I	H	L	H	X5
I	H	H	L	X6
I	H	H	H	X7



IC602
B REC EQ

[HP BOARD (1/2)]

[PJ BOARD]

[DOLBY BOARD]

[HP BOARD (2/2)]

DISPLAY BOARD (1/3)

REC VOL BOARD (1/2)

MPX SW BOARD

IC603
B EQ SWITCH

IC507
HEADPHONES AMP

IC601
A REC EQ

IC71

IC71

IC72

IC72

IC75
REC IN SELECT

IC73

IC74
REC IN SELECT

IC73

IC73

IC73

IC73

IC73

IC73

IC73

IC73

IC73

IC73

IC73

IC73

IC73

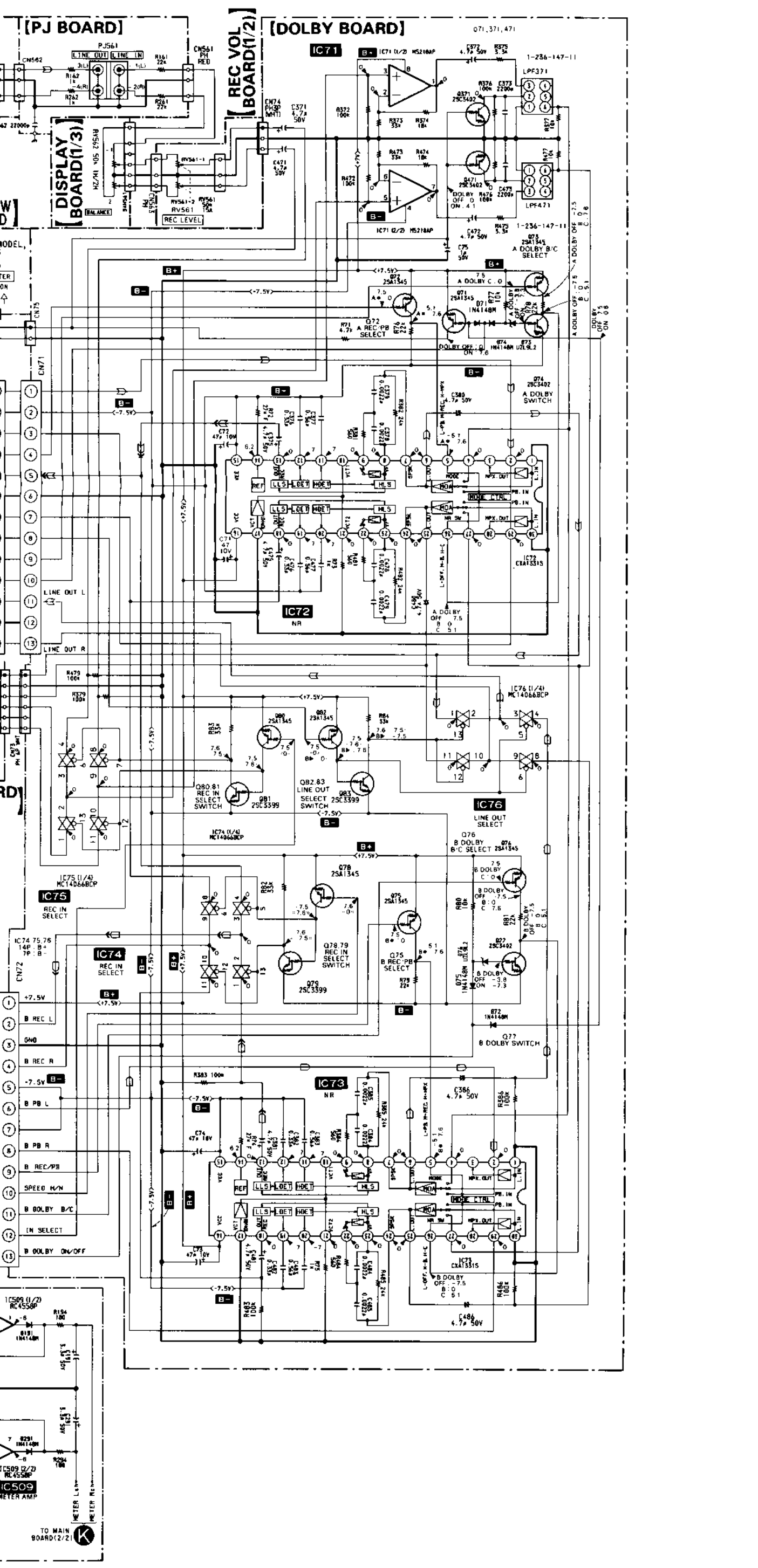
IC73

IC73

IC73

IC73

	C	B	A	ON
X+2	L	L	L	X1
X2	L	L	L	X1
1+2	L	L	L	X2
X+2	L	L	L	X2
X	L	L	L	X3
I	L	L	L	X3
I	L	L	L	X3
I	L	L	L	X3
I	L	L	L	X3
I	L	L	L	X3
I	L	L	L	X3



A
B
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D
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H
I
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K
L
M
N
O
P

Note:

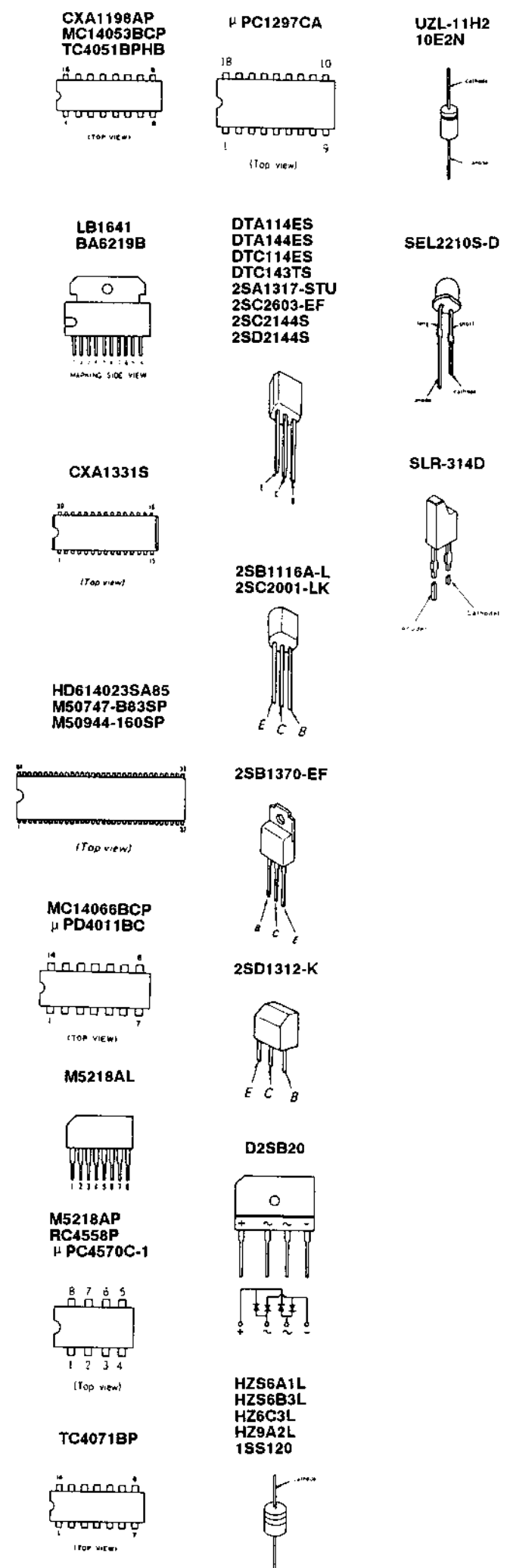
- All capacitors are in μF unless otherwise noted. pF : μF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}$ W or less unless otherwise specified.
- Δ : internal component.
- \square : nonflammable resistor.

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

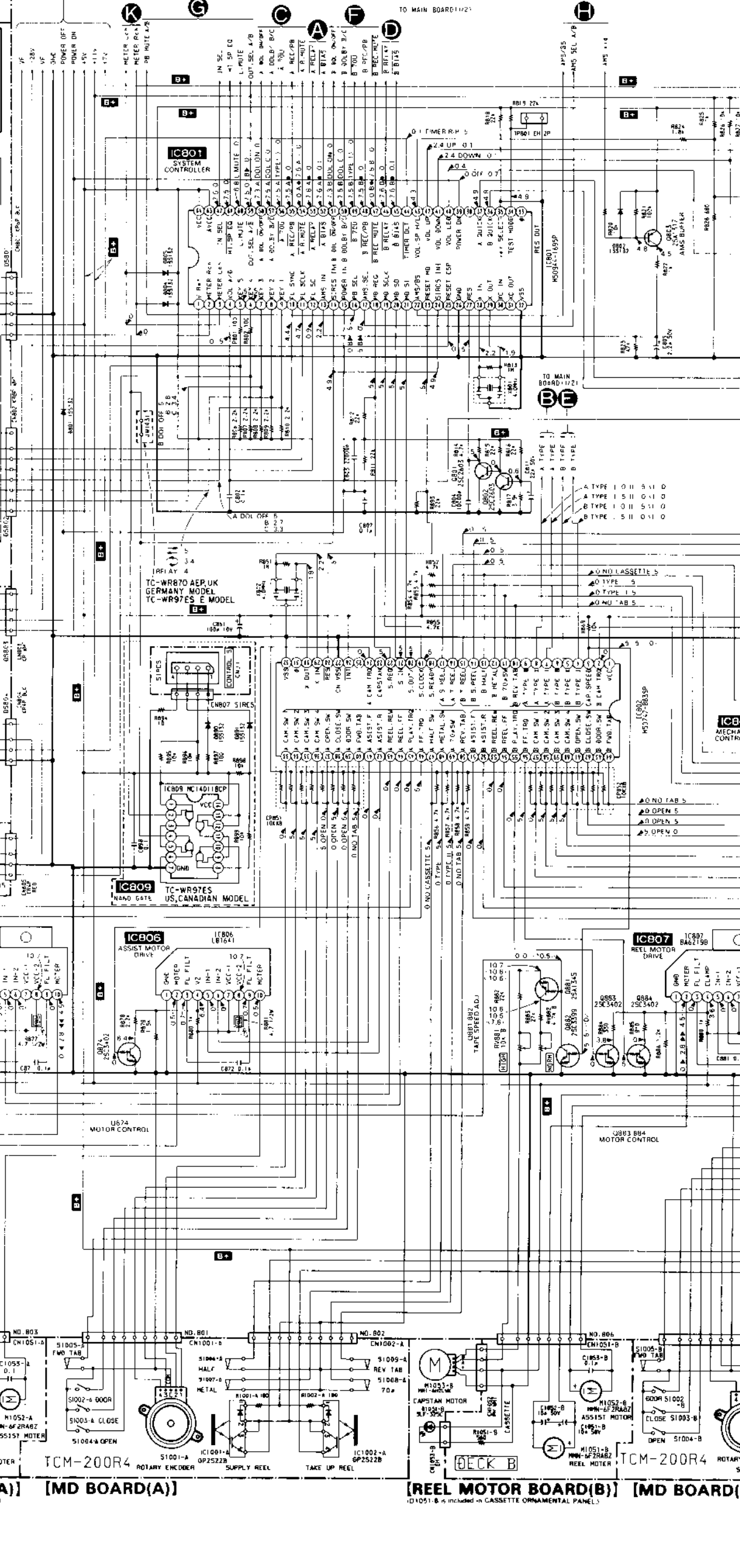
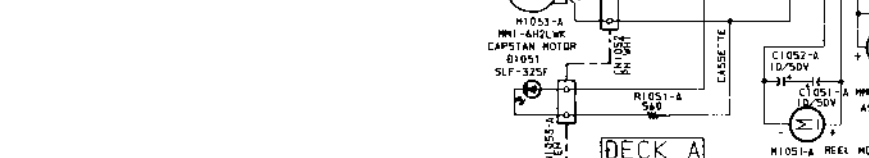
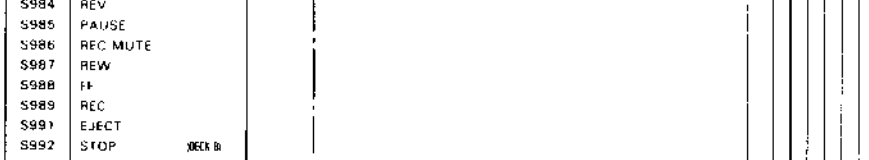
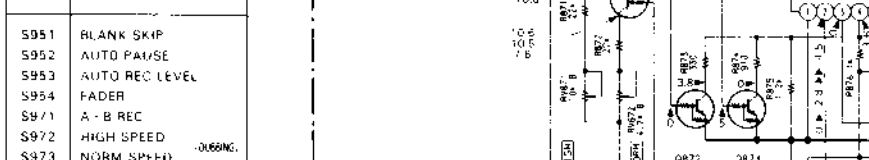
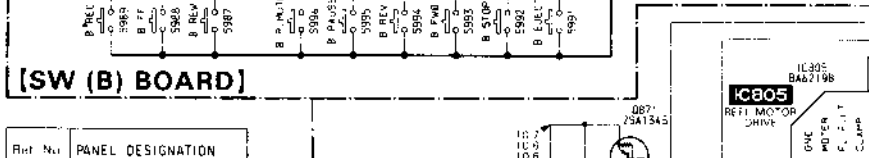
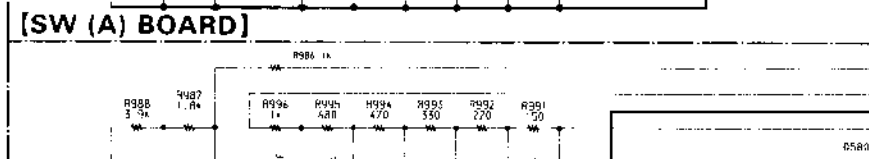
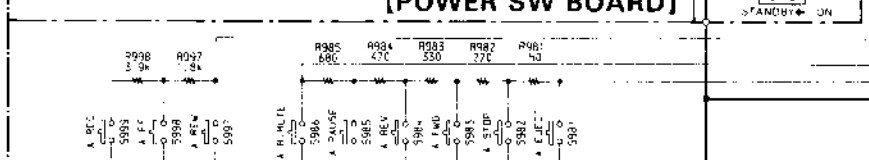
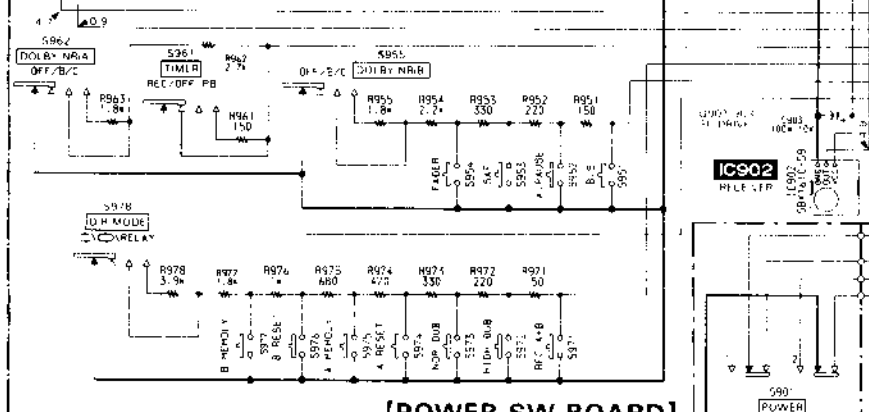
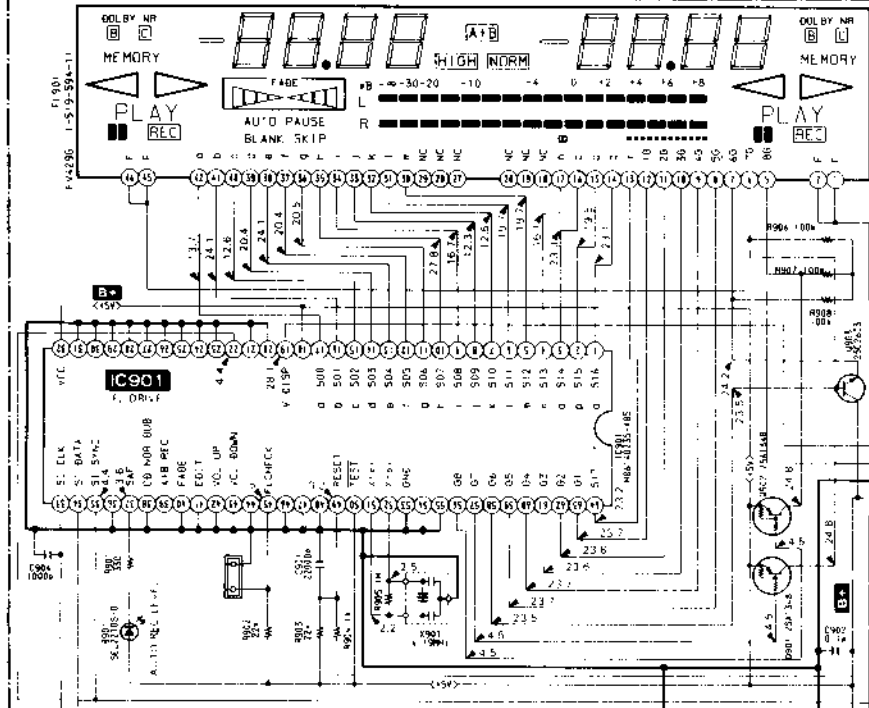
Note:
Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- \square : B + Line.
- \square : B - Line.
- \square : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions. no mark: STOP
- < >: NORMAL SPEED DUBBING
- << >>: HIGH SPEED DUBBING
- ▶: FWD ◀: REV
- Voltages are taken with a VOM (10 M Ω /V). Voltage variations may be noted due to normal production tolerances.
- Signal path.
 - ▶: PB (DECK A)
 - ◀: REC (DECK A)
 - ◻: PB (DECK B)
 - ◻: REC (DECK B)

• Semiconductor Lead Layouts



[DISPLAY BOARD(3/3)]



Ref. No.	PANEL DESIGNATION
S951	BLANK SKIP
S952	AUTO PAUSE
S953	AUTO REC LEVEL
S954	FADER
S971	A - B REC
S972	HIGH SPEED
S973	NORM SPEED
S974	RESET
S975	MEMORY
S976	RESET
S977	MEMORY
S981	EJECT
S982	STOP
S983	FWD
S984	REV
S985	PAUSE
S986	REC MUTE
S987	REW
S988	FF
S989	REC
S991	EJECT
S992	STOP
S993	FWD
S994	REV
S995	PAUSE
S996	REC MUTE
S997	REW
S998	FF
S999	REC

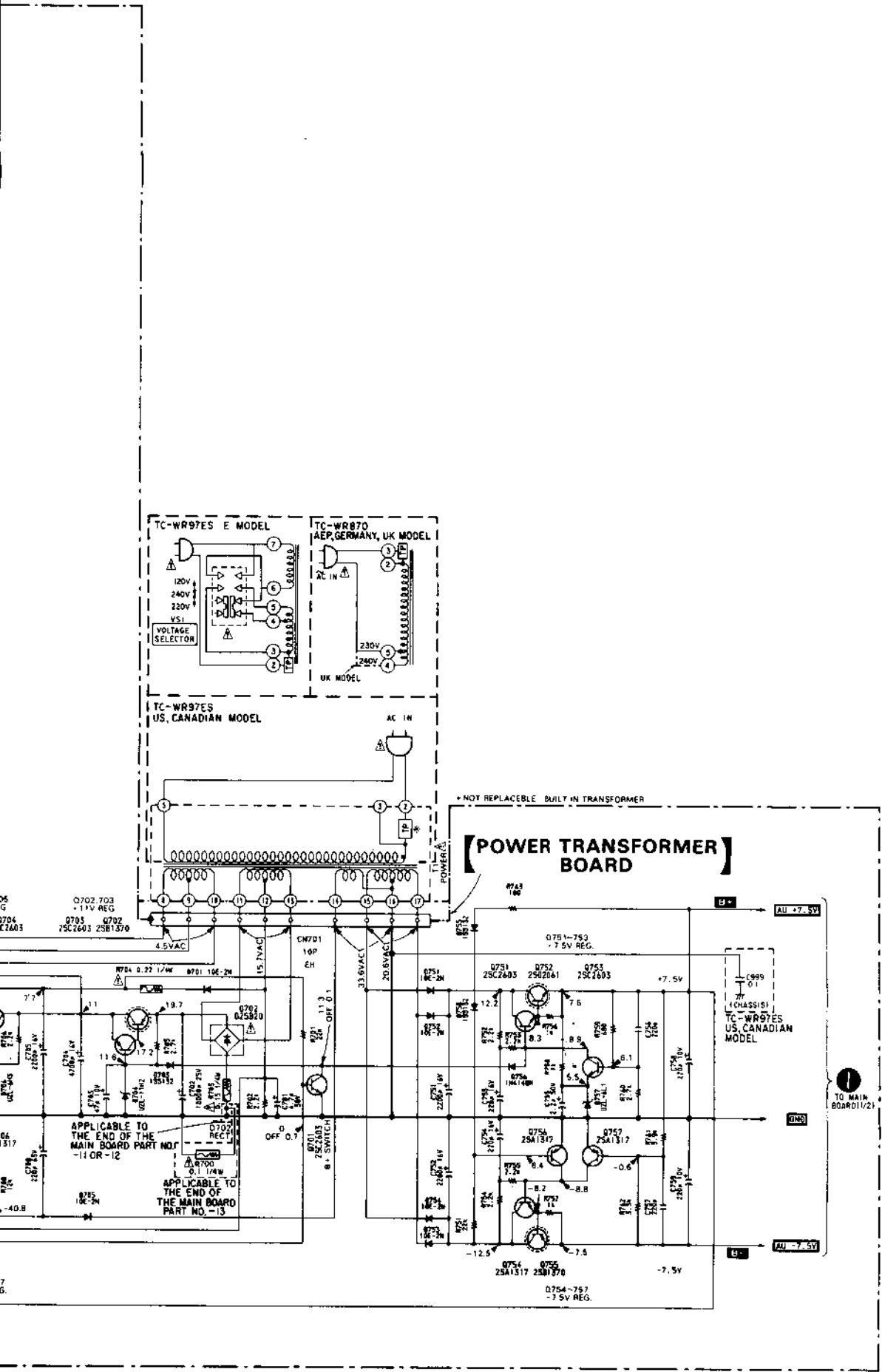
[REEL MOTOR BOARD(A)] [MD BOARD(A)]

[REEL MOTOR BOARD(B)] [MD BOARD(B)]

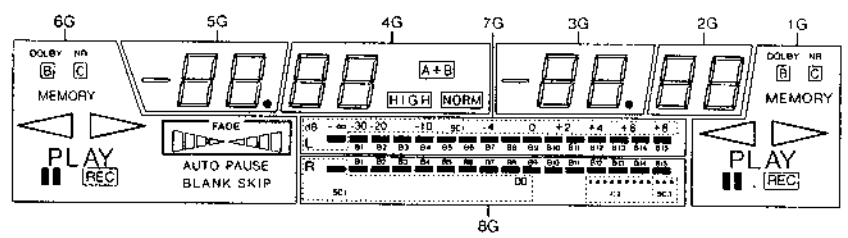
(D1001 & is included in CASSETTE ORNAMENTAL PANEL.)

(D1051 & is included in CASSETTE ORNAMENTAL PANEL.)

A
B
C
D
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F
G
H
I
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K
L
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P



• FL 901 Internal Connection

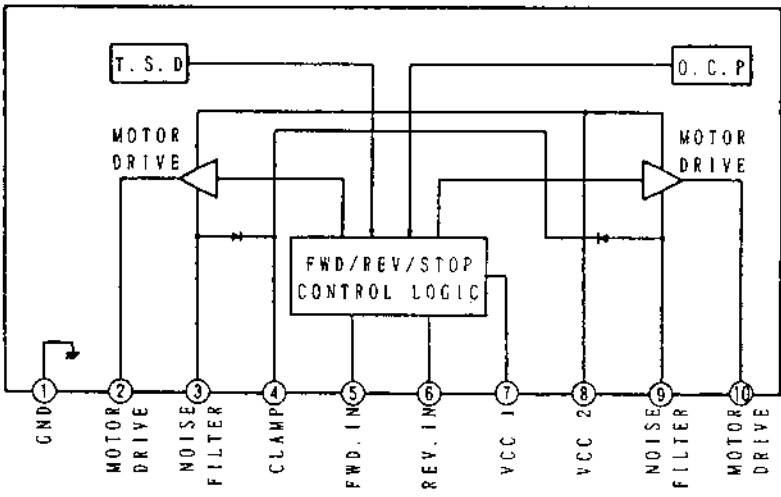


ANODE CONNECTION

	6G	7G	8G	5G	4G	3G	2G	1G
a	SC1	SC1	DOLBY NR	a	a	a	a	DOLBY NR
b	(B1)	(B1)	(B1)	b	b	b	b	(B1)
c	(B4)	(B4)	<	c	c	c	c	<
d	(B6)	(B6)	PLAY	d	d	d	d	PLAY
e	(B5)	(B5)	>	e	e	e	e	>
f	(B2)	(B2)	(I)	f	f	f	f	(I)
g	(B3)	(B3)	MEMORY	g	g	g	g	MEMORY
h	(B7)	(B7)		-	-	-	-	
i	(B8)	(B8)	REC	i	i	i	i	REC
j	(B9)	(B9)	FADE	j	j	j	j	-
k	(B12)	(B12)		k	k	k	k	-
l	(B14)	(B14)	BLANK SKIP	l	l	l	l	-
m	(B13)	(B13)	AUTOPAUSE	m	m	m	m	-
n	(B10)	(B10)		n	n	n	n	-
o	(B11)	(B11)	-	o	o	o	o	-
p	(B15)	(B15)	-	(DP)	(A+B)	(DP)	-	-
q	SC3	-	-	-	HIGH	-	-	-
r	SC2	-	-	-	NORM	-	-	-

• IC Block Diagram

IC805, 807 BA6219B
IC803, 806, 808 LB1641



SECTION 5 EXPLODED VIEWS

NOTE:

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

↑ ↑
Parts Color Cabinet's Color

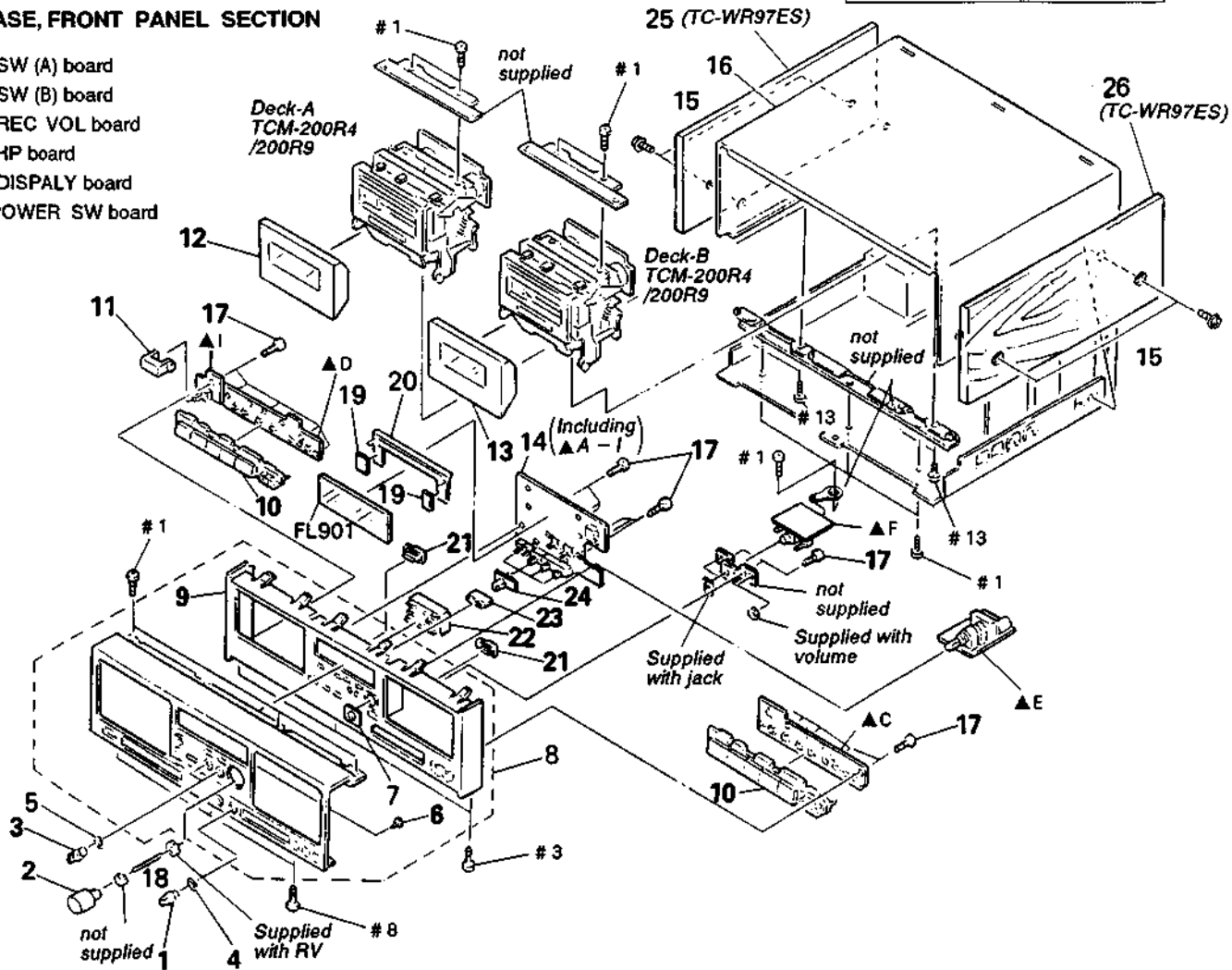
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

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

Les composants identifiés par une marque **▲** sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

(1) CASE, FRONT PANEL SECTION

- ▲ D: SW (A) board
- ▲ C: SW (B) board
- ▲ E: REC VOL board
- ▲ F: HP board
- ▲ B: DISPLAY board
- ▲ I: POWER SW board

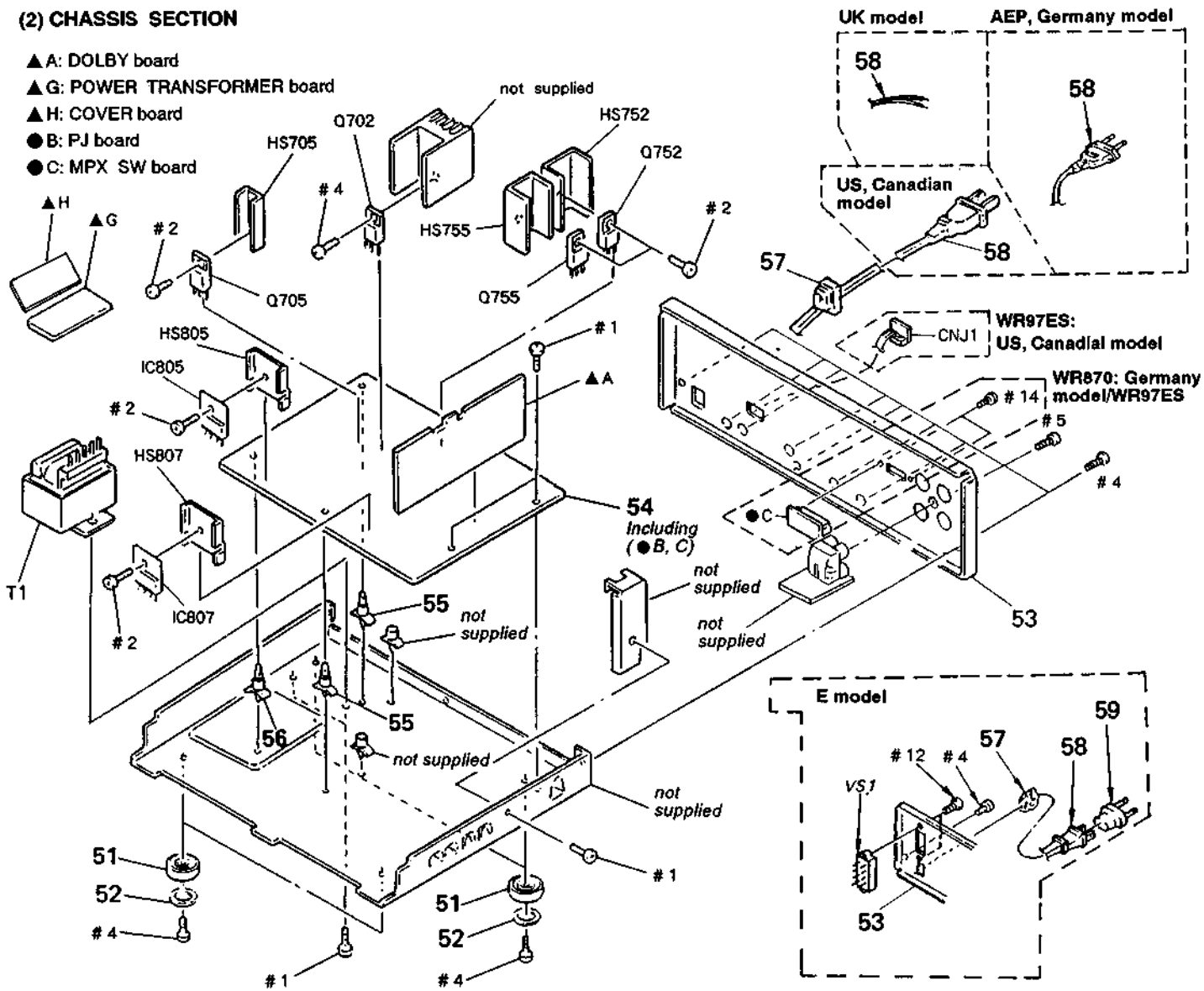


Ref. No.	Part No.	Description	Remark
1	3-354-931-01	KNOB (DIA. 10)	
2	3-329-983-01	KNOB (REC)	
3	3-354-931-11	KNOB (DIA. 10)	
4	3-356-935-01	SPRING	
5	3-354-981-01	SPRING (SUS), RING	
6	3-354-924-01	PLATE, INDICATION	
7	3-354-923-01	PLATE (VOL), ORNAMENTAL	
8	A-2003-900-A	PANEL ASSY, FRONT (WR87ES)	
8	A-2003-726-A	PANEL ASSY, FRONT (WR870)	
8	A-2003-719-A	PANEL ASSY, FRONT (WR97ES:US, Canadian)	
9	3-354-916-01	PANEL (BASE)	
10	3-365-419-01	BUTTON (A)	
11	3-354-932-01	BUTTON (POWER)	
12	X-3362-816-1	LID (A) ASSY, CASSETTE	
13	X-3362-817-1	LID (B) ASSY, CASSETTE	
14	* A-2006-395-A	PANEL BOARD, COMPLETE (WR870:UK)	
14	* A-2006-534-A	PANEL BOARD, COMPLETE (WR97ES:US, Canadian)	
14	* A-2006-546-A	PANEL BOARD, COMPLETE (WR870:Germany/WR97ES:G)	
14	* A-2006-615-A	PANEL BOARD, COMPLETE (WR870: AEP)	

Ref. No.	Part No.	Description	Remark
15	4-933-446-01	SCREW (SIDE PANEL)	
16	4-925-039-61	CASE	
17	4-928-635-01	SCREW, +BV (2.6X8) TAPPING	
18	4-922-979-01	INDICATOR	
19	9-911-844-XX	CUSHION	
20	3-365-420-01	HOLDER, FL TUBE	
21	3-354-930-01	BUTTON (D)	
22	3-354-938-21	BUTTON (B)	
23	3-354-929-01	BUTTON (C)	
24	4-922-518-01	KNOB (TIMER)	
25	X-3340-187-1	PANEL (L) ASSY, SIDE	
26	X-3340-188-1	PANEL (R) ASSY, SIDE	
FL901	1-519-594-11	INDICATOR TUBE, FLUORESCENT	

(2) CHASSIS SECTION

- ▲ A: DOLBY board
- ▲ G: POWER TRANSFORMER board
- ▲ H: COVER board
- B: PJ board
- C: MPX SW board



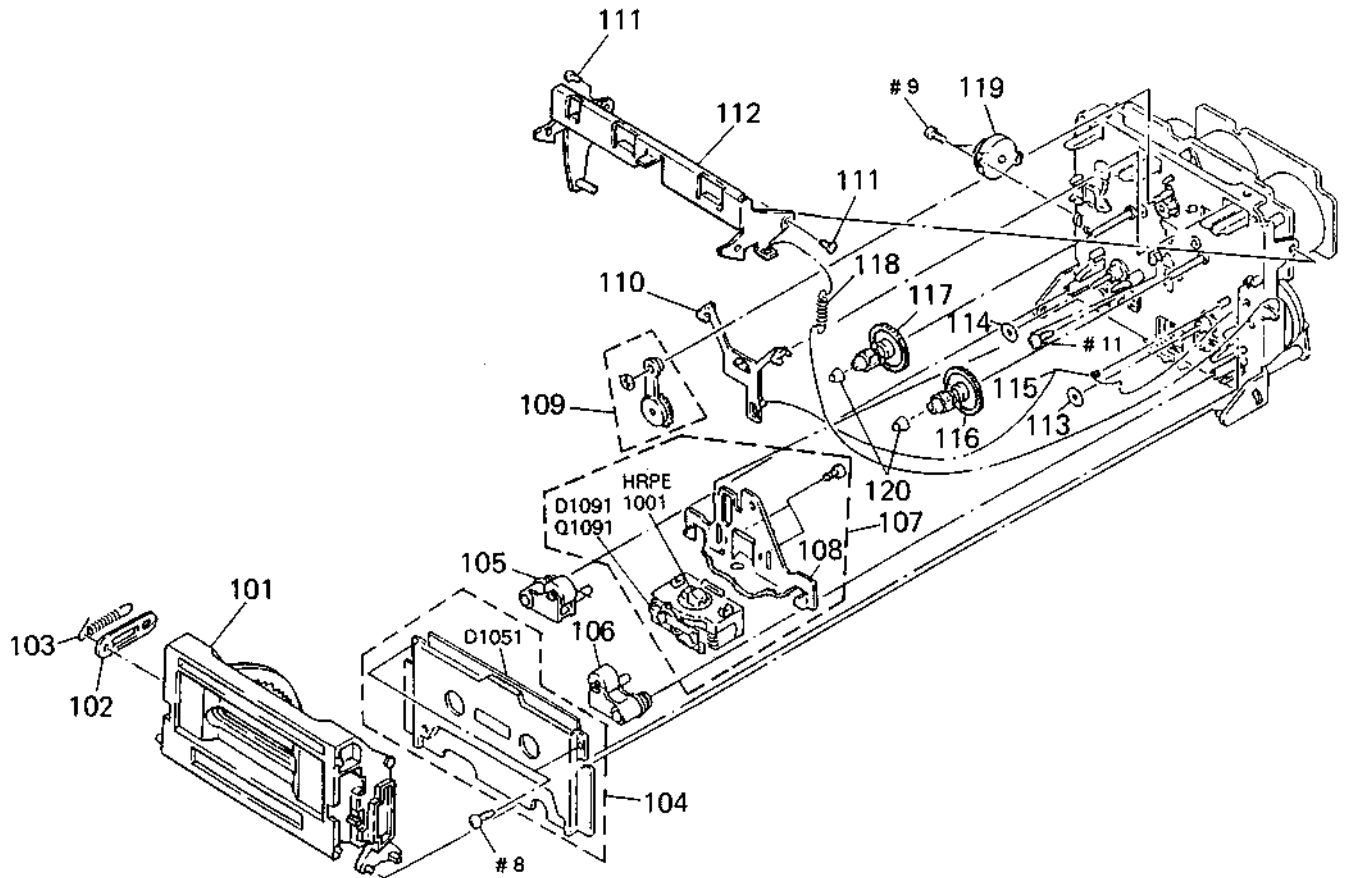
Ref. No.	Part No.	Description	Remark
51	X-3304-938-2	FOOT ASSY	
52	4-923-836-11	CUSHION	
53	* 3-365-368-11	PANEL, BACK (WR97ES:US, Canadian)	
53	* 3-365-368-21	PANEL, BACK (WR870:Germany)	
53	* 3-365-368-31	PANEL, BACK (WR870:UK)	
53	* 3-365-368-41	PANEL, BACK (WR870:AEP)	
53	* 3-365-368-51	PANEL, BACK (WR870:AEP)	
53	* 3-365-368-61	PANEL, BACK (WR97ES:E)	
54	* A-2006-535-A	MAIN BOARD, COMPLETE (WR870:Germany/WR97ES:E)	
54	* A-2006-394-A	MAIN BOARD, COMPLETE (WR870:UK)	
54	* A-2006-390-A	MAIN BOARD, COMPLETE (WR97ES:US, Canadian)	
54	* A-2006-616-A	MAIN BOARD, COMPLETE (WR870:AEP)	
55	* 3-346-265-11	HOLDER, PC BOARD	
56	* 4-924-098-11	HOLDER, PC BOARD	

Ref. No.	Part No.	Description	Remark
57	* 3-703-571-11	BUSHING (S) (4516), CORD (WR97ES:E)	
57	* 3-703-244-00	BUSHING (2104), CORD	?
58	▲ 1-555-465-00	CORD, POWER (WR97ES:US, Canadian)	
59	▲ 1-569-007-11	ADAPTOR, CONVERSION 2P (WR97ES:E)	
CNJ1	1-558-350-21	CORD (WITH CONNECTOR) (WR97ES:US, Canadian)	
HS705	* 3-309-144-21	HEAT SINK	
HS752	* 4-880-403-11	HEAT SINK	
HS755	* 4-880-403-11	HEAT SINK	
HS805	* 3-356-925-01	HEAT SINK	
HS807	* 3-356-925-01	HEAT SINK	
T1	▲ 1-450-446-11	TRANSFORMER, POWER (WR870)	
T1	▲ 1-450-445-11	TRANSFORMER, POWER (WR97ES:E)	
T1	▲ 1-450-444-11	TRANSFORMER, POWER (WR97ES:US, Canadian)	
VS1	▲ 1-570-307-11	SWITCH, VOLTAGE CHANGE (VOLTAGE SELECTOR) (WR97ES:E)	

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

Note:
Les composants identifiés par une marque ▲ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

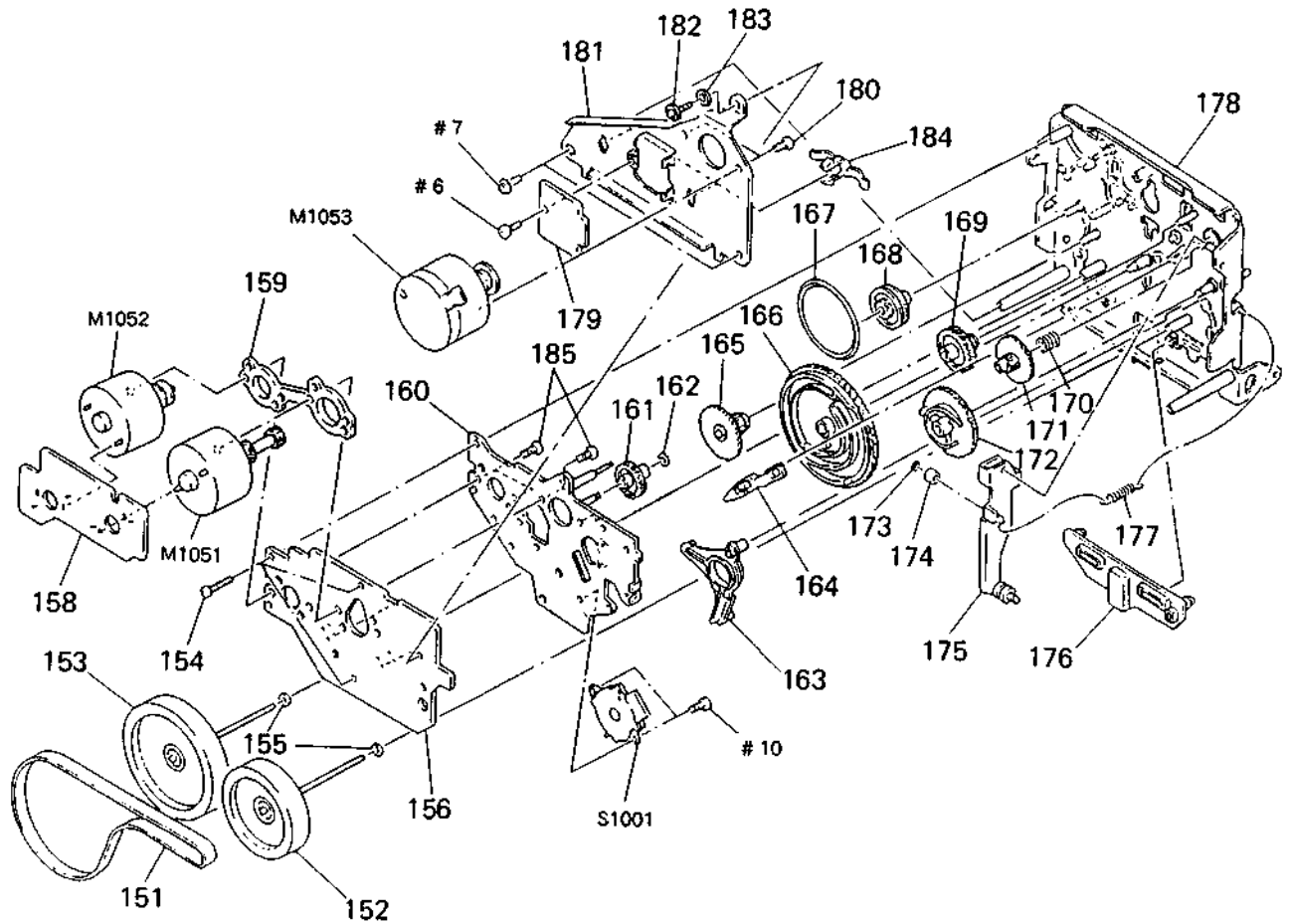
(3) MECHANISM DECK SECTION 1
 TCM-200R4: TC-WR97ES; US, Canadian
 TCM-200R9: (TC-WR97ES; E
 TC-WR870; AE, UK Germany)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	X-3362-814-4	HOLDER (CD) ASSY, CASSETTE		113	3-356-713-01	WASHER	
102	* 3-356-717-01	LEVER (JOINT)		114	3-356-714-01	WASHER	
103	3-356-626-01	SPRING, TENSION		115	3-356-619-01	SPRING (B), TORSION	
104	X-3356-613-1	PLATE ASSY, ORNAMENTAL		116	X-3356-627-1	GEAR (T) ASSY	
105	X-3343-456-1	LEVER (PINCH R) ASSY		117	X-3356-628-1	GEAR (S) ASSY	
106	X-3343-455-1	LEVER (PINCH F) ASSY		118	3-356-625-01	SPRING, TENSION	
107	A-2003-722-A	SLIDER (R4) COMPLETE ASSY (TCM-200R4)		119	3-319-224-31	DAMPER, SMALL	
107	A-2003-901-A	SLIDER (R9) COMPLETE ASSY (TCM-200R9)		120	3-362-308-01	CAP (REEL)	
108	X-3362-819-2	SLIDER (HEAD CHASSIS R) ASSY		D1051	8-719-980-85	DIODE SLF-325C	
109	X-3356-641-1	LEVER (FR2) ASSY		D1091	8-719-950-74	DIODE SLR-314D-8	
110	3-356-614-01	SLIDER (BRAKE)		Q1091	8-729-809-43	SPS-314B-8E	
111	3-356-601-11	SCREW, STEP					
112	* X-3356-608-1	LEVER (LIFTER) ASSY					

TC-WR97ES/WR870

(4) MECHANISM DECK SECTION 2
 (TCM-200R4: TC-WR97ES; US, Canadian Model)
 (TCM-200R9: TC-WR870, TC-WR97ES; E Model)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
151	3-356-604-01	BELT (CAPSTAN)		171	3-356-609-01	GEAR (LOADING)	
152	X-3356-642-1	FLYWHEEL (R FWD) ASSY		172	3-356-616-01	GEAR (LOADING CAM)	
153	X-3356-643-1	FLYWHEEL (R REV) ASSY		173	3-558-708-11	WASHER, STOPPER	
154	3-355-801-01	SCREW (BTP 2X18)		174	3-356-630-01	ROLLER (LOADING)	
155	3-356-705-01	WASHER (CAPSTAN)		175	* X-3356-606-1	LEVER (LOADING) ASSY	
156	* 1-632-740-11	MD BOARD		176	3-356-612-01	SLIDER (REVERSE)	
158	* 1-632-741-11	REEL MOTOR BOARD		177	3-356-624-01	SPRING, TENSION	
159	* 3-356-628-01	SPACER (MOTOR)		178	X-3356-634-1	CHASSIS (R2) COMPLETE ASSY, MECH	
160	* X-3356-602-4	BRACKET (MOTOR R) ASSY		179	* 1-634-323-11	TRANSLATION BOARD	
161	3-356-702-01	GEAR (COMMUNICATION B)		180	4-885-599-00	SCREW, FITTING, REINFORCEMENT	
162	3-669-465-00	WASHER (1.5), STOPPER		181	* 3-356-629-01	BRACKET (THRUST RETAINER R)	
163	3-356-613-01	LEVER (MODE)		182	3-356-707-01	SCREW (+PTPWH 2X25)	
164	3-356-617-01	LEVER (SELECTION)		183	* 3-356-718-01	SPACER (THRUST RETAINER R)	
165	3-356-606-01	GEAR (MODE)		184	3-575-321-00	RETAINER, THRUST, CAPSTAN	
166	3-356-615-01	GEAR (MODE CAM RR)		185	3-363-804-01	SCREW (+P 2.6X6.5)	
167	3-356-603-01	BELT (MODE)		M1051	X-3356-638-1	MOTOR (REEL R) ASSY	
168	3-356-607-01	PULLEY (MODE)		M1052	X-3356-604-1	MOTOR (ASSIST) ASSY	
169	3-356-703-01	GEAR (COMMUNICATION C)		M1053	X-3356-605-1	MOTOR (CAPSTAN R) ASSY	
170	3-356-605-01	SPRING, COMPRESSION		S1001	1-466-525-11	ENCODER, ROTARY	

SECTION 6
ELECTRICAL PARTS LIST

TRANSLATION

MD 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 and -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.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
	* 1-634-323-11	TRANSLATION BOARD *****		S1007	1-572-125-11	SWITCH, LEAF	
		< CONNECTOR >		S1008	1-572-125-11	SWITCH, LEAF	
CN1091	* 1-564-709-11	PIN, CONNECTOR (SMALL TYPE) 7P		S1009	1-572-125-11	SWITCH, LEAF	
CN1092	* 1-564-509-11	PLUG, CONNECTOR 6P				< CONNECTOR >	
CN1093	* 1-564-705-11	PIN, CONNECTOR (SMALL TYPE) 3P		TB1001	* 1-569-066-11	PIN, CONNECTOR 5P	
CN1094	* 1-564-506-11	PLUG, CONNECTOR 3P				*****	
		*****				* A-2006-390-A	MAIN BOARD, COMPLETE ***** (WR97ES: US, Canadian)
	* 1-632-740-11	MD BOARD *****				* A-2006-394-A	MAIN BOARD, COMPLETE ***** (WR870: UK)
	3-356-631-01	HOLDER (SENSOR)				* A-2006-535-A	MAIN BOARD, COMPLETE ***** (WR870: Germany/WR97ES: E)
		< CONNECTOR >				* A-2006-616-A	MAIN BOARD, COMPLETE ***** (WR870: AEP)
CN1001	1-506-615-11	PIN, CONNECTOR 9P		7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3		
CN1002	* 1-564-502-11	PIN, CONNECTOR 10P		7-682-548-04	SCREW +BVTT 3X8 (S)		
		< IC >				< CAPACITOR >	
IC1001	8-749-920-97	IC PHOTO REFLECTOR GP2S22B		C121	1-136-153-00	FILM 0.01uF 5% 50V	
IC1002	8-749-920-97	IC PHOTO REFLECTOR GP2S22B		C122	1-136-157-00	FILM 0.022uF 5% 50V	
		< RESISTOR >		C123	1-136-161-00	FILM 0.047uF 5% 50V	
R1001	1-249-408-11	CARBON 180 5% 1/4W		C124	1-136-272-00	FILM 68PF 5% 630V	
R1002	1-249-408-11	CARBON 180 5% 1/4W		C125	1-136-433-11	FILM 100PF 5% 630V	
		< SWITCH >		C126	1-130-468-00	MYLAR 560PF 5% 50V	
S1002	1-570-953-11	SWITCH, PUSH (1 KEY)		C131	1-136-935-11	FILM 22PF 5% 630V	
S1003	1-571-958-11	SWITCH, PUSH (1 KEY)		C132	1-162-285-31	CERAMIC 180PF 10% 50V	
S1004	1-572-126-11	SWITCH, PUSH (1 KEY)		C133	1-130-469-00	MYLAR 680PF 5% 50V	
S1005	1-572-125-11	SWITCH, LEAF		C134	1-136-157-00	FILM 0.022uF 5% 50V	
S1006	1-572-202-11	SWITCH, LEAF		C135	1-124-657-00	ELECT 10uF 20% 50V	
				C136	1-136-158-00	FILM 0.027uF 5% 50V	
				C141	1-136-153-00	FILM 0.01uF 5% 50V	
				C142	1-136-157-00	FILM 0.022uF 5% 50V	
				C143	1-136-161-00	FILM 0.047uF 5% 50V	

TC-WR97ES/WR870

MAIN

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C144	1-136-272-00	FILM	68PF 5% 630V	C523	1-136-230-00	FILM	0.0022uF 5% 100V
C145	1-136-433-11	FILM	100PF 5% 630V	C524	1-136-230-00	FILM	0.0022uF 5% 100V
C146	1-130-468-00	MYLAR	560PF 5% 50V	C525	1-130-856-00	FILM	0.0068uF 5% 100V
C151	1-136-935-11	FILM	22PF 5% 630V	C526	1-124-907-11	ELECT	10uF 20% 50V
C152	1-162-285-31	CERAMIC	180PF 10% 50V	C527	1-136-558-11	FILM	0.0039uF 5% 630V
C153	1-130-469-00	MYLAR	680PF 5% 50V	C528	1-124-477-11	ELECT	47uF 20% 25V
C154	1-136-157-00	FILM	0.022uF 5% 50V	C529	1-124-477-11	ELECT	47uF 20% 25V
C155	1-124-657-00	ELECT	10uF 20% 50V	C530	1-107-046-00	MICA	4.7PF 500V
C156	1-136-158-00	FILM	0.027uF 5% 50V	C535	1-126-176-11	ELECT	220uF 20% 10V
C191	1-123-382-00	ELECT	3.3uF 20% 100V	C536	1-126-176-11	ELECT	220uF 20% 10V
C221	1-136-153-00	FILM	0.01uF 5% 50V	C541	1-124-925-11	ELECT	2.2uF 20% 100V
C222	1-136-157-00	FILM	0.022uF 5% 50V	C542	1-124-902-00	ELECT	0.47uF 20% 50V
C223	1-136-161-00	FILM	0.047uF 5% 50V	C543	1-136-230-00	FILM	0.0022uF 5% 100V
C224	1-136-272-00	FILM	68PF 5% 630V	C544	1-136-230-00	FILM	0.0022uF 5% 100V
C225	1-136-433-11	FILM	100PF 5% 630V	C545	1-130-856-00	FILM	0.0068uF 5% 100V
C226	1-130-468-00	MYLAR	560PF 5% 50V	C546	1-124-907-11	ELECT	10uF 20% 50V
C231	1-136-935-11	FILM	22PF 5% 630V	C547	1-136-558-11	FILM	0.0039uF 5% 630V
C232	1-162-285-31	CERAMIC	180PF 10% 50V	C548	1-124-477-11	ELECT	47uF 20% 25V
C233	1-130-469-00	MYLAR	680PF 5% 50V	C549	1-124-477-11	ELECT	47uF 20% 25V
C234	1-136-157-00	FILM	0.022uF 5% 50V	C550	1-107-046-00	MICA	4.7PF 500V
C235	1-124-657-00	ELECT	10uF 20% 50V	C555	1-126-176-11	ELECT	220uF 20% 10V
C236	1-136-158-00	FILM	0.027uF 5% 50V	C556	1-126-176-11	ELECT	220uF 20% 10V
C241	1-136-153-00	FILM	0.01uF 5% 50V	C561	1-124-120-11	ELECT	220uF 20% 25V
C242	1-136-157-00	FILM	0.022uF 5% 50V	C562	1-161-494-00	CERAMIC	0.022uF 25V
C243	1-136-161-00	FILM	0.047uF 5% 50V	C581	1-124-925-11	ELECT	2.2uF 20% 100V
C244	1-136-272-00	FILM	68PF 5% 630V	C582	1-162-217-31	CERAMIC	56PF 5% 50V
C245	1-136-433-11	FILM	100PF 5% 630V	C583	1-136-157-00	FILM	0.022uF 5% 50V
C246	1-130-468-00	MYLAR	560PF 5% 50V	C585	1-162-286-31	CERAMIC	220PF 10% 50V
C251	1-136-935-11	FILM	22PF 5% 630V	C586	1-124-925-11	ELECT	2.2uF 20% 100V
C252	1-162-285-31	CERAMIC	180PF 10% 50V	C587	1-124-925-11	ELECT	2.2uF 20% 100V
C253	1-130-469-00	MYLAR	680PF 5% 50V	C601	1-124-903-11	ELECT	1uF 20% 50V
C254	1-136-157-00	FILM	0.022uF 5% 50V	C651	1-124-903-11	ELECT	1uF 20% 50V
C255	1-124-657-00	ELECT	10uF 20% 50V	C701	1-124-927-11	ELECT	4.7uF 20% 100V
C256	1-136-158-00	FILM	0.027uF 5% 50V	C702	1-124-772-11	ELECT	10000uF 20% 25V
C291	1-123-382-00	ELECT	3.3uF 20% 100V	C703	1-124-126-00	ELECT	47uF 20% 10V
C301	1-124-902-00	ELECT	0.47uF 20% 50V	C704	1-124-898-11	ELECT	4700uF 20% 16V
C303	1-124-927-11	ELECT	4.7uF 20% 100V	C705	1-124-556-11	ELECT	2200uF 20% 16V
C304	1-124-927-11	ELECT	4.7uF 20% 100V	C706	1-124-443-00	ELECT	100uF 20% 10V
C351	1-124-902-00	ELECT	0.47uF 20% 50V	C707	1-124-471-00	ELECT	1000uF 20% 6.3V
C353	1-124-927-11	ELECT	4.7uF 20% 100V	C708	1-124-919-11	ELECT	220uF 20% 63V
C354	1-124-927-11	ELECT	4.7uF 20% 100V	C709	1-124-927-11	ELECT	4.7uF 20% 100V
C401	1-124-902-00	ELECT	0.47uF 20% 50V	C710	1-124-927-11	ELECT	4.7uF 20% 100V
C403	1-124-927-11	ELECT	4.7uF 20% 100V	C751	1-124-556-11	ELECT	2200uF 20% 16V
C404	1-124-927-11	ELECT	4.7uF 20% 100V	C752	1-124-556-11	ELECT	2200uF 20% 16V
C451	1-124-902-00	ELECT	0.47uF 20% 50V	C753	1-124-120-11	ELECT	220uF 20% 25V
C453	1-124-927-11	ELECT	4.7uF 20% 100V	C754	1-124-120-11	ELECT	220uF 20% 25V
C454	1-124-927-11	ELECT	4.7uF 20% 100V	C755	1-124-925-11	ELECT	2.2uF 20% 100V
C521	1-124-925-11	ELECT	2.2uF 20% 100V	C756	1-162-286-31	CERAMIC	220PF 10% 50V
C522	1-124-902-00	ELECT	0.47uF 20% 50V	C757	1-162-286-31	CERAMIC	220PF 10% 50V

MAIN

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C758	1-126-176-11	ELECT	220uF 20% 10V	D542	8-719-912-20	DIODE 1SS120	
C759	1-126-176-11	ELECT	220uF 20% 10V	D561	8-719-912-20	DIODE 1SS120	
C802	1-164-159-11	CERAMIC	0.1uF 50V	D601	8-719-912-20	DIODE 1SS120	
C803	1-161-494-00	CERAMIC	0.022uF 25V	D602	8-719-912-20	DIODE 1SS120	
C804	1-162-306-11	CERAMIC	0.01uF 20% 16V	D701	8-719-200-77	DIODE 10E2N	
C805	1-124-925-11	ELECT	2.2uF 20% 100V	D702	8-719-500-36	DIODE D2S820	
C806	1-164-159-11	CERAMIC	0.1uF 50V	D703	8-719-912-20	DIODE 1SS120	
C807	1-164-159-11	CERAMIC	0.1uF 50V	D704	8-719-001-54	DIODE UZL-11H2	
C811	1-126-233-11	ELECT	22uF 20% 50V	D705	8-719-200-77	DIODE 10E2N	
C831	1-124-927-11	ELECT	4.7uF 20% 100V	D706	8-719-933-41	DIODE HZS6C3L	
C832	1-124-477-11	ELECT	47uF 20% 25V	D707	8-719-912-20	DIODE 1SS120	
C833	1-130-479-00	MYLAR	0.0047uF 5% 50V	D708	8-719-933-38	DIODE HZS6C3L	
C841	1-124-927-11	ELECT	4.7uF 20% 100V	D751	8-719-200-77	DIODE 10E2N	
C842	1-124-477-11	ELECT	47uF 20% 25V	D752	8-719-200-77	DIODE 10E2N	
C843	1-130-479-00	MYLAR	0.0047uF 5% 50V	D753	8-719-200-77	DIODE 10E2N	
C851	1-124-443-00	ELECT	100uF 20% 10V	D754	8-719-200-77	DIODE 10E2N	
C871	1-164-159-11	CERAMIC	0.1uF 50V	D755	8-719-912-20	DIODE 1SS120	
C872	1-164-159-11	CERAMIC	0.1uF 50V	D756	8-719-912-20	DIODE 1SS120	
C881	1-164-159-11	CERAMIC	0.1uF 50V	D757	8-719-933-33	DIODE HZS6A1L	
C882	1-164-159-11	CERAMIC	0.1uF 50V	D758	8-719-912-20	DIODE 1SS120	
C898	1-164-159-11	CERAMIC	0.1uF 50V	D801	8-719-912-20	DIODE 1SS120	
			(WR97ES:US, Canadian)	D802	8-719-912-20	DIODE 1SS120	
			< CONNECTOR >	D804	8-719-912-20	DIODE 1SS120	
CN541	* 1-568-951-11	PIN, CONNECTOR 2P		D805	8-719-912-20	DIODE 1SS120	
CN561	* 1-564-705-11	PIN, CONNECTOR (SMALL TYPE) 3P		D831	8-719-912-20	DIODE 1SS120	
CN562	* 1-564-337-00	PIN, CONNECTOR 3P		D841	8-719-912-20	DIODE 1SS120	
CN571	* 1-564-707-11	PIN, CONNECTOR (SMALL TYPE) 5P		D890	8-719-912-20	DIODE 1SS120 (WR97ES:US, Canadian)	
CN601	* 1-566-220-11	PIN, CONNECTOR 13P		D891	8-719-912-20	DIODE 1SS120 (WR97ES:US, Canadian)	
CN602	* 1-566-220-11	PIN, CONNECTOR 13P				< HEAT SINK >	
CN701	* 1-564-513-11	PLUG, CONNECTOR 10P		HS705	* 3-309-144-21	HEAT SINK	
CN801	* 1-568-955-11	PIN, CONNECTOR 6P		HS752	* 4-880-403-11	HEAT SINK	
CN802	* 1-568-935-11	PIN, CONNECTOR 8P		HS755	* 4-880-403-11	HEAT SINK	
CN803	* 1-568-953-11	PIN, CONNECTOR 4P		HS805	* 3-356-925-01	HEAT SINK	
CN804	* 1-568-953-11	PIN, CONNECTOR 4P		HS807	* 3-356-925-01	HEAT SINK	
CN805	* 1-568-953-11	PIN, CONNECTOR (STRAIGHT) 4P				< IC >	
CN806	* 1-564-340-00	PIN, CONNECTOR 6P		IC501	8-759-106-56	IC uPC1297CA	
CN807	1-565-951-11	SOCKET, CONNECTOR (PC BOARD) 4P	(WR97ES:US, Canadian)	IC502	8-759-106-56	IC uPC1297CA	
			< CIRCUIT BLOCK >	IC503	8-759-111-44	IC uPC4570C-1	
CP851	1-233-199-11	COMPOSITION CIRCUIT BLOCK		IC504	8-759-111-44	IC uPC4570C-1	
CP852	1-233-199-11	COMPOSITION CIRCUIT BLOCK		IC506	8-759-140-53	IC MC140538CP	
			< DIODE >	IC508	8-759-945-58	IC RC4558P	
D191	8-719-912-20	DIODE 1SS120		IC509	8-759-945-58	IC RC4558P	
D291	8-719-912-20	DIODE 1SS120		IC601	8-752-038-02	IC CXA1198AP	
D521	8-719-912-20	DIODE 1SS120		IC602	8-752-038-02	IC CXA1198AP	
D522	8-719-912-20	DIODE 1SS120		IC603	8-759-208-06	IC TC4051BPHB	
D541	8-719-912-20	DIODE 1SS120					

TC-WR97ES/WR870

MAIN

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
IC801	8-759-636-40	IC M50944-169SP		Q548	8-729-142-46	TRANSISTOR 2SC2001-LK	
IC802	8-759-633-86	IC M50747-B83SP		Q549	8-729-142-46	TRANSISTOR 2SC2001-LK	
IC803	8-759-822-09	IC LB1641		Q551	8-729-900-89	TRANSISTOR DTC144ES	
IC804	8-759-240-71	IC TC40718P		Q552	8-729-900-89	TRANSISTOR DTC144ES	
IC805	8-759-973-95	IC BA6219B		Q553	8-729-900-65	TRANSISTOR DTA144ES	
IC806	8-759-822-09	IC LB1641		Q561	8-729-900-65	TRANSISTOR DTA144ES	
IC807	8-759-973-95	IC BA6219B		Q562	8-729-821-04	TRANSISTOR 2SA1317-STU	
IC808	8-759-822-09	IC LB1641		Q581	8-729-900-65	TRANSISTOR DTA144ES	
IC809	8-759-140-11	IC uPD4011BC (WR97ES:US, Canadian)		Q582	8-729-900-89	TRANSISTOR DTC144ES	
		< COIL >		Q601	8-729-900-65	TRANSISTOR DTA144ES	
L131	1-410-780-11	INDUCTOR 27mH		Q602	8-729-900-89	TRANSISTOR DTC144ES	
L151	1-410-780-11	INDUCTOR 27mH		Q603	8-729-900-89	TRANSISTOR DTC144ES	
L231	1-410-780-11	INDUCTOR 27mH		Q604	8-729-620-05	TRANSISTOR 2SC2603-EF	
L251	1-410-780-11	INDUCTOR 27mH		Q605	8-729-900-89	TRANSISTOR DTC144ES	
		< JACK >		Q651	8-729-900-65	TRANSISTOR DTA144ES	
PJ561	1-573-070-11	JACK, PIN 4P (LINE IN/OUT)		Q652	8-729-900-80	TRANSISTOR DTC114ES	
		< TRANSISTOR >		Q653	8-729-900-89	TRANSISTOR DTC144ES	
Q131	8-729-900-74	TRANSISTOR DTC143TS		Q654	8-729-900-65	TRANSISTOR DTA144ES	
Q151	8-729-900-74	TRANSISTOR DTC143TS		Q701	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q161	8-729-922-37	TRANSISTOR 2SD2144S-UVW		Q702	8-729-924-90	TRANSISTOR 2SB1370-EF	
Q231	8-729-900-74	TRANSISTOR DTC143TS		Q703	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q251	8-729-900-74	TRANSISTOR DTC143TS		Q704	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q261	8-729-922-37	TRANSISTOR 2SD2144S-UVW		Q705	8-729-111-55	TRANSISTOR 2SD1312-K	
Q301	8-729-620-05	TRANSISTOR 2SC2603-EF		Q706	8-729-821-04	TRANSISTOR 2SA1317-STU	
Q351	8-729-620-05	TRANSISTOR 2SC2603-EF		Q707	8-729-140-04	TRANSISTOR 2SB1116A-L	
Q401	8-729-620-05	TRANSISTOR 2SC2603-EF		Q751	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q451	8-729-620-05	TRANSISTOR 2SC2603-EF		Q752	8-729-111-55	TRANSISTOR 2SD1312-K	
Q521	8-729-900-65	TRANSISTOR DTA144ES		Q753	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q522	8-729-900-65	TRANSISTOR DTA144ES		Q754	8-729-821-04	TRANSISTOR 2SA1317-STU	
Q523	8-729-900-61	TRANSISTOR DTA114ES		Q755	8-729-924-90	TRANSISTOR 2SB1370-EF	
Q524	8-729-900-89	TRANSISTOR DTC144ES		Q756	8-729-821-04	TRANSISTOR 2SA1317-STU	
Q525	8-729-900-89	TRANSISTOR DTC144ES		Q757	8-729-821-04	TRANSISTOR 2SA1317-STU	
Q526	8-729-900-80	TRANSISTOR DTC114ES		Q801	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q527	8-729-821-04	TRANSISTOR 2SA1317-STU		Q802	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q528	8-729-142-46	TRANSISTOR 2SC2001-LK		Q803	8-729-821-04	TRANSISTOR 2SA1317-STU	
Q529	8-729-142-46	TRANSISTOR 2SC2001-LK		Q831	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q531	8-729-900-89	TRANSISTOR DTC144ES		Q832	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q532	8-729-900-89	TRANSISTOR DTC144ES		Q841	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q533	8-729-900-65	TRANSISTOR DTA144ES		Q842	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q541	8-729-900-65	TRANSISTOR DTA144ES		Q871	8-729-900-65	TRANSISTOR DTA144ES	
Q542	8-729-900-65	TRANSISTOR DTA144ES		Q872	8-729-900-80	TRANSISTOR DTC114ES	
Q543	8-729-900-61	TRANSISTOR DTA114ES		Q873	8-729-900-80	TRANSISTOR DTC114ES	
Q544	8-729-900-89	TRANSISTOR DTC144ES		Q874	8-729-900-80	TRANSISTOR DTC114ES	
Q545	8-729-900-89	TRANSISTOR DTC144ES		Q881	8-729-900-65	TRANSISTOR DTA144ES	
Q546	8-729-900-80	TRANSISTOR DTC114ES		Q882	8-729-900-89	TRANSISTOR DTC144ES	
Q547	8-729-821-04	TRANSISTOR 2SA1317-STU		Q883	8-729-900-80	TRANSISTOR DTC114ES	
				Q884	8-729-900-80	TRANSISTOR DTC114ES	
				Q885	8-729-900-80	TRANSISTOR DTC114ES	

MAIN

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
< RESISTOR >											
R121	1-249-427-11	CARBON	6.8K	5%	1/4W	R237	1-247-840-00	CARBON	2.4K	5%	1/4W
R122	1-249-435-11	CARBON	33K	5%	1/4W	R238	1-247-887-00	CARBON	220K	5%	1/4W
R123	△ 1-219-153-11	FUSIBLE	10	5%	1/4W F	R239	1-249-425-11	CARBON	4.7K	5%	1/4W
R124	1-247-883-00	CARBON	150K	5%	1/4W	R241	1-249-427-11	CARBON	6.8K	5%	1/4W
R131	1-249-428-11	CARBON	8.2K	5%	1/4W	R242	1-249-435-11	CARBON	33K	5%	1/4W
R132	1-249-433-11	CARBON	22K	5%	1/4W	R243	△ 1-219-153-11	FUSIBLE	10	5%	1/4W F
R133	1-249-403-11	CARBON	68	5%	1/4W	R244	1-247-883-00	CARBON	150K	5%	1/4W
R134	1-247-882-11	CARBON	130K	5%	1/4W	R251	1-249-428-11	CARBON	8.2K	5%	1/4W
R135	1-249-426-11	CARBON	5.6K	5%	1/4W	R252	1-249-433-11	CARBON	22K	5%	1/4W
R136	1-249-420-11	CARBON	1.8K	5%	1/4W	R253	1-249-403-11	CARBON	68	5%	1/4W
R137	1-247-840-00	CARBON	2.4K	5%	1/4W	R254	1-247-882-11	CARBON	130K	5%	1/4W
R138	1-247-887-00	CARBON	220K	5%	1/4W	R255	1-249-426-11	CARBON	5.6K	5%	1/4W
R139	1-249-425-11	CARBON	4.7K	5%	1/4W	R256	1-249-420-11	CARBON	1.8K	5%	1/4W
R141	1-249-427-11	CARBON	6.8K	5%	1/4W	R257	1-247-840-00	CARBON	2.4K	5%	1/4W
R142	1-249-435-11	CARBON	33K	5%	1/4W	R258	1-247-887-00	CARBON	220K	5%	1/4W
R143	△ 1-219-153-11	FUSIBLE	10	5%	1/4W F	R259	1-249-425-11	CARBON	4.7K	5%	1/4W
R144	1-247-883-00	CARBON	150K	5%	1/4W	R261	1-249-433-11	CARBON	22K	5%	1/4W
R151	1-249-428-11	CARBON	8.2K	5%	1/4W	R262	1-249-417-11	CARBON	1K	5%	1/4W
R152	1-249-433-11	CARBON	22K	5%	1/4W	R263	1-249-421-11	CARBON	2.2K	5%	1/4W
R153	1-249-403-11	CARBON	68	5%	1/4W	R264	1-249-432-11	CARBON	18K	5%	1/4W
R154	1-247-882-11	CARBON	130K	5%	1/4W	R265	1-249-421-11	CARBON	2.2K	5%	1/4W
R155	1-249-426-11	CARBON	5.6K	5%	1/4W	R291	1-249-429-11	CARBON	10K	5%	1/4W
R156	1-249-420-11	CARBON	1.8K	5%	1/4W	R292	1-247-864-11	CARBON	24K	5%	1/4W
R157	1-247-840-00	CARBON	2.4K	5%	1/4W	R293	1-249-434-11	CARBON	27K	5%	1/4W
R158	1-247-887-00	CARBON	220K	5%	1/4W	R294	1-249-408-11	CARBON	180	5%	1/4W
R159	1-249-425-11	CARBON	4.7K	5%	1/4W	R301	1-249-429-11	CARBON	10K	5%	1/4W
R161	1-249-433-11	CARBON	22K	5%	1/4W	R302	1-249-425-11	CARBON	4.7K	5%	1/4W
R162	1-249-417-11	CARBON	1K	5%	1/4W	R304	1-249-425-11	CARBON	4.7K	5%	1/4W
R163	1-249-421-11	CARBON	2.2K	5%	1/4W	R305	1-249-425-11	CARBON	4.7K	5%	1/4W
R164	1-249-432-11	CARBON	18K	5%	1/4W	R306	1-249-425-11	CARBON	4.7K	5%	1/4W
R165	1-249-421-11	CARBON	2.2K	5%	1/4W	R351	1-249-429-11	CARBON	10K	5%	1/4W
R191	1-249-429-11	CARBON	10K	5%	1/4W	R352	1-249-425-11	CARBON	4.7K	5%	1/4W
R192	1-247-864-11	CARBON	24K	5%	1/4W	R354	1-249-425-11	CARBON	4.7K	5%	1/4W
R193	1-249-434-11	CARBON	27K	5%	1/4W	R355	1-249-425-11	CARBON	4.7K	5%	1/4W
R194	1-249-408-11	CARBON	180	5%	1/4W	R356	1-249-425-11	CARBON	4.7K	5%	1/4W
R221	1-249-427-11	CARBON	6.8K	5%	1/4W	R401	1-249-429-11	CARBON	10K	5%	1/4W
R222	1-249-435-11	CARBON	33K	5%	1/4W	R402	1-249-425-11	CARBON	4.7K	5%	1/4W
R223	△ 1-219-153-11	FUSIBLE	10	5%	1/4W F	R404	1-249-425-11	CARBON	4.7K	5%	1/4W
R224	1-247-883-00	CARBON	150K	5%	1/4W	R405	1-249-425-11	CARBON	4.7K	5%	1/4W
R231	1-249-428-11	CARBON	8.2K	5%	1/4W	R406	1-249-425-11	CARBON	4.7K	5%	1/4W
R232	1-249-433-11	CARBON	22K	5%	1/4W	R451	1-249-429-11	CARBON	10K	5%	1/4W
R233	1-249-403-11	CARBON	68	5%	1/4W	R452	1-249-425-11	CARBON	4.7K	5%	1/4W
R234	1-247-882-11	CARBON	130K	5%	1/4W	R454	1-249-425-11	CARBON	4.7K	5%	1/4W
R235	1-249-426-11	CARBON	5.6K	5%	1/4W	R455	1-249-425-11	CARBON	4.7K	5%	1/4W
R236	1-249-420-11	CARBON	1.8K	5%	1/4W	R456	1-249-425-11	CARBON	4.7K	5%	1/4W
						R521	1-249-425-11	CARBON	4.7K	5%	1/4W
						R522	1-249-422-11	CARBON	2.7K	5%	1/4W
						R523	1-249-430-11	CARBON	12K	5%	1/4W
						R524	1-249-441-11	CARBON	100K	5%	1/4W

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

Note:
Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

TC-WR97ES/WR870

MAIN

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
R526	1-247-844-11	CARBON	3.6K	5%	1/4W	R646	1-249-441-11	CARBON	100K	5%	1/4W
R527	1-249-421-11	CARBON	2.2K	5%	1/4W	R651	1-249-417-11	CARBON	1K	5%	1/4W
R528	1-249-429-11	CARBON	10K	5%	1/4W	R652	1-249-441-11	CARBON	100K	5%	1/4W
R529	1-249-437-11	CARBON	47K	5%	1/4W	R653	1-247-864-11	CARBON	24K	5%	1/4W
R530	1-249-437-11	CARBON	47K	5%	1/4W	R655	1-247-887-00	CARBON	220K	5%	1/4W
R531	1-249-389-11	CARBON	4.7	5%	1/4W						
R532	1-249-389-11	CARBON	4.7	5%	1/4W	R656	1-249-429-11	CARBON	10K	5%	1/4W
R541	1-249-425-11	CARBON	4.7K	5%	1/4W	R662	1-249-434-11	CARBON	27K	5%	1/4W
R542	1-249-422-11	CARBON	2.7K	5%	1/4W	R663	1-249-434-11	CARBON	27K	5%	1/4W
R543	1-249-430-11	CARBON	12K	5%	1/4W	R664	1-249-439-11	CARBON	68K	5%	1/4W
R544	1-249-441-11	CARBON	100K	5%	1/4W	R665	1-247-885-00	CARBON	180K	5%	1/4W
R546	1-249-421-11	CARBON	2.2K	5%	1/4W	R666	1-249-437-11	CARBON	47K	5%	1/4W
R547	1-249-421-11	CARBON	2.2K	5%	1/4W	R667	1-249-439-11	CARBON	68K	5%	1/4W
R548	1-249-429-11	CARBON	10K	5%	1/4W	R668	1-249-436-11	CARBON	39K	5%	1/4W
R549	1-249-437-11	CARBON	47K	5%	1/4W	R669	1-247-868-11	CARBON	36K	5%	1/4W
R550	1-249-437-11	CARBON	47K	5%	1/4W	R670	1-247-883-00	CARBON	150K	5%	1/4W
R551	1-249-389-11	CARBON	4.7	5%	1/4W	R671	1-247-887-00	CARBON	220K	5%	1/4W
R552	1-249-389-11	CARBON	4.7	5%	1/4W	R672	1-247-870-11	CARBON	43K	5%	1/4W
R561	1-249-409-11	CARBON	220	5%	1/4W	R673	1-247-889-00	CARBON	270K	5%	1/4W
R562	1-249-433-11	CARBON	22K	5%	1/4W	R674	1-249-436-11	CARBON	39K	5%	1/4W
R581	1-247-887-00	CARBON	220K	5%	1/4W	R675	1-249-436-11	CARBON	39K	5%	1/4W
R582	1-249-425-11	CARBON	4.7K	5%	1/4W	R676	1-249-440-11	CARBON	82K	5%	1/4W
R583	1-249-437-11	CARBON	47K	5%	1/4W	R677	1-247-885-00	CARBON	180K	5%	1/4W
R584	1-249-428-11	CARBON	8.2K	5%	1/4W	R678	1-247-868-11	CARBON	36K	5%	1/4W
R585	1-249-441-11	CARBON	100K	5%	1/4W	R679	1-249-441-11	CARBON	100K	5%	1/4W
R586	1-249-423-11	CARBON	3.3K	5%	1/4W	R681	1-247-858-11	CARBON	13K	5%	1/4W
R587	1-249-421-11	CARBON	2.2K	5%	1/4W	R682	1-247-866-11	CARBON	30K	5%	1/4W
R588	1-249-441-11	CARBON	100K	5%	1/4W	R683	1-247-858-11	CARBON	13K	5%	1/4W
R601	1-249-417-11	CARBON	1K	5%	1/4W	R684	1-249-438-11	CARBON	56K	5%	1/4W
R602	1-249-441-11	CARBON	100K	5%	1/4W	R685	1-249-435-11	CARBON	33K	5%	1/4W
R603	1-247-864-11	CARBON	24K	5%	1/4W	R686	1-247-885-00	CARBON	180K	5%	1/4W
R604	1-249-433-11	CARBON	22K	5%	1/4W	R687	1-247-864-11	CARBON	24K	5%	1/4W
R621	1-249-434-11	CARBON	27K	5%	1/4W	R688	1-247-870-11	CARBON	43K	5%	1/4W
R622	1-249-434-11	CARBON	27K	5%	1/4W	R689	1-249-435-11	CARBON	33K	5%	1/4W
R623	1-247-874-11	CARBON	62K	5%	1/4W	R690	1-249-438-11	CARBON	56K	5%	1/4W
R624	1-247-883-00	CARBON	150K	5%	1/4W	R691	1-247-866-11	CARBON	30K	5%	1/4W
R625	1-249-437-11	CARBON	47K	5%	1/4W	R692	1-247-887-00	CARBON	220K	5%	1/4W
R626	1-249-439-11	CARBON	68K	5%	1/4W	R693	1-247-862-11	CARBON	20K	5%	1/4W
R631	1-249-436-11	CARBON	39K	5%	1/4W	R694	1-247-870-11	CARBON	43K	5%	1/4W
R632	1-247-868-11	CARBON	36K	5%	1/4W	R695	1-249-429-11	CARBON	10K	5%	1/4W
R633	1-247-880-11	CARBON	110K	5%	1/4W	R696	1-249-437-11	CARBON	47K	5%	1/4W
R634	1-247-885-00	CARBON	180K	5%	1/4W	R697	1-249-435-11	CARBON	33K	5%	1/4W
R635	1-249-437-11	CARBON	47K	5%	1/4W	R698	1-247-885-00	CARBON	180K	5%	1/4W
R636	1-247-889-00	CARBON	270K	5%	1/4W	R700	△ 1-219-119-91	FUSIBLE	0.1	5%	1/4W F
R641	1-249-436-11	CARBON	39K	5%	1/4W	R701	1-249-433-11	CARBON	22K	5%	1/4W
R642	1-249-436-11	CARBON	39K	5%	1/4W	R702	1-249-421-11	CARBON	2.2K	5%	1/4W
R643	1-249-439-11	CARBON	68K	5%	1/4W	R703	1-219-154-91	FUSIBLE	0.12	10%	1/4W
R644	1-247-883-00	CARBON	150K	5%	1/4W	R704	1-219-136-11	FUSIBLE	0.22	10%	1/4W
R645	1-247-868-11	CARBON	36K	5%	1/4W	R705	1-249-422-11	CARBON	2.7K	5%	1/4W
						R706	1-249-421-11	CARBON	2.2K	5%	1/4W

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

Note:
Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
R707	1-249-421-11	CARBON	2. 2K 5% 1/4W
R708	1-249-430-11	CARBON	12K 5% 1/4W
R709	1-247-856-00	CARBON	11K 5% 1/4W
R710	1-249-436-11	CARBON	39K 5% 1/4W
R751	1-249-433-11	CARBON	22K 5% 1/4W
R752	1-249-421-11	CARBON	2. 2K 5% 1/4W
R753	1-249-421-11	CARBON	2. 2K 5% 1/4W
R754	1-249-421-11	CARBON	2. 2K 5% 1/4W
R755	1-249-421-11	CARBON	2. 2K 5% 1/4W
R756	1-249-417-11	CARBON	1K 5% 1/4W
R757	1-249-417-11	CARBON	1K 5% 1/4W
R758	1-249-417-11	CARBON	1K 5% 1/4W
R759	1-249-415-11	CARBON	680 5% 1/4W
R760	1-249-422-11	CARBON	2. 7K 5% 1/4W
R761	1-249-424-11	CARBON	3. 9K 5% 1/4W
R762	1-249-423-11	CARBON	3. 3K 5% 1/4W
R763	1-249-405-11	CARBON	100 5% 1/4W
R801	1-249-405-11	CARBON	100 5% 1/4W
R802	1-249-405-11	CARBON	100 5% 1/4W
R806	1-249-421-11	CARBON	2. 2K 5% 1/4W
R807	1-249-421-11	CARBON	2. 2K 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	1-249-421-11	CARBON	2. 2K 5% 1/4W
R811	1-249-433-11	CARBON	22K 5% 1/4W
R812	1-249-433-11	CARBON	22K 5% 1/4W
R813	1-247-903-00	CARBON	1M 5% 1/4W
R814	1-249-425-11	CARBON	4. 7K 5% 1/4W
R815	1-249-433-11	CARBON	22K 5% 1/4W
R816	1-249-433-11	CARBON	22K 5% 1/4W
R817	1-249-424-11	CARBON	3. 9K 5% 1/4W
R818	1-249-433-11	CARBON	22K 5% 1/4W
R819	1-249-433-11	CARBON	22K 5% 1/4W
R820	1-249-429-11	CARBON	10K 5% 1/4W
R821	1-249-441-11	CARBON	100K 5% 1/4W
R822	1-249-417-11	CARBON	1K 5% 1/4W
R823	1-249-437-11	CARBON	47K 5% 1/4W
R824	1-249-420-11	CARBON	1. 8K 5% 1/4W
R825	1-249-417-11	CARBON	1K 5% 1/4W
R826	1-249-429-11	CARBON	10K 5% 1/4W
R827	1-249-429-11	CARBON	10K 5% 1/4W
R828	1-249-415-11	CARBON	680 5% 1/4W
R829	△ 1-249-482-11	CARBON	4. 7 5% 1/2W F
R831	1-249-429-11	CARBON	10K 5% 1/4W
R832	1-249-433-11	CARBON	22K 5% 1/4W
R833	1-249-429-11	CARBON	10K 5% 1/4W
R834	1-249-421-11	CARBON	2. 2K 5% 1/4W
R835	1-249-429-11	CARBON	10K 5% 1/4W
R836	1-249-417-11	CARBON	1K 5% 1/4W

Ref. No.	Part No.	Description	Remark
R837	1-249-412-11	CARBON	390 5% 1/4W
R841	1-249-429-11	CARBON	10K 5% 1/4W
R842	1-249-433-11	CARBON	22K 5% 1/4W
R843	1-249-429-11	CARBON	10K 5% 1/4W
R844	1-249-421-11	CARBON	2. 2K 5% 1/4W
R845	1-249-429-11	CARBON	10K 5% 1/4W
R846	1-249-417-11	CARBON	1K 5% 1/4W
R847	1-249-412-11	CARBON	390 5% 1/4W
R851	1-247-903-00	CARBON	1M 5% 1/4W
R852	1-249-425-11	CARBON	4. 7K 5% 1/4W
R853	1-249-425-11	CARBON	4. 7K 5% 1/4W
R854	1-249-425-11	CARBON	4. 7K 5% 1/4W
R855	1-249-425-11	CARBON	4. 7K 5% 1/4W
R856	1-249-425-11	CARBON	4. 7K 5% 1/4W
R857	1-249-425-11	CARBON	4. 7K 5% 1/4W
R858	1-249-425-11	CARBON	4. 7K 5% 1/4W
R859	1-249-425-11	CARBON	4. 7K 5% 1/4W
R861	1-249-436-11	CARBON	39K 5% 1/4W
R862	1-249-436-11	CARBON	39K 5% 1/4W
R863	1-247-895-00	CARBON	470K 5% 1/4W
R864	1-247-895-00	CARBON	470K 5% 1/4W
R865	1-249-436-11	CARBON	39K 5% 1/4W
R866	1-249-436-11	CARBON	39K 5% 1/4W
R867	1-247-895-00	CARBON	470K 5% 1/4W
R868	1-247-895-00	CARBON	470K 5% 1/4W
R869	1-249-429-11	CARBON	10K 5% 1/4W
R871	1-249-433-11	CARBON	22K 5% 1/4W
R872	1-249-434-11	CARBON	27K 5% 1/4W
R873	1-249-411-11	CARBON	330 5% 1/4W
R874	1-247-830-11	CARBON	910 5% 1/4W
R875	1-249-418-11	CARBON	1. 2K 5% 1/4W
R876	1-249-417-11	CARBON	1K 5% 1/4W
R877	△ 1-249-482-11	CARBON	4. 7 5% 1/2W F
R878	1-249-421-11	CARBON	2. 2K 5% 1/4W
R879	1-249-419-11	CARBON	1. 5K 5% 1/4W
R880	1-249-417-11	CARBON	1K 5% 1/4W
R881	△ 1-249-482-11	CARBON	4. 7 5% 1/2W F
R882	1-249-433-11	CARBON	22K 5% 1/4W
R883	1-249-434-11	CARBON	27K 5% 1/4W
R884	1-249-411-11	CARBON	330 5% 1/4W
R885	1-247-830-11	CARBON	910 5% 1/4W
R886	1-249-418-11	CARBON	1. 2K 5% 1/4W
R887	△ 1-249-482-11	CARBON	4. 7 5% 1/2W F
R888	1-249-417-11	CARBON	1K 5% 1/4W
R889	1-249-419-11	CARBON	1. 5K 5% 1/4W
R890	1-249-421-11	CARBON	2. 2K 5% 1/4W
R891	1-249-417-11	CARBON	1K 5% 1/4W
R892	△ 1-249-482-11	CARBON	4. 7 5% 1/2W F
R893	1-249-433-11	CARBON	22K 5% 1/4W

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

Note:
Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

TC-WR97ES/WR870

MAIN **REEL** **PANEL**

Ref. No.	Part No.	Description	Remark
R894	1-249-393-11	CARBON	10 5% 1/4W (WR97ES:US, Canadian)
R895	1-249-429-11	CARBON	10K 5% 1/4W (WR97ES:US, Canadian)
R896	1-249-429-11	CARBON	10K 5% 1/4W (WR97ES:US, Canadian)
R897	1-249-405-11	CARBON	100 5% 1/4W (WR97ES:US, Canadian)
R898	1-249-429-11	CARBON	10K 5% 1/4W (WR97ES:US, Canadian)
R899	1-249-429-11	CARBON	10K 5% 1/4W (WR97ES:US, Canadian)

< VARIABLE RESISTOR >

RV121	1-238-601-11	RES. ADJ. CARBON	22K
RV131	1-238-600-11	RES. ADJ. CARBON	10K
RV141	1-238-601-11	RES. ADJ. CARBON	22K
RV151	1-238-600-11	RES. ADJ. CARBON	10K
RV221	1-238-601-11	RES. ADJ. CARBON	22K
RV231	1-238-600-11	RES. ADJ. CARBON	10K
RV241	1-238-601-11	RES. ADJ. CARBON	22K
RV251	1-238-600-11	RES. ADJ. CARBON	10K
RV301	1-238-600-11	RES. ADJ. CARBON	10K
RV351	1-238-600-11	RES. ADJ. CARBON	10K
RV401	1-238-600-11	RES. ADJ. CARBON	10K
RV451	1-238-600-11	RES. ADJ. CARBON	10K
RV631	1-238-602-11	RES. ADJ. CARBON	47K
RV841	1-238-602-11	RES. ADJ. CARBON	47K
RV871	1-238-600-11	RES. ADJ. CARBON	10K
RV872	1-238-599-11	RES. ADJ. CARBON	4.7K
RV881	1-238-600-11	RES. ADJ. CARBON	10K
RV882	1-238-599-11	RES. ADJ. CARBON	4.7K

< RELAY >

RY531	1-515-683-11	RELAY
RY551	1-515-683-11	RELAY

< SWITCH >

S599	1-571-083-11	SWITCH, SLIDE (MPX FILTER)	(WR870:Germany/WR97ES)
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< TRANSFORMER >

T121	1-433-382-11	TRANSFORMER, OSCILLATION
T141	1-433-382-11	TRANSFORMER, OSCILLATION
T221	1-433-382-11	TRANSFORMER, OSCILLATION
T241	1-433-382-11	TRANSFORMER, OSCILLATION
T521	1-433-336-11	TRANSFORMER, BIAS OSCILLATION
T541	1-433-336-11	TRANSFORMER, BIAS OSCILLATION

Ref. No.	Part No.	Description	Remark
		< TEST PIN >	
TP521	* 1-564-506-11	PLUG, CONNECTOR	3P
TP541	* 1-564-506-11	PLUG, CONNECTOR	3P
TP581	* 1-564-505-11	PLUG, CONNECTOR	2P
TP801	* 1-564-505-11	PLUG, CONNECTOR	2P
TP802	* 1-564-505-11	PLUG, CONNECTOR	2P
TP803	* 1-564-505-11	PLUG, CONNECTOR	2P

< CERAMIC >

X801	1-577-358-21	VIBRATOR, CERAMIC	(4.0MHz)
X802	1-577-358-21	VIBRATOR, CERAMIC	(4.0MHz)

* 1-632-741-11 REEL MOTOR BOARD

< CAPACITOR >

C1051	1-124-907-11	ELECT	10uF	20%	50V
C1052	1-124-907-11	ELECT	10uF	20%	50V
C1053	1-164-159-11	CERAMIC	0.1uF		50V

< CONNECTOR >

CN1051	1-564-501-11	PIN, CONNECTOR	8P
CN1052	* 1-564-720-11	PIN, CONNECTOR (SMALL TYPE)	4P
CN1053	* 1-564-718-11	PIN, CONNECTOR (SMALL TYPE)	2P

< RESISTOR >

R1051	1-249-414-11	CARBON	560	5%	1/4W
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* A-2006-395-A PANEL BOARD, COMPLETE (WR870: UK)

* A-2006-534-A PANEL BOARD, COMPLETE

(WR97ES: US, Canadian)

* A-2006-546-A PANEL BOARD, COMPLETE

(WR870: Germany/WR97ES: E)

* A-2006-615-A PANEL BOARD, COMPLETE

(WR870: AEP)

* 3-362-478-01 HOLDER (T), LED
3-365-420-01 HOLDER, FL TUBE
9-911-844-XX CUSHION

< CAPACITOR >

C71	1-124-126-00	ELECT	47uF	20%	10V
C72	1-124-126-00	ELECT	47uF	20%	10V
C73	1-124-126-00	ELECT	47uF	20%	10V
C74	1-124-126-00	ELECT	47uF	20%	10V
C75	1-124-903-11	ELECT	1uF	20%	50V

C171	1-126-157-11	ELECT	10uF	20%	16V
C172	1-162-288-31	CERAMIC	330PF	10%	50V
C271	1-126-157-11	ELECT	10uF	20%	16V
C272	1-162-288-31	CERAMIC	330PF	10%	50V
C371	1-124-927-11	ELECT	4.7uF	20%	100V

Ref. No.	Part No.	Description	Remark		
C372	1-124-927-11	ELECT	4.7uF	20%	100V
C373	1-161-375-00	CERAMIC	0.0022uF	20%	50V
C375	1-124-927-11	ELECT	4.7uF	20%	100V
C376	1-136-171-00	FILM	0.33uF	5%	50V
C377	1-136-174-00	FILM	0.56uF	5%	50V
C378	1-130-475-00	MYLAR	0.0022uF	5%	50V
C379	1-130-475-00	MYLAR	0.0022uF	5%	50V
C380	1-124-768-11	ELECT	4.7uF	20%	50V
C381	1-124-927-11	ELECT	4.7uF	20%	100V
C382	1-136-171-00	FILM	0.33uF	5%	50V
C383	1-136-174-00	FILM	0.56uF	5%	50V
C384	1-130-475-00	MYLAR	0.0022uF	5%	50V
C385	1-130-475-00	MYLAR	0.0022uF	5%	50V
C386	1-124-768-11	ELECT	4.7uF	20%	50V
C471	1-124-927-11	ELECT	4.7uF	20%	100V
C472	1-124-927-11	ELECT	4.7uF	20%	100V
C473	1-161-375-00	CERAMIC	0.0022uF	20%	50V
C475	1-124-927-11	ELECT	4.7uF	20%	100V
C476	1-136-171-00	FILM	0.33uF	5%	50V
C477	1-136-174-00	FILM	0.56uF	5%	50V
C478	1-130-475-00	MYLAR	0.0022uF	5%	50V
C479	1-130-475-00	MYLAR	0.0022uF	5%	50V
C480	1-124-768-11	ELECT	4.7uF	20%	50V
C481	1-124-927-11	ELECT	4.7uF	20%	100V
C482	1-136-171-00	FILM	0.33uF	5%	50V
C483	1-136-174-00	FILM	0.56uF	5%	50V
C484	1-130-475-00	MYLAR	0.0022uF	5%	50V
C485	1-130-475-00	MYLAR	0.0022uF	5%	50V
C486	1-124-768-11	ELECT	4.7uF	20%	50V
C571	1-126-157-11	ELECT	10uF	20%	16V
C572	1-126-157-11	ELECT	10uF	20%	16V
C573	1-161-494-00	CERAMIC	0.022uF		25V
C808	1-164-159-11	CERAMIC	0.1uF		50V
C809	1-164-159-11	CERAMIC	0.1uF		50V
C810	1-124-927-11	ELECT	4.7uF	20%	100V
C899	1-164-159-11	CERAMIC	0.1uF		50V
C901	1-161-494-00	CERAMIC	0.022uF		25V
C902	1-164-159-11	CERAMIC	0.1uF		50V
C903	1-124-443-00	ELECT	100uF	20%	10V
C904	1-162-294-31	CERAMIC	0.001uF	10%	50V
C999	1-164-159-11	CERAMIC	0.1uF		50V (WR97ES:US, Canadian)
< CONNECTOR >					
CN71	* 1-563-664-11	CONNECTOR 13P			
CN72	* 1-563-664-11	CONNECTOR 13P			
CN73	* 1-564-708-11	PIN, CONNECTOR (SMALL TYPE) 6P			
CN74	* 1-564-705-11	PIN, CONNECTOR (SMALL TYPE) 3P			
CN75	* 1-564-336-00	PIN, CONNECTOR 2P (WR870:Germany/WR97ES)			

Ref. No.	Part No.	Description	Remark		
CN76	* 1-564-722-11	PIN, CONNECTOR (SMALL TYPE) 6P			
CN563	* 1-564-705-11	PIN, CONNECTOR (SMALL TYPE) 3P			
CN572	* 1-564-721-11	PIN, CONNECTOR (SMALL TYPE) 5P			
< DIODE >					
D71	8-719-912-20	DIODE 1SS120			
D72	8-719-912-20	DIODE 1SS120			
D73	8-719-933-54	DIODE HZS9A2L			
D74	8-719-912-20	DIODE 1SS120			
D75	8-719-912-20	DIODE 1SS120			
D76	8-719-933-54	DIODE HZS9A2L			
D901	8-719-301-39	DIODE SEL2210S-D			
< FLUORESCENT INDICATOR >					
FL901	1-519-594-11	INDICATOR TUBE, FLUORESCENT			
< IC >					
IC71	8-759-634-51	IC M5218AP			
IC72	8-752-035-94	IC CXA1331S			
IC73	8-752-035-94	IC CXA1331S			
IC74	8-759-000-49	IC MC14066BCP			
IC75	8-759-000-49	IC MC14066BCP			
IC76	8-759-000-49	IC MC14066BCP			
IC507	8-759-634-50	IC M5218AL			
IC901	8-759-323-40	IC HD614023SA85			
IC902	8-741-100-48	IC SBX1610-59			
< JACK >					
J501	1-507-796-71	JACK (PHONES)			
< FILTER >					
LPF371	1-236-147-11	FILTER, LOW PASS			
LPF471	1-236-147-11	FILTER, LOW PASS			
< TRANSISTOR >					
Q71	8-729-900-65	TRANSISTOR DTA144ES			
Q72	8-729-900-65	TRANSISTOR DTA144ES			
Q73	8-729-900-65	TRANSISTOR DTA144ES			
Q74	8-729-900-80	TRANSISTOR DTC114ES			
Q75	8-729-900-65	TRANSISTOR DTA144ES			
Q76	8-729-900-65	TRANSISTOR DTA144ES			
Q77	8-729-900-80	TRANSISTOR DTC114ES			
Q78	8-729-900-65	TRANSISTOR DTA144ES			
Q79	8-729-900-89	TRANSISTOR DTC144ES			
Q80	8-729-900-65	TRANSISTOR DTA144ES			
Q81	8-729-900-89	TRANSISTOR DTC144ES			
Q82	8-729-900-65	TRANSISTOR DTA144ES			
Q83	8-729-900-89	TRANSISTOR DTC144ES			

PANEL

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
Q371	8-729-900-80	TRANSISTOR DTC114ES				R474	1-249-432-11	CARBON	18K	5%	1/4W
Q471	8-729-900-80	TRANSISTOR DTC114ES				R475	1-249-423-11	CARBON	3.3K	5%	1/4W
Q901	8-729-900-61	TRANSISTOR DTA114ES				R476	1-249-441-11	CARBON	100K	5%	1/4W
Q902	8-729-900-61	TRANSISTOR DTA114ES				R477	1-249-429-11	CARBON	10K	5%	1/4W
Q903	8-729-620-05	TRANSISTOR 2SC2603-EF				R479	1-249-441-11	CARBON	100K	5%	1/4W
< RESISTOR >											
R71	1-249-425-11	CARBON	4.7K	5%	1/4W	R481	1-249-414-11	CARBON	560	5%	1/4W
R72	1-215-455-00	METAL	27K	1%	1/6W	R482	1-247-864-11	CARBON	24K	5%	1/4W
R73	1-249-417-11	CARBON	1K	5%	1/4W	R483	1-249-441-11	CARBON	100K	5%	1/4W
R74	1-215-455-00	METAL	27K	1%	1/6W	R484	1-249-414-11	CARBON	560	5%	1/4W
R75	1-249-417-11	CARBON	1K	5%	1/4W	R485	1-247-864-11	CARBON	24K	5%	1/4W
R76	1-249-433-11	CARBON	22K	5%	1/4W	R486	1-249-441-11	CARBON	100K	5%	1/4W
R77	1-249-429-11	CARBON	10K	5%	1/4W	R491	1-247-878-00	CARBON	91K	5%	1/4W
R78	1-249-433-11	CARBON	22K	5%	1/4W	R545	1-247-842-11	CARBON	3K	5%	1/4W
R79	1-249-433-11	CARBON	22K	5%	1/4W	R830	1-249-410-11	CARBON	270	5%	1/4W
R80	1-249-429-11	CARBON	10K	5%	1/4W	R901	1-249-411-11	CARBON	330	5%	1/4W
R81	1-249-433-11	CARBON	22K	5%	1/4W	R902	1-249-433-11	CARBON	22K	5%	1/4W
R82	1-249-435-11	CARBON	33K	5%	1/4W	R903	1-249-433-11	CARBON	22K	5%	1/4W
R83	1-249-435-11	CARBON	33K	5%	1/4W	R904	1-249-417-11	CARBON	1K	5%	1/4W
R84	1-249-435-11	CARBON	33K	5%	1/4W	R905	1-247-903-00	CARBON	1M	5%	1/4W
R001	1-249-673-11	CARBON	1K	5%	1/2W	R906	1-249-441-11	CARBON	100K	5%	1/4W
R002	1-249-673-11	CARBON	1K	5%	1/2W	R907	1-249-441-11	CARBON	100K	5%	1/4W
R171	1-249-432-11	CARBON	18K	5%	1/4W	R908	1-249-441-11	CARBON	100K	5%	1/4W
R172	1-249-421-11	CARBON	2.2K	5%	1/4W	R951	1-249-407-11	CARBON	150	5%	1/4W
R173	1-249-432-11	CARBON	18K	5%	1/4W	R952	1-249-409-11	CARBON	220	5%	1/4W
R174	1-249-409-11	CARBON	220	5%	1/4W	R953	1-249-411-11	CARBON	330	5%	1/4W
R271	1-249-432-11	CARBON	18K	5%	1/4W	R954	1-249-421-11	CARBON	2.2K	5%	1/4W
R272	1-249-421-11	CARBON	2.2K	5%	1/4W	R955	1-249-420-11	CARBON	1.8K	5%	1/4W
R273	1-249-432-11	CARBON	18K	5%	1/4W	R961	1-249-407-11	CARBON	150	5%	1/4W
R274	1-249-409-11	CARBON	220	5%	1/4W	R962	1-249-422-11	CARBON	2.7K	5%	1/4W
R372	1-249-441-11	CARBON	100K	5%	1/4W	R963	1-249-420-11	CARBON	1.8K	5%	1/4W
R373	1-249-435-11	CARBON	33K	5%	1/4W	R971	1-249-407-11	CARBON	150	5%	1/4W
R374	1-249-432-11	CARBON	18K	5%	1/4W	R972	1-249-409-11	CARBON	220	5%	1/4W
R375	1-249-423-11	CARBON	3.3K	5%	1/4W	R973	1-249-411-11	CARBON	330	5%	1/4W
R376	1-249-441-11	CARBON	100K	5%	1/4W	R974	1-249-413-11	CARBON	470	5%	1/4W
R377	1-249-429-11	CARBON	10K	5%	1/4W	R975	1-249-415-11	CARBON	680	5%	1/4W
R379	1-249-441-11	CARBON	100K	5%	1/4W	R976	1-249-417-11	CARBON	1K	5%	1/4W
R381	1-249-414-11	CARBON	560	5%	1/4W	R977	1-249-420-11	CARBON	1.8K	5%	1/4W
R382	1-247-864-11	CARBON	24K	5%	1/4W	R978	1-249-424-11	CARBON	3.9K	5%	1/4W
R383	1-249-441-11	CARBON	100K	5%	1/4W	R981	1-249-407-11	CARBON	150	5%	1/4W
R384	1-249-414-11	CARBON	560	5%	1/4W	R982	1-249-409-11	CARBON	220	5%	1/4W
R385	1-247-864-11	CARBON	24K	5%	1/4W	R983	1-249-411-11	CARBON	330	5%	1/4W
R386	1-249-441-11	CARBON	100K	5%	1/4W	R984	1-249-413-11	CARBON	470	5%	1/4W
R391	1-247-878-00	CARBON	91K	5%	1/4W	R985	1-249-415-11	CARBON	680	5%	1/4W
R472	1-249-441-11	CARBON	100K	5%	1/4W	R986	1-249-417-11	CARBON	1K	5%	1/4W
R473	1-249-435-11	CARBON	33K	5%	1/4W	R987	1-249-420-11	CARBON	1.8K	5%	1/4W
						R988	1-249-424-11	CARBON	3.9K	5%	1/4W
						R991	1-249-407-11	CARBON	150	5%	1/4W
						R992	1-249-409-11	CARBON	220	5%	1/4W
						R993	1-249-411-11	CARBON	330	5%	1/4W

PANEL

Ref. No.	Part No.	Description	Remark
R994	1-249-413-11	CARBON 470 5% 1/4W	
R995	1-249-415-11	CARBON 680 5% 1/4W	
R996	1-249-417-11	CARBON 1K 5% 1/4W	
R997	1-249-420-11	CARBON 1.8K 5% 1/4W	
R998	1-249-424-11	CARBON 3.9K 5% 1/4W	

< VARIABLE RESISTOR >

RV71	1-241-496-11	RES. VAR. CARBON 20K/20K	
RV541	1-238-952-11	RES. VAR. CARBON 5K (BIAS DECK-B)	
RV561	1-238-908-11	RES. VAR. CARBON 20K/50K/50K (REC LEVEL)	
RV562	1-238-953-11	RES. VAR. CARBON 50K/50K (BALANCE)	
RV571	1-238-085-11	REA. VAR. CARBON 20K/20K (PHONES LEVEL)	

< SWITCH >

S901	1-554-118-00	SWITCH, PUSH (1 KEY) (POWER)	
S951	1-554-303-21	SWITCH, TACTILE (BLANK SKIP)	
S952	1-554-303-21	SWITCH, TACTILE (AUTO PAUSE)	
S953	1-554-303-21	SWITCH, TACTILE (AUTO REC LEVEL)	
S954	1-554-303-21	SWITCH, TACTILE (FADER)	
S955	1-571-520-11	SWITCH, SLIDE (DOLBY NR DECK-B)	
S961	1-571-520-11	SWITCH, SLIDE (TIMER)	
S962	1-571-520-11	SWITCH, SLIDE (DOLBY NR DECK-A)	
S971	1-554-303-21	SWITCH, TACTILE (A+B REC)	
S972	1-554-303-21	SWITCH, TACTILE (HIGH SPEED DUBBING)	
S973	1-554-303-21	SWITCH, TACTILE (NORM SPEED DUBBING)	
S974	1-554-303-21	SWITCH, TACTILE (COUNTER RESET DECK-A)	
S975	1-554-303-21	SWITCH, TACTILE (COUNTER MEMORY DECK-A)	
S976	1-554-303-21	SWITCH, TACTILE (COUNTER RESET DECK-B)	
S977	1-554-303-21	SWITCH, TACTILE (COUNTER MEMORY DECK-B)	
S978	1-571-520-11	SWITCH, SLIDE (DIR MODE)	
S981	1-554-303-21	SWITCH, TACTILE (DECK-A:OPEN/CLOSE)	
S982	1-554-303-21	SWITCH, TACTILE (DECK-A:STOP)	
S983	1-554-303-21	SWITCH, TACTILE (DECK-A:FWD)	
S984	1-554-303-21	SWITCH, TACTILE (DECK-A:REV)	
S985	1-554-303-21	SWITCH, TACTILE (DECK-A:PAUSE)	
S986	1-554-303-21	SWITCH, TACTILE (DECK-A:REC MUTE)	
S987	1-554-303-21	SWITCH, TACTILE (DECK-B:REW)	
S988	1-554-303-21	SWITCH, TACTILE (DECK-B:FF)	
S989	1-554-303-21	SWITCH, TACTILE (DECK-B:REC)	
S991	1-554-303-21	SWITCH, TACTILE (DECK-B:OPEN/CLOSE)	
S992	1-554-303-21	SWITCH, TACTILE (DECK-B:STOP)	
S993	1-554-303-21	SWITCH, TACTILE (DECK-B:FWD)	
S994	1-554-303-21	SWITCH, TACTILE (DECK-B:REV)	
S995	1-554-303-21	SWITCH, TACTILE (DECK-B:PAUSE)	
S996	1-554-303-21	SWITCH, TACTILE (DECK-B:REC MUTE)	
S997	1-554-303-21	SWITCH, TACTILE (DECK-A:REW)	
S998	1-554-303-21	SWITCH, TACTILE (DECK-A:FF)	
S999	1-554-303-21	SWITCH, TACTILE (DECK-A:REC)	

Ref. No.	Part No.	Description	Remark
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< CERAMIC >

X901	1-577-359-21	VIBRATOR, CERAMIC (4.19MHZ)	
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MISCELLANEOUS

58	△	1-555-465-00	CORD, POWER (WR97ES:US, Canadian)
59	△	1-569-007-11	ADAPTOR, CONVERSION 2P (WR97ES:E)
CWJ1		1-558-350-21	CORD (WITH CONNECTOR)
D1051		8-719-980-85	DIODE SLF-325C
D1091		8-719-950-74	DIODE SLR-314D-B
M1051		X-3356-638-1	MOTOR (REEL R) ASSY
M1052		X-3356-604-1	MOTOR (ASSIST) ASSY
M1053		X-3356-605-1	MOTOR (CAPSTAN R) ASSY
Q1091		8-729-809-43	SPS-314B-BE
S1001		1-466-525-11	ENCODER, ROTARY
T1	△	1-450-444-11	TRANSFORMER, POWER (WR97ES:US, Canadian)
T1	△	1-450-445-11	TRANSFORMER, POWER (WR97ES:E)
T1	△	1-450-446-11	TRANSFORMER, POWER (WR870)
VS1	△	1-570-307-11	SWITCH, VOLTAGE CHANGE

ACCESSORY & PACKING MATERIAL

1-465-369-11	COMMANDER, REMOTE (RM-J902)	(WR870/WR97ES:E)
1-559-533-11	CORD, CONNECTION	
2-181-754-01	COVER, BATTERY (FOR RM-J902)	(WR870/WR97ES:E)
* 3-354-915-01	CUSHION	
* 3-354-919-21	INDIVIDUAL CARTON	
3-677-503-00	SHEET (LARGE), PROTECTION	(WR97ES:US, Canadian)
3-703-450-01	INSTRUCTION	
3-704-366-01	SCREW (CASE) (M3X8)	
3-753-074-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE)	(WR870:AEP, UK)
3-753-074-21	MANUAL, INSTRUCTION (ENGLISH)	(WR97ES:US)
3-753-074-31	MANUAL, INSTRUCTION (ENGLISH, FRENCH)	(WR97ES:Canadian)
3-753-074-41	MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, ITALIAN)	(WR870:AEP/Germany)
3-753-074-51	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, CHINESE)	(WR97ES:E)

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

Note:
Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
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HARDWARE LIST

# 1	7-682-547-04	SCREW +BVTT 3X6 (S)	
# 2	7-682-548-04	SCREW +BVTT 3X8 (S)	
# 3	7-685-645-79	SCREW +BVTP 3X6 TYPE 2 IT-3	
# 4	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3	
# 5	7-621-849-00	SCREW (BV/RING)	
# 6	7-621-770-67	SCREW +BVTT 2.6X6 (S)	
# 7	7-685-131-19	SCREW +BTP 2.6X4 TYPE2 N-S	
# 8	7-685-133-19	SCREW +BTP 2.6X6 TYPE2 N-S	
# 9	7-621-255-20	SCREW +BVTT 2X4 (S)	
#10	7-621-255-35	SCREW +BVTT 2X5 (S)	
#11	7-621-283-00	SCREW +BVTT 2X5 (S)	
#12	7-685-534-19	SCREW +BTP 2.6X8 (E)	
#13	7-685-870-01	SCREW +BVTT 3X5 (S)	
#14	7-621-775-10	SCREW +B 2.6X4	