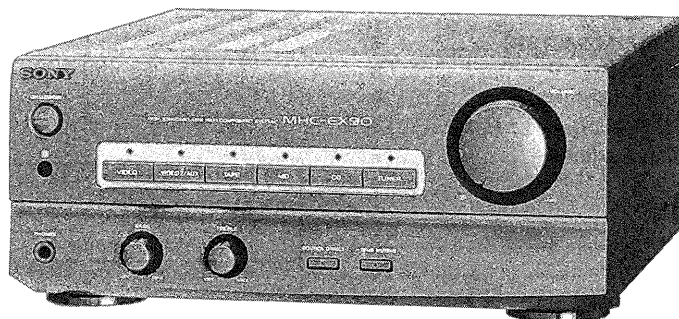


# TA-EX50/EX90

## SERVICE MANUAL

AEP Model  
UK Model  
TA-EX50/EX90  
E Model  
TA-EX50



TA-EX50/EX90 is the amplifier section  
in MHC-EX50, MHC-EX90.

Photo : TA-EX90

### SPECIFICATIONS

DIN power output 45 W + 45 W (6 ohms,  
at 1 kHz, DIN)  
(EX50: AEP, UK, G, IT,  
CIS models)  
50 W + 50 W (6 ohms,  
at 1 kHz, DIN) (EX90)

Continuous RMS power output  
55 W + 55 W (6 ohms,  
at 1 kHz, 10% THD)  
(EX50: AEP, UK, G, IT,  
CIS models)  
50 W + 50 W (6 ohms,  
at 1 kHz, 5% THD)  
(EX50: EXCEPT AEP,  
UK, G, IT, CIS models)  
65 W + 65 W (6 ohms,  
at 1 kHz, 10% THD)  
(EX90)

Music power output  
95 W + 95 W (6 ohms,  
at 1 kHz, 10% THD)  
(EX50: AEP, UK, G, IT,  
CIS models)  
120 W + 120 W (6 ohms,  
at 1 kHz, 10% THD)  
(EX90)

Input	Jack type	Sensitivity	Impedance
CD	Phono	450 mV	47 kilohms
MD	Phono	450 mV	47 kilohms
TUNER	Phono	250 mV	47 kilohms
VIDEO1	Phono	250 mV	47 kilohms
VIDEO2/ AUX	Phono	250 mV	47 kilohms
TAPE	Phono	250 mV	47 kilohms

Output	Jack type	Voltage	Impedance
MD	Phono	250 mV	1 kilohm
VIDEO1	Phono	250 mV	1 kilohm
TAPE	Phono	250 mV	1 kilohm
PHONES	Stereo phone	—	Accepts headphones of 8 ohms or more

Dimensions  
Approx. 280 x 122.5 x 290 mm  
(11 1/8 x 4 7/8 x 11 1/2 in) (w/h/d)  
incl. projecting parts and controls

Mass  
Approx. 5.3 kg  
(11 lb 10 oz)

#### General

##### Power requirements

220 – 230 V AC,  
50/60 Hz (EX50: AEP,  
UK, G, IT, CIS, EX90  
models)

220 V AC, 50/60 Hz  
(EX50: TH)

110 – 120 V or  
220 – 240 V AC,  
50/60 Hz

Adjustable with the  
voltage selector

(EX50: EXCEPT AEP, UK,  
G, IT, CIS, TH models)

##### Power consumption

135 W (system)

(EX50: AEP, UK, G, IT,  
CIS models)

145 W (system)

(EX50: EXCEPT AEP,  
UK, G, IT, CIS models)

155 W (active speaker  
not included) (EX90)

Design and specifications are subject to  
change without notice.

##### • Abbreviation

G : German model.  
IT : Italian model.  
TH : Thailand model.

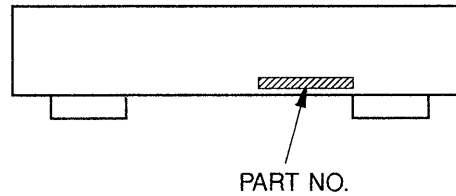
INTEGRATED STEREO AMPLIFIER  
**SONY**<sup>®</sup>

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## MODEL IDENTIFICATION

— BACK PANEL —



MODEL	PARTS No.
EX50 : E model	4-978-966-0□
Malaysia model	
Singapore model	
Hong Kong model	4-978-966-1□
Saudi Arabia model	4-978-966-3□
Thailand model	4-978-966-4□
AEP model	4-978-969-0□
German model	4-978-969-1□
Italian model	4-978-969-2□
UK model	4-978-969-3□
CIS model	4-978-969-5□
EX90 : AEP model	4-978-974-0□
Italian model	4-978-974-2□
UK model	4-978-974-3□

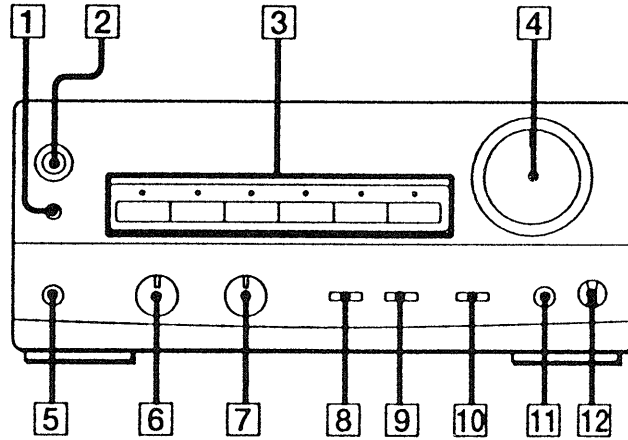
### SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK  $\triangle$  OR DOTTED LINE WITH MARK  $\triangle$  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.

### Identifying the Parts

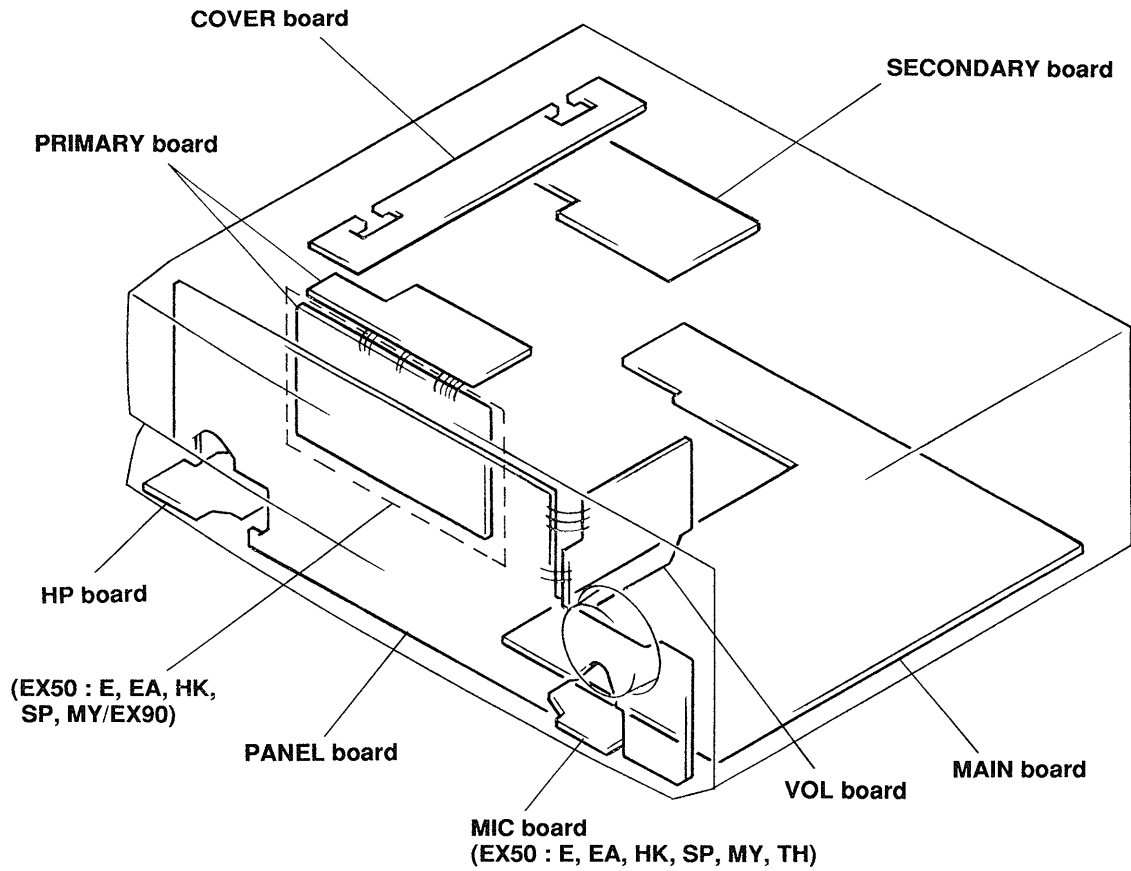


- 1 Remote sensor
- 2 SYSTEM POWER switch and ON/STANDBY indicator (7)  
The indicator remains lit as long as the AC power cord is connected to a wall outlet.
- 3 Function buttons\* (17, 21, 22)  
VIDEO 1 (22)  
VIDEO 2/AUX (22)  
TAPE  
MD  
CD (13, 17, 21)  
TUNER (17)
- 4 VOLUME control (5, 7, 18, 19)
- 5 PHONES jack (18, 22)
- 6 BASS control (18)
- 7 TREBLE control (18)
- 8 SOURCE DIRECT button\* (18)
- 9 MUTING button\* (18)
- 10 KARAOKE PON button\* (21)  
(EX50: E, EA, HK, SP, MY, TH models)
- 11 MIX MIC jack (phone jack) (21, 22)  
(EX50: E, EA, HK, SP, MY, TH models)
- 12 MIC LEVEL control (21)  
(EX50: E, EA, HK, SP, MY, TH models)

- Abbreviation  
EA : Saudi Arabia model.  
HK : Hong Kong model.  
SP : Singapore model.  
MY : Malaysia model.  
TH : Thailand model.

## SECTION 2 DIAGRAMS

### 2-1. CIRCUIT BOARDS LOCATION



- Abbreviation
  - EA : Saudi Arabia model.
  - HK : Hong Kong model.
  - SP : Singapore model.
  - MY : Malaysia model.
  - TH : Thailand model.

## 2-2. IC PIN FUNCTION


### • IC101 SYSTEM CONTROL (M37471M2-461SP)

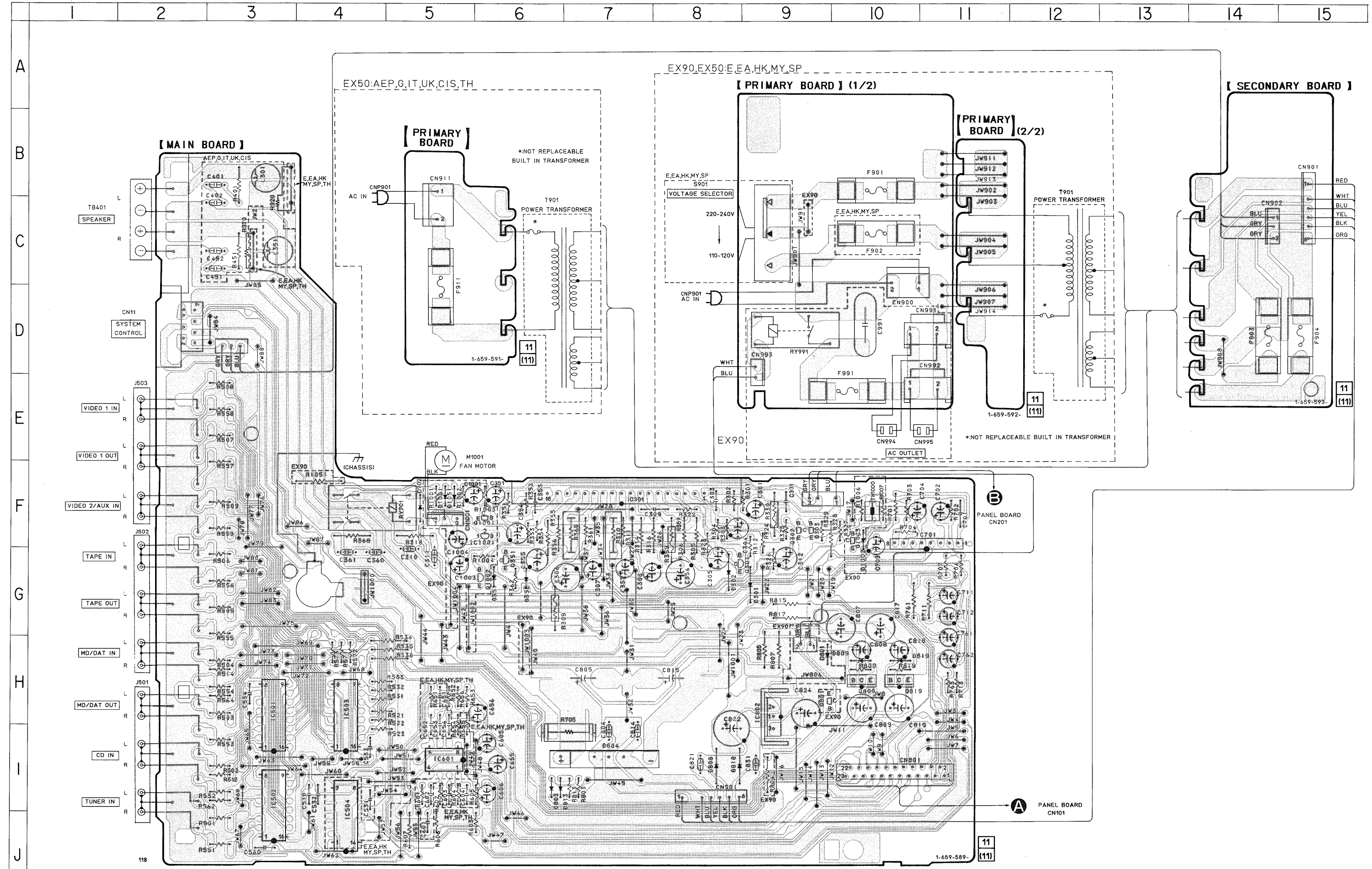
Pin No.	Pin Name	I/O	Function
1	—	—	} Not used. (Ground)
2	—	—	
3	—	—	
4	—	—	
5	POWER RELAY	O	Power relay control output.
6	LINE MUTE 2	O	Pre amp mute output.
7	LINE MUTE 1	O	Line mute output.
8	VOL UP	O	Volume up control output.
9	VOL DOWN	O	Volume down control output.
10	K-PON	O	KARAOKE PON control output.
11	—	—	} Not used. (Ground)
12	—	—	
13	—	—	
14	—	—	
15	MIC IN	I	Microphone detect input. (not used: +5V)
16	KEY 1	I	} Key input. (analog)
17	KEY 0	I	
18	VREF	—	Reference voltage input (+5V).
19	XIN	I	System clock input (8 MHz).
20	XOUT	O	System clock output (8 MHz).
21	Vss	—	Ground
22	Vcc	—	Power supply (+5V).
23	MODEL	I	Destination identification input.
24	—	—	Not used. (Ground)
25	RESET	I	Reset signal input.
26	—	—	Not used. (Ground)
27	AU BUS IN	I	Audio bus signal input.
28	SIRCS IN	I	SIRCS signal input.
29	—	—	Not used. (Ground)
30	AU BUS OUT	O	Audio bus signal output.
31	AFUNC 0	O	} Function control output.
32	AFUNC 1	O	
33	AFUNC 2	O	
34	VIDEO 1	O	} Function LED control output.
35	VIDEO 2	O	
36	TAPE	O	
37	MD	O	
38	CD	O	
39	TUNER	O	
40	-20 dB MUTE	O	-20 dB muting control output.
41	SOURCE DIRECT	O	SOURCE DIRECT control output.
42	—	—	Not used. (Ground)

2-3. PRINTED WIRING BOARD — MAIN SECTION —  
 • See page 4 for Circuit Boards Location.

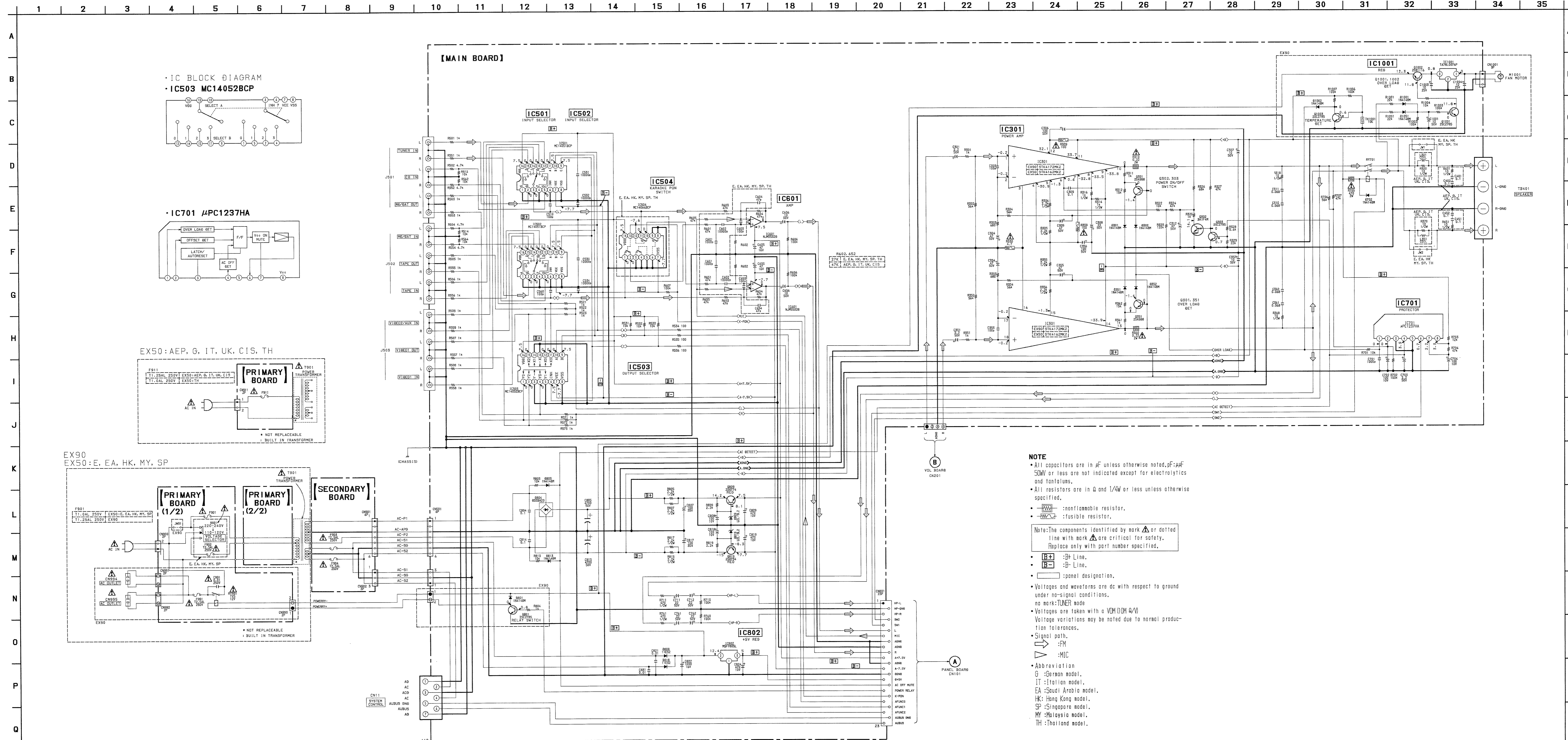
• Semiconductor Location

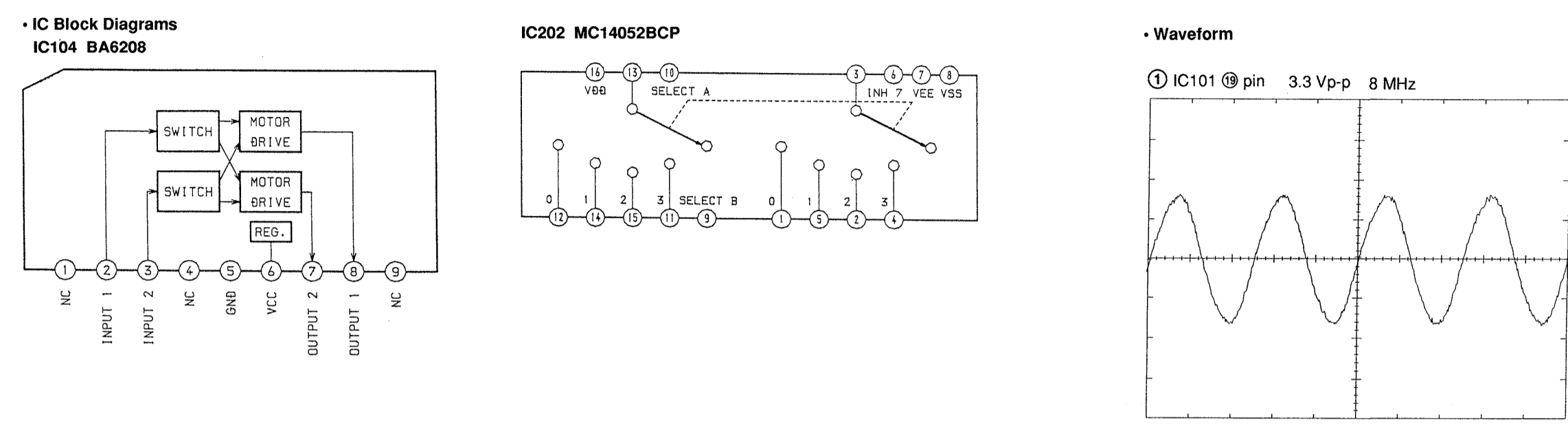
Ref. No.	Location
D301	G-9
D302	G-8
D351	G-6
D352	G-6
D702	F-5
D801	H-9
D803	I-6
D804	I-7
D808	I-8
D809	H-10
D813	I-6
D818	I-8
D819	H-10
D1001	F-5
D1002	F-10
D1051	F-5
IC301	F-7
IC501	H-3
IC502	I-3
IC503	H-4
IC504	I-4
IC601	I-5
IC701	F-11
IC802	H-9
IC1001	F-6
Q301	G-8
Q302	F-9
Q303	F-9
Q351	G-6
Q801	H-9
Q809	H-10
Q819	H-10
Q1001	F-6
Q1002	G-6
Q1003	F-10

Note:  
 •  : Pattern from the side which enable seeing.  
 • Abbreviation  
 G : German model.  
 IT : Italian model.  
 EA : Saudi Arabia model.  
 HK : Hong Kong model.  
 SP : Singapore model.  
 MY : Malaysia model.  
 TH : Thailand model.

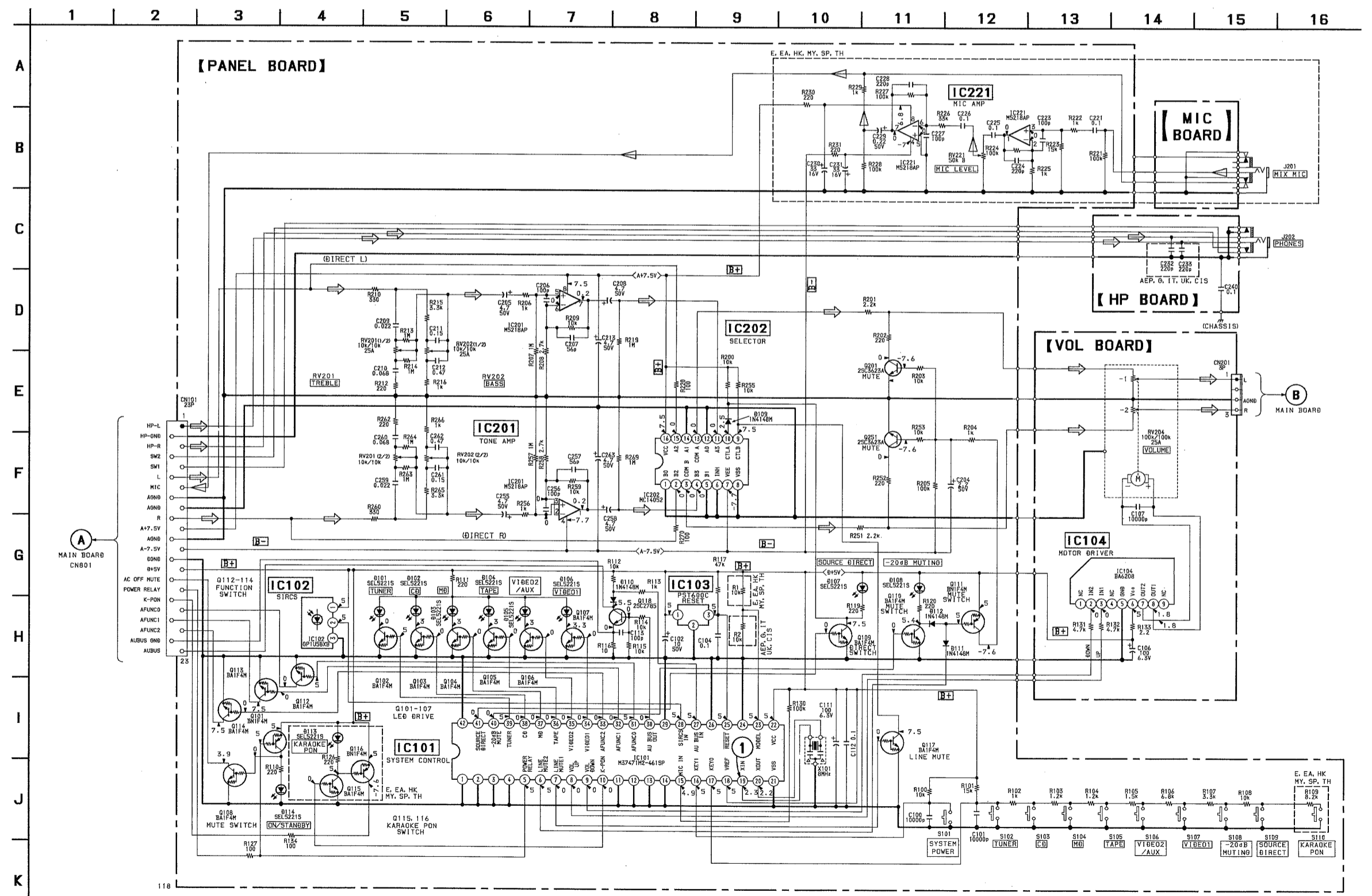


2-4. SCHEMATIC DIAGRAM — MAIN SECTION —





2-5. SCHEMATIC DIAGRAM — PANEL SECTION —  
• See page 5 for IC Pin Function. (IC101)

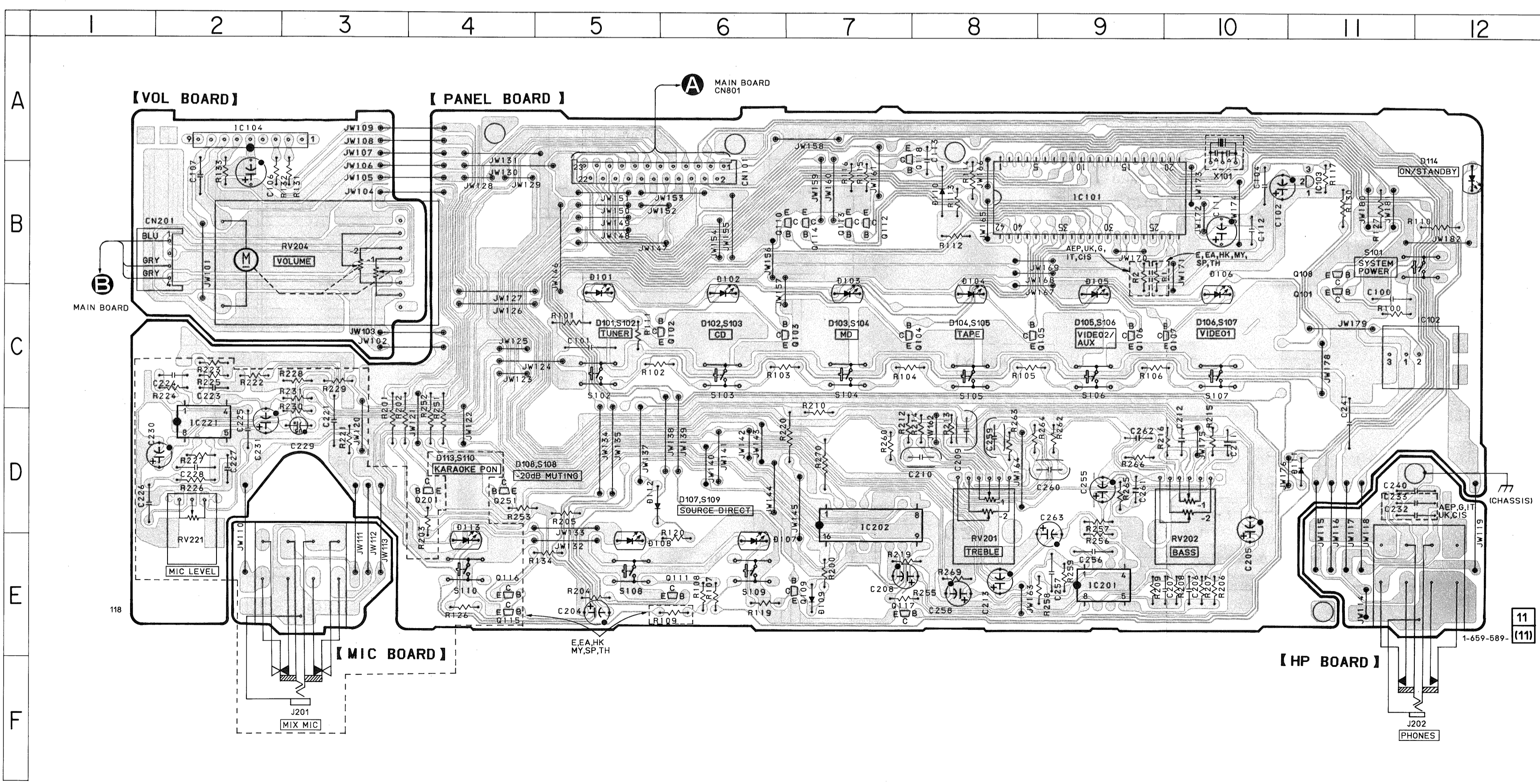


**NOTE**

- All capacitors are in  $\mu\text{F}$  unless otherwise noted,  $\text{pF} = \text{pF}$ .  $50\text{W}$  or less are not indicated except for electrolytics and tantalums.
- All resistors are in  $\Omega$  and  $1/\text{W}$  or less unless otherwise specified.
- Panel designation.
- Voltages and waveforms are dc with respect to ground under no-signal conditions, no mark: TUNER mode.
- Voltages are taken with a VOM (10M $\Omega$ /V). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
- FM
- MIC

Abbreviation  
 G : German model.  
 IT : Italian model.  
 EA : Saudi Arabia model.  
 HK : Hong Kong model.  
 SP : Singapore model.  
 MY : Malaysia model.  
 TH : Thailand model.

2-6. PRINTED WIRING BOARD — PANEL SECTION —  
• See page 4 for Circuit Boards Location.



• Semiconductor Location

Ref. No.	Location
D101	C-5
D102	C-6
D103	C-7
D104	C-8
D105	C-9
D106	C-10
D107	E-6
D108	E-5
D109	E-7
D110	B-8
D111	D-11
D112	D-5
D113	E-4
D114	B-12
IC101	B-9
IC102	C-12
IC103	B-11
IC104	A-2
IC201	E-9
IC202	D-7
IC221	D-2
Q101	C-11
Q102	C-6
Q103	C-7
Q104	C-7
Q105	C-8
Q106	C-9
Q107	C-10
Q108	B-11
Q109	E-7
Q110	B-7
Q111	E-6
Q112	B-7
Q113	B-7
Q114	B-7
Q115	E-4
Q116	E-4
Q117	E-7
Q118	A-7
Q201	D-4
Q251	D-4

**Note:**

- △ : internal component.
- : Pattern from the side which enable seeing.
- Abbreviation
- G : German model.
- IT : Italian model.
- EA : Saudi Arabia model.
- HK : Hong Kong model.
- SP : Singapore model.
- MY : Malaysia model.
- TH : Thailand model.



## SECTION 3 EXPLODED VIEWS

**NOTE:**

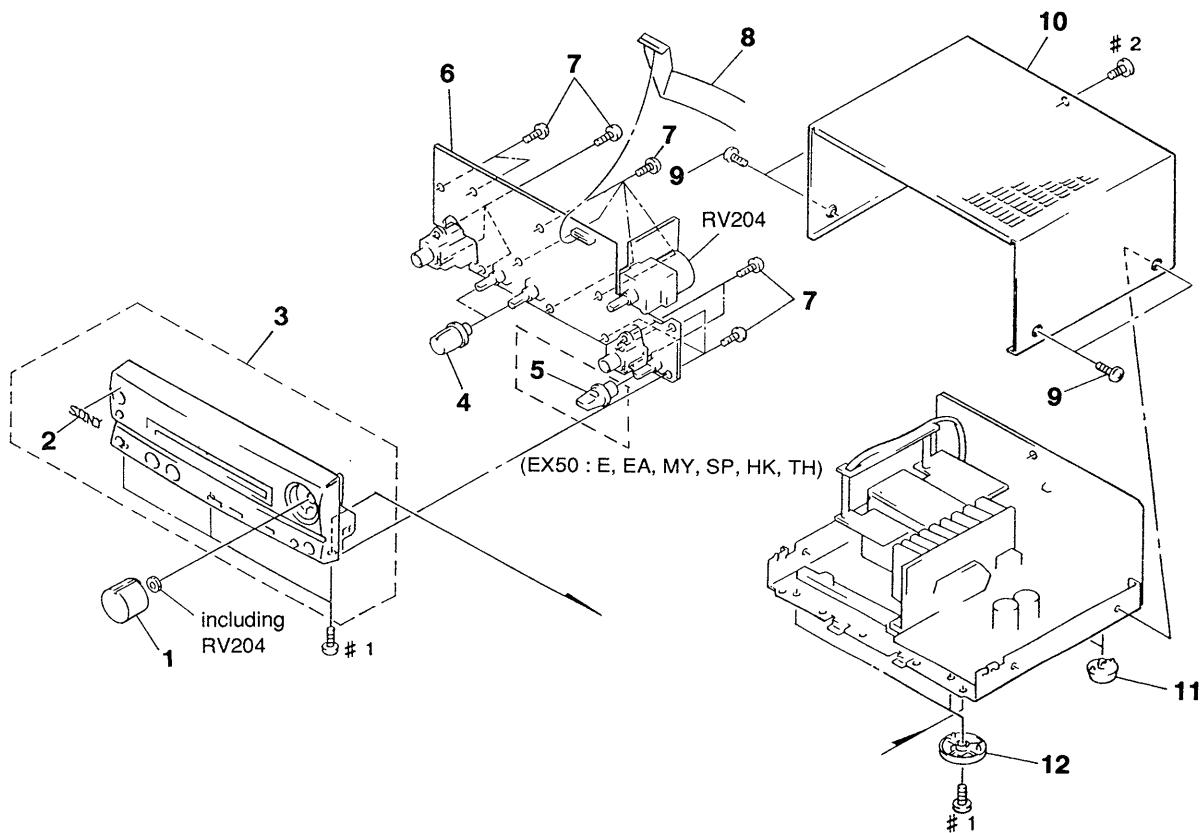
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " \* " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:  
KNOB, BALANCE (WHITE) . . . (RED)  

↑ Parts color    ↑ Cabinet's color
- The mechanical parts with no reference number in the exploded views are not supplied.

- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation  
 G : German model  
 IT : Italian model  
 EA : Saudi Arabia model  
 HK : Hong Kong model  
 SP : Singapore model  
 MY : Malaysia model  
 TH : Thai model

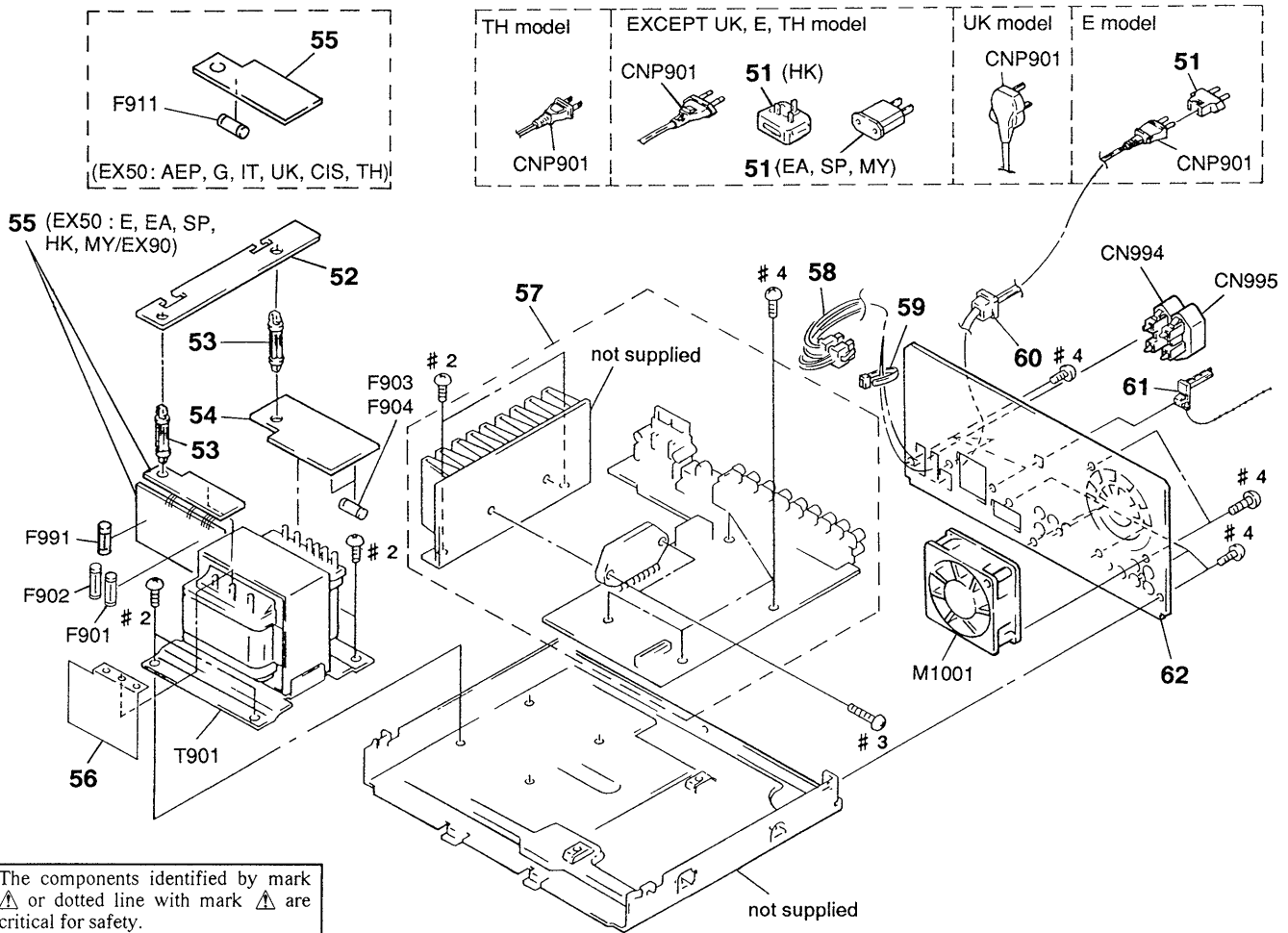
The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

### 3-1. FRONT PANEL AND CASE SECTION



Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
1	4-970-944-21	KNOB (VOL) (BLACK)... (BLACK)		5	4-973-043-31	KNOB (KR) (EX50:E, EA, MY, SP, HK, TH)	
1	4-970-944-31	KNOB (VOL) (GRAY)... (SILVER)		* 6	A-4378-852-A	PANEL BOARD, COMPLETE (EX50:E, EA, MY, SP, HK, TH)	
2	4-962-708-11	EMBLEM (4-A), SONY		* 6	A-4378-855-A	PANEL BOARD, COMPLETE (EX90)	
3	X-4946-596-1	PANEL ASSY (GA), FRONT (GRAY)... (SILVER) (EX50:E, EA, MY, SP, HK)		* 6	A-4378-859-A	PANEL BOARD, COMPLETE (EX50:AEP, UK, G, IT, CIS)	
3	X-4946-597-1	PANEL ASSY (AEP) (S), FRONT (GRAY)... (SILVER) (EX50:AEP, UK, G, IT, CIS)		7	4-951-620-01	SCREW (2. 6X8), +BVTP	
3	X-4946-599-1	PANEL ASSY (AEP), FRONT (GRAY)... (SILVER) (EX90)		8	1-773-187-11	WIRE (FLAT TYPE) (23 CORE)	
3	X-4946-833-1	PANEL ASSY (AEP) (B), FRONT (BLACK)... (BLACK) (EX50:AEP, UK, G, IT)		9	3-363-099-01	SCREW (CASE 3 TP2)	
3	X-4946-954-1	PANEL ASSY, FRONT (GRAY)... (SILVER) (EX50:TH)		10	3-919-558-71	CASE (BLACK)... (BLACK) (EX50)	
4	4-970-965-21	KNOB (TONE) (BLACK)... (BLACK)		10	4-978-245-11	CASE (GRAY)... (SILVER)	
4	4-970-965-31	KNOB (TONE) (GRAY)... (SILVER)		10	4-978-245-31	CASE (GRAY)... (SILVER) (EX90)	
				11	4-965-822-01	FOOT	
				12	4-977-699-11	LEG (F)	
				RV204	1-223-811-11	RES, VAR, CARBON 100K/100K (VOLUME)	

### 3-2. CHASSIS SECTION



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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
$\triangle$ 51	1-569-007-11	ADAPTER, CONVERSION 2P (EX50:E)		* 62	4-978-969-31	PANEL, BACK (EX50:UK)	
$\triangle$ 51	1-569-008-11	ADAPTER, CONVERSION 2P (EX50:EA, MY, SP)		* 62	4-978-969-51	PANEL, BACK (EX50:CIS)	
$\triangle$ 51	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (EX50:HK)		* 62	4-978-974-01	PANEL, BACK (EX90:AEP)	
* 52	1-659-594-11	COVER BOARD		* 62	4-978-974-21	PANEL, BACK (EX90:IT)	
* 53	4-385-948-01	HOLDER, PCB		* 62	4-978-974-31	PANEL, BACK (EX90:UK)	
* 54	1-659-593-11	SECONDARY BOARD		$\triangle$ CN994	1-526-794-11	OUTLET, AC (AC OUTLET) (EX90)	
* 55	1-659-591-11	PRIMARY BOARD (EX50:AEP, UK, G, IT, CIS, TH)		$\triangle$ CN995	1-526-794-11	OUTLET, AC (AC OUTLET) (EX90)	
* 55	1-659-592-11	PRIMARY BOARD (EX50:E, EA, HK, MY, SP/EX90)		$\triangle$ CNP901	1-575-651-11	CORD, POWER (EX50:AEP, G, IT, CIS, EA, MY, SP, HK/EX90:AEP, IT)	
* 56	4-978-612-02	SHEET, INSULATING		$\triangle$ CNP901	1-575-653-11	CORD, POWER (EX50:E)	
* 57	A-4364-898-A	MAIN ASSY BOARD, COMPLETE (EX50:TH)		$\triangle$ CNP901	1-751-326-31	CORD, POWER (EX50:TH)	
* 57	A-4378-853-A	MAIN BOARD, COMPLETE (EX50:E, EA, MY, SP, HK, TH)		$\triangle$ CNP901	1-751-520-21	CORD, POWER (EX50:UK/EX90:UK)	
* 57	A-4378-856-A	MAIN BOARD, COMPLETE (EX90)		$\triangle$ F901	1-532-078-00	FUSE, TIME LAG (T1.0AL, 250V) (EX50:E, EA, MY, SP, HK, TH)	
* 57	A-4378-860-A	MAIN BOARD, COMPLETE (EX50:AEP, UK, G, IT, CIS)		$\triangle$ F901	1-532-285-00	FUSE, TIME LAG (T1.25AL, 250V) (EX90)	
58	1-776-429-11	CORD (WITH CONNECTOR) (EX90)		$\triangle$ F902	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V) (EX50:E, EA, MY, SP, HK)	
59	3-655-653-01	BAND (TAITON), BINDING (EX90:UK)		$\triangle$ F903	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V)	
* 60	3-703-244-00	BUSHING (2104), CORD (EX50:AEP, UK, G, IT, CIS, EA, MY, SP, HK/EX90)		$\triangle$ F904	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V)	
60	3-703-571-11	BUSHING (S) (4516), CORD (EX50:E, TH)		$\triangle$ F911	1-532-078-00	FUSE, TIME LAG (T1.0AL, 250V) (EX50:TH)	
61	4-956-370-02	BAND, PLUG FIXED (EX50:UK, HK/EX90:UK)		$\triangle$ F911	1-532-285-00	FUSE, TIME LAG (T1.25AL, 250V) (EX50:AEP, UK, G, IT, CIS)	
* 62	4-978-966-01	PANEL, BACK (EX50:E, MY, SP)		$\triangle$ F991	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V) (EX90)	
* 62	4-978-966-11	PANEL, BACK (EX50:HK)		$\triangle$ M1001	1-698-720-11	MOTOR, FAN (DC) (EX90)	
* 62	4-978-966-31	PANEL, BACK (EX50:EA)		$\triangle$ T901	1-429-311-11	TRANSFORMER, POWER (EX50:E, EA, MY, SP, HK, TH)	
* 62	4-978-966-41	PANEL, BACK (EX50:TH)		$\triangle$ T901	1-429-312-11	TRANSFORMER, POWER (EX90)	
* 62	4-978-969-01	PANEL, BACK (EX50:AEP)		$\triangle$ T901	1-429-484-11	TRANSFORMER, POWER (EX50:AEP, UK, G, IT, CIS)	
* 62	4-978-969-11	PANEL, BACK (EX50:G)					
* 62	4-978-969-21	PANEL, BACK (EX50:IT)					

# SECTION 4 ELECTRICAL PARTS LIST

COVER

MAIN

NOTE:

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

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

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS  
All resistors are in ohms  
METAL: Metal-film resistor  
METAL OXIDE: Metal Oxide-film resistor  
F : nonflammable
- COILS  
uH :  $\mu$ H

- SEMICONDUCTORS  
In each case, u:  $\mu$ , for example:  
uA...:  $\mu$ A..., uPA...:  $\mu$ PA..., uPB...:  $\mu$ PB...,  
uPC...:  $\mu$ PC..., uPD...:  $\mu$ PD...
- CAPACITORS  
uF :  $\mu$ F
- Abbreviation  
G : German model  
IT : Italian model  
EA : Saudi Arabia model  
HK : Hong Kong model  
SP : Singapore model  
MY : Malaysia model  
TH : Thailand model

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	1-659-594-11	COVER BOARD *****		C510	1-162-282-31	CERAMIC 100PF 10% 50V	
*****				C531	1-162-306-11	CERAMIC 0.01uF 30% 16V	
*	A-4378-853-A	MAIN BOARD, COMPLETE (EX50:E, EA, HK, MY, SP, TH) *****		C532	1-162-306-11	CERAMIC 0.01uF 30% 16V	
				C533	1-162-306-11	CERAMIC 0.01uF 30% 16V	
*	A-4378-856-A	MAIN BOARD, COMPLETE (EX90) *****		C534	1-162-306-11	CERAMIC 0.01uF 30% 16V	
				C560	1-162-282-31	CERAMIC 100PF 10% 50V	
*	A-4378-860-A	MAIN BOARD, COMPLETE (EX50:AEP, UK, G, IT, CIS) *****		C601	1-162-294-31	CERAMIC 0.001uF 10% 50V (EX50:E, EA, HK, MY, SP, TH)	
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S < CAPACITOR >		C602	1-162-306-11	CERAMIC 0.01uF 30% 16V (EX50:E, EA, HK, MY, SP, TH)	
C301	1-126-961-11	ELECT 2.2uF 20% 50V		C603	1-162-282-31	CERAMIC 100PF 10% 50V (EX50:E, EA, HK, MY, SP, TH)	
C303	1-162-282-31	CERAMIC 100PF 10% 50V		C604	1-162-215-31	CERAMIC 47PF 5% 50V (EX50:E, EA, HK, MY, SP, TH)	
C304	1-124-910-11	ELECT 47uF 20% 50V		C605	1-104-664-11	ELECT 47uF 20% 16V	
C305	1-124-910-11	ELECT 47uF 20% 50V		C606	1-124-907-11	ELECT 10uF 20% 50V	
C306	1-124-122-11	ELECT 100uF 20% 50V		C651	1-162-294-31	CERAMIC 0.001uF 10% 50V (EX50:E, EA, HK, MY, SP, TH)	
C307	1-124-907-11	ELECT 10uF 20% 50V		C652	1-162-306-11	CERAMIC 0.01uF 30% 16V (EX50:E, EA, HK, MY, SP, TH)	
C308	1-126-965-11	ELECT 22uF 20% 50V		C653	1-162-282-31	CERAMIC 100PF 10% 50V (EX50:E, EA, HK, MY, SP, TH)	
C309	1-164-159-11	CERAMIC 0.1uF 50V		C654	1-162-215-31	CERAMIC 47PF 5% 50V (EX50:E, EA, HK, MY, SP, TH)	
C310	1-136-163-00	FILM 0.068uF 5% 50V		C655	1-104-664-11	ELECT 47uF 20% 16V	
C311	1-136-163-00	FILM 0.068uF 5% 50V		C656	1-124-907-11	ELECT 10uF 20% 50V	
C312	1-124-910-11	ELECT 47uF 20% 50V		C701	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C351	1-126-961-11	ELECT 2.2uF 20% 50V		C702	1-124-443-00	ELECT 100uF 20% 10V	
C353	1-162-282-31	CERAMIC 100PF 10% 50V		C703	1-126-961-11	ELECT 2.2uF 20% 50V	
C354	1-124-910-11	ELECT 47uF 20% 50V		C704	1-124-443-00	ELECT 100uF 20% 10V	
C355	1-124-910-11	ELECT 47uF 20% 50V		C711	1-126-965-11	ELECT 22uF 20% 50V	
C356	1-124-122-11	ELECT 100uF 20% 50V		C712	1-126-965-11	ELECT 22uF 20% 50V	
C357	1-124-907-11	ELECT 10uF 20% 50V		C761	1-126-965-11	ELECT 22uF 20% 50V	
C360	1-136-163-00	FILM 0.068uF 5% 50V		C762	1-126-965-11	ELECT 22uF 20% 50V	
C361	1-136-163-00	FILM 0.068uF 5% 50V		C804	1-136-165-00	FILM 0.1uF 5% 50V	
C401	1-136-165-00	FILM 0.1uF 5% 50V (EX50:AEP, UK, G, IT, CIS/EX90)		C805	1-126-138-11	ELECT 4700uF 20% 50V	
C402	1-136-165-00	FILM 0.1uF 5% 50V (EX50:AEP, UK, G, IT, CIS/EX90)		C807	1-126-968-11	ELECT 100uF 20% 35V	
C451	1-136-165-00	FILM 0.1uF 5% 50V (EX50:AEP, UK, G, IT, CIS/EX90)		C808	1-124-443-00	ELECT 100uF 20% 10V	
C452	1-136-165-00	FILM 0.1uF 5% 50V (EX50:AEP, UK, G, IT, CIS/EX90)		C809	1-124-472-11	ELECT 470uF 20% 10V	
				C814	1-136-165-00	FILM 0.1uF 5% 50V	
				C815	1-126-138-11	ELECT 4700uF 20% 50V	
				C817	1-126-968-11	ELECT 100uF 20% 35V	
				C818	1-124-443-00	ELECT 100uF 20% 10V	
				C819	1-124-472-11	ELECT 470uF 20% 10V	

# MAIN

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C821	1-136-153-00	FILM	0.01uF 5% 50V			< COIL >	
C822	1-126-952-11	ELECT	1000uF 20% 16V	L301	1-420-872-00	COIL, AIR-CORE	(EX50:AEP, UK, G, IT, CIS/EX90)
C824	1-124-472-11	ELECT	470uF 20% 10V	L351	1-420-872-00	COIL, AIR-CORE	(EX50:AEP, UK, G, IT, CIS/EX90)
C831	1-136-153-00	FILM	0.01uF 5% 50V			< TRANSISTOR >	
C1001	1-124-907-11	ELECT	10uF 20% 50V (EX90)	Q301	8-729-140-82	TRANSISTOR	2SA988-PAFAEA
C1003	1-126-096-11	ELECT	10uF 20% 35V (EX90)	Q302	8-729-900-36	TRANSISTOR	DTC124ES
C1004	1-126-096-11	ELECT	10uF 20% 35V (EX90)	Q303	8-729-119-78	TRANSISTOR	2SC2785-HFE
		< CONNECTOR >		Q351	8-729-140-82	TRANSISTOR	2SA988-PAFAEA
CN11	1-770-158-21	HOUSING, CONNECTOR 7P (SYSTEM CONTROL)		Q801	8-729-119-78	TRANSISTOR	2SC2785-HFE (EX90)
CN501	1-770-966-11	PIN, CONNECTOR (PCB) (V TYPE) 6P		Q809	8-729-140-96	TRANSISTOR	2SD774-34
* CN801	1-568-839-11	SOCKET, CONNECTOR 23P		Q819	8-729-140-97	TRANSISTOR	2SB734-34
CN1001	1-564-506-11	PLUG, CONNECTOR 3P (EX90)		Q1001	8-729-119-78	TRANSISTOR	2SC2785-HFE (EX90)
		< DIODE >		Q1002	8-729-118-00	TRANSISTOR	2SB1116-L (EX90)
D301	8-719-987-63	DIODE	1N4148M	Q1003	8-729-119-78	TRANSISTOR	2SC2785-HFE (EX90)
D302	8-719-987-63	DIODE	1N4148M			< RESISTOR >	
D351	8-719-987-63	DIODE	1N4148M	R301	1-249-417-11	CARBON	1K 5% 1/4W
D352	8-719-987-63	DIODE	1N4148M	R302	1-249-438-11	CARBON	56K 5% 1/4W
D702	8-719-987-63	DIODE	1N4148M	R303	1-249-415-11	CARBON	680 5% 1/4W
D801	8-719-987-63	DIODE	1N4148M (EX90)	R304	1-249-438-11	CARBON	56K 5% 1/4W
D803	8-719-987-63	DIODE	1N4148M	R305	1-260-103-11	CARBON	2.2K 5% 1/2W
D804	8-719-510-68	DIODE	D5SBA20F01	R306	1-260-103-11	CARBON	2.2K 5% 1/2W
D808	8-719-024-99	DIODE	11ES2-NTA2B	△R309	1-212-881-11	FUSIBLE	100 5% 1/4W F
D809	8-719-933-54	DIODE	HZS9A2L	△R310	1-217-151-00	METAL PLATE	0.22 10% 2W F
D813	8-719-987-63	DIODE	1N4148M	R311	1-249-417-11	CARBON	1K 5% 1/4W
D818	8-719-024-99	DIODE	11ES2-NTA2B	R312	1-249-431-11	CARBON	15K 5% 1/4W
D819	8-719-933-54	DIODE	HZS9A2L	R314	1-260-099-11	CARBON	1K 5% 1/2W
D1001	8-719-987-63	DIODE	1N4148M (EX90)	R316	1-260-099-11	CARBON	1K 5% 1/2W
D1002	8-719-987-63	DIODE	1N4148M (EX90)	R318	1-260-076-11	CARBON	10 5% 1/2W
D1051	8-719-987-63	DIODE	1N4148M (EX90)	R320	1-260-076-11	CARBON	10 5% 1/2W
		< IC >				(EX50:AEP, UK, G, IT, CIS/EX90)	
IC301	8-749-900-24	IC	STK-4162MK2 (EX50)	R322	1-249-429-11	CARBON	10K 5% 1/4W
IC301	8-749-920-10	IC	STK4172MK2 (EX90)	R323	1-247-881-00	CARBON	120K 5% 1/4W
IC501	8-759-000-47	IC	MC14051BCP	R324	1-249-437-11	CARBON	47K 5% 1/4W
IC502	8-759-000-47	IC	MC14051BCP	R325	1-249-417-11	CARBON	1K 5% 1/4W
IC503	8-759-000-48	IC	MC14052BCP	R326	1-249-439-11	CARBON	68K 5% 1/4W
IC504	8-759-000-49	IC	MC14066BCP (EX50:E, EA, HK, MY, SP, TH)	R327	1-249-437-11	CARBON	47K 5% 1/4W
IC601	8-759-710-59	IC	NJM4580D-D	R328	1-249-426-11	CARBON	5.6K 5% 1/4W
IC701	8-759-111-68	IC	UPC1237HA	R329	1-249-433-11	CARBON	22K 5% 1/4W
IC802	8-759-231-53	IC	TA7805S	△R330	1-212-849-00	FUSIBLE	4.7 5% 1/4W F
IC1001	8-759-377-68	IC	TA78L007AP-TPE6 (EX90)	R351	1-249-417-11	CARBON	1K 5% 1/4W
		< JACK >		R352	1-249-438-11	CARBON	56K 5% 1/4W
J501	1-770-015-11	JACK, PIN 6P(TUNER IN, CD IN, MD/DAT OUT)		R353	1-249-415-11	CARBON	680 5% 1/4W
J502	1-770-015-11	JACK, PIN 6P(MD/DAT IN, TAPE OUT, TAPE IN)		R354	1-249-438-11	CARBON	56K 5% 1/4W
J503	1-770-015-11	JACK, PIN 6P (VIDEO2/AUX IN, VIDEO1 OUT, VIDEO1 IN)		R355	1-260-103-11	CARBON	2.2K 5% 1/2W
				R356	1-260-103-11	CARBON	2.2K 5% 1/2W
				△R359	1-212-881-11	FUSIBLE	100 5% 1/4W F

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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
△R360	1-217-151-00	METAL PLATE	0.22 10% 2W F	R604	1-249-437-11	CARBON	47K 5% 1/4W
R361	1-249-417-11	CARBON	1K 5% 1/4W	R605	1-249-437-11	CARBON	47K 5% 1/4W
R362	1-249-431-11	CARBON	15K 5% 1/4W				(EX50:E, EA, HK, MY, SP, TH)
R368	1-260-076-11	CARBON	10 5% 1/2W	R606	1-249-441-11	CARBON	100K 5% 1/4W
R370	1-260-076-11	CARBON	10 5% 1/2W	R607	1-249-441-11	CARBON	100K 5% 1/4W
			(EX50:AEP, UK, G, IT, CIS/EX90)	R651	1-249-437-11	CARBON	47K 5% 1/4W
							(EX50:E, EA, HK, MY, SP, TH)
R401	1-260-076-11	CARBON	10 5% 1/2W	R652	1-249-437-11	CARBON	47K 5% 1/4W
			(EX50:AEP, UK, G, IT, CIS/EX90)				(EX50:AEP, UK, G, IT, CIS/EX90)
R451	1-260-076-11	CARBON	10 5% 1/2W	R652	1-249-434-11	CARBON	27K 5% 1/4W
			(EX50:AEP, UK, G, IT, CIS/EX90)				(EX50:E, EA, HK, MY, SP, TH)
R501	1-249-417-11	CARBON	1K 5% 1/4W	R653	1-249-437-11	CARBON	47K 5% 1/4W
R502	1-249-425-11	CARBON	4.7K 5% 1/4W	R654	1-249-437-11	CARBON	47K 5% 1/4W
R503	1-249-417-11	CARBON	1K 5% 1/4W	R655	1-249-437-11	CARBON	47K 5% 1/4W
							(EX50:E, EA, HK, MY, SP, TH)
R504	1-249-425-11	CARBON	4.7K 5% 1/4W	R656	1-249-441-11	CARBON	100K 5% 1/4W
R505	1-249-417-11	CARBON	1K 5% 1/4W	R701	1-249-429-11	CARBON	10K 5% 1/4W
R506	1-249-417-11	CARBON	1K 5% 1/4W	R702	1-249-441-11	CARBON	100K 5% 1/4W
R507	1-249-417-11	CARBON	1K 5% 1/4W	R703	1-249-430-11	CARBON	12K 5% 1/4W
R508	1-249-417-11	CARBON	1K 5% 1/4W	R704	1-249-437-11	CARBON	47K 5% 1/4W
R509	1-249-417-11	CARBON	1K 5% 1/4W	△R705	1-215-890-11	METAL OXIDE	470 5% 2W F
R512	1-249-429-11	CARBON	10K 5% 1/4W	R706	1-249-438-11	CARBON	56K 5% 1/4W
R514	1-249-429-11	CARBON	10K 5% 1/4W	R707	1-249-437-11	CARBON	47K 5% 1/4W
R521	1-249-417-11	CARBON	1K 5% 1/4W	R711	1-260-095-11	CARBON	470 5% 1/2W
R522	1-249-417-11	CARBON	1K 5% 1/4W	R713	1-249-441-11	CARBON	100K 5% 1/4W
R523	1-249-417-11	CARBON	1K 5% 1/4W				
R531	1-249-429-11	CARBON	10K 5% 1/4W	R761	1-260-095-11	CARBON	470 5% 1/2W
R532	1-249-429-11	CARBON	10K 5% 1/4W	R763	1-249-441-11	CARBON	100K 5% 1/4W
R533	1-249-429-11	CARBON	10K 5% 1/4W	R803	1-249-429-11	CARBON	10K 5% 1/4W
R534	1-247-807-31	CARBON	100 5% 1/4W	R804	1-249-417-11	CARBON	1K 5% 1/4W (EX90)
				R805	1-260-103-11	CARBON	2.2K 5% 1/2W
R535	1-247-807-31	CARBON	100 5% 1/4W				
R536	1-247-807-31	CARBON	100 5% 1/4W	R807	1-260-103-11	CARBON	2.2K 5% 1/2W
R551	1-249-417-11	CARBON	1K 5% 1/4W	R809	1-249-421-11	CARBON	2.2K 5% 1/4W
R552	1-249-425-11	CARBON	4.7K 5% 1/4W	R813	1-249-429-11	CARBON	10K 5% 1/4W
R553	1-249-417-11	CARBON	1K 5% 1/4W	R815	1-260-103-11	CARBON	2.2K 5% 1/2W
				R817	1-260-103-11	CARBON	2.2K 5% 1/2W
R554	1-249-425-11	CARBON	4.7K 5% 1/4W				
R555	1-249-417-11	CARBON	1K 5% 1/4W	R819	1-249-421-11	CARBON	2.2K 5% 1/4W
R556	1-249-417-11	CARBON	1K 5% 1/4W	R1001	1-249-433-11	CARBON	22K 5% 1/4W (EX90)
R557	1-249-417-11	CARBON	1K 5% 1/4W	R1002	1-249-441-11	CARBON	100K 5% 1/4W (EX90)
R558	1-249-417-11	CARBON	1K 5% 1/4W	R1003	1-249-441-11	CARBON	100K 5% 1/4W (EX90)
				R1004	1-249-429-11	CARBON	10K 5% 1/4W (EX90)
R559	1-249-417-11	CARBON	1K 5% 1/4W				
R562	1-249-429-11	CARBON	10K 5% 1/4W	R1006	1-249-441-11	CARBON	100K 5% 1/4W (EX90)
R564	1-249-429-11	CARBON	10K 5% 1/4W	R1007	1-249-441-11	CARBON	100K 5% 1/4W (EX90)
R571	1-249-417-11	CARBON	1K 5% 1/4W	R1051	1-249-433-11	CARBON	22K 5% 1/4W (EX90)
R572	1-249-417-11	CARBON	1K 5% 1/4W				
							< RELAY >
R573	1-249-417-11	CARBON	1K 5% 1/4W				
R601	1-249-437-11	CARBON	47K 5% 1/4W				
			(EX50:E, EA, HK, MY, SP, TH)	RY701	1-515-920-11	RELAY (24V)	
R602	1-249-437-11	CARBON	47K 5% 1/4W				< TERMINAL >
			(EX50:AEP, UK, G, IT, CIS/EX90)				
R602	1-249-434-11	CARBON	27K 5% 1/4W				
			(EX50:E, EA, HK, MY, SP, TH)	TB401	1-537-240-11	TERMINAL BOARD (CHECKER PIN) (SPEAKER)	
R603	1-249-437-11	CARBON	47K 5% 1/4W				

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

**MAIN**

**PANEL**

Consisting the following section  
in the panel. (HP, MIC, VOL)

Ref.No.	Part No.	Description	Remark
		< THERMISTOR >	
TH1001	1-807-796-11	THERMISTOR (EX90)	
*****			
*	A-4378-852-A	PANEL BOARD, COMPLETE (EX50:E, EA, HK, MY, SP, TH)	
*****			
*	A-4378-855-A	PANEL BOARD, COMPLETE (EX90)	
*****			
*	A-4378-859-A	PANEL BOARD, COMPLETE (EX50:AEP, UK, G, IT, CIS)	
*****			
		(Including HP, MIC, VOL BOARD)	
	1-690-880-11	LEAD (WITH CONNECTOR)	
		< CAPACITOR >	
C100	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C101	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C102	1-124-907-11	ELECT 10uF 20% 50V	
C104	1-164-159-11	CERAMIC 0.1uF 50V	
C106	1-126-968-11	ELECT 100uF 20% 6.3V	
C107	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C111	1-126-968-11	ELECT 100uF 20% 6.3V	
C112	1-164-159-11	CERAMIC 0.1uF 50V	
C113	1-162-282-31	CERAMIC 100PF 10% 50V	
C204	1-124-257-00	ELECT 2.2uF 20% 50V	
C205	1-126-963-11	ELECT 4.7uF 20% 50V	
C206	1-162-282-31	CERAMIC 100PF 10% 50V	
C207	1-162-217-31	CERAMIC 56PF 5% 50V	
C208	1-126-963-11	ELECT 4.7uF 20% 50V	
C209	1-136-157-00	FILM 0.022uF 5% 50V	
C210	1-136-163-00	FILM 0.068uF 5% 50V	
C211	1-136-167-00	FILM 0.15uF 5% 50V	
C212	1-136-173-00	FILM 0.47uF 5% 50V	
C213	1-126-963-11	ELECT 4.7uF 20% 50V	
C221	1-164-159-11	CERAMIC 0.1uF 50V (EX50:E, EA, HK, MY, SP, TH)	
C223	1-162-282-31	CERAMIC 100PF 10% 50V (EX50:E, EA, HK, MY, SP, TH)	
C224	1-162-286-31	CERAMIC 220PF 10% 50V (EX50:E, EA, HK, MY, SP, TH)	
C225	1-164-159-11	CERAMIC 0.1uF 50V (EX50:E, EA, HK, MY, SP, TH)	
C226	1-164-159-11	CERAMIC 0.1uF 50V (EX50:E, EA, HK, MY, SP, TH)	
C227	1-162-282-31	CERAMIC 100PF 10% 50V (EX50:E, EA, HK, MY, SP, TH)	
C228	1-162-286-31	CERAMIC 220PF 10% 50V (EX50:E, EA, HK, MY, SP, TH)	

Ref.No.	Part No.	Description	Remark
C229	1-124-464-11	ELECT 0.22uF 20% 50V (EX50:E, EA, HK, MY, SP, TH)	
C230	1-104-663-11	ELECT 33uF 20% 16V (EX50:E, EA, HK, MY, SP, TH)	
C231	1-104-663-11	ELECT 33uF 20% 16V (EX50:E, EA, HK, MY, SP, TH)	
C232	1-162-286-31	CERAMIC 220PF 10% 50V (EX50:AEP, UK, G, IT, CIS/EX90)	
C233	1-162-286-31	CERAMIC 220PF 10% 50V (EX50:AEP, UK, G, IT, CIS/EX90)	
C240	1-164-159-11	CERAMIC 0.1uF 50V	
C255	1-126-963-11	ELECT 4.7uF 20% 50V	
C256	1-162-282-31	CERAMIC 100PF 10% 50V	
C257	1-162-217-31	CERAMIC 56PF 5% 50V	
C258	1-126-963-11	ELECT 4.7uF 20% 50V	
C259	1-136-157-00	FILM 0.022uF 5% 50V	
C260	1-136-163-00	FILM 0.068uF 5% 50V	
C261	1-136-167-00	FILM 0.15uF 5% 50V	
C262	1-136-173-00	FILM 0.47uF 5% 50V	
C263	1-126-963-11	ELECT 4.7uF 20% 50V	
		< CONNECTOR >	
* CN101	1-568-839-11	SOCKET, CONNECTOR 23P	
CN201	1-764-341-11	PIN, CONNECTOR (PCB) (L TYPE) 4P	
		< DIODE >	
D101	8-719-046-44	DIODE SEL5221S (TUNER)	
D102	8-719-046-44	DIODE SEL5221S (CD)	
D103	8-719-046-44	DIODE SEL5221S (MD)	
D104	8-719-046-44	DIODE SEL5221S (TAPE)	
D105	8-719-046-44	DIODE SEL5221S (VIDEO2/AUX)	
D106	8-719-046-44	DIODE SEL5221S (VIDEO1)	
D107	8-719-046-44	DIODE SEL5221S (SOURCE DIRECT)	
D108	8-719-046-44	DIODE SEL5221S (-20dB MUTING)	
D109	8-719-987-63	DIODE 1N4148M	
D110	8-719-987-63	DIODE 1N4148M	
D111	8-719-987-63	DIODE 1N4148M	
D112	8-719-987-63	DIODE 1N4148M	
D113	8-719-046-44	DIODE SEL5221S (KARAOKE PON) (EX50:E, EA, HK, MY, SP, TH)	
D114	8-719-046-44	DIODE SEL5221S (ON/STANDBY)	
		< IC >	
IC101	8-759-386-85	IC M37471M2-S1	
IC102	8-749-923-11	IC GP1U58XB (R)	
IC103	8-759-165-80	IC PST600C-T	
IC104	8-759-962-08	IC BA6208	
IC201	8-759-634-51	IC M5218AP	
IC202	8-759-000-48	IC MC14052BCP	
IC221	8-759-634-51	IC M5218AP (EX50:E, EA, HK, MY, SP, TH)	

**PANEL**

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
		< JACK >					
J201	1-507-854-00	JACK, PHONE (MIX MIC)	(EX50:E, EA, HK, MY, SP, TH)	R116	1-249-393-11	CARBON	10 5% 1/4W
J202	1-507-854-00	JACK, PHONE (PHONES)		R117	1-249-437-11	CARBON	47K 5% 1/4W
		< TRANSISTOR >		R119	1-249-409-11	CARBON	220 5% 1/4W
Q101	8-729-900-63	TRANSISTOR DTA124ES		R120	1-249-409-11	CARBON	220 5% 1/4W
Q102	8-729-900-36	TRANSISTOR DTC124ES		R126	1-249-409-11	CARBON	220 5% 1/4W
Q103	8-729-900-36	TRANSISTOR DTC124ES					(EX50:E, EA, HK, MY, SP, TH)
Q104	8-729-900-36	TRANSISTOR DTC124ES		R127	1-247-807-31	CARBON	100 5% 1/4W
Q105	8-729-900-36	TRANSISTOR DTC124ES		R130	1-249-441-11	CARBON	100K 5% 1/4W
Q106	8-729-900-36	TRANSISTOR DTC124ES		R131	1-249-425-11	CARBON	4.7K 5% 1/4W
Q107	8-729-900-36	TRANSISTOR DTC124ES		R132	1-249-425-11	CARBON	4.7K 5% 1/4W
Q108	8-729-900-36	TRANSISTOR DTC124ES		R133	1-249-385-11	CARBON	2.2 5% 1/6W
Q109	8-729-900-36	TRANSISTOR DTC124ES		R134	1-247-807-31	CARBON	100 5% 1/4W
Q110	8-729-900-36	TRANSISTOR DTC124ES		R200	1-249-429-11	CARBON	10K 5% 1/4W
Q111	8-729-900-63	TRANSISTOR DTA124ES		R201	1-249-421-11	CARBON	2.2K 5% 1/4W
Q112	8-729-900-36	TRANSISTOR DTC124ES		R202	1-249-409-11	CARBON	220 5% 1/4W
Q113	8-729-900-36	TRANSISTOR DTC124ES		R203	1-249-429-11	CARBON	10K 5% 1/4W
Q114	8-729-900-36	TRANSISTOR DTC124ES		R204	1-249-417-11	CARBON	1K 5% 1/4W
Q115	8-729-900-36	TRANSISTOR DTC124ES	(EX50:E, EA, HK, MY, SP, TH)	R205	1-249-441-11	CARBON	100K 5% 1/4W
Q116	8-729-900-63	TRANSISTOR DTA124ES	(EX50:E, EA, HK, MY, SP, TH)	R206	1-249-417-11	CARBON	1K 5% 1/4W
Q117	8-729-900-36	TRANSISTOR DTC124ES		R207	1-247-903-00	CARBON	1M 5% 1/4W
Q118	8-729-119-78	TRANSISTOR 2SC2785-HFE		R208	1-249-422-11	CARBON	2.7K 5% 1/4W
Q201	8-729-141-30	TRANSISTOR 2SC3623A-LK		R209	1-249-429-11	CARBON	10K 5% 1/4W
Q251	8-729-141-30	TRANSISTOR 2SC3623A-LK		R210	1-249-411-11	CARBON	330 5% 1/4W
		< RESISTOR >		R212	1-249-409-11	CARBON	220 5% 1/4W
R1	1-249-429-11	CARBON	10K 5% 1/4W (EX50:E, EA, HK, MY, SP, TH)	R213	1-247-903-00	CARBON	1M 5% 1/4W
R2	1-249-429-11	CARBON	10K 5% 1/4W (EX50:AEP, UK, G, IT, CIS/EX90)	R214	1-247-903-00	CARBON	1M 5% 1/4W
R100	1-249-429-11	CARBON	10K 5% 1/4W	R215	1-249-423-11	CARBON	3.3K 5% 1/4W
R101	1-249-431-11	CARBON	15K 5% 1/4W	R216	1-249-417-11	CARBON	1K 5% 1/4W
R102	1-249-417-11	CARBON	1K 5% 1/4W	R219	1-247-903-00	CARBON	1M 5% 1/4W
R103	1-249-418-11	CARBON	1.2K 5% 1/4W	R220	1-247-807-31	CARBON	100 5% 1/4W
R104	1-249-418-11	CARBON	1.2K 5% 1/4W	R221	1-249-441-11	CARBON	100K 5% 1/4W (EX50:E, EA, HK, MY, SP, TH)
R105	1-249-419-11	CARBON	1.5K 5% 1/4W	R222	1-249-417-11	CARBON	1K 5% 1/4W (EX50:E, EA, HK, MY, SP, TH)
R106	1-249-427-11	CARBON	6.8K 5% 1/4W	R223	1-249-431-11	CARBON	15K 5% 1/4W (EX50:E, EA, HK, MY, SP, TH)
R107	1-249-423-11	CARBON	3.3K 5% 1/4W	R224	1-249-441-11	CARBON	100K 5% 1/4W (EX50:E, EA, HK, MY, SP, TH)
R108	1-249-429-11	CARBON	10K 5% 1/4W	R225	1-249-417-11	CARBON	1K 5% 1/4W (EX50:E, EA, HK, MY, SP, TH)
R109	1-249-428-11	CARBON	8.2K 5% 1/4W (EX50:E, EA, HK, MY, SP, TH)	R226	1-249-435-11	CARBON	33K 5% 1/4W (EX50:E, EA, HK, MY, SP, TH)
R110	1-249-409-11	CARBON	220 5% 1/4W	R227	1-249-441-11	CARBON	100K 5% 1/4W (EX50:E, EA, HK, MY, SP, TH)
R111	1-249-409-11	CARBON	220 5% 1/4W	R228	1-249-441-11	CARBON	100K 5% 1/4W (EX50:E, EA, HK, MY, SP, TH)
R112	1-249-429-11	CARBON	10K 5% 1/4W	R229	1-249-417-11	CARBON	1K 5% 1/4W (EX50:E, EA, HK, MY, SP, TH)
R113	1-249-417-11	CARBON	1K 5% 1/4W	R230	1-249-409-11	CARBON	220 5% 1/4W (EX50:E, EA, HK, MY, SP, TH)
R114	1-249-429-11	CARBON	10K 5% 1/4W	R231	1-249-409-11	CARBON	220 5% 1/4W (EX50:E, EA, HK, MY, SP, TH)
R115	1-249-429-11	CARBON	10K 5% 1/4W				

**PANEL    PRIMARY    SECONDARY**

Ref. No.	Part No.	Description	Remark
R251	1-249-421-11	CARBON	2.2K 5% 1/4W
R252	1-249-409-11	CARBON	220 5% 1/4W
R253	1-249-429-11	CARBON	10K 5% 1/4W
R255	1-249-429-11	CARBON	10K 5% 1/4W
R256	1-249-417-11	CARBON	1K 5% 1/4W
R257	1-247-903-00	CARBON	1M 5% 1/4W
R258	1-249-422-11	CARBON	2.7K 5% 1/4W
R259	1-249-429-11	CARBON	10K 5% 1/4W
R260	1-249-411-11	CARBON	330 5% 1/4W
R262	1-249-409-11	CARBON	220 5% 1/4W
R263	1-247-903-00	CARBON	1M 5% 1/4W
R264	1-247-903-00	CARBON	1M 5% 1/4W
R265	1-249-423-11	CARBON	3.3K 5% 1/4W
R266	1-249-417-11	CARBON	1K 5% 1/4W
R269	1-247-903-00	CARBON	1M 5% 1/4W
R270	1-247-807-31	CARBON	100 5% 1/4W
< VARIABLE RESISTOR >			
RV201	1-223-973-11	RES, VAR, CARBON 10K/10K (TREBLE)	
RV202	1-223-973-11	RES, VAR, CARBON 10K/10K (BASS)	
RV204	1-223-811-11	RES, VAR, CARBON 100K/100K (VOLUME)	
RV221	1-223-974-11	RES, VAR, CARBON 50K (MIC LEVEL) (EX50:E, EA, HK, MY, SP, TH)	
< SWITCH >			
S101	1-554-303-21	SWITCH, TACTILE (SYSTEM POWER)	
S102	1-554-303-21	SWITCH, TACTILE (TUNER)	
S103	1-554-303-21	SWITCH, TACTILE (CD)	
S104	1-554-303-21	SWITCH, TACTILE (MD)	
S105	1-554-303-21	SWITCH, TACTILE (TAPE)	
S106	1-554-303-21	SWITCH, TACTILE (VIDEO2/AUX)	
S107	1-554-303-21	SWITCH, TACTILE (VIDEO1)	
S108	1-554-303-21	SWITCH, TACTILE (-20dB MUTING)	
S109	1-554-303-21	SWITCH, TACTILE (SOURCE DIRECT)	
S110	1-554-303-21	SWITCH, TACTILE (KARAOKE PON) (EX50:E, EA, HK, MY, SP, TH)	
< VIBRATOR >			
X101	1-579-125-11	VIBRATOR, CERAMIC (8MHz)	
*****			
*	1-659-591-11	PRIMARY BOARD (EX50:AEP, UK, G, IT, CIS, TH) *****	
*	1-659-592-11	PRIMARY BOARD (EX50:E, EA, HK, MY, SP/EX90) *****	
	1-533-217-31	HOLDER, FUSE	
< CAPACITOR >			
△C991	1-113-925-51	ELECT	0.01uF 20% 250V(EX90)

Ref. No.	Part No.	Description	Remark
< CONNECTOR >			
CN900	1-564-321-00	PIN, CONNECTOR 2P (EX50:E, EA, HK, MY, SP/EX90)	
CN911	1-564-321-00	PIN, CONNECTOR 2P (EX50:AEP, UK, G, IT, CIS, TH)	
CN991	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P (EX90)	
CN992	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P (EX90)	
CN993	1-764-325-11	PIN, CONNECTOR (PCB) (V TYPE) 2P (EX90)	
< FUSE >			
△F901	1-532-078-00	FUSE, TIME LAG (T1. 0AL 250V) (EX50:E, EA, HK, MY, SP)	
△F901	1-532-285-00	FUSE, TIME LAG (T1. 25AL 250V) (EX90)	
△F902	1-532-286-00	FUSE, TIME LAG (T2. 5AL 250V) (EX50:E, EA, HK, MY, SP)	
△F911	1-532-078-00	FUSE, TIME LAG (T1. 0AL 250V) (EX50:TH)	
△F911	1-532-285-00	FUSE, TIME LAG (T1. 25AL 250V) (EX50:AEP, UK, G, IT, CIS)	
△F991	1-532-286-00	FUSE, TIME LAG (T2. 5AL 250V) (EX90)	
< RELAY >			
△RY991	1-755-018-11	RELAY (EX90)	
< SWITCH >			
S901	1-572-675-11	SWITCH, POWER VOLTAGE CHANGE (VOLTAGE SELECTOR) (EX50:E, EA, HK, MY, SP)	
*****			
*	1-659-593-11	SECONDARY BOARD *****	
	1-533-217-31	HOLDER, FUSE	
< CONNECTOR >			
CN901	1-770-966-11	PIN, CONNECTOR (PCB) (V TYPE) 6P	
CN902	1-764-326-11	PIN, CONNECTOR (PCB) (V TYPE) 3P	
< FUSE >			
△F903	1-532-286-00	FUSE, TIME LAG (T2. 5AL 250V)	
△F904	1-532-286-00	FUSE, TIME LAG (T2. 5AL 250V)	
*****			
MISCELLANEOUS *****			
8	1-773-187-11	WIRE (FLAT TYPE) (23 CORE)	
△51	1-569-007-11	ADAPTER, CONVERSION 2P (EX50:E)	
△51	1-569-008-11	ADAPTER, CONVERSION 2P (EX50:EA, MY, SP)	
△51	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (EX50:HK)	
58	1-776-429-11	CORD (WITH CONNECTOR) (EX90)	

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
△CN994	1-526-794-11	OUTLET, AC (AC OUTLET) (EX90)	
△CN995	1-526-794-11	OUTLET, AC (AC OUTLET) (EX90)	
△CNP901	1-575-651-11	CORD, POWER (EX50:AEP, G, IT, CIS, EA, MY, SP, HK/EX90:AEP, IT)	
△CNP901	1-575-653-11	CORD, POWER (EX50:E)	
△CNP901	1-751-326-31	CORD, POWER (EX50:TH)	
△CNP901	1-751-520-21	CORD, POWER (EX50:UK/EX90:UK)	
△F901	1-532-078-00	FUSE, TIME LAG (T1.0AL, 250V) (EX50:E, EA, MY, SP, HK, TH)	
△F901	1-532-285-00	FUSE, TIME LAG (T1.25AL, 250V) (EX90)	
△F902	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V) (EX50:E, EA, MY, SP, HK)	
△F903	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V)	
△F904	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V)	
△F911	1-532-078-00	FUSE, TIME LAG (T1.0AL, 250V) (EX50:TH)	
△F911	1-532-285-00	FUSE, TIME LAG (T1.25AL, 250V) (EX50:AEP, UK, G, IT, CIS)	
△F991	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V) (EX90)	
△M1001	1-698-720-11	MOTOR, FAN (DC) (EX90)	
RV204	1-223-811-11	RES, VAR, CARBON 100K/100K (VOLUME)	
△T901	1-429-311-11	TRANSFORMER, POWER (EX50:E, EA, MY, SP, HK, TH)	
△T901	1-429-312-11	TRANSFORMER, POWER (EX90)	
△T901	1-429-484-11	TRANSFORMER, POWER (EX50:AEP, UK, G, IT, CIS)	
*****			
ACCESSORIES & PACKING MATERIALS			
*****			
*	4-980-537-01	CUSHION (UPPER)	
*	4-980-538-01	CUSHION (LOWER)	
*****			
*****			
HARDWARE LIST			
*****			
#1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
#2	7-682-548-04	SCREW +BVTT 3X8 (S)	
#3	7-685-650-79	SCREW +BVTP 3X16 TYPE2 IT-3	
#4	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	

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

