

TA-H4900

SERVICE MANUAL

*AEP Model
UK Model
E Model
Australian Model*



Photo : AEP model

TA-H4900 is the Integrated stereo amplifier section in MHC-4900/E80X

SPECIFICATIONS

Peak music power output (E, EA, MX, AUS, SP, MY model)	1000 watts, 6 Ω
Continuous RMS power output	60 + 60 watts (6 ohms at 1 kHz, DIN) 70 + 70 watts (6 ohms at 1 kHz, 5% THD)
Music power output	140 + 140 watts (6 ohms at 1kHz, 10% THD)
Inputs	MIX MIC (minijack): sensitivity 1mV, impedance 600 ohms
Outputs	HEADPHONES (stereo minijack): accepts headphones of 8 ohms or more SURROUND SPEAKER (phono jack): accepts impedance of 8 to 16 ohms
Dimensions	Approx. 225 x 125 x 285 mm (w/h/d) (8 7/8 x 5 x 11 1/4 inches)
Mass	Approx. 4.3kg (9 lb 8 oz)

General

<u>Desti- nation</u>	<u>Power requirements</u>	<u>Power consumption</u>
UK model	240 V AC, 50 Hz	160 W
AEP, G, IT model	220 — 230 V AC, 50/60Hz	160W
E, EA, MX, AUS, SP, MY model	110 - 120 V or 220 - 240 VAC Adjustable 50/60 Hz	160 W

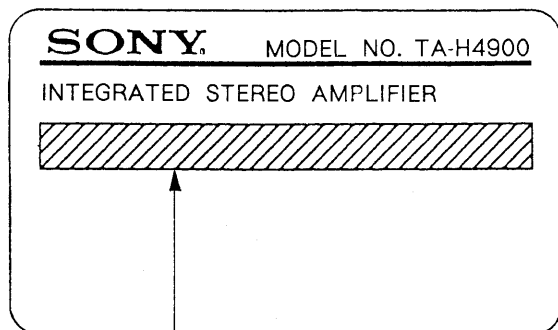
Design and specifications subject to change without notice.

Note :

- G : German model.
- IT : Italian model.
- EA : Saudi Arabia model.
- MX : Mexican model.
- AUS : Australian model.
- SP : Singapore model.
- MY : Malaysia model.

INTEGRATED STEREO AMPLIFIER
SONY®

— MODEL IDENTIFICATION —
(Specification Label)



AEP model : AC : 220 – 230V ~ 50/60Hz 160W
 G, IT model : AC : 220 – 230V ~ 50Hz 160W
 UK model : AC : 240V ~ 50Hz
 E, EA, MX, AUS, SP, MY model : AC : 110 – 120V/220 – 240V ~
 50/60Hz 160W

Note :

- G : German model.
- IT : Italian model.
- EA : Saudi Arabia model.
- MX : Mexican model.
- AUS : Australian model.
- SP : Singapore model.
- MY : Malaysia model.

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
1.	GENERAL	3
2.	DIAGRAMS	
2-1.	Circuit Boards Location	4
2-2.	Semiconductor Lead Layouts	5
2-3.	Block Diagram	6
2-4.	Printed Wiring Board	9
2-5.	Schematic Diagram	13
2-6.	IC Block Diagrams	18
2-7.	IC Pin Functions	
	• IC501 Controller (MC68HC05P9-SC405679B)	20
3.	EXPLODED VIEW	
3-1.	Front Panel and Rear Panel Section	21
3-2.	Chassis section	22
4.	ELECTRICAL PARTS LIST	23

SERVICE NOTE

• **Power Supply Used in Servicing**

This unit have its own power supply as it works on the power supplied from the equalizer (SEQ-H4900) used for this series, connect this amplifier when servicing the unit (conduction repair, etc.).

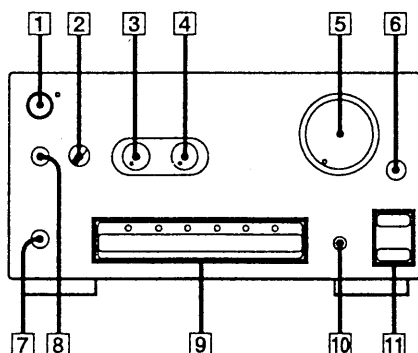
SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK Δ OR DOTTED LINE WITH MARK Δ 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

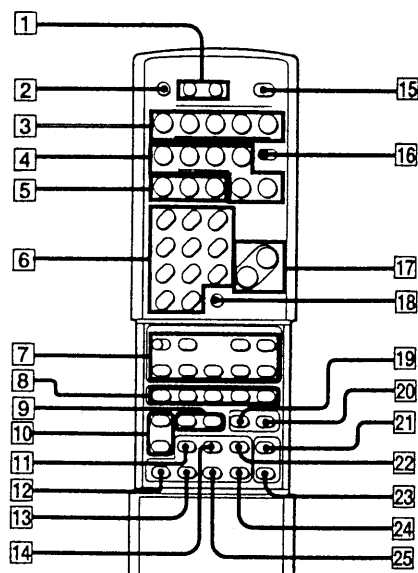
This section is extracted from instruction manual.

Front Panel



- 1 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.
- 2 MIC LEVEL control (25)
- 3 DBS FREQUENCY control (20)
- 4 DBS LEVEL control (20)
- 5 VOLUME control* (5, 7, 20)
- 6 MUTING button* (20)
- 7 HEADPHONES jack (stereo minijack) (20, 26)
- 8 MIX MIC jack (minijack) (25, 26)
- 9 FUNCTION INDICATOR (16, 25, 26)
VIDEO (26)
TAPE (19)
MD/DAT (26)
CD (16, 25)
TUNER (24)
PHONO (26)
- 10 Remote sensor
- 11 FUNCTION >/< buttons (16, 25, 26)

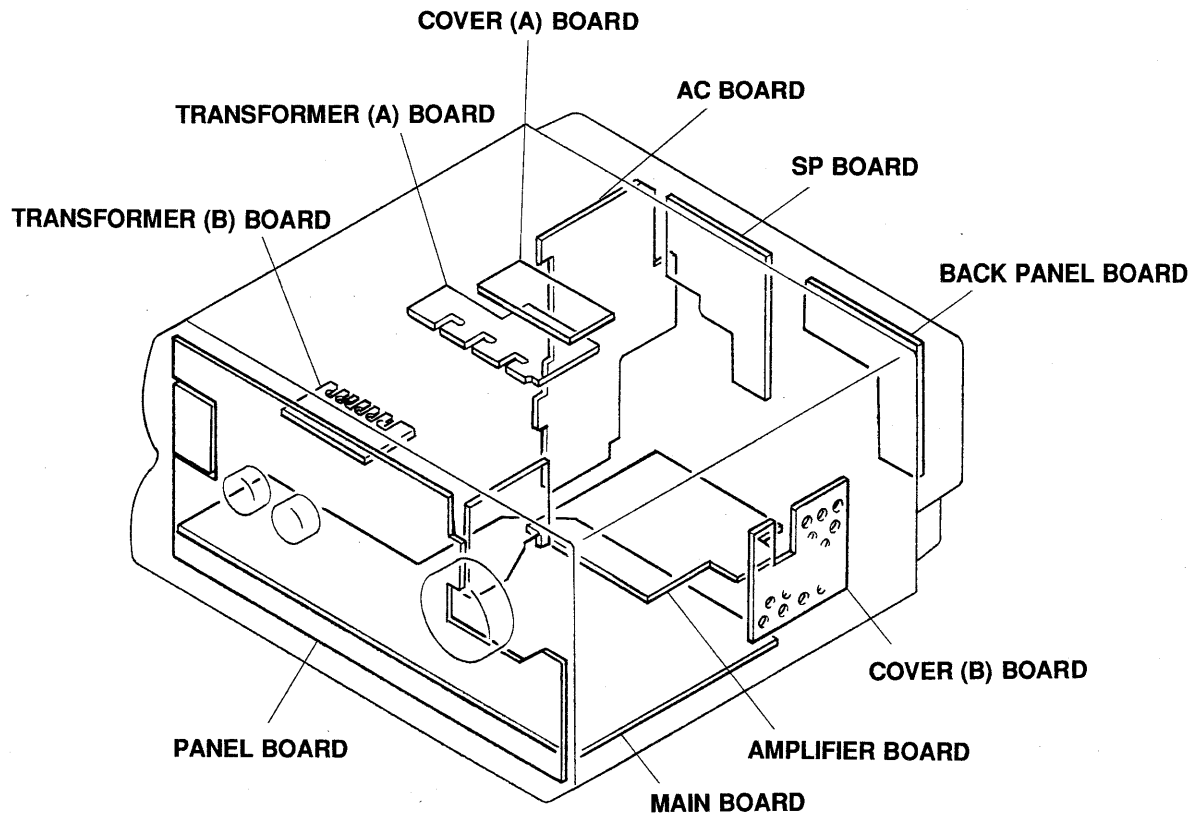
Remote commander (RM-S49/RM-S49E)



- 1 TAPE DECK A/B buttons (14)
- 2 SLEEP button (23)
- 3 CD/MD operating buttons (7)
- 4 Cassette deck operating buttons (14)
- 5 Tuner operating buttons (10)
- 6 CD/Tuner/numeric buttons (7, 11)
- 7 VCR operating buttons (26)
- 8 TV operating buttons (26)
- 9 MENU 1, 2 button (15, 20)
- 10 FUNCTION </> buttons (16, 25, 26)
- 11 CONTINUE button (8)
- 12 CHECK button (9)
- 13 CLEAR button (9)
- 14 SHUFFLE button (8)
- 15 SYSTEM POWER switch (7)
- 16 CD/MD switch (7)
- 17 VOLUME +/- buttons (7, 20)
- 18 MUTING button (20)
- 19 P.FILE button (22)
- 20 DIRECT button (15, 21)
- 21 RDS EON button (12)
(AEP, UK, G, IT model) (RM-S49)
- 22 REC button (12)
(E, EA, MX, AUS, SP, MY model) (RM-S49E)
- 23 PROGRAM button (8)
- 24 DISPLAY button (21)
(AEP, UK, G, IT model) (RM-S49)
- 25 REC MUTE button (21)
(E, EA, MX, AUS, SP, MY model) (RM-S49E)
- 26 TIME button (8)
- 27 REPEAT button (9)

SECTION 2 DIAGRAMS

2-1. CIRCUIT BOARDS LOCATION

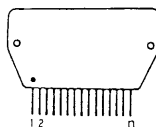


2-2. SEMICONDUCTOR LEAD LAYOUTS

GP1U57XB

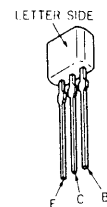


STK4172MK2K



MARKING SIDE VIEW

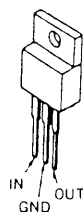
DTA124ES



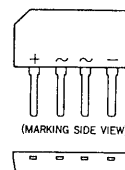
LB1638



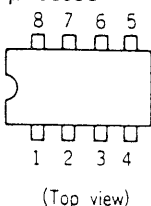
TA7812S



D5SBA20F01

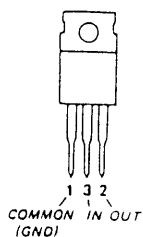


μ PC393C

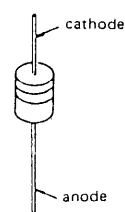


(Top view)

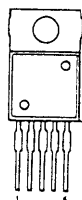
TA7912S



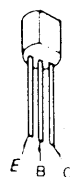
UZL-15M
11ES2



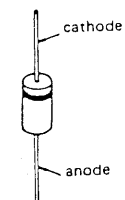
L78MR06



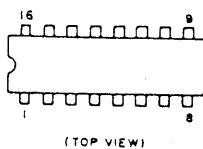
2SB1116



10E2
1N4148M



MC68HC05P9-SC405679B
SN74HC138AN

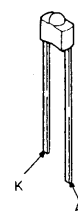


(TOP VIEW)

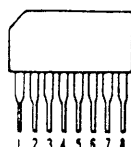
2SC2603-EF
2SC3622A-LK
DTA144WS
DTC124ES



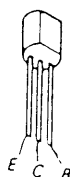
SEL5220S



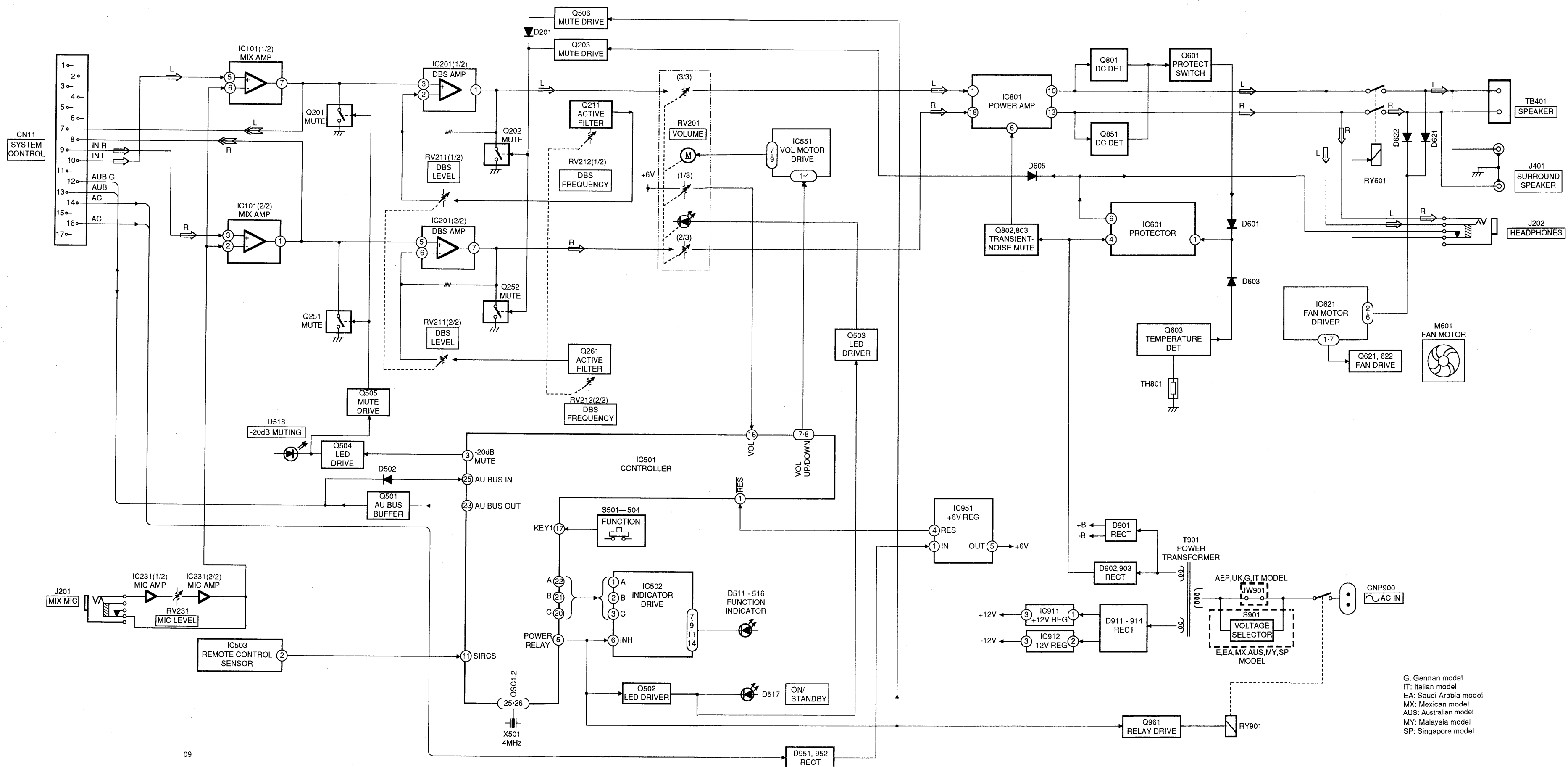
M5218AL
 μ PC1237HA



2SC1841-PAFAEA



2-3. BLOCK DIAGRAM



2-4. PRINTED WIRING BOARDS

- See page 4 for Circuit Boards Location.
- See page 5 for Semiconductor Lead Layouts.

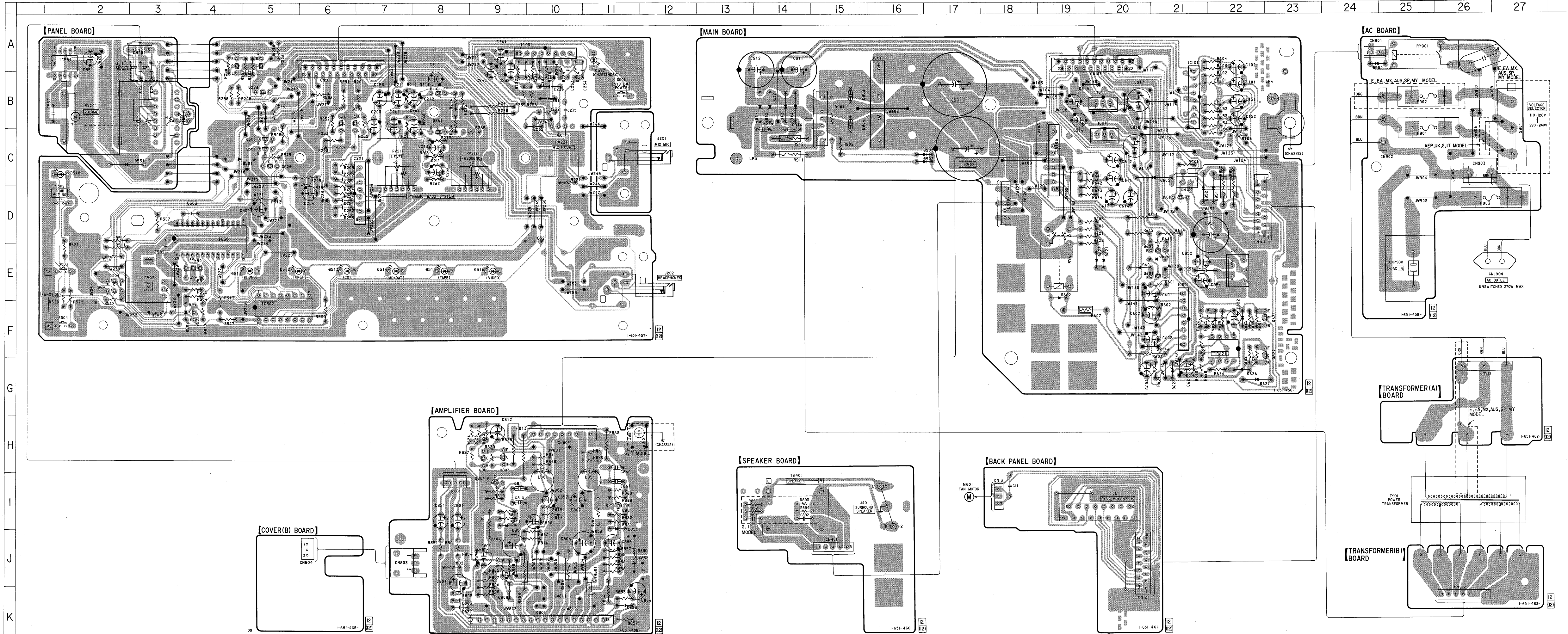
• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D201	B-5	IC503	E-3
D501	C-5	IC551	A-1
D502	F-4	IC601	E-21
D511	E-4	IC621	F-22
D512	E-5	IC801	K-10
D513	E-6	IC911	B-20
D514	E-7	IC912	B-20
D515	E-8	IC951	E-22
D516	E-9		
D517	A-10	Q201	B-7
D518	C-2	Q202	A-5
D551	C-3	Q203	B-5
D601	E-20	Q211	B-8
D602	E-19	Q251	B-6
D605	C-21	Q252	A-4
D606	E-21	Q261	B-8
D621	E-20	Q501	F-4
D622	E-20	Q502	C-5
D623	G-21	Q503	C-5
D624	F-22	Q504	E-2
D625	F-22	Q505	E-2
D626	G-22	Q506	C-5
D627	G-22	Q601	E-20
D801	J-9	Q603	E-20
D851	J-11	Q621	F-23
D900	A-24	Q622	F-23
D901	A-16	Q801	I-9
D902	C-17	Q802	H-9
D903	C-17	Q803	H-9
D911	B-14	Q851	I-11
D912	B-14	Q961	D-21
D913	B-14		
D914	B-14		
D951	D-22		
D952	D-21		
IC101	A-21		
IC201	C-7		
IC231	A-9		
IC501	D-4		
IC502	F-5		

Note:

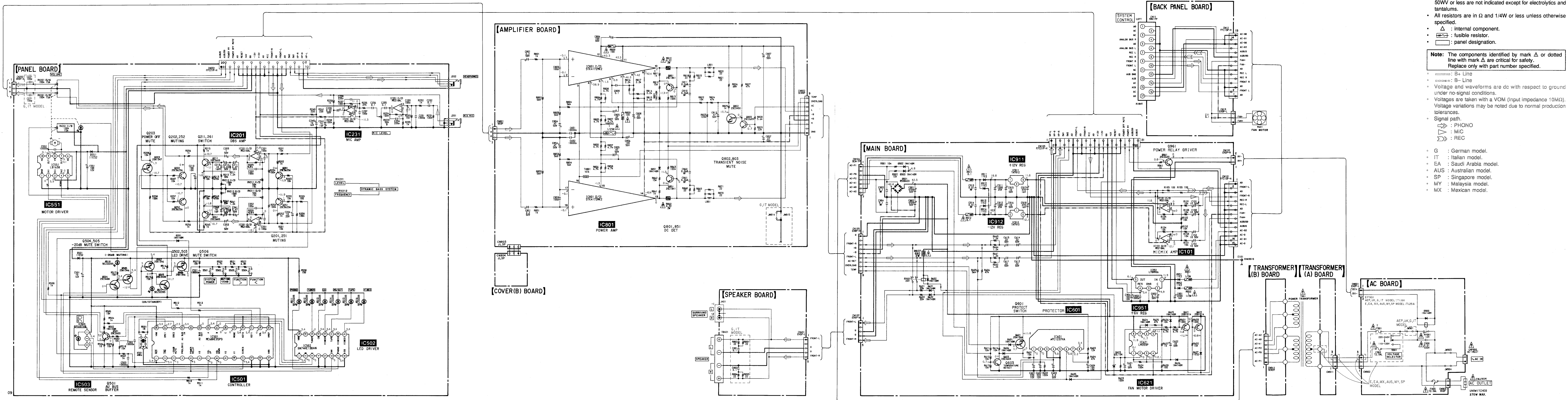
- : parts extracted from the component side.
- : indicates side identified with part number.
- : Pattern from the side which enable seeing.

- G : German model.
- IT : Italian model.
- EA : Saudi Arabia model.
- AUS : Australian model.
- SP : Singapore model.
- MY : Malaysia model.
- MX : Mexican model.



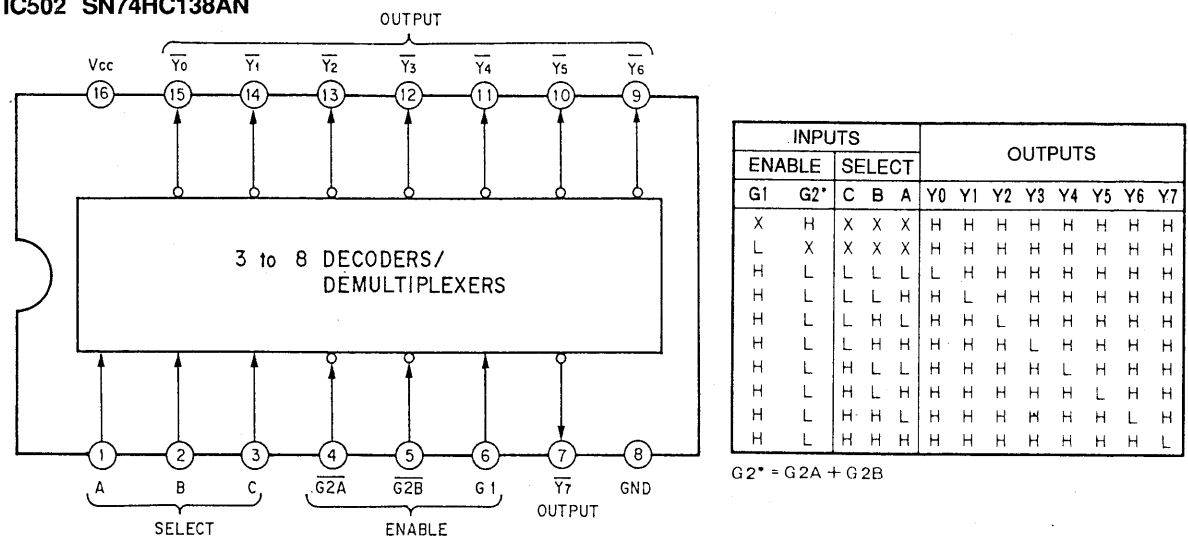
2-5. SCHEMATIC DIAGRAM

- See page 18, 19 for IC Block Diagrams.
- See page 20 for IC Pin Functions. (IC501)

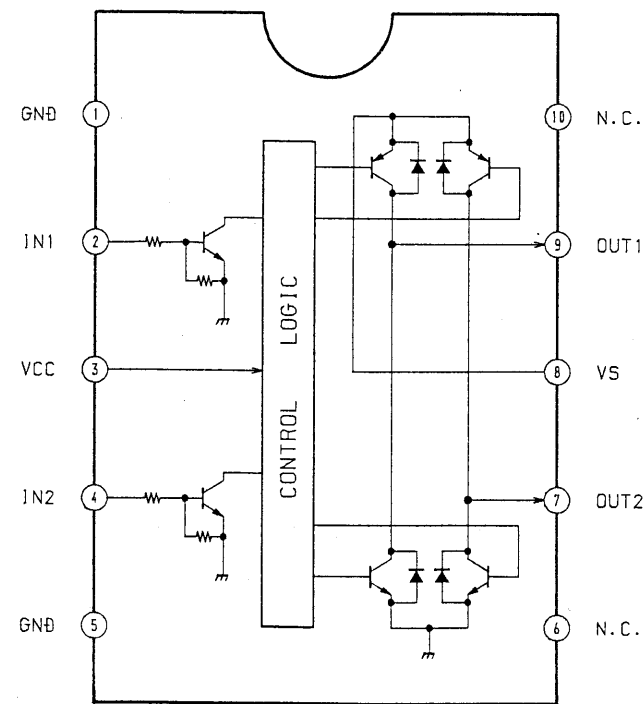


2-6. IC BLOCK DIAGRAMS

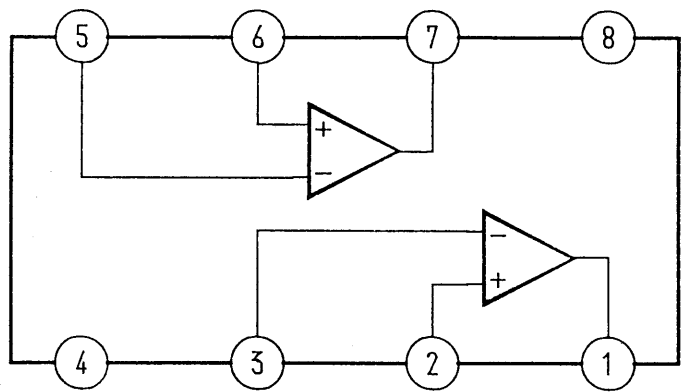
IC502 SN74HC138AN



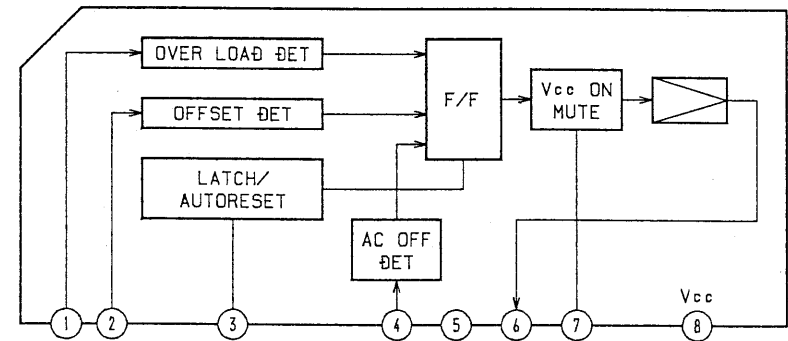
IC551 LB1638



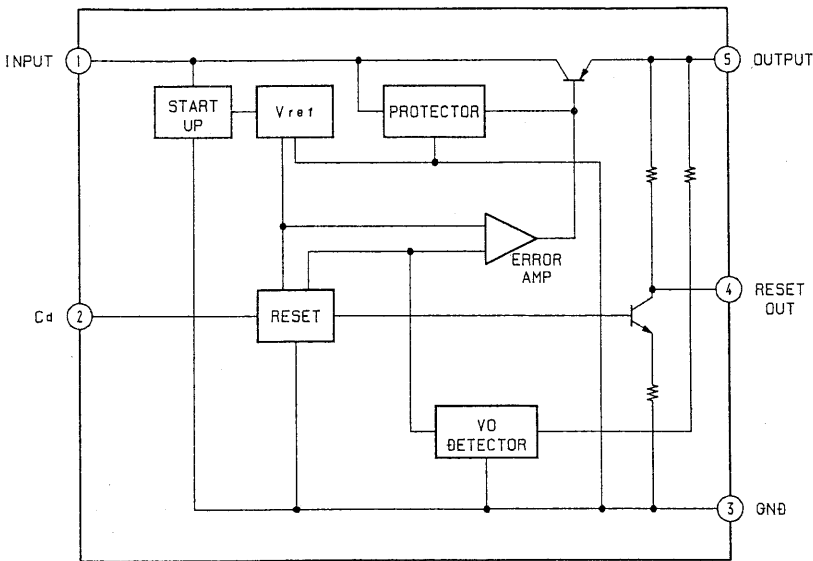
IC621 LM393P



IC601 µPC1237HA



IC951 L78MR06



2-7. IC PIN FUNCTIONS

- IC501 CONTROLLER (MC68HC05P9-SC405679B)

Pin No.	Pin Name	I/O	Function
1	RES	I	Reset input. Normally "H"
2	IRQ	I	Connected to RES
3	-20dB MUTE	O	Muting control. "H": Mute
4	PROLOGIC	O	Not used
5	POWER RELAY	O	Power relay control "H": ON
6	V3	O	Not used
7	VOL UP	O	Volume UP control output
8	VOL DOWN	O	Volume DOWN control output
9	V2	O	} Not used
10	V1	O	
11	SIRCS	I	SIRCS data input
12	—	—	} Not used
13	—	—	
14	VSS	—	GND
15	VREF	I	Reference voltage input +5V
16	VOL	I	Volume position detection input
17	KEY1	I	Key input
18	KEY2	I	Connected to +5V
19	MODE	I	Connected to GND
20	C	O	} Function control output *1
21	B	O	
22	A	O	
23	AU BUS OUT	O	Audio bus output
24	—	—	Not used
25	AU BUS IN	I	Audio bus input
26	OSC2	I	} System clock (4 MHz)
27	OSC1	O	
28	VDD	—	+5V

* 1

FUNCTION	FUNCTION CONTROL		
	A	B	C
PHONO	H	H	H
TUNER	H	L	L
CD	L	H	L
TAPE	L	L	H
MD/DAT	H	H	L
VIDEO	L	H	H

Note: All output ports should be set to "L" at power off.
After power on, all output ports should be set to "L" until the AU BUS inputs a signal.

SECTION 3 EXPLODED VIEWS

NOTE:

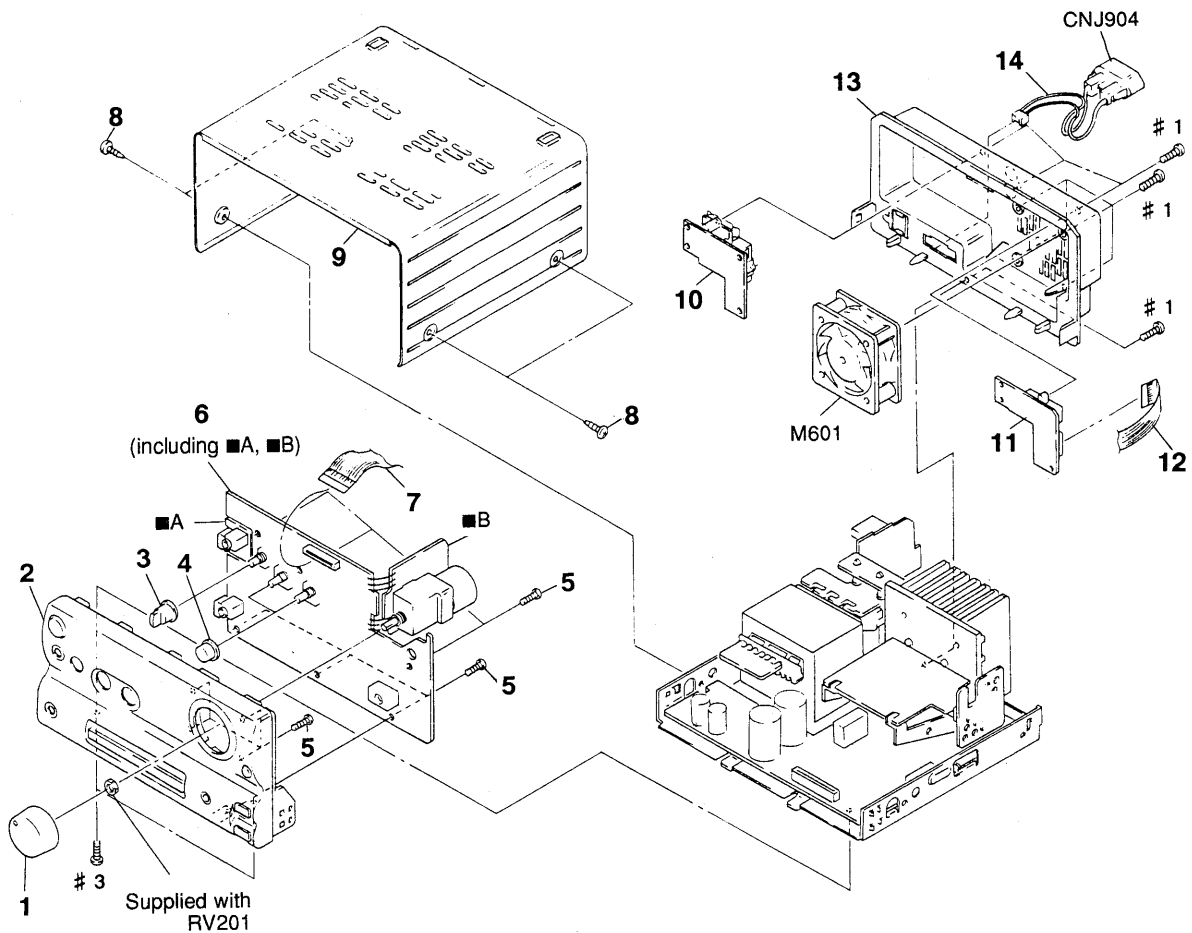
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- The mechanical parts with no reference number in the exploded views are not supplied.

• Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

- G ; German model
- IT ; Italian model
- EA ; Saudi Arabia model
- MX ; Mexican model
- AUS ; Australian model
- SP ; Singapore model
- MY ; Malaysia model

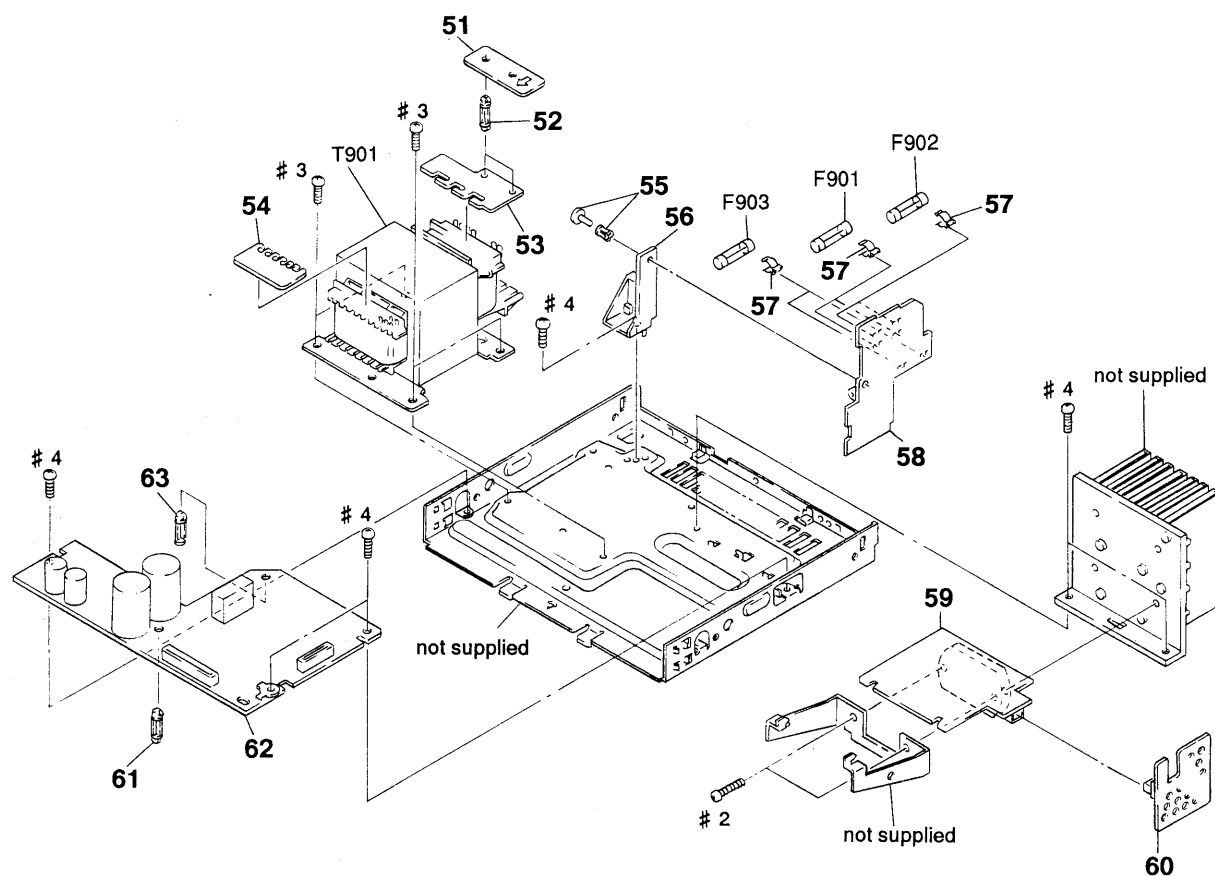
The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

3-1. FRONT PANEL AND REAR PANEL SECTION



Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
1	X-4944-094-1	KNOB (VOLUME) ASSY		8	3-363-099-21	SCREW (CASE 3 TP2)	
2	X-4944-647-1	PANEL ASSY, FRONT (AEP, UK, G, IT)		9	4-961-519-21	CASE	
3	X-4944-648-1	PANEL ASSY, FRONT (E, AUS, EA, MY, SP, MX)		* 10	1-651-460-11	SPEAKER BOARD	
4	4-961-911-11	KNOB (MICROPHONE)		* 11	1-651-461-11	BACK PANEL BOARD	
	4-961-912-01	KNOB (DBFB)					
5	4-951-620-01	SCREW (2.6X8), +BVTP		12	1-765-192-11	WIRE (FLAT TYPE) (15 CORE)	
* 6	A-4369-243-A	PANEL BOARD, COMPLETE (AEP)		* 13	4-954-256-81	PANEL, BACK (AEP, UK, G, IT)	
* 6	A-4369-244-A	PANEL BOARD, COMPLETE (UK)		* 13	4-954-256-91	PANEL, BACK (E, AUS, EA, MY, SP, MX)	
* 6	A-4369-245-A	PANEL BOARD, COMPLETE (G, IT)		14	1-751-216-31	LEAD (WITH CONNECTOR) (2 CORE)	
* 6	A-4369-249-A	PANEL BOARD, COMPLETE (E, AUS, EA, MY, SP, MX)		CNJ904	1-526-794-11	OUTLET, AC	
7	1-765-194-11	WIRE (FLAT TYPE) (21 CORE)		M601	1-541-953-11	MOTOR, DC FAN	

3-2. CHASSIS SECTION



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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* 51	1-651-464-11	COVER (A) BOARD		* 61	3-682-419-71	HOLDER, PCB	
* 52	4-385-948-01	HOLDER, PCB		* 62	A-4369-239-A	MAIN BOARD, COMPLETE (AEP)	
* 53	1-651-462-11	TRANSFORMER (A) BOARD		* 62	A-4369-240-A	MAIN BOARD, COMPLETE (UK)	
* 54	1-651-463-11	TRANSFORMER (B) BOARD		* 62	A-4369-241-A	MAIN BOARD, COMPLETE (G, IT)	
55	4-812-134-11	RIVET NYLON, 3.5		* 62	A-4369-242-A	MAIN BOARD, COMPLETE (E, AUS, EA, MY, SP, MX)	
* 56	4-954-242-01	BRACKET (IN)		* 63	3-669-610-00	SPACER	
57	1-533-293-11	FUSE HOLDER		 F901	1-532-259-00	FUSE (T1. 6A) (AEP, UK, G, IT)	
* 58	1-651-459-11	AC BOARD		 F901	1-532-285-00	FUSE (T1. 25A) (E, AUS, EA, MY, SP, MX)	
* 59	A-4369-250-A	AMPLIFIER BOARD, COMPLETE (AEP)		 F902	1-532-286-00	FUSE (T2. 5A) (E, AUS, EA, MY, SP, MX)	
* 59	A-4369-251-A	AMPLIFIER BOARD, COMPLETE (UK)		 F903	1-532-286-00	FUSE (T2. 5A)	
* 59	A-4369-252-A	AMPLIFIER BOARD, COMPLETE (G, IT)		 T901	1-426-683-11	TRANSFORMER, POWER (AEP, G, IT)	
* 59	A-4369-253-A	AMPLIFIER BOARD, COMPLETE (E, AUS, EA, MY, SP, MX)		 T901	1-426-684-11	TRANSFORMER, POWER (UK)	
* 60	1-651-465-11	COVER (B) BOARD		 T901	1-426-685-11	TRANSFORMER, POWER (E, AUS, EA, MY, SP, MX)	

SECTION 4 ELECTRICAL PARTS LIST

AC

AMPLIFIER

NOTE:

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

When indicating parts by reference number, please include the board 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.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- 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
- RESISTORS
All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F: nonflammable
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- G: German model
- IT: Italian model
- EA: Saudi Arabia model
- MX: Mexican model
- AUS: Australian model
- SP: Singapore model
- MY: Malaysia model

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
*	1-651-459-11	AC BOARD *****		*	A-4369-250-A	AMPLIFIER BOARD, COMPLETE (AEP) *****	
	1-533-293-11	FUSE HOLDER < CAPACITOR >		*	A-4369-251-A	AMPLIFIER BOARD, COMPLETE (UK) *****	
△C900	1-161-744-51	CERAMIC 0.01uF 400V < CONNECTOR >		*	A-4369-252-A	AMPLIFIER BOARD, COMPLETE (G, IT) *****	
CN901	1-564-517-11	PLUG, CONNECTOR 2P		*	A-4369-253-A	AMPLIFIER BOARD, COMPLETE ***** 	

AMPLIFIER
BACK PANEL
COVER (A)
COVER (B)

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
< IC >							
IC801	8-749-920-10	IC STK4172MK2		R856	1-249-425-11	CARBON 4.7K 5% 1/4W F	
< COIL >				R857	1-249-425-11	CARBON 4.7K 5% 1/4W F	
L801	1-420-872-00	COIL, AIR CORE		R858	1-249-425-11	CARBON 4.7K 5% 1/4W F	
L851	1-420-872-00	COIL, AIR CORE		△R859	1-212-881-11	FUSIBLE 100 5% 1/4W F	
< TRANSISTOR >				△R860	1-217-151-00	RES, METAL PLATE 0.22 2W	
Q801	8-729-140-84	TRANSISTOR 2SC1841-PAFAEA		R861	1-249-417-11	CARBON 1K 5% 1/4W F	
Q802	8-729-900-36	TRANSISTOR DTC124ES		R862	1-249-431-11	CARBON 15K 5% 1/4W	
Q803	8-729-620-05	TRANSISTOR 2SC2603-EF		R863	1-249-441-11	CARBON 100K 5% 1/4W	
Q851	8-729-140-84	TRANSISTOR 2SC1841-PAFAEA		R868	1-249-397-11	CARBON 22 5% 1/4W F	
< RESISTOR >				R869	1-249-397-11	CARBON 22 5% 1/4W F	
R801	1-249-417-11	CARBON 1K 5% 1/4W F		R870	1-249-397-11	CARBON 22 5% 1/4W F	
R802	1-249-438-11	CARBON 56K 5% 1/4W		R871	1-249-397-11	CARBON 22 5% 1/4W F	
R803	1-249-414-11	CARBON 560 5% 1/4W F		*****			
R804	1-249-438-11	CARBON 56K 5% 1/4W		*	1-651-461-11	BACK PANEL BOARD	
R805	1-249-425-11	CARBON 4.7K 5% 1/4W F				*****	
R806	1-249-425-11	CARBON 4.7K 5% 1/4W F		< CAPACITOR >			
R807	1-249-425-11	CARBON 4.7K 5% 1/4W F		C11	1-164-159-11	CERAMIC 0.1uF 50V	
R808	1-249-425-11	CARBON 4.7K 5% 1/4W F		< CONNECTOR >			
△R809	1-212-881-11	FUSIBLE 100 5% 1/4W F		* CN11	1-580-740-11	SOCKET, CONNECTOR 17P (SYSTEM CONTROL)	
△R810	1-217-151-00	RES, METAL PLATE 0.22 2W		* CN12	1-568-834-11	SOCKET, CONNECTOR 15P	
R811	1-249-417-11	CARBON 1K 5% 1/4W F		* CN13	1-564-518-11	PLUG, CONNECTOR 3P	
R812	1-249-431-11	CARBON 15K 5% 1/4W		*****			
R813	1-249-441-11	CARBON 100K 5% 1/4W		*	1-651-464-11	COVER (A) BOARD	
R814	1-249-421-11	CARBON 2.2K 5% 1/4W F				*****	
R815	1-249-421-11	CARBON 2.2K 5% 1/4W F		*****			
R816	1-249-421-11	CARBON 2.2K 5% 1/4W F		*	1-651-465-11	COVER (B) BOARD	
R817	1-249-421-11	CARBON 2.2K 5% 1/4W F				*****	
R818	1-249-397-11	CARBON 22 5% 1/4W F		< CONNECTOR >			
R819	1-249-397-11	CARBON 22 5% 1/4W F		CN804	1-569-490-11	SOCKET, CONNECTOR 3P	
R820	1-249-397-11	CARBON 22 5% 1/4W F		*****			
R821	1-249-397-11	CARBON 22 5% 1/4W F					
R822	1-249-429-11	CARBON 10K 5% 1/4W					
R823	1-247-881-00	CARBON 120K 5% 1/4W					
R824	1-249-437-11	CARBON 47K 5% 1/4W					
R825	1-249-417-11	CARBON 1K 5% 1/4W F					
R826	1-249-439-11	CARBON 68K 5% 1/4W					
R827	1-249-437-11	CARBON 47K 5% 1/4W					
R828	1-249-426-11	CARBON 5.6K 5% 1/4W					
R829	1-249-433-11	CARBON 22K 5% 1/4W					
△R830	1-212-934-00	RES, FUSE 1 5% 1/2W F					
R851	1-249-417-11	CARBON 1K 5% 1/4W F					
R852	1-249-438-11	CARBON 56K 5% 1/4W					
R853	1-249-414-11	CARBON 560 5% 1/4W F					
R854	1-249-438-11	CARBON 56K 5% 1/4W					
R855	1-249-425-11	CARBON 4.7K 5% 1/4W F					

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

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
*	A-4369-239-A	MAIN BOARD, COMPLETE (AEP) *****				< DIODE >	
*	A-4369-240-A	MAIN BOARD, COMPLETE (UK) *****		D601	8-719-987-63	DIODE 1N4148M	
*	A-4369-241-A	MAIN BOARD, COMPLETE (G, IT) *****		D602	8-719-987-63	DIODE 1N4148M	
*	A-4369-242-A	MAIN BOARD, COMPLETE (E, EA, MX, AUS, SP, MY) *****		D605	8-719-987-63	DIODE 1N4148M	
		< CAPACITOR >		D606	8-719-987-63	DIODE 1N4148M	
C101	1-124-907-11	ELECT 10uF 20% 50V		D621	8-719-987-63	DIODE 1N4148M	
C102	1-124-907-11	ELECT 10uF 20% 50V		D622	8-719-987-63	DIODE 1N4148M	
C151	1-124-907-11	ELECT 10uF 20% 50V		D623	8-719-001-91	DIODE UZL-15M	
C152	1-124-907-11	ELECT 10uF 20% 50V		D624	8-719-987-63	DIODE 1N4148M	
C601	1-126-176-11	ELECT 220uF 20% 10V		D625	8-719-987-63	DIODE 1N4148M	
C602	1-126-176-11	ELECT 220uF 20% 10V		D626	8-719-987-63	DIODE 1N4148M	
C603	1-124-925-11	ELECT 2.2uF 20% 100V		D627	8-719-200-82	DIODE 11ES2	
C604	1-124-443-00	ELECT 100uF 20% 10V		D901	8-719-510-68	DIODE D5SBA20F01	
C611	1-124-916-11	ELECT 22uF 20% 63V		D902	8-719-987-63	DIODE 1N4148M	
C612	1-124-916-11	ELECT 22uF 20% 63V		D903	8-719-987-63	DIODE 1N4148M	
C613	1-124-916-11	ELECT 22uF 20% 63V		D911	8-719-200-02	DIODE 10E2	
C614	1-124-916-11	ELECT 22uF 20% 63V		D912	8-719-200-02	DIODE 10E2	
C621	1-124-907-11	ELECT 10uF 20% 50V		D913	8-719-200-02	DIODE 10E2	
C622	1-124-907-11	ELECT 10uF 20% 50V		D914	8-719-200-02	DIODE 10E2	
C901	1-126-138-11	ELECT 4700uF 20% 50V		D951	8-719-200-02	DIODE 10E2	
C902	1-126-138-11	ELECT 4700uF 20% 50V		D952	8-719-200-02	DIODE 10E2	
C903	1-136-165-00	FILM 0.1uF 5% 50V				< GROUND PLATE >	
C904	1-136-165-00	FILM 0.1uF 5% 50V		* E101	4-942-204-01	PLATE, GROUND	
C911	1-124-557-11	ELECT 1000uF 20% 25V				< IC >	
C912	1-124-557-11	ELECT 1000uF 20% 25V		IC101	8-759-634-50	IC M5218AL	
C913	1-136-153-00	FILM 0.01uF 5% 50V		IC601	8-759-111-68	IC UPC1237HA	
C914	1-136-153-00	FILM 0.01uF 5% 50V		IC621	8-759-103-93	IC UPC393C	
C915	1-124-907-11	ELECT 10uF 20% 50V		IC911	8-759-094-64	IC TA7812S	
C916	1-124-907-11	ELECT 10uF 20% 50V		IC912	8-759-094-59	IC TA7912S	
C917	1-126-935-11	ELECT 470uF 20% 16V		IC951	8-759-820-13	IC L78MR06	
C918	1-126-935-11	ELECT 470uF 20% 16V				< TRANSISTOR >	
C951	1-126-768-11	ELECT 2200uF 20% 16V		Q601	8-729-900-63	TRANSISTOR DTA124ES	
C952	1-124-463-00	ELECT 0.1uF 20% 50V		Q603	8-729-620-05	TRANSISTOR 2SC2603-EF	
C953	1-162-294-31	CERAMIC 0.001uF 10% 50V		Q621	8-729-118-01	TRANSISTOR 2SB1116	
C954	1-124-443-00	ELECT 100uF 20% 10V		Q622	8-729-118-01	TRANSISTOR 2SB1116	
		< CONNECTOR >		Q961	8-729-620-05	TRANSISTOR 2SC2603-EF	
* CN101	1-568-834-11	SOCKET, CONNECTOR 15P				< RESISTOR >	
CN102	1-564-505-11	PLUG, CONNECTOR 2P		R101	1-249-429-11	CARBON 10K 5% 1/4W	
CN103	1-568-838-11	SOCKET, CONNECTOR 21P		R102	1-249-429-11	CARBON 10K 5% 1/4W	
CN105	1-691-770-11	PLUG (MICRO CONNECTOR) 8P		R103	1-249-429-11	CARBON 10K 5% 1/4W	
CN107	1-691-766-11	PLUG (MICRO CONNECTOR) 4P		R104	1-249-429-11	CARBON 10K 5% 1/4W	
				R105	1-247-807-31	CARBON 100 5% 1/4W	
				R151	1-249-429-11	CARBON 10K 5% 1/4W	
				R152	1-249-429-11	CARBON 10K 5% 1/4W	
				R153	1-249-429-11	CARBON 10K 5% 1/4W	
				R154	1-249-429-11	CARBON 10K 5% 1/4W	

MAIN

PANEL

Ref. No.	Part No.	Description	Remark
R155	1-247-807-31	CARBON	100 5% 1/4W
R601	1-249-429-11	CARBON	10K 5% 1/4W
R602	1-249-441-11	CARBON	100K 5% 1/4W
R603	1-249-430-11	CARBON	12K 5% 1/4W
R604	1-249-437-11	CARBON	47K 5% 1/4W
R605	1-249-438-11	CARBON	56K 5% 1/4W
R606	1-249-437-11	CARBON	47K 5% 1/4W
△R607	1-215-891-11	METAL OXIDE	680 5% 2W F
R611	1-249-429-11	CARBON	10K 5% 1/4W
R612	1-249-429-11	CARBON	10K 5% 1/4W
R613	1-249-429-11	CARBON	10K 5% 1/4W
R614	1-249-429-11	CARBON	10K 5% 1/4W
R621	1-249-435-11	CARBON	33K 5% 1/4W
R622	1-249-435-11	CARBON	33K 5% 1/4W
R623	1-249-441-11	CARBON	100K 5% 1/4W
R624	1-249-441-11	CARBON	100K 5% 1/4W
R625	1-249-437-11	CARBON	47K 5% 1/4W
R626	1-249-429-11	CARBON	10K 5% 1/4W
R627	1-249-417-11	CARBON	1K 5% 1/4W F
R628	1-247-807-31	CARBON	100 5% 1/4W
R629	1-249-425-11	CARBON	4.7K 5% 1/4W F
R630	1-249-425-11	CARBON	4.7K 5% 1/4W F
R631	1-249-441-11	CARBON	100K 5% 1/4W
R632	1-249-429-11	CARBON	10K 5% 1/4W
R633	1-249-441-11	CARBON	100K 5% 1/4W
R641	1-249-418-11	CARBON	1.2K 5% 1/4W F
R642	1-249-418-11	CARBON	1.2K 5% 1/4W F
R643	1-249-418-11	CARBON	1.2K 5% 1/4W F
R644	1-249-418-11	CARBON	1.2K 5% 1/4W F
R901	1-249-429-11	CARBON	10K 5% 1/4W
R902	1-249-429-11	CARBON	10K 5% 1/4W
△R911	1-219-134-11	FUSIBLE	0.1 10% 1/4W
△R912	1-219-134-11	FUSIBLE	0.1 10% 1/4W
△R951	1-212-934-00	FUSIBLE	1 5% 1/2W F
△R952	1-212-934-00	FUSIBLE	1 5% 1/2W F
R961	1-249-417-11	CARBON	1K 5% 1/4W F
< RELAY >			
RY601	1-515-920-11	RELAY (24V)	
< THERMISTOR >			
TH801	1-807-796-11	THERMISTOR	

Ref. No.	Part No.	Description	Remark
*	A-4369-243-A	PANEL BOARD, COMPLETE (AEP)	*****
*	A-4369-244-A	PANEL BOARD, COMPLETE (UK)	*****
*	A-4369-245-A	PANEL BOARD, COMPLETE (G, IT)	*****
*	A-4369-249-A	PANEL BOARD, COMPLETE (E, EA, MX, AUS, SP, MY)	*****
< CAPACITOR >			
C201	1-162-282-31	CERAMIC	100PF 10% 50V
C202	1-162-282-31	CERAMIC	100PF 10% 50V
C203	1-126-301-11	ELECT	1uF 20% 50V
C204	1-126-096-11	ELECT	10uF 20% 35V
C210	1-124-443-00	ELECT	100uF 20% 10V
C211	1-124-465-00	ELECT	0.47uF 20% 50V
C212	1-124-464-11	ELECT	0.22uF 20% 50V
C213	1-126-157-11	ELECT	10uF 20% 16V
C221	1-162-282-31	CERAMIC	100PF 10% 50V (G, IT)
C231	1-162-294-31	CERAMIC	0.001uF 10% 50V
C232	1-164-159-11	CERAMIC	0.1uF 50V
C233	1-162-282-31	CERAMIC	100PF 10% 50V
C234	1-162-286-31	CERAMIC	220PF 10% 50V
C235	1-164-159-11	CERAMIC	0.1uF 50V
C236	1-164-159-11	CERAMIC	0.1uF 50V
C237	1-162-282-31	CERAMIC	100PF 10% 50V
C238	1-162-286-31	CERAMIC	220PF 10% 50V
C239	1-124-464-11	ELECT	0.22uF 20% 50V
C240	1-126-157-11	ELECT	10uF 20% 16V
C241	1-126-157-11	ELECT	10uF 20% 16V
C251	1-162-282-31	CERAMIC	100PF 10% 50V
C252	1-162-282-31	CERAMIC	100PF 10% 50V
C253	1-126-301-11	ELECT	1uF 20% 50V
C261	1-124-465-00	ELECT	0.47uF 20% 50V
C262	1-124-464-11	ELECT	0.22uF 20% 50V
C263	1-126-157-11	ELECT	10uF 20% 16V
C271	1-162-282-31	CERAMIC	100PF 10% 50V (G, IT)
C501	1-126-157-11	ELECT	10uF 20% 16V
C502	1-161-379-00	CERAMIC	0.01uF 20% 25V
C503	1-161-379-00	CERAMIC	0.01uF 20% 25V
C521	1-161-379-00	CERAMIC	0.01uF 20% 25V
C551	1-124-443-00	ELECT	100uF 20% 10V
C552	1-161-379-00	CERAMIC	0.01uF 20% 25V
< CONNECTOR >			
CN201	1-568-838-11	SOCKET, CONNECTOR 21P	
* CN202	1-564-337-00	PIN, CONNECTOR 3P	

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

PANEL

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
< DIODE >				R208	1-249-429-11	CARBON	10K 5% 1/4W
D201	8-719-987-63	DIODE 1N4148M		R209	1-247-807-31	CARBON	100 5% 1/4W
D501	8-719-200-82	DIODE 11ES2		R211	1-249-418-11	CARBON	1.2K 5% 1/4W F
D502	8-719-987-63	DIODE 1N4148M		R212	1-249-435-11	CARBON	33K 5% 1/4W
D511	8-719-032-83	DIODE SEL5220S (PHONO)		R213	1-247-895-00	CARBON	470K 5% 1/4W
D512	8-719-032-83	DIODE SEL5220S (TUNER)		R214	1-249-429-11	CARBON	10K 5% 1/4W
D513	8-719-032-83	DIODE SEL5220S (CD)		R215	1-249-417-11	CARBON	1K 5% 1/4W F
D514	8-719-032-83	DIODE SEL5220S (MD/DAT)		R231	1-249-441-11	CARBON	100K 5% 1/4W
D515	8-719-032-83	DIODE SEL5220S (TAPE)		R232	1-249-417-11	CARBON	1K 5% 1/4W F
D516	8-719-032-83	DIODE SEL5220S (VIDEO)		R233	1-249-431-11	CARBON	15K 5% 1/4W
D517	8-719-032-83	DIODE SEL5220S (ON/STANDBY)		R234	1-249-441-11	CARBON	100K 5% 1/4W
D518	8-719-032-83	DIODE SEL5220S (-20dB MUTE)		R235	1-249-417-11	CARBON	1K 5% 1/4W F
D551	8-719-200-82	DIODE 11ES2		R236	1-249-434-11	CARBON	27K 5% 1/4W
< IC >				R237	1-249-441-11	CARBON	100K 5% 1/4W
IC201	8-759-634-50	IC M5218AL		R238	1-249-441-11	CARBON	100K 5% 1/4W
IC231	8-759-634-50	IC M5218AL		R239	1-249-417-11	CARBON	1K 5% 1/4W F
IC501	8-759-192-72	IC MC68HC05P9-SC405679B		R240	1-249-409-11	CARBON	220 5% 1/4W F
IC502	8-759-917-43	IC SN74HC138AN		R241	1-249-409-11	CARBON	220 5% 1/4W F
IC503	8-749-923-43	IC GP1U57XB		R251	1-249-429-11	CARBON	10K 5% 1/4W
IC551	8-759-184-40	IC LB1638		R252	1-249-417-11	CARBON	1K 5% 1/4W F
< JACK >				R253	1-249-429-11	CARBON	10K 5% 1/4W
J201	1-764-106-11	JACK (MIX MIC)		R254	1-249-441-11	CARBON	100K 5% 1/4W
J202	1-764-106-11	JACK (HEADPHONES)		R255	1-249-427-11	CARBON	6.8K 5% 1/4W F
< TRANSISTOR >				R256	1-249-417-11	CARBON	1K 5% 1/4W F
Q201	8-729-141-30	TRANSISTOR 2SC3623A-LK		R257	1-249-429-11	CARBON	10K 5% 1/4W
Q202	8-729-141-30	TRANSISTOR 2SC3623A-LK		R258	1-249-441-11	CARBON	100K 5% 1/4W
Q203	8-729-900-69	TRANSISTOR DTA144WS		R259	1-249-441-11	CARBON	100K 5% 1/4W
Q211	8-729-620-05	TRANSISTOR 2SC2603-EF		R261	1-249-418-11	CARBON	1.2K 5% 1/4W F
Q251	8-729-141-30	TRANSISTOR 2SC3623A-LK		R262	1-249-435-11	CARBON	33K 5% 1/4W
Q252	8-729-141-30	TRANSISTOR 2SC3623A-LK		R263	1-247-895-00	CARBON	470K 5% 1/4W
Q261	8-729-620-05	TRANSISTOR 2SC2603-EF		R264	1-249-429-11	CARBON	10K 5% 1/4W
Q501	8-729-620-05	TRANSISTOR 2SC2603-EF		R265	1-249-417-11	CARBON	1K 5% 1/4W F
Q502	8-729-900-63	TRANSISTOR DTA124ES		R501	1-247-903-00	CARBON	1M 5% 1/4W
Q503	8-729-900-36	TRANSISTOR DTC124ES		R502	1-249-429-11	CARBON	10K 5% 1/4W
Q504	8-729-900-36	TRANSISTOR DTC124ES		R503	1-249-429-11	CARBON	10K 5% 1/4W
Q505	8-729-900-63	TRANSISTOR DTA124ES		R504	1-249-417-11	CARBON	1K 5% 1/4W F
Q506	8-729-900-63	TRANSISTOR DTA124ES		R505	1-249-429-11	CARBON	10K 5% 1/4W
< RESISTOR >				R506	1-249-393-11	CARBON	10 5% 1/4W F
R201	1-249-429-11	CARBON	10K 5% 1/4W	R507	1-249-417-11	CARBON	1K 5% 1/4W F
R202	1-249-417-11	CARBON	1K 5% 1/4W F	R508	1-249-417-11	CARBON	1K 5% 1/4W F
R203	1-249-429-11	CARBON	10K 5% 1/4W	R510	1-249-417-11	CARBON	1K 5% 1/4W F
R204	1-249-441-11	CARBON	100K 5% 1/4W	R511	1-249-417-11	CARBON	1K 5% 1/4W F
R205	1-249-427-11	CARBON	6.8K 5% 1/4W F	R512	1-249-417-11	CARBON	1K 5% 1/4W F
R206	1-249-417-11	CARBON	1K 5% 1/4W F	R513	1-249-417-11	CARBON	1K 5% 1/4W F
R207	1-249-429-11	CARBON	10K 5% 1/4W	R515	1-247-811-31	CARBON	150 5% 1/4W
				R516	1-249-417-11	CARBON	1K 5% 1/4W F
				R517	1-247-811-31	CARBON	150 5% 1/4W
				R518	1-249-429-11	CARBON	10K 5% 1/4W
				R520	1-249-422-11	CARBON	2.7K 5% 1/4W F
				R521	1-249-424-11	CARBON	3.9K 5% 1/4W F

PANEL	SPEAKER	TRANSFORMER (A)	TRANSFORMER (B)
--------------	----------------	------------------------	------------------------

Ref.No.	Part No.	Description	Remark
R522	1-249-427-11	CARBON 6.8K 5% 1/4W F	
R527	1-249-429-11	CARBON 10K 5% 1/4W	
R530	1-247-811-31	CARBON 150 5% 1/4W	
< VARIABLE RESISTOR >			
RV201	1-223-200-11	RES, VAR, CARBON 10K/100K/100K (VOLUME)	
RV211	1-223-336-11	RES, VAR, CARBON 50K/50K (LEVEL)	
RV212	1-223-201-11	RES, VAR, CARBON 100K/100K (FREQUENCY)	
RV231	1-241-813-11	RES, VAR, CARBON 50K (MIC LEVEL)	
< SWITCH >			
S501	1-572-184-11	SWITCH, KEYBOARD (SYSTEM POWER)	
S502	1-572-184-11	SWITCH, KEYBOARD (-20dB MUTING)	
S503	1-572-184-11	SWITCH, KEYBOARD (FUNCTION >)	
S504	1-572-184-11	SWITCH, KEYBOARD (FUNCTION <)	
< VIBRATOR >			
X501	1-577-358-21	VIBRATOR, CERAMIC (4MHz)	

*	1-651-460-11	SPEAKER BOARD	

< CAPACITOR >			
C891	1-164-159-11	CERAMIC 0.1uF 50V (G, IT)	
C892	1-164-159-11	CERAMIC 0.1uF 50V (G, IT)	
< CONNECTOR >			
* CN401	1-564-520-11	PLUG, CONNECTOR 5P	
< JACK >			
J401	1-568-572-11	JACK, PIN 2P (SURROUND SPEAKER)	
< RESISTOR >			
R891	1-249-397-11	CARBON 22 5% 1/4W F (G, IT)	
R892	1-249-397-11	CARBON 22 5% 1/4W F (G, IT)	
R893	1-249-397-11	CARBON 22 5% 1/4W F (G, IT)	
R894	1-249-397-11	CARBON 22 5% 1/4W F (G, IT)	
< TERMINAL >			
TB401	1-537-445-11	TERMINAL BOARD (SP) (SPEAKER)	

Ref.No.	Part No.	Description	Remark
*	1-651-462-11	TRANSFORMER (A) BOARD	

*	1-651-463-11	TRANSFORMER (B) BOARD	

MISCELLANEOUS			

7	1-765-194-11	WIRE (FLAT TYPE) (21 CORE)	
12	1-765-192-11	WIRE (FLAT TYPE) (15 CORE)	
14	1-751-216-31	LEAD (WITH CONNECTOR) (2 CORE)	
△CNJ904	1-526-794-11	OUTLET, AC	
△F901	1-532-259-00	FUSE (T1. 6A) (AEP, UK, G, IT)	
△F901	1-532-285-00	FUSE (T1. 25A) (E, AUS, EA, MY, SP, MX)	
△F902	1-532-286-00	FUSE (T2. 5A) (E, AUS, EA, MY, SP, MX)	
△F903	1-532-286-00	FUSE (T2. 5A)	
M601	1-541-953-11	MOTOR, DC FAN	
△T901	1-426-683-11	TRANSFORMER, POWER (AEP, G, IT)	
△T901	1-426-684-11	TRANSFORMER, POWER (UK)	
△T901	1-426-685-11	TRANSFORMER, POWER (E, AUS, EA, MY, SP, MX)	

HARDWARE LIST			

#1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
#2	7-685-650-79	SCREW +BVTP 3X16 TYPE2 IT-3	
#3	7-682-547-09	SCREW +BVTT 3X6 (S)	
#4	7-682-548-04	SCREW +BVTT 3X8 (S)	

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