

TA-EX7

SERVICE MANUAL

AEP Model
UK Model



This set is the amplifier section in MHC-EX7.

SPECIFICATIONS

Integrated stereo amplifier

60 W + 60 W (6 ohms,
at 1 kHz, DIN)

Continuous RMS power output
70 W + 70 W (6 ohms,
at 1 kHz, 5% THD)

Music power output
140 W + 140 W (6 ohms
at 1 kHz, 10% THD)

Inputs

CD (phono jacks):
MD/DAT (phono jacks):
sensitivity 450 mV,
impedance 47 kilohms

TUNER (phono jacks):
AUX/VIDEO (phono jacks):
TAPE1 (phono jacks):
TAPE2 (phono jacks):
sensitivity 250 mV,
impedance 47 kilohms

Outputs

MD/DAT (phono jacks):
voltage 250 mV
impedance 1 kilohm

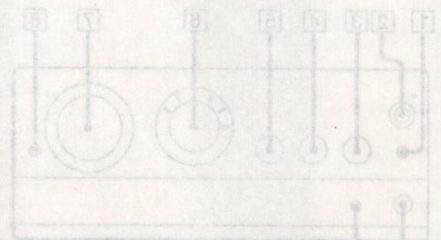
HEADPHONES (stereo phone jack):
accepts headphones of 8 ohms
or more

TAPE1 (phono jacks):
TAPE2 (phono jacks):
voltage 250mV
impedance 1 kilohm

Dimensions

Approx. 280 x 125 x 315 mm (w/h/d)
(11 1/8 x 5 x 12 1/2 inches)

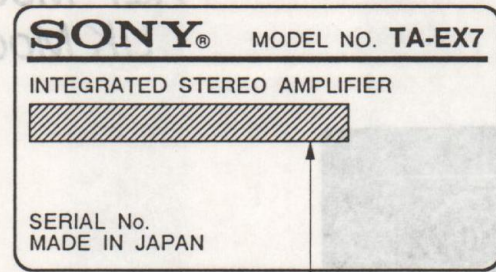
Mass Approx. 6.5 kg
(14 lb 6 oz)



INTEGRATED STEREO AMPLIFIER
SONY

SECTION 2 ELECTRICAL ADJUSTMENT

MODEL IDENTIFICATION — Model Number Portion —



AEP Model: AC 220 – 230 V ~50/60 Hz 170 W
 UK Model: AC 220 – 230 V ~50 Hz
 German, Italian Model: AC 220 – 230 V ~50 Hz 170 W

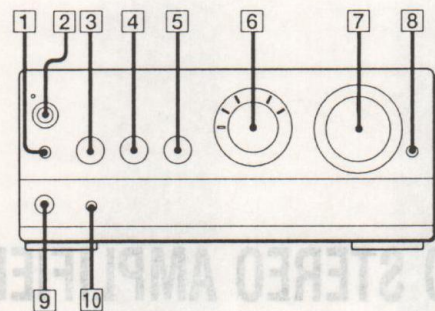
Section	Title	Page
1.	GENERAL	2
2.	ELECTRICAL ADJUSTMENT	3
3.	DIAGRAMS	
3-1.	IC Pin Function Description	4
3-2.	Block Diagram	6
3-3.	Printed Wiring Boards	9
3-4.	Schematic Diagram	13
4.	EXPLODED VIEWS	17
5.	ELECTRICAL PARTS LIST	19

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK **▲** OR DOTTED LINE WITH MARK **▲** ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1 GENERAL

This section is extracted from instruction manual.



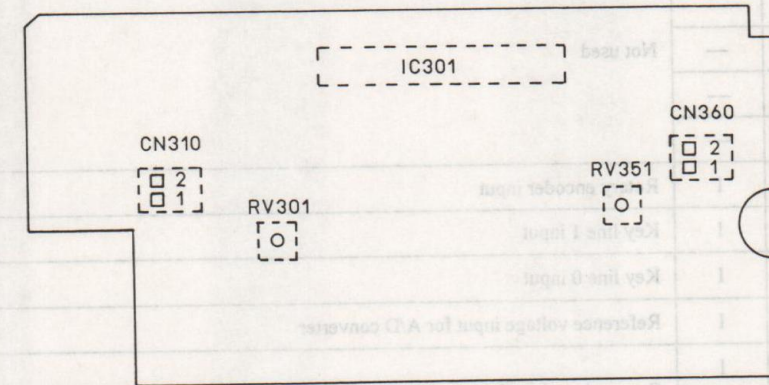
- | | |
|---|---|
| <ul style="list-style-type: none"> 1 Remote sensor 2 SYSTEM POWER switch and ON/STANDBY indicator (7)
The indicator remains lit as long as the AC power cord is connected to a wall outlet. 3 BASS control (20) 4 TREBLE control (20) 5 BALANCE control (20) | <ul style="list-style-type: none"> 6 FUNCTION control* (19, 23)
TAPE 1 (23)
TAPE 2 (23)
MD/DAT (23)
AUX/VIDEO (24)
CD (15)
TUNER (19) 7 VOLUME control (5, 7, 20) 8 MUTING button* (20) 9 HEADPHONES jack (20, 23) 10 SOURCE DIRECT button* (20) |
|---|---|

Idling Current Adjustment

1. Select the source voltage 230 V, and place the set power supply in standby status.
2. Connect a digital voltmeter to the CN310 and CN360 on the POWER AMPLIFIER board. (1P: - side, 2P: +side)
3. Rotate fully counterclockwise the RV301 and RV351 on the POWER AMPLIFIER board. (from pattern side).
4. Turn the set power supply on. (Press the SYSTEM POWER switch)
5. Adjust the RV301 (from pattern side) so that the voltmeter connected to the CN310 indicates 8.0 ± 0.1 mV.
* Adjustment should be completed within 5 seconds after the power on.
6. Adjust the RV351 (from pattern side) so that the voltmeter connected to the CN360 indicates 8.5 ± 0.1 mV.
* Adjustment should be completed within 5 seconds after the adjustment of RV301.
7. The voltage will be stabilized about 6 minutes after the adjustment of RV351. At this time, confirm that the voltmeter reading is 11 to 13 mV.

Adjustment Location:

— POWER AMPLIFIER BOARD — (Conductor side)



SECTION 3

ELECTRIC DIAGRAMS

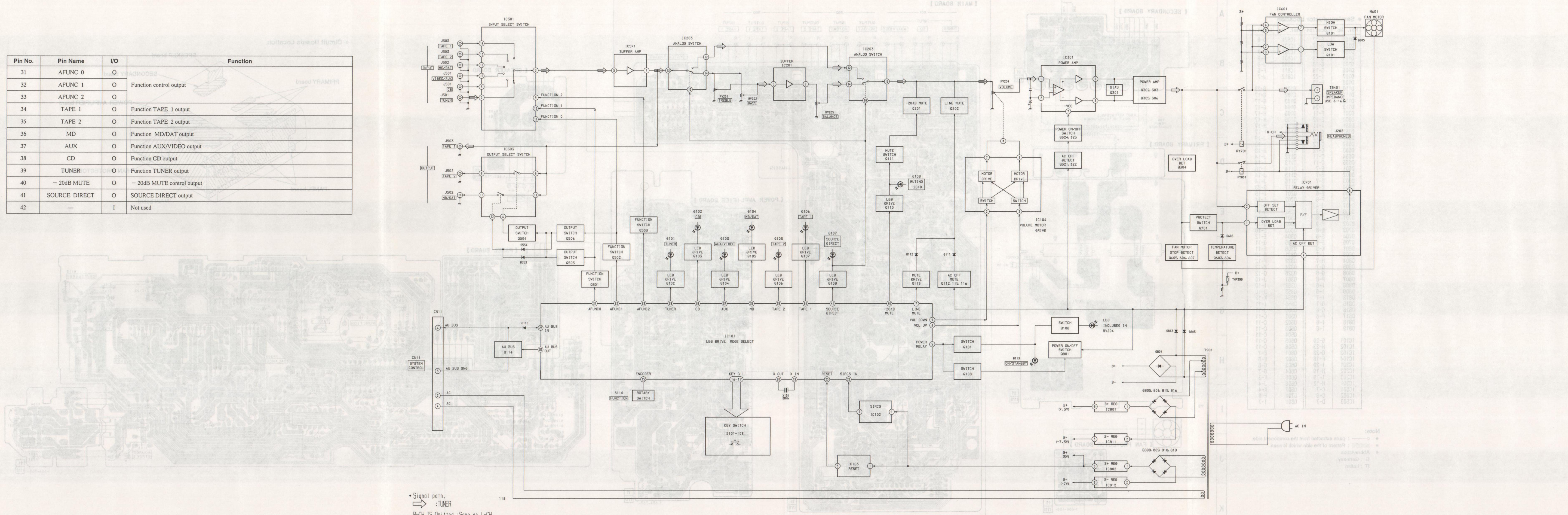
3-1. IC PIN FUNCTION DESCRIPTION

MAIN BOARD IC101 M37471M2-281SP (Key Control, LED Drive)

Pin No.	Pin Name	I/O	Function
1	—	—	Not used
2	—	—	
3	—	—	
4	—	—	
5	POWER RELAY	O	Power relay control output
6	SP RELAY	I	Not used
7	LINE MUTE	O	Line mute control output
8	VOL UP	O	Volume up output
9	VOL DOWN	O	Volume down output
10	—	—	Not used
11	—	—	
12	—	—	
13	—	—	
14	—	—	
15	ENCODER	I	Rotary encoder input
16	KEY 1	I	Key line 1 input
17	KEY 0	I	Key line 0 input
18	V REF	I	Reference voltage input for A/D converter
19	X IN	I	Connecting pins of the ceramic oscillator
20	X OUT	O	
21	VSS	—	Ground
22	VCC	—	+5 V
23	MODEL	I	"H" E model "L" except E model
24	—	I	Not used
25	$\overline{\text{RESET}}$	I	System reset input
26	—	I	Not used
27	AU BUS IN	I	AU BUS input
28	SIRCS IN	I	SIRCS input
29	—	I	Not used
30	AU BUS OUT	O	AU BUS output

3-2. BLOCK DIAGRAM

Pin No.	Pin Name	I/O	Function
31	AFUNC 0	O	Function control output
32	AFUNC 1	O	
33	AFUNC 2	O	
34	TAPE 1	O	Function TAPE 1 output
35	TAPE 2	O	Function TAPE 2 output
36	MD	O	Function MD/DAT output
37	AUX	O	Function AUX/VIDEO output
38	CD	O	Function CD output
39	TUNER	O	Function TUNER output
40	-20dB MUTE	O	-20dB MUTE control output
41	SOURCE DIRECT	O	SOURCE DIRECT output
42	—	I	Not used



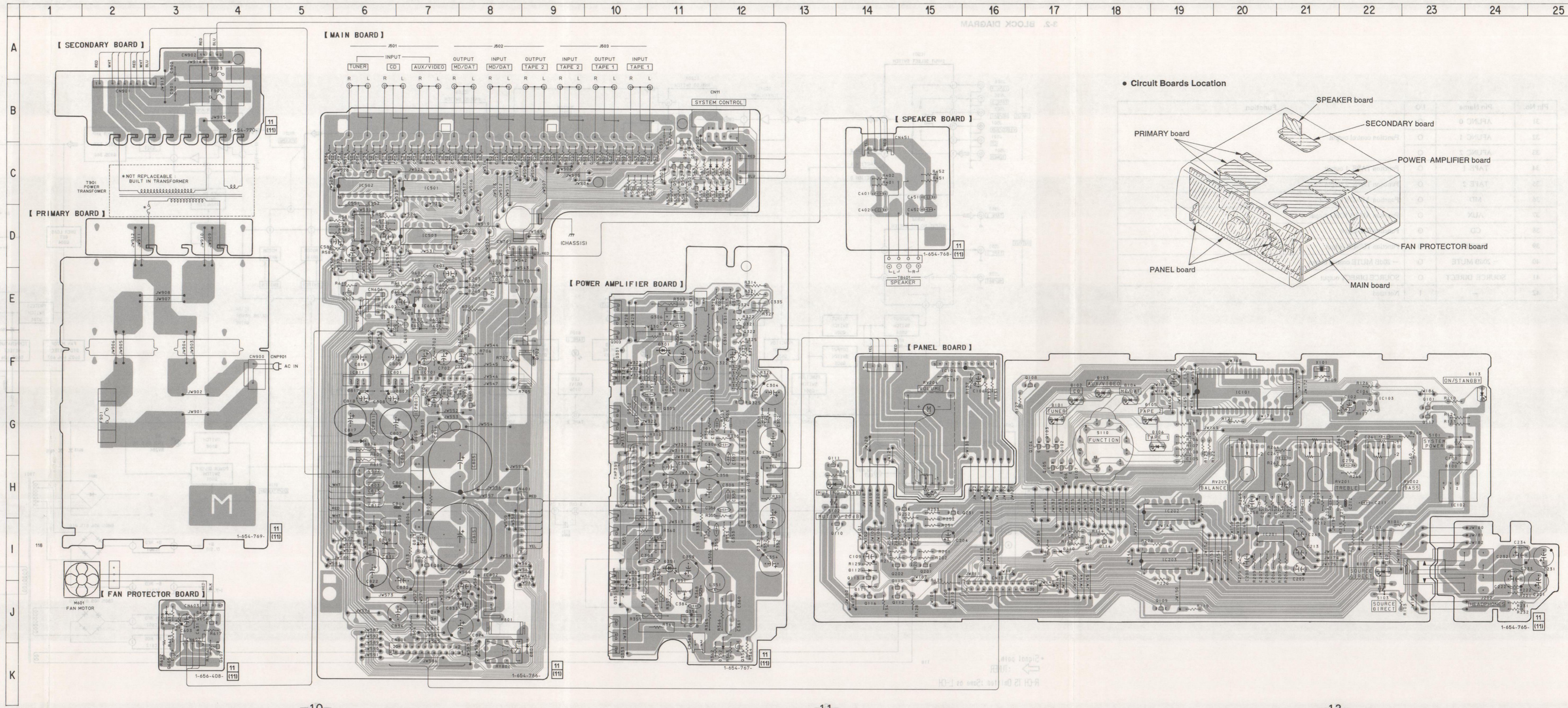
• Signal path.
 → : TUNER
 R-CH TS Omitted : Same as L-CH

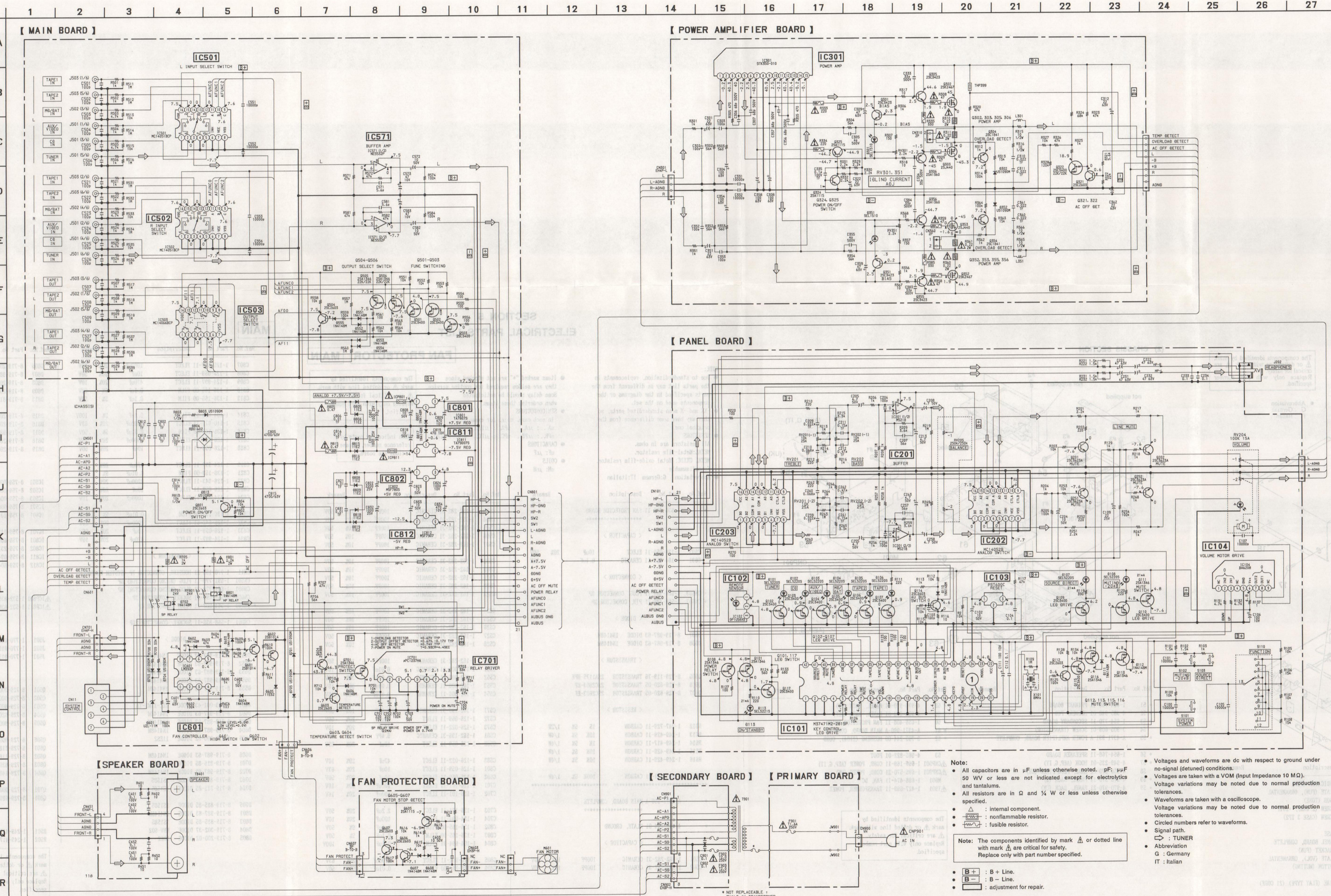
3-3. PRINTED WIRING BOARDS

• Semiconductor Location

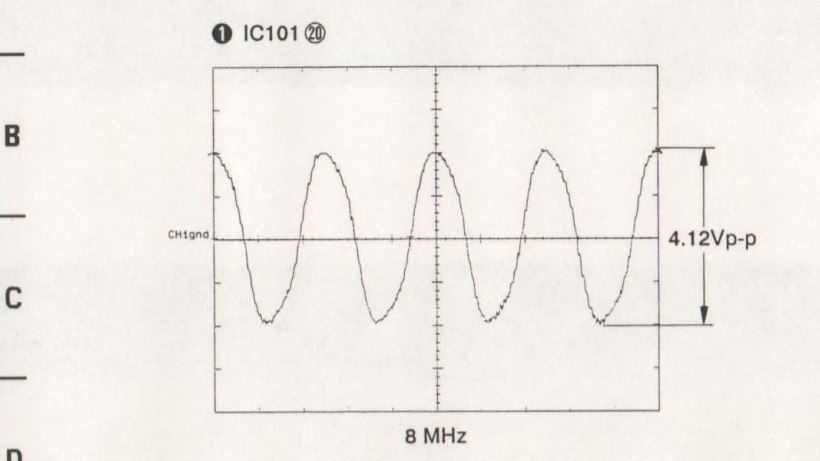
Ref. No.	Location	Ref. No.	Location
D101	G-17	IC571	D-6
D102	G-17	IC601	F-7
D103	G-18	IC701	F-7
D104	G-18	IC801	F-6
D105	G-18	IC802	J-8
D106	G-19	IC811	F-6
D107	I-22	IC812	F-7
D108	H-13		
D110	I-17	Q101	G-23
D111	J-14	Q102	G-17
D112	I-14	Q103	G-17
D113	F-24	Q104	G-17
D301	F-11	Q105	H-17
D302	E-12	Q106	H-17
D351	I-11	Q107	H-17
D352	K-12	Q108	F-17
D551	C-12	Q109	J-19
D552	C-12	Q110	I-13
D553	C-12	Q111	H-13
D554	C-11	Q112	J-14
D555	C-11	Q113	I-14
D601	F-7	Q114	I-18
D602	F-7	Q115	J-14
D603	F-7	Q116	J-14
D604	F-7	Q117	G-23
D605	F-6	Q201	I-15
D606	F-8	Q202	I-14
D607	J-4	Q251	H-15
D608	J-3	Q252	H-15
D701	F-8	Q301	F-10
D702	F-9	Q302	G-10
D703	F-8	Q303	F-10
D704	F-8	Q304	F-12
D705	F-8	Q305	G-11
D801	K-9	Q306	F-11
D803	I-7	Q321	F-12
D804	H-7	Q322	F-12
D805	G-7	Q324	E-12
D806	G-6	Q325	G-12
D807	F-6	Q351	J-10
D808	I-6	Q352	I-10
D809	I-6	Q353	J-10
D813	I-7	Q354	K-12
D815	G-7	Q355	I-11
D816	G-6	Q356	J-11
D817	F-6	Q501	C-11
D818	I-6	Q502	C-11
D819	I-6	Q503	C-11
		Q504	C-11
IC101	G-20	Q505	C-11
IC102	H-23	Q506	C-11
IC103	G-22	Q601	E-7
IC104	F-16	Q602	F-6
IC201	I-20	Q603	G-8
IC202	H-19	Q604	G-7
IC203	I-19	Q605	K-3
IC301	H-12	Q606	J-4
IC501	C-7	Q607	K-4
IC502	C-6	Q701	E-8
IC503	D-7	Q801	I-7

Note:
 • — : parts extracted from the component side.
 • — : Pattern of the side which is seen.
 • Abbreviation
 G : Germany
 IT : Italian

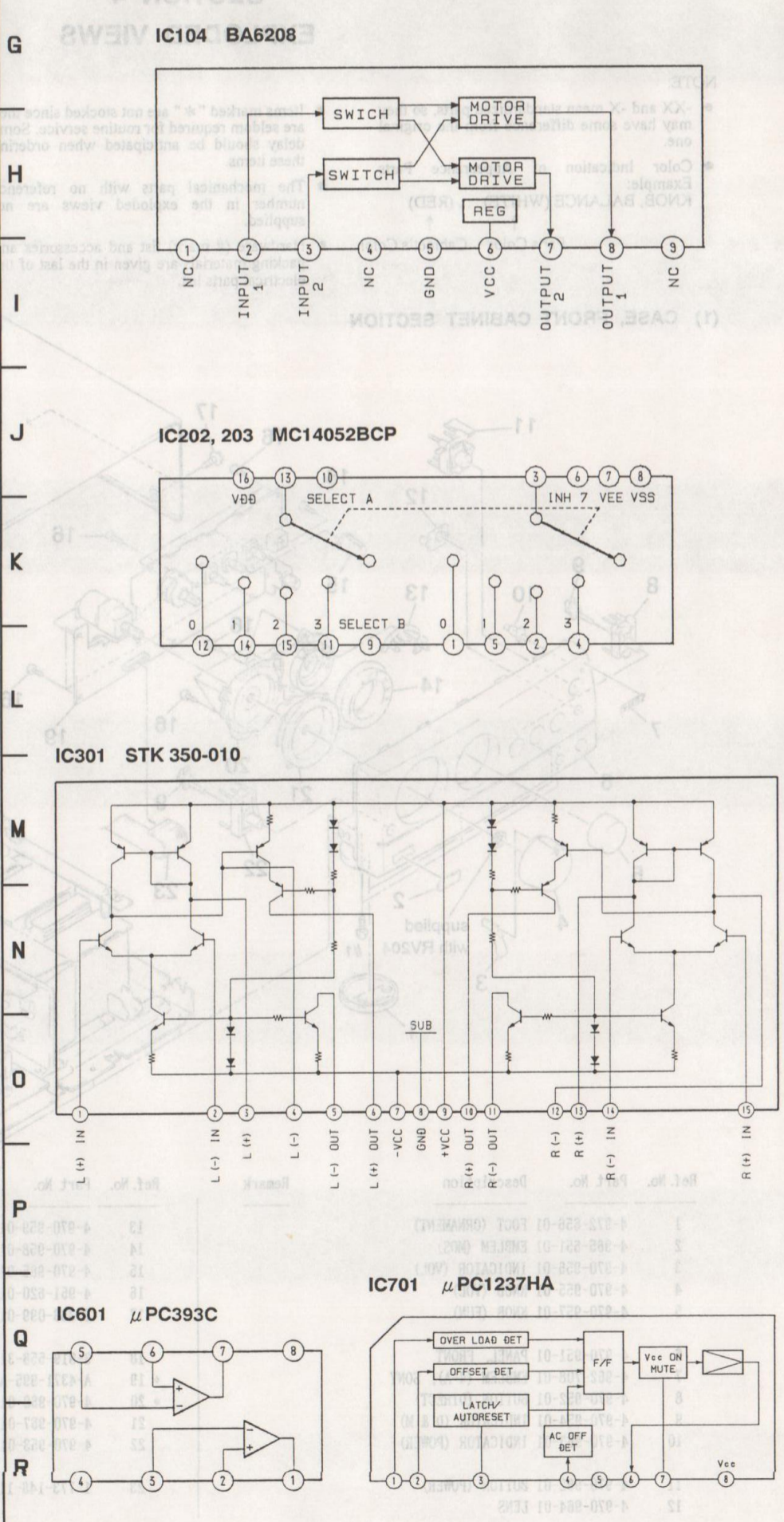




• Waveform



• IC Block Diagrams



Note:

- All capacitors are in μF unless otherwise noted. pF: 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.
- \square : internal component.
- \square : nonflammable resistor.
- \square : fusible resistor.

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

- $\text{B}+$: B + Line.
- $\text{B}-$: B - Line.
- \square : adjustment for repair.

SECTION 4 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.
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 the electrical parts list.

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

- Abbreviation
G : German
IT : Italian

(1) CASE, FRONT CABINET SECTION

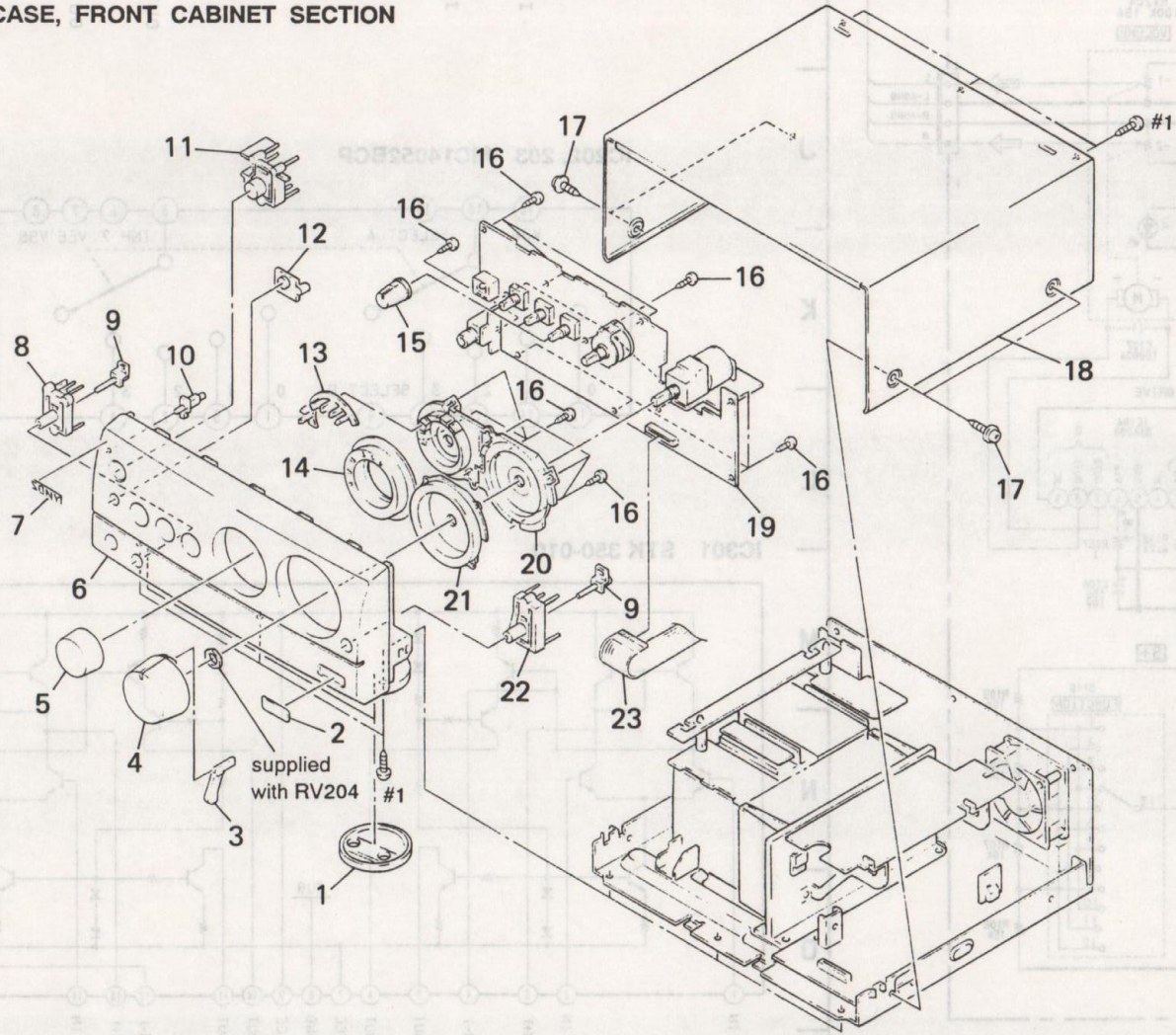


Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 1 through 12 for the front cabinet section.

Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 13 through 23 for the front cabinet section.

(2) CHASSIS SECTION

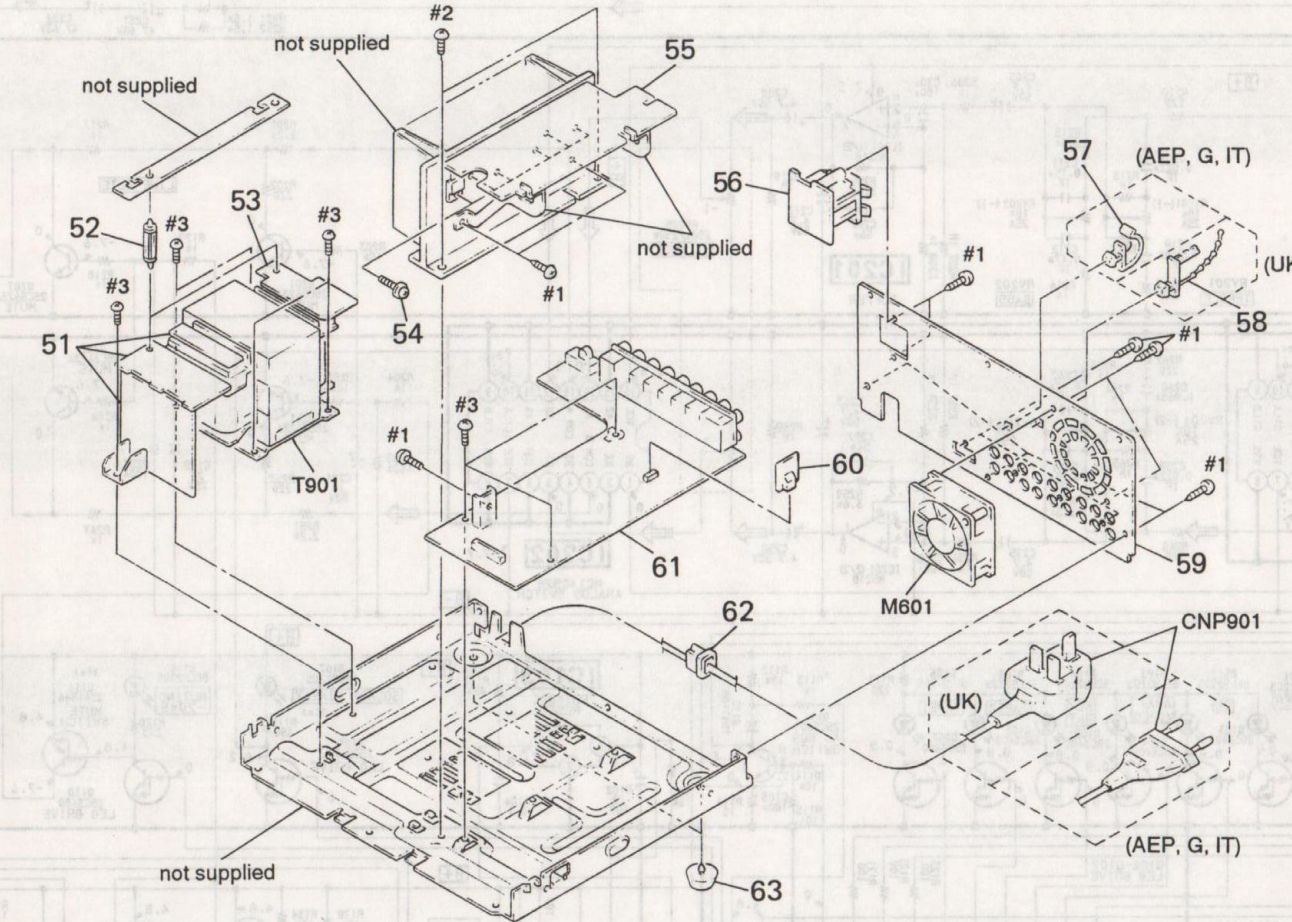


Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 51 through 55 for the chassis section.

Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 59 through 62 for the chassis section.

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

SECTION 5 ELECTRICAL PARTS LIST

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
Abbreviation G: German IT: Italian

Main electrical parts list table with columns: Ref. No., Part No., Description, Remark. Lists various components like capacitors, resistors, diodes, transistors, and connectors.

FAN PROTECTOR MAIN

- Items marked "*" are not stocked since they are seldom required for routine service.
SEMICONDUCTORS
In each case, u: μ, for example:
uA.: μA., uPA.: μPA., uPB.: μPB., uPC.: μPC., uPD.: μPD..
CAPACITORS
uF: μF
COILS
uH: μH

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.

Continuation of the electrical parts list table with columns: Ref. No., Part No., Description, Remark. Lists components like ceramic capacitors, resistors, and diodes.

MAIN

Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 807 through 818 for the main section.

Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 819 through 834 for the main section.

Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 835 through 850 for the main section.

Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 851 through 866 for the main section.

Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 867 through 882 for the main section.

Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 883 through 898 for the main section.

Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 899 through 914 for the main section.

Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 915 through 930 for the main section.

Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 931 through 946 for the main section.

Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 947 through 962 for the main section.

Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 963 through 978 for the main section.

Table with 4 columns: Ref. No., Part No., Description, Remark. Lists parts 979 through 994 for the main section.

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

Ref. No.	Part No.	Description	Remark
R503	1-249-425-11	CARBON	4.7K 5% 1/4W
R504	1-249-417-11	CARBON	1K 5% 1/4W
R505	1-249-425-11	CARBON	4.7K 5% 1/4W
R506	1-249-417-11	CARBON	1K 5% 1/4W
R507	1-249-417-11	CARBON	1K 5% 1/4W
R508	1-249-417-11	CARBON	1K 5% 1/4W
R509	1-249-417-11	CARBON	1K 5% 1/4W
R511	1-247-903-00	CARBON	1M 5% 1/4W
R512	1-247-903-00	CARBON	1M 5% 1/4W
R513	1-249-429-11	CARBON	10K 5% 1/4W
R514	1-247-903-00	CARBON	1M 5% 1/4W
R515	1-249-429-11	CARBON	10K 5% 1/4W
R516	1-247-903-00	CARBON	1M 5% 1/4W
R517	1-247-903-00	CARBON	1M 5% 1/4W
R518	1-247-903-00	CARBON	1M 5% 1/4W
R519	1-247-903-00	CARBON	1M 5% 1/4W
R521	1-249-417-11	CARBON	1K 5% 1/4W
R522	1-249-417-11	CARBON	1K 5% 1/4W
R523	1-249-425-11	CARBON	4.7K 5% 1/4W
R524	1-249-417-11	CARBON	1K 5% 1/4W
R525	1-249-425-11	CARBON	4.7K 5% 1/4W
R526	1-249-417-11	CARBON	1K 5% 1/4W
R527	1-249-417-11	CARBON	1K 5% 1/4W
R528	1-249-417-11	CARBON	1K 5% 1/4W
R529	1-249-417-11	CARBON	1K 5% 1/4W
R531	1-247-903-00	CARBON	1M 5% 1/4W
R532	1-247-903-00	CARBON	1M 5% 1/4W
R533	1-249-429-11	CARBON	10K 5% 1/4W
R534	1-247-903-00	CARBON	1M 5% 1/4W
R535	1-249-429-11	CARBON	10K 5% 1/4W
R536	1-247-903-00	CARBON	1M 5% 1/4W
R537	1-247-903-00	CARBON	1M 5% 1/4W
R538	1-247-903-00	CARBON	1M 5% 1/4W
R539	1-247-903-00	CARBON	1M 5% 1/4W
R551	1-249-429-11	CARBON	10K 5% 1/4W
R552	1-249-429-11	CARBON	10K 5% 1/4W
R553	1-249-429-11	CARBON	10K 5% 1/4W
R554	1-247-807-31	CARBON	100 5% 1/4W
R555	1-247-807-31	CARBON	100 5% 1/4W
R556	1-247-807-31	CARBON	100 5% 1/4W
R557	1-247-903-00	CARBON	1M 5% 1/4W
R558	1-249-429-11	CARBON	10K 5% 1/4W
R559	1-249-441-11	CARBON	100K 5% 1/4W
R560	1-247-903-00	CARBON	1M 5% 1/4W
R561	1-247-807-31	CARBON	100 5% 1/4W
R562	1-249-429-11	CARBON	10K 5% 1/4W
R563	1-247-807-31	CARBON	100 5% 1/4W
R564	1-249-429-11	CARBON	10K 5% 1/4W

Ref. No.	Part No.	Description	Remark
R571	1-249-437-11	CARBON	47K 5% 1/4W
R572	1-249-437-11	CARBON	47K 5% 1/4W
R574	1-249-441-11	CARBON	100K 5% 1/4W
R581	1-249-437-11	CARBON	47K 5% 1/4W
R582	1-249-437-11	CARBON	47K 5% 1/4W
R584	1-249-441-11	CARBON	100K 5% 1/4W
R601	1-249-441-11	CARBON	100K 5% 1/4W
R602	1-249-441-11	CARBON	100K 5% 1/4W
R603	1-249-437-11	CARBON	47K 5% 1/4W
R604	1-249-425-11	CARBON	4.7K 5% 1/4W
R605	1-249-417-11	CARBON	1K 5% 1/4W
R606	1-247-807-31	CARBON	100 5% 1/4W
R607	1-249-425-11	CARBON	4.7K 5% 1/4W
R608	1-249-425-11	CARBON	4.7K 5% 1/4W
R609	1-249-441-11	CARBON	100K 5% 1/4W
R610	1-249-441-11	CARBON	100K 5% 1/4W
R611	1-249-429-11	CARBON	10K 5% 1/4W
R701	1-249-429-11	CARBON	10K 5% 1/4W
R702	1-249-441-11	CARBON	100K 5% 1/4W
R703	1-249-435-11	CARBON	33K 5% 1/4W
R704	1-249-437-11	CARBON	47K 5% 1/4W
△R705	1-215-892-11	METAL OXIDE	1K 5% 2W F
R706	1-249-438-11	CARBON	56K 5% 1/4W
R707	1-249-437-11	CARBON	47K 5% 1/4W
R708	1-249-435-11	CARBON	33K 5% 1/4W
R709	1-249-435-11	CARBON	33K 5% 1/4W
R710	1-249-429-11	CARBON	10K 5% 1/4W
R711	1-249-435-11	CARBON	33K 5% 1/4W
R712	1-249-429-11	CARBON	10K 5% 1/4W
△R801	1-215-894-11	METAL OXIDE	2.2K 5% 2W F
R802	1-249-429-11	CARBON	10K 5% 1/4W
R803	1-260-111-11	CARBON	10K 5% 1/2W
R804	1-249-429-11	CARBON	10K 5% 1/4W
△R805	1-219-123-81	FUSIBLE	0.47 5% 1/4W F
R813	1-260-111-11	CARBON	10K 5% 1/2W
△R815	1-219-123-81	FUSIBLE	0.47 5% 1/4W F
< RELAY >			
RY701	1-515-920-11	RELAY (24V)	
RY801	1-515-793-11	RELAY	
< THERMISTOR (POSITIVE) >			
THP399	1-807-796-11	THERMISTOR	

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

PANEL

Table with columns: Ref. No., Part No., Description, Remark. Includes components like CERAMIC, ELECT, FILM, SOCKET, CONNECTOR, DIODE, LED, and CARBON.

The components identified by mark A or B or C should be replaced only with the same type and value.

Table with columns: Ref. No., Part No., Description, Remark. Includes components like LED, IC, JACK, TRANSISTOR, and CARBON.

PANEL POWER AMPLIFIER

Table with columns: Ref. No., Part No., Description, Remark. Includes components like CARBON, RES, VAR, SWITCH, and VIBRATOR.

Table with columns: Ref. No., Part No., Description, Remark. Includes components like CARBON, RES, VAR, SWITCH, and VIBRATOR.

The components identified by mark A or B or C should be replaced only with the same type and value.

POWER AMPLIFIER

Ref. No.	Part No.	Description	Remark
C303	1-162-282-31	CERAMIC	100PF 10% 50V
C304	1-124-572-11	ELECT	100uF 20% 63V
C305	1-102-230-00	CERAMIC	4PF 0.25PF 500V
C306	1-102-989-00	CERAMIC	68PF 5% 500V
C307	1-102-989-00	CERAMIC	68PF 5% 500V
C308	1-124-572-11	ELECT	100uF 20% 63V
C309	1-124-918-11	ELECT	47uF 20% 63V
C310	1-136-157-00	FILM	0.022uF 5% 50V
C311	1-136-157-00	FILM	0.022uF 5% 50V
C312	1-124-916-11	ELECT	22uF 20% 63V
C322	1-124-916-11	ELECT	22uF 20% 63V
C331	1-162-306-11	CERAMIC	0.01uF 30% 16V
C332	1-162-306-11	CERAMIC	0.01uF 30% 16V
C333	1-102-233-00	CERAMIC	33PF 10% 500V
C334	1-102-233-00	CERAMIC	33PF 10% 500V
C335	1-104-694-91	FILM	0.1uF 5% 100V
C351	1-124-916-11	ELECT	22uF 20% 63V
C352	1-162-282-31	CERAMIC	100PF 10% 50V
C353	1-162-282-31	CERAMIC	100PF 10% 50V
C354	1-124-572-11	ELECT	100uF 20% 63V
C355	1-102-230-00	CERAMIC	4PF 0.25PF 500V
C356	1-102-989-00	CERAMIC	68PF 5% 500V
C357	1-102-989-00	CERAMIC	68PF 5% 500V
C358	1-124-572-11	ELECT	100uF 20% 63V
C359	1-124-918-11	ELECT	47uF 20% 63V
C360	1-136-157-00	FILM	0.022uF 5% 50V
C361	1-136-157-00	FILM	0.022uF 5% 50V
C362	1-124-916-11	ELECT	22uF 20% 63V
C383	1-102-233-00	CERAMIC	33PF 10% 500V
C384	1-102-233-00	CERAMIC	33PF 10% 500V
< CONNECTOR >			
* CN301	1-564-519-11	PLUG, CONNECTOR 4P	
* CN310	1-561-649-00	SOCKET, CONNECTOR 2P	
* CN360	1-561-649-00	SOCKET, CONNECTOR 2P	
< DIODE >			
D301	8-719-310-60	LED	SEL1510C-C
D302	8-719-815-85	DIODE	1S1585
D351	8-719-310-60	LED	SEL1510C-C
D352	8-719-815-85	DIODE	1S1585
< IC >			
IC301	8-749-010-77	IC	STK350-010
< COIL >			
* L301	1-420-872-00	COIL, AIR-CORE	
* L351	1-420-872-00	COIL, AIR-CORE	

Ref. No.	Part No.	Description	Remark
< TRANSISTOR >			
Q301	8-729-203-45	TRANSISTOR	2SC3423-0
Q302	8-729-030-34	TRANSISTOR	2SK2467-Y
Q303	8-729-030-35	TRANSISTOR	2SJ440-Y
Q304	8-729-140-84	TRANSISTOR	2SC1841-PAFAEA
Q305	8-729-203-45	TRANSISTOR	2SC3423-0
Q306	8-729-209-18	TRANSISTOR	2SA1360-Y
Q321	8-729-620-05	TRANSISTOR	2SC2603-EF
Q322	8-729-900-36	TRANSISTOR	DTC124ES
Q324	8-729-119-76	TRANSISTOR	2SA1175-HFE
Q325	8-729-119-76	TRANSISTOR	2SA1175-HFE
Q351	8-729-203-45	TRANSISTOR	2SC3423-0
Q352	8-729-030-34	TRANSISTOR	2SK2467-Y
Q353	8-729-030-35	TRANSISTOR	2SJ440-Y
Q354	8-729-140-84	TRANSISTOR	2SC1841-PAFAEA
Q355	8-729-203-45	TRANSISTOR	2SC3423-0
Q356	8-729-209-18	TRANSISTOR	2SA1360-Y
< RESISTOR >			
R301	1-249-417-11	CARBON	1K 5% 1/4W
R302	1-249-438-11	CARBON	56K 5% 1/4W
R303	1-249-414-11	CARBON	560 5% 1/4W
R304	1-249-438-11	CARBON	56K 5% 1/4W
R305	1-249-413-11	CARBON	470 5% 1/4W
R306	1-249-923-11	CARBON	1K 5% 1/4W
R307	1-249-407-11	CARBON	150 5% 1/4W
△R308	1-212-873-11	FUSIBLE	47 5% 1/4W F
△R309	1-212-873-11	FUSIBLE	47 5% 1/4W F
△R310	1-217-151-00	RES, METAL PLATE	0.22 F
△R311	1-217-151-00	RES, METAL PLATE	0.22 F
R312	1-249-417-11	CARBON	1K 5% 1/4W
R313	1-249-431-11	CARBON	15K 5% 1/4W
R314	1-249-441-11	CARBON	100K 5% 1/4W
R315	1-260-076-11	CARBON	10 5% 1/2W
R316	1-260-076-11	CARBON	10 5% 1/2W
R317	1-249-393-11	CARBON	10 5% 1/4W
R318	1-249-393-11	CARBON	10 5% 1/4W
R320	1-249-437-11	CARBON	47K 5% 1/4W
R321	1-249-426-11	CARBON	5.6K 5% 1/4W
R322	1-247-863-91	CARBON	22K 5% 1/4W
R323	1-249-437-11	CARBON	47K 5% 1/4W
R324	1-249-439-11	CARBON	68K 5% 1/4W
R325	1-249-417-11	CARBON	1K 5% 1/4W
R326	1-249-437-11	CARBON	47K 5% 1/4W
R327	1-249-429-11	CARBON	10K 5% 1/4W
R328	1-247-881-00	CARBON	120K 5% 1/4W
R329	1-249-421-11	CARBON	2.2K 5% 1/4W
R330	1-249-421-11	CARBON	2.2K 5% 1/4W

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

POWER AMPLIFIER

Ref. No.	Part No.	Description	Remark
R331	1-249-421-11	CARBON	2.2K 5% 1/4W
R332	1-249-421-11	CARBON	2.2K 5% 1/4W
△R333	1-212-889-00	FUSIBLE	220 5% 1/4W F
△R334	1-212-889-00	FUSIBLE	220 5% 1/4W F
△R335	1-212-893-00	FUSIBLE	330 5% 1/4W F
R351	1-249-417-11	CARBON	1K 5% 1/4W
R352	1-249-438-11	CARBON	56K 5% 1/4W
R353	1-249-414-11	CARBON	560 5% 1/4W
R354	1-249-438-11	CARBON	56K 5% 1/4W
R355	1-249-413-11	CARBON	470 5% 1/4W
R356	1-249-923-11	CARBON	1K 5% 1/4W
R357	1-249-407-11	CARBON	150 5% 1/4W
△R358	1-212-873-11	FUSIBLE	47 5% 1/4W F
△R359	1-212-873-11	FUSIBLE	47 5% 1/4W F
△R360	1-217-151-00	RES, METAL PLATE	0.22 F
△R361	1-217-151-00	RES, METAL PLATE	0.22 F
△R362	1-249-417-11	CARBON	1K 5% 1/4W F
R363	1-249-431-11	CARBON	15K 5% 1/4W
R364	1-249-441-11	CARBON	100K 5% 1/4W
R365	1-260-076-11	CARBON	10 5% 1/2W
R366	1-260-076-11	CARBON	10 5% 1/2W
R367	1-249-393-11	CARBON	10 5% 1/4W
R368	1-249-393-11	CARBON	10 5% 1/4W
△R385	1-212-893-00	FUSIBLE	330 5% 1/4W F
< VARIABLE RESISTOR >			
RV301	1-238-598-11	RES, ADJ, CARBON	2.2K
RV351	1-238-598-11	RES, ADJ, CARBON	2.2K

* 1-654-769-11	PRIMARY BOARD		

1-533-293-11	FUSE HOLDER		
< CONNECTOR >			
CN900	1-564-321-00	PIN, CONNECTOR 2P	
< FUSE >			
△F901	1-532-259-00	FUSE (TIME-LAG 1.6A 250V)	

* 1-654-770-11	SECONDARY BOARD		

1-533-293-11	FUSE HOLDER		
< CAPACITOR >			
C901	1-164-159-11	CERAMIC	0.1uF 50V

PRIMARY

SECONDARY

SPEAKER

Ref. No.	Part No.	Description	Remark
C902	1-164-159-11	CERAMIC	0.1uF 50V
< CONNECTOR >			
CN901	1-691-770-11	PLUG (MICRO CONNECTOR) 8P	
* CN902	1-564-506-11	PLUG, CONNECTOR 3P	
< FUSE >			
△F902	1-532-203-00	FUSE (TIME-LAG 2.0A 250V)	
△F903	1-532-203-00	FUSE (TIME-LAG 2.0A 250V)	

* 1-654-768-11	SPEAKER BOARD		

< CAPACITOR >			
C401	1-104-694-91	FILM	0.1uF 5% 100V
C402	1-104-694-91	FILM	0.1uF 5% 100V
C451	1-104-694-91	FILM	0.1uF 5% 100V
C452	1-104-694-91	FILM	0.1uF 5% 100V
< CONNECTOR >			
* CN451	1-564-519-11	PLUG, CONNECTOR 4P	
< RESISTOR >			
R401	1-249-393-11	CARBON	10 5% 1/4W
R402	1-249-393-11	CARBON	10 5% 1/4W
R451	1-249-393-11	CARBON	10 5% 1/4W
R452	1-249-393-11	CARBON	10 5% 1/4W
< TERMINAL >			
TB401	1-537-822-11	TERMINAL BOARD (SP) (SPEAKER)	

MISCELLANEOUS			

23	1-773-146-11	WIRE (FLAT TYPE) (21 CORE)	
△CNP901	1-696-169-11	CORD, POWER (AEP, G, IT)	
△CNP901	1-696-570-21	CORD, POWER (UK)	
M601	1-698-474-11	FAN, DC	
△T901	1-427-699-11	TRANSFORMER, POWER	

#1	7-685-646-79	SCREW +BVTP	3X8 TYPE2 N-S
#2	7-682-548-04	SCREW +BVTT	3X8 (S)
#3	7-685-871-01	SCREW +BVTT	3X6 (S)

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

SPEAKER		SECONDARY		PRIMARY		POWER AMPLIFIER	
Part No.	Description	Part No.	Description	Part No.	Description	Part No.	Description
8301	1-164-124-11 CERAMIC	8302	1-164-123-11 CERAMIC	8303	1-164-122-11 CERAMIC	8304	1-249-421-11 CARBON
8305	0.1UF	8306	< CONNECTOR >	8307	1-091-770-11 PLUG (MICRO CONNECTOR) 2P	8308	1-249-421-11 CARBON
8309	1-524-508-11 PLUG CONNECTOR 2P	8310	< FUSE >	8311	1-524-508-00 FUSE(TIME-LAG 2.0A 250V)	8312	1-249-421-11 CARBON
8313	1-524-508-00 FUSE(TIME-LAG 2.0A 250V)	8314	1-524-508-00 FUSE(TIME-LAG 2.0A 250V)	8315	1-524-508-00 FUSE(TIME-LAG 2.0A 250V)	8316	1-249-421-11 CARBON
8317	1-064-708-11 SPEAKER BOARD	8318	< CAPACITOR >	8319	1-104-824-01 FILM	8320	1-249-421-11 CARBON
8321	0.1UF	8322	1-104-824-01 FILM	8323	1-104-824-01 FILM	8324	1-249-421-11 CARBON
8325	0.1UF	8326	1-104-824-01 FILM	8327	1-104-824-01 FILM	8328	1-249-421-11 CARBON
8329	0.1UF	8330	< CONNECTOR >	8331	1-500-078-11 CARBON	8332	1-249-421-11 CARBON
8333	1-500-078-11 CARBON	8334	< RESISTOR >	8335	1-249-421-11 CARBON	8336	1-249-421-11 CARBON
8337	1-249-421-11 CARBON	8338	10	8339	1-249-421-11 CARBON	8340	1-249-421-11 CARBON
8341	1-249-421-11 CARBON	8342	10	8343	1-249-421-11 CARBON	8344	1-249-421-11 CARBON
8345	1-249-421-11 CARBON	8346	10	8347	1-249-421-11 CARBON	8348	1-249-421-11 CARBON
8349	1-249-421-11 CARBON	8350	10	8351	1-249-421-11 CARBON	8352	1-249-421-11 CARBON
8353	1-249-421-11 CARBON	8354	10	8355	1-249-421-11 CARBON	8356	1-249-421-11 CARBON
8357	1-249-421-11 CARBON	8358	10	8359	1-249-421-11 CARBON	8360	1-249-421-11 CARBON
8361	1-249-421-11 CARBON	8362	10	8363	1-249-421-11 CARBON	8364	1-249-421-11 CARBON
8365	1-249-421-11 CARBON	8366	10	8367	1-249-421-11 CARBON	8368	1-249-421-11 CARBON
8369	1-249-421-11 CARBON	8370	10	8371	1-249-421-11 CARBON	8372	1-249-421-11 CARBON
8373	1-249-421-11 CARBON	8374	10	8375	1-249-421-11 CARBON	8376	1-249-421-11 CARBON
8377	1-249-421-11 CARBON	8378	10	8379	1-249-421-11 CARBON	8380	1-249-421-11 CARBON
8381	1-249-421-11 CARBON	8382	10	8383	1-249-421-11 CARBON	8384	1-249-421-11 CARBON
8385	1-249-421-11 CARBON	8386	10	8387	1-249-421-11 CARBON	8388	1-249-421-11 CARBON
8389	1-249-421-11 CARBON	8390	10	8391	1-249-421-11 CARBON	8392	1-249-421-11 CARBON
8393	1-249-421-11 CARBON	8394	10	8395	1-249-421-11 CARBON	8396	1-249-421-11 CARBON
8397	1-249-421-11 CARBON	8398	10	8399	1-249-421-11 CARBON	8400	1-249-421-11 CARBON
8401	1-249-421-11 CARBON	8402	10	8403	1-249-421-11 CARBON	8404	1-249-421-11 CARBON
8405	1-249-421-11 CARBON	8406	10	8407	1-249-421-11 CARBON	8408	1-249-421-11 CARBON
8409	1-249-421-11 CARBON	8410	10	8411	1-249-421-11 CARBON	8412	1-249-421-11 CARBON
8413	1-249-421-11 CARBON	8414	10	8415	1-249-421-11 CARBON	8416	1-249-421-11 CARBON
8417	1-249-421-11 CARBON	8418	10	8419	1-249-421-11 CARBON	8420	1-249-421-11 CARBON
8421	1-249-421-11 CARBON	8422	10	8423	1-249-421-11 CARBON	8424	1-249-421-11 CARBON
8425	1-249-421-11 CARBON	8426	10	8427	1-249-421-11 CARBON	8428	1-249-421-11 CARBON
8429	1-249-421-11 CARBON	8430	10	8431	1-249-421-11 CARBON	8432	1-249-421-11 CARBON
8433	1-249-421-11 CARBON	8434	10	8435	1-249-421-11 CARBON	8436	1-249-421-11 CARBON
8437	1-249-421-11 CARBON	8438	10	8439	1-249-421-11 CARBON	8440	1-249-421-11 CARBON
8441	1-249-421-11 CARBON	8442	10	8443	1-249-421-11 CARBON	8444	1-249-421-11 CARBON
8445	1-249-421-11 CARBON	8446	10	8447	1-249-421-11 CARBON	8448	1-249-421-11 CARBON
8449	1-249-421-11 CARBON	8450	10	8451	1-249-421-11 CARBON	8452	1-249-421-11 CARBON
8453	1-249-421-11 CARBON	8454	10	8455	1-249-421-11 CARBON	8456	1-249-421-11 CARBON
8457	1-249-421-11 CARBON	8458	10	8459	1-249-421-11 CARBON	8460	1-249-421-11 CARBON
8461	1-249-421-11 CARBON	8462	10	8463	1-249-421-11 CARBON	8464	1-249-421-11 CARBON
8465	1-249-421-11 CARBON	8466	10	8467	1-249-421-11 CARBON	8468	1-249-421-11 CARBON
8469	1-249-421-11 CARBON	8470	10	8471	1-249-421-11 CARBON	8472	1-249-421-11 CARBON
8473	1-249-421-11 CARBON	8474	10	8475	1-249-421-11 CARBON	8476	1-249-421-11 CARBON
8477	1-249-421-11 CARBON	8478	10	8479	1-249-421-11 CARBON	8480	1-249-421-11 CARBON
8481	1-249-421-11 CARBON	8482	10	8483	1-249-421-11 CARBON	8484	1-249-421-11 CARBON
8485	1-249-421-11 CARBON	8486	10	8487	1-249-421-11 CARBON	8488	1-249-421-11 CARBON
8489	1-249-421-11 CARBON	8490	10	8491	1-249-421-11 CARBON	8492	1-249-421-11 CARBON
8493	1-249-421-11 CARBON	8494	10	8495	1-249-421-11 CARBON	8496	1-249-421-11 CARBON
8497	1-249-421-11 CARBON	8498	10	8499	1-249-421-11 CARBON	8500	1-249-421-11 CARBON
8501	1-249-421-11 CARBON	8502	10	8503	1-249-421-11 CARBON	8504	1-249-421-11 CARBON
8505	1-249-421-11 CARBON	8506	10	8507	1-249-421-11 CARBON	8508	1-249-421-11 CARBON
8509	1-249-421-11 CARBON	8510	10	8511	1-249-421-11 CARBON	8512	1-249-421-11 CARBON
8513	1-249-421-11 CARBON	8514	10	8515	1-249-421-11 CARBON	8516	1-249-421-11 CARBON
8517	1-249-421-11 CARBON	8518	10	8519	1-249-421-11 CARBON	8520	1-249-421-11 CARBON
8521	1-249-421-11 CARBON	8522	10	8523	1-249-421-11 CARBON	8524	1-249-421-11 CARBON
8525	1-249-421-11 CARBON	8526	10	8527	1-249-421-11 CARBON	8528	1-249-421-11 CARBON
8529	1-249-421-11 CARBON	8530	10	8531	1-249-421-11 CARBON	8532	1-249-421-11 CARBON
8533	1-249-421-11 CARBON	8534	10	8535	1-249-421-11 CARBON	8536	1-249-421-11 CARBON
8537	1-249-421-11 CARBON	8538	10	8539	1-249-421-11 CARBON	8540	1-249-421-11 CARBON
8541	1-249-421-11 CARBON	8542	10	8543	1-249-421-11 CARBON	8544	1-249-421-11 CARBON
8545	1-249-421-11 CARBON	8546	10	8547	1-249-421-11 CARBON	8548	1-249-421-11 CARBON
8549	1-249-421-11 CARBON	8550	10	8551	1-249-421-11 CARBON	8552	1-249-421-11 CARBON
8553	1-249-421-11 CARBON	8554	10	8555	1-249-421-11 CARBON	8556	1-249-421-11 CARBON
8557	1-249-421-11 CARBON	8558	10	8559	1-249-421-11 CARBON	8560	1-249-421-11 CARBON
8561	1-249-421-11 CARBON	8562	10	8563	1-249-421-11 CARBON	8564	1-249-421-11 CARBON
8565	1-249-421-11 CARBON	8566	10	8567	1-249-421-11 CARBON	8568	1-249-421-11 CARBON
8569	1-249-421-11 CARBON	8570	10	8571	1-249-421-11 CARBON	8572	1-249-421-11 CARBON
8573	1-249-421-11 CARBON	8574	10	8575	1-249-421-11 CARBON	8576	1-249-421-11 CARBON
8577	1-249-421-11 CARBON	8578	10	8579	1-249-421-11 CARBON	8580	1-249-421-11 CARBON
8581	1-249-421-11 CARBON	8582	10	8583	1-249-421-11 CARBON	8584	1-249-421-11 CARBON
8585	1-249-421-11 CARBON	8586	10	8587	1-249-421-11 CARBON	8588	1-249-421-11 CARBON
8589	1-249-421-11 CARBON	8590	10	8591	1-249-421-11 CARBON	8592	1-249-421-11 CARBON
8593	1-249-421-11 CARBON	8594	10	8595	1-249-421-11 CARBON	8596	1-249-421-11 CARBON
8597	1-249-421-11 CARBON	8598	10	8599	1-249-421-11 CARBON	8600	1-249-421-11 CARBON
8601	1-249-421-11 CARBON	8602	10	8603	1-249-421-11 CARBON	8604	1-249-421-11 CARBON
8605	1-249-421-11 CARBON	8606	10	8607	1-249-421-11 CARBON	8608	1-249-421-11 CARBON
8609	1-249-421-11 CARBON	8610	10	8611	1-249-421-11 CARBON	8612	1-249-421-11 CARBON
8613	1-249-421-11 CARBON	8614	10	8615	1-249-421-11 CARBON	8616	1-249-421-11 CARBON
8617	1-249-421-11 CARBON	8618	10	8619	1-249-421-11 CARBON	8620	1-249-421-11 CARBON
8621	1-249-421-11 CARBON	8622	10	8623	1-249-421-11 CARBON	8624	1-249-421-11 CARBON
8625	1-249-421-11 CARBON	8626	10	8627	1-249-421-11 CARBON	8628	1-249-421-11 CARBON
8629	1-249-421-11 CARBON	8630	10	8631	1-249-421-11 CARBON	8632	1-249-421-11 CARBON
8633	1-249-421-11 CARBON	8634	10	8635	1-249-421-11 CARBON	8636	1-249-421-11 CARBON
8637	1-249-421-11 CARBON	8638	10	8639	1-249-421-11 CARBON	8640	1-249-421-11 CARBON
8641	1-249-421-11 CARBON	8642	10	8643	1-249-421-11 CARBON	8644	1-249-421-11 CARBON
8645	1-249-421-11 CARBON	8646	10	8647	1-249-421-11 CARBON	8648	1-249-421-11 CARBON
8649	1-249-421-11 CARBON	8650	10	8651	1-249-421-11 CARBON	8652	1-249-421-11 CARBON
8653	1-249-421-11 CARBON	8654	10	8655	1-249-421-11 CARBON	8656	1-249-421-11 CARBON
8657	1-249-421-11 CARBON	8658	10	8659	1-249-421-11 CARBON	8660	1-249-421-11 CARBON
8661	1-249-421-11 CARBON	8662	10	8663	1-249-421-11 CARBON	8664	1-249-421-11 CARBON
8665	1-249-421-11 CARBON	8666	10	8667	1-249-421-11 CARBON	8668	1-249-421-11 CARBON
8669	1-249-421-11 CARBON	8670	10	8671	1-249-421-11 CARBON	8672	1-249-421-11 CARBON
8673	1-249-421-11 CARBON	8674	10	8675	1-249-421-11 CARBON	8676	1-249-421-11 CARBON
8677	1-249-421-11 CARBON	8678	10	8679	1-249-421-11 CARBON	8680	1-249-421-11 CARBON
8681	1-249-421-11 CARBON	8682	10	8683	1-249-421-11 CARBON	8684	1-249-421-11 CARBON
8685	1-249-421-11 CARBON	8686	10	8687	1-249-421-11 CARBON	8688	1-249-421-11 CARBON
8689	1-249-421-11 CARBON	8690	10	8691	1-249-421-11 CARBON	8692	1-249-421-11 CARBON
8693	1-249-421-11 CARBON	8694	10	8695	1-249-421-11 CARBON	8696	1-249-421-11 CARBON
8697	1-249-421-11 CARBON	8698	10	8699	1-249-421-11 CARBON	8700	1-249-421-11 CARBON
8701	1-249-421-11 CARBON	8702	10	8703	1-249-421-11 CARBON	8704	1-249-421-11 CARBON
8705	1-249-421-11 CARBON	8706	10	8707	1-249-421-11 CARBON	8708	1-249-421-11 CARBON
8709							