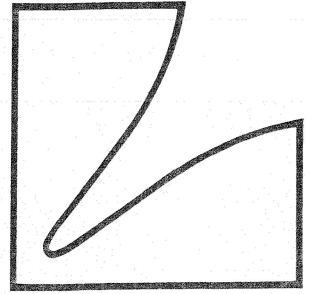
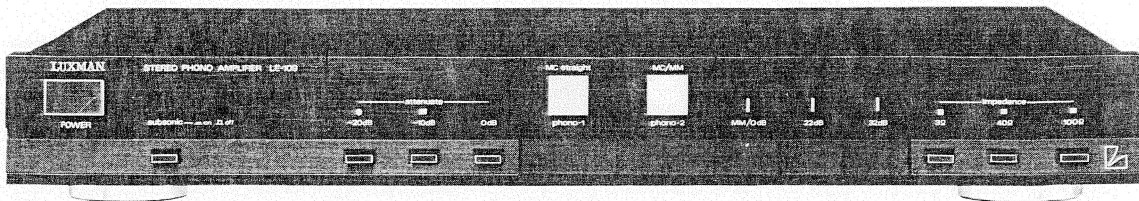


# SERVICE MANUAL

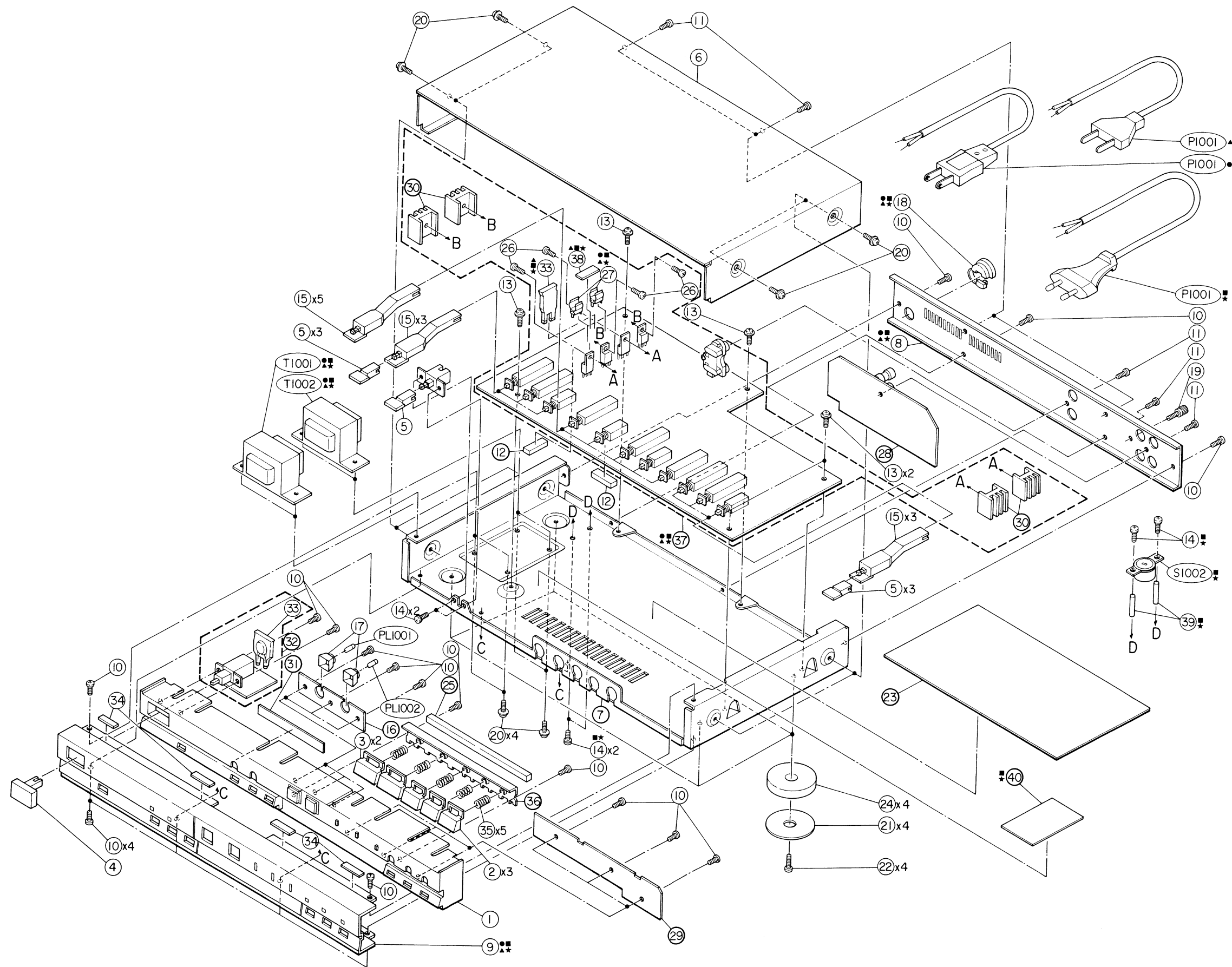


## Stereo Phono Amplifier **LE-109**

**Temporary**



# Exploded View (Cabinet)



# Electrical Parts List

Resistors: Carbon resistors under ¼ watts are not mentioned in the parts list, please confirm them by schematic diagram.  
 uF = microfarads, pF = picofarads

Symbol No.	Part No.	Description
<b>Main P.C. Board</b>		
<b>IC's</b>		
IC1101	51T60588F01	NJM7812
IC2101	51T72167F01	M5220L
IC2102	51T72167F01	M5220L
<b>Transistors</b>		
Q1001	48S43525F03	2SC1815
Q1002	48S43525F03	2SC1815
Q1003	48T51118F02	2SA1015
Q1004	48T51118F02	2SA1015
Q1005	48T51118F02	2SA1015
Q1006	48T51118F02	2SA1015
Q1007	48S43525F03	2SC1815
Q1008	48S43525F03	2SC1815
Q1009	48S43525F03	2SC1815
Q1010	48S43525F03	2SC1815
Q1011	48T64240F01	2SC2344
Q1012	48T64240F01	2SC2344
Q1013	48T51118F02	2SA1015
Q1014	48T51118F02	2SA1015
Q1015	48S43525F03	2SC1815
Q1016	48S43525F03	2SC1815
Q1017	48S43525F03	2SC1815
Q1018	48S43525F03	2SC1815
Q1019	48T51118F02	2SA1015
Q1020	48T51118F02	2SA1015
Q1021	48T51118F02	2SA1015
Q1022	48T51118F02	2SA1015
Q1023	48T47145F02	2SA1011
Q1024	48T47145F02	2SA1011
Q1101	48S43525F03	2SC1815
Q1102	48T51118F02	2SA1015
Q1103	48S43525F03	2SC1815
Q1104	48S43525F03	2SC1815
Q2001	48T61719F01	FET, 2SK389
Q2002	48T61719F01	FET, 2SK389
Q2003	48T71752F02	FET, 2SJ109
Q2004	48T71752F02	FET, 2SJ109
Q2005	48T72598F01	2SC2291
Q2006	48T72598F01	2SC2291
Q2007	48T72597F01	2SA995

Symbol No.	Part No.	Description
Q2008	48T72597F01	2SA995
Q2009	48T72597F01	2SA995
Q2010	48T72597F01	2SA995
Q2011	48T72598F01	2SC2291
Q2012	48T72598F01	2SC2291
Q2013	48T72889F01	2SC2910
Q2014	48T72889F01	2SC2910
Q2015	48T72888F01	2SA1208
Q2016	48T72888F01	2SA1208
Q2017	48T72889F01	2SC2910
Q2018	48T72889F01	2SC2910
Q2019	48T72888F01	2SA1208
Q2020	48T72888F01	2SA1208
Q2021	48T53301F01	2SC2240
Q2022	48T53301F01	2SC2240
Q2023	48T64376F01	2SC3423
Q2024	48T64376F01	2SC3423
Q2025	48T64375F01	2SA1360
Q2026	48T64375F01	2SA1360
Q2101	48T72887F01	FET, 2SK332
Q2102	48T72887F01	FET, 2SK332
Q2103	48T53301F01	2SC2240
Q2104	48T53301F01	2SC2240
Q2201	48T56281F01	FET, 2SK170
Q2202	48T56281F01	FET, 2SK170
Q2203	48T81611F01	FET, 2SJ74
Q2204	48T81611F01	FET, 2SJ74
Q2205	48S43525F03	2SC1815
Q2206	48S43525F03	2SC1815
Q2207	48T51118F02	2SA1015
Q2208	48T51118F02	2SA1015
Q2209	48T51118F02	2SA1015
Q2210	48T51118F02	2SA1015
Q2211	48S43525F03	2SC1815
Q2212	48S43525F03	2SC1815

Symbol No.	Part No.	Description
<b>Diodes</b>		
▲ D1001	48T80317F01	Twin D5KC20H
■ D1001	48T80317F01	Twin D5KC20H
★ D1001	48T80317F01	Twin D5KC20H
● D1001	48T80987F01	FMG 22S
▲ D1002	48T80317F01	Twin D5KC20H
■ D1002	48T80317F01	Twin D5KC20H
★ D1002	48T80317F01	Twin D5KC20H
● D1002	48T80987F01	FMG 22S
▲ D1003	48T80317F02	Twin D5KC20RH
■ D1003	48T80317F02	Twin D5KC20RH
★ D1003	48T80317F02	Twin D5KC20RH
● D1003	48T80987F02	FMG 22R
▲ D1004	48T80317F02	Twin D5KC20RH
■ D1004	48T80317F02	Twin D5KC20RH
★ D1004	48T80317F02	Twin D5KC20RH
● D1004	48T80987F02	FMG 22R
D1005	48T52741F38	Zener. HZ12A-2L
D1006	48T52741F38	Zener. HZ12A-2L
D1007	48T52741F38	Zener. HZ12A-2L
D1008	48T52741F38	Zener. HZ12A-2L
D1101	48S40477U01	IN4003
D1102	48S40477U01	IN4003
D1103	48S40477U01	IN4003
D1104	48S40477U01	IN4003
D1105	48S40477U01	IN4003
D1106	48S40477U01	IN4003
D1107	48T51582F01	MA-150
D1108	48T52739F31	Zener. HZ 5C-1
D1109	48S40477U01	IN4003
D1118	48T51582F01	MA-150
D1119	48T51582F01	MA-150
D1120	48T52739F16	Zener. HZ 4A-1
D2001	48T51582F01	MA-150
D2002	48T51582F01	MA-150
D2003	48T51582F01	MA-150
D2004	48T51582F01	MA-150
D2005	48T51582F01	MA-150
D2006	48T51582F01	MA-150
D2007	48T51582F01	MA-150
D2008	48T51582F01	MA-150

Symbol No.	Part No.	Description
D2201	48T51087F01	Varistor, KB-265C4
D2202	48T51087F01	Varistor, KB-265C4
D2203	48T51087F01	Varistor, KB-265C4
D2204	48T51087F01	Varistor, KB-265C4
LD2101	48T60947F06	LED, SLH-34VR5F (RED)
LD2102	48T60947F06	LED, SLH-34VR5F (RED)
<b>Relay</b>		
RL1001	80T68404F01	G5A
<b>Switches</b>		
S2001	40T81479F02	PUSH SPUL 2 (Function)
S2101	40T81479F01	PUSH SPUL 3 (Sensitivity)
S2102	40T81478F01	PUSH SPUN 3 (Impedance)
S2103	40T81480F01	PUSH SWPJ 220 (Subsonic)
S2201	40T81478F01	PUSH SPUN 3 (Attenuate)
<b>Fuses</b>		
● F1001	65T55050F05	MF60NR 0.5A-125V
▲ F1001	65T52486F31	CS61M 0.5A-250V
■ F1001	65T42077U09	SEMKO T-200mA
★ F1001	65T42077U09	SEMKO T-200mA
<b>Capacitors</b>		
C1001	23T00142L37	Electrolytic 1000 $\mu$ F/63V
C1002	23T00142L37	Electrolytic 1000 $\mu$ F/63V
C1003	23T00142L37	Electrolytic 1000 $\mu$ F/63V
C1004	23T00142L37	Electrolytic 1000 $\mu$ F/63V
C1005	23T00136L98	Electrolytic 22 $\mu$ F/100V
C1006	23T00136L98	Electrolytic 22 $\mu$ F/100V
C1007	23T00136L98	Electrolytic 22 $\mu$ F/100V
C1008	23T00136L98	Electrolytic 22 $\mu$ F/100V
C1101	23T68328F44	Electrolytic 470 $\mu$ F/35V
C1102	23S40657F20	Electrolytic 47 $\mu$ F/25V
C1103	23T42478F24	Electrolytic 1 $\mu$ F/50V
C1104	23T42478F11	Electrolytic 10 $\mu$ F/25V
C1105	08T57437F09	Ceramic 0.01 $\mu$ F
C1107	23S40657F13	Electrolytic 47 $\mu$ F/16V
C2005	08T61630F73	Polyethylene 100pF

Note: ● : For Japanese model only (JA)

▲ : For North American model only (UZ)

Other : Common

■ : For West Germany model only (AD)

★ : For General Foreign model only (EK)

Symbol No.	Part No.	Description
C2006	08T61630F73	Polyethylene 100pF
▲ C2009	23T00132L02	Electrolytic 220 μ F/16V
■ C2009	23T00132L02	Electrolytic 220 μ F/16V
★ C2009	23T00132L02	Electrolytic 220 μ F/16V
● C2009	23T00132L12	Electrolytic 100 μ F/25V
▲ C2010	23T00132L02	Electrolytic 220 μ F/16V
■ C2010	23T00132L02	Electrolytic 220 μ F/16V
★ C2010	23T00132L02	Electrolytic 220 μ F/16V
● C2010	23T00132L12	Electrolytic 100 μ F/25V
C2011	08T61642F20	MIC 47pF
C2012	08T61642F20	MIC 47pF
C2013	08T61642F20	MIC 47pF
C2014	08T61642F20	MIC 47pF
C2015	08T61642F20	MIC 47pF
C2016	08T61642F20	MIC 47pF
C2017	08T61642F20	MIC 47pF
C2018	08T61642F20	MIC 47pF
C2019	08T61630F82	Polyethylene 0.01 μ F
C2020	08T61630F82	Polyethylene 0.01 μ F
C2021	08T61630F78	Polyethylene 2700pF
C2022	08T61630F78	Polyethylene 2700pF
C2023	08T00019L10	UA 2D 0.22 μ F
C2024	08T00019L10	UA 2D 0.22 μ F
C2025	23T68970F74	Electrolytic 47 μ F/100V
C2026	23T68970F74	Electrolytic 47 μ F/100V
C2027	23T68970F74	Electrolytic 47 μ F/100V
C2028	23T68970F74	Electrolytic 47 μ F/100V
C2105	08T61630F73	Polyethylene 100pF
C2106	08T61630F73	Electrolytic 100pF
C2107	08T61630F58	Polyethylene 4700pF
C2108	08T61630F58	Polyethylene 4700pF
C2109	23T00132L12	Electrolytic 100 μ F/25V
C2110	23T00132L12	Electrolytic 100 μ F/25V
C2111	08T61630F81	Polyethylene 6800pF
C2112	08T61630F81	Polyethylene 6800pF
C2113	08T61630F77	Polyethylene 1800pF
C2114	08T61630F77	Polyethylene 1800pF
C2115	08T00019L06	UA 2D 0.1 μ F
C2116	08T00019L06	UA 2D 0.1 μ F
C2117	08T64568F28	Mylar 0.18 μ F
C2118	08T64568F28	Mylar 0.18 μ F
C2119	23T68970F61	Electrolytic 47 μ F/63V
C2120	23T68970F61	Electrolytic 47 μ F/63V
C2121	23T68970F61	Electrolytic 47 μ F/63V
C2122	23T68970F61	Electrolytic 47 μ F/63V

Symbol No.	Part No.	Description
C2123	08T61630F79	Polyethylene 3300pF
C2124	08T61630F79	Polyethylene 3300pF
C2201	08T00019L06	UA 2D 0.1 μ F
C2202	08T00019L06	UA 2D 0.1 μ F
C2203	23T68970F48	Electrolytic 22 μ F/50V
C2204	23T68970F48	Electrolytic 22 μ F/50V
C2205	23T68970F48	Electrolytic 22 μ F/50V
C2206	23T68970F48	Electrolytic 22 μ F/50V
<b>Resistors</b>		
VR2001	18C41732G07	Variable 1Kohm
VR2002	18C41732G07	Variable 1Kohm
VR2003	18T45040F14	Variable, ADJ 0.3W-15Kohm
VR2004	18T45040F14	Variable, ADJ 0.3W-15Kohm
<b>Power Switch P.C. Board</b>		
<b>Switch</b>		
S1001	40T45561F03	POWER (SDL 1P)
<b>Capacitor</b>		
C1106	08T57437F09	Ceramic 0.01 μ F
<b>ATT LED P.C. Board</b>		
<b>LED's</b>		
LD1110	48T66616F02	SLR-54VR3 (RED)
LD1111	48T66616F02	SLR-54VR3 (RED)
<b>IMP LED P.C. Board</b>		
<b>LED's</b>		
LD1112	48T66616F02	SLR-54VR3 (RED)
LD1113	48T66616F02	SLR-54VR3 (RED)
LD1114	48T66616F02	SLR-54VR3 (RED)
LD1115	48T66616F02	SLR-54VR3 (RED)
LD1116	48T66616F02	SLR-54VR3 (RED)
LD1117	48T66616F02	SLR-54VR3 (RED)

Note: ● : For Japanese model only (JA)      ■ : For West Germany model only (AD)  
 ▲ : For North American model only (UZ)    ★ : For General Foreign model only (EK)  
 Other : Common



# Cabinet Assembly Parts List

Note: The parts without part number are not supplied.

Symbol No.	Index	Part No.	Description	Symbol No.	Part No.	Description
	1	13D81383F01	Escutcheon, Front			
	2	36A81384F01	Knob, Function (A)			
	3	36A81385F01	Knob, Function (B)			
	4	36B70885F07	Knob, Power			
	5	36A67333F01	Knob, Push			
	6	15D81388F01	Cover, Top			
●	8	15D81390F01	Cover, Rear			
▲	8	15D81390F03	Cover, Rear			
■	8	15D81390F03	Cover, Rear			
★	8	15D81390F03	Cover, Rear			
●	9	01V81700F43	Assembly, Front Panel			
▲	9	01V83300F58	Assembly, Front P. C. Board			
■	9	01V83300F58	Assembly, Front P. C. Board			
★	9	01V83300F58	Assembly, Front P. C. Board			
	10	03S71031F04	Screw, Bind (M3×8)			
	11	03A82468F01	Screw, Bind (M3×10)			
	13	03C42723U07	Screw, Cup (M3×6)			
	14	03D40014G49	Screw, W/Washer (M3×8)			
	15	45A81386F01	Lever, Push Switch			
	17	43A80689F01	Holder, Lamp L. S.			
●	18	43B41625J05	Stopper, Cord			
▲	18	43B41625J02	Stopper, Cord			
■	18	43B41625J02	Stopper, Cord			
★	18	43B41625J02	Stopper, Cord			
	19	29T66964F01	Terminal, Ground			
	20	03S40036U01	Screw, Pan (M4×8)			
	21	75A67064F01	Felt			
	22	03S44205G20	Screw, Pan (M4×12)			
	24	01A80230F01	Assembly, Trannleg			
	26	03S43997P76	Screw, Bind (M3×6)			
●	27	09T51960F01	Holder, Fuse			
■	27	09T51410F01	Holder, Fuse			
★	27	09T51410F01	Holder, Fuse			
▲	27	09T51960F01	Holder, Fuse			
	33	43T53136F01	Bush, Cap			
	34	75S72374F66	Cushion, Rubber			
	35	41A81537F01	Spring			
▲	38	54B62266F27	Label, Fuse 0.5A-250V			
■	38	54B62266F47	Label, Fuse 0.5A-250V			
★	38	54B62266F47	Label, Fuse 0.5A-250V			
■	39	47C64899F44	Shaft			
★	39	47C64899F44	Shaft			

Note: ● : For Japanese model only (JA)

▲ : For North American model only (UZ)

■ : For West Germany model only (AD)

★ : For General Foreign model only (EK)

Other : Common

# Packing Assembly Parts List

NOTE: The parts without part number are not supplied.

Symbol No.	Part No.	Description
101	56B40442T07	Packing, Front Frame
102	56B40230G08	Sack, Polyethylene
103	56D81391F01	Tray, Packing
104	56D81391F02	Tray, Packing
● 105	56S71001F76	Carton, Packing (Individual)
▲ 105	56S71001F87	Carton, Packing (Individual)
■ 105	56S71001F87	Carton, Packing (Individual)
★ 105	56S71001F87	Carton, Packing (Individual)
▲ 106	01V83400F65	Assembly, Pamphlet
● 106-1	68P80130F62	Owners, Manual
■ 106-1	68P81707F22	Owners, Manual
★ 106-1	68P81707F22	Owners, Manual
● 106-2	28T58909F01	Plug, Audio Cable
■ 106-2	28T58909F01	Plug, Audio Cable
★ 106-2	28T58909F01	Plug, Audio Cable

Symbol No.	Part No.	Description

Note: ● : For Japanese model only (JA)

▲ : For North American model only (UZ)

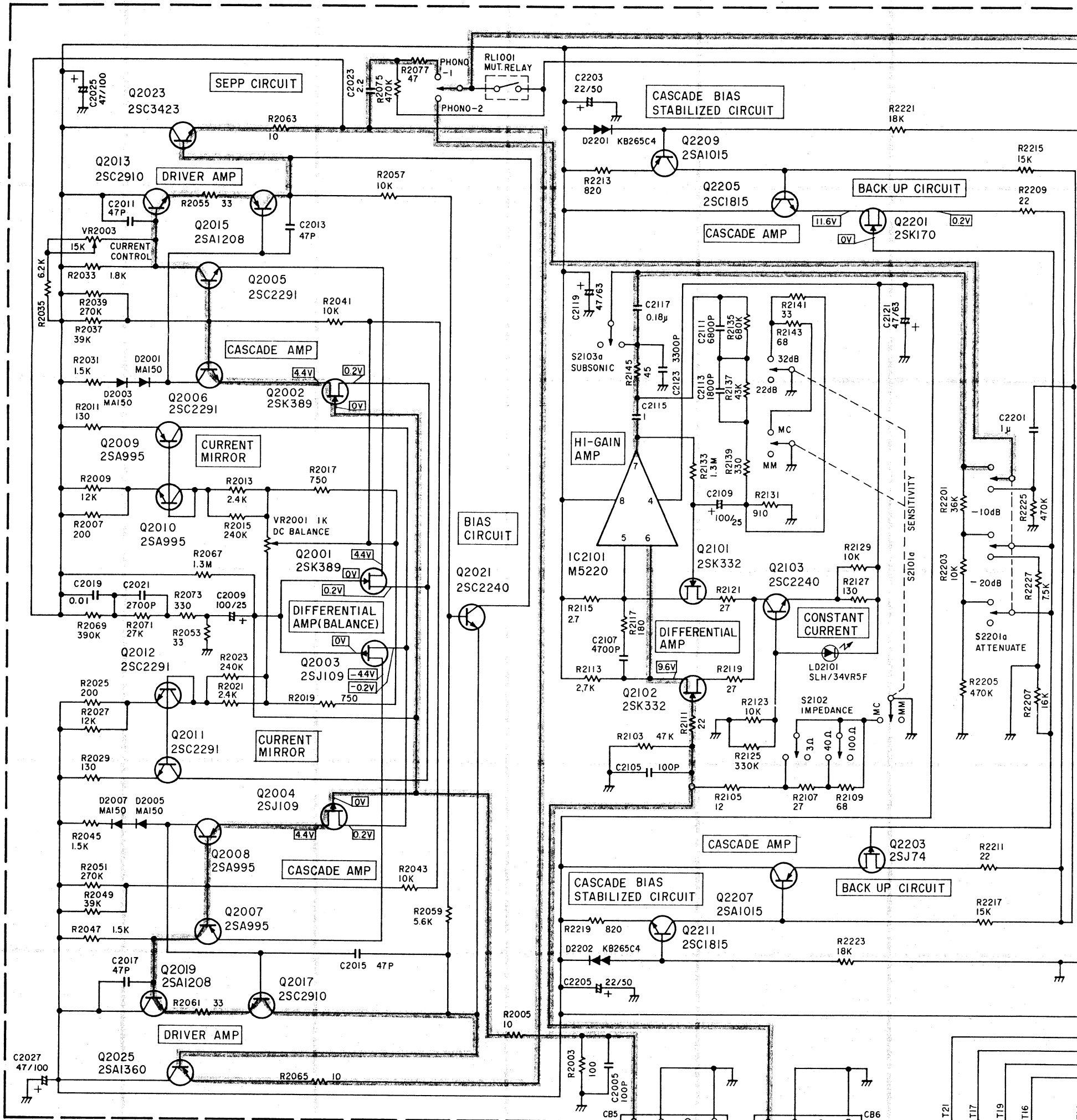
■ : For West Germany model only (AD)

★ : For General Foreign model only (EK)

Other : Common



# Schematic Diagram



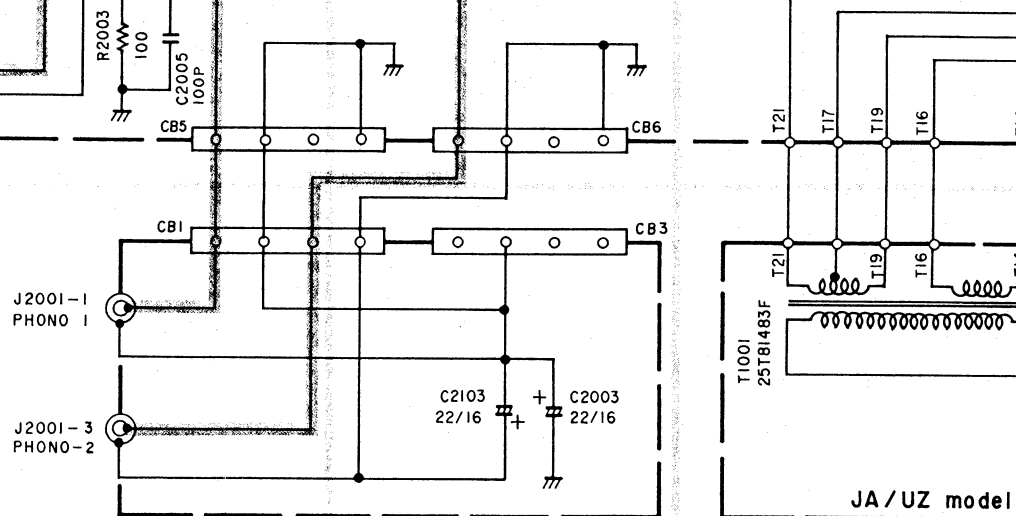
	JA model only	AD model only	UZ model only	EK model only
S1002	X	O	X	O
C2009	100/25	220/16	220/16	220/16
C2010	100/25	220/16	220/16	220/16
D1001	FMG22S	D5KC20H	D5KC20H	D5KC20H
D1002	FMG22S	D5KC20H	D5KC20H	D5KC20H
D1003	FMG22R	D5KC20RH	D5KC20RH	D5KC20RH
D1004	FMG22R	D5KC20RH	D5KC20RH	D5KC20RH
F1001	0.5A-125V	T-200mA	0.5A-250V	T-200mA
R2067	1.3M	1.3M	1.3M	1.3M
R2133	1.3M	1.5M	1.5M	1.5M

	Q1001	Q1003	Q1005	Q1007	Q1009	Q1011	Q1013	Q1015	Q1017	Q1019	Q1021	Q1023	Q1101	Q1102	Q1103	Q1104	Q2005	Q2006
B	12V	20V	20V	12V	20.8V	22.6V	-12V	-20V	-20V	-12V	-20.8V	-22.6V	5.6V	10.8V	10.8V	4.6V	5V	5V
C	20V	20V	20.8V	20.8V	34V	-20V	-20V	-20.8V	-20.8V	-34V	-34V	98V	10.8V	12V	10.2V	13.6V	12.4V	12.4V
E	11.4V	20.6V	20.6V	11.4V	22.6V	22V	-11.4V	-20.6V	-11.4V	-22.6V	-22V	5V	12V	10.2V	4V	4.4V	4.4V	4.4V

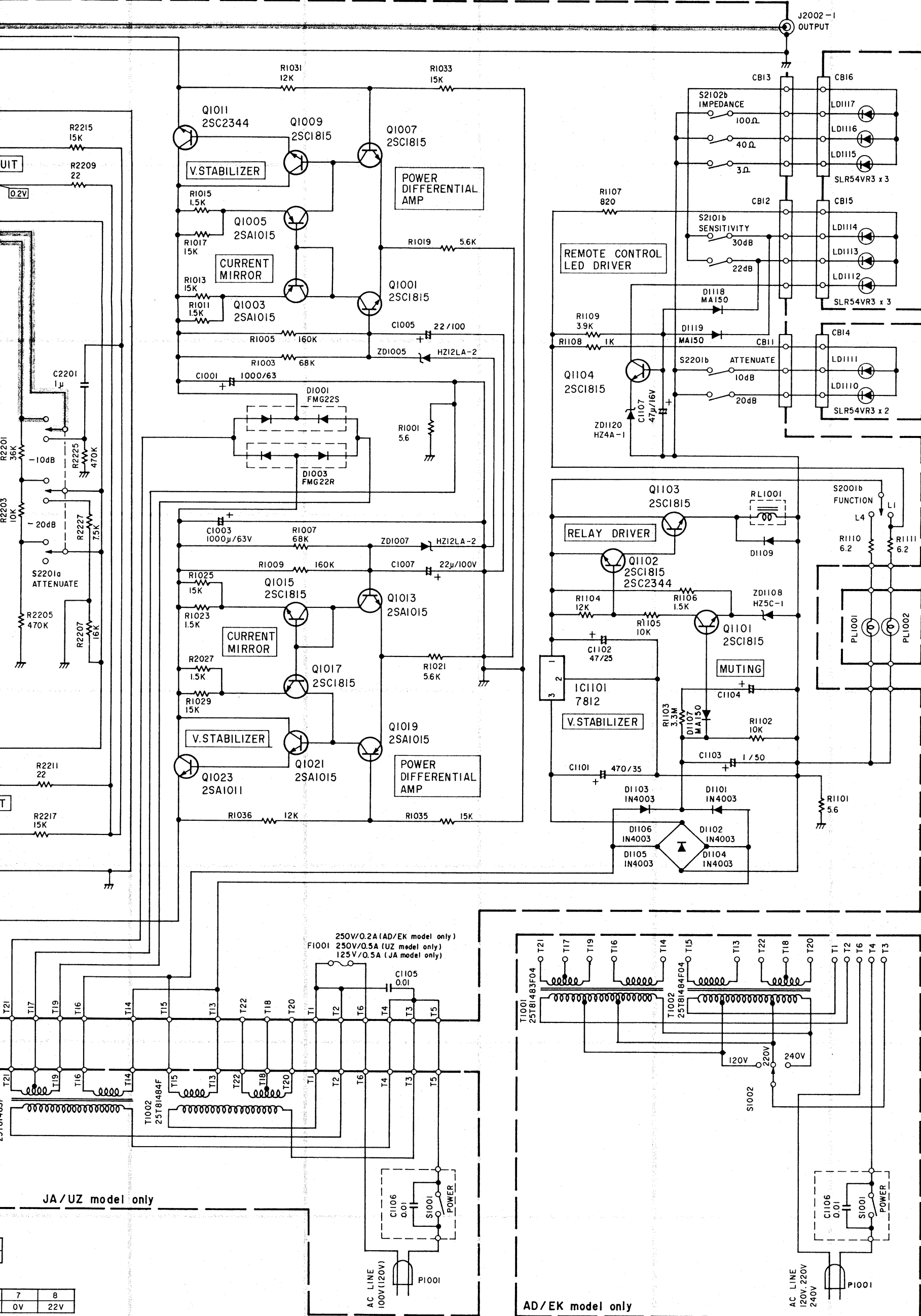
	Q2007	Q2008	Q2009	Q2010	Q2011	Q2012	Q2013	Q2015	Q2017	Q2021	Q2023	Q2025	Q2103	Q2019	Q2205	Q2207	Q2209	Q2211
B	-5V	-5V	20V	20V	-20V	20V	13.6V	12.4V	-12.4V	-0.2V	0.8V	-0.8V	-20.2V	-13.6V	11V	11V	20.8V	-20.8V
C	13.6V	-12.4V	-0.2V	20V	0.2V	20V	22V	0.8V	-0.8V	0.8V	22V	-22V	-0.12V	-22V	22V	22V	11V	-11V
E	-4.4V	20.6V	22.6V	-20.6V	20.6V	13V	13V	-13V	-0.8V	0.2V	-0.2V	-20.8V	-13V	11.6V	-10.4V	21.4V	-21.4V	-21.4V

IC1101	1	2	3
	12V	0V	17.5V

IC2101	4	5	6	7	8
	-22V	9.6V	9.6V	0V	22V



JA/UZ model



NOTES:

1. All resistance values are in ohms. K = 1,000
2. All capacitance values are in microfarads. P =  $\frac{1}{1,000,000}$

LE-109

## Parts List by Specific Countries

Symbol No.	Description	POWER SOURCE			
		JA ● 100V	UZ ▲ 120V	AD ■ 220V	EK ★ 220V
		Japan	North America	West Germany	General Foreign
C2009	Capacitor	23T00132L12	23T00132L02	23T00132L02	23T00132L02
C2010	Capacitor	23T00132L12	23T00132L02	23T00132L02	23T00132L02
D1001	Diode	48T80987F01	48T80317F01	48T80317F01	48T80317F01
D1002	Diode	48T80987F01	48T80317F01	48T80317F01	48T80317F01
D1003	Diode	48T80987F02	48T80317F02	48T80317F02	48T80317F02
D1004	Diode	48T80987F02	48T80317F02	48T80317F02	48T80317F02
F1001	Fuse	65T55050F05	65T52486F31	65T42077U09	65T42077U09
P1001	Plug, AC Cord	28T81592F02	28T55335F02	28T43812P03	28T43812P03
S1002	Switch	Not Used	Not Used	40T80258F02	40T80258F02
T1001	Trans, Power	25T81483F01	25T81483F02	25T81483F04	25T81483F04
T1002	Trans, Power	25T81484F01	25T81484F02	25T81484F04	25T81484F04
8	Cover, Rear	15D81390F01	15D81390F03	15D81390F03	15D81390F03
9	Assembly, Front Panel	01V81700F43	01V83300F58	01V83300F58	01V83300F58
18	Stopper, Cord	43B41625J05	43B41625J02	43B41625J02	43B41625J02
27	Holder, Fuse	09T51960F01	09T51960F01	09T51410F01	09T51410F01
38	Label, Fuse	Not Used	54B62266F27	54B62266F47	54B62266F47
39	Shaft	Not Used	Not Used	47C64899F44	47C64899F44
105	Carton, Packing	56S71001F76	56S71001F87	56S71001F87	56S71001F87
106	Assembly, Pamphlet	Not Used	01V83400F65	Not Used	Not Used
106-1	Owners, Manual	68P80130F62	Not Used	68P81707F22	68P81707F22
106-2	Plug, Audio Cable	28T58909F01	Not Used	28T58909F01	28T58909F01

**Note:** ● : For Japanese model only (JA)      ■ : For West Germany model only (AD)  
 ▲ : For North American model only (UZ)      ★ : For General Foreign model only (EK)  
 Other : Common