

SERVICE MANUAL

Q U A D
AMPLIFIER

QX-4960

interM

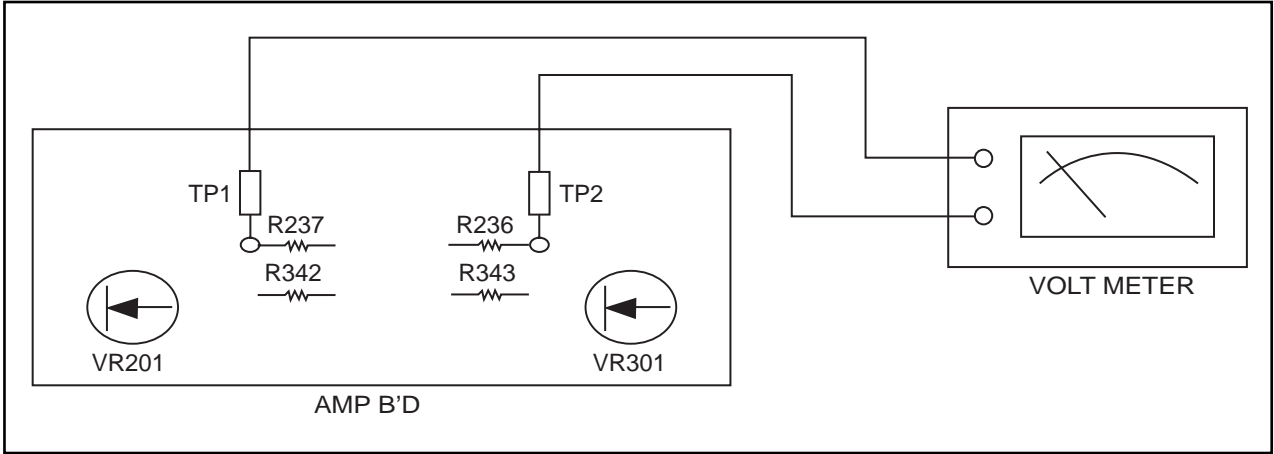
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MADE IN KOREA
NO: 9007979300

interM

ELECTRICAL ADJUSTMENT PROCEDURE

■ IDLE CURRENT

- A. Setting
Set the master volume minimum.
- B. Connection



- C. Adjustment
 - Adjust VR301 so that the current through the R237, R236, R342, R343 become 10 milliampere.
 - When that voltage across the “TP1” to “TP2” becomes 10 millivolt, the current becomes 10 milliampere.

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SPECIFICATIONS

MODEL	QX-4960	
Power Output Level f=1kHz, THD+N ≤ 0.05% (Typical) QUAD RL=8Ω RL=4Ω BRIDGED STEREO RL=8Ω One Channel Driven f=1kHz THD+N ≤ 0.05% RL=4Ω	170W 240W 480W 240W	
Frequency Response RL=8Ω, P.=1W	0dB+0.5, −1.5dB: f=DC~55kHz	
Power Bandwidth Half Power, THD+N ≤ 0.1% STEREO RL=8Ω	10Hz~20kHz	
Total Harmonic Distortion (THD+N) f=20Hz~20kHz, Half Power QUAD RL=8Ω RL=4Ω BRIDGED STEREO RL=8Ω	≤ 0.05% ≤ 0.07% ≤ 0.07%	
Channel Separation Half Power RL=8Ω, f=1kHz, ATT. max. Input 600Ω shunt	≥ 80dB	
Residual Noise (DIN Audio Filter)	≤ −85dB: ATT min.	
Signal-to-Noise Ratio DIN Audio, Input 600Ω Shunt	≥ 100dB	
Sensitivity (ATT max.) Rated Power into 4Ω 1kHz	0dB	
Input Impedance (ATT max.)	20kΩ (Balance/Unbalance)	
Indicators	Power (Red) Protection (Mute) × 4 (Red) Clip × 4 (Orange) Signal × 4 (Green)	
Protection	Power SW ON/OFF muting Heatsink Temp ≥ 100°C (212°F)	
PC Limiter	RL=2Ω	
Fan Circuit	-50°C (122°F)-60°C (140°F) Low-Speed – Variable – Hi-Speed	
Controls	(Front) Power SW: Push up On/Push down Off Attenuator: 21-position dB calibrated (Rear) Mode Sw: Bridged/Stereo/Parallel X-OVER SW	
Power Source	AC 110V–240V, 50/60Hz	
Power Consumption	770W	
Weight	17kg	
Dimensions	482(W) × 88(H) × 369(D) mm	
Connectors	Input Combination Jack (Balance) Output 5-Way binding posts × 4	

■ ACTIVE CROSSOVER

Crossover Frequency	From 60Hz to 250Hz or 600Hz to 2.5kHz
Crossover Slope	24dB/octave Roll/off (Linkwitz Filter)
LOW Filter	40Hz (12dB/octave)

* Specifications and design subject to change without notice for improvements.

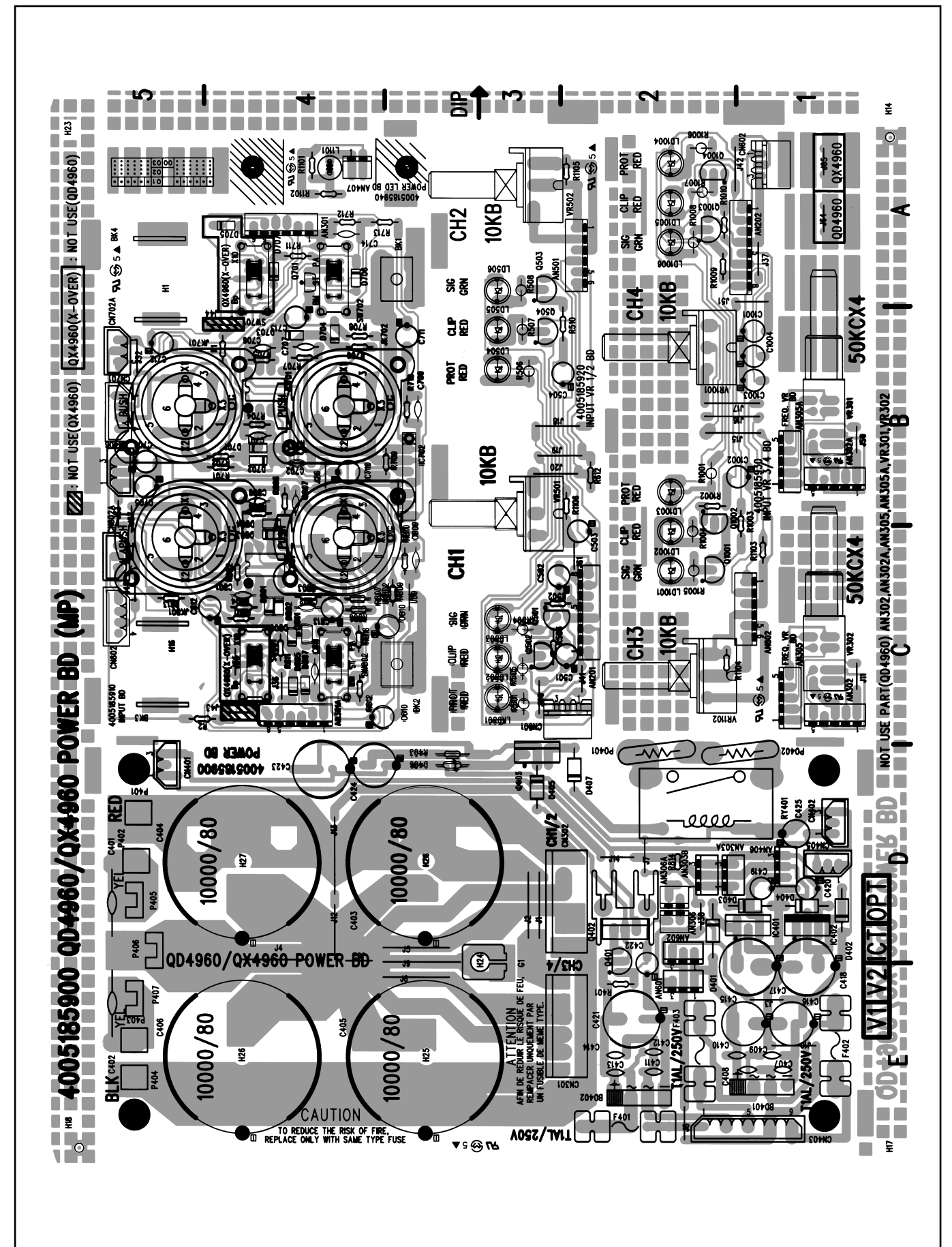
ELECTRICAL PARTS LIST

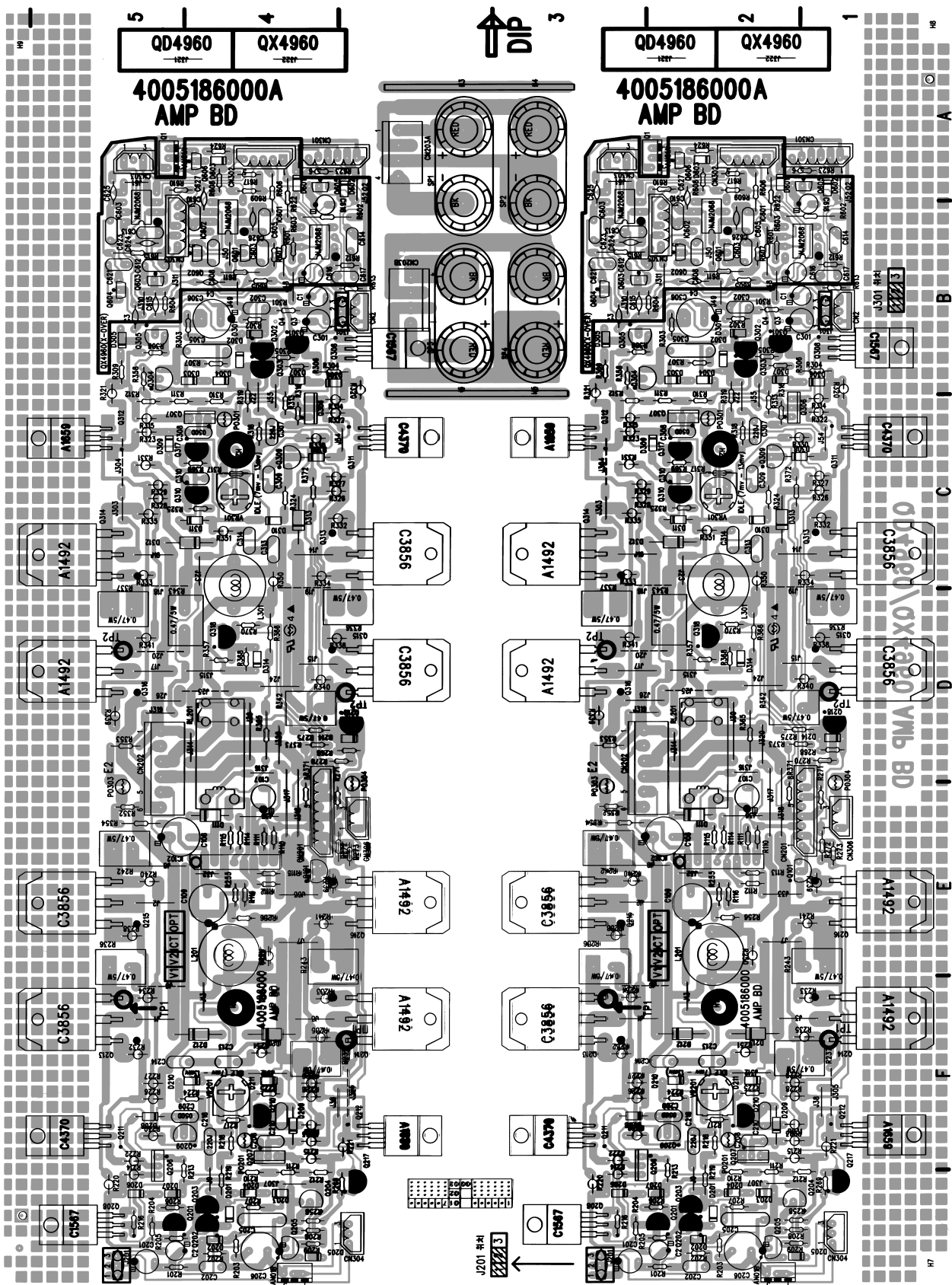
Ref No.	Part No.	Description	Value
POWER B'D (4005185900)			
AN303, AN406	4355763615	CON ASS'Y 3P FLAT 330MM	CON 3P
AN306	4355763718	CON ASS'Y 2P FILAT 420MM	CON 2P
AN601-602	4355863620	CPM ASS'Y 3P FLAT 480MM	CON 3P
BD1	2058100998	DIODE KBPC3504	KBPC 3504
BD401-402	2058100979	DIODE BRIDGE (KBP01G/KBP153G)	KBPB 152
C26	3549472407	CAP SPARK KILLER 0.0047UF 400V	0.0047/400
C401-402	3619474153	CAP POLY TM 0.47UF 250V	0.47/250
C403-406	3419510300	CAP HM 10000UF/80V 35P*60	10000/80
C407-414	3509472530-T	CAP CE F 0.0047UF 50V Z	0.0047/50
C415-416	3409222171-T	CAP AF RSG 220UF 50V SG 10P	220/50
C417-418	3408247161	CAP RSA 470UF 35V SNAP 13P	470/35
C4190-420, C422	3409210071-T	CAP AF RSG 10UF 50V 5P	10/50
C421	3408210261	CAP RSG 1000UF 35V SNAP 16P	1000/35
C423	3409210171-T	CAP AF RSG 100UF 50V 8P	100/50
C424-425	3409247071-T	CAP AF RSG 47UF 50V 6P	47/50
CN301-302	4355923806	CONNECTOR WAFER 06P (J.ST)	CN 6P
CN401-402, CN405	4428595003	LW5267/LWB0640/2.5MM-03P	CN 3P
CN403	4428595009	LW5267/LWB0640/2.5MM-09P	CN 9P
D401-405, D407	2058100996	DIODE RECTIFIER LT1N4006 (4007)	1N 4006
D406	2058502240	DIODE ZENER UZ-24BM (23.1, 25.5)	UZ 24BM
F6	5568224433	CIRCUIT BREAKER 20A (UL/CSA)	20A (UL/CSA)
F6	5568224633	CIRCUIT BREAKER 12A (DOM)	12A (DOM)
F6	5568224533	CIRCUIT BREAKER 10A (EUROPE)	10A (EUROPE)
F401-403	5508412234	FUSE TS 20MM 1A/250V U/C/S	T1A/250V
IC401	2128610900	IC KA7815 COMMON	7815
IC402	2128610800	IC MC7915 COMMON	7915
INLET1	4448997410	AC INLET 6100.4315 250T SCURTE	AC INPUT
P401	4355789207	CON ASS'Y RED	ASS'Y
P402-403	4355789306	CON ASS'Y 1P ORG	ASS'Y
P404	4355789403	CON ASS'Y 1P BLK	ASS'Y
P405-407	4465998210	TERMINAL (250) PCB TAB	250T
PT4	2828063200	TRANS POWER 120Version (UL/CSA)	P.T (120Version)
PT4	2828063210	TRANS POWER 220Version (DOM)	P.T (220Version)
PT4	2828063220	TRANS POWER 230Version (EUROPE)	P.T (230Version)
PT4	2828063230	TRANS POWER 240Version (EUROPE)	P.T (240Version)
PQ401-402	2438200515	THERMISTOR POWER NTC 5D-15	TH5D-15
Q401	2008606108-T	TR NPN KTC2240BL (KTC 3200BL)	KTC 2240BL
Q402	2028407990	TR NPN 2SC 3298A(Y), KTC4370A(Y)	KTC 4370
Q403	2028406113	TR NPN KTD 2058Y (D880Y)	KTD 2058Y
R401	3009122973	RES CF 1.2K 1/5W J N	1.2K
R403	3009822973	RES CF 8.2K 1/5W J N	8.2K
R814	3009102973	RES CF 1K 1/5W J N	1K
RY401	5528009993	RELAY VH-24H O.E.G/TAKAMISAWA	HR-CR6
SW1	4625996611	SW POWER (C1350AT) ARCOLECTRIC	POWER SWITCH
FREQ VR B'D (4005185900)			
AN302-302A, AN305-305A, VR301-302	4355764013	CON ASS'Y 5P S/D 270MM	
	3238085510	VR RK0971410A0353C	503C X 4
INPUT B'D (4005185910)			
AN301	4355764114	CON ASS'Y 6P S/D 300MM	CON 6P
C610, C710-713, C810, C812-813	3409247071-T	CAP AF RSG 47UF 50V 6P	47/50
C701-702, C706-707, C801-802, C806-807	3529560311-A	CAP CE SL 56PF 50V J AXIAL	56P
C704-705	3409222071-T	CAP AF RSG 22UF 50V 5P	22/50
C709, C809	3509101231-A	CAP CE B 100PF 50V K AXIAL	100P
C714, C811	3539104531-A	CAP CE Y 100000PF 50V Z AXIAL	100000P
CN406, CN702A, CNB802	4428595003	LW5267/LWB0640/2.5MM-03P	CN 3P
CN701, CN802	4428595004	LW5267/LWB0640/2.5MM-04P	CN 4P
D701-707, D801-807	2058304100	DIODE IN4148	1N 4148

Ref No.	Part No.	Description	Value
IC701, IC801	2118010432	IC NJM2068DD JRC	NJM 2068DD
IC702	2168220989	IC NJM 2068L JRC	NJM 2068L
JK701-702, JK801-802	4438090310	JACK COMBINATION CXLF-06L	JACK
Q701, Q801	2028821134-T	FET 2SK372 BL-TYPE 4	2SK 372
R1-2	3009102973	RES CF 1K 1/5W J N	1K
R701-708, R801-808	3002120953	RES CF 12K 1/5W FN	12K 1%
R709-710, R809-810	3009103973	RES CF 10K 1/5W J N	10K
R711, R811	3009472973	RES CF 4.7K 1/5W J N	4.7K
R712, R812	3009473973	RES CF 47K 1/5W J N	47K
R713, R813	3009123973	RES CF 12K 1/5W J N	12K
SW701-702, SW801-802	4618999910	SW SS65010-0203-9H-FN	SW
VR 1/2 B'D (4005185920)			
AN201	4355763507	CON ASS'Y 8P FLAT 150MM	CON 8P
AN501	4355763800	CON ASS'Y 6P S/D	CON 6P
C501-504	3409222871-T	CAP AF RSG 0.22UF 50V 5P	0.22/50
CN601	4428594903	LA5268/LAB0640/2.5MM-03P	CN 3P
LD501, LD504	2300050105	LED LTL-307E-041A LITEON	GRE (EL204GD)
LD502, LD506	2300052105	LED LTL-307G-041A LITEON	RED (SLR34UR)
LD503, LD505	2300050105	LED LTL-307E-041A LITEON	RED (SLR34UR)
Q501-504	2008606108-T	TR NPN KTC2240BL (KTC 3200BL)	KTC 2240BL
R501, R504-508	3089332275	RES NFR 3.3K 1/4W J R PHILKO	FR 3.3K
R502-503, R509-510	3009223973	RES CF 22K 1/5W J N	22K
R1105-1106	3009472973	RES CF 4.7K 1/5W J N	4.7K
VR501-502	3228075410	VR PI16 10KB (21 DETENT)	10KB
VR 3/4 B'D (4005185930)			
AN202	4355763507	CON ASS'Y 8P FLAT 150MM	CON 8P
AN802	4355763800	CON ASS'Y 6P S/D	CON 6P
C1001-1004	3409222871-T	CAP AF RSG 0.22UF 50V 5P	0.22/50
CN602	4428594903	LA5268/LAB0640/2.5MM-03P	CN 3P
LD1001, LD1006	2300052105	LED LTL-307E-041A LITEON	GRE (EL204GD)
LD1002, LD1005	2300050105	LED LTL-307G-041A LITEON	RED (SLR34UR)
LD1003, LD1004	2300050105	LED LTL-307E-041A LITEON	RED (SLR34UR)
Q1001-1004	2008606108-T	TR NPN KTC2240BL (KTC 3200BL)	KTC 2240BL
R1001, R1004-1008	3089332275	RES NFR 3.3K 1/4W J R PHILKO	FR 3.3K
R1002-1003, R1009-1010	3009223973	RES CF 22K 1/5W J N	22K
R1103-1104	3009472973	RES CF 4.7K 1/5W J N	4.7K
VR1101-1102	3228075410	VR PI16 10KB (21 DETENT)	10KB
POWER LED B'D (4005185940)			
AN407	4355763718	CON ASS'Y 2P FILAT 420MM	CON ASS'Y 2P
L1101	2300050100	LED LTL-307E LITEON	LTL-307E012A
R1101-1102	3009622973	RES CF 6.2K 1/5W J N	6.2K
AMP B'D (4005186000)			
C1-2	3409215971-T	CAP AF RSG 1.5UF 50V 5P	1.5/50
C107	3409210141-T	CAP AF RSG 100UF 25V 6P	100/25
C108-109, C206, C306	3409810141-T	CAP AF NP 100UF 25V	100/25 NP
C201, C301	3409547031-T	CAP AF 47UF 16V (MOSE)	47/16
C202, C302	3688471118	CAP MO SR22C 471JA	471JA
C205, C305	3698152198	CAP NPP POLY 152J 2J	152J
C208, C308	3678050177	CAP M1 DM1 C 050D5	050D5
C209-210, C309-310	3609222120-T	CAP MA 0.0022UF 100V J	0.0022M
C213-214, C313-314	3609104122-T	CAP MA 0.1UF 100V J SMALL	0.1/100 (M)
C218, C307	3678220177	CAP M1 DM 5C 220J5	220J5
C603, C608, C612, C621	3609393120-T	CAP MA 0.039UF 100V J	0.039/100 (M)

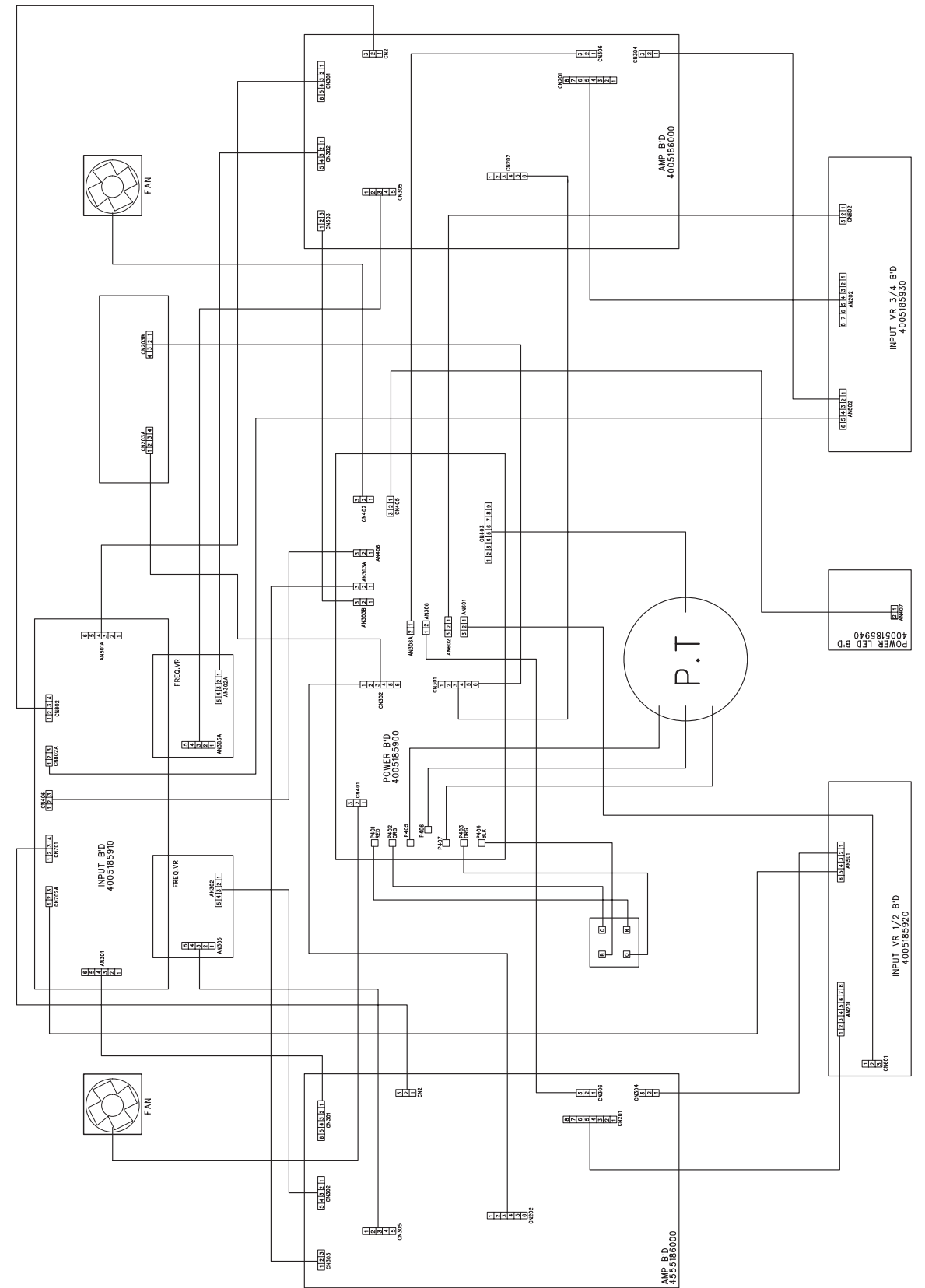
Ref No.	Part No.	Description	Value
C605, C610, C613, C623	3609392120-T	CAP MA 0.0039UF 100V J	0.0039/100 (M)
C614, C617	3609683120-T	CAP MA 0.068UF 100V J	0.068/100 (M)
C615	3539104531-A	CAP CE Y 100000PF 50V Z AXIAL	100000P
C616, C618	3409247071-T	CAP AF RSG 47UF 50V 6P	47/50
C624-627	3509331231-A	CAP CE B 330PF 50V K AXIAL	330P
CN2, CN304, CN306	4428595003	LW5267/LWB0640/2.5MM-03P	CN 3P
CN201	4428595008	LW5267/LWB0640/2.5MM-08P	CN 8P
CN202	4355923806	CONNECTOR WAFER 06P (J.ST)	CN 6P
CN203A, CN203B	4355923804	CONNECTOR WAFER 04P (J.ST)	CN 4P
CN301	4428595006	LW5267/LWB0640/2.5MM-06P	CN 6P
CN302, CN305	4428595005	LW5267/LWB0640/2.5MM-05P	CN 5P
D111	2058100996	DIODE RECTIFIER LT1N4006 (4007)	1N 4006
D201-209, D214, D301-309, D314, D601-603	2058304100	DIODE IN4148	1N 4148
D210-211, D310-311, D212-213, D312-313	2058322100	DIODE 1SS145 ROHM	ISS 145
IC102	2118050410	DIODE PS2010 PYUNG CHANG	PS 2010
IC601-603	2118010432	IC TA7317P TOSHIBA	TA 7317P
J201, J301	4408194903	IC NJM2068DD JRC	NJM 2068DD
L201, L301	2648099940	PIN HEADER 3P	PIN 3P
PO201, PO301	2438007994	COIL INDUCTOR 1.2UM	1.2uH
PO303	2438007993	POSISTOR PTH 59F04 BE 471TS	BE471TS
PO304	2438007995	POSISTOR PTH 9M04 BE 222TS 2F	BE222TS
Q101, Q204-205, Q209, Q304-305, Q309	2008606108-T	POSISTOR PTH 9M04 BH 471TS 2F	BE471TS
Q201, Q210, Q217-218, Q301, Q310, Q317-318	2008206104-T	TR NPN KTC2240BL (KTC 3200BL)	KTC 2240BL
Q202-203, Q302-303	2008206106-T	TR PNP KTA 1268BL	KTA 1268BL
Q206, Q306	2008005999	TR PNP KTA2400G KEC	KTA 2400G
Q207, Q307	2008405999	TR PNP 2SA 1546 NEC	2SA 1546
Q208, Q308	2008400960	TR NPN 2SC4001 NEC	2SC 4001
Q211, Q311	2028407990	TR NPN 2SC 1567A-R MATSUSHITA	2SC 1567A
Q212, Q312	2028107984	TR NPN 2SC 3298A (Y), KTC4370A (Y)	2SC 3298A
Q213, Q215, Q313, Q315, Q214, Q215, Q314, Q316	2028427998	TR PNP 2SA 1306A (Y), KTA1659A (Y)	2SA 1306A
Q601-606	2028821134-T	TR 2SC 3856 W/ACC	2SC 3856
R110, R114	3009822973	TR PNP 2SA 1492 W/ACC	2SA 1492
R111, R352-353	3009104973	FET 2SK372 BL-TYPE 4	2SK 372
R112, R202, R210-212, R302, R310-312, R612	3009473973	RES CF 8.2K 1/5W J N	8.2K
R113	3009682973	RES CF 100K 1/5W J N	100K
R115-116, R255-256, R268, R271, R273, R365-366, R368, R371, R373	3009223973	RES CF 47K 1/5W J N	47K
R201, R301	3009271973	RES CF 6.8K 1/5W J N	6.8K
R203, R303	3003120953	RES CF 22K 1/5W J N	22K
R204, R208-209, R304, R308-309	3009561973	RES CF 270 1/5W J N	270
		RES CF 1.2K 1/5W FN	1.2K 1%
		RES CF 560 1/5W J N	560

Ref No.	Part No.	Description	Value
R205, R305, R624	3009123973	RES CF 12K 1/5W J N	12K
R206, R306, R623	3009102973	RES CF 1K 1/5W J N	1K
R207, R307	3009121973	RES CF 120 1/5W J N	120
R213, R313	3009100973	RES CF 10 1/5W J N	10
R214-215, R314-315	3089820275	RES NFR 82 1/4W J R PHILKO	FR 82
R216, R316	3009182973	RES CF 1.8K 1/5W J N	1.8K
R217, R317	3009471973	RES CF 470 1/5W J N	470
R218-219, R318-319	3002220953	RES CF 22K 1/5W F N	22K 1%
R220-221, R320-321	3089100275	RES NFR 10 1/4W J R PHILKO	FR 10
R222-223, R226-229, R322-323, R326-329	3089221275	RES NFR 220 1/4W J R PHILKO	FR 220
R224-225, R324-325	3009333973	RES CF 33K 1/5W J N	33K
R230-231, R330-331	3089332275	RES NFR 3.3K 1/4W J R PHILKO	FR 3.3K
R232-233, R238-239, R332-333, R338-339	3089479275	RES NFR 4.7 1/4W J R PHILKO	FR 4.7
R234-235, R240-241, R334-335, R340-341	3079101275	RES ERD-2FCVG 101T 1/4W R	FR 100
R236-237, R242-243, R336-337, R342-343	3049478783	RES CE 0.47 5W J T HAN NAE	0.47 5W
R250, R350	3039479575-T	RES MO 4.7 2W J RADIAL	4.7/2W
R251, R351	3039100575-T	RES MO 10 2W JR	10 2W
R258, R358	3009224973	RES CF 220K 1/5W J N	220K
R269, R369	3009103973	RES CF 10K 1/5W J N	10K
R270, R272, R370, R372	3009221973	RES CF 220 1/5W J N	220
R275, R357	3009683973	RES CF 68K 1/5W J N	68K
R354	3009184973	RES CF 180K 1/5W J N	180K
R601-603, R617	3003324953	RES CF 3.24K 1/5W F N	3.24K 1%
R604	3002470953	RES CF 47K 1/5W F N	47K 1%
R605	3003470953	RES CF 4.7K 1/5W F N	4.7K 1%
R606, R608, R610, R615	3002150953	RES CF 15K 1/5W F N	15K 1%
R607, R611	3003115953	RES CF 1.15K 1/5W F N	1.15K 1%
R609	3004806953	RES CF 806 1/5W FN	806 1%
R613	3009823973	RES CF 82K 1/5W J N	82K
RL201	5528009950	RELAY CR 323 DC24V	CR323
SP1-4	4438090210	TERMINAL BINDING POST 2P	BINDING POST
VR201, VR301	3248347110	RES SEMI RH 470 SIDE ADJ	470B

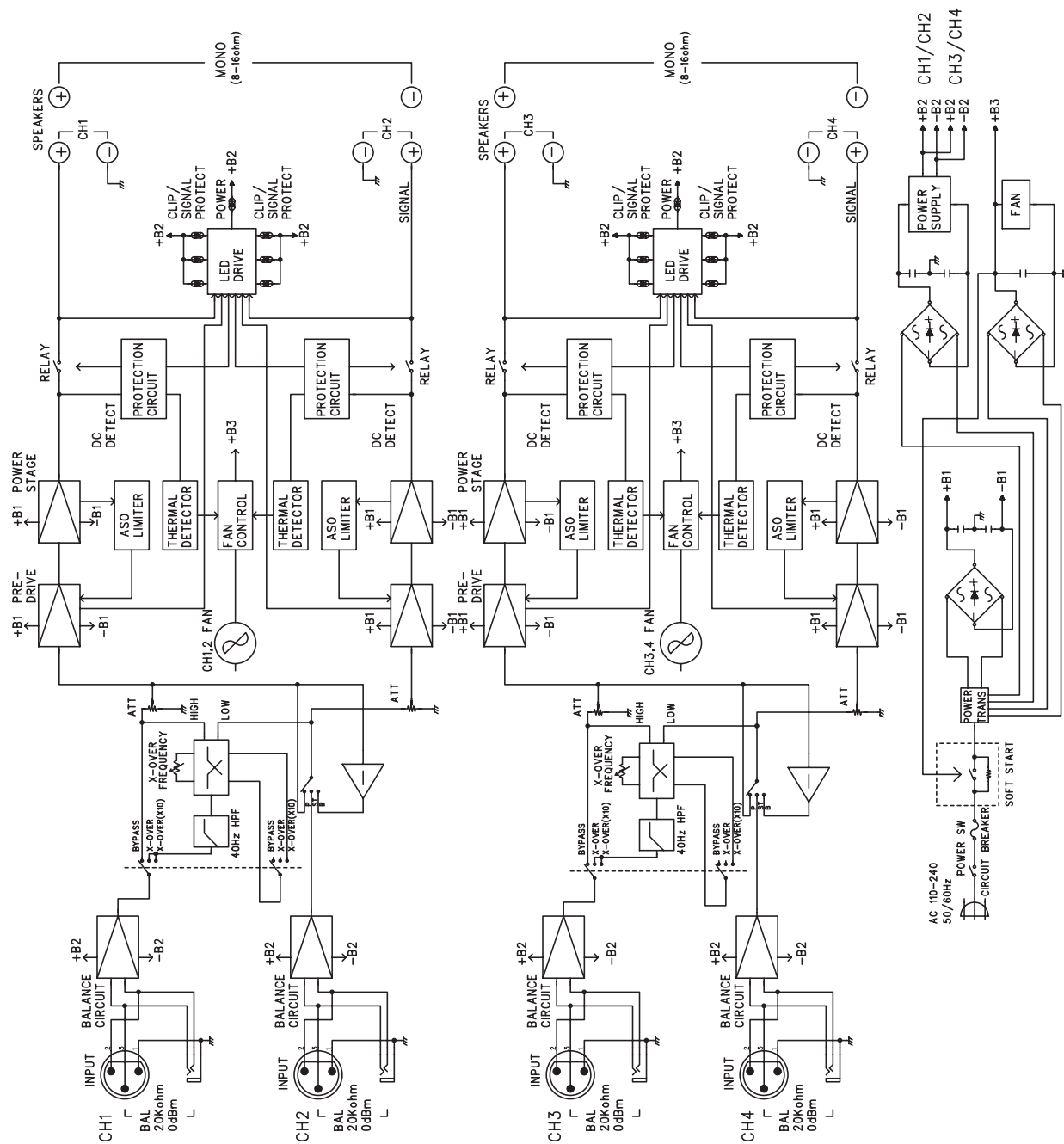




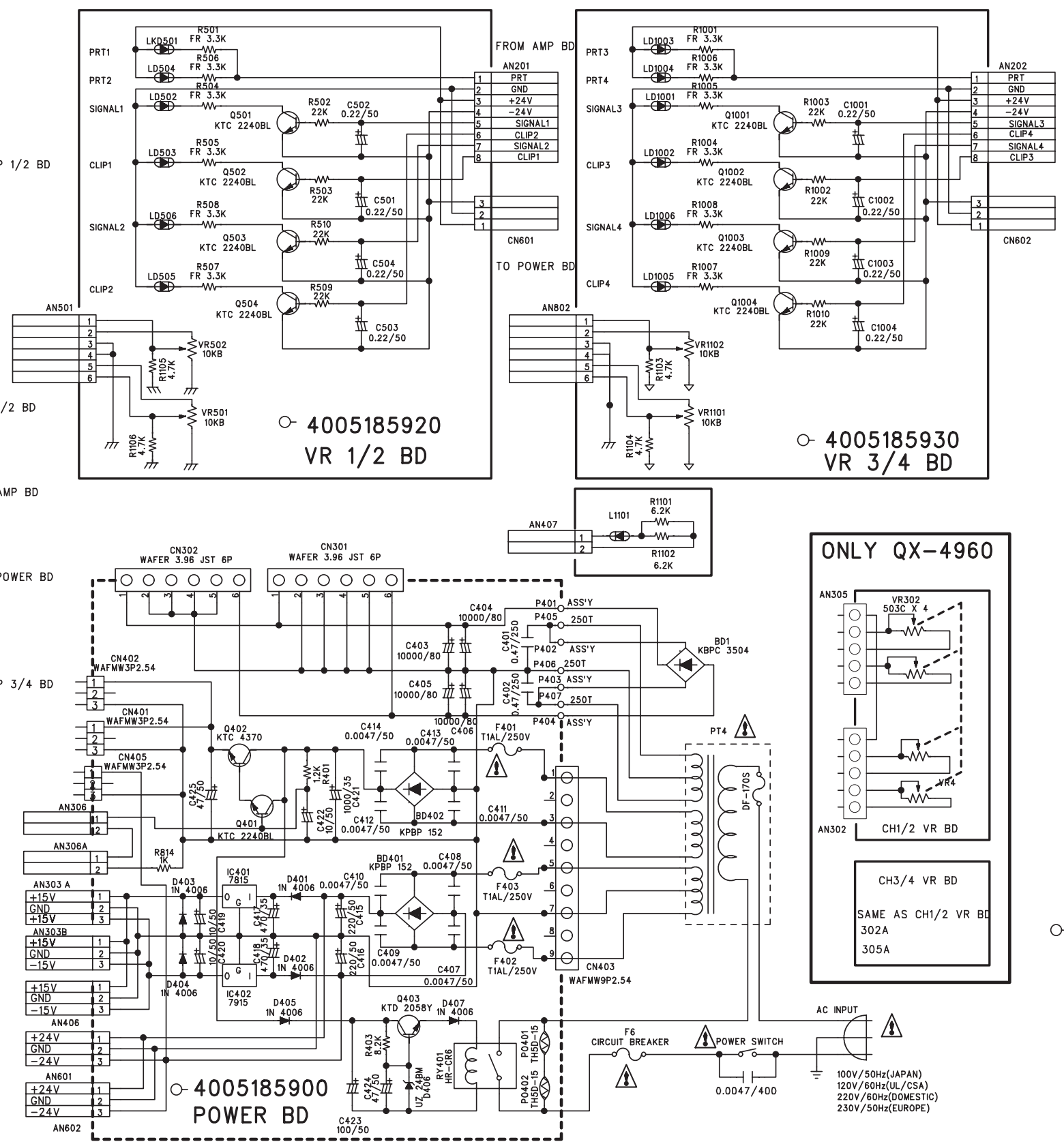
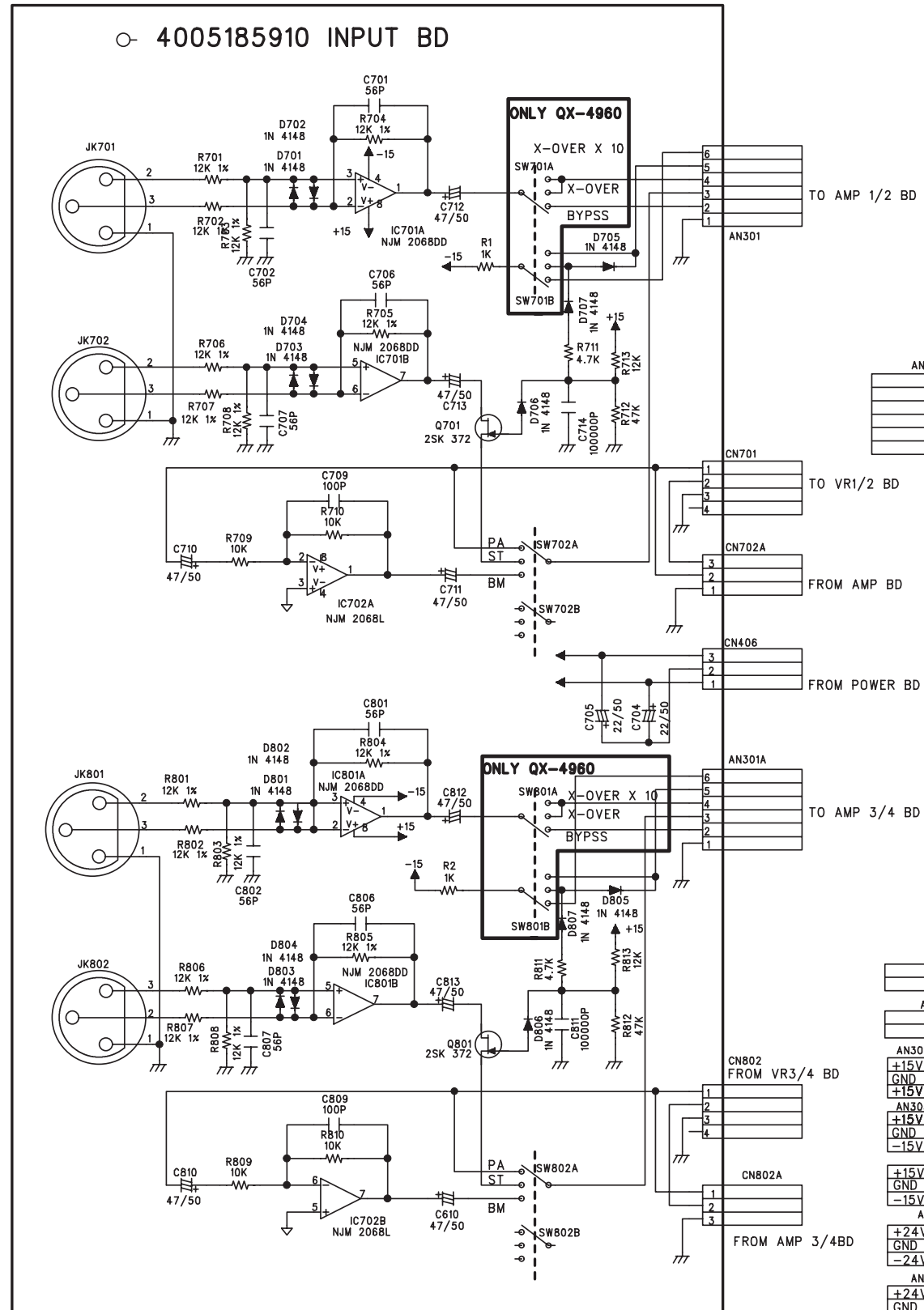
WIRING DIAGRAM

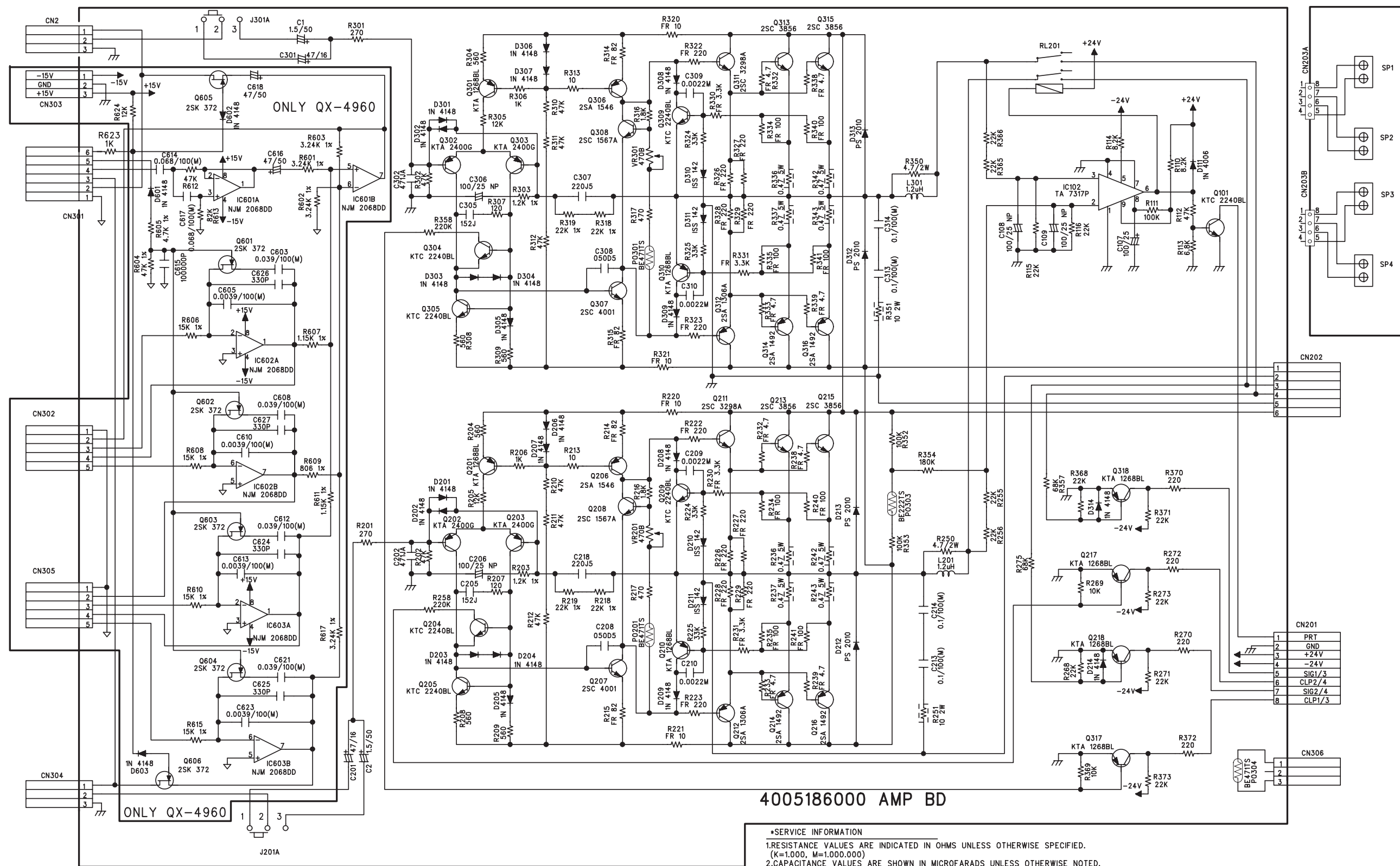


BLOCK DIAGRAM



SCHEMATIC DIAGRAM

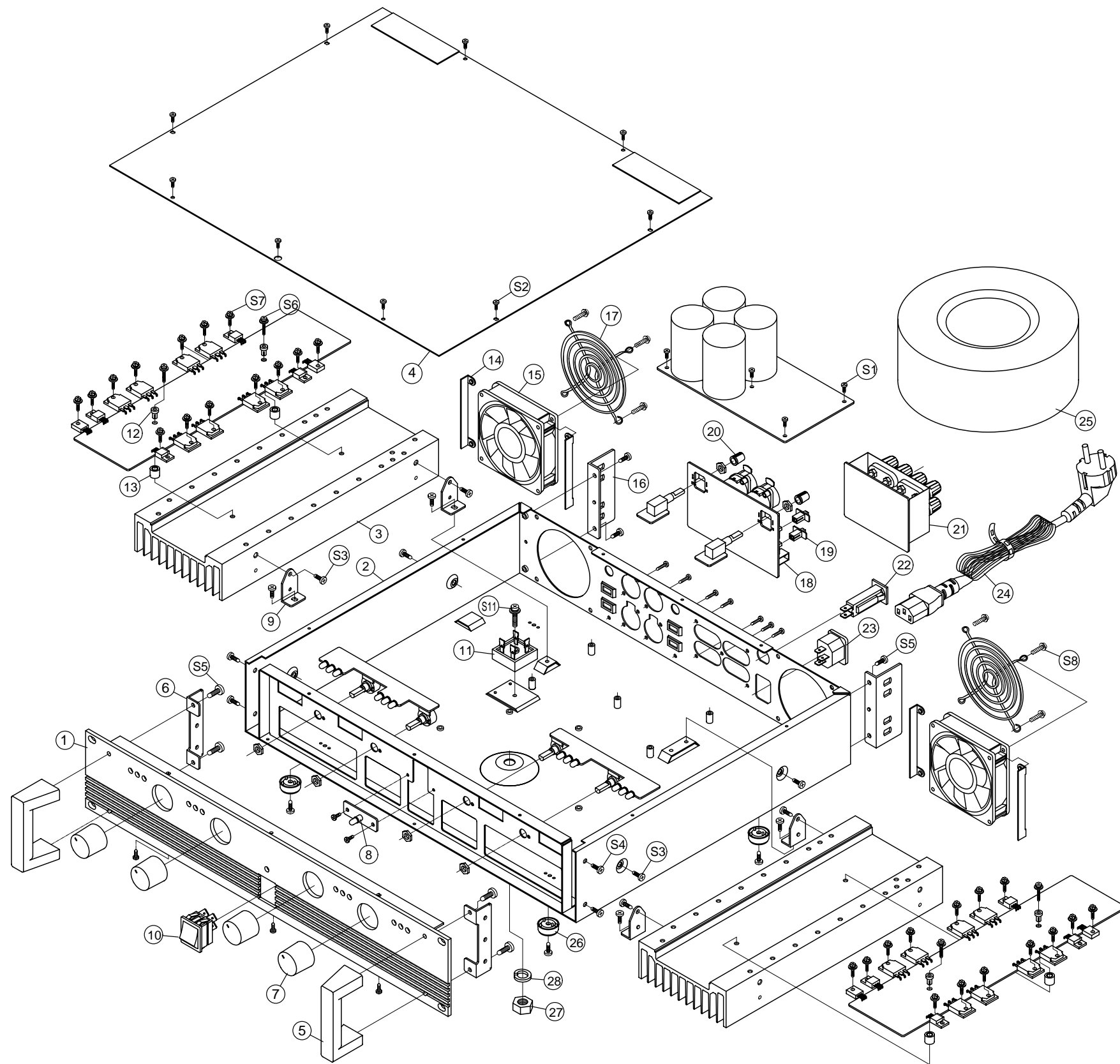




4005186000 AMP BD

- *SERVICE INFORMATION
- 1.RESISTANCE VALUES ARE INDICATED IN OHMS UNLESS OTHERWISE SPECIFIED.
(K=1,000, M=1,000,000)
 - 2.CAPACITANCE VALUES ARE SHOWN IN MICROFARADS UNLESS OTHERWISE NOTED.
(P=MICRO-MICROFARADS)
 - 3.ALL VOLTAGES ARE REFERRED TO GROUND UNDER THE FOLLOWING CONDITIONS.
DC:NO SIGNAL EXCEPT WHERE INDICATED.
AC:RMS

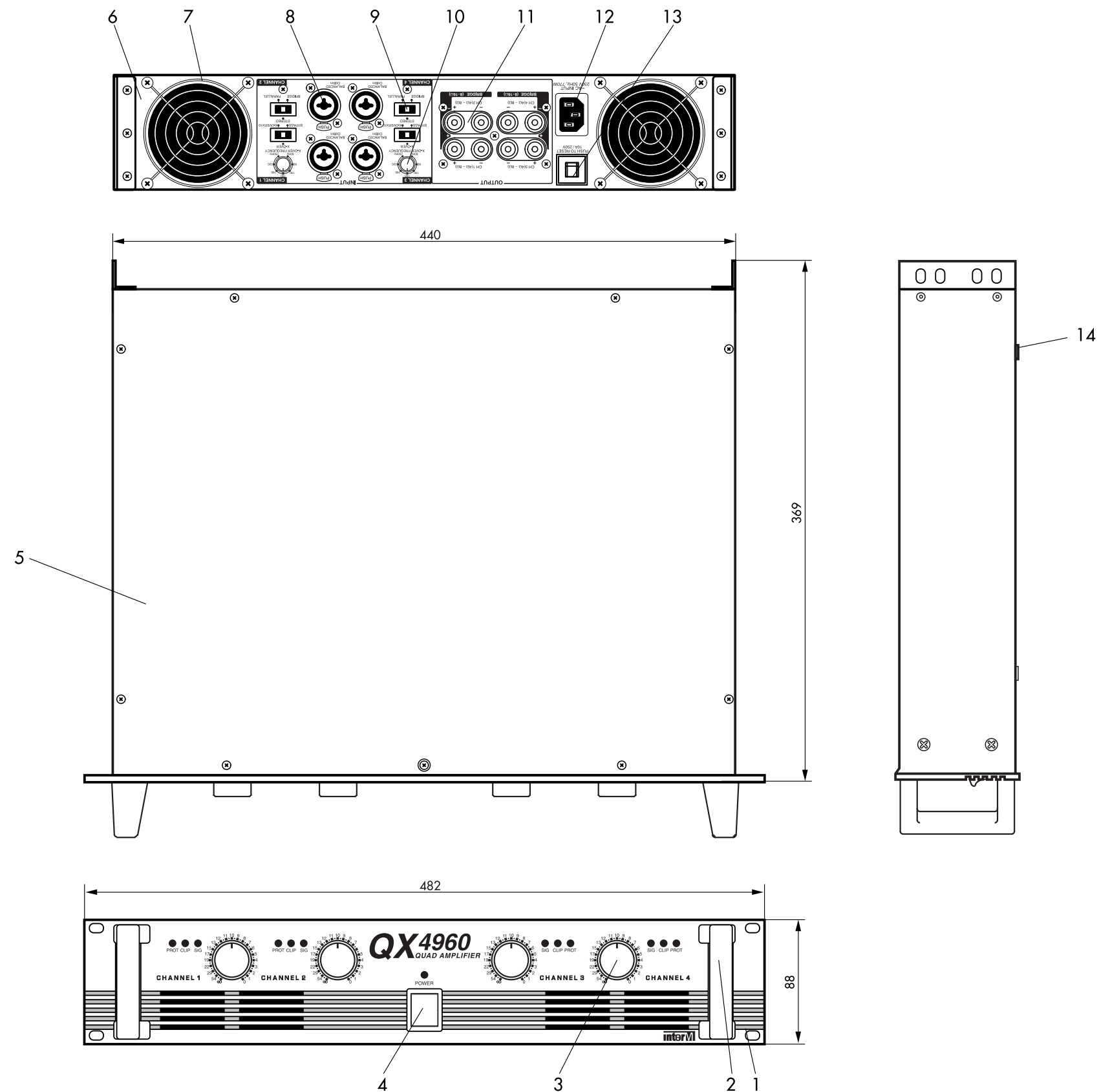
EXPLODED VIEW OF CABINET & CHASSIS/MECHANICAL PARTS LIST



S11	ASS'Y PM 4X18B	8095996930	1	
S10	DOT SCREW BM 3X8B	8095996720	2	
S9	DOT SCREW 2BTC 3X10B	8095996520	13	
S8	ASS'Y PM 4X16N	8095997010	8	
S7	HEX MSPM 3X12Y	8099130121	32	
S6	ASS'Y PM3X22B	8095997110	4	
S5	SCREW 3BTC 4X18Y	8109340181	4	
S4	SCREW 3BTC 4X8B	8109340083	16	
S3	SCREW BM 4X8B	8009140083	8	
S2	SCREW 3BTC 3X6B	8109330063	12	
S1	SCREW BM 3X6N	8009130064	5	
NO.	PART NAME	PART NUMBER	QTY	REMARK

28	WASHER SPRING	8309100013	1	
27	NUT M10B	8209110013	1	
26	FOOT&FOOT FELT	056335999520	4	
25	POWER TRANS	2828063210	1	
24	AC CORD	4308997310	1	
23	AC INLET	4448997410	1	
22	CIRCUIT BREAKER	5568224533	1	
21	BKT SUPPORT	6505936710	1	
20	KNOB CONTROL	6503973410	2	QD-4960 REMOVE
19	KNOB SLIDE	8545084520	2	QD-4960
		8545084520	4	QX-4960
18	BKT GND	6505955520	2	
17	FAN COVER	6538999110	2	
16	BKT (REAR)	046505939911	2	
15	FAN	7308999010	2	
14	FAN BKT	046505968210	4	
13	SPACER	6705998310	4	
12	SPACER HOLDER	6705998410	4	
11	DIODE	2058100998	1	
10	POWER SW	4625996611	1	
9	BKT (HEAT SINK)	6505939810	4	
8	LED LIMITS	8545993390	1	
7	KNOB CONTROL	048543985811	4	
6	BKT (HANDLE)	6505940010	2	
5	HANDLE	048603995220	2	
4	TOP COVER	046122095910	1	
3	HEAT SINK	7502090910	2	
2	CHASSIS MAIN	046121678021	1	QD-4960
		046121678011	1	QX-4960
1	PANEL FRONT	048601992414	1	QD-4960
		048601992413	1	QX-4960
NO.	PART NAME	PART NUMBER	QTY	REMARK

ASS'Y DRAWING



No.	Description	Part No	Q'ty	Remark
1	FRONT PANEL	048601992413	1	
2	HANDLE(2SIZE)	048603995220	2	
3	CONTROL KNOB	048543985811	4	
4	POWER SW.	4625996611	1	
5	TOP COVER	046122095910	1	
6	MAIN CHASSIS	046121678011	1	220V
		046121678012	1	230V
		046121678013	1	120V
		046121678014	1	240V
7	FAN COVER	6538999110	1	
8	COMBINATION JACK	4438090310	4	
9	SLIDE KNOB	8545084520	4	
10	CONTROL KNOB	048523995811	2	
11	BINDING POST	4438088810	2	
12	AC INLET	4448997410	1	
13	CIRCUIT BREAKER	5568224433	1	
14	RUBBER FOOT	6335000610	4	