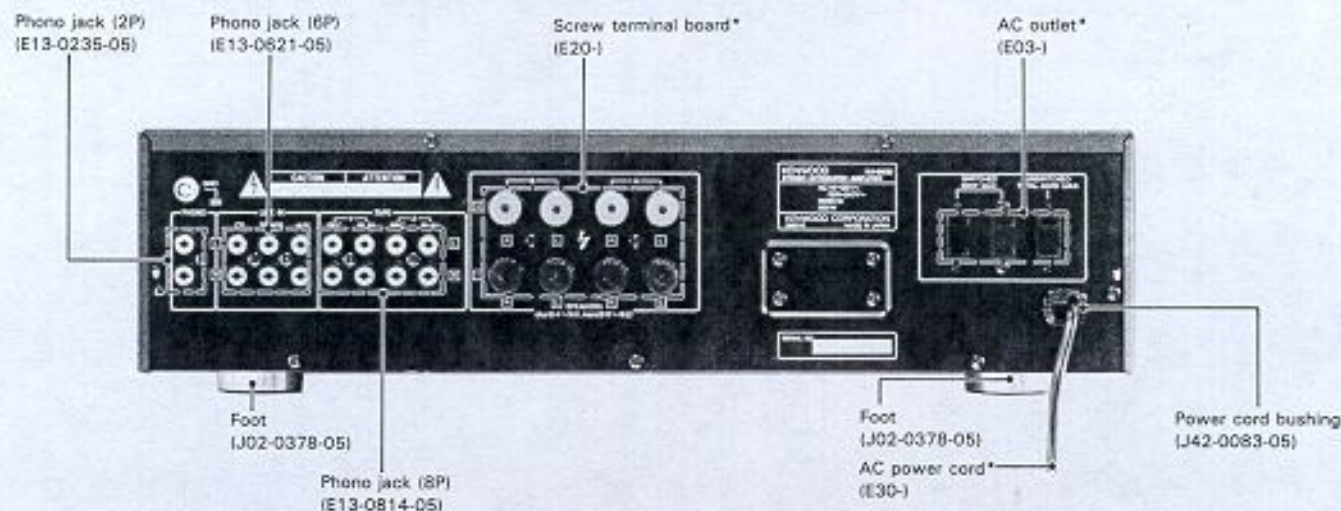
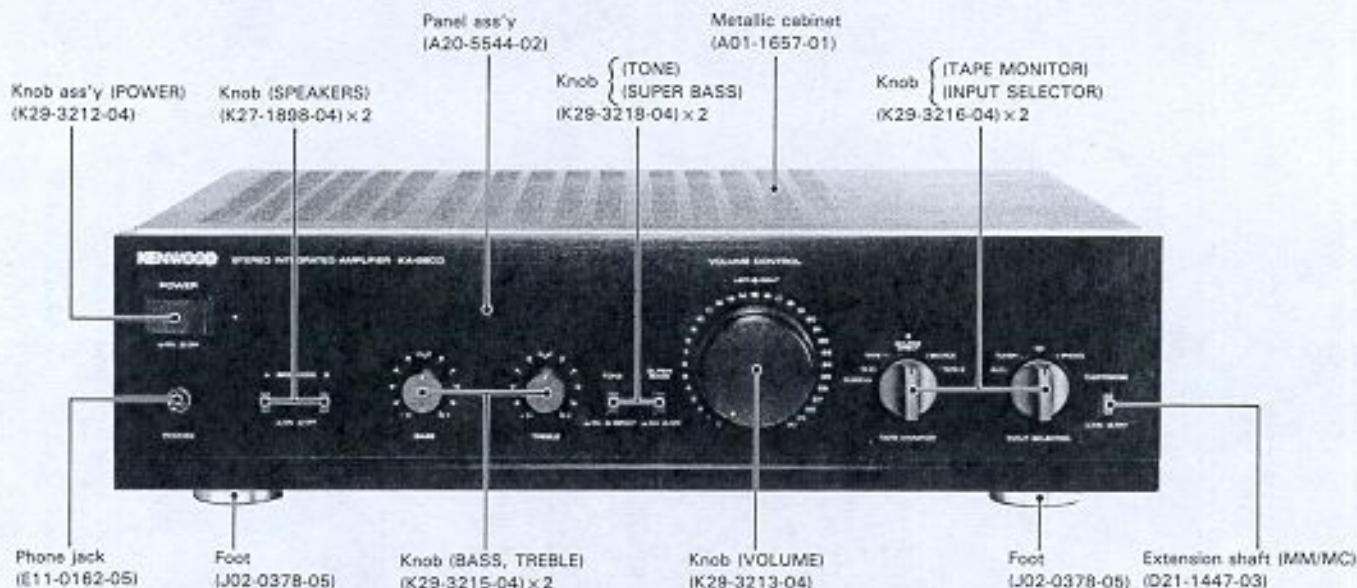


STEREO INTEGRATED AMPLIFIER

**KA-660D****SERVICE MANUAL****KENWOOD** 2378©1988-6 PRINTED IN JAPAN  
B51-3596-00(T)1662

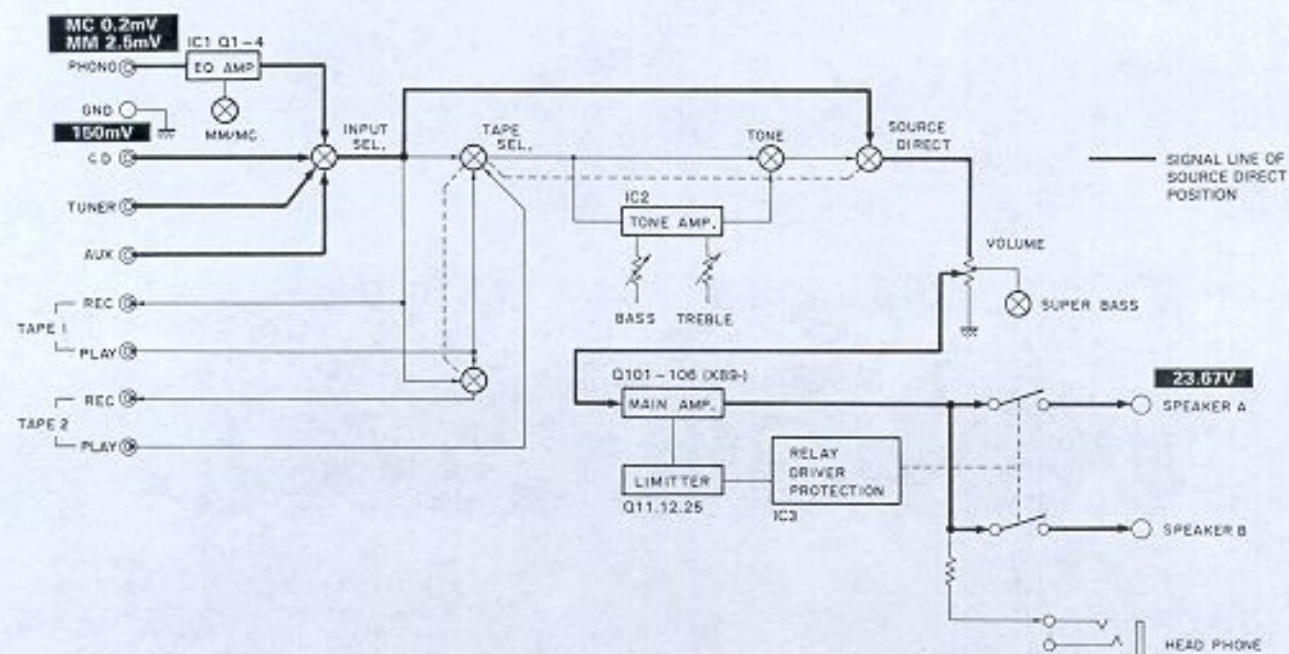
\* Refer to parts list on page 18.



## CONTENTS

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## BLOCK & LEVEL DIAGRAM



## CIRCUIT DESCRIPTION

## DESCRIPTION OF COMPONENTS

Audio unit (X09-3642-70)

Component	Use/Function	Operation/Condition/Compatibility
Q1~4	1st differential amp	
Q11, 12	Protection	Current limiter Tr. Used to limit the current flowing to the final Tr in case of an overload drive.
Q21, 22	AVR for EQ power supply	
Q23, 24	PHONO shock noise prevention	
Q25	Protection	Transmits the operation signals of current limiter Q11 and Q12 to the protection IC (IC3).
IC1 (M5218P-A)	EQ circuit operation amp	
IC2 (M5218P-A)	Tone circuit operation amp	
IC3 ( $\mu$ PC1237HA)	Protection IC	
D1, 2	Current limiter	1SS131 or 1SS178
D11, 12	Static electricity protection	1SS133 or 1SS176
D13, 14	Constant current for the EQ power supply	E-452
D15, 16	Constant voltage for the EQ power supply	RD16ES (B2) or HZS16N (B2)
D17	Constant voltage for the Class A power supply	RD15JS (B) or HZS15S (B)
D18	Protection	1SS131 or 1SS178
D19	LED power supply	DSM1A1 or S5566B
D20	Power rectifier diode	RBV-602LFA or D5SBA20F03
D21	Headphone shock noise prevention	DSM1A1 or S5566B
D22, 23	Constant-voltage tone circuit power supply	RD16ES (B2) or HZS16N (B2)
D24, 25	Relay	1SS131 or 1SS178
D26, 27	Indicator LEDs	D26: For SOURCE DIRECT    D27: For POWER



## ADJUSTMENT/REGLAGES/ABGLEICH

### ADJUSTMENT

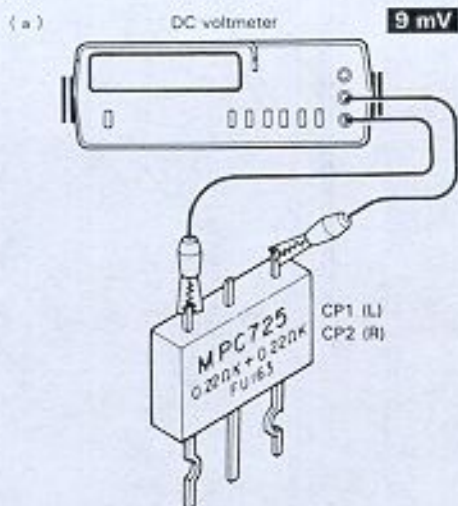
No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTING	ALIGNMENT POINTS	ALIGN FOR	FIG.
Unless otherwise specified, the individual switches should be set as follows. POWER: ON SPEAKER: B REC OUT: OFF SELECTOR: PHONO							
1	IDLE CURRENT	-	Connect a DC voltmeter across CP1 (L) CP2 (R) (X09-)	VOLUME: 0	VR1 (L) VR2 (R) (X89-) (X07-)	9mV	(a)

### REGLAGE

N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DE L'AMPLIFICATEUR	POINTS DE L'ALIGNMENT	ALIGNER POUR	FIG.
Sauf en cas d'indications spéciales, régler chaque commutateur comme suit. POWER: ON SPEAKER: B REC OUT: OFF SELECTOR: PHONO							
1	COURANT DE POLARISATION	-	Connecter un voltmètre de CC SUR CP1 (G) CP2 (D) (X89-)	VOLUME: 0	VR1 (G) VR2 (D) (X89-) (X07-)	9mV	(a)

### ABGLEICH

NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSANG-EINSTELLUNG	VORSTÄRKER-EINSTELLUNG	ABGLEICHE-PUNKTE	ABGLEICHEN FÜR	ABB.
Außer wenn anders angegeben, die verschiedenen Schalter wie folgt einstellen. POWER: ON SPEAKER: B REC OUT: OFF SELECTOR: PHONO							
1	LEERLAUFSTROM	-	Einen Gleichspannungsmesser über CP1 (L) CP2 (R) anschließen. (X09-)	VOLUME: 0	VR1 (L) VR2 (R) (X89-) (X07-)	9mV	(a)

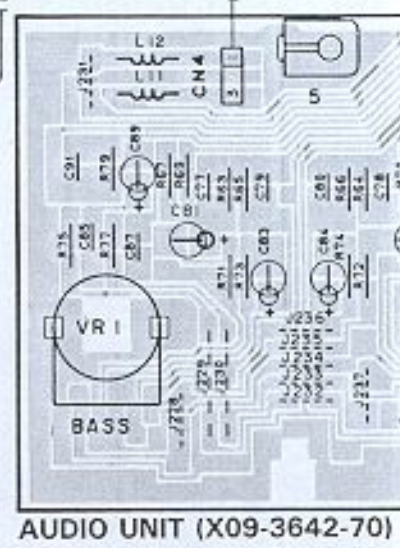
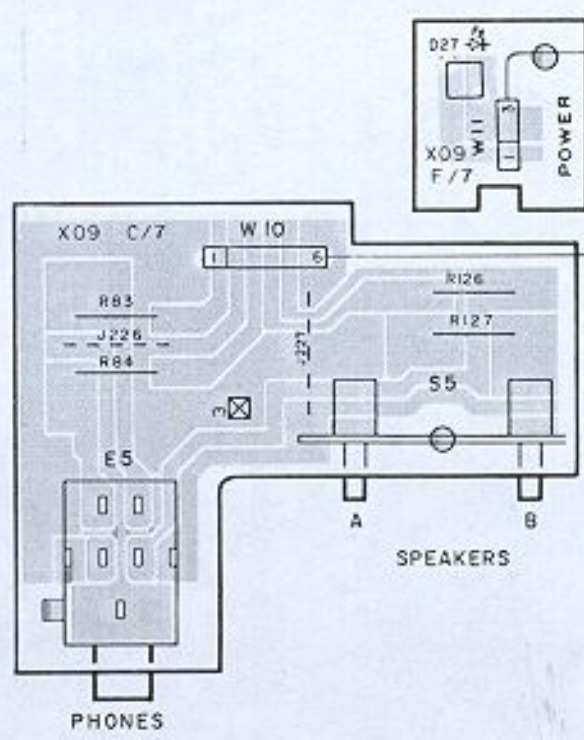
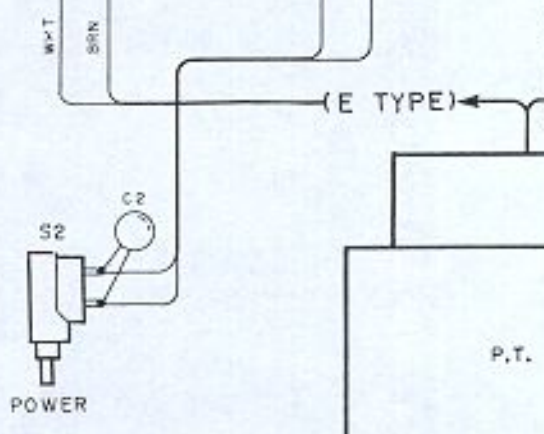
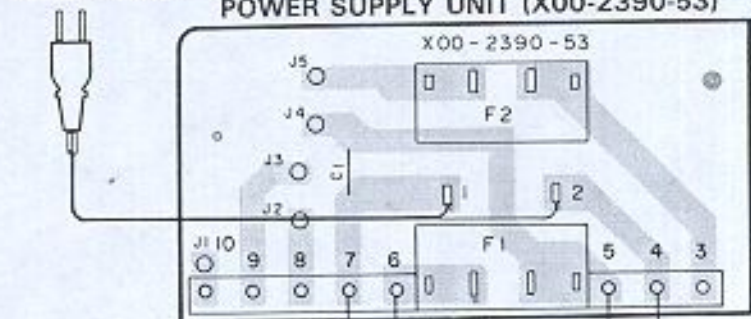




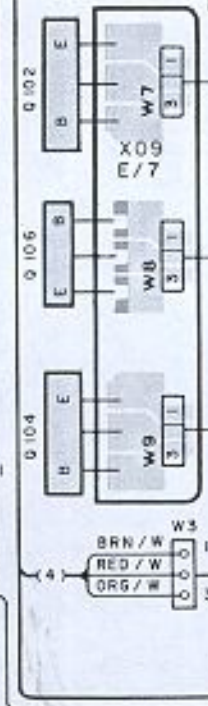
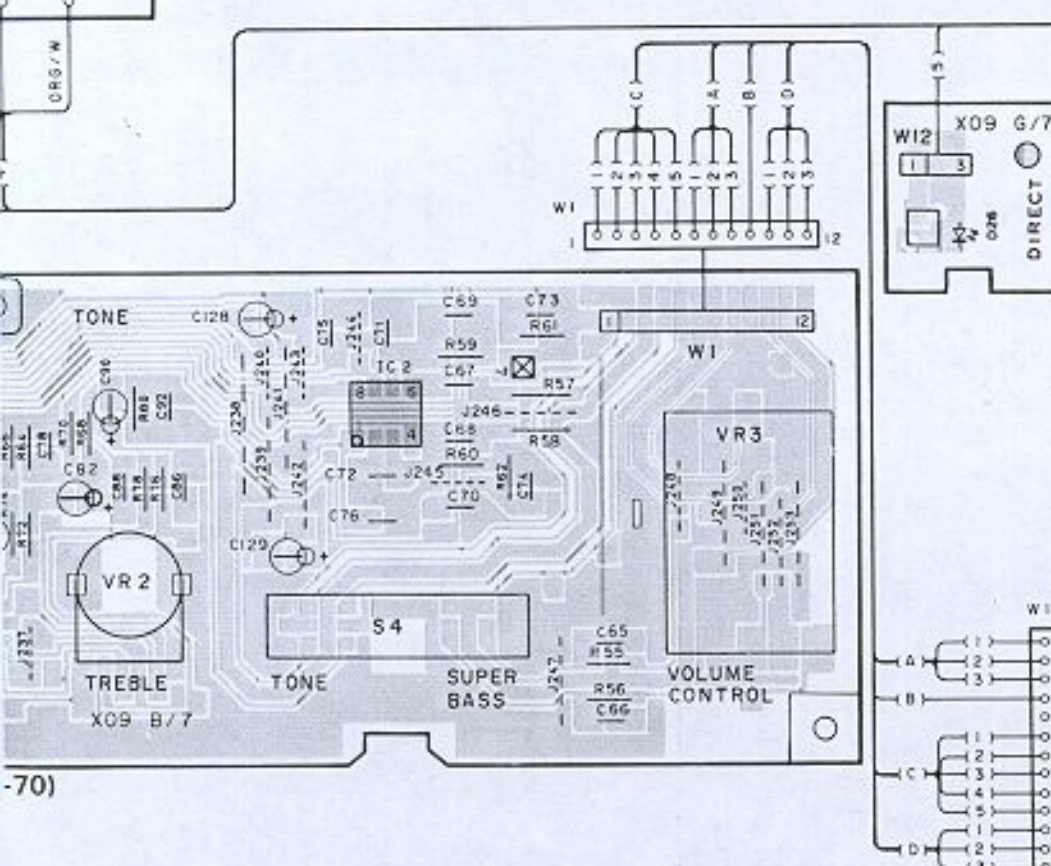
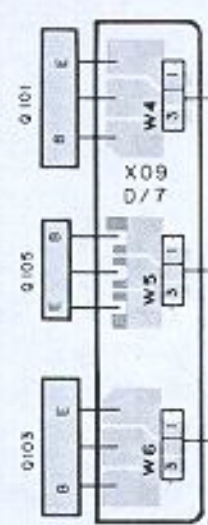
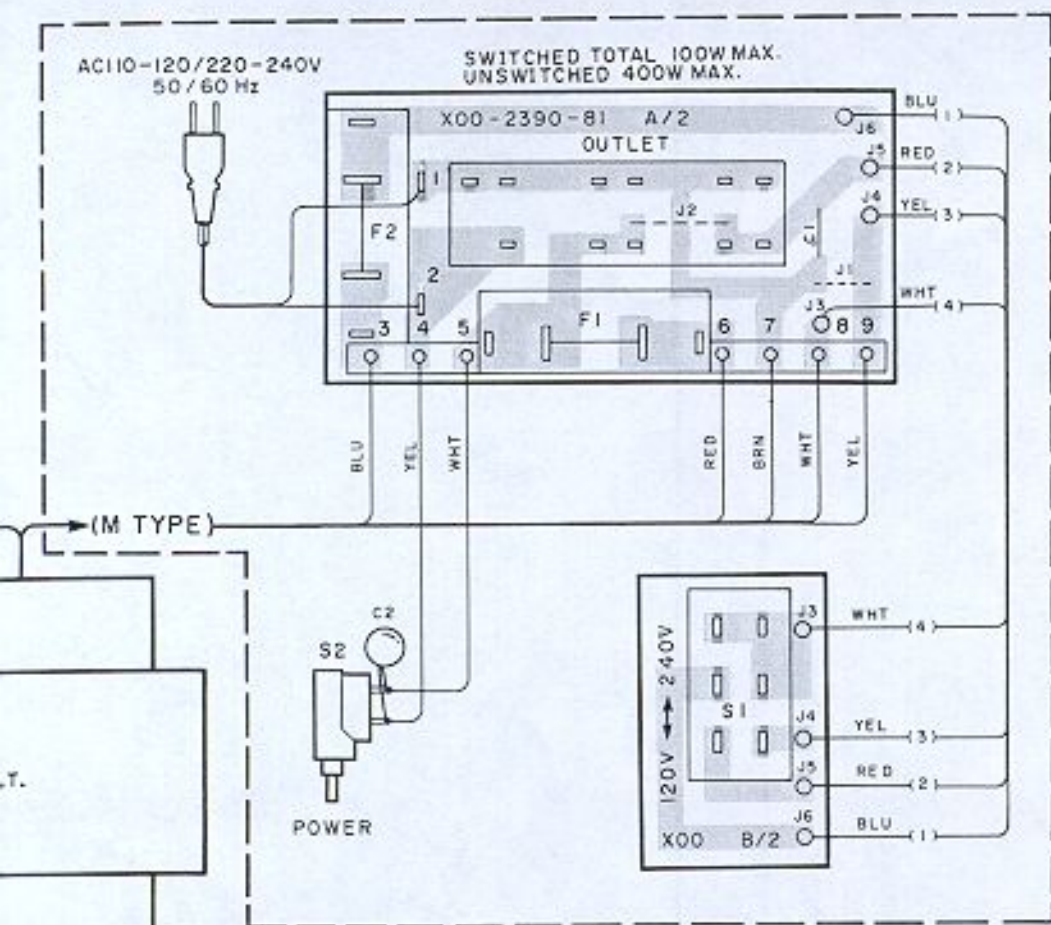
# PC BOARD (Component side view)

AC220V / 50Hz

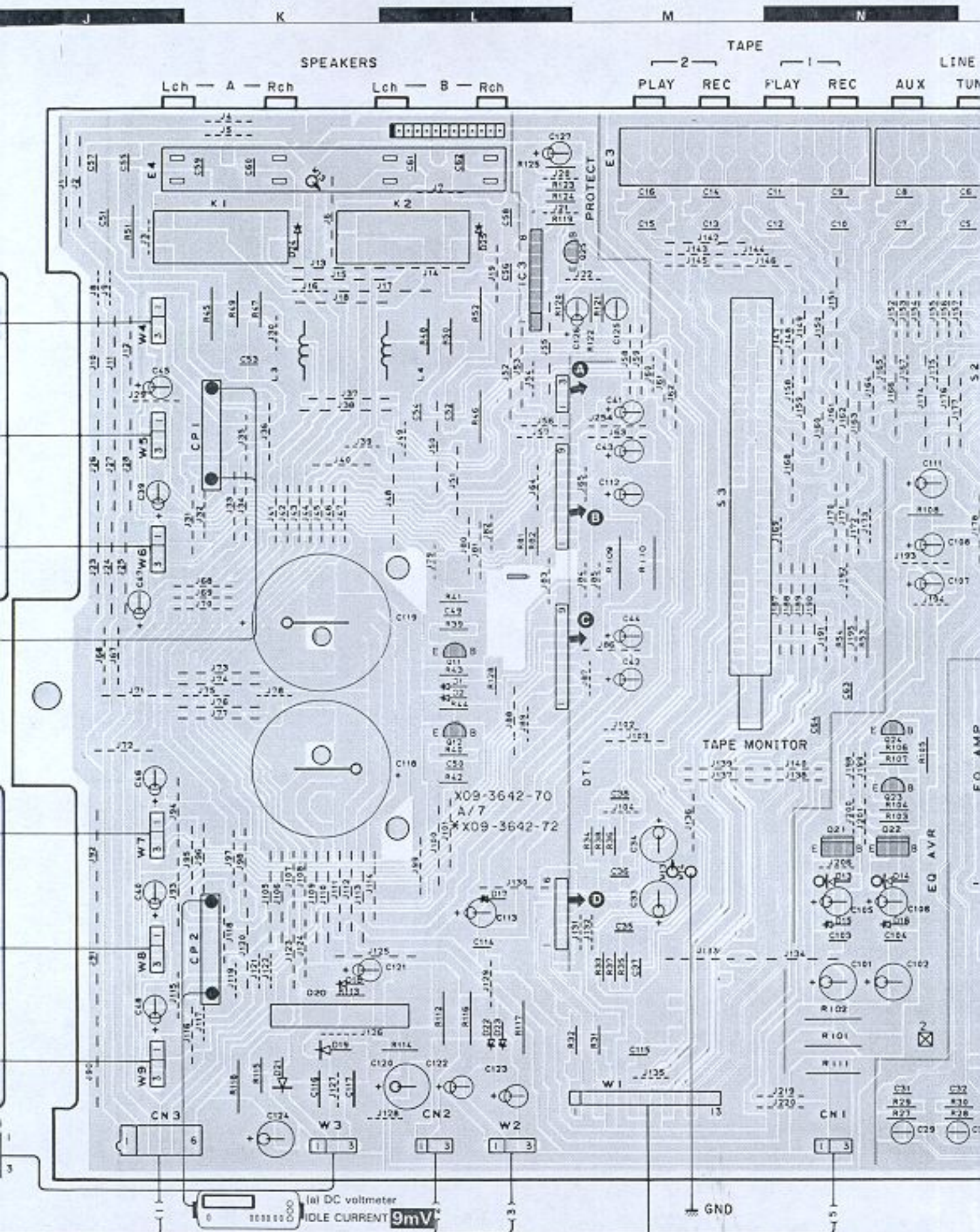
POWER SUPPLY UNIT (X00-2390-53)





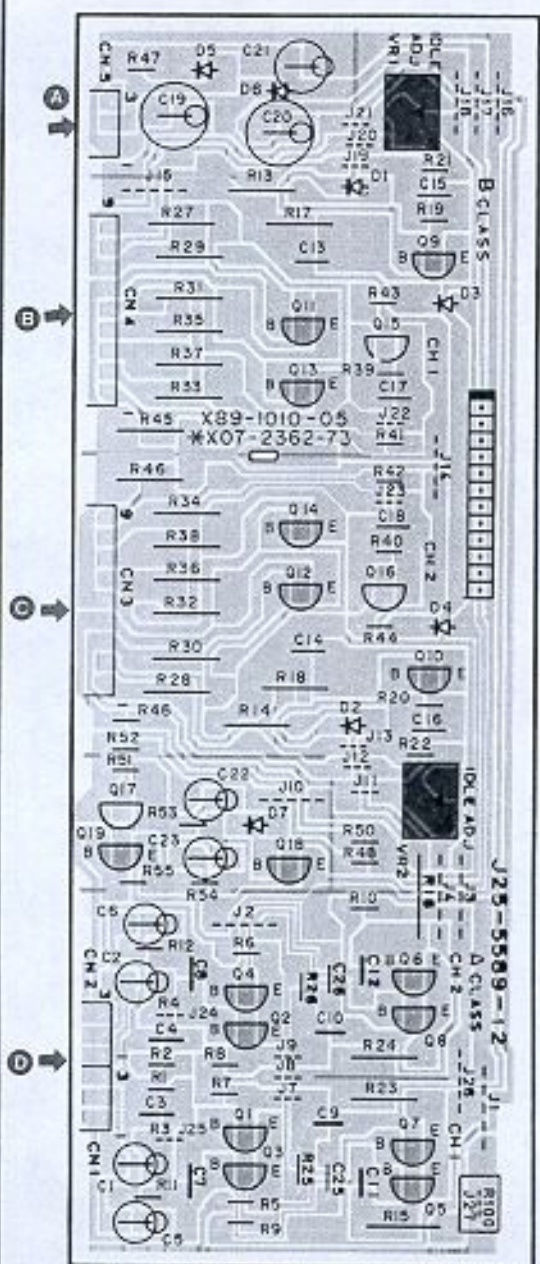
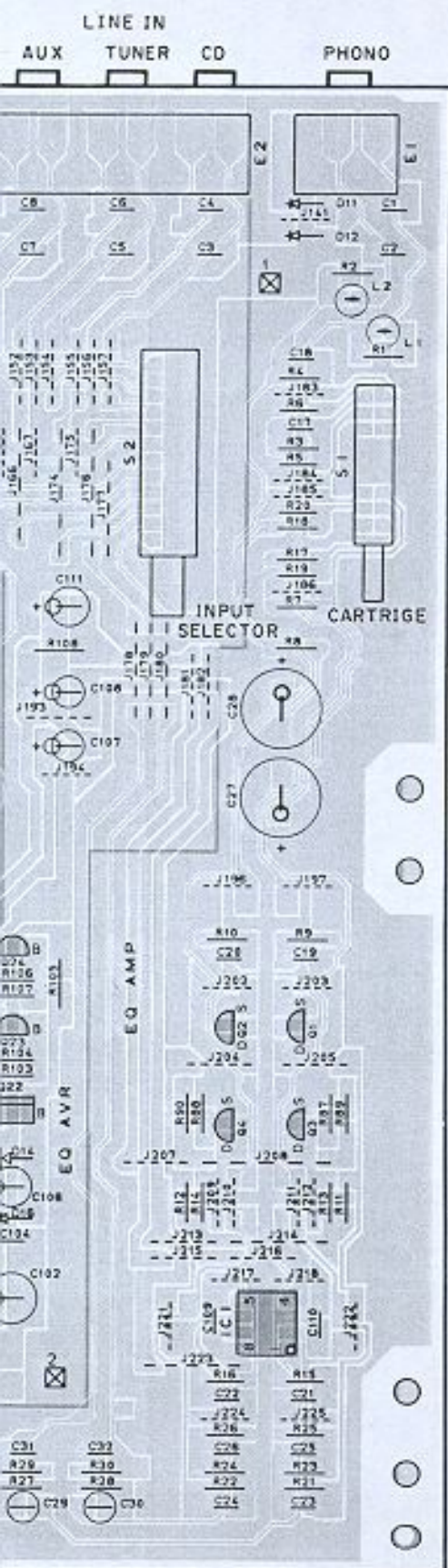




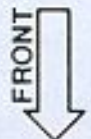


AUDIO UNIT (X09-3642-70)





MAIN AMPLIFIER UNIT (X89-1010-05)



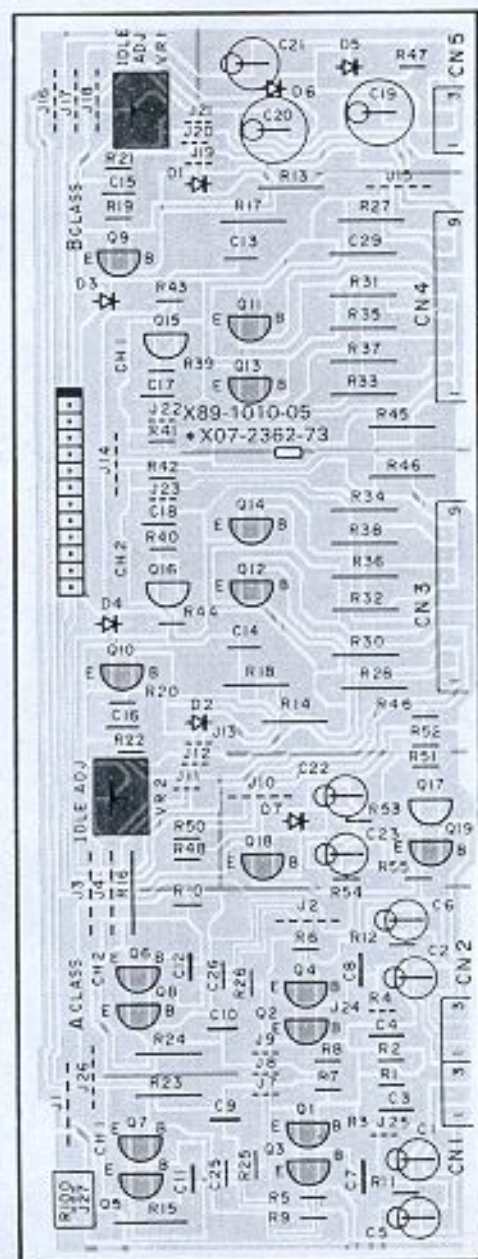
\* SINGAPORE MADE

KA-660D (E)

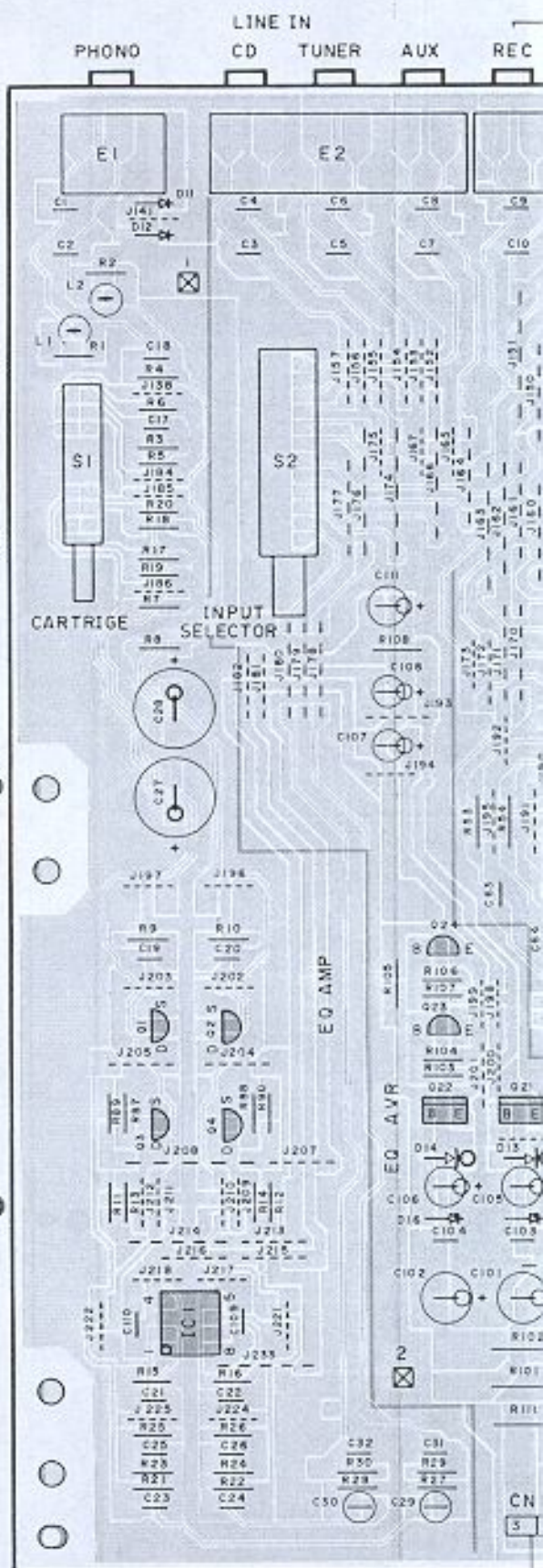
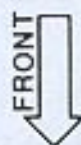
Refer to the schematic diagram for the values of resistors and capacitors.



# PC BOARD (Foil side view)

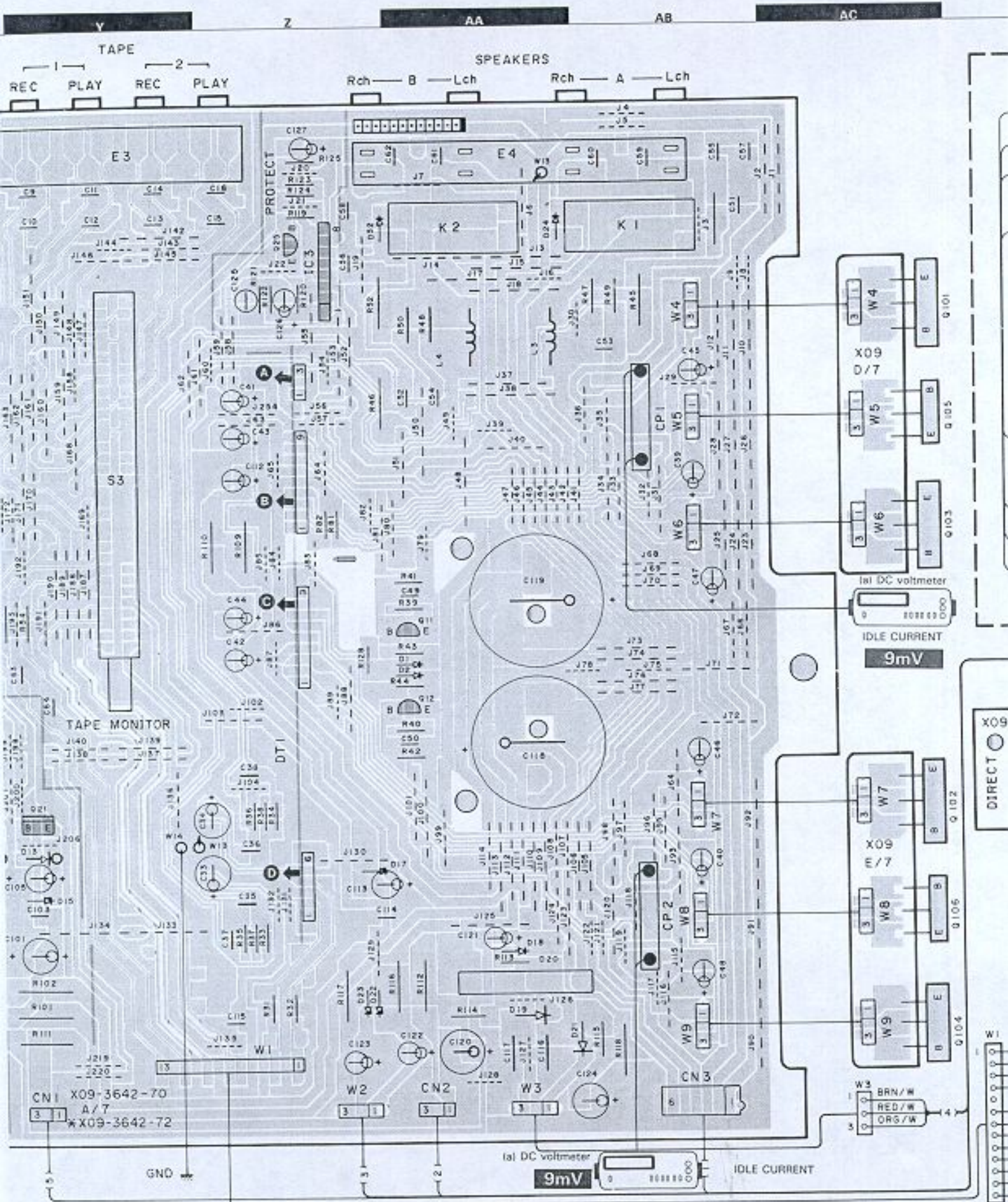


MAIN AMPLIFIER UNIT (X89-1010-05)

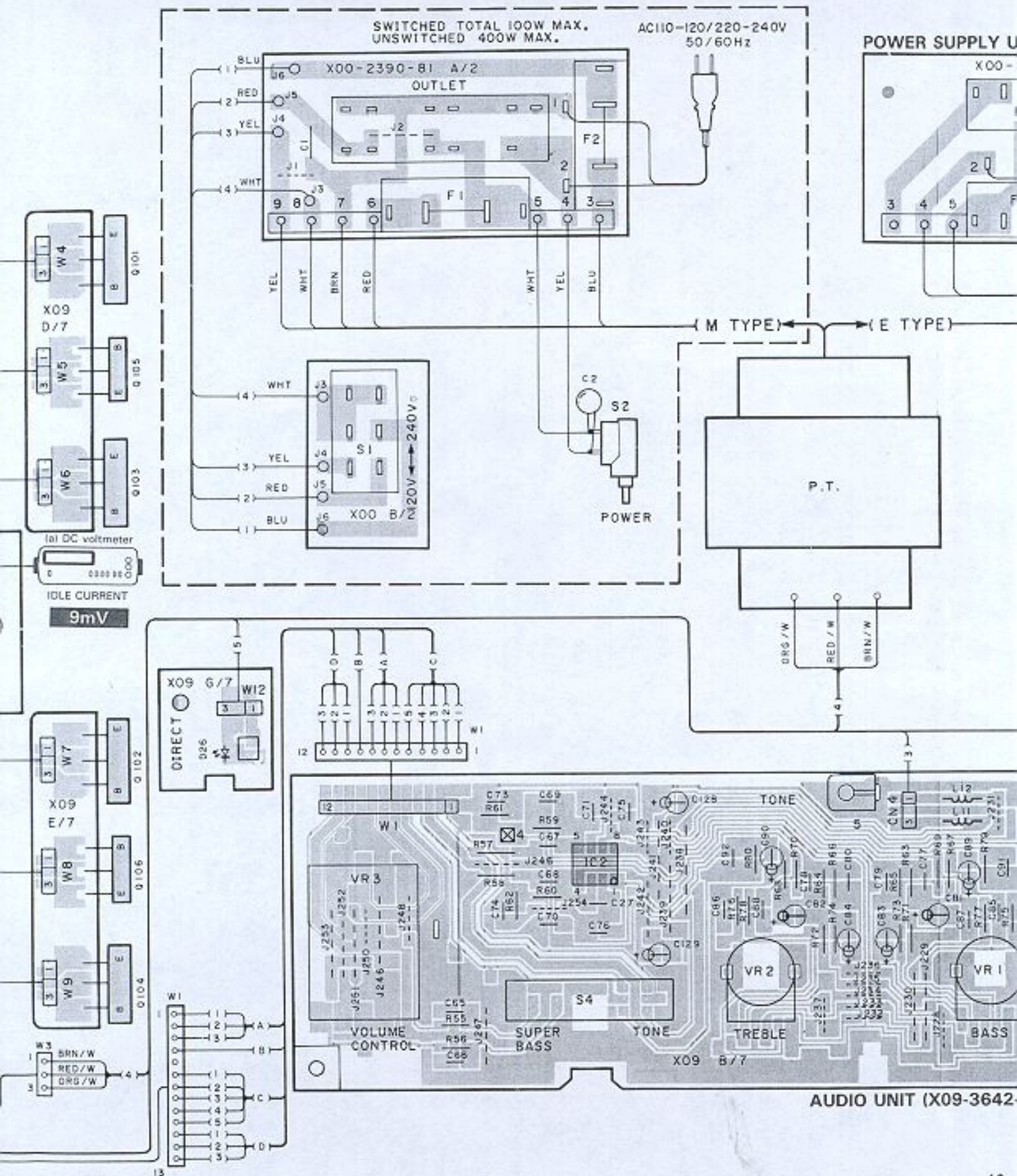


\* SINGAPORE MADE  
AUDIO UNIT (X09-3642-70)



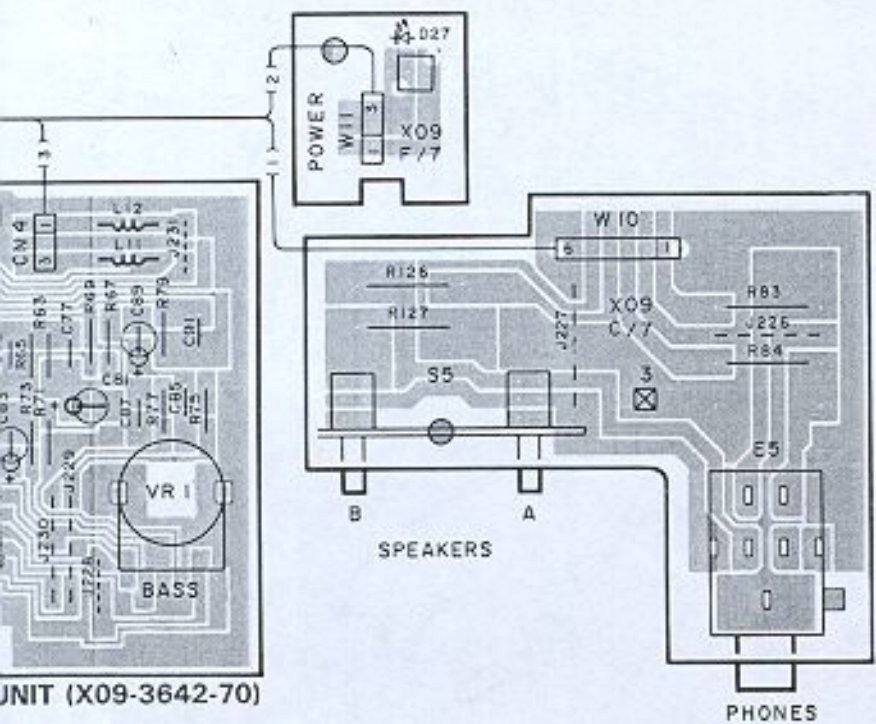
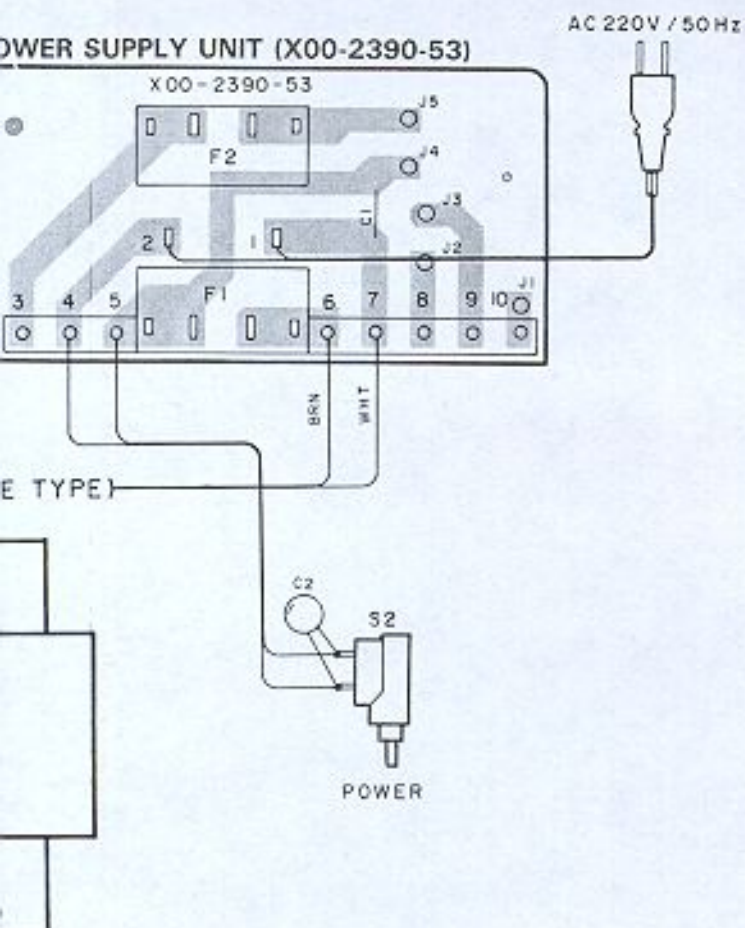








## POWER SUPPLY UNIT (X00-2390-53)



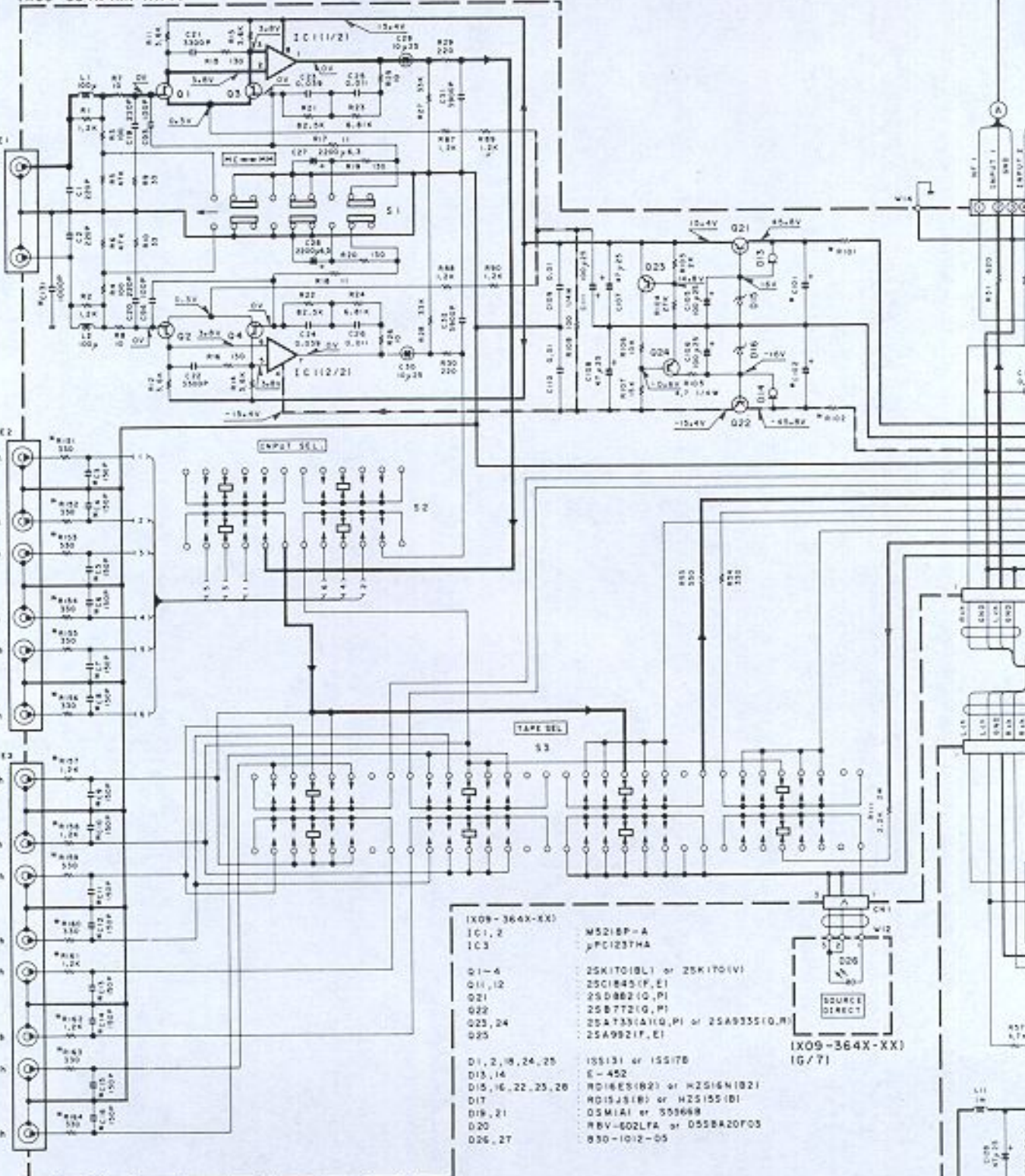
KA-660D (E)

Refer to the schematic diagram for the values of resistors and capacitors.



(X09-364X-XX) (A/7)

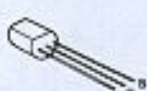
1  
2  
3  
4  
5  
6  
7



(X09-364X-XX)	M5218P-A
IC 1, 2	PC1237HA
IC 3	
Q1-4	2SK170(BL) or 2SK170(V)
Q11, 12	2SC1845(F, E)
Q21	2SD882(G, P)
Q22	2SB772(G, P)
Q23, 24	2SA733(A)(G, P) or 2SA933S(G, R)
Q25	2SA992(F, E)
D1, 2, 18, 24, 25	1SS131 or 1SS17B
D13, 14	E-452
D15, 16, 22, 23, 20	RD18ES182) or H25155(B)
D17	RD15J5(B) or H25155(B)
D19, 21	OSM1A1 or 55868R
D20	RBV-602LFA or 055BA20F03
D26, 27	850-1012-05



2SA733 (A)  
2SA992  
2SC1845  
2SC945 (A)



2SA1110  
2SB772  
2SC2590  
2SD882



2SA933S



2SC4137



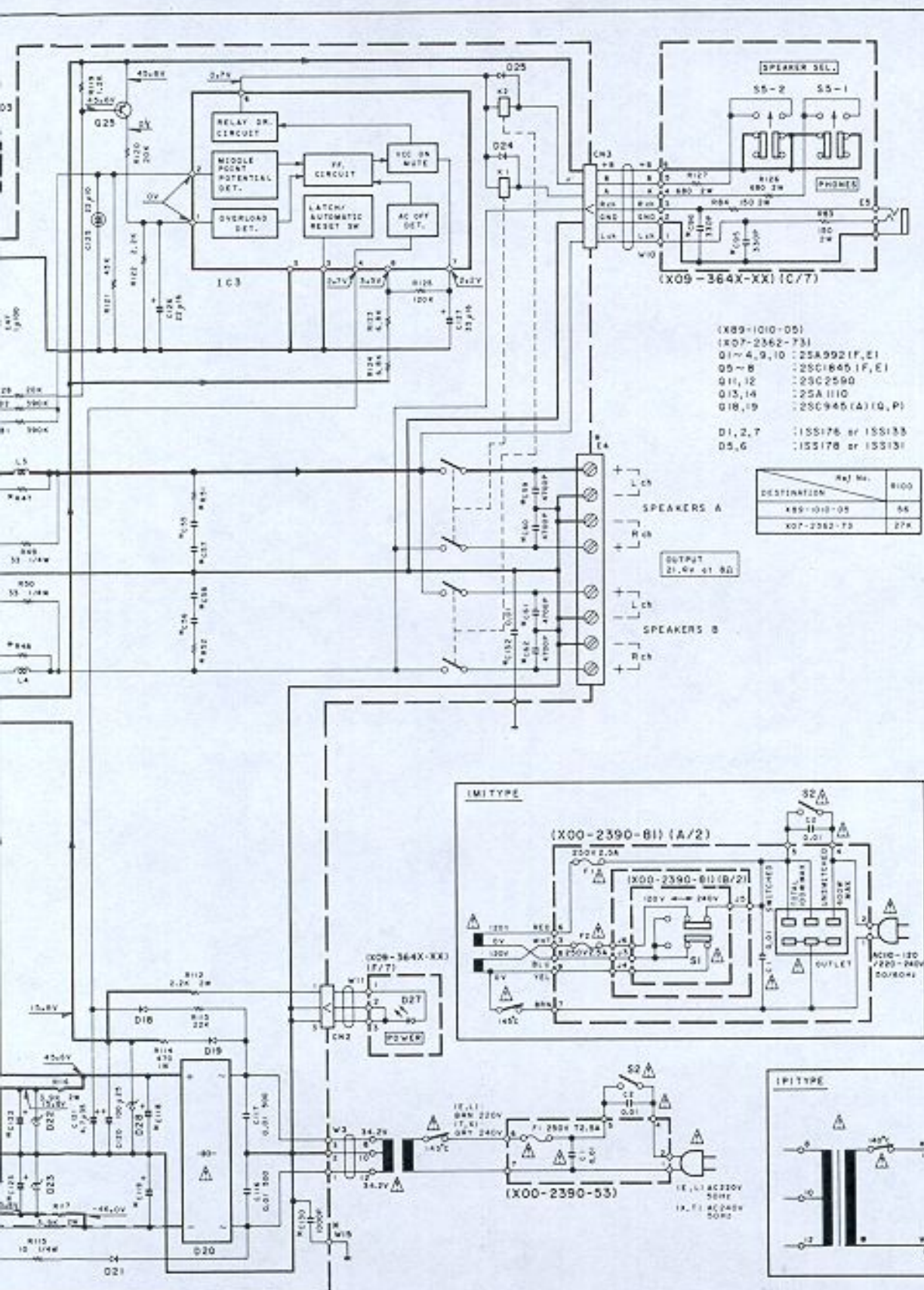
2SB1182  
2SD1717







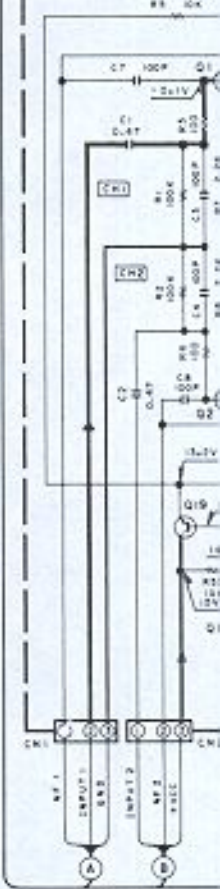




- (X89-1010-05)  
 (X07-2362-73)  
 Q1~4, 9, 10 : 2SA992 (F, E)  
 Q5~8 : 2SC1845 (F, E)  
 Q11, 12 : 2SC2590  
 Q13, 14 : 2SA1110  
 Q18, 19 : 2SC945 (A) (Q, P)  
 D1, 2, 7 : 1SS176 or 1SS183  
 D5, 6 : 1SS178 or 1SS191

DESTINATION	Ref No.	8100
X89-1010-05	55	
X07-2362-73	27A	

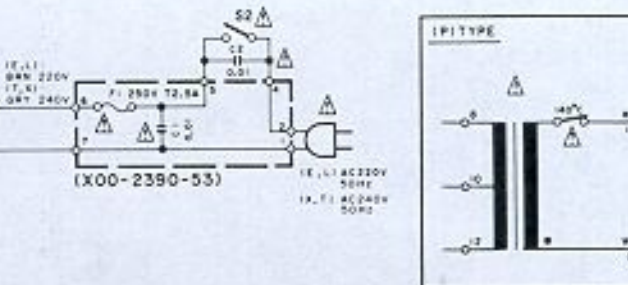
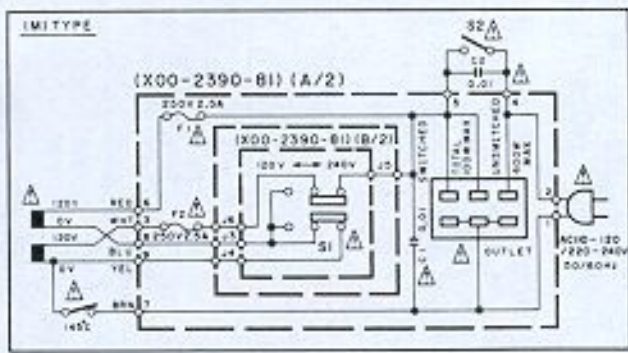
(X89-1010-05) JAP  
 (X07-2362-73) SIN



(X09-364X-XX)

DESTINATION	Ref No.	8100
2-10	2-72	8
1-71	1-73	L, M, S
0-51	0-53	7

JAPAN MADE    STOCKHOLM MADE



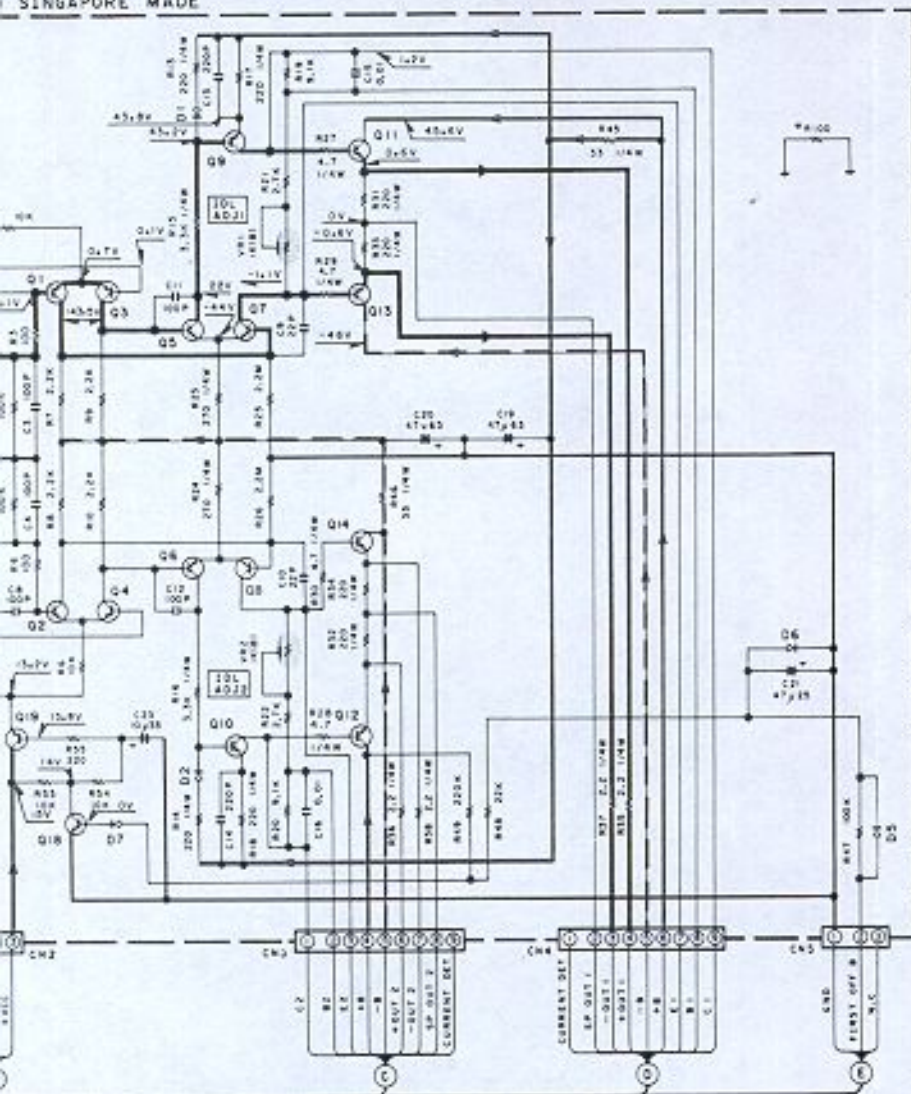
DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or land units.

Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance sans signal d'entrée. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

Die angegebenen Gleichspannungswerte sind mit einem hochohmigen Spannungsmessgerät ohne Signal gemessen. Dabei schwanken die Werte aufgrund von Unterschieden zwischen den Instrumenten oder Geräten u.U. geringfügig.



JAPAN MADE  
SINGAPORE MADE



Ref No.	R35, 36	R45, 46, 51, 52	R47, 48	R101, 102	R104, 110	R151-158, 159 160, 162, 164	R157, 158 161, 162	C3 - 16	C15, 16	C25 - 28
R	20K 1/4W	4.7 2W	10 1/4W	3.3 1W	1.8K 2W	550	1.2K	100P	220P	0.22K
L, M, S, P	20K 1/8W	10 2W	4.7 1/4W	220 1/4W	1.8K 1/4W	JUMPER	JUMPER	NO	100P	0.1
T	20K 1/8W	10 2W	4.7 1/4W	220 1/4W	1.8K 1/4W	JUMPER	JUMPER	NO	100P	0.1


C95 - 97	C95, 96	C101, 102	C118, 114	C122, 123	W18	W16	SP1K	D36, 151	C132	E4
4700P	330P	220p45	10000p50	470p25	YES	NO	YES	1600P	0.01	E20-0833-05
NO	NO	100p50	10000p50	4.7p55	NO	YES	NO	NO	NO	E20-0832-05
NO	NO	100p50	10000p50	4.7p55	NO	YES	NO	NO	NO	E20-0833-08



ungswerte wurden mit  
messgerät ohne Eingangs-  
widerstände die Meßwerte  
zwischen einzelnen  
Leitungen.

— +B LINE      — SIGNAL LINE  
- - - -B LINE      — GND LINE

KA-660D (E)

CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list).  Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

KA-660D  
KENWOOD







## PARTS LIST

\* New Parts

Parts without Parts No. are not supplied.

Les articles non mentionnés dans le Parts No. ne sont pas fournis.

Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名/規格	Desti- nation 仕向	Re- marks 備考
<b>KA-660D</b>						
1	1A	*	A01-1657-01	METALLIC CABINET		
2	2A	*	A20-5544-02	PANEL ASSY		
3	2A	*	B43-0278-04	KENWOOD BADGE		
-			B46-0096-13	WARRANTY CARD	X	
-			B46-0121-03	WARRANTY CARD	P	
-			B46-0122-13	WARRANTY CARD	EL	
-			B46-0143-03	WARRANTY CARD	T	
-		*	B50-8946-00	INSTRUCTION MANUAL (ENGLISH)		
-		*	B50-8947-00	INSTRUCTION MANUAL (FRENCH)	ELMXP	
-		*	B50-8948-00	INSTRUCTION MANUAL (G.D.I)	EL	
-		*	B50-8949-00	INSTRUCTION MANUAL (SPANISH)	M	
-		*	B58-0803-13	CAUTION CARD	E	
△ C2			C91-0023-05	CERAMIC 0.01UF AC250V	M	
△ C2			C91-0647-05	CERAMIC 0.01UF P	ELXT	
6	2B		D21-1445-04	EXTENSION SHAFT(S-DIRECT)		
7	2B	*	D21-1446-04	EXTENSION SHAFT(TAPE SEL)		
8	2B	*	D21-1447-03	EXTENSION SHAFT(MM/MC)		
9	2B,2C		D22-0063-04	SHAFT COUPLING (TAPE SEL)		
13	2B,2C	*	E29-0320-04	LEAD PLATE		
△ 14	1C		E30-0459-05	AC POWER CBRD	EL	
△ 14	1C		E30-0812-05	AC POWER CBRD	M	
△ 14	1C		E30-0974-05	AC POWER CBRD	P	
△ 14	1C		E30-1341-05	AC POWER CBRD	X	
△ 14	1C		E30-1416-05	AC POWER CBRD	T	
△ F1			F05-2525-05	FUSE (SEMKO) (250V 12.5A)	ELXT	
△ F1			F06-5022-05	FUSE (UL) (250V 5A)	P	
△ F1	.2		F05-2521-05	FUSE (250V 2.5A)	M	
-		*	H01-7879-04	ITEM CARTON CASE		
-		*	H10-3623-12	POLYSTYRENE FOAMED FIXTURE		
-		*	H10-3624-12	POLYSTYRENE FOAMED FIXTURE		
-			H25-0225-04	PROTECTION BAG (850X450X0.03)		
-			H25-0232-04	PROTECTION BAG (235X350X0.03)		
18	2B,2C		J02-0378-05	FOOT		
19	2C	*	J19-0581-05	UNIT HOLDER (H-27.3)		
20	2C	*	J19-3078-05	UNIT HOLDER		
△ 21	1C		J42-0083-05	POWER CBRD BUSHING		
-			J61-0307-05	WIRE BAND		
25	2A	*	K27-1898-04	KNBB (BUTTON) SPEAKER		
26	1A	*	K29-3212-04	KNBB ASSY (BUTTON) POWER		
27	2A		K29-3213-04	KNBB (VOLUME)		
28	2A	*	K29-3214-04	KNBB (VOLUME)		
29	2A		K29-3215-04	KNBB (BASS, TREBLE)		
30	2A	*	K29-3216-04	KNBB (TAPE MBI, INPUT SEL)		
31	2A	*	K29-3218-04	KNBB (TONE, SUPER BASS)		
△ 35	1B	*	L01-5281-05	POWER TRANSFORMER	EL	
△ 35	1B	*	L01-5282-05	POWER TRANSFORMER	M	
△ 35	1B	*	L01-5285-05	POWER TRANSFORMER	P	
△ 35	1B	*	L01-5287-15	POWER TRANSFORMER	XT	
39	1C		N08-0128-35	BINDING POST (GND)		
40	1C	*	N29-0255-05	PUSH RIVET		

E: Europe

K: USA

P: Canada

U: PX(Far East, Hawaii)

T: England

M: Other Areas

UE: AAFES(Europe)

X: Australia

L: Scandinavia

△ indicates safety critical components.



## PARTS LIST

\* New Parts

Parts without Parts No. are not supplied.

Les articles non mentionnés dans le Parts No. ne sont pas fournis.

Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名/規格	Desti- nation 仕向	Re- marks 備考
F 6	1B 2A		N09-0333-05 N09-1445-05	TAPPING SCREW (3X12) TR SET SCREW (M3XB) PANEL		
△ S2			S40-1073-05	PUSH SWITCH (P8WER)		
△ 0101,102			25D1717	TRANSISTOR		
△ 0103,104			25B1162	TRANSISTOR		
△ 0105,106		*	25C4137	TRANSISTOR		
<b>POWER SUPPLY UNIT (X00-2390-53)</b>						
△ C1			C91-0023-05	CERAMIC 0.01UF AC250V	M	
△ C1			C91-0647-05	CERAMIC 0.01UF P	ELXTP	
△ 44	1C	*	E03-0077-05	AC BUTLET	M	
△ 44	1C	*	E03-0078-05	AC BUTLET	P	
52	1C		J13-0041-05	FUSE CLIP	MP	
52	1C		J13-0054-05	FUSE CLIP	ELXT	
△ S1	2C		S31-2126-05	SLIDE SWITCH (P8WER TYPE)	M	
<b>AUDIO UNIT (X09-3642-70)</b>						
D26 ,27	1A,2B		B30-1012-05	LED(SLP-981C-50)S8RCE DIR ,P8W		
C1 ,2			CF92FV1H221K	MF 220PF K		
C3			CF92FV1H151K	MF 150PF K	E	
C4		*	CF92FV1H151K	MF 150PF K	E	
C5			CF92FV1H151K	MF 150PF K	E	
C6		*	CF92FV1H151K	MF 150PF K	E	
C7			CF92FV1H151K	MF 150PF K	E	
C8 ,9		*	CF92FV1H151K	MF 150PF K	E	
C10			CF92FV1H151K	MF 150PF K	E	
C11		*	CF92FV1H151K	MF 150PF K	E	
C12 ,13			CF92FV1H151K	MF 150PF K	E	
C14		*	CF92FV1H151K	MF 150PF K	E	
C15			CF92FV1H151K	MF 150PF K	E	
C16		*	CF92FV1H151K	MF 150PF K	E	
C19 ,20			CC45FSL1H221J	CERAMIC 220PF J		
C21 ,22			CF92FV1H332J	MF 3300PF J		
C23 ,24			CF92FV1H393J	MF 0.039UF J		
C25 ,26			CF92FV1H113J	MF 0.011UF J		
C27 ,28			CE04KW0J222M	ELECTR8 2200UF 6.3WV		
C29 ,30			C90-1332-05	NP-ELEC 10UF 25WV		
C31 ,32			CF92FV1H392J	MF 3900PF J		
C33 ,34			CE04KW1E221M	ELECTR8 220UF 25WV		
C35 ,36			C009FS1H101J	P8LYSTY 100PF J	LMXTP	
C35 ,36			C009FS1H221J	P8LYSTY 220PF J	E	
C37 ,38			C91-0170-05	P8LYSTY 22PF K		
C39 ,40			CE04KW1C220M	ELECTR8 22UF 16WV		
C41 -48			CE04KW2A010M	ELECTR8 1.0UF 100WV		
C49 ,50			CK45FB1H222K	CERAMIC 2200PF K		
C51 ,52			CF92FV1H333J	MF 0.033UF J		
C53 ,54			CF92FV1H334J	MF 0.033UF J		
C55 -58			CF92FV1H104J	MF 0.10UF J	LMXTP	
C55 -58			CF92FV1H683J	MF 0.068UF J	E	
C59 -62			CK45FF1H472Z	CERAMIC 4700PF Z	E	
C63 ,64			CC45FSL1H101J	CERAMIC 100PF J		
C65 ,66			CF92FV1H154J	MF 0.15UF J		
C67 ,68			CF92FV1H474J	MF 0.47UF J		

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C69 .70			C009FS1H221J	P8LYSTY 220PF J		
C71 .72			CF92FV1H101K	MF 100PF K		
C75 .76			C009FS1H101J	P8LYSTY 100PF J		
C77 -80			CF92FV1H334J	MF 0.33UF J		
C81 .82			CE04KW1V100M	ELECTR0 10UF 35WV		
C83 .84			CE04KW1V100M	ELECTR0 10UF 35WV		
C85 -88			CF92FV1H223J	MF 0.022UF J		
C89 .90			CE04KW1H010M	ELECTR0 1.0UF 50WV		
C91 .92			CK45FB1H561K	CERAMIC 560PF K		
C93 .94			CF92FV1H101K	MF 100PF K		
C95 .96			CC45FSL1H331J	CERAMIC 330PF J	E	
C101 .102			CE04KW1H101M	ELECTR0 100UF 50WV	LMXTP	
C101 .102			CE04KW1J221M	ELECTR0 220UF 63WV	E	
C105 .106			CE04KW1E101M	ELECTR0 100UF 25WV		
C107 .108			CE04KW1E470M	ELECTR0 47UF 25WV		
C109 .110			CF92FV1H103J	MF 0.010UF J		
C111			CE04KW1E101M	ELECTR0 100UF 25WV		
C112			CE04KW1H470M	ELECTR0 47UF 50WV		
C113			CE04KW1E101M	ELECTR0 100UF 25WV		
C114			CF92FV1H103J	MF 0.010UF J		
C115			CF92FV1H224J	MF 0.22UF J		
C116 .117			CK45FE2H103P	CERAMIC 0.010UF P		
C118 .119		*	C90-1660-05	ELECTR0 10000UF 50WV	E	
C118 .119		*	C90-1661-05	ELECTR0 10000UF 56WV	LMXTP	
C120			CE04KW1E101M	ELECTR0 100UF 25WV		
C121			CE04KW1V4R7M	ELECTR0 4.7UF 35WV	E	
C121-123			CE04KW1V4R7M	ELECTR0 4.7UF 35WV	LMXTP	
C122 .123			CE04KW1E471M	ELECTR0 470UF 25WV	E	
C124			CE04KW1J470M	ELECTR0 47UF 63WV		
C125			C90-1333-05	NP-ELEC 22UF 10WV		
C126			CE04KW1C220M	ELECTR0 22UF 16WV		
C127			CE04KW1C330M	ELECTR0 33UF 16WV		
C128 .129			CE04KW1E470M	ELECTR0 47UF 25WV		
C130 .131			CF92FV1H102J	MF 1000PF J	E	
C132			CF92V1H103J	MF 0.010UF J	E	
E1	1C,2C		E13-0235-05	PH8NB JACK (2P) PH8NB		
E2	1C,2C		E13-0621-05	PH8NB JACK (6P) LINE IN		
E3	1C,2C		E13-0814-05	PH8NB JACK (8P) TAPE		
E4	1C	*	E20-0832-05	SCREW TERMINAL BOARD(SPEAKERS)	LMXP	
E4	1C	*	E20-0833-05	SCREW TERMINAL BOARD(SPEAKERS)	ET	
E5	1B		E11-0162-05	PH8NE JACK (3P) PH8NES		
L1 .2			L40-1011-47	SMALL FIXED INDUCTOR(100UH,K)		
L3 .4			L39-0080-15	PHASE-COMPENSATION COIL		
L11 .12			L40-1021-14	SMALL FIXED INDUCTOR(1.0MH,K)		
CP1 .2			R90-0187-05	MULTI-COMP 0.22X2 K 5W		
R21 .22			RN14BK2C8252FTS	RN 82.5K F 1/6W		
R23 .24			RN14BK2C6811FTS	RN 6.81K F 1/6W		
R45 .46			RS14DB3D100JTE	FL-PR88F RS 10 J 2W	LMXTP	
R45 .46			RS14DB3D4R7JTE	FL-PR88F RS 4.7 J 2W	E	
R47 .48			RD14AB2E100JTS	FL-PR88F RD 10 J 1/4W	E	
R47 .48			RD14AB2E4R7JTS	FL-PR88F RD 4.7 J 1/4W	LMXTP	
R49 .50			RD14AB2E330JTS	FL-PR88F RD 33 J 1/4W		
RS1 .52			RS14DB3D100JTE	FL-PR88F RS 10 J 2W	LMXTP	
RS1 .52			RS14DB3D4R7JTE	FL-PR88F RS 4.7 J 2W	E	

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R83 .84 R101,102 R101,102 R105 R108		*	RS14DB3D151JTE RD14AB2E221JTS RS14DB3A3R3JTE RD14AB2E4R7JTS RD14AB2E1D1JTS	FL-PR88F RS 150 J 2W FL-PR88F RD 220 J 1/4W FL-PR88F RS 3.3 J 1W FL-PR88F RD 4.7 J 1/4W FL-PR88F RD 100 J 1/4W	LMXTP E	
R109,110 R109,110 R111,112 R114 R115		*	RD14AB2E182JTS RS14DB3D182JTE RS14DB3D222JTE RS14KB3A471JTE RD14AB2E100JTS	FL-PR88F RD 1.8K J 1/4W FL-PR88F RS 1.8K J 2W FL-PR88F RS 2.2K J 2W FL-PR88F RS 470 J 1W FL-PR88F RD 10 J 1/4W	LMXTP E	
R116,117 R118 R126,127 VR1 .2 VR3			RS14DB3D392JTE RS14DB3D332JTE RS14DB3D681JTE R06-3048-05 R19-5002-05	FL-PR88F RS 3.9K J 2W FL-PR88F RS 3.3K J 2W FL-PR88F RS 680 J 2W POTENTIOMETER(10K B)DASS, TREBL POTENTIOMETER(100K B)		
K1 .2 S1 S2 S3 S4		*	S51-2078-05 S40-6035-05 S29-4020-05 S29-8002-05 S42-2161-05	MAGNETIC RELAY PUSH SWITCH (MC/MM) ROTARY SWITCH (INPUT SEL) ROTARY SWITCH (TAPE SEL) MULTIPLE PUSH SWIT(T8N,SUP BAS)		
S5		*	S42-2166-05	MULTIPLE PUSH SWIT(SPEAKER SEL)		
D1 .2 D1 .2 D13 .14 D15 .16 D15 .16			1SS131 1SS178 E-452 HZS16N(B2) RD16ES(B2)	DIODE DIODE CONSTANT CURRENT DIODE ZENER DIODE ZENER DIODE		
D17 D17 D18 D18 D19			HZS15S(B) RD15JS(B) 1SS131 1SS178 DSM1A1	ZENER DIODE ZENER DIODE DIODE DIODE DIODE		
D19 D20 D20 D21 D21	△ △	*	S5566B D55BA20F03 RBV-602LFA DSM1A1 S5566B	DIODE DIODE DIODE DIODE DIODE		
D22 .23 D22 .23 D24 .25 D24 .25 D28			HZS16N(B2) RD16ES(B2) 1SS131 1SS178 HZS16N(B2)	ZENER DIODE ZENER DIODE DIODE DIODE ZENER DIODE		
D28 IC1 .2 IC3 Q1 -4 Q1 -4			RD16ES(B2) MS218P-A UPC1237HA 2SK170(BL) 2SK170(V)	ZENER DIODE IC(8P AMP X2) IC(P8WER AMP) FET FET		
Q11 .12 Q21 Q22 Q23 .24 Q23 .24			2SC1845(F,E) 2SD882(Q,P) 2SB772(Q,P) 2SA733(A)(Q,P) 2SA933S(Q,R)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q25			2SA992(F,E)	TRANSISTOR		

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<b>MAIN AMPLIFIER UNIT (X89-1010-05: JAPAN MADE, X07-2362-73: SINGAPORE MADE)</b>						
C1	.2		CF92FU1H474J	MF	0.47UF	J
C3	.4		C009FS1H101J	P6LYSTY	100PF	J
C7	.8		C009FS1H101J	P6LYSTY	100PF	J
C9	.10		CC45FSL1H220J	CERAMIC	22PF	J
C11	.12		CC45FSL1H101J	CERAMIC	100PF	J
C13	.14		CC45FSL1H221J	CERAMIC	220PF	J
C15	.16		CK45FF1H103Z	CERAMIC	0.010UF	Z
C19			CE04KW1J470M	ELECTR9	47UF	63WV
C20			CE04KW1J470M	ELECTR9	47UF	63WV
C21			CE04KW1E470M	ELECTRB	47UF	25WV
C23			CE04KW1V100M	ELECTRB	10UF	35WV
R13	.14		RD14AB2E221JTS	FL-PR88F RD	220	J 1/4W
R17	.18		RD14AB2E221JTS	FL-PR88F RD	220	J 1/4W
R23	.24		RD14AB2E271JTS	FL-PR88F RD	270	J 1/4W
R27	.30		RD14AB2E4R7JTS	FL-PR88F RD	4.7	J 1/4W
R31	.34	*	RD14AB2E221JTS	FL-PR88F RD	220	J 1/4W
R35	.38		RD14AB2E2R2JTS	FL-PR88F RD	2.2	J 1/4W
R45	.46		RD14AB2E330JTS	FL-PR88F RD	33	J 1/4W
VR1	.2		R12-1070-05	TRIMMING P9T. (1K B)		10LE ADJ
D1	.2		1SS133	DI9DE		
D1	.2		1SS176	DI9DE		
D5	.6		1SS131	DI9DE		
D5	.6		1SS178	DI9DE		
D7			1SS133	DI9DE		
D7			1SS176	DI9DE		
Q1	-4		2SA992(F,E)	TRANSIST9R		
Q5	-8		2SC1845(F,E)	TRANSIST9R		
Q9	.10		2SA992(F,E)	TRANSIST9R		
Q11	.12		2SC2590	TRANSIST9R		
Q13	.14		2SA1110	TRANSIST9R		
Q1B	.19		2SC945(A)(Q,P)	TRANSIST9R		

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