

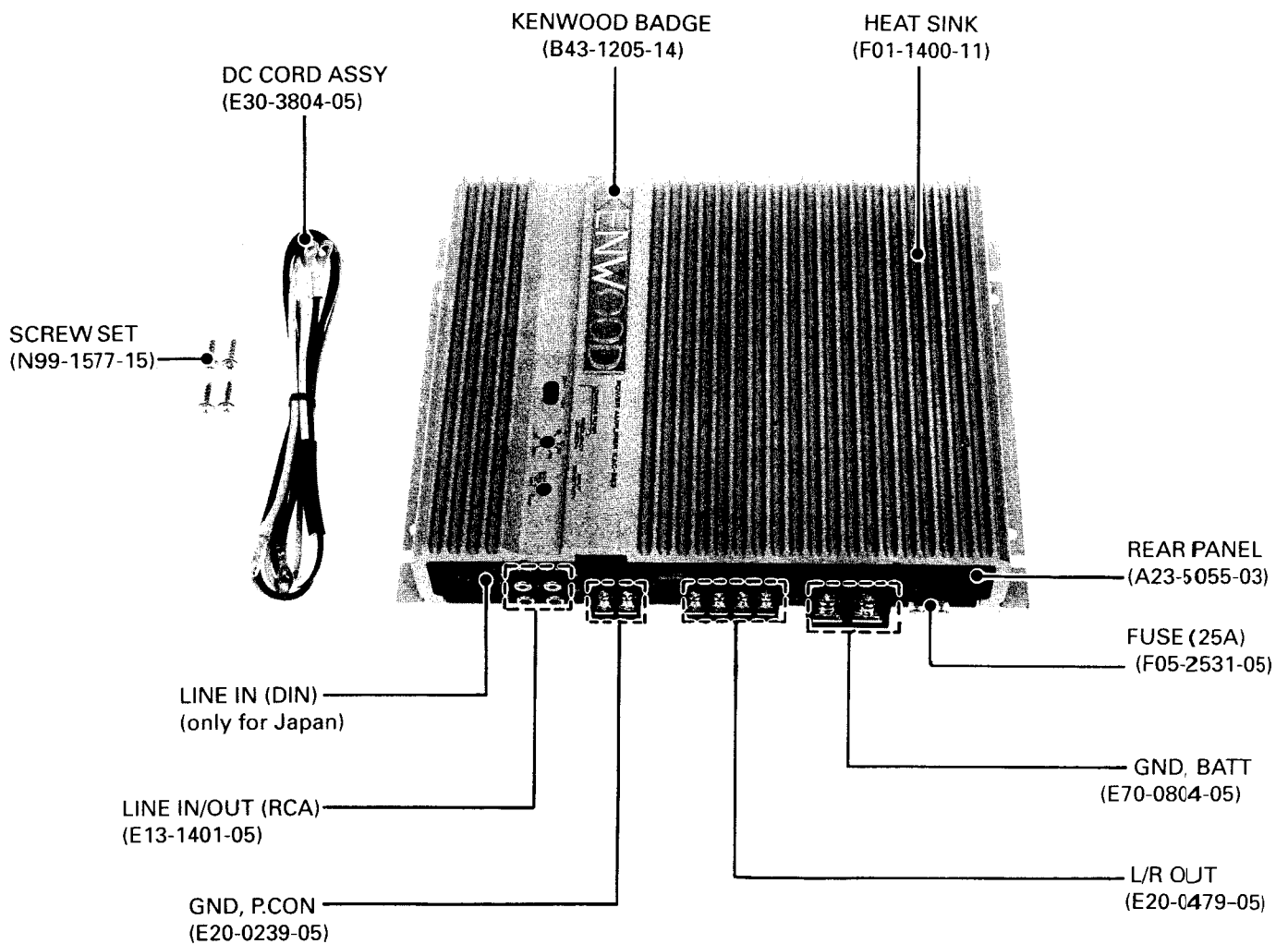
CAR STEREO AMPLIFIER

# KAC-823

## SERVICE MANUAL

# KENWOOD

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B51-6443-00(J) 3679

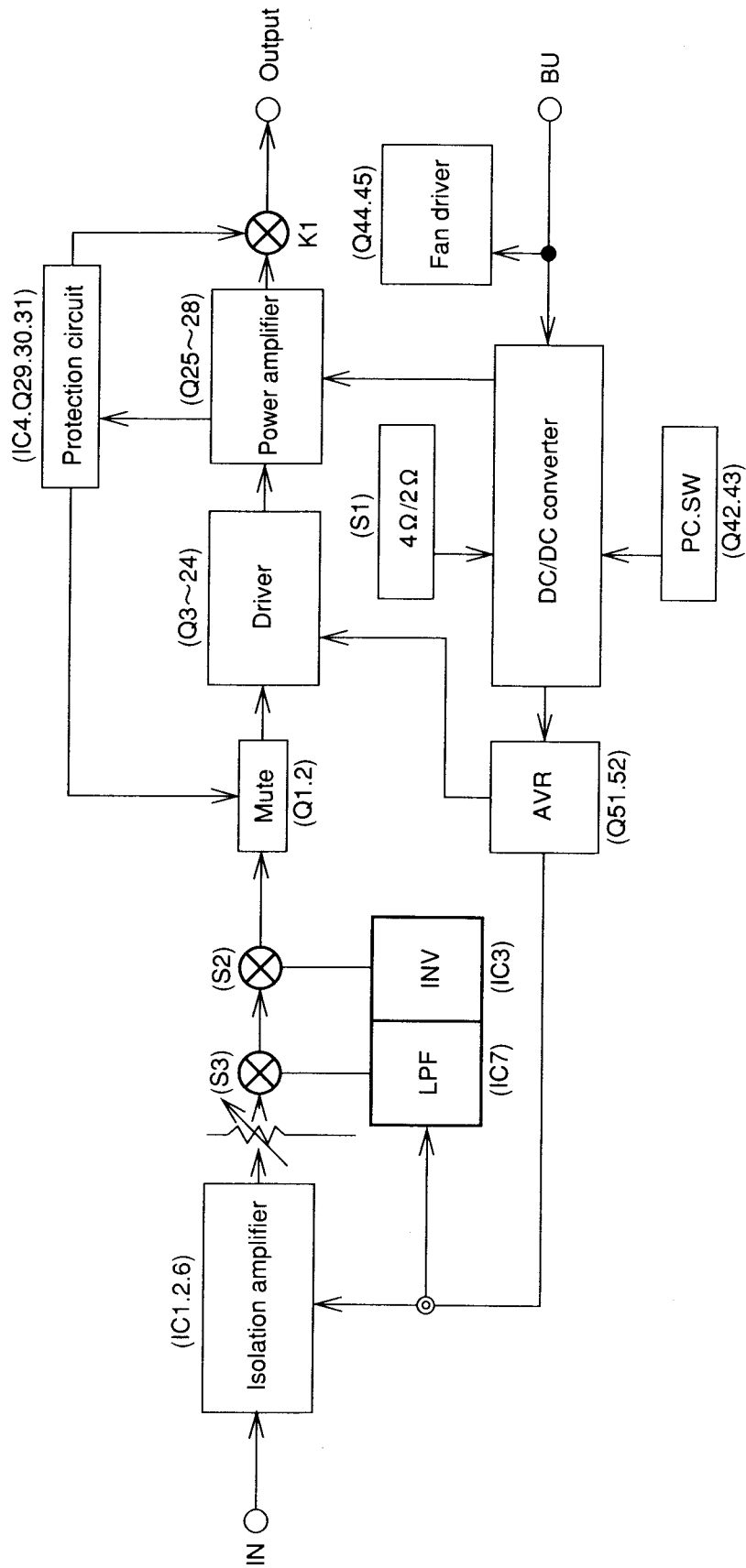


# KAC-823

## CONTENTS

<b>BLOCK DIAGRAM</b> .....	<b>3</b>	<b>SCHEMATIC DIAGRAM (X09-3640-01)</b> .....	<b>11</b>
<b>CIRCUIT DESCRIPTION</b>		<b>(X09-3640-10)</b> .....	<b>15</b>
<b>(Indicator lighting condition)</b> .....	<b>4</b>	<b>EXPLODED VIEW</b> .....	<b>19</b>
<b>ADJUSTMENT</b> .....	<b>6</b>	<b>PARTS LIST</b> .....	<b>20</b>
<b>PC BOARD (X09-3640-01)</b> .....	<b>7</b>	<b>SPECIFICATIONS</b> .....	<b>24</b>
<b>(X09-3640-10)</b> .....	<b>9</b>		

## BLOCK DIAGRAM



## CIRCUIT DESCRIPTION

### Indicator lighting condition

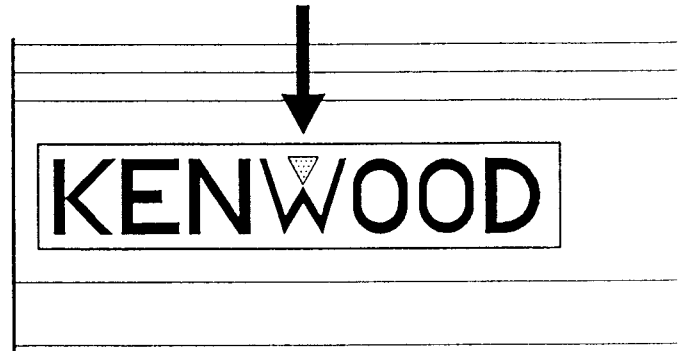
The PWR indicator lights green and red

[Green]

- (1) After P. CON turns on until the relay operates
- (2) If an error occurs and protection works

[Red]

During normal operation



## CIRCUIT DESCRIPTION

FUNCTIONS OF COMPONENTS  
(X09-3640-10)

Components	Application/functions	Operation/conditions/compatibility
IC 1,2,6	Isolation amplifier	Removes car noise that enters the amplifier.
IC 3	Inverter circuit	Bridging inverter
IC 4	Protection	Overload, DC offset, and P. con detection
IC 5	Switching regulator	DC/DC converter oscillator (Pulse Width Modulation control for (X09-3640-10) destination)
IC 7	LPF	LPF for sub-woofer
Q 1,2	Input mute	Operates before the relay operates when the amplifier is turned on or off to protect the relay contact.
Q 3~6	Input differential amplifier	Apply input to the one end and negative feedback to the other to determine the amplifier gain.
Q 7~10	Differential amplifier, second stage	
Q 11~14	Differential amplifier, third stage	
Q 15~16	Thermal protection	Prevents temperature rise.
Q 17~18	Current mirror	Load on differential amplifier Q13 and Q14 at the third stage
Q 19,20	Temperature compensation	
Q 21~24	Power drive stage	
Q 25~28	Power stage	
Q 29~30	Current detection	Detects overcurrent and controls IC4.
Q 32~37	Switching power stage	
Q 38~41,48,49	Switching driver	
Q 42,43	Power switch	When Q43 turns on, Q42 turns on to supply power.
Q 44,45	Fan drive	Detects temperature with TH3 and operates the fan.
Q 46,47	Operation indicator driver	Q46 turns on when the amplifier is protected. Q47 turns on when the amplifier is operating.
Q 51,52	AVR	$\pm 20$ V, constant voltage

## ADJUSTMENT

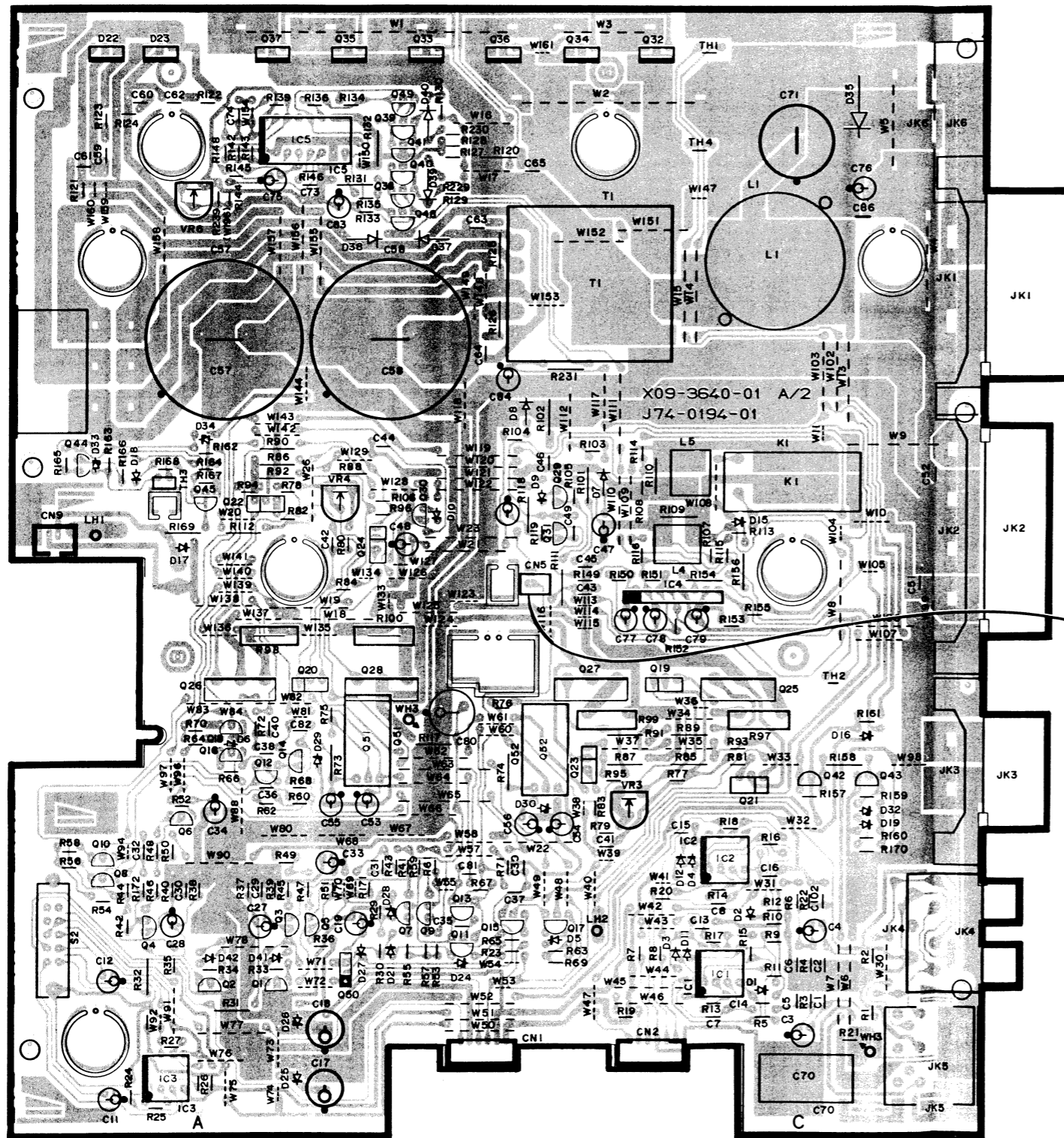
No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	CASSETTE RECEIVER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
Connect a cassette receiver.							
1	BEAT CANCELLER	--	--	Receive AM BROADCAST STATION	VR6	Only when there is BEAT NOISY SOUND. Adjust to minimal position.	
2	IDLE CURRENT	--	Connect a DC voltmeter to CN5	VOLUME: 0	VR3 (L) VR4 (R)	Adjust to 2mV after surely heat up the product.	(a)
* 3	VOLTAGE for OUTPUT of DC-DC converter	--	Connect a DC voltmeter to CN6	VOLUME: 0	VR5	Adjust to 32V when no-signal and S1 is positino of 4Ω.	(b)

\* 3 : This adjustment is for only X09-3640-10 (for North America and Another Areas without Europe).  
X09-3640-01 (for Europe) dose not need this adjustment \*3.

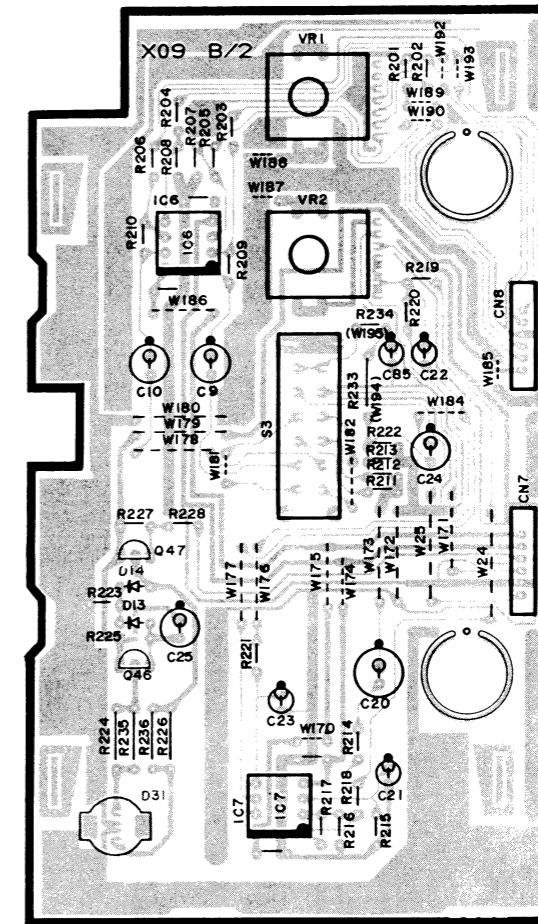
(Note) The DC power shall have a large capacity (of 10 A or more). If it is smaller, the DC-DC converter may not operate.

# PC BOARD (Component side view)

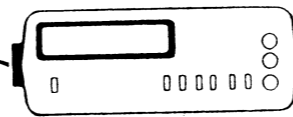
X09-3640-01 A/2



X09-3640-01 B/2



(a) IDLE  
CURRENT  
2mV

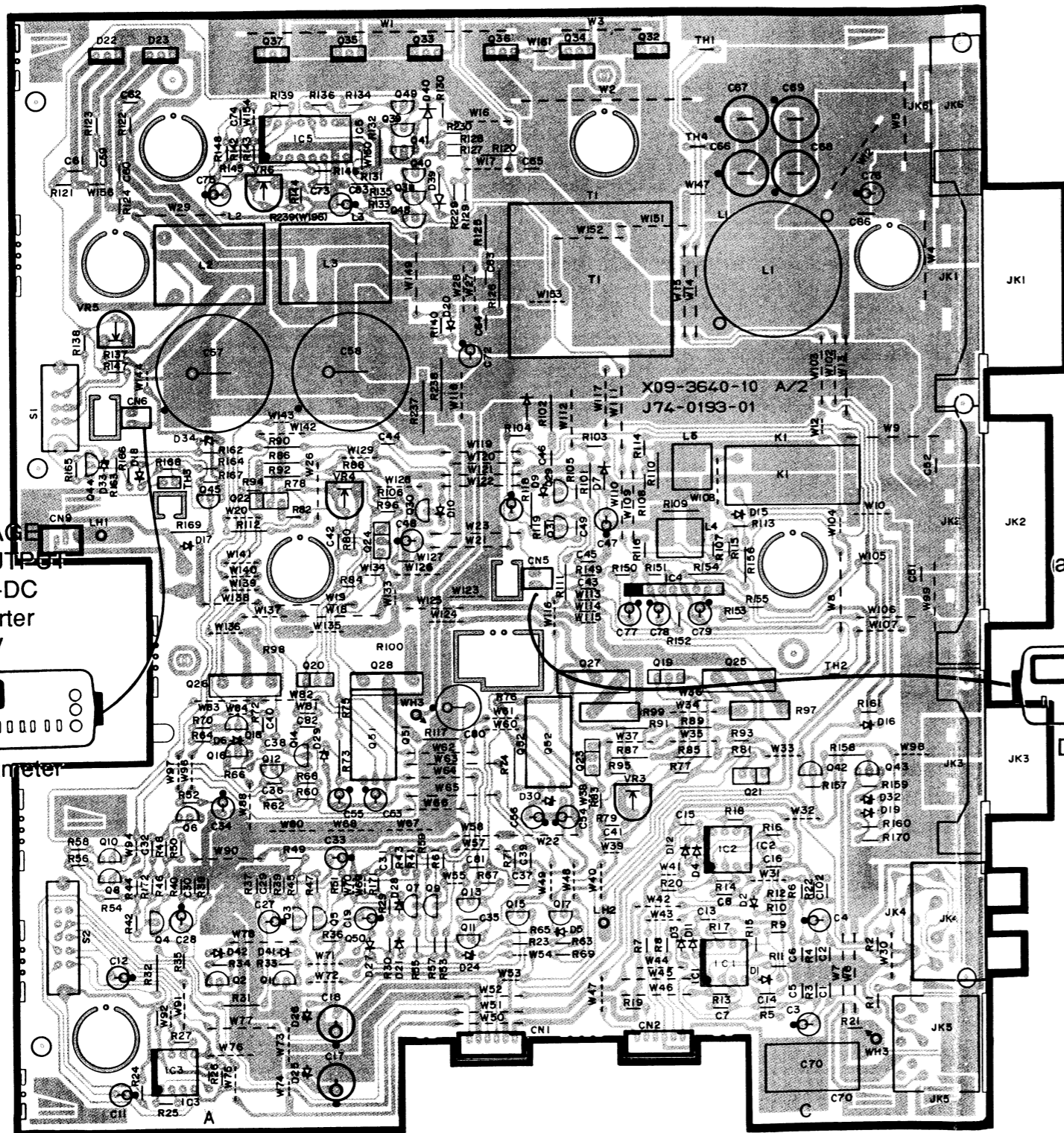


DC Voltmeter

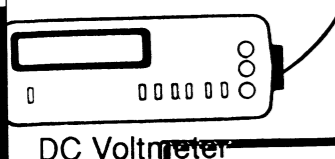
Refer to the schematic diagram for the values of registers and capacitors.

# PB BOARD (Component side view)

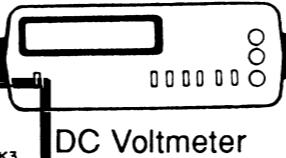
X09-3640-10 A/2



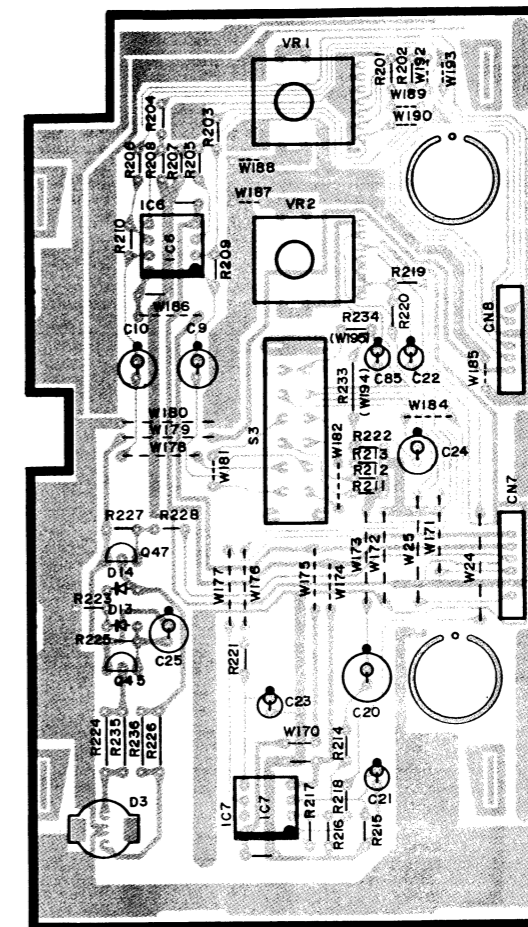
(b) VOLTAGE  
for OUTPUT  
of DC-DC  
converter  
32V



(a) IDLE  
CURRENT  
2mV



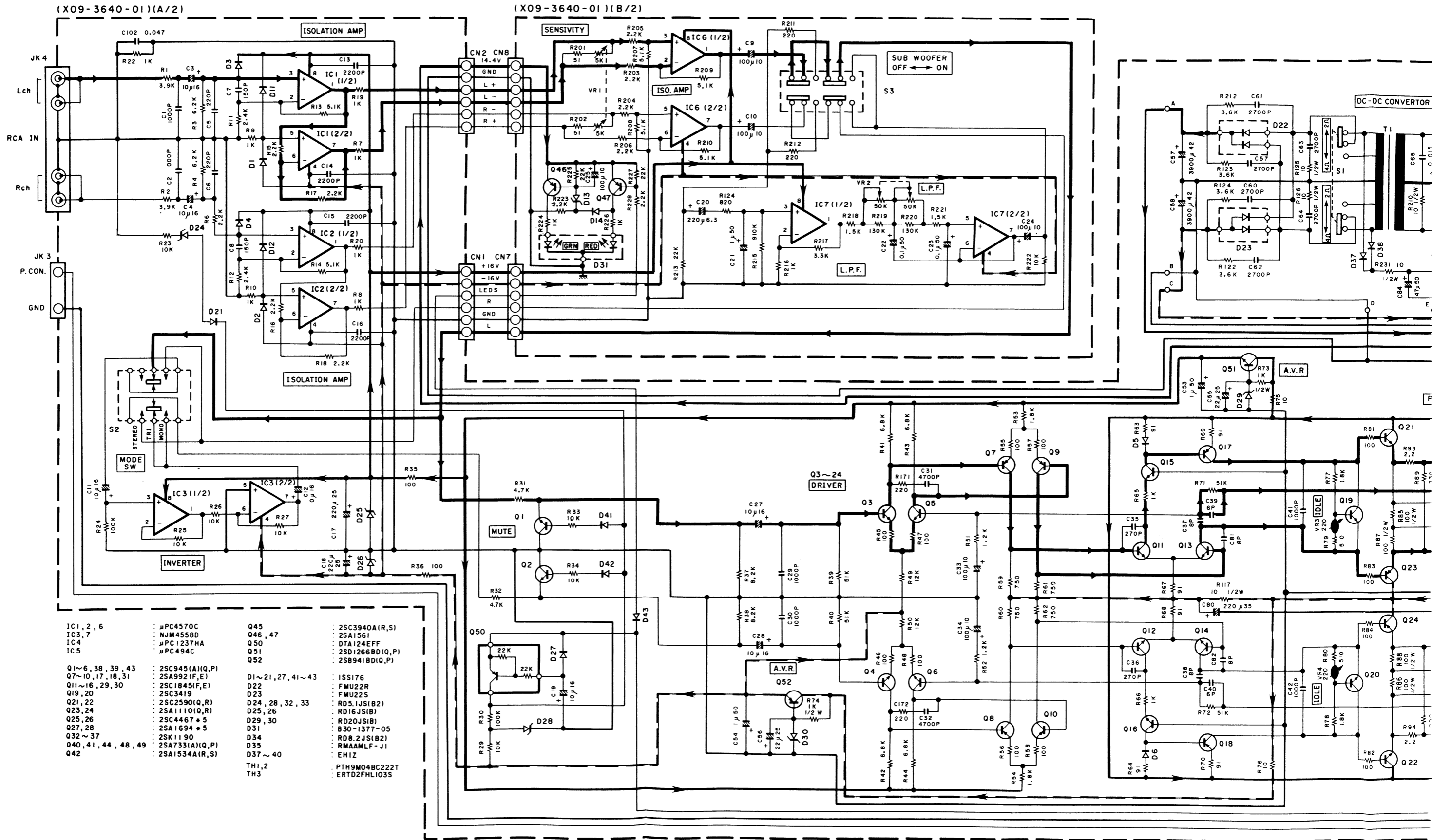
X09-3640-10 B/2



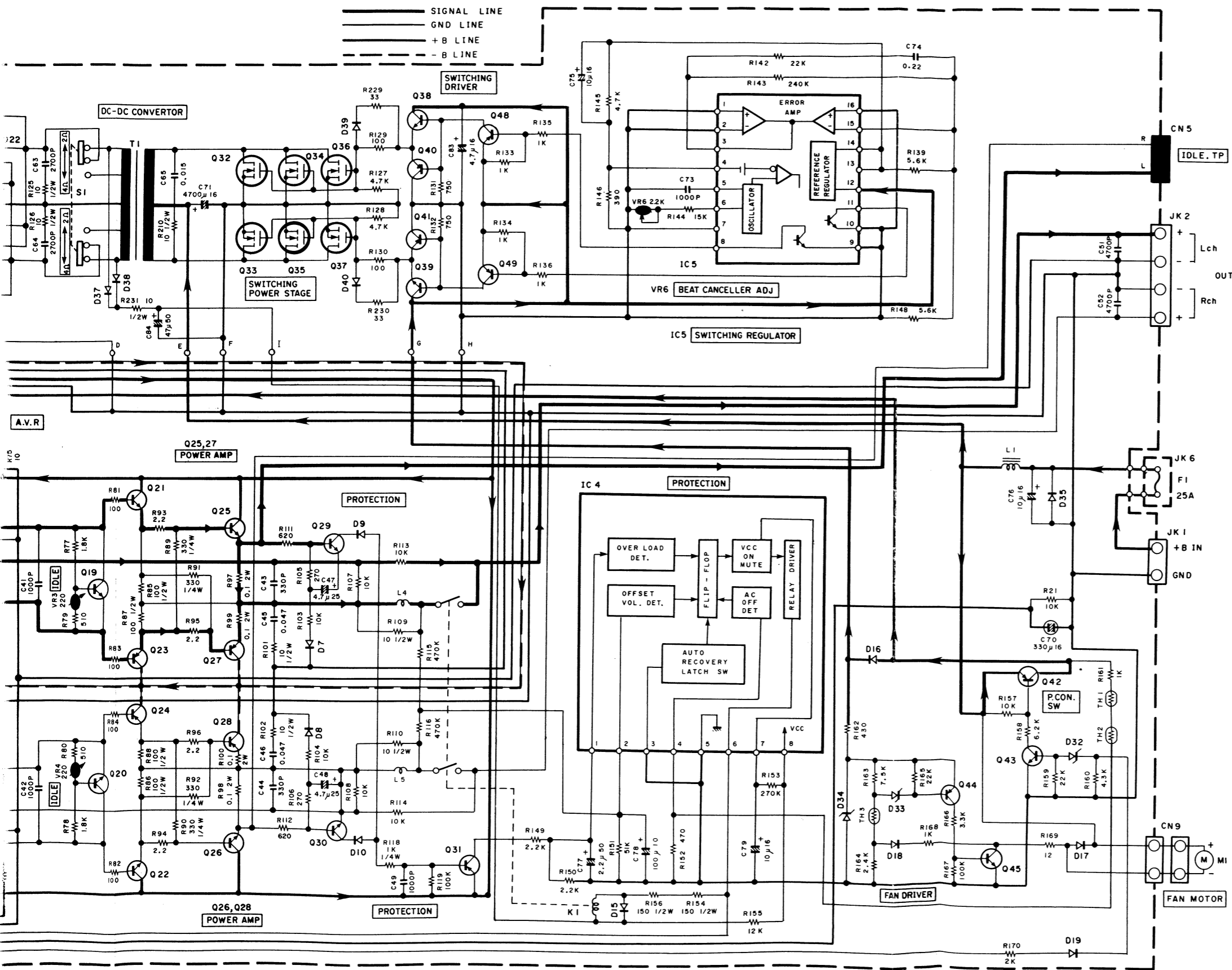
Refer to the schematic diagram for the values of registers and capacitors.



Before begin to repair, please confirm PC Board's Number in product expressing "X09-3640-01".  
 If number has expressing "X09-3640-10", look at a next page. The circuit diagram for "X09-3640-10" is shown.



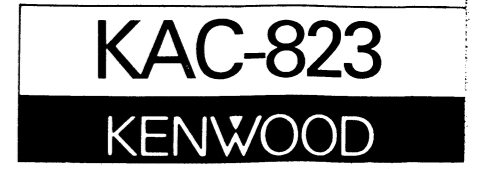
- |                     |                  |                  |                  |
|---------------------|------------------|------------------|------------------|
| IC1, 2, 6           | μPC4570C         | Q45              | 2SC3940A(R,S)    |
| IC3, 7              | NJM4558D         | Q46, 47          | 2SA1561          |
| IC4                 | μPC1237HA        | Q50              | DTA124EFF        |
| IC5                 | μPC494C          | Q51              | 2SD12668D(I,Q,P) |
|                     |                  | Q52              | 2SB941BD(I,Q,P)  |
| Q1~6, 38, 39, 43    | 2SC945(A)(I,Q,P) | D1~21, 27, 41~43 | ISS176           |
| Q7~10, 17, 18, 31   | 2SA992(F,E)      | D22              | FMU22R           |
| Q11~16, 29, 30      | 2SC1845(F,E)     | D23              | FMU22S           |
| Q19, 20             | 2SC3419          | D24, 28, 32, 33  | RD5.1JS(B2)      |
| Q21, 22             | 2SC2590(Q,R)     | D25, 26          | RD16JS(B)        |
| Q23, 24             | 2SA1110(I,Q,R)   | D29, 30          | RD20JS(B)        |
| Q25, 26             | 2SC4467 * 5      | D31              | B30-1377-05      |
| Q27, 28             | 2SA1694 * 5      | D34              | RD8.2JS(B2)      |
| Q32~37              | 2SK1190          | D35              | RMAAMLF-J1       |
| Q40, 41, 44, 48, 49 | 2SA733(A)(I,Q,P) | D37~40           | EHIZ             |
| Q42                 | 2SA1534A(R,S)    | TH1, 2           | PTH9M04BC222T    |
|                     |                  | TH3              | ERTD2FHLI03S     |



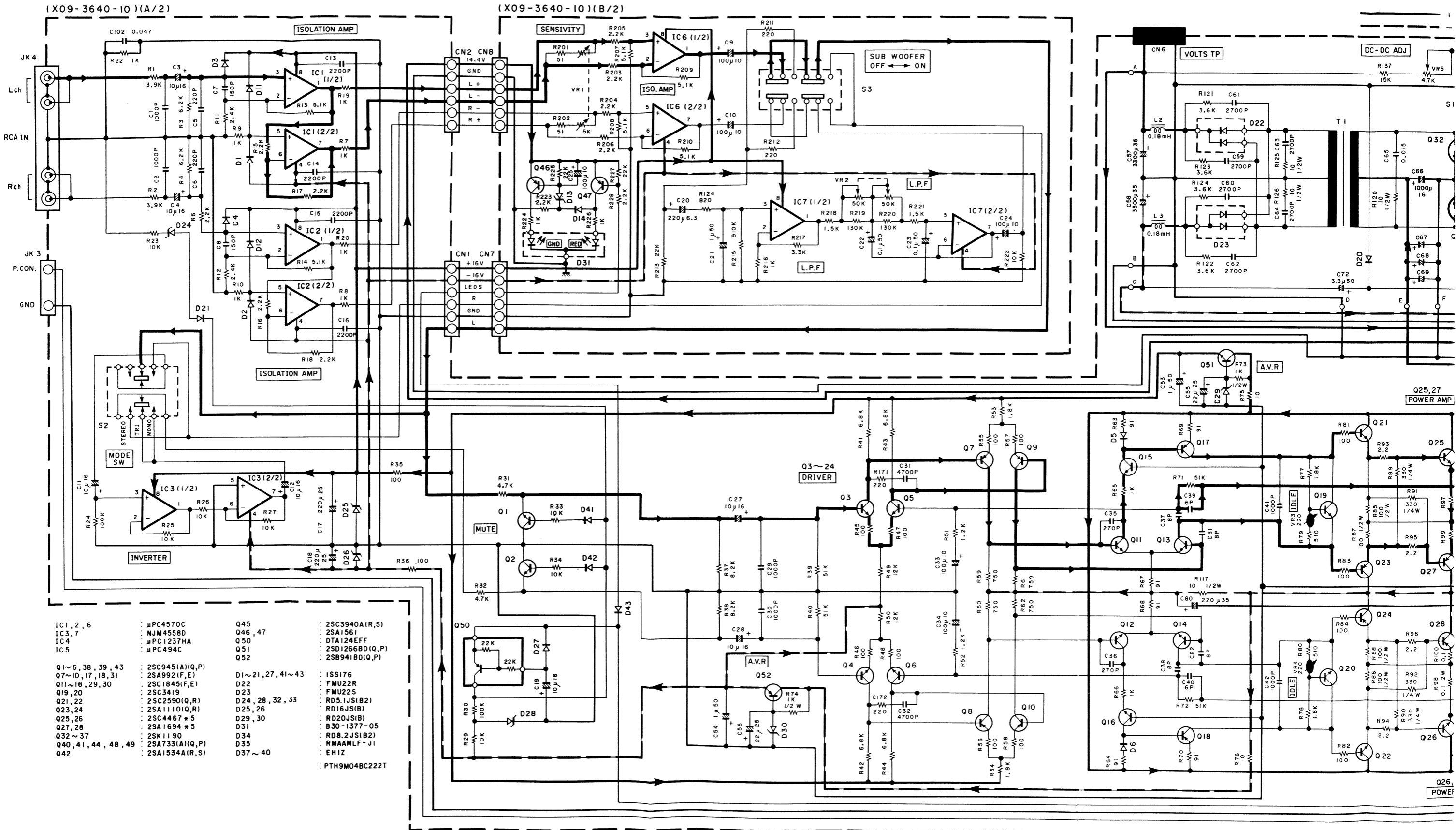
DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

**CAUTION:** For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list).  $\Delta$  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.

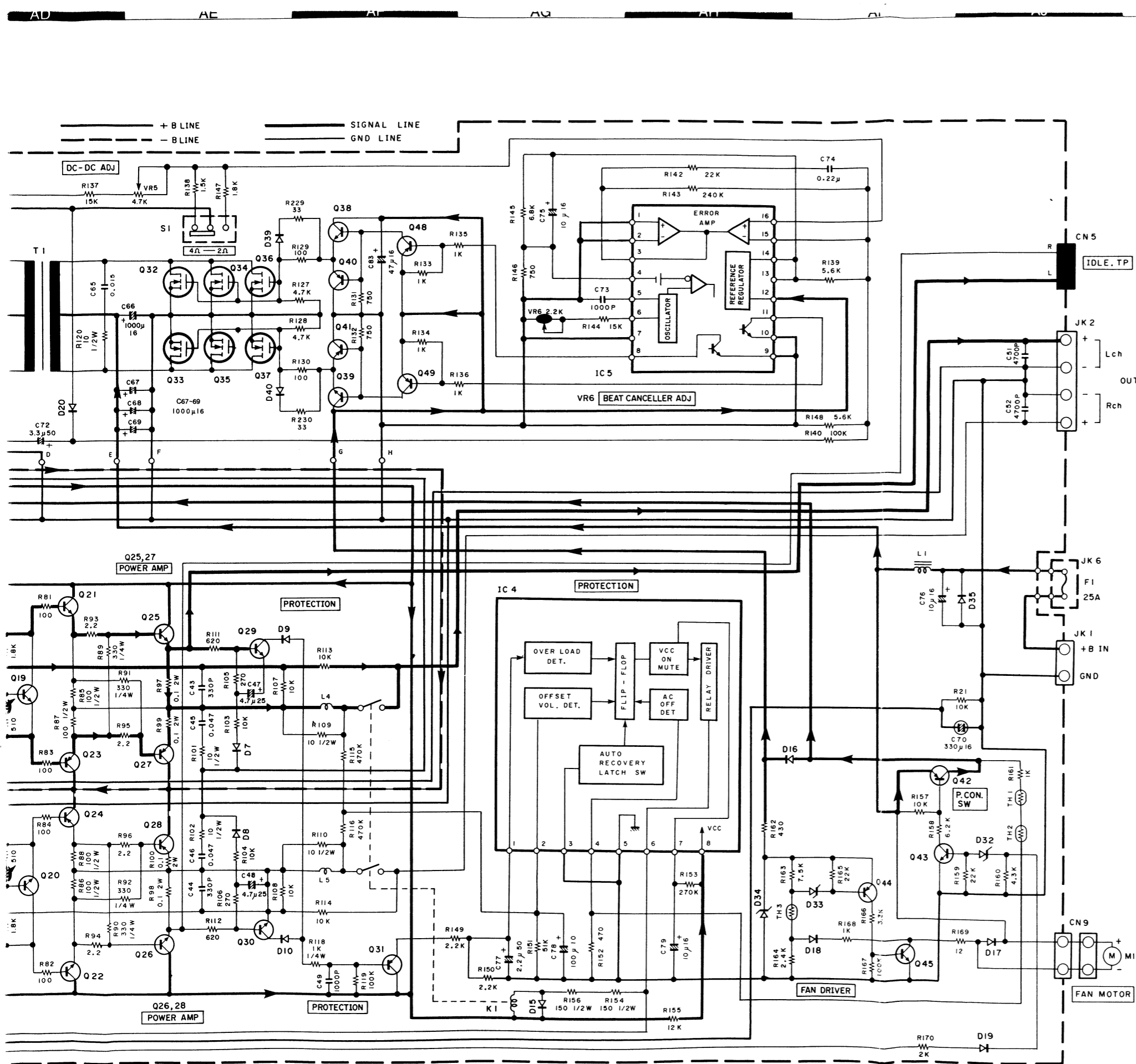
Y-08-4650-10



Before begin to repair, please confirm PC Board's Number in product expressing "X09-3640-10".  
 If number has expressing "X09-3640-01", look at a page before. The circuit diagram for "X09-3640-01" is shown.



- |                     |                |                  |                |
|---------------------|----------------|------------------|----------------|
| IC1, 2, 6           | PC4570C        | Q45              | 2SC3940A(R,S)  |
| IC3, 7              | NJM4558D       | Q46, 47          | 2SA1561        |
| IC4                 | PC1237HA       | Q50              | DTA124EFF      |
| IC5                 | PC494C         | Q51              | 2SD1266BD(Q,P) |
|                     |                | Q52              | 2SB941BD(Q,P)  |
| Q1~6, 38, 39, 43    | 2SC945(A)(Q,P) | D1~21, 27, 41~43 | ISS176         |
| Q7~10, 17, 18, 31   | 2SA992(F,E)    | D22              | FMU22R         |
| Q11~16, 29, 30      | 2SC1845(F,E)   | D23              | FMU22S         |
| Q19, 20             | 2SC3419        | D24, 28, 32, 33  | RD5.1JS(B2)    |
| Q21, 22             | 2SC2590(Q,R)   | D25, 26          | RD16JS(B)      |
| Q23, 24             | 2SA1110(Q,R)   | D29, 30          | RD20JS(B)      |
| Q25, 26             | 2SC4467 * 5    | D31              | B30-1377-05    |
| Q27, 28             | 2SA1694 * 5    | D34              | RDB.2JS(B2)    |
| Q32~37              | 2SK1190        | D35              | RMAAMLF-J1     |
| Q40, 41, 44, 48, 49 | 2SA7331A(Q,P)  | D37~40           | EH1Z           |
| Q42                 | 2SA1534A(R,S)  |                  |                |
- PT9M04BC222T

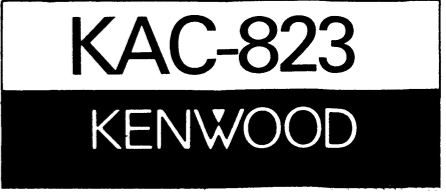


- 2SA1534
- 2S773(A)
- 2SA992
- 2SC1845
- 2SC3940A
- 2SC945(A)
- 2SA1110
- 2SC2590
- 2SB941BD
- 2SA1694\*5
- 2SC4467\*5
- DTA124EFF
- 2SC3419
- 2SD1266BD
- NJM4558D
- UPC494C
- UPC4570C
- UPC1237HA

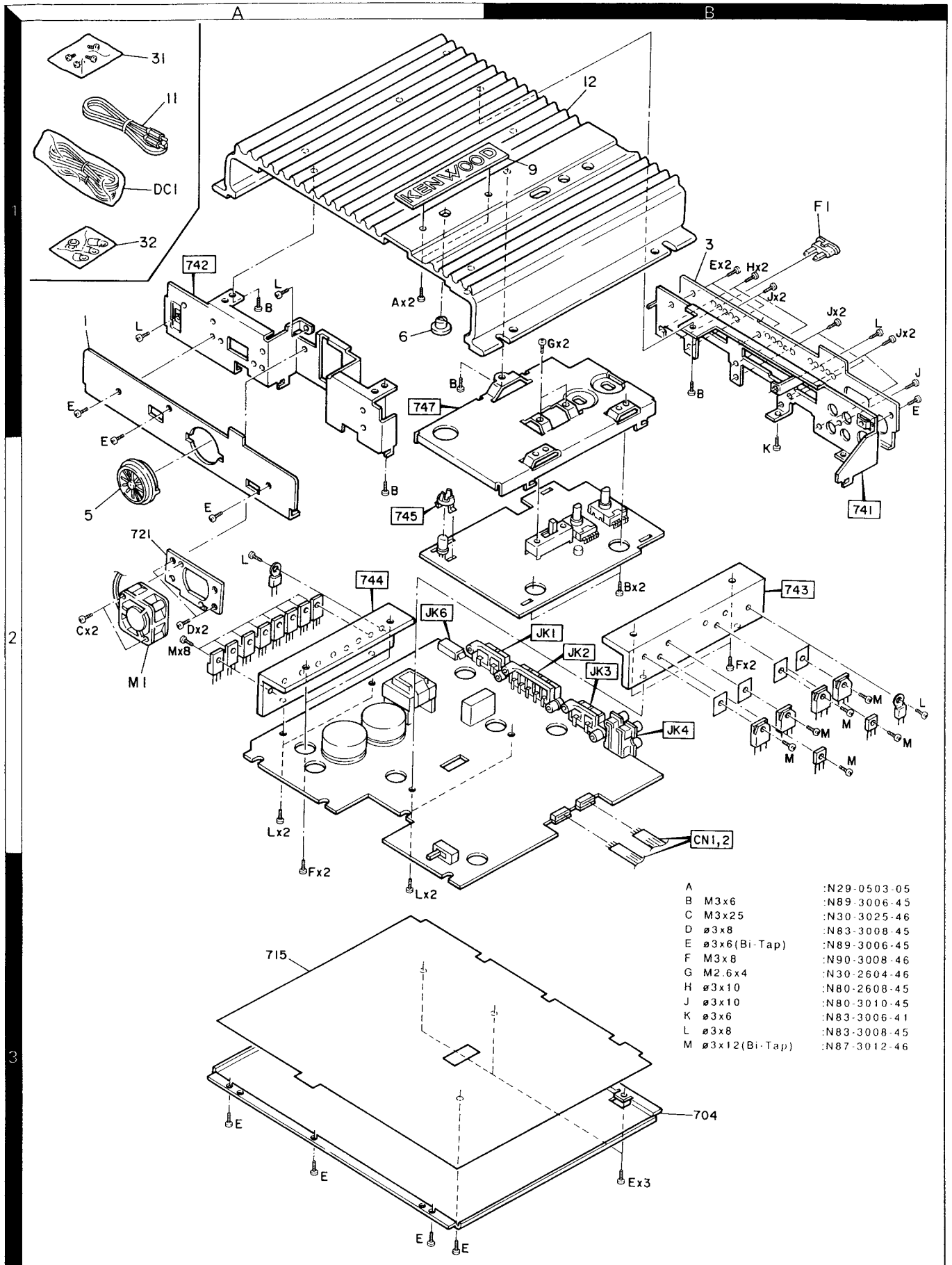
DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

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Y-08-4650-10



## EXPLODED VIEW



A		:N29-0503-05
B	M3x6	:N89-3006-45
C	M3x25	:N30-3025-46
D	ø3x8	:N83-3008-45
E	ø3x6 (Bi-Tap)	:N89-3006-45
F	M3x8	:N90-3008-46
G	M2.6x4	:N30-2604-46
H	ø3x10	:N80-2608-45
J	ø3x10	:N80-3010-45
K	ø3x6	:N83-3006-41
L	ø3x8	:N83-3008-45
M	ø3x12 (Bi-Tap)	:N87-3012-46

Parts with the exploded numbers larger than 700 are not supplied.

## 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>KAC-823</b>						
1	1A	*	A20-7822-13	PANEL ASSY	KM E	
1	1A	*	A20-7823-03	PANEL ASSY		
3	1B	*	A23-5055-03	REAR PANEL		
5	2A		B07-2028-14	ESCUTCHEON		
6	1A	*	B19-0907-14	LIGHTING BOARD		
9	1B		B43-1205-14	KENWOOD BADGE		
-			B46-0100-20	WARRANTY CARD		
-			B58-1210-04	CAUTION CARD		
-		*	B59-0707-00	SUB-INSTRUCTION MANUAL	M	
-		*	B64-0187-00	INSTRUCTION MANUAL	KM	
-		*	B64-0188-00	INSTRUCTION MANUAL	E	
11	1A	*	E30-3999-05	AUDIO CORD	M EM	
△ DC1	1A	*	E30-3804-05	DC CORD ASSY (critical comp.)		
12	1B	*	F01-1400-11	HEAT SINK		
F1	1B		F05-2531-05	FUSE (25A フレトカマタ)		
M1	2A		F09-1208-05	FAN		
-		*	H01-9422-04	ITEM CARTON CASE		
-		*	H01-9430-04	ITEM CARTON CASE		
-		*	H03-3493-04	OUTER CARTON CASE	KM E	
-		*	H10-4416-02	POLYSTYRENE FOAMED FIXTURE		
-		*	H25-0321-04	PROTECTION BAG (600X315X0.03)		
-			H25-0336-04	PROTECTION BAG (170X250X0.03)		
31	1A		N99-1577-15	SCREW SET		
A	2A		N29-0503-05	RETAINING RING (3マ)		
B	1A, 2A		N89-3006-45	PAN HEAD MACHIN SCREW		
C	2A		N30-3025-46	PAN HEAD MACHIN SCREW		
D	2A		N83-3008-45	PAN HEAD TAPTITE SCREW		
E	3A, 3B		N89-3006-45	BINDING HEAD TAPTITE SCREW		
F	2A, 2B		N90-3008-46	PAN HEAD MACHIN SCREW		
32	1A	*	W01-0720-05	ACCESSORY	EM	
<b>AUDIO UNIT (X09-3640-10:K.M / -01:E)</b>						
D31		*	B30-1377-05	LED		
C1 ,2			CK45FB1H102K	CERAMIC	1000PF	K
C3 ,4			CE04DW1C100M	ELECTRO	10UF	16WV
C5 ,6			CC45FSL1H221J	CERAMIC	220PF	J
C7 ,8			CC45SL1H151J	CERAMIC	150PF	J
C9 ,10			CE04CW1A101M	ELECTRO	100UF	10WV
C11 ,12			CE04DW1C100M	ELECTRO	10UF	16WV
C13 -16			CK45FB1H222K	CERAMIC	2200PF	K
C17 ,18			CE04DW1E221M	ELECTRO	220UF	25WV
C19			CE04DW1C100M	ELECTRO	10UF	16WV
C20			CE04CW0J221M	ELECTRO	220UF	6.3WV
C21			C90-2608-05	ELECTRO	1.0UF	50WV
C22			C90-2604-05	ELECTRO	0.22UF	50WV
C23			C90-2602-05	ELECTRO	0.1UF	50WV
C24 ,25			CE04CW1A101M	ELECTRO	100UF	10WV
C27 ,28			CE04DW1C100M	ELECTRO	10UF	16WV
C29 ,30			CF92FV1H102J	MF	1000PF	J
C31 ,32			CF92FV1H472J	MF	4700PF	J

E: Scandinavia & Europe K: USA P: Canada W: Europe

U: PX(Far East, Hawaii) T: England M: Other Areas

UE: AAFES(Europe) X: Australia

E: for Europe

K: for North america

M: Other areas

△ indicates safety critical components.

## PARTS LIST

× New Parts

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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
C33 ,34			CE04DW1A101M	ELECTRO 100UF 10WV		
C35 ,36			CC45FSL1H271J	CERAMIC 270PF J		
C37 ,38			CC45FSL1H080D	CERAMIC 8.0PF D		
C39 ,40			CC45FSL1H060D	CERAMIC 6.0PF D		
C41 ,42			CF92FV1H102J	MF 1000PF J		
C43 ,44			CC45FSL1H331J	CERAMIC 330PF J		
C45 ,46			CF92FV1H473J	MF 0.047UF J		
C47 ,48			CE04DW1E4R7M	ELECTRO 4.7UF 25WV		
C49			CK45FB1H102K	CERAMIC 1000PF K		
C51 ,52			CF92FV1H472J	MF 4700PF J		
C53 ,54			CE04DW1H010M	ELECTRO 1.0UF 50WV		
C55 ,56			CE04DW1E220M	ELECTRO 22UF 25WV		
C57 ,58			C90-1616-05	ELECTRO 3300UF 35WV	KM	
C57 ,58			C90-1617-05	ELECTRO 3900UF 42WV	E	
C59 -64			CF92FV1H272J	MF 2700PF J		
C65			CF92V1H153J	MF 0.015UF J		
C66 -69			C90-2660-05	ELECTRO 1000UF 16WV	KM	
C70			C90-2576-05	NP-ELECT 330UF 16WV		
C71		*	C90-2690-05	ELECTRO 4700UF 16WV	E	
C72			CE04DW1H3R3M	ELECTRO 3.3UF 50WV	KM	
C73			CF92FV1H102J	MF 1000PF J		
C74		*	C91-2056-05	MF 0.22UF J		
C75 ,76			CE04DW1C100M	ELECTRO 10UF 16WV		
C77			CE04DW1H2R2M	ELECTRO 2.2UF 50WV		
C78			CE04DW1A101M	ELECTRO 100UF 10WV		
C79			CE04DW1C100M	ELECTRO 10UF 16WV		
C80			CE04DW1V221M	ELECTRO 220UF 35WV		
C81 ,82			CC45FSL1H080D	CERAMIC 8.0PF D		
C83			CE04DW1C470M	ELECTRO 47UF 16WV		
C84		*	C90-2724-05	ELECTRO 47UF 50WV	E	
C102			CF92FV1H473J	MF 0.047UF J		
CN1 ,2	2B		E40-9129-05	FLAT CABLE CONNECTOR		
JK1	2B		E70-0804-05	TERMINAL BOARD (B.UP/GND)		
JK2	2B		E20-0479-05	TERMINAL BOARD (L/R OUT ,4P)		
JK3	2B		E20-0239-05	TERMINAL BOARD (P.CON/GND ,2P)		
JK4	2B		E13-1401-05	PHONE JACK (L/R IN)		
△ JK6	2A	*	J13-0601-05	FUSE HOLDER (critical comp.)		
LH1 ,2			J19-2826-05	HOLDER		
L1		*	L33-0991-05	CHOKE COIL		
L2 ,3		*	L33-0990-05	CHOKE COIL		KM
L4 ,5			L39-0085-05	PHASE-COMPENSATION COIL		
T1		*	L19-0523-05	TRANSFORMER FOR CONVERTER		KM
T1		*	L19-0524-05	TRANSFORMER FOR CONVERTER		E
G	1B		N30-2604-46	PAN HEAD MACHIN SCREW		
H	1B		N80-2608-45	PAN HEAD TAPTITE SCREW		
J	1B		N80-3010-45	PAN HEAD TAPTITE SCREW		
K	1B		N83-3006-41	PAN HEAD TAPTITE SCREW		
L	1A, 2A		N83-3008-45	PAN HEAD TAPTITE SCREW		
M	2A, 2B		N87-3012-46	BRAZIER HEAD TAPTITE SCREW		
R7 ,8			R92-2101-05	METAL FILM 1K D 1/6W		
R13 ,14			R92-2103-05	METAL FILM 5.1K D 1/6W		
R15 -18			R92-2102-05	METAL FILM 2.2K D 1/6W		
R19 ,20			R92-2101-05	METAL FILM 1K D 1/6W		

E: Scandinavia & Europe K: USA P: Canada W: Europe

U: PX(Far East, Hawaii) T: England M: Other Areas

UE: AAFES(Europe) X: Australia

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R73 ,74			RD14DB2H102J	SMALL-RD 1.0K J 1/2W		
R85 -88			RD14DB2H101J	SMALL-RD 100 J 1/2W		
R97 -100			R92-0205-05	METAL-PLATE 0.1 K 2W		
R101,102			RD14DB2H100J	SMALL-RD 10 J 1/2W		
R109,110			RD14DB2H100J	SMALL-RD 10 J 1/2W		
R117			RD14DB2H100J	SMALL-RD 10 J 1/2W		
R120			RD14DB2H100J	SMALL-RD 10 J 1/2W		
R125,126			RD14DB2H100J	SMALL-RD 10 J 1/2W		
R154			RD14DB2H151J	SMALL-RD 150 J 1/2W		
R156			RD14DB2H151J	SMALL-RD 150 J 1/2W		
R203-206			R92-2102-05	METAL FILM 2.2K D 1/6W		
R207-210			R92-2103-05	METAL FILM 5.1K D 1/6W		
R231			RD14DB2H100J	SMALL-RD 10 J 1/2W	E	
VR1			R10-2622-05	POTENTIOMETER(5K)		
VR2			R10-4645-05	POTENTIOMETER(50K)		
VR3 ,4			R12-0092-05	TRIMMING POT.(220 ㄱ)		
VR5			R12-1069-05	TRIMMING POT.(4.7K ㄱ)	KM	
VR6			R12-1067-05	TRIMMING POT.(2.2K)		
K1			S76-0804-05	MAGNETIC RELAY		
S1		*	S31-2130-05	SLIDE SWITCH	KM	
S1		*	S62-0815-05	SLIDE SWITCH	E	
S2		*	S62-0814-05	SLIDE SWITCH		
S3		*	S62-0810-05	SLIDE SWITCH		
D1 -19			1SS176	DIODE	E	
D1 -21			1SS176	DIODE	KM	
D21			1SS176	DIODE	E	
D22			FMU22R	DIODE		
D23			FMU22S	DIODE		
D24			RD5.1JS(B2)	ZENER DIODE		
D25 ,26			RD16JS(B)	ZENER DIODE		
D27			1SS176	DIODE		
D28			RD5.1JS(B2)	ZENER DIODE		
D29 ,30			RD20JS(B)	ZENER DIODE		
D32 ,33			RD5.1JS(B2)	ZENER DIODE		
D34			RD8.2JS(B2)	ZENER DIODE		
D35			RM4AAMLF-J1	DIODE		
D37 -40			EH1Z	DIODE	E	
D39 ,40			EH1Z	DIODE	KM	
D41 -43			1SS176	DIODE		
IC1 ,2			UPC4570C	IC(OP AMP X2)		
IC3			NJM4558D	IC(OP AMP X2)		
IC4			UPC1237HA	IC(POWER AMP)		
IC5			UPC494C	IC(SWITCHING REGULATOR)		
IC6			UPC4570C	IC(OP AMP X2)		
IC7			NJM4558D	IC(OP AMP X2)		
Q1 -6			2SC945(A)(Q,P)	TRANSISTOR		
Q7 -10			2SA992(F,E)	TRANSISTOR		
Q11 -16			2SC1845(F,E)	TRANSISTOR		
Q17 ,18			2SA992(F,E)	TRANSISTOR		
Q19 ,20			2SC3419	TRANSISTOR		
Q21 ,22			2SC2590(Q,R)	TRANSISTOR		
Q23 ,24			2SA1110(Q,R)	TRANSISTOR		
Q25 ,26			2SC4467*5	TRANSISTOR		
Q27 ,28			2SA1694*5	TRANSISTOR		

E: Scandinavia & Europe K: USA P: Canada W: Europe

U: PX(Far East, Hawaii) T: England M: Other Areas

UE: AAFES(Europe) X: Australia

E: for Europe

K: for North america

M: Other areas

⚠ 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
Q29 ,30			2SC1845(F,E)	TRANSISTOR		
Q31			2SA992(F,E)	TRANSISTOR		
Q32 -37			2SK1190	FET		
Q38 ,39			2SC945(A)(Q,P)	TRANSISTOR		
Q40 ,41			2SA733(A)(Q,P)	TRANSISTOR		
Q42			2SA1534A(R,S)	TRANSISTOR		
Q43			2SC945(A)(Q,P)	TRANSISTOR		
Q44			2SA733(A)(Q,P)	TRANSISTOR		
Q45			2SC3940A(R,S)	TRANSISTOR		
Q46 ,47			2SA1561	TRANSISTOR		
Q48 ,49			2SA733(A)(Q,P)	TRANSISTOR		
Q50			DTA124EFF	DIGITAL TRANSISTOR		
Q51			2SD1266BD(Q,P)	TRANSISTOR		
Q52			2SB941BD(Q,P)	TRANSISTOR		
TH1 ,2		*	PTH9M04BC222T	POSITIVE RESISTOR		
TH3			ERTD2FHL103S	THERMISTOR		

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# KAC-823

## [Audio Section]

Max Power Output (4 ohm) Normal .....	150 W + 150 W
Bridged .....	360 W
Rated Power Output (4 ohm)	
Normal (20 Hz~20 kHz, less than 0.05% THD .....	70 W + 70 W
Bridged (1 kHz, less than 0.3% THD) .....	170 W
Rated Power Output (2 ohm)	
Normal (1 kHz, less than 0.3% THD .....	85 W + 85 W
Frequency Response (-3 dB) .....	2 Hz ~ 45 kHz
Sensitivity (rated output) MAX .....	0.15 V
MIN .....	3.0 V
Signal to Noise Ration .....	105 dB
Input Impedance .....	10 kΩ
Damping Factor (100 Hz) .....	More than 200
Low Pass Filter Frequency .....	30 ~ 200 Hz (VARIABLE)

## [General]

Operating Voltage.....	14.4 V (11~16 V allowable)
Current Consumption (MAX.) .....	25 A
Dimensions (W x H x D) .....	273 x 56 x 220 mm
	(10 x 3/4 x 2-3/16 x 8-11/16 in.)
Weight .....	3.7 kg. (8.2 lb)