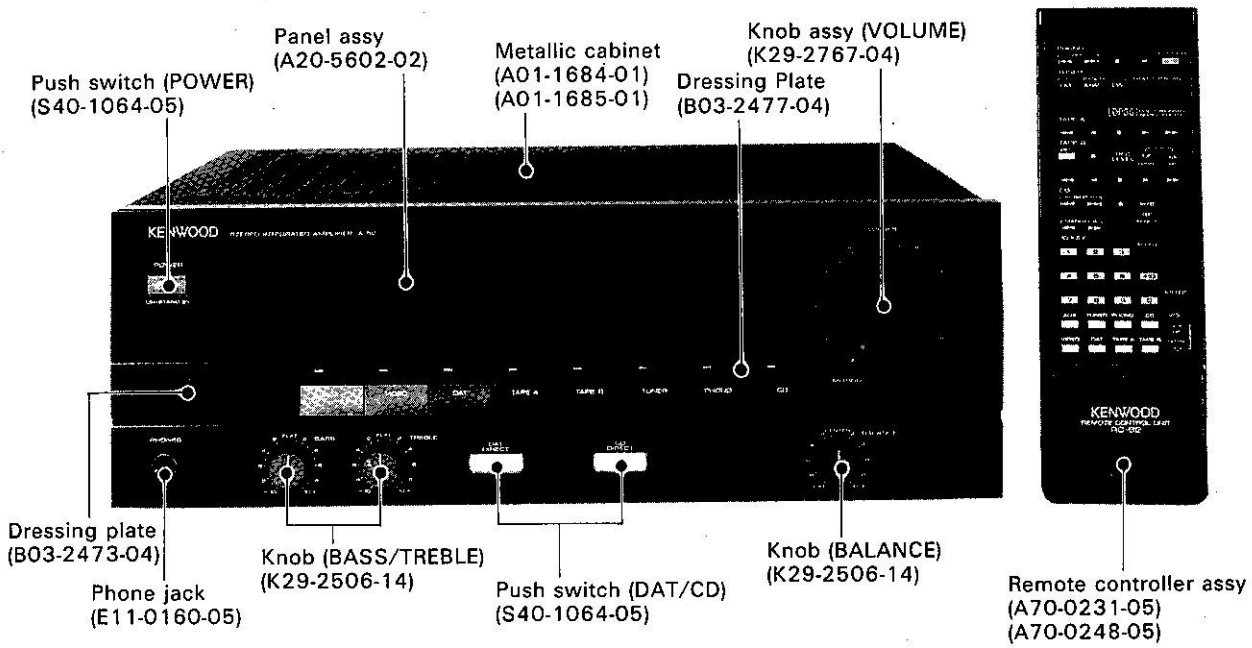
STEREO INTEGRATED AMPLIFIER

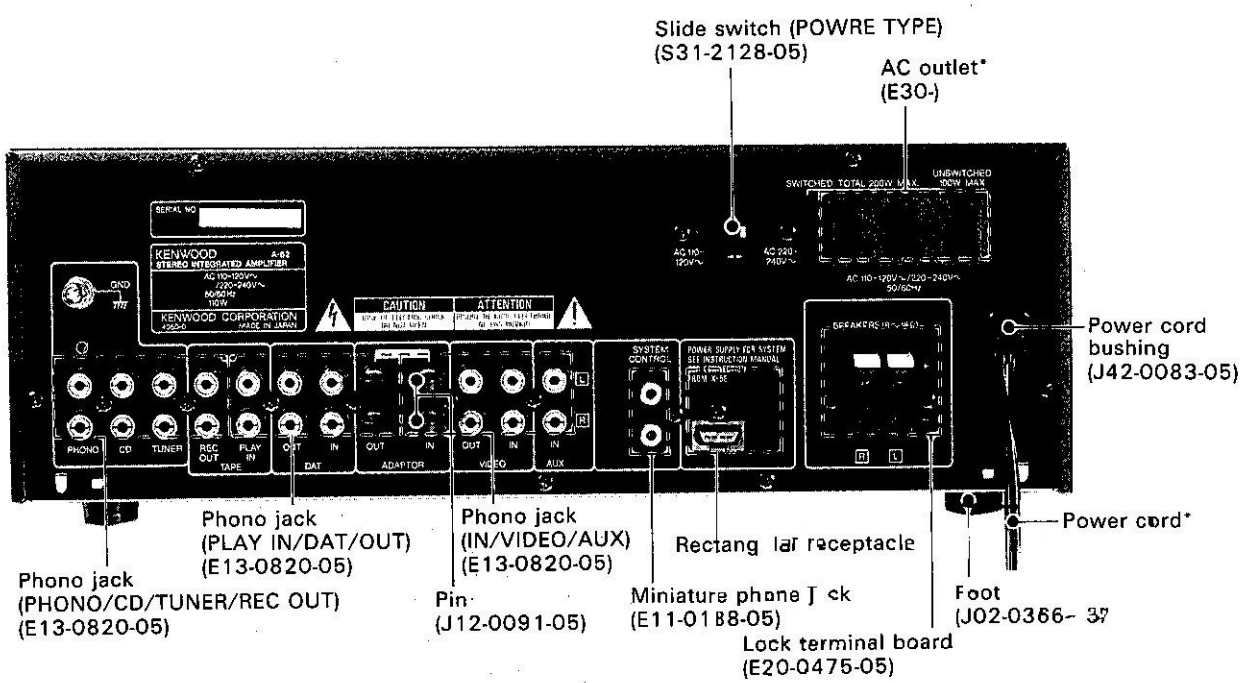
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SERVICE MANUAL

KENWOOD

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B51-3607-00 (G) 1663





Parts List on page 30.

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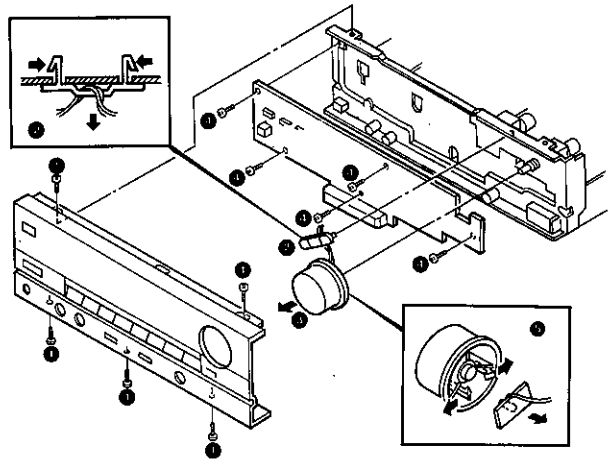
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CAUTION

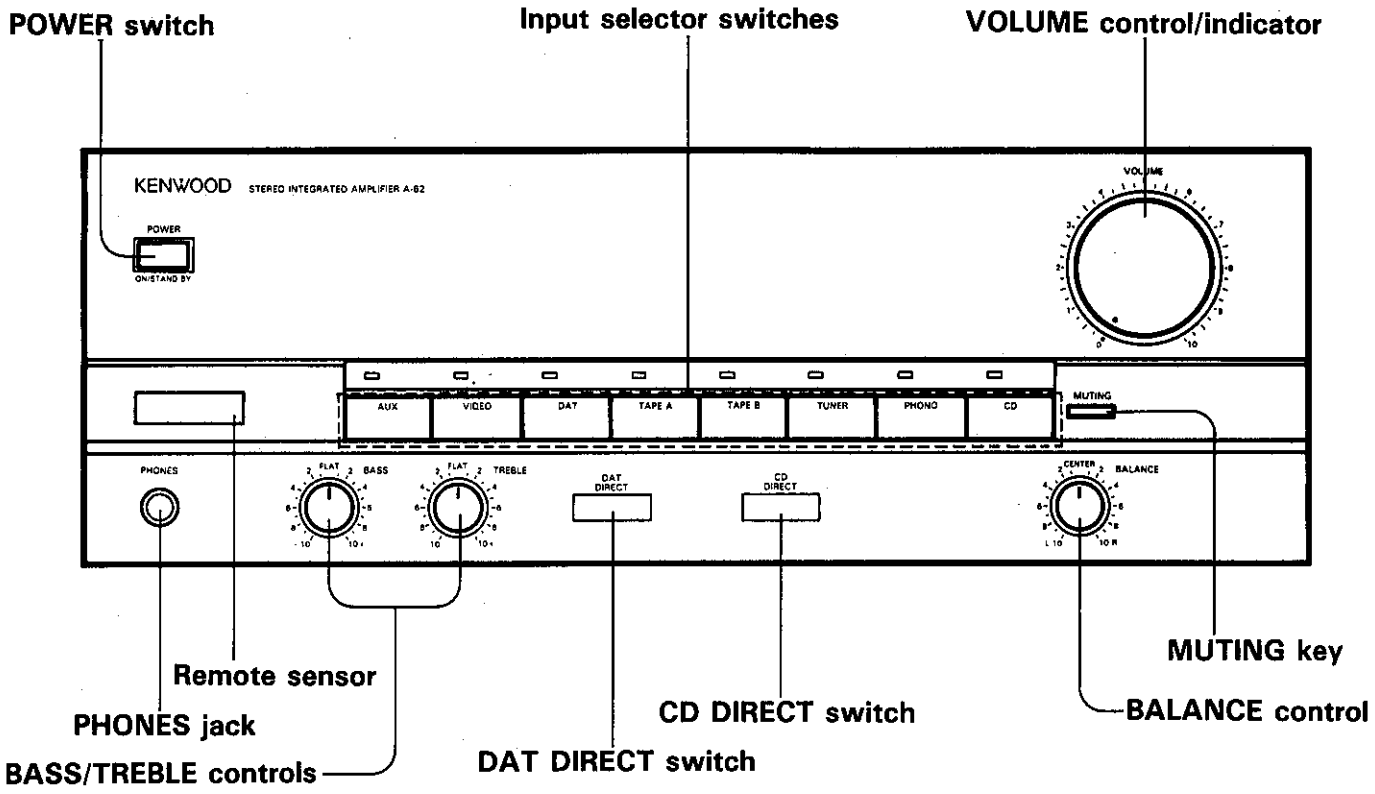
- The AC power supply for the X-91 on the rear panel outputs 16 V AC. Therefore, it cannot be used for supplying AC power to the X Series.
- In addition to conventional audio circuitry, this unit is equipped with 4 video input systems and 2 video output systems.

DISASSEMBLY FOR REPAIR

1. Remove the 5 screws (❶) fixing the front panel.
2. Remove the clamper (❷).
3. Remove the VOLUME control knob (❸). As LED cords are connected to the knobs, be careful not to pull them too far.
4. Remove the 5 screws (❹) and disengage the connectors from the PC board as shown in the illustration.
5. Remove the LED board of the VOLUME control knobs by disengaging the 2 claws (❺) retaining the PC board.

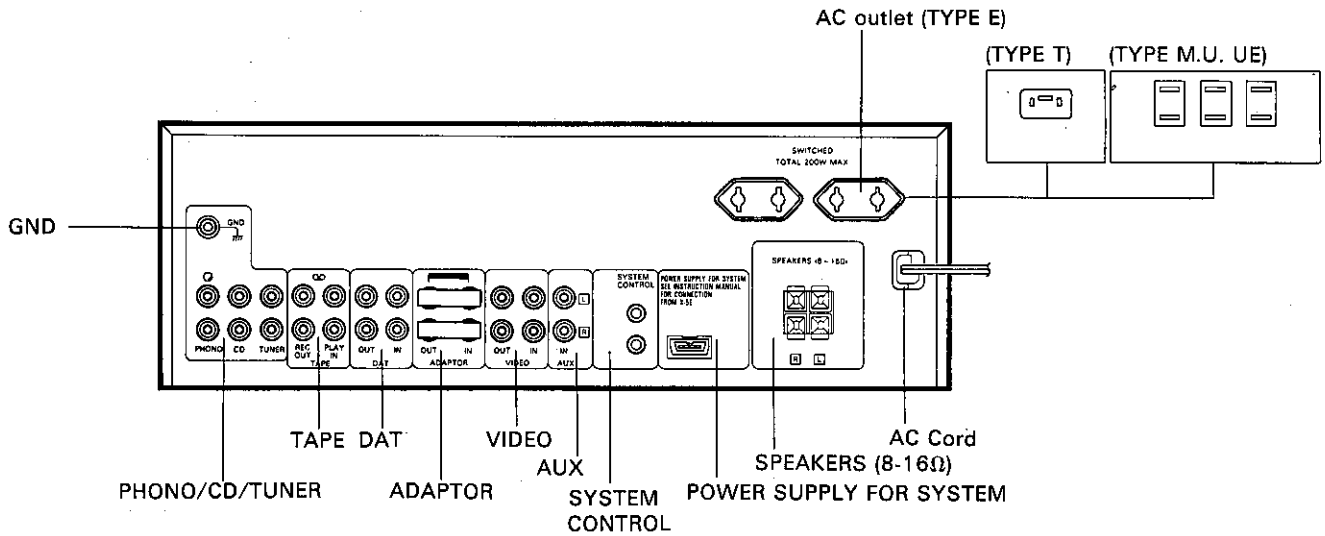


FUNCTION OF AMPLIFIER

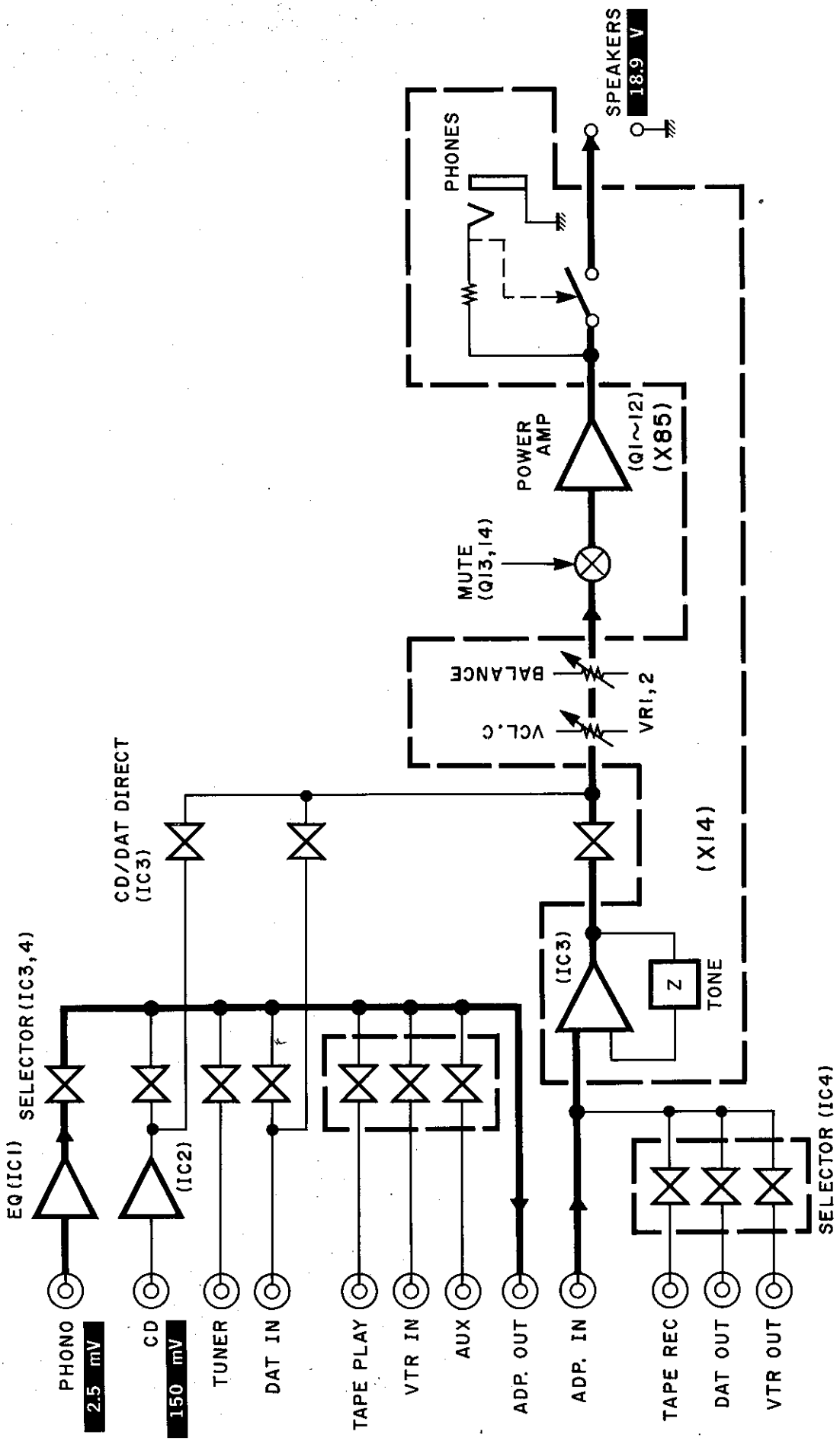


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FUNCTION OF AMPLIFIER



BLOCK LEVEL DIAGRAM



CIRCUIT DESCRIPTION

Description of Components

MAIN AMP UNIT (X85-1160-00): DT 1

Component	Use/Function	Operation/Condition/Compatibility
Q1~Q4	Class-A primary stage differential amplifier	
Q5~8	Class-A secondary stage differential amplifier	
Q9, 10	Class-A current mirror circuit	
Q11	PROTECTION	
Q12	PROTECTION	
Q13	PROTECTION	

SUPPLEMENTARY UNIT (X13-6140-00): DT 2

Component	Use/Function	Operation/Condition/Compatibility
IC1 (LC4966)	Switch IC	For DAT REC OUT select
Q1, 2	Q3 control	
Q3	IC1 control	

DISPLAY UNIT (X14-2422-70)

Component	Use/Function	Operation/Condition/Compatibility
Q1	DAT Direct current drive	Turns ON when DAT Direct is selected, and OFF for any other mode. Compatible with 2SC2003
Q2	CD Direct current drive	Turns ON when CD Direct is selected, and OFF for any other mode. Compatible with 2SC2003.
IC1	Microcomputer (CXP5016-313S)	
IC2	Reversible motor driver (LB164J)	For driving the motor-drive volume control. When the volume is increased with the remote control, pins 2 and 5 go high. When the volume is decreased with the remote control, pins 10 and 6 go high.
IC3	Op-amp (μJH4558D)	For tone amp.
IC4	Reset IC (M5195/A8L)	Low reset.

CIRCUIT DESCRIPTION

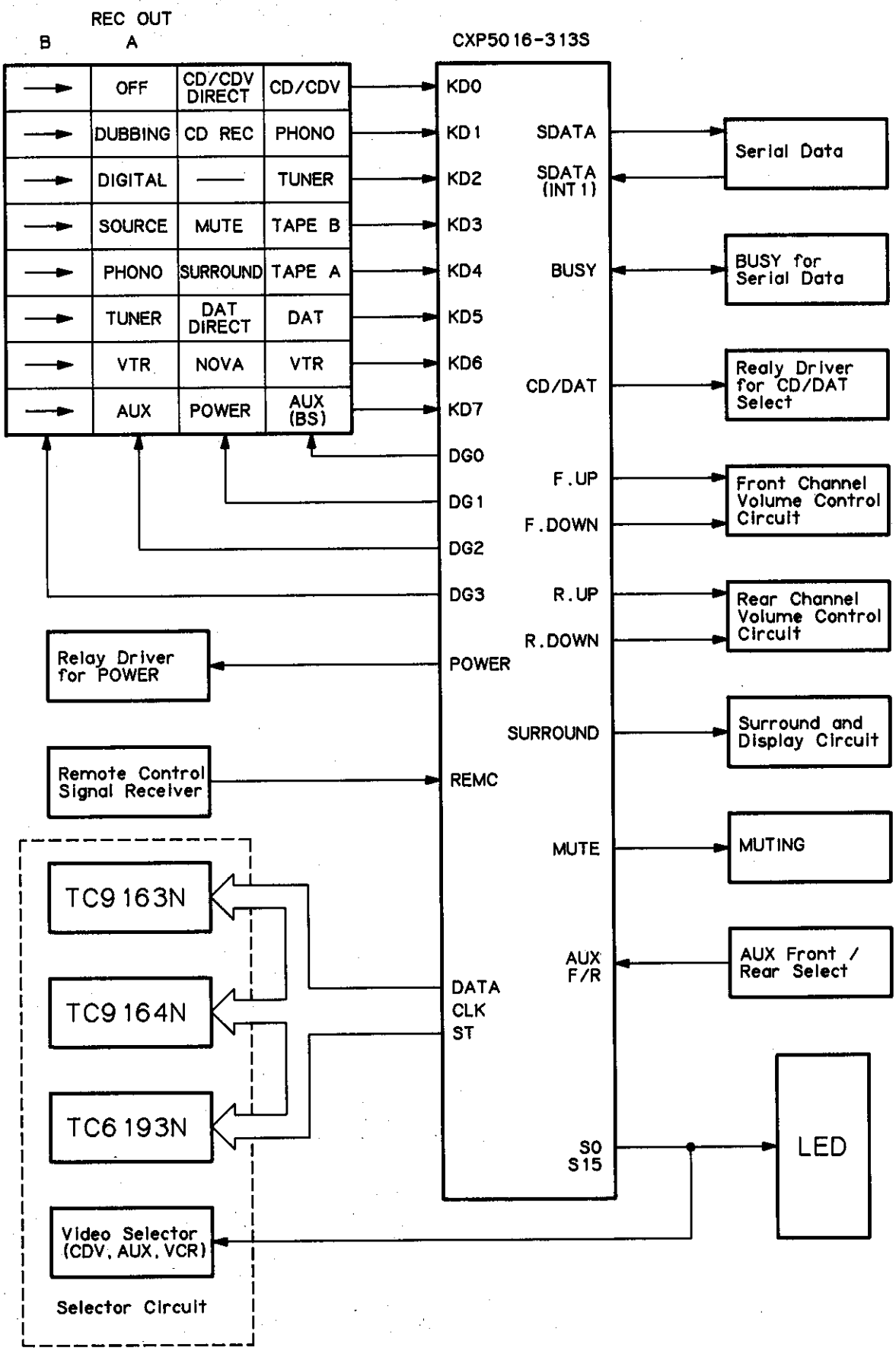
AUDIO UNIT (X09-2752-70)

Component	Use/Function	Operation/Condition/Compatibility
IC1 (M5218P-A)	Phono equalizer	Compatible with M2518P-A
IC2	Buffer amp	Compatible with M5218P-A
IC3, 4 (TC9163N, TC9164N)	Input selector	IC3 compatible with TC9163N, IC4 compatible with TC9164N
Q1~Q4	Pre-driver	
Q5, Q6	Current limiter	
Q7, Q8	For bias current compensation	
Q9, Q10	Final transistor	
Q11, Q12	Final transistor	
Q13, Q14	Muting	
Q21~26	Constant-voltage power supply	±13V
Q27, 35, 37	Constant-voltage power supply	+13V (For the lamps and motor VR)
Q31, Q36	Power relay drive	Turns ON when the power is switched ON. (Q36 is only for the M-type model)
Q32, Q33	Constant-voltage power supply	+5V (for the microcomputer) (Q33 is only for the M-type model)
Q34	Muting driver	Turns Q13 and Q14 ON/OFF.
Q15~20	Not used for the amplifier.	
Q28~30	Not used for the amplifier.	

Note: The unit (X13-6140-00) is deleted due to the change of the microprocessor (CXP5016-313S → CXP5016-315S).

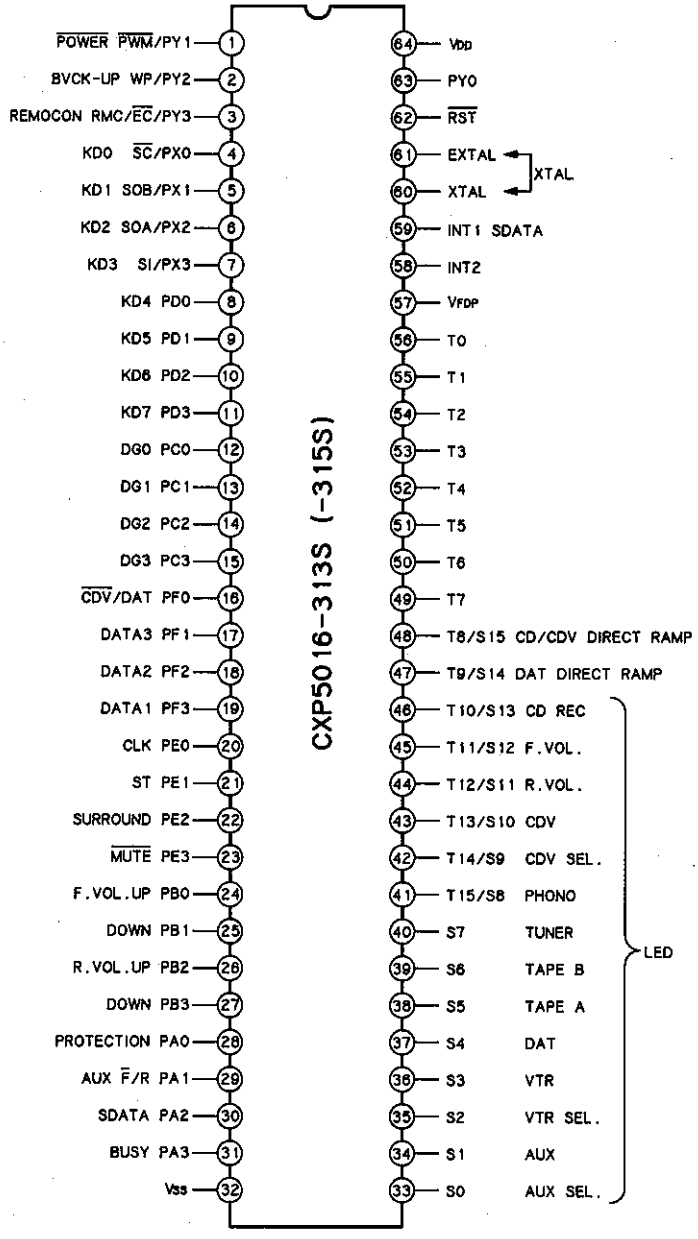
CIRCUIT DESCRIPTION

1-1. Block Diagram of the Microprocessor and Its Surroundings



CIRCUIT DESCRIPTION

1-2. Pin Assignment



Note : CXP5016-313S will be used in the units manufactured in the period S/N 80900001, and after then, it will be replaced with the -315S, which has the same port allocations and compatibility.

CIRCUIT DESCRIPTION

1-3. Explanation of Pins

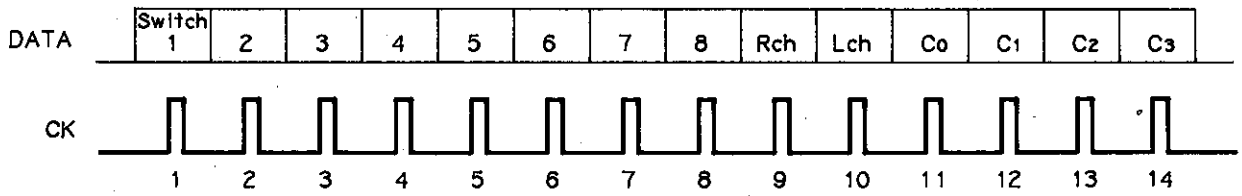
Pin No.	Pin Name	I/O	Name	Function
1	PY1	O	POWER	POWER ON/OFF port. Goes low when power is ON and high when power is OFF.
2	PY2	I	BUCK-UP	Not used (connected to +5 V)
3	RMC	I	REMOCON	Remote control input pin
4 ~ 7	PX0~PX3	I	KD0~KD3	Key scan input port. Active high.
8 ~ 11	PD0~PD3	I	KD4~KD7	Key scan input port. Active high.
12 ~ 15	PC0~PC3	O	DG0~DG3	Key scan output port.
16	PF0	O	CDV/DAT	
17	PF1	O	DATA3	
18	PF2	O	DATA2	
19	PF3	O	DATA1	For MIDI series: Serial data output port for TC9163N/ TC-9164N.
20	PE0	O	CLK	Serial data clock output port for Selector IC.
21	PE1	O	ST	Serial data S7 output port for Selector IC.
22	PE2	O	SURROUND	Surround ON/OFF and display LED driver port. Goes high when surround is ON, and goes low when it is OFF.
23	PE3	O	MUTE	Muting port. Goes low when muting is ON, and high when it is OFF.
24	PB0	O	F.VOL.UP	Front channel volume UP drive port. When it is high, volume level is increased.
25	PB1	O	F.VOL.DOWN	Front channel volume DOWN drive port. When it is high, volume level is decreased.
26	PB2	O	R.VOL. UP	Rear channel volume UP drive port. When it is high, volume level is increased.
27	PB3	O	R.VOL.DOWN	Rear channel volume DOWN drive port. When it is high, volume level is decreased.
28	PA0	I	PROTECTION	
29	PA1	I	AUX F/R	AUX front/rear select input port. Rear AUX is selected when it is high, and front AUX is selected when it is low.
30	PA2	O	SDATA	Serial data output port between system components.
31	PA3	I/O	BUSY	Serial data BUSY I/O port between system components.
32	Vss	O		Ground for microcomputer.
33	S0	O	AUX SEL.	Video selector (AUX) and display LED drive port. Turns ON and LED lights when it is high.
34	S1	O	BC/AUX	Selector AUX (EQ) display LED drive port. LED lights when it is high.
35	S2	O	VTR SEL.	Video selector (AUX) and display LED drive port. Turns ON and LED lights when it is high.
36	S3	O	VTR	Selector VCR display LED drive port. LED lights when it is high.
37	S4	O	NAT	DAT
38	S5	O	TAPE A	TAPE A (1)
39	S6	O	TAPE B	TAPE B (2)
40	S7	O	TUNER	TUNER
41	S8	O	PHONO	PHONO
42	S9	O	CDV SEL.	Video selector (CDV) and display LED drive port. Turns ON and LED lights when it is high.
43	S10	O	CDV	Selector CDV display LED drive port. LED lights when it is high.
44	S11	O	R. VOL	Rear channel volume
45	S12	O	F. VOL	Front channel volume
46	S13	O	CD REC	CD REC
47	S14	O	DAT DIRECT RAMP	DAT Direct indicator lamp
48	S15	O	CDV DIRECT RAMP	CDV Direct indicator lamp
49~56	T7~T0			Not used (OPEN)
57	VFDP	I		Loading power supply pin
58	INT2			Not used (GND)
59	INT1	I	SDATA	Serial data input port between system components.
60	XTAL	O		Clock generator output port.
61	EXTAL	I		Clock generator input port.
62	$\overline{RST}$			Reset signal input, and built-in power ON reset circuit output pin.
63	PY0			Not used (Pull-up)
64	VDD			Positive power supply pin of the microcomputer.

CIRCUIT DESCRIPTION

2. Selector IC Operation

Data input

TC9162/63/64N can control each analog switch arbitrarily by inputting the specified data to the DATA, CK and ST pins. The data consists of 14 bits which are allocated as follows:



Since the 1st ~ 8th bits are corresponding to the analog switches 1 ~ 8, set the bit level to '1' corresponding to the switch to be turned ON. (Note)

The 9th and 10th bits are the left and right channel select bits.
When this bit level is set to '1', the corresponding channel is selected. Therefore, both L/R simultaneous status ('1', '1') or L/R independent status ('1', '0' or '0', '1') can also be set.

The 11th bit to 14th bit are the code bits to be used for chip select.
For example, when TC9162N, TC9163N and TC9164N are used simultaneously, DATA, CK and ST pins are connected commonly and any of TC9162N, TC9163N and TC9164N can be selected by these code bit data.

Chip select codes are set as follows:

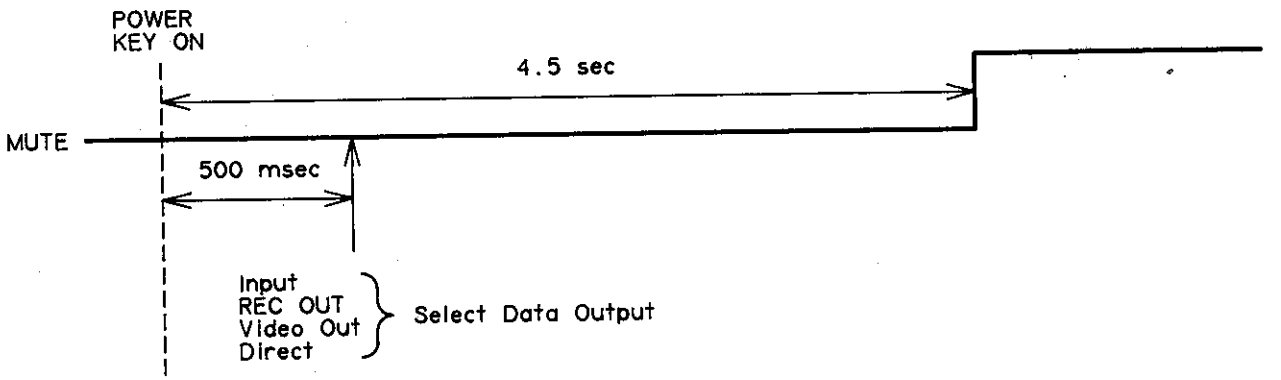
	C_0	C_1	C_2	C_3
TC9162N	0	0	0	0
TC9163N	1	0	0	0
TC9164N	0	1	0	0

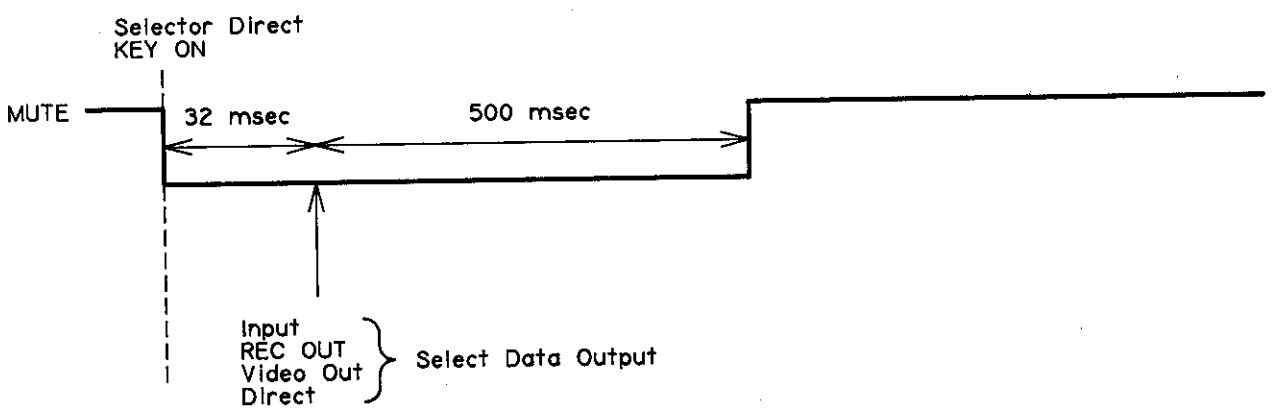
Note : Since TC9162N has the switches of 7 lines, the 8th bit should be set to '0'.

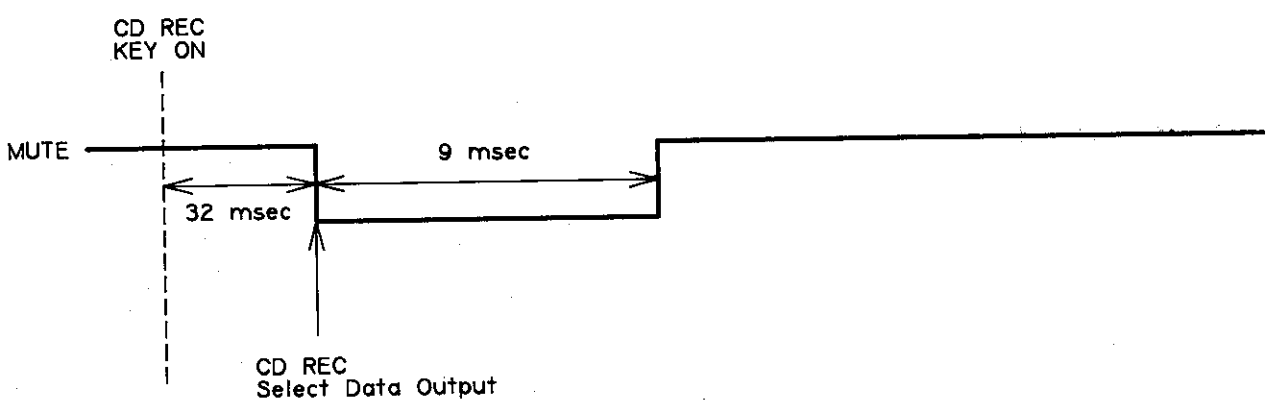
CIRCUIT DESCRIPTION

3. Timing Chart

Muting timing

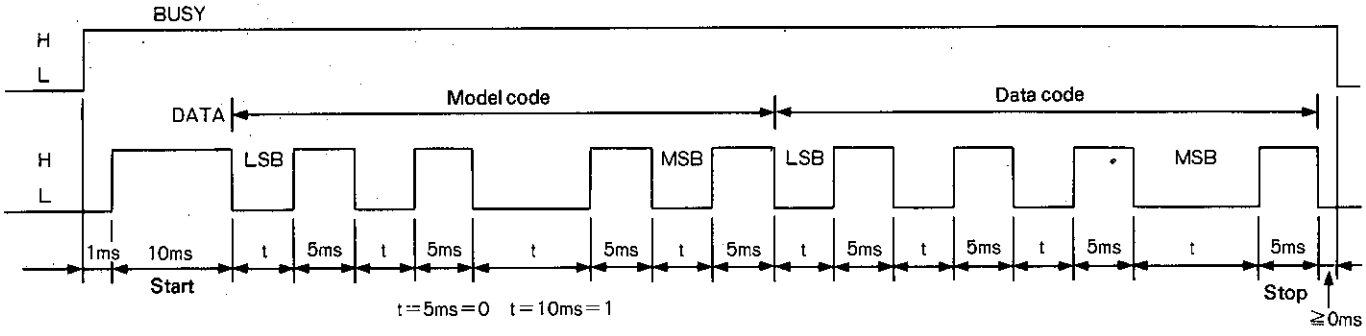






CIRCUIT DESCRIPTION

4-1. Explanation of Serial Data Communication

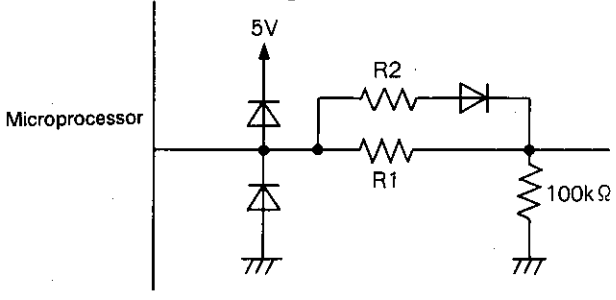


The serial data communication format is defined as shown above, in which the BUSY/DATA 2-wire full-duplex bus is used. 1 word consists of 8 bits, and the most significant 4 bits are defined as the model code of the transmitter (4 = CD player in the above example) while the subsequent 4 bits are defined as the data code (8 = PLAY in the above example). <48H> The high level signal of 10 ms at the beginning of the DATA shows the start of the serial data. Data is determined by the length of L period. It is '0' when L is 5 ms, and '1' when 10 ms. The high level signal of 5 ms shows the separator of the data. The BUSY signal is inverted to high 1 ms faster than the start of DATA and goes low at the same time or later of the end (stop) of the DATA. The BUSY signal is used so that the DATA output signals do not interfere with each other between components, and should be low level when the serial data is output. If the BUSY signal is high, the data is output until the BUSY signal goes low.

4-2. System Connections with serial signals

Interface circuit

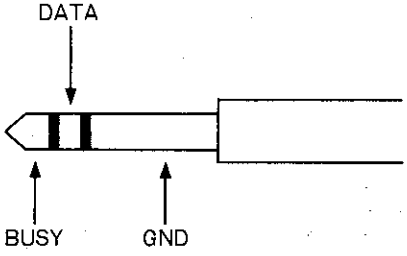
Both DATA and BUSY signals are connected as follows:



* Constants for R_1, R_2 differ for each microcomputer used.
  - In case of μPD7537, μPD7538..... R_1: 4.7 kΩ, R_2: 330 Ω
  - In other cases..... R_1: 100 kΩ, R_2: 680 Ω,

Connection

DATA and BUSY lines should be connected using stereo mini jacks.

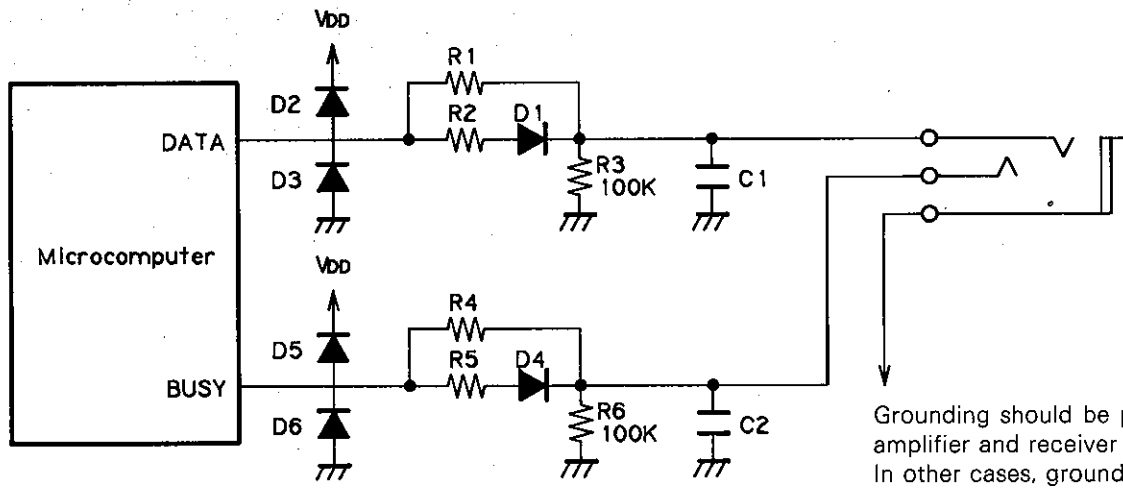


* GND should be applied to the amplifier.

Number of stereo mini jacks

Amplifier, Cassette Deck, Tuner, Remote Control..... 2
CD player, Turntable..... 1

CIRCUIT DESCRIPTION



Grounding should be performed for amplifier and receiver only.
In other cases, ground via capacitor or diode, or set open.

① R1, R4 :
R1, R4 are determined by the input leakage signal of the microcomputer used.
- When leakage current is less than 10 μA/5 V:
  R1, R4 = 100 kΩ
  (In the normal CMOS input port, it is almost 3 μA/5 V.)
- When the leakage current exceeds the above value:
  R1, R4 = 4.7 kΩ
  (Example : μPD77538AC/37AC, etc.)

② R2, R5 : For protection when output is shorted.
- The minimum value with which the current becomes the maximum rated value or less even when the output is short-circuited. But less the 680 Ω. Normally about 330 Ω.

③ R3, R6 : Input pull-down resistance.
- 100 kΩ regardless of the microcomputer. Be sure to insert the line between R1, D2 and the jacks.

④ D1, D4 : Reverse current prevention (To prevent the impedance from lowering when power is turned OFF.)

⑤ D7, D3, D5, D6 : For port protection. Be sure to insert this position (between R1, R4 and the port).

⑥ C1, C2 : For dealing with static electricity.
- It is attached only when required. Less than 1000 pF.

⑦ The GND terminal of the jacks should be grounded for the amplifier and the receiver only. For other components, it should be open, or grounded via capacitor or diodes.

⑧ When the input and output are separated such as using the N-channel open drain port, etc., it should be connected so as to be equivalent to the above circuit.

⑨ Since an impedance between R1, R4 and the microcomputer ports is high in the condition all components are connected, the connection line should be as short as possible.

Model (Type) Code (4-bit) / FUNCTION Code (4-bit)		AMPI	TUNER	PLAYER	CD	DECK A	DECK B	AMP II	REMOTE CONTROL							
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	—	—	—	—	—	—	—	—	0	PHONO	DAT	FRONT BAL L	□ (PLAYER)	◁ (DECK A)	AV AMP M.READ 1	REC SEL TAPE1
1	—	POWER ON	POWER ON	POWER ON	POWER ON	POWER ON	AUTO BIAS START	—	1	TUNER	TV	FRONT BAL R	◁ or ◁/○ (PLAYER)	▷ (DECK A)	AV AMP M.READ 2	REC SEL TAPE 2
2	—	SEL.TUNER	Deck Timer P/R Cancel	—	—	TUNER REC	TUNER REC	POS. TUNER	2	CD (CD/AUX)	VIDEO 2	REAR BAL L	◁◁ (PLAYER)	◁◁ (DECK A)	AV AMP M.READ 3	REC SEL VIDEO 1
3	—	SEL. PHONO	—	—	—	PHONO REC	PHONO REC	POS PHONO	3	AUX (VIDEO 2)	(DIG1) DAT DIG.	REAR BAL R	▷▷ (PLAYER)	▷▷ (DECK A)	AV AMP M.READ 4	REC SEL VIDEO 2
4	—	SEL.CD	—	—	CLOSE	CD REC	CD REC	POS. CD	4	TAPE 1 (TAPE A)	(DIG 2) CD DIG.	VIDEO A (VDP1)	MODE (CD)	▯▯ (DECK A)	—	—
5	—	SEL. TAPE A	SYSTEM ON	COUNT	MEMORY READ	TAPE A REC	TAPE A REC	POS. TAPE A	5	TAPE 2 (TAPE B)	—	VIDEO B (VDP2)	GE	□ (DECK A)	—	—
6	—	SEL. TAPE B	SYSTEM OFF	MEMO	MEMO	TAPE B REC	TAPE B REC	POS.TAPE B	6	VIDEO (VIDEO 1)	—	VDP 3 (BS)	REAR VOL. DOWN	○ REC (DECK A)	—	—
7	—	SEL. AUX (SEL. VIDEO 3)	REMOCON KEY OFF	—	—	AUX REC	AUX REC	POS AUX	7	ROULETTE PLAY	—	AUDIO	REAR VOL. UP	SURROUND ON/OFF	—	—
8	—	ROULETTE ON	PLAY	PLAY	PLAY	PLAY	PLAY	—	8	CH. DOWN	DISC (CD CONTROL)	REAR BAL L	CHECK (CD)	◁ (DECK B)	SHARPNESS DOWN	—
9	—	ROULETTE OFF	—	STOP	STOP	STOP	STOP	—	9	CH. UP (PRESET SCAN)	—	REAR BAL R	□ (CD)	▷ (DECK B)	SHARPNESS UP	—
A	—	SEL. VIDEO (VIDEO1) (VTR)	SEL. ANALOG	MUTE ON	PAUSE	VIDEO REC	VIDEO REC	POS. VIDEO	VIDEO 3	VOL. DOWN	—	REAR VOL. DOWN	CLEAR (CD)	◁◁ (DECK B)	DETAIL DOWN	—
B	—	—	SEL. DIGITAL	MUTE OFF	SAMPLE START	—	Computer CD REC Start	PHONO REC SW ON	MUSIC SELECT MODE ON/OFF	VOL. UP	—	REAR VOL. UP	▷ (CD)	▷▷ (DECK B)	DETAIL UP	—
C	—	—	DUB	DUB 2	DUB	—	DUB	PHONO REC SW OFF	MUSIC SELECT	MUTE	—	AV AMP MEMORY	REPEAT (CD)	▯▯ (DECK B)	DELAY TIME DOWN	—
D	—	—	SEL. CD DIG.	DUB 1	Tray OPEN	TAPE 2 REC	TAPE 2 REC	TAPE 1 ON	LW (J= TV)	POWER	+10 (CD)	AV AMP MEMU	EDIT (CD)	□ (DECK B)	DELAY TIME UP	—
E	—	—	SEL. DAT DIG.	RANDOM REC	Computer CD REC Standby	—	Computer CD REC Standby	TAPE 2 OFF	MW (AM)	DIRECT	TIME DISPLAY (CD)	TAPE MONITOR	⋈◁ (CD)	○ REC (DECK B)	ENHANCER ON/OFF	—
F	—	DP75 Connection Cord (SEL. DAT)	SEL. CDV.DIG.	—	S-CCRS START	POWER OFF (DAT REC)	DAY REC	POS. DAT	FM	PRESET FUNC. A/B	GE ON/OFF	AUDIO INJECTION	▷▷⋈ (CD)	SURROUND MODE	DELAY ON/OFF	—

ADJUSTMENT/REGLAGE/ABGLEICH

ADJUSTMENT

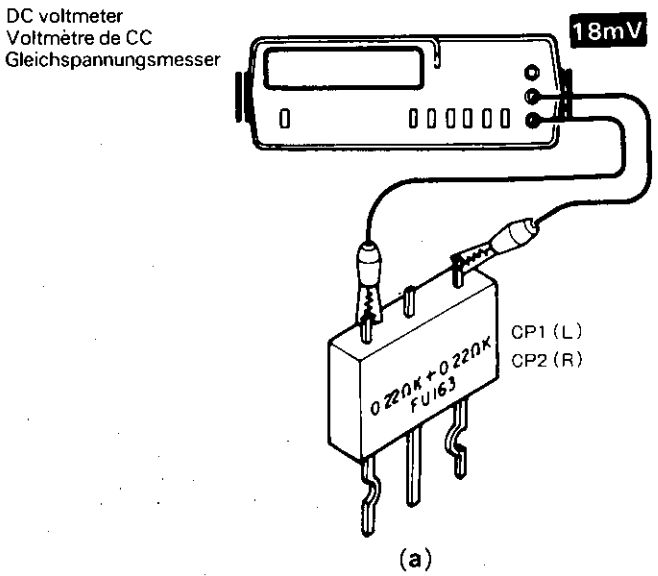
No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
1	IDLE CURRENT	–	Connect a DC voltmeter across CP1 (L) CP2 (R) (X09-)	VOLUME: 0	VR1 (L) VR2 (R) (X09-)	18mV	(a)

REGLAGE

N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DE L'AMPLIFICATEUR	POINT L'ALIGNEMENT	ALIGNER POUR	
1	COURANT DE POLARISATION	–	Connecter un voltmètre de CC sur CP1 (G) CP2 (D) (X09-)	VOLUME: 0	VR1 (G) VR2 (D) (X09-)	18mV	(a)

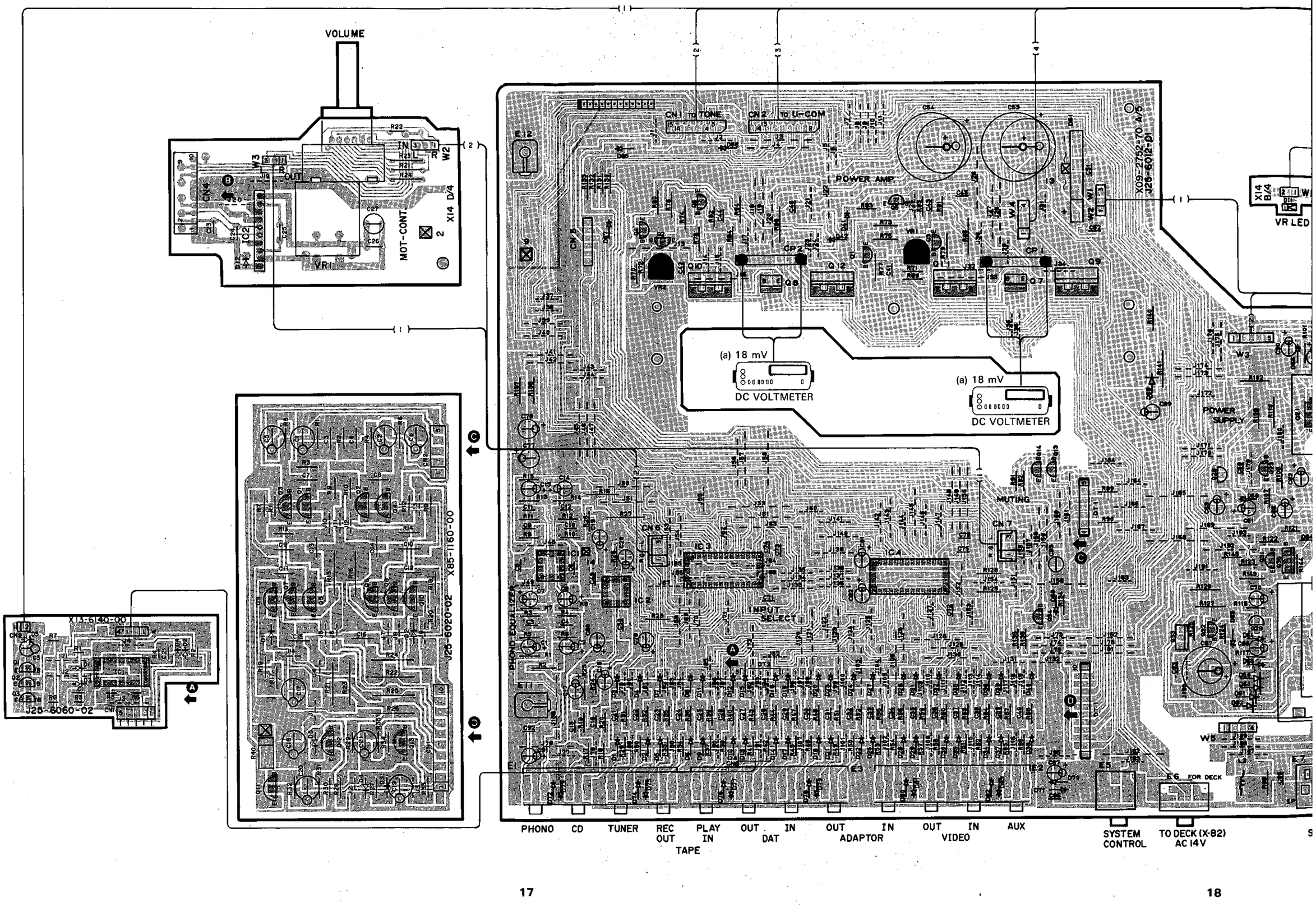
ABGLEICH

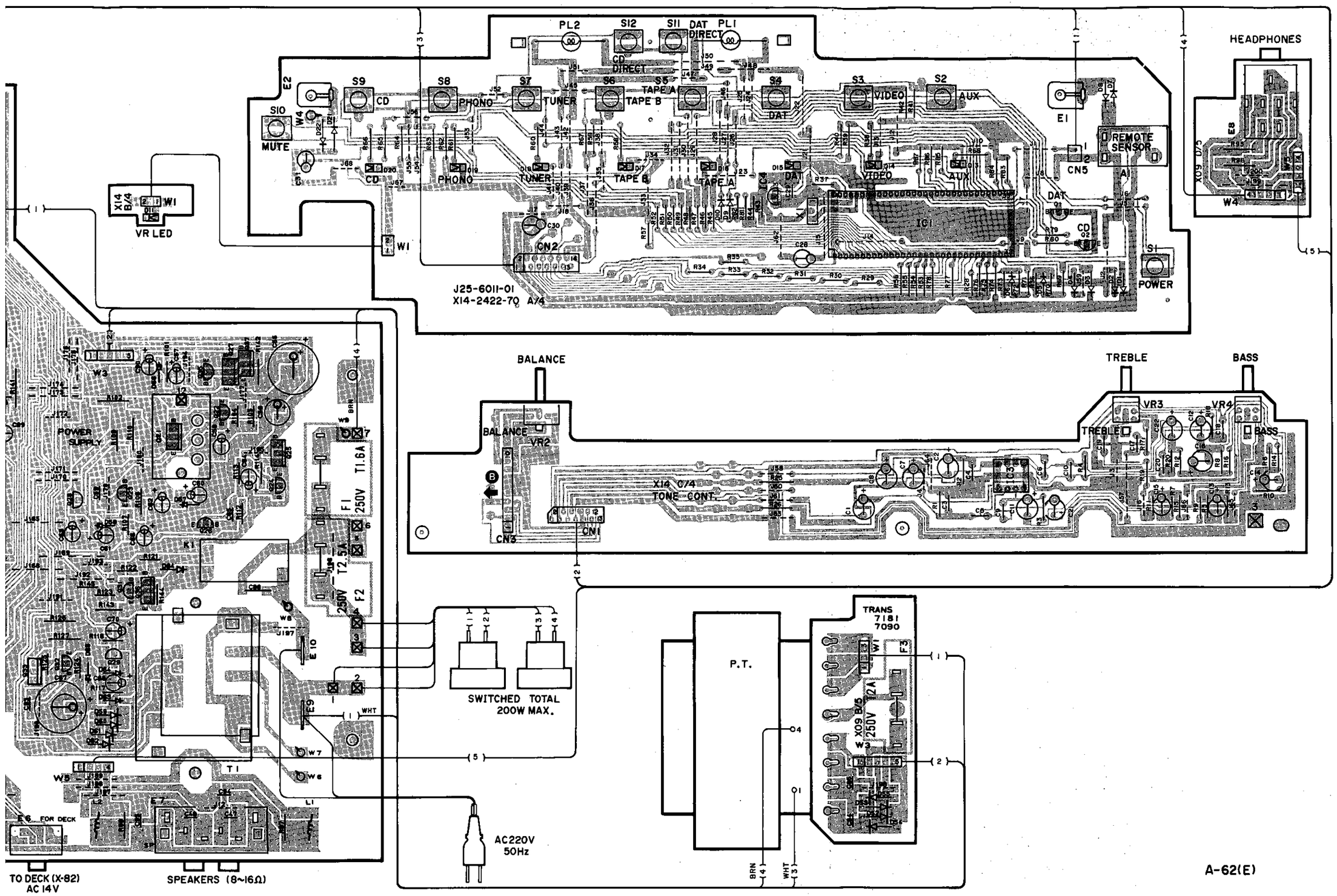
NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	VERSTÄRKER EINSTELLUNG	ABGLEICH-PUNKTE	ABGLEICHEN FÜR	ABB.
1	LEERLAUFSTROM	–	Einen Gleichspannungs-messer über CP1 (L) CP2 (R) anschließen. (X09-)	VOLUME: 0	VR1 (L) VR2 (R) (X09-)	18mV	(a)



(a)

P.C. BOARD (Component side view)

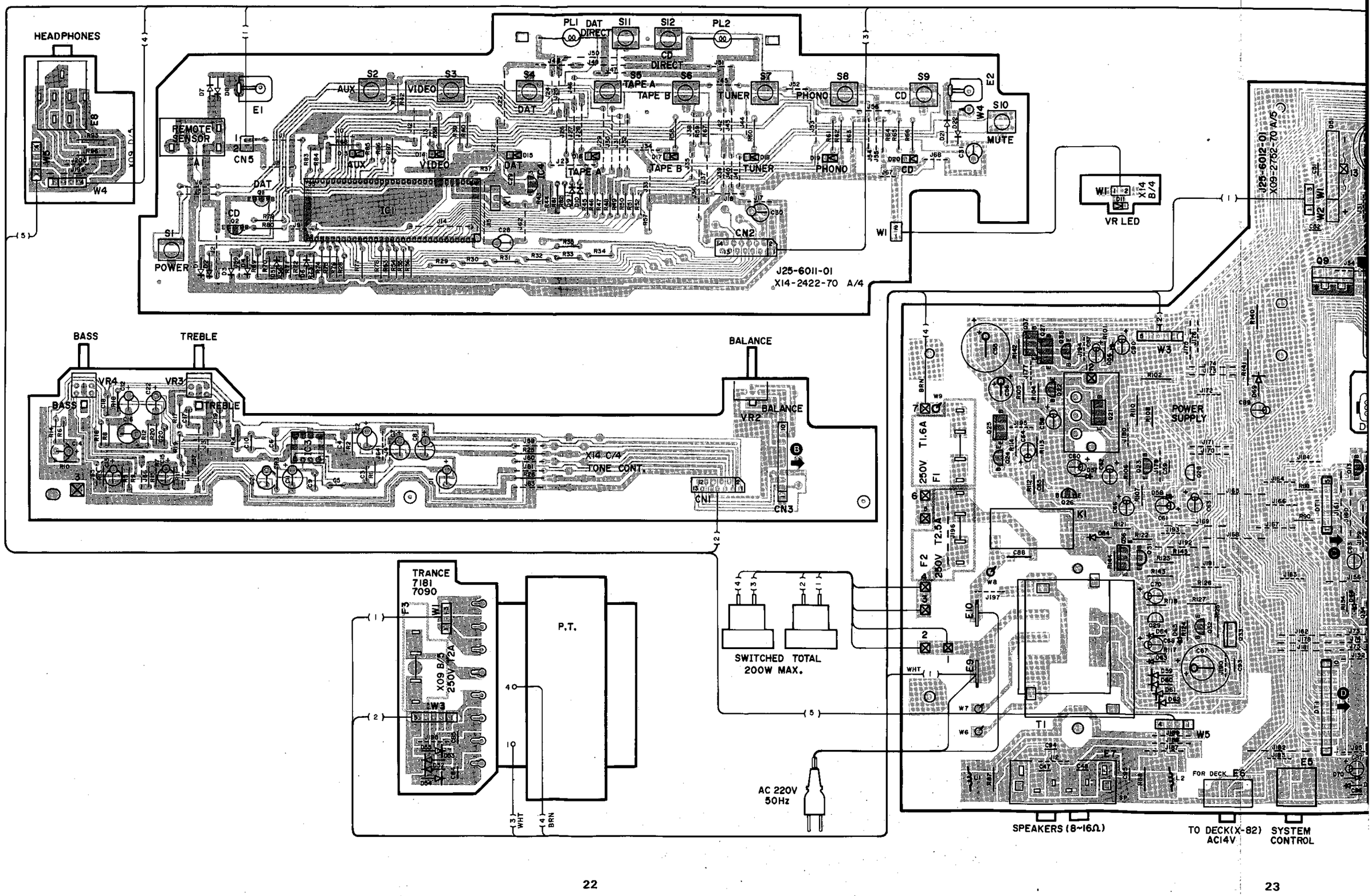


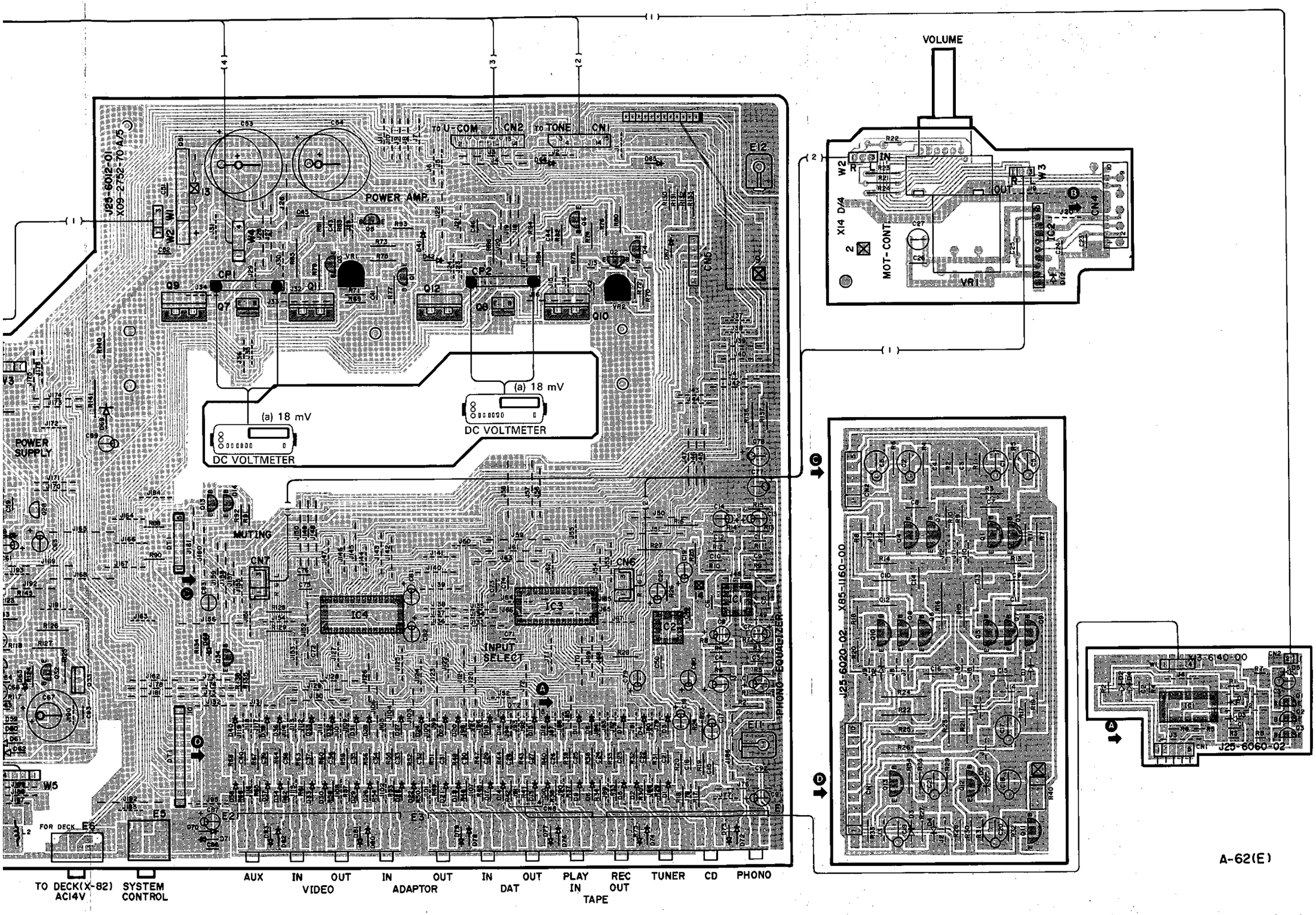


A-62(E)

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

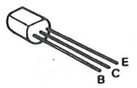
P.C. BOARD (Foil side view)



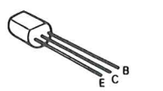


Refer to the schematic diagram for the values of resistors and capacitors.

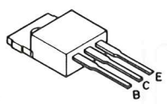
DTA124EN



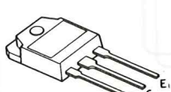
DTC124EN
2SA1284
2SA733
2SA733 (A)
2SA954
2SA992
2SC1845
2SC2003
2SC2320
2SC2878
2SC3244
2SC945 (A)



2SD1266



2SA1490*5
2SC3854*5



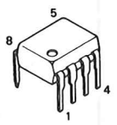
2SA933S
2SC1740S



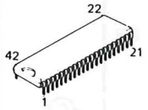
2SC4137



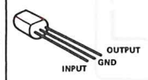
NJM4558D



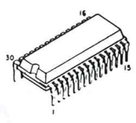
M5218P
M5218P-A



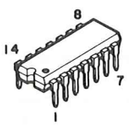
M51951ASL



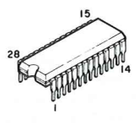
M50461-057SP



LC4966



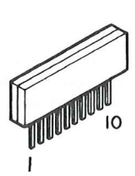
TC9163N
TC9164N



CX5016-313S



LB1641



(X09-275X-XX)						
DESTINATION	Ref No	R125	R126, 127	R143	C67	C88	C93
2-70	E	J	NO	J	220u25	C90-0147-05	NO
0-51	T,X	J	NO	J	220u25	C90-0147-05	NO
0-81	U,UE,M	220	J	15 1/4W	470u50	C90-0023-05	YES

C5,6	RI46	Q36	F1	F2	F3	W9	I,4
1500P	10K	2SC2003	T1.6A	T2.5A	T2A	NO	YES
1000P	10K	2SC2003	T1.6A	NO	T2A	NO	YES
1000P	8.2K	25D1266	2A	2A	2A	YES	NO

CAUTIO
nents or
list). ⚠
electric
carried
circuit)

-XX)												
ION	Ref No	R125	R126, 127	R143	C67	C88	C93	Q32	Q33	C3,4
	E	J	NO	J	220u25	C90-0147-05	NO	2SA954(L,K)	NO	330P
	T,X	J	NO	J	220u25	C90-0147-05	NO	2SA954(L,K)	NO	220P
	U,UE,M	220	J	I5 1/4W	470u50	C90-0023-05	YES	2SA733(A)(Q,P) or 2SA933S(Q,R)	YES	220P

C5,6	R146	Q36	F1	F2	F3	W9	1,4	5	J190	J196	C94,95
1500P	10K	2SC2003	T1.6A	T2.5A	T2A	NO	YES	NO	YES	NO	YES
1000P	10K	2SC2003	T1.6A	NO	T2A	NO	YES	NO	YES	NO	NO
1000P	8.2K	2SD1266	2A	2A	2A	YES	NO	YES	NO	NO	NO

(X14-2422-70)(C/4)

(X14-2422-70)(A/4)

(X14-2422-70)(D/4)

(X85-1160-00)

(X09-275X-XX)(D/5)

(X09-275X-XX)(B/5)

(X13-6140-00)

(X14)(B/4)

(X09-2750-81)(E/5)

(X09-275X-XX)
IC1,2 : M5218P-A
IC3 : TC9163N
IC4 : TC9164N

Q1,2 : 2SC3244
Q3,4 : 2SA1284
Q5,6 : 2SC1845(F,E)
Q7,8 : 2SC4137
Q9,10 : 2SC3854※5
Q11,12 : 2SA1490※5
Q13,14 : 2SC2878(B)
Q21,25,27,33 : 2SD1266
Q22,23,35 : 2SC945(A)(Q,P) or 2SC1740S(Q,R)
Q24,26,34 : 2SA733(A)(Q,P) or 2SA933S(Q,R)
Q30 : 2SC2003(L,K)
Q31 : 2SA733(E,F)
※Q32,36 : REF. TO DESTINATION TABLE
※Q33,37 : 2SD1266

D1~40,70~83 : ISS133 or HSS104
D41,42 : ISS131 or HSS104A
D51 : RBV-602(FA or D5SBA20F03
D52~55,59~62,69,84 : S5566B
D56,57 : RD13ES(B2)
D65 : RD5.6ES(B2) or HZS5.6N(B2)
D68 : RD3.9ES(B2) or HZS3.9N(B2)

Q1~4,9,10,13 : 2SA992(F,E)
Q5~8 : 2SC1845(F,E)
Q11,12 : 2SC945(A)(Q,P) or 2SC1740S(Q,R)
D1,2,5 : ISS133 or HSS104
D3,4 : ISS131 or HSS104A

IC1 : LC4966
Q1,2 : DTC124EN
Q3 : DTA124EN
D1~4 : HSS104 or ISS133
D5 : HSS104 or ISS131

IC1 : CXP5016-320S
IC2 : LB1641
IC3 : NJM4558D or M5218P
IC4 : M5195ISL
Q1,2 : 2SC2320(E,F) or 2SC2003(L,K)
D1~10,23 : ISS133 or HSS104
D11 : B30-1012-05
D12 : RD5.1ES(B2) or HZS5.1N(B2)
D13~20 : B30-0431-05

SIGNAL LINE
GND LINE
+B LINE
-B LINE

(T)TYPE
(X)TYPE
(M,U,UE)TYPE

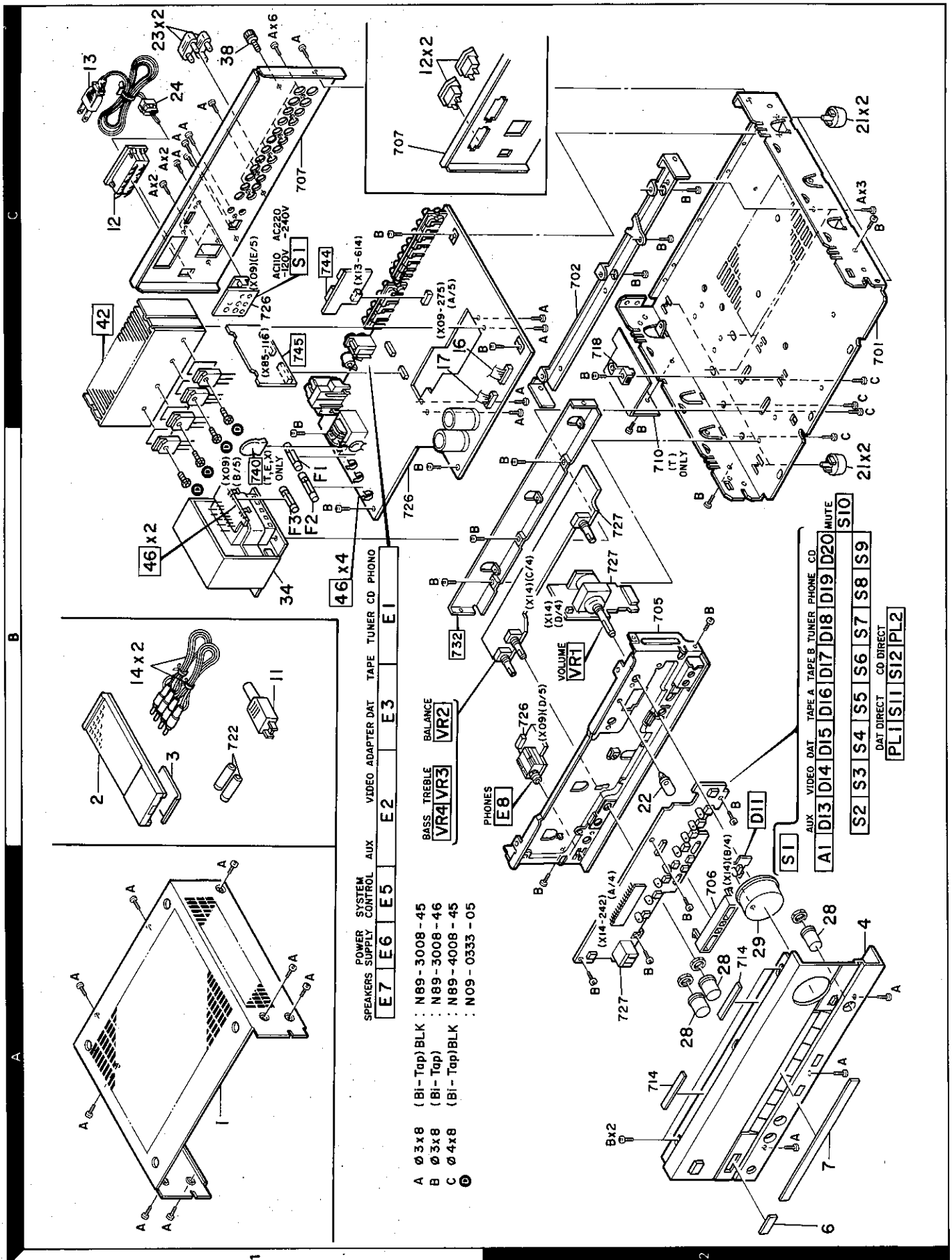
CAUTION : For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably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

DC voltages are as measured with a high impedance voltmeter. during reception of the FM broadcast signal (with a signal strength of 60 dB at the ANT terminal). Values may vary slightly due to variations between individual instruments or/and units.

Les tensions c.c. doivent être measurées avec un voltmètre à haute impédance pendant la réception d'un signal de programme FM (avec une force der signal de 60 dB à la borne ANT). Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser bei Empfang eines UKW-Signals (mit einer Feldstärke von 60 dB am Antennenanschluß) gemessen. Dabei schwanken die Meßwerte aufgrunt von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

EXPLODED VIEW



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 mentionnes 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	Destination 仕向	Remarks 備考
			A-62			
1	1A	*	A01-1684-01	METALLIC CABINET		
1	1A	*	A01-1685-01	METALLIC CABINET		S
2	1B	*	A70-0231-05	REMOTE CONTROLLER ASSY		J
2	1B	*	A70-0248-05	REMOTE CONTROLLER ASSY		S
3	1B		A09-0073-08	BATTERY COVER(REMOTE CONTROL)		J
4	2A	*	A20-5602-02	PANEL ASSY		
6	2A		B03-2473-04	DRESSING PLATE		
7	2A	*	B03-2477-04	DRESSING PLATE		
-			B46-0094-03	WARRANTY CARD	UUE	
-			B46-0095-03	WARRANTY CARD	UUE	
-			B46-0096-13	WARRANTY CARD	X	
-			B46-0122-13	WARRANTY CARD	E	
-			B46-0143-03	WARRANTY CARD	T	
-		*	B50-9094-00	INSTRUCTION MANUAL(ENGLISH)		J
-		*	B50-9095-00	INSTRUCTION MANUAL(FRENCH)	EXM	J
-		*	B50-9096-00	INSTRUCTION MANUAL(SPANISH)	M	J
-		*	B50-9098-00	INSTRUCTION MANUAL(G,D)	E	J
-		*	B50-9305-00	INSTRUCTION MANUAL(ENGLISH)		S
-		*	B50-9306-00	INSTRUCTION MANUAL(FRENCH)	EXM	S
-		*	B50-9307-00	INSTRUCTION MANUAL(SPANISH)	M	S
-		*	B50-9308-00	INSTRUCTION MANUAL(G,D)	E	S
-		*	B52-0274-00	CONNECTING DIAGRAM		J
-		*	B52-0296-00	CONNECTING DIAGRAM		S
-			B58-0223-04	CAUTION CARD (PRE-SET 120V)	U	
-			B58-0513-04	CAUTION CARD (PRESET220-240)	UE	
			B58-0803-13	CAUTION CARD	E	
-			B59-0092-00	SERVICE DIRECTORY	UUE	
⚠ 11	1B		E03-0049-05	AC PLUG	T	
⚠ 12	1C		E03-0055-05	AC OUTLET	E	
⚠ 12	1C		E03-0068-05	AC OUTLET	UUEM	
⚠ 12	1C		E03-0085-05	AC OUTLET	T	
⚠ 13	1C		E30-0459-05	AC POWER CORD	E	
⚠ 13	1C		E30-0812-05	AC POWER CORD	UUEM	
⚠ 13	1C		E30-1341-05	AC POWER CORD	X	
⚠ 13	1C		E30-1416-05	AC POWER CORD	T	
14	1B		E30-1392-05	CORD WITH PLUG		
16	1C,2C	*	E31-4747-05	WIRING HARNESS (13P)		
17	1C,2C	*	E31-4748-05	WIRING HARNESS (14P)		
-		*	H01-7962-04	ITEM CARTON CASE		J
-		*	H01-8358-04	ITEM CARTON CASE		S
-			H10-3708-02	POLYSTYRENE FOAMED FIXTURE(L)		J
-			H10-3709-02	POLYSTYRENE FOAMED FIXTURE(R)		J
-			H10-3735-02	POLYSTYRENE FOAMED FIXTURE		S
-			H10-3736-02	POLYSTYRENE FOAMED FIXTURE		S
-			H25-0181-04	PROTECTION BAG (150X260X0.05)	T	J
-			H25-0224-04	PROTECTION BAG (800X400X0.03)		
-			H25-0232-04	PROTECTION BAG (235X350X0.03)		
21	2C		J02-0366-15	FOOT		
22	2B		J11-0106-05	CLAMPER		J
23	1C		J12-0091-05	PIN		
⚠ 24	1C		J42-0083-05	POWER CORD BUSHING		

E: Scandinavia & Europe K: USA P: Canada J: JAPAN MADE
U: PX(Far East, Hawaii) T: England M: Other Areas S: SINGAPORE MADE
UE: AAFES(Europe) X: Australia

⚠ indicates safety critical components.

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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			Destination 仕向	Remarks 備考
-			J61-0307-05	WIRE BAND				
28	2A		K29-2506-14	KNOB (BASS/TREBLE/BALANCE)				
29	2A		K29-2767-04	KNOB ASSY(VOLUME)				
⚠ 34	1B	*	L01-5462-05	POWER TRANSFORMER			E	
⚠ 34	1B	*	L01-5465-05	POWER TRANSFORMER			UUEM	
⚠ 34	1B	*	L01-5467-05	POWER TRANSFORMER			TX	
38	1C		N08-0128-35	BINDING POST (GND)				
IC1			M50461-057SP	IC(REMOTE CONTROLLER)				
AUDIO UNIT (X09-275X-XX) 0-51: T, X, 0-81: U, UE, M, 2-70: E JAPAN MADE								
(X09-279X-XX) 0-51: T, X, 0-81: U, UE, M, 2-70: E SINGAPORE MADE								
C1 ,2			CE04KW1V100M	ELECTRO	10UF	35WV		
C3 ,4			CC45FSL1H221J	CERAMIC	220PF	J	TXUUEM	
C3 ,4			CC45FSL1H330J	CERAMIC	33PF	J	E	
C5 ,6			CK45FB1H102K	CERAMIC	1000PF	K	TXUUEM	
C5 ,6			CK45FB1H152K	CERAMIC	1500PF	K	E	
C7 ,8			CE04KW1V100M	ELECTRO	10UF	35WV		
C9 ,10			CF92FV1H123J	MF	0.012UF	J		
C11 ,12			CF92FV1H332J	MF	3300PF	J		
C13 ,14			CE04KW1V4R7M	ELECTRO	4.7UF	35WV		
C15 ,16			CK45FB1H471K	CERAMIC	470PF	K		
C17 ,18			CE04KW1HR47M	ELECTRO	0.47UF	50WV		
C19 ,20			CE04KW1V4R7M	ELECTRO	4.7UF	35WV		
C21 -26			CC45FSL1H221J	CERAMIC	220PF	J		
C27 ,28			CC45FSL1H221J	CERAMIC	220PF	J		S
C29 -40			CC45FSL1H221J	CERAMIC	220PF	J		
C41 ,42			CK45FF1H103Z	CERAMIC	0.010UF	Z		
C43 ,44			CF92FV1H222J	MF	2200PF	J		
C45 ,46			CF92FV1H473J	MF	0.047UF	J		
C47 ,48			CK45FB1H102K	CERAMIC	1000PF	K		
C49 ,50			CC45FSL1H101J	CERAMIC	100PF	J		
C51 ,52			CK45FF1H103Z	CERAMIC	0.010UF	Z		
C53 ,54			C90-1588-05	ELECTRO	4700UF	50WV		
C55			CE04KW1E222M	ELECTRO	2200UF	25WV		
C56			CE04KW1E221M	ELECTRO	220UF	25WV		
C57			CE04KW1V100M	ELECTRO	10UF	35WV		
C58			CE04KW1V220M	ELECTRO	22UF	35WV		
C59			CK45FB1H102K	CERAMIC	1000PF	K		
C60			CE04KW1C470M	ELECTRO	47UF	16WV		
C62			CE04KW1C470M	ELECTRO	47UF	16WV		
C64			CE04KW1V220M	ELECTRO	22UF	35WV		
C65			CK45FB1H102K	CERAMIC	1000PF	K		
C66			CE04KW1C470M	ELECTRO	47UF	16WV		
C67			CE04KW1E221M	ELECTRO	220UF	25WV	ETX	
C67			CE04KW1H471M	ELECTRO	470UF	50WV	UUEM	
C70			CE04KW1A101M	ELECTRO	100UF	10WV		
C71 ,72			CK45FF1H103Z	CERAMIC	0.010UF	Z		
C77 ,78			CE04KW1C101M	ELECTRO	100UF	16WV		
C79 -82			CE04KW1C470M	ELECTRO	47UF	16WV		
C83			C90-1351-05	NP-ELEC	3.3UF	50WV		
C84 -86			CK45FF1H103Z	CERAMIC	0.010UF	Z		
C87			CE04KW1H010M	ELECTRO	1.0UF	50WV		
⚠ C88			C91-0023-05	CERAMIC	0.01UF	AC250V	UUEM	
⚠ C88			C91-0647-05	CERAMIC	0.01UF	P	ETX	

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C89			CE04KW1J100M	ELECTRO 10UF 63WV		
C90			CE04KW1C470M	ELECTRO 47UF 16WV		
C91			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C92			CK45FB1H561K	CERAMIC 560PF K		
C93			CK45FB1H102K	CERAMIC 1000PF K	UUEM	
C94 ,95			CK45FB1H561K	CERAMIC 560PF K	E	
C96			CE04KW1A101M	ELECTRO 100UF 10WV		
CN1			E10-1306-05	FLAT CABLE CONNECTOR		
CN2			E10-1413-05	FLAT CABLE CONNECTOR		
E1 ,2			E13-0820-05	PHONO JACK		
E3			E13-0820-05	PHONO JACK		
E5			E11-0188-05	MINIATURE PHONE JACK		
E6			E08-0411-05	RECTANGULAR RECEPTACLE		
E7			E20-0475-05	LOCK TERMINAL BOARD		
E8			E11-0160-05	PHONE JACK (7P)		
42	1C	*	F01-1249-03	HEAT SINK		
⚠ F1	1B		F05-1623-05	FUSE (SEMKO) (250V T1.6A)	ETX	
⚠ F1 -3	1B	*	F04-2026-05	FUSE (250V 2A)	UUEM	
⚠ F2	1B		F05-2525-05	FUSE (SEMKO) (250V T2.5A)	E	
⚠ F3	1B		F06-2021-05	FUSE (SEMKO) (250V T2A)	ETX	
46	1B		J13-0054-05	FUSE CLIP		
L1 ,2			L39-0085-05	PHASE-COMPENSATION COIL		
⚠ T1			L01-7652-05	POWER TRANSFORMER	E	
⚠ T1			L01-7657-05	POWER TRANSFORMER	TX	
⚠ T1			L01-7658-05	POWER TRANSFORMER	UUEM	
D	1B		N09-0333-05	TAPPING SCREW (3X12)		
CP1 ,2			R90-0187-05	MULTI-COMP 0.22X2 K 5W		
R73 -76			RD14AB2E221J	FL-PROOF RD 220 J 1/4W		
R77 -80			RD14AB2E2R2J	FL-PROOF RD 2.2 J 1/4W		
R85 ,86			RS14DB3D100J	FL-PROOF RS 10 J 2W		
R87 ,88			RD14AB2E100J	FL-PROOF RD 10 J 1/4W		
R95 ,96			RS14DB3A561J	FL-PROOF RS 560 J 1W		
R106			RD14AB2E101J	FL-PROOF RD 100 J 1/4W		
R128,129			RD14AB2E470J	FL-PROOF RD 47 J 1/4W		
R136,137			RD14AB2E100J	FL-PROOF RD 10 J 1/4W		
R140			RD14AB2E100J	FL-PROOF RD 10 J 1/4W		
R141			RS14DB3D332J	FL-PROOF RS 3.3K J 2W		
R142			RD14AB2E100J	FL-PROOF RD 10 J 1/4W		
R143			RD14AB2E150J	FL-PROOF RD 15 J 1/4W	UUEM	
VR1 ,2			R12-1083-05	TRIMMING POT.		
⚠ K1			S51-1052-05	MAGNETIC RELAY		
⚠ S1			S31-2128-05	SLIDE SWITCH (POWER TYPE)	UUEM	
D1 -12			HSS104	DIODE		J
D1 -12			1SS133	DIODE		J
D1 -40			HSS104	DIODE		S
D1 -40			1SS133	DIODE		S
D17 -40			HSS104	DIODE		J
D17 -40			1SS133	DIODE		J
D41 ,42			HSS104A	DIODE		
D41 ,42			1SS131	DIODE		
D51			D5SBA20F03	DIODE		
⚠ D51			RBV-602LFA	DIODE		

E: Scandinavia & Europe K: USA P: Canada
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PARTS LIST

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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	Destination 仕向	Remarks 備考
D52 -55			S5566B	DIODE		
D56 ,57			HZS13N(B2)	ZENER DIODE		
D56 ,57			RD13ES(B2)	ZENER DIODE		
D59 -62			S5566B	DIODE		
D65			HZS5.6N(B2)	ZENER DIODE		
D65			RD5.6ES(B2)	ZENER DIODE		
D68			HZS3.9N(B2)	ZENER DIODE		
D68			RD3.9ES(B2)	ZENER DIODE		
D69			S5566B	DIODE		
D70 -83			HSS104	DIODE		
D70 -83			1SS133	DIODE		
D84			S5566B	DIODE		
IC1 ,2			M5218P-A	IC(OP AMP X2)		
IC3			TC9163N	IC(BILATERAL SWITCH X16)		
IC4			TC9164N	IC(16CH BILATERAL SELECTOR SW)		
Q1 ,2			2SC3244	TRANSISTOR		
Q3 ,4			2SA1284	TRANSISTOR		
Q5 ,6			2SC1845(F,E)	TRANSISTOR		
⚠ Q7 ,8			2SC4137	TRANSISTOR		
⚠ Q9 ,10			2SC3854*5	TRANSISTOR		
Q11 ,12			2SA1490*5	TRANSISTOR		
Q13 ,14			2SC2878(B)	TRANSISTOR		
Q21			2SD1266	TRANSISTOR		
Q22 ,23			2SC1740S(Q,R)	TRANSISTOR		
Q22 ,23			2SC945(A)(Q,P)	TRANSISTOR		
Q24			2SA733(A)(Q,P)	TRANSISTOR		
Q24			2SA933S(Q,R)	TRANSISTOR		
Q25			2SD1266	TRANSISTOR		
Q26			2SA733(A)(Q,P)	TRANSISTOR		
Q26			2SA933S(Q,R)	TRANSISTOR		
Q27			2SD1266	TRANSISTOR		
Q31		*	2SA733(E,F)	TRANSISTOR		
Q32			2SA733(A)(Q,P)	TRANSISTOR	UUEM	
Q32			2SA933S(Q,R)	TRANSISTOR	UUEM	
Q32			2SA954(L,K)	TRANSISTOR	ETX	
Q33			2SD1266	TRANSISTOR	UUEM	
Q34			2SA733(A)(Q,P)	TRANSISTOR		
Q34			2SA933S(Q,R)	TRANSISTOR		
Q35			2SC1740S(Q,R)	TRANSISTOR		
Q35			2SC945(A)(Q,P)	TRANSISTOR		
Q36 ,37			2SD1266	TRANSISTOR	UUEM	
Q37			2SD1266	TRANSISTOR	ETX	
SUB-CIRCUIT UNIT (X13-6140-00)						
C1 ,2			CC45FSL1H221J	CERAMIC 220PF J		J
C3			CE04KW1H010M	ELECTRO 1.0UF 50WV		J
D1 -4			HSS104	DIODE		J
D1 -4			1SS133	DIODE		J
D5			HSS104A	DIODE		J
D5			1SS131	DIODE		J
IC1			LC4966	IC(CMOS LOGIC BILATERAL SW)		J
Q1 ,2			DTC124EN	DIGITAL TRANSISTOR		J
Q3			DTA124EN	DIGITAL TRANSISTOR		J

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DISPLAY UNIT (X14-242X-XX) 2-70: JAPAN MADE, 2-71: SINGAPORE MADE						
D11			B30-1012-05	LED(SLP-981C-50)		
D13 -20			B30-0431-05	LED(LN21CPH)		
PL1 ,2			B30-1260-05	LAMP		
C1 ,2			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C3 ,4			CC45FSL1H221J	CERAMIC 220PF J		
C5 ,6			CK45FB1H102K	CERAMIC 1000PF K		
C7 ,8			CE04KW1C470M	ELECTRO 47UF 16WV		
C9 ,10			CK45FB1H102K	CERAMIC 1000PF K		
C11 ,12			CE04KW1H4R7M	ELECTRO 4.7UF 50WV		
C13 -16			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C17 -20			CF92FV1H473J	MF 0.047UF J		
C21 ,22			CE04KW1H100M	ELECTRO 10UF 50WV		
C23 ,24			CK45FF1H103Z	CERAMIC 0.010UF Z		
C25 ,26			CF92FV1H104J	MF 0.10UF J		
C27			C90-1333-05	NP-ELEC 22UF 10WV		
C28			CE04KW1A101M	ELECTRO 100UF 10WV		
C29			CK45FF1H103Z	CERAMIC 0.010UF Z		
C32			CK45FB1H102K	CERAMIC 1000PF K		
CN1			E10-1306-05	FLAT CABLE CONNECTOR		
CN2			E10-1413-05	FLAT CABLE CONNECTOR		
X1			L78-0209-05	RESONATOR (4.194MHZ)		
R25 ,26			RD14GB2E100J	FL-PROOF RD 10 J 1/4W		
VR1			R29-5022-05	POTENTIOMETER (VOLUME)		
VR2			R05-5025-05	POTENTIOMETER (BALANCE)		
VR3 ,4			R10-3038-05	POTENTIOMETER (BASS/TREBLE)		
S1 -12			S40-1064-05	PUSH SWITCH		
D1 -10			HSS104	DIODE		
D1 -10			1SS133	DIODE		
D12			HZS5.1N(B2)	ZENER DIODE		
D12			RD5.1ES(B2)	ZENER DIODE		
D23			HSS104	DIODE		
D23			1SS133	DIODE		
IC1			CXP5016-313S	IC(MICROPROCESSOR)		
IC2			LB1641	IC(MOTOR DRIVER)		
IC3			M5218P	IC(OP AMP X2)		
IC3			NJM4558D	IC(OP AMP X2)		
IC4			M51951ASL	IC(SYSTEM RESET)		
Q1 ,2			2SC2003(L,K)	TRANSISTOR		
Q1 ,2			2SC2320(E,F)	TRANSISTOR		
A1	2B		W02-0910-05	ELECTRIC CIRCUIT MODULE		
POWER AMPLIFIER UNIT (X85-1160-00: JAPAN MADE, X85-1170-00: SINGAPORE MADE)						
C1 ,2			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C3 ,4			CC45FSL1H221J	CERAMIC 220PF J		
C5 ,6			CE04KW1C470M	ELECTRO 47UF 16WV		
C7 ,8			CC45FSL1H680J	CERAMIC 68PF J		
C9 ,10			CC45FSL1H020C	CERAMIC 2.0PF C		
C11 -14			CC45FSL1H680J	CERAMIC 68PF J		
C15 ,16			CC45FSL1H221J	CERAMIC 220PF J		
C17 ,18			CE04KW1H470M	ELECTRO 47UF 50WV		
C19			CE04KW1C470M	ELECTRO 47UF 16WV		

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C20			CE04KW1E330M	ELECTRO 33UF 25WV		
C21			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
R15 ,16			RD14AB2E271J	FL-PROOF RD 270 J 1/4W		
R21 -24			RD14AB2E221J	FL-PROOF RD 220 J 1/4W		
R25 ,26			RD14AB2E470J	FL-PROOF RD 47 J 1/4W		
D1 ,2			HSS104	DIODE		
D1 ,2			1SS133	DIODE		
D3 ,4			HSS104A	DIODE		
D3 ,4			1SS131	DIODE		
D5			HSS104	DIODE		
D5			1SS133	DIODE		
Q1 -4			2SA992(F,E)	TRANSISTOR		
Q5 -8			2SC1845(F,E)	TRANSISTOR		
Q9 ,10			2SA992(F,E)	TRANSISTOR		
Q11 ,12			2SC1740S(Q,R)	TRANSISTOR		
Q11 ,12			2SC945(A)(Q,P)	TRANSISTOR		
Q13			2SA992(F,E)	TRANSISTOR		

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A-62

SPECIFICATIONS

Amplifier (A-62)

Power Output

45 watts per channel minimum RMS, both channels driven, at 8 ohms from 20 Hz to 20,000 Hz with no more than 0.5% total harmonic distortion.

Maximum continuous output power (IEC)
from 60 Hz to 12,500 Hz, 0.7% THD
at 8 ohms ..... 45 W + 45 W
Total Harmonic Distortion
(20 Hz to 20,000 Hz 8 ohms)/
At 1/2 rated output 0.07%
Intermodulation distortion
(60 Hz:7 kHz = 4:1) ..... 0.08% at rated output into 8 ohms
Signal-to-Noise ratio (IHF-A)
PHONO MM (2.5 mV) ..... 70 dB
TUNER, AUX, TAPE PLAY ..... 97 dB
Signal-to-Noise ratio at unweighted, 50 mW output (DIN)
PHONO (MM) ..... 57 dB
TUNER, AUX, TAPE PLAY ..... 58 dB
Tone Control
Bass ..... ±10 dB at 100 Hz
Treble ..... ±10 dB at 10 kHz
Damping Factor ..... 35 at 50 Hz
Channel Separation (DIN) at 1,000 Hz
PHONO (Terminated with 2.2 kΩ) ..... 58 dB
AUX (Terminated with 47 kΩ + 250 pF) ..... 58 dB
Input sensitivity/impedance
PHONO MM ..... 2.5 mV/47 kohms
TUNER, AUX., TAPE PLAY ..... 150 mV/47 kohms

General
Power consumption ..... 110 W
Dimensions ..... W: 360 mm (14-3/16″)
H: 127 mm (5″)
D: 371 mm (14-5/ 8″)
Weight (Net) ..... 6.7 kg (14.74 lb)

Remote control unit (RC-62)

Maximum remote-controllable distance ..... 6 m (on an axis of optical sensor)
Remote control system ..... Infrared control system
Battery for remote control unit ..... Size "AA" (R6) × 2

Note

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on the U.S.A. (K) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

KENWOOD CORPORATION
Shionogi Shibuya Building, 17-5, 2-chome Shibuya, Shibuya-ku, Tokyo 150, Japan

KENWOOD U.S.A. CORPORATION
2201 East Dominguez Street, Long Beach, CA 90810;
550 Clark Drive, Mount Olive, NJ 07828, U.S.A.

KENWOOD ELECTRONICS CANADA INC.
P.O. Box 1075 959 Gana Court, Mississauga, Ontario, Canada L4T 4C2

KENWOOD ELECTRONICS BENELUX N.V.
Mechelsesteenweg 418 B-1930 Zaventem, Belgium

KENWOOD ELECTRONICS DEUTSCHLAND GMBH
Rembrücker-Str. 15, 6056 Heusenstamm, West Germany

TRIO-KENWOOD FRANCE S.A.
Hi-Fi•VIDEO•CAR Hi-Fi
13, Boulevard Ney, 75018 Paris, France

TRIO-KENWOOD U.K. LTD.
17 Bristol Road, The Metropolitan Centre, Greenford, Middx. UB6 8UP England

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.
4E Woodcock Place, Lane Cove, N.S.W. 2066, Australia

KENWOOD & LEE ELECTRONICS, LTD.
Wang Kee Building, 4 th Floor, 34-37, Connaught Road, Central, Hong Kong