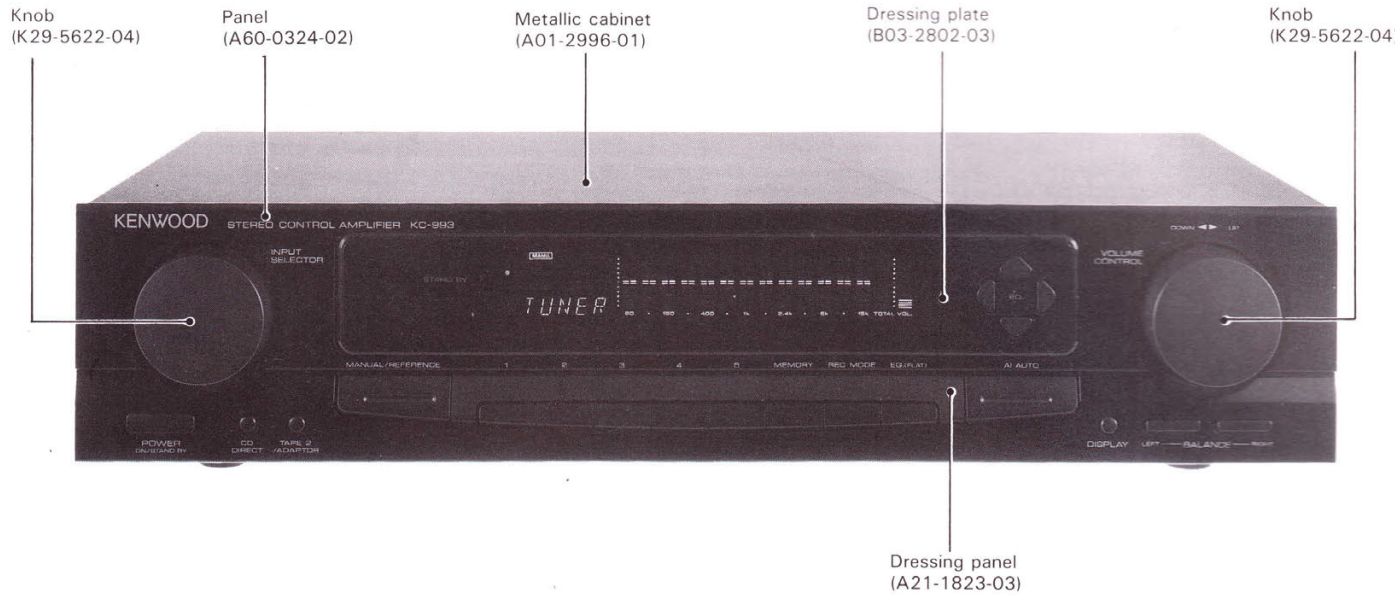
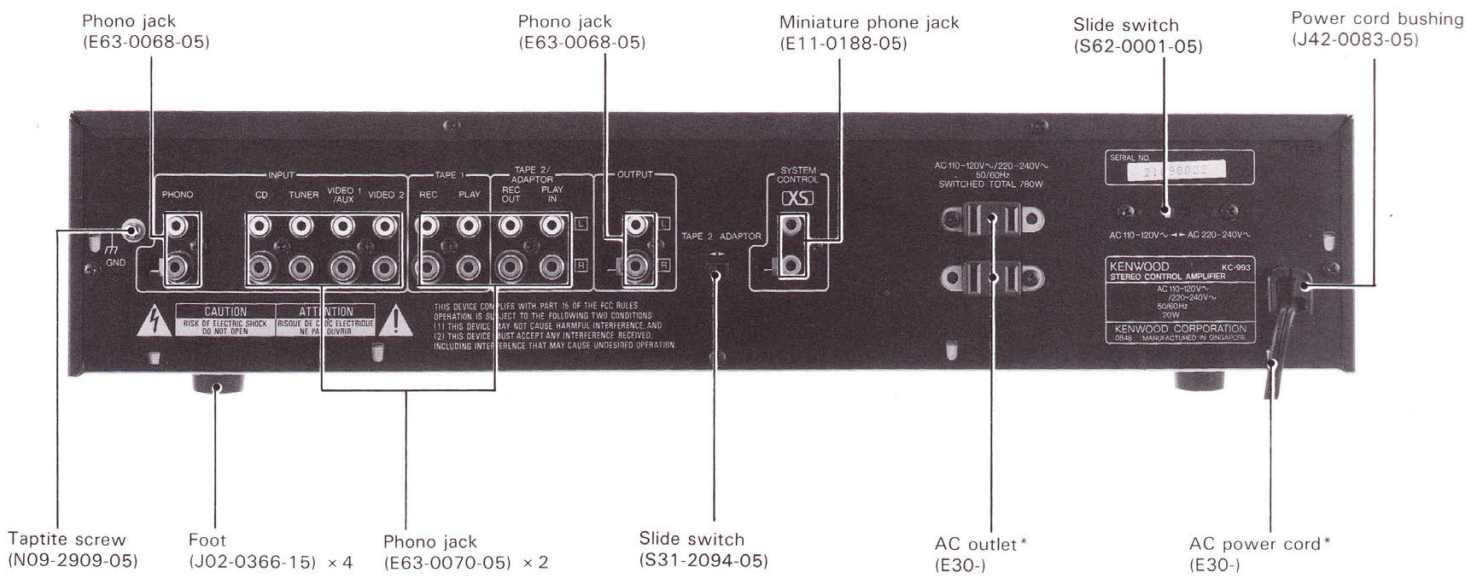
STEREO CONTROL AMPLIFIER

KC-993

SERVICE MANUAL

KENWOOD





* Refer to parts list on page 26.

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ACCESSORIES ..... BACK COVER

NAME AND OPERATION OF CONTROL

REMOTE CONTROL ASSY UNIT : X94-1030-00
BATTERRY COVER : A09-0140-03

LEARN/TRANSMIT indicator
LEARN : Blinks or lights steadily during programming procedure.
TRANSMIT: Lights up while the remote control signal is being transmitted.

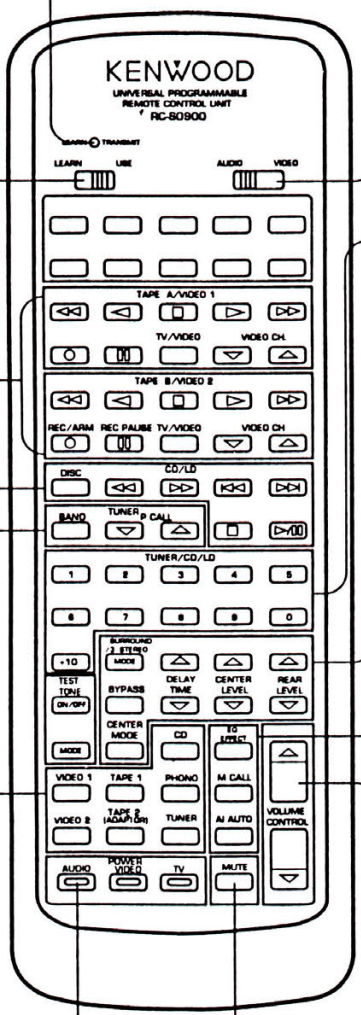
LEARN/USE switch
Normally set to the USE position. Set to the LEARN position when programming remote control signal.

Cassette tape deck/video deck operation keys
The TAPE A and TAPE B keys allow to operate a double cassette tape deck. When using a single cassette tape deck, use the TAPE B keys.
A video deck can also be operated by programming the control signals of a video deck in the VIDEO mode.

CD player keys
Operate the CD player.
DISC: The DISC key can be used the disc selector key of a multi-disc player with a disc changer. For details, read the instruction manual provided with the CD player.

TUNER operation keys
BAND: Switches the bands.
P. CALL: Select the preset stations.

Input selector keys
Switch the input selector on the amplifier.



MODE switch
Selects the mode to be used.

Numeric keys
When the CD source is selected, these keys can be used as the numeric keys of the CD player.
When the TUNER source is selected, they can be used as the numeric keys of the tuner.
How to enter numerals:
For 23, press +10, +10, 3.
For 40, press +10, +10, +10, +10, 0.

Surround processor operation keys
Operate the surround processor SS-992 or SS-592.

Amplifier's equalizer operation keys
AI AUTO: Turns the AI equalizer ON and OFF.
M. CALL: Recalls equalizer patterns stored in memory.

M1 → M2 → M3 → M4 → M5 → R1
R5 ← R4 ← R3 ← R2

EQ EFFECT: Turns the graphic equalizer effect ON and OFF.

VOLUME CONTROL keys
Adjust the volume level of this unit and the surround processor SS-992 or SS-592.

Power key
Turn the power of components ON/OFF.

MUTE key
Press to mute the volume temporarily.

INSTRUCTION MANUAL

B60-1054-00	(ENGLISH)	
B60-1055-00	(FRENCH)	P
B60-1056-00	(SPA , CHI)	M

POLYSTEREN FOAMED FIXTURE

H10-5411-02	R
H10-5412-02	L

CIRCUIT DESCRIPTION

TEST MODE

① **To get in the TEST MODE**

Plug the AC power cord in the wall outlet while pushing the FLAT key.

◇ All indications light up.

② **To cancel the TEST MODE**

Unplug the AC power cord from the wall outlet.

③ **Operation during the TEST MODE**

<1> The TEST MODE starts with all indications lit up and with POWER ON.

◇ The Light up state returns to the normal operation state when any key of the main unit is pushed.

<2> Check of the effectiveness of the keys of the main unit

- Cursor key

  The cursor key is effective at any display mode.

  ◇ Level UP/DOWN operation.

  ◇ Frequency UP/DOWN operation

<3> Check of the circuit operation by means of the keys of the main unit.

- Check of EQ ON/OFF

  Carried out by means of the FLAT key.

  ◇ The EQ circuit is turned ON/OFF repeatedly.

<4> EQ curve DATA

- The following results are obtained when the keys M1 to M3 are pushed.

  ◇ M1 → EQ All bands at center level

  ◇ M2 → EQ All bands at MAX level

  ◇ M3 → EQ All bands at MIN level

<5> FL display mode switching

The display switches successively as shown below when the DISPLAY key is pushed.

◇

→ Inverted spectrum analyzer display →

EQ mode display ← Niagara mode display ←

INITIAL SETTING

① **Initial setting**

- Plug the AC power cord in the wall outlet while pushing the POWER key.

  ◇ All memorys are cleared.

  ◇ The backup operation is returned to the normal operation.

SERIAL TEST MODE

① **To get in the SERIAL TEST MODE**

Enter the TEST ON code (71).

② **To cancel the SERIAL TEST MODE**

Enter the TEST OFF code (70), unplug the AC power cord from the electrical outlet, or RESET the equipment.

◇ The operation returns from the test mode to the normal mode.

③ **Operation during the SERIAL TEST MODE**

- The following functions become ineffective during the test mode.

  ◇ Keys of the main unit, keys of the remote controller, ordinary serial codes.

- The same codes as the received ones are outputted.
- Output of the MUTE signal.

  ◇ The MUTE function does not work during the SERIAL TEST MODE. The operation of the MUTE function is checked with a specific code.

- Codes received during the SERIAL TEST MODE are effective irrespective of the display mode.
- The key entry inhibit state with 16-second duration is not available when the ADAPTER is turned ON/OFF.
- When the initial setting is carried out by means of the initial setting AMP (3F) and the initial setting GE (DF) code.

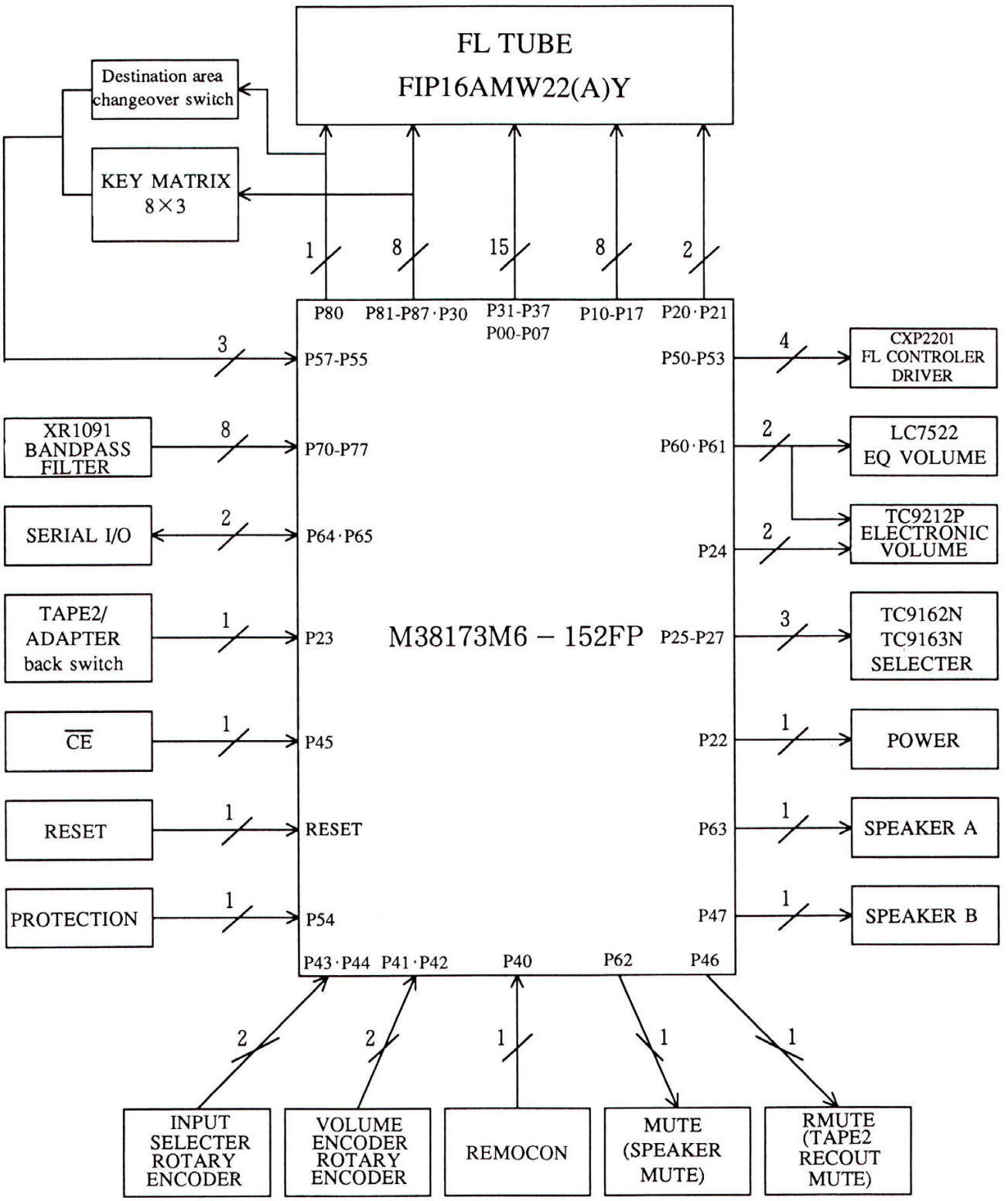
  ◇ SPEAKERS A/B turn OFF in response to software operation.

8 bit SERIAL TEST CODE

TYPE CODE / FUNCTION CODE	AMP				TUNER				SURROUND				GE			
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	POWER OFF	CD DIRECT OFF	SP B OFF		POWER OFF	0	MEMORY	TEST OFF	POWER OFF	REAR MUTE ON	ASFC MAX	ACOUSTIC BGM	POWER OFF			
1	POWER ON	CD DIRECT ON	SP B ON		POWER ON	1	MAIN	TEST ON	POWER ON	MUTE ALL OFF	SEAT POS MIN	CINEMA SCREEN OFF	POWER ON			
2	PHONO	CD REC OFF	HIT MASTER OFF		MUTE OFF	2	SUB		BYPASS	CENTER LEVEL MIN	SEAT POS MID	CINEMA SCREEN 1	MUTE OFF			
3	CD	CD REC ON	HIT MASTER ON		MUTE ON	3	BOTH		DOLBY SUR-ROUND	CENTER LEVEL MID	SEAT POS MAX	CINEMA SCREEN 2	MUTE ON			
4	TUNER	SOURCE DIRECT OFF	MOTOR VOL UP		AUTO STEREO	4			DOLBY 3 STEREO	CENTER LEVEL MAX	WALL MIN	CINEMA SCREEN 3	EQ OFF			
5	TAPE 1 (TAPE A)	SOURCE DIRECT ON	MOTOR VOL DOWN		MONO	5			DSP	REAR LEVEL MIN	WALL MID	CH.MODE 2	EQ ON			
6	TAPE 2 (TAPE B)	LINE STRAIGHT OFF	MOTOR VOL STOP		TUNED OFF	6			DSP LOGIC	REAR LEVEL MID	WALL MAX	CH.MODE 3	M1 (ALL MID)			
7	AUX	LINE STRAIGHT ON	DBS/TV		TUNED ON	7			S.4CH	REAR LEVEL MAX	ROOM SIZE MIN	CH.MODE 4	M2 (ALL MAX)			
8	DAT	LOUD-NESS OFF	VR 0dB		A.R OFF	8			F.4CH	DILAY TIME MIN	ROOM SIZE MID	CH.MODE 5	M3 (ALL MIN)			
9	VIDEO 1 (VIDEO)	LOUD-NESS ON	-20dB		A.R ON	9			CENTER MODE NORMAL	DILAY TIME MID	ROOM SIZE MAX					
A	VIDEO 2	SUB SONIC OFF	-30dB		RF DIRECT	+10			CENTER MODE WIDE	DILAY TIME MAX	STEREO (KARAOKE)					
B	VIDEO 3	SUB SONIC ON	-70dB		RF DISTANCE	BAND FM			CENTER MODE PHANTOM	PRESENCE LEVE (EFECT)MIN	MULTI (KARAOKE)					
C	VDP	S WOOFER OFF	∞		IF WIDE	BAND AM/MW			TEST TONE OFF	PRESENCE LEVE (EFECT)MID	HiFi MULTI (KARAOKE)					
D	MUTE ON	S WOOFER ON	BALANCE L	ALL LIGHT UP ON	IF NORMAL	BAND TV/LW			TEST TONE ON	PRESENCE LEVE (EFECT)MAX	NORMAL (KARAOKE)			ALL LIGHT UP ON		
E	SELMUTE ON	SP OFF (SP A OFF)	BALANCE C	ALL LIGHT UP OFF	IF NARROW	DOWN			FRONT MUTE ON	ASFC MIN	ACOUSTIC NON DIRE 1			ALL LIGHT UP OFF		
F	MUTE ALL OFF	SP ON (SP A ON)	BALANCE R	INITIAL SETTING (AMP)	DIRECT	UP			CENTER MUTE ON	ASFC MID	ACOUSTIC NON DIRE 2	INITAIL SETTING (SURROUND)		INITIAL SETTING (GE)		

CIRCUIT DESCRIPTION

MICROPROCESSOR PERIPHERY BLOCK DIAGRAM



CIRCUIT DESCRIPTION

KEY MATRIX

	KR0	KR1	KR2		
(A1) KSINI	—	KA/$\overline{KC}$	—	P80/SEG0	72
(A2) KS0	POWER	CD DIRECT	TAPE2·ADAPTER ON/OFF	P81/SEG1	71
(A3) KS1	MR3	MR5	MR4	P82/SEG2	70
(A4) KS2	—	SPEAKER B	SPEAKER A	P83/SEG3	69
(A5) KS3	M/R	MR1	MR2	P84/SEG4	68
(A6) KS4	▽L-	▽f-	△L+	P85/SEG5	67
(A7) KS5	△f+	BALANCE L	BALANCE R	P86/SEG6	66
(A8) KS6	AI AUTO	—	DISPLAY	P87/SEG7	65
(A9) KS7	MEMORY	REC MODE	FLAT	P30/SEG8	64
	P55/SOUT2	P56/SCLK2	P57/$\overline{SRDY2}$		
	7	6	5		

DESTINATION AREA CHANGEOVER

The destination area is changed over by outputting the SCAN signal from the KSINI (pin #72) terminal, and by reading the setting of the destination area by means of the KR1 (pin # 56) via diode switch.

KC-993

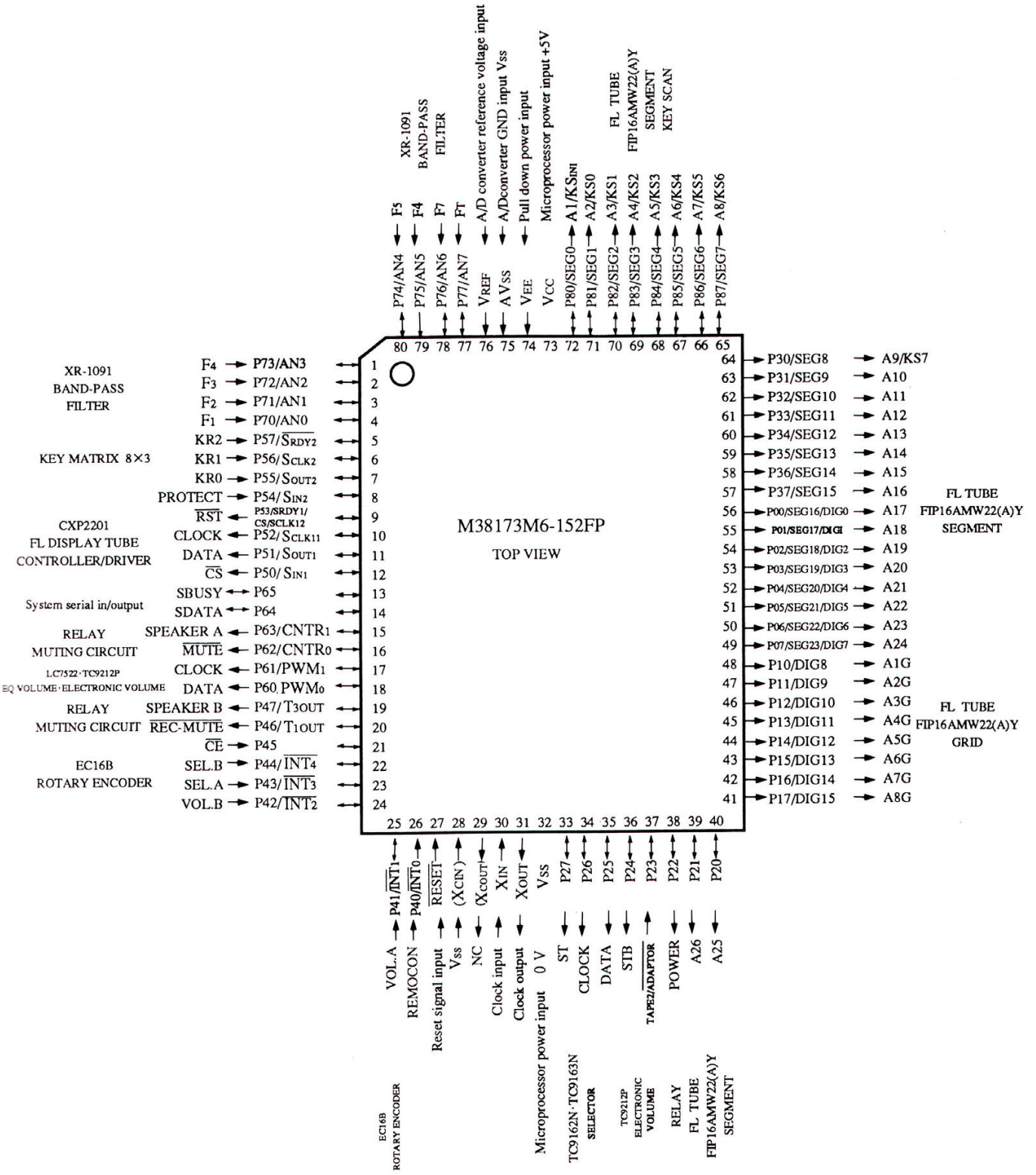
No SPEAKER A/B changeover, POWER INDICATOR indication, INPUT SELECTOR VIDEO2

INPUT SELECTOR VIDEO indication: VIDEO1, VIDEO2

CIRCUIT DESCRIPTION

MICRO PROCESSOR M38173M6-152FP X09 (IC17)

PORT LAYOUT



CIRCUIT DESCRIPTION

Pin description

Pin No.	Pin Name	I/O	Name	Description
1	P73/AN3	I	F_4	1.0kHz Analog signal input (Signal entered directly from filter circuit)
2	P72/AN2	I	F_3	400Hz Analog signal input (Signal entered directly from filter circuit)
3	P71/AN1	I	F_2	150Hz Analog signal input (Signal entered directly from filter circuit)
4	P70/AN0	I	F_1	60 Hz Analog signal input (Signal entered directly from filter circuit)
5	P57/$\overline{SRDY2}$	I	KR2	KEY RETURN Signal input — H: on, L: off
6	P56/S_{CLK2}	I	KR1	KEY RETURN Signal input — H: on, L: off
7	P55/S_{OUT2}	I	KR0	KEY RETURN Signal input — H: on, L: off
8	P54/S_{IN2}	I	PROTECT	PROTECTION control signal input — H: on, L: off
9	P53/$\overline{SRDY1}$/ $\overline{CS}$/S_{CLK12}	O	$\overline{RST}$	Output of $\overline{RST}$ signal for control of FL tube CONTROLLER/DRIVER CXP2301
10	P52/S_{CLK11}	O	CLOCK	Output of CLOCK signal for control of FL tube CONTROLLER/DRIVER CXP2301
11	P51/S_{OUT1}	O	DATA	Output of DATA signal for control of FL tube CONTROLLER/DRIVER CXP2301
12	P50/S_{IN1}	O	$\overline{CS}$	Output of $\overline{CS}$ signal for control of FL tube CONTROLLER/DRIVER CXP2301
13	P65	I/O	SBUSY	System serial BUSY signal input/output
14	P64	I/O	SDATA	System serial DATA signal input/output
15	P63/$CNTR_1$	O	SPEAKER A	SPEAKER A RELAY Control signal output — H: on, L: off
16	P62/$CNTR_0$	O	$\overline{MUTE}$	MUTING circuit control signal output — H: on, L: off
17	P61/PWM_1	O	CLOCK	Output of CLOCK signal for control of graphic equalizer electronic VR LC7522 Output of CLOCK signal for control of AMP MAIN electronic VOLUME PC9212P
18	P60/PWM_0	O	DATA	Output of DATA signal for control of graphic equalizer electronic VR LC7522 Output of DATA signal for control of AMP MAIN electronic VOLUME PC9212P
19	P47/T_{3OUT}	O	SPEAKER B	SPEAKER B RELAY control signal output — H: on, L: off
20	P46/T_{1OUT}	O	$\overline{REC\text{-}MUTE}$	TAPE2 REC-MUTE circuit control signal output — H: on, L: off
21	P45	I	$\overline{CE}$	BACK UP detection — H: others, L: backing up
22	P44/$\overline{INT_4}$	I	SELECTOR B	Input of ROTARY ENCODER EC16B PHASE B signal for INPUT SELECTOR
23	P43/$\overline{INT_3}$	I	SELECTOR A	Input of ROTARY ENCODER EC16B PHASE A signal for INPUT SELECTOR
24	P42/$\overline{INT_2}$	I	VOLUME B	Input of ROTARY ENCODER BC16B PHASE B signal for VOLUME
25	P41/$\overline{INT_1}$	I	VOLUME B	Input of ROTARY ENCODER EC16B PHASE B signal for VOLUME
26	P40/$\overline{INT_0}$	I	REMOCON	REMOTE CONTROLLER signal input
27	$\overline{RESET}$	I	$\overline{RESET}$	RESET signal detection — H: others, L: reset
28	X_{CIN}	I	V_{SS}	Unused (Clock input terminal)
29	X_{COUT}	O	NC	Unused (Clock output terminal)
30	X_{IN}	I	X_{IN}	System clock input (6.3 MHz clock)

CIRCUIT DESCRIPTION

Pin description

Pin No.	Pin Name	I/O	Name	Description
31	X_{OUT}	O	X_{OUT}	System clock ouptut (63 MHz clock)
32	V_{SS}			GND
33	P27	O	ST	Output of STROBE signal for control of SELECTOR TC9162N·TC9163N
34	P26	O	CLOCK	Output of CLOCK signal for control of SELECTOR TC9126N·TC9163N
35	P25	O	DATA	Ouptut of DATA signal for control of SELECTOR TC9126N·TC9163N
36	P24	O	STB	Ouptut of STROBE signal for control of AMP MAIN electronic VOLUME TC9212P
37	P23	I	TAPE2/$\overline{\text{ADAPTOR}}$	Detection of rear side TAPE2/$\overline{\text{ADAPTER}}$ SW H: TAPE2 L: ADAPTOR
38	P22	O	POWER	POWER RELAY control signal output H: on L: off
39	P21	O	A26	FL tube segment A26 (pin #76) driving signal output H: on L: off
40	P20	O	A25	FL tube segment A25 (pin #75) driving signal output H: on L: off
41	P17/DIG15	O	A8G	FL tube grid A8G (pin #72) driving signal output H: on L: off
42	P16/DIG14	O	A7G	FL tube grid A7G (pin #71) driving signal output H: on L: off
43	P15/DIG13	O	A6G	FL tube grid A6G (pin #70) driving signal output H: on L: off
44	P14/DIG12	O	A5G	FL tube grid A5G (pin #69) driving signal output H: on L: off
45	P13/DIG11	O	A4G	FL tube grid A4G (pin #68) driving signal output H: on L: off
46	P12/DIG10	O	A3G	FL tube grid A3G (pin #67) driving signal output H: on L: off
47	P11/DIG9	O	A2G	FL tube grid A2G (pin #66) driving signal output H: on L: off
48	P10/DIG8	O	A1G	FL tube grid A1G (pin #65) driving signal output H: on L: off
49	P07/ SEG23/DIG7	O	A24	FL tube grid A24 (pin #62) driving signal output H: on L: off
50	P06/ SEG22/DIG7	O	A23	FL tube grid A23 (pin #61) driving signal output H: on L: off
51	P05/ SEG21/DIG5	O	A22	FL tube grid A22 (pin #60) driving signal output H: on L: off
52	P04/ SEG20/DIG4	O	A21	FL tube grid A21 (pin #59) driving signal output H: on L: off
53	P03/ SEG19/DIG3	O	A20	FL tube grid A20 (pin #58) driving signal output H: on L: off
54	P02/ SEG18/DIG2	O	A19	FL tube grid A19 (pin #57) driving signal output H: on L: off
55	P01/ SEG17/DIG1	O	A18	FL tube grid A18 (pin #56) driving signal output H: on L: off
56	P00/ SEG16/DIG0	O	A17	FL tube grid A17 (pin #55) driving signal output H: on L: off

CIRCUIT DESCRIPTION

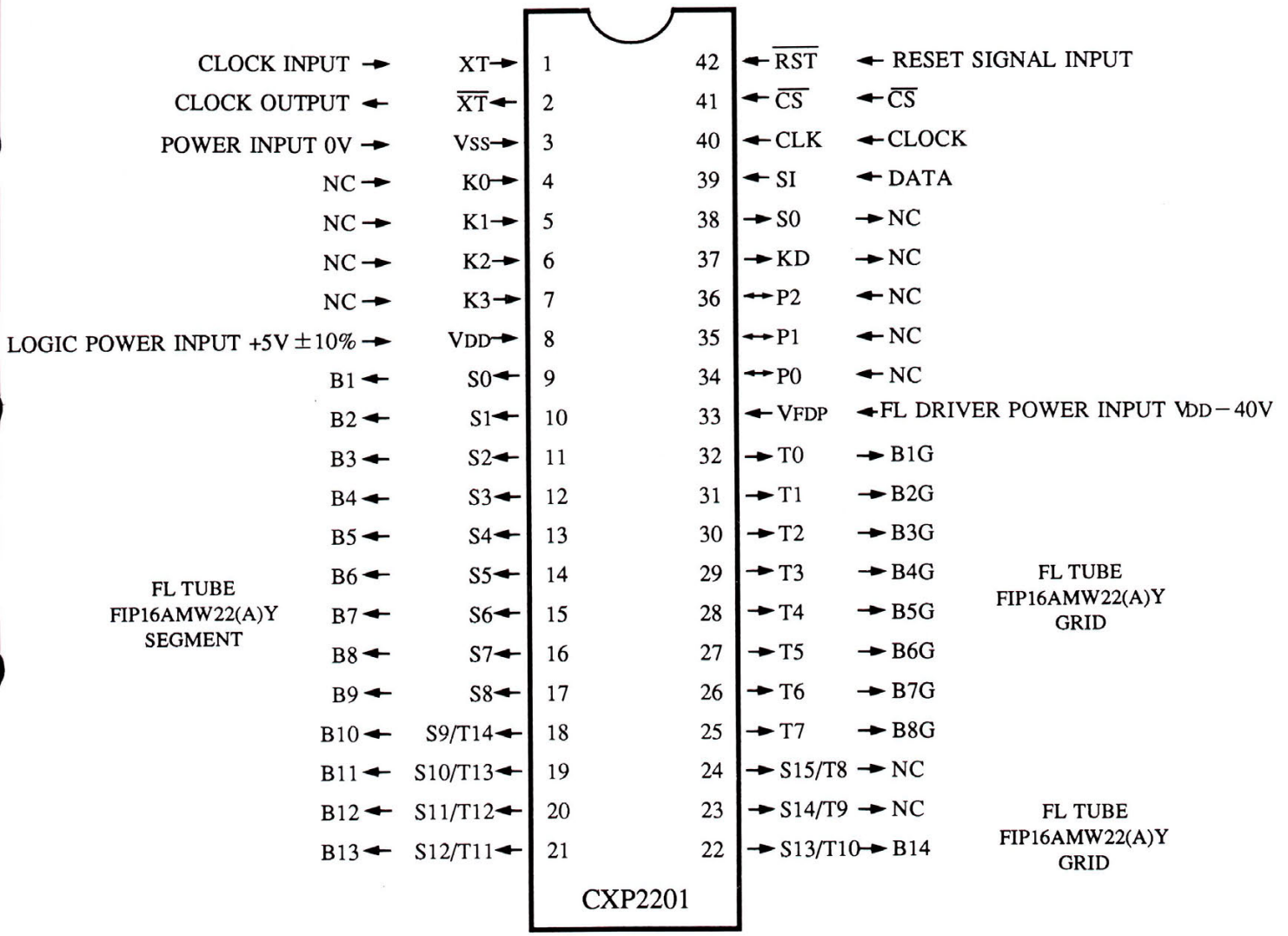
Pin description

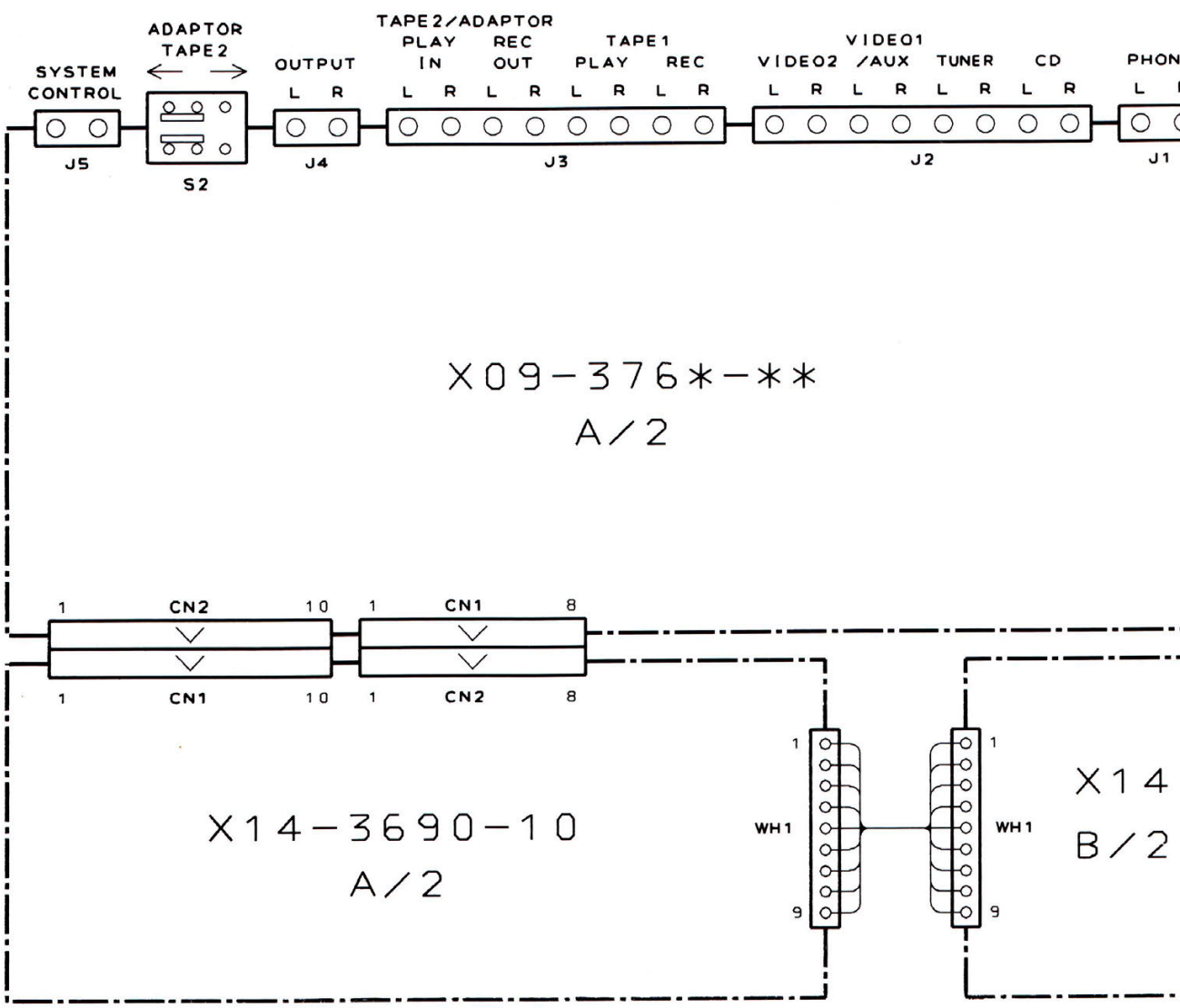
Pin No.	Pin Name	I/O	Name	Description
57	P37/ SEG15	O	A16	FL tube grid A16 (pin #54) driving signal output H: on L: off
58	P36/SEG14	O	A15	FL tube grid A15 (pin #53) driving signal output H: on L: off
59	P35/SEG13	O	A14	FL tube grid A14 (pin #52) driving signal output H: on L: off
60	P34/SEG12	O	A13	FL tube grid A13 (pin #51) driving signal output H: on L: off
61	P33/SEG11	O	A12	FL tube grid A12 (pin #50) driving signal output H: on L: off
62	P32/SEG10	O	A11	FL tube grid A11 (pin #49) driving signal output H: on L: off
63	P31/SEG9	O	A10	FL tube grid A10 (pin #48) driving signal output H: on L: off
64	P30/SEG8	O	A9/KS7	FL tube grid A09 (pin #47) driving signal output H: on L: off KEY SCAN 7 signal out put
65	P87/SEG7	O	A8/KS6	FL tube grid A08 (pin #46) driving signal output H: on L: off KEY SCAN 6 signal out put
66	P86/SEG6	O	A7/KS5	FL tube grid A07 (pin #45) driving signal output H: on L: off KEY SCAN 5 signal out put
67	P85/SEG5	O	A6/KS4	FL tube grid A06 (pin #44) driving signal output H: on L: off KEY SCAN 4 signal out put
68	P84/SEG4	O	A5/KS3	FL tube grid A05 (pin #43) driving signal output H: on L: off KEY SCAN 3 signal out put
69	P83/SEG3	O	A4/KS2	FL tube grid A04 (pin #42) driving signal output H: on L: off KEY SCAN 2 signal out put
70	P82/SEG2	O	A3/KS1	FL tube grid A03 (pin #41) driving signal output H: on L: off KEY SCAN 1 signal out put
71	P81/SEG1	O	A2/KS0	FL tube grid A02 (pin #40) driving signal output H: on L: off KEY SCAN 0 signal out put
72	P80/SEG0	O	A1/KS$_{INI}$	FL tube grid A01 (pin #39) driving signal output H: on L: off KEY SCAN INI signal out put
73	V_{CC}	I	V_{CC}	Microprocessor power input +5 V ±10%
74	V_{EE}	I	V_{EE}	PULL DOWN power input −30V
75	AV_{SS}	I	AV_{SS}	A/D converter GND input V_{SS}
76	V_{REF}	I	V_{REF}	A/D converter reference voltage input +5V
77	P77/AN7	I	F_T	TOTAL analog signal input (Signal entered directly from filter circuit)
78	P76/AN6	I	F_7	15 kHz analog signal input (Signal entered directly from filter circuit)
79	P75/AN5	I	F_6	6.0 kHz analog signal input (Signal entered directly from filter circuit)
80	P74/AN4	I	F_5	2.4 kHz analog signal input (Signal entered directly from filter circuit)

CIRCUIT DESCRIPTION

I/O PROCESSOR (FL DRIVER) CXP2201 X09(IC18)

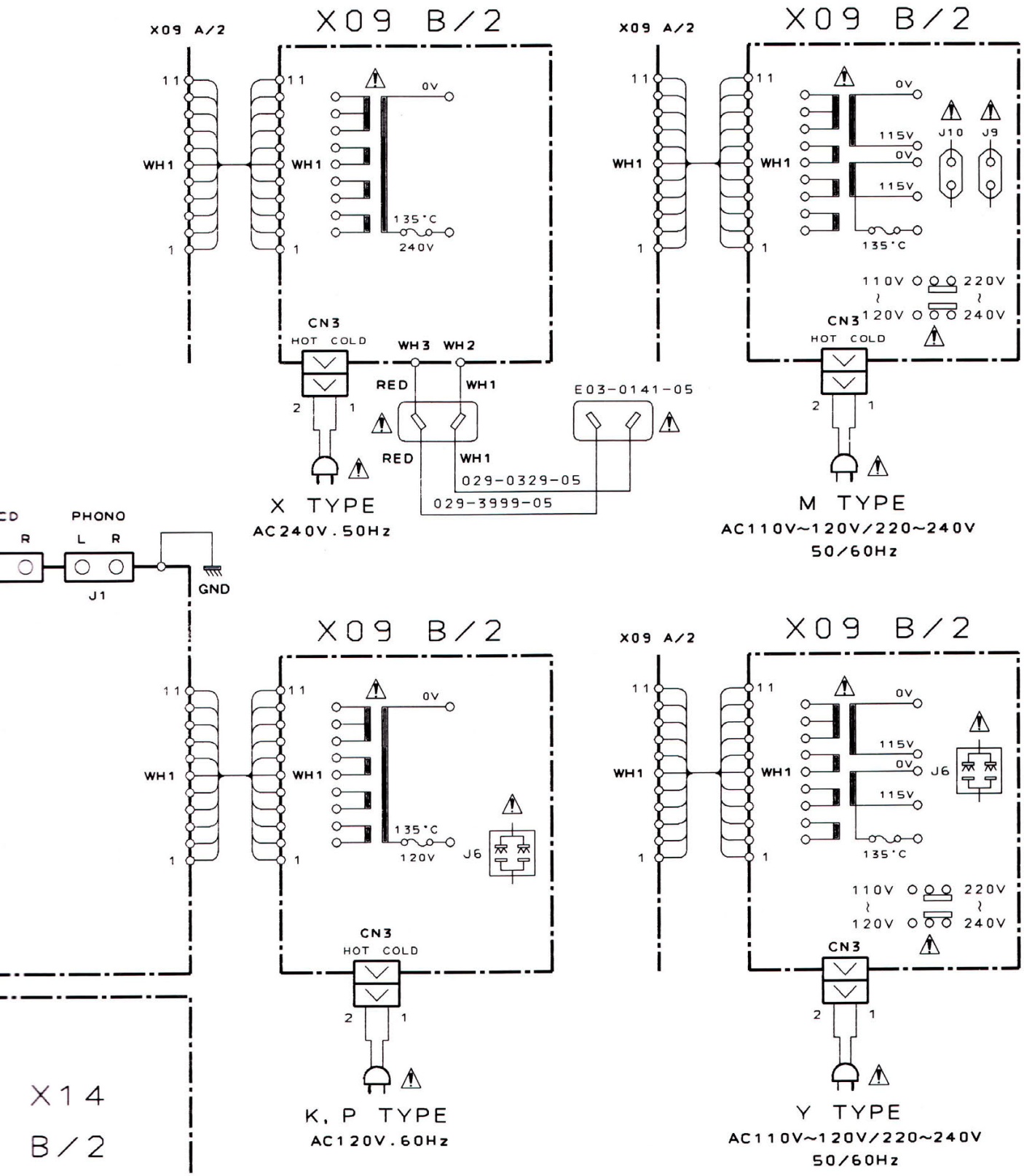
PIN LAYOUT




SYSTEM CONTROL
ADAPTOR TAPE2
OUTPUT
L R
TAPE2/ADAPTOR
PLAY IN
REC OUT
TAPE1
PLAY
REC
VIDEO1
VIDEO2
/AUX
TUNER
CD
PHON
L R L R L R L R L R L R L R L R L R L R
J5
S2
J4
J3
J2
J1
X09-376*-**
A/2
1 CN2 10
1 CN1 8
1 CN1 10
1 CN2 8
X14-3690-10
A/2
WH1
WH1
1
9
1
9
X14
B/2

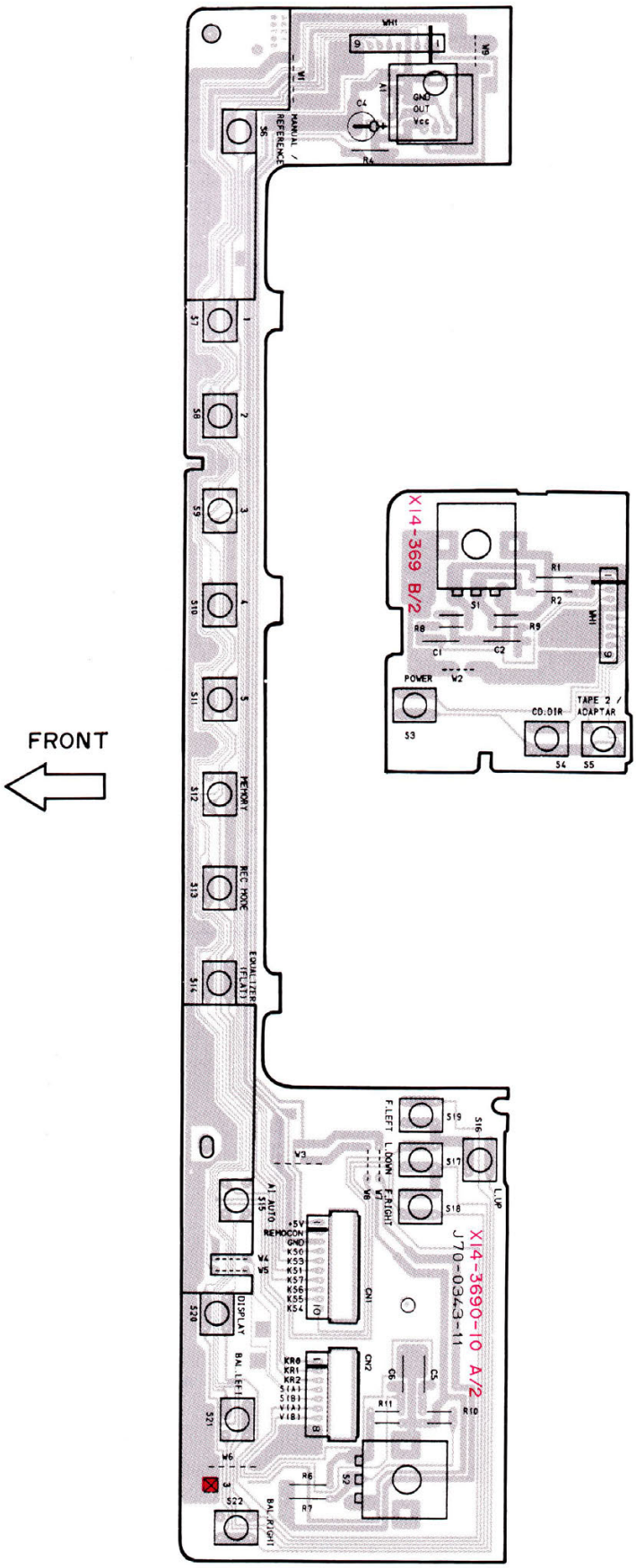
93 KC-993

TIRING DIAGRAM

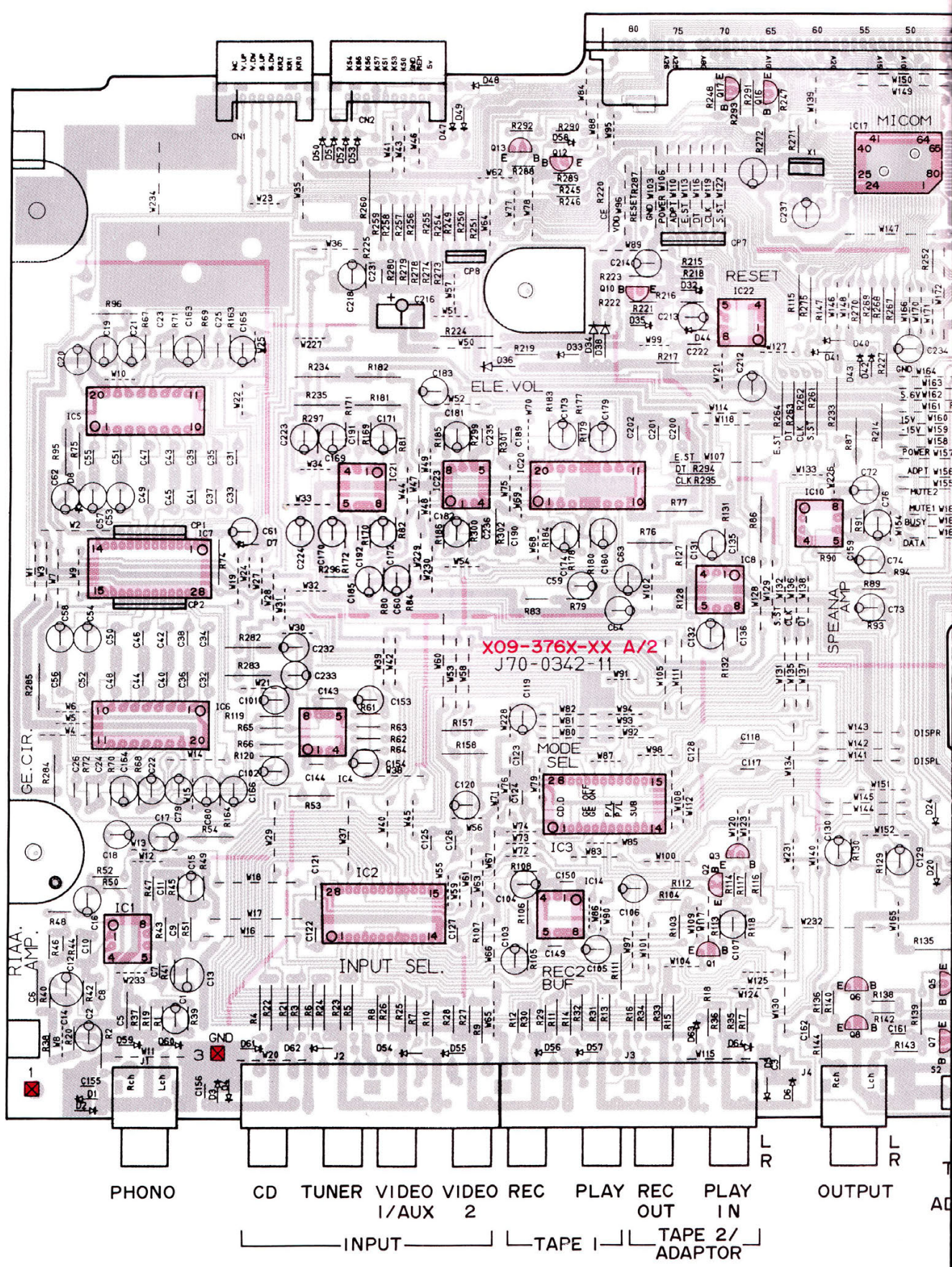


PC BOARD (Component side view)

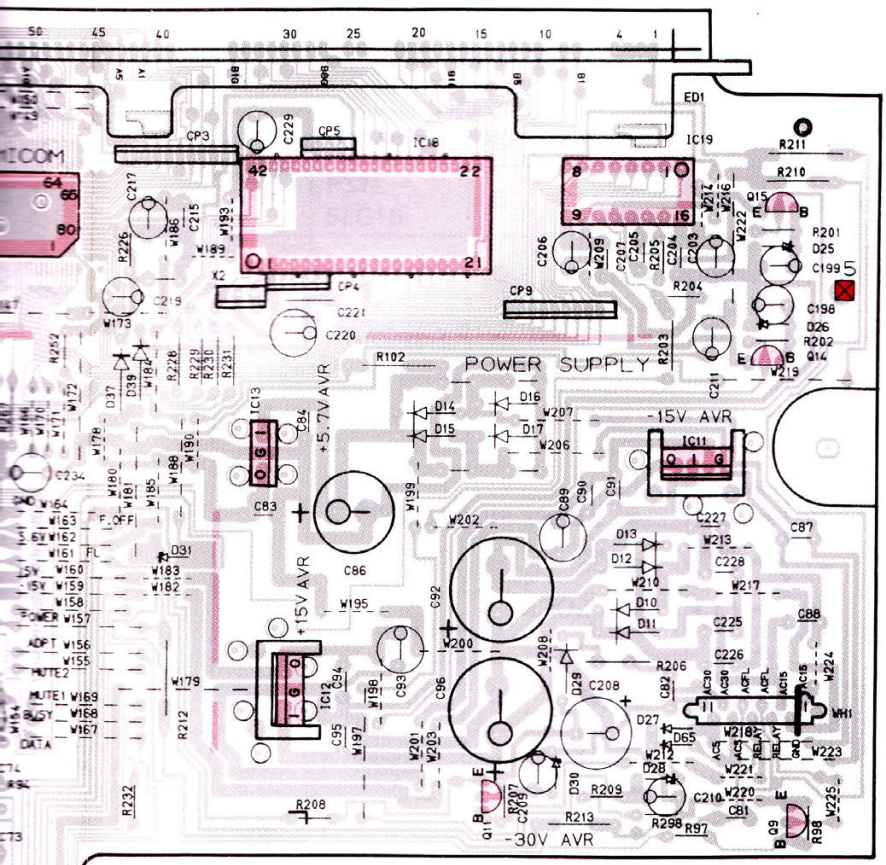
DISPLAY UNIT (X14-3690-10)



AUDIO UNIT (X09-3760-10:K, P, KW, PW, 0-21:M, 0-71:X, 2-91:Y)



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

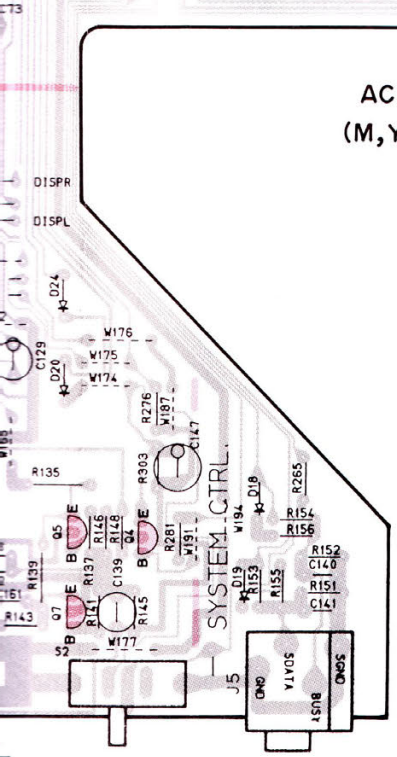


AC OUTLET

AC110-120V~/220-240V~ (K,P,Y TYPE)
50/60Hz
SWITCHED
TOTAL 780W

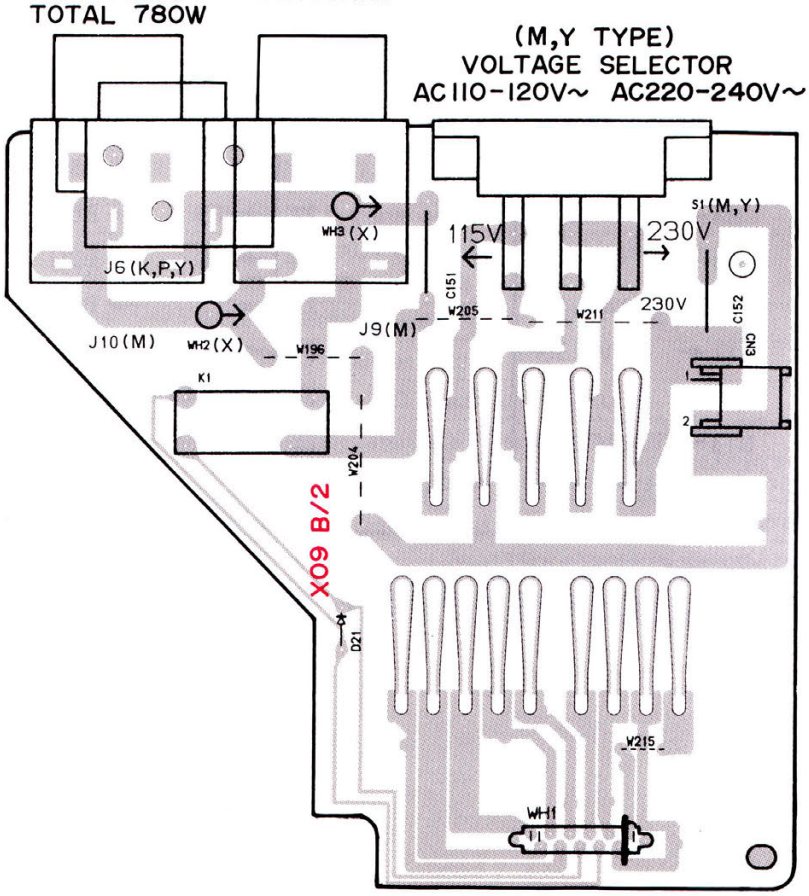
(M,Y TYPE)
AC120V 60Hz
SWITCHED

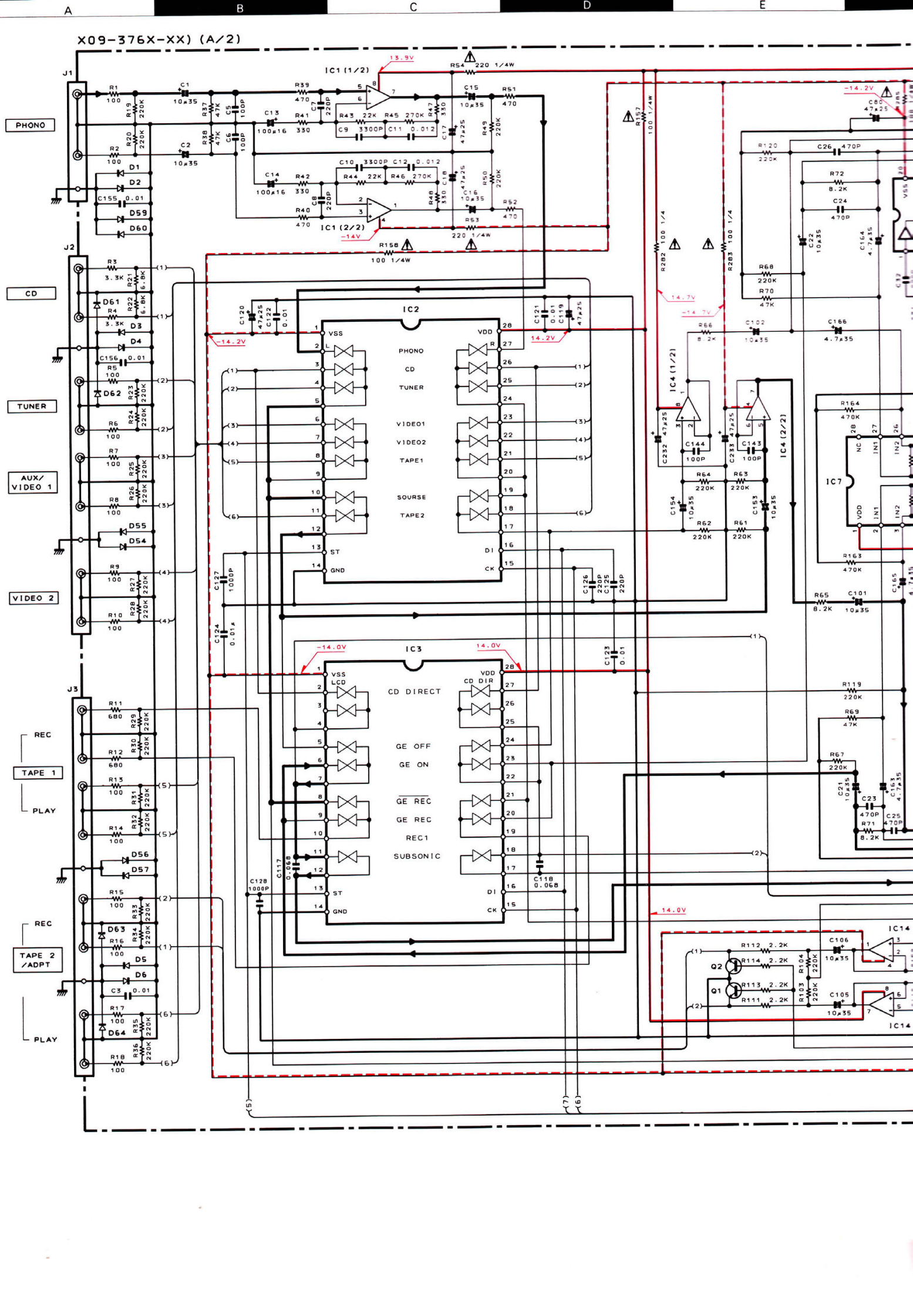
(M,Y TYPE)
VOLTAGE SELECTOR
AC110-120V~ AC220-240V~



TAPE 2
◄►
ADAPTOR

SYSTM
CONTROL




X09-376X-XX) (A/2)
PHONO
CD
TUNER
AUX/ VIDEO 1
VIDEO 2
TAPE 1
PLAY
REC
TAPE 2 /ADPT
IC1 (1/2)
IC1 (2/2)
IC2
IC3
IC4 (1/2)
IC4 (2/2)
IC7
IC14
PHONO
CD
TUNER
VIDEO1
VIDEO2
TAPE1
SOURSE
TAPE2
CD DIRECT
GE OFF
GE ON
GE REC
REC1
SUBSONIC
VSS
VDD
ST
GND
DI
CK
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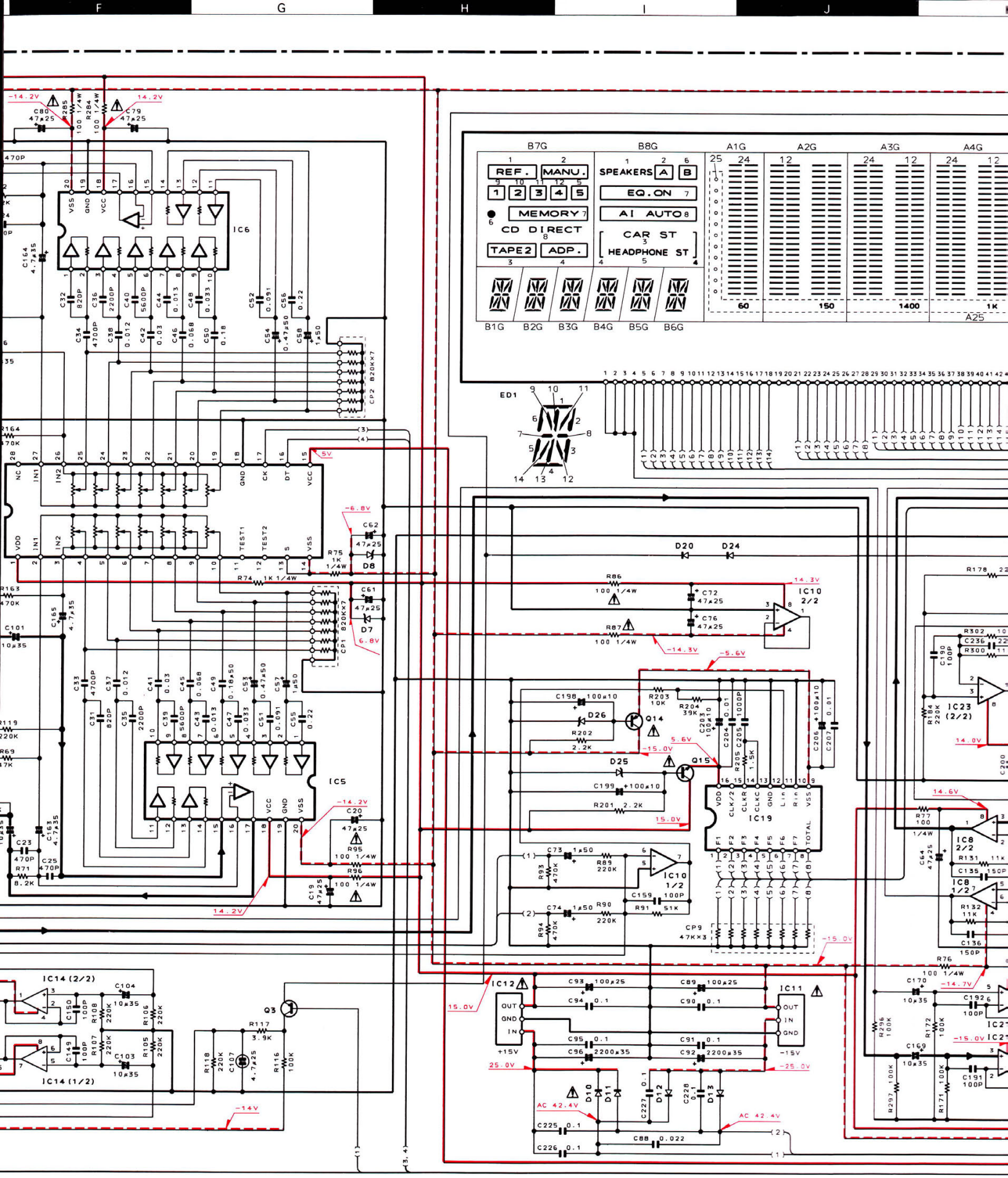
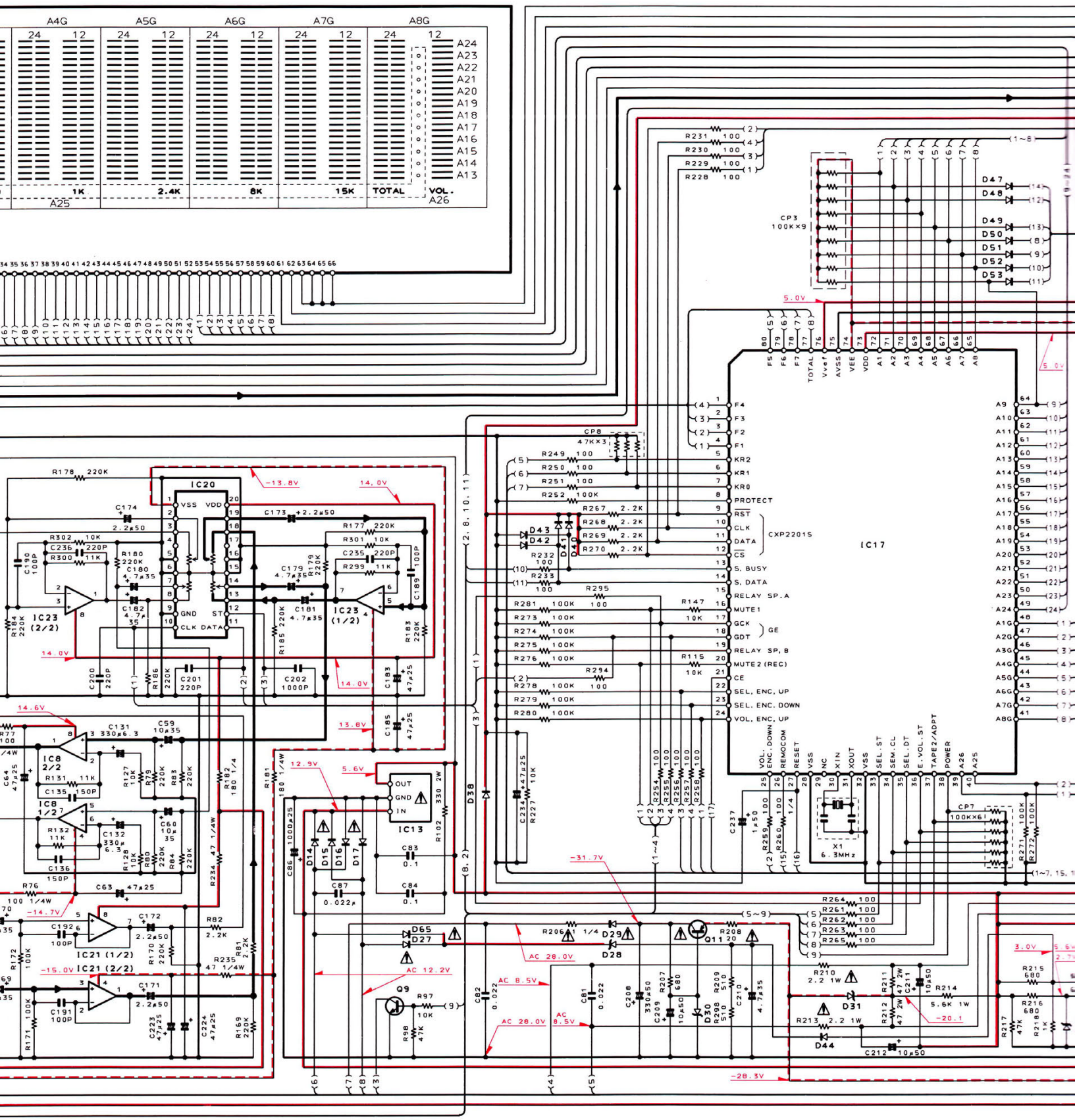
-14V
-14.2V
14.2V
14.7V
-14.7V
-14.0V
14.0V



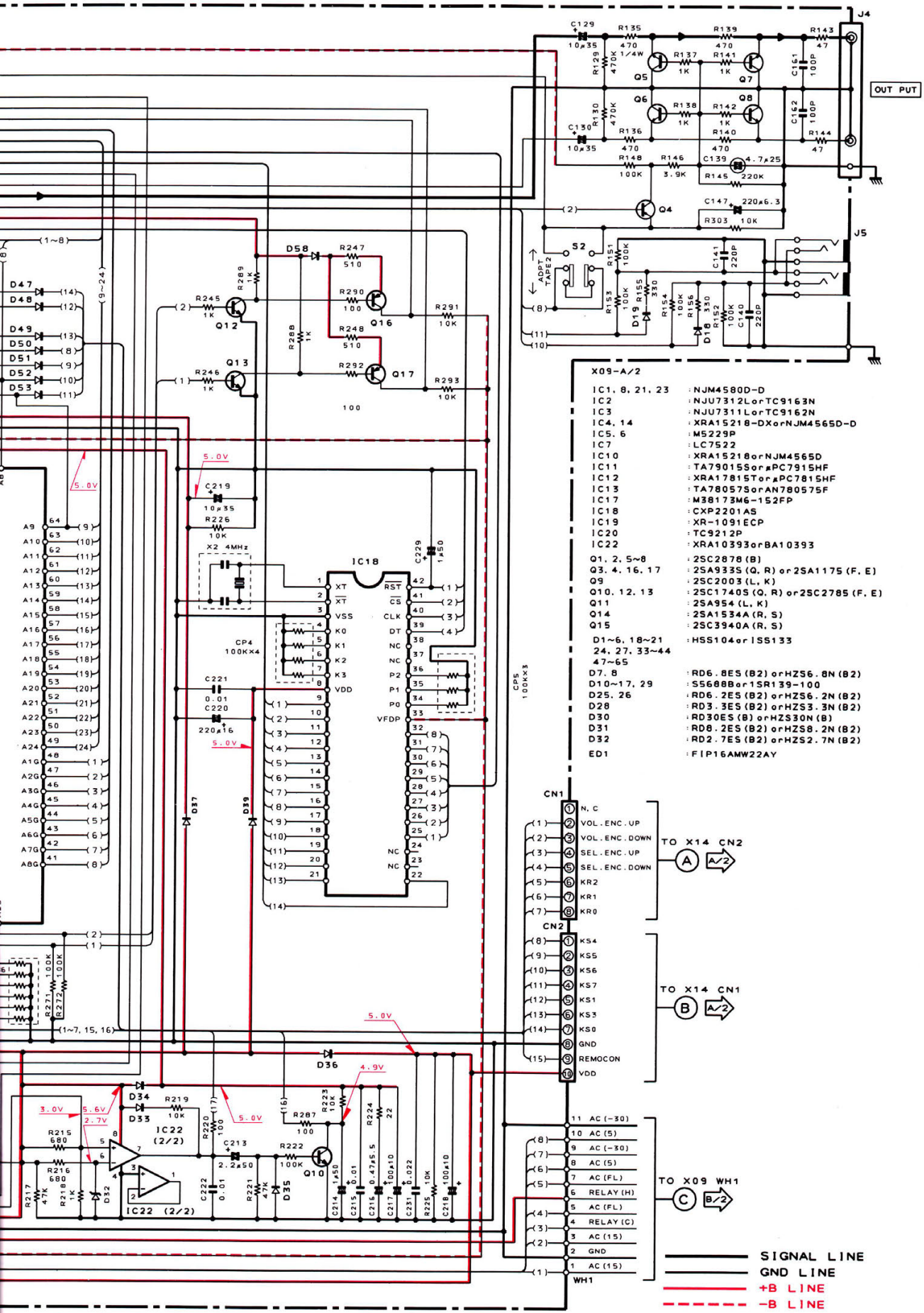
DC volta
ter with
tions be



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.

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 wurd hochohmigen Spannungsmesser ohne E gemessen. Dabei schwanken die Meßwerte auf terschieden zwischen einzelnen Instrumenten o U. geringfügig.



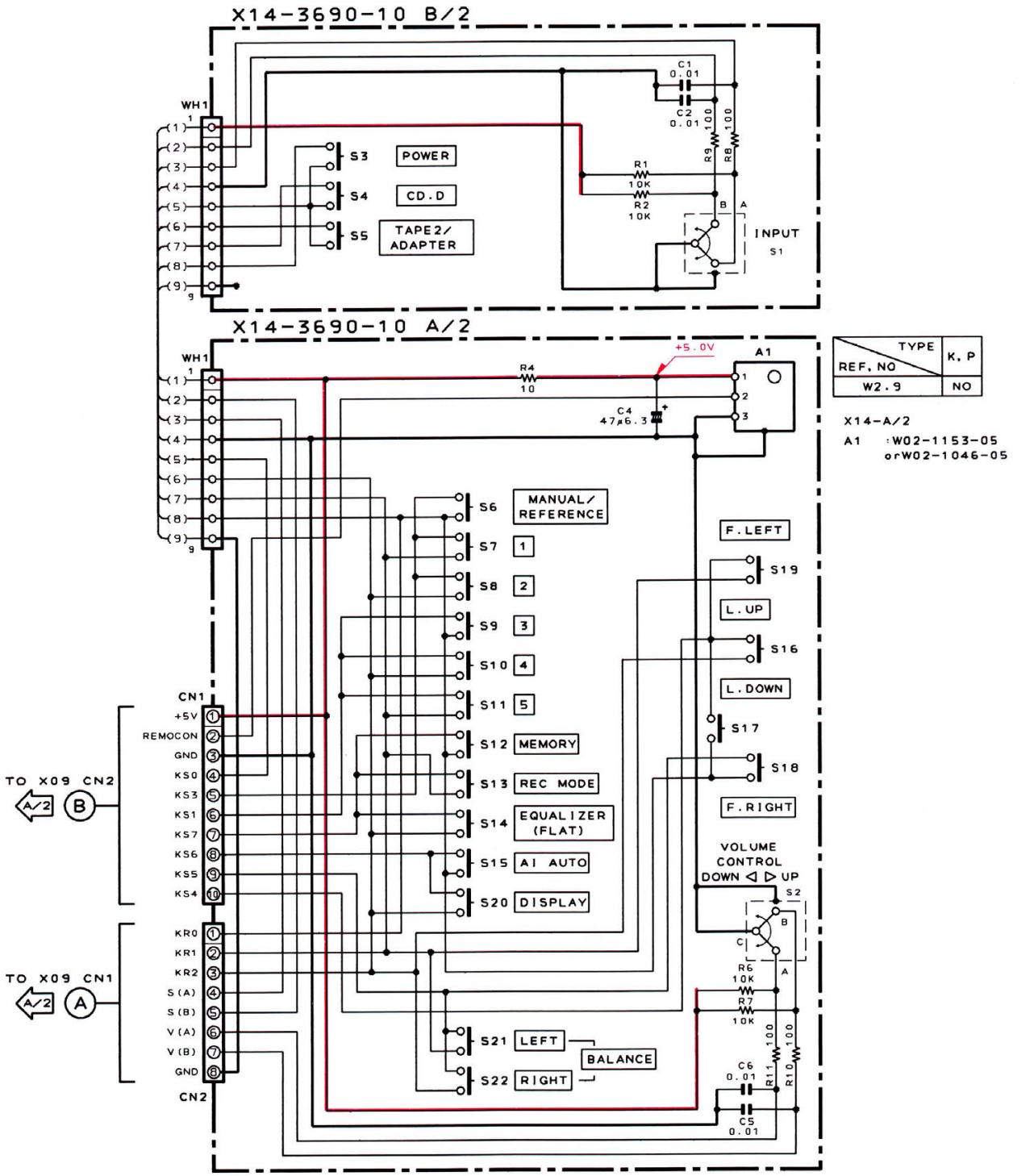
ungswerte wurden mit einem esser ohne Eingangssignal ie Meßwerte aufgrund von Un- n Instrumenten oder Geräten u.

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.

Y08-4750-10

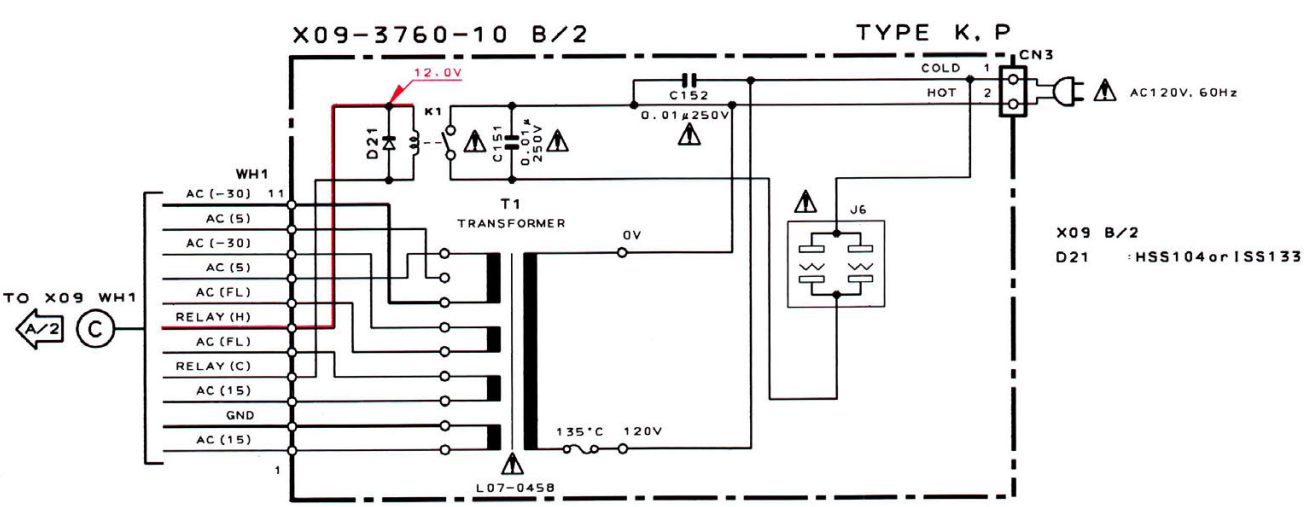
KC-9

KENWO

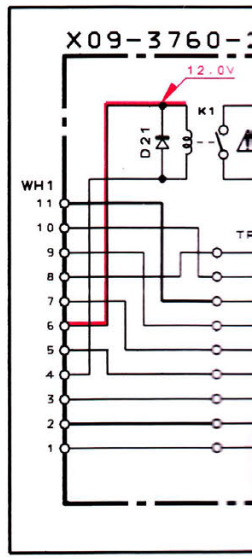


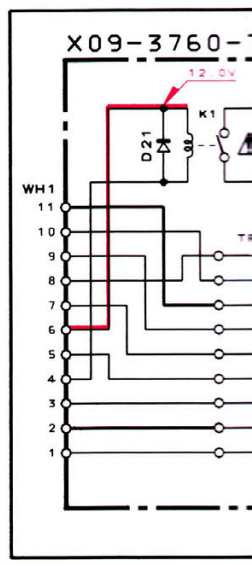
REF. NO \ TYPE	K, P
W2.9	NO

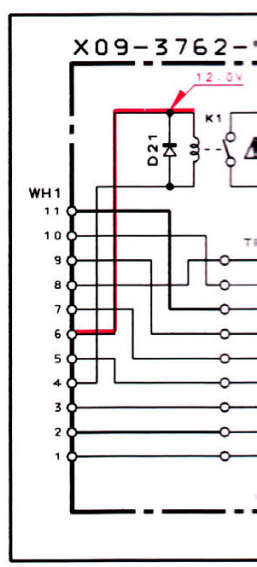
X14-A/2
A1 :W02-1153-05 orW02-1046-05

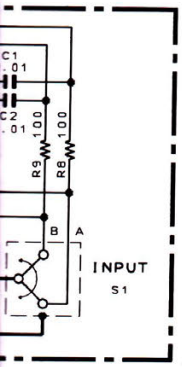


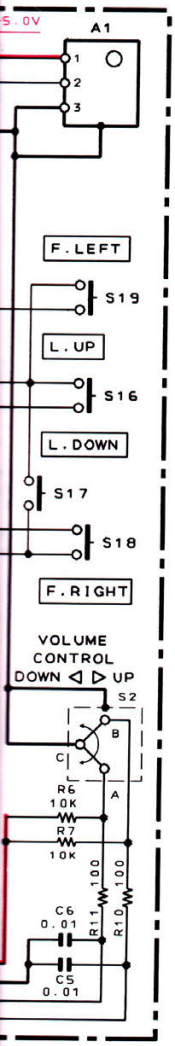
X09 B/2
D21 :HSS104 or ISS133







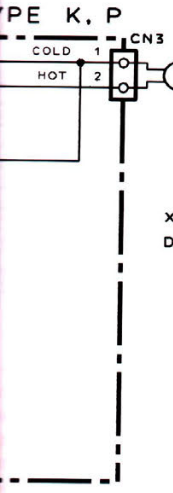




TYPE / REF, NO	K, P
W2.9	NO

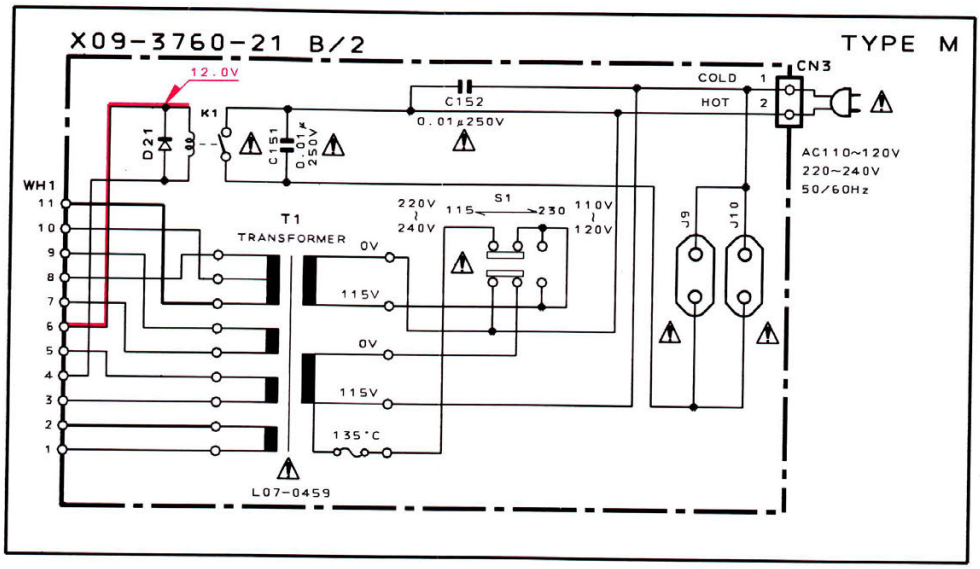
X14-A/2

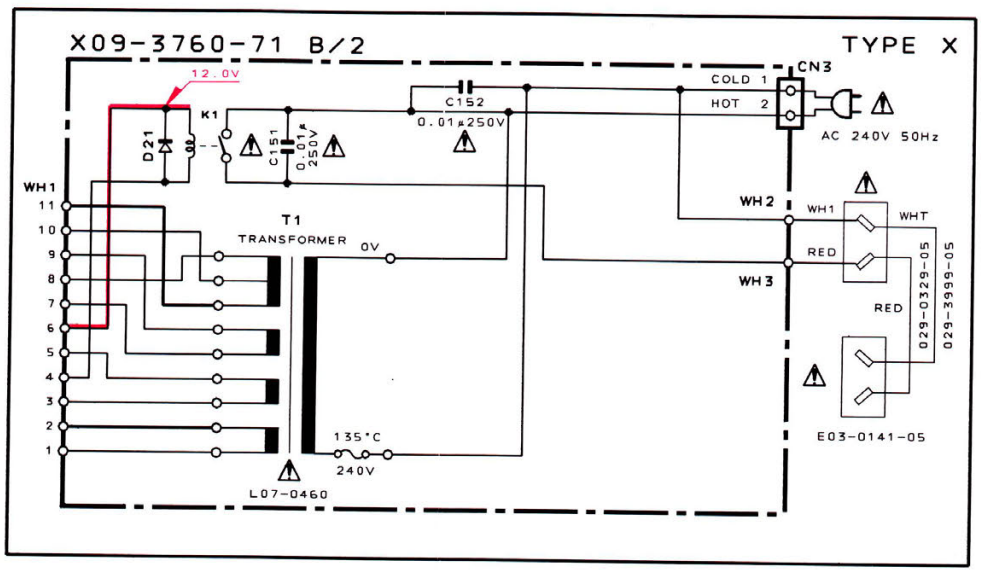
A1 :W02-1153-05
orW02-1046-05

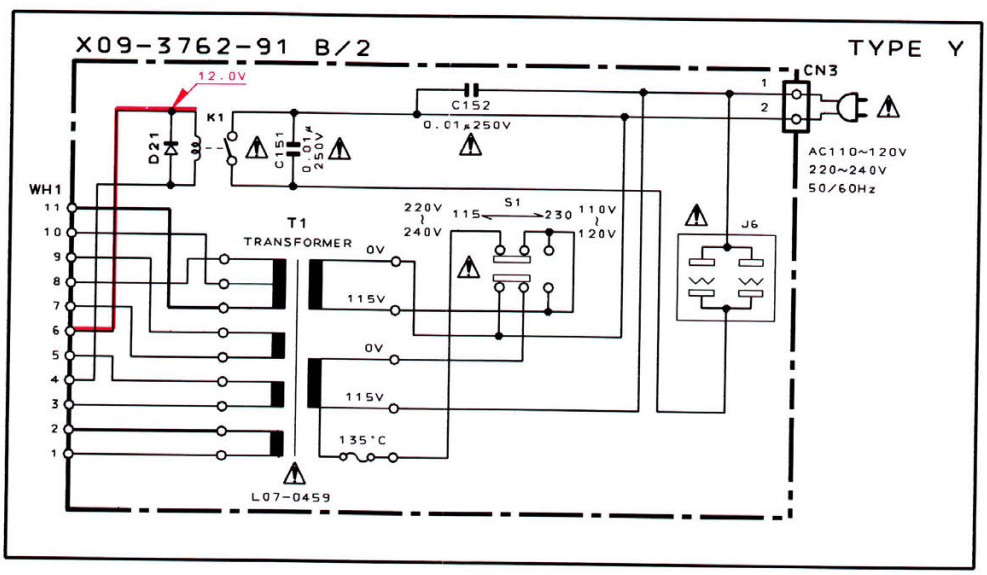


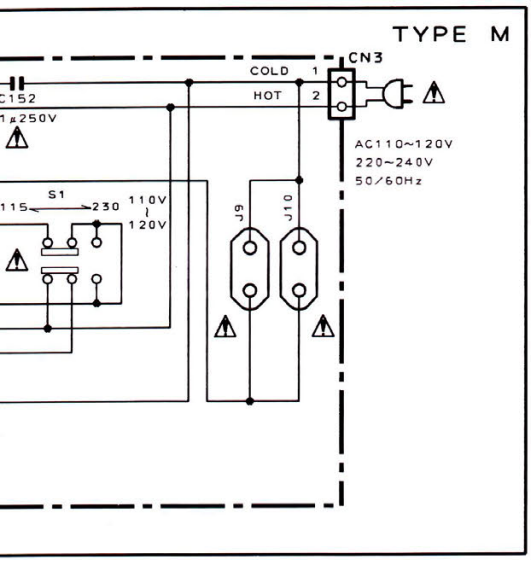
X09 B/2

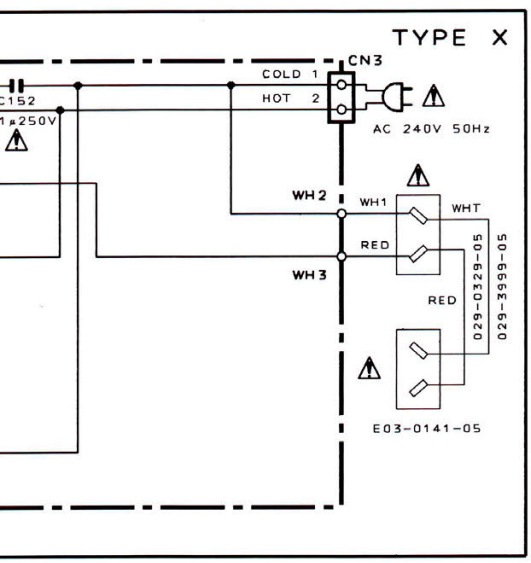
D21 :HSS104orISS133

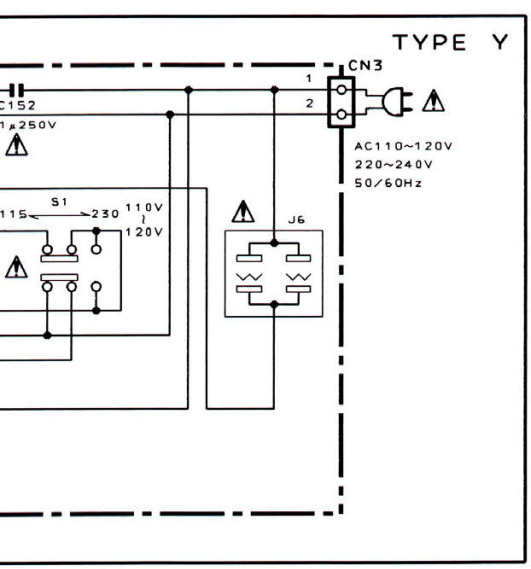




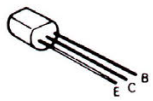



TYPE M
CN3
COLD 1
HOT 2
AC110~120V
220~240V
50/60Hz
S1
115
230
110V
~
120V
J9
J10


TYPE X
CN3
COLD 1
HOT 2
AC 240V 50Hz
WH2
WH1
WHT
RED
WH3
RED
029-0329-05
029-3999-05
E03-0141-05


TYPE Y
CN3
1
2
AC110~120V
220~240V
50/60Hz
S1
115
230
110V
~
120V
J6

GND LI
+B LIN



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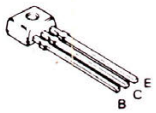
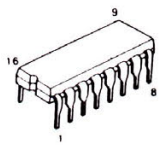
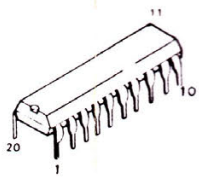
2SA954
2SC2003
2SC2878
2SC3940A



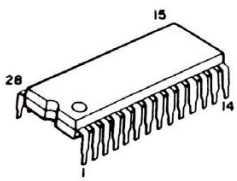
2S
2S



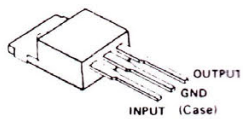
TC9212P



M522

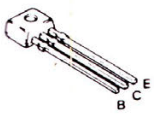


LC7522
NJU7311L
NJU7312L



UPC7915HF

GND LINE
+B LINE



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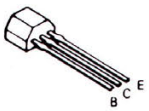
2SC2785



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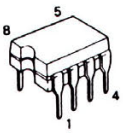
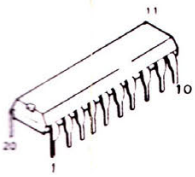
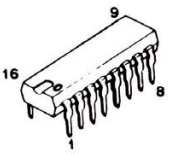
2SC1740S



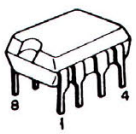
NJM4565D
NJM4565D-D



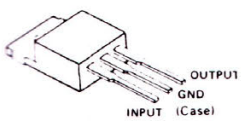
M5229P



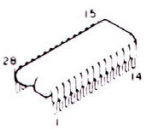
XR-1091ECP



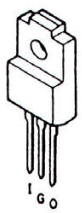
BA10393
NJM4580D-D
XRA10393



UPC7815HF



TC9162N
TC9163N



AN7805F

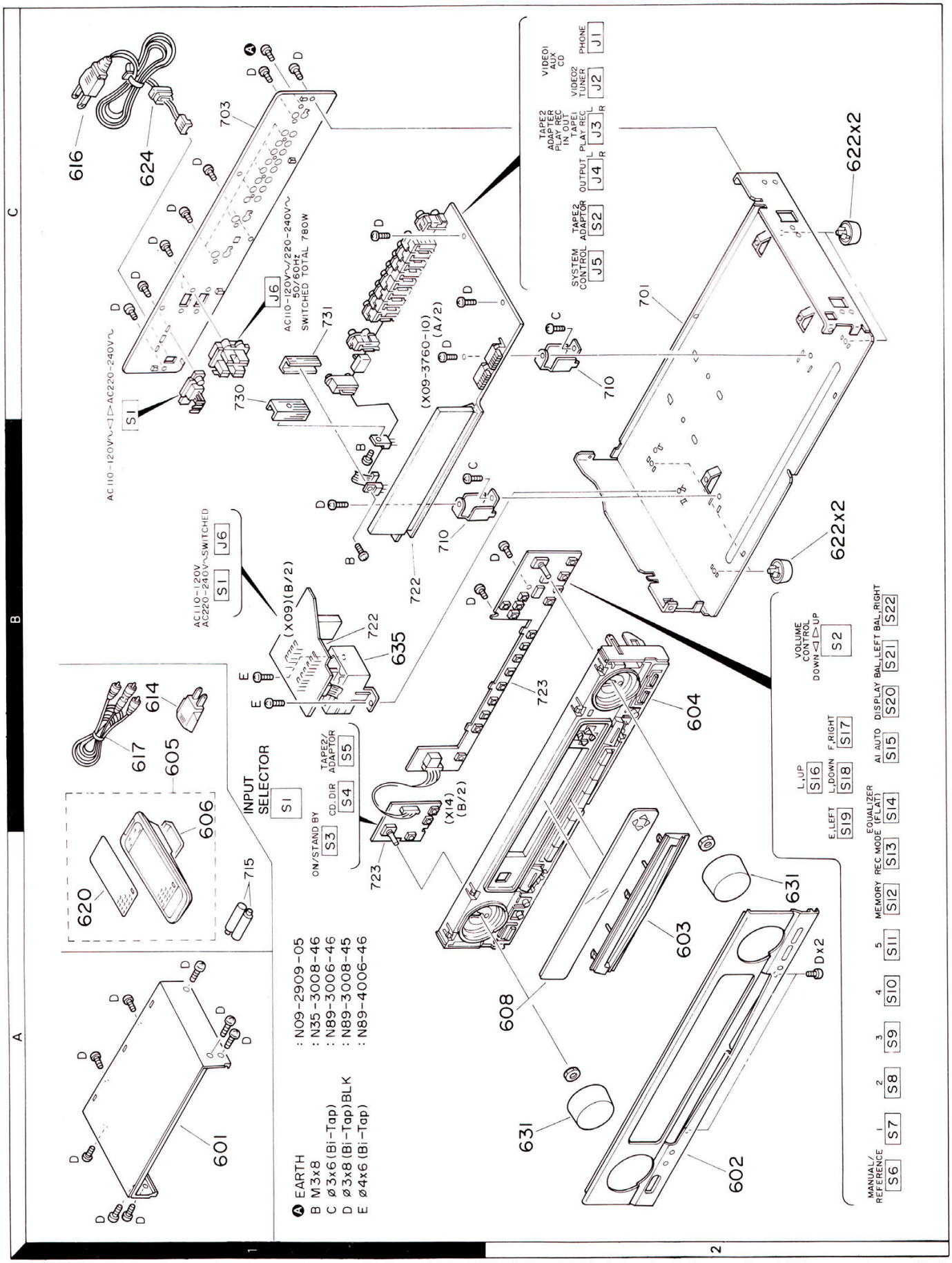
DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

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 wurden mit einem hochohmigen Spannungsmesser ohne Eingangssignal gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u. U. geringfügig.

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.

EXPLODED VIEW (UNIT)



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
KC-993 (SINGAPORE MADE)						
601	1A	*	A01-2996-01	METALLIC CABINET		
602	2A	*	A60-0324-02	PANEL		
603	2A	*	A21-1823-03	DRESSING PANEL		
604	2B	*	A22-1602-01	SUB PANEL		
605	1B	*	X94-1030-00	REMOTE CONTROL ASSY UNIT		
606	1A	*	A09-0140-03	BATTERY COVER		
608	2A	*	B03-2802-03	DRESSING PLATE		
-		*	B46-0092-13	WARRANTY CARD	K	
-			B46-0094-03	WARRANTY CARD	Y	
-			B46-0095-03	WARRANTY CARD	Y	
-			B46-0096-33	WARRANTY CARD	X	
-			B46-0121-23	WARRANTY CARD	P	
-			B58-0513-04	CAUTION CARD (PRESET220-240)	Y	
-		*	B60-1054-00	INSTRUCTION MANUAL (ENGLISH)		
-		*	B60-1055-00	INSTRUCTION MANUAL (FRENCH)	P	
-		*	B60-1056-00	INSTRUCTION MANUAL (SPA,CHI)	M	
⚠ 614	1B		E03-0115-05	AC PLUG ADAPTER	M	
⚠ 615	1C		E03-0141-05	AC OUTLET	X	
⚠ 616	1C		E30-2592-15	AC POWER CORD	M	
⚠ 616	1C		E30-2605-05	AC POWER CORD	Y	
⚠ 616	1C		E30-2643-05	AC POWER CORD	KP	
⚠ 616	1C		E30-2717-05	AC POWER CORD	X	
617	1B		E30-0615-05	AUDIO CORD		
620	1A	*	G16-0804-04	WRITEING SHEET		
		*	H50-0506-04	ITEM CARTON CASE	KPYX	
		*	H50-0507-04	ITEM CARTON CASE	M	
-		*	H10-5411-02	POLYSTYRENE FOAMED FIXTURE		
-		*	H10-5412-02	POLYSTYRENE FOAMED FIXTURE		
-		*	H13-0130-04	CARTON BOARD	X	
-			H25-0223-04	PROTECTION BAG (750X350X0.03)		
-			H25-0232-04	PROTECTION BAG (235X350X0.03)		
622	2B,2C		J02-0366-15	FOOT		
⚠ 624	1C		J42-0083-05	POWER CORD BUSHING		
-			J61-0307-05	WIRE BAND		
631	2A	*	K29-5622-04	KNOB VOLUME/INPUT SELECTOR		
⚠ 635	1B		L07-0458-05	POWER TRANSFORMER	KP	
⚠ 635	1B		L07-0459-05	POWER TRANSFORMER	YM	
⚠ 635	1B		L07-0460-05	POWER TRANSFORMER	X	
A	1C		N09-2909-05	TAPTITE SCREW		
C	1B,2C		N89-3006-46	BINDING HEAD TAPTITE SCREW		
D	1A,1C		N89-3008-45	BINDING HEAD TAPTITE SCREW		
E	1B		N89-4006-46	BINDING HEAD TAPTITE SCREW		
KC-993 (MALAYSIA MADE)						
601	1A	*	A01-2996-01	METALLIC CABINET		
602	2A	*	A60-0324-02	PANEL		
603	2A	*	A21-1823-03	DRESSING PANEL		
604	2B	*	A22-1602-01	SUB PANEL		
605	1B	*	X94-1030-00	REMOTE CONTROL ASSY UNIT		
606	1A	*	A09-0140-03	BATTERY COVER		

L:Scandinavia **K:**USA **P:**Canada
Y:PX(Far East, Hawaii) **T:**England **E:**Europe
Y:AAFES(Europe) **X:**Australia **M:**Other Areas

⚠ indicates safety critical components.

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
		*	B60-1054-00	INSTRUCTION MANUAL (ENGLISH)			
		*	B60-1055-00	INSTRUCTION MANUAL (FRENCH)		P	
608	2A	*	B03-2802-03	DRESSING PLATE			
-			B46-0092-13	WARRANTY CARD		K	
-			B46-0121-23	WARRANTY CARD		P	
⚠ 616	1C		E30-2643-05	AC POWER CORD			
617	1B		E30-0615-05	AUDIO CORD			
620	1A	*	G16-0804-04	WRITEING SHEET			
		*	H50-0573-04	ITEM CARTON CASE			
-		*	H10-5457-02	POLYSTYRENE FOAMED FIXTURE			
-		*	H10-5458-02	POLYSTYRENE FOAMED FIXTURE			
-			H25-0223-04	PROTECTION BAG (750X350X0.03)			
-			H25-0232-04	PROTECTION BAG (235X350X0.03)			
622	2B,2C		J02-0366-15	FOOT			
⚠ 624	1C		J42-0083-05	POWER CORD BUSHING			
-			J61-0307-05	WIRE BAND			
631	2A	*	K29-5622-04	KNOB VOLUME/INPUT SELECTOR			
⚠ 635	1B		L07-0458-05	POWER TRANSFORMER			
A	1C		N09-2909-05	TAPTITE SCREW			
C	1B,2C		N89-3006-46	BINDING HEAD TAPTITE SCREW			
D	1A,1C		N89-3008-45	BINDING HEAD TAPTITE SCREW			
E	1B		N89-4006-46	BINDING HEAD TAPTITE SCREW			
AUDIO UNIT (X09-3760-10:K, P, KW, PW, 0-21:M, 0-71:X, 2-91:Y)							
C1 ,2			CE04LW1V100M	ELECTRO	10UF	35WV	
C3			CK45FF1H103Z	CERAMIC	0.010UF	Z	
C5 ,6			C91-0745-05	CERAMIC	100PF	K	
C7 ,8			CC45FSL1H221J	CERAMIC	220PF	J	
C9 ,10			CF92FV1H332J	MF	3300PF	J	
C11 ,12			CF92FV1H123J	MF	0.012UF	J	
C13 ,14			CE04LW1C101M	ELECTRO	100UF	16WV	
C15 ,16			CE04LW1V100M	ELECTRO	10UF	35WV	
C17 -20			CE04LW1E470M	ELECTRO	47UF	25WV	
C21 ,22			CE04LW1V100M	ELECTRO	10UF	35WV	
C23 -26			CK45FB1H471K	CERAMIC	470PF	K	
C31 ,32			CK45FB1H821K	CERAMIC	820PF	K	
C33 ,34			CF92FV1H472J	MF	4700PF	J	
C35 ,36			CF92FV1H222J	MF	2200PF	J	
C37 ,38			CF92FV1H123J	MF	0.012UF	J	
C39 ,40			CF92FV1H562J	MF	5600PF	J	
C41 ,42			CF92FV1H303J	MF	0.030UF	J	
C43 ,44			CF92FV1H133J	MF	0.013UF	J	
C45 ,46			CF92FV1H683J	MF	0.068UF	J	
C47 ,48			CF92FV1H333J	MF	0.033UF	J	
C49 ,50			CF92FV1H184J	MF	0.18UF	J	
C51 ,52			CF92FV1H913J	MF	0.091UF	J	
C53 ,54			CE04LW1HR47M	ELECTRO	0.47UF	50WV	
C55 ,56			CF92FV1H224J	MF	0.22UF	J	
C57 ,58			CE04LW1H010M	ELECTRO	1.0UF	50WV	
C59 ,60			CE04LW1V100M	ELECTRO	10UF	35WV	
C61 -64			CE04LW1E470M	ELECTRO	47UF	25WV	
C72			CE04LW1E470M	ELECTRO	47UF	25WV	
C73 ,74			CE04LW1H010M	ELECTRO	1.0UF	50WV	

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C76			CE04LW1E470M	ELECTRO	47UF 25WV		
C79 ,80			CE04LW1E470M	ELECTRO	47UF 25WV		
C81 ,82			CK45FF1H223Z	CERAMIC	0.022UF Z		
C83 ,84			CF92FV1H104J	MF	0.10UF J		
C86			CE04LW1E102M	ELECTRO	1000UF 25WV		
C87 ,88			CK45FF1H223Z	CERAMIC	0.022UF Z		
C89			CE04LW1E101M	ELECTRO	100UF 25WV		
C90 ,91			CF92FV1H104J	MF	0.10UF J		
C92			CE04LW1V222M	ELECTRO	2200UF 35WV		
C93			CE04LW1E101M	ELECTRO	100UF 25WV		
C94 ,95			CF92FV1H104J	MF	0.10UF J		
C96			CE04LW1V222M	ELECTRO	2200UF 35WV		
C101-106			CE04LW1V100M	ELECTRO	10UF 35WV		
C107			CE04HW1E4R7M	NP-ELEC	4.7UF 25WV		
C117,118			CF92FV1H683J	MF	0.068UF J		
C119,120			CE04LW1E470M	ELECTRO	47UF 25WV		
C121-124			CK45FF1H103Z	CERAMIC	0.010UF Z		
C125,126			CC45FSL1H221J	CERAMIC	220PF J		
C127,128			CK45FB1H102K	CERAMIC	1000PF K		
C129,130			CE04LW1V100M	ELECTRO	10UF 35WV		
C131,132			CE04LW0J331M	ELECTRO	330UF 6.3WV		
C135,136			CF92FV1H151K	MF	150PF K		
C139			CE04HW1E4R7M	NP-ELEC	4.7UF 25WV		
C140,141			CC45FSL1H221J	CERAMIC	220PF J		
C143,144			CC45FSL1H101J	CERAMIC	100PF J		
C147			CE04LW0J221M	ELECTRO	220UF 6.3WV		
C149,150			CC45FSL1H101J	CERAMIC	100PF J		
⚠ C151,152			C91-1439-05	FILM	0.01UF 250VAC		
C153,154			CE04LW1V100M	ELECTRO	10UF 35WV		
C155,156			CK45FF1H103Z	CERAMIC	0.010UF Z		
C159			CC45FSL1H101J	CERAMIC	100PF J		
C161,162			CC45FSL1H101J	CERAMIC	100PF J		
C163-166			CE04LW1V4R7M	ELECTRO	4.7UF 35WV		
C169,170			CE04LW1V100M	ELECTRO	10UF 35WV		
C171-174			CE04LW1H2R2M	ELECTRO	2.2UF 50WV		
C179-182			CE04LW1V4R7M	ELECTRO	4.7UF 35WV		
C183			CE04LW1E470M	ELECTRO	47UF 25WV		
C185			CE04LW1E470M	ELECTRO	47UF 25WV		
C189-192			CC45FSL1H101J	CERAMIC	100PF J		
C198,199			CE04LW1A101M	ELECTRO	100UF 10WV		
C200,201			CC45FSL1H221J	CERAMIC	220PF J		
C202			CF92FV1H102J	MF	1000PF J		
C203			CE04LW1A101M	ELECTRO	100UF 10WV		
C204			CF92FV1H103J	MF	0.010UF J		
C205			CF92FV1H102J	MF	1000PF J		
C206			CE04LW1A101M	ELECTRO	100UF 10WV		
C207			CF92FV1H103J	MF	0.010UF J		
C208			CE04LW1H331M	ELECTRO	330UF 50WV		
C209			CE04LW1H100M	ELECTRO	10UF 50WV		
C210			CE04LW1V4R7M	ELECTRO	4.7UF 35WV		
C211,212			CE04LW1H100M	ELECTRO	10UF 50WV		
C213			CE04LW1H2R2M	ELECTRO	2.2UF 50WV		
C214			CE04LW1H010M	ELECTRO	1.0UF 50WV		
C215			CF92FV1H103J	MF	0.010UF J		
C216			C90-1826-05	BACKUP	0.047F 5.5WV		

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C217,218			CE04LW1A101M	ELECTRO 100UF 10WV		
C219			CE04LW1V100M	ELECTRO 10UF 35WV		
C220			CE04LW1C221M	ELECTRO 220UF 16WV		
C221			C91-0769-05	CERAMIC 0.01UF K		
C222			CF92FV1H103J	MF 0.010UF J		
C223,224			CE04LW1E470M	ELECTRO 47UF 25WV		
C225-228			CF92FV1H104J	MF 0.10UF J		
C229			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C231			CK45FF1H223Z	CERAMIC 0.022UF Z		
C232-234			CE04LW1E470M	ELECTRO 47UF 25WV		
C235,236			CC45FSL1H221J	CERAMIC 220PF J		
C237			CE04LW1H010M	ELECTRO 1.0UF 50WV		
J1		*	E63-0068-05	PHONO JACK PHONO		
J2 ,3		*	E63-0070-05	PHONO JACK CD,TUNER,VIDEO,TAPE		
J4		*	E63-0068-05	PHONO JACK OUT PUT		
J5			E11-0188-05	MINIATURE PHONE JACK SYNCHRO		
⚠ J6			E03-0117-05	AC OUTLET	KPY	S
⚠ J6			E03-0117-05	AC OUTLET	KP	W
⚠ J9 ,10			E03-0108-05	AC OUTLET	M	S
X1			L78-0602-05	RESONATOR 6.300MHz		
X2			L78-0244-05	RESONATOR 4.000MHz		
B	1B		N35-3008-46	BINDING HEAD MACHINE SCREW		
CP1 ,2			R90-0491-05	MULTI-COMP 820KX7 J 1/6W		
CP3			R90-0493-05	MULTI-COMP 100KX9 J 1/6W		
CP4			R90-0482-05	MULTI-COMP 100KX4 J 1/6W		
CP5			R90-0850-05	MULTI-COMP 100KX3 J 1/6W		
CP7			R90-0500-05	MULTI-COMP 100KX6 J 1/4W		
CP8			R90-0854-05	MULTI-COMP 4.7KX3 J 1/6W		
CP9			R90-0492-05	MULTI-COMP 100KX8 J 1/6W		
R53 ,54			RD14NB2E221J	RD 220 J 1/4W		
R76 ,77			RD14NB2E101J	RD 100 J 1/4W		
R86 ,87			RD14NB2E101J	RD 100 J 1/4W		
R95 ,96			RD14NB2E101J	RD 100 J 1/4W		
R102			RS14KB3D331J	FL-PROOF RS 330 J 2W		
R157,158			RD14NB2E101J	RD 100 J 1/4W		
R181,182			RD14NB2E181J	RD 180 J 1/4W		
R206			RD14NB2E1R0J	RD 1.0 J 1/4W		
R210			RS14KB3A2R2J	FL-PROOF RS 2.2 J 1W		
R211,212			RS14KB3D470J	FL-PROOF RS 47 J 2W		
R213			RS14KB3A2R2J	FL-PROOF RS 2.2 J 1W		
R214			RS14KB3A562J	FL-PROOF RS 5.6K J 1W		
R234,235			RD14NB2E470J	RD 47 J 1/4W		
R282-285			RD14NB2E101J	RD 100 J 1/4W		
⚠ K1			S76-0002-05	MAGNETIC RELAY		
⚠ S1			S62-0001-05	SLIDE SWITCH VOLTAGE SELECTOR	YM	S
S2			S31-2094-05	SLIDE SWITCH ADAPTER		
D1 -6			HSS104	DIODE		
D1 -6			1SS133	DIODE		
D7 ,8			HZS6.8N(B2)	ZENER DIODE		
D7 ,8			RD6.8ES(B2)	ZENER DIODE		
D10 -17			S5688B	DIODE		

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D10 -17			1SR139-100	DIODE		
D18 -21			HSS104	DIODE		
D18 -21			1SS133	DIODE		
D24			HSS104	DIODE		
D24			1SS133	DIODE		
D25 ,26			HZS6.2N(B2)	ZENER DIODE		
D25 ,26			RD6.2ES(B2)	ZENER DIODE		
D27			HSS104	DIODE		
D27			1SS133	DIODE		
D28			HZS3.3N(B2)	ZENER DIODE		
D28			RD3.3ES(B2)	ZENER DIODE		
D29			S5688B	DIODE		
D29			1SR139-100	DIODE		
D30			HZS30N(B)	ZENER DIODE		
D30			RD30ES(B)	ZENER DIODE		
D31			HZS8.2N(B2)	ZENER DIODE		
D31			RD8.2ES(B2)	ZENER DIODE		
D32			HZS2.7N(B2)	ZENER DIODE		
D32			RD2.7ES(B2)	ZENER DIODE		
D33 -44			HSS104	DIODE		
D33 -44			1SS133	DIODE		
D47 -65			HSS104	DIODE		
D47 -65			1SS133	DIODE		
ED1		*	FIP16AMW22AY	INDICATOR TUBE		
IC1			NJM4580D-D	IC(OP AMP X2)		
IC2			NJU7312L	IC(ANALOG SWITCH)		
IC2			TC9163N	IC(BILATERAL SWITCH X16)		
IC3			NJU7311L	IC(ANALOG SWITCH)		
IC3			TC9162N	IC(ANALOG SWITCH ARRAY)		
IC4			NJM4565D-D	IC(OP AMP X2)		
IC4			XRA15218-DX	IC(OP AMP X2)		
IC5 ,6			M5229P	IC(7CH GRAPHIC EQUALIZER)		
IC7			LC7522	IC(7CH GRAPHIC EQUALIZER)		
IC8			NJM4580D-D	IC(OP AMP X2)		
IC10			NJM4565D	IC(OP AMP X2)		
IC10			XRA15218	IC(OP AMP X2)		
IC11			TA79015S	IC(VOLTAGE REGULATOR/ -15V)		
IC11			UPC7915HF	IC(VOLTAGE REGULATOR/ -15V)		
IC12			UPC7815HF	IC(VOLTAGE REGULATOR/ +15V)		
IC12			XRA17815T	IC(VOLTAGE REGULATOR/ +15V)		
IC13		*	AN780575F	IC(VOLTAGE REGULATOR/+5.75V)		
IC13		*	TA78057S	IC(VOLTAGE REGULATOR/+5.75V)		
IC14			NJM4565D-D	IC(OP AMP X2)		
IC14			XRA15218-DX	IC(OP AMP X2)		
IC17		*	M38173M6-152FP	IC(MICROPROCESSOR)		
IC18		*	CXP2201AS	IC(FL DRIVER)		
IC19			XR-1091ECP	IC(EQUALIZER FILTER)		
IC20		*	TC9212P	IC(ELECTRICAL VOLUME)		
IC21			NJM4580D-D	IC(OP AMP X2)		
IC22			BA10393	IC(DUAL COMPALATOR)		
IC22			XRA10393	IC(DUAL COMPALATOR)		
IC23			NJM4580D-D	IC(OP AMP X2)		
Q1 ,2			2SC2878(B)	TRANSISTOR		
Q3 ,4			2SA1175(F,E)	TRANSISTOR		
Q3 ,4			2SA933S(Q,R)	TRANSISTOR		

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Q5 -8			2SC2878(B)	TRANSISTOR		
Q9			2SC2003(L,K)	TRANSISTOR		
Q10			2SC1740S(Q,R)	TRANSISTOR		
Q10			2SC2785(F,E)	TRANSISTOR		
Q11			2SA954(L,K)	TRANSISTOR		
Q12 ,13			2SC1740S(Q,R)	TRANSISTOR		
Q12 ,13			2SC2785(F,E)	TRANSISTOR		
Q14			2SA1534A(R,S)	TRANSISTOR		
Q15			2SC3940A(R,S)	TRANSISTOR		
Q16 ,17			2SA1175(F,E)	TRANSISTOR		
Q16 ,17			2SA933S(Q,R)	TRANSISTOR		
DISPLAY UNIT (X14-3690-10)						
C1 ,2			C91-0769-05	CERAMIC 0.01UF K		
C4			C90-3212-05	ELECTRO 47UF 6.3WV		
C5 ,6			C91-0769-05	CERAMIC 0.01UF K		
S3 -22			S40-1064-05	PUSH SWITCH KEY BOARD		
S1		*	T99-0530-05	ROTARY ENCODER INPUT SELECTOR		
S2		*	T99-0537-05	ROTARY ENCODER VOLUME CONTROL		
A1			W02-1046-05	ELECTRIC CIRCUIT MODULE		
A1		*	W02-1153-05	ELECTRIC CIRCUIT MODULE		

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KC-993

SPECIFICATIONS

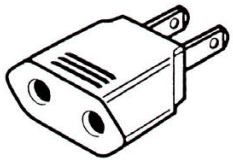
Frequency response	10 Hz to 50 kHz, 0 dB, -3 dB
Input sensitivity/impedance	
PHONO	3.0 mV/47 kΩ
TUNER/TAPE/VIDEO	280 mV/47kΩ
CD	450mV/47 kΩ
TAPE 2/ADAPTOR	280mV/47kΩ
Signal-to noise ratio (IHF-A)	
PHONO	78 dB for 3.0mV input
TUNER/TAPE/CD/VIDEO	102 dB
Phono maximum input level	100 mV,T.H.D. 0.5% at 1kHz
Total harmonic distortion	
20Hz to 20,000 Hz	0.005% at rated output
Graphic equalizer control	
(60 Hz, 150 Hz, 400 Hz, 1 kHz, 2.4kHz,	
6 kHz, 15 kHz)	±10 dB
Output voltage and impedance	
Tape REC	280 mV/3.3 kΩ
PRE OUT	1V/1.0 kΩ
General	
Power consumption	20W
AC outles	
SWITCHED	For USA and Canada: 2; (Total 780 W, 6.5 A Max.)
	For other countries : 2; (Total 480 W)
Dimensions	W:440 mm (17-5/16")
	H:99 mm (3-7/8")
	D:284 mm (11-3/16")
Weight (Net)	3.3 kg (7.3 lb)

Note:

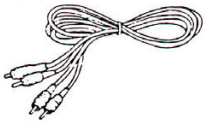
KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

Accessories

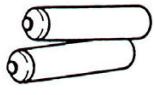
- AC plug adaptor 1
  (Except for some areas)
  For the unit with a European AC plug in areas other than Europe.



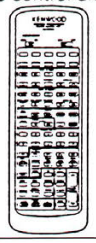
- Audio cord 1



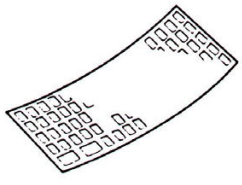
- Batteries (R03/AAA) 2



- Remote control unit 1



- Overlay sheet 1



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