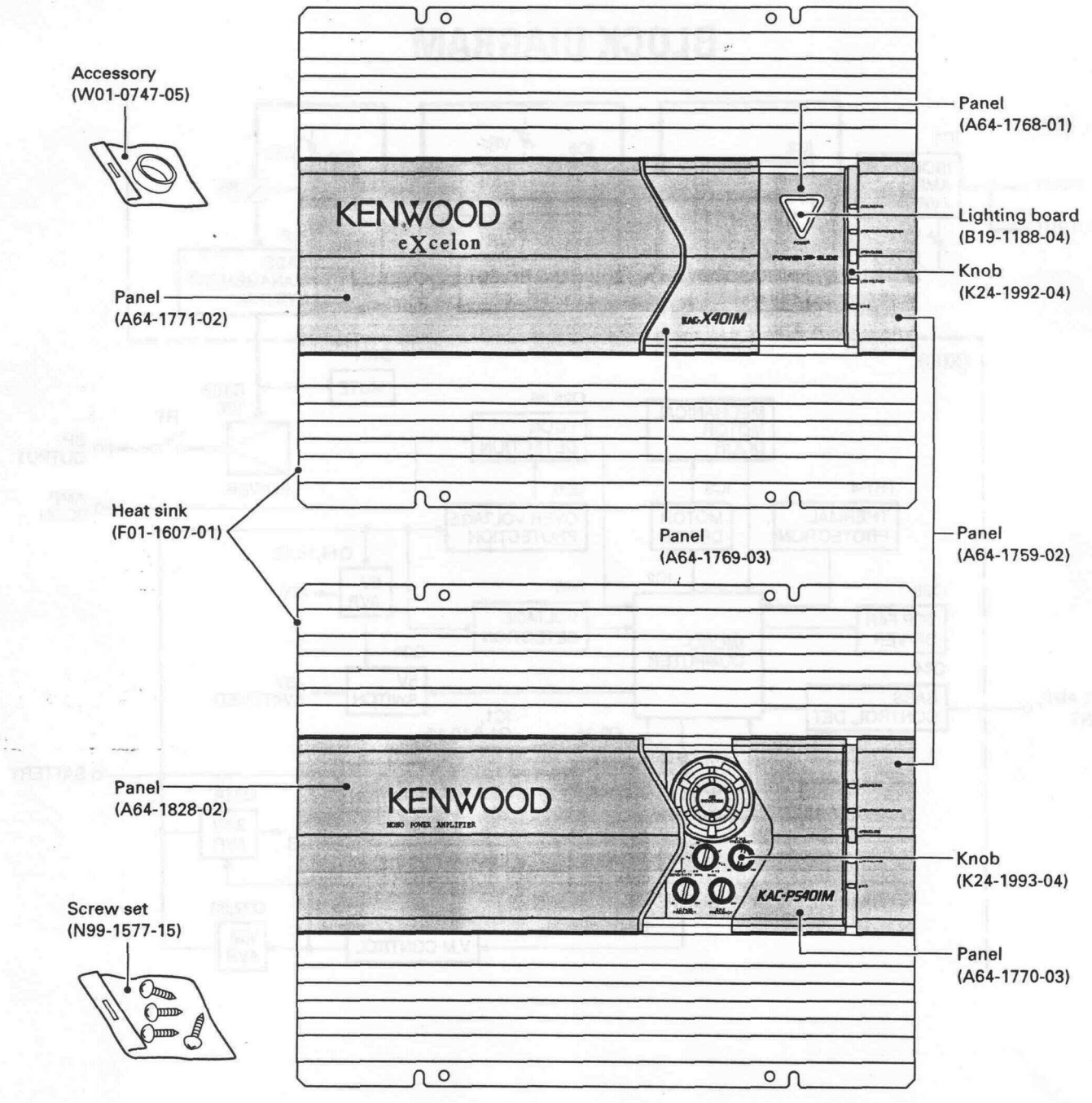
MONO POWER AMPLIFIER

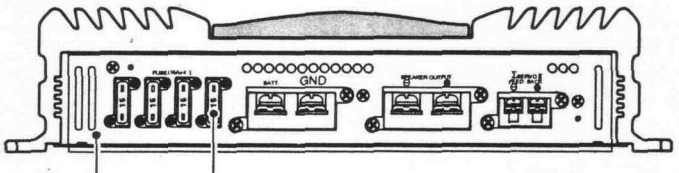
KAC-X401M/PS401M

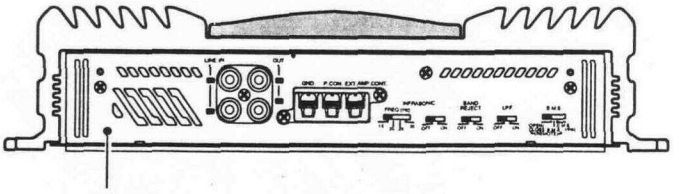
SERVICE MANUAL

KENWOOD

B51-7448-00 (4) 3279



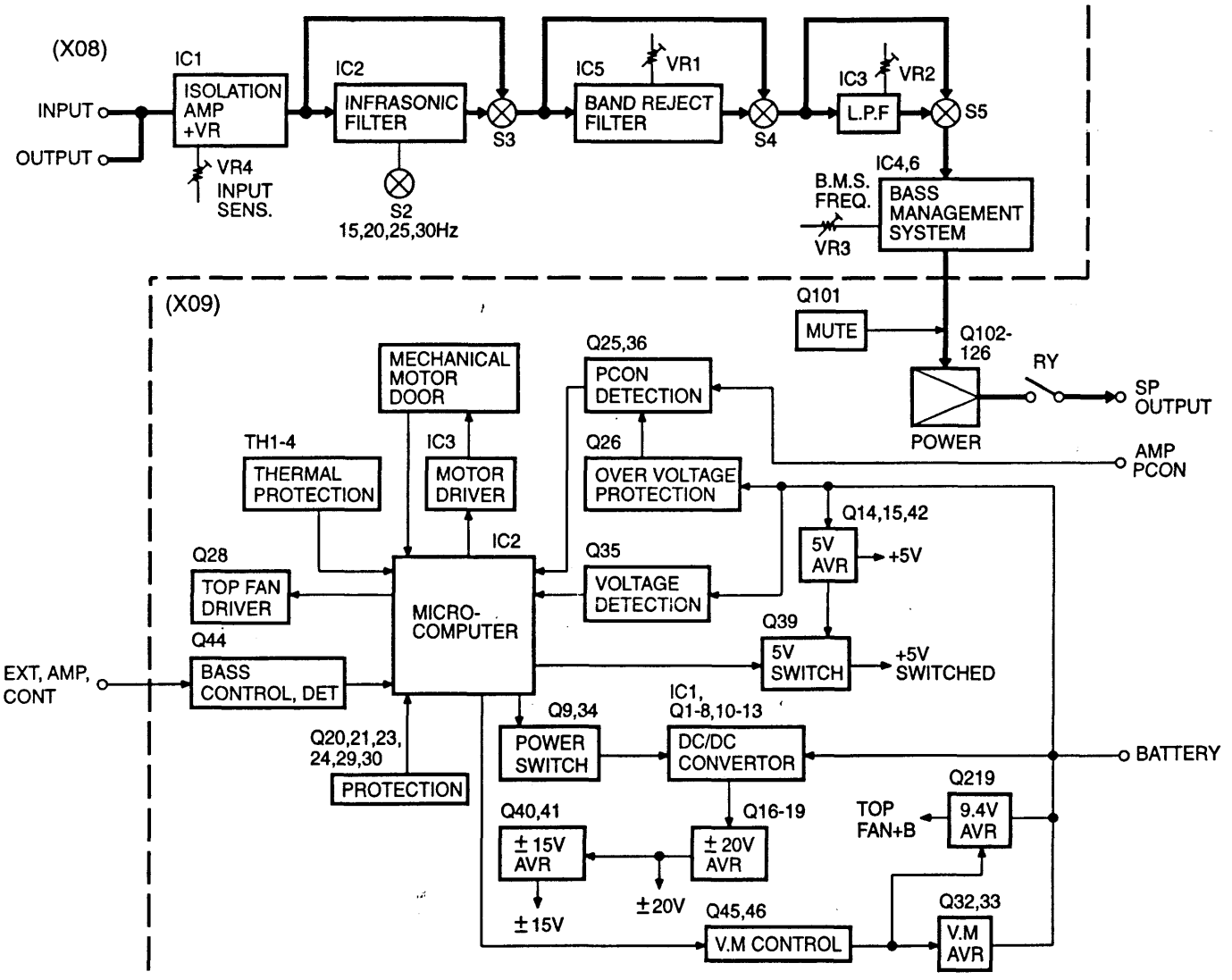




KAC-X401M/PS401M

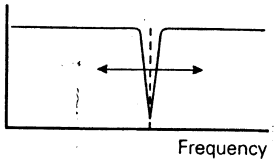
CONTENTS

BLOCK DIAGRAM



Band reject

The acoustic properties of vehicle compartment tend to cause oscillation due to resonance or unclearness of sound due to standing waves at certain frequencies. The band reject filter can solve the problems of resonance or unclear sound with minimum influence on the sound quality because it eliminates only the frequencies causing resonance or standing waves.



■ ***Adjustment method:***

The band reject filter cuts only the limited frequencies to minimize influence on the sound quality. Therefore, its effect cannot be obtained unless the cutoff frequencies are set accurately to the frequencies causing resonance and standing waves. The band reject filter can be adjusted according to what you feel through your ears, but we recommend the use of a signal generator or a spectrum analyzer with a fine frequency measurement capability for the adjustment.

- **Adjustment using a signal generator:**
  Output a sine wave, vary its frequency to find the frequencies at which the vehicle compartment resonates or volume increases (standing waves occur), and set the BAND REJECT FREQUENCY control to the position with which the resonance and standing waves disappear.
- **Adjustment using a spectrum analyzer:**
  Output white noise (sound in which all frequencies are at a certain level), find the peak frequency observed on the spectrum analyzer, and set the BAND REJECT FREQUENCY control to the position with which the peak observed on the spectrum analyzer disappears.

TROUBLESHOOTING GUIDE

What might appear to be a malfunction in your unit may just be the result of slight misoperation or miswiring. Before calling service, first check the following table for possible problems.

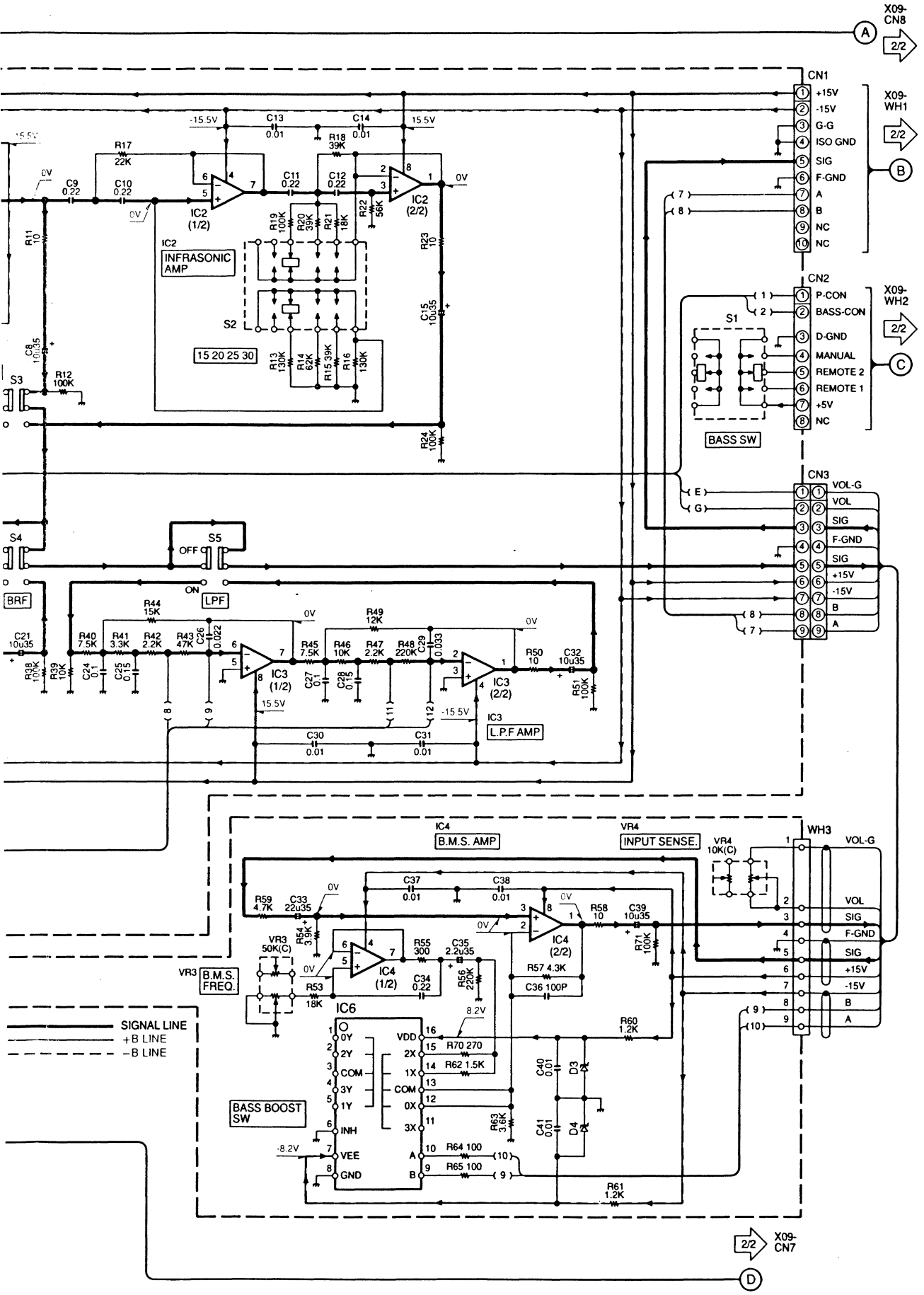
PROBLEM	POSSIBLE CAUSE	SOLUTION
No sound. **(No sound from one side.)**	• Input (or output) cables are disconnected. • Protection circuit may be activated. • The fuse may be blown because the volume was too high.	• Connect the input (or output) cables. • Check connections by referring to "Controls". • Replace the fuse with a new fuse and use a lower volume.
The output level is too small (or too large).	The input sensitivity adjusting control is not set to the correct position.	Adjust the control correctly referring to "Controls".
The sound quality is bad. **(The sound is distorted.)**	• The speakers cable are connected with wrong ⊕ / ⊖ polarity. • A speaker cable is pinched by a screw in the car body. • The switches may be set improperly.	• Connect them properly checking the ⊕ / ⊖ of the terminals and cables well. • Connect the speaker cable again so that it is not pinched by anything. • Set switches properly by referring to "Controls".
If the slide panel moves of its own accord.	• The system is in DEMO mode. • The slide panel has gone into remote operation mode.	• Cancel DEMO mode by pressing the OPEN/CLOSE button. • Check the B.M.S. and operate the slide panel remotely or manually.
The external amplifier controller (B.M.S.) will not work.	• The B.M.S. switch is set to "B.M.S. (+6)". • The external amplifier control cable has come loose.	• The B.M.S. switch is set to "(REMOTE)". • Check that the external amplifier control cable is properly connected.

MICROCOMPUTER'S TERMINAL DESCRIPTION

SYSTEM u-com: TMP87C847U4C84 (X09- : IC2)

●Terminal description

Pin	Pin name	Function	I/O	Description	Processing operation
1	SCK/P73	MOTOR_2	O	Panel motor control 2 (M2)	Stop when M1 and M2 are "L". Forward when M1 is "L" and M2 is "H". Reverse when M1 and M2 are "H".
2	PDO/PWM/P72	MOTOR_1	O	Panel motor control 1 (M1)	
3	INT4/P71	SIDE_FAN	O	Side fan rotation control	Active "H"
4	INT3/TC3/P70	TOP_FAN	O	Cooling fan rotation control	Active "H"
5	P07	PROTECT	I	Protection detection	Active "H"
6	P06	V_DOWN	I	Voltage down detection	Active "H"
7	P05	SIGMA	I	Σ drive prptection	Active "H"
8	P04	VM_POWER	O	Panel motor power supply	Active "H"
9	P03	LED_COOL	O	LED indicator output (cooling fan)	Active "L"
10	P02	LED_DRPR	O	LED indicator output (drive protection)	Active "L"
11	P01	LED_VOLT	O	LED indicator output (voltage down)	Active "L"
12	P00	LED_BASS	O	LED indicator output (bass boost)	Active "L"
13	TEST	test			
14	RESET			Reset pin	
15	XIN	xin		Oscillator pin	
16	XOUT	xout		Oscillator pin	
17	VSS(VASS)	gnd		GND	
18	VAREF			A/D reference	
19	AIN0/P60	ADIN_1	I	Temperature detection 1 (A/D input)	
20	AIN1/P61	ADIN_2	I	Temperature detection 2 (A/D input)	
21	AIN2/P62	ADIN_3	I	Temperature detection 3 (A/D input)	
22	AIN3/P63	ADIN_4	I	Temperature detection 4 (A/D input)	
23	AIN4/P64	MUTE_CON	O	Mute control	Active "L"
24	AIN5/P65	BASS_SW1	I	Amp. bass boost switch input 1	Active "H"
25	AIN6/P66	BASS_SW2	I	Amp. bass boost switch input 2	Active "H"
26	AIN7/P67	BASS_SW3	I	Amp. bass boost switch input 3	Active "H"
27	P50				
28	P51	+5V_SW	O	Low current control	Active "L"
29	INT0/P10	RELAY_CON	O	Relay control	Active "H"
30	INT1/P11	POWER	O	Amp. power control	Active "H"
31	INT2/TC1/P12	COM_HU	I	Pulse measurement from H/U communications	
32	DVO/P13	MOTOR_END	O	Motor voltage control	"H" at high speed, "L" at low speed
33	PPG/P14	BASS_CON1	O	Bass boost control 1 (C1)	Boost off when C1 and C2 are "L". Boost low when C1 is "H" and C2 is "L". Boost high when C1 is "L" and C2 is "H".
34	TC2/P15	BASS_CON2	O	Bass boost control 2 (C2)	
35	P16	FUSE_1	I	Fuse 1 detection	Active "L"
36	P17	FUSE_2	I	Fuse 2 detection	Active "L"
37	INT5/STOP/P20	STANDBY	I	Release of stop mode by P. CON. on (external interruption)	P. CON turns on when "H". P. CON turns off when "L".
38	XTIN/P21	xtin		External clock input	
39	XTOUT/P22	xtout		External clock output	
40	VDD	Vdd		Power supply	
41	HSO/P77	CLOSE END	I	Panel closing completed detection	Active "H"
42	HSCK/P76	OPEN END	I	Panel opening completed detection	Active "H"
43	SO/P75	OPEN/CLOSE_SW	I	Open/close switch	Active "H"
44	SI/P74	A_CLASS	O	A class control	A class on when "H". A class off when "L".



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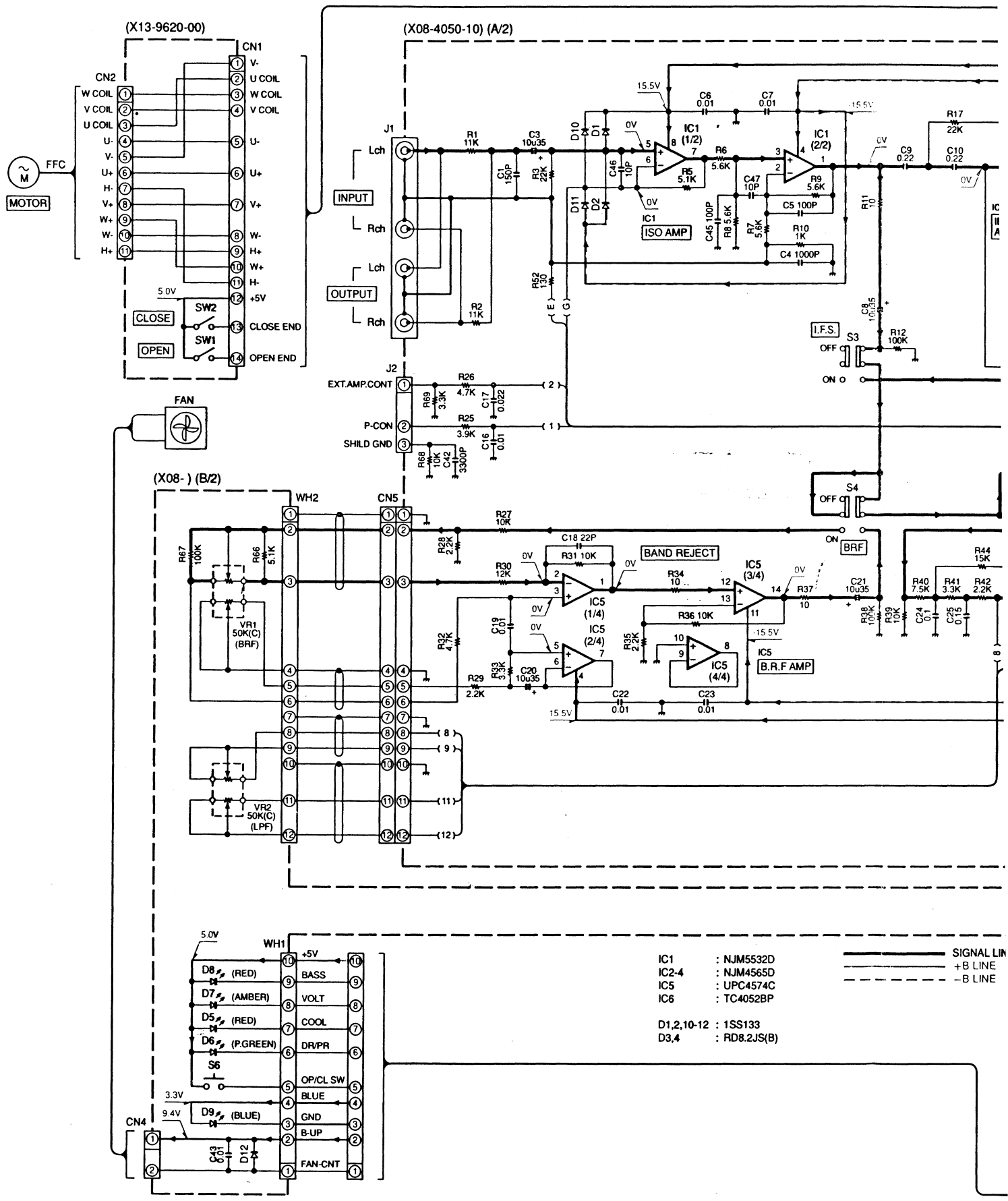
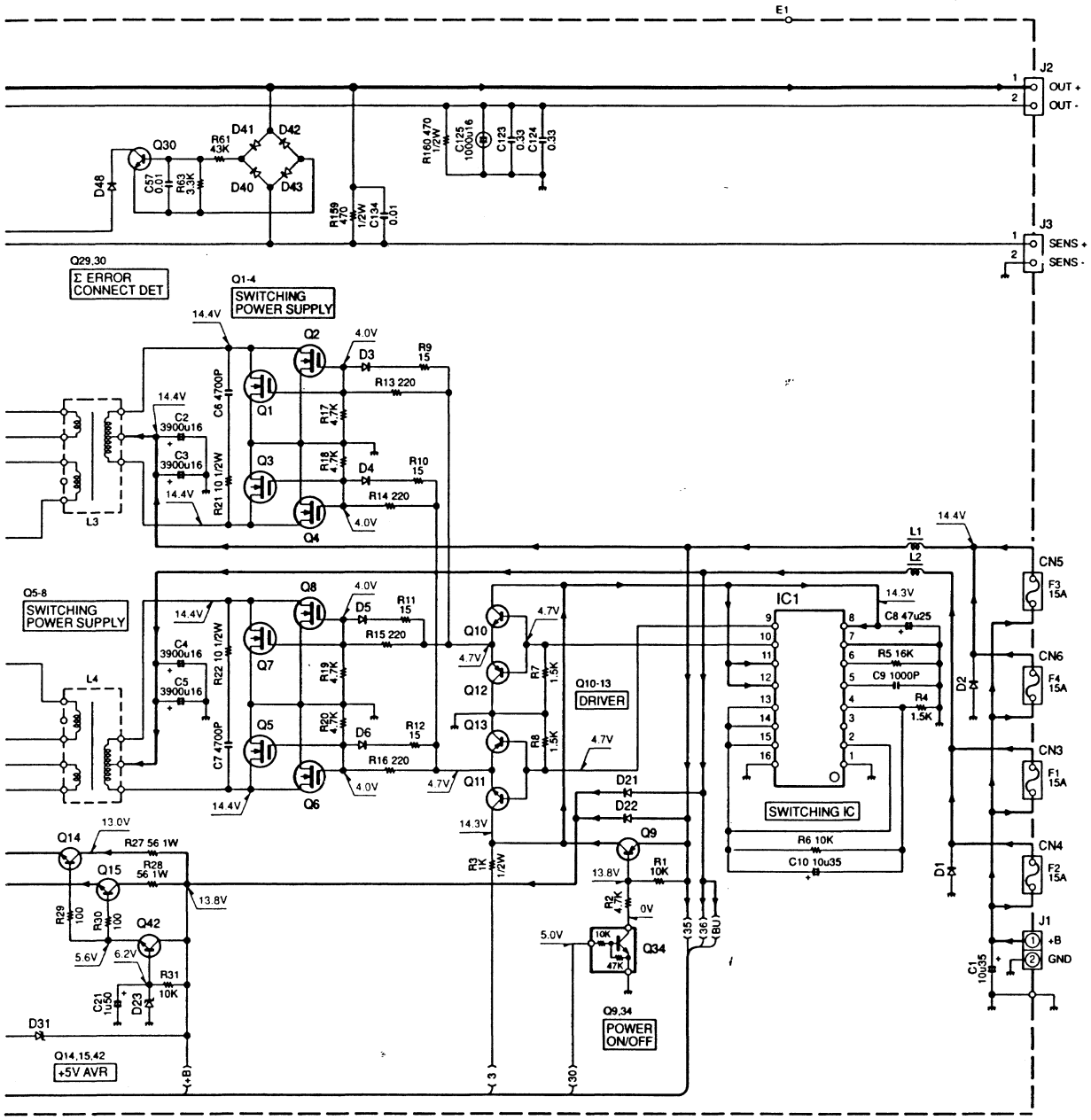


·DC voltages are as measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

CAUTION: For continued safety, replace safety critical parts (refer to parts list). ⚠ Indicates safety critical com current or resistance measurements shall be carried supply circuit) before the appliance is returned to the cu



Q1-8	: IRFIZ48N	Q34-36,45,220	: DTC114YK	D1,2	: 1N5406-M	D30,45,46	: RD16JS(B)
Q9,41	: 2SA1534A(R,S)	Q37,38,46	: DTA114YK	D3-6,32,33,36-44,47,48,		D31,111	: RD10JS(B)
Q10,11,18,25-28,42,44,		Q103,106,107,110	: 2SA1123(Q,R)	52,53,101,102,104-107,		D35	: RD4.7JS(B2)
101,102,104,105,221	: 2SC945(A) (Q,P)	Q108,109,113,114	: 2SC2631(Q,R)	109,110,114,116-118	: 1SS133	D50,51,112,113	: E-202
Q12,13,19,39,118	: 2SA733(A) (Q,P)	Q111	: 2SC2590(Q,R)	D7,8	: FML22S	D115	: RD3.9ES(B2)
Q14,15,32,33,40,219	: 2SC3940A(R,S)	Q112	: 2SA1110(Q,R)	D9,10	: FML22R		
Q16	: 2SD2396	Q115	: 2SC4883A	D11-18,21,22	: 1N4935	IC1	: UPC494GS
Q17	: 2SB1565	Q116	: 2SA1859A	D23	: RD6.2JS(B2)	IC2	: TMP87C847U4C84
Q20,21	: 2SA992(F,E)	Q119-122	: 2SC3284*5	D24-28,34,103	: RD5.1JS(B2)	IC3	: BA6840BFS
Q22-24,29,30,117,128,129	: 2SC1845(F,E)	Q123-126	: 2SA1303*5	D29	: RD7.5JS(B)	IC4	: PST9125NR

SIGNAL LINE
+B LINE
-B LINE

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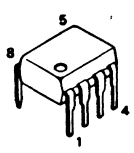
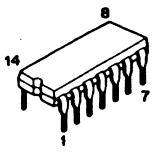
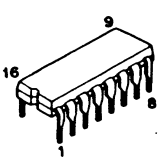


NJM4565D
NJM5532D



UPC4574C



TC4052BP

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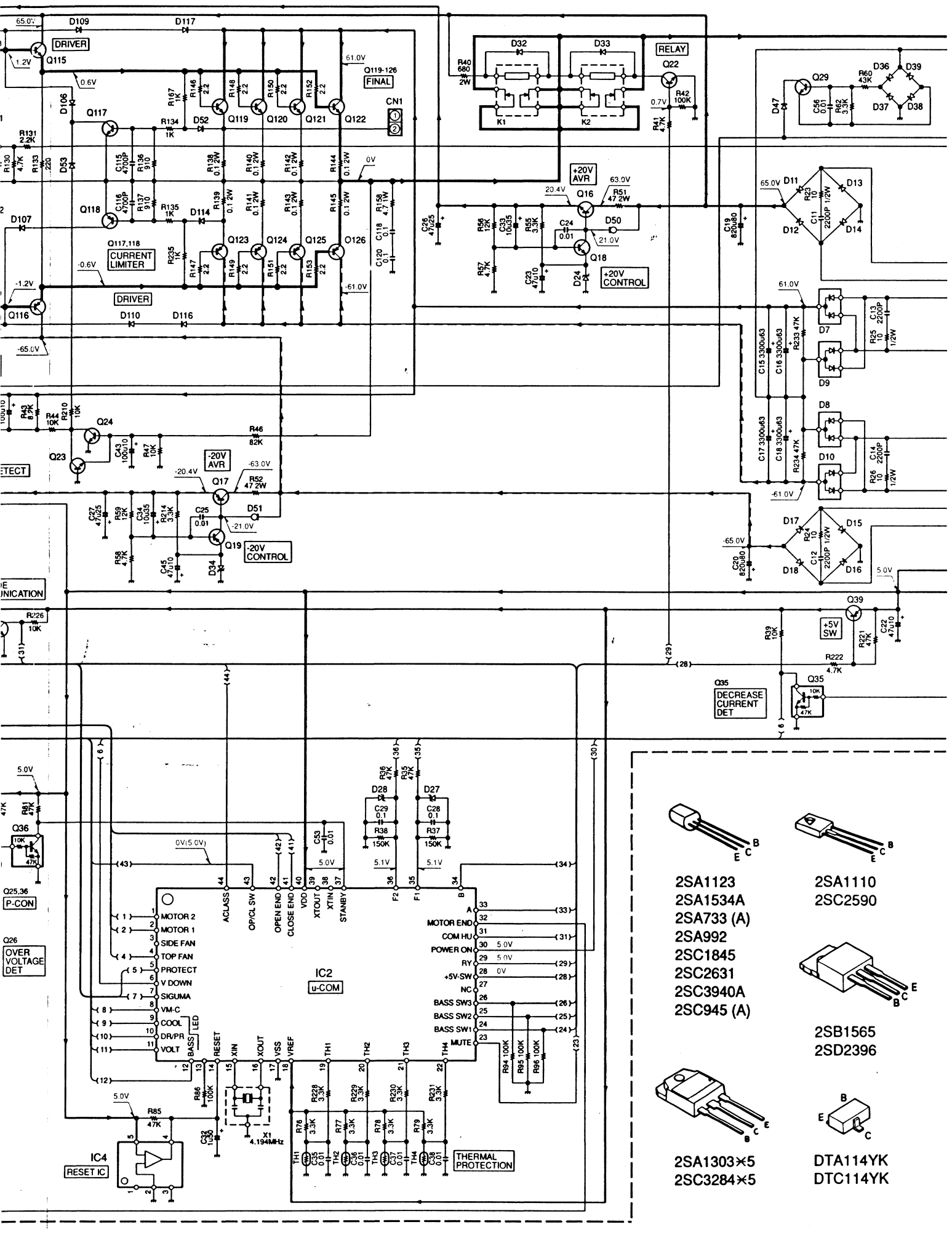
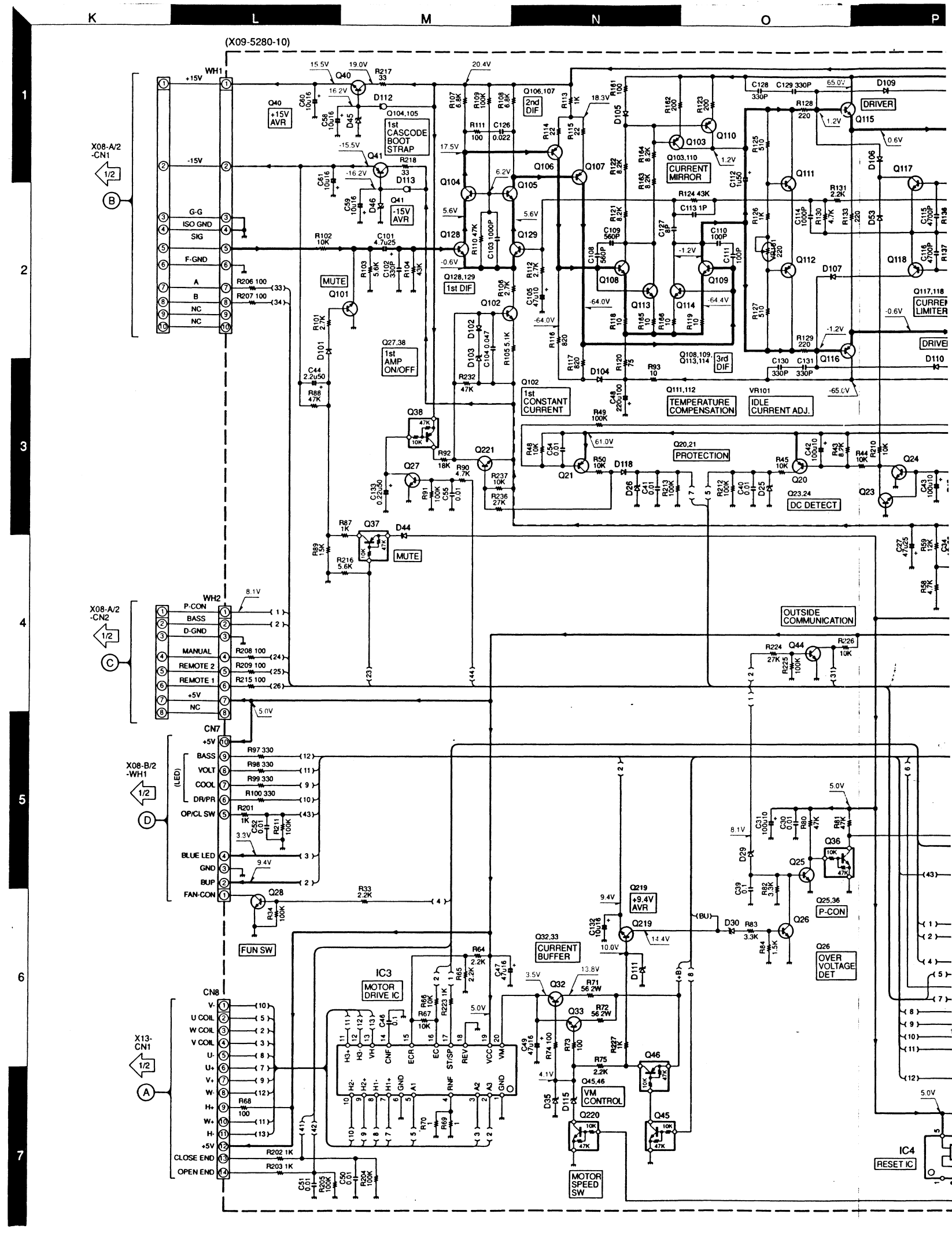

DRIVER
Q115
Q116
Q117
Q118
Q119
Q120
Q121
Q122
Q123
Q124
Q125
Q126
FINAL
Q119-126
CURRENT LIMITER
Q117,118
D109
D110
D116
D117
D106
D107
D114
D52
D53
CN1
RELAY
Q22
D32
D33
K1
K2
+20V AVR
Q16
Q18
D50
+20V CONTROL
Q29
D36
D39
D37
D38
D47
D11
D12
D13
D14
D7
D9
D8
D10
D15
D16
D17
D18
Q24
Q23
-20V AVR
Q17
Q19
D51
-20V CONTROL
D34
Q39
+5V SW
Q35
DECREASE CURRENT DET
IC2
u-COM
MOTOR 2
MOTOR 1
SIDE FAN
TOP FAN
PROTECT
V DOWN
SIGUMA
VM-C
COOL
DR/PR
VOLT
MOTOR END
COM HU
POWER ON
RY
+5V-SW
NC
BASS SW3
BASS SW2
BASS SW1
MUTE
ACLASS
OP/CL SW
OPEN END
CLOSE END
VDD
XTOUT
XTIN
STANBY
RESET
XIN
XOUT
VSS
VREF
X1
4.194MHz
IC4
RESET IC
THERMAL PROTECTION
Q25,36
P-CON
Q26
OVER VOLTAGE DET
Q36
2SA1123
2SA1534A
2SA733 (A)
2SA992
2SC1845
2SC2631
2SC3940A
2SC945 (A)
2SA1110
2SC2590
2SB1565
2SD2396
2SA1303×5
2SC3284×5
DTA114YK
DTC114YK


(X09-5280-10)
WH1
+15V
-15V
G-G
ISO GND
SIG
F-GND
A
B
NC
NC
X08-A/2
-CN1
1/2
Q40
+15V AVR
Q41
-15V AVR
Q104,105
1st CASCODE BOOT STRAP
Q106,107
2nd DIF
Q128,129
1st DIF
Q102
1st CONSTANT CURRENT
Q103,110
CURRENT MIRROR
Q108,109, Q113,114
3rd DIF
Q111,112
TEMPERATURE COMPENSATION
VR101
IDLE CURRENT ADJ.
Q27,38
1st AMP ON/OFF
MUTE
Q20,21
PROTECTION
Q23,24
DC DETECT
DRIVER
CURRENT LIMITER
DRIVE
WH2
P-CON
BASS
D-GND
MANUAL
REMOTE 2
REMOTE 1
+5V
NC
X08-A/2
-CN2
OUTSIDE COMMUNICATION
CN7
BASS
VOLT
COOL
DR/PR
OP/CL SW
BLUE LED
GND
BUP
FAN-CON
X08-B/2
-WH1
(LED)
FUN SW
Q219
+9.4V AVR
Q32,33
CURRENT BUFFER
Q25,36
P-CON
Q26
OVER VOLTAGE DET
IC3
MOTOR DRIVE IC
CN8
V-
U COIL
W COIL
V COIL
U-
U+
V+
W-
H+
W+
H-
+5V
CLOSE END
OPEN END
X13-
CN1
Q45,46
VM CONTROL
MOTOR SPEED SW
IC4
RESET IC

ADJUSTMENT

ADJUSTMENT

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	CASSETTE RECEIVER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
1	IDLE CURRENT	—	Connect a DC voltmeter to CN1 and SP+	VOLUME: 0	VR101	2mV	(a)