ORDER NO. AVS8901154C8

Service Manual

2-channel Power Amplifier

WP-9440

RAMSA

CONTENTS

Panasonic

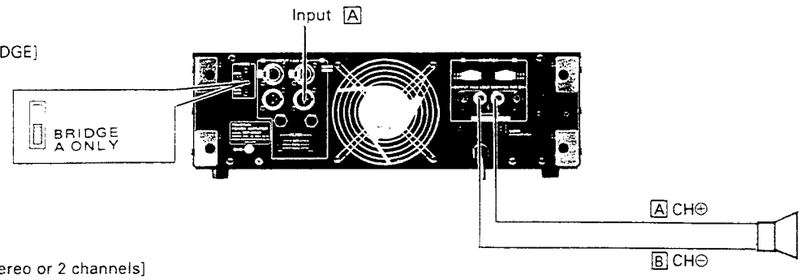
Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

SPECIFICATIONS AND ACCESSORIES

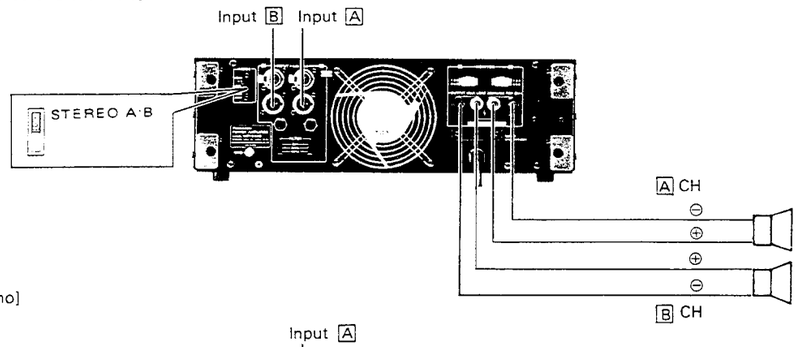
Power Source :	220V/240V AC (selectable, set to 240V AC) 50/60Hz
Power Consumption :	Approx. 1300W at the rated output of 350W + 350W 8Ω
Rated Power Output :	350W + 350W (8Ω Continuous output)
Bridge Output :	700W (16Ω Continuous output)
Frequency Response :	20 to 20KHz ± 1 dB (at rated output)
Total Harmonic Distortion :	Less than 0.1% (8Ω, 350W + 350W, 20 ± 20kHz) Less than 0.2% (Bridge 16Ω, 700W, 20 to 20kHz)
Crosstalk :	More than 60dB (20kHz)
Intermodulation distortion :	Less than 0.1% (8Ω, 350W, 60Hz : 7kHz = 4:1)
Damping Factor :	More than 300 (8Ω, 1kHz)
Signal-to-Noise Ratio :	More than 100 dB (IHF A WTD)
Input Level :	+ 4dB
Voltage Gain :	32.5dB
Input Impedance :	40kΩ (balanced)
Remote Monitor Output : VU meter output : Relay terminals :	 + 14dB 300Ω (7.5kΩ optimum) No-voltage make contact (contact capacity : DC24V 1A)
Connectors :	Input : 3-pin XLR-type connector (male and female) and 1/4" Tip-ring-sleeve phone jack Output : 5-Way binding posts
Dimensions :	480(W) x 149(H) x 486(D) mm (Height includes rubber feet and depth includes rear panel rubber stays.)
Weight :	Approx. 33.5 kg
Finish :	Panel : Black alumite Cabinet : Dull black painting
Standard Accessories :	Filter ..... 2 Operating Instructions 1
Option Accessories (WP-Q02) :	Connector pin ..... 12 Nylon connector ..... 2 Protective cap 2

CONNECTIONS

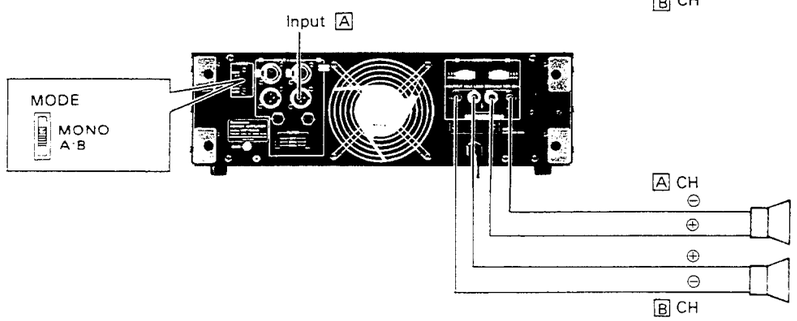
For 1 input: [BRIDGE]



For 2 inputs: [Stereo or 2 channels]



For 1 input: [Mono]



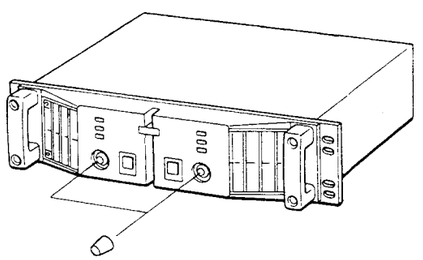
CAUTIONS:

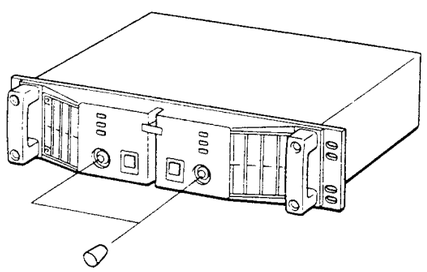
- Connect the speakers after selecting either bridge, mono, or stereo.
- When using bridge connection, never connect the speakers between ⊕ and ⊖ or A CH or B CH.

■ Protective Cap Installation (OPTION WP-Q02)

After adjusting the input level controls, install the protective covers to protect the controls from tampering as follows.

1. Detach the knobs from the front panel.
2. Insert the protective caps (option) in the holes.





■ Connections of Remote Monitor Output Connectors:

(Example)

1 +14dB 300Ω
(optimum impedance 7.5kΩ)

2 Ground

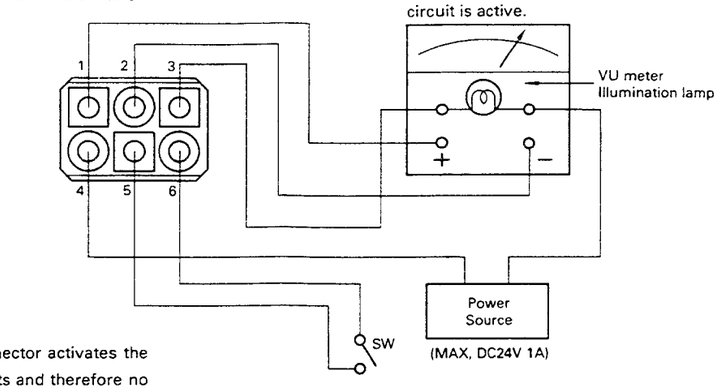
3 Relay contact
4 (contact capacity up to DC24V 1A)
By wiring a lamp to the relay contacts as shown, the lamp will turn off if the amplifier goes into protect mode.

5 } Mute control
6 }

[Monitor output terminals A ,B]

VU meter
(with built-in rectifier)

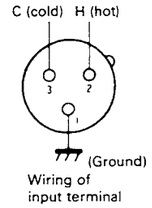
Note:
VU meter will not operate when muting circuit is active.

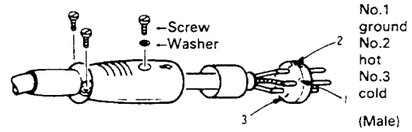


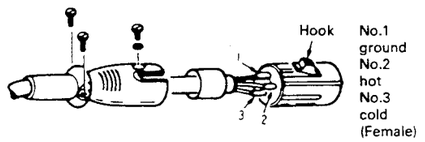
- Shorting together pins 5 and 6 of the connector activates the muting circuit. This opens the relay contacts and therefore no signal may be passed.

■ Connection of Plugs and Connectors:

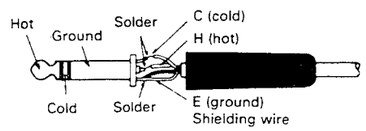
1. Input connector (3-pin XLR-type connectors, male and female)



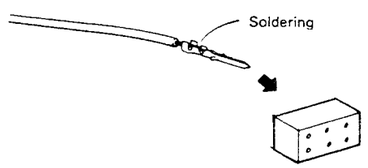




2. Tip-ring-sleeve phone plug

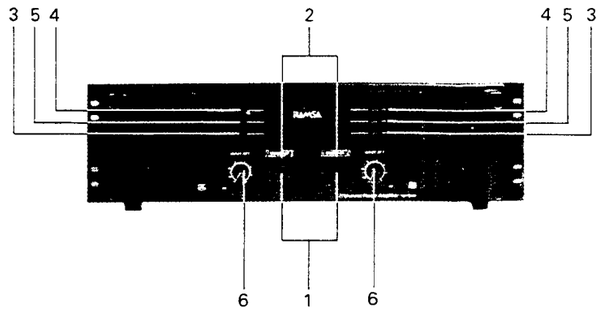


3. Nylon connector for monitor output (6-pin) (option)

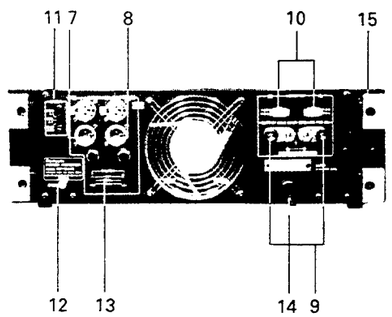


MAJOR OPERATING CONTROLS

● Front Panel:



● Rear Panel:



1. Stand-by switch [STAND BY]
   - Turns on power for each channel.
     WHEN USING AMPLIFIER IN EITHER MONO OR BRIDGE MODE, BOTH STAND-BY SWITCHES MUST BE TURNED ON.

   CAUTION:

   When using the WP-9440 in a system with other equipment such as a mixer, equalizer, crossover, etc., always turn the amplifier on last as switching noise from the other equipment can damage the speakers.
   Similarly, at system power-down always turn the amplifier off first.

2. Stand-by ON indicator lamp [STAND BY] (red)
   Indicates that the amplifier is turned on.

3. Protect indicator lamp [PROTECT] (red)
   This LED indicates that the muting circuit is activated and therefore sound cannot be produced at the output.
   This occurs for 6 to 8 seconds when the amplifier is turned on, and also during overheating or any malfunction that may cause damage to the speakers.

4. Peak level indicator lamp [PEAK (red) [A] , [B]]

   This light indicates that output signal is at clipping level. Should this light come on steadily, adjust accordingly either the output level of the equipment feeding the amplifier input or the amplifier input level control.

NOTE:
Due to the soft clipping characteristic of this amplifier, when occasional flashing of the peak lights occur, there will be no adverse effect on the sound. The result is an increase in apparent headroom.

5. Signal Indicator [SIGNAL (green) [A] , [B]]

   Lights when the signal level reaches −20 dB below the rated output level.

6. Input level control (INPUT ATT [A] , [B])
   - When this control is at "0" the amplifier will reach its rated power output when the input signal is at a level of +4 dB.
   - The calibrated markings on the front panel indicate the amount of attenuation applied to the input signal.
     This allows proper volume setting of the speakers when the input signal source is at its rated level.

7. Input connectors [INPUT [A]] +4 dB, 40 kΩ, balanced
   (XLR Male, XLR Female and Phone Jack)
   - These three input connectors are connected in parallel internally. This allows one signal to be "chained" to multiple power amplifiers.
     Do not connect more than one input signal to these connectors at the same time.

8. Input connectors [INPUT [B]] +4 dB, 40 kΩ, balanced
   (XLR Male, XLR Female and Phone Jack)
   Same as item 7.

9. Output terminals [SPEAKER 8Ω MIN [A] , [B]]

   - 8Ω ..... 350W + 350W (RMS)
   - Bridge ..... 16Ω 700W (RMS)

   - When using in bridge mode, the + side of the [A] CH output terminals becomes the hot side, and the + side of the [B] CH output terminal becomes the cold.

   CAUTIONS:
   - Do not connect the output channels in parallel.
   - When using bridge connection, always use minimum 16Ω speakers. Never connect the speakers between + and − of [A] CH, or + and − of [B] CH.

10. Remote monitor output connector [MONITOR [A] , [B]]
    (6 pin)

    This terminal is used for remote monitoring of amplifier status and remote muting (see page 5).

11. Mode selector, [MODE]

STEREO	[A]	·	[B]
MONO	[A]	·	[B]
BRIDGE	[A]	ONLY	

    When using either MONO Mode or Bridge Mode the input signal must be applied to the [A] Channel only.

12. Ground terminal [GND]

    An external amplifier ground terminal.

13. High pass filter

    A selectable high-pass (low-cut) filter. Setting the filter appropriately protects speakers from DC and low-frequency transients and noise that can get into the system from a variety of sources (banging a microphone, accidentally unplugging the mixer, etc.). It also prevents wasting power on the amplification of inaudible low frequencies. The high pass filter is switchable among off, 20Hz and 40Hz.

14. AC Power cord

    220V/240V AC 50/60 Hz - approx. 2.5m

15. Rear Panel rubber feet.

    These are rubber feet to protect the input and output terminals against damage. However, do not stand the power amplifier on them during performance.

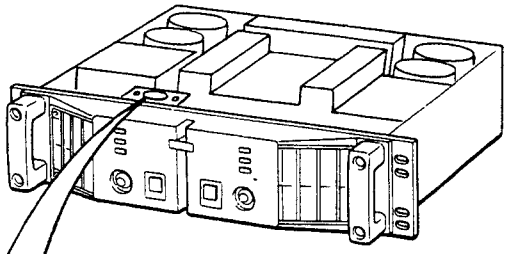
POWER SOURCE VOLTAGE SETTING

At the time of shipment, the WP-9440 is set to 240V AC power supply. Before putting it in operation, check the commercial voltage available in your region, and set the AC voltage selector according to the following procedure. When setting power source voltage, remove upper cover by removing ten screws.

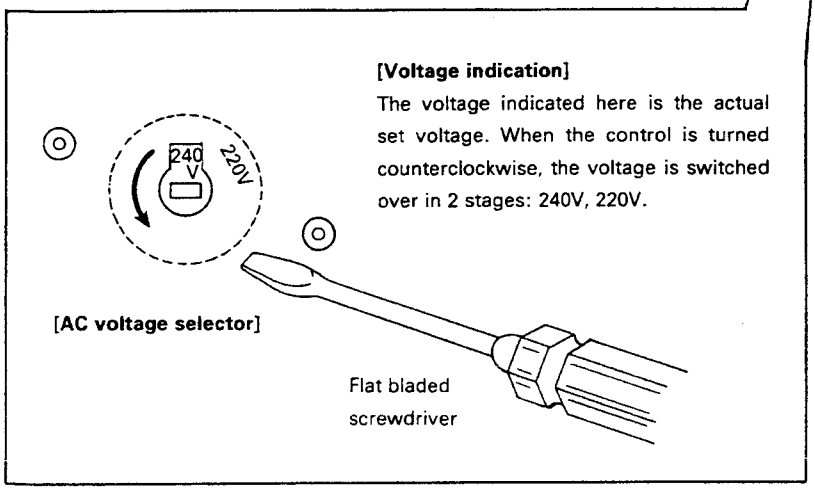
CAUTION:

The following power source voltage setting should be made by qualified service personnel or system installers.

At the time of setting the AC voltage regulator, invariably disconnect the power plug from its power outlet.
If incorrect voltage is set, the instrument may be damaged.
Make sure that the right power is used.



The AC voltage selector is located on the bottom. Set the voltage to the desired voltage as illustrated below.

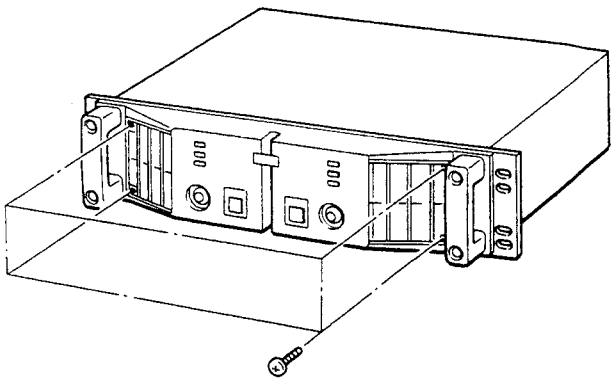


[Voltage indication]
The voltage indicated here is the actual set voltage. When the control is turned counterclockwise, the voltage is switched over in 2 stages: 240V, 220V.

AIR FILTER CLEANING

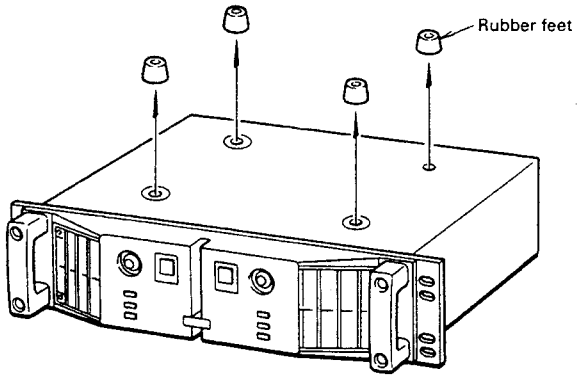
The following air filter cleaning should be made by qualified service personnel or system installers.

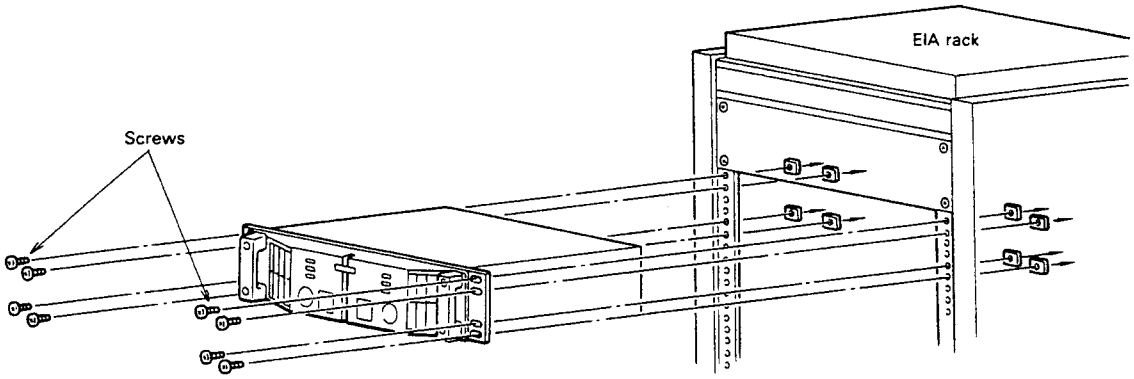
1. Remove the 4 screws and remove the grills.
   *The air filter can now be removed.
2. Wash the filter with water and dry thoroughly.
3. Reinstall the filter and grill in their original position and fasten the screws.



RACK MOUNTING

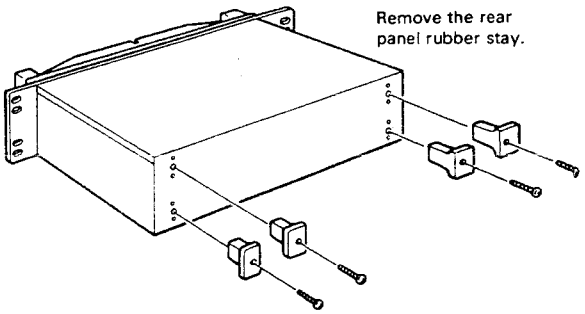
1. Remove the screws and detach the four rubber feet from the bottom.
2. Remove the rear panel rubber stays.
3. Mount the power amplifier to the rack with eight rack mounting screws (M5 × 12).





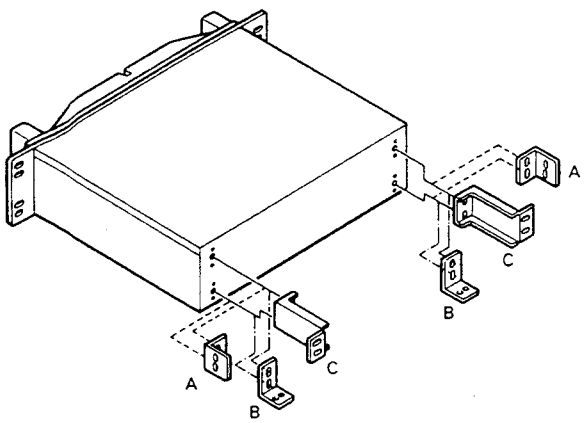
Note:

When transporting the amplifier while mounted in a rack, rear-fixing angles (not provided, locally made) must be installed so that the rear of the amplifier will be secure during transportation. Use an angle with a thickness of at least 2 mm.

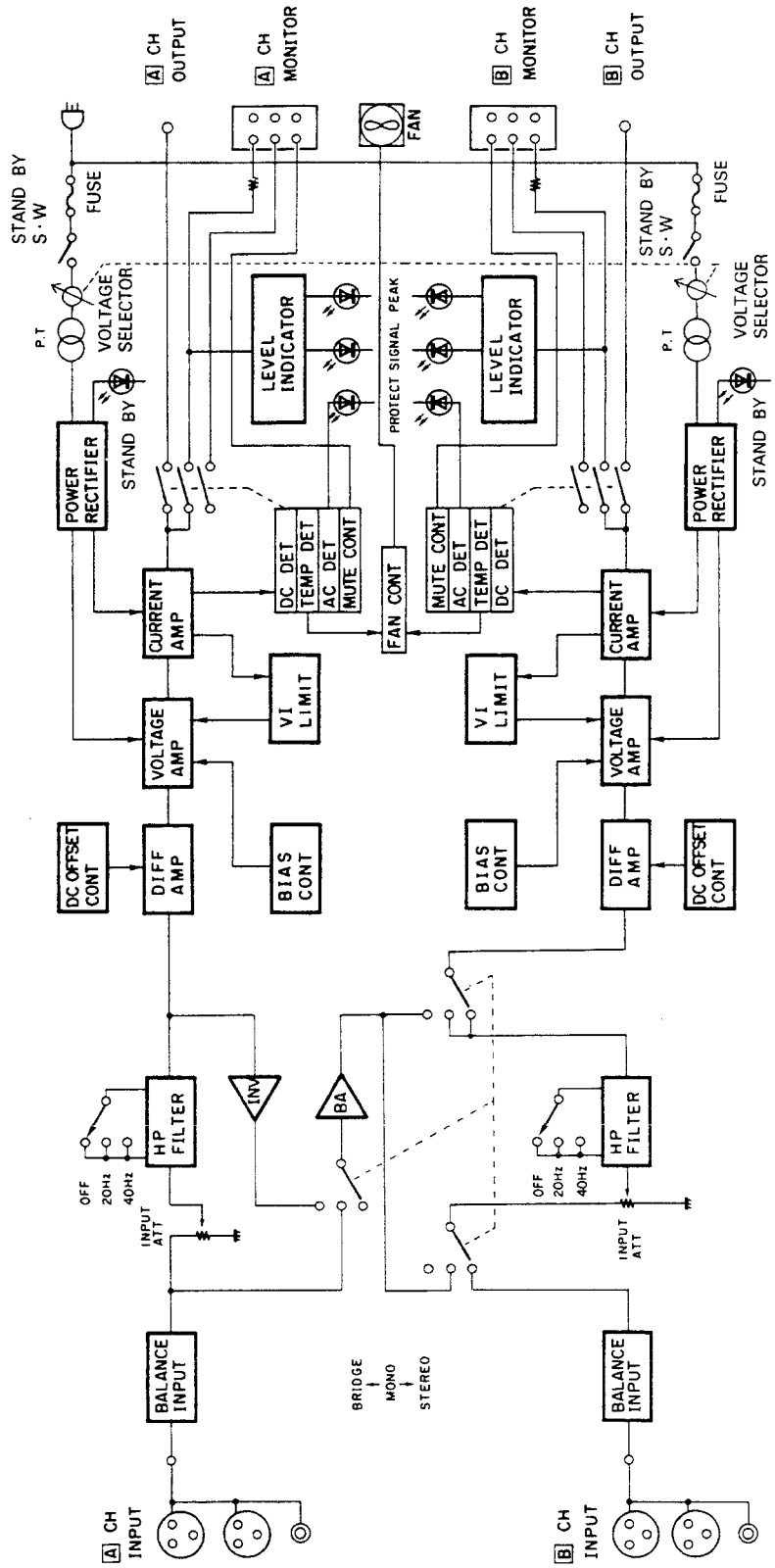


Rear-fixing angle (not provided, locally made) :

A ... Rear-fixing angle for mounting side of rack.
B ... Rear-fixing angle for mounting on bottom of rack.
C ... Rear-fixing angle for mounting on rear of rack.



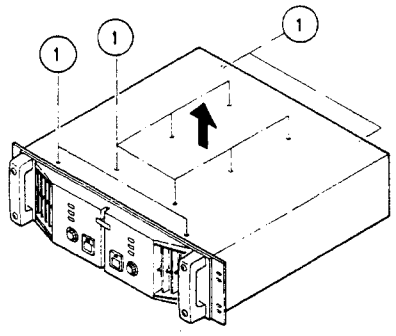
BLOCK DIAGRAM



DISASSEMBLY PROCEDURE

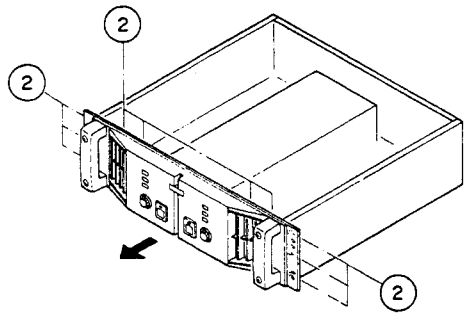
■ UPPER COVER REMOVAL

- Remove ten screws ① and remove the upper cover.



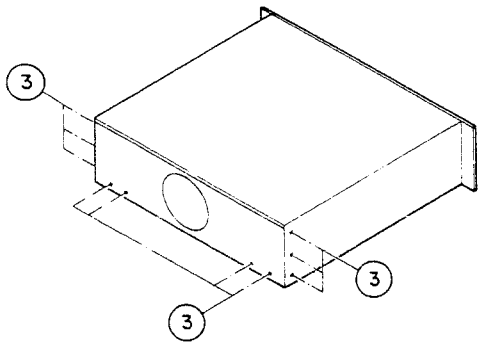
■ FRONT PANEL REMOVAL

- Remove ten screws ② and remove the front panel.



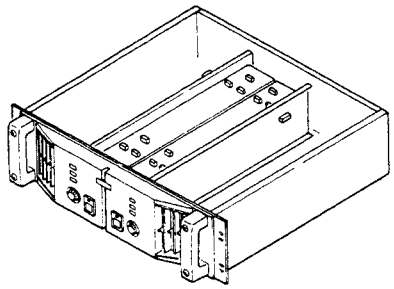
■ REAR PANEL REMOVAL

- Remove ten screws ③ and remove the rear panel.

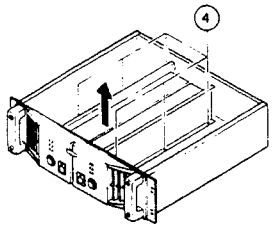


■ HEATSINK BLOCK REMOVAL

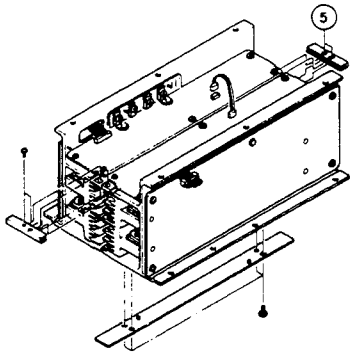
- Disconnect the connectors from Drive circuit board.



- Remove six screws ④ and remove the heatsink block.



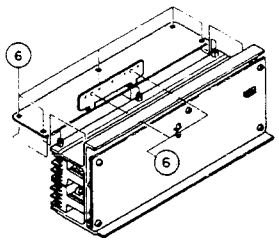
- Disconnect connector CN603 from the circuit board.
- Remove eight screws ⑤ and separate the Ach and Bch block.



■ CIRCUIT BOARD REMOVAL

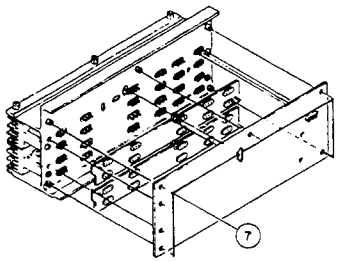
(1) **Power Drive Board Removal**

- Disconnect connector CN301 from the Ach power circuit board.
- Remove seven screws ⑥ and remove the Drive circuit board.
- The Bch Drive circuit board can be removed in the same way.



(2) **Power TR Board Removal**

- Remove five screws ⑦ and unsolder the transistors.



PERFORMANCE CHECK

After performing any repairs to the power amplifier, make the following measurements. Should the measured results differ from those shown, then refer to the adjustment procedures on the indicated pages.

MEASUREMENT	CHANNEL	TEST POINT	RESULT
1. DC OFFSET	CH. A	Voltage between TP301 and TP303 (Ach Power TR Board)	0 Volts
	CH. B	Voltage between TP701 and TP703 (Bch Power TR Board)	
2. BIAS	CH. A	Voltage between TP301 and TP302 (Ach Power TR Board)	8 millivolts (Measure a few minutes after the power switch is initially turned on.)
	CH. B	Voltage between TP701 and TP702 (Bch Power TR Board)	

3. POWER OUTPUT/THD

PROCEDURE :

a) Connect a 8-ohm load across the CHANNEL A speaker output terminals.

b) Set attenuator control on front panel to "0" (maximum).

c) Apply a 20kHz sine wave to the CHANNEL A input (Stereo Mode).

d) Adjust the signal level so that the voltage across the 8-ohm load indicates that the amplifier is at its rated output.
Power level : WP-9440 --------- 53 Volts (350 Watts)

e) Measure THD at the output.
THD should be 0.1 % or less.

f) Repeat steps a) ~ e) for Channel B.

4. After completing measurements 1-3, repeat DC offset measurement, and readjust if necessary.

ADJUSTMENT PROCEDURE

EQUIPMENT NEEDED : DIGITAL DC VOLTMETER

PREPARATION

1. Remove the upper cover. (Refer to "Disassembly Procedure")
2. Do not connect any audio signal to the INPUT TERMINAL.
3. Disconnect the speakers from the output terminals.
4. Then turn the power switch on and allow the amplifiers to warm up for a few minutes.

BIAS ADJUSTMENT

(Perform a few minutes after the power switch is initially turned on.)

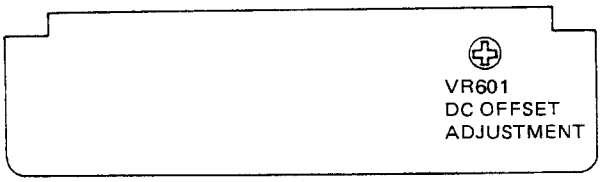
1. Under no signal and no load condition, connect the ⊕ terminal of the digital DC voltmeter to TP301 and the ⊖ terminal to TP302 on the Ach Power TR Board.
2. Adjust VR301(BIAS ADJUSTMENT) on the Ach Power Drive Board so that the voltage becomes +8mV.
3. Connect the ⊕ terminal of the DC voltmeter to TP701 and the ⊖ terminal to TP702 on the Bch Power TR Board and adjust VR701(BIAS ADJUSTMENT) so that the voltage becomes +8mV.

DC OFFSET ADJUSTMENT

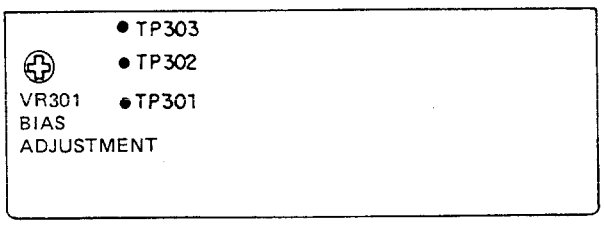
1. Connect the digital DC voltmeter between TP301 and TP303 on the Ach Power TR Board.
2. Adjust VR201(DC OFFSET ADJUSTMENT) in the Ach Power TR Board so that voltage becomes 0V.
3. Connecting the digital DC voltmeter between TP701 and TP703 on the Bch Power TR Board and adjust VR601(DC OFFSET ADJUSTMENT) on the Bch Power TR Board so that voltage becomes 0V.

Ach Power Drive Board

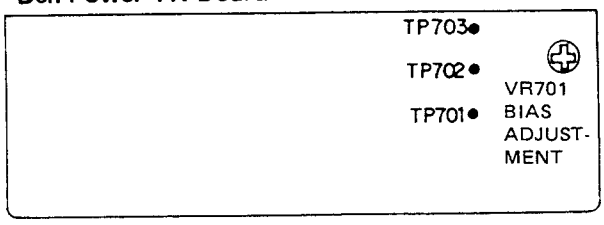
Bch Power Drive Board



Ach Power TR Board



Bch Power TR Board



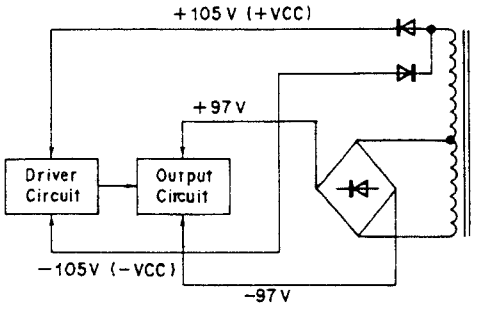
TECHNICAL EXPLANATION

■ SUPERRAIL SYSTEM

Two separate power supply voltages are used; a ±105 volts supply for the front-end/drive circuit, and a ±97 volts supply for the output circuit. This high-voltage drive stage greatly reduces the possibility of a signal becoming distorted before it even reaches the output stage.

Since the inherent distortion is so low, the amount of negative feedback used is kept to a minimum.

Negative feedback is commonly used to improve the stability of an amplifier, but in doing so may cause some degradation of the sound quality. So by using the superrail system and minimal negative feedback, the sound quality is good even when the amplifier is driven to clipping level, and the high level of stability results in more reliable operation and longer amplifier life.



(Fig.1)

■ VOLTAGE BOOSTER CIRCUIT

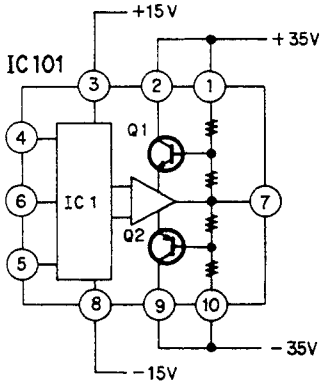
A typical amplifier circuit is shown in Fig. 3. In this case, a bipolar ±15 volts is applied to the power supply pins of the op-amp. The total voltage across the op-amp's power supply pins is therefore 30 volts. As a result, the maximum signal level available from the output before distortion due to clipping is 30 volts p-p.

In this type of op-amp, 30 volts is commonly the maximum voltage which may be safely applied to the power supply pins. The maximum distortion-free output signal is limited by this supply voltage.

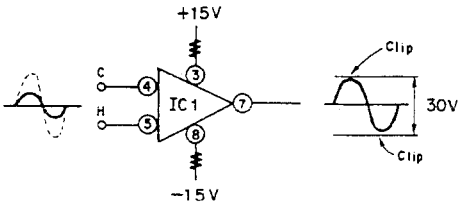
By using a varied power supply voltage which is based on the output signal of the IC, a larger non-distorted output signal can be obtained, even when remaining within the 30 volts safe operating area of the IC. This is accomplished by using Q1 and Q2 to control the voltage supplied to the op-amp. When a positive-going signal is present at the input of IC1, the positive-going output of the IC is applied to the base of Q1. Q1, being an NPN, will conduct more as the voltage rises, causing the voltage at pin 8 to also rise. Q2 acts in the same manner during the negative-going phase of the signal.

Since Q2 is a PNP, as the output signal moves toward its negative peak, the voltage present at pin 4 will increase in the negative direction.

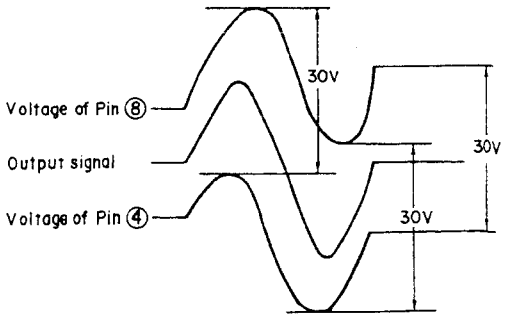
The result of this configuration is that the output signal will never distort due to clipping because the power supply voltage is always greater than the output voltage, yet the total voltage across the power supply pins of the IC will never exceed its safe operating area of 30 volts. (See Fig. 4)



(Fig , 2)



(Fig.3)

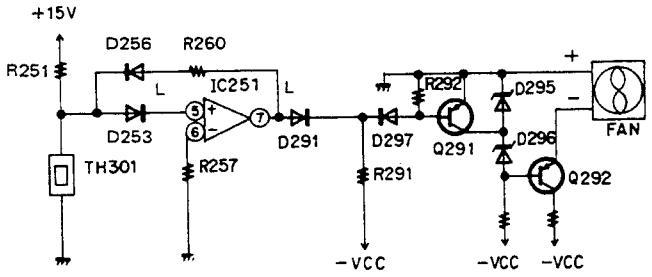


(Fig.4)

■ FAN CONTROL CIRCUIT

At normal operating temperature, the resistance of the thermistor is low. The resulting low voltage at pin 5 of IC251 causes the voltage of pin 7 to go low. This turns Q291 on, effectively putting a short-circuit across zener diode D295. The voltage across D296 is then applied to the base of Q292, which supplies the low level of current required to run the fan at low speed.

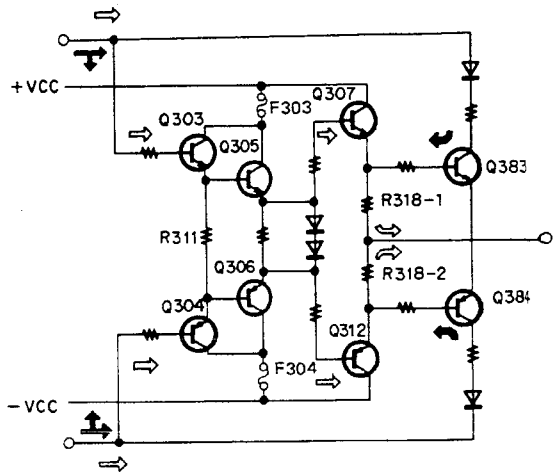
As the amplifier heats up, the resistance of the thermistor increases, causing the voltage at pin 5 of IC251 to rise to the point at which pin 7 goes high. this turns Q291 off, causing the voltage across D295 + D296 to be applied to the base of Q292. This increase in forward-bias results in a higher current flow which rotates the fan at high speed.



■ VOLTAGE/CURRENT DETECTION PROTECTION CIRCUIT

This circuit protects the output transistors.
If there is an overload or output short by allowing a portion of the input signal to bypass the output transistors.

Note : Output transistors Q308 ~ Q310, Q313 ~ Q315, Q321 ~ Q324 and Q326 ~ Q329 are not shown.



Overload or output short

↓

Excessive current flows through output transistors.

↓

Voltage across R318 increases.

↓

Q383 and Q384 turned on.

↓

Input signal flows through Q383 and Q384.

↓

Output transistors input signal decreases.

↓

Current flow through output transistors decreases.

Note : The above diagrams refer to "A" channel only.
Operation of "B" channel Voltage/Current Detection Protection Circuit is the same.
Refer to schematic diagram for correct component reference numbers.

■ MUTING CIRCUIT

The amplifier output is operational 6 to 8 seconds after the power switch is turned on, and is disconnected immediately when the power switch is turned off.
This prevents any electrical click noise from occurring when the amplifier is turned on and off.

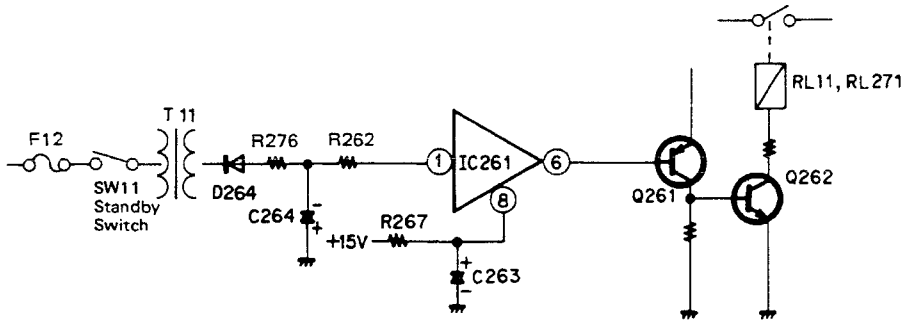


Fig. 2

Power switch is turned on

↓

IC261 Pin ⑥ goes high

↓

Q261 is turned off

↓

Q262 is turned off

↓

Relay RL11 is open

↓

C263 starts to charge

↓

IC261 Pin ⑧ voltage gradually increases

↓

After 5 to 8 seconds, IC261 Pin ⑧ reaches its reference level (approx. 1.4 volts)

↓

IC261 Pin ⑥ goes low

↓

Q261 turns on

↓

Q262 turns on

↓

Relay RL11 closes, allowing signal to pass to output

Power switch is turned off

↓

IC261 Pin ① voltage goes positive

↓

IC261 Pin ⑥ goes high

↓

Q261 turns off

↓

Q262 turns off

↓

Relay RL11 opens, disconnecting signal from output

↓

Amplifier main power supply discharges

Note : The above diagrams refer to "A" channel only.
Operation of "B" channel Muting Circuit is the same.
Refer to schematic diagram for correct component reference numbers.

■ DC DETECTION CIRCUIT

This circuit protects the speakers by disconnecting the output if a DC component is present at the output.

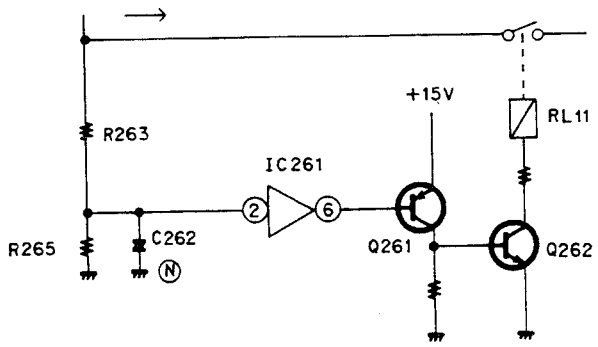
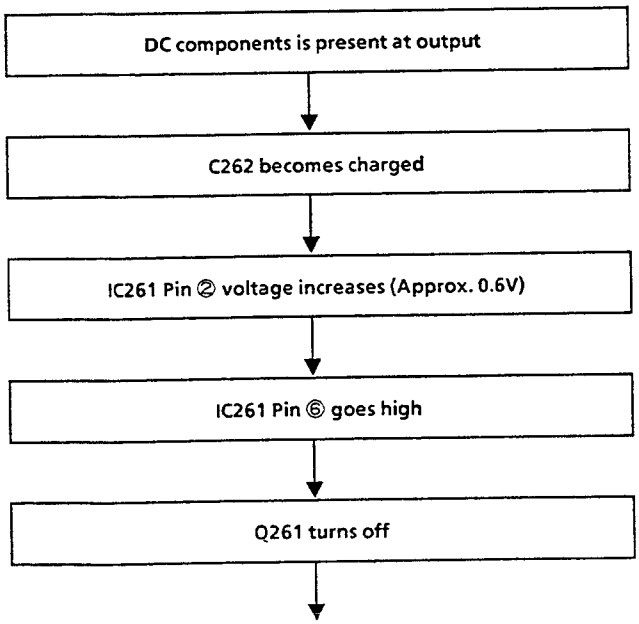
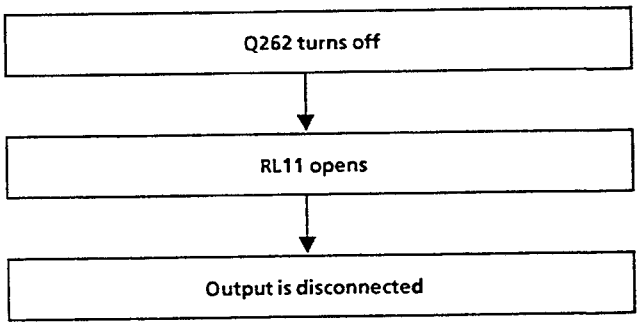


Fig. 3

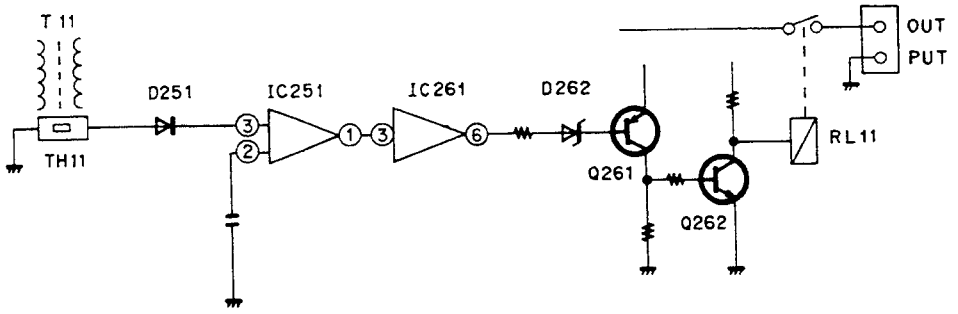


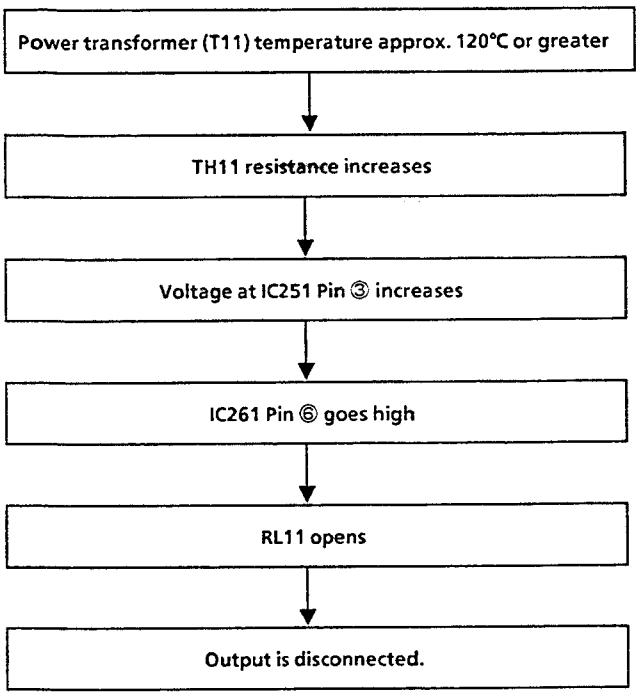


Note : The above diagrams refer to "A" channel only. Operation of "B" channel DC Detection is the same. Refer to schematic diagram for correct component reference numbers.

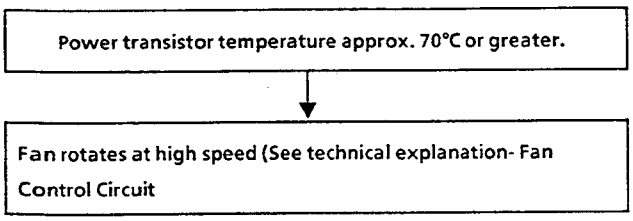
■ TEMP. DETECTION CIRCUIT

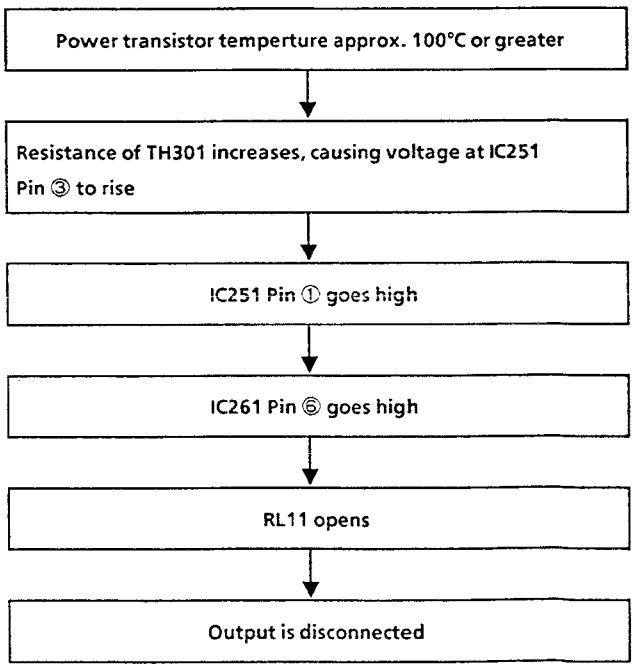
This circuit protects the output transistors and power transformer by disconnecting the output if they begin to overheat.





The left diagram refers to "A" channel only.
Refer to schematic diagram for correct component reference numbers.





Note : The above diagrams refer to "A" channel only.
Operation of "B" channel DC Detection is the same.
Refer to schematic diagram for correct component reference numbers.

ADDRESS INFORMATION OF CONDUCTOR VIEW

Fan Control Board

Q291	H3
D293	H3
D294	H3
D295	H3
D296	H3
D297	H3

Ach LED Board

Q411	I11
Q412	I11
Q413	H11
Q414	I11
Q415	I12
D411	I11
D412	I11
D413	I12
D414	I11
D415	I11

Bch LED Board

Q811	E12
Q812	E12
Q813	D11
Q814	E11
Q815	E11
D811	E12
D812	D11
D813	D11
D814	E11
D815	D11

Ach Muting Board

IC261	H12

Bch Muting Board

IC661	C13

Ach Temp Detect Board

IC251	H11
D251	H11
D252	G11
D253	G11
D254	H11
D255	G11
D256	G11

Bch Temp Detect Board

IC651	C11
D651	C11
D652	C11
D653	C11
D654	C11
D655	C11
D656	C11

Ach Power Drive Board

IC201	I8
IC241	I6
IC242	I7
Q201	I9
Q202	I9
Q203	I8
Q204	I8
Q241	I7
Q242	I7
Q261	I5
Q262	I5
Q292	I6
D205	I9
D206	I9
D207	I9
D208	I9
D241	I7
D242	I8
D261	I7
D262	I5
D263	I6
D264	I5
D265	I5
D266	I5
D281	I5
D282	I6
D283	H5
D291	I6

Bch Power Drive Board

IC601	D8
IC641	D6
IC642	D7
Q601	D9
Q602	D9
Q603	E8
Q604	E8
Q641	E7
Q642	E7
Q661	D5
Q662	D5
D605	D9
D606	D9
D607	E9
D608	E9
D641	E7
D642	E8
D661	D7
D662	D5
D663	D6
D664	D5
D665	E5
D681	E6
D682	E6
D683	E5
D691	D6

Ach Power TR Board

Q303	G9
Q304	G9
Q305	G9
Q306	G9
Q307	G8
Q308	G7
Q309	G6
Q310	G5
Q312	G8
Q313	G7
Q314	G6
Q315	G5
Q317	F9
Q318	F9
Q319	F9
Q320	F9
Q321	F8
Q322	F7
Q323	F6
Q324	F5
Q326	F8
Q327	F7
Q328	F6
Q329	F5
Q331	G10
Q332	G7
Q381	H5
Q382	G5
Q383	H5
Q384	G5
D305	G7
D306	G7
D307	G9
D308	G9
D311	F7
D312	F7
D381	H5
D382	G4
D383	H5
D384	G5

Ach Input Board

IC101	H1
IC102	I3
D101	I2
D102	I2
D103	I2
D104	I2
D105	I3
D106	I3
D107	I3
D108	I3

Ach Power LED Board

D240	I12

Bch Power TR Board

Q703	B5
Q704	B5
Q705	B5
Q706	B5
Q707	B6
Q708	B7
Q709	B9
Q710	B9
Q712	B6
Q713	B7
Q714	C9
Q715	B9
Q717	A5
Q718	B5
Q719	A5
Q720	B5
Q721	A6
Q722	A7
Q723	A9
Q724	A9
Q726	B6
Q727	B7
Q728	B9
Q729	B9
Q731	B4
Q732	B8
Q781	C10
Q782	C10
Q783	C9
Q784	C9
D705	B8
D706	B8
D707	C5
D708	C5
D711	B8
D712	B8
D781	C10
D782	C10
D783	C9
D784	C9

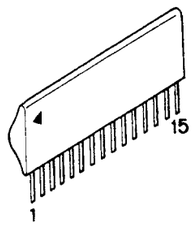
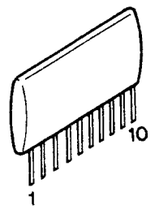
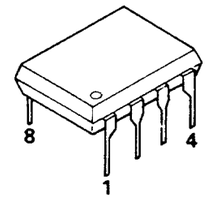
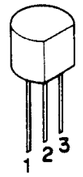
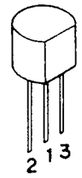
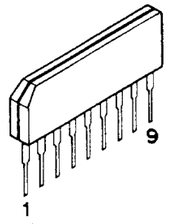
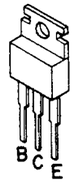
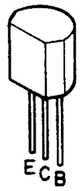
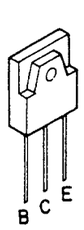
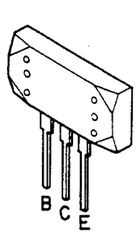
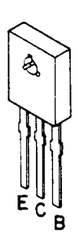
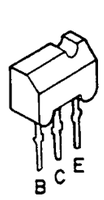
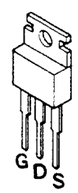
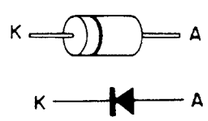
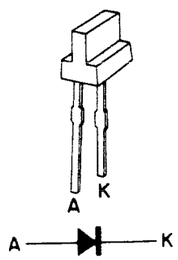
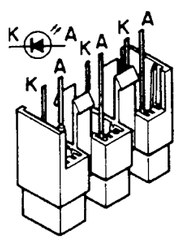
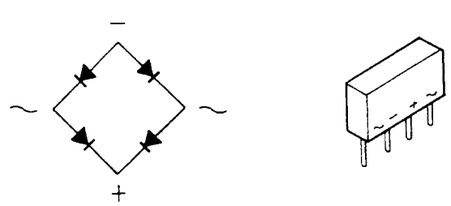
Bch Input Board

IC501	A1
IC502	B3
D501	B2
D502	B2
D503	B2
D504	B2
D505	B3
D506	B3
D507	A2
D508	A2

Bch Power LED Board

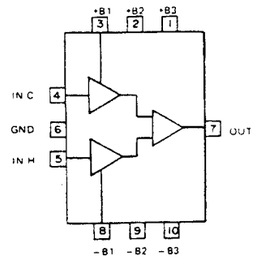
D640	E12

APPEARANCE OF IC, TRANSISTOR AND DIODE

YWMC5707A 	YWMC8134B 	YWNJM2068DD YWUPC4570C 	YWNJM78L15A  1 : IN 2 : GND 3 : OUT
YWNJM79L15A  1 : IN 2 : GND 3 : OUT	YWTA7317P 	2SA1006B-PQ 2SA968B-0Y 2SB940A-PQ 2SC2336B-PQ 2SD1264A-PQ YW2SC2238B0Y 	2SA1123-RS 2SA1127-ST 2SC2631-RS 
2SA1294-0Y 2SC3263-0Y 	2SA1295M0Y 2SC3264M0Y 	2SA794-RS 2SC1567-RS 	2SB788-RS 
2SJ117 2SK310 	MA165 MA167 YWAM01V0 YWHZS12EB2 YWHZS16EB2 YWHZS33EB2 YWHZS39EB1 YWHZS6R2EB2 YWHZS6R8EB2 1SS82 		YWRB154F 
LN217RP 	LN031335PH 		

BLOCK DIAGRAM OF ICs

YWMC8134B



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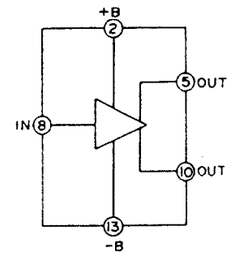

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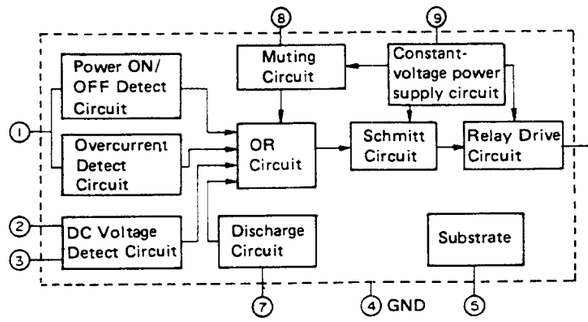


ADDRESS INFORMATION OF SCHEMATIC DIAGRAM

Fan Control Board

Q291	C6
D293	C6
D294	C6
D295	C6
D296	C6
D297	C6

Ach LED Board

Q411	D3
Q412	D3
Q413	D3
Q414	D3
Q415	D3
D411	D3
D412	D3
D413	D3
D414	D3
D415	D3

Bch LED Board

Q811	A3
Q812	A3
Q813	A3
Q814	A3
Q815	A3
D811	A3
D812	A2
D813	A2
D814	A2
D815	A3

Ach Muting Board

IC261	C4

Bch Muting Board

IC661	B4

Ach Temp Detect Board

IC251	C4
D251	C4
D252	C4
D253	C4
D254	C4
D255	C4
D256	C4

Bch Temp Detect Board

IC651	A4
D651	A4
D652	A4
D653	A4
D654	A4
D655	A4
D656	A4

Ach Power Drive Board

IC201	E4
IC241	D4
IC242	D4
Q201	E5
Q202	D5
Q203	E5
Q204	E5
Q241	D4
Q242	D4
Q261	D5
Q262	D5
Q292	C5
D205	E5
D206	E5
D207	E5
D208	E5
D241	D4
D242	D4
D261	D5
D262	D5
D263	D5
D264	D5
D265	D5
D266	D5
D281	E5
D282	D5
D283	D5
D291	C5

Bch Power Drive Board

IC601	C4
IC641	B4
IC642	B4
Q601	B5
Q602	B5
Q603	B5
Q604	B5
Q641	B4
Q642	B4
Q661	B5
Q662	B5
D605	B5
D606	B5
D607	B5
D608	B5
D641	B4
D642	B4
D661	A4
D662	B5
D663	A5
D664	B5
D665	B5
D681	B5
D682	B5
D683	B5
D691	A5

Ach Power TR Board

Q303	E6
Q304	E6
Q305	E6
Q306	E6
Q307	E6
Q308	E6
Q309	E7
Q310	E7
Q312	E6
Q313	E6
Q314	E7
Q315	E7
Q317	D6
Q318	D6
Q319	D6
Q320	D6
Q321	D6
Q322	D6
Q323	D7
Q324	D7
Q326	D6
Q327	D6
Q328	D7
Q329	D7
Q331	D7
Q332	D7
Q381	E7
Q382	E7
Q383	E7
Q384	E7
D305	E6
D306	E6
D307	E7
D308	D7
D311	D7
D312	D7
D381	E7
D382	E7
D383	E7
D384	E7

Ach Input Board

IC101	E2
IC102	E3
D101	E2
D102	E2
D103	E2
D104	E2
D105	E2
D106	E2
D107	E3
D108	E3

Ach Power LED Board

D240	C5

Bch Power TR Board

Q703	C6
Q704	B6
Q705	C6
Q706	B6
Q707	C6
Q708	C6
Q709	C7
Q710	C7
Q712	B6
Q713	B6
Q714	B6
Q715	B7
Q717	B6
Q718	B6
Q719	B6
Q720	B6
Q721	B6
Q722	B6
Q723	B6
Q724	B7
Q726	B6
Q727	B6
Q728	B6
Q729	B6
Q731	B7
Q732	B7
Q781	C7
Q782	B7
Q783	B7
Q784	B7
D705	B6
D706	B6
D707	B7
D708	B7
D711	B6
D712	B6
D781	C7
D782	B7
D783	B7
D784	B7

Bch Input Board

IC501	B2
IC502	B3
D501	B2
D502	B2
D503	B2
D504	B2
D505	B3
D506	B3
D507	B3
D508	B3

Bch Power LED Board

D640	A5

REPLACEMENT PARTS LIST

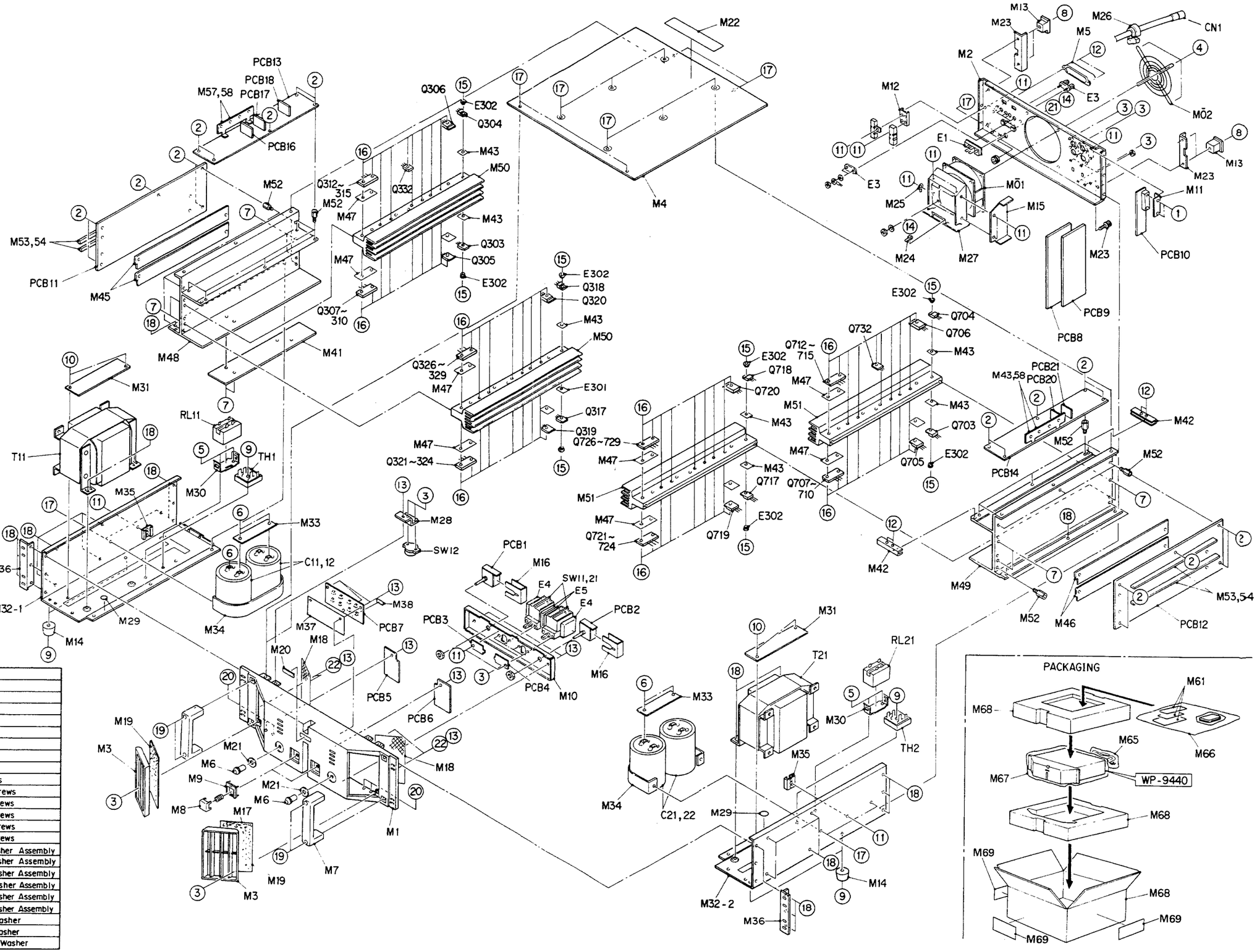
Important Notice

1. Components identified by "⚠" mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
2. Printed circuit board assembly with mark (NLA) is no longer available after production discontinuation of the complete set.

REF.NO.	PART NO.	DESCRIPTION	
MISCELLANEOUS			
Q303	2SC2336B-PQ	Transistor	
Q304	2SA1006B-PQ	Transistor	
Q305	2SC3263-0Y	Transistor	
Q306	2SA1294-0Y	Transistor	
Q307-310	2SC3264M0Y	Transistor	
Q312-315	2SA1295M0Y	Transistor	
Q317	2SC2336B-PQ	Transistor	
Q318	2SA1006B-PQ	Transistor	
Q319	2SC3263-0Y	Transistor	
Q320	2SA1294-0Y	Transistor	
Q321-324	2SC3264M0Y	Transistor	
Q326-329	2SA1295M0Y	Transistor	
Q332	2SC1567-RS	Transistor	
Q703	2SC2336B-PQ	Transistor	
Q704	2SA1006B-PQ	Transistor	
Q705	2SC3263-0Y	Transistor	
Q706	2SA1294-0Y	Transistor	
Q707-710	2SC3264M0Y	Transistor	
Q712-715	2SA1295M0Y	Transistor	
Q717	2SC2336B-PQ	Transistor	
Q718	2SA1006B-PQ	Transistor	
Q719	2SC3263-0Y	Transistor	
Q720	2SA1294-0Y	Transistor	
Q721-724	2SC3264M0Y	Transistor	
Q726-729	2SA1295M0Y	Transistor	
Q732	2SC1567-RS	Transistor	
D11	YWRB2506	Diode	
D21	YWRB2506	Diode	
TH11	ERPF3B1M101A	Thermistor	
TH21	ERPF3B1M101A	Thermistor	
TH301	YWTH487BH471	Thermistor	
TH701	YWTH487BH471	Thermistor	
R295,296	ERF20HMJ820	Wire Wound	82 ohms 20W
C11,12	ECEG105Y303T	Electrolytic	30000 μF 105V
C13	ECQU2A333MF	Plastic	0.033 μF 100V
C14	ECQU2A333MN	Plastic	0.033 μF 100V
C21,22	ECEG105Y303T	Electrolytic	30000 μF 105V
C23	ECQU2A333MF	Plastic	0.033 μF 100V
C24	ECQU2A333MN	Plastic	0.033 μF 100V
T11 ⚠	YWAPTA0051A4	Power Transformer for A ch	
T21 ⚠	YWAPTA0052A4	Power Transformer for B ch	
RL11	YWG5D1142T25	Relay for A ch	
RL21	YWG5D1142T25	Relay for B ch	
SW11 ⚠	ESB99887V	Standby Switch	
SW12 ⚠	ESE37280	Power Selection Switch	
SW21 ⚠	ESB99887V	Standby Switch	

REF.NO.	PART NO.	DESCRIPTION
F12 ⚠	XBA2E150NS1	Current Fuse 15A 250V
F22 ⚠	XBA2E150NS1	Current Fuse 15A 250V
MO1	YWCNDC24B491	DC Motor
MO2	YWFG102	DC Motor Guide
CN1 ⚠	YWAACA0003A4	AC Power Cord
E1	YWFDC1142PAC	Terminal
E2	YWTN040B	Speaker Terminal
E3	YWUB0029	Terminal
E4	YW820731	Insulator Cover A for Capacitor
E5	YW821135	Insulator Cover B for Capacitor
E301	N0.18D	Insulator
E302	N0.24	Insulator
M1	YWA5WB0710A1	Front Panel
M2	YWA5WC0718A2	Rear Panel
M3	YWA5WA0719A3	Panel
M4	YWA5EA0481A2	Upper Cover
M5	YWA5EA0482A3	SP Terminal Cover
M6	YWA5RA0127A3	VR Knob(X2)
M7	YWA6AA0012A3	Handle
M8	YWA6JA0009A3	Switch Button
M9	YWA6JA0027C2	Switch Guide
M10	YWA2SA1070A3	Front Sub Panel
M11	YWA2SA1071A4	Mounting Angle for Switch
M12	YWA2SA1127A4	Mounting Angle for Resistor
M13	YWA5LA0027B4	Rubber Foot (X4)
M14	YWS-WB03	Rubber Foot
M15	YWA2HA0488A4	Shield Parts for Fan
M16	YWA2HA0506A4	Shield Parts for VR
M17	YWA4JA0115A4	Spring for Switch Button
M18	YWA5SA0151A4	VentiLation Net
M19	YWA3AA0092A4	Dust Proof Parts(X2)
M20	YWA7QB0885A4	Main Label
M21	YWA7RA0013A4	Scale Plate
M22	YWA7SA0980A4	Caution Label
M23	YWA2SA1220A4	Mounting Angle
M24	YWCS1	Cord Clamp A
M25	YWCS4	Cord Clamp B
M26	YWSR6W1	Cord Clamp C
M27	YWA2EA0075A2	Fan Duct
M28	YWA2SA1410A4	Mounting Angle for Relay
M29	YWA7SA0689A4	Earth Label
M30	YWR9907G5D	Mounting Base for Relay
M31	YWA5EA0483A4	Cover for Power Transformer
M32-1	YWA5KA0704A1	A CH Mounting Angle
M32-2	YWA5KA0705A1	B CH Mounting Angle

EXPLODED VIEW



○ Number Show Screws

No.	Screws	Description
①	XSB26+4FX	Binding Head Screws
②	XSB3+4FX	Binding Head Screws
③	XSB3+6FZ	Binding Head Screws
④	XSB3+45FZ	Binding Head Screws
⑤	XSB4+4FX	Binding Head Screws
⑥	XSB4+6FN	Binding Head Screws
⑦	XSB4+8FX	Binding Head Screws
⑧	XSB4+25FZ	Binding Head Screws
⑨	XSN4+16FX	Pan Head Machine Screws
⑩	XTB3+4FFX	Binding Head Tapping Screws
⑪	XTB3+6FFZ	Binding Head Tapping Screws
⑫	XTB3+8FFX	Binding Head Tapping Screws
⑬	XTB3+8JFX	Binding Head Tapping Screws
⑭	XTB3+15FZ	Binding Head Tapping Screws
⑮	XYN3+F8FX	Machine Screws and Washer Assembly
⑯	XYN3+F12FX	Machine Screws and Washer Assembly
⑰	XYM4+E8FZ	Machine Screws and Washer Assembly
⑱	XYM5+C10FZ	Machine Screws and Washer Assembly
⑲	XYM5+C55FZ	Machine Screws and Washer Assembly
⑳	XYM4+E10FX	Machine Screws and Washer Assembly
㉑	XWG3FZ	Polished Round Plain Washer
㉒	XWG4FX	Polished Round Plain Washer
㉓	XWC4AFX	External Toothed Lock Washer

PACKAGING

REF.NO.	PART NO.	DESCRIPTION
M33	YWA2QA0096A4	Electrode
M34	YWA2CA0212B3	Hold Plate for Capacitor
M35	YWA2CA0213A4	Hold Angle for Capacitor
M36	YWA2SA1214A4	Mounting Angle
M37	YWA2PA0321A4	Insulator
M38	YWA7SA0678A4	Fuse Label
M41	YWA2SA1068A4	Mounting Angle
M42	YWA2SA1069A4	Mounting Angle(X2)
M43	YWAC-256	Insulator
M44	YWAC254	Insulator
M45	YWA2NA0173B3	Spacer
M46	YWA2NA0174B3	Spacer
M47	YWA2PA0247A4	Insulator(X32)
M48	YWA7DA0174A2	Heat Sink A
M49	YWA7DA0175A2	Heat Sink B
M50	YWA7DA0176A3	Heat Sink C
M51	YWA7DA0177A3	Heat Sink D
M52	YWA1EA0082A4	Special Screw(X10)

VR A CH BOARD

PCB1 (NLA)	YWP9440PPE1	Printed Circuit Board Assy
VR101	YWAVRA0060A4	Variable Resistor

VR B CH BOARD

PCB2 (NLA)	YWP9440PPE2	Printed Circuit Board Assy
VR501	YWAVRA0060A4	Variable Resistor

POWER LED A CH BOARD

PCB3 (NLA)	YWP9440PPE3	Printed Circuit Board Assy
D401	LN217RP	LED
M55	YWE8010FR02A	Parts Holder

POWER LED B CH BOARD

PCB4 (NLA)	YWP9440PPE4	Printed Circuit Board Assy
D801	LN217RP	LED
M55	YWE8010FR02A	Parts Holder

REF.NO.	PART NO.	DESCRIPTION

LED A CH BOARD

PCB5 (NLA)	YWP9440PPE5	Printed Circuit Board Assy	
Q411,412	2SC2631-RS	Transistor	
Q413	2SA1123-RS	Transistor	
Q414,415	2SC2631-RS	Transistor	
D411	1SS82	Diode	
D412	YWHZS6R8EB2	Diode	
D413,414	1SS82	Diode	
D415	LN031335PH	LED	
R411	ERDS2TJ473	Carbon	47K ohms 1/4W
R412	ERDS2TJ224	Carbon	220K ohms 1/4W
R413	ERDS2TJ333	Carbon	33K ohms 1/4W
R414	ERG1SJ183P	Metal	18K ohms 1W
R415	ERDS2TJ472	Carbon	4.7K ohms 1/4W
R416	ERDS2TJ393	Carbon	39K ohms 1/4W
R417	ERDS2TJ104	Carbon	100K ohms 1/4W
R418	ERDS2TJ103	Carbon	10K ohms 1/4W
R419	ERDS2TJ102	Carbon	1K ohms 1/4W
R420	ERDS2TJ103	Carbon	10K ohms 1/4W
R421	ERDS2TJ222	Carbon	2.2K ohms 1/4W
R422	ERDS2TJ473	Carbon	47K ohms 1/4W
R423	ERDS2TJ103	Carbon	10K ohms 1/4W
R424	ERDS1TJ472	Carbon	4.7K ohms 1/2W
C411	ECEA2CU4R7E	Electrolytic	4.7 µF 160V
C412	ECEA1HU2R2	Electrolytic	2.2 µF 50V
C413	ECCD2H680J2	Ceramic	68 pF 150V
C414	ECEA2AU2R2	Electrolytic	2.2 µF 100V

LED B CH BOARD

PCB6 (NLA)	YWP9440PPE6	Printed Circuit Board Assy	
Q811,812	2SC2631-RS	Transistor	
Q813	2SA1123-RS	Transistor	
Q814,815	2SC2631-RS	Transistor	
D811	1SS82	Diode	
D812	YWHZS6R8EB2	Diode	
D813,814	1SS82	Diode	
D815	LN031335PH	LED	
R811	ERDS2TJ473	Carbon	47K ohms 1/4W
R812	ERDS2TJ224	Carbon	220K ohms 1/4W
R813	ERDS2TJ333	Carbon	33K ohms 1/4W
R814	ERG1SJ183P	Metal	18K ohms 1W
R815	ERDS2TJ472	Carbon	4.7K ohms 1/4W
R816	ERDS2TJ393	Carbon	39K ohms 1/4W
R817	ERDS2TJ104	Carbon	100K ohms 1/4W
R818	ERDS2TJ103	Carbon	10K ohms 1/4W
R819	ERDS2TJ102	Carbon	1K ohms 1/4W
R820	ERDS2TJ103	Carbon	10K ohms 1/4W
R821	ERDS2TJ222	Carbon	2.2K ohms 1/4W
R822	ERDS2TJ473	Carbon	47K ohms 1/4W

REF.NO.	PART NO.	DESCRIPTION	
R823	ERDS2TJ103	Carbon	10K ohms 1/4W
R824	ERDS1TJ472	Carbon	4.7K ohms 1/2W
C811	ECEA2CU4R7E	Electrolytic	4.7 µF 160V
C812	ECEA1HU2R2	Electrolytic	2.2 µF 50V
C813	ECCD2H680J2	Ceramic	68 pF 150V
C814	ECEA2AU2R2	Electrolytic	2.2 µF 100V

FUSE BOARD

PCB7	YWAPRA1267D2	Printed Board
E1-4	YWH00171	Fuse Holder
E5	YWA2QA0054A4	Electrode

A CH INPUT BOARD

PCB8 (NLA)	YWP9440PPE8	Printed Circuit Board Assy	
IC101	YWMC8134B	IC	
IC102	YWNJM2068DD	IC	
D101-104	MA167	Diode	
D105,106	YWHZS12EB2	Diode	
D107,108	YWHZS6R2EB2	Diode	
R101,102	ERDS2TJ474	Carbon	470K ohms 1/4W
R103,104	ER0S2CKF1002	Metal	10K ohms
R105	ERDS2TJ471	Carbon	470 ohms 1/4W
R106	ERDS2TJ153	Carbon	15K ohms 1/4W
R107	ERDS2TJ105	Carbon	1M ohms 1/4W
R108	ERDS2TJ104	Carbon	100K ohms 1/4W
R109	ERDS2TJ433	Carbon	43K ohms 1/4W
R110,111	ERDS2TJ104	Carbon	100K ohms 1/4W
R112	ERDS2TJ471	Carbon	470 ohms 1/4W
R141,142	ER0S2CKF1002	Metal	10K ohms
R143	ERDS2TJ104	Carbon	100K ohms 1/4W
C101,102	YWRBA16V101M	Electrolytic	100 µF 16V
C103,104	ECQV1H105JZ	Plastic	1 µF 50V
C105,106	YWUP05B101KN	Ceramic	100 pF
C107,108	ECQM1H103KV	Plastic	0.01 µF 50V
C109	YWRBA16V470M	Electrolytic	47 µF 16V
C110	ECQV1H105JZ	Plastic	1 µF 50V
C111,112	ECQV1H184JZ3	Plastic	1.8 µF 50V
C113	ECQV1H334JZ	Plastic	0.33 µF 50V
C114	YWRBA50V2R2M	Electrolytic	2.2 µF 50V
C115	ECQM1H473KZ	Plastic	0.047 µF 50V
C116	YWRBA16V220M	Electrolytic	22 µF 16V
C117,118	ECQV1H105JZ	Plastic	1 µF 50V
C141	YWUP05S330JN	Ceramic	33 pF
C142	YWRBA16V220M	Electrolytic	22 µF 16V
C151	YWR0A50V470M	Electrolytic	47 µF 50V
C152,153	YWR0A25V470M	Electrolytic	47 µF 25V
C154	YWR0A50V470M	Electrolytic	47 µF 50V
SW101	YWSSSB323NS	Slide Switch	

REF.NO.	PART NO.	DESCRIPTION
CN101	YWAF3LSPC	3 pin Connector
CN102	YWAF3LRPC	3 pin Connector
JK101	HLJ052101010	Jack
CN122	YWS3BXHA	3 pin Connector
E1	YWJM15M1R0	Lead Wire

B CH INPUT BOARD

PCB9 (NLA)	YWP9440PPE9	Printed Circuit Board Assy	
IC501	YWMC8134B	IC	
IC502	YWNJM2068DD	IC	
D501-504	MA167	Diode	
D505	YWHZS12EB2	Diode	
D506	YWHZS12EB2	Diode	
D507,508	YWHZS6R2EB2	Diode	
R501,502	ERDS2TJ474	Carbon	470K ohms 1/4W
R503,504	ER0S2CKF1002	Metal	10K ohms
R505	ERDS2TJ471	Carbon	470 ohms 1/4W
R506	ERDS2TJ153	Carbon	15K ohms 1/4W
R507	ERDS2TJ105	Carbon	1M ohms 1/4W
R508	ERDS2TJ104	Carbon	100K ohms 1/4W
R509	ERDS2TJ433	Carbon	43K ohms 1/4W
R510,511	ERDS2TJ104	Carbon	100K ohms 1/4W
R512	ERDS2TJ471	Carbon	470 ohms 1/4W
R541	ERDS2TJ104	Carbon	100K ohms 1/4W
R542-545	ER0S2CKF1002	Metal	10K ohms
R546	ERDS2TJ104	Carbon	100K ohms 1/4W
C501,502	YWRBA16V101M	Electrolytic	100 µF 16V
C503,504	ECQV1H105JZ	Plastic	1 µF 50V
C505,506	YWUP05B101KN	Ceramic	100 pF
C507,508	ECQM1H103KV	Plastic	0.01 µF 50V
C509	YWRBA16V470M	Electrolytic	47 µF 16V
C510	ECQV1H105JZ	Plastic	1 µF 50V
C511,512	ECQV1H184JZ	Plastic	0.18 µF 50V
C513	ECQV1H334JZ	Plastic	0.33 µF 50V
C514	YWRBA50V2R2M	Electrolytic	2.2 µF 50V
C515	ECQM1H473KZ	Plastic	0.047 µF 50V
C516	YWRBA16V220M	Electrolytic	22 µF 16V
C517,518	ECQV1H105JZ	Plastic	1 µF 50V
C541,542	YWUP05S330JN	Ceramic	33 pF
C543	YWRBA16V220M	Electrolytic	22 µF 16V
C551	YWR0A50V470M	Electrolytic	47 µF 50V
C552,553	YWR0A25V470M	Electrolytic	47 µF 25V
C554	YWR0A50V470M	Electrolytic	47 µF 50V
SW501	YWSSSB323NS	Slide Switch	
CN501	YWAF3LSPC	3 pin Connector	
CN502	YWAF3LRPC	3 pin Connector	
CN522	YWS8BXHA	8 pin Connector	
JK501	HLJ052101010	Jack	

REF.NO.	PART NO.	DESCRIPTION
BTL SWITCH BOARD		
PCB10 (NLA)	YWP9440PPE10	Printed Board
SW901	YWSSSB343NS	Slide Switch
A CH POWER TR BOARD		
PCB11 (NLA)	YWP9440PP01	Printed Circuit Board Assy
Q331,381	2SA794-RS	Transistor
Q382,383	2SC1567-RS	Transistor
Q384	2SA794-RS	Transistor
D305-308	YWAM01V0	Diode
D311,312	YWAM01V0	Diode
D381-384	1SS82	Diode
TH301	YWTH487BH471	Thermistor
R309,310	ERD25FJ470	Carbon 47 ohms 1/4W
R311	ERD25FJ331	Carbon 330 ohms 1/4W
R312,313	ERD25FJ330	Carbon 33 ohms 1/4W
R315	ERD25FJ330	Carbon 33 ohms 1/4W
R317	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R318	ERF3GEKR47N	Wire Wound 0.47 ohms 3W
R319,320	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R321	ERF3GEKR47N	Wire Wound 0.47 ohms 3W
R322,323	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R324	ERF3GEKR47N	Wire Wound 0.47 ohms 3W
R325,326	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R327	ERF3GEKR47N	Wire Wound 0.47 ohms 3W
R328	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R332,333	ERD25FJ470	Carbon 47 ohms 1/4W
R334,335	ERD25FJ330	Carbon 33 ohms 1/4W
R337	ERD25FJ330	Carbon 33 ohms 1/4W
R339	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R340	ERF3GEKR47N	Wire Wound 0.47 ohms 3W
R341,342	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R343	ERF3GEKR47N	Wire Wound 0.47 ohms 3W
R344,345	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R346	ERF3GEKR47N	Wire Wound 0.47 ohms 3W
R347,348	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R349	ERF3GEKR47N	Wire Wound 0.47 ohms 3W
R350	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R354	ERD25FJ331	Carbon 330 ohms 1/4W
R355-359	YWRGC55R47J2	Wire Wound 0.47 ohms 3W
R360,365	ERG3SJ150	Metal 15 ohms 3W
R366	ERG3SJ150	Metal 15 ohms 3W
R367	ERDS2TJ621	Carbon 620 ohms 1/4W
R368	ERDS2TJ301	Carbon 300 ohms 1/4W
R369	ERDS2TJ302	Carbon 3K ohms 1/4W
R370	ERDS2TJ102	Carbon 1K ohms 1/4W
R371	ERDS2TJ391	Carbon 390 ohms 1/4W
R381,382	ERDS2TJ102	Carbon 1K ohms 1/4W
R385,386	ERDS2TJ203	Carbon 20K ohms 1/4W
R387,388	ERDS2TJ621	Carbon 620 ohms 1/4W
R389,390	ERDS2FJ821	Carbon 820 ohms
VR301	EVND1AA00B13	Variable Resistor 1K ohms
C305,306	YWR02C800KPS	Electrolytic 80 µF 160V
C307,308	ECQM2104KZ	Plastic 0.1 µF 200V
C309	ECQF2333KZ	Plastic 0.033 µF 200V
C310	ECQV1H104JZ	Plastic 0.1 µF 50V (TF)
C311	ECQV1H105JZ	Plastic 1 µF 50V
C312	YWR0A6V101MS	Electrolytic 100 µF 6.3V
C381,382	ECQM1H152JZ	Plastic 1500 pF 50V
L301	YWALCA0029A4	Coil 2.2 µH
F301,302	YWSSFR3AF003	Current Fuse
SF303-306	YWSSFR3AF003	Current Fuse
CN301	YWB8BXHA	8 pin Connector
CN302	YW3504301	Connector
E301-303	YVL437TM027	Test pin
M53	YWA2QA0097C3	Electrode
M54	YWA2QA0098C4	Electrode
M55	YWA2NA0191A4	Spacer
B CH POWER TR BOARD		
PCB12 (NLA)	YWP9440PP02	Printed Circuit Board Assy
Q731,781	2SA794-RS	Transistor
Q782,783	2SC1567-RS	Transistor
Q784	2SA794-RS	Transistor
D705-708	YWAM01V0	Diode
D711,712	YWAM01V0	Diode
D781-784	1SS82	Diode
TH701	YWTH487BH471	Thermistor
R709,710	ERD25FJ470	Carbon 47 ohms 1/4W
R711	ERD25FJ331	Carbon 330 ohms 1/4W
R712,713	ERD25FJ330	Carbon 33 ohms 1/4W
R715	ERD25FJ330	Carbon 33 ohms 1/4W
R717	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R718	ERF3GEKR47N	Wire Wound 0.47ohms 1/4W
R719,720	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R721	ERF3GEKR47N	Wire Wound 0.47 ohms 1/4W
R722,723	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R724	ERF3GEKR47N	Wire Wound 0.47 ohms 1/4W
R725,726	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R727	ERF3GEKR47N	Wire Wound 0.47 ohms 3W
R728	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R732,733	ERD25FJ470	Carbon 47 ohms 1/4W
R734,735	ERD25FJ330	Carbon 33 ohms 1/4W
R737	ERD25FJ330	Carbon 33 ohms 1/4W
R739	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R740	ERF3GEKR47N	Wire Wound 0.47 ohms 3W
R741,742	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R743	ERF3GEKR47N	Wire Wound 0.47 ohms 3W
R744,745	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R746	ERF3GEKR47N	Wire Wound 0.47 ohms 3W

REF.NO.	PART NO.	DESCRIPTION
R747,748	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R749	ERF3GEKR47N	Wire Wound 0.47 ohms 3W
R750	ERD25FJ2R2	Fuse Resistor 2.2 ohms 1/4W
R754	ERD25FJ331	Carbon 330 ohms 1/4W
R755-759	YWRGC55R47J2	Wire Wound 0.47 ohms 3W
R760,765	ERG3SJ150	Metal 15 ohms 3W
R766	ERG3SJ150	Metal 15 ohms 3W
R767	ERDS2TJ621	Carbon 620 ohms 1/4W
R768	ERDS2TJ301	Carbon 300 ohms 1/4W
R769	ERDS2TJ302	Carbon 3K ohms 1/4W
R770	ERDS2TJ102	Carbon 1K ohms 1/4W
R771	ERDS2TJ391	Carbon 390 ohms 1/4W
R781,782	ERDS2TJ102	Carbon 1K ohms 1/4W
R785,786	ERDS2TJ203	Carbon 20K ohms 1/4W
R787,788	ERDS2TJ621	Carbon 620 ohms 1/4W
R789,790	ERDS2FJ821	Carbon 820 ohms
VR701	EVND1AA00B13	Variable Resistor 1K ohms
C705,706	YWR02C800KPS	Electrolytic 80 µF 160V
C707,708	ECQM2104KZ	Plastic 0.1 µF 200V
C709	ECQF2333KZ	Plastic 0.033 µF 200V
C711	ECQV1H105JZ	Plastic 1 µF 50V
C712	YWR0A6V101MS	Electrolytic 100 µF 6.3V
C732	ECQV1H104JZ	Plastic 0.1 µF 50V
C781,782	ECQM1H152JZ	Plastic 1500 pF 50V
L701	YWALCA0029A4	Coil 2.2 µH
F701,702	YWSSFR3AF003	Current Fuse 3A
SF703-706	YWSSFR3AF003	Current Fuse 3A
CN701	YWB8BXHA	8 pin Connector
CN702	YW3504301	Connector
E701-703	YVL437TM027	Test pin
M53	YWA2QA0097C3	Electrode
M54	YWA2QA0098C4	Electrode
M55	YWA2NA0191A4	Spacer

A CH POWER DRIVE BOARD

PCB13 (NLA)	YWP9440PPA1	Printed Circuit Board Assy
IC201	YWMC5707A	IC
IC241	YWNJM78L15A	IC
IC242	YWNJM79L15A	IC
Q201	2SA968B-0Y	Transistor
Q202	YW2SC2238B0Y	Transistor
Q203	2SJ117	Transistor
Q204	2SK310	Transistor
Q241	2SD1264A-PQ	Transistor
Q242	2SB940A-PQ	Transistor
Q261	2SA1127-ST	Transistor
Q262	2SD1264A-PQ	Transistor
Q292	2SB940A-PQ	Transistor
D205,206	YWHZS12EB2	Diode
D207,208	1SS82	Diode
D241,242	YWHZS39EB1	Diode
D261	YWHZS6R2EB2	Diode
D262	YWHZS33EB2	Diode
D263-265	YWAM01V0	Diode
D266	MA165	Diode
D281,282	YWAM01V0	Diode
D283	YWRB154F	Diode
D291	MA165	Diode
R201	ERDS2TJ563	Carbon 56K ohms 1/4W
R202	ERDS2TJ471	Carbon 470 ohms 1/4W
R203	ERDS2TJ102	Carbon 1K ohms 1/4W
R204,205	ERDS2TJ220	Carbon 22 ohms 1/4W
R206	ER0S2CKF1301	Metal 1.3K ohms
R207	ER0S2CKF5622	Metal 56.2K ohms
R208,209	ERDS1TJ123	Carbon 12K ohms 1/2W
R212,213	ERDS2FJ680	Carbon 68 ohms
R214,215	ERDS2TJ102	Carbon 1K ohms 1/4W
R216,217	ERDS2TJ683	Carbon 68K ohms 1/4W
R241	ERQ2AJP271S	Fuse Resistor 270 ohms
R242	ERQ2AJP561S	Fuse Resistor 560 ohms
R243,244	ERDS1TJ273	Carbon 27K ohms 1/2W
R245,246	ERDS2TJ102	Carbon 1K ohms 1/4W
R247,248	ERQ1AJP561S	Fuse Resistor 560 ohms
R259	ERDS2TJ683	Carbon 68K ohms 1/4W
R269	ERDS1TJ472	Carbon 4.7K ohms 1/2W
R270	ERDS2TJ102	Carbon 1K ohms 1/4W
R271	ERDS2TJ103	Carbon 10K ohms 1/4W
R272	ERDS2TJ333	Carbon 33K ohms 1/4W
R273	ERDS2TJ472	Carbon 4.7K ohms 1/4W
R274	ERG2SJ222	Metal 2.2K ohms 2W
R275	ERDS1TJ272	Carbon 2.7K ohms 1/2W
R276	ERDS2TJ104	Carbon 100K ohms 1/4W
R277	ERG2SJ222	Metal 2.2K ohms 2W
R278	ERDS2TJ102	Carbon 1K ohms 1/4W
R296	ERG1SJ392P	Metal 3.9K ohms 1W
R297	ERDS2TJ331	Carbon 330 ohms 1/4W
R298	ERG1SJ183P	Metal 18K ohms 1W
VR201	EVND4AA00B53	Variable Resistor 5K ohms
C201	YWUP05S220JN	Ceramic 22 pF
C204,205	ECQB1H562JZ	Plastic 5600 pF 50V
C206	YWRBA10V471M	Electrolytic 470 µF 10V
C207	ECQV1H104JZ	Plastic 0.1 µF 50V (TF)
C208	ECCW2H470J2	Ceramic 47 pF 500V
C209,210	ECCF2H330K	Ceramic 33 pF 500V
C213,214	ECKW2H331KB	Ceramic 330 pF 500V
C241,242	ECEA2AU470	Electrolytic 47 µF 100V
C243,244	ECEA2AU100	Electrolytic 10 µF 100V
C245,246	ECEA1HU100	Electrolytic 10 µF 50V
C247,248	ECQV1H334JZ	Plastic 0.33 µF 50V TF
C249,250	ECQV1H104JZ	Plastic 0.1 µF 50V (TF)
C252	ECQV1H104JZ	Plastic 0.1 µF 50V (TF)
C262	ECEA1AN101S	Electrolytic 100 µF 10V
C263	ECEA0JU470	Electrolytic 47 µF 6.3V
C264	ECEA1CU100	Electrolytic 10 µF 16V
C265	ECQV1H104JZ	Plastic 0.1 µF 50V (TF)
C281,282	YWR02C800KPS	Electrolytic 80 µF 160V

E

D

C

ACH INPUT BOARD

INPUT CONNECTOR (INPUT A) +40dB 40kΩ balance

XLR-type connector

1/4" tip-ring-sleeve phone jack

HIGH PASS FILTER SWITCH SW101

ACH VOLUME BOARD

VR101 ACH INPUT LEVEL CONTROL

ACH POWER

VR201 DC OFFSET ADJUSTMENT

ACH LED BOARD

PEAK (red)

SIGNAL (green)

PROTECT (red)

BTL SW BOARD

SW901

BRIDGE ⇕ MONO ⇕ STEREO

FUSE BOARD

220V/240V AC 50Hz/60Hz

E1 TERMINAL

CN1

SW11 STANDBY SWITCH

SW12 POWER SELECTION SWITCH

SW21 STANDBY SWITCH

F12 15A

F22 15A

TEMP FUSE

T11 POWER TRANSFORMER

T21 POWER TRANSFORMER

D11 25A

D21 25A

+VCC(Ach)

-VCC(Ach)

+VCC(Bch)

-VCC(Bch)

ACH TEMP. DETECT BOARD (A2)

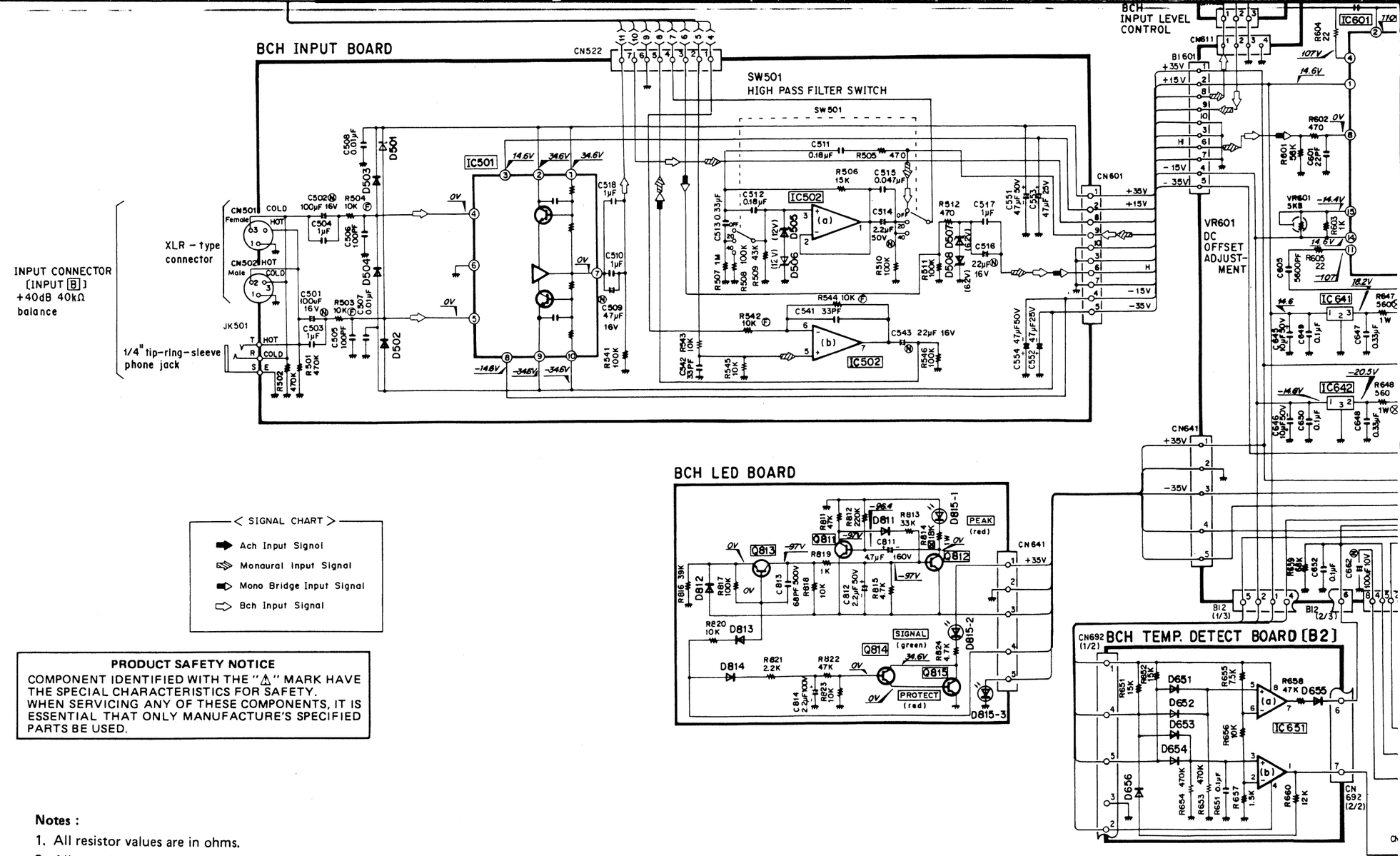
BCH INPUT BOARD

SW501 HIGH PASS FILTER SWITCH

BCH VOLUME BOARD

VR501 BCH INPUT LEVEL CONTROL

BCH POWER D



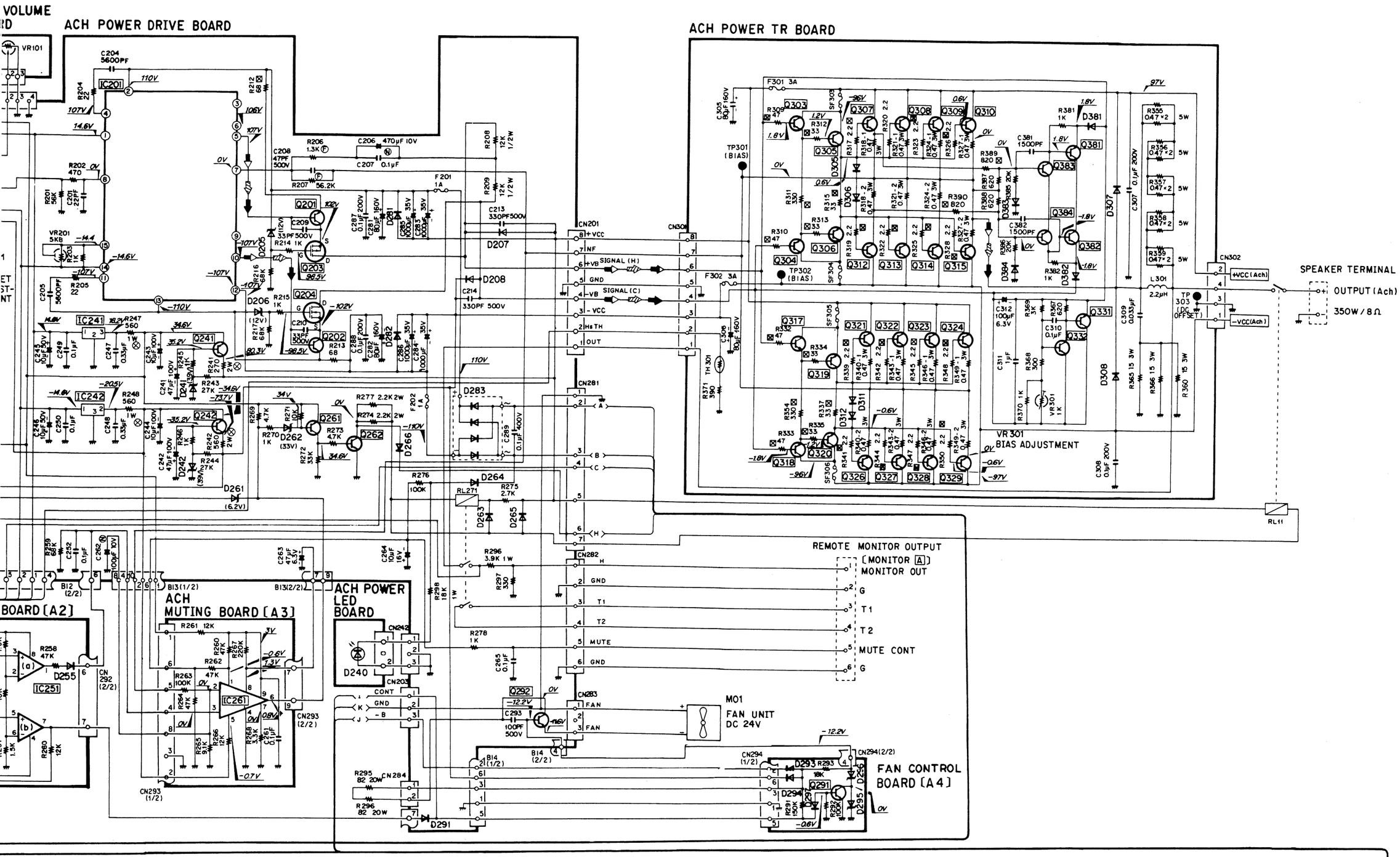
PRODUCT SAFETY NOTICE

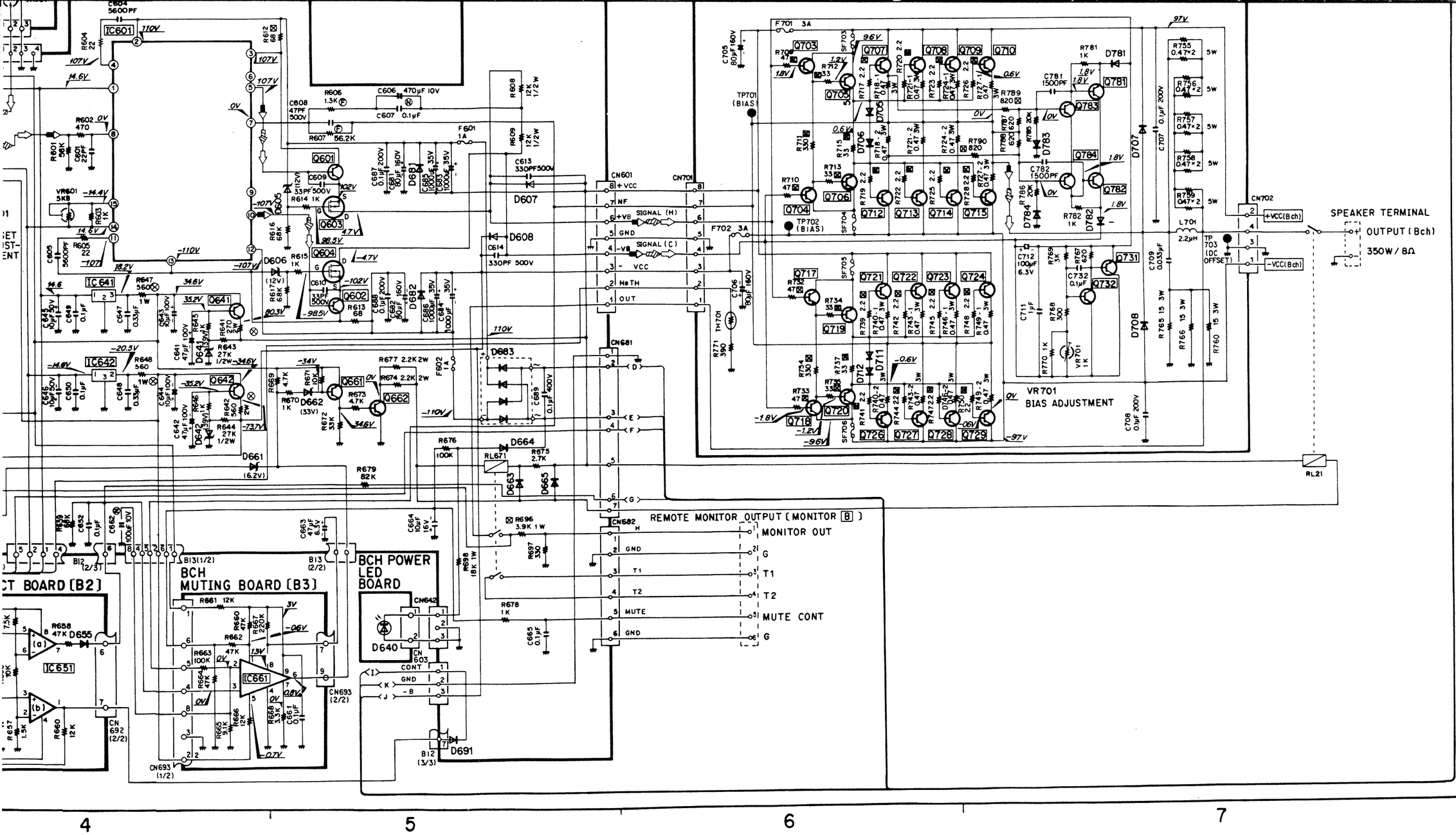
COMPONENT IDENTIFIED WITH THE "⚠" MARK HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN SERVICING ANY OF THESE COMPONENTS, IT IS ESSENTIAL THAT ONLY MANUFACTURE'S SPECIFIED PARTS BE USED.

Notes :

1. All resistor values are in ohms.
2. All capacitor values are in farads.

SCHEMATIC DIAGRAM




IC601
IC641
IC642
Q601
Q602
Q603
Q604
Q641
Q642
Q661
Q662
D606
D607
D608
D661
D662
D663
D664
D665
D681
D682
D683
D691
F601 1A
F602 1A
F701 3A
F702 3A
CN601
CN681
CN682
CN693 (1/2)
CN693 (2/2)
CN692 (2/2)
CN603
CN642
CN701
CN702
TP701 (BIAS)
TP702 (BIAS)
TP703 (DC OFFSET)
TH701
VR601 5KB
VR701 1K
RL671
RL21
+VCC
NF
+VB
SIGNAL (H)
GND
-VB
SIGNAL (C)
- VCC
Hs TH
OUT
D
E
F
G
H
CONT
K
J
- B
REMOTE MONITOR OUTPUT (MONITOR B)
MONITOR OUT
GND
G
T1
T2
MUTE
MUTE CONT
GND
G
VR701
BIAS ADJUSTMENT
SPEAKER TERMINAL
OUTPUT (Bch)
350W / 8Ω
+VCC(Bch)
-VCC(Bch)
BCH POWER LED BOARD
BCH MUTING BOARD (B3)
CT BOARD (B2)
B12 (2/3)
B13 (1/2)
B13 (2/2)
B12 (3/3)
IC651
IC661
D640
D655
110V
107V
14.6V
0V
-107V
-110V
18.2V
-14.4V
-14.6V
-20.5V
34.6V
35.2V
-34V
-34.6V
-35.2V
-73.7V
80.3V
98.5V
102V
-102V
4.7V
-4.7V
96V
97V
1.2V
1.8V
0.6V
-0.6V
-1.8V
-1.2V
-96V
-97V
3V
1.3V
0.8V
0.7V
0.6V

J

I

H

G

F

E

ACH INPUT BOARD

BI201

BI122

JK101 INPUT CONNECTOR [A] JACK

SW101
HIGH PASS
FILTER
SWITCH

CN101
INPUT
CONNECTOR [A] MALE

CN102
INPUT
CONNECTOR [A]
FEMALE

M01
FAN

FAN
CONTROL
BOARD

CN294

POWER
TRANSFORMER

T11

REMOTE
MONITOR
OUTPUT
(MONITOR [A])

SPEAKER
TERMINAL
(A ch)

POWER
TRANSFORMER

T21

REMOTE
MONITOR
OUTPUT
(MONITOR [B])

SPEAKER
TERMINAL
(B ch)

E1
TERMINAL

220V/240V AC
50Hz/60Hz

SW11,21 STANDBY SWITCH

SW11

SW12

SW21

220V AC

240V AC

SW12 POWER SELECTION
SWITCH

FUSE BOARD

ACH POWER DRIVE BOARD

BI201

CN281

CN282

CN283

CN284

CN203

CN301

BI4

BI3

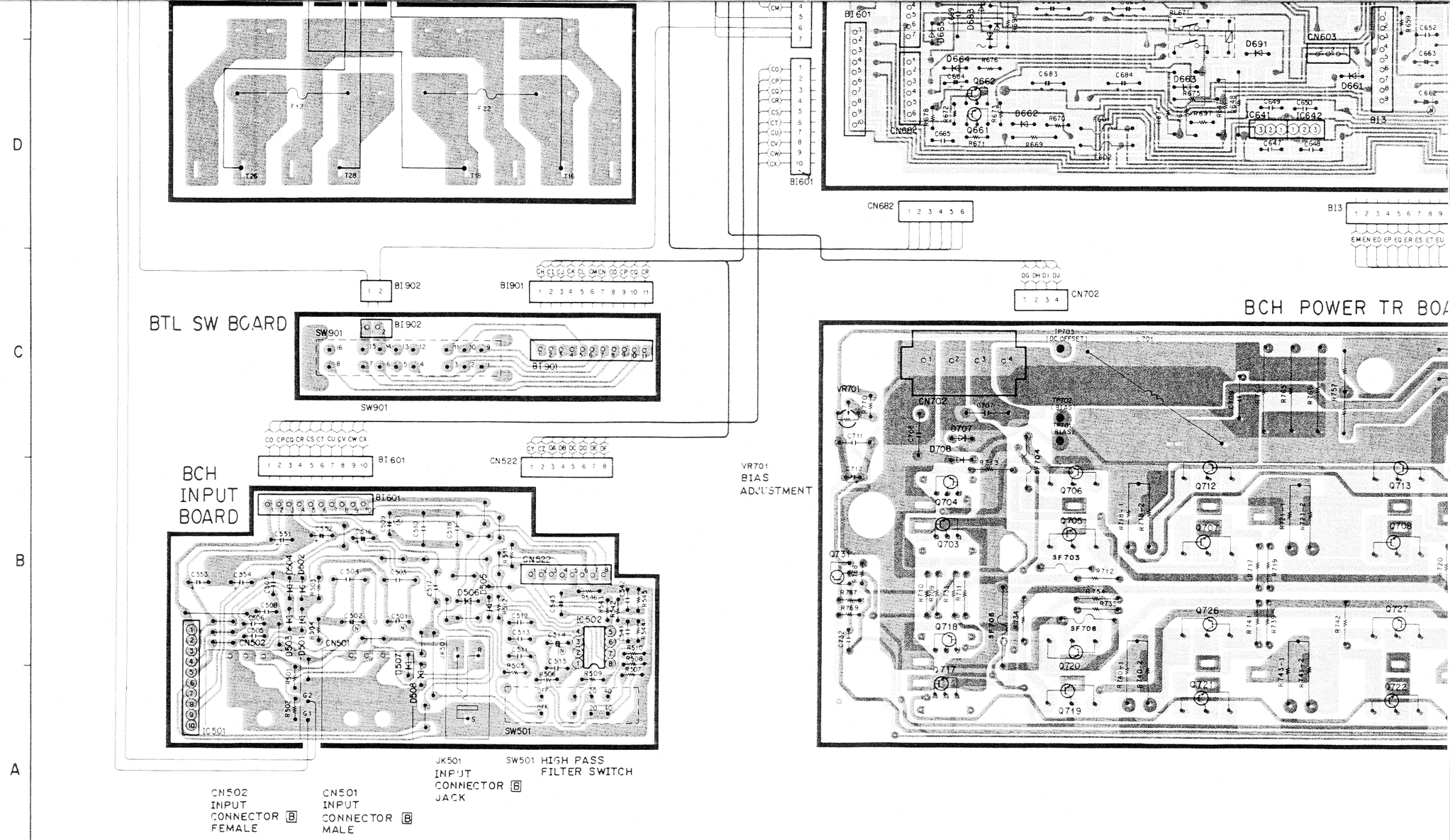
ACH PO

BCH POWER DRIVE BOARD

CN681

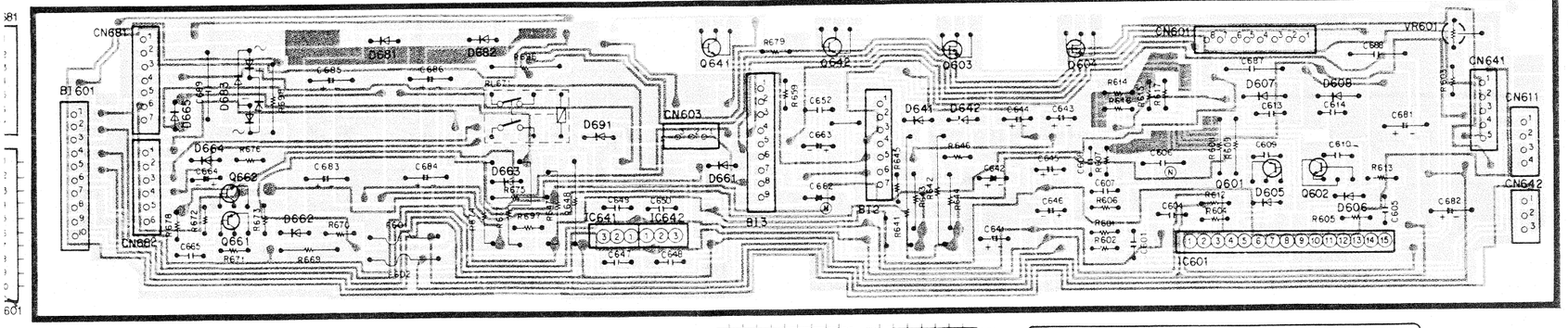
CN603

BI601


BTL SW BOARD
SW901
BI902
BI901
BCH INPUT BOARD
BI601
CN522
CN502
CN501
IC501
IC502
SW501
JK501
VR701
BIAS
ADJUSTMENT
BCH POWER TR BOA
CN702
IP703
(DC OFFSET)
Q703
Q704
Q705
Q706
Q707
Q708
Q712
Q713
Q717
Q718
Q719
Q720
Q721
Q722
Q726
Q727
3F703
SF706
JK501
INPUT
CONNECTOR 5
JACK
SW501 HIGH PASS
FILTER SWITCH
CN502
INPUT
CONNECTOR 8
FEMALE
CN501
INPUT
CONNECTOR 8
MALE

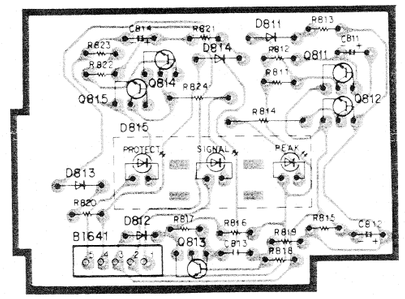

H POWE
D BOAR
OLUME
VR101
ACH
INPUT LEV
CONTROL
NG BOA
R26
132k
99.8k
CF CG
ED EE
B1652
B1652
D640

BCH POWER DRIVE BOARD



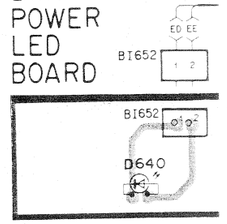
VR601
DC OFFSET
ADJUSTMENT

BCH LED BOARD

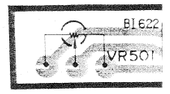


BI641
DZ DY DX DW DV

BCH POWER LED BOARD



BCH VOLUME



VR501
BCH INPUT LEV

CN682
1 2 3 4 5 6

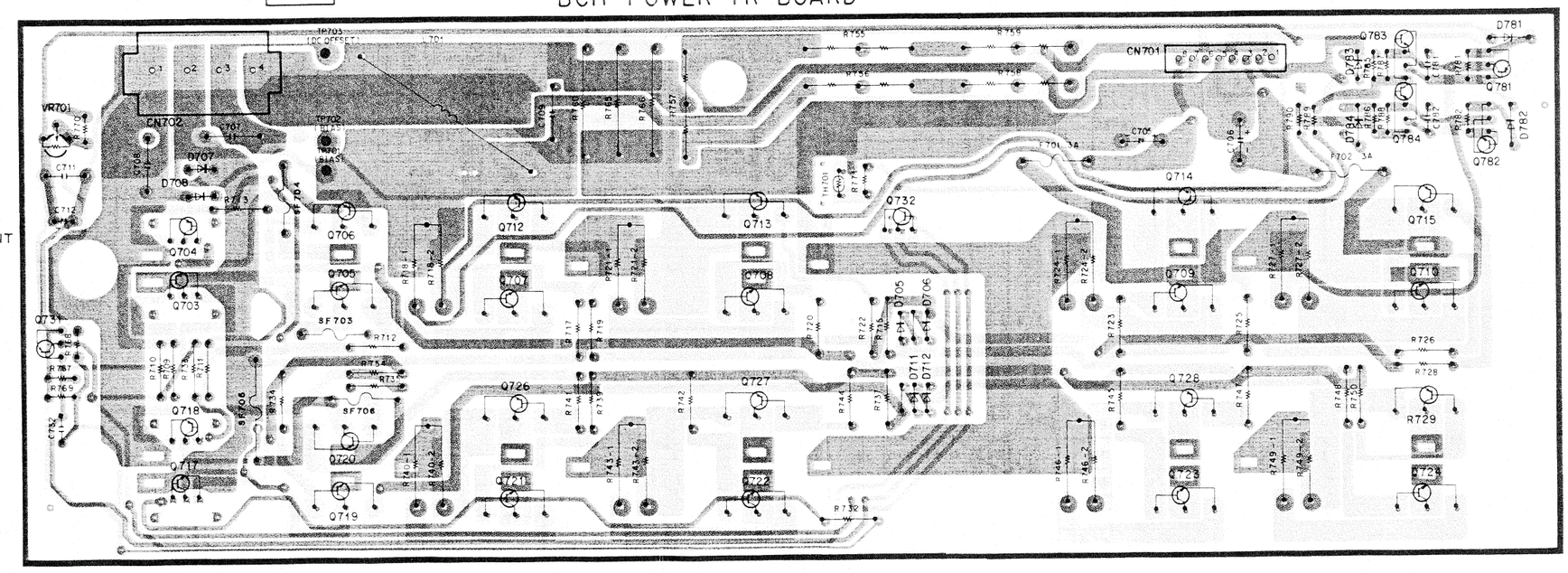
B13
1 2 3 4 5 6 7 8 9
EM EN EO EP EQ ER ES ET EU

BI2
1 2 3 4 5 6 7
EF EG EH EI EJ EK EL

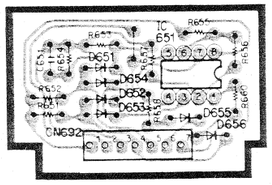
DG DH DI DJ
CN702
1 2 3 4

DN DO DP DQ DR DS DT DU
CN701
8 7 6 5 4 3 2 1

BCH POWER TR BOARD

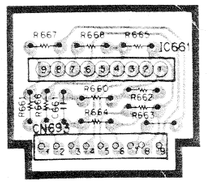


BCH TEMP. DETECT BOARD



CN692
1 2 3 4 5 6 7
EE EG EH EI EJ EK EL

BCH MUTING BC



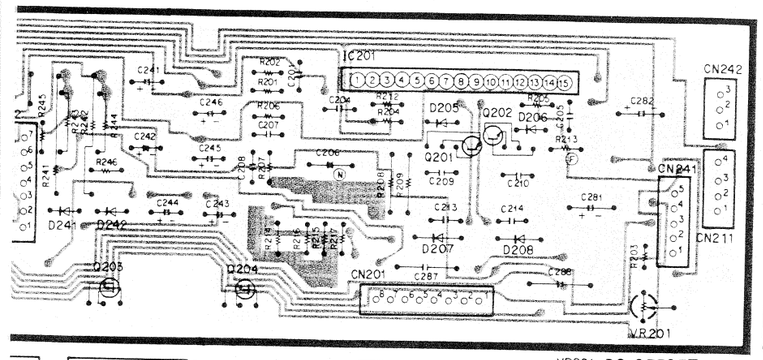
CN693
1 2 3 4 5 6 7 8 9
EM EN EO EP EQ ER ES ET EU

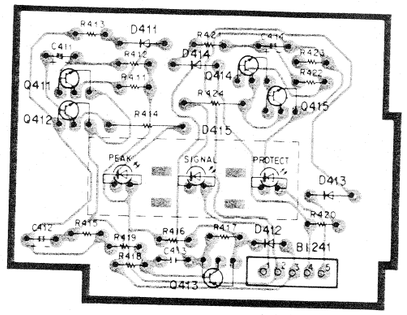
COMPONENT SIDE

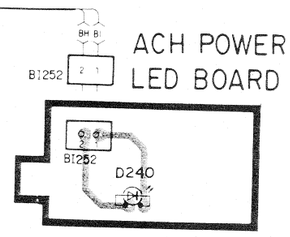
PATTERN SIDE

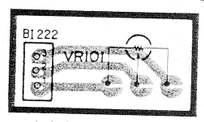
5 6 7 8 9 10 11 12

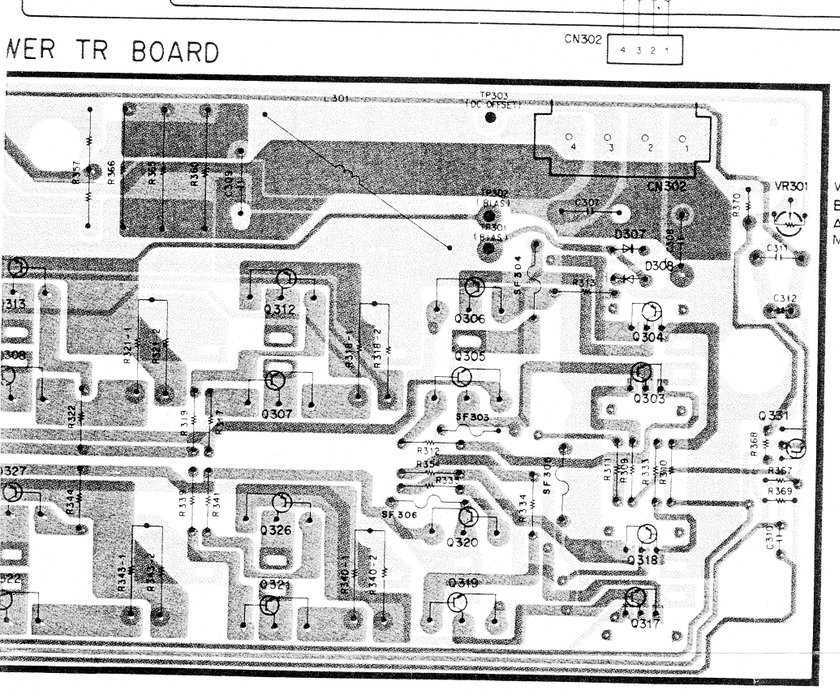
WIRING DIAGRAM

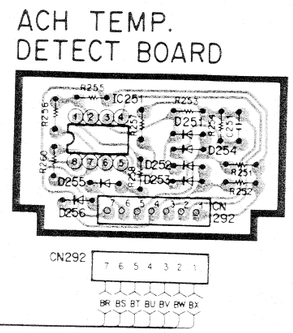


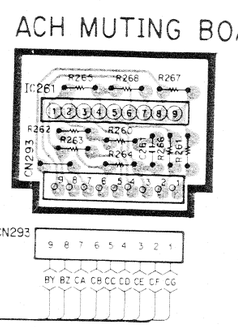


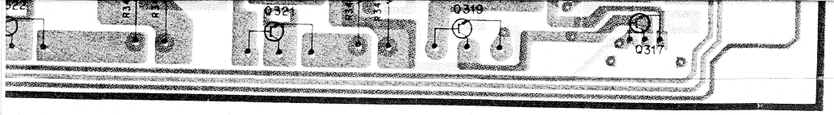


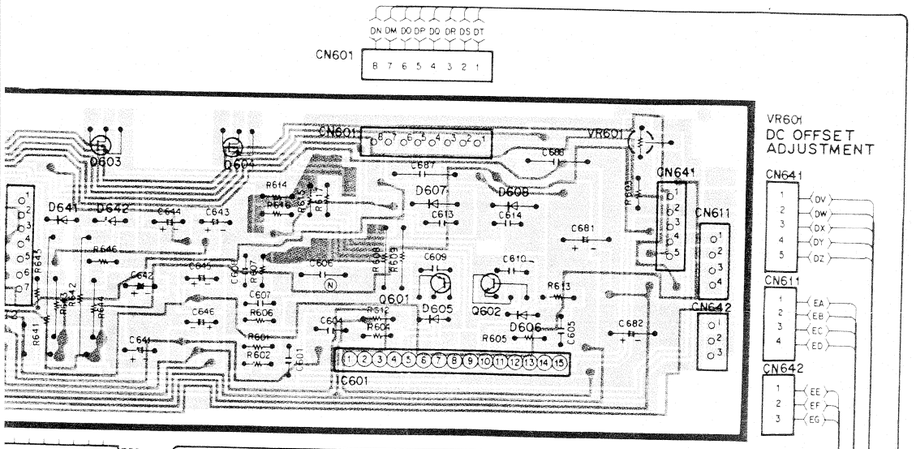




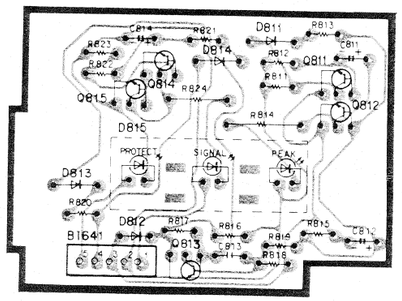




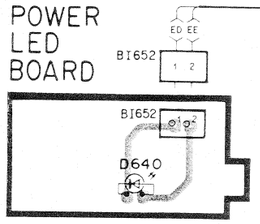




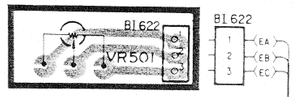
BCH LED BOARD

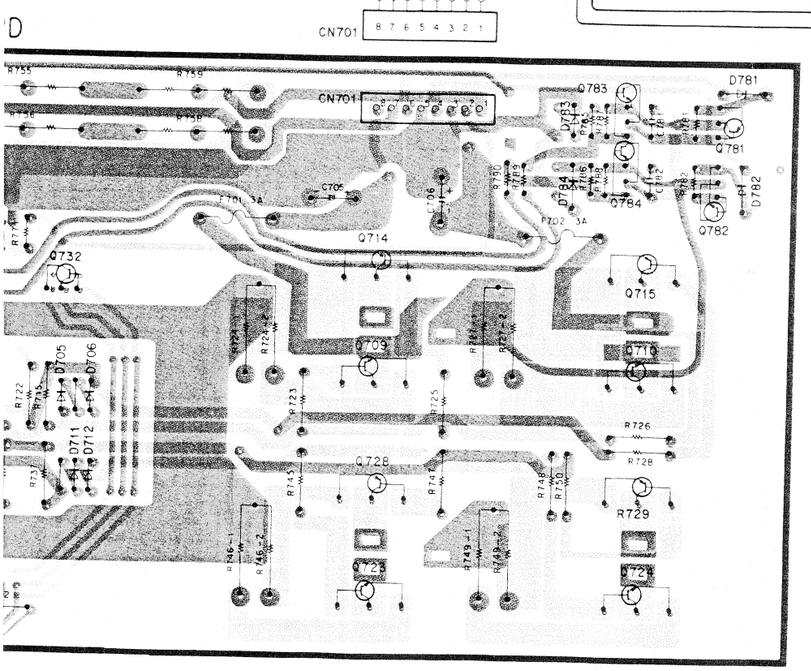


BCH POWER LED BOARD

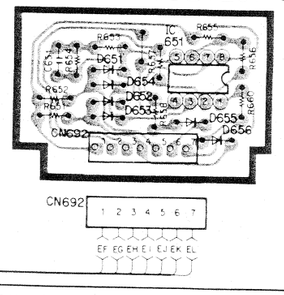


BCH VOLUME BOARD

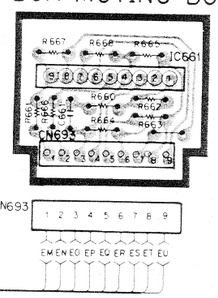




BCH TEMP. DETECT BOARD



BCH MUTING BOARD



COMPONENT SIDE

PATTERN SIDE

8 9 10 11 12 13

A CH TEMP DETECT BOARD

REF.NO.	PART NO.	DESCRIPTION
PCB16 (NLA)	YWP9440PPB2	Printed Circuit Board Assy
IC251	YWUPC4570C	IC
D251-256	MA165	Diode
R251,252	ERDS2TJ153	Carbon 15K ohms 1/4W
R253,254	ERDS2TJ474	Carbon 470K ohms 1/4W
R255	ERDS2TJ752	Carbon 7.5K ohms 1/4W
R256	ERDS2TJ103	Carbon 10K ohms 1/4W
R257	ERDS2TJ152	Carbon 1.5K ohms 1/4W
R258	ERDS2TJ473	Carbon 47K ohms 1/4W
R260	ERDS2TJ123	Carbon 12K ohms 1/4W
C251	ECQV1H104JZ	Plastic 0.1 µF 50V (TF)
CN292	YWMB7P90	7 pin Connector

A CH MUTING BOARD

REF.NO.	PART NO.	DESCRIPTION
PCB17 (NLA)	YWP9440PPB3	Printed Circuit Board Assy
IC261	YWTA7317P	IC
R260	ERDS2TJ473	Carbon 47K ohms 1/4W
R261	ERDS2TJ123	Carbon 12K ohms 1/4W
R262	ERDS2TJ473	Carbon 47K ohms 1/4W
R263	ERDS2TJ104	Carbon 100K ohms 1/4W
R264	ERDS2TJ473	Carbon 47K ohms 1/4W
R265	ERDS2TJ912	Carbon 9.1K ohms 1/4W
R266	ERDS2TJ123	Carbon 12K ohms 1/4W
R267	ERDS2TJ224	Carbon 220K ohms 1/4W
R268	ERDS2TJ332	Carbon 3.3K ohms 1/4W
C261	ECQV1H104JZ	Plastic 0.1 µF 50V (TF)
CN293	YWMB9P90	9 pin Connector

FAN CONTROL BOARD

REF.NO.	PART NO.	DESCRIPTION
PCB18 (NLA)	YWP9440PPB4	Printed Circuit Board Assy
Q291	2SB788-RS	Transistor
D293,294	YWAM01V0	Diode
D295	YWHZS16EB2	Diode
D296	YWHZS12EB2	Diode
D297	MA165	Diode
R291	ERDS2TJ154	Carbon 150K ohms 1/4W
R292	ERDS2TJ104	Carbon 100K ohms 1/4W
R293	ERDS1TJ183	Carbon 18K ohms 1/2W
CN294	YWMB6P90	6 Pin Connector

B CH TEMP DETECT BOARD

REF.NO.	PART NO.	DESCRIPTION
PCB20 (NLA)	YWP9440PPB6	Printed Circuit Board Assy
IC651	YWUPC4570C	IC
D651-656	MA165	Diode
R651,652	ERDS2TJ153	Carbon 15K ohms 1/4W
R653,654	ERDS2TJ474	Carbon 470K ohms 1/4W
R655	ERDS2TJ752	Carbon 7.5K ohms 1/4W
R656	ERDS2TJ103	Carbon 10K ohms 1/4W
R657	ERDS2TJ152	Carbon 1.5K ohms 1/4W
R658	ERDS2TJ473	Carbon 47K ohms 1/4W
R660	ERDS2TJ123	Carbon 12K ohms 1/4W
C651	ECQV1H104JZ	Plastic 0.1 µF 50V (TF)
CN692	YWMB7P90	7 pin Connector

B CH MUTING BOARD

REF.NO.	PART NO.	DESCRIPTION
PCB21 (NLA)	YWP9440PPB7	Printed Circuit Board Assy
IC661	YWTA7317P	IC
R260,262	ERDS2TJ473	Carbon 47K ohms 1/4W
R264	ERDS2TJ473	Carbon 47K ohms 1/4W
R661	ERDS2TJ123	Carbon 12K ohms 1/4W
R663	ERDS2TJ104	Carbon 100K ohms 1/4W
R665	ERDS2TJ912	Carbon 9.1K ohms 1/4W
R666	ERDS2TJ123	Carbon 12K ohms 1/4W
R667	ERDS2TJ224	Carbon 220K ohms 1/4W
R668	ERDS2TJ332	Carbon 3.3K ohms 1/4W
C661	ECQV1H104JZ	Plastic 0.1 µF 50V (TF)
CN693	YWMB9P90	9 Pin Connector

ACCESSORY PARTS/PACKAGING PARTS

M61	YWA8QA1765AN	Operating Instructions
M64	YWA8EA0097A4	Polyethylene Bag
M65	YWT10X16C03	Polyethylene Bag
M66	YWT20X35C03	Polyethylene Bag
M67	XZB26X40C05	Polyethylene Bag
M68	YWP9440CHA1	Packaging
M69	YWA8FB0147A4	Packaging Label

REF.NO.	PART NO.	DESCRIPTION
C283-286	YWRE01V102M	Electrolytic 1000 µF 35V
C287,288	ECQM2104KZ	Plastic 0.1 µF 200V
C289	ECQM4104KZ	Plastic 0.1 µF 400V
C293	ECCD2H101J2	Ceramic 100 pF 500V
RL271	YWG5A234P24V	Relay
F201,202	YWSSFR1AF003	Current Fuse
CN201	YWB10BXHA	10 pin Connector
CN211	YFB4B-XH-A	4 pin Connector
CN241	YWB5B-XHA	5 pin Connector
CN242	YWB3BXHA	3 pin Connector
CN281	YWB7BXHA	7 pin Connector
CN282	YWB6BXHA	6 pin Connector
CN283	YWB3BXHA	3 pin Connector
CN284	YWB2PVH	2 pin Connector
E301	N0.18D	Insulator
E302	N0.24	Insulator

B CH POWER DRIVE BOARD

PCB14 (NLA	YWP9440PPA2	Printed Circuit Board Assy	
IC601	YWMC5707A	IC	
IC641	YWNJM78L15A	IC	
IC642	YWNJM79L15A	IC	
Q601	2SA968B-0Y	Transistor	
Q602	YW2SC2238B0Y	Transistor	
Q603	2SJ117	Transistor	
Q604	2SK310	Transistor	
Q641	2SD1264A-PQ	Transistor	
Q642	2SB940A-PQ	Transistor	
Q661	2SA1127-ST	Transistor	
Q662	2SD1264A-PQ	Transistor	
D605,606	YWHZS12EB2	Diode	
D607,608	1SS82	Diode	
D641,642	YWHZS39EB1	Diode	
D661	YWHZS6R2EB2	Diode	
D662	YWHZS33EB2	Diode	
D663-665	YWAM01V0	Diode	
D681,682	YWAM01V0	Diode	
D683	YWRB154F	Diode	
D691	MA165	Diode	
R601	ERDS2TJ563	Carbon	56K ohms 1/4W
R602	ERDS2TJ471	Carbon	470 ohms 1/4W
R603	ERDS2TJ102	Carbon	1K ohms 1/4W
R604,605	ERDS2TJ220	Carbon	22 ohms 1/4W
R606	ER0S2CKF1301	Metal	1300 ohms
R607	ER0S2CKF5622	Metal	56.2K ohms
R608,609	ERDS1TJ123	Carbon	12K ohms 1/2W
R612,613	ERDS2FJ680	Carbon	68 ohms 1/4W
R614,615	ERDS2TJ102	Carbon	1K ohms 1/4W
R616,617	ERDS2TJ683	Carbon	68K ohms 1/4W

REF.NO.	PART NO.	DESCRIPTION
R641	ERQ2AJP271S	Fuse Resistor 270 ohms 2W
R642	ERQ2AJP561S	Fuse Resistor 560 ohms 2W
R643,644	ERDS1TJ273	Carbon 27K ohms 1/2W
R645,646	ERDS2TJ102	Carbon 1K ohms 1/4W
R647,648	ERQ1AJP561S	Fuse Resistor 560 ohms 1W
R659	ERDS2TJ683	Carbon 68K ohms 1/4W
R669	ERDS1TJ472	Carbon 4.7K ohms 1/2W
R670	ERDS2TJ102	Carbon 1K ohms 1/4W
R671	ERDS2TJ103	Carbon 10K ohms 1/4W
R672	ERDS2TJ333	Carbon 33K ohms 1/4W
R673	ERDS2TJ472	Carbon 4.7K ohms 1/4W
R674	ERG2SJ222	Metal 2.2K ohms 2W
R675	ERDS1TJ272	Carbon 2.7K ohms 1/2W
R676	ERDS2TJ104	Carbon 100K ohms 1/4W
R677	ERG2SJ222	Metal 2.2K ohms 2W
R678	ERDS2TJ102	Carbon 1K ohms 1/4W
R679	ERDS2TJ823	Carbon 82K ohms 1/4W
R696	ERG1SJ392P	Metal 3.9K ohms 1W
R697	ERDS2TJ331	Carbon 330 ohms 1/4W
R698	ERG1SJ183P	Metal 18K ohms 1W
VR601	EVND4AA00B53	Variable Resistor 5K ohms
C601	YWUP05S220JN	Ceramic 22 pF
C604,605	ECQB1H562JZ	Plastic 5600 pF 50V
C606	YWRBA10V471M	Electrolytic 470 µF 10V
C607	ECQV1H104JZ	Plastic 0.1 µF 50 V (TF)
C608	ECCW2H470J2	Ceramic 47 pF 500V
C609,610	ECCF2H330K	Ceramic 33 pF 500V
C613,614	ECKW2H331KB	Ceramic 330 pF 500V
C641,642	ECEA2AU470	Electrolytic 47 µF 10OV
C643,644	ECEA2AU100	Electrolytic 10 µF 10OV
C645,646	ECEA1HU100	Electrolytic 10 µF 50V
C647,648	ECQV1H334JZ	Plastic 0.33 µF 50V
C649,650	ECQV1H104JZ	Plastic 0.1 µF 50 V (TF)
C652	ECQV1H104JZ	Plastic 0.1 µF 50 V (TF)
C662	ECEA1AN101S	Electrolytic 100 µF 10V
C663	ECEA0JU470	Electrolytic 47 µF 6.3 V
C664	ECEA1CU100	Electrolytic 10 µF 16V
C665	ECQV1H104JZ	Plastic 0.1 µF 50 V (TF)
C681,682	YWR02C800KPS	Electrolytic 80 µF 16OV
C683-686	YWRE01V102M	Electrolytic 1000 µF 35V
C687,688	ECQM2104KZ	Plastic 0.1 µF 200V
C689	ECQM4104KZ	Plastic 0.1 µF 400V
RL671	YWG5A234P24V	Relay
F601,602	YWSSFR1AF003	Current Fuse
CN601	YWB10BXHA	10 pin Connector
CN603	YWB3BXHA	3 pin Connector
CN611	YFB4B-XH-A	4 pin Connector
CN641	YWB5B-XHA	5 pin Connector
CN642	YWB3BXHA	3 pin Connector
CN681	YWB7BXHA	7 pin Connector
CN682	YWB6BXHA	6 pin Connector
E301	N0.18D	Insulator
E302	N0.24	Insulator