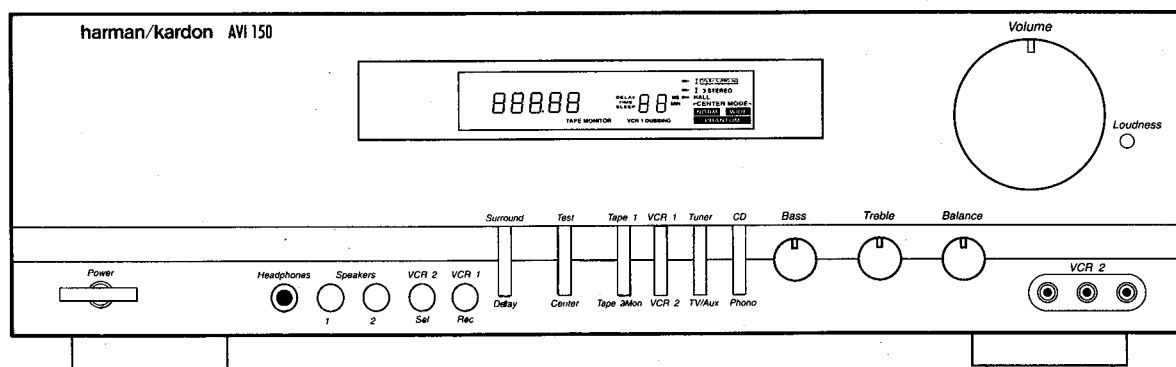


The Harman Kardon Model AVI150 AUDIO AND VIDEO AMPLIFIER

Manual A

Technical Manual



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harman/kardon

Parts and Service Office
80 Crossways Park West, Woodbury, N.Y. 11797
1112-AVI150A G9603 1200 Printed in Korea

SPECIFICATIONS

	Nominal	Limit
● FRONT AMP SECTION		
RMS Output Power		
(Stereo Mode) Input: CD		
THD 0.09%, 8 ohms	≥ 65 W	≥ 63 W
Both Channel Driven (40 Hz-10 kHz)		
(Surround Mode)	≥ 55 W	≥ 50 W
THD (0.09%, 8 ohms, 1 kHz)		
Im Distortion Input : CD	≤ 0.2%	≤ 0.3%
At 63 W, 60:7000 Hz = 4:1		
THD (40 Hz-10 KHz) at 8 ohms, 63 W Input: CD		
40 Hz	≤ 0.06%	≤ 0.09%
1 kHz	≤ 0.06%	≤ 0.09%
10 kHz	≤ 0.06%	≤ 0.09%
Input Sensitivity		
Phono (MM)	2.5 mV	±0.4 mV
CD, AUX, VCR	150 mV	±30 mV
S/N (WTD IHF-A) Input Shorted at Volume Max		
Phono	≥ 74 dB	≥ 70 dB
CD, Tape1, 2	≥ 92 dB	≥ 90 dB
TV, VCR1, 2	≥ 82 dB	≥ 80 dB
Phono Overload at 1 kHz, THD: 0.5%		
Phono Input → Tape Output	≥ 140 mV	≥ 130 mV
Phono Equalization		
RIAA 30 Hz-15 kHz, Tape Mon, Output		
RIAA dB		±1.5 dB
Tone Control		
Bass, 100 Hz	±10 dB	±2 dB
Treble, 10 kHz	±10 dB	±2 dB
Loudness control at -40 dB		
100 Hz	+6 dB	±2 dB
10 kHz	+3 dB	±2 dB
Frequency Response		
CD/AUX		
20 Hz, 20 kHz	±0.5 dB	±1 dB
Channel Crosstalk Input Shorted		
1 kHz	≥ 60 dB	≥ 50 dB
10 kHz	≥ 50 dB	≥ 40 dB

● CENTER AMP SECTION

RMS Output Power		
THD < 0.3%, 8 ohms, 1 kHz		
Only Center Channel Driven	≥ 55 W	≥ 50 W
S/N Ratio		
Input Shorted, IHF A WTD		
Line Input : 350 mV	≥ 67 dB	≥ 65 dB

	Nominal	Limit
Frequency Response at -3dB		
Normal	100 Hz-20 kHz	150 Hz-15 kHz
Wide	20 Hz-20 kHz	50 Hz-15 kHz

● REAR AMP SECTION

RMS Output Power		
THD < 0.7%, 8 ohms, 1 kHz		
Only Rear Channel Driven	≥ 27 W	≥ 25 W
S/N Ratio		
Input Shorted, IHF A WTD,		
Delay : 20 mS, Line Input :350 mV		
Dolby	≥ 60 dB	≥ 55 dB
Hall	≥ 60 dB	≥ 55 dB
Frequency Response at -3 dB		
8 ohms, Dolby Pro-Logic	80 Hz-7 kHz	100 Hz-6 kHz

● VIDEO SECTION

Input Sensitivity/Impedance		
VCR1, VCR2, VDP	1Vp-p/75 Ω	±1 dB
Output Level/Impedance		
VCR1, REC out, TV Monitor Out		
	1Vp-p/75 Ω	±1 dB
Frequency Response -3dB		
	DC -10 MHz	5-16 MHz
Crosstalk at 1.0 MHz	≥ 45 dB	≥ 40 dB

● GENERAL

Speaker Load Impedance	8 Ω
Power Consumption	
No Signal	45 Watts
Full Signal at Both Channels AC 230 V, 50 Hz,	500 Watts
Dimensions (W) 17-5/16 x (H) 4-7/8 x (D) 14-15/16 Inches	
(W) 440 x (H) 125 x (D) 380 mm	
Weight	23.59 lbs (10.7 kg)

Note : Nominal speces represent the design specs. All units should be able to approximate these. Some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition that still might be considered acceptable ; in no case should a unit fail to meet limit specs. This manual is based on the Europe Standard wiring diagram, and information on regional component variations through use of parts list. Design and specifications are subject to change without notice for improvement.

LEAKAGE TEST

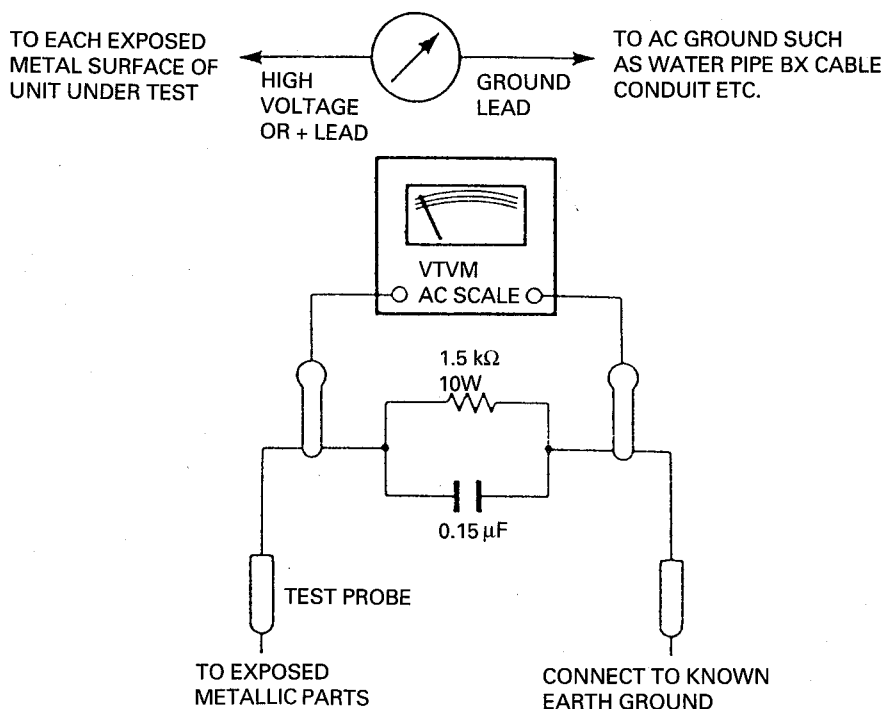
Before returning the unit to the user, perform the following safety checks:

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metallic parts in the unit.
2. Be sure that any protective devices such as nonmetallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators, etc., which were removed for servicing are properly reinstalled.
3. Be sure that no shock hazard exists; check for leakage current using Simpson Model 229 Leakage Tester, standard equipment item no. 21641, RCA model WT540A or use alternate method as follows: plug the power cord directly into a 230-volt AC receptacle (do not use an Isolation transformer for this test).

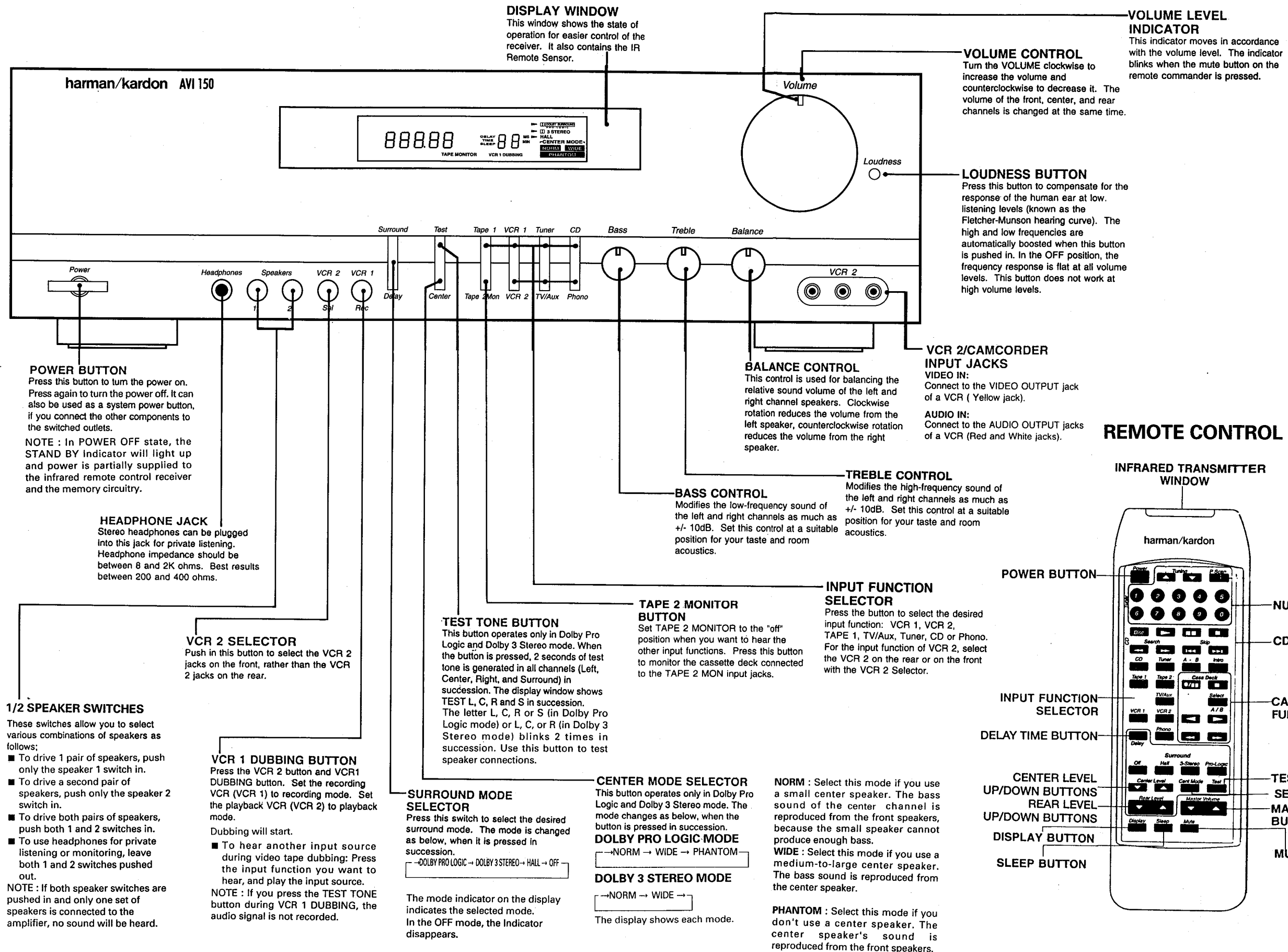
Using two clip leads, connects a 1500 ohm, 10-watt resistor paralleled by a $0.15\mu\text{F}$ capacitor, in series with all exposed metal cabinet parts and a known earth ground, such as a water pipe or conduit. Use a VTVM or VOM with 1000 ohms per volt, or higher sensitivity to measure the AC voltage drop across the resistor (see diagram) Move the resistor connection to each exposed metal part having a return path to the chassis (antenna, metal cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor. (This test should be performed with the power switch in both the on and off positions.)

A reading of 0.35 volt RMS or more is excessive and indicates a potential shock hazard which must be corrected before returning the unit to the owner.

SIMPSON MODEL 229 ETC. FOR LEAKAGE TEST



CONTROLS AND FUNCTIONS

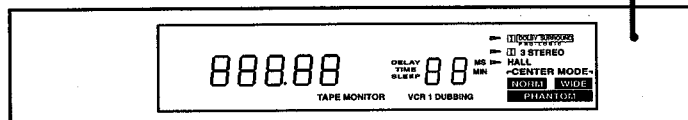


CONTROLS AND FUNCTIONS

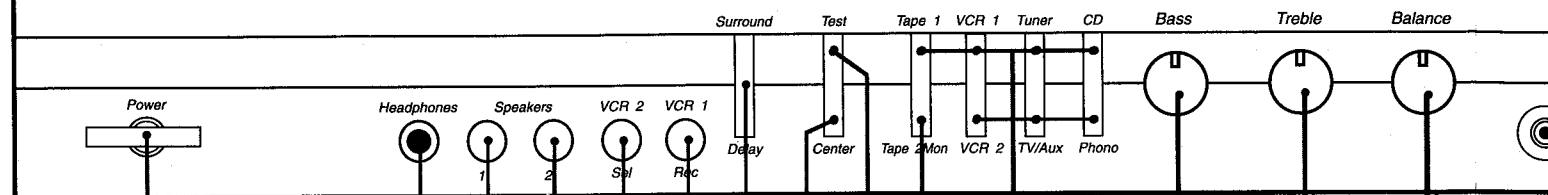
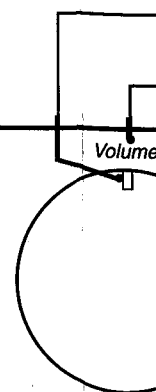
DISPLAY WINDOW

This window shows the state of operation for easier control of the receiver. It also contains the IR Remote Sensor.

harman/kardon AVI 150



Volume



POWER BUTTON

Press this button to turn the power on. Press again to turn the power off. It can also be used as a system power button, if you connect the other components to the switched outlets.

NOTE : In POWER OFF state, the STAND BY Indicator will light up and power is partially supplied to the infrared remote control receiver and the memory circuitry.

HEADPHONE JACK

Stereo headphones can be plugged into this jack for private listening. Headphone impedance should be between 8 and 2K ohms. Best results between 200 and 400 ohms.

VCR 2 SELECTOR

Push in this button to select the VCR 2 jacks on the front, rather than the VCR 2 jacks on the rear.

1/2 SPEAKER SWITCHES

These switches allow you to select various combinations of speakers as follows:

- To drive 1 pair of speakers, push only the speaker 1 switch in.
- To drive a second pair of speakers, push only the speaker 2 switch in.
- To drive both pairs of speakers, push both 1 and 2 switches in.
- To use headphones for private listening or monitoring, leave both 1 and 2 switches pushed out.

NOTE : If both speaker switches are pushed in and only one set of speakers is connected to the amplifier, no sound will be heard.

VCR 1 DUBBING BUTTON

Press the VCR 2 button and VCR1 DUBBING button. Set the recording VCR (VCR 1) to recording mode. Set the playback VCR (VCR 2) to playback mode.

Dubbing will start.

- To hear another input source during video tape dubbing: Press the input function you want to hear, and play the input source.

NOTE : If you press the TEST TONE button during VCR 1 DUBBING, the audio signal is not recorded.

TEST TONE BUTTON

This button operates only in Dolby Pro Logic and Dolby 3 Stereo mode. When the button is pressed, 2 seconds of test tone is generated in all channels (Left, Center, Right, and Surround) in succession. The display window shows TEST L, C, R and S in succession. The letter L, C, R or S (in Dolby Pro Logic mode) or L, C, or R (in Dolby 3 Stereo mode) blinks 2 times in succession. Use this button to test speaker connections.

SURROUND MODE SELECTOR

Press this switch to select the desired surround mode. The mode is changed as below, when it is pressed in succession.

→ DOLBY PRO LOGIC → DOLBY 3 STEREO → HALL → OFF →

The mode indicator on the display indicates the selected mode. In the OFF mode, the indicator disappears.

TAPE 2 MONITOR BUTTON

Set TAPE 2 MONITOR to the "off" position when you want to hear the other input functions. Press this button to monitor the cassette deck connected to the TAPE 2 MON input jacks.

CENTER MODE SELECTOR

This button operates only in Dolby Pro Logic and Dolby 3 Stereo mode. The mode changes as below, when the button is pressed in succession.

DOLBY PRO LOGIC MODE

→ NORM → WIDE → PHANTOM →

DOLBY 3 STEREO MODE

→ NORM → WIDE →

The display shows each mode.

BALANCE CONTROL

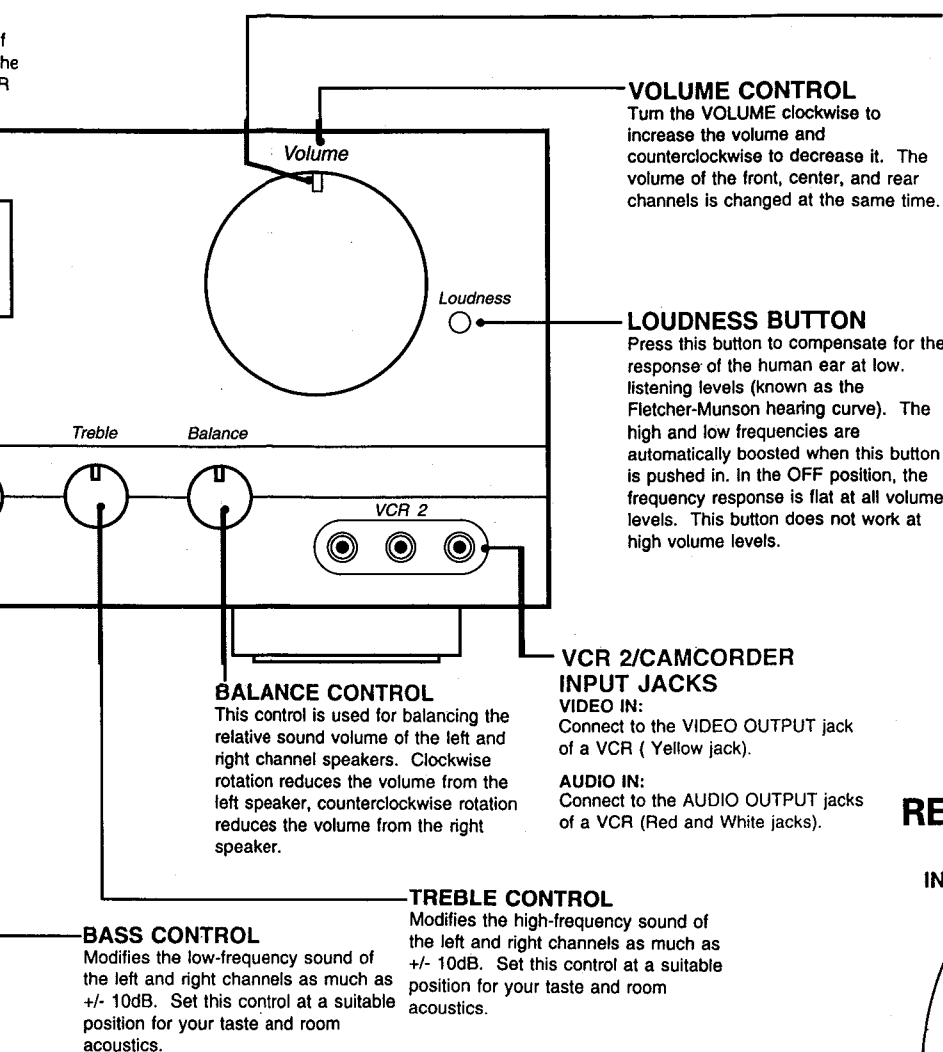
This control is used to adjust the relative sound volume between the left and right channels. As the balance knob is rotated, the sound from the right channel speaker is reduced, and the sound from the left channel speaker is increased.

BASS CONTROL

Modifies the low-frequency sound of the left and right channels as much as +/- 10dB. Set this control at a position for your taste and room acoustics.

NORM : a small sound reproduction because of the medium the center

PHANTOM : don't use center reproduction



REMOTE CONTROL

TAPE 2 MONITOR BUTTON
Set TAPE 2 MONITOR to the "off" position when you want to hear the other input functions. Press this button to monitor the cassette deck connected to the TAPE 2 MON input jacks.

INPUT FUNCTION SELECTOR
Press the button to select the desired input function: VCR 1, VCR 2, TAPE 1, TV/Aux, Tuner, CD or Phono. For the input function of VCR 2, select the VCR 2 on the rear or on the front with the VCR 2 Selector.

MODE SELECTOR
The receiver operates only in Dolby Pro Logic mode. The bass sound of the center channel is reproduced from the front speakers, because the small speaker cannot produce enough bass.

DOLBY PRO LOGIC MODE
NORM → WIDE → PHANTOM

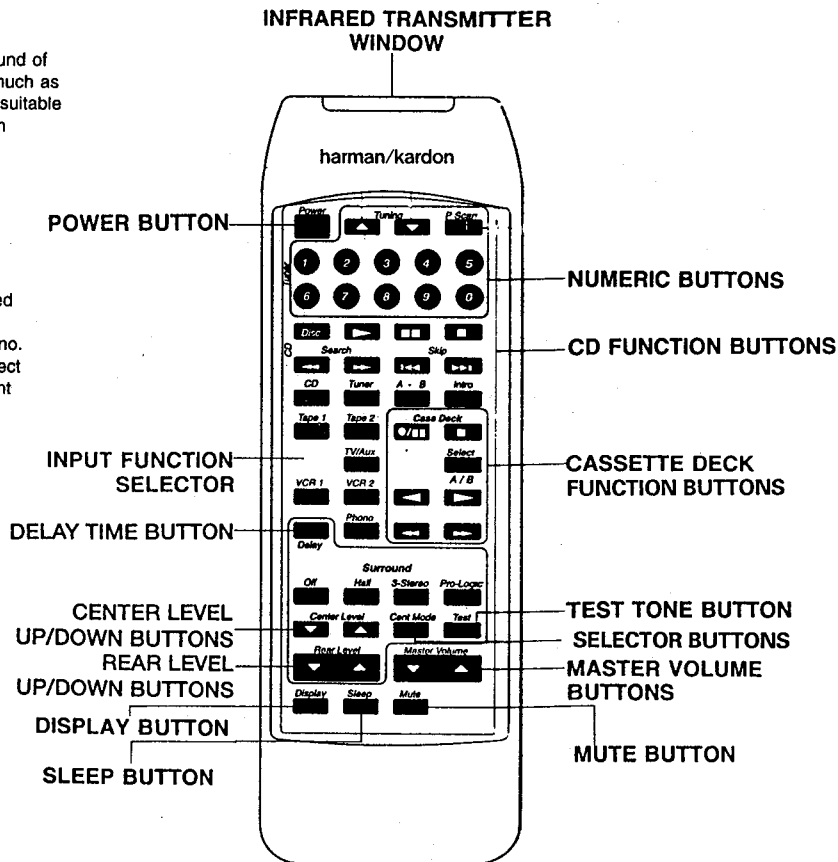
DOLBY 3 STEREO MODE
NORM → WIDE → PHANTOM

play shows each mode.

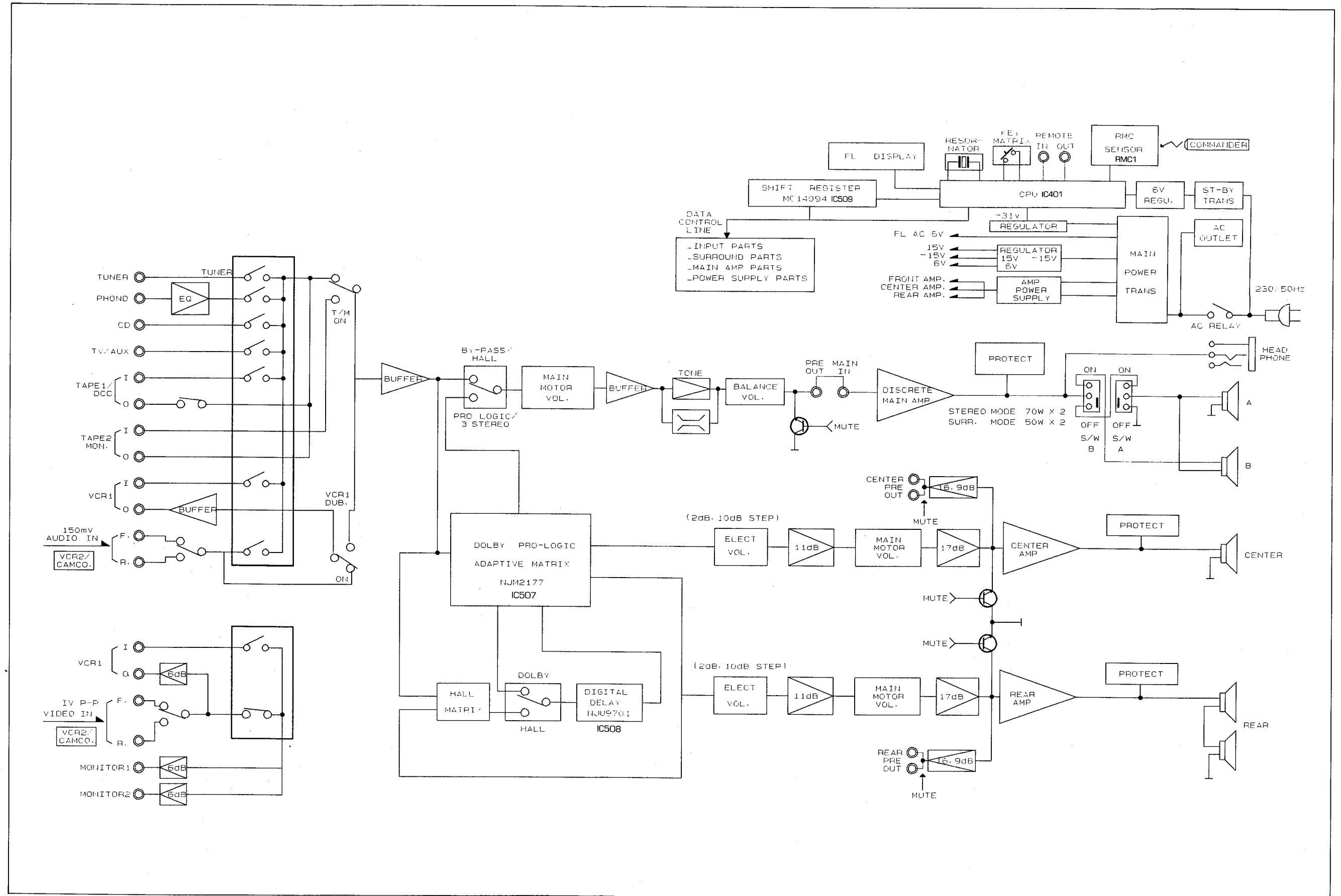
NORM : Select this mode if you use a small center speaker. The bass sound of the center channel is reproduced from the front speakers, because the small speaker cannot produce enough bass.

WIDE : Select this mode if you use a medium-to-large center speaker. The bass sound is reproduced from the center speaker.

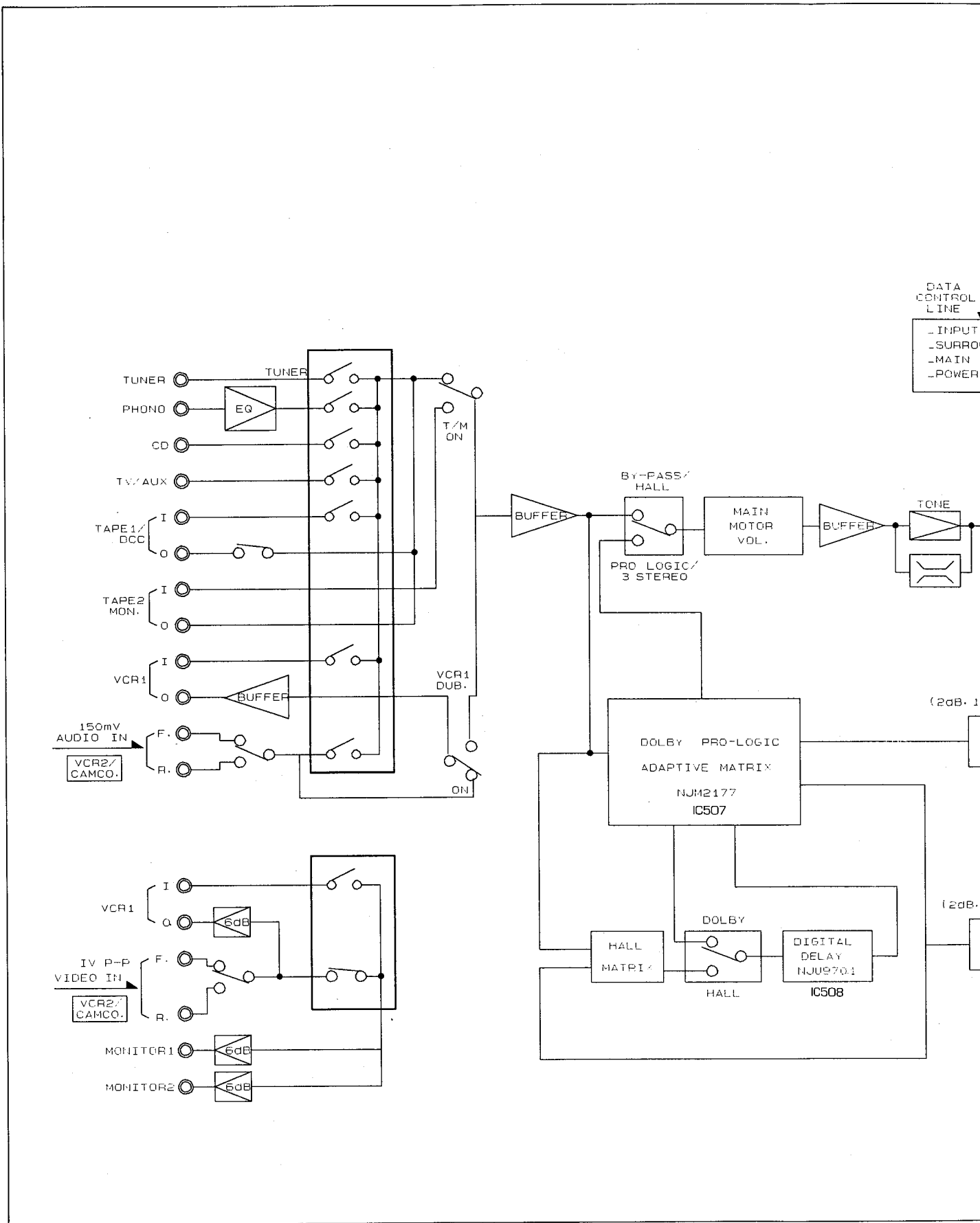
PHANTOM : Select this mode if you don't use a center speaker. The center speaker's sound is reproduced from the front speakers.



BLOCK DIAGRAM



BLOCK DIAGRAM





DISASSEMBLY PROCEDURES

1 Cover Top Removal (Figure 1)

1. Remove 6 screws (① to ⑥) from the both sides of chassis.
2. Remove 2 screws (⑦ and ⑧) from the chassis back.
3. Carefully lift the cover top to remove.

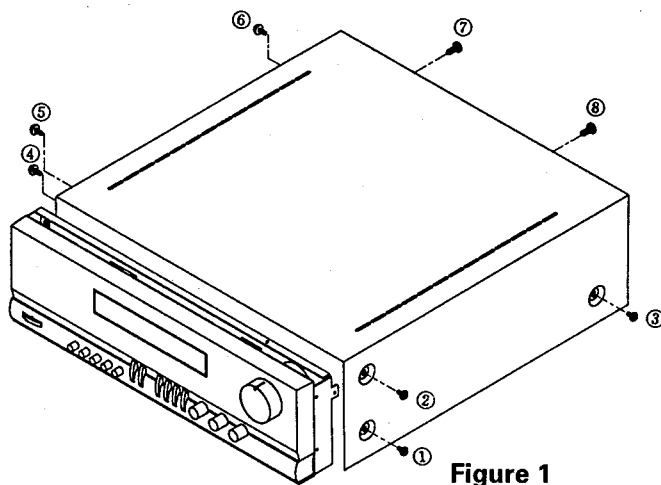


Figure 1

2 Cover Bottom Removal (Figure 2)

1. Remove 10 screws (① to ⑩) from the cover bottom.
2. Carefully lift the cover bottom to remove.

3 Surround P.C.Board Removal (Figure 2)

1. Remove the cover top (Refer to step 1).
2. Remove 2 screws (⑪ and ⑫) from the chassis back and chassis front.
3. Disconnect CNT602 from the Surround P.C.Board.
4. Remove the Surround P.C.Board.

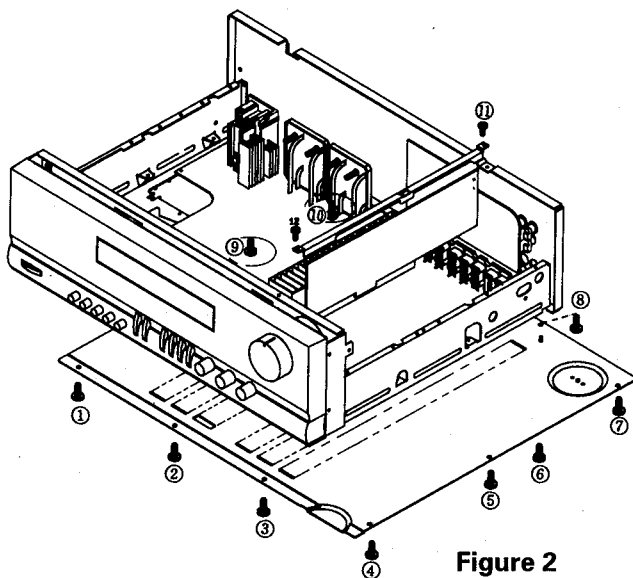


Figure 2

4 Panel Front Assembly Removal (Figure 3)

1. Remove the cover top (Refer to step 1).
2. Remove 4 screws (① to ④) from both sides of the panel front.
3. Remove a screw (⑤) from top of the panel front.
4. Remove 3 screws (⑥ to ⑧) from the bottom of the panel front.
5. Remove a screw (⑨) from the right frame.
6. Disconnect CNT602 from the Surround P.C.Board.
7. Disconnect CP402, CP901 and CP902 from the Main P.C.Board.
8. Disconnect CP401, CP701 and CP702 from the Input P.C.Board.
9. Disconnect CP102 from the Volume P.C.Board.
10. Disconnect CP703 from the Video P.C.Board.

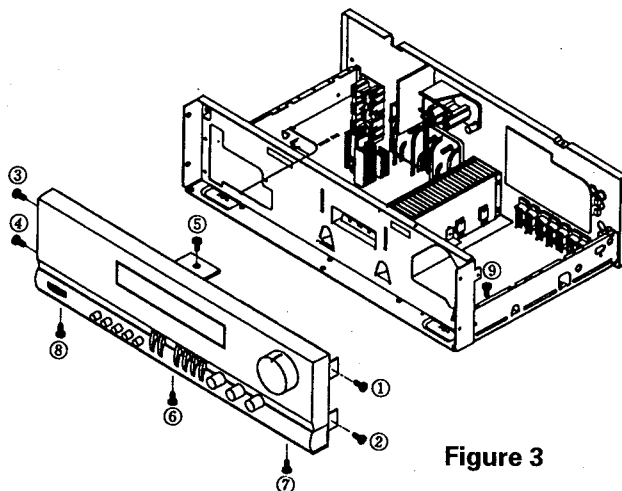


Figure 3

5 Volume P.C.Board Removal (Figure 4)

1. Remove the panel front assembly. (Refer to step 4)
2. Disconnect CP603 from the Volume P.C.Board.
3. Pull the knob (main volume).
4. Remove the hex nut from the volume motor to release the Volume P.C.Board.
5. Remove 2 screws (① and ②) from load switch.
6. Pull the Volume P.C.Board from the panel front assembly to remove.

6 Tone P.C.Board Removal (Figure 4)

1. Remove the panel front assembly. (Refer to step 4).
2. Pull out the knobs (bass, treble, balance) from the panel front assembly.
3. Remove the hex nuts from the variable resistors.
4. Remove 4 screws (③ and ⑥) from the Tone P.C.Board.
5. Remove the shield fence.

7 Front P.C.Board Removal (Figure 4)

1. Remove the panel front assembly. (Refer to step 4)
2. Remove 11 screws (7 and 17) to release the panel front, pressing both books.

8 Speaker P.C.Board Removal (Figure 4)

1. Remove the panel front assembly. (Refer to step 4)
2. Remove 4 screws (18 and 21) from the panel front to release the Headphone P.C.Board.

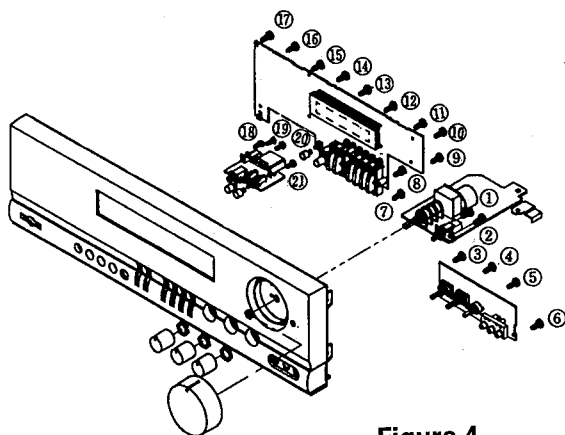


Figure 4

9 Video P.C.Board Removal (Figure 5)

1. Remove the cover top and Surround P.C.Board. (Refer to step 1 and 3)
2. Disconnect CP101, CP104 and CP703 from the Video P.C.Board.
3. Disconnect CP301 from the Main P.C.Board.
4. Disconnect CP105 from the Input P.C.Board.
5. Remove 6 screws (1 and 6) from the chassis back.

10 Outlet P.C.Board Removal (Figure 5)

1. Remove the cover top. (Refer to step 1)
2. Disconnect CN201E, CN202E from the Main P.C.Board.
3. Remove 2 screws (7 and 8) from the chassis back.

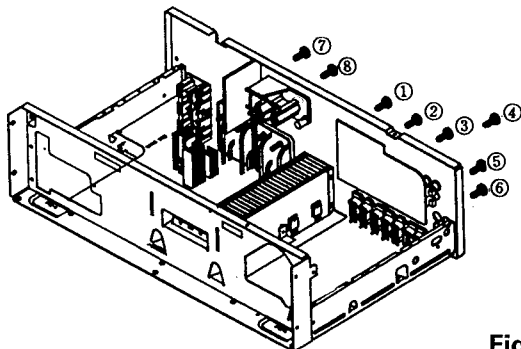


Figure 5

11 Chassis Back Removal (Figure 6)

1. Remove the cover top. (Refer to step 1)
2. Do steps 2, 3, 9 and 10.
3. Remove 18 screws (1 to 18) from the chassis back.

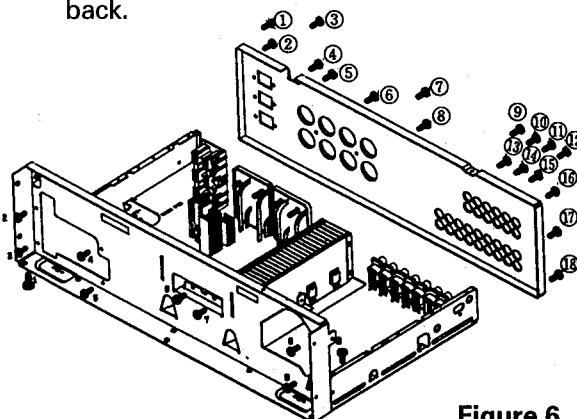


Figure 6

12 Main P.C.Board Removal (Figure 7)

1. Remove the cover top. (Refer to step 1)
2. Remove the panel front assembly. (Refer to step 4)
3. Remove the chassis back. (Refer to step 11)
4. Disconnect CP201, CP202, CP203, CP207H, CP207T, and CP301 from the Main P.C.Board.
5. Disconnect CP204 and CP207 from the Input P.C.Board.
6. Unsolder all leads of Q217L/R, Q213L/R, Q216L/R in the Main P.C.Board.
7. Remove a screw (1) from the front bottom of the frame left.
8. Remove 8 screws (2 to 9) from the chassis front and remove 2 screws (10 and 11) from the Input P.C.Board to release the chassis front.
9. Remove 5 screws (12 to 16) from the Main P.C.Board.

13 Input P.C.Board Removal (Figure 7)

1. Remove the Main P.C.Board. (Refer to step 12)
2. Unsolder all leads of Q112, Q115, Q116, Q123 and Q127 in the Input P.C.Board.
3. Remove 2 screws (17 and 18) from the right frame.

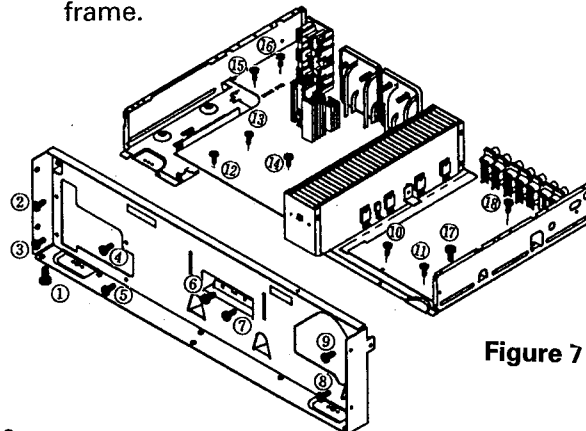
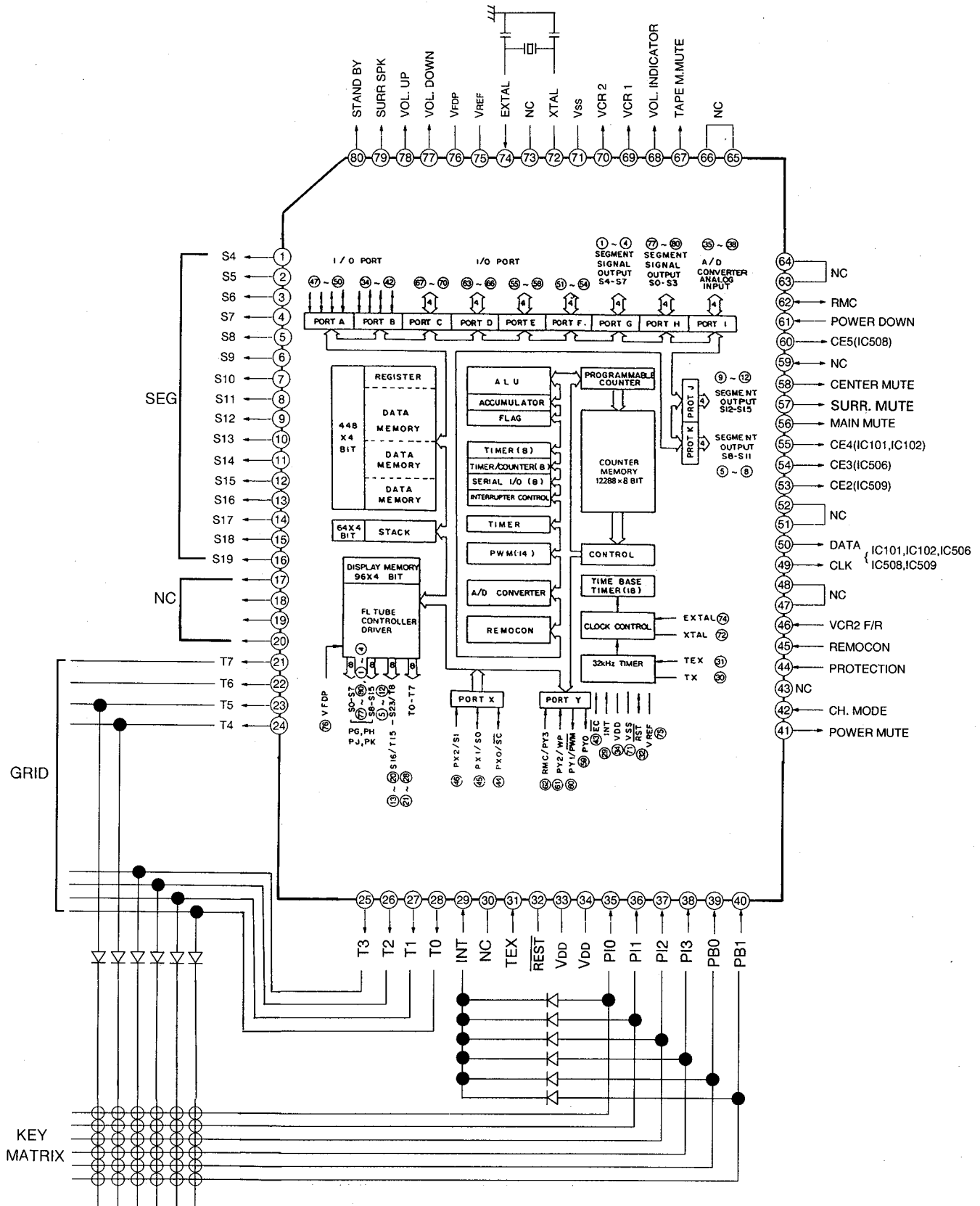


Figure 7

CIRCUIT DESCRIPTION

CPU(IC401) : CXP50112-583Q

1. Pin Description & Block Diagram



2. Pin Functions

Pin No.	Symbol	Description								
1 ~ 16	S4 ~ S19	Segment signal output for FIP.								
17 ~ 20	NC	Not used! (They are left open.)								
21 ~ 28	T7 ~ T0	Grid signal output for FIP.								
29	INT	Data input of k ₀ ~ k ₅ for key scan.								
30	NC	Not used! (It is left open.)								
31	TEX	Not used! (It is connected to +5V.)								
32	RST	Input for resetting CPU. (At "H", it is active.)								
33/34	V _{DD}	+5V power supply.								
35 ~ 40	PI 0 ~ PI 3, PB0/PB1	Data input of k ₀ ~ k ₅ for key scan.								
41	POWER MUTE	Output for mute when the power is turned on or off.								
42	CH. MODE	Data input for PRO · LOGIC and 3-STEREO mode. According to each mode, data output is as follows. <table><tr><th>MODE</th><th>OUTPUT</th></tr><tr><td>3-STEREO</td><td>High impedance</td></tr><tr><td>PRO · LOGIC</td><td>H</td></tr><tr><td>OTHERS</td><td>L</td></tr></table>	MODE	OUTPUT	3-STEREO	High impedance	PRO · LOGIC	H	OTHERS	L
MODE	OUTPUT									
3-STEREO	High impedance									
PRO · LOGIC	H									
OTHERS	L									
43	NC	Not used! (It is connected to ground.)								
44	PROTECTION	Signal input for protection. At "L", it is changed to STAND BY. (But, for first 3 seconds, PROTECTION is not checked.)								
45	REMOCON	Input for remocon data. (At "L", it is active.)								
46	VCR 2 F/R	Input for selecting front or rear of VCR 2. (At "H", rear of VCR 2 is selected and At "L", front is selected.)								
47/48	NC	Not used! (They are left open.)								
49/50	CLK/DATA	Output for CLK/DATA of LC7821(IC101,102), TC9176(IC506), NJU9701(IC508) and MC14094(IC509).								
51/52	NC	Not used! (They are left open.)								
53	CE2	Chip enable output for MC14094(IC509).								
54	CE3	Chip enable output for TC9176(IC506).								
55	CE4	Chip enable output for LC7821(IC101,102).								
56 ~ 58	MAIN/SURR./CENTER MUTE	Output for main, surround and center mute. Under the following conditions, it becomes "H". 1. When the power is turned on or off. 2. At the PROTECTION of CPU, it becomes "L". 3. "- ∞" mute signal is transferred from the commander.								
59	NC	Not used! (It is left open.)								
60	CE5	Chip enable output for NJU9701(IC508).								
62	RMC	Not used! (It is connected to ground.)								

Pin No.	Symbol	Description															
63 ~ 66	NC	Not used! (They are left open.)															
67	TAPE M. MUTE	Output for tape monitor mute.															
68	VOL. INDICATOR	Output for driving volume LED.															
69/70	VCR 1/VCR 2	Control data output for selecting VCR 1 or VCR 2 video signal. According to each mode, data output is as follows. <table><tr><th>MODE \ OUTPUT</th><th>VCR 1</th><th>VCR 2</th><th>REMARKS</th></tr><tr><td>VCR 1</td><td>H</td><td>L</td><td rowspan="2">Initial settings</td></tr><tr><td>VCR 2</td><td>L</td><td>H</td></tr><tr><td>OTHERS</td><td>△</td><td>△</td><td>△:Previous state</td></tr></table> ※ Last memory function is available.	MODE \ OUTPUT	VCR 1	VCR 2	REMARKS	VCR 1	H	L	Initial settings	VCR 2	L	H	OTHERS	△	△	△:Previous state
MODE \ OUTPUT	VCR 1	VCR 2	REMARKS														
VCR 1	H	L	Initial settings														
VCR 2	L	H															
OTHERS	△	△	△:Previous state														
71	V _{SS}	This pin provides the ground potential.															
72	XTAL	Output for crystal oscillator.															
73	NC	Not used!															
74	EXTAL	Input for crystal oscillator.															
75	V _{REF}	+5V reference voltage.															
76	V _{FDP}	-30V power supply for FIP.															
77	VOL. DOWN	Output to drive volume motor for decreasing volume level.															
78	VOL. UP	Output to drive volume motor for increasing volume level.															
79	SURR. SPK	Output for controlling in the surround mode. <table><tr><th>SURROUND MODE</th><th>OUTPUT</th></tr><tr><td>PRO · LOGIC, 3-STEREO, HALL</td><td>H</td></tr><tr><td>SURR. OFF</td><td>L</td></tr></table>	SURROUND MODE	OUTPUT	PRO · LOGIC, 3-STEREO, HALL	H	SURR. OFF	L									
SURROUND MODE	OUTPUT																
PRO · LOGIC, 3-STEREO, HALL	H																
SURR. OFF	L																
80	STAND BY	When the power is on, control data output is "H". When the power is off, control data output is "L". (and last memory function is activated.)															

Key Matrix

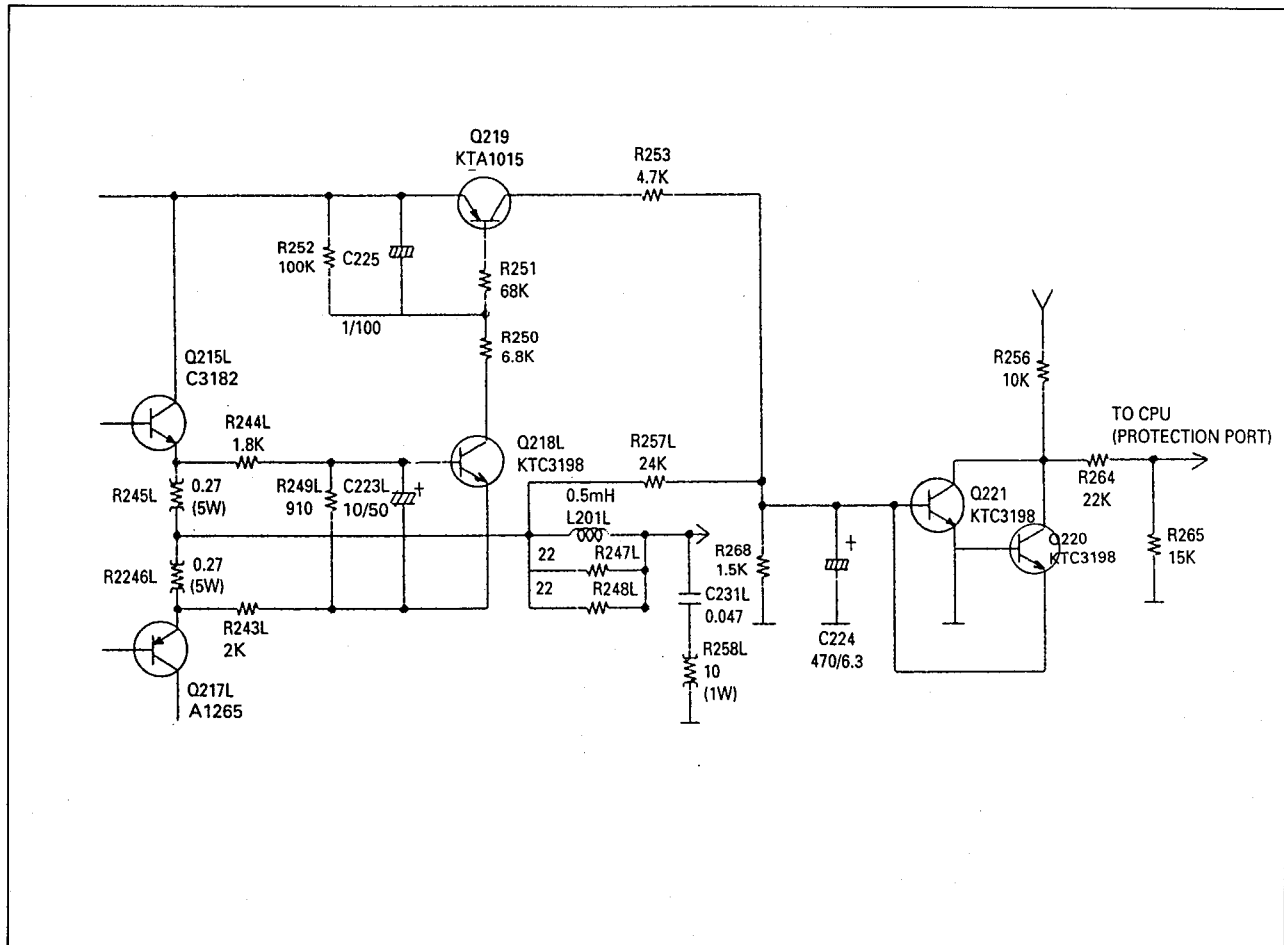
	KEY0	KEY1	KEY2	KEY3	KEY4	KEY5
T6			CD			PHONO
T5	VCR1	VCR2	TV	TAPE2 MON.	TAPE1	TUNER
T4		VCR1 REC	SURR. MODE			
T1				POWER		
T0	DELAY TIME	TEST TONE	TEST TONE		CENTER MODE	

3. Protection Circuits

SPEAKER PROTECTION CIRCUIT

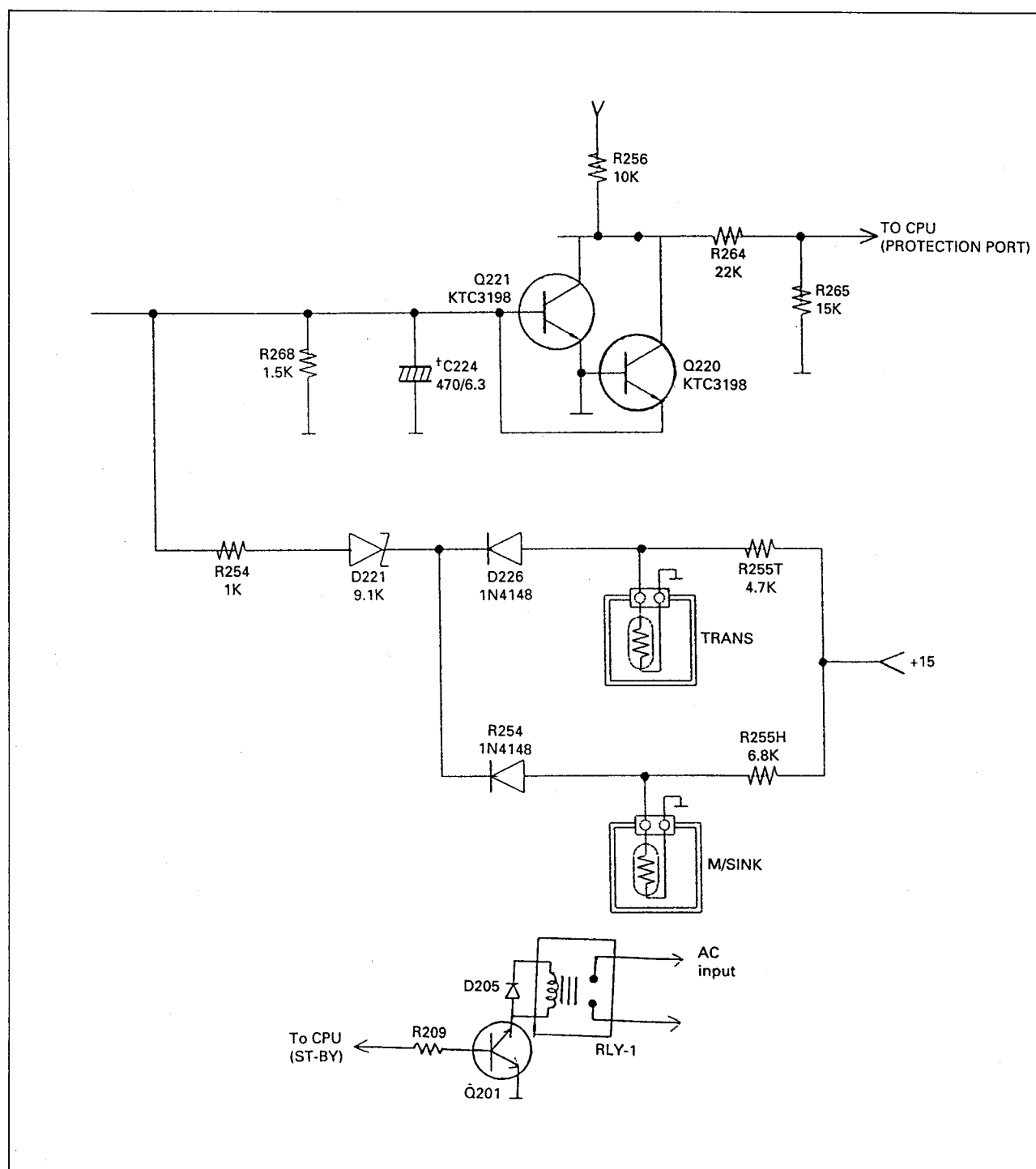
The CPU protects both this unit and the speakers when an abnormally high current flows in Q216 L/R and Q217 L/R due to excessive input drive, too low of a load impedance, or short of the speaker terminals. If current increase is excessive the voltage across R245 L/R or R246 L/R turns on Q218 L/R, then Q219 turns on Q221.

It makes the protection port of the CPU to low state, and the CPU turns off Q201 and RLY-1. Then the power is turned off.



THERMAL PROTECTION CIRCUIT

This receiver has a overload thermal protection circuits to guard against abnormal operation. When the temperature of TRANS POSISTOR installed with the main transformer or H/SINK POSISTOR rises abnormally, the resistance of the posistor becomes larger and Q221 is turned on. It makes the protection port of the CPU to low state, and the CPU turns off Q201 and RLY-1. Then the power is turned off.



TROUBLESHOOTING

Symptom	Cause and Remedy
Integrated Amp inoperative. (FL indicator does not light.)	A) Faulty AC power cord. Replace. B) Defective the power switch. Replace. C) Broken wire in the power transformer. Replace the power transformer. D) Blown fuse: Replace the fuse.
Fuse blows when power is turned on.	A) Defective power transformer. Replace. B) Short in the primary or secondary of the transformer circuitry. Repair the short. C) Damaged rectifier (D208 to D211) or damaged transistor (Q216 to Q217). Replace the defective component(s). D) Short circuit in the amplifier circuit. Repair the short.
Power indicator lights but no sound from both channels.	A) Speaker switch 1 or 2 is defective. Replace the defective switch (es) B) Defect in transistors Q216 L/R, Q217 L/R on the Main Amp Board. Replace the defective component(s).
Speaker A inoperative.	A) Speaker switch A is defective. Replace.
Speaker B inoperative.	A) Speaker switch B is defective. Replace.
One channel does not work when Volume is at maximum with a test signal applied to the center terminal of volume control VR5 of the dead channel.	A) Defect in transistors Q216 L/R, Q217 L/R on the Main Amp Board Locate and correct the defect. B) Break in copper foil of printed circuit board. Repair the circuit trace. C) Short in speaker output terminal. Repair or replace.
Speaker works normally but headphones inoperative.	A) Headphone plug does not mate with jack. Replace the jack. B) Defective resistors R901, R902. Replace.
PHONO input inoperative.	A) Poor contact in phono input jack. Repair or replace the jack. B) Defective phono switch or IC103. Replace.
LOUDNESS has no effect.	A) Defective loudness switch. Replace. B) Defective resistors R601, R602, C601, C602. Replace the defective component(s).
Bass control has no effect.	A) Variable resistor BASS defective. Replace. B) Defective R709 L/R, R710 L/R, C702 L/R, C708 L/R Replace the defective component(s).

Symptom	Cause and Remedy
Treble control has no effect.	A) Variable resistor TREBLE is defective. B) Defective R711 L/R, R712 L/R, C709 L/R, C710L/R Replace the defective components(s).
FL inoperative.	A) Defective FL. Replace. B) Defective IC401. Replace. C) Defective X401. Replace.
Noisy Volume control.	A) Defective volume control. Replace. B) Defective capacitor C615 or C616. Replace the defective capacitor(s).
Remote Control Unit inoperative.	A) Weak Battery. Replace. B) Defective. Replace. C) Defective IC401 (CPU Board) or IC01. Replace.

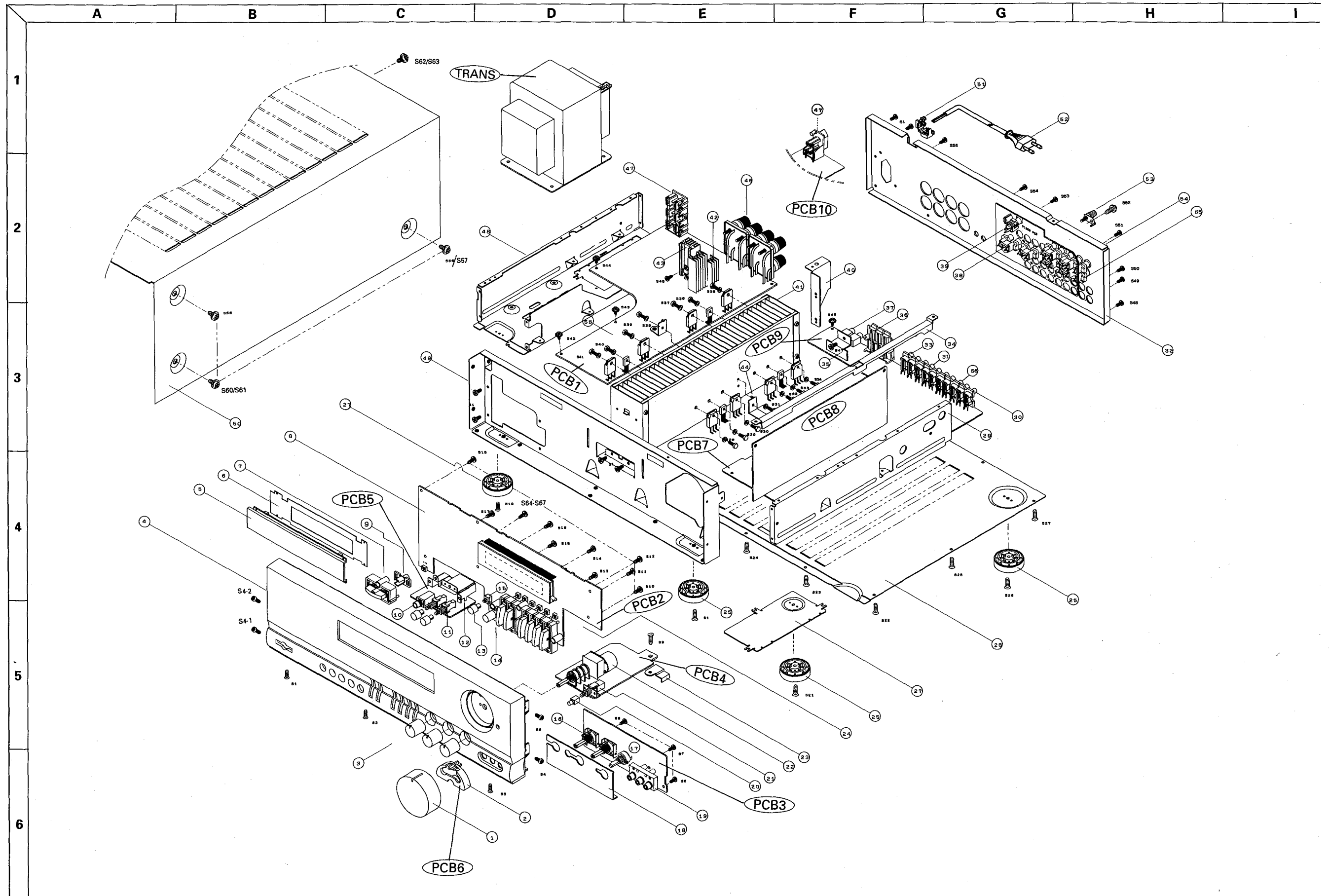
GENERAL UNIT PARTS LIST

Ref. No.	Mfr. Part No.	Description	Q'ty
CABINET AND CHASSIS			
1	048543059811	Knob, Main-Volume	1
2	8555048610	Indicator, Main Volume	1
3	048545124311	Knob, Rotary, Tone Volume	3
4	048501035411	Panel, Front, ABS, Black	1
5	8553019710	Window, Display	1
6	048555048511	Filter	1
7	048545124011	Button, Power, ABS Black	1
8	8555048710	Indicator, Power	1
9	4658003710	Switch, Tact	14
10	4438005020	Jack, Phone	1
11	4628043810	Switch, Push, Speaker	2
12	6165147910	Shield, Fence	1
13	048545124111	Button, Speaker, ABS Black	3
14	048543059911	Button, Function, ABS Black	1
15	4628054410	Switch, Push, VCR2	1
16	3208049510	Volume, Tone	2
17	3208052010	Volume, Balance	1
18	6165148410	Shield, Fence	1
19	4438109710	Jack, RCA, 3P	1
20	048545124211	Button, Loud, ABS Black	1
21	4628059610	Switch, Loud	1
22	3228019410	Volume, Main, Motor	1
23	6505138410	Bracket, Main Volume	1
24	4438103110	Jack, RCA, 4P	1
25	046033102511	Foot, Hot-stamping, Gold	2
26	046033102511	Foot, Hot-stamping, Gold	2
27	6123205210	Frame, Cover	1
28	6122418120	Cover Bottom, SECC	1
29	6122636410	Frame (R)	1
30	4438108110	Jack, RCA, 4P	1
31	4408103410	Jack, RCA, 4P	1
32	046102040641	Chassis, Back, SECC	1
33	4438111410	Jack, RCA, 2P	1
34	6123205110	Frame, Center	1
35	6505138510	Bracket, Jack	1
36	4408107410	Terminal, Speaker, 6P	1
37	4438006510	Jack, Multi	2
38	4438109310	Jack, RCA, 2P	2
39	4438113810	Jack, RCA, 1P	1
40	6505135010	Bracket, Heatsink	1
41	7502008520	Heatsink, Power	1
42	7505206220	Heatsink, Regulator TR.	1
43	7505206120	Heatsink, Regulator TR.	2
44	6505130010	Bracket, PCB	1
45	6505134910	Bracket, PCB	1
46	4408105810	Terminal, Speaker, 8P	1
47 Δ	4448103610	Outlet AC	1
48	6121608930	Frame Left	1
49	6122214510	Chassis, Front	1
50	046122022421	Cover, Top	1
51	6518002310	Stopper, Cord	1
52 Δ	4308000430	Cord, AC Power	1
53	4408103720	System Ground	1
54	4438109310	Jack, RCA, 2P	2
55	7505210010	Heatsink, Regulator TR.	4
56	4438108010	Jack, RCA, 6P	1
HARDWARE KIT			
S1-S5	8109230083	Screw, #2BTC 3X8B	5
S6-S8	8119130103	Screw, #1PT 3X10B	3
S9	8159230081	Screw, #2WPPTC 3X8Y	1
S10-S18	8119130103	Screw, #1PT 3X10B	9
S19-S27	8109230083	Screw, #2BTC 3X8B	9
S28-S41	8099130121	Screw, HEX MPSTW 3X12Y	14
S42-S44	8159230081	Screw, #2WPPTC 3X8Y	3
S45	8109230083	Screw, #2BTC 3X8B	1
S46	8159230081	Screw, #2WPPTC 3X8Y	1
S47-S55	8109230083	Screw, #2BTC 3X8B	9
S56-S58	8159440083	Screw, WSAM 4X8B	3
MISCELLANEOUS			
Trans Δ	2828100257	Power Transformer, 230V 50Hz	1
	052438012202	Ass'y Posistor	2
	4118625215	Card Cable, P=1.25, K-25-210	1

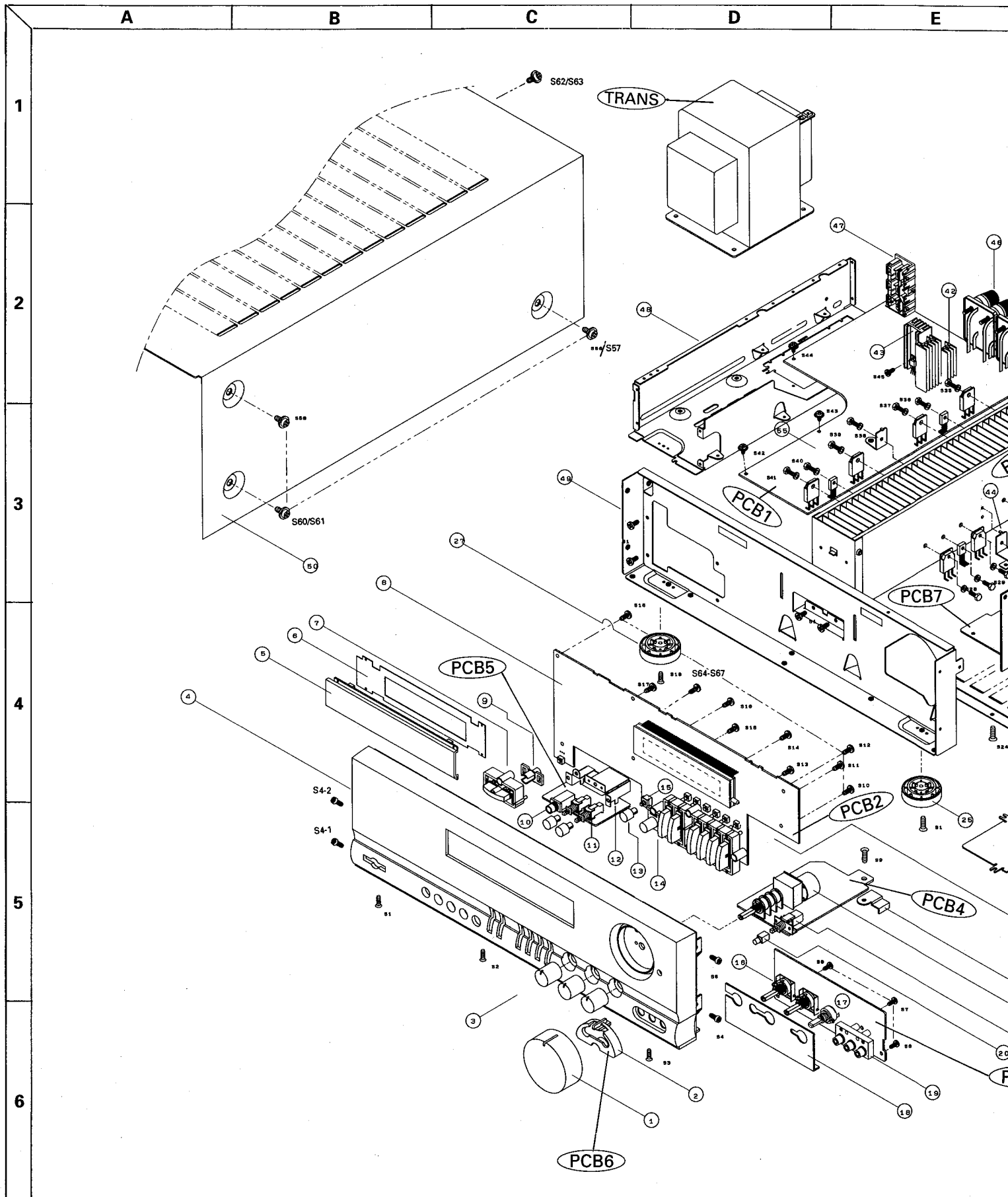
PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol Δ in the part list are of special significance to safety. When replacing a component identified with Δ , use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

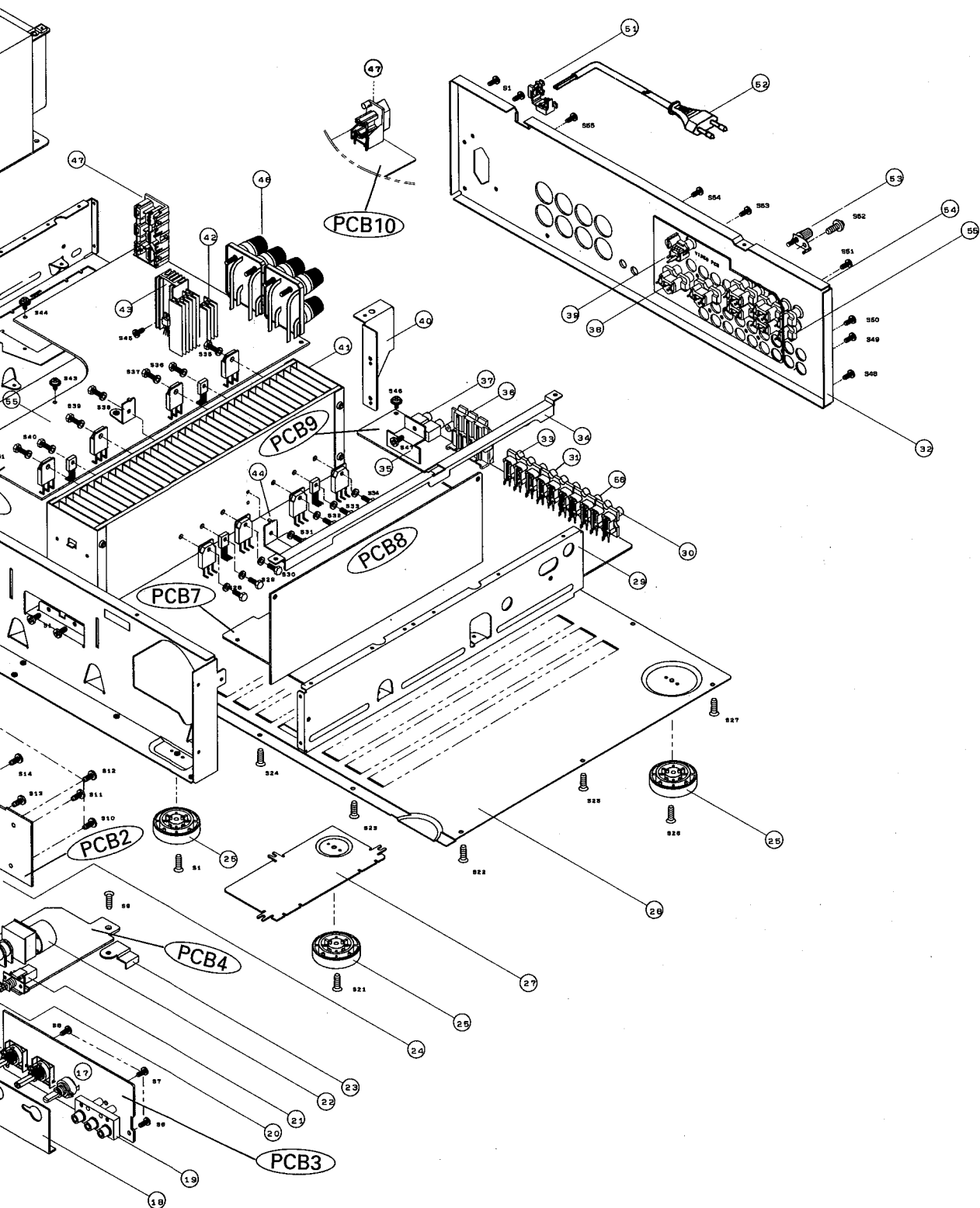
GENERL UNIT



GENERL UNIT

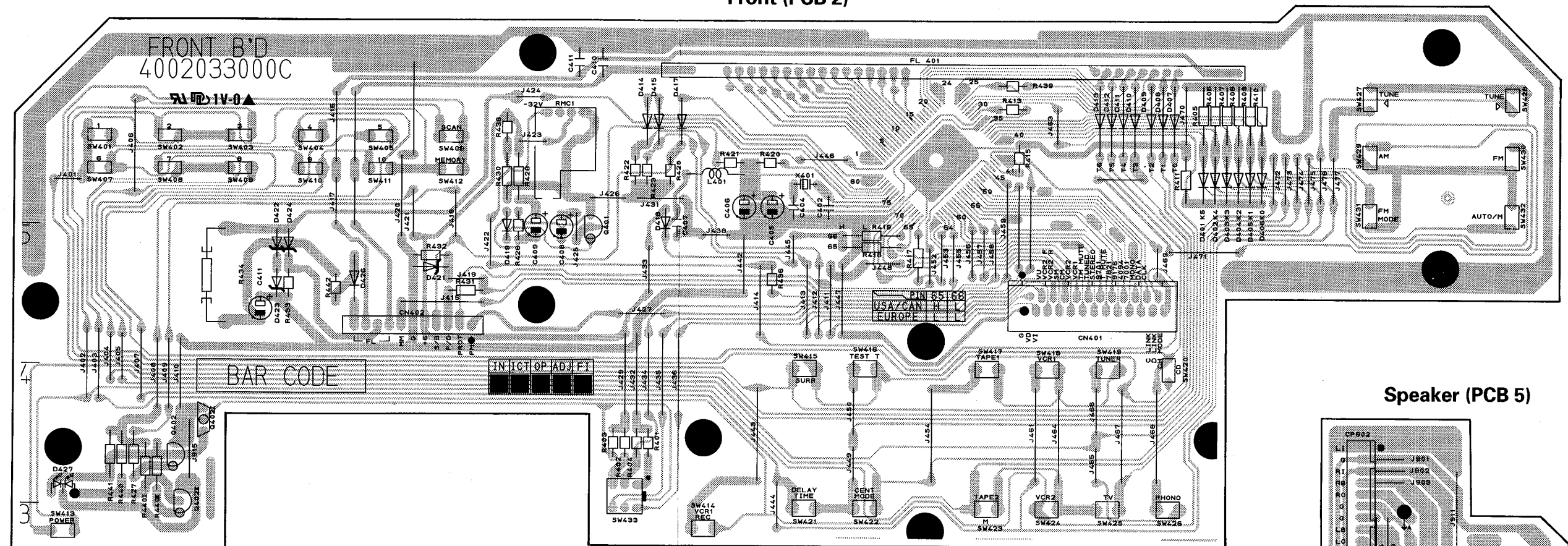


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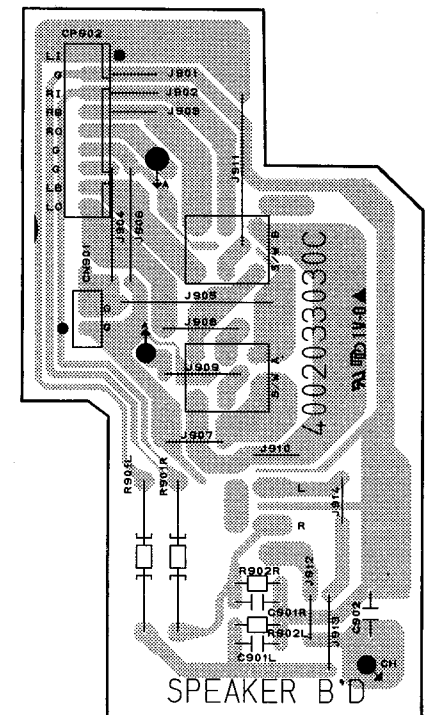


PRINTED CIRCUIT BOARDS

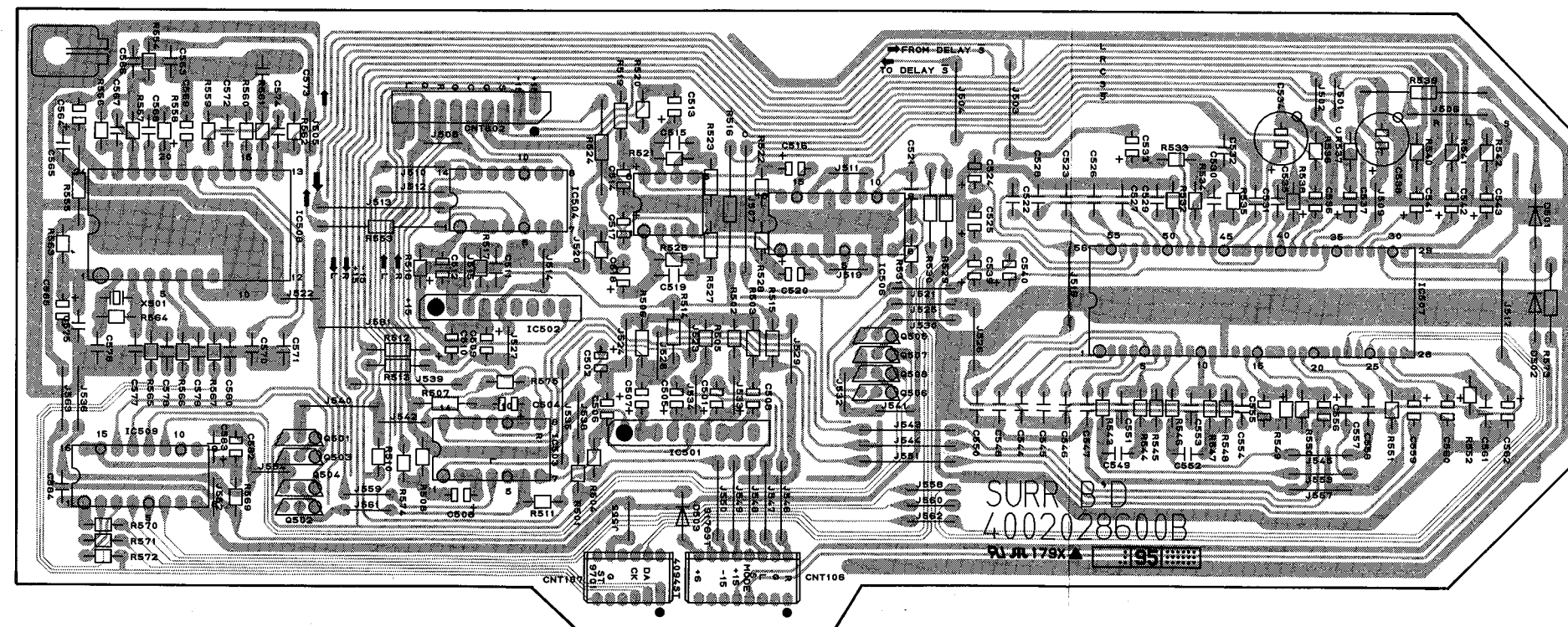
Front (PCB 2)



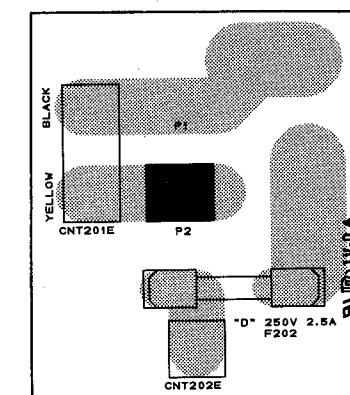
Speaker (PCB 5)



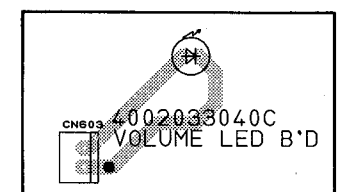
Surround (PCB 8)



Outlet (PCB 10)

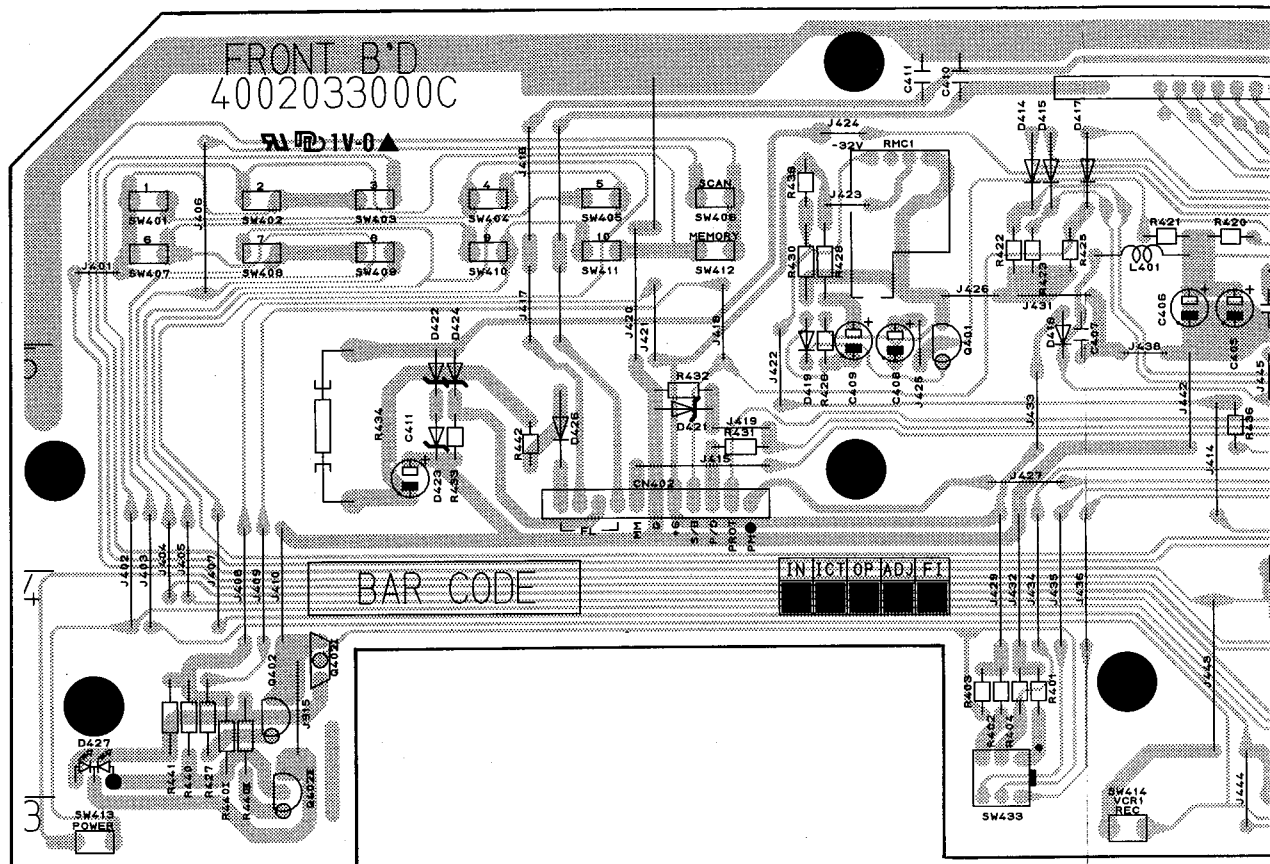


Volume LED (PCB 6)

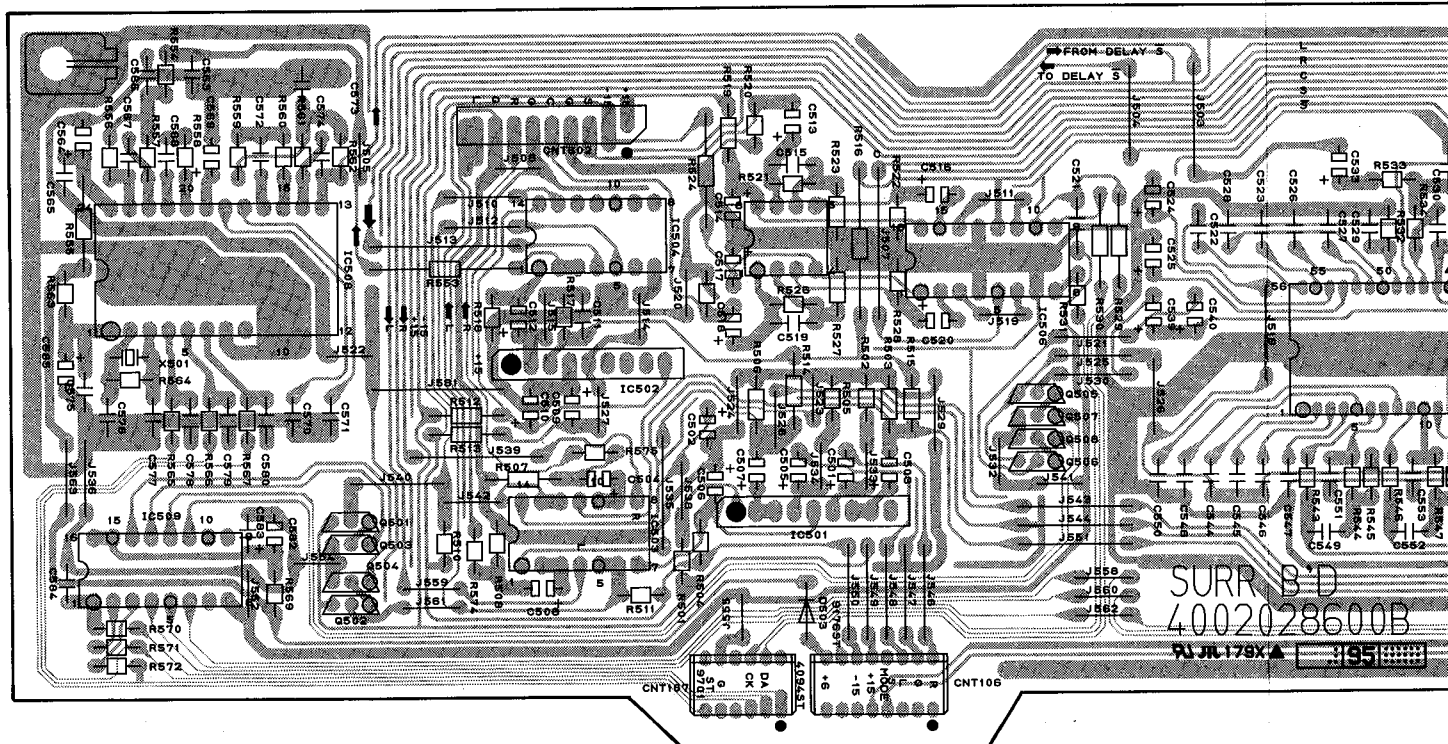


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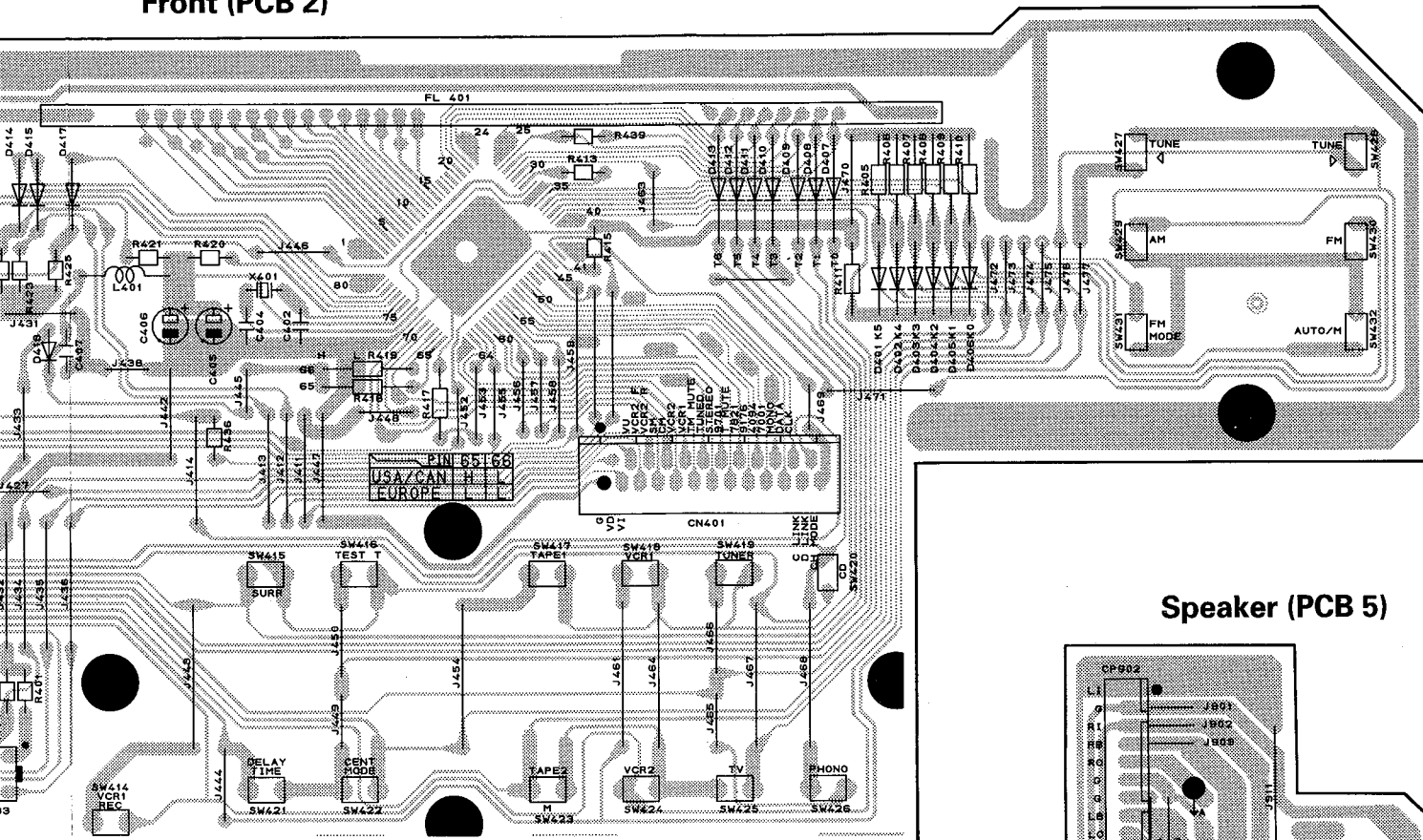
Front (F)



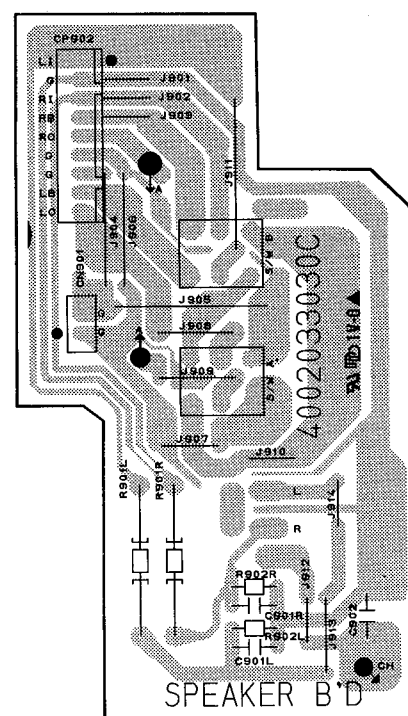
Surround (PCB 8)



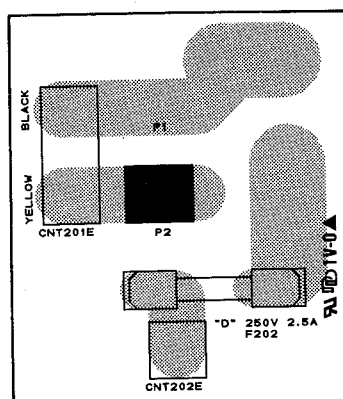
Front (PCB 2)



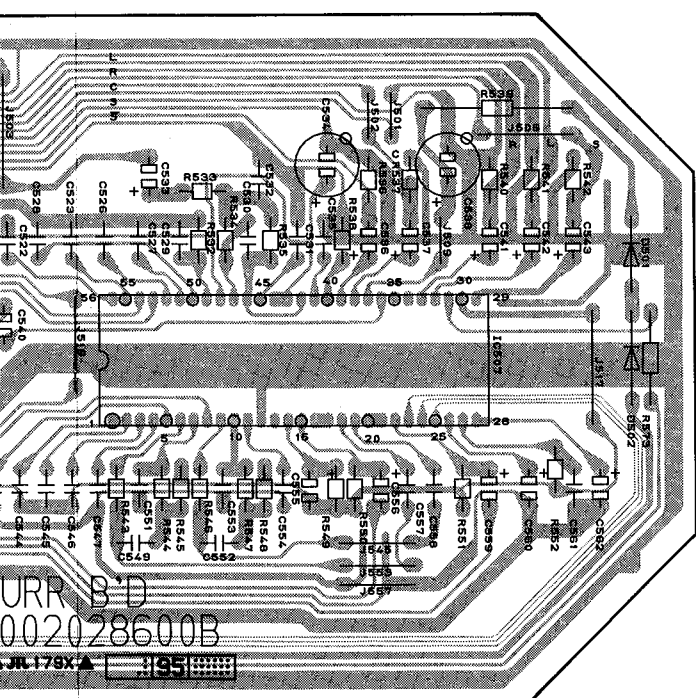
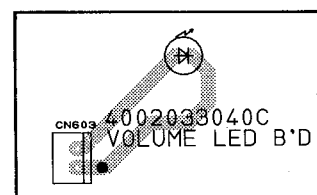
Speaker (PCB 5)



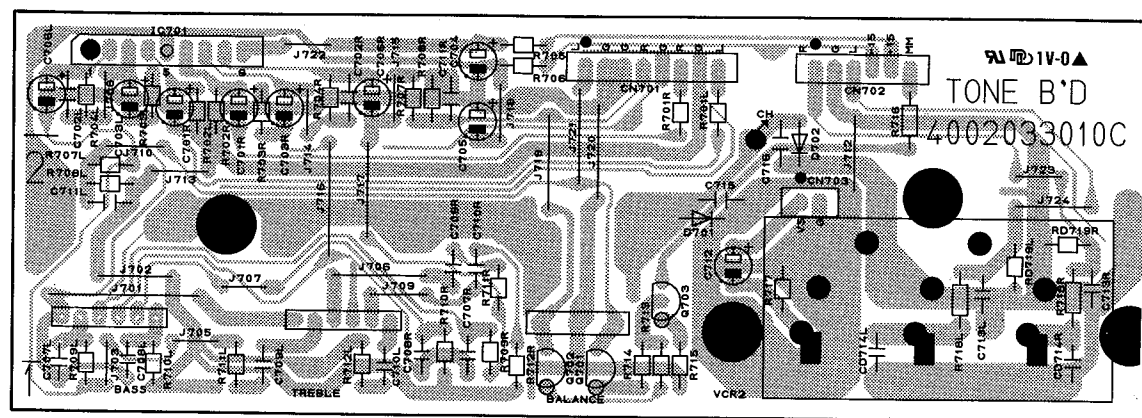
Outlet (PCB 10)



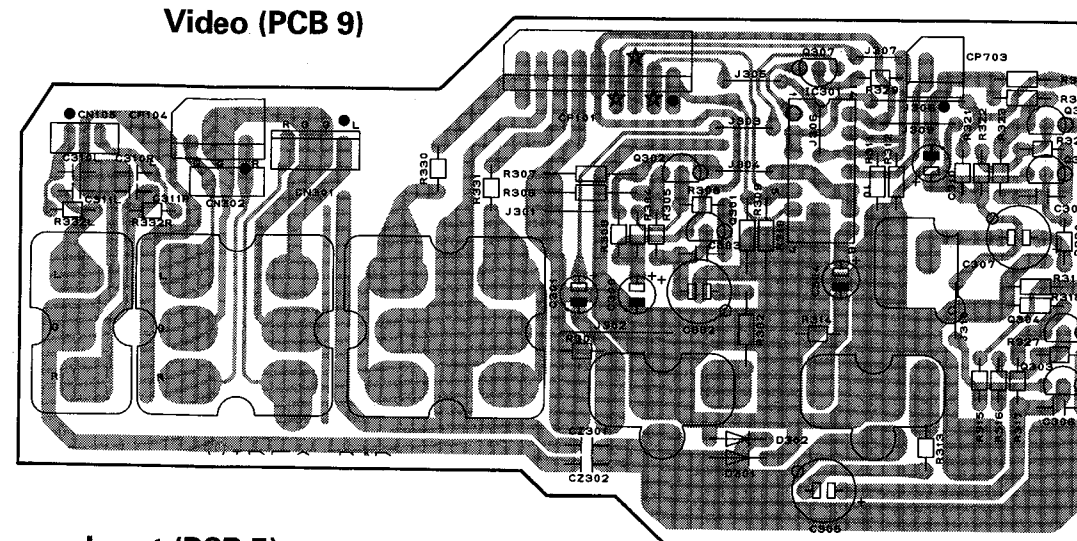
Volume LED (PCB 6)



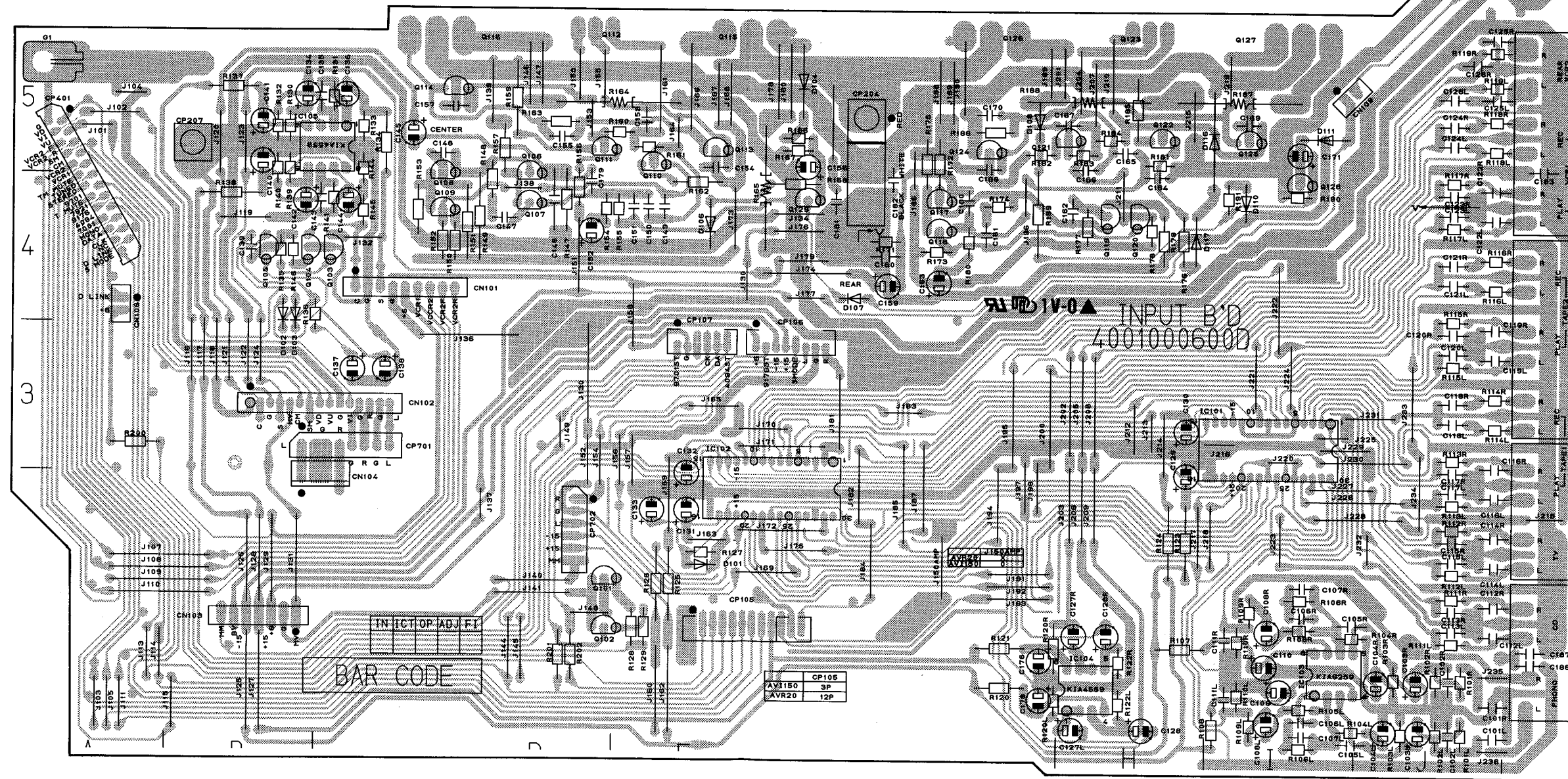
Tone (PCB 3)



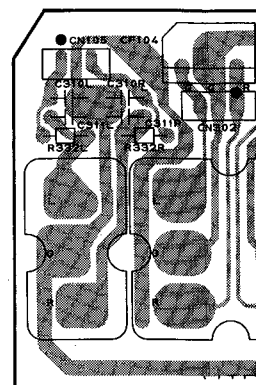
Video (PCB 9)



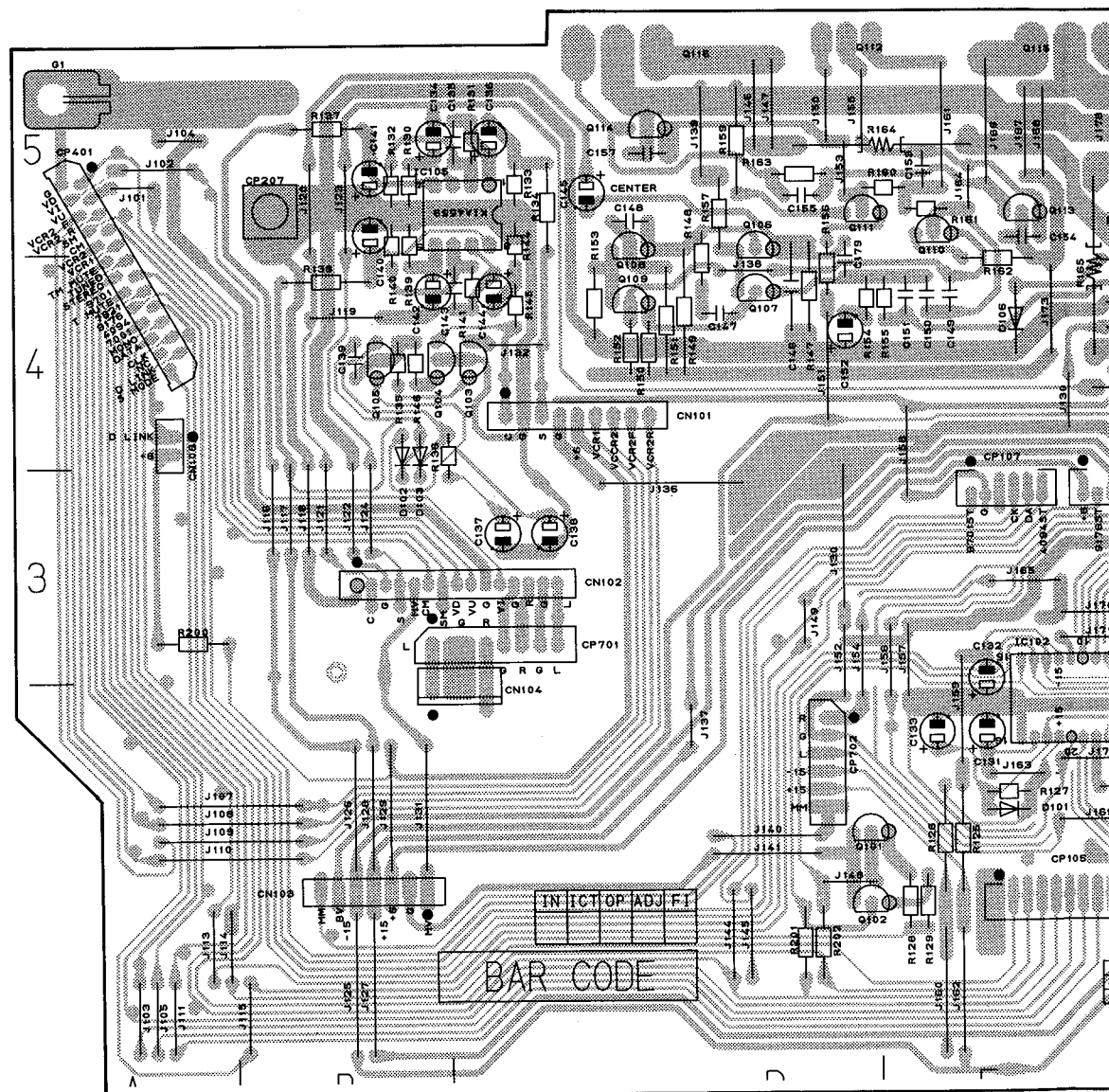
Input (PCB 7)



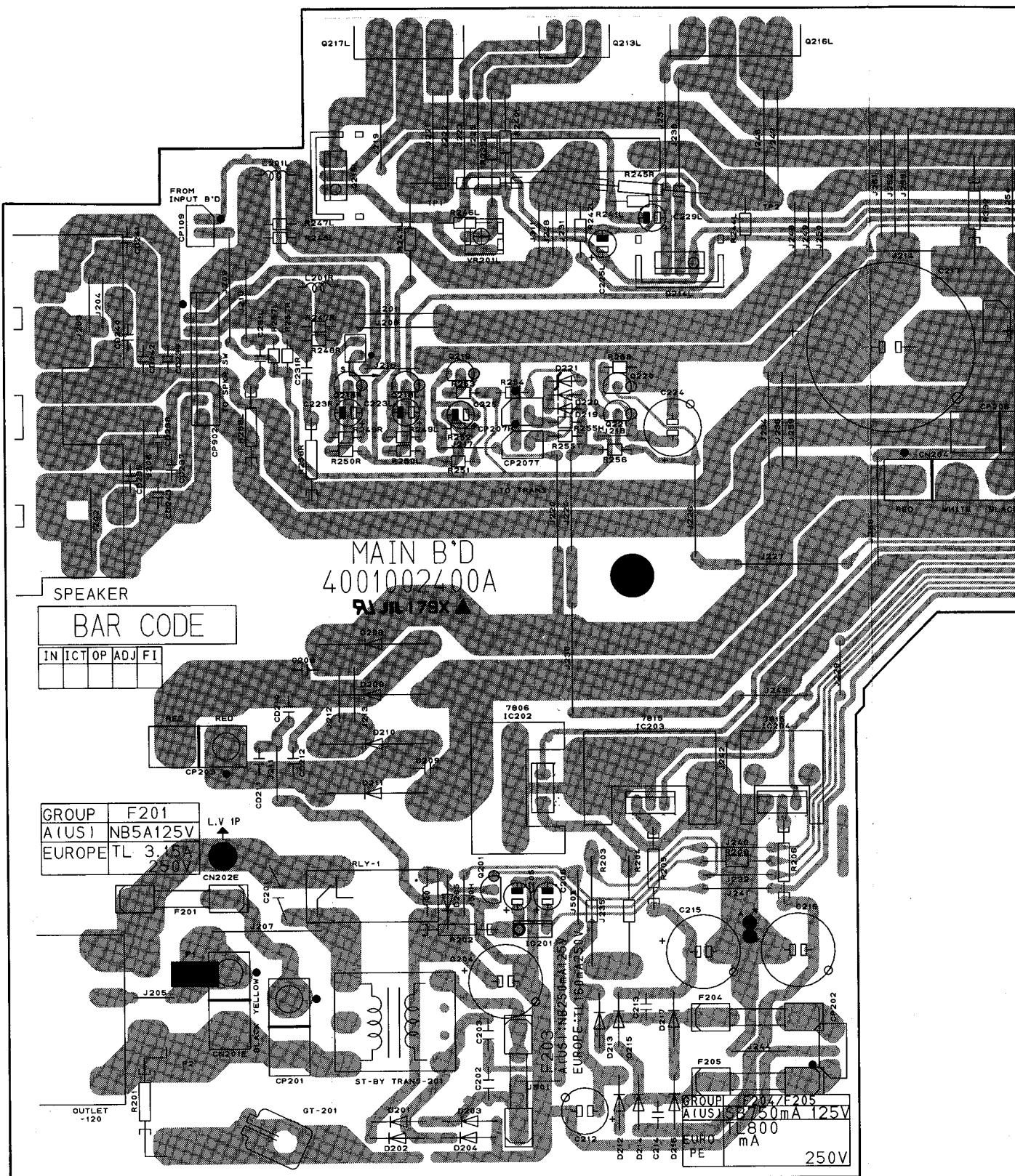
Video. (



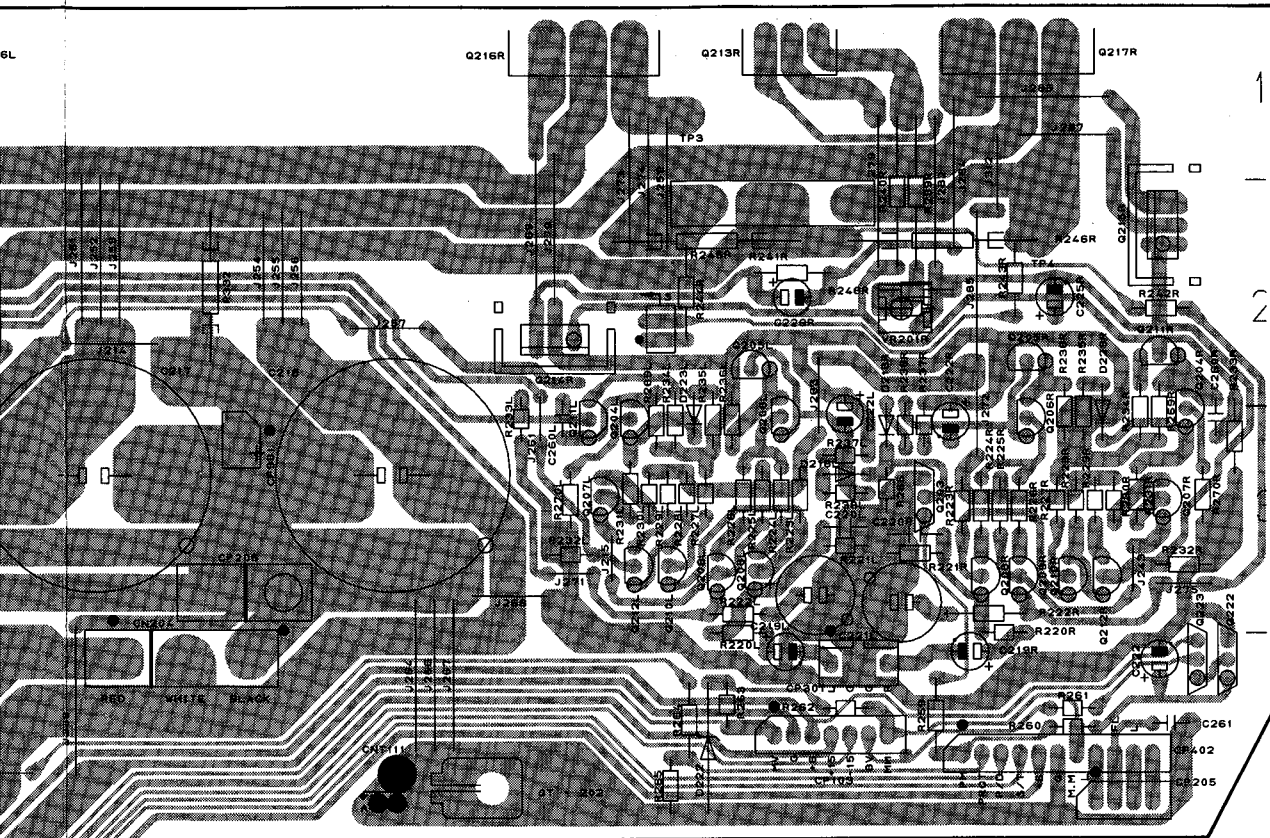
Input (PCB 7



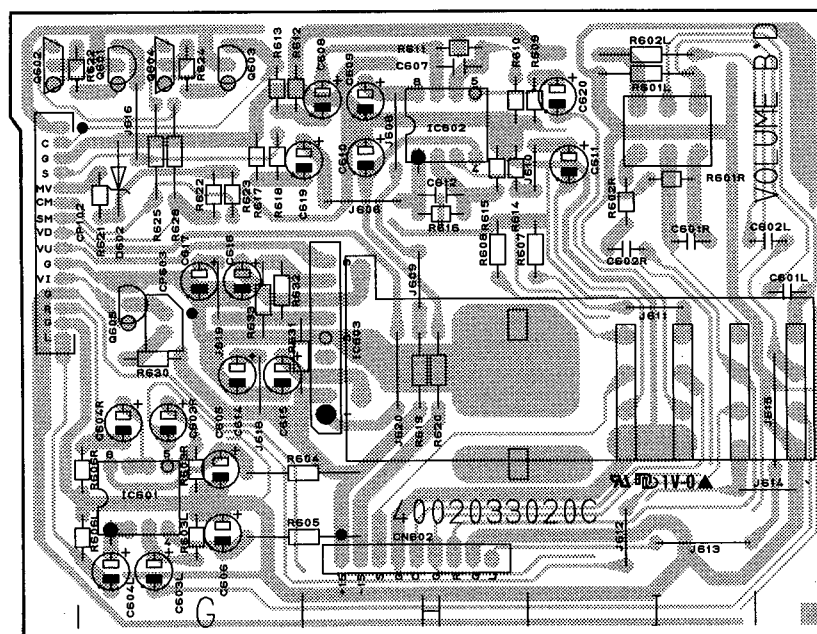
Main (PCB 1)



(PCB 1)



Volume (PCB 4)



ELECTRICAL PARTS LIST

PRODUCT SAFETY NOTICE : Products marked with Δ have special characteristics important to safety.

If you replace any of these components, read carefully the product safety notice in this manual.

Don't degrade the safety of the product through improper servicing.

Resistor/Capacitor tolerance – D : ($\pm 0.5\%$), J : ($\pm 5\%$), K : ($\pm 10\%$), M : ($\pm 20\%$), Z : (+80, – 20%)

Ref. No.	Mfr. Part No.	Description	Q'ty	Ref. No.	Mfr. Part No.	Description	Q'ty
PCB1 ASSY P.C. BOARD MAIN							
CAPACITORS							
C201	3548472340	Ceramic Disc	0.0047 uF 400 V K 1	Q215/LR	2028016100	2SA1859A, PNP	2
C202/203	3679473120	Mylar	0.047 uF 100 V J 2	Δ Q216/LR	2028307101	2SC3182N-O	2
C204	3479347139	Electric SG	470 uF 16 V M 1	Δ Q217/LR	2028007101	2SA1265N-O	2
C206	3479322071	Electrolytic SG	22 uF 50 V M 1	Q218/LR	2208606104	KTC1815Y/BKTC3198Y,NPN	2
C208/209	3679104257	Mylar	0.1 uF 250 V J 2	Q219	2208206105	KTA1015Y/BKTA1266Y, PNP	1
C212	3519101935	Ceramic Tubular	100 pF 35 V K 1	Q220/221	2208606104	KTC1815Y/BKTC3198Y,NPN	2
C213/214	3679473120	Mylar	0.047 uF 100 V J 2	Q222/223	2208622106	DTC114YS, NPN	2
Δ C215/216	3409310269	Electric SG	1000 uF 35 V M 2	RESISTORS			
Δ C217/218	3419582235	Electrolytic HM	8200 uF 63 V M 2	Δ R202	3029479472	Metal Film	4.7 ohm 1 W J 1
C219/LR	3479347041	Electrolytic SG	47 uF 25 V M 2	Δ R203/204	3029220572	Metal Film	22 ohm 2 W J 2
C220/LR	3479310171	Electrolytic SG	100 uF 50 V J 2	R205	3029100472	Metal Film	10 ohm 1 W J 1
C221/LR	3479347121	Electrolytic SG	470 uF 10 V M 2	Δ R206	3029479472	Metal Film	4.7 ohm 1 W J 1
C222	3479310071	Electrolytic SG	10 uF 50 V M 1	R209	3069332970	Carbon Film	3.3 kohm 1/5 W J 1
C222/LR	3479310971	Electrolytic SG	1 uF 50 V M 2	R220/LR	3069331970	Carbon Film	330 ohm 1/5 W J 2
C223/LR	3479310071	Electrolytic SG	10 uF 50 V M 2	R221/LR	3069333970	Carbon Film	33 kohm 1/5 W J 2
C224	3479347121	Electrolytic SG	470 uF 10 V M 1	R222/LR	3069102970	Carbon Film	1 kohm 1/5 W J 2
C225	3479310971	Electrolytic SA	1 uF 50 V M 1	R223/LR	3069152970	Carbon Film	1.5 kohm 1/5 W J 2
C225/LR	3479310071	Electrolytic SG	10 uF 50 V M 2	R224/LR	3069391970	Carbon Film	390 ohm 1/5 W J 2
C229/LR	3479347971	Electrolytic SG	4.7 uF 50 V M 2	R225/LR	3069152970	Carbon Film	1.5 kohm 1/5 W J 2
C231/LR	3679473120	Mylar	0.047 uF 100 V J 2	R255H	3069682970	Carbon Film	6.8 kohm 1/5 W J 1
C260/LR	3579509030	Ceramic Disc	5 pF 50 V D 2	R226/LR	3069391970	Carbon Film	390 ohm 1/5 W J 2
CONNECTORS				R227/LR	3069561970	Carbon Film	560 ohm 1/5 W J 2
CN201E	4428525780	Wafer 2P, LV	1	R228/LR	3069561970	Carbon Film	560 ohm 1/5 W J 2
CN204	4358800353	Lead Ass'y 3P 530mm	1	R229/LR	3069820970	Carbon Film	82 ohm 1/5 W J 2
CN301	436204608331	Lead Ass'y, 4P, Shield, 600 mm	1	R230/LR	3069561970	Carbon Film	560 ohm 1/5 W J 2
CP103	4428505410	Wafer 7P	1	R231/LR	3069561970	Carbon Film	560 ohm 1/5 W J 2
CP109	4428508210	Wafer 2P	1	R232/LR	3069223970	Carbon Film	22 kohm 1/5 W J 2
CP201	4428525780	Wafer 2P, LV	1	R233/LR	3069223970	Carbon Film	22 kohm 1/5 W J 2
CP202	4428505710	Wafer 3P	1	R234/LR	3069820970	Carbon Film	82 ohm 1/5 W J 2
CP203	4428525780	Wafer 2P, LV	1	R235/LR	3069561970	Carbon Film	560 ohm 1/5 W J 2
CP205	4428505610	Wafer 4P	1	R236/LR	3069271970	Carbon Film	270 ohm 1/5 W J 2
CP206	4428525860	Wafer 1P, LV	1	R237/LR	3069103970	Carbon Film	10 kohm 1/5 W J 2
CP207H	4428508210	Wafer 2P	1	R238/LR	3069333970	Carbon Film	33 kohm 1/5 W J 2
CP207T	4428508210	Wafer 2P	1	R239/LR	3027442025	Carbon Film	442 ohm 1/4 W J 2
CP402	4428510710	Wafer 11P	1	R240/LR	3027121125	Carbon Film	1.21 kohm 1/4 W J 2
CP901	4428508210	Wafer 2P	1	R241/LR	3069820970	Carbon Film	82 ohm 1/5 W J 2
CP902	4428518210	Wafer 9P	1	R242/LR	3069333970	Carbon Film	33 kohm 1/5 W J 2
DIODES				R243/LR	3069202970	Carbon Film	2 kohm 1/5 W J 2
Δ D201-205	2258100135	1N4002, Rectifier	5	R244/LR	3069182970	Carbon Film	1.8 kohm 1/5 W J 2
Δ D208-211	2058100138	PX6A03, Rectifier	4	Δ R245/LR	3059278782	Cement	0.27 ohm 5 W K 2
Δ D212-217	2258100135	1N4002, Rectifier	6	Δ R246/LR	3059278782	Cement	0.27 ohm 5 W K 2
D218/LR	2058322101	1N4148M	2	R247/LR	3069220970	Carbon Film	22 ohm 1/5 W J 2
D219/220	2058322101	1N4148M	2	R248/LR	3069220970	Carbon Film	22 ohm 1/5 W J 2
D221	2258599107	Zener, UZ 9.1 BSC	1	R249/LR	3069911970	Carbon Film	910 ohm 1/5 W J 2
D222	2258599102	Zener, UZ 4.3 BSB	1	R250/LR	3069682970	Carbon Film	6.8 kohm 1/5 W J 2
D223/LR	2058322101	1N4148M	2	R251	3069683970	Carbon Film	68 kohm 1/5 W J 2
INTEGRATED CIRCUITS				R252	3069104970	Carbon Film	100 kohm 1/5 W J 2
Δ IC201/202	2168601110	GL7806, Regulator	2	R253	3069332970	Carbon Film	3.3 kohm 1/5 W J 2
Δ IC203	2168602109	GL7815, Regulator	1	R254	3069102970	Carbon Film	1 kohm 1/5 W J 2
Δ IC204	2168602114	GL7915, Regulator	1	R255T	3069472970	Carbon Film	4.7 kohm 1/5 W J 1
TRANSISTORS				R256	3069103970	Carbon Film	10 kohm 1/5 W J 1
Q112	2008622110	2SC4137, Bias NPN	1	R257/LR	3069243970	Carbon Film	24 kohm 1/5 W J 2
Q115	2028407109	2SD7180/KTD718, NPN	1	R258/LR	3029100472	Metal Film	10 ohm 1 W J 2
Q116	2028107106	2SB688/KTB688, PNP	1	R259	3069103970	Carbon Film	10 kohm 1/5 W J 1
Q123	2008622110	2SC4137, Bias NPN	1	R260	3069103970	Carbon Film	10 kohm 1/5 W J 1
Q126	2028407109	2SD7180/KTD718, NPN	1	R261	3069103970	Carbon Film	10 kohm 1/5 W J 1
Q127	2028107106	2SB688/KTB688, PNP	1	R262	3069102970	Carbon Film	1 kohm 1/5 W J 1
Q201	2208606104	KTC1815Y/BKTC3198Y,NPN	1	R263	3069242970	Carbon Film	2.4 kohm 1/5 W J 1
Q203	2208622106	DTC114YS, NPN	1	R264	3069223970	Carbon Film	22 kohm 1/5 W J 1
Q204/LR	2208206104	KTA970/KTA1268, PNP	2	R265	3069153970	Carbon Film	15 kohm 1/5 W J 1
Q205/LR	2208206105	KTA1015Y/BKTA1266Y, PNP	2	R266	3069154970	Carbon Film	150 kohm 1/5 W J 1
Q206/LR	2208206104	KTA970/KTA1268, PNP	2	R269/LR	3069561970	Carbon Film	560 ohm 1/5 W J 2
Q207/LR	2208606108	KTC2240/BKTC3200, NPN	2	R270/LR	3069242970	Carbon Film	2.4 kohm 1/5 W J 2
Q208/LR	2208206104	KTA970/KTA1268, PNP	2	MISCELLANEOUS			
Q209/LR	2208206104	KTA970/KTA1268, PNP	2	42	7505206220	Heatsink, Regulator TR.	1
Q210/LR	2208606108	KTC2240/BKTC3200, NPN	2	43	7505206120	Heatsink, Regulator TR.	2
Q211/LR	2208206102	BKTA949/KTA1024, PNP	2	46	4408105810	Terminal, Speaker, 8P	1
Q212/LR	2208606107	KTC2229/KTC3206, NPN	2	Δ 47	4448103610	Outlet AC	1
Q213/LR	2008622110	2SC4137, Bias NPN	2	55	7505210010	Heatsink, Regulator TR.	4
Q214/LR	2028316100	2SC4883A, NPN	2	Δ F201	5508302735	TL 250 V, 3.15 A	1
				Δ F202	5508302535	TL 250 V, 2.5 A	1
				Δ F203	5508301035	TL 250 V, 160 mA	1
				Δ F204/205	5508301934	TL 250 V, 800 mA	2
				GT201/202	4235007310	Ground Plate	2

Ref. No.	Mfr. Part No.	Description	Q'ty
L201/LR	2648001010	Inductor, 0.5 uF	2
RLY-1	5528001620	OEG OST-S-112DM, Relay	1
TRANS201	2828090901	Transformer, Standby	1

PCB2 ASS'Y P.C. BOARD FRONT

CAPACITORS				
C402	3528560210	Ceramic CH	56	pF 50 V J 1
C404	3528560210	Ceramic CH	56	pF 50 V J 1
C405	3409247022	Electric SS	47	uF 10 V M 1
C406	3438247315	Electrolytic, Bac	0.047	uF 5.5 V K 1
C407	3579104534	Ceramic Disc	0.1	uF 50 V Z 1
C408	3479310971	Electrolytic SG	1	uF 50 V M 1
C409	3479310071	Electrolytic SG	10	uF 50 V M 1
C410	3679473120	Mylar	0.047	uF 100 V J 1
C411	3479310171	Electrolytic SG	100	uF 50 V M 1
C411	3679473120	Mylar	0.047	uF 100 V J 1

CONNECTORS

CN401	4428525826	Wafer 25P, 52575-2530	1
CN402	436111203331	Lead Assy, 11P, 200 mm	1

DIODES

D401-408	2058322101	1N4148M	8
D411-415	2058322101	1N4148M	5
D417-419	2058322101	1N4148M	3
D421	2258599102	Zener, UZ 4.3 BSB	1
D422/423	2258599117	Zener, UZ 16.0 BSD	2
D424	2258599107	Zener, UZ 9.1 BSC	1
D426	2258100135	1N4002, Rectifier	1
D427	2308222302	LED, SPR54MWV3, RED/GREEN	1

INTEGRATED CIRCUIT

IC401	2138322188	CPU, CXP50112-583Q, DWP442	1
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TRANSISTORS

Q401/402	2208606104	KTC1815Y/BKTC3198Y,NPN	2
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RESISTORS

R401-403	3069103970	Carbon Film	10	kohm 1/5 W J 4
R404	3069223970	Carbon Film	22	kohm 1/5 W J 1
R405-410	3069473970	Carbon Film	47	kohm 1/5 W J 6
R411	3069224970	Carbon Film	220	kohm 1/5 W J 1
R413	3069334970	Carbon Film	330	kohm 1/5 W J 1
R415	3069103970	Carbon Film	10	kohm 1/5 W J 1
R417	3069103970	Carbon Film	10	kohm 1/5 W J 1
R420	3069103970	Carbon Film	10	kohm 1/5 W J 1
R421	3069104970	Carbon Film	100	kohm 1/5 W J 1
R422/423	3069473970	Carbon Film	47	kohm 1/5 W J 2
R425	3069473970	Carbon Film	47	kohm 1/5 W J 1
R426	3069103970	Carbon Film	10	kohm 1/5 W J 1
R427	3069102970	Carbon Film	1	kohm 1/5 W J 1
R428	3069331970	Carbon Film	330	ohm 1/5 W J 1
R430	3069473970	Carbon Film	47	kohm 1/5 W J 1
R431/432	3069472970	Carbon Film	4.7	kohm 1/5 W J 2
R433	3069153970	Carbon Film	15	kohm 1/5 W J 1
R434	3029391472	Metal Film	390	ohm 1 W J 1
R436	3069331970	Carbon Film	330	ohm 1/5 W J 1
R438	3069332970	Carbon Film	3.3	kohm 1/5 W J 1
R439	3069221970	Carbon Film	220	ohm 1/5 W J 1
R440	3069271970	Carbon Film	270	ohm 1/5 W J 1
R441	3069221970	Carbon Film	220	ohm 1/5 W J 1
R442	3069101970	Carbon Film	100	ohm 1/5 W J 1

MISCELLANEOUS

9	4658003710	Switch, Tact	14
15	4628054410	Switch, Push, VCR2	1
FL401	2328130925	FIP, 11CM9, FL Display	1
L401	2648610182	Inductor, 100 uH	1
RMC1	2408005001	TFMT5380, 38 kHz, Remoon sensor	1
X401	3938124005	Resonator, 4.19MHz	1
	6715020730	Sponge, Rubber	1

PCB3 ASS'Y P.C. BOARD TONE

CAPACITORS				
C701/LR	3479310071	Electrolytic SG	10	uF 50 V M 2
C702/LR	3519470935	Ceramic Tubular	47	pF 50 V K 2
C703/LR	3479347971	Electrolytic SG	4.7	uF 50 V M 2
C704/705	3479347041	Electrolytic SG	47	uF 25 V M 2
C706/LR	3479310071	Electrolytic SG	10	uF 50 V M 2
C707/LR	3679183120	Mylar	0.018	uF 100 V J 2
C708/LR	3679823297	Mylar	0.082	uF 63 V K 2

Ref. No.	Mfr. Part No.	Description	Q'ty
C709/LR	3679392120	Mylar	0.0039 uF 100 V J 2
C710/LR	3679183120	Mylar	0.018 uF 100 V J 2
C711/LR	3519561935	Ceramic Tubular	560 pF 50 V K 2
C712	3479333041	Electrolytic SG	33 uF 25 V M 1
C713/LR	3519101935	Ceramic Tubular	100 pF 50 V K 2
C715/716	3519104935	Ceramic Tubular	0.1 uF 50 V K 2

CONNECTORS

CN701	436108203331	Lead Ass'y, 8P, 200mm	1
CN702	436106223331	Lead Ass'y, 6P, 220mm	1
CN703	436102483331	Lead Ass'y 2P, 480 mm	1

INTEGRATED CIRCUIT

IC701	2168206103	KIA7559S/KIA4559S,OP AMP	1
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TRANSISTORS

Q701/702	2208606112	KTD1302, NPN	2
Q703	2208206105	KTA1015Y/BKTA1266Y, PNP	1

RESISTORS

R701/LR	3069102970	Carbon Film	1	kohm 1/5 W J 2
R702/LR	3069104970	Carbon Film	100	kohm 1/5 W J 2
R703/LR	3069104970	Carbon Film	100	kohm 1/5 W J 2
R704/LR	3069105970	Carbon Film	1	Mohm 1/5 W J 2
R705/706	3069470970	Carbon Film	47	ohm 1/5 W J 2
R707/LR	3069102970	Carbon Film	1	kohm 1/5 W J 2
R708/LR	3069104970	Carbon Film	100	kohm 1/5 W J 2
R709/LR	3069183970	Carbon Film	18	kohm 1/5 W J 2
R710/LR	3069392970	Carbon Film	3.9	kohm 1/5 W J 2
R711/LR	3069272970	Carbon Film	2.7	kohm 1/5 W J 2
R712/LR	3069751970	Carbon Film	750	ohm 1/5 W J 2
R713/714	3069102970	Carbon Film	1	kohm 1/5 W J 2
R715	3069103970	Carbon Film	10	kohm 1/5 W J 1
R716	3069471970	Carbon Film	470	ohm 1/5 W J 1
R717	3069750970	Carbon Film	75	ohm 1/5 W J 1
R718/LR	3069102970	Carbon Film	1	kohm 1/5 W J 2

MISCELLANEOUS

16	3208049510	Volume, Tone	2
17	3208052010	Volume, Balance	1
19	4438109710	Jack, RCA, 3P	1
	152624102858	LUG, HI-WP #24BK LF 280	1

PCB4 ASS'Y P.C. BOARD VOLUME

CAPACITORS				
C601/LR	3679104297	Mylar	0.1	uF 63 V K 2
C602/LR	3519681935	Ceramic Tubular	680	pF 50 V K 2
C603/LR	3479347971	Electrolytic SG	4.7	uF 50 V M 2
C604/LR	3479347971	Electrolytic SG	4.7	uF 50 V M 2
C605/606	3479347041	Electrolytic SG	47	uF 25 V M 2
C607	3579102530	Ceramic Disc	1000	pF 50 V Z 1
C608	3479310971	Electrolytic SG	1	uF 50 V M 1
C609/610	3479347041	Electrolytic SG	47	uF 25 V M 2
C611	3479310971	Electrolytic SG	1	uF 50 V M 1
C612	3579102530	Ceramic Disc	1000	pF 50 V Z 1
C614	3479310071	Electrolytic SG	10	uF 50 V M 1
C615/616	3479310121	Electrolytic SG	100	uF 10 V M 2
C617	3479310131	Electrolytic SG	100	uF 16 V M 1
C620	3479310971	Electrolytic SG	1	uF 50 V M 1

CONNECTORS

CP102	4428517410	Wafer 15P	
CN602	436109183331	Lead Ass'y, 9P, 180mm	1
CP603	4428508210	Wafer 2P	1

DIODES

D602	2258599102	Zener, UZ 4.3 BSB	1
D701	2058322101	1N4148M	1
D702	2058322101	1N4148M	1

INTEGRATED CIRCUITS

IC601/602	2168206104	KIA7559P/KIA4559P,OP AMP	2
IC603	2168007204	TA7291S	1

TRANSISTORS

Q601	2208606112	KTD1302, NPN	1
Q602	2238006103	KTA114Y/KRA107M, PNP	1
Q603	2208606112	KTD1302, NPN	1
Q604	2238006103	KTA114Y/KRA107M, PNP	1
Q605	2208622108	DTC114TS, NPN	1

Ref. No.	Mfr. Part No.	Description	Q'ty	Ref. No.	Mfr. Part No.	Description	Q'ty
RESISTORS				C135	3579102530	Ceramic Disc	1000
R601L/R	3069512970	Carbon Film	5.1 kohm 1/5 W J 2	C136	3479310971	Electrolytic SG	1
R602L/R	3069183970	Carbon Film	18 kohm 1/5 W J 2	C137	3479347031	Electrolytic SG	47
R603L/R	3069104970	Carbon Film	100 kohm 1/5 W J 2	C138	3479322041	Electrolytic SG	22
R604/605	3069101970	Carbon Film	100 ohm 1/5 W J 2	C139	3679223120	Mylar	0.022
R606L/R	3069104970	Carbon Film	100 kohm 1/5 W J 2	C140/141	3479347041	Electrolytic SG	47
R607/608	3069512970	Carbon Film	5.1 kohm 1/5 W J 2	C142	3479310971	Electrolytic SG	1
R609	3069473970	Carbon Film	47 kohm 1/5 W J 1	C143	3579102530	Ceramic Disc	1000
R610	3069102970	Carbon Film	1 kohm 1/5 W J 1	C144/145	3479310971	Electrolytic SG	1
R611	3069622970	Carbon Film	6.2 kohm 1/5 W J 1	C146	3519681935	Ceramic Tubular	680
R612	3069473970	Carbon Film	47 kohm 1/5 W J 1	C147	3519471935	Ceramic Tubular	470
R613	3069471970	Carbon Film	470 ohm 1/5 W J 1	C148	3519270935	Ceramic Tubular	27
R614	3069473970	Carbon Film	47 kohm 1/5 W J 1	C149	3519150935	Ceramic Tubular	15
R615	3069102970	Carbon Film	1 kohm 1/5 W J 1	C151	3579809030	Ceramic Disc	8
R616	3069622970	Carbon Film	6.2 kohm 1/5 W J 1	C152	3479333041	Electrolytic SG	33
R617	3069473970	Carbon Film	47 kohm 1/5 W J 1	C153	3579102530	Ceramic Disc	1000
R618	3069471970	Carbon Film	470 ohm 1/5 W J 1	C154	3519221935	Ceramic Tubular	220
R619/620	3069101970	Carbon Film	100 ohm 1/5 W J 2	C155	3679473120	Mylar	0.047
R621	3069242970	Carbon Film	2.4 kohm 1/5 W J 1	C156	3479310971	Electrolytic SG	1
R622-624	3069102970	Carbon Film	1 kohm 1/5 W J 3	C157	3519221935	Ceramic Tubular	220
R625	3069471970	Carbon Film	470 ohm 1/5 W J 1	C158	3679473120	Mylar	0.047
R627	3069102970	Carbon Film	1 kohm 1/5 W J 1	C159	3479347871	Electrolytic SG	0.47
R628	3069471970	Carbon Film	470 ohm 1/5 W J 1	C160	3519681935	Ceramic Tubular	680
R630	3069561970	Carbon Film	560 ohm 1/5 W J 1	C161	3519471935	Ceramic Tubular	470
R631	3069479970	Carbon Film	4.7 ohm 1/5 W J 1	C162	3519270935	Ceramic Tubular	27
R632	3069103970	Carbon Film	10 kohm 1/5 W J 1	C163	3479333041	Electrolytic SG	33
R633	3069302970	Carbon Film	3 kohm 1/5 W J 1	C164	3579809030	Ceramic Disc	8
MISCELLANEOUS				C166	3579150130	Ceramic Disc	15
21	4628059610	Switch, Loud	1	C167	3579102530	Ceramic Disc	1000
22	3228019410	Volume, Main, Motor	1	C168/169	3519221935	Ceramic Tubular	220
PCB5 ASS'Y P.C. BOARD SPEAKER				C170	3679473120	Mylar	0.047
CONNECTORS				C171	3479310971	Electrolytic SG	1
CN901	436102283321	Lead Ass'y, 2P, 280mm	1	C172	3679473120	Mylar	0.047
CN902	435209403401	Lead Ass'y, 9P, 400mm	1	C173-175	3579472530	Ceramic Disc	0.0047
RESISTORS				C176	3479347041	Electrolytic SG	47
R901L/R	3029271572	Metal Film	270 ohm 2 W J 2	C178	3479347041	Electrolytic SG	47
MISCELLANEOUS				C187	3579104534	Ceramic Disc	0.1
10	4438005020	Jack, Phone	1	C188	3519473935	Ceramic Tubular	0.047
11	4628043810	Switch, Push, Speaker	2	CONNECTORS			
12	6165147910	Shield, Fence, knob	1	CN101	436109303331	Lead Ass'y, 9P, 300mm	1
	152624100626	LUG, HI-W AWG #24BK60	1	CN102	436215163332	Lead Ass'y, 15P, 160mm	1
PCB6 ASS'Y P.C. BOARD VOLUME LED				CN204	4428525790	Wafer 3P, LV	1
CN603	435102183181	Lead Ass'y, 2P, 180mm	1	CN103	436107463331	Lead Ass'y, 7P 460mm	1
D601	2308220324	LED, SLR 40MG3	1	CN104	436104308331	Lead Ass'y, 4P, 300mm	1
PCB7 ASS'Y P.C. BOARD INPUT				CN108	436402443231	Lead Ass'y, 2P, 440mm	1
CAPACITORS				CN109	436102223331	Lead Ass'y, 2P, 220mm	1
C101L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	CP105	4428516210	Wafer 3P	1
C102L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	CP106	4428550080	Wafer 8P	1
C103L/R	3479310971	Electrolytic SG	1 uF 50 V M 2	CP107	4428550060	Wafer 6P	1
C104L/R	3479333041	Electrolytic SG	33 uF 25 V M 1	CP401	4428526370	Wafer, FPC, 25P	1
C105L/R	3519222935	Ceramic Tubular	2200 uF 50 V K 2	CP701	4428505510	Wafer 8P	1
C106L/R	3679562120	Mylar	0.0056 uF 100 V J 2	CP702	4428505810	Wafer 6P	1
C107L/R	3679182120	Mylar	0.0018 uF 100 V J 2	COILS			
C108L/R	3479310971	Electrolytic SG	1 uF 50 V M 2	L101L/102	2648001010	Inductor, 0.5 uF	2
C109/110	3479347041	Electrolytic SG	47 uF 25 V M 2	L101L/R	2648601470	Inductor, 50 uF	2
C111L/R	3679182120	Mylar	0.0018 uF 100 V J 2	DIODES			
C112L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	D101-104	2058322101	1N4148M	4
C113L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	D106-108	2058322101	1N4148M	3
C114L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	D110/111	2058322101	1N4148M	2
C115L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	D116/117	2058322101	1N4148M	2
C116L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	INTEGRATED CIRCUITS			
C117L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	IC101/102	2168017132	LC7821	2
C118L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	IC103	2168206107	KIA6259P, OP AMP	1
C119L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	IC104/105	2168206104	KIA7559P/KIA4559P, OP AMP	2
C120L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	IC106	2408000136	LTV817, Photo-Coupler	1
C121L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	TRANSISTORS			
C122L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	Q103/104	2208606104	KTC1815Y/BKTC3198Y, NPN	2
C123L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	Q105	2238006103	KTA114Y/KRA107M, PNP	1
C124L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	Q106/107	2208606108	KTC2240/BKTC3200, NPN	2
C125L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	Q108/109	2208606104	KTC1815Y/BKTC3198Y, NPN	2
C126L/R	3519101935	Ceramic Tubular	100 pF 50 V K 2	Q110	2208206102	BKTA949/KTA1024, PNP	1
C127L/R	3479347971	Electrolytic SG	4.7 uF 50 V M 2	Q111	2208606107	KTC2229/KTC3206, NPN	1
C128L/R	3479347971	Electrolytic SG	4.7 uF 50 V M 2	Q113	2228406120	BKTC2235/KTC1027, NPN	1
C129-132	3479347041	Electrolytic SG	47 uF 25 V M 4	Q114	2228106107	BKTA965/KTA1023, PNP	1
C133/134	3479310971	Electrolytic SG	1 uF 50 V M 2	Q117/118	2208606108	KTC2240/BKTC3200, NPN	2
				Q119/120	2208606104	KTC1815Y/BKTC3198Y, NPN	2
				Q121	2208206102	BKTA949/KTA1024, PNP	1
				Q122	2208606107	KTC2229/KTC3206, NPN	1
				Q124	2228406120	BKTC2235/KTC1027, NPN	1

Ref. No.	Mfr. Part No.	Description	Q'ty
Q125	2228106107	BKTA965/KTA1023, PNP	1
Q128/129	2208606104	KTC1815Y/BKTC3198Y,NPN	2
Q130	2238006103	KTA114Y/KRA107M, PNP	1

RESISTORS

R101/LR	3069102970	Carbon Film	1 kohm 1/5 W J 2
R102/LR	3069913970	Carbon Film	91 kohm 1/5 W J 2
R103/LR	3069913970	Carbon Film	91 kohm 1/5 W J 2
R104/LR	3069821970	Carbon Film	820 ohm 1/5 W J 2
R105/LR	3069564970	Carbon Film	560 kohm 1/5 W J 2
R106/LR	3069433970	Carbon Film	43 kohm 1/5 W J 2
R107/108	3069470970	Carbon Film	47 ohm 1/5 W J 2
R109/LR	3069471970	Carbon Film	470 ohm 1/5 W J 2
R110/LR	3069104970	Carbon Film	100 kohm 1/5 W J 2
R111/LR	3069102970	Carbon Film	1 kohm 1/5 W J 2
R112/LR	3069102970	Carbon Film	1 kohm 1/5 W J 2
R113/LR	3069102970	Carbon Film	1 kohm 1/5 W J 2
R114/LR	3069102970	Carbon Film	1 kohm 1/5 W J 2
R115/LR	3069102970	Carbon Film	1 kohm 1/5 W J 2
R116/LR	3069102970	Carbon Film	1 kohm 1/5 W J 2
R117/LR	3069102970	Carbon Film	1 kohm 1/5 W J 2
R118/LR	3069102970	Carbon Film	1 kohm 1/5 W J 2
R119/LR	3069102970	Carbon Film	1 kohm 1/5 W J 2
R120	3069471930	Carbon Film	470 kohm 1/5 W J 1
R120/LR	3069473970	Carbon Film	47 kohm 1/5 W J 2
R121	3069471970	Carbon Film	470 ohm 1/5 W J 1
R122/LR	3069104970	Carbon Film	100 kohm 1/5 W J 2
R123-126	3069471970	Carbon Film	470 ohm 1/5 W J 4
R127	3069104970	Carbon Film	100 kohm 1/5 W J 1
R130	3069104970	Carbon Film	100 kohm 1/5 W J 1
R131	3069123970	Carbon Film	12 kohm 1/5 W J 1
R132	3069202970	Carbon Film	2 kohm 1/5 W J 1
R133	3069104970	Carbon Film	100 kohm 1/5 W J 1
R134	3069471970	Carbon Film	470 ohm 1/5 W J 1
R135	3069332970	Carbon Film	3.3 kohm 1/5 W J 1
R136	3069222970	Carbon Film	2.2 kohm 1/5 W J 1
R137/138	3069471970	Carbon Film	470 ohm 1/5 W J 2
R139	3069104970	Carbon Film	100 kohm 1/5 W J 1
R140	3069202970	Carbon Film	2 kohm 1/5 W J 1
R141	3069123970	Carbon Film	12 kohm 1/5 W J 1
R144	3069104970	Carbon Film	100 kohm 1/5 W J 1
R145	3069471970	Carbon Film	470 ohm 1/5 W J 1
R146	3069332970	Carbon Film	3.3 kohm 1/5 W J 1
R147	3069393970	Carbon Film	39 kohm 1/5 W J 1
R148	3069681970	Carbon Film	680 ohm 1/5 W J 1
R149/150	3069103970	Carbon Film	10 kohm 1/5 W J 2
R151/152	3069432970	Carbon Film	4.3 kohm 1/5 W J 2
R153	3069433970	Carbon Film	43 kohm 1/5 W J 1
R154	3069182970	Carbon Film	1.8 kohm 1/5 W J 1
R155	3069393970	Carbon Film	39 kohm 1/5 W J 1
R156	3069332970	Carbon Film	3.3 kohm 1/5 W J 1
R157	3069104970	Carbon Film	100 kohm 1/5 W J 1
R159	3069121970	Carbon Film	120 ohm 1/5 W J 1
R160	3069102970	Carbon Film	1 kohm 1/5 W J 1
R161	3069272970	Carbon Film	2.7 kohm 1/5 W J 1
R162	3069121970	Carbon Film	120 ohm 1/5 W J 1
R163	3069221970	Carbon Film	220 ohm 1/5 W J 1
R164/165	3059278682	Cement	0.27 ohm 3 W K 2
R166	3069561970	Carbon Film	560 ohm 1/5 W J 1
R167	3069472970	Carbon Film	4.7 kohm 1/5 W J 1
R168	3069153970	Carbon Film	15 kohm 1/5 W J 1
R169	3069100970	Carbon Film	10 ohm 1/5 W J 1
R170	3069100270	Carbon Film	10 ohm 1/4 W J 1
R171	3069393970	Carbon Film	39 kohm 1/5 W J 1
R172/173	3069103970	Carbon Film	10 kohm 1/5 W J 2
R174	3069681970	Carbon Film	680 ohm 1/5 W J 1
R175	3069104970	Carbon Film	100 kohm 1/5 W J 1
R176	3069332970	Carbon Film	3.3 kohm 1/5 W J 1
R177/178	3069432970	Carbon Film	4.3 kohm 1/5 W J 2
R179	3069433970	Carbon Film	43 kohm 1/5 W J 1
R180	3069182970	Carbon Film	1.8 kohm 1/5 W J 1
R181	3069393970	Carbon Film	39 kohm 1/5 W J 1
R182	3069121970	Carbon Film	120 ohm 1/5 W J 1
R183	3069272970	Carbon Film	2.7 kohm 1/5 W J 1
R184	3069102970	Carbon Film	1 kohm 1/5 W J 1
R185	3069121970	Carbon Film	120 ohm 1/5 W J 1
R186	3069221970	Carbon Film	220 ohm 1/5 W J 1
R187/188	3059278682	Cement	0.27 ohm 3 W K 2
R189	3069271970	Carbon Film	270 ohm 1/5 W J 1
R190	3069472970	Carbon Film	4.7 kohm 1/5 W J 1
R191	3069153970	Carbon Film	15 kohm 1/5 W J 1
R192	3069100970	Carbon Film	10 ohm 1/5 W J 1
R193	3069100270	Carbon Film	10 ohm 1/4 W J 1
R194/195	3069243970	Carbon Film	24 kohm 1/5 W J 2

Ref. No.	Mfr. Part No.	Description	Q'ty
R196	3069392970	Carbon Film	3.9 kohm 1/5 W J 1
R197	3069470970	Carbon Film	47 ohm 1/5 W J 1
R198	3069473970	Carbon Film	47 kohm 1/5 W J 1
R199	3069271970	Carbon Film	270 ohm 1/5 W J 1
R200	3069101970	Carbon Film	100 ohm 1/5 W J 1
R201	3069102970	Carbon Film	1 kohm 1/5 W J 1

MISCELLANEOUS

30	4438108110	Jack, RCA, 4P	1
31	4408103410	Jack, RCA, 4P	1
33	4438111410	Jack, RCA, 2P	1
36	4408107410	Terminal, Speaker	1
37	4438006510	Jack, Multi	2
56	4438108010	Jack, RCA, 6P	1
	152222101408	LUG, HI-WP #22BK FF 140	1
	152624101844	LUG, HI-WP #24BK FF 180	1

PCBB

ASSY P.C. BOARD SURROUND

CAPACITORS

C501	3479310071	Electrolytic SG	10 uF 50 V M 1
C502	3479347041	Electrolytic SG	47 uF 25 V M 1
C503-505	3479310071	Electrolytic SG	10 uF 50 V M 3
C506	3479347041	Electrolytic SG	47 uF 25 V M 1
C507/508	3479310071	Electrolytic SG	10 uF 50 V M 2
C509/510	3479347041	Electrolytic SG	47 uF 25 V M 2
C511	3519101935	Ceramic Tubular	100 pF 50 V K 1
C512	3479310971	Electrolytic SG	1 uF 50 V M 1
C513	3479347871	Electrolytic SG	0.47 uF 50 V J 1
C514	3479347041	Electrolytic SG	47 uF 25 V M 1
C515	3519681935	Ceramic Tubular	680 pF 50 V K 1
C516	3479310971	Electrolytic SG	1 uF 50 V M 1
C517	3479347041	Electrolytic SG	47 uF 25 V M 1
C518	3479310971	Electrolytic SG	1 uF 50 V M 1
C519	3519681935	Ceramic Tubular	680 pF 50 V K 1
C520	3479310971	Electrolytic SG	1 uF 50 V M 1
C521	3519101935	Ceramic Tubular	100 pF 50 V K 1
C522	3679104297	Mylar	0.1 uF 63 V K 1
C523	3679223120	Mylar	0.022 uF 100 V J 1
C524/525	3479347971	Electrolytic SG	4.7 uF 50 V M 2
C526-528	3679224297	Mylar	0.22 uF 63 V K 3
C529	3679684297	Mylar	0.68 uF 63 V K 1
C530	3619471110	Poly	470 pF 50 V J 1
C531	3679473120	Mylar	0.047 uF 100 V J 1
C532	3679222120	Mylar	0.0022 uF 100 V J 1
C533	3479310971	Electrolytic SG	1 uF 50 V M 1
C534	3479322131	Electrolytic SG	220 uF 16 V M 1
C535	3679562120	Mylar	0.0056 uF 100 V J 1
C536/537	3479310971	Electrolytic SG	1 uF 50 V M 2
C538	3479322131	Electrolytic SG	220 uF 16 V M 1
C539	3479310071	Electrolytic SG	10 uF 50 V M 1
C540	3479322871	Electrolytic SG	0.22 uF 50 V K 1
C541/542	3479310971	Electrolytic SG	1 uF 50 V M 2
C543	3479347871	Electrolytic SG	0.47 uF 50 V M 1
C544-546	3679104297	Mylar	0.1 uF 63 V K 3
C547/548	3679224297	Mylar	0.22 uF 63 V K 2
C549	3679104297	Mylar	0.1 uF 63 V K 1
C550	3679473120	Mylar	0.047 uF 100 V J 1
C551	3619681110	Poly	680 pF 50 V J 1
C552	3679104297	Mylar	0.1 uF 63 V K 1
C553	3619681110	Poly	680 pF 50 V J 1
C554	3679473120	Mylar	0.047 uF 100 V J 1
C555	3479310061	Electrolytic SG	10 uF 35 V M 1
C556	3479310971	Electrolytic SG	1 uF 50 V M 1
C557/558	3679104297	Mylar	0.1 uF 63 V K 2
C559	3479310971	Electrolytic SG	1 uF 50 V M 1
C560	3479310061	Electrolytic SG	10 uF 35 V M 1
C561	3679472120	Mylar	0.0047 uF 100 V J 1
C562	3479322071	Electrolytic SG	22 uF 50 V M 1
C563	3679562120	Mylar	0.0056 uF 100 V J 1
C564	3479310121	Electrolytic SG	100 uF 10 V M 1
C565	3579104534	Ceramic Disc	0.1 uF 50 V Z 1
C566	3679562120	Mylar	0.0056 uF 100 V J 1
C567	3519471935	Ceramic Tubular	470 pF 50 V K 1
C568	3679104297	Mylar	0.1 uF 63 V K 1
C569	3479347041	Electrolytic SG	47 uF 25 V M 1
C570/571	3679473120	Mylar	0.047 uF 100 V J 2
C572	3679104297	Mylar	0.1 uF 63 V K 1
C573	3679332120	Mylar	0.0033 uF 100 V J 1
C574	3519471935	Ceramic Tubular	470 pF 50 V K 1
C576/577	3519271935	Ceramic Tubular	270 pF 50 V K 2
C578-580	3519101935	Ceramic Tubular	100 pF 50 V K 3
C582	3479347041	Electrolytic SG	47 uF 25 V M 1
C583	3519103935	Ceramic Tubular	0.01 uF 50 V J 1

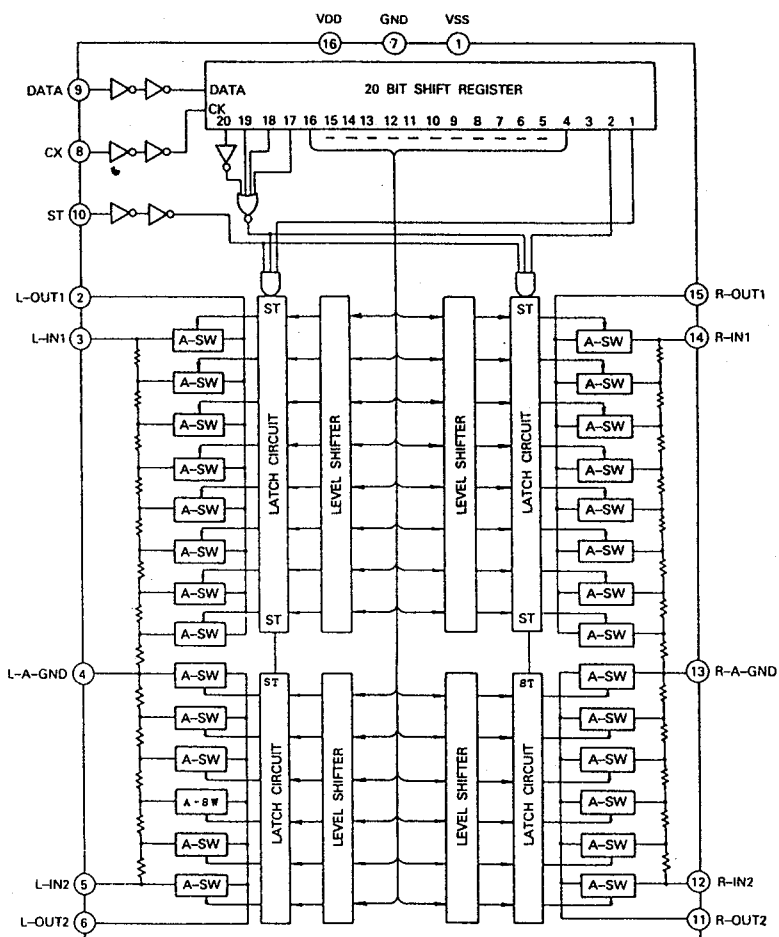
Ref. No.	Mfr. Part No.	Description	Q'ty
C584	3519101935	Ceramic Tubular	100 pF 50 V K 1
C585	3479310121	Electrolytic SG	100 uF 10 V M 1
CONNECTORS			
CN106	4428560080	Wafer, 8P	1
CN107	4428560060	Wafer, 6P	1
CNT602	4428507010	Wafer, 9P	1
DIODES			
D501-503	2058322101	1N4148M	3
INTEGRATED CIRCUITS			
IC501/502	2168206103	KIA7559S/KIA4559S, OP AMP	2
IC503/504	2138017108	LC4966	2
IC505	2168206104	KIA7559P/KIA4559P, OP AMP	1
IC506	2138007124	TC9176P	1
IC507	2168020115	NJM2177L	1
IC508	2168020114	NJU9701D	1
IC509	2138009115	MC14094BCP	1
TRANSISTORS			
Q501/502	2238006103	KTA114Y/KRA107M, PNP	2
Q503/504	2208622106	DTC114YS, NPN	2
Q505/506	2238006103	KTA114Y/KRA107M, PNP	2
Q507/508	2208622106	DTC114YS, NPN	2
RESISTORS			
R501	3069101970	Carbon Film	100 ohm 1/5 W J 1
R502/503	3069104970	Carbon Film	100 kohm 1/5 W J 2
R504	3069101970	Carbon Film	100 ohm 1/5 W J 1
R505-508	3069104970	Carbon Film	100 kohm 1/5 W J 4
R510/511	3069154970	Carbon Film	150 kohm 1/5 W J 2
R512/513	3069101970	Carbon Film	100 ohm 1/5 W J 2
R514/515	3069223970	Carbon Film	22 kohm 1/5 W J 2
R516	3069124970	Carbon Film	120 kohm 1/5 W J 1
R517	3069103970	Carbon Film	10 kohm 1/5 W J 1
R518	3069104970	Carbon Film	100 kohm 1/5 W J 1
R519	3069101970	Carbon Film	100 ohm 1/5 W J 1
R520	3069473970	Carbon Film	47 kohm 1/5 W J 1
R521	3069362970	Carbon Film	3.6 kohm 1/5 W J 1
R522	3069564970	Carbon Film	560 kohm 1/5 W J 1
R523	3069182970	Carbon Film	1.8 kohm 1/5 W J 1
R524	3069101970	Carbon Film	100 ohm 1/5 W J 1
R525	3069473970	Carbon Film	47 kohm 1/5 W J 1
R526	3069472970	Carbon Film	4.7 kohm 1/5 W J 1
R527	3069182970	Carbon Film	1.8 kohm 1/5 W J 1
R528	3069564970	Carbon Film	560 kohm 1/5 W J 1
R529-531	3069102970	Carbon Film	1 kohm 1/5 W J 3
R532	3069334970	Carbon Film	330 kohm 1/5 W J 1
R533-535	3069153970	Carbon Film	15 kohm 1/5 W J 3
R536-538	3069104970	Carbon Film	100 kohm 1/5 W J 3
R539	3069470970	Carbon Film	47 ohm 1/5 W J 1
R540/541	3069104970	Carbon Film	100 kohm 1/5 W J 2
R542	3069103970	Carbon Film	10 kohm 1/5 W J 1
R543	3069752970	Carbon Film	7.5 kohm 1/5 W J 1
R544	3069473970	Carbon Film	47 kohm 1/5 W J 1
R545	3069153970	Carbon Film	15 kohm 1/5 W J 1
R546	3069752970	Carbon Film	7.5 kohm 1/5 W J 1
R547	3069473970	Carbon Film	47 kohm 1/5 W J 1
R548	3069153970	Carbon Film	15 kohm 1/5 W J 1
R549	3069223970	Carbon Film	22 kohm 1/5 W J 1
R550	3069106970	Carbon Film	10 Mohm 1/5 W J 1
R551	3069223970	Carbon Film	22 kohm 1/5 W J 1
R552	3069104970	Carbon Film	100 kohm 1/5 W J 1
R553	3069822970	Carbon Film	8.2 kohm 1/5 W J 1
R554	3069752970	Carbon Film	7.5 kohm 1/5 W J 1
R555	3069560970	Carbon Film	56 ohm 1/5 W J 1
R556	3069183970	Carbon Film	18 kohm 1/5 W J 1
R557	3069562970	Carbon Film	5.6 kohm 1/5 W J 1
R558	3069220970	Carbon Film	22 ohm 1/5 W J 1
R559	3069153970	Carbon Film	15 kohm 1/5 W J 1
R560	3069220970	Carbon Film	22 ohm 1/5 W J 1
R561	3069183970	Carbon Film	18 kohm 1/5 W J 1
R562	3069153970	Carbon Film	15 kohm 1/5 W J 1
R563	3069470970	Carbon Film	47 ohm 1/5 W J 1
R564	3069105970	Carbon Film	1 Mohm 1/5 W J 1
R565-567	3069102970	Carbon Film	1 kohm 1/5 W J 3
R569	3069471970	Carbon Film	470 ohm 1/5 W J 1
R570	3069102970	Carbon Film	1 kohm 1/5 W J 1
R571/572	3069102970	Carbon Film	1 kohm 1/5 W J 2
R573	3069101970	Carbon Film	100 ohm 1/5 W J 1

Ref. No.	Mfr. Part No.	Description	Q'ty
RESONATOR			
X501	3938124001	2MHz	1
PCB9 ASS'Y P.C. BOARD VIDEO			
CAPACITORS			
C301	3479333041	Electrolytic SG	33 uF 25 V M 1
C302	3479347121	Electrolytic SG	470 uF 10 V M 1
C303	3519010935	Ceramic Tubular	1 pF 50V D 1
C304	3479333041	Electrolytic SG	33 uF 25 V M 1
C305	3479347121	Electrolytic SG	470 uF 10 V M 1
C306	3519010935	Ceramic Tubular	1 pF 50 V K 1
C307	3479347121	Electrolytic SG	470 uF 10 V M 1
C308	3519010935	Ceramic Tubular	1 pF 50 V K 1
C309	3479310121	Electrolytic SG	100 uF 10 V M 1
C310/L/R	3519101935	Ceramic Tubular	100 pF 50 V J 2
C311	3519104935	Ceramic Tubular	0.1 uF 50 V K 1
CZ301/302	3579104534	Ceramic Disc	0.1 uF 50 V Z 2
CONNECTORS			
CP101	4428513490	Wafer 9P, Angle	1
CP104	4428513440	Wafer 4P, Angle	1
CP301	4428517710	Wafer 4P	1
CP703	4428513420	Wafer 2P, Angle	1
CN105	436203263332	Lead Ass'y, 3P, 260mm	1
DIODES			
D301/302	2058322101	1N4148M	2
INTEGRATED CIRCUIT			
IC301	2138001101	GD4066, Switching	1
TRANSISTORS			
Q301	2208206105	KTA1015Y/BKTA1266Y, PNP	1
Q302	2208606104	KTC1815Y/BKTC3198Y,NPN	1
Q303	2208206105	KTA1015Y/BKTA1266Y, PNP	1
Q304	2208606104	KTC1815Y/BKTC3198Y,NPN	1
Q305	2208206105	KTA1015Y/BKTA1266Y, PNP	1
Q306	2208606104	KTC1815Y/BKTC3198Y,NPN	1
Q307	2218207106	FET, 2SK117Y	1
RESISTORS			
R301/302	3069750970	Carbon Film	75 ohm 1/5 W J 2
R303	3069123970	Carbon Film	12 kohm 1/5 W J 1
R304	3069122970	Carbon Film	1.2 kohm 1/5 W J 1
R305	3069181970	Carbon Film	180 ohm 1/5 W J 1
R306	3069151970	Carbon Film	150 ohm 1/5 W J 1
R307	3069822970	Carbon Film	8.2 kohm 1/5 W J 1
R308	3069122970	Carbon Film	1.2 kohm 1/5 W J 1
R309-312	3069104970	Carbon Film	100 kohm 1/5 W J 4
R313/314	3069750970	Carbon Film	75 ohm 1/5 W J 2
R315	3069123970	Carbon Film	12 kohm 1/5 W J 1
R316	3069122970	Carbon Film	1.2 kohm 1/5 W J 1
R317	3069181970	Carbon Film	180 ohm 1/5 W J 1
R318	3069151970	Carbon Film	150 ohm 1/5 W J 1
R319	3069822970	Carbon Film	8.2 kohm 1/5 W J 1
R320	3069750970	Carbon Film	75 ohm 1/5 W J 1
R321	3069123970	Carbon Film	12 kohm 1/5 W J 1
R322	3069122970	Carbon Film	1.2 kohm 1/5 W J 1
R323	3069181970	Carbon Film	180 ohm 1/5 W J 1
R324	3069122970	Carbon Film	1.2 kohm 1/5 W J 1
R325	3069151970	Carbon Film	150 ohm 1/5 W J 1
R326	3069822970	Carbon Film	8.2 kohm 1/5 W J 1
R327	3069122970	Carbon Film	1.2 kohm 1/5 W J 1
R329	3069105970	Carbon Film	1 Mohm 1/5 W J 1
R330/331	3069471970	Carbon Film	470 ohm 1/5 W J 2
R332/L/R	3069102970	Carbon Film	1 kohm 1/5 W J 2
MISCELLANEOUS			
38	4438109310	Jack, RCA, 2P	2
39	4438113810	Jack, RCA, 1P	1
54	4438109310	Jack, RCA, 2P	2
PCB10 ASS'Y P.C. BOARD OUTLET			
CNT201E	4428525780	Pin Base, 2P	1
CNT202E	4428525860	Pin Base, 1P	1
F202	5508302535	Fuse, T 250 V, 2.5 A	1
47	4448103610	Outlet, AC	1

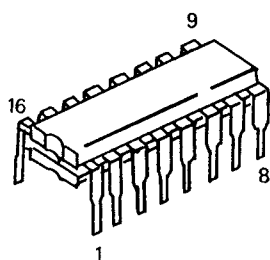
SEMICONDUCTOR LEAD IDENTIFICATION & INTERNAL DIAGRAM

TC9176 : IC506

Block Diagram

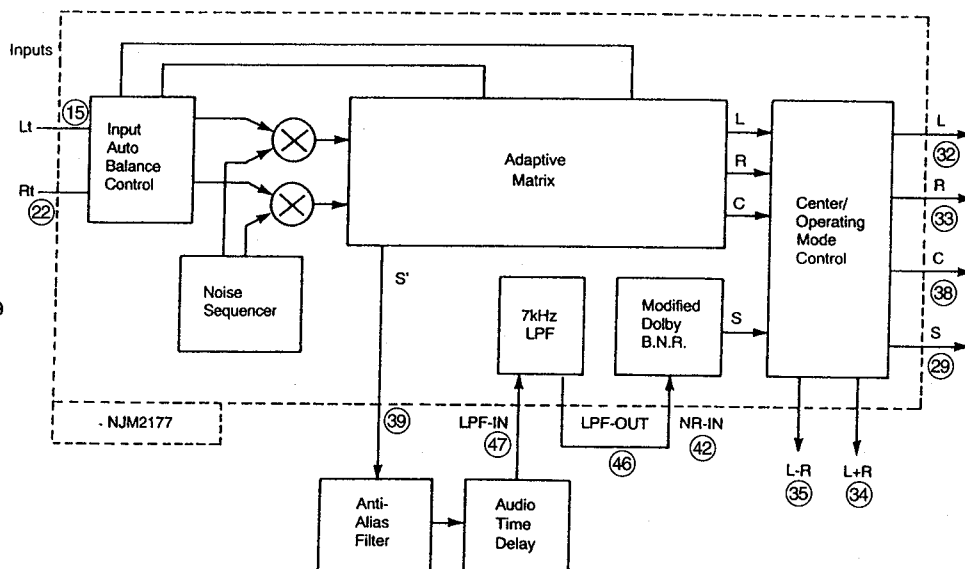


Package Outline

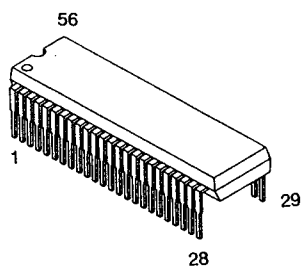


NJM2177 : IC507

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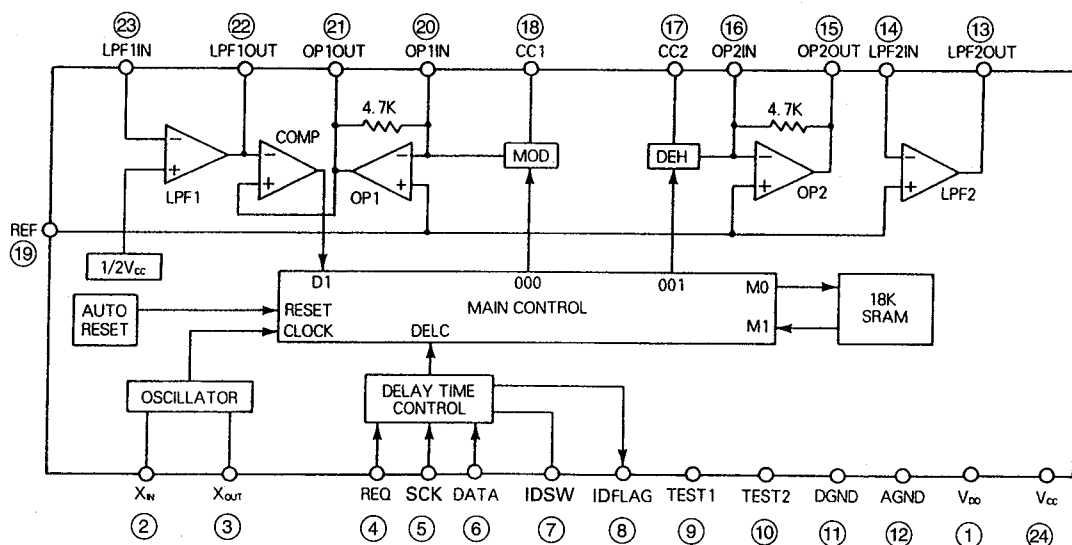
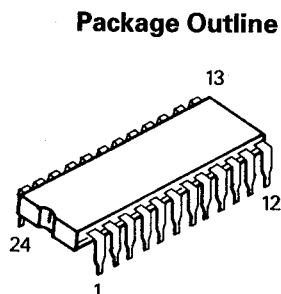


Package Outline



NJU9701 : IC508

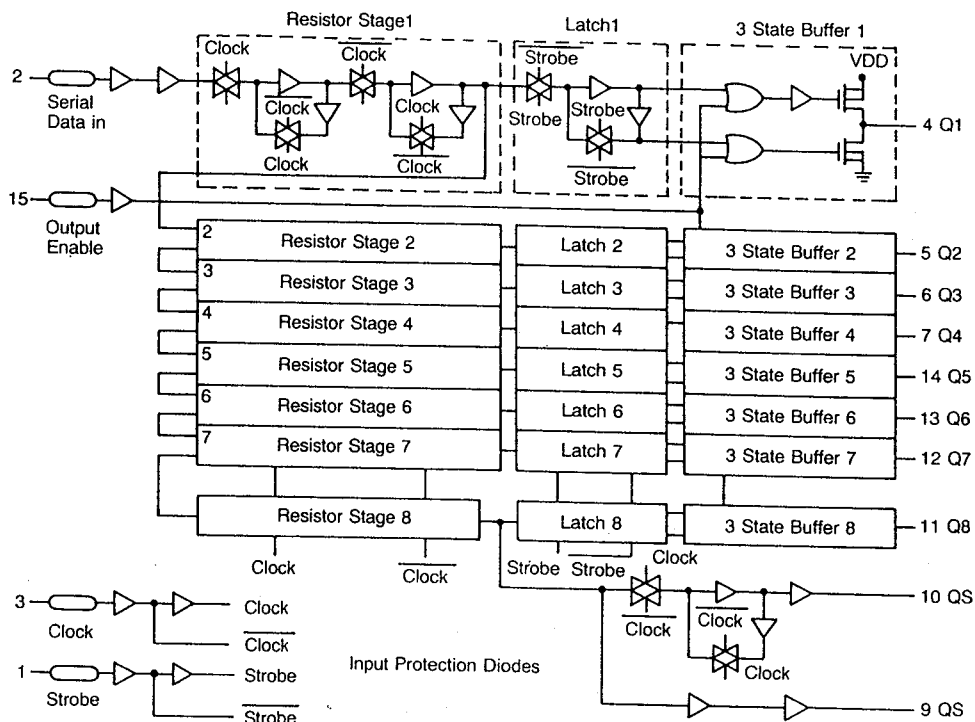
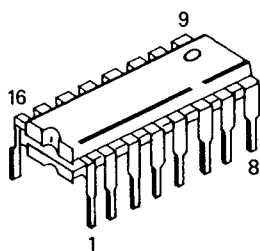
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MC14094 : IC509

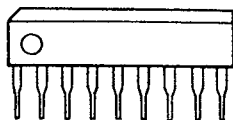
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Package Outline

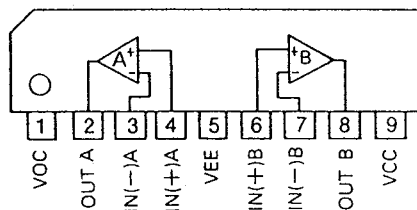


**KIA4559S : IC501, IC502, IC701
(KIA7559)**

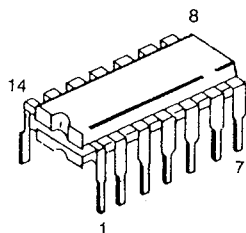
Front View



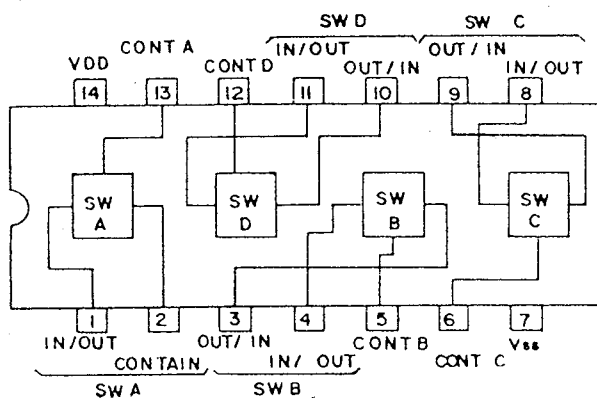
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**LC4966B : IC503, IC504
Package Outline**

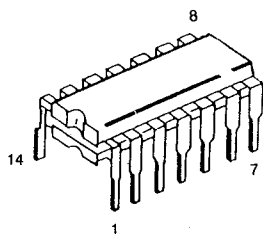


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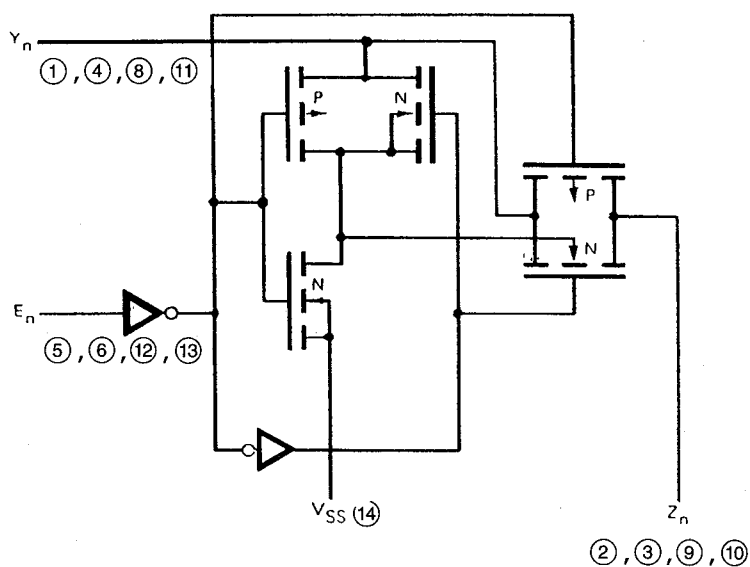


GD4066 : IC301

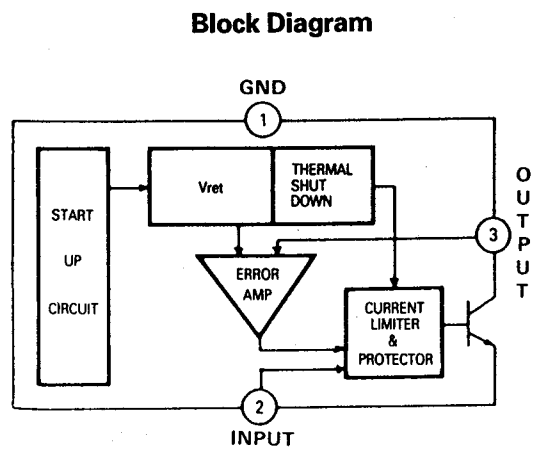
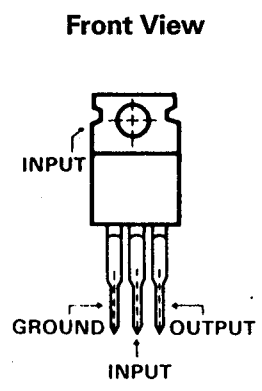
Package Outline



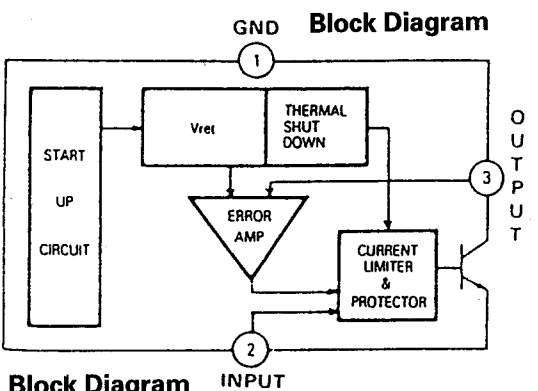
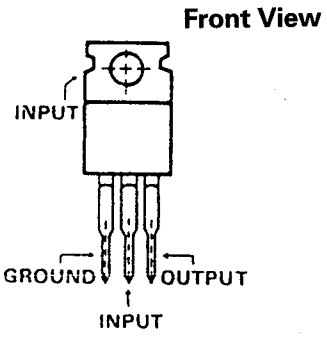
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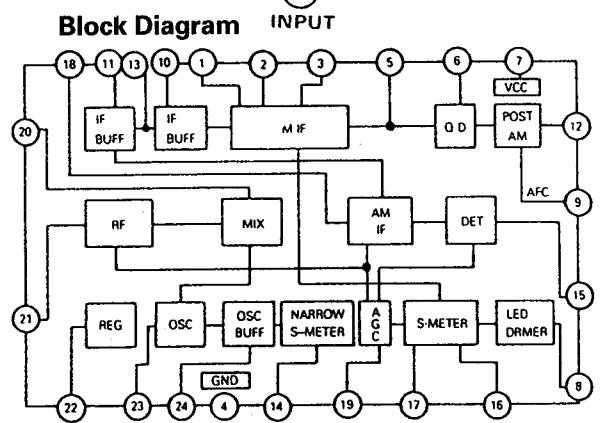
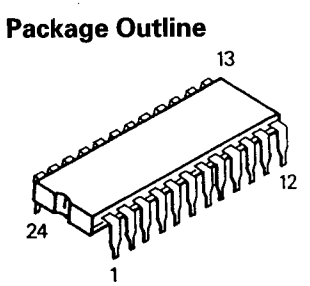
GD78XX : IC201, IC202, IC203



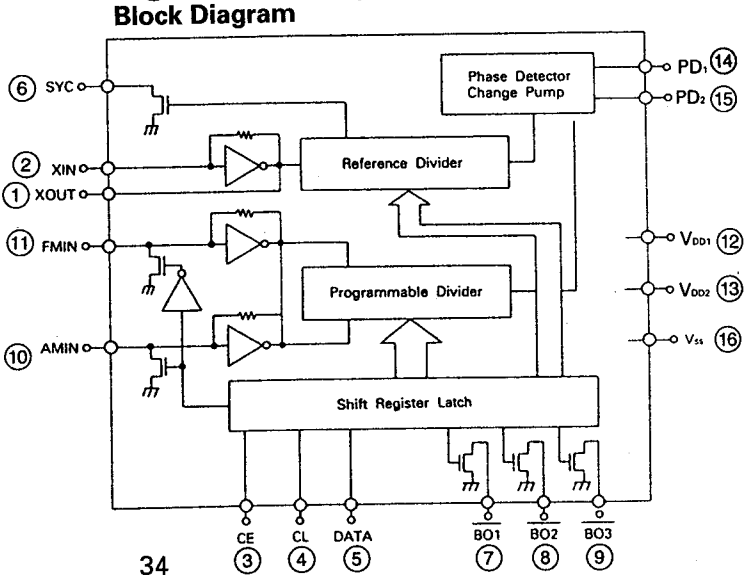
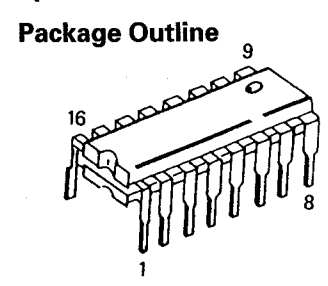
GD7915 : IC204



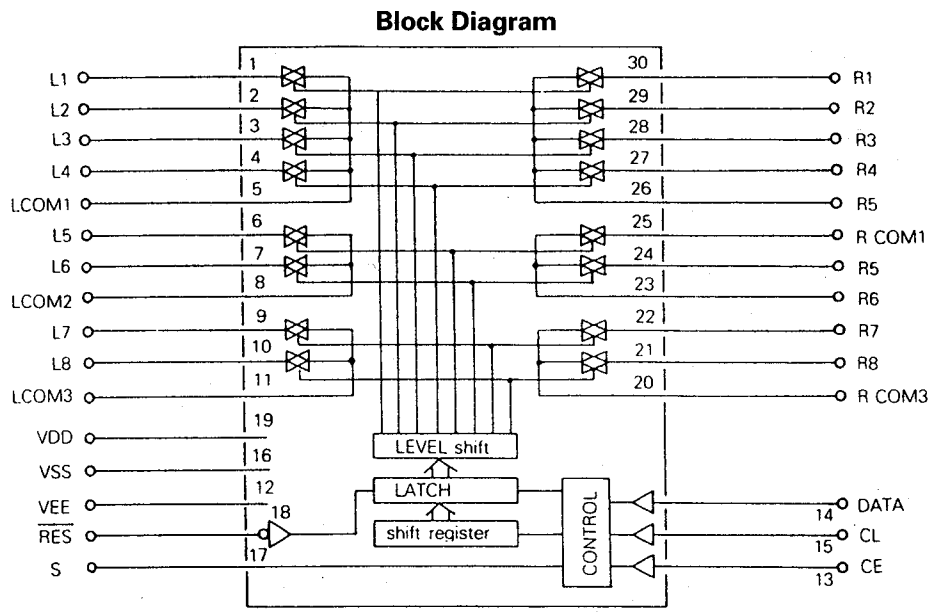
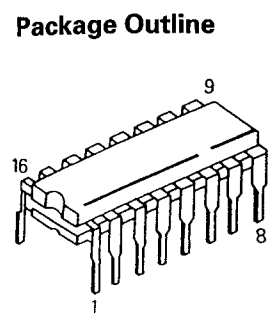
LA1266 : IC801



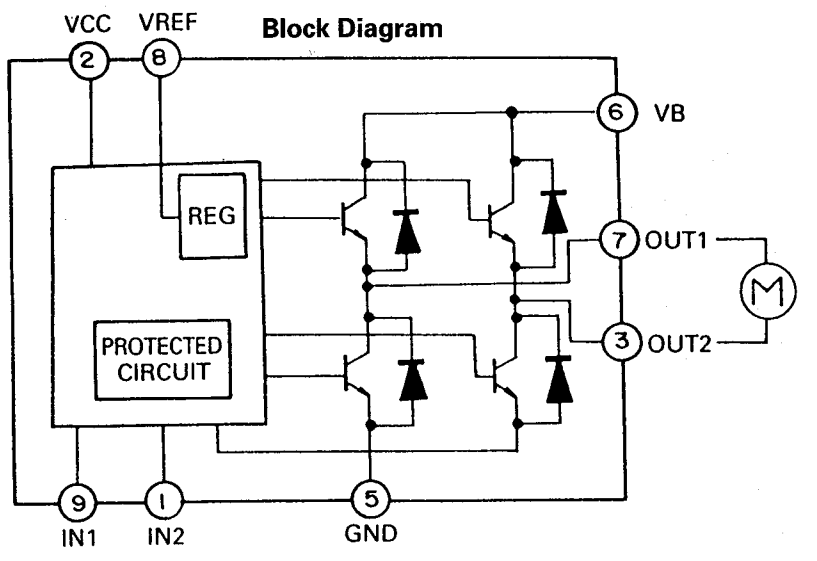
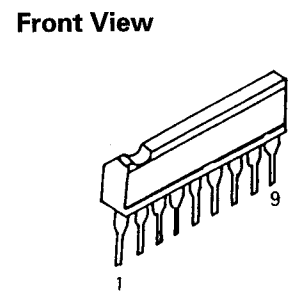
LM7001 : IC802



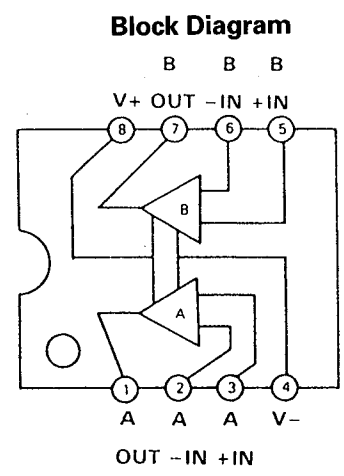
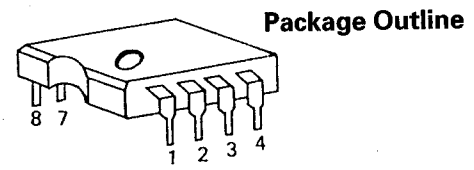
LC7821 : IC101, IC102



TA7291S : IC603

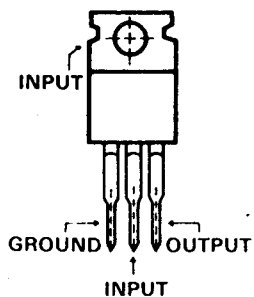


KIA 4559P : IC104, IC105, IC505, IC601, IC602
KIA 6259P : IC103

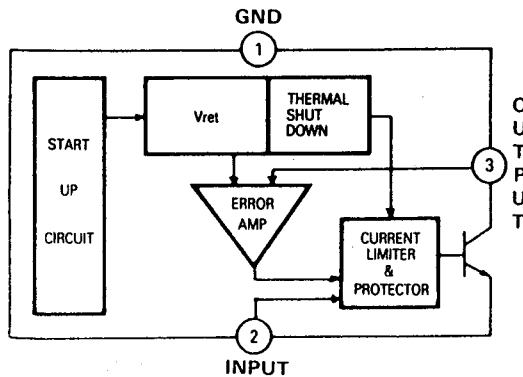


GD78XX : IC201, IC202, IC203

Front View

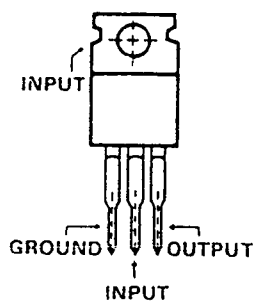


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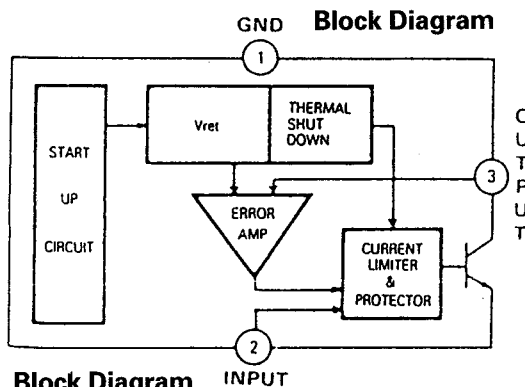


GD7915 : IC204

Front View

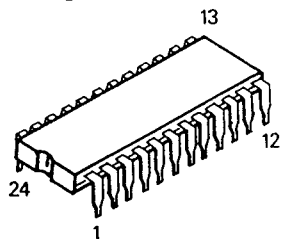


Block Diagram

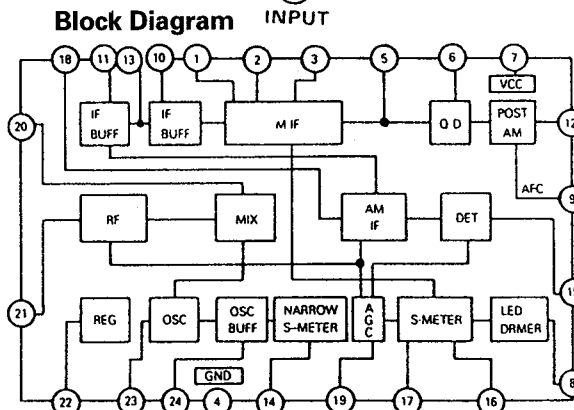


LA1266 : IC801

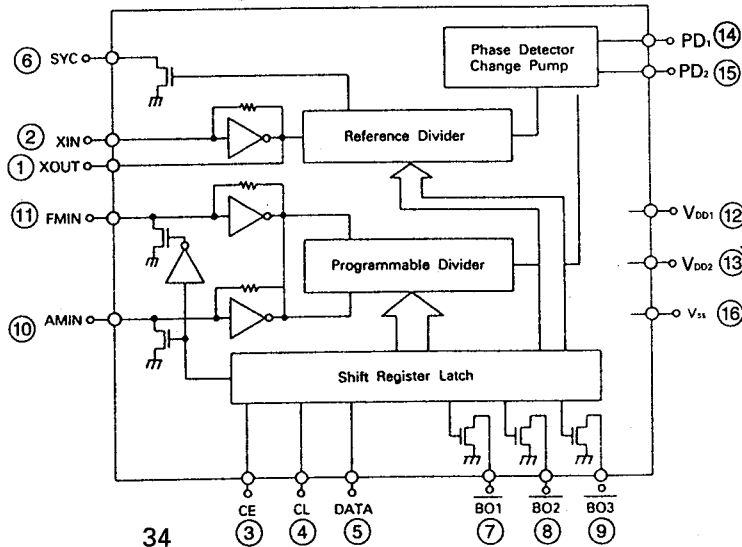
Package Outline



Block Diagram

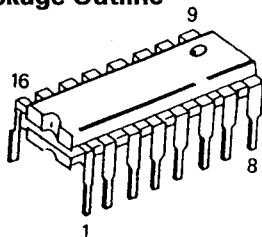


Block Diagram



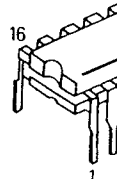
LM7001 : IC802

Package Outline



LC7821 : IC

Package



TA7291S : IC

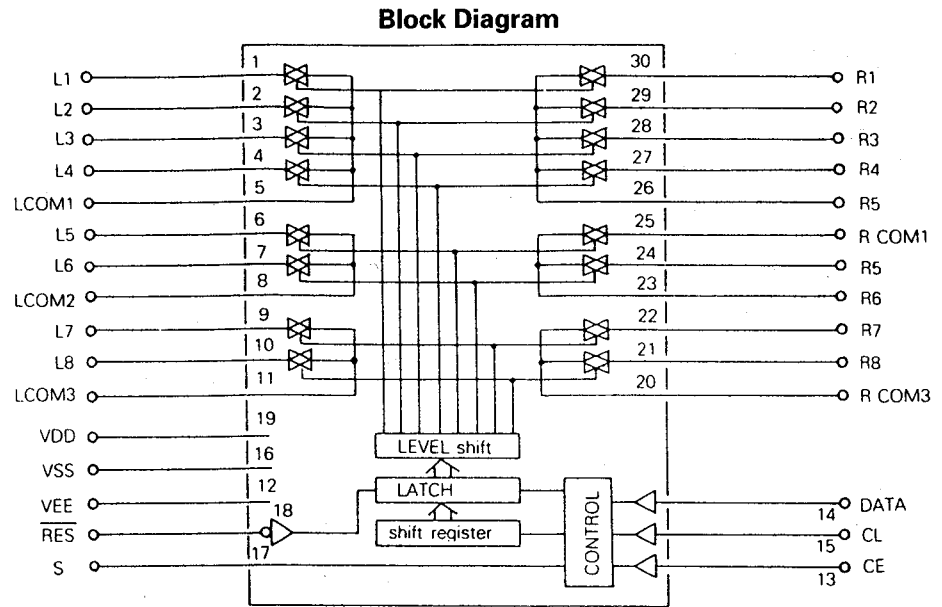
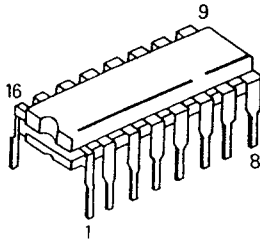
Front

KIA 4559P :

KIA 6259P :

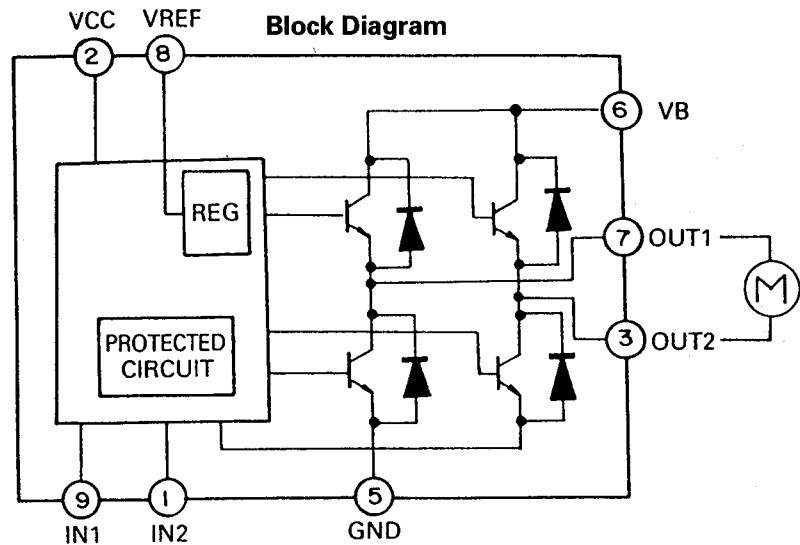
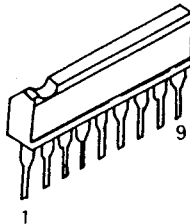
LC7821 : IC101, IC102

Package Outline



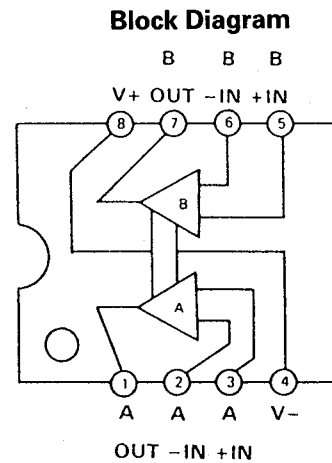
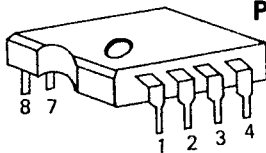
TA7291S : IC603

Front View



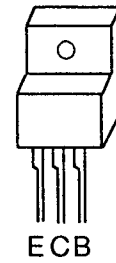
KIA 4559P : IC104, IC105, IC505, IC601, IC602
KIA 6259P : IC103

Package Outline

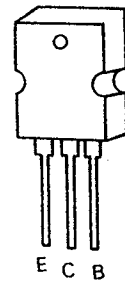


TRANSISTORS

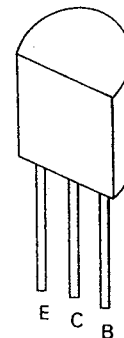
2SC4883
2SA1859



2SC4137

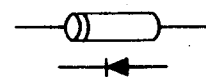


2SD1302S
KTC2240BL
KTC2235C
KTA949
KTA1015Y
KTC1815Y
KTTA970

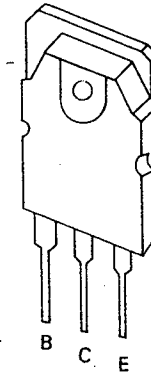


DIODES

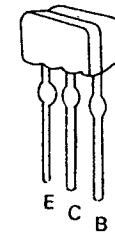
IN4148
IN4002
6A3



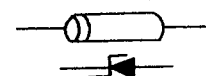
2SC3182
2SA1265
KTD718
KTB688



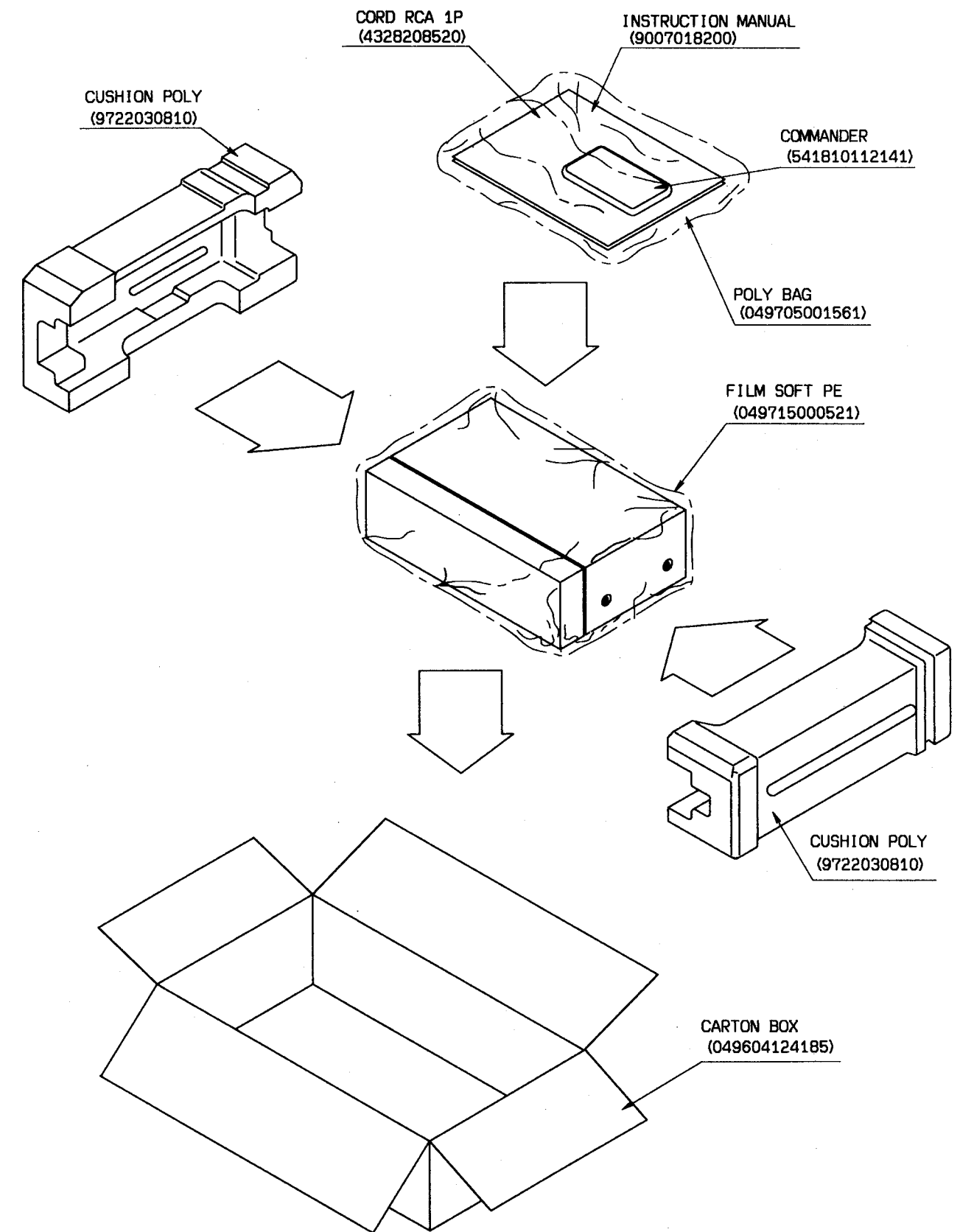
DTA114Y
DTC114Y
DTC114T



ZD9.1BS
ZD4.3BS

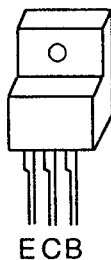


PACKAGE

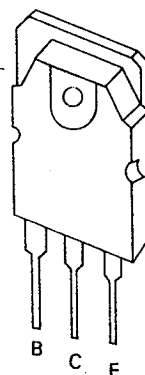


TRANSISTORS

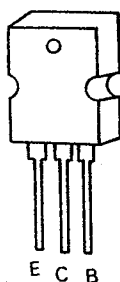
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2SA1859



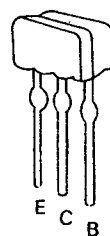
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2SA1265
KTD718
KTB688



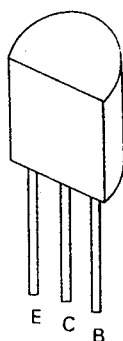
2SC4137



DTA114Y
DTC114Y
DTC114T

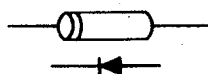


2SD1302S
KTC2240BL
KTC2235C
KTA949
KTA1015Y
KTC1815Y
KTTA970

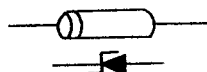


DIODES

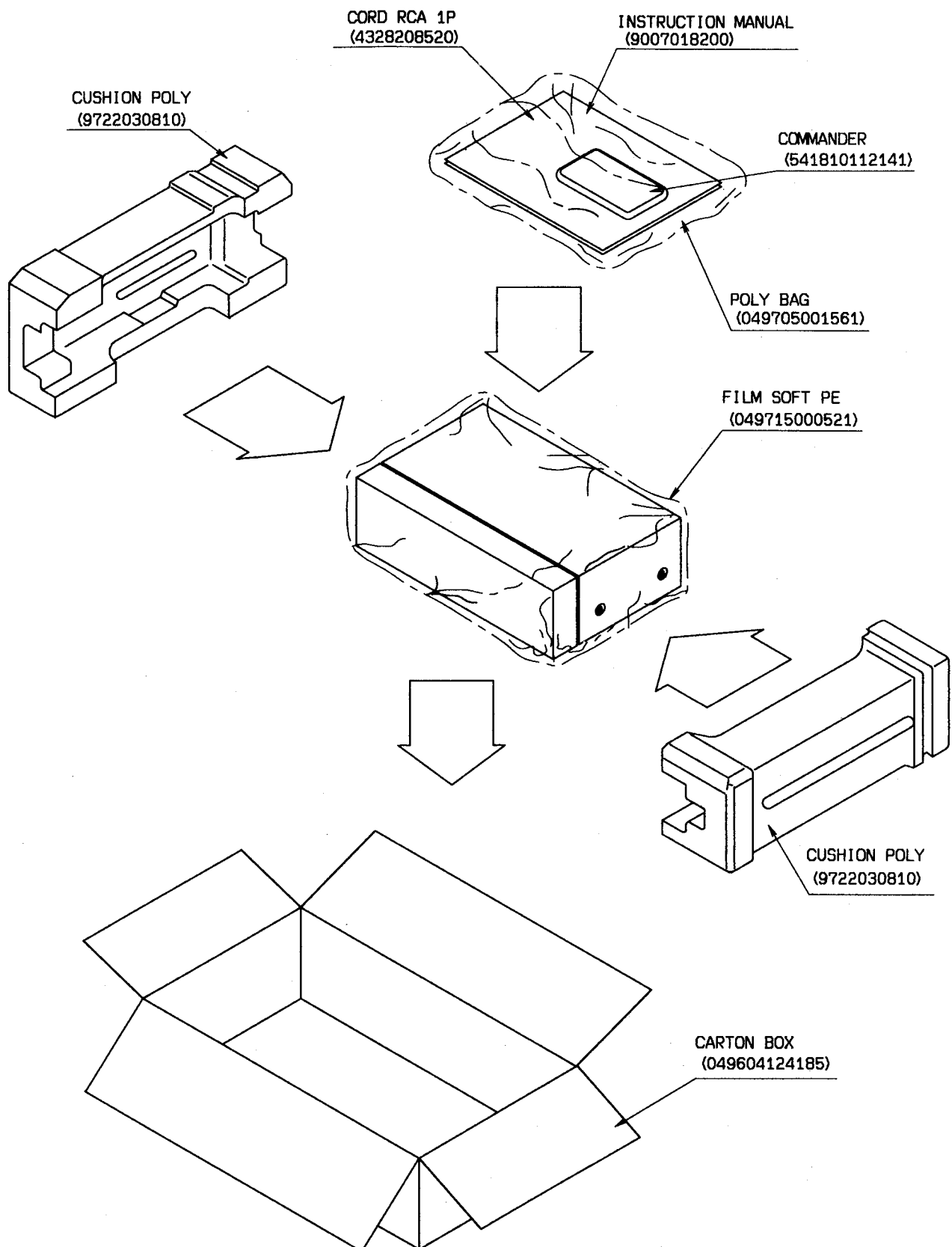
IN4148
IN4002
6A3



ZD9.1BS
ZD4.3BS



PACKAGE



WIRING DIAGRAM

A

B

C

D

E

1

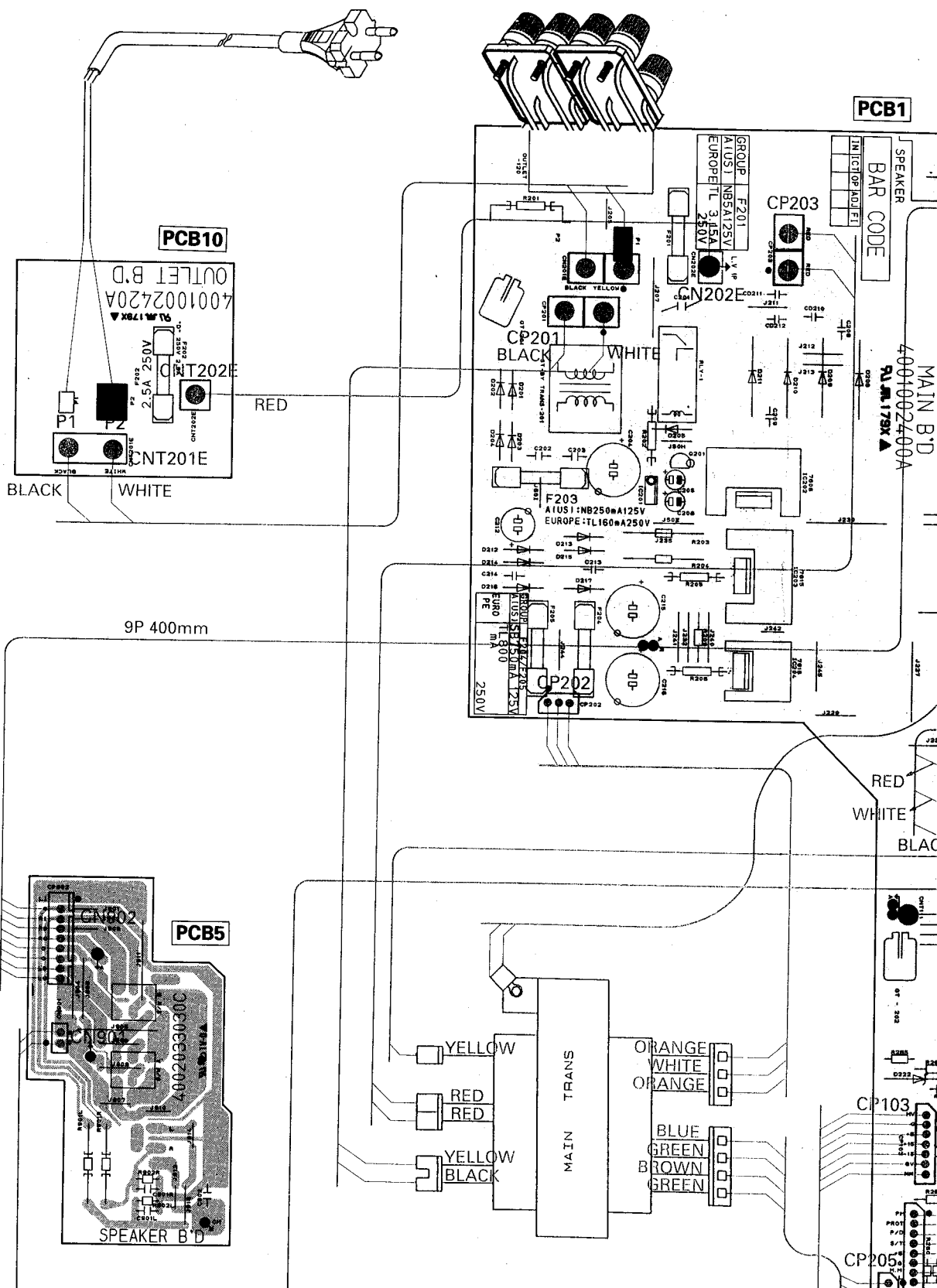
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3

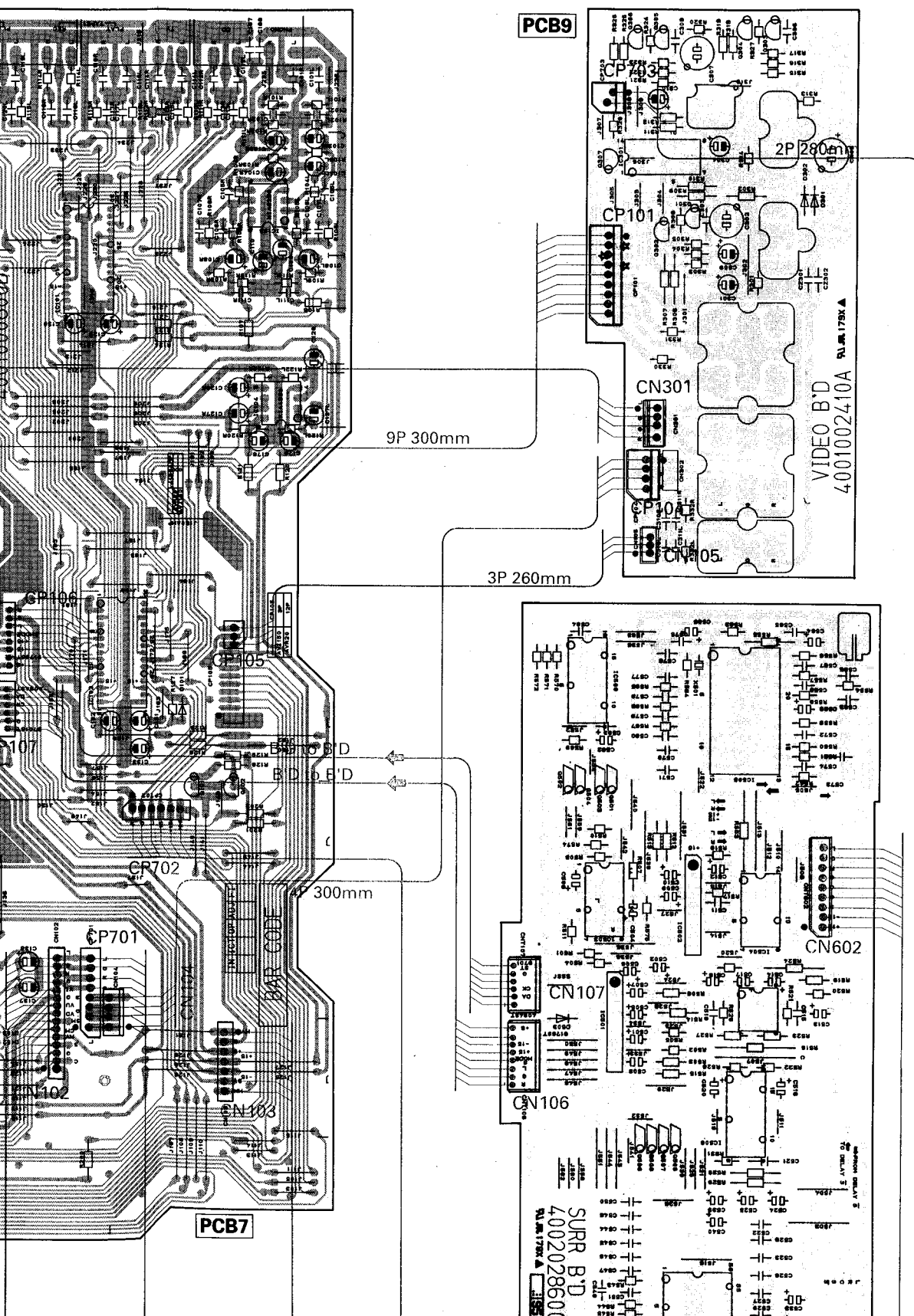
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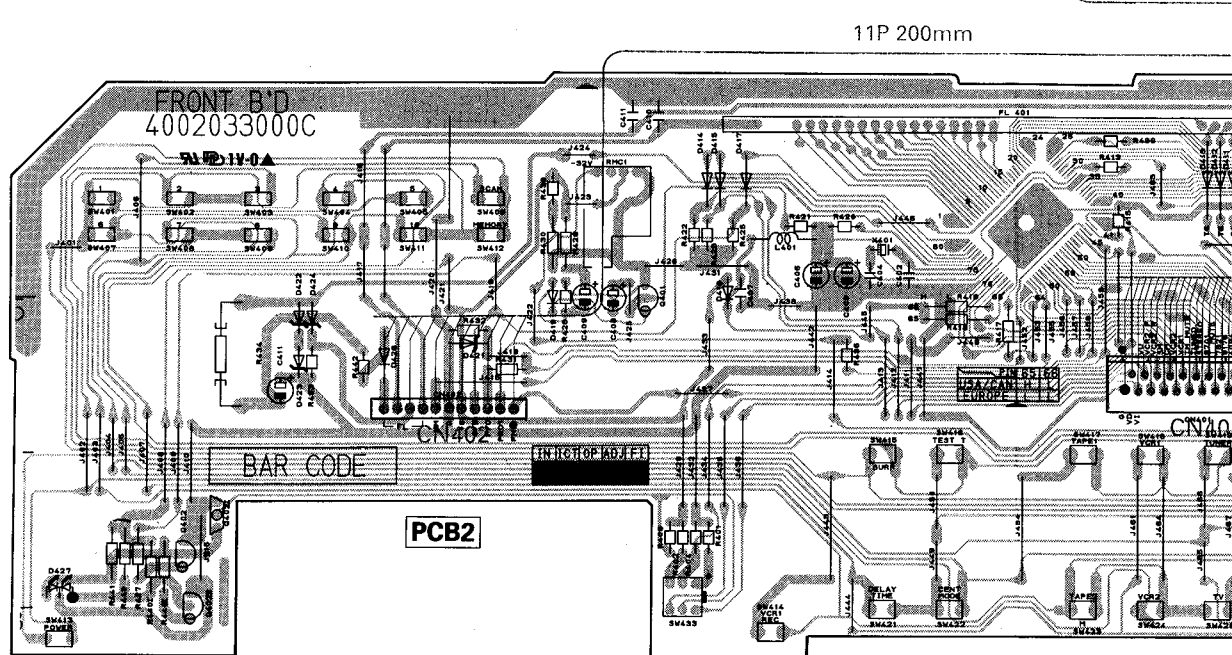
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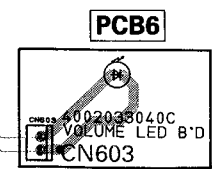
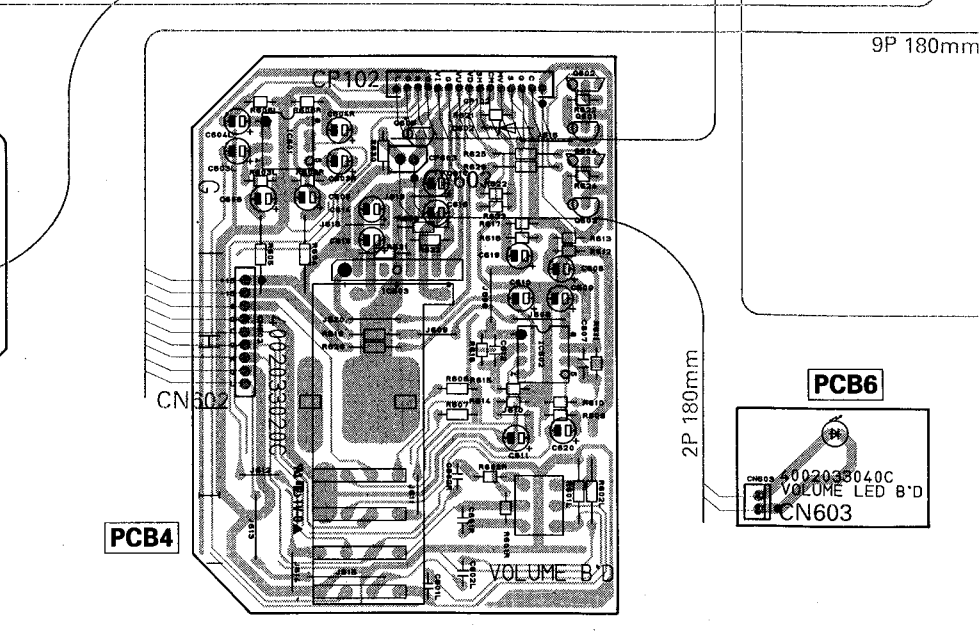
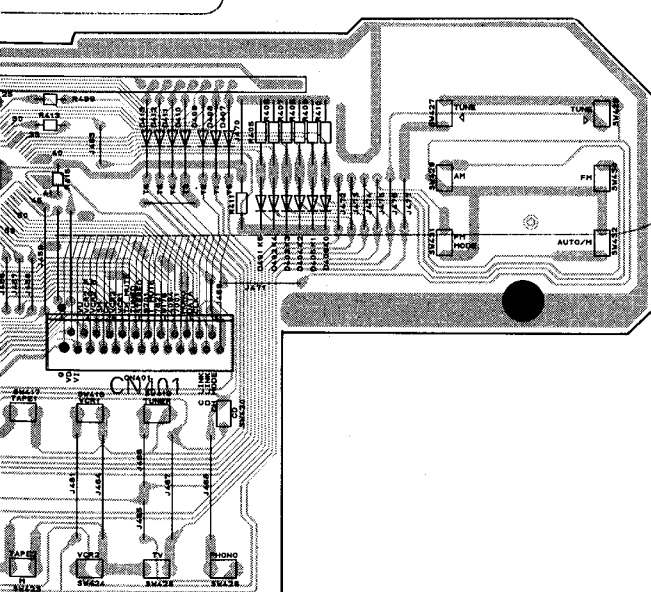
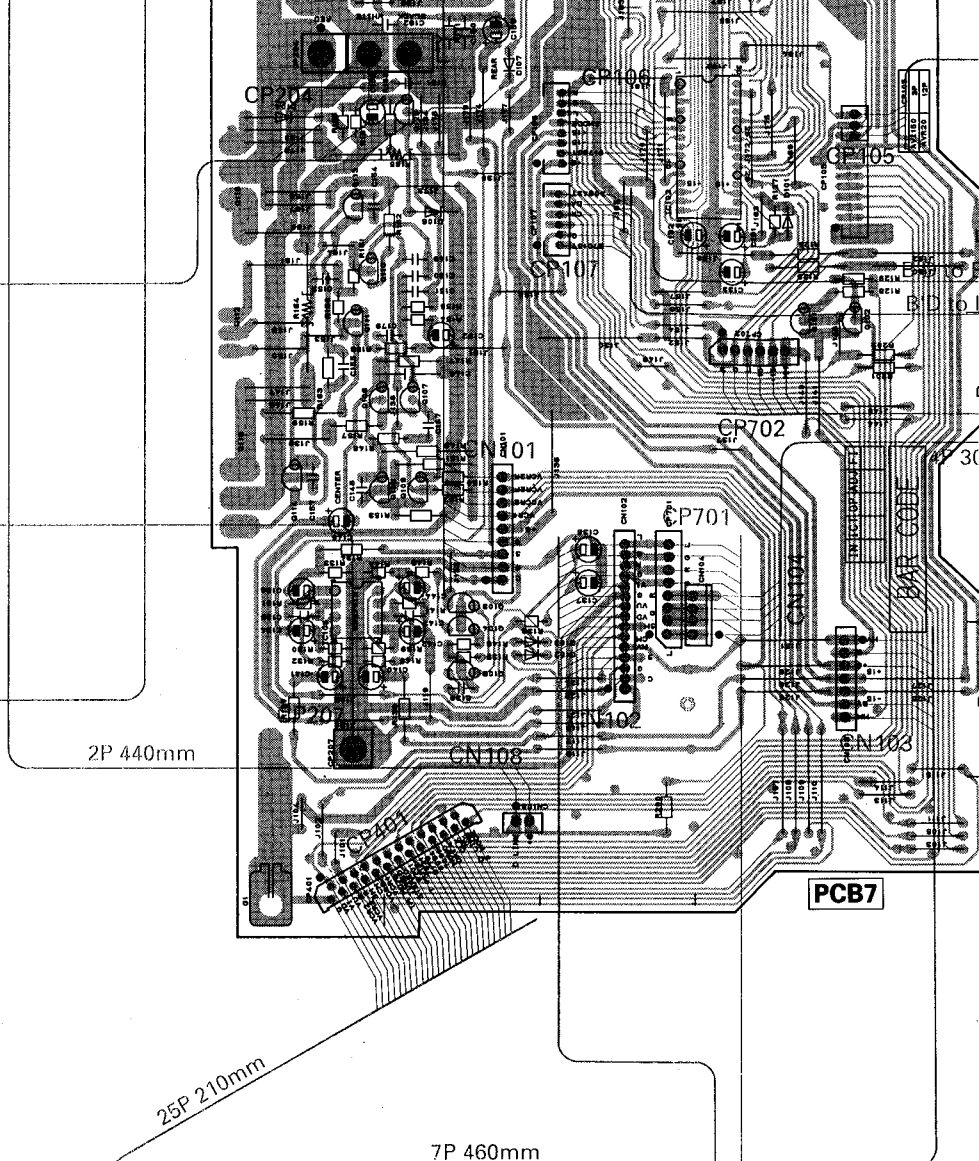
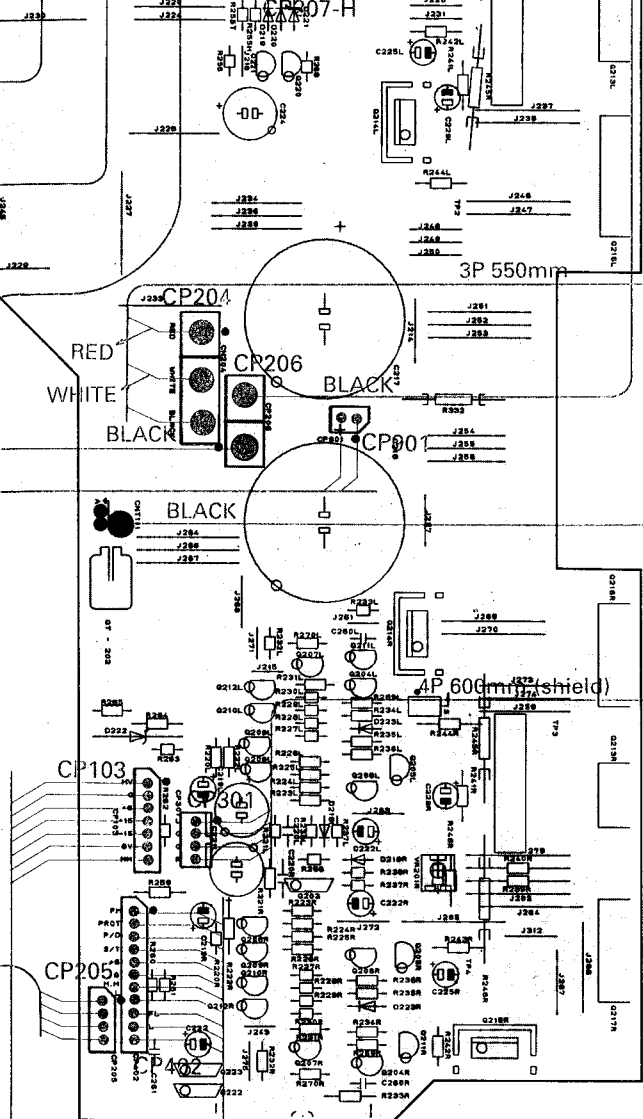
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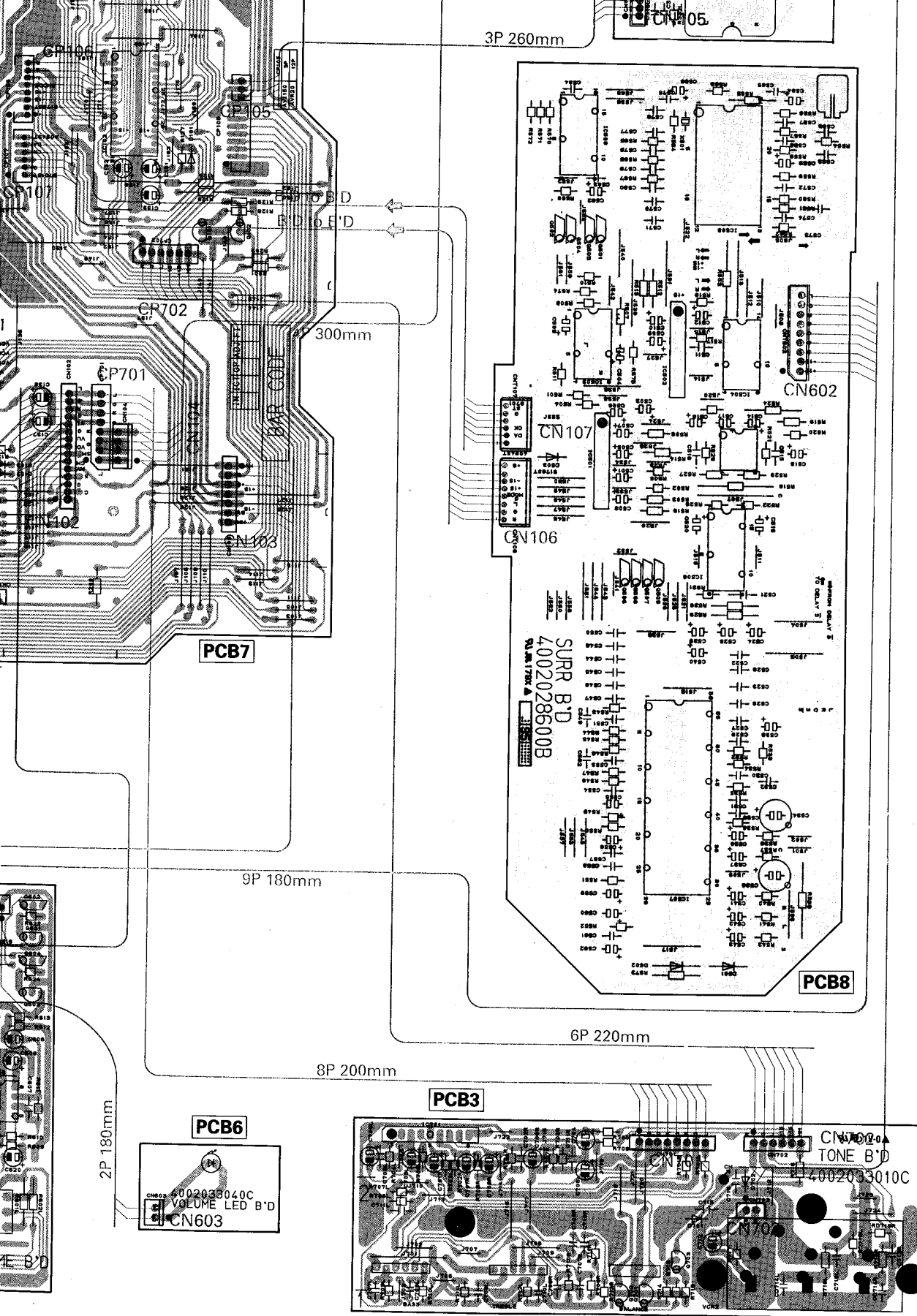


I J K L M

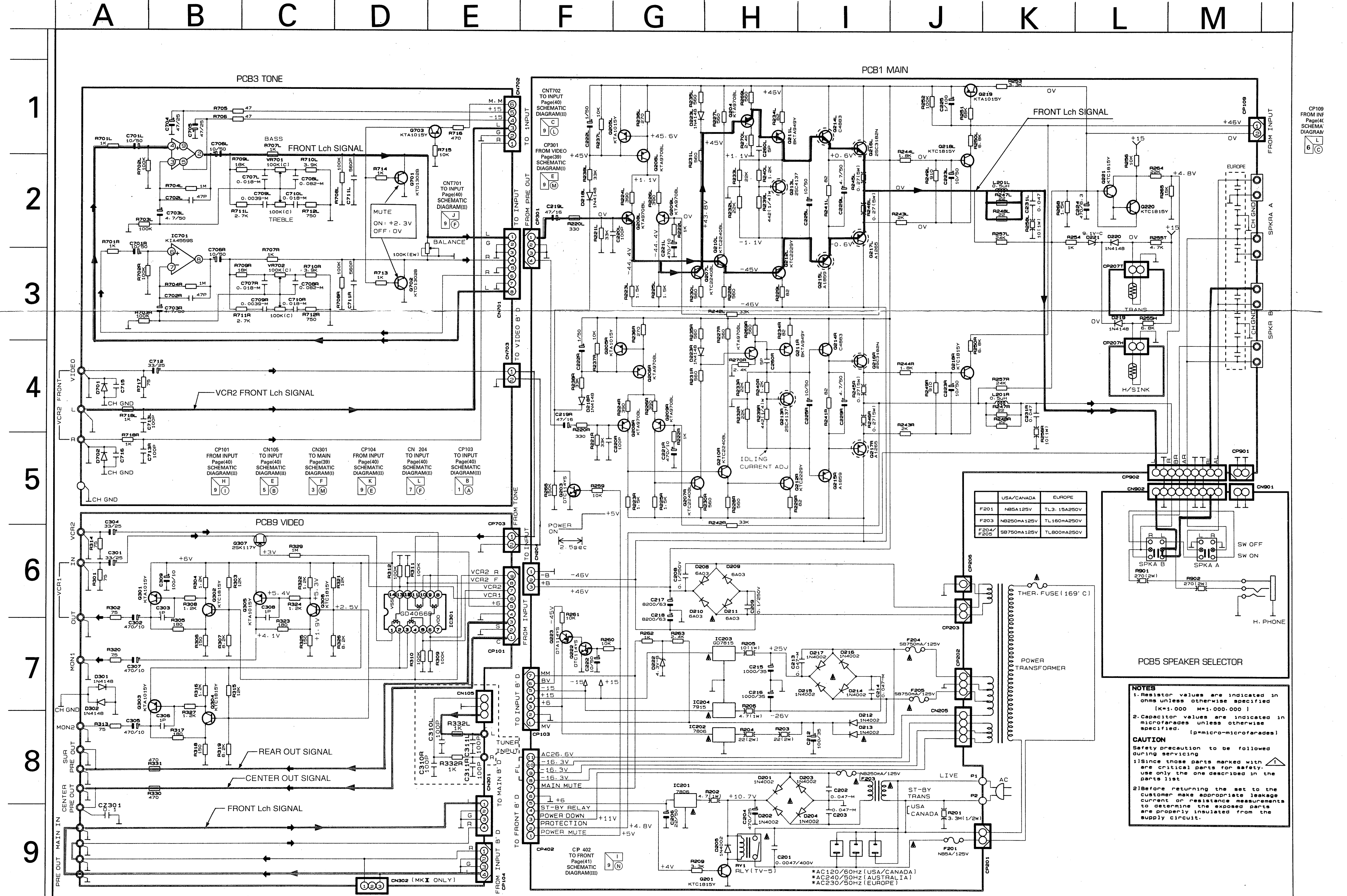








SCHEMATIC DIAGRAM I



NOTES

1. Resistor values are indicated in ohms unless otherwise specified.
[K=1,000 M=1,000,000]
2. Capacitor values are indicated in microfarads unless otherwise specified.
[p=micro-microfarads]

CAUTION

Safety precaution to be followed during servicing:

- 1) Since those parts marked with * are critical parts for safety, use only the one described in the parts list.
- 2) Before returning the set to the customer make appropriate leakage current or resistance measurements to determine the exposed parts are properly insulated from the supply circuit.

SCHEMATIC DIAGRAM I

A

B

C

D

E

1

2

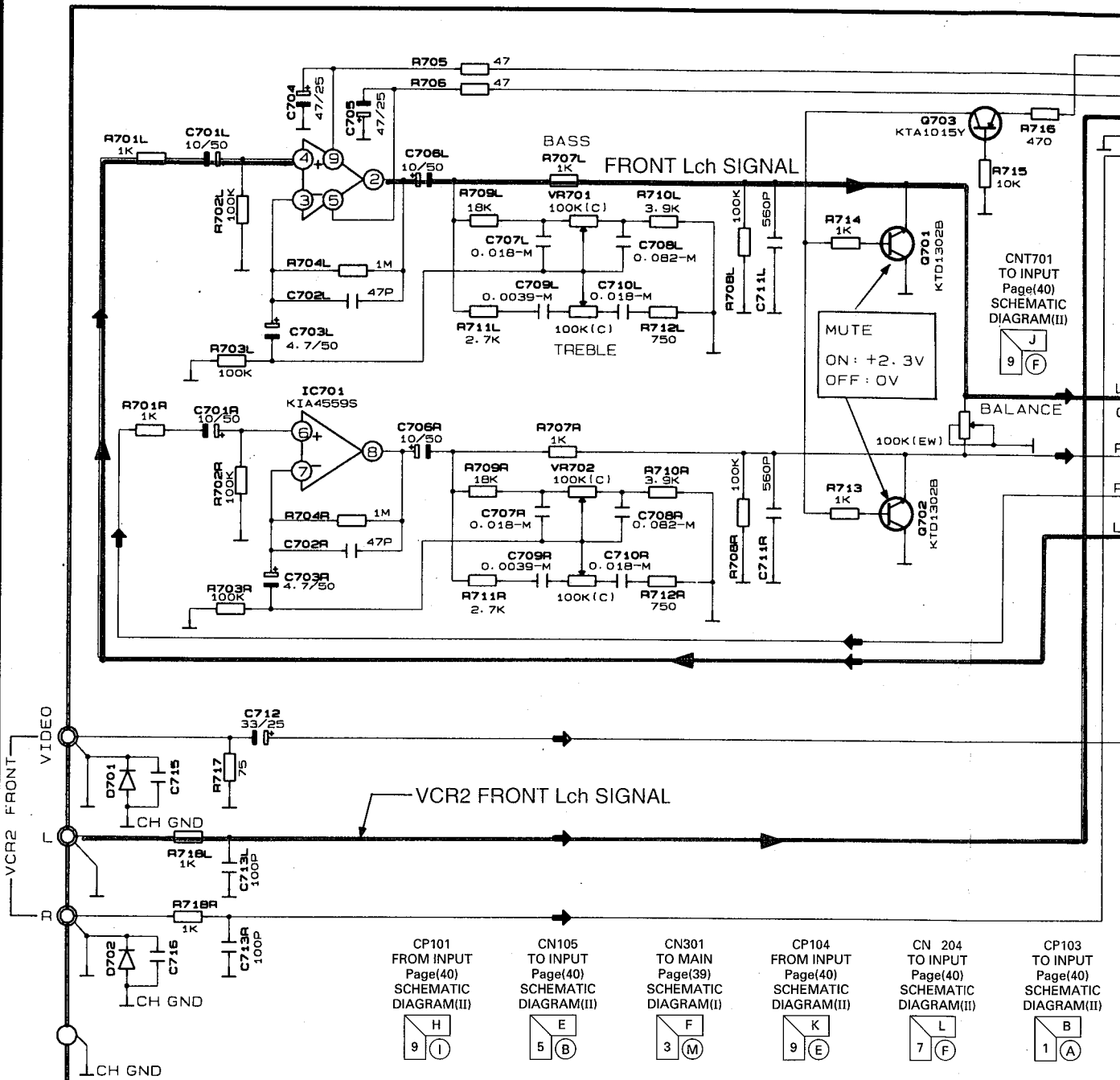
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4

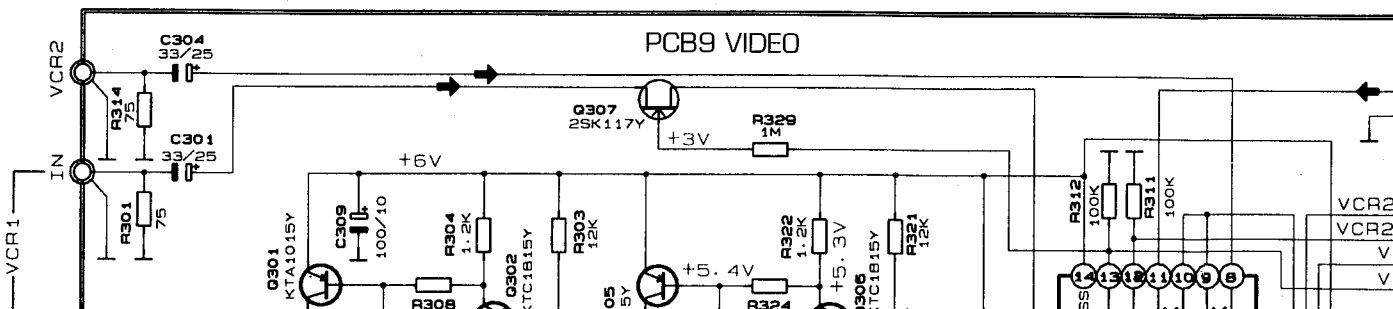
5

6

PCB3 TONE

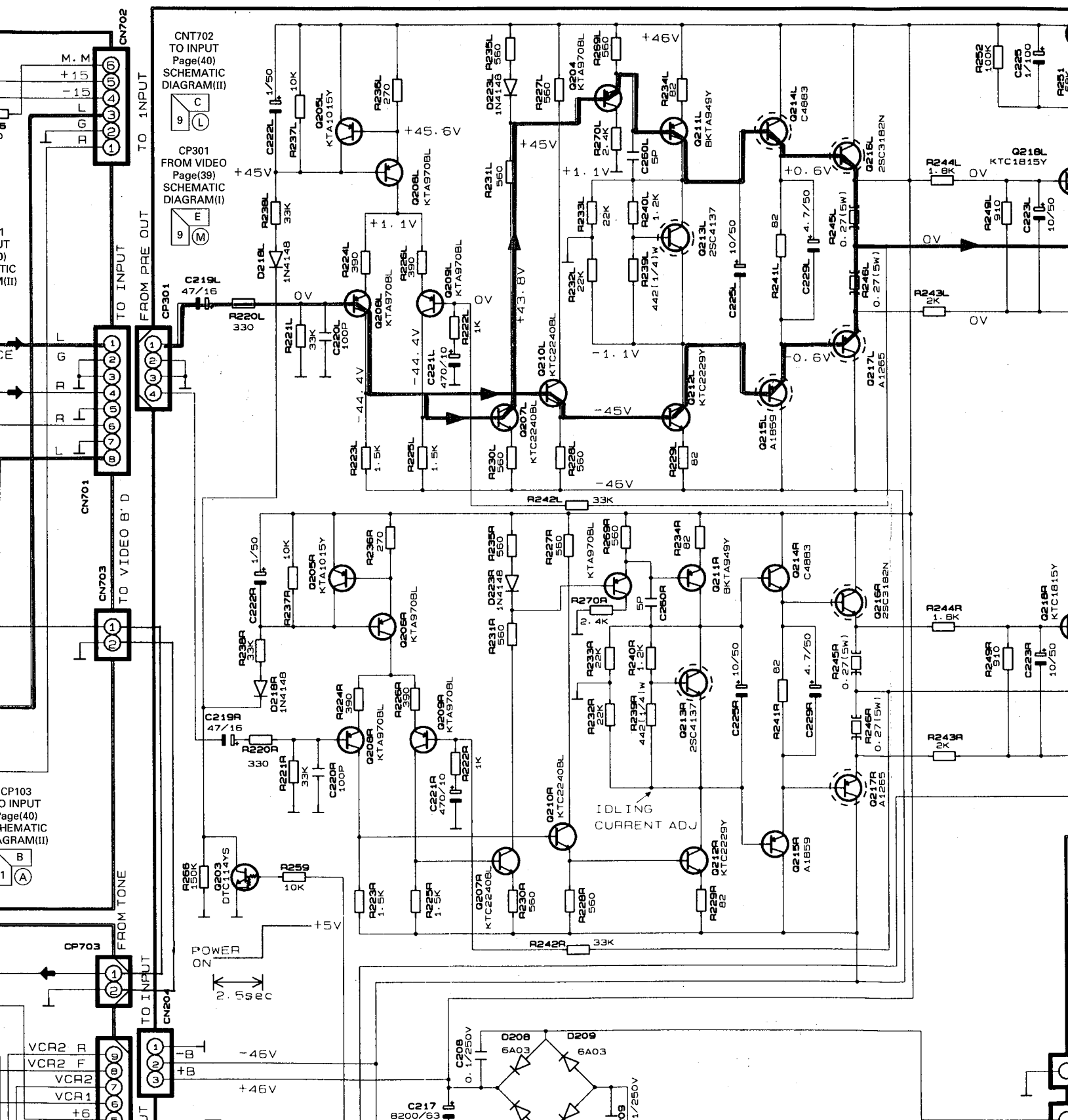


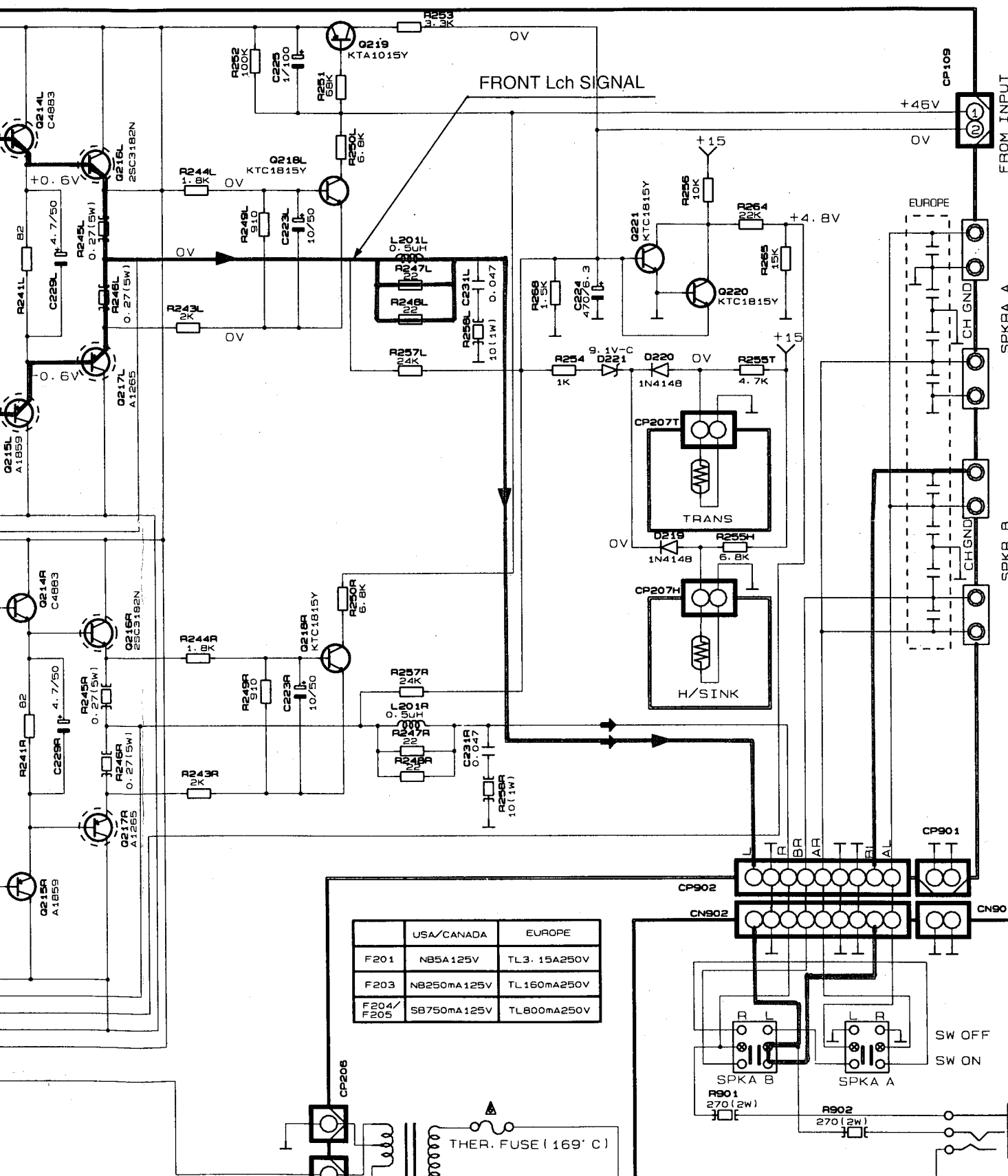
PCB9 VIDEO



E F G H I J

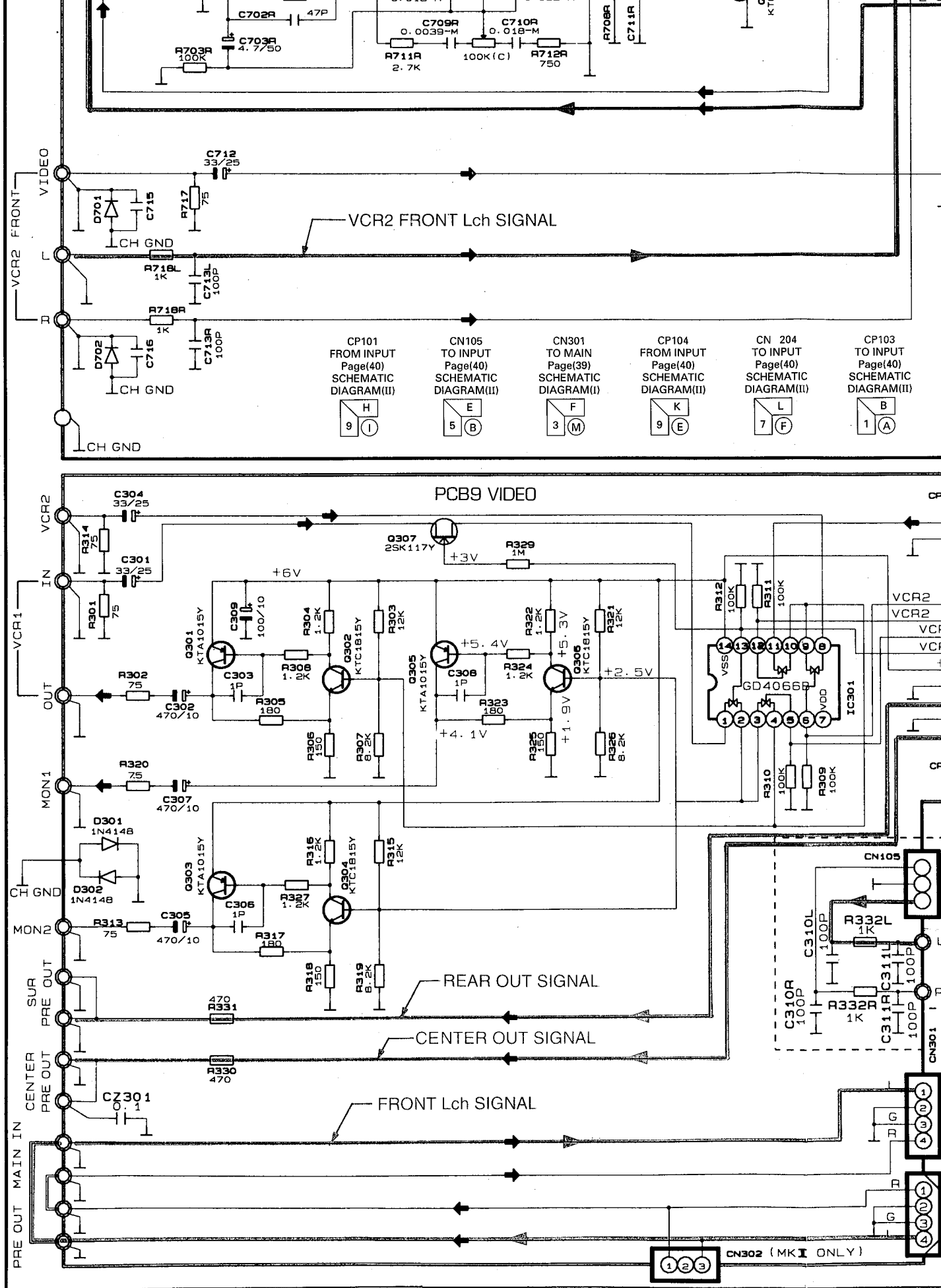
PCB1 MAIN

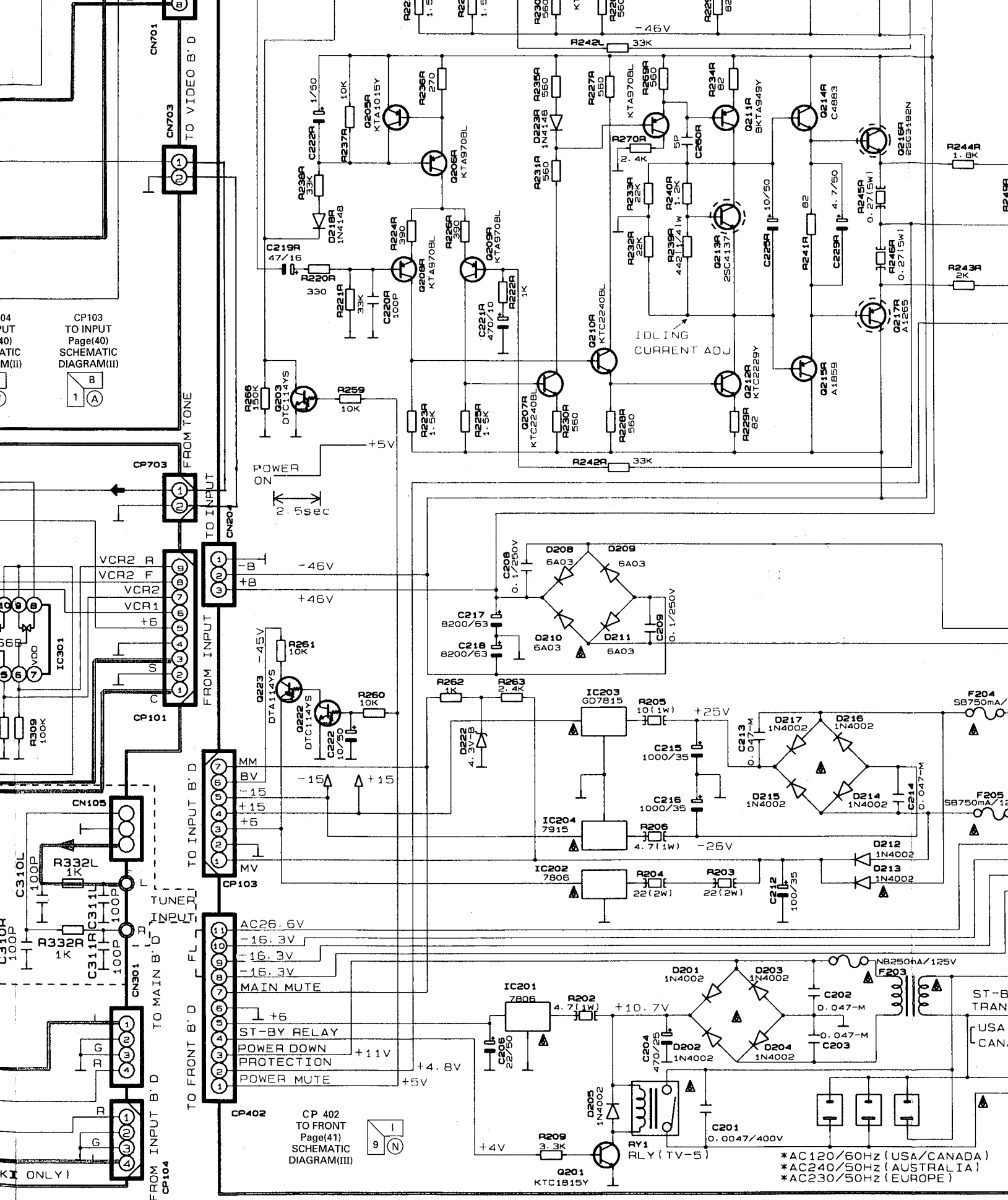


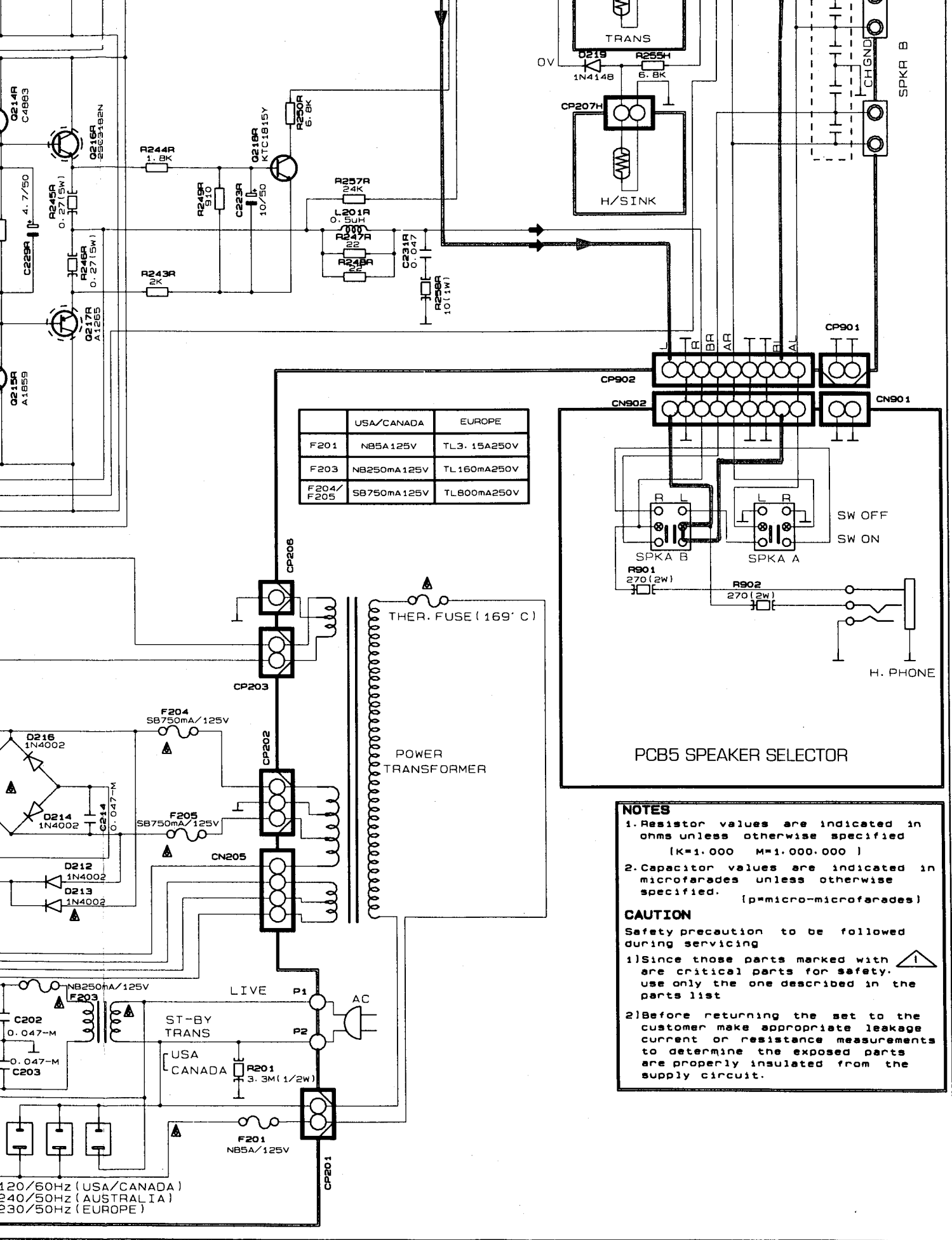


	USA/CANADA	EUROPE
F201	NB5A125V	TL3. 15A250V
F203	NB250mA125V	TL160mA250V
F204/ F205	SB750mA125V	TL800mA250V

SW OFF
SW ON







NOTES

1. Resistor values are indicated in ohms unless otherwise specified
(K=1.000 M=1.000.000)
2. Capacitor values are indicated in microfarads unless otherwise specified.
[p=micro-microfarads]

CAUTION

Safety precaution to be followed during servicing

- 1) Since those parts marked with  are critical parts for safety, use only the one described in the parts list
- 2) Before returning the set to the customer make appropriate leakage current or resistance measurements to determine the exposed parts are properly insulated from the supply circuit.

E F G H I J

AL

AL

PLAY SIGNAL

PE REC SIGNAL

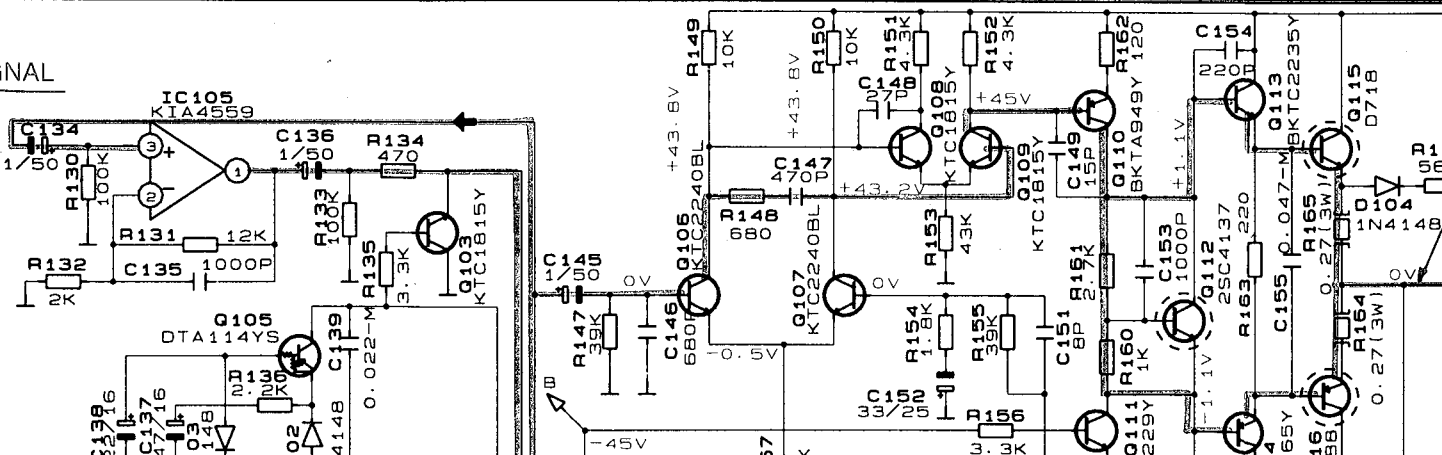
PCB7 INPUT

- | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|
| CP105
TO VIDEO
Page(39)
SCHEMATIC
DIAGRAM(I) | CP702
FROM TONE
Page(39)
SCHEMATIC
DIAGRAM(II) | CP106
TO SURROUND
Page(42)
SCHEMATIC
DIAGRAM(IV) | CP107
TO SURROUND
Page(42)
SCHEMATIC
DIAGRAM(IV) | CN401
FROM FRONT
Page(41)
SCHEMATIC
DIAGRAM(III) | CN101
TO VIDEO
Page(39)
SCHEMATIC
DIAGRAM(I) | CN102
TO VOLUME
Page(42)
SCHEMATIC
DIAGRAM(IV) | CP701
FROM TONE
Page(39)
SCHEMATIC
DIAGRAM(II) | CN104
TO VIDEO
Page(39)
SCHEMATIC
DIAGRAM(I) |
| | | | | | | | | |

FRONT Lch SIGNAL

SIGNAL(PLAY)

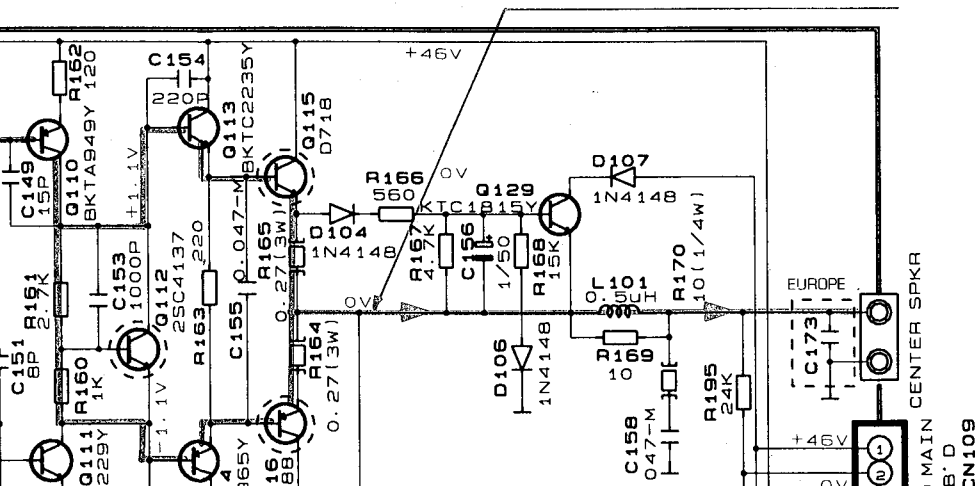
SIGNAL(REC)



I J K L M

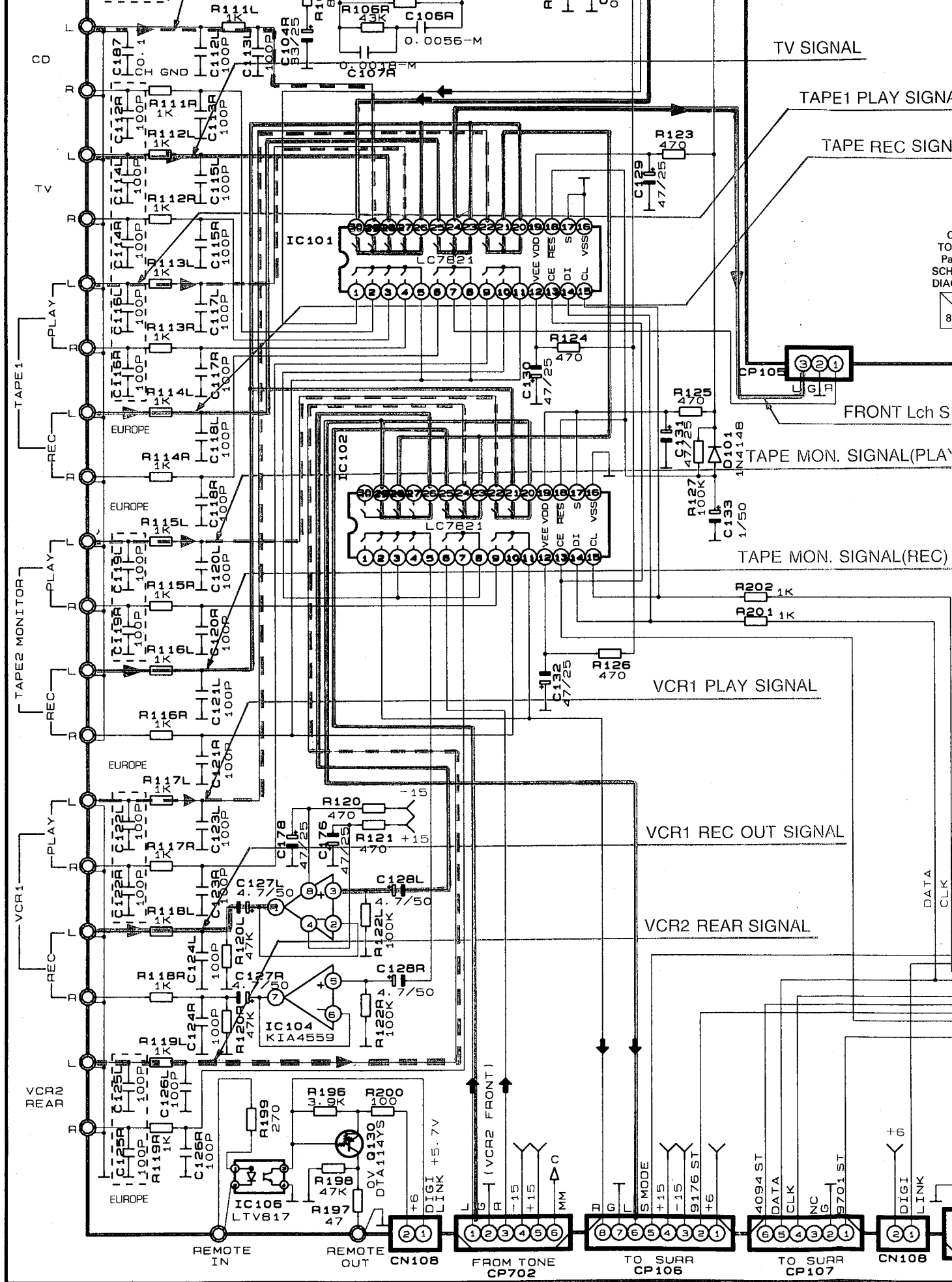
CN104
TO VIDEO
Page(39)
SCHEMATIC
DIAGRAM(I)

CENTER SIGNAL



CN109
TO MAIN
Page(39)
SCHEMATIC
DIAGRAM(I)

M

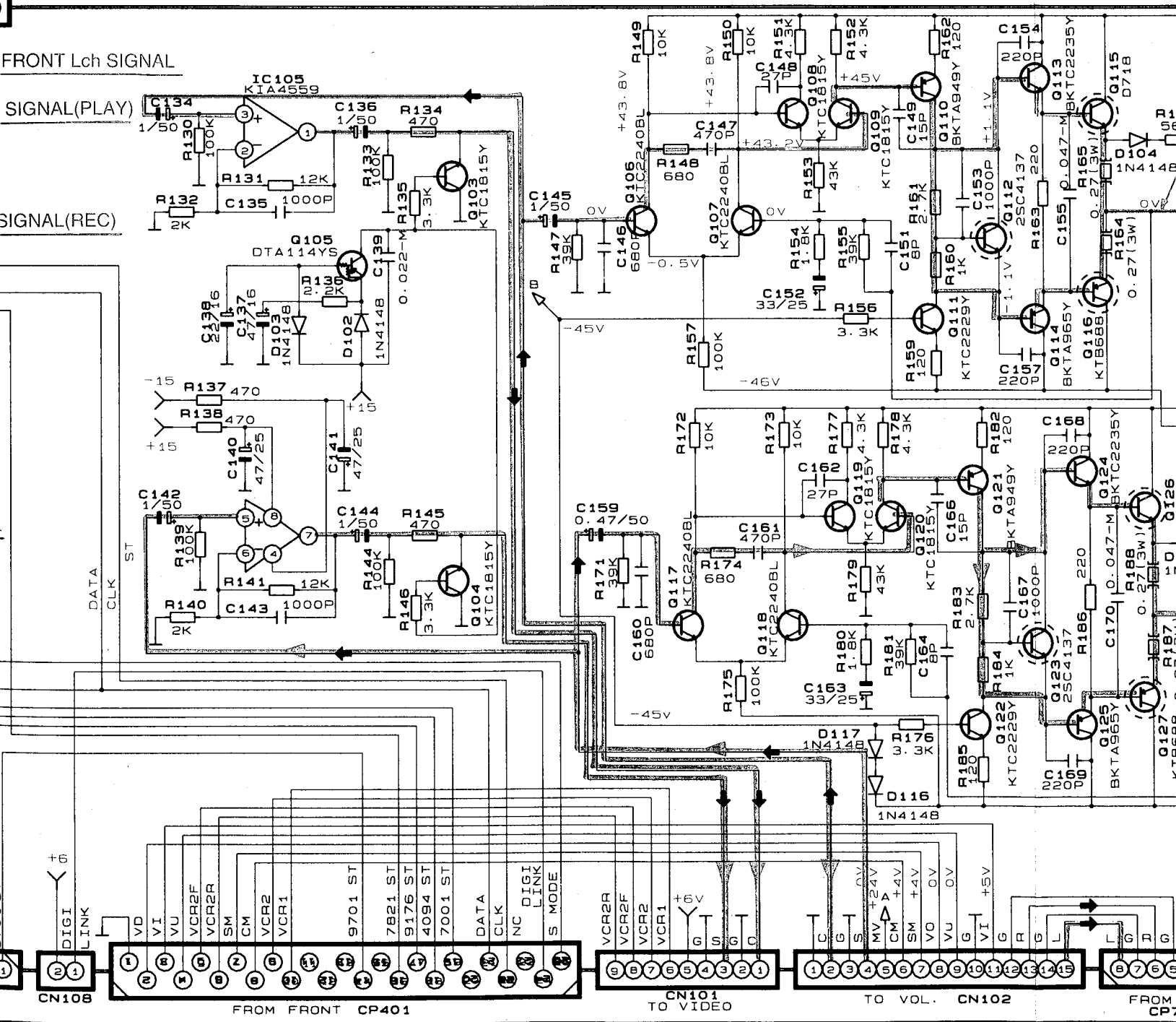


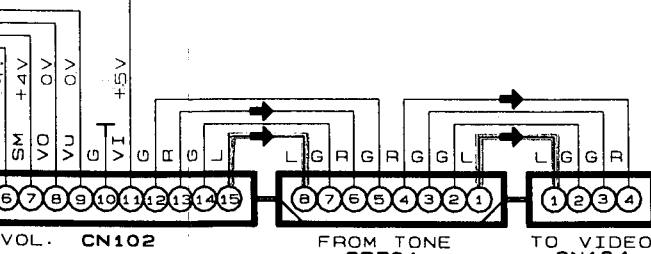
AL
1 PLAY SIGNAL
PE REC SIGNAL

PCB7 INPUT

- CP105 TO VIDEO Page(39) SCHEMATIC DIAGRAM(I)
- CP702 FROM TONE Page(39) SCHEMATIC DIAGRAM(I)
- CP106 TO SURROUND Page(42) SCHEMATIC DIAGRAM(IV)
- CP107 TO SURROUND Page(42) SCHEMATIC DIAGRAM(IV)
- CN401 FROM FRONT Page(41) SCHEMATIC DIAGRAM(III)
- CN101 TO VIDEO Page(39) SCHEMATIC DIAGRAM(I)
- CN102 TO VOLUME Page(42) SCHEMATIC DIAGRAM(IV)
- CP701 FROM TONE Page(39) SCHEMATIC DIAGRAM(I)
- CN104 TO VIDEO Page(39) SCHEMATIC DIAGRAM(I)

FRONT Lch SIGNAL
SIGNAL(PLAY)
SIGNAL(REC)





M
1
C

1. Resistor values are indicated in ohms unless otherwise specified
(K=1,000 M=1,000,000)
2. Capacitor values are indicated in microfarads unless otherwise specified.
(p=micro-microfarads)

Safety precaution to be followed during servicing

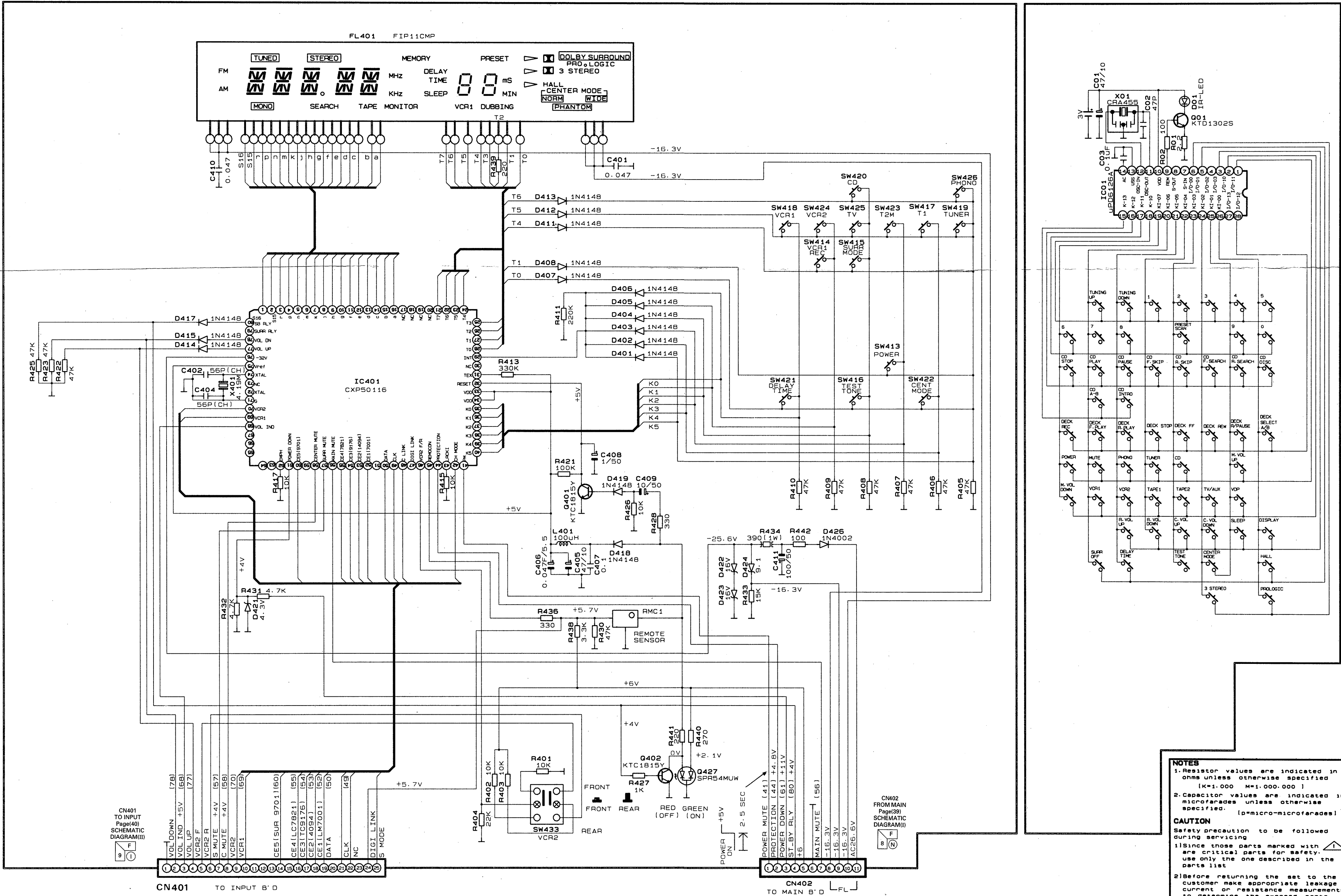
- 1) Since those parts marked with  are critical parts for safety, use only the one described in the parts list
- 2) Before returning the set to the customer make appropriate leakage current or resistance measurements to determine the exposed parts are properly insulated from the supply circuit.

SCHEMATIC DIAGRAM III

A B C D E F G H I J K L M

1
2
3
4
5
6
7
8
9

COMMANDER



NOTES
1. Resistor values are indicated in ohms unless otherwise specified (K=1,000 M=1,000,000)
2. Capacitor values are indicated in microfarads unless otherwise specified. (p=micro-microfarads)

CAUTION
Safety precaution to be followed during servicing:
1. Since those parts marked with a triangle are critical parts for safety, use only the one described in the parts list.
2. Before returning the set to the customer make appropriate leakage current or resistance measurements to determine the exposed parts are properly insulated from the supply circuit.

SCHEMATIC DIAGRAM III

A B C D E

1

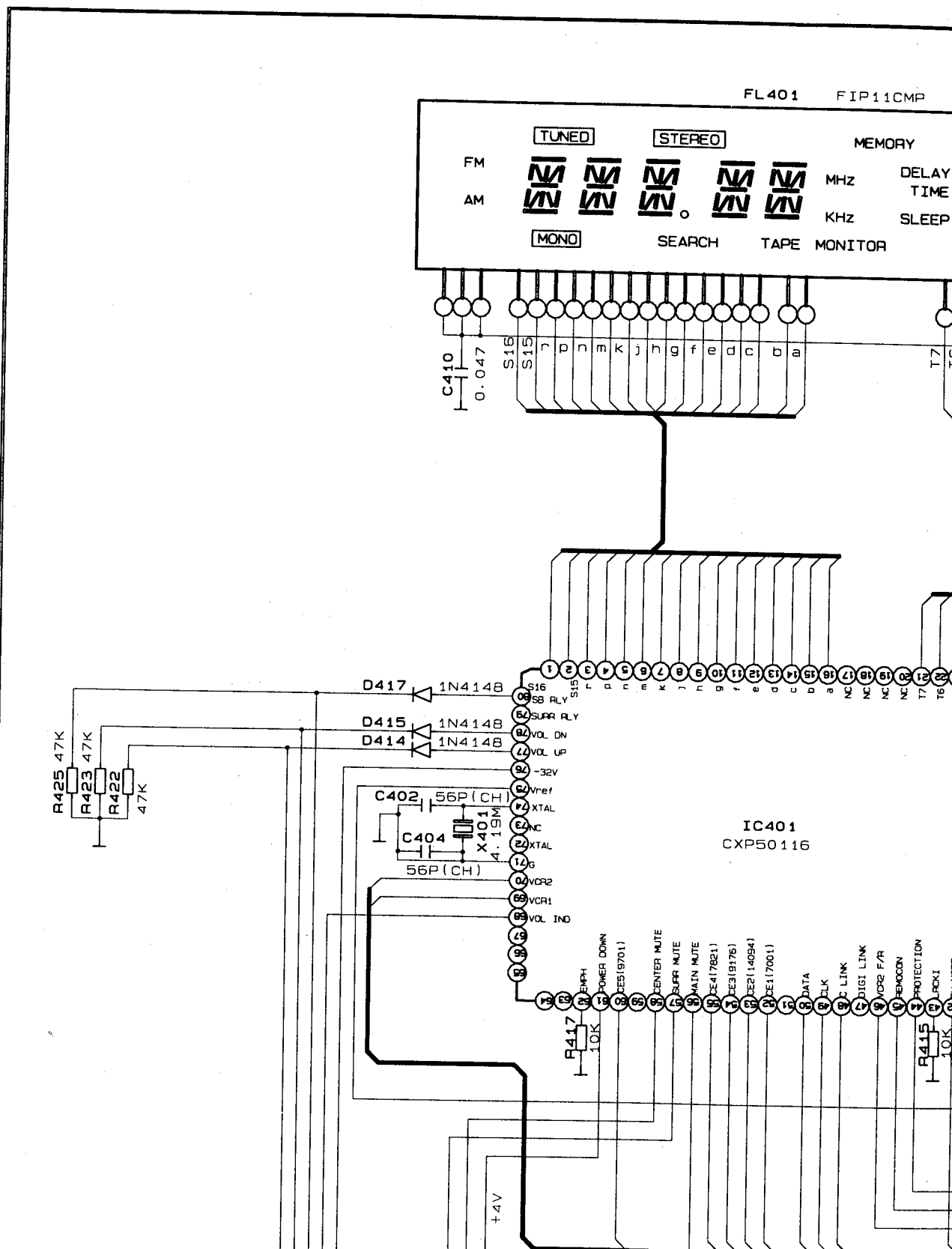
2

3

4

5

6



E

F

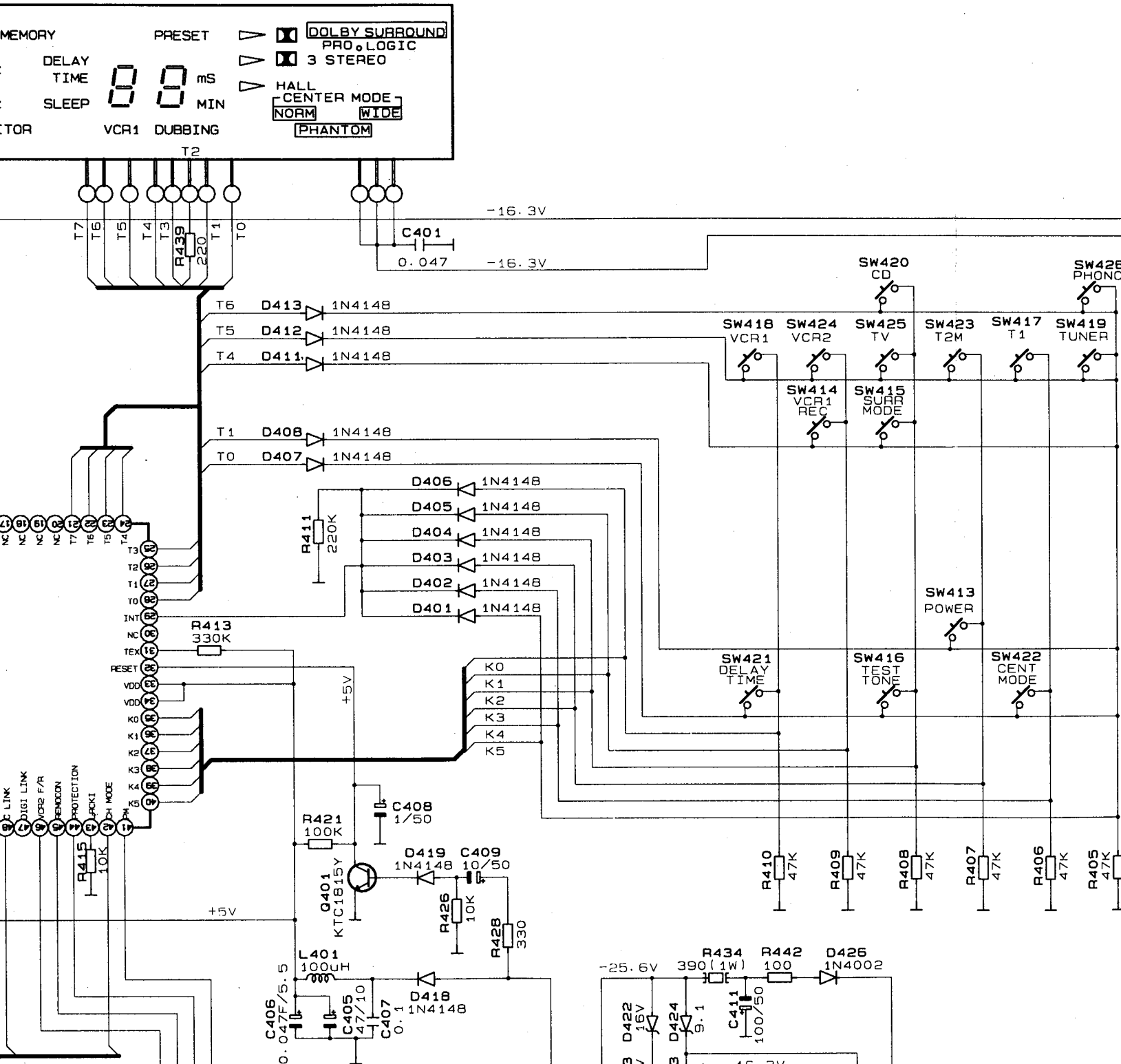
G

H

I

J

P11CMP



I

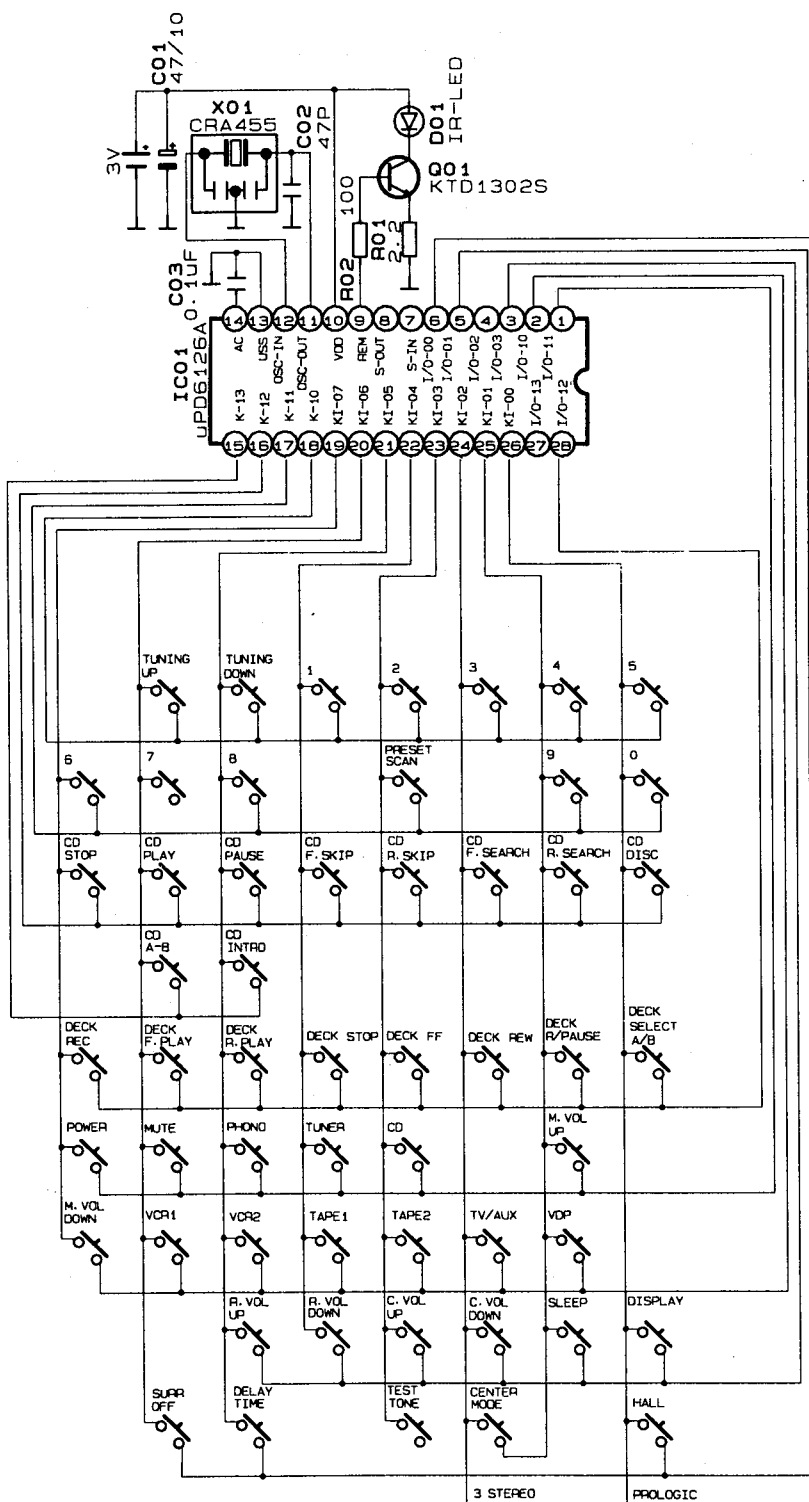
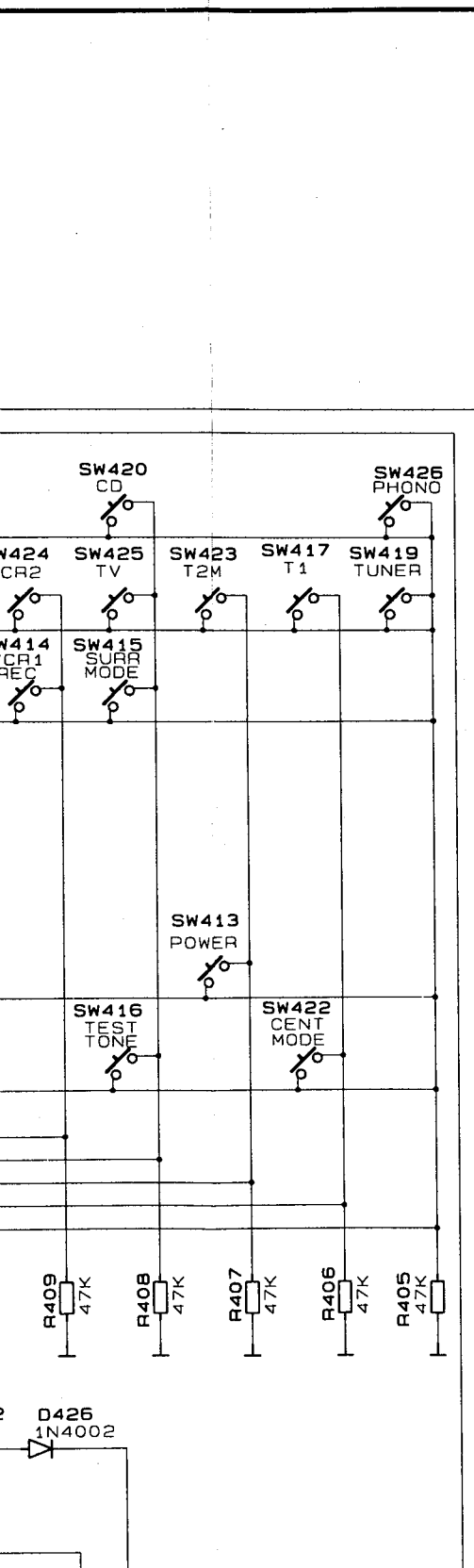
J

K

L

M

COMMANDER



3

4

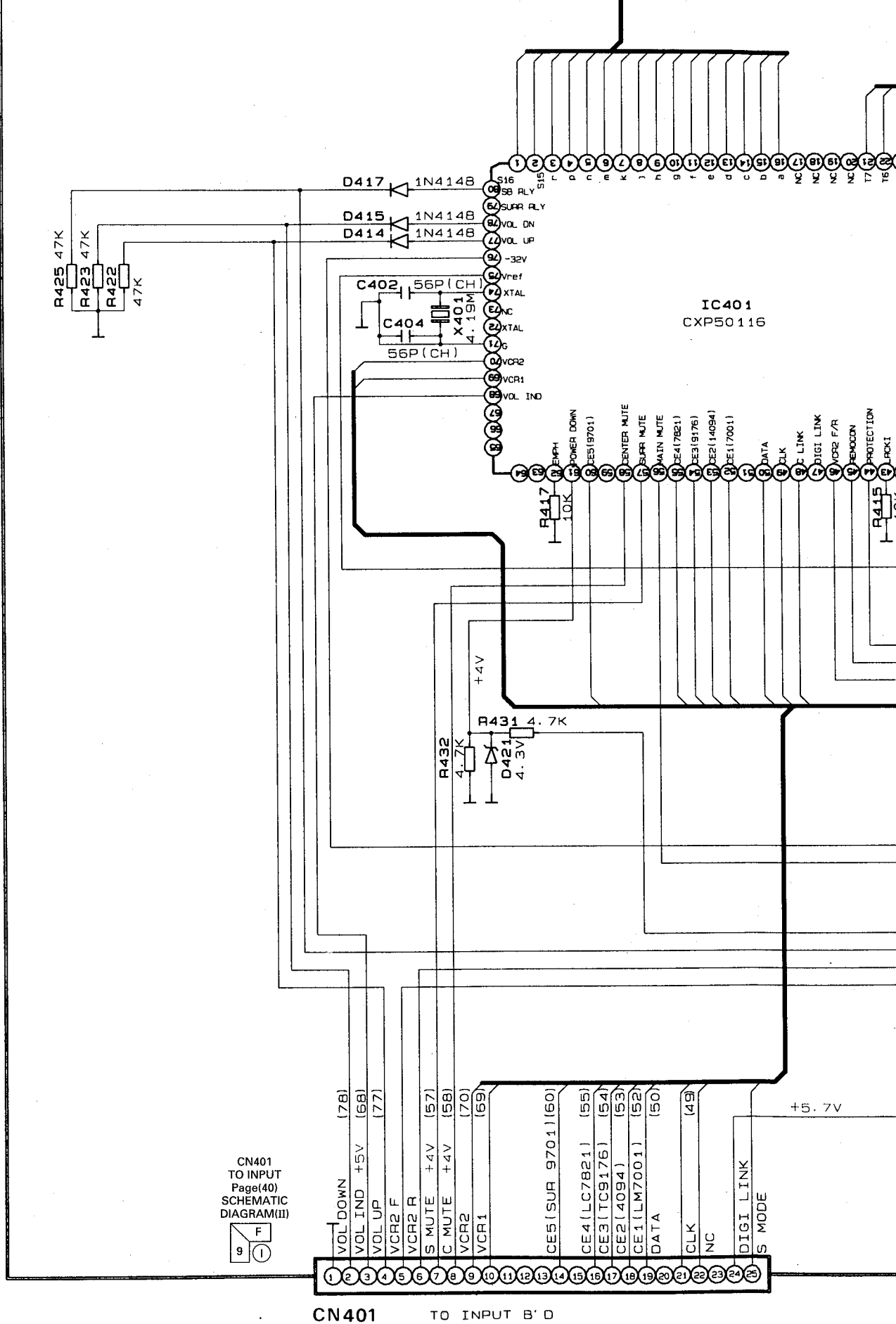
5

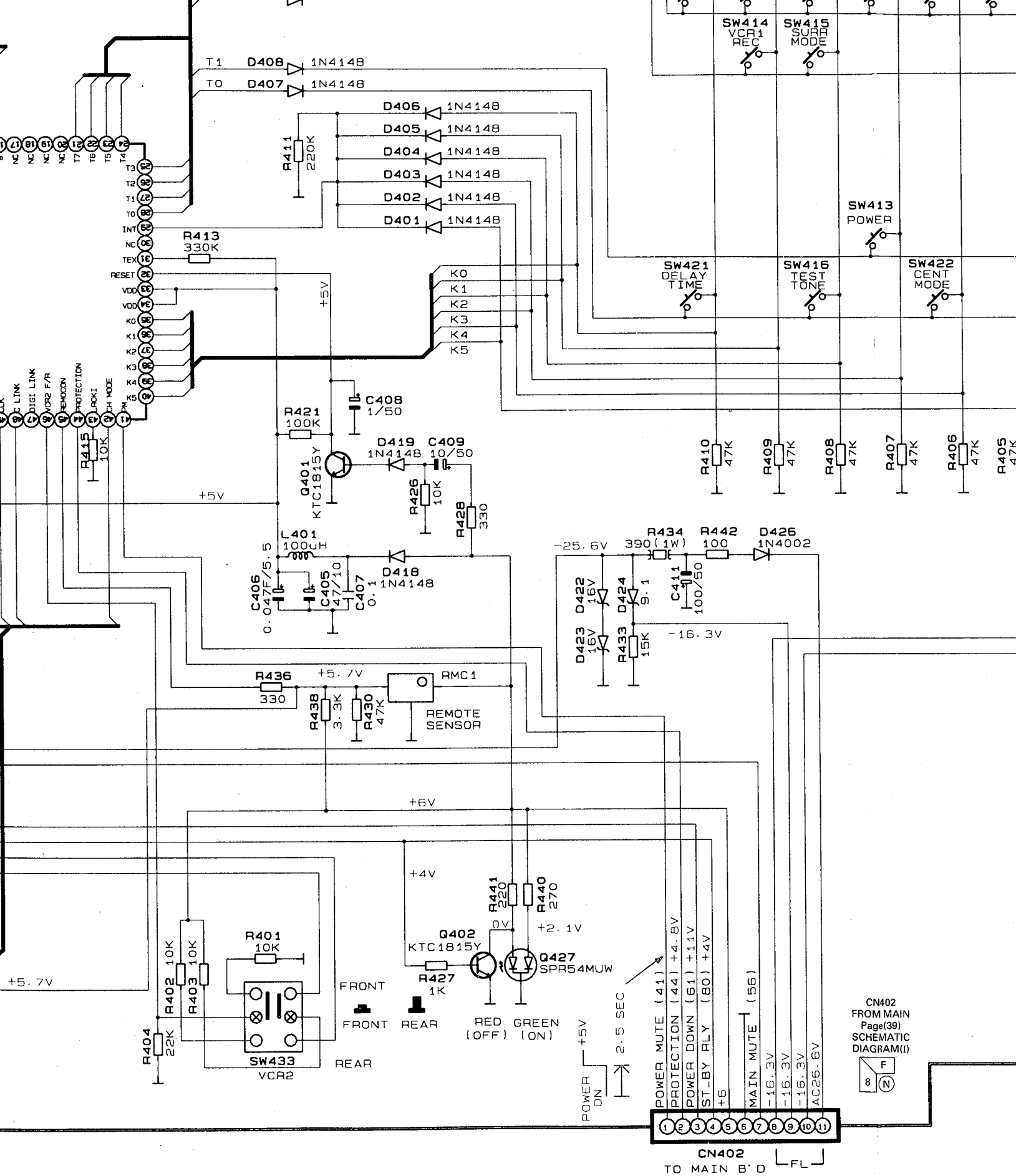
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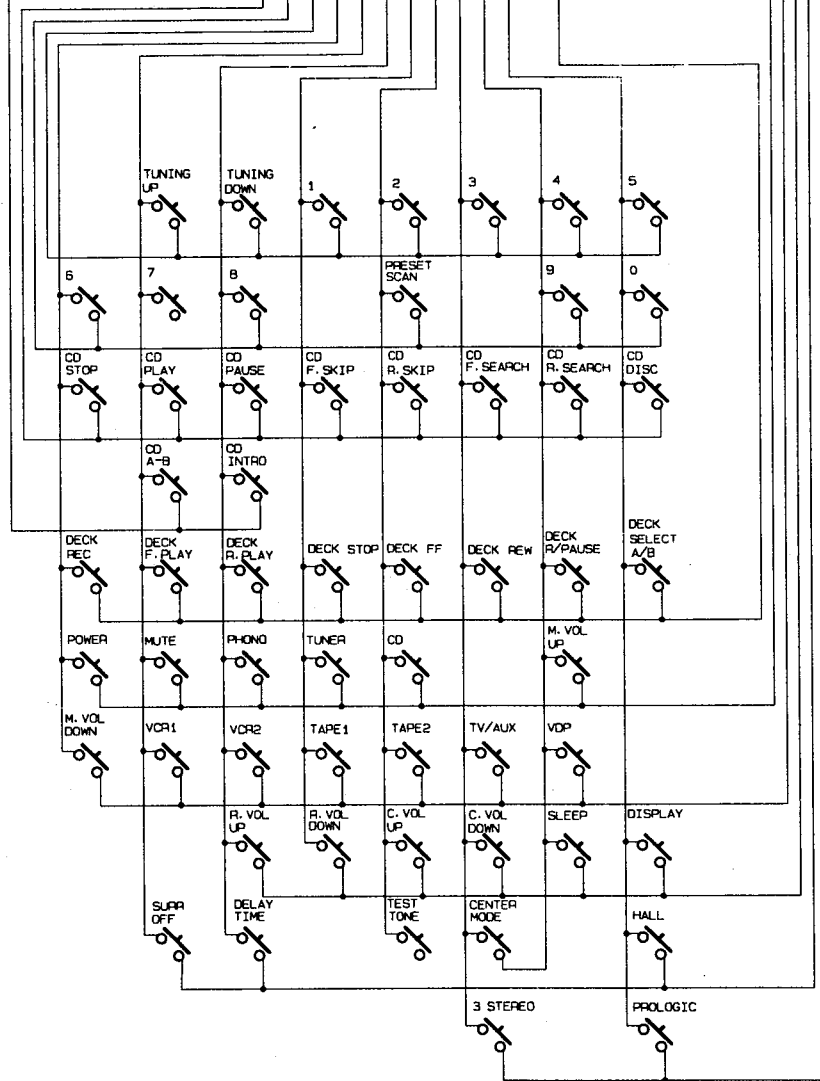
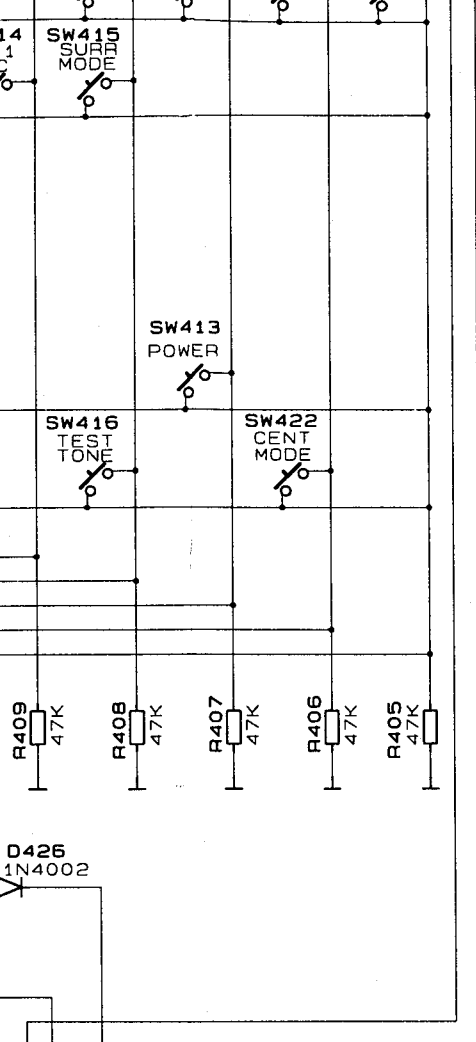
7

8

9







D426
1N4002

CN402
FROM MAIN
Page(39)
SCHEMATIC
DIAGRAM(1)



-16.3V
-16.3V
-16.3V
AC26.6V

7 8 9 10 11

D FL

NOTES

1. Resistor values are indicated in ohms unless otherwise specified
[K=1.000 M=1.000.000]
2. Capacitor values are indicated in microfarades unless otherwise specified. [p=micro-microfarades]

CAUTION

Safety precaution to be followed during servicing

- 1) Since those parts marked with  are critical parts for safety, use only the one described in the parts list
- 2) Before returning the set to the customer make appropriate leakage current or resistance measurements to determine the exposed parts are properly insulated from the supply circuit.

SCHEMATIC DIAGRAM IV

A

B

C

D

E

1

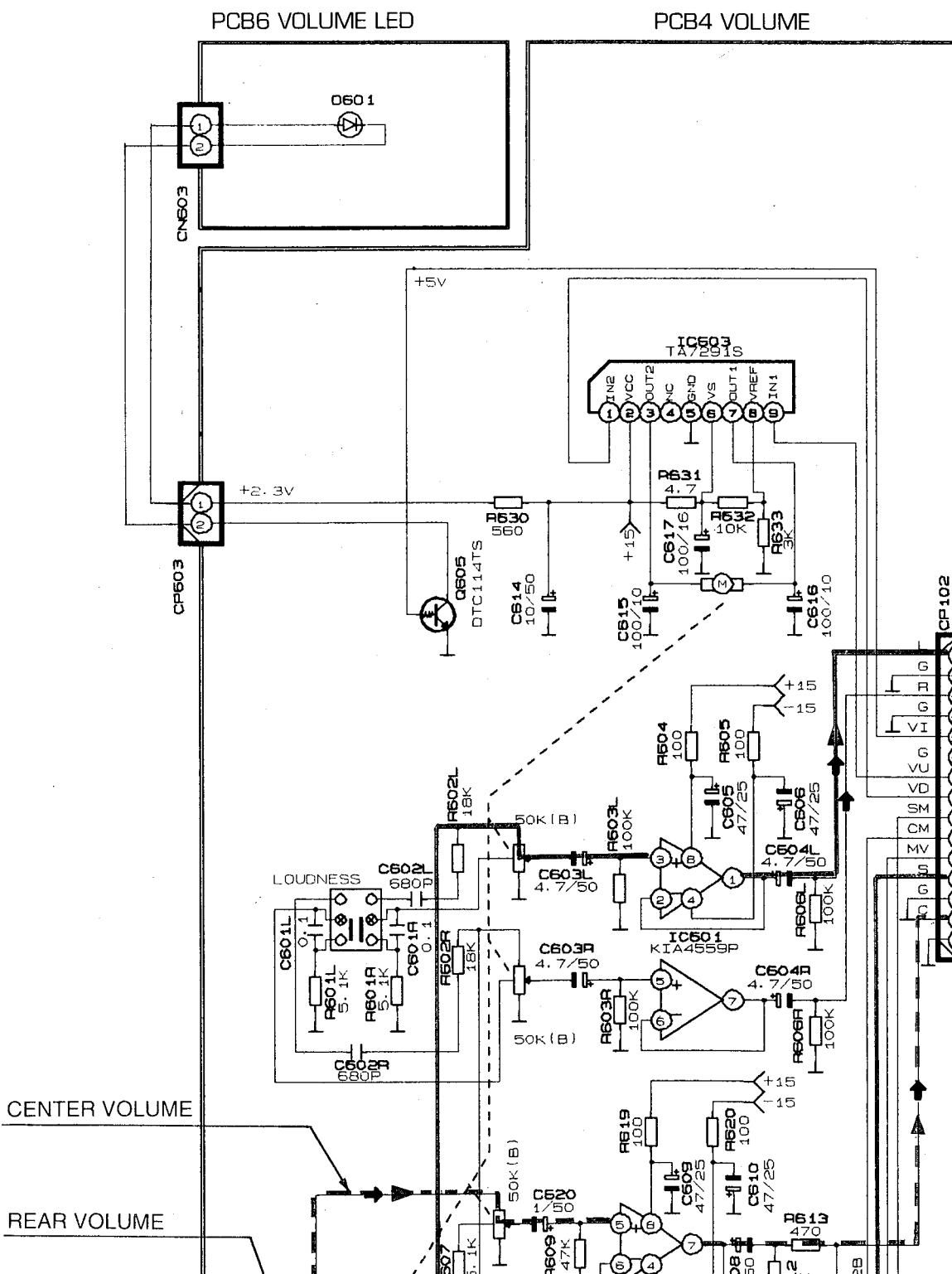
2

3

4

5

6



CP102
FROM INPUT
Page(40)
SCHEMATIC
DIAGRAM(III)

9 (G)

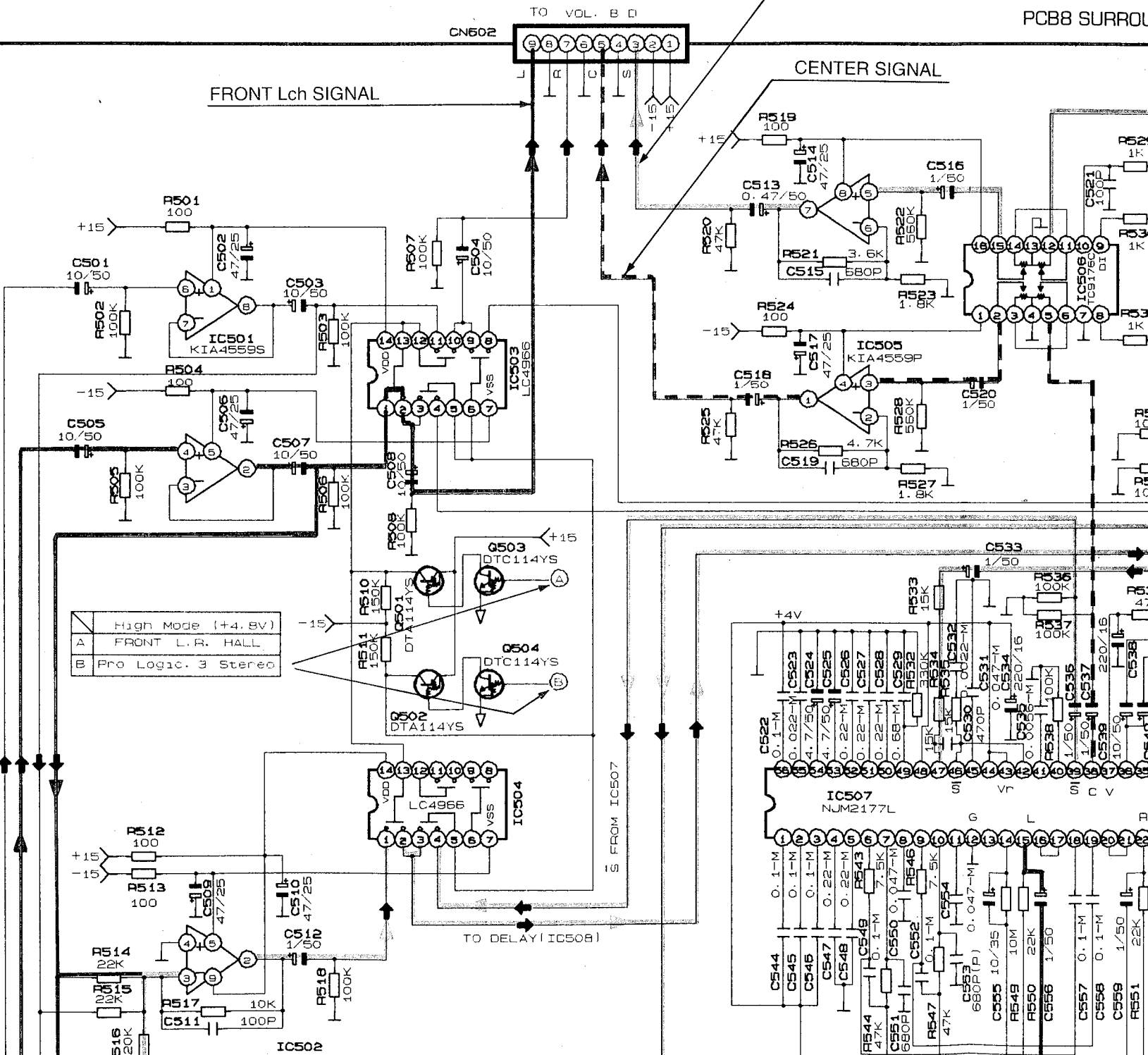
FROM INPUT B'D

J

PCB8 SURROU

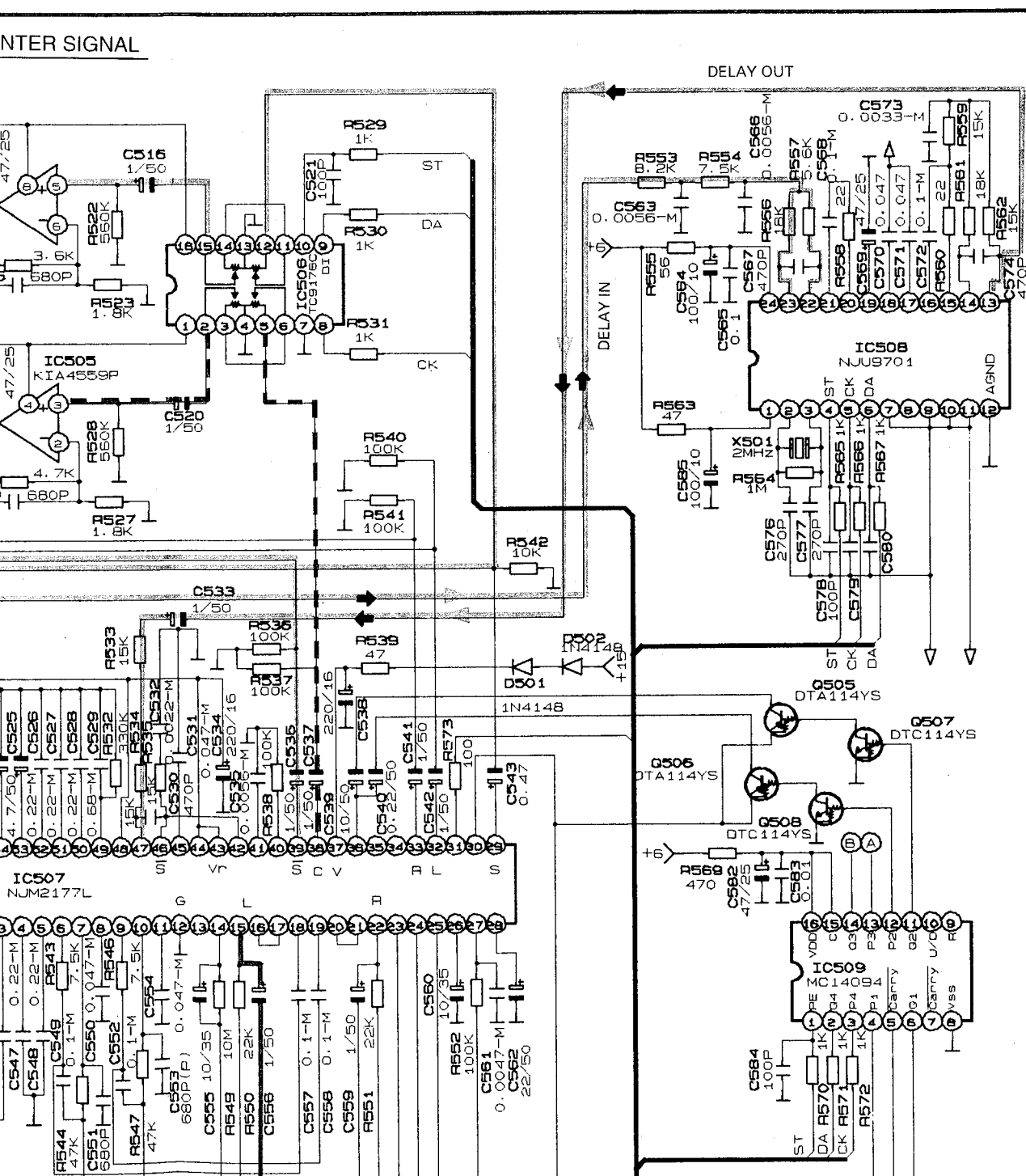
TO VOL. B D

CN602

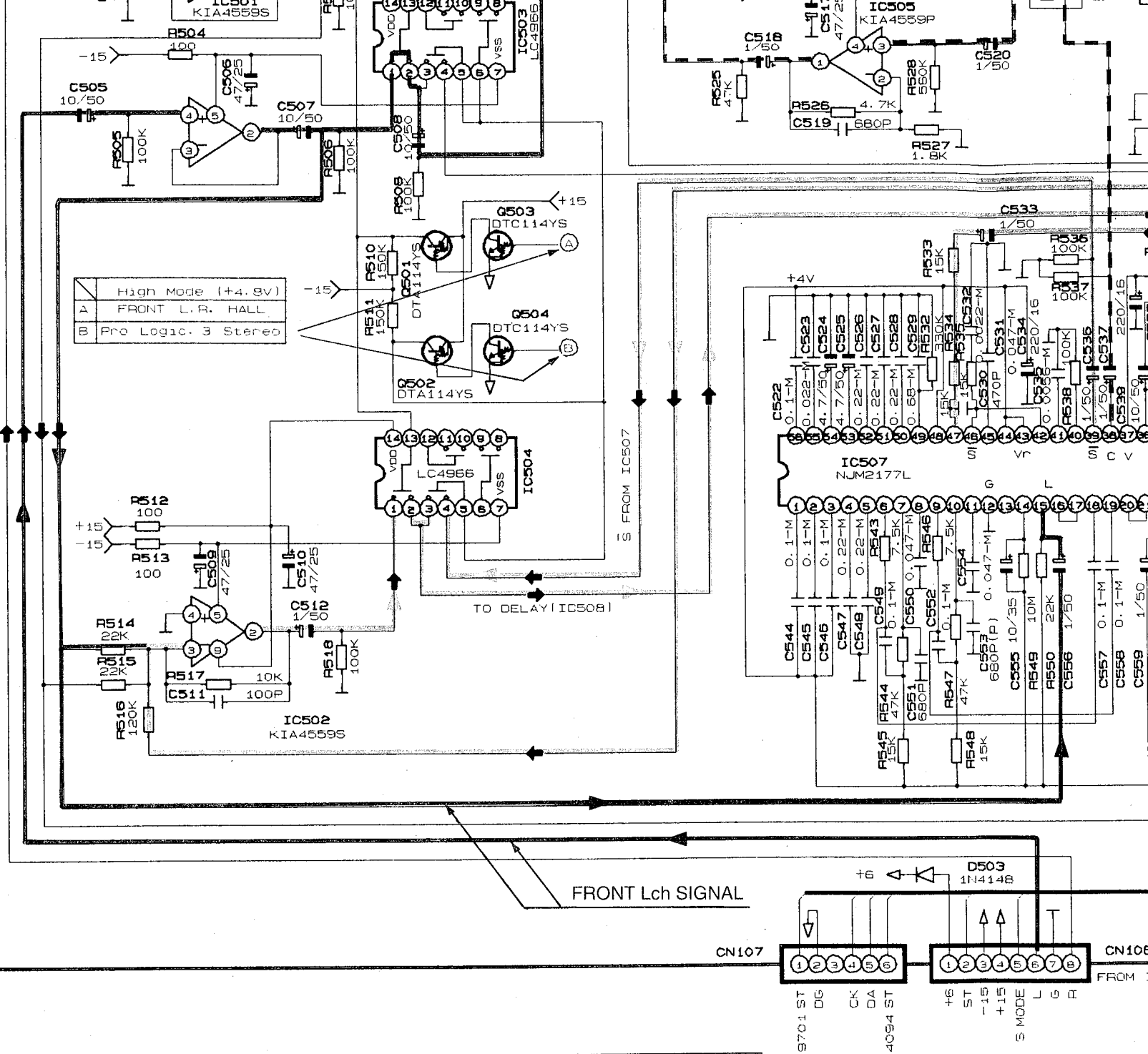


PCB8 SURROUND

ENTER SIGNAL







NOTES

1. Resistor values are indicated in ohms unless otherwise specified.
[K=1,000 M=1,000,000]
2. Capacitor values are indicated in microfarads unless otherwise specified. (p=micro-microfarads)

CAUTION

Safety precaution to be followed during servicing

- 1) Since those parts marked with  are critical parts for safety, use only the one described in the parts list
- 2) Before returning the set to the customer make appropriate leakage current or resistance measurements to determine the exposed parts are properly insulated from the supply circuit.

CN107
FROM INPUT
Page(40)
SCHEMATIC
DIAGRAM(III)



CN106
FROM INPUT
Page(40)
SCHEMATIC
DIAGRAM(III)



