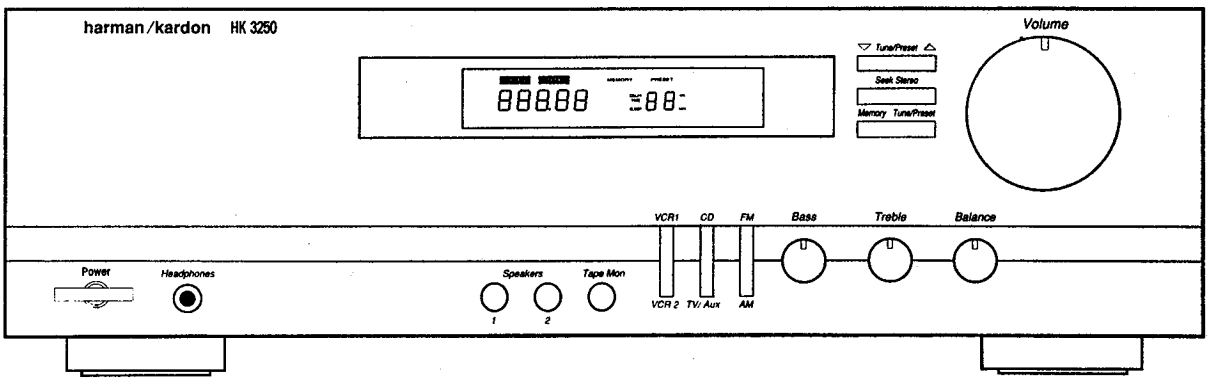
The Harman Kardon
Model HK3250

Manual A

AUDIO AND VIDEO RECEIVER

Technical Manual



■ CONTENTS ■

harman/kardon

Parts and Service Office
80 Crossways Park West, Woodbury, N.Y. 11797
1112-HK3250A G9603 1200 Printed in Korea

SPECIFICATIONS

● FRONT AMP SECTION

	Nominal	Limit
RMS Output Power		
THD 3 %, 4 ohms	≧ 67 W	≧ 65 W
Both Channel Driven (40 Hz-10 kHz)		
THD at 67 W, 4 ohms		
40 Hz	≦ 0.2 %	≦ 0.3 %
1 kHz	≦ 0.2 %	≦ 0.3 %
10 kHz	≦ 0.2 %	≦ 0.3 %
IM Distortion at 67 W, 4 ohms, 60:7000 Hz = 4:1		
	≦ 0.1 %	≦ 0.3 %
Input Sensitivity at 67 W, 4 ohms		
CD, AUX, VCR	170 mV	170±30 mV
S/N Ratio Input Shorted at Volume Max.		
(WTD IHF-A) at 67 W, 4 ohms		
CD, AUX	≧ 95 dB	≧ 90 dB
TV, VCR1, 2	≧ 85 dB	≧ 80 dB
Tone Control		
Bass, 50 Hz	±10 dB	±10±2 dB
Treble, 10 kHz	±10 dB	±10±2 dB
Frequency Response at 1 W, 4 ohms		
CD/AUX		
20 Hz, 20 kHz	±1.0 dB	±1.5 dB
Channel Crosstalk Input Shorted at 67 W, 4 ohms		
1 kHz	≧ 60 dB	≧ 50 dB
10 kHz	≧ 47 dB	≧ 45 dB

● FM SECTION

	Nominal	Limit
Tuning Cover Range 50 kHz Step		
Low	87.5 MHz	
High	108.0 MHz	
Usable Sensitivity 75 ohms Input		
S/N 30 dB UL/CSA	≦ 14.2 dBf	≦ 17.2 dBf
S/N 26 dB Europe		
Image Rejection at 106 MHz		
UL/CSA	≧40 dB	≧ 35 dB
Europe	≧80 dB	≧ 70 dB
IF Rejection, at 90 MHz	≧80 dB	≧ 70 dB
Full Limiting at -3 dB	≦ 12.2 dBf	≦ 15.2 dBf
50 dB Quieting Sensitivity at 98 MHz, 75 k DEV		
IHF Band Pass Filter		
Mono	≦ 20.2 dBf	≦ 23.3 dBf
Stereo	≦ 40.3 dBf	≦ 43.3 dBf
Distortion, 1 kHz 100 % MOD at 98 MHz		
IHF Band Pass Filter		
Mono	≦ 0.3 %	≦ 0.5 %
Stereo	≦ 0.5 %	≦ 0.7 %
S/N Ratio, 1 mV 75K,DEV Input,100 % MOD, at 98 MHz		
IHF Band Pass Filter		
Mono	≧ 70 dB	≧ 65 dB
Stereo	≧ 65 dB	≧ 60 dB
Frequency Response, 20 Hz-15 kHz		
	± 1.5 dB	± 3 dB
AM-Rejection Ratio		
(100 µV-20 mV Input)	≧ 60 dB	≧ 50 dB
Search Level (at 98 MHz)	31.2 dBf	31.2± 5 dBf
Automatic Stereo Threshold at 98 MHz		
	31.2 dBf	31.2± 5 dBf
Muting Threshold. at 98 MHz	31.2 dBf	31.2± 5 dBf
Overload. at 98 MHz		
100 % MOD 100 mV RF Input	≦ 0.3 %	≦ 0.5 %
Suprious Response.		
at 98 MHz Antenna Input 3 µV	≧ 70 dB	≧ 60 dB
Capture Ratio 40/60 dBf	≦ 2 dB	≦ 2.5 dB
Alternative Channel Selectivity.	≧ 65 dB	≧ 55 dB
Input at 98 MHz		
Stereo Separation,100% MOD, 1 mV Input at 98 MHz		
IHF Band Pass Filter		
100 Hz	≧ 40 dB	≧ 35 dB
1 kHz	≧ 45 dB	≧ 40 dB
10 kHz	≧ 35 dB	≧ 30 dB
Output Voltage at 75 kHz DEV, 1 kHz MOD, 1 mV Input		
Mono	600 mV	600± 150 mV
Stereo	550 mV	550± 150 mV

● AM SECTION

	Nominal	Limit
Tuning Cover Range. 10 kHz/9 kHz Step		
Low	520/522 kHz	
High	1710/1611 kHz	
Usable Sensitivity.		
400Hz, 30% MOD, S/N 20 dB	≦ 500 µV/m	≦ 1000 µV/m
Image Rejection at 1400 kHz	≧ 35 dB	≧ 30 dB
IF Rejection at 600 kHz	≧ 50 dB	≧ 45 dB
AGC Figure of Merit.	≧ 50 dB	≧ 45 dB
From 100 mV/m at 1000 kHz		
Distortion.	≦ 0.8 %	≦ 1.5 %
400 Hz, 30% MOD, 5 mV/m Input		
IF Bandwidth	6 kHz	4-11 kHz
6 dB Down, 350 µV/m		
Audio Response, 5 mV/m Input 1 kHz 0 dB, 1000 kHz		
at -6 dB	80 -2.2 kHz	100 2 kHz
Selecticity at 350 µV/m		
±10 kHz	≧ 25 dB	≧ 20 dB

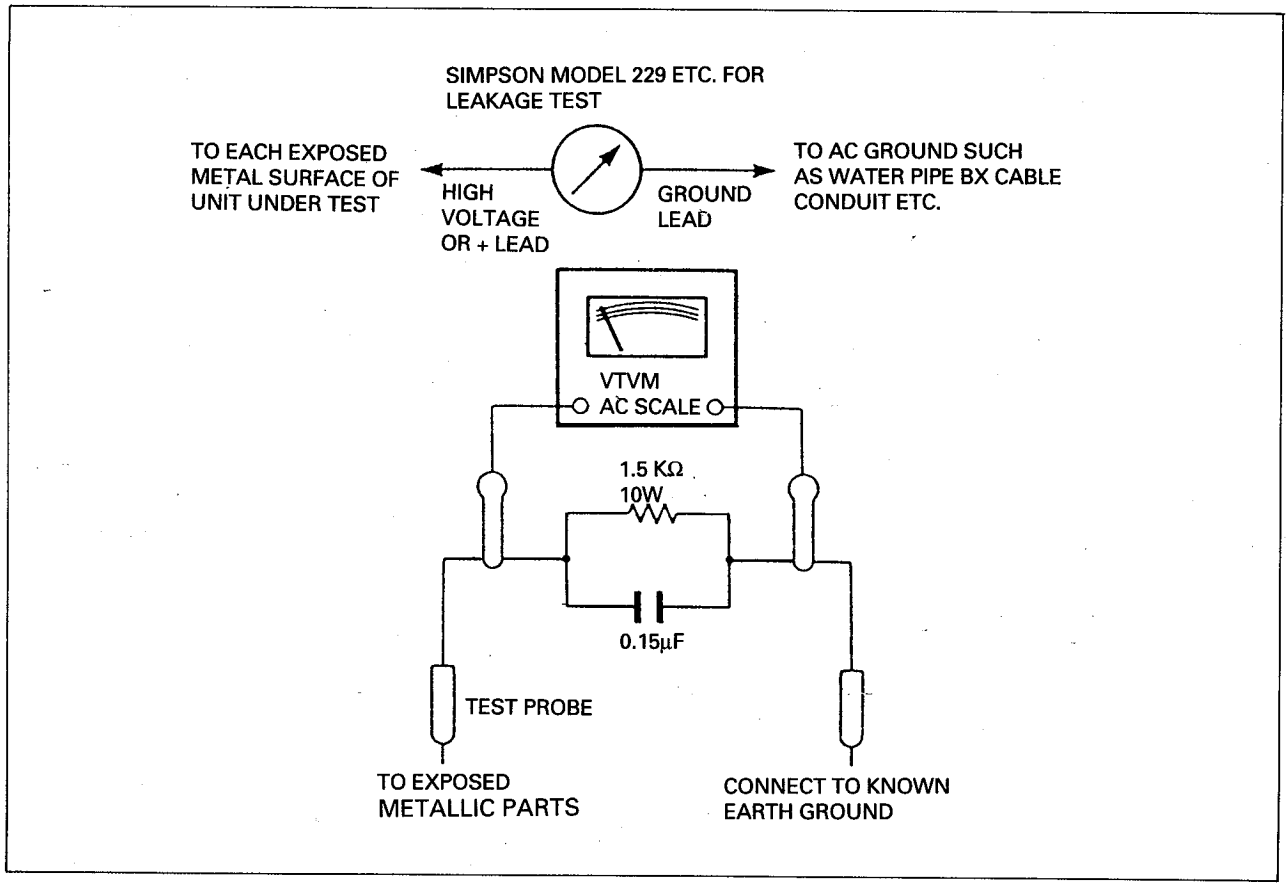
S/N Ratio, 1000 kHz, With Antenna Input 5 mV/m		
	≧ 43 dB	≧ 40 dB
RF Overload. 400 Hz 80 % MOD, 100 mV/m Input		
	≦ 5 %	≦ 10 %
Search Level. (at 1000 kHz)	800 µV	800±6 dBµV
Output Voltage, 400 Hz 30 % MOD 5 mV/m Input		
	200 mV	200±40 mV
Whistle	≦ 10 %	≦ 15 %

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.

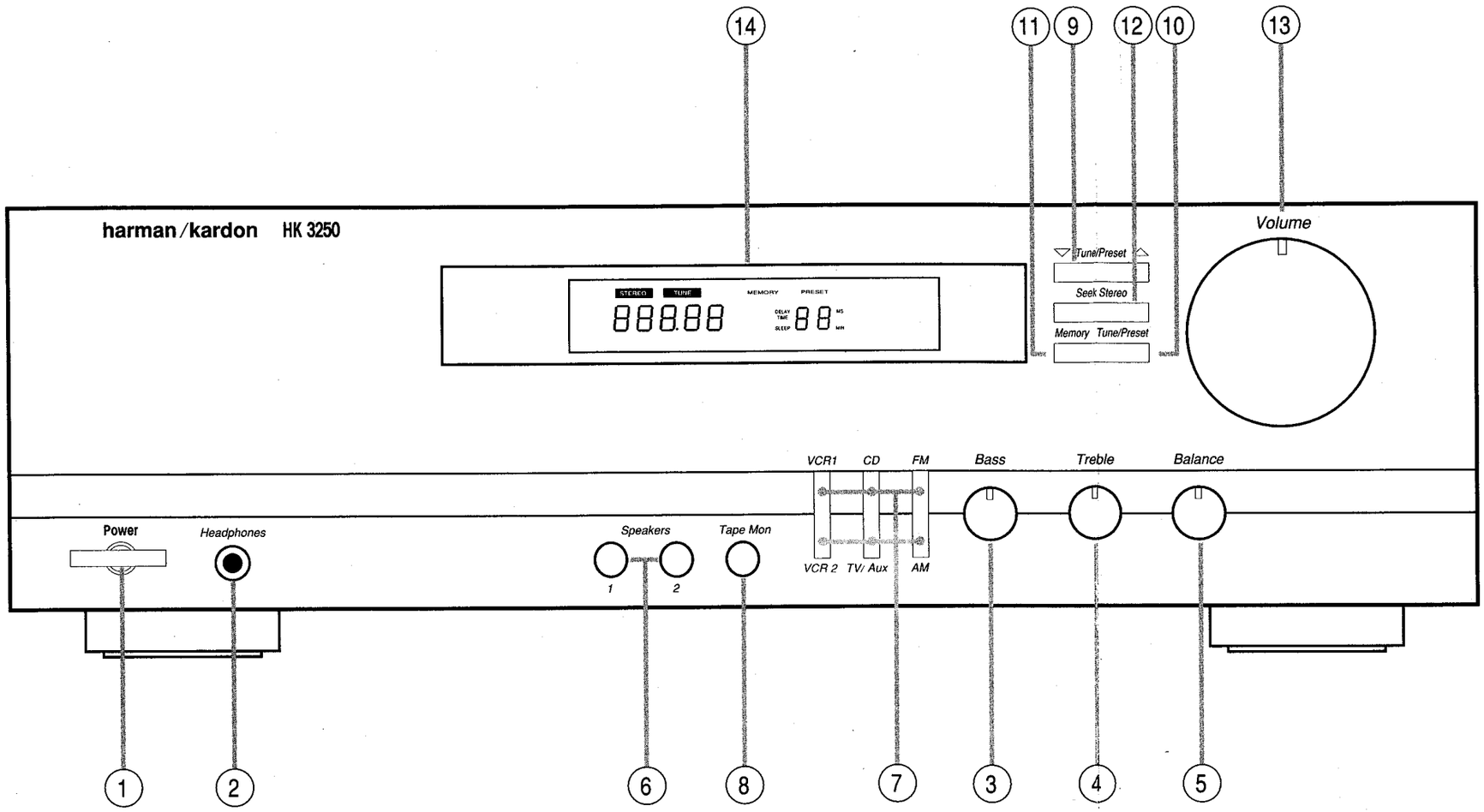
LEAKAGE TEST

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

1. Inspect all lead dress to makes 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 0.15µF 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.



CONTROLS AND FUNCTIONS



1. POWER BUTTON
Press this button to turn the power on. Press again to turn the power off. If you connect the other components to the switched outlet, it can also be used as a system power button.

2. 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.

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

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

5. BALANCE CONTROL
This control is used for balancing the relative sound volume of the left and right channel speakers. Clockwise rotation reduces the volume from the left speaker, counterclockwise rotation reduces the volume from the right speaker.

6. 1/2 SPEAKER SWITCHES
This 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

7. INPUT FUNCTION SELECTOR BUTTONS
Press these buttons to select the desired input source.

8. TAPE MONITOR BUTTON
Press this button to select input from a tape deck.

9. TUNE/PRESET BUTTON
When AUTO is not lit, the TUNE/PRESET buttons will allow you to tune to a station manually.

10. TUNE/PRESET SCAN BUTTONS
Press the TUNE/PRESET button to light up PRESET then use the up/down buttons momentarily to scan the preset station frequencies. The receiver stops at each preset location from 1-30 that has been entered in memory. Hold the button down to skip through the presets quickly. In the TUNE mode press these buttons to change selected frequencies.

11. STATION MEMORY BUTTON
Use this button to store an AM or FM frequency. Press this button and select one of 30 preset locations to store the frequency with the TUNE/PRESET buttons while the MEM indicator blinks, press MEMORY again to store preset station.

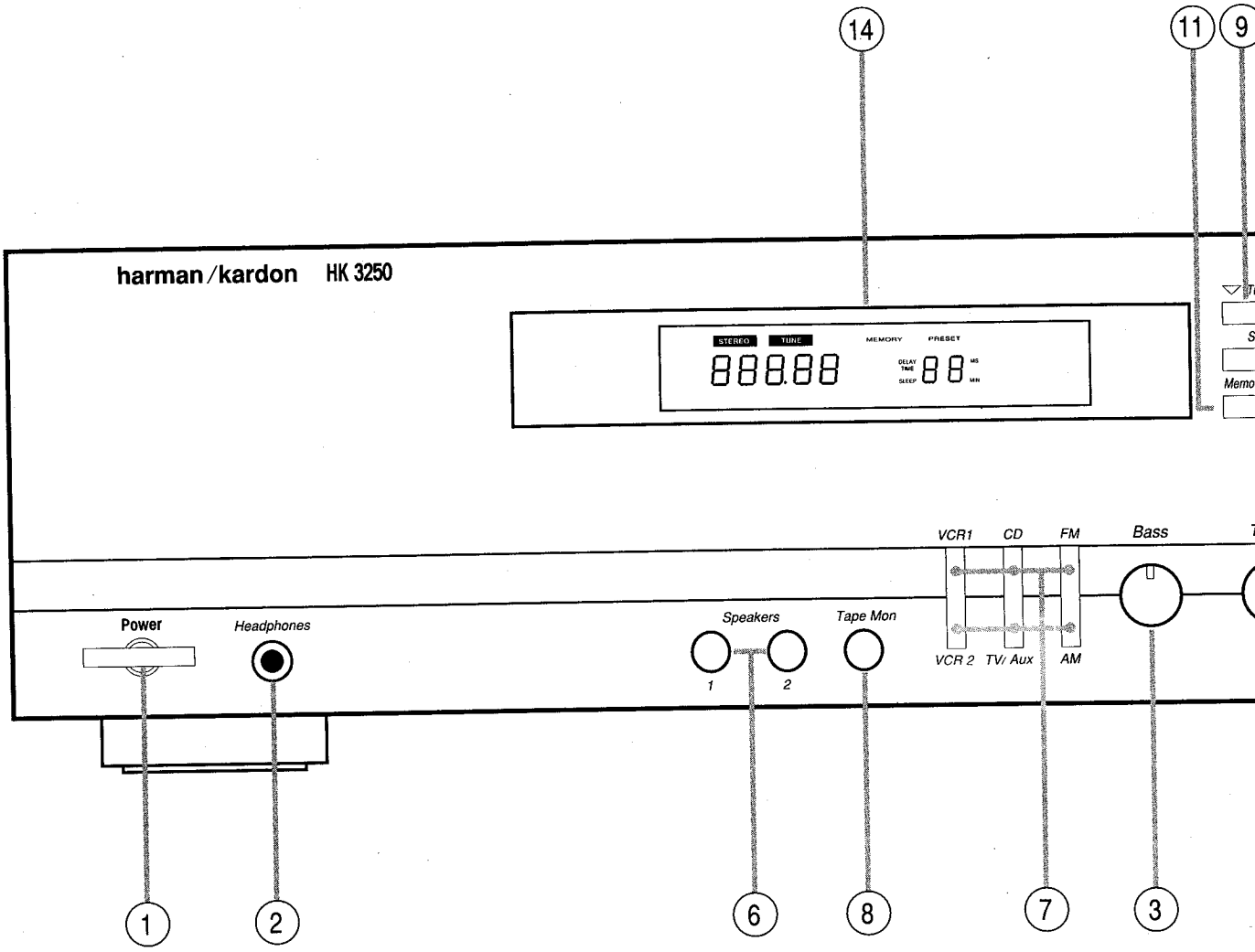
NOTE : When you store a frequency in a memory location that already contains a frequency, you replace the previous frequency. If your receiver is disconnected from AC power for more than about 2 weeks, it loses all stored frequencies.

12. SEEK STEREO BUTTON
Press this button, "Auto" will illuminate in the display. Then press the TUNE/PRESET button. The tuner will automatically seek out stations in your area that have enough signal strength to be listenable. The tuner will stop on stations until the SEEK/STEREO button is pressed again.

13. VOLUME CONTROL
Turn the VOLUME clockwise to increase the volume and counterclockwise to decrease it.

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

CONTROLS AND FUNCTIONS



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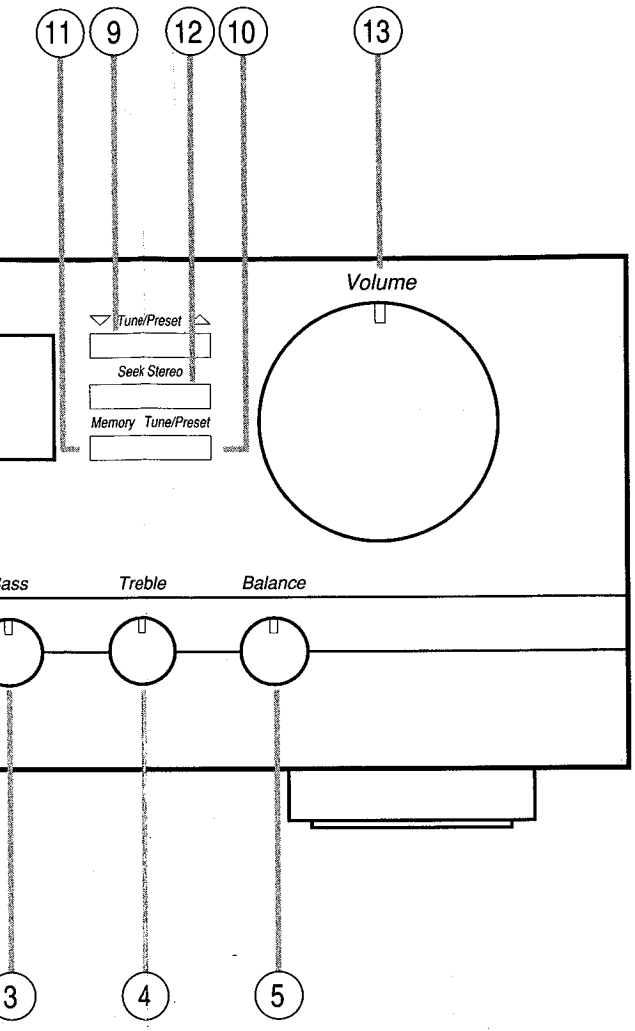

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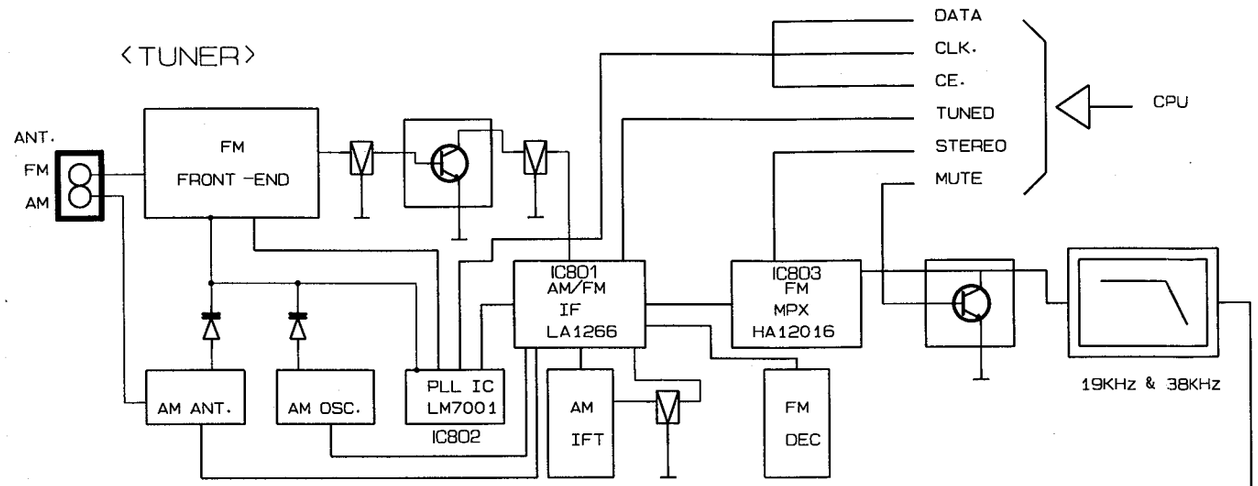
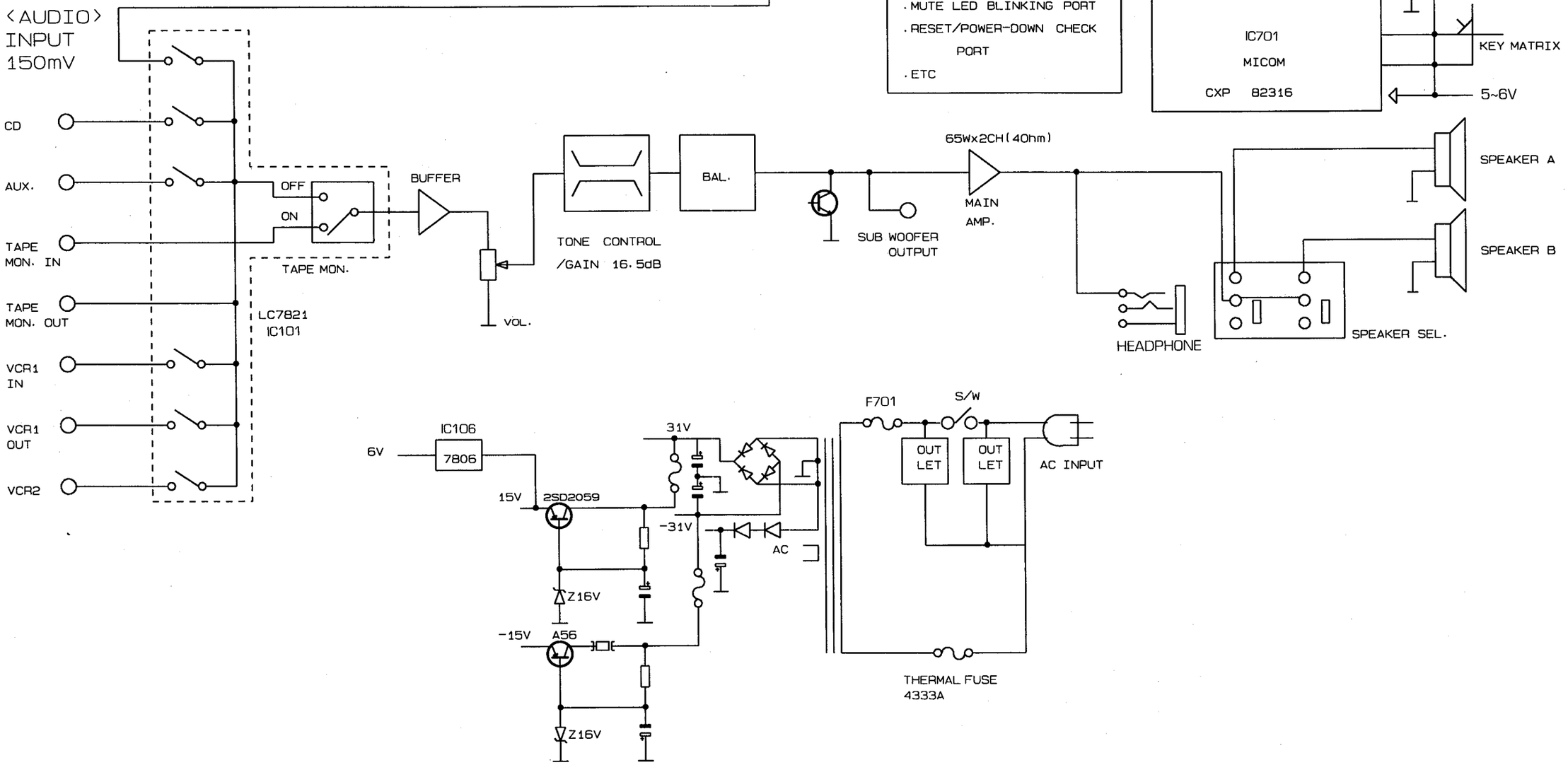
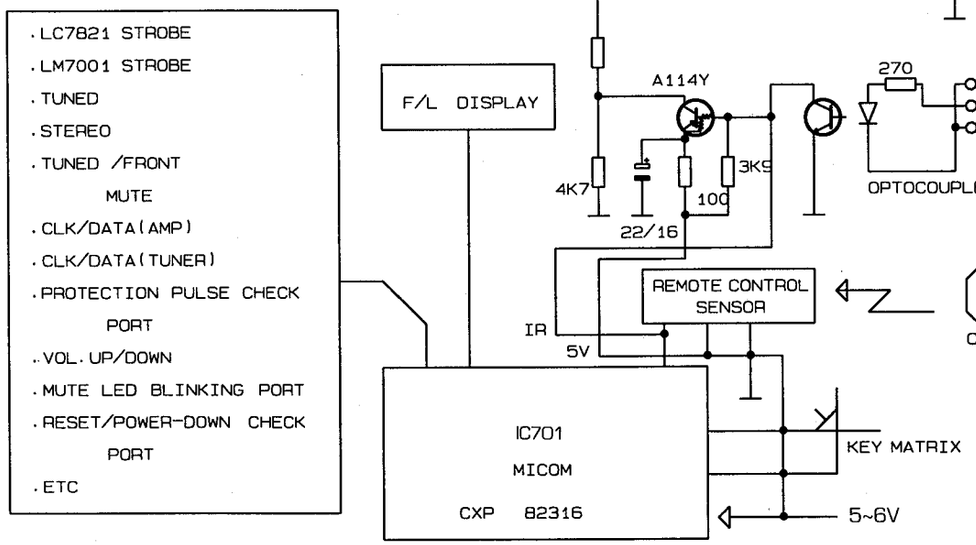
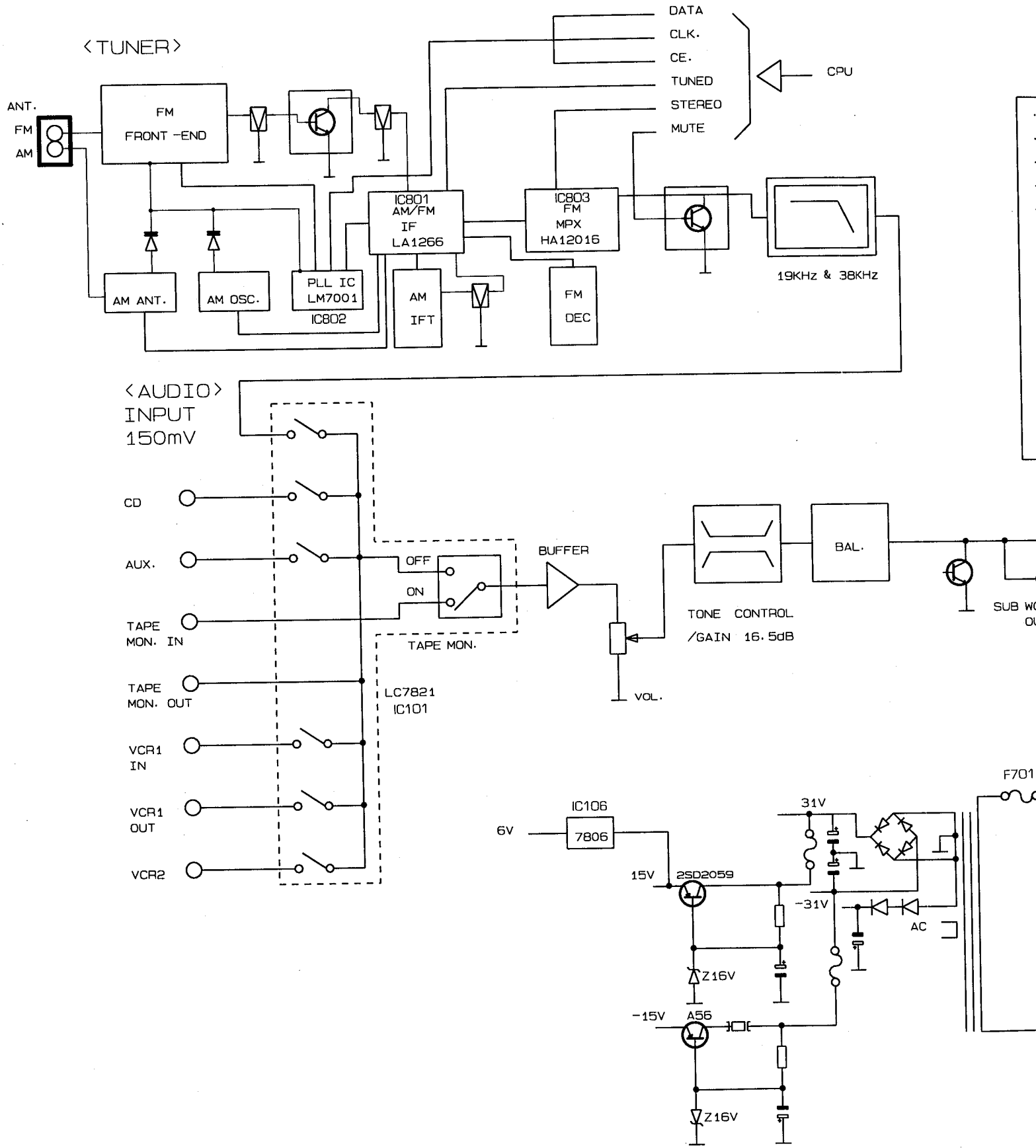
BLOCK DIAGRAM

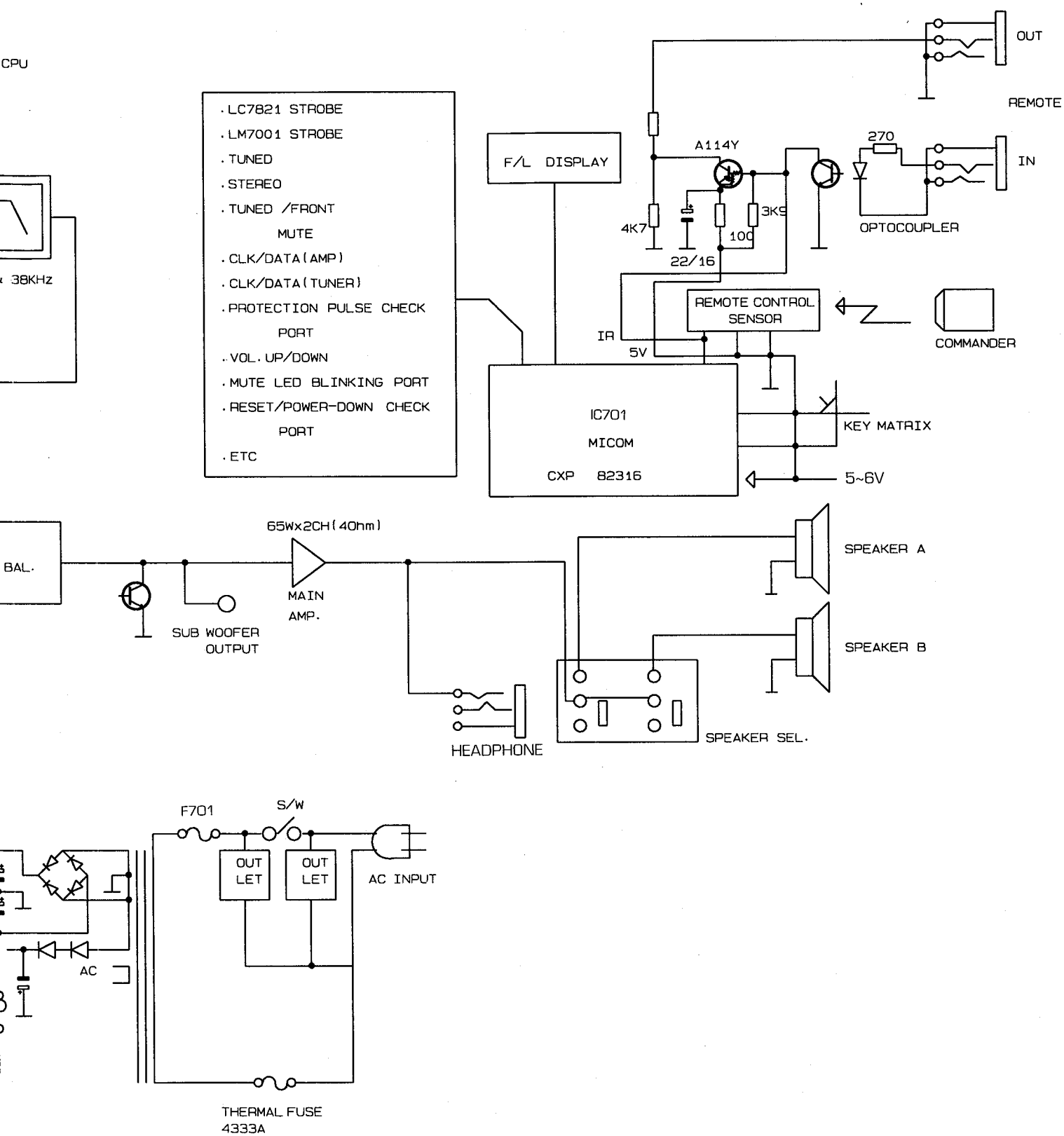






BLOCK DIAGRAM




CPU
& 38KHz
. LC7821 STROBE
. LM7001 STROBE
. TUNED
. STEREO
. TUNED /FRONT MUTE
. CLK/DATA(AMP)
. CLK/DATA(TUNER)
. PROTECTION PULSE CHECK PORT
. VOL. UP/DOWN
. MUTE LED BLINKING PORT
. RESET/POWER-DOWN CHECK PORT
. ETC
F/L DISPLAY
A114Y
4K7
22/16
100
3K9
270
OUT
REMOTE
IN
OPTOCOUPLER
REMOTE CONTROL SENSOR
COMMANDER
IR
5V
IC701
MICOM
CXP 82316
KEY MATRIX
5~6V
BAL.
65Wx2CH(4Ohm)
MAIN AMP.
SUB WOOFER OUTPUT
SPEAKER A
SPEAKER B
HEADPHONE
SPEAKER SEL.
F701
S/W
OUT LET
OUT LET
AC INPUT
AC
THERMAL FUSE
4333A

DISASSEMBLY PROCEDURES

[1] Cover Top Removal (Figure 1)

1. Remove 4 screws (① to ④) from the both sides of chassis.
2. Remove 2 screws (⑤ and ⑥) from the chassis back.
3. Carefully lift the cover top to remove.

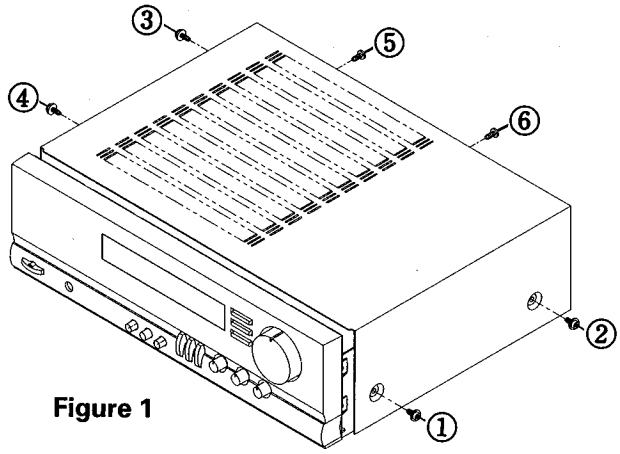


Figure 1

[2] Cover Bottom Removal (Figure 2)

1. Remove 12 screws (① to ⑫) from the cover bottom.
2. Carefully lift the cover bottom to remove.

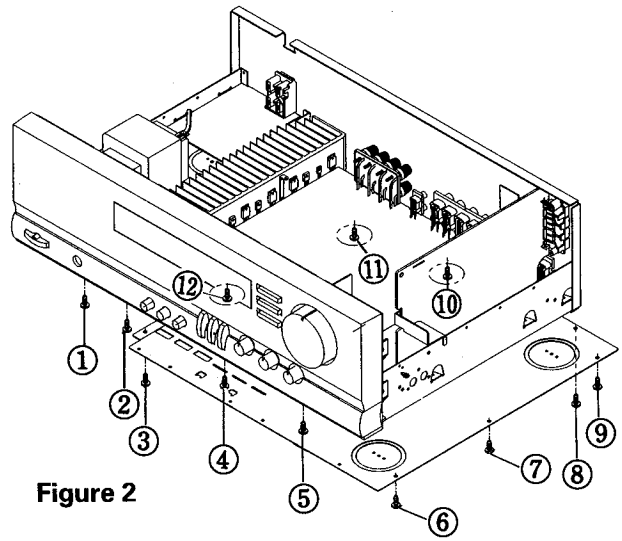


Figure 2

[3] Panel Front Assembly Removal (Figure 3)

1. Remove the cover top and cover bottom (Refer to step [1] and [2]).
2. Remove 4 screws (① to ④) from both sides of the panel front.
3. Remove a screw ⑤ from the bottom.
4. Disconnect CNT114, CNT107, CNT116, CNT119 from the Main PC Board.
5. Disconnect CNT122 from the Outlet PC Board.
6. Disconnect CNT105-1 from the Front PC Board.
7. Remove a screw ⑥ from the right frame to release lug wire.
8. Remove a screw ⑦ from the left frame to release lug wire.

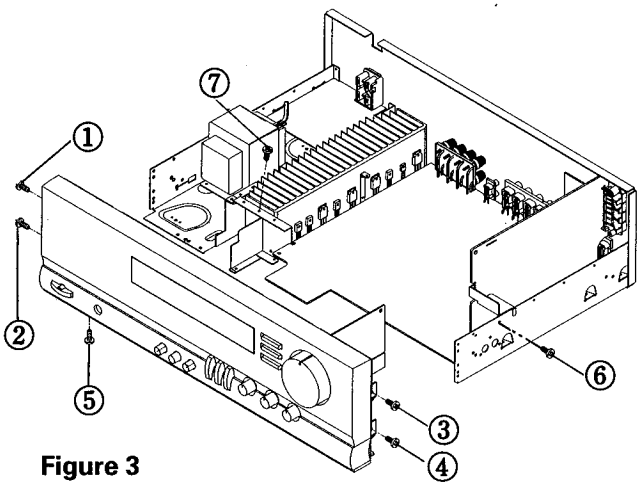


Figure 3

[4] Volume and Front PC Board Removal (Figure 4)

1. Remove the panel front assembly. (Refer to step [3]).
2. Disconnect CNT700 from the Volume PC Board.
3. Disconnect CNT701 from the Front PC Board.
4. Pull the knob(Volume) from the panel front.
5. Remove the hex nut from the volume motor and remove 5 screws (① to ⑤) from the Front PC Board to release the Volume and Front PC Board.

[5] Tone PC Board Removal (Figure 4)

1. Remove the panel front assembly. (Refer to step [3]).
2. Pull the knobs (Bass/Treble/Balance) from the panel front assembly.
3. Remove the hex nuts from the variable resistors to release the Tone PC Board.

[6] SPKR Selector PC Board Removal (Figure 4)

1. Remove the panel front assembly (Refer to step [3])
2. Disconnect CNT120 from the Speaker Selector PC Board.
3. Remove 2 screws (⑥ and ⑦) from the speaker selector switch.

7 Head Phone PC Board Removal (Figure 4)

1. Remove the panel front assembly (Refer to step 3)
2. Remove a screw ⑧ from the headphone jack.
3. Remove 2 screws (⑨ and ⑩) from the power switch to release the Headphone PC Board.
4. Disconnect CNT120 from the Speaker Selector PC Board.

8 Power LED PC Board Removal (Figure 4)

1. Remove the panel front assembly (Refer to step 3)
2. Remove the Headphone PC Board (Refer to step 7)
3. Remove 2 screws (⑪ and ⑫) from the Power LED PC Board to release the PC Board.
4. Disconnect CNT701 from the Front PC Board.

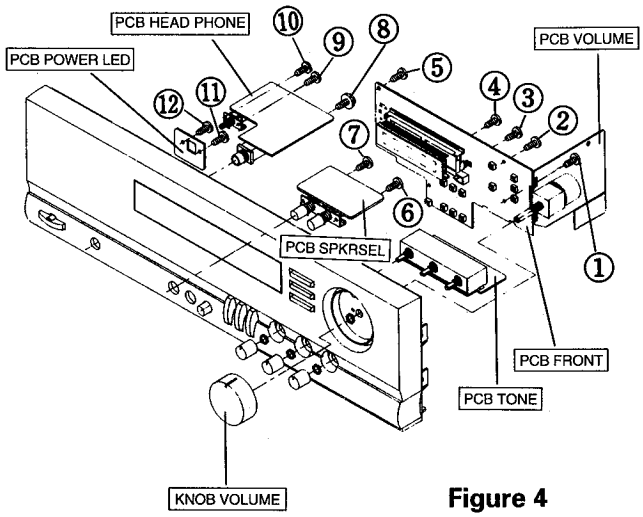


Figure 4

9 Tuner PC Board Removal (Figure 5)

1. Remove the cover top (Refer to step 1)
2. Remove a screw ⑬ from the Tuner PC Board bracket.
3. Remove 2 screws (⑭ and ⑮) from the chassis back.
4. Disconnect CNT106 from the Main PC Board to release the Tuner PC Board.

10 Sub-woofer PC Board Removal (Figure 4)

1. Remove the cover top (Refer to step 1)
2. Remove 2 screws (⑯ and ⑰) from the chassis back.
3. Disconnect CNT113 from the Subwoofer PC Board.

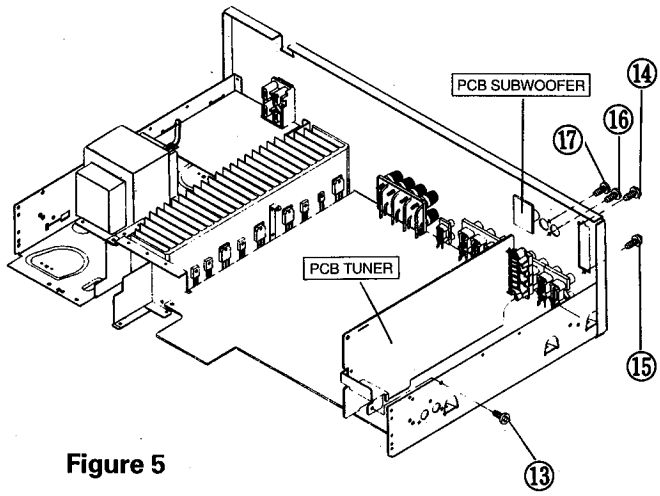


Figure 5

11 Outlet PC Board Removal (Figure 6)

1. Remove the cover top (Refer to step 1).
2. Remove 2 screws (① and ②) from the chassis back.
3. Disconnect CNT101-1, CNT122 from the Outlet P.C Board.
4. Remove 2 screws (③ and ④) from the Outlet P.C Board.

12 Main P.C Board Removal (Figure 6)

1. Remove the cover top (Refer to step 1)
2. Remove the Panel front assembly (Refer to step 3)
3. Do step 9, 10.
4. Remove 8 screws (⑤ and ⑫) from the chassis back.
5. Remove 4 screws (⑪ and ⑭) from the Main P.C Board top.
6. Disconnect CNT103, CNT102, CNT115 from the Main P.C Board.
7. Unsolder all leads of Q216L/R, Q211L/R, Q215L/R, Q186, IC106 P201 in the Main P.C Board.
8. Relese the Main P.C Board.

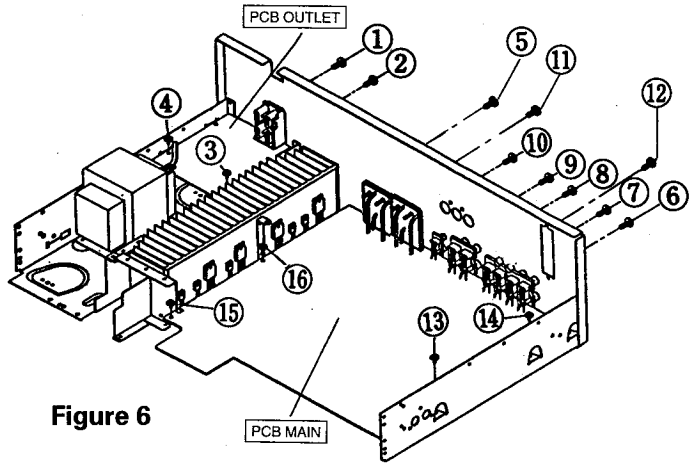
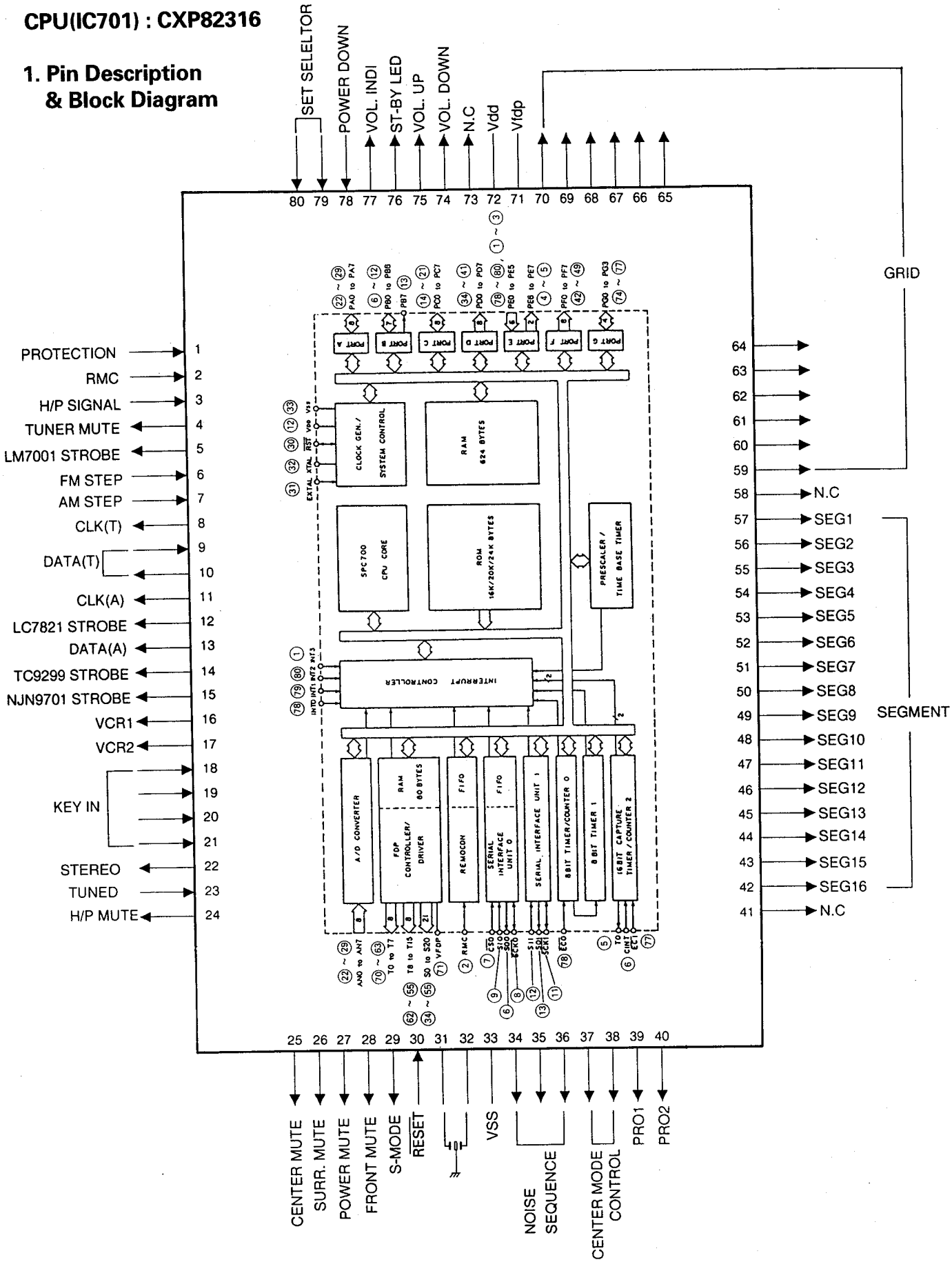


Figure 6

CIRCUIT DESCRIPTION

CPU(IC701) : CXP82316

1. Pin Description & Block Diagram



2. Input and Output Terminal Functions

<table>
<tr><th>Pin. No.</th><th>Symbol</th><th>Description</th></tr>
<tr><td>1</td><td>PROTECTION</td><td>Input for protection signal.
If it is low, all channel mute signal level is turned to high. Except for first 3 second it doesn't check protection.</td></tr>
<tr><td>2</td><td>RMC</td><td>Input for remote control signal.("L-active")</td></tr>
<tr><td>3</td><td>H/P SIGNAL</td><td>Input for headphone signal.</td></tr>
<tr><td>4</td><td>TUNER MUTE</td><td>Output for tuner mute.
Output, high under the following conditions.
1. When power is turned on or off.
2. When tuner band is changed.
3. When tuner up or down button is pressed.
4. When preset button is pressed.
5. When preset number display changes during memory scan.
6. When the protection port is low.
7. When "-∞ mute signal" is received from the commander.</td></tr>
<tr><td>5</td><td>LM7001 STROBE</td><td>Output to enable IC LM7001.</td></tr>
<tr><td>6, 7</td><td>STEP</td><td>Input to select step.
<table>
<tr><th>BAND</th><th>STEP</th><th>6</th><th>7</th></tr>
<tr><td>FM</td><td>50 K</td><td>L</td><td>H</td></tr>
<tr><td>AM</td><td>10 K</td><td>L</td><td>H</td></tr>
<tr><td>FM</td><td>50 K</td><td>L</td><td>L</td></tr>
<tr><td>AM</td><td>9 K</td><td>L</td><td>L</td></tr>
</table></td></tr>
<tr><td>8,10</td><td>CLK(T),DATA(T)</td><td>Output, clock and dataa signal to IC LM7001.</td></tr>
<tr><td>11,13</td><td>CLK(A),DATA(A)</td><td>Output, clock and data signal to ICs, LC7821, NJU9701 and TC9299.</td></tr>
<tr><td>12</td><td>LC7821 STROBE</td><td>Output to enable IC LC7821.</td></tr>
<tr><td>14</td><td>TC9299 STROBE</td><td>Output to enable IC TC9299.</td></tr>
<tr><td>15</td><td>NJN9701 STROBE</td><td>Output to enable IC NJN9701.</td></tr>
<tr><td>16, 17</td><td>VCR1/VCR2</td><td>Output to select the video signal of VCR1 or VCR2.
Output data for each mode is as follows.
<table>
<tr><th>MODE</th><th>18</th><th>19</th></tr>
<tr><td>VCR1</td><td>H</td><td>L</td></tr>
<tr><td>VCR2</td><td>L</td><td>H</td></tr>
<tr><td>ELSE</td><td>△</td><td>△</td></tr>
</table>
△;keeping last state.</td></tr>
<tr><td>18～21</td><td>KEY INPUT</td><td>Input data of K_1 - K_4 for key scan.</td></tr>
<tr><td>22</td><td>STEREO</td><td>Receiving low level, it turns on the stereo flag of FL.</td></tr>
<tr><td>23</td><td>TUNED</td><td>Input for station detector signal in searching turning.
Stops searching up or down when station detector reached a certain level.</td></tr>
<tr><td>24</td><td>H/P MUTE</td><td>Output for headphone mute.
Output, low level under the following conditions.
1. When power is turned on or off.
2. When headphone plug is removed from headphone jack.</td></tr>
<tr><td>25</td><td>CENTER MUTE</td><td>Output for center mute.
Output, low level under the following conditions.
1. When power is turned on or off.
2. When center mode is turned on or off.
3. When center mode is switched.
4. When test tone mode is switched on, or when output is not directed to center.</td></tr>
</table>

<table>
<tr><th>Pin. No.</th><th>Symbol</th><th>Description</th></tr>
<tr><td>26</td><td>SURR MUTE</td><td>Output for surround mute.
Output,low level under the following conditions.
1. When power is turned on or off.
2. When surround mode is turned on or off.(Keeping low level in surr. off.)
3. When test tone mode is changed, or when output is not directed to surround.
4. When delay time is switched.
5. When the protection terminal's level is low.
6. When "-∞ mute signal" is received from the commander.
7. When headphone jack is inserted.</td></tr>
<tr><td>27</td><td>POWER MUTE</td><td>Output for all amp. mute.
Output,low level under the following conditions.
1. When power is turned on or off.
2. When the protection terminal's level is low.</td></tr>
<tr><td>28</td><td>FRONT MUTE</td><td>Output for main mute.
Output,low level under the following conditions.
1. When power is turned on or off.
2. When function is changed.
3. When mono and stereo is changed.
4. When the protection terminal's level is low.
5. When "-∞ mute signal " is received from the commander.
6. When headphone plug is inserted.</td></tr>
<tr><td>29</td><td>S-MODE</td><td>Output voltage to control surround mode.
Prologic:5V, 3-stereo:2.5V, bypass:0V</td></tr>
<tr><td>30</td><td>RESET</td><td>Input to reset micom</td></tr>
<tr><td>31,32</td><td>EXTAL, XTAL</td><td>Input and output pin for a oscillator crystal.</td></tr>
<tr><td>33</td><td>VSS</td><td>Provides the ground potential.</td></tr>
<tr><td>34～36</td><td>NOISE SEQUENCE</td><td>Output signal to select output channal in testing tone.
Output signal for 2 second per each channal in order L,C,R,S.
<table>
<tr><th>MODE / PIN No.</th><th>L</th><th>C</th><th>R</th><th>S</th><th>TEST TONE OFF</th></tr>
<tr><td>34</td><td>L</td><td>L</td><td>L</td><td>L</td><td>H</td></tr>
<tr><td>35</td><td>L</td><td>L</td><td>H</td><td>H</td><td>△</td></tr>
<tr><td>36</td><td>L</td><td>H</td><td>L</td><td>H</td><td>△</td></tr>
</table></td></tr>
<tr><td>37, 38</td><td>CENTER MODE CONTROL</td><td>Output data to control center mode.
<table>
<tr><th>MODE / PIN No.</th><th>NOR MAL</th><th>PHAN TOM</th><th>WIDE</th></tr>
<tr><td>37</td><td>H</td><td>L</td><td>L</td></tr>
<tr><td>38</td><td>L</td><td>L</td><td>H</td></tr>
</table></td></tr>
<tr><td>39, 40</td><td>PRO1, PRO2</td><td>Input for protection signal.</td></tr>
<tr><td>41</td><td>NC</td><td>Not used.</td></tr>
<tr><td>42～57</td><td>S16-S1</td><td>Output for segment.</td></tr>
<tr><td>58</td><td>NC</td><td>Not used.</td></tr>
<tr><td>59～70</td><td>G1-G12</td><td>Output for grid.</td></tr>
<tr><td>71</td><td>Vfdp</td><td>Input power supply of the FL controller.</td></tr>
<tr><td>72</td><td>Vdd</td><td>Power supply.</td></tr>
<tr><td>73</td><td>NC</td><td>Not used.</td></tr>
<tr><td>74, 75</td><td>VOL. UP/DOWN</td><td>Output signal to turn up or down volume moter.</td></tr>
</table>

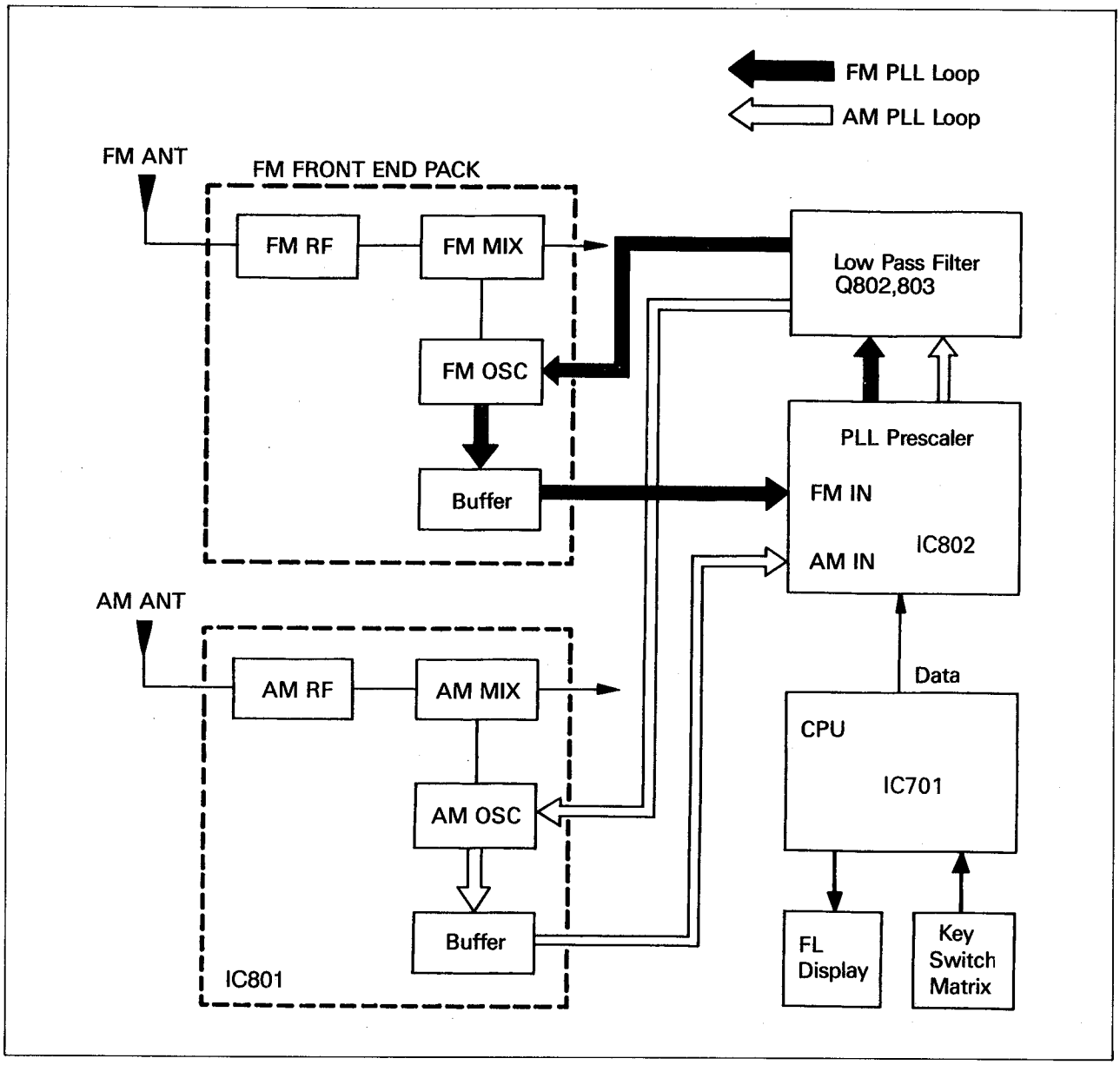
<table>
<tr><th>Pin. No.</th><th>Symbol</th><th>Description</th></tr>
<tr><td>76</td><td>ST-BY LED</td><td>Output to control ST-BY LED.
When power is turned on by power s/w or off by remocon, it is high level.
Else, it is low level. (Keeping last level)</td></tr>
<tr><td>77</td><td>VOL. INDI.</td><td>Output signal to turn on or off the led which is used to master volume indicator.
It is high level in turning on and low level in turning off.</td></tr>
<tr><td>78</td><td>PD</td><td>Input for power down. (At "L", it is active)</td></tr>
<tr><td>79, 80</td><td>SELECTOR</td><td>Input signal to select one of three sets(AVR10, AVI100 and HK3250).
<table>
<tr><th>SET</th><th>AVR10</th><th>AVI100</th><th>HK3250</th></tr>
<tr><td>79</td><td>H</td><td>L</td><td>L</td></tr>
<tr><td>80</td><td>L</td><td>L</td><td>H</td></tr>
</table>
</td></tr>
</table>

3. Key Matrix

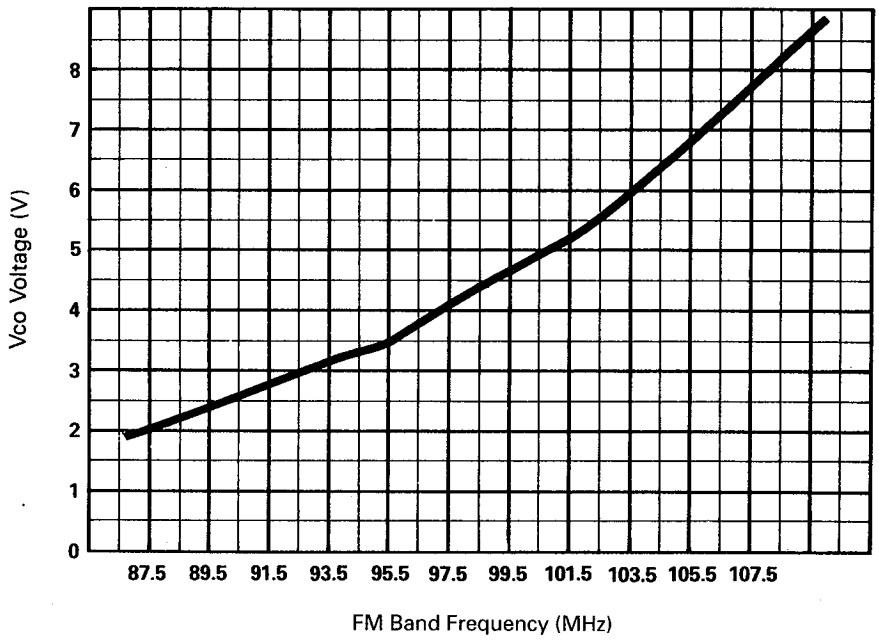
PIN NO.	51	52	53	54
18	SURR1. BYPASS	SURR. MODE	SEEK STEREO	PRESET UP
19	TAPE MON.	VCR1	TUNER ▼ PRESET ▲	PRESET DOWN
20	TV/VCR2	CD	MEMORY	
21	AUX	FM	AM	

4. Digital Tuning System Description

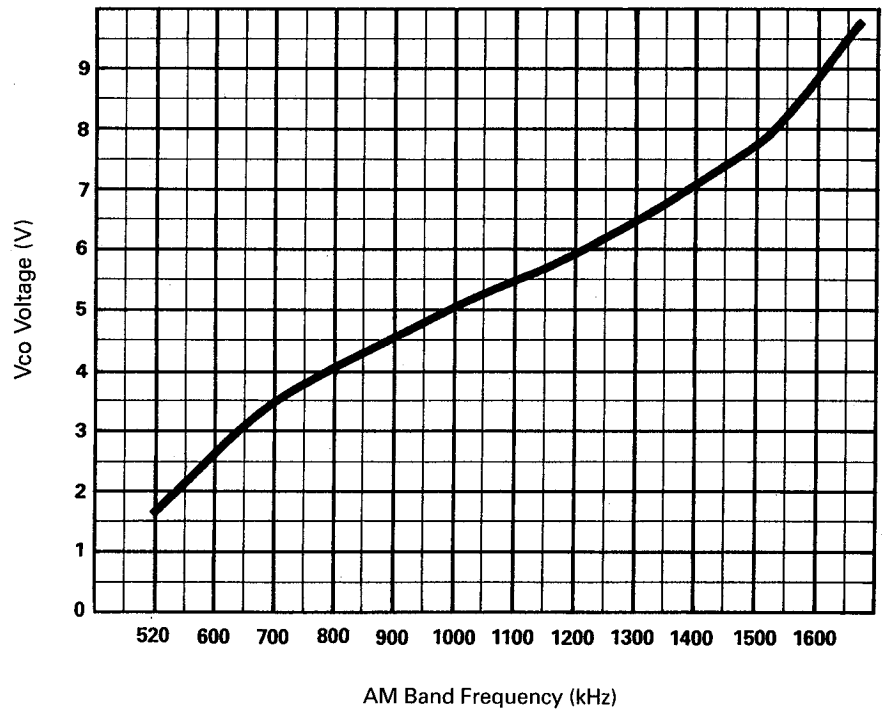
DIGITAL TUNING SYSTEM



Vco vs. FM Band Frequency Curve



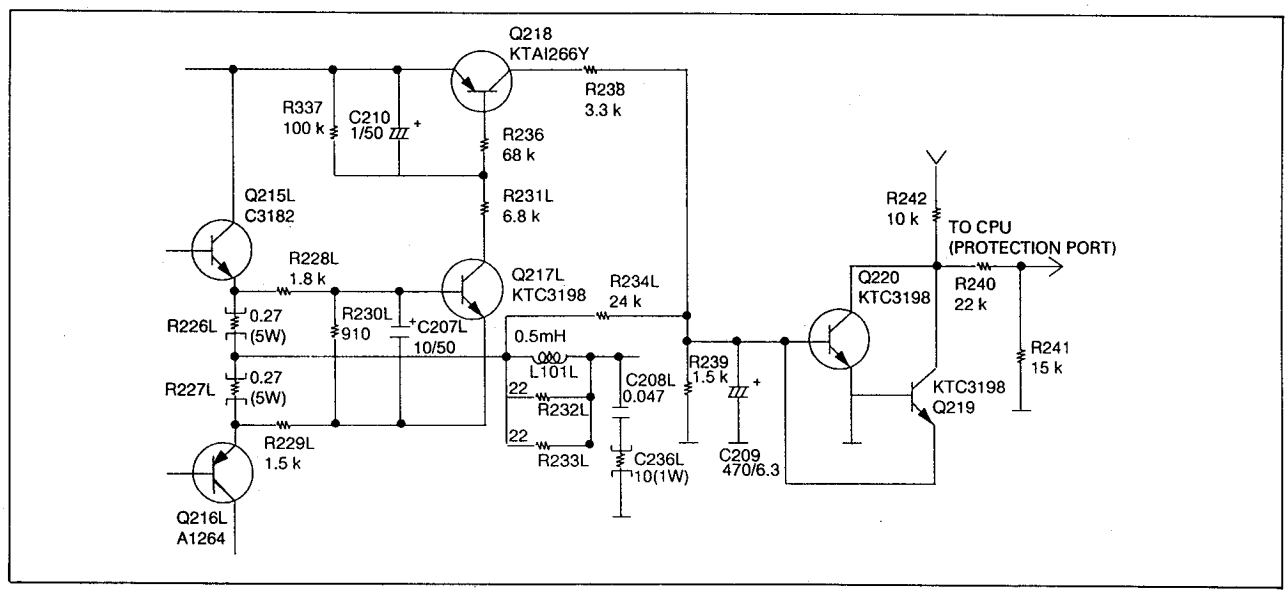
Vco vs. AM Band Frequency Curve



5. Protection Circuits

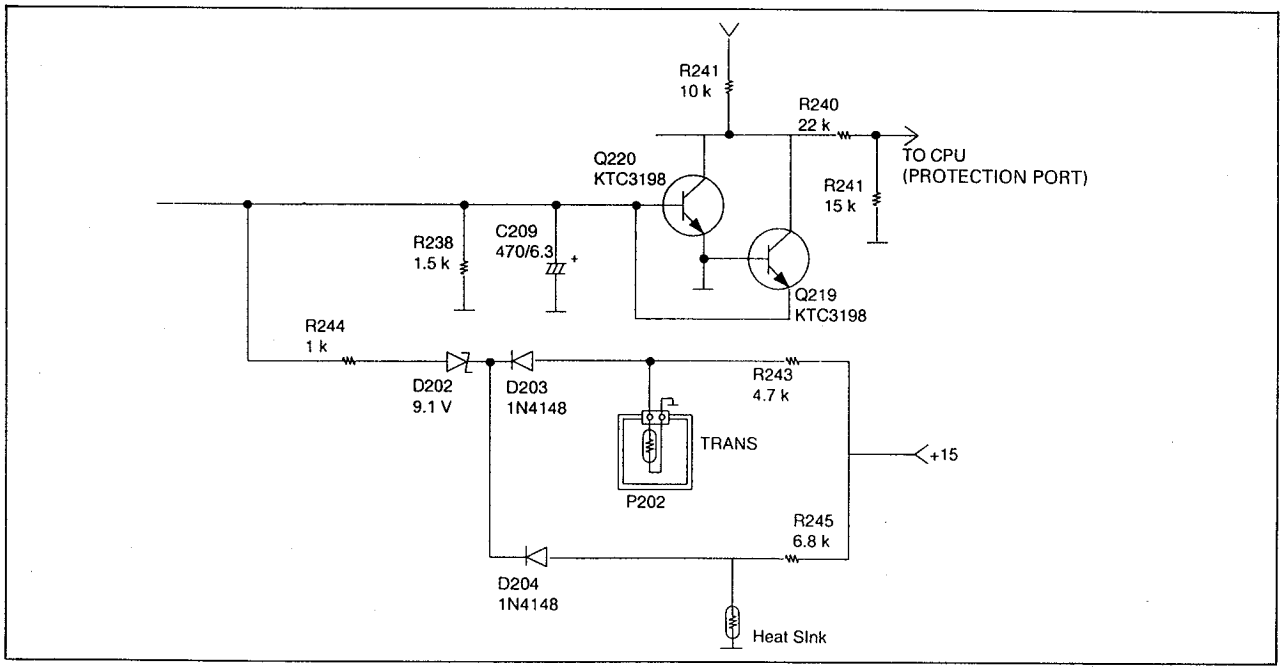
SPEAKER PROTECTION CIRCUIT

The CPU protects both this unit and the speakers when an abnormally high current flows in Q215 L/R and Q216 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 R226 L/R or R227 L/R turns on Q217 L/R, then Q218 turns on Q220.
It makes the protection port of the CPU to low state.
Then all channels are muted and the display 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 Q220 is turned on.
It makes the protection port of the CPU to low state. Then all channels are muted and the display is turned off.



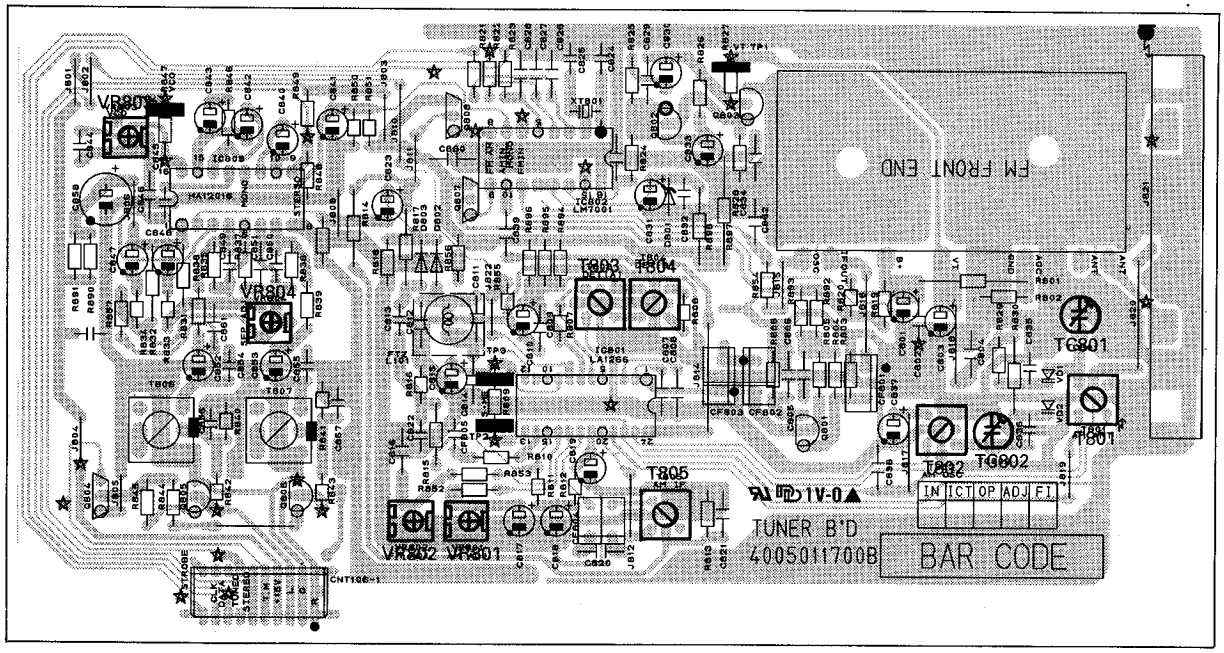
ALIGNMENT PROCEDURES

1. Equipment Required

- AM Standard Signal Generator (AM SSG)
- Oscilloscope
- AC Voltmeter
- FM Standard Signal Generator (FM SSG)
- Stereo Modulator
- Audio Generator
- Distortion Meter
- DC Voltmeter
- Frequency Counter

Note : Disconnect external FM antenna prior to alignment.

2. Alignment and Test Points (PCB9)



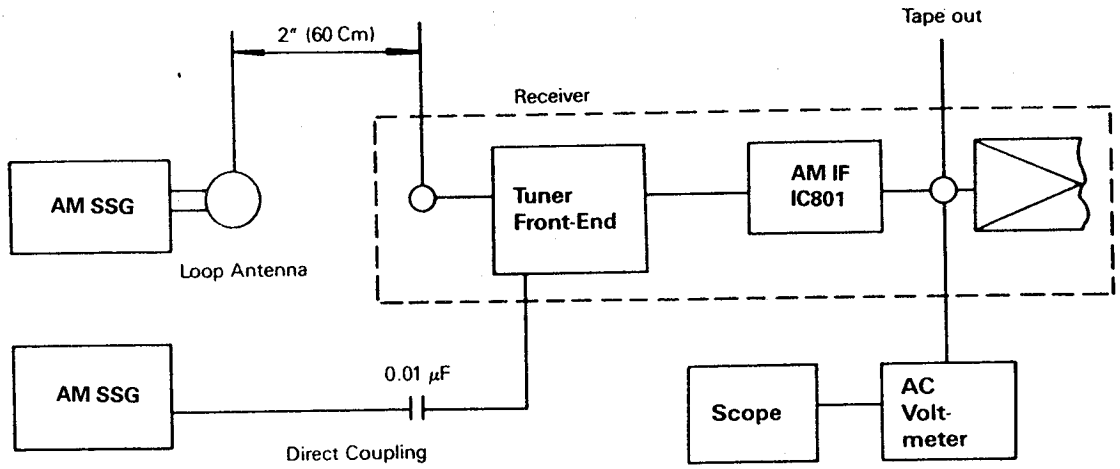
3. AM IF and RF Alignment

Preparation

1. Output of Signal Generator should not be higher than necessary to obtain an optimum output reading.
2. Signal Generator Modulation : 30%
3. Switch : Press to AM.

Step	Signal Generator Frequency	Receiver Frequency on the Display	Equipment Connection	Adjustment Point	Adjust for
1	999 kHz (400 Hz, Mod.)	522 kHz	DC Voltmeter TP1	T802	1.2 V reading
		1611 kHz	DC Voltmeter TP1	TC802	8.5 V reading
2	594 kHz (400 Hz, Mod.)	594 kHz	Same as Step 1.	T801 (ANT Coil)	Same as Step 1
3	1404 kHz (400 Hz, Mod.)	1404 kHz	Same as Step 1.	TC801 (ANT Trimmer)	Same as Step 1

4	450 kHz (400 Hz, Mod.)	Place at a noninterference spot around 600 kHz	AC voltmeter to TAPE OUT jack.	T805 (IFT)	Maximum reading
5	999 kHz (400 Hz, Mod.)	999 kHz	Same as Step 1.	VR801	FL display 'TUNED' Indication on receiver with AM SSG Output level of 800 μV/m



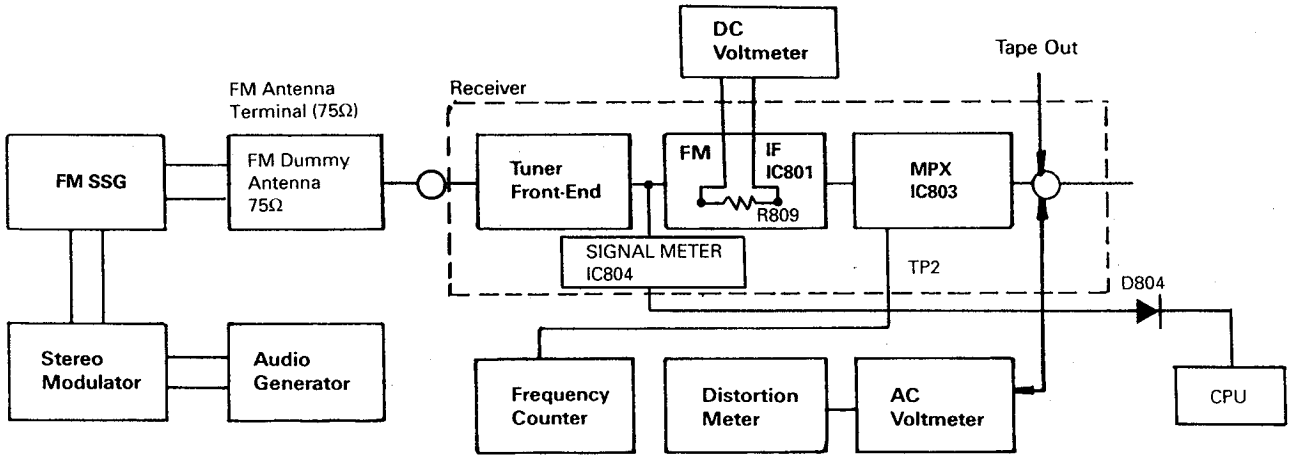
AM Alignment Connection

4. FM IF Alignment

Preparation

1. Signal Generator output should be no higher than necessary to obtain an optimum output reading.
2. Switch Press to FM.
3. Signal generator deviation : 40 kHz.

Step	Signal Generator Frequency	Receiver Frequency Display	Equipment Connection	Adjustment Point	Adjust for
1	98.0 MHz (1 kHz, Mod.)	98.0 MHz	Distortion meter to TAPE OUT jack	T804	Minimum distortion
2	98.0 MHz (1 kHz, Mod.)	98.0 MHz	Same as Step 1	VR802	FL display 'TUNED' Indication on receiver with FM SSG output level of 10 μV/m
3	98.0 MHz (1 kHz, Mod.)	98.0 MHz	DC Volt meter to R809 (PCB9)	T803	Zero reading on DC volt meter.



5. MPX Alignment, SM Alignment

Preparation

1. Switch : Press to FM.
2. Tuner for 98 MHz on band.
3. Signal Generator output level : 1000 μV.
4. Deviation : 40 kHz, at 100% modulation of composite signal.
5. Connect Signal Generator to FM antenna terminal through FM dummy antenna (75Ω).

Step	19 kHz Modulation Level	Signal Generator Frequency Setting	Equipment Connection	Adjustment Point	Adjust for
1	Pilot off	Carrier only	Frequency counter connect to TP2 (HOT) of PCB and ground	VR803	76 kHz
2	8% Mod.	Composite to channel 1kHz R	AC voltmeter to TAPE OUT jack of R channel	–	Adjust for about 450mV of audio output
3	8% Mod.	Composite to channel 1 kHz L	AC voltmeter to TAPE OUT jack of R channel	VR804	AC voltmeter reading should be at least 40 dB below.
4	8% Mod.	Composite to channel 1 kHz R	AC voltmeter to TAPE OUT jack of L channel	VR804	Same as Step 3.
5	8% Mod.	Composite to channel 1 kHz L or R	AC voltmeter to TAPE OUT jack Lor R channel	VR805	FL display 'SIG 60 dB' indication on receiver with FM SSG output level of 1000 μV/m
If you could not obtain –40dB readings in Steps 3 and 4 (compared with Step 2), readjust VR804 until you obtain –40dB readings for both Steps 3 and 4. Nominal is –45 dB.					

TROUBLESHOOTING

Symptom	Cause and Remedy
Receiver inoperative. (FL indicator does not light.)	A) Faulty AC power cord. Replace. B) Defectve 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 on the primary or secondary of the transformer circuitry. Repair the trace. C) Damaged rectifier (D208 to D211) or damaged transistor (Q216, Q217). Replace the defective component(s). D) Short circuit in the amplifier circuit. Replace the shorted component(s) in the amplifier circuit.
Power indicator lights but no sound from both channels.	A) Defect in transistor Q215 L/R, Q216 L/R on the Main Amp Board. Replace the defective component(s).
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 Q215 L/R, Q216 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 match with the jack. Replace the jack. B) Defective resistor R728L/R. Replace.
FM inoperative	A) Defective front-end. (FIH3-505H) Replace. B) Defective FM switch. Replace the switch. C) Defective transistors Q801, Q805, Q806, IC801, IC803 Replace the defective transistor(s) or IC(s). D) Defective coil T803 or T804. Replace the coil(s). E) Defective lead-in. Repair or replace the lead-in. F) Ceramic filters CF801, CF802, CF803 defective. Replace the defective ceramic filter(s). G) Defective controller circuit component. Replace.

Symptom	Cause and Remedy
Poor multiplex separation.	A) Improper adjustment. Readjust VR803 and VR804. (Refer to MPX Alignment.) B) IC803 defective. Replace. C) Variable resistor VR803 or VR804 defective. Replace the variable resistor(s).
FM volume not sufficient	A) If volume from both L and R channels is not loud enough : Front end section defective. Faulty IC801, Coil T803, Defective C838 of tuner Board. If sound of one channel is not loud enough: Defective T806, T807
FM Mono has no effect.	A) Defective FM MODE switch. Replace.
AM inoperative.	A) Damaged IC801 of tuner board. Replace. B) Defective T801, T802, T805 or CF804 of tuner board. Replace the defective component(s). C) Resistors R829, R817 defective. Replace the defective component(s). D) Capacitors C836, C818, C813 defective. Replace the defective capacitor(s). E) Defective AM switch. Replace. F) Defective varicap diodes VD1, VD2 Replace varicap diode(s). G) Damaged AM loop antenna. Repair or replace. H) Defective controller circuit component. Replace.
Bass control has no effect	A) Variable resistor BASS defective. Replace. B) Defective R129L/R, R131L/R, C126L/R, C128L/R. Replace the defective component(s).

Symptom	Cause and Remedy
Treble control has no effect.	A) Variable resistor TREBLE defective. B) Defective R130L/R, R132L/R, C127L/R, C129L/R. Replace the defective components(s).
Auto tune inoperative. (UP/DOWN)	A) Poor contact in Up/Down key. Repair or replace. B) Defective IC701. Replace. C) Defective tuner circuit component. Replace. D) In case of FM only, improper adjustment of FM front-end. Readjust.
Manual tune inoperative. (UP/DOWN) (AM or FM)	A) Poor contact in Up/Down key. Replace. B) Defective IC701. Replace.
Memory setting inoperative.	A) Poor contact in memory set key. Replace. B) Defective IC701. Replace the defective component.
FL inoperative.	A) FL defective. Replace. B) Defective IC701. Replace C) Defective X-700. Replace.
Noisy Volume control.	A) Defective volume control. Replace. B) Defective capacitors C701 or C703 Replace the defective capacitor(s).
Remote Control Unit inoperative.	A) Weak Battery. Replace. B) Defective. Replace. C) Defective IC701 (CPU Board) or IC01. Replace.

GENERAL UNIT PARTS LIST

Ref. No.	Description	Mfr. Part No.	Q'ty
	CABINET & CHASSIS		
1	Panel, Front, ABS, Black	048501035021	1
2	Button, Power, ABS, Black	048545128611	1
3	Knob, Volume, ABS, Black	048543059811	1
4	Indicator, Volume	8555048610	1
5	Knob, Rotary(Bass/Treble/Balance)	048545124311	3
6	Window, Display	8553019720	1
7	Filter FL	048555048512	1
8	Spring, Power	6555008720	1
9	Spring, Indicator	6555008730	2
10	Indicator, Power	8545128810	1
11	Jack, Phone	4438004510	1
12	Switch, Power, Push Type	4628055910	1
13	Knob, Speaker	048545124111	2
14	Switch, Speaker, Push Type	4628060610	1
15	Button, Preset, ABS, Black, 5key	048543065011	1
16	Button, Function, ABS, Black, 7key	048543064911	1
17	Volume, Bass/Treble	3208068910	2
18	Volume, Balance	3208068810	1
19	Shield Fence, Tone	6165149710	1
20	Switch, Tact	4658004810	14
21	Volume, Motor, 50 k(A)	3228019910	1
22	Holder, FL	6043010210	1
23	Foot, Hot-Stamping, Gold	046033102510	4
24	Frame Left, SECC, 1t	6121607640	1
25	Bracket, Heatsink	6503031410	1
26	Bracket, PCB	6505139720	1
27	Heatsink, Power	7502008740	1
28	Clamp Wire	6528302540	1
29	Bracket, Tuner	6505139810	1
30	Frame Right, SECC, 1t	6122633520	1
31	Cover, Button, SECC, 1t	6122420410	1
32	Terminal Antenna	4408108310	1
33	Jack, RCA, 4P	4438103110	2
34	Jack, RCA, 6P	4438103210	1
35	Jack, Multi, 2P	4438007510	1
36	Terminal Speaker, Screw Type, 8P	4408105810	1
37	Jack, RCA, 2P	4438111410	1
38	Chassic, Back, SECC, 1t	046102042721	1
39	Stopper Holder	6518002310	1
⚠ 40	Cord, AC Power	4308001410	1
41	Clamp Wire	6525002610	1
42	Cover, Top, SECC, Black	046122029611	1
⚠ 43	Outlet, AC	4448104810	1
44	Locking Tie	6528002810	1
	HARDWARE KIT		
S1-S21	Screw #2BTC 3x8B, Black	8109230083	21
S22	Screw Wsher	8155001210	1
S23-S26	Screw WSAM 4x8B	8159440083	4
S27-S29	Screw #2WPTC 3x8Y	8159230081	3
S30/S31	Screw #2BTC 3x8B, Black	8109230083	2
S32	Screw #2WPTC 3x8Y	8159230081	1
S33-S35	Screw #2BTC 3x8B, Black	8109230083	3
S36/S37	Screw #2WPTC 3x8Y	8159230081	2
S38-S43	Screw HEX MSPW 3x12Y, Yellow	8099130121	6
S44	Screw, Heatsink	8109230083	1
S45	Screw HEX MSPW 3x12Y, Yellow	8099130121	1
S46/S47	Screw #2BTC 3x8B, Black	8109230083	2
S48/S49	Screw #2WPTC 3x8Y	8159230081	2
S50-S63	Screw #2BTC 3x8B, Black	8109230083	14
S64/S65	Screw #1PT 3x10B, Black	8119130103	2
S66-S69	Screw #2BTC 3x8B, Black	8109230083	4
S70-S80	Screw #1PT 3x10B, Black	8119130103	11
S81/S82	Screw #2BTC 3x8B, Black	8109230083	2
S83-S86	Screw WSAM 4x8B	8159440083	4
S87/S88	Screw #2BTC 3x8B, Black	8109230083	2
	MISCELLANEOUS		
⚠ Trans	Power Transformer, 120 V, 60 Hz	2828100297	1
	FPC Cable, 19P, 270mm	4118619275	1

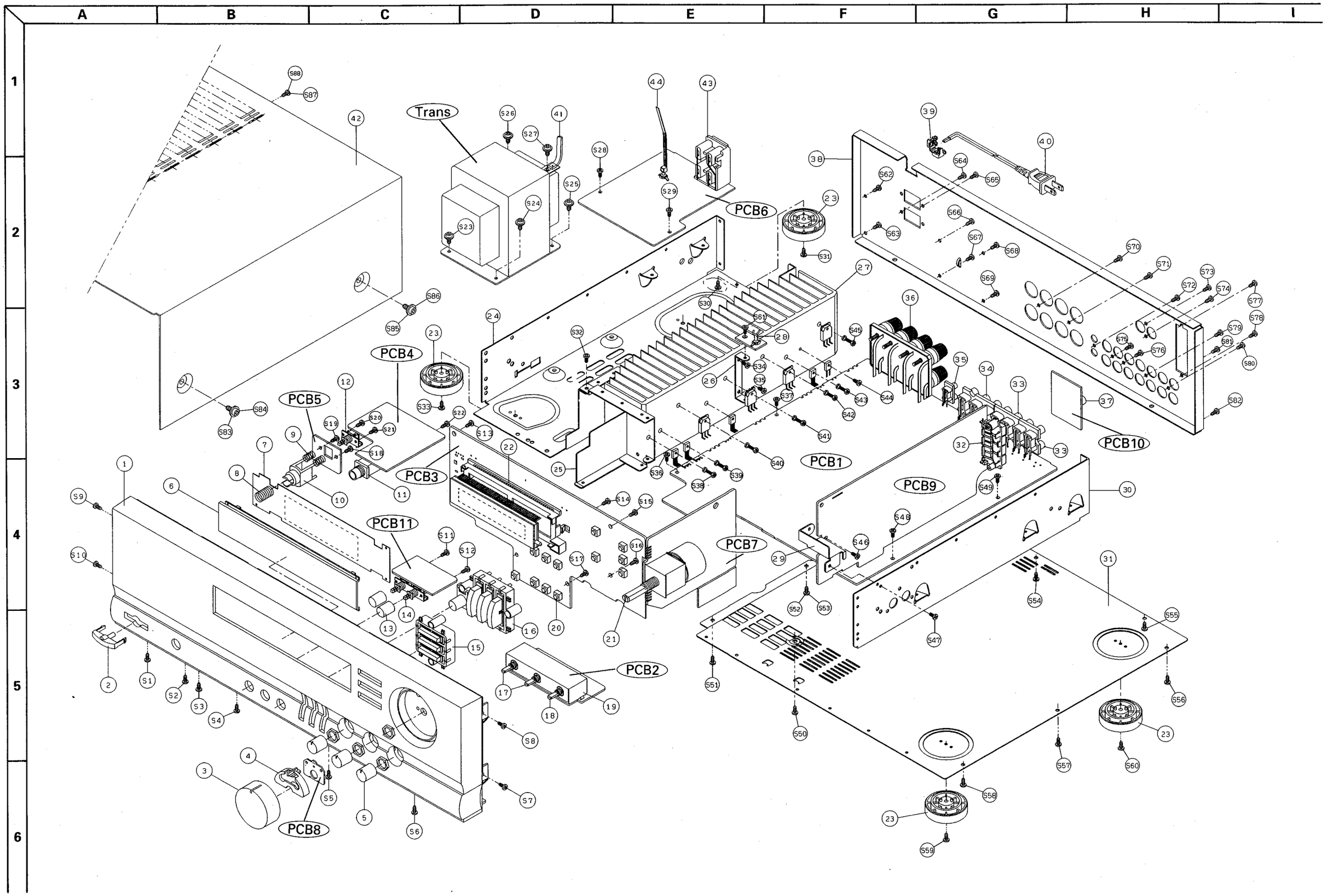
1. This parts list for HK3250 230V version is based on 120V version.
2. Each initial in the Remark is denoted as follows.
C: Changed, D: Deleted, A: Added

Ref. No.	Description	Mfr. Part No.	Q'ty	Remark
	CABINET & CHASSIS			
32	Terminal Antenna	4408101610	1	C
38	Chassis Back, SECC, Black	046102042751	1	C
40 ⚠	Cord AC Power	4308000430	1	C
43 ⚠	Outlet, AC	4448103610	1	C
	MISCELLANEOUS			
Trans ⚠	Power Transformer, 230 V, 50 Hz	2828100461	1	C

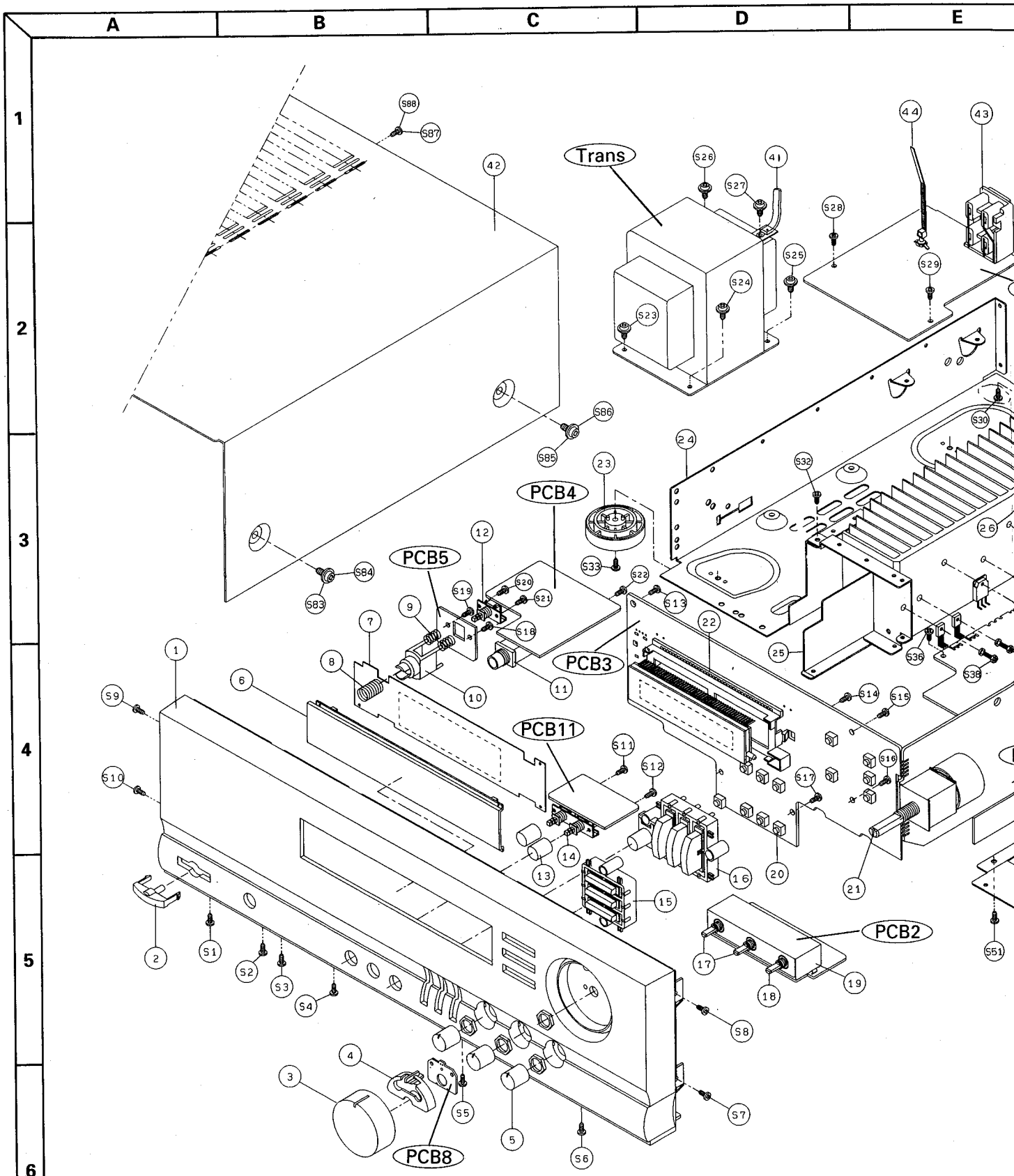
PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the part list are of special significance to safety. When replacing a component identified with ⚠ , 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.

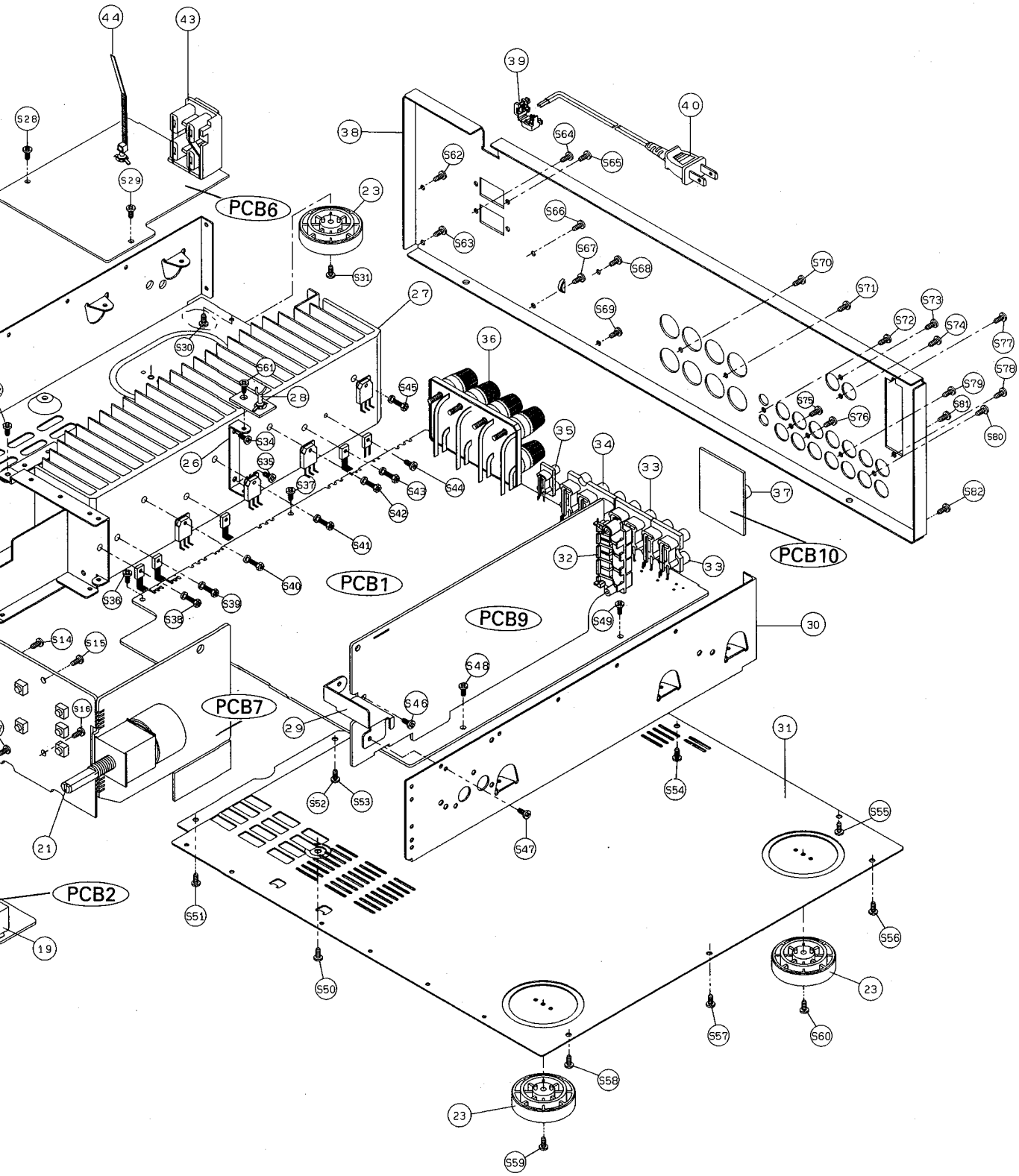
GENERAL UNIT



GENERAL UNIT

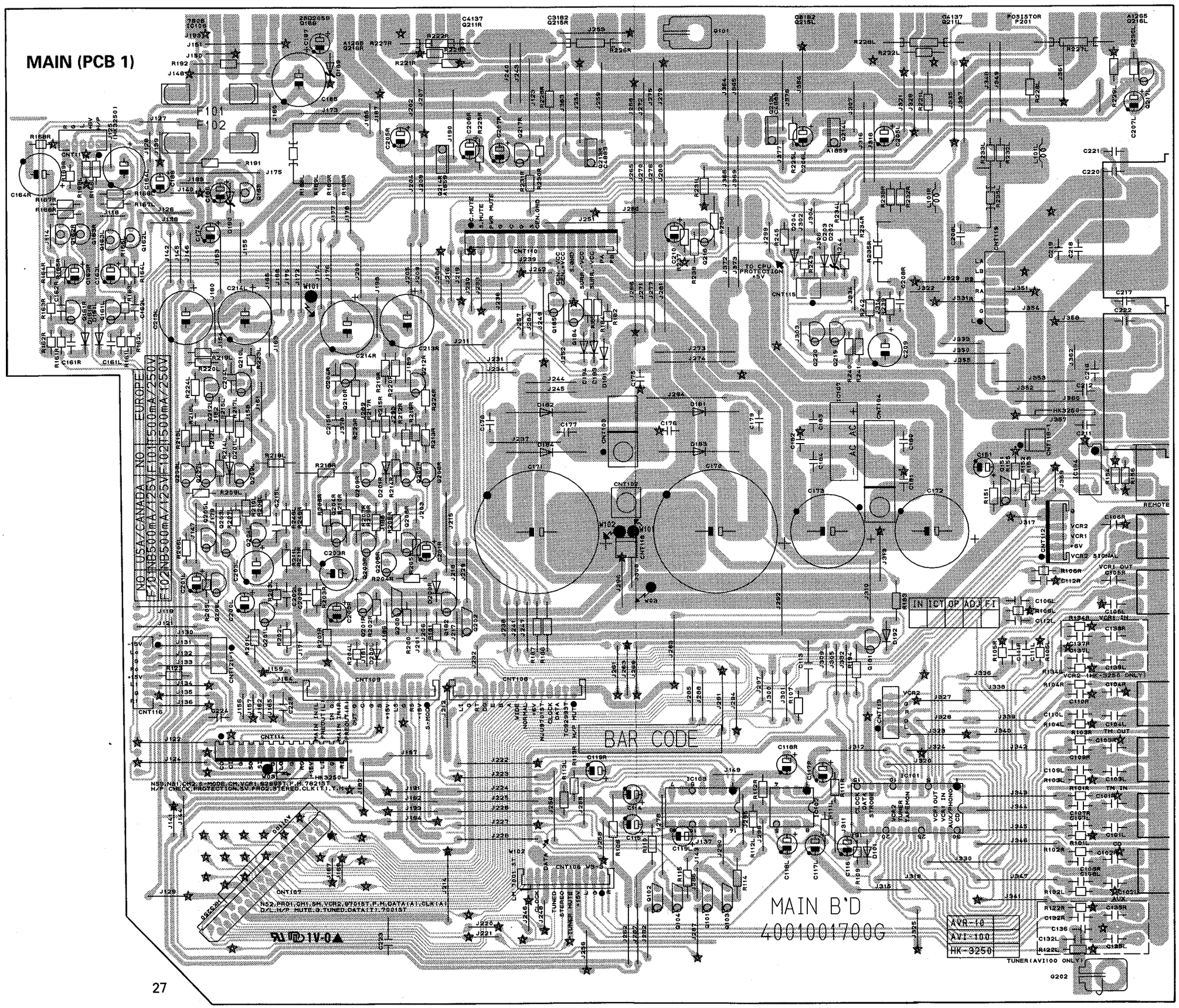


	E	F	G	H	I

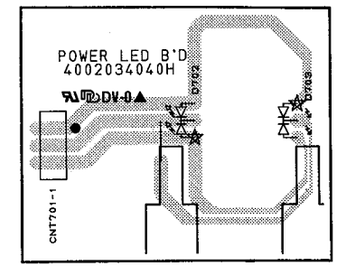


PRINTED CIRCUIT BOARDS

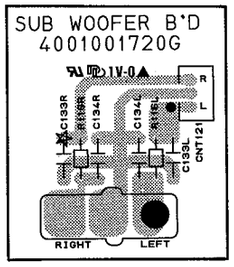
MAIN (PCB 1)



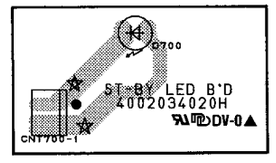
POWER LED (PCB 5)



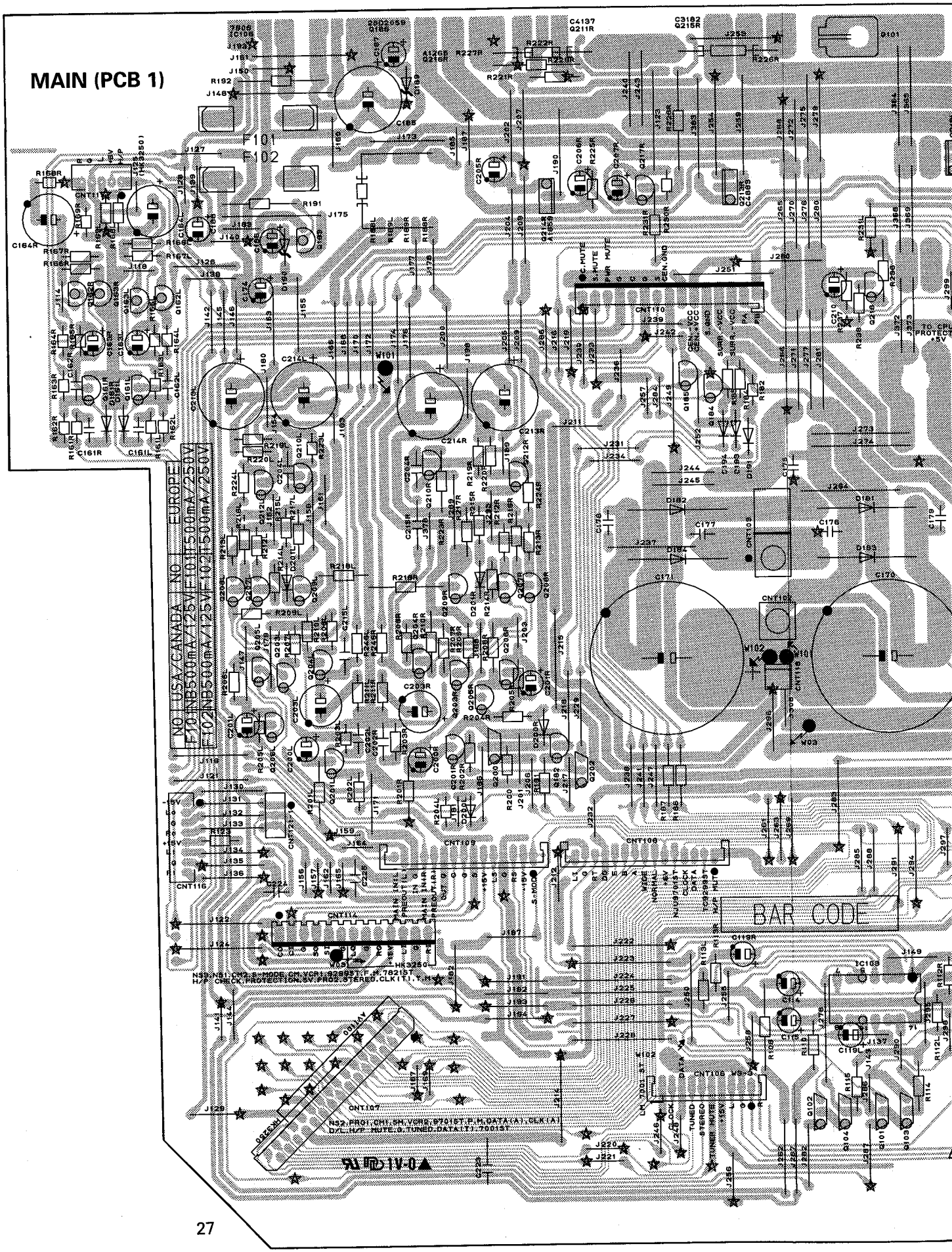
SUB-WOOFER (PCB 10)

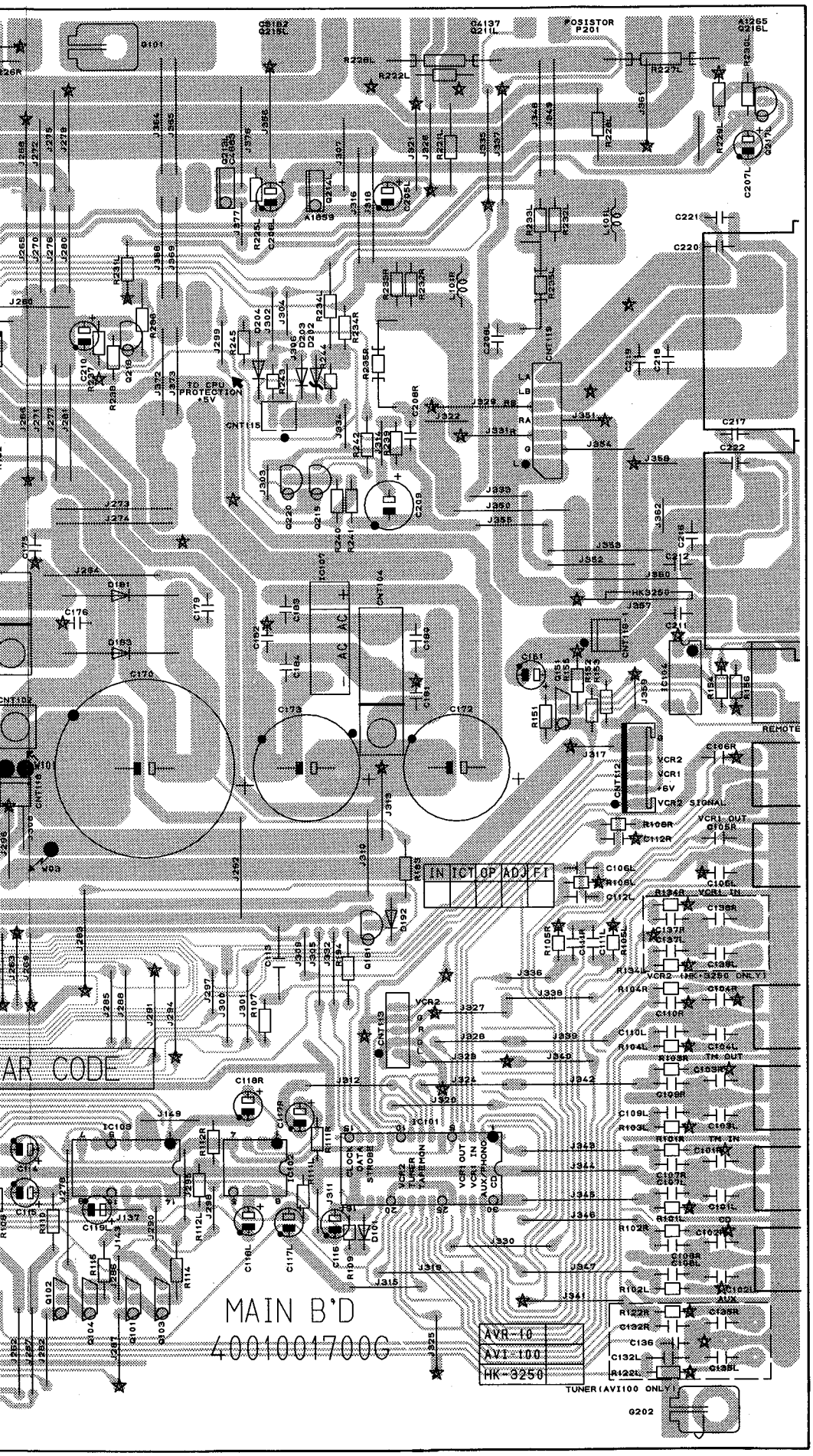


ST-BY LED (PCB 8)

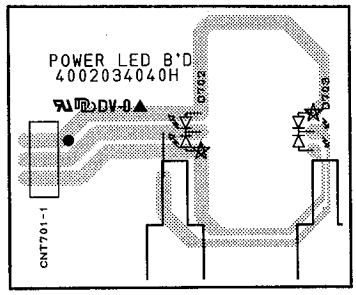


PRINTED CIRCUIT BOARDS

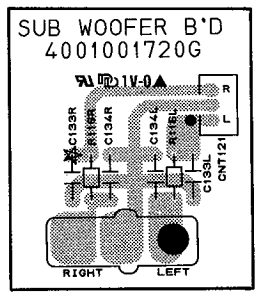




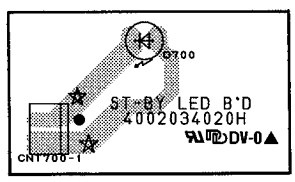
POWER LED (PCB 5)



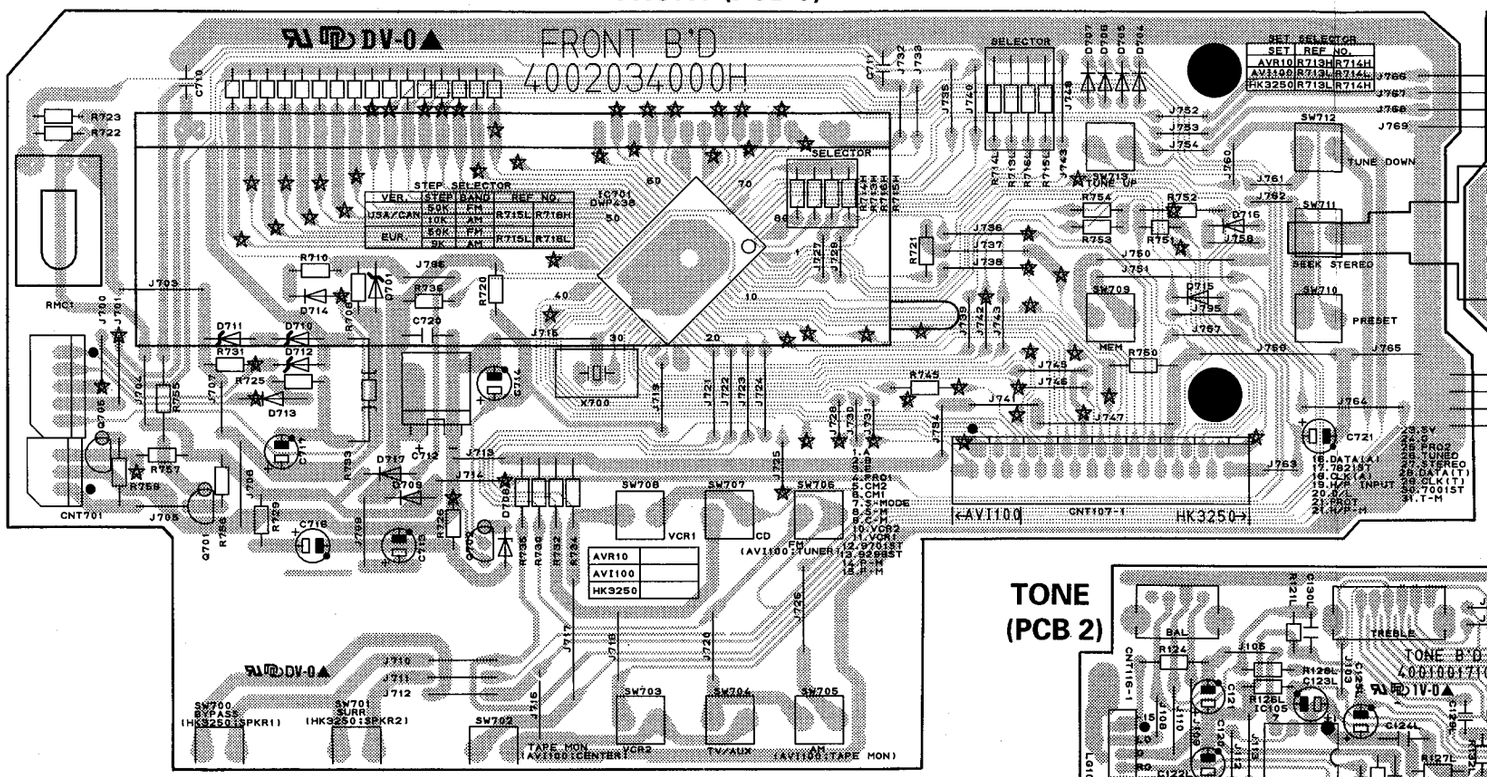
SUB-WOOFER (PCB 10)



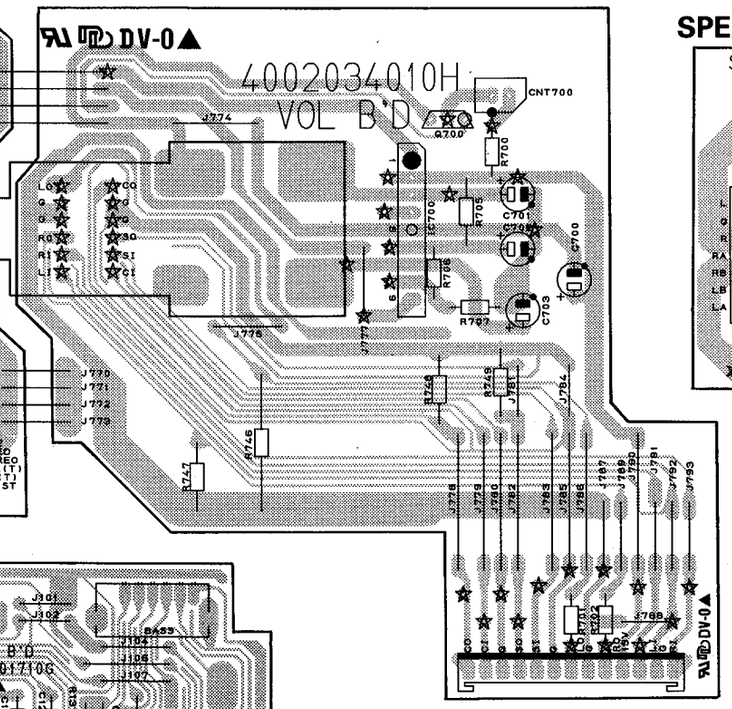
ST-BY LED (PCB 8)



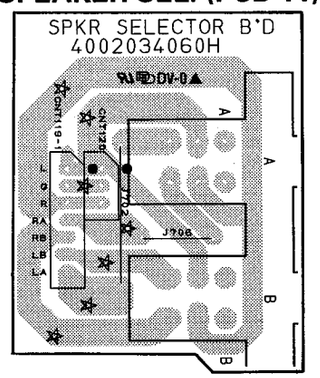
FRONT (PCB 3)



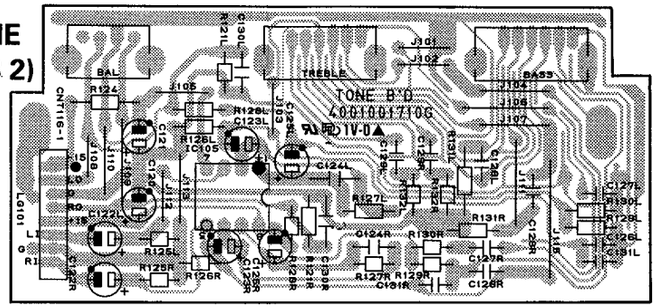
VOLUME (PCB 7)

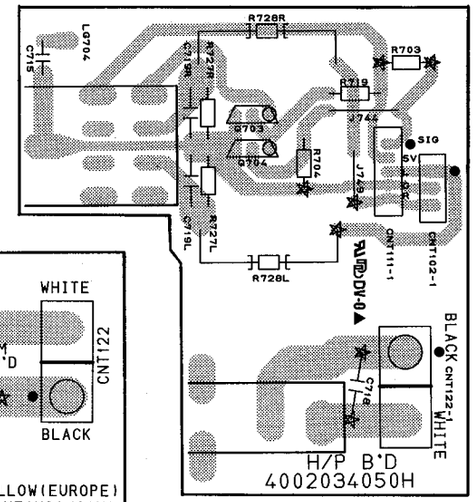


SPEAKER SEL. (PCB 11)



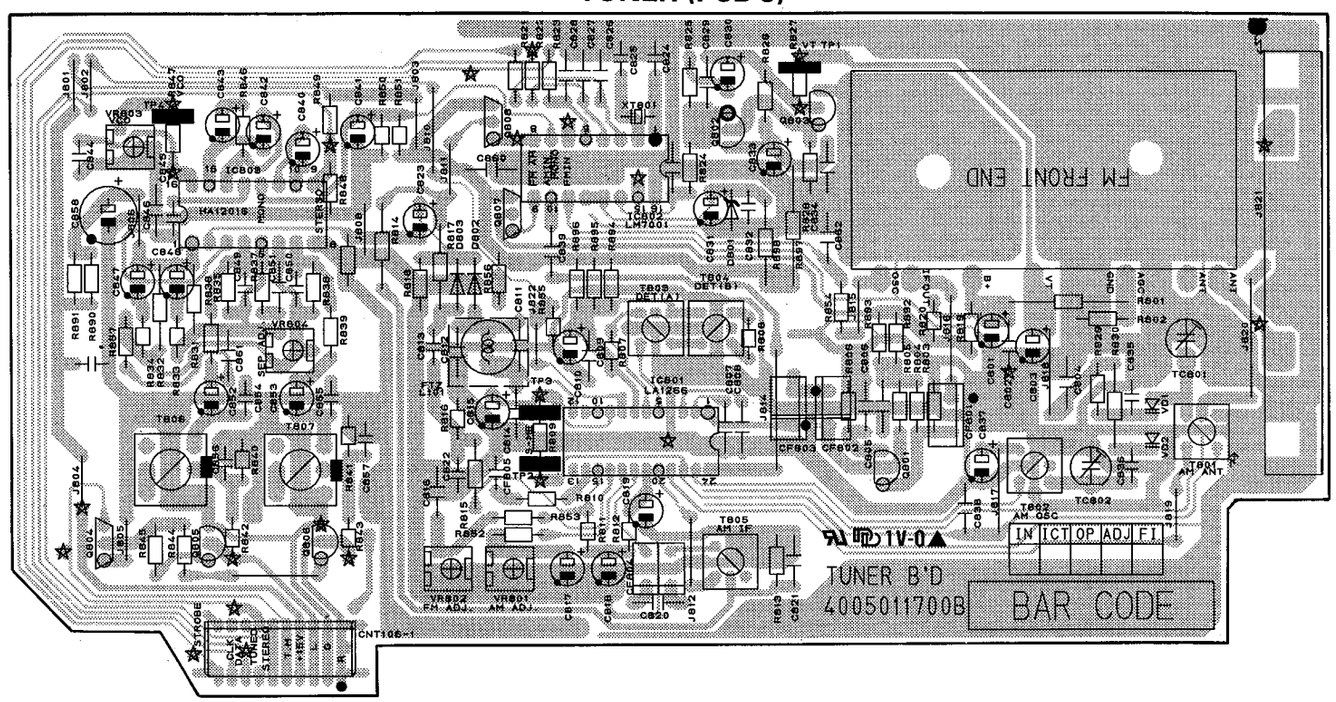
TONE (PCB 2)



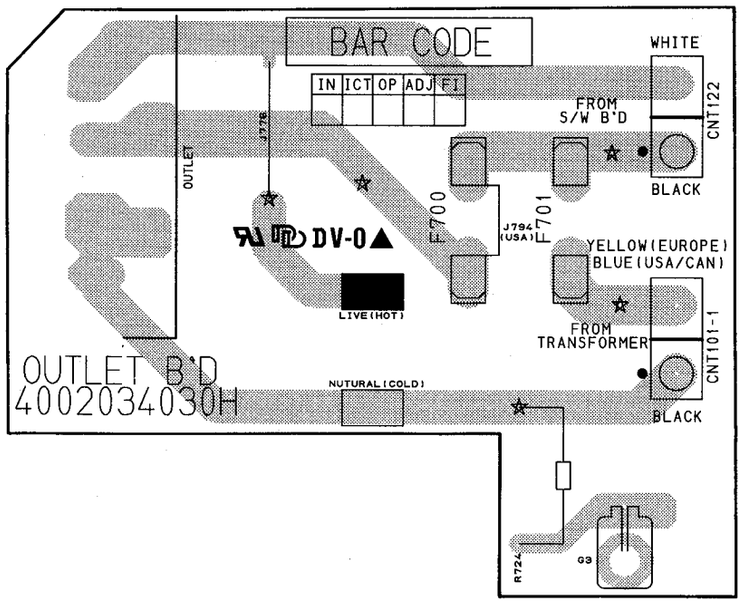


HEADPHONE (PCB 4)

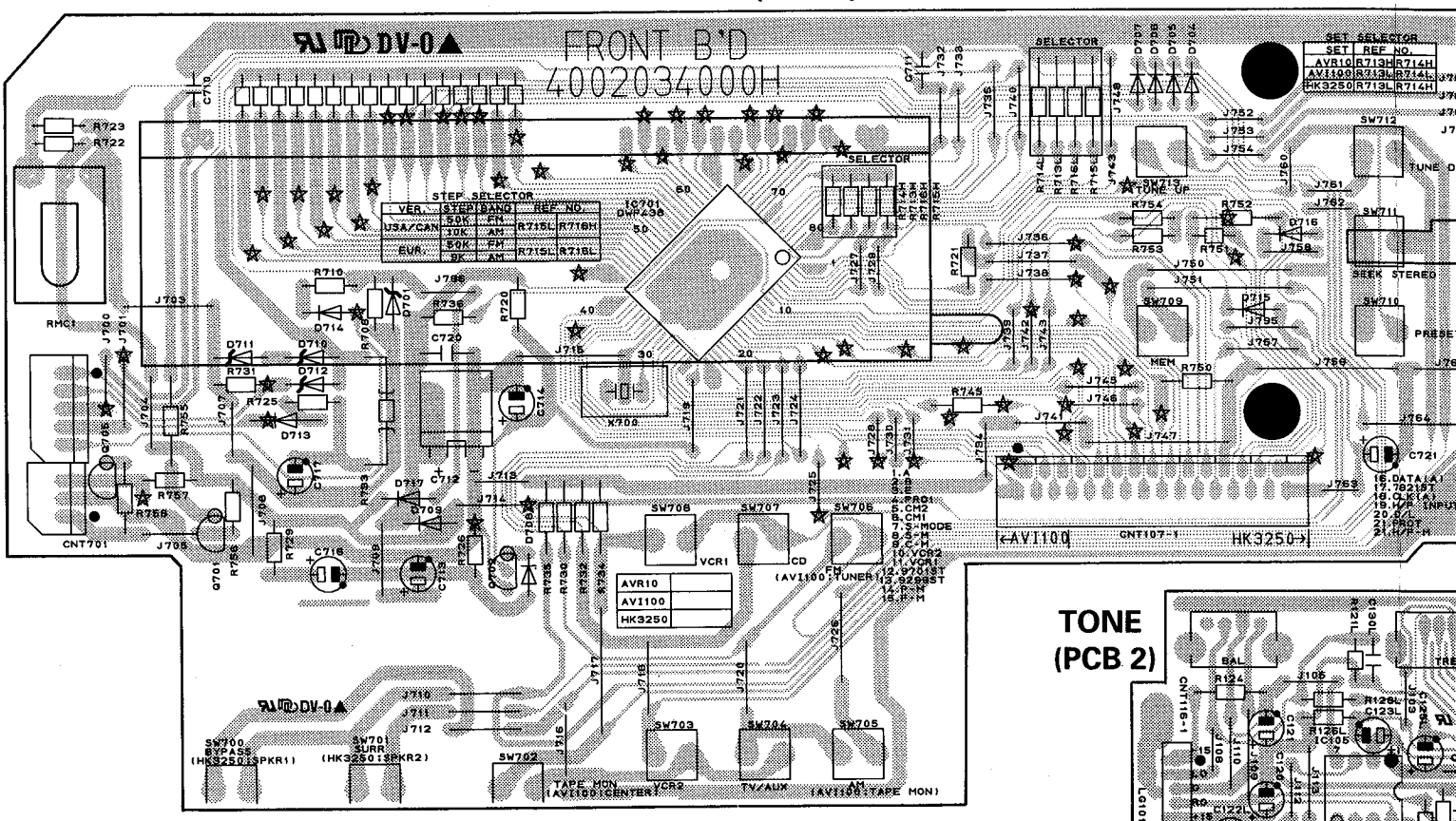
TUNER (PCB 9)



OUTLET (PCB 6)

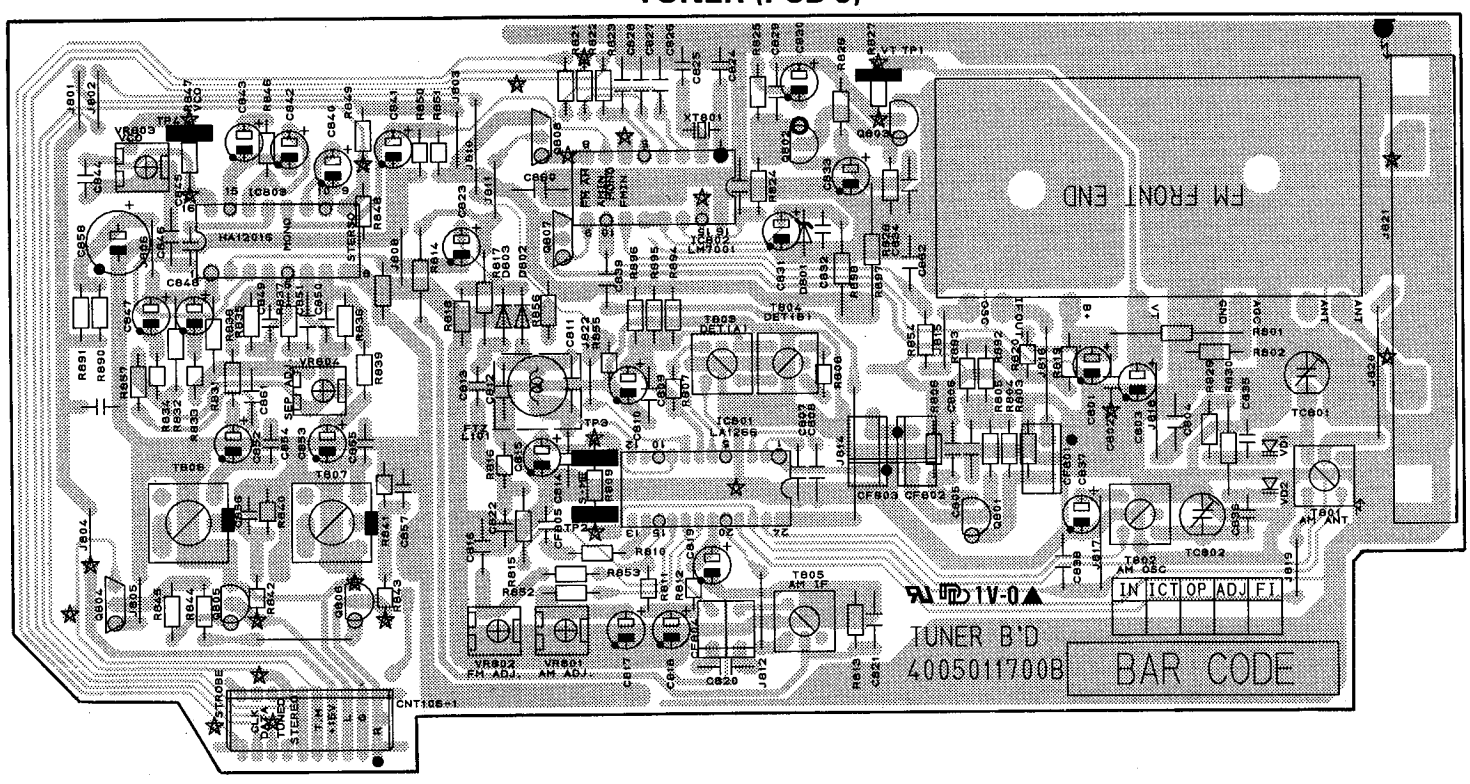


FRONT (PCB 3)

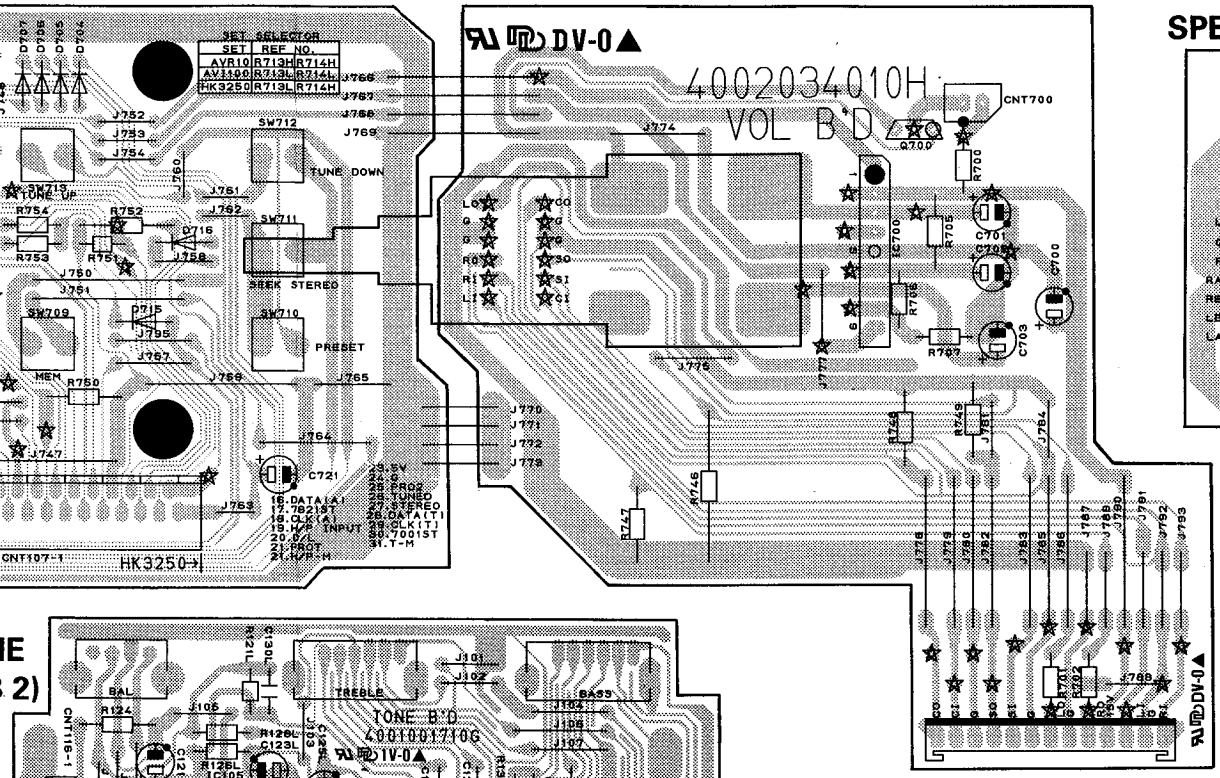


TONE (PCB 2)

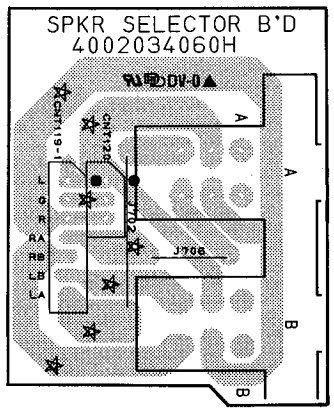
TUNER (PCB 9)

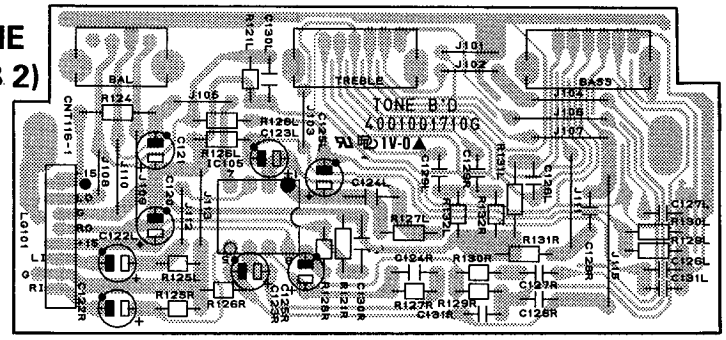


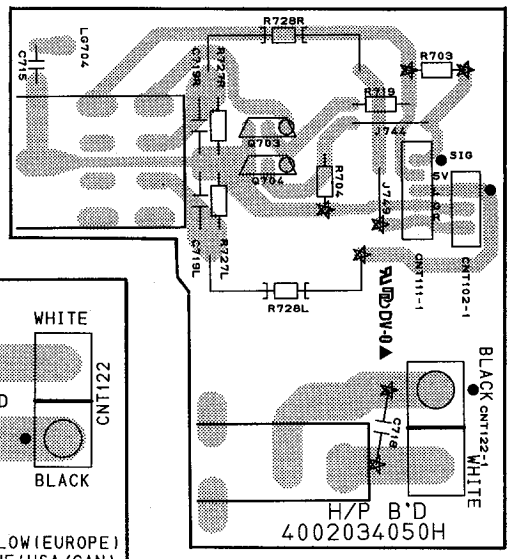
VOLUME (PCB 7)



SPEAKER SEL. (PCB 11)

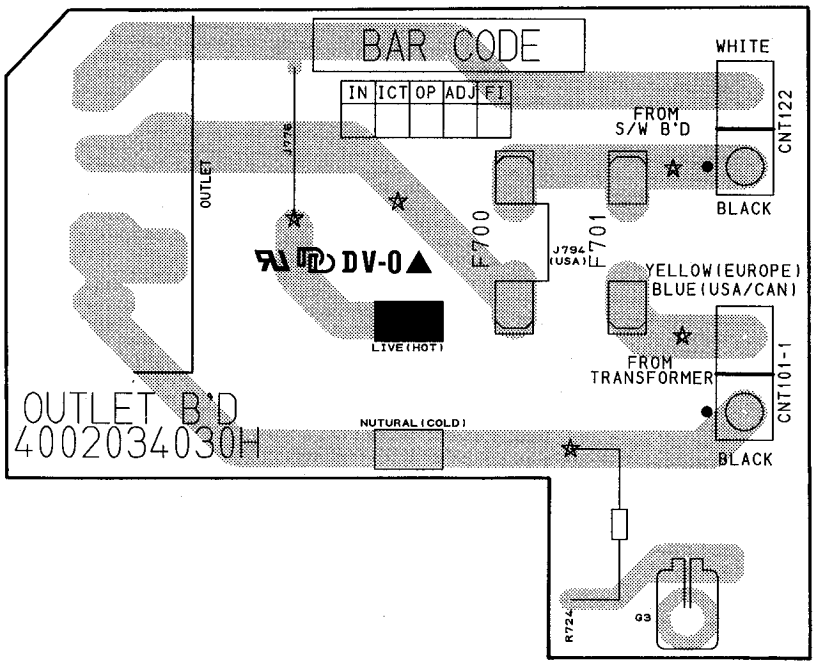






HEADPHONE (PCB 4)

OUTLET (PCB 6)



ELECTRICAL PARTS LIST

PRODUCT SAFETY NOTICE : Products marked with ⚠ 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 : (±0.5%), J : (±5%), K : (±10%), M : (±20%), Z : +80, – 20%)

Ref. No.	Description					Mfr. Part No.	Q'ty
PCB1	ASSEMBLY P.C.BOARD MAIN						
	CAPACITORS						
C107L/R	Ceramic Tubular	100	pF	50 V	K	3519101935	2
C108L/R	Ceramic Tubular	100	pF	50 V	K	3519101935	2
C109L/R	Ceramic Tubular	100	pF	50 V	K	3519101935	2
C111L/R	Ceramic Tubular	100	pF	50 V	K	3519101935	2
C113	Ceramic Tubular	100	pF	50 V	K	3519101935	1
C114/C115	Electrolytic SG	47	μF	16 V	M	3479347031	2
C116	Electrolytic SG	1	μF	50 V	M	3479310971	1
C117L/R	Electrolytic SG	4.7	μF	50 V	M	3479347971	2
C118L/R	Electrolytic SG	47	μF	16 V	M	3479347031	2
C120/C121	Electrolytic SG	47	μF	16 V	M	3479347031	2
C136	Ceramic Disk	0.1	μF	50 V	J	3509104512	1
C151	Electrolytic SG	22	μF	10 V	M	3479322021	1
⚠ C170/C171	Electrolytic HS	6800	μF	50 V	M	3419568224	2
C174	Electrolytic SG	4.7	μF	50 V	M	3479347971	1
C175-C184	Mylar	0.047	μF	100 V	J	3679473120	10
C185	Electrolytic SG	330	μF	50 V	M	3409333179	1
C186-C188	Electrolytic SG	4.7	μF	50 V	M	3479347971	3
C200L/R	Electrolytic SG	47	μF	16 V	M	3479347031	2
C201L/R	Electrolytic SG	1	μF	50 V	M	3479310971	2
C202L/R	Ceramic Tubular	68	pF	50 V	J	3579680130	2
C203L/R	Electrolytic SG	470	μF	6.3 V	M	3479347111	2
C204L/R	Ceramic Tubular	47	pF	50 V	J	3519470935	2
C205L/R	Electrolytic SG	10	μF	50 V	M	3479310071	2
C206L/R	Electrolytic SG	4.7	μF	50 V	M	3479347971	2
C207L/R	Mylar	0.068	μF	100 V	J	3679683120	2
C208L/R	Mylar	0.047	μF	100 V	J	3679473120	2
C209	Electrolytic SG	470	μF	6.3 V	M	3479347111	1
C210	Electrolytic SG	1	μF	50 V	M	3479310971	1
C211	Ceramic Disc	0.0022	μF	50 V	Z	3579222130	1
C213L/R	Electrolytic SG	330	μF	50 V	M	3409333179	2
C214L/R	Electrolytic SG	330	μF	50 V	M	3409333179	2
C215L/R	Ceramic Tubular	3.3	pF	50 V	J	3519033935	2
C216	Mylar	0.047	μF	100 V	J	3679473120	1
C217	Ceramic Disc	0.0022	μF	50 V	Z	3579222130	1
C222	Mylar	0.047	μF	100 V	J	3679473120	1
	CONNECTORS						
CNT102-1	Pin Base, 1P					4428525860	1
CNT103-1	Pin Base, 2P					4428525780	1
CNT106	Wafer, 10P, B'D to B'D					4428550100	1
CNT107	Wafer FPC, 19P					4428509017	1
CNT114	Wafer, 7P, B'D to B'D Type					4428505410	1
CNT115	Wafer, 2P					4428516110	1
CNT116	Wafer, 8P					4428516710	1
CNT118	Lead Ass'y, 2P, 200mm, to CNT118-1					436102203601	1
CNT119	Wafer, 7P					4408100927	1
CNT121	Lead Ass'y, 3P, 300mm					436203303332	1
	DIODES						
D101	1N4148, Switching					2058322101	1
⚠ D181-D184	1N5402, Retifier					2058100105	4
⚠ D189/D190	BZ 16BM					2258599120	2
D191	1N4148, Switching					2058322101	1
D200L/R	1N4148, Switching					2058322101	2
D201L/R	1N4148, Switching					2058322101	2
D202	UZ 9.1BSC					2258599107	1
D203/D204	1N4148, Switching					2058322101	2
	FUSES						
⚠ F101	NB 125 V, 0.5 A					5508201621	1
⚠ F102	NB 125 V, 0.5 A					5508201621	1
	INTEGRATED CIRCUITS						
IC101	LC7821					2168017132	1
IC102	KIA4559P (KIA75559P), OP Amp					2168206104	1
IC104	LTV-817, Optocoupler					2408000136	1
⚠ IC106	KIA7806PI, Regulator					2168606110	1
	COILS						
L101L/R	Inductor, 0.5uH					2648001010	2
	POSISTORS						
P201	Ass'y Posistor, 280mm					052438000280	1
P202	PTH9M04BE222TS2F33					2438012200	1
	TRANSISTORS						
Q151	DTA114YS/KRA107M					2238006103	1

Ref. No.	Description					Mfr. Part No.	Q'ty
Q181/Q182	BKTC3198Y(KTC1815Y), NPN					2208606104	2
Q183	MPSA56Y, PNP					2208206113	1
Q186	2SD2059Y(KTD2059Y)					2028406123	1
Q200	DTC114YS					2208622106	1
Q201L/R	KTD1302, NPN					2208606112	2
Q202	DTA114YS/KRA107M					2238006103	1
Q203L/R	KTA1268(KTA970BL), PNP					2208206104	2
Q204L/R	KTA1268(KTA970BL), PNP					2208206104	2
Q205L/R	KTA1268(KTA970BL), PNP					2208206104	2
Q206L/R	KTA1266Y(KTA1015Y), PNP					2208206105	2
Q207L/R	BKTC3200BL(KTC2240BL), NPN					2208606108	2
Q208L/R	BKTC3200BL(KTC2240BL), NPN					2208606108	2
Q209L/R	KTA1268(KTA970BL), PNP					2208206104	2
Q210L/R	KTA1024Y(BKTA949Y), PNP					2208206102	2
Q211L/R	2SC4137, NPN, Bias					2008622110	2
Q212L/R	KTC3206Y(BKTC2229Y), NPN					2208606107	2
Q213L/R	KSC2690AY, NPN					2008602102	2
Q214L/R	KSA1220AY, PNP					2008202101	2
⚠ Q215L/R	2SC3181N-O					2028307100	2
⚠ Q216L/R	2SA1264N-O					2028007100	2
Q217L/R	BKTC3198Y(KTC1815Y), NPN					2208606104	2
Q218	KTA1266Y(KTA1015Y), PNP					2208206105	1
Q219/Q220	BKTC3198Y(KTC1815Y), NPN					2208606104	2
	RESISTORS						
R101L/R	Carbon Film	1	kohm	1/5 W	J	3069102970	2
R102L/R	Carbon Film	1	kohm	1/5 W	J	3069102970	2
R103L/R	Carbon Film	1	kohm	1/5 W	J	3069102970	2
R104L/R	Carbon Film	1	kohm	1/5 W	J	3069102970	2
R105L/R	Carbon Film	1	kohm	1/5 W	J	3069102970	2
R106L/R	Carbon Film	1	kohm	1/5 W	J	3069102970	2
R107	Carbon Film	1	kohm	1/5 W	J	3069102970	1
R108	Carbon Film	150	ohm	1/5 W	J	3069151970	1
R109	Carbon Film	100	kohm	1/5 W	J	3069104970	1
R110	Carbon Film	150	ohm	1/5 W	J	3069151970	1
R111L/R	Carbon Film	100	kohm	1/5 W	J	3069104970	2
R112L/R	Carbon Film	220	kohm	1/5 W	J	3069224970	2
R123	Carbon Film	150	ohm	1/5 W	J	3069151970	1
R151	Carbon Film	3.9	kohm	1/5 W	J	3069392970	1
R152	Carbon Film	3.3	kohm	1/5 W	J	3069332970	1
R153	Carbon Film	100	ohm	1/5 W	J	3069101970	1
R154	Carbon Film	47	ohm	1/5 W	J	3069470970	1
R155	Carbon Film	47	kohm	1/5 W	J	3069473970	1
R156	Carbon Film	270	ohm	1/5 W	J	3069271970	1
R181	Carbon Film	3.3	kohm	1/5 W	J	3069332970	1
R182	Carbon Film	47	kohm	1/5 W	J	3069473970	4
R183-R185	Carbon Film	47	kohm	1/5 W	J	3069473970	4
R188L/R	Metal Film	47	ohm	1 W	J	3029470470	2
R189L/R	Metal Film	47	ohm	1 W	J	3029470470	2
R191/R192	Carbon Film	4.7	kohm	1/5 W	J	3069472970	2
R200	Carbon Film	150	kohm	1/5 W	J	3069154970	2
R201L/R	Carbon Film	330	ohm	1/5 W	J	3069331970	2
R202L/R	Carbon Film	3.3	kohm	1/5 W	J	3069332970	2
R203L/R	Carbon Film	33	kohm	1/5 W	J	3069333970	2
R204L/R	Carbon Film	33	kohm	1/5 W	J	3069333970	2
R205L/R	Carbon Film	10	kohm	1/5 W	J	3069103970	2
R206L/R	Carbon Film	270	ohm	1/5 W	J	3069271970	2
R207L/R	Carbon Film	390	ohm	1/5 W	J	3069391970	2
R208L/R	Carbon Film	390	ohm	1/5 W	J	3069391970	2
R209L/R	Carbon Film	1.5	kohm	1/5 W	J	3069152970	2
R210L/R	Carbon Film	1.5	kohm	1/5 W	J	3069152970	2
R211L/R	Carbon Film	1.8	kohm	1/5 W	J	3069182970	2
R212L/R	Carbon Film	560	ohm	1/5 W	J	3069561970	2
R213L/R	Carbon Film	560	ohm	1/5 W	J	3069561970	2
R214L/R	Carbon Film	560	ohm	1/5 W	J	3069561970	2
R215L/R	Carbon Film	560	ohm	1/5 W	J	3069561970	2
R216L/R	Carbon Film	560	ohm	1/5 W	J	3069561970	2
R217L/R	Carbon Film	560	ohm	1/5 W	J	3069561970	2
R218L/R	Carbon Film	4.7	kohm	1/5 W	J	3069472970	2
R219L/R	Carbon Film	22	kohm	1/5 W	J	3069223970	2
R220L/R	Carbon Film	22	kohm	1/5 W	J	3069223970	2
R221L/R	Metal Film	1.21	kohm	1/4 W	F	3027121125	2
R222L/R	Metal Film	442	ohm	1/4 W	F	3027442025	2
R223L/R	Carbon Film	82	ohm	1/5 W	J	3069820970	2
R224L/R	Carbon Film	82	ohm	1/5 W	J	3069820970	2
R225L/R	Carbon Film	82	ohm	1/5 W	J	3069820970	2
⚠ R226L/R	Cement	0.27	ohm	5 W	J	3059027776	2
⚠ R227L/R	Cement	0.27	ohm	5 W	J	3059027776	2
R228L/R	Carbon Film	1.8	kohm	1/5 W	J	3069182970	2

Ref. No.	Description					Mfr. Part No.	Q'ty
R229L/R	Carbon Film	1.5	kohm	1/5 W	J	3069152970	2
R230L/R	Carbon Film	910	ohm	1/5 W	J	3069911970	2
R231L/R	Carbon Film	6.8	kohm	1/5 W	J	3069682970	2
R232L/R	Carbon Film	22	ohm	1/5 W	J	3069220970	2
R233L/R	Carbon Film	22	ohm	1/5 W	J	3069220970	2
R234L/R	Carbon Film	24	kohm	1/5 W	J	3069243970	2
R235L/R	Metal Film	10	ohm	1 W	J	3029100470	2
R236	Carbon Film	68	kohm	1/5 W	J	3069683970	1
R237	Carbon Film	100	kohm	1/5 W	J	3069104970	1
R238	Carbon Film	3.3	kohm	1/5 W	J	3069332970	1
R239	Carbon Film	1.5	kohm	1/5 W	J	3069152970	1
R240	Carbon Film	22	kohm	1/5 W	J	3069223970	1
R241	Carbon Film	15	kohm	1/5 W	J	3069153970	1
R242	Carbon Film	10	kohm	1/5 W	J	3069103970	1
R243	Carbon Film	4.7	kohm	1/5 W	J	3069472970	1
R244	Carbon Film	1	kohm	1/5 W	J	3069102970	1
R245	Carbon Film	6.8	kohm	1/5 W	J	3069682970	1
R246L/R	Carbon Film	33	kohm	1/5 W	J	3069333970	2
	MISCELLANEOUS						
	Terminal Ground					4235007310	2
	Clip Fuse					4255001010	4
33	Jack, RCA, 4P					4438103110	2
34	Jack, RCA, 6P					4438103210	1
35	Jack, Multi, 2P					4438007510	1
36	Terminal Speaker, Screw Type, 8P					4408105810	1
PCB2	ASSEMBLY P.C.BOARD TONE						
	CAPACITORS						
C122L/R	Electrolytic SG	47	μF	16 V	M	3479347031	2
C123L/R	Electrolytic SG	4.7	μF	50 V	M	3479347971	2
C124L/R	Ceramic Tubular	47	pF	50 V	J	3519470935	2
C125L/R	Electrolytic SG	4.7	μF	50 V	M	3479347971	2
C126L/R	Mylar	0.027	μF	100 V	J	3679273120	2
C127L/R	Mylar	0.0033	μF	100 V	J	3679332120	2
C128L/R	Mylar	0.15	μF	63V	K	3679154297	2
C129L/R	Mylar	0.018	μF	100 V	J	3679183120	2
C130L/R	Ceramic Tubular	330	pF	50 V	K	3519331935	2
	CONNECTOR						
CNT116-1	Lead Ass'y, 8P, 120mm					436208123332	1
	INTEGRATED CIRCUIT						
IC105	KIA4559P (KIA75559P), OP Amp					2168206104	1
	RESISTORS						
R124	Carbon Film	150	ohm	1/5 W	J	3069151970	1
R121L/R	Carbon Film	100	kohm	1/5 W	J	3069104970	2
R125L/R	Carbon Film	100	kohm	1/5 W	J	3069104970	2
R126L/R	Carbon Film	270	kohm	1/5 W	J	3069274970	2
R127L/R	Carbon Film	1	Mohm	1/5 W	J	3069105970	2
R128L/R	Carbon Film	1	kohm	1/5 W	J	3069102970	2
R129L/R	Carbon Film	18	kohm	1/5 W	J	3069183970	2
R130L/R	Carbon Film	1	kohm	1/5 W	J	3069102970	2
R131L/R	Carbon Film	3.9	kohm	1/5 W	J	3069392970	2
R132L/R	Carbon Film	620	ohm	1/5 W	J	3069621970	2
	MISCELLANEOUS						
17	Volume, Bass/Treble					3208068910	2
18	Volume, Balance					3208068810	1
19	Shield Fence, Tone					6165149710	1
PCB3	ASSEMBLY P.C. BOARD FRONT						
	CAPACITORS						
C710/C711	Mylar	0.047	μF	100 V	J	3679473120	2
C712	Back-Up	0.047	μF	5.5 V	M	3439247315	1
C713	Electrolytic SG	47	μF	10 V	M	3479347021	1
C714	Electrolytic SG	1	μF	50 V	M	3479310971	1
C716	Electrolytic SG	10	μF	50 V	M	3479310071	1
C717	Electrolytic SG	100	μF	50 V	M	3479310171	1
C720	Ceramic Disc	0.022	μF	50 V	Z	3519223530	1
C721	Electrolytic SG	0.47	μF	50 V	M	3479347871	1
	DIODES						
D701	UZ 4.3BSB					2258599102	1
D704-D709	1N4148, Switching					2058322101	6
D710/D711	UZ 16.0BSD					2258599117	2
D712	UZ 9.1BSC					2258599107	1
D713	1N4002, Rectifier					2258100135	1
D714	1N4148, Switching					2058322101	1
D716	1N4148, Switching					2058322101	1
	FIP						
FL700	FL Display CM1361C					2328002306	1

Ref. No.	Description					Mfr. Part No.	Q'ty
	INTEGRATED CIRCUIT						
IC701	CXP82316, CPU					2138322189	1
	TRANSISTORS						
Q701	BKTC3198Y(KTC1815Y), NPN					2208606104	1
Q702	BKTC3198Y(KTC1815Y), NPN					2208606104	1
	RESISTORS						
R708	Carbon Film	4.7	kohm	1/5 W	J	3069472970	1
R710	Carbon Film	4.7	kohm	1/5 W	J	3069472970	1
R713H	Carbon Film	47	kohm	1/5 W	J	3069473970	1
R714L	Carbon Film	47	kohm	1/5 W	J	3069473970	1
R715H	Carbon Film	47	kohm	1/5 W	J	3069473970	1
R716L	Carbon Film	47	kohm	1/5 W	J	3069473970	1
R717	Carbon Film	470	ohm	1/5 W	J	3069471970	1
R718	Carbon Film	3.3	kohm	1/5 W	J	3069332970	1
R720	Carbon Film	100	kohm	1/5 W	J	3069104970	1
R721	Carbon Film	330	ohm	1/5 W	J	3069331970	1
R722	Carbon Film	3.3	kohm	1/5 W	J	3069332970	1
R723	Carbon Film	47	kohm	1/5 W	J	3069473970	1
R725	Carbon Film	100	ohm	1/5 W	J	3069101970	1
R726	Carbon Film	10	kohm	1/5 W	J	3069103970	1
R729	Carbon Film	330	ohm	1/5 W	J	3069331970	1
R730	Carbon Film	100	kohm	1/5 W	J	3069104970	1
R731	Carbon Film	15	kohm	1/5 W	J	3069153970	1
R732	Carbon Film	100	kohm	1/5 W	J	3069104970	1
R733	Metal Film	390	ohm	1 W	J	3029391470	1
R734/R735	Carbon Film	100	kohm	1/5 W	J	3069104970	2
R745	Carbon Film	1	kohm	1/5 W	J	3069102970	1
	REMOTE SENSOR						
RMC1	TEMT5380(38 kHz)					2408005001	1
	RESONATOR						
X700	CST10MTW-TF01					3938124010	1
	CONNECTORS						
CNT105-1	Wafer, 5P, Angle					4428513450	1
CNT107-1	Wafer FPC, 19P					4428519826	1
CNT701	Wafer, 2P, Angle					4428513420	1
	MISCELLANEOUS						
22	Holder FL					6043010210	1
20	Switch, Tact					4658004810	14
PCB4	ASSEMBLY P.C. BOARD HEADPHONE						
	CAPACITORS						
C715	Ceramic Disc.	0.1	μF	50V	Z	3579104530	1
C718	SPK-Killer	0.0047	μF	400V		3548472340	1
C719L/R	Ceramic Disc.	0.047	μF	50 V	Z	3579473530	2
	TRANSISTORS						
Q703/Q704	DTC114YS					2208622106	2
	RESISTORS						
R703	Carbon Film	2	kohm	1/5 W	J	3069202970	1
R704	Carbon Film	10	kohm	1/5 W	J	3069103970	1
R719	Carbon Film	10	kohm	1/5 W	J	3069103970	1
R728L/R	Carbon Film	100	ohm	1/5 W	J	3069101970	2
	CONNECTORS						
CNT122-1	Lead Ass'y, 2P, 300mm, LV Type					4358850230	1
CNT120-1	Lead Ass'y, 3P, 220mm					436102303331	
	MISCELLANEOUS						
11	Jack, Phone					4438004510	1
12	Switch, Power, Push Type					4628055910	1
PCB5	ASSEMBLY P.C. BOARD POWER LED						
D702/D703	SLR-34GC, Green					2371124701	2
CNT701-1	Lead Ass'y, 2P, 180mm					436102183331	1
PCB6	ASSEMBLY P.C BOARD OUTLET						
⚠ F700	Jumper					1508400602	1
⚠ F701	NB 125 V, 5 A					5508203021	1
R724	Carbon Film	3.3	Mohm	1/2 W	J	3029335380	1
CNT101-1	Pin Base, 2P					4428525780	1
CNT122	Pin Base, 2P					4428525780	1
	Clip Fuse					4255001010	2
	Pin Solder					4228001410	2
	Terminal Ground					4235007310	1
⚠ 43	Outlet, AC					4448104810	1

ELECTRICAL PARTS LIST

PRODUCT SAFETY NOTICE : Products marked with ⚠ 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 : (±0.5%), J : (±5%), K : (±10%), M : (±20%), Z : +80, – 20%)

Ref. No.	Description					Mfr. Part No.	Q'ty
PCB1	ASSEMBLY P.C.BOARD MAIN						
	CAPACITORS						
C107L/R	Ceramic Tubular	100	pF	50 V	K	3519101935	2
C108L/R	Ceramic Tubular	100	pF	50 V	K	3519101935	2
C109L/R	Ceramic Tubular	100	pF	50 V	K	3519101935	2
C111L/R	Ceramic Tubular	100	pF	50 V	K	3519101935	2
C113	Ceramic Tubular	100	pF	50 V	K	3519101935	1
C114/C115	Electrolytic SG	47	μF	16 V	M	3479347031	2
C116	Electrolytic SG	1	μF	50 V	M	3479310971	1
C117L/R	Electrolytic SG	4.7	μF	50 V	M	3479347971	2
C118L/R	Electrolytic SG	47	μF	16 V	M	3479347031	2
C120/C121	Electrolytic SG	47	μF	16 V	M	3479347031	2
C136	Ceramic Disk	0.1	μF	50 V	J	3509104512	1
C151	Electrolytic SG	22	μF	10 V	M	3479322021	1
⚠ C170/C171	Electrolytic HS	6800	μF	50 V	M	3419568224	2
C174	Electrolytic SG	4.7	μF	50 V	M	3479347971	1
C175-C184	Mylar	0.047	μF	100 V	J	3679473120	10
C185	Electrolytic SG	330	μF	50 V	M	3409333179	1
C186-C188	Electrolytic SG	4.7	μF	50 V	M	3479347971	3
C200L/R	Electrolytic SG	47	μF	16 V	M	3479347031	2
C201L/R	Electrolytic SG	1	μF	50 V	M	3479310971	2
C202L/R	Ceramic Tubular	68	pF	50 V	J	3579680130	2
C203L/R	Electrolytic SG	470	μF	6.3 V	M	3479347111	2
C204L/R	Ceramic Tubular	47	pF	50 V	J	3519470935	2
C205L/R	Electrolytic SG	10	μF	50 V	M	3479310071	2
C206L/R	Electrolytic SG	4.7	μF	50 V	M	3479347971	2
C207L/R	Mylar	0.068	μF	100 V	J	3679683120	2
C208L/R	Mylar	0.047	μF	100 V	J	3679473120	2
C209	Electrolytic SG	470	μF	6.3 V	M	3479347111	1
C210	Electrolytic SG	1	μF	50 V	M	3479310971	1
C211	Ceramic Disc	0.0022	μF	50 V	Z	3579222130	1
C213L/R	Electrolytic SG	330	μF	50 V	M	3409333179	2
C214L/R	Electrolytic SG	330	μF	50 V	M	3409333179	2
C215L/R	Ceramic Tubular	3.3	pF	50 V	J	3519033935	2
C216	Mylar	0.047	μF	100 V	J	3679473120	1
C217	Ceramic Disc	0.0022	μF	50 V	Z	3579222130	1
C222	Mylar	0.047	μF	100 V	J	3679473120	1
	CONNECTORS						
CNT102-1	Pin Base, 1P					4428525860	1
CNT103-1	Pin Base, 2P					4428525780	1
CNT106	Wafer, 10P, B'D to B'D					4428550100	1
CNT107	Wafer FPC, 19P					4428509017	1
CNT114	Wafer, 7P, B'D to B'D Type					4428505410	1
CNT115	Wafer, 2P					4428516110	1
CNT116	Wafer, 8P					4428516710	1
CNT118	Lead Ass'y, 2P, 200mm, to CNT118-1					436102203601	1
CNT119	Wafer, 7P					4408100927	1
CNT121	Lead Ass'y, 3P, 300mm					436203303332	1
	DIODES						
D101	1N4148, Switching					2058322101	1
⚠ D181-D184	1N5402, Retifier					2058100105	4
⚠ D189/D190	BZ 16BM					2258599120	2
D191	1N4148, Switching					2058322101	1
D200L/R	1N4148, Switching					2058322101	2
D201L/R	1N4148, Switching					2058322101	2
D202	UZ 9.1BSC					2258599107	1
D203/D204	1N4148, Switching					2058322101	2
	FUSES						
⚠ F101	NB 125 V, 0.5 A					5508201621	1
⚠ F102	NB 125 V, 0.5 A					5508201621	1
	INTEGRATED CIRCUITS						
IC101	LC7821					2168017132	1
IC102	KIA4559P (KIA75559P), OP Amp					2168206104	1
IC104	LTV-817, Optocoupler					2408000136	1
⚠ IC106	KIA7806PI, Regulator					2168606110	1
	COILS						
L101L/R	Inductor, 0.5uH					2648001010	2
	POSISTORS						
P201	Ass'y Posistor, 280mm					052438000280	1
P202	PTH9M04BE222TS2F33					2438012200	1
	TRANSISTORS						
Q151	DTA114YS/KRA107M					2238006103	1
Q181/Q182	BKTC3198Y(KTC1815Y), NPN					2208606104	2
Q183	MPSA56Y, PNP					2208206113	1
Q186	2SD2059Y(KTD2059Y)					2028406123	1
Q200	DTC114YS					2208622106	1
Q201L/R	KTD1302, NPN					2208606112	2
Q202	DTA114YS/KRA107M					2238006103	1
Q203L/R	KTA1268(KTA970BL), PNP					2208206104	2
Q204L/R	KTA1268(KTA970BL), PNP					2208206104	2
Q205L/R	KTA1268(KTA970BL), PNP					2208206104	2
Q206L/R	KTA1266Y(KTA1015Y), PNP					2208206105	2
Q207L/R	BKTC3200BL(KTC2240BL), NPN					2208606108	2
Q208L/R	BKTC3200BL(KTC2240BL), NPN					2208606108	2
Q209L/R	KTA1268(KTA970BL), PNP					2208206104	2
Q210L/R	KTA1024Y(BKTA949Y), PNP					2208206102	2
Q211L/R	2SC4137, NPN, Bias					2008622110	2
Q212L/R	KTC3206Y(BKTC2229Y), NPN					2208606107	2
Q213L/R	KSC2690AY, NPN					2008602102	2
Q214L/R	KSA1220AY, PNP					2008202101	2
⚠ Q215L/R	2SC3181N-O					2028307100	2
⚠ Q216L/R	2SA1264N-O					2028007100	2
Q217L/R	BKTC3198Y(KTC1815Y), NPN					2208606104	2
Q218	KTA1266Y(KTA1015Y), PNP					2208206105	1
Q219/Q220	BKTC3198Y(KTC1815Y), NPN					2208606104	2
	RESISTORS						
R101L/R	Carbon Film	1	kohm	1/5 W	J	3069102970	2
R102L/R	Carbon Film	1	kohm	1/5 W	J	3069102970	2
R103L/R	Carbon Film	1	kohm	1/5 W	J	3069102970	2
R104L/R	Carbon Film	1	kohm	1/5 W	J	3069102970	2
R105L/R	Carbon Film	1	kohm	1/5 W	J	3069102970	2
R106L/R	Carbon Film	1	kohm	1/5 W	J	3069102970	2
R107	Carbon Film	1	kohm	1/5 W	J	3069102970	1
R108	Carbon Film	150	ohm	1/5 W	J	3069151970	1
R109	Carbon Film	100	kohm	1/5 W	J	3069104970	1
R110	Carbon Film	150	ohm	1/5 W	J	3069151970	1
R111L/R	Carbon Film	100	kohm	1/5 W	J	3069104970	2
R112L/R	Carbon Film	220	kohm	1/5 W	J	3069224970	2
R123	Carbon Film	150	ohm	1/5 W	J	3069151970	1
R151	Carbon Film	3.9	kohm	1/5 W	J	3069392970	1
R152	Carbon Film	3.3	kohm	1/5 W	J	3069332970	1
R153	Carbon Film	100	ohm	1/5 W	J	3069101970	1
R154	Carbon Film	47	ohm	1/5 W	J	3069470970	1
R155	Carbon Film	47	kohm	1/5 W	J	3069473970	1
R156	Carbon Film	270	ohm	1/5 W	J	3069271970	1
R181	Carbon Film	3.3	kohm	1/5 W	J	3069332970	1
R182	Carbon Film	47	kohm	1/5 W	J	3069473970	4
R183-R185	Carbon Film	47	kohm	1/5 W	J	3069473970	4
R188L/R	Metal Film	47	ohm	1 W	J	3029470470	2
R189L/R	Metal Film	47	ohm	1 W	J	3029470470	2
R191/R192	Carbon Film	4.7	kohm	1/5 W	J	3069472970	2
R200	Carbon Film	150	kohm	1/5 W	J	3069154970	2
R201L/R	Carbon Film	330	ohm	1/5 W	J	3069331970	2
R202L/R	Carbon Film	3.3	kohm	1/5 W	J	3069332970	2
R203L/R	Carbon Film	33	kohm	1/5 W	J	3069333970	2
R204L/R	Carbon Film	33	kohm	1/5 W	J	3069333970	2
R205L/R	Carbon Film	10	kohm	1/5 W	J	3069103970	2
R206L/R	Carbon Film	270	ohm	1/5 W	J	3069271970	2
R207L/R	Carbon Film	390	ohm	1/5 W	J	3069391970	2
R208L/R	Carbon Film	390	ohm	1/5 W	J	3069391970	2
R209L/R	Carbon Film	1.5	kohm	1/5 W	J	3069152970	2
R210L/R	Carbon Film	1.5	kohm	1/5 W	J	3069152970	2
R211L/R	Carbon Film	1.8	kohm	1/5 W	J	3069182970	2
R212L/R	Carbon Film	560	ohm	1/5 W	J	3069561970	2
R213L/R	Carbon Film	560	ohm	1/5 W	J	3069561970	2
R214L/R	Carbon Film	560	ohm	1/5 W	J	3069561970	2
R215L/R	Carbon Film	560	ohm	1/5 W	J	3069561970	2
R216L/R	Carbon Film	560	ohm	1/5 W	J	3069561970	2
R217L/R	Carbon Film	560	ohm	1/5 W	J	3069561970	2
R218L/R	Carbon Film	4.7	kohm	1/5 W	J	3069472970	2
R219L/R	Carbon Film	22	kohm	1/5 W	J	3069223970	2
R220L/R	Carbon Film	22	kohm	1/5 W	J	3069223970	2
R221L/R	Metal Film	1.21	kohm	1/4 W	F	3027121125	2
R222L/R	Metal Film	442	ohm	1/4 W	F	3027442025	2
R223L/R	Carbon Film	82	ohm	1/5 W	J	3069820970	2
R224L/R	Carbon Film	82	ohm	1/5 W	J	3069820970	2
R225L/R	Carbon Film	82	ohm	1/5 W	J	3069820970	2
⚠ R226L/R	Cement	0.27	ohm	5 W	J	3059027776	2
⚠ R227L/R	Cement	0.27	ohm	5 W	J	3059027776	2
R228L/R	Carbon Film	1.8	kohm	1/5 W	J	3069182970	2

Ref. No.	Description	Mfr. Part No.	Q'ty
R229L/R	Carbon Film 1.5 kohm 1/5 W J	3069152970	2
R230L/R	Carbon Film 910 ohm 1/5 W J	3069911970	2
R231L/R	Carbon Film 6.8 kohm 1/5 W J	3069682970	2
R232L/R	Carbon Film 22 ohm 1/5 W J	3069220970	2
R233L/R	Carbon Film 22 ohm 1/5 W J	3069220970	2
R234L/R	Carbon Film 24 kohm 1/5 W J	3069243970	2
R235L/R	Metal Film 10 ohm 1 W J	3029100470	2
R236	Carbon Film 68 kohm 1/5 W J	3069683970	1
R237	Carbon Film 100 kohm 1/5 W J	3069104970	1
R238	Carbon Film 3.3 kohm 1/5 W J	3069332970	1
R239	Carbon Film 1.5 kohm 1/5 W J	3069152970	1
R240	Carbon Film 22 kohm 1/5 W J	3069223970	1
R241	Carbon Film 15 kohm 1/5 W J	3069153970	1
R242	Carbon Film 10 kohm 1/5 W J	3069103970	1
R243	Carbon Film 4.7 kohm 1/5 W J	3069472970	1
R244	Carbon Film 1 kohm 1/5 W J	3069102970	1
R245	Carbon Film 6.8 kohm 1/5 W J	3069682970	1
R246L/R	Carbon Film 33 kohm 1/5 W J	3069333970	2
	MISCELLANEOUS		
	Terminal Ground	4235007310	2
	Clip Fuse	4255001010	4
33	Jack, RCA, 4P	4438103110	2
34	Jack, RCA, 6P	4438103210	1
35	Jack, Multi, 2P	4438007510	1
36	Terminal Speaker, Screw Type, 8P	4408105810	1

PCB2 ASSEMBLY P.C.BOARD TONE

	CAPACITORS		
C122L/R	Electrolytic SG 47 µF 16 V M	3479347031	2
C123L/R	Electrolytic SG 4.7 µF 50 V M	3479347971	2
C124L/R	Ceramic Tubular 47 pF 50 V J	3519470935	2
C125L/R	Electrolytic SG 4.7 µF 50 V M	3479347971	2
C126L/R	Mylar 0.027 µF 100 V J	3679273120	2
C127L/R	Mylar 0.0033 µF 100 V J	3679332120	2
C128L/R	Mylar 0.15 µF 63V K	3679154297	2
C129L/R	Mylar 0.018 µF 100 V J	3679183120	2
C130L/R	Ceramic Tubular 330 pF 50 V K	3519331935	2
	CONNECTOR		
CNT116-1	Lead Ass'y, 8P, 120mm	436208123332	1
	INTEGRATED CIRCUIT		
IC105	KIA4559P (KIA75559P), OP Amp	2168206104	1
	RESISTORS		
R124	Carbon Film 150 ohm 1/5 W J	3069151970	1
R121L/R	Carbon Film 100 kohm 1/5 W J	3069104970	2
R125L/R	Carbon Film 100 kohm 1/5 W J	3069104970	2
R126L/R	Carbon Film 270 kohm 1/5 W J	3069274970	2
R127L/R	Carbon Film 1 Mohm 1/5 W J	3069105970	2
R128L/R	Carbon Film 1 kohm 1/5 W J	3069102970	2
R129L/R	Carbon Film 18 kohm 1/5 W J	3069183970	2
R130L/R	Carbon Film 1 kohm 1/5 W J	3069102970	2
R131L/R	Carbon Film 3.9 kohm 1/5 W J	3069392970	2
R132L/R	Carbon Film 620 ohm 1/5 W J	3069621970	2
	MISCELLANEOUS		
17	Volume, Bass/Treble	3208068910	2
18	Volume, Balance	3208068810	1
19	Shield Fence, Tone	6165149710	1

PCB3 ASSEMBLY P.C.BOARD FRONT

	CAPACITORS		
C710/C711	Mylar 0.047 µF 100 V J	3679473120	2
C712	Back-Up 0.047 µF 5.5 V M	3439247315	1
C713	Electrolytic SG 47 µF 10 V M	3479347021	1
C714	Electrolytic SG 1 µF 50 V M	3479310971	1
C716	Electrolytic SG 10 µF 50 V M	3479310071	1
C717	Electrolytic SG 100 µF 50 V M	3479310171	1
C720	Ceramic Disc 0.022 µF 50 V Z	3519223530	1
C721	Electrolytic SG 0.47 µF 50 V M	3479347871	1
	DIODES		
D701	UZ 4.3BSB	2258599102	1
D704-D709	1N4148, Switching	2058322101	6
D710/D711	UZ 16.0BSD	2258599117	2
D712	UZ 9.1BSC	2258599107	1
D713	1N4002, Rectifier	2258100135	1
D714	1N4148, Switching	2058322101	1
D716	1N4148, Switching	2058322101	1
	FIP		
FL700	FL Display CM1361C	2328002306	1

Ref. No.	Description	Mfr. Part No.	Q'ty
	INTEGRATED CIRCUIT		
IC701	CXP82316, CPU	2138322189	1
	TRANSISTORS		
Q701	BKTC3198Y(KTC1815Y), NPN	2208606104	1
Q702	BKTC3198Y(KTC1815Y), NPN	2208606104	1
	RESISTORS		
R708	Carbon Film 4.7 kohm 1/5 W J	3069472970	1
R710	Carbon Film 4.7 kohm 1/5 W J	3069472970	1
R713H	Carbon Film 47 kohm 1/5 W J	3069473970	1
R714L	Carbon Film 47 kohm 1/5 W J	3069473970	1
R715H	Carbon Film 47 kohm 1/5 W J	3069473970	1
R716L	Carbon Film 47 kohm 1/5 W J	3069473970	1
R717	Carbon Film 470 ohm 1/5 W J	3069471970	1
R718	Carbon Film 3.3 kohm 1/5 W J	3069332970	1
R720	Carbon Film 100 kohm 1/5 W J	3069104970	1
R721	Carbon Film 330 ohm 1/5 W J	3069331970	1
R722	Carbon Film 3.3 kohm 1/5 W J	3069332970	1
R723	Carbon Film 47 kohm 1/5 W J	3069473970	1
R725	Carbon Film 100 ohm 1/5 W J	3069101970	1
R726	Carbon Film 10 kohm 1/5 W J	3069103970	1
R729	Carbon Film 330 ohm 1/5 W J	3069331970	1
R730	Carbon Film 100 kohm 1/5 W J	3069104970	1
R731	Carbon Film 15 kohm 1/5 W J	3069153970	1
R732	Carbon Film 100 kohm 1/5 W J	3069104970	1
R733	Metal Film 390 ohm 1 W J	3029391470	1
R734/R735	Carbon Film 100 kohm 1/5 W J	3069104970	2
R745	Carbon Film 1 kohm 1/5 W J	3069102970	1
	REMOTE SENSOR		
RMC1	TEMT5380(38 kHz)	2408005001	1
	RESONATOR		
X700	CST10MTW-TF01	3938124010	1
	CONNECTORS		
CNT105-1	Wafer, 5P, Angle	4428513450	1
CNT107-1	Wafer FPC, 19P	4428519826	1
CNT701	Wafer, 2P, Angle	4428513420	1
	MISCELLANEOUS		
22	Holder FL	6043010210	1
20	Switch, Tact	4658004810	14

PCB4 ASSEMBLY P.C.BOARD HEADPHONE

	CAPACITORS		
C715	Ceramic Disc. 0.1 µF 50V Z	3579104530	1
C718	SPK-Killer 0.0047 µF 400V	3548472340	1
C719L/R	Ceramic Disc. 0.047 µF 50 V Z	3579473530	2
	TRANSISTORS		
Q703/Q704	DTC114YS	2208622106	2
	RESISTORS		
R703	Carbon Film 2 kohm 1/5 W J	3069202970	1
R704	Carbon Film 10 kohm 1/5 W J	3069103970	1
R719	Carbon Film 10 kohm 1/5 W J	3069103970	1
R728L/R	Carbon Film 100 ohm 1/5 W J	3069101970	2
	CONNECTORS		
CNT122-1	Lead Ass'y, 2P, 300mm, LV Type	4358850230	1
CNT120-1	Lead Ass'y, 3P, 220mm	436102303331	
	MISCELLANEOUS		
11	Jack, Phone	4438004510	1
12	Switch, Power, Push Type	4628055910	1

PCB5 ASSEMBLY P.C.BOARD POWER LED

D702/D703	SLR-34GC, Green	2371124701	2
CNT701-1	Lead Ass'y, 2P, 180mm	436102183331	1

PCB6 ASSEMBLY P.C.BOARD OUTLET

⚠ F700	Jumper	1508400602	1
⚠ F701	NB 125 V, 5 A	5508203021	1
R724	Carbon Film 3.3 Mohm 1/2 W J	3029335380	1
CNT101-1	Pin Base, 2P	4428525780	1
CNT122	Pin Base, 2P	4428525780	1
	Clip Fuse	4255001010	2
	Pin Solder	4228001410	2
	Terminal Ground	4235007310	1
⚠ 43	Outlet, AC	4448104810	1

Ref. No.	Description	Mfr. Part No.	Q'ty
PCB7	**ASSEMBLY P. C. BOARD VOLUME**		
	CAPACITORS		
C700	Electrolytic SG 10 µF 50 V M	3479310071	1
C701	Electrolytic SG 100 µF 10 V M	3479310121	1
C702	Electrolytic SG 100 µF 16 V M	3479310131	1
C703	Electrolytic SG 100 µF 10 V M	3479310121	1
	INTEGRATED CIRCUIT		
IC700	TA7291S	2168007204	1
	TRANSISTOR		
Q700	DTC114TS	2208622108	1
	RESISTORS		
R700	Carbon Film 680 ohm 1/5 W J	3069681970	1
R701/R702	Carbon Film 1 kohm 1/5 W J	3069102970	2
R705	Carbon Film 4.7 ohm 1/5 W J	3069479970	1
R706	Carbon Film 10 kohm 1/5 W J	3069103970	1
R707	Carbon Film 3 kohm 1/5 W J	3069302970	1
	CONNECTORS		
CNT114-1	Wafer, 7P	4438302958	1
CNT700	Wafer, 2P	4428508210	1
	MISCELLANEOUS		
21	Volume, Motor, 50 k(A)	3228019910	1
PCB8	**ASSEMBLY P. C. B ST-BY LED**		
D700	SLR 40MG3, Green	2308220324	1
CNT700-1	Lead Ass'y, 2P, 180mm	435102183181	1
PCB9	**ASSEMBLY P. C. B TUNER**		
	CAPACITORS		
C801	Electrolytic SG 100 µF 25 V M	3479310141	1
C802	Ceramic Tubular 0.022 µF 50 V Z	3519223935	1
C804-C809	Ceramic Tubular 0.022 µF 50 V Z	3519223935	6
C810	Electrolytic SG 47 µF 25 V M	3479347041	1
C813	Mylar 0.047 µF 100 V J	3679473120	1
C814	Ceramic Tubular 330 pF 50 V K	3519331935	1
C815	Electrolytic SG 0.47 µF 50 V M	3479347871	1
C816	Ceramic Tubular 0.022 µF 50 V Z	3519223935	1
C817	Electrolytic SG 4.7 µF 50 V M	3479347971	1
C818	Electrolytic SG 3.3 µF 50 V M	3479333971	1
C819	Electrolytic SG 4.7 µF 50 V M	3479347971	1
C820	Ceramic Tubular 47 pF 50 V J	3519470935	1
C821	Ceramic Tubular 0.022 µF 50 V Z	3519223935	1
C822	Mylar 0.0027 µF 100 V J	3679272120	1
C823	Electrolytic SG 2.2 µF 50 V M	3479322971	1
C824/C825	Ceramic Disc, CH 33 pF 50 V J	3528330210	2
C828	Ceramic Tubular 100 pF 50 V K	3519101935	1
C829	Ceramic Tubular 0.01 µF 50 V Z	3519103935	1
C830	Electrolytic SG 1 µF 50 V M	3479310971	1
C831	Electrolytic SG 47 µF 25 V M	3479347041	1
C832	Ceramic Tubular 0.022 µF 50 V Z	3519223935	1
C833	Electrolytic SG 47 µF 25 V M	3479347041	1
C834	Ceramic Tubular 0.022 µF 50 V Z	3519223935	1
C835	Ceramic Disc 0.047 µF 50 V Z	3579473530	1
C836	Poly 470 pF 50 V J	3615471110	1
C837	Electrolytic SG 10 µF 50 V M	3479310071	1
C838	Ceramic Tubular 0.022 µF 50 V Z	3519223935	1
C839	Ceramic Tubular 0.01 µF 50 V Z	3519103935	1
C840	Electrolytic SG 3.3 µF 50 V M	3479333971	1
C841/C842	Electrolytic SG 1 µF 50 V M	3479310971	2
C843	Electrolytic SG 3.3 µF 50 V M	3479333971	1
C844	Poly 1000 pF 50 V J	3615102110	1
C845	Mylar 0.047 µF 100 V J	3679473120	1
C846	Ceramic Tubular 680 pF 50 V J	3519681935	1
C847/C848	Electrolytic SG 22 µF 25 V M	3479322041	2
C849/C850	Mylar 0.0015 µF 100 V J	3679152120	2
C851	Ceramic Tubular 150 pF 50 V K	3519151935	1
C852/C853	Electrolytic SG 2.2 µF 50 V M	3479322971	2
C854/C855	Mylar 0.0022 µF 100 V J	3679222120	2
C858	Electrolytic SG 100 µF 25 V M	3479310141	1
	FILTERS		
CF801/802	SFE10.7MS3GH-ATF21	3978011011	2
CF804	Ceramic, SFZ450F	3908001380	1
CF805	Ceramic, BFU450C	3908001020	1
	DIODES		
D801	UZ 5.1BSB	2258599103	1
D802/D803	1N4148, Switching	2058322101	2

Ref. No.	Description	Mfr. Part No.	Q'ty
	INTEGRATED CIRCUITS		
IC801	LA1266	2168017128	1
IC802	HA12016	2168411105	1
IC803	LM7001	2138017112	1
	TRANSISTORS		
Q801	KTC1923Y(KTC3194Y), NPN	2208406103	1
Q802	2SK168, N-CH., FET	2018211100	1
Q803	BKTC3200BL(KTC2240BL), NPN	2208606108	1
Q804	DTA114YS/KRA107M	2238006103	1
Q805/Q806	KTD1302, NPN	2208606112	2
Q807/Q808	DTA114YS/KRA107M	2238006103	2
	RESISTORS		
R803	Carbon Film 470 ohm 1/5 W J	3069471970	1
R804	Carbon Film 3.3 kohm 1/5 W J	3069332970	1
R805	Carbon Film 330 ohm 1/5 W J	3069331970	1
R806	Carbon Film 470 ohm 1/5 W J	3069471970	1
R807	Carbon Film 10 kohm 1/5 W J	3069103970	1
R808	Carbon Film 3.3 kohm 1/5 W J	3069332970	1
R809	Carbon Film 47 kohm 1/5 W J	3069473970	1
R810	Carbon Film 82 ohm 1/5 W J	3069820970	1
R811	Carbon Film 24 kohm 1/5 W J	3069243970	1
R812	Carbon Film 10 kohm 1/5 W J	3069103970	1
R813	Carbon Film 68 kohm 1/5 W J	3069683970	1
R814	Carbon Film 4.7 kohm 1/5 W J	3069472970	1
R815	Carbon Film 2.2 kohm 1/5 W J	3069222970	1
R816	Carbon Film 2.7 kohm 1/5 W J	3069272970	1
R817/R818	Carbon Film 100 kohm 1/5 W J	3069104970	2
R819/R820	Carbon Film 220 ohm 1/5 W J	3069221970	2
R821-R823	Carbon Film 1 kohm 1/5 W J	3069102970	3
R824	Carbon Film 820 ohm 1/5 W J	3069821970	1
R825	Carbon Film 1.5 kohm 1/5 W J	3069152970	1
R826	Carbon Film 10 kohm 1/5 W J	3069103970	1
R827	Carbon Film 1 kohm 1/5 W J	3069102970	1
R828	Carbon Film 100 ohm 1/5 W J	3069101970	1
R829/R830	Carbon Film 100 kohm 1/5 W J	3069104970	2
R831/R832	Carbon Film 22 kohm 1/5 W J	3069223970	2
R833/R834	Carbon Film 2.7 kohm 1/5 W J	3069272970	2
R835/R836	Carbon Film 47 kohm 1/5 W J	3069473970	2
R837	Carbon Film 3.9 kohm 1/5 W J	3069392970	1
R838-R841	Carbon Film 3.3 kohm 1/5 W J	3069332970	4
R842/R843	Carbon Film 1 kohm 1/5 W J	3069102970	2
R844/R845	Carbon Film 3.3 kohm 1/5 W J	3069332970	2
R846	Carbon Film 1 kohm 1/5 W J	3069102970	1
R847	Carbon Film 5.6 kohm 1/5 W J	3069562970	1
R848	Carbon Film 22 kohm 1/5 W J	3069223970	1
R849	Carbon Film 47 kohm 1/5 W J	3069473970	1
R850/R851	Carbon Film 10 kohm 1/5 W J	3069103970	2
R852	Carbon Film 1 kohm 1/5 W J	3069102970	1
R854	Carbon Film 100 ohm 1/5 W J	3069101970	1
R855	Carbon Film 22 kohm 1/5 W J	3069223970	1
R856	Carbon Film 47 kohm 1/5 W J	3069473970	1
R890-R898	Carbon Film 270 ohm 1/5 W J	3069271970	9
	COILS		
T801	AM-ANT	2608201120	1
T802	AM-OSC	2638201150	1
T803	FM Quad DET(A)	2838501110	1
T804	FM Quad DET(B)	2838501210	1
T805	AM-IFT, P-7SB	2848001250	1
T806	Filter, '19KHz/38KHz, MPX BLK	2658001050	1
T807	Filter, '19KHz/38KHz, MPX BLK	2658001050	1
	TRIMMERS		
TC801	TZ03-T200FR	3838001010	1
TC802	TZ03-T110FR	3838001000	1
	SEMI FIXED RESISTORS		
VR801	5 k(B)	3248050243	1
VR802	20 k(B)	3248020343	1
VR803	5 k(B)	3248050243	1
VR804	200 k(B)	3248020443	1
	CRYSTAL		
XT801	7.2MHz	3978101031	1
	DIODE VARECTOR		
VD1/VD2	KV1236Z	2058819106	1
	MISCELLANEOUS		
	F/E FTH3-505H 3	3928101790	1
32	Terminal Antenna	4408108310	1

Ref. No.	Description	Mfr. Part No.	Q'ty
PCB10	**ASSEMBLY P. C. BOARD SUB-WOOFER OUT**		
R116L/R	Carbon Film 1 kohm 1/5 W J	3069102970	2
CNT121	Wafer, 3P	4428516210	1
37	Jack, RCA, 2P	4438111410	1
PCB11	**ASSEMBLY P. C. BOARD SPEAKER SELECTOR**		
CNT119-1	Lead Ass'y, 7P, 400mm	436107403401	1
CNT110	Wafer, 3P	4428505710	1
14	Switch, Speaker, Push Type	4628060610	1

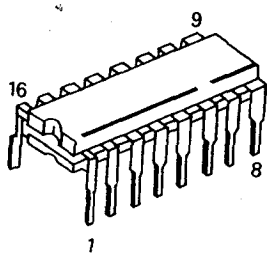
1. This parts list for HK3250 230V version is based on 120V version.
2. Each initial in the Remark is denoted as follows.
C: Changed, D: Deleted, A: Added

Ref. No.	Description	Mfr. Part No.	Q'ty	Remark
PCB6	**ASSEMBLY P. C. BOARD OUTLET**			
	FUSE			
⚠ F700	T 250 V, 1 A	5508302035	1	C
⚠ F701	T 250 V, 3.15 A	5508302735	1	C
	RESISTOR			
R724	Carbon Film 3.3 Moh 1/2 W J	3029335380	1	D
	MISCELLANEOUS			
⚠ 43	Outlet, AC	4448103610	1	C
PCB9	**ASSEMBLY P. C. BOARD TUNER**			
	CAPACITORS			
C811	Ceramic Tubular 82 pF 50 V J	3519820935	1	A
C812	Ceramic Tubular 100 pF 50 V J	3519101935	1	A
C861	Ceramic Tubular 270 pF 50 V K	3519271935	1	A
	FILTERS			
CF803	SFE10.7MS3GH-ATF21	3908011011	1	A
	RESISTORS			
R801	Carbon Film 62 kohm 1/5 W J	3069623970	1	A
R802	Carbon Film 100 kohm 1/5 W J	3069104970	1	A
R809	Carbon Film 56 kohm 1/5 W J	3069563970	1	C
R857	Carbon Film 1 kohm 1/5 W J	3069102970	1	A
	COIL			
L101	Inductor, 20.8 mH	2648601430	1	A
	SEMI FIXED RESISTOR			
VR804	500 k(B)	3248050443	1	C
	MISCELLANEOUS			
	FE407-G60, Front-end	3928801890	1	C
32	Terminal Antenna	4408101610	1	C

SEMICONDUCTOR LEAD IDENTIFICATION & INTERNAL DIAGRAM

HA12016 : IC803

Package Outline



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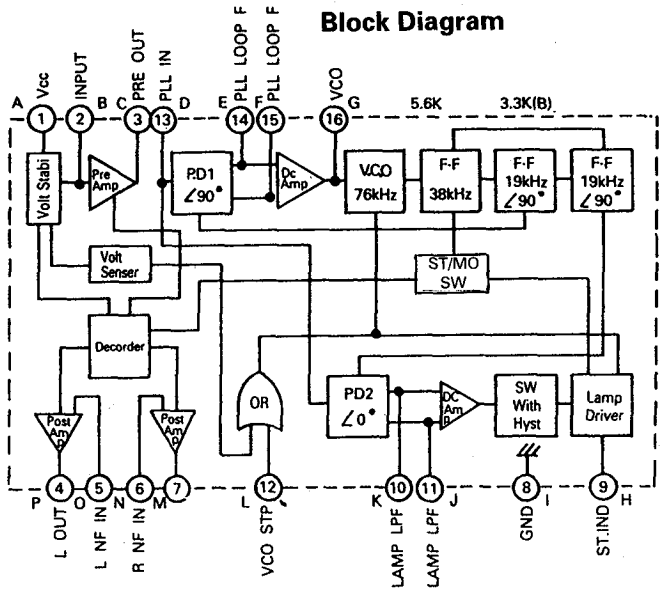
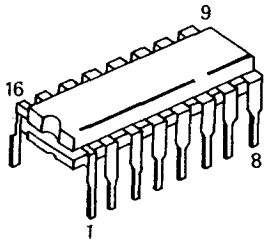


LC7821 : IC101

Package Outline



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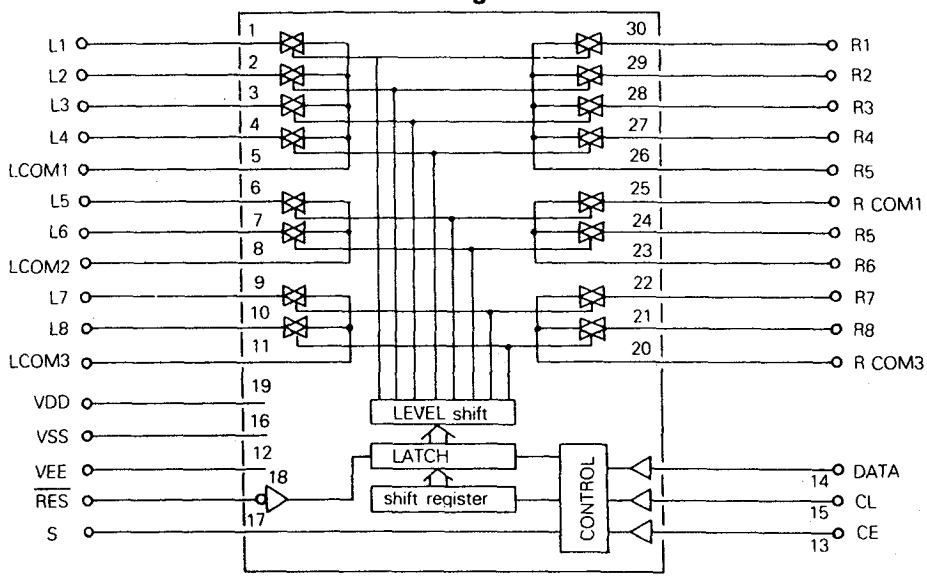

TA7291S : IC700

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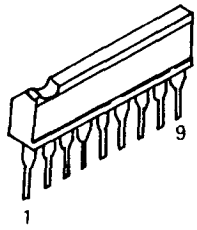

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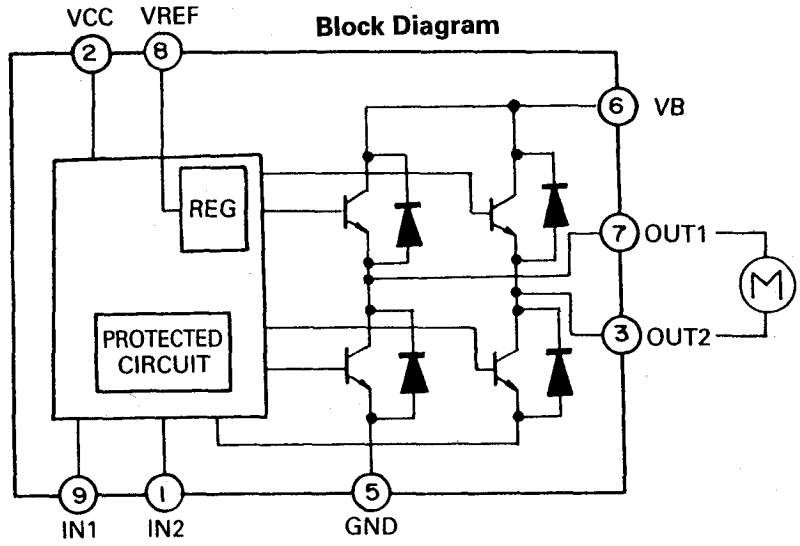

LA1266 : IC801

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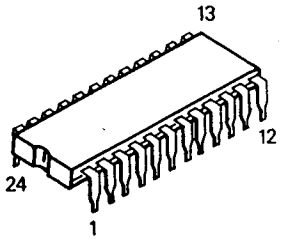

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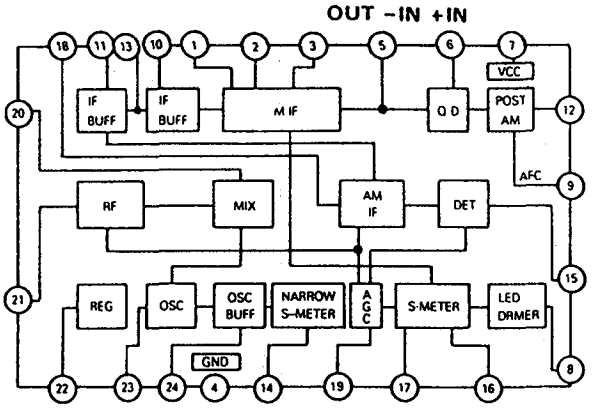
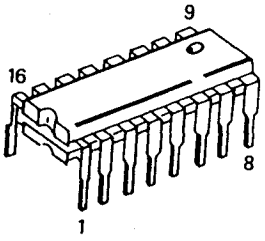


LM7001 : IC802

Package Outline



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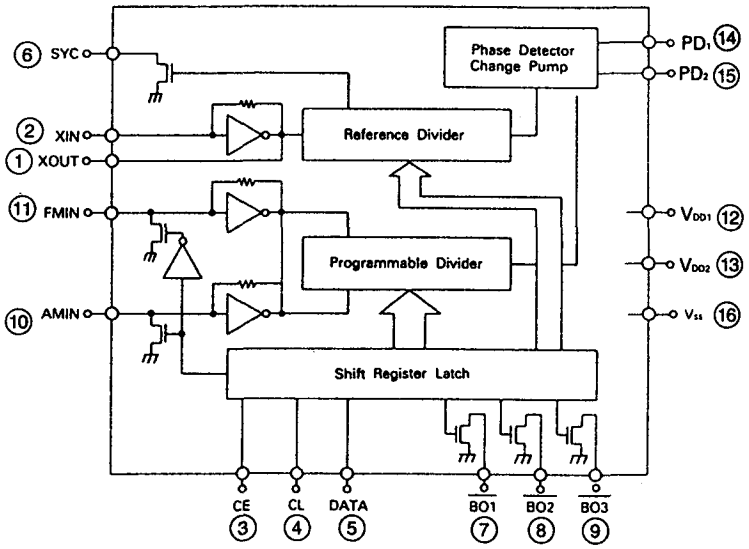
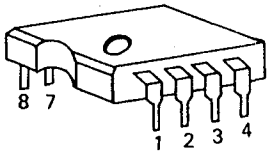


(KIA 4559P/KIA75559P)
IC102, IC105, IC304, IC305,

Package Outline



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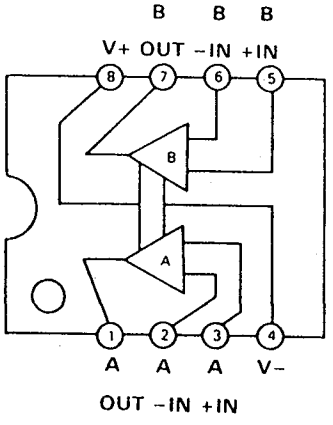
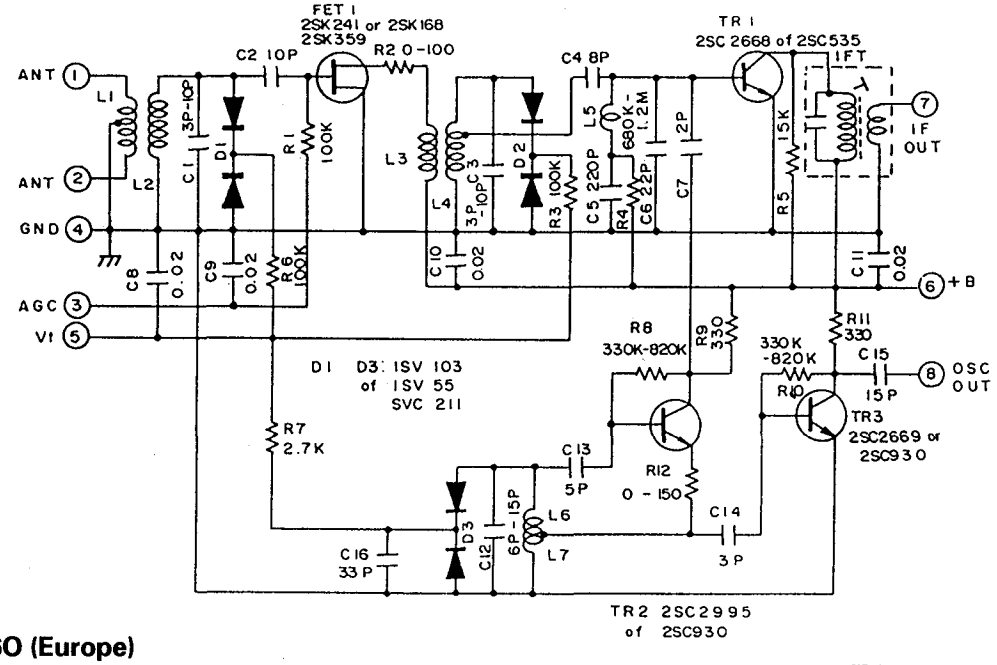
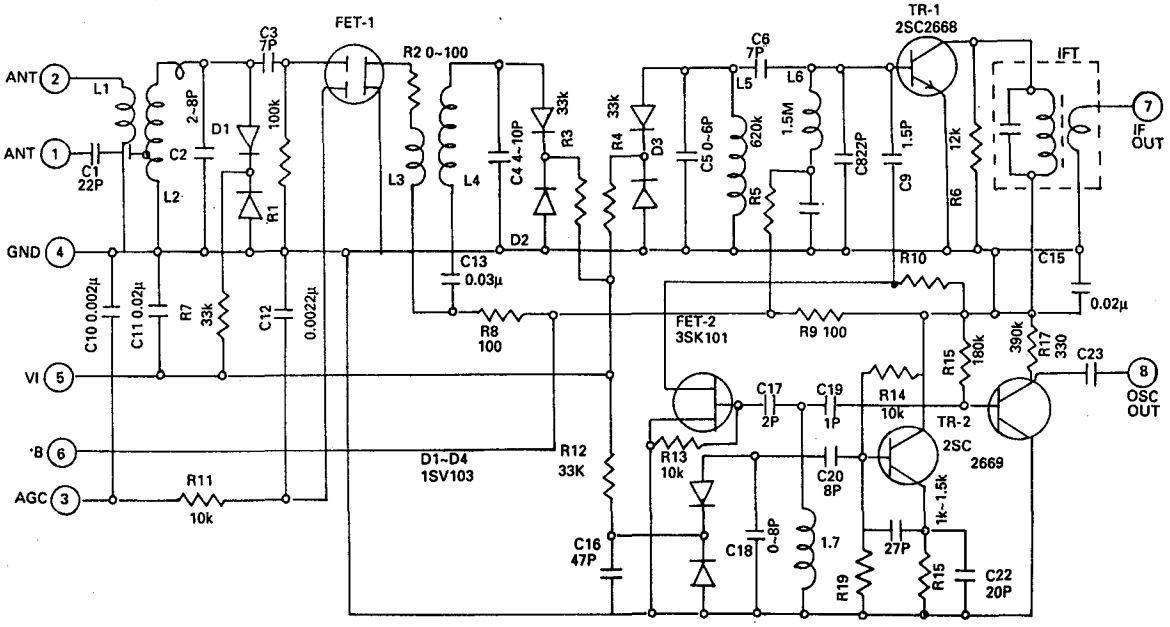


FRONT-END : FE FTH3-505H (USA/CA)

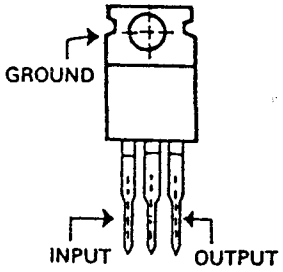


FE407-G60 (Europe)



GD78XX : IC105

Front View



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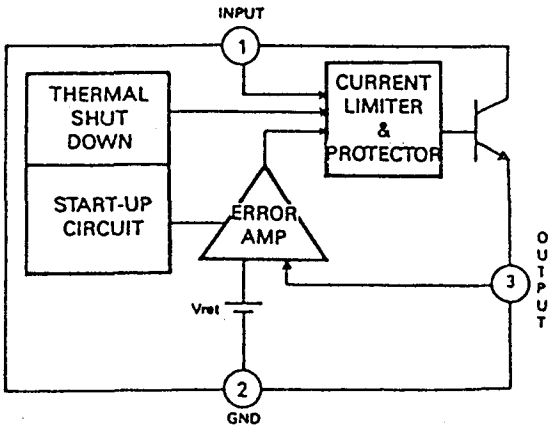
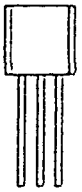
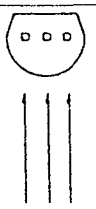
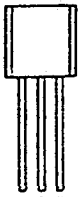
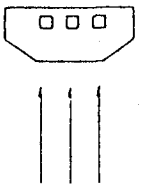
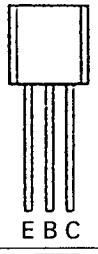
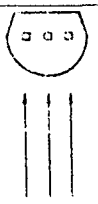
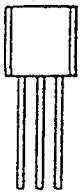
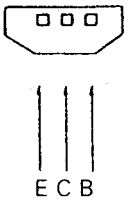
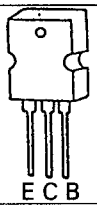
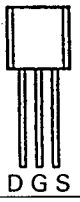
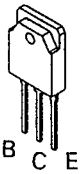
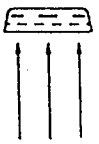


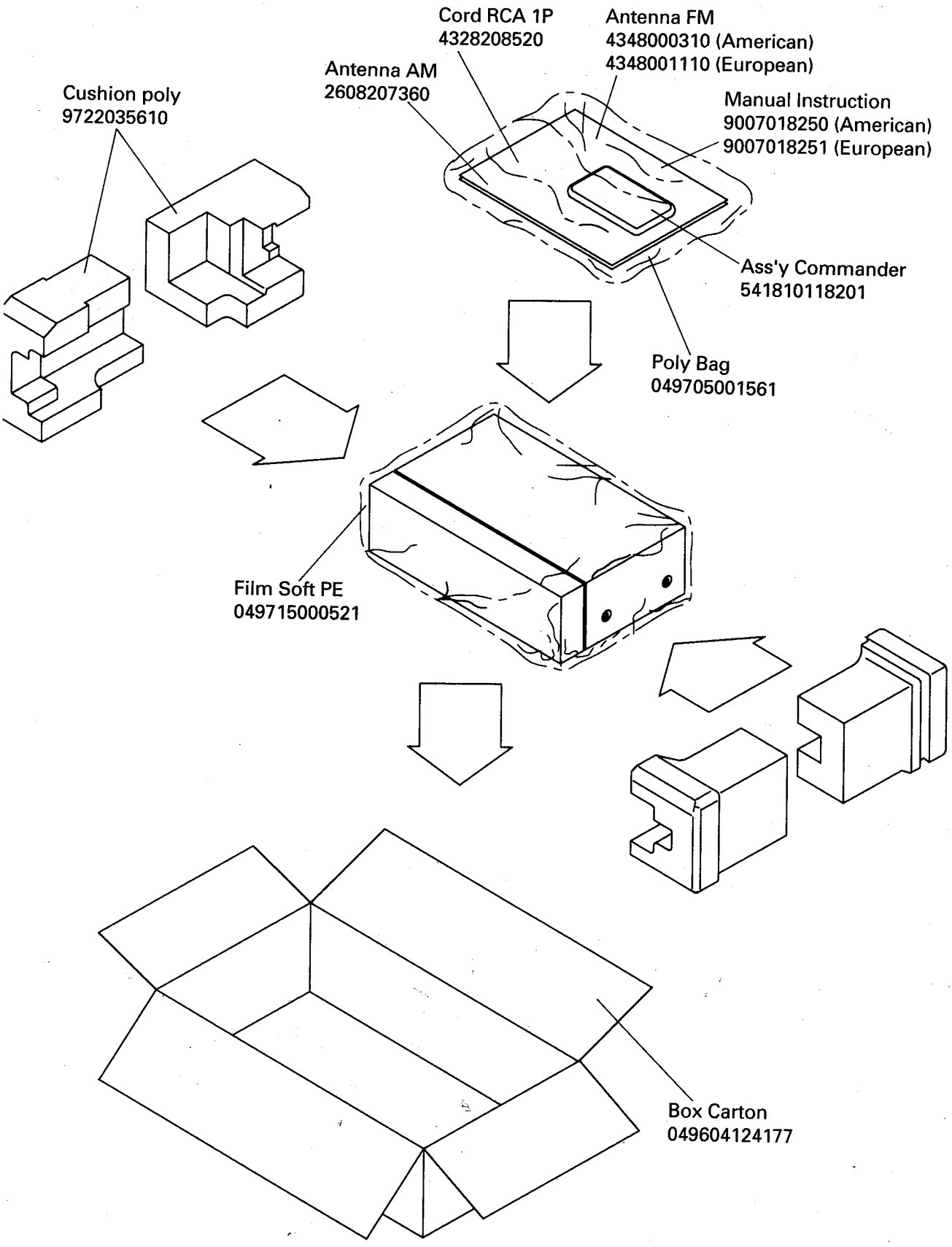
TRANSISTORS LEAD IDENTIFICATION

TRANSISTOR	FRONT VIEW	BOTTOM VIEW
KTD1302 KTC3200/KTC2240 KTC3198/KTC1815 KTC1923/KTC3194 KTA2400 KTA1268/KTA970 KTA1266/KTA1015		
DTC114YS DTA114YS		
MPSA06 MPSA56		
KTA1024 KTC3206		
2SC4137 2SC4883 2SA1859		
2SK168D		
2SA1265N-O 2SC3182N-O		

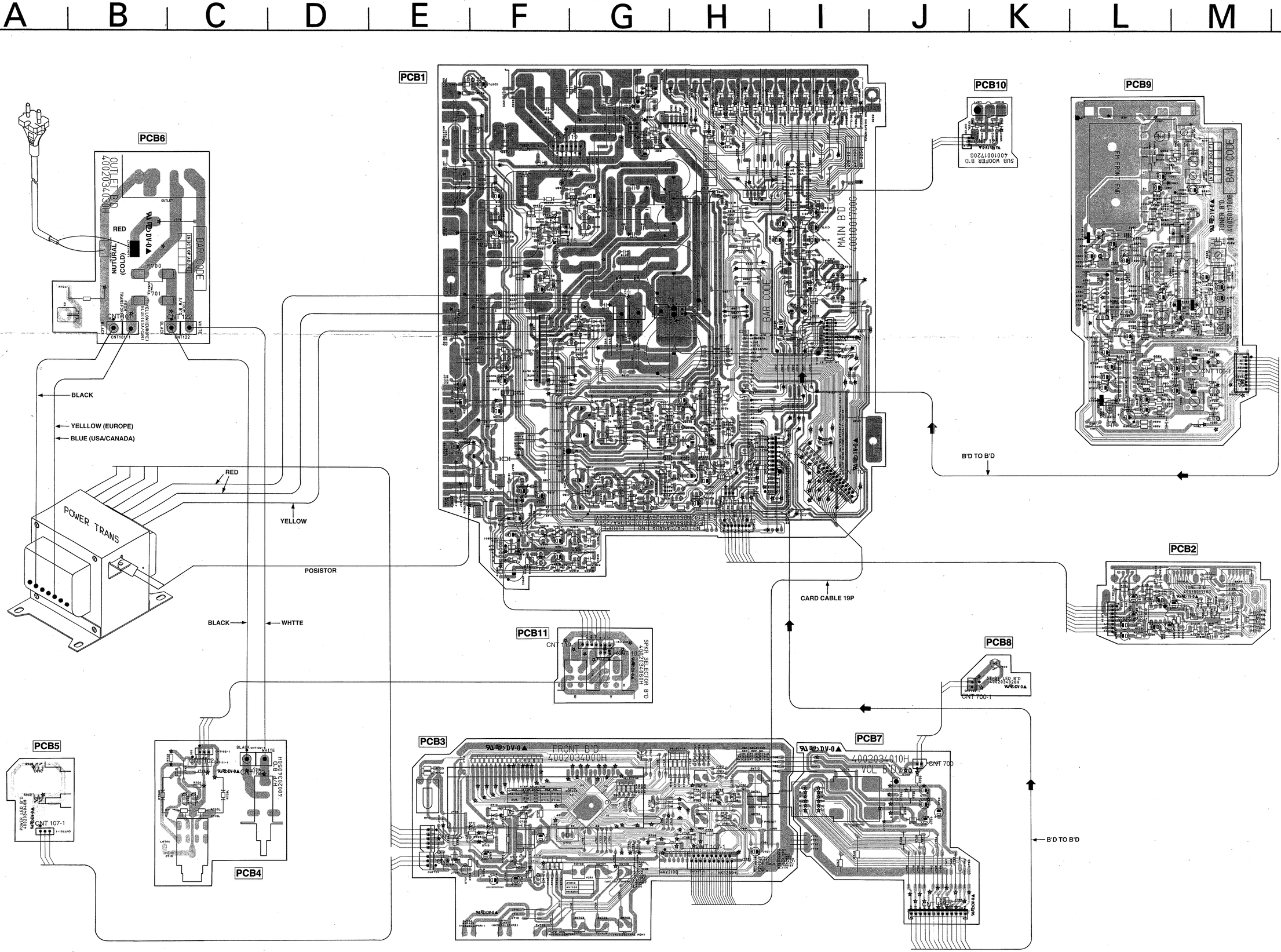
TERMINAL NAME

D→DRAIN	B→BASE
G→GATE	C→COLLECTOR
S→SOURCE	E→EMITTER

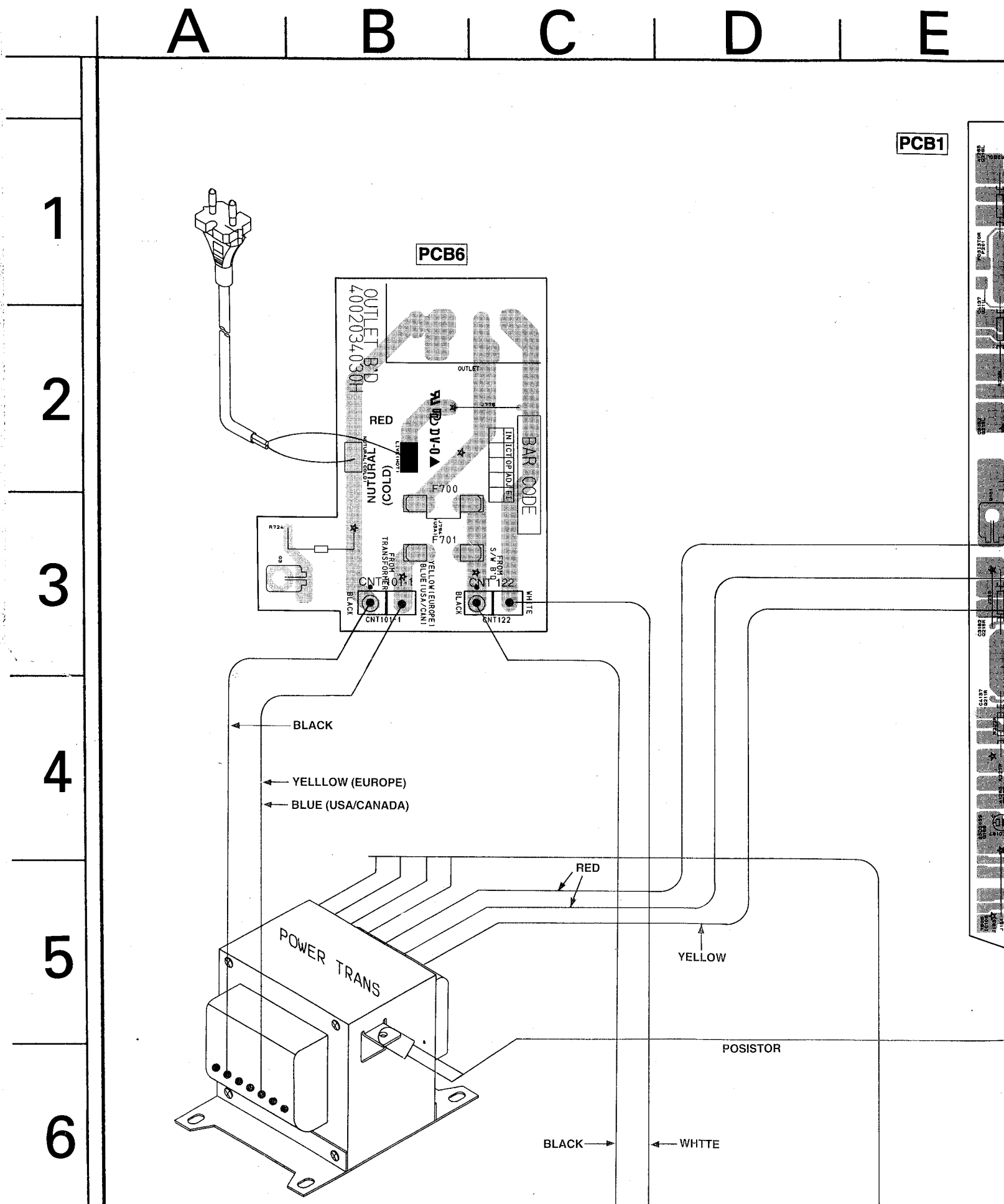
PACKAGE


Cord RCA 1P
4328208520
Antenna FM
4348000310 (American)
4348001110 (European)
Antenna AM
2608207360
Cushion poly
9722035610
Manual Instruction
9007018250 (American)
9007018251 (European)
Ass'y Commander
541810118201
Poly Bag
049705001561
Film Soft PE
049715000521
Box Carton
049604124177

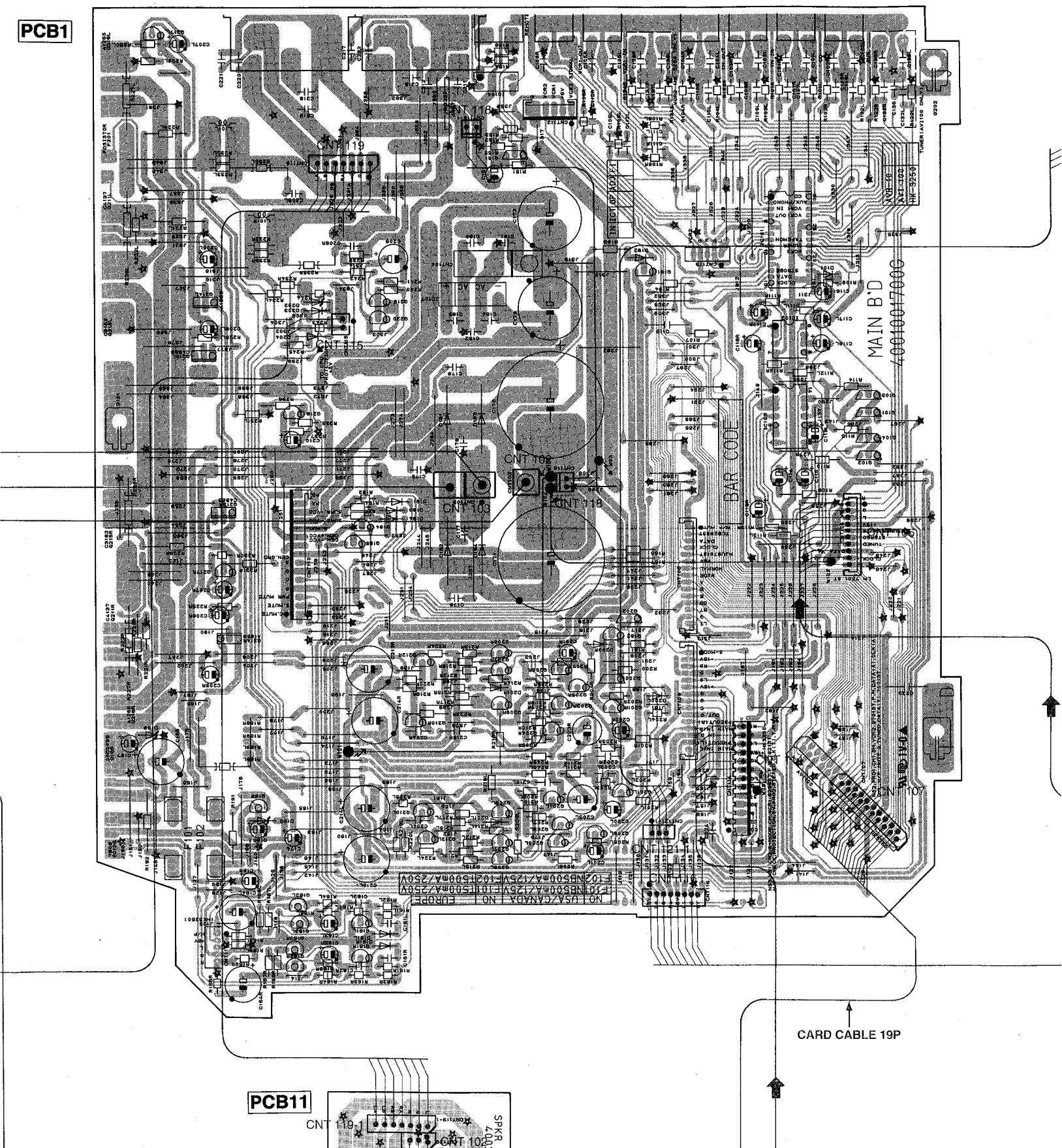
WIRING DIAGRAM



WIRING DIAGRAM



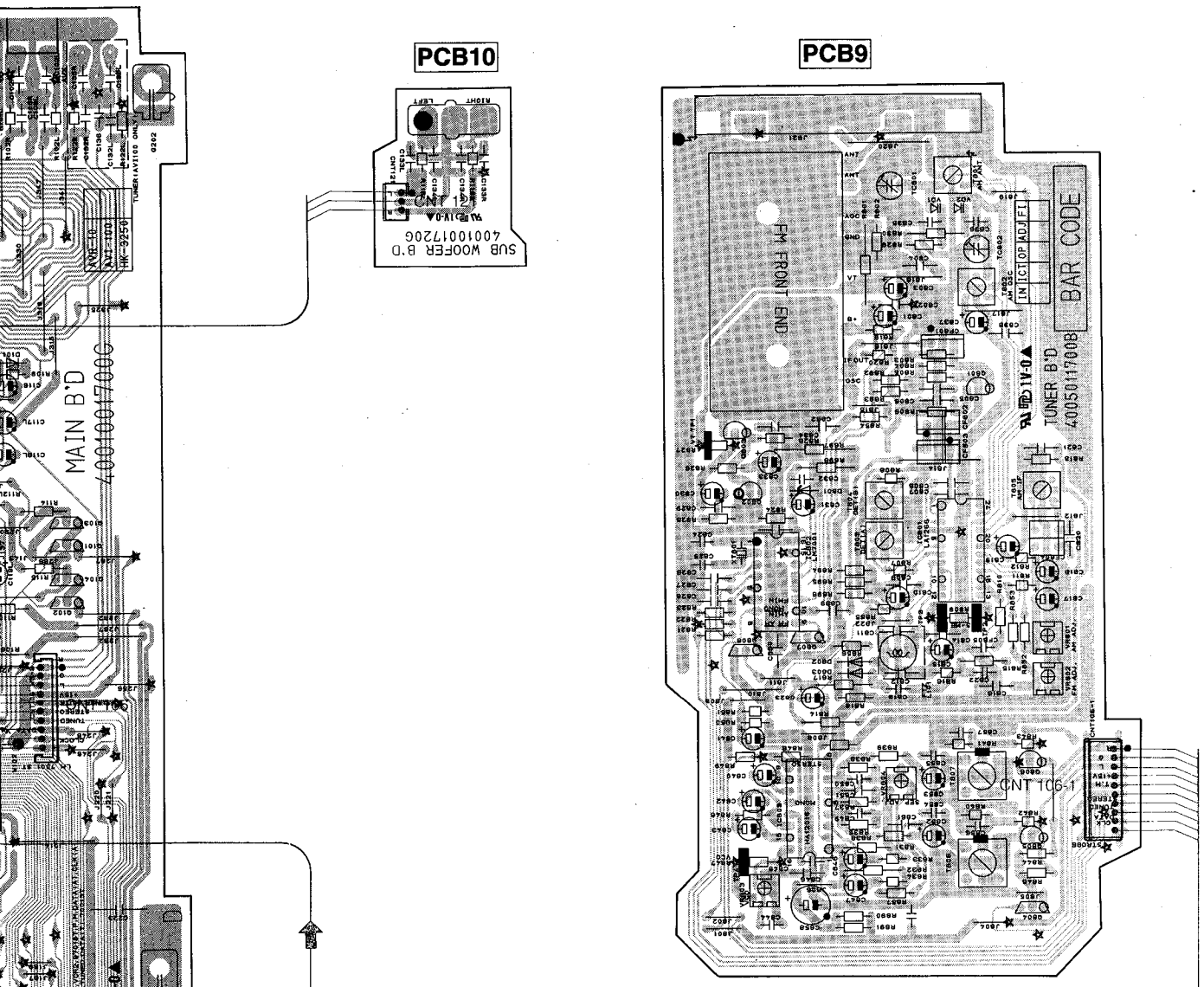
E F G H I J


PCB1
CNT 119
CNT 118
CNT 115
CNT 102
CNT 103
CNT 118
CNT 107
CNT 121
MAIN B'D
BAR CODE
CARD CABLE 19P
PCB11
CNT 119-1
CONT 102

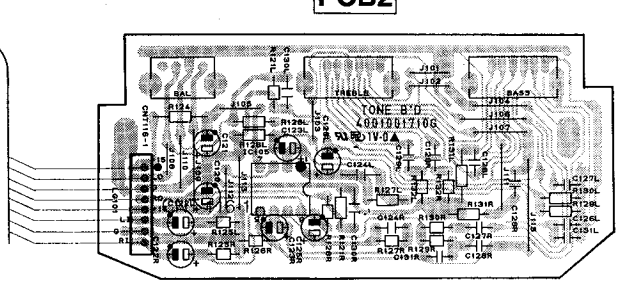
I J K L M

PCB10

PCB9



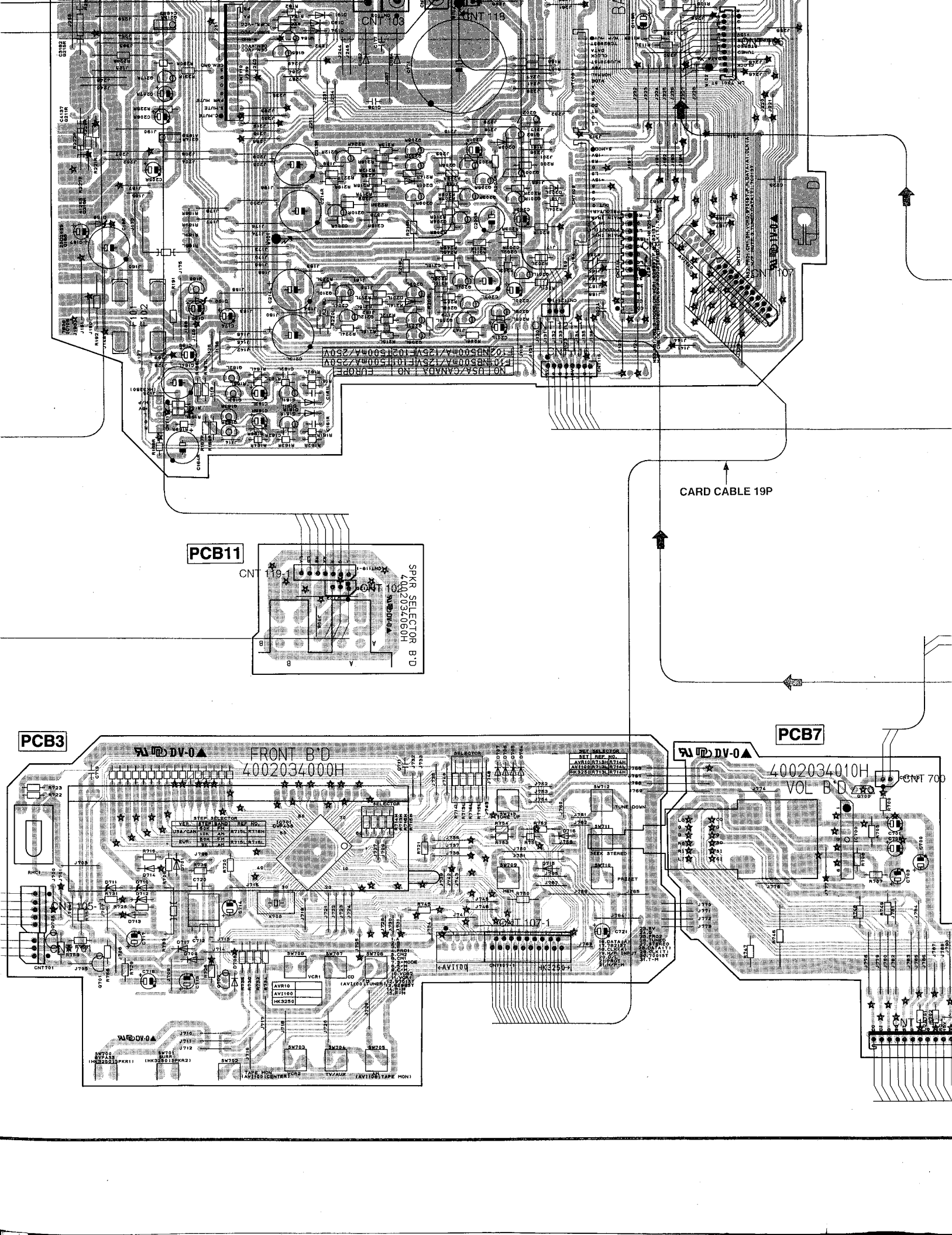
PCB2

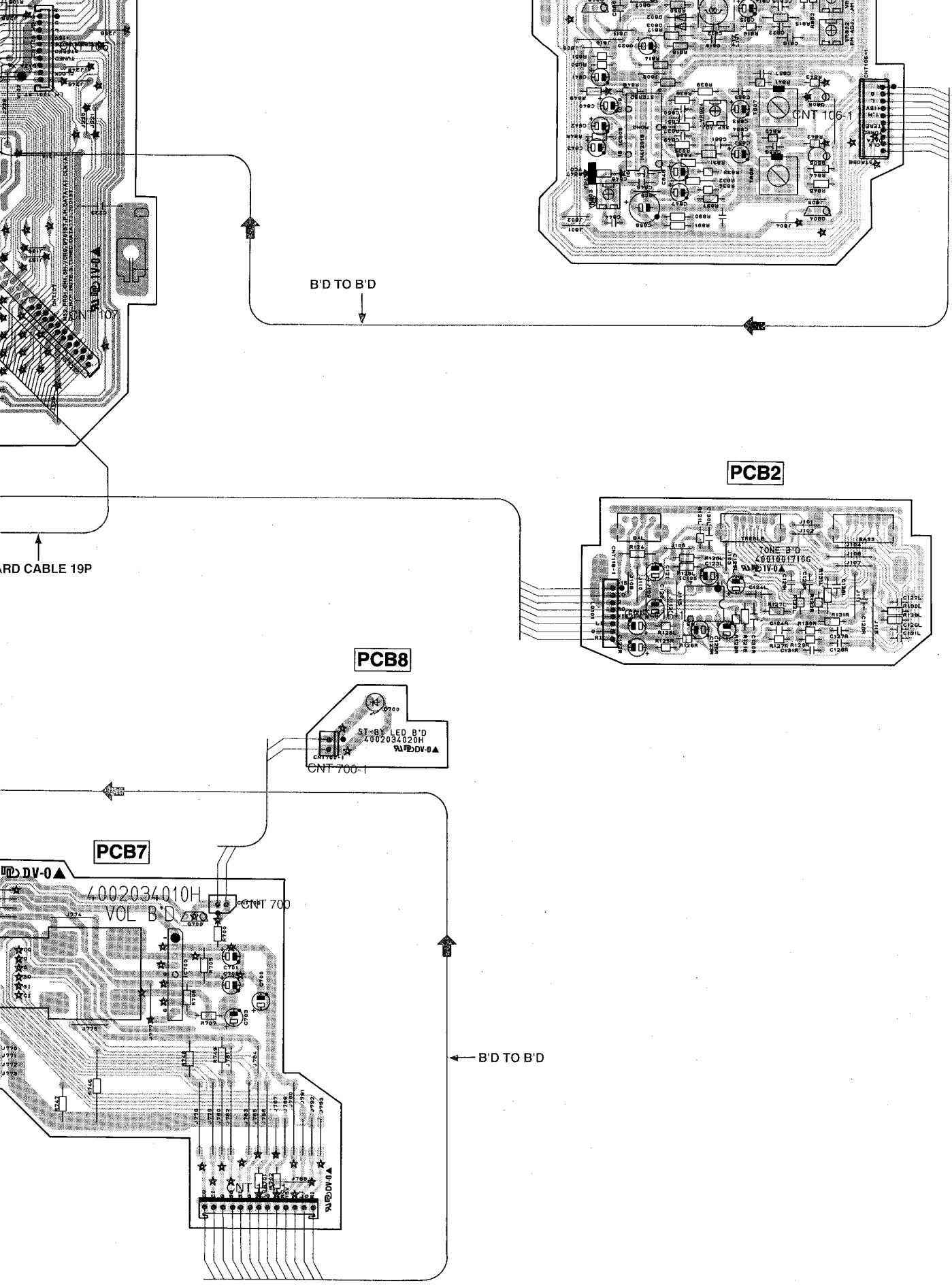


RD CABLE 19P

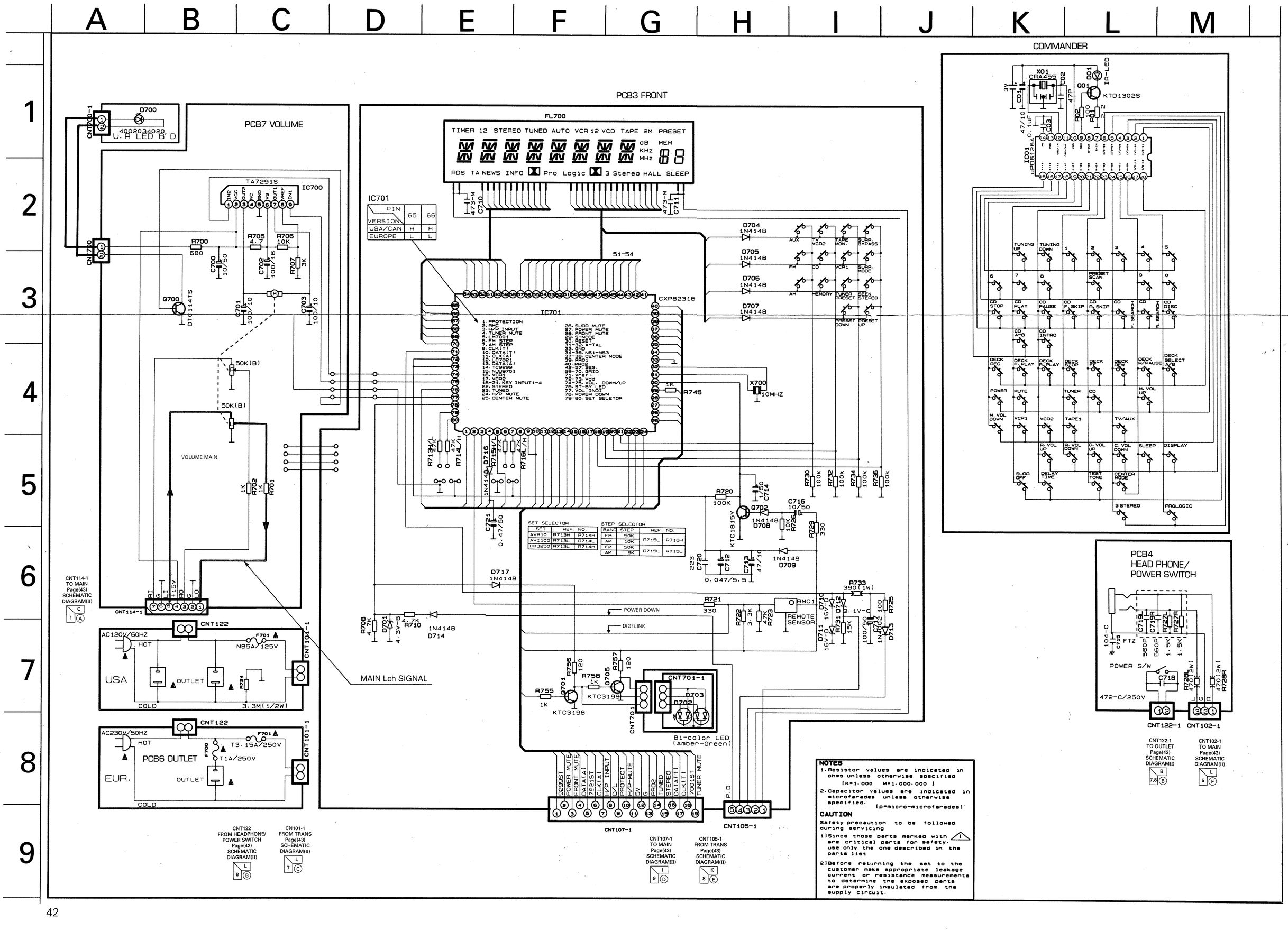
PCB8

CNT101-1
CNT122
BLACK
WHITE
BLACK
YELLLOW (EUROPE)
BLUE (USA/CANADA)
RED
YELLOW
POWER TRANS
POSISTOR
BLACK
WHTTE
PCB5
POWER LED B'D
4002034040H
CNT 107-1
CNT102-1
CNT111-1
CNT 102-1
BLACK CNT122-1
WHITE
CNT 122-1
H/P B'D
4002034050H
PCB4
PCB3
CN 105
CN 701

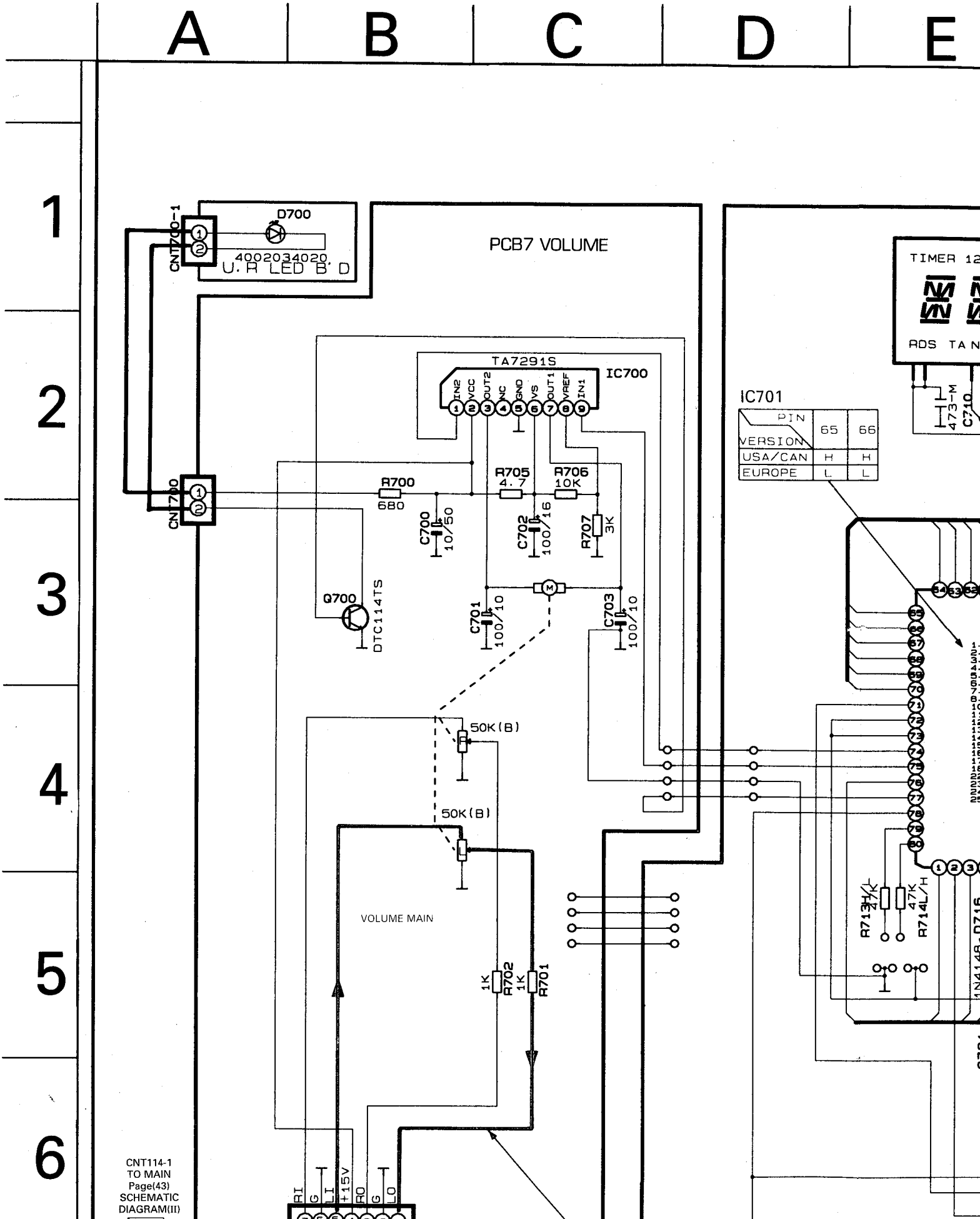

CNT 103
CNT 118
CNT 106
CNT 107
CNT 124
CNT 116
CARD CABLE 19P
PCB11
CNT 119-1
CNT 102
SPKR SELECTOR B'D
400203406OH
PCB3
DV-0
FRONT B'D
400203400OH
CNT 105-1
CNT 107-1
PCB7
400203401OH
VOL B'D
CNT 700
CNT 701


CNT 106-1
B'D TO B'D
PCB2
TONE B'D
4001001710G
PCB8
ST-BY LED B'D
4002034020H
CNT 700-1
PCB7
4002034010H
VOL B'D
CNT 700
B'D TO B'D

SCHEMATIC DIAGRAM I

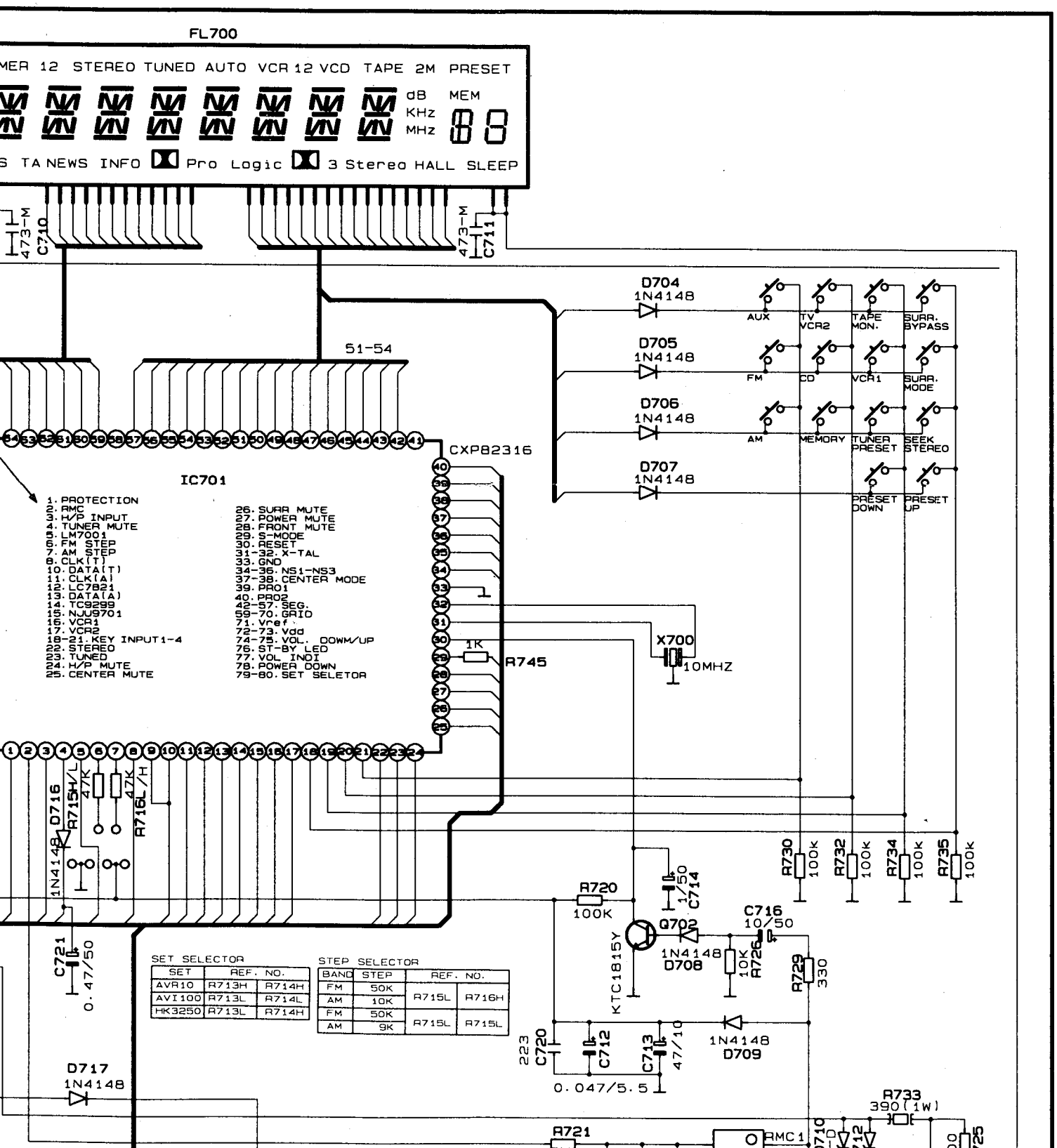


SCHEMATIC DIAGRAM I



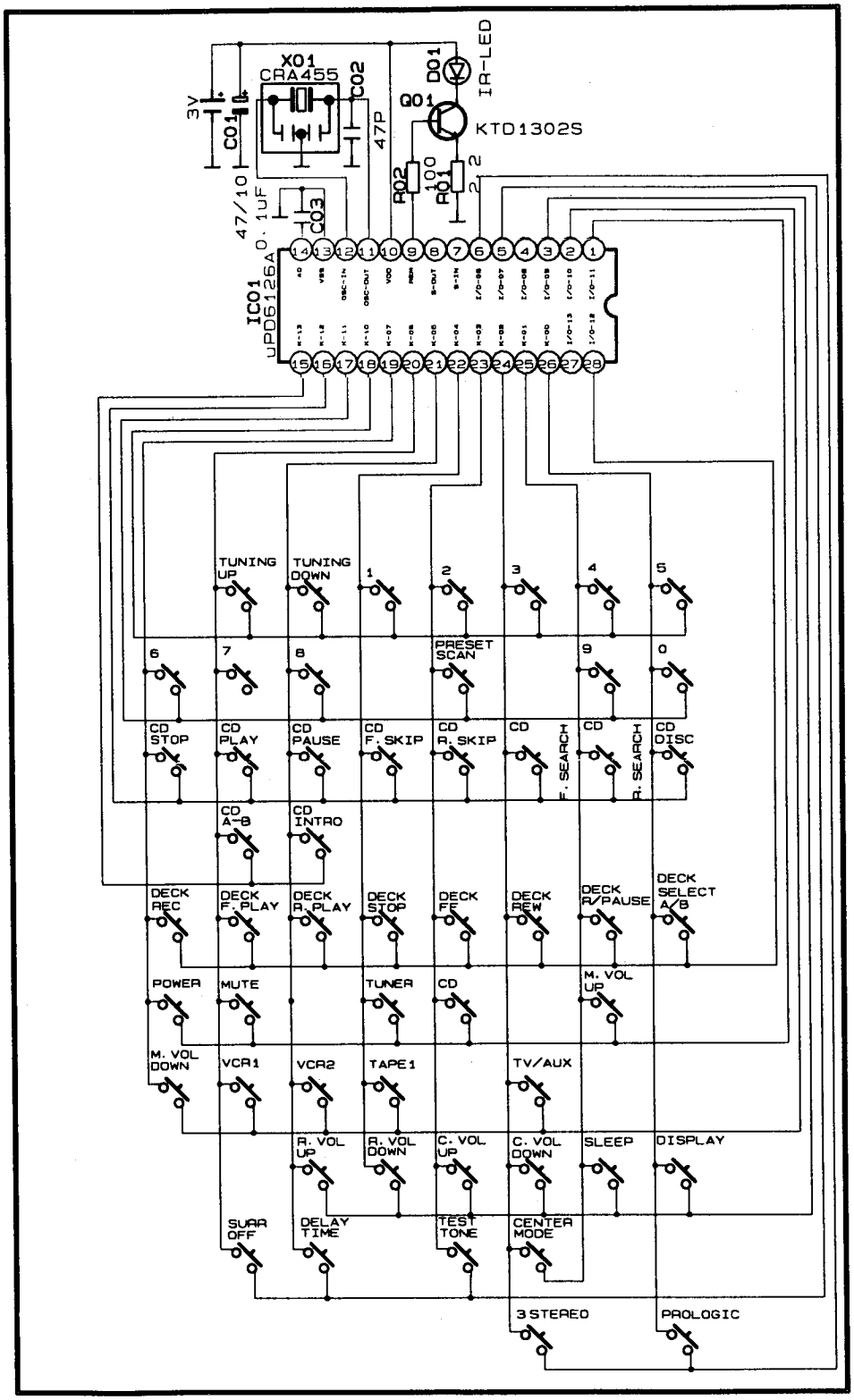
E | F | G | H | I | J

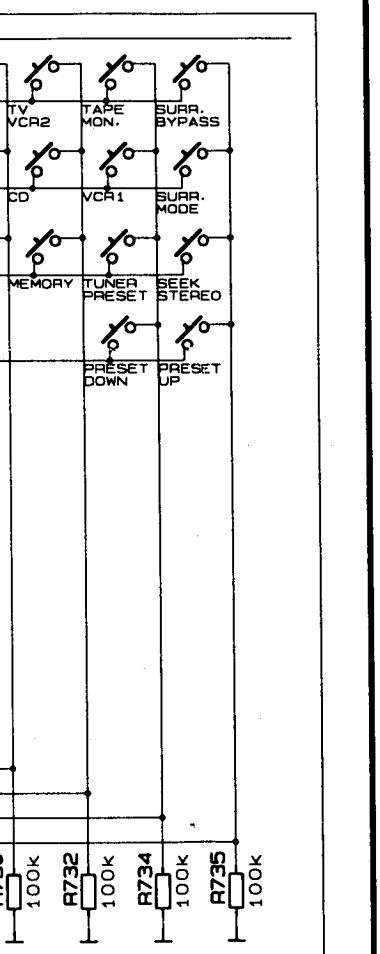
PCB3 FRONT



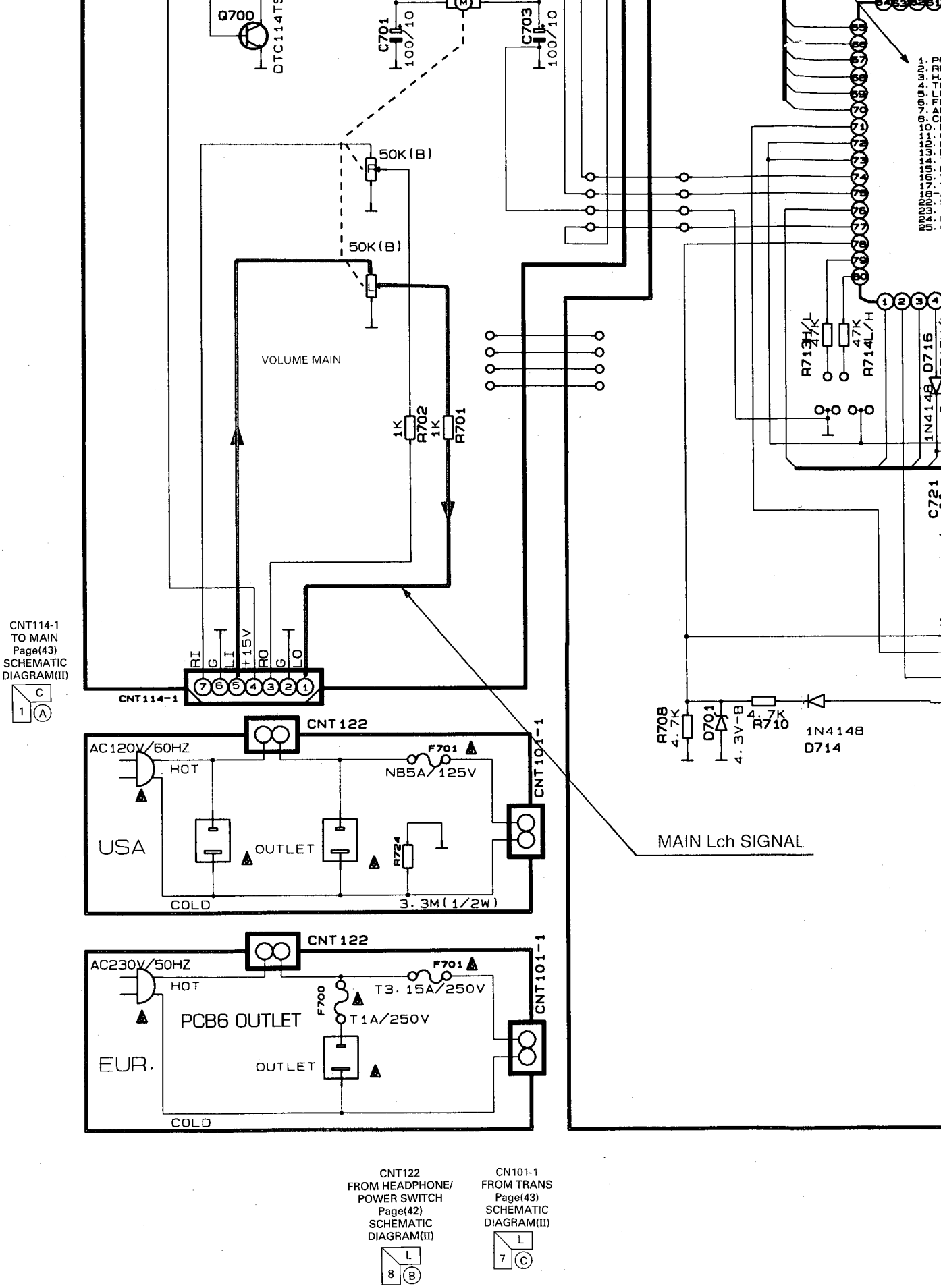
I J K L M

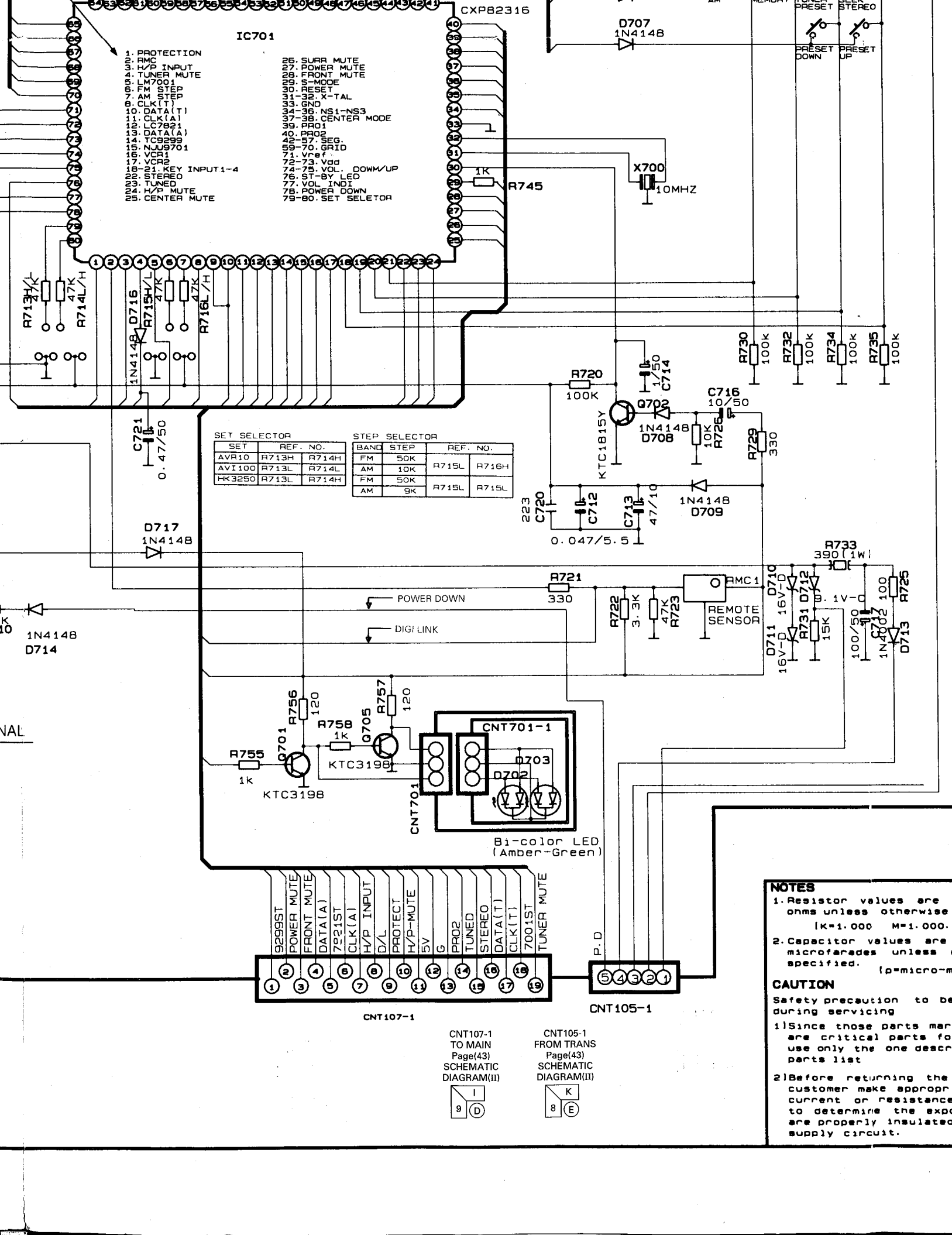
COMMANDER

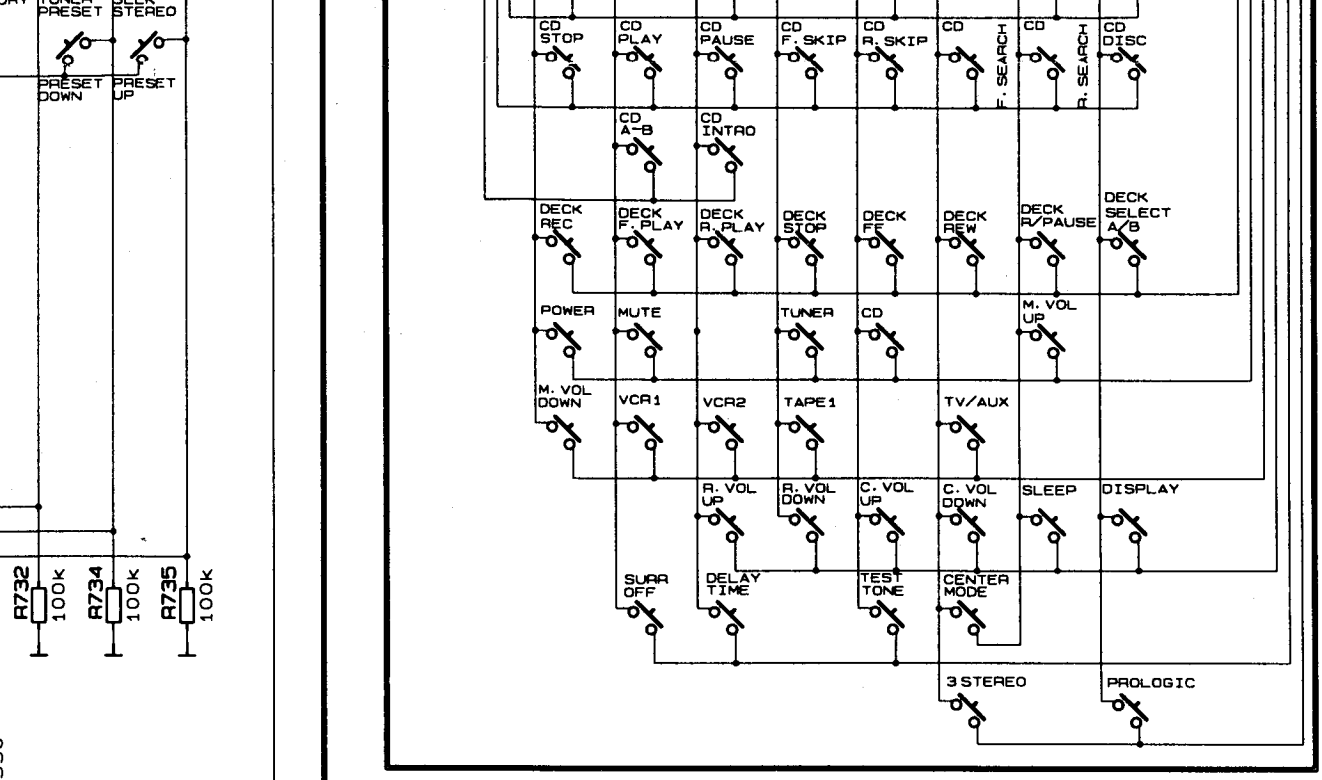


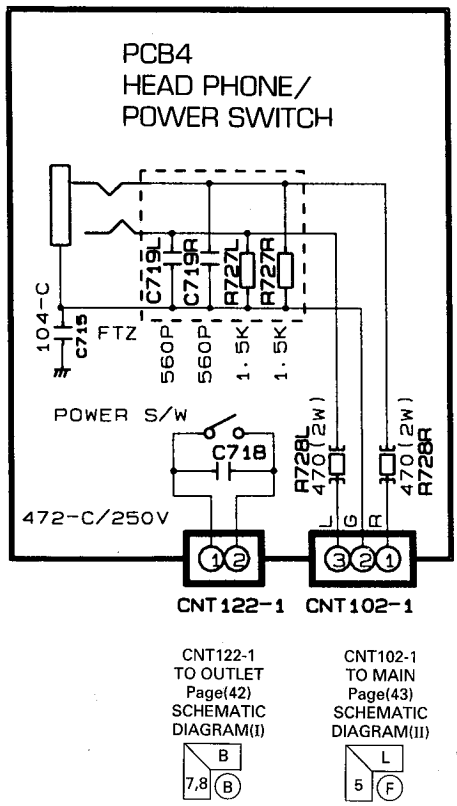


PCB4
HEAD PHONE/
POWER SWITCH


Q700
DTC114TS
C701
100/10
C703
100/10
50K(B)
50K(B)
VOLUME MAIN
1K
R702
1K
R701
R713
47K
R714
47K
D716
1N4148
C721
R708
4.7K
D701
4.3V-B
R710
4.7K
1N4148
D714
MAIN Lch SIGNAL
CNT114-1
RI
G
LI
+15V
RO
G
LO
7 6 5 4 3 2 1
CNT114-1
TO MAIN
Page(43)
SCHEMATIC
DIAGRAM(II)
C
1
A
CNT122
AC120V/60HZ
HOT
F701
NB5A/125V
CNT101-1
USA
OUTLET
R724
COLD
3.3M(1/2W)
CNT122
AC230V/50HZ
HOT
F701
T3.15A/250V
F700
T1A/250V
CNT101-1
PCB6 OUTLET
EUR.
OUTLET
COLD
CNT122
FROM HEADPHONE/
POWER SWITCH
Page(42)
SCHEMATIC
DIAGRAM(II)
L
8
B
CN101-1
FROM TRANS
Page(43)
SCHEMATIC
DIAGRAM(II)
L
7
C


IC701
CXP82316
1. PROTECTION
2. AMC
3. H/P INPUT
4. TUNER MUTE
5. LM7001
6. FM STEP
7. AM STEP
8. CLK(T)
10. DATA(T)
11. CLK(A)
12. LC7821
13. DATA(A)
14. TC9299
15. NJU9701
16. VCR1
17. VCR2
18-21. KEY INPUT1-4
22. STEREO
23. TUNED
24. H/P MUTE
25. CENTER MUTE
26. SUBR MUTE
27. POWER MUTE
28. FRONT MUTE
29. S-MODE
30. RESET
31-32. X-TAL
33. GND
34-36. NS1-NS3
37-38. CENTER MODE
39. PRO1
40. PRO2
42-57. SEG.
59-70. GRID
71. Vref
72-73. Vdd
74-75. VOL. DOWM/UP
76. ST-BY LED
77. VOL. INDI
78. POWER DOWN
79-80. SET SELETOR
D707
1N4148
PRESET DOWN
PRESET UP
X700
10MHZ
R745
1K
R713H/L
R714L/H
R715H/L
R716L/H
47K
D716
1N4148
C721
0.47/50
R720
100K
C714
1/50
Q702
KTC1815Y
1N4148
D708
C716
10/50
R726
10K
R729
330
R730
R732
R734
R735
100K
C720
223
C712
C713
47/10
0.047/5.5
1N4148
D709
SET SELECTOR
SET | REF. NO. | |
AVR10 | R713H | R714H
AVI100 | R713L | R714L
HK3250 | R713L | R714H
STEP SELECTOR
BAND | STEP | REF. NO. | |
FM | 50K | R715L | R716H
AM | 10K
FM | 50K | R715L | R715L
AM | 9K
D717
1N4148
D714
R733
390(1W)
R721
330
POWER DOWN
DIGI LINK
R722
3.3K
R723
47K
AMC1
REMOTE SENSOR
D710
16V-D
D712
9.1V-D
D711
16V-D
R731
15K
C717
100/50
D713
1N4002
R725
100
R756
120
R757
120
R758
1K
Q705
KTC3198
Q701
KTC3198
R755
1k
CNT701-1
D703
D702
CNT701
Bi-color LED
(Amber-Green)
9299ST
POWER MUTE
FRONT MUTE
DATA(A)
7221ST
CLK(A)
H/P INPUT
D/L
PROTECT
H/P-MUTE
5V
G
PRO2
TUNED
STEREO
DATA(T)
CLK(T)
7001ST
TUNER MUTE
CNT107-1
P.D
CNT105-1
CNT107-1
TO MAIN
Page(43)
SCHEMATIC
DIAGRAM(II)
I
9
D
CNT105-1
FROM TRANS
Page(43)
SCHEMATIC
DIAGRAM(II)
K
8
E
NOTES
1. Resistor values are
ohms unless otherwise
[K=1.000 M=1.000.
2. Capacitor values are
microfarades unless
specified.
[p=micro-m
CAUTION
Safety precaution to be
during servicing
1]Since those parts mar
are critical parts fo
use only the one descr
parts list
2]Before returning the
customer make appropr
current or resistance
to determine the expo
are properly insulated
supply circuit.





CNT122-1
TO OUTLET
Page(42)
SCHEMATIC
DIAGRAM(I)

B
7,8 (B)

CNT102-1
TO MAIN
Page(43)
SCHEMATIC
DIAGRAM(II)

L
5 (F)

NOTES

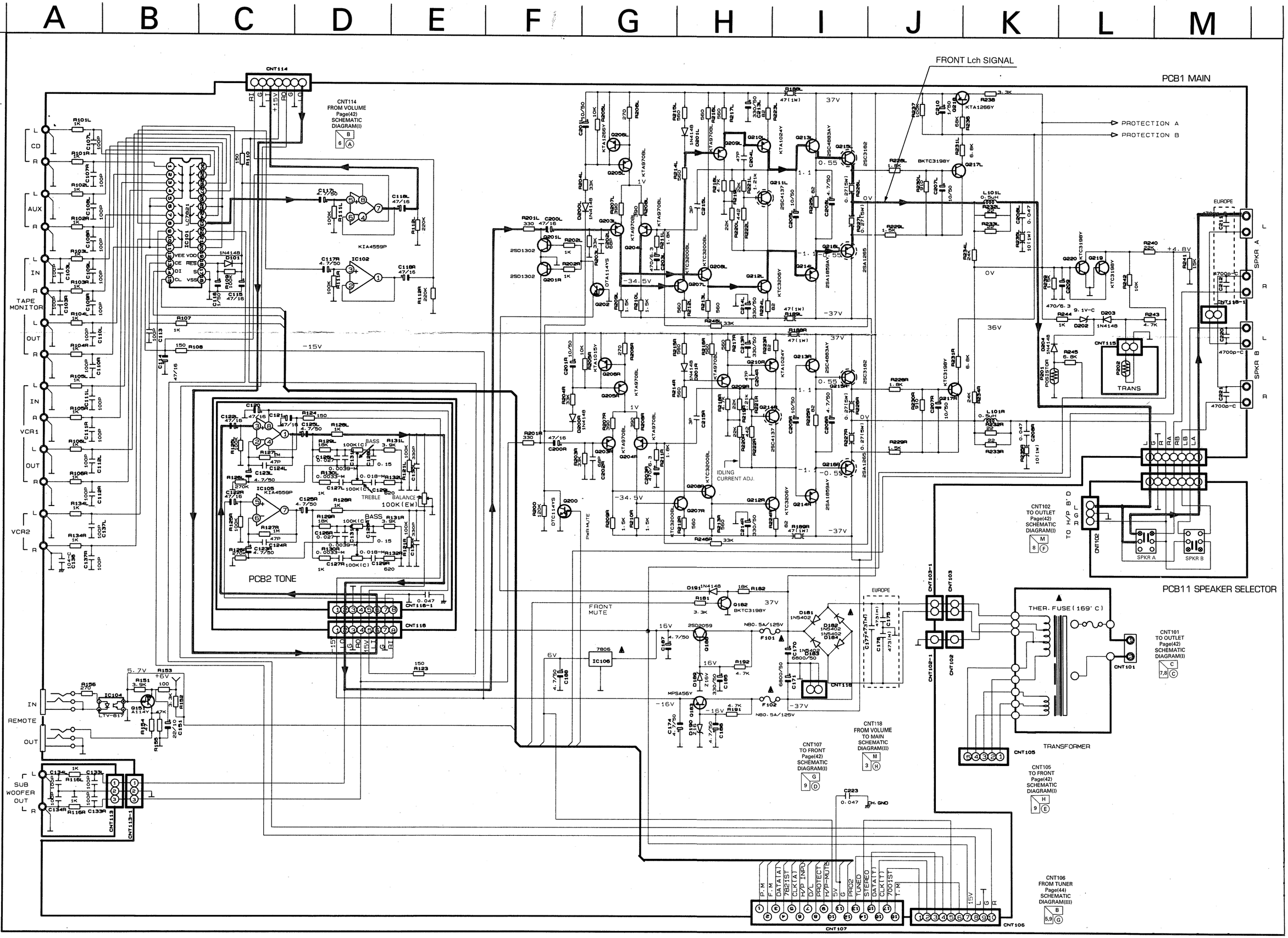
1. Resistor values are indicated in ohms unless otherwise specified
   [K=1.000 M=1.000.000]
2. Capacitor values are indicated in microfarades unless otherwise specified.
   [p=micro-microfarades]

CAUTION

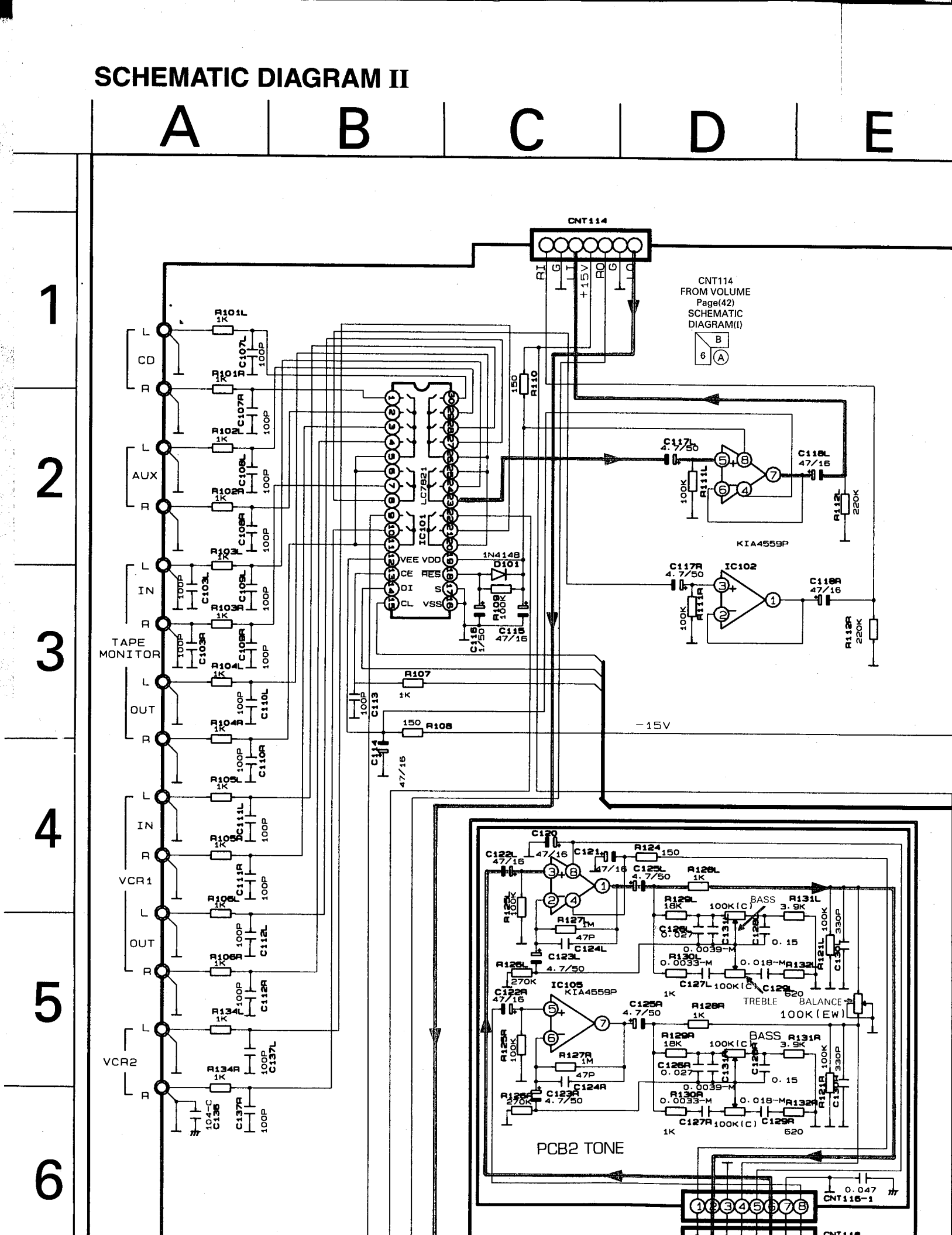
Safety precaution to be followed during servicing

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.

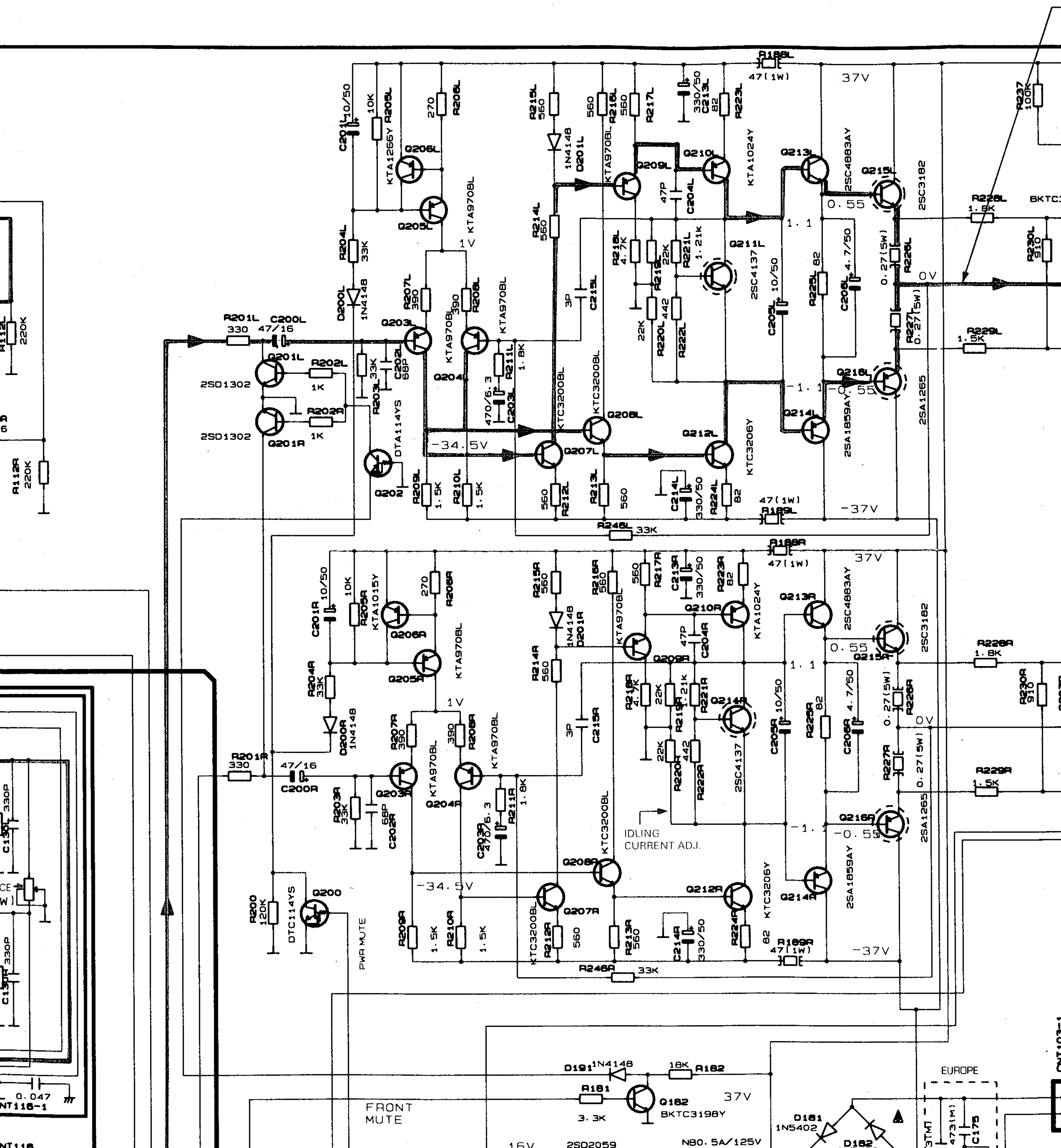
SCHEMATIC DIAGRAM II

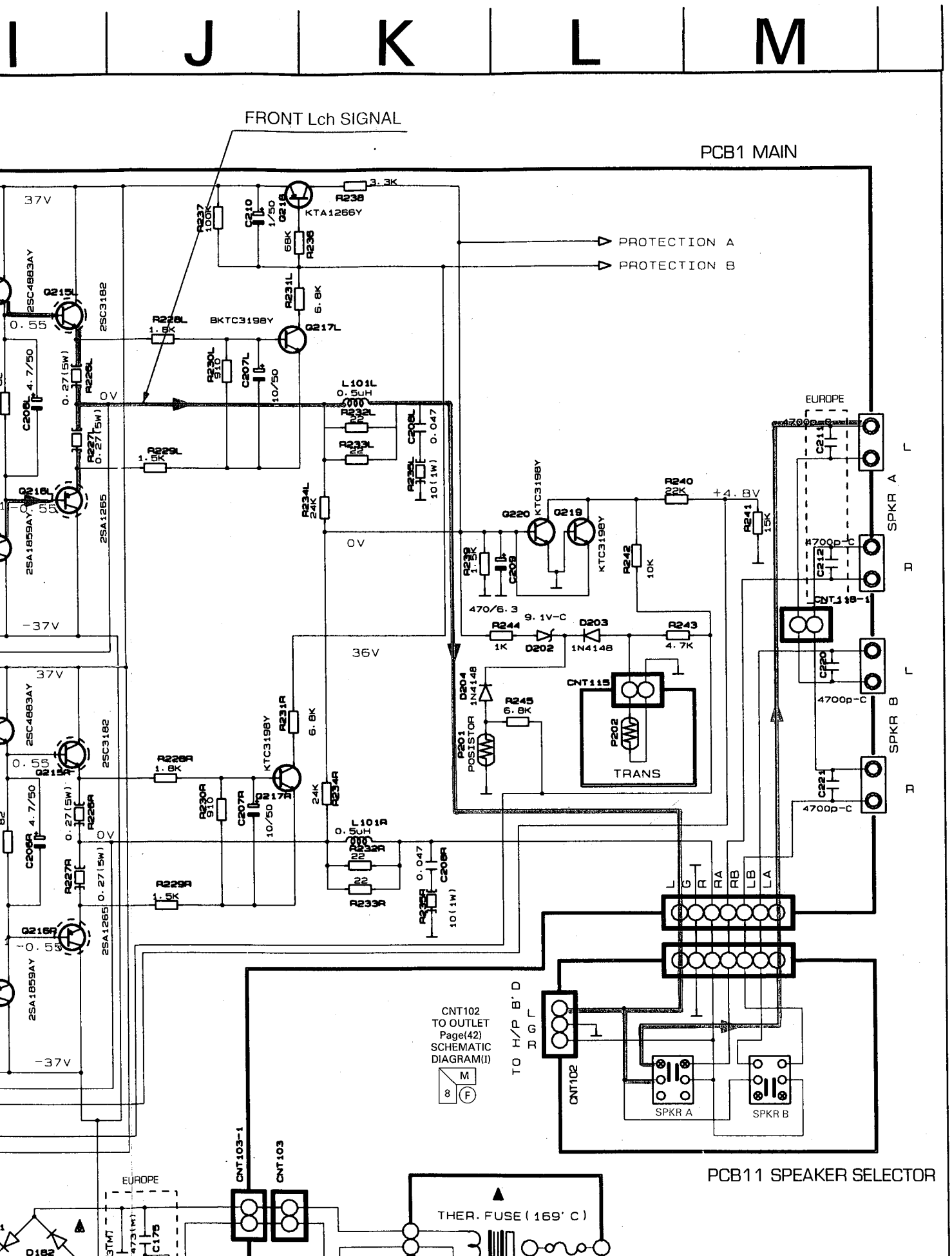


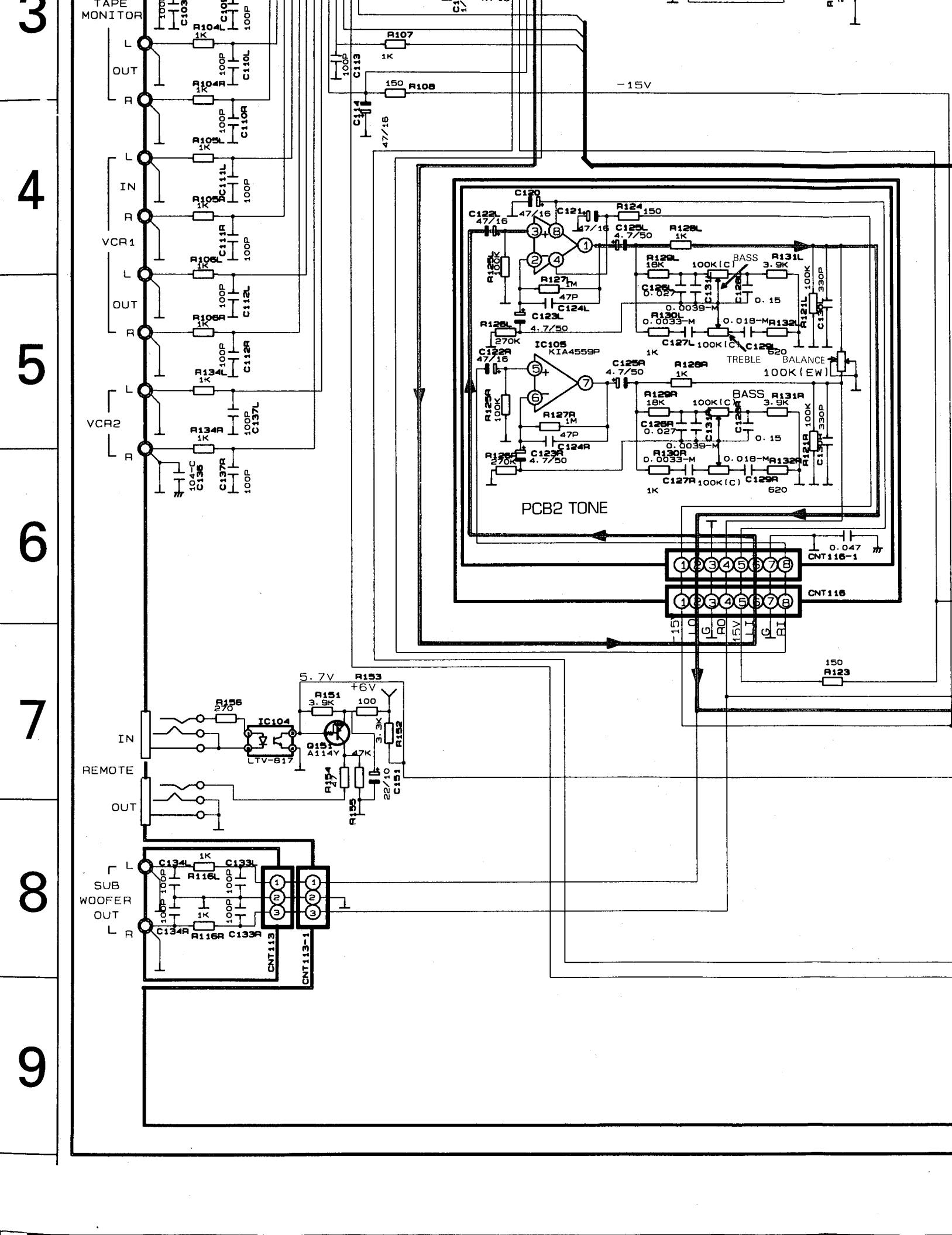
SCHEMATIC DIAGRAM II

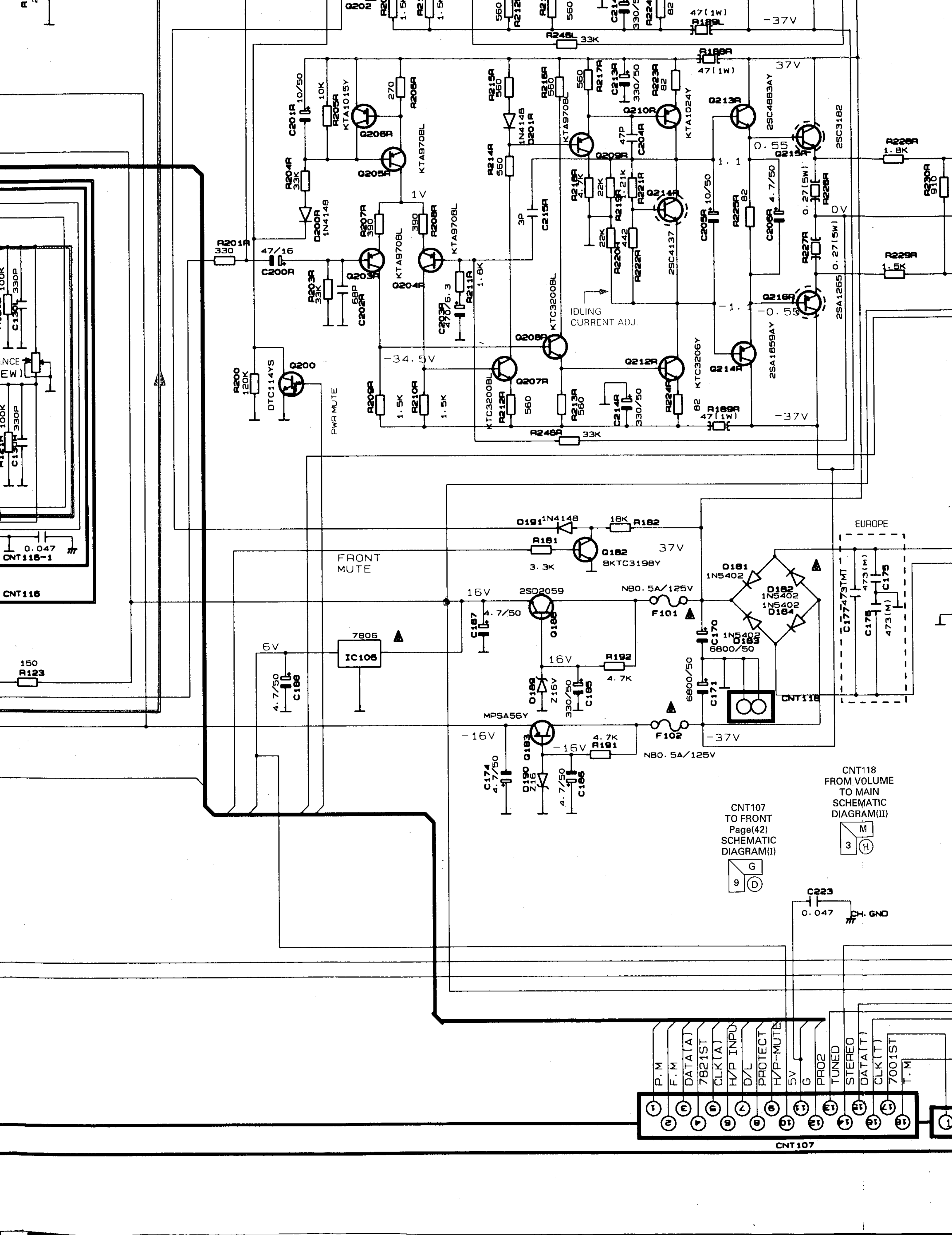


E	F	G	H	I	J

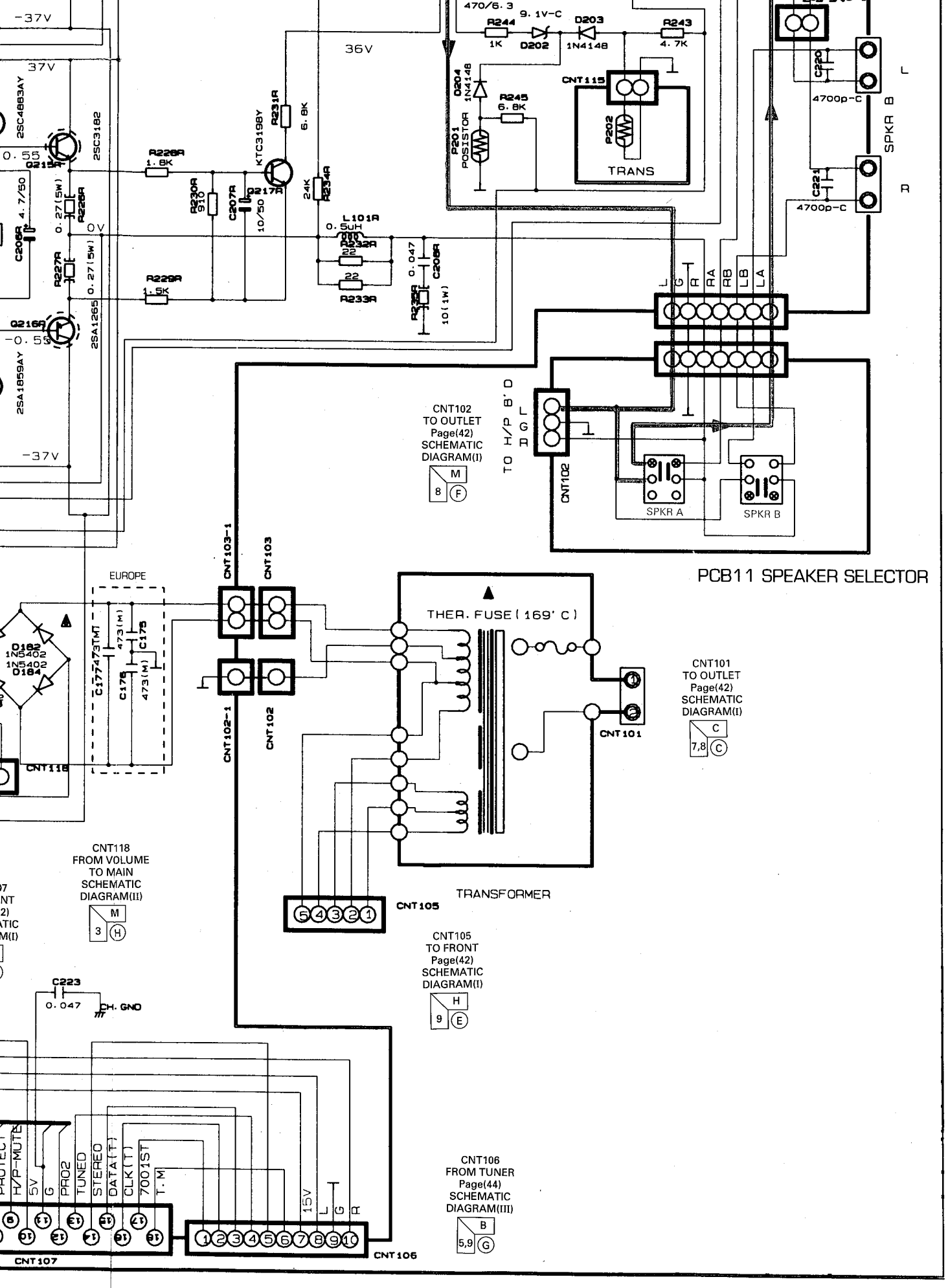

R188L 47(1W)
37V
R237 100K
C201L 10/50
10K R205L
270 R206L
KTA1266Y
Q206L
Q205L
KTA970BL
1V
R204L 33K
D200L 1N4148
R207L 390
R208L 390
Q203L
KTA970BL
Q204L
R201L 330
C200L 47/16
Q201L
2SD1302
R202L 1K
R202R 1K
Q201R
R203L 33K
C202L 68P
DTA114YS
Q202
R112L 220K
R112R 220K
R209L 1.5K
R210L 1.5K
470/6.3 C203L
R211L 1.8K
R215L 560
1N4148 D201L
R214L 560
3P C215L
560 R216L
560 R217L
KTA970BL
Q209L
Q210L
KTA1024Y
47P C204L
330/50 C213L
82 R223L
R218L 4.7K
22K
R219L
R221L 1.21k
442
R220L 22K
R222L
Q211L
2SC4137
C205L 10/50
Q213L
2SC4883AY
Q215L
2SC3182
0.55
1.1
R225L 82
C206L 4.7/50
R226L 0.27(5W)
0V
R227L 0.27(5W)
R228L 1.8K
BKTC
R230L 910
R229L 1.5K
Q216L
-1.1
-0.55
2SA1859AY
Q214L
2SA1265
KTC3200BL
Q208L
-34.5V
Q207L
Q212L
KTC3206Y
560 R212L
R213L 560
C214L 330/50
R224L 82
47(1W) R189L
-37V
R246L 33K
R188R 47(1W)
37V
C201R 10/50
10K R205R
KTA1015Y
Q206R
270 R206R
Q205R
KTA970BL
R204R 33K
D200R 1N4148
1V
R207R 390
390 R208R
KTA970BL
R201R 330
47/16 C200R
Q203R
Q204R
R203R 33K
68P C202R
C203R 470/6.3
R211R 1.8K
R215R 560
1N4148 D201R
R214R 560
3P C215R
R216R 560
560 R217R
C213R 330/50
R223R 82
KTA970BL
Q210R
KTA1024Y
47P C204R
Q209R
R218R 4.7K
22K
R219R 1.21k
R221R
Q214R
2SC4137
22K R220R
442 R222R
IDLING CURRENT ADJ.
C205R 10/50
R225R 82
C206R 4.7/50
Q213R
2SC4883AY
Q215R
2SC3182
0.55
1.1
R226R 0.27(5W)
0V
R227R 0.27(5W)
R228R 1.8K
R230R 910
R229R 1.5K
Q216R
-1.1
-0.55
2SA1265
Q214R
2SA1859AY
KTC3200BL
Q208R
-34.5V
Q207R
Q212R
KTC3206Y
R209R 1.5K
R210R 1.5K
KTC3200BL
R212R 560
R213R 560
C214R 330/50
R224R 82
R189R 47(1W)
-37V
R246R 33K
R200 120K
Q200
DTC114YS
PWR MUTE
330P C130L
330P C130R
0.047
CNT116-1
D191 1N4148
18K R182
R181 3.3K
Q182 BKTC3198Y
37V
FRONT MUTE
16V
2SD2059
NBO.5A/125V
D181 1N5402
D182
EUROPE
473(M) C175
CNT103-1


I
J
K
L
M
FRONT Lch SIGNAL
PCB1 MAIN
PROTECTION A
PROTECTION B
37V
-37V
0V
36V
+4.8V
Q215L
2SC4883AY
2SC3182
Q216L
2SA1859AY
2SA1265
Q217L
BKTC3198Y
Q219
Q220
KTC3198Y
Q215R
Q216R
Q217R
KTA1266Y
Q218
R237 100K
R238 3.3K
R236 68K
R231L 6.8K
R228L 1.5K
R230L 910
R207L 10/50
C210 1/50
R232L 22
R233L 22
R234L 24K
R235L 10(1W)
C208L 0.047
R229L 1.5K
R227L 0.27(5W)
C206L 4.7/50
L101L 0.5uH
R231R 6.8K
R228R 1.8K
R230R 910
R207R 10/50
R234R 24K
R232R 22
R233R 22
R235R 10(1W)
C208R 0.047
R229R 1.5K
R227R 0.27(5W)
C206R 4.7/50
L101R 0.5uH
R239 1.5K
C209 470/6.3
R240 22K
R241 15K
R242 10K
R243 4.7K
R244 1K
D202 9.1V-C
D203 1N4148
D204 1N4148
R245 6.8K
P201 POSISTOR
P202 TRANS
CNT115
EUROPE
C211 4700p-C
C212 4700p-C
C220 4700p-C
C221 4700p-C
SPKR A
SPKR B
CNT118-1
CNT118-1 FROM MAIN Page(43) SCHEMATIC DIAGRAM(II)
CNT102 TO OUTLET Page(42) SCHEMATIC DIAGRAM(I)
TO H/P B'D
L G R RA RB LB LA
CNT102
SPKR A
SPKR B
PCB11 SPEAKER SELECTOR
CNT103-1
CNT103
EUROPE
THER. FUSE (169° C)
D182
C175


TAPE MONITOR
OUT
IN
VCR1
VCR2
SUB WOOFER OUT
REMOTE
-15V
5.7V
+6V
PCB2 TONE
IC105 KIA4559P
IC104
LTV-817
Q151 A114Y
BASS
TREBLE
BALANCE
100K(EW)
CNT116
CNT116-1
CNT113
CNT113-1
R107
R108
R123
R124
R151
R152
R153
R154
R155
R156
C113
C114
C120
C121
C122L
C122R
C123L
C123R
C124L
C124R
C125L
C125R
C126L
C126R
C127L
C127R
C128L
C128R
C129L
C129R
C130L
C130R
C131L
C131R
C132L
C132R
C133L
C133R
C134L
C134R
C135
C136
C137L
C137R
C151
C152
R104L
R104R
R105L
R105R
R106L
R106R
R110L
R110R
R111L
R111R
R112L
R112R
R116L
R116R
R121L
R121R
R125L
R125R
R126L
R126R
R127L
R127R
R128L
R128R
R129L
R129R
R130L
R130R
R131L
R131R
R132L
R132R
R134L
R134R
R137L
R137R



IDLING CURRENT ADJ.
PWR MUTE
FRONT MUTE
EUROPE
CNT116
CNT116-1
CNT118
CNT107
CNT118 FROM VOLUME TO MAIN SCHEMATIC DIAGRAM(II)
CNT107 TO FRONT Page(42) SCHEMATIC DIAGRAM(I)
CH. GND
P.M
F.M
DATA(A)
7821ST
CLK(A)
H/P INPUT
D/L
PROTECT
H/P-MUTE
5V
G
PRO2
TUNED
STEREO
DATA(T)
CLK(T)
7001ST
T.M
37V
-37V
16V
-16V
6V
0V
1V
-34.5V
0.55
-0.55
NBO. 5A/125V
7805
IC106
2SD2059
MPSA56Y


-37V
37V
36V
0V
-37V
2SC4883AY
2SC3182
2SA1265
2SA1859AY
KTC3198Y
Q215R
Q216R
Q217R
R226R 1.8K
R227R 0.27(5W)
R228R 4.7/50
R229R 1.5K
R230R 910
R231R 6.8K
R232R 22
R233R 22
R234R 24K
C205R 4.7/50
C206R 0.047
C207R 10/50
L101R 0.5UH
R233R 10(1W)
470/6.3
9.1V-C
D202
D203 1N4148
R244 1K
R243 4.7K
R245 6.8K
D204 1N4148
P201 POSISTOR
P202
CNT115
TRANS
C220 4700P-C
C221 4700P-C
SPKR B L
SPKR B R
L G R RA RB LB LA
CNT102
SPKR A
SPKR B
TO H/P B'D R G L
CNT102 TO OUTLET Page(42) SCHEMATIC DIAGRAM(I) M 8 F
PCB11 SPEAKER SELECTOR
EUROPE
CNT103-1
CNT103
CNT102-1
CNT102
C177473TMT
C175 473(M)
C175 473(M)
D182 1N5402
D183 1N5402
D184
CNT118
THER. FUSE(169°C)
CNT101
CNT101 TO OUTLET Page(42) SCHEMATIC DIAGRAM(I) C 7,8 C
CNT118 FROM VOLUME TO MAIN SCHEMATIC DIAGRAM(II) M 3 H
TRANSFORMER
CNT105
CNT105 TO FRONT Page(42) SCHEMATIC DIAGRAM(I) H 9 E
C223 0.047
CH. GND
H/P-MUTE
5V
G
PRO2
TUNED
STEREO
DATA(T)
CLK(T)
7001ST
T.M
15V
L G R
CNT107
CNT106
CNT106 FROM TUNER Page(44) SCHEMATIC DIAGRAM(III) B 5,9 G
FROM MAIN Page(43) SCHEMATIC DIAGRAM(II) I 7 H

SCHEMATIC DIAGRAM III

PCB9 TUNER

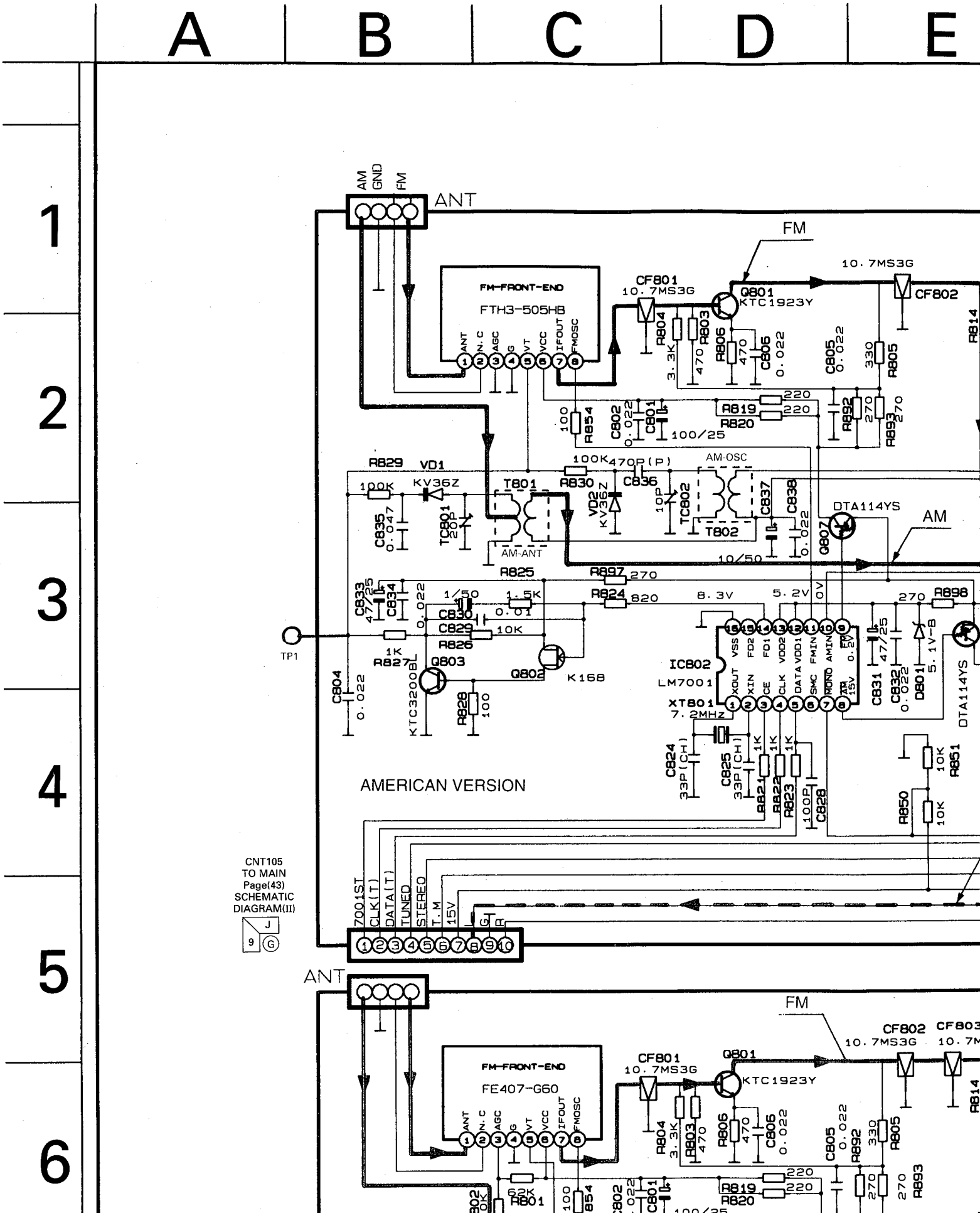
AMERICAN VERSION

EUROPEAN VERSION

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)

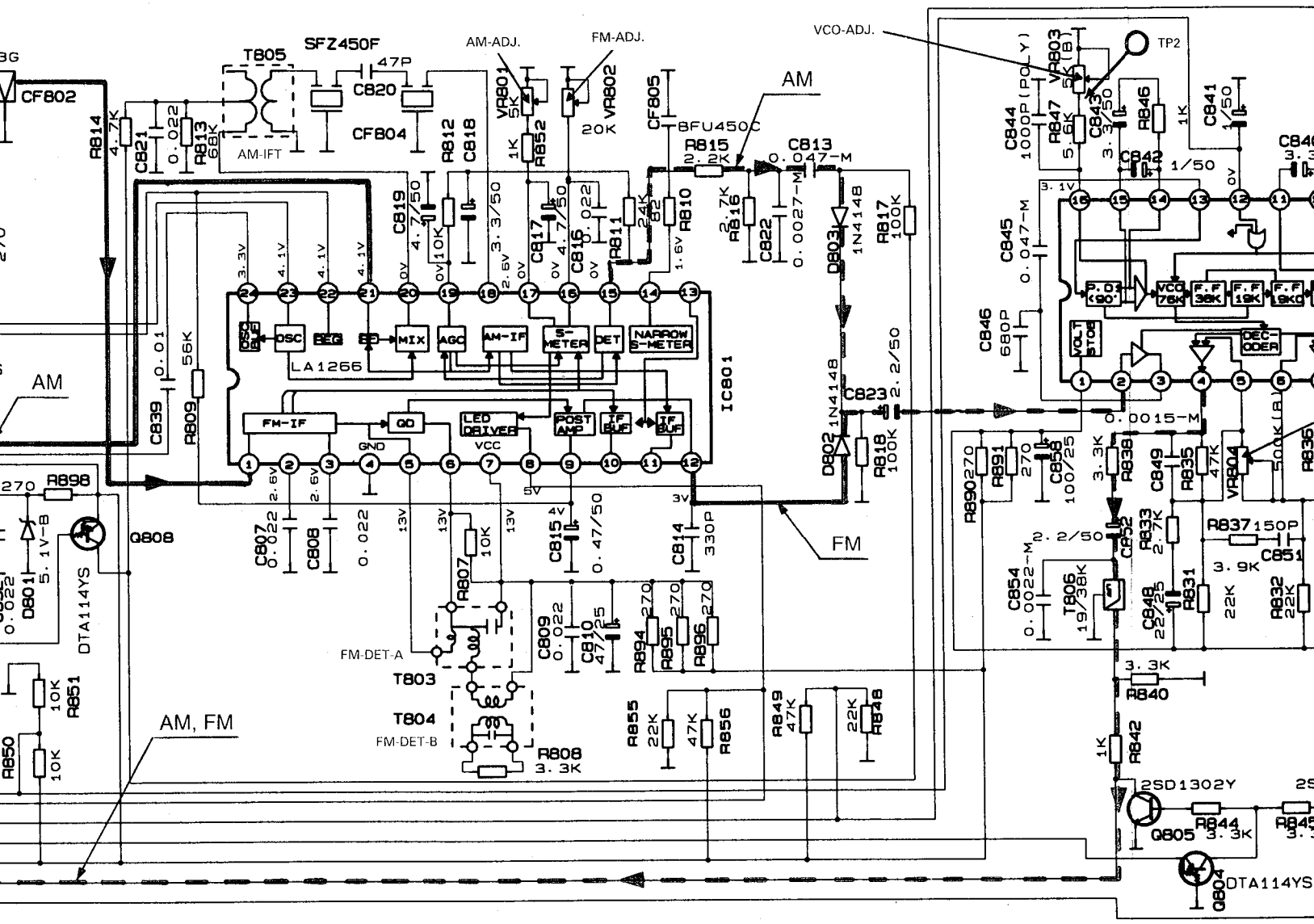
CAUTION
Safety precaution to be followed during servicing
1) Since those parts marked with ⚠ are critical parts for safety. use only the one described in the parts list
2) Before returning the set to the customer make appropriate leakage current or resistance measurements to determine the exposed parts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

SCHEMATIC DIAGRAM III

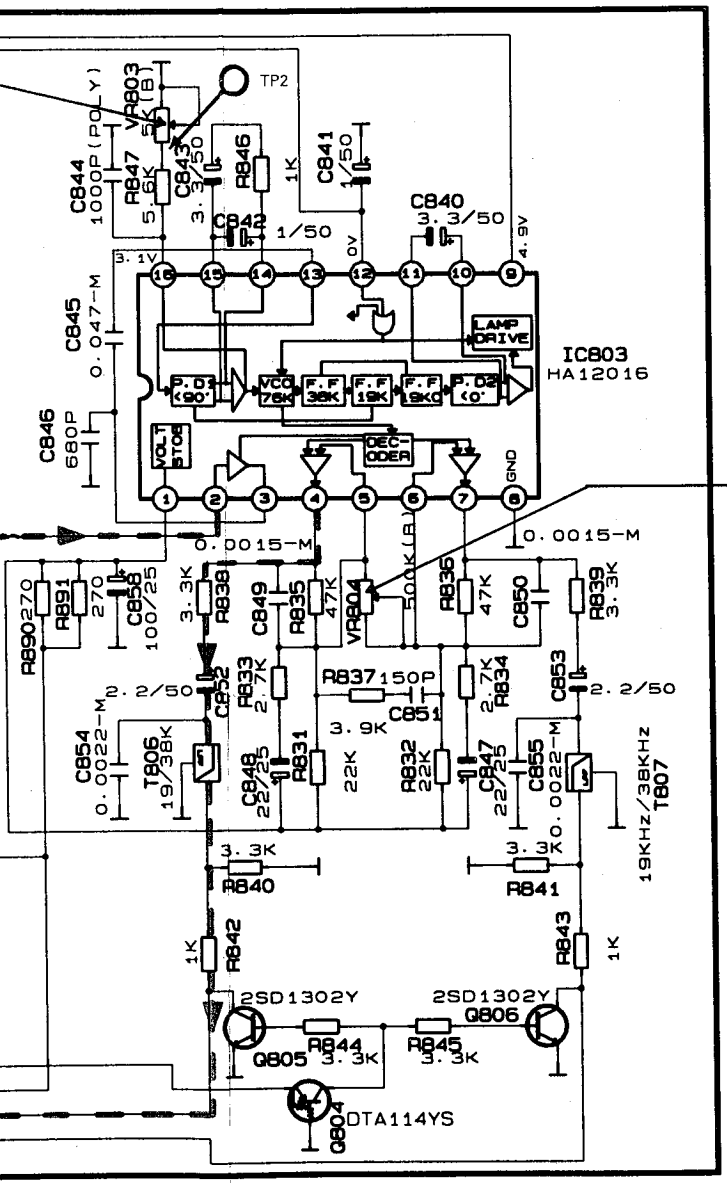


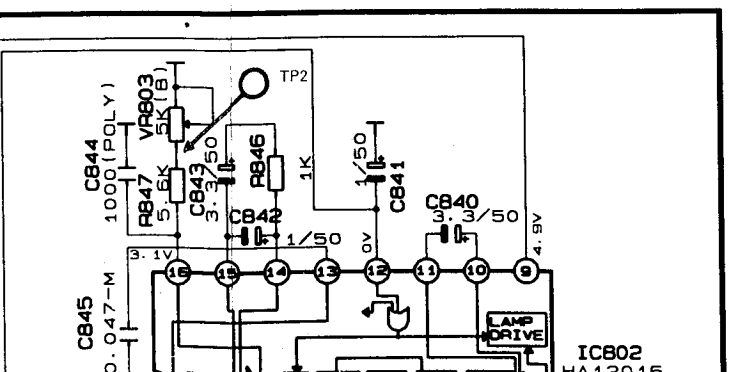
E F G H I J

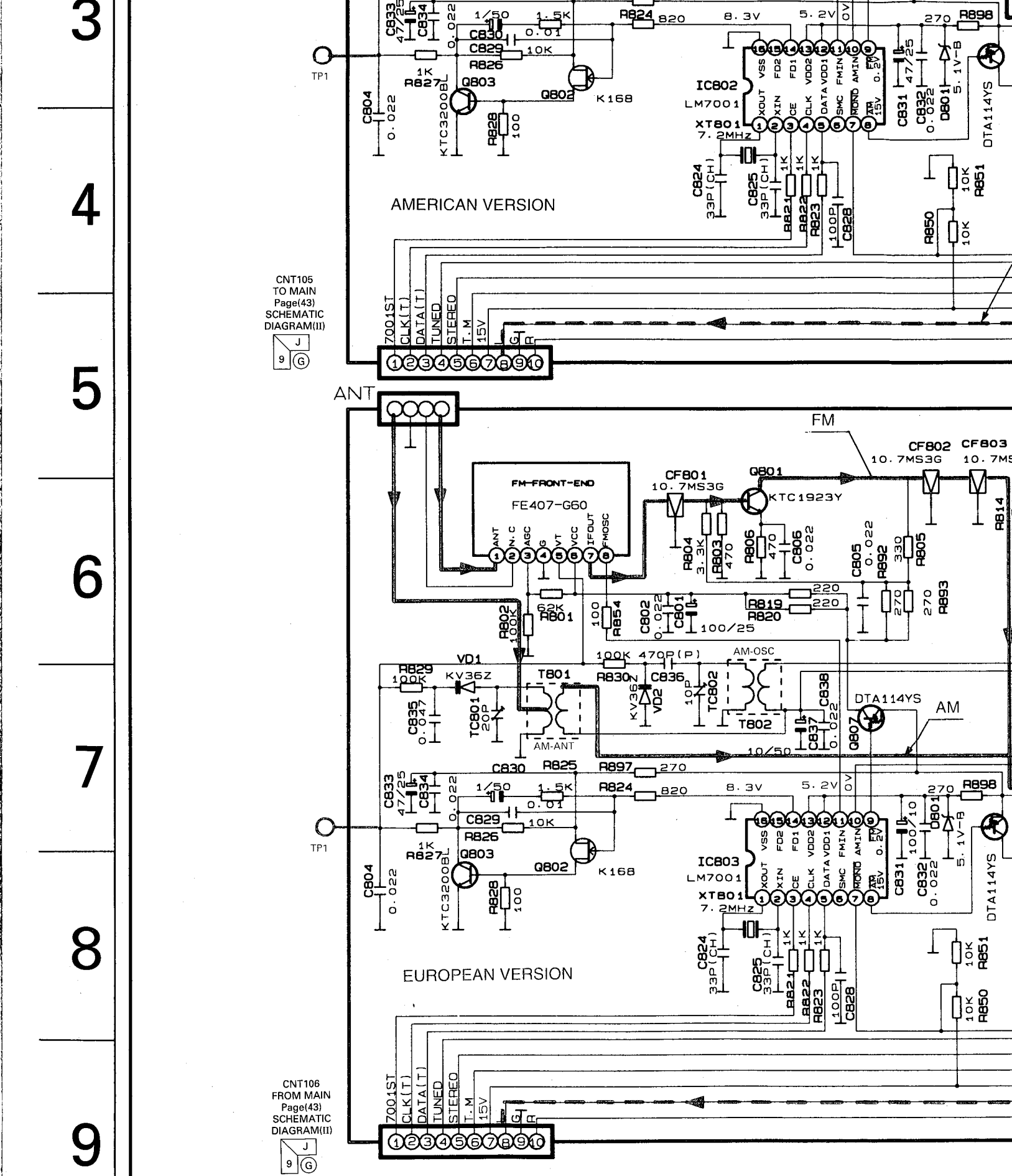
PCB9 TUNER

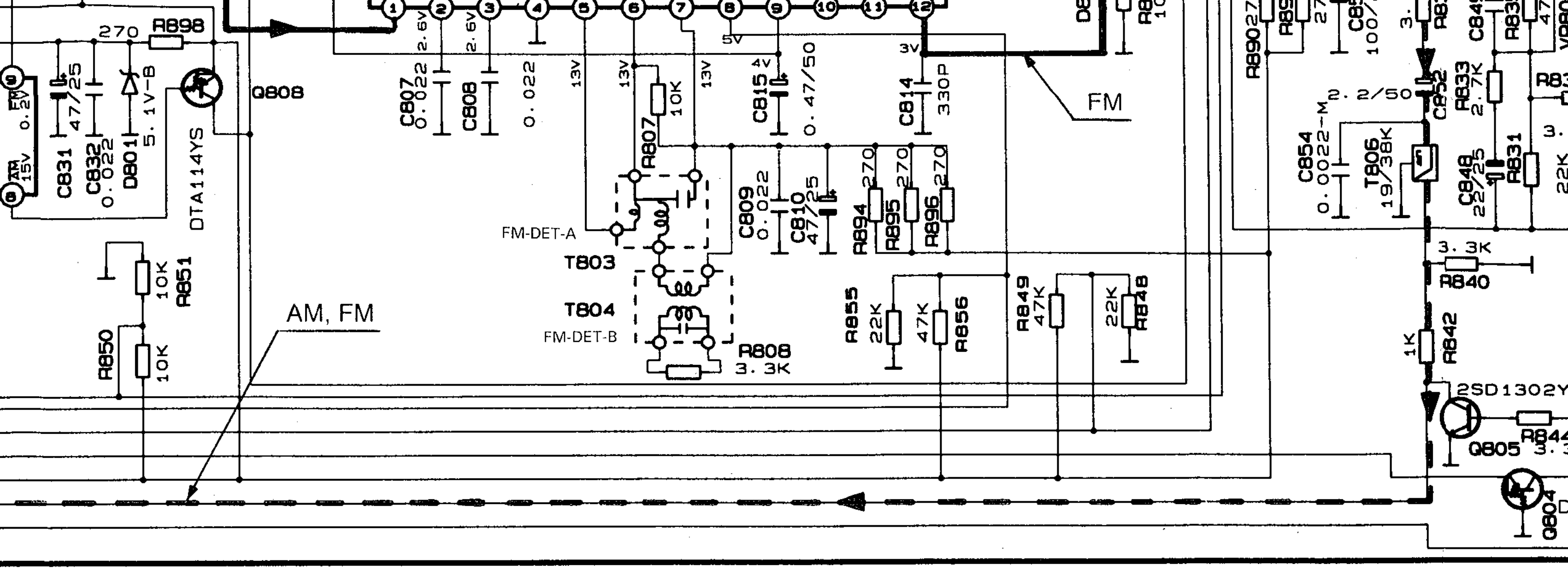


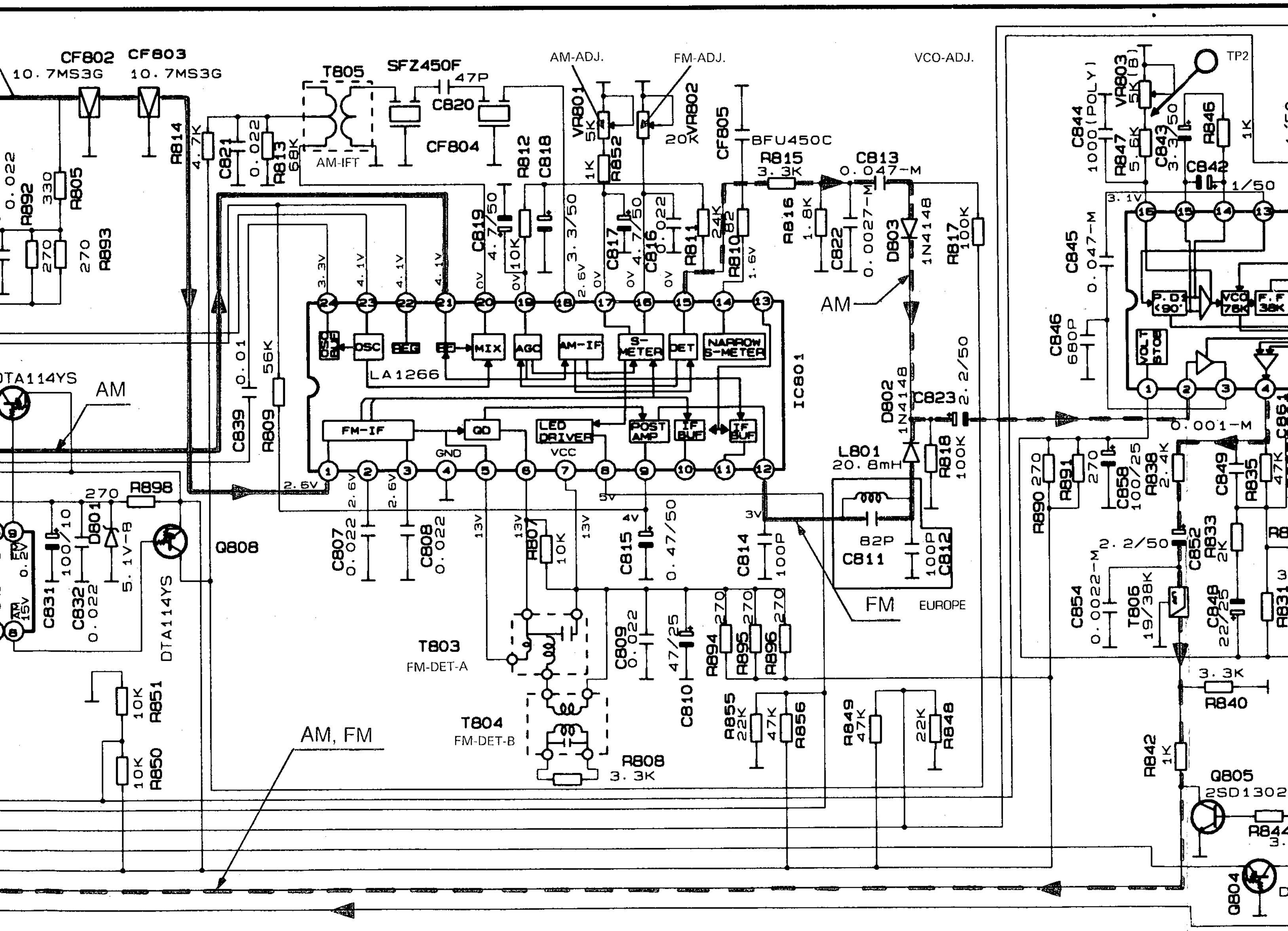
I J K L M

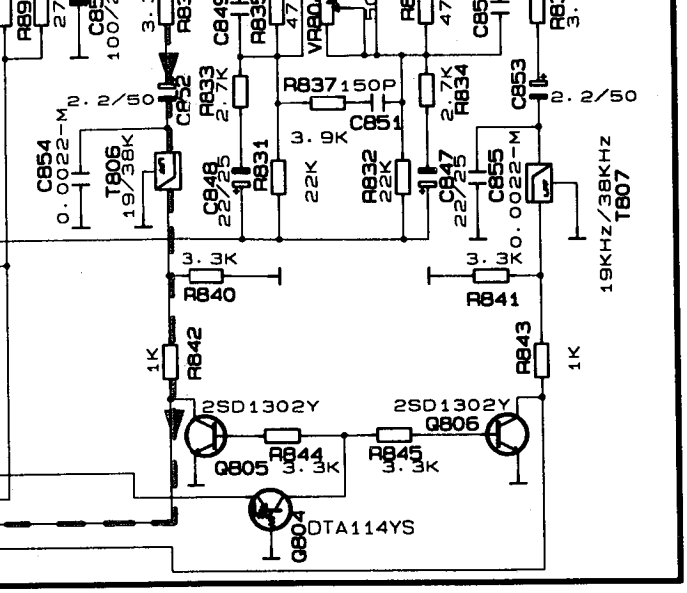

TP2
VR803 5K(B)
C844 1000P(POLY)
R847 5.6K
C843 3.3/50
R846 1K
C841 1/50
C842 1/50
C840 3.3/50
3.1V
0V
4.9V
C845 0.047-M
C846 680P
IC803 HA12016
LAMP DRIVE
P.D (90°)
VCO 76K
F.F 38K
F.F 19K
F.F 19KD
P.D2 (0°)
VOLT REG
DEC-ODER
GND
SEP-ADJ.
0.0015-M
0.0015-M
R890 270
R891 270
C858 100/25
R838 3.3K
C849
R835 47K
VR804 500K(B)
R836 47K
C850
R839 3.3K
C852 2.2/50
R833 2.7K
R837 150P
C851 3.9K
R834 2.7K
C853 2.2/50
C854 0.0022-M
T806 19/38K
C848 22/25
R831 22K
R832 22K
C847 22/25
C855 0.0022-M
T807 19KHz/38KHz
3.3K R840
3.3K R841
R842 1K
R843 1K
2SD1302Y Q805
2SD1302Y Q806
R844 3.3K
R845 3.3K
Q804 DTA114YS

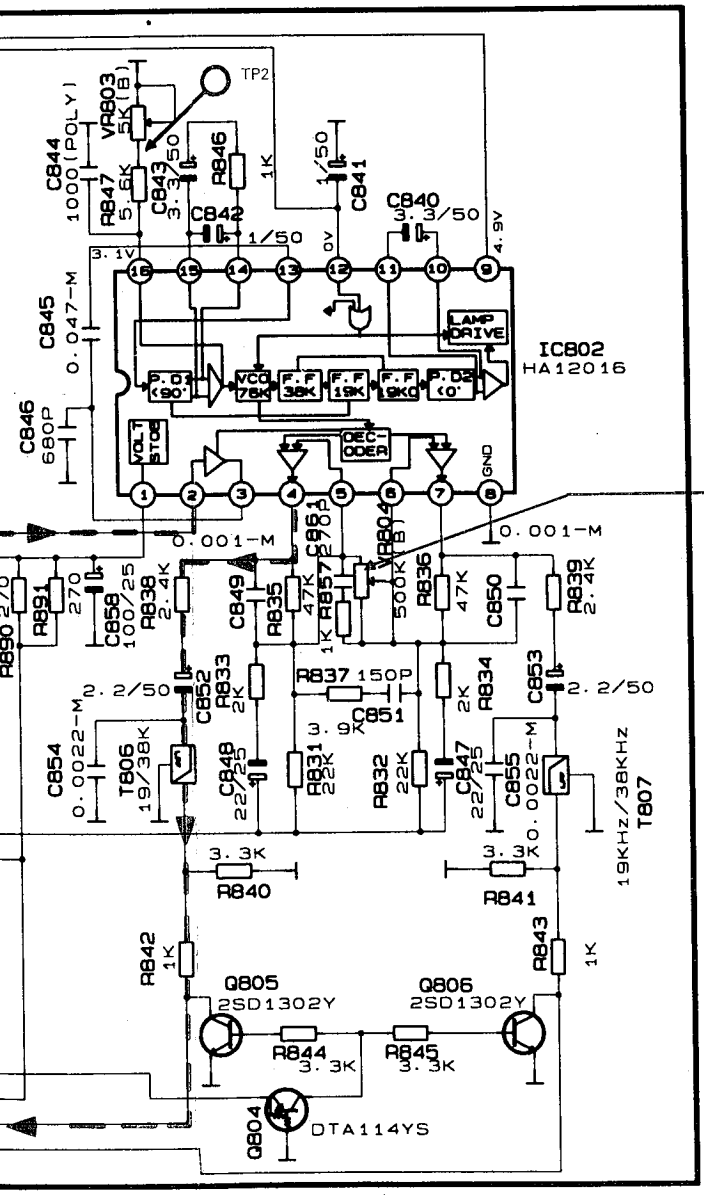

TP2
VR803 5K(B)
C844 1000(POLY)
R847 5.6K
C843 3.3/50
R846 1K
C841 1/50
C842 1/50
C840 3.3/50
3.1V
0V
4.9V
C845 0.047-M
IC802 HA12016
LAMP DRIVE


AMERICAN VERSION
EUROPEAN VERSION
ANT
FM
AM
FM-FRONT-END
FE407-G60
IC802
IC803
LM7001
XT801
7.2MHz
Q801
KTC1923Y
Q802
K168
Q803
KTC3200BL
Q807
DTA114YS
CF801
CF802
CF803
10.7MS3G
VD1
VD2
KV36Z
T801
T802
AM-ANT
AM-OSC
TC801
TC802
CNT105
TO MAIN
Page(43)
SCHEMATIC
DIAGRAM(II)
CNT106
FROM MAIN
Page(43)
SCHEMATIC
DIAGRAM(II)
7001ST
CLK(T)
DATA(T)
TUNED
STEREO
T.M
15V
TP1


FM
FM-DET-A
T803
T804
FM-DET-B
R808
3.3K
AM, FM
Q808
DTA114YS
2SD1302Y
Q805
Q804


CF802
10.7MS3G
CF803
10.7MS3G
T805
SFZ450F
47P
C820
AM-IFT
CF804
AM-ADJ.
FM-ADJ.
VCO-ADJ.
VR801
5K
VR802
20K
CF805
BFU450C
R815
3.3K
C813
0.047-M
R816
1.8K
C822
0.0027-M
D803
1N4148
R817
100K
AM
LA1266
OSC
REG
MIX
AGC
AM-IF
S-METER
DET
NARROW S-METER
FM-IF
QD
LED DRIVER
POST AMP
IF BUF
GND
VCC
IC801
D802
1N4148
C823
2.2/50
L801
20.8mH
R818
100K
82P
C811
100P
C812
FM
EUROPE
TP2
VR803
5K(B)
C844
1000(POLY)
C845
0.047-M
C846
680P
VCO 76K
F.F 38K
VOLT STOR
DTA114YS
AM
Q808
T803
FM-DET-A
T804
FM-DET-B
R808
3.3K
AM, FM
T806
19/38K
R840
R842
1K
Q805
2SD1302
Q804





NOTES

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   [K=1.000 M=1.000.000]
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   [p=micro-microfarades]

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