MP3 Mini Hi-Fi System

FWM603X/78

FWM603/55

Service
Service
Service

Service Manual

CONTENTS

CLASS 1 LASER PRODUCT

Published by LX 0914 Service Audio Subject to modification

3141 785 33940

Version 1.0

PHILIPS

TECHNICAL SPECIFICATION

Amplifier

Total output power	600W RMS
Frequency response	60 - 16kHz
Signal-to- noise ratio	>67dB A (IEC)
Aux input	1500mV/2000mV

Disc

Laser type	Semiconductor
Disc diameter	12cm/8cm
Support disc	CD-DA, CD-R, CD-RW, MP3-CD, WMA-CD
Audio DAC	24Bits / 44.1kHz
Total harmonic distortion	<1.5%
Frequency response	60Hz -16kHz (44.1kHz)
S/N ratio	>75dBA

Tuner

Tuning range	FM: 87.5 - 108MHz; AM: 531 - 1602kHz (9KHz); 530 - 1700KHz (10KHz)
Tuning grid	50KHz (FM); 9KHz/10KHz (AM)
Number of presets	40 (FM + AM)
FM	75ohm wire
AM	loop antenna

Speakers

Speaker Impedance	6ohm
Woofer	2 x 5.25”
Tweeter	2 x 1.75”
Dimensions (W x H x D)	230 x 345 x 279mm
Weight	3.58kg each

Subwoofer

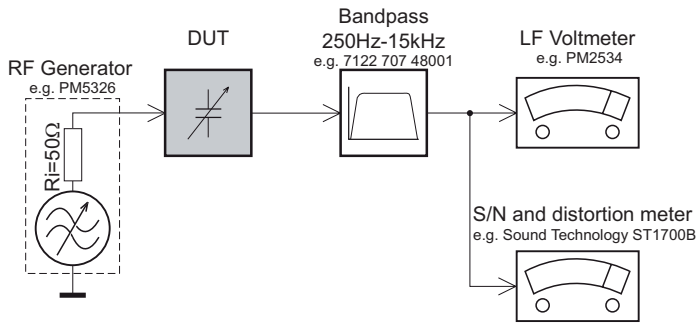
Speaker impedance	6ohm
Speaker driver	8”
Output power	160W
Dimensions (W x H x D)	270 x 345 x 396mm
Weight	6.28kg

General information

AC power	110 - 127/220 - 240V, 50/60Hz
Operation power consumption	100W
Standby power consumption	<2W
USB direct	Version 2.0/1.1
Dimensions Main Unit (W x H x D)	269 x 311 x 366mm
Weight (without speakers)	7.31kg

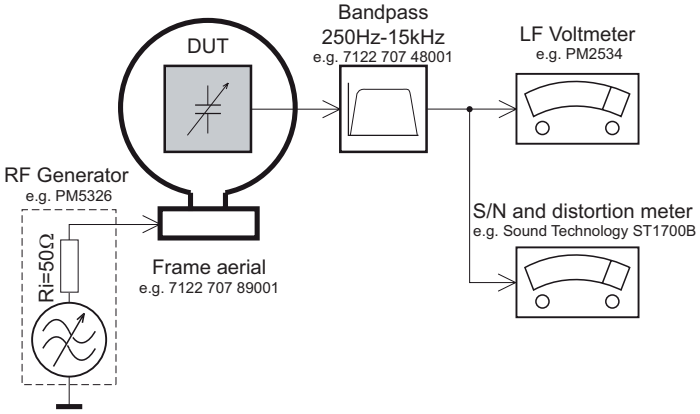
MEASUREMENT SETUP

Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

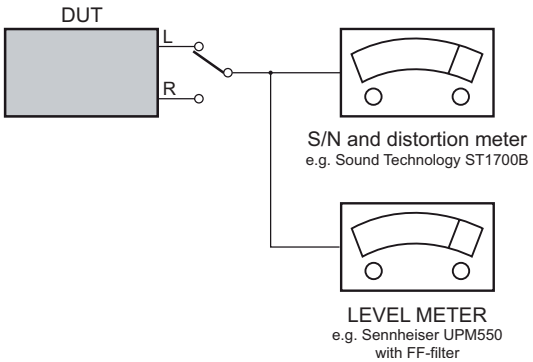
Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

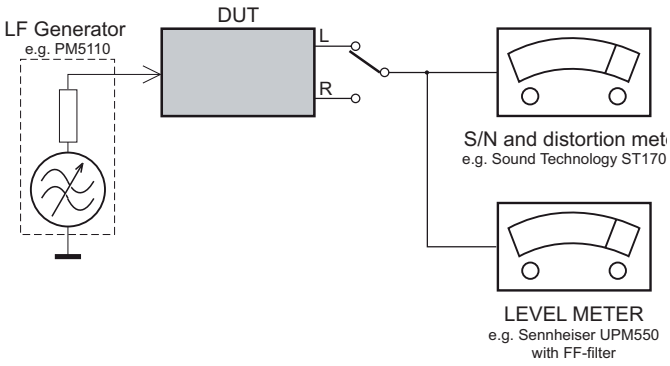
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)



Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071



SERVICE AIDS

GB **WARNING**

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

ESD

GB

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used

Safety components are marked by the symbol ⚠.

CLASS 1
LASER PRODUCT

INFORMATION ABOUT LEAD-FREE SOLDERING

Philips CE is producing lead-free sets from 1.1.2005 onwards.
IDENTIFICATION:

Regardless of special logo (not always indicated) one must treat all sets from 1 Jan 2005 onwards, according next rules:

- On our website **www.atyourservice.ce.Philips.com** you find more information to:
  - BGA-de-/soldering (+ baking instructions)
  - Heating-profiles of BGAs and other ICs used in Philips-sets
  - Lead free

  You will find this and more technical information within the "magazine", chapter "workshop news".

For additional questions please contact your local repair-helpdesk.

SERVICE INSTRUCTION

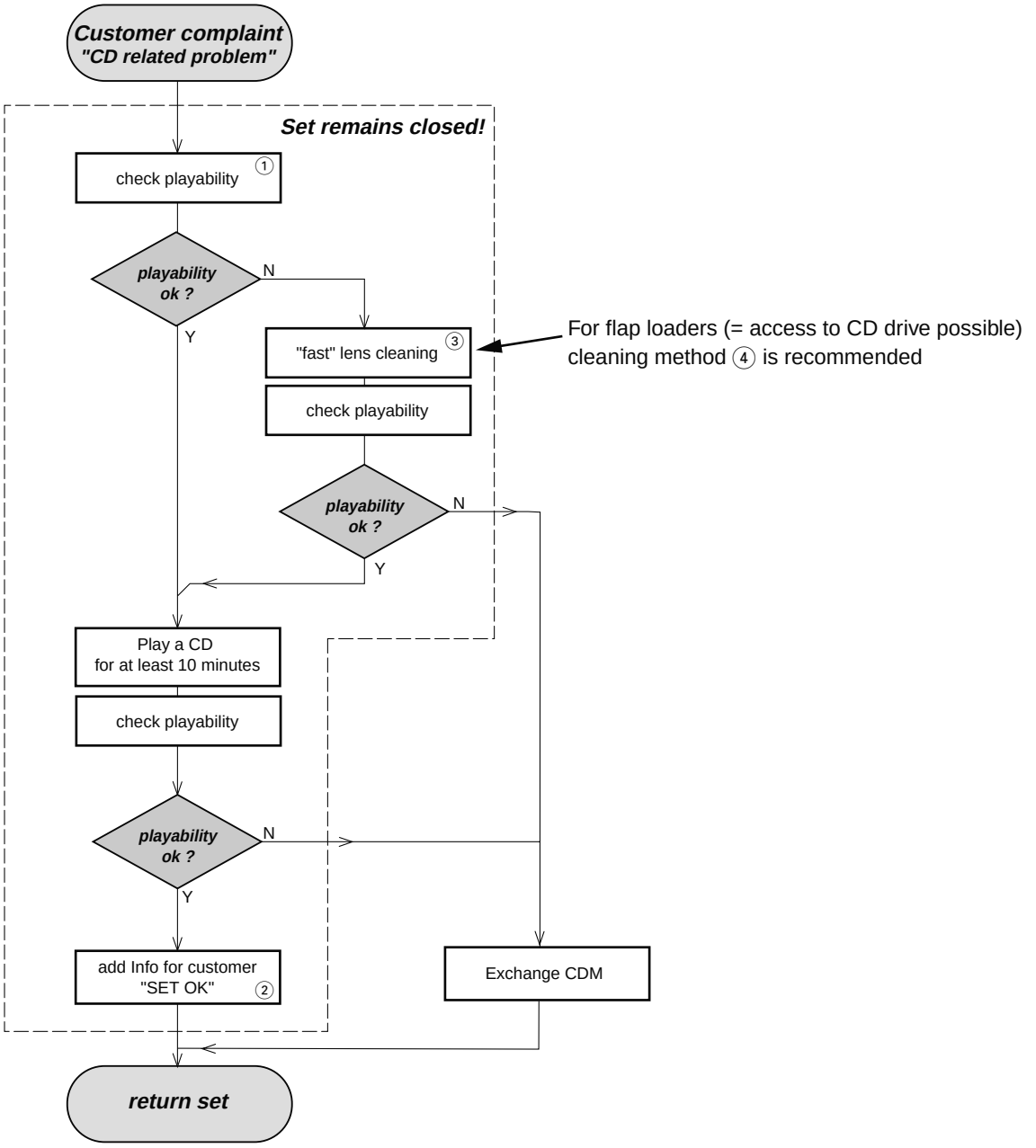
Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the AC Power lead for external damage.
- Check the strain relief of the AC Power cord for proper function.
- Check the electrical DC resistance between the AC Power Plug and the secondary side (only for sets which have a AC Power isolated power supply):

1. Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
2. Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
3. Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be larger than 4.5 Mohm (For U.S. it should be between 4.2 Mohm and 12 Mohm).
4. Switch "off" the set, and remove the wire between the two pins of the AC Power plug.

- Check the cabinet for defects, to avoid touching of any inner parts by the customer.

INSTRUCTIONS ON CD PLAYABILITY



① - ④ For description - see following pages

INSTRUCTIONS ON CD PLAYABILITY

①

PLAYABILITY CHECK

For sets which are compatible with **CD-RW** discs
use CD-RW Printed Audio Disc 7104 099 96611
TR 3 (Fingerprint)
TR 8 (600µ Black dot) **maximum at 01:00**

- playback of these two tracks without audible disturbance
  playing time for: Fingerprint ≥10seconds
  Black dot from 00:50 to 01:10
- jump forward/backward (search) within a reasonable time

For all other sets
use CD-DA SBC 444A.....4822 397 30245
TR 14 (600µ Black dot) **maximum at 01:15**
TR 19 (Fingerprint)
TR 10 (1000µ wedge)

- playback of all these tracks without audible disturbance
  playing time for: 1000µ wedge ≥10seconds
  Fingerprint ≥10seconds
  Black dot from 01:05 to 01:25
- jump forward/backward (search) within a reasonable time

②

CUSTOMER INFORMATION

It is proposed to add an addendum sheet to the set which informs the customer that the set has been checked carefully - but no fault was found.
The problem was obviously caused by a scratched, dirty or copy-protected CD. In case problems remain, the customer is requested to contact the workshop directly.
The lens cleaning (method ③) should be mentioned in the addendum sheet.

The final wording in national language as well as the printing is under responsibility of the Regional Service Organizations.

④

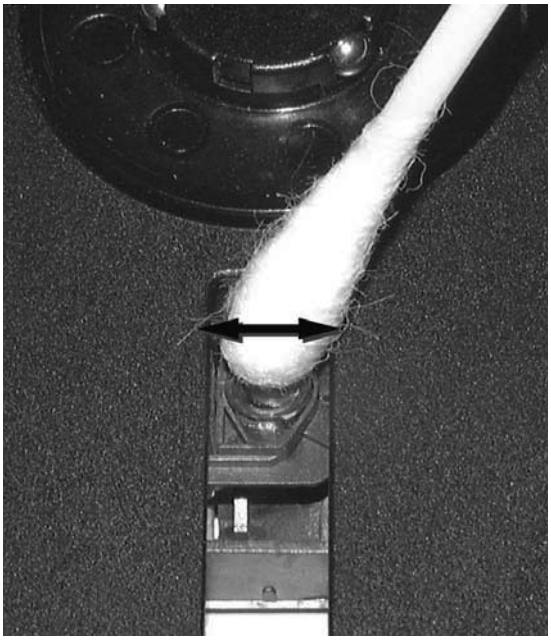
LIQUID LENS CLEANING

Before touching the lens it is advised to clean the surface of the lens by blowing clean air over it. This to avoid that little particles make scratches on the lens.

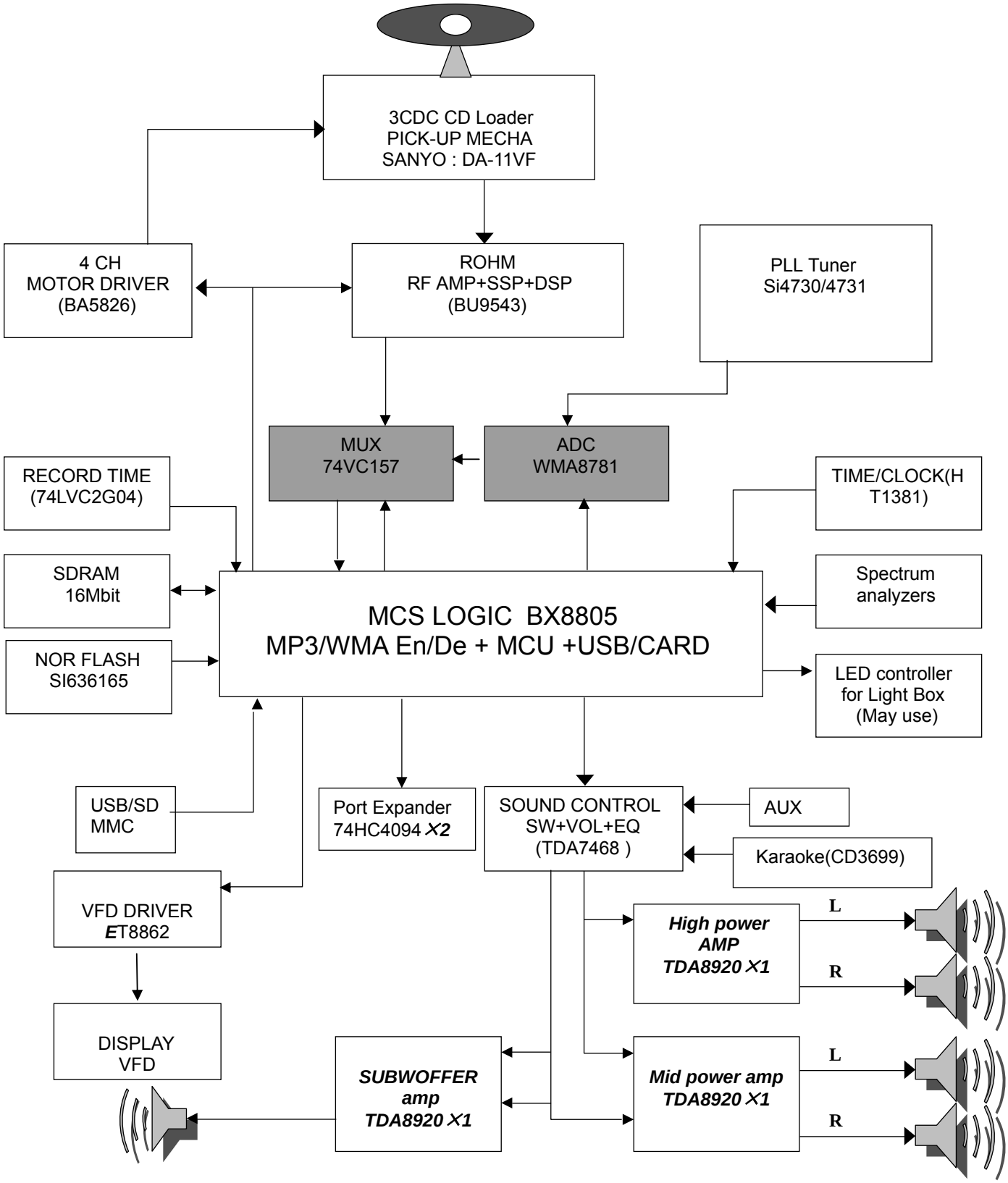
Because the material of the lens is synthetic and coated with a special anti-reflectivity layer, cleaning must be done with a non-aggressive cleaning fluid. It is advised to use “Cleaning Solvent

The actuator is a very precise mechanical component and may not be damaged in order to guarantee its full function. Clean the lens gently (don’t press too hard) with a soft and clean cotton bud moistened with the special lens cleaner.

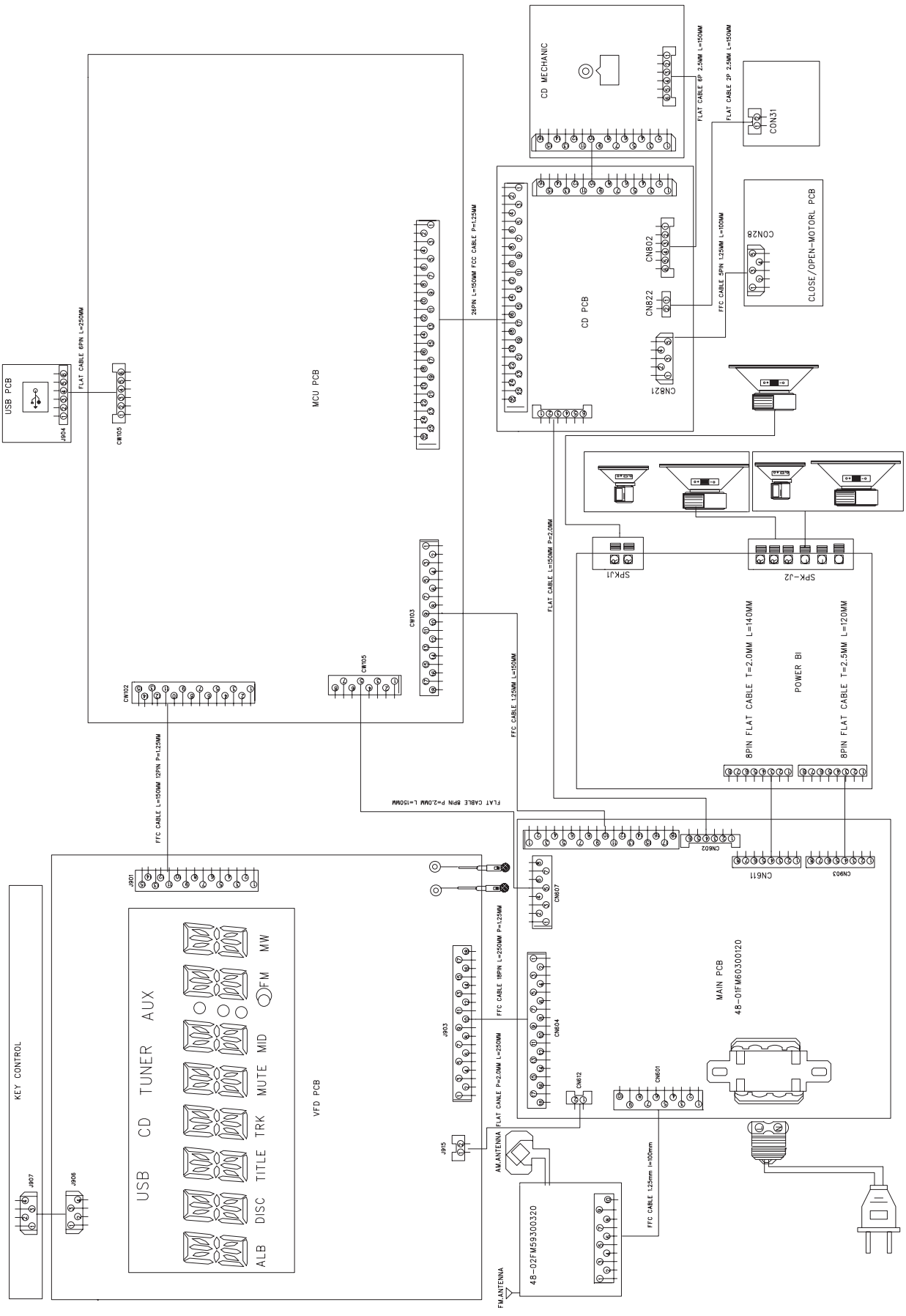
The direction of cleaning must be in the way as indicated in the picture below.



SET BLOCK DIAGRAM



SET WIRING DIAGRAM

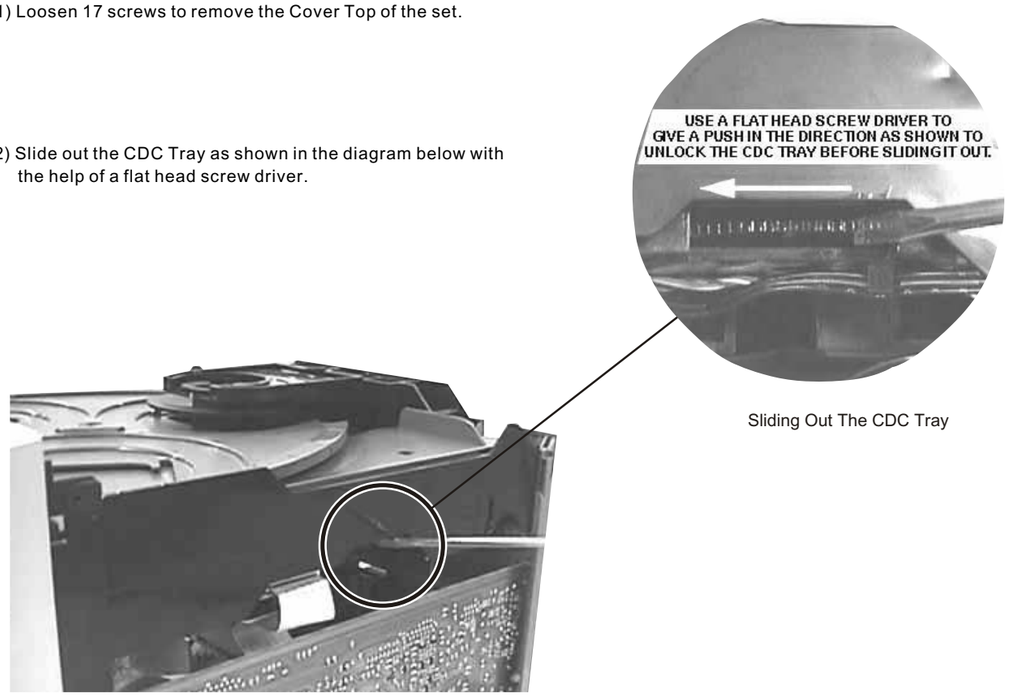


DISASSEMBLY DIAGRAM

Dismantling of the CDC Module and Front Panel

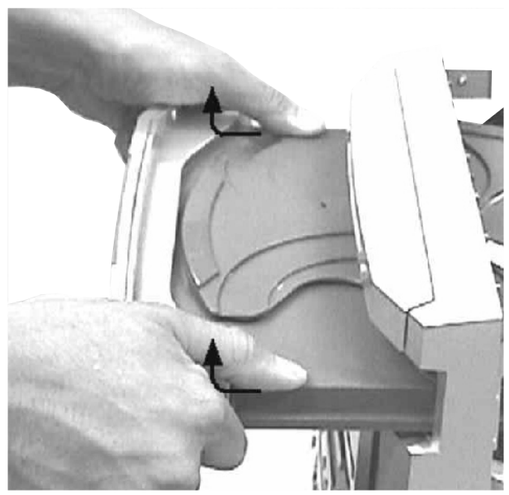
1) Loosen 17 screws to remove the Cover Top of the set.

2) Slide out the CDC Tray as shown in the diagram below with the help of a flat head screw driver.



Sliding Out The CDC Tray

3) Remove the Cover Tray CDC as indicated.

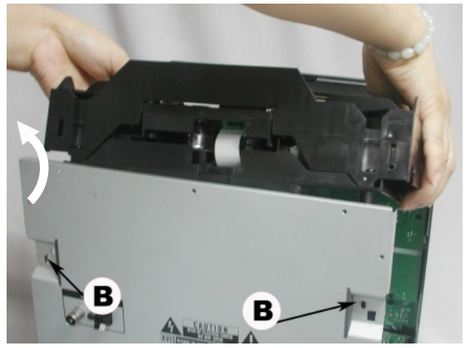


Remove Cover Tray CDC

5-1

4) Loosen 2 screws A and 2 screws B to remove the CDC Module as indicated.
5) Remove 2 screws at the bottom to separate the Front Panel Assembly from the plate bottom.

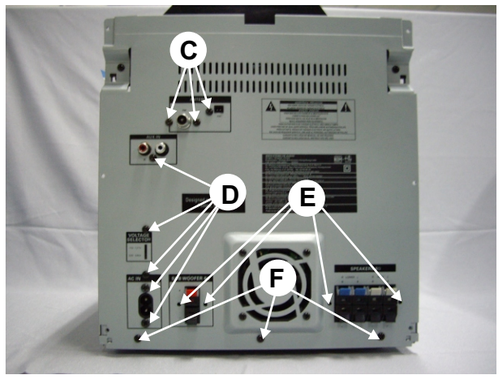
Front View CDC

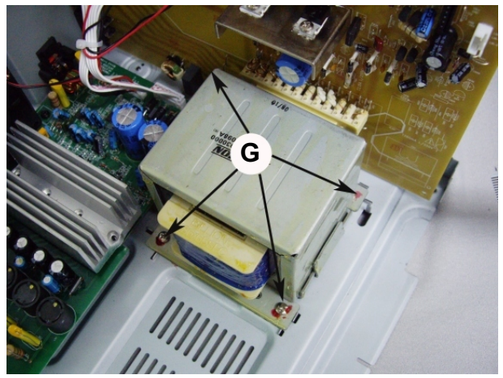


Remove CDC Module

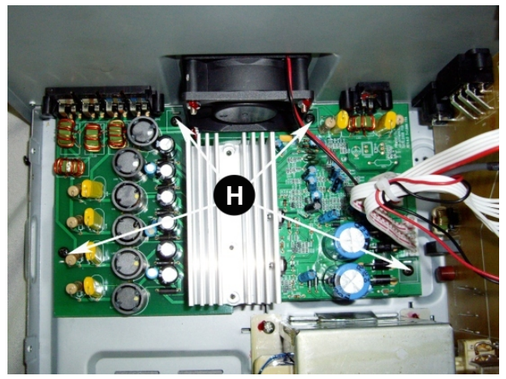
Dismantling of Rear Portion

1)Remove 3 screws C as indicated to loosen the Tuner Module.
2)Remove 9 screws D&G as indicated to loosen the Main Board.
3)Remove 8 screws E&H as indicated to loosen the AMP Board.
4)Remove 3 screws F as indicated to loosen the Bottom Cabinet.



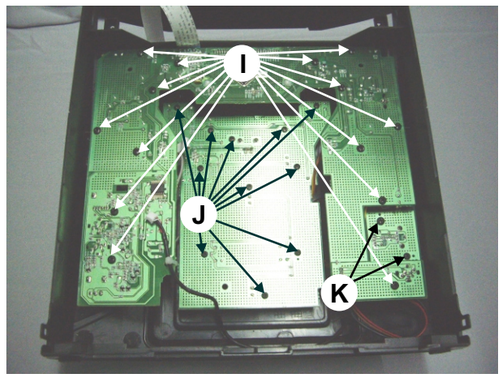


5-2



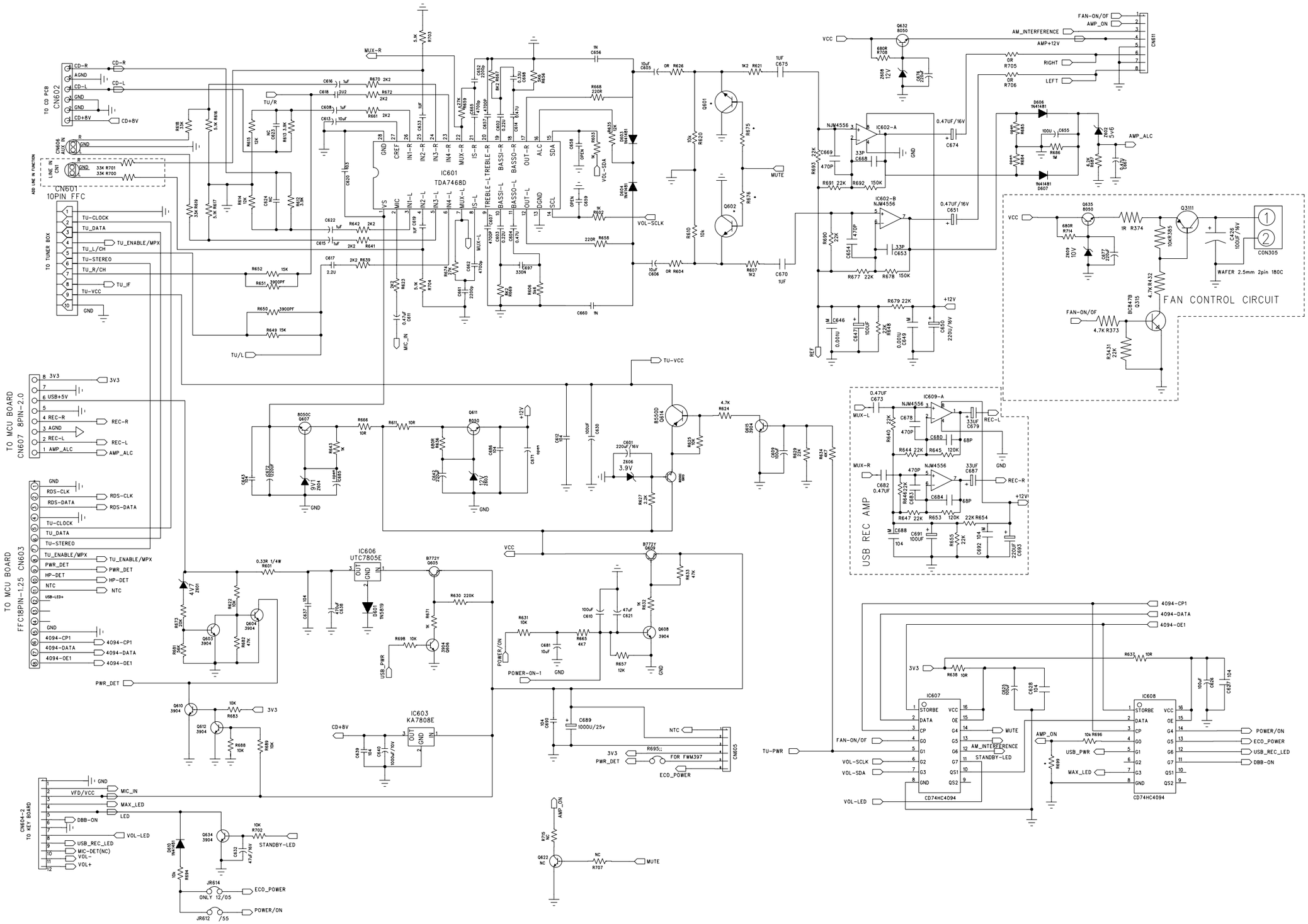
Dismantling of the PCB Board

1) Remove 14 screws I as indicated to loosen the Display Board.
2) Remove 11 screws J as indicated to loosen the Key Board.
3) Remove 2 screws K as indicated to loosen the USB jack Board.



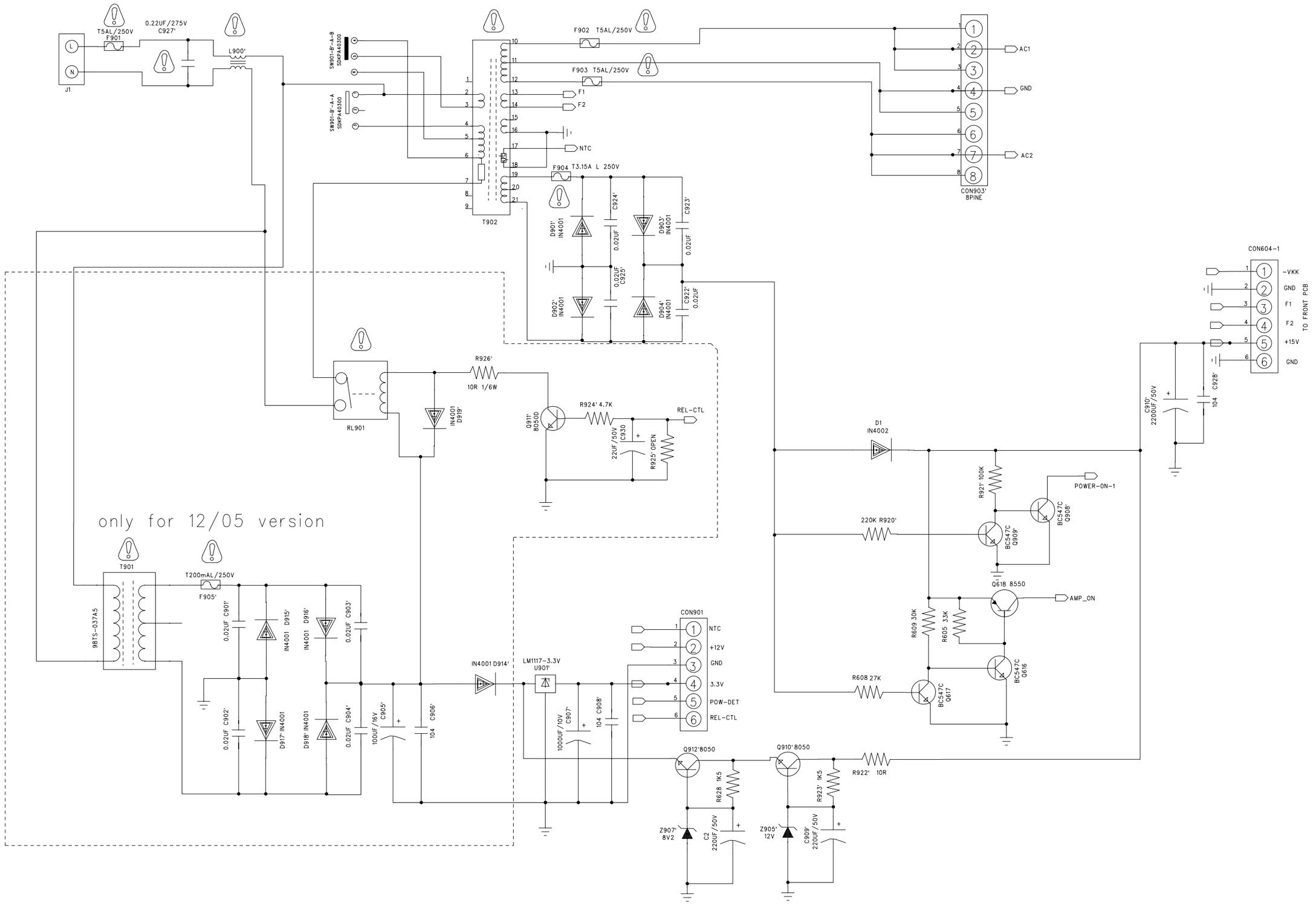
6-1

CIRCUIT DIAGRAM - MAIN BOARD
PART1



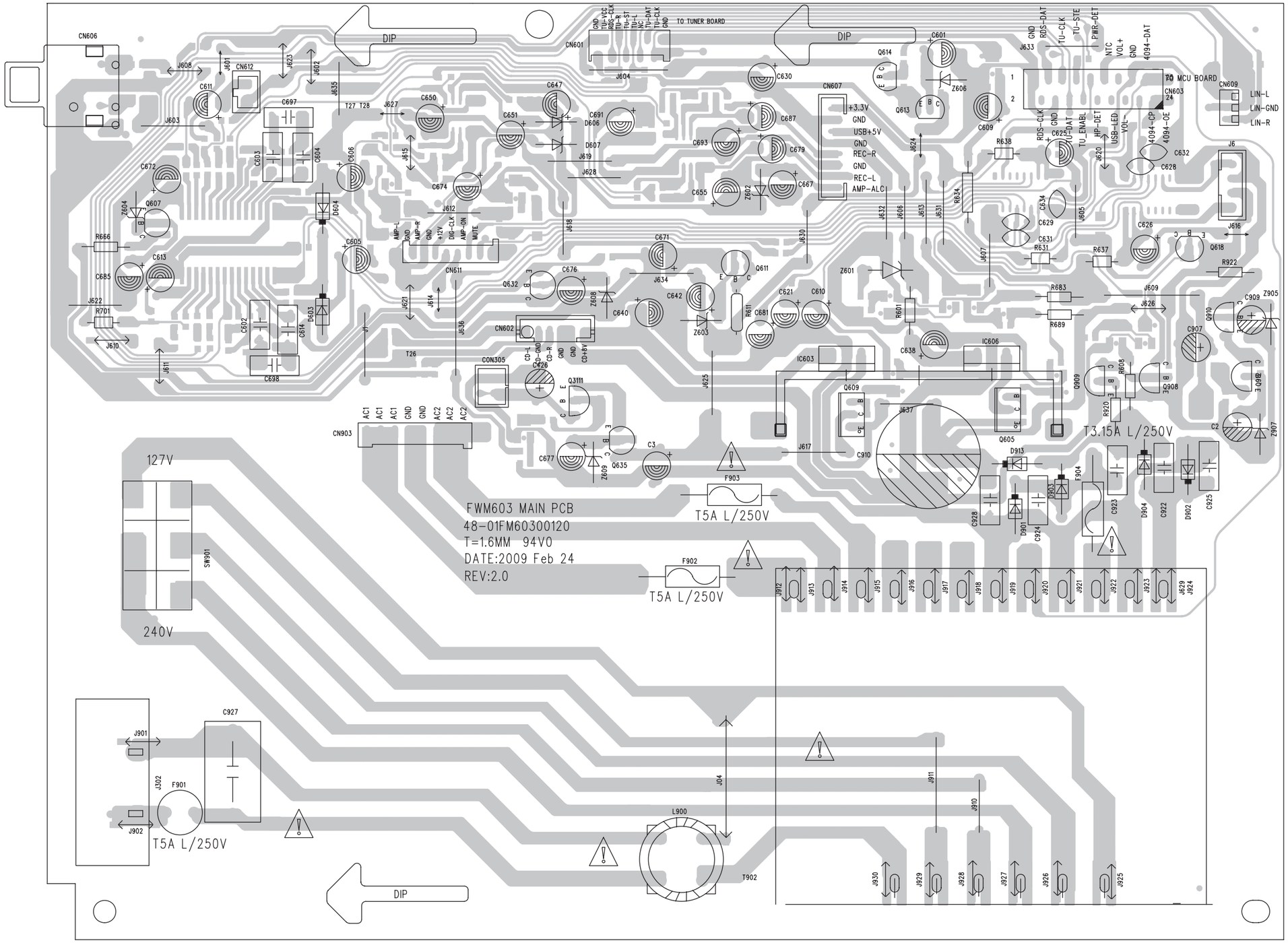
6-2

CIRCUIT DIAGRAM - MAIN BOARD
PART2



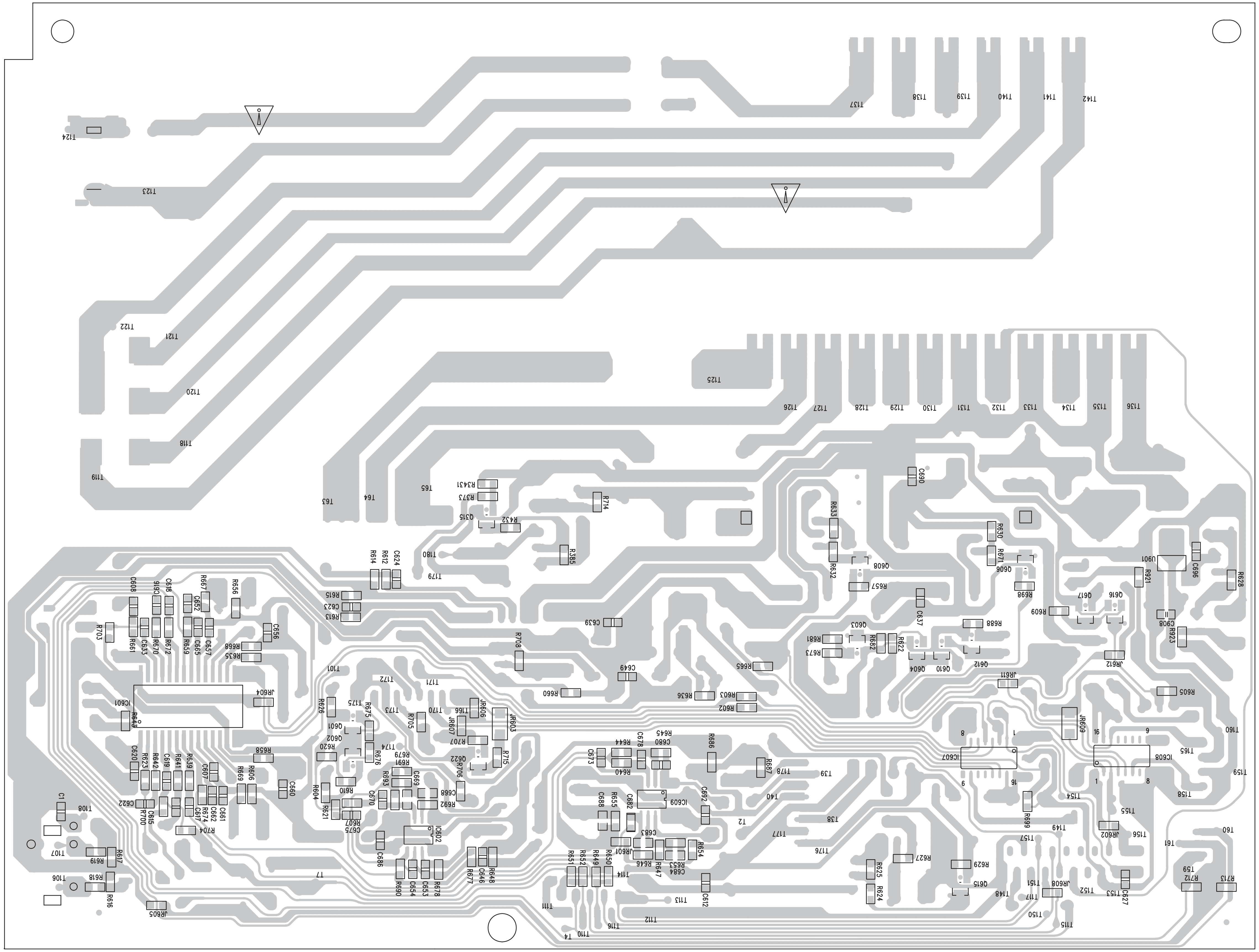
6-3

LAYOUT DIAGRAM - MAIN BOARD
TOP SIDE



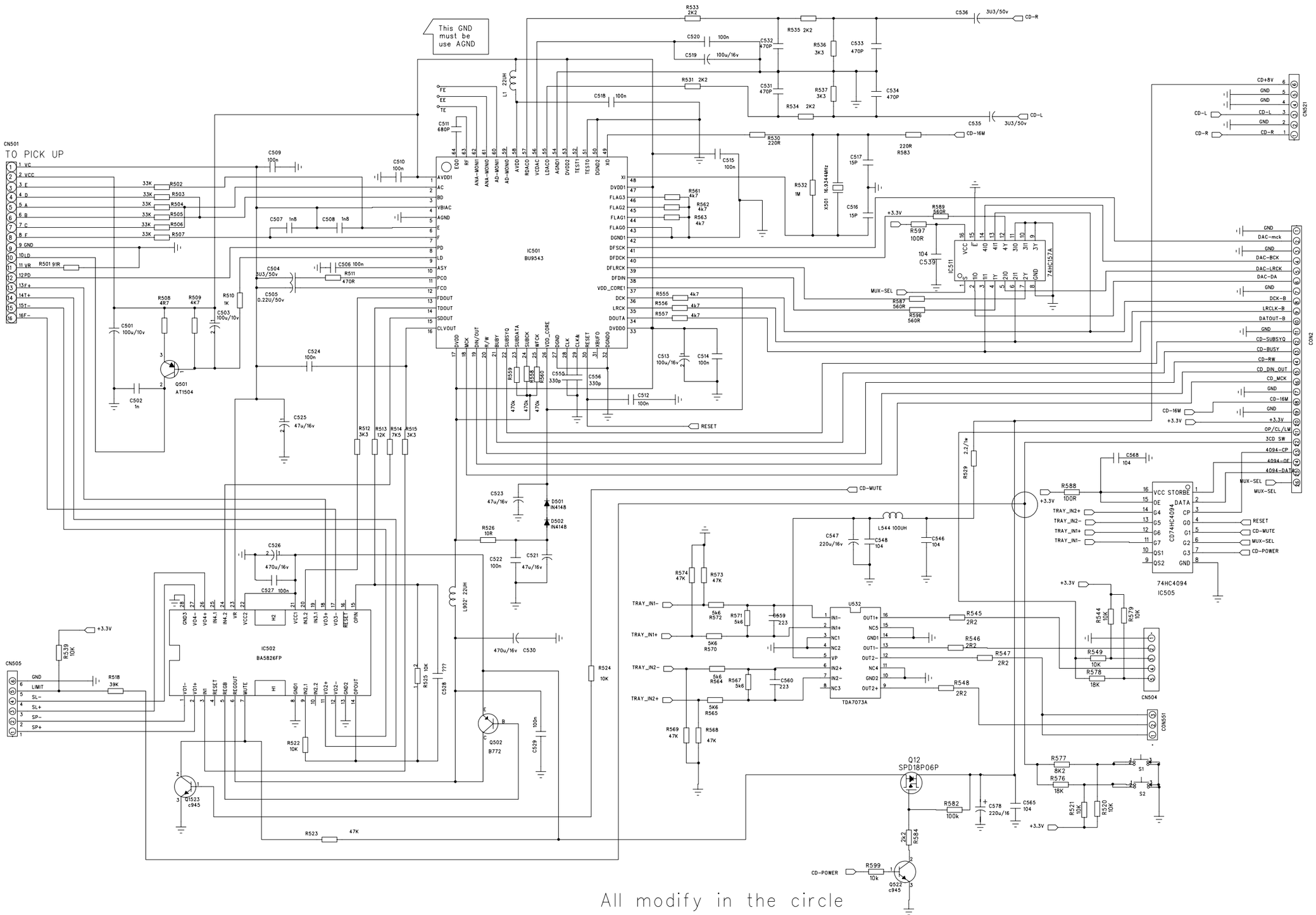
6-4

LAYOUT DIAGRAM - MAIN BOARD
BOTTOM SIDE



7-1

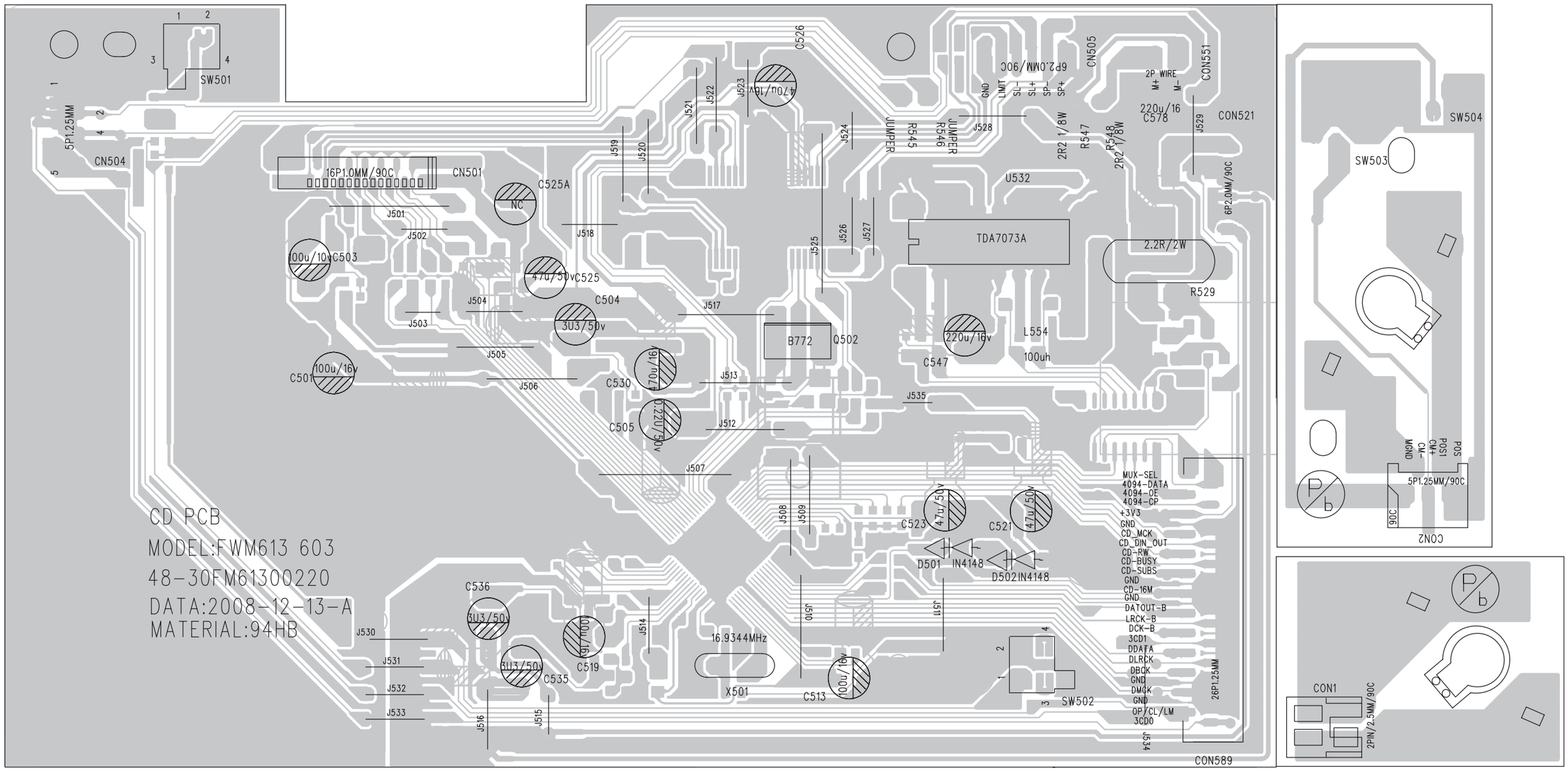
CIRCUIT DIAGRAM - CD BOARD



All modify in the circle

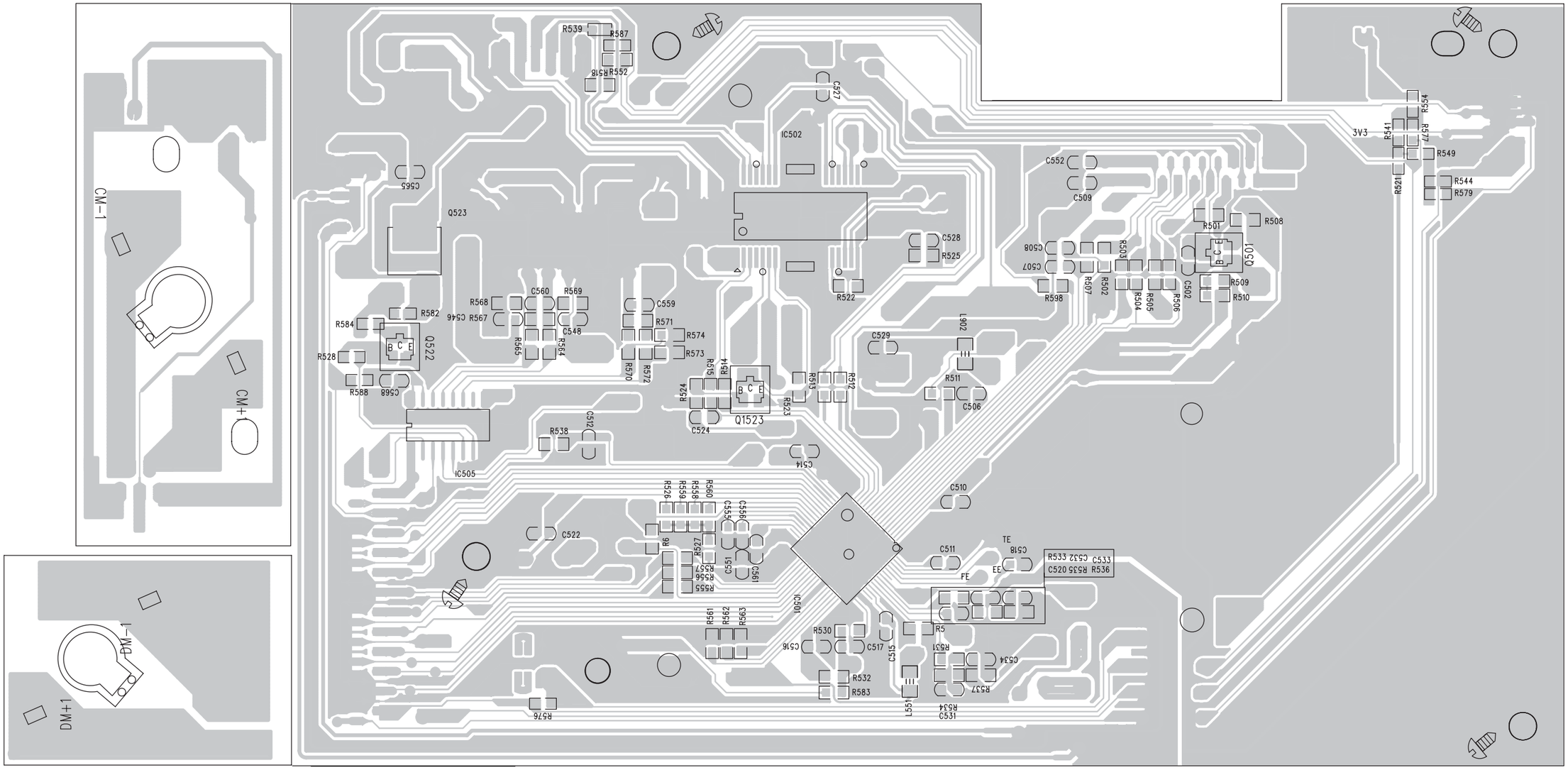
7-2

LAYOUT DIAGRAM - CD BOARD
TOP SIDE



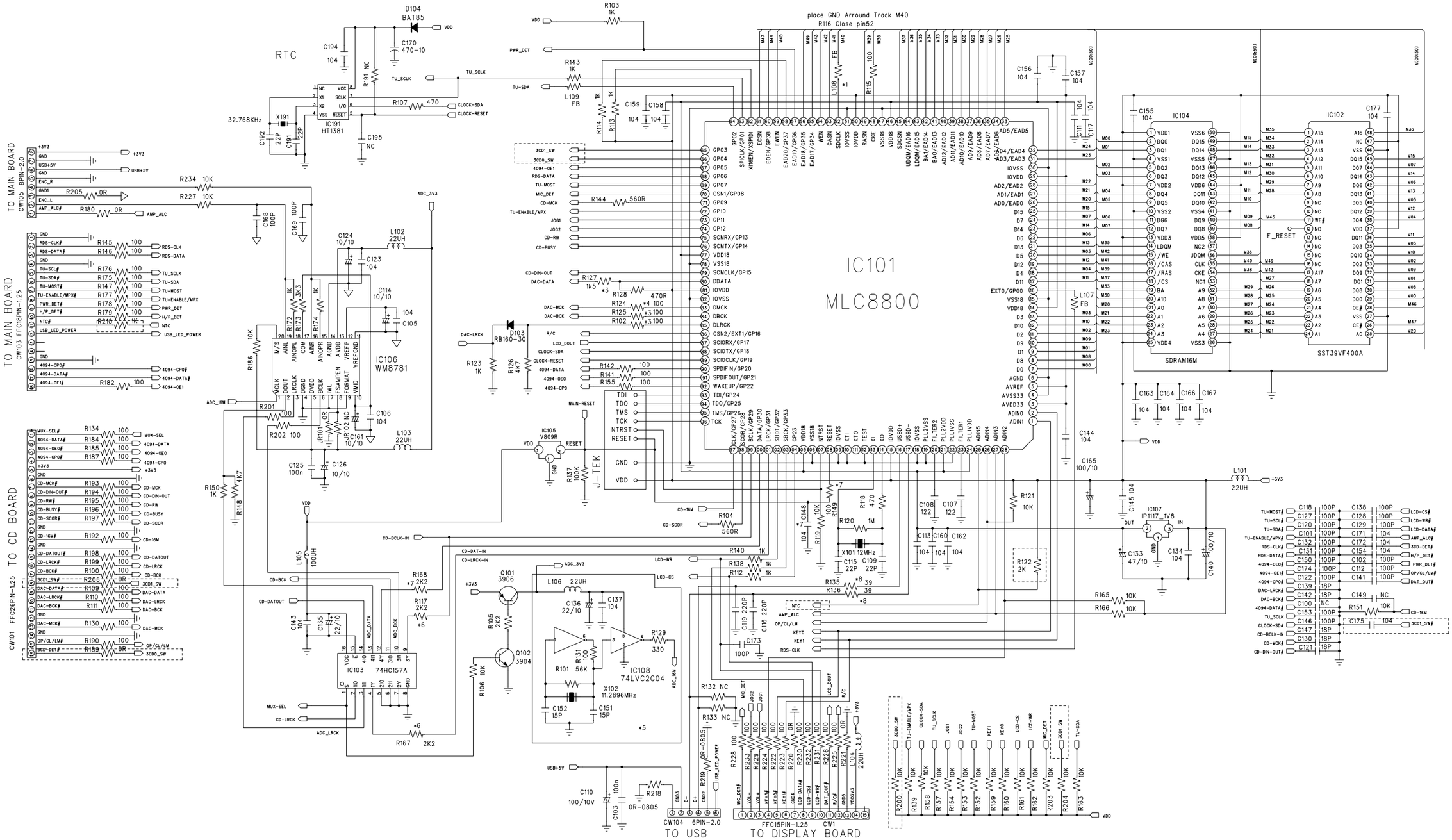
7-3

LAYOUT DIAGRAM - CD BOARD
BOTTOM SIDE



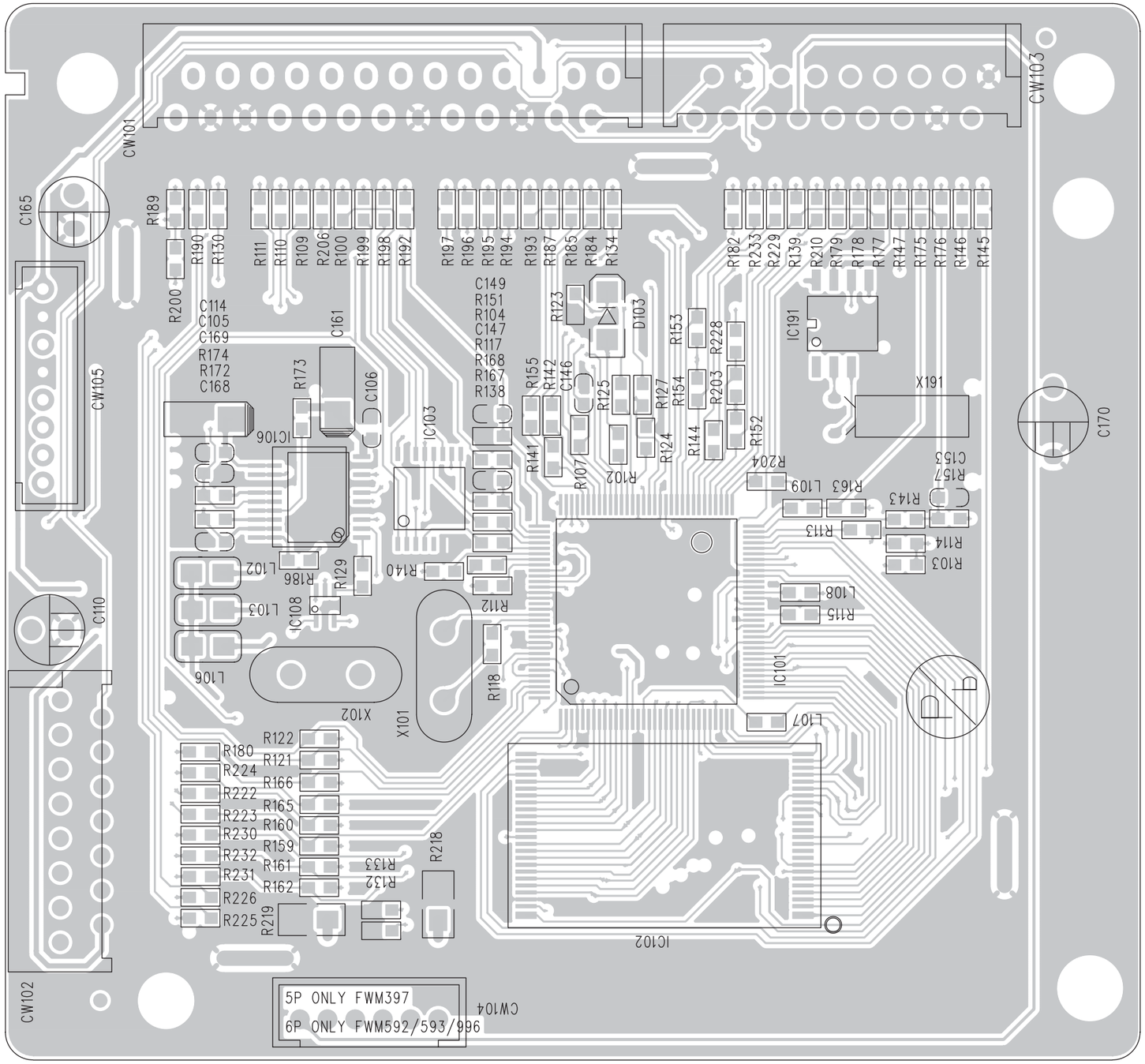
8-1

CIRCUIT DIAGRAM - MCU BOARD



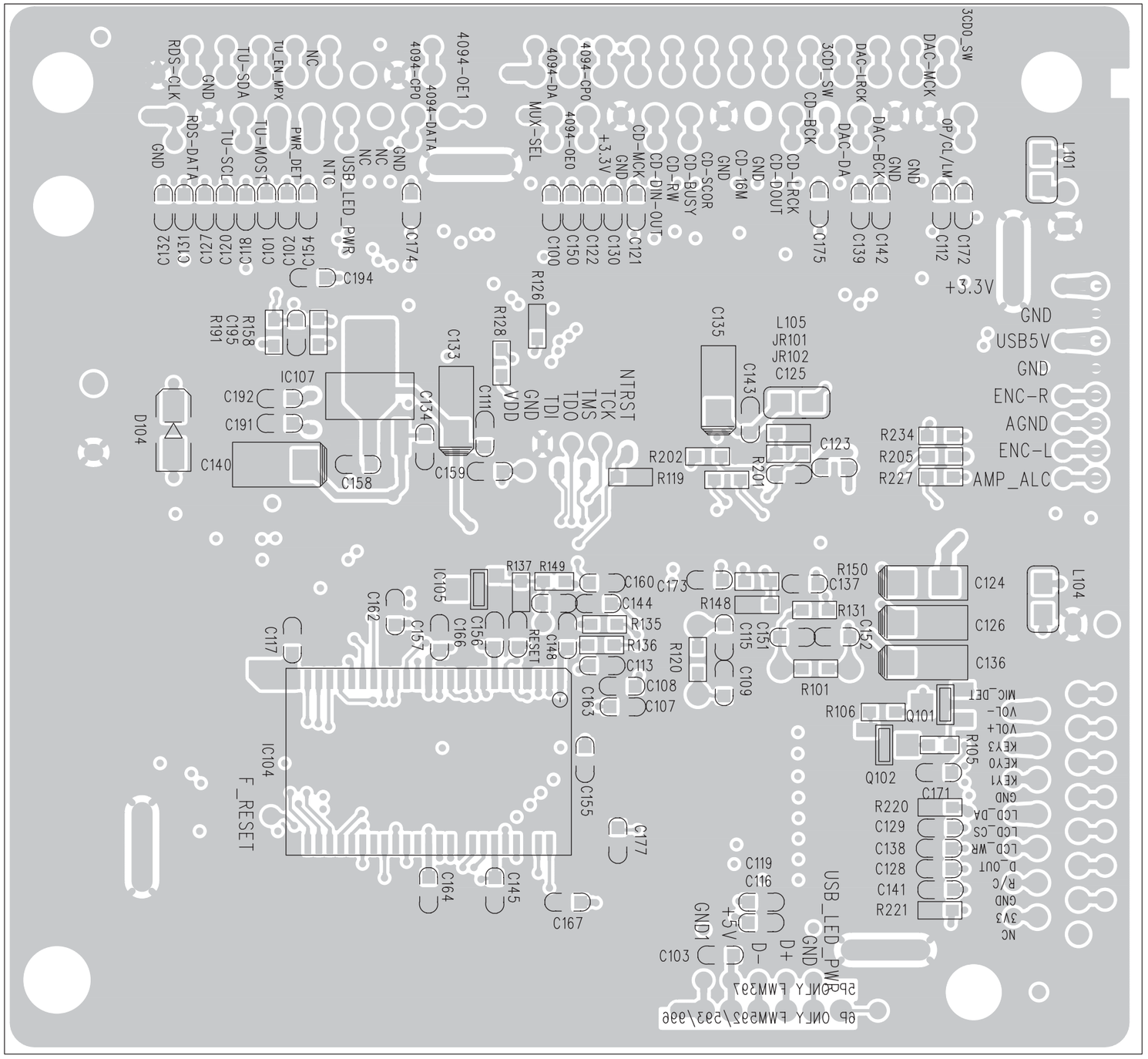
8-2

LAYOUT DIAGRAM - MCU BOARD
TOP SIDE



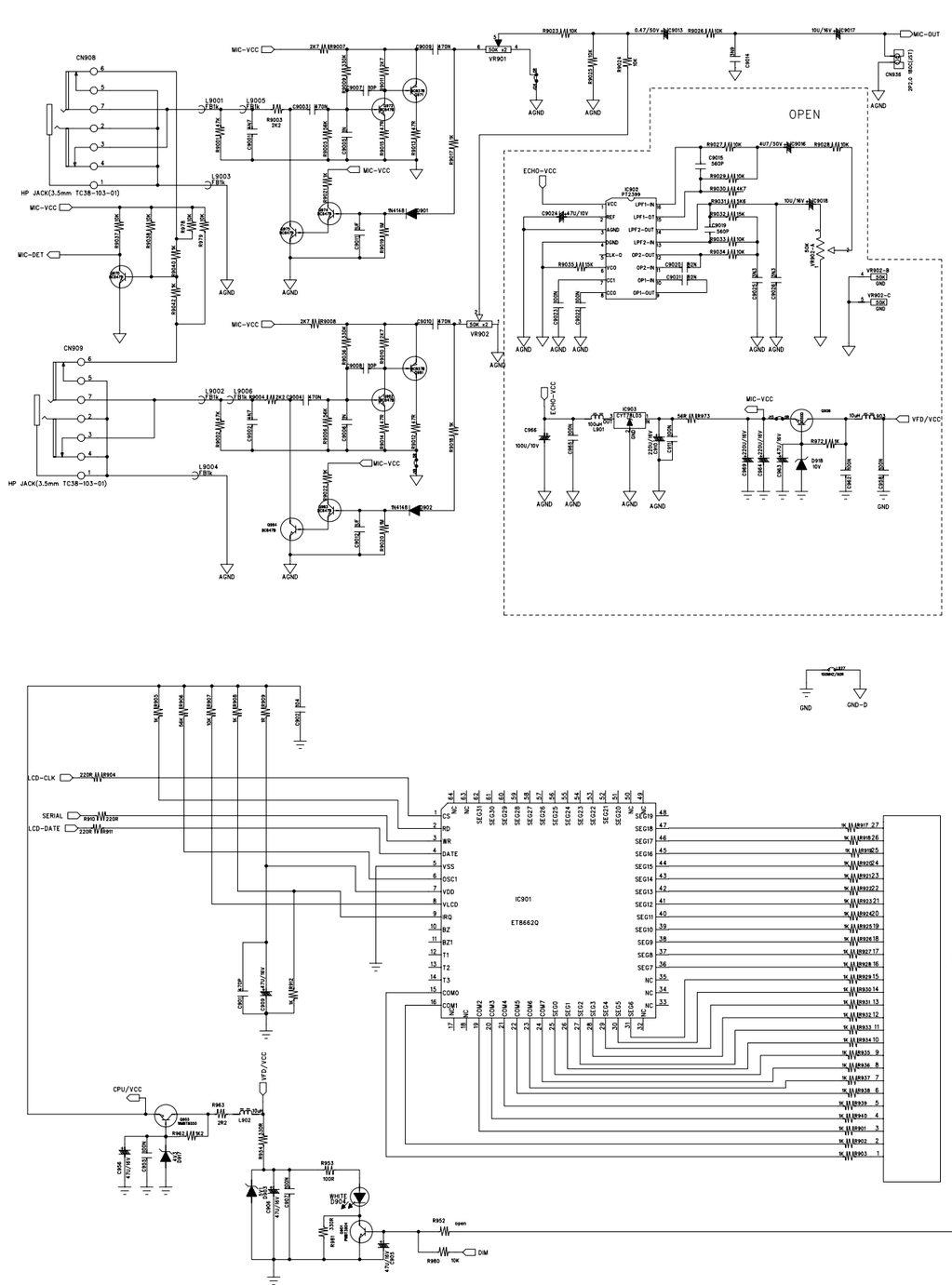
8-3

LAYOUT DIAGRAM - MCU BOARD
BOTTOM SIDE



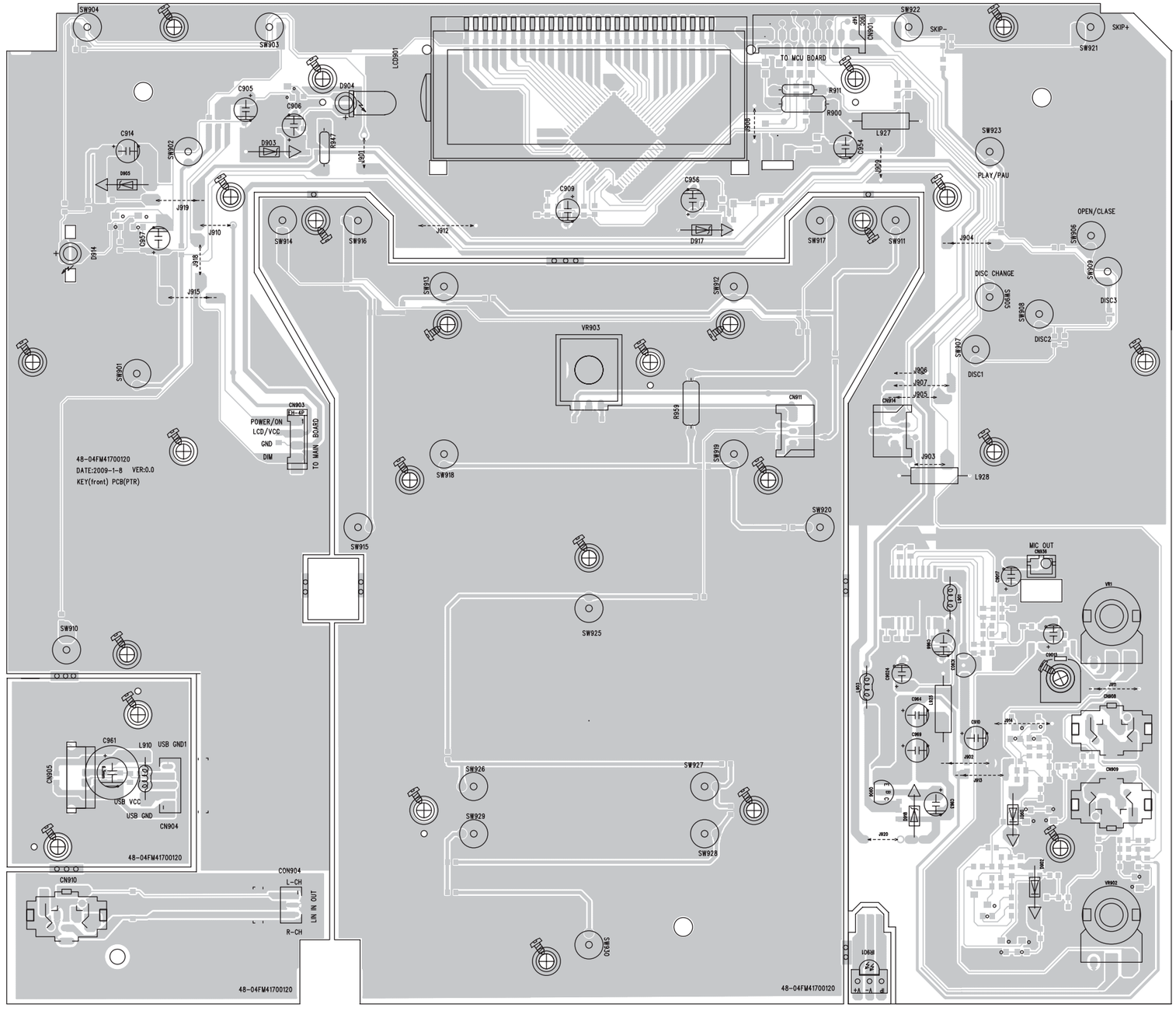
9-1

CIRCUIT DIAGRAM - DISPLAY BOARD



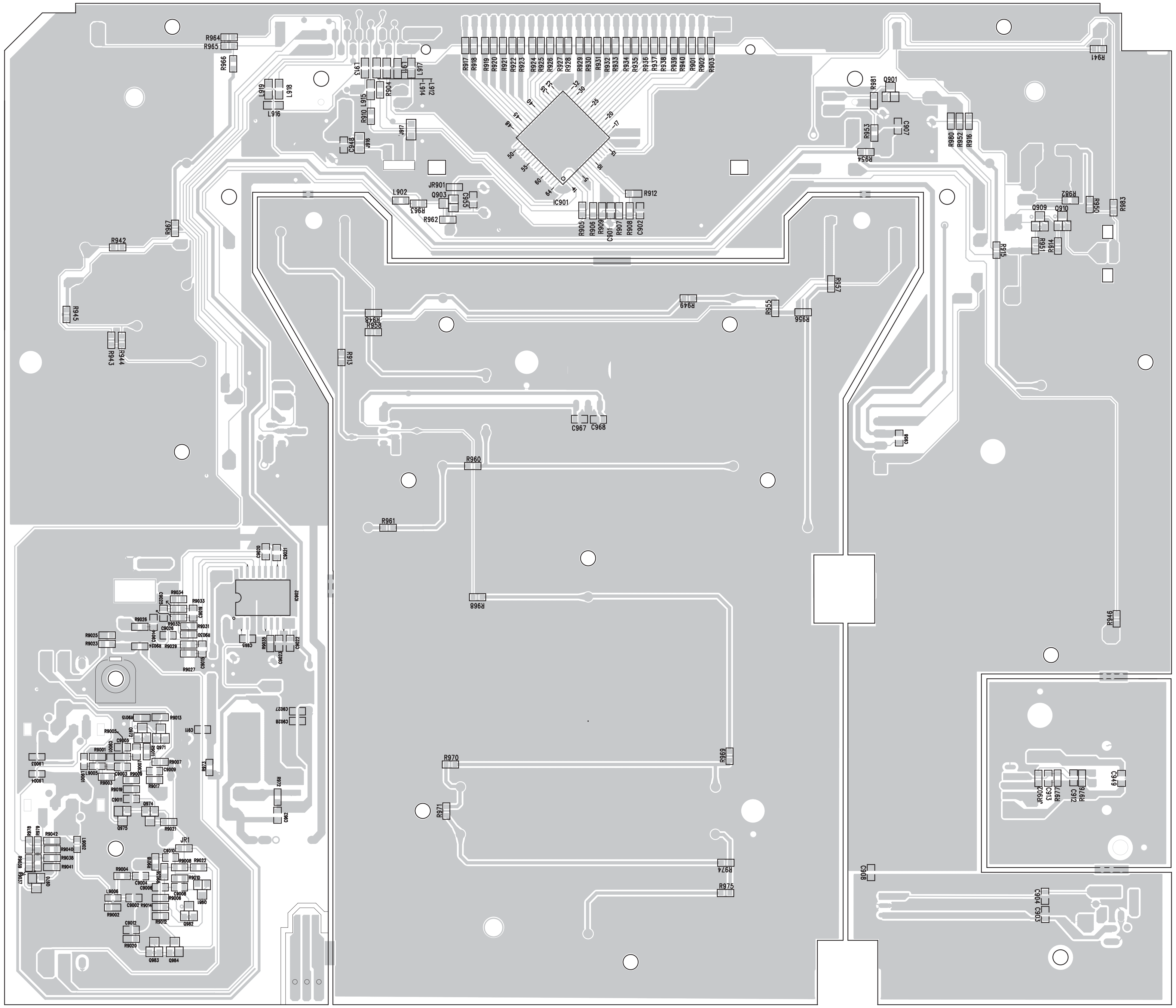
9-2

LAYOUT DIAGRAM - DISPLAY BOARD
TOP SIDE



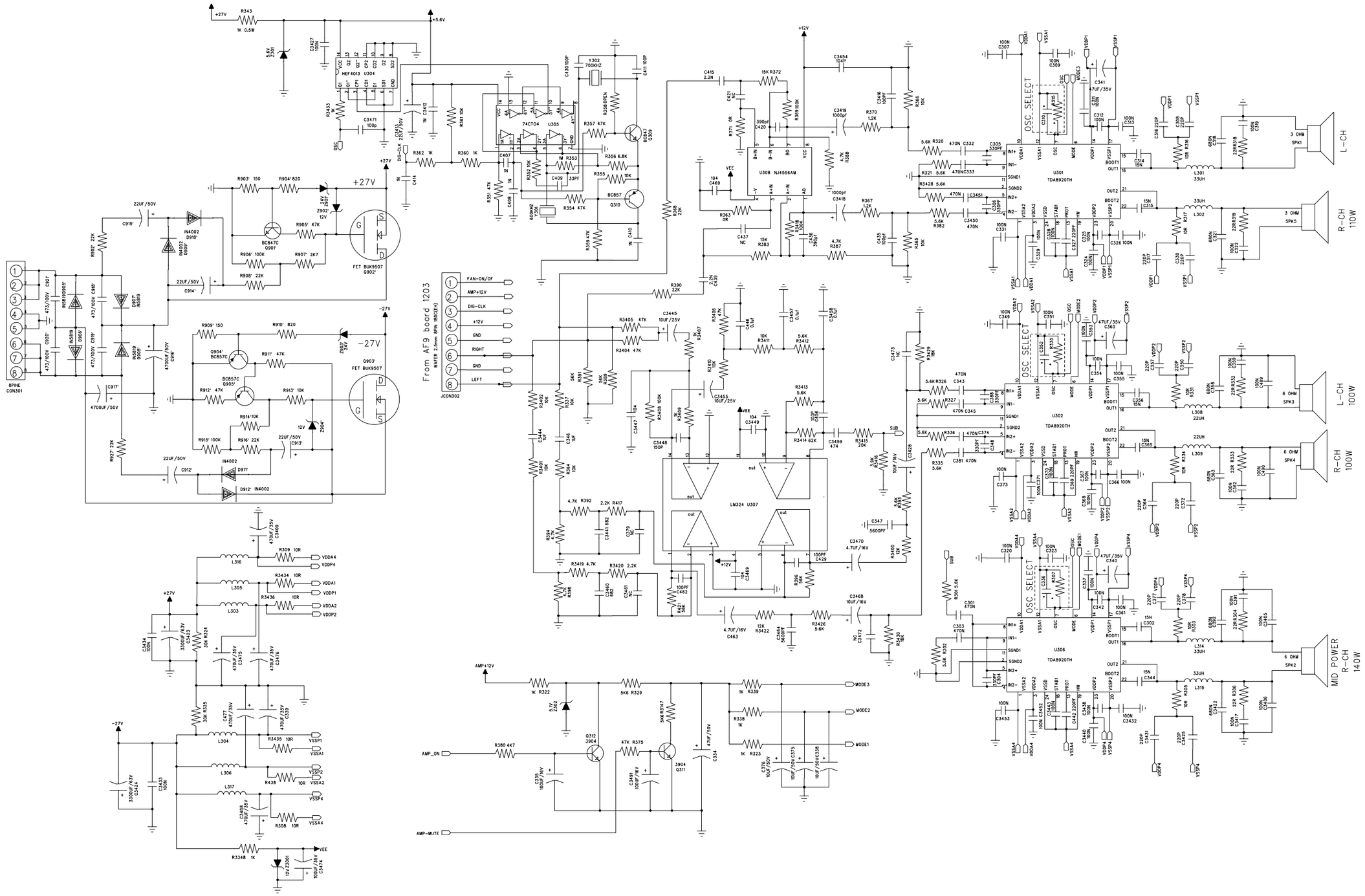
9-3

LAYOUT DIAGRAM - DISPLAY BOARD
BOTTOM SIDE



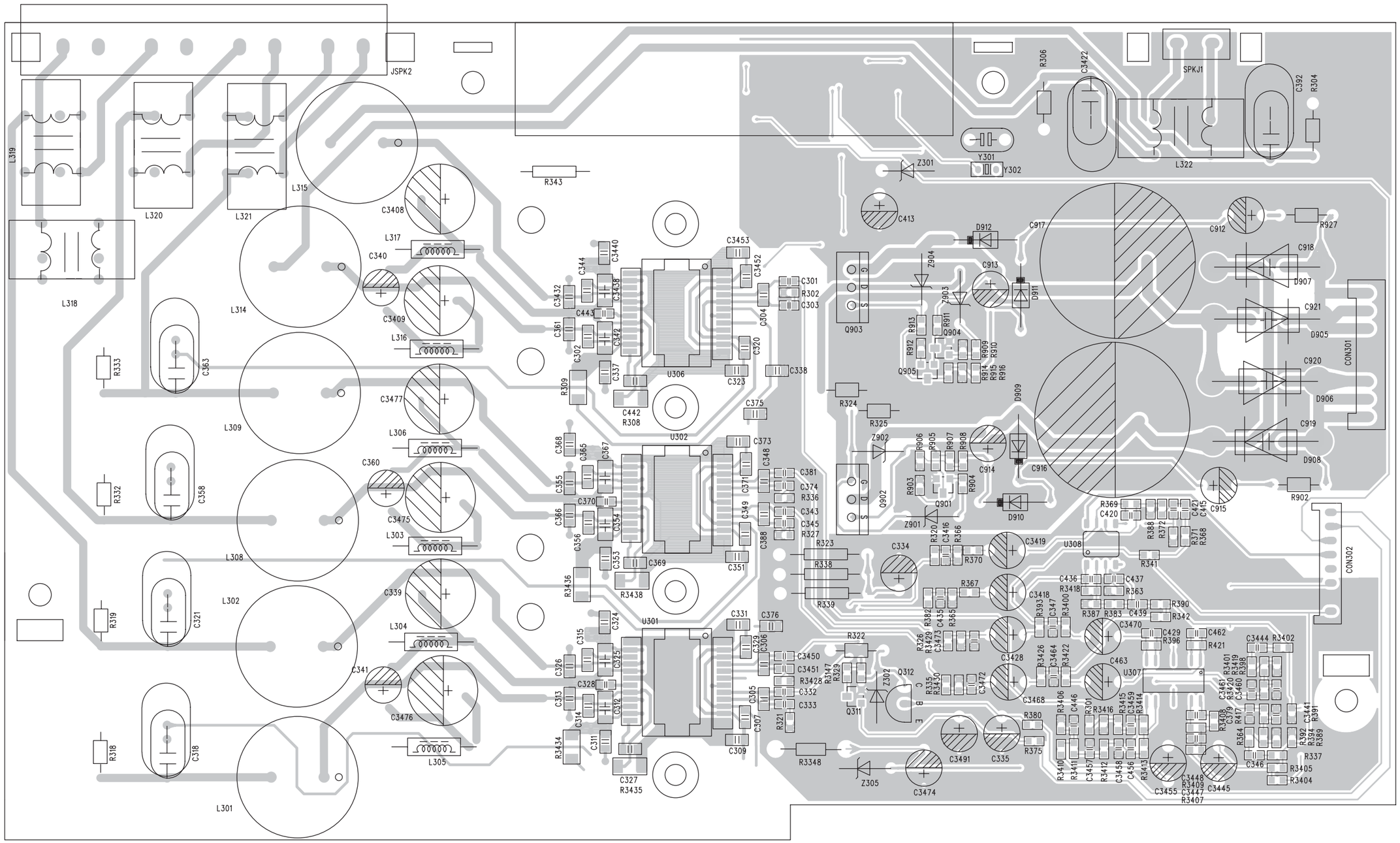
10-1

CIRCUIT DIAGRAM - AMP BOARD



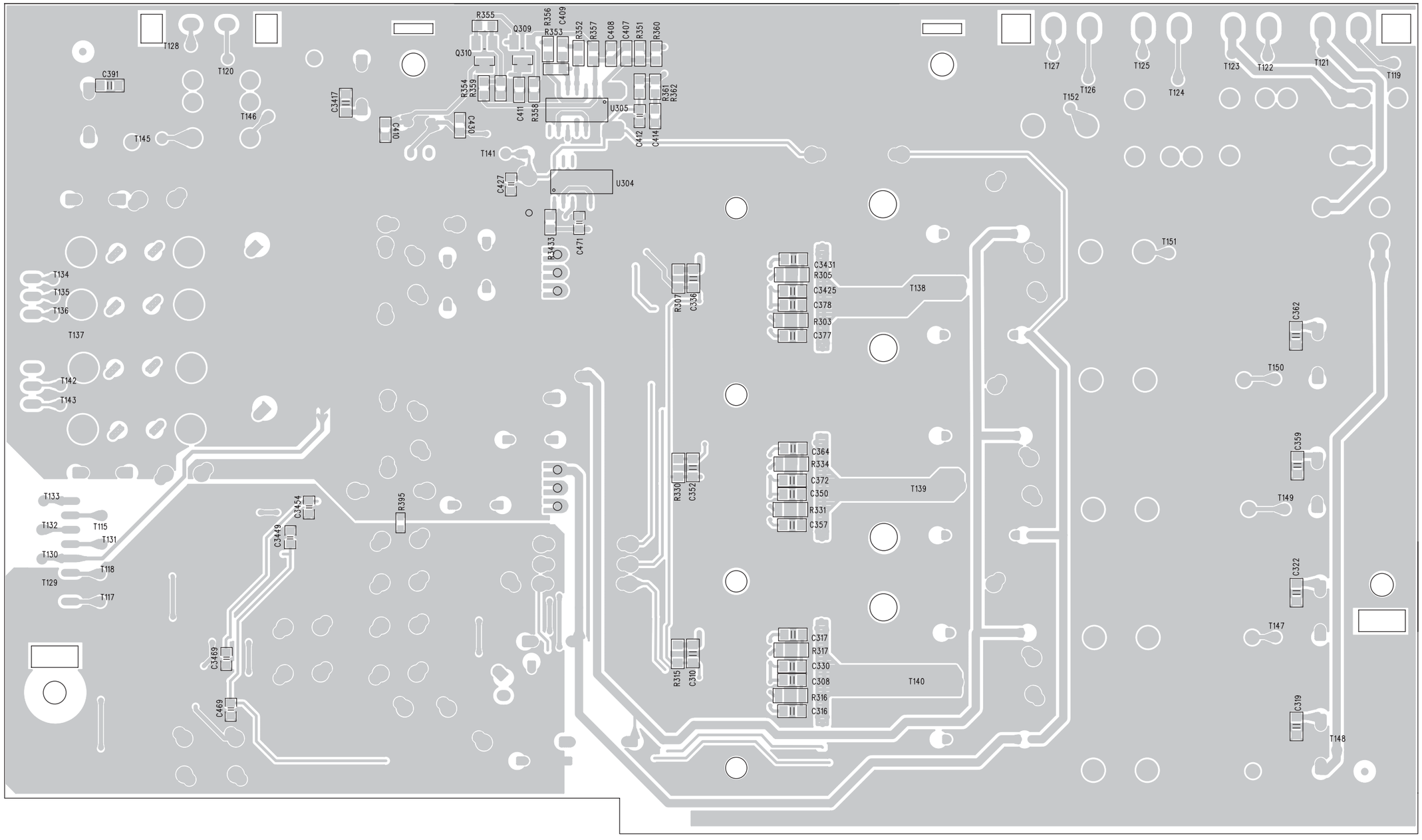
10-2

LAYOUT DIAGRAM - AMP BOARD
TOP SIDE



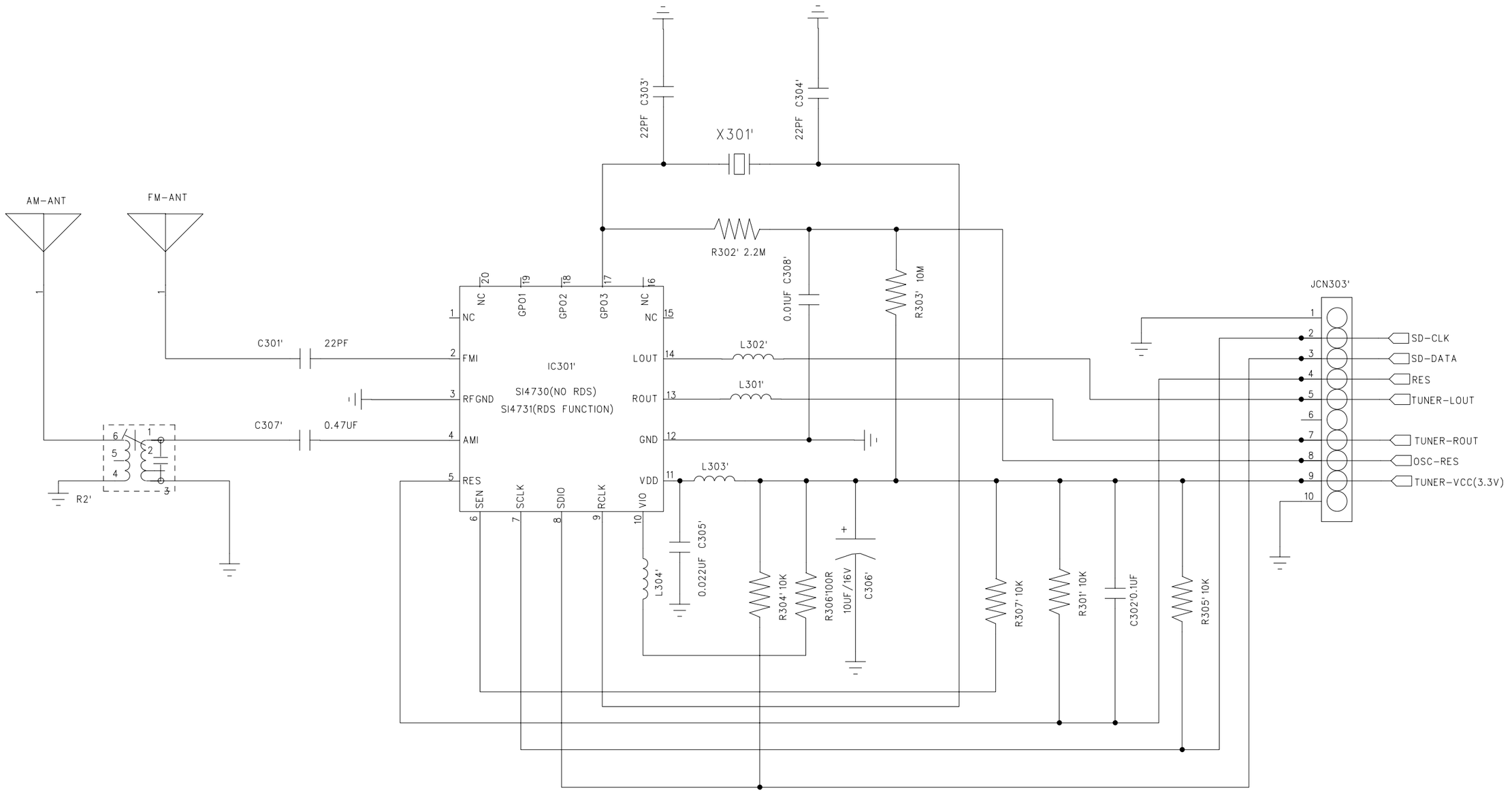
10-3

LAYOUT DIAGRAM - AMP BOARD
BOTTOM SIDE



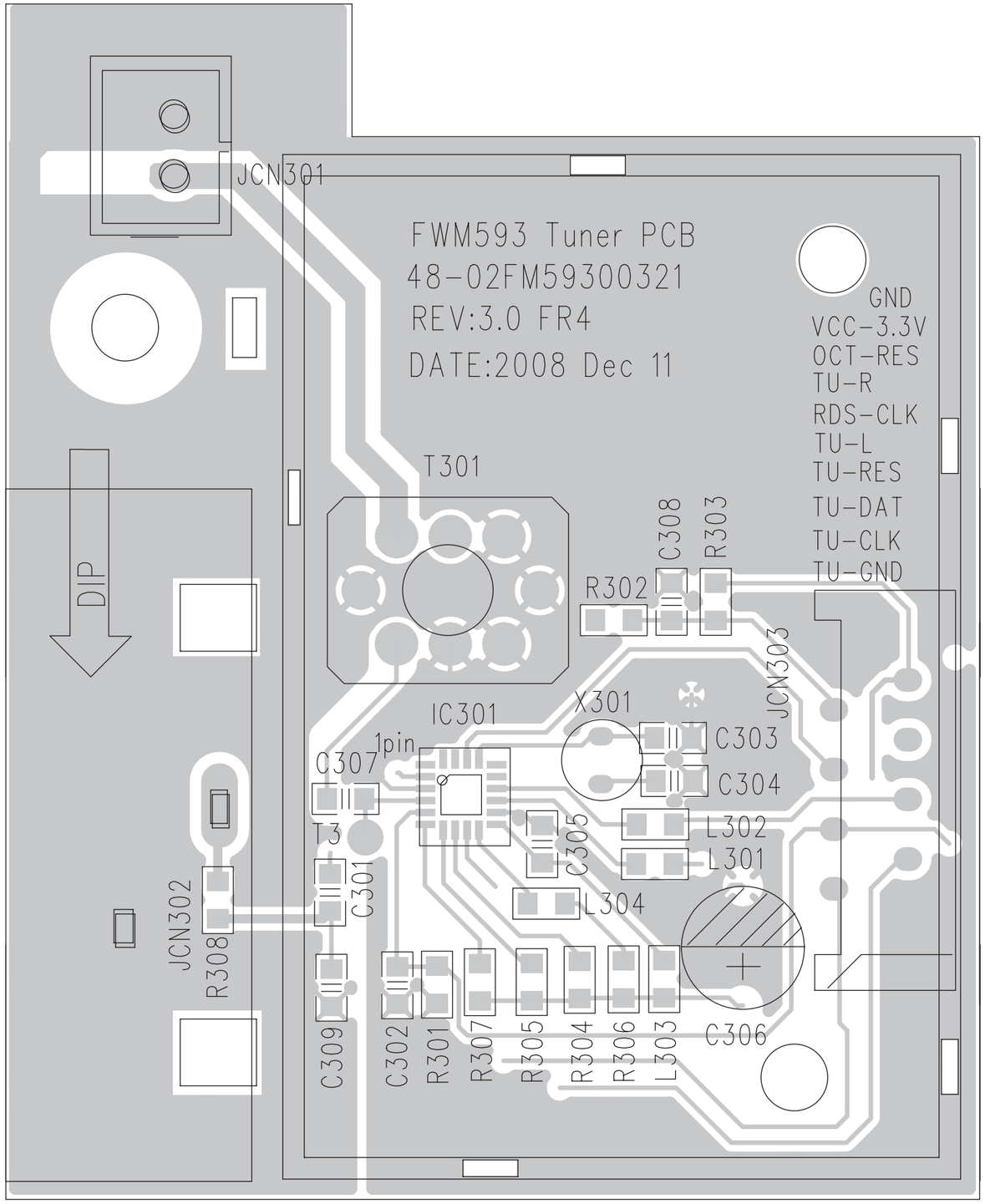
11-1

CIRCUIT DIAGRAM - TUNER BOARD



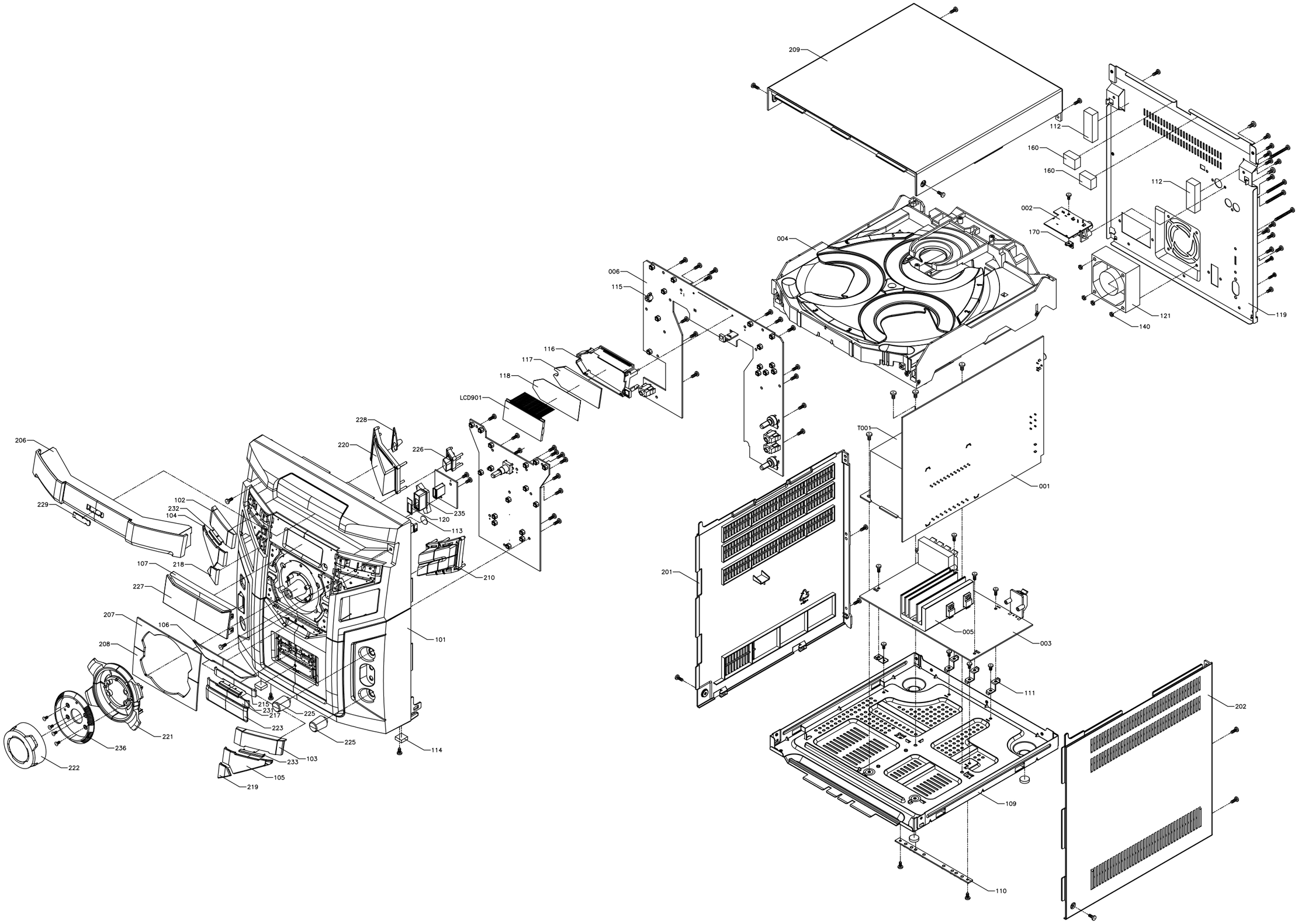
11-2

LAYOUT DIAGRAM - TUNER BOARD



12 - 1

EXPLODED VIEW DIAGRAM



MECHANICAL PARTSLIST

082	994000003669	CD MECHANISM (SANYO) DA11VF
101	996510022972	FRONT CABINET
102	996510014310	MAGNET 27x16x4mm 546g
102	996510015489	ALBUM BUTTON
103	996510015490	TITLE BUTTON
104	996510015491	STOP BUTTON
105	996510015492	PLAY BUTTON
106	996510022984	USB REC BUTTON
107	996510022968	DISPLAY TOP BAR
110	996510014336	SPRING-GUIDING
111	996510014337	SPRING-DISC
201	994000001276	PANEL LEFT
202	994000001277	PANEL RIGHT
206	996510022977	3CDC DOOR
207	996510022978	COSMETIC COVER UP
208	996510022974	COSMETIC COVER DOWN
209	994000001285	TOP COVER
210	996510015502	CD BUTTON
215	996510014357	JAZZ-POP BUTTON
217	996510014361	ROCK-CLASSIS BUTTON
218	996510015493	MODE BUTTON
219	996510015494	PROGRAM BUTTON
220	996510015495	POWER BUTTON
221	996510015498	CLUSTER BUTTON
222	996510022973	VOL KNOB
223	996510022975	MAX SOUND BUTTON
225	996510020805	MIC KNOB
226	996510020806	USB DELETE BUTTON
227	996510014362	DISPLAY LENS (PMMA)
228	996510014363	POWER LIGHT GUIDE
229	996510000439	PHILIPS LOGO
231	996510014365	MIDDLE STRAP OF SOUND BUTTON
232	996510015500	MIDDLE STRAP L
233	996510015501	MIDDLE STRAP R
235	996510021305	USB RING
236	996510021316	VOL RING
004	996510025032	3CD MECHA PART DA11VF(NO PCBA)
8001	994000004487	16P FFC 1MM L=170MM
8003	994000004457	5P FFC L=200MM(AA)
J002	996510015477	26P FFC.1.25mm L=80mm
T001	⚠ 996510022981	TRANSFORMER EI86xS65 127/240V
J013	996500039522	4P FFC CABLE 1.25mm L=270mm
J014	996510016102	9P FFC.1.25mm L=80mm
J015	994000002431	FFC CABLE 10P L=120MM
J016	996510016103	14P FFC.1.25mm L=180mm
J017	996510015486	18P FFC.1.25mm L=150mm
J018	996500040407	18P FFC 1.25mm L=130mm

Note: Only these parts mentioned in the list are normal service parts.

ACCESSORIES

S001		996510022982	SINGLE SPEAKER BOX L/R
S002		996510022971	SUBWOOFER BOX
0006		996510020798	REMOTE CONTROL
J010	⚠	996500037714	AC CORD SET VDE/BRAZIL APP 1.8
J011		996510009429	FM ANT (GREY) 1.5M CE/75
J012		996510002103	CONN. CORD 3.5 ST/PLUGx2 500mm
J013	⚠	994000001478	AC PLUG ADAPTOR
201		996510016101	AM LOOP ANTENNA

Note: Only these parts mentioned in the list are normal service parts.

ELECTRICAL PARTSLIST

MAIN BOARD ASSEMBLY

C910	996510022979	E.CAP 4700UF 25V +-20% 85C
C927	994000001225	SAFETY CAP 275V 0.22UF -20%
CN606	994000001221	V/RCA JACK 2P
F901	⚠ 994000001223	FUSE RADIAL T5A 250V
F902	⚠ 996510002426	CERAMIC FUSE 3.9x10.5mmW
F903	⚠ 996510002426	CERAMIC FUSE 3.9x10.5mmW
F904	⚠ 994000000586	GLASS FUSE W/LEAD 3.15A/250V
IC601	996510005250	IC TDA7468D
IC602	994000001201	IC NJM4556AM
IC603	996510018852	IC UTC7808
IC606	996510018962	IC UTC7805
IC607	994000001247	IC HEF4094BT
IC608	994000001247	IC HEF4094BT
IC609	994000001201	IC NJM4556AM
J001	996510014304	AC SOCKET UL APP
L900	994000001226	AC LINE FILTER IND. 400UH 3A
Q315	996510006580	SMD TRANSIST BC847C
Q605	994000004145	TRANSISTORS B772Y (160-320)
Q609	994000004145	TRANSISTORS B772Y (160-320)
SW901	994000001323	SWITCH
U901	996510016090	IC AP1117E33L-13

AMP BOARD ASSEMBLY

JSPK1	996510016371	SPK JACK
JSPK2	996510016097	SPK JACK 8P PT-24V11A
Q902	994000004545	TRANSISTORS BUK9507-30B
Q903	994000004545	TRANSISTORS BUK9507-30B
U301	996510003980	IC TDA8920(SOT566-3) 2X100W
U302	996510003980	IC TDA8920(SOT566-3) 2X100W
U304	996500042457	IC HEF4013BT
U305	996500042456	IC 74HCT04D SOP14
U306	996510003980	IC TDA8920(SOT566-3) 2X100W
U307	996500039808	IC SM LM324D
U308	994000001201	IC NJM4556AM
Y301	996500042460	CERAMIC RESONATOR 600KHz
Y302	996500042461	CERAMIC RESONATOR 700KHz

CD BOARD ASSEMBLY

IC501	996510009311	IC BU9543KV (SMD)
IC502	996510009310	IC BA5826FP
IC505	994000001247	IC HEF4094BT
SW501	994000004552	DETECT SWITCH
SW502	994000004552	DETECT SWITCH
SW503	994000004552	DETECT SWITCH
SW504	994000004552	DETECT SWITCH
U532	996510003998	IC TDA7073A/N4

ELECTRICAL PARTSLIST

DISPLAY BOARD ASSEMBLY

CN905	996510000344	USB SOCKET
CN908	994000001244	V/PHONE JACK 3.5MM
CN909	994000001244	V/PHONE JACK 3.5MM
CN910	994000001244	V/PHONE JACK 3.5MM
D904	996510021295	LED LAMP 5mm
D914	996510000438	LED LAMP
IC901	996510020783	IC ET8862Q
IR901	994000000325	OPTIC SENSER (OPTO..)
LCD901	996510014305	LCD DISPLAY
SW901	994000001243	TACT SWITCH
SW902	994000001243	TACT SWITCH
SW903	994000001243	TACT SWITCH
SW904	994000001243	TACT SWITCH
SW905	994000001243	TACT SWITCH
SW906	994000001243	TACT SWITCH
SW907	994000001243	TACT SWITCH
SW908	994000001243	TACT SWITCH
SW909	994000001243	TACT SWITCH
SW910	994000001243	TACT SWITCH
SW911	994000001243	TACT SWITCH
SW912	994000001243	TACT SWITCH
SW913	994000001243	TACT SWITCH
SW914	994000001243	TACT SWITCH
SW915	994000001243	TACT SWITCH
SW916	994000001243	TACT SWITCH
SW917	994000001243	TACT SWITCH
SW918	994000001243	TACT SWITCH
SW919	994000001243	TACT SWITCH
SW920	994000001243	TACT SWITCH
SW921	994000001243	TACT SWITCH
SW922	994000001243	TACT SWITCH
SW923	994000001243	TACT SWITCH
SW925	994000001243	TACT SWITCH
SW926	994000001243	TACT SWITCH
SW927	994000001243	TACT SWITCH
SW928	994000001243	TACT SWITCH
SW929	994000001243	TACT SWITCH
SW930	994000001243	TACT SWITCH
VR1	996510003986	ROTARY VOLUME
VR902	996510003986	ROTARY VOLUME
VR903	996510021317	ROTARY ENCODER

ELECTRICAL PARTSLIST

MCU BOARD ASSEMBLY

IC101	996510015478	IC BX8800
IC102	996510009337	IC SST39VF800A-70 8M 3.3V TSOP
IC103	996510001318	IC 74LVC157APW
IC104	996510020772	IC SI636165TS
IC105	996510022969	IC HWD809R 2.63V
IC106	996510015480	IC WM8782SEDS
IC107	996510009335	IC LM1117S-1.8V SOT-223
IC108	996510015479	IC 74LVC2G04GW
IC191	996510015481	IC HT1381
X101	996510008326	CRYSTAL 12 MHzHC-49/US H=3.5mm
X102	996510015482	CRYSTAL 11.2896MHz
X191	996510012559	CRYSTAL 32.768KHZ

TUNER BOARD ASSEMBLY

IC301	996510022983	IC SI4730
JCN302	994000001353	COAXIAL JACK IF-01A
T301	996510000886	AM ANT BLACK 7mm 7M4A1951X
X301	996500042441	X'TAL 32.768KHZ -20PPM

Note: Only these parts mentioned in the list are normal service parts.